

Service Manual

Panasonic **VHS**
PAL

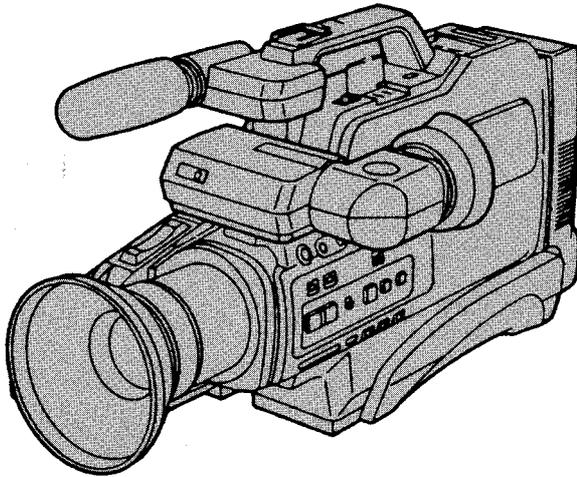
HQ

VHS Movie

NV-M40^E_A

NV-M3000^{EN}_{EM}

NV-M3300MC



SPECIFICATIONS/ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ

TECHNICAL INFORMATION/ТЕХНИЧЕСКАЯ ИНФОРМАЦИЯ

ADJUSTMENT PROCEDURES/ПРОЦЕДУРЫ РЕГУЛИРОВКИ

BLOCK DIAGRAMS & SCHEMATIC DIAGRAMS/БЛОК-СХЕМЫ И ПРИНЦИПИАЛЬНЫЕ СХЕМЫ

CCD drive block diagram/блок-схема управления ПЗС матрицы

Auto focus block diagram/блок-схема автоматической фокусировки

Process block diagram/блок-схема обработки видеосигнала

Power block diagram/ блок-схема электропитания

System control & servo block diagram/блок - схема системы управления и сервопривода

Luminance/chrominance & head AMP block diagram/блок-схема каналов яркости/цветности и

усилителя видеоголовок

CCD drive schematic diagram/принципиальная схема управления ПЗС матрицы

Process, camera operation & CCD unit schematic diagram/принципиальная схема обработки

видеосигнала, выбора режимов работы и блока ПЗС матрицы

Auto focus schematic diagram/принципиальная схема автоматической фокусировки

EVF schematic diagram/принципиальная схема видоискателя

Power schematic diagram/принципиальная схема электропитания

System control & servo schematic diagram/принципиальная схема системы управления и

сервопривода

Sub servo schematic diagram/принципиальная схема сервопривода

Luminance/chrominance & head AMP schematic diagram/принципиальная схема каналов яркости/

цветности и усилителя видеоголовок

Audio schematic diagram/принципиальная схема аудиоусилителя

AV jack (A) schematic diagram/принципиальная схема аудио/видео разъема (A)

AV jack (B) schematic diagram/принципиальная схема аудио/видео разъема (B)

VTR operation schematic diagram/принципиальная схема блока управления видеомэгнитофоном

Circuit board layout/размещение монтажных плат

Interconnection schematic diagram/схема соединений

EXPLODED VIEWS & PARTS LIST/СБОРОЧНЫЕ ЧЕРТЕЖИ И СПИСКИ ЗАПАСНЫХ ЧАСТЕЙ

VTR mechanism section (1)/механизм видеомэгнитофона (секция 1)

VTR mechanism section (2)/механизм видеомэгнитофона (секция 2)

Camera lens section/модуль оптики

Frame & casing parts section (1)/корпус и шасси (секция 1)

Frame & casing parts section (2)/корпус и шасси (секция 2)

EVF section/видоискатель

Packing parts & accessories section (NV-M40E/A, NV-M3000EN, NV-M3300MC)/упаковочные материалы и принадлежности (NV-M40E/A, NV-M3000EN, NV-M3300MC)

Packing parts & accessories section (NV-M3000EM)/упаковочные материалы и принадлежности (NV-M3000EM)

Mechanical replacement parts list/список механических запасных частей

Electrical replacement parts list/список электрических запасных частей

Panasonic

SPECIFICATIONS

ITEM	SPECIFICATION	ITEM	SPECIFICATION
POWER	Source: BATTERY; DC 12V Consumption; Recording mode; 8.7W (Battery operation) 17.8W (with Zoom Auto Light)	VIDEO	HEADS: 4 rotary heads, 1 fling erase head
			OUTPUT: PHONO CONNECTOR; 1.0Vp-p 75Ω unbalanced
VIDEO RECORDING SYSTEM	4 rotary heads, helical scanning system PAL	AUDIO	HEAD: 1 Stationary head (Normal Audio)
TAPE FORMAT	VHS-C Cassette Tape (Tape width 12.7mm)		INPUT: MIC IN (M3); -70dB, 4.7kΩ unbalanced
TAPE SPEED	23.39mm/s Record/Playback Time 240min. with NV-E240 FF/REW Time less than 12min. with NV-E180		OUTPUT: PHONO CONNECTOR; -8dB, 47kΩ loaded EARPHONE JACK (M3); -28dB, 8Ω unbalanced
		WEIGHT	Approx. 2.6kg (without Battery Pack)
		DIMENSIONS	230(W) × 245(H) × 459(D)mm
CAMERA	PICK-UP ELEMENT: CCD (Charge Coupled Device)	STANDARD ACCESSORIES	1 pc. AC Adaptor 1 pc. Battery Pack 1 pc. Shoulder Strap 1 pc. AV Output Cable 1 pc. DC Input Cable 1 pc. RF Adaptor (NV-M40A) 1 pc. Auto Light 1 pc. Battery Pack Charging Connector 1 pc. System Carrying Case (NV-M3000EM)
	STANDARD ILLUMINATION: 1,400 lux		
	MINIMUM REQUIRED ILLUMINATION: 1 lux		
	LENS: Built-in 8 : 1 2-Speed Power Zoom Lens with Digital AI Auto Focus, Auto Iris, Manual/Auto Focus System, F1.4 (5~40mm), Filter Diameter 49mm		
	IMAGE SENSOR: 1/3 inch CCD Image Sensor		
	VIEW FINDER: 0.7" Electric View Finder		

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

Technical Information

Service caution

1-1. Service Extension Cables

Use the following extension cables when checking or adjusting the individual circuit boards.

	PART NBR	PART NAME	CONNECTION	Q'TY
1	VFK0667	30 PIN EXTENSION CABLE	MAIN C.B.A. B3001~PROCESS C.B.A. B302	1
2	VFK0724	32 PIN EXTENSION CABLE	SENSOR C.B.A. B201~PROCESS C.B.A. B301	1
3	VFK0783	12 PIN EXTENSION CABLE	CCD UNIT~SENSOR C.B.A. B202	1
4	VFK0802	24 PIN FLAT CABLE	LENS UNIT~PROCESS C.B.A. FP701	1
5	VFK0823	6 PIN FLAT CABLE	PROCESS C.B.A. FP301~CAMERA OPERATION C.B.A. FP6701	1

How to use extension cables.

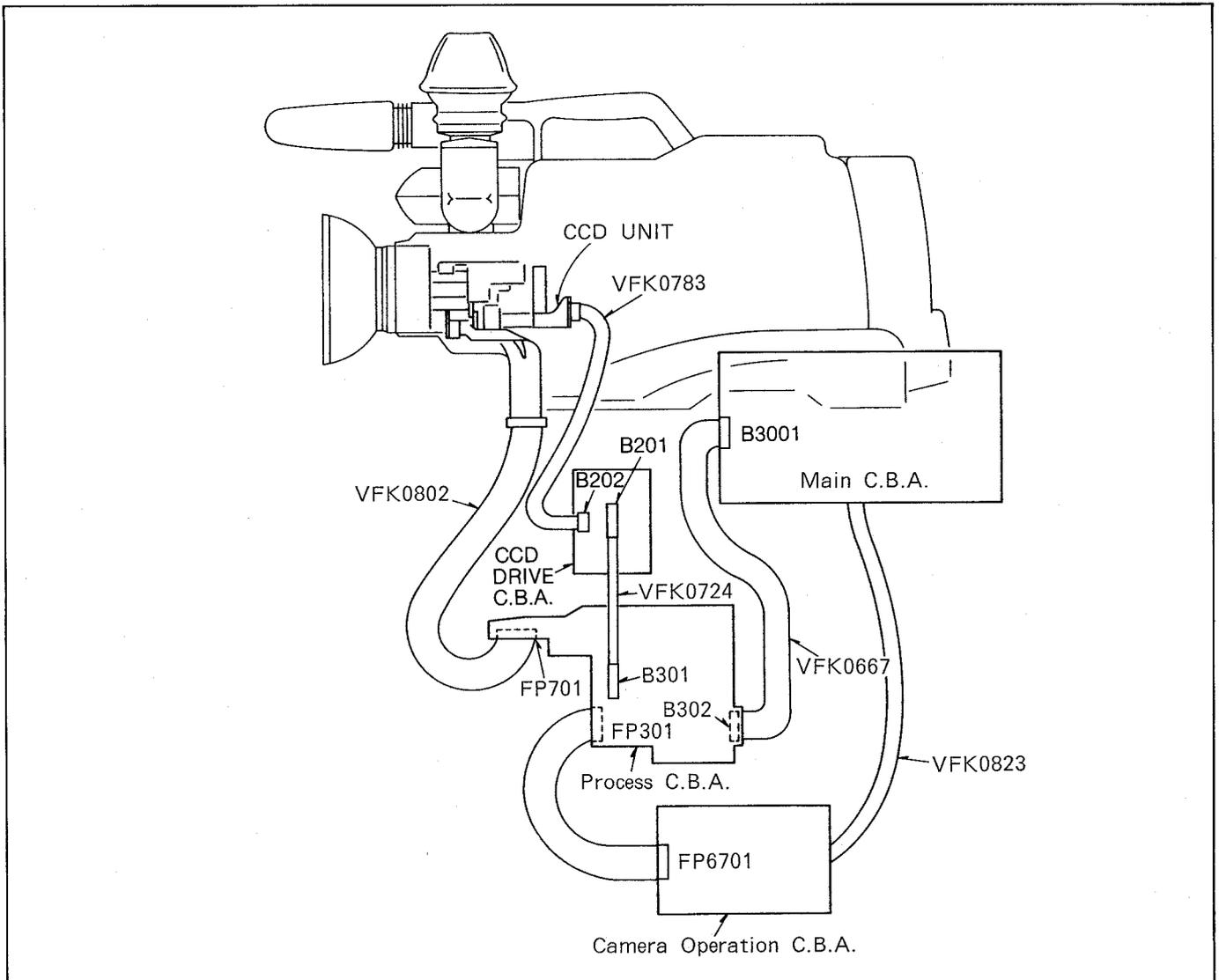
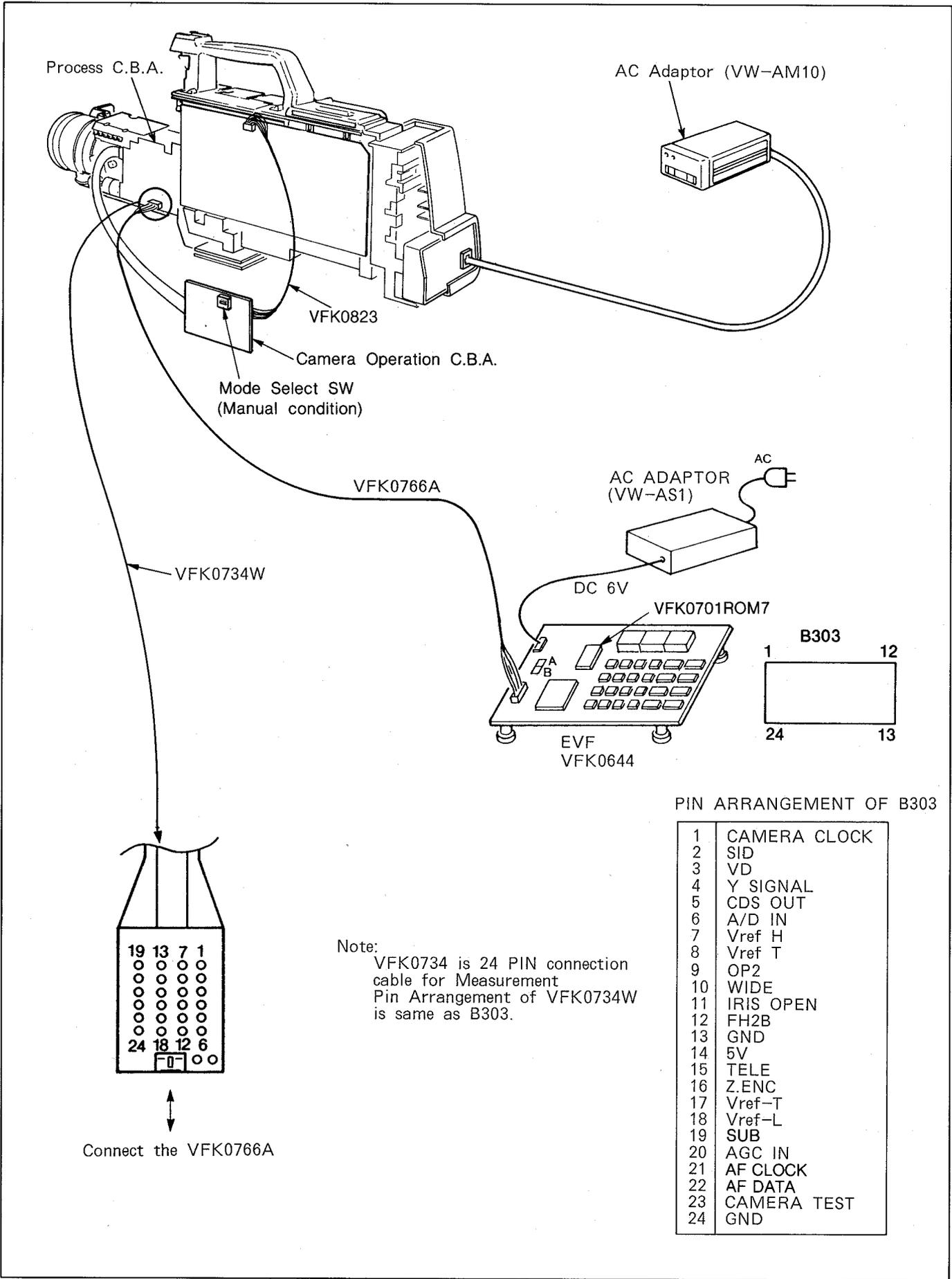


Fig. T1



Process C.B.A.

AC Adaptor (VW-AM10)

VFK0823

Camera Operation C.B.A.

Mode Select SW
(Manual condition)

VFK0766A

VFK0734W

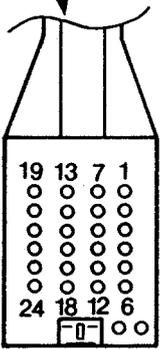
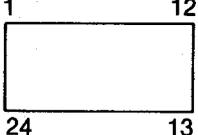
AC ADAPTOR
(VW-AS1)

DC 6V

VFK0701ROM7

B303

EVF
VFK0644



Connect the VFK0766A

Note:
VFK0734 is 24 PIN connection
cable for Measurement
Pin Arrangement of VFK0734W
is same as B303.

PIN ARRANGEMENT OF B303

1	CAMERA CLOCK
2	SID
3	VD
4	Y SIGNAL
5	CDS OUT
6	A/D IN
7	Vref H
8	Vref T
9	OP2
10	WIDE
11	IRIS OPEN
12	FH2B
13	GND
14	5V
15	TELE
16	Z.ENC
17	Vref-T
18	Vref-L
19	SUB
20	AGC IN
21	AF CLOCK
22	AF DATA
23	CAMERA TEST
24	GND

Fig. T2

1-2. New ROM IC for EVR fixture.

We are pleased to introduce the new ROM IC (VFK0701ROM7) for EVR fixture that we developed to adjust this Movie Camera.

This ROM IC will provide you with many superior features as automatic calculation of auto white balance and/or colour reproduction and more.

We are also pleased to introduce the new connecting cables (VFK0766A & VFK0734W) for this Movie Camera and EVR Fixture (VFK0644).

Connections between this Movie Camera and EVR fixture are solderless when using the VFK0766A and VFK0734W.

Please refer to Fig.T3 for how to use the cables.

ROM NUMBER & availability	Applicable models & Function	PART NUMBER OF EVR CONNECTION CABLE
VFK0701ROM1 available	NV-MS70/NV-M810/NV-S1/NV-S100 (PAL & NTSC) ① General Adjustment for Camera unit ② Automatic Calculation for AWB & Colour Reproduction ③ Average Data Automatic rewriting	VFK0769
VFK0701ROM2 available	NV-S5/NV-S500 (PAL & NTSC) ① General Adjustment for Camera unit ② Automatic Calculation for AWB & Colour Reproduction ③ Average Data Automatic rewriting	VFK0730
VFK0701ROM3 available	NV-G1/G2/G3 (G100/G200/G300) & NV-MS95/MS950 (PAL ONLY) ① General Adjustment for Camera unit ② Automatic Calculation for AWB & Colour Reproduction ③ Average Data Automatic rewriting	VFK0699
VFK0701ROM4 available	NV-S7/S9 (NTSC ONLY) ① General Adjustment for Camera unit ② Automatic Calculation for AWB & Colour Reproduction ③ Average Data Automatic rewriting	VFK0766A
VFK0701ROM5 available	NV-S7/NV-S700/G220/G202 (PAL ONLY) ① General Adjustment for Camera unit ② Automatic Calculation for AWB & Colour Reproduction ③ Average Data Automatic rewriting	VFK0766A & VFK0734W (NV-S7/S700) VFK0699 (NV-G220/G202)
VFK0701ROM6 available	NV-T1 (NTSC ONLY) ① General Adjustment for Camera unit ② Automatic Calculation for AWB & Colour Reproduction ③ Average Data Automatic rewriting	VFK0766A & VFK0734W
VFK0701ROM7 available	NV-M40/NV-M3000/NV-M3300/(PAL ONLY) ① General Adjustment for Camera unit ② Automatic Calculation for AWB & Colour Reproduction ③ Average Data Automatic rewriting	VFK0766A & VFK0734W

2. Self-diagnostic system and service mode

2-1. General

This Movie camera has a self-diagnostic system which facilitates quick trouble shooting. Pressing the START/STOP Switch and Memory switch simultaneously, same time turn on the Power Switch, After that, unit into Service mode.

2-2. Service Mode

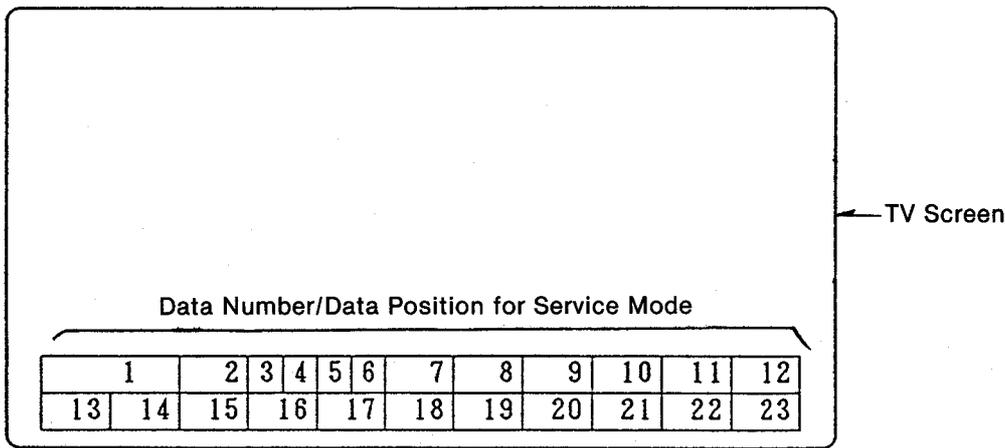
This Movie camera is possible to see RAM data of IC6004 on the TV screen or EVF.

How to read the RAM data is shown in Fig.T3. All data is displayed in the Hexadecimal Number. (letters and number 0 or F)

Note:

Pressing the START/STOP Switch and Memory switch simultaneously, same time turn on the power switch.

After that this Movie camera Shows data 1 to data 23 on TV screen as shown in Fig.T3-T11.



DATA NUMBER	DATA CONTENTS
1	Data Number 1 is position that indicates Motor conditions data
2~4	Not used
5	Data Number 5 is position that indicates Mechanism positions data
6	Data Number 6 is position that indicates tape condition
7	Data Number 7 is position that indicates key operation informations
8	Data Number 8 is position that indicates I/O condition of IC6004 PIN 118~PIN 125
9	Data Number 9 is position that indicates I/O condition of IC6004 PIN 7~PIN 14
10	Data Number 10 is position that indicates I/O condition of IC6004 PIN 29~PIN 37
11~12	Data Number 11~12 are position that indicates Battery Voltage level
13~14	Not used
15	Not used
16~23	Not used

Fig. T3

2-3. Detail of Data for Service Mode

- (1) Data Number 1:
If Data 1 indicate "CYL", There is possibility that cylinder Motor is locked up.

INDICATION AT POSITION 1	CONDITION OF MOTOR
TRL	REEL is locked up
UNLD	Unloading condition
LOAD	Loading condition
CYL	Cylinder Motor is locked up

Fig. T4

- (2) Data Number 5:
If Data 5 indicate "01", Mechanism is Eject position.

INDICATION AT POSITION 5	MECHANISM CONDITION
01	EJECT
02	EJECT
03	STOP
04	---
05	S-LOAD
06	---
07	PRE-PAUSE
08	---
09	PAUSE
0A	---
0B	REVIEW
0C	---
0D	PLAY

Fig. T5

- (3) Data Number 6:
If Data 6 indicate "A", There is possibility that sensor detect the tape end.

INDICATION AT POSITION 6	TAPE CONDITION
0	Normal condition
3	There is no video cassette inside
9	Detect the begining of Tape
A	Detect the Tape end

Fig. T6

(4) Data Number 7:
When the pushed STOP key, Data 7 indicate

INDICATION AT POSITION 7	KEY OPERATION
00	STOP
01	EJECT
02	REWIND
03	FF
04	REVIEW
05	CUE
06	PAUSE
08	REC
09	A. DUB
0A	PLAY
0C	F. ADV
54	COUNTER CLEAR
55	COUNTER MEMORY
57	OSD ON/OFF
67	DATE ON/OFF
9F	EDIT
B1	TRACKING UP
B2	TRACKING DOWN
B3	INSERT
CC	START/STOP
FF	NOP

Fig. T7

(5) Data Number 8:

INDICATION AT POSITION 8	I/O PORT CONDITION FOR I6004
80	Loading Command is output (PIN 125)
40	Unloading Command is output (PIN 124)
20	Not use
10	Audio Mute "H" is output (PIN 122)
8	Not use
4	Audio EE "H" is output (PIN 120)
2	Video EE "H" is output (PIN 119)
1	PB "L" is output (Pin 118)

Fig. T8

(6) Data Number 9

INDICATION AT POSITION 9	I/O PORT CONDITION FOR IC6004
80	SENSOR LED "L" Command is output (IC6004 PIN 14)
40	REMOCON LED "L" Command is output (IC6004 PIN 13)
20	TALLY LED "L" Command is output (IC6004 PIN 12)
10	POWER LED "L" Command is output (IC6004 PIN 11)
8	CYLINDER ON "L" Command is output (IC6004 PIN 10)
4	FULL ERASE ON Command is output (IC6004 PIN 9)
2	CAMERA P. ON Command is output (IC6004 PIN 8)
1	POWER ON Command is output (IC6004 PIN 7)

Fig. T9

(7) Data Number 10

INDICATION AT POSITION 10	I/O PORT CONDITION FOR IC6004
80	DC LIGHT ON Command is output (IC6004 PIN 37)
40	X. TAL ON Command is output (IC6004 PIN 36)
20	_____
10	_____
8	_____
4	_____
2	_____
1	_____

Fig. T10

(8) Data Number 11 and 12

INDICATION AT POSITION 11	INDICATION AT POSITION 12	BATTERY VOLTAGE LEVEL
00~03	10	Less than 10.5 Volt
04~0A	8	10.5~11.0 Volt
0B~0A	4	11.0~11.5 Volt
11~17	2	11.5~12.0 Volt
18~	1	More than 12.0 Volt

Fig. T11

SECTION 2 ADJUSTMENT PROCEDURES

2-1. DETAILED DISSEMBLY METHOD

1. REMOVAL OF SHOULDED PAD/LENS HOOD

- (1) Remove the 4 screws(A).
- (2) Pull the shoulder PAD.
- (3) Remove the Lens Hood.(By roatating counter-clockwise.)

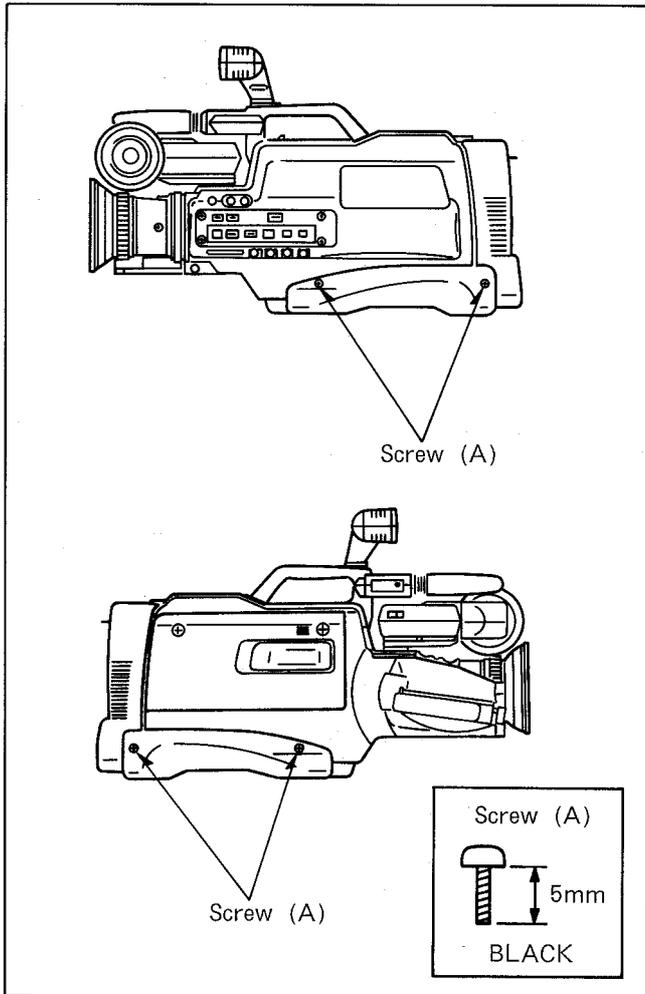


Fig. D1

2. REMOVAL OF CASSETTE COVER

- (1) Remove 2 Screws(B).
- (2) Pull the Cassette Cover straight up to remove.

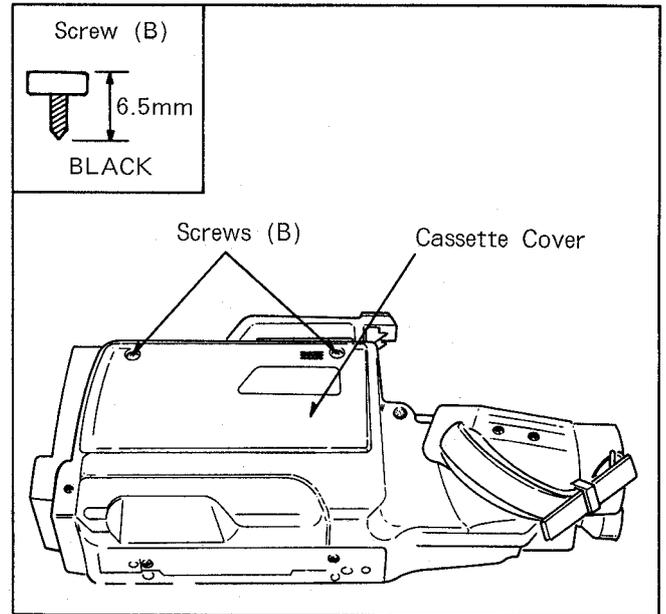


Fig. D2

3. REMOVAL OF THE MIC UNIT

- (1) Remove 4 Screws (C), (D) and (E).
- (2) Slide the MIC Unit in the direction shown by the arrow.
- (3) Disconnect the connector on the MIC Unit.

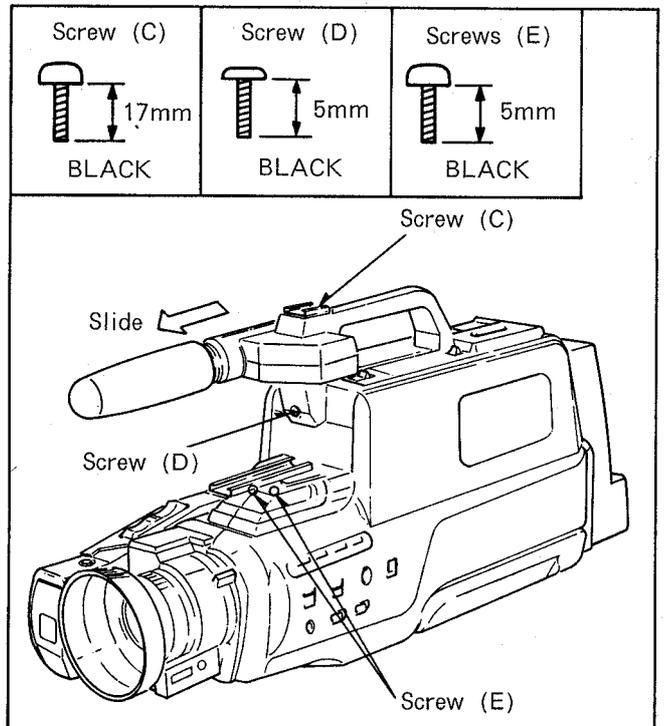


Fig. D3

4. REMOVAL OF SIDE CASE(R) UNIT

- (1) Remove 2 Screws(E) shown in Fig.D3.
- (2) Remove 7 Screws(F), 2 Screws(G).
- (3) Lift the side case(R) unit slightly.

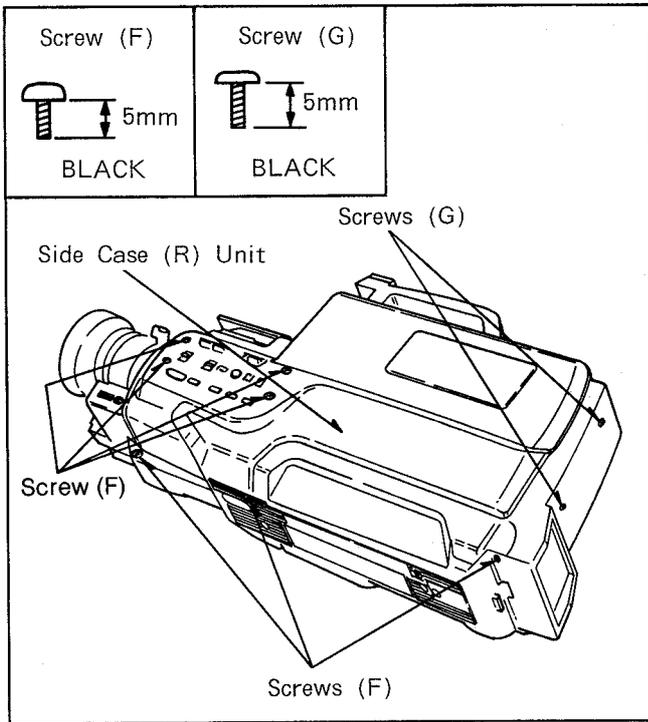


Fig. D4

5. REMOVAL OF SIDE CASE (L) UNIT

- (1) Remove Screw(B), 2 Screws(H), 2 Screws(I) shown in Fig.D5.
- (2) Lift the Side Case(L) Unit slightly. Then Disconnect the connector on Main C.B.A. and Process C.B.A..(EVF, TALLY, ZOOM)

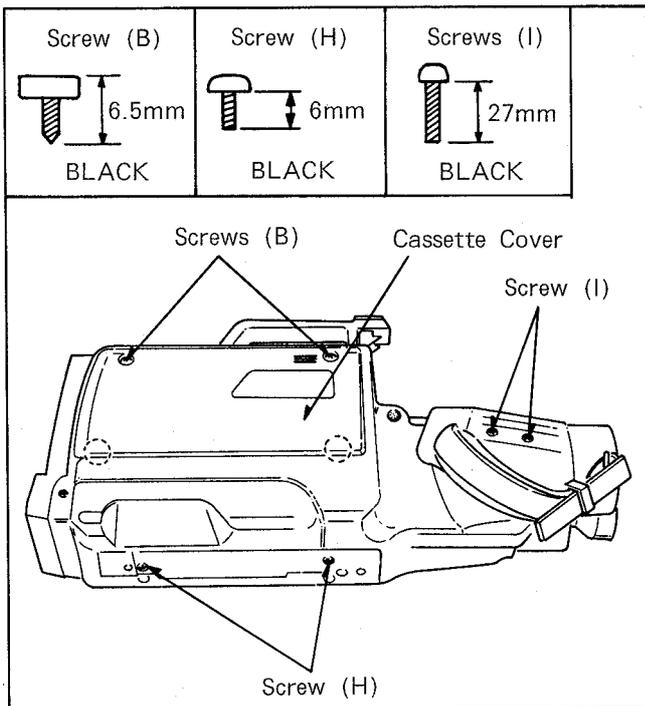


Fig. D5

6. REMOVAL OF OPERATION PANEL UNIT

- (1) Disconnect the connector P6005(Safety tab), and Flexible Connector FP6001(Operation Panel) on Main C.B.A..

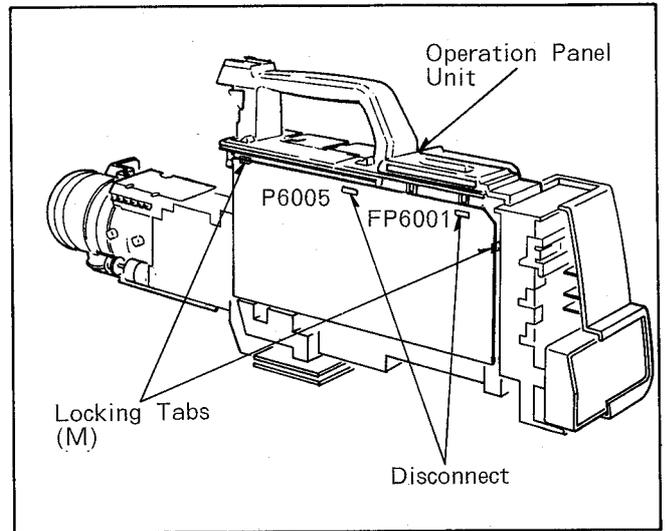


Fig. D6

7. OPENING OF MAIN C.B.A.

- (1) Unsnap 2 Locking Tabs(O).
- (2) Disconnect the Connector P3001(CHRA: GENE), and B3001.
- (3) Open the Main C.B.A..

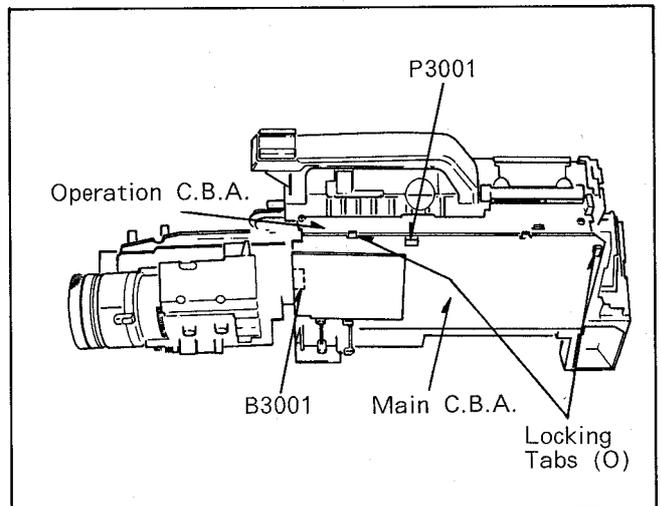


Fig. D7

8. REMOVAL OF CAMERA C.B.A.

- (1) Remove Screw(J).
- (2) Disconnect the Connector B301 and Flexible Connector FP701.
- (3) Lift up the camera C.B.A. slightly and then Remove.

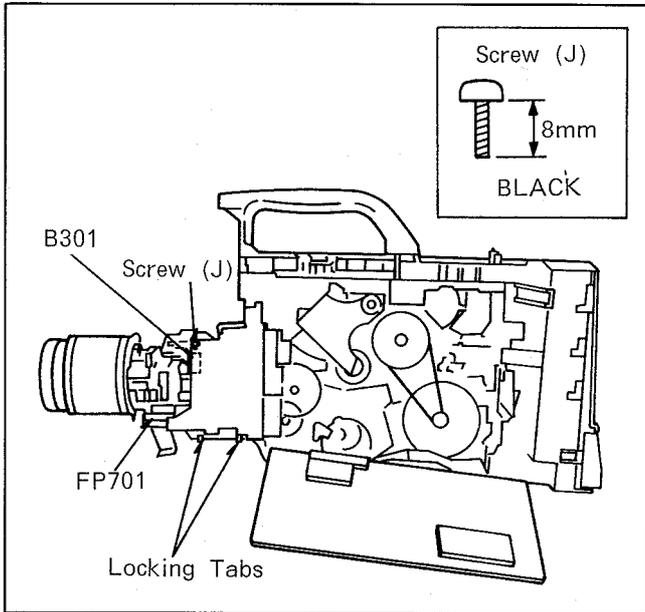


Fig. D8

10. REMOVAL OF SENSOR C.B.A.

- (1) Disconnect the Connector B202.
- (2) Remove 2 Screw(L).

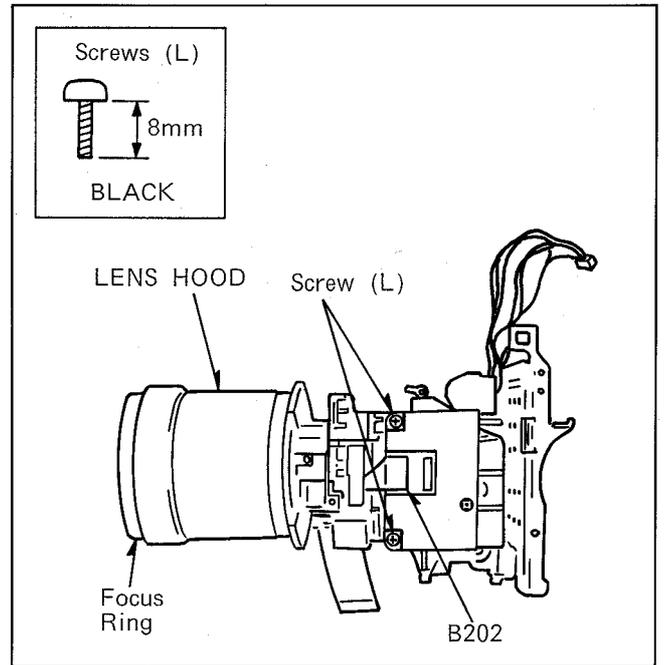


Fig. D10

9. REMOVAL OF LENS UNIT

- (1) Remove 2 Screws(K).

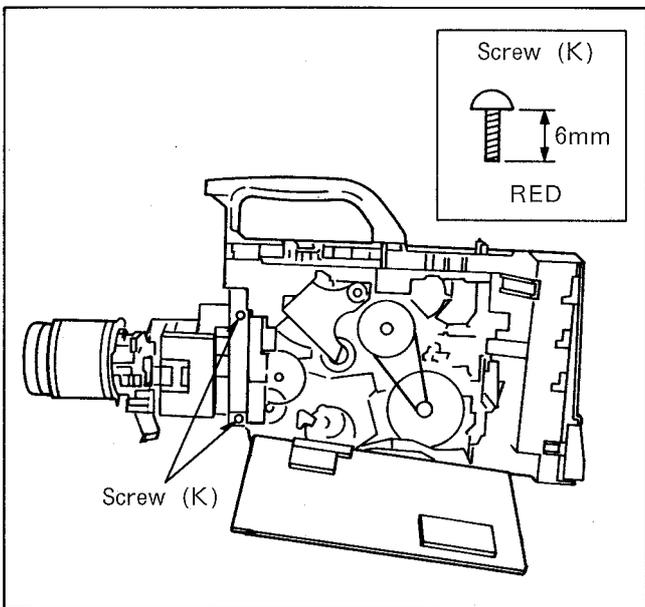


Fig. D9

11. REMOVAL OF THE FOCUS RING

Unlock...3 Locking Portion(B).
(By Screwdriver(-))

Set the screwdriver(-) to square hole of the Focus Ring, and then release the locking portion one by one by pushing the screwdriver to the inner direction.

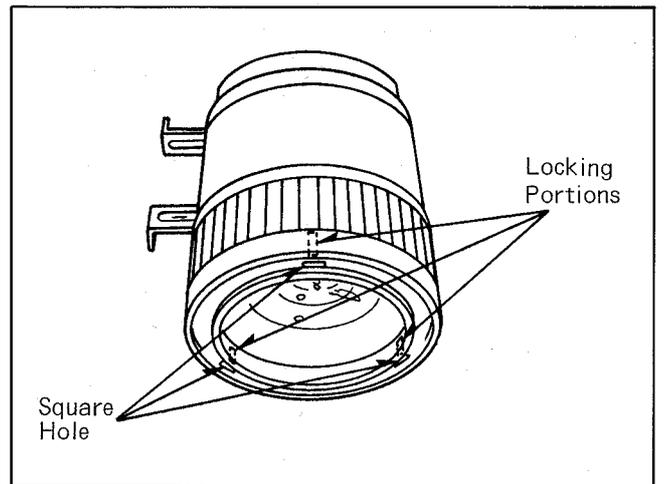


Fig. D11

12. REMOVAL OF THE LENS COVER

- (1) Remove 2 Screws(M).

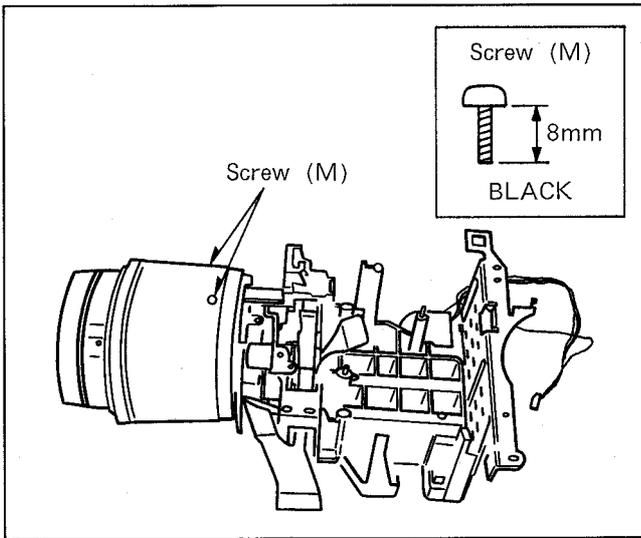


Fig. D12

13. REMOVAL OF THE LENS HOLDER

- (1) Unlock...4 Locking Portion(A).
(By Screwdriver(-))

Set the screwdriver(-) to square hole of the Lens Holder, and then release the locking portion one by one by pushing the screwdriver to the inner direction.

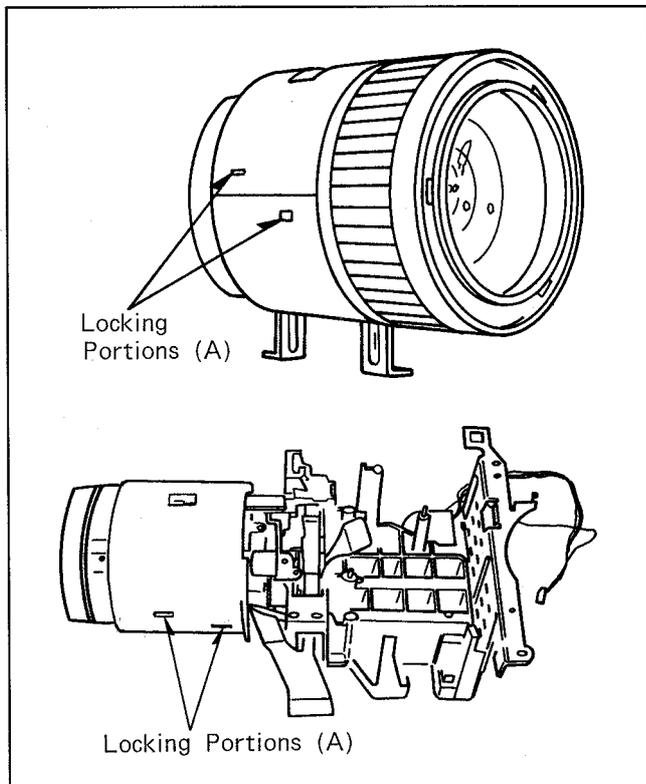


Fig. D13

14. REMOVAL OF THE LENS UNIT

- (1) Remove 3 Screws(N).
- (2) Remove 2 Locking Portions.

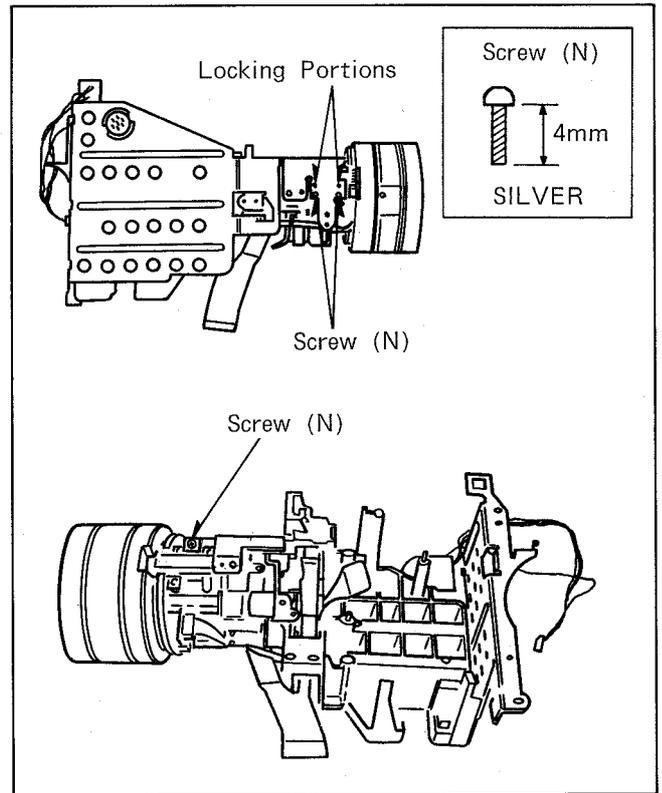


Fig. D14

15. REMOVAL OF EVF UNIT

- (1) Remove 2 Screws (O).

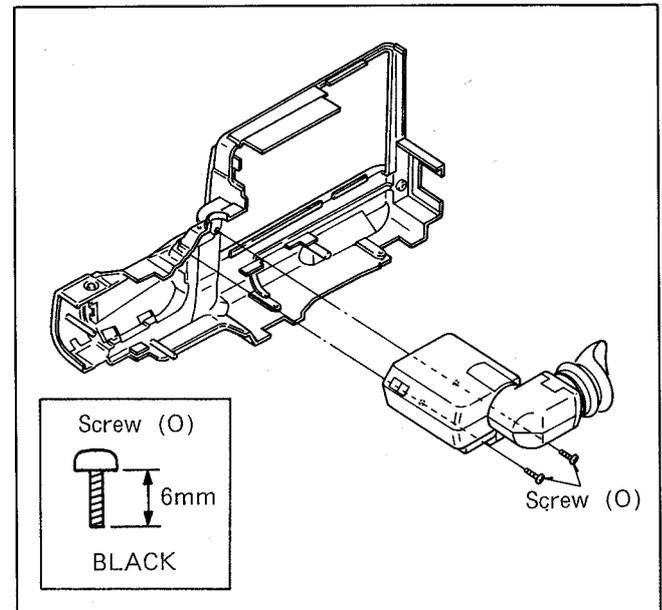


Fig. D15

16. DISASSEMBLY OF E.V.F. UNIT

- (1) Remove 3 Screws (P) on the bottom of the E.V.F. Unit and then remove the Bottom Case.

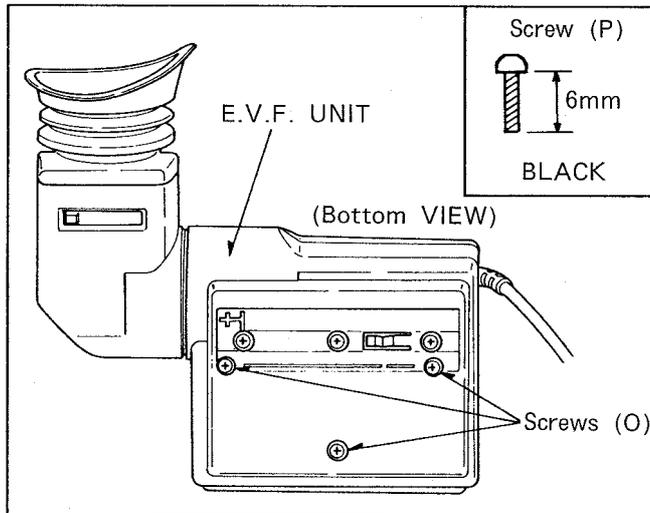


Fig. D16

- (2) Lift the CRT Assembly up shown in Fig.D23.

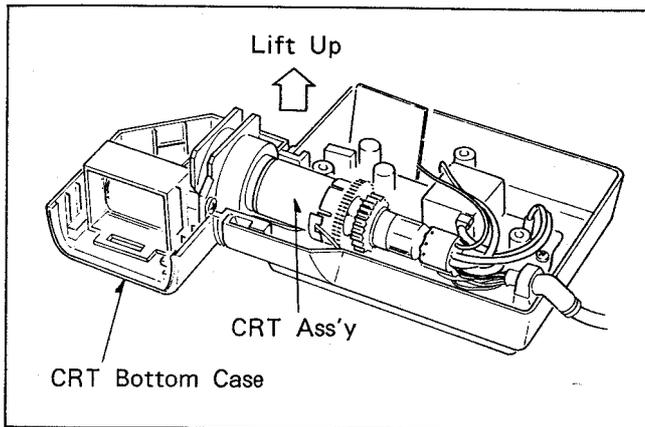


Fig. D17

- (3) Rotate Nut(v) and then pull DY Assembly in the direction shown in Fig.D24 to remove it. Then the CRT can be replaced.
- (4) For re-installation, reverse the above steps.

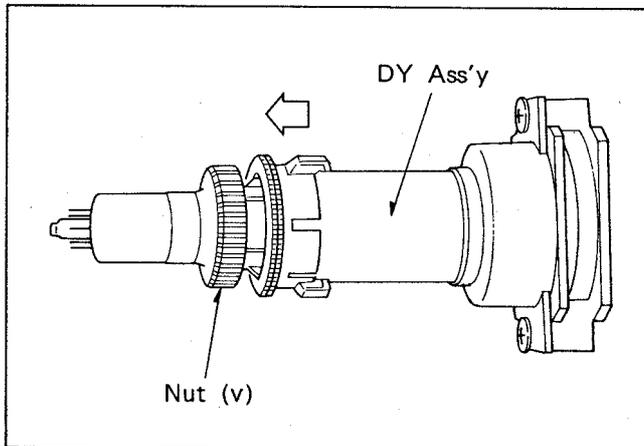


Fig. D18

2-2. DISASSEMBLY PROCEDURES OF ZOOM MOTOR AND FOCUS MOTOR

The following flowchart describes order or steps for removing the Lens Units and certain Printed Circuit Boards in order to make access to the items needing service.

To reassemble the unit follow the steps in reverse order.

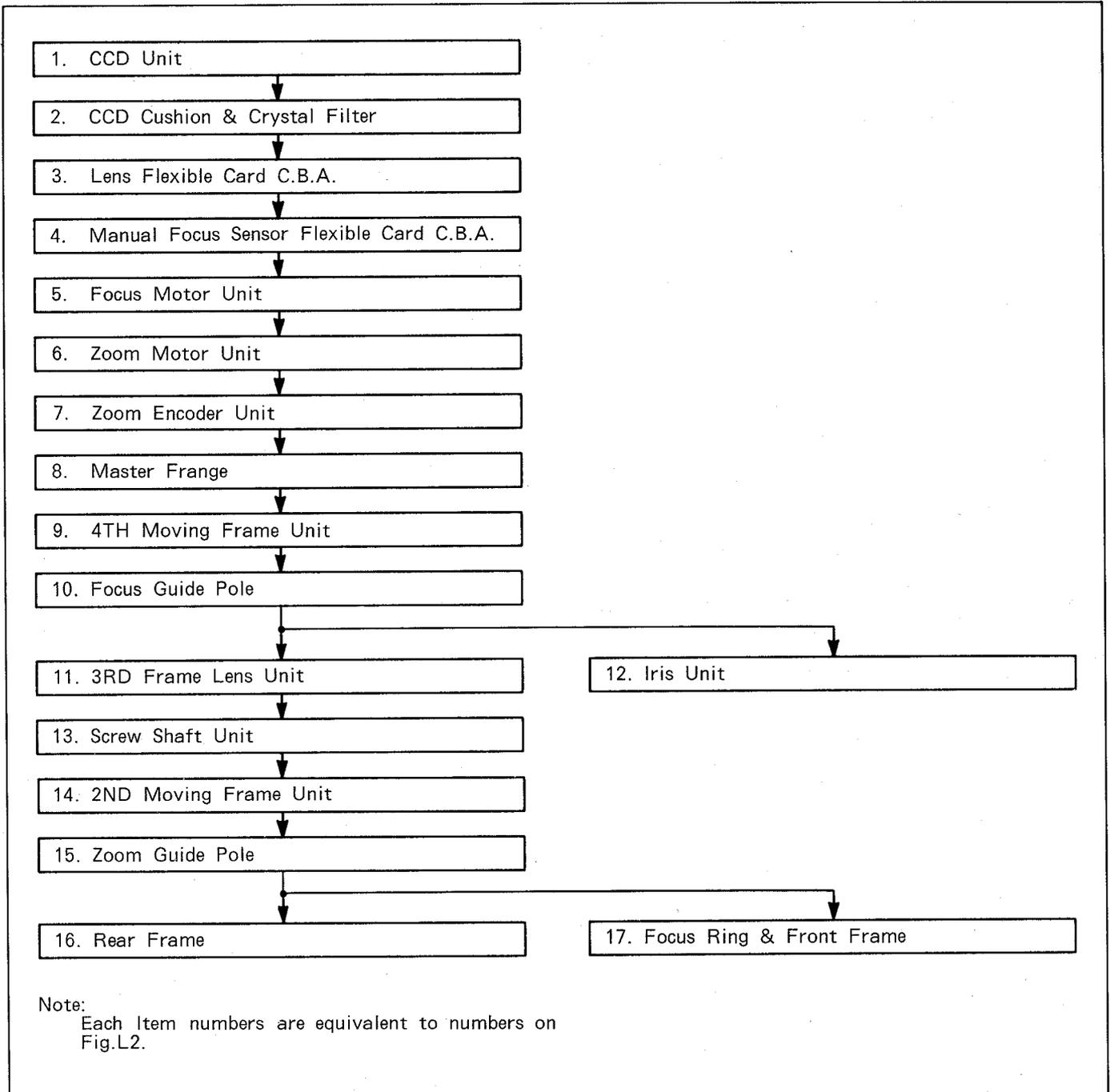


Fig. L1

2-3. REPLACEMENT PROCEDURES

2-3-1. REPLACEMENT OF THE UPPER CYLINDER UNIT

(1) Preparation.....Removal of Side case.

1. Remove.....4 Screws (Screw (X), (Z)).
2. Remove.....Lift up the cassette frame.

(2) Replacement the upper cylinder.

Work with extremely care when removing or replacing the Upper Cylinder Unit.
Do not touch the Video Head during servicing.

1. Remove 2 screws as shown below.
2. Unsolder 18 soldered portions indicated by arrows on the Circuit Board.
3. Remove the Upper Cylinder Unit by lifting it upward.

Note:

Soldered portion can be easily removed by using solder sucking wire, etc.

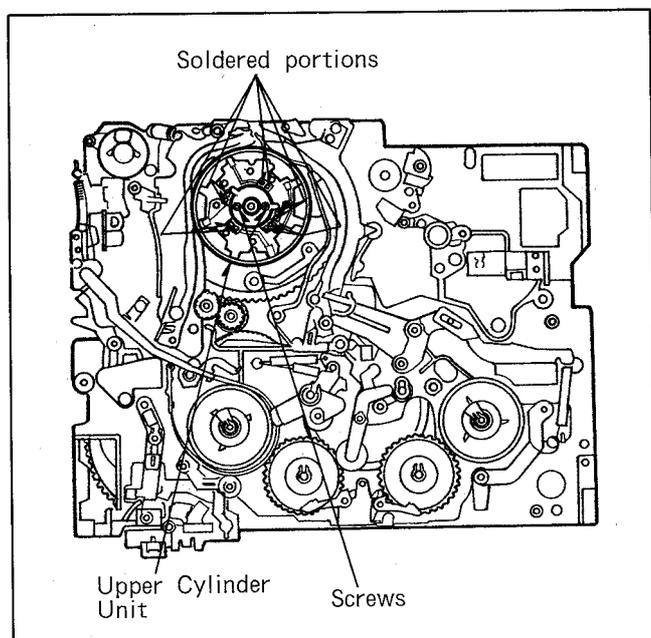


Fig. R1

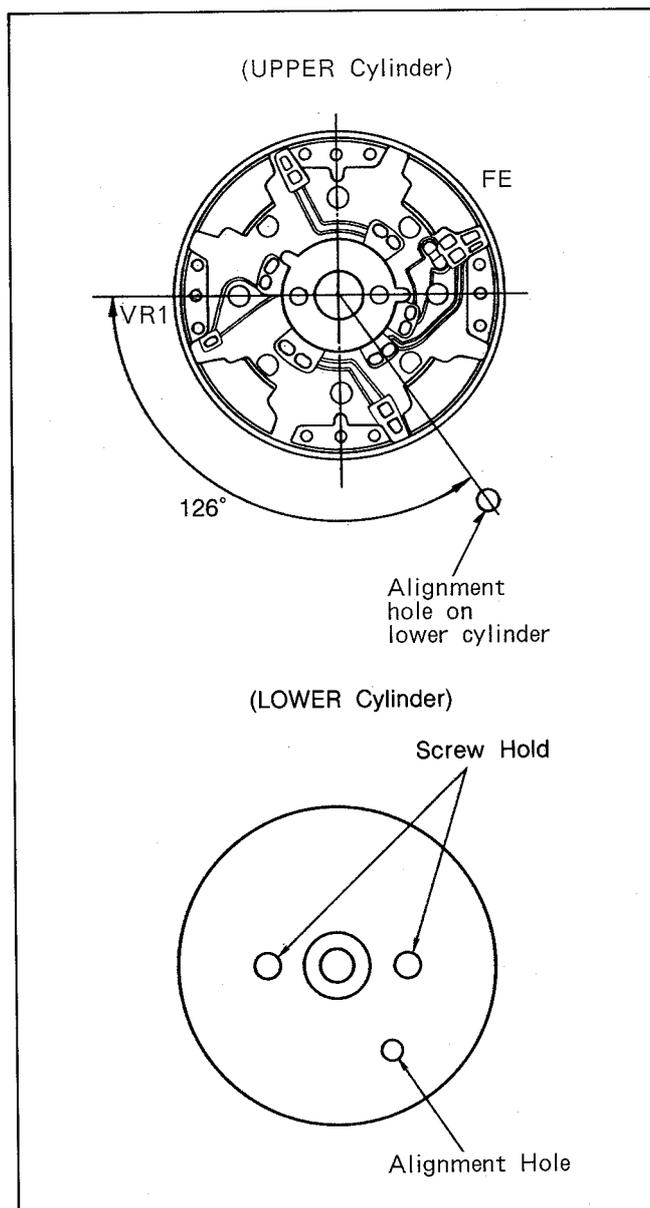


Fig. R2

4. The Upper Cylinder Unit can be reinstalled by reversing the removal procedure, however, when the Upper Cylinder is reinstalled, be extremely carefully so that VR1 of upper cylinder should be align 126° from lower cylinder alignment hole as Fig. R2.

2-3-2. REPLACEMENT OF DD CYLINDER UNIT

1. Remove the 3 screws and connector.
2. Take out D.D. Cylinder carefully.

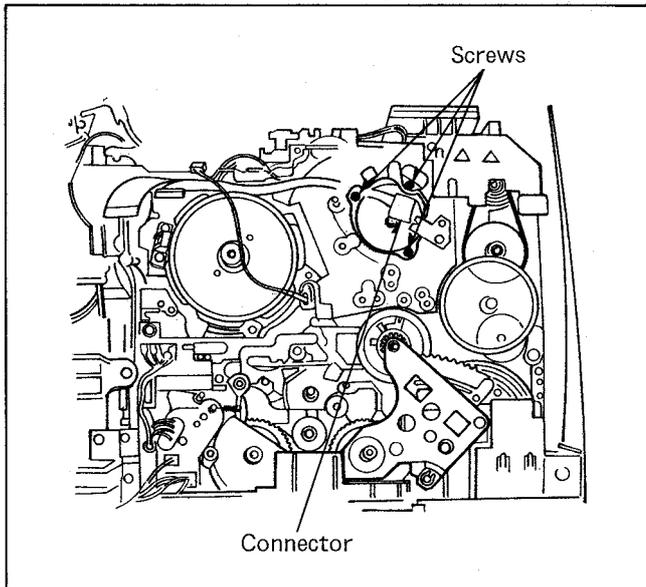


Fig. R3

Note:

Since there is very little clearance between the D.D. Cylinder Unit and the chassis, remove the D.D. Cylinder Unit carefully.

3. Reinstall the new D.D. Cylinder Unit, tighten the 3 screws and reconnect the connector.

Note:

- (1) Gently rub the video head in direction of tape travel with Head cleaning stick.
- (2) After replacement, confirm the performance.
If any further maintenance is required, perform "TAPE INTER-CHANGE ABILITY ADJUSTMENT."

2-3-3. REPLACEMENT OF CAPSTAN MOTOR UNIT

- * Equipment required:
Reel Table Height Gauge (VFK0190)
- * Specification...0.5+/-0.05mm

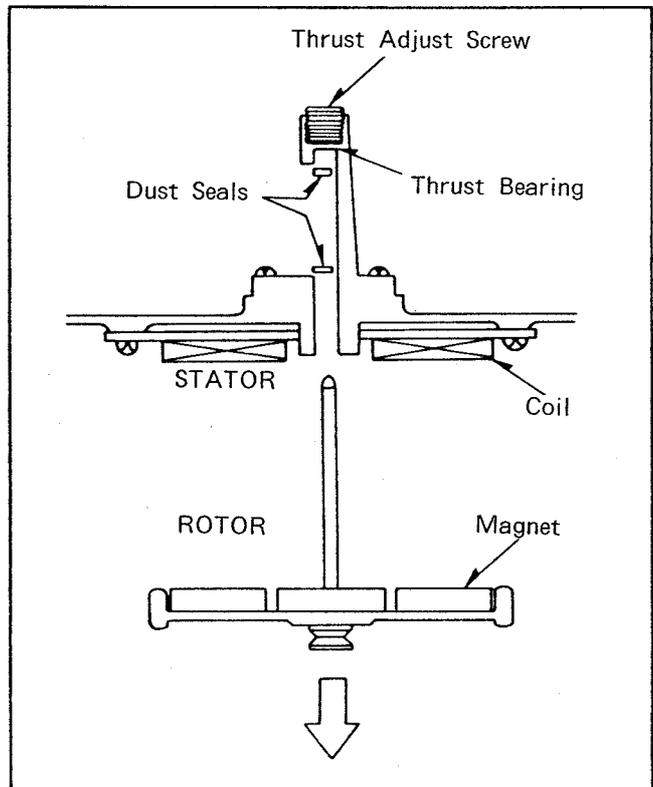


Fig. R4

- (1) Remove the 2 screws and take belt cover off. After that remove the capstan belt.
- (2) Tighten the Thrust Adjust Screw fully and pull the capstan rotor.

Note :

In this time pay attention not to lose two pieces of Dust Seal.

- (3) Replace the new rotor with two pieces of Dust Seal.

Note :

- (1) Pay attention to the replaced new rotor not to shock because of magnet absorption. So hold the rotor firmly and replace it carefully.
- (2) In this replacement, do not touch the Capstan shaft with any hard material like drivers or tweezers.

- (4) After replacement, wipe off the Capstan shaft to remove oil, grease or dust.
- (5) Unscrew Thrust Adjust Screw till the rotor is just touching to the stator.
- (6) Turn this mechanism upside down and place the Reel Table Height Gauge so that the gauge fits to the chassis correctly, and read the height.
- (7) Adjust the Thrust Adjust Screw so that the height difference just meets in the specification ($0.5 \pm 0.005\text{mm}$) reading the height from the gauge.

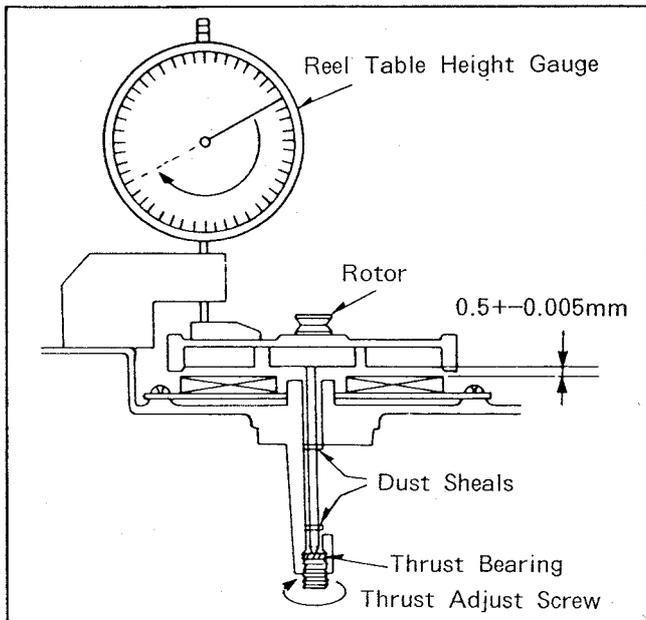


Fig. R5

Note:

If the Thrust Adjust Screw is fully opened, you have to pay attention not to lose Thrust Bearing. When it is fixed, confirm that the direction of Thrust Bearing is correct as shown below.

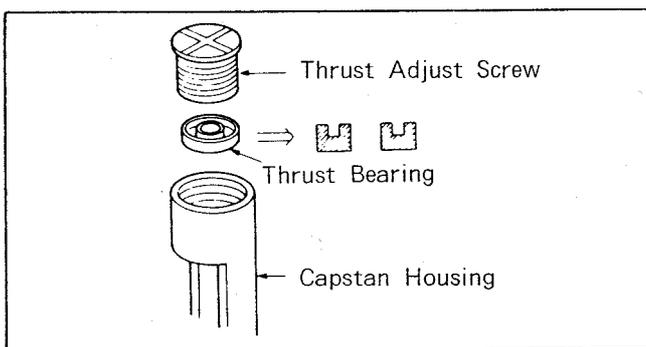


Fig. R6

2-3-4. REPLACEMENT OF TENSION BAND

- (1) Remove the cassette compartment.
- (2) Remove a retaining ring and take out a Rew Arm (A) Unit.
- (3) Remove a retaining ring and a snap washer and take out a tension Band Unit.

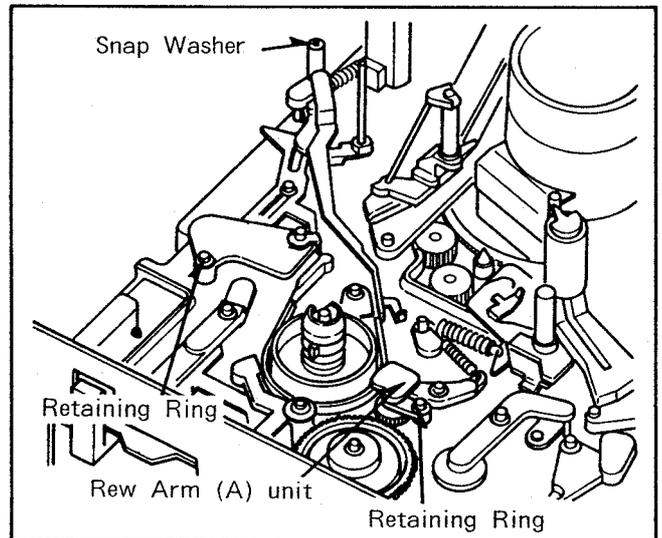


Fig. R7

- (4) Remove a Tension Band from Band Release Arm and Tension Arm Unit.

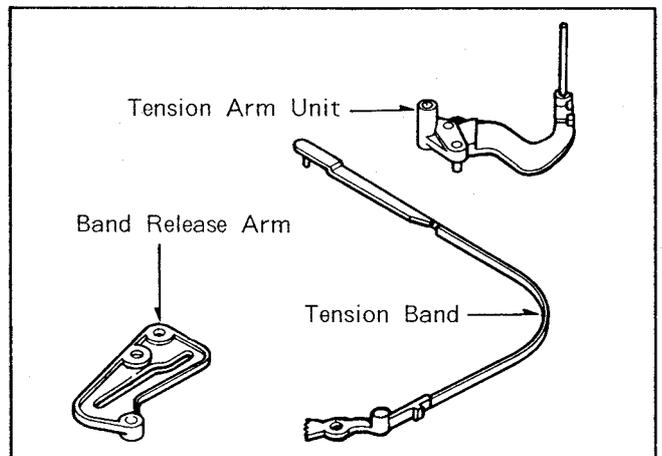
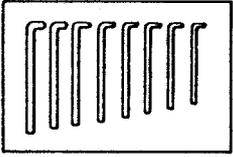
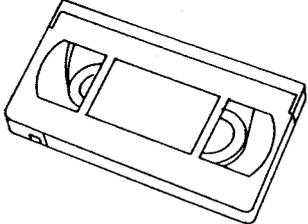
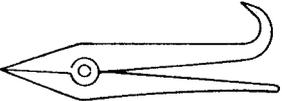
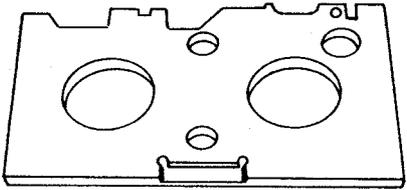
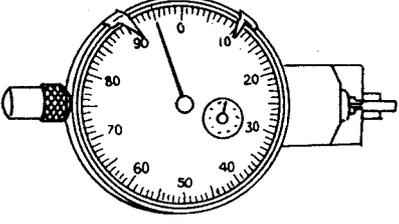
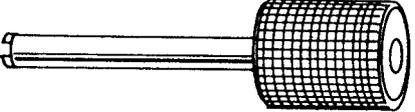
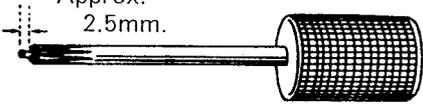
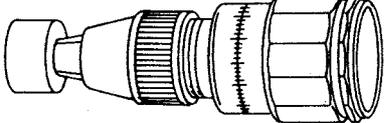
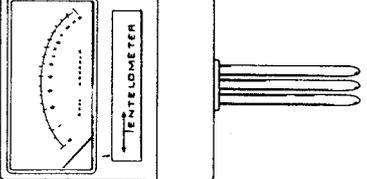
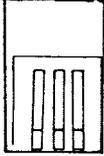
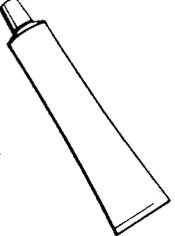


Fig. R8

- (5) Replace a new Tension Band by Proceeding reverse steps shown above.

2-4. MECHANICAL ADJUSTMENT PROCEDURES

1. SERVICING FIXTURES & TOOLS

<p>VFK0326 Hex Wrench Set (0.7, 0.9, 1.2, 1.5, 1.6, 2, 2.4, 3mm)</p> 	<p>VFJ8125H3F VHS Alignment Tape</p> 	<p>VFK0335 Retaining Ring Remover (3mm/4mm)</p> 
<p>VFK0191 Post Adjustment Plate</p> 	<p>VFK0190 Reel Table Height Gauge</p> 	<p>VFK0328 H-Position Adj. Fixture</p> 
<p>VFK0329 Post Adjustment Screwdriver</p> 	<p>VFK0157 Fine Adjustment Screwdriver</p> <p>Approx. 2.5mm.</p>  <p>Grind the top portion approximately 2.5mm</p>	<p>VFK0133 Dial Torque Gauge VFK0134 Adaptor for VFK0133 VFK0180 (Plastic Clamper Only)</p> 
<p>VFK0343 Check Light</p> 	<p>VFK0132 Back Tension Meter (TZ-H7-UM) (Tentelometer, Made in U.S.A.)</p> 	<p>VKF27 Head Cleaning Stick</p> 
<p>MOR265 Morlytone Grease</p> 	<p>High Quality Machine Oil <Purchase Locally> (Reel Shaft, Capstan Shaft etc.)</p> <p>Cleaning Liquid (Freon, TF, Alcohol) <Purchase Locally> (Tape Transport Rubber Parts etc.)</p>	

2. PROCEDURES FOR CLEANING OF UPPER CYLINDER UNIT

- (1) Position the video head to clean and hold the upper cylinder to keep it from turning while cleaning.
- (2) Gently rub the video head in direction of tape travel with Head Cleaning Stick.
- (3) Repeat for the other three video heads.

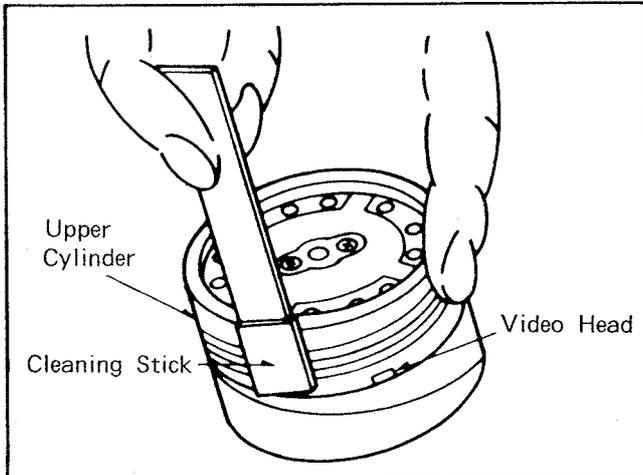


Fig. U1

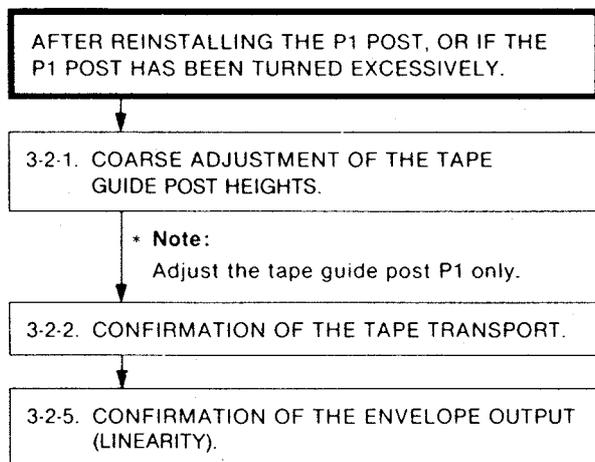
Note:

- (1) Do not rub vertically.
- (2) Do not apply any pressure to heads. If contamination is not easily removed, continued gentle wiping will usually remove the substance.

3. TAPE INTERCHANGEABILITY ADJUSTMENT PROCEDURES

3-1. ADJUSTMENT FLOW CHART

This flow chart describes the order of steps for adjusting the tape guide posts and A/C head in order to gain access to the items needing servicing.



AFTER REINSTALLING THE UPPER CYLINDER OR CYLINDER UNIT.

3-2-5. CONFIRMATION OF THE ENVELOPE OUTPUT.

3-2-9. FINE ADJUSTMENT OF THE A/C HEAD HORIZONTAL POSITION (X-VALUE).

* Note:

Do not change the height of the P1 and P4 posts and position of the A/C head.

AFTER REINSTALLING ALL POSTS OR IF ALL POSTS HAVE BEEN TURNED EXTREMELY.

3-2-1. COARSE ADJUSTMENT OF THE TAPE GUIDE POST HEIGHTS.

3-2-2. CONFIRMATION OF THE TAPE TRANSPORT.

3-2-3. ADJUSTMENT OF THE PULL-OUT POST (P5 POST) HEIGHT.

3-2-4. CONFIRMATION OF THE A/C HEAD TILT.

3-2-5. CONFIRMATION OF THE ENVELOPE OUTPUT.

AFTER REINSTALLING THE A/C HEAD.

3-2-4. CONFIRMATION OF THE A/C HEAD TILT.

* Note:

Do not change the height of P4 post.

3-2-6. COARSE ADJUSTMENT OF THE A/C HEAD HEIGHT.

3-2-7. ADJUSTMENT OF THE A/C HEAD HEIGHT AND AZIMUTH.

3-2-8. COARSE ADJUSTMENT OF THE A/C HEAD HORIZONTAL POSITION (X-VALUE).

3-2-9. FINE ADJUSTMENT OF THE A/C HEAD HORIZONTAL POSITION (X-VALUE).

AFTER REINSTALLING THE P4 POST, OR IF THE P4 POST HAS BEEN TURNED EXCESSIVELY.

3-2-1. COARSE ADJUSTMENT OF THE TAPE GUIDE POST HEIGHTS.

* **Note:**
Adjust the P4 post only.

3-2-2. CONFIRMATION OF THE TAPE TRANSPORT.

* **Note:**
Adjust the P4 post only.

3-2-4. CONFIRMATION OF THE A/C HEAD TILT.

3-2-5. CONFIRMATION OF THE ENVELOPE OUTPUT (LINEARITY).

AFTER REINSTALLING THE PULL-OUT POST (P5 POST).

3-2-3. ADJUSTMENT OF THE PULL-OUT POST (P5 POST).

* **Note:**
Do not readjust any other post.

3-2. ADJUSTMENT PROCEDURES

3-2-1. COARSE ADJUSTMENT OF THE TAPE GUIDE POST HEIGHT (P1, P2, P3 AND P4)

- * **Equipment Required:**
 Post Adjustment Plate.....VFK0191
 Reel Table Height Gauge.....VFK0190
 Nut Driver (Purchase locally)
 Post Adjustment Screwdriver.....VFK0329

1. Remove the cassette compartment from the mechanical chassis.
2. Place the Post Adjustment Plate over the reel tables. (Fig. M1)
Confirm that the Post Adjustment Plate is firmly seated.

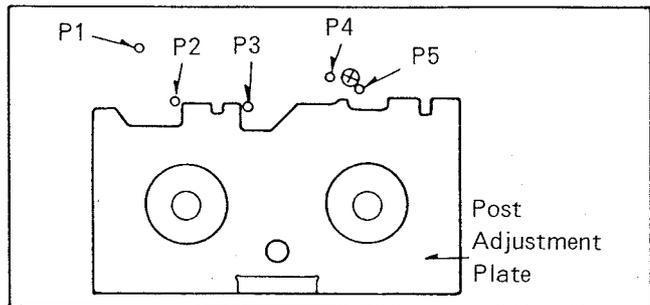


Fig. M1

3. Lower all 4 tape guide posts so that the lower tape guide on each post is below the top surface of the adjustment plate. Use the post Adjustment screwdriver to lower posts P2 and P3, and the Nut Driver to lower Posts P1, P4 and P5.
4. Place the Reel Table Height Gauge on the Post Adjustment Plate and lower the scraper so that it touches the plate (Fig. M2).

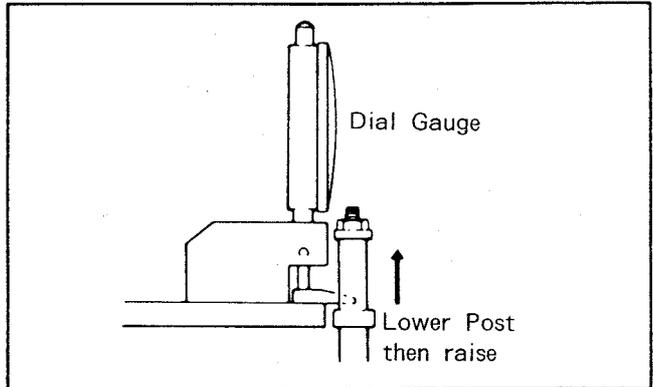


Fig. M2

5. Place the side of the scraper against the each post as shown in Figure M3, set the gauge to zero, then slowly raise the post until the lower tape guide just touches the bottom of the scraper. Use the gauge to determine the exact point at which the lower tape guide touches the scraper. (Fig. M3)

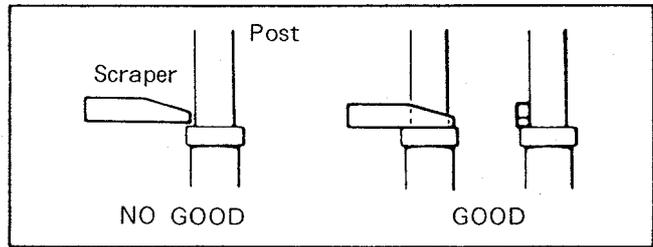


Fig. M3

3-2-2. CONFIRMATION OF THE TAPE TRANSPORT (TAPE GUIDE POSTS)

- * **Note:**
1. The tape guide posts have been precisely adjusted at the factory. Therefore, normally do not change the height of P1, P4 and P5 posts. The following adjustment is required only when replacing the posts.
 2. If curling is apparent proceed to the P4 post, wipe dirt from the pressure roller and capstan shaft using a soft cloth impregnated with Freon TF or cleaning liquid.
 3. The adjustment of the post height is required only the one which has been replaced.

- * Equipment Required
- Post Adjustment Screwdriver.....VFK0329
- Check Light.....VFK0343
- Nut Driver (Purchase locally)

1. To prevent the alignment tape from being damaged, use a normal cassette tape for this procedure. Playback the normal cassette tape and confirm that the tape travels without any curling at the edges of all the posts by using the check light. (Fig. M4 and Fig. M5)

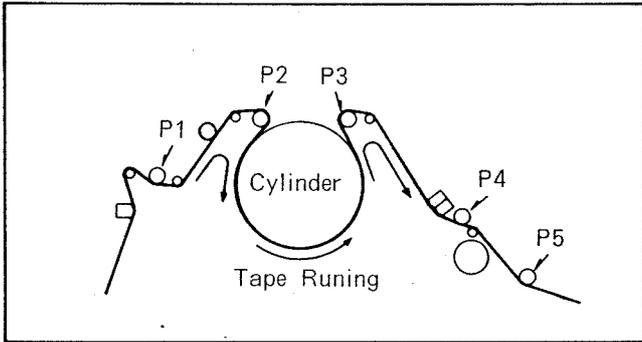


Fig. M4 Tape Transport Posts

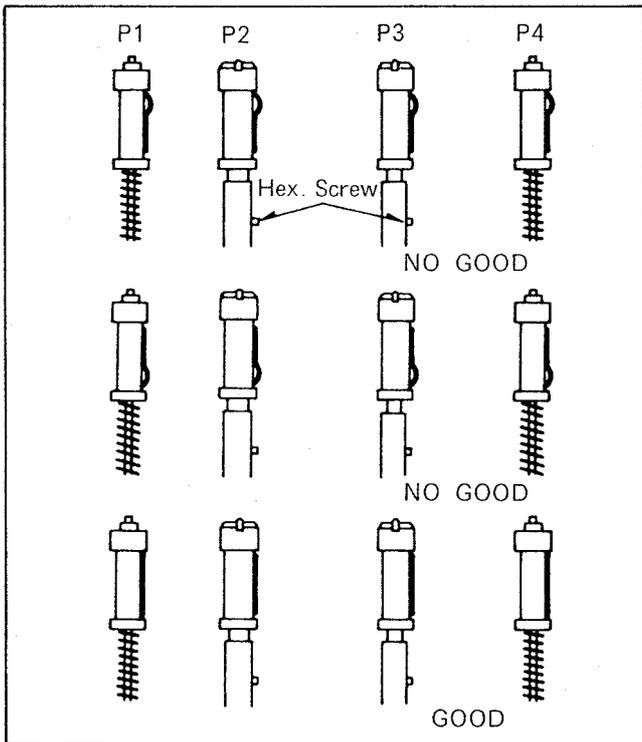


Fig. M5 Tape Guide Posts

2. If curling is apparent, adjust the height of posts by turning the top of post with the post adjustment screwdriver (posts P2 and P3) or the nut-driver (Posts P1 and P4). (Fig. M4 and M5)
3. After adjusting the P4 post, adjustment of the pull-out post (P5) is required. (Refer to "ADJUSTMENT OF THE PULL-OUT POST HEIGHT".)
4. If the tape curling cannot be corrected by adjusting the tape guide posts, then adjustment of the A/C head tilt may be needed.

3-2-3. ADJUSTMENT OF THE PULL-OUT POST (P5 POST) HEIGHT

* Notes:

1. This adjustment should be performed only after adjusting tape guide post P4 as the height of the pull-out post is based on the height of post P4.

- * Tools and Equipment Required:
- Post Adjustment Plate.....VFK0191
- Reel Table Height Gauge.....VFK0190
- Check Light.....VFK0343
- Nut Driver (Purchase locally)

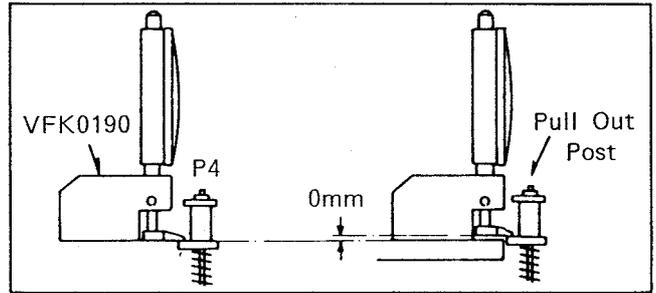


Fig. M6

1. Remove the cassette compartment by unscrewing 4 screws.
2. Place the Post Adjustment plate over the reel tables.
3. Place the Reel Table Height Gauge on the tape guide post P4, lower the scraper so that it touches the lower edges of P4, then set the gauge to zero ("0"). (Fig. M6)
4. Slightly lower the pull-out post by turning the nut on the post clockwise with the nut driver, and set the side of the scraper against the post as shown in Fig. M7.
5. Slowly turn the nut on the post counterclockwise until the gauge reads 0mm. (Fig. M6)
6. Confirm there is no tape curling at P4 post during reverse mode by using the check light. If tape curling occurs, Go back to step 3.

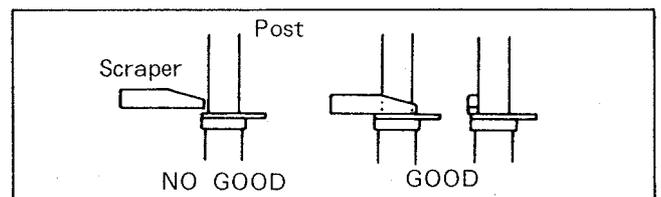


Fig. M7 Post Adjustment

3-2-4. CONFIRMATION OF THE A/C HEAD TILT

* Note:

This procedure should be performed after replacing the A/C head and pressure roller, and adjusting the height of the tape guide post (P4). (Refer to "COARSE ADJUSTMENT OF THE TAPE GUIDE POST HEIGHTS".)

- * Tools and Equipment Required:
- Hex. Wrench Set.....VFK0326
- Nut Driver (purchase locally)

1. Play back the beginning portion of NV-E240 blank cassette tape and confirm that the tape runs between lower and upper limiters of the P4 post. If there is waviness or frilling in the lower edge or top edge of the tape, correct the tilt of the A/C head by turning the screw located behind the A/C head. (Fig. M8)

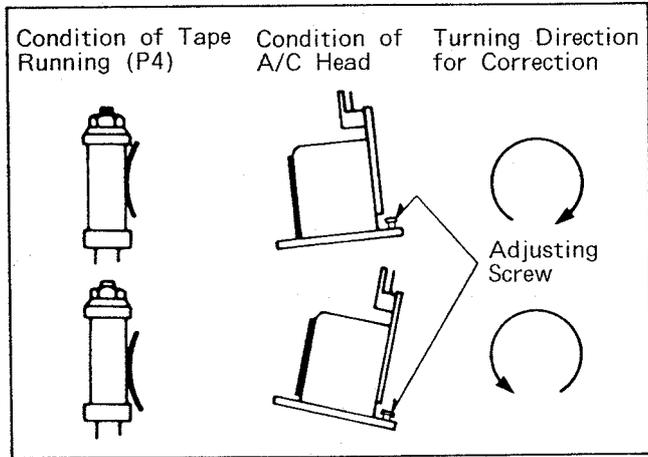


Fig. M8

2. If the tape curling cannot be removed by adjusting the A/C head tilt, then readjustment of the height of the tape guide post (P4) may be needed.

* Notes:

1. The tape guide post (P4) has been precisely adjusted at the factory. Therefore, normally the tape guide post (P4) readjustment is not required to eliminate the tape curling.
2. After adjusting the A/C head tilt, the A/C head height adjustment is required.

3-2-5. CONFIRMATION OF THE ENVELOPE OUTPUT (LINEARITY)

* Note:

Before playing back the alignment tape, play back a normal cassette tape and confirm correct transport. (Refer to "CONFIRMATION OF THE TAPE TRANSPORT".)

* Tools and Equipment Required:
 Post Adjustment Screwdriver.....VFK0329
 Alignment Tape.....VFJ8125H3F

1. Connect the scope to the output of the Head Amp (CL3003) on the Main C.B.A. and TP6201 on the same C.B.A. to EX +- Trigger of the scope.
2. Play back the monoscope portion of the alignment tape VFJ8125H3F.
3. Turn the Tracking Control VR and adjust for maximum RF envelope.
4. If the RF envelope appears like example "A" or "B" in Fig.M9, then adjustment of tape guide post (P2 : Entrance) is necessary.
5. Adjust the tape guide post (P2) with the post adjustment screwdriver so that the RF envelope waveform at the entrance portion becomes flat as shown "C" in Fig.M9. (See Fig.M12 also)

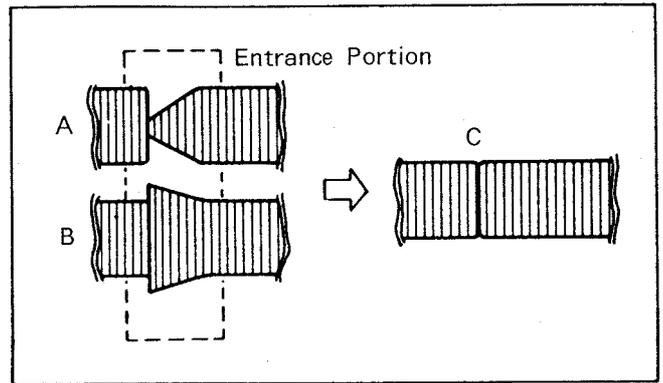


Fig. M9

6. If the RF envelope appears like example "D" or "E" in Fig. M10, then adjustment of the tape guide post (P3 : Exit) is necessary.
7. Adjust the tape guide post (P3) in the same manner as the P2 post so that the exit portion becomes flat as shown in "F" in Fig. M10.

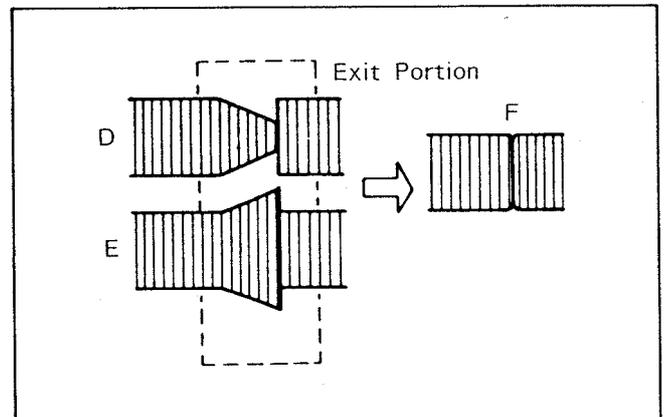


Fig. M10

8. Turn the Tracking VR from end to end. The variation of RF envelope should be nearly parallel as shown in Figure M11.
9. Turn the Tracking VR and adjust for maximum RF envelope. If the RF envelope does not meet these specs, V1/V 0.7, V2/V 0.8, then repeat steps 1-9 of item 3-2-5. again. (Fig. M13)

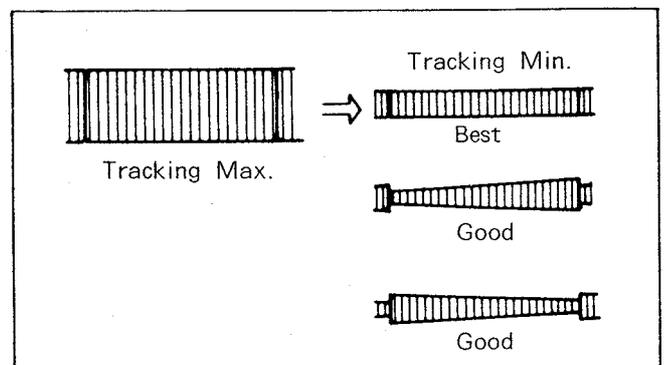


Fig. M11

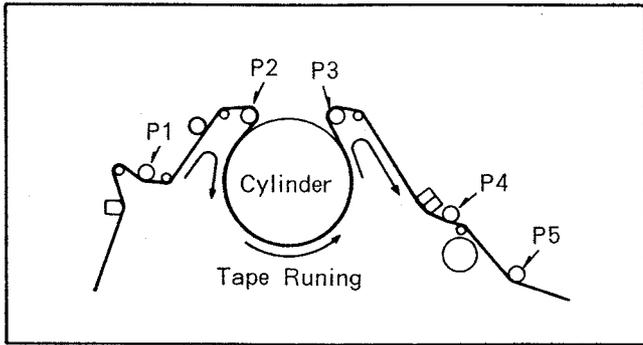


Fig. M12 Loading of post

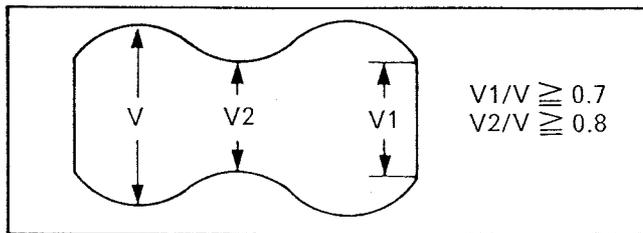


Fig. M13 Spec. of Envelope Figure

3-2-7. ADJUSTMENT OF THE A/C HEAD AND AZIMUTH

* Note:
This procedure should be performed only when the A/C Head is replaced and posts height are readjusted.

* Tools and Equipment Required:
Nut Driver (Purchase locally)
Alignment Tape.....VFJ8125H3F

1. Connect the scope to the audio output.
2. Play back the 2nd portion (Normal Audio 6KHz) of the alignment tape, VFJ8125H3F.
3. Adjust the screw (B) so that the audio output level becomes maximum. (Fig.M15)

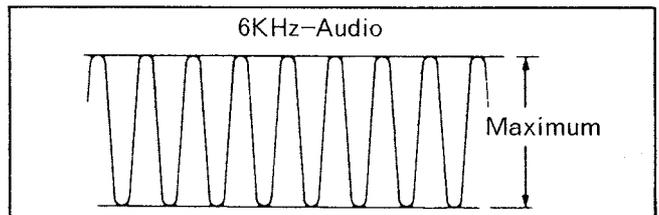


Fig. M15

4. Then adjust the nut (A) so that the audio output level (at TP4001) maximum.

3-2-8. ADJUSTMENT OF A/C HEAD HORIZONTAL POSITION

Note:
This procedure should be performed only when the A/C head is replaced and after performing the tape interchangeability adjustment.

* Tools and Equipment Required:
H. Position Adj. Fixture.....VFK0328
Alignment Tape.....VFJ8125H3F

1. Set the Tracking Control VR to the center detent (fixed) position.
2. Connect the scope CH1 to TP3001 on the Main C.B.A.; and TP4001 on the Audio C.B.A. to Ext-trigger the scope.
3. Play back the Monoscope pattern of the alignment tape (VFM8125H3F).
4. Adjust the adjust screw so that the RF envelope output level becomes is maximum at the detent position (Fig.M16,M17).
5. Turn the Tracking VR from end to end and then back to the detent position. Confirm that the RF envelope output level is maximized at the detent position. (Fig.M11)

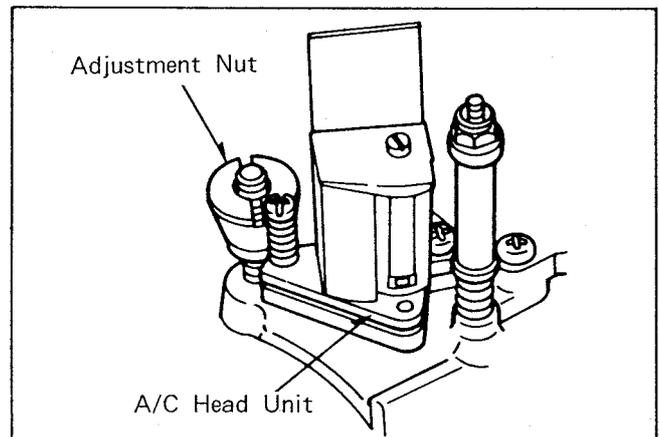


Fig. M16

10. Turn the Tracking VR from end to end again and then back to the detent (Fix) position. At the detent position, the RF envelope waveform should be at maximum. If it is not at maximum then "ADJUSTMENT OF THE A/C HEAD HORIZONTAL POSITION" is necessary. (Refer to "FINE ADJUSTMENT OF THE A/C HEAD HORIZONTAL POSITION".)

3-2-6. COARSE ADJUSTMENT OF THE A/C/ HEAD HEIGHT

* Note:
This procedure should be performed only when the A/C Head is replaced.

* Tools and Equipment Required:
Check Light.....VFK0343
Nut Driver (Purchase locally)

- (1) Looking at the lower edge of the control head within the tape running, ensure that lower edge of the tape runs along 0.25mm far from lower edge of the control head. (litte bit up position from lower edge of control head.) If it doesn't, slightly turn the nut (A) in either direction to correct clockwise to lower the head and counterclockwise to raise it.

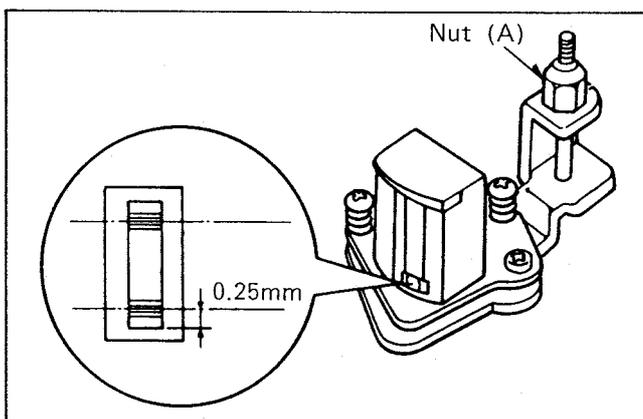


Fig. M14

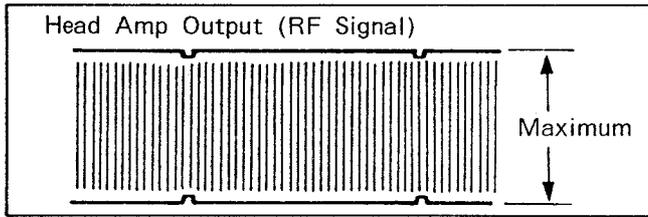


Fig. M17

4. OTHER ADJUSTMENT PROCEDURES

4-1. CONFIRMATION OF BRAKE TORQUE

* Equipment Required:

Dial Torque Gauge.....VFK0133

Adaptor for Gauge.....VFK0134

* Specification:-----see spec table (Fig. M19).

- (1) Remove the cassette compartment by unscrewing 4 screws.
- (2) Attach the adaptor to the torque gauge and place the unit in STOP mode.
- (3) Place the torque on the reel table. The weight of gauge should not rest on the reel table.

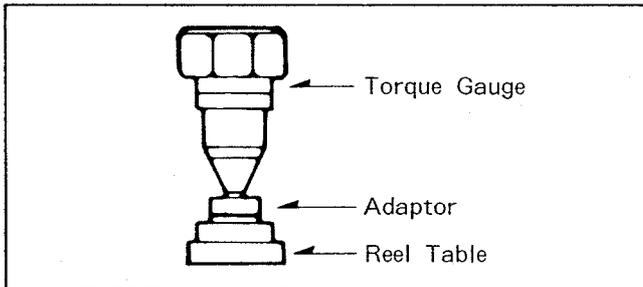
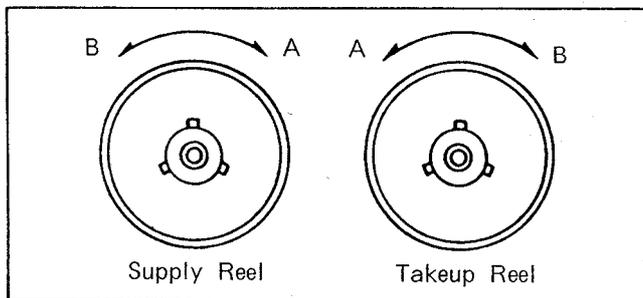


Fig. M18

- (4) Turn torque gauge in either direction indicated in the Fig. M19, and read the gauge when the brake begins slipping.

Note:

If proper brake torque can not be obtained, check the both take-up and supply clutch gear.



	A	B
Takeup	28+-8g-cm	28+-8g-cm
Supply	28+-8g-cm	28+-8g-cm

Fig. M19

4-2. TENSION POST POSITION ADJUSTMENT

* Specification : -----2.4mm~2.9mm

- (1) Remove the Cassette Up unit by unscrewing 4 screws. (Refer to the disassembly procedures titled in Removal of the Cassette Up Unit). Place the unit in Play mode by rotating Drive Gear (A) in clockwise shown below.

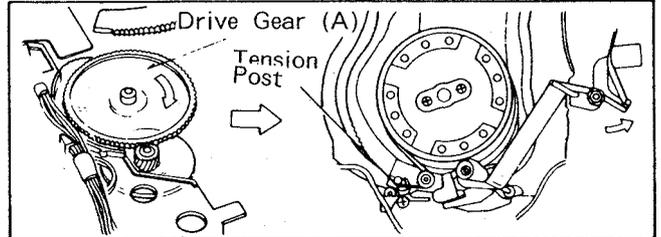


Fig. M20

Note:

In this case, make sure that the power is not applied.

- (2) Loosen the screw (A) a little bit and adjust the Tension Post adjustment plate so that the "Distance (A)" shown below becomes just meet in the specification (2.4m~2.9mm).
- (3) Tighten the screw (A) to fix it.

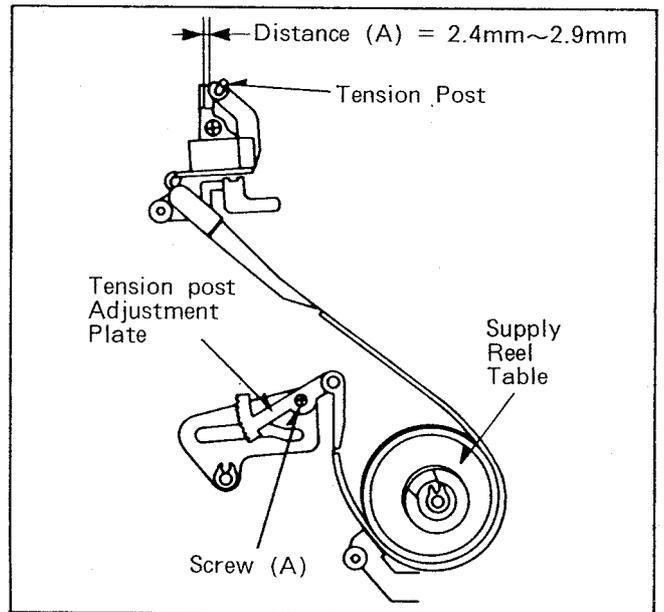


Fig. M21

4-3. BACK TENSION ADJUSTMENT

* Equipment Required:

Back Tension Meter.....VFK0132

VHS Cassette Tape (120min)

* Specification:-----19-23g

1. Playback the cassette tape from the beginning and wait until the tape movement get the stabilized. (for approx. 10-20 seconds) is stabilized.

2. Insert the Back Tension Meter into the path of a tape, and measure if the back tension is within specification as shown in Fig.M22.

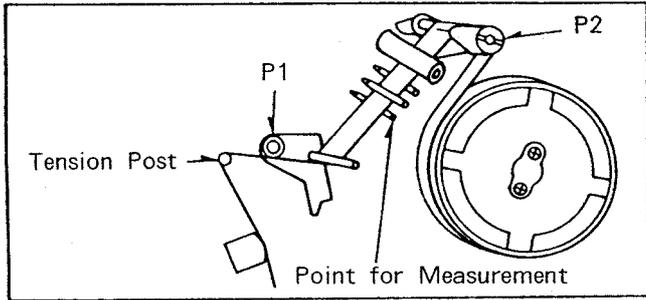


Fig. M22 Measurement of Back Tension

Note:

1. While measuring, make sure that the three probes of the meter are all in good contact with the tape.
2. As the tension meter is very sensitive, we recommend taking 3 separate readings.
3. If it is out of specification, change the spring notch as shown in Fig. M23.

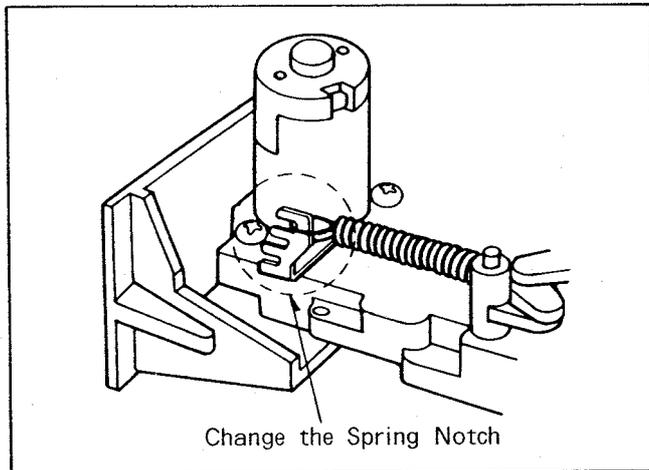


Fig. M23

4-4. REEL TABLES HEIGHT ADJUSTMENT

- * Equipment Required:
 Post Adjustment Plate.....VFK0191
 Reel Table Height Gauge.....VFK0190
 * Specification-----0~-0.15mm

Note:

Cut-out on Post Adjustment Plate is reference of reel table height and their height is measured based on this reference.

1. Place the post adjustment plate on the reels, and put the Gauge on the plate. Set the gauge to zero "0" with the foot scraper of the gauge touching the cut-out portion of the plate.

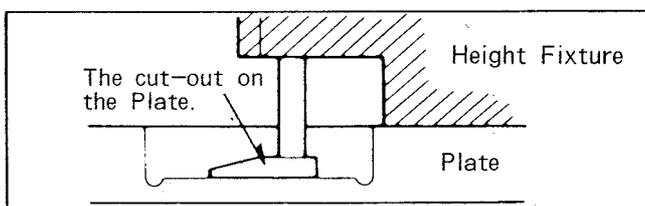


Fig. M24

2. Then measure the height of reel table and confirm the difference performed in step 1 as shown below. Do the same for the other reel table.

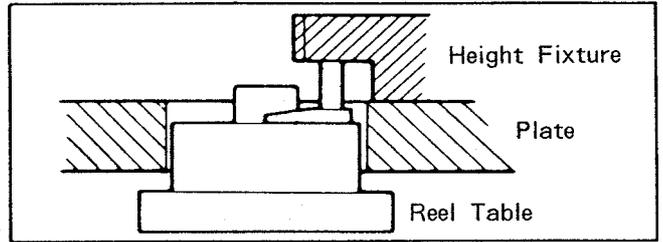


Fig. M25

3. If a height difference in readings between the cut-out portion of plate and reel tables is not 0~-0.15mm (higher or lower), adjust the height of the reel to obtain specified height.
4. For adjustment add or reduce a washer.

4-5. ADJUSTMENT OF FG HEAD GAP

* Specification:-----0.17~0.18mm

- (1). Slightly loosen the 2 screws.
- (2). Put the paper which is used for cover page of this volume into the gap between F.G.Head and Capstan rotor. (The thickness of the cover page is approx 0.17mm)
- (3). After adjustment, tighten 2 screws.

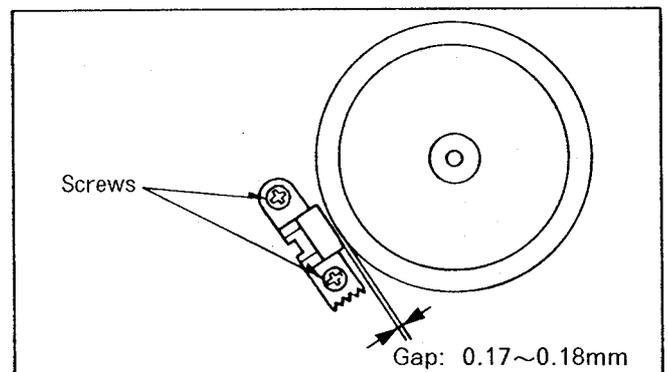


Fig. M26

Note:

Do not touch the surface of rotor and keep any magnetizable material away.

4-6. ASSEMBLY ADJUSTMENT PROCEDURES OF MECHANISM

The mechanism of this model is mostly engaged to the System Control Circuit, through the mode select switch.

Therefore the relation between the mode select switch and the cam gear decides all further mechanical movement of the mechanical parts such as levers, gears, rollers and so on.

If these parts are fixed in properly, the unit will be unloaded or compulsorily stopped. And it will result being damage to any mechanical or electrical parts.

[1] PROCEDURES FOR ASSEMBLING LOADING RING AND LOADING GEARS

- (1) Install a Loading Ring T (1) unit and a Loading Gear (B) so that both triangle marks line on as shown below.

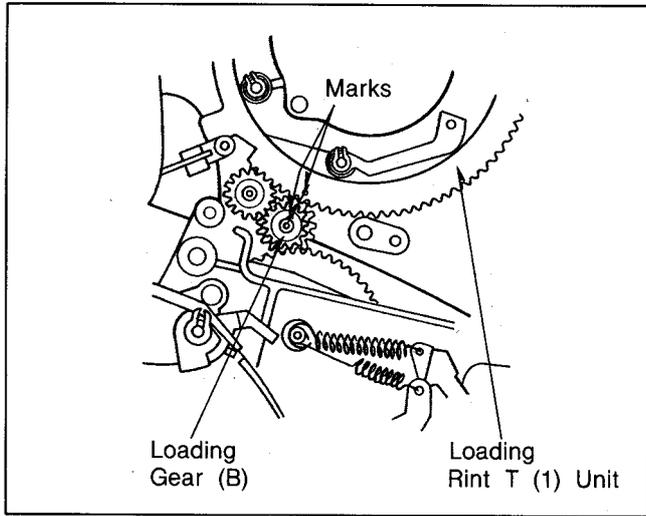


Fig. M27

- (2) Install a Loading Gear (A) and next fix a Loading Ring S (1) Unit so that the holes of Loading Ring S (1) Unit and T (1) Unit line on as shown below.

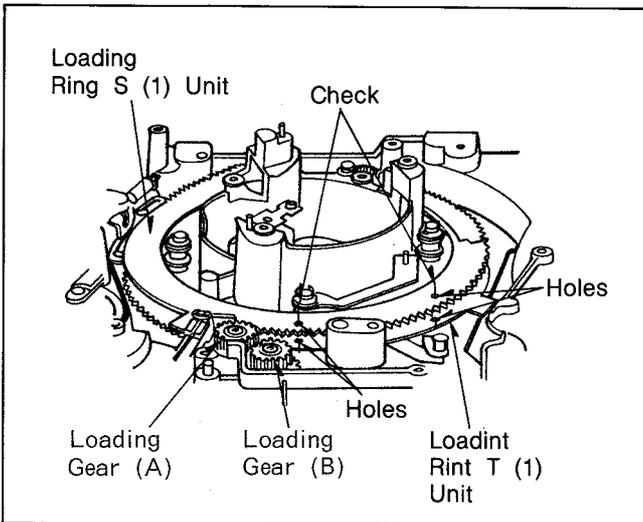


Fig. M28

[2] PROCEDURES FOR ASSEMBLING TAKE-UP LOADING GUIDE AND TAKE-UP LOADING POST UNIT

- (1) Install Loading Guide T unit. The small projection of a Loading Link T unit must be inserted into gap of Loading Guide T unit.

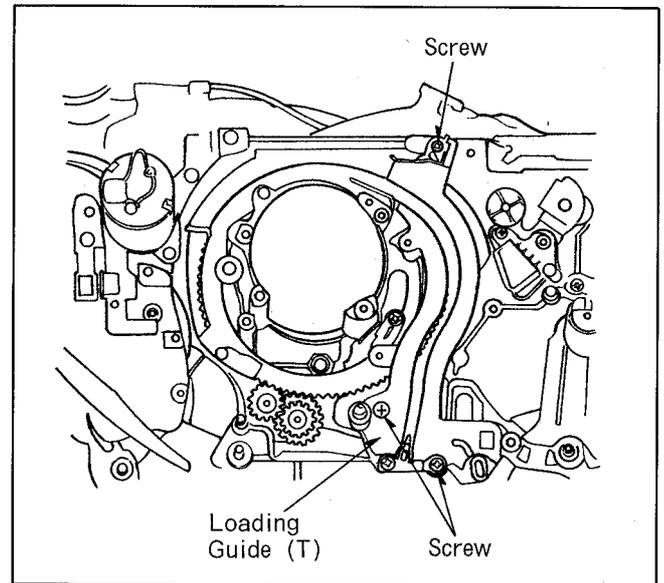


Fig. M29

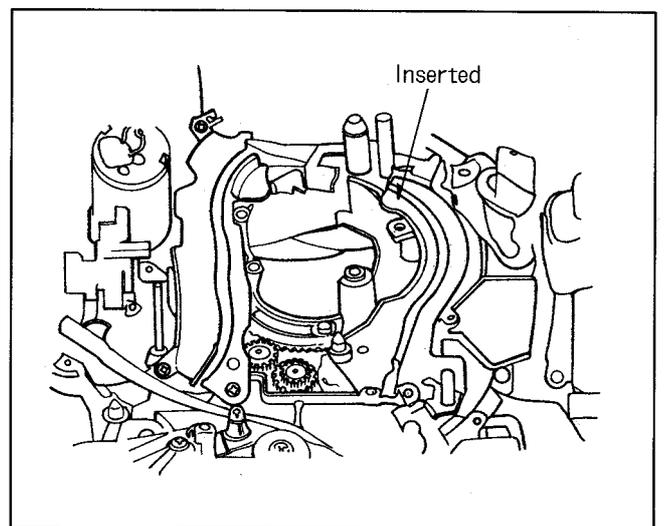


Fig. M30

Note:

Pay attention that the washers are remaining under the loading gears or any other parts.

- (2) Fix a Take-up Side Loading Post unit holding the Small projection of the Loading Link T. unit and install at shaft Holder Unit.

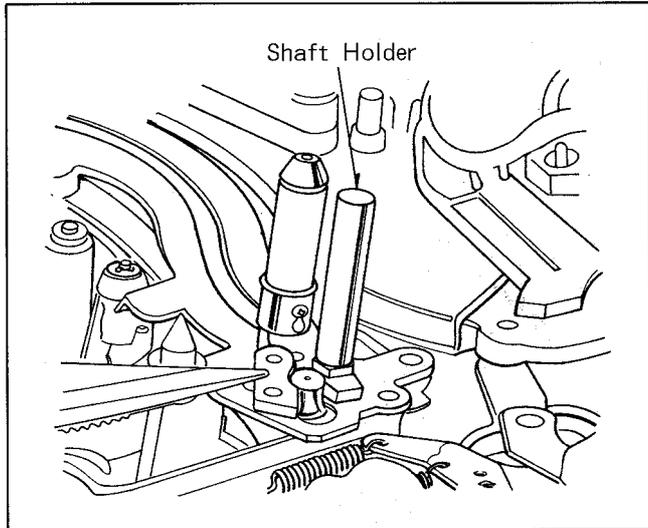


Fig. M31

[3] PROCEDURES FOR ASSEMBLING SUPPLY LOADING GUIDES AND SUPPLY LOADING POST UNIT

- (1) Install the Loading Guide S-1 and S-2. Then tighten 3 screws.

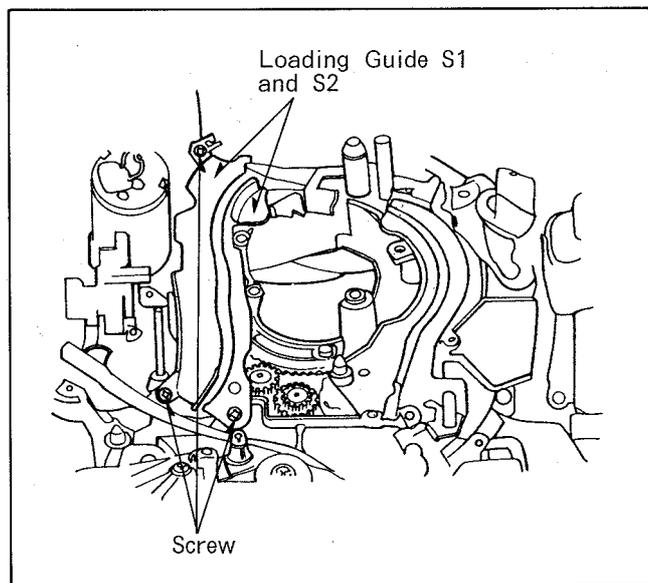


Fig. M32

- (2) Slide a Supply Loading Post Unit into a gap between the Loading Guide S1 and S2 hooking a connection Rod to a connect Tie Unit as shown below.

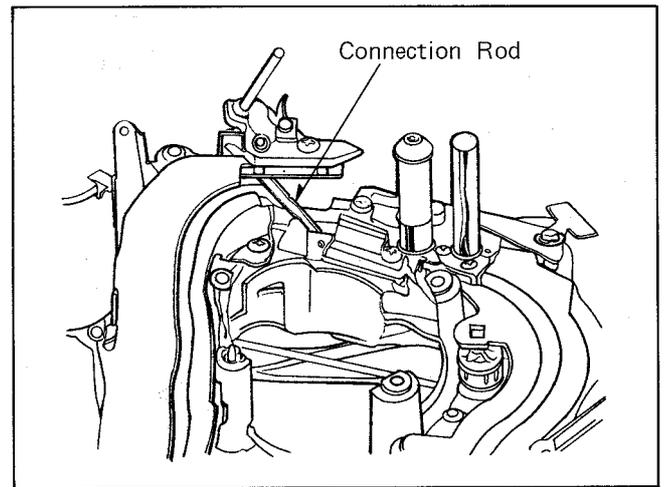


Fig. M33

- (3) Install a V stopper Base and Supply Post Stopper.

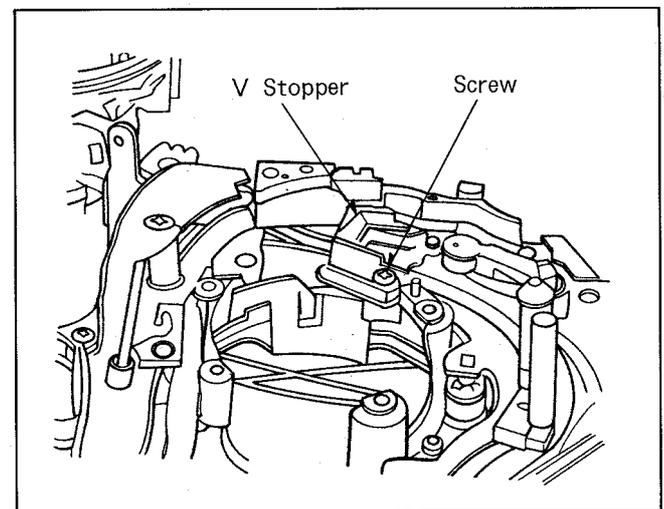


Fig. M34

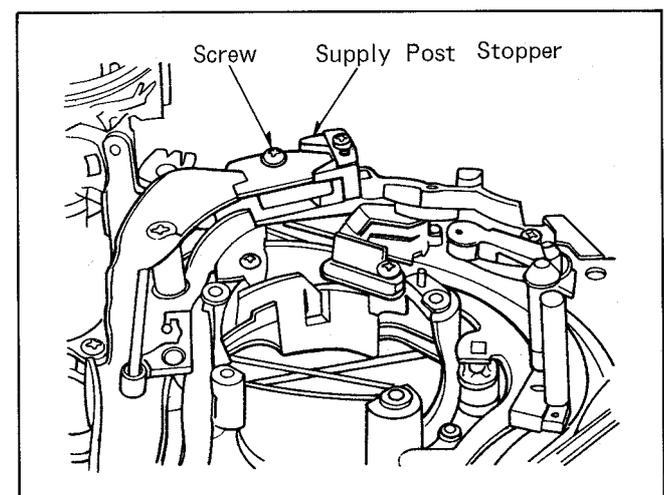


Fig. M35

- (4) Set the Loading Post unit into Stop position. as Shown below.

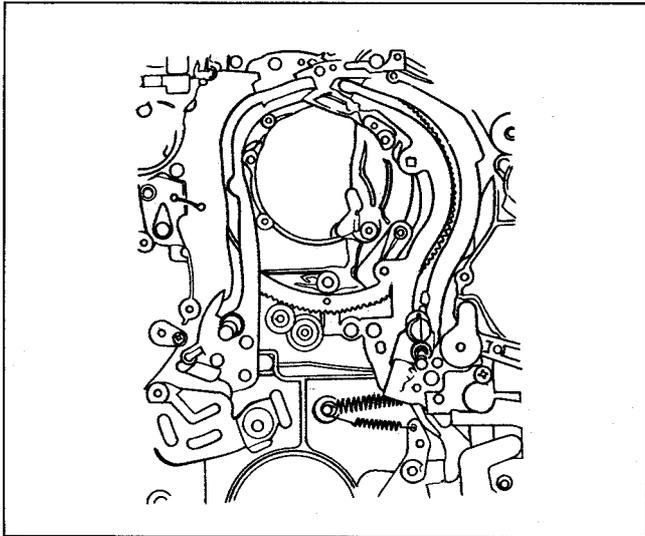


Fig. M36

- (2) Install a Drive Arm kick Lever hooking a Drive Arm Kick Lever Spring and fix it using ring.

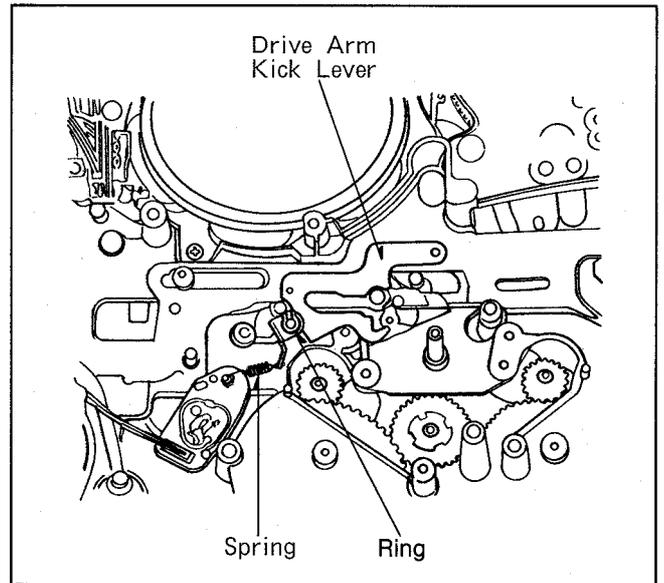


Fig. M38

[4] PROCEDURES FOR ASSEMBLING MAIN ROD

- (1) Place a Main Rod inserting 3 Thrust Washers and then insert 3 washers. After that, fix them using 2 retaining rings as shown below.

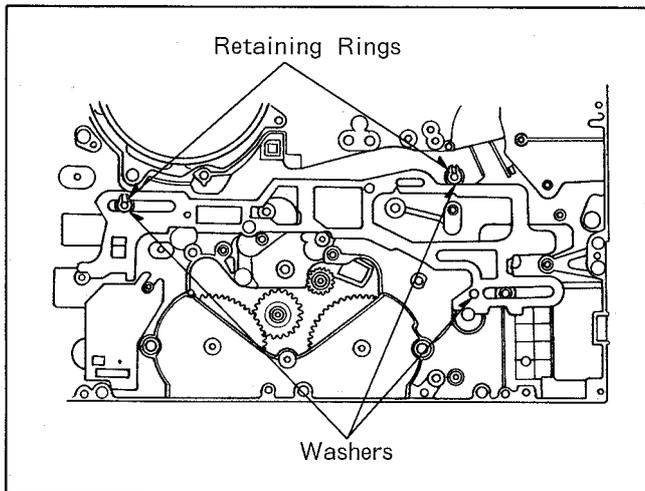


Fig. M37

[5] PROCEDURES FOR ASSEMBLING CAM GEAR AND LOADING GEAR (C)

- (1) Make sure that the hole on a Main Rod Line up exactly with hole on chassis as shown below. Make sure also, the hole on a Cam Gear Line up with hole on chassis.

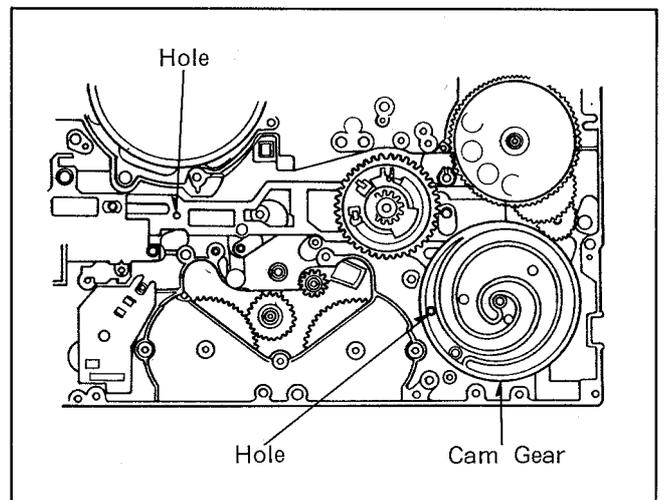


Fig. M39

- (2) Install a Loading Gear (C) keeping the relation as shown below.

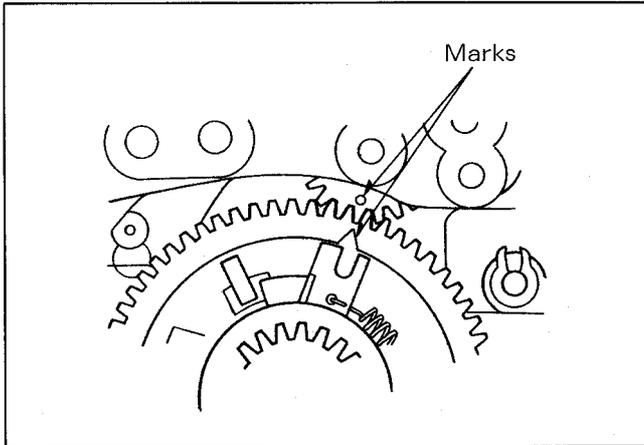


Fig. M40

- (3) Install a Sector Gear as shown below.

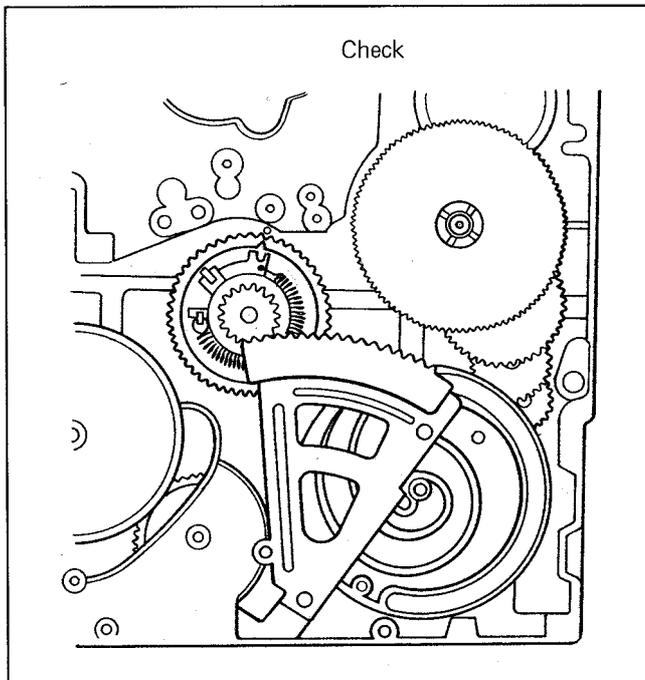


Fig. M41

- (4) Fix a SG Limiter

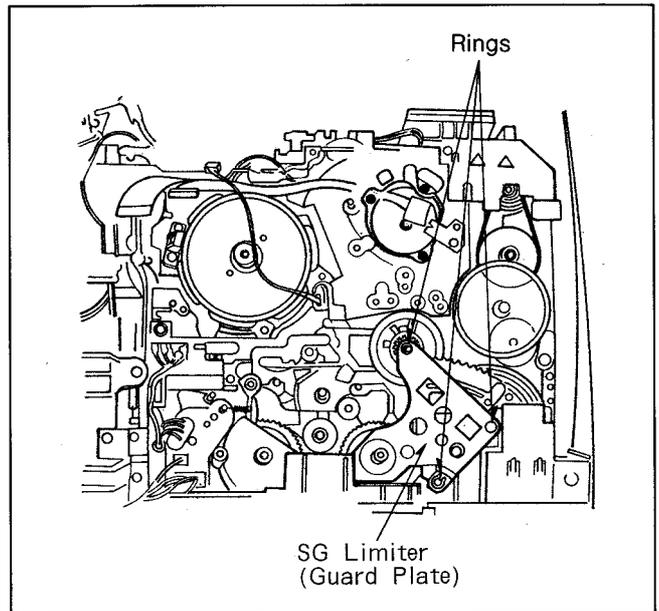


Fig. M42

[6] ASSEMBLY PROCEDURES OF MODE SELECT SWITCH

- (1) Perform this procedures after confirming the complete setting of mechanical parts. First of all, confirm that the hole on a Main Rod is meeting with a hole on a chassis.
- (2) Move the moving contact of a Mode Select position as shown below.

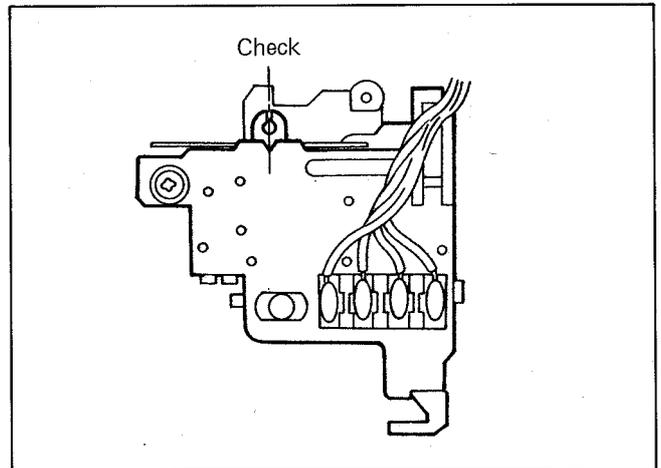


Fig M43

- (3) Install the Mode Select Switch keeping these relation written in item (1) and (2) by screwing 2 screw.

2-5. ELECTRICAL ADJUSTMENT PROCEDURES

2-5-1. ELECTRICAL ADJUSTMENT FOR CAMERA SECTION

TEST EQUIPMENT AND TOOLS

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

1) TEST EQUIPMENT

1. Oscilloscope
Dual Trace, 50MHz, 2mV/DIV
10:1 Probe
1:1 Probe
2. Digital Volt Meter of 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.

2) TOOLS

- * Logarithmic Gray Scale Chart (Part No.:YWV2310RB99)
 - * Colour Chip Chart (Part No.:YWV2100RB98)
 - * Hunting Chart (Part No.:VFK0546)
 - * J Chart & Ball Chart (Part No.:VFK0580)
 - * Colour Bar Chart (Part No.:VFK0677)
10. Plastic Tip Driver
 11. E.V.R. FIXTURE (Part No.:VFK0644)
* ROM 7 (Part No.:VFK0701ROM7)

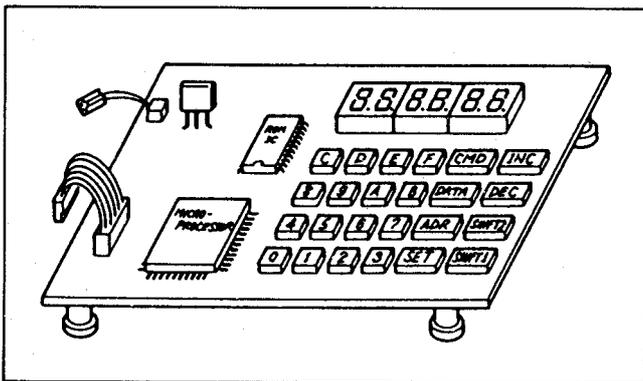


Fig. C1

12. Colour Temperature Conversion Filter
* C12 Filter (Part No. VFK0374 or VFK0713)
* C2 Filter (Part No. VFK0375 or VFK0716)
* Movie Light Box VRD91MLB (including VFK0777 Gray Scale Chart)
13. Extension Cable
* CONNECTION Cable for Measurement (24P) (Part No.VFK0766A)
* EVR CONNECTION Cable (15P) (Part No.VFK0734W)
14. Camera Extension Cables

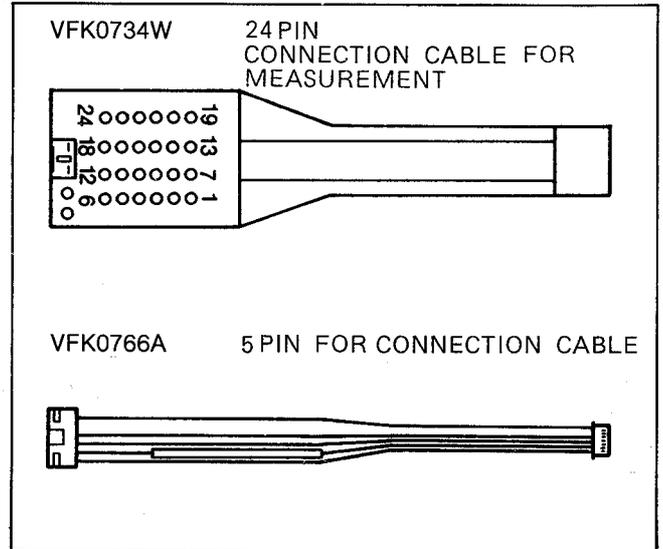


Fig. C2

(Standard Setting for Camera Adjustment)

The camera switches must be set in the following position for camera adjustment unless other wise specified each adjustment procedure.

- 1) White Balance Switch...White set (Refer to How to White Set)
AF...Auto
High speed shutter...OFF
Fade...OFF
- 2) Iris...Center(ALC condition)
- 3) Use 3200 degrees kelvin light source for lighting.
- 4) To 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 set White Balance)

- 1) Aim the camera at white chart.
- 2) Push [SHIFT 1 + 8] simultaneously.

(Description of Command)

Selecting the communication for the type of data exchange performed between EVR Fixture and camcorder.

Command	Communication	Contents
02	EVR Fixture → EEPROM	Writing the data to address of EEPROM. (Lower Digit)
12	EVR Fixture → EEPROM	Writing the data to address of EEPROM. (Upper Digit)
04	EEPROM → EVR Fixture	Reading out the data of EEPROM. (Lower Digit)
14	EEPROM → EVR Fixture	Reading out the data of EEPROM. (Upper Digit)
08	EVR Fixture → Micro Computer (RAM)	Data transmission of EVR Fixture to Micro computer (RAM).
18	EVR Fixture → Micro computer (RAM)	Data transmission of EVR Fixture to Micro computer (RAM).
09	Micro computer (RAM) → EVR Fixture	Reading out the data of Micro computer (RAM).
19	Micro computer (RAM) → EVR Fixture	Reading out the data of Micro computer (RAM).

Fig. C3

(Error Indication)

If an error occurs while EVR is operating, EVR will display one of the error messages listed in Fig.C4 for 2 seconds and then return to the previous indication.

Error NO.	Contents of Error	Simple checking method
1	Set the command number	
2	Set the wrong Address number	
3	VD signal from camera is not coming.	TP lead wire may be cut
4~6	Detect the error during communication	TP lead wire may be cut
7	Writing error in the EEPROM of camera.	Command or address cure wrong
8	Communication error in the EEPROM of camera	Same as above

Fig. C4

(Macro Operation)

The following operation is provided to transfer the data by one touch.

NO.	Buttom to be pushed	Operation						
1	SHIFT 1+0	Fully opens the IRIS						
2	SHIFT 1+1	Fully close the IRIS.						
3	SHIFT 1+2	Minimizes AGC Gain.						
4	SHIFT 1+3	Maximizes AGC Gain.						
5	SHIFT 1+4	Turns Fade on.						
6	SHIFT 1+5	Turns Fade off.						
7	SHIFT 1+6	NOT USED						
8	SHIFT 1+7	<p>Switching the Auto/manual Focus. * Press the SHIFT 1+7 to select the Auto or Manual Focus. (The focus mode selected is displayed on Address LED only while the keys are deppresses)</p> <table border="1"> <thead> <tr> <th>LED INDICATION</th> <th>MODE</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Manual Focus mode.</td> </tr> <tr> <td>1</td> <td>Auto Focus mode.</td> </tr> </tbody> </table>	LED INDICATION	MODE	0	Manual Focus mode.	1	Auto Focus mode.
LED INDICATION	MODE							
0	Manual Focus mode.							
1	Auto Focus mode.							
9	SHIFT 1+8	White set						
10	SHIFT 1+9	Making Iris manual condition.						
11	SHIFT 1+A	Iris is return to Auto Mode.						
12	SHIFT 1+B	AGC Gain is return to Auto Mode.						
13	SHIFT 2+2	Writes the Average data and Fixed data to the EEPROM.						
14	SHIFT 2+3	Automatically Calculates the Colour Reproduction and White Balance.						
15	SHIFT 2+4	NOT USED						
16	SHIFT 2+5	Zooms to "WIDE" position.						
17	SHIFT 2+6	Stop the Zoom.						
18	SHIFT 2+7	Zooms to "TELE" position.						
19	SHIFT 2+8	Stop the Zoom.						
20	SHIFT 2+9	Automatic Calculating for Manual Iris setting.						

Fig. C5

PREPARATION

- 1) Remove both side cases referring to disassembly method.
- 2) Connect the E.V.R. FIXTURE and measuring equipment as shown in Fig.C6.

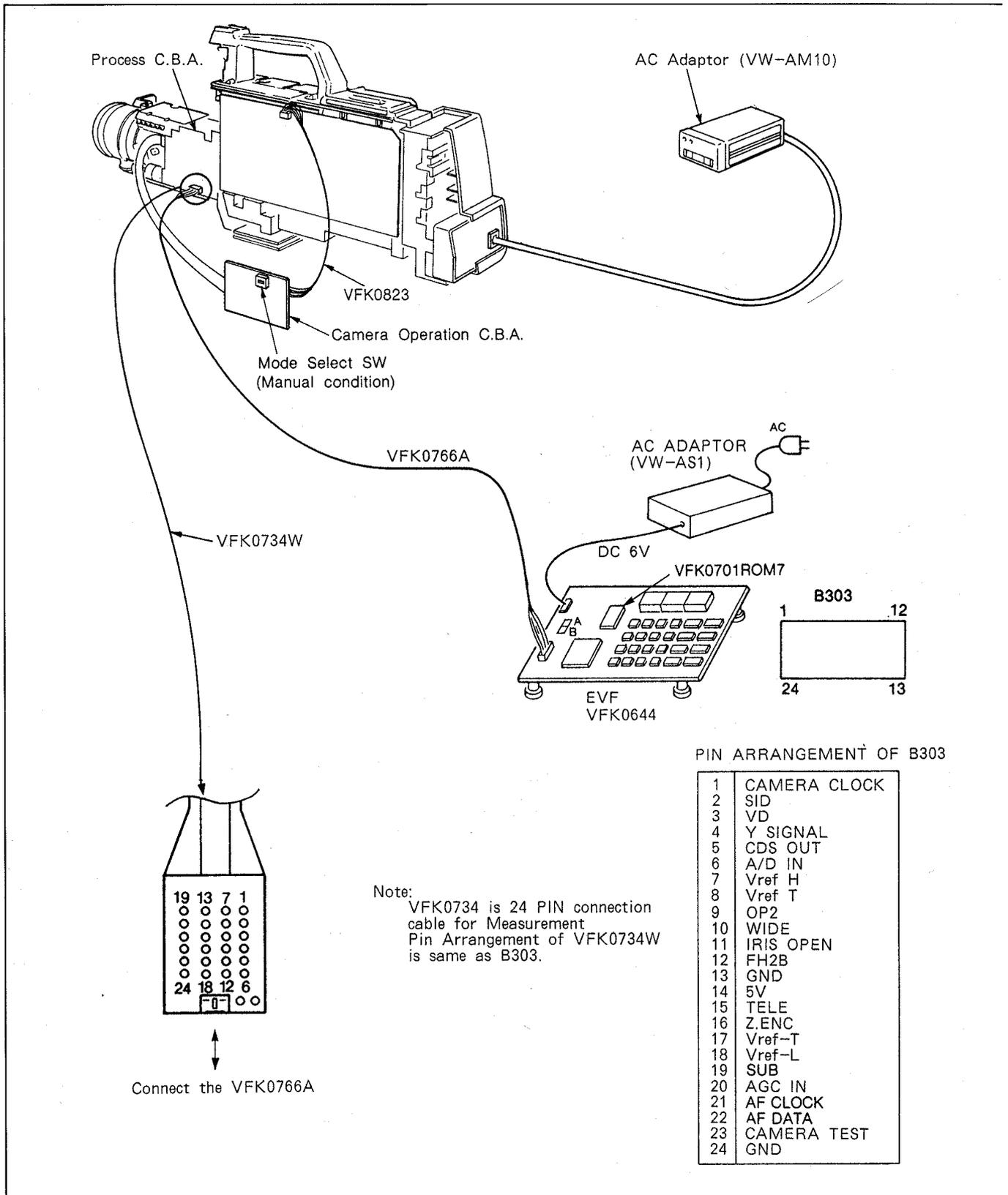


Fig. C6-1

How to connect the EVR Fixture

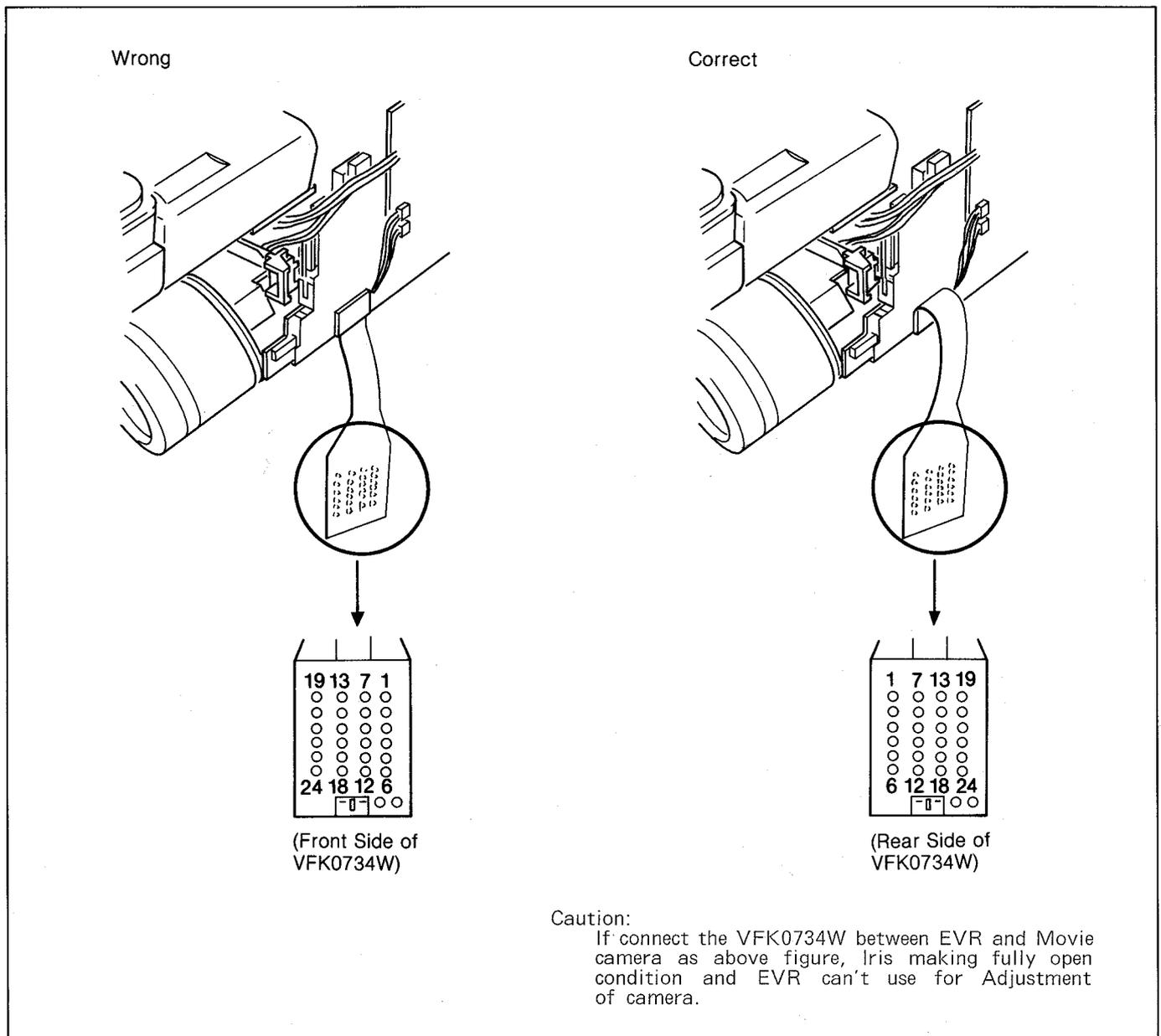


Fig. C6-2

- 1) Set the mode selector on the E.V.R. Fixture to "A" side. (Refer to Fig.C27)
- 2) Turn on the power SW of Movie camera.
- 3) Turn on the power SW of E.V.R. fixture. The LED Display on E.V.R. Fixture will indicate 08,80,00. If it does not indicated, push the Reset button and/or check the cable connections between EVR and CAMERA.
- 4) Mode Select SW on the camera Operation C.B.A., should be "manual" condition.
If "AUTO" condition, focus is always "AUTO".

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

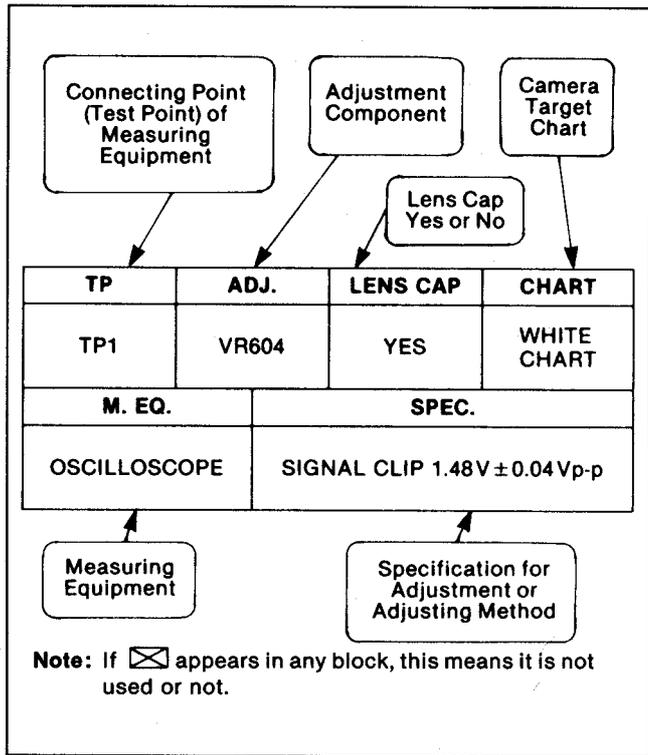


Fig. C7

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

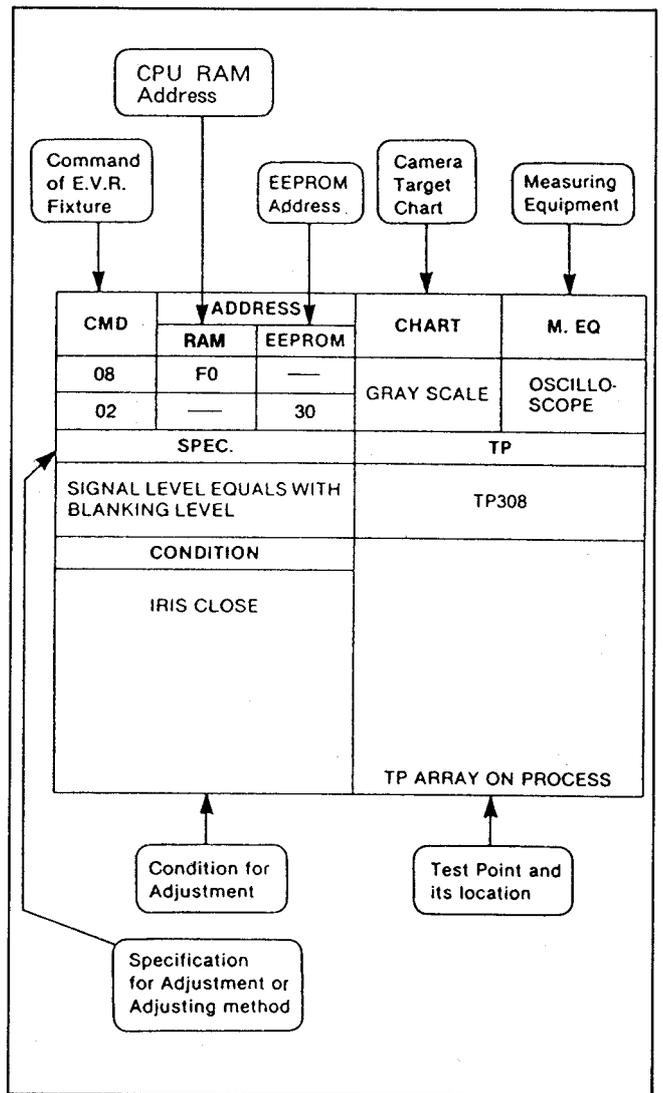


Fig. C8

1. DATA WRITING

When EEPROM is replaced, all item needs re-adjustment.

But If VFK0701ROM7 (New ROM) is installed to the EVR Fixture (VFK0644), when the pushing [SHIFT 2 and "2" keys simultaneously, Average Data is written in to EEPROM Automatically.

LOWER		UPPER							
		0	1	2	3	4	5	6	7
0	H DIGIT	B-Y Gain 6000 1D	B-Y MAT 6000 83	B-Y WB 6000 5C	B-Y limit 6000 49	B-hili 6000 4C	BACKUP 1 6E	vap-c1 D0	cnt lapt 25
	L DIGIT	R-Y Gain 6000 1E	R-Y MAT 6000 49	R-Y WB 6000 3E	R-Y limit 6000 1A	R-hili 6000 44	BACKUP 1 99	vap-core 26	g lap 83
1	H DIGIT	B-Y Gain 5100 1D	B-Y MAT 5100 83	B-Y WB 5100 68	B-Y limit 5100 4C	B-hili 5100 74	BACKUP 2 7A	Hap-cor 82	cnt ck B0
	L DIGIT	R-Y Gain 5100 1A	R-Y MAT 5100 49	R-Y WB 5100 41	R-Y limit 5100 1D	R-hili 5100 5D	BACKUP 2 50	hi-1. ap 10	cnt ct B0
2	H DIGIT	B-Y Gain 4500 1E	B-Y MAT 4500 85	R-Y WB 4500 7B	B-Y limit 4500 74	B-hili 4500 92	BACKUP 3 8A	cnt2-up 06	cnt lapk 25
	L DIGIT	R-Y Gain 4500 19	R-Y MAT 4500 43	R-Y WB 4500 3A	R-Y limit 4500 2F	R-hili 4500 4A	BACKUP 3 55	cnt2-dn 80	g lapk F8
3	H DIGIT	B-Y Gain 3600 24	B-Y MAT 3600 86	B-Y WB 3600 8D	B-Y limit 3600 85	B-hili 3600 AA	BACKUP 4 F0	H+gain 20	NOT USED
	L DIGIT	R-Y Gain 3600 1D	R-Y MAT 3600 45	R-Y WB 3600 5C	R-Y limit 3600 4A	R-hili 3600 67	BACKUP 4 1A	Vap-gain 10	NOT USED
4	H DIGIT	B-Y Gain 3300 33	B-Y MAT 3300 84	B-Y WB 3300 96	C-FLAG TH 67	CSPDm 09	agclim 2 A0	c-g-ap 20	NOT USED
	L DIGIT	R-Y Gain 3300 15	R-Y MAT 3300 46	R-Y WB 3300 69	CHSPD 04	CSPDs 1A	EIS ON/OFF 83	c-g-sw 55	NOT USED
5	H DIGIT	B-Y Gain 3100 33	B-Y MAT 3100 84	B-Y WB 3100 A0	B-limit 3100 86	B-hili 3100 D0	ped-h 36	H-st/p 20	NOT USED
	L DIGIT	R-Y Gain 3100 15	R-Y MAT 3100 46	R-Y WB 3100 76	R-limit 3100 67	R-hili 3100 87	ped-1H-ed/p 27	H-ed F8	NOT USED
6	H DIGIT	B-Y Gain 2800 2B	B-Y MAT 2800 84	B-Y WB 2800 A6	B-limit 2800 86	B-hili 2800 D0	ped-st 30	V-st/b 30	NOT USED
	L DIGIT	R-Y Gain 2800 19	R-Y MAT 2800 46	R-Y WB 2800 8E	R-limit 2800 87	R-hili 2800 B3	ped-end 50	v-ed/p 18	NOT USED
7	H DIGIT	STH FF		Bwb Llimit 5C	B-limit SKY 00	B-hili SKY 49	NOT USED 01	H-st/b 20	NOT USED
	L DIGIT			Rwb Llimit 3E	R-limit SKY 17	R-hili SKY 44	flag 3 FD	sw 0D	NOT USED
8	H DIGIT	Hap gain 20	Hap-core 82	Bwb Hlimit 68	B-limit TREE 74	B-hili TREE AA	flag7 FF	Y-base AC	NOT USED
	L DIGIT	Uap gain 10		Rwb Hlimit 41	R-limit TREE 17	R-hili TREE 2F	flag8 0F	Vap-core 05	NOT USED
9	H DIGIT	Houwa-U D0	HAP-NO 3C	B-Y WB 4900 68	BWBZ B 00	BWBZ C 00	Tree BK 03	cntlap 4F	NOT USED
	L DIGIT	Houwa-L B0	PEAKLPF 10	R-Y WB 4900 41	RWBZ B 00	BWBZ C 00	P-WAITE A0	g-lap CD	NOT USED
A	H DIGIT	palflag F4	cls4 31	DSP Ver 20	U puls 18	Baxish Th 74	st-alc 05	D-Aagc 49	NOT USED
	L DIGIT	haloth 17	cls8 71	MODEL-NBR C2	d puls 98	Baxish Th 4A	st-alc 05	cntc BF	NOT USED
B	H DIGIT	B in 10	VSTART 1D	TH 1 55	TH 3 6F	PALBR 00	open g 1 24	Ychk h A0	NOT USED
	L DIGIT	R in 10	ab set 93	TH 2 22	TH 4 10	LOOPH 02	open g 2 24	Ychk 1 28	NOT USED
C	H DIGIT	Outb1 9F	inal F3	OPS 4 31	KOTEI A 1F	OPEN 1 9B	OPEN 3 CB	Yclpv 1 65	NOT USED
	L DIGIT	Outb2 7B	ina2 E6	ST 81	KOTEI B 20	OPEN 2 B3	OPEN G 3 24	darklv 1 00	NOT USED
D	H DIGIT	Outb3 5C	ina3 CD	Seki A0	KOTEI C 18	CLOSE 1 73	CLOSE 3 53	BACK UP 46	NOT USED
	L DIGIT	Outb4 4F	ina4 B3	AGC lim 8D	KOTEI D 18	CLOSE 2 63	CLOSE G 3 44	BACK UP 00	NOT USED
E	H DIGIT	Outb0 0B	close 00	SW-set 83	keisha 04	ag cnt1 3F	CORE 04	loop gn 19	NOT USED
	L DIGIT	T-gain 24	open 06	MIX 03	AG-CENTER 9F	f cnd 48	CLOSE G2 64	loop gt 00	NOT USED
F	H DIGIT	A/D IN 7D	AF-ap 90	OR bias 80	R-YKB 4B	LOW CLIP 61	OPS8 71	clipmax F8	NOT USED
	L DIGIT	AF-Vn 58	AF-AMP 1E	PWM-B C8	Y-GAIN 1B	B-YKB 4B	CLOSE G3 84	PAL flkg 41	NOT USED

Fig. C9 Address map of all Average data.

2. VTR CARRIER BALANCE ADJUSTMENT

CMD	ADDRESS		CHART	M. EQ.
	RAM	EEPROM		
18	R: B8 B: BB	—	X	VECTOR-SCOPE
12, 02	—	R-Y: 3F (H) B-Y: 4F (L)		
SPEC.			TP	
CENTRE OF VECTORSCOPE			VIDEO OUT	

Purpose:

Set chroma signal black and white level.

Symptom of Misadjustment:

With a large shift, colour is added to Black and white areas in the picture.

Note:

Refer to preparation for connection of EVR.

<Preparation>

1. Connect the vectorscope to Video out.
2. Aim the camera at white chart.
3. Push [SHIFT 1 + 8] keys simultaneously for white set.
4. Place the unit to "IRIS CLOSE" by pushing [SHIFT 1 + 1] keys simultaneously.

<Adjustment for R-Y>

Push following keys in order.

5. * [CMD], [1], [8].
- * [ADR], [B], [8].
6. Push [INC] or [DEC] keys until the vectors are in or close as possible to the centre, See Fig.C10.

<Data writing for R-Y>

Push following keys in order.

7. * [CMD], [1], [2].
- * [ADR], [3], [F]. (Does not change the data).
- * [SET].

<Adjustment for B-Y>

Push following keys in order.

8. * [CMD], [1], [8].
- * [ADR], [B], [8].
9. * Push [INC] or [DEC] keys until the vectors are in or as close as possible to the centre, See Fig.C10.

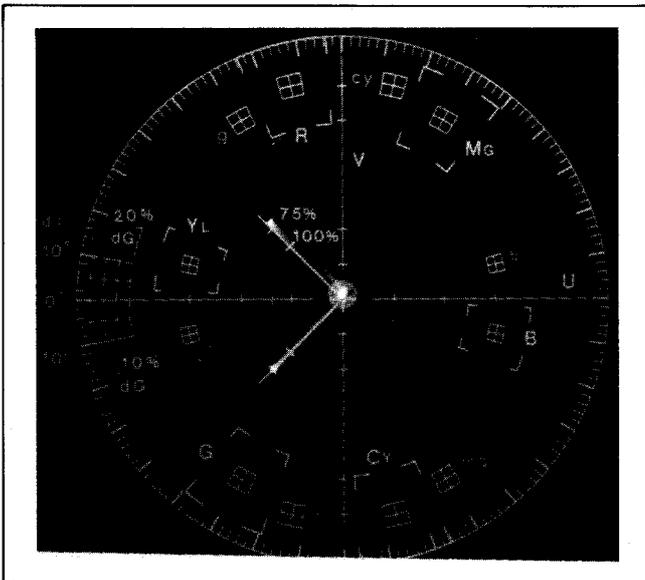


Fig. C10

<Data writing for B-Y>

Push following keys in order.

10. * [CMD], [0], [2].
- * [ADR], [4], [F]. (Does not change the data).
- * [SET].
- * [SHIFT 1 + A] (Iris is return to Auto Mode).

3. HALL AMP ADJUSTMENT

CMD	ADDRESS		CHART	M. EQ.																																				
	RAM	EEPROM																																						
18	B5	—	X	D.V.M																																				
	VR701	—																																						
02	—	IF																																						
SPEC.			TP																																					
VOLTAGE B303-9 (VFK0734W-PIN 9)= VOLTAGE B303-18 (VFK0734W-PIN 18)			B303-9 (PIN Number 9 of VFK0734W) VFK0734W-REAR																																					
VOLTAGE B303-9 (VFK0734W-PIN 9)= VOLTAGE B303-7 (VFK0734W-PIN 7)			<table border="1" style="text-align: center;"> <tr><td>1</td><td>7</td><td>13</td><td>19</td></tr> <tr><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>6</td><td>12</td><td>18</td><td>24</td></tr> <tr><td>0</td><td>0</td><td>0</td><td>0</td></tr> </table>		1	7	13	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	12	18	24	0	0	0	0
1	7	13	19																																					
0	0	0	0																																					
0	0	0	0																																					
0	0	0	0																																					
0	0	0	0																																					
0	0	0	0																																					
0	0	0	0																																					
6	12	18	24																																					
0	0	0	0																																					

Purpose:

Hall Amp Adjustment

Symptom of Misadjustment:

Hunting occurs or focus stops.

<Preparation>

1. Connect the jumper wire between B303-11 (VFK0734W-PIN11) and GND for Making Iris close. (Do not use EVR for IRIS close)

<Adjustment 1>

Push the following keys in order.

2. * [CMD], [1], [8].
- * [ADR], [B], [5].
3. * Push [INC] or [DEC] keys until the voltage level at B303-9 (VFK0734W-PIN9) become Vref 1 +- 10mV. (Vref 1 = B303-18 (VFK0734W-PIN18)).

<Data Writing for Adjustment 1>

Push the following keys in order.

4. * [CMD], [0], [2].
- * [ADR], [1], [F].
- * [SET].
- * Remove the jumper wire.

<Adjustment 2>

5. Connect the jumper wire between B303-11 (VFK0734W-PIN11) and B303-14 (VFK0734W-PIN14) for fully open the Iris.
6. Adjust the VR701 so that Voltage at B303-9 (VFK0734W-PIN9) become Vref 3+-30mV. (Vref 3 = B303-7 (VFK0734W-PIN7))
7. Remove the jumper wire.

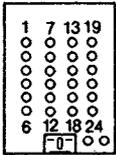
4. PLL FREQUENCY ADJUSTMENT

TP	ADJ.	LENS CAP	CHART
CL203	C223		
M. EQ.		SPEC.	
FREQUENCY COUNTER		9.656250MHz±15Hz	

Purpose:
CCD Drive pulse adjustment

Symptom of Misadjustment:
Picture sync misoperation.

5. P WM ADJUSTMENT

CMD	ADDRESS		CHART	M. EQ.
	RAM	EEPROM		
18	B7	—		D.V.M
02	—	2F (L)		
SPEC.			TP	
			B303-9 (VFK0734W-PIN 9) VFK0734W-REAR 	

<Pre paration>

- Set the Iris to "open". (Push [SHIFT 1 + 0]).
- Connect the D.V.M. to B303-9 (VFK0734W-PIN9).

<Pre-Adjustment>

Push the following keys in order.

- * [CMD], [1], [8].
* [ADR], [B], [7].
- Push [INC] or [DEC] keys until the Voltage level at B303-9 (VFK0734W-PIN9) become Vref 1±50mV. (Vref 1 = Voltage at B303-7-500mV)
- * [SHIFT 1 + 1] (fully close the Iris).
- * [SHIFT 1 + 0] (fully open the Iris).

<Fine-Adjustment>

Push the following keys in order.

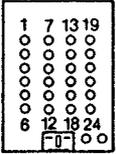
- * [CMD], [1], [8].
* [ADR], [B], [7].
- Push [INC] or [DEC] keys until the Voltage level at B303-9 (VFK0734W-PIN9) become Vref2±20mV. (Vref 2 = Voltage at B303-7-140mV).

<Data Writing>

Push the following keys in order.

- * [CMD], [0], [2].
* [ADR], [2], [F]. (Does not change the data).
* [SET].
* [SHIFT 1 + A] (Iris is return to Auto Mode).

6. ZOOM ENCODER AND FOCUS ENCODER ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ. |
|----------------------------|----------------|-----------|---|----------------------|
| | RAM | EEPROM | | |
| 18 | T: B4
W: B3 | — | object:
1m (Hunting
chart) | DIGITAL
VOLTMETER |
| 12 | — | T: 1F (H) | | |
| 02 | — | W: 0F (L) | | |
| SPEC. | | | TP | |
| To be calculated | | | B303-8 (VF0734W-8)
B303-17 (VFK0734W-17)
VFK0734W-REAR
 | |
| CONDITION | | | | |
| • Focus Manual (SHIFT 1+7) | | | | |

Note:

- Unless you replaced Zoom Encoder, 3rd lens (1) unit or 4th moving frame (1) unit, do not perform this adjustment. (Because this adjustment is critical).
- Regarding the connection of EVR, refer to preparation. (Fig.C6)

<Initial Measurement and Preparation>

- Check the voltage at B303-8(VFK0734W-PIN8) and B303-17(VFK0734W-PIN17) before changing the defective lens unit.
For example:
B303-8(VFK0734W-PIN8) : 3.652V
B303-17(VFK0734W-PIN17) : 1.456V
- Make note the potential difference between B303-8(VFK0734W-PIN8) and B303-17(VFK0734W-PIN17).
For example:
3.652-1.456 = 2.196V
- Turn off the power SW.
- Replace lens unit.
- Loosen 2 screws of Focus encoder C.B.A. and move C.B.A. to center position as shown in Fig.C11-1.

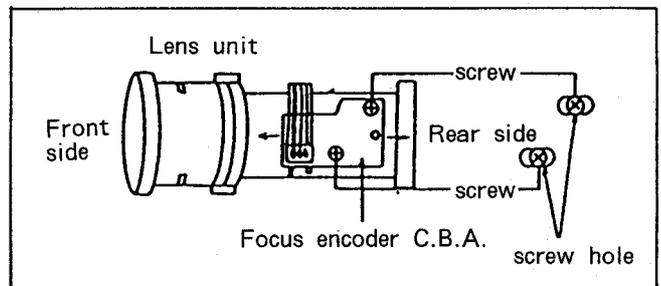


Fig. C11-1

6. Turn on the power SW.
7. Set the Focus system to Manual Focus.
(Pushing [SHIFT 1 + 7] keys simultaneously switches the Focus system between Manual and Auto Focus, "0" displayed at address LED while [SHIFT 1 + 7] keys depressed indicates Manual Focus, "1" indicates Auto Focus.
8. Zoom the lens to full tele position.
Push [SHIFT 2 + 7] keys simultaneously.
9. Aim the unit at Hunting chart from a distance 1 meter.
10. Set the focus to full (-) position.
* Turn the focus ring counterclockwise until the picture focus does not change.

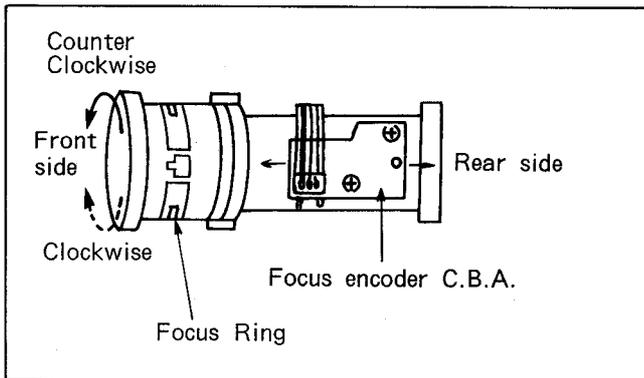


Fig. C11-2

<Adjustment for Tele Side>

Push the following keys in order.

11. * [CMD], [1], [8].
* [ADR], [B], [4].
12. * Push [INC] or [DEC] keys until the lens focus is in correct position.

[Note 1]

The focus does not change while focus voltage is being adjusted on the EVR.
To see the focus adjustment the lens unit must be zoomed from TELE to WIDE and back to TELE to activate the focus.

[Note 2]

Using the zoom controls on the EVR disables the Zoom controls of TELE/WIDE button on the camera.
Therefore, use EVR([SHIFT 2 + 7] or [SHIFT 2 + 5]) to move zoom for the TELE or WIDE position.

13. When lens focus comes to the correct position (at fully TELE Side), Push the following keys in order for store the data to EEPROM directly.
* [CMD], [1], [2].
* [ADR], [1], [F].
* [SET].

If the lens assembly cannot be focused, the Focus Encoder C.B.A. must be repositioned.
Turn the focus ring clockwise.

- * If the focus improves more, the Focus Encoder C.B.A. to the rear.
- * If the focus deteriorates more, the Focus Encoder C.B.A. to the front.

Return to Step(6) to reposition the Focus Encoder C.B.A..

<Adjustment for Wide Side>

14. Check the Voltage at B303-8 (VFK0734W-PIN 8).
15. Subtract the voltage that was noted at step(2) from the voltage at step(14).
For example:
If the voltage at B303-8(VFK0734W-PIN8) is 3.662V.
 $3.662 - 2.196 = 1.466$
16. Set the voltage at B303-17(VFK0734W-PIN17) to 1.466V with EVR as follows.
Push the following keys in order.
* [CMD], [1], [8].
* [ADR], [B], [3].
* Push [INC] or [DEC] until the voltage at B303-17(VFK0734W-PIN17) is 1.466V.
17. Push the following keys in order for store the data to EEPROM Directly.
* [CMD], [0], [2]. (Does not change the data).
* [ADR], [0], [F].
* [SET].

<Confirm the focus when zooming to Wide Side>

18. Turn OFF and ON the Power SW.
19. Set the focus system to Manual focus as step(7).
20. Check the back focus while Zooming.
(If back focus is not good refer to following table)

- 1) Focus is not good at full wide side.

Adjust the data of ADR "B3" at the full Wide Side keeping the voltage at B303-(18) within $\pm 0.05V$ of the voltage in Step(16).

Check back focus While Zooming.

- * If back focus is good, go to Step(19).
- * If back focus is not good, stop the zoom at the position of bad focus.
Turn the focus ring clockwise and/or counter-clockwise.

If focus improves when the focus ring is turned counter-clockwise reposition the Focus Encoder C.B.A. to the front.

If focus improves when the focus ring is turned clockwise, reposition the Focus Encoder C.B.A. to the rear.

Return to Step(5) to reposition the Focus Encoder C.B.A.

- 2) Focus is not good-between TELE and WIDE.
Stop the zoom at the position of bad focus.
Turn the focus ring clockwise and/or counter-clockwise.
* If focus improves when the focus ring is turned counter-clockwise, reposition the Focus Encoder C.B.A. to the front.
* If focus improves when the focus ring is turned clockwise, reposition the Focus Encoder C.B.A. to the rear.
Return to Step(5) to reposition the Focus Encoder C.B.A..

7. V-SUB ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ. |
|-------------|---------|--------|--------------|------------|
| | RAM | EEPROM | | |
| 18 | B6 | — | HALOGEN LAMP | MONITOR TV |
| 12 | — | 2F | | |
| SPEC. | | | TP | |
| NO BLOOMING | | | | |

1. Zoom all the way in (full tele position or full wide position) and aim the camera at the Halogen Lamp as shown in Fig.C12.
2. Set the High Speed Shutter SW to "OFF" position.
3. Diffuse the incoming light using frosted glass or acryl plate. Place the cardboard which has been cut to "U" shape as shown in Fig.C12. between the diffusion plate and the camera.
4. Set the Iris to "Open" [SHIFT 1 + 0].

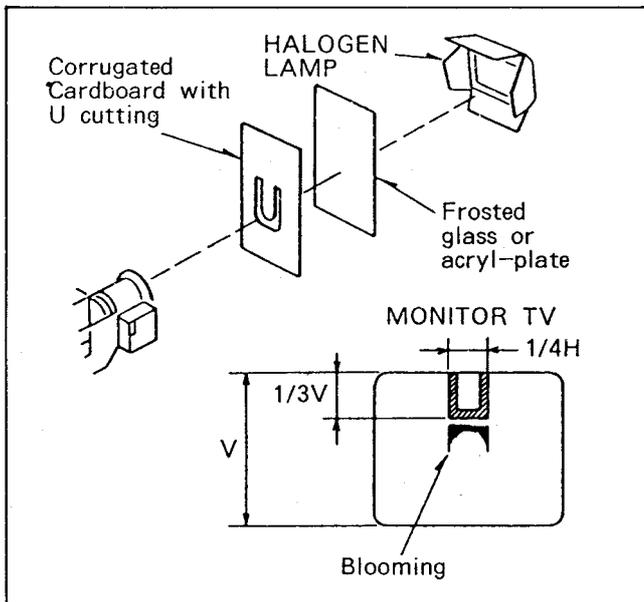


Fig. C12

<Adjustment>

Push the following keys in order.

5. * [CMD], [1], [8].
* [ADR], [B], [6].
6. * Push [INC], or [DEC] keys until the blooming disappears (If blooming does not disappear completely, adjust until the blooming minimize).

<Data Writing>

Push the following keys in order.

7. * [CMD], [1], [2].
* [ADR], [2], [F].
* [SET].
* [SHIFT 1 + A].
8. Confirm that the monitored picture does not contain Blooming in both High Speed Shutter "ON" and "OFF" modes even if the camera moves as shown in Fig.C13.

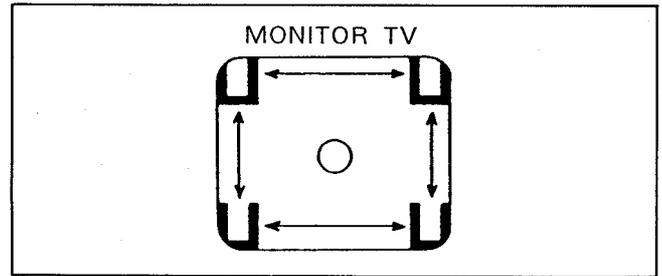


Fig. C13

8. PEDESTAL LEVEL ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ. |
|--------------|---------|--------|--------------------------------------|--------------|
| | RAM | EEPROM | | |
| 18 | BA | — | X | OSCILLOSCOPE |
| 12 | — | 4F | | |
| SPEC. | | | TP | |
| A=0mV ± 10mV | | | B303-6 (VFK0734W-6)
VFK0734W-REAR | |
| | | | | |

<Preparation>

1. Cover the lens.
Push [SHIFT 1 + 3] keys (Maximizes AGC Gain).
Push [SHIFT 1 + 9] keys (Making Iris manual condition).
2. Connect the oscilloscope to B303-6(VFK0734W-PIN6).

<Adjustment>

Push the following keys in order.

3. * [CMD], [1], [8].
* [ADR], [B], [A].
4. * Push [INC] or [DEC] keys until the "A" level is minimized, as shown in Fig.C14.

<Data writing>

Push the following keys in order.

5. * [CMD], [1], [2].
* [ADR], [A], [F].
* [SET].
6. * [SHIFT 1 + A].

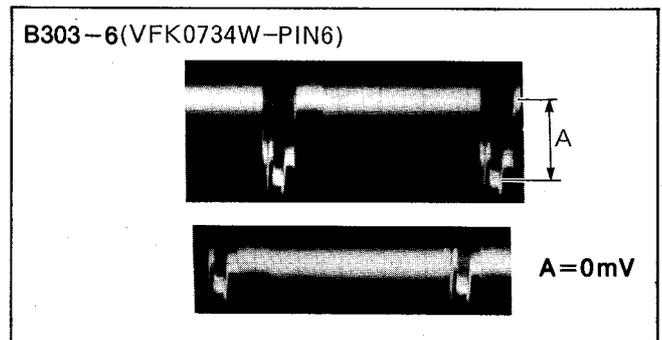
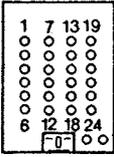


Fig. C14

9. AGC ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ. |
|------------|---------|--------|---|--------------|
| | RAM | EEPROM | | |
| 18 | BC | — | GRAY SCALE CHART | OSCILLOSCOPE |
| 12 | — | 6A | | |
| SPEC. | | | TP | |
| 230mV±20mV | | | B303-5 (VFK0734W-PIN 5)
B303-20 (VFK0734W-PIN 20)
VFK0734W-REAR | |
| | | |  | |

Purpose:

Set standard signal gain.

Symptom of Misadjustment:

The picture is sometimes too dark or too bright.

< Preset for AGC Adjustment >

1. Making Iris manual condition [SHIFT 1+9].
2. Aim the camera at Gray Scale Chart.
3. Connect the Oscilloscope to B302-5. (VFK0734W-PIN5)

< Preset 1-Rough >

Push the following keys in order.

4. * [CMD], [1], [8].
- * [ADR], [D], [F].
5. * Push [INC] or [DEC] keys until signal level at B303-5 (VFK0734W-PIN5) is 250mV±10mV.

< Preset 2-Fine >

Push the following keys in order.

6. * [CMD], [1], [8].
- * [ADR], [D], [E].
7. * Push [INC] or [DEC] keys until signal level at B303-5 (VFK0734W-PIN5) is 250mV±10mV.

< AGC Adjustment >

Push the following keys in order.

8. * [CMD], [1], [8].
- * [ADR], [B], [C].
9. * Push [INC] or [DEC] keys until the signal level at B303-20 (VFK0734W-PIN20) is 230mV±20mV.

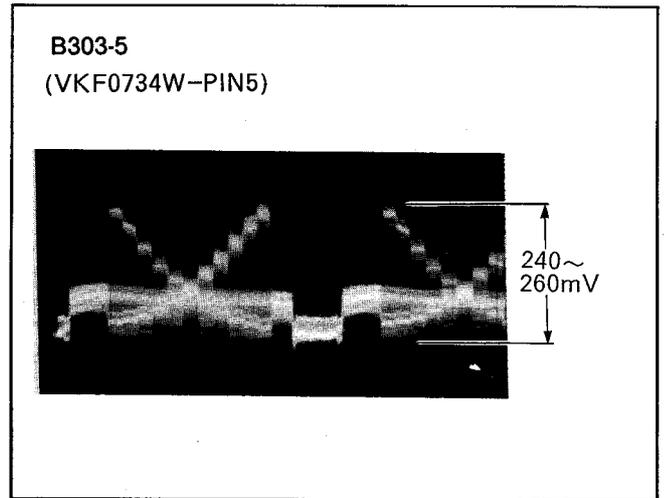


Fig. C15-1

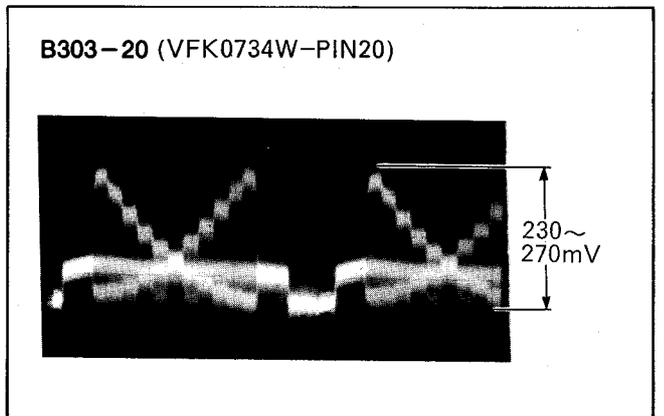


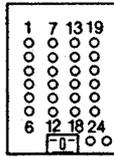
Fig. C15-2

< Data Writing >

Push the following keys in order.

10. * [CMD], [1], [2]. (Does not change the Data).
- * [ADR], [6], [A].
- * [SET].
11. * Push [SHIFT 1+A] keys (Iris return to Auto mode)

10. A/D INPUT LEVEL ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ. |
|-----------|---------|--------|---|--------------|
| | RAM | EEPROM | | |
| 18 | B1 | — | GRAY SCALE CHART | OSCILLOSCOPE |
| 12 | — | 0F | | |
| SPEC. | | | TP | |
| 1.2V±40mV | | | B303-5 (VFK0734W-PIN 5)
B303-6 (VFK0734W-PIN 6) | |
| | | |  | |

Purpose:

A/D converter input Level adjustment.

Symptom of Misadjustment:

The picture becomes too dark or too bright.

< Preset for AGC Adjustment >

1. Making Iris manual condition [SHIFT 1+9].
2. Aim the camera at Gray Scale Chart.
3. Connect the Oscilloscope to B302-5. (VFK0734W-PIN5)

< Preset 1-Rough >

Push the following keys in order.

4. * [CMD], [1], [8].
* [ADR], [D], [F].
5. * Push [INC] or [DEC] keys until signal level at B303-5 (VFK0734W-PIN5) is 250mV±10mV.

< Preset 2-Fine >

Push the following keys in order.

6. * [CMD], [1], [8].
* [ADR], [D], [E].
7. * Push [INC] or [DEC] keys until signal level at B303-5 (VFK0734W-PIN5) is 250mV±10mV.

< A/D Input level Adjustment >

8. * [CMD], [1], [8].
* [ADR], [B], [1].
9. * Push [INC] or [DEC] keys until the signal level at B303-6 (VFK0734W-PIN6) is 1.2V±40mV.

< Data Writing >

Push the following keys in order.

10. * [CMD], [1], [2]. (Does not change the Data)
* [ADR], [0], [F].
* [SET].

Push [SHIFT 1+A] keys. (Iris return to Auto mode)

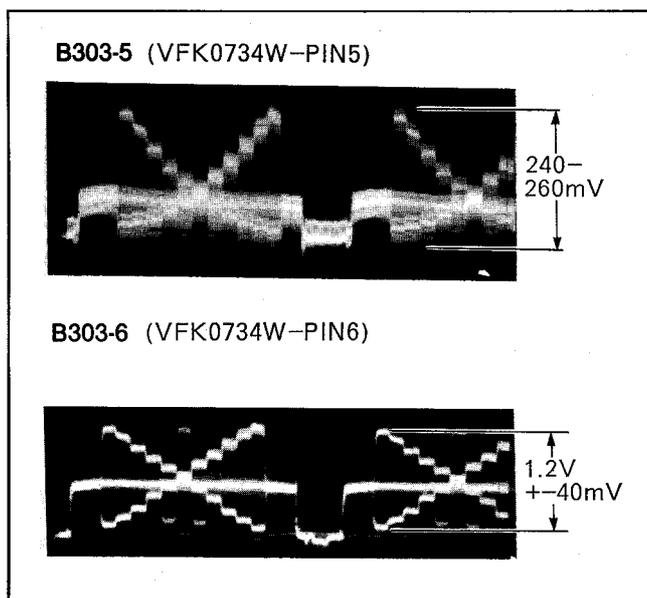


Fig. C16

11. ALC ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ. |
|------------|---------|--------|-------------------------|--------------|
| | RAM | EEPROM | | |
| 18 | D4 | — | GRAY SCALE CHART | OSCILLOSCOPE |
| 02 | — | 2C | | |
| SPEC. | | | TP | |
| 1.20V±40mV | | | B303-6 (VFK0734W-PIN 6) | |
| | | | | |

Note:

Perform this adjustment after finishing the AGC and A/D INPUT LEVEL ADJUSTMENT.

Purpose:

ALC level adjustment.

Symptom of Misadjustment:

The picture is too white or too dark.

<Preparation>

1. Set the IRIS to Auto [SHIFT 1 + A].
2. Aim the camera at Gray Scale Chart.
3. Connect the oscilloscope to B303-6(VFK0734W-PIN6).

<Adjustment>

Push the following keys in order.

4. * [CMD], [1], [8].
* [ADR], [D], [4].
5. * Push [INC] or [DEC] keys until the signal level at B303-6(VFK0734W-PIN6) is 1.20V ±40mV.

<Data Writing>

Push the following keys in order.

6. * [CMD], [0], [2]. (Does not change the Data)
* [ADR], [2], [C].
* [SET].

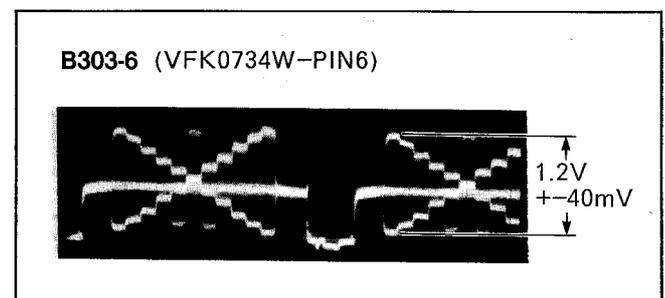


Fig. C17

12. MANUAL IRIS ADJUSTMENT

| NO. | ITEM | EEPROM ADDRESS | FORMULA | CMD | RESULT OF CALCULATION |
|-----|--------|-----------------|-------------|-----------------------|-----------------------|
| 1 | OPEN1 | 4C (High digit) | ADR (2C)+24 | READ: 04
WRITE: 12 | |
| 2 | OPEN2 | 4C (Low digit) | ADR (4C)+24 | READ: 14
WRITE: 02 | |
| 3 | OPEN3 | 5C (High digit) | ADR (4C)+24 | READ: 04
WRITE: 12 | |
| 4 | CLOSE1 | 4D (High digit) | ADR (2C)-16 | READ: 04
WRITE: 12 | |
| 5 | CLOSE2 | 4D (Low digit) | ADR (4D)-16 | READ: 14
WRITE: 02 | |
| 6 | CLOSE3 | 5D (High digit) | ADR (4D)-16 | READ: 04
WRITE: 12 | |

Calculation for Manual IRIS.

Note 1:
ADR(2C) = ALC Data

Note 2:
Push [SHIFT 2 + 9] keys simultaneously.
(All formulas for Manual Iris are performed and results are stored into EEPROM Automatically)

Note 3:
If the ALC Adjustment is incorrect the Manual Iris SET UP will also be incorrect.
Be sure to carry out the ALC Adjustment procedure correctly before doing the Manual Iris Adjustment.

* Example
Item 1 : OPEN 1
Formula : ADR(2C)+24

Read out the data From Address(2C) of EEPROM as follows.

- * Select read command(04) => Push [CMD],[0],[4].
- * Select Address(2C) => Push [ADR],[2],[C].
- * Push (SET) to Read the data => Push [SET].

When the (SET) key is pushed, the data LED will indicate the data of Address(2C).
Convert this data to decimal.
If data LED indicate(6D).
HEX(6D) = 109(Decimal Value)

Now using the formula (2C)+24 Calculate the Reset.
(Substitute the Decimal Value for the HEX data in (2C)109+24=133.

Convert the Result to a HEX Value using the table (Fig.C18)
133(decimal)=85(in HEX CODE)

Store the above HEX Value in the EEPROM.
Address(4C) High digit as follows.

- * Select command(12) => Push [CMD],[1],[2].

- * Select Address(4C) => Push [ADR],[4],[C].
- * Set the data(85) => Push [DATA],[8],[5].
- * Push (SET) to write the data => Push [SET].

Note 4:
Priority of Formula.

ADR "2C"(Low digit) = ALC Adjustment

1. OPEN 1 : "4C"(High digit) =

ADR "2C"(Low digit)+24

2. OPEN 2 : "4C"(Low digit) =

ADR "4C"(High digit)+24

3. OPEN 3 : "5C"(High digit) =

ADR "4C"(Low digit)+24

ADR "2C"(Low digit) = ALC Adjustment

4. CLOSE 1 : "4D"(High digit) =

ADR "2C"(Low digit)-16

5. CLOSE 2 : "4D"(Low digit) =

ADR "4D"(High digit)-16

6. CLOSE 3 : "5D"(High digit) =

ADR "4D"(Low digit)-16

| | | ② | | | | | | | | | | | | | | | |
|----------------------------|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Hexadecimal
upper digic | Hexadecimal
lower 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 |
| 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 |
| ① 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 "6D" (as upper digit is "6" and lower digit is "D"), a decimal value of "109" is obtained from the intersection of ① and ② in the above table.

Fig. C18 Hexadecimal-Decimal Conversion Table

(Hexadecimal-Decimal Conversion Table)

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. Write the new hexadecimal adjustment data into EEPROM. A hexadecimal-decimal conversion table is shown in Fig.C18.

13. Y CLIP LEVEL ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ. |
|-----------|---------|--------|---|-------------------|
| | RAM | EEPROM | | |
| 18 | B9 | — | WHITE
CHART | OSCILLO-
SCOPE |
| 02 | — | 3F | | |
| SPEC. | | | TP | |
| V/S=7.7:3 | | | B303-4
(VFK0734W-PIN 4)
VFK0734W-REAR | |
| | | | | |

<Preparation>

1. Set the IRIS to "OPEN". [SHIFT1 + 0].
2. Aim the camera at white chart.
3. Connect the Oscilloscope to B303-4. (VFK0734W-PIN4)

<Adjustment>

Push the following keys in order.

4. * [CMD], [1], [8].
5. * [ADR], [B], [9].
5. * Push [INC] or [DEC] keys until ratio of V and S is 7.7:3.

<Data Writing>

Push the following keys in order.

6. * [CMD], [0], [2]. (Does not change the data)
7. * [ADR], [3], [F].
7. * [SET].
7. * [SHIFT 1 + A] (IRIS return to Auto Mode)

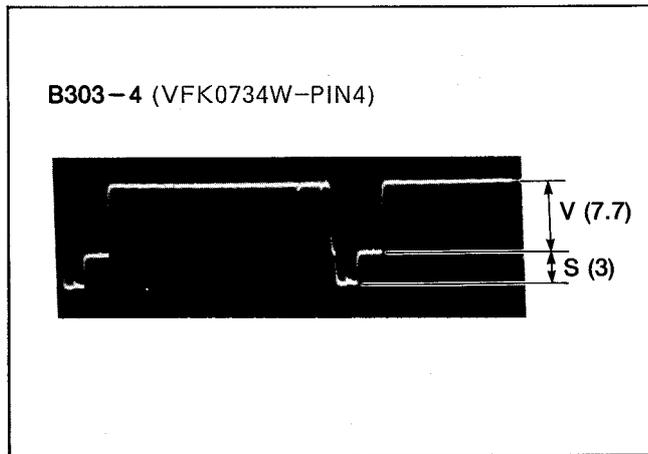


Fig. C19

14. INDOOR WHITE BALANCE ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|--|----------------------|----------|----------------|--|
| | RAM | EEPROM | | |
| 09 | BB (R-Y)
AB (B-Y) | — | WHITE
CHART | VECTOR-
SCOPE OR
OSCILLO-
SCOPE |
| 02 | — | 25 (R-Y) | | |
| 12 | — | 25 (R-Y) | | |
| SPEC. | | | TP | |
| VECTOR COMES CENTRE
OR WAVEFORM IS
MINIMIZED | | | VIDEO OUT | |
| CONDITION | | | X | |
| IRIS: ALC | | | | |

<Preparation>

1. Connect the Video out to Vectorscope.
2. Aim the camera at white chart. And Push [SHIFT 1 + 8] for white set. (Please confirm, vector came to center)

<Read Out the data for R-Y>

Push the following keys in order.

3. * [CMD], [0], [9].
 3. * [ADR], [B], [B].
 3. * [SET].
- (When the pushed [SET] key, Data LED of EVR indicate the data of white balance for R-Y)

<Data Writing for R-Y>

Push the following keys in order.

4. * [CMD], [0], [2]. (Do not change the data)
4. * [ADR], [2], [5].
4. * [SET].

<Read Out the data for B-Y>

Push the following keys in order.

5. * [CMD], [0], [9].
5. * [ADR], [A], [B].
5. * [SET].

(When the pushed [SET] key, Data LED of EVR indicate the data of white balance for B-Y)

<Data writing for B-Y>

Push the following keys in order.

6. * [CMD], [1], [2]. (Do not change the data)
6. * [ADR], [2], [5].
6. * [SET].

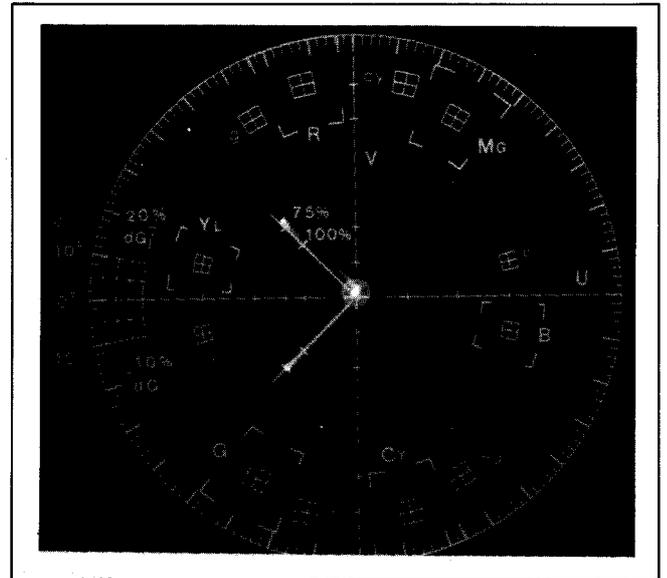


Fig. C20

15. COLOUR PHASE AND GAIN ADJUSTMENT (INDOOR)

| CMD | ADDRESS | | CHART | M. EQ. |
|--|--|--------------------------|------------------|--------------|
| | RAM | EEPROM | | |
| 08 | 95 (R-Y G)
97 (R-Y P)
94 (B-Y G)
96 (B-Y P) | — | COLOUR BAR CHART | VECTOR SCOPE |
| 02 | — | 05 (R-Y G)
15 (R-Y P) | | |
| 12 | — | 05 (B-Y G)
15 (B-Y P) | | |
| SPEC. | | | TP | |
| RED: 104+ -3 degree/PHASE
190%+ -10%/GAIN
(RED/BURST)
168+ -3 degree/PHASE
140%+ -10%/GAIN
(Yellow/BURST) | | | VIDEO OUT | |

Note:

Be sure to carry out the Indoor White Balance Adjustment before doing this Adjustment.

1. Aim the camera at Colour Bar Chart.
2. Connect the Video out to vectorscope.

<R-Y GAIN>

(Step3 to 5 are R-Y Gain Adjustment)

Push the following keys in order.

3. * [CMD], [0], [8].
* [ADR], [9], [5].
4. * Push [INC] or [DEC] keys until phase of red and yellow vectors are as close as possible to Spec. See Fig.C21.

<Data Writing for R-Y Gain>

Push the following keys in order.

5. * [CMD], [0], [2]. (Does not change the data)
* [ADR], [0], [5].
* [SET].

<R-Y PHASE>

(Step6 to 8 are R-Y Phase Adjustment)

Push the following keys in order.

6. * [CMD], [0], [8].
* [ADR], [9], [7].
7. * Push [INC] or [DEC] keys until phase of red and yellow vectors are as close as possible to Spec. See Fig.C21.

<Data Writing for R-Y Phase>

Push the following keys in order.

8. * [CMD], [0], [2]. (Does not change the data)
* [ADR], [1], [5].
* [SET].

<B-Y Gain>

(Step9 to 11 are B-Y Gain Adjustment)

Push the following keys in order.

9. * [CMD], [0], [8].
* [ADR], [9], [4].
10. * Push [INC] or [DEC] keys until phase of red and yellow vectors are as close as possible to Spec. See Fig.C21.

<Data Writing for B-Y GAIN>

Push the following keys in order.

11. * [CMD], [1], [2].
* [ADR], [0], [5].
* [SET].

<B-Y PHASE>

(Step12 to 14 are B-Y PHASE Adjustment)

Push the following keys in order.

12. * [CMD], [0], [8].
* [ADR], [9], [6].
13. * Push [INC] or [DEC] keys until phase of red and Yellow Vectors are as close as possible to Spec. See Fig.C21.

<Data Writing for B-Y PHASE>

Push the following keys in order.

14. * [CMD], [1], [2].
* [ADR], [1], [5].
* [SET].

15. Repeat the Step(3) to Step(14) unit vectors becomes within Spec.

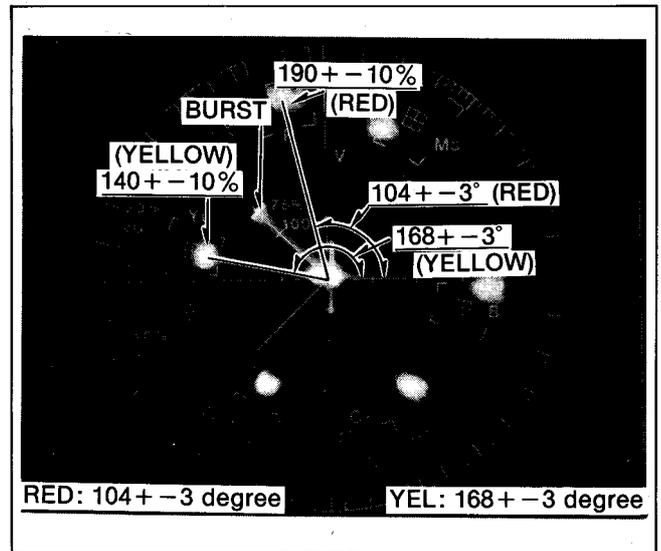


Fig. C21

16. OUTDOOR WHITE BALANCE ADJUSTMENT

| CMD | ADDRESS | | CHART | M. EQ |
|---|----------------------|----------|-------------|------------------------------|
| | RAM | EEPROM | | |
| 09 | BB (R-Y)
AB (B-Y) | — | WHITE CHART | VECTOR-SCOPE OR OSCILLOSCOPE |
| 02 | — | 21 (R-Y) | | |
| 12 | — | 21 (B-Y) | | |
| SPEC. | | | TP | |
| VECTOR COMES CENTRE OR WAVEFORM IS MINIMIZED | | | VIDEO OUT | |
| CONDITION | | | X | |
| TEMPERATURE CONVERSION FILTER: VFK0713 (C12)
VFK0716 (C2)
IRIS: ALC | | | | |

Purpose:

Set standard white level for each colour temperature.

Symptom of Misadjustment:

White becomes bluish or reddish.

<Preparation>

1. Connect the Video Out to Vectorscope.
2. Cover the lens with colour temperature conversion filter VFK0713 and VFK0716 to imitate the Outdoor lighting.
3. Aim the camera at white chart, and push [SHIFT 1 + 8] keys for white set.
(Please confirm, vectors came to center)

<Read Out the data for R-Y>

Push the following keys in order.

4. * [CMD], [0], [9].
* [ADR], [B], [B].
* [SET].
(When the pushed [SET] key, Data LED of EVR indicate the data of white balance for R-Y)

<Data Writing for R-Y>

Push the following keys in order.

5. * [CMD], [0], [2]. (Does not change the data)
* [ADR], [2], [1].
* [SET].

<Read Out the data for B-Y>

Push the following keys in order.

6. * [CMD], [0], [9].
* [ADR], [A], [B].
* [SET].

(When the pushed [SET] key, data LED of EVR indicate the data of white balance for B-Y)

<Data Writing for B-Y>

Push the following keys in order.

7. * [CMD], [1], [2]. (Does not change the data)
* [ADR], [2], [1].
* [SET].

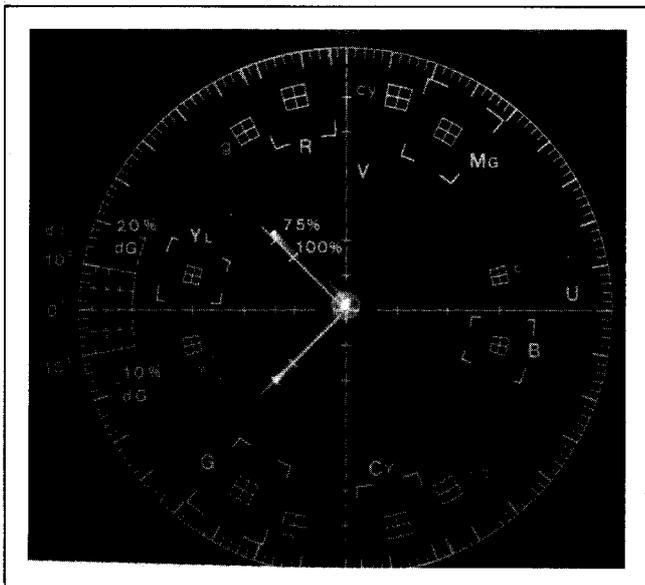


Fig. C22

17. COLOUR PHASE AND GAIN ADJUSTMENT (OUTDOOR)

| CMD | ADDRESS | | CHART | M. EQ. |
|--|--|--------------------------|------------------|--------------|
| | RAM | EEPROM | | |
| 08 | 95 (R-Y G)
97 (R-Y P)
94 (B-Y G)
96 (B-Y P) | — | COLOUR BAR CHART | VECTOR SCOPE |
| 02 | — | 01 (R-Y G)
11 (R-Y P) | | |
| 12 | — | 01 (B-Y G)
11 (B-Y P) | | |
| SPEC. | | | TP | |
| RED: 104 + -3 degree/
PHASE, 190% + -10%
GAIN (Red/BURST)
YEL: 168 + -3 degree/
PHASE, 140% + -10%
GAIN Yellow/BURST) | | | VIDEO OUT | |

Note:

Be sure to carry out the Outdoor white balance Adjustment before doing this Adjustment.

<Preparation>

1. Connect the Video output to vectorscope.
2. Aim the camera at colour bar chart and cover the lens with colour temperature conversion filter VFK0713 and VFK0716 to imitate the outdoor lighting.

<R-Y Gain>

(Step3 to 5 are R-Y Gain Adjustment)

Push the following keys in order.

3. * [CMD], [0], [8].
* [ADR], [9], [5].
4. * Push [INC] or [DEC] keys until phase of red and yellow vectors are as close as possible to Spec. See Fig.C22.

<Data Writing for R-Y Gain>

Push the following keys in order.

5. * [CMD], [0], [2]. (Do not change the data)
* [ADR], [0], [1].
* [SET].

<R-Y PHASE>

(Step6 to 8 are R-Y Phase Adjustment)

Push the following keys in order.

6. * [CMD], [0], [8].
* [ADR], [9], [7].
7. * Push the [INC] or [DEC] keys until phase of red and yellow vectors are as close as possible to Spec. See Fig.C23.

<Data Writing for R-Y Phase>

Push the following keys in order.

8. * [CMD], [0], [2]. (Do not change the data)
* [ADR], [1], [1].
* [SET].

<B-Y Gain>
(Step9 to 11 are B-Y Gain Adjustment)

Push the following keys in order.

9. * [CMD], [0], [8].
* [ADR], [9], [4].
10. * Push [INC] or [DEC] keys until phase of red and yellow vectors are as close as possible to Spec. See Fig.C23.

<Data Writing for B-Y Gain>

Push the following keys in order.

11. * [CMD], [1], [2]. (Do not change the data)
* [ADR], [0], [1].
* [SET].

<B-Y PHASE>
(Step12 to 14 are B-Y Phase Adjustment)

Push the following keys in order.

12. * [CMD], [0], [8].
* [ADR], [9], [6].
13. * Push [INC] or [DEC] keys until phase of red and yellow vectors are as close as possible to Spec. See Fig.C23.

<Data Writing for B-Y Phase>

Push the following keys in order.

14. * [CMD], [1], [2]. (Do not change the data)
* [ADR], [1], [1].
* [SET]
15. Repeat the Step(3) to Step(14) until vectors becomes within Spec. as shown in Fig.C23.

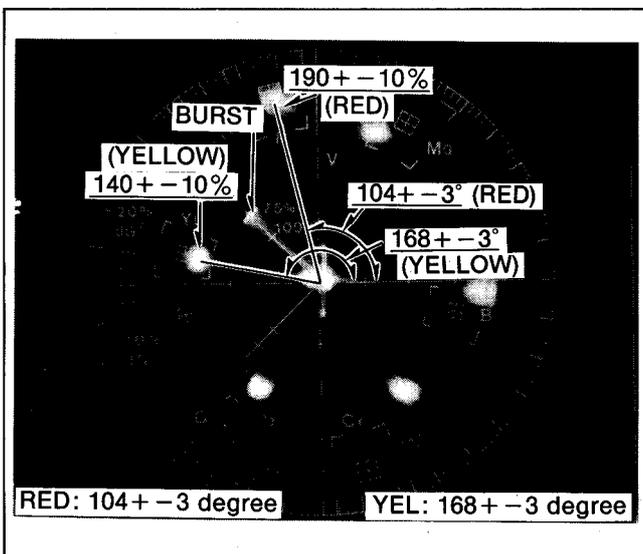


Fig. C23

18. DATA WRITING FOR COLOUR REPRODUCTION AND WHITE BALANCE

Purpose:

Each adjustment voltage is recorded in EEPROM as digital data. For colour reproduction adjustments such as white balance, phase and gain adjustments, the adjustments have only been performed for indoor lighting (3200 degree kelvin) and outdoor lighting (5600 degree kelvin). The EEPROM requires the data for other lighting conditions such as 3600 degree kelvin, 4500 degree kelvin and 6000 degree kelvin. In order to supply the rest of the data the following calculation has to be done and the results entered in the proper address of EEPROM.

Misentering:

White balance and colour reproduction in lighting conditions between indoor and outdoor are poor.

Note 1:

VFK0701ROM7 (New ROM) for EVR must be installed in EVR fixture.
Mode selector should be "A" side.

1. Push [SHIFT 2 + 3] key simultaneously. (All formulas in Fig.C24, are performed and results stored in EEPROM automatically)

Note 2:

How to calculate and enter the data manually. You can do calculation and entering the data to EEPROM manually as follows;

(For example)

ITEM : R-Y GC 36

FORMULA : $ADR05 + 0.882 \times (ADR01 - ADR05)$

EEPROM ADDRESS : 03

- 1) Read Out the data.
ADR05 : Set the command to "04".
Set the address to "05".
Push the "SET" button.
The number which is indicated in "DATA" LED is a data of ADR05 (Address "05") for example, if indicated data is "56", substitute "56" to ADR05. (This is hexadecimal number)
The same as above, read out the data from address "01".
For example if data which is read out is ADR01="6C", ADR05="56" above formula becomes;
 $R-Y GC 36 = 56 + -1.00 \times (6C - 56)$.
- 2) Convert the hexadecimal data into decimal number using conversion table. (Shown in Fig.C18) For example, "56" in hexadecimal is "86" in decimal from intersection of 5 and 6. Substitute it into the formula.
Therefore,
 $R-Y GC 36 = 86 + 0.882 \times (108 - 86)$
 $= 86 + 0.882 \times (22)$
 $= 105$
- 3) Convert the result "105" to hexadecimal using conversion table (Fig.C18).
"105" decimal is "69" in hexadecimal.
Write the "69" into EEPROM address "03".
* Set the command to [02].
* Set the address to [03].
* Set the data [69].
* Push the [SET] key.

Calculation for Colour Reproduction

| NBR | ITEM | EEPROM ADDRESS | CMD | RESULT OF CALCULATION | FORMULA |
|------|-----------------|--------------------|-------------------------|-----------------------|--|
| (1) | R-Y GC 36 | 03
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*05''} + 0.882 \times (ADR^{*01''} - ADR^{*05''})$ |
| (2) | R-Y GC 45 | 02
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*05''} + 0.471 \times (ADR^{*01''} - ADR^{*05''})$ |
| (3) | R-Y GC 28 | 06
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*05''} + 0.412 \times (ADR^{*01''} - ADR^{*05''})$ |
| (4) | R-Y GC 60 | 00
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*05''} + 1.000 \times (ADR^{*01''} - ADR^{*05''})$ |
| (5) | R-Y GC 33 | 04
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*05''} + 0.000 \times (ADR^{*01''} - ADR^{*05''})$ |
| (6) | R-Y MAT 28 | 16
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*15''} + 0.000 \times (ADR^{*11''} - ADR^{*15''})$ |
| (7) | R-Y MAT 36 | 13
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*15''} - 0.091 \times (ADR^{*11''} - ADR^{*15''})$ |
| (8) | R-Y MAT 45 | 12
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*15''} - 0.750 \times (ADR^{*11''} - ADR^{*15''})$ |
| (9) | R-Y MAT 60 | 10
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*15''} + 1.000 \times (ADR^{*11''} - ADR^{*15''})$ |
| (10) | R-Y MAT 33 | 14
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*15''}$ |
| (11) | B-Y GC 28 | 06
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*05''} + 0.333 \times (ADR^{*01''} - ADR^{*05''})$ |
| (12) | B-Y GC 36 | 03
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*05''} + 0.667 \times (ADR^{*01''} - ADR^{*05''})$ |
| (13) | B-Y GC 45 | 02
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*05''} + 0.939 \times (ADR^{*01''} - ADR^{*05''})$ |
| (14) | B-Y GC 60 | 00
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*05''} + 1.000 \times (ADR^{*01''} - ADR^{*05''})$ |
| (15) | B-Y GC 33 | 04
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*05''} - 0.000 \times (ADR^{*01''} - ADR^{*05''})$ |
| (16) | B-Y MAT 28 | 16
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*15''} + 0.000 \times (ADR^{*11''} - ADR^{*15''})$ |
| (17) | B-Y MAT 36 | 13
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*15''} - 1.750 \times (ADR^{*11''} - ADR^{*15''})$ |
| (18) | B-Y MAT 45 | 12
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*15''} - 1.125 \times (ADR^{*11''} - ADR^{*15''})$ |
| (19) | B-Y MAT 60 | 10
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*15''} + 1.000 \times (ADR^{*11''} - ADR^{*15''})$ |
| (20) | B-Y MAT 33 | 14
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*15''}$ |
| (21) | R-Y WB 28 | 26
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*25''} + 0.455 \times (ADR^{*25''} - ADR^{*21''})$ |
| (22) | R-Y WB 33 | 24
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*25''} - 0.242 \times (ADR^{*25''} - ADR^{*21''})$ |
| (23) | R-Y WB 36 | 23
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*25''} - 0.485 \times (ADR^{*25''} - ADR^{*21''})$ |
| (24) | R-Y WB 45 | 22
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*25''} - 1.136 \times (ADR^{*25''} - ADR^{*21''})$ |
| (25) | R-Y WB 49 | 29
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*25''} - 1.000 \times (ADR^{*25''} - ADR^{*21''})$ |
| (26) | R-Y-WB 60 | 20
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*25''} - 1.061 \times (ADR^{*25''} - ADR^{*21''})$ |
| (27) | R-Y WB
L-LIM | 27
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*25''} - 1.061 \times (ADR^{*25''} - ADR^{*21''})$ |
| (28) | R-Y WB
H-LIM | 28
(LOW DIGIT) | READ : 04
WRITE : 02 | | $ADR^{*25''} - 1.000 \times (ADR^{*25''} - ADR^{*21''})$ |
| (29) | B-Y WB 28 | 26
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*25''} + 0.121 \times (ADR^{*25''} - ADR^{*21''})$ |
| (30) | B-Y WB 33 | 24
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*25''} - 0.167 \times (ADR^{*25''} - ADR^{*21''})$ |
| (31) | B-Y WB 36 | 23
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*25''} - 0.333 \times (ADR^{*25''} - ADR^{*21''})$ |
| (32) | B-Y WB 45 | 22
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*25''} - 0.667 \times (ADR^{*25''} - ADR^{*21''})$ |
| (33) | B-Y WB 49 | 29
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*25''} - 1.000 \times (ADR^{*25''} - ADR^{*21''})$ |
| (34) | B-Y WB 60 | 20
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*25''} - 1.212 \times (ADR^{*25''} - ADR^{*21''})$ |
| (35) | B-Y WB
L-LIM | 27
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*25''} - 1.212 \times (ADR^{*25''} - ADR^{*21''})$ |
| (36) | B-Y WB
H-LIM | 28
(HIGH DIGIT) | READ : 14
WRITE : 12 | | $ADR^{*25''} - 1.000 \times (ADR^{*25''} - ADR^{*21''})$ |

Fig. C24-1

Calculation for Auto White Balance

| NBR | ITEM | EEPROM ADDRESS | CMD | RESULT OF CALCULATION | FORMULA |
|------|---------|--------------------|------------------------|-----------------------|--|
| (1) | BH 28 | 46
(HIGH DIGIT) | READ : 14
WRITE: 12 | | $ADR^{*25} + 0.864 \times (ADR^{*25} - ADR^{*21})$ |
| (2) | BH 30 | 45
(HIGH DIGIT) | READ : 14
WRITE: 12 | | $ADR^{*25} + 0.864 \times (ADR^{*25} - ADR^{*21})$ |
| (3) | BH 36 | 43
(HIGH DIGIT) | READ : 14
WRITE: 12 | | $ADR^{*25} + 0.182 \times (ADR^{*25} - ADR^{*21})$ |
| (4) | BH 45 | 42
(HIGH DIGIT) | READ : 14
WRITE: 12 | | $ADR^{*25} - 0.242 \times (ADR^{*25} - ADR^{*21})$ |
| (5) | BH 51 | 41
(HIGH DIGIT) | READ : 14
WRITE: 12 | | $ADR^{*25} - 0.788 \times (ADR^{*25} - ADR^{*21})$ |
| (6) | BH 60 | 40
(HIGH DIGIT) | READ : 14
WRITE: 12 | | $ADR^{*25} - 1.500 \times (ADR^{*25} - ADR^{*21})$ |
| (7) | BH TR | 48
(HIGH DIGIT) | READ : 14
WRITE: 12 | | $ADR^{*25} + 0.182 \times (ADR^{*25} - ADR^{*21})$ |
| (8) | BH SKY | 47
(HIGH DIGIT) | READ : 14
WRITE: 12 | | $ADR^{*25} - 1.561 \times (ADR^{*25} - ADR^{*21})$ |
| (9) | Baxisth | 4A
(HIGH DIGIT) | READ : 14
WRITE: 12 | | $ADR^{*25} - 0.788 \times (ADR^{*25} - ADR^{*21})$ |
| (10) | BL 28 | 36
(HIGH DIGIT) | READ : 14
WRITE: 12 | | $ADR^{*25} - 0.455 \times (ADR^{*25} - ADR^{*21})$ |
| (11) | BL 30 | 35
(HIGH DIGIT) | READ : 14
WRITE: 12 | | $ADR^{*25} - 0.455 \times (ADR^{*25} - ADR^{*21})$ |
| (12) | BL 36 | 33
(HIGH DIGIT) | READ : 14
WRITE: 12 | | $ADR^{*25} - 0.485 \times (ADR^{*25} - ADR^{*21})$ |
| (13) | BL 45 | 32
(HIGH DIGIT) | READ : 14
WRITE: 12 | | $ADR^{*25} - 0.788 \times (ADR^{*25} - ADR^{*21})$ |
| (14) | BL 51 | 31
(HIGH DIGIT) | READ : 14
WRITE: 12 | | $ADR^{*25} - 1.500 \times (ADR^{*25} - ADR^{*21})$ |
| (15) | BL 60 | 30
(HIGH DIGIT) | READ : 14
WRITE: 12 | | $ADR^{*25} - 1.561 \times (ADR^{*25} - ADR^{*21})$ |
| (16) | BL TR | 38
(HIGH DIGIT) | READ : 14
WRITE: 12 | | $ADR^{*25} - 0.788 \times (ADR^{*25} - ADR^{*21})$ |
| (17) | BL SK | 37
(HIGH DIGIT) | READ : 14
WRITE: 12 | | ADR^{*00} |
| (18) | RH 28 | 46
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} + 1.152 \times (ADR^{*25} - ADR^{*21})$ |
| (19) | RH 30 | 45
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} + 0.333 \times (ADR^{*25} - ADR^{*21})$ |
| (20) | RH 36 | 43
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} - 0.833 \times (ADR^{*25} - ADR^{*21})$ |
| (21) | RH 45 | 42
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} - 0.833 \times (ADR^{*25} - ADR^{*21})$ |
| (22) | RH 51 | 41
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} - 0.470 \times (ADR^{*25} - ADR^{*21})$ |
| (23) | RH 60 | 40
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} - 0.939 \times (ADR^{*25} - ADR^{*21})$ |
| (24) | RH TR | 48
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} - 1.348 \times (ADR^{*25} - ADR^{*21})$ |
| (25) | RH SK | 47
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} - 0.939 \times (ADR^{*25} - ADR^{*21})$ |
| (26) | Rxisth | 4A
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} - 0.833 \times (ADR^{*25} - ADR^{*21})$ |
| (27) | RL 28 | 36
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} + 0.333 \times (ADR^{*25} - ADR^{*21})$ |
| (28) | RL 30 | 35
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} - 0.288 \times (ADR^{*25} - ADR^{*21})$ |
| (29) | RL 36 | 33
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} - 0.833 \times (ADR^{*25} - ADR^{*21})$ |
| (30) | RL 45 | 32
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} - 1.348 \times (ADR^{*25} - ADR^{*21})$ |
| (31) | RL 51 | 31
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} - 1.682 \times (ADR^{*25} - ADR^{*21})$ |
| (32) | RL 60 | 30
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} - 1.742 \times (ADR^{*25} - ADR^{*21})$ |
| (33) | RL TR | 38
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} - 1.803 \times (ADR^{*25} - ADR^{*21})$ |
| (34) | RL SK | 37
(LOW DIGIT) | READ : 04
WRITE: 02 | | $ADR^{*25} - 1.803 \times (ADR^{*25} - ADR^{*21})$ |

Fig. C24-2

19. ADDITIONAL FOR
HOW TO USE E.V.R.

E.V.R. FIXTURE

Camera Process section uses a memory IC called a E.E.P.R.O.M.(Electrical Erasable Programmable Read Only Memory) that replaces the variable resistor in conventional camera process. In the conventional camera process, each adjustment point was adjusted by turning variable resistors as shown in Fig.C25. In the Movie Camera adjustment voltage is recorded in the EEPROM as 8 bit digital data. The EEPROM supplies the recorded adjustment voltage to the adjustment point as shown in Fig.C26.

The data in the EEPROM can be changed electrically. The E.V.R.(Electric Variable Resistor) has been designed to change the 8 bit data of EEPROM in process circuit. The E.V.R. can also communicate directly with the RAM of the micro processor to change each control voltage. In normal operation the EEPROM would send the voltage data to RAM where the digital data is used to changed the adjustment values in the various circuits. Using the E.V.R. you can change the data stored in the EEPROM easily there by adjusting the camera process section. And the E.V.R. can also send the data to the RAM directly to confirm the adjustment.

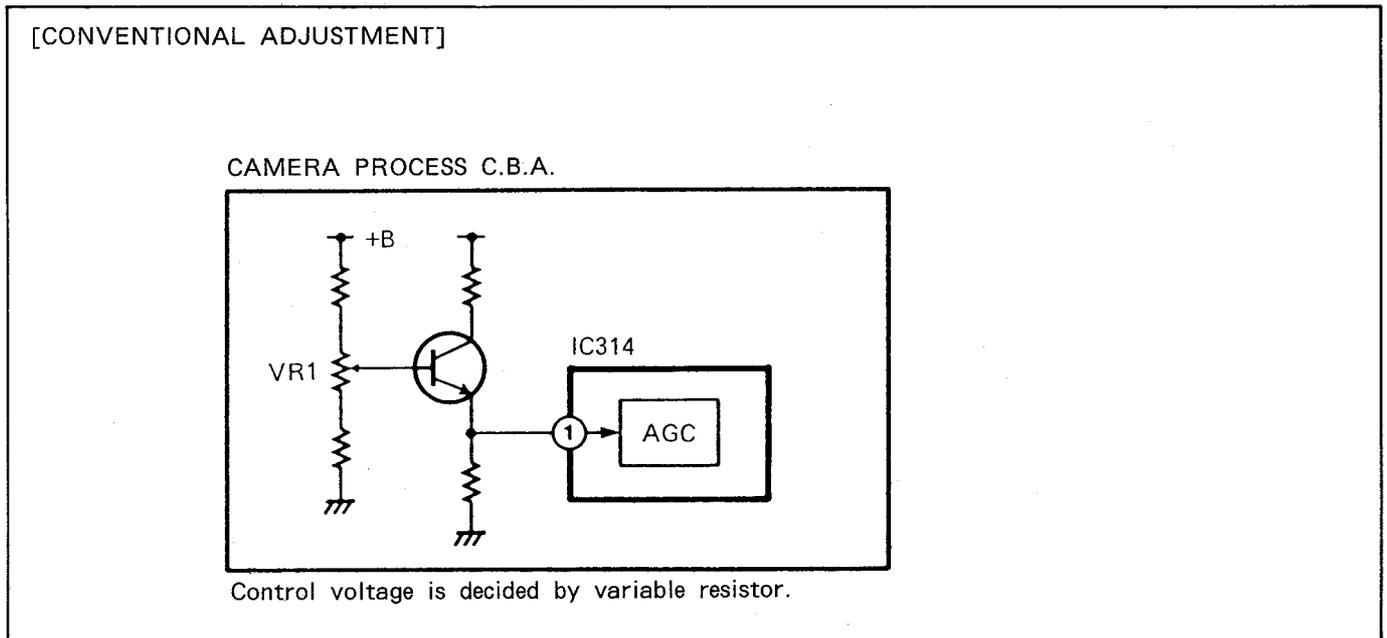


Fig. C25

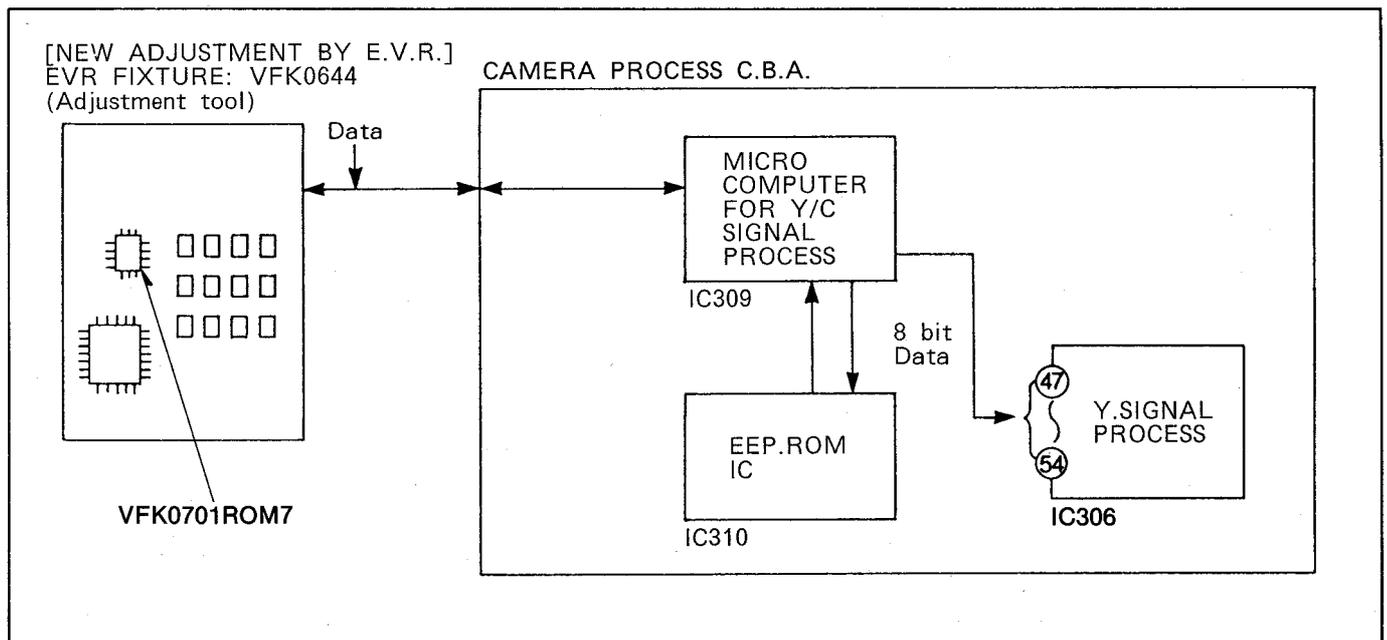
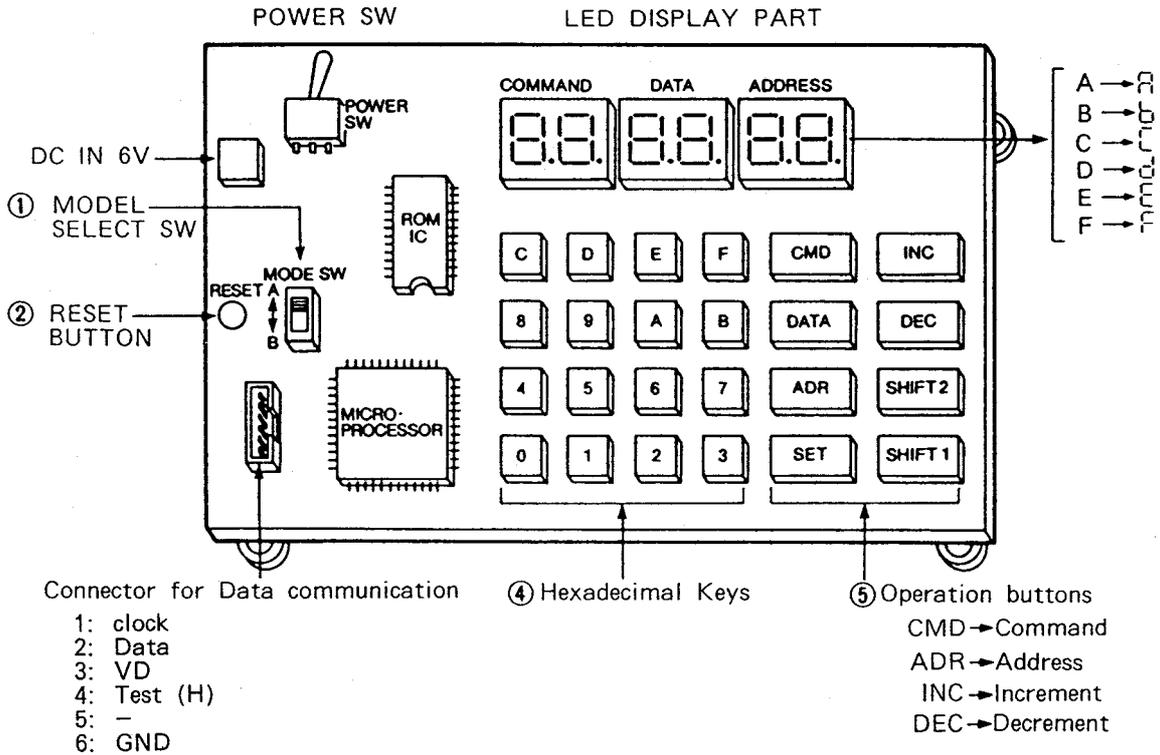


Fig. C26

Name of key



| NO. | NAME | DESCRIPTION |
|-----|----------------------------------|---|
| ① | MODE SW | MODEL selection switch. In case of this model 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 future, 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 mode (command) between E.V.R and camcorder (for example, data writing or reading) to perform. |
| | DATA: Data button | For changing Data. |
| | ADR: Address button | To appoint the EEPROM address or RAM address. |
| | SET: Set button | To perform the appointed command (for example reading or writing). |
| | INC: Incliment
DEC: Decliment | Increase or decrease the data one by one (+1, -1) |
| | SHIFT 1 button | To carry out macro operation (while pushing with hexadecimal keys) SHIFT 1 button is used. (Macro operations will be described later) |
| | SHIFT 2 button | To carry out macro operation(while pushing with hexadecimal keys) SHIFT 2 button is used (Macro operations will be described later.) |

Fig. C27

(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.

Result:

Adjustment value of AGC has been set for "6A". It is advisable to read out the data like this and make a note of it before writing the new data so that if an error should occur you can rewrite original data.

| Item | Proceduring Order | Buttons to be Pushed | LED Indication |
|--|-------------------|--|---|
| For Example, Reading out the data of AGC Adjustment communication from camcorder to E.V.R. EEPROM → E.V.R. | 1 | Set the Command mode to "14", "14" is read out command. (Refer to command description) | CMD [1] [4]

LED lights up
14/80 00
Command setting |
| | 2 | Set the Address of EEPROM | ADR [6] [A]

14 80 6A
Address setting LED lights up of EEPROM |
| | 3 | Read out the data | SET
Push this for 2 seconds

14 09 6A
data for AGC LED for example lights up |

Fig. C28

- 2) Writing the New Data.

- (1) Search and Write Procedure
(For example : AGC Adjustment).

Procedure:

1. Set the Command to [04].
2. Set the Address to [41].
3. Push the [SET] button.
4. The number which is indicated on DATA LED is a data which has been written.

Confirmation:
Confirm whether data is written correctly or not.

| Item | Proceduring Order | Buttons to be Pushed | LED Indication |
|---|-------------------|--|---|
| For Example, writing the AGC adjustment data. E.V.R. → EEPROM | 1 | Set the command to "18". | CMD [1] [8]

Command for search mode. |
| | 2 | Set the Address of RAM to "BC" E.V.R. → RAM (communication from E.V.R. to RAM) | ADR [B] [C]

LED lights up.
18/80 6C |
| | 3 | Adjustment Push "DEC" or "INC" button so that AGC at B302-20 becomes 240 | Search with INC or DEC

18 9 16C
LED lights up |
| | 4 | Change the command to "12" | CMD [1] [2]

LED lights up
12/9 16C
Command for Direct Writing |

Fig. C29

| Item | Proceduring Order | Buttons to be Pushed | LED Indication |
|------|-------------------|--|---|
| | 5 | Set the address of EEPROM to "6A"

ADR 4 F | address of EEPROM
02 9 16 A
LED lights up ↗ |
| | 6 | Do not change the data after adjustment

DATA 9 1 | 02 9 16 A
LED lights up ↘ |
| | 7 | Write the data

SET
Push this for 2sec. | LED disappear
02 9 16 A |

Fig. C30

3) Direct Writing Procedure

| Item | Proceduring Order | Buttons to be Pushed | LED Indication |
|--|-------------------|---|--|
| For Example, writing the AGC adjustment data | 1
2
3 | Searching the best Point.
same as (1) | same as (2) |
| | 4 | Change the command to "01"

CMD 1 2 | LED lights up
12/0021
Command for Direct writing |
| | 5 | Set the address of EEPROM to "6A"

ADR 6 A | address of EEPROM
12 006 A
LED lights up ↗ |
| | 6 | Set the data of best point "91"

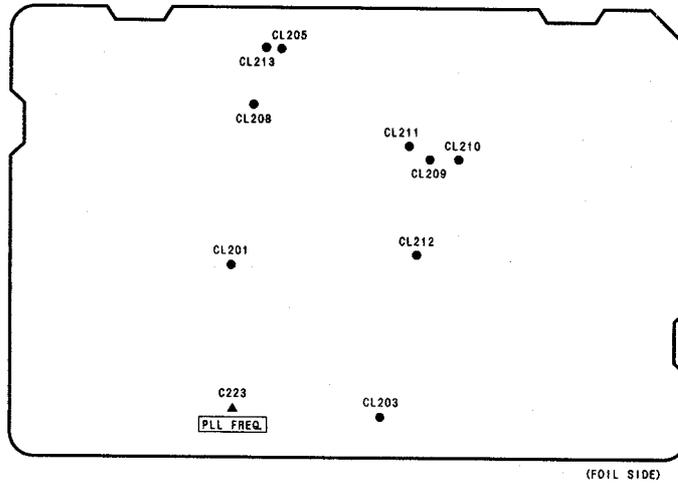
DATA 9 1 | 12 9 16 A
LED lights up ↘ |
| | 7 | Write the data

SET
Push this for 2sec. | LED disappear.
12 9 16 A |

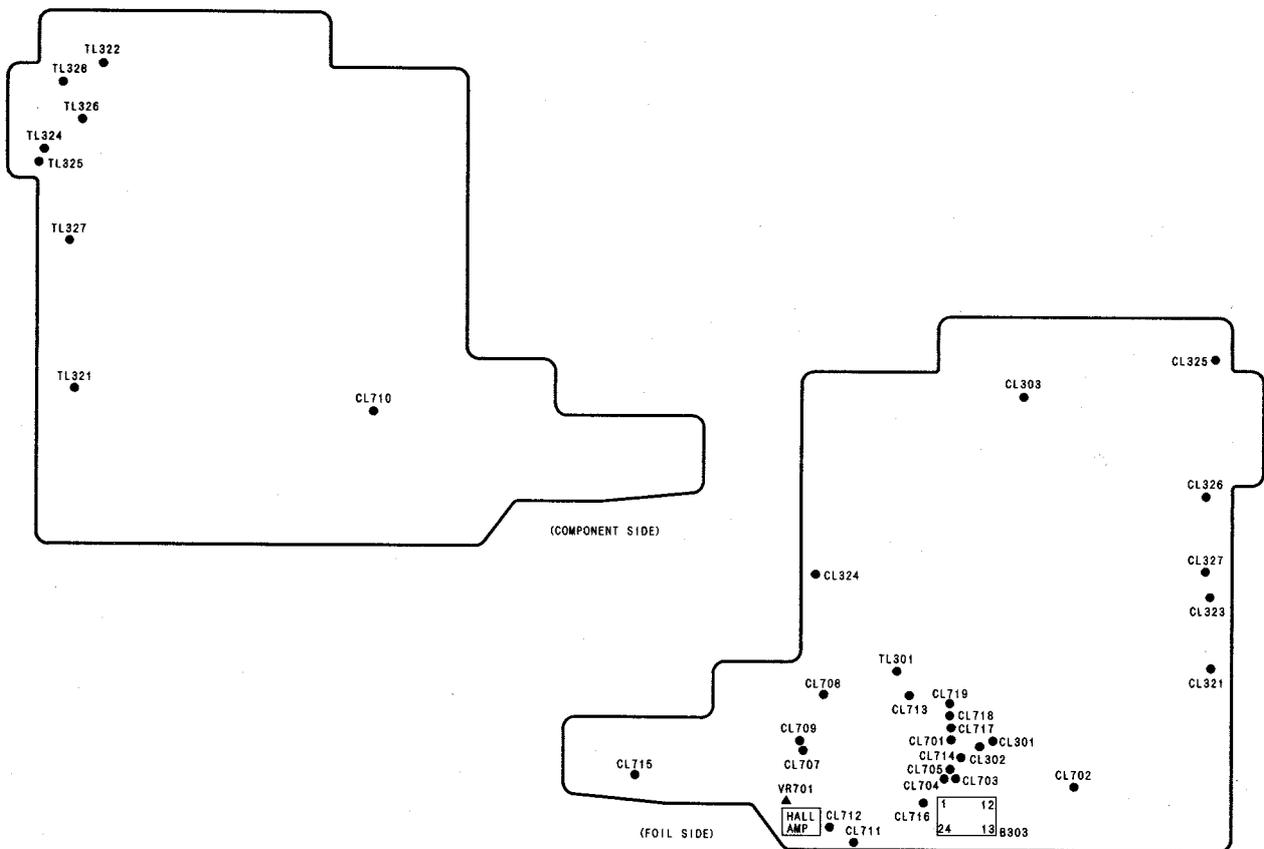
Fig. C31

LOCATION OF TEST POINTS AND CONTROLS (1)

CCD DRIVE C.B.A.

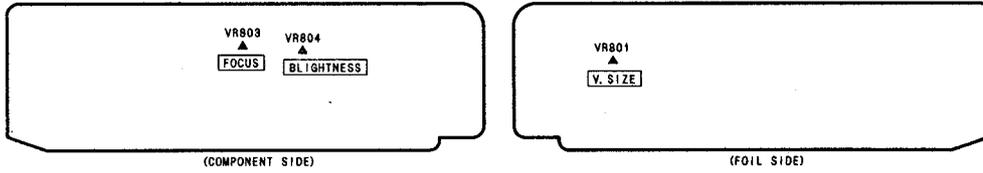


PROCESS & AF C.B.A.

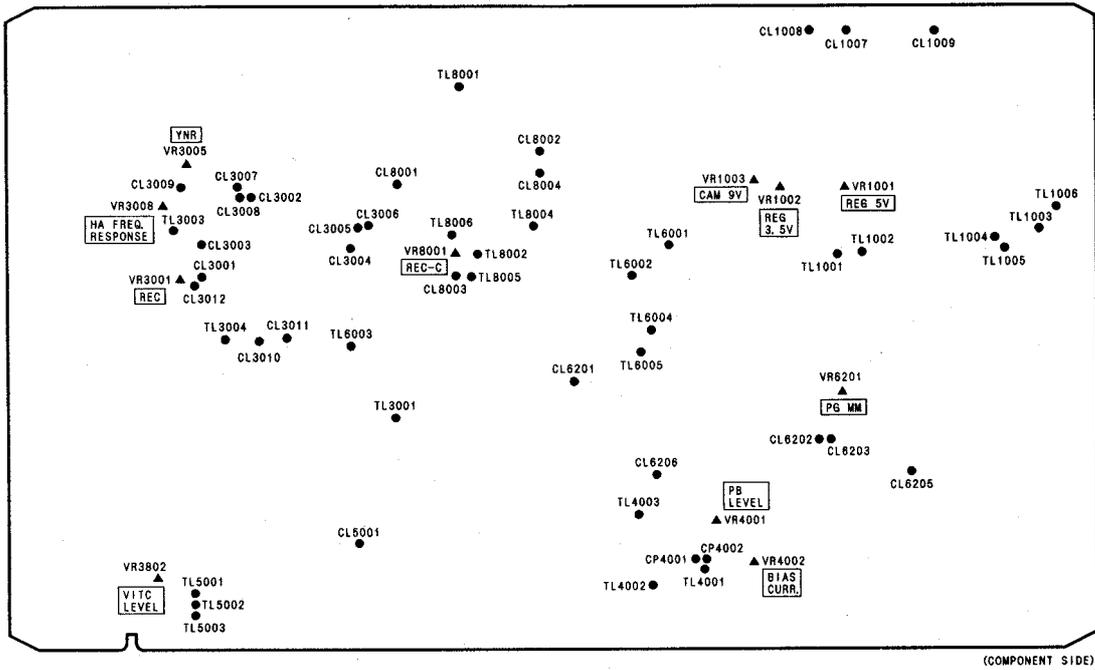


LOCATION OF TEST POINTS AND CONTROLS (2)

E.V.F. C.B.A.



MAIN C.B.A.



2-5-2. ELECTRICAL ADJUSTMENT FOR E.V.F. SECTION

The following adjustment are for Electric Viewfinder.

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

1. CENTERING ADJUSTMENT

- (1) Aim the camera at the registration chart.
- (2) Adjust the deflection Yoke centering magnets turning them so that the picture on monitor TV is centered.

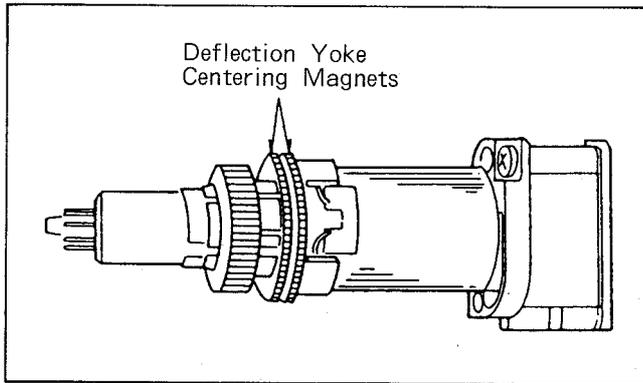


Fig. E1

2. FOCUS ADJUSTMENT

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

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

- 1) Aim the connect at Ball chart.
- 2) Adjust the VR803 for best resolution in viewfinder.

3. V.SIZE ADJUSTMENT

| TP | ADJ. | LENS CAP | CHART |
|------------|-------|------------------------|------------------|
| X | 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 that the Vertical size is correct and the picture does not roll as shown in Fig.E2.

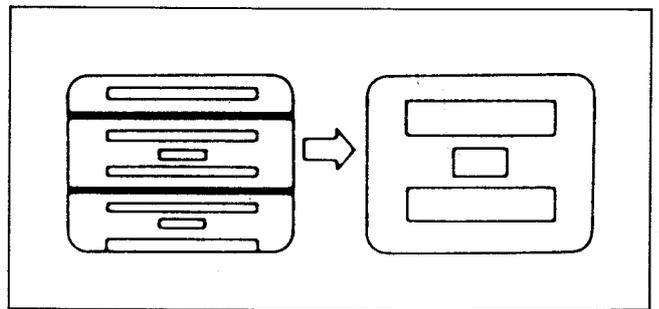


Fig. E2

4. BRIGHTNESS ADJUSTMENT

| TP | ADJ. | LENS CAP | CHART |
|------------|-------|-------------------|------------------|
| X | 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.

2-5-3. ELECTRICAL ADJUSTMENT FOR VTR SECTION

TEST EQUIPMENT AND TOOLS

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

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-Movie. Alignment Tape (VFJ8125H3F)
9. VHS-Movie. Blank Tape
10. Pattern Generator
11. Vectorscope
12. DC Power Supply

PREPARATION

1. Remove the casing panels.
(Refer to the disassembly method)
2. Connect the extension cable if necessary.
VFK0823

HOW TO READ THE ADJUSTMENT PROCEDURES

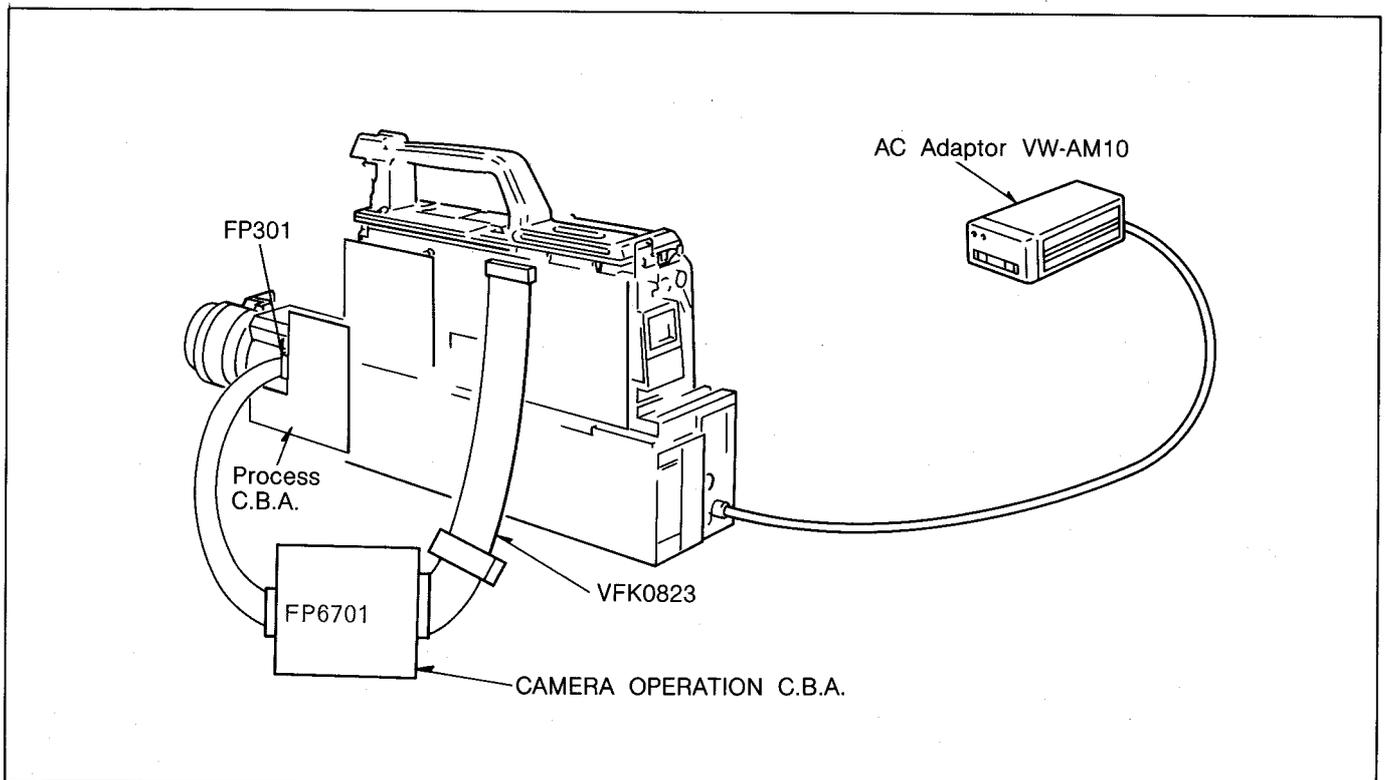
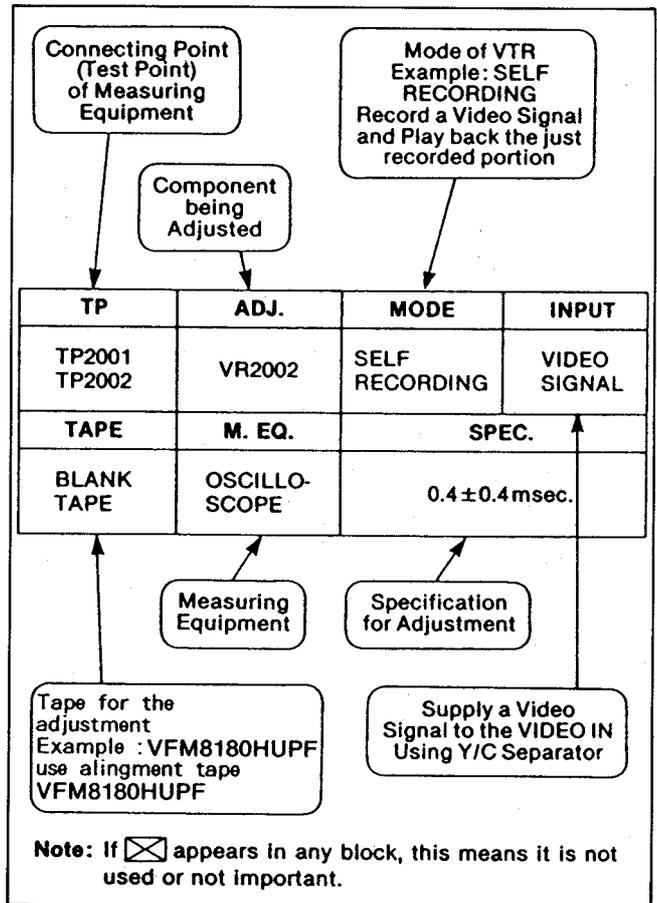


Fig. V1

TRIGGERING THE OSCILLOSCOPE

To trigger the Oscilloscope, the following test point is used.

H. rate : TP (video output)
V. rate : TP6201 (Head Switching signal)

POWER SECTION

1. REG. 5V ADJUSTMENT

Purpose:

To properly calibrate the 5V voltage to $4.87 \text{ DC} \pm 0.025\text{V}$.

Symptom of Misadjustment:

All circuits in the unit will not operate properly.

| TP | ADJ. | MODE | INPUT |
|------------------------------|--------|--|-------|
| TL1001 (HOT)
TL1006 (GND) | VR1001 | VHS
CAMERA
RECORDING
(EIS ON) | X |
| TAPE | M. EQ. | SPEC. | |
| VHS
BLANK TAPE | D.V.M. | $4.87 \pm 0.025\text{V}$ | |

Note:

Sensor, process, and camera operation C.B.A. are connect to the main C.B.A.

- (1) Connect the D.V.M. To TL1001(HOT) and TL1006 (GND) Adjust the VR1001 so that D.V.M. is $4.87 \pm 0.025\text{V}$.

2. CAMERA 3.5V ADJUSTMENT

Purpose:

To properly calibrate the voltage to $3.51\text{V DC} \pm 0.025\text{V}$.

Symptom of Misadjustment:

All circuits in N Unit will not operate properly.

| TP | ADJ. | MODE | INPUT |
|------------------------------|--------|--|-------|
| TL1002 (HOT)
TL1006 (GND) | VR1002 | VHS
CAMERA
RECORDING
(EIS ON) | X |
| TAPE | M. EQ. | SPEC. | |
| VHS
BLANK TAPE | D.V.M. | $3.51 \pm 0.025\text{V}$ | |

Note:

Sensor, process, and camera operation C.B.A. are connect to the main C.B.A.
Turn the power sw on and then set EIS system to the ON position.

- (1) Connect the D.V.M. to the TL1002(HOT) and TL1006(GND) Adjust the VR1002 so that D.V.M. is $3.51 \pm 0.025\text{V}$.

3. CAMERA 9V REGULATOR

| TP | ADJ. | MODE | INPUT |
|------------------------------|--------|--|-------|
| TL1003 (HOT)
TL1006 (GND) | VR1003 | VHS
CAMERA
RECORDING
(EIS ON) | X |
| TAPE | M. EQ. | SPEC. | |
| BLANK TAPE | D.V.M. | $8.70 \pm 0.05\text{V}$
-0.05V | |

Note:

Eis system must be set to the ON position.

- (1) Connect the D.V.M. To TL1003(HOT) and TL1006 (GND) Adjust the VR1003 so that D.V.M. is $8.70 \pm 0.05\text{V}, -0.05\text{V}$.

SERVO SECTION

4. PG SHIFTER ADJUSTMENT

Purpose:

Determine the Head Switching point during play-back.

Symptom of Misadjustment:

May cause Head Switching Noise and/or Vertical jitter in the picture.

| TP | ADJ. | MODE | INPUT |
|-----------------------------------|-------------------|-------------------------------|-------|
| B6001 ⑥
(CKJ6)
VIDEO OUT | VR6201 | PLAY | X |
| TAPE | M. EQ. | SPEC. | |
| ALIGNMENT
TAPE
(VFJ8125H3F) | OSCILLO-
SCOPE | $6.5\text{H} \pm 0.5\text{H}$ | |

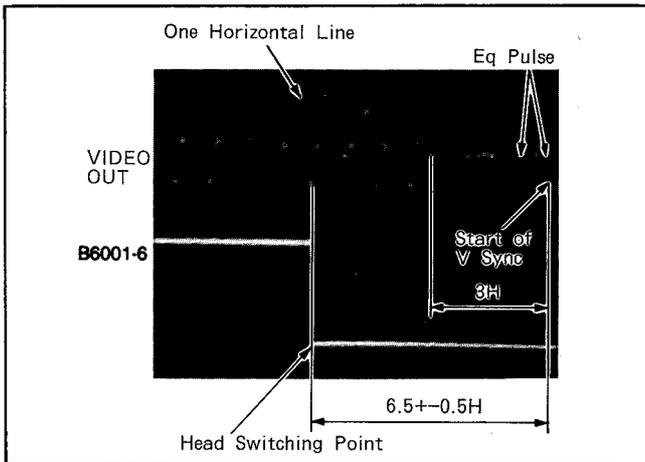


Fig. V2

LUMINANCE & CHROMINANCE SECTION

**5. RECORDING CURRENT ADJUSTMENT
REC CHROMA LEVEL ADJUSTMENT**

Purpose:
Set the optimum Record Chroma Level.

Symptom of Misadjustment:
If the Record Chroma Level is too high, Beats may be seen in the picture. If the Level is too low, Picture will be Black and White.

| TP | ADJ. | MODE | INPUT |
|------------------------------|-------------------|----------------------|---------------|
| TL5001 (HOT)
TL5002 (GND) | VR8001 | VHS
REC/PLAY | COLOUR
BAR |
| TAPE | | M. EQ. | |
| VHS
BLANK
TAPE | OSCILLO-
SCOPE | SPEC.
14 ± 2mVp-p | |

Note 1: Cover the Lens with cap.

- Note 2:
Minimize the luminance recording current by turning VR3001 before this adjustment.
1. Connect the oscilloscope to TL5001(HOT) and TL5002(GND).
 2. Aim the camera at colour bar.
 3. Make recording with SP mode.
 4. Eliminate luminance signal by turning off.
 5. Adjust the VR8001 so that chroma level is 14 ± 2mVp-p.

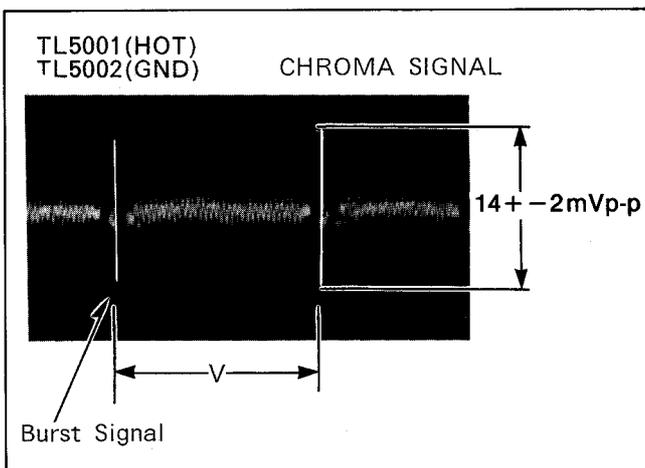


Fig. V3

**6. LUMINANCE RECORDING CURRENT
ADJUSTMENT**

Purpose:
Set the optimum Recording Luminance Level.

Symptom of Misadjustment:
If the Record Luminance Level is too high, video may overload.
If the Level is too low, the S/N Ratio deteriorates.

| TP | ADJ. | MODE | INPUT |
|------------------------------|-------------------|-----------------------|-----------------|
| TL5001 (HOT)
TL5002 (GND) | VR3001 | VHS
REC/PLAY | DARK
PICTURE |
| TAPE | | M. EQ. | |
| VHS
BLANK
TAPE | OSCILLO-
SCOPE | SPEC.
120 ± 5mVp-p | |

Note: Cover the Lens with cap.

1. Connect the oscilloscope to TL5001(HOT) and TL5002(GND).
2. Aim the camera at colour bar.
3. Make recording with SP mode.
4. Adjust the VR3001 so that luminance level is 120 ± 5mVp-p.

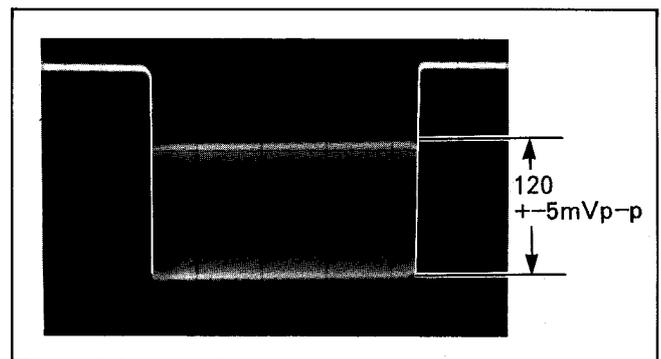


Fig. V4

7. YNR ADJUSTMENT

Purpose:
Improve the overall S/N Ratio especially in the Low Frequency component.

Symptom of Misadjustment:
The S/N Ratio is low.

| TP | ADJ. | MODE | CHART |
|---------------------------------|-------------------|--|---------------|
| TL3004 | VR3005 | PLAY | COLOUR
BAR |
| TAPE | | M. EQ. | |
| ALIGNMENT
TAPE
VFJ8125H3F | OSCILLO-
SCOPE | SPEC.
SIGNAL IS MINIMIZED
(LESS THAN 50mV) | |

1. Play Back the Alignment tape.
2. Connect the Video output to oscilloscope.
3. Adjust VR3005 so that signal is minimized.

8. HEAD AMP FREQUENCY RESPONSE ADJUSTMENT

Purpose:

To improve Video Frequency Response Level.

Symptom of Misadjustment:

Video Frequency Response deteriorates.
Picture is noisy.

| TP | ADJ. | MODE | INPUT |
|------------|---------------------------|----------------------|--------------------|
| VIDEO OUT | VR3008 | SELF RECORDING | VIDEO SWEEP SIGNAL |
| TAPE | M. EQ. | SPEC. | |
| BLANK TAPE | VIDEO SWEEP/ OSCILLOSCOPE | A=0dB+-1dB (89~112%) | |

Note:

Process C.B.A. must be remove.

1. Set the sweep generator output as shown below.

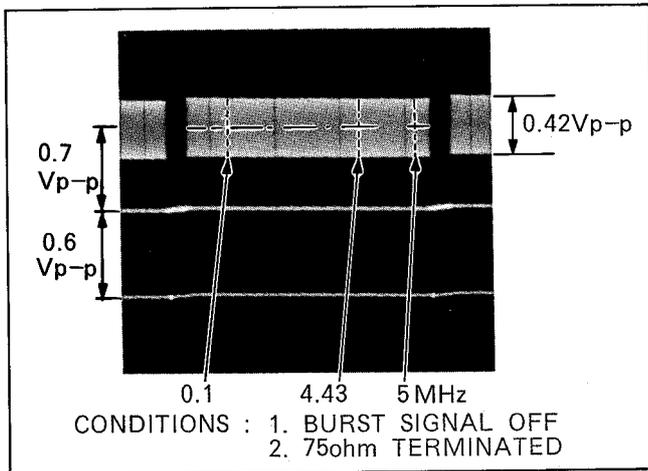


Fig. V5

2. Supply sweep signal to C3060.
3. Record the signal for ten minutes.
4. Play back the recorded signal.
5. Adjust VR3008 so that the level is within the 2MHz spec. as shown below.

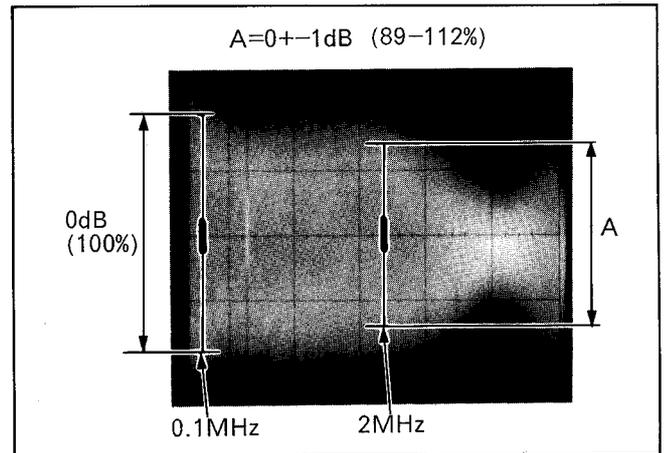


Fig. V6

AUDIO SECTION

9. AUDIO BIAS CURRENT ADJUSTMENT

| TP | ADJ. | MODE | INPUT |
|------------------------------|-------------------------|---------------------------------------|------------------|
| TL4001 (HOT)
TL4002 (GND) | VR4002 | REC | disconnect P4001 |
| TAPE | M. EQ. | SPEC. | |
| BLANK TAPE | oscilloscope (V.T.V.M.) | 7.6+-0.3mVp-p
(2.7mVrms+-0.1mVrms) | |

Note:

Connector(P4001) must be disconnected.

10. AUDIO PLAYBACK LEVEL ADJUSTMENT

| TP | ADJ. | MODE | INPUT |
|------------|--|---------------------------|--|
| LINE OUT | VR4001 | VHS REC/PB | 1kHz Audio
56.5±33mVp-p
(-34±0.5dB)
CKR1
(P4001 ③) IN
CKR2
(P4001 ②) GND |
| TAPE | M. EQ. | SPEC. | |
| BLANK TAPE | SIGNAL GENERATOR/
OSCILLOSCOPE
(V.T.V.M) | 1.1±0.1Vp-p
(-8±0.5dB) | |

Note:

Audio bias current adjustment must be completed before this adjustment.

1. Supply the audio signal (1KHz/-34dB sine-wave) to audio circuit through the test point. (CKR1,CKR2)
2. Audio VR4001 so that the level is PB Level 1.1±0.1Vp-p (-8dB±0.5dB).

11. VITC SIGNAL LEVEL ADJUSTMENT

| TP | ADJ. | MODE | INPUT |
|-----------|---------------------------------|-------------------------------|------------------|
| VIDEO OUT | VR3802 | VHS SELF RECORDING | GRAY SCALE CHART |
| TAPE | M. EQ. | SPEC. | |
| X | VITC GENERATOR/
OSCILLOSCOPE | V/S 1.8±0.07
(540±20mVp-p) | |

1. Aim the Camera at Gray Scale Chart.
2. Set the unit to VHS-Movie. Mode and set to recording mode.
3. Adjust the VR3802 so that ratio of V and S is 1.8±0.07 as shown below.

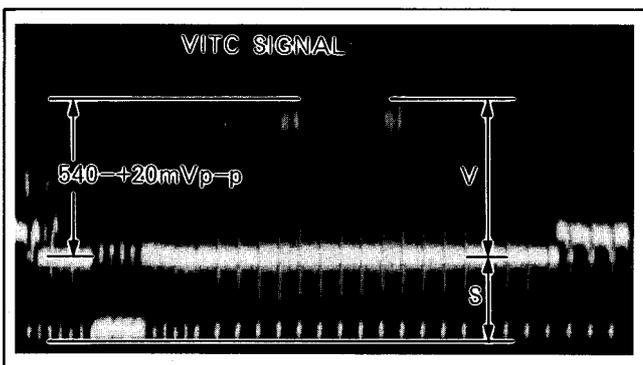
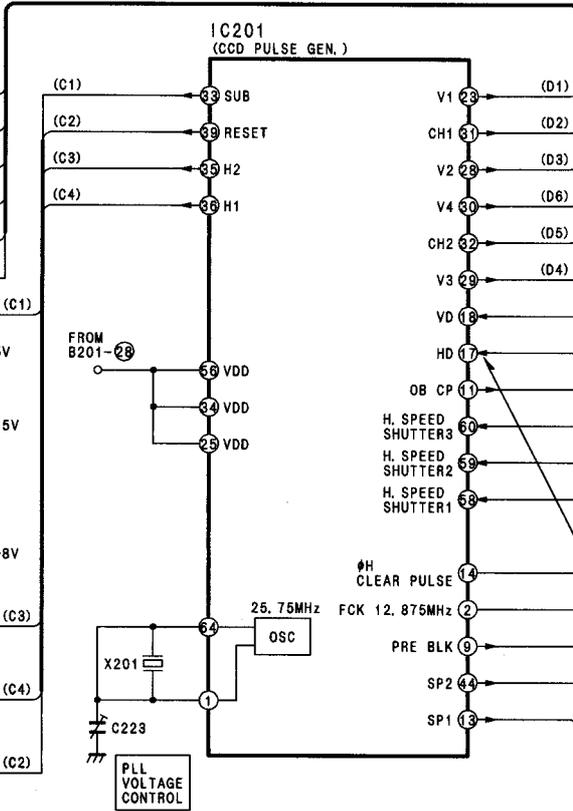
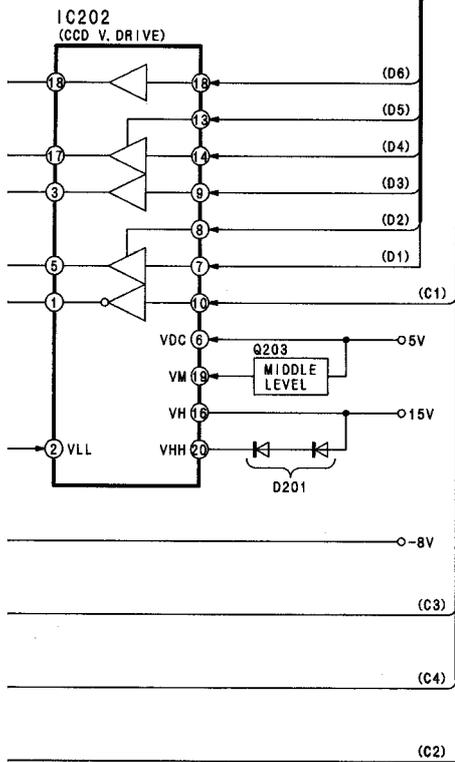


Fig. V7

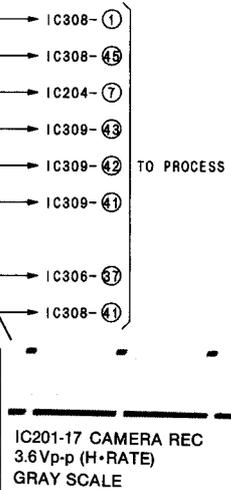
← PRE VIDEO SIGNAL

1/8, 9 CAMERA REC
p-p (H-RATE) GRAY SCALE

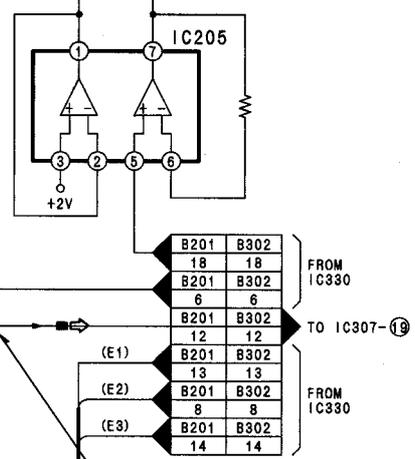
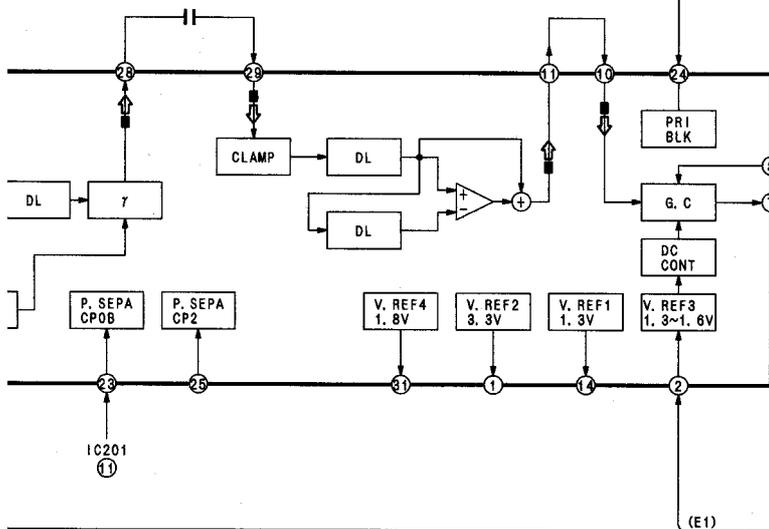


HIGH SPEED SHUTTER MODE

| 68 | 69 | 60 | |
|----|----|----|--------|
| H | H | H | 1/50 |
| H | L | L | 1/120 |
| L | H | L | 1/250 |
| H | H | L | 1/500 |
| L | L | H | 1/1000 |
| H | L | H | 1/2000 |
| L | H | H | 1/4000 |



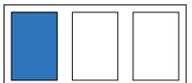
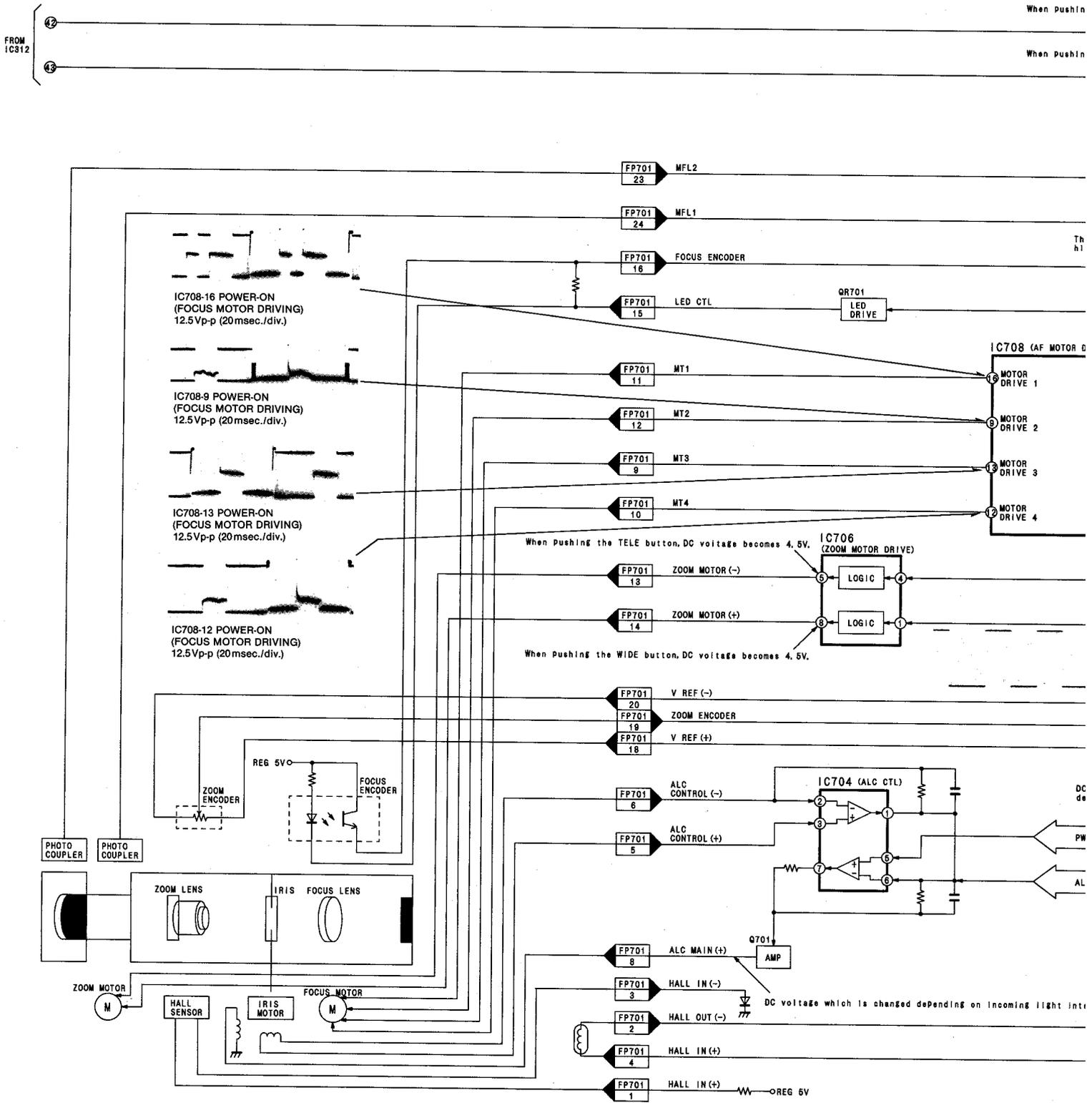
1/8, 9 CAMERA REC
(H-RATE) GRAY SCALE

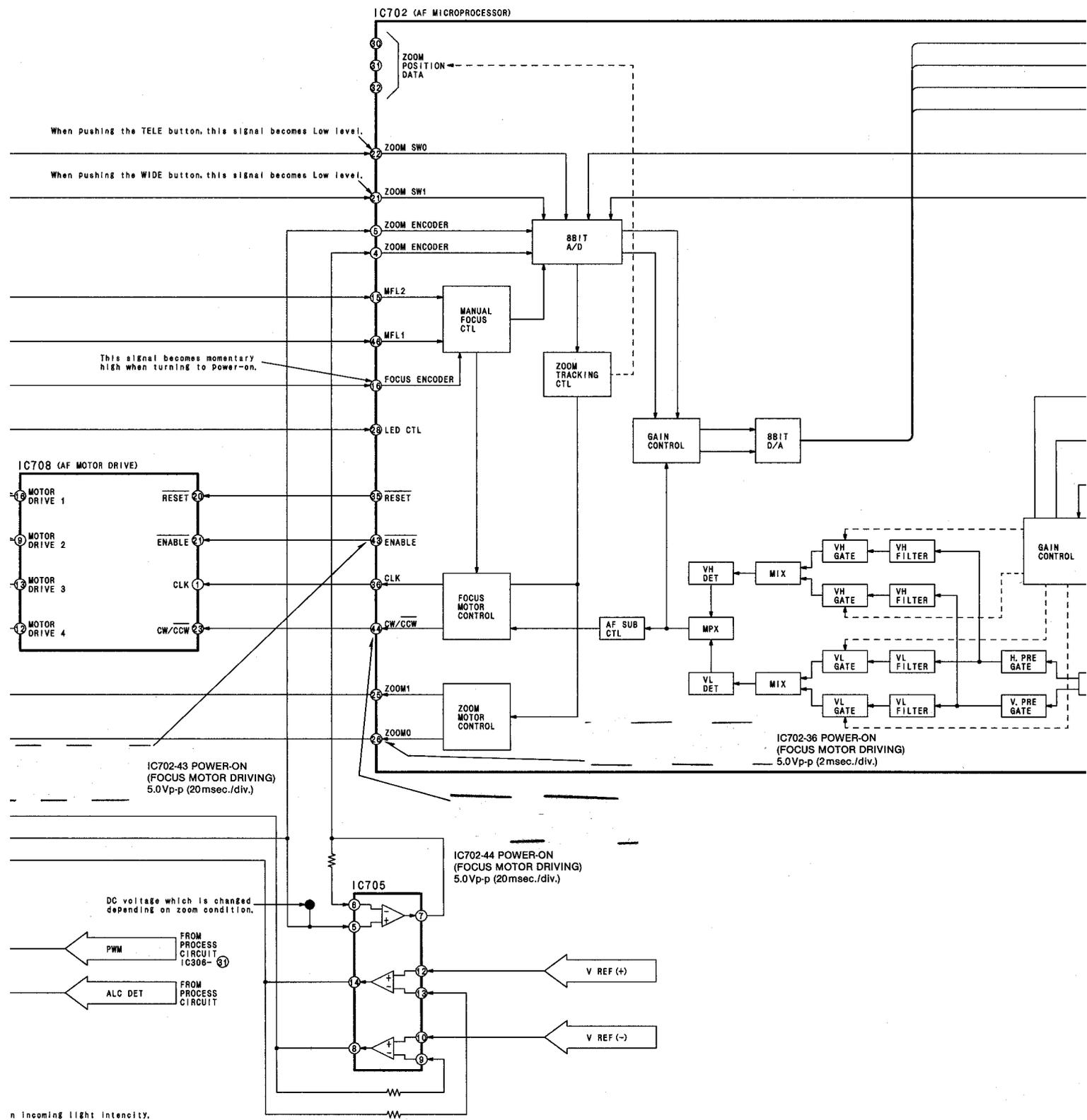


IC204-7 CAMERA REC
1.5Vp-p (H-RATE) GRAY SCALE

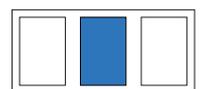


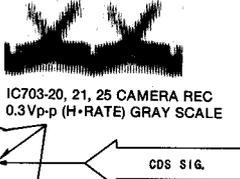
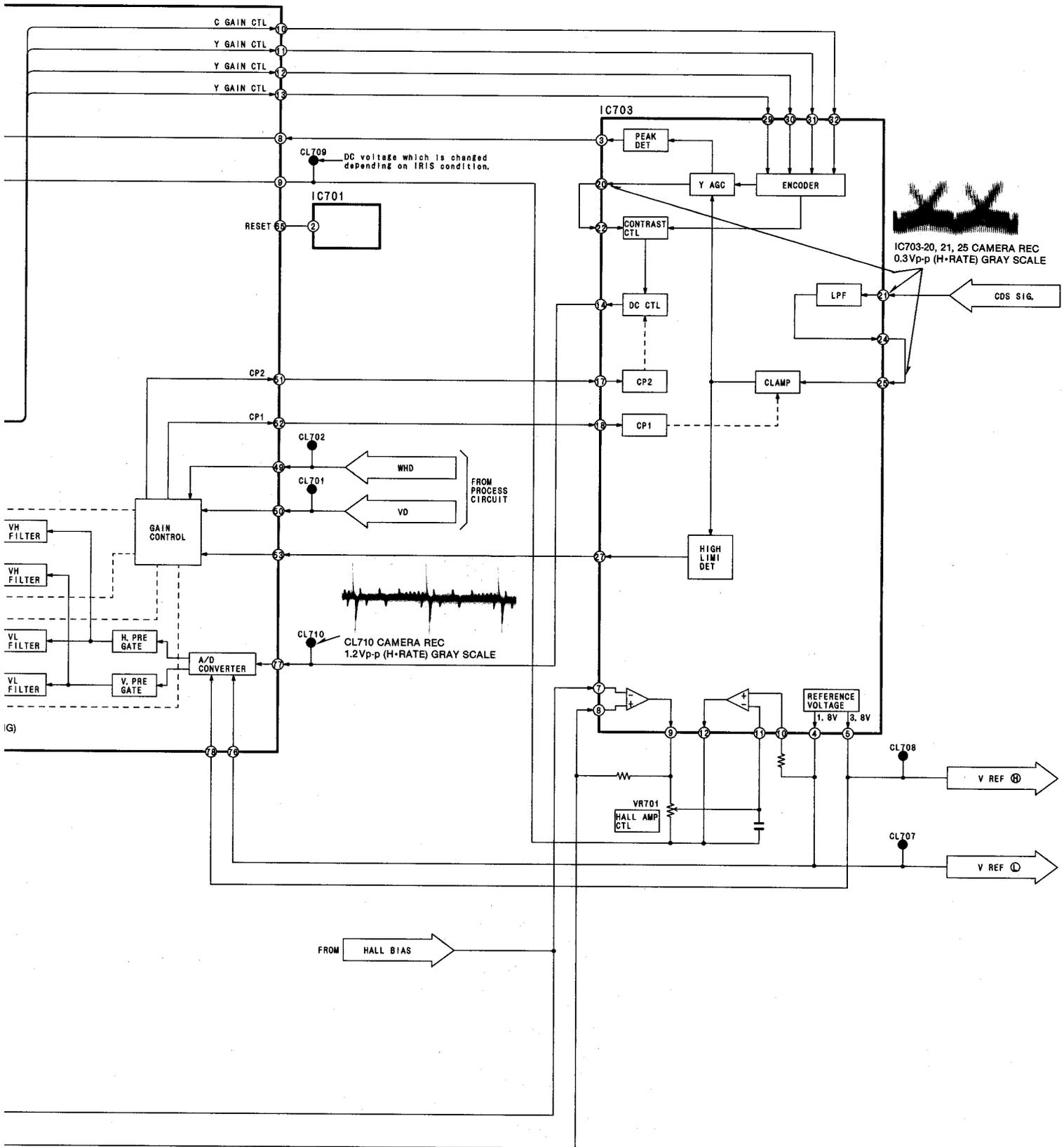
3-2. AUTO FOCUS BLOCK DIAGRAM



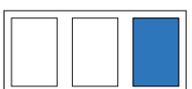


n incoming light intensity.

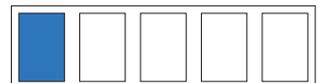
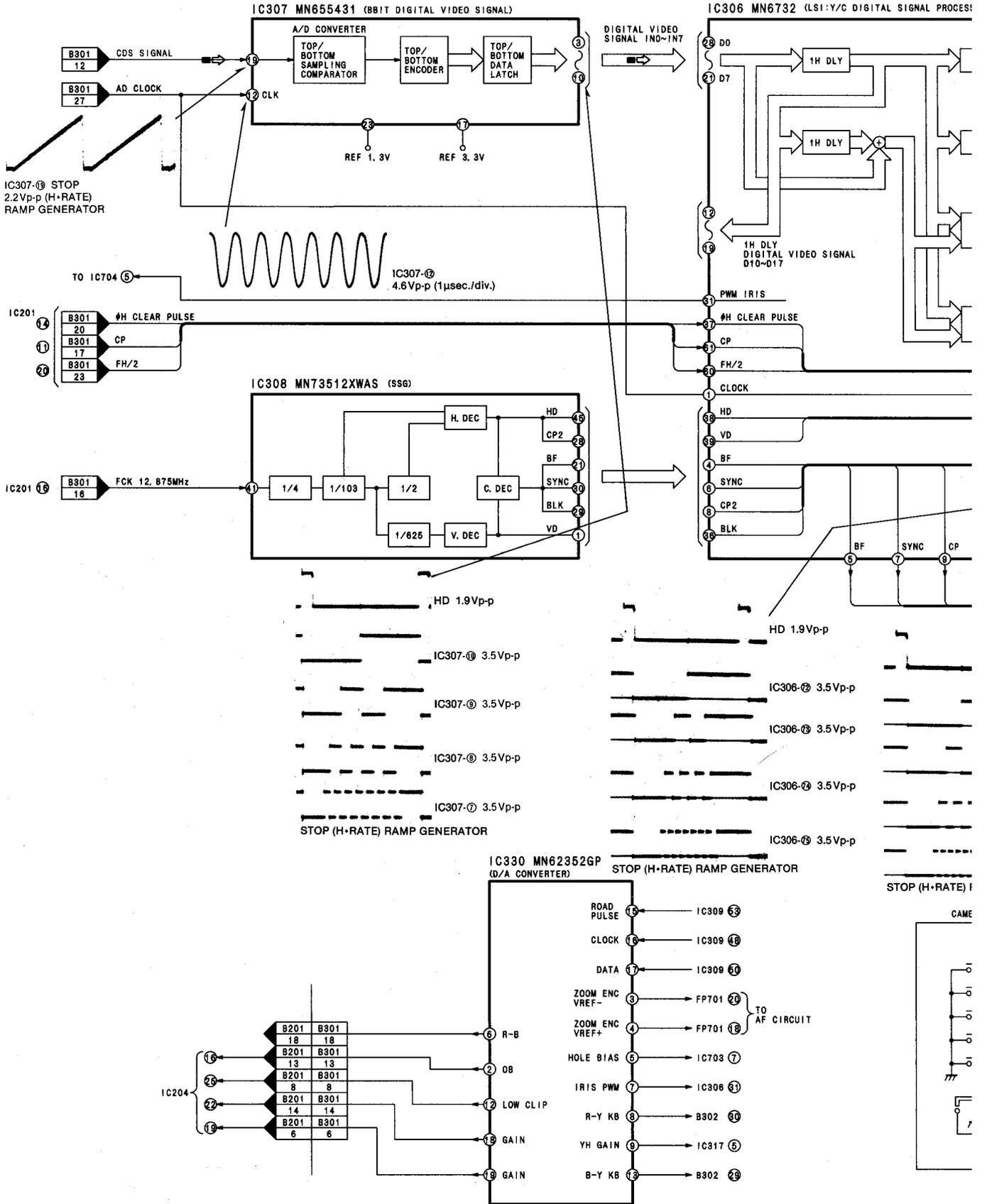




FROM HALL BIAS



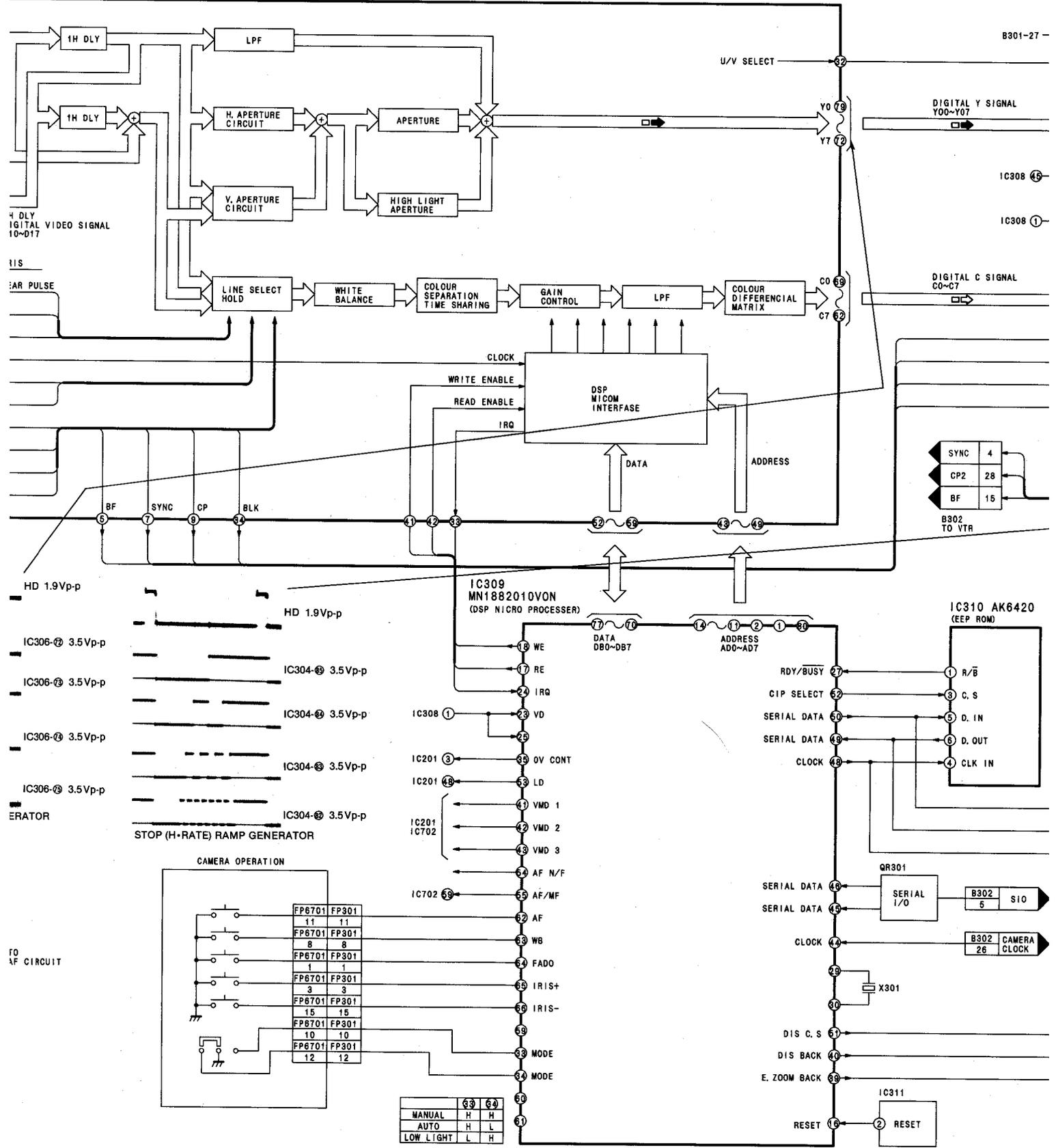
3-3. PROCESS BLOCK DIAGRAM



PROCESS Section



MN6732 (LSI:Y/C DIGITAL SIGNAL PROCESS)



4 DLY
DIGITAL VIDEO SIGNAL
10-D17

SYNC PULSE

HD 1.9Vp-p

IC306-② 3.5Vp-p

IC306-③ 3.5Vp-p

IC306-④ 3.5Vp-p

IC306-⑤ 3.5Vp-p

IC306-⑥ 3.5Vp-p

IC306-⑦ 3.5Vp-p

IC306-⑧ 3.5Vp-p

IC306-⑨ 3.5Vp-p

IC306-⑩ 3.5Vp-p

IC306-⑪ 3.5Vp-p

IC306-⑫ 3.5Vp-p

IC306-⑬ 3.5Vp-p

IC306-⑭ 3.5Vp-p

IC306-⑮ 3.5Vp-p

IC306-⑯ 3.5Vp-p

IC306-⑰ 3.5Vp-p

IC306-⑱ 3.5Vp-p

IC306-⑲ 3.5Vp-p

IC306-⑳ 3.5Vp-p

IC306-㉑ 3.5Vp-p

IC306-㉒ 3.5Vp-p

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IC306-ⓡ 3.5Vp-p

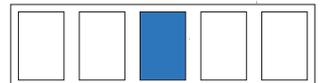
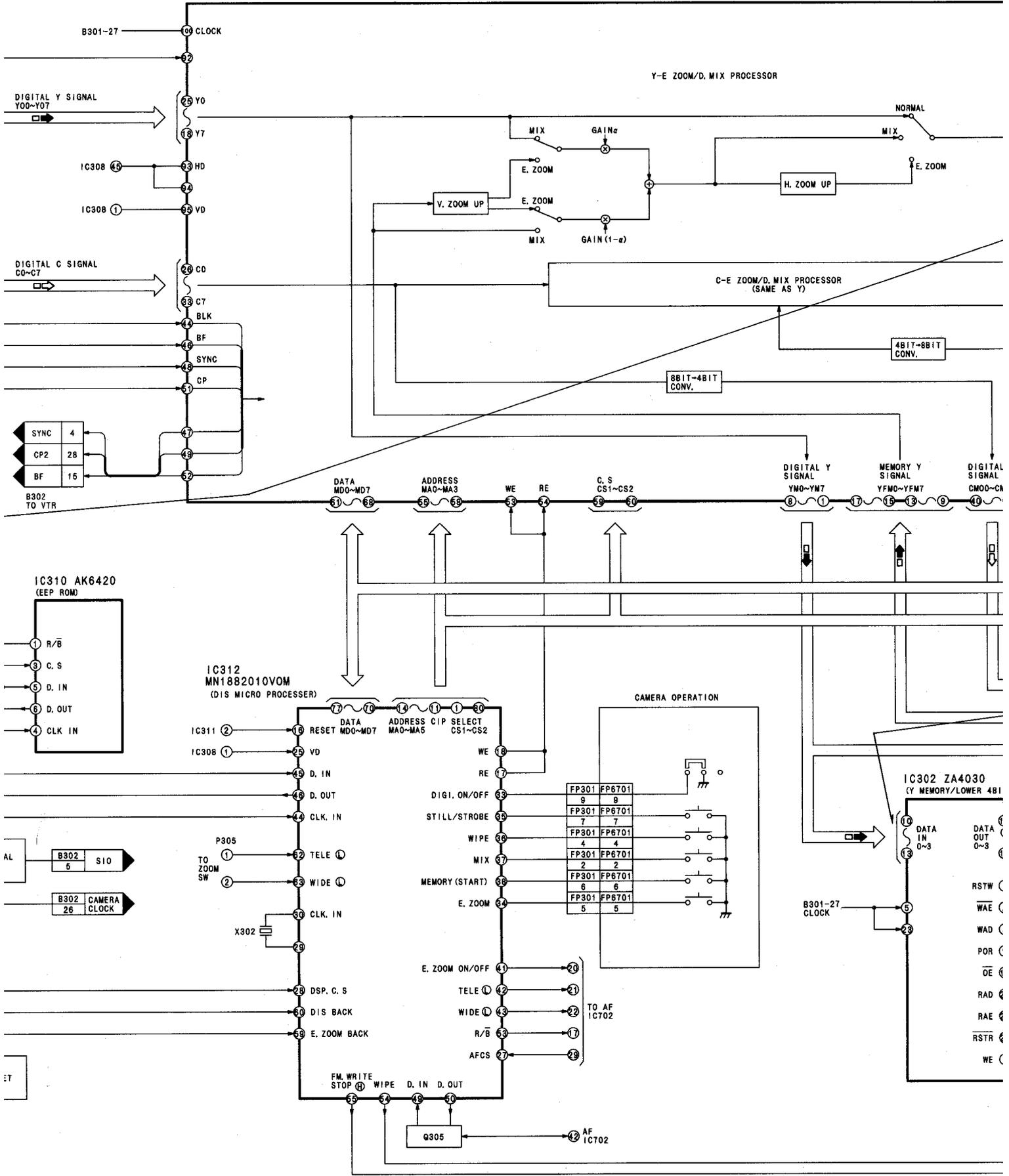
IC306-ⓢ 3.5Vp-p

IC306-ⓣ 3.5Vp-p

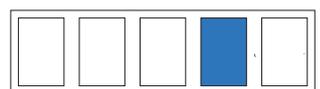
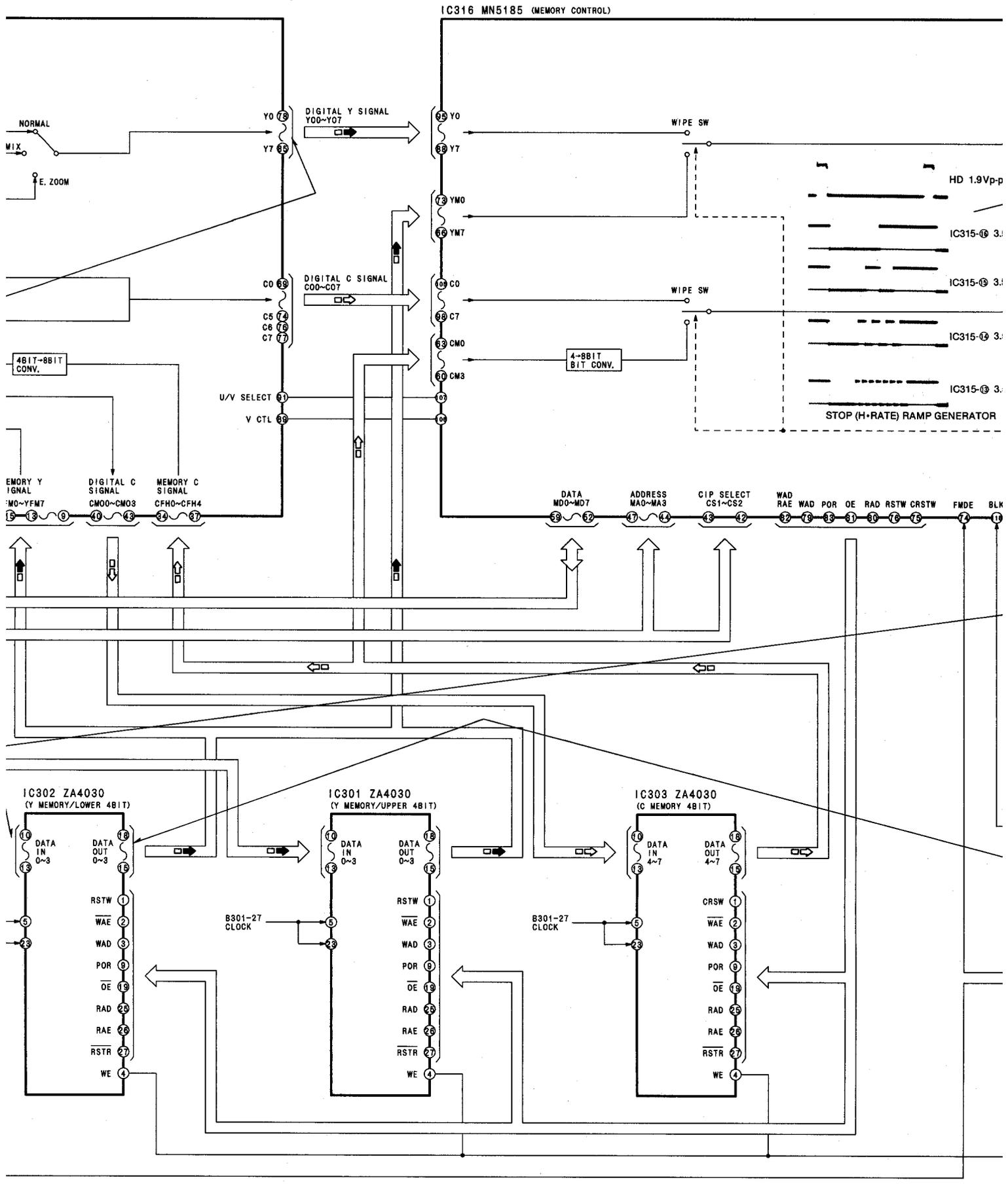
IC306-ⓤ 3.5Vp

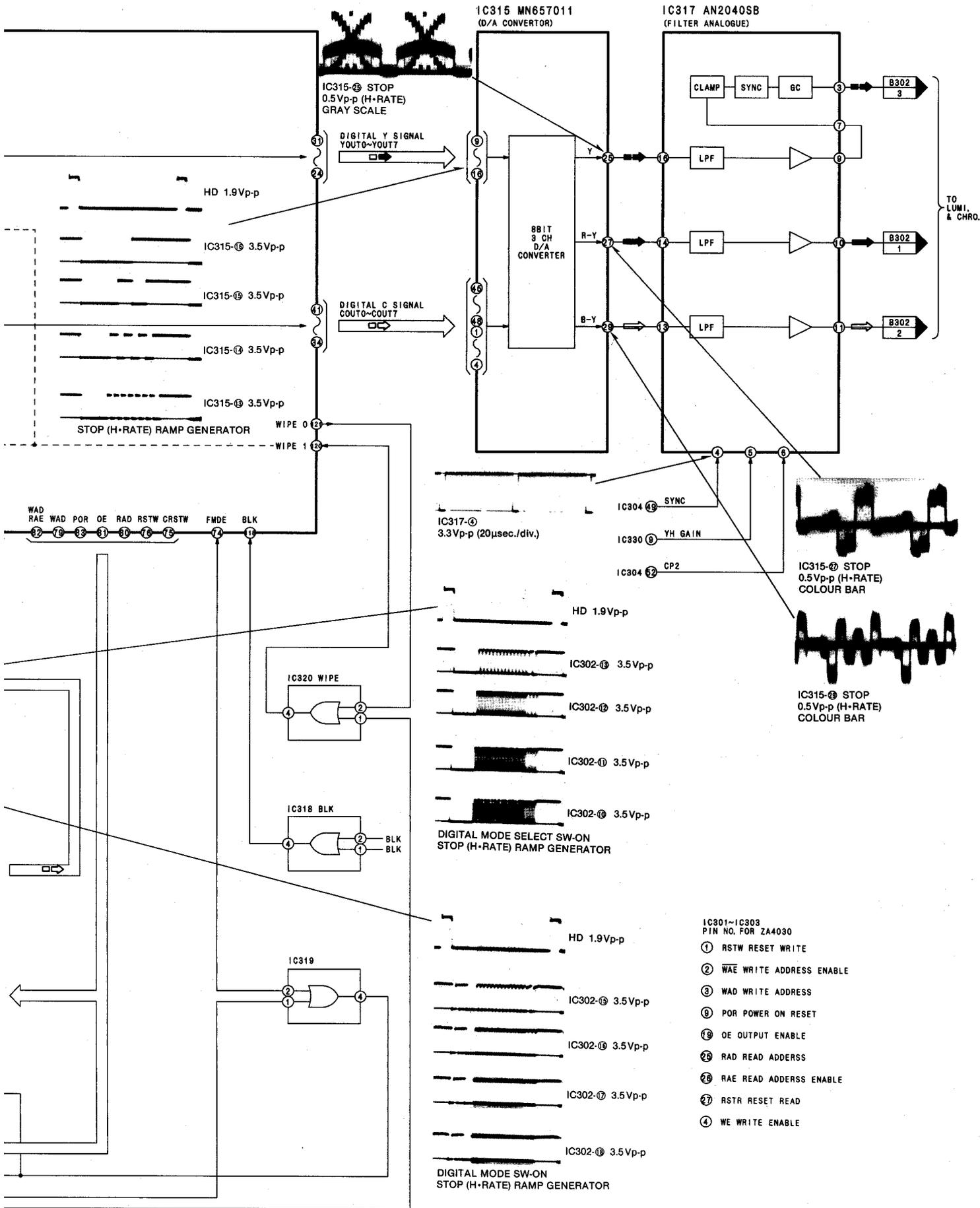
← PRE VIDEO SIGNAL ← DIGITAL Y SIGNAL ← DIGITAL C SIGNAL ←

IC304 MN6733 (LSI: ELECTRIC ZOOM)

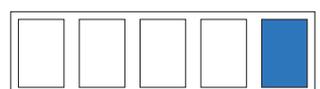


NAL ← Y SIGNAL ← R-Y SIGNAL ← B-Y SIGNAL

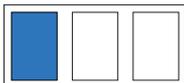
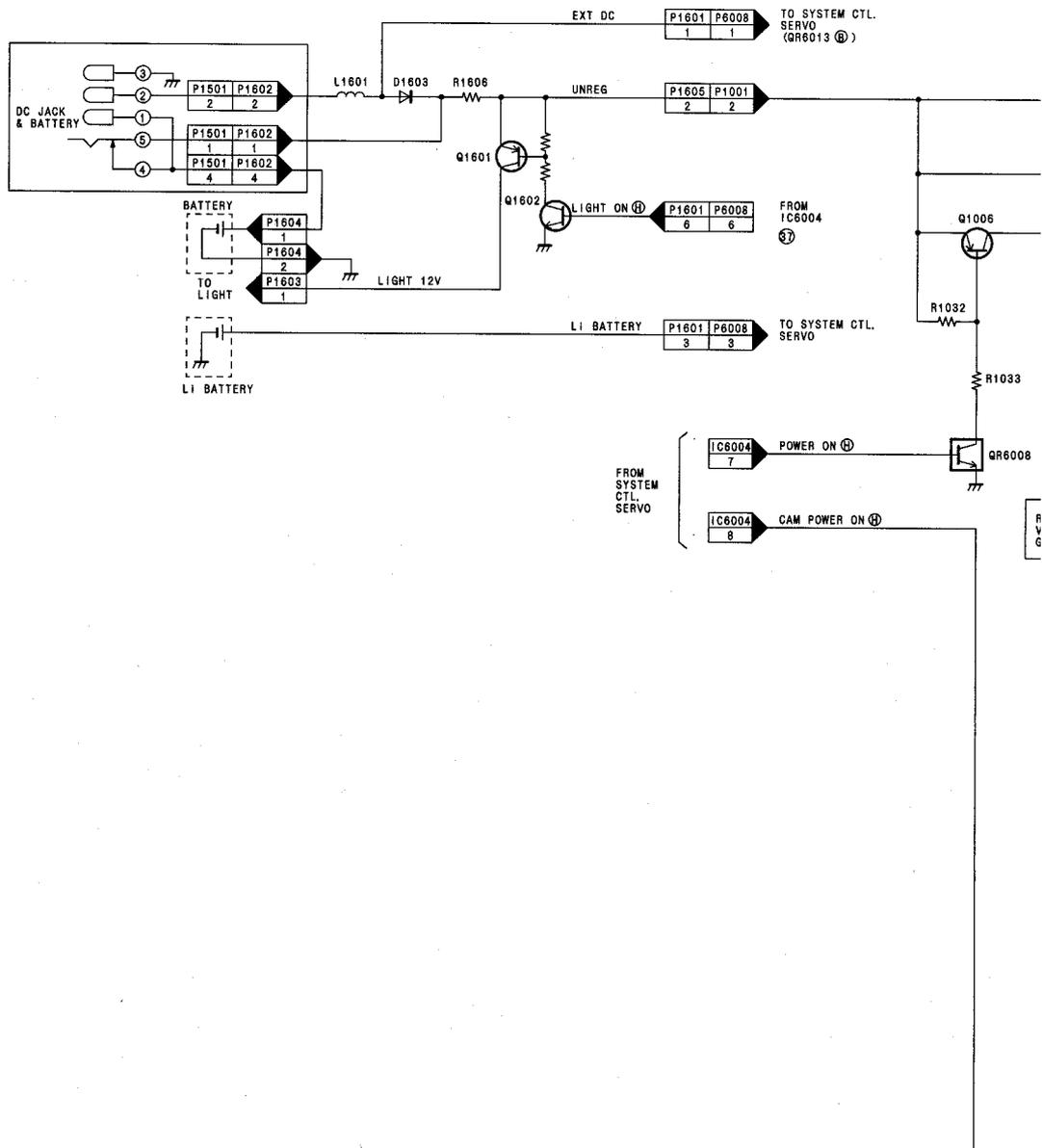


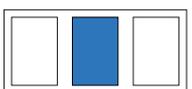
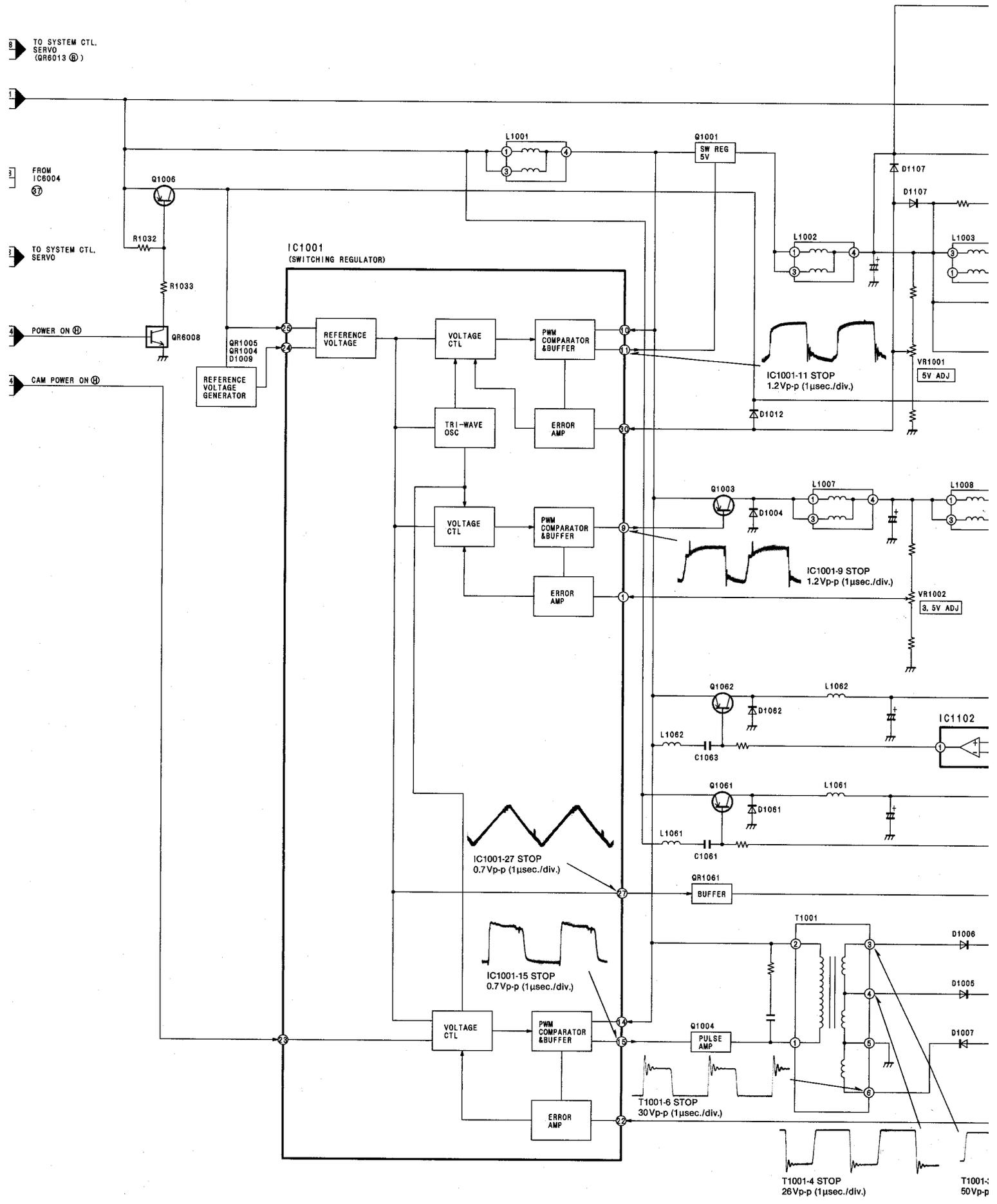


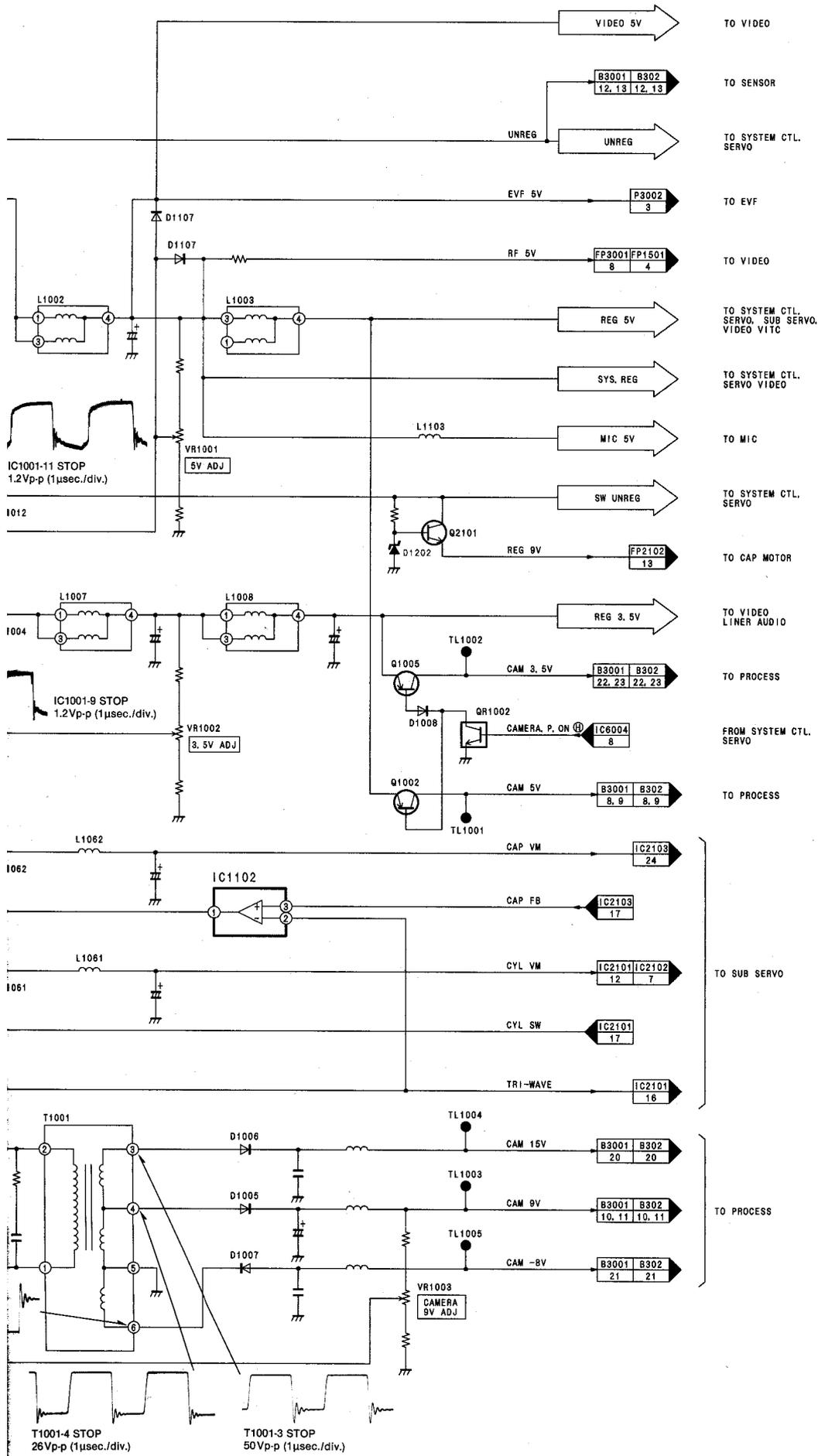
- IC301~IC303
PIN NO. FOR ZA4030
- ① RSTW RESET WRITE
 - ② WAE WRITE ADDRESS ENABLE
 - ③ WAD WRITE ADDRESS
 - ④ POR POWER ON RESET
 - ⑤ OE OUTPUT ENABLE
 - ⑥ RAD READ ADDRESS
 - ⑦ RAE READ ADDRESS ENABLE
 - ⑧ RSTR RESET READ
 - ⑨ WE WRITE ENABLE



3-4. POWER BLOCK DIAGRAM







IC1001-11 STOP
1.2Vp-p (1μsec./div.)

IC1001-9 STOP
1.2Vp-p (1μsec./div.)

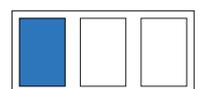
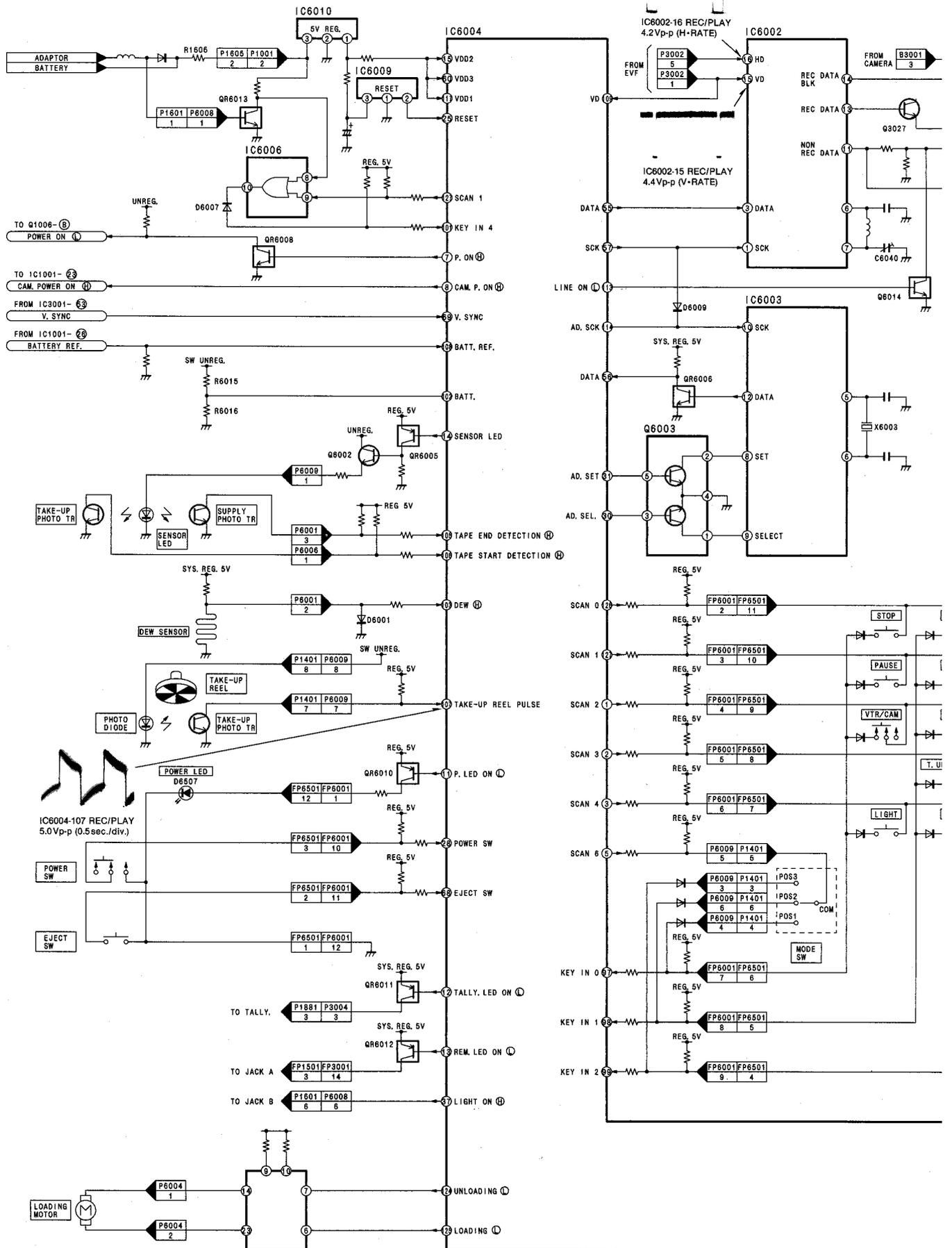
T1001-4 STOP
26Vp-p (1μsec./div.)

T1001-3 STOP
50Vp-p (1μsec./div.)



3-5. SYSTEM CONTROL & SERVO BLOCK DIAGRAM

 CAPSTAN
 CAPSTAN

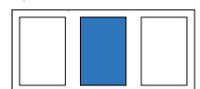
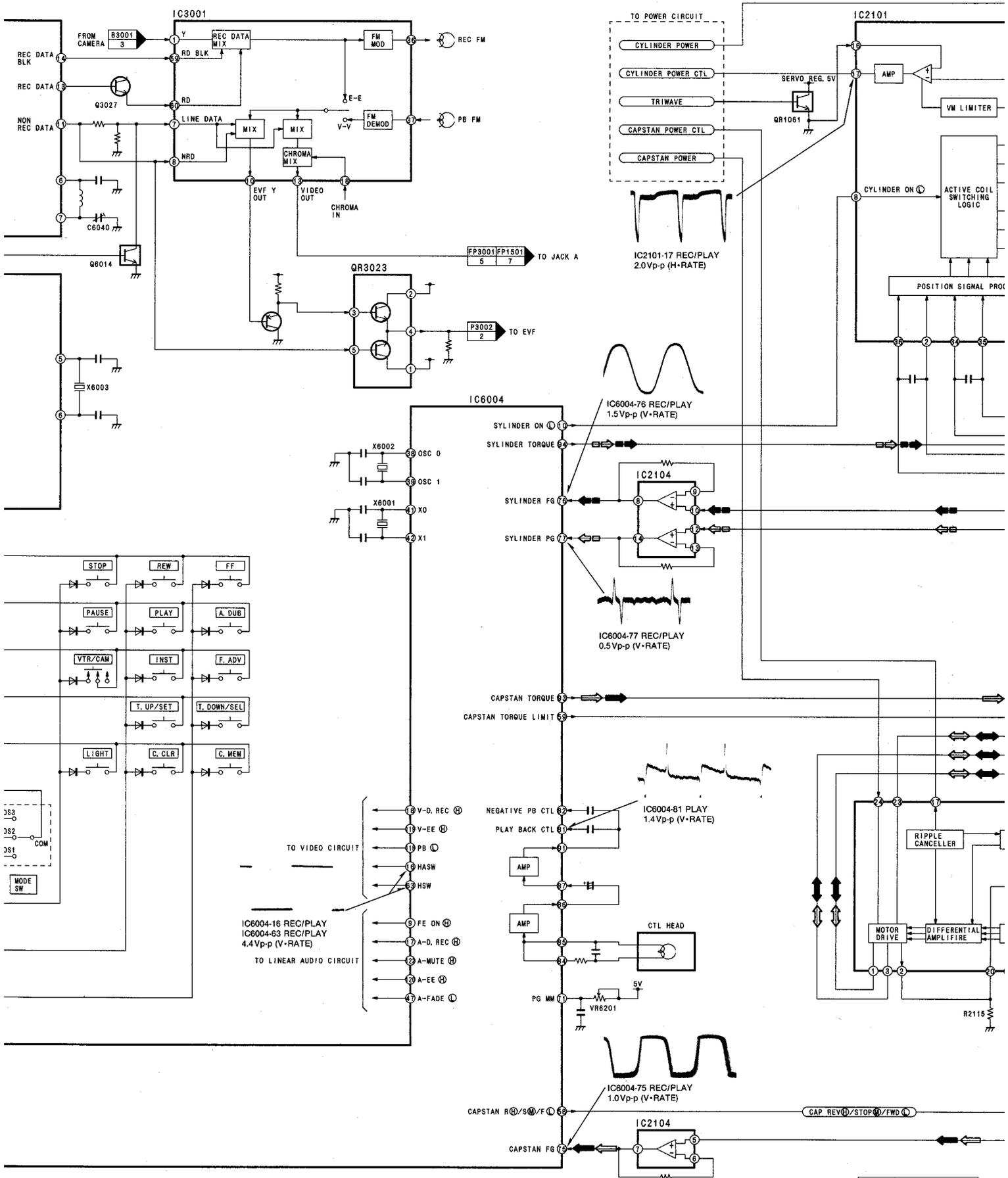


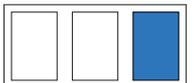
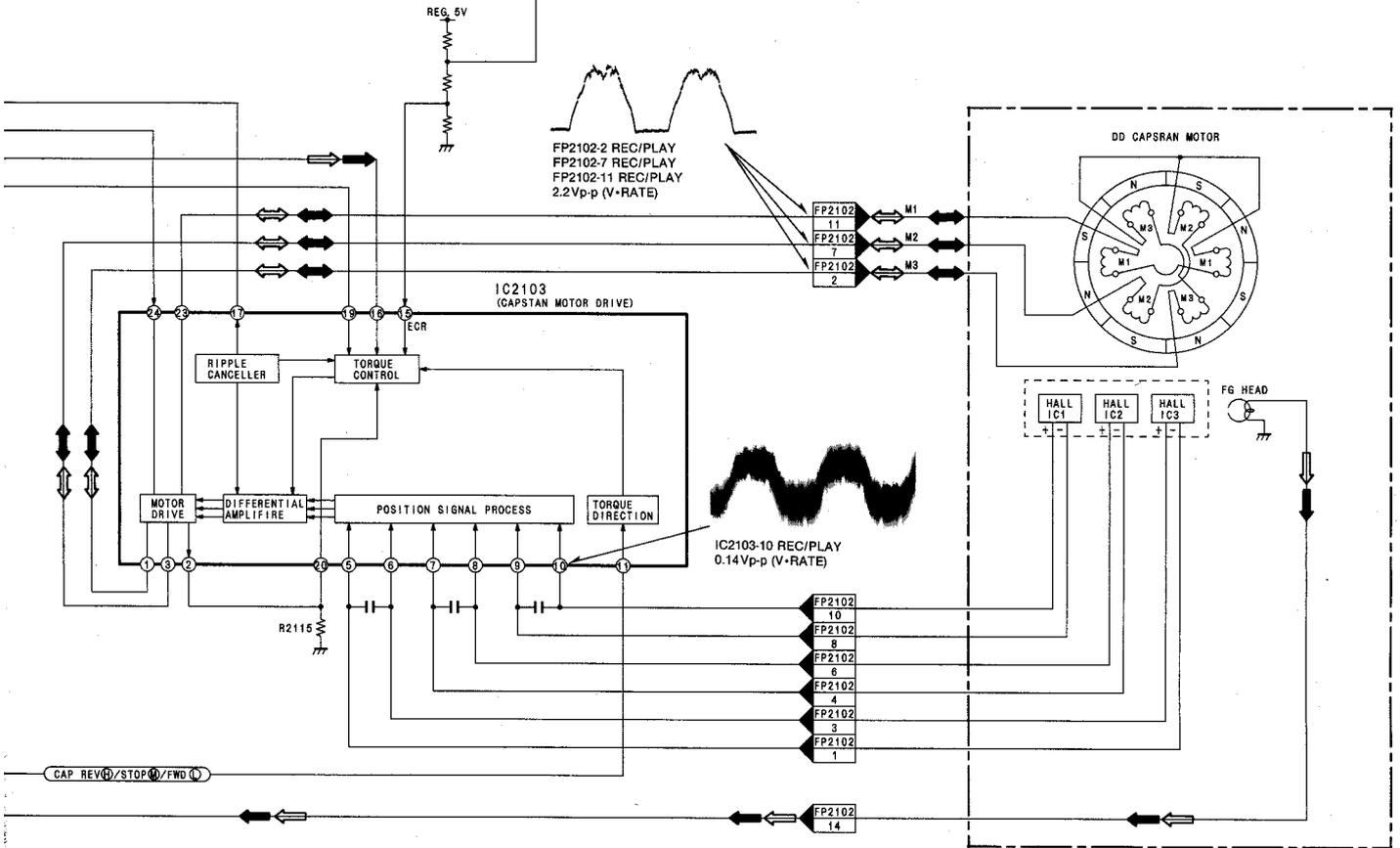
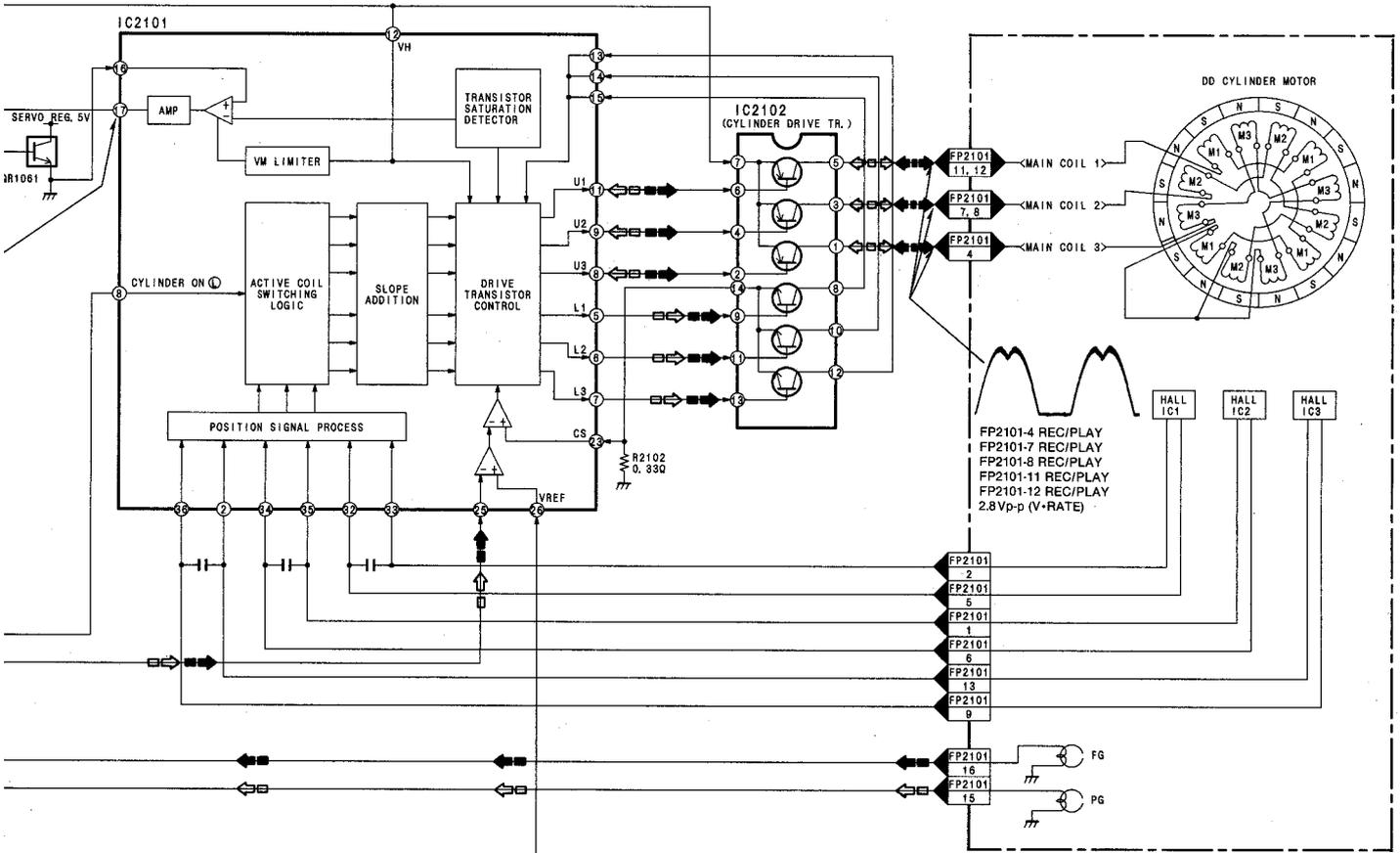
▶ CAPSTAN SERVO SPEED LOOP

◀ CYLINDER SERVO SPEED LOOP

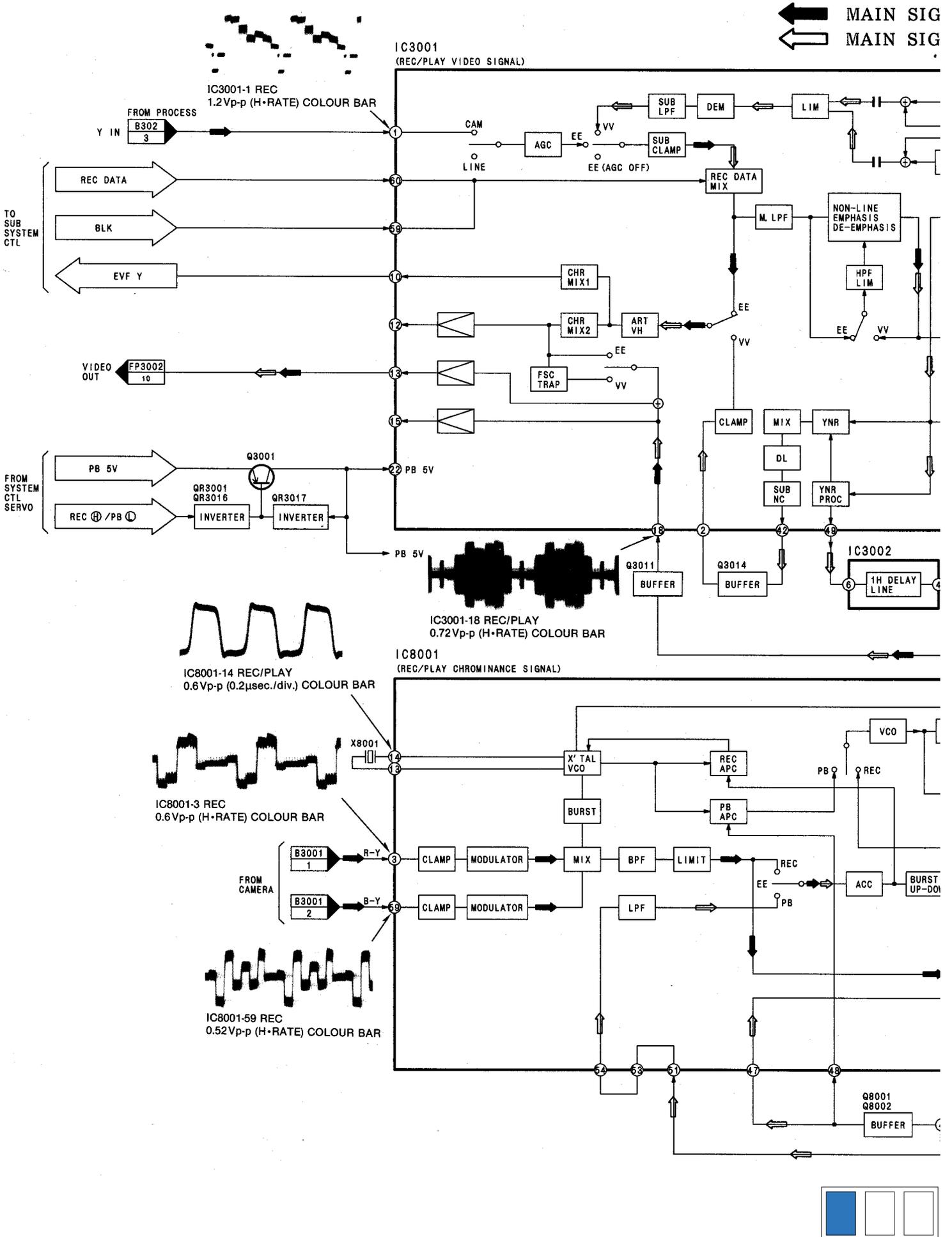
↔ CAPSTAN SERVO PHASE LOOP

↔ CYLINDER SERVO PHASE LOOP

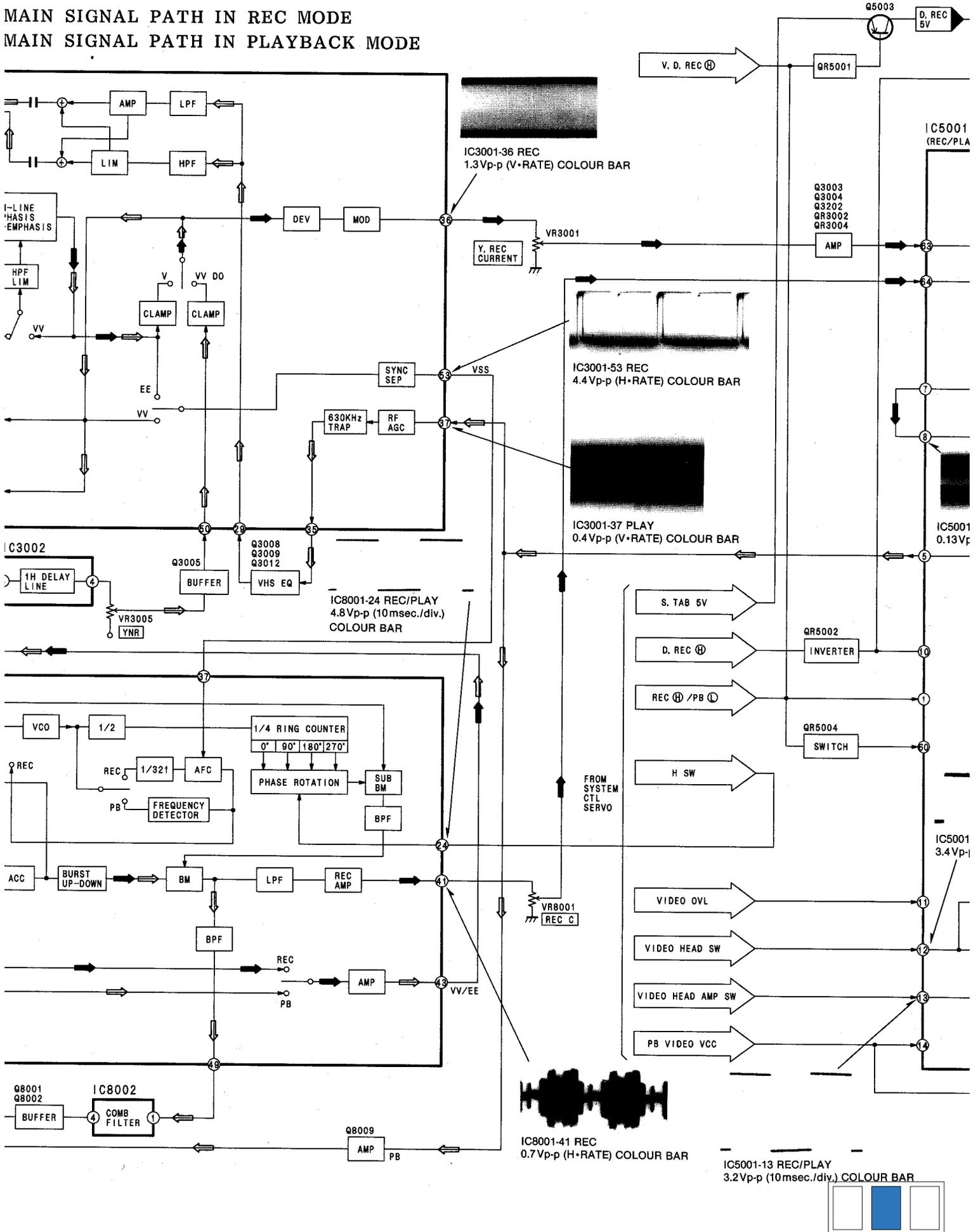


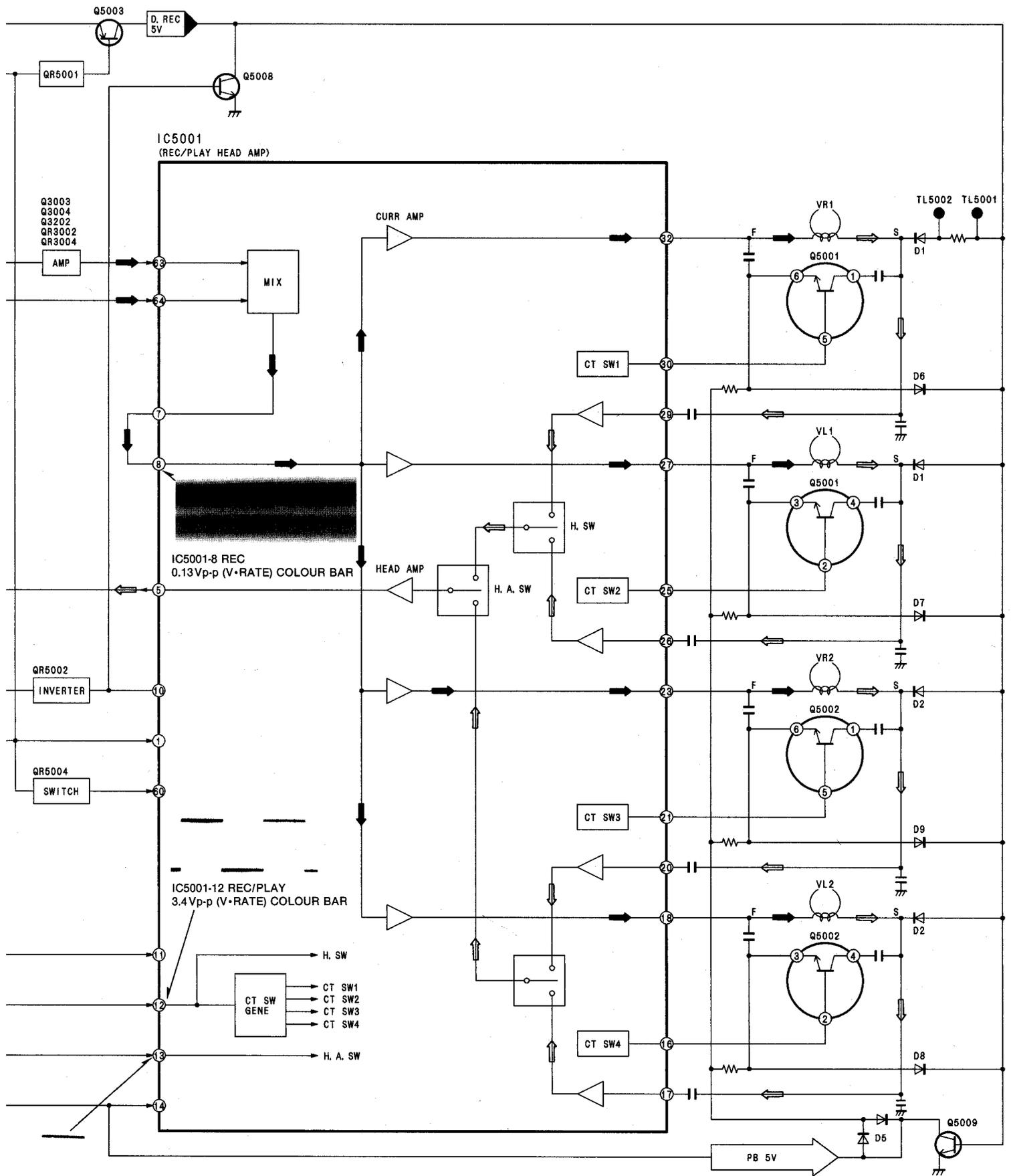


3-6. LUMINANCE/CHROMINANCE & HEAD AMP BLOCK DIAGRAM



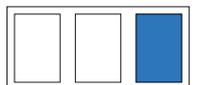
MAIN SIGNAL PATH IN REC MODE
MAIN SIGNAL PATH IN PLAYBACK MODE





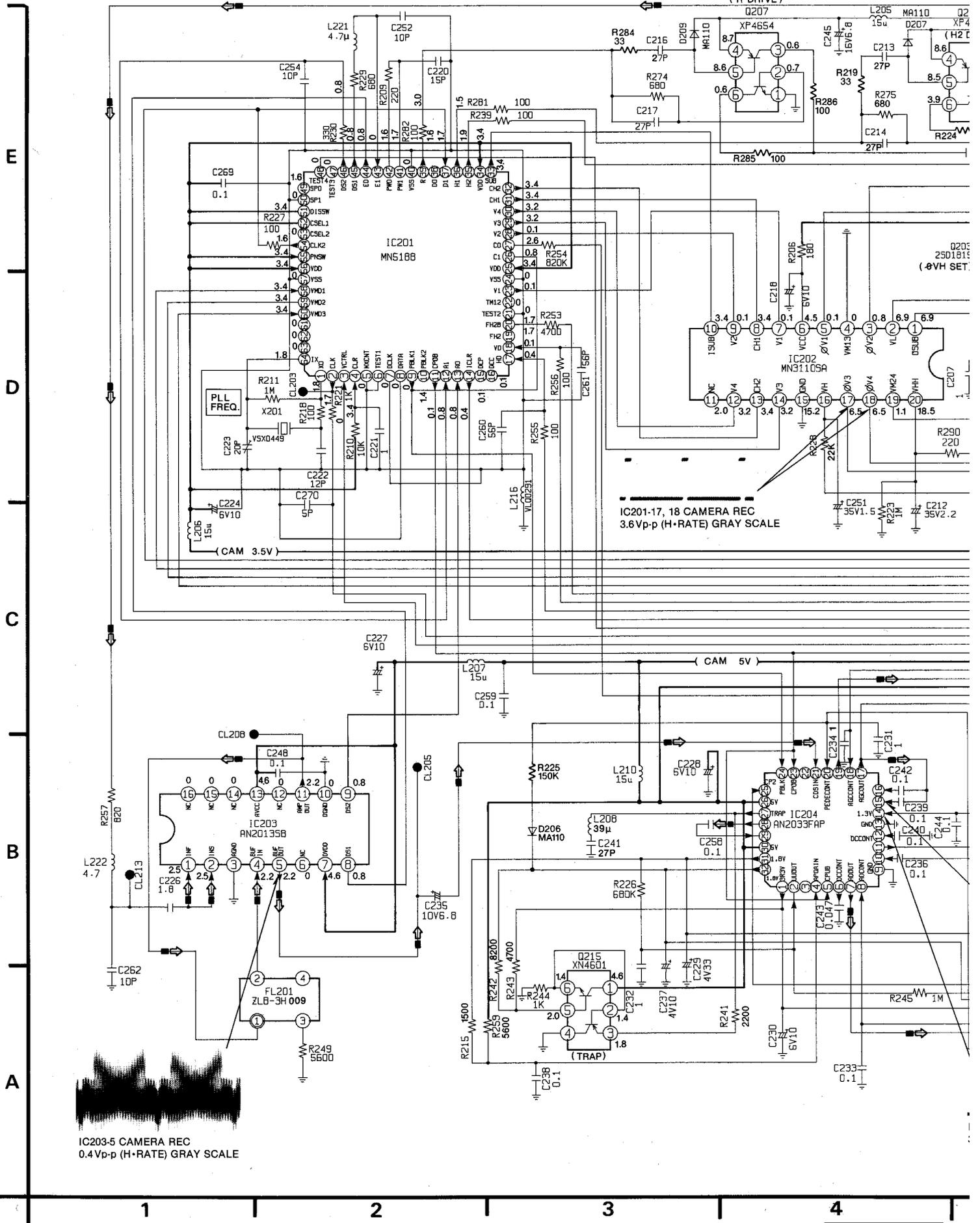
REC/PLAY
0msec./div.) COLOUR BAR

Next Page:

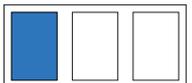


3-7. CCD DRIVE SCHEMATIC DIAGRAM

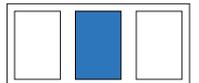
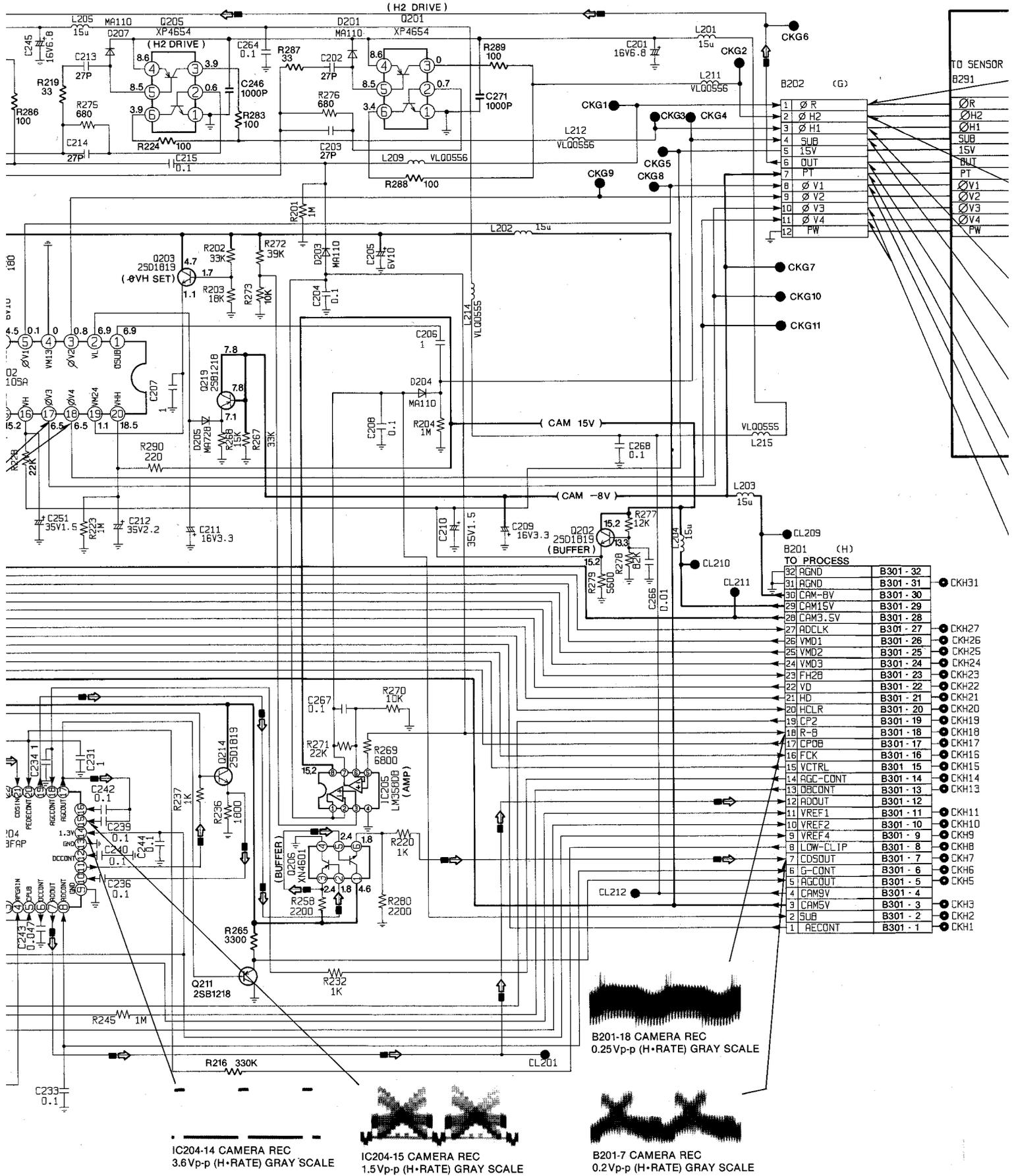
◀ VIDEO SIGNAL

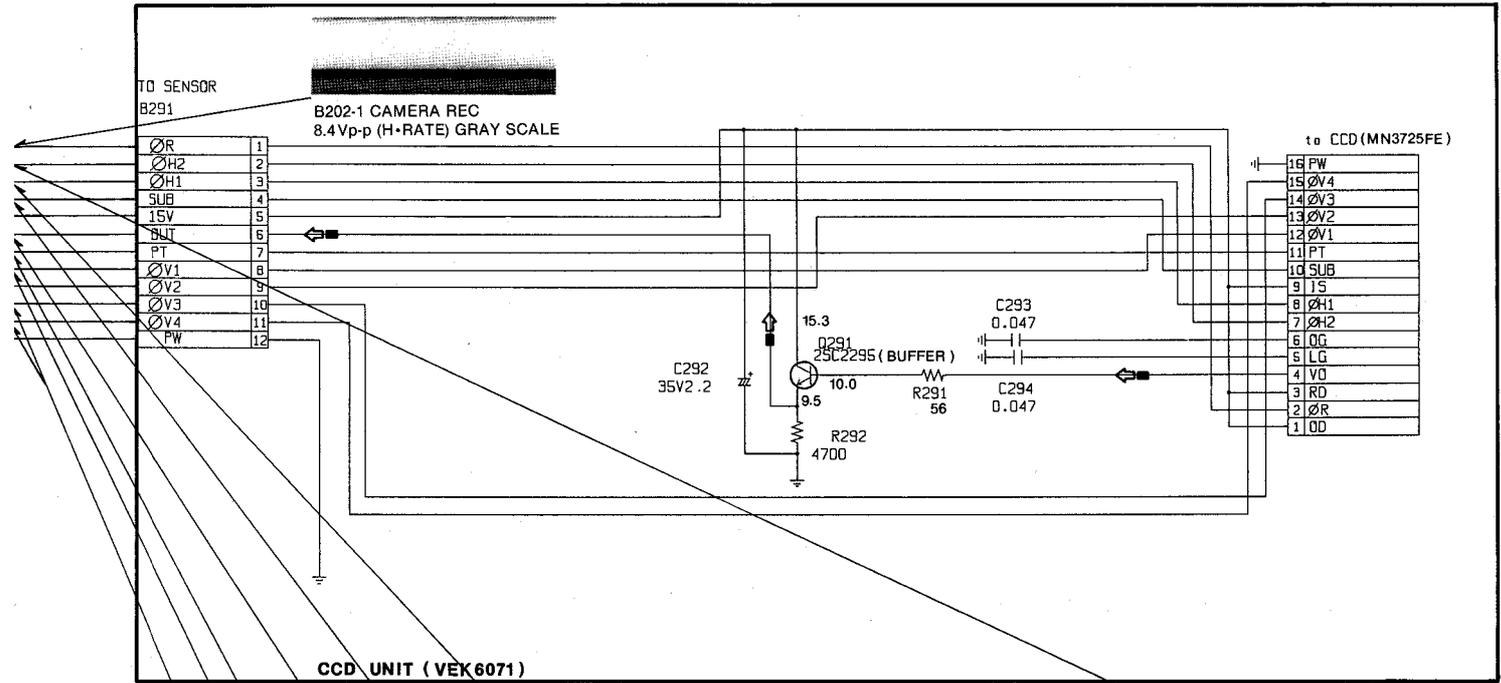


IC203-5 CAMERA REC
0.4Vp-p (H-RATE) GRAY SCALE

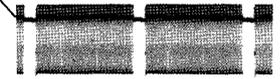


VIDEO SIGNAL

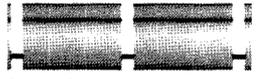




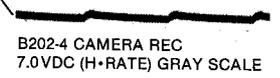
- B301 - 32
- B301 - 31 ● CKH31
- B301 - 30
- B301 - 29
- B301 - 28
- B301 - 27 ● CKH27
- B301 - 26 ● CKH26
- B301 - 25 ● CKH25
- B301 - 24 ● CKH24
- B301 - 23 ● CKH23
- B301 - 22 ● CKH22
- B301 - 21 ● CKH21
- B301 - 20 ● CKH20
- B301 - 19 ● CKH19
- B301 - 18 ● CKH18
- B301 - 17 ● CKH17
- B301 - 16 ● CKH16
- B301 - 15 ● CKH15
- B301 - 14 ● CKH14
- B301 - 13 ● CKH13
- B301 - 12
- B301 - 11 ● CKH11
- B301 - 10 ● CKH10
- B301 - 9 ● CKH9
- B301 - 8 ● CKH8
- B301 - 7 ● CKH7
- B301 - 6 ● CKH6
- B301 - 5 ● CKH5
- B301 - 4
- B301 - 3 ● CKH3
- B301 - 2 ● CKH2
- B301 - 1 ● CKH1



B202-3 CAMERA REC
15.1Vp-p (H-RATE) GRAY SCALE



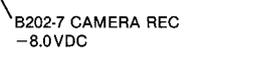
B202-2 CAMERA REC
15.1Vp-p (H-RATE) GRAY SCALE



B202-4 CAMERA REC
7.0VDC (H-RATE) GRAY SCALE



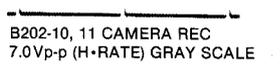
B202-6 CAMERA REC
0.8Vp-p (H-RATE) GRAY SCALE



B202-7 CAMERA REC
-8.0VDC



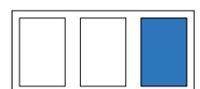
B202-8, 9 CAMERA REC
7.0Vp-p (H-RATE) GRAY SCALE



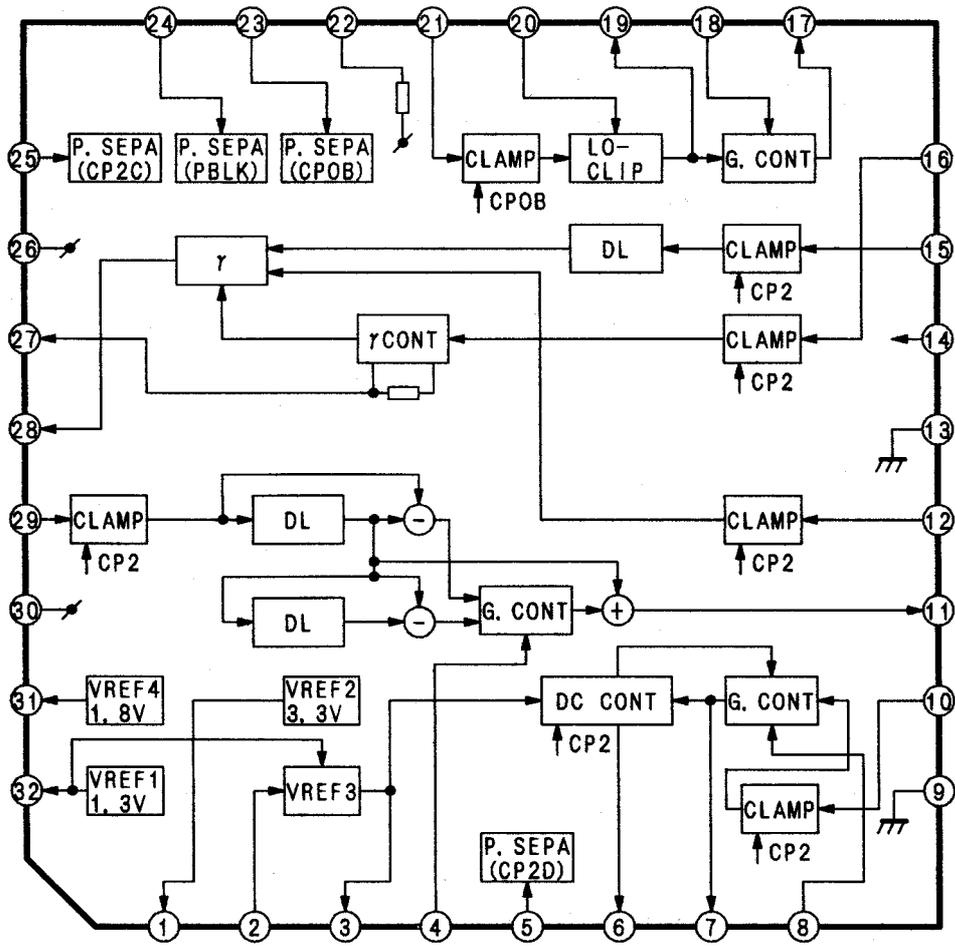
B202-10, 11 CAMERA REC
7.0Vp-p (H-RATE) GRAY SCALE

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE WITH AIM THE CAMERA AT THE LOGARITHMIC GRAY SCALE CHART.

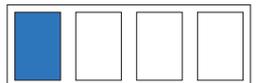
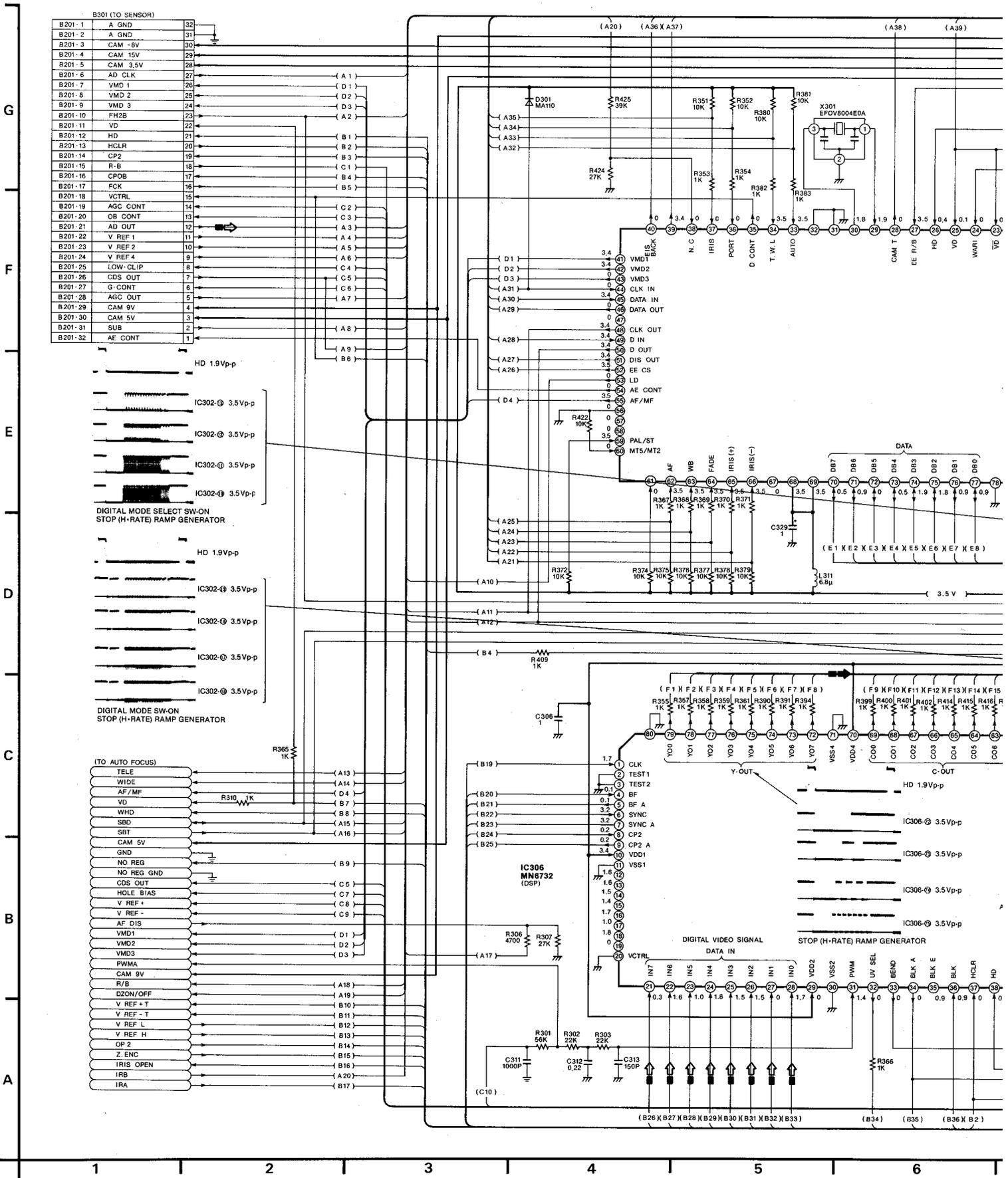
NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

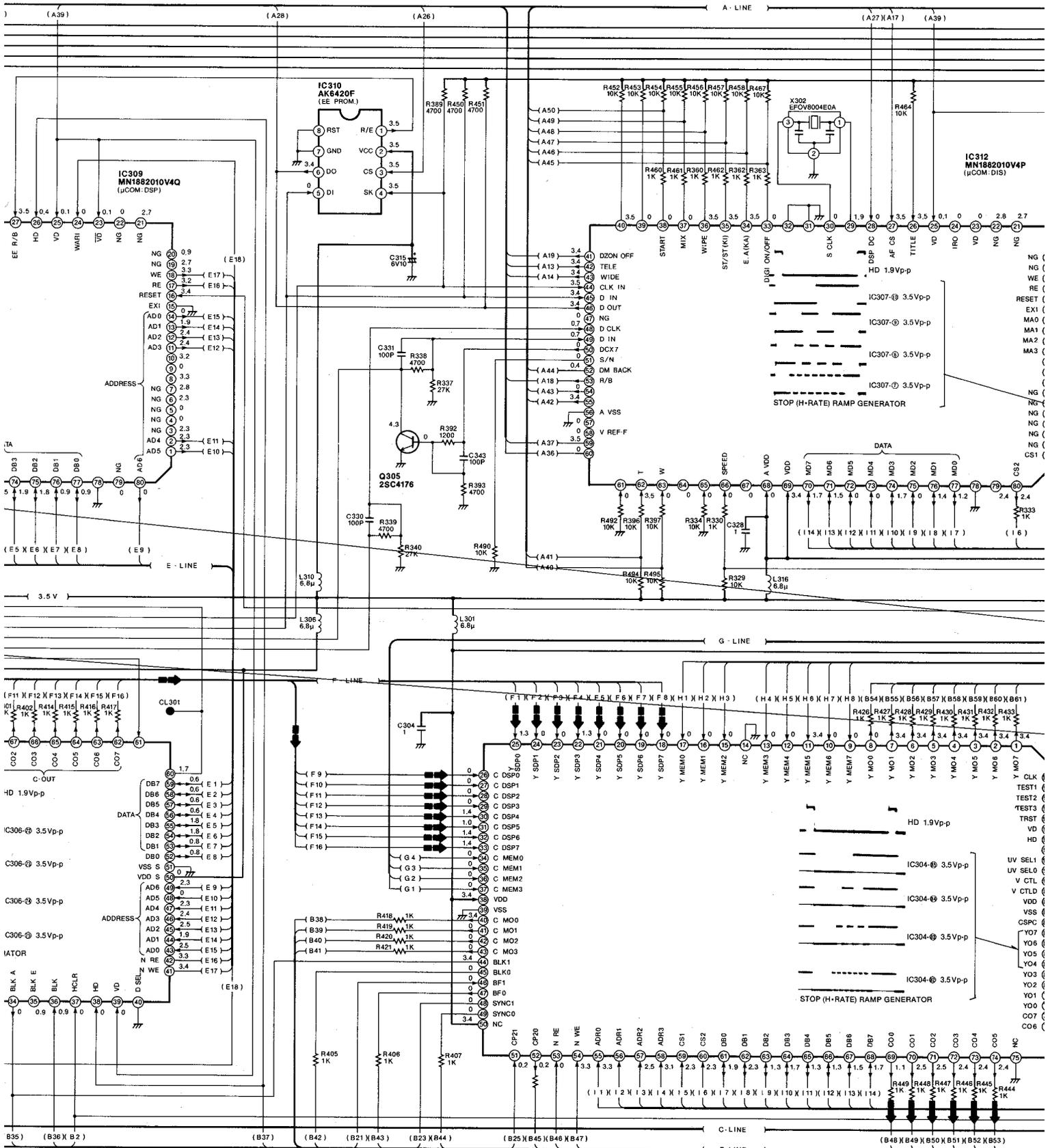


IC204
AN2033FAP
AN2032FAP

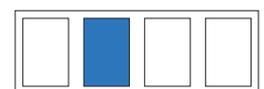


3-9. PROCESS, CAMERA OPERATION & CCD UNIT SCHEMATIC DIAGRAM

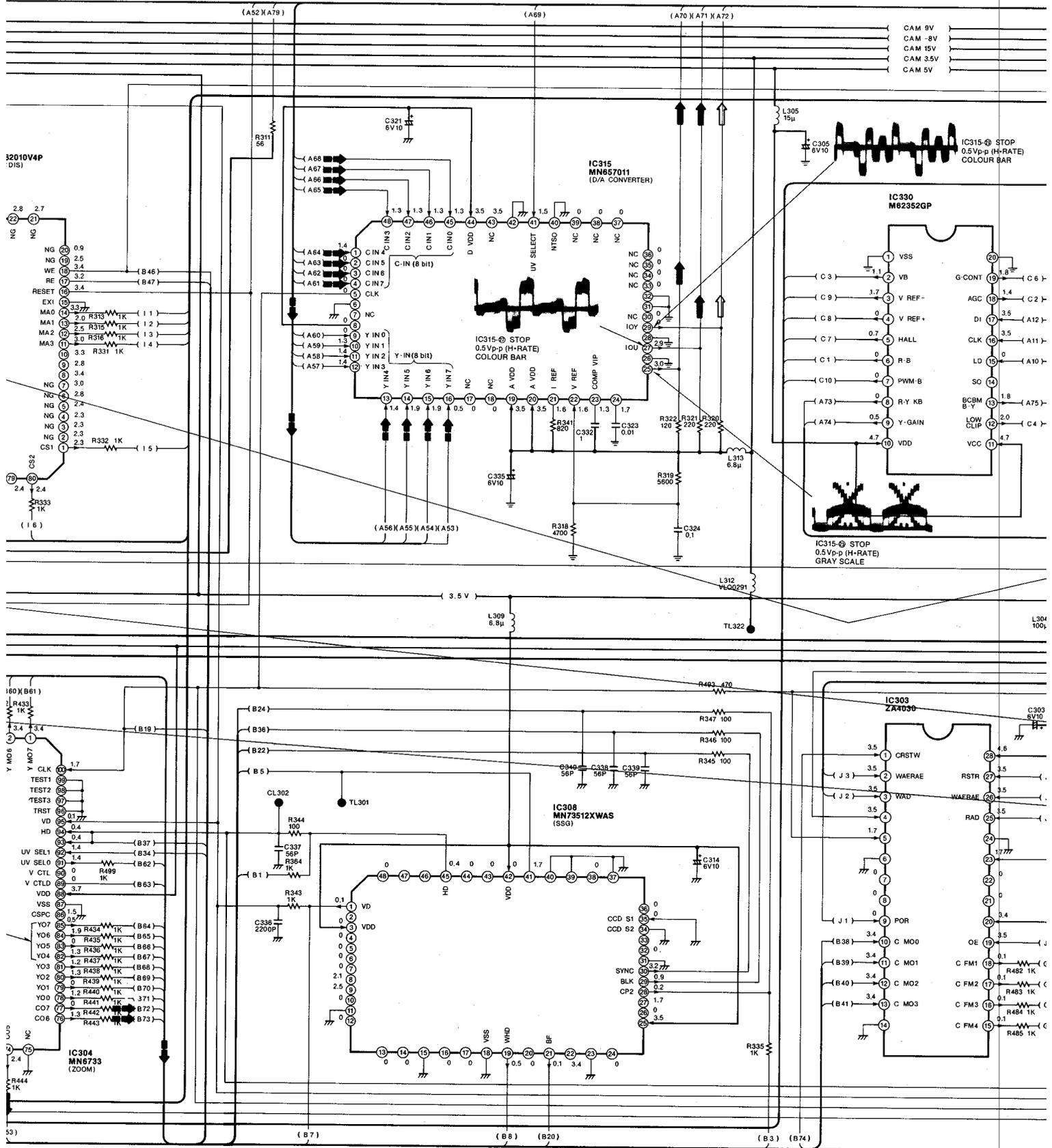




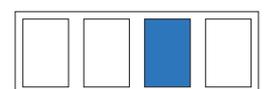
6 7 8 9 10 11 12

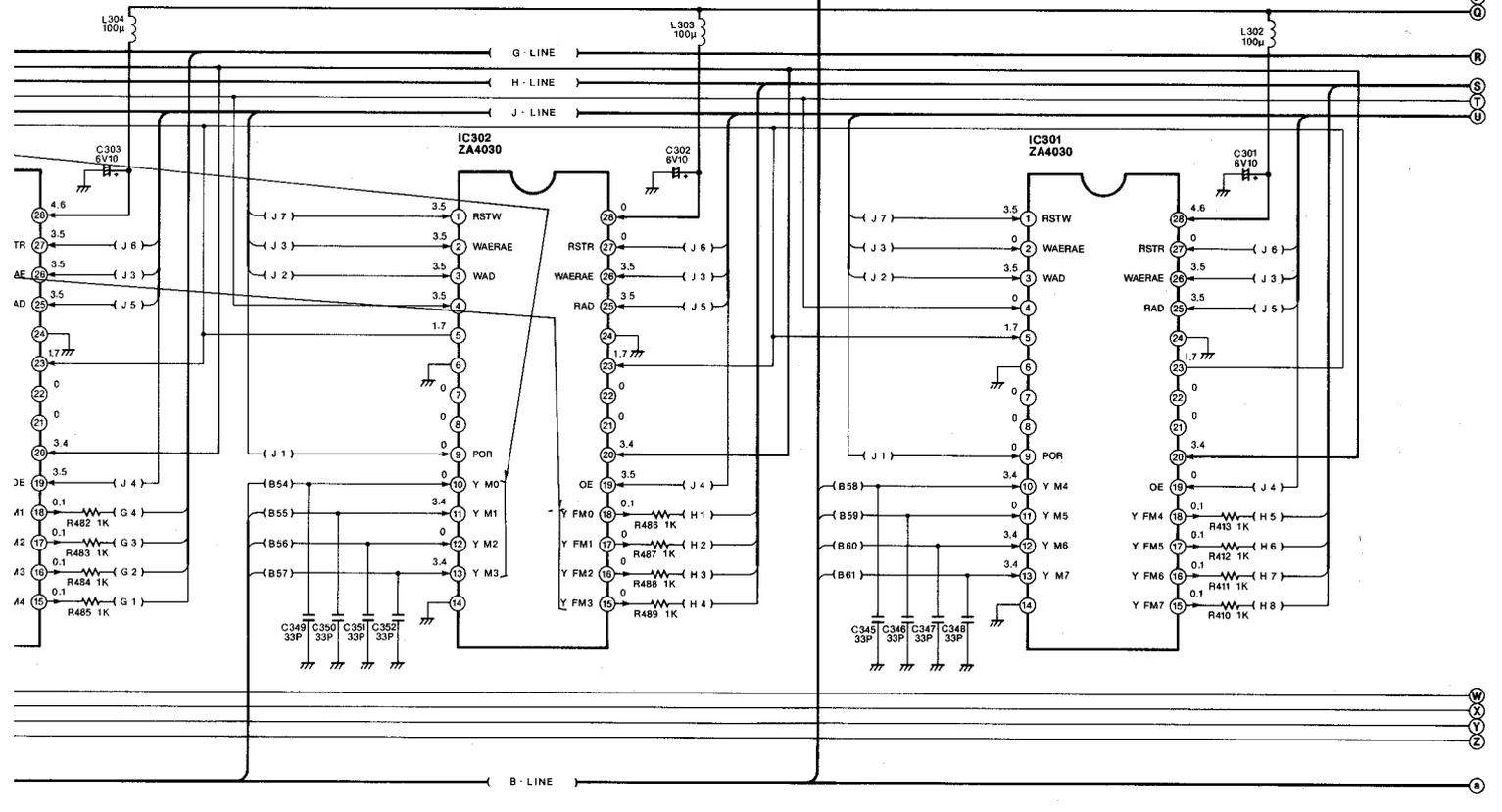
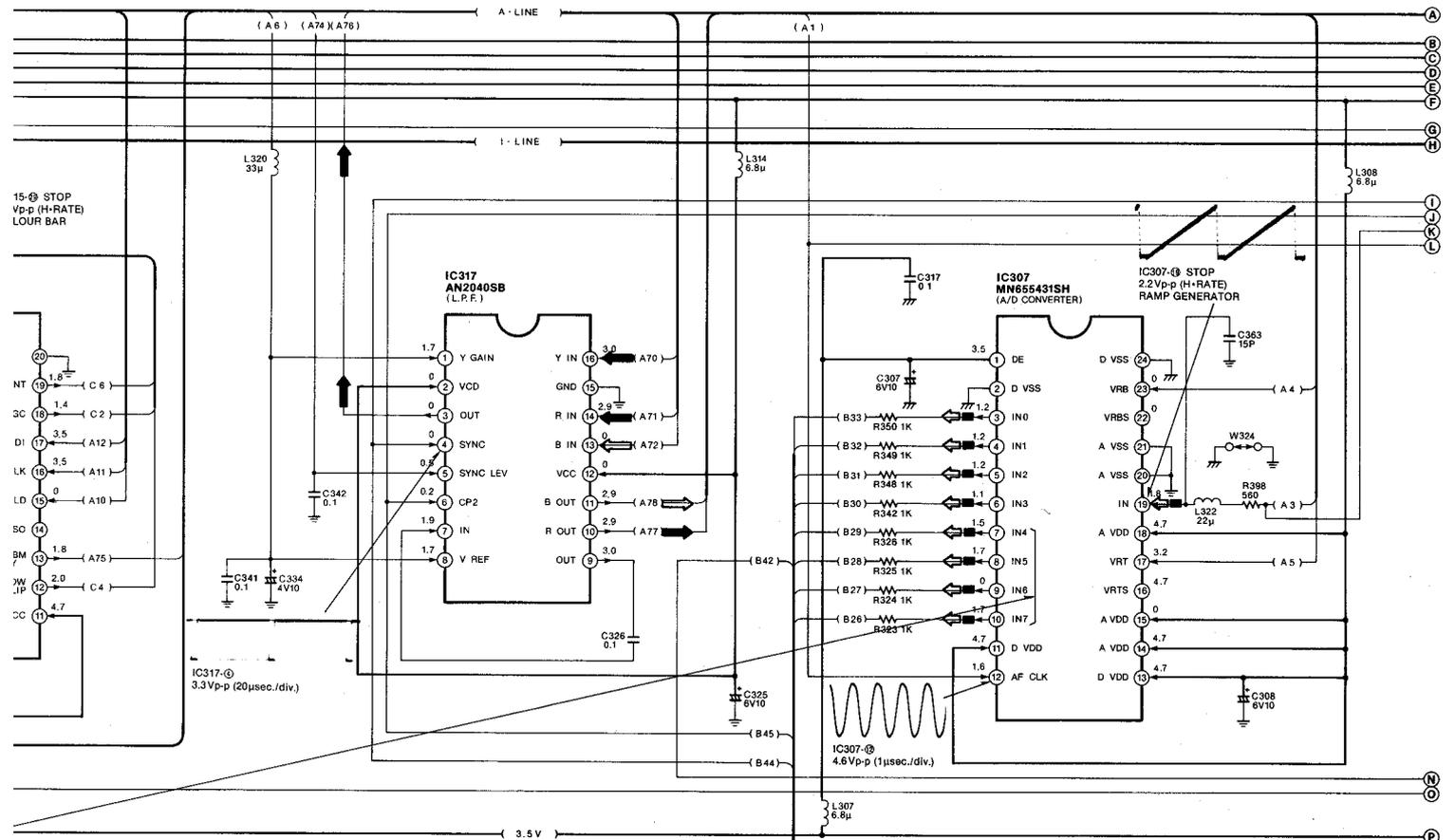


AL ← Y SIGNAL ← R-Y SIGNAL ← B-Y SIGNAL

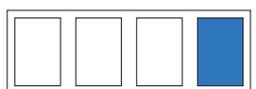


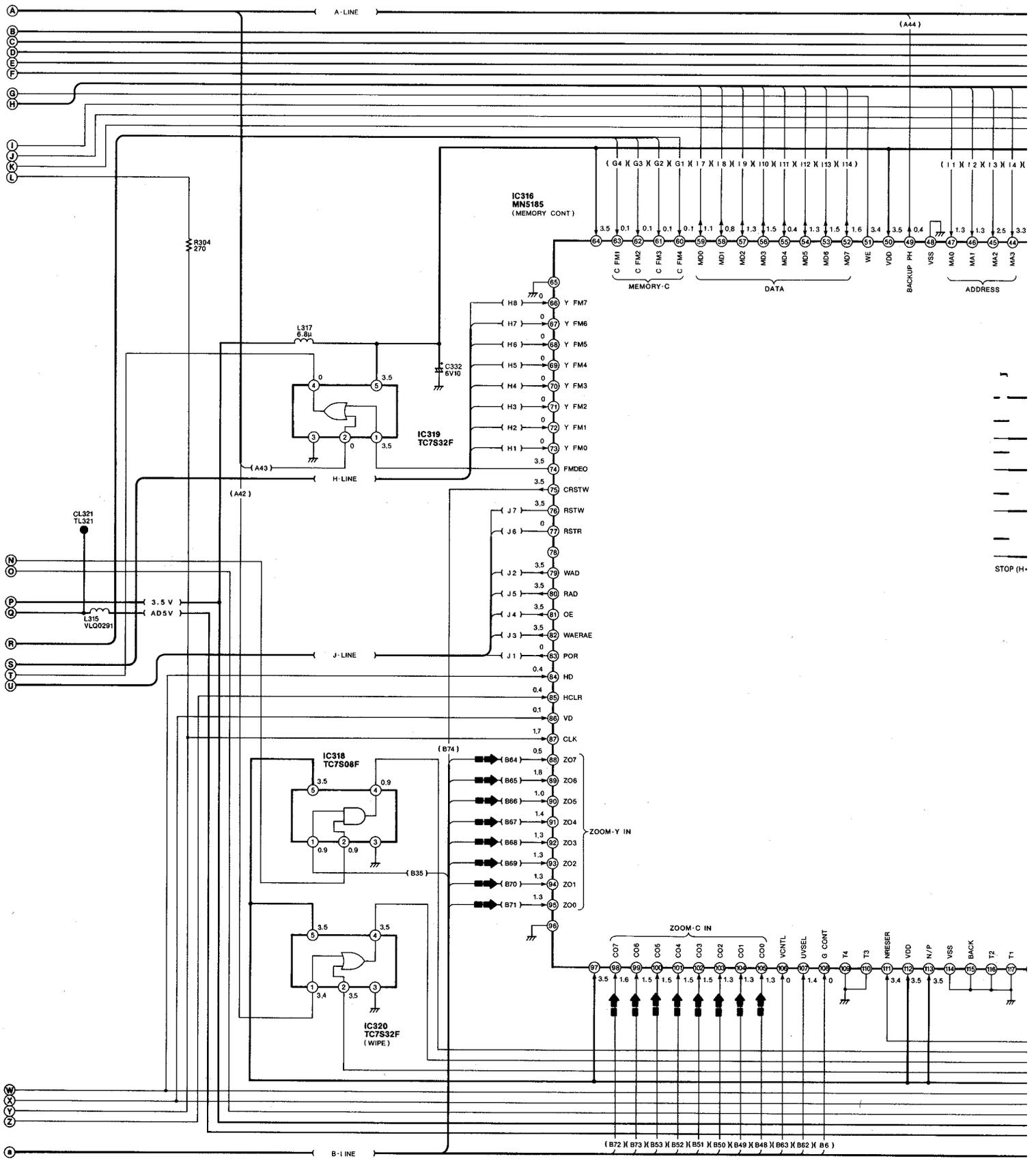
12 | 13 | 14 | 15 | 16 | 17 | 18



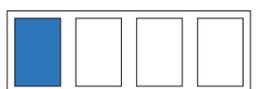


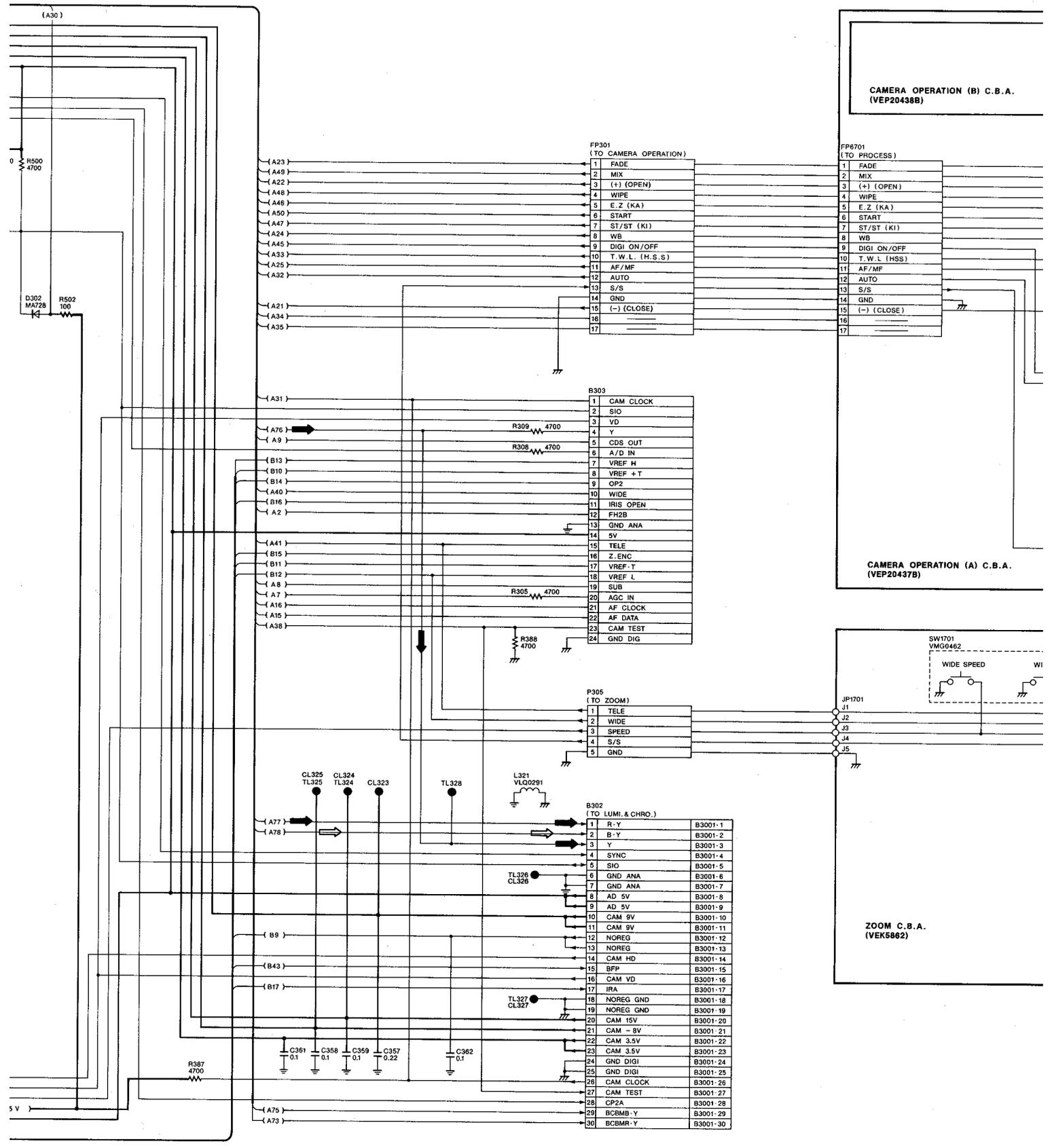
18 | 19 | 20 | 21 | 22 | 23





STOP (H-



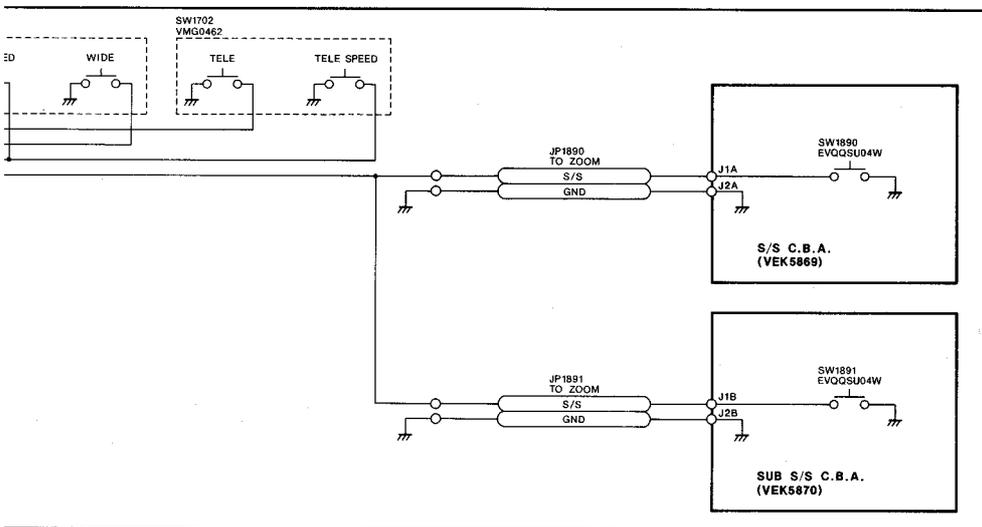
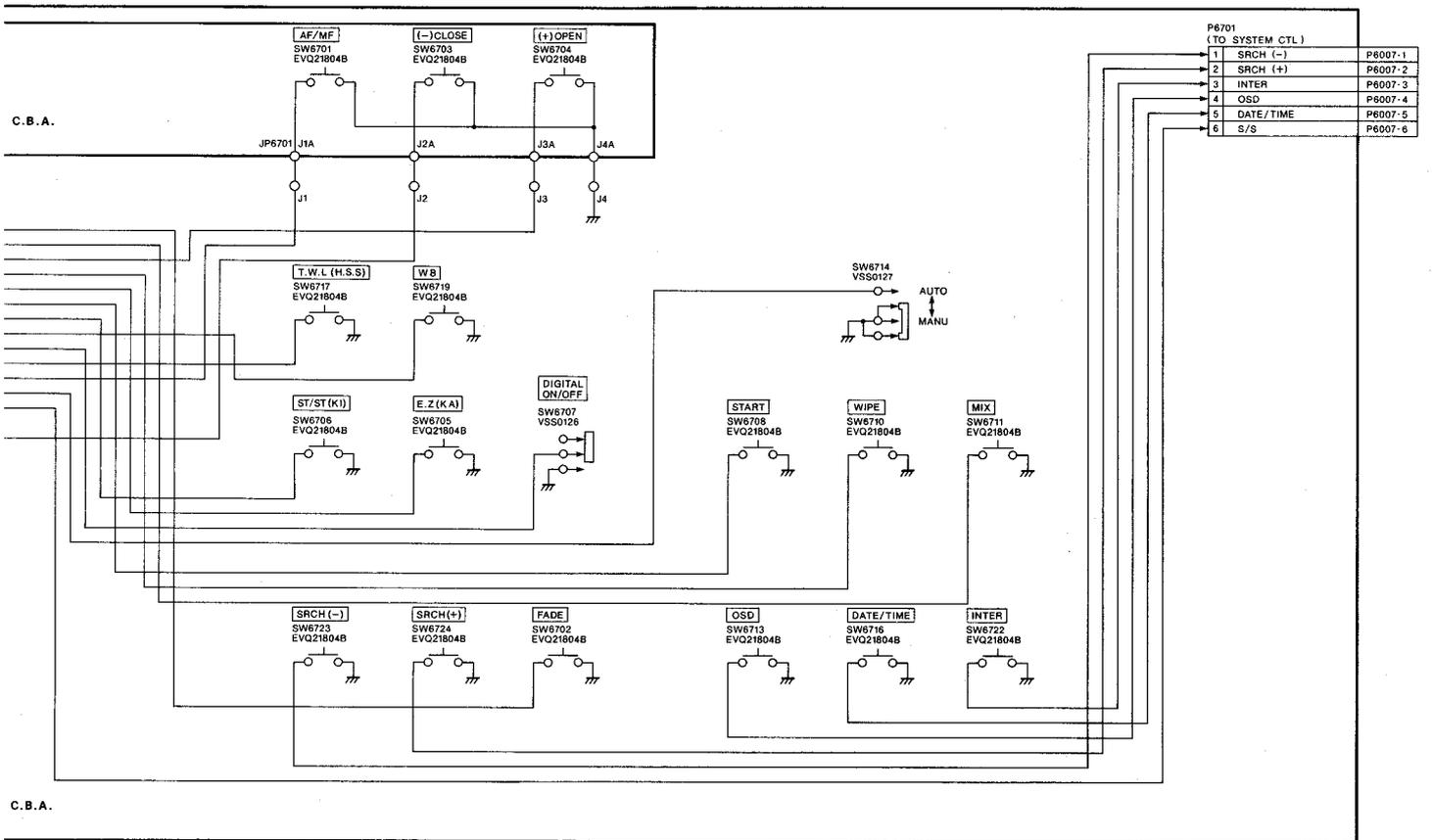


CAMERA OPERATION (B) C.B.A. (VEP20438B)

CAMERA OPERATION (A) C.B.A. (VEP20437B)

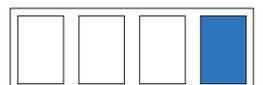
ZOOM C.B.A. (VEK5862)



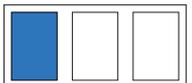
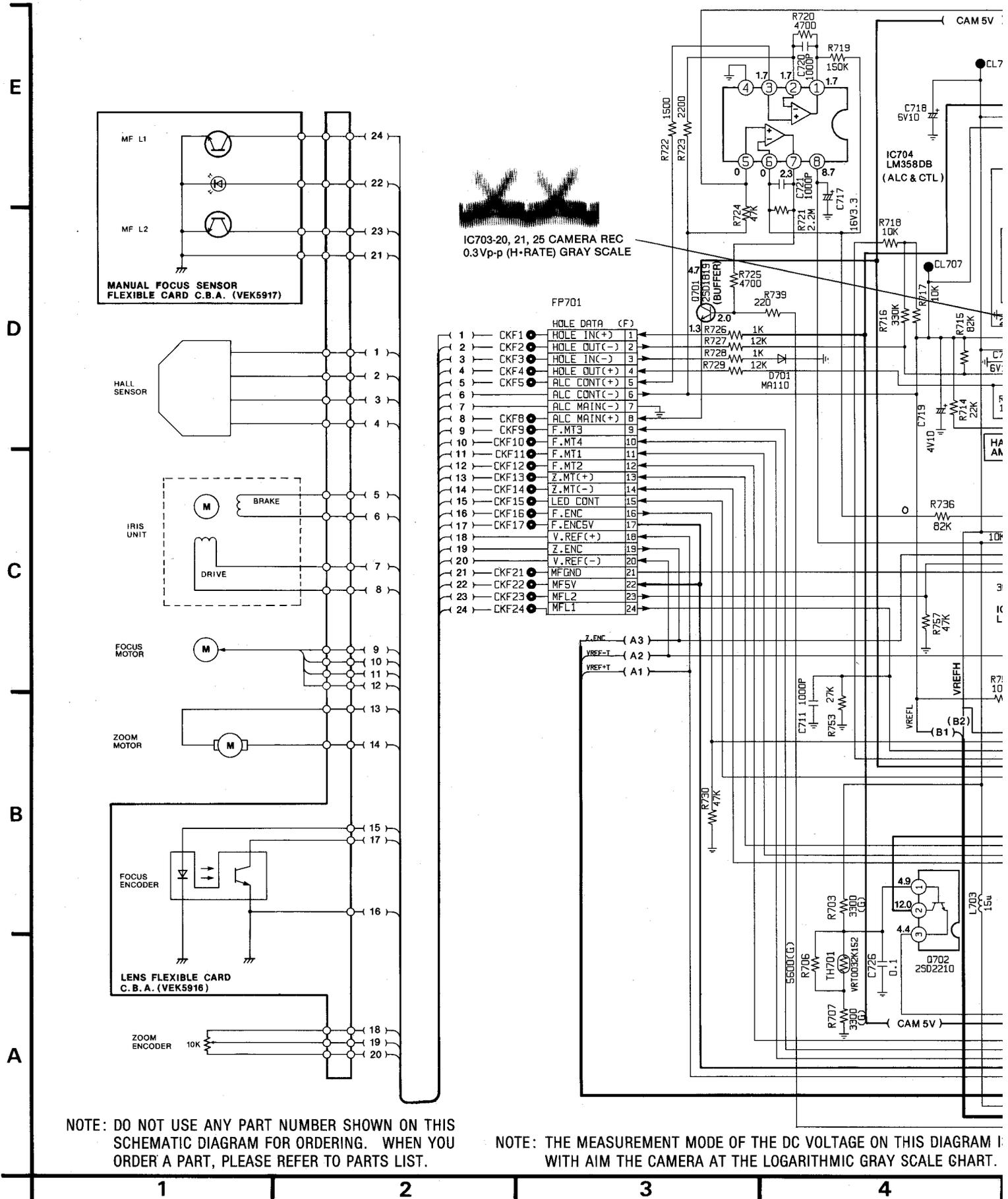


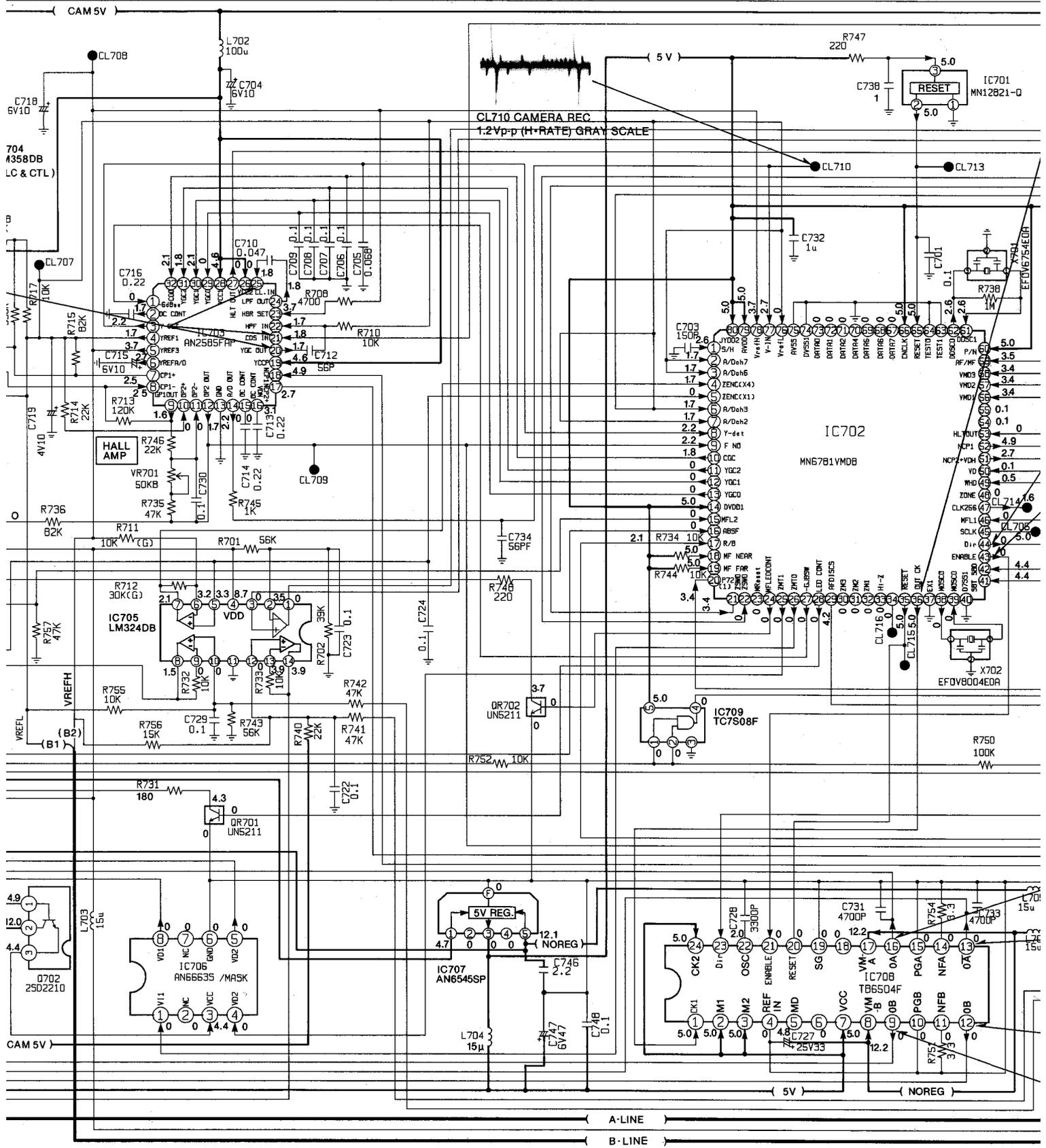
NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE WITH AIM THE CAMERA AT THE LOGARITHMIC GRAY SCALE CHART.



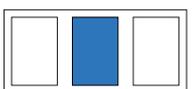
3-10. AUTO FOCUS SCHEMATIC DIAGRAM

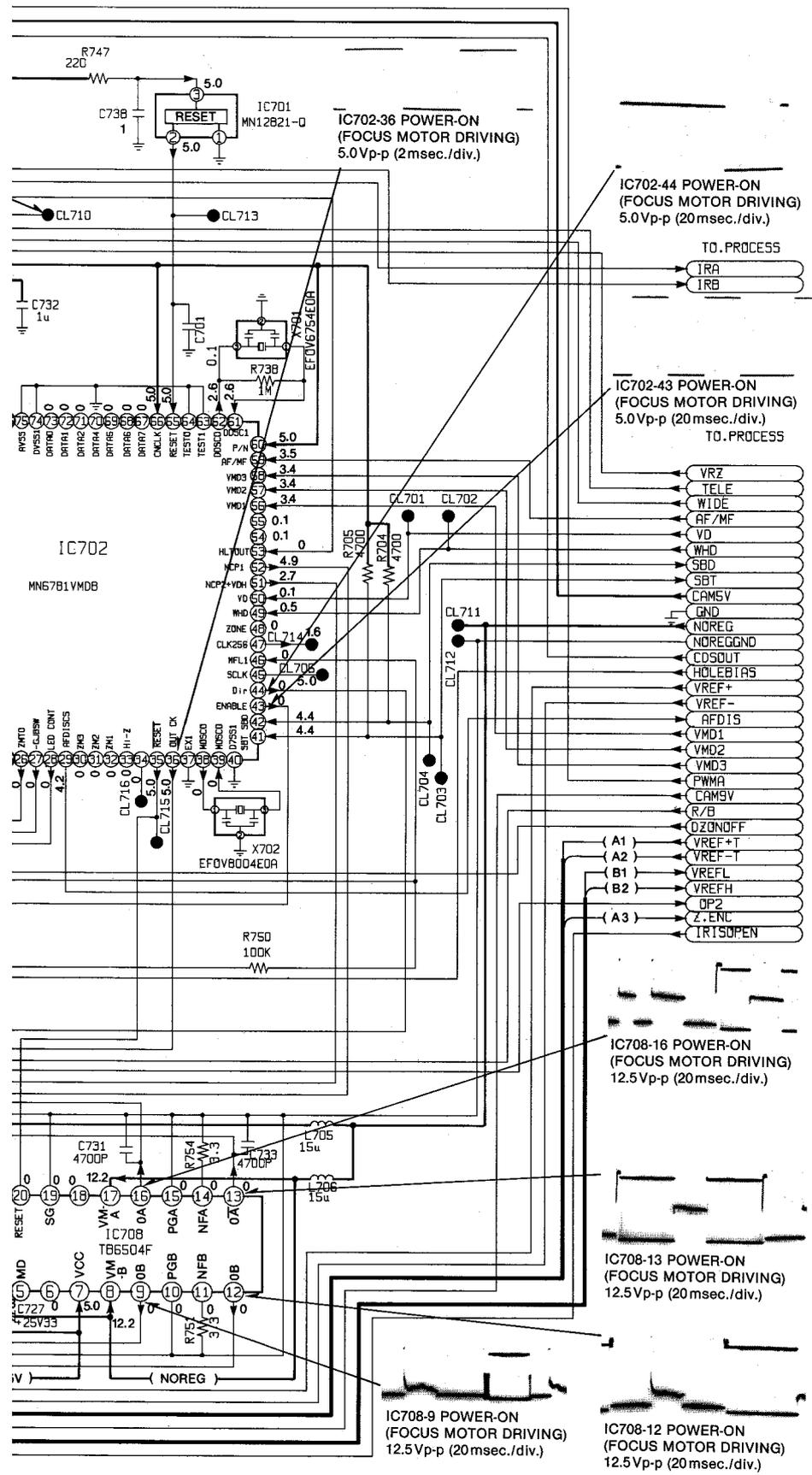




THIS DIAGRAM IS STOP MODE SCALE CHART.

5 6 7 8





IC708-9 POWER-ON
(FOCUS MOTOR DRIVING)
12.5Vp-p (20msec./div.)

IC708-12 POWER-ON
(FOCUS MOTOR DRIVING)
12.5Vp-p (20msec./div.)

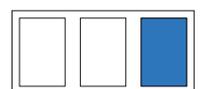
IC708-13 POWER-ON
(FOCUS MOTOR DRIVING)
12.5Vp-p (20msec./div.)

IC708-16 POWER-ON
(FOCUS MOTOR DRIVING)
12.5Vp-p (20msec./div.)

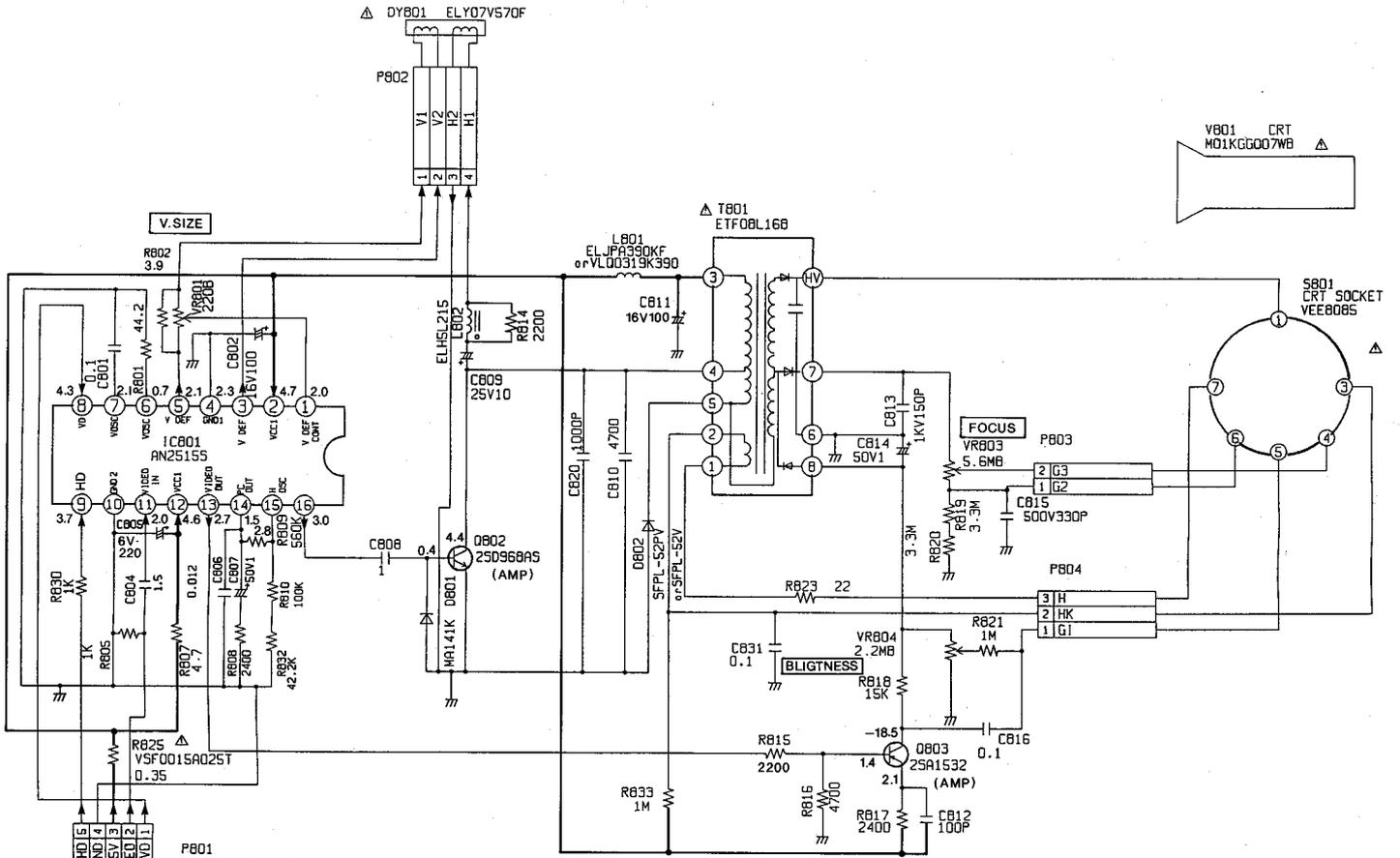
IC702-43 POWER-ON
(FOCUS MOTOR DRIVING)
5.0Vp-p (20msec./div.)

IC702-44 POWER-ON
(FOCUS MOTOR DRIVING)
5.0Vp-p (20msec./div.)

IC702-36 POWER-ON
(FOCUS MOTOR DRIVING)
5.0Vp-p (2msec./div.)



EVF SCHEMATIC DIAGRAM



P801 TO LUMI. & CHRO.

| | | |
|-------|---|----------|
| F3002 | 5 | HD1E |
| F3002 | 4 | GD14 |
| F3002 | 3 | EVF SV13 |
| F3002 | 2 | VD012 |
| F3002 | 1 | VD11 |

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK Δ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

1

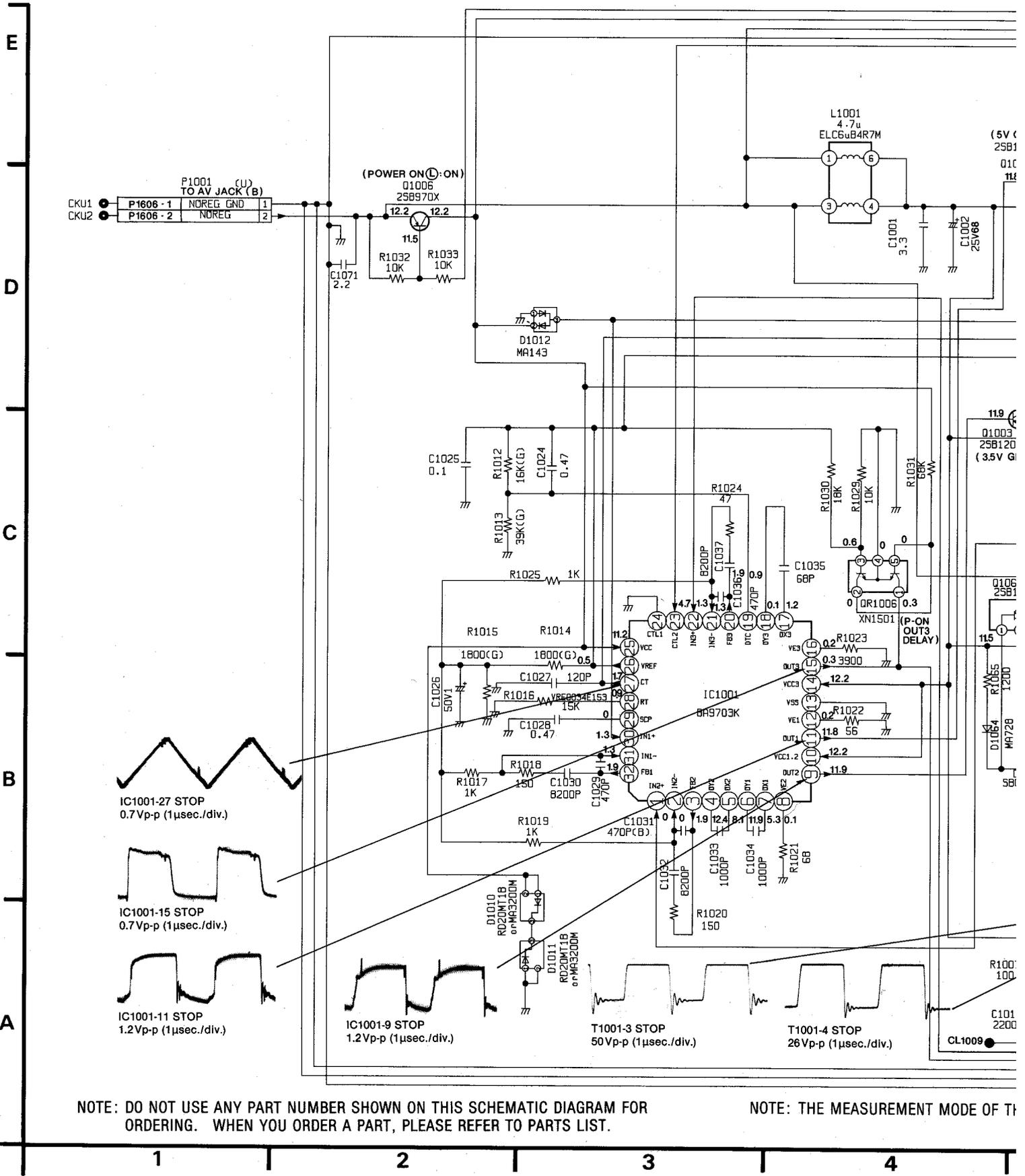
2

3

4

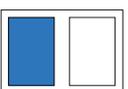
5

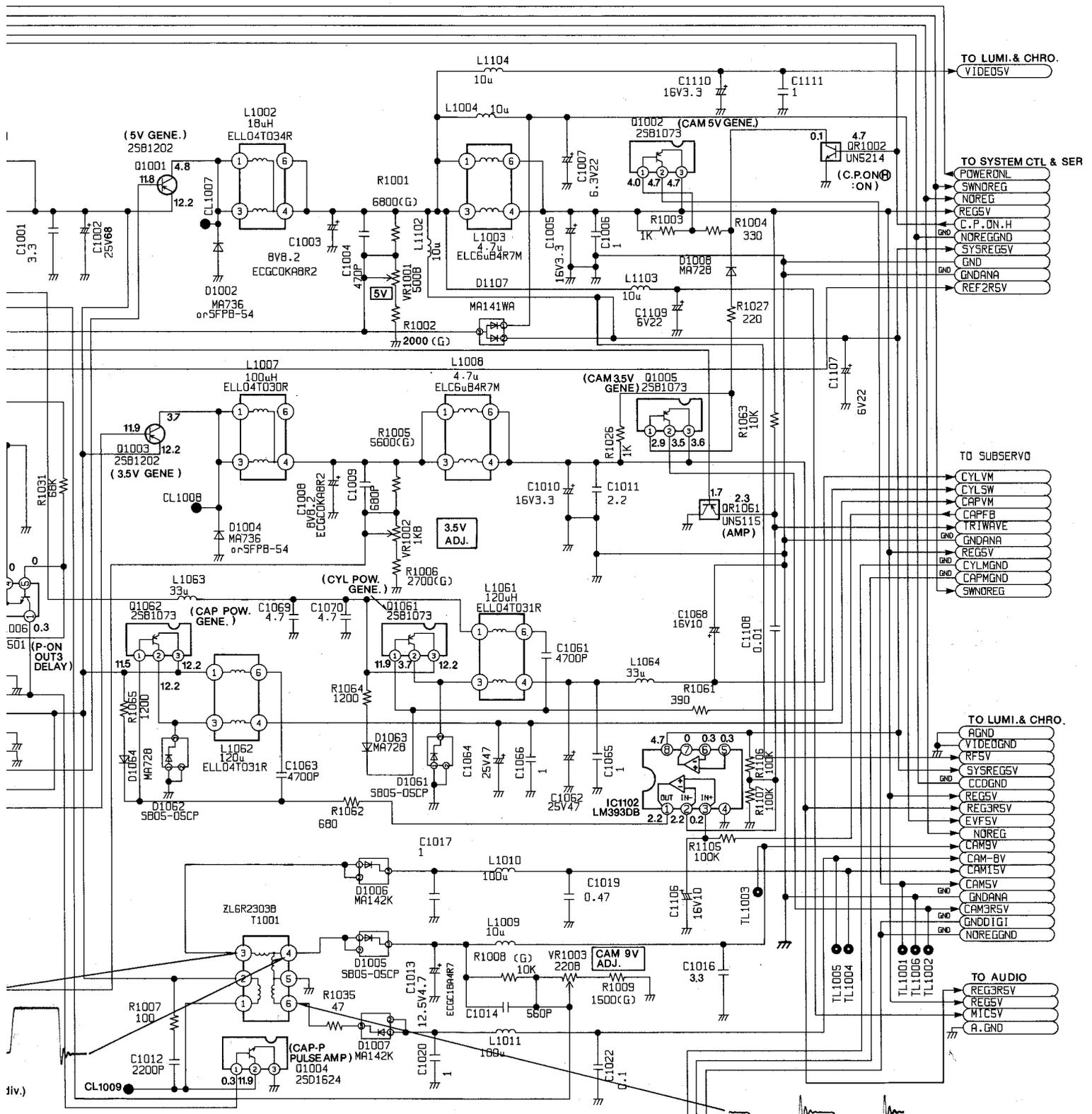
3-15. POWER SCHEMATIC DIAGRAM



NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

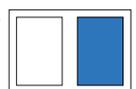
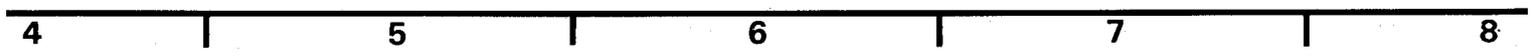
NOTE: THE MEASUREMENT MODE OF THE





INCREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

T1001-6 STOP
30Vp-p (1µsec./div.)



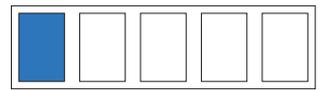
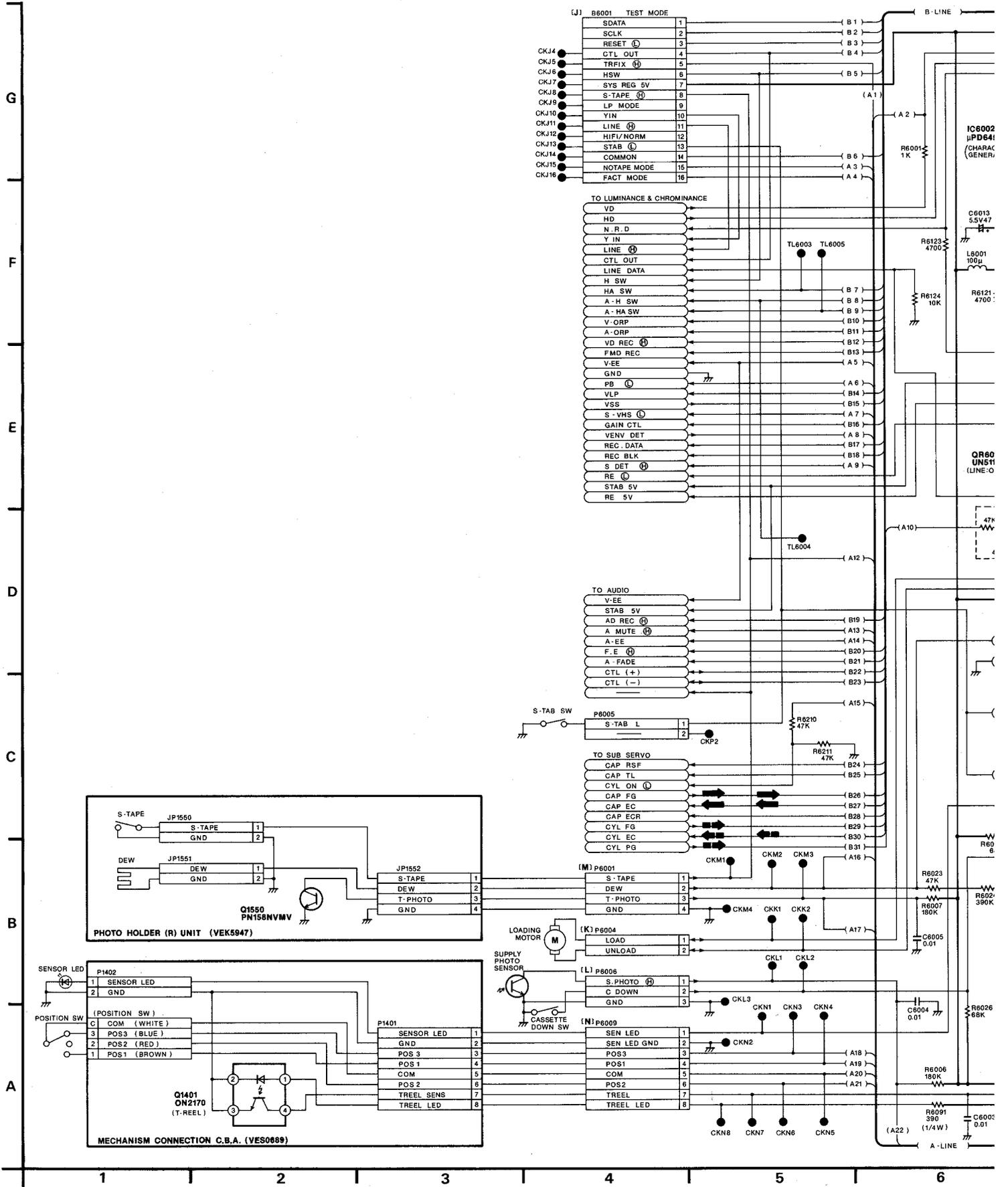
SYSTEM CONTROL & SERVO ICs DC VOLTAGE CHART

| REF. NO. | IC6009 | | | | | | | | | IC6010 | | | | | | | | | |
|----------|--------|-----|-----|-----|-----|--|--|--|--|--------|---|------|--|--|--|--|--|--|--|
| MODE | 1 | 2 | 3 | | | | | | | 1 | 2 | 3 | | | | | | | |
| STOP | 0 | 4.7 | 4.7 | | | | | | | 5.0 | 0 | 12.2 | | | | | | | |
| REC/PLAY | 0 | 4.7 | 4.7 | | | | | | | 5.0 | 0 | 12.1 | | | | | | | |
| F.F | 0 | 4.7 | 4.7 | | | | | | | 5.0 | 0 | 12.1 | | | | | | | |
| REF. NO. | IC6011 | | | | | | | | | | | | | | | | | | |
| MODE | 1 | 2 | 3 | 4 | 5 | | | | | | | | | | | | | | |
| STOP | 4.7 | 4.5 | 0 | 4.5 | 4.7 | | | | | | | | | | | | | | |
| REC/PLAY | 4.7 | 4.6 | 0 | 4.6 | 4.7 | | | | | | | | | | | | | | |
| F.F | 4.6 | 4.6 | 0 | 4.7 | 4.7 | | | | | | | | | | | | | | |

SYSTEM CONTROL & SERVO TRANSISTORS DC VOLTAGE CHART

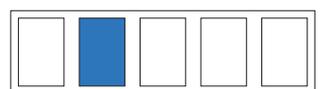
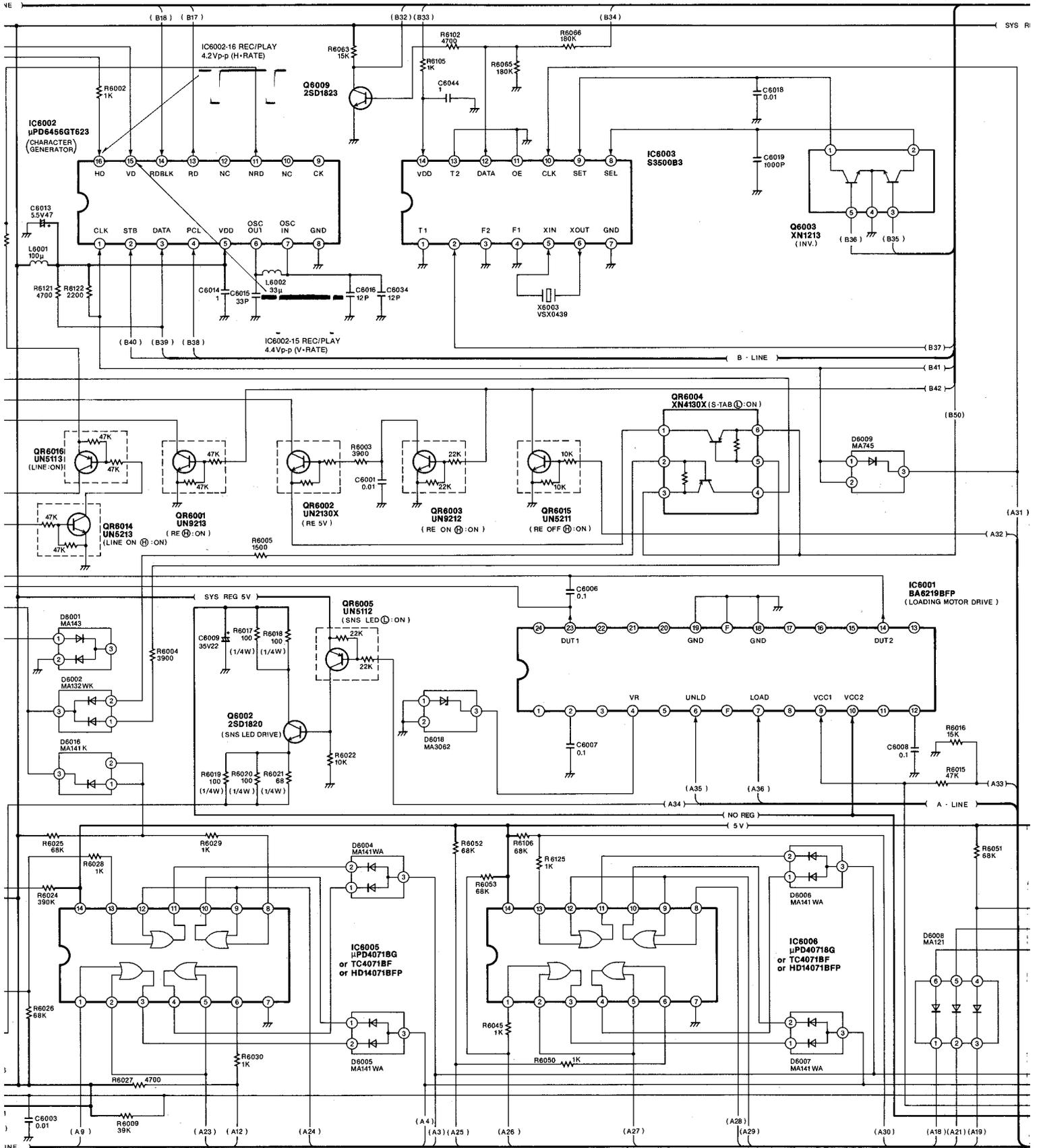
| REF. NO. | Q6002 | | | Q6003 | | | | | Q6004 | | | Q6005 | | | Q6006 | | | |
|----------|--------|------|------|--------|-----|-----|--------|-----|-------|--------|-----|-------|--------|-----|-------|--------|-----|-----|
| MODE | E | C | B | 1 | 2 | 3 | 4 | 5 | E | C | B | E | C | B | E | C | B | |
| STOP | 0 | 12.2 | 0 | 1.8 | 1.8 | 0 | 0 | 0 | 4.7 | 4.7 | 4.0 | 0 | 0.1 | 0.7 | 0 | 4.6 | 0.1 | |
| REC/PLAY | 0 | 12.1 | 0 | 1.8 | 1.8 | 0 | 0 | 0 | 4.7 | 4.7 | 4.0 | 0 | 0.1 | 0.7 | 0 | 4.7 | 0.1 | |
| F.F | 1.6 | 10.9 | 1.6 | 1.8 | 1.8 | 0 | 0 | 0 | 4.7 | 4.7 | 4.0 | 0 | 0.1 | 0.7 | 0 | 4.6 | 0.1 | |
| REF. NO. | Q6007 | | | Q6008 | | | Q6009 | | | Q6010 | | | Q6012 | | | | | |
| MODE | E | C | B | E | C | B | E | C | B | E | C | B | E | C | B | | | |
| STOP | 4.7 | 0 | 4.7 | 3.1 | 0 | 0 | | | | | | | | | | | | |
| REC/PLAY | 4.7 | 0 | 4.7 | 3.1 | 3.9 | 0 | | | | | | | | | | | | |
| F.F | 4.7 | 0 | 4.7 | 3.1 | 4.0 | 0 | | | | | | | | | | | | |
| REF. NO. | QR6001 | | | QR6002 | | | QR6003 | | | QR6004 | | | | | | QR6005 | | |
| MODE | E | C | B | E | C | B | E | C | B | 1 | 2 | 3 | 4 | 5 | 6 | E | C | B |
| STOP | 0 | 0.1 | 0 | 4.7 | 0.1 | 4.7 | 0 | 0 | 0 | 4.7 | 4.0 | 4.7 | 4.7 | 4.1 | 4.7 | 4.7 | 0 | 4.7 |
| REC/PLAY | 0 | 0 | 4.4 | 4.7 | 1.6 | 4.7 | 0 | 4.7 | 0.1 | 4.7 | 0 | 4.7 | 4.6 | 4.0 | 4.7 | 4.7 | 0 | 4.7 |
| F.F | 0 | 0 | 0 | 4.7 | 0.1 | 4.7 | 0 | 4.7 | 0 | 4.7 | 4.0 | 4.7 | 4.7 | 4.1 | 4.7 | 4.7 | 1.6 | 3.8 |
| REF. NO. | QR6006 | | | QR6007 | | | QR6008 | | | QR6010 | | | QR6011 | | | QR6012 | | |
| MODE | E | C | B | E | C | B | E | C | B | E | C | B | E | C | B | E | C | B |
| STOP | 0 | 0 | 0 | 0 | 0.1 | 4.5 | 0 | 0.1 | 4.7 | 4.7 | 4.6 | 0 | 4.7 | 0 | 4.7 | 4.7 | 0 | 4.7 |
| REC/PLAY | 0 | 4.7 | 0 | 0 | 0.1 | 4.3 | 0 | 0.1 | 4.7 | 4.7 | 4.6 | 0 | 4.7 | 0 | 0 | 4.7 | 4.7 | 0 |
| F.F | 0 | 4.7 | 0 | 0 | 0.1 | 4.3 | 0 | 0.1 | 4.7 | 4.7 | 4.6 | 0 | 4.7 | 0 | 4.7 | 4.7 | 0 | 4.7 |
| REF. NO. | QR6013 | | | QR6014 | | | QR6015 | | | QR6016 | | | QR6017 | | | QR6018 | | |
| MODE | E | C | B | E | C | B | E | C | B | E | C | B | E | C | B | E | C | B |
| STOP | 0 | 0 | 12.6 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | |
| REC/PLAY | 0 | 0 | 12.5 | 0 | 0 | 4.7 | 0 | 0 | 4.7 | | | | | | | | | |
| F.F | 0 | 0 | 12.4 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | | |

3-16. SYSTEM CONTROL & SERVO SCHEMATIC DIAGRAM



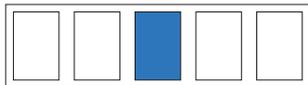
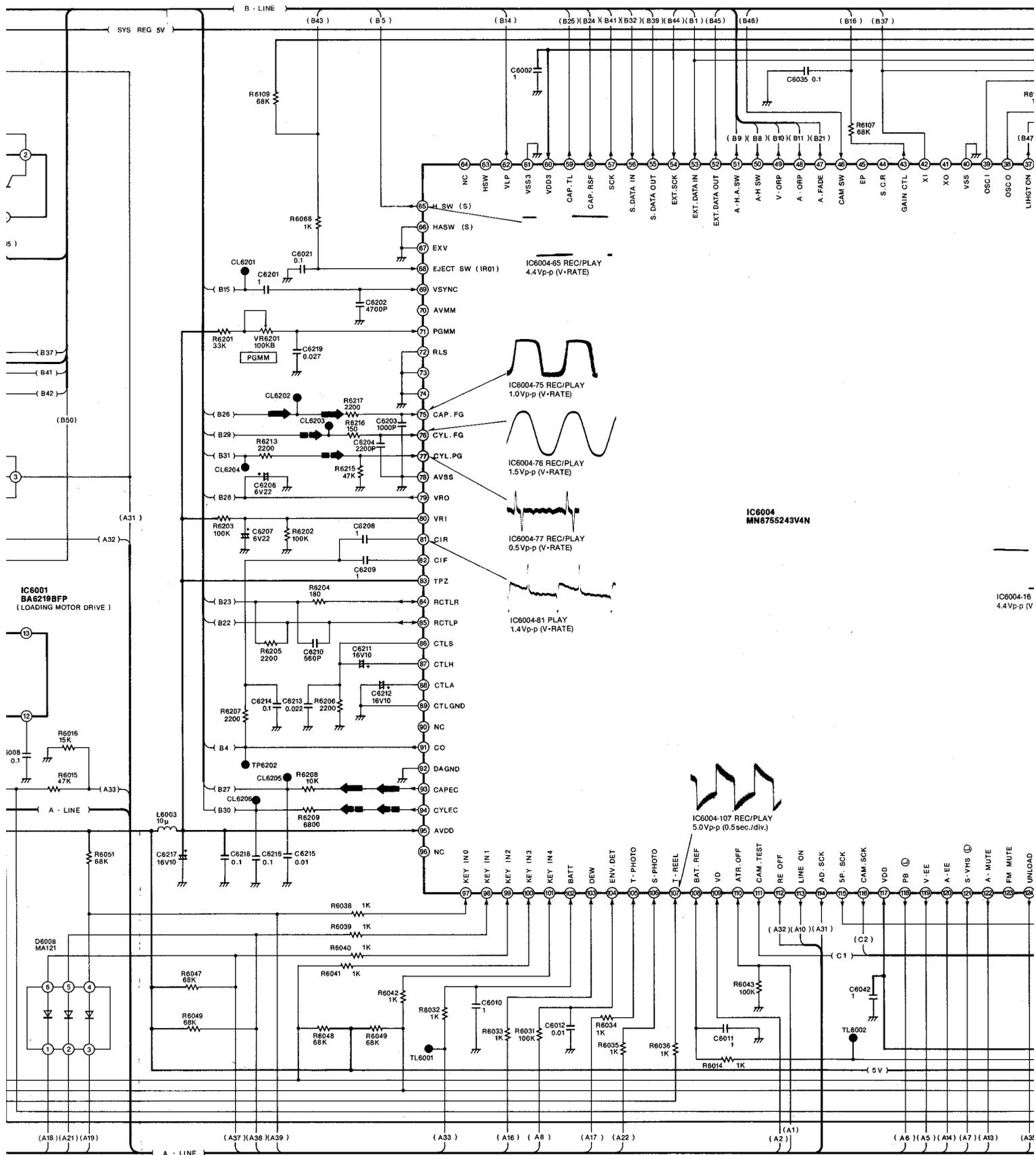
← CAPSTAN SERVO SPEED LOOP

← CAPSTAN SERVO PHA

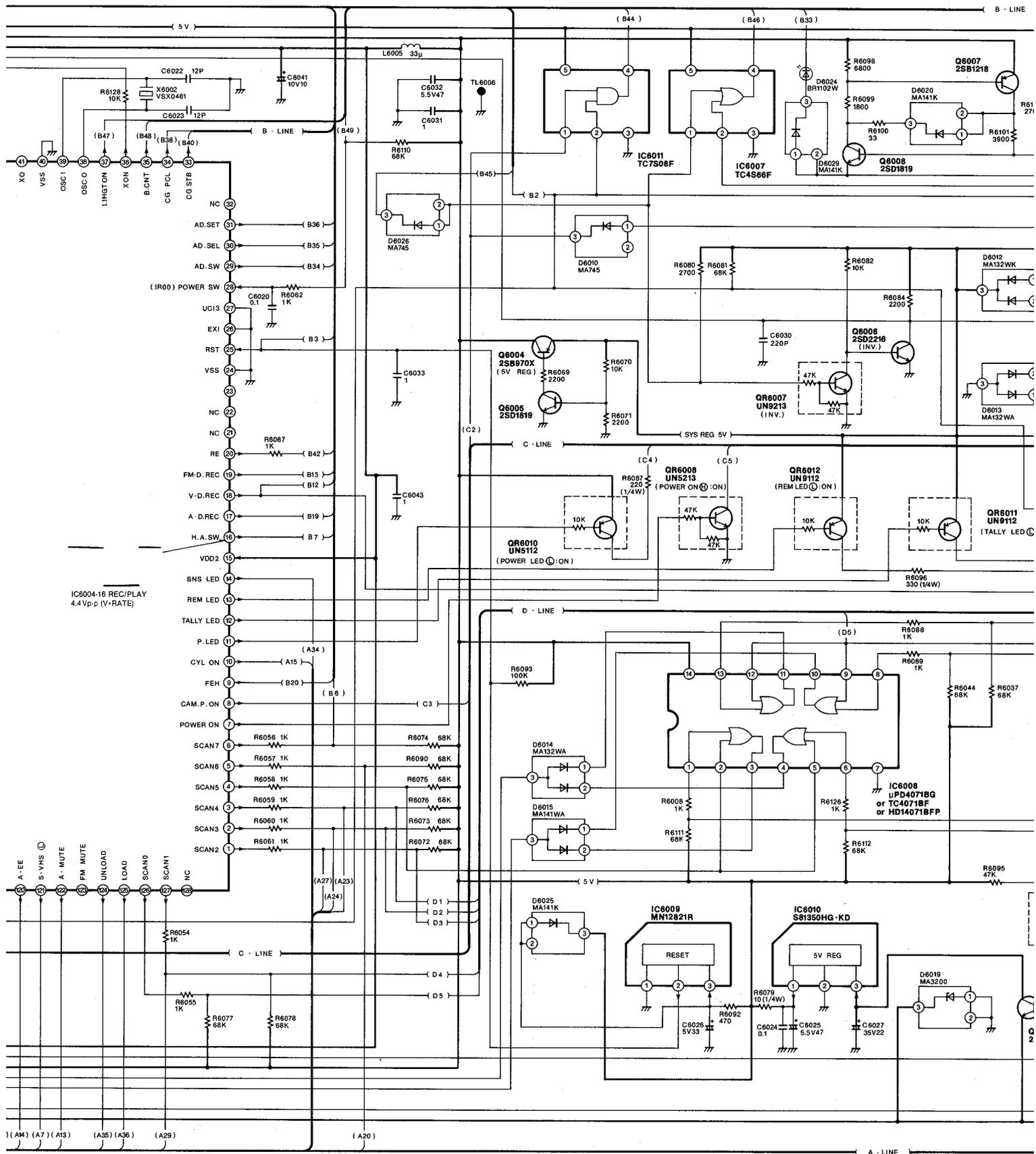


1 SERVO PHASE LOOP

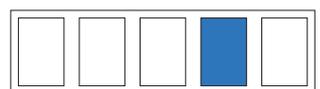
← CYLINDER SERVO SPEED LOOP →

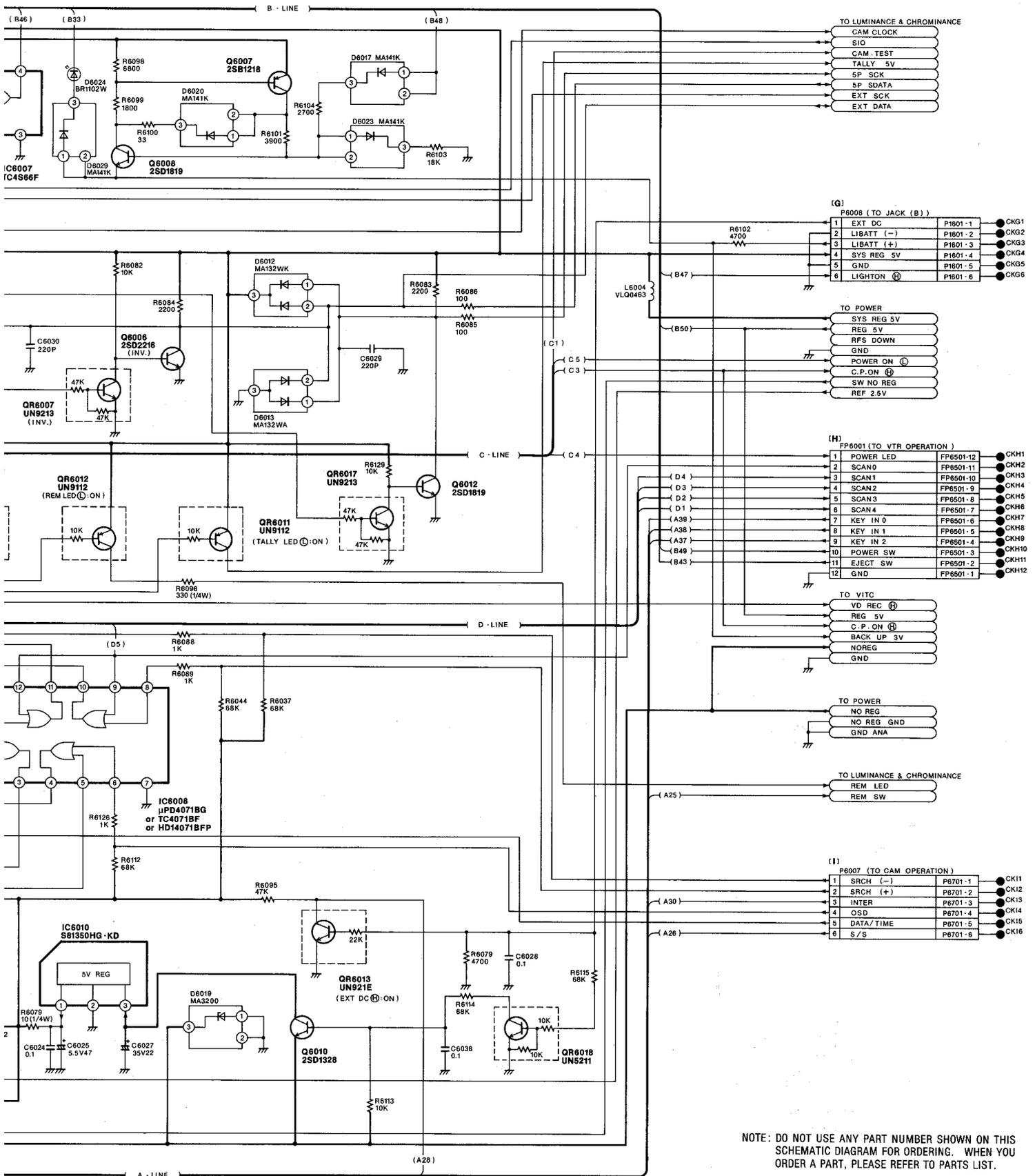


CYLINDER SERVO PHASE LOOP



17 18 19 20 21 22 23





NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

22

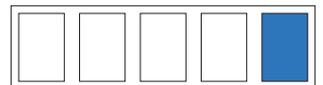
23

24

25

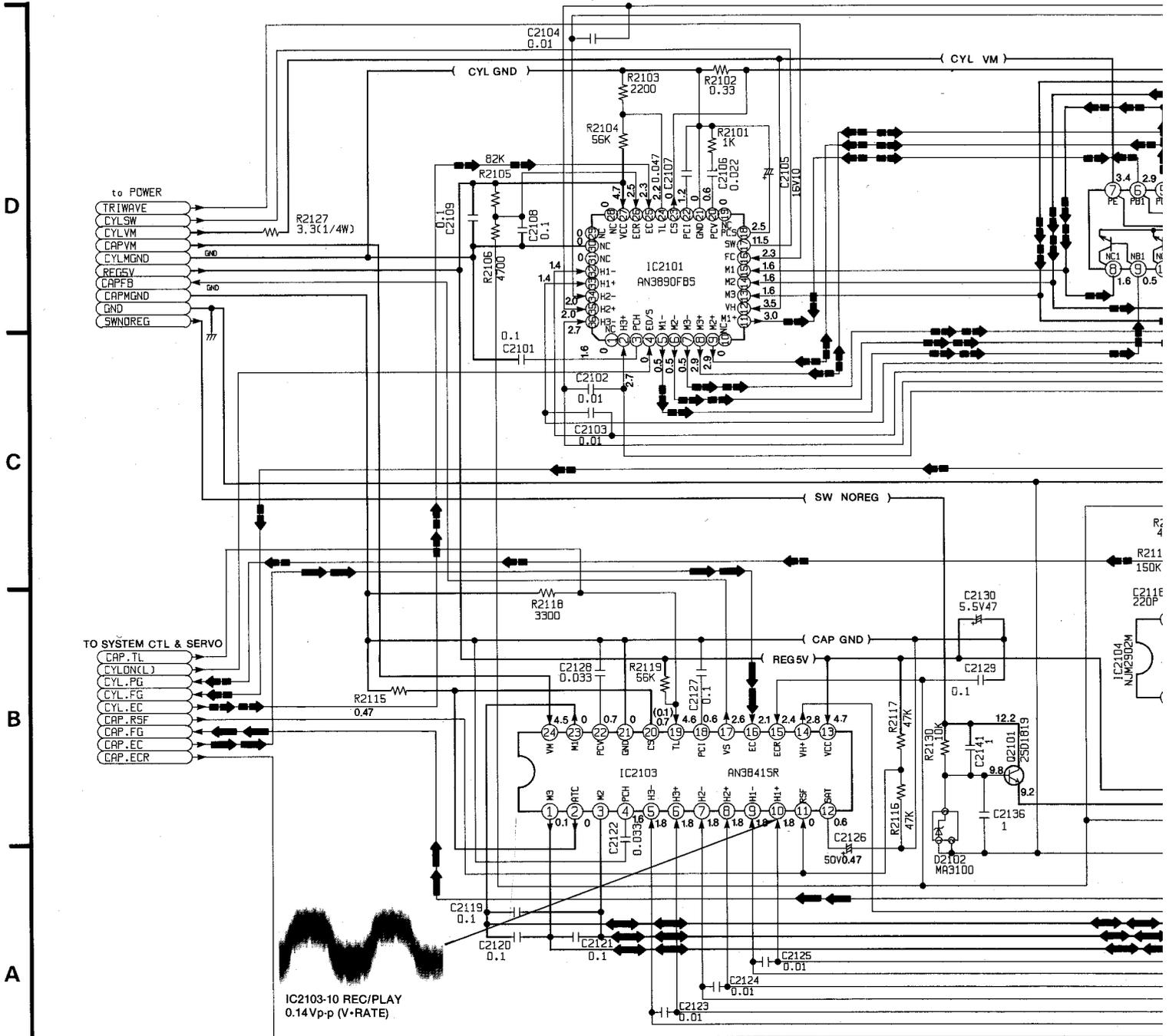
26

27



3-17. SUB SERVO SCHEMATIC DIAGRAM

- ← CAPSTAN SE
- ← CAPSTAN SE
- ← CYLINDER S
- ← CYLINDER S



NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

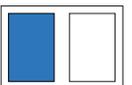
NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS (THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS

1

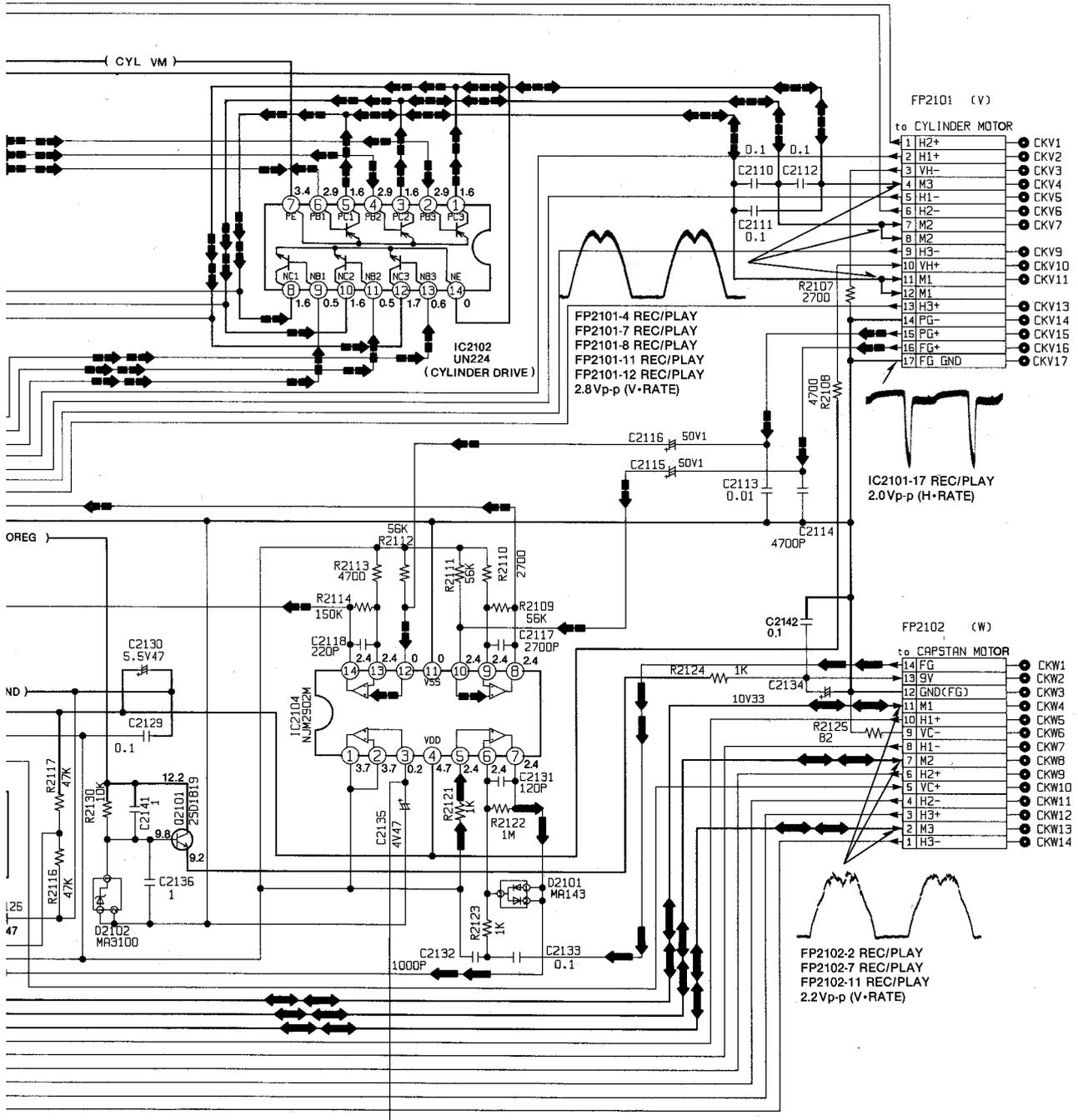
2

3

4



- ← CAPSTAN SERVO SPEED LOOP
- ← CAPSTAN SERVO PHASE LOOP
- ← CYLINDER SERVO SPEED LOOP
- ← CYLINDER SERVO PHASE LOOP



MODE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS RECORD MODE.
 MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE.

4 | 5 | 6 | 7

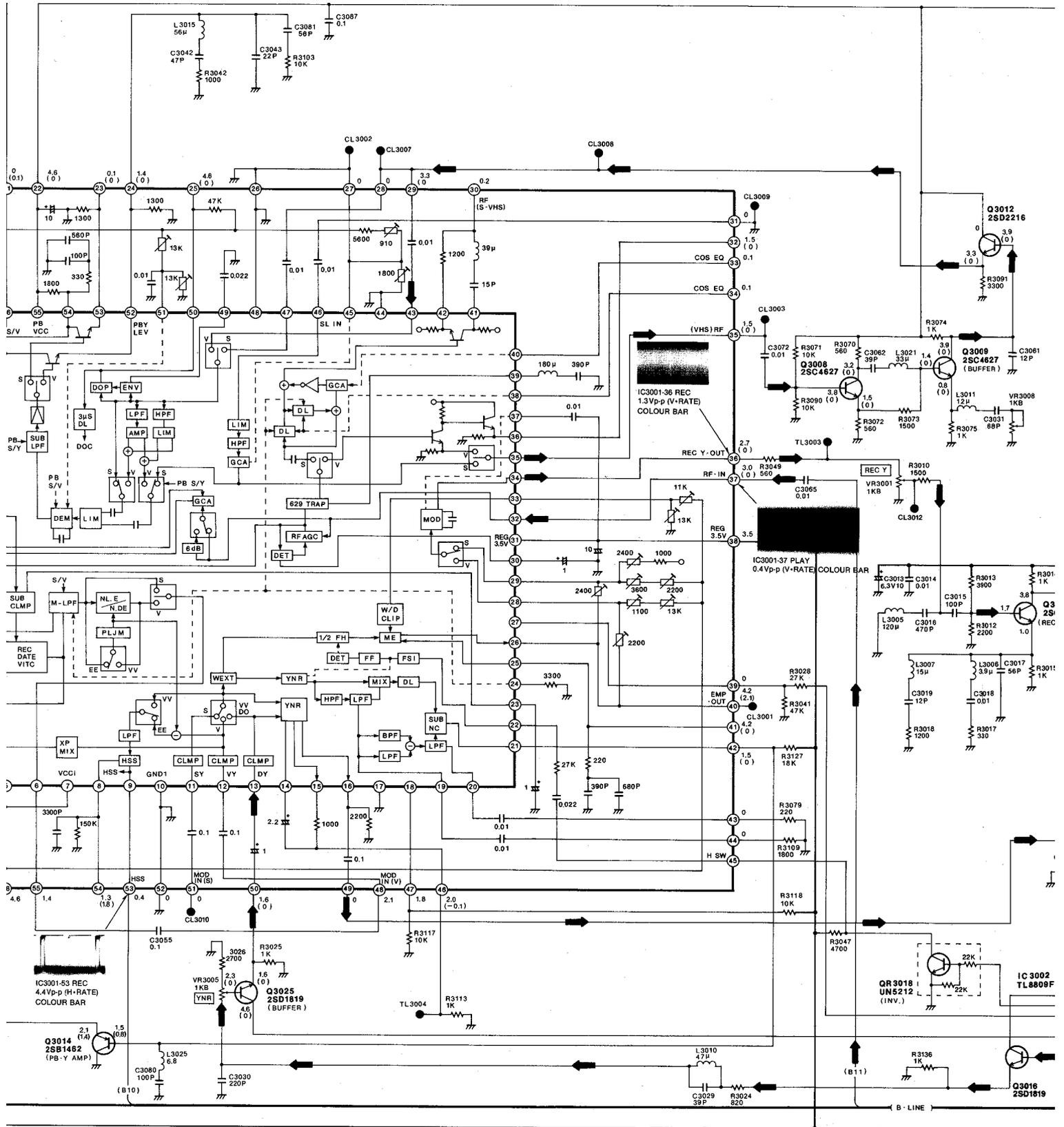


C DIAGRAM

MAIN SIGNAL PATH IN REC MODE

MA

(A-LINE)



7

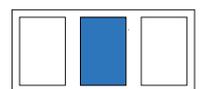
8

9

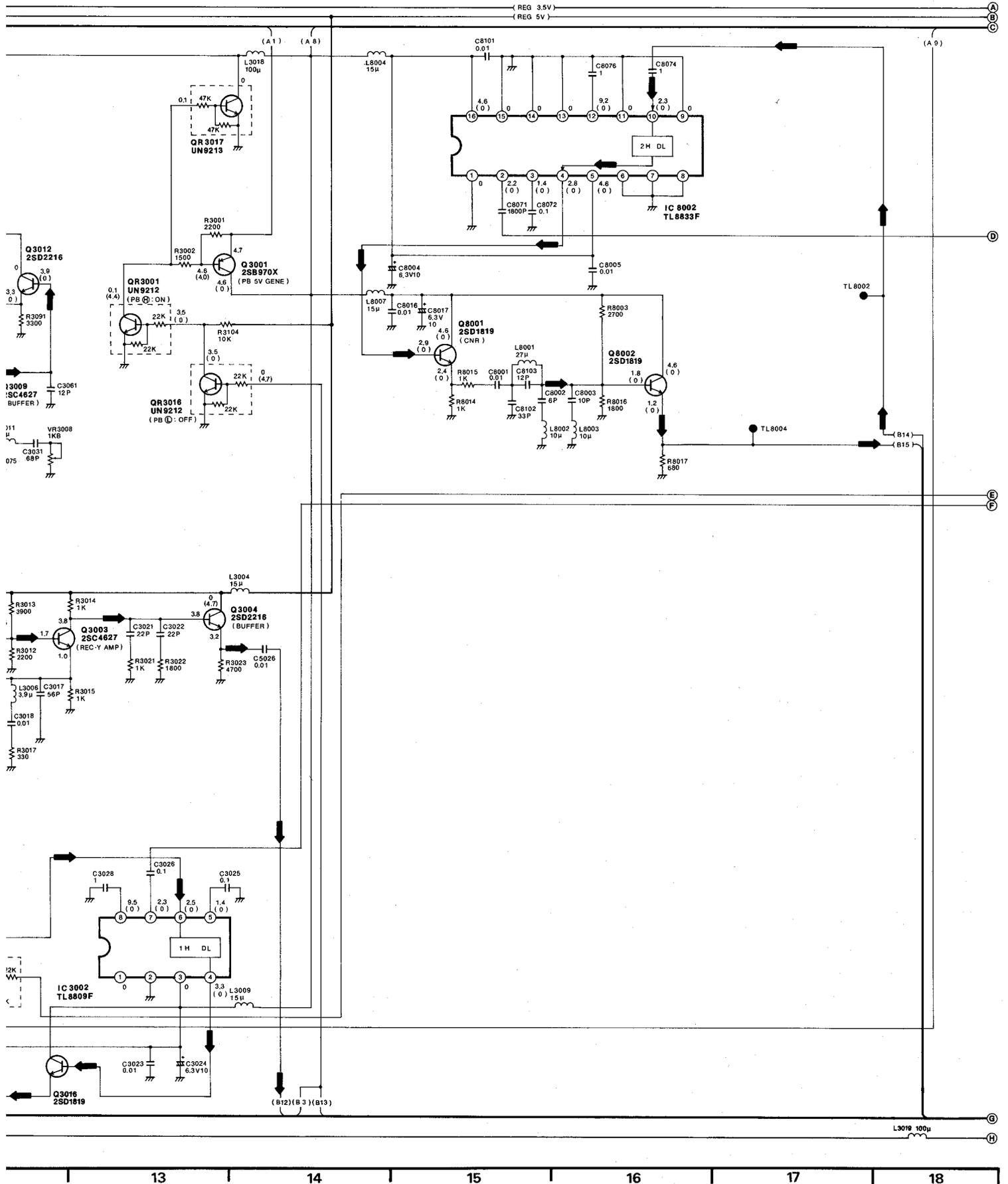
10

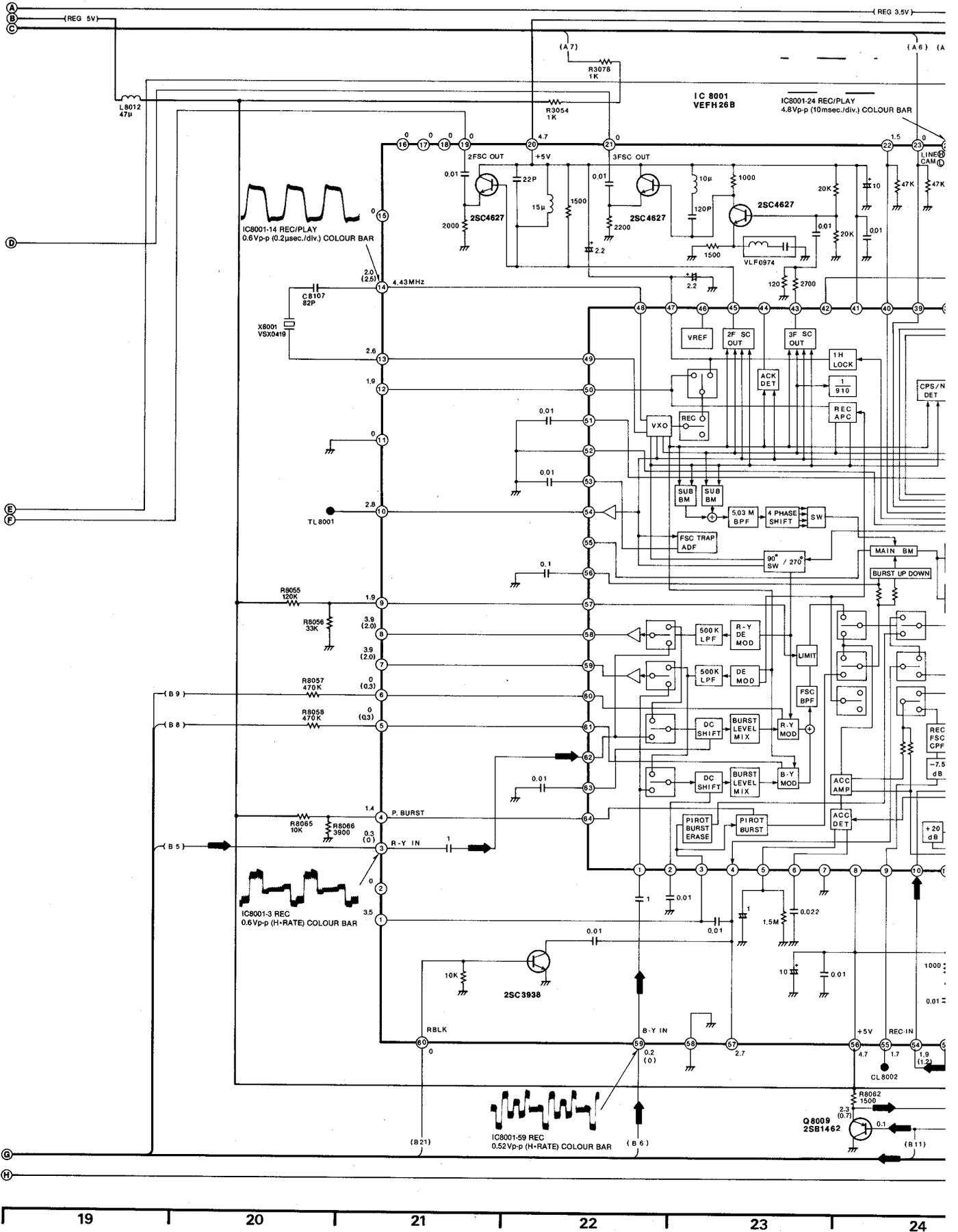
11

12

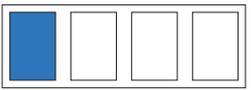


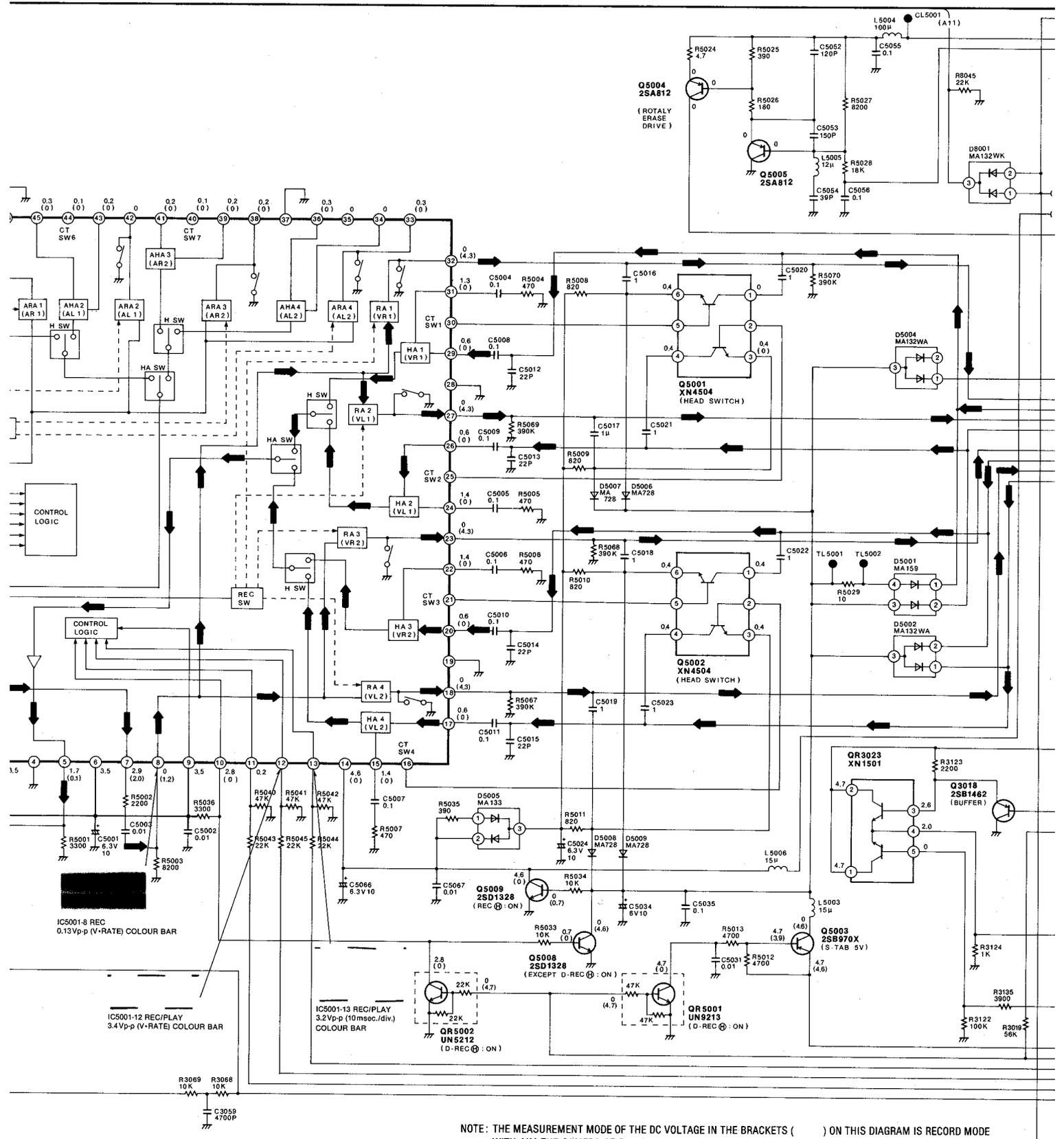
MAIN SIGNAL PATH IN PLAYBACK MODE





19 | 20 | 21 | 22 | 23 | 24





NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS RECORD MODE WITH AIM THE CAMERA AT THE COLOUR CHART. THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH PAL COLOUR SIGNAL.

30

31

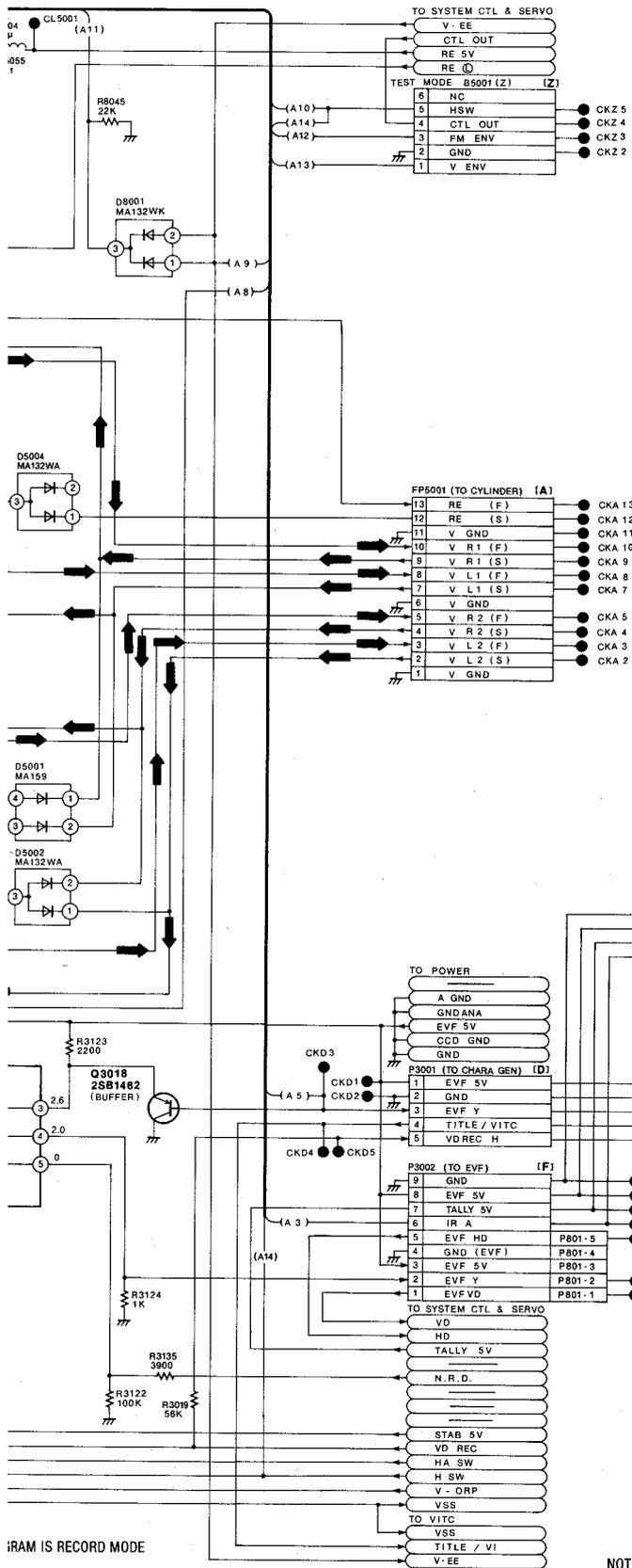
32

33

34

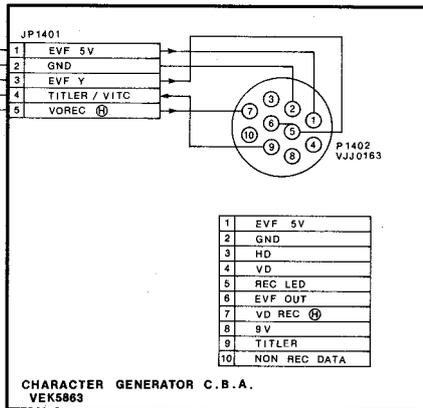
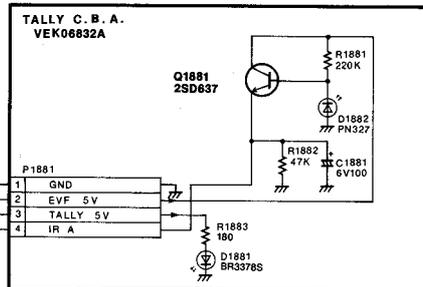
35





IRAM IS RECORD MODE
 M IS PLAYBACK MODE

NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.



G
F
E
D
C
B
A

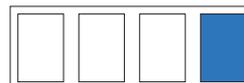
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36

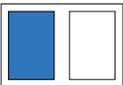
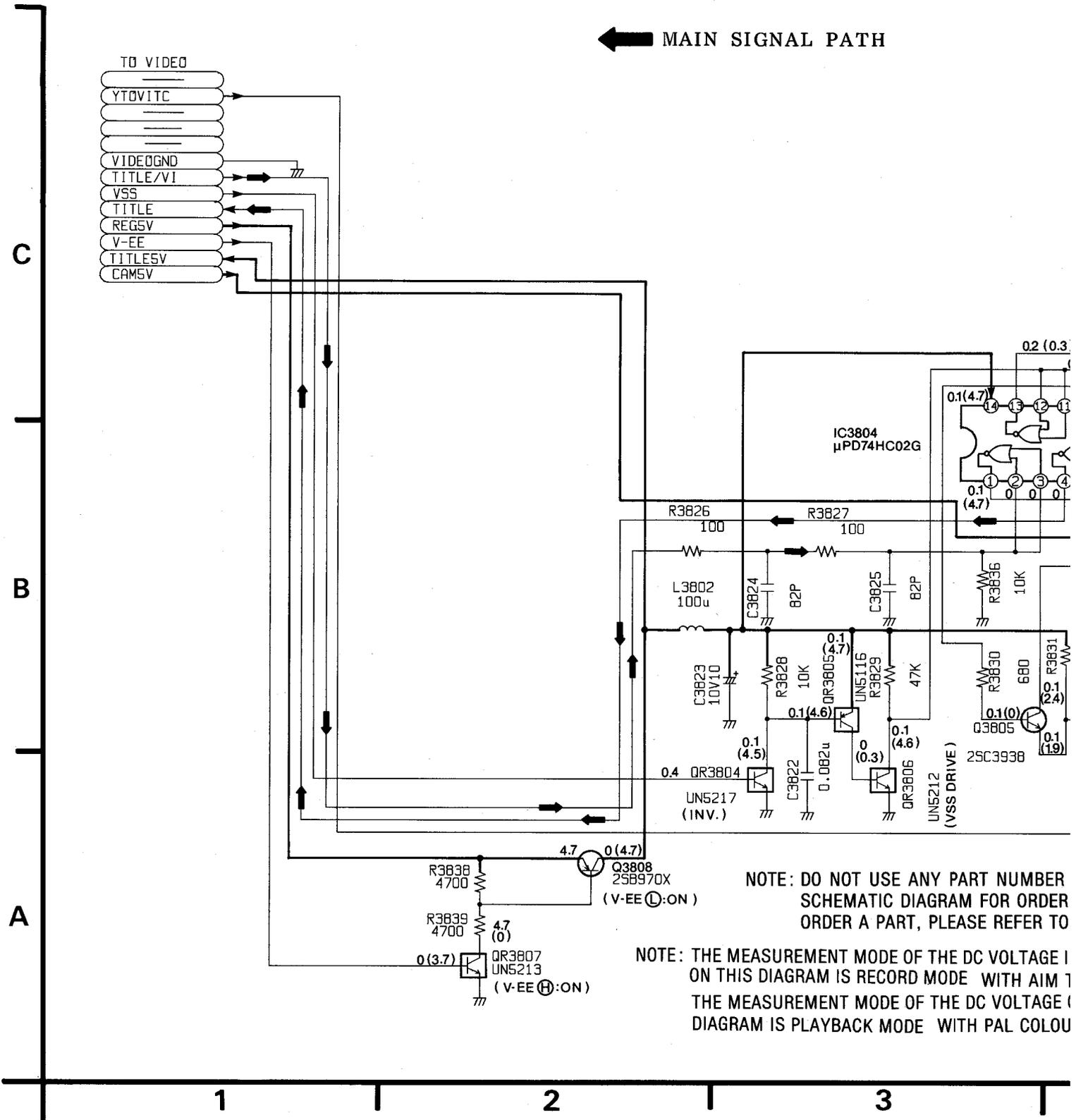
37

38

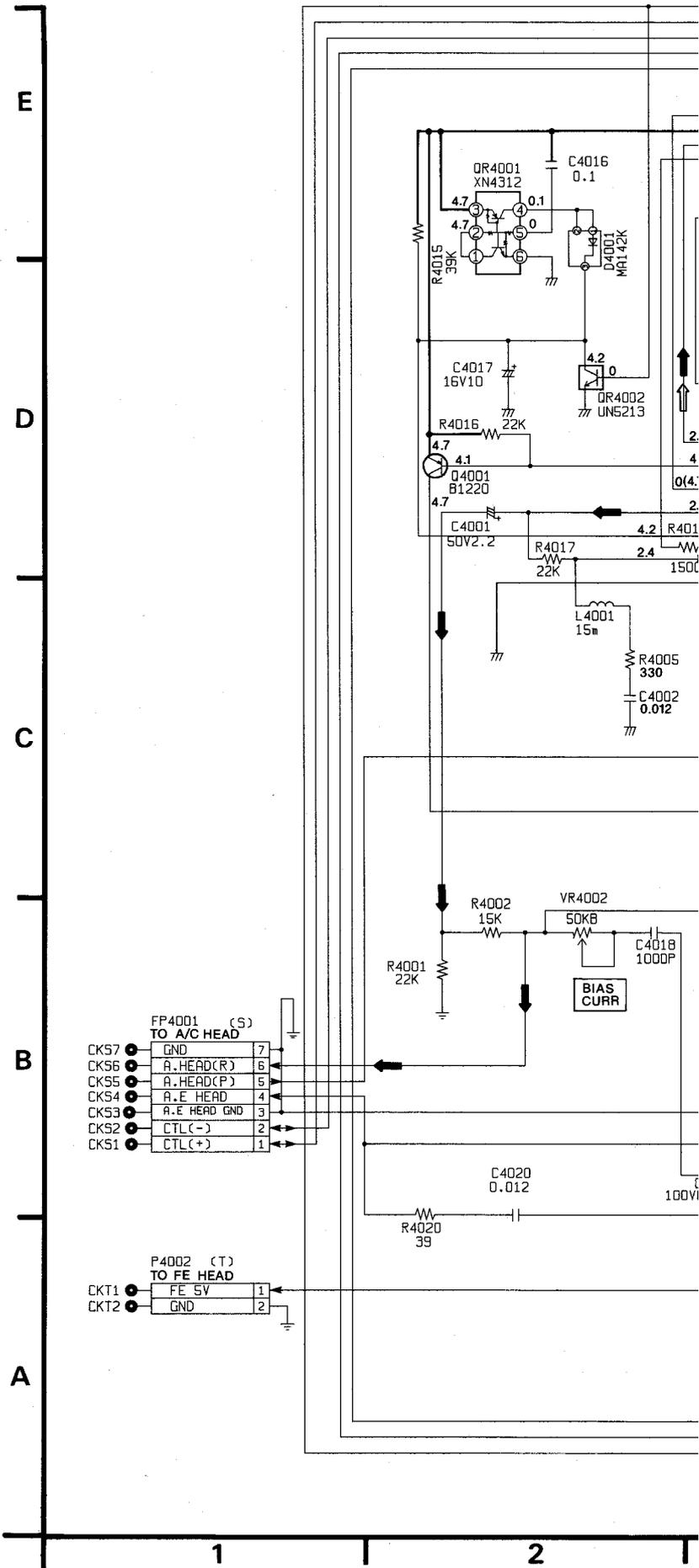
39



3-19. VITC SCHEMATIC DIAGRAM

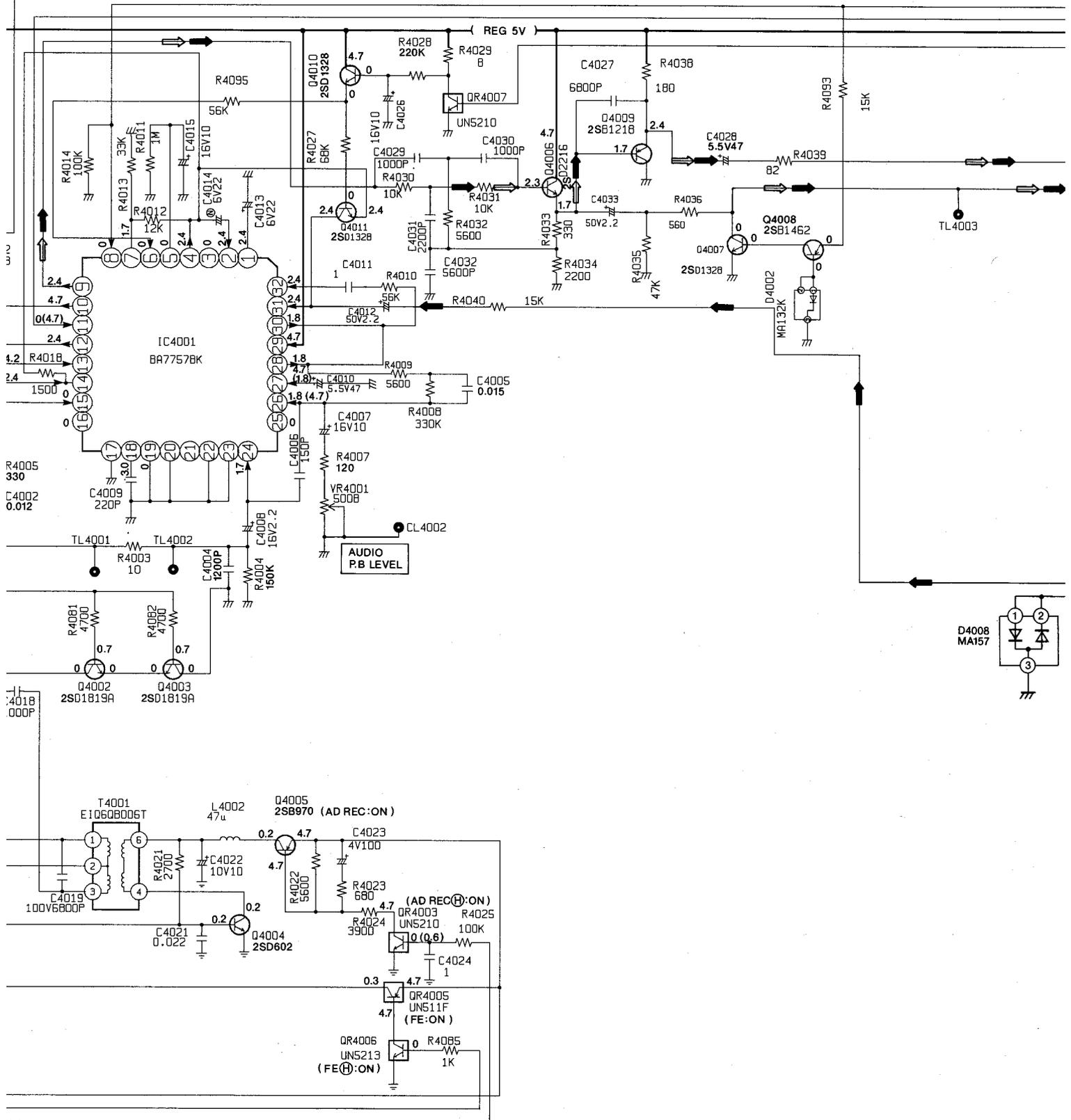


3-20. AUDIO SCHEMATIC DIAGRAM



← MAIN SIGNAL PATH IN REC MODE

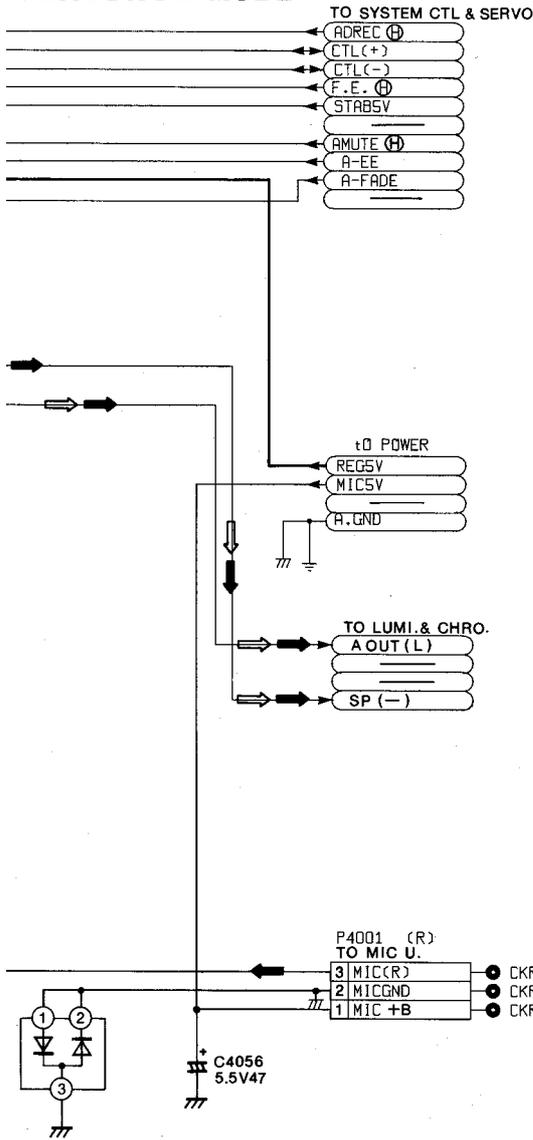
← MAIN SIGNAL PATH IN PLAY MODE



NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS () ON THE SCHEMATIC IS THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS SCHEMATIC.

PLAYBACK MODE



MAIN C.B.A. ADDRESS INFORMATION

| POWER Section | |
|----------------------------------|------|
| Transistor | |
| Q1001 | G-14 |
| Q1002 | E-13 |
| Q1003 | G-15 |
| Q1004 | G-14 |
| Q1005 | F-13 |
| Q1006 | E-16 |
| Q1061 | G-15 |
| Q1062 | G-16 |
| Transistor & Resistor | |
| QR1002 | F-14 |
| QR1006 | F-14 |
| QR1061 | E-15 |
| Integrated Circuit | |
| IC1001 | F-15 |
| IC1102 | E-16 |
| Test Point | |
| CL1007 | G-9 |
| CL1008 | G-9 |
| CL1009 | G-10 |
| TL1001 | E-9 |
| TL1002 | E-9 |
| TL1003 | E-10 |
| TL1004 | E-10 |
| TL1005 | E-10 |
| TL1006 | E-10 |
| Adjustment | |
| VR1001 | F-9 |
| VR1002 | F-9 |
| VR1003 | E-8 |
| Connector | |
| P1001 | G-11 |

ADDRESS INFORMATION

| AUDIO Section | |
|----------------------------------|------|
| Transistor | |
| Q4001 | B-15 |
| Q4002 | A-16 |
| Q4003 | A-16 |
| Q4004 | A-15 |
| Q4005 | A-15 |
| Q4006 | B-15 |
| Q4007 | B-8 |
| Q4008 | B-15 |
| Q4009 | B-15 |
| Q4010 | B-16 |
| Q4011 | B-16 |
| Transistor & Resistor | |
| QR4001 | B-15 |
| QR4002 | B-15 |
| QR4003 | A-16 |
| QR4005 | A-16 |
| QR4006 | A-16 |
| QR4007 | B-8 |
| Integrated Circuit | |
| IC4001 | B-16 |
| Test Point | |
| CL4001 | B-8 |
| CL4002 | B-8 |
| TL4001 | B-8 |
| TL4002 | A-7 |
| TL4003 | B-7 |
| Adjustment | |
| VR4001 | B-8 |
| VR4002 | B-8 |
| Connector | |
| FP4001 | A-8 |
| P4001 | G-6 |
| P4002 | C-1 |

ADDRESS INFORMATION

| LUMINANCE/CHROMINANCE & HEAD AMP Section | | | |
|--|------|-------------------|------|
| Transistor | | Test Point | |
| Q3001 | D-22 | CL3001 | E-3 |
| Q3008 | E-21 | CL3002 | E-3 |
| Q3009 | E-21 | CL3003 | E-3 |
| Q3011 | G-22 | CL3004 | E-4 |
| Q3012 | E-21 | CL3005 | E-4 |
| Q3014 | D-21 | CL3006 | E-4 |
| Q3016 | F-22 | CL3007 | E-3 |
| Q3018 | D-20 | CL3008 | E-3 |
| Q3022 | C-2 | CL3009 | E-2 |
| Q3025 | F-2 | CL3010 | D-3 |
| Q3026 | D-20 | CL3011 | D-4 |
| Q3027 | E-20 | CL3012 | E-3 |
| Q5001 | B-20 | CL5001 | B-4 |
| Q5002 | A-21 | CL8001 | E-5 |
| Q5003 | B-20 | CL8002 | F-6 |
| Q5004 | A-4 | CL8003 | E-5 |
| Q5005 | A-5 | CL8004 | F-6 |
| Q5008 | B-19 | TL3001 | C-5 |
| Q5009 | A-20 | TL3003 | E-2 |
| Q8001 | F-5 | TL3004 | D-3 |
| Q8002 | E-6 | TL5001 | A-3 |
| Q8009 | F-18 | TL5002 | A-3 |
| Q8013 | E-6 | TL5003 | A-3 |
| Q8014 | E-18 | TL5004 | D-8 |
| Transistor & Resistor | | Adjustment | |
| QR3001 | D-22 | VR3001 | D-2 |
| QR3009 | E-20 | VR3005 | F-2 |
| QR3016 | D-22 | VR3008 | E-2 |
| QR3023 | F-4 | VR8001 | E-5 |
| QR3024 | C-2 | | |
| QR5001 | C-19 | | |
| QR5002 | B-3 | | |
| QR5004 | C-21 | | |
| QR8101 | E-19 | | |
| Integrated Circuit | | Connector | |
| IC3001 | E-3 | B3001 | E-22 |
| IC3002 | F-21 | B5001 | C-4 |
| IC5001 | B-3 | FP3001 | B-6 |
| IC8001 | E-5 | FP5001 | A-3 |
| IC8002 | F-19 | P3001 | G-2 |
| | | P3002 | G-4 |
| | | P3004 | G-3 |

ADDRESS INFORMATION

| SUB SERVO Section | |
|---------------------------|------|
| Transistor | |
| Q2101 | B-11 |
| Integrated Circuit | |
| IC2101 | B-14 |
| IC2102 | A-14 |
| IC2103 | B-13 |
| IC2104 | B-13 |
| Test Point | |
| CL2101 | B-9 |
| Connector | |
| FP2101 | A-9 |
| FP2102 | A-11 |

ADDRESS INFORMATION

| VITC Section | |
|----------------------------------|------|
| Transistor | |
| Q3805 | B-2 |
| Q3806 | A-2 |
| Q3807 | B-2 |
| Q3808 | C-22 |
| Transistor & Resistor | |
| QR3804 | C-21 |
| QR3805 | B-21 |
| QR3806 | B-2 |
| QR3807 | C-22 |
| Test Point | |
| CL3801 | A-1 |
| Integrated Circuit | |
| IC3804 | A-2 |
| Adjustment | |
| VR3802 | A-2 |

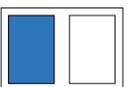
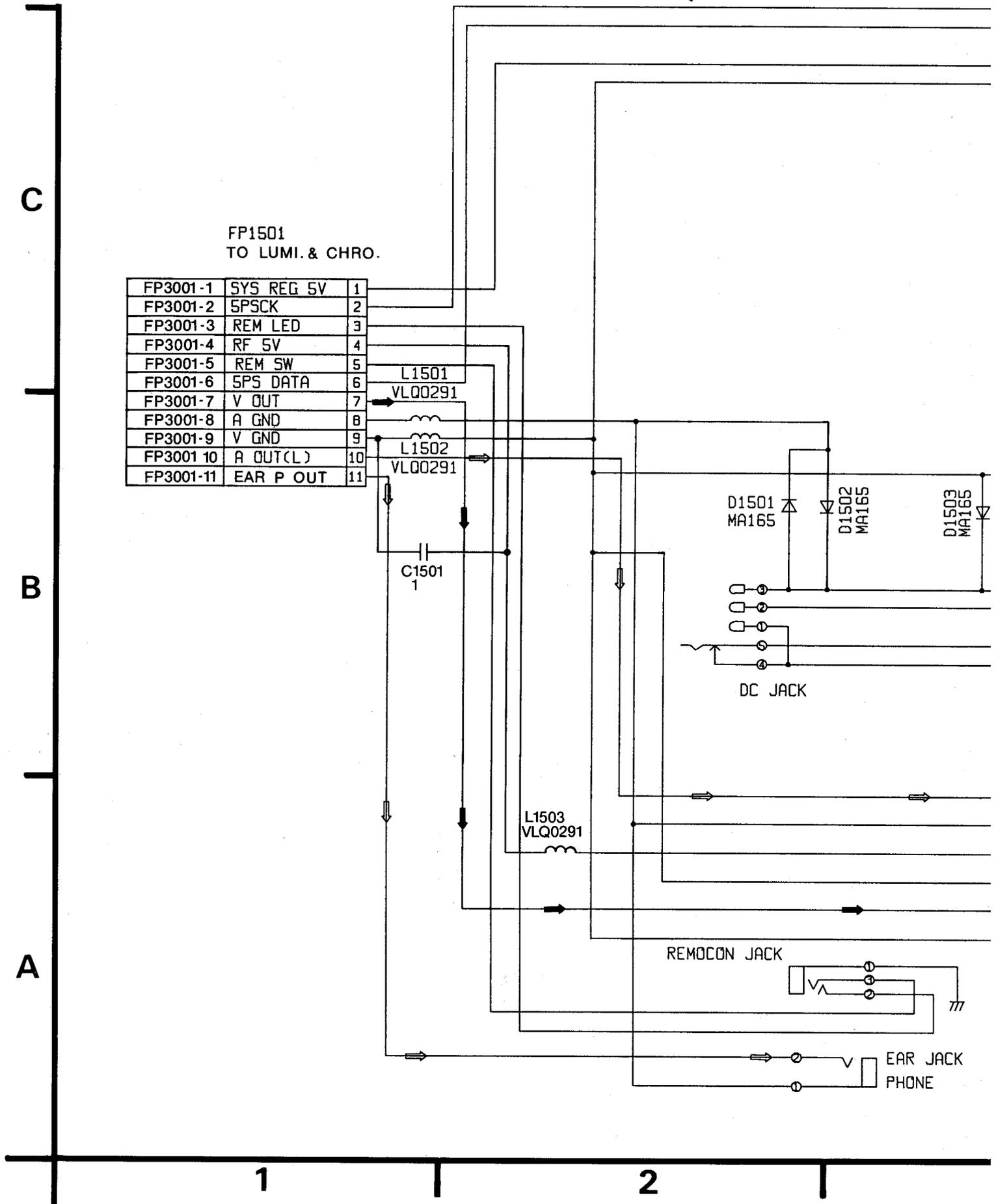
ADDRESS INFORMATION

() ON THIS DIAGRAM IS RECORD MODE
KETS ON THIS DIAGRAM IS PLAYBACK MODE



3-22. AV JACK (A) SCHEMATIC DIAGRAM

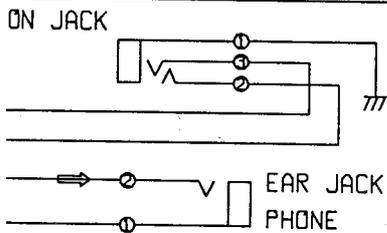
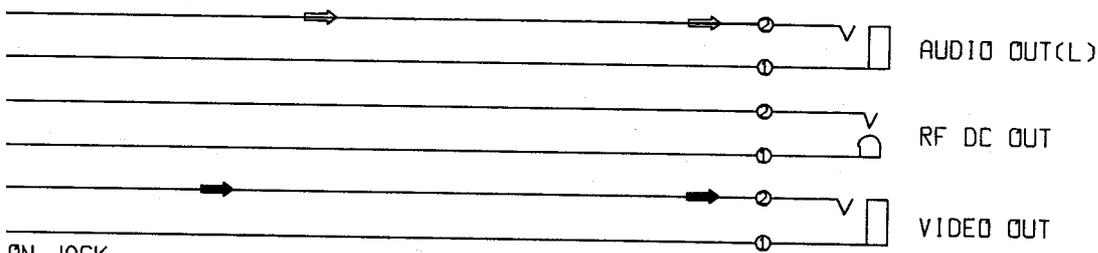
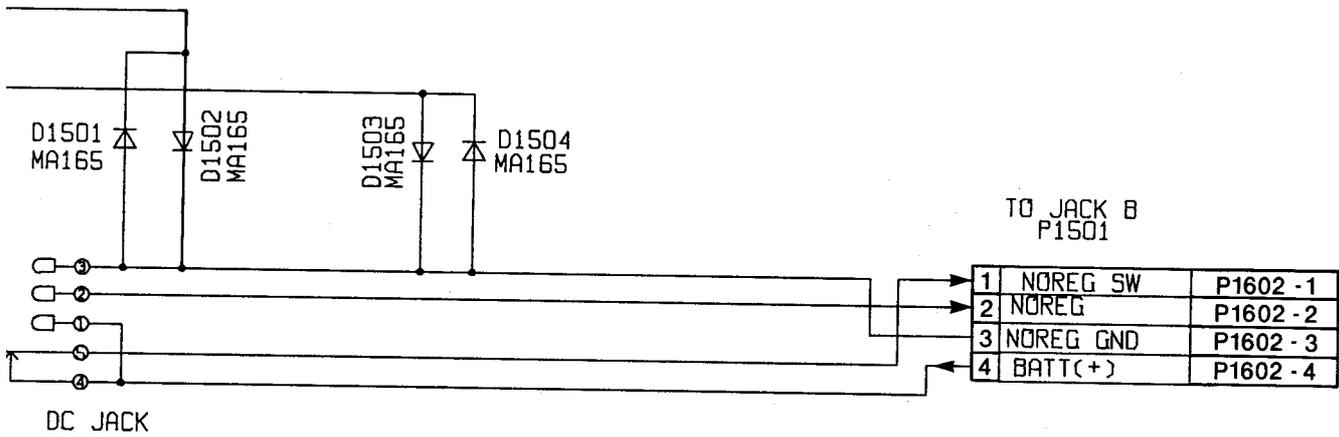
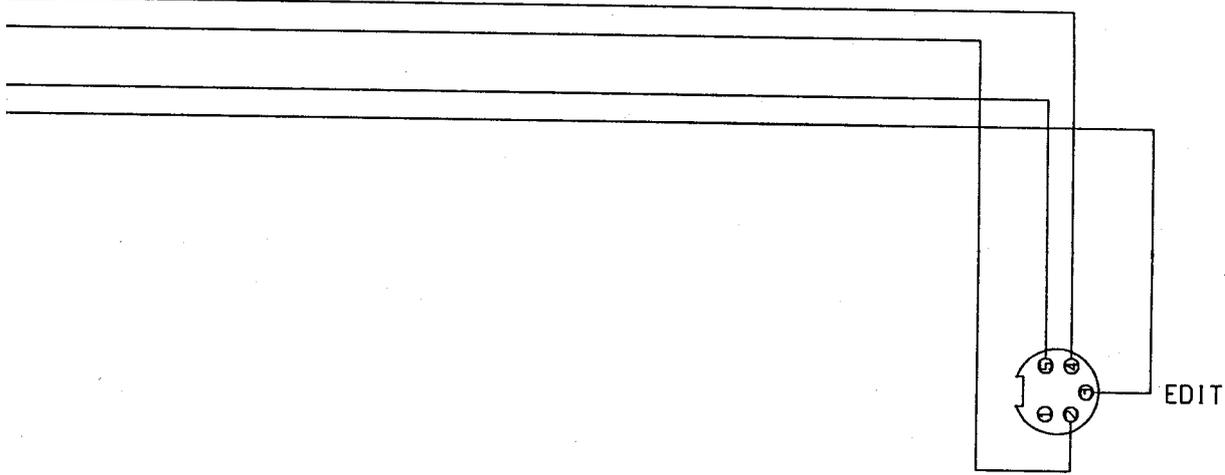
← VIDEO SIGNAL PATH



■ VIDEO SIGNAL PATH

← AUDIO SIGNAL PATH

AV JACK (A) Section



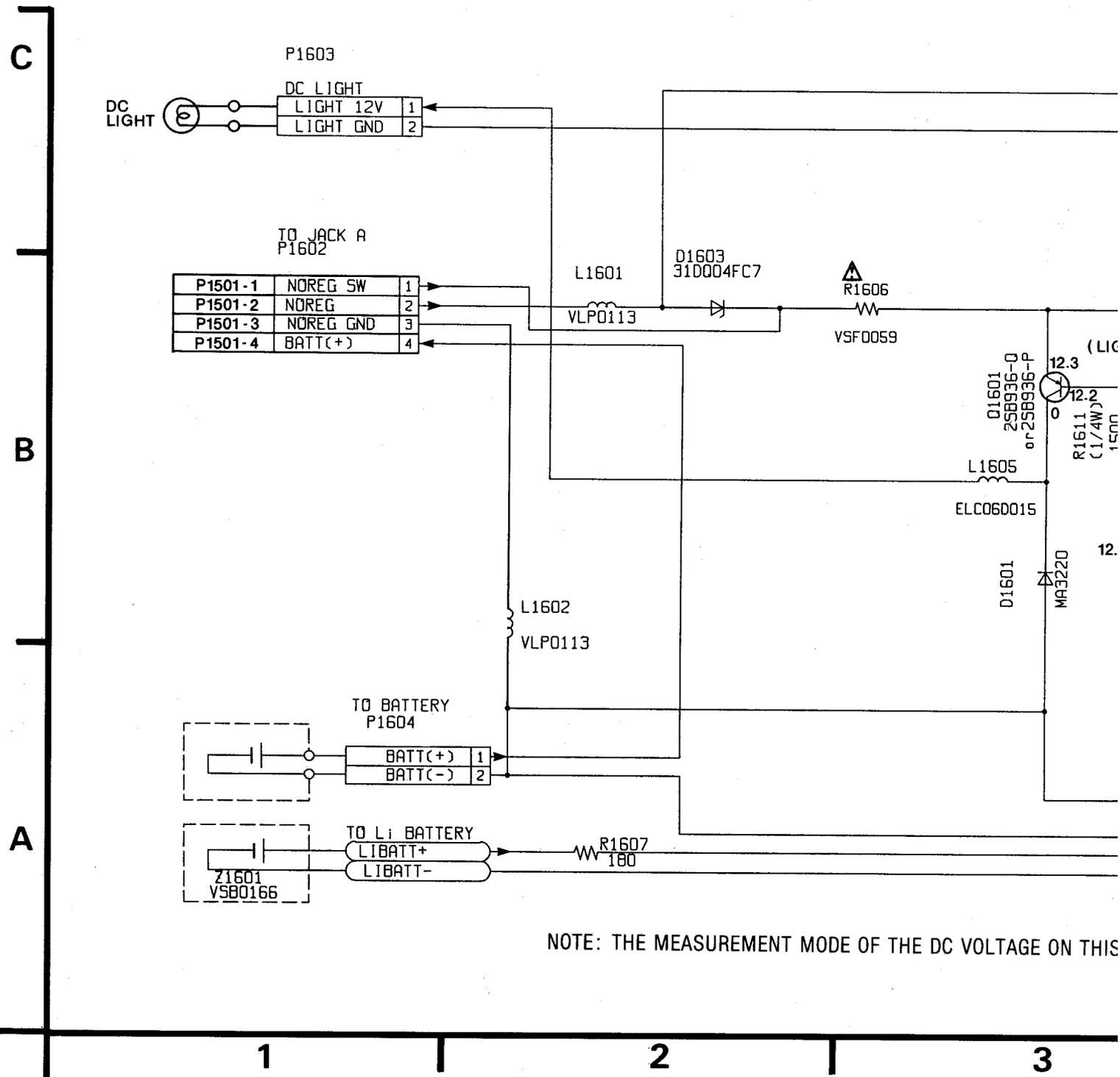
NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

3

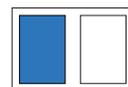
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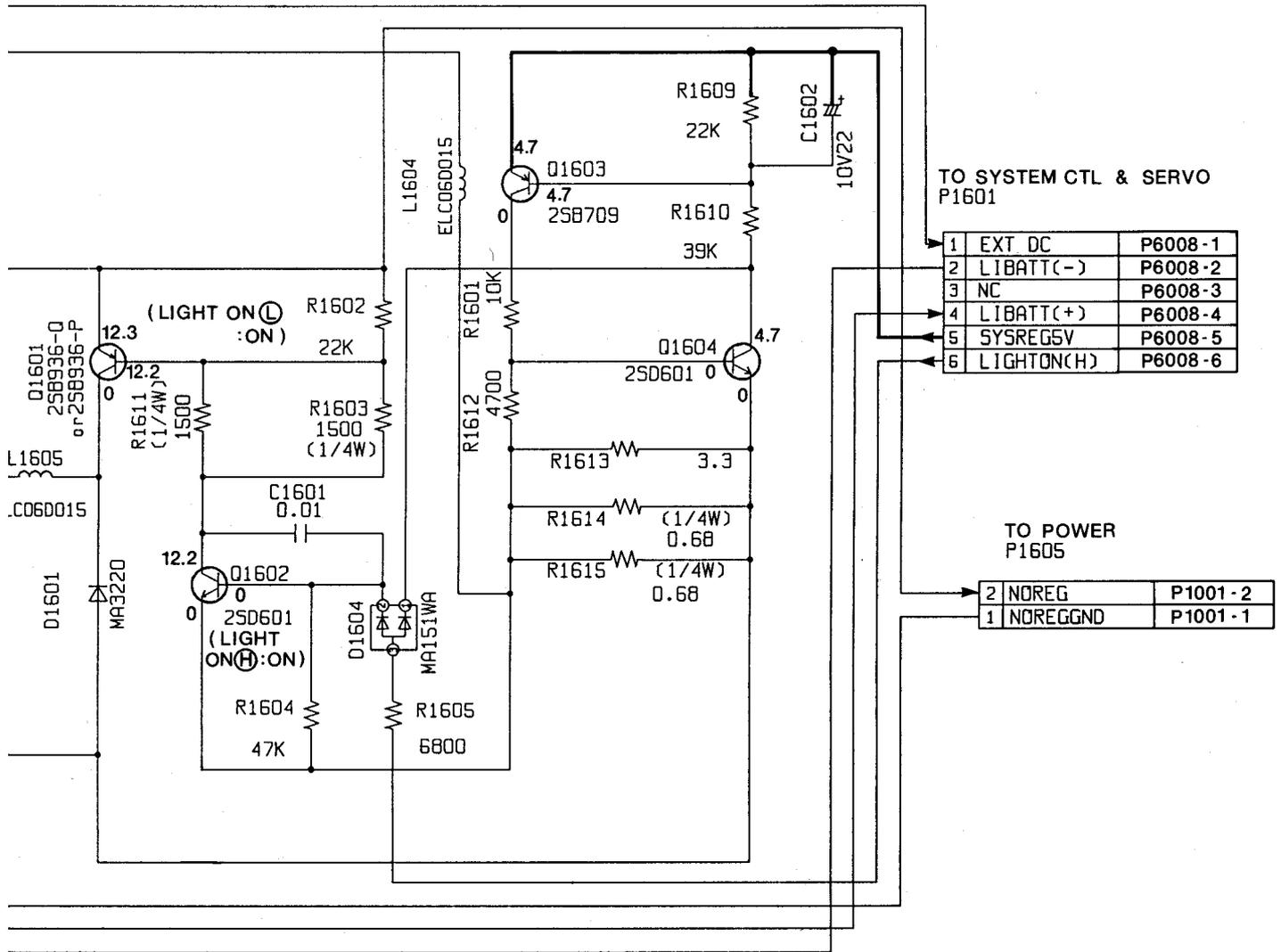


3-24. AV JACK (B) SCHEMATIC DIAGRAM



NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS





VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

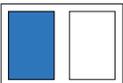
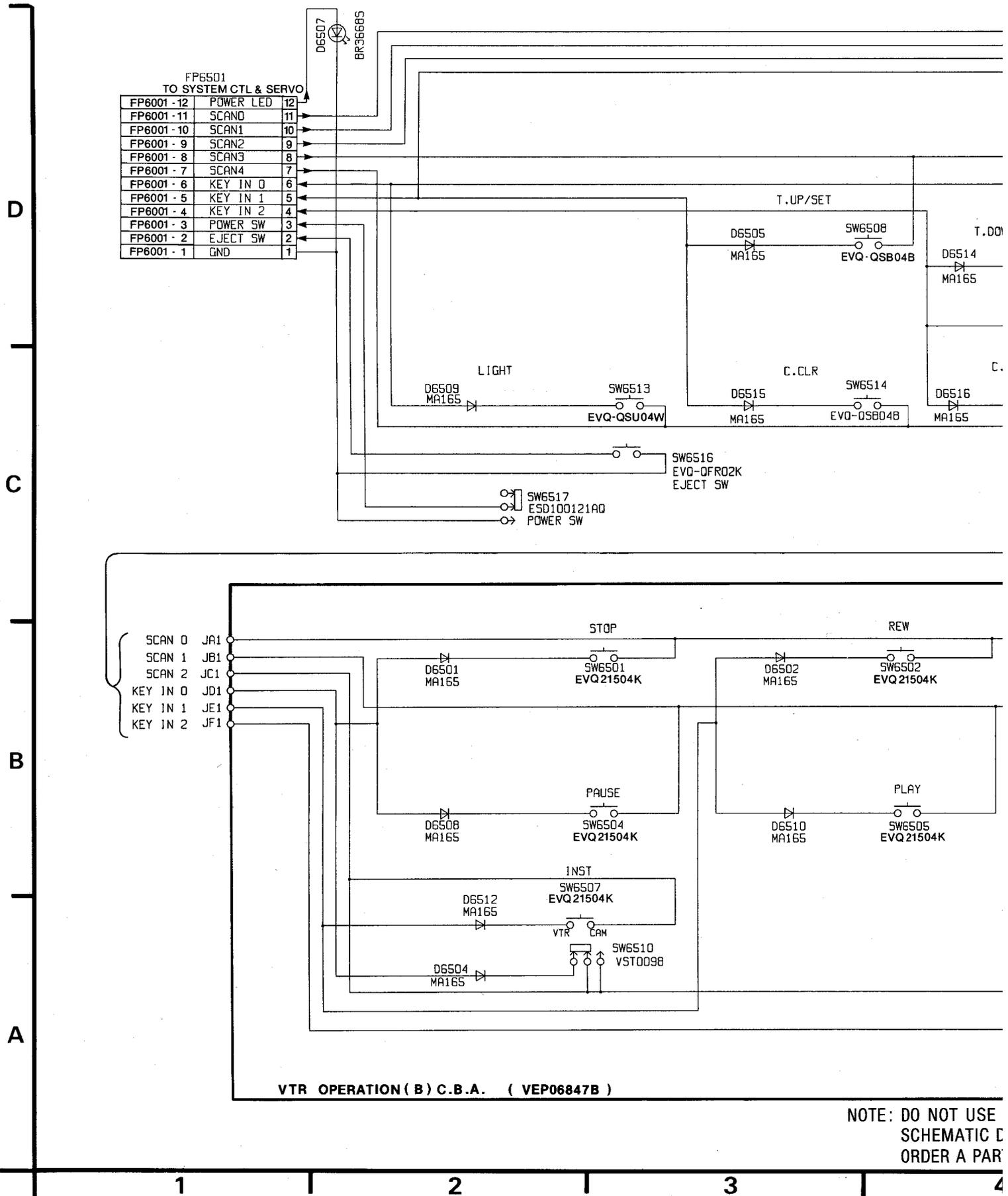
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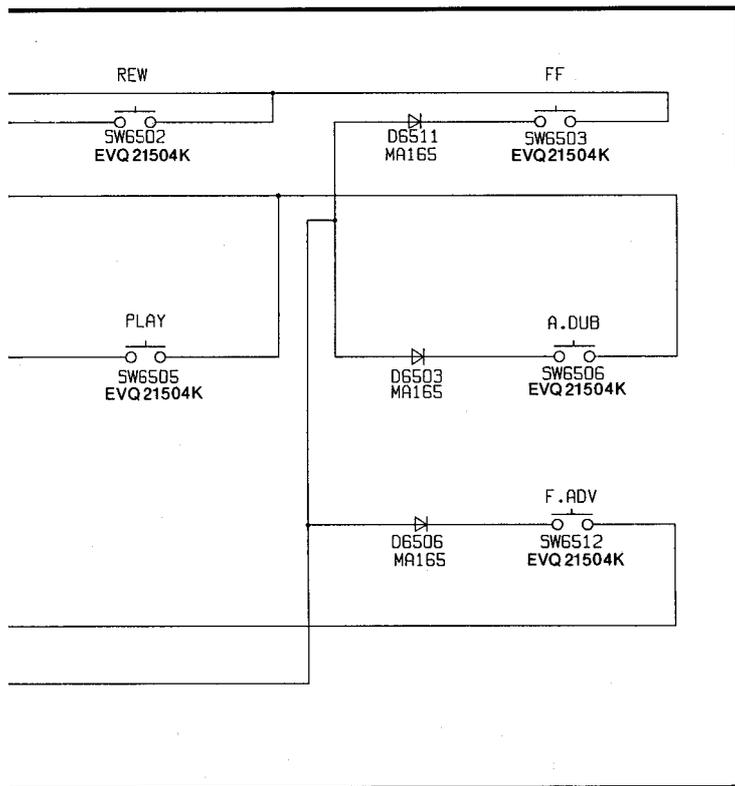
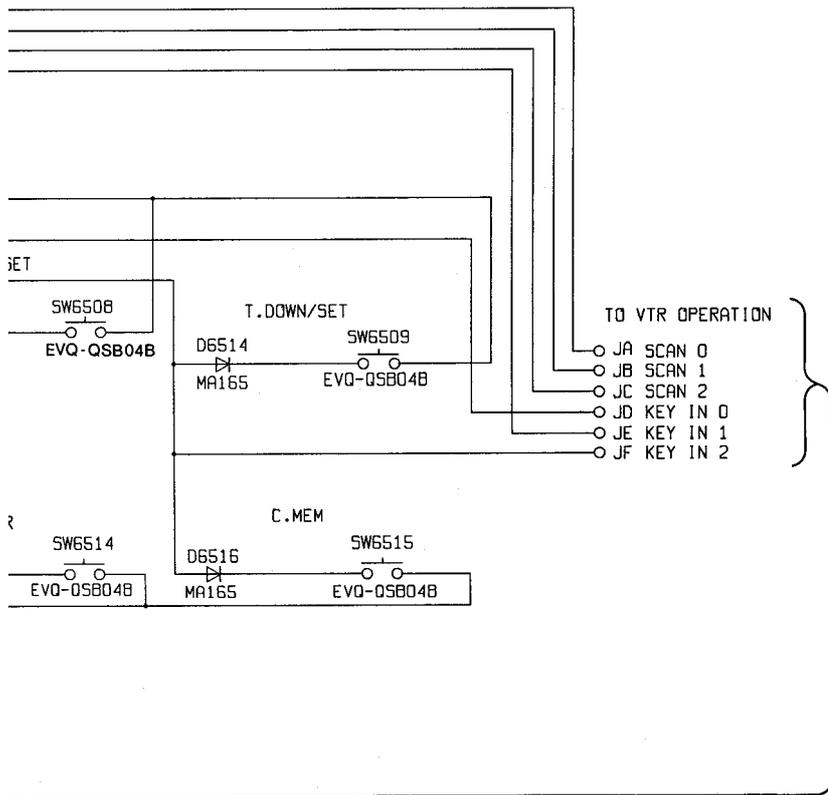
4

5



3-26. VTR OPERATION SCHEMATIC DIAGRAM

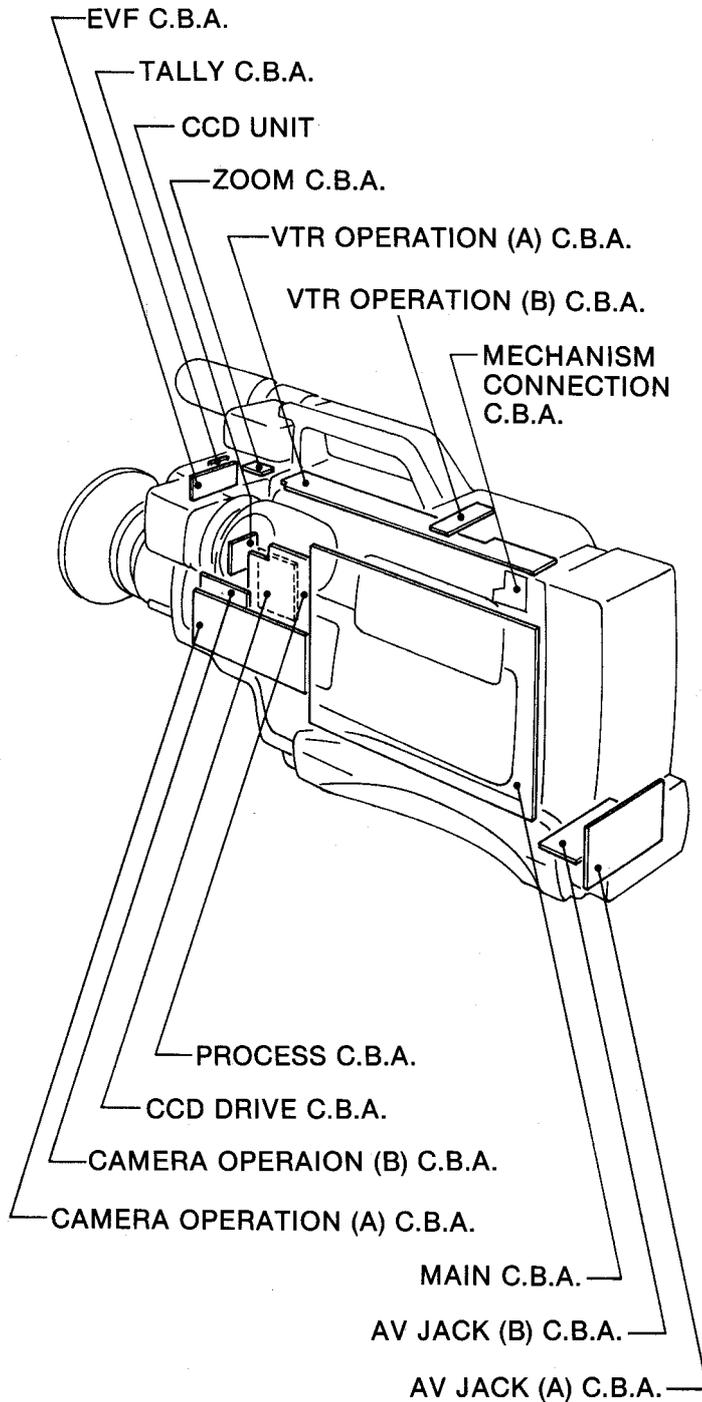




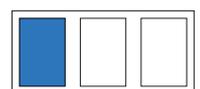
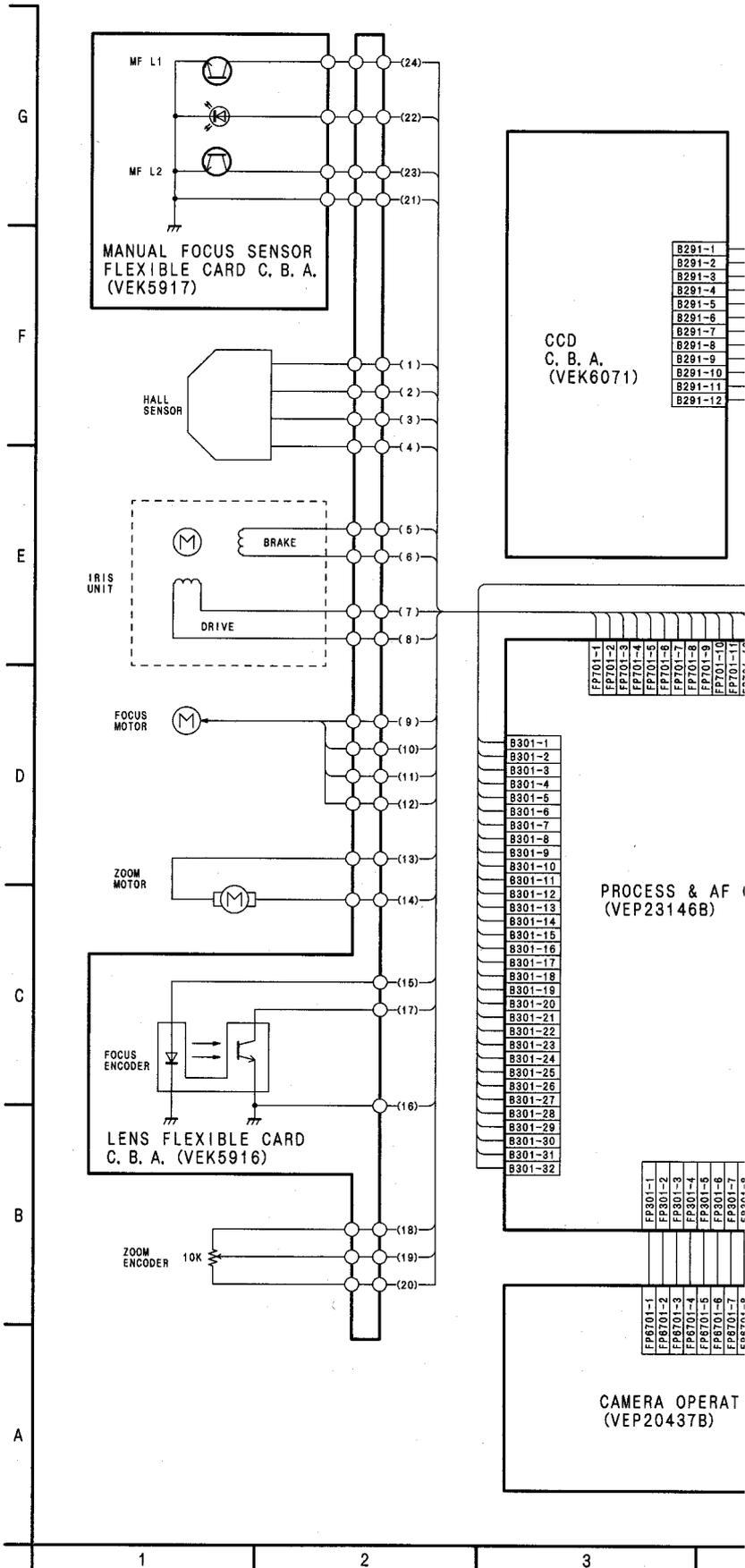
NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.



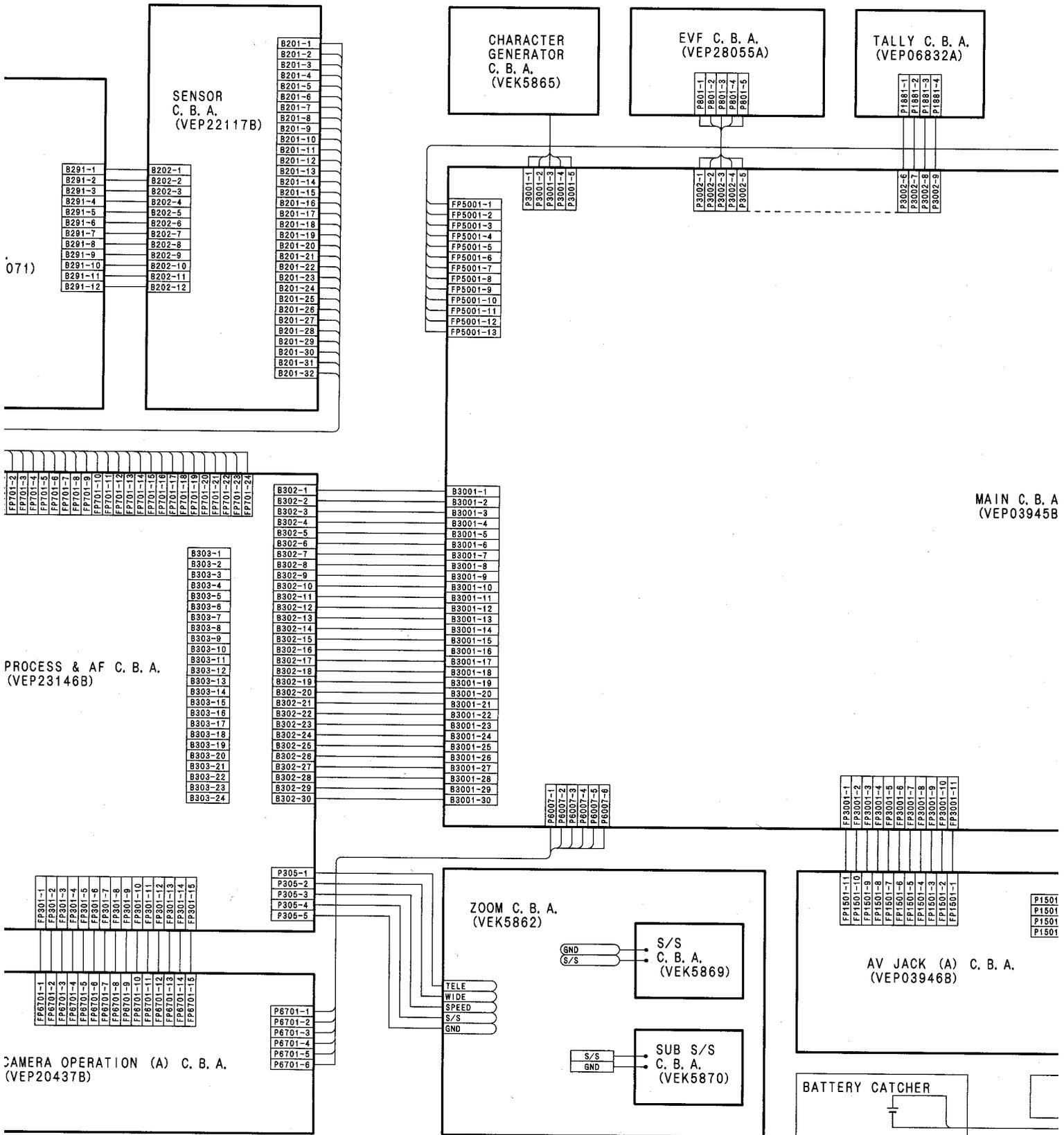
3-28. CIRCUIT BOARD LAYOUT



3-29. INTERCONNECTION SCHEMATIC D



IATIC DIAGRAM

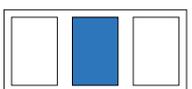


071)

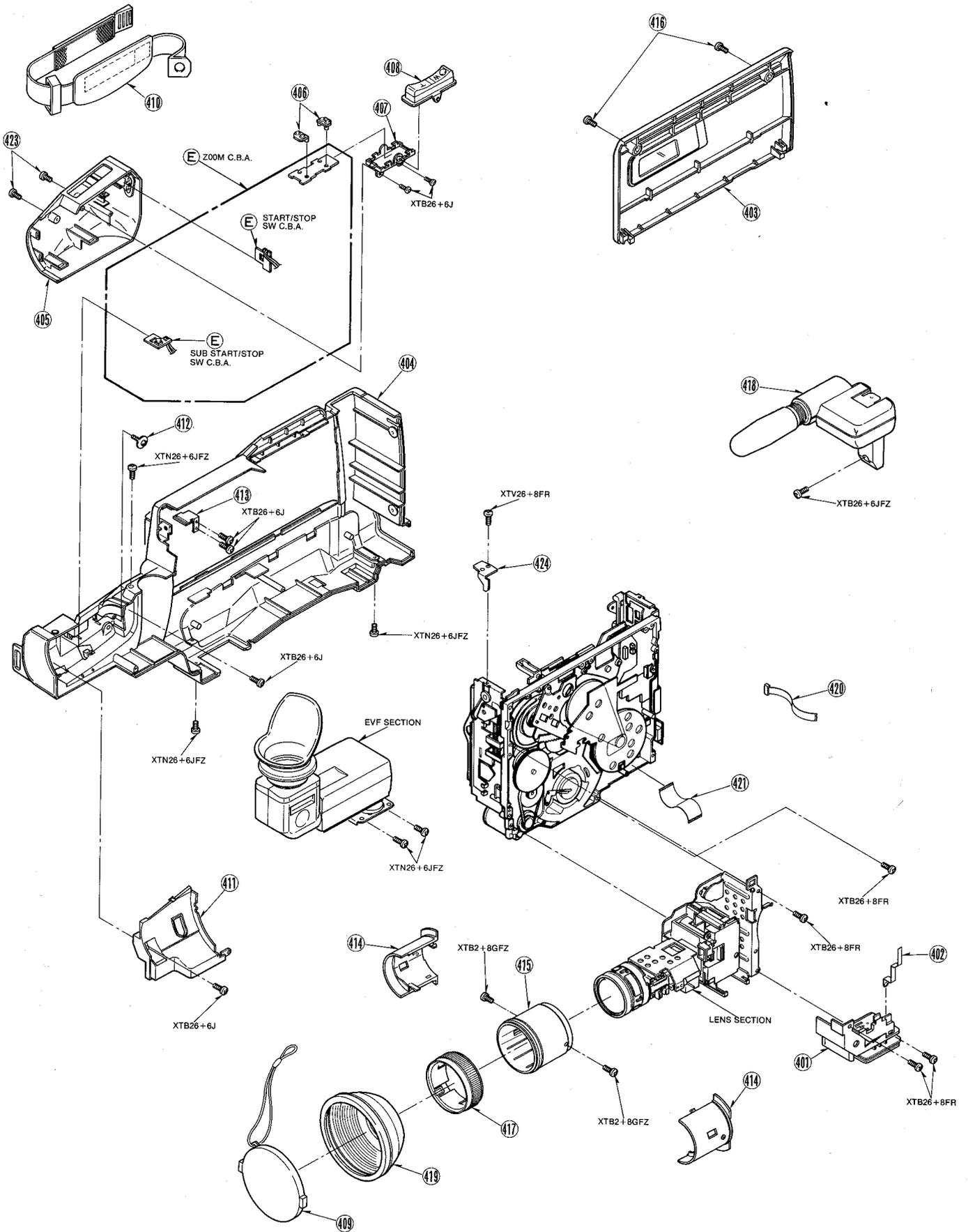
PROCESS & AF C. B. A.
(VEP23146B)

CAMERA OPERATION (A) C. B. A.
(VEP20437B)

MAIN C. B. A.
(VEP03945B)



4 FRAME & CASING PARTS SECTION (1)



6 EVF SECTION

