ORDER NO. VRD9101M101

Service Manual

General Description
Adjustment Procedures
Block / Schematic Diagrams
Exploded Views / Parts List

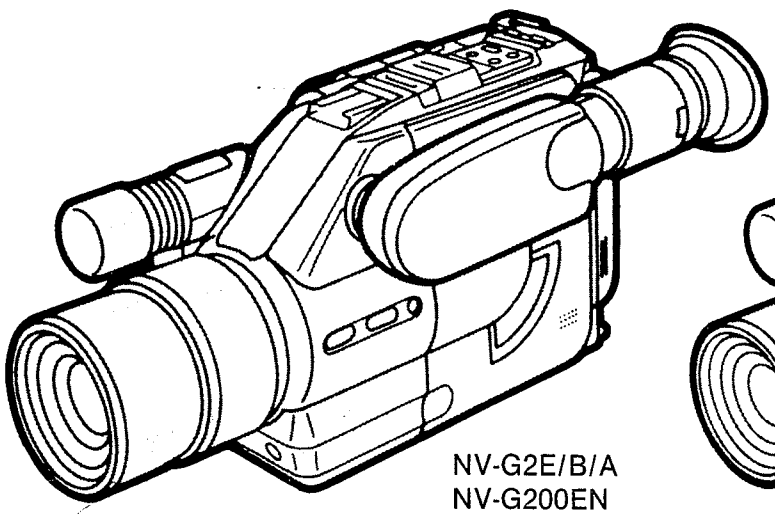
Panasonic VHS C VHS PAL 625

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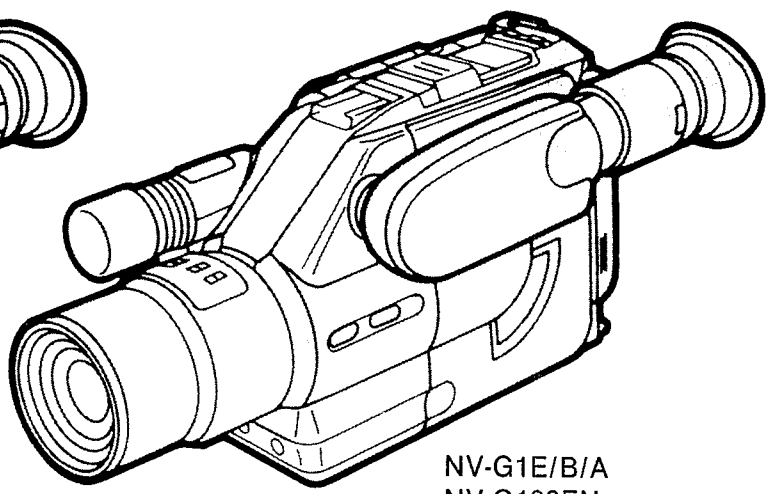
VHS-C Movie

MASTER
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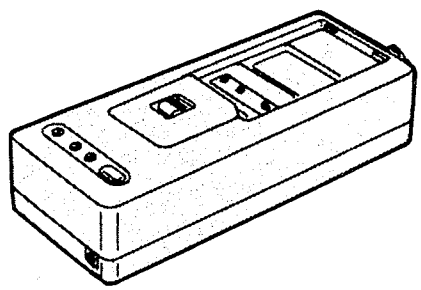
NV-G2E/B/A
NV-G200EN
NV-G1E/B/A
NV-G100EN



NV-G2E/B/A
NV-G200EN



NV-G1E/B/A
NV-G100EN



VW-AS1

試用
廃棄

Panasonic

INTRODUCTION

This service manual contains technical information which will allow service personnels to understand and service this model.

Section 1 presents you with some general information of features and controls, enabling you to become familiar with each function.

Section 2 contributes to your mechanical and electrical adjustment as well disassembly and replacement procedures.

In the case of very common information relating to other models like mechanical adjustments, please refer to each service manual.

Section 3 contains block diagrams which offers you information for checking and understanding each circuit. Schematic diagrams which give you detailed information such as waveforms, voltage data, function e.t.c. ...

Section 4 contains exploded views and parts list.

Please place orders using the parts list and not the drawing reference numbers.

If the circuit is changed or modified, this information will be followed by supplementary service manual to be filed with original service manual.

Technical Information

Service caution

1. Adjustment the Camera Section.

In the camera section EEPROM(Electric Programmable Read Only Memory) is adopted as adjustment element instead of conventional variable resistor.
EEPROM memorize the adjustment value as digital data and data to D/A (Digital to Analogue) converter to be changed DC voltage which is supplied to adjustment point as shown in Fig.T1.
Thus, when adjusting the camera process it is necessary to change the adjustment data which is stored in EEPROM. For this prupose, EVR(Electric Variable Resistor) Fixture enables to communicate with EEPROM, D/A converter directly and can change its stored adjustment data.

The EVR Fixture is connect with camera as shown below and is used. (For more details, Please refer to Camera adjustment section.)

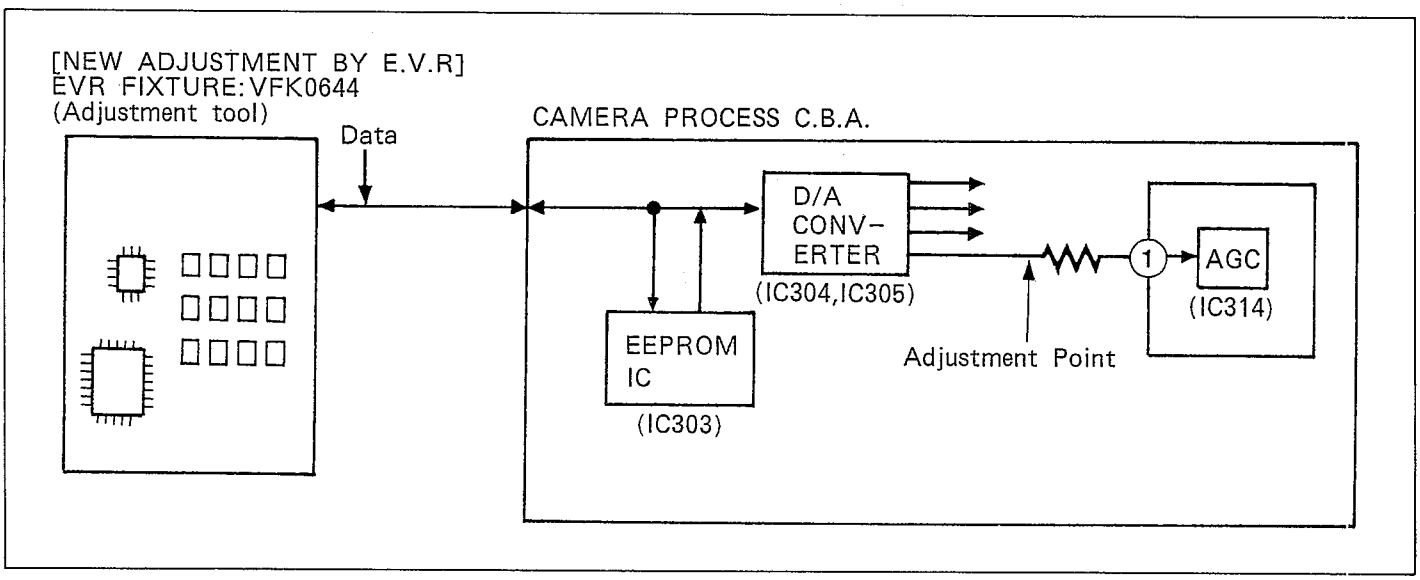


Fig. T1

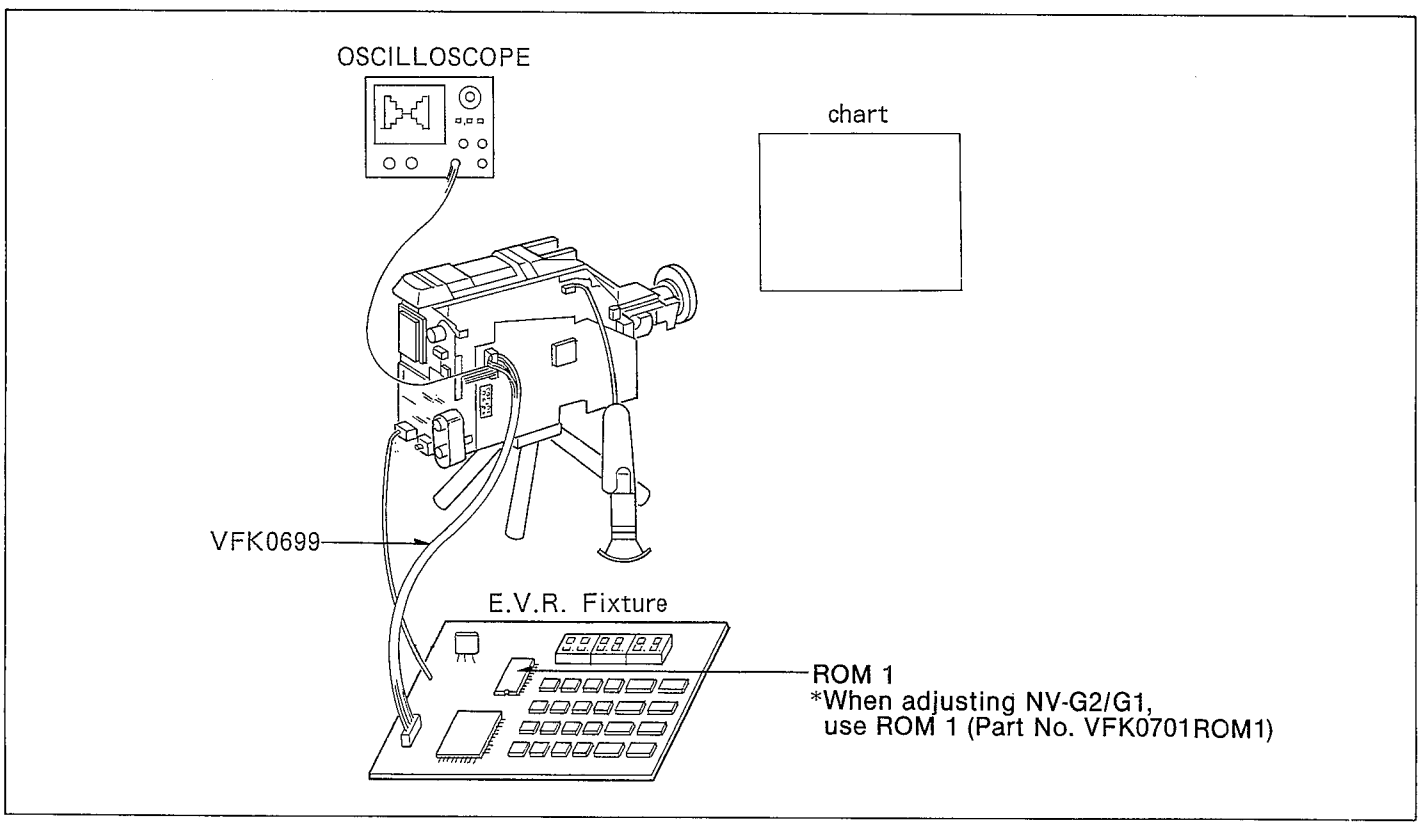


Fig. T2

2. Service Extension Cable.

Use following Extension Cable when checking or adjusting the individual circuit board assembly (C.B.A.) of video part or camera part.

NO.	PART NO.	Q'TY	PART NAME	CONNECTION
1	VFK0698	1	18 PIN EXTENSION CABLE	B702(CAMERA MAIN C.B.A.) TO B6005(MAIN C.B.A.)
2	VFK0698	1	18 PIN EXTENSION CABLE	B302(CAMERA MAIN C.B.A.) TO B8001(MAIN C.B.A.)
3	VFK0667	1	30 PIN EXTENSION CABLE	B301(CAMERA MAIN C.B.A.) TO B201(SENSOR C.B.A.)
4	VFK0670	1	18 PIN FLAT CABLE	FP6001(MAIN C.B.A.) TO MECHANISM FLEXIBLE CABLE C.B.A.
5	VFK0668	1	24 PIN EXTENSION CABLE	B6003(MAIN C.B.A.) TO P2101(DRIVE C.B.A.)
6	VFK0672	1	13 PIN EXTENSION CABLE	B4001(MAIN C.B.A.) TO B4301(MIC INTERFACE C.B.A.)
7	VFK0699	1	22 PIN E.V.R CONNECTION CABLE	E.V.R. FIXTURE TO B303(CAMERA MAIN C.B A)

3. How To Use Extension Cables.

(1) Connection between Camera Main C.B.A. and Main C.B.A.

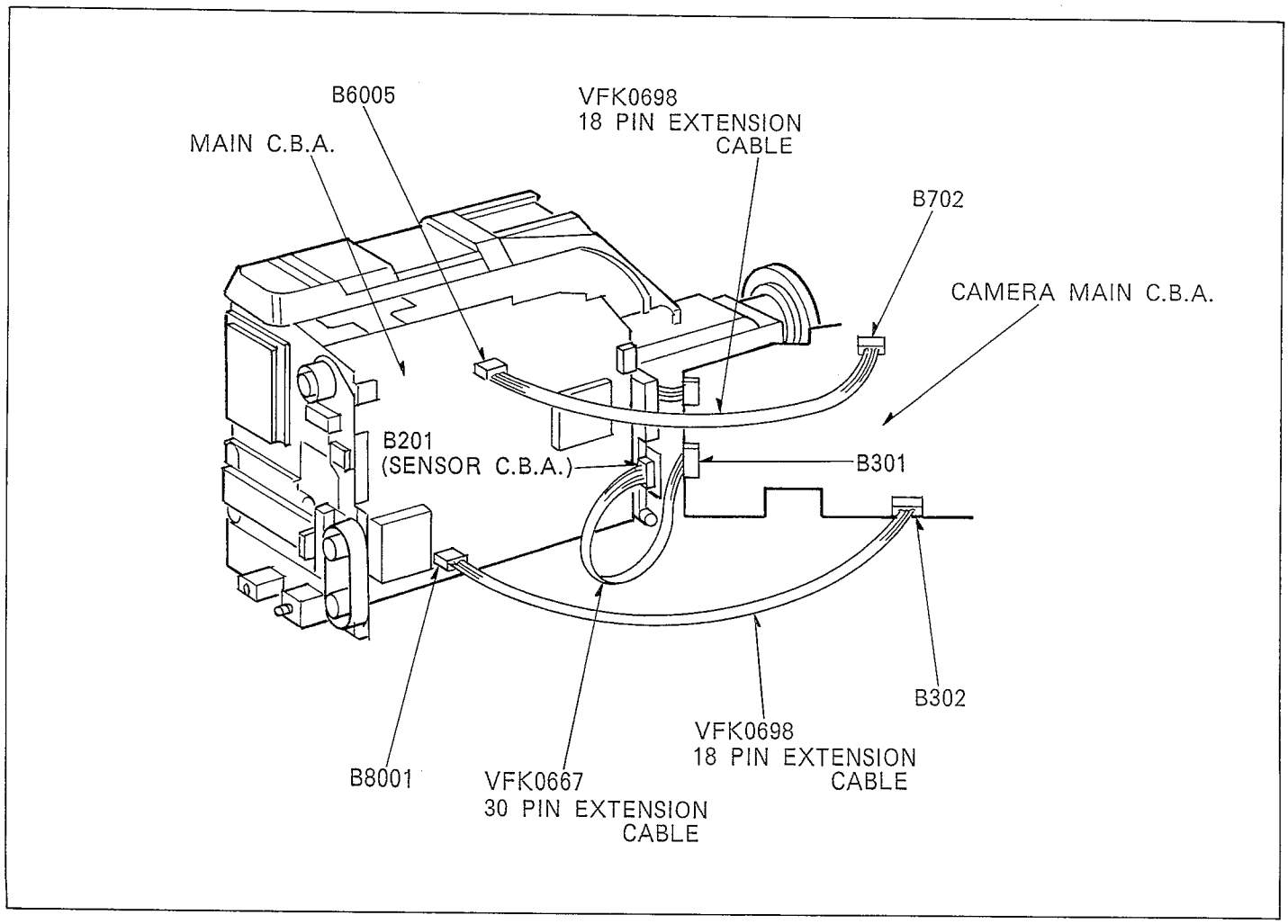


Fig. T3

(2) Connection between Main C.B.A. and Mechanism Flexible Cable C.B.A.

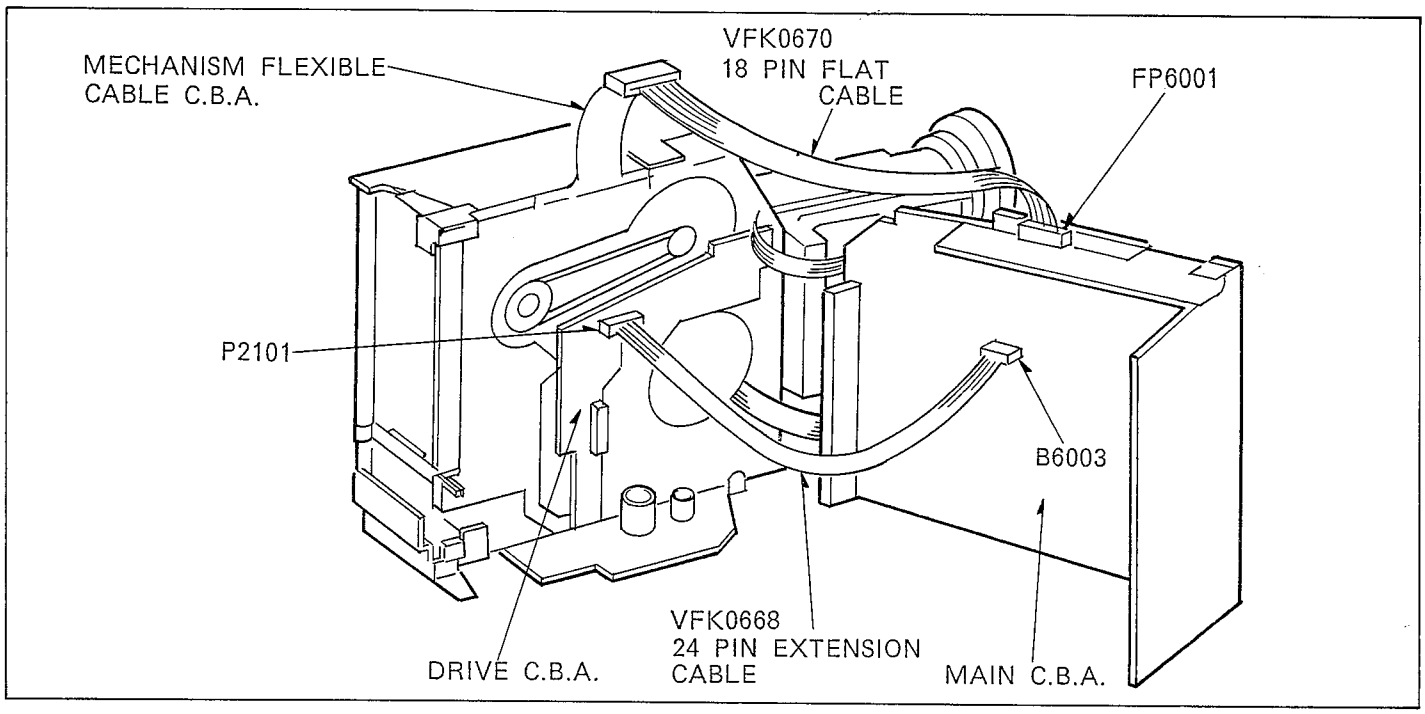


Fig. T4

(3) Connection between Camera Main C.B.A. and Sensor C.B.A.

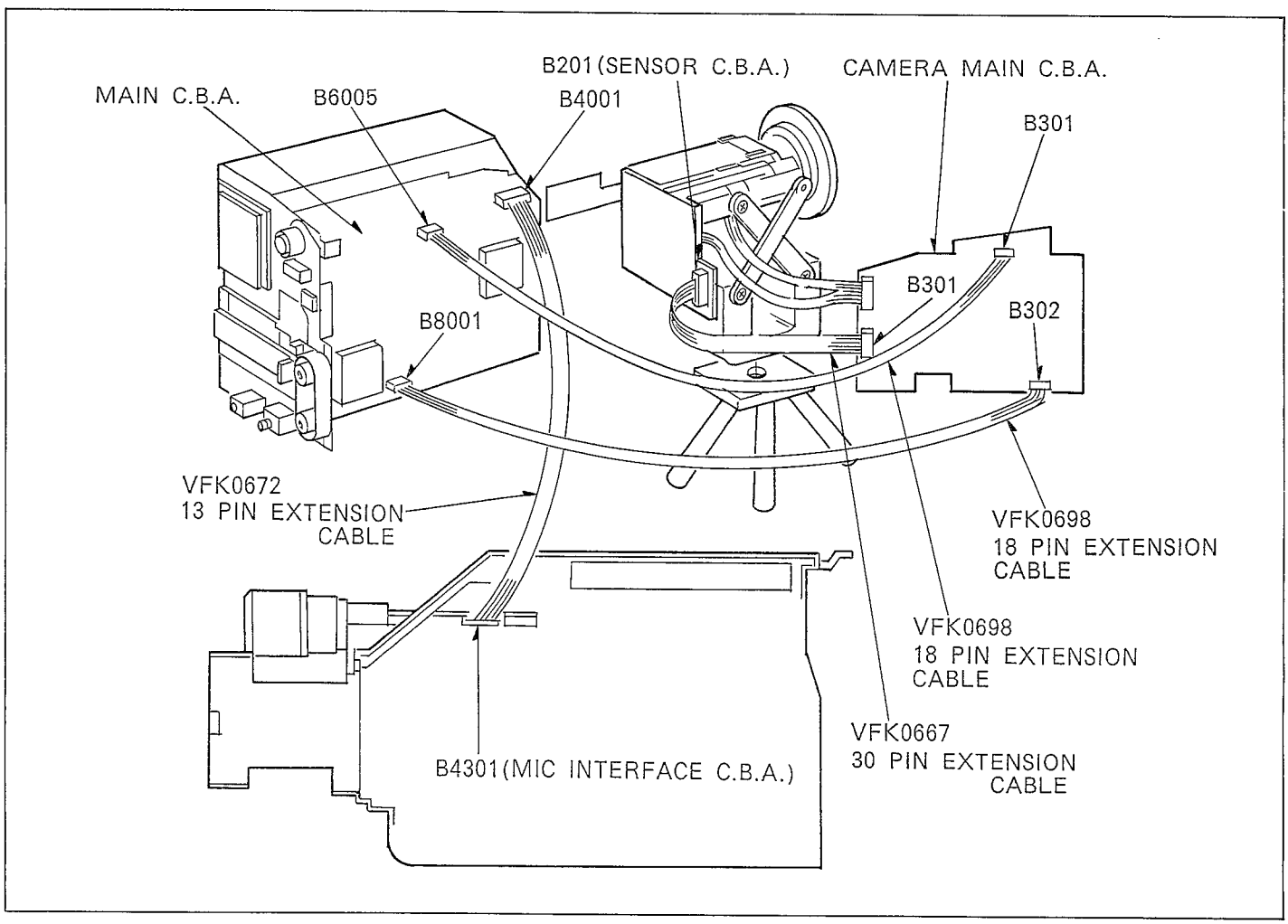


Fig. T5

4. How To Replace 0.5mm pitch IC.

(Required tools)
* Spot Heater: (HS-600,etc) or cordless soldering - iron: (80AEX,etc) (HOT Blowing type)
* Blower Nozzle for spot Heater: (HS-611.614 615.618,etc)
* Tweezers
* Paper tape (Non-flammable Type)
* Glue (paper glue,etc, to fix IC momentary)
* Soldering sucker. (De-solder braid)
* 0.3mm diameter solder
* Solder flux
* Special soldering iron (HS-11,etc) (sharp tip pencil type) (Removal)

(1) Stick the paper tape around the IC for protection of chip components when hot air is blowed.
(2) Blow the hot air from upright position to the legs of IC using spot heater (attaching suitable nozzle).

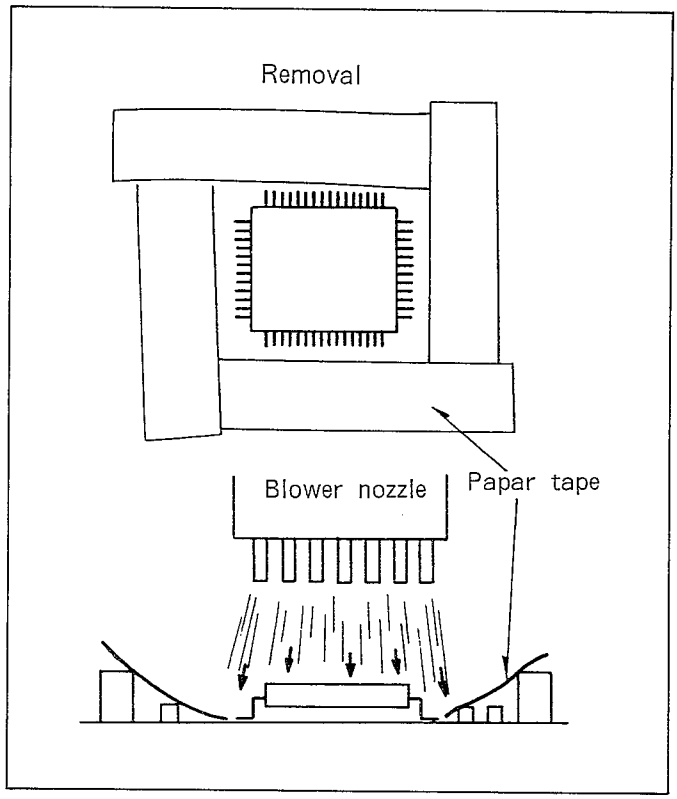


Fig. T6 Removal of IC

(3) When solder is melting, pick up the IC using tweezers.
(4) Take paper tape out from C.B.A.

(Assemble)

1) Remove the solder which is remained on the round of IC using solder sucker. (De-Solder braid).
2) Attach the glue little bit on the centre of IC round.
3) Put the new IC on to round and align the position of each pins with round.
4) Solder the 2 pins of opposite angle of IC with 0.3mm solder and confirm the position.
5) Solder the all pins of IC with 0.3mm solder and 0.3mm tip solder iron.
6) Confirm if all pins are connected.
7) If solder becomes bridge as shown in Fig.T9 correct the solder using solder sucker (De-solder braid).

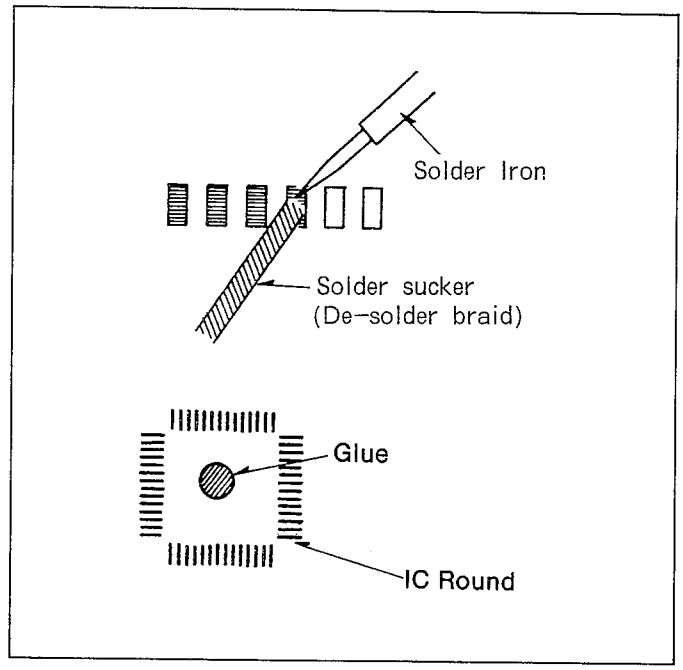


Fig. T7 Cleaning the remained solder

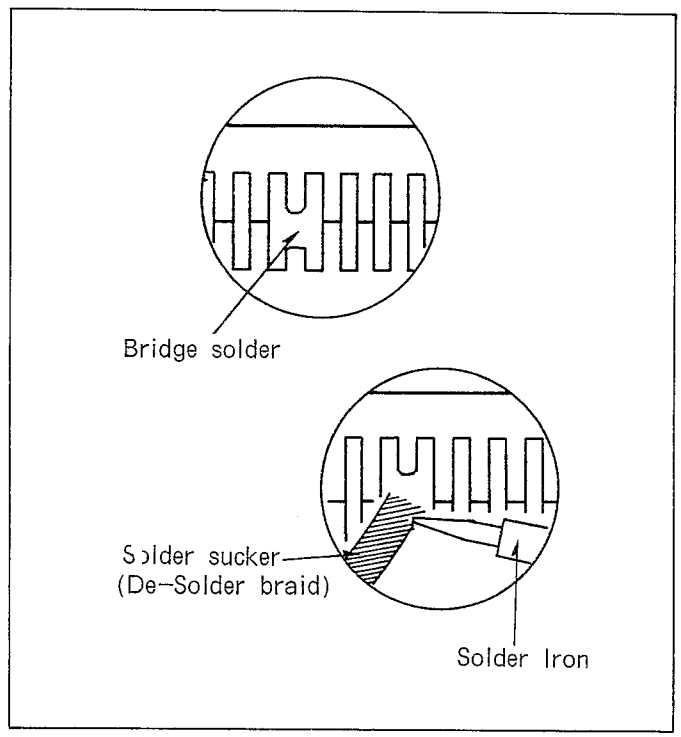


Fig. T8 Correcting bridge solder

5. How To Replace Capacitor.(New)

1) Heat the one side of capacitor with solder Iron. and push its one side up by finger.
2) Remove one side of leg.
3) Heat the opposite side of capacitor and remove it.
4) When replacing new capacitor put the capacitory and solder it as conventional.

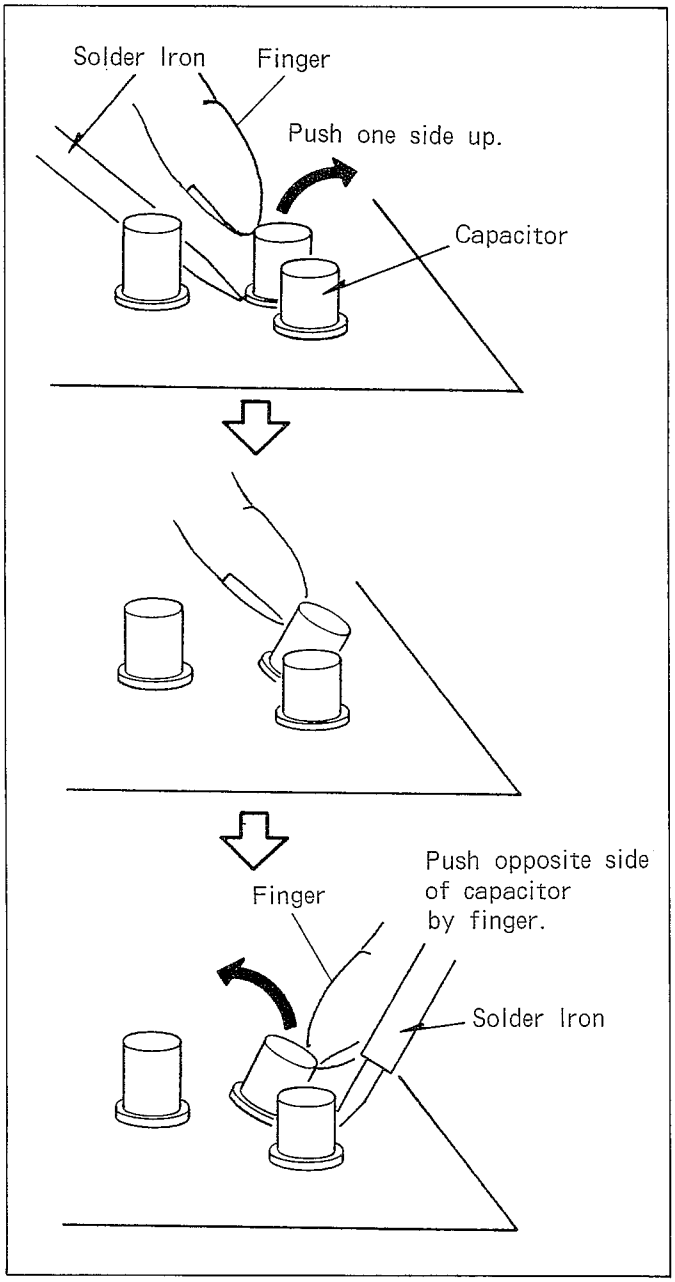


Fig. T9

6 How To Eject Manually.

(1) In Case that Tape is fully unloaded.

* Remove the cassette cover and push the "A" position as shown in Fig.T10.

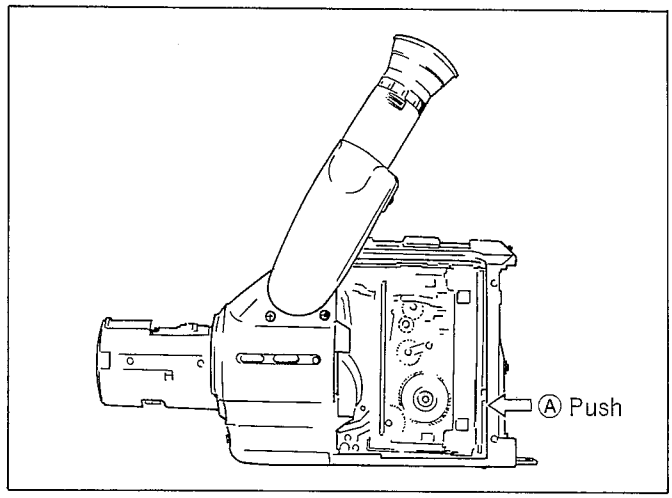


Fig. T10

(2) In Case that Tape is not rewound Completely but mechanism is fully unloaded.

* Remove the case as shown in Fig.T11.
* Rotate the capstan Rotor until tape is rewound completely.
* Eject it as procedure (1).

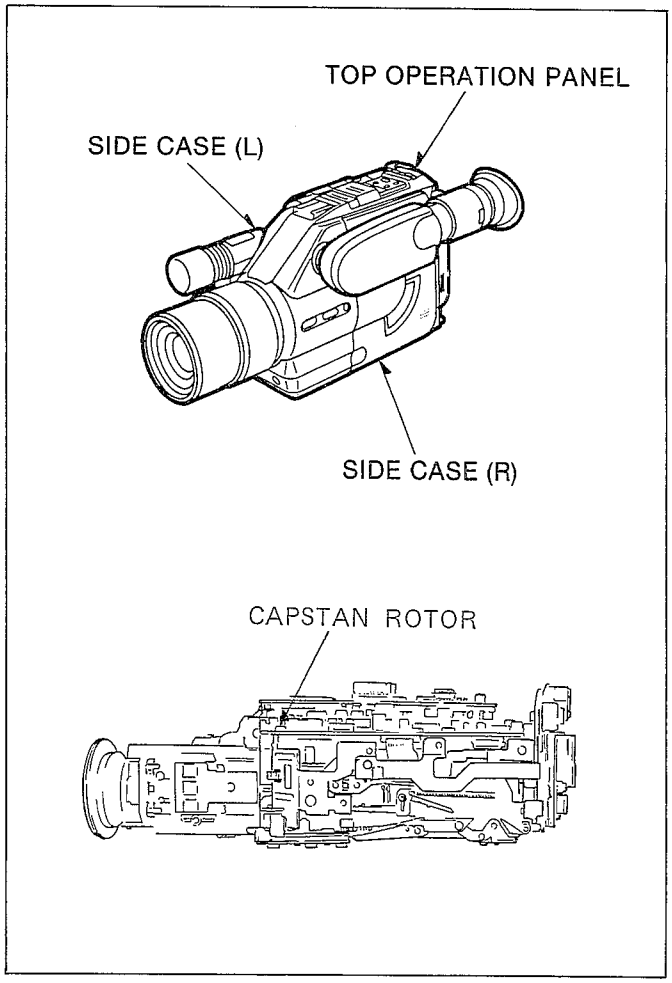


Fig. T11

(3) In Case that Tape and mechanism are still loading condition.

* Remove the cabinet parts.
* Remove Camera Main C.B.A. and Main C.B.A.
* De-solder the soldering between loading motor and Mechanism flexible C.B.A.
* Supply DC voltage (3V) to loading motor terminal and make it unloading.

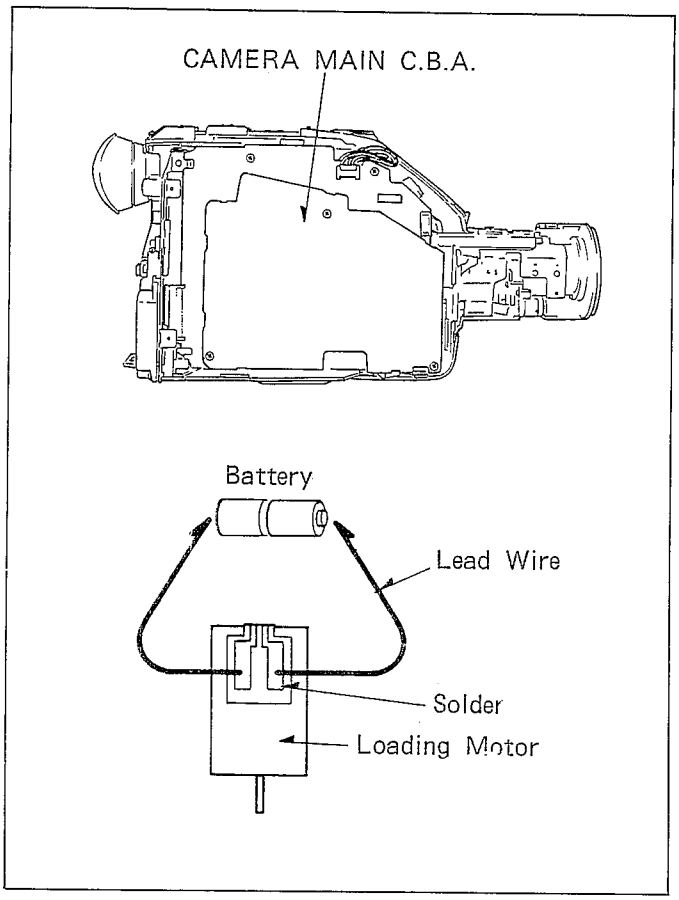
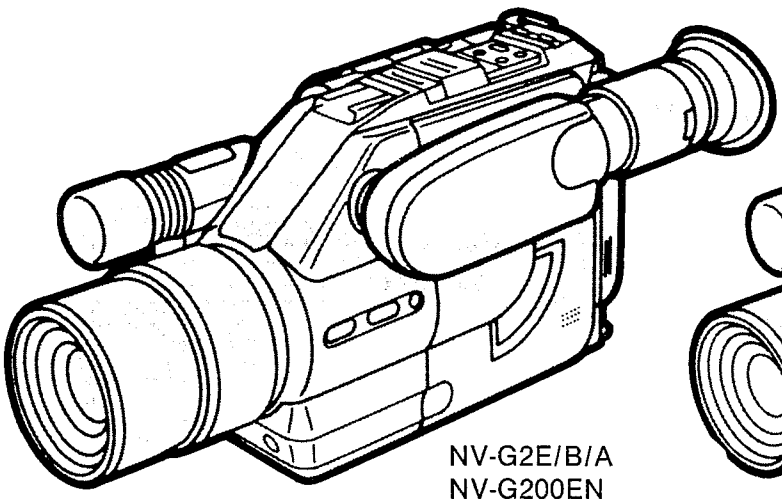


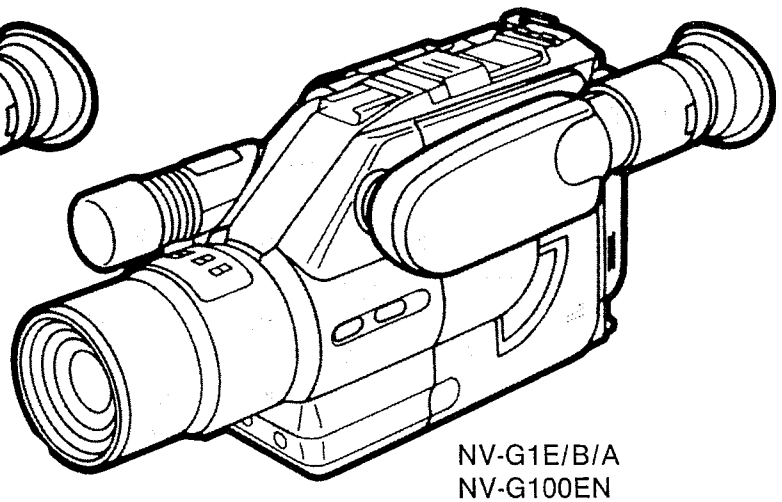
Fig. T12

VHS-C Movie

NV-G2E/B/A
NV-G200EN
NV-G1E/B/A
NV-G100EN



NV-G2E/B/A
NV-G200EN



NV-G1E/B/A
NV-G100EN

SPECIFICATIONS

ITEM	SPECIFICATION	ITEM	SPECIFICATION
POWER	Source: BATTERY; DC 6.0V Consumption; Recording mode; 6.4W (Battery operation)	AUDIO	HEAD: 1 Stationary head (Normal Audio)
			INPUT: MIC IN (M3); −70dB, 4.7kΩ unbalanced
VIDEO RECORDING SYSTEM	4 rotary heads, helical scanning system PAL		OUTPUT: PHONO CONNECTOR; −8dB, 600Ω unbalanced EARPHONE JACK; −28.5dB, 8Ω unbalanced
TAPE FORMAT	VHS-C Cassette Tape (Tape width 12.7mm)		
TAPE SPEED	SP mode: 23.39mm/s LP mode: 11.7mm/s (NV-G2E/B/A, G200EN) Record/Playback Time SP mode: 45min. with NV-EC45EHG LP mode: 90min. with NV-EC45EHG (NV-G2E/B/A, G200EN) FF/REW Time less than 5min. with NV-EC45EHG	WEIGHT	Approx. 880g (without Battery Pack) (NV-G2E/B/A, G200EN) 870g (without Battery Pack) (NV-G1E/B/A, G100EN)
		DIMENSIONS	142.1(W)×119.7(H)×263.4(D)mm
CAMERA	PICK-UP ELEMENT: CCD (Charge Coupled Device)	STANDARD ACCESSORIES	1 pc. AC Adaptor 1 pc. Battery Pack 1 pc. Cassette Adaptor 1 pc. Shoulder Strap 1 pc. AV Output Cable 1 pc. DC Input Cable 1 pc. Battery for Cassette Adaptor Operation 1 pc. Battery for Clock Operation 1 pc. RF Adaptor (NV-G2B/A, G200EN, G1A) 1 pc. Video Light (NV-G2E/B/A, G200EN) 1 pc. Soft Case (NV-G2B, G1B) 1 pc. BNC/Phono Adaptor Plug (NV-G2B, G1B)
	STANDARD ILLUMINATION: 1,400 lux		
	MINIMUM REQUIRED ILLUMINATION: 3 lux		
	LENS: Built-in 8 : 1 Power Zoom Lens with Digital AI Auto Focus, Auto Iris, Auto Focus System, F1.4 (6~48mm), Filter Diameter 43mm		
	IMAGE SENSOR: 1/3 inch CCD Image Sensor		
	VIEW FINDER: 2/3″ Electric View Finder		
VIDEO	HEADS: 4 rotary heads, 1 flging erase head		
	OUTPUT: PHONO CONNECTOR; 1.0Vp-p 75Ω unbalanced		

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

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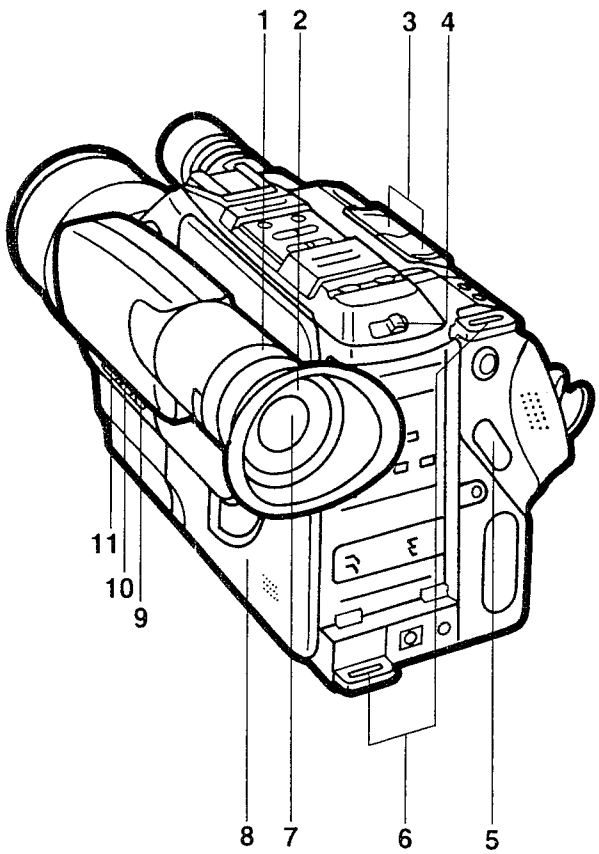
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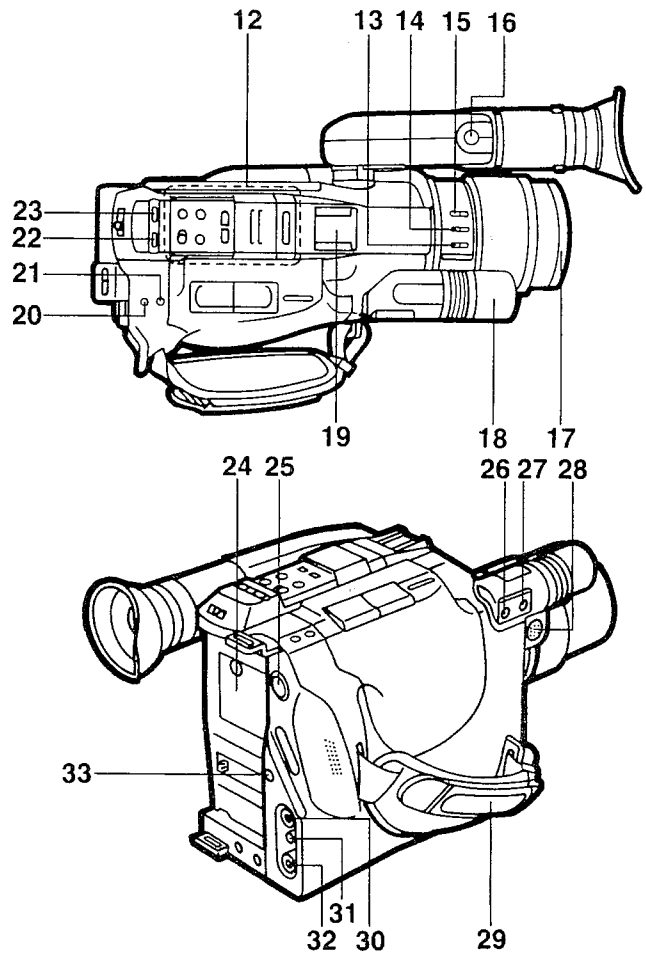
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MECHANICAL REPLACEMENT PARTS LIST
ELECTRICAL REPLACEMENT PARTS LIST

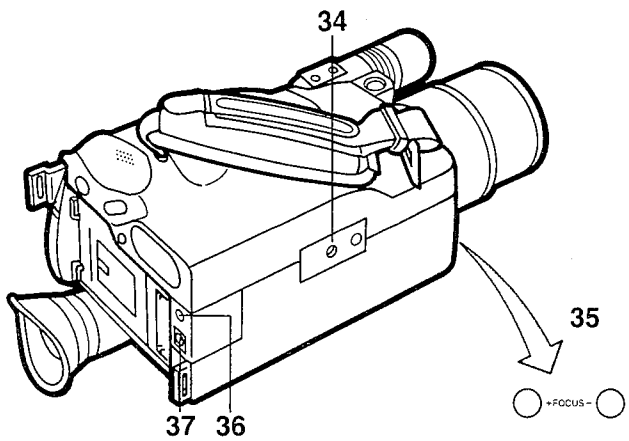
SECTION 1
GENERAL DESCRIPTIONS

1-1. CONTROLS AND COMPONENTS

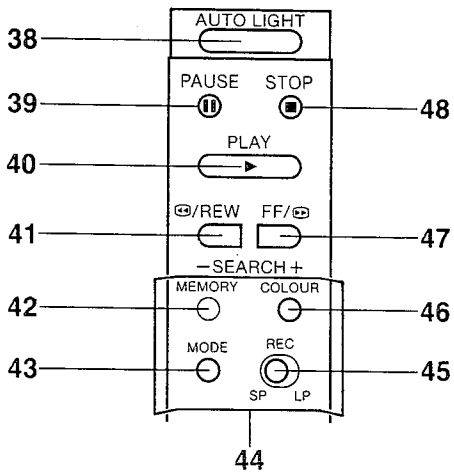




1 Eyepiece Corrector Control
2 Eyecup
3 Power Zoom Control Buttons
4 Operation Switch
5 Recording Start/Stop Buttons
6 Shoulder Strap Holder
7 Electronic Viewfinder
8 Cassette Conpartment
9 Title Button (NV-G2E/B/A, G200EN)
10 Fade Button
11 Date/Time Selector
12 General Operation Controls
13 White Balance Button
14 High Speed Shutter
15 Focus Button
16 Eject Button
17 White Cap
18 Microphone
19 Light Shoe
20 Tracking/Date/Time Shift Button
21 Tracking/Time Set Button
22 Reset Button
23 Memory Display Button
24 Button Battery Compartment
25 Edit Socket (NV-G2E/B/A, G200EN)
26 Earphone Socket
27 External Microphone Socket
28 Charactor Generator Socket (NV-G2E/B/A, G200EN)
29 Grip Belt
30 Video Output Socket
31 RF DC Output Socket
32 Audio Output Socket
33 Battery Eject Button



12 General Operation Controls



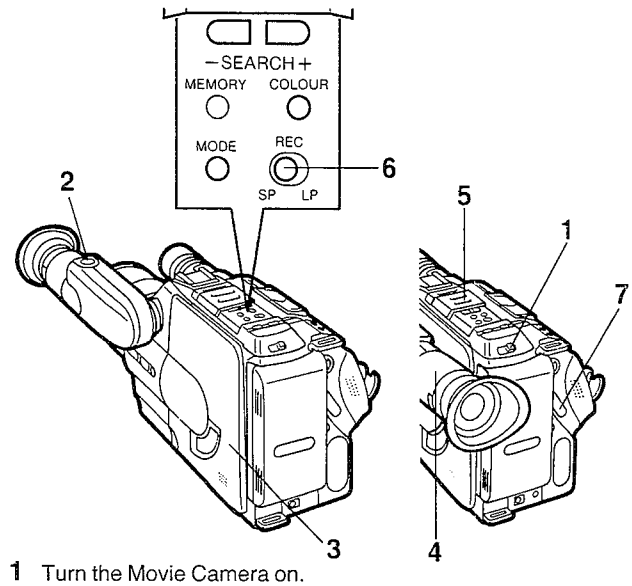
34 Tripod Receptacle
35 Focus +/– Buttons
36 Remote Control Socket
37 DC Input Socket
38 Auto Light Button **(NV-G2E/B/A, G200EN)**
39 Pause Button
40 Play Button
41 Rewind/Review Button
42 Memory Button **(NV-G2E/B/A, G200EN)**
43 Titling Mode Selector Button **(NV-G2E/B/A, G200EN)**
44 Camera/VTR Selector Cover
45 Recording Speed Selector Switch **(NV-G2E/B/A, G200EN)**
46 Title Colour Selector Button **(NV-G2E/B/A, G200EN)**
47 Fast Forward/Cue Button
48 Stop Button

44 Function of the Camera/VTR Selector Cover

CAMERA position ..... For camera recording.
VTR position (as illustrated) ..... For other operations than camera recording.

1-2 EASY OPERATIONS

Camera Recording



1 Turn the Movie Camera on.

2 Turn the EVF by 180° towards the Lens, and press the Eject Button.

3 Insert a Video Cassette.

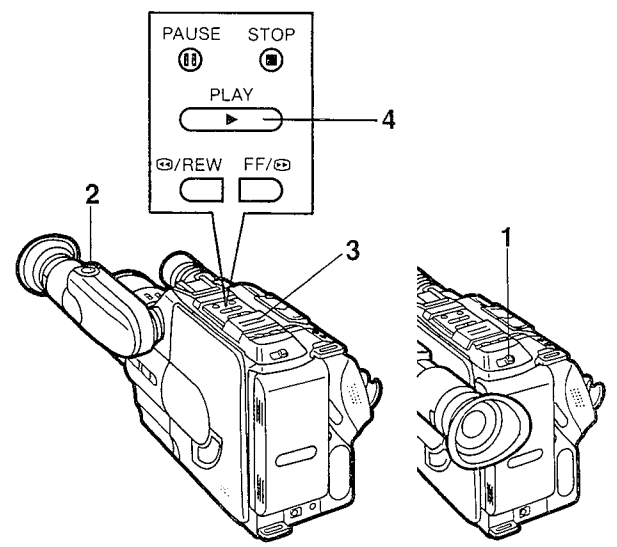
4 Pull out the EVF to its fully extended position.

5 Set the CAMERA/VTR Selector Cover to "CAMERA" (slide the CAMERA/VTR Selector Cover towards the Lens) until it stops.

6 Set the Recording Speed Selector to "SP" or "LP". **(NV-G2E/B/A, G200EN)**

7 Press the Start/Stop Button.
- Recording starts.
- Press this button again to stop recording.

Playback



1 Turn the Movie Camera on.

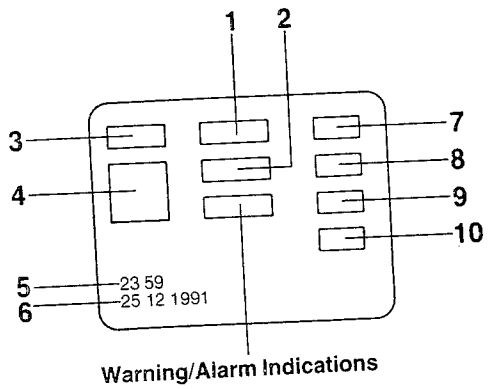
2 Turn the EVF by 180° towards the Lens, and press the Eject Button, then insert the recorded cassette.

3 Set the CAMERA/VTR Selector Cover to "VTR" (slide the CAMERA/VTR Selector Cover towards the Battery Pack) until it stops.

4 Press the Play Button.
- Playback starts.
- Press the Stop Button to stop playback.

1-3 INDICATIONS IN THE ELECTRONIC VIEWFINDER (E V.F.)

The following indications are displayed in the Electronic Viewfinder (EVF) to inform you of the conditions of the Movie Camera.



Warning/Alarm Indications

Warning/Alarm Indications

There is little battery power left. Movie Camera will be turned off in a few minutes. Replace the battery pack by a fully recharged one.

TAPE — There is no cassette tape inserted, or the tab of the inserted cassette is broken out. The indications flashes to warn that recording is not possible.

END — During recording, the tape has almost reached its end. Replace the tape with a new one. The indication will remain lit when the tape has reached its end.

DEW — When condensation has formed inside the Movie Camera, the "DEW" indication will flash and a few seconds later, the unit itself off.

Video Head Clogging (see page 20.)

BACKUP — When the button type Battery for the Title Memory and Auto Date functions is not inserted or when it is exhausted, the indication will flash for 10 seconds after the Movie Camera is turned on.

1 Remaining Battery Power Indication

E---F The "▬" indications begin to disappear from right to left as the power of the Battery Pack weakens.

- When attaching the Battery Pack to the Movie Camera, the indication "E---F" will initially be displayed for approx. one minute and then the actual remaining battery power will then be displayed.

2 Counter Indication

M 0:00.00 Tape Counter with Memory Indication

3 Auto Light Mode Indications (NV-G2E/B/A, G200EN)

ᗤD AUTO Auto Mode

ᗤD ON Video Light On

4 Digital Memory Indication (NV-G2E/B/A, G200EN)

WHT Colour Indication

WIPE ↑ Mode Indication (No indication in normal mode.)

5 Time Indication

6 Date Indication

7 Tape Running Indications

REC Recording mode

PAUSE Recording Pause mode, Rec Review

▷ Play mode, Camera Search (In forward direction)

❚❚ Still mode

▷▷ Fast Forward/Cue mode

◁◁ Rewind/Review mode, Camera Search (In reverse direction)

8 Recording Mode Indications (NV-G2E/B/A, G200EN)

SP SP mode

LP LP mode

9 Manual White Balance Indication

WHITE — Manual Mode, Not adjusted

W.SET Manual Mode, Hold Mode

10 High Speed Shutter Mode Indications

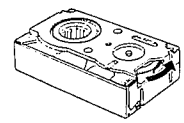
1/120	1/120 sec.
1/250	1/250 sec.
1/500	1/500 sec.
1/1000	1/1000 sec.
1/2000	1/2000 sec.
1/4000	1/4000 sec.

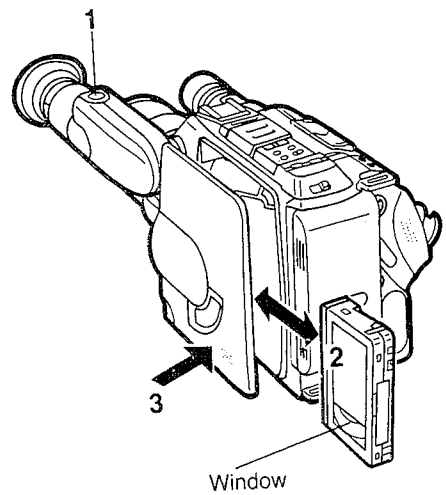
Focus Mode Indication

MF MF Mode

- Some of the above indications may light up alternately at the same place in the EVF to indicate the corresponding operating condition or warnings.

1-4. VIDEO CASSETTE





Inserting the Video Cassette

Before Inserting the Cassette

Make sure that the tape is not loose, If it is loose, pull it in by turning the cog wheel on the side of the cassette in the direction of the arrow.

1 Turn the EVF by 180° towards the Lens, and press the Eject Button.

2 Insert the video cassette into the cassette compartment with its window facing outside.

3 Push the cassette compartment cover inward until it locks with a click and then turn the EVF back to its original position.

Removing a Video Cassette

1 Turn the EVF by 180° towards the Lens, and press the Eject Button.

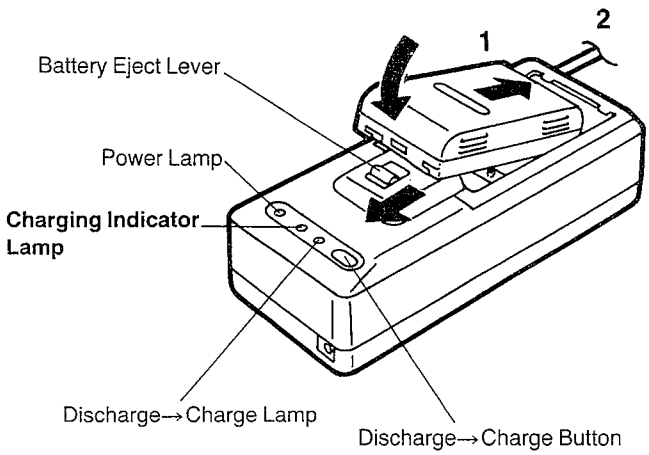
2 Pull out the video cassette.

3 Push the cassette compartment cover inward until it locks with a click and then turn the EVF back to its original position.

Note:
- Use VHS-C video cassettes only.

1-5. BATTERY PACK

Charging



1 Attach the Battery Pack.

2 Connect the AC Adaptor to the Mains.

- **Charging Indicator Lamp**
  Lights while charging is taking place and goes out when charging is finished.

Note:
- The charging takes about 60 minutes.
- The Movie Camera can be used continuously for approx. 45 minutes with a fully charged Battery Pack.
- With the VW-VBS2E Battery Pack (optional), the charging as well as possible recording time is twice as long as for the standard supplied Battery Pack.

■ When the charging is completed, slide the Battery Eject Lever in the direction of the arrow and remove the Battery Pack.

■ **Discharge→Charge Function**

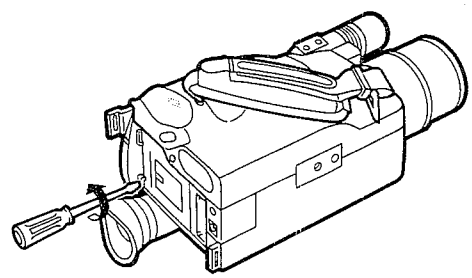
The Battery Pack can be recharged for repeated use. However, if it is recharged repeatedly while there is still some charge left, its charging capacity will be gradually reduced. Therefore, if you often need to recharge semi-discharged Battery Packs, attach the Battery Pack to the AC Adaptor, connect the AC Adaptor Mains, and press the Discharge→Charge Button to completely discharge the Battery Pack. (The Discharge→Charge Lamp will light up, and when the discharging is finished, the Charging Indicator Lamp will light up instead.) This will increase the charging capacity and extend the operating life of the Battery Pack. Therefore, if the operating life of the Battery Pack becomes noticeably shorter, refresh it. (It is recommended to refresh the Battery Pack approx. once every five rechargings.)

1-6. SETTING THE CLOCK

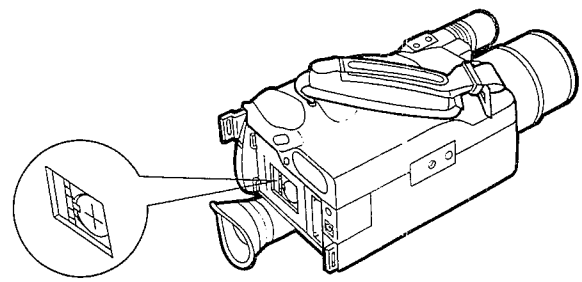
How to Insert the Battery for the Clock Operation

The "CR2032" size battery is necessary for the date & time and title to be memorized by the Movie Camera.

1



2



1 Remove the lid.

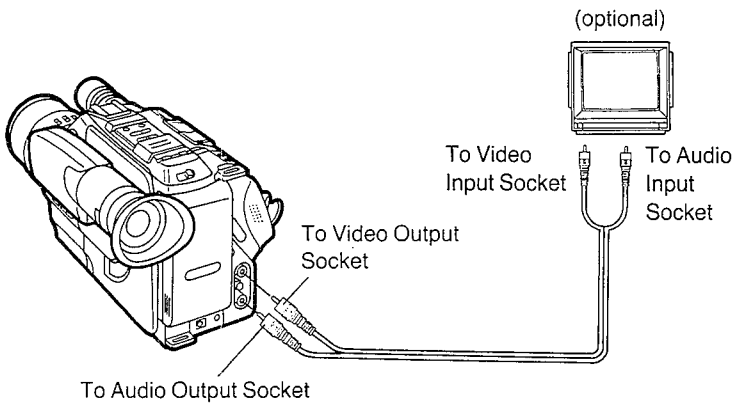
2 Insert the "CR2032" size battery on the Battery Holder with (+) mark facing upward.

Note:
- If the battery is not inserted or if it is exhausted, the indication "BACKUP" in the EVF will flash for approximately 10 seconds when turning the Movie Camera on.
- Before replacing the battery, connect the AC Adaptor to the Movie Camera to maintain correct operation of the clock during battery replacement.

CAUTION FOR BATTERY REPLACEMENT
- The life of the battery is about one year. Inspect and if necessary, replace the Battery once a year.
- Load the new battery with its polarities (+ and −) aligned correctly.
- Remove an exhausted battery immediately from the Movie Camera and dispose of it.
- Do not try to short-circuit, recharge or heat the battery and do not throw it into a fire.

1-7 PLAYBACK VIA TV SET (CONNECTIONS)

TV Set with AV Input

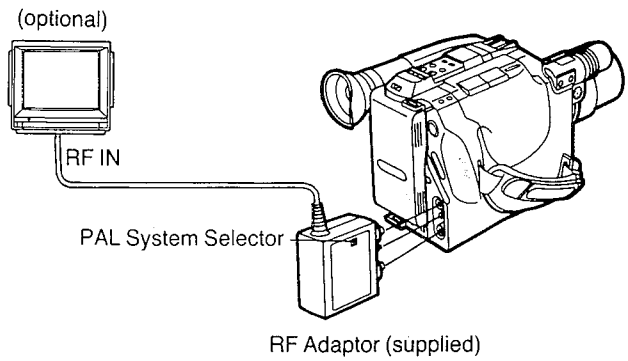


Playback on a table Type VTR

Use the Cassette Adaptor.

TV Set without AV Socket

Before connecting the RF Adaptor, turn the Movie Camera off with the Operation Switch.



Australia model only:

FOR YOUR SAFETY:
Install any external aerial to AS 1417.1.

TV
Tune to UHF channel 36.

PAL System Selector
For the Australia and New Zealand region, set the RF Converter Channel Selector at "G" position.

1-8. ACCESSORIES

Standard Accessories

○: Supplied
×: Not Supplied

	NV-G2E	NV-G2B	NV-G2A	NV-G200EN	NV-G1E	NV-G1B	NV-G1A	NV-G100EN
AC Adaptor	○	○	○	○	○	○	○	○
Battery Pack	○	○	○	○	○	○	○	○
RF Adaptor	×	○	○	○	×	×	○	×
Cassette Adaptor	○	○	○	○	○	○	○	○
Shoulder Strap	○	○	○	○	○	○	○	○
AV Output Cable	○	○	○	○	○	○	○	○
DC Input Cable	○	○	○	○	○	○	○	○
Battery for Cassette Adaptor Operation	○	○	○	○	○	○	○	○
Battery for Clock Operation	○	○	○	○	○	○	○	○
Video Light	○	○	○	○	×	×	×	×
Soft Case	×	○	×	×	×	○	×	×
BNC/PHONO Adaptor Plug	×	○	×	×	×	○	×	×

Optional Accessories

○: Supplied
×: Not Supplied

	NV-G2E	NV-G2B	NV-G2A	NV-G200EN	NV-G1E	NV-G1B	NV-G1A	NV-G100EN
Battery Pack (VW-VBS2E)	○	○	○	○	○	○	○	○
Battery Pack Holder (VW-VH1E)	○	○	○	○	○	○	○	○
Car Battery Cord (VW-ACC11E)	○	○	○	○	○	○	○	○
Battery Charger (VW-BCS1E/B/A)	○	○	○	○	○	○	○	○
Travel Kit (VW-TKS1E/B/A)	○	○	○	○	○	○	○	○
Carrying Bag (VW-CBG2E)	○	×	○	○	○	○	○	○
Video DC Light (VZ-LDS15E)	○	○	○	○	○	○	○	○
Replacement Bulb for DC Light (VZ-LL15E)	○	○	○	○	○	○	○	○
Filter Kit (VW-LF43E)	○	○	○	○	○	○	○	○
Tele Conversion Lens (VW-LT4320E)	○	○	○	○	○	○	○	○
Tele Conversion Lens (VW-LT4350E)	○	○	○	○	○	○	○	○
Wide Conversion Lens (VW-LW2E)	○	○	○	○	○	○	○	○
Step Up Ring (VW-SUR1E)	○	○	○	○	○	○	○	○
Hand Grip (VW-GPC1E)	○	○	○	○	○	○	○	○
Pause Remote Control (VW-RM1E)	○	○	○	○	○	○	○	○
L-Shaped Shoe Adaptor (VW-SK3E)	○	○	○	○	○	○	○	○
RF-Adaptor (VW-RF7E)	○	×	×	○	○	○	○	○
Standard Tripod (VZ-CT55E)	○	○	○	○	○	○	○	○
Deluxe Tripod (VZ-CT75E)	○	○	○	○	○	○	○	○
Table Tripod (VZ-CTT1E)	○	○	○	○	○	○	○	○
Charactor Generator (VW-CG2E) (VW-CG5E)	○	○	○	○	×	×	×	×
VITC Generator (VW-VG1E)	○	○	×	×	×	×	×	×
VITC Controller (VW-EC10E)	○	○	×	×	×	×	×	×
Editing Controller (VW-EC300E)	○	○	○	○	×	×	×	×
Editing Controller (VW-EC310E)	○	○	○	○	×	×	×	×
Cassette Adaptor (VW-TCA7E)	×	×	×	×	○	×	×	×

SAFETY PRECAUTIONS

GENERAL GUIDELINES

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Measure the resistance value, with an ohm meter, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads connectors, control shafts,etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1M ohm and 5.2M ohm. When the exposed metal does not have a return path to the chassis, the reading must be

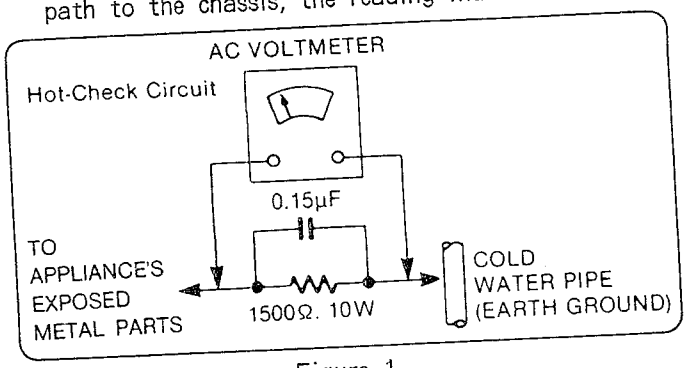


Figure 1

LEAKAGE CURRENT HOT CHECK (See Figure 1)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5k ohm, 10 watts resistor, in parallel with a 0.15uF capacitor, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliamp. In case a measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

ELECTROSTATICALLY SENSITIVE(ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are calledElectrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package untilimmediately before you are ready to install it. (Most replacementES devices are packaged with leads eletcrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   CAUTION : Be sure no power is applied to the chassis or circuit, and observe all otner asfety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device).

X-RADIATION

WARNING:

1. The potential source of X-Radiation in the display is the High Voltage section and the picture tube.
2. When using a picture tube test equipment for service, make sure the equipment is capable of handing 25.0kV without causing X-Radiation.

NOTE: It is important to use an accurate periodically calibrated high voltage meter.

1. Turn Bright and Contrast controls fully counterclockwise.
2. Set Service switch to SERVICE.
3. Measure the high voltage. The high voltage meter (electrostatic type) reading should indicate 23.0kV +/- 1.0kV. If the meter indication is out of tolerance, immediate service and correction is required to prevent the possibility of premature component failure.
4. To prevent anX-Radiation possibility, it is essential to use the specified picture tube.

SECTION 2
ADJUSTMENT PROCEDURES

2-1. DISASSEMBLY PROCEDURES

2-1-1. DISASSEMBLY FLOWCHART

The following flowchart describes the order or steps for removing the cabinet parts and certain printed circuit boards in order to make access to the items needing servicing. To reassemble the unit, follow the steps in reverse order.

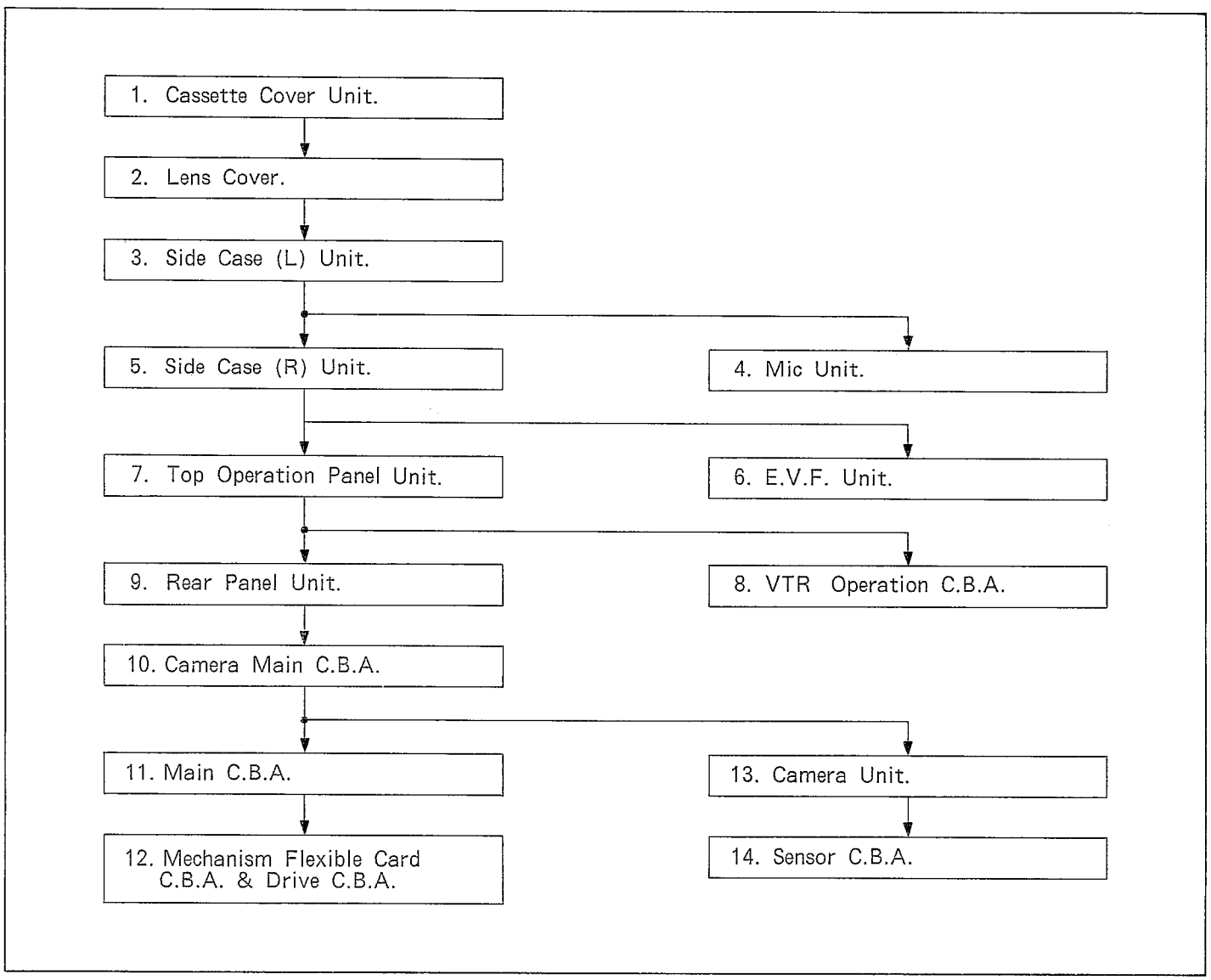


Fig. D1

2-1-2. DETAILED DISASSEMBLY METHOD

1. Removal of the Cassette Cover Unit.

   Remove ..... 2 Screws(A)

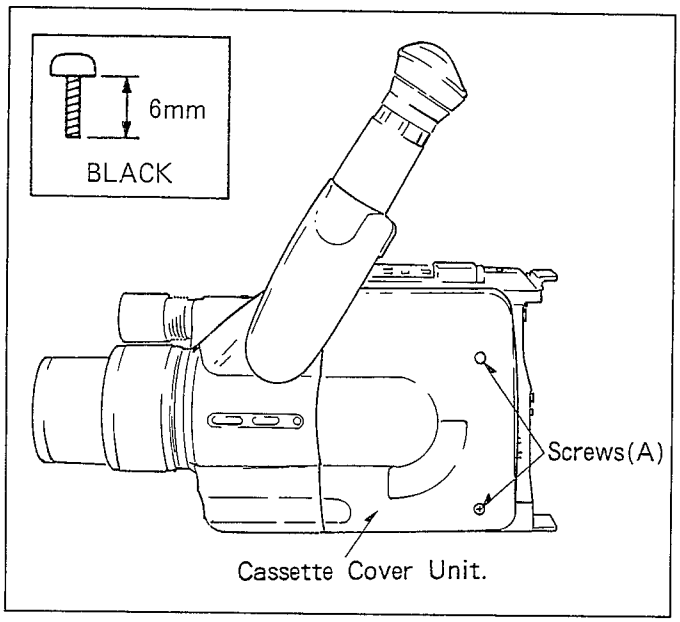


Fig. D2

2. Removal of Lens Cover.
   Put the palm to the Lens Hood and remove it by rotating counter-clockwise.

   Remove ..... 2 Screws(B)
   Remove ..... Screw(C)

   Rotate Lens Cover to counter-clockwise and remove it.

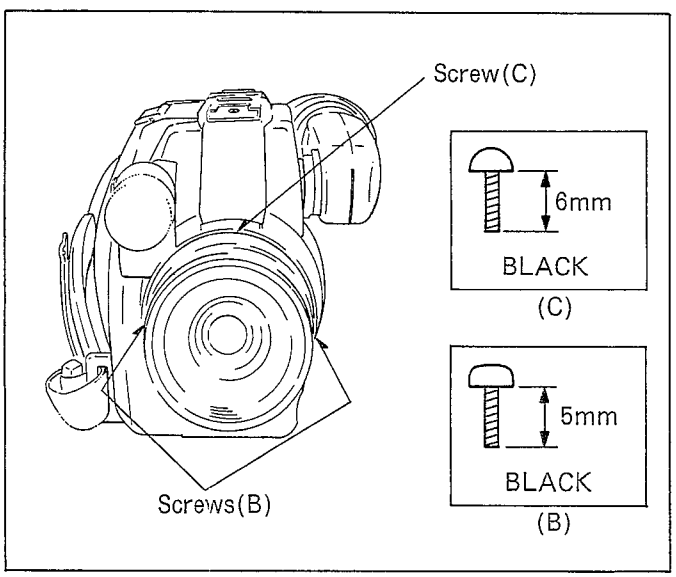


Fig. D3

3. Removal of Side Case(L) Unit.

   Remove ..... 6 Screws(D)
   Connector(B4001)

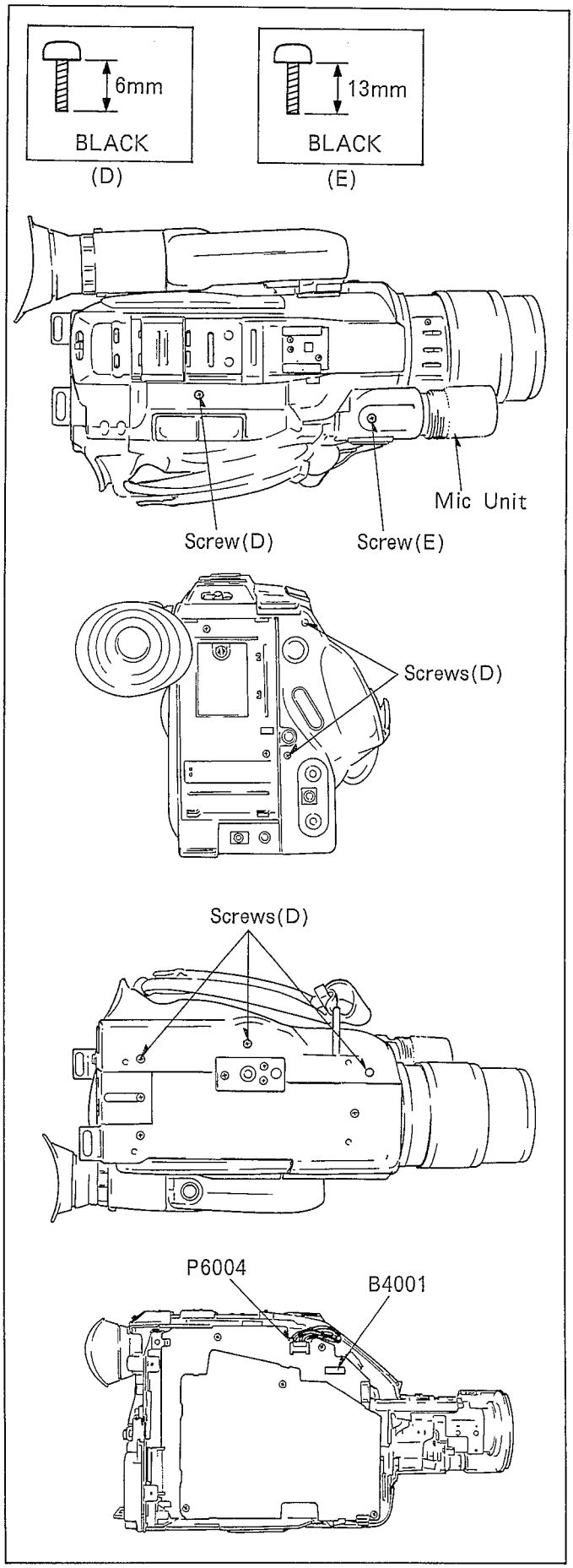


Fig. D4

4. Removal of Mic Unit.

Remove ..... Screw(E) shown in Fig.D4
Screw(F)
Microphone Connector

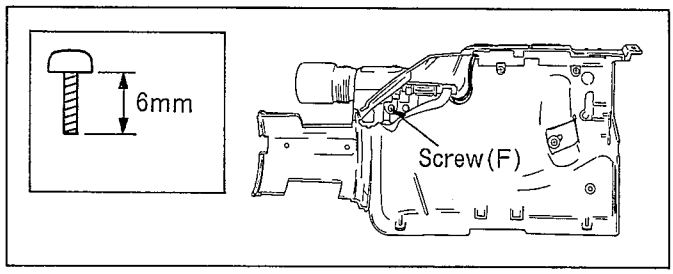


Fig. D5

5. Removal of Side Case(R) Unit.

Remove ..... 7 Screws(G)
Screw(H)

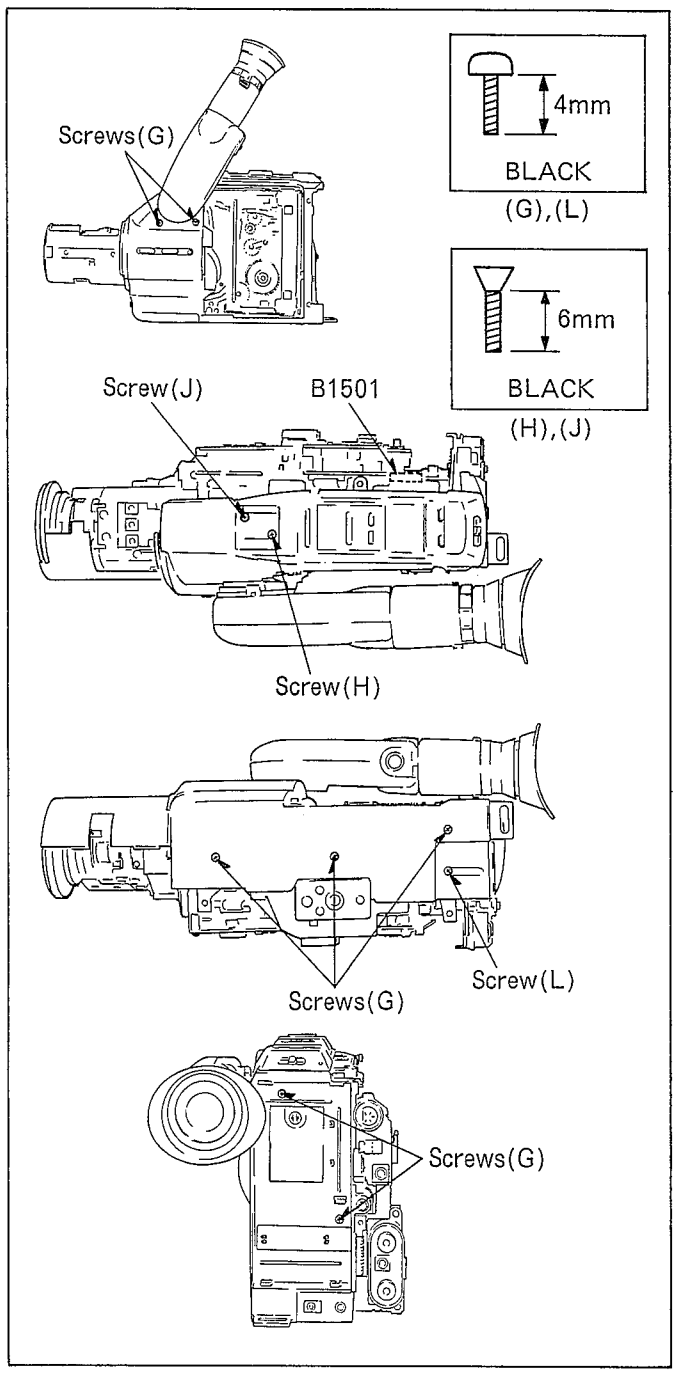


Fig. D6

6. Removal of E.V.F. Unit.

Remove ..... Connector(P6004) shown in Fig.D4
Remove ..... 2 Screws(I)

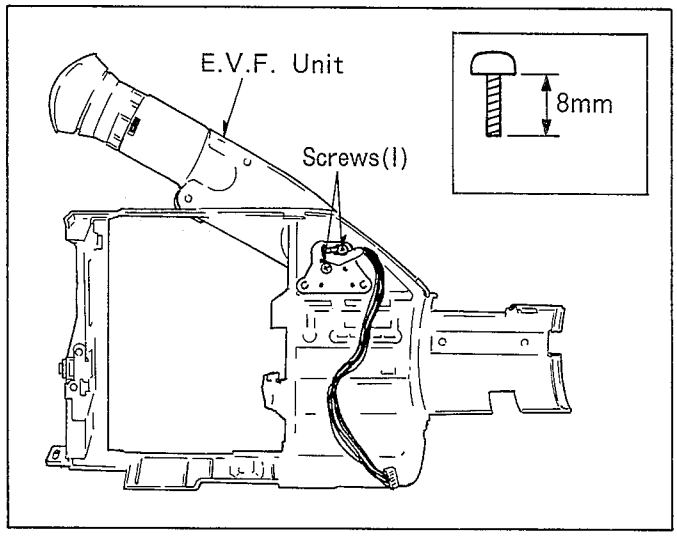


Fig. D7

7. Removal of Top Operation Panel Unit.

Remove ..... Screw(J)
Connector(B1501) shown in Fig.D6

8. Removal of VTR Operation C.B.A.

Remove ..... 3 Screws(K)

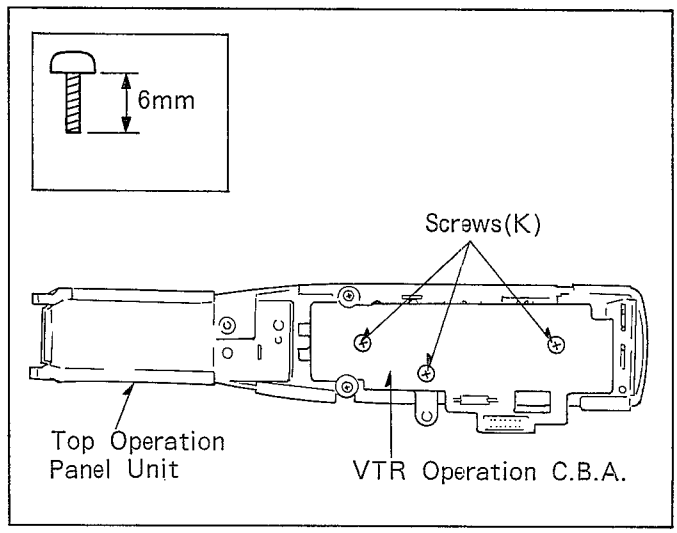


Fig. D8

9. Removal of Rear Panel Unit.

Remove ..... Screw(L) shown in Fig.D6
Remove ..... Screw(M)
3 Screws(N)
Connector(B1702)

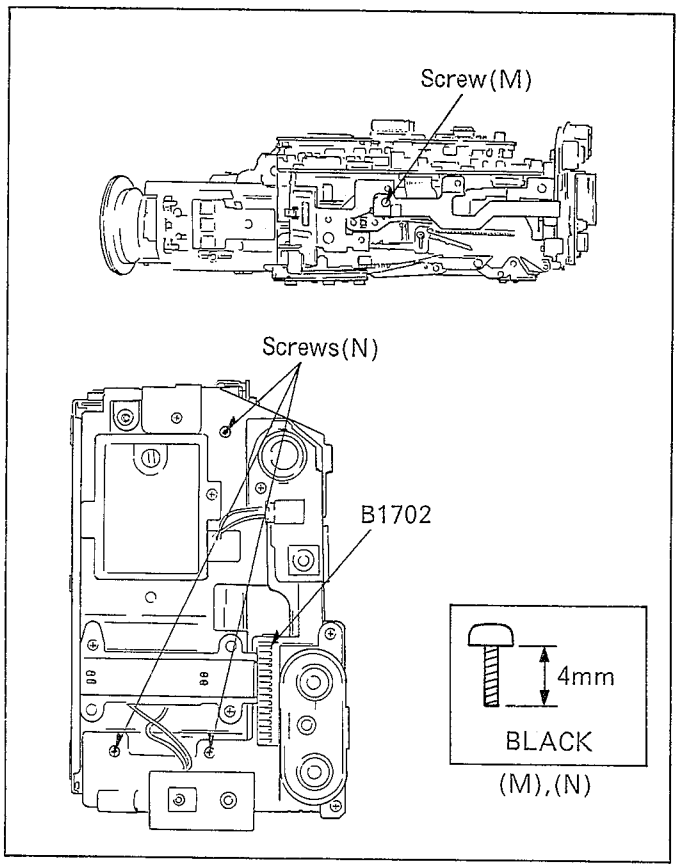


Fig. D9

10. Removal of Camera Main C.B.A.

Remove ..... Screw(O)
4 Connectors (B301, B302, B702, FP701)

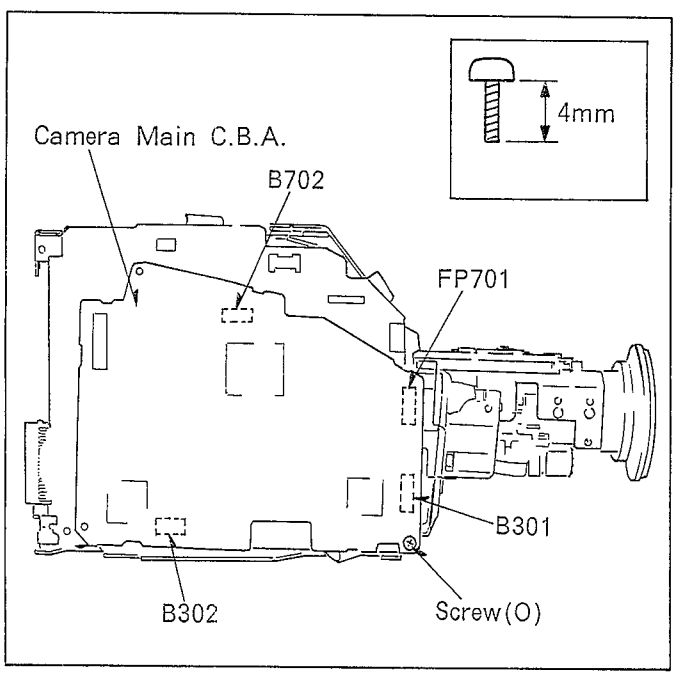


Fig. D10

11. Removal of Main C.B.A.

Remove ..... Screw(P)
4 Connectors (FP4002, FP5001, FP6001, B6003)

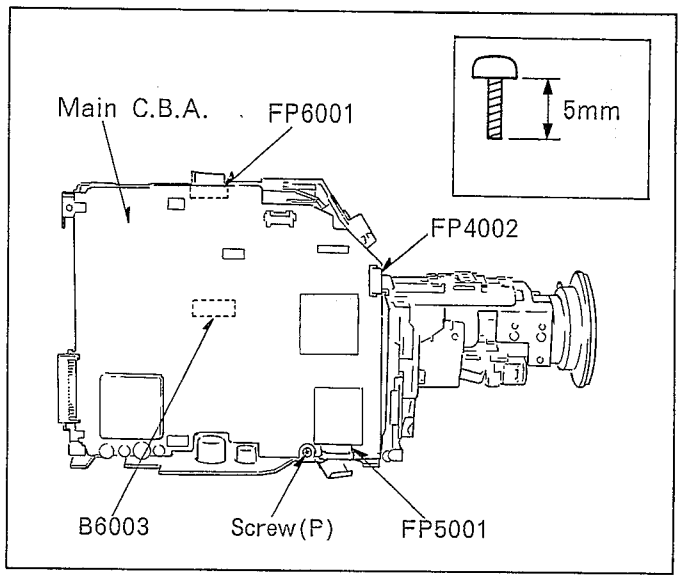


Fig. D11

12. Removal of Mechanism Flexible Card C.B.A & Drive C.B.A.

Remove ..... 4 Screws(Q)
3 Screws(R)
2 Connectors(P2102,P2103)
Resolder ... 19 Soldering Portions(S)

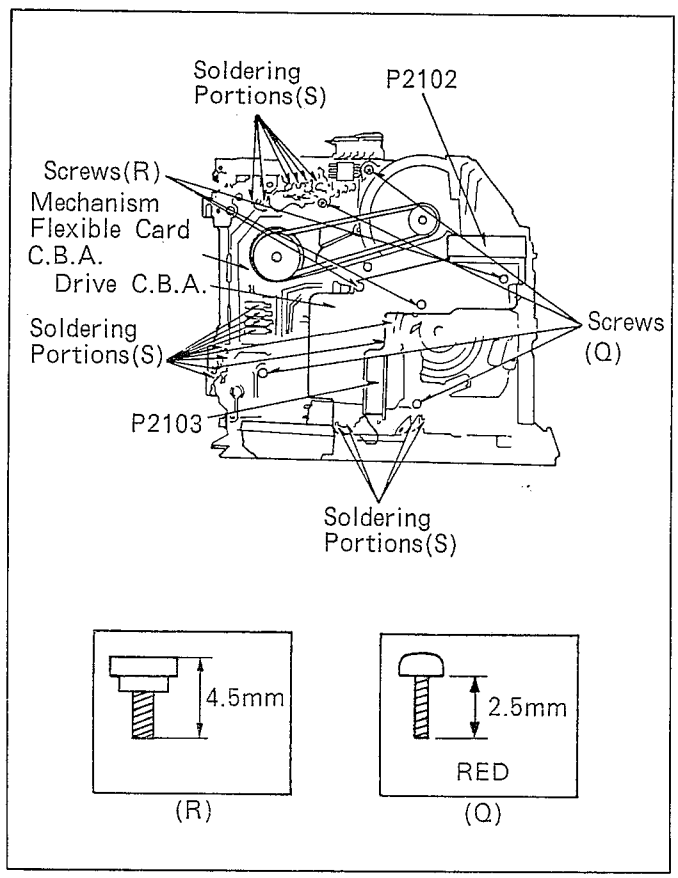


Fig. D12

13 Removal of Camera Unit.

Remove ..... 4 Screws(T)
Connector(B071)

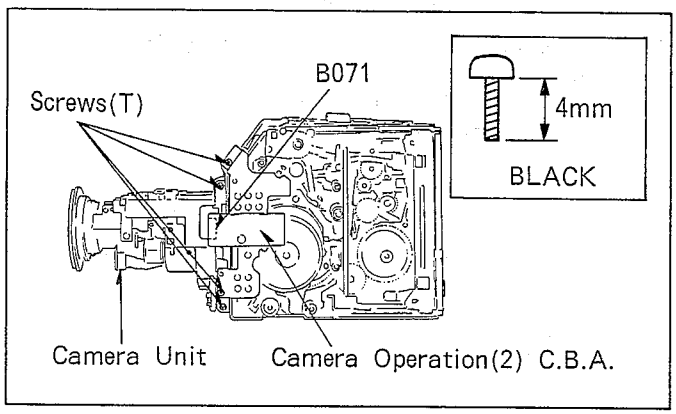


Fig. D13

14. Removal of Sensor C.B.A.

Unlock ..... 5 Locking Tabs(U)
Remove ..... 2 Screws(V)
Connector(B051)
2 Screws(W)
Connector(FP203)

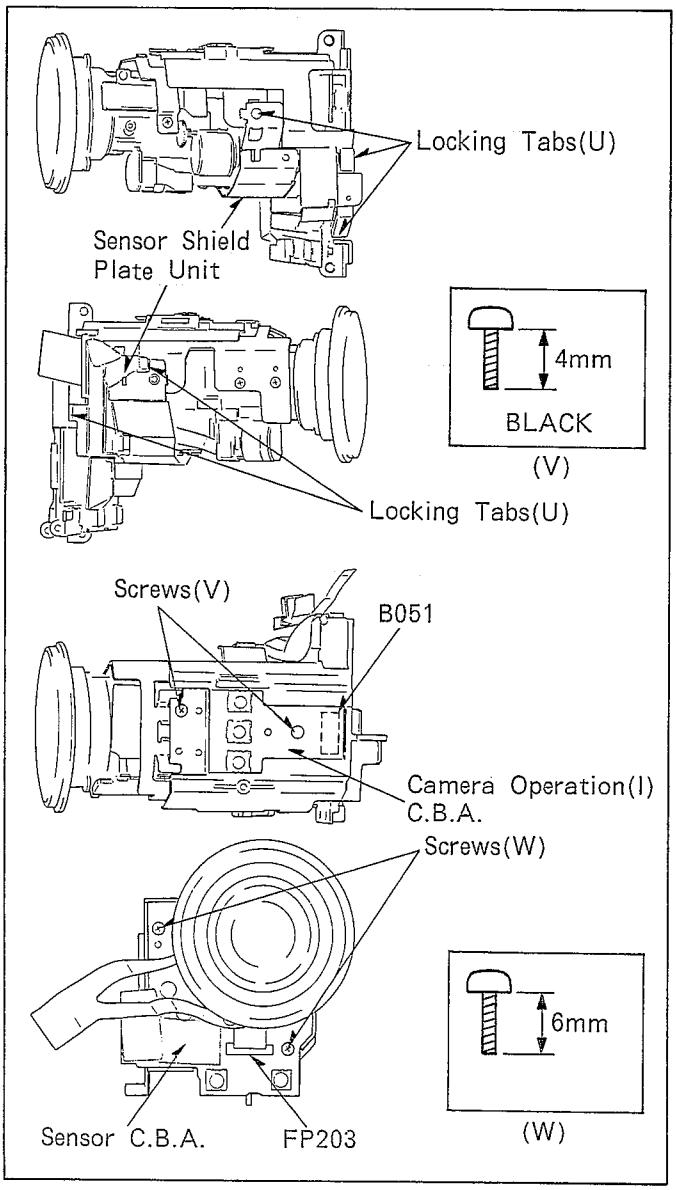


Fig. D14

2-2 REPLACEMENT OF THE CYLINDER UNIT

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

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.

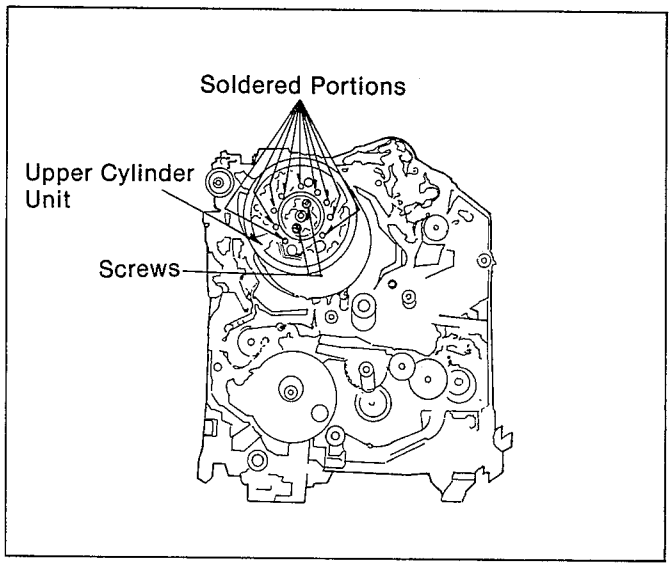


Fig. D15

4. The Upper Cylinder Unit can be reinstalled by reversing the removal procedure, however, when the Upper Cylinder is reinstalling, be extremely carefull so that white portion of circuit Board of the Upper Cylinder correctly matches the white portion of the bottom Cylinder.

Note:
1) If the Upper Cylinder Unit is reversely installed, no colour will appear when play back a pre-recorded tape.

13 Removal of Camera Unit.

Remove ..... 4 Screws(T)
Connector(B071)

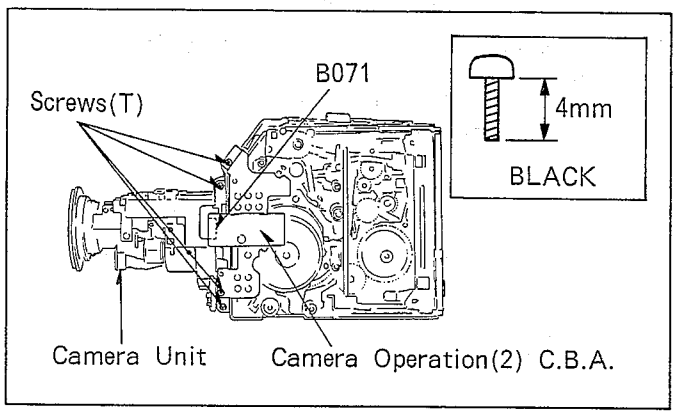


Fig. D13

14. Removal of Sensor C.B.A.

Unlock ..... 5 Locking Tabs(U)
Remove ..... 2 Screws(V)
Connector(B051)
2 Screws(W)
Connector(FP203)

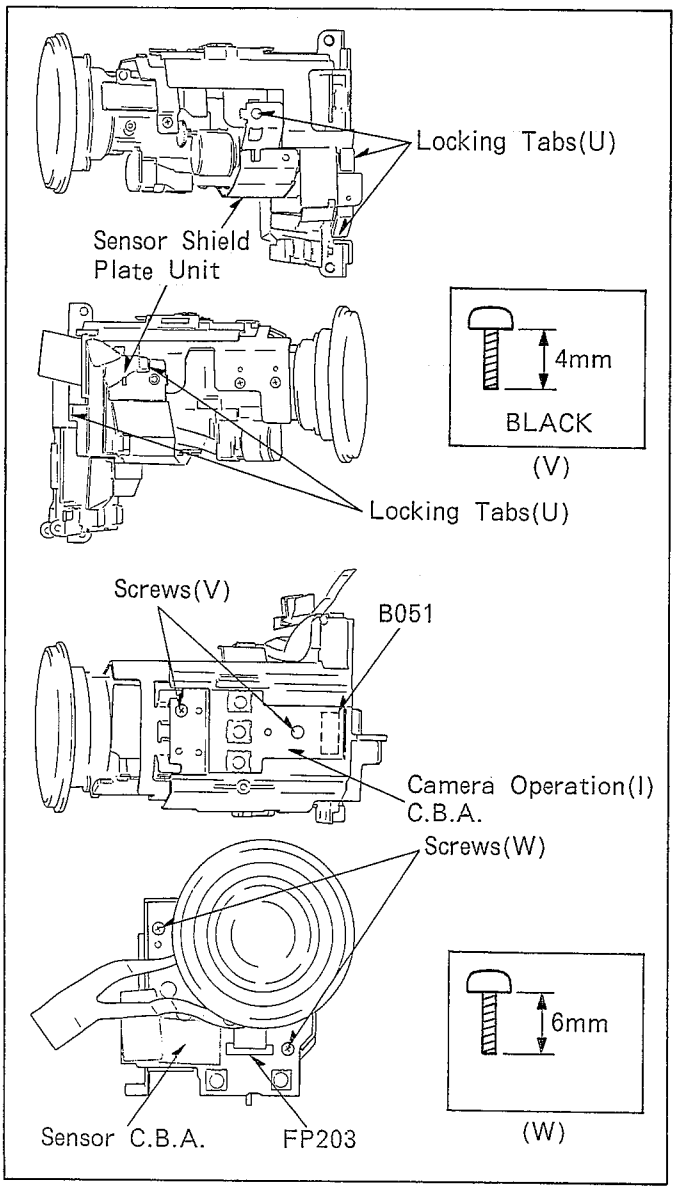


Fig. D14

2-2 REPLACEMENT OF THE CYLINDER UNIT

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

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.

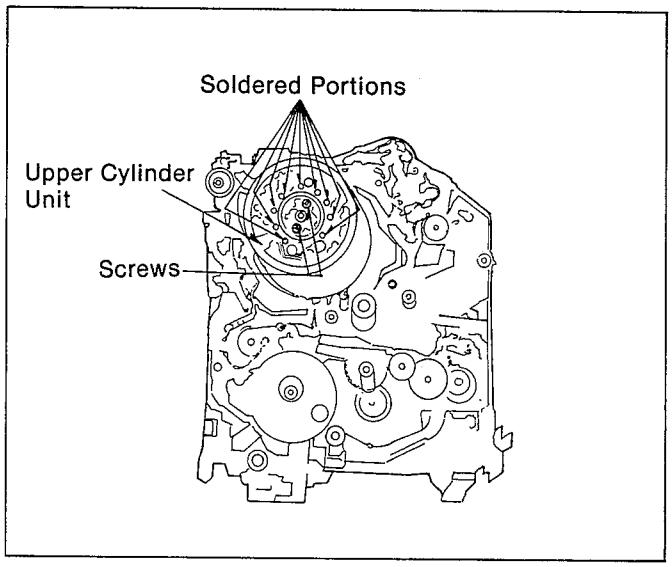


Fig. D15

4. The Upper Cylinder Unit can be reinstalled by reversing the removal procedure, however, when the Upper Cylinder is reinstalling, be extremely carefull so that white portion of circuit Board of the Upper Cylinder correctly matches the white portion of the bottom Cylinder.

Note:
1) If the Upper Cylinder Unit is reversely installed, no colour will appear when play back a pre-recorded tape.

2-2-2 REPLACEMENT OF DD CYLINDER UNIT

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

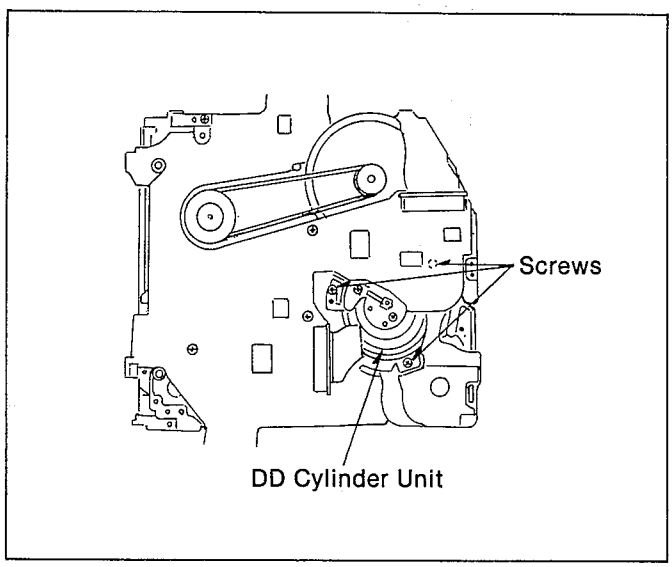


Fig. D16

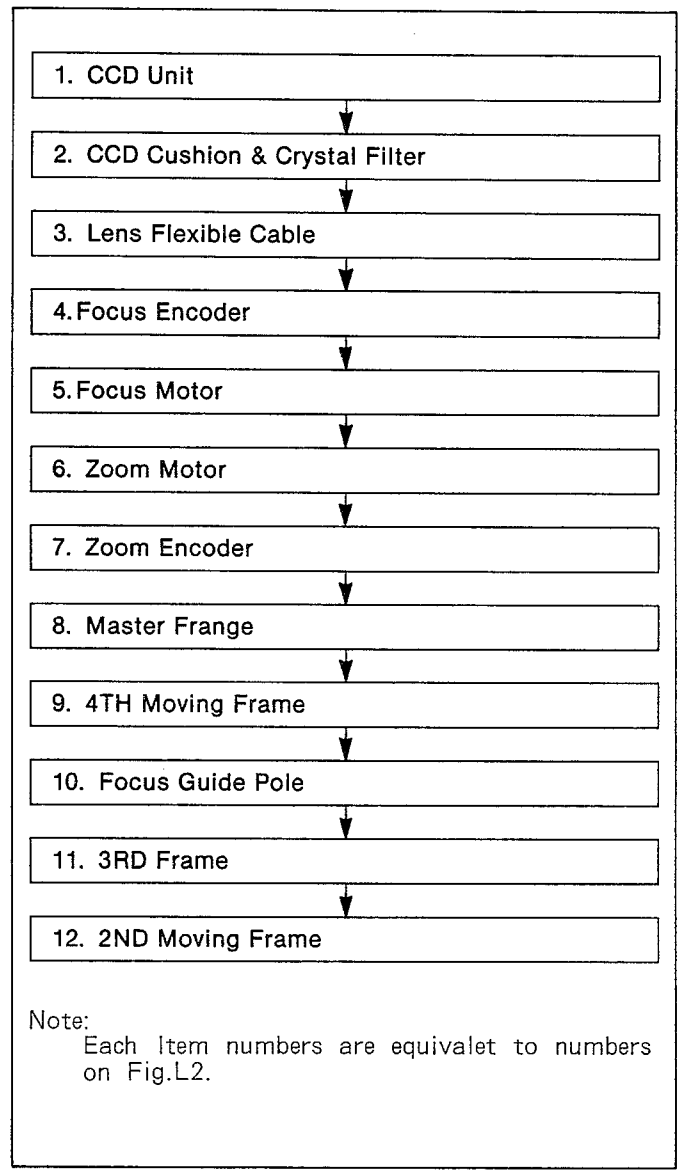
Note:
Since there is very little clearance between the D.D. Cylinder Unit and the chassis, remove the D.D. Cylinder Unit carefully.

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 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.



Note:
Each Item numbers are equivalet to numbers on Fig.L2.

Fig. L1

2-2-2 REPLACEMENT OF DD CYLINDER UNIT

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

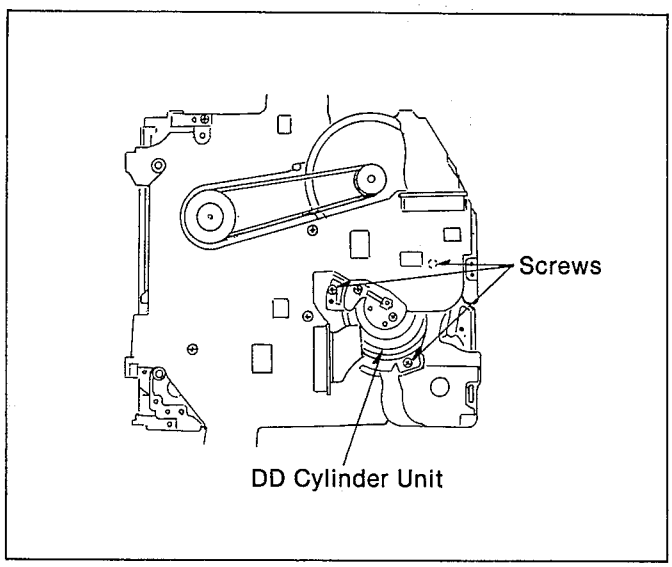


Fig. D16

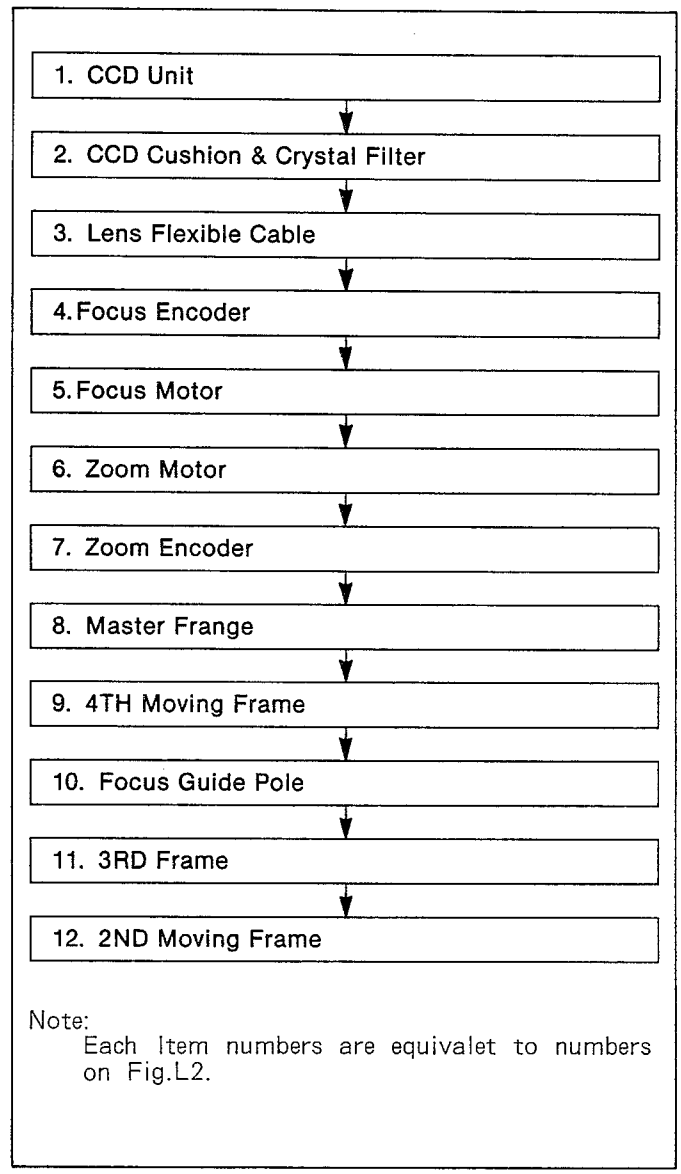
Note:
Since there is very little clearance between the D.D. Cylinder Unit and the chassis, remove the D.D. Cylinder Unit carefully.

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 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.



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Each Item numbers are equivalet to numbers on Fig.L2.

Fig. L1

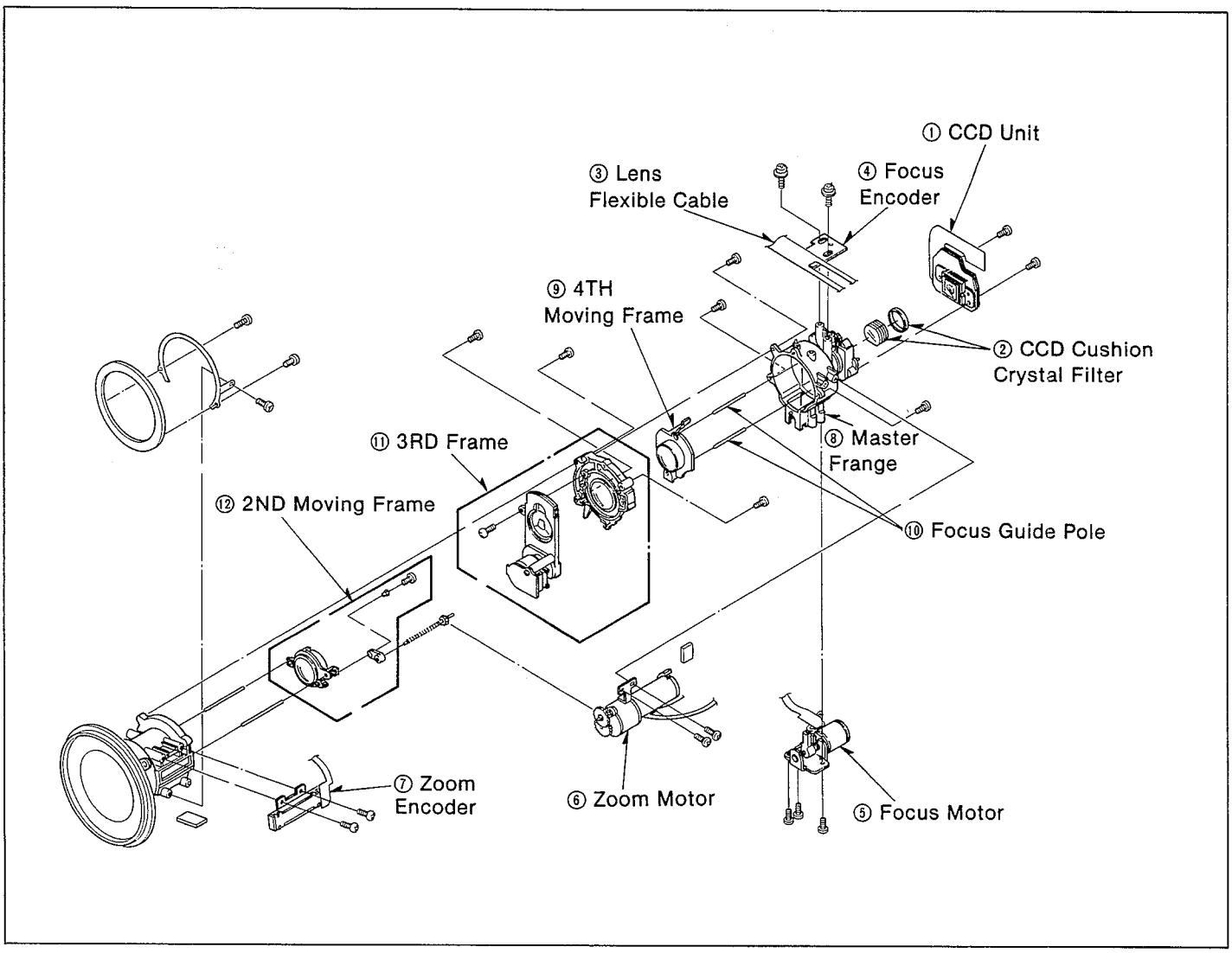

① CCD Unit
③ Lens
Flexible Cable
④ Focus
Encoder
⑨ 4TH
Moving Frame
② CCD Cushion
Crystal Filter
⑪ 3RD Frame
⑧ Master
Frange
⑫ 2ND Moving Frame
⑩ Focus Guide Pole
⑦ Zoom
Encoder
⑥ Zoom Motor
⑤ Focus Motor

Fig. L2

2-4 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 cam gear decides all further mechanical movement of the mechanical parts such as levers,gears,rollers and so on. If these parts are fixed improperly,the units will be unloaded or compulsory stopped.
And it will result being damaged at any mechanical or electrical parts.

2-4-1. ASSEMBLY PROCEDURES OF T-RAIL UNIT AND LOCK BASE.

(1). Install a T-Rail Unit and Lock Base Unit as shown in Fig. M1 and M2.

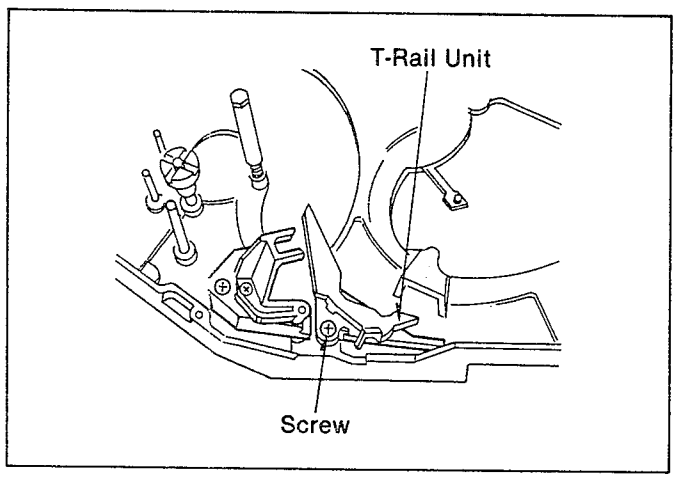


Fig. M1

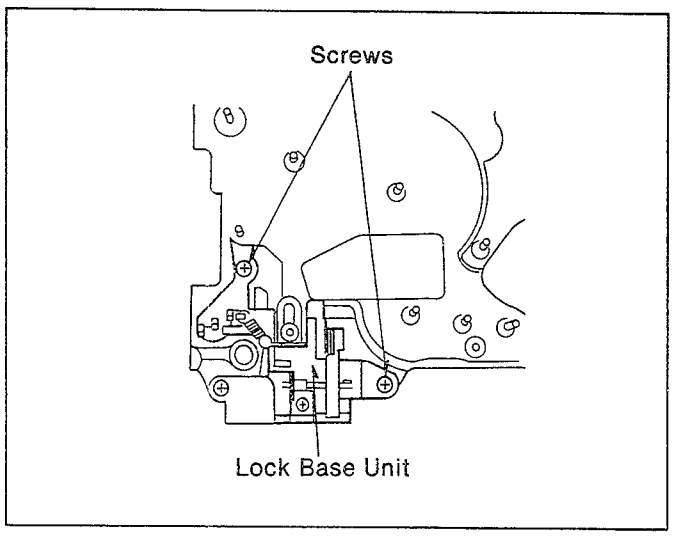


Fig. M2

2-4-2. ASSEMBLY PROCEDURES OF CAM GEAR AND ZENEBA GEAR

(1). Install a Cam Gear so that phase mark on the Cam Gear,with its point turned up,and then insert the Cut washer as shown in Fig.M3.

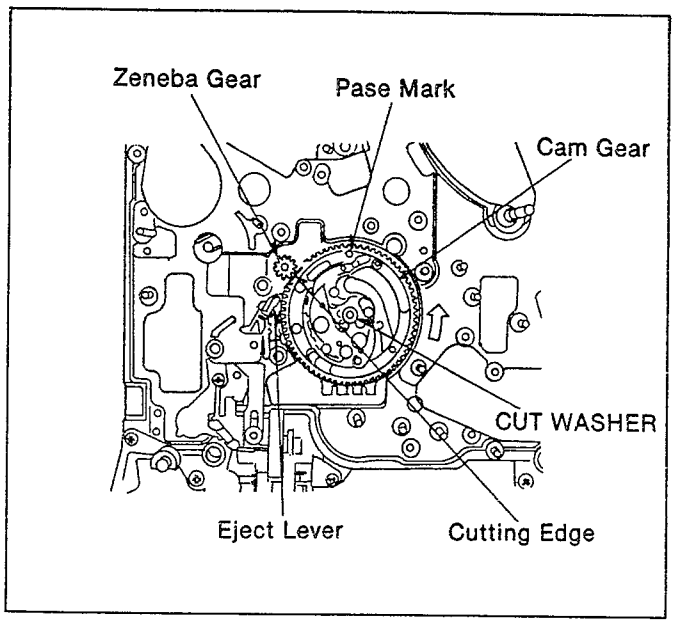


Fig. M3

NOTE:
If can't install the Cam Gear,Eject Lever caught on the Cam Gear.
The Cam Gear turn to the left for free from the Eject Lever and then install a Cam Gear.

(2). Install the Zeneba Gear so that cutting edge of the Zeneba Gear face to the Cam Gear as shown in Fig.M4.

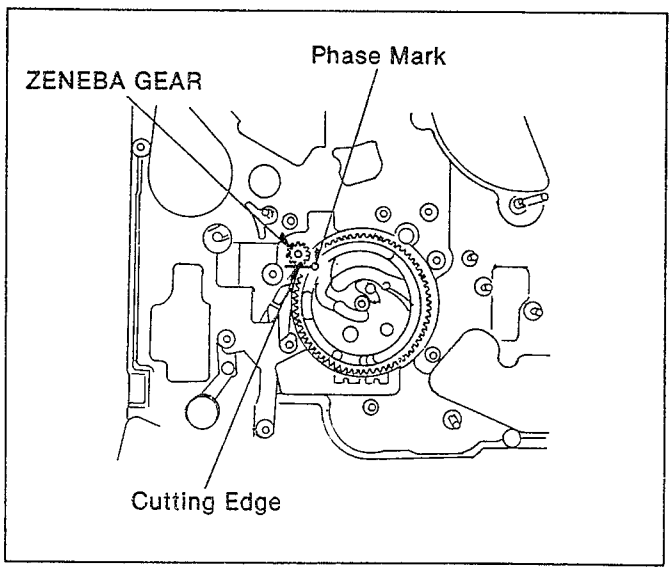


Fig. M4

NOTE:
When installation of the these Gears are finished,make sure that phase mark on the Cam on the Cam Gear face to the Zeneba Gear.

2-4-3 ASSEMBLY PROCEDURES OF S-BOARD UNIT AND GEAR

(1). Install the S-Board Unit as shown in Fig.M5.

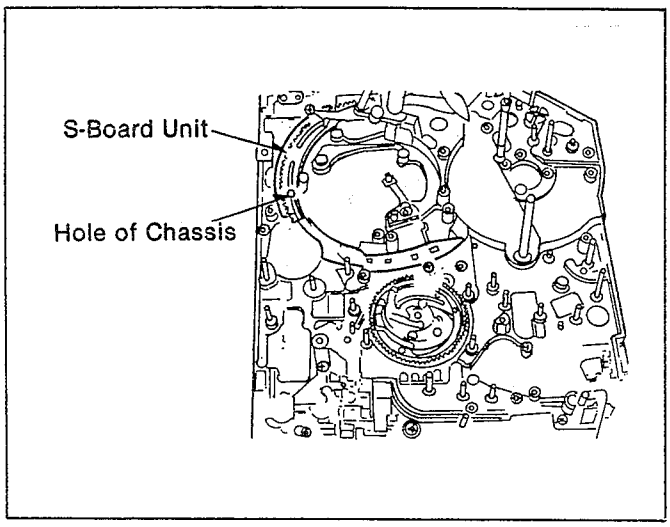


Fig. M5

NOTE
1: S-Board Unit contain the S-Rack,S-Rack Guide,S-Shaft Holder Unit and S2 Roller Post unit.

NOTE
2: The hole of S-Rack is exactly in line with the hole of chassis.

(2). Install the Loading Gear-S so that the hole of Loading Gear is exactly in with the hole of metal frame of Loading Gear-S Unit as shown in Fig.M6.

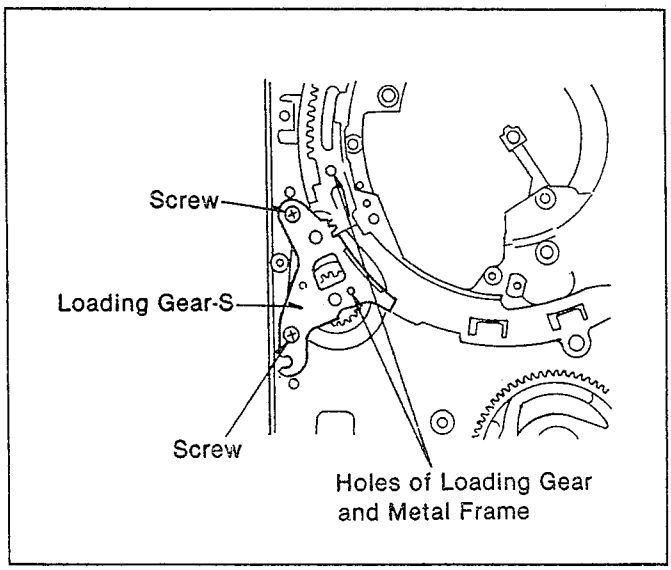


Fig. M6

2-4-4 ASSEMBLY PROCEDURES OF T-RACK GUIDE, T-RAIL, LOADING GEAR T2, LOADING GEAR T1, AND LOADING GEAR 5

(1). Install the T-Rack Guide as shown in Fig.M7.

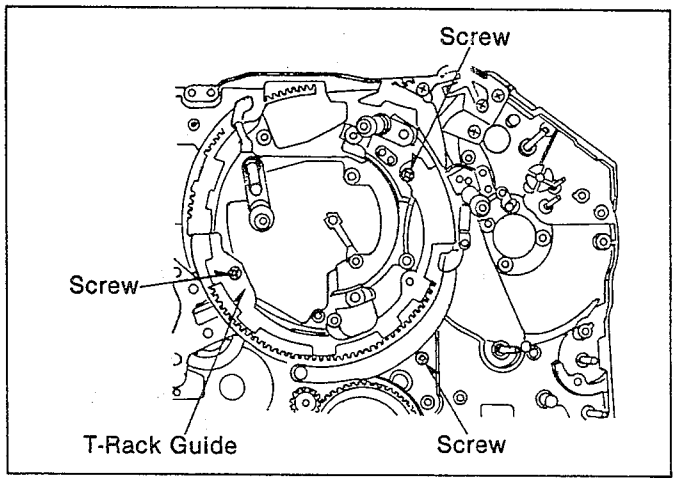


Fig. M7

(2). Install the T-Rail(R) Unit as shown in Fig.M8

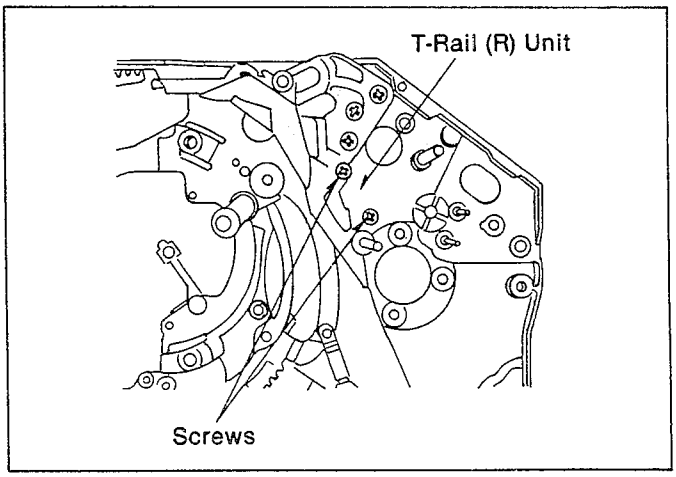


Fig. M8

(3). The 1st tooth on the T-Rack Guide face to the hole of Guide as shown in Fig.M9.

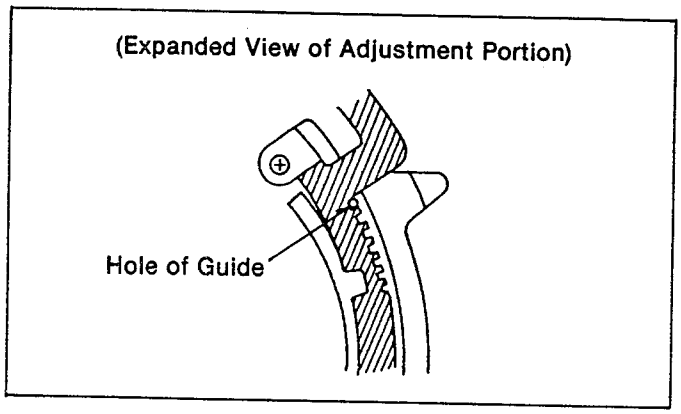


Fig. M9

(4). Install the Loading Gear–T2 so that the mark on the the Loading Gear T2 is exactly in line with the mark of Loading Gear S as shown in Fig. M10 and M11.

(5). Install the Loading Gear–T1 so that the mark on the Loading Gear–T1 is exactly in line with the hole of T–Rack Guide.

(6). Install the Loading Gear 5.

(7). Insert the Cut Washer to each Loading Gear when phase of each gears are collect.

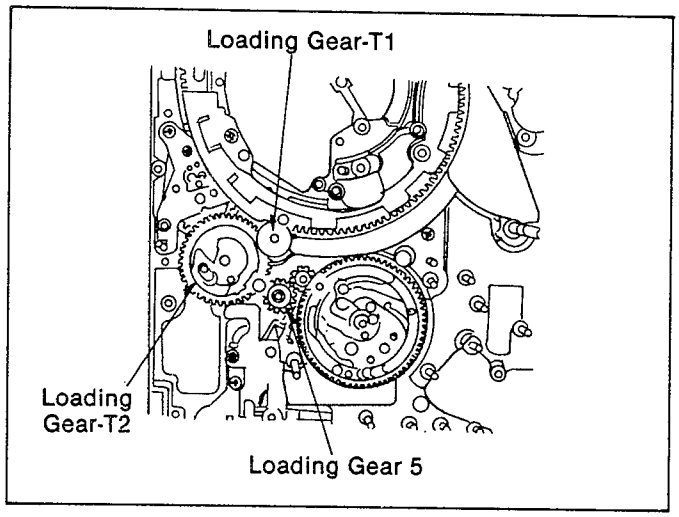


Fig. M10

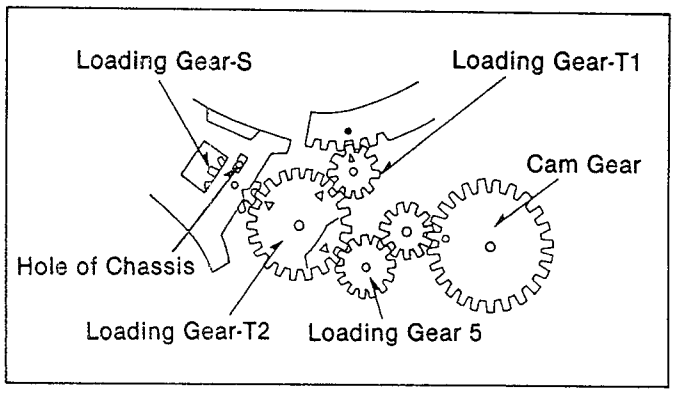


Fig. M11

2-4-5 ASSEMBLY PROCEDURES OF BAND GUIDE AND S-RAIL UNIT.

(1). Install the Band Guide and then insert the Cut Washer as shown in Fig.M12.

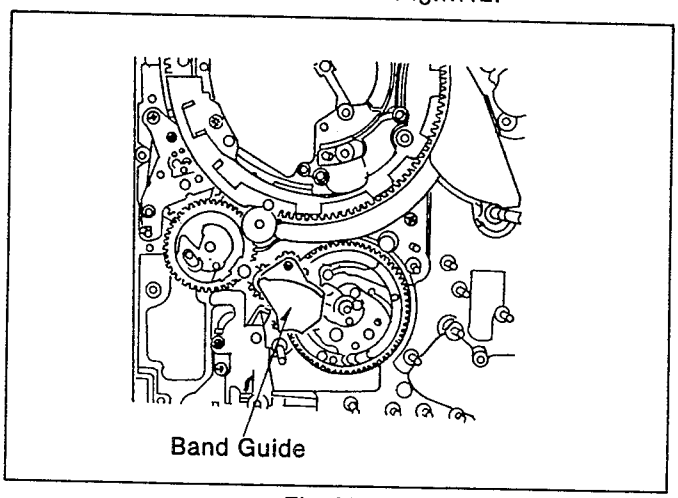


Fig. M12

(2). Install the S–Rail Unit and then tighten the 3–Screws as shown in Fig.M13.

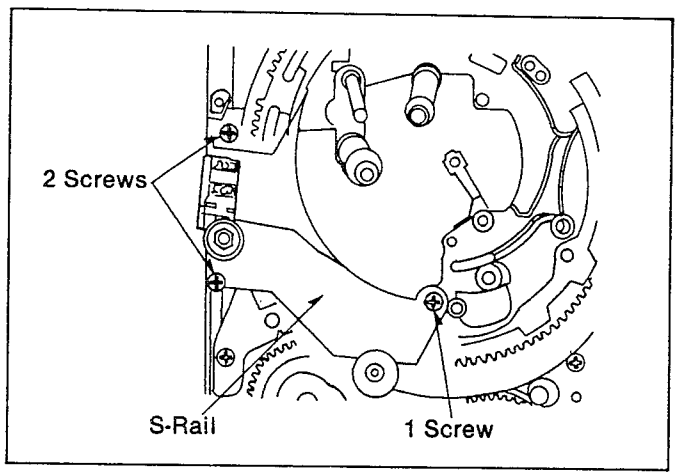


Fig. M13

2-4-6 ASSEMBLY PROCEDURES OF T-RAIL AND S-TV STOPPER.

(1). Install the T–Rail and then tighten the 3–Screws as shown Fig.M14.

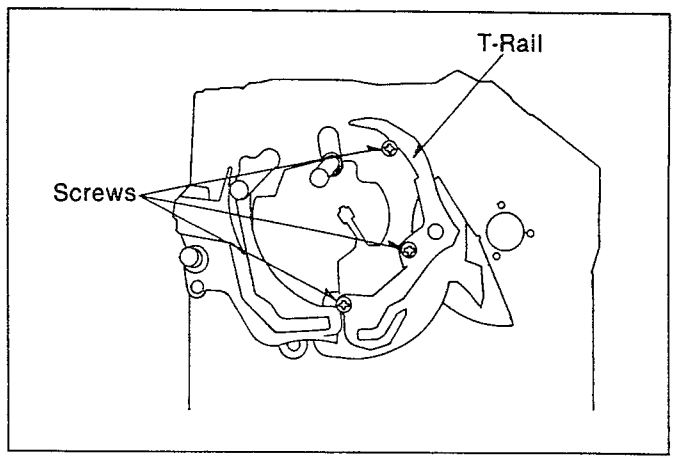


Fig. M14

(2). When installting of T-Rail finished,turn the Cam Gear to counter-clockwise that set the Roller Posts into stop position as shown in Fig. M15 and M16.

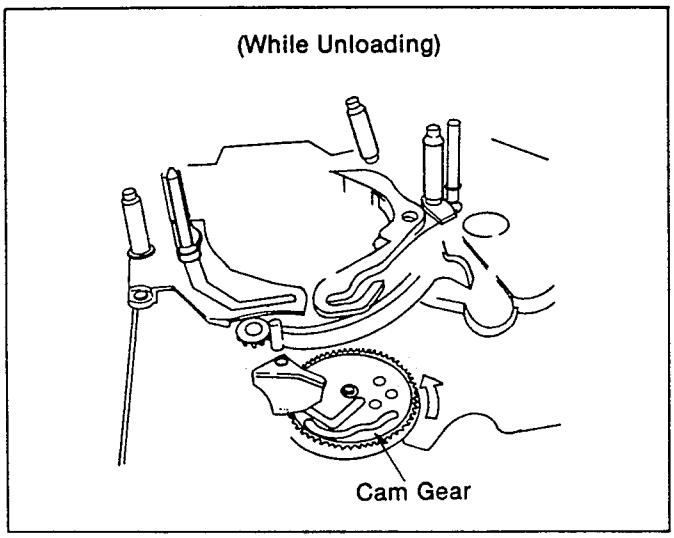


Fig. M15

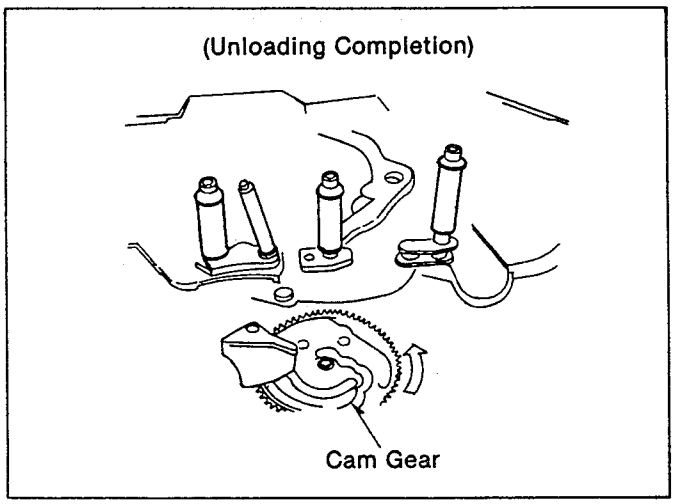


Fig. M16

NOTE:
Roller posts is made up of S2 Roller post, T-Roller Post,and Roller Post.

(3). Install the S-TV Stopper and then tighten the 2-Screws as shown in Fig.M17.

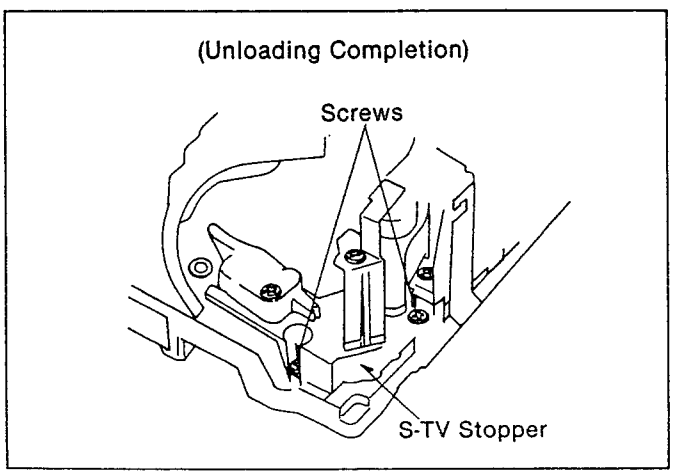


Fig. M17

NOTE:
Before install of the S-TV Stopper,install the the Impedance Roller unit into the S-TV stopper.

2-4-7 ASSEMBLY PROCEDURES OF SECTOR GEAR AND PINCH ARM UNIT

(1). Install the Sector Gear so that insert the pin of Sector Gear in the ditch on the Cam Gear.
And insert the Pin to the Sector Gear from the Mechanism chassis as shown in Fig.M18.
After that,install the 2-Springs.

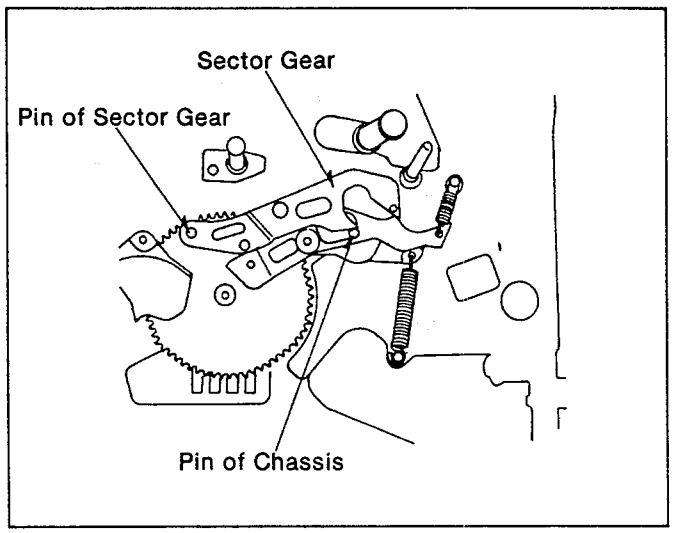


Fig. M18

(2). When the installating of the Sector Gear is finished,turn the Cam Gear to clockwise that set the Mechanism to play position(loading end) as shown in Fig.M19.

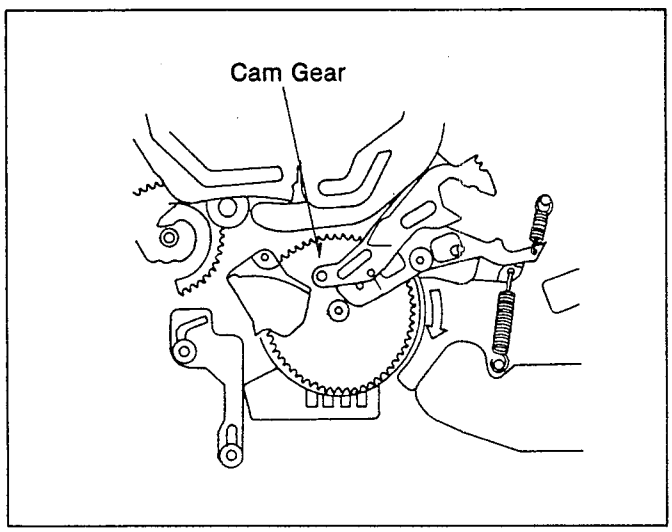


Fig. M19

(3). Install the Pinch Arm Unit,and then insert the E-Ring as shown in Fig. M20 and M21.

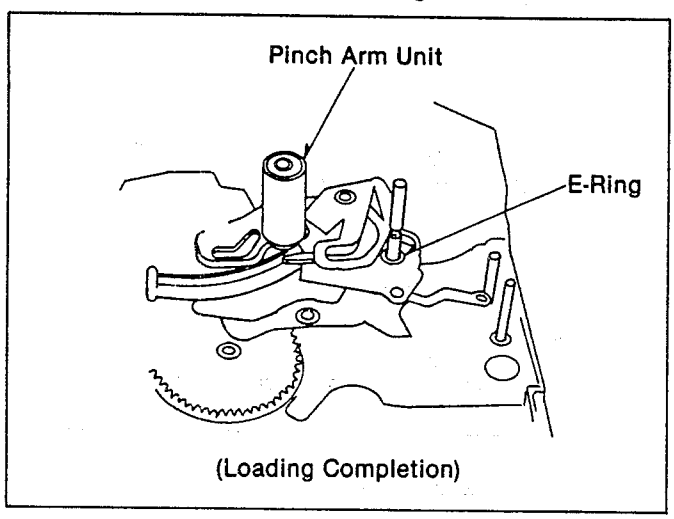


Fig. M20

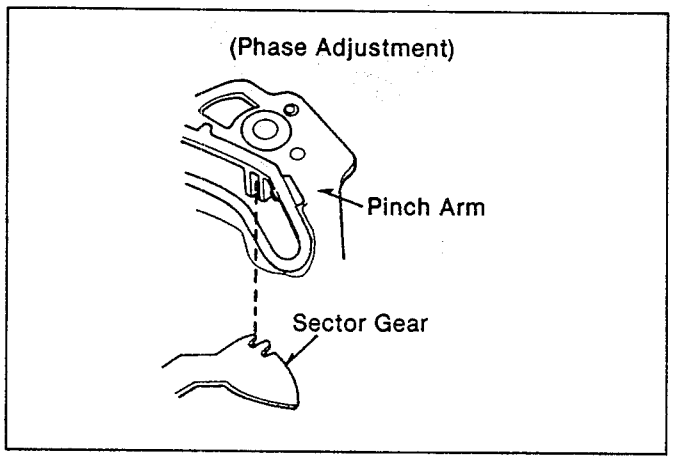


Fig. M21

(4). Insert the T1-returner Spring so that insert a hooked end(short side) in the hole of the Pinch Arm Base as shown in Fig.M22.

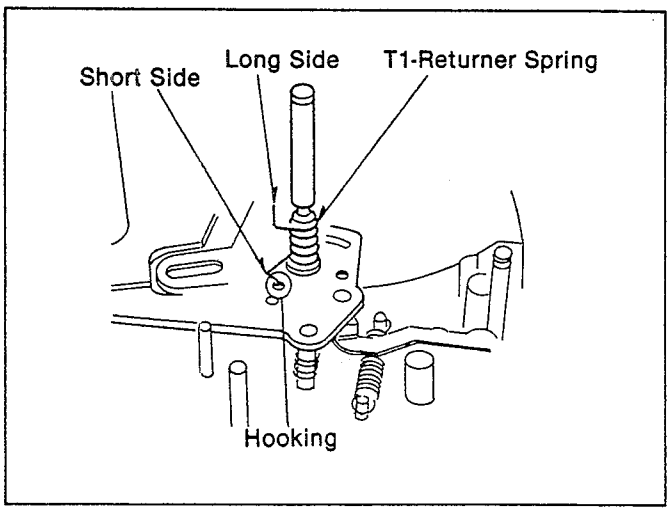


Fig. M22

(5) Make sure of up side of T1-Returner,after that install the T1-Returner.
Then insert hooked end(long side) of T1-Returner Spring in the hole of T1-Returner.
Then,turn the T1-Returner to clockwise.
Finally,insert the E-ring as shown in Fig.M23

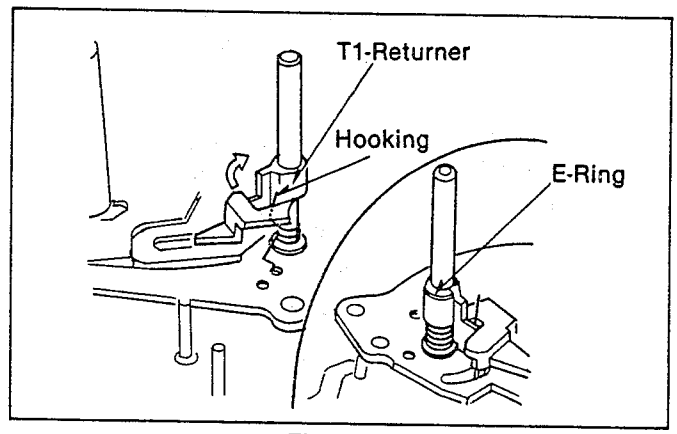


Fig. M23

(6). Insert the Tape Opener Spring,and then fix the Tape Opener as shown in Fig.M24.

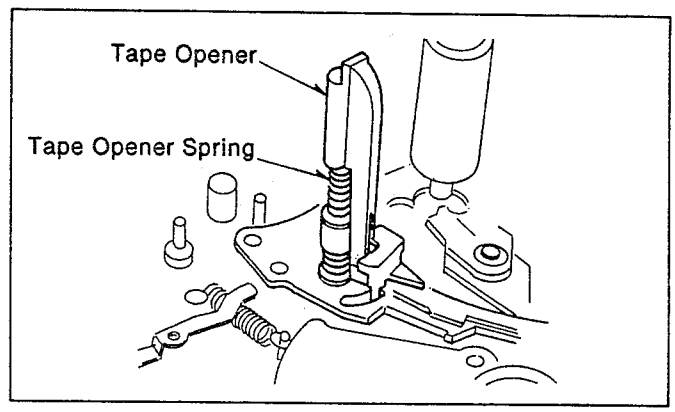


Fig. M24

2-4-8. ASSEMBLY PROCEDURES OF T-LUTCH GEAR AND DRIVE GEAR.

(1). Turn the Cam Gear to counterclockwise that set the Mechanism to stop position(unloading end)as shown in Fig.M25.

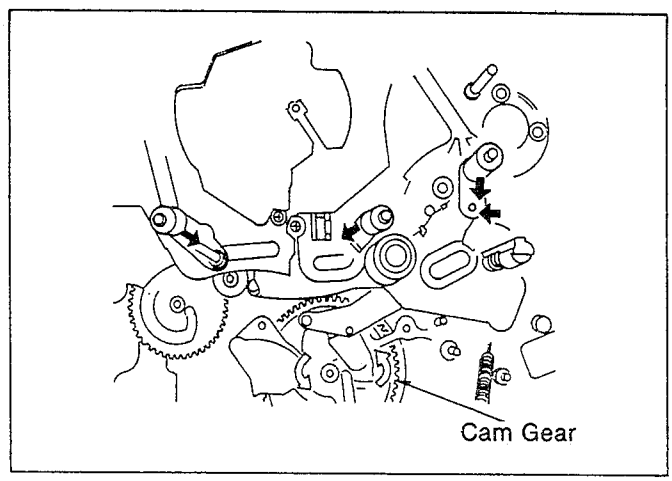


Fig. M25

(2). Install the T-Clutch gear and then insert the Cut Washer,after that install the Drive Gear D, C and A

And then insert the Cut Washer to the each Drive Gears as shown in Fig.M26.

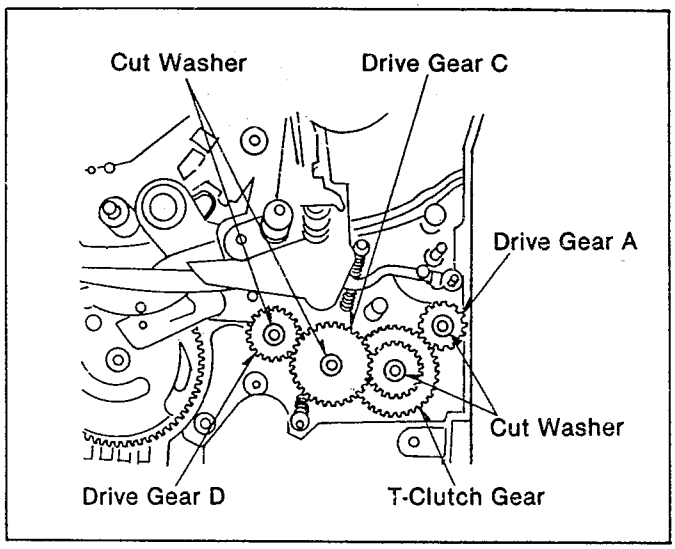


Fig.M26

2-4-9. ASSEMBLY PROCEDURES OF LOADING MOTOR AND LOADING GEAR 2, 3, 4

(1). Install the Loading Motor Unit and tighten the 2 Screws as shown in Fig.M27.

(2). Install the Loading Gear 4 as shown in Fig. M27.

(3). Insert the washer and then install the Loading Gear 2.

(4). Insert the washer,then install the loading Gear 3.

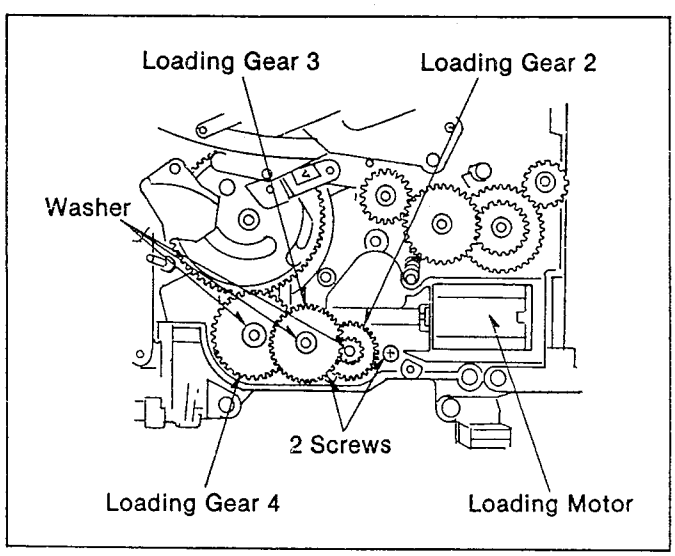


Fig. M27

NOTE : Up side of Loading Gear 4 has rib on inside circle.

2-4-10. ASSEMBLY PROCEDURES OF PULLEY PLATE UNIT AND PULLEY

(1). install the Pulley Plate and then tighten the 2 Screws as shown in Fig.M28.

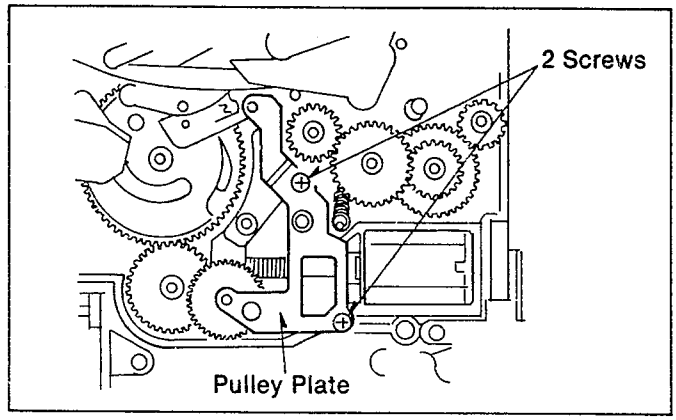


Fig. M28

(2). Insert the Washer and the pulley from reverse side of chassis,after that install the pulley cap as shown in Fig.M29.

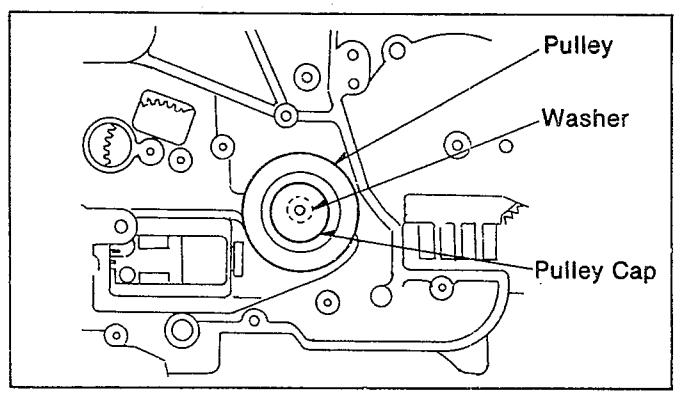


Fig. M29

2-4-11 ASSEMBLY PROCEDURES OF CORRECTOR DRIVE ARM UNIT AND CORRECTOR A, CORRECTOR C.

(1). Insert the washer to point c and install the Corrector Drive Arm.
And then insert the Cut Washer as shown in Fig.M30.

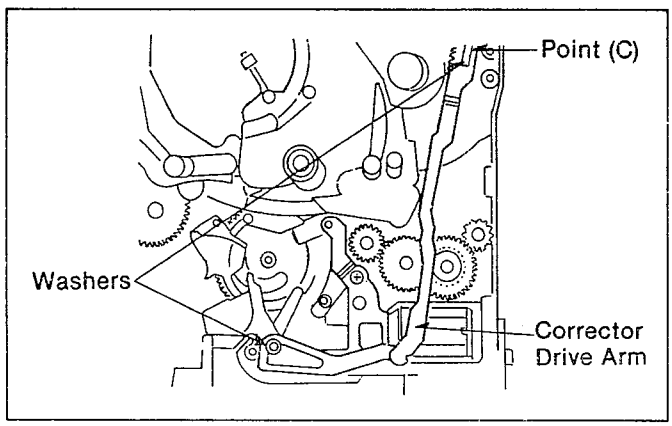


Fig. M30

(2). Install the Corrector (A) so that the first tip of Corrector Drive Arm comes to first tip of Corrector (A).
After that set a spring in the Corrector (A).
And then insert the Cut Washer to mount it as shown in Fig.M32 and M33.

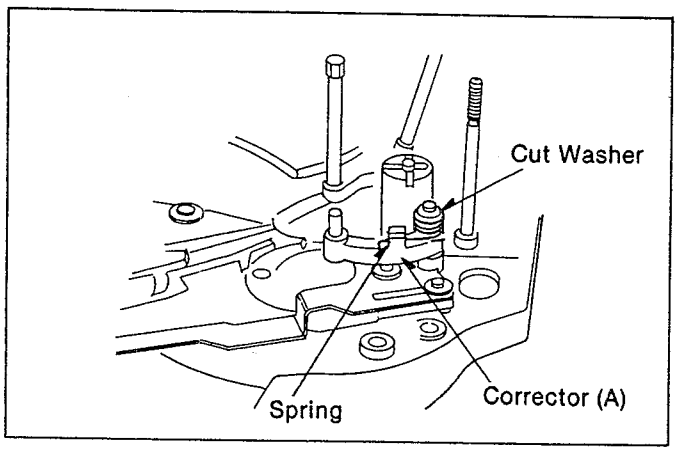


Fig. M31

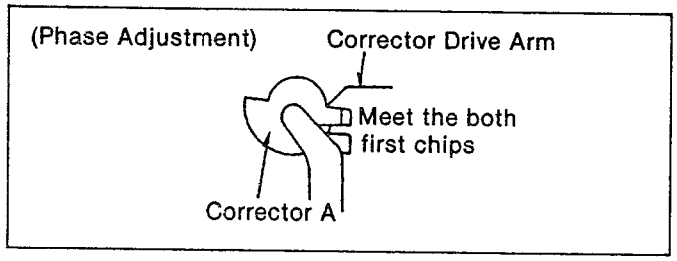


Fig. M32

(3). Install the Corrector C and the set a Spring in the Corrector C.
After that insert the Cut Washer to mount it as shown in Fig.M33.

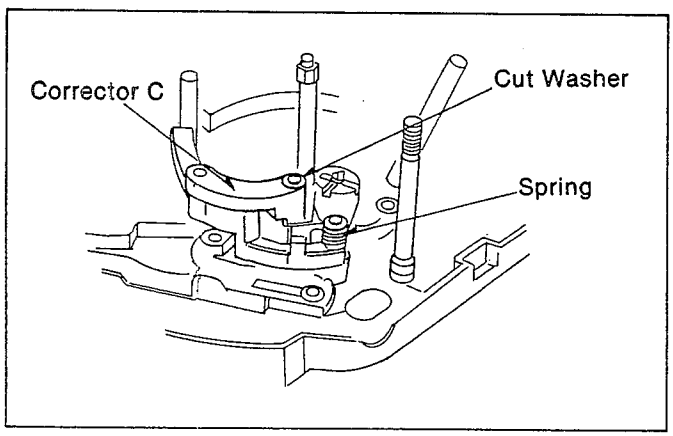


Fig. M33

2-4-12. ASSEMBLY PROCEDURES OF CENTRE GEAR AND T5 ARM

(1). Insert the Washer and then install the Centre Gear.
After that insert the Cut Washer to mount it as shown in Fig.M34.

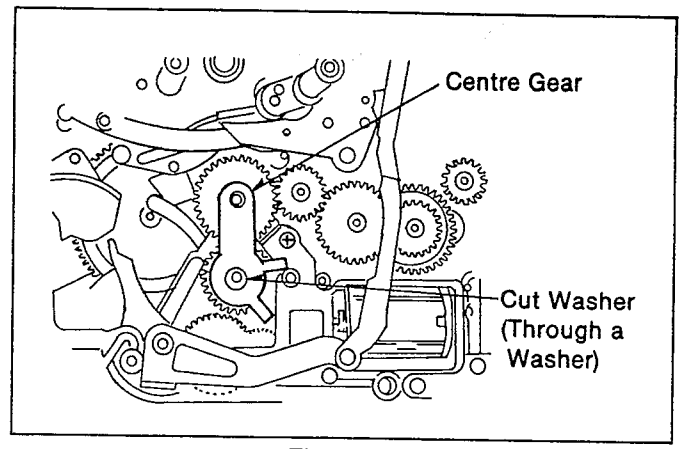


Fig. M34

(2). Insert the T5 Arm Spring and then install the T5 Arm.
The T5 Arm connect to the Center Gear.
After that insert the E Ring to mount it.

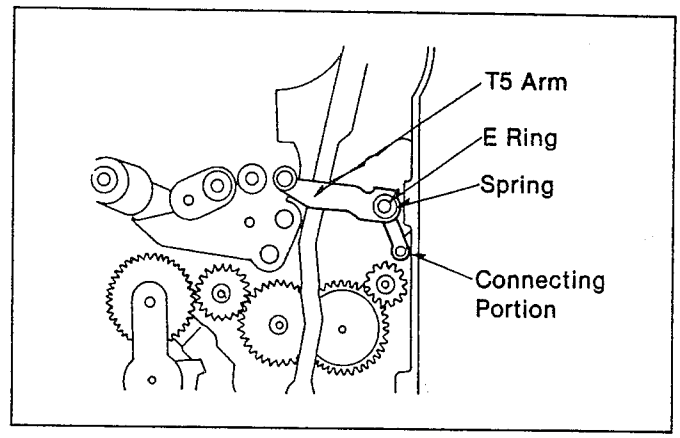


Fig. M35

2-4-13 ASSEMBLY PROCEDURES OF TENSION REGULATOR UNIT AND SUPPLY REEL TABLE.

(1). Insert the Washer and then install the Tension Regulator Unit so that the Tension Band Arm of Tension Regulator Unit connect to the Loading Gear.
fter that insert the Cut Washer as shown in Fig.M36.

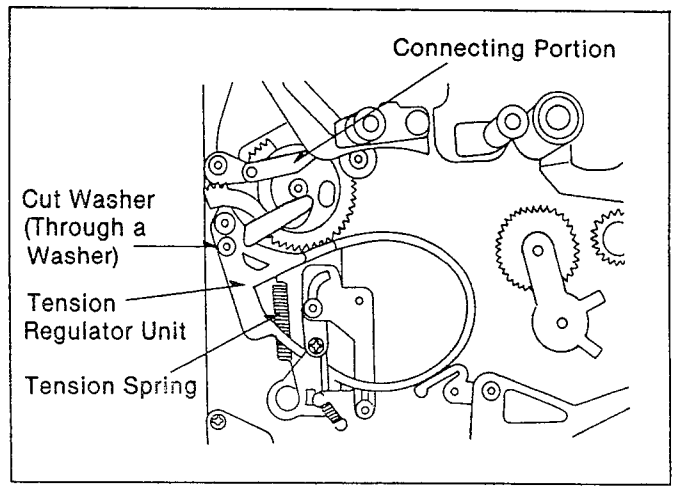


Fig. M36

(2) Set the Tension Spring in the Lock Base Unit.

(3) Insert the Washer and then install the Tension Arm so that make sure of phase between the
Tension Arm and Tension Band as shown in Fig.M37.
After that insert the Cut Washer to mount it.

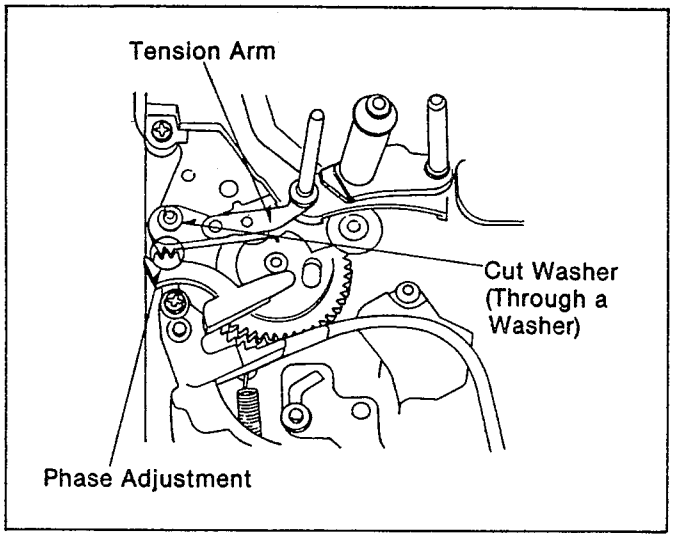


Fig. M37

(4). Insert the Washer and then install the Supply Reel Table,after that insert the Cut Washer to mount it.

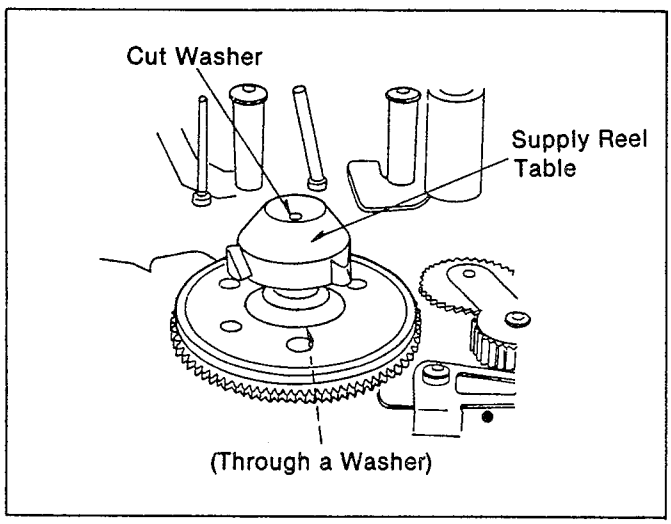


Fig. M38

2-4-14. ASSEMBLY PROCEDURES OF A/C HEAD AND CAPSTAN MOTOR UNIT

(1). Install the A/C Head Spring and the A/C Head.

(2). Tighten the hight Adjustment Screw for A/C Head.

NOTE:
Specification of Hight Adjustment of A/C head is as same as interchangebility adjustment.

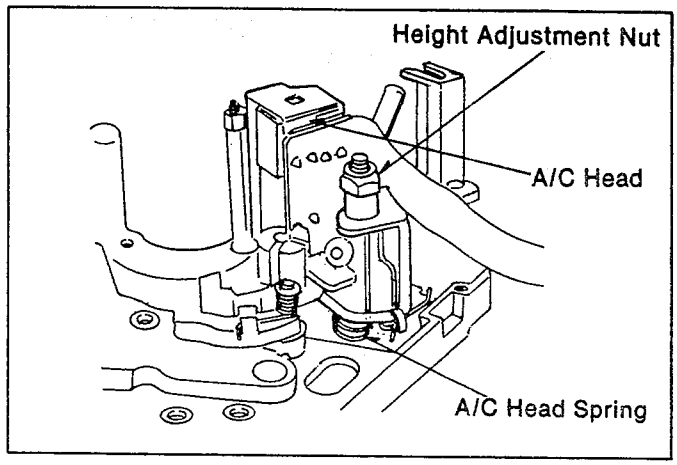


Fig. M39

(3). Install the Capstan Motor and the tighten the 3 screws as shown Fig.M40.

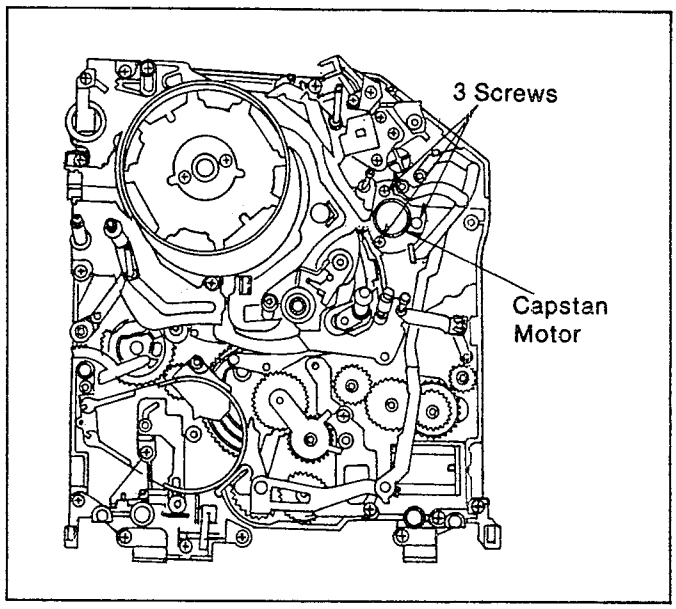


Fig. M40

2-4-15. ASSEMBLY PROCEDURES OF CYLINDER UNIT

(1). Install the Cylinder unit from the top side. and then tighten the 3-Screws as shown Fig.M41.

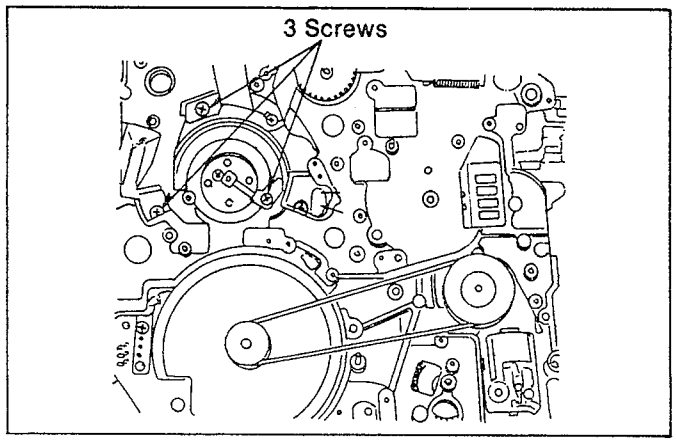


Fig. M41

2-5. INTERCHANGEABILITY ADJUSTMENT

2-5-1 ADJUSTMENT OF BACK TENSION

*Equipment Required.
Tension meter
Alignment tape (VFM8180HUPF)
Specification 17+−2g.

(1) Remove the Impedance Roller.
(2) Insert the cassette tape and playback the tape.
(3) Insert the Tension Meter to Mechanism as shown Fig.T1.

If Back tension is high, spring position change to a.
If Back tension is low, spring position change to c as shown Fig. T2

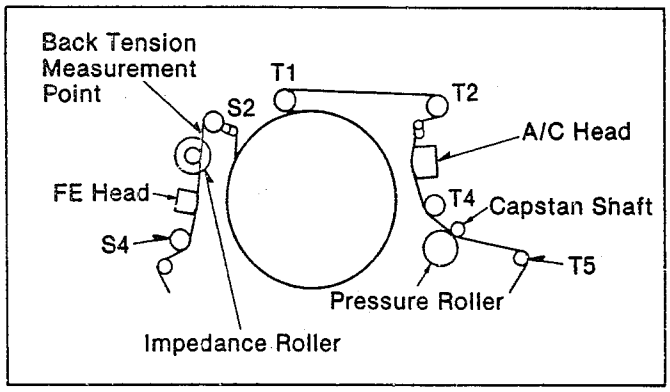


Fig.T1

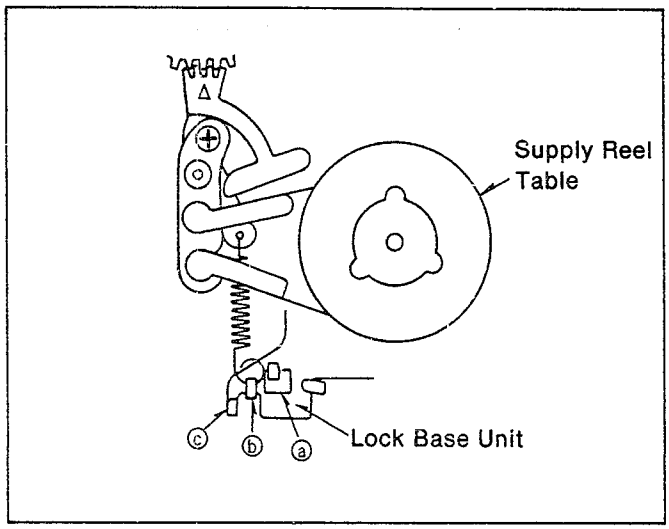


Fig.T2 S-REEL TABLE LOCK.BASE UNIT

(4) After check the Back tension, install the impedance Roller.

2-5-2. HEIGHT ADJUSTMENT OF TAPE GUIDE POST (PRELIMINARY ADJUSTMENT)

Height adjustment of S4 Post, T4 POST, T5 Post specification.

S4 Post: 17.125+−0.025mm
T5 Post: 17.175+−0.025mm
T4 Post: 17.175+−0.025mm

(1) For adjustment S4 Post height, turn 4mm Nut (A) Slightly in either direction as necessary to the correct clearance between the uuper edge of lower tape guide on S1 Post and lower portion of Mecha chassis Fig. T3 4mm Nut A. upper edge of the Lower tape guide.

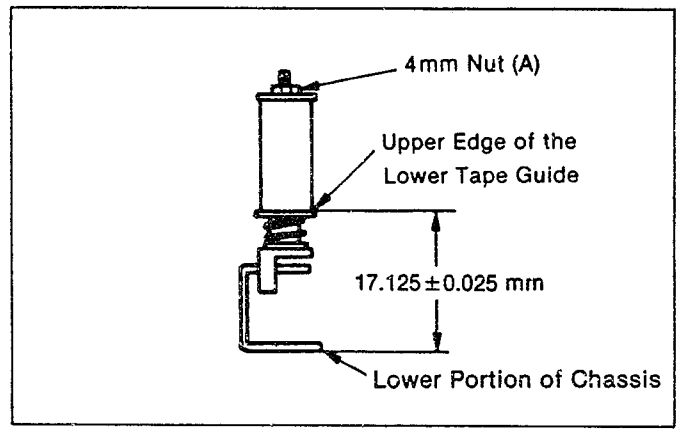


Fig. T3

Confirmation of Tape Travel
(1) Playback a cassette tape and confirm that the tape travels Without curling at upper and lower guides on posts T4, T2, S4 and S2. Fig. T4.

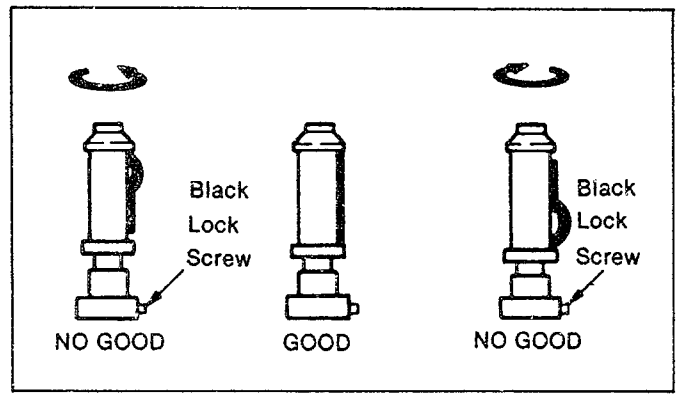


Fig. T4

(2) If curing is apparent adjust the height of posts by turning the top of post With Hex Wrench.

Note:
Before turning S2 and T1, slightly loosen the Black Lock screw useing the Screw driver.

2-5-3. TAPE INTERCHANGEABILITY ADJUSTMENT

NOTE:
1) To perform these adjustment/confirmation procedures make sure that the Tracking control is set in fixed position by connecting the jumper wire between P6007–6 and GND.

2) Before these adjustment/confirmation procedures,remove the cassette protective tape cover from a cassette tape or the Alignment tape (VFM8180HUPF).

*Equipment Reqaired
Dual Trace Oscilloscope
Alignment tape (VFM8180HUPF)

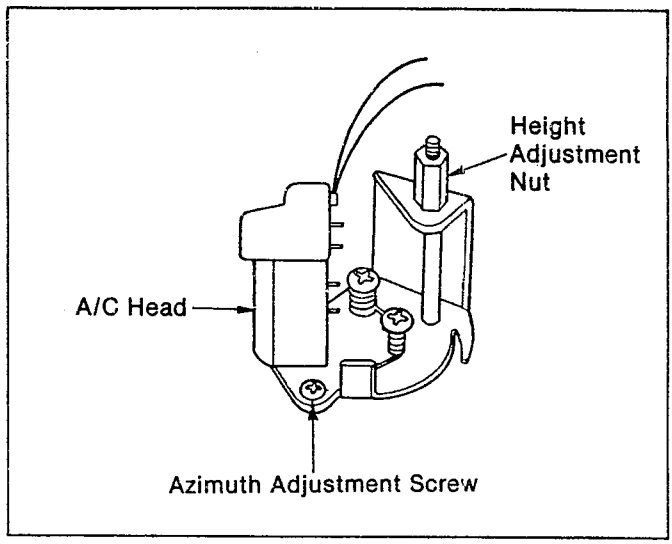


Fig. T6

2-5-4. CONFIRMATION OF TAPE TRAVEL

(1) Confirmation of A/C Head. This confirmation is required when the A/C Head or capstan Motor is replaced and for preliminary height adjustment
(2) Looking at the lower edge of the control Head with the tape in motion, ensure that lower edge of the tape runs 0.25mm above the lower edge of control Head. If it doesn't turn the A/C Head height Adjustment Nut slightly in either direction as necessary to correct it.

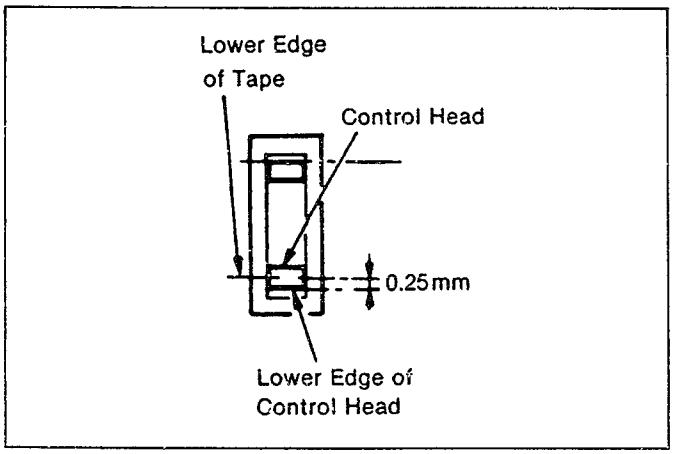


Fig.T5.

2-5-5. AZIMUTH ADJUSTMENT OF A/C HEAD.

(1) Connect the oscilloscope to Audio Line Output.
(2) Play back the Monoscope portion (6KHZ,MONO) of the Alignment tape.
(3) Adjust the Azimuth Adjustment screw on the A/C Head Base in Fig. T6 so that output level is at a maximum.

2-5-6. HORIZONTAL POSITION ADJUSTMENT OF A/C HEAD

(1) Set the tracking control to the fixed position by pushing both of the tracking control Up/Down switches, in at the same time. Connect the oscilloscope to P5001 pin 23.
(2) Playback the monoscope portion of the alignment tape and confirm that RF envelope appears as show Fig. T7

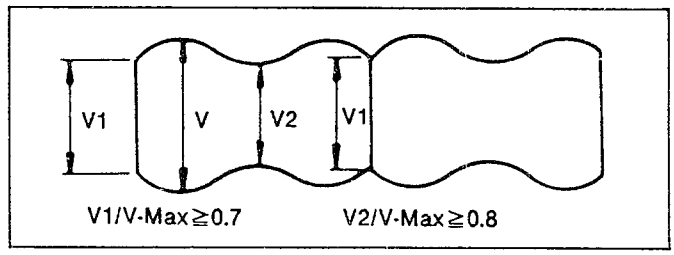


Fig. T7

(3) If adjustment is required, slowly move the A/C Head Base back and forth using a screwdriver by Turning screwdriver by Turning screw D so that envelope is at a maximum.

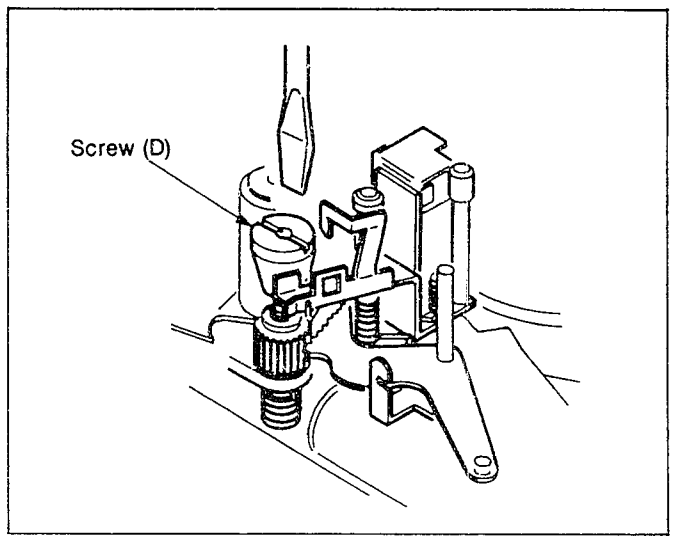


Fig. T8

(4) Confirmation of the correct adjustment can be made by alternately pushing the Traking control Up/Down Switches, to check the symmetry of the envelope.
(5) Reconfirm the symmetry of the envelope. If it has changed, repeat step (B) and (4).

2-5-7 CONFIRMATION/ADJUSTMENT OF ENVELOPE OUTPUT

(1) Set the tracking control to the fixed position by pushing both of the tracking control Up/Down Switches, connect the Oscilloscope to P5001 PIN23.
(2) Playback the Monoscope portion of the Alignment Tape and adjust the height of posts S2, T1 posts watching the scope display so that the envelope becomes as flat as possible. (V1/V-MAX>=0.7, V2/V-MAX>=0.8)
If adjustment is required, turn top of post with Hex, wrench for adjustment of S2 and T1.

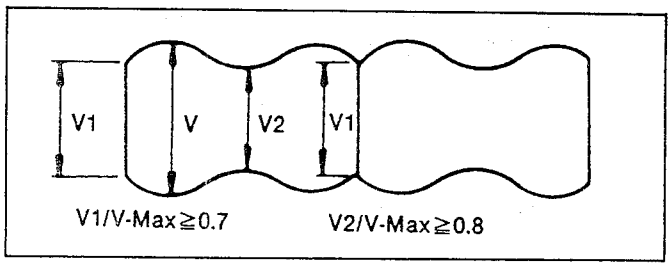


Fig. T9

(3) When the scope display is shown in Fig. T10 adjust the heihgt of S2 so that the wave looks like Fig.T12.

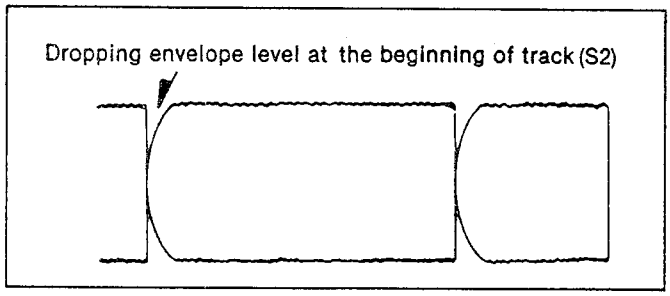


Fig. T10

(4) When the scope display is shown in Fig. T11. adjust the height of T1 so that the wave form looks like Fig. T12.
Fig. T11

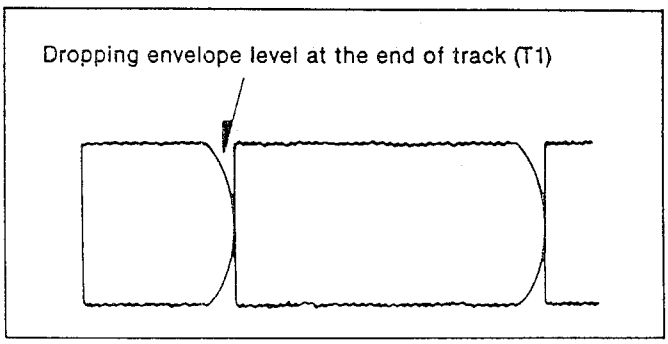


Fig. T11

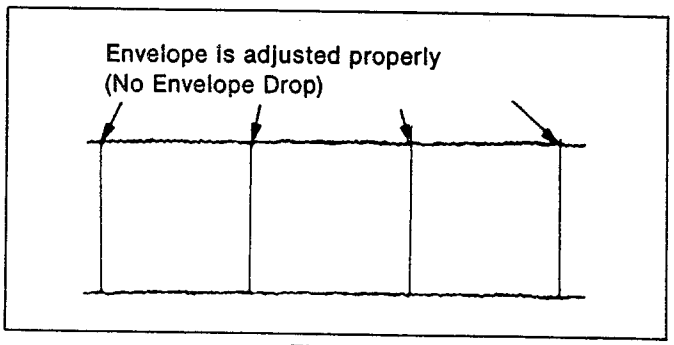


Fig. T12

2-6 ELECTRICAL ADJUSTMENT PROCEDURES

2-6-1 ELECTRICAL ADJUSTMENT FOR CAMERA SECTION

TEST EQUIPMENT AND TOOLS

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

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

* ROM1 (Part No.:VFK0701 ROM1)
ROM1 performs the adjustment with manual calculation for NV-G2/G1.

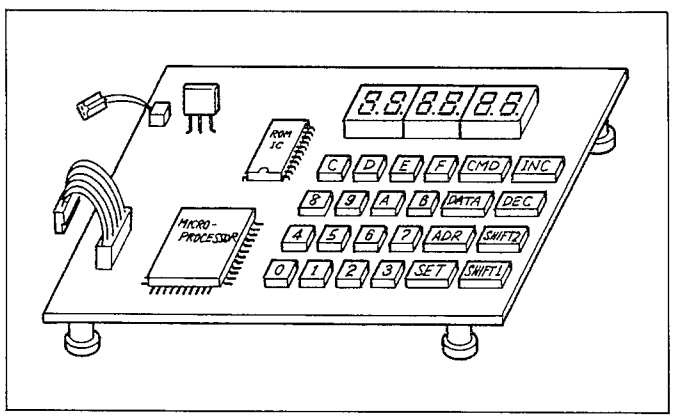


Fig. C1

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

13. Camera Extension Cables
    * Extension Cable (18P) (Part No.:VFK0698)
    * Extension Cable (30P) (Part No.:VFK0667)
    * Extension Cable (13P) (Part No.:VFK0672)
    * 22 PIN E.V.R. CONNECTION CABLE (22P) (Part No.:VFK0699)
      Following Extension Cables can be used for VTR section too.
    * FLAT Cable (18P) (Part No.:VFK0670)
    * Extension Cable (24P) (Part No.:VFK0668)

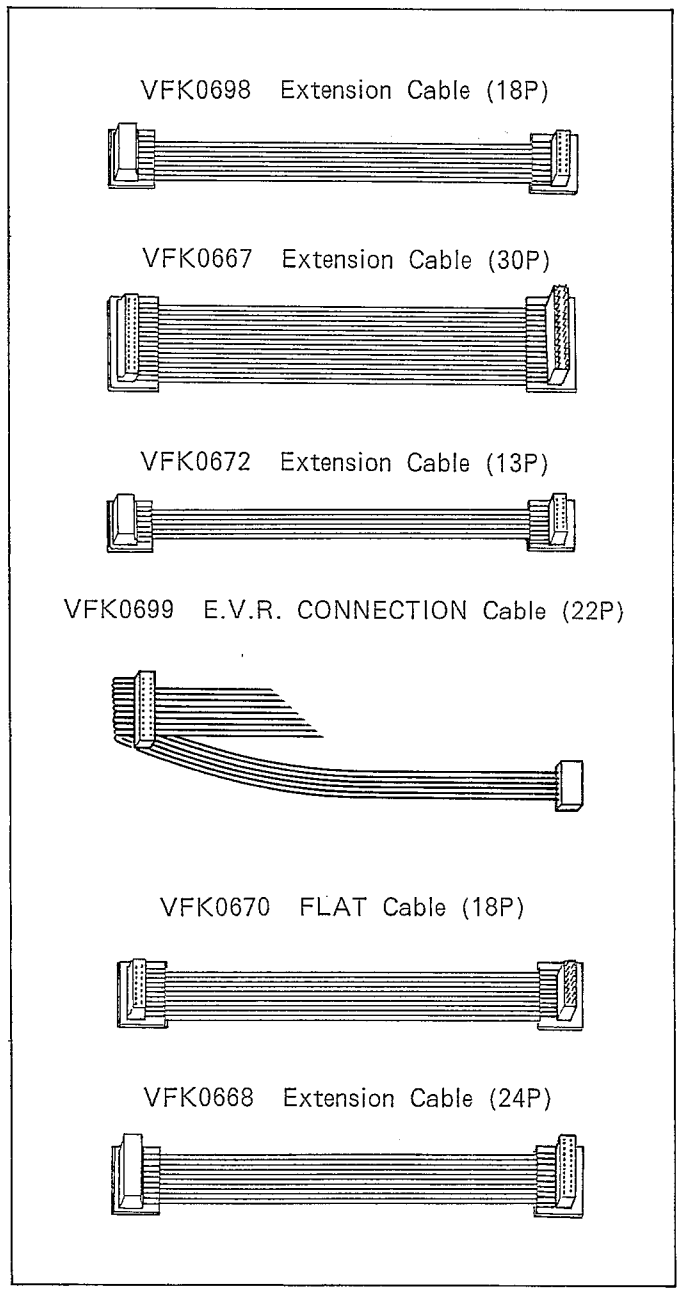


Fig. C2

E.V.R. FIXTURE

Camera Process section employs the remarkable memory IC so called E.E.P.R.O.M. (Electric Erasable Programmable Read Only Memory) that fulfills the role of variable resistor in conventional camera process.
In the conventional camera process, each adjsutment points were used to be adjusted by turning variable resistors as shown in Fig.C39.

PREPARATION

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

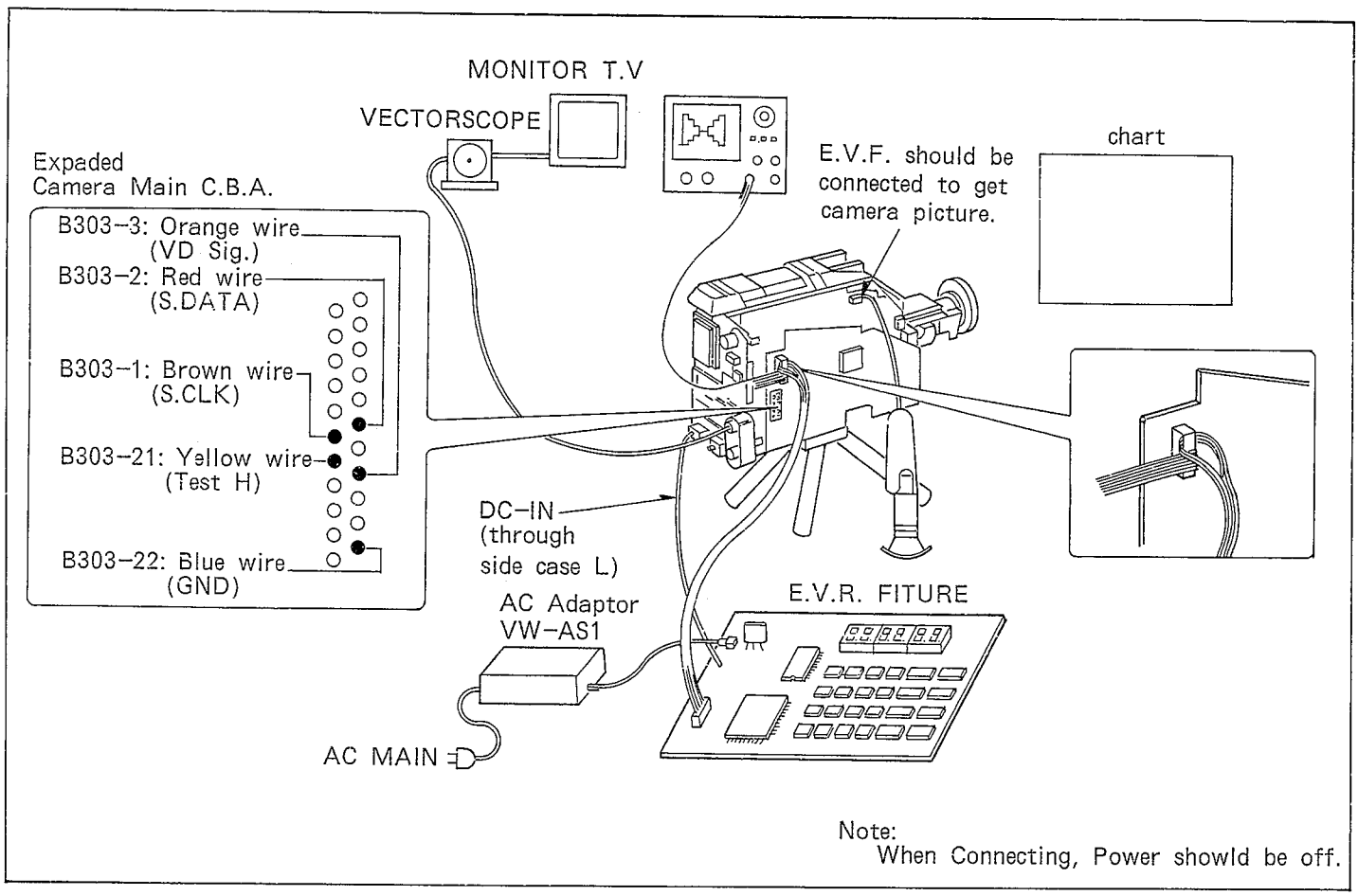


Fig. C3

Initial setting (For getting Picture)

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

(Adjustment Items required after replacing the individual compornents.)

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

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

○ mark .....Adjustment may be required.
△ mark .....Confirm adjustment necessity and adjust it, if necessary.
Colour Reproduction.....WB, Colour gain, colour phase adjustments.

Fig. C4

(Standard Setting for Camera Adjustment)

Unless specified, switches are set to following positions.

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

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

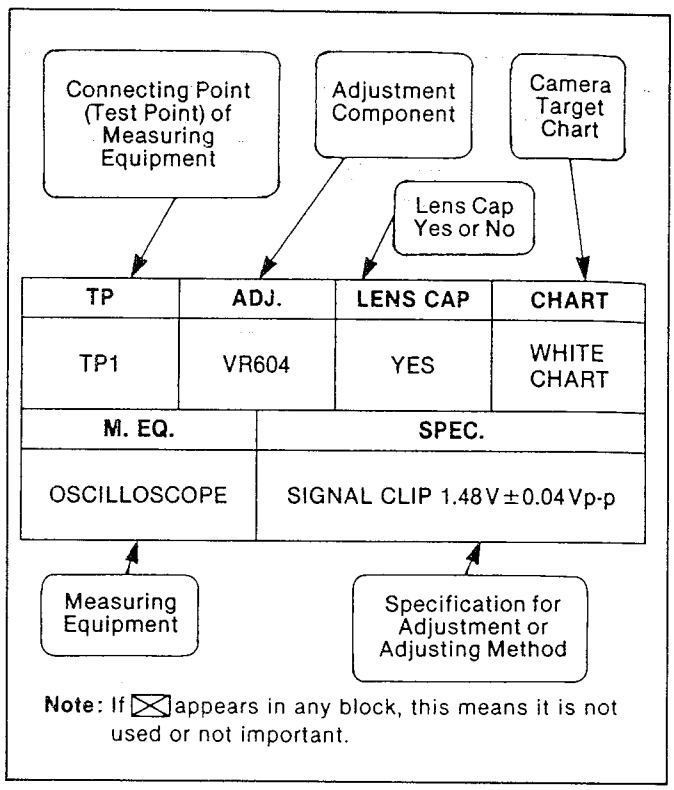
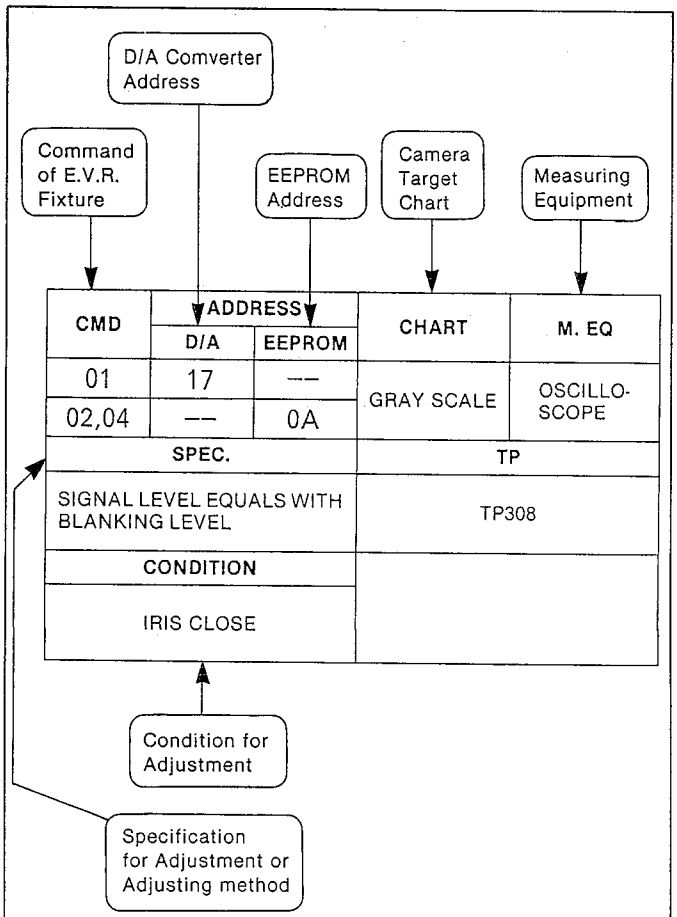
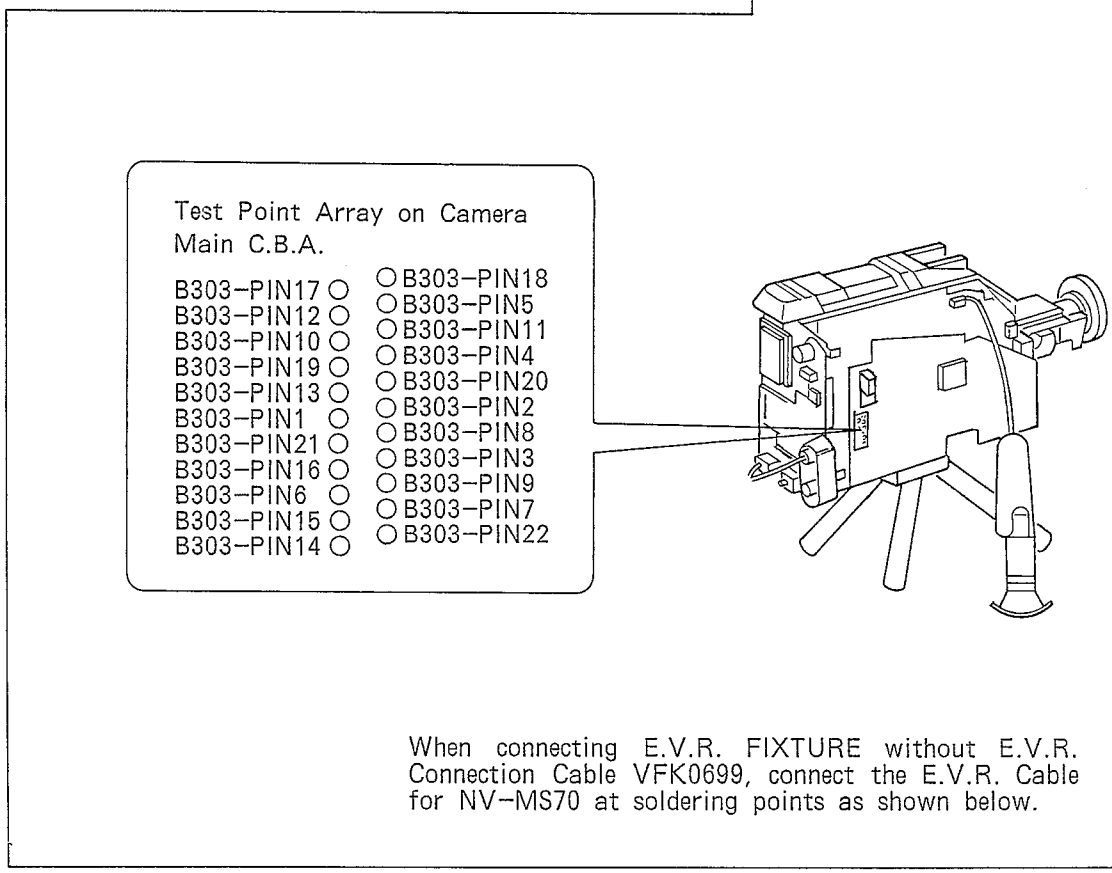


Fig. C5

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





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

Fig. C6

1. FCK FREQUENCY ADJUSTMENT

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

2. AF ZONE ADJUSTMENT

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

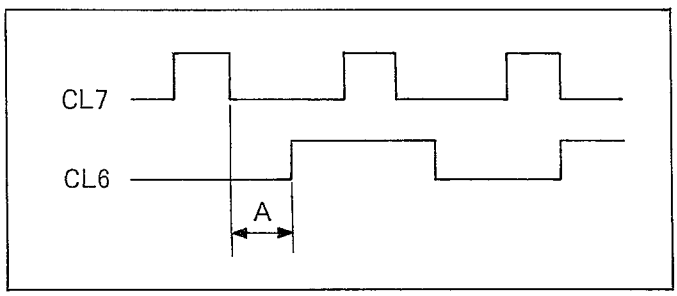


Fig. C7

3. ZOOM ENCODER ADJUSTMENT

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

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

(Simplified adjustment)

(1) Set the Focus sw to "MANUAL"(SHIFT 1 + C).
(2) Check the back Focus.
(3) If back focus is not correct, proceed to (4)
If back focus is correct, skip this adjustment.
(4) Connect the EVR to camcorder. (Refer to Preparation Fig.C3)
(5) Perform the initial setting by pushing "SHIFT 1" key and "1" key together.
(6) Read the data of Tele side and wide side in EEPROM as follows;
* Push "CMD" button and then push "0" and "4". (Setting command 04)
* Push "ADR" button and then push "0"and"F". (Setting Address OF)
* Push "SET" button and take memo of number which is indicated on LED Display. (as TELE side data)
* As the same way, set the command "04".
* Set the address "10".
* Push the "SET" button and memo the number which is indicated on LED Display. (as wide side data)
(7) Set the command(CMD) to "01".
(8) Set the address(ADR) to "25" for TELE.
(9) Push "INC" or "DEC" once to increase or decrease the data for one step.
(10) Confirm the back focus.
Repeat (8) and (9) until back focus becomes best.
(11) When back focus becomes best, write the data by pushing "SHIFT 1" and "0" together.
(12) Set the address(ADR) to "26" for WIDE.
(13) Push "INC" or "DEC" once to increase or decrease the data for one step.
(14) Confirm the back focus.
Repeat(13) and (14) until back focus becomes best.
(15) When back focus becomes best, write the data by pushing "SHIFT 1" and "0" together.

(Pre cise Adjustment for Zoom Encoder)

Acco rding to number which is mentioned on white shee t of lens unit, calculate the voltage to be supp lied the both side of zoom Encoder.
And write the its result into EEPROM as follows:

<Pre −Adjustment>

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

TELE side
B303−PIN5: V.REF(+) = V.REF3+
(V.REF3−V.REF1)*
(5/VT)/(VT−VW)

WIDE side
B303−PIN18: V.REF(−) =
V .REF1−(V.REF3−V.REF1)*VW/
(VT−VW)

V.REF3 = Voltage at B303−PIN19(Please measure it)
V.REF1 = Voltage at B303−PIN20(Please measure it)
VT = which is mentioned on white sheet of top portion of lens unit. (Bigger number)
VW = Which is mentioned on white sheet of top portion of lens unit. (Smaller number)
VA = Voltage of B303−PIN18 at full zoom WIDE position.
VB = Voltage of B303−PIN5 at full zoom TELE position.

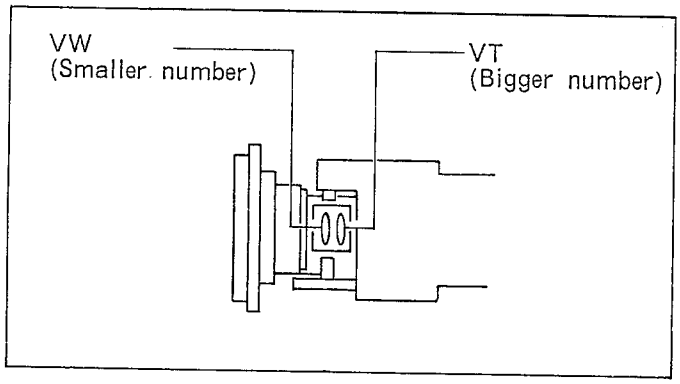


Fig. C8

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

<Fine Adjustment>

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

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

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

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

(2) Set the zoom to fully TELE position.
(3) While measuring the voltage at B303-PIN5. Change the data of D/A address "25" with command "01" so that voltage at B303-PIN5 become same as a result of calculation and when B303-PIN5 voltage comes same as result of calculation write its data by pushing "SHIFT 1" and "0" keys together.
* Push "CMD", "0" and "1" keys.
* Push "ADR", "2" and "5" keys.
* Measure the voltage at B303-PIN5.
* Push "INC" or "DEC" so that voltage at B303-PIN5 become same as a result of calculation.
* Push "SHIFT 1" and "0" keys together to write the data.
(4) Set the zoom to fully wide position.
(5) While measuring the voltage at B303-PIN18, change the data of D/A address "26" with command "01" so that voltage at B303-PIN18 become same as a result of calculation and write its data by pushing "SHIFT 1" and "0" keys together.
The procedure is same as (3), only address is "26".

4. AF HALL AMP OFFSET GAIN ADJUSTMENT

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

NOTE:
1) Manual Focus mode.....SHIFT 1 + C
2) Marking ALC(IRIS) fully close...SHIFT 1 + 3
3) Marking ALC(IRIS) fully open...SHIFT 1 + 2

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

5. V-SUB ADJUSTMENT

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

Note:
(1)Making ALC(IRIS) fully open...SHIFT 1 + 2

(2)High Speed Shutter "OFF".....
Set the command "06", Data "00" and DA address "40".

(3)High Speed Shutter "1/250".
Set the command "06", Data "40" and DA address "40".

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

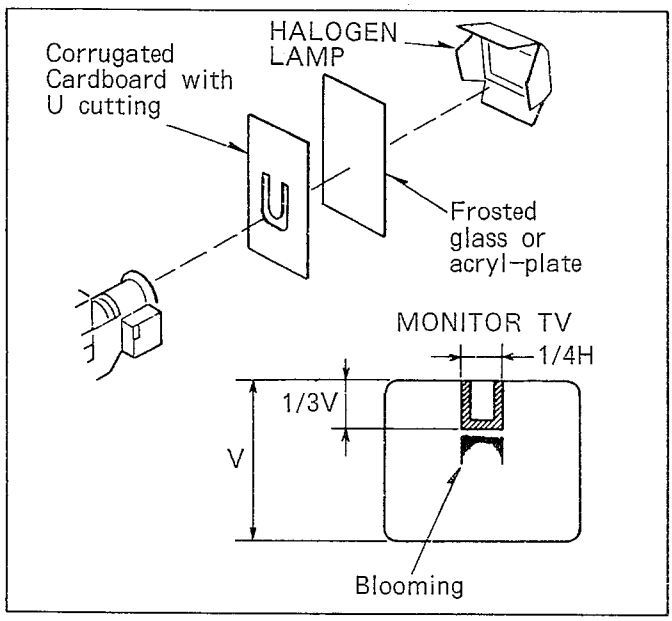


Fig. C9

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

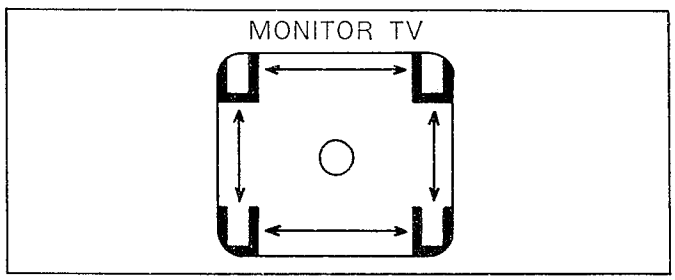


Fig. C10

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

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

NOTE:
Refer to preparation for connection of EVR.

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

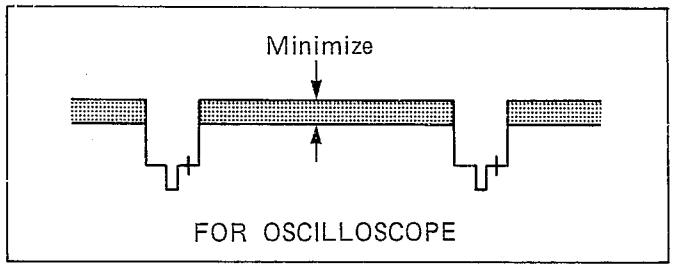


Fig. C11

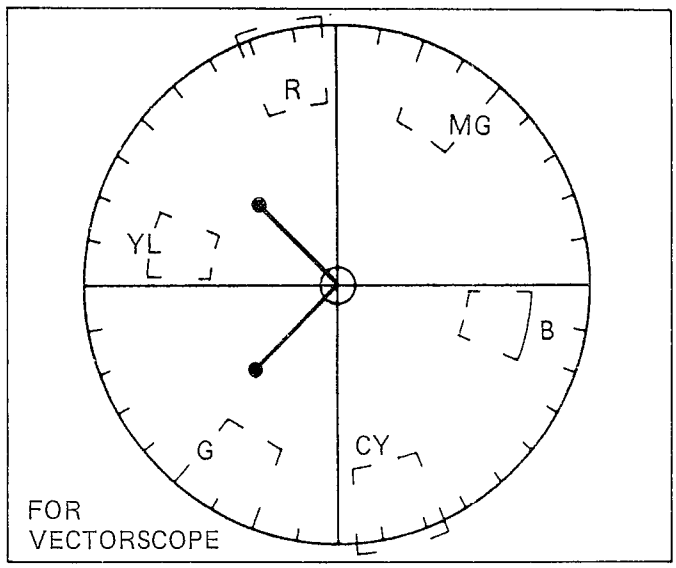


Fig. C12

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

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

CMD	ADDRESS		CHART	M. EQ
	D/A	EEPROM		
01	27 (PHASE) 28 (90°) 23 (270°)	---------- ---------- ----------	COLOUR BAR	VECTOR SCOPE
02,04	---------- ---------- ----------	17 (PHASE) 18 (90°) 15 (270°)		
SPEC.			TP	
SHOWN BELOW			VIDEO OUT	
CONDITION				
WHITE BALANCE: INDOOR				

NOTE:
Perform this adjustment after finishing the VTR PEDESTAL ADJUSTMENT.

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

8. BURST LEVEL ADJUSTMENT

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

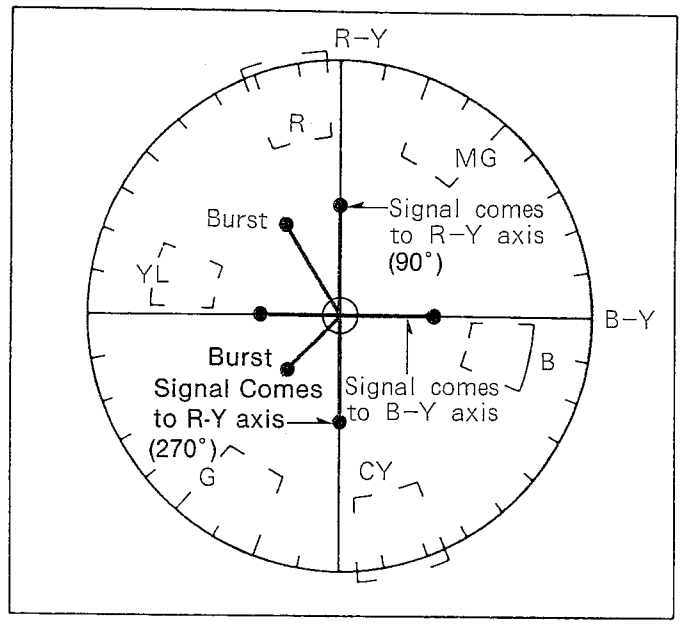


Fig. C13

NOTE:
Refer to preparation for connection of EVR and Initial setting.

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

9. OR BIAS ADJUSTMENT

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

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

(1) Aim the camera at J chart.
(2) Connect the oscilloscope to TP201.

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

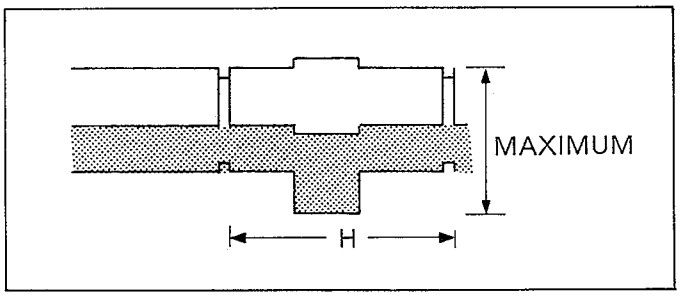


Fig. C14

10. ALC ADJUSTMENT

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

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

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

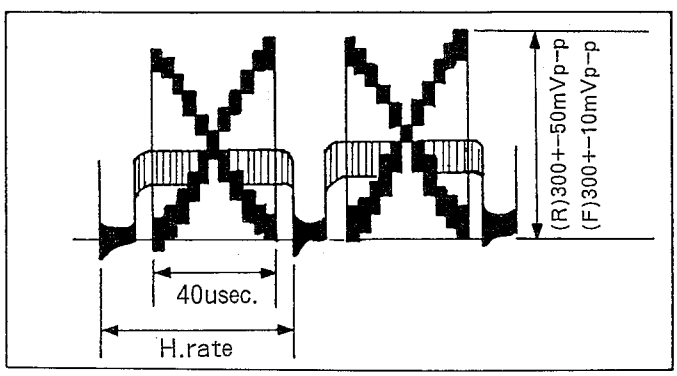


Fig. C15

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

11. CDS GAIN ADJUSTMENT

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

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

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

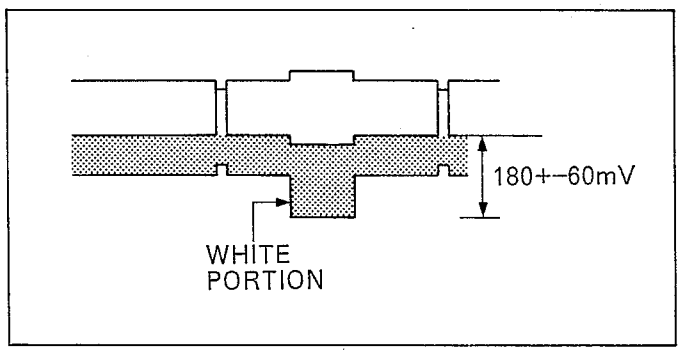


Fig. C16

12. PEDESTAL ADJUSTMENT

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

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

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

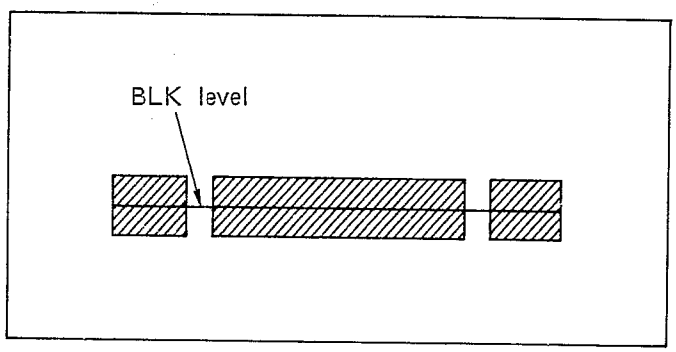


Fig. C17

13. AGC ADJUSTMENT

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

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

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

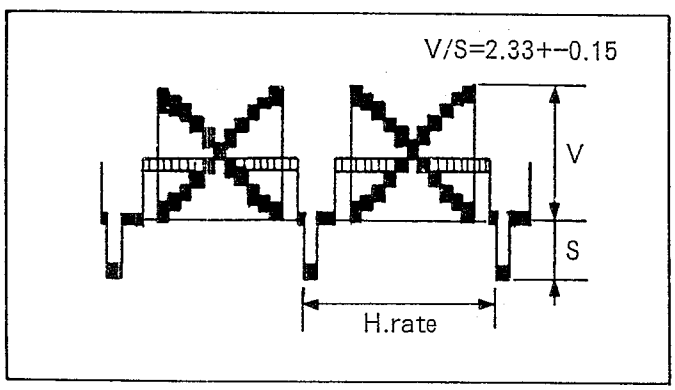


Fig.C18

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

14. r LEAK ADJUSTMENT

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

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

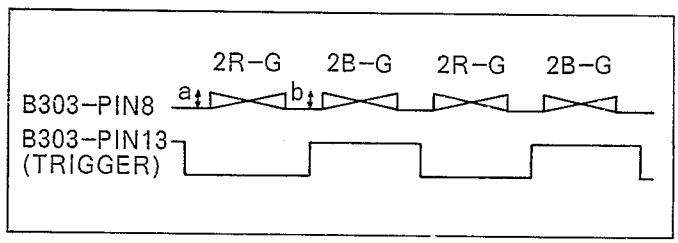


Fig. C 19-1

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

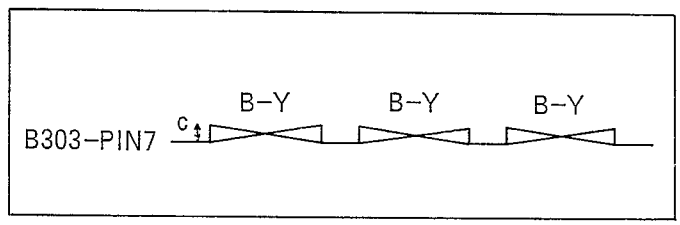


Fig. C19-2

15. FH/2 LEVEL DIFFERENCE ADJUSTMENT

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

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

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

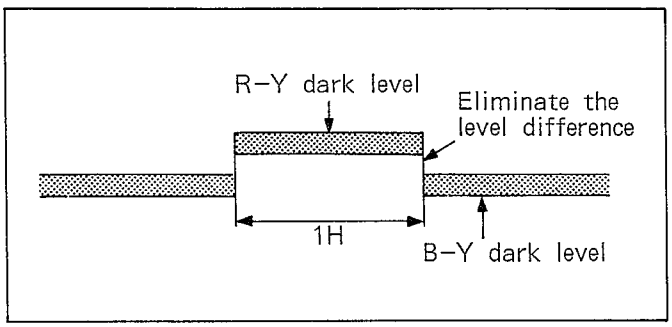


Fig. C20

16. CHROMA PEDESTAL ADJUSTMENT

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

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

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

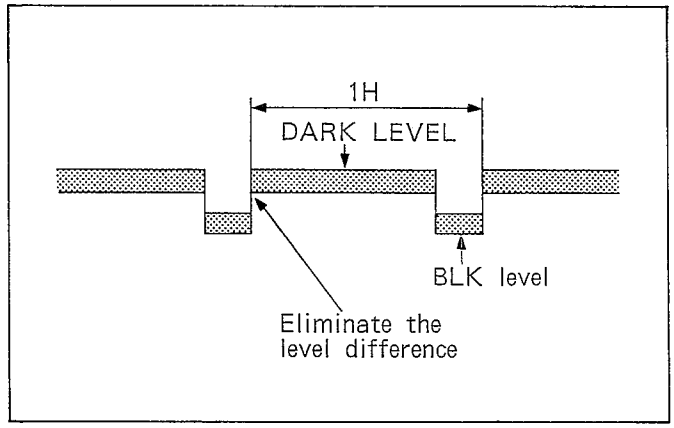


Fig. C21

17. R-Y,B-Y PEDESTAL ADJUSTMENT

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

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

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

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

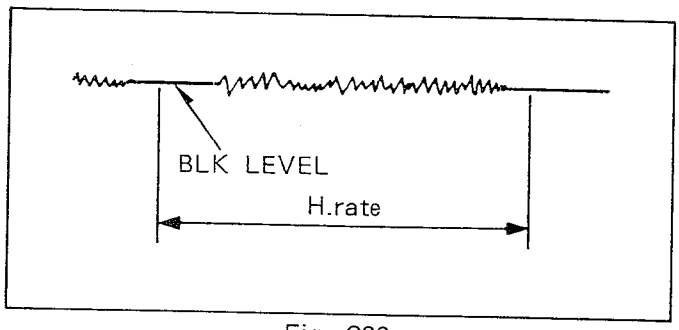


Fig. C22

18. INDOOR WHITE BALANCE ADJUSTMENT

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

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

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

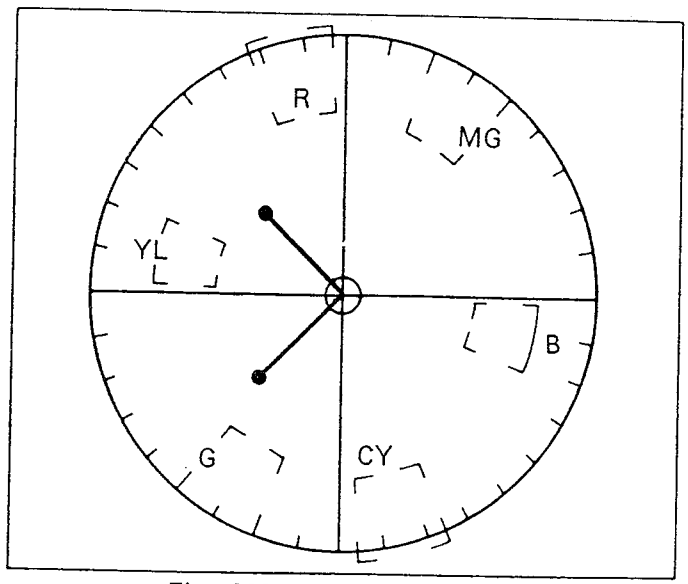


Fig. C23 With Vectorscope

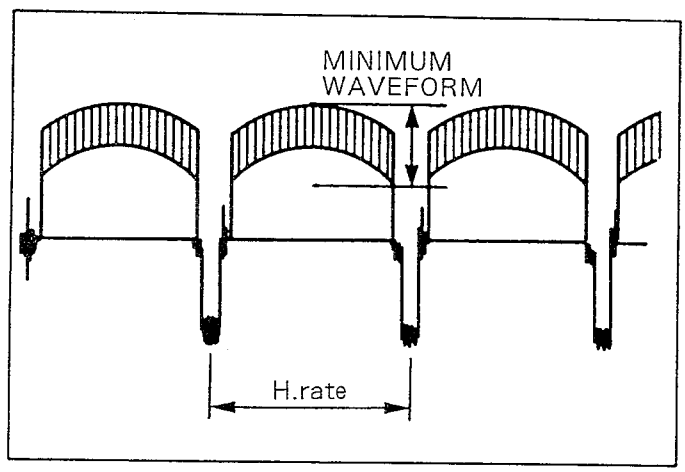


Fig. C24 With Oscilloscope

19. COLOUR PHASE AND GAIN ADJUSTMENT (INDOOR)

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

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

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

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

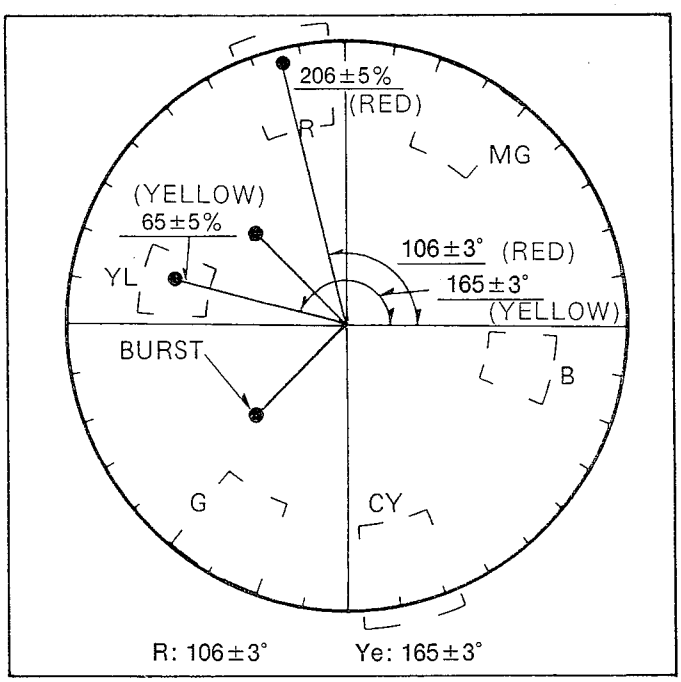


Fig. C25

20. OUTDOOR WHITE BALANCE ADJUSTMENT

CMD	ADDRESS		CHART	M. EQ
	D/A	EEPROM		
01	0B (R–Y) 0C (B–Y)	--- ---	WHITE CHART	VECTOR-SCOPE OR OSCILLO-SCOPE
02,04	--- ---	72 (R–Y) 75 (B–Y)		

SPEC.	TP
VECTOR COMES CENTRE OR WAVEFORM IS MINIMIZED	VIDEO OUT
CONDITION	
WHITE BALANCE: OUTDOOR IRIS VR: CENTRE COLOUR TEMPERATURE CONVERSION FILTER: VFK0324	

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

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

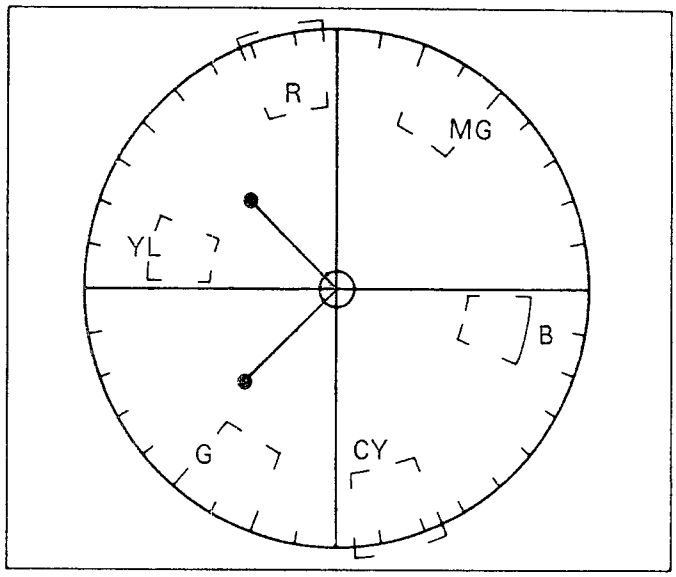


Fig. C26 With Vectorscope

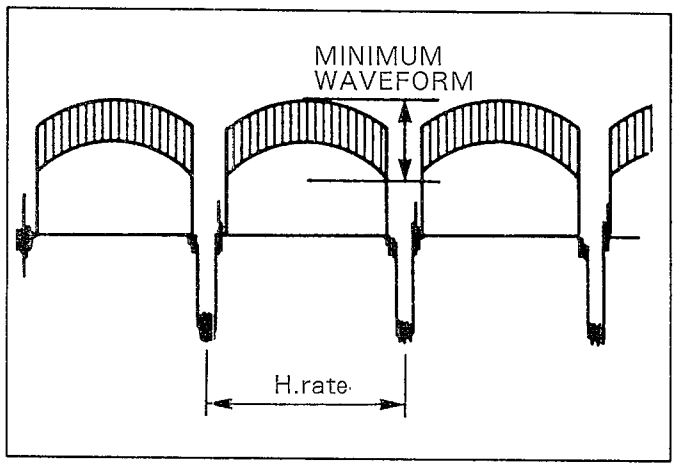


Fig. C27 With Oscilloscope

21. COLOUR PHASE AND GAIN ADJUSTMENT (OUTDOOR)

CMD	ADDRESS		CHART	M. EQ
	D/A	EEPROM		
01	09,07 (PHASE) 0A,08 (GAIN)	--- ---	COLOUR CHIP CHART	VIDEO OUT
02,04	--- ---	74,77 (PHASE) 73.76 (GAIN)		
SPEC.			TP	
VECTORSCOPE			RED: 106+−3 degree/PHASE 290+−5%/GAIN YEL: 160+−5 degree/PHASE 80+−5%/GAIN	

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

(1) Aim the camera at colour chip chart. and cover the lens with colour temperature conversion filter VFK0324.
(2) Connect the video output to vectorscope.
(3) Set the command to "01" by pushing the "CMD" key, "0" key and "1" key.
(4) Set the address to "09"(R−Y Phase) by pushing the "ADR" key, "0" key and "9" key.
(5) Push the "INC" key or "DEC" key so that phase of Red and Yellow vectors approach to spec.
(6) When best point comes, change the command to "02" by pushing "CMD" key, "0" key and "2" key and change the address to "74" by pushing the "ADR" key, "7" key and "4" key (Do not change the data) and then push the "SET" key to write its adjusted data into EEPROM directly.
(7) Change the command to "01" by pushing the "CMD" key, "0" key and "1" key.
Change the address to "07" by pushing the "ADR" key, "0" key and "7" key.
(8) Push the "INC" key or "DEC" key so that phase of Red and Yellow vectors approach to the spec.
(9) When best point comes, change the command to "02" by pushing the "CMD" key, "0" key and "2" key. (Do not change the data), and change the address to "77" by pushing "ADR" key, "7" key and "7" key.
Then, Push the "SET" key to write its adjusted data to EEPROM Directly.
(10) Change the command to "01" by pushing the "CMD" key, "0" key and "1" key. Change the address to "0A" (R−Y Gain) by pushing "ADR" key, "0" key and "A" key.
(11) Push the "INC" or "DEC" key so that gain of Red and Yellow vectors approach to the spec.
(12) When best point comes, change the command to "02" and change the address to "73" while keeping the data.
Then, Push the "SET" key to write its adjusted data to EEPROM directly.
(13) Change the command to "01".
Change the address to "08"(B−Y Gain).
(14) Push the "INC" or "DEC" key so that gain of Red and Yellow vectors approach to the spec.
(15) When the best point comes, change the command to "02" and change the address to "76" (do not change the data). Then, Push the "SET" key to write adjusted data to EEPROM directly.
(16) Repeat the 3. to 15. until vectors become within spec as shown in Fig.C28.

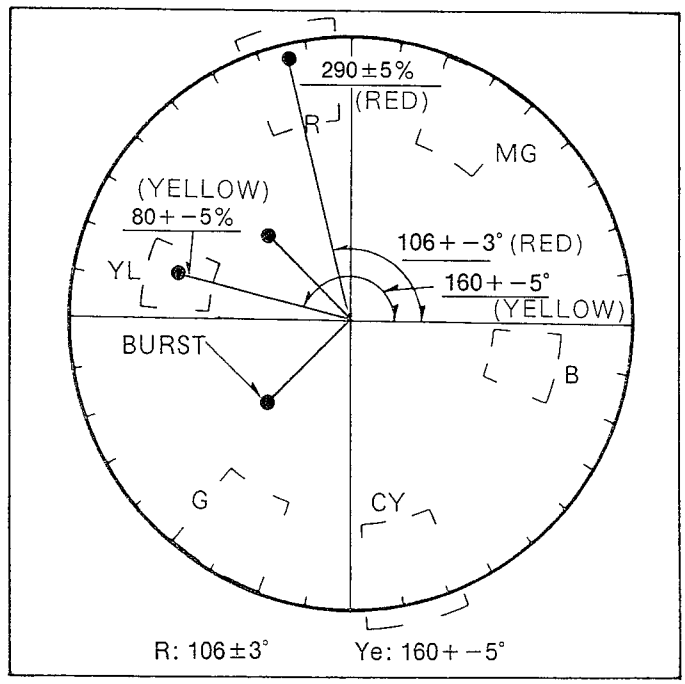


Fig. C28

22. EDGE CORRECTION ADJUSTMENT

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

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

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

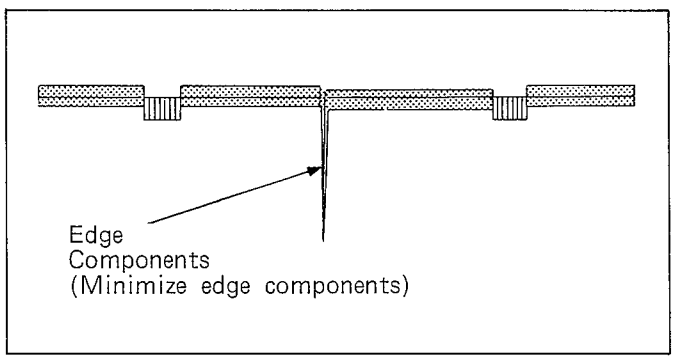


Fig. C29

23. HC(High Cut) ADJUSTMENT

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

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

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

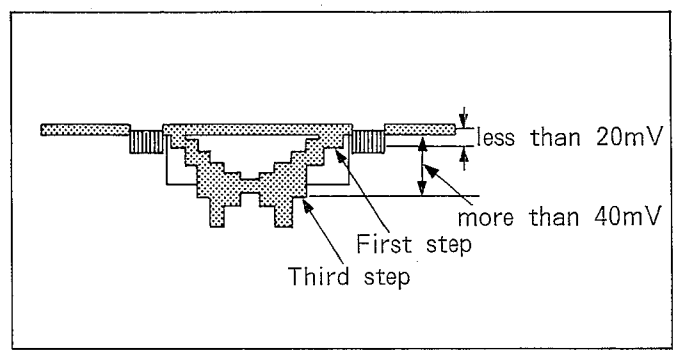


Fig. C30

24. DATA WRITING FOR COLOUR REPRODUCTION

As stated before, each adjustment voltage are memorized in EEPROM as digital data.
Regarding colour reproduction adjustments such as white balance, phase and gain adjustments, only adjustments have been performed at indoor condition (3200 degree kelvin) and outdoor condition (5100 degree kelvin).
EEPROM needs the data at other condition, too such

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

(How to calculate and enter the data)

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

(For Example)

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

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

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

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

Fig. C31 Calculation

25. R-Y, B-Y OFFSET SETTING

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

25-1. R-Y OFFSET

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

25-2. B-Y OFFSET

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

26. AWB DATA SETTING FOR INDOOR

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

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

Fig. C32 Memo 1

26-1. AWBY (DARK)

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

26-2. S/H 1 (DARK)

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

26-3. S/H 2 (DARK)

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

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

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

26-4. AWBY (WHITE)

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

26-5. S/H 1 (WHITE)

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

26-6. S/H 2 (WHITE)

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

26-7. Writing the data

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

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

S/H 2 (WHITE) to "55"
(9) Set the command to "02".
(10) Set the address to "55".
(11) Push the "DATA" key and enter the data of S/H 2 (WHITE) which is taken memo at 26-6.
(12) Push the "SET" key to write its data.

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

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

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

26-8. Calculation of AWB INDOOR SETTING

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

(A) S/H1 31 = memo = S/H 1(WHITE)-S/H 1(DARK)/ AWBY(WHITE)-AWBY(DARK)*128

(B) S/H2 31 = memo = S/H 2(WHITE)-S/H 2(DARK)/ AWBY(WHITE)-AWBY(DARK)*128

Fig. C33 Calculation 2 and memo.

27. AWB DATA SETTING FOR OUTDOOR

MEMO

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

Fig. C34 Memo

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

27-1. AWBY (WHITE)

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

27-2. S/H 1(WHITE)

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

27-3 S/H 2(WHITE)

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

27-4. Writing the data

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

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

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

27-5. Calculation of AWB OUTDOOR SETTING

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

(C) S/H1 51 = Memo = S/H 1(WHITE)-S/H 1(DARK)/ AWBY(WHITE)-AWBY(DARK)*128

(D) S/H2 51 = Memo = S/H 2(WHITE)-S/H 2(DARK)/ AWBY(WHITE)-AWBY(DARK)*128

Fig. C35 Calculation 3 and Memo

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

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

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

Fig. C36

((FOR Example))

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

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

29. WRITING THE DATA DIRECTLY

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

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

NO.	ITEM	EEPROM ADDRESS	DATA
1	FADE TIME 1	30	6A
2	MEMORY SW1	31	00
3	MEMORY SW2	32	10
4	MEMORY SW3	33	08
5	WRITE PROTECT	34	00
6	D.K HOLD L	35	10
7	FADE TIME 2	36	20
8	MEMORY SW4	37	10
9	FADE SPEED	38	80
10	AWB IN	1A	40
11	RG IN	1B	10
12	RMAT IN	1C	00
13	BWB IN	1D	20
14	RG IN	1E	0A
15	BMAT IN	1F	00

Fig. C37

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

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

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

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

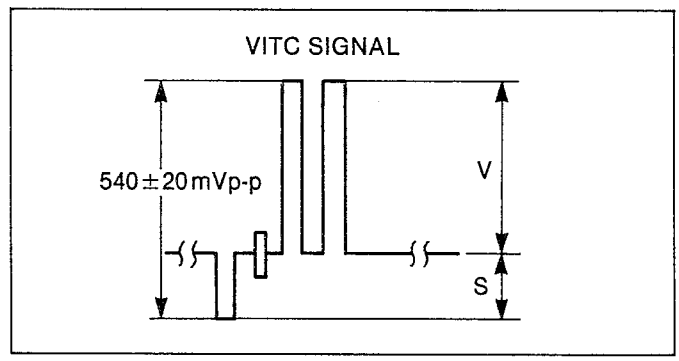
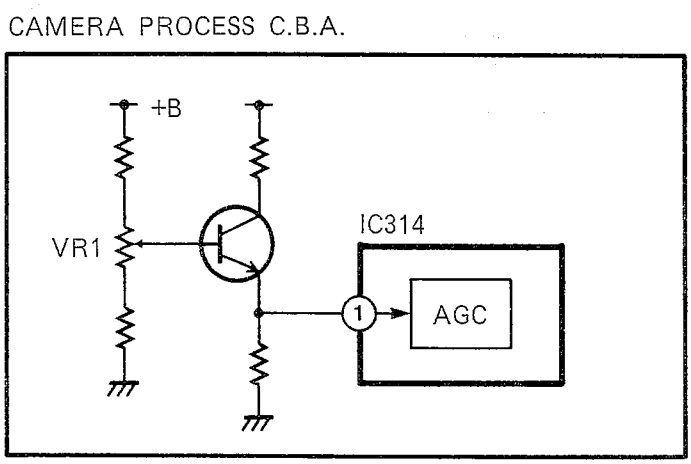


Fig. C38

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

(CONVENTIONAL ADJUSTMENT)



Control voltage is decided by variable resistor.

Fig. C39

(NEW ADJUSTMENT BY E.V.R)

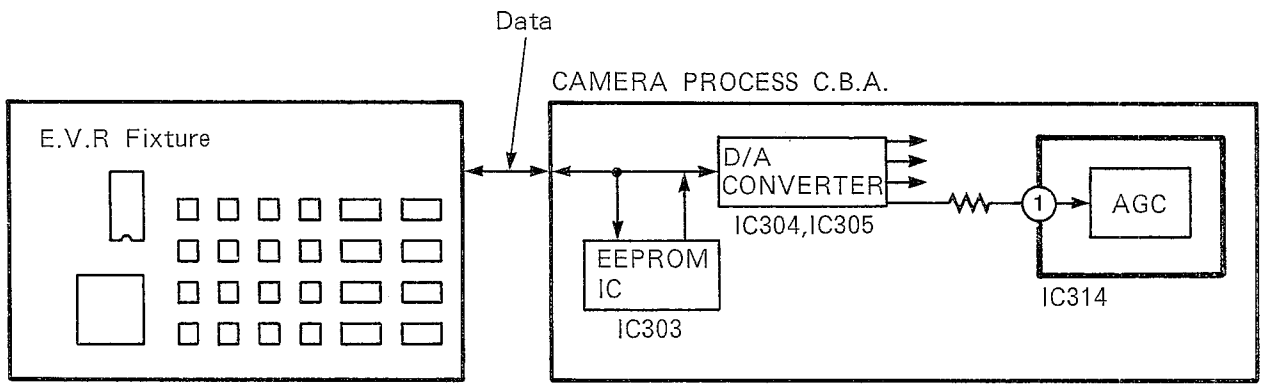
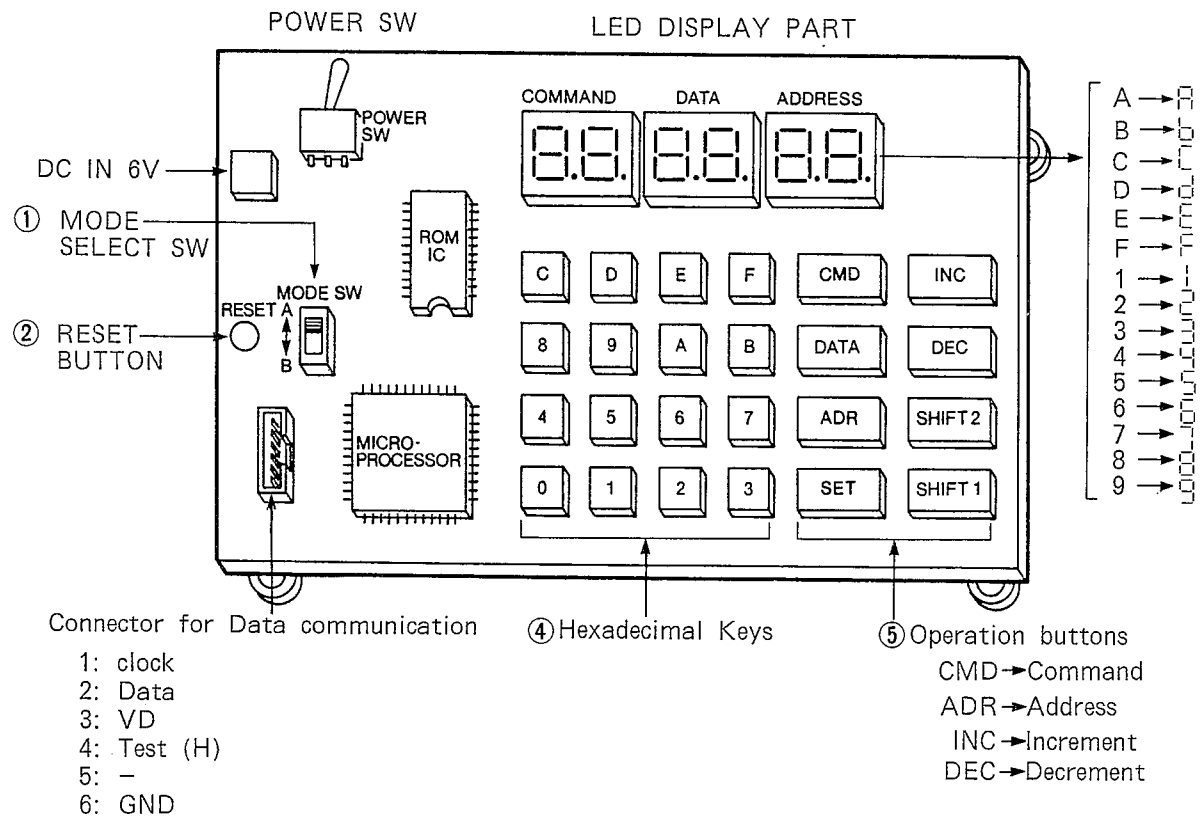


Fig. C40

In case of NV-G2/G200/G1/G100, adjustment voltage is memorized in EEPROM as 8 bit digital data.
EEPROM supplies the memorized adjustment voltage to the adjustment point through D/A converter as shown in Fig.C4.
The data in EEPROM can be electrically exchanged freely. E.V.R. (Electric Variable Resistor) has been developed to exchange the 8 bit data of EEPROM in process circuit.

E.V.R can also communicate with D/A converter directly to change
the each control voltage.
Normally EEPROM is having voltage data and is sent to D/A converter where digital data is changed into DC voltage (control voltage).
Using E.V.R. you can change the data stored in EEPROM easily, in other words, you can adjust the camera process section. And E.V.R. can also send the date to D/A converter directly for confirming the adjustment.

Name of Key



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

Fig. C41

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

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

Result: Adjustment value of ALC has been set for "4D".
It is convenient to read out the data like this (and take memo) before writing the new data next time)
even if something mistake is happened when writing the new data, you can rewrite original data.

Item	Proceduring Order		Buttons to be Pushed	LED Indication
	1	Initial Setting (Refer to Preparation) It is not necessary to do "Initial Setting" at before every Read out. It is enough to do once before starting the adjustment.	[SHIFT 1] + [1] Push both buttons together.	0 180 00
For Example, Recording out the data of ALC Adjustment comunication from camcorder to E.V.R Fixture Camera → E.V.R	2	Set the Command mode to "04" "04" is read out command. (Refer to command description)	[CMD] [0] [4]	LED lights up 04 80 00 Command setting
	3	Set the Address of EEPROM	[ADR] [0] [6]	04 4d 06 Address setting of EEPROM LED lights up
	4	Read out the data	[SET] Push this for 2 seconds	04 4d 06 data for ALC for example

Fig. C42

2) Writing the New Data.

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

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

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

Confirmation: Confirm whether data is written correctly or not.
Procedure – 1. Set the command to "04"
2. Set the address to "06"
3. Push the "SET" button.
4. The number which is indicated on DATA LED is a data which has been written.

Note 2:
In this procedure, E.V.R. controls the D/A converter directly (Because data of D/A converter is changed, adjustment voltage is changed) and after finding the best point E.V.R. markes D/A converter transfer the data to EEPROM. (Refer to construction system in Fig.C-4) Then, Data is written in EEPROM, Therefore, Address of D/A converter is different from address of EEPROM.
For example, in case of ALC adjustment, address of D/A converter is "21" but address of EEPROM is "06".
At the first, when command "01" is appointed, D/A converter is controlled directly by E.V.R. Then, when "SHIFT 1" and "0" are pushed together, data in D/A converter is written in EEPROM where address is "06" automatically in spite of without appointing the address of EEPROM.(When "SHIFT 1" and "0" keys are pushed together, data of D/A converter is automatically transferred in to corresponding EEPROM address and is stored automatically.)

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

Item		Proceduring Order	Buttons to be Pushed	LED Indication
	1	Initial Setting (Refer to Preparation) It is not necessary to do "Initial Setting" at before every writing the data. It is enough to do once before starting the adjustment.	SHIFT 1 + 1 Push both buttons together	0 180 00
For Example, writing the ALC adjustment data. E.V.R→Camera	2	Set the command to "01".	CMD 0 1	Command for search mode.
	3	Set the Address of D/A converter for "21" E.VR→D/A (communication from E.V.R to D/A converter))	ADR 2 1	LED lights up 0 1 80 00
	4	Adjustment Push "DEC" or "INC" button so that Peak to Peak of waveform at TP307 become 300mV±20mV. (use oscilloscope)	Search with INC or DEC	0 180 21 LED lights up
	5	Write in the data after finding the best front.	SHIFT 1 + 0 Push both buttons together.	LED will disappear. 0 14d 21 Data "4D" has been stoved into EEPROM.

Fig. C43

(2) Direct Writing Procedure

Item	Proceduring Order		Buttons to be Pushed	LED Indication
	1	Initial Setting same as (1)	same as (1)	same as (1)
For Example, writing the ALC adjustment data	2 3 4	Searching the best Point. same as (1)	same as (1)	same as (1)
	5	Change the command to "02"	CMD 0 2	LED lights up 02 21 Command for Direct writing
	6	Set the address of EEPROM to "06"	ADR 0 6	address of EEPROM 02 06 LED lights up
	7	Set the data of best point "4D"	DATA 4 D	02 4D 06 LED lights up
	8	Write the data	SET Push this for 2sec.	LED disappear. 02 4D 06

Fig. C44

Confirmation: Confirm whether data is written correctly or not.
Procedure – 1. Set the Command to "04"
2 Set the Address to "06"
3. Push the "SET" button
4. The number which is indicated on DATA LED is a data which has been written.

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

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

Command	Communication	Contents
01	EVR Fixture → D/A converter	Data transmission from EVR to address of D/A converter.
02	EVR Fixture → EEPROM	Writing the data to address of EEPROM.
03	EEPROM → D/A converter	——
04	EEPROM → EVR Fixture	Reading out the data of EEPROM.
05	A/D→EVR Fixture	Data transmission of A/D convertion to EVR.

Fig. C45

(SHIFT1 Command)

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

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

Fig. C46

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

(Error Indication)

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

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

Fig. C47

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

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

Fig. C49

Camera operation can be controlled by EVR even during adjustment.
For example, in case of high speed shutter 1/120sec. Set the command "06", Data "20" and D/A address "20".
Then push "SET" button, camera becomes 1/120sec. shutter speed.

1) Push "CMD" button then push "0" and "6" buttons.
2) Push "DATA" button then push "2" and "0" buttons.
3) Push "ADR" button then push "4" and "0" buttons.
4) Push "SET" button. Camera becomes 1/120sec. shutter speed.

As the same way, following operation can be done.

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

Hexadecimal lower digit / Hexadecimal upper digit	0	1	2	3	4	5	6	7	8	9	A	b	C	d	E	F
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A ← ①	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

(②: 8)

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

Fig. C50 Hexadecimal–Decimal Conversion Table

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

The following adjustments are for Electronic Viewfinder.

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

1. H-OSC ADJUSTMENT

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

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

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

2. CENTERING ADJUSTMENT

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

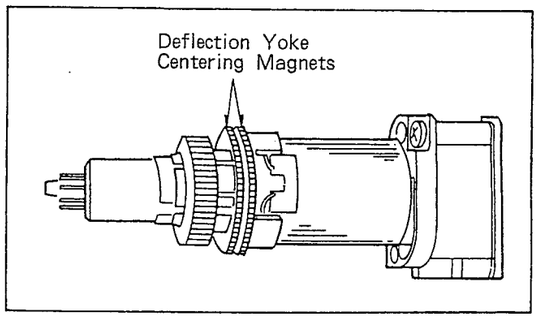


Fig. C51

3. FOCUS ADJUSTMENT

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

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

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

4 V.SIZE ADJUSTMENT

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

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

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

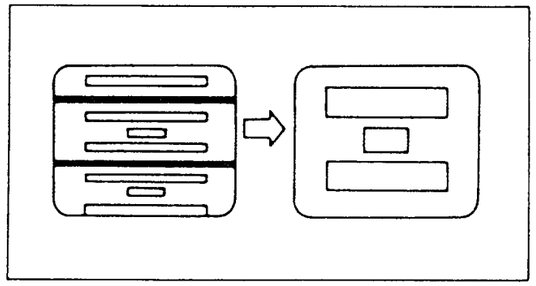


Fig. C52

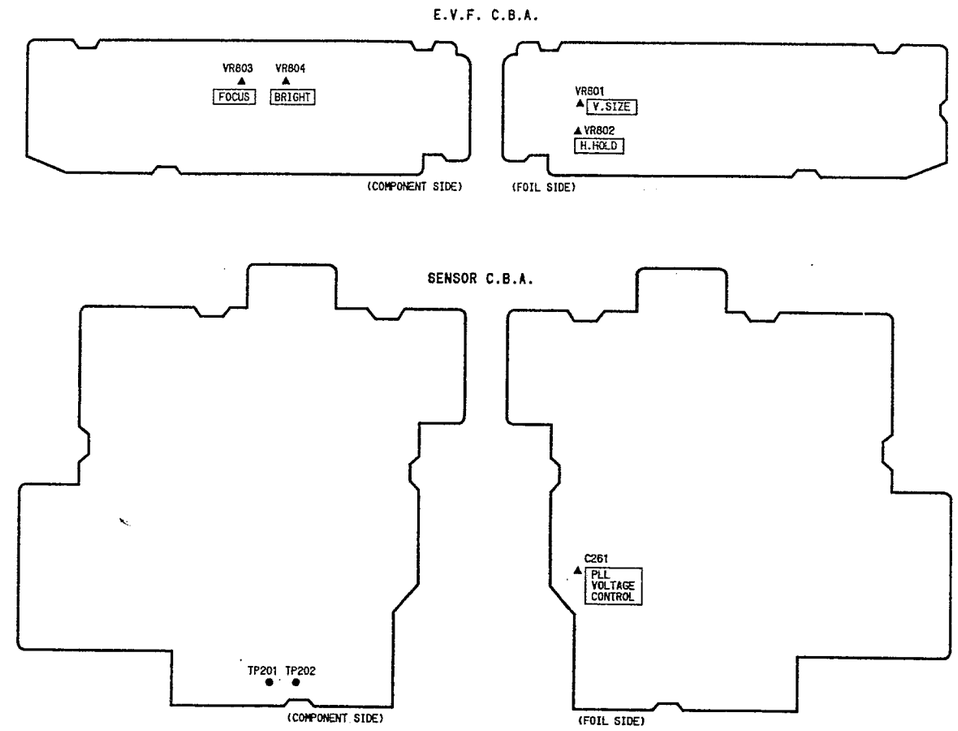
5. BRIGHTNESS ADJUSTMENT

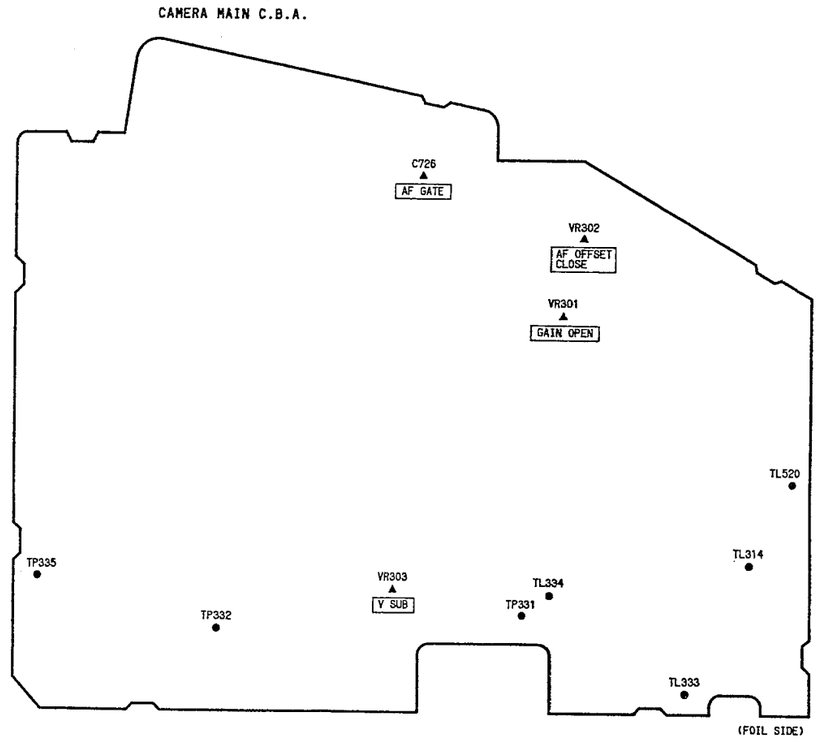
TP	ADJ.	LENS CAP	CHART
	VR804	NO	GRAY SCALE CHART
M. EQ.		SPEC.	
VIEWFINDER		NATURAL GRADATION	

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

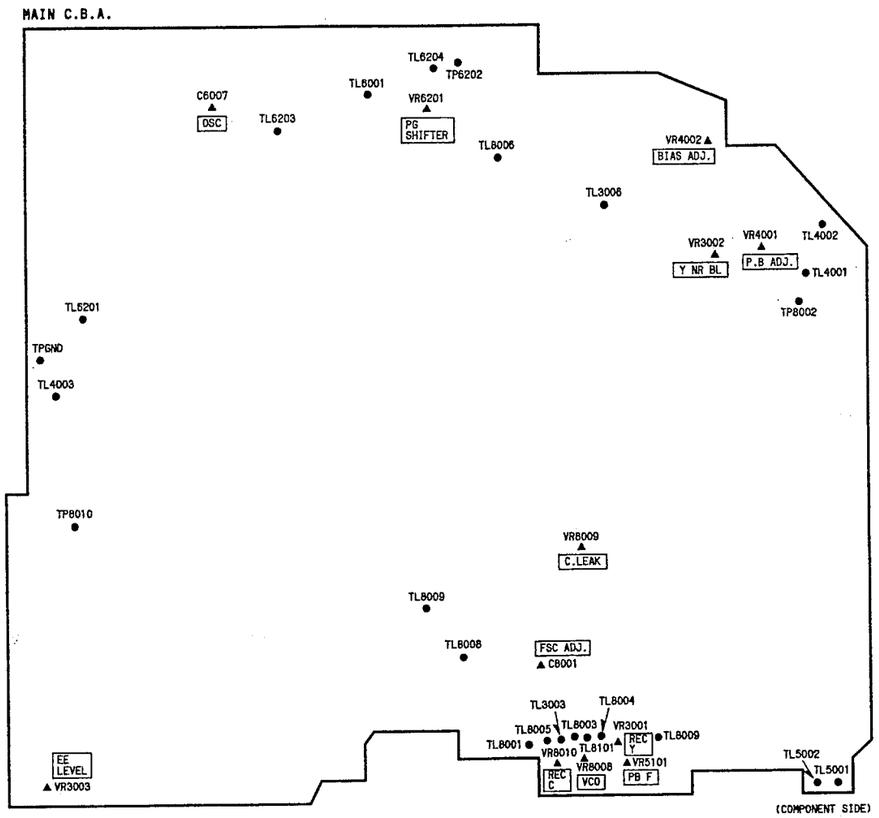
(1) Aim the camera at gray scale chart.
(2) Adjust the brightness control(VR804) so that the black and white bars in the E.V.F. screen are the same as they are in the monitor TV screen.

LOCATION OF TEST POINTS & CONTROLS (1)





LOCATION OF TEST POINTS & CONTROLS (2)



2-6-4. ELECTRICAL ADJUSTMENT FOR VTR SECTION

TEST EQUIPMENT AND TOOLS

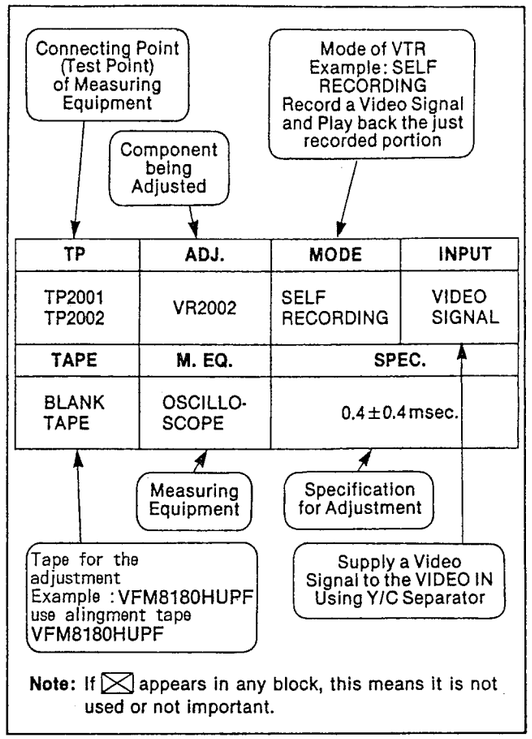
The following equipment is required for adjustment of the VTR section.

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

PREPARATION

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

HOW TO READ THE ADJUSTMENT PROCEDURES



Note: If ⊠ appears in any block, this means it is not used or not important.

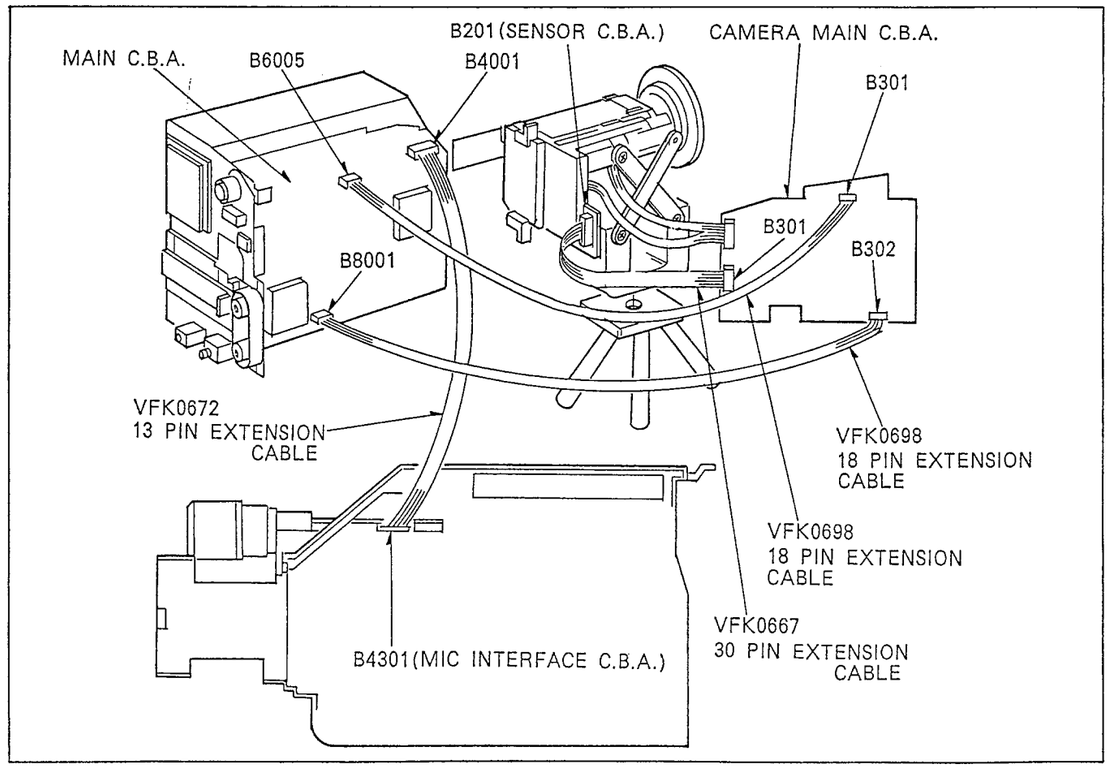


Fig. V1

SERVO SECTION

1. PG SHIFTER ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP6202 VIDEO OUT	VR6201	PLAY	⊠
TAPE	M. EQ.	SPEC.	
ALIGNMENT TAPE (VFM8180HUPF)	OSCILLO-SCOPE	6.5H+—0.5H	

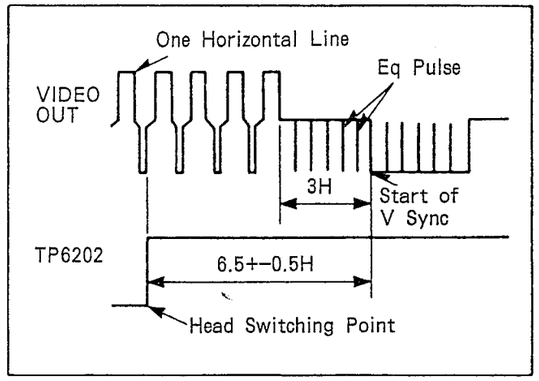


Fig. V2

LUMINANCE & CHROMINANCE SECTION

2. E-E LEVEL ADJUSTMENT

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

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

(In case of shooting colour bar by camera)

(1) Aim the camera at colour bar chart.
(2) Connect the oscilloscope to video output.
(3) Adjust the VR3003 so that Y output (White portion of colour bar) becomes 1.0+—.05Vp—p.

(In case of use of pattern generator)

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

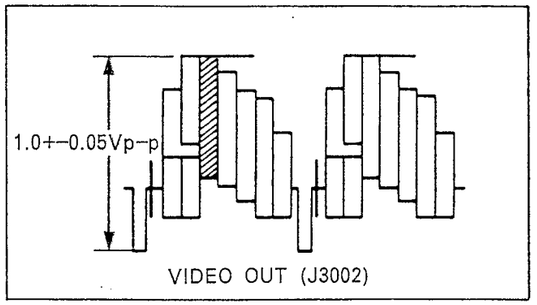


Fig. V3

3. Fsc ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP8009	C8001	PLAY	⊠
TAPE	M. EQ.	SPEC.	
BLANK TAPE	FREQUENCY COUNTER	4433619+—50Hz	

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

4. VCO FREE-RUN FREQUENCY ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP8003	VR8008	STOP	⊠
TAPE	M. EQ.	SPEC.	
⊠	FREQUENCY COUNTER	613+—5KHz	

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

5. MAIN BM CARRIER LEAK ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP8008	VR8009	STOP	
TAPE	**M. EQ.**	**SPEC.**	
	OSCILLO-SCOPE	"A" IS MINIMIZED	

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

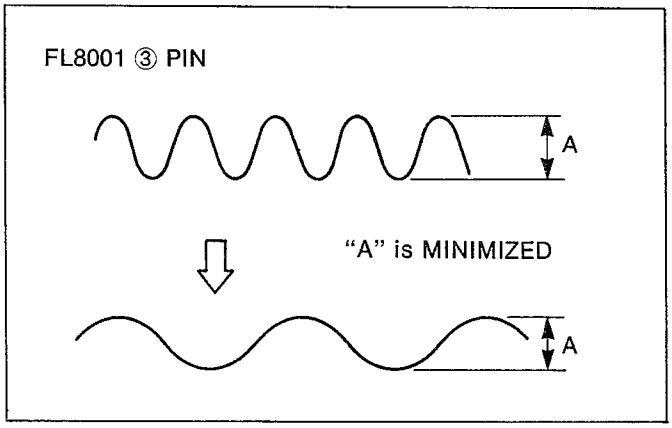


Fig. V4

6. RECORDIGN CURRENT ADJUSTMENT

6-1. REC CHROMA LEVEL ADJUSTMENT

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

NOTE:
Perform this adjustment after finishing the Burst Level adjustment.

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

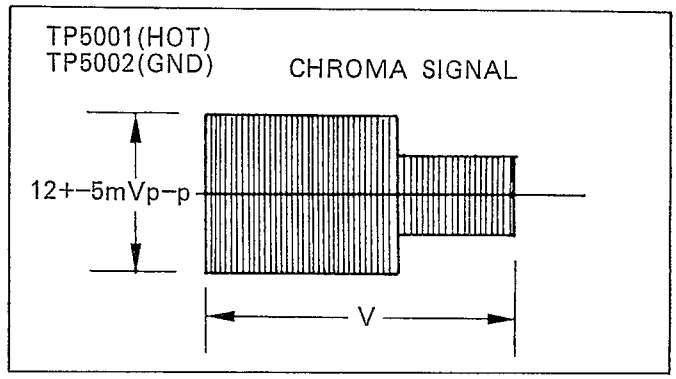


Fig. V5

6-2. LUMINANCE RECORDING CURRENT ADJUSTMENT

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

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

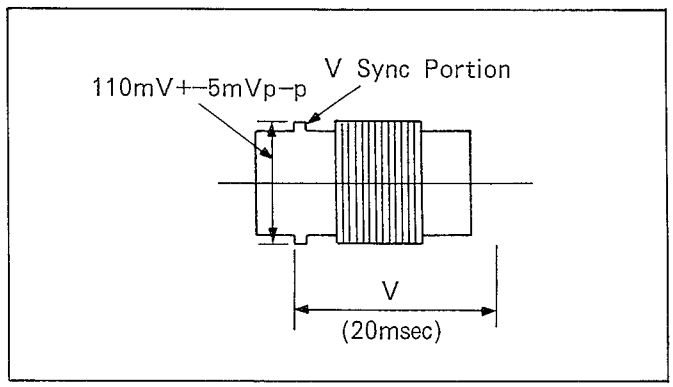


Fig. V6

7. YNR ADJUSTMENT

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

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

8. HEAD FREQUENCY RESPONCE ADJUSTMENT FOR VHS MODE

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

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

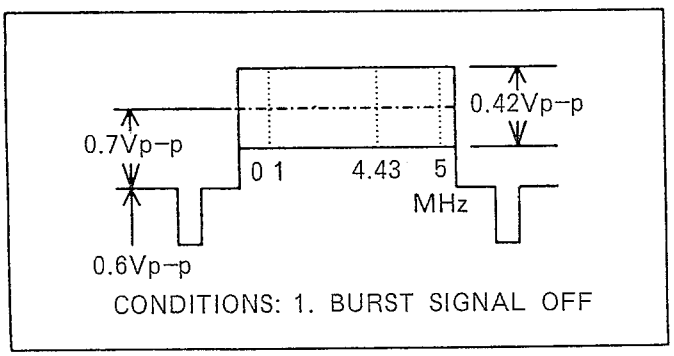


Fig. V7

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

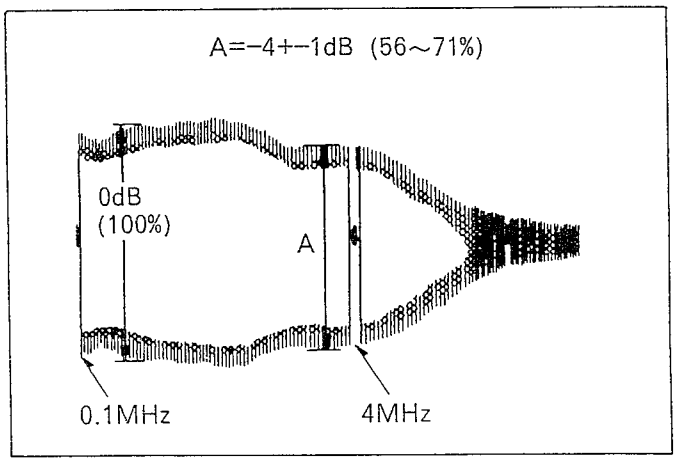


Fig. V8

AUDIO SECTION

9. AUDIO BIAS CURRENT ADJUSTMENT

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

10. AUDIO PLAYBACK LEVEL ADJUSTMENT

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

NOTE:
Audio select SW should be normal

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

SYSTEM CONTROL SECTION

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

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

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

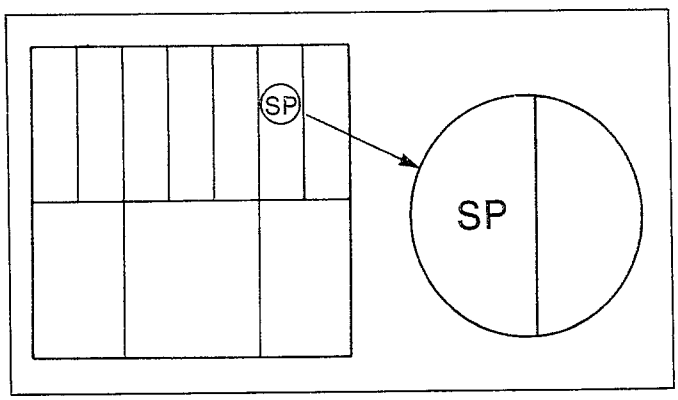
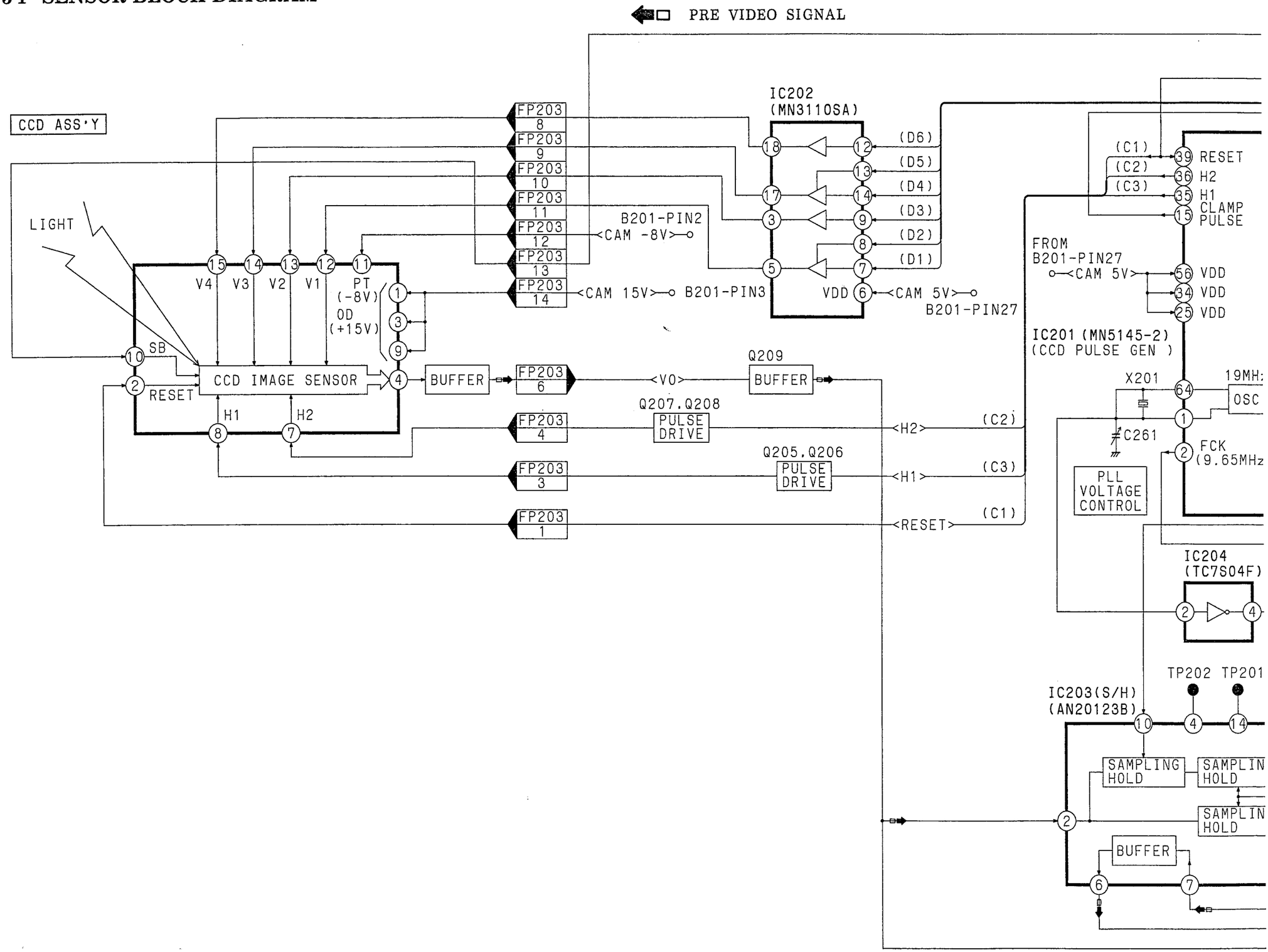


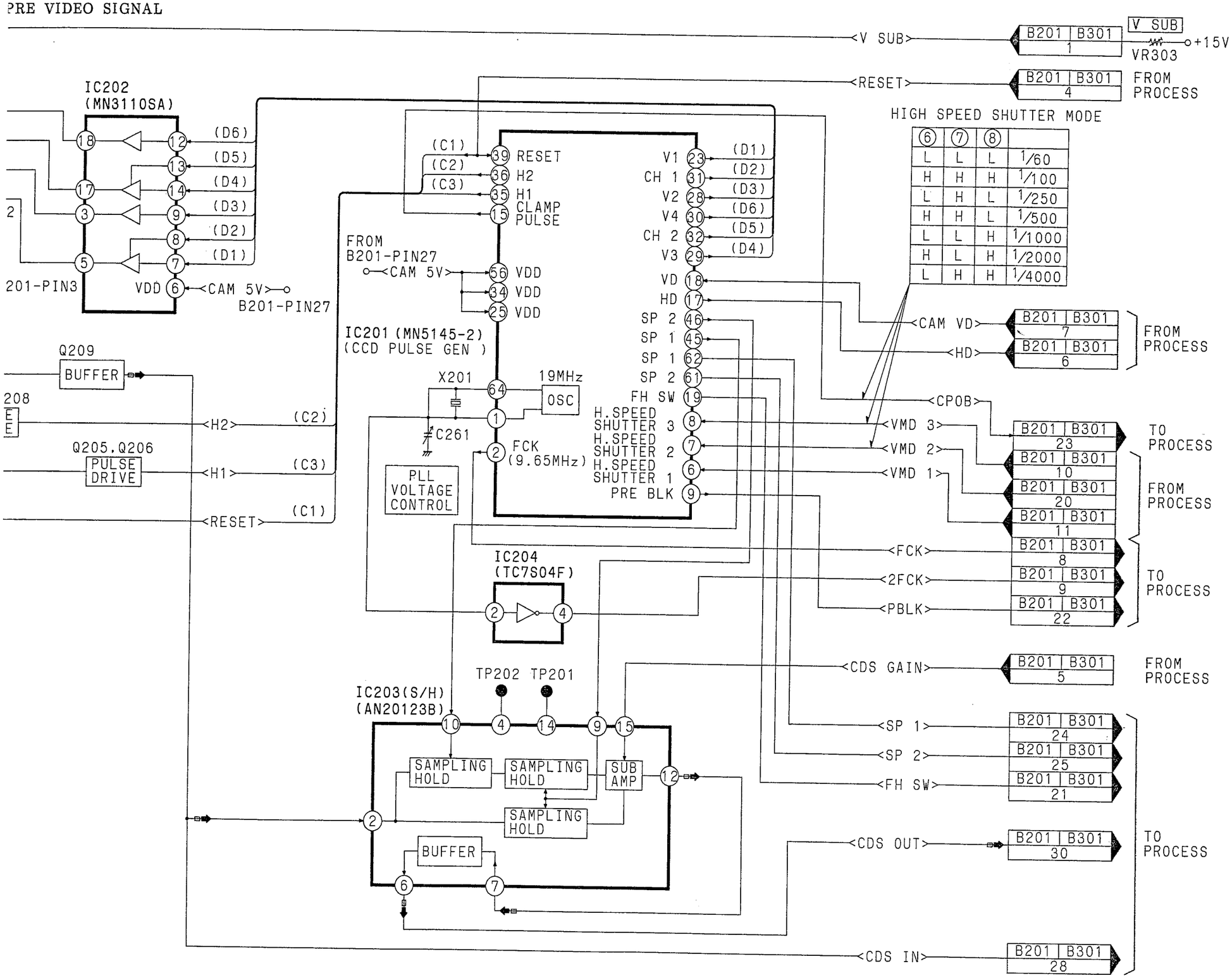
Fig. V9

SECTION 3
BLOCK DIAGRAMS & SCHEMATIC DIAGRAMS

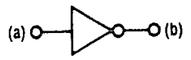
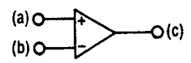
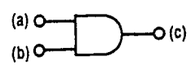
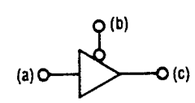
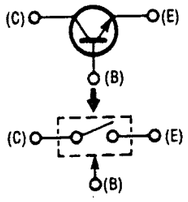
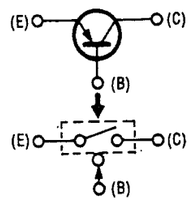
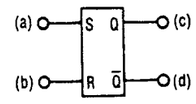
3-1 SENSOR BLOCK DIAGRAM



PRE VIDEO SIGNAL

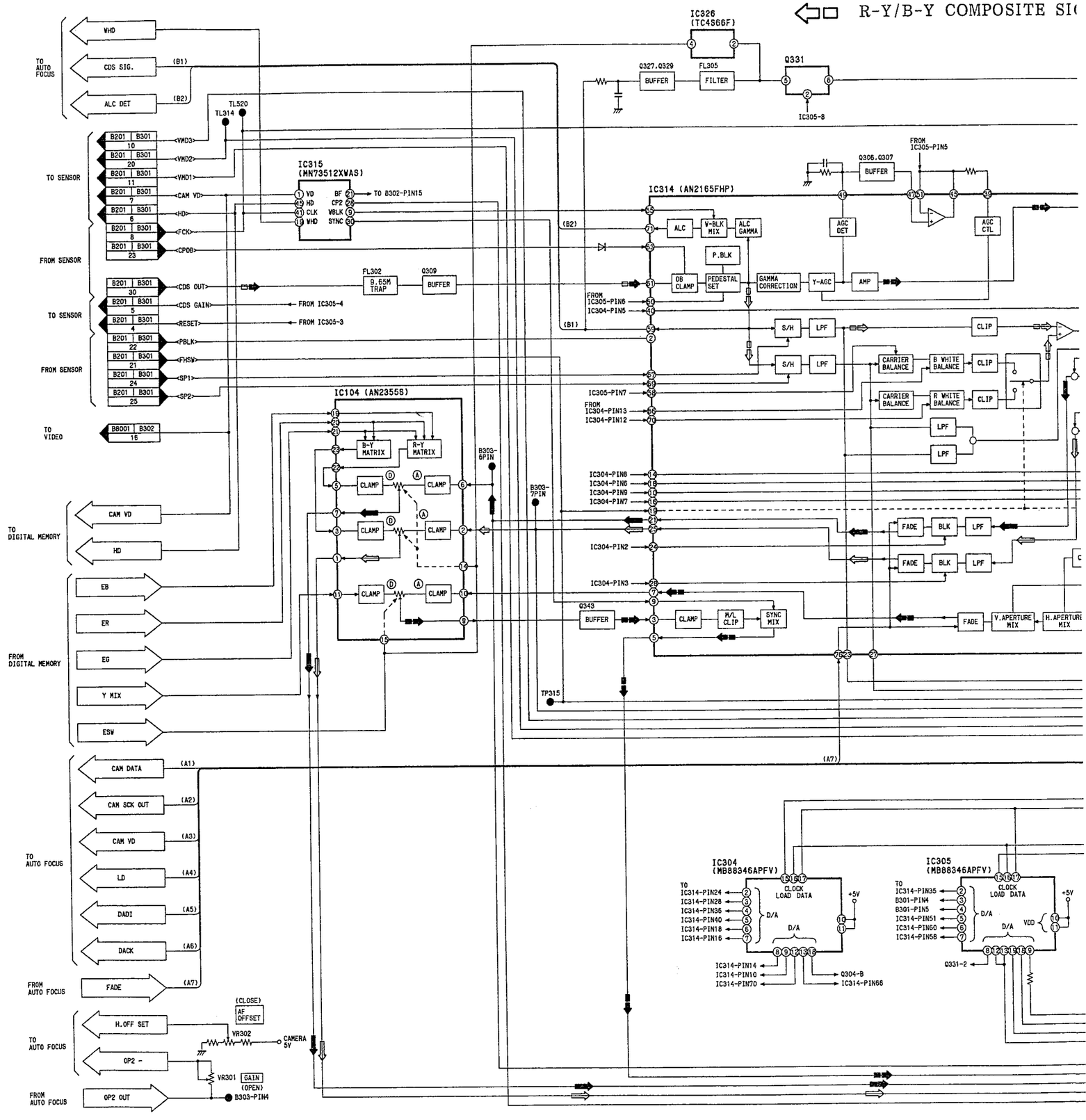


Next Page:
PROCESS Section

SYMBOL	TRUTH VALUE TABLE
INVERTER 	IN (a) H L OUT (b) L H
COMPARTOR 	IN (a)/(b) (a)>(b) (a)<(b) OUT (c) H L
AND CIRCUIT 	IN (a) L L H H (b) L H L H OUT (c) L L L H
OR CIRCUIT 	IN (a) L L H H (b) L H L H OUT (c) L H H H
THREE STATES BUFFER 	IN (a) H L H or L (b) L L H OUT (c) H L ※ ※ High Impedance
TR. SW (NPN TYPE) 	BASE H L TR. SW ON OFF
TR. SW (PNP TYPE) 	BASE H L TR. SW OFF ON
R-S TYPE FLIP-FLOP 	IN (a) L L ⎍ (b) L ⎍ L OUT (c) ※ L H (d) ◆ H L ※ Initial condition is maintained. ◆ Initial condition is reversed.

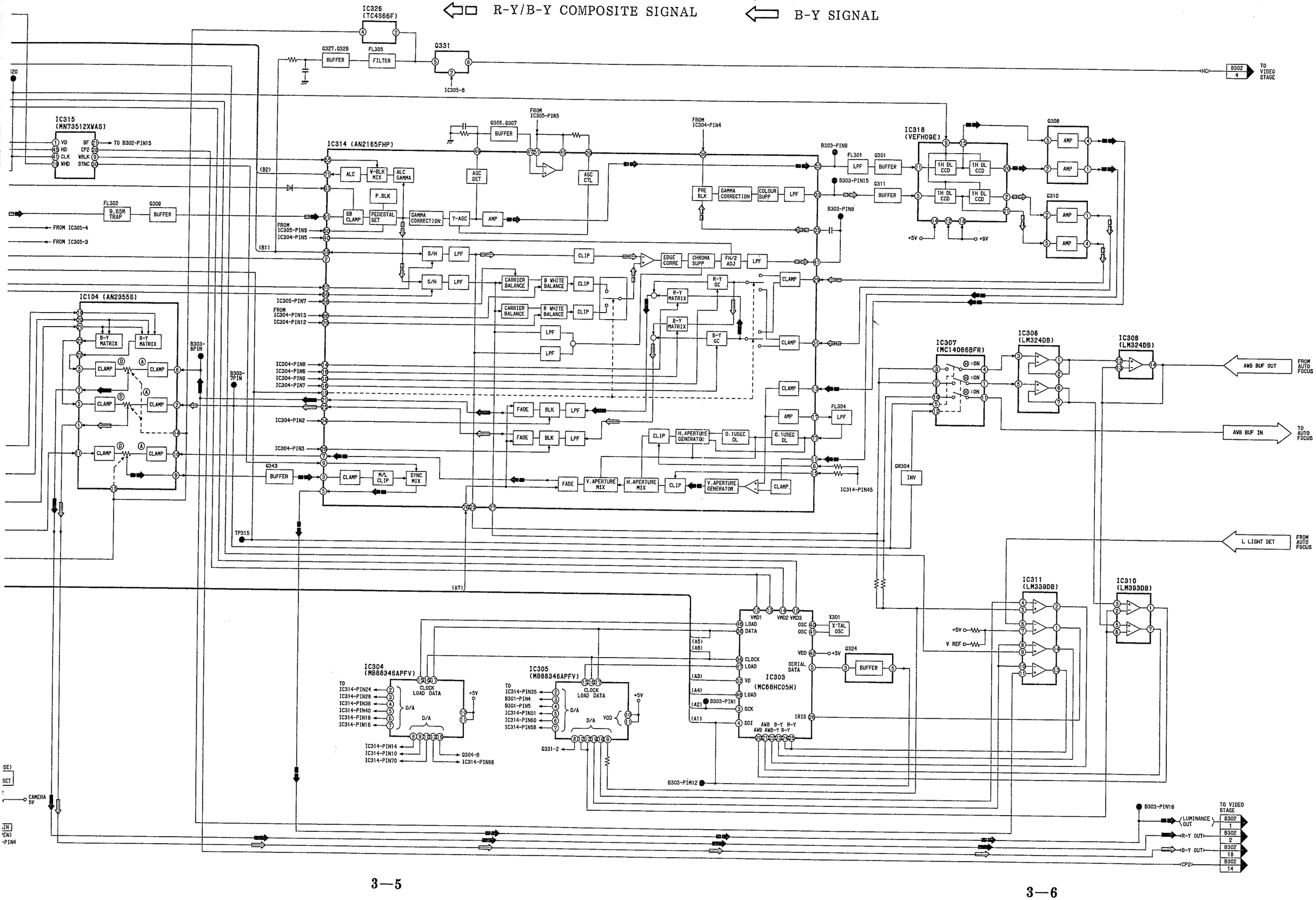
3-2 PROCESS BLOCK DIAGRAM

PRE VIDEO SIGNAL
LUMINANCE SIGNAL
R-Y/B-Y COMPOSITE SI(



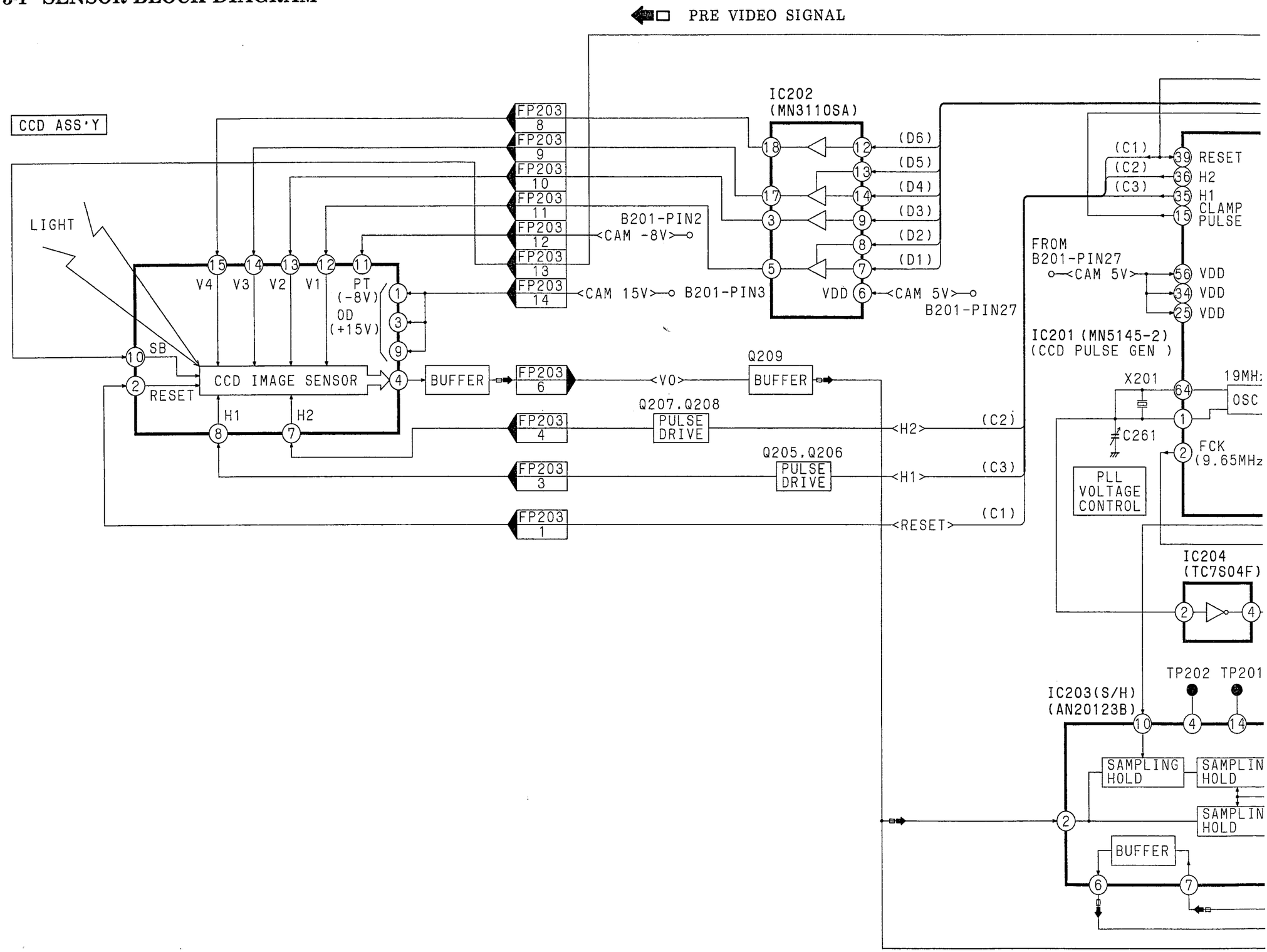
DIAGRAM

PRE VIDEO SIGNAL
LUMINANCE SIGNAL
R-Y/B-Y COMPOSITE SIGNAL
R-Y SIGNAL
B-Y SIGNAL

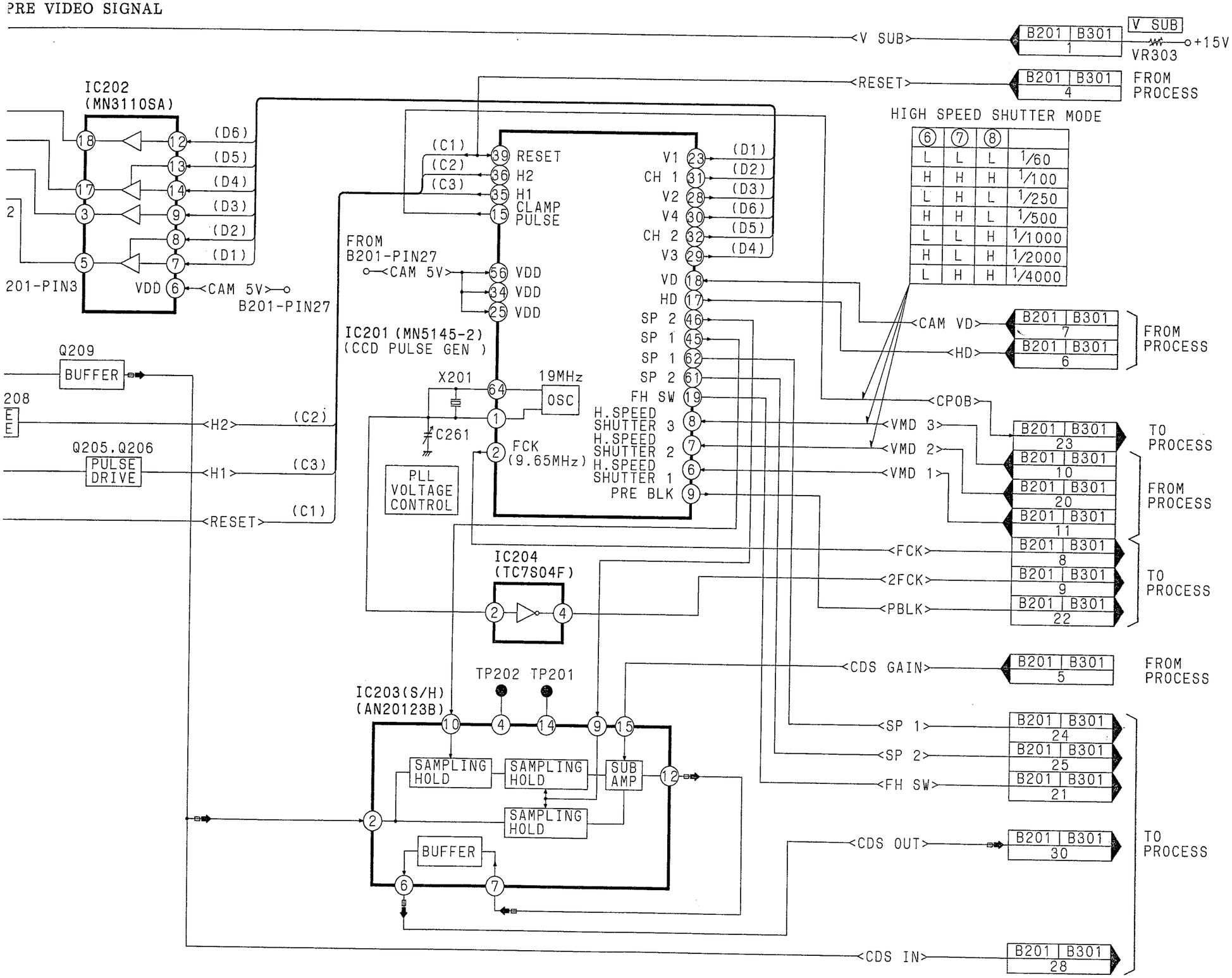


SECTION 3
BLOCK DIAGRAMS & SCHEMATIC DIAGRAMS

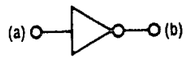
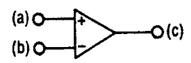
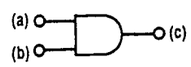
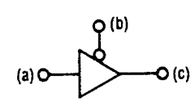
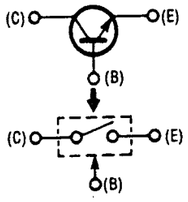
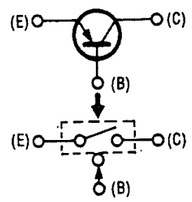
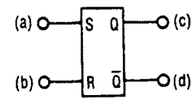
3-1 SENSOR BLOCK DIAGRAM



PRE VIDEO SIGNAL

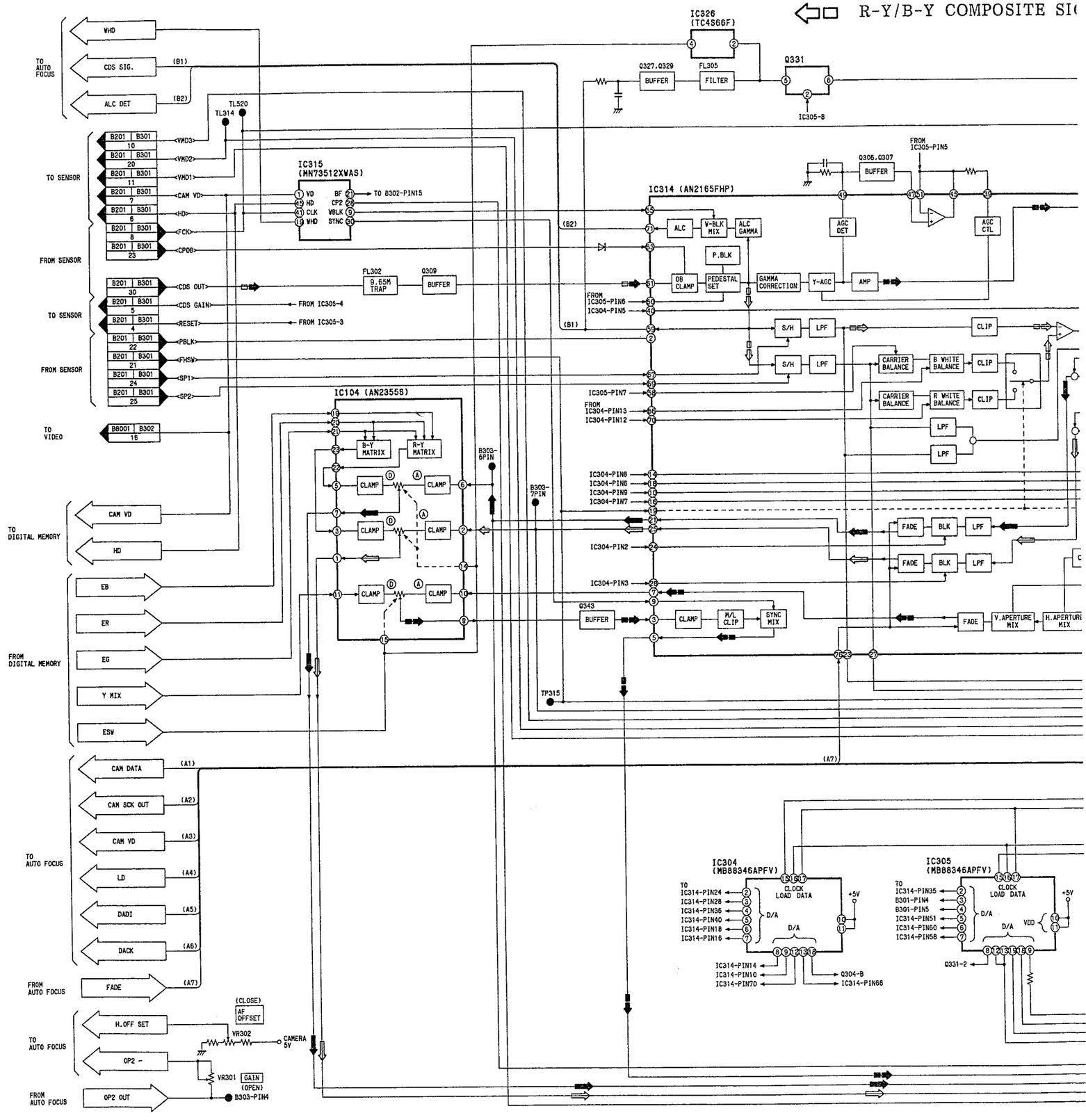


Next Page:
PROCESS Section

SYMBOL	TRUTH VALUE TABLE
INVERTER 	IN (a) H L OUT (b) L H
COMPARTOR 	IN (a)/(b) (a)>(b) (a)<(b) OUT (c) H L
AND CIRCUIT 	IN (a) L L H H (b) L H L H OUT (c) L L L H
OR CIRCUIT 	IN (a) L L H H (b) L H L H OUT (c) L H H H
THREE STATES BUFFER 	IN (a) H L H or L (b) L L H OUT (c) H L ※ ※ High Impedance
TR. SW (NPN TYPE) 	BASE H L TR. SW ON OFF
TR. SW (PNP TYPE) 	BASE H L TR. SW OFF ON
R-S TYPE FLIP-FLOP 	IN (a) L L ⎍ (b) L ⎍ L OUT (c) ※ L H (d) ◆ H L ※ Initial condition is maintained. ◆ Initial condition is reversed.

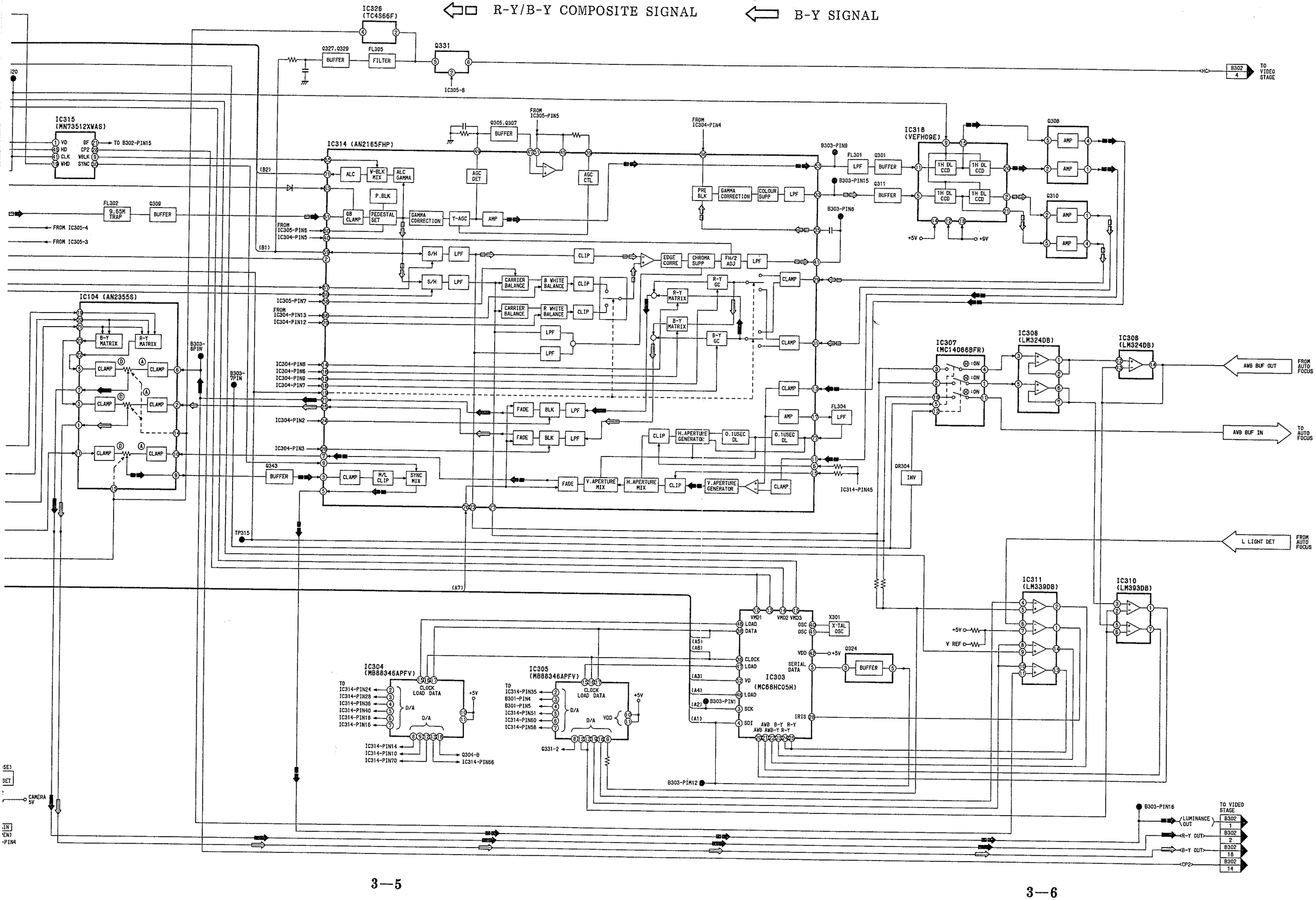
3-2 PROCESS BLOCK DIAGRAM

PRE VIDEO SIGNAL
LUMINANCE SIGNAL
R-Y/B-Y COMPOSITE SI(

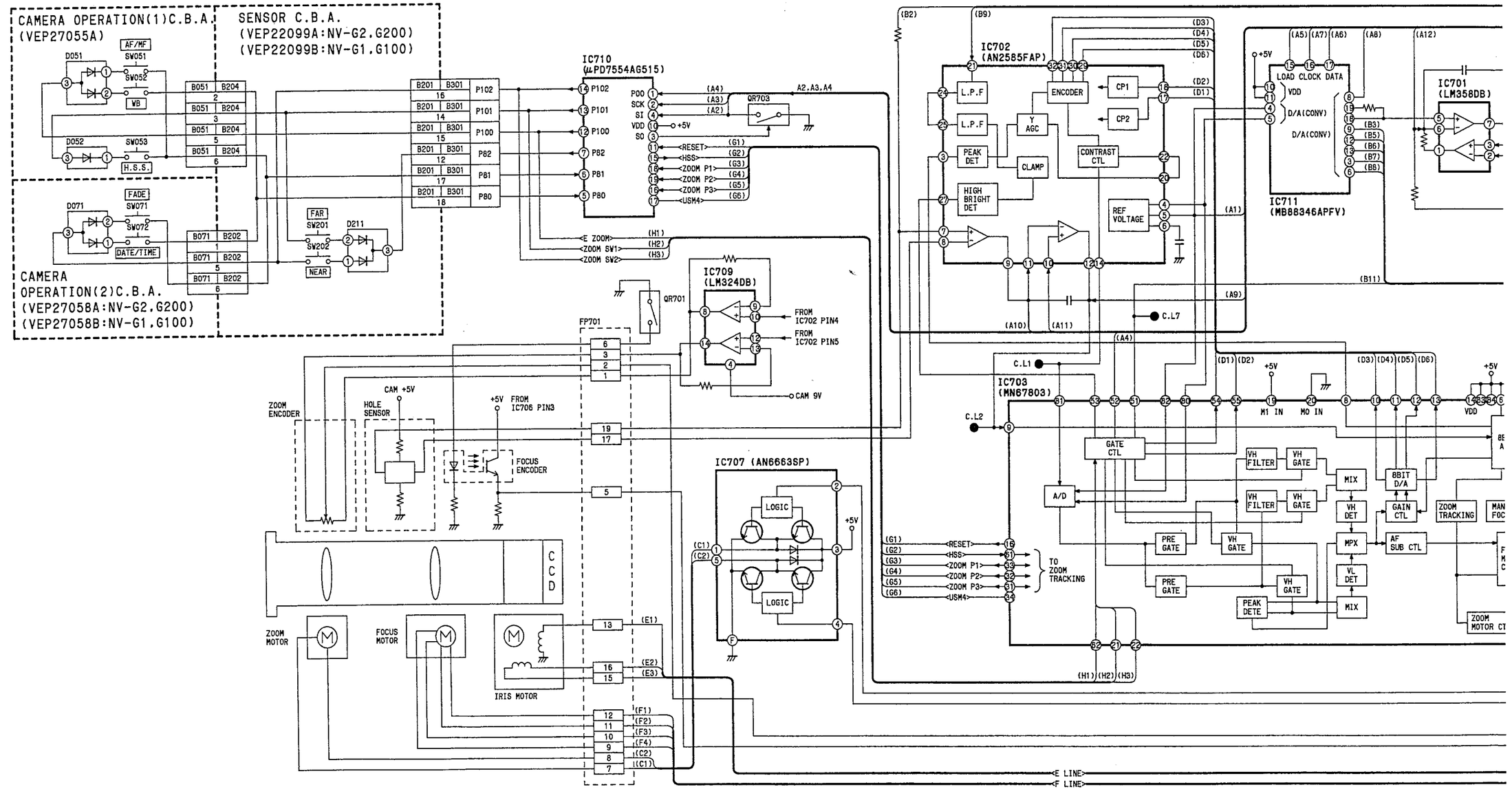


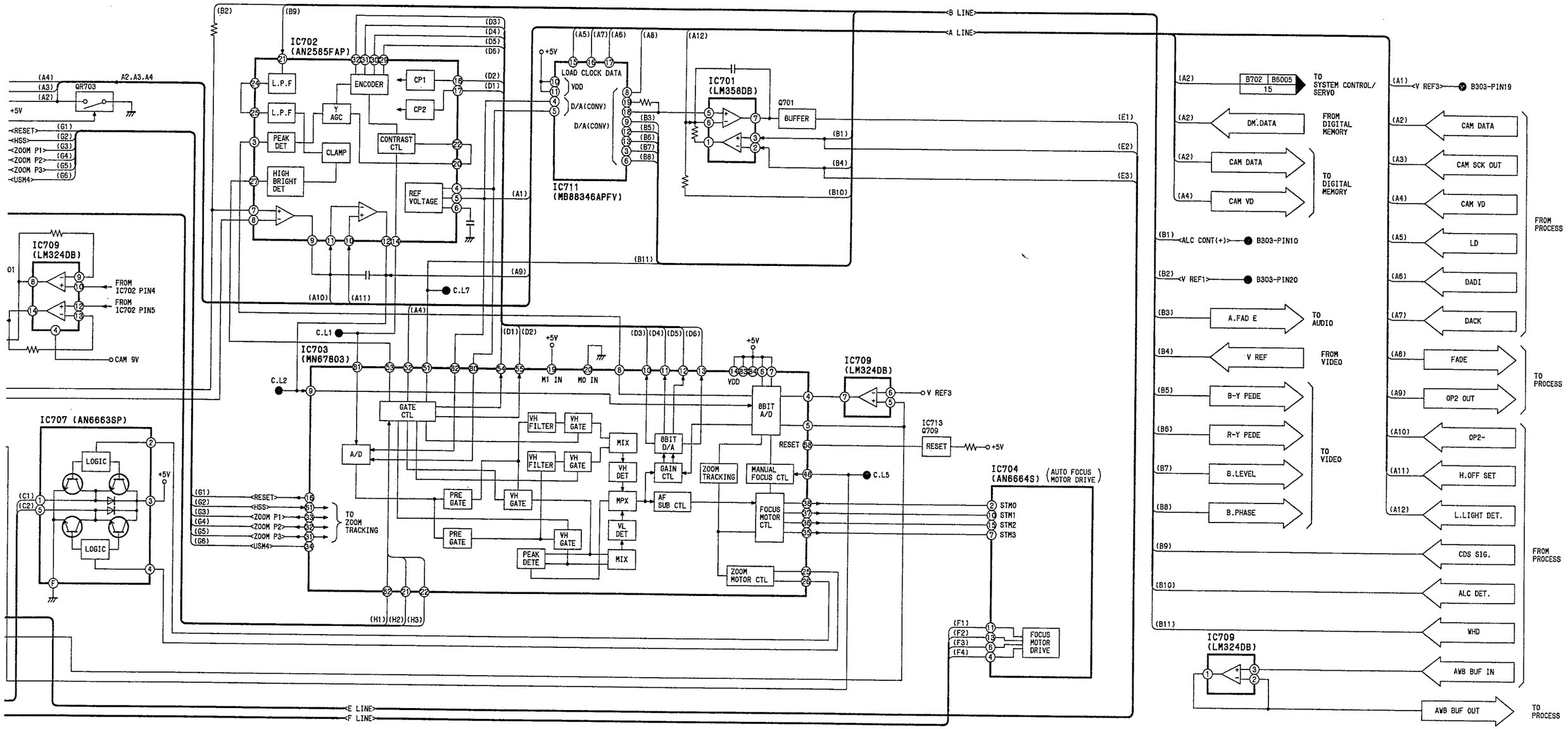
DIAGRAM

PRE VIDEO SIGNAL
LUMINANCE SIGNAL
R-Y/B-Y COMPOSITE SIGNAL
R-Y SIGNAL
B-Y SIGNAL



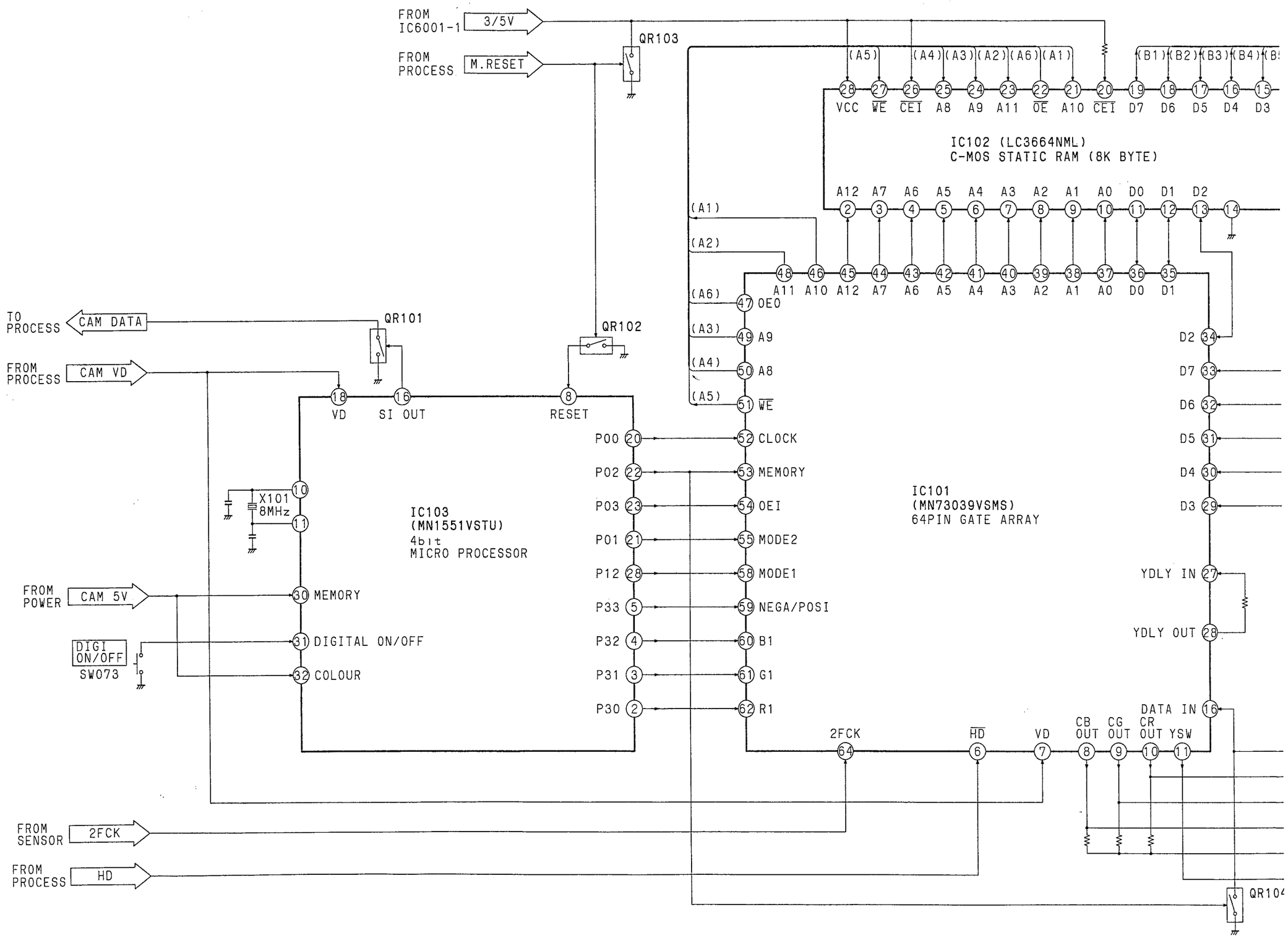
3-3. AUTO FOCUS BLOCK DIAGRAM

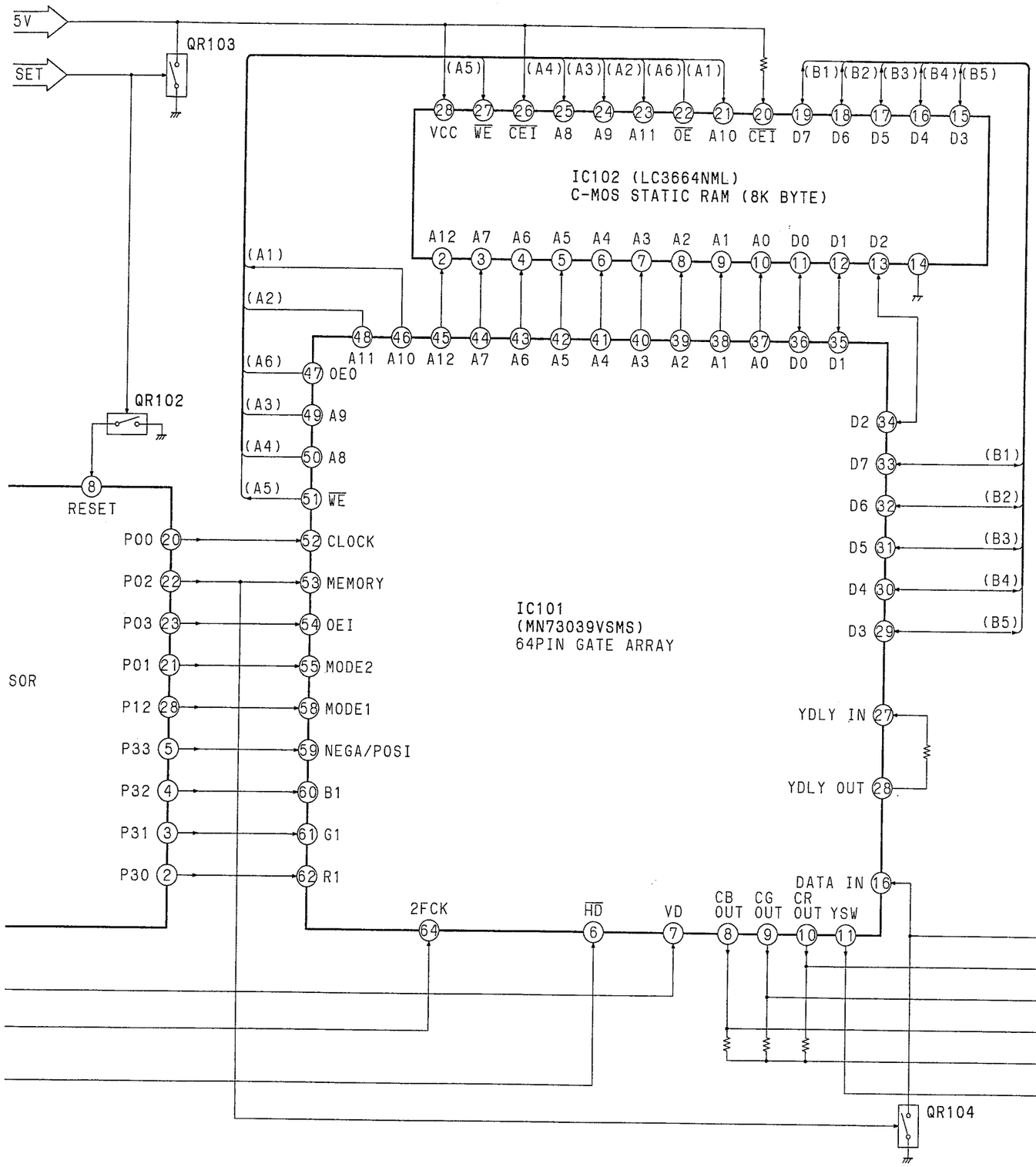


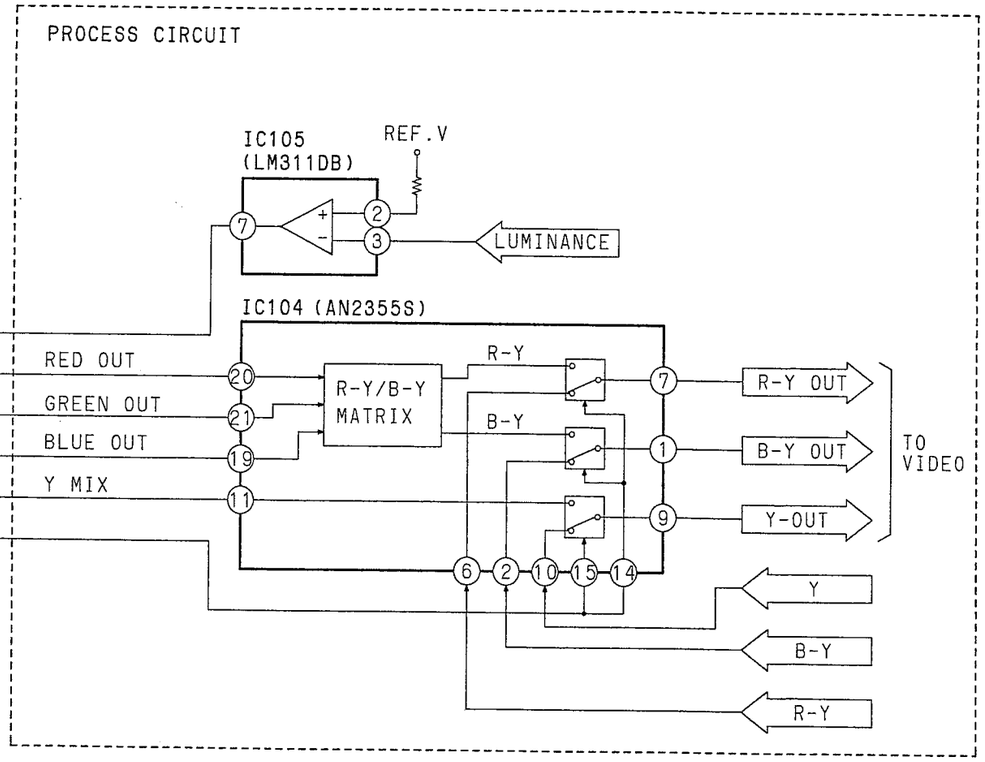


Next Page:
DIGITAL MEMORY Section

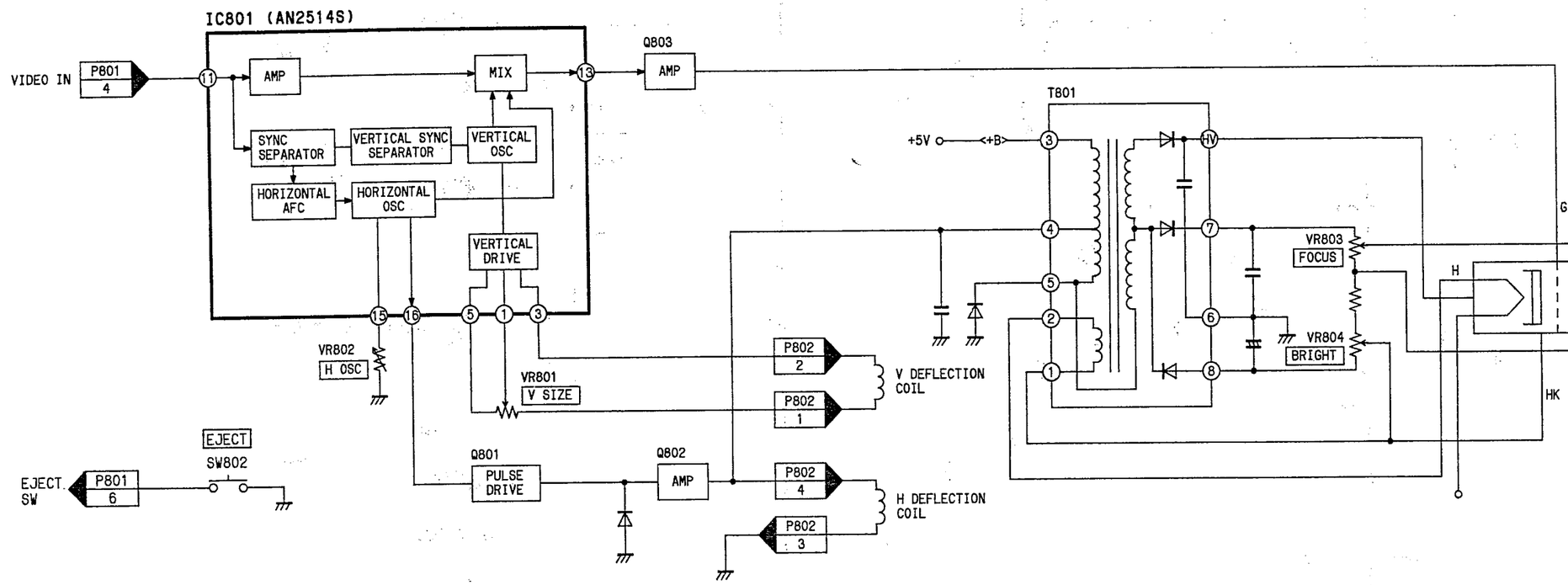
3-4. DIGITAL MEMORY BLOCK DIAGRAM (NV-G2, G200 SERIES)



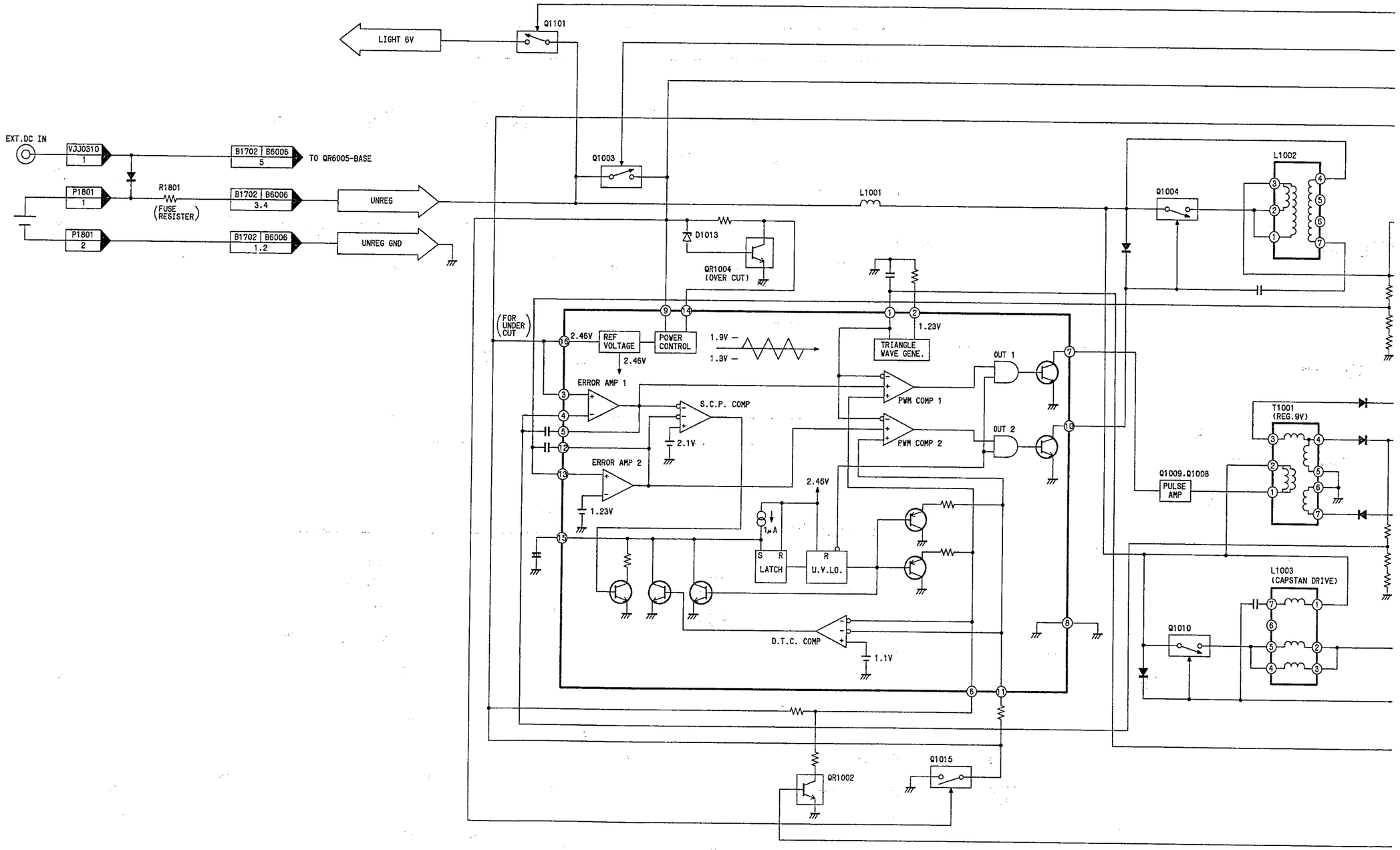

5V
SET
QR103
QR102
QR104
(A5) (A4) (A3) (A2) (A6) (A1)
(B1) (B2) (B3) (B4) (B5)
28 VCC
27 WE
26 CEI
25 A8
24 A9
23 A11
22 OE
21 A10
20 CEI
19 D7
18 D6
17 D5
16 D4
15 D3
IC102 (LC3664NML)
C-MOS STATIC RAM (8K BYTE)
A12 A7 A6 A5 A4 A3 A2 A1 A0 D0 D1 D2
2 3 4 5 6 7 8 9 10 11 12 13 14
(A1)
(A2)
48 46 45 44 43 42 41 40 39 38 37 36 35
A11 A10 A12 A7 A6 A5 A4 A3 A2 A1 A0 D0 D1
(A6) 47 OE0
(A3) 49 A9
(A4) 50 A8
(A5) 51 WE
8 RESET
P00 20 52 CLOCK
P02 22 53 MEMORY
P03 23 54 OEI
P01 21 55 MODE2
P12 28 58 MODE1
P33 5 59 NEGA/POSI
P32 4 60 B1
P31 3 61 G1
P30 2 62 R1
SOR
IC101
(MN73039VSMS)
64PIN GATE ARRAY
D2 34
D7 33 (B1)
D6 32 (B2)
D5 31 (B3)
D4 30 (B4)
D3 29 (B5)
YDLY IN 27
YDLY OUT 28
DATA IN 16
2FCK 64
HD 6
VD 7
CB OUT 8
CG OUT 9
CR OUT 10
YSW 11

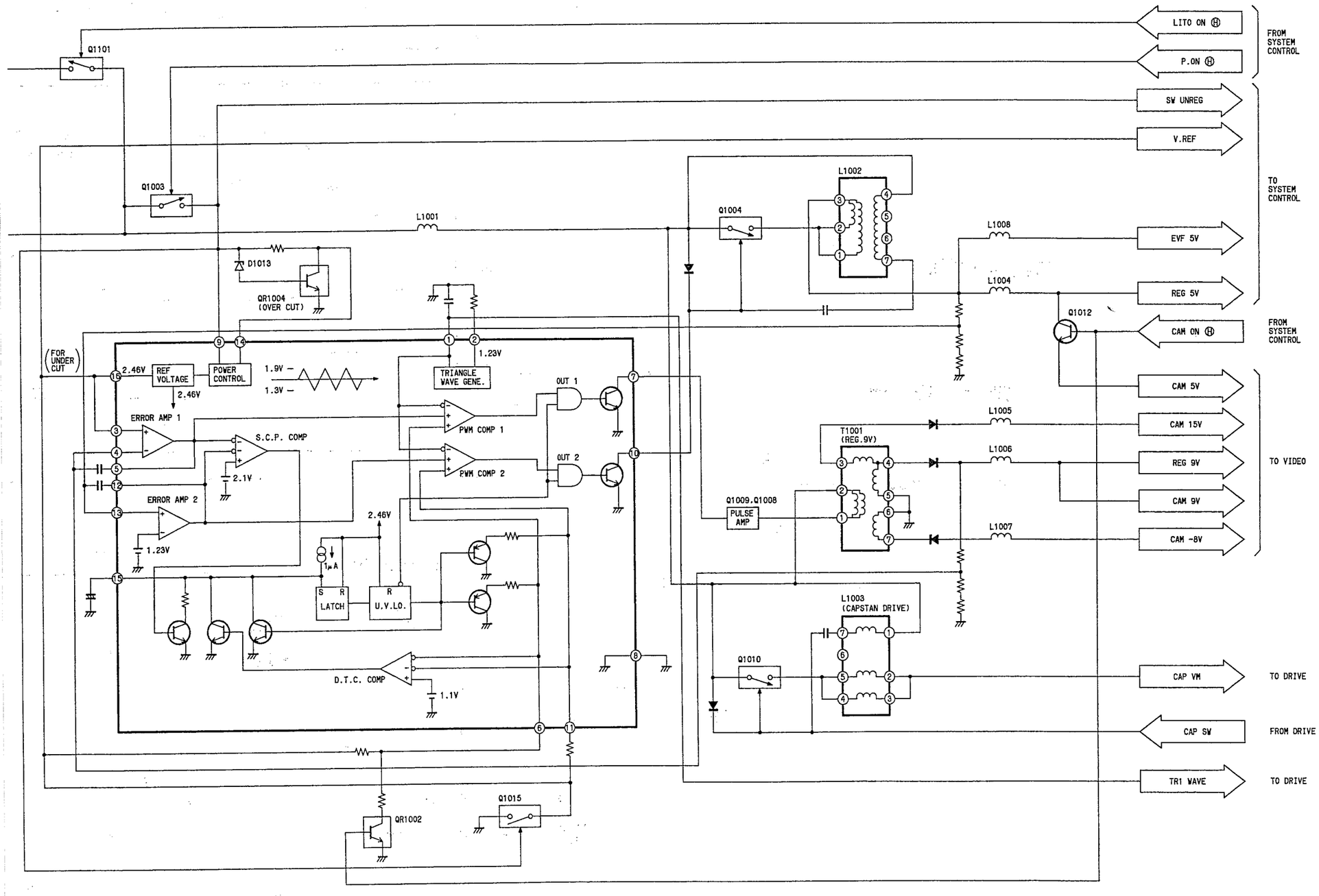

PROCESS CIRCUIT
IC105
(LM311DB)
REF.V
7 2 3
LUMINANCE
IC104 (AN2355S)
RED OUT 20
GREEN OUT 21
BLUE OUT 19
Y MIX 11
R-Y/B-Y
MATRIX
R-Y
B-Y
7 1 9
R-Y OUT
B-Y OUT
Y-OUT
TO
VIDEO
6 2 10 15 14
Y
B-Y
R-Y

3-5. E.V.F. BLOCK DIAGRAM

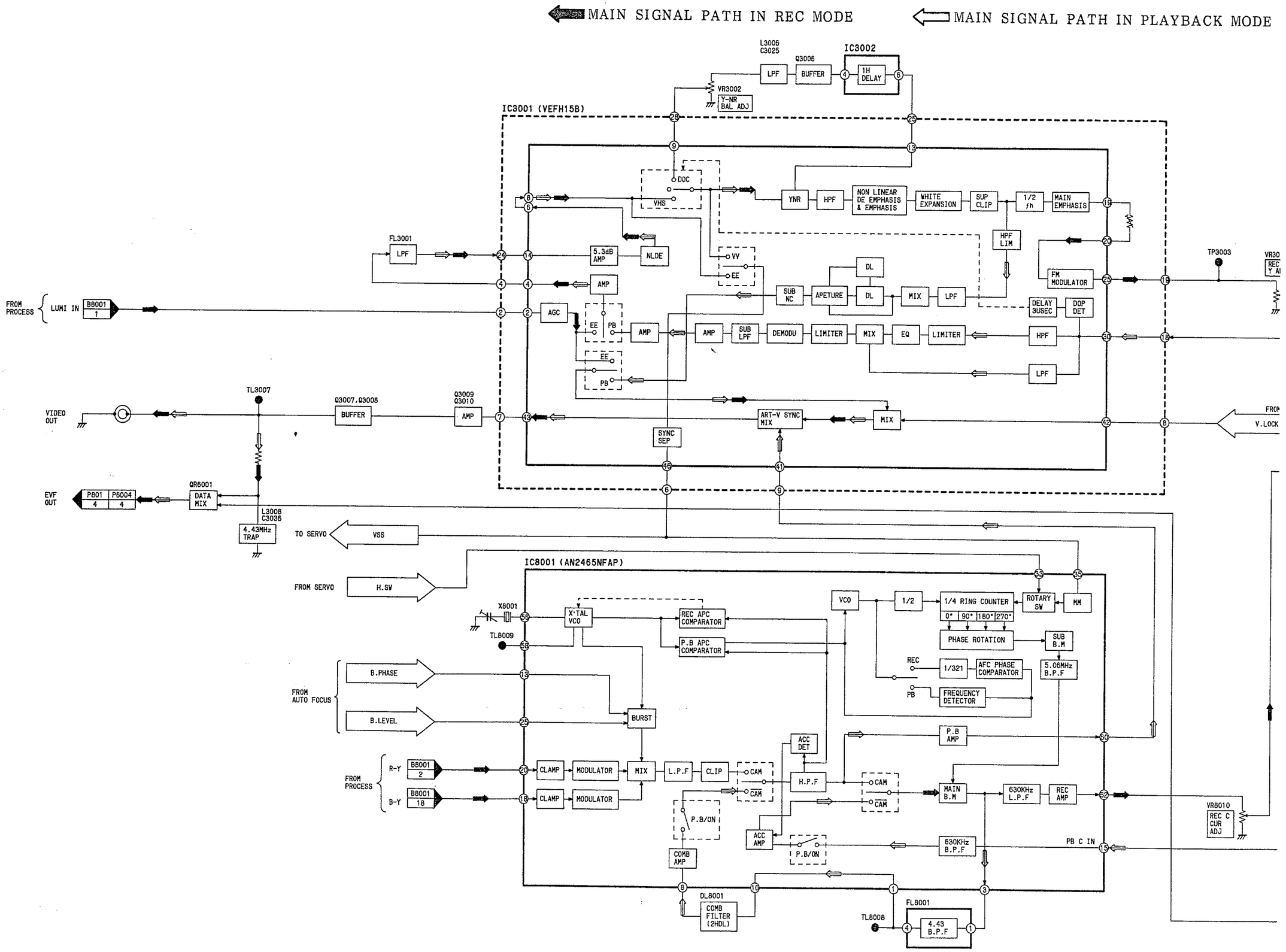


3-6 POWER BLOCK DIAGRAM



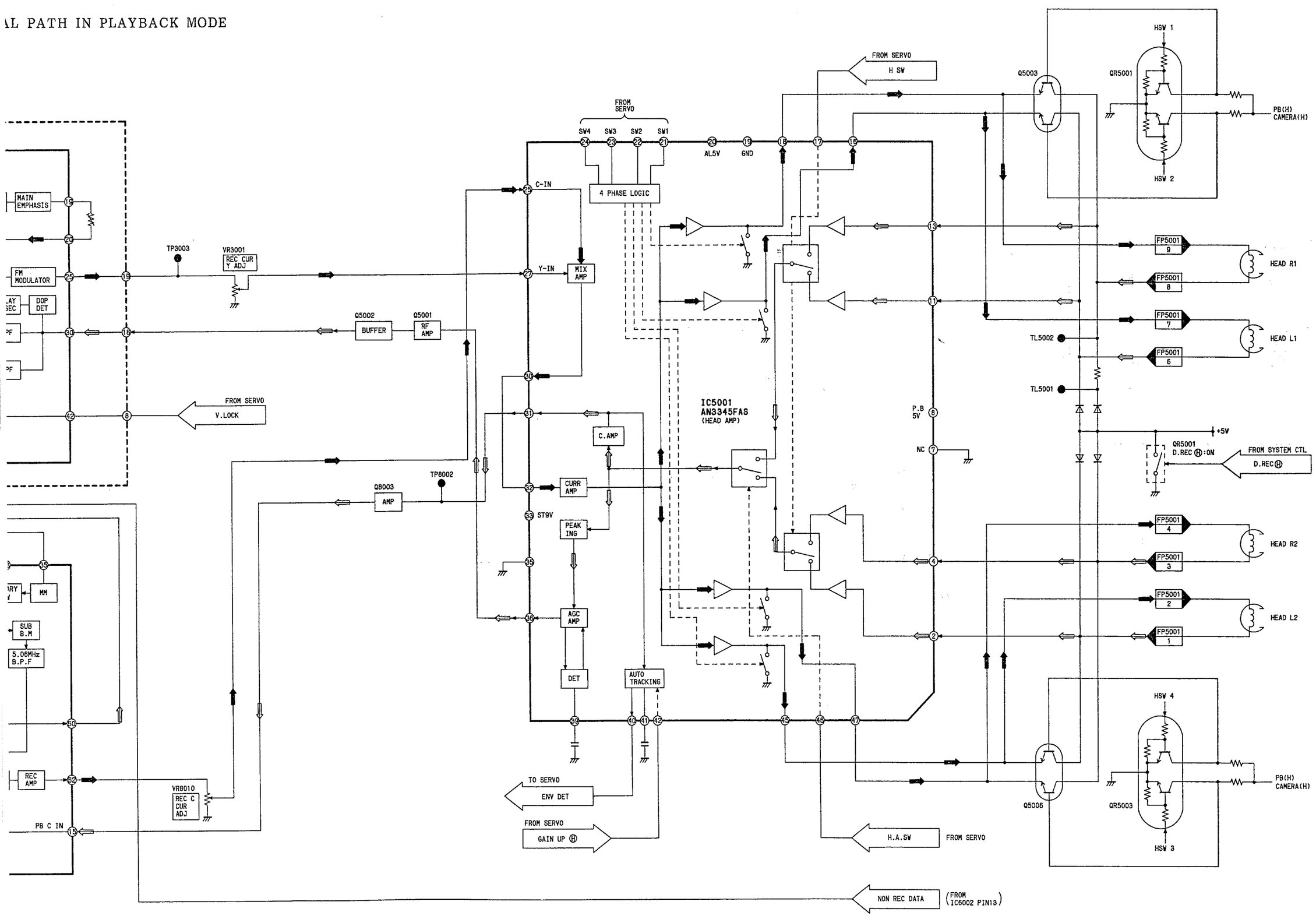

Q1101
Q1003
L1001
D1013
QR1004
(OVER CUT)
(FOR UNDER CUT)
2.46V
REF VOLTAGE
POWER CONTROL
1.9V
1.3V
1.23V
TRIANGLE WAVE GENE.
ERROR AMP 1
S.C.P. COMP
2.1V
PWM COMP 1
PWM COMP 2
OUT 1
OUT 2
ERROR AMP 2
1.23V
2.46V
1μA
S R
LATCH
R
U.V.LO.
D.T.C. COMP
1.1V
QR1002
Q1015
Q1004
L1002
L1008
L1004
Q1012
T1001
(REG.9V)
L1005
L1006
L1007
Q1009.Q1008
PULSE AMP
L1003
(CAPSTAN DRIVE)
Q1010
LITO ON H
P.ON H
SW UNREG
V.REF
EVF 5V
REG 5V
CAM ON H
CAM 5V
CAM 15V
REG 9V
CAM 9V
CAM -8V
CAP VM
CAP SW
TR1 WAVE
FROM SYSTEM CONTROL
TO SYSTEM CONTROL
FROM SYSTEM CONTROL
TO VIDEO
TO DRIVE
FROM DRIVE
TO DRIVE

3-7 LUMINANCE/CHROMINANCE & HEAD AMP BLOCK DIAGRAM

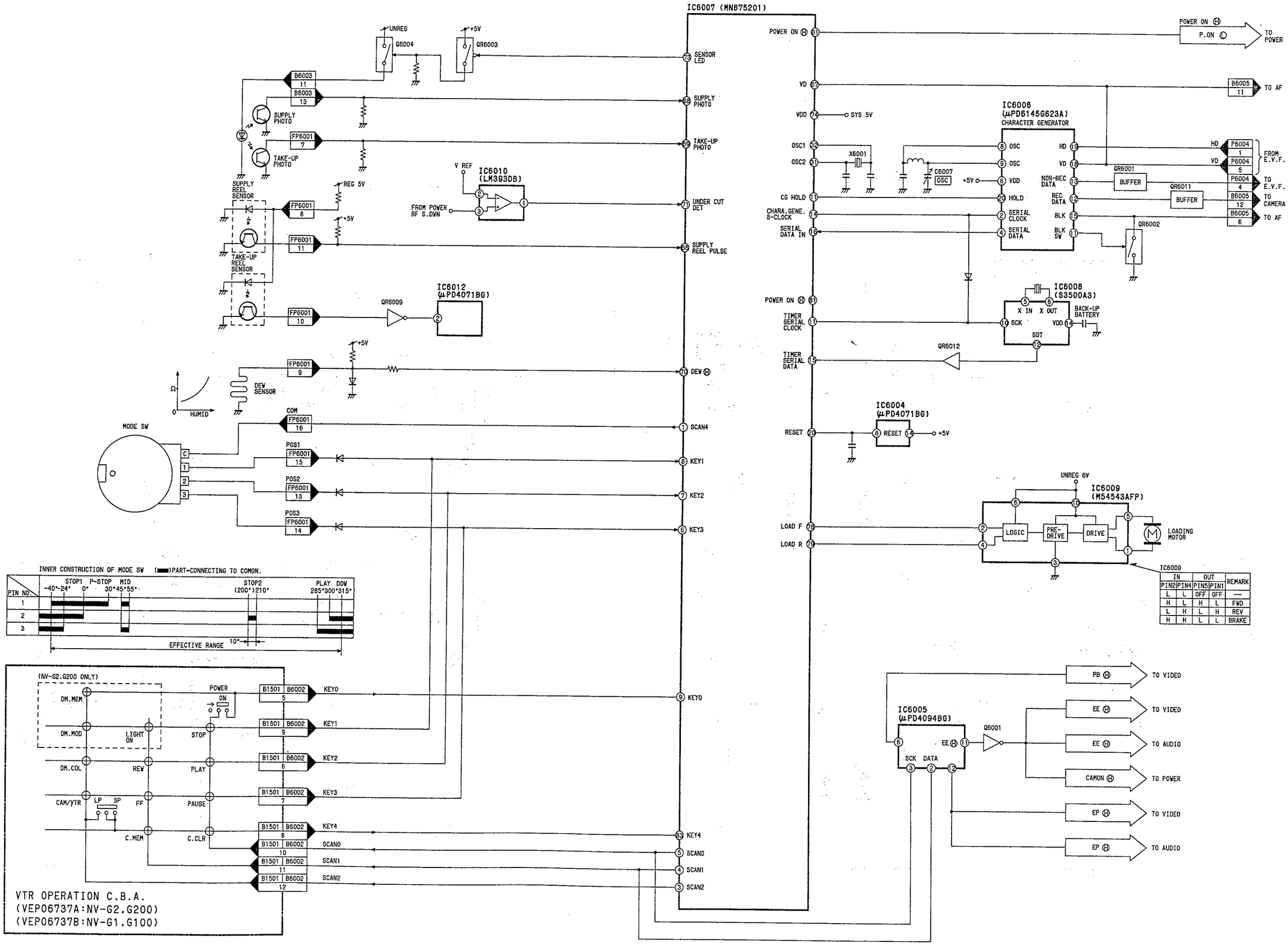


Back Page:
E.V.F. & POWER Section

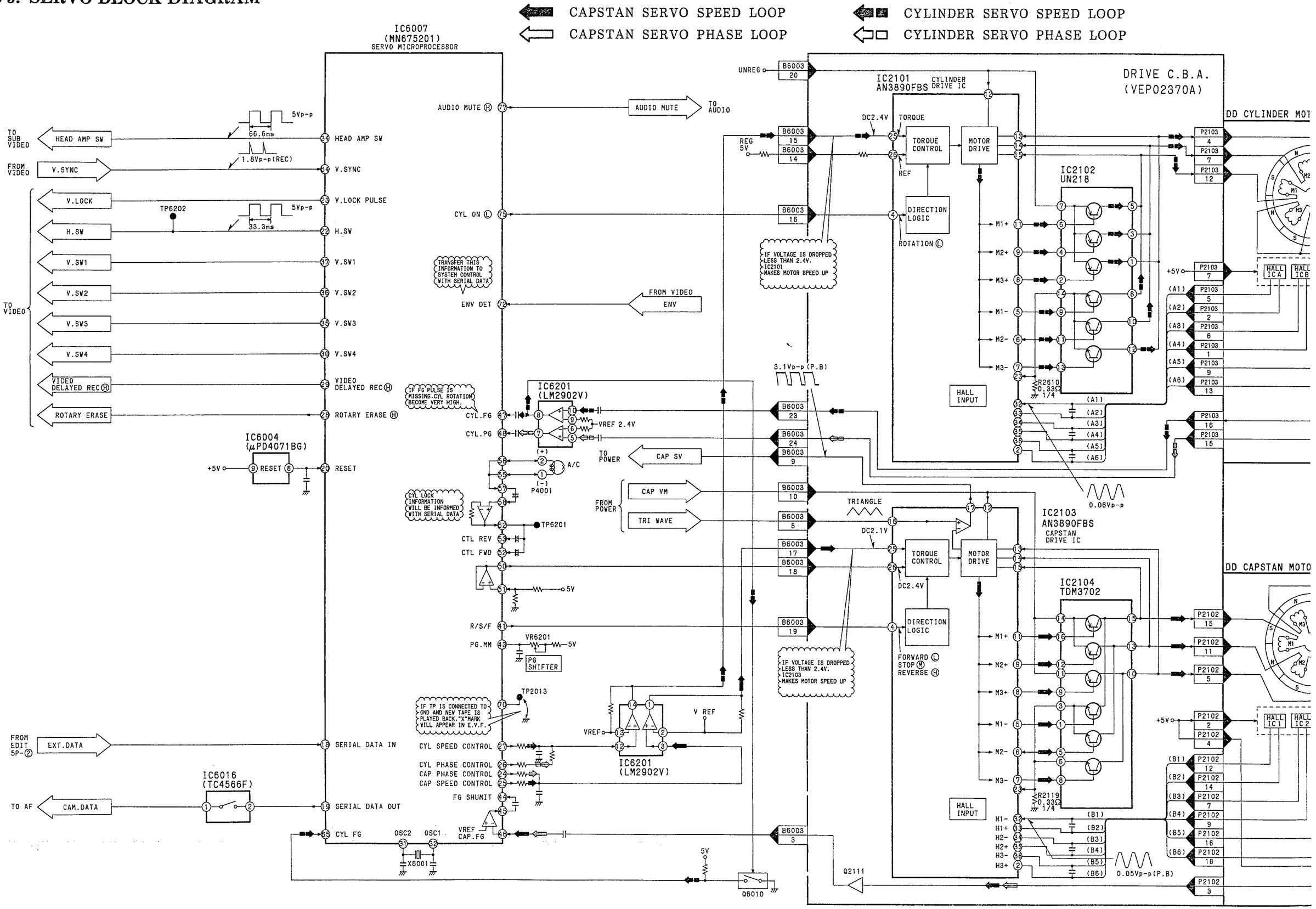
AL PATH IN PLAYBACK MODE

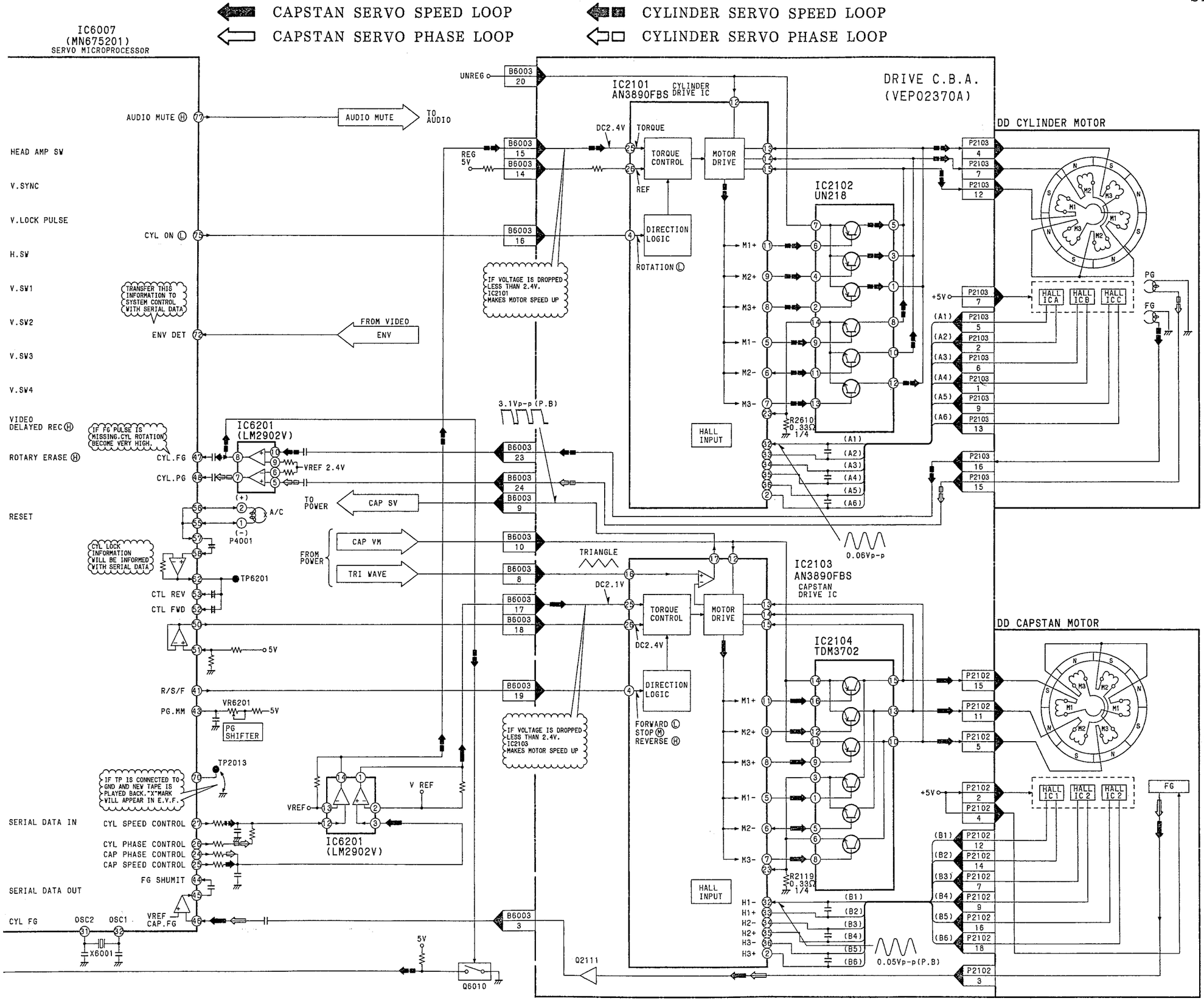


3-8. SYSTEM CONTROL BLOCK DIAGRAM



3-9. SERVO BLOCK DIAGRAM

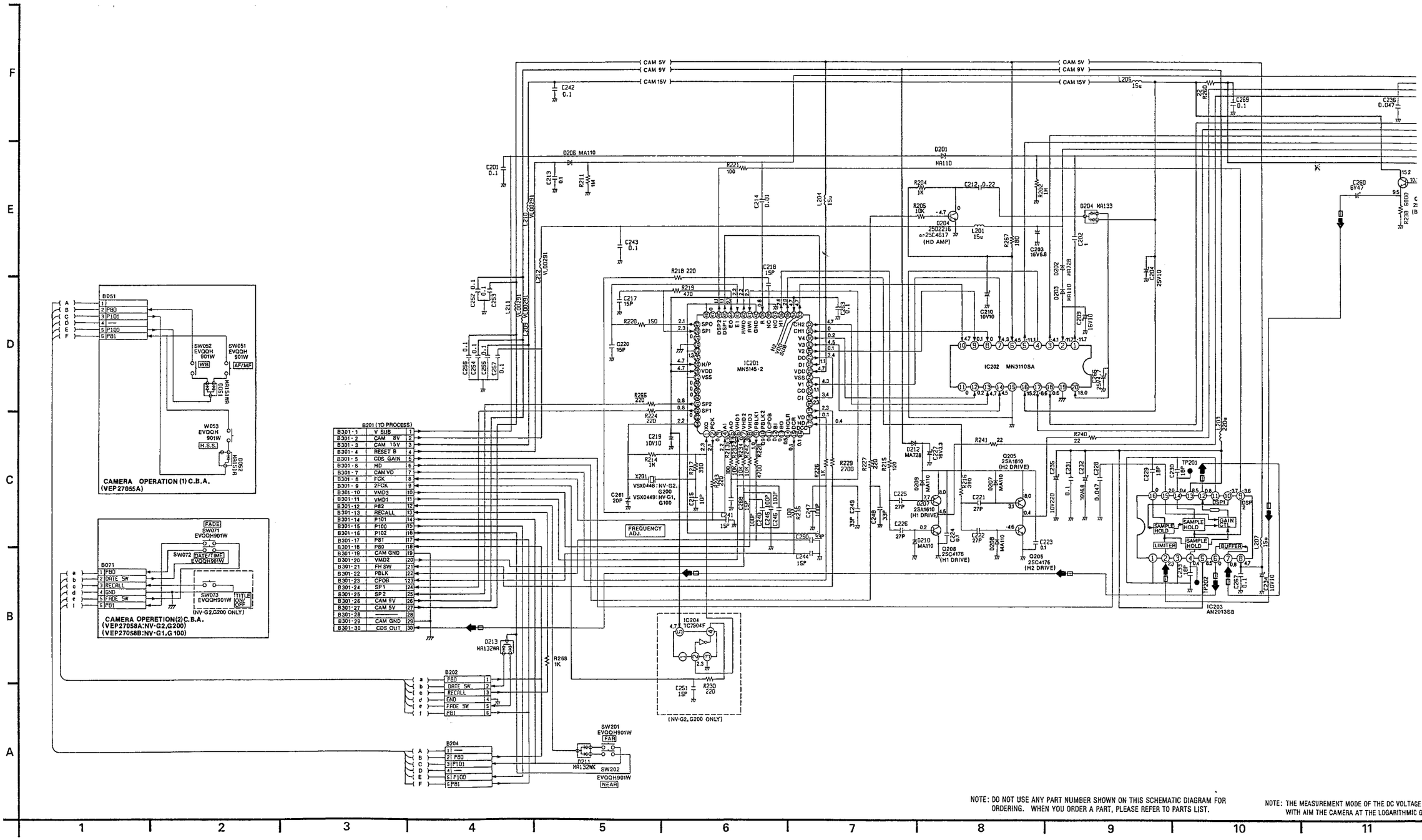




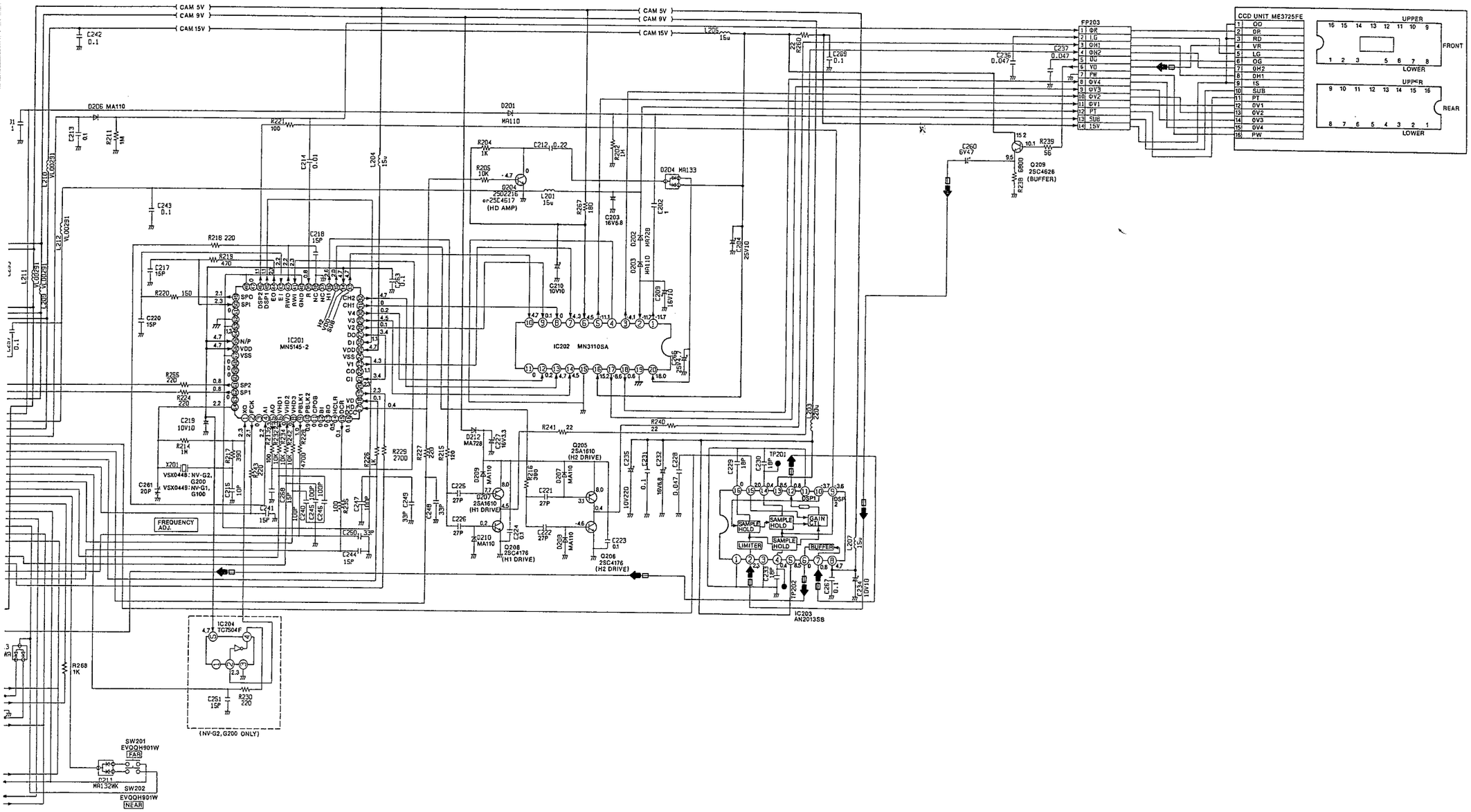
Next Page:
SENSOR Section

3-10 SENSOR SCHEMATIC DIAGRAM

PRE VIDEO SIGNAL



VIDEO SIGNAL



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.

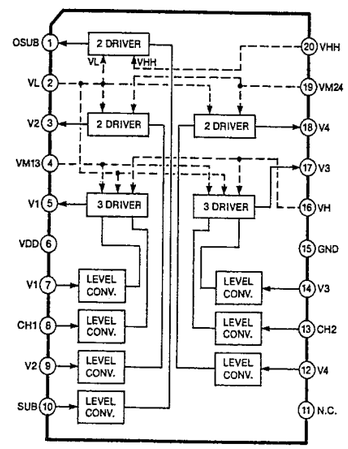
NOTE: THE WAVEFORM OF THIS DIAGRAM IS MEASURED WITH AIM THE CAMERA AT THE LOGARITHMIC GRAY SCALE CHART.

SENSOR C.B.A.	
Transistor	
Q204	B-7 Ⓕ
Q205	D-6 Ⓕ
Q206	D-6 Ⓕ
Q207	D-4 Ⓒ
Q208	D-4 Ⓒ
Q209	B-3 Ⓒ
Integrated Circuit	
IC201	C-6 Ⓕ
IC202	C-7 Ⓕ
IC203	B-7 Ⓕ
IC204	C-3 Ⓒ
Test Point	
TP201	A-3 Ⓒ
TP202	A-3 Ⓒ
Adjustment	
C261	B-6 Ⓕ
Connector	
B051	E-3 Ⓕ
B071	E-8
B202	D-5 Ⓕ
B204	D-3 Ⓒ
B201	B-8 Ⓕ
FP203	B-3 Ⓒ

ADDRESS INFORMATION
Ⓒ... COMPONENT SIDE
Ⓕ... FOIL SIDE

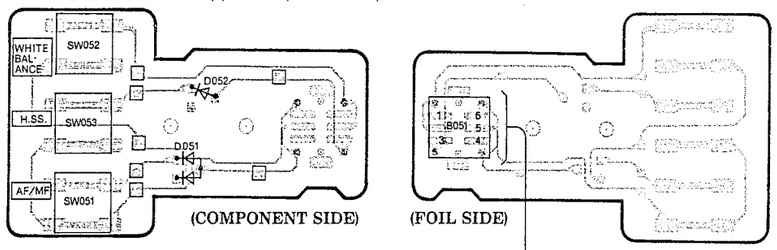
IC BLOCK

IC202 (MN3110SA)



3-11 SENSOR C B A (VEP22099A: NV-G2, G200 SERIES) (VEP22099B: NV-G1, G100 SERIES)

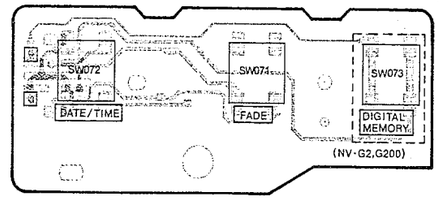
CAMERA OPERATION (1) C.B.A. (VEP27055A)



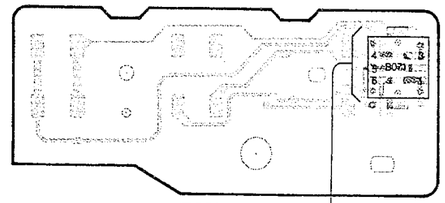
(COMPONENT SIDE)

(FOIL SIDE)

CAMERA OPERATION (2) C.B.A. (VEP27058A: NV-G2, G200)
(VEP27058B: NV-G1, G100)

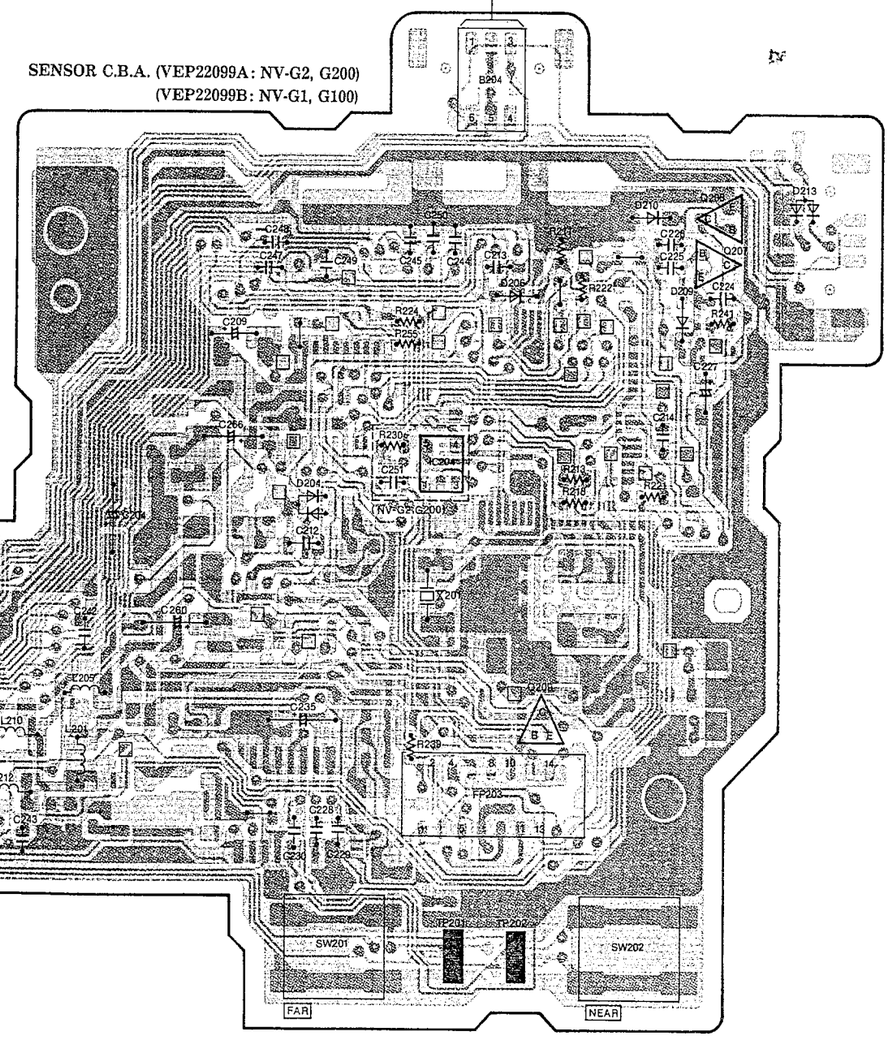


(COMPONENT SIDE)



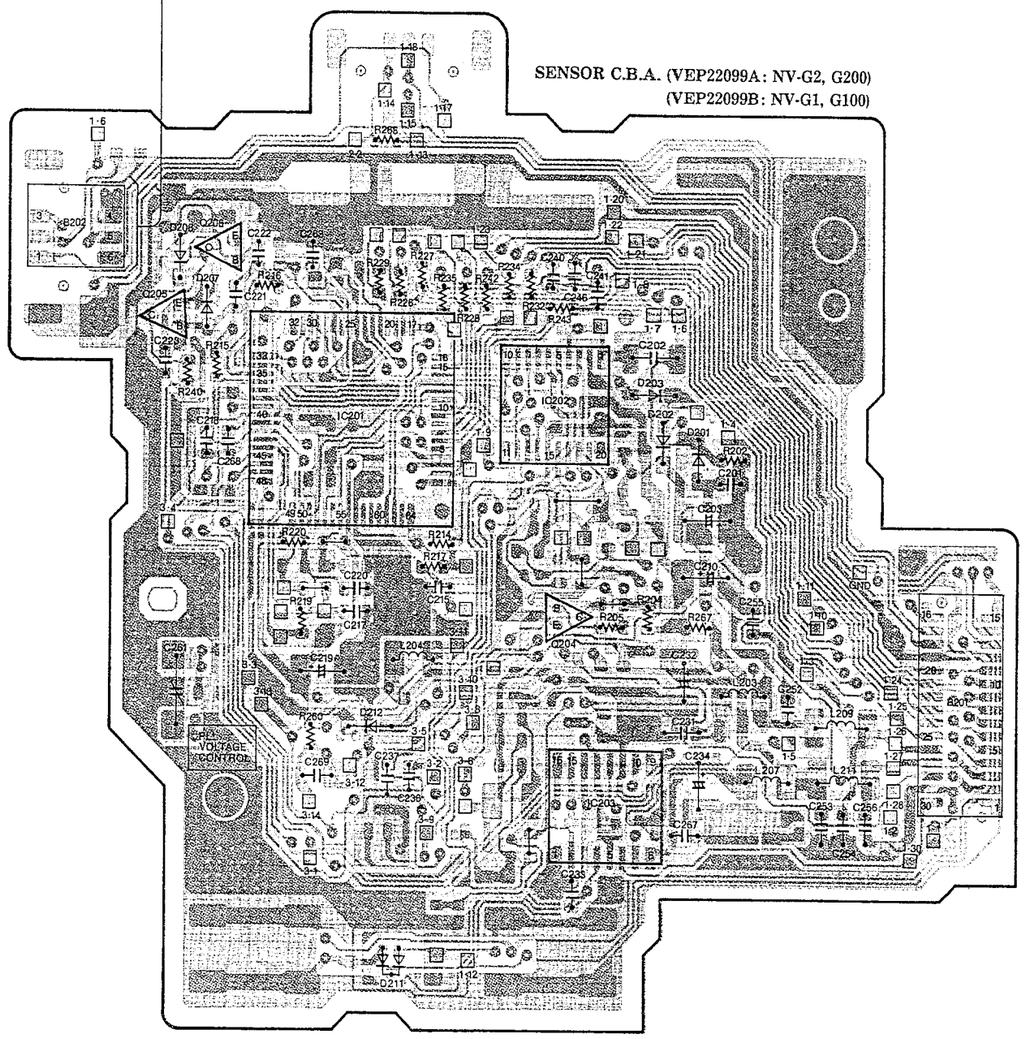
(FOIL SIDE)

SENSOR C.B.A. (VEP22099A: NV-G2, G200)
(VEP22099B: NV-G1, G100)



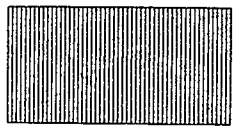
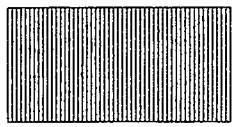
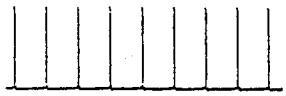
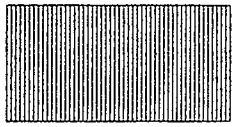
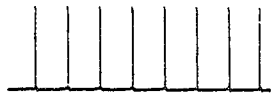
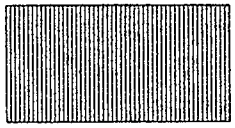
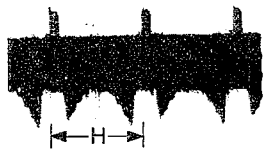
(COMPONENT SIDE)

SENSOR C.B.A. (VEP22099A: NV-G2, G200)
(VEP22099B: NV-G1, G100)

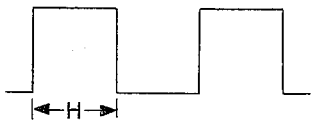
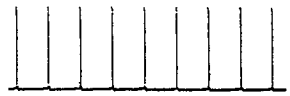
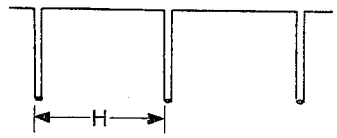
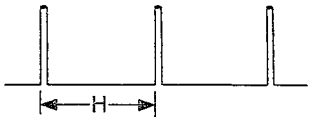
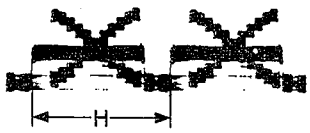
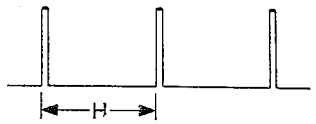
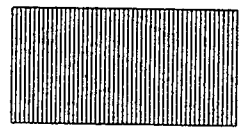
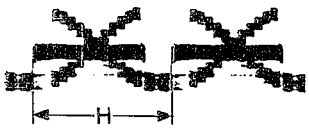
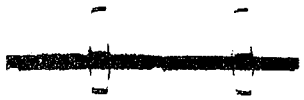
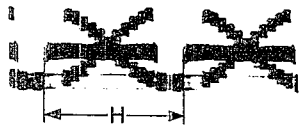
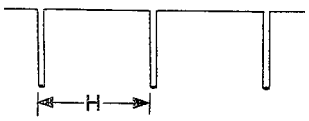
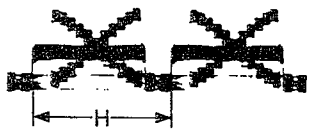
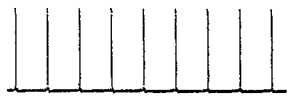
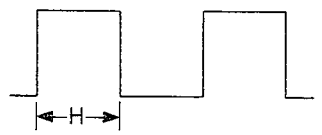
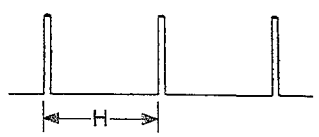


(FOIL SIDE)

SENSOR CIRCUIT WAVEFORM (STOP MODE)

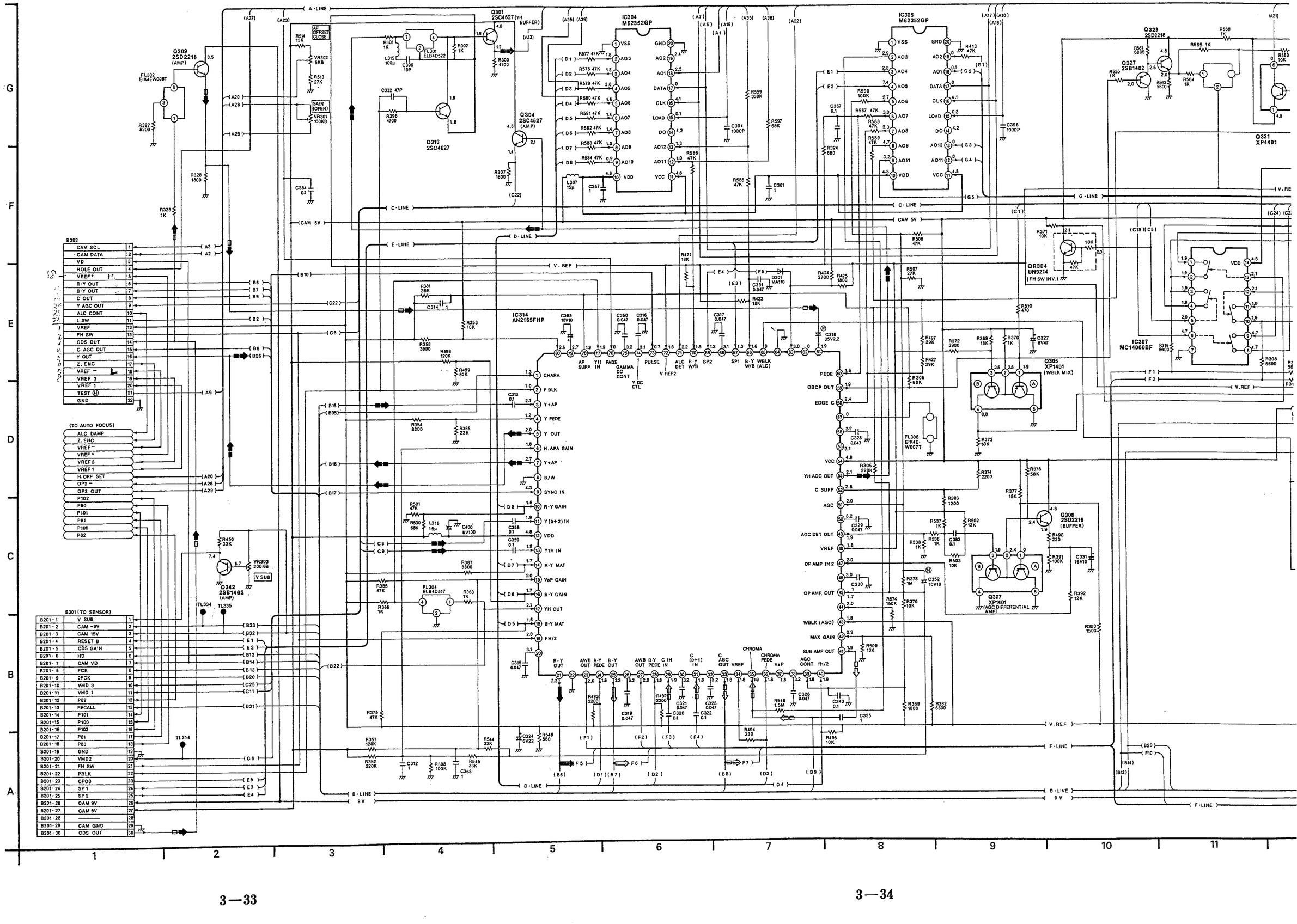
IC201-④  1.8Vp-p	IC201-⑥①, ⑥②  7.0Vp-p	IC203-④  0.6Vp-p
IC201-⑤  4.5Vp-p	IC202-③  8.0Vp-p	IC203-⑥, ⑦, ⑫  1.0Vp-p
IC201-⑥, ⑦, ⑧  2.5Vp-p	IC202-⑤, ⑫  5.0Vp-p	
IC201-㉓, ㉙  5.0Vp-p	IC202-⑦  5.0Vp-p	
IC201-㉘, ㉚  5.0Vp-p	IC202-⑨  5.0Vp-p	
IC201-㊶, ㊷  2.5Vp-p	IC202-⑰  8.0Vp-p	
IC201-㊸, ㊾, ㊿  5.0Vp-p	IC203-②  0.7Vp-p	

PROCESS CIRCUIT WAVEFORM (STOP MODE)

IC314-①  0.4Vp-p	IC314-⑲  0.4Vp-p	IC314-㊺  0.8Vp-p	IC315-㉚  5.0Vp-p
IC314-②  5.0Vp-p	IC314-㉓  0.5Vp-p	IC314-㊸  1.1Vp-p	IC315-㊶  2.2Vp-p
IC314-③, ⑦  1.0Vp-p	IC314-㉑  0.5Vp-p	IC314-㊺  5.0Vp-p	
IC314-⑤  1.2Vp-p	IC314-㉕  0.4Vp-p	IC314-㊼, ㊾  5.0Vp-p	
IC314-⑨  5.0Vp-p	IC314-㉗  0.5Vp-p	IC314-㊼  0.4Vp-p	
IC314-⑪, ⑬  0.4Vp-p	IC314-㉟, ㊶  0.6Vp-p	IC315-⑨, ㉗  5.0Vp-p	
IC314-⑰  1.2Vp-p	IC314-㊹, ㊾, ㊸, ㊼, ㊾, ㊶  0.7Vp-p	IC315-⑲, ㉑, ㉘, ㉙  5.0Vp-p	

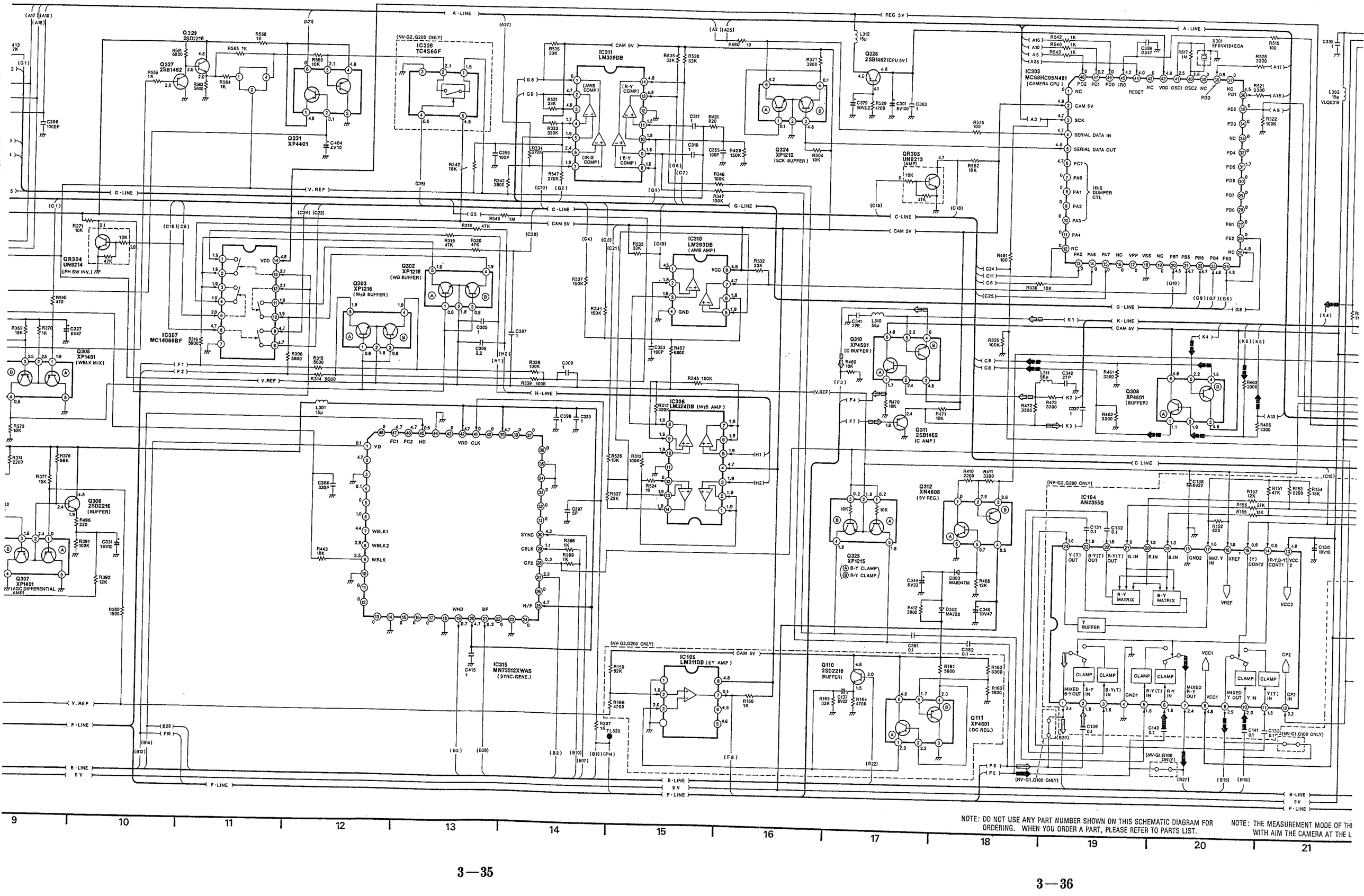
3-12 PROCESS SCHEMATIC DIAGRAM

PRE VIDEO SIGNAL　LUMINANCE SIGNAL　R-Y/B-Y COMPOSITE SIGNAL　R-Y SIGNAL　B-Y SIGNAL



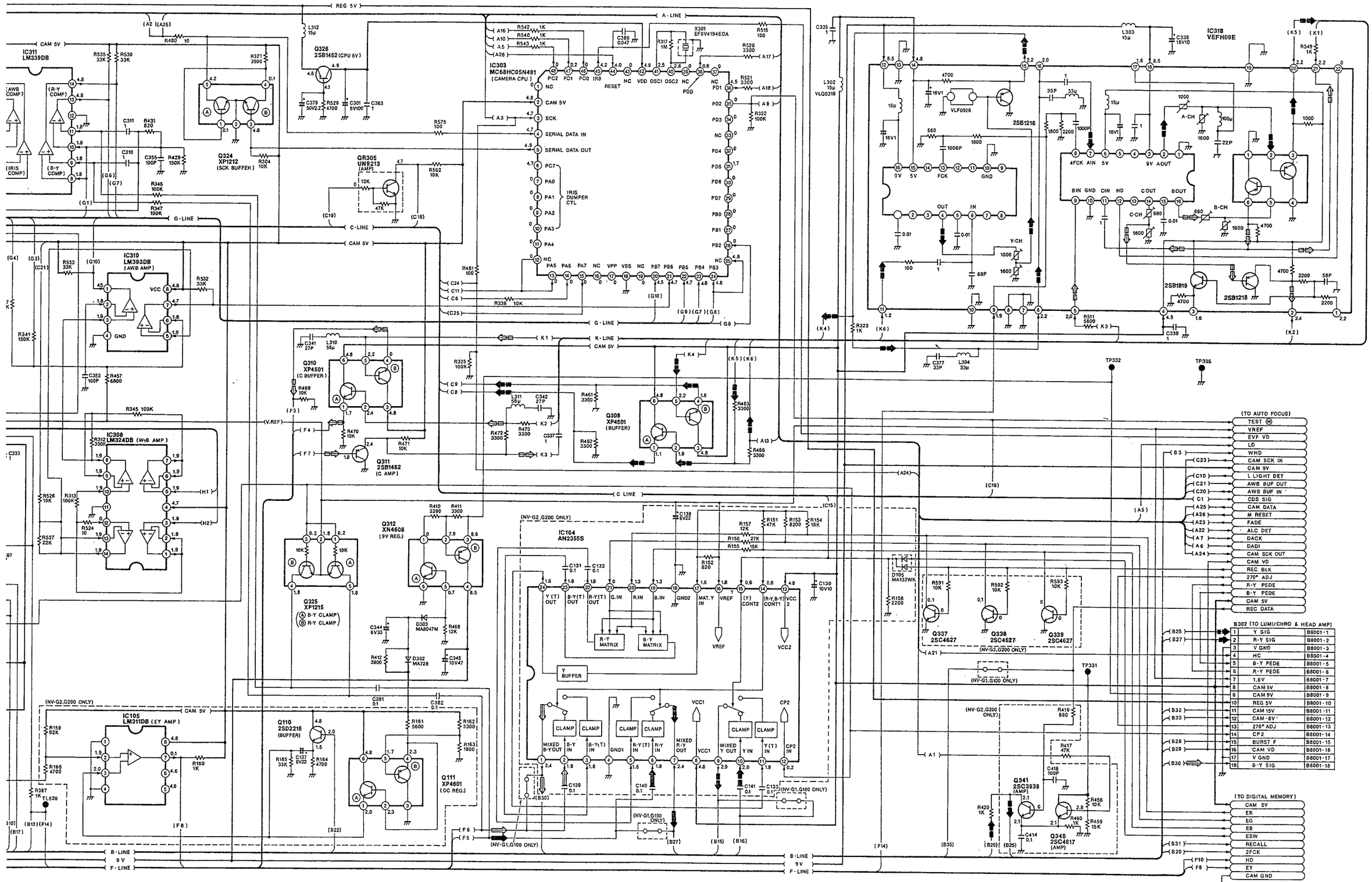
3—33　　3—34

NAL ⟸ R-Y SIGNAL ⟸ B-Y SIGNAL



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 TH WITH AIM THE CAMERA AT THE L



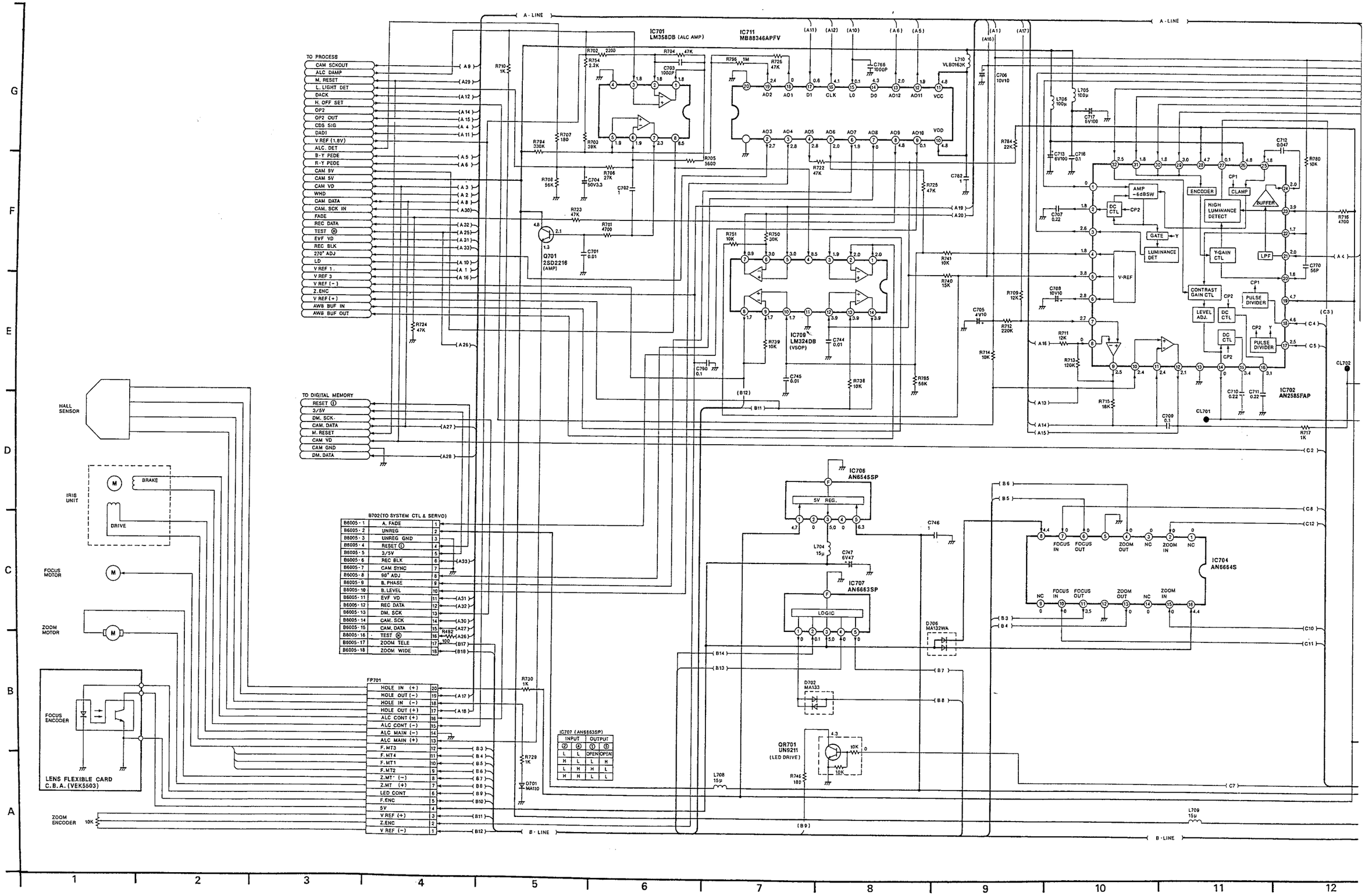
NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

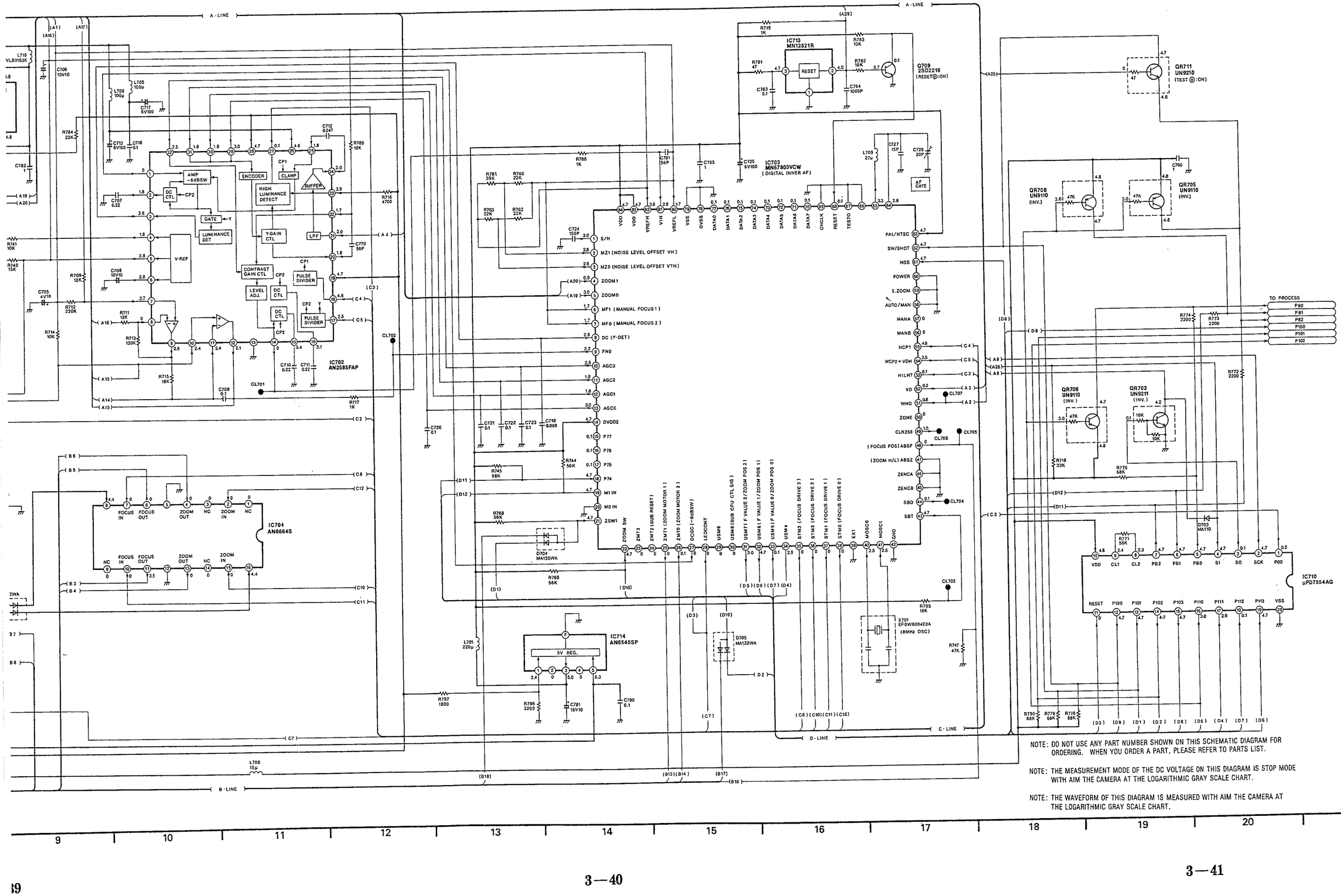
NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE WITH AIM THE CAMERA AT THE LOGARITHMIC GRAY SCALE CHART.

NOTE: THE WAVEFORM OF THIS DIAGRAM IS MEASURED WITH AIM THE CAMERA AT THE LOGARITHMIC GRAY SCALE CHART.

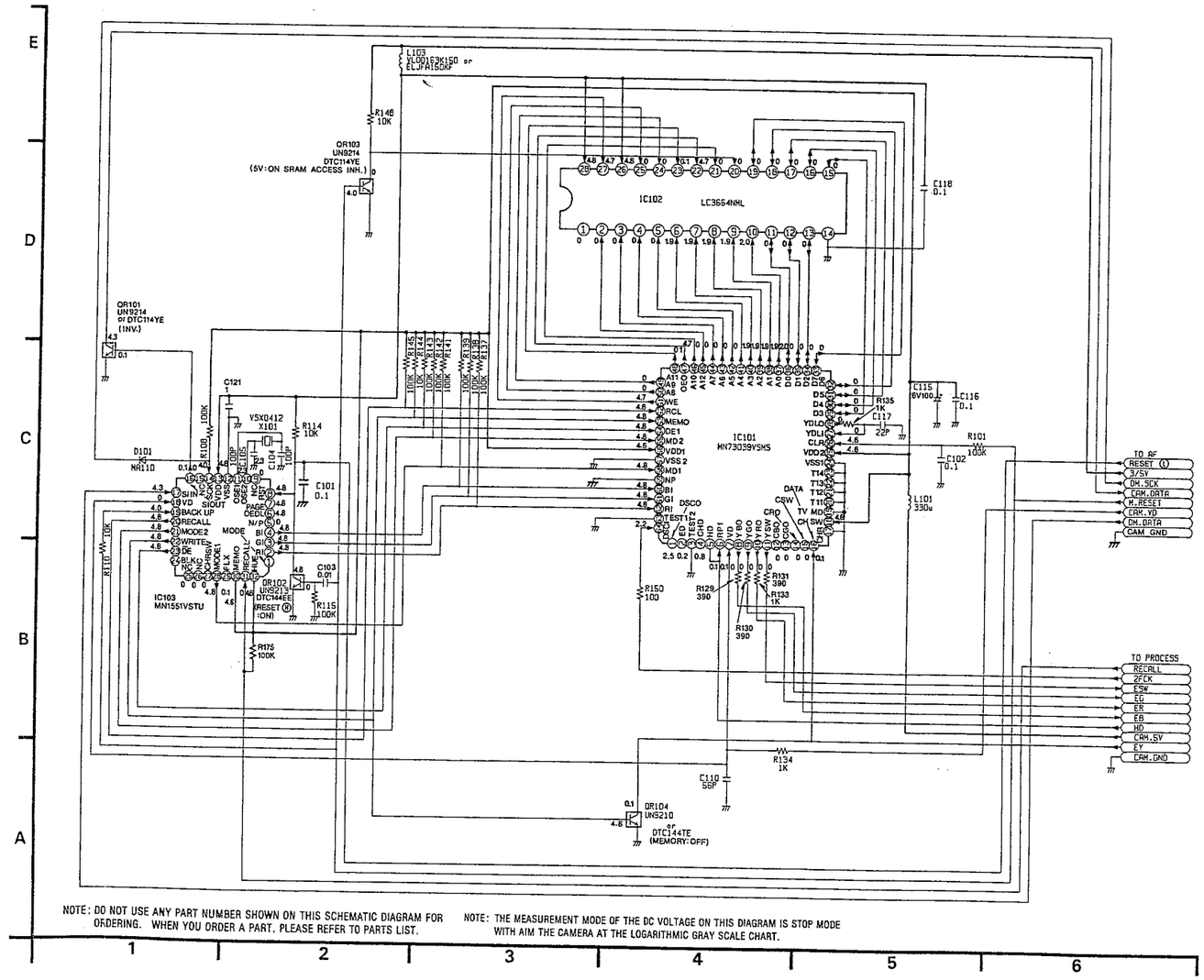
Next Page:
A.F. & DIGITAL MEMORY Section

3-13. AUTO FOCUS SCHEMATIC DIAGRAM



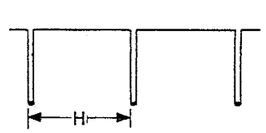

A-LINE
IC702 AN2585FAP
IC703 MN67803VCW (DIGITAL INNER AF)
IC704 AN6664S
IC710 μPD7554AG
IC712 MN12821R
IC714 AN6545SP
Q709 2SD2216 (RESET@:ON)
QR711 UN9210 (TEST Ⓢ:ON)
QR708 UN9110 (INV.)
QR705 UN9110 (INV.)
QR706 UN9110 (INV.)
QR703 UN9211 (INV.)
D704 MA132WA
D705 MA132WA
D703 MA110
X701 EFOWB004E0A (8MHz OSC)
AMP -6dBSW
ENCODER
CLAMP
BUFFER
HIGH LUMINANCE DETECT
DC CTL
GATE
LUMINANCE DET
V-REF
Y-GAIN CTL
LPF
CONTRAST GAIN CTL
LEVEL ADJ.
PULSE DIVIDER
AF GATE
5V REG.
RESET
B-LINE
C-LINE
D-LINE
TO PROCESS
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.
NOTE: THE WAVEFORM OF THIS DIAGRAM IS MEASURED WITH AIM THE CAMERA AT THE LOGARITHMIC GRAY SCALE CHART.

3-14 DIGITAL MEMORY SCHEMATIC DIAGRAM (NV-G2, G200 SERIES)



AUTO FOCUS CIRCUIT WAVEFORM (STOP MODE)

IC702-⑱



5.0Vp-p

IC702-⑳



0.3Vp-p

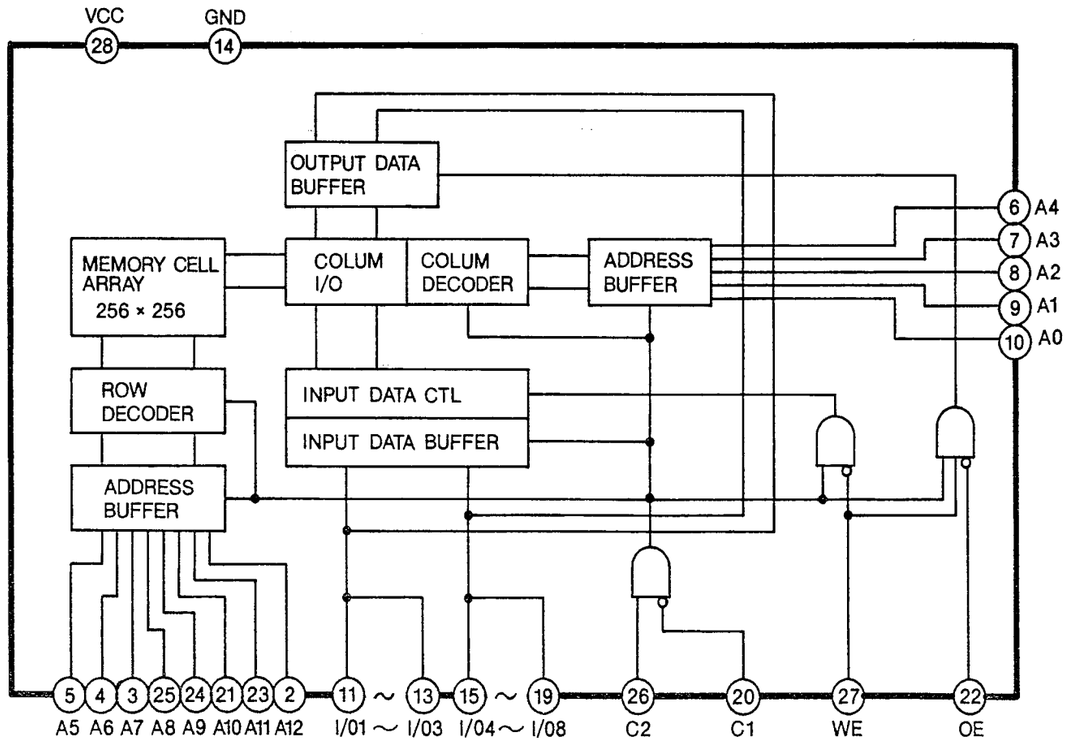
IC702-㉑



0.6Vp-p

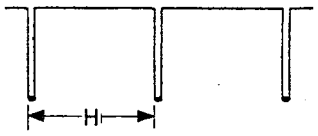
IC BLOCK

IC102 (LC3664NML)



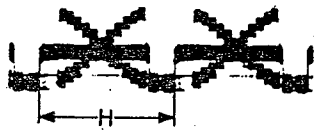
AUTO FOCUS CIRCUIT WAVEFORM (STOP MODE)

IC702-⑱



5.0Vp-p

IC702-⑳



0.3Vp-p

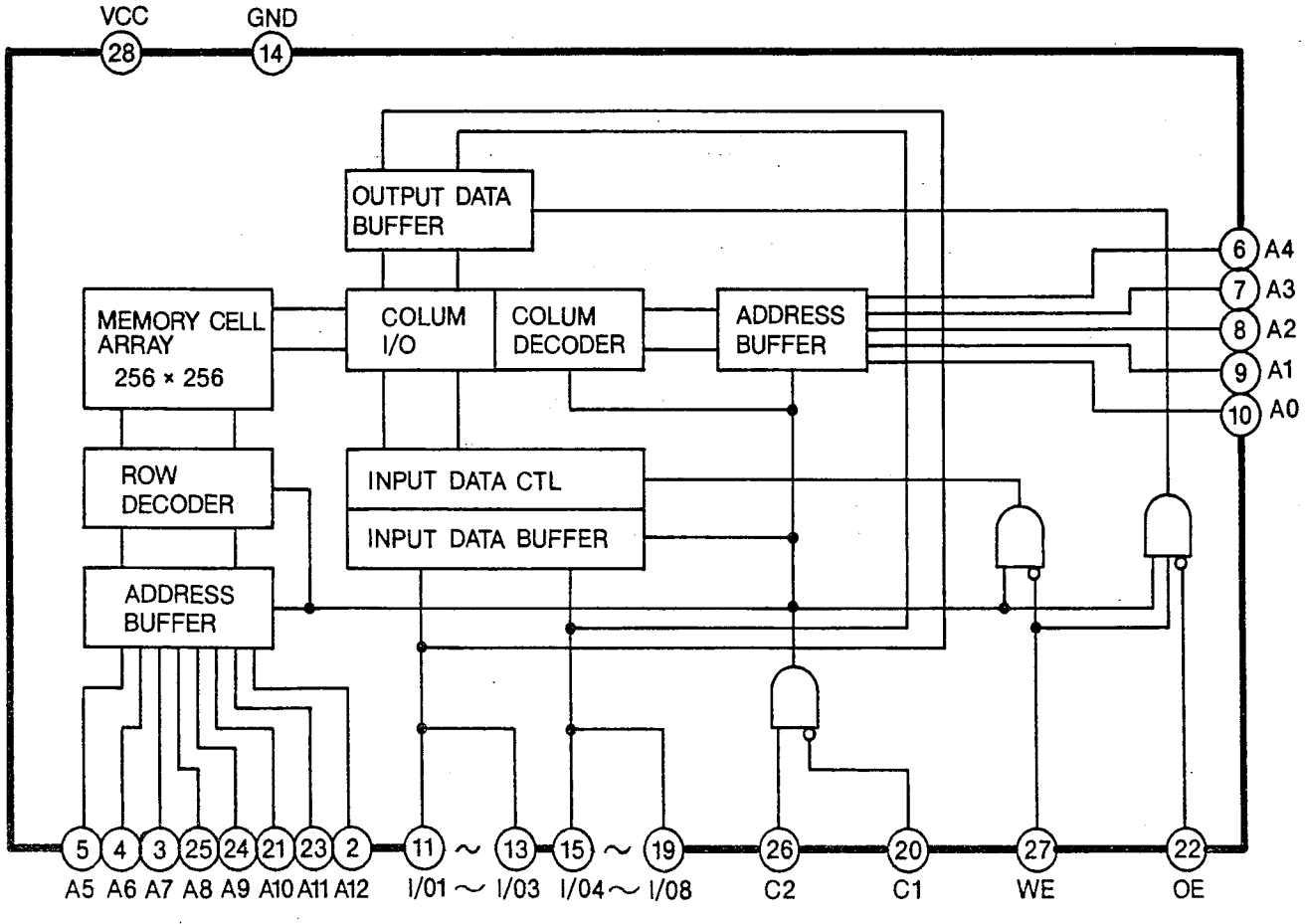
IC702-㉑

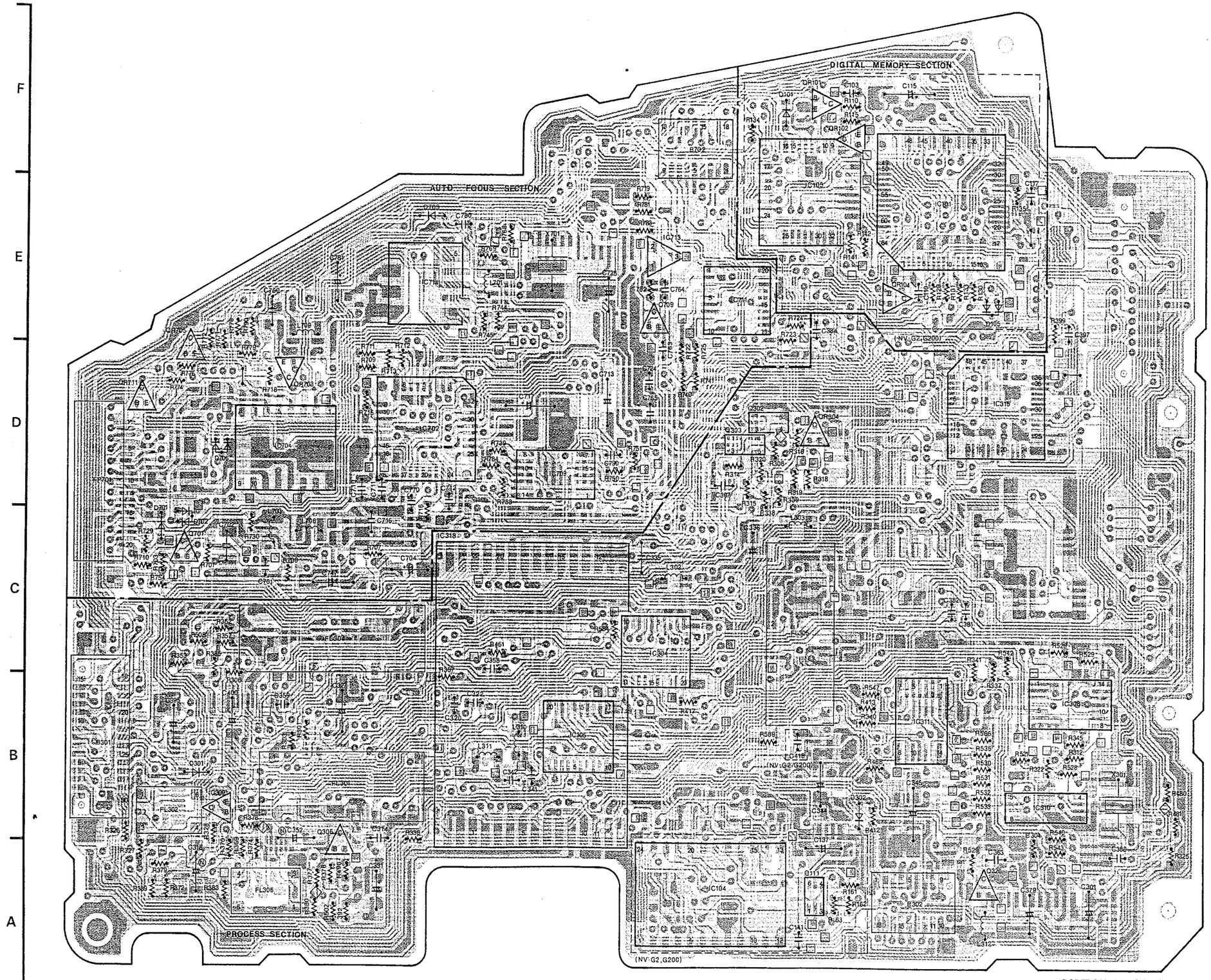


0.6Vp-p

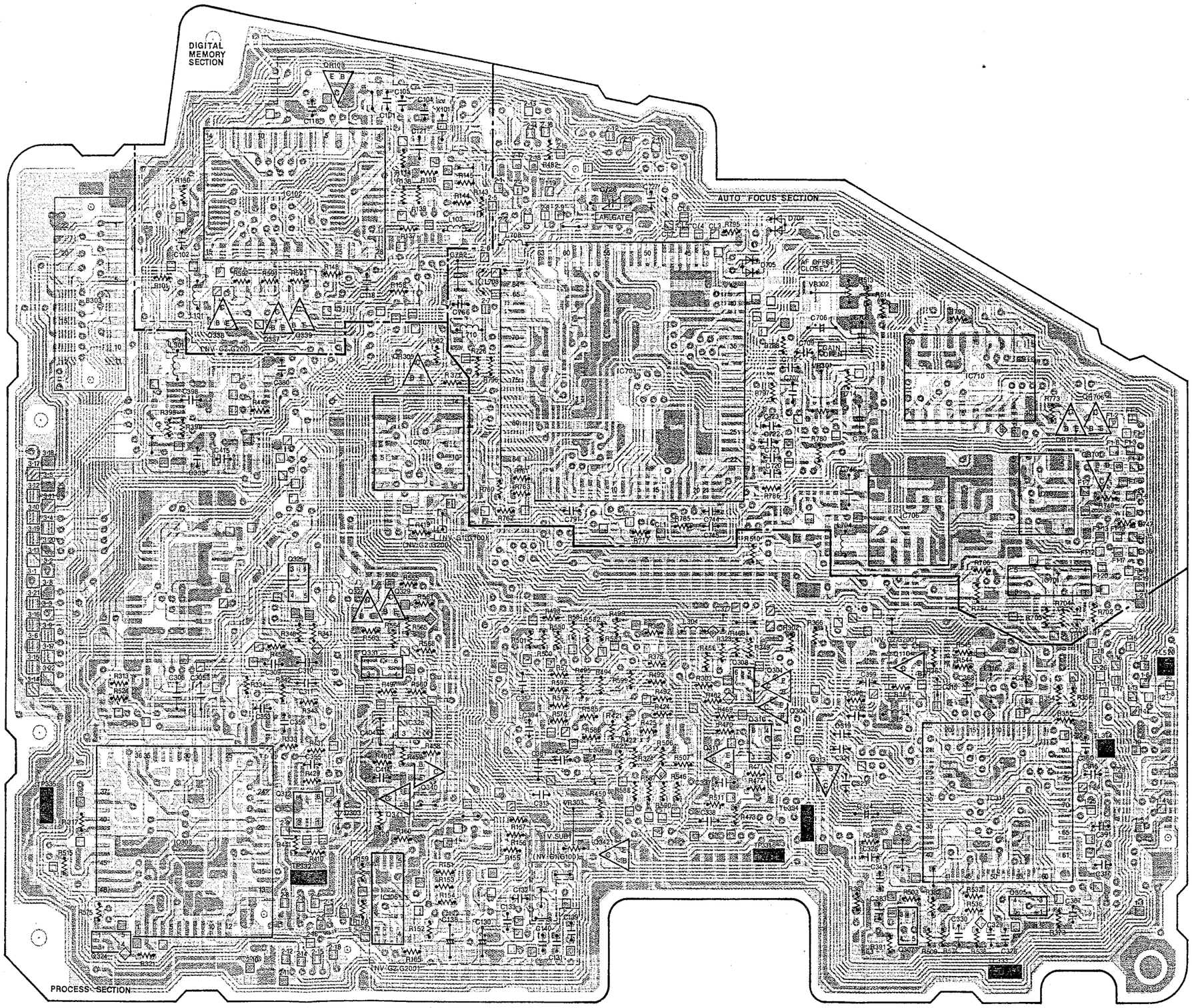
IC BLOCK

IC102 (LC3664NML)





(COMPONENT SIDE)



(FOIL SIDE)

9 10 11 12 13 14 15

CAMERA MAIN C.B.A. ADDRESS INFORMATION

PROCESS Section	
Transistor	
Q110	C-14 Ⓕ
Q111	A-6 Ⓒ
Q301	C-13 Ⓕ
Q302	D-5 Ⓒ
Q303	D-5 Ⓒ
Q304	B-13 Ⓕ
Q305	A-15 Ⓕ
Q306	A-3 Ⓒ
Q307	A-14 Ⓕ
Q308	C-13 Ⓕ
Q309	B-2 Ⓒ
Q310	B-13 Ⓕ
Q311	B-13 Ⓕ
Q312	B-10 Ⓕ
Q313	B-13 Ⓕ
Q324	A-9 Ⓕ
Q325	C-10 Ⓕ
Q326	A-7 Ⓒ
Q327	C-11 Ⓕ
Q329	C-11 Ⓕ
Q331	C-11 Ⓕ
Q337	E-10 Ⓕ
Q338	E-9 Ⓕ
Q339	E-10 Ⓕ
Q340	B-11 Ⓕ
Q341	B-11 Ⓕ
Q342	B-12 Ⓕ
Q343	B-5 Ⓒ
Transistor & Resistor	
QR101	F-5 Ⓒ
QR304	D-6 Ⓒ
QR305	D-11 Ⓕ
Integrated Circuit	
IC104	A-5 Ⓒ
IC105	A-11 Ⓕ
IC303	B-9 Ⓕ
IC304	C-5 Ⓒ
IC305	B-4 Ⓒ
IC307	D-11 Ⓕ
IC308	B-7 Ⓒ
IC310	B-7 Ⓒ
IC311	B-6 Ⓒ
IC314	B-14 Ⓕ
IC315	D-7 Ⓒ
IC318	C-3 Ⓒ
IC326	B-11 Ⓕ
Test Point	
TL314	B-15 Ⓕ
TL333	A-14 Ⓕ
TL334	B-13 Ⓕ
TL520	C-15 Ⓕ
TP331	B-13 Ⓕ
TP332	A-10 Ⓕ
TP335	B-9 Ⓕ
Adjustment	
VR301	D-13 Ⓕ
VR302	E-13 Ⓕ
VR303	B-12 Ⓕ
Connector	
B301	B-1 Ⓒ
B302	A-6 Ⓒ
B303	E-9 Ⓕ

ADDRESS INFORMATION
Ⓒ... COMPONENT SIDE
Ⓕ... FOIL SIDE

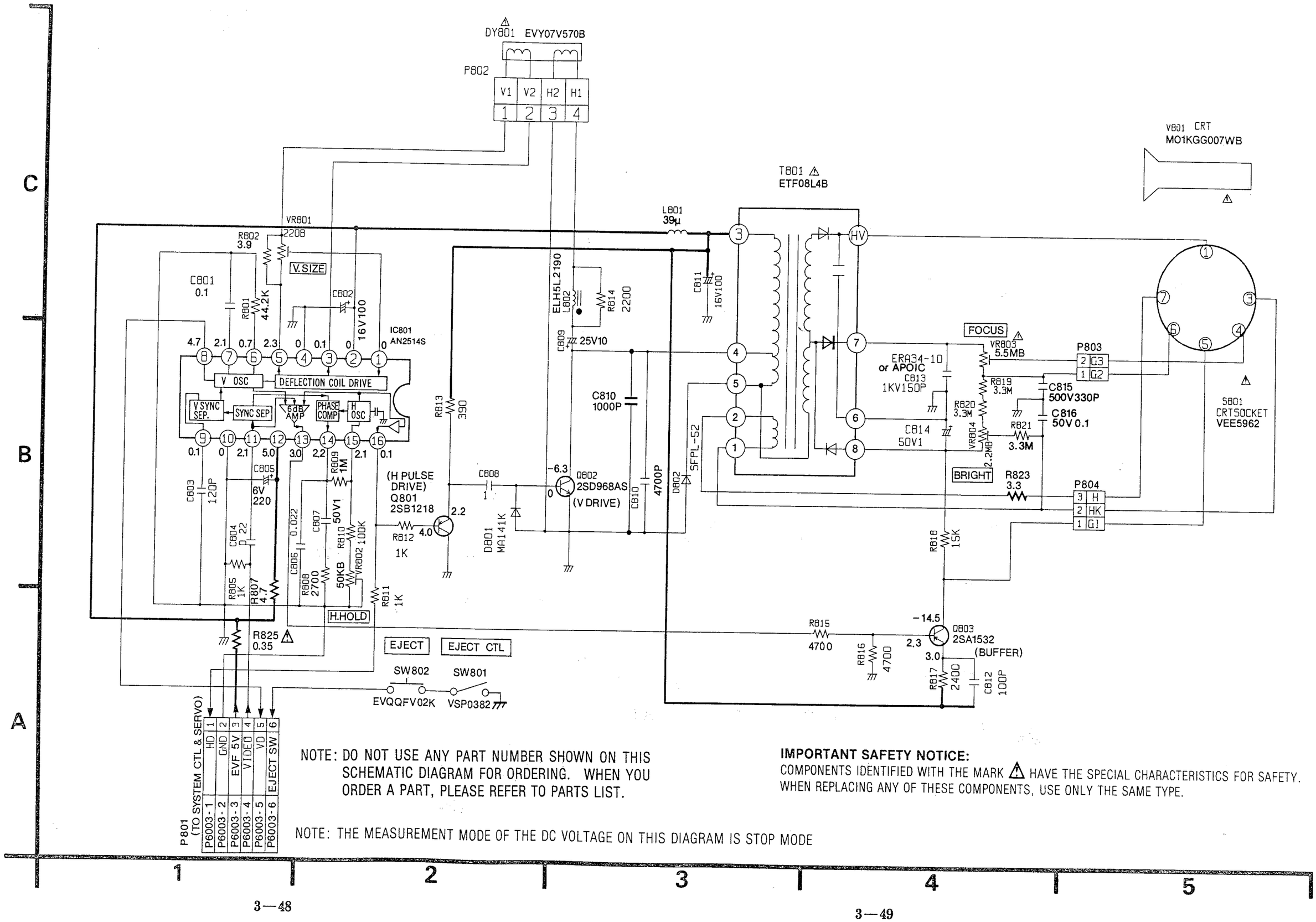
DIGITAL MEMORY Section	
Transistor & Resistor	
QR102	F-6 Ⓒ
QR103	F-10 Ⓕ
QR104	E-6 Ⓒ
Integrated Circuit	
IC101	E-6 Ⓒ
IC102	E-10 Ⓕ
IC103	E-5 Ⓒ

ADDRESS INFORMATION
Ⓒ... COMPONENT SIDE
Ⓕ... FOIL SIDE

AUTO FOCUS Section	
Transistor	
Q701	C-2 Ⓒ
Q709	E-5 Ⓒ
Transistor & Resistor	
QR700	D-15 Ⓕ
QR701	D-15 Ⓕ
QR703	D-2 Ⓒ
QR705	D-2 Ⓒ
QR706	D-15 Ⓕ
QR708	D-15 Ⓕ
QR711	D-1 Ⓒ
Integrated Circuit	
IC701	C-15 Ⓕ
IC702	D-3 Ⓒ
IC703	D-12 Ⓕ
IC704	D-2 Ⓒ
IC706	D-14 Ⓕ
IC707	D-15 Ⓕ
IC709	D-4 Ⓒ
IC710	D-14 Ⓕ
IC711	E-5 Ⓒ
IC713	E-5 Ⓒ
IC714	E-3 Ⓒ
Adjustment	
C726	E-12 Ⓕ
Connector	
B702	F-5 Ⓒ
EP701	D-1 Ⓒ

ADDRESS INFORMATION
Ⓒ... COMPONENT SIDE
Ⓕ... FOIL SIDE

Next Page:
E.V.F. Section

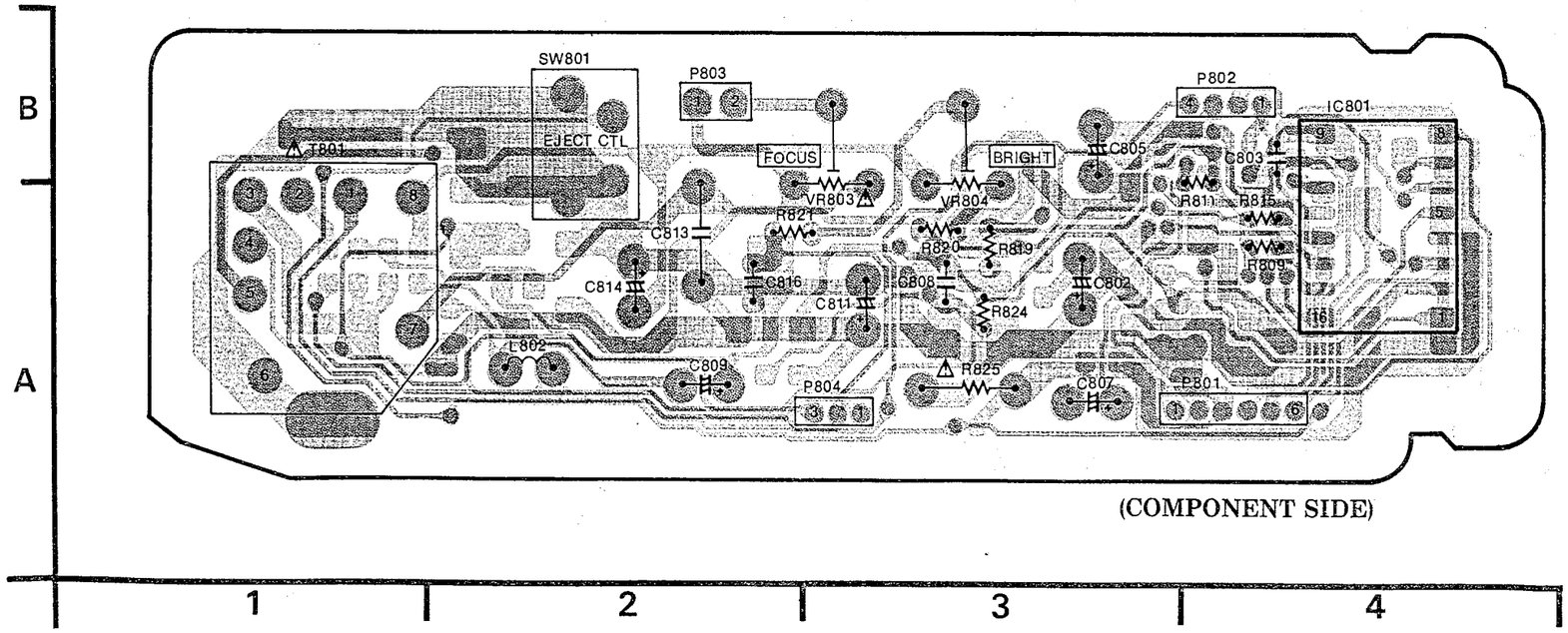


NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

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

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

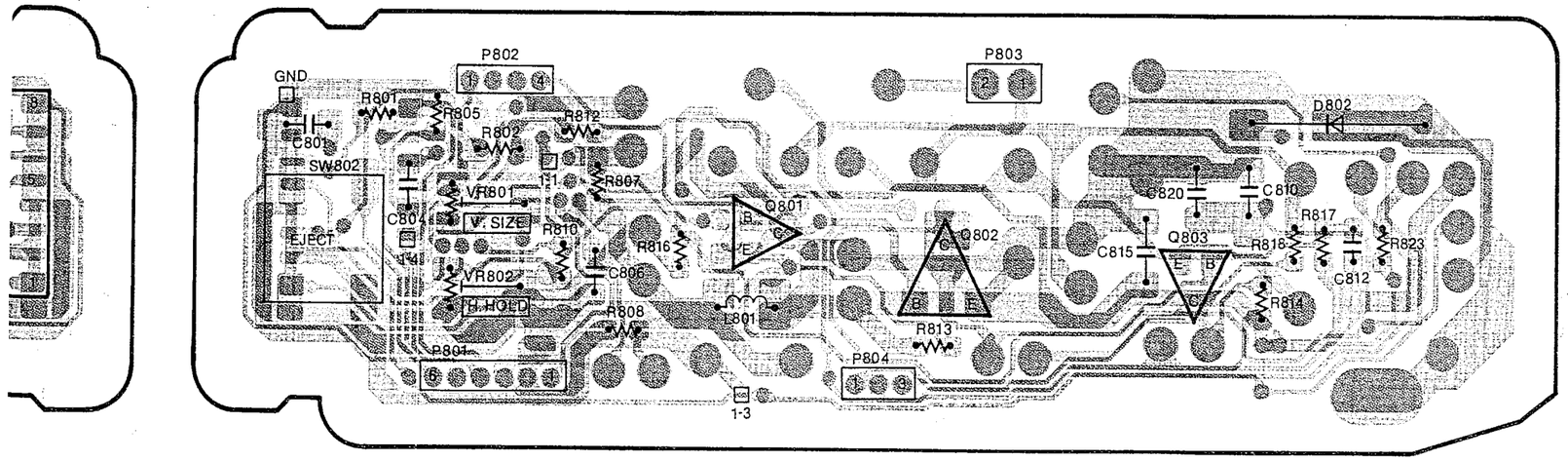
3-17 E V F C B A (VEP28032B)



(COMPONENT SIDE)

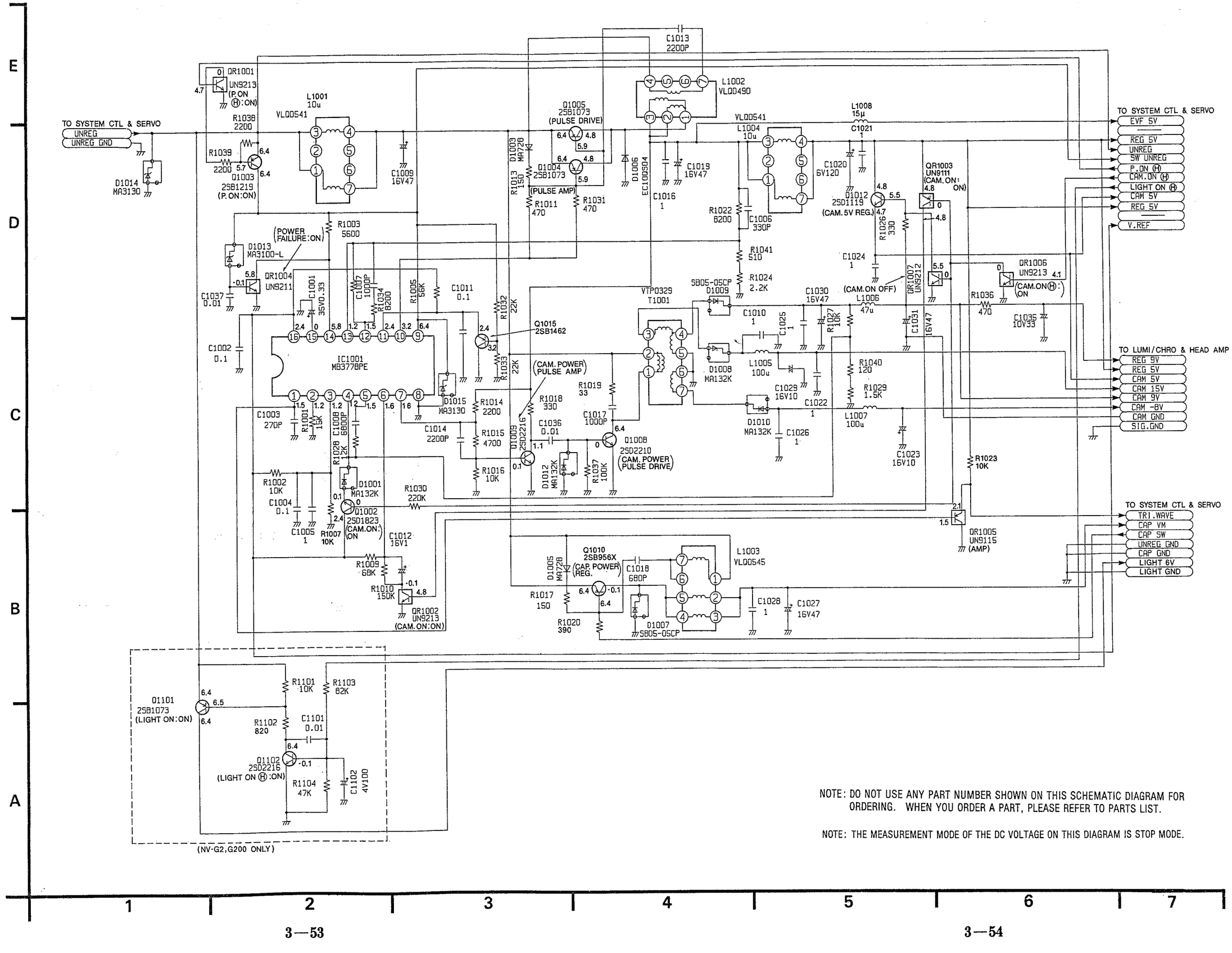
E.V.F. C.B.A.	
Transistor	
Q801	A-6 Ⓕ
Q802	A-7 Ⓕ
Q803	B-7 Ⓕ
Integrated Circuit	
IC801	B-4 Ⓒ
Adjustment	
VR801	A-5 Ⓕ
VR802	A-5 Ⓕ
VR803	A-3 Ⓒ
VR804	A-3 Ⓒ
Connector	
P801	A-4 Ⓒ
P801	A-5 Ⓕ
P802	B-4 Ⓒ
P802	B-5 Ⓕ
P803	B-2 Ⓒ
P803	B-7 Ⓕ
P804	A-3 Ⓒ
P804	A-6 Ⓕ

ADDRESS INFORMATION
Ⓒ... COMPONENT SIDE
Ⓕ... FOIL SIDE



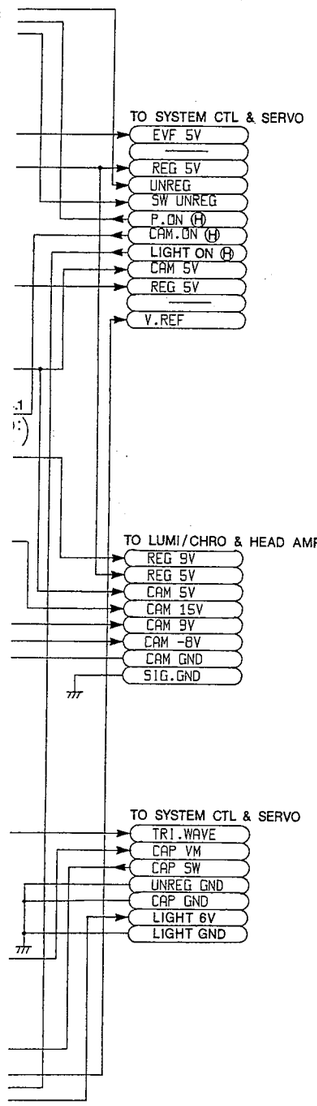
(FOIL SIDE)

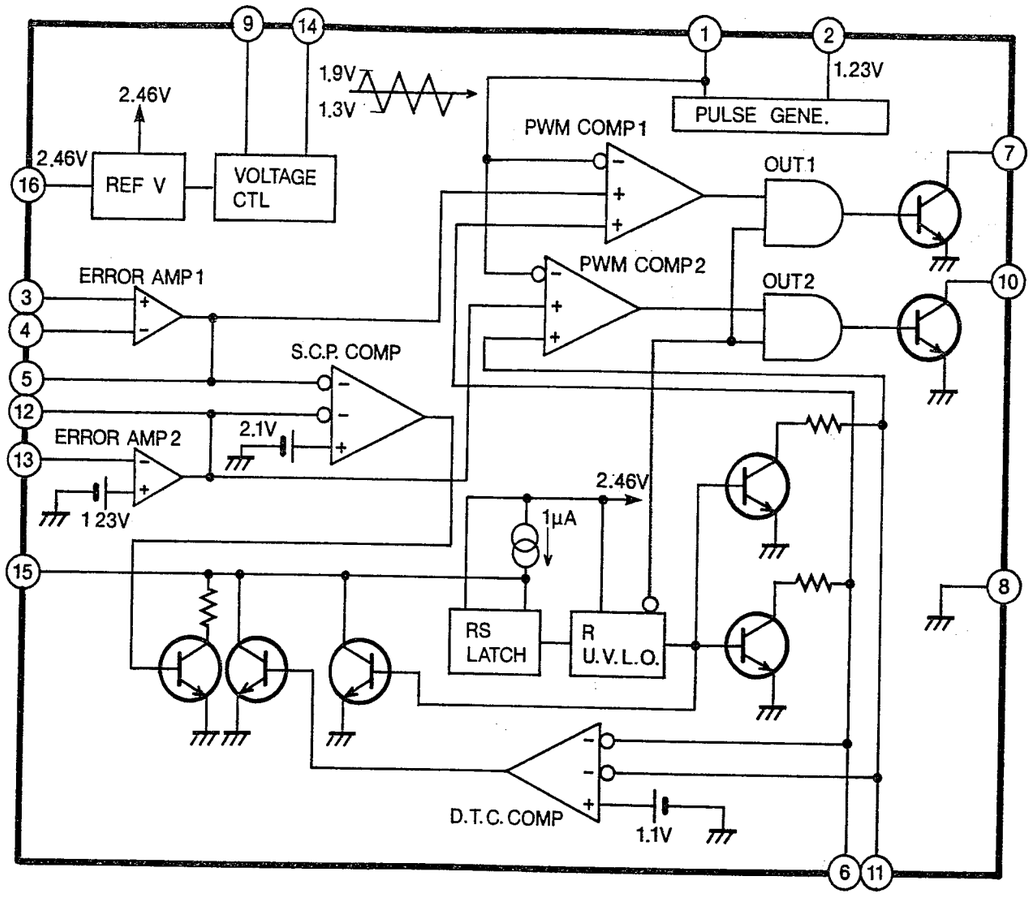
3-18. POWER SCHEMATIC DIAGRAM



IC BLOCK

IC1001 (MB3778PE)





S SCHEMATIC DIAGRAM FOR
REFER TO PARTS LIST.

THIS DIAGRAM IS STOP MODE.

7

Next Page:
SYSTEM CTL & SERVO Section

SYSTEM CONTROL & SERVO ICs DC VOLTAGE CHART (SP MODE)

REF. NO.	IC6001																			
MODE	1	2	3	4	5	6	7	8												
STOP	4.9	−0.1	4.8	0	4.8	−0.1	5.0	6.4												
PLAY	5.0	0	4.8	0	5.0	0	5.0	6.6												
F.F.	4.9	−0.1	4.8	0	4.8	−0.1	5.0	6.3												
REF. NO.	IC6004																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14						
STOP	3.4	4.5	4.7	4.6	4.5	2.2	−0.1	4.7	4.7	0	0	0	0	4.8						
PLAY	4.0	4.5	4.8	4.6	4.7	0	0	4.8	4.8	4.8	4.8	0	0	0						
F.F.	3.4	4.5	4.7	4.7	4.5	0	−0.1	4.7	0	4.8	4.8	0	0	4.8						
REF. NO.	IC6005																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
STOP	0			4.8	−0.1	−0.1	−0.1	−0.1	3.7	4.7	4.8	−0.1	−0.1	−0.1	4.7	4.8				
PLAY	0	4.6	4.8	4.8	0	0	0.1	0	0	3.7	0	0	0	0	0	4.8				
F.F.	0			4.8	−0.1	−0.1	0.1	−0.1	0	4.7	4.8	−0.1	−0.1	−0.1	4.7	4.8				
REF. NO.	IC6006																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	−0.1	4.7	0	4.7	0	4.8	0	2.1	0	−0.1	1.3	−0.1	0	−0.1	0	0	−0.1	4.5	3.6	4.8
PLAY	0	4.8	0	4.7	0	0	0	2.2	0	0	1.3	0	0	0	0	0	0	4.2	3.6	4.8
F.F.	−0.1	4.7	0	4.7	0	0	1.4	2.1	2.1	−0.1	1.3	−0.1	0	0	0	0	−0.1	4.1	3.6	4.7
REF. NO.	IC6007																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	4.6	4.6	4.6	4.6	4.7	4.7	4.4	4.7	4.6	4.7	4.8	0	0	4.6	3.5	4.7	4.5	4.6	4.3	4.8
PLAY	4.7	4.7	0	4.7	4.7	4.5	4.7	4.8	4.7	4.8	4.8	0	0.2	4.8	0	4.8	4.7	4.6	4.4	4.8
F.F.	4.7	4.6	4.6	4.5	4.6	4.5	4.6	4.7	4.7	4.2	4.8	0	0	4.6	2.5	4.7		4.6	4.4	4.8
REF. NO.	IC6007																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
STOP	−0.1	4.7	−0.1	2.3	−0.1	2.3	−0.1	−0.1	−0.1	−0.1	1.8	1.8	−0.1	0	−0.1	4.7	−0.1	0.1	4.7	−0.1
PLAY	0	3.5	0	2.2	2.4	2.8	2.4	0	0	3.6			0	4.8	4.8	4.8	0	0.2	0	0
F.F.	−0.1	4.7	0	2.3	2.3	2.3	2.2	−0.1	−0.1	4.8			−0.1	4.8	4.7	4.7	4.7	0.2	4.7	−0.1
REF. NO.	IC6007																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
STOP	2.3	−0.1	0	2.3	2.3	2.3	0	2.3	−0.1	2.3	2.3	2.1	2.6	4.8	−0.1	−0.1	−0.1	2.3	2.3	−0.1
PLAY	0	0	1.3	2.4	2.4	2.4	2.4	2.4	0	2.4	2.4	2.1	2.6	4.8	0	0	0	2.4	2.4	0
F.F.	0	−0.1	1.3	2.3	2.4	2.3	2.3	2.3	−0.1	2.3	2.3	2.3	2.6	4.8	−0.1	−0.1	−0.1	2.3	2.3	−0.1
REF. NO.	IC6007																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
STOP	0	0	4.8	0	0.2	4.1	4.1	−0.1	−0.1	0	4.7	−0.1	4.8	4.8	4.8	0.7	4.7	0	0	0
PLAY	2.7	0	4.8	2.4	2.9	4.1	4.1	0	0	0	4.8	0.9	4.8	4.8	0	0.7	0	0	0	0
F.F.	2.9	0.4	4.8	2.3	2.9	4.1	4.1	0	−0.1	0	4.7	−0.1	4.1	4.8	0	0.7	4.7	0	0	0
REF. NO.	IC6007																			
MODE	81	82	83	84																
STOP	4.7	4.7	4.6	2.3																
PLAY	4.8	4.8	4.6	2.4																
F.F.	4.8	4.7	4.6	2.3																
REF. NO.	IC6008																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14						
STOP	−0.1	0	−0.1	−0.1	0	0	−0.1	0	−0.1	4.7	−0.1	0.6	−0.1	−0.1						
PLAY	0	0	0	0	0	0	0	0	0	4.8	0	0.6	0	0						
F.F.	−0.1	0.1	−0.1	0	0	0	−0.1	−0.1	−0.1	4.7	−0.1	0.5	−0.1	−0.1						

REF. NO.	IC6009										IC6010									
MODE	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8		
STOP	0	0	−0.1	0	0	6.4	4.8	0	4.8	6.4	0	2.4	3.4	−0.1	4.6	2.4	3.2	6.4		
PLAY	0.1	0	0	0	0	6.6	4.8	0	4.8	6.6	4.8	2.4	3.5	0	0	2.4	3.4	6.6		
F.F.	0	0	0	0	0	6.2	4.8	0	4.8	6.2	4.7	2.4	3.3	−0.1	4.6	2.4	3.2	6.3		
REF. NO.	IC6012																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14						
STOP	4.6	4.7	4.8	−0.1	−0.1	−0.1	−0.1	4.7	0	4.7	4.8	4.7	4.7	4.8						
PLAY	4.6	4.7	4.8	0.2	0	0	0	4.8	0	4.7	4.8	4.7	4.8	4.8						
F.F.	4.6	4.7	4.8	−0.1	0.1	−0.1	−0.1	4.8	0	4.7	4.8	4.7	4.7	4.8						
REF. NO.	IC6013																			
MODE	1	2	3																	
STOP	4.8	−0.1	0																	
PLAY	4.8	0	0																	
F.F.	4.8	0	0																	
REF. NO.	IC6014																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14						
STOP	−0.1	4.6	4.6	4.6	4.6	0	−0.1	4.7	4.6	4.8	4.6	4.6	0	4.8						
PLAY	0	4.7	4.6	4.6	4.6	0	0	4.8	4.6	4.8	4.7	4.7	0	4.8						
F.F.	−0.1	4.6	4.6	4.6	4.6	0	−0.1	4.7	4.6	4.8	4.6	4.6	−0.1	4.8						
REF. NO.	IC6015																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14						
STOP	4.7	4.7	4.8	4.8	4.7	4.7	−0.1	4.7	0	4.8	4.8	0	4.7	4.8						
PLAY	4.7	4.8	4.8	4.8	4.7	4.8	0	4.8	4.7	4.8	4.8	4.8	4.7	4.8						
F.F.	4.7	4.7	4.8	4.8	4.7	4.7	−0.1	4.7	4.6	4.8	4.8	4.7	0	4.8						

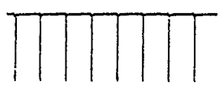
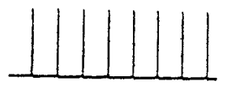
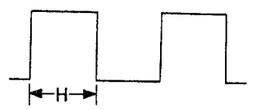
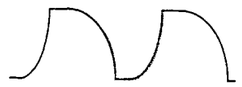
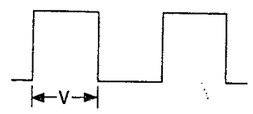
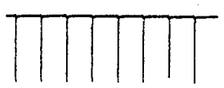
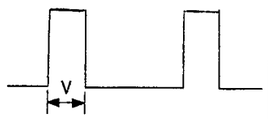
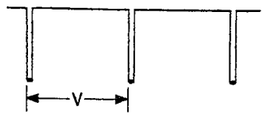
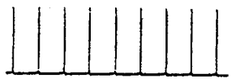
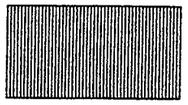
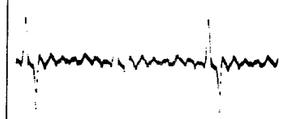
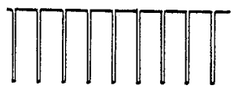
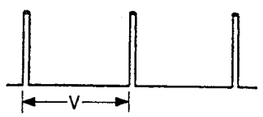
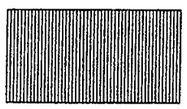
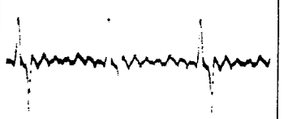
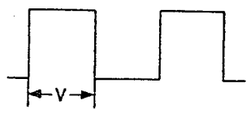
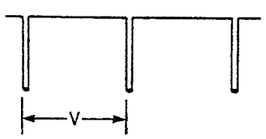
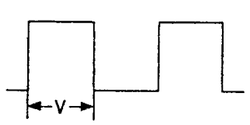
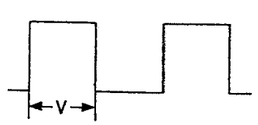
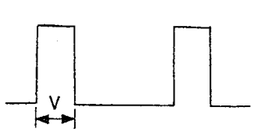
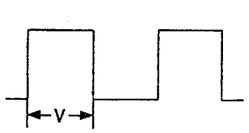
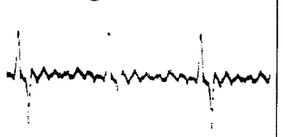
SYSTEM CONTROL & SERVO ICs DC VOLTAGE CHART (SP MODE)

REF. NO.	IC6016																			
MODE	1	2	3	4	5															
STOP	4.4	4.4	−0.1	4.1	4.8															
PLAY	0	4.4	0	0	0															
F.F.	4.3	4.3	−0.1	4.1	4.8															
REF. NO.	IC6201																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14						
STOP	0.5	1.3	0.7	4.8	2.3	2.3	2.3	2.4	2.3	2.3	−0.1	1.2	1.2	1.2						
PLAY	2.1	2.4	2.4	4.8	2.4	2.4	2.4	2.4	2.4	2.4	0	2.4	2.4	2.4						
F.F.	1.9	2.3	2.3	4.8	2.3	2.3	2.3	2.4	2.3	0	−0.1	2.4	2.4	2.4						

SYSTEM CONTROL & SERVO TRs DC VOLTAGE CHART (SP MODE)

REF. NO.	Q6001			Q6003			Q6004			Q6005			Q6006			Q6010		
MODE	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP	4.1	4.8	4.8	−0.1	4.5	0	0	6.5	−0.1	4.8	4.8	4.1	−0.1	0	0.6	−0.1	0.1	0.5
PLAY	0	4.8	0	0	4.6	0	0	6.6	0	4.8	4.8	4.1	0	0	0.6	0	2.9	0.2
F.F.	4.1	4.8	4.8	−0.1	4.6	0	1.1	6.2	1.0	4.8	4.8	4.1	−0.1	0	0.6	−0.1	2.9	0.1
REF. NO.	QR6001						QR6002			QR6003			QR6004			QR6005		
MODE	1	2	3	4	5		E	C	B	E	C	B	E	C	B	E	C	B
STOP	4.6	4.6	0	0.7	1.3		−0.1	−0.1	1.3	4.8	−0.1	4.8	−0.1	0	4.3	−0.1	−0.1	6.8
PLAY	4.6	4.6	0	1.0	1.4		0	0	1.3	4.8	0	4.8	0	0	4.4	0	0	6.9
F.F.	4.6	4.6	0	0.7	1.4		−0.1	−0.1	1.3	4.8	1.0	0	−0.1	0	4.3	0	−0.1	6.7
REF. NO.	QR6006						QR6008			QR6009			QR6010					
MODE	1	2	3	4	5		E	C	B	E	C	B	E	C	B			
STOP	−0.1	−0.1	−0.1	−0.1	−0.1		−0.1	3.4	2.3	4.8	4.7	2.7	4.8	0	4.8			
PLAY	0	0	0	0	0		0	3.4	2.3	4.8	4.7	4.7	4.8	0	4.8			
F.F.	−0.1	−0.1	−0.1	−0.1	−0.1		−0.1	3.4	2.3	4.8	4.7	4.7	4.8	0	4.8			
REF. NO.	QR6011						QR6012			QR6013			QR6014					
MODE	1	2	3	4	5		E	C	B	E	C	B	E	C	B			
STOP	4.7	4.7	−0.1	−0.1	0		−0.1	3.5	0.5	3.3	−0.1	4.7	1.3	4.6	0.7			
PLAY	0	0	0	0	0		0	3.5	0.6	3.4	0	4.6	1.4	4.6	0.9			
F.F.	4.7	4.7	−0.1	−0.1	0		−0.1	3.5	0.5	3.2	−0.1	4.7	1.4	4.6	0.9			

SYSTEM CONTROL & SERVO CIRCUIT WAVEFORM

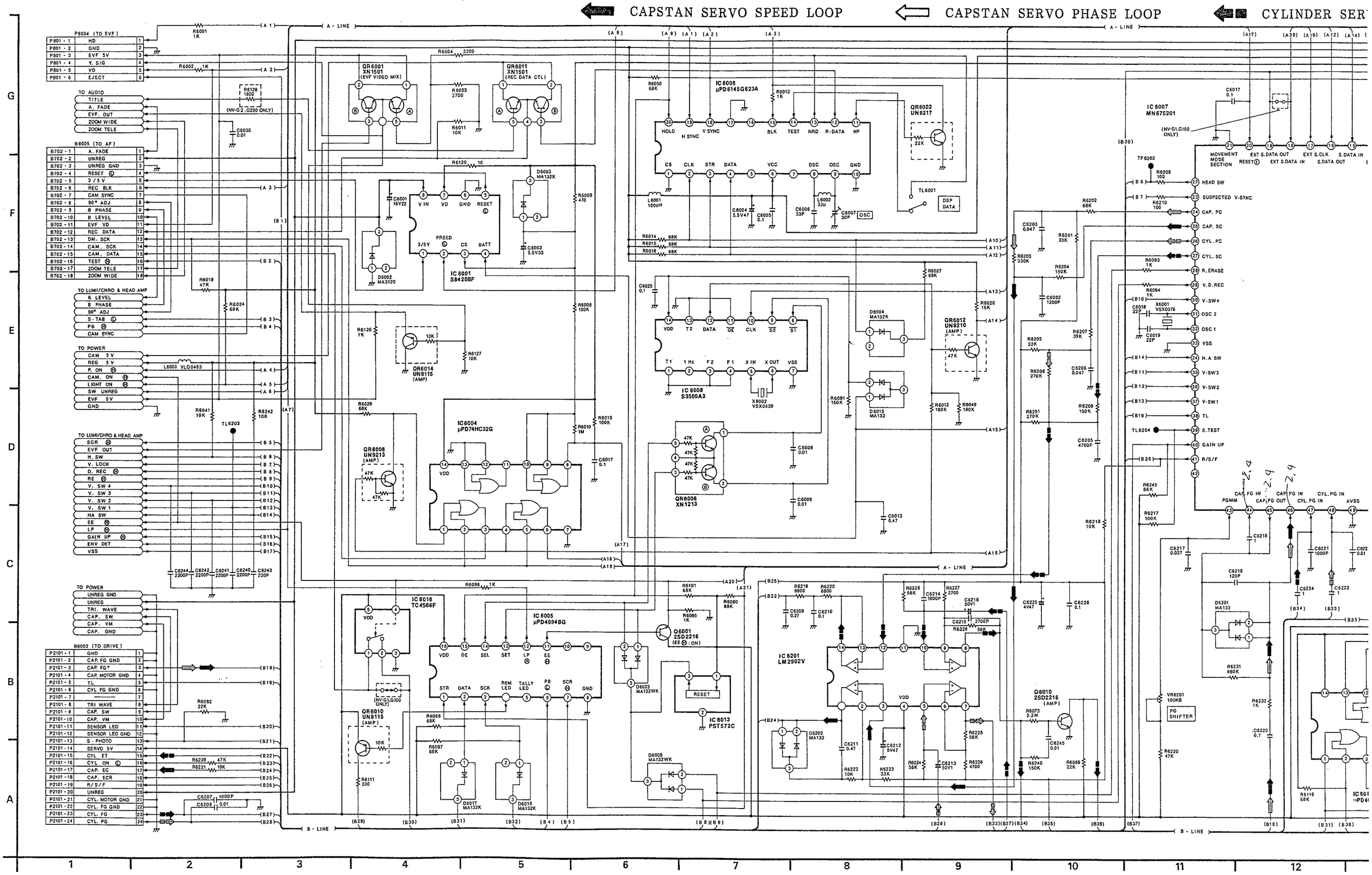
IC6007-①  5.0Vp-p (REC/PLAY)	IC6007-⑯, ⑰, ⑱, ⑲  5.0Vp-p (REC/PLAY)	IC6007-㊸  5.0Vp-p (REC/PLAY)	IC6007-㊹  1.7Vp-p (PLAY)
IC6007-②, ③, ④, ⑤, ⑥, ⑦, ⑨  5.0Vp-p (REC/PLAY)	IC6007-㉔, ㉕, ㉖, ㉗  5.0Vp-p (REC/PLAY)	IC6007-㊹, ㊺  1.3Vp-p (REC/PLAY)	IC6007-㊺  5.0Vp-p (REC/PLAY)
IC6007-⑩  5.0Vp-p (REC)	IC6007-㉚  5.0Vp-p (REC/PLAY)	IC6007-㊼  1.6Vp-p (REC/PLAY)	IC6007-㊼, ㉓  5.0Vp-p (REC/PLAY)
IC6007-⑫  5.0Vp-p (REC)	IC6007-㉛  4.5Vp-p (REC/PLAY)	IC6007-㊽  0.3Vp-p (PLAY)	IC6007-㊸  4.5Vp-p (REC/PLAY)
IC6007-⑬  5.0Vp-p (REC/PLAY)	IC6007-㉜  3.5Vp-p (REC/PLAY)	IC6007-㊷, ㊸  2.0Vp-p (PLAY)	IC6007-㊹  5.0Vp-p (PLAY)
IC6007-⑭  5.0Vp-p (REC/PLAY)	IC6007-㉞, ㉟, ㊱  5.0Vp-p (REC/PLAY)	IC6007-㊺, ㊻  5.0Vp-p (REC)	
IC6007-⑮  5.0Vp-p (REC/PLAY)	IC6007-㊲  5.0Vp-p (PLAY)	IC6007-㊷  4.0Vp-p (PLAY)	

3-19 SYSTEM CONTROL & SERVO SCHEMATIC DIAGRAM

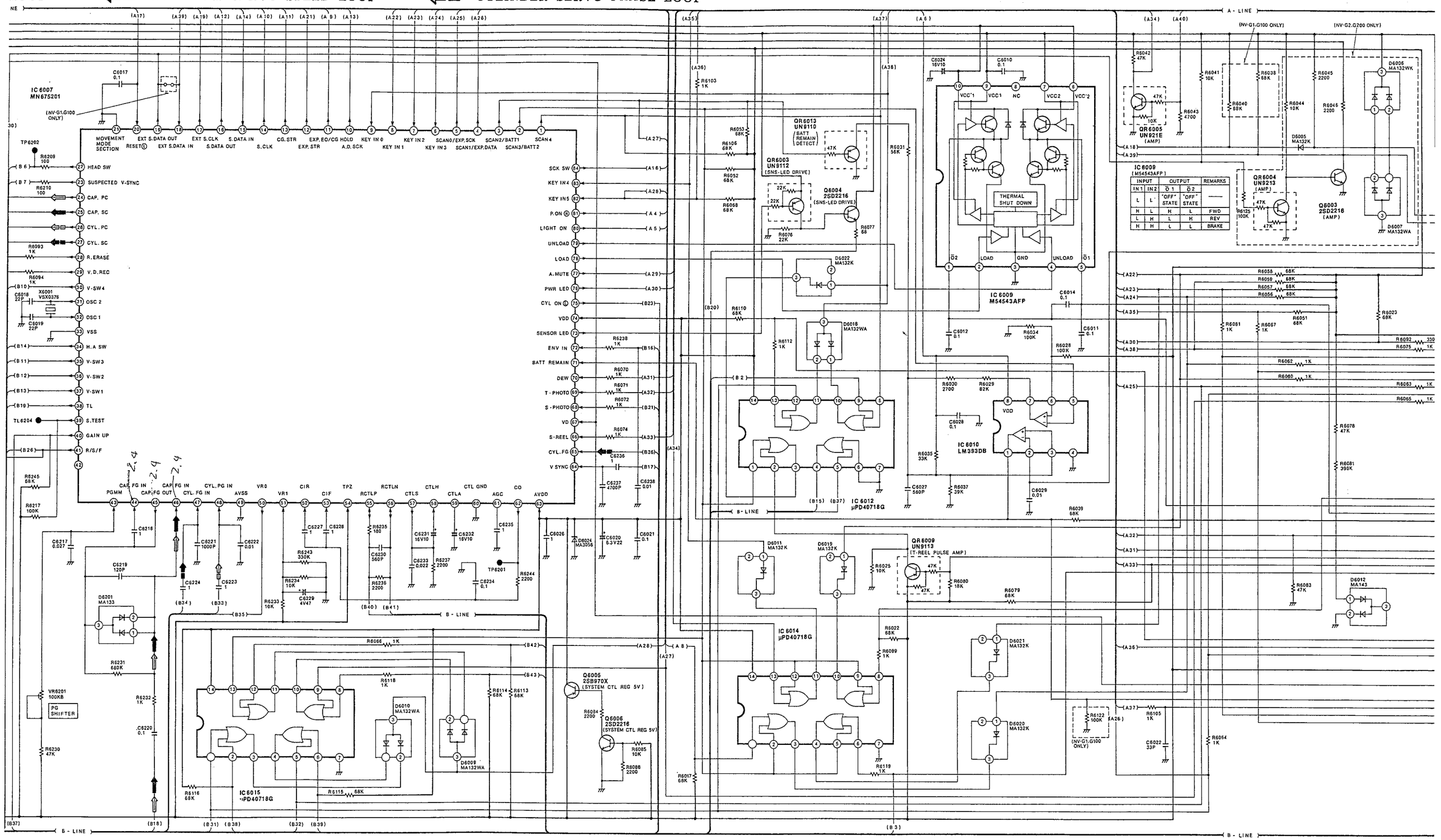
CAPSTAN SERVO SPEED LOOP

CAPSTAN SERVO PHASE LOOP

CYLINDER SER

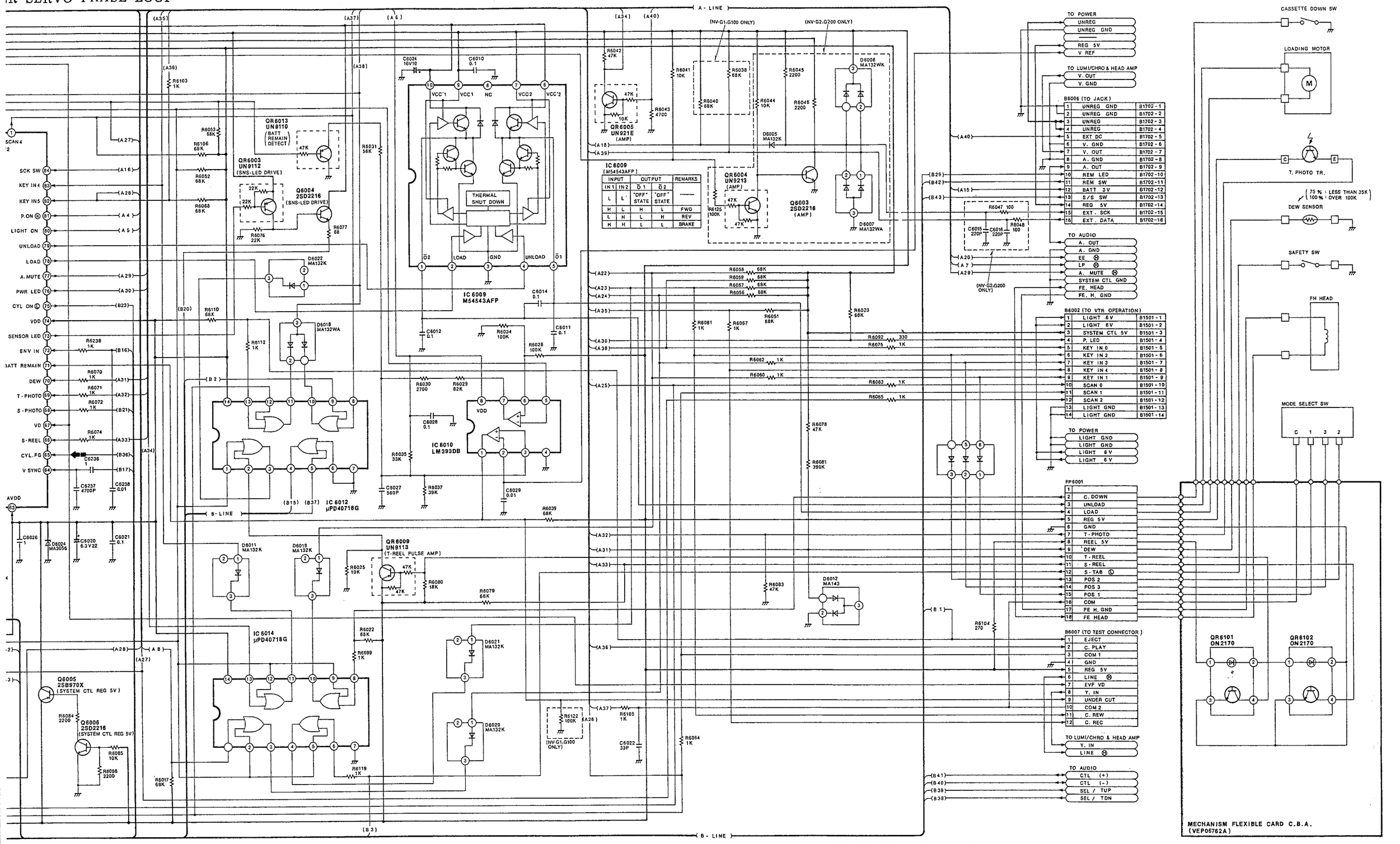


LOOP ◀■ CYLINDER SERVO SPEED LOOP ◁□ CYLINDER SERVO PHASE LOOP



NOTE: DO NOT USE ANY PART NUMBER SHOWN (ORDERING. WHEN YOU ORDER A PART, P

:R SERVO PHASE LOOP



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 WAVEFORM OF THIS DIAGRAM IS MEASURED WITH AIM THE CAMERA AT THE COLOUR CHART.

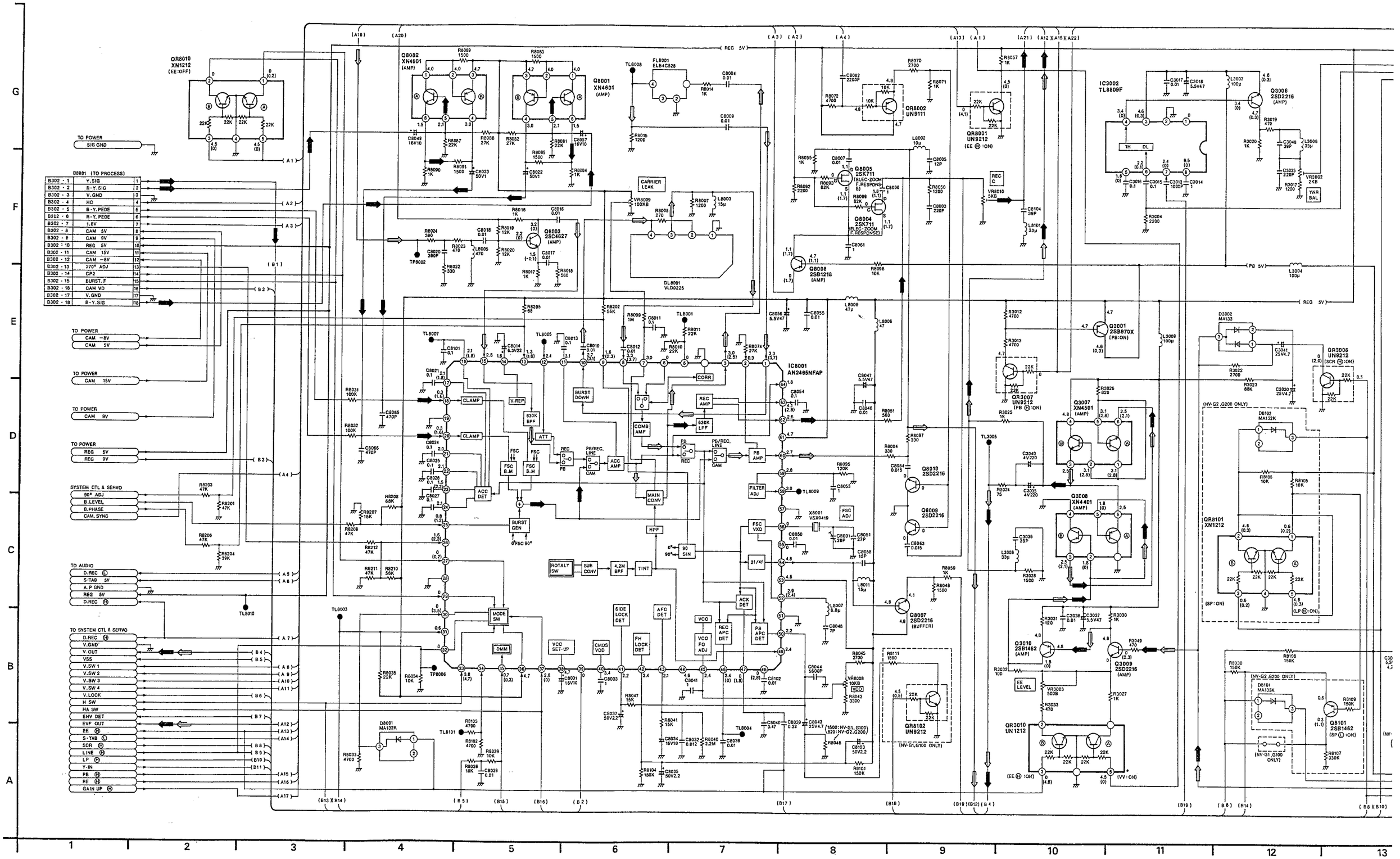
16 17 18 19 20 21 22 23 24 25 26 27

Next Page:
LUMI/CHRO & HEAD AMP Section

3-20 LUMINANCE/CHROMINANCE & HEAD AMP SCHEMATIC DIAGRAM

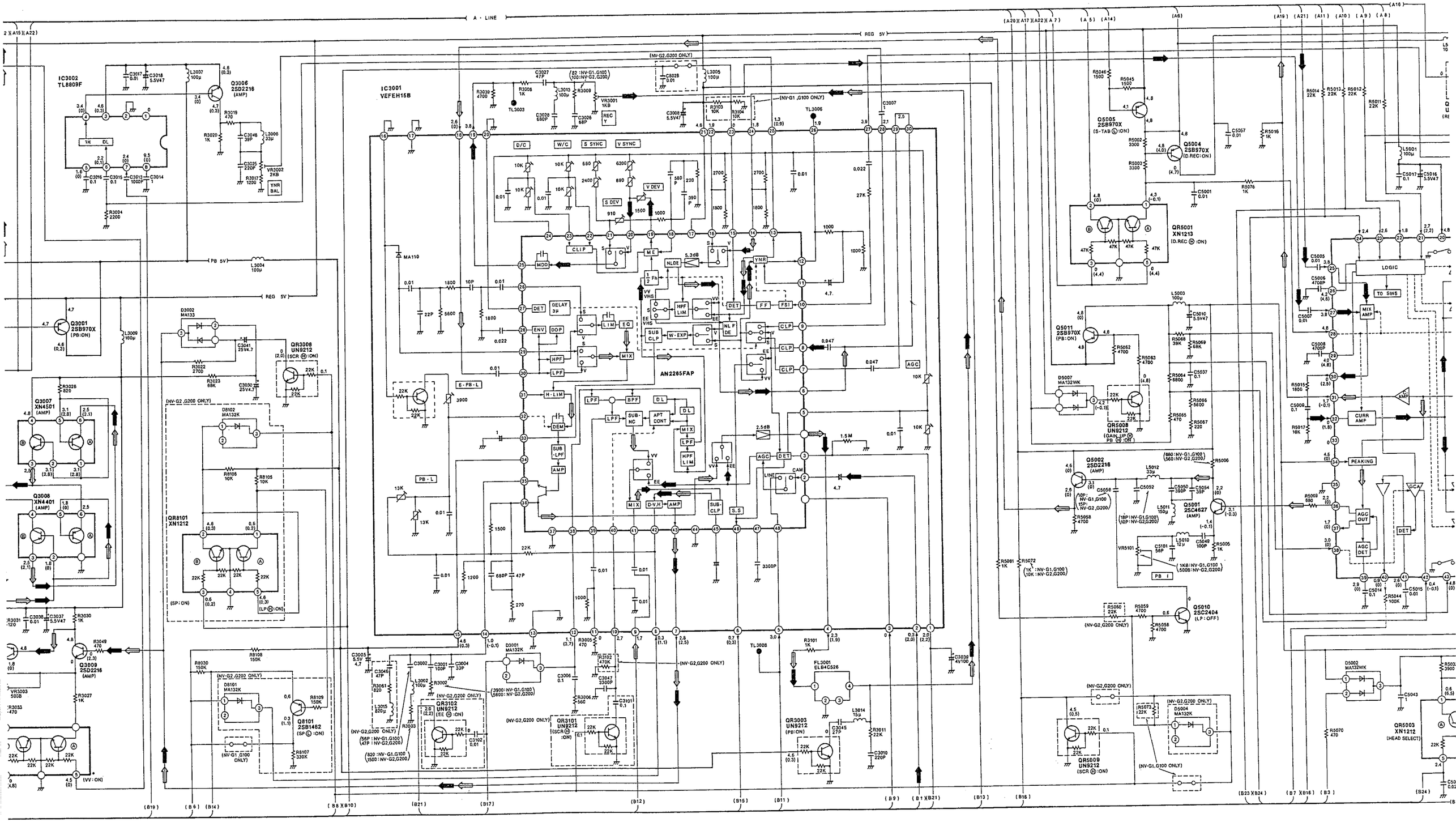
MAIN SIGNAL PATH IN REC MODE

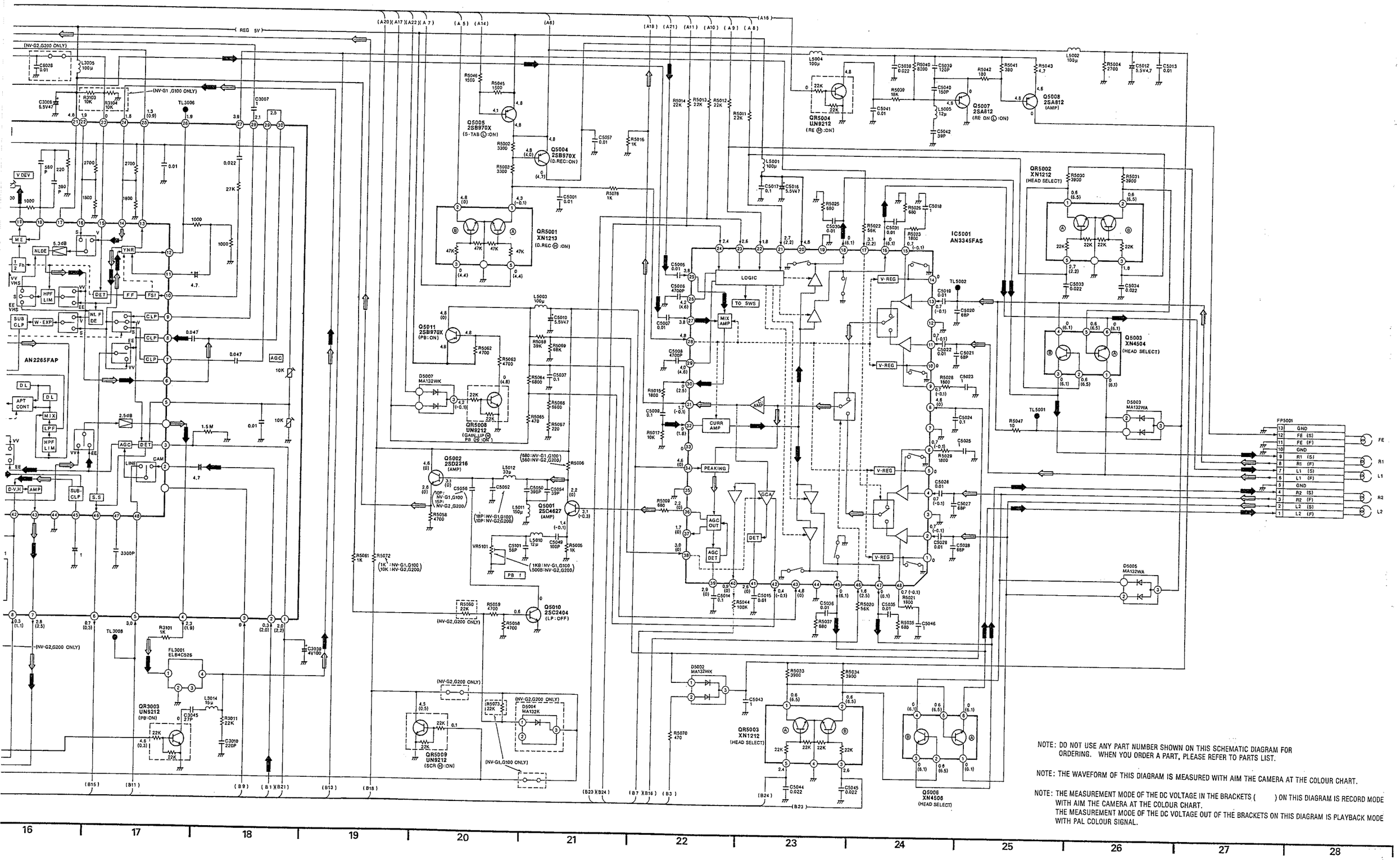
MAIN SIGNAL PATH IN PLAYB



)E

⇦ MAIN SIGNAL PATH IN PLAYBACK MODE



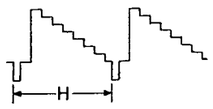
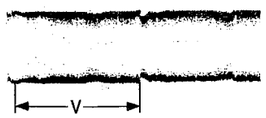
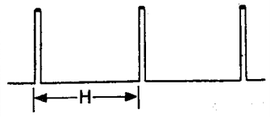
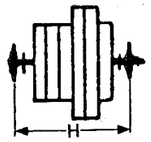
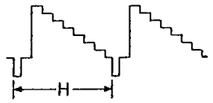
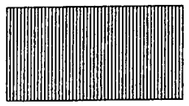
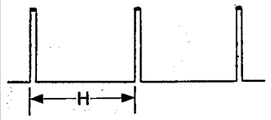
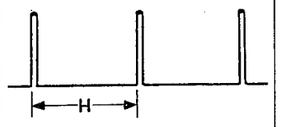
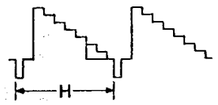
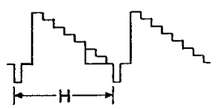
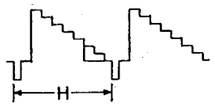
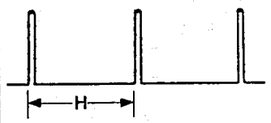
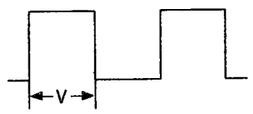
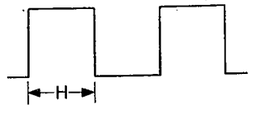
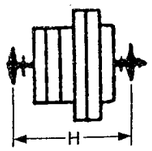
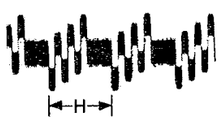
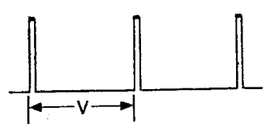
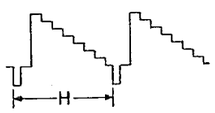
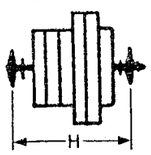


NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

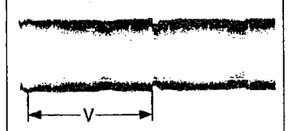
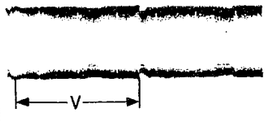
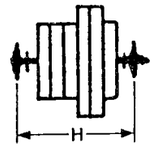
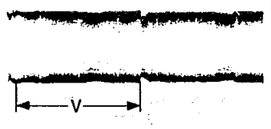
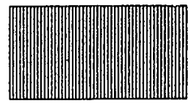
NOTE: THE WAVEFORM OF THIS DIAGRAM IS MEASURED WITH AIM THE CAMERA AT THE COLOUR CHART.

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.

LUMINANCE & CHROMINANCE CIRCUIT WAVEFORM

IC3001-②  1.0Vp-p (REC)	IC3001-⑱  1.0Vp-p (PLAY)	IC8001-㉗, ㉙  5.0Vp-p (REC)	IC8001-㊷  0.4Vp-p (REC)
IC3001-④  0.7Vp-p (REC/PLAY)	IC3001-⑲  0.9Vp-p (REC)	IC8001-㉛  3.1Vp-p (REC)	
IC3001-⑥  5.0Vp-p (REC/PLAY)	IC3001-㉔, ㉙, ㉚  0.3Vp-p (REC/PLAY)	IC8001-㉛  4.0Vp-p (PLAY)	
IC3001-⑦  2.3Vp-p (REC/PLAY)	IC3001-㉕, ㉘  0.4Vp-p (PLAY)	IC8001-㉟  5.0Vp-p (REC/PLAY)	
IC3001-⑧  4.0Vp-p (REC)	IC3001-㉗  5.0Vp-p (REC/PLAY)	IC8001-㉝, ㊲  5.0Vp-p (REC/PLAY)	
IC3001-⑨  0.2Vp-p (REC/PLAY)	IC8001-⑱  0.2Vp-p (REC)	IC8001-㊴  5.0Vp-p (REC)	
IC3001-⑭  1.0Vp-p (PLAY)	IC8001-⑳  0.2Vp-p (REC)	IC8001-㊵  0.4Vp-p (REC/PLAY)	

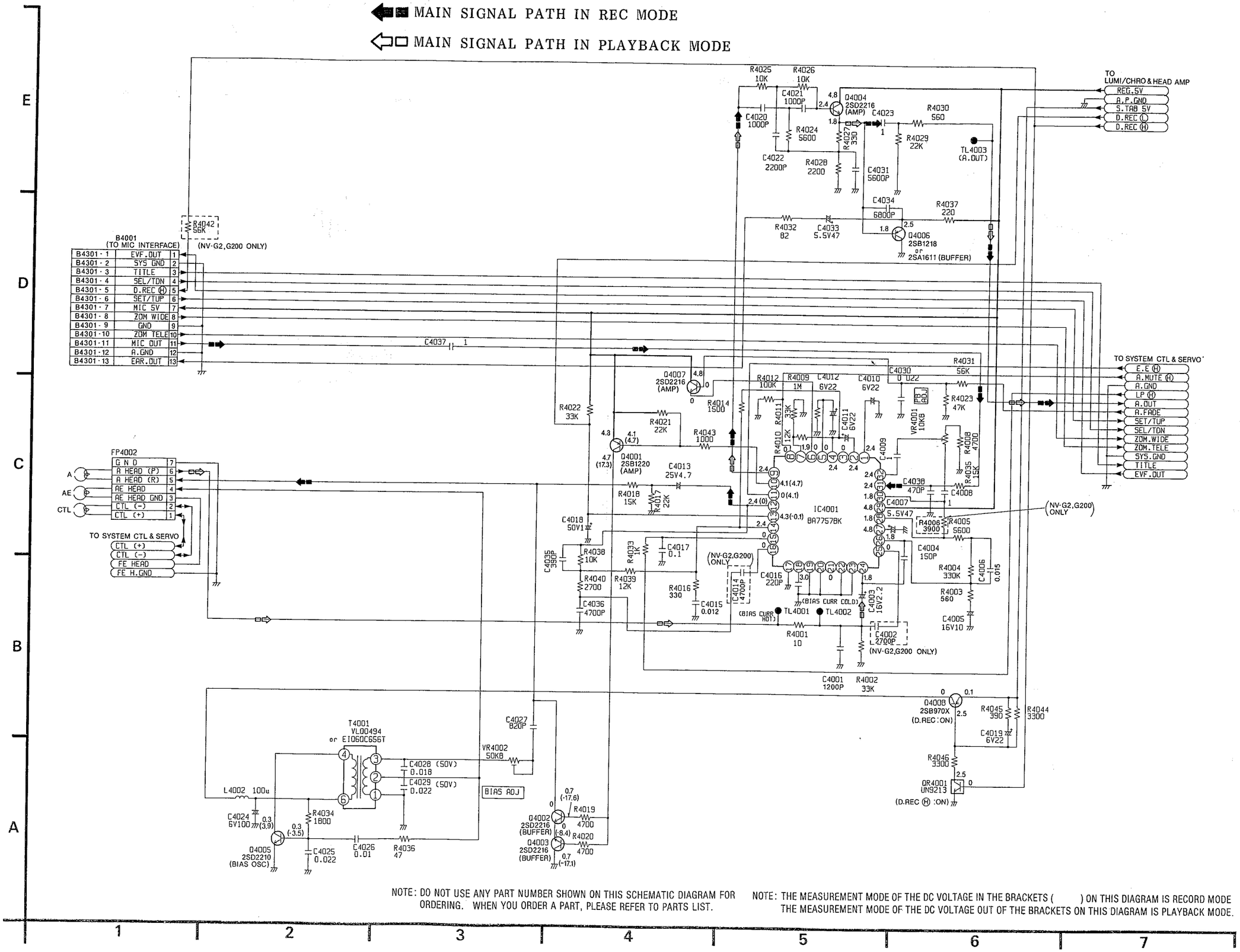
HEAD AMP CIRCUIT WAVEFORM

IC5001-②  1.0Vp-p (PLAY)	IC5001-㉛  80mVp-p (PLAY)
IC5001-㉕  0.2Vp-p (REC)	IC5001-㊲  0.25Vp-p
IC5001-㉗  0.12Vp-p (REC)	

3-21. AUDIO SCHEMATIC DIAGRAM

MAIN SIGNAL PATH IN REC MODE

MAIN SIGNAL PATH IN PLAYBACK MODE



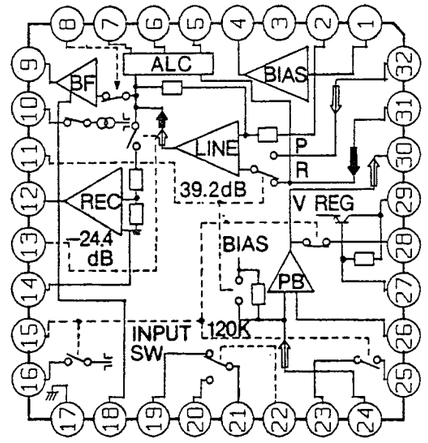
NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

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

Back Page:
LUMI/CHRO & HEAD AMP Section

IC BLOCK

IC4001 (BA7757BK)



MAIN C.B.A. ADDRESS INFORMATION

SYSTEM CONTROL & SERVO Section	
Transistor	
Q6001	F-12 Ⓕ
Q6003	E-2 Ⓒ
Q6004	D-12 Ⓕ
Q6005	D-16 Ⓕ
Q6006	D-15 Ⓕ
Q6010	D-2 Ⓒ
Q6013	G-15 Ⓕ
Transistor & Resistor	
QR6001	F-12 Ⓕ
QR6002	G-14 Ⓕ
QR6003	E-12 Ⓕ
QR6004	D-2 Ⓒ
QR6005	E-1 Ⓒ
QR6006	F-12 Ⓕ
QR6008	F-2 Ⓒ
QR6009	F-2 Ⓒ
QR6010	F-14 Ⓕ
QR6011	G-4 Ⓒ
QR6012	F-4 Ⓒ
QR6013	D-2 Ⓒ
QR6014	F-12 Ⓕ
Integrated Circuit	
IC6001	F-2 Ⓒ
IC6004	F-16 Ⓕ
IC6005	F-13 Ⓕ
IC6006	G-14 Ⓕ
IC6007	E-15 Ⓕ
IC6008	F-13 Ⓕ
IC6009	F-14 Ⓕ
IC6010	D-16 Ⓕ
IC6012	F-2 Ⓒ
IC6013	D-13 Ⓕ
IC6014	F-3 Ⓒ
IC6015	G-2 Ⓒ
IC6016	E-13 Ⓕ
IC6201	D-14 Ⓕ
Test Point	
TL6001	G-4 Ⓒ
TL6201	E-1 Ⓒ
TL6203	F-3 Ⓒ
TL6204	G-5 Ⓒ
TP6202	G-5 Ⓒ
Adjustment	
C6007	G-3 Ⓒ
Connector	
B6002	G-16 Ⓕ
B6003	D-13 Ⓕ
B6005	F-5 Ⓒ
B6006	C-1 Ⓒ
B6006	C-16 Ⓕ
B6007	G-4 Ⓒ
FP6001	G-13 Ⓕ
P6004	F-6 Ⓒ

ADDRESS INFORMATION
Ⓒ... COMPONENT SIDE
Ⓕ... FOIL SIDE

LUMINANCE/CHROMINANCE & HEAD AMP Section	
Transistor	
Q3001	E-7 Ⓒ
Q3006	B-6 Ⓒ
Q3007	B-13 Ⓕ
Q3008	B-13 Ⓕ
Q3009	B-13 Ⓕ
Q3010	B-13 Ⓕ
Q3101	D-7 Ⓒ
Q5001	B-10 Ⓕ
Q5002	C-9 Ⓕ
Q5003	A-10 Ⓕ
Q5004	C-11 Ⓕ
Q5005	B-11 Ⓕ
Q5006	A-10 Ⓕ
Q5007	A-10 Ⓕ
Q5008	A-8 Ⓒ
Q5010	C-9 Ⓕ
Q5011	B-11 Ⓕ
Q8001	C-13 Ⓕ
Q8002	C-13 Ⓕ
Q8003	C-10 Ⓕ
Q8004	A-12 Ⓕ
Q8005	Q-12 Ⓕ
Q8007	B-11 Ⓕ
Q8008	A-13 Ⓕ
Q8009	A-11 Ⓕ
Q8010	A-11 Ⓕ
Q8101	D-7 Ⓒ
Transistor & Resistor	
QR3003	D-10 Ⓕ
QR3006	C-13 Ⓕ
QR3007	D-8 Ⓒ
QR3010	A-1 Ⓒ
QR3101	D-7 Ⓒ
QR3102	D-11 Ⓕ
QR5001	E-11 Ⓕ
QR5002	A-10 Ⓕ
QR5003	A-10 Ⓕ
QR5004	A-10 Ⓕ
QR5007	D-8 Ⓒ
QR5008	D-11 Ⓕ
QR5009	D-8 Ⓒ
QR8001	D-11 Ⓕ
QR8002	B-12 Ⓕ
QR8010	C-5 Ⓒ
QR8101	D-8 Ⓒ
QR8102	A-12 Ⓕ
Integrated Circuit	
IC3001	E-6 Ⓒ
IC3002	B-6 Ⓒ
IC5001	B-7 Ⓒ
IC8001	B-12 Ⓕ
Test Point	
TL3003	A-6 Ⓒ
TL3006	F-6 Ⓒ
TL5001	A-8 Ⓒ
TL5002	A-8 Ⓒ
TL8001	A-5 Ⓒ
TL8003	A-6 Ⓒ
TL8004	A-6 Ⓒ
TL8005	A-6 Ⓒ
TL8006	F-5 Ⓒ
TL8007	B-5 Ⓒ
TL8008	B-5 Ⓒ
TL8009	A-7 Ⓒ
TL8101	A-6 Ⓒ
TP8002	E-8 Ⓒ
TP8010	C-1 Ⓒ
Adjustment	
C8001	B-6 Ⓒ
VR3001	A-6 Ⓒ
VR3002	E-7 Ⓒ
VR3003	A-1 Ⓒ
VR5101	A-6 Ⓒ
VR8008	A-6 Ⓒ
VR8009	C-6 Ⓒ
VR8010	A-6 Ⓒ
Connector	
B8001	A-3 Ⓒ
EP5001	A-7 Ⓒ

ADDRESS INFORMATION
Ⓒ... COMPONENT SIDE
Ⓕ... FOIL SIDE

POWER Section	
Transistor	
Q1002	A-15 Ⓕ
Q1003	C-2 Ⓒ
Q1004	B-16 Ⓕ
Q1005	C-2 Ⓒ
Q1006	B-15 Ⓕ
Q1009	C-15 Ⓕ
Q1010	B-2 Ⓒ
Q1012	B-14 Ⓕ
Q1015	B-15 Ⓕ
Q1101	B-16 Ⓕ
Q1102	C-16 Ⓕ
Transistor & Resistor	
QR1001	C-2 Ⓒ
QR1002	B-15 Ⓕ
QR1003	A-16 Ⓕ
QR1004	B-15 Ⓕ
QR1005	B-3 Ⓒ
QR1006	A-15 Ⓕ
QR1007	C-14 Ⓕ
Integrated Circuit	
IC1001	B-15 Ⓕ

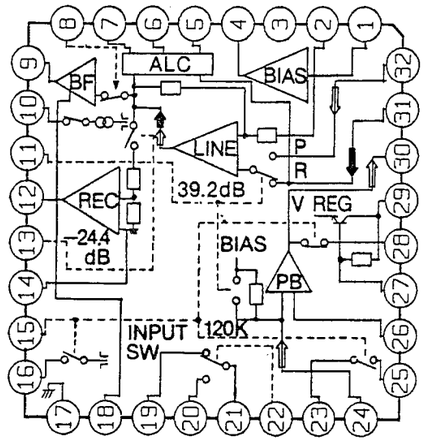
ADDRESS INFORMATION
Ⓒ... COMPONENT SIDE
Ⓕ... FOIL SIDE

AUDIO Section	
Transistor	
Q4001	F-11 Ⓕ
Q4002	E-10 Ⓕ
Q4004	E-11 Ⓕ
Q4005	G-5 Ⓒ
Q4006	F-11 Ⓕ
Q4007	E-11 Ⓕ
Q4008	F-12 Ⓕ
Transistor & Resistor	
QR4001	E-11 Ⓕ
Integrated Circuit	
IC4001	F-10 Ⓕ
Test Point	
TL4001	E-8 Ⓒ
TL4002	F-8 Ⓒ
TL4003	D-1 Ⓒ
Adjustment	
VR4001	E-8 Ⓒ
VR4002	F-7 Ⓒ
Connector	
B4001	F-7 Ⓒ
FP4002	E-8 Ⓒ

ADDRESS INFORMATION
Ⓒ... COMPONENT SIDE
Ⓕ... FOIL SIDE

IC BLOCK

IC4001 (BA7757BK)



MAIN C.B.A. ADDRESS INFORMATION

SYSTEM CONTROL & SERVO Section	
Transistor	
Q6001	F-12 Ⓕ
Q6003	E-2 Ⓒ
Q6004	D-12 Ⓕ
Q6005	D-16 Ⓕ
Q6006	D-15 Ⓕ
Q6010	D-2 Ⓒ
Q6013	G-15 Ⓕ
Transistor & Resistor	
QR6001	F-12 Ⓕ
QR6002	G-14 Ⓕ
QR6003	E-12 Ⓕ
QR6004	D-2 Ⓒ
QR6005	E-1 Ⓒ
QR6006	F-12 Ⓕ
QR6008	F-2 Ⓒ
QR6009	F-2 Ⓒ
QR6010	F-14 Ⓕ
QR6011	G-4 Ⓒ
QR6012	F-4 Ⓒ
QR6013	D-2 Ⓒ
QR6014	F-12 Ⓕ
Integrated Circuit	
IC6001	F-2 Ⓒ
IC6004	F-16 Ⓕ
IC6005	F-13 Ⓕ
IC6006	G-14 Ⓕ
IC6007	E-15 Ⓕ
IC6008	F-13 Ⓕ
IC6009	F-14 Ⓕ
IC6010	D-16 Ⓕ
IC6012	F-2 Ⓒ
IC6013	D-13 Ⓕ
IC6014	F-3 Ⓒ
IC6015	G-2 Ⓒ
IC6016	E-13 Ⓕ
IC6201	D-14 Ⓕ
Test Point	
TL6001	G-4 Ⓒ
TL6201	E-1 Ⓒ
TL6203	F-3 Ⓒ
TL6204	G-5 Ⓒ
TP6202	G-5 Ⓒ
Adjustment	
C6007	G-3 Ⓒ
Connector	
B6002	G-16 Ⓕ
B6003	D-13 Ⓕ
B6005	F-5 Ⓒ
B6006	C-1 Ⓒ
B6006	C-16 Ⓕ
B6007	G-4 Ⓒ
FP6001	G-13 Ⓕ
P6004	F-6 Ⓒ

ADDRESS INFORMATION
Ⓒ... COMPONENT SIDE
Ⓕ... FOIL SIDE

LUMINANCE/CHROMINANCE & HEAD AMP Section	
Transistor	
Q3001	E-7 Ⓒ
Q3006	B-6 Ⓒ
Q3007	B-13 Ⓕ
Q3008	B-13 Ⓕ
Q3009	B-13 Ⓕ
Q3010	B-13 Ⓕ
Q3101	D-7 Ⓒ
Q5001	B-10 Ⓕ
Q5002	C-9 Ⓕ
Q5003	A-10 Ⓕ
Q5004	C-11 Ⓕ
Q5005	B-11 Ⓕ
Q5006	A-10 Ⓕ
Q5007	A-10 Ⓕ
Q5008	A-8 Ⓒ
Q5010	C-9 Ⓕ
Q5011	B-11 Ⓕ
Q8001	C-13 Ⓕ
Q8002	C-13 Ⓕ
Q8003	C-10 Ⓕ
Q8004	A-12 Ⓕ
Q8005	Q-12 Ⓕ
Q8007	B-11 Ⓕ
Q8008	A-13 Ⓕ
Q8009	A-11 Ⓕ
Q8010	A-11 Ⓕ
Q8101	D-7 Ⓒ
Transistor & Resistor	
QR3003	D-10 Ⓕ
QR3006	C-13 Ⓕ
QR3007	D-8 Ⓒ
QR3010	A-1 Ⓒ
QR3101	D-7 Ⓒ
QR3102	D-11 Ⓕ
QR5001	E-11 Ⓕ
QR5002	A-10 Ⓕ
QR5003	A-10 Ⓕ
QR5004	A-10 Ⓕ
QR5007	D-8 Ⓒ
QR5008	D-11 Ⓕ
QR5009	D-8 Ⓒ
QR8001	D-11 Ⓕ
QR8002	B-12 Ⓕ
QR8010	C-5 Ⓒ
QR8101	D-8 Ⓒ
QR8102	A-12 Ⓕ
Integrated Circuit	
IC3001	E-6 Ⓒ
IC3002	B-6 Ⓒ
IC5001	B-7 Ⓒ
IC8001	B-12 Ⓕ
Test Point	
TL3003	A-6 Ⓒ
TL3006	F-6 Ⓒ
TL5001	A-8 Ⓒ
TL5002	A-8 Ⓒ
TL8001	A-5 Ⓒ
TL8003	A-6 Ⓒ
TL8004	A-6 Ⓒ
TL8005	A-6 Ⓒ
TL8006	F-5 Ⓒ
TL8007	B-5 Ⓒ
TL8008	B-5 Ⓒ
TL8009	A-7 Ⓒ
TL8101	A-6 Ⓒ
TP8002	E-8 Ⓒ
TP8010	C-1 Ⓒ
Adjustment	
C8001	B-6 Ⓒ
VR3001	A-6 Ⓒ
VR3002	E-7 Ⓒ
VR3003	A-1 Ⓒ
VR5101	A-6 Ⓒ
VR8008	A-6 Ⓒ
VR8009	C-6 Ⓒ
VR8010	A-6 Ⓒ
Connector	
B8001	A-3 Ⓒ
EP5001	A-7 Ⓒ

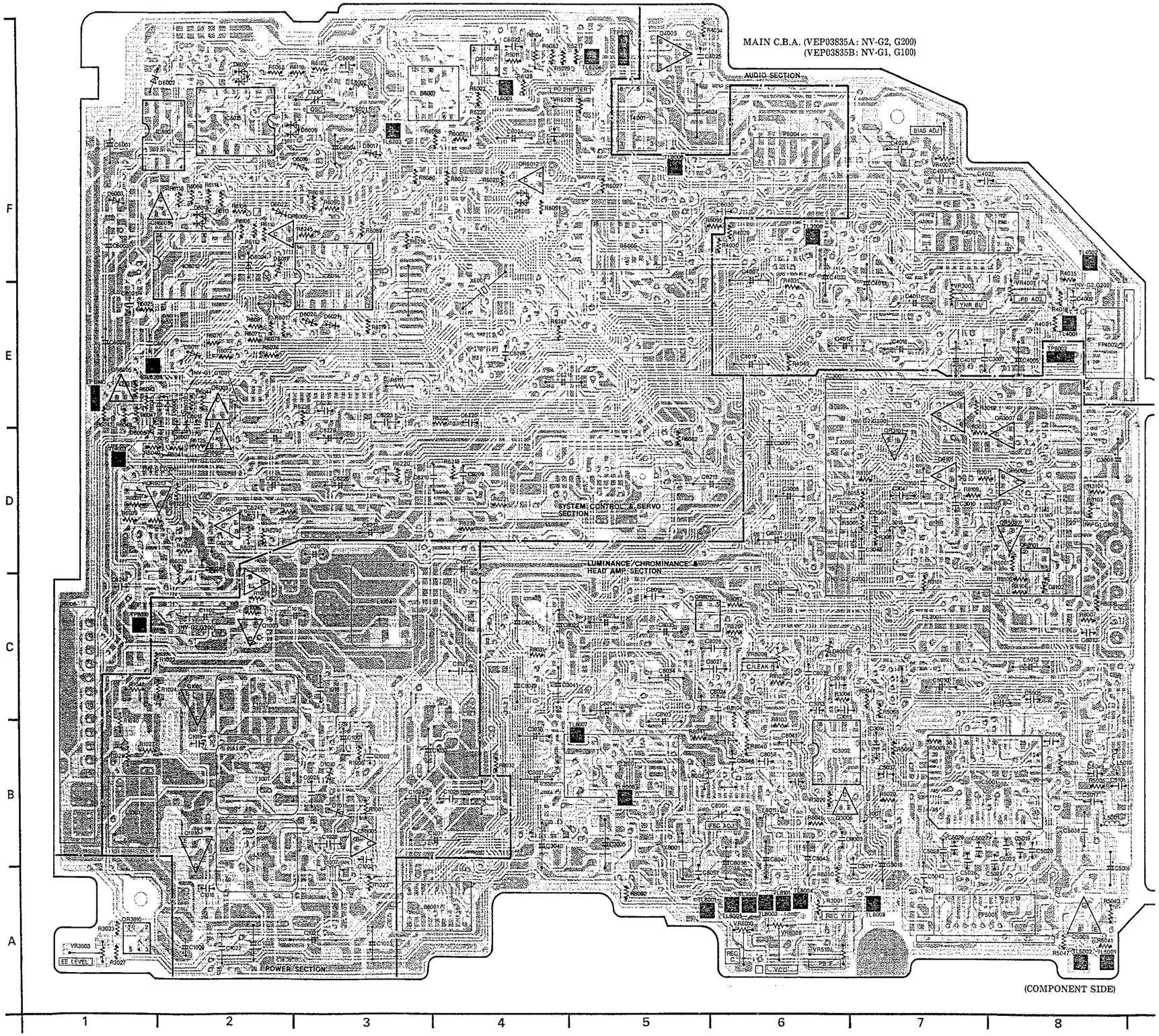
ADDRESS INFORMATION
Ⓒ... COMPONENT SIDE
Ⓕ... FOIL SIDE

POWER Section	
Transistor	
Q1002	A-15 Ⓕ
Q1003	C-2 Ⓒ
Q1004	B-16 Ⓕ
Q1005	C-2 Ⓒ
Q1006	B-15 Ⓕ
Q1009	C-15 Ⓕ
Q1010	B-2 Ⓒ
Q1012	B-14 Ⓕ
Q1015	B-15 Ⓕ
Q1101	B-16 Ⓕ
Q1102	C-16 Ⓕ
Transistor & Resistor	
QR1001	C-2 Ⓒ
QR1002	B-15 Ⓕ
QR1003	A-16 Ⓕ
QR1004	B-15 Ⓕ
QR1005	B-3 Ⓒ
QR1006	A-15 Ⓕ
QR1007	C-14 Ⓕ
Integrated Circuit	
IC1001	B-15 Ⓕ

ADDRESS INFORMATION
Ⓒ... COMPONENT SIDE
Ⓕ... FOIL SIDE

AUDIO Section	
Transistor	
Q4001	F-11 Ⓕ
Q4002	E-10 Ⓕ
Q4004	E-11 Ⓕ
Q4005	G-5 Ⓒ
Q4006	F-11 Ⓕ
Q4007	E-11 Ⓕ
Q4008	F-12 Ⓕ
Transistor & Resistor	
QR4001	E-11 Ⓕ
Integrated Circuit	
IC4001	F-10 Ⓕ
Test Point	
TL4001	E-8 Ⓒ
TL4002	F-8 Ⓒ
TL4003	D-1 Ⓒ
Adjustment	
VR4001	E-8 Ⓒ
VR4002	F-7 Ⓒ
Connector	
B4001	F-7 Ⓒ
FP4002	E-8 Ⓒ

ADDRESS INFORMATION
Ⓒ... COMPONENT SIDE
Ⓕ... FOIL SIDE


MAIN C.B.A. (VEP03835A: NV-G2, G200)
(VEP03835B: NV-G1, G100)
AUDIO SECTION
SYSTEM CONTROL & SERVO SECTION
LUMINANCE/CHROMINANCE & HEAD AMP. SECTION
POWER SECTION
(COMPONENT SIDE)
F
E
D
C
B
A
1
2
3
4
5
6
7
8

MAIN C.B.A. (VEP03835A: NV-G2, G200)
(VEP03835B: NV-G1, G100)

AUDIO SECTION

LUMINANCE/CHROMINANCE & HEAD AMP SECTION

SYSTEM CONTROL & SERVO SECTION

POWER SECTION

(FOIL SIDE)

9 10 11 12 13 14 15 16 17 18 19

TO FE HEAD UNIT

MECHANISM FLEXIBLE CARD C.B.A. (VEP06762A)

TO REC SAFETY SWITCH UNIT

S-REEL

TO CASSETTE DOWN SWITCH UNIT

TO MODE SELECT SWITCH

T-REEL

TO LOADING MOTOR UNIT

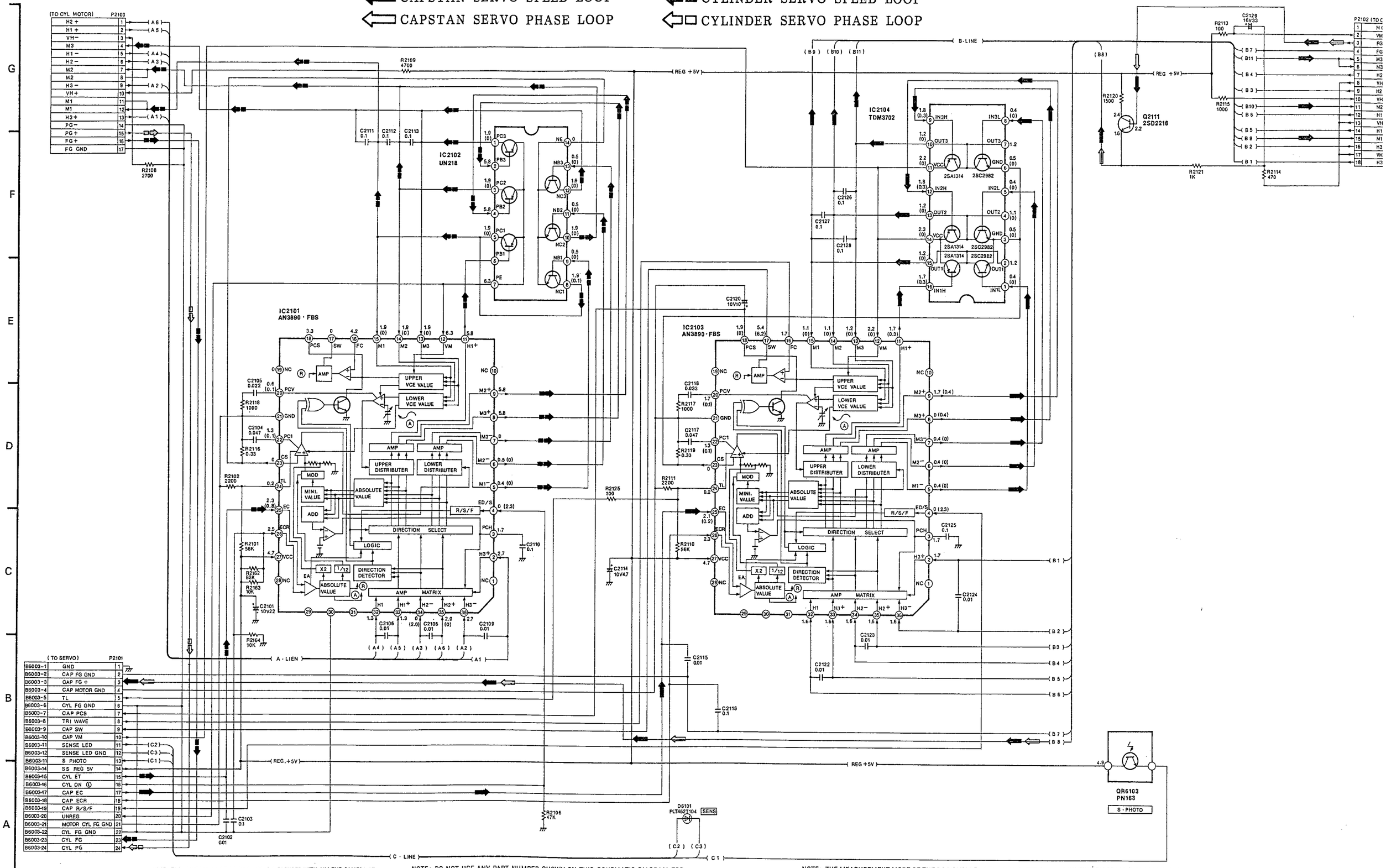
TO DEW DETECTION UNIT

TO TAKE UP PHOTO TR

Next Page:
DRIVE Section

3-23 DRIVE SCHEMATIC DIAGRAM

CAPSTAN SERVO SPEED LOOP
CAPSTAN SERVO PHASE LOOP
CYLINDER SERVO SPEED LOOP
CYLINDER SERVO PHASE LOOP



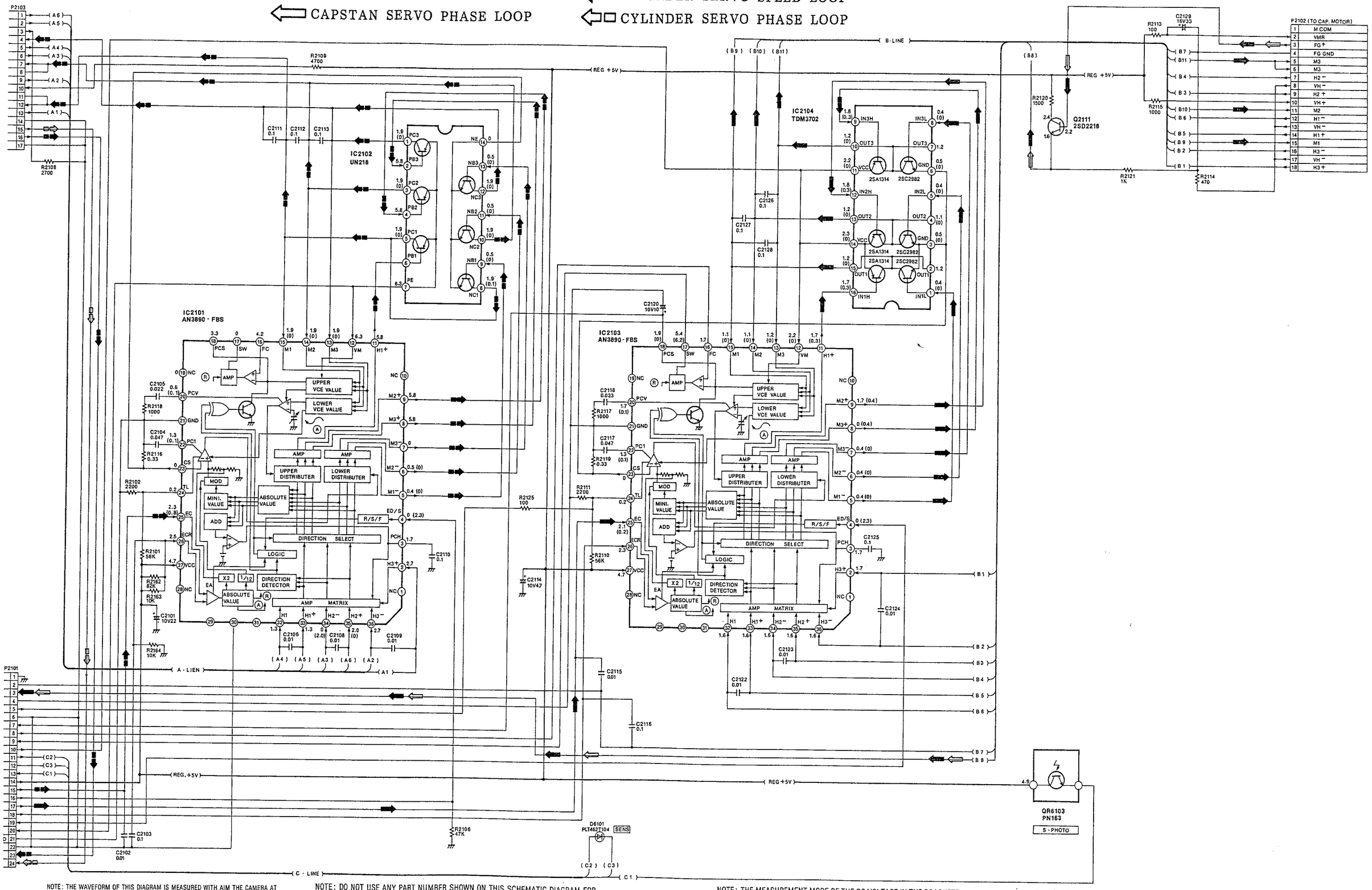
NOTE: THE WAVEFORM OF THIS DIAGRAM IS MEASURED WITH AIM THE CAMERA AT THE LOGARITHMIC GRAY SCALE CHART OR COLOUR CHART.

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

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS ( ) ON THIS DIAGRAM IS RECORD MODE WITH AIM THE CAMERA AT THE COLOR CHART.

THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF ON THIS DIAGRAM IS PLAYBACK MODE WITH PAL COLOI

CAPSTAN SERVO SPEED LOOP
CAPSTAN SERVO PHASE LOOP
CYLINDER SERVO SPEED LOOP
CYLINDER SERVO PHASE LOOP

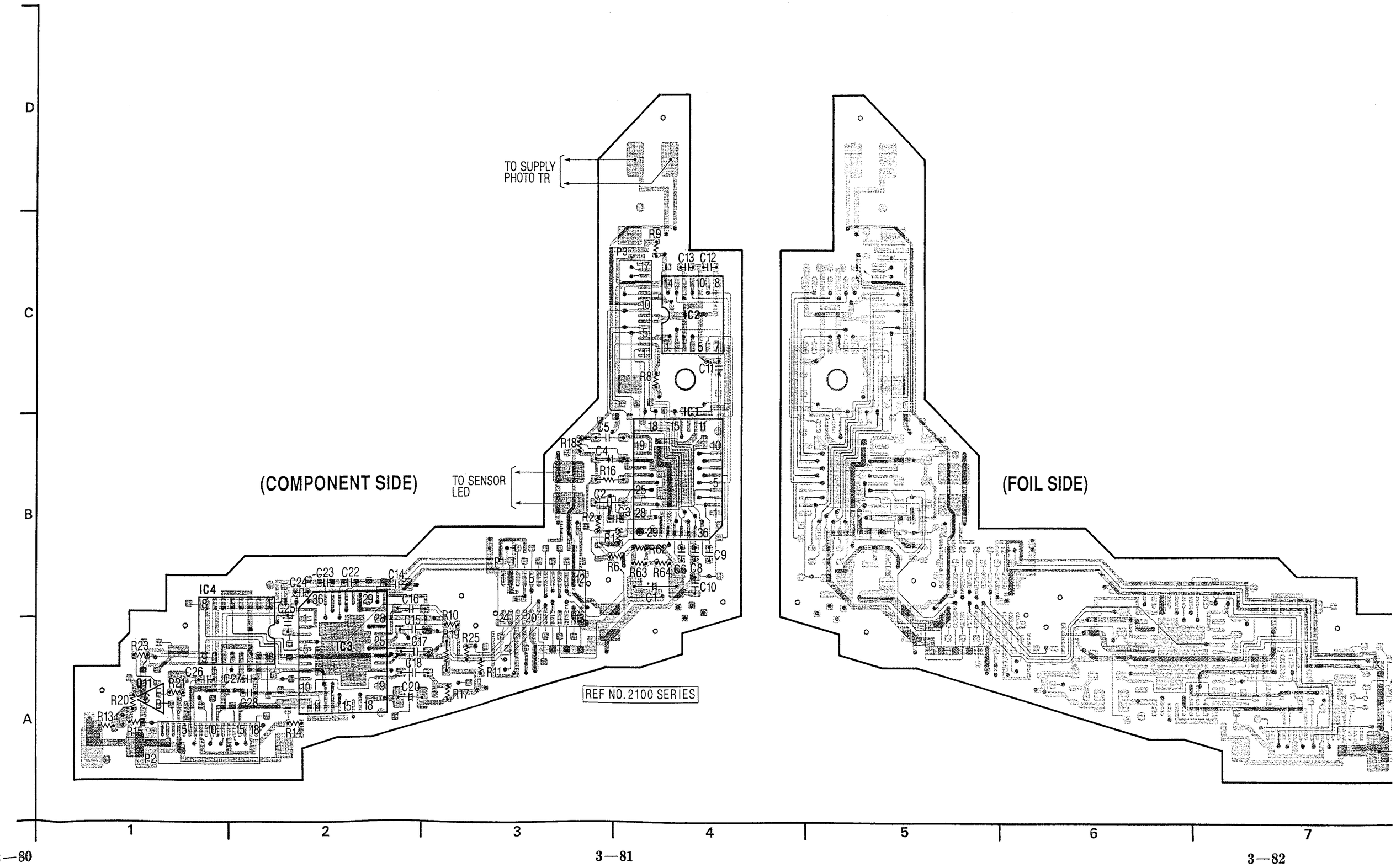


NOTE: THE WAVEFORM OF THIS DIAGRAM IS MEASURED WITH AIM THE CAMERA AT THE LOGARITHMIC GRAY SCALE CHART OR COLOUR CHART.

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

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS ( ) ON THIS DIAGRAM IS RECORD MODE WITH AIM THE CAMERA AT THE COLOR CHART.

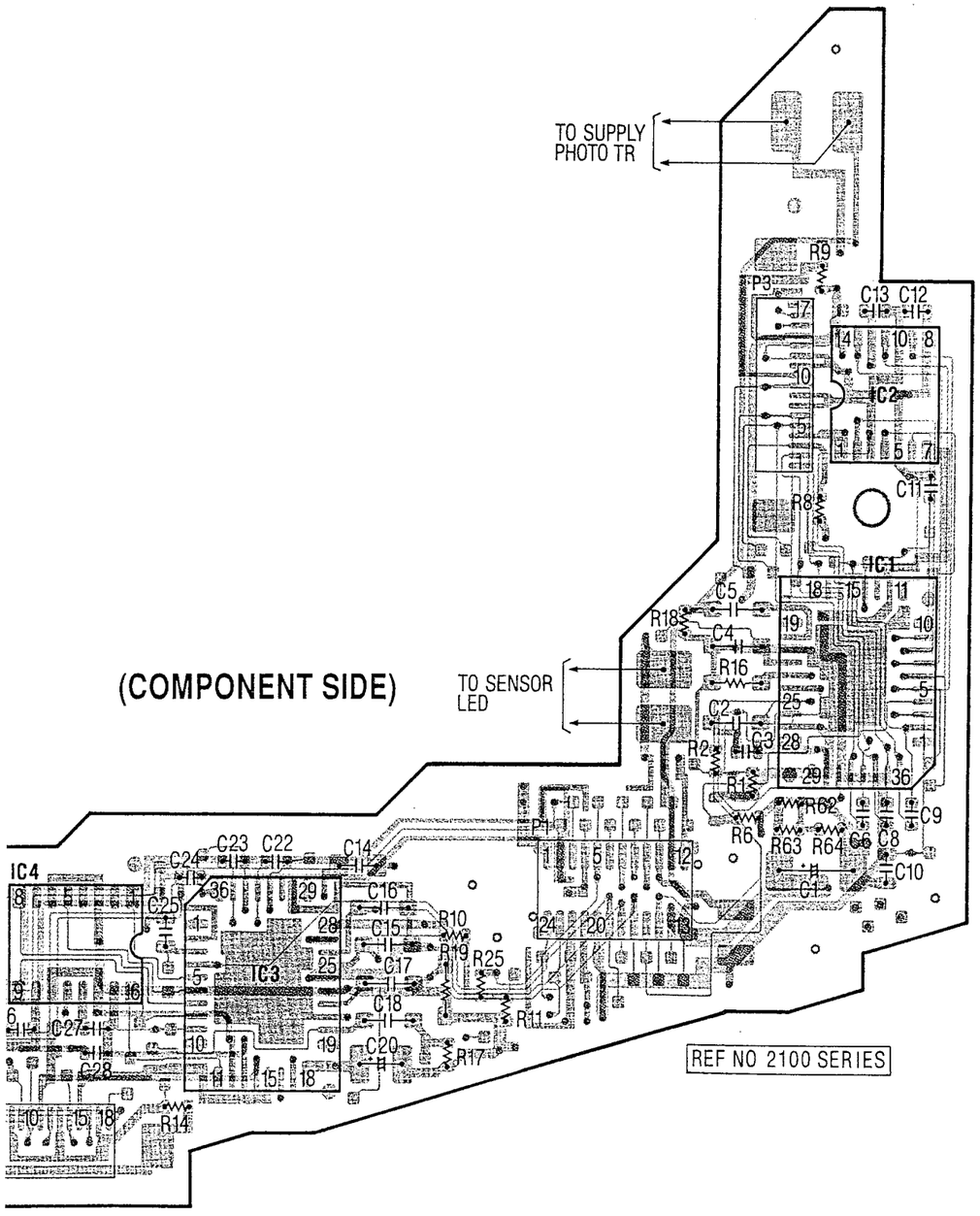
THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH PAL COLOUR SIGNAL.

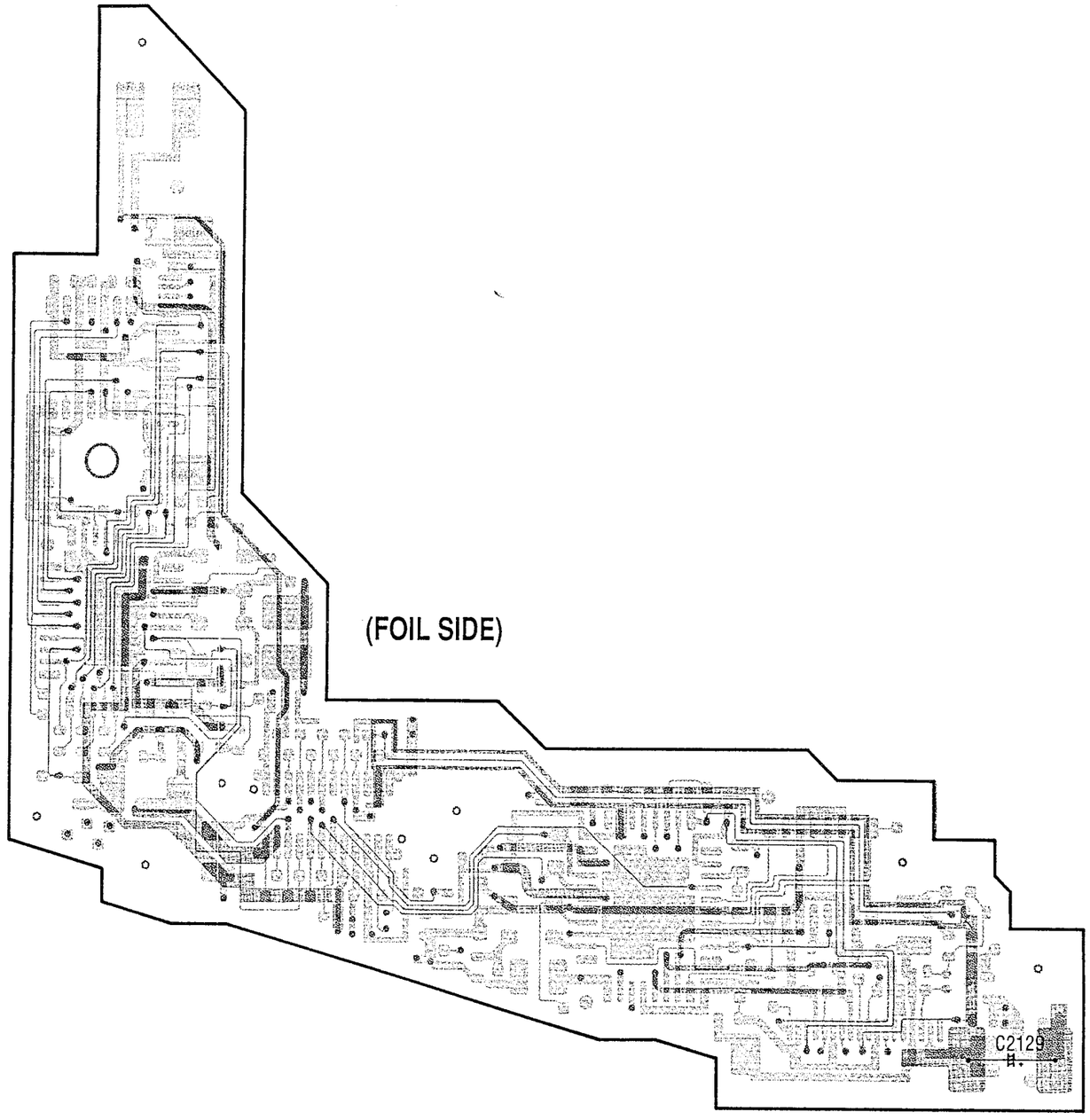

D
C
B
A
1
2
3
4
5
6
7
TO SUPPLY
PHOTO TR
TO SENSOR
LED
(COMPONENT SIDE)
(FOIL SIDE)
REF NO. 2100 SERIES
R9
P3
C13
C12
C2
C11
R8
IC1
C5
R18
C4
R16
C3
R2
R1
R62
R6
R63
R64
C8
C9
C10
C1
P1
C14
C23
C22
C24
IC4
C25
C16
C15
R10
R19
R25
C17
IC3
C18
R23
C26
C27
Q11
R21
R20
C28
C20
R17
R11
R13
R15
R14
P2

VEP02370A)

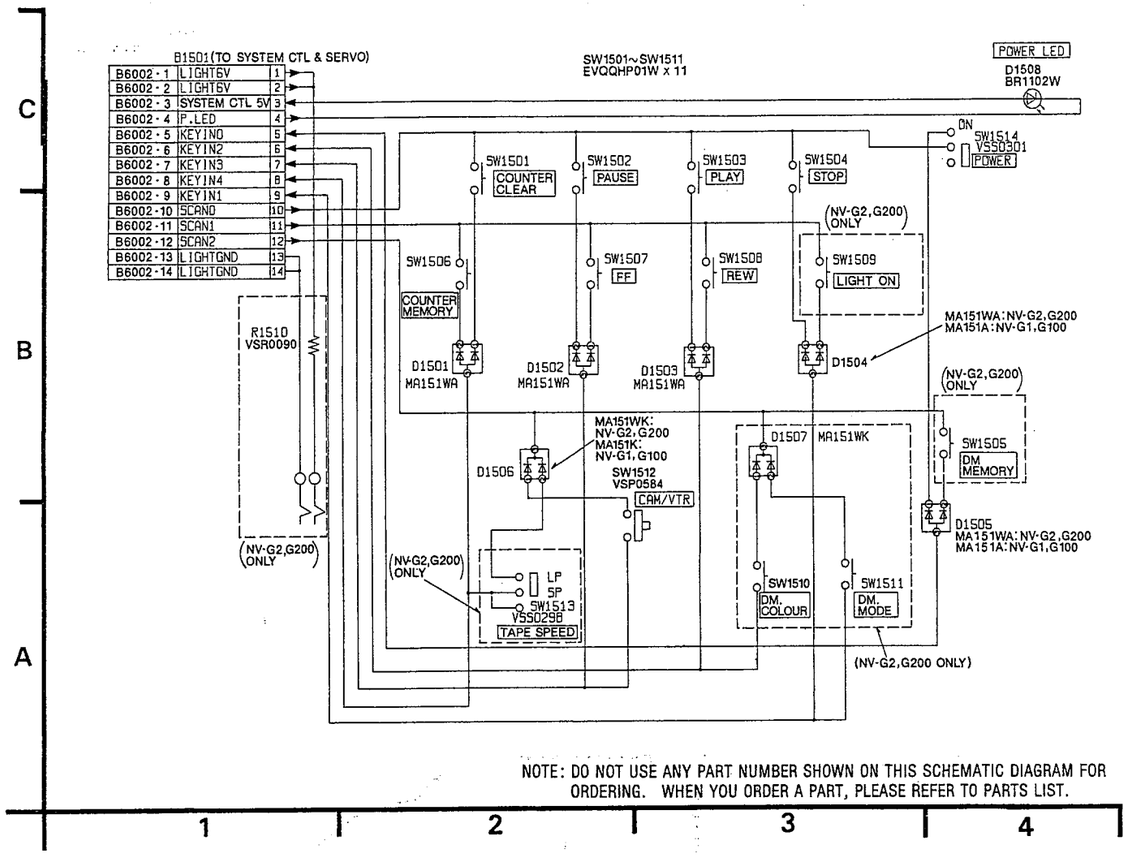
DRIVE C.B.A.	
Transistor	
Q2111	A-1 ©
Integrated Circuit	
IC2101	B-4 ©
IC2102	C-4 ©
IC2103	A-2 ©
IC2104	B-1 ©
Connector	
P2101	A-1 ©
P2102	B-3 ©
P2151	C-4 ©

ADDRESS INFORMATION
©... COMPONENT SIDE
Ⓕ... FOIL SIDE



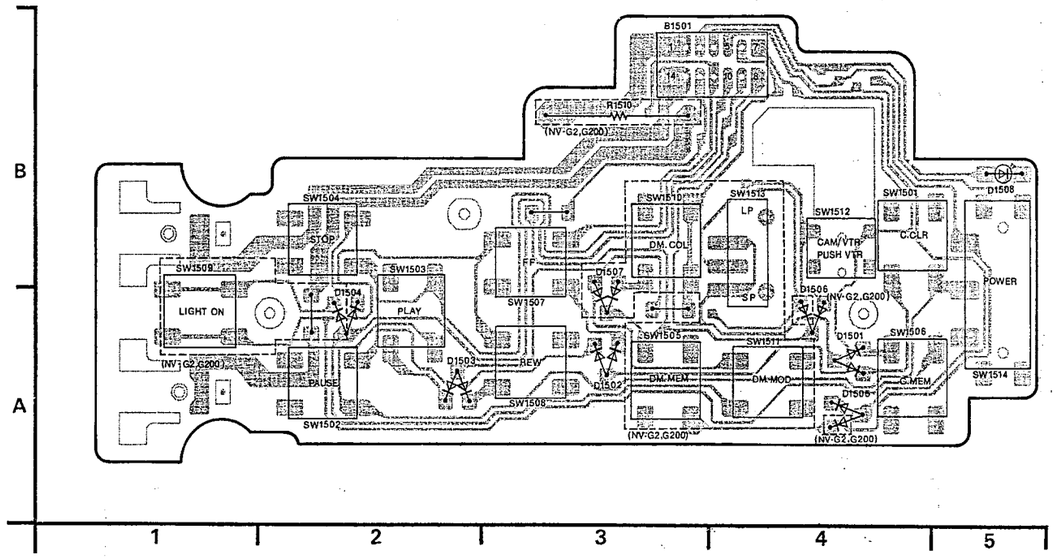


3-25 VTR OPERATION SCHEMATIC DIAGRAM



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

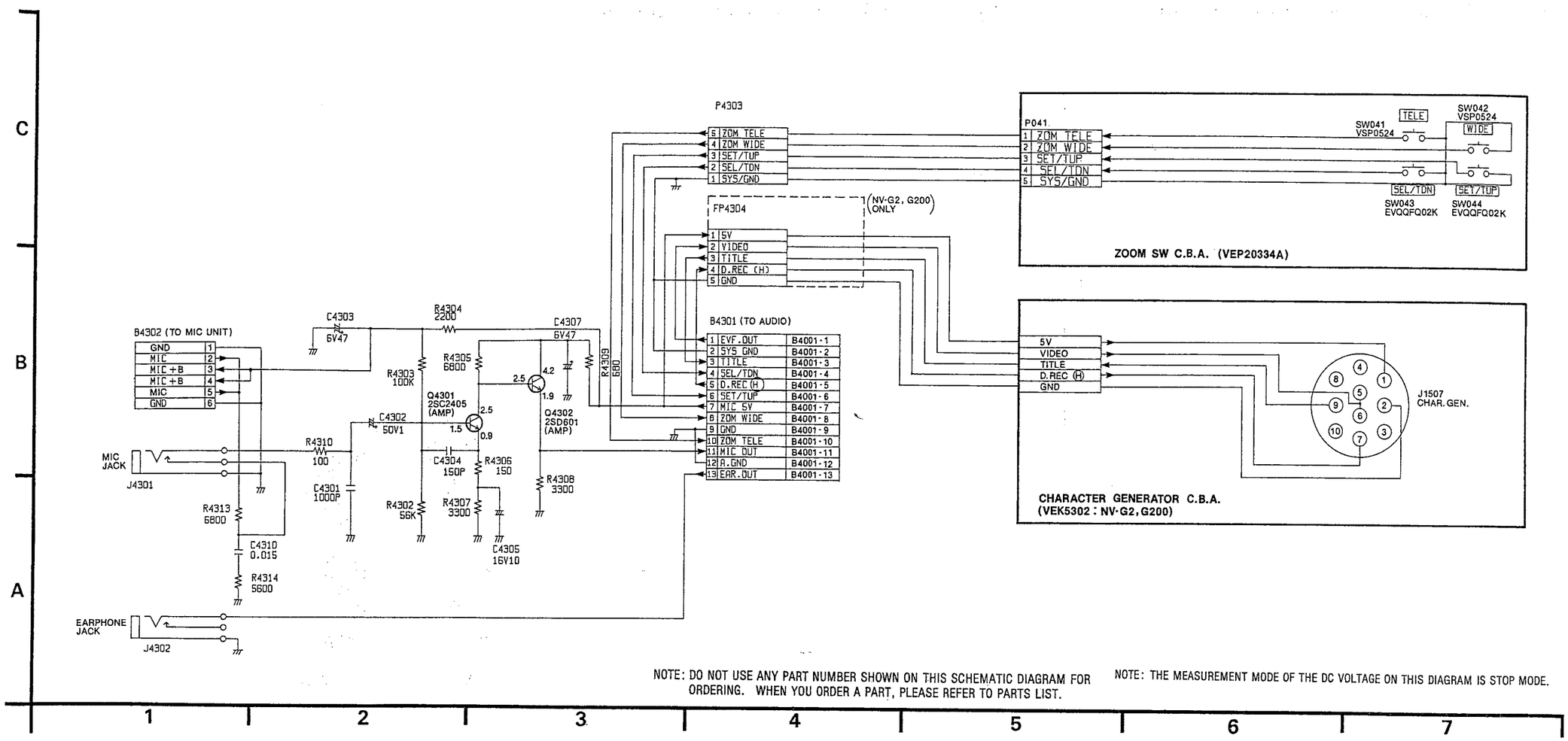
3-26. VTR OPERATION C B A (VEP06737A: NV-G2, G200 SERIES) (VEP06737B: NV-G1, G100 SERIES)



VTR OPERATION C.B.A.	
Connector	
B1501	B-3

ADDRESS INFORMATION
Ⓒ... COMPONENT SIDE
Ⓕ... FOIL SIDE

3-27. MIC INTERFACE 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.

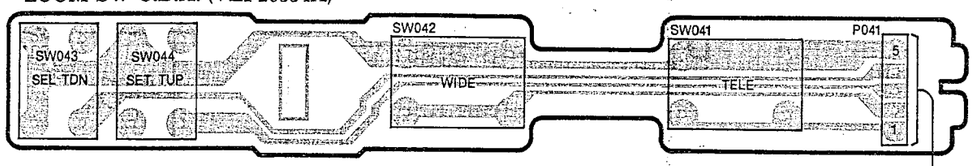
NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

MIC INTERFACE C.B.A.	
Transistor	
Q4301	C-2
Q4302	C-2
Connector	
B4301	D-2
B4302	C-1
B4303	D-3
FP4304	C-3
P041	D-3

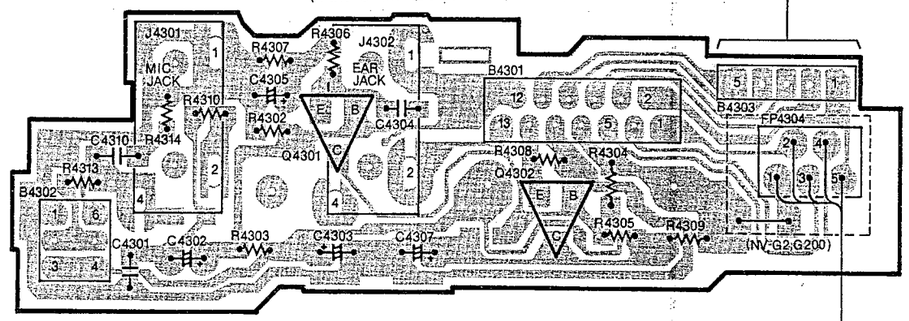
ADDRESS INFORMATION
Ⓒ... COMPONENT SIDE
Ⓕ... FOIL SIDE

(VEP04337A: NV-G2, G200 SERIES) (VEP04337B: NV-G1, G100 SERIES)

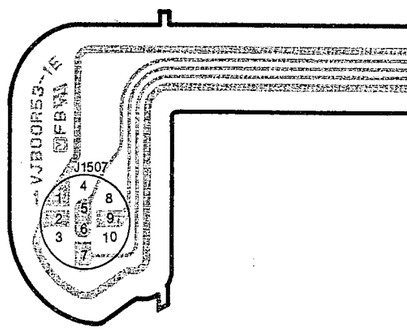
ZOOM SW C.B.A. (VEP20334A)



MIC INTERFACE C.B.A. (VEP04337A: NV-G2, G200)
(VEP04337B: NV-G1, G100)



CHARACTER GENERATOR C.B.A
(VEK5302: NV-G2, G200)



Next Page:
JACK Section

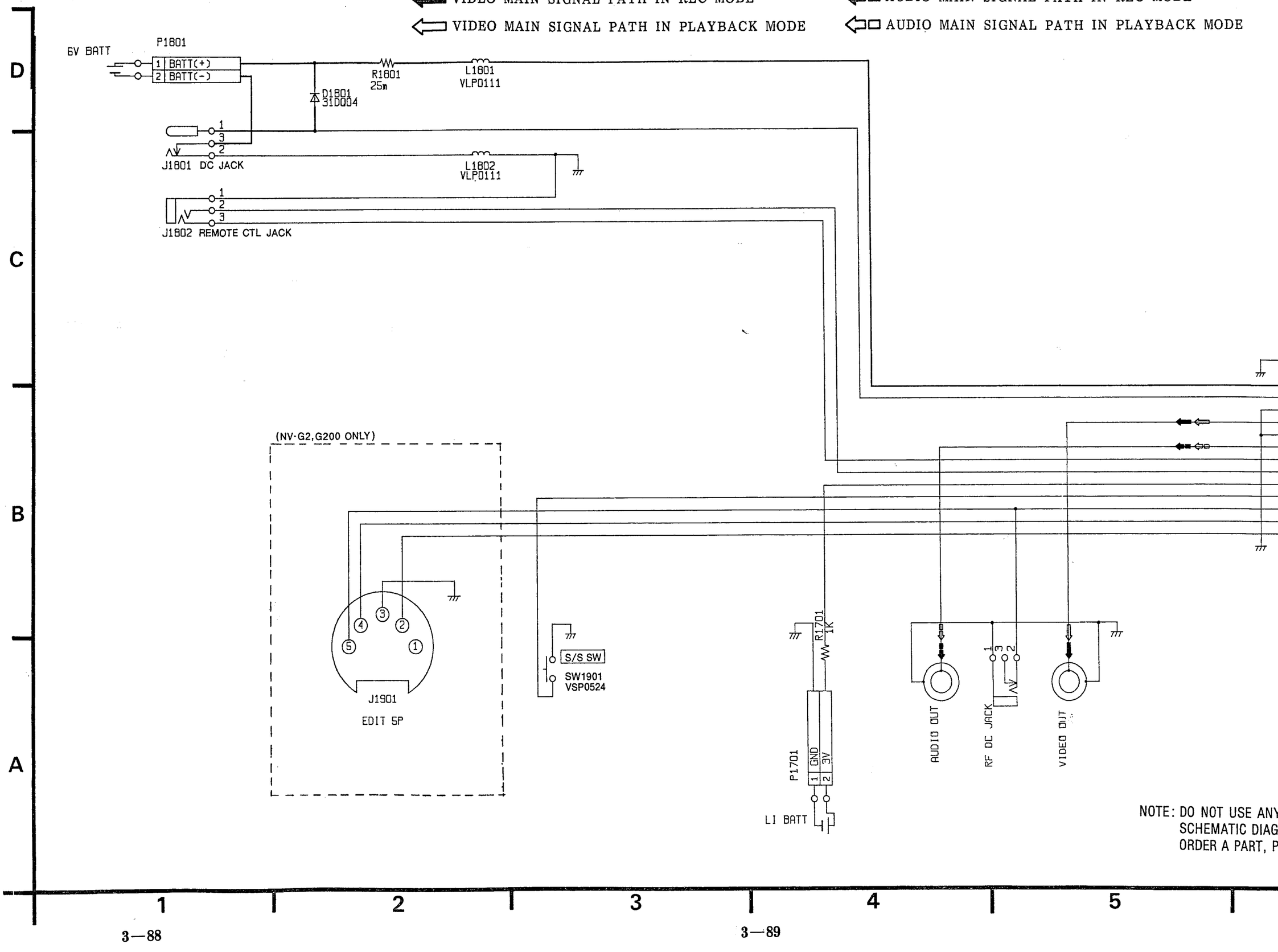
3-29 JACK SCHEMATIC DIAGRAM

VIDEO MAIN SIGNAL PATH IN REC MODE

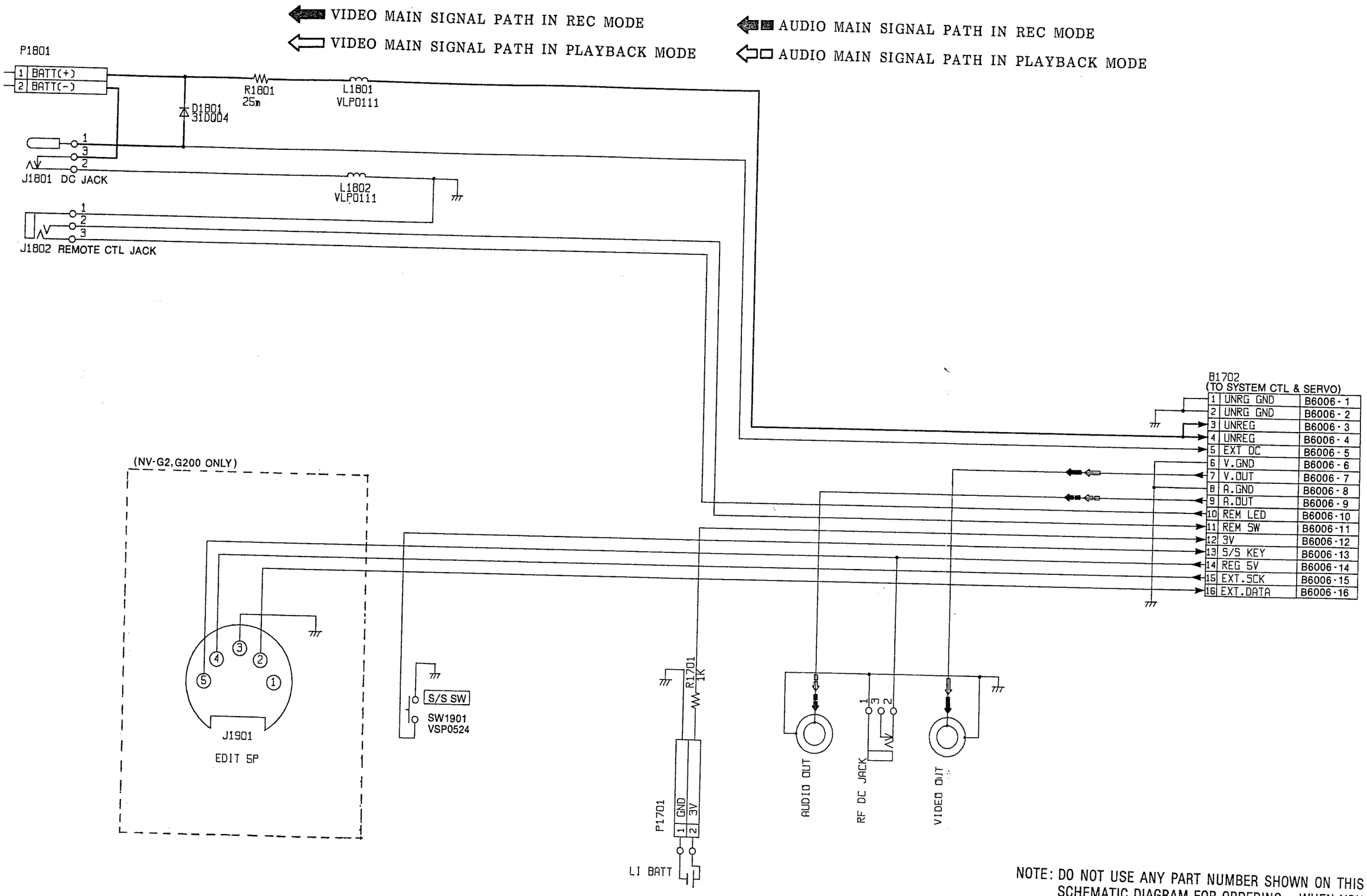
VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE

AUDIO MAIN SIGNAL PATH IN REC MODE

AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE

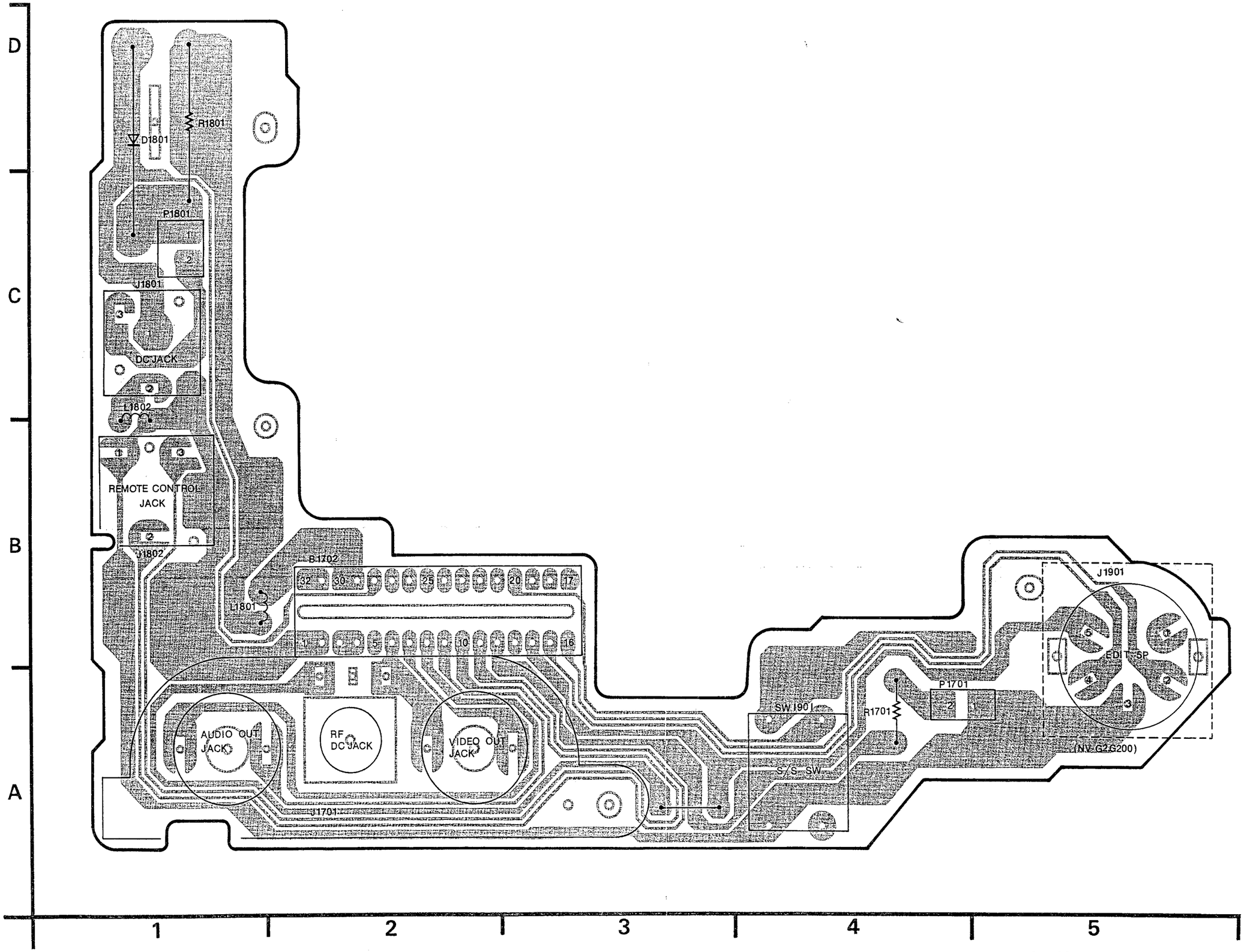


EMATIC DIAGRAM



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

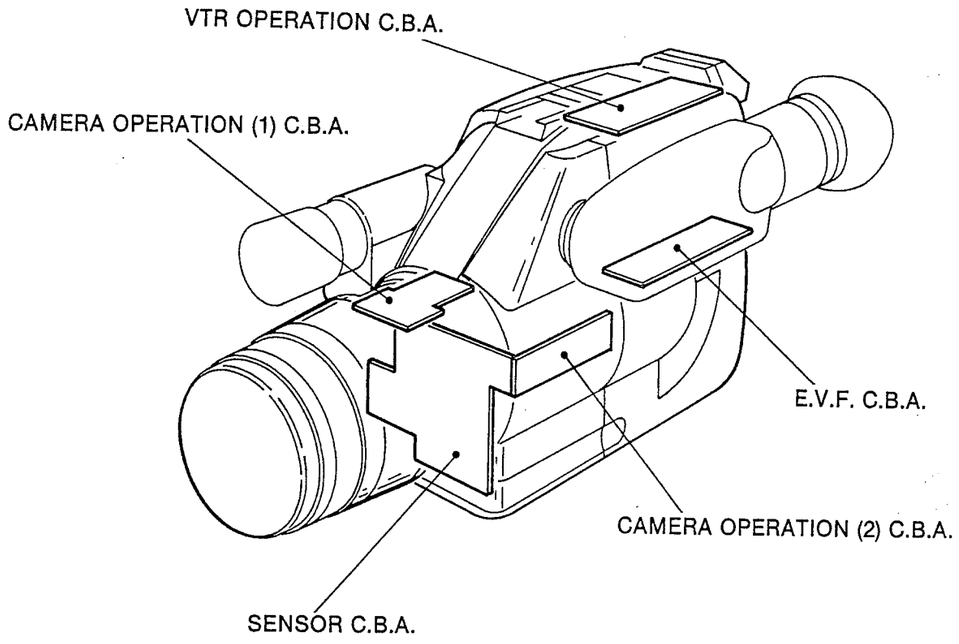
3-30 JACK C B A (VEP00R15A: NV-G2, G200 SERIES) (VEP00R15B: NV-G1, G100 SERIES)

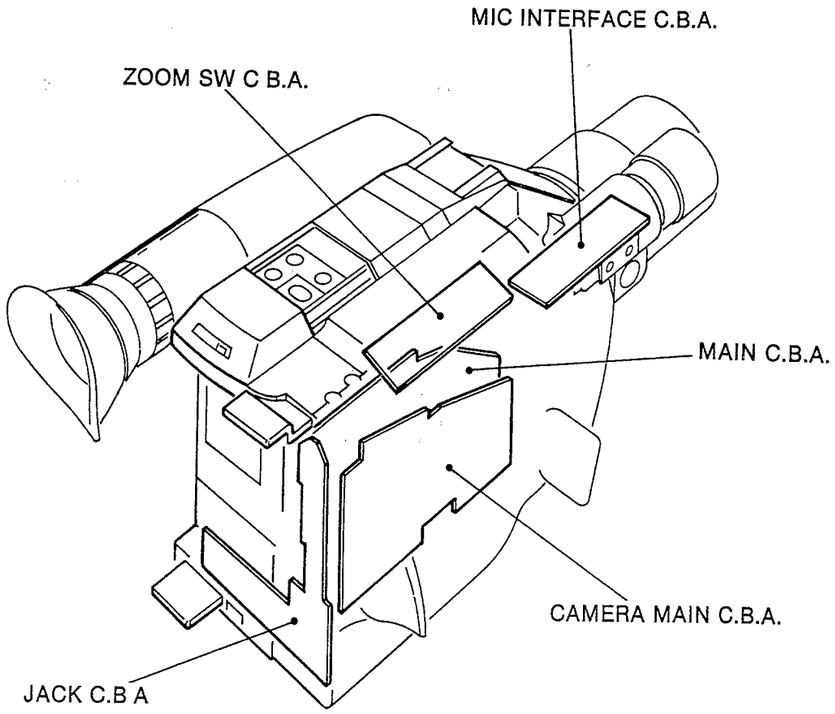


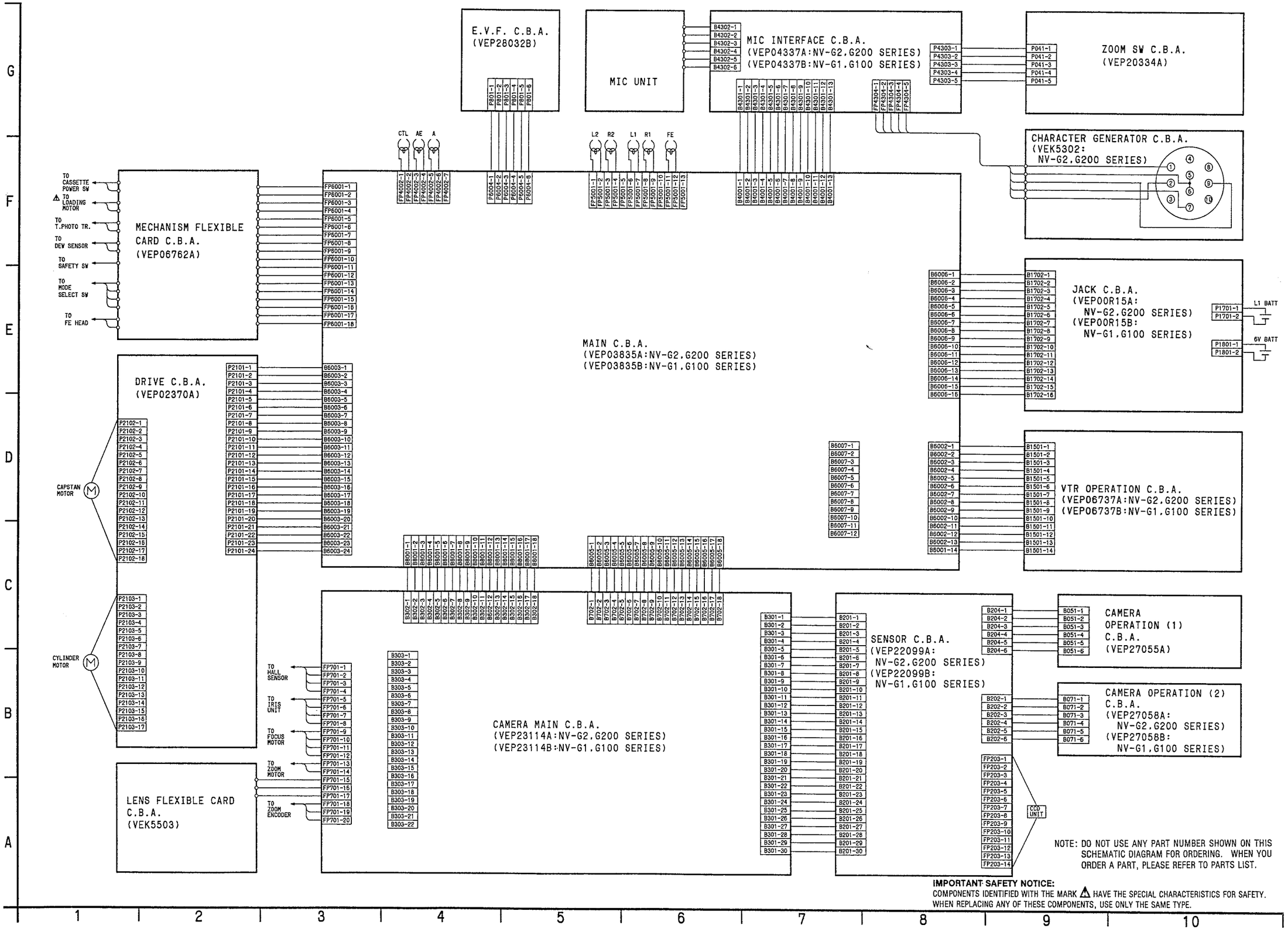
JACK C.B.A.	
Connector	
B1702	B-2
P1701	A-4
P1801	C-1

ADDRESS INFORMATION
Ⓒ... COMPONENT SIDE
Ⓕ... FOIL SIDE

3-31. CIRCUIT BOARD LAYOUT







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

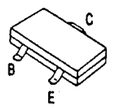
IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

Next Page:
ICs & TRs INFORMATION Section

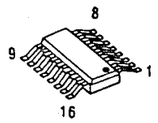
3-33. ICs & TRs INFORMATION



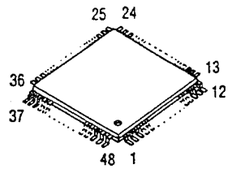
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TL8809F
LM393DB
LM311DB
LM358DB



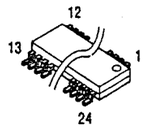
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2SA812 2SC2404
2SA1532 2SC4627
2SB1219 2SC4176
2SB1462 2SC3933
2SB1220 2SD2216
2SB970 2SD968A
2SB1218 2SD1823



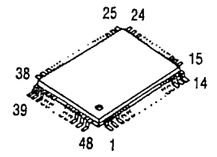
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AN2514S
TDM3702



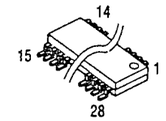
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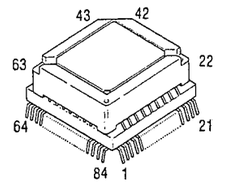
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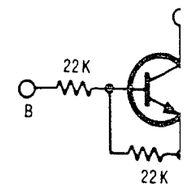
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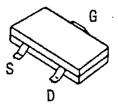
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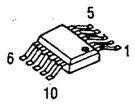
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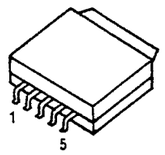
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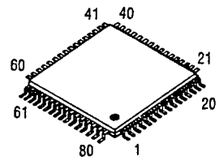
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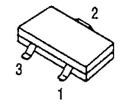
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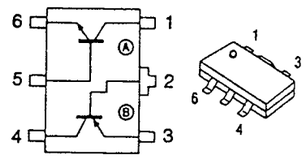
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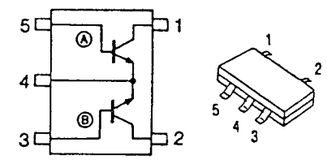
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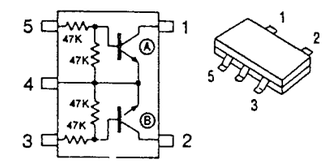
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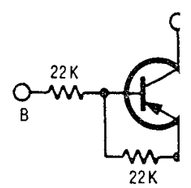
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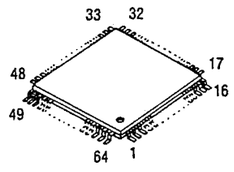
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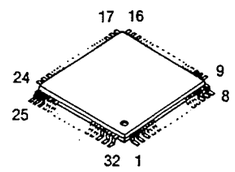
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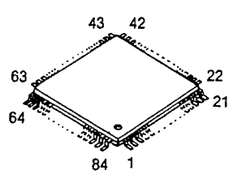
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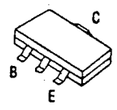
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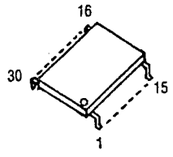
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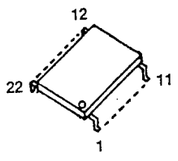
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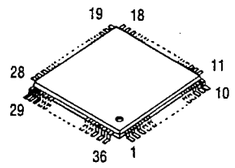
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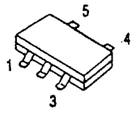
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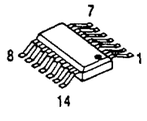
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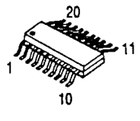
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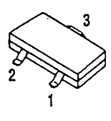
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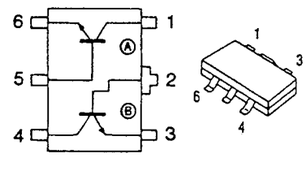
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LM324DB
LM339DB
MC14066BFR
UN218CU



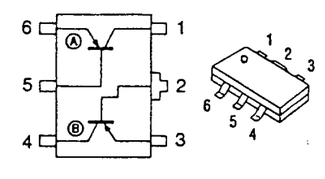
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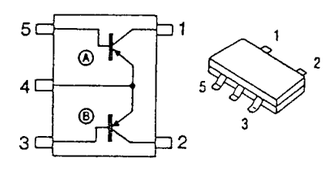
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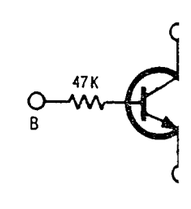
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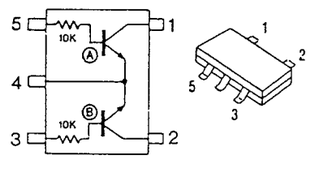
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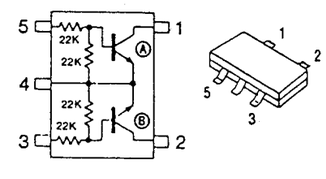
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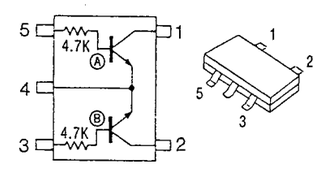
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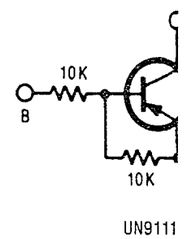
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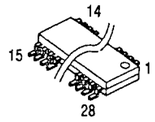
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XP1212
XN9212



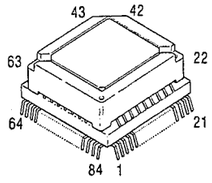
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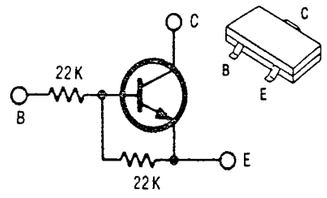
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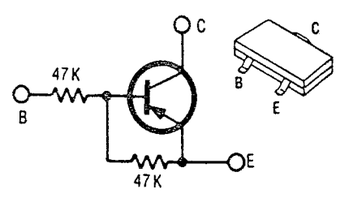
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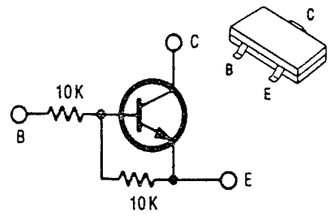
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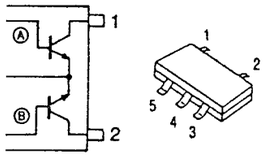
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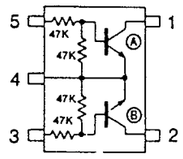
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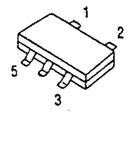


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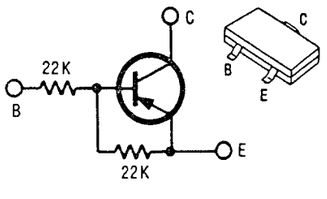


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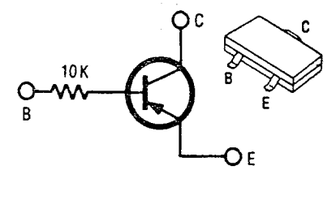




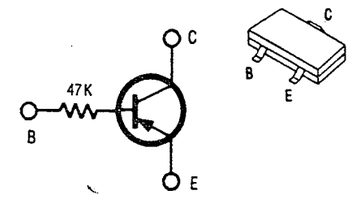
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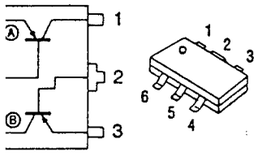
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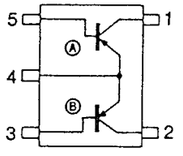
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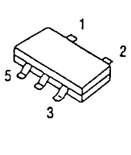


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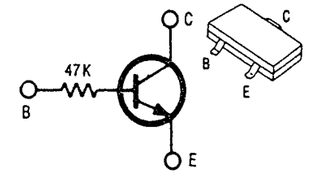


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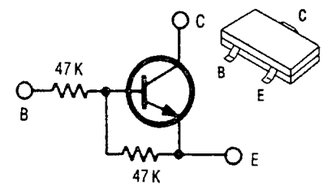




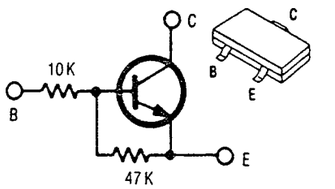
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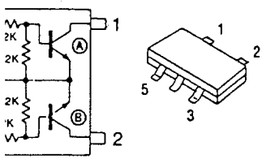
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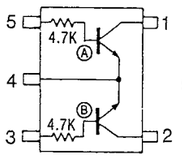
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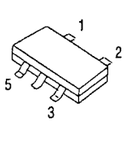


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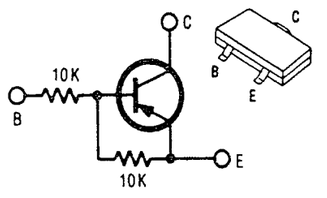


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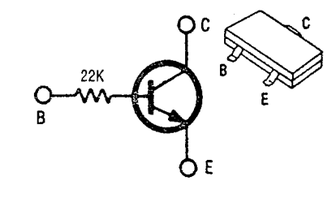




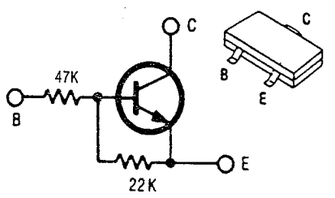
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UN9111



UN9217



UN921E

Panasonic

MATSUSHITA ELECTRIC

Japan