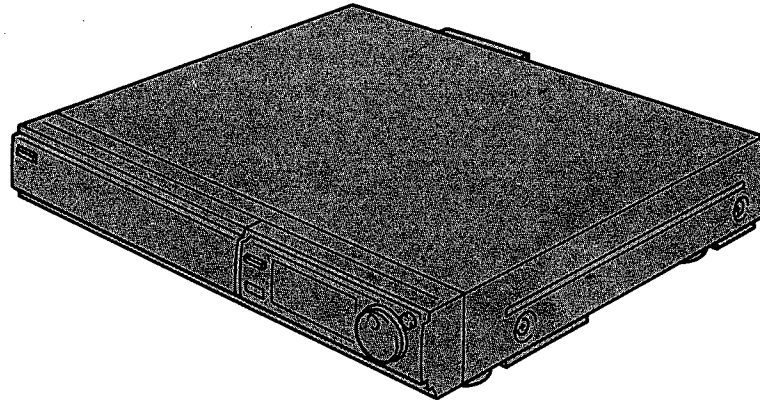


Service Manual

Operating Instructions
Disassembly Method
Maintenance
Mechanical Adjustment
Electrical Adjustment
Block Diagrams
Schematic Diagrams
Circuit Board Diagrams
Exploded Views
Replacement Parts List

Panasonic **SVHS** **Hi-Fi**
Professional/Industrial Video

Video Cassette Recorder
AG-1970P



SPECIFICATIONS

ITEM	SPECIFICATION	ITEM	SPECIFICATION
Power	Source: AC 120V, 50~60Hz Consumption: Approx. 42 watts	Audio	Head: Normal Audio/Control: 1 stationary head Hi-Fi Audio: 2 rotary heads; 26 μ m \times 2 Erase: 1 full track erase 1 Audio track erase
Television Format	EIA standard (525 lines, 60 fields) NTSC color signal TV Tuners: VHF: CH2-CH13, CHA-5~CHA-1, CHA~CHW, CHAA~CHFFF, CH5A UHF: CH14~CH69, CH66~CH94 75 Ω terminated		Track: 4 tracks (Normal: 1 track, Hi-Fi: 2 tracks)
Tape Speed	SP; 1-5/16 i.p.s. (33.35 mm/s) SLP; 7/16 i.p.s. (11.12 mm/s)		Input level: LINE IN (PHONO) \times 4; -10dBV, 47 Ω unbalanced MIC IN (M3); -30dBV
Tape Format	VHS tape, SVHS tape		Output level: LINE OUT (PHONO) \times 4; -8dBV, 1 k Ω unbalanced HEADPHONES (M3); -30dBV, 8 Ω
FF/REW Time	Approx. 2-1/2min. with NV-T120		Frequency Response: 60Hz~12kHz (NORMAL/SP) 20Hz~20kHz (Hi-Fi)
Video	Head: 4 rotary heads, 2 head-helical scanning system 49 μ m (SP) \times 2, 26 μ m (SLP) \times 2 1 flying (rotary) erase head 115 μ m	Hi-Fi Dynamic Range: more than 90dB (Hi-Fi)	
	Luminance: FM azimuth recording	Signal-to Noise Ratio: better than 40dB (NORMAL), 65dB (Hi-Fi)	
	Color signal: Converted subcarrier phase shift recording	RF Output	
	Input level: LINE IN (Front: PHONO), (Rear: BNC); 1.0Vp-p, 75 Ω unbalanced S-VIDEO IN (4P) \times 2; Y; 1.0Vp-p, 75 Ω unbalanced C; 0.286Vp-p, burst level 75 Ω unbalanced	Operating Condition	
	Output level: LINE OUT (BNC) \times 2; 1.0Vp-p, 75 Ω unbalanced S-VIDEO OUT (4P); Y; 1.0Vp-p, 75 Ω unbalanced C; 0.286Vp-p, burst level 75 Ω unbalanced	Dimensions	
	Signal-to-Noise Ratio: Video more than 43dB (VHS/SP), 44dB (S-VHS/SP)	Weight	
Horizontal Resolution: Color more than 400 lines (VHS/SP), 230 lines (S-VHS/SP)	Accessories	1 pc. Infrared Remote Controller 1 pc. Coaxial Cable 1 pc. Stereo Type Phone Cable 1 pc. AC Power Cord 1 pc. S-Video Cable 2 psc. "AA" size Batteries	

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

INTRODUCTION

*This Service Manual contains all the technical information which will allow service personnel to understand and service this Panasonic **S-VHS** video cassette recorder model AG-1970P.*

By the use of the S-VHS system and the introduction of high reliability mechanisms, a sharp picture quality with high resolution is obtained.

Added to the basic VHS format, these features make the AG-1970P an ideal unit for business, education, entertainment, sales and training applications.

Just slightly ahead of our time...Panasonic

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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 ∞ .

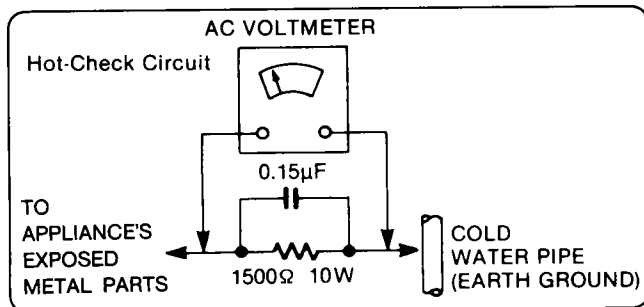


Figure 1

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 called Electrostatically 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 until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically 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 other safety 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).

SECTION 1

GENERAL DESCRIPTIONS

1-1. TECHNICAL INFORMATION

INITIALIZATION OF CHANNEL MEMORY IC (IC7503/M6M80021P)

When replace the channel memory IC (IC7503/M6M80021P), the memory IC should be initialized to keep formal specification.

<<Note>>

1. It should be performed before tuner preset.
2. During initialization or after initialization within 1 second, do not stop the power source. (Do not disconnect AC cord)
3. Meaning of "INITIALIZATION" is to erase the "SKIP CH". In another to say the number of POSITION CH and DISPLAY CH to be same.

<<Method>>

1. Press the CH UP/DOWN Button so that the Channel indicator "--".
2. Connect the Diode (MA165) to Pin 54 of IC7501 for Anode, Pin 35 of IC7501 for Cathode twice.
3. Channel indication disappears, and approximately 3 seconds later Channel indicator indicates "2".

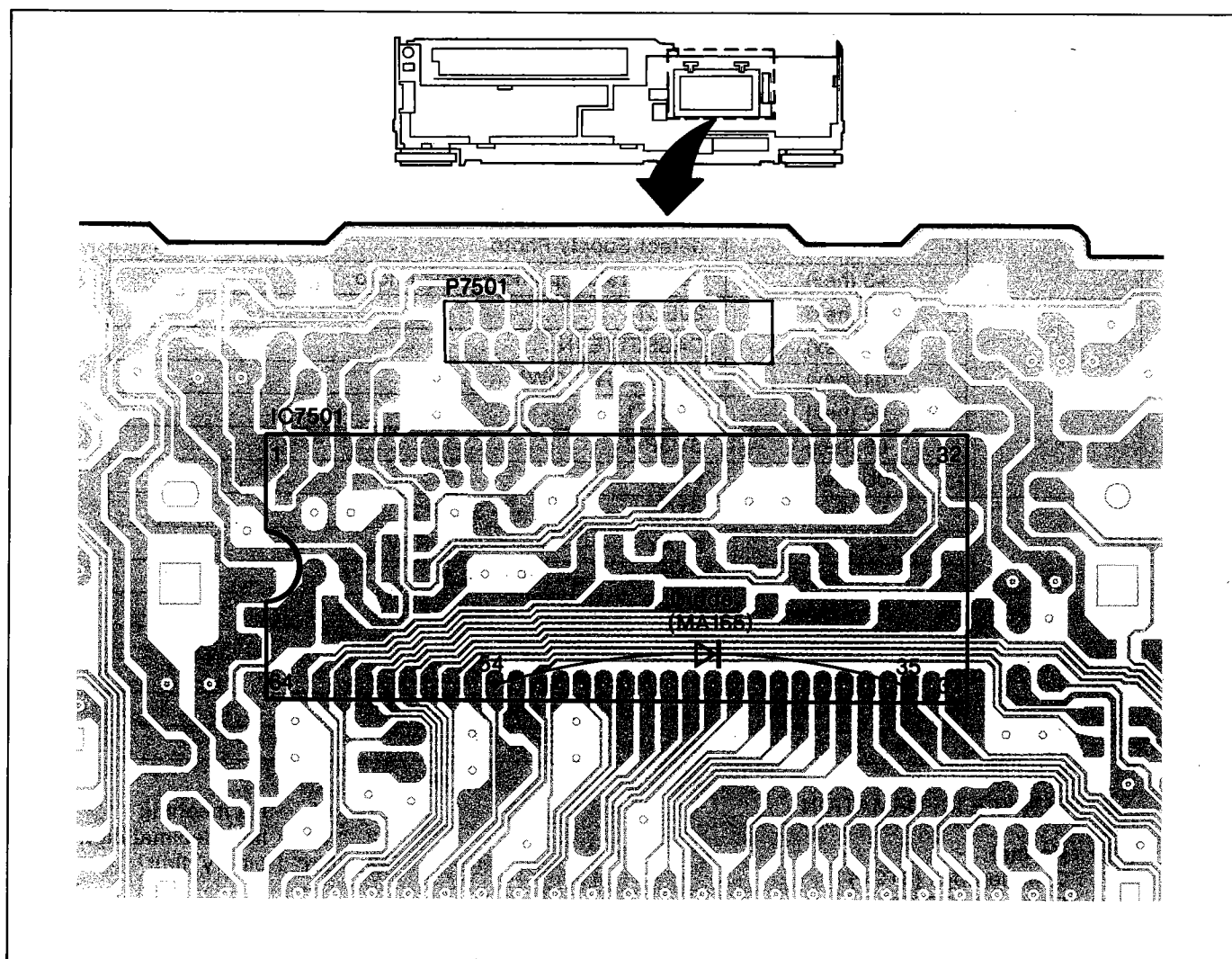


Figure T1

SERVICE NOTE

When repairing without the top panel unit, Tape Select Switch must be set to the T120 position to prevent the malfunction of the Take-Up Photo Sensor.

SERVICE INFORMATION DISPLAY

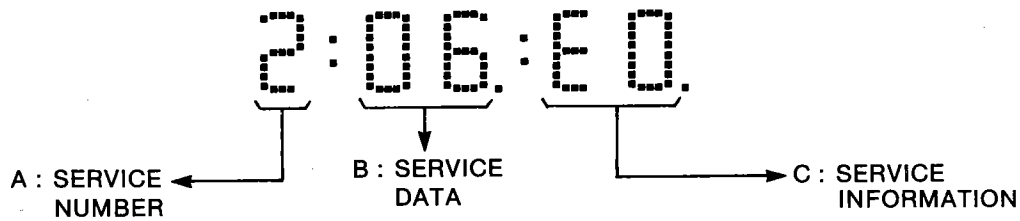
This unit can be confirmed the mode information which is detected by microprocessor IC6001 via multi function display.

<<Method>>

1. Press "EJECT", "FF" and "REW" keys at the same time.
2. The counter of multi function display indicates microprocessor data approximately 1 minutes as shown in FigureT2.

<<Note>>

1. This mode can be entered even when Power off.
2. Also it can be displayed the data when connect jumper wire between TP6001 and TPGND. In this case the data is indicated still open the TPSErv. (Press "EJECT", "FF" and "REW" keys at the same time, increment service number)



A: SERVICE NUMBER	B: SERVICE DATA	
1	*0 (hex)	can not detect Take-up and Supply Photo
	*9 (hex)	detect Take-up Photo
	*U (hex)	detect Supply Photo
	*3 (hex)	detect Take-up and Supply Photo
2	02 (hex)	EJECT
	03 (hex)	CASSETTE IN
	04 (hex)	CASSETTE DOWN
	06 (hex)	STOP 1
	08 (hex)	STOP 2
	0U (hex)	PLAY
3	L* (hex)	STOP 1 → STOP 2
	4* (hex)	PLAY → CUE/REV
	3* (hex)	STOP 2 → PLAY
	2* (hex)	STOP 1 → FF/REW
	1* (hex)	During Unloading
5	1*** **** (bin)	capstan motor ON
	**** 1*** (bin)	capstan motor reverse direction
6	***1 **** (bin)	cylinder motor ON

C : SERVICE INFORMATION

- E0 : Normal
- E1 : Cylinder lock (STOP)
- E2 : Reel lock (STOP)
- E3 : Rev Motor lock
- E4 : Mechanism lock during unloading
- E5 : Mechanism lock during mode transfer to FF or REW
- E6 : Mechanism lock during front unloading (Cassette out)
- E9 : Serial data (IC6001 – IC7501) can not be transmitted.

Note:

1. "*" : No meaning
2. "hex" : hexadecimal digit
3. "bin" : binary digit

ex.

bin	hex
0000	0
0001	1
⋮	⋮
1010	U
1110	L

Figure T2

Precautions

Please read these precautions before you operate this VCR.

Cassette Compartment Door

When first unpacking the VCR, the cassette compartment door may be open partially. This is due to a safety device designed to protect the VCR from vibration during shipment; it is not a malfunction. After the AC Power Cord is connected to an AC outlet, the door returns to its original position.

Avoid Sudden Temperature Changes

If the VCR is suddenly moved from a cold to a warm place, moisture may form on the tape and inside the VCR. In such a case the Dew Indicator " " will flash on and off and the VCR will not operate.

Humidity and Dust

Avoid places with high humidity or a lot of dust. These can damage internal parts.

Avoid Covering Ventilation Holes

The ventilation holes prevent abnormal increased temperature in the VCR. Do not block or cover these holes. Especially avoid covering the holes with soft materials such as cloth or paper.

Keep away from High Temperature

Keep the VCR away from extreme direct heat such as direct sunlight, radiators, or in closed automobiles.

Keep Magnets away

Never bring a magnet or magnetized object near the VCR because it will adversely affect the performance of the VCR.

No Fingers or Other Objects Inside

Touching internal parts of the VCR is dangerous, and may cause serious VCR damage. Do not attempt to disassemble the VCR. There are no user-serviceable parts inside.

Keep Away from Water

Keep the VCR away from flower vases, tubs, sinks, etc. CAUTION: If liquids are spilled into the VCR, serious damage may occur. If you spill any liquid into the VCR, immediately disconnect the AC Power Cord and consult qualified service personnel.

Lightning

To avoid damage by lightning, disconnect the antenna plug from the VCR.

Keep VCR Clean

Wipe the VCR with a clean, dry cloth. Never use cleaning fluid, or other chemicals. Do not use compressed air to remove dust.

Stacking

Place the VCR in a horizontal position and do not place anything heavy on it.

Video Head Clogging

The video heads place picture signals on the tape during recording, and read picture signals from the tape during playback. Therefore they are of critical importance for the picture quality. To ensure that they can always provide optimum picture quality, this VCR is equipped with an Auto Head Cleaning Function that removes tape particles and dust from the video heads. However, if the VCR is used over extremely long periods of time, these heads may still become dirty and clogged. In such a case, the signals can no longer be recorded correctly, and the playback picture will be distorted accordingly. This is the case, for example, if during playback sound is reproduced normally, but no picture is seen, or the picture is greatly distorted. When such symptoms occur consult your dealer for further advice.

If Dew Condensation Forms in the VCR

Condensation may form in the VCR if:

- The VCR is in a room where the heater has just been turned on.
- The VCR is in a room with steam or high humidity.
- The VCR is brought from cold surroundings into a well-heated room.
- The VCR is suddenly brought from cool surroundings, such as an air-conditioned room or car, to a hot and humid place.

When dew forms in the VCR:

The Dew Indicator " " on the VCR Display will flash on and off all the function buttons are made non-operational to protect the tape and the video heads. When the Dew Indicator flashes, wait until this indicator disappears. If dew condensation forms inside the VCR while the power is off, it will turn on automatically and the Dew Indicator will flash on and off. As soon as the dew condensation has been dissolved, the VCR will turn itself off again.

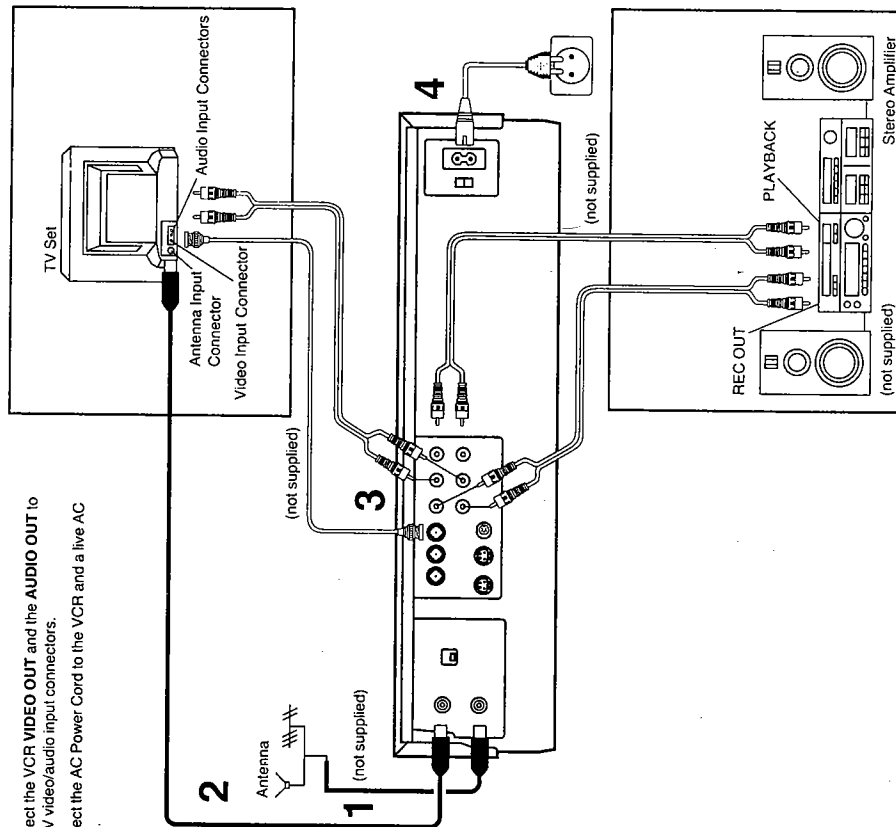
Connections

The following connections are required to operate the VCR for recording and playback through a TV set.

Procedure of connection to TV without S-Video Input

- 1 Unplug VHF/UHF antenna plug from the TV antenna input connector and plug it into the VCR VHF/UHF IN.
- 2 Connect the VCR VHF/UHF OUT to the TV antenna input connector with the Coaxial Cable supplied with the VCR.
- 3 Connect the VCR VIDEO OUT and the AUDIO OUT to the TV video/audio input connectors.
- 4 Connect the AC Power Cord to the VCR and a live AC outlet.

• Connection to a TV Set without an S-Video Input



• Connection to a Stereo Amplifier

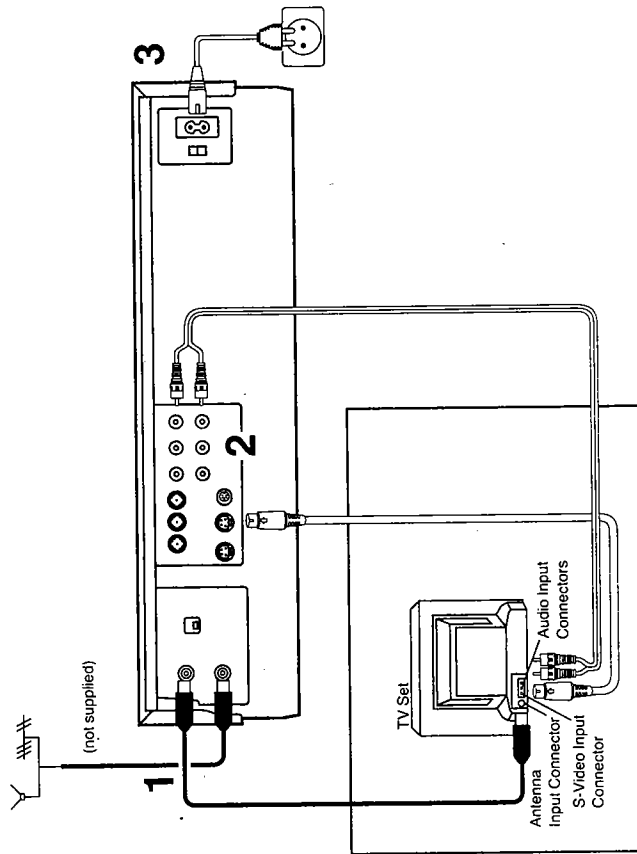
Procedure of connection to TV having S-Video Input

- 1 Execute steps 1 and 2 on page 5.
- 2 Connect the VCR S-VIDEO OUT and the AUDIO OUT to the TV S-Video and audio input connectors.
- 3 Connect the AC Power Cord to VCR and live AC outlet.

The S-VHS format used in this VCR enables you to obtain high resolution and high picture quality when high performance S-VHS video cassette tapes are used.

The conventional VCR video connectors output and input signals which are composed of the luminance signal (Y) and color signal (C) which are then recorded on the video tape. The new S (Separate)-Video Connector allows separate transmission of signals in order to obtain clearer pictures.

The connection with the S-Video Cable can also be used for playback of a tape that was recorded in the conventional VHS system. The "S" in the "S-Video Connector" stands for "SEPARATED Y/C", not for "S-VHS".



•Connection to a TV Set with S-Video Jack

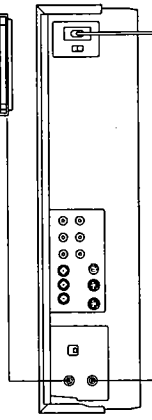
Cable Connection

Cable-VCR-TV (For CATV/PAY Channels Recording/Playback)

The VCR has an extended range, and can tune the Low-Band, Mid-Band, Super-Band, Hyper-Band, Ultra-Band and Special cable channels (Channels A-W, AA-FFF, A-5-A-1, 66-94, 5A). Also, the VCR can tune to any of the 56 UHF channels (14-69). Refer to Storing TV Channels on your VCR on page 10.

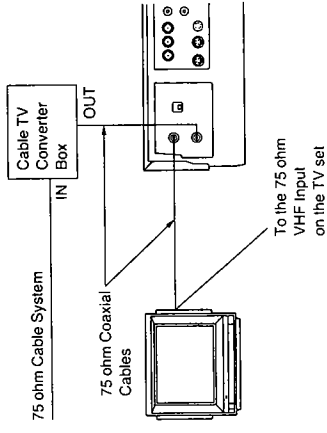
BASIC Hook-Up

Since the VCR can tune Mid and Super Bands, this connection will provide with the reception of all cable channels except those which are intentionally scrambled.

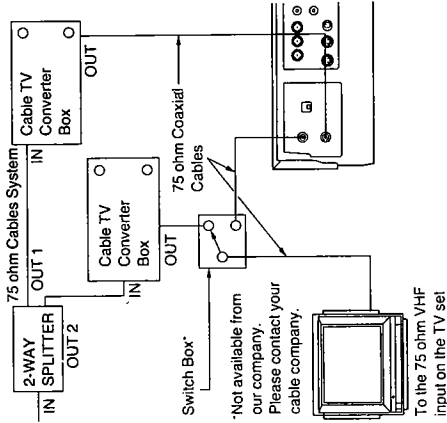


75 ohm coaxial cable Channels 2-13 and 5A, A-5-A-1, A-W, AA-FFF, 66-94 However, if you subscribe to a special channel which is scrambled—you will probably have a descrambler box for proper reception. The VCR by itself cannot properly receive a scrambled program since it does not contain a descrambler. In order for the VCR to properly receive a scrambled program, your existing descrambler must be used. There are two commonly used methods of connection in this case.

Typical Cable System Hook Ups with Cable Converter/Descrambler Boxes



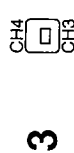
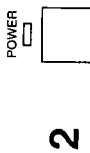
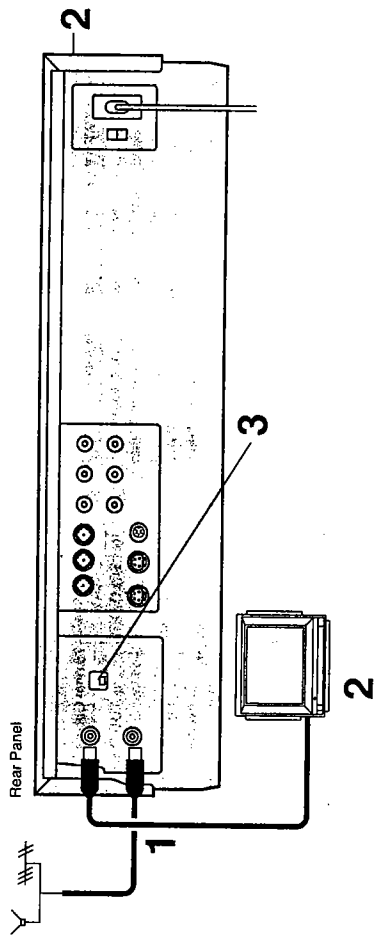
The above cable hook-up allows VCR-TV functions except for viewing one channel while recording another.



The above cable hook-up allows VCR functions, including viewing one channel while recording another, but it requires two cable TV Converter Boxes, one Switch Box and one 2-Way Splitter.

Since the VCR has an extended range of tuning, tuning-programming of non-scrambled Mid-Band and Super-Band TV programs is possible. When a cable converter or descrambler box is connected to the VCR, all timer-controlled recording functions will continue to operate with the exception of changing channels automatically. CATV Channel selection will have to be performed with the cable converter. Timer-controlled recording from CATV Channels is therefore limited to one channel at any given time.

Tuning the TV into your VCR



After connecting your VCR to a TV set, you are ready to set the RF converter. This will allow you to view tapes in playback and to use your TV as a monitor. Your VCR contains an RF converter which translates the video and audio signals in the VCR to a standard broadcast signal that your TV can receive.

The RF converter can transmit this signal on channel 3 or 4. To prevent any interference it is advisable that you select the channel that is not normally broadcast in your area.

Tuning procedure

1 Refer to pages 5 and 6 confirm that the VCR and TV have been connected correctly.

2 Turn on the VCR and TV.

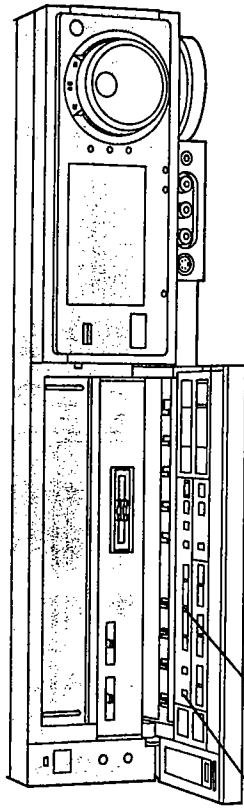
3 Set RF Converter Channel Selector (on the rear panel) to "CH3" or "CH4", whichever is not normally broadcast or the least viewed. This is to select a channel for video playback.

Channel Reception Check

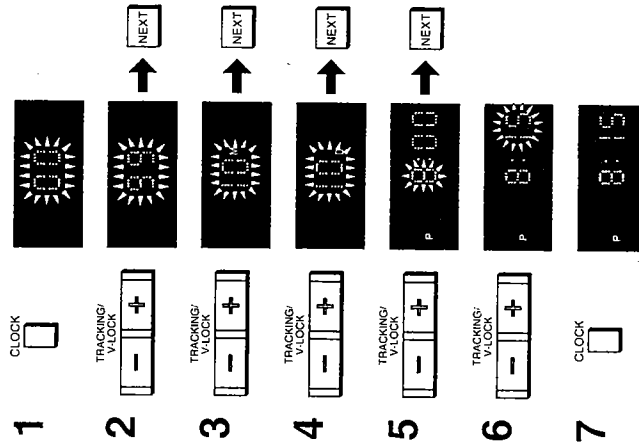
- 1 Set channel 3 or 4 on your TV (selected in step 3) in order to check a proper broadcast reception.
- 2 Press VCR/TV (on the front panel) to "VCR" to select the "VCR" operation mode.
 - The "VCR" indicator appears on the VCR Display.
- 3 Select channels on the VCR that you would normally receive clearly in your area to check proper reception.

Setting the Clock of the VCR

Tuning the TV into your VCR
Setting the Clock of the VCR



1, 7 2~6



The built-in digital clock employs the 12-hour system.

Preparation

Turn the VCR on.

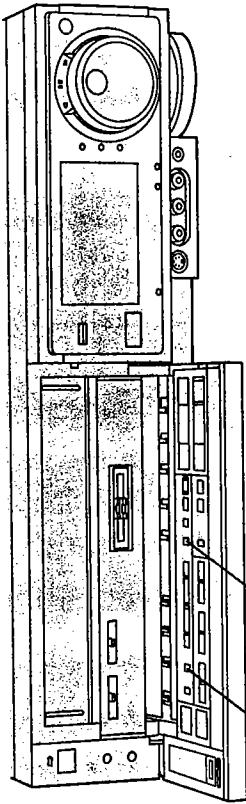
Setting procedure

- 1 Press **CLOCK** to start Clock Setting.
- 2 Press **TRACKING/V-LOCK** "-" or "+" to set the **YEAR**, then press **NEXT**.
- 3 Press **TRACKING/V-LOCK** "-" or "+" to set the **MONTH**, then press **NEXT**.
- 4 Press **TRACKING/V-LOCK** "-" or "+" to set the **DAY**, then press **NEXT**.
- 5 Press **TRACKING/V-LOCK** "-" or "+" to set the **HOURL**, then press **NEXT**.
- 6 Press **TRACKING/V-LOCK** "-" or "+" to set the **MINUTE**.
- 7 Press **CLOCK** to finish the setting.

Note:

In case of a power failure, the back-up system retains the present time memory for about 60 minutes.

Storing TV Channels on your VCR



Storing TV Channels on your VCR

Fine Tuning Procedure

- 1 Press **PRESET/FINE/NORMAL** twice.
- 2 Press **TRACKING/V-LOCK** "+", "-", or "—" to correct tuning.
 - "A" indicator does not appear.
 - To return the tuning to its former state, press **ANT SELECT**.
- 3 Press **PRESET/FINE/NORMAL**.

Blanking of unoccupied program positions

- 1 Press **PRESET/FINE/NORMAL**.
- 2 Press **✓** or **∧** (channel button) to select the program position that is not to be occupied with a TV station.
- 3 Press **ADD/DELETE**. ("—") appears on the Program Position Display.
 - Repeat steps 2 and 3 for all program positions which are not occupied by a TV station. Afterwards, these program positions can no longer be called up.
 - To cancel the blanked program position, select the corresponding program position on VCR and then press **ADD/DELETE**.
- 4 Press **PRESET/FINE/NORMAL** twice.

1



2



TV mode



CATV NORMAL mode



CATV HRC mode



CATV IRC mode



PX mode



3



Introduction

The VCR is fitted with its own tuner (just like a normal TV set) and can be preset to receive up to 155 TV broadcast stations.

Preparations

- Turn the TV on.
- Select Channel 3 or 4 on the TV for video playback.
- Set the VCR/TV to "VCR".

Direct Tuning

Your VCR is preset at factory. This means that all channels can be received at the program positions shown in the chart on the next page. This is achieved by selecting the desired Tuning mode.

- Blanking unwanted channels so that they will be skipped during the channel selection will allow you to find your desired channel quickly. Refer to the next page how to blank program positions.

Selecting the Tuning Mode

This VCR can select from among 5 tuning modes: TV, CATV, CATV H, CATV I and PX.

- 1 Press **PRESET/FINE/NORMAL**.
- 2 The tuning mode can be changed by pressing **ANT SELECT**.
- 3 Press **PRESET/FINE/NORMAL** twice to select the VCR normal operation mode.

CHANNEL CHART

• TV mode

CHANNEL DESIGNATIONS	CHANNEL RECEIVED OFF THE AIR	CHANNEL SELECTION & INDICATION ON VCR
VHF	2-13	2-13
UHF	14-69	14-69

• CATV modes (NOR, HRC, IRC)

CHANNEL DESIGNATIONS	CATV CHANNEL RECEIVED FROM CABLE	CHANNEL SELECTION & INDICATION ON VCR
BROADCAST VHF	2-13	2-13
CATV LOW BAND	A-5-A-1	95-99
CATV MID/SUPER BANDS	A-W	14-36
CATV HYPER BAND	AA-FFF	37-65
ULTRA BAND	66-94	66-94
SPECIAL CATV CHANNEL	5A (HRC, IRC only)	1 (HRC, IRC only)

• PX mode (AFN-TV in Europe)

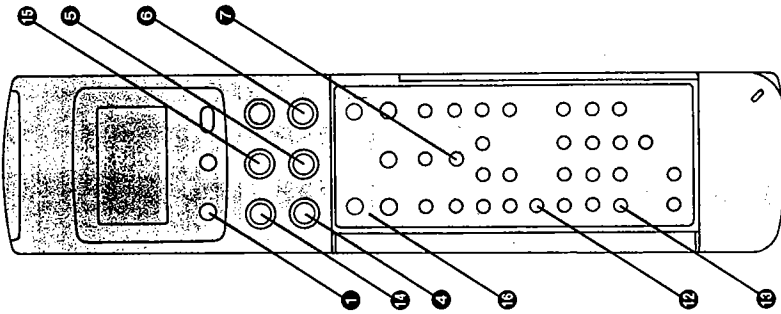
CHANNEL DESIGNATIONS	CHANNEL RECEIVED OFF THE AIR	CHANNEL SELECTION & INDICATION ON VCR
VHF (USA)	2-13	2-13
UHF (CCIR)	E21-E69	21-69

(NV-FS200PX ONLY)

(NV-FS200PX ONLY)

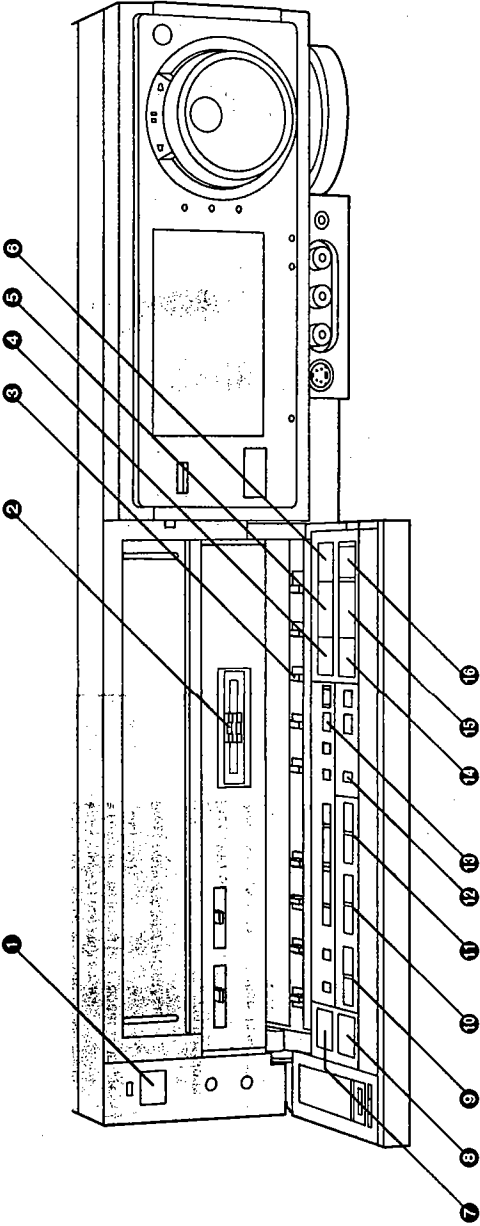
Controls, Indicators and Connectors

Controls, Indicators and Connectors

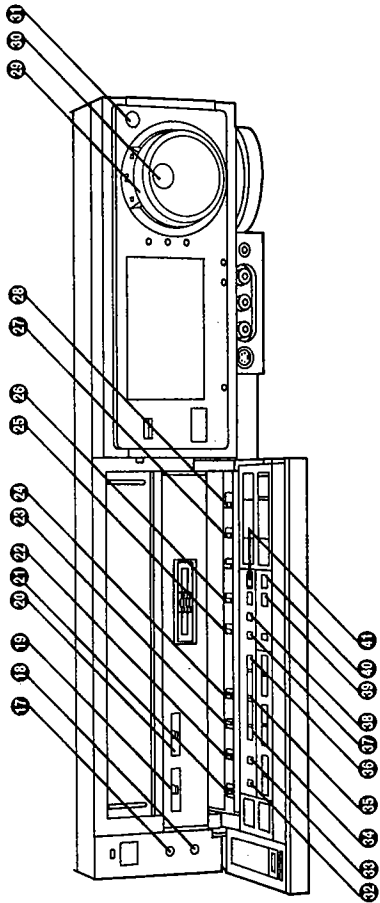


Basic Controls

- 1 POWER Button with Indicator**
Turns the VCR on and off.
Inserting a video cassette automatically turns the VCR on.
- 2 HI-FI REC LEVEL Control**
Adjusts the Hi-Fi recording level so that the peak reaches about +4 dB on the Audio Level Meter.
- 3 S-VHS Selector**
Selects the correct tape recording mode.
ON: S-VHS cassettes are recorded in the S-VHS System.
• The S-VHS indicator is lit.
OFF: S-VHS cassettes are recorded in the VHS system.
• The S-VHS indicator is not lit.

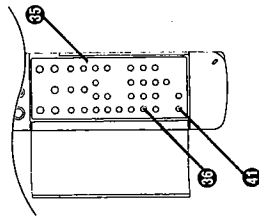


- 4 REW Button**
Used to rewind the tape rapidly. "◀◀" appears on the VCR Display.
When this button is held pressed during Normal playback or Rewind operation, the picture is played back at higher speed in reverse direction. (Review Playback)
If you tap this button during Normal Playback, Review Playback remains activated. Press PLAY to resume Normal Playback.
- 5 PLAY Button**
Starts normal playback. "▷" is lit on the VCR Display.
- 6 FF Button**
Used to advance the tape rapidly. "▶▶" appears on the VCR Display.
When this button is held pressed during Normal playback or Fast Forward operation, the picture is played back at higher speed in forward direction. (Cue Playback)
If you tap this button during Normal Playback, Cue Playback remains activated. Press PLAY to resume Normal Playback.
- 7 VCR/TV Button**
Selects "VCR" or "TV" operation mode.
- 8 EJECT Button**
Eject the cassette.
• If this button is pressed to eject a cassette loaded in the VCR when the power is turned off, the VCR is turned on for automatic ejection and, afterwards, turned off.
- 9 Channel V and A Buttons**
Selects the program positions (channels), the VCR can memorize TV stations in 99 program positions.
- 10 OTR ON + and - Buttons**
Used to set the OTR (One-touch Timer Recording) starting time.
- 11 OTR OFF + and - Buttons**
Used to set the OTR ending time.
- 12 AUDIO OUT Button**
Selects the audio track. Each time you press this button, the audio track changes as follows:
Hi-Fi stereo (L and R) → Hi-Fi mono left (L) → Hi-Fi mono right (R) → Normal (Hi-Fi Off) → Hi-Fi Stereo...
- 13 RECORDING SP/SLP Button**
Selects the recording tape speed.
"SP" for normal tape speed gives the best picture quality.
"SLP" for one-third tape speed gives the longest (3 times) normal recording time.
• The VCR selects the correct tape speed during playback.
- 14 PAUSE/STILL Button**
Used to interrupt recording temporarily (Recording Pause).
Pressing this button again resumes recording.
Used to view a still picture during playback "still" again resumes playback.
• The VCR automatically switches to the Stop mode to protect the tape and the video heads if Recording Pause or Still Playback continues for more than 5 minutes.
- 15 STOP Button**
Stops Recording or Playback.
- 16 REC Button**
Starts Recording. ("▷ REC" appears on the VCR Display.)
On the Remote Controller, you must press two buttons simultaneously.

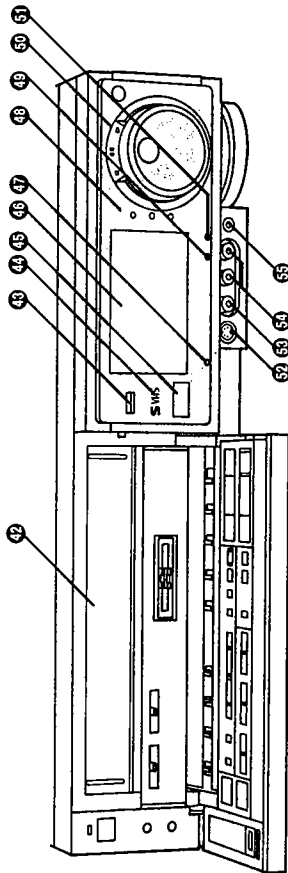


Additional Controls

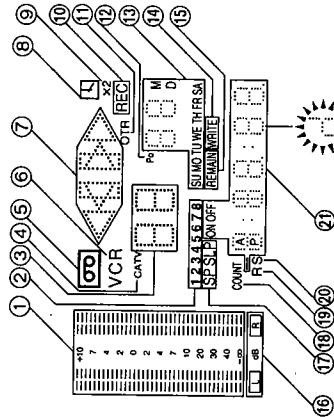
- 17 MIC Jack**
For connecting a microphone. If a microphone is connected, other audio inputs are automatically switched off.
- 18 PHONES Jack**
For connecting stereo headphones.
- 19 PHONES LEVEL Control**
Adjusts the volume of connected stereo headphones.
- 20 PICTURE Control**
Adjusts the picture sharpness during playback.
- 21 NOISE FILTER/EDIT Selector**
OFF: For normal VCR operation.
EDIT: For dubbing. (PICTURE Control is not operative.)
NOISE FILTER ON:
For playback of tapes whose picture quality is inferior, for example, from repeated dubbing.
• This position has no effect on the playback of S-VHS recordings.
- 22 TBC Switch (Time Base Corrector)**
When playing back a tape which is loose or damaged, or when the tape movement is unstable during recording or playback, the playback picture may shake from side to side and be distorted. You can improve the picture quality by setting TBC Switch to "ON". Normally, this switch must be set to "OFF".
• During playback of some pre-recorded tapes, the playback picture may shake vertically. If this occurs, set TBC Switch to "OFF".
• The TBC function works only during normal playback.
- 23 SEARCH SOUND Selector**
OFF: The sound is played back only during normal playback.
ON: The sound can also be heard during Cue playback and Review playback.
• No sound may be heard during playback of SLP recordings if VCR and TV have been connected each other with only coaxial cable.
- 24 HI-FINORMAL MIX Switch**
Audio signal is recorded on both the Hi-Fi and normal audio tracks.
OFF: Normal position for Hi-Fi audio playback.
ON: Both audio tracks are played back simultaneously. (For playback of tapes edited by Insert Editing or Audio Dubbing.)
- 25 INPUT SELECT Switch**
Used to select the corresponding connectors if you wish to perform recording through the external input connectors.
Select the program position "A1" or "A2" on Channel Display with **INPUT SELECT** on the Remote Controller.
S-VIDEO: For recording through the S-VIDEO IN and AUDIO IN.
LINE: For recording through the VIDEO IN and AUDIO IN.
- 26 TAPE SELECT Switch**
Set according to the cassette tape length in order to obtain correct indication of the remaining tape time.
-T120: For cassettes T30, T60, T90, T120
T140-T180: For cassettes T140, T160 and T180.
- 27 MONO Switch**
OFF: For normal recording.
ON: For recording normal sound during a stereo or Audio II broadcast. Select this position if the stereo sound is distorted due to poor reception.
- 28 MTS Switch**
For selecting the audio track to be recorded.
- 29 SHUTTLE Ring**
Used to adjust the playback speed step by step in both forward and reverse directions.
- 30 JOG Dial**
Used to locate any desired frame precisely.
- 31 JOG/SHUTTLE Button**
Switches to JOG and SHUTTLE operation.
• To resume Normal playback, press **PLAY** or this button again.
- 32 CLOCK Button**
For setting the date and time, and memorizing the setting.
- 33 PRESET/FINE/NORMAL Button**
For storing TV stations on the VCR.
- 34 PROG/CHECK Button**
For selecting the program number (up to 8) for limer recording and checking the limer programming.
- 35 TRACKING/V-LOCK + and - Buttons**
• Used to input data for clock setting and timer programming.
• For manual tracking adjustment: minimize color and noise bar distortions which cannot be eliminated by the automatic digital tracking control. After the manual adjustment, simultaneously press **TRACKING/V-LOCK +** and **-** Buttons to return to automatic digital tracking control.
If tapes recorded on another VCR are played back, manual tracking adjustment may be required to reproduce optimum Hi-Fi sound and picture quality.
- 36**
- 37**
- 38**
- 39**
- 40**
- 41**



- For slow tracking adjustment:
Used to minimize the noise bar distortions during Still, Still Advance or Slow playback. Put VCR in Slow playback to make this adjustment.
- For vertical locking adjustment:
Used to minimize vertical jitter during Still playback.
- 36 NEXT Button**
Used to memorize input data and to change to the next display segment. Each time you press this button, the flashing indication on Date Display changes in the order YEAR, MONTH, DAY, HOUR, MINUTE.
- 37 ANT SELECT Button**
Used to select the tuning mode.
- 38 ADD/DELETE Button**
Used to blank unoccupied program positions.
- 39 AUDIO DUB Button**
Used to make Audio Dubbing. (The Audio Dubbing Indicator is lit.)
- 40 INSERT Button**
Used for Insert Editing. (The Insert Editing Indicator is lit.)
- 41 TIMER REC Button**
Used to enter VCR Timer Recording; standby mode. When Timer Recording has been activated ("T") appears on the VCR Display, the VCR cannot be operated manually.
Press this button again to operate the VCR. Pressing this button if no Timer Recording data is programmed or no cassette is inserted, "T" flashes on and off to indicate that Timer Recording cannot be performed.

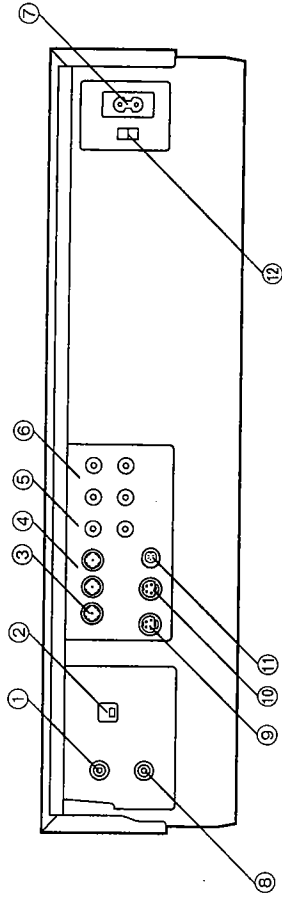


- 12 **Cassette Compartment**
- 13 **PUSH-OPEN**
Open the control panel.
- 14 **S-VHS Indicator**
- 15 **Infrared Remote Control Receiver Window**
Receives signals from the Remote Controller.
- 16 **Multi-Function Display**



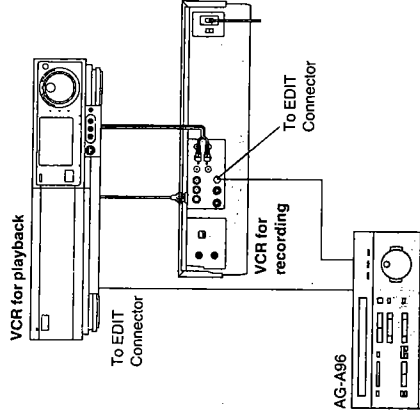
- 1 **Audio Level Meter**
- 2 **Timer Program Number**
- 3 **Channel Display**
- 4 **Cable TV Indicator**
- 5 **Cassette-in Indicator**
- 6 **VCR Mode Indicator**
- 7 **Tape Running Indicator**
- 8 **Timer Recording Indicator**
- 9 **Double Speed Indicator (NV-FS200PX ONLY)**
- 10 **Recording Indicator**
- 11 **OTR Mode Indicator**

When dew forms:
Dew Indicator



- 1 **VHF/UHF OUT Connector**
For connecting to a TV antenna connector.
- 2 **CH3/CH4 Switch**
Used to select the RF Converter Channel (CH3 or CH4).
- 3 **VIDEO IN Connector (AV1)**
For connecting to another VCR or to a signal source equipped with a video output connector.
- 4 **VIDEO OUT Connector**
For connecting to another VCR or to a TV equipped with a video input connector.
- 5 **AUDIO IN Connector (AV1)**
For connecting the audio cables of a stereo audio system.
- 6 **AUDIO OUT Connectors**
For connecting the audio cables to a stereo audio system or to a TV equipped with audio input connectors.
- 7 **AC IN--**
- 8 **VHF/UHF IN Connector**
For connecting an external antenna.
- 9 **S-VIDEO IN Connector (AV1)**
For connecting to another VCR or to a signal source equipped with an S-Video output connector.
- 10 **S-VIDEO OUT Connector**
For connecting to another VCR or to a TV equipped with an S-Video input connector.
- 11 **EDIT Connector**
By connecting the optional Editing Controller AG-A96 to this connector, editing functions can be performed more quickly and efficiently between two VCRs or between a VCR and a camera recorder.
- 12 **Voltage Selector (NV-FS200PX ONLY)**
Use a screwdriver to set this selector to the voltage range that covers the AC power voltage of the country in which this VCR is to be used.

The use of the Editing Controller AG-A96 (optional) gives you control over both the playback and the recording VCRs directly from this controller, to let you perform such editing functions as Assemble Editing, Insert Editing and Audio Dubbing more quickly and efficiently.



Carefully read the operating instructions for the AG-A96.

Caution:

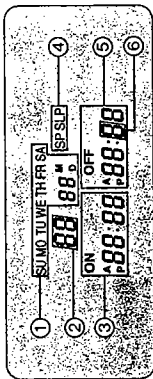
When using the AG-A96, switch the AG-A96 to the standard speed mode. Do this by pressing the EDIT STOP button and PLAYER button simultaneously.

Infrared Remote Controller (NV-FS200PX)

Infrared Remote Controller

- 1 **CLOCK/COUNTER Button**
Changes the indication on the VCR Display from CLOCK time to COUNTER (tape running time) and vice versa. If the character-forming segments for seconds are circulating on COUNTER Display, this indicates that there is nothing recorded on the tape being moved.
- 2 **MONITOR Button**
Keep this button depressed during playback to watch TV broadcast.
- 3 **INDEX Buttons**
For Index Search function.
- 4 **REPEAT Button**
For Repeat Playback.
- 5 **ZERO STOP Button**
For Zero Stop function.
- 6 **PROG Button**
For programming Timer Recording.
- 7 **CANCEL Button**
For cancelling a timer programming.
- 8 **Infrared Transmitter**
The data (signals) from the Remote Controller are transmitted from here to the VCR.
- 9 **Display for Bar Code Reader and Remote Controller**

- 12 **STILL ADV Button**
For Still Picture Advance playback. Each time you press this button during Still playback, the still picture is advanced by one field.
- 13 **SEARCH, +, and - Buttons**
Press SEARCH Button to switch to Still playback. Pressing "+, -" Button once starts Slow playback at 1/30th of normal playback speed. Each time you press the "+, -" Button, playback speed in forward direction is increased. "SEARCH" Button is to select the playback speed in reverse direction. The "+, -" and "SEARCH" have the same function as that of SHUTTLE Ring.
- 14 **TAPE REMAIN Button**
Changes the indicator of the VCR Display from tape running time (COUNTER) to remaining tape time, or vice versa. "REMAIN" appears on the VCR Display during remaining tape time display mode.
- 15 **RESET Button**
Resets the Tape Counter (tape running time) to "0:00.00".
• The Tape Counter is automatically reset to "0:00.00" when a cassette is inserted.
- 16 **INPUT SELECT Button**
Selects external recording source connected to video/audio input connectors. "A1" or "A2" appears on the VCR Display.
A1: Recording through S-VIDEO IN or VIDEO IN and AUDIO IN Connectors on Rear Panel.
A2: Recording through S-VIDEO IN or VIDEO IN and AUDIO IN Connectors on Front Panel.
- 17 **TIME SEARCH Button**
For Time Search function.
- 18 **Numeric Buttons 1-0**
• For selecting the program positions (channels)
• For Time Search function
• For programming of Timer Recording
- 19 **Bar Code Reading Tip**
After the Bar Code Reader is turned on, the tip is lit.



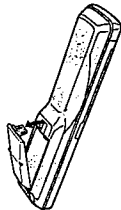
- 1 Date Indicator
- 2 Channel Display
- 3 Start Time Display
- 4 Tape Speed Indicator
- 5 End Time Display
- 6 Check Indicator
- 10 **SCANNER ON/OFF Button**
Used to turn the Bar Code Recorder on and off.
- 11 **TRANSMIT Button**
Used to transmit the data or signal from the Remote Controller to the VCR.

Power source for the Remote Controller
Infrared Remote Controller is powered by 2 ANSI "AA" size batteries. Replace the batteries with new ones about every year. However, battery life depends on the frequency of use or the selected operation mode.

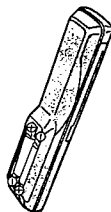
- Precautions for battery replacement**
- Load new batteries with their polarities (+ and -) aligned correctly.
 - Do not mix new and old batteries and never use an alkaline battery with a manganese battery.
 - Do not apply heat to the batteries, or an internal short-circuit may occur.
 - Remove batteries and store them in a cool and dry place when Remote Controller is not in use for long periods of time.
 - Remove spent batteries immediately and dispose of them.

Loading the batteries

- 1 Remove Battery Compartment Lid.

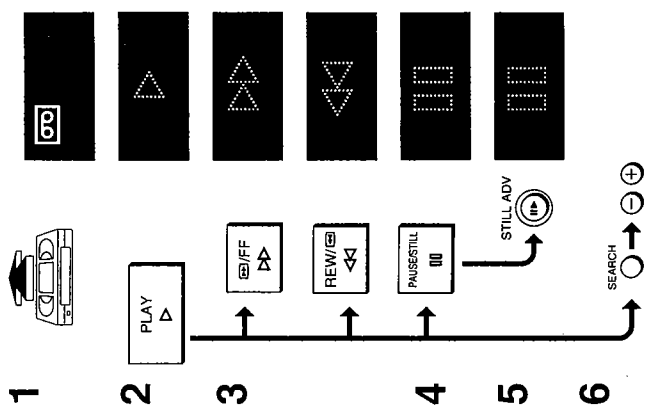
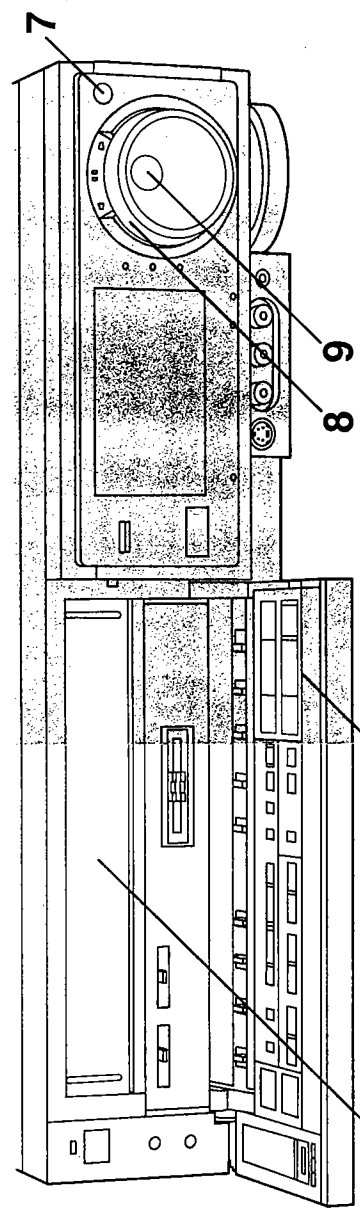
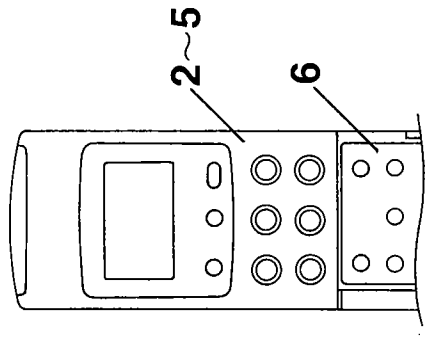


- 2 Insert the batteries, aligning their polarities as indicated inside Battery Compartment.



- 3 Replace the lid.

Playback (NV-FS200PX)



Introduction
The following playback can be performed with the Remote Controller or with the appropriate operation buttons on the VCR.

- Normal playback
- Cue/Review playback
- Still playback
- Still Advance playback*
- Search playback*
- Repeat playback*
- Shuttle operation to change the playback speed in small steps between Still and Cue/Review playback.
- Jog operation to locate the desired picture exactly.

*Operative only with the Remote Controller.

The playback picture appears promptly on the TV from the Stop mode because the VCR head cylinder remains rotating for about 20 minutes even in the Stop mode.

Preparation
Turn the TV on and select channel 3 or 4 for video playback on the TV.

Playback procedure
1 Insert a recorded cassette.
If a cassette has been inside the VCR, press **POWER** to turn VCR on.

Normal playback
2 Press **PLAY** to start Normal playback.

Cue/Review playback
3 Keep **FF** or **REW** pressed to perform Cue or Review playback at a higher speed in forward or backward direction.
• This is convenient to search for a specific scene during Normal playback.
If you tap **FF** or **REW**, Cue or Review playback remains activated. Press **PLAY** to resume normal playback.

Still playback
4 Press **PAUSE/STILL** to view the still picture during Normal playback.
Press **PLAY** or **PAUSE/STILL** to resume normal playback.

Still Advance playback
5 Press **STILL ADV** on Remote Controller during Still playback to advance the still picture by one frame.

Search playback
6 Press **SEARCH** on Remote Controller to switch to Still playback. "++" selects the playback speed in forward direction and "--" selects the playback speed in backward direction. These buttons have the same function as that of **SHUTTLE RING**.
Press **PLAY** to resume normal playback.

Jog/Shuttle playback
7 Press **JOG/SHUTTLE**. Still playback starts.
8 Rotate **Shuttle Ring** to select the desired playback speed in forward and backward directions.
9 Rotate **Jog Dial** to locate the desired picture precisely.

Options

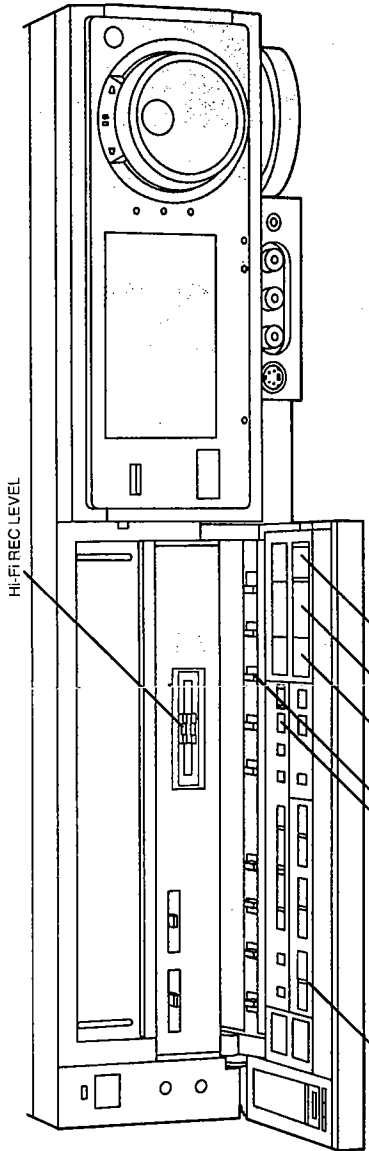
- If you press **TAPE REMAIN** on the Remote Controller, the approximate remaining tape time is indicated in hours and minutes. For correct Remaining Tape Time indication, set **TAPE SELECT** on the VCR according to the cassette type:
 - T120: For cassettes T30, T60, T90 and T120
 - T140-T180: For cassettes T140, T160 and T180
- To listen to the sound during Cue playback and Review playback, set **SEARCH SOUND** on the VCR to "ON".
- If the picture shakes from side to side or is distorted during playback because it was recorded on another VCR, you can improve the picture quality. Set **TBC** on VCR to "ON". Normally, this switch must be set to "OFF".
- Press **REPEAT** on Remote Controller to perform Repeat playback from the beginning of the tape to the end of the recording (recording pause lasting for more than 5 seconds).

Notes:

- Cue/Review playback for more than 10 minutes switches the VCR to normal playback.
- Still or Slow playback for more than 5 minutes switches the VCR to Stop mode.
- Cue or Review playback picture can contain horizontal noise bars or distortions. However this does not indicate a malfunction.
- In the playback of the LP recording:
 1. In the special playback functions except normal playback, the picture may contain horizontal noise bars, distortions, unstable colors, or can be in black-and-white.
 2. A tape recorded on another VCR may need Tracking Control adjustment; picture may still be inferior owing to formal limitations.

On-the-spot Recording (NV-FS200PX)

On-the-spot Recording



1 3 5 6 4

Introduction

You can record a TV broadcast without turning on the TV by using the Infrared Remote Controller or by using the appropriate buttons on the VCR. You can also watch a TV broadcast on the TV while recording another TV broadcast.

Preparations

- Insert a cassette with an erasure prevention tab. (If a cassette has been inside VCR, press POWER to turn VCR on.)
- Press VCR/TV to display "VCR" on the VCR Display.

Recording procedure

- 1 Select the desired tape speed "SP" or "SLP" with RECORDING SP/SLP.
- 2 Select the desired channel to be recorded by pressing ∇ or \blacktriangle on the VCR.

• If you wish to confirm proper reception, turn TV on and select channel 3 or 4 (for video playback channel) on TV.

How to select the channel on Remote Controller

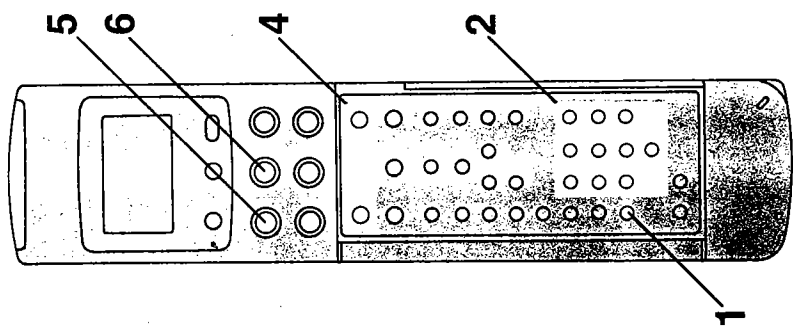
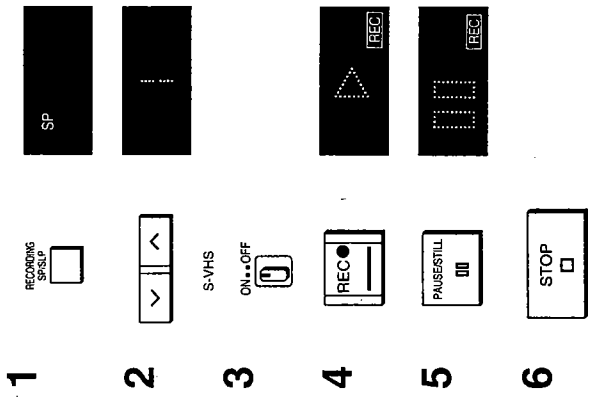
To select a channel between 1 and 9, first press "0". Button, and then the desired channel number. To select a 2-digit channel, press the two corresponding numeric buttons one after the other. The second button must be pressed within 5 seconds of the first button.

- 3 Set S-VHS to "ON" or "OFF".

ON: S-VHS tape is recorded in S-VHS format; VHS tape in VHS format.
OFF: for VHS format on S-VHS tape

- 4 Press REC to start Recording.

• When a video cassette without an erasure prevention tab is inserted, "REC" blinks and an alarm sounds indicating that recording is not possible.



- 5 To interrupt recording temporarily, press PAUSE/STILL. Press this button again to continue recording.
 - A recording pause for more than 5 minutes switches the VCR to Stop mode to protect the tape and the video heads.
- 6 Press STOP to stop recording.

Watching any other TV broadcast while recording

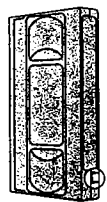
- 1 Set VCR/TV to "TV" during recording.
- 2 Select the desired channel on TV.

Hi-Fi Audio Recording Level Adjustment

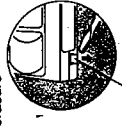
Normally set HI-FI REC LEVEL in the middle "5" position (click stop). Recommended peaks in audio level are +4 dB. When using the VCR as a Hi-Fi Audio Recorder or when producing your own tapes, it may be desirable to adjust HI-FI REC LEVEL to some other position.

- Sound on normal track is adjusted automatically.

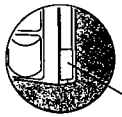
Erasure Prevention Tab



To prevent accidental erasure

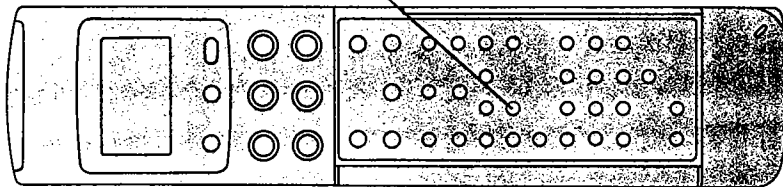


Break off the tab with a screwdriver.



Cover the hole with adhesive tape.

Automatic Features (NV-FS200PX)



Introduction

This VCR has the following automatic functions:

ZERO STOP
Winds the tape rapidly in forward or backward direction (Fast forward or Rewind) and stops the tape at the counter position "0:00.00".

Auto power on
Inserting a cassette turns the VCR on.

Auto playback
Inserting a cassette without an erasure prevention tab starts Playback.

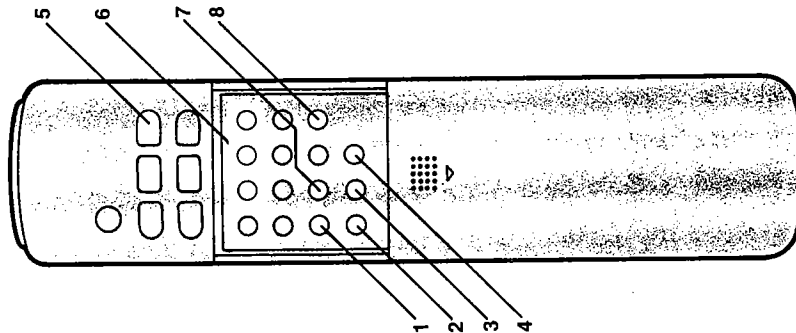
Auto rewind
Fully rewind the tape when the tape reaches its end during Playback and Recording (except OTR and Timer Recording).

Auto power off eject
Ejects a cassette when the VCR is OFF by pressing EJECT only (the VCR turns OFF after ejecting the cassette).

Auto head cleaning
Removes tape particles and dust from the video heads so that the heads always provide optimum picture quality. While this function is working, some mechanical noise can be heard from the VCR; this does not indicate a malfunction.

Infrared Remote Controller (AG-1970P)

Infrared Remote Controller



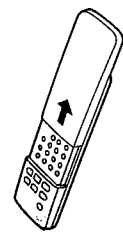
Power source for the Remote Controller
 Infrared Remote Controller is powered by 2 ANSI "AA" size batteries. Replace the batteries with new ones about every year. However, battery life depends on the frequency of use or the selected operation mode.

Precautions for battery replacement

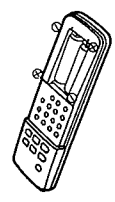
- Load new batteries with their polarities (+ and -) aligned correctly.
- Do not mix new and old batteries and never use an alkaline battery with a manganese battery.
- Do not apply heat to the batteries, or an internal short-circuit may occur.
- Remove batteries and store them in a cool and dry place when Remote Controller is not in use for long periods of time.
- Remove spent batteries immediately and dispose of them.

Loading the batteries

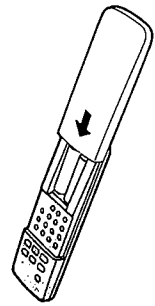
- 1 Remove Battery Compartment Lid.



- 2 Insert the batteries, aligning their polarities as indicated inside Battery Compartment.

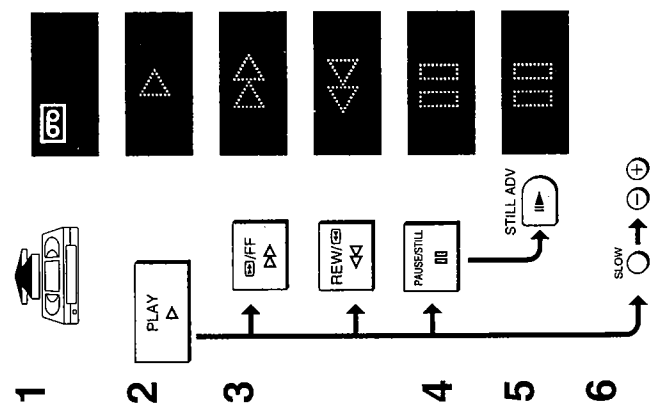
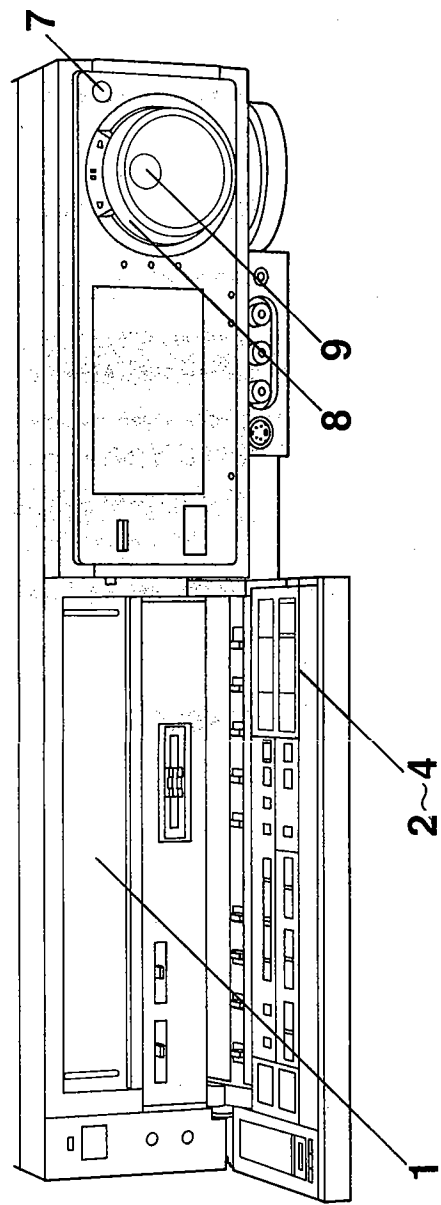
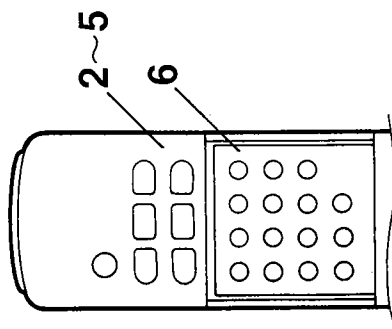


- 3 Replace the lid.



- 1 INPUT SELECT Button**
 Selects external recording source connected to video/audio input connectors. "A1" or "A2" appears on the VCR Display.
 A1: Recording through S-VIDEO IN or VIDEO IN and AUDIO IN Connectors on Rear Panel.
 A2: Recording through S-VIDEO IN or VIDEO IN and AUDIO IN Connectors on Front Panel.
- 2 CLOCK/COUNTER Button**
 Changes the indication on the VCR Display from CLOCK time to COUNTER (tape running time) and vice versa. If the character-forming segments for seconds are circulating on COUNTER Display, this indicates that there is nothing recorded on the tape being moved.
- 3 TAPE REMAIN Button**
 Changes the indication of the VCR Display from tape running time (COUNTER) to remaining tape time, or vice versa. "REMAIN" appears on the VCR Display during remaining tape time display mode.
- 4 RESET Button**
 Resets the Tape Counter (tape running time) to "0:00.00".
 • The Tape Counter is automatically reset to "0:00.00" when a cassette is inserted.
- 5 STILL ADV Button**
 For Still Picture Advance playback. Each time you press this button during Still playback, the still picture is advanced by one field.
- 6 SLOW Buttons**
 For Slow Motion playback. Press SLOW Button during normal playback. The slow-motion speed can be varied with "+", "-", "S", "R" Buttons.
- 7 MEMORY PLAY Button**
 If you press this button in Stop mode, the tape winds forward or backward and normal playback starts at the tape counter position "0:00.00".
- 8 MONITOR Button**
 Keep this button depressed during playback to watch TV broadcast.

Playback (AG-1970P)



Introduction

The following playback can be performed with the Remote Controller or with the appropriate operation buttons on the VCR.

- Normal playback
- Cue/Review playback
- Still playback
- Still Advance playback*
- Slow playback*
- Shuttle operation to change the playback speed in small steps between Still and Cue/Review playback.
- Jog operation to locate the desired picture exactly.
- *Operative only with the Remote Controller.

The playback picture appears promptly on the TV from the Stop mode because the VCR head cylinder remains rotating for about 20 minutes even in the Stop mode.

Preparation

Turn the TV on and select channel 3 or 4 for video playback on the TV.

Playback procedure

1 Insert a recorded cassette.
 * If a cassette has been inside the VCR, press **POWER** to turn VCR on.

Normal playback

2. Press **PLAY** to start Normal playback.

Cue/Review playback

3. Keep **FF** or **REW** pressed to perform Cue or Review playback at a higher speed in forward or backward direction.

- This is convenient to search for a specific scene during Normal playback.
- If you tap **FF** or **REW**, Cue or Review playback remains activated. Press **PLAY** to resume normal playback.

Still playback

4. Press **PAUSE/STILL** to view the still picture during Normal playback.
 Press **PLAY** or **PAUSE/STILL** to resume normal playback.

Still Advance playback

5. Press **STILL ADV** on Remote Controller during Still playback to advance the still picture by one frame.

Slow playback

6. Press **SLOW** on the Remote Controller to view the slow-motion picture. The tape speed of Slow playback can be adjusted with "+", "0", or "-".
 Press **PLAY** to resume normal playback.

Jog/Shuttle playback

7. Press **JOG/SHUTTLE**. Still playback starts.
 8. Rotate Shuttle Ring to select the desired playback speed in forward and backward directions.
 9. Rotate Jog Dial to locate the desired picture precisely.

Options

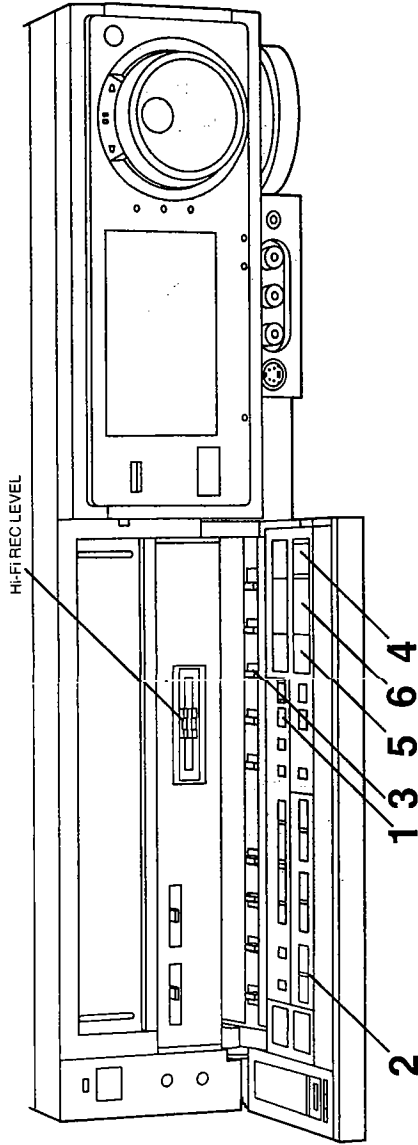
- If you press **TAPE REMAIN** on the Remote Controller, the approximate remaining tape time is indicated in hours and minutes. For correct Remaining Tape Time indication, set **TAPE SELECT** on the VCR according to the cassette type:
 - T120: For cassettes T30, T60, T90 and T120
 - T140-T180: For cassettes T140, T160 and T180
- To listen to the sound during Cue playback and Review playback, set **SEARCH SOUND** on the VCR to "ON".
- If the picture shakes from side to side or is distorted during playback because it was recorded on another VCR, you can improve the picture quality. Set **TBC** on VCR to "ON". Normally, this switch must be set to "OFF".

Notes:

- Cue/Review playback for more than 10 minutes switches the VCR to normal playback.
- Still or Slow playback for more than 5 minutes switches the VCR to normal playback.
- Cue or Review playback picture can contain horizontal noise bars or distortions. However this does not indicate a malfunction.
- In the playback of the LP recording:
 1. In the special playback functions except normal playback, the picture may contain horizontal noise bars, distortions, unstable colors, or can be in black-and-white.
 2. A tape recorded on another VCR may need Tracking Control adjustment; picture may still be inferior owing to format limitations.

On-the-spot Recording (AG-1970P)

On-the-spot Recording



HI-FI REC LEVEL

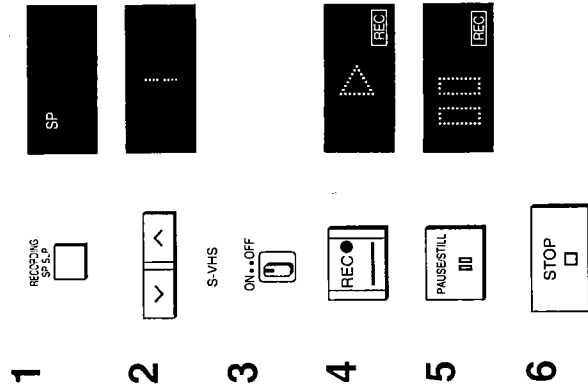
Introduction
 You can record a TV broadcast without turning on the TV by using the Infrared Remote Controller or by using the appropriate buttons on the VCR. You can also watch a TV broadcast on the TV while recording another TV broadcast.

Preparations

- Insert a cassette with an erasure prevention tab (if a cassette has been inside VCR, press **POWER** to turn VCR on.)
- Press **VCR/TV** to display "VCR" on the VCR Display.

Recording procedure

- 1 Select the desired tape speed "SP" or "SLP" with **RECORDING SP/SLP**.
- 2 Select the desired channel to be recorded by pressing **Y** or **▲** on the VCR.
 - If you wish to confirm proper reception, turn TV on and select channel 3 or 4 (for video playback channel) on TV.
- 3 Set **S-VHS** to "ON" or "OFF":
 - ON: S-VHS tape is recorded in S-VHS format; VHS tape in VHS format.
 - OFF: for VHS format on S-VHS tape
- 4 Press **REC** to start Recording.
 - When a video cassette without an erasure prevention tab is inserted, "REC" blinks and an alarm sounds indicating that recording is not possible.
- 5 To interrupt recording temporarily, press **PAUSE/STILL**. Press this button again to continue recording.
 - A recording pause for more than 5 minutes switches the VCR to Stop mode to protect the tape and the video heads.
- 6 Press **STOP** to stop recording.



Watching any other TV broadcast while recording

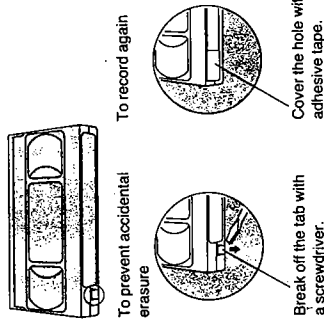
- 1 Set **VCR/TV** to "TV" during recording.
- 2 Select the desired channel on TV.

Hi-Fi Audio Recording Level Adjustment

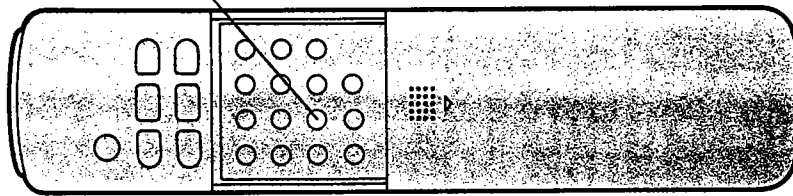
Normally set **HI-FI REC LEVEL** in the middle "5" position (click stop). Recommended peaks in audio level are +4 dB. When using the VCR as a Hi-Fi Audio Recorder or when producing your own tapes, it may be desirable to adjust **HI-FI REC LEVEL** to some other position.

- Sound on normal track is adjusted automatically.

Erasure Prevention Tab



Automatic Features (AG-1970P)



Introduction
This VCR has the following automatic functions:

Memory playback
If you wish to start playback at the counter position "0:00.00", press **MEMORY PLAY** on Remote Controller in Stop mode. The tape winds to "0:00.00" and normal playback starts.

Auto power on
Inserting a cassette turns the VCR on.

Auto playback
Inserting a cassette without an erasure prevention tab starts Playback.

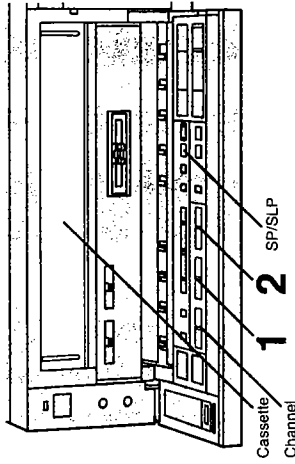
Auto rewind
Fully rewind the tape when the tape reaches its end during Playback and Recording (except OTR and Timer Recording).

Auto power off eject
Ejects a cassette when the VCR is OFF by pressing **EJECT** only (the VCR turns OFF after ejecting the cassette).

Auto head cleaning
Removes tape particles and dust from the video heads so that the heads always provide optimum picture quality. While this function is working, some mechanical noise can be heard from the VCR; this does not indicate a malfunction.

One-Touch Timer Recording (OTR)

Automatic Features
One-Touch Timer Recording (OTR)



Introduction
OTR is for immediately setting the VCR to record a TV broadcast starting within the next 24 hours.

Preparation

- Insert a cassette with an erasure prevention tab. (If it has already been inserted, press **POWER** to turn VCR on.)
- Select the desired tape speed "SP" or "SLP" with **RECORDING SP/SLP**.
- Select the desired channel to be recorded by pressing **V** or **^** on VCR.

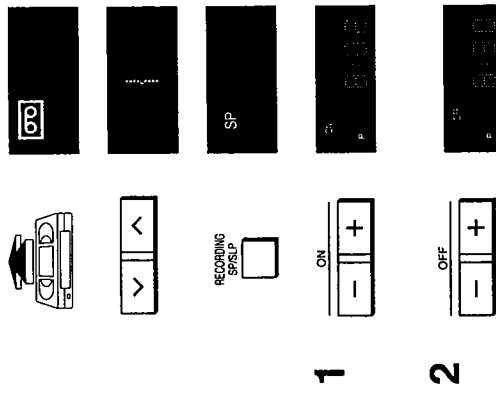
OTR procedure
Each time you tap **OTR ON +/-** or **OTR OFF +/-** Button, the time indication changes in 1-minute increments. Keeping it depressed changes the time indication in 10-minute increments.

- 1 Set OTR starting time by pressing **ON +** or **-**.
If you want to start OTR recording immediately, disregard this step.
 - When a cassette without an erasure prevention tab is inserted, "OTR" blinks and an alarm sounds indicating that recording is not possible.
- 2 Set OTR ending time by pressing **OFF +** or **-**.
 - If the OTR starting time is set, **OFF +** or **-** Button must be pressed within 8 seconds to select the OTR ending time, otherwise the starting time will be canceled.

After 4 seconds, the display will automatically change back to the starting time indication.
The VCR will automatically switch off, when the OTR is completed. To turn the VCR on, press **POWER**.

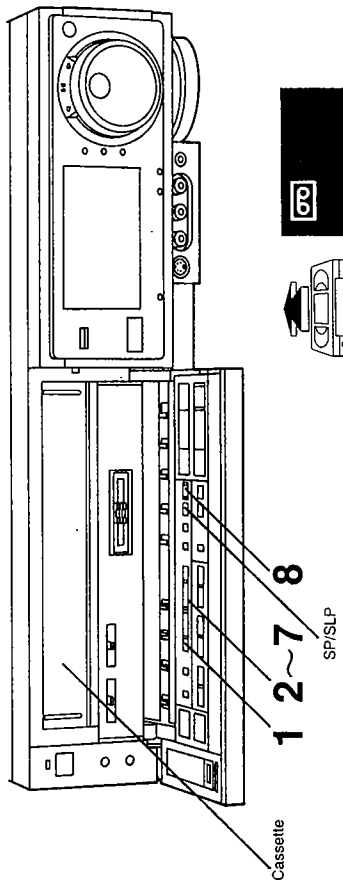
- Notes:**
- To interrupt an OTR, press **POWER**.
 - It is possible to change the OTR starting time or ending time before the recording starts.
 - It is possible to change the OTR ending time even during the recording.
 - Be sure that the OTR function does not overlap with a programmed timer recording. An OTR always takes precedence over an timer recording.
- To confirm the OTR ending time before the recording starts**
Press **PROG/CHECK** once.
If pressed twice, the present time is displayed again.
Press **PROG/CHECK** to confirm the present time during recording.

For example:
OTR recording of TV Station 1 from 8:02 pm to 8:30 pm.



Timer Recording

Timer Recording



Introduction

You can program the VCR so that it automatically records up to 8 TV broadcasts with the period of one month. You can also program Timer Recording of daily and weekly broadcasts at the same time.

For daily recording, there are three categories to choose from.

- (1) from Monday to Friday, (2) from Monday to Saturday, (3) from Sunday to Saturday

For Example:

Timer programming for a TV program to be broadcast on Wednesday, October 27, from 8:02 pm to 9:30 pm, on program position (channel) 1, on timer program number 1. (Present date = October 10, 1999)

Preparations

- Insert a cassette with an erasure prevention tab. (If it has already been inserted, press **POWER** to turn VCR the on.)
- Select the desired tape speed "SP" or "SLP" with **RECORDING SP/SLP**.

Timer Recording procedure

- 1 Press **PROG/CHECK** to start programming.
 - Timer program number "1" appears. (Each time this button is pressed, the timer program number is changed.)
- 2 Press **TRACKING/V-LOCK +/-** to select the desired TV station and then **NEXT** to memorize input data and change to the next display segment.
- 3 Press **TRACKING/V-LOCK +/-** to set the starting date of timer recording and then **NEXT**.
 - For daily recording, press **TRACKING/V-LOCK -** until the desired daily recording type.
 - For weekly recording, press **TRACKING/V-LOCK -** until the desired indication for the day of the week appears.
- 4 Press **TRACKING/V-LOCK +/-** to set the start time (hour), then **NEXT**.
- 5 Press **TRACKING/V-LOCK +/-** to set the start time (minute), then **NEXT**.
- 6 Press **TRACKING/V-LOCK +/-** to set the end time (hour), then **NEXT**.
- 7 Press **TRACKING/V-LOCK +/-** to set the end time (minute). No need to press **NEXT**.
 - Repeat steps 1 to 7 to program several timer recordings successively.
- 8 Press **TIMER REC** to activate Timer Recording.
 - "TG" appears on the VCR Display and the VCR cannot be operated manually.
 - If you want to operate the VCR, press **TIMER REC** to switch off "TG". To reactivate the timer, press this button again.

Confirming timer programming

Press **PROG/CHECK** to select the timer program number to be checked. The channel, date, starting and ending time are displayed for about 12 seconds.

Cancelling timer programming

- 1 Press **TIMER REC** to deactivate Timer Recording. (Be sure that "TG" disappears.)
- 2 Press **PROG/CHECK** to select the timer program number to be canceled.
- 3 Press **TRACKING/V-LOCK +/-** simultaneously for more than 3 seconds.

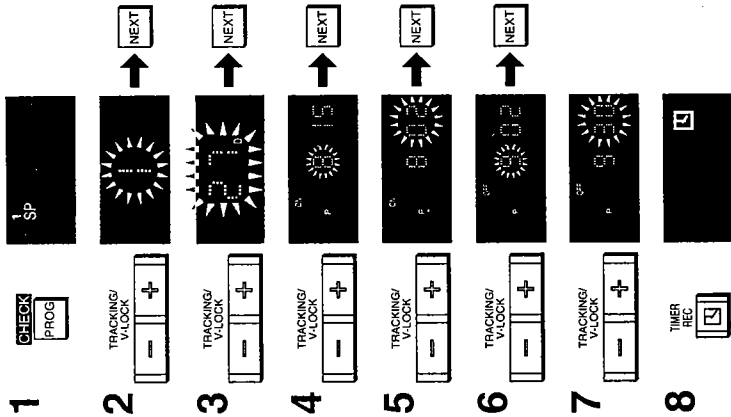
Note:

If a timer recording is interrupted or canceled, the programmed recording data is memorized until 4:00 am two days later. However, if another timer recording or OTR is activated or performed at 4:00 am two days later, the recording data will be maintained until 4 am on the following day.

Note:

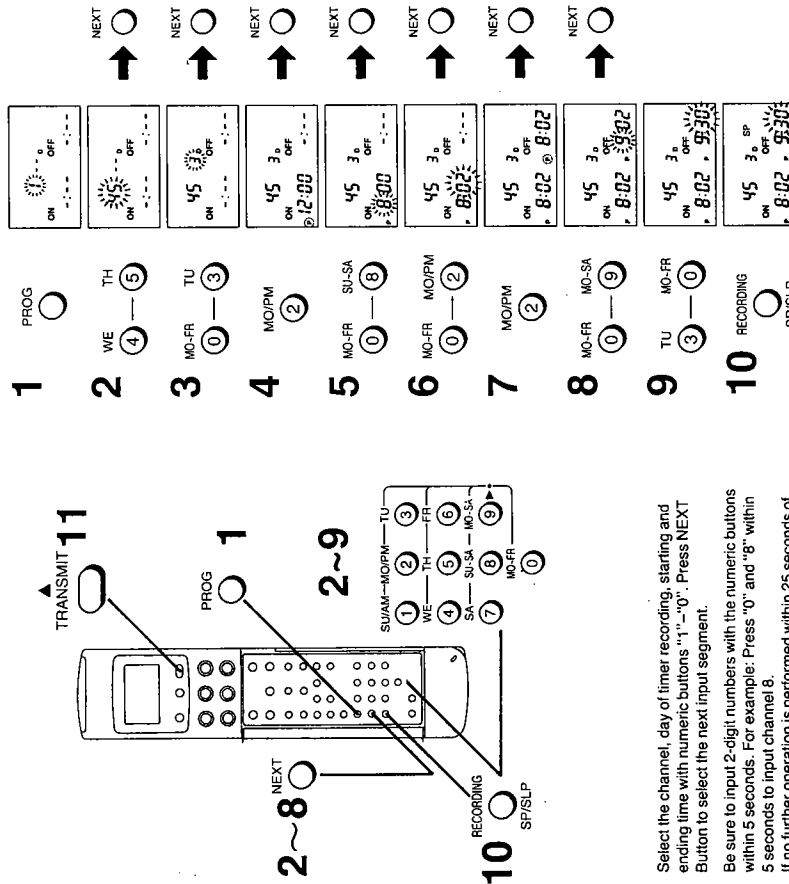
If a timer recording is interrupted or canceled, the programmed recording data is memorized until 4:00 am two days later. However, if another timer recording or OTR is activated or performed at 4:00 am two days later, the recording data will be maintained until 4 am on the following day.

- 1 Press **PROG/CHECK** to start programming.
 - Timer program number "1" appears. (Each time this button is pressed, the timer program number is changed.)
- 2 Press **TRACKING/V-LOCK +/-** to select the desired TV station and then **NEXT** to memorize input data and change to the next display segment.
- 3 Press **TRACKING/V-LOCK +/-** to set the starting date of timer recording and then **NEXT**.
 - For daily recording, press **TRACKING/V-LOCK -** until the desired daily recording type.
 - For weekly recording, press **TRACKING/V-LOCK -** until the desired indication for the day of the week appears.
- 4 Press **TRACKING/V-LOCK +/-** to set the start time (hour), then **NEXT**.
- 5 Press **TRACKING/V-LOCK +/-** to set the start time (minute), then **NEXT**.
- 6 Press **TRACKING/V-LOCK +/-** to set the end time (hour), then **NEXT**.
- 7 Press **TRACKING/V-LOCK +/-** to set the end time (minute). No need to press **NEXT**.
 - Repeat steps 1 to 7 to program several timer recordings successively.
- 8 Press **TIMER REC** to activate Timer Recording.
 - "TG" appears on the VCR Display and the VCR cannot be operated manually.
 - If you want to operate the VCR, press **TIMER REC** to switch off "TG". To reactivate the timer, press this button again.

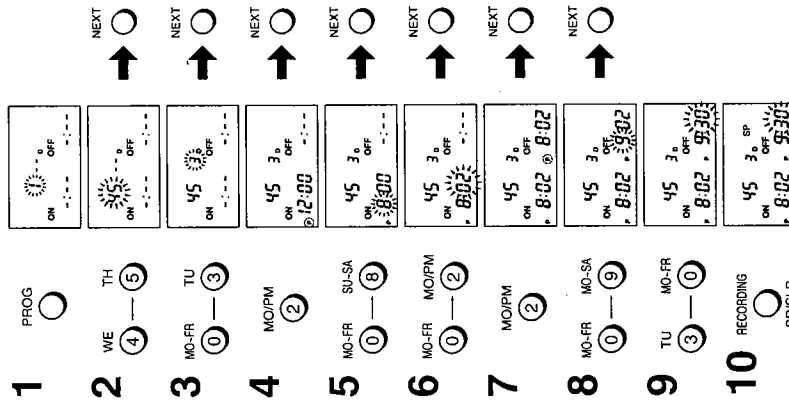


(NV-FS200PX ONLY)

Programming Timer Recording with Remote Controller



For example:
When programming a Timer Recording for a TV broadcast on channel 45 on the 3rd of the month, from 8:02 pm to 9:30 pm.



Select the channel, day of timer recording, starting and ending time with numeric buttons "1"-"0". Press NEXT Button to select the next input segment.
Be sure to input 2-digit numbers with the numeric buttons within 5 seconds. For example: Press "0" and "8" within 5 seconds to input channel 8.
If no further operation is performed within 25 seconds of input, the programming is canceled.

- 8 0 → 8
- 15 1 → 5
- 30 3 → 0

Timer Recording

Turning Timer On and Off

After programming Timer Recording, Timer Recording Indicator "TR" appears and the VCR can no longer be operated manually. To use the VCR, turn off **TIMER REC** ("TR" goes out). To reactivate the timer, press this button again.



Timer Recording from External Video/Audio Source

If Timer Recording is performed by another appliance connected to the Video/Audio Input Connectors on the VCR, press **INPUT SELECT** to select "A1" or "A2" indicator for the program position.
A1: Through S-VIDEO IN or VIDEO IN and AUDIO IN (AV1) Connectors on the rear panel.
A2: Through S-VIDEO IN or VIDEO IN and AUDIO IN (AV2) Connectors on the front panel.
Set **INPUT SELECT** on VCR to S-VIDEO or LINE.



Checking Timer Programming

- The VCR must be turned on, or Timer Recording Indicator "TR" must be lit.
- Be sure that Remote Controller Display is off. If it is on, turn it off with **SCANNER ON/OFF**.

Press TRANSMIT.

- If necessary, press **TRANSMIT** several times until the desired timer program number is displayed.
- The programmed data will be displayed for about 12 seconds on the display of the VCR. To check the data on the next timer program number, press **TRANSMIT** again.



Canceled Timer Programming

To cancel a programmed Timer Recording, this data must be displayed on the VCR Display.

- 1 Press **TRANSMIT**.
 - If necessary, press this button several times until the desired timer program number is displayed.
- 2 Press **CANCEL**.
 - Programmed Timer Recording will be canceled and dashes "----" will appear on the VCR Display.



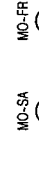
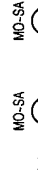
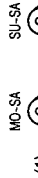
Operations

- 1 Press **PROG** to start programming.
The input segment for the program position (channel) on Remote Controller Display blinks.
- 2 Use Numeric Buttons to enter the program position (channel) and then press **NEXT**.
- 3 Enter the day of the broadcast with Numeric Buttons and then press **NEXT**.

Daily Recording at the Same Time

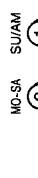
For daily recording, there are three categories to choose from.

- (1) from Sunday to Saturday
 - (2) from Monday to Saturday
 - (3) from Monday to Friday
- Press the "9" Button and the "8", "9", or "0" Button within 5 seconds according to the desired type of Daily Recording (1)-(3).



Weekly Recording at the Same Time

For example: Press the "9" Button and then the "1" Button within 5 seconds. The "SU" indication for Sunday appears.



- 4 Press the "2" Button to display "P" (=PM), then press **NEXT**.
 - To select the indication: "A" (=AM), press the "1" Button.

- 5 Enter the starting time (hour), then press **NEXT**.
- 6 Enter the starting time (minute), then press **NEXT**.
- 7 Press the "2" Button, then press **NEXT**.
- 8 Enter the ending time (hour), then press **NEXT**.
- 9 Enter the ending time (minute).
- 10 Press **SP/SLP** to select the desired tape speed (SP or SLP).
- 11 Point the Infrared Transmitter at the VCR Receiver Window and press **TRANSMIT** to transmit the programmed data.
 - The read data are displayed and a repeated beep confirms their reception.

Search Function (NV-FS200PX ONLY)

Index Search

Introduction

This function allows you to quickly locate the beginning of each recording marked with an index signal. An index signal is set automatically, and the indicator "WRITE" appears for a few seconds on the VCR Display in the following cases:

- When recording is started with the REC Button.
- At the beginning of Timer or OTR Recording.

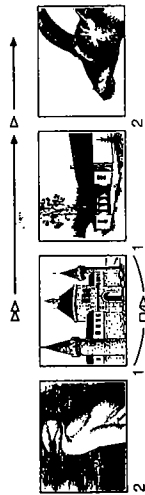
Additionally, you can set an index signal during Recording by pressing the REC Button(s) at the desired position. It is possible to skip up to 20 index signals in forward or backward direction to access the desired recording.

Preparation

Press PLAY or STOP Button.

For example:

Access the 2nd recorded segment ahead.



Time Search

Introduction

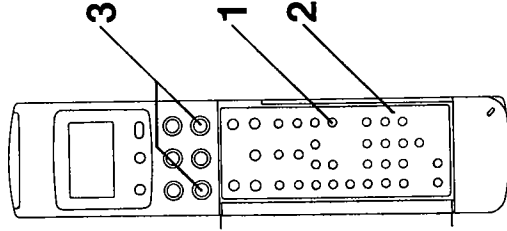
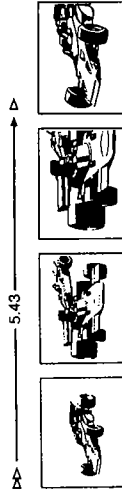
This function allows you to access the desired scene from any position by inputting the exact playback time of the part you want to skip.

Preparation

Insert a recorded cassette and put the VCR in the Stop mode.

For example:

Access the recording at the counter position of 5 minutes and 43 seconds after the start of playback.



Operations

- 1 Press TIME SEARCH.
- 2 Input the time from the present position by using Numeric Buttons.
- 3 Press FF or REW.
Playback automatically starts after the desired tape position is accessed.

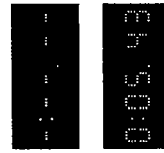


- Press INDEX to access previous recorded segment (in backward direction).

Notes:

- The interval between two index signals should be at least 3 minutes in SP recording and 5 minutes in SLP recording.
- If using cassettes that contain long blank (unrecorded) portions or which have been repeatedly recorded and re-recorded, Search may not function correctly.

- 1 TIME SEARCH
- 2
- 3



Editing

Copy Editing

This function is used to make duplicates.

Preparations

- Connect a Movie Camera or another VCR to this VCR as shown in the diagram.
- Set **NOISE FILTER/EDIT** to "EDIT".
- Insert a recorded cassette in the connected Movie Camera or another VCR, used as Player, and a blank cassette in this VCR, used as Recorder.
- Press **INPUT SELECT** on Remote Controller to select the program position (channel) "A1" or "A2".
- A1: Recording through S-VIDEO IN or AUDIO IN and AUDIO IN Connectors (AV1) on the rear panel.
- A2: Recording through S-VIDEO IN or VIDEO IN and AUDIO IN Connectors (AV2) on the front panel.
- Set **INPUT SELECT** on VCR to select the corresponding connectors.

S-VIDEO: S-VIDEO and AUDIO IN Connectors
LINE: VIDEO IN and AUDIO IN Connectors



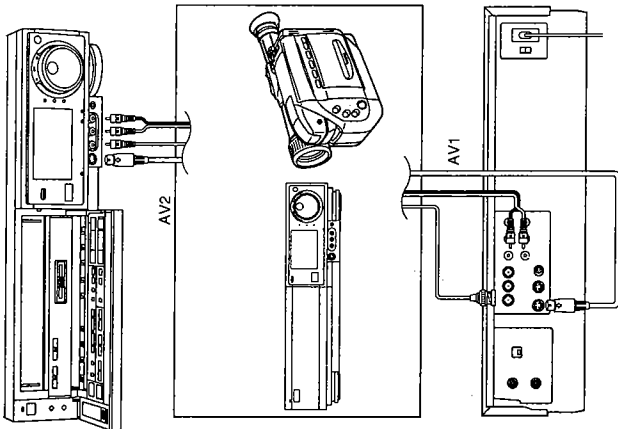
- 1
- 2
- 3

Operations

- 1 Play back the recorded tape on the Player VCR.
- 2 Press **REC** on the Recording VCR.
- 3 Press **STOP** to stop copying.

Note:

Be sure to set **NOISE FILTER/EDIT** to "OFF" after copying is finished for normal use.



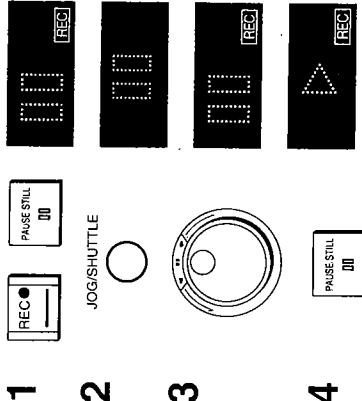
Assembly Editing

This function is used to make an edited tape from several other video recordings.

A new scene can be joined to the end of an existing recording without interference or distortion.

Preparations

- Insert a recorded cassette with an erasure prevention tab.
- Select the corresponding input connectors. (Refer to "Preparation" on page 32.)
- Set **NOISE FILTER/EDIT** to "EDIT".



Operations

- 1 Press **REC** and then **PAUSE/STILL** to put the VCR in Recording Pause.
- 2 Press **JOG/SHUTTLE**.
- 3 Search for the end part of a scene by using the **JOG Dial**. #2 seconds later, the VCR is set to Recording Pause again.
- 4 Start Recording to join a new scene by pressing **PAUSE/STILL**.

Synchronized Editing

It is possible to synchronize the playback start and stop of the Movie Camera with the recording start and stop of this VCR.

Preparations

- Connect a Movie Camera to the VCR with Synchro Connection Cord (optional).
- Insert a recorded cassette with an erasure prevention tab.
- Select the corresponding input connectors. (Refer to "Preparation" on page 32.)
- Set **NOISE FILTER/EDIT** to "EDIT".

Operations

- 1 Press **REC** and then **PAUSE/STILL** to put the VCR in Recording Pause.
- 2 Put the Movie Camera into Still playback at the point where you want to start editing.
- 3 Press **PAUSE/STILL** on the VCR so that Movie Camera starts playback.
 - Dubbing starts.

Synchronized Editing between two VCRs

When editing from another VCR equipped with Synchro Edit connector, synchronized start and stop of both VCRs can be activated from this VCR.

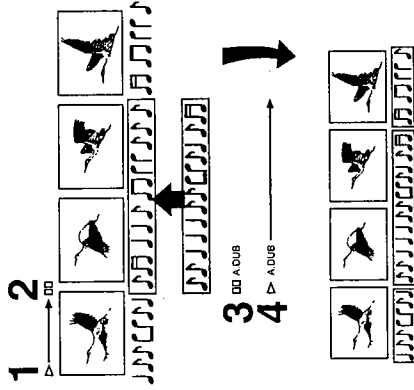
The operation is the same as described for synchronized editing from a Movie Camera.

Audio Dubbing

This function is used to add background music, narration, etc. on an already recorded tape.

Preparations

- Insert a recorded cassette with an erasure prevention tab.
- Select the corresponding input connectors. (Refer to "Preparation" on page 32.)



Operations

- 1 Press **PLAY** and search for the starting point where you wish to record the new sound-track.
- 2 Press **PAUSE/STILL** at the starting point of Audio Dubbing.
- 3 Press **AUDIO DUB**. (AUDIO DUB Indicator is lit.)
- 4 Press **PAUSE/STILL** to start Audio Dubbing.
- 5 Stop Audio Dubbing by pressing **STOP**.

Note:

- A new sound is be dubbed onto the normal audio track of the tape, and the original sound is erased. However, the original sound is maintained on the Hi-Fi audio tracks. This means that Audio Dubbing is made monoaurally.
- Press **AUDIO OUT** to select the normal audio track to listen to the sound recorded with Audio Dubbing.
- Select the Hi-Fi audio tracks to listen to the original sound.
- Set **HI-FI/NORMAL MIX** to "ON": to listen to both the original sound and the sound-track added by Audio Dubbing.

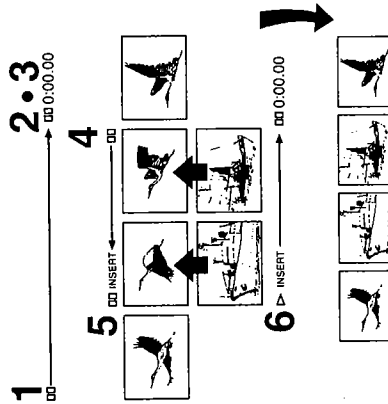
Insert Editing

This function allows you to smoothly insert new scenes between selected Editing "In" and "Out" points on an existing recording.

Insert Editing cannot be executed on blank tape segments. In such a case, it is necessary to use Assembly Editing first.

Preparations

- Connect a Movie Camera or another VCR to this VCR as shown in the diagram on page 32.
- Insert a recorded cassette with an erasure prevention tab.
- Select the corresponding input connectors. (Refer to "Preparation" on page 32.)
- Set **NOISE FILTER/EDIT** to "EDIT".



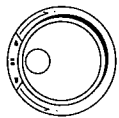
Operations

- 1 Press **JOG/SHUTTLE**.
- 2 Search for Editing Out (ending) point with **SHUTTLE Ring** and **JOG Dial**. Put the VCR into Still playback.
- 3 Press **RESET** to reset the Tape Counter to "0:00.00".
- 4 Search for Editing In (starting) point with **SHUTTLE Ring** and **JOG Dial**. Put the VCR into Still playback.
- 5 Press **INSERT**. (INSERT Indicator is lit.)
 - If you want to replace the original sound-track on the normal audio track with a new sound-track, press **AUDIO DUB**. (AUDIO DUB Indicator is lit.)
- 6 Press **PAUSE/STILL** to start Insert Editing.
 - Insert Editing stops when the tape reaches editing out point (counter position "0:00.00"). The VCR switches to Still playback.

JOG/SHUTTLE



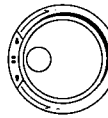
1



RESET



2



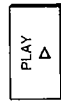
3



4



5



1



2



3

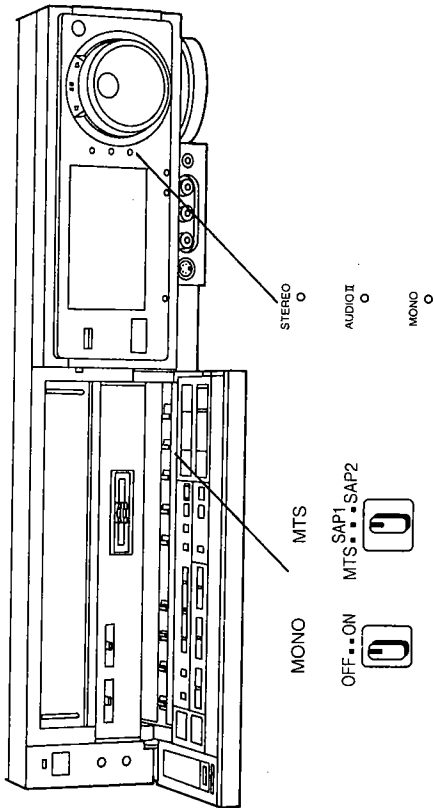


4



Audio Channel Selection

Bar Code Operation (NV-FS200PX ONLY) Audio Channel Selection Bar Code Operation



When a stereo and/or Audio II broadcast is received, "STEREO" and/or "AUDIO II" are lit to inform you of the type of broadcast.

The table below shows the TV broadcast type, MTS switch settings, and audio recording patterns.

Be sure that **MONO Switch** is set to "OFF" before setting **MTS Switch** and follow the operation procedure described on page 23 to record on the Hi-Fi audio tracks.

TV Broadcast	MTS switch	Audio Track		
		Normal (Mono)	Left	Right
Mono	All position	Mono	Mono	Mono
Stereo	All position	L+R (Mixed)	Left	Right
Mono and Audio II (SAP)	MTS	Mono	Mono	Mono
	SAP1	Mono	Mono	Audio II
	SAP2	Audio II		
Stereo and Audio II (SAP)	MTS	L+R (Mixed)	Left	Right
	SAP1	L+R (Mixed)	L+R (Mixed)	Audio II
	SAP2	Audio II		

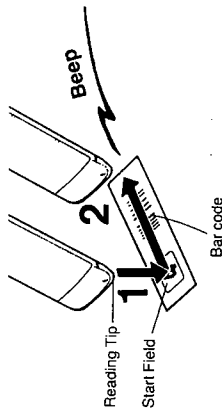
Scanner Preparation

Your Remote Controller also works as Bar Code Reader to set date/clock and to program Timer Recording quickly and easily.

Turning on Bar Code Reader
Press **SCANNER ON/OFF** on Remote Controller to turn on Bar Code Reader.

If no operation is performed within 25 seconds, the Bar Code Reader turns off automatically to save battery power (Bar Code Reading Tip is not lit.) If a bar code has already been read but not transmitted to the VCR within 25 seconds, the programmed data will be canceled. Then, press **SCANNER ON/OFF** again.

Reading Bar Codes



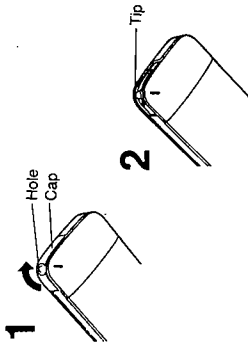
Operations

- 1 Place Reading Tip on the square start field.
- 2 Trace the bar code quickly, in the direction of the arrow, past the last bar. If no beep is heard, trace the bar code again.

Cleaning of Bar Code Reading Tip

If no indication appears on the Remote Controller Display or no beep sound is heard after tracing the bar code correctly, the Bar Code Reading Tip requires cleaning.

Cleaning



- 1 Remove the cap from the Bar Code Reading Tip.
 - Remove dirt and dust from the hole of the cap.
- 2 Carefully clean the tip with a soft cloth.

Note:

The bar codes "VCR 1" and "VCR 2" in the column "REMOTE MODE" in the Programming Sheet cannot be used with this unit.

If the bar code "VCR 2" is traced by mistake, the data transmission to the VCR is not possible. To remedy this mistake, trace the "VCR 1". (The indication "VCR 2" on the Display disappears.)

REMOTE MODE



The bar code "1, P" in the column "RECORDING" on the Programming Sheet cannot be used with this unit.

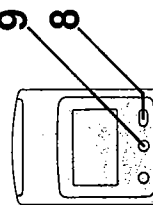
(NV-FS200PX ONLY)

Timer Recording with Bar Code Reader

Successively read the data for the program position (channel), day, start time, end time and tape speed by tracing the bar codes 1 through 7 on the Programming Sheet.

For example:
Program a timer recording for a TV broadcast on channel 4 on the 3rd of the month, from 8:02 pm to 9:30 pm.

The programming sheet is divided into columns: CHANNEL, DAY, START TIME, END TIME, and TAPE SPEED. Each column contains a bar code and a checkbox. Below these columns are sections for 'EVERYDAY', 'EVERY WEEK', and 'EVERY MONTH'. Arrows labeled 1 through 7 point to specific bar codes: 1 points to the Channel bar code, 2 to the Day bar code, 3 to the Start Time bar code, 4 to the End Time bar code, 5 to the Tape Speed bar code, 6 to the 'EVERYDAY' bar code, and 7 to the 'EVERY WEEK' bar code.



Preparations

- Turn on the VCR by pressing **POWER**.
- Turn on the Bar Code Reader by pressing **SCANNER ON/OFF**.

Trace the bar code:

- 1 In the column **CHANNEL** for the corresponding program position (channel).
- 2 In the column **DATE** for the corresponding day.

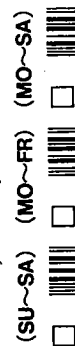


Weekly Recording at the Same Time
Trace the bar code for the day of the week in the column **EVERYWEEK**.

Daily Recording at the Same Time

For daily recording, there are three categories to choose from in the column **EVERYDAY**.

- (1) from Sunday to Saturday
- (2) from Monday to Friday
- (3) from Monday to Saturday



Bar Code Operation

Checking of Timer Programming

The VCR must be turned on, or Timer Recording Indicator "TR" must be lit.

- 1 Trace the bar code **CHECK**.



- 2 Press **TRANSMIT** to transmit the data to the VCR.

- The programmed data is displayed for about 12 seconds on the VCR Display. To check the data on the next timer program number, press **TRANSMIT**.

Cancelling Timer Programming

To cancel a timer programming, this data must be displayed on the VCR Display.

- 1 Trace the bar code **CHECK**.
- 2 Transmit the data to the VCR.
- 3 Trace the bar code **CANCEL**.



- 4 Transmit the data to the VCR.

The programmed timer recording is cancelled and "TR" is displayed.

- 3 In the column **START TIME** for the start time (hour).

- 4 In the column **MIN** for the start time (minute).

- 5 In the column **END TIME** for the end time (hour).

- A repeated beep indicates correct data reading and readiness for data transmission to the VCR.

- 6 In the column **MIN** for the corresponding minute, if necessary.

- The repeated beep is heard again.

- 7 In the column **RECORDING** for the desired tape speed.

Point the Remote Controller at the Reception Window on the VCR and press **TRANSMIT** to transmit the read data.

- The read data appears on the VCR Display of the VCR, and a repeated beep confirms proper reception.

- 9 Press **SCANNER ON/OFF** again to turn off the Bar Code Reader.

Turning Timer On and Off

After programming a timer recording, Timer Recording Indicator "TR" appears, and the VCR can no longer be operated manually. To use the VCR, trace the **TIMER ON/OFF** bar code and transmit it to the VCR ("TR" goes out). To reactivate the timer, trace the **TIMER ON/OFF** bar code again and transmit it to the VCR.



Timer Recording from External Video/Audio Source

If Timer Recording is performed by another appliance connected to the Video/Audio Input Connectors on VCR, trace the bar code AV1 or AV2 in the column **CHANNEL** for the program position.

A1: Through S-VIDEO IN or VIDEO IN and AUDIO IN

(AV1) Connectors on the rear panel.

A2: Through S-VIDEO IN or VIDEO IN and AUDIO IN

(AV2) Connectors on the front panel.

Set **INPUT SELECT** on VCR to S-VIDEO or LINE.



(NV-FS200PX ONLY)

Clock Setting

Read in the required data by successively tracing the bar codes 1 to 6 on the Programming Sheet.

For Example:

Set the clock for Sunday, October 10, 1998, 8:15 am.

Preparations

- Turn on the VCR by pressing **POWER**.
- Turn on the Bar Code Reader by pressing **SCANNER ON/OFF**.

Trace the bar code:

- 1 SETTING OF THE CLOCK** for initiating the setting.
- In the column **YEAR** for the corresponding year.
- In the column **MONTH** for the corresponding month.
- In the column **DATE** for the corresponding day.
- In the column **START TIME** for the corresponding hour.
 - A repeated beep indicates correct data reading and readiness for data transmission to the VCR.

- In the column **MIN** for the corresponding minute, if necessary.
 - The repeated beep is heard again.

- Point the Remote Controller at the Reception Window on the VCR and press **TRANSMIT** to transmit the read data.
 - The read data appears on the VCR Display of the VCR, and a repeated beep confirms proper reception.

- Press **SCANNER ON/OFF** again to turn off the Bar Code Reader.
 - If no operation is performed within 4 minutes during setting, the Bar Code Reader turns off automatically to save battery power. If a bar code has already been read but not transmitted to the VCR, the read data will be canceled.

1-3. TECHNICAL DESCRIPTION

TIME BASE CORRECTOR

1-3-1. GENERAL DESCRIPTION

With the recent advances in technology, it has been possible to develop high resolution and high quality picture systems (such as S-VHS and the HQ systems) VHS video tape recorders.

However, time base errors (such as Skew and Jitter) can not be eliminated by using conventional VHS circuits.

This model employs a T.B.C. circuit which eliminates Time Base errors and jitter on a TV monitor. Time Base Correctors circuits were originally designed to produce VTR playback pictures for broadcast purposes. Their uses fall into two categories: Frame Synchronizers and Time Base Correctors (T.B.C.).

What causes time base errors? There are three main kinds of Skew or Jitter.

- 1) Electrical Jitter
- 2) Mechanical Jitter
- 3) Other Jitter
(For example: Tape Interchangeability, Dubbing, External)

1-3-2. PRINCIPLE OF THE TIME BASE CORRECTOR

The principle operation of the Time Base Corrector (T.B.C.) is as shown in Figure T1.

It can be seen from Figure T2-(a) that the original signal is recorded and played back, it has suffered some time base errors.

Figure T2-(b): when this signal is displayed on a TV monitor, jitter problems are encountered.

From this playback signal with jitter, the sync pulses are removed and used as a "Write Clock" Figure T2-(c) to clock the data into a memory Figure T2-(d). The read clock Figure T2-(e) is produced by counting down a stable crystal oscillator to line frequency. This is used to clock the data out of the memory at a stable/constant rate.

By using this method, it is possible to correct for errors such as skew or jitter caused by the record/playback process. The output is as shown in Figure T2-(f).

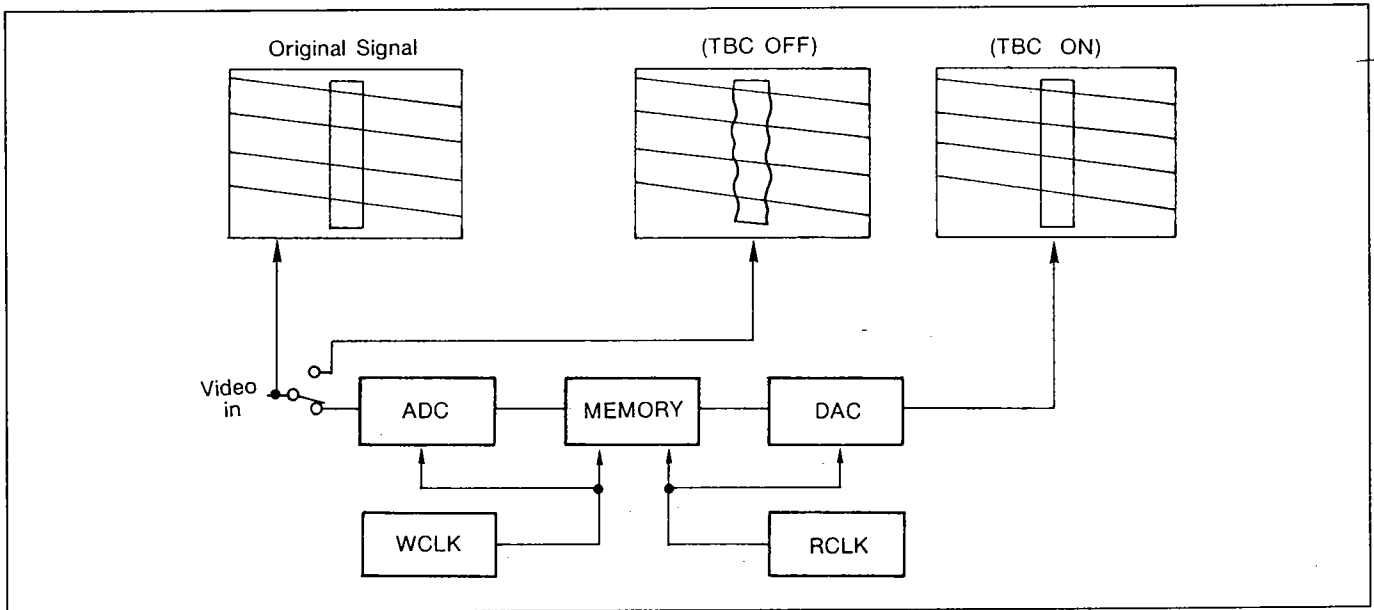


Figure T1 The Principle Operation of T.B.C.

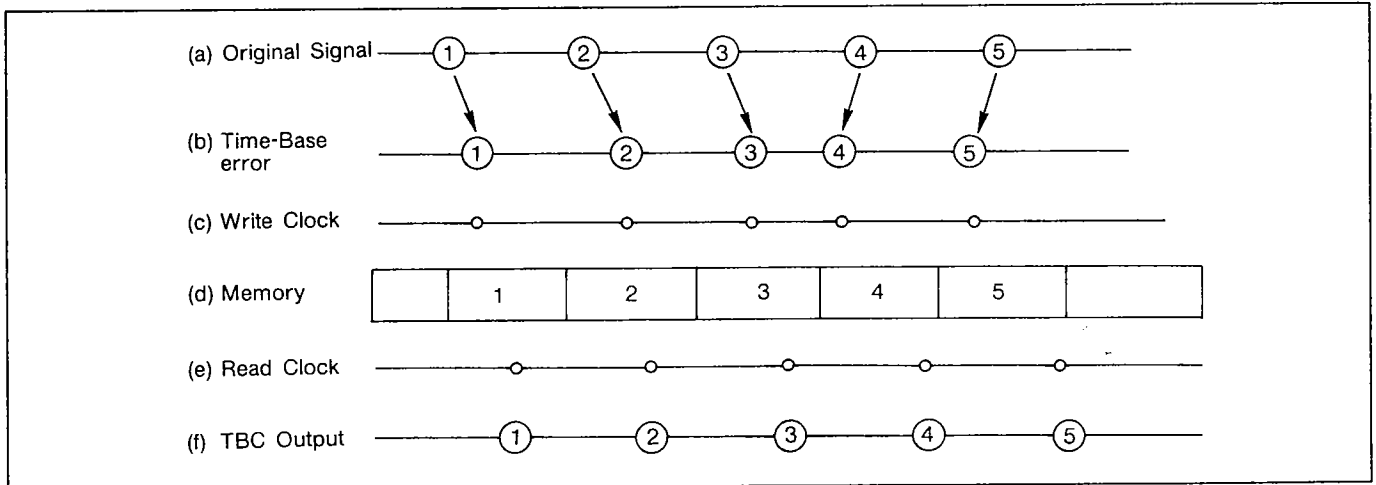


Figure T2 The Principle Signal Process of T.B.C.

1-3-3. T.B.C. NOISE REDUCTION CIRCUIT

When a signal has been recorded and played back, it is subject to noise and cross-talk from an adjacent track. This can cause the sync pulses to become distorted. Therefore, the first stage of the TBC is the "Sync Noise Reduction circuit".

A simplified version of the block diagram showing the Sync Noise Reduction circuit is shown in Figure T3. The main purpose of the circuit is to "clean up" the sync pulse from noisy to sharp edges.

If this was not done, the operation of the TBC would be impaired because this model calculates time base errors by counting sync pulse. If they were noisy, operation would cease.

A. Circuit Operation

The Sync Noise Reduction circuit works by mixing 3 delayed signals 1H, 2H, and 3H. These signals are derived from a non delayed and a 2H delayed signal taken from the luminance and chrominance section. The non delayed signal is applied to a 1H delay line to produce 1H delayed signal. The 2H signal is obtained from Video section, but also, is 1H delayed to give 3H signal.

Thus 1H, 2H and 3H signals are produced.

It can be seen from Figure T3 that: (2) improve S/N ratio, 1H delayed (1) and 3H delayed (3) are mixed (4). Secondly, to identify poor sync pulses, this signal (4) and inverted 2H delayed are mixed (6). Finally, to produce a sharper edge on the sync, this signal (6) and 2H delayed (2) are mixed to produce sync output (7).

As a result, the output of the sync noise reduction circuit has clean sync pulse.

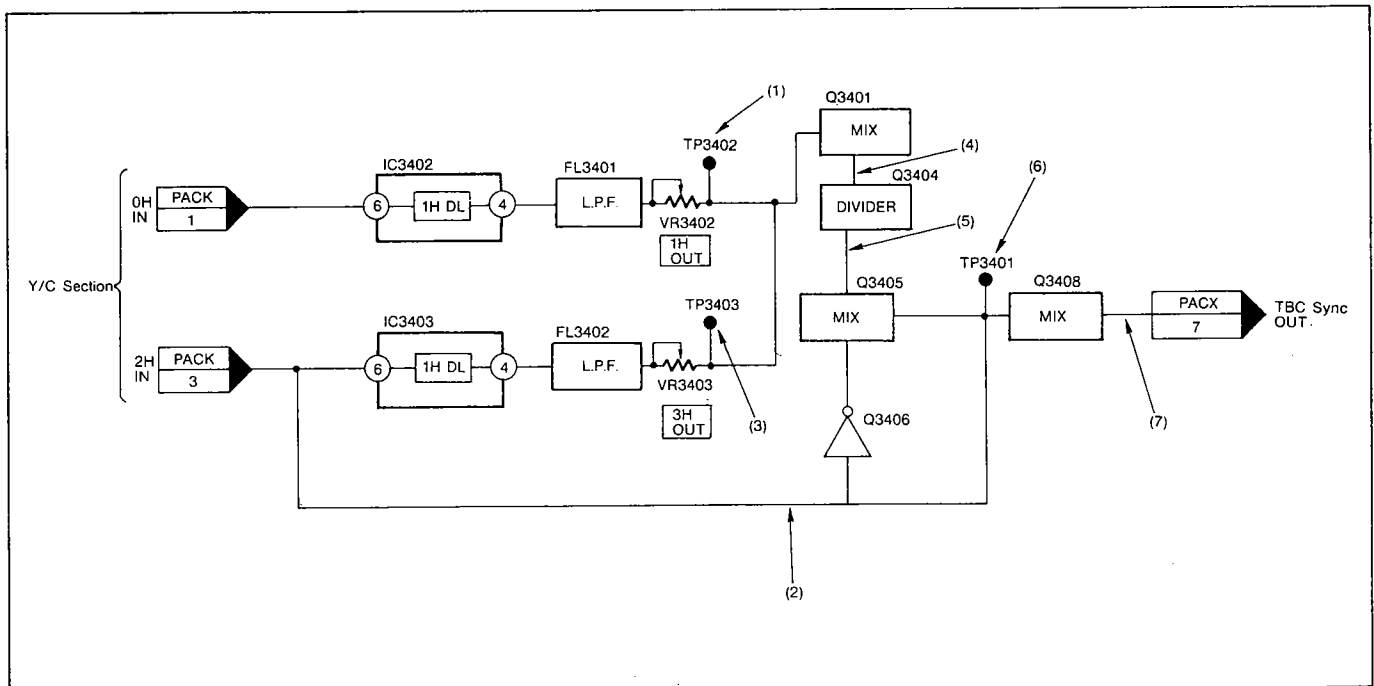


Figure T3 The Simplified Block Diagram of T.B.C. Noise Reduction Circuit

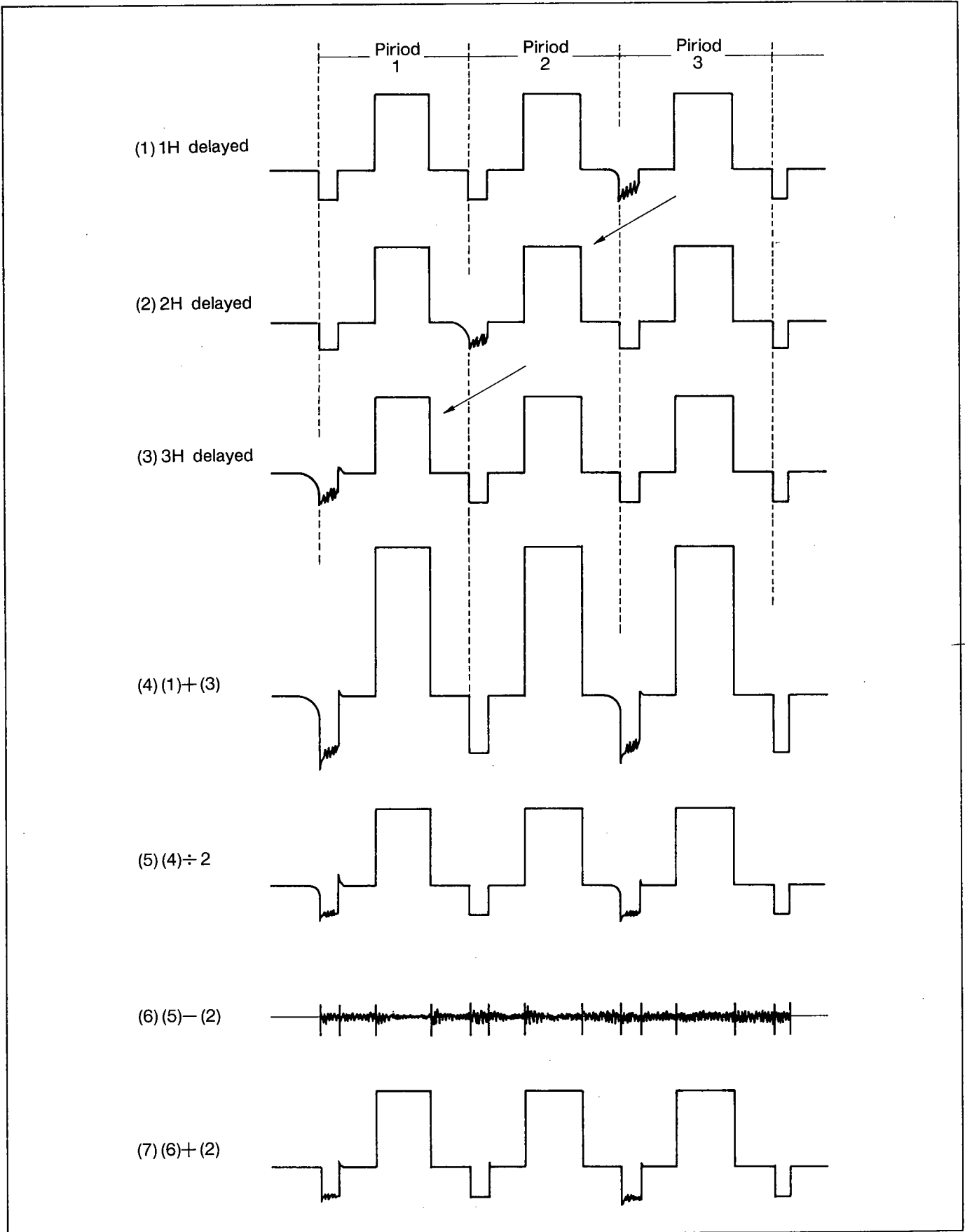


Figure T4 The Signal Process of T.B.C. Noise Reduction Circuit

1-3-4. T.B.C. SYNC GENERATOR

As mentioned previously, the T.B.C. System uses the rising edge of H sync for write timing.

A simplified block diagram for this section is shown in Figure T5.

Waveform for the various stages of the Sync Generator are as shown in Figure T6.

Processed Sync Signals are applied to IC9001-15/16.

The Input from pin 15 is applied to the AFC loop via the Sync Clamp, Sync Separator and Half Horizontal Killer circuits. From the AFC loop, the signal is decoded and sent to the Sync Gate where a sync gate pulse is produced (Waveform No.3).

The other input from pin16 is also applied via the 6dB Amp, Pedestal Clamp and Sync Separator to a Noise Gate. If the luminance signal Figure T6-(1) with noise A/B is applied to pins 15/16 circuit, mis-operation would result, so the noise is removed by the Sync and Noise Gate. Noise during H sync (Figure T6-(2)-(A)) is removed by Noise Gate pulse. (Figure T6-(3)): The Noise Gate width can be adjusted with VR9002.

Noise-(B): Figure T6-(2)-(B) during visible period is removed by sync gate pulse (4). The centre of the sync gate pulse is the same phase as the rising edge of H sync and therefore, the output of this circuit is shown as waveform (5).

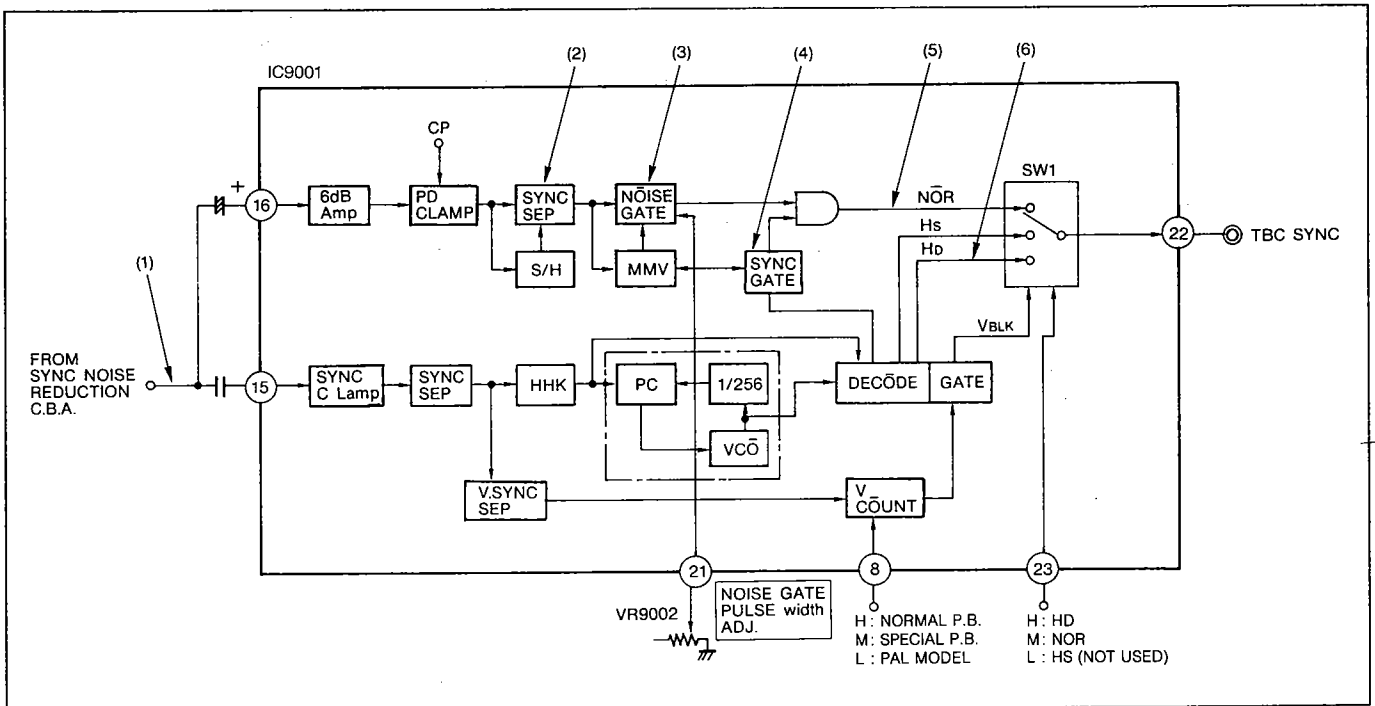


Figure T5 T.B.C. Sync Generator Circuit

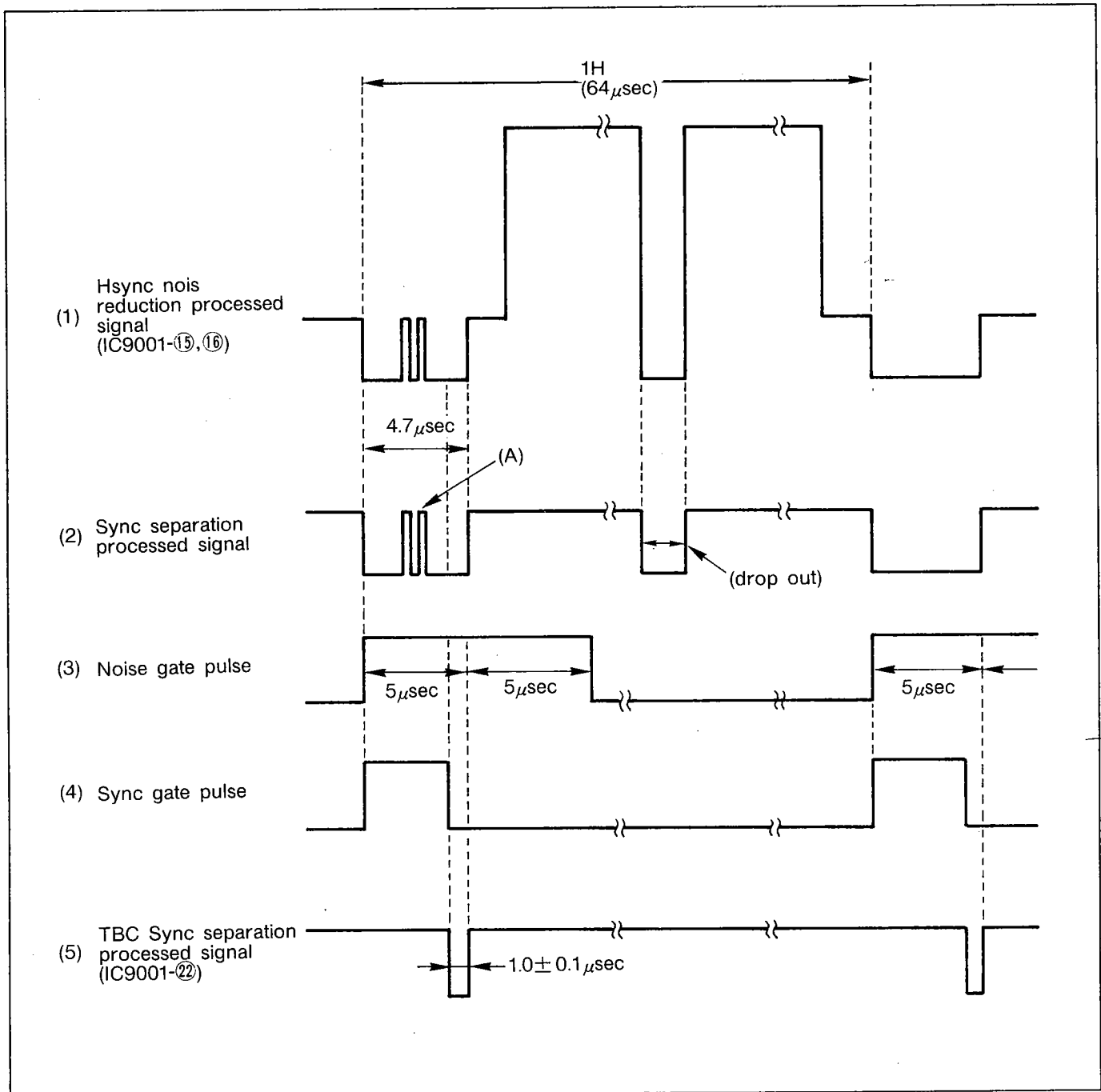


Figure T6 The Signal Process of T.B.C. Sync Generator Circuit

1-3-5. LUMINANCE PROCESSING

The playback luminance signal is applied to IC9001 where the first stage is the Sync Clamp to obtain a stable Sync Tip (Sync level becomes 2V).

After this, the signal is pedestal clamped to obtain stable pedestal level (Pedestal level becomes 2.5V).

The Sync and Pedestal clamped signal is output from IC9001-Pin 33 and fed to the A/D converter IC9004-29.

The A/D converter IC9004 has three Input signals; Clamped Luminance signal and 2 reference voltages (2 and 4V).

The clamped luminance signal is converted to 8 bit digital signal by the A/D converter.

The 8 Bit digital signal is applied to the Memory IC (IC9007). It can be seen from Figure T7 that IC9002 has two 1H Memory devices. The read clock is derived from a 13.5MHz source and is used as a latch pulse.

As the signal is read out of the memories, it is applied to D/A-1/2. D/A-1 output contains luminance information only and D/A-2 output only contains horizontal and vertical blanking pulses. The output from D/A-1 is fed to the MIX circuit within IC9001. The output from D/A-2 containing Sync is fed into IC9009-37 to synchronise the Sync Generator and also fed to IC9001-25 to the mix circuit. Thus converted luminance signal and Sync are mixed together and T.B.C. operation is achieved.

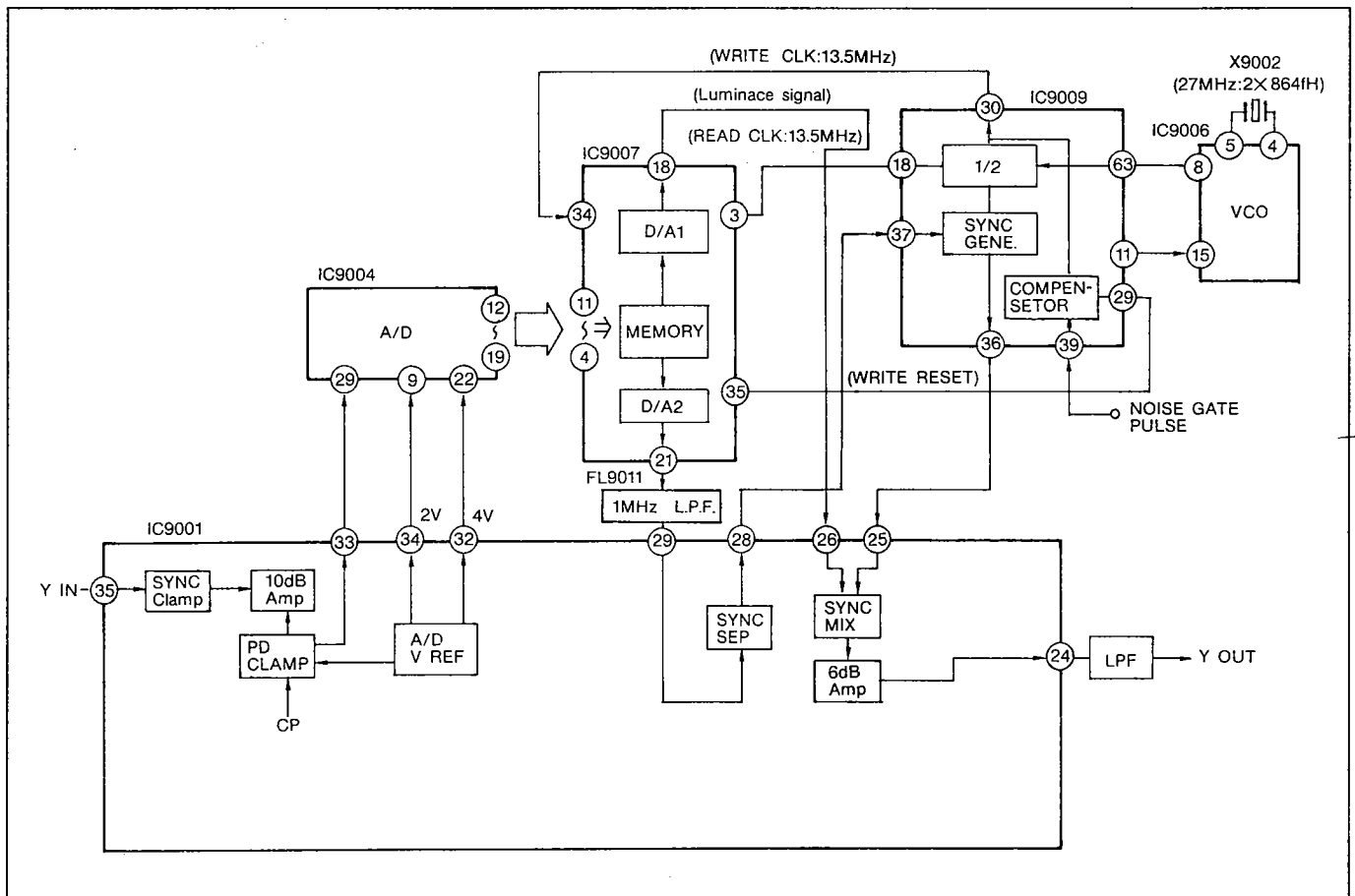


Figure T7 The Simplified Block Diagram of Luminance Processing

1-3-6. CHROMINANCE PROCESSING

Due to the way the chrominance signal is composed, it is not possible to directly memorize it. So it is necessary to separate it into R-Y and B-Y components before applying it to memory.

To do this, the composite chrominance signal is demodulated and fed into Pin 3 and 4 of IC9003. IC9003 multiplexes R-Y and B-Y signals and they are fed to IC9005-29 (A/D converter).

After processing the signal, processing is the same as it is for luminance channel.

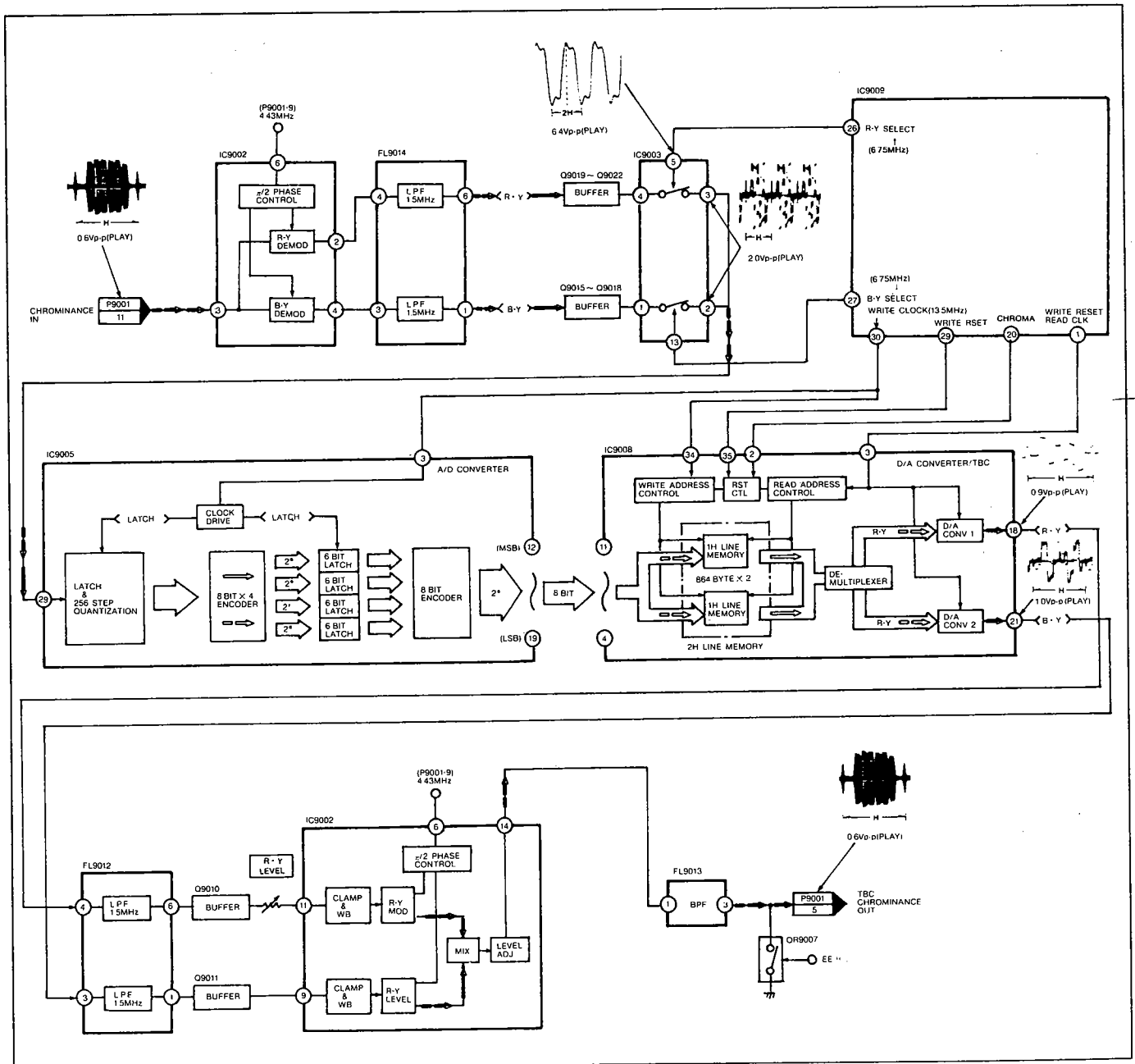


Figure T8 The Simplified Block Diagram of Chrominance

SECTION 2 ADJUSTMENT PROCEDURES

2-1. DISASSEMBLY METHOD

2-1-1. DISASSEMBLY FLOW CHART

This flow chart indicates disassembly steps of the cabinet parts and the circuit boards in order to find the necessary items for servicing.

When assembling, perform the steps in the reverse order.

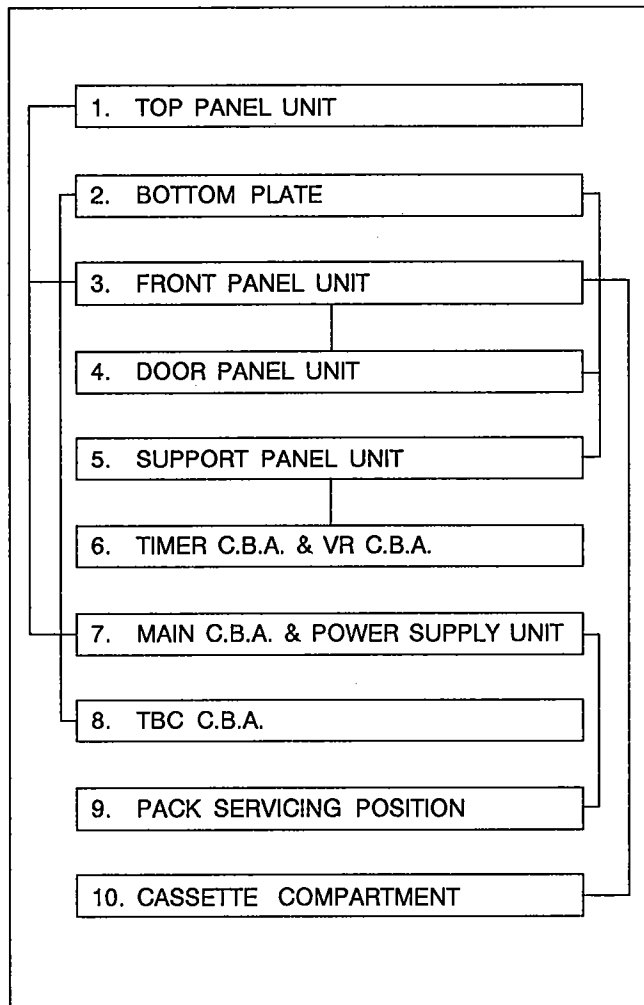


Figure D1

2-1-2. DETAIL OF DISASSEMBLY METHOD

1. REMOVAL OF THE TOP PANEL UNIT

Remove.....4 Screws (B)

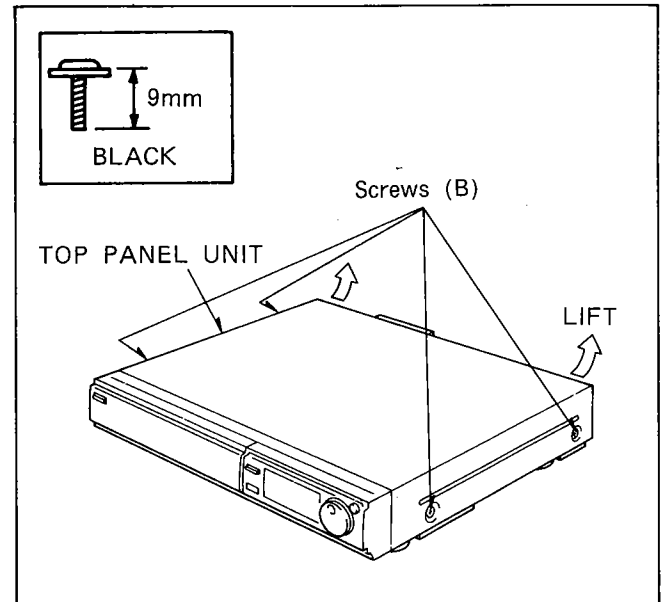


Figure D2

2. REMOVAL OF THE BOTTOM PLATE

Remove.....9 Screws (C)

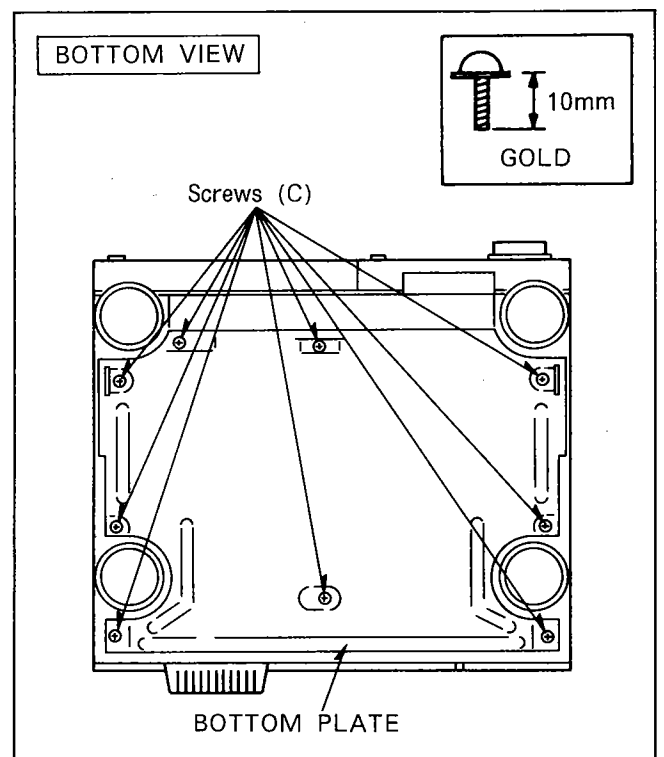


Figure D3

3. REMOVAL OF THE FRONT PANEL UNIT

Remove.....Screw (D)
 Unlock.....7 Tabs (E)
 (DOOR PANEL.....OPEN)

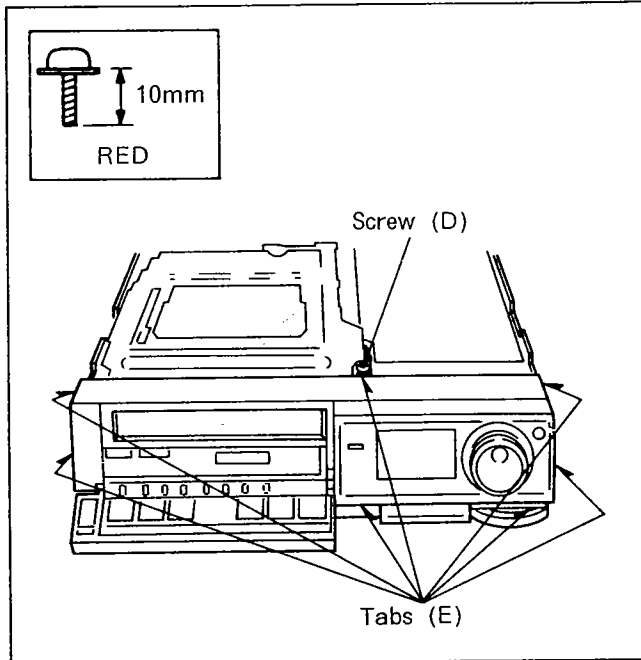


Figure D4

4. REMOVAL OF THE DOOR PANEL UNIT

Remove.....2 Screws (F)
 Disconnect.....2 Connectors (G)

5. REMOVAL OF THE SUPPORT PANEL UNIT

Remove.....3 Screws (H)
 Unlock.....3 Tabs (I)
 Remove.....Front Jack Cover

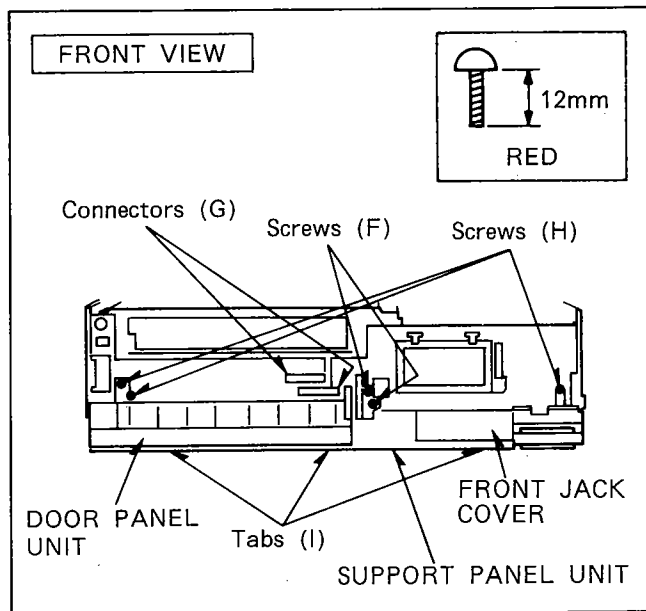


Figure D5

6. REMOVAL OF THE TIMER C.B.A. & VR C.B.A.

REMOVAL OF THE TIMER C.B.A.

Remove.....Screw (J)
 Unlock.....2 Tabs (K)

REMOVAL OF THE VR C.B.A.

Remove.....Screw (L)
 Unlock.....2 Tabs (M)

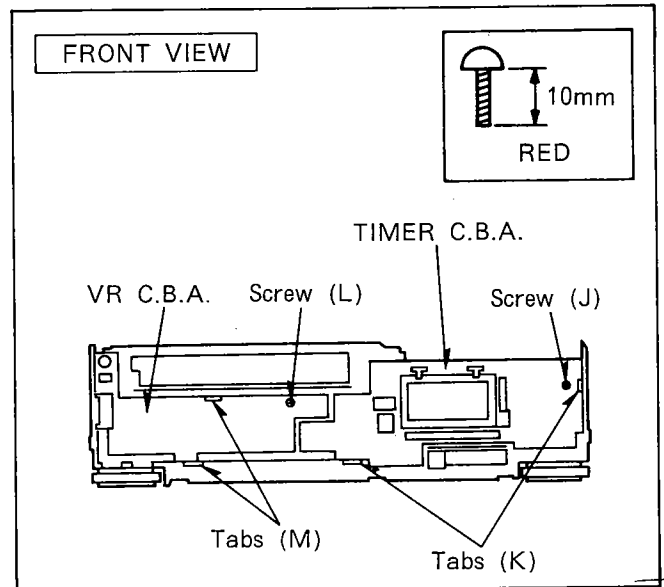


Figure D6

7. REMOVAL OF THE MAIN C.B.A. & POWER SUPPLY UNIT

REMOVAL OF THE MAIN C.B.A.

Remove.....Screw (N)
 Remove.....3 Screws (O)
 Remove.....3 Screws (P)

REMOVAL OF THE POWER SUPPLY UNIT

Remove.....2 Screws (Q)
 Remove.....Screw (R)
 Remove.....2 Screws (S) and Heat Sink Cover
 Remove.....Screw (T) and Heat Sink

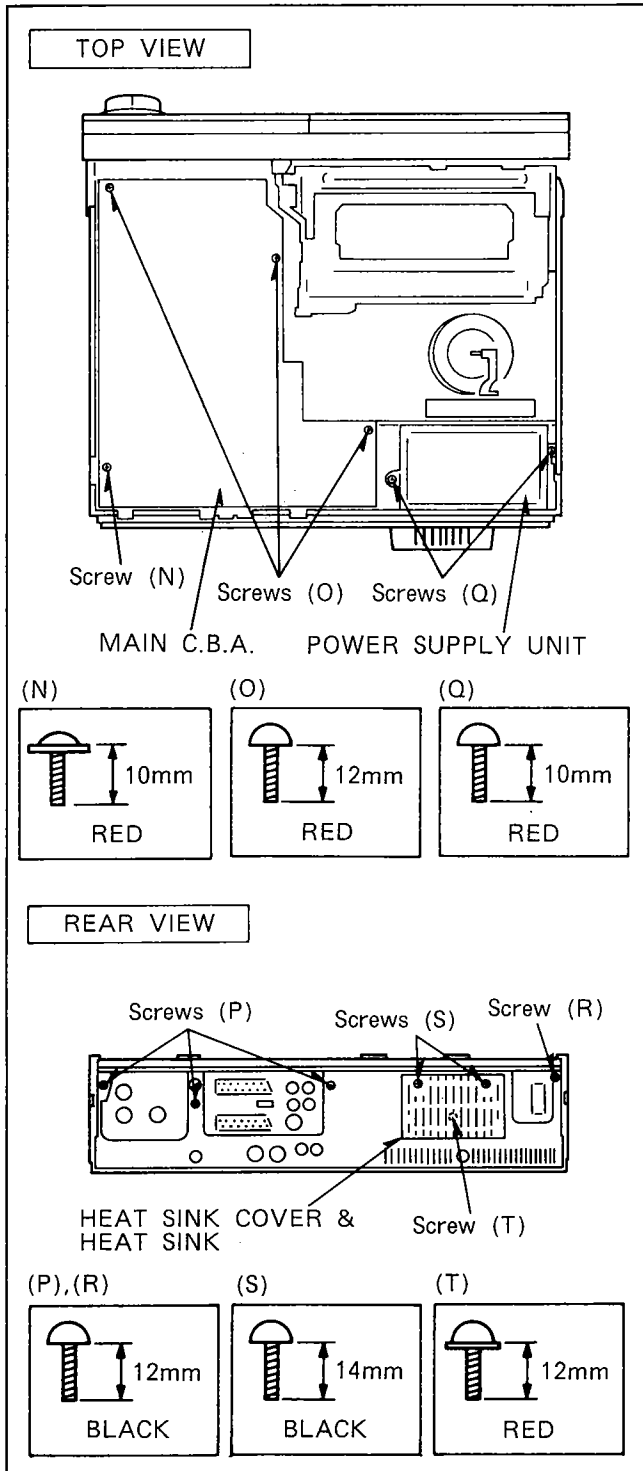


Figure D7

8. REMOVAL OF THE TBC C.B.A.

Remove.....4 Screws (U)

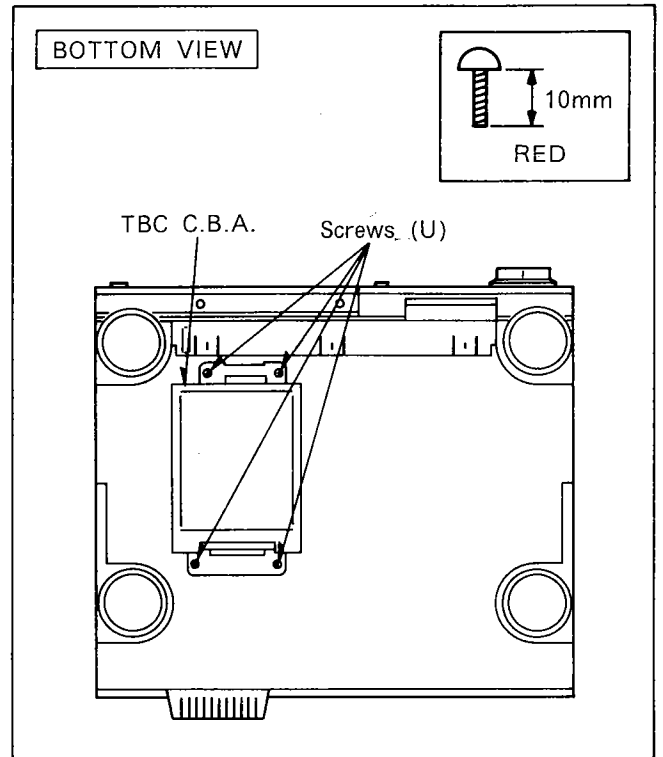


Figure D8

9. PACK SERVICING POSITION

<<CAUTION>>

Confirm that the isolation between Mechanical Chassis and Main C.B.A. before connecting Main AC.

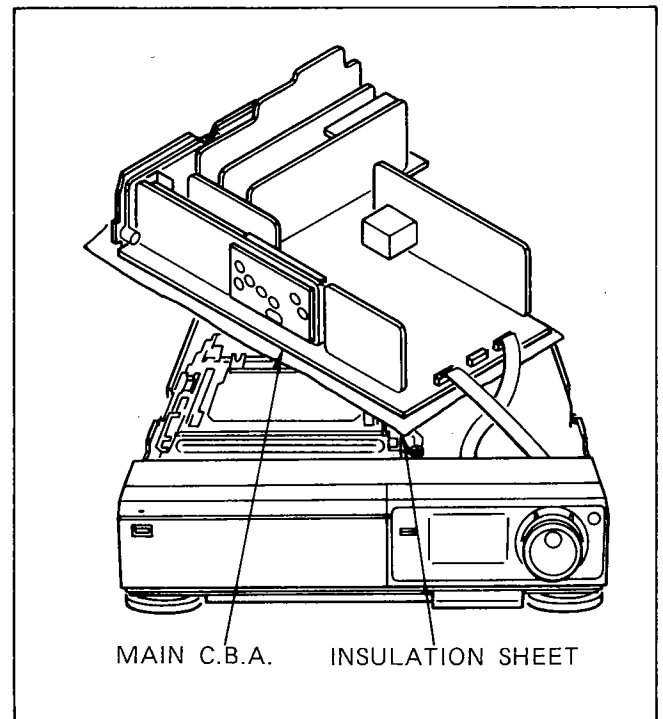


Figure D9

10. REMOVAL OF THE CASSETTE COMPARTMENT

Remove the 2 screws (V) and a screw (W).

Slide the cassette holder unit for appearing 2 screws (X) by turning (clockwise) the Capstan Rotor Unit (located in the bottom side as shown in Figure D11) and remove the 2 screws (X).

Remove the wire cable from connector P1508 mounted on Take-up Photo Tr. C.B.A., then carefully pull out the Cassette Compartment.

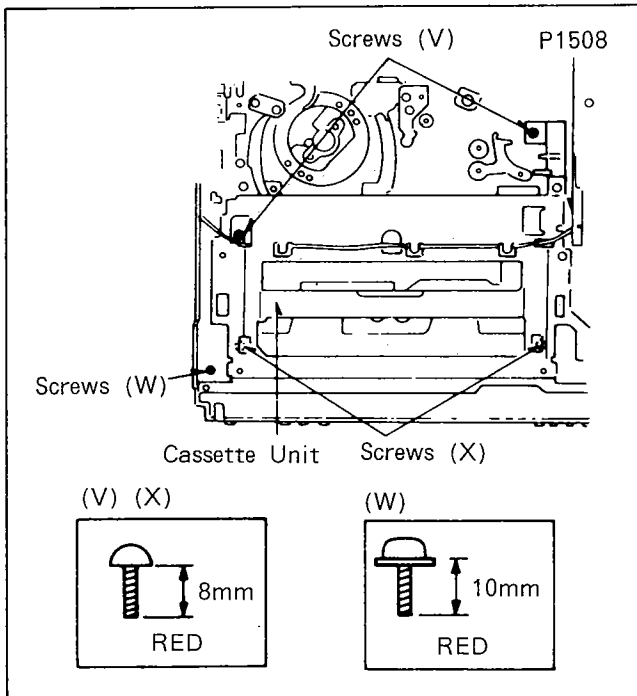


Figure D10

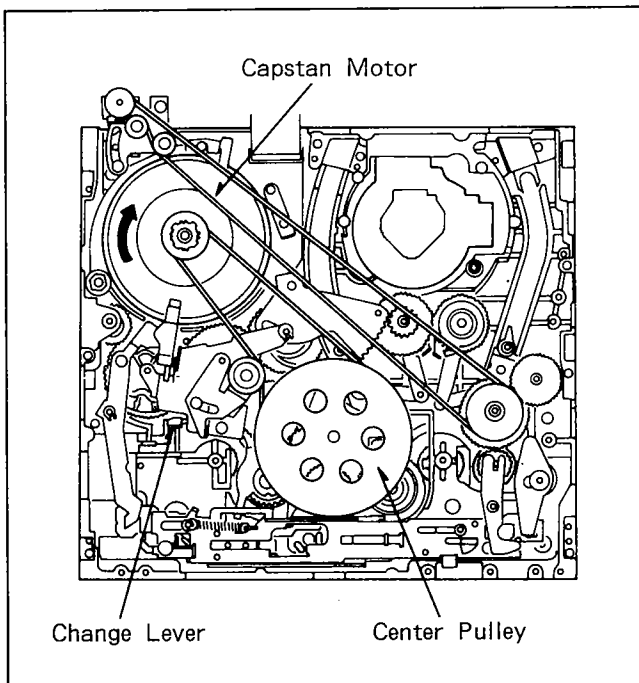


Figure D11

2-2. MAINTENANCE PROCEDURES

2-2-1. REGULAR MAINTENANCE

The purpose of periodic maintenance is to preserve the functioning of this machine throughout its useful life. The user or service dealer should perform these maintenance regularly to ensure that maximum utility is obtained from the machine.

The VCR is a complicated piece of equipment. It contains many belts, rollers, heads etc., which become worn, and deteriorate as time goes by, causing trouble. Dust and dirt will also impede the proper functioning of the machine. In light of this, it is very important that overall maintenance be done according to the maintenance chart to maintain the functions of the VCR, and to avoid accidental problems. This maintenance should also be performed after any repairs are done on the equipment.

The VCR used for business applications requires particular attention for several reasons. The installation conditions and applications are not always the best. Long use times, to poor environmental conditions may adversely affect the life-span and performance of the machine. Regular maintenance assures that the purchaser obtains the maximum value for his expenditure. Accordingly, the necessity of regular maintenance should be fully explained at the time of sale, as well as during after-sale repairs. Please note that the recommended maintenance schedule depends on temperature and humidity.

2-2-2. MAINTENANCE CHART

The following periodic maintenance is required to prolong the life of the machine.

Ref. No. In P/L	Parts Name	Hour										Ref. No. In P/L	Parts Name	Hour									
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000			500	1000	1500	2000	2500	3000	3500	4000	4500	5000
—	Tape Transporters	●	●	●	●	●	●	●	●	●	●	58 (1)	Inclined Base (S) U		■		■		■		■		○
34 (1)	A/C Head (1) U	●	●	●	●	●	●	●	○	●	●	62 (1)	Inclined Base (T) U		■		■		■		■		○
17 (1)	FE Head	●	●	●	●	●	●	○	●	●	74 (1)	Head Cleaning U		○		○		○		○		○	
7 (1)	Upper Cylinder U	●	○	●	○	●	○	●	○	○	●	55 (1)	Mode SW	●	●	●	●	●	●	●	○	●	●
6 (1)	Cylinder U	●	○	●	●	●	●	○	●	●	57 (1)	Reel Table U (S)	●	●	●	●	●	●	●	●	●	●	●
72 (1)	Housing Unit							○			61 (1)	Reel Table U (T)	●	●	●	●	●	●	●	●	●	●	●
41 (1)	Thrust Screw							○			142 (2)	Loading Cam Gear		■		■		■		■		■	
43 (1)	Oil Seal							○			111 (2)	Main Cam Gear		×		×		×		×		×	
133 (2)	Capstan Rotor Unit	●	●	●	●	●	●	○	●	●	24 (1)	Main Brake (S) U				○				○			
45 (1)	Pressure Roller U					○		○			27 (1)	Main Brake (T) U				○				○			
159 (2)	Rev Timing Belt					○		○			25 (1)	Soft Brake				○				○			
13 (1)	Tension Band U				○			○			96 (1)	Rev Motor U				○				○			
5 (1)	Earth Plate U				○			○															

Symbol	Maintenance	Requirement	Remark
●	Cleaning	Ethyl-alcohol or Cleaning Liquid (Purchase locally)	Wipe dirt from the parts using soft cloth impregnated with Ethyl-Alcohol. Note: When cleaning rubber parts, avoid using excessive alcohol since it may acceleratedeterioration of these parts. After cleaning with alcohol, wipe the alcohol quickly and thoroughly.
○	Replacement	—	
■	Greasing	Molytone Grease (Mor265)	Wipe the old grease and apply new grease.
×	Greasing	S.C.R. Grease (VFK0680)	Wipe the old grease and apply new grease.

2-2-3. PARTS LOCATION

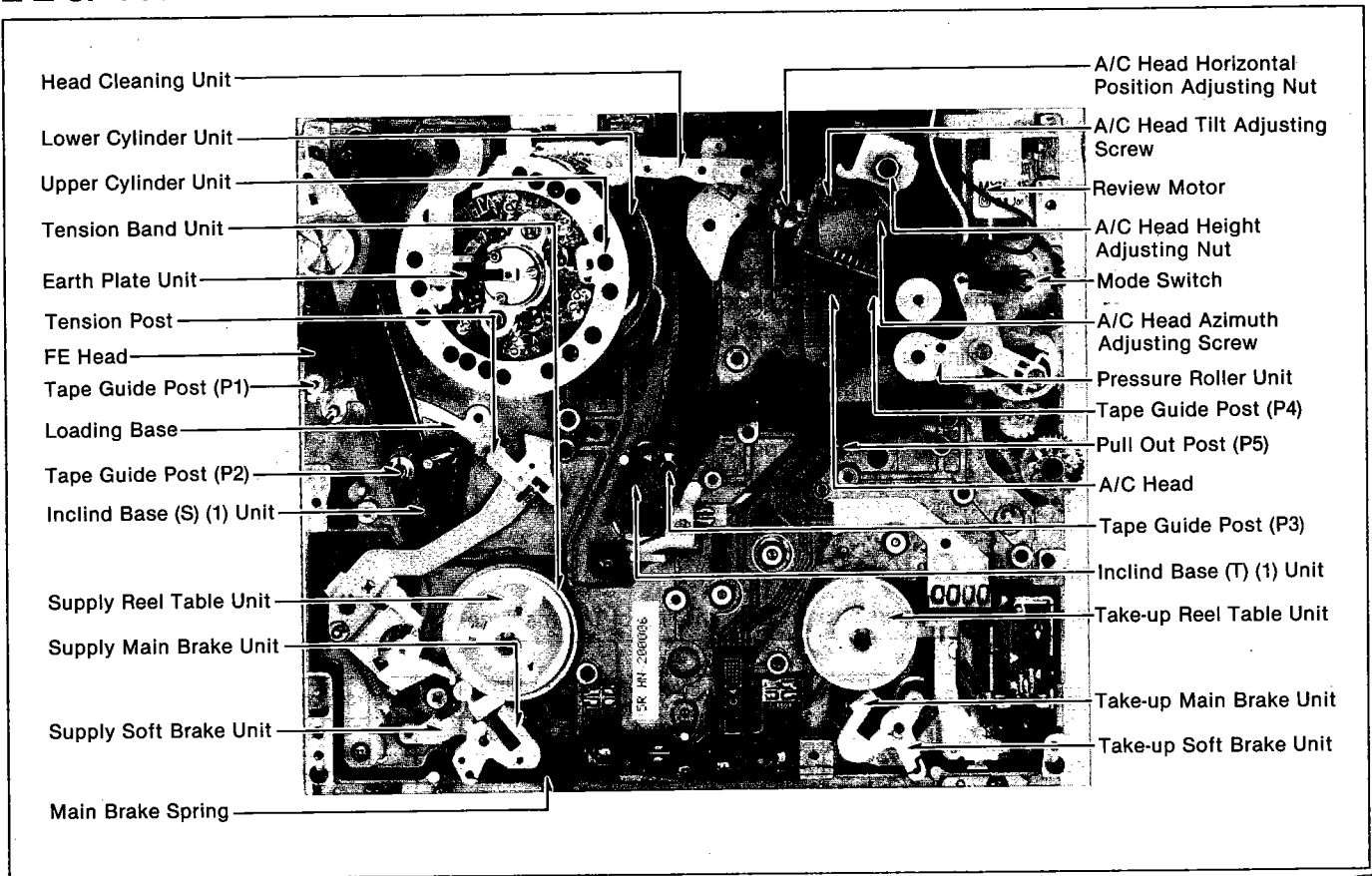


Figure MA1 Top View

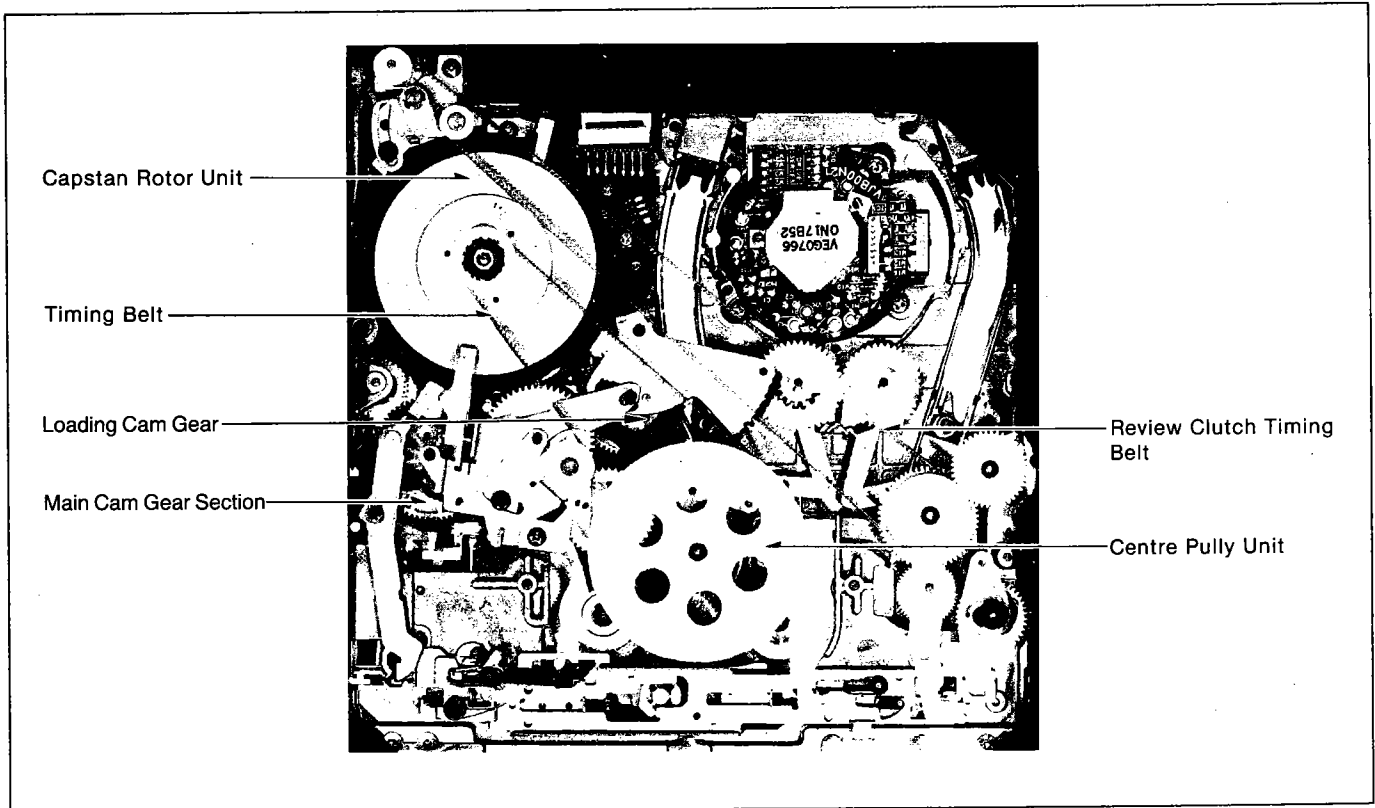


Figure MA2 Bottom View

2-2-4. HOW TO EJECT MANUALLY

If the electrical circuit is defective and the action of unloading and front unloading don't work properly, it is possible to eject manually as follows.

1. Take out the Main AC.
2. Release the Change Lever direction as shown in Figure MA3.
3. Turn the capstan motor to counter-clockwise slowly until the Clutch Disk is locked.
(Clutch Disk is locked once in one rotation)
4. Release the Change Lever again when the Clutch Disk is locked.
5. Repeat the step 2 and 3 until cassette is ejected.

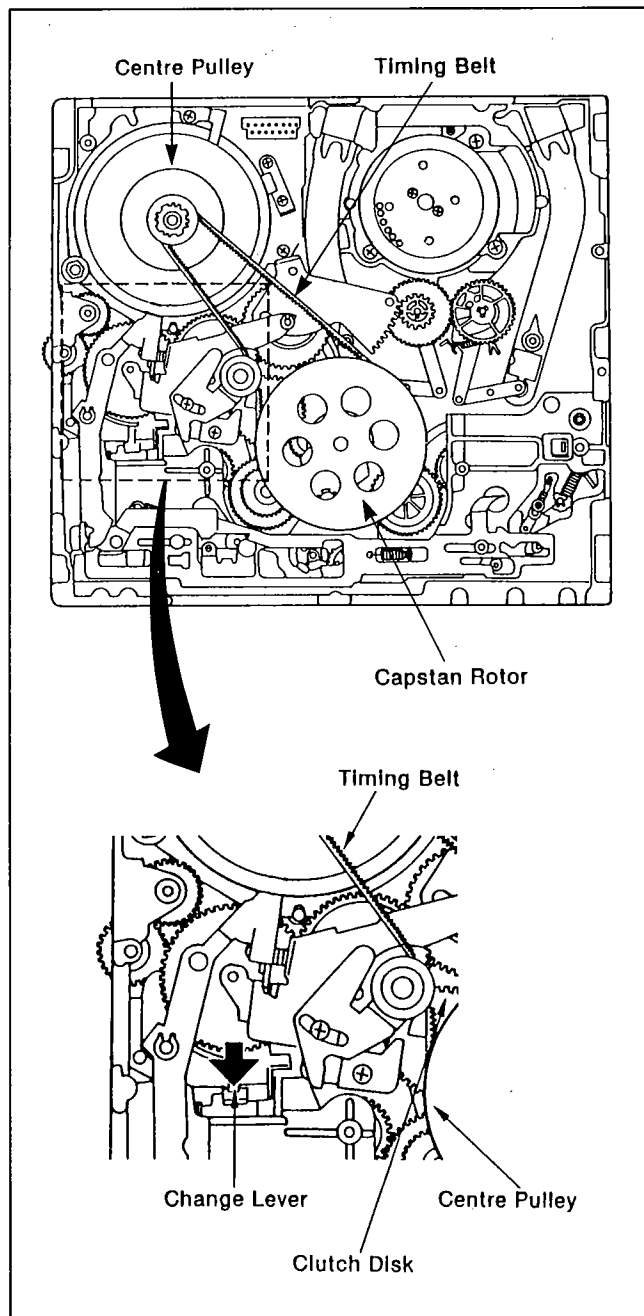


Figure MA3

2-2-5. HOW TO SEE THE MOVEMENT OF MECHANISM WITHOUT CASSETTE COMPARTMENT

Since capstan motor works as loading motor and front loading motor, phase relationship between cassette compartment and mechanism is important, so Playback and FF/REW can not be performed even just only taking out the cassette compartment, however, if you want to see the mechanical movement without cassette compartment, it is possible as follows.

1. Take out the Main AC.
2. Take out the 5 pin flexible cable from connector on the cassette compartment and remove the cassette compartment from chassis.
Set the Mechanism to stop (FF/REW) mode as following items 3.,4.,5.,6.
3. Release the change lever by pushing it to arrow mark direction as shown in Figure MA3.
4. Turn the capstan motor clockwise until the Clutch Disk is locked.
(Clutch Disk is locked once in one rotation)
5. Release the change lever again when Clutch Disk is locked.
6. Repeat item 4 and 5 until mechanism come to stop (sub loading) position as shown in Figure MA4. (STOP position is same as FF/REW position, therefore, when you rotate the capstan motor in STOP position, supply or Take up reel table is rotated corresponding with direction of rotation)
7. Turn the power on.
8. Now, any operation can be performed without cassette compartment.

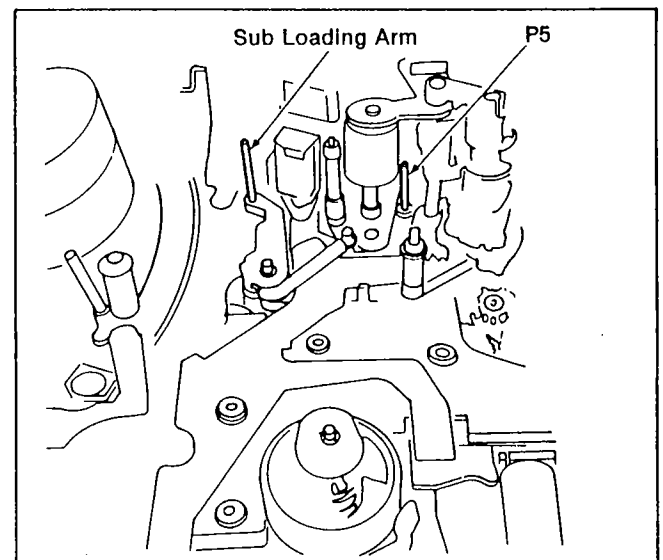


Figure MA4

<<Notes>>

1. Don't add the large torque to any gears not to break it.
2. When reinstalling the cassette compartment, refer to Reinstallation of Cassette Compartment procedures.
3. It is not possible to operate the mechanism from Eject position.

2-2-6. CYLINDER MAINTENANCE PROCEDURES

A. Replacement of the D.D. Cylinder Unit

Work with extreme care when removing or replacing the D.D. cylinder unit.

Do not touch the video head during servicing.

1. Remove the 2 screws (A) to take the Head Amp Pack Out.
2. Remove the 1 screw (B) to take the Earth Holder Unit Out.
3. Disconnect the 5P connector on the cylinder drive C.B.A.

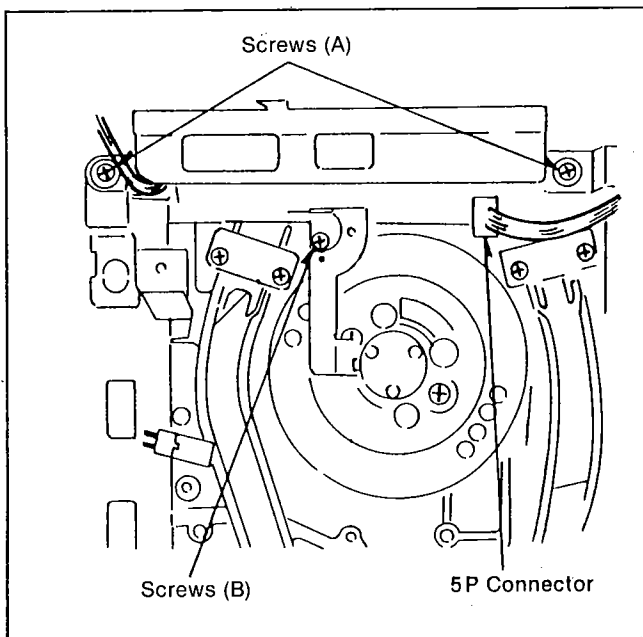


Figure MA5

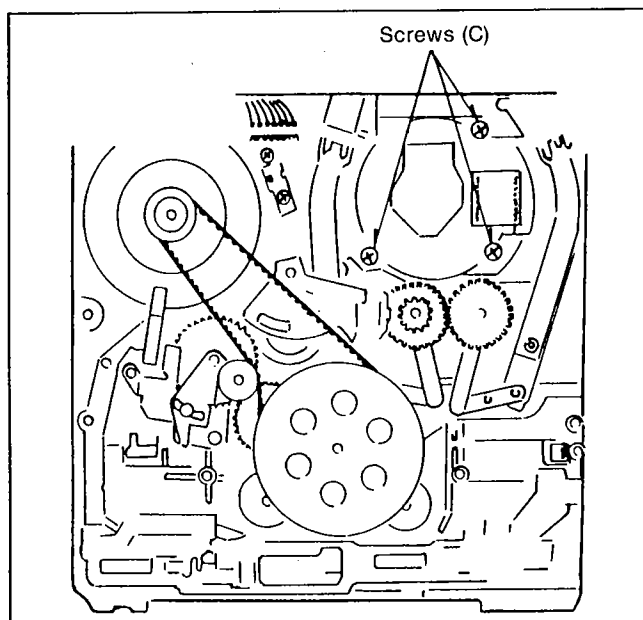


Figure MA6

4. Remove the 3 screws (C) to take the D.D. cylinder unit (with the cylinder drive C.B.A.) out.

<<Note>>

Since there is very little clearance between the D.D. cylinder unit and the chassis, remove the D.D. cylinder unit gently and carefully.

5. Reinstall the new D.D. Cylinder Unit, tighten the 3 screws (C) and reinstall the Earth Holder Unit, tighten the 1 screw (B). Then re-connect the Head Amp pack and 5P connector and tighten 2 screws (A).

<<Notes>>

1. Gently rub the video head in direction of tape travel with Head cleaning stick.
2. After replacement, maintenance is required, perform TAPE INTER-CHANGE ABILITY ADJUSTMENT.

B. Replacement of the Upper Cylinder Unit

1. Remove 2 screws as shown below.
2. Unsolder 16 soldered portions indicated by arrows on the C.Board.
3. Remove the Upper Cylinder Unit by lifting it upward.

<<NOTE>>

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

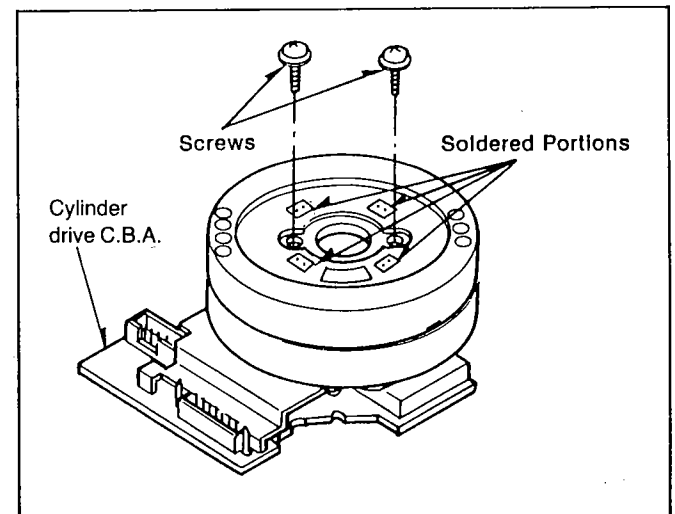


Figure MA7

4. The upper cylinder unit can be reinstalled by reversing the removal procedure, however, when the upper cylinder is reinstalled, be extremely carefully so that indication mark of C. Board of the upper cylinder correctly matches the indication mark of the bottom cylinder.

C. Adjustment After Re-Installing

Figure MA8 shows the order of steps for adjusting the mechanical and electrical.

These adjustments should be performed after completion of reinstalling the Upper Cylinder or Lower Cylinder Unit.

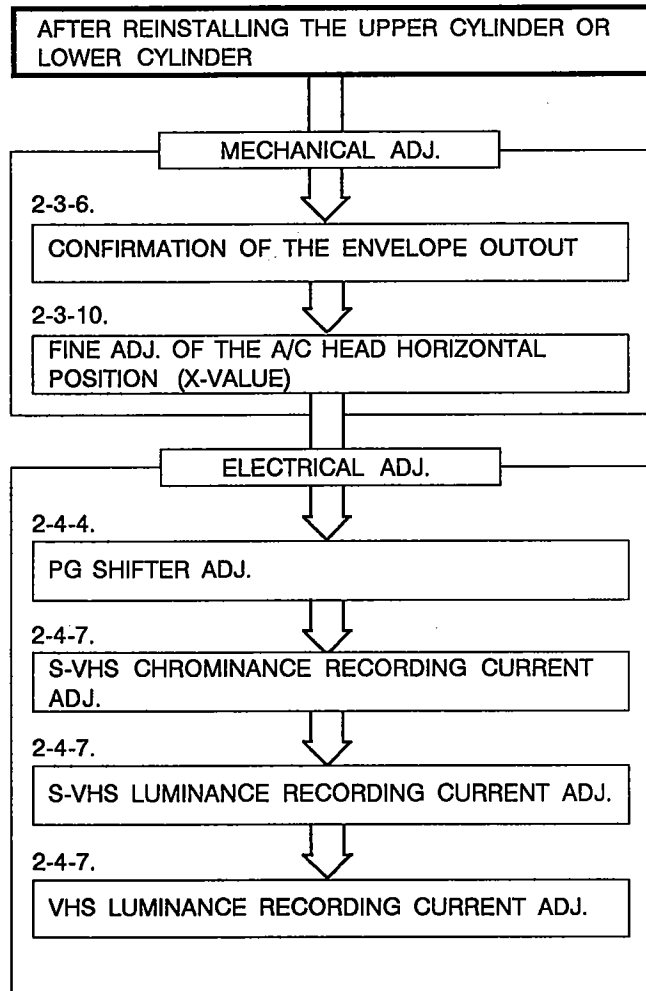


Figure MA8

2-2-7. A/C HEAD MAINTENANCE PROCEDURES

A. Replacement of the A/C Head Unit

1. Disconnect a connector (A).
2. Unscrew 2 screw (D), (E) with a spring and then remove the A/C Head Unit.
3. The new A/C Head Unit can be reinstalled by reversing the removal procedure.

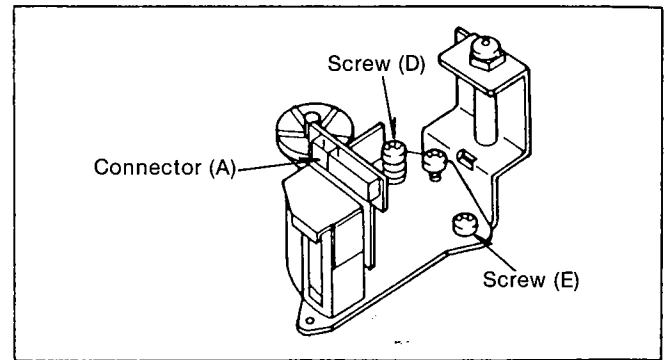


Figure MA9

B. Adjustment After Re-Installing

Figure MA10 shows the order of steps for adjusting the mechanical and electrical.

These adjustments should be performed after completion of reinstalling the A/C Head (1) Unit.

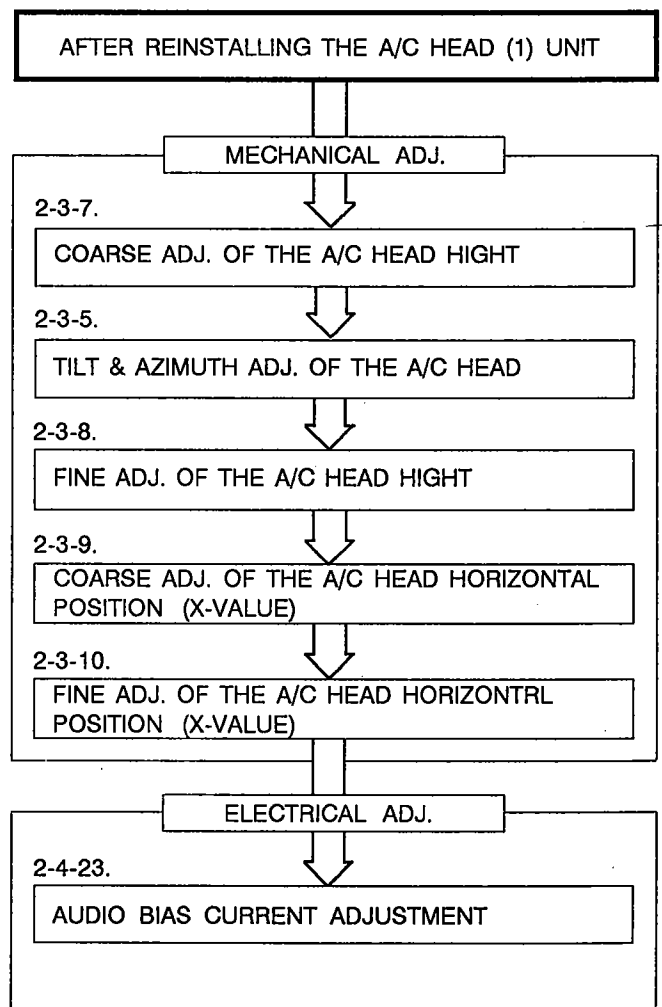


Figure MA10

2-2-8. FULL ERASE HEAD MAINTENANCE PROCEDURES

A. Replacement of the Full Erase Head

1. Disconnect a connector (B).
2. Unscrew a screw (F) and remove the Full Erase Head.
3. Unsolder the 2 Solder portions and remove the FE Head C.B.A. from the FE Head Unit.

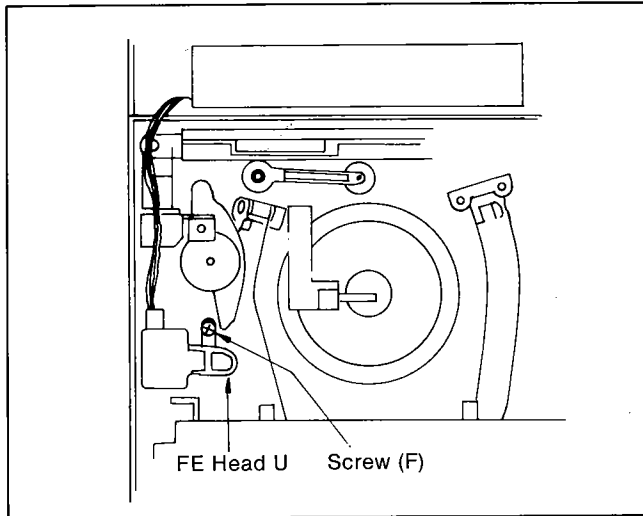


Figure MA11

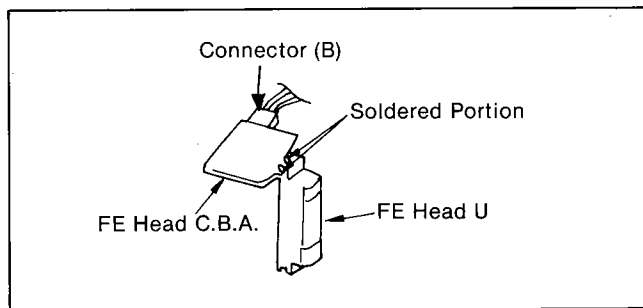


Figure MA12

4. The new Full Erase Head can be reinstalled by reversing the removal procedure.

2-2-9. PRESSURE ROLLER MAINTENANCE PROCEDURES

A. Replacement of the Pressure Roller Unit

1. Place the deck in STOP or EJECT mode.
2. Remove the Pinch Cam Cap.
3. Remove the pressure Roller Unit.

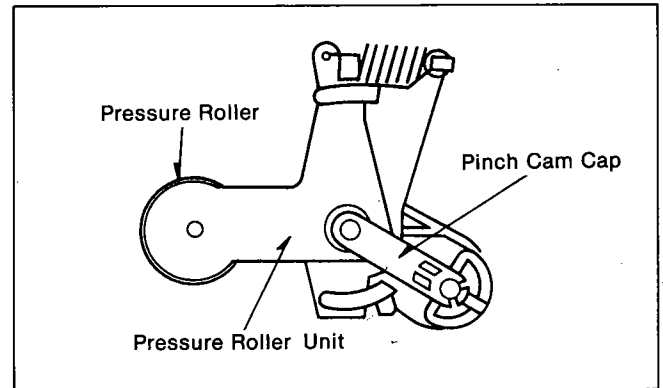


Figure MA13

4. The new Pressure Roller Unit can be reinstalled by reversing the removal procedure.

2-2-10. CAPSTAN HOUSING UNIT MAINTENANCE PROCEDURES

A. Replacement of the Capstan housing Unit

1. Remove the pressure Roller Unit.
2. Remove the Sub post spring.
3. Unscrew the 3 screws (G) and remove the Capstan Housing Unit.
4. Remove the 2 oil seal and thrust screw.

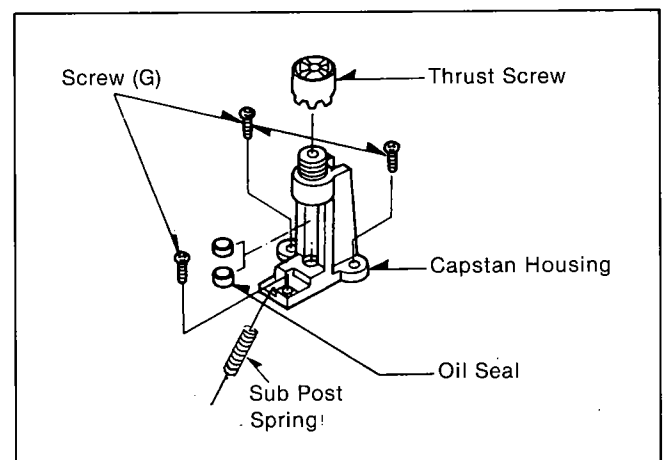


Figure MA14

5. Replace the new Capstan Housing 2 oilseal and thrust screw at same time.
6. Reinstall the Capstan Housing Unit by reversing the remove procedure.

2-2-11. REW TIMING BELT MAINTENANCE PROCEDURES

A. Replacement of the Rew Timing Belt

1. Remove a Cut Washer (A) and the tension release clutch unit.
2. Remove the Rev Timing Belt.

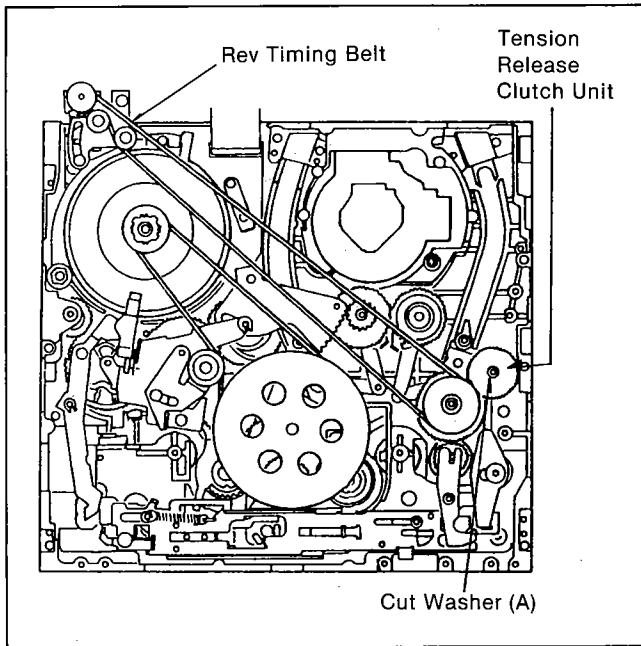


Figure MA15

3. The new Timing Belt can be reinstalled by reversing the removal procedure.

2-2-12. CAPSTAN ROTOR MAINTENANCE PROCEDURES

A. Replacement of the Capstan Rotor

1. Remove the Capstan Belt and the Rew Timing Belt.
2. Unscrew the 2 screws (H) and remove the Tension Pulley Base Unit.
3. Remove the Stator Nut.
4. Remove a C-Ring (A).
5. Unscrew a screw (I) and remove the SS brake Base Unit.
6. Pull out the Capstan Rotor.

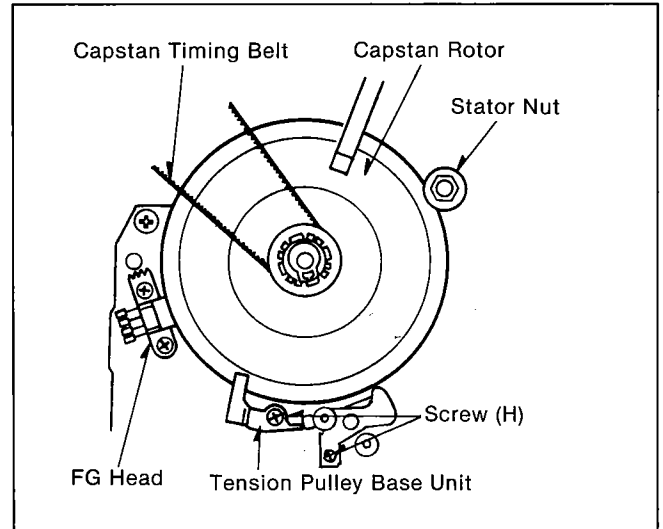


Figure MA16-A

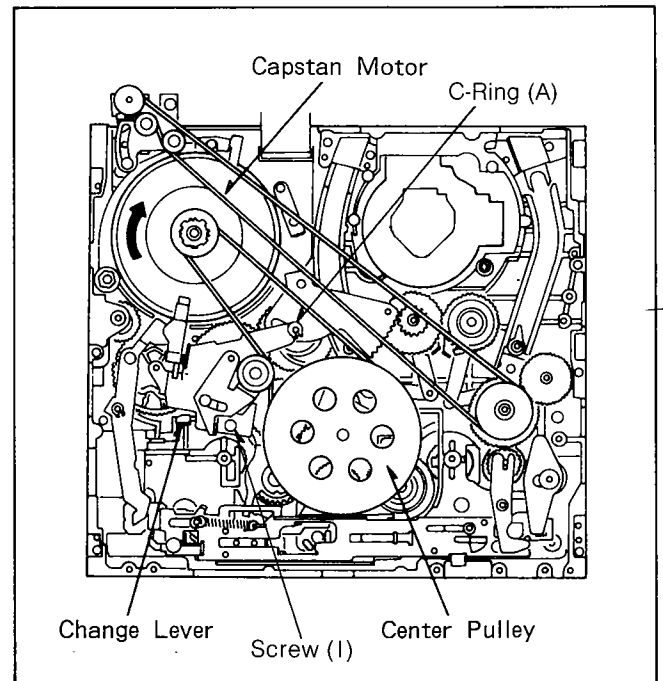


Figure MA16-B

7. The new Capstan Rotor can be reinstalled by reversing the removal procedure.

2-2-13. MAIN BRAKE (S), (T) UNIT MAINTENANCE PROCEDURE

A. Replacement of the Main Brake (S), (T) Unit

1. Remove the Main Brake (S), (T) with a spring.

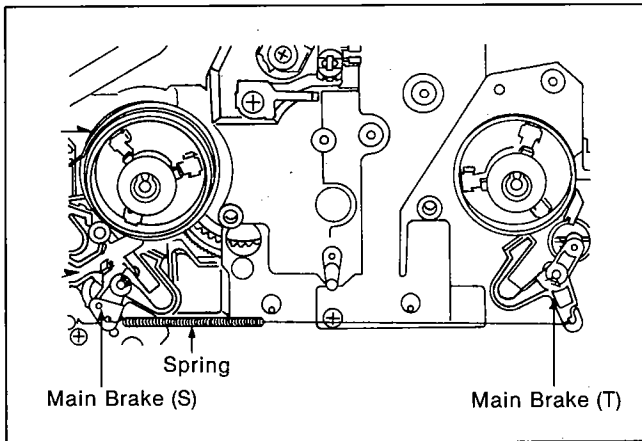


Figure MA17

2. The new Main Brake (S), (T) Unit can be reinstalled by reversing the removal procedure.

2-2-14. SUPPLY SOFT BRAKE MAINTENANCE PROCEDURES

A. Replacement of the Supply Soft Brake

1. Remove the Main Brake Unit.
2. Remove the Soft Brake Spring from chassis.
3. Remove the Soft Brake.

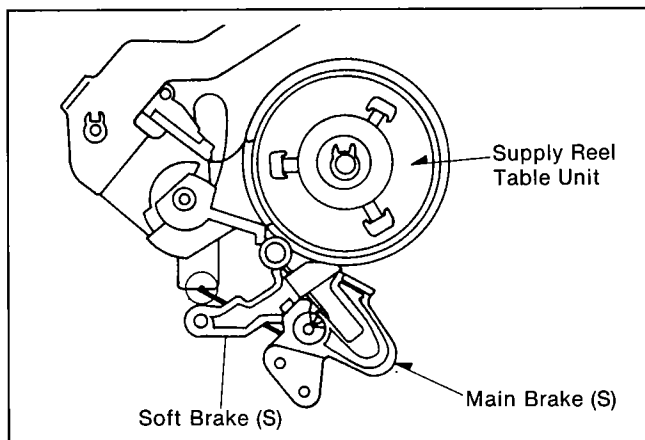


Figure MA18

4. The new Soft Brake can be reinstalled by reversing the removal procedure.

2-2-15. TENSION BAND UNIT MAINTENANCE PROCEDURES

A. Replacement of the Tension Band

1. Remove the Supply Main Brake and Supply Soft Brake.
2. Remove a C ring (A) and the Tension Spring.
3. Remove the Tension Arm Unit with Tension Band Unit.
4. Remove the Tension Band Unit from Tension Arm Unit.

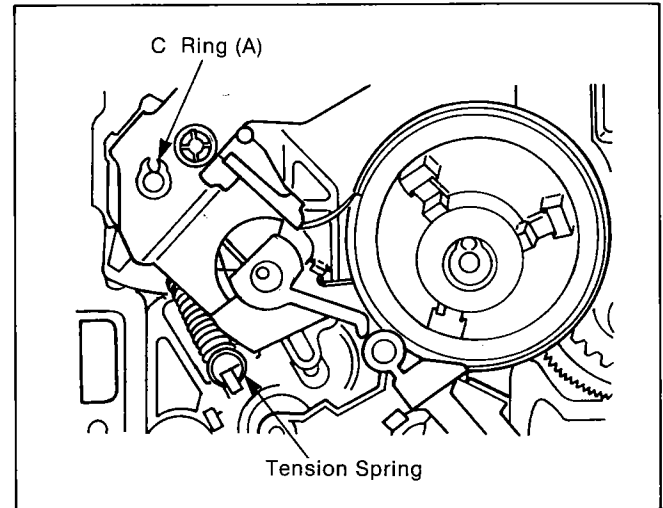


Figure MA19

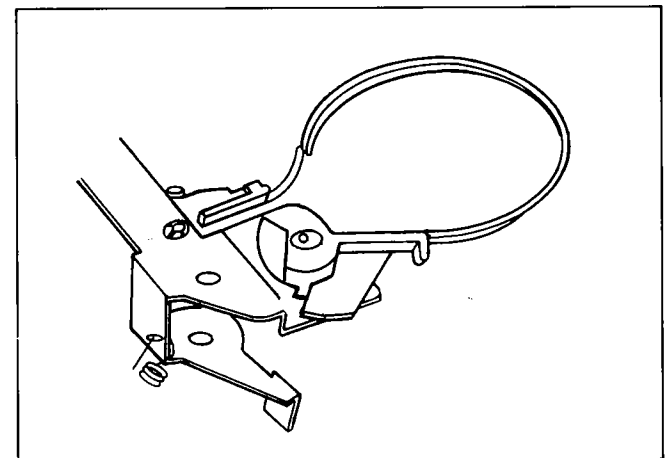


Figure MA20

5. The new Tension Band Unit can be reinstalled by reversing the removal procedure.

2-2-16. REV MOTOR UNIT MAINTENANCE PROCEDURES

A. Replacement of the Rev Motor Unit

1. Disconnect a (C) connector on the Rev Motor connection C.B.A. as shown in Figure MA21.
2. Unscrew 2 screw (A) and remove the Head Amp pack as shown in Figure MA5.
3. Unscrew 3 screw (J), (K), (L) and remove the Motor Mount Plate Unit as shown in Figure MA21.
4. Unsolder 2 solder portion (A) and Reel Motor Bracket Unit from Motor Mount Plate Unit as shown in Figure MA22.
5. Unscrew 2 screw (M) and remove the Rev Motor.

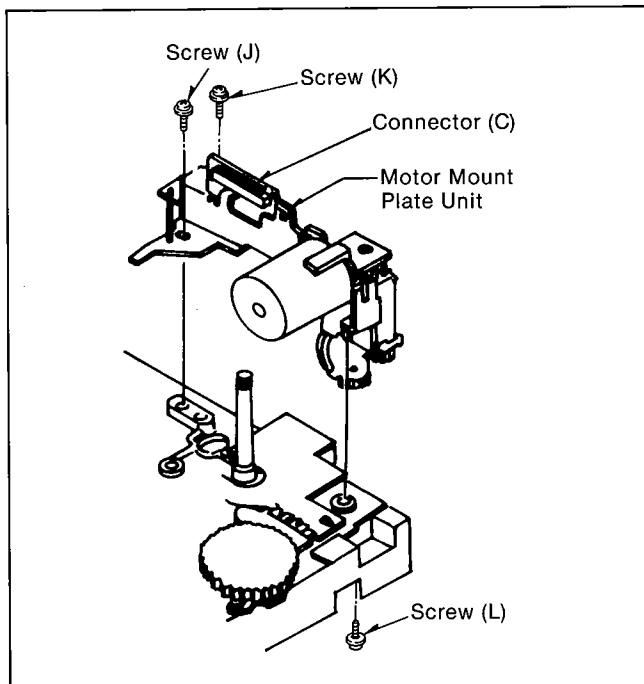


Figure MA21

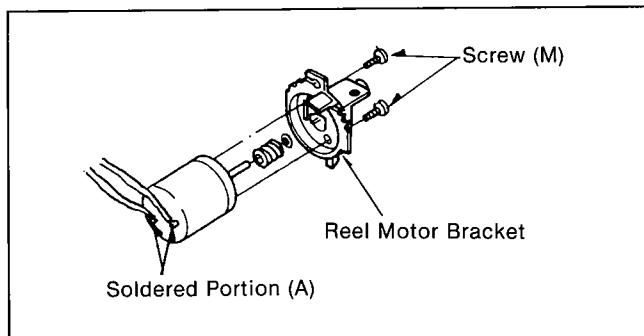


Figure MA22

6. The new Rev Motor can be reinstalled by reversing the removal procedure.

2-2-17. CLEANER ARM UNIT MAINTENANCE PROCEDURES

A. Replacement of the Cleaner Arm Unit

1. Hook the spring Arm (a) to lower side of Hook (b).
2. Unlock the locking portion (c) and then remove the Cleaner Arm Unit.
3. The new cleaner Arm Unit can be reinstalled by reversing the removal procedure.

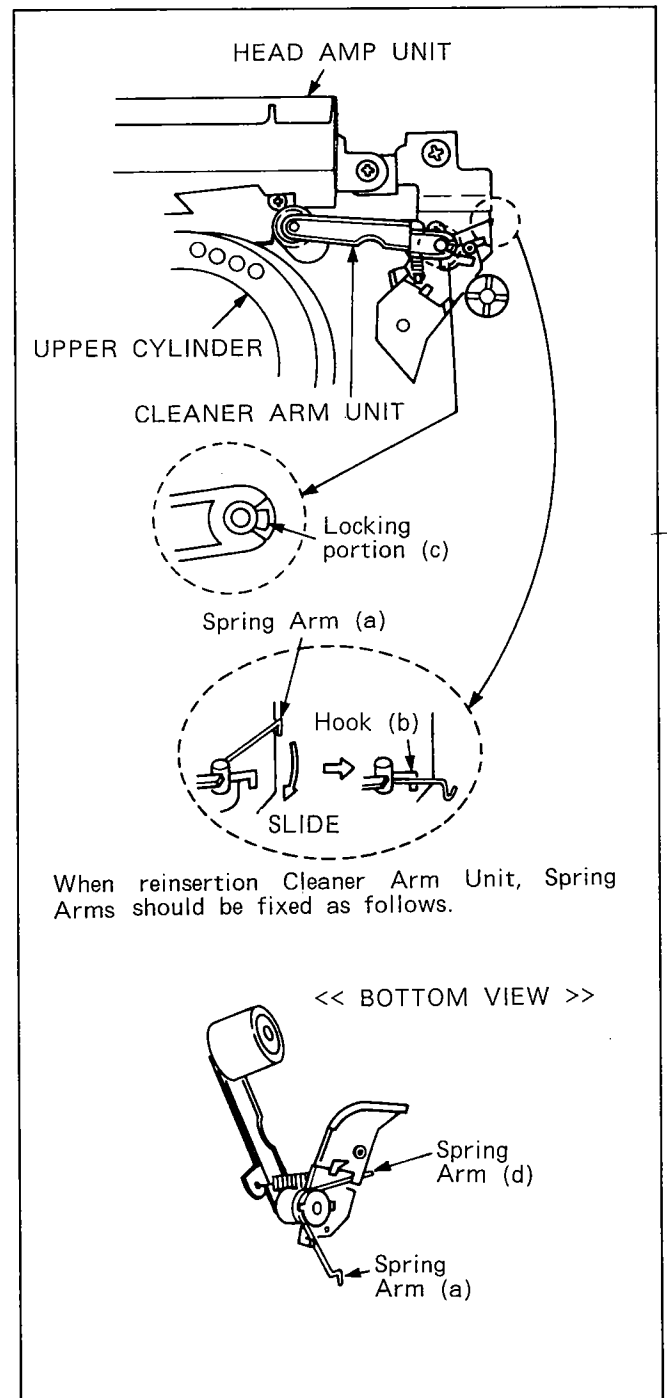


Figure MA23

2-2-18. MODE SWITCH MAINTENANCE PROCEDURES

A. Replacement of the Mode Switch

1. Place the deck in the STOP mode.
2. Remove the Cassette Compartment Unit.
3. Unscrew the 2 screws (A) and remove the Head Amp pack as shown in Figure MA5.
4. Unscrew the 3 screws and remove the Motor Mount Plate Unit as shown in Figure MA21.
5. Remove the Pinch Cam Cap and Pressure Roller Unit as shown in Figure MA13.
6. Remove the Pinch Cam.
7. Unscrew a screw (N) and unsolder 5 of solder portions.
8. Finally remove the Mode Switch.

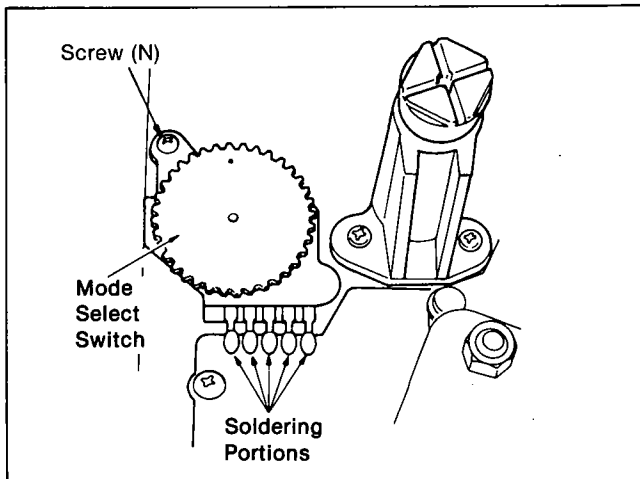


Figure MA24

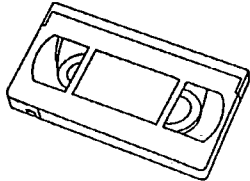
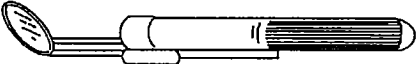


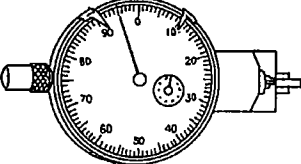
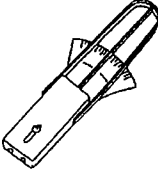
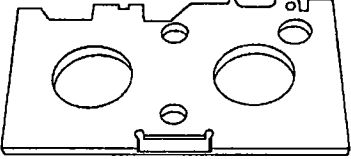
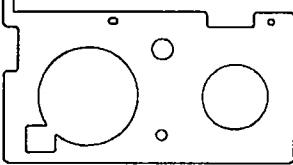
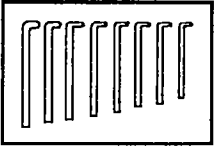
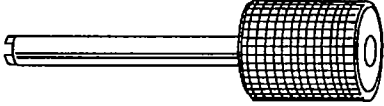
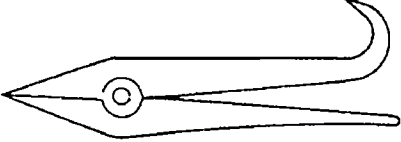
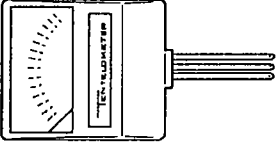
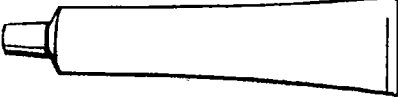
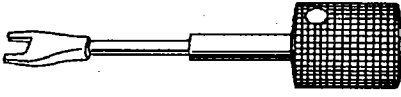
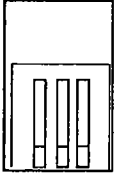
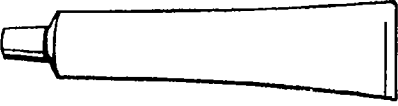
9. Install a Mode Switch and tighten screw (N), then solder 5 soldering portions.
10. Install the pinch Cam and Pressure Roller Unit.
11. Install the Motor Mount Plate Unit and tighten 3 screws (J), (K), (L).
12. Install the Cassette Compartment.

2-3. MECHANICAL ADJUSTMENT PROCEDURES

The regular maintenance is important to maintain the initial specification of the deck and to prevent tape damage. The specified servicing fixture must be used to conduct adjustment.

The following fixtures, tools and measuring equipments are required to conduct complete Mechanical Adjustment.

2-3-1. SERVICING FIXTURES & TOOLS

<p>VFM8080HQFP ; VHS Alignment Tape</p> 	<p>VFK0343 ; Check Light</p> 	<p>VFK0344 ; Post Height Adj. Fixture</p> 
<p>VFK0269 ; L Type Screwdriver</p> 	<p>VFK0190 ; Reel Table Height Fixture</p> 	<p>VFK66 ; Fan Type Tension Gauge</p> 
<p>VFK0191 ; Post Adjustment Plate</p> 	<p>VFK0387 ; Tension Post Adj. Fixture</p> 	<p>VFK0326 ; Hex. Wrench Set (0.7, 0.9, 1.2, 1.5, 1.6, 2.0, 2.4, 3.0mm)</p> 
<p>VFK0329 ; Post Adj. Screwdriver</p> 	<p>VFK0335 ; Retaining Ring Remover</p> 	<p>VFK0132 ; Back Tension Meter (Tentelometer, Made in U.S.A.)</p> 
<p>MOR265 ; Morlytone Grease (Black) (for metal part)</p> 	<p>VFK0328 ; H-Position Adj. Screwdriver</p> 	<p>VFK27 ; Head Cleaning Stick</p> 
<p>VFK0680 ; S.C.R. Grease (White) (for plastic part)</p> 	<p>Cleaning Liquid (Alcohol)</p> <p><<PURCHASE LOCALLY>> (Tape Transport Rubber Parts etc.)</p>	

2-3-2 TAPE INTERCHANGEABILITY ADJUSTMENT PROCEDURES

A. ADJUSTMENT FLOW CHART

This flow chart describes the order of steps for adjusting the tape guide posts and A/C head in order to gain access to the items needing servicing. (Figures M1)

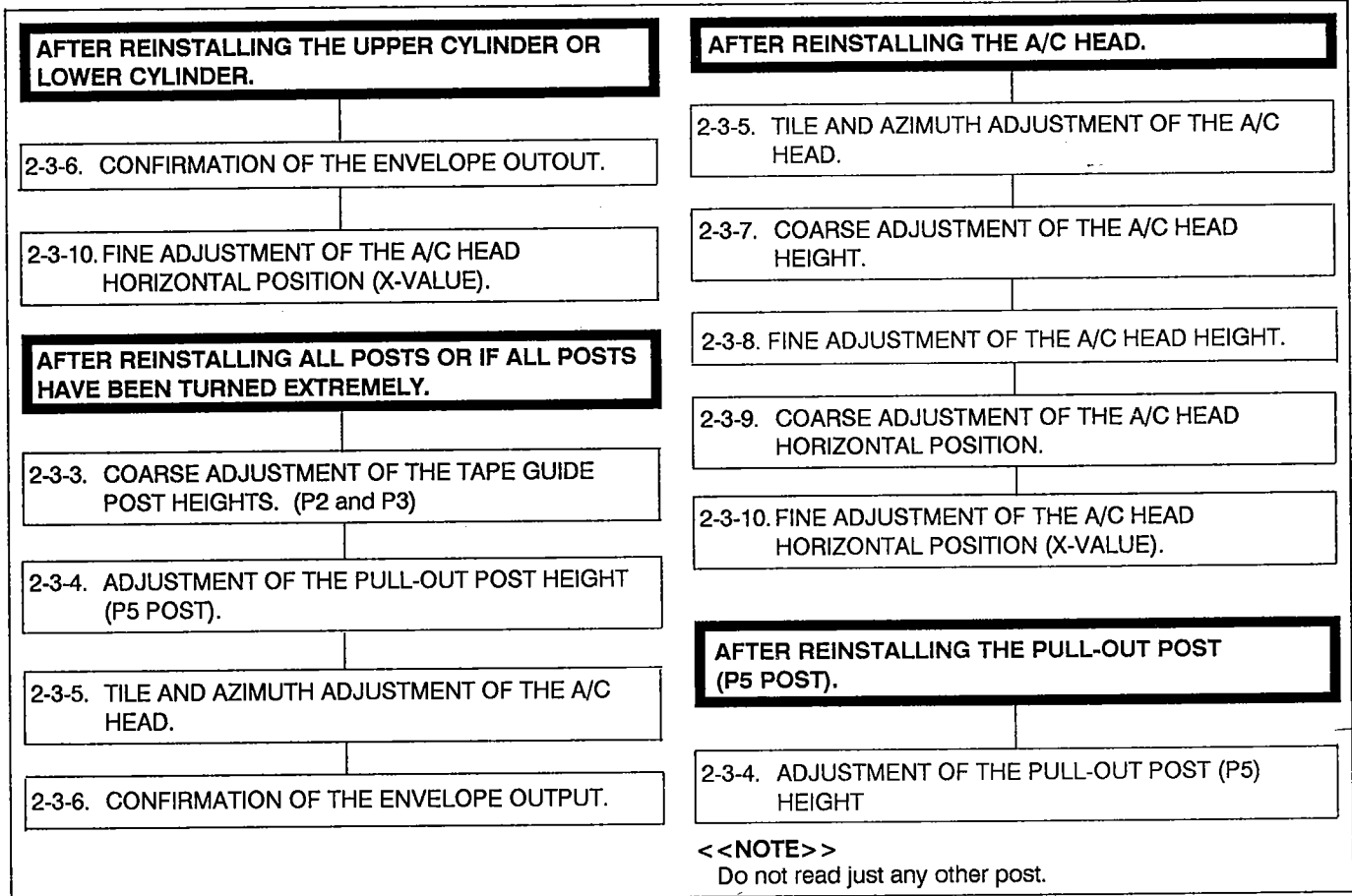


Figure M1

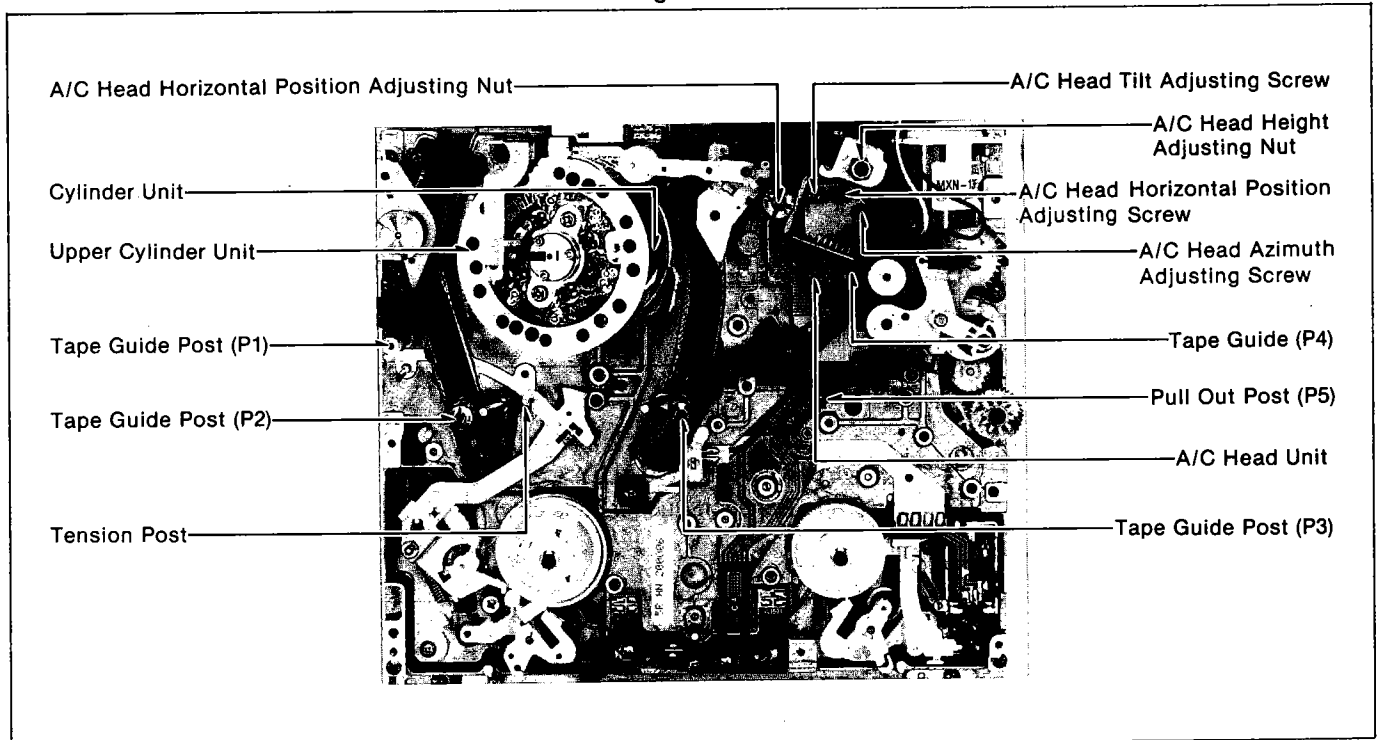


Figure M2 Parts Location

2-3-3. COARSE ADJUSTMENT OF THE TAPE GUIDE POST HEIGHTS (P2 and P3)

<<NOTES>>

1. The Tape Guide Posts have been precisely adjusted at the factory.
Therefore, normally do not change the height of the P2 and P3 Posts.
The following adjustment is required only when replacing the posts.
2. To prevent the alignment tape from being damaged, use a normal cassette tape for this procedure.

<<TOOLS>>

Post Adjustment Plate; VFK0191
Reel Table Height Gauge; VFK0190
Post Adjustment Screwdriver; VFK0329
L Type Adjustment Screwdriver; VFK0269

1. Remove the cassette compartment.
2. Place the Post Adjustment Plate over the reel tables. Confirm that the Post Adjustment Plate is firmly seated as shown in Figure M3.

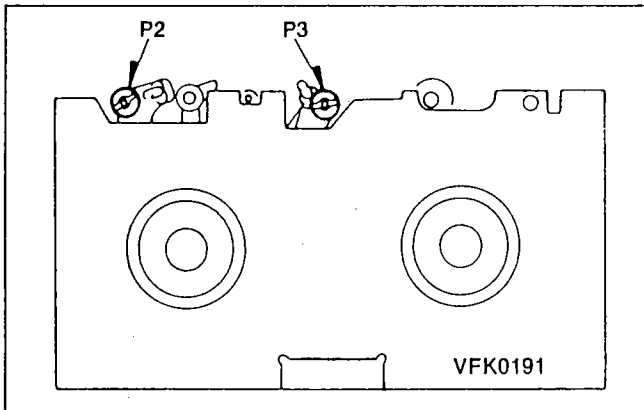


Figure M3

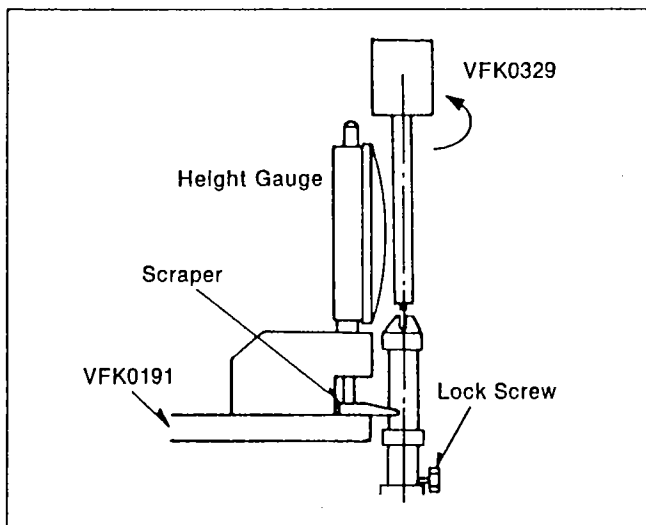


Figure M4

3. Lower 2 tape guide posts (P2 and P3) by turning the Post Adjustment screwdriver so that the condition of height becomes as shown in Figure M4. That is, the lower edge of Tape guide should be lower than surface of Adjustment Plate.

<<NOTE>>

Before turning P2 and P3 posts, slightly loosen the Lock Screw using the L Type Screwdriver.

4. Place the scraper of Reel Table Height Gauge as shown in Figure M5. Set the gauge to zero, then raise the post slowly until the lower tape guide just touches the bottom of the scraper. Use the gauge to determine the exact point at which the lower tape guide touches the scraper.

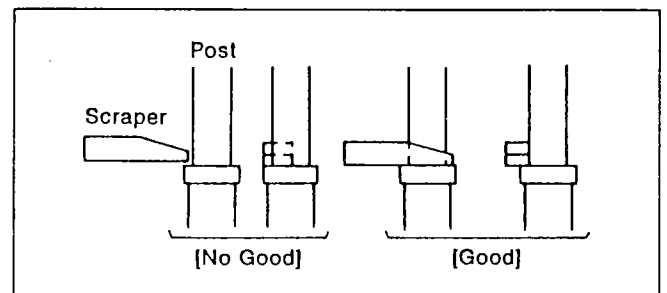


Figure M5

<<NOTE>>

After the adjustment, install the cassette compartment referring to Reinstallation of cassette compartment procedures.

2-3-4. ADJUSTMENT OF THE PULL-OUTPOST HEIGHT (P5 POST)

<<TOOLS>>

Post Adjustment Plate; VFK0191
Reel Table Height Gauge; VFK0190
Nut Driver; (Purchase locally)

<<SPECIFICATION>>

-0.06mm +/- 0.01mm

<<NOTE>>

Unless the replacement or adjustment this post is required, the adjustment nut should not be turned.

1. Remove the cassette compartment.
2. Place the Post Adjustment Plate over the reel tables.

- Turn the Capstan Motor counterclockwise (loading direction) until the mechanical condition becomes as shown in Figure M6.

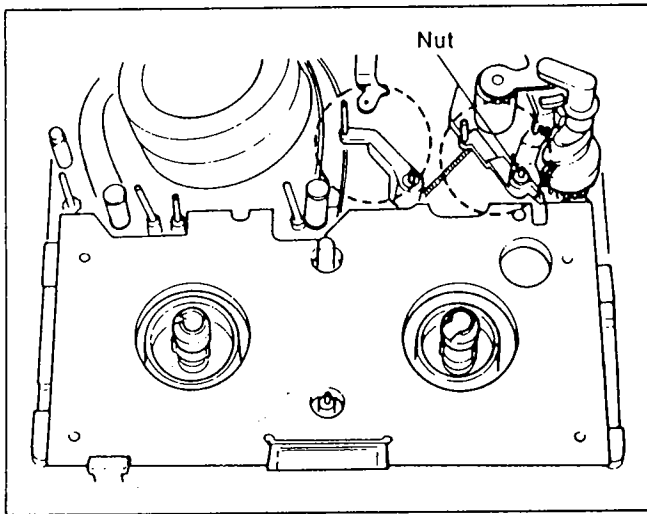


Figure M6

- Place the Reel Table Height Gauge on the Post Adjustment Plate and set the gauge to zero "0" as shown in Figure M7.

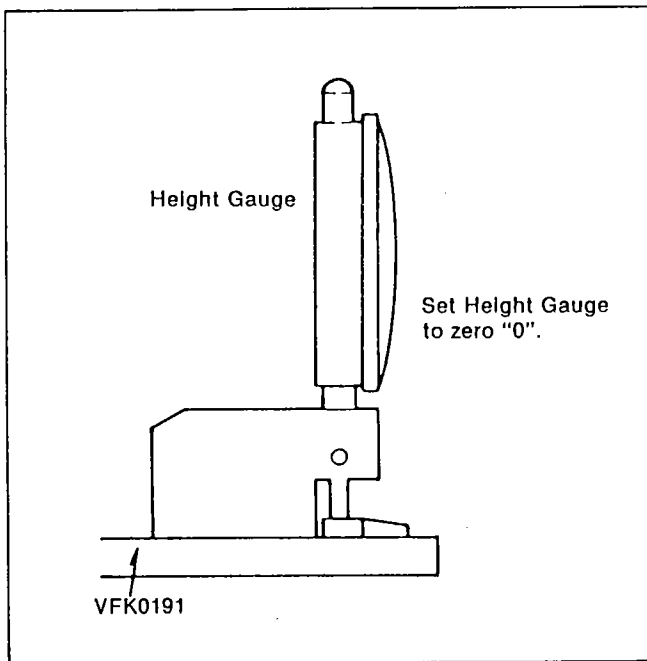


Figure M7

- Place the Reel Table Height Gauge as shown in Figure M8 and turn the nut slowly until the gauge reads -0.06mm +/- 0.01mm.
- After the adjustment, install the cassette compartment. (Refer to Reinstallation of Cassette Compartment procedures).

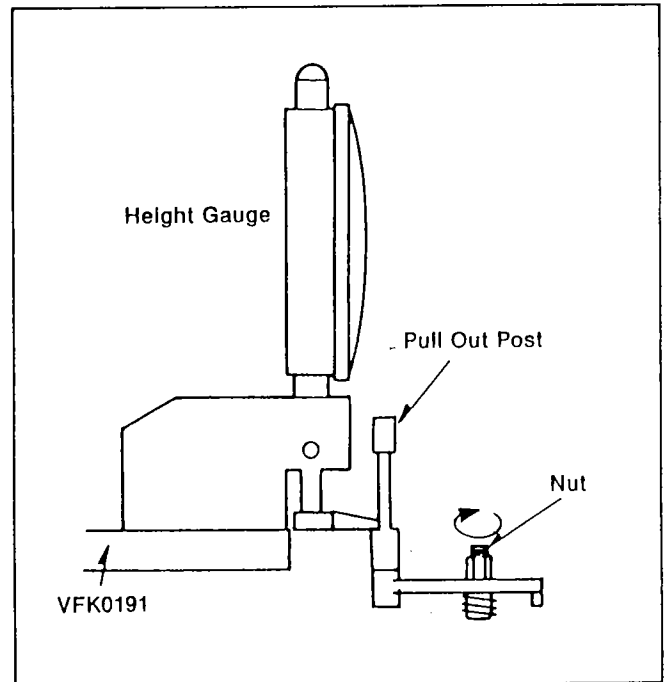


Figure M8

- Play back a normal cassette tape and make sure that the edges of the tape are not curling at the bottom or top end of the posts P1, P2, P3, P4 and pull out post as shown in Figure M9 and M10.

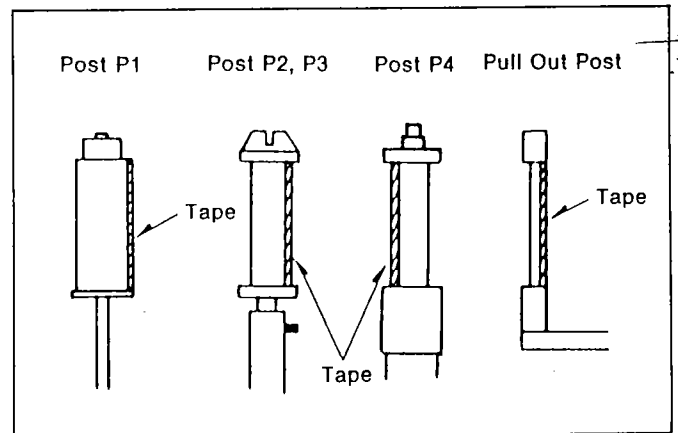


Figure M9

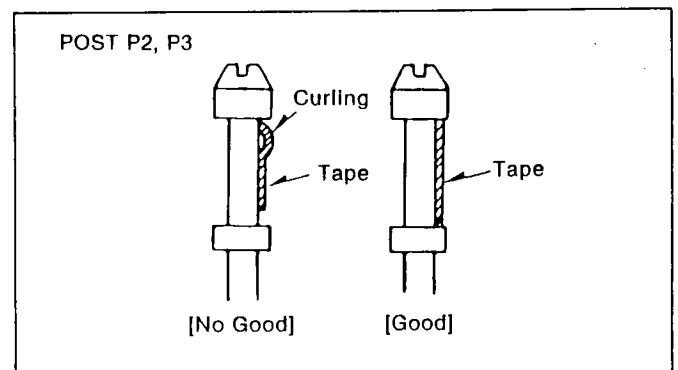


Figure M10

- If curling appears, readjusts each post (except P1, P4).

2-3-5. TILT AND AZIMUTH ADJUSTMENT OF THE A/C HEAD

<<NOTE>>

This procedure should be performed only when the A/C Head is replaced and posts high are readjusted.

<<TOOLS>>

Alignment Tape; VFM8080HQFP
Check Light; VFK0343

1. Connect the oscilloscope to the audio output on the rear panel.
2. Play back the 2nd portion (Normal Audio 10KHz) of the alignment tape (VFM8080HQFP).
3. Adjust the screw (H)(Figure M11) so that the output level becomes maximum as shown in Figure M12.

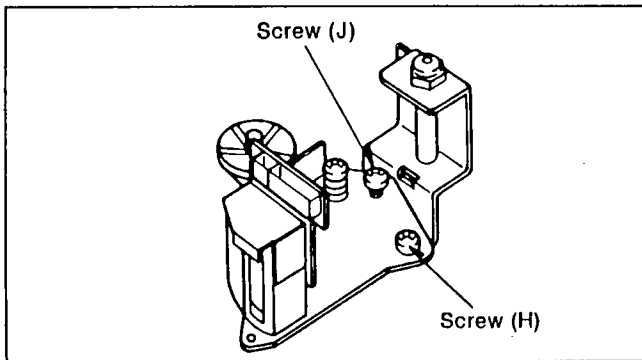


Figure M11

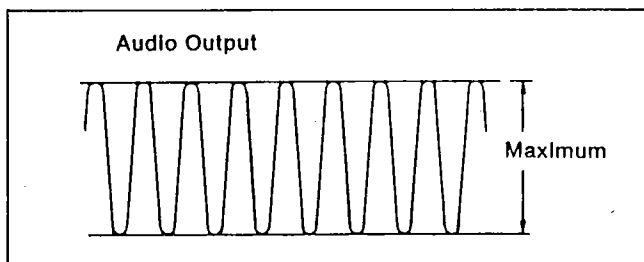


Figure M12

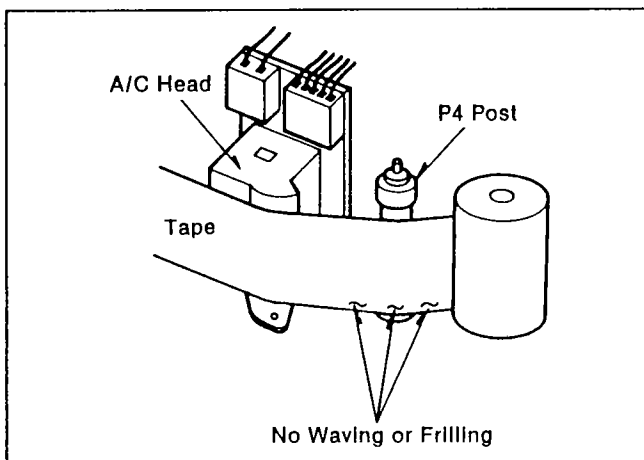


Figure M13

4. Adjust the screw (H)(Figure M11) so that the output level becomes maximum as shown in Figure M12.
5. Confirm that the tape runs around lower limiter of P4 post by using the Check Light.
6. If there is waving or frilling in the lower edge (Figure M13), then repeat step 3 to 4.

<<NOTE>>

After Tilt adjustment of A/C head, height adjustment of A/C head is required.

2-3-6. CONFIRMATION OF THE ENVELOPE OUTPUT

<<TOOLS>>

Alignment Tape; VFM8080HQFP
Post Adjustment Screwdriver; VFK0329

<<NOTE>>

Before playing back the alignment tape, playback a normal cassette tape and confirm correct transport.

1. Connect a jumper wire between (A) and (B) on the Main C.B.A. as shown in Figure 14.

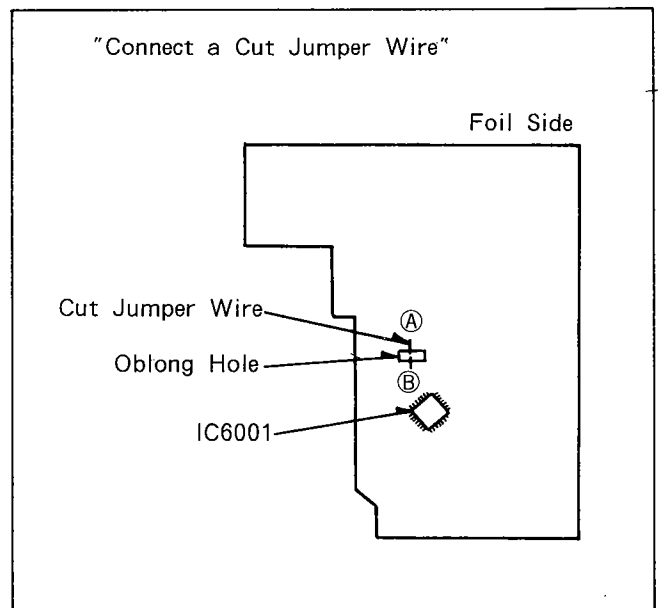


Figure M14

2. Connect the scope to test point of video FM envelope and test point of head switching pulse to Ext-Trigger the scope.
3. Playback the 1-st portion (Monoscope 1) of the alignment tape VFM8080HQFP.
4. Press the Tracking Control Button and adjust for maximum VIDEO FM envelope.

- If the RF envelope appears like example "A" or "B" in Figure M15 then adjustment of the tape guide post (P2 : Entrance) is necessary.
- Adjust the tape guide post (P2) with the post adjustment screwdriver so that the RF envelope waveform at the entrance portion becomes flat as shown in Figure M15-"C".

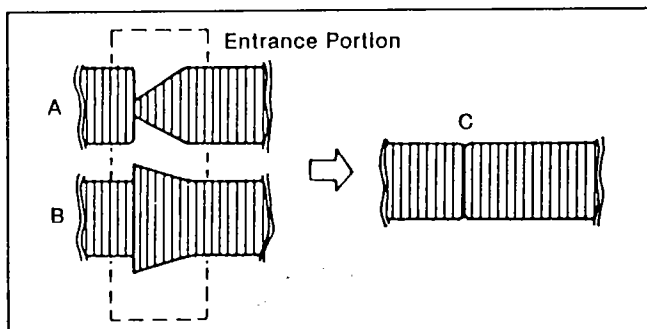


Figure M15

- If the RF envelope appears like example "D" or "E" in Figure M16, then adjustment of the tape guide post (P3 : Exit) is necessary.
- Adjust the tape guide post (P3) in the same manner as the P2 post so that the exit portion becomes flat as shown in Figure M16-"F".

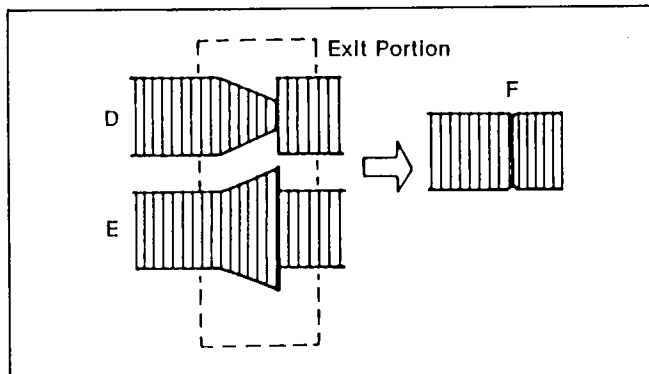


Figure M16

- Press the (+) side and (-) side of Tracking Button simultaneously. The output envelope should vary nearly parallel with other condition as shown in Figure M16.
- Press the Tracking Button into center fix position and adjust for maximum RF envelope. If the RF envelope does not meet these specifications.

$$\begin{aligned} V1/V0 &\geq 0.7 \\ V2/V0 &\geq 0.8 \\ V3 &\geq 0.7 \end{aligned}$$

then repeat steps 1-9 again.

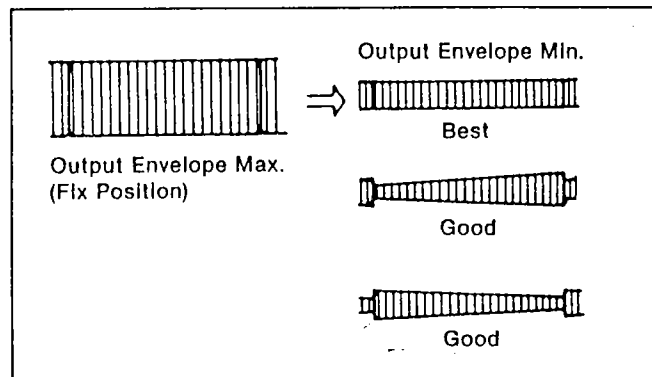


Figure M17

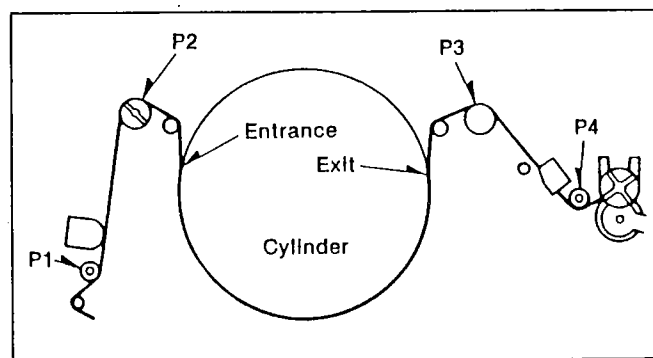


Figure M18 Loading of Posts

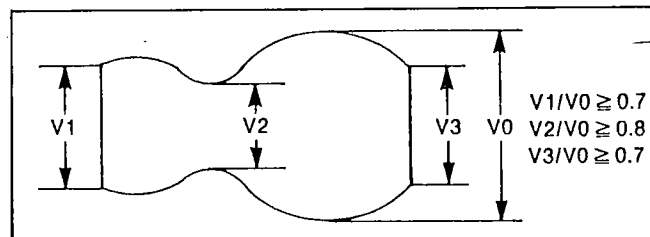


Figure M19 Spec. of Envelope Figure

2-3-7. COARSE ADJUSTMENT OF A/C HEAD HEIGHT

<<NOTE>>

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

<<TOOLS>>

Check Light; VFK0343
Nut Driver; (Purchase locally)

With the tape running, look at the lower edge of the control head by using the check light and check if the lower edge of tape runs along the lower edge of the control head. If it doesn't slightly turn the nut (K) behind the A/C Head (Figure M20) to either lower or raise the A/C head so that the tape runs along the lower edge of the control head. Turn the nut (K) clockwise to lower the head, and counter-clockwise to raise it.

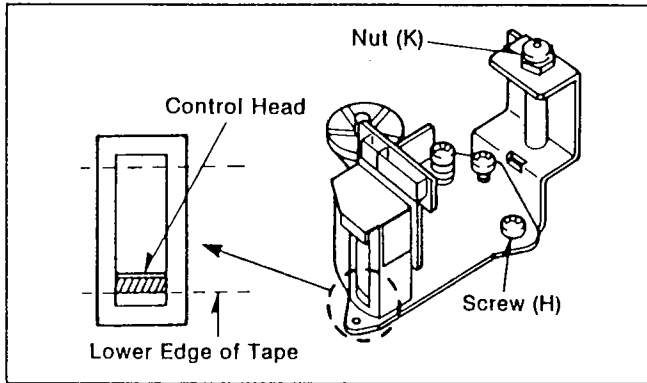


Figure M20

2-3-8. FINE ADJUSTMENT OF THE A/C HEAD HEIGHT

<<NOTE>>

When the A/C head is replaced, the coarse adjustment of the A/C head height is required before performing this fine adjustment.

<<TOOLS>>

Alignment Tape; VFM8080HQFP
Nut Driver; (Purchase locally)

1. Connect the oscilloscope to the audio output on the rear panel.
2. Play back the 2-nd portion (Normal Audio 10KHz) of the alignment tape (VFM8080HQFP).
3. Adjust the nut (K)(Figure M20) so that the envelope becomes maximum.

2-3-9. COARSE ADJUSTMENT OF THE A/C HEAD HORIZONTAL POSITION

<<NOTE>>

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

<<TOOLS>>

H-Position Adjustment Screwdriver; VFK0328
Alignment Tape; VFM8080HQFP

1. Connect a jumper wire between (A) and (B) on the Main C.B.A. as shown in Figure M14.
2. Press the Tracking Control Button and fixed to center detent position.
3. Connect the scope to test point of video FM envelope and scope CH2 to the Audio Output on the rear panel.
4. Playback the 4-th position (Monoscope 3 and Audio / Every 10-th field is skipped) of the Alignment tape VFM8080HQFP.
5. Adjust A/C head horizontal position screw (Figure M21) so that the phase of audio drop out and video RF envelope drop-out becomes the same. (Figure M22)

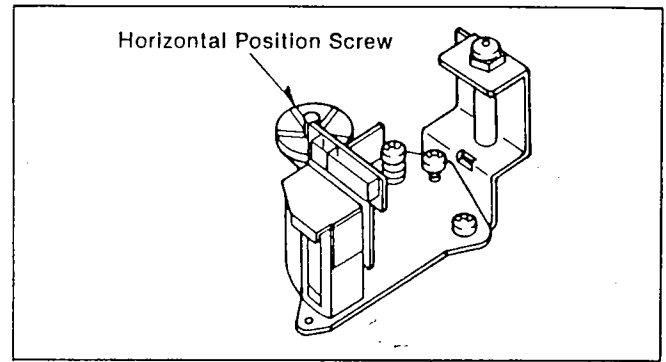


Figure M21

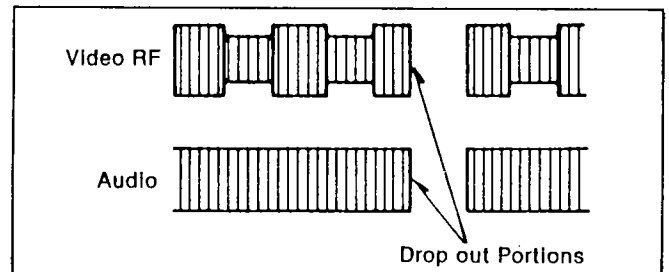


Figure M22 Horizontal Position Adjustment of A/C Head

<<NOTE>>

After completion the fine adjustment of the A/C head horizontal position, the phase of Audio drop-out and Video RF envelope drop-out may be changed slightly.

2-3-10. FINE ADJUSTMENT OF THE A/C HEAD HORIZONTAL POSITION (X-VALUE)

<<NOTE>>

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

<<TOOLS>>

H-Position Adjustment Screwdriver; VFK0328
Alignment Tape; VFM8080HQFP

1. Connect a jumper wire between (A) and (B) on the Main C.B.A. as shown in Figure M14.
2. Press the Tracking Control Button and fixed to centre position.
3. Connect the oscilloscope to test point of video FM envelope.
4. Play back the 1-st portion of the alignment tape (VFM8080HQFP).
5. Adjust the Horizontal Position Screw of A/C head so that the RF signal becomes maximum level.

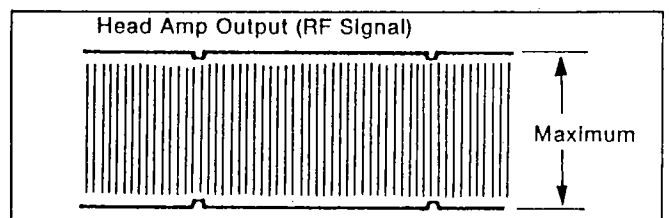


Figure M23

2-3-11. TENSION ADJUSTMENT OF TIMING BELT

<<TOOLS>>

Fan Type Tension Gauge; VFK66

<<SPECIFICATION>>

40g +/- 5g

1. Loosen a screw (A) slightly by using the screwdriver.
2. Set the Fan Type Tension Gauge to the direction indicated by the arrow (B) as shown in Figure M24.
3. Tighten a screw (A) when the reading of the Fan Type Tension Gauge becomes within 40g +/- 5g.

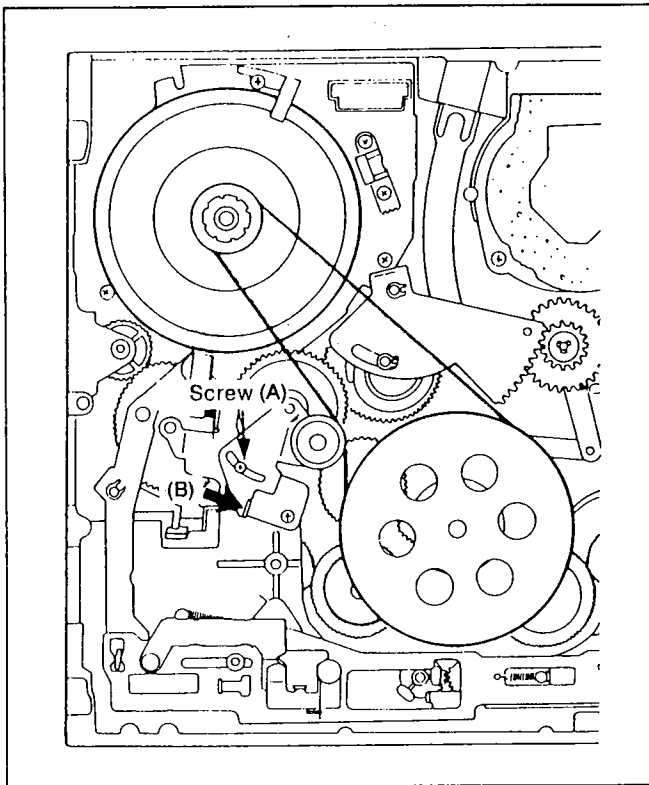


Figure M24

2-3-12. TENSION ADJUSTMENT FOR REV MOTOR TIMING BELT

<<TOOLS>>

Fan Type Tension Gauge; VFK66

<<SPECIFICATION>>

225g +/- 25g

1. Loosen a screw (C) by using the screwdriver.
2. Set the Fan Type Tension Gauge to the direction indicated by arrow (D) as shown in Figure M25.
3. Tighten a screw (C) when the reading of the Fan Type Tension Gauge becomes within 255 +/- 25g.

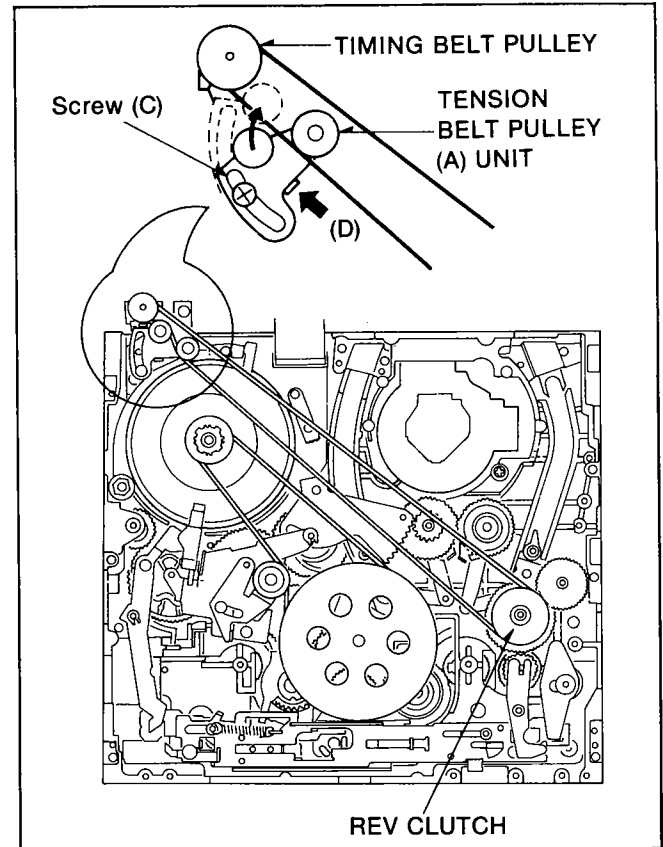


Figure M25

2-3-13. POSITION ADJUSTMENT OF TENSION POST

<<Equipment Required>>

Tension Post Adjustment Plate; VFK0387

Hex. Wrench:2mm(Hex Wrench Set); VFK0326

1. Disconnect the AC plug.
2. Remove the cassette compartment.
3. Turn the Capstan Motor to the clockwise while the change lever is being pushed until the loading is completed as shown in Figure M26.
4. Place the Adjustment Plate and insert the hex wrench into the hole of Tension Band Fastener as shown in Figure M27.
5. Adjust the hole of Tension Band Fastener by using the hex wrench so that the Tension Post just touches the fixture of Adjustment Plate.
6. After the Adjustment, turn the Capstan Motor until the unloading is completed.

<<NOTE>>

When you assemble cassette compartment, refer to "Reinstallation of Cassette Compartment".

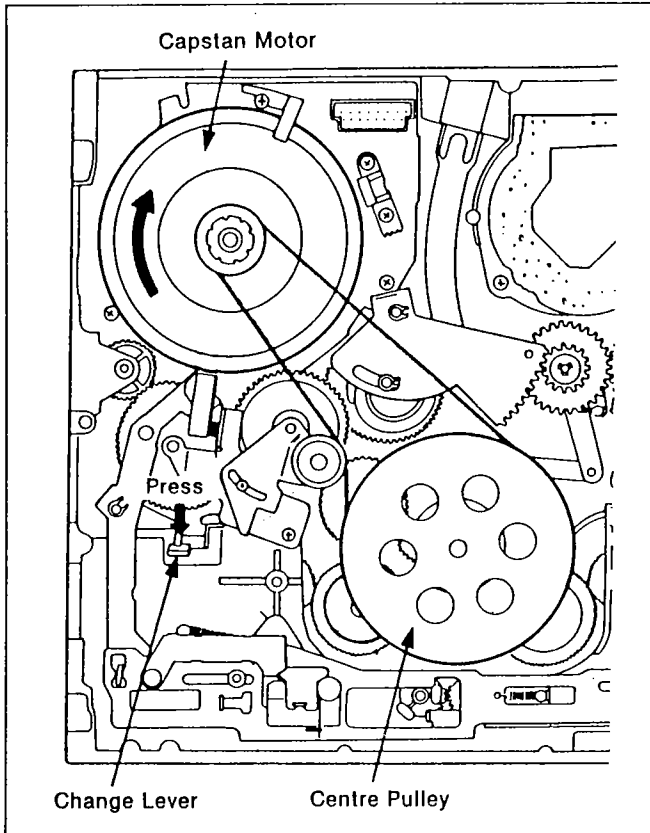


Figure M26

1. Playback the cassette tape from the beginning and wait until the tape movement get the stabilization. (for approx. 10 to 20 seconds)
2. Insert the Back Tension Meter into the path of a tape, and measure the back tension to be within specification as shown in Figure M28.
3. If it is out of specification, change the spring notch as shown in Figure M29.

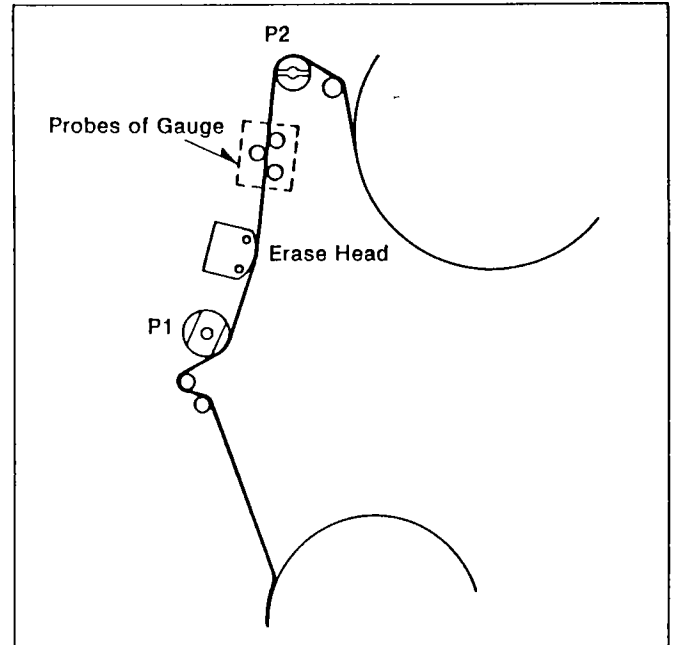


Figure M28 Measurement of Back Tension

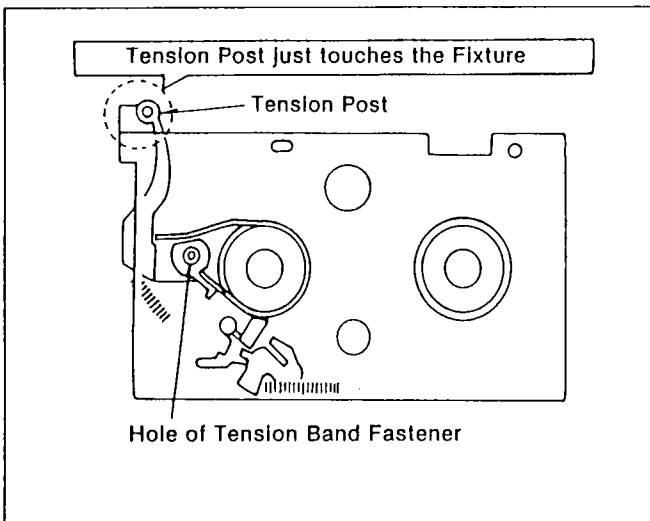


Figure M27

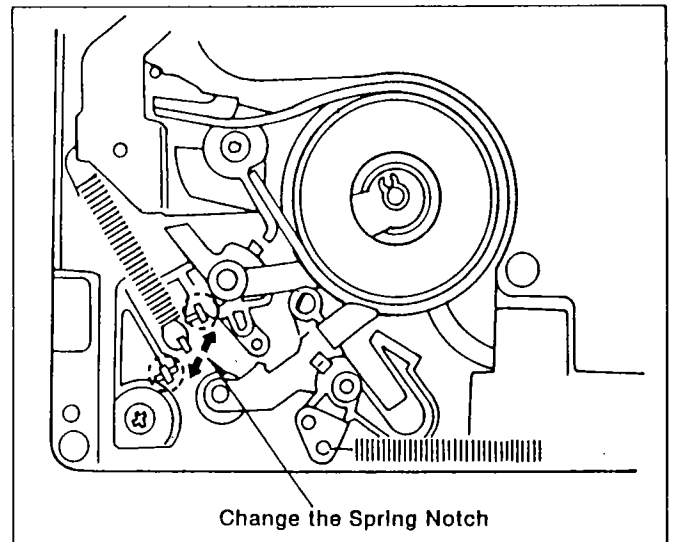


Figure M29

2-3-14. MEASUREMENT AND ADJUSTMENT OF BACK TENSION

<<TOOLS>>

Back Tension Meter; VFK0132
VHS Cassette Tape (120 minutes tape)

<<SPECIFICATION>>

22.5g - 27.5g

<<NOTES>>

1. While measuring, make sure that the three probes of the meter are all in good contact with the tape.
2. As the tension meter is very sensitive, we recommend taking 3 separate readings.

2-3-15. HEIGHT ADJUSTMENT OF THE REEL TABLES

<<TOOLS>>

Post Adjustment Plate; VFK0191
 Reel Table Height Gauge; VFK0190

<<SPECIFICATION>>

0mm - 0.2mm

1. Remove the cassette compartment.
2. Place the Post Adjustment Plate on the reel tables.
3. Place the Reel Table Height Gauge on the plate so that the scraper of the gauge touches the cut-out portion of the plate, then set the gauge to zero "0" as shown in Figure M30.

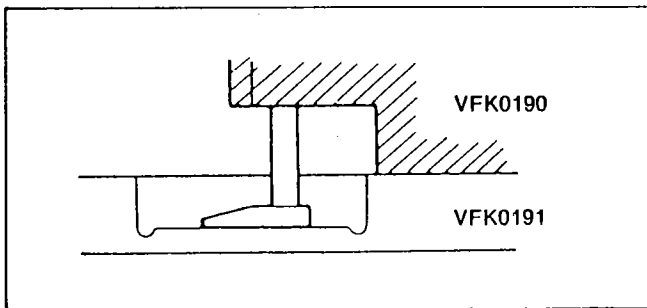


Figure M30

4. Measure the meter indication of top surface of reel table as shown in Figure M31. And then perform the same measurement and confirmation for the other reel table.

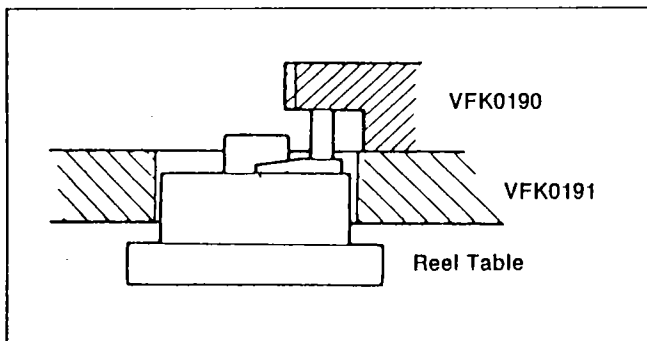


Figure M31

5. If the difference is more than 0.2mm higher or lower, replace or remove the poly-slider washer located under the reel table with one of the appropriate thickness. Reel washers are available in thickness of 0.2mm, 0.3mm and 0.5mm.

Thickness	Washer	Parts No.
0.2mm		VMX1238
0.3mm		VMX1239
0.5mm		VMX1171

Figure M32

2-3-16. ADJUSTMENT OF THE CAPSTAN THRUST GAP

<<TOOLS>>

Reel Table Height Gauge; VFK0190
 Height Adjustment Fixture; VFK0344

<<SPECIFICATION>>

0.5mm - 0.55mm

1. Turn a Thrust Adjust Screw slightly until the capstan rotator unit just touches the coil of the capstan stator unit.

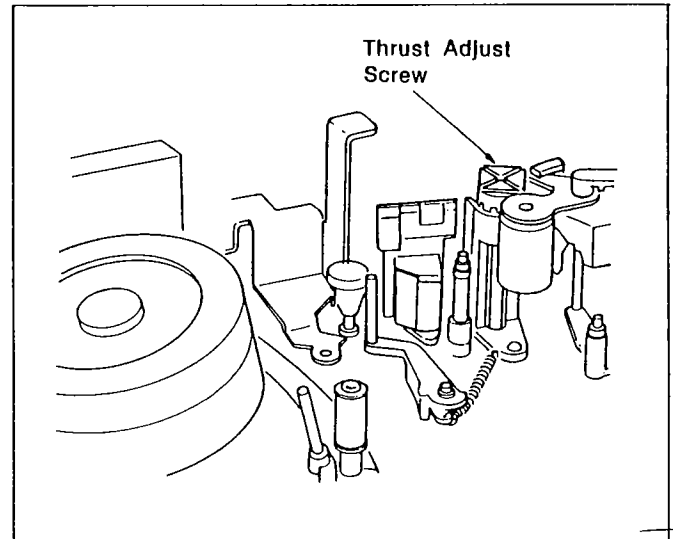


Figure M33

2. Set the Height Adjustment Fixture on the Capstan Rotor unit.
3. Place the height gauge on the bottom case unit and set the height gauge to zero "0".

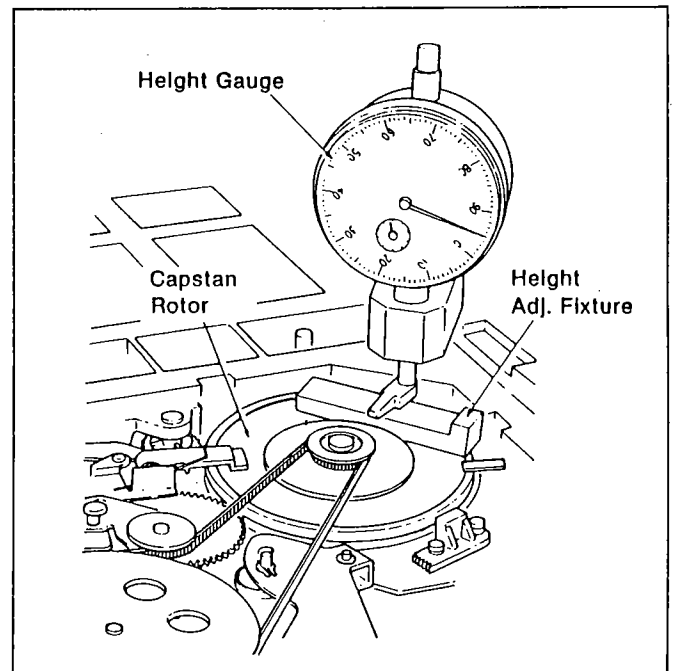


Figure M34

4. Adjust a Thrust Adjust Screw so that the thrust gap becomes 0.5mm - 0.55mm.

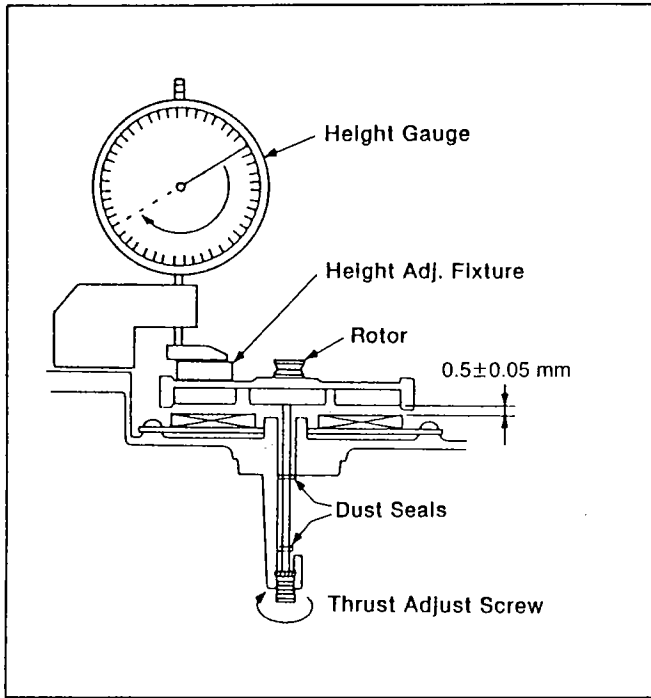


Figure M35

2-3-17. ASSEMBLY AND ADJUSTMENT PROCEDURES OF MECHANISM

The mechanism of this model is mostly engaged to the System Control Circuit, through the mode select switch. Therefore the relation between the mode select switch and the cam gear decides all further mechanical movement of the mechanical parts such as levers, gears, rollers and so on.

If these parts are not fixed properly, the unit will be unloaded or compulsorily stopped.

And it will result being damaged at any mechanical or electrical parts.

The overall mechanical condition (alignment) of bottom and top view are shown in Figure M36 and Figure M37. This mechanical adjustment is performed in STOP mode.

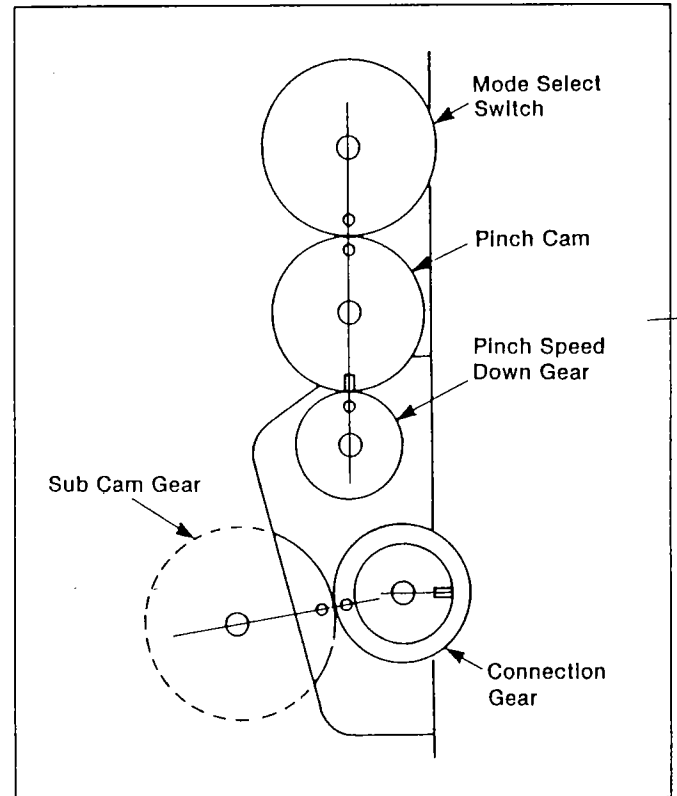


Figure M36 Bottom View of Overall G-Mechanical Condition

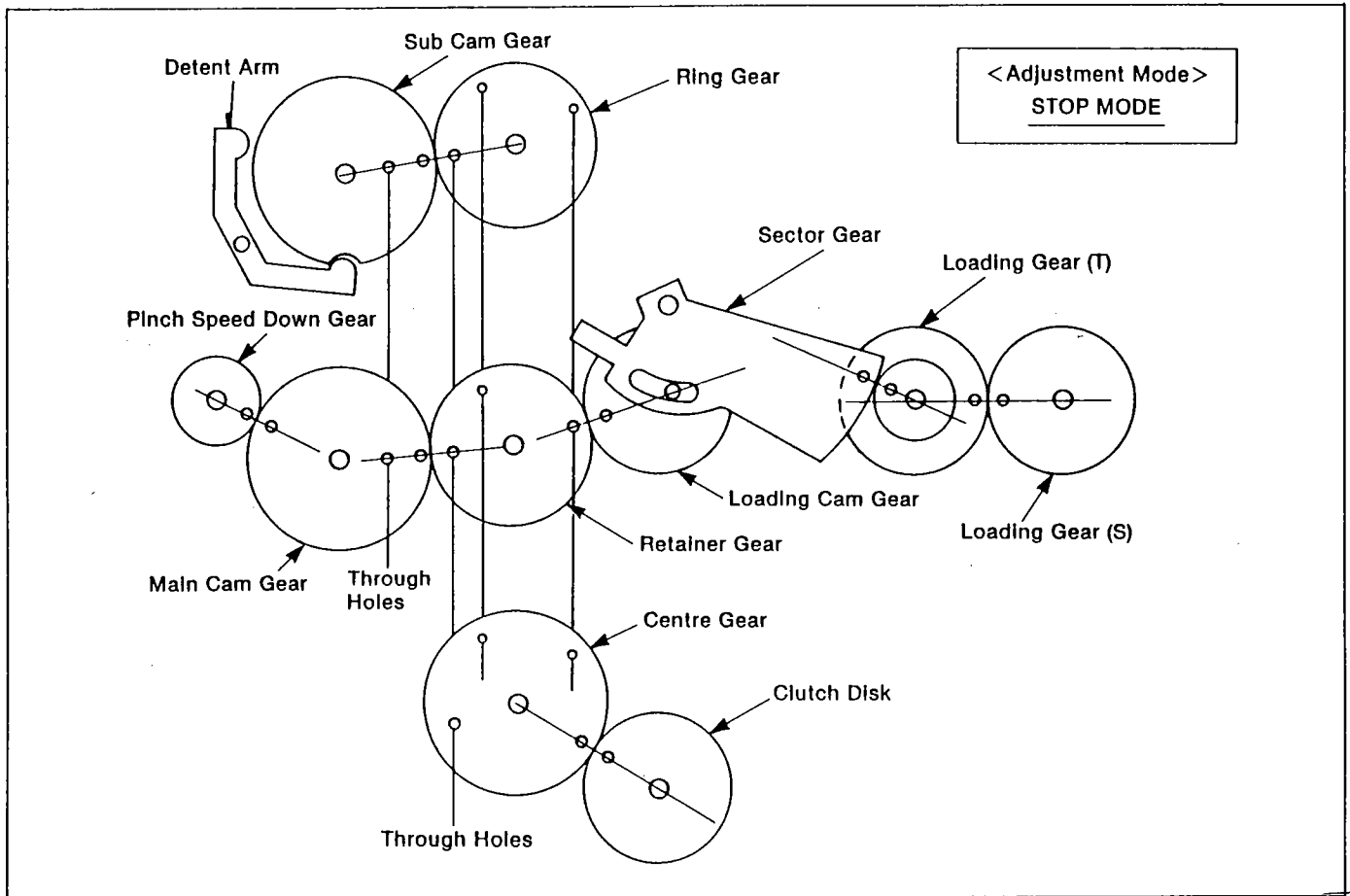


Figure M37 Top View of Overall Mechanical Condition

2-3-18. ASSEMBLY PROCEDURES OF SUB CAM GEAR, RING GEAR AND DETENT ARM

1. Install the Ring Gear so that the two holes in the Ring Gear align with the two holes in the chassis as shown in Figure M38.
2. Install the Sub Cam Gear so that the large hole in Sub Cam Gear is aligned with the hole in chassis. Also the small hole (located just outside of large hole) on Sub Cam Gear should align with the hole on Ring Gear as shown in Figure M38.

<<NOTE>>

It may be best to also align Connection Gear (on top side) with Sub Cam Gear as shown in Figure M36.

3. Install the Detent Arm and make sure Detent Arm seats perfectly in detent of Sub Cam Gear as shown in Figure M38.

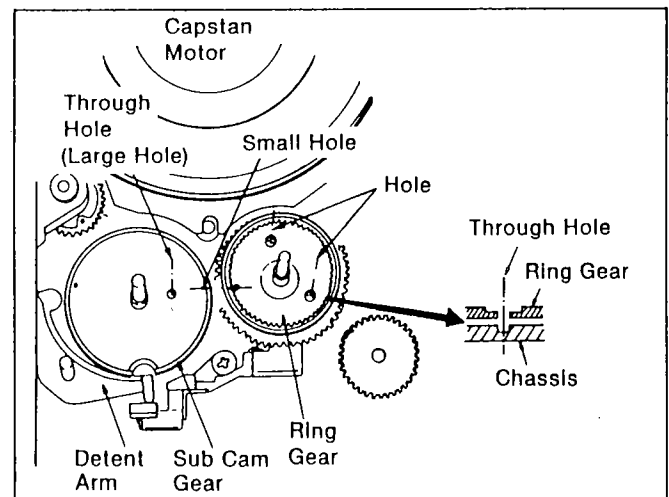


Figure M38

2-3-19. ASSEMBLY PROCEDURES OF MAIN CAM GEAR AND PINCH SPEED DOWN GEAR

1. Install the Main Cam Gear onto the Sub Cam Gear so that the large hole on the Main Cam Gear aligns with large hole on the Sub Cam Gear and chassis as shown in Figure M39.

2. Install the Pinch Speed Down Gear from top side of chassis so that the outer hole on the Main Cam Gear aligns with small hole on the Pinch Speed Down Gear as shown in Figure M39.

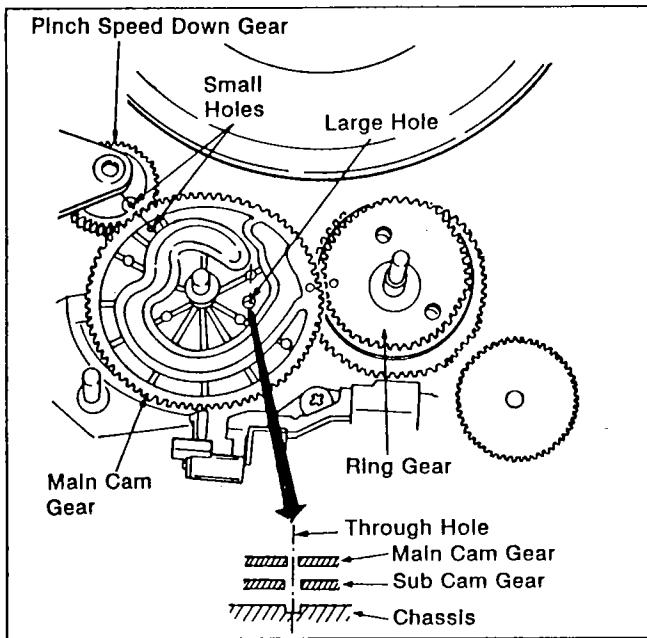


Figure M39

2-3-20. ASSEMBLY PROCEDURES OF RETAINER GEAR AND LOADING CAM GEAR

1. Install the Retainer Gear onto the Ring Gear so that the two holes in the Retainer Gear align with the two holes in the Main Cam Gear, at this time, small indent outside of large hole on the Main Cam Gear should align with small hole on the Retainer Gear as shown in Figure M40.

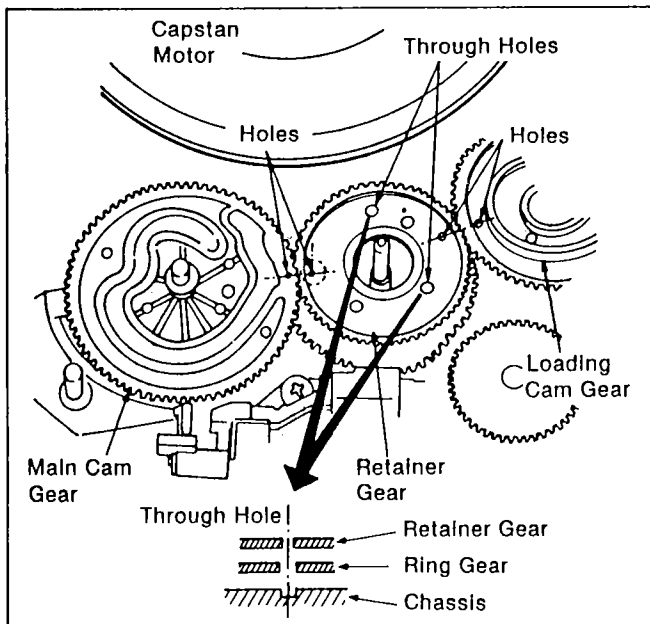


Figure M40

2. Push the Sub Loading Arm to the STOP position and keep it as shown in Figure M41.
3. Install the Loading Cam Gear so that the small hole which is directly outside of the large hole on the Loading Cam Gear is aligned with the outside hole of the Retainer Gear as shown in Figure M40.

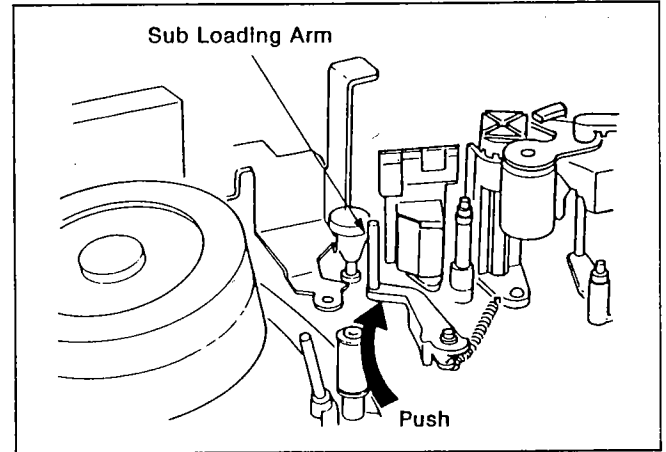


Figure M41

2-3-21. ASSEMBLY PROCEDURES OF CENTER GEAR

1. Install the Center Gear onto the Retainer Gear so that the two holes in the Center Gear align with the holes on the Retainer Gear, then install the cut washer as shown in Figure M42.
2. Install the Clutch Disk so that the small outside hole on the Center Gear aligns with the small outside hole on the Clutch Disk, then insert the cut washer as shown in Figure M42.
3. Install the Center Pulley and cut washer.

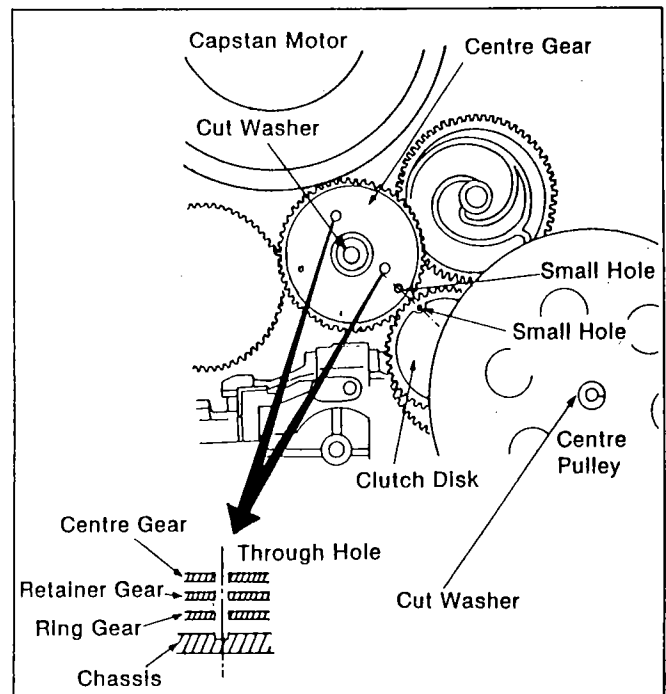


Figure M42

2-3-22. ASSEMBLY PROCEDURES OF MAIN LEVER UNIT AND CAM FOLLOWER ARM UNIT

1. Install the Main Lever Unit so that the pins which are in the correct position as shown in Figure M43. The Main Lever Unit should seat perfectly without having to apply outside pressure, insert the cut washers.
2. Install the Cam Follower Arm so that the pin of the Cam Follower Arm inserts into the groove of the Main Cam Gear and also inserts into the slot on the Main Lever Unit, insert the retaining ring as shown in Figure M44.

<<NOTE>>

Be careful not to bend Cam Follower Arm.

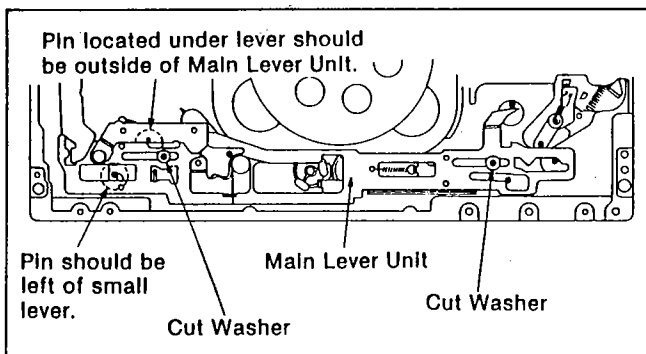


Figure M43

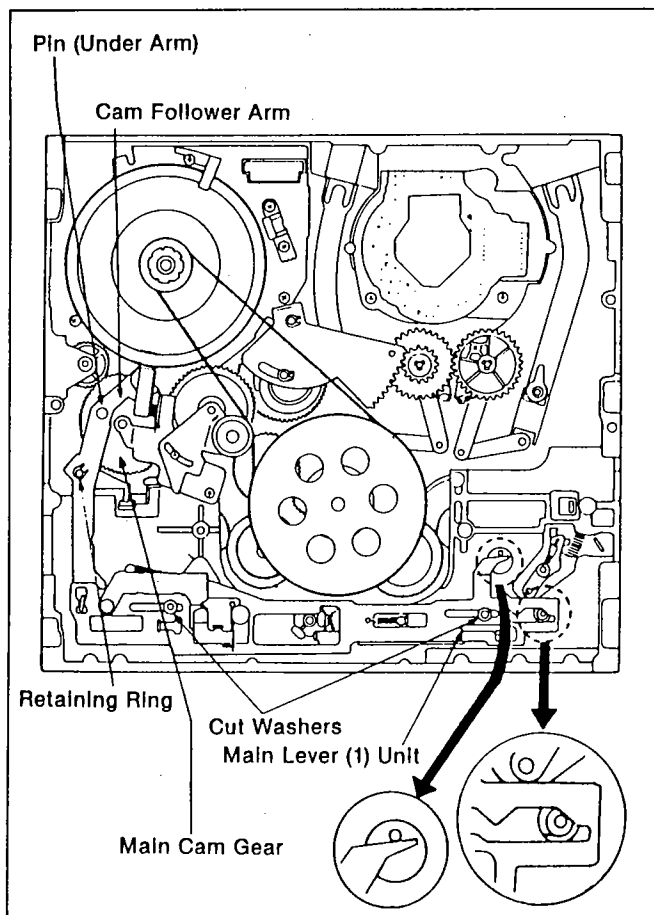


Figure M44

2-3-23. ASSEMBLY PROCEDURES OF LOADING GEAR (T), LOADING GEAR (S) SECTOR GEAR, TENSION ROLLER AND TIMING BELT

1. Set the P2 and P3 posts to fully unloaded position, then install the Loading Gear (T) and (S) so that the outer hole in the Loading Gear (T) aligns with the outer hole in the Loading Gear (S). (Figure M45)
2. Install the Sector Gear so that the outer hole in the Sector Gear aligns with the projection mark on Loading Gear (T). Then insert the retaining rings. (Figure M45)
3. Install the Tension Roller Unit and SS Brake Unit, then tighten the screws.
4. Install the Timing Belt.

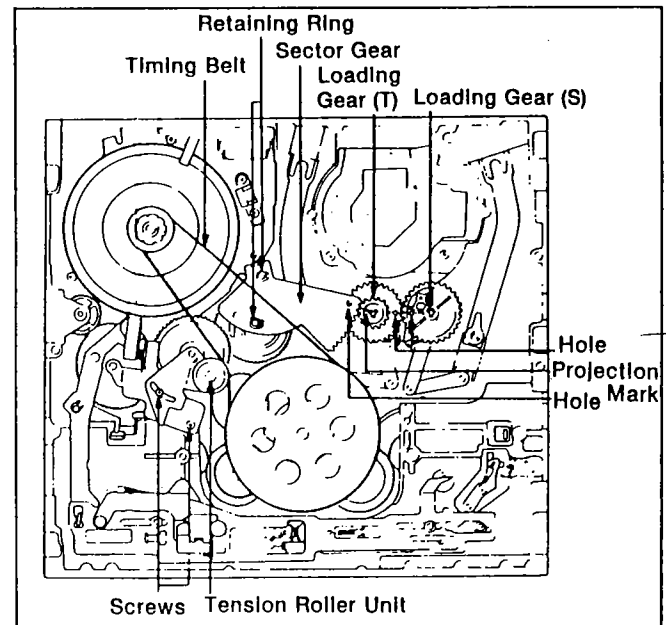


Figure M45

2-3-24. ASSEMBLY PROCEDURES OF REV ARM UNIT, REV CLUTCH UNIT, TENSION RELEASE LEVER AND TENSION RELEASE CLUTCH UNIT

1. Install the Rev arm unit and Rev clutch unit.
2. Hitch the Rev motor timing belt to Rev clutch unit.
3. Install the Tension Release Lever unit and Tension Release clutch unit.

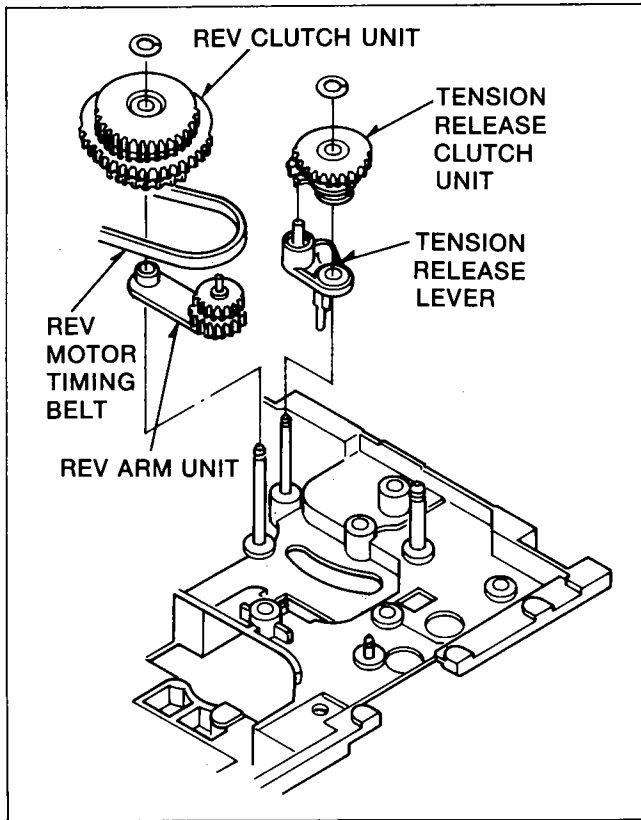


Figure M46

2-3-25. ASSEMBLY PROCEDURES OF SUB LEVER CAM, SUB CAM FOLLOWER AND REV CONTROL LEVER

1. Install the SUB LEVER CAM RUBBER STOPPER, SUB CAM FOLLOWER and washer as shown in below.

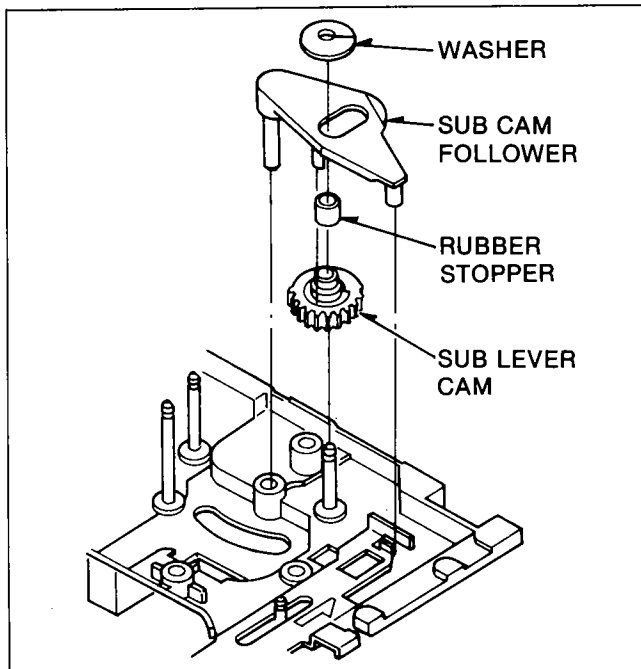


Figure M47

2. Install the Review Control Lever as shown below.

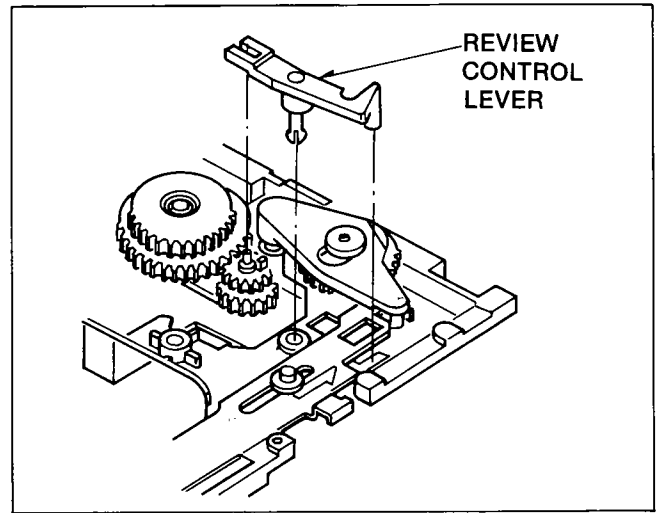


Figure M48

2-3-26. ASSEMBLY PROCEDURES OF TENSION PULLEY BASE (A) UNIT

1. Install the Tension Pulley Base (A) unit as shown below
2. Hitch the Rev Motor Timing belt. (Refer to 2-3-2. Tension Adjustment For Rev Motor Timing Belt.)

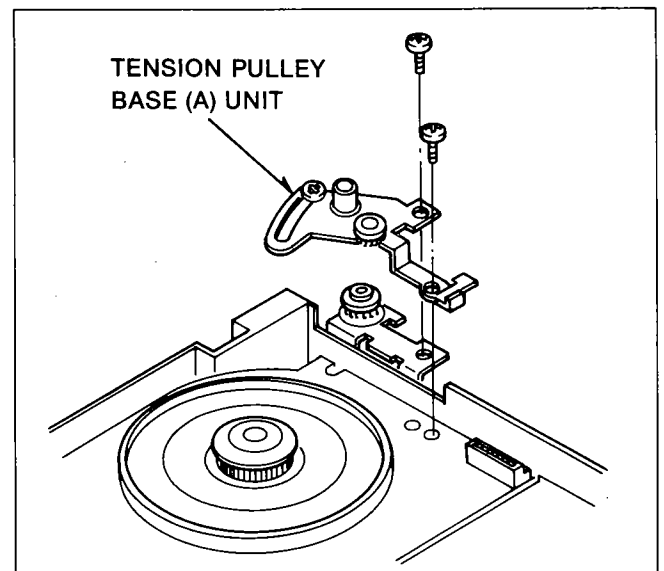


Figure M49

2-3-27. ASSEMBLY PROCEDURES OF CONNECTION GEAR

<<NOTE>>

Before assembling, Sub Cam Gear position (and positions of bottom side gears) must be correct as described before (STOP mode).

1. Install the Connection Gear so that the small hole in the Connection Gear aligns with the small hole in the Sub Cam Gear as shown in Figure M50.

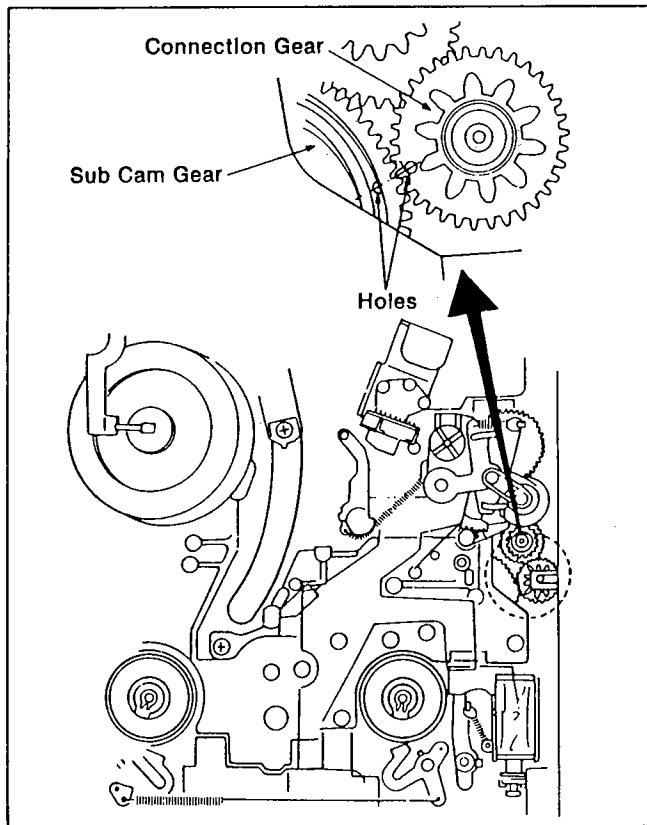


Figure M50

2-3-28. ASSEMBLY PROCEDURES OF MODE SELECT SWITCH AND P5 PULL OUT SECTOR GEAR

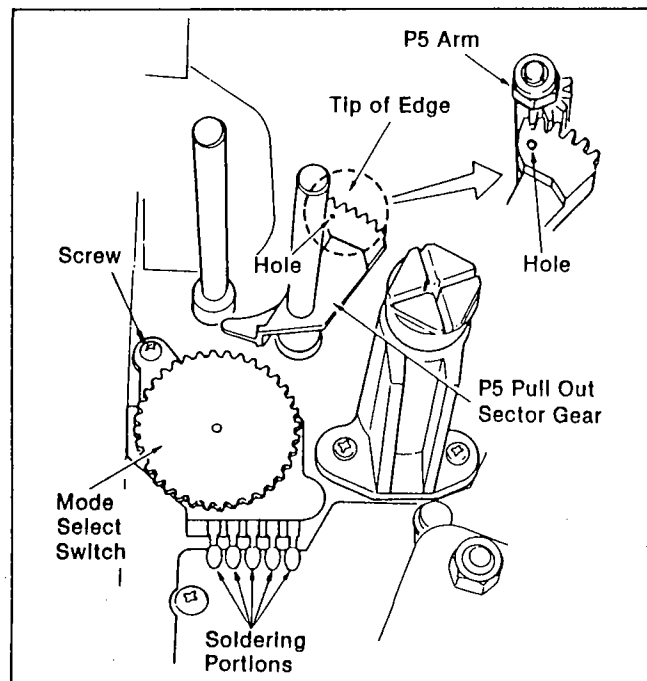


Figure M51

1. Install the Mode Select Switch and tighten the mounting screw, then solder the 5 soldering portions.
2. Install the P5 Pull Out Sector Gear so that the hole of P5 Pull Out Sector Gear aligns with the tip of edge at P5 gear as shown in Figure M51.

2-3-29. ASSEMBLY PROCEDURES OF PINCH CAM AND PRESSURE ROLLER UNIT

1. Install the Pinch Cam while pushing the P5 post forward. The Pinch Cam Gear should drop to a seated position. In this position make sure hole in the Mode Select Switch aligns with small hole on the Pinch Cam, also the small rift on the Pinch Cam should align with the hole on the Pinch Speed Down Gear as shown in Figure M52.
2. Install the Pressure Roller Unit. Make sure the seats perfectly onto the Pinch Cam, then install the Pinch Cam Cap.

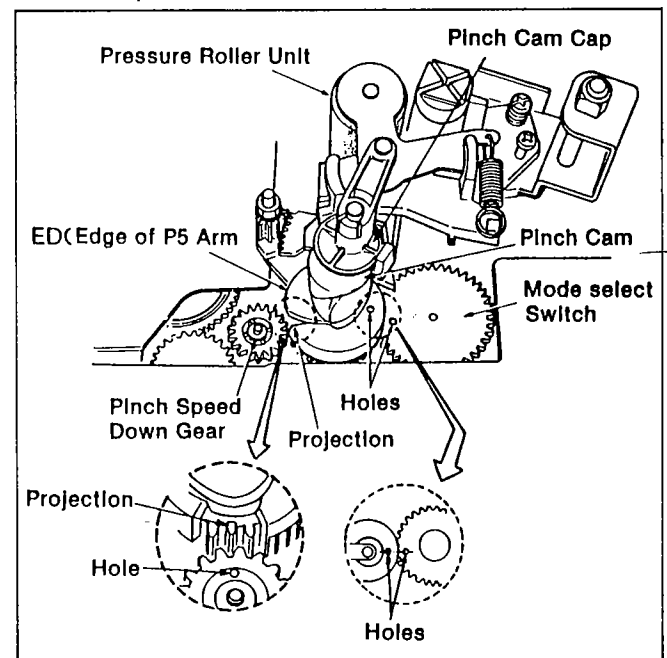


Figure M52

2-3-30. REINSTALLATION OF CASSETTE COMPARTMENT

When you reinstall the cassette compartment, the position adjustment (alignment) of mechanism is necessary for correct operation, as follows.

A. Confirmation of STOP (Sub-load) Position (Refer to Figure M37)

1. Press the change Lever in the direction indicated by arrow mark as shown in Figure M53 (to release the lock).

2. Turn the Capstan Motor counter-clockwise or clockwise until mechanism is placed into the STOP position as following conditions.
 - a) Identification hole on the Mode Select Switch at 6 o'clock position and aligned with small hole on Pinch Cam.
 - b) The projection on the Pinch Cam should align with small hole on Pinch Speed Down Gear.
 - c) Small hole on Sub Cam Gear should align with small hole on the Connection Gear and rectangular mark on the Connection Gear should be at a 3 o'clock position.

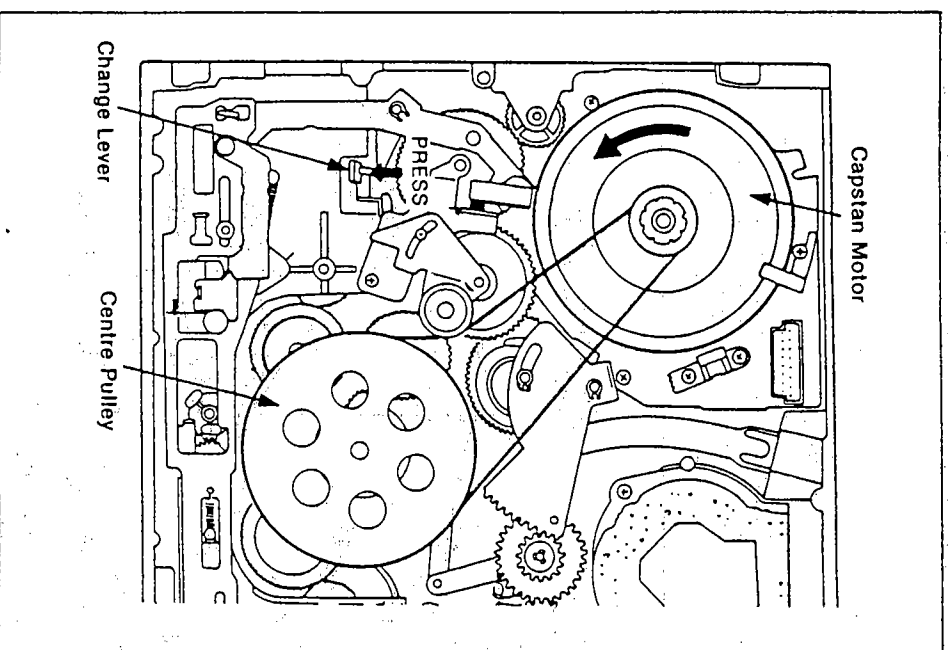


Figure M53

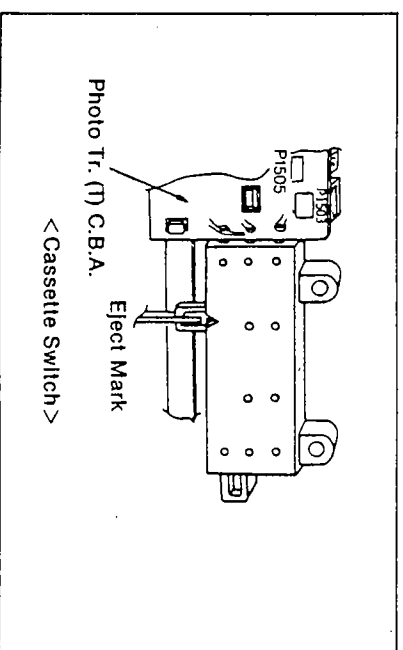


Figure M54

B. Confirmation of Cassette Compartment

1. Confirm that the Cassette Compartment is aligned properly. In the EJECT position (Cassette Holder up and advanced to the front) the two V-shaped marks on the slide switch should align. The slide switch is located on the right side of the Cassette Assembly towards the rear as shown in Figure M54.
2. Remove the 2 screws (A) as shown in Figure M55.
3. Take the top plate out.
4. Take the cassette Holder unit out as shown in Figure M56.

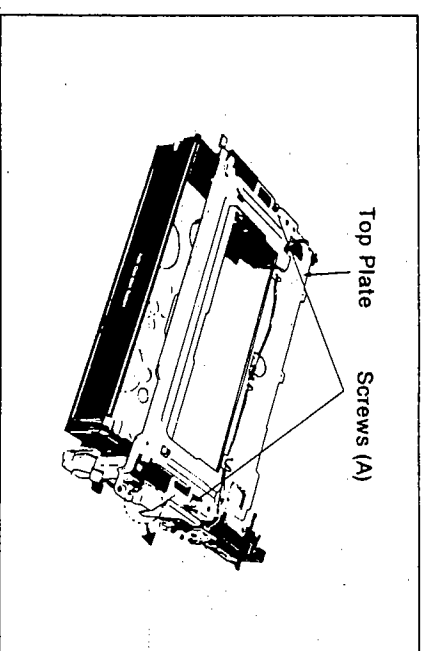


Figure M55

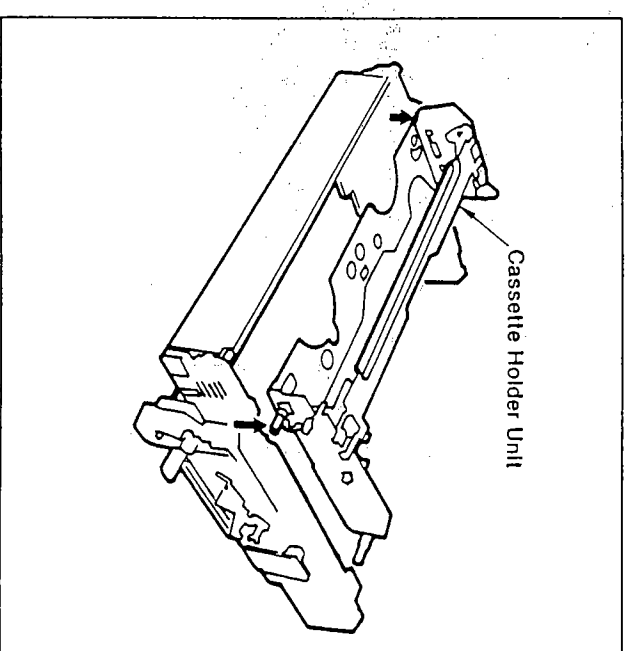


Figure M56 Removal of cassette holder unit

5. Press the sub wiper arm (R) to direction indicated by arrow so that the sub wiper arm (R) comes to cassette down position (STOP) completely as shown in Figure M57 and keep it. In this position, the arrow on the Sub Wiper Arm (R) should align with the arrow on the Rack (A) (1) Unit as shown in Figure M58.

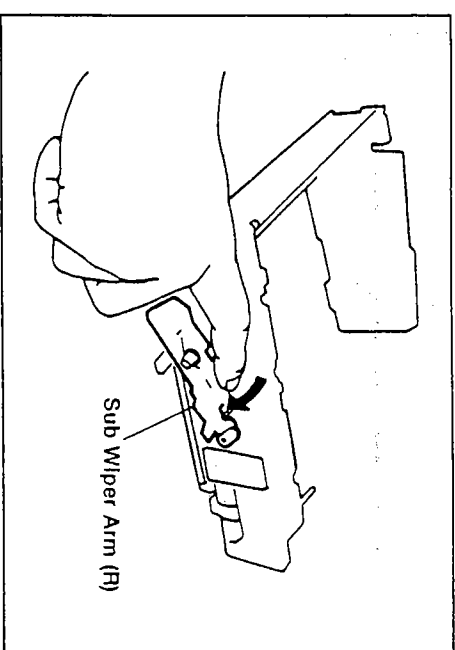


Figure M57

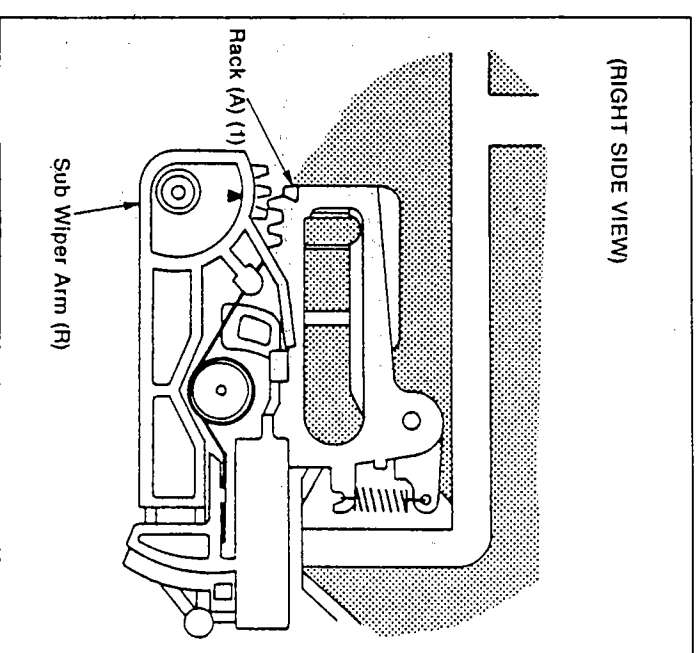


Figure M58

6. If the Cassette Compartment is not aligned, re-alignment may be accomplished by pushing the Main Shaft Unit to the right (gently) and pushing the front of the Rack Unit to the left. This procedure will disengage the teeth of the Rack Gear from the teeth on Sub Wiper Arm assembly. This will allow you to change the positional relationship between the Sub Wiper Arm Assembly and Rack Unit. This procedure is best attempted in the EJECT position. Once this is done, check for smooth operation of the compartment by inserting a cassette, and pushing in, and down.

C. Installation Procedure

1. Bring loading mechanism to the STOP (Sub Load) position.
2. Confirm that the chassis is aligned properly for STOP position as shown in Figure M37 and M36.
3. Put the Sub Wiper Arm (R) in its full down position (Sub Wiper Arm should rest on plastic protrusion on the bottom of the right side plat).
4. Install the cassette compartment (without cassette holder) to chassis so that the rectangular marking (or slot) on the connection gear should be line up with first tooth of the Rack Gear as shown in Figure M59 and M60.

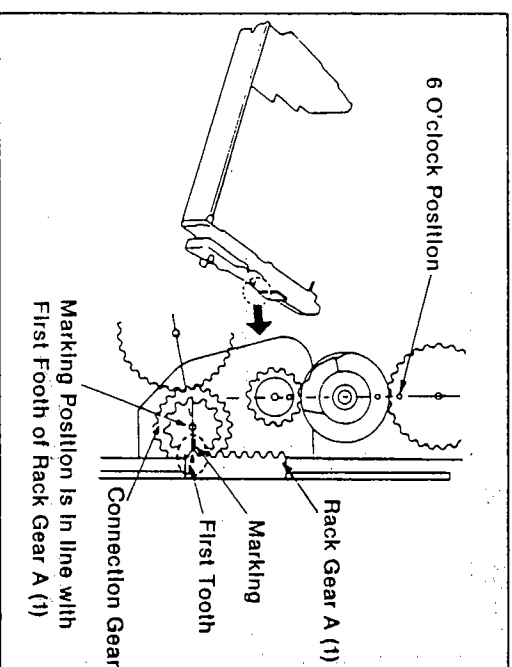


Figure M59

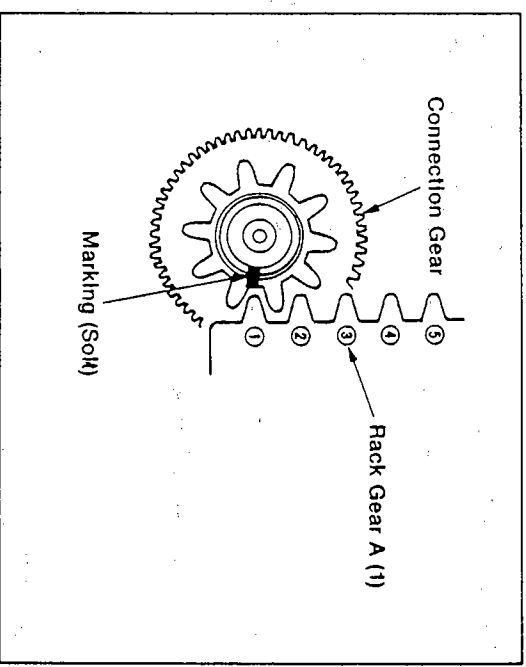
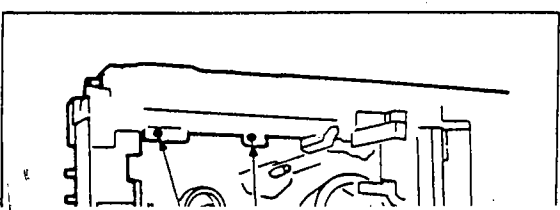
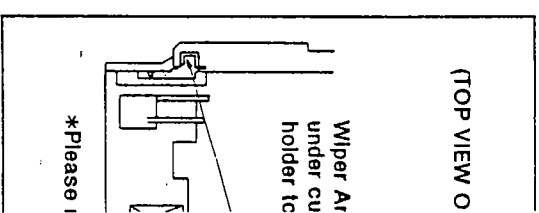


Figure M60

5. Tighten the 4 screws



6. Press the Char mechanism to the STOP position, so that the marking on the connection gear is also aligned with the first tooth of the Rack Gear (A) (1).
7. Stop the main shaft unit, so that the marking on the connection gear is also aligned with the first tooth of the Rack Gear (A) (1).
8. Install the Cassette compartment Base plate if the Sub Wiper Arm is not installed in step 7.



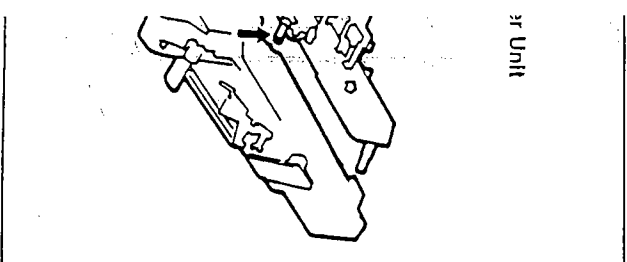
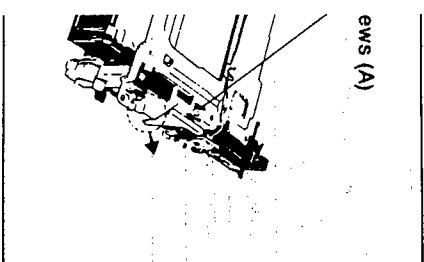
<<Note>>
For proper front view, the cassette compartment should follow the procedure in Figure M63.

e Compartment

mpartment is aligned
1 (Cassette Holder up
no V-shaped marks on
the slide switch is lo-
Cassette Assembly to-
e M54.
wn in Figure M55.

ut as shown in Figure

ews (A)



5. Press the sub wiper arm (R) to direction indicated by arrow so that the sub wiper arm (R) comes to cassette down position (STOP) completely as shown in Figure M57 and keep it.
In this position, the arrow on the Rack (A) (1) Unit as shown in Figure M58.

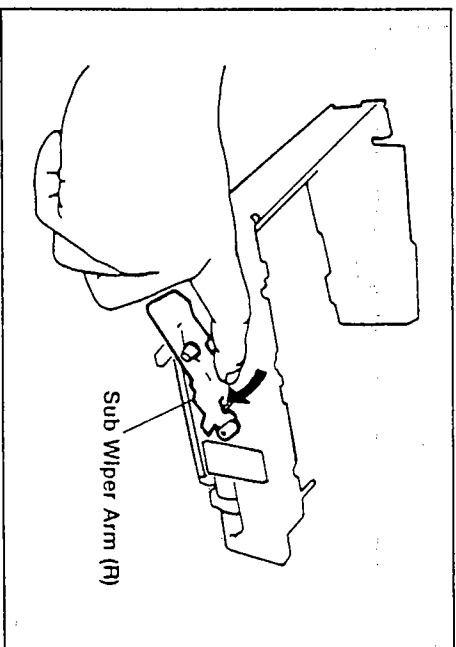


Figure M57

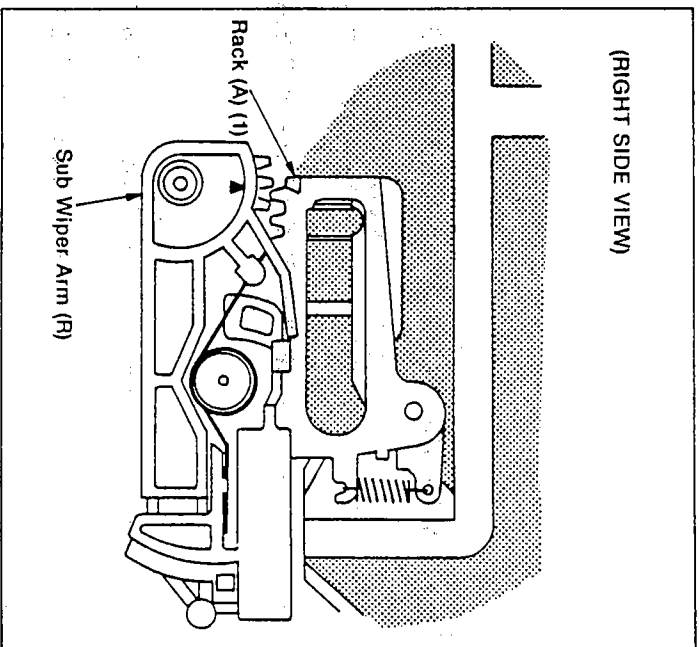


Figure M58

6. If the Cassette Compartment is not aligned, re-alignment may be accomplished by pushing the Main Shaft Unit to the right (gently) and pushing the front of the Rack Unit to the left. This procedure will disengage the teeth of the Rack Gear from the teeth on Sub Wiper Arm assembly. This will allow you to change the positional relationship between the Sub Wiper Arm Assembly and Rack Unit. This procedure is best attempted in the EJECT position. Once this is done, check for smooth operation of the compartment by inserting a cassette, and pushing in, and down.

C. Installation Procedure

1. Bring loading mechanism to the STOP (Sub Load) position.
2. Confirm that the chassis is aligned properly for STOP position as shown in Figure M37 and M36.
3. Put the Sub Wiper Arm (R) in it's full down position (Sub Wiper Arm should rest on plastic protrusion on the bottom of the right side plate).
4. Install the cassette compartment (without cassette holder) to chassis so that the rectangular marking (or slot) on the connection gear should be line up with first tooth of the Rack Gear as shown in Figure M59 and M60.

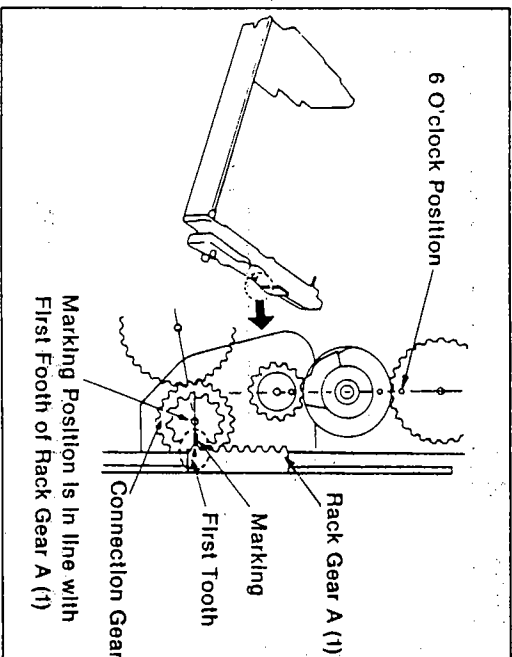


Figure M59

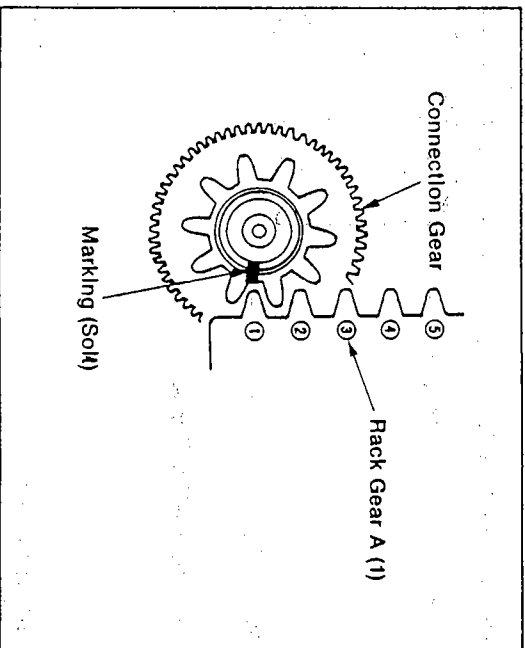


Figure M60

5. Tighten the 4 screws (D) as shown in Figure M61.

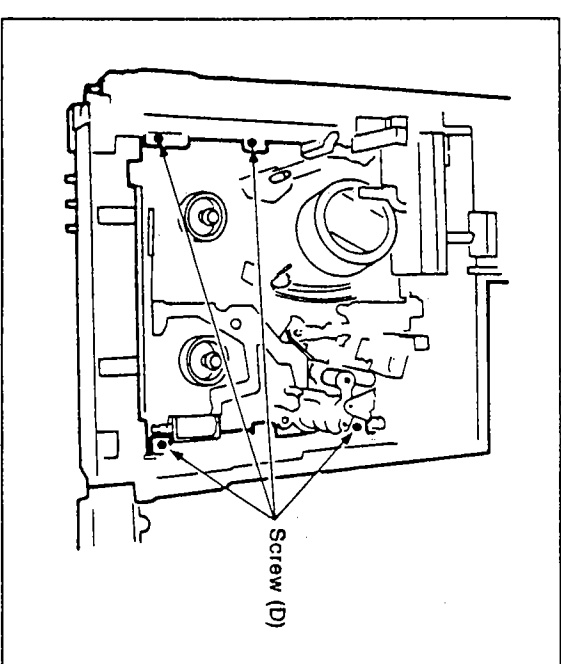


Figure M61

6. Press the Change Lever and manually move the loading mechanism toward the EJECT position (Figure M53).
7. Stop the manual eject procedure just before completion, so that the Sub Wiper Arms straight up. This position is also characterized by the channel guides (in the Wiper Arms) being directly under the cut outs on the top of the Cassette compartment base (Figure M62).
8. Install the Cassette Holder Unit in the Cassette Compartment Base. The Cassette Holder should drop into place if the Sub Wiper Arms are portioned as called for in step 7.

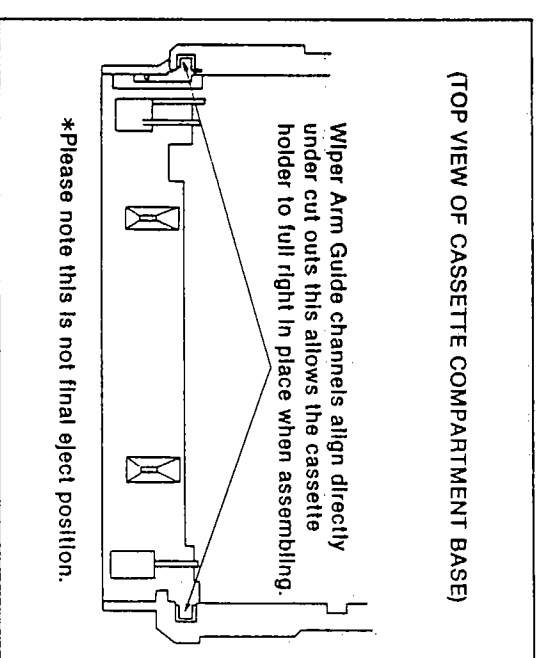


Figure M62

<<Note>>
For proper front loading, the guide pin on the opener lever should follow the upper track of the right side panel as shown in Figure M63.

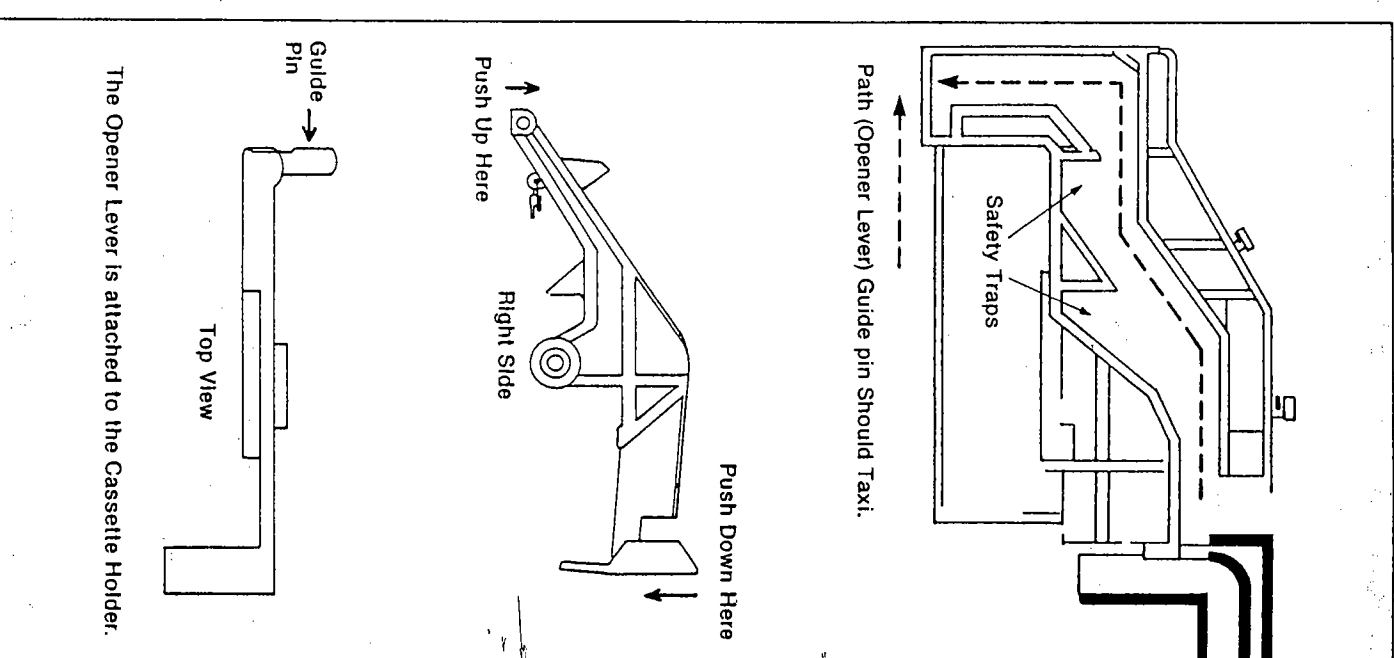
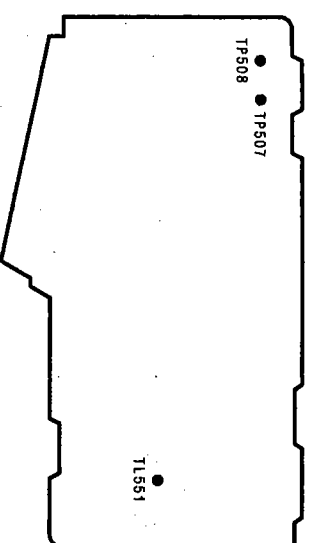


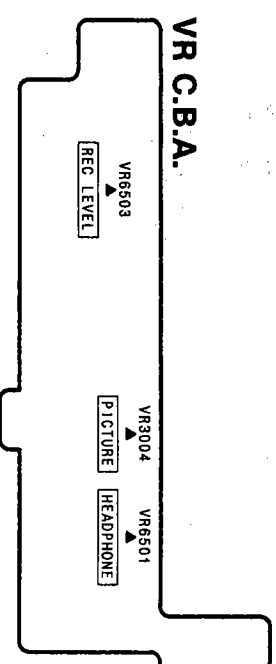
Figure M63 Right Side Plate

9. Install the top plate on the Cassette Compartment Base and tighten the 2 screws (A) as shown in Figure M55.
10. Manually confirm that front loading and main loading run smoothly. Also confirm EJECT before power is applied.

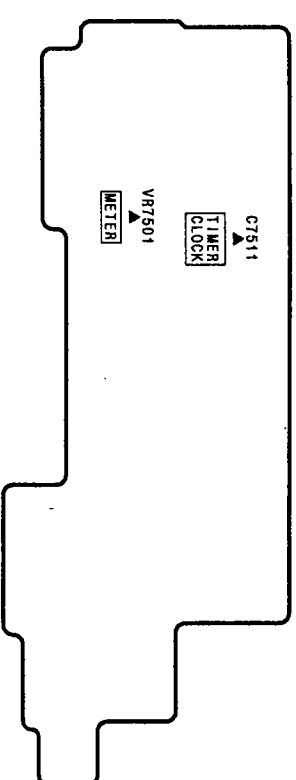
HEAD AMP C.B.A.



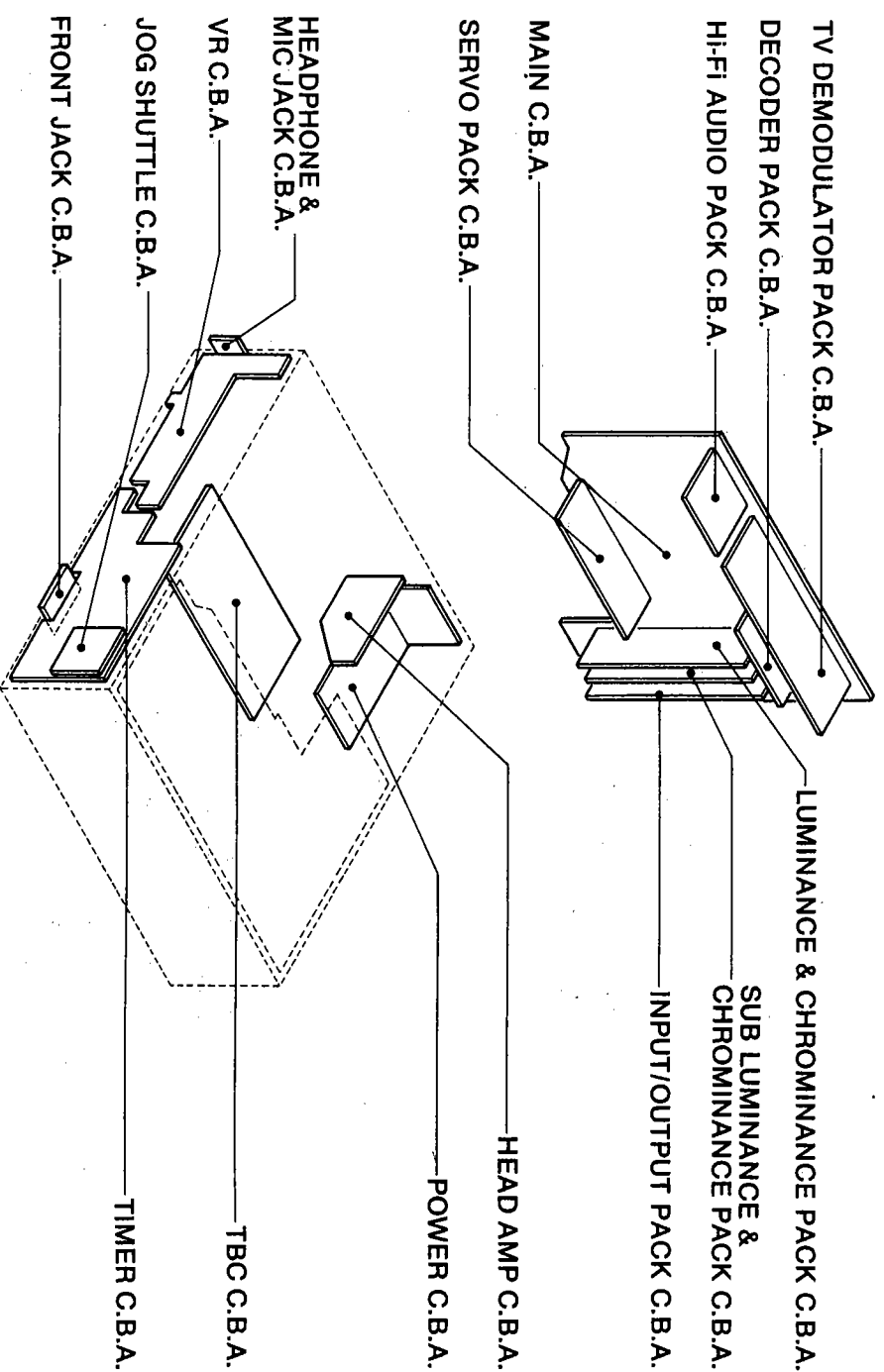
VR C.B.A.



TIMER C.B.A.



CIRCUIT BOARD LAYOUT



2.4. ELECTRICAL ADJUSTMENT PROCEDURES

This section provides electrical adjustment procedures for the S-VHS Video Cassette Recorders NV-FS200PX, AG-1970P.

2-4-1. SERVICE INFORMATION

A. Servicing the Luminance & Chrominance pack C.B.A. and the Sub Luminance & Chrominance Pack C.B.A.

When servicing the luminance/chrominance pack C.B.A. and Sub luminance/chrominance pack C.B.A., connections of extension cables are necessary as shown below.

PART NO.	PART NAME	PCS	CONNECTION
VFK0807	9P EXTENSION CABLE	1	PS3001-PP3001
VFK0808	12P EXTENSION CABLE	2	PS3002-PP3002, PS3003-PP3003
VFK0678	18P EXTENSION CABLE	2	PS3011-PP3011, PS3012-PP3012

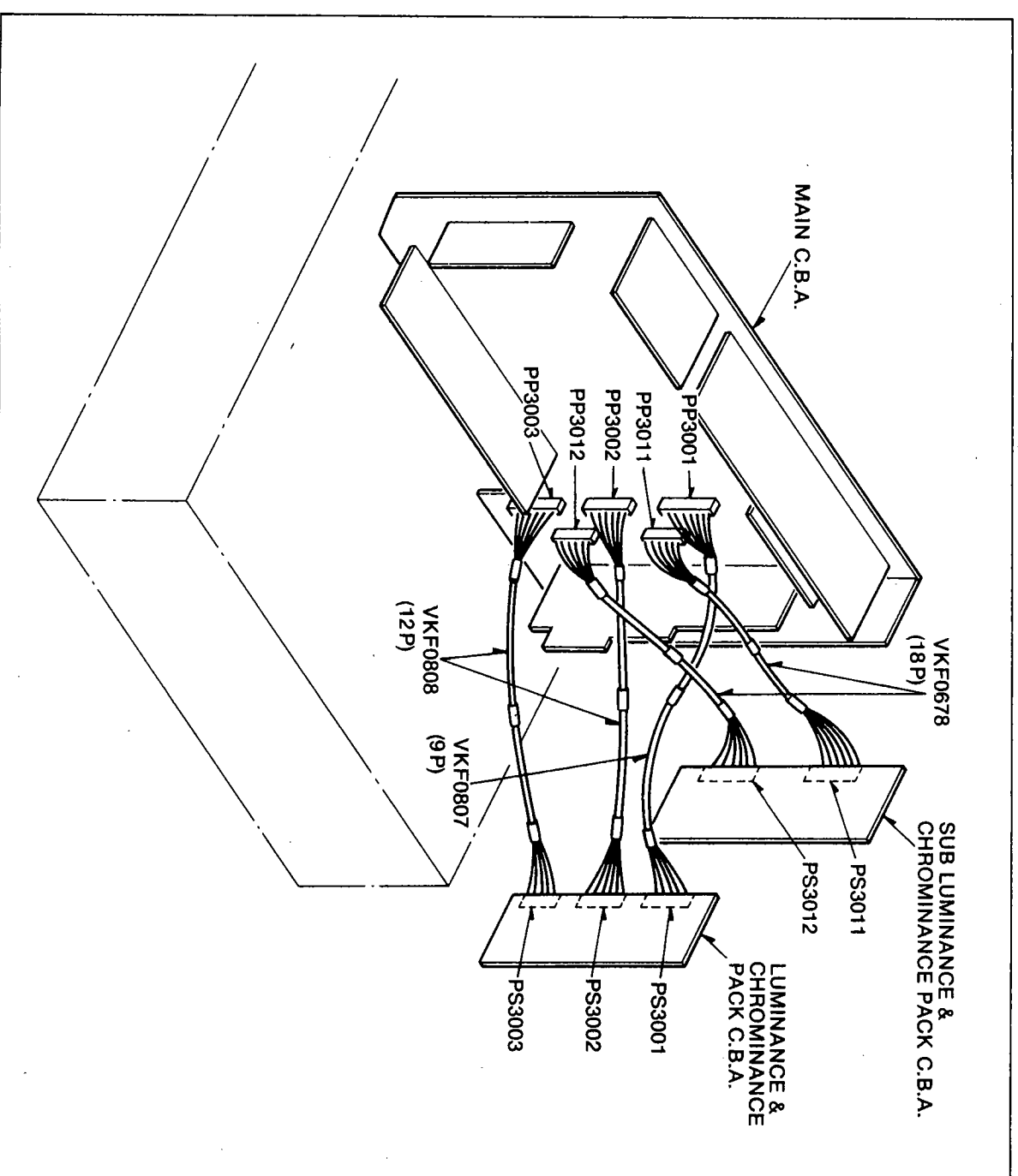


Figure E1

2-4-2. TEST EQUIPMENT

To perform electrical adjustment the following equipment is required.

1. VTVM (Vacuum Tube Volt Meter) or DVM (Digital Volt Meter)
Voltage Range : 0.001 – 50V
2. Dual-Trace Oscilloscope
Voltage Range : 0.005 – 50V/div.
Frequency Range : DC-30MHz
Probes : 10:1
3. Frequency counter
Frequency Range : 0 – 10MHz
4. Signal Generator (Sinewave)
Frequency Range : 0 – 50MHz
5. Video Sweep Generator
Frequency Range : 0 – 10MHz
6. Colour Monitor TV
7. Plastic Tip Driver
8. VHS Alignment Tape
9. Pattern Generator (VFM8080HQFP)
10. VHS Blank Tape
11. S-VHS Blank Tape
12. Vectorscope

2-4-3. HOW TO READ THE ADJUSTMENT PROCEDURES

<<Note>>

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

TP	ADJ.	MODE	INPUT
TP2010 TP2002	R2002	SELF RECORDING	VIDEO SIGNAL
TAPE	M.EQ.	SPEC.	
ALIGNMENT TAPE VFJ8125H3F	OSCILLOSCOPE	0.4+-0.4msec.	

Connecting Point (Test Point) of Measuring Equipment

Mode of VTR
Exmple : SELF RECORDING
Recorded the Video Signal and Play back the just recorded portion

Adjustment Component

Measuring Equipment

Specification for Adjustment

Tape for the adjustment
Example: VFJ8125H3F
use alignment tape
VFJ8125H3F

Supply a Video Signal to the VIDEO INPUT on the rear panel or tune in a local on-air

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

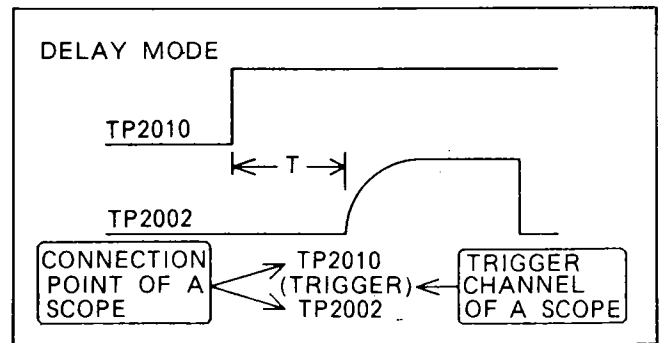


Figure E3

<<Note>>

Before making electrical adjustments set the VTR controls as follows.

1. Noise Filter SW...OFF
2. HiFi/Normal MIX SW...OFF
3. Tape Select SW...T120
4. Picture VR...FIX
5. HIFI REC VR...FIX
6. Phones Level VR...MIN
7. JOG/SHUTTLE...CENTER
8. Audio Output Mode...HiFi MODE
9. S-VHS SW...ON
10. Input Select Front SW...S-VIDEO
11. Search Sound SW...OFF
12. TBC SW...OFF
13. Channel...A1

Figure E2

SERVO Section

2-4.4. PG SHIFTER ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP2001 TP3002	VR2001	PLAYBACK	X
TAPE	M. EQ.	SPEC.	
ALIGNMENT TAPE (VFM8080HQFP)	OSCILLO- SCOPE	6.5+ -0.5H	

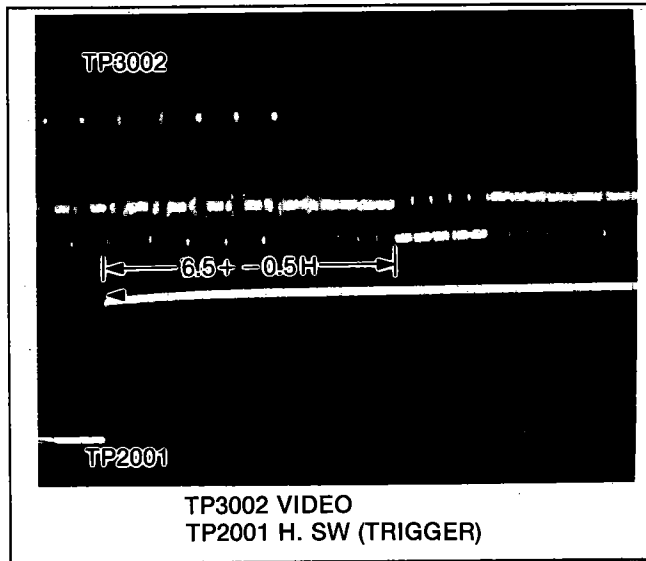


Figure E4

2-4.5. AUTO TRACKING GAIN ADJUSTMENT

TP	ADJ.	MODE	INPUT
PS3011-1	VR3301	PLAYBACK	4 MHz 200mVp-p (TO TP3001)
TAPE	M. EQ.	SPEC.	
X	SIGNAL GENERATOR/ D.V.M.	2.5+ -0.1Vp-p	

1. Set the S-VHS SW to OFF position.
2. Set the output of Sinewave Signal Generator to 4MHz, 200mVp-p and supply it to TP3001.
3. Connect the D.V.M. (Digital Volt Meter) to PS3011-1.
4. Adjust VR3301 until the reading of D.V.M. is 2.5 +/- 0.1 (Vp-p).

2-4.6. SLOW TRACKING ADJUSTMENT

TP	ADJ.	MODE	INPUT
ON THE MONITOR SCREEN	VR2011 (SP FWD) VR2019 (SP REV) VR2006 (SLP FWD) VR2018 (SLP REV)	SELF RECORDING AND SLOW (SP/SLP MODE)	COLOUR BAR (AV1 IN)
TAPE	M. EQ.	SPEC.	
BLANK TAPE	TV MONITOR	REFER TO PROCEDURE	

<<Note>>

Each slow speed is not specified.

1. Record the colour bar in the SP mode for a few minutes, then Record the colour bar in the SLP mode for a few minutes.
2. Connect a cut jumper wire as shown in Figure E5.
3. Play back the just recorded SP portion and place the unit in the forward SLOW mode.
4. Push the tracking button "+" and "-" at the same time.
5. Adjust the VR2011 until the noise band is minimized.
6. Place the unit in the reverse SLOW mode.
7. Adjust the VR2019 until the noise band is minimized.
8. Play back the just recorded SLP portion and place the unit in the forward SLOW mode.
9. Push the tracking button "+" and "-" at the same time.
10. Adjust the VR2006 until the noise band is minimized.
11. Place the unit in the reverse SLOW mode.
12. Adjust the VR2018 until the noise band is minimized.
13. Disconnect a jumper wire.

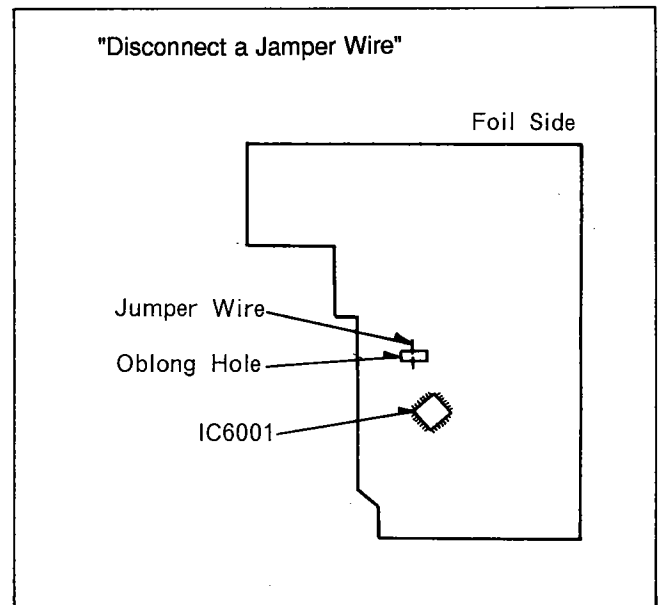


Figure E5

LUMINANCE, CHROMINANCE & HEAD AMP Section

2-4-7. CHROMINANCE & LUMINANCE RECORDING CURRENT ADJUSTMENT

S-VHS CHROMINANCE RECORDING CURRENT ADJ.

TP	ADJ.	MODE	INPUT
TP507 (HOT) TP508 (GND)	VR3003	RECORDING (SP MODE)	COLOUR BAR (AV1 IN)
TAPE	M. EQ.	SPEC.	
S-VHS BLANK TAPE	OSCILLO- SCOPE	36 + - 2mVp-p	

1. Supply colour bar signal to the video input of AV1.
2. Supply the DC 5V to P3001-10 to reduce luminance component.
3. Connect the oscilloscope to TP507 (HOT) and TP508 (GND).
4. Adjust the VR3003 for 36 +/- 2Vp-p as shown in Figure E6.

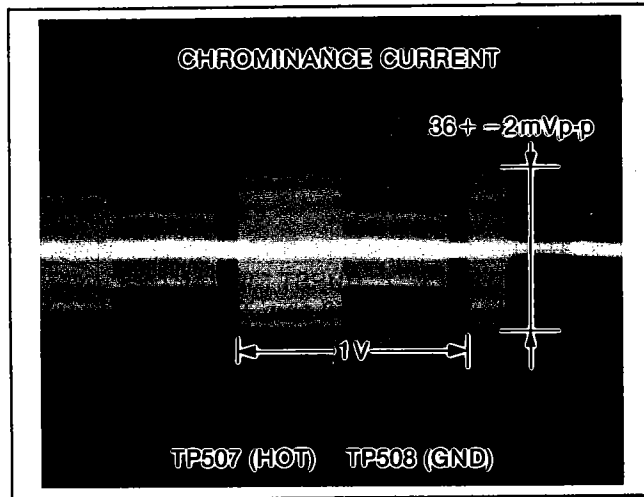


Figure E6

S-VHS LUMINANCE RECORDING CURRENT ADJ.

TP	ADJ.	MODE	INPUT
TP507 (HOT) TP508 (GND)	VR3002	RECORDING (SP MODE)	COLOUR BAR (S-VIDEO IN)
TAPE	M. EQ.	SPEC.	
S-VHS BLANK TAPE	OSCILLO- SCOPE	140 + - 5mVp-p	

5. After chrominance recording current adjustment, remove the supplying DC 5V.
6. Adjust the VR3002 for 140 +/- 5mVp-p as shown in Figure E7.

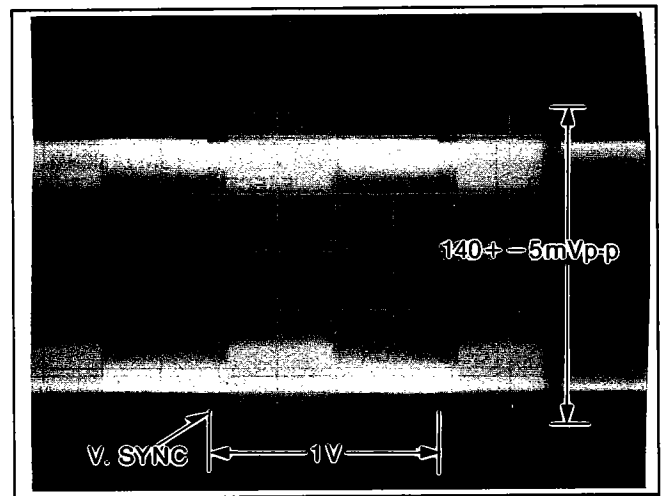


Figure E7

VHS LUMINANCE RECORDING CURRENT ADJ.

TP	ADJ.	MODE	INPUT
TP507 (HOT) TP508 (GND)	VR3001	RECORDING (SP MODE)	COLOUR BAR (AV1 IN)
TAPE	M. EQ.	SPEC.	
VHS BLANK TAPE	OSCILLO- SCOPE	140 + - 5mVp-p	

1. Set the S-VHS SW to OFF position.
2. Connect the oscilloscope to TP507 (HOT) and TP508 (GND).
3. Adjust the VR3001 for 140 +/- 5mVp-p as shown in Figure E8

This adjustment should be completed after S-VHS luminance and chrominance recording current adjustment.

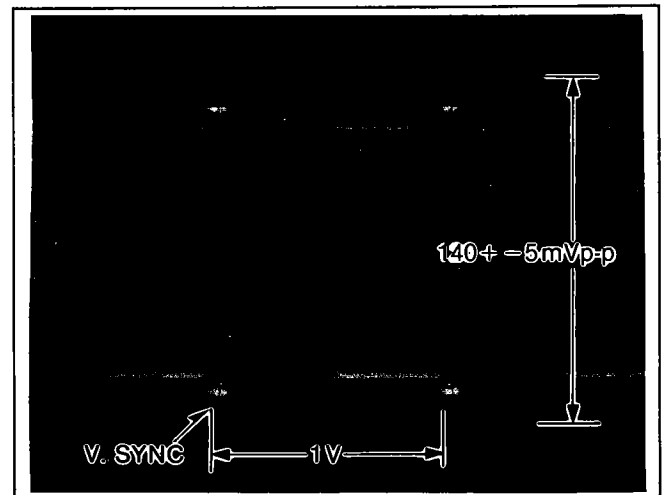


Figure E8

2-4-8. RF PEAK FREQUENCY ADJUSTMENT

TP	ADJ.	MODE	INPUT
PP3011-18	VR3004	EJECT	SWEEP SIGNAL (150mVp-p, 7MHz) (PP3011-14)
TAPE	M. EQ.	SPEC.	
X	OSCILLOSCOPE/ VIDEO SWEEP GENERATOR	7.0+/-0.2MHz	

<<Note>>

1. Connect the Service Circuit as shown in Figure E9.
2. VR3002 is center position.

1. Set the output signal of sweep generator to 150mmVp-p, 7MHz (Video signal only).
2. Connect a jumper wire between PP3002-17 and GND (compulsory S-VHS).
3. Supply set up video sweep signal to input point of service circuits.
4. Connect the oscilloscope to PP3011-18.
5. Adjust VR3004 until the peak frequency is 7.0 +/- 0.2MHz as shown in Figure E10.

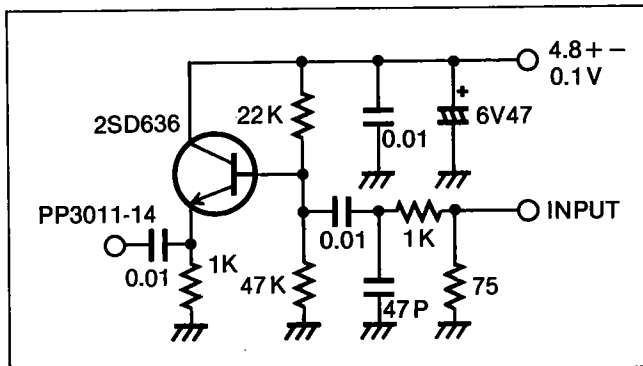


Figure E9

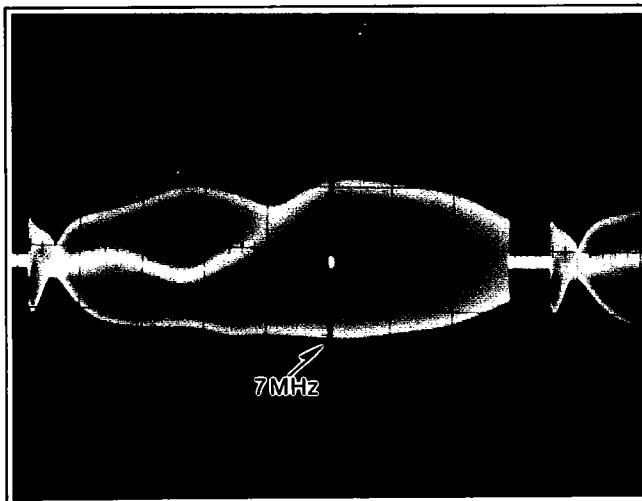


Figure E10

2-4-9. S-VHS FREQUENCY RESPONSE ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3021	VR3302	SELF RECORDING AND PLAYBACK (SP MODE)	SWEEP SIGNAL (S-VIDEO IN)
TAPE	M. EQ.	SPEC.	
S-VHS BLANK TAPE	OSCILLOSCOPE/ VIDEO SWEEP GENERATOR	A : B = -3.1±1dB (60~80%)	

<<Note>>

1. Set the output of video sweep generator as shown in Figure E11.
2. This adjustment must be done after the RF peak frequency adjustment.

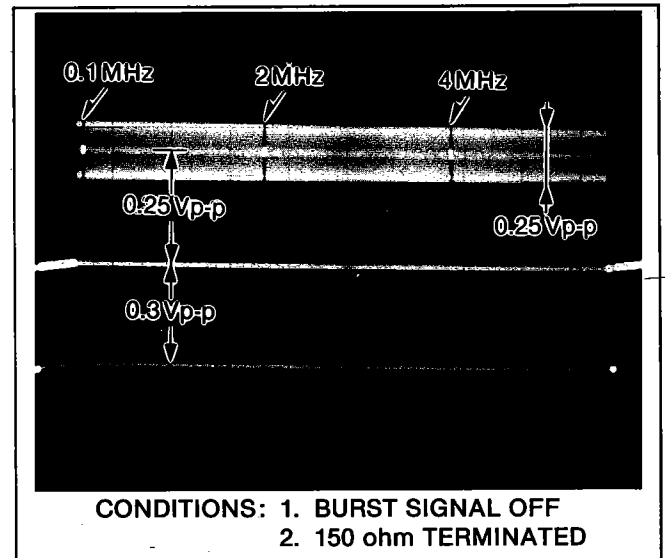


Figure E11

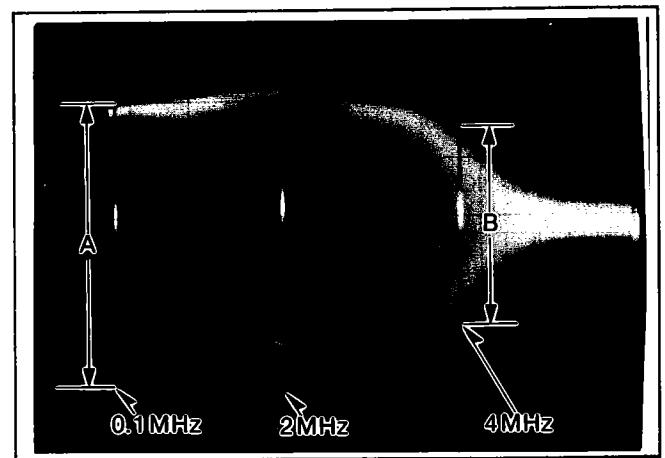


Figure E12

1. Supply video sweep signal to S-VIDEO-IN.
2. Record the signal in the SP mode for a few minutes.

3. Connect the oscilloscope to TP3021.
4. Play back the just recorded signal.
5. Adjust VR3302 until the B level (4MHz) is -3.1 ± 1 dB (60 to 80 percent) of the A level (0.1MHz) as shown in Figure E12.
(Measure the wide amplitude channel on 4MHz)

2-4-10. VHS FREQUENCY RESPONSE ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3021	VR3305 (SP) VR3304 (SLP)	SELF RECORDING AND PLAYBACK (SP/SLP MODE)	SWEEP SIGNAL
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLOSCOPE/ VIDEO SWEEP GENERATOR	SP: -1 ± 3 dB (60~125%) SLP: -3 ± 4 dB (45~110%)	

<<Note>>

Set the output of video sweep generator as shown in Figure E13

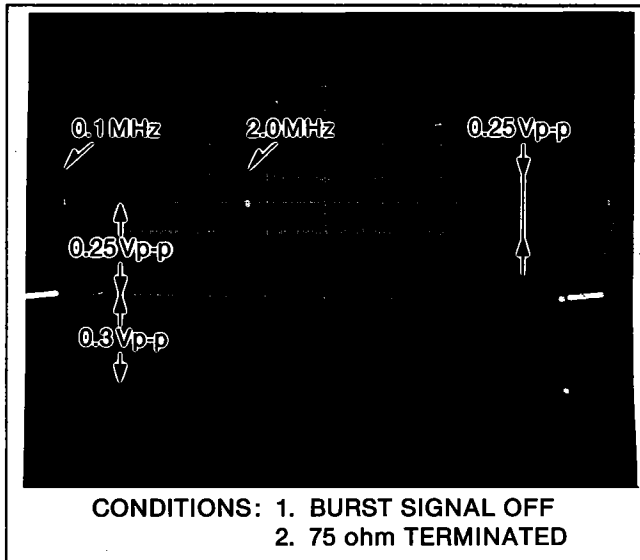


Figure E13

1. Supply video sweep signal to the Video input of AV1 and record the signal in the SP mode for a few minutes and record in the SLP mode for a few minutes.
2. Connect the oscilloscope to TP3021.
3. Play back the just recorded signal in the SP mode.
4. Adjust VR3305 until the B level (2MHz) is -1 ± 3 dB (60 to 125 percent) of the A level (0.1MHz) as shown in Figure E14.
5. Play back the just recorded signal in the SLP mode.
6. Adjust VR3304 until the B level (2MHz) is -3 ± 4 dB (45 to 110 percent) of the A level (0.1MHz) as shown in Figure E15.

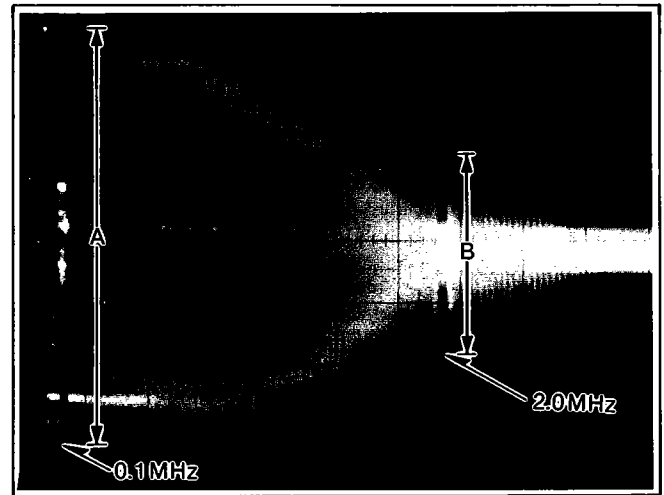


Figure E14 SP MODE

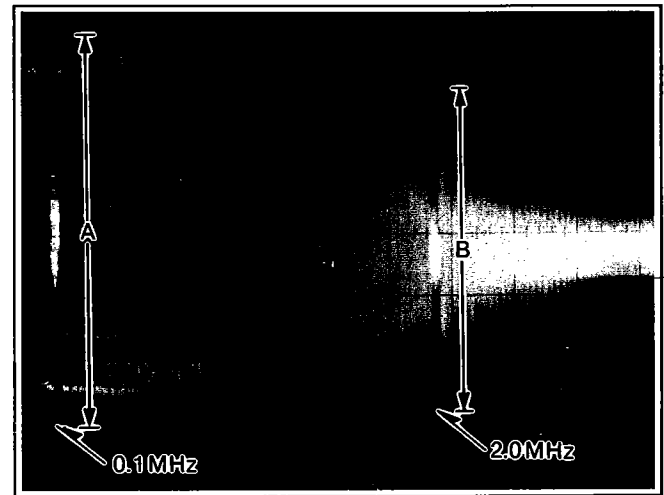


Figure E15 SLP MODE

2-4-11. LUMINANCE NOISE REDUCTION BALANCE ADJUSTMENT

TP	ADJ.	MODE	INPUT
IC301-34	VR304	RECORDING (SLP MODE)	COLOUR BAR (AV1 IN)
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLOSCOPE	WAVEFORM IS MINIMIZED	

<<Note>>

Connect the capacitor (1500pF) between IC301-34 and GND as shown in Figure E16.

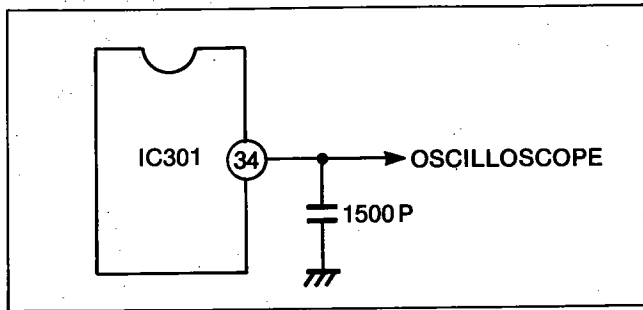


Figure E16

1. Supply colour bar Signal to the video input of AV1 and record the signal in the SLP mode for a few minutes.
2. Connect the Oscilloscope to IC301-34.
3. Adjust VR304 until the waveform is as small as possible. See Figure E17.

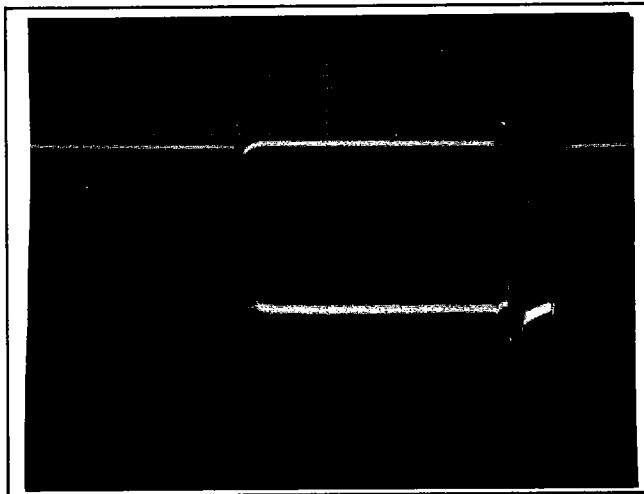


Figure E17 Before ADJ.

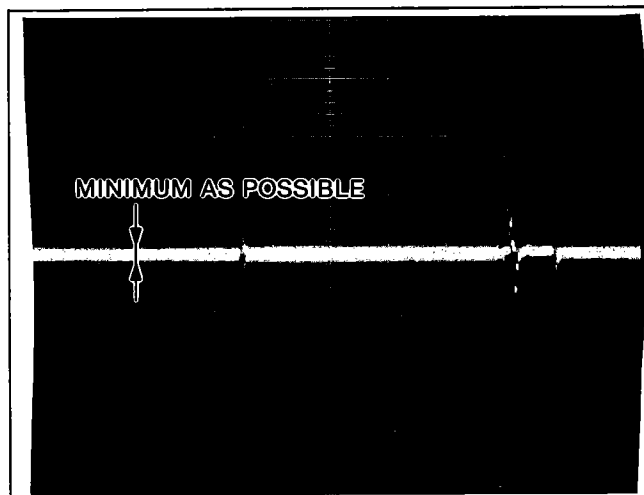


Figure E18 After ADJ.

2-4-12. CHROMINANCE RECURSIVE ADJUSTMENT

TP	ADJ.	MODE	INPUT
IC3801-9	VR3801 VR3802	SELF RECORDING AND PLAYBACK (SP MODE)	COLOUR BAR (AV1 IN)
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLOSCOPE	MINIMUM WAVEFORM	

1. Supply colour bar signal to the video input of AV1 and record the signal in the SP mode for a few minutes.
2. Connect the oscilloscope to IC3801-9.
3. Play back the just recorded signal.
4. Adjust both VR3801 and VR3802 until the chrominance amplitude is as small as possible. See Figure E20

<<Note>>

Check this adjustment after completing the recording current adjustment.

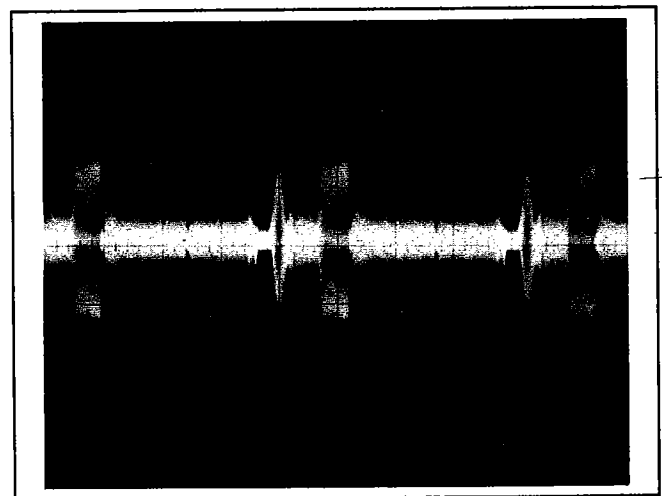


Figure E19 Before ADJ.

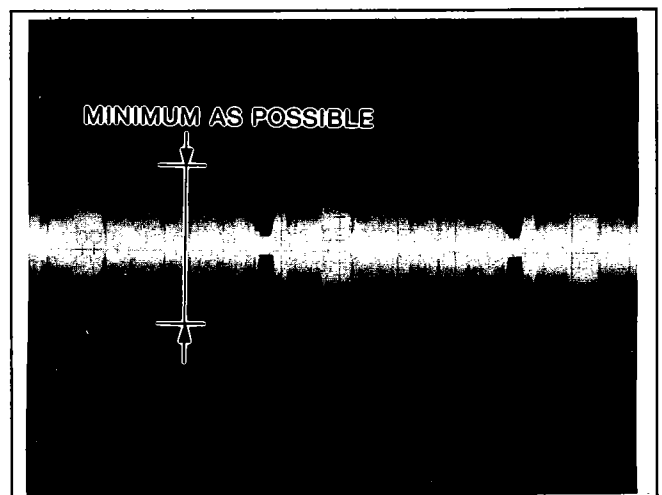


Figure E20 After ADJ.

2-4-13. VHS PLAYBACK LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3021	VR303	SELF RECORDING AND PLAYBACK (SP MODE)	COLOUR BAR (AV1 IN)
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLOSCOPE	2.0 + - 0.05 Vp-p	

<<Note>>

Set the S-VHS SW to OFF position.

1. Supply colour bar signal to the video input of AV1 and record the signal for a few minutes.
2. Connect the oscilloscope to TP3021.
3. Play back the just recorded signal.
4. Adjust VR303 until the luminance level is 2.0 +/- 0.05Vp-p as shown in Figure E21.

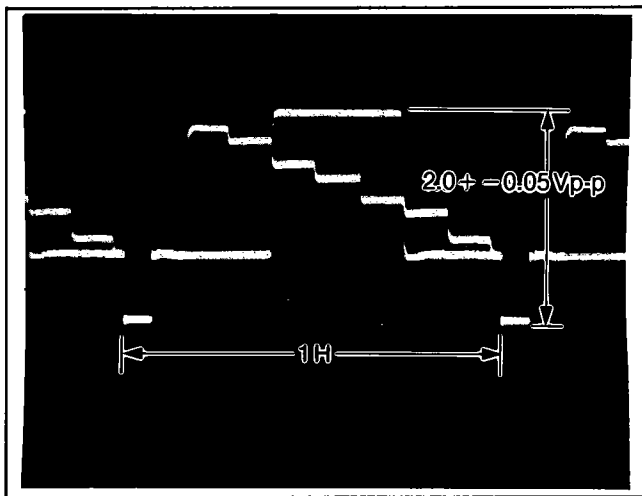


Figure E21

4. Adjust VR301 until the luminance level is 400 +/- 10mVp-p as shown in Figure E22.

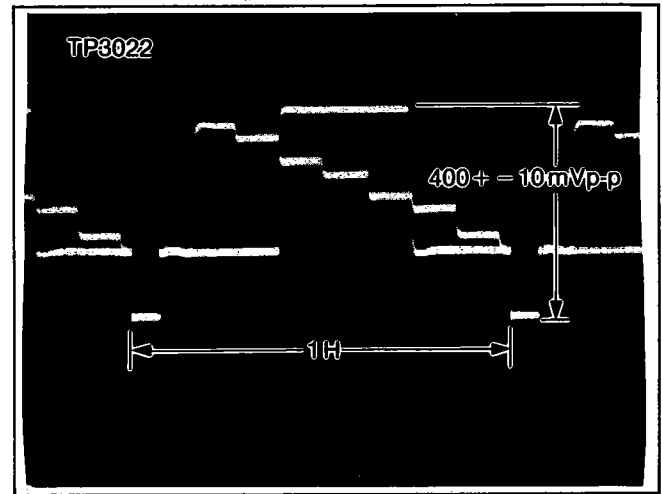


Figure E22

5. Connect the oscilloscope to TP3021.
6. Adjust VR302 until the luminance level is 2.0 +/- 0.05Vp-p as shown in Figure E23.

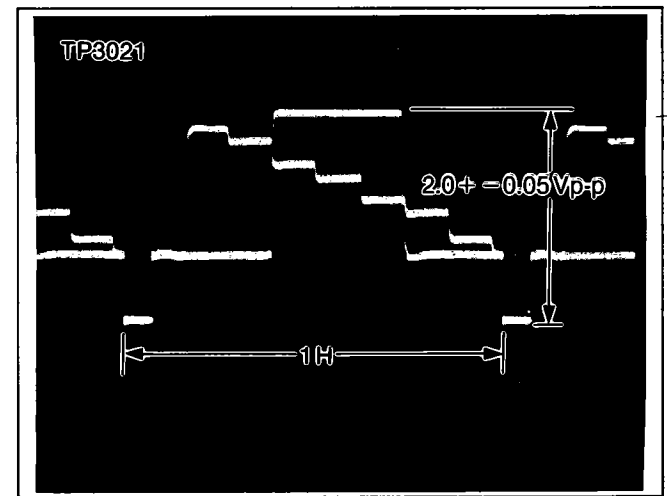


Figure E23

2-4-14. S-VHS PLAYBACK LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3022 TP3021	VR301 (S-P.B 1) VR302 (S-P.B 2)	SELF RECORDING AND PLAYBACK (SP MODE)	COLOUR BAR (AV1 IN)
TAPE	M. EQ.	SPEC.	
S-VHS BLANK TAPE	OSCILLOSCOPE	TP3022: 400 + - 10mVp-p TP3021: 2.0 + - 0.05Vp-p	

1. Supply colour bar signal to the video input of AV1 and record the signal in the SP mode for a few minutes.
2. Connect the oscilloscope to TP3022.
3. Play back the just recorded signal.

2-4-15. CHROMINANCE PLAYBACK LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP8021	VR801	SELF RECORDING AND PLAYBACK (SP MODE)	COLOUR BAR (AV1 IN)
TAPE	M. EQ.	SPEC.	
VHS BLANK TAPE	OSCILLOSCOPE	BURST: 0.42 + - 0.02Vp-p	

1. Supply colour bar signal to the video input of AV1 and record the signal in the SP mode for a few minutes.
2. Connect the oscilloscope to TP8021.

3. Play back the just recorded signal.
4. Adjust VR801 until the playback burst level is $0.42 \pm 0.02V_{p-p}$ as shown in Figure E24.

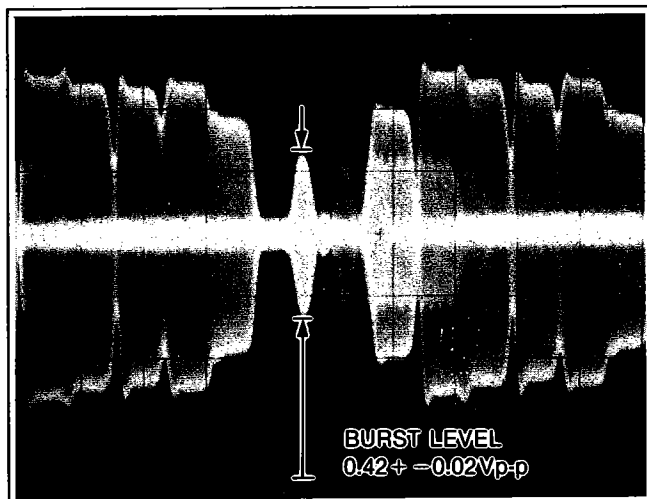


Figure E24

2-4-16. TBC NOISE GATE ADJUSTMENT

TP	ADJ.	MODE	INPUT
P9001-1	VR9001	SELF RECORDING AND PLAYBACK (SP MODE)	COLOUR BAR (AV1 IN)
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLOSCOPE	B = $1.0 \pm 0.1 \mu\text{sec}$	

1. Supply colour bar signal to the video input of AV1 and record the signal in the SP mode for a few minutes.
2. Connect the oscilloscope to TP9001.
3. Play back the just recorded signal.
4. Adjust VR9002 until the noise gate width "B" is $1.0 \pm 0.1 \mu\text{s}$ as shown in Figure E25.

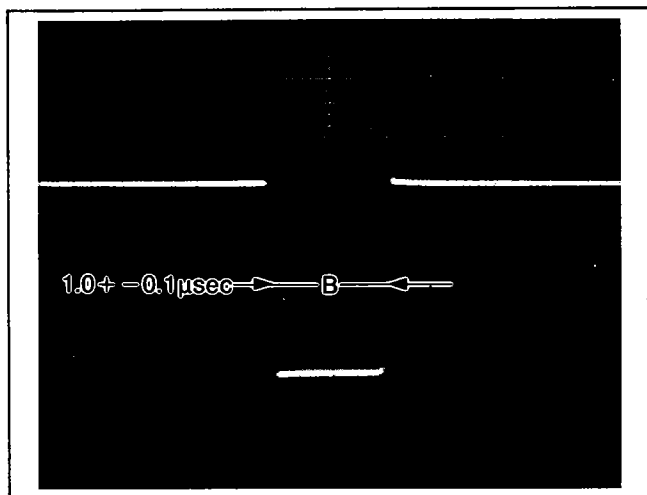


Figure E25.

2-4-17. TBC SYNC LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
P9001-1	VR9001	SELF RECORDING AND PLAYBACK (SP MODE)	COLOUR BAR (AV1 IN)
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLOSCOPE	B/A = $40 \pm 2\%$	

<<Note>>

TBC SW should be ON.

1. Supply colour bar signal to the video input of AV1 and record the signal in the SP mode for a few minutes.
2. Connect the oscilloscope to P9001-1.
3. Play back the just recorded signal.
4. Adjust VR9001 until the A level is $40 \pm 2\%$ of the B level. See Figure E26.

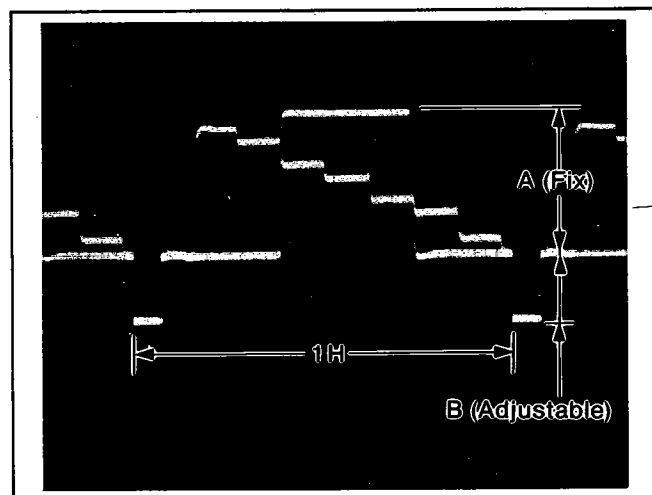


Figure E26

2-4-18. TBC WHITE BALANCE ADJUSTMENT

TP	ADJ.	MODE	INPUT
P9001-5	VR9005 VR9006	SELF RECORDING AND PLAYBACK (SP MODE)	COLOUR BAR (AV1 IN)
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLOSCOPE	MINIMUM AC COMPONENT ON WHITE PORTION	

<<Note>>

TBC SW should be ON.

1. Supply colour bar signal to the video input of AV1 and record the signal in the SP mode for a few minutes.

2. Connect the oscilloscope to P9001-5.
3. Play back the just recorded signal.
4. Adjust both VR9005 and VR9006 until the white portion signal is as small as possible. See Figure E27.

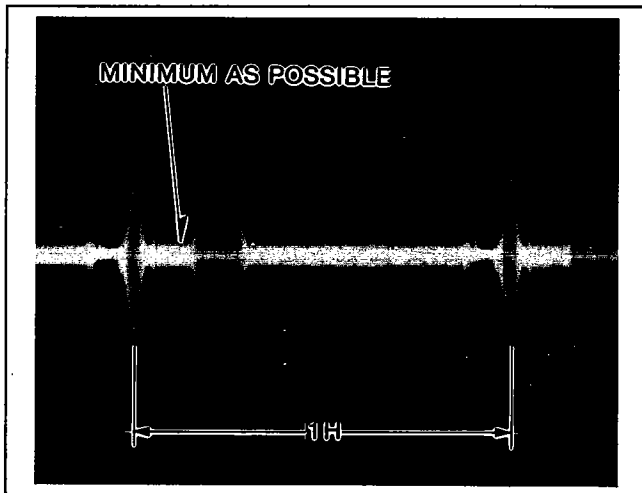


Figure E27

2-4-19. TBC R-Y LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
AV1 OUT	VR9003	SELF RECORDING AND PLAYBACK (SP MODE)	COLOUR BAR (AV1 IN)
TAPE	M. EQ.	SPEC.	
BLANK TAPE	VECTOR-SCOPE	TBC ON AND OFF RED VECTOR PHASE DIFFERENCE IS $\pm 3^\circ$	

1. Supply colour bar signal to the video input of AV1 and record the signal in the SP mode for a few minutes.
2. Play back the just recorded signal.
3. Check the RED vector phase when TBC SW is off.
4. Turn on the TBC SW and adjust VR9003 until the red vector is ± 3 degrees of TBC SW OFF. See Figure E28.

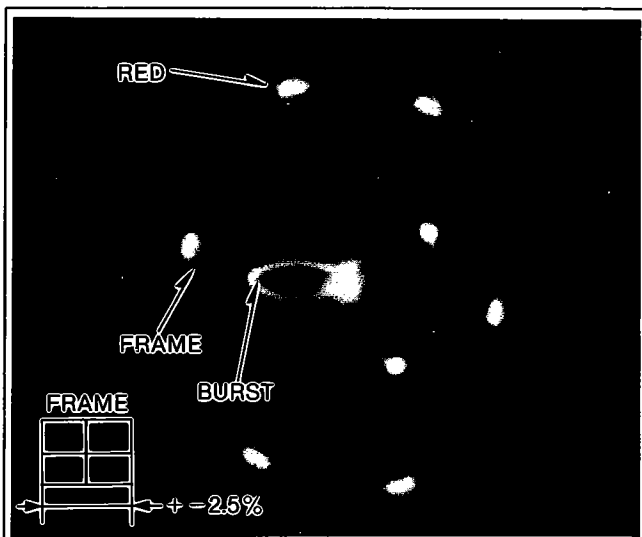


Figure E28

2-4-20. TBC DIGITAL CHROMINANCE LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
AV1 OUT	VR9004	SELF RECORDING AND PLAYBACK (SP MODE)	COLOUR BAR (AV1 IN)
TAPE	M. EQ.	SPEC.	
BLANK TAPE	VECTOR-SCOPE	TBC ON AND OFF BURST LEVEL BECOMES SAME	

1. Supply colour bar signal to the video input of AV1 and record the signal in the SP mode for a few minutes.
2. Play back the just recorded signal.
3. Adjust GAIN VR in the vectorscope until the burst vector gain is 75% when TBC SW off.
4. Turn on the TBC SW and adjust VR9004 until the burst vector gain is the same as the TBC SW OFF. See Figure E29.

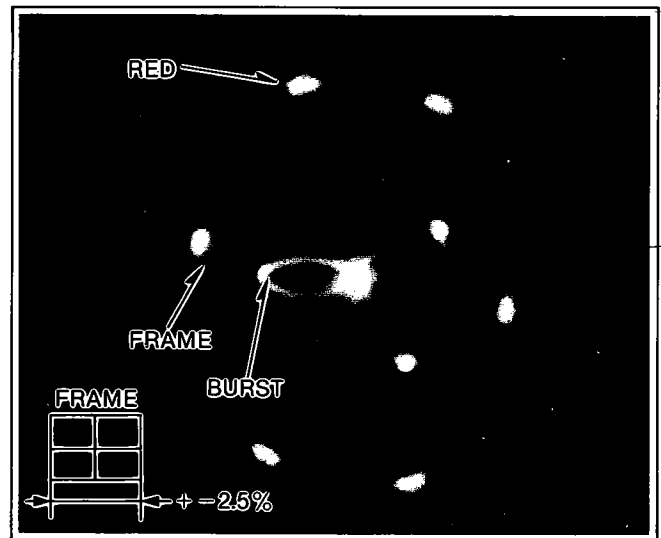


Figure E29

<<Note>>

Check TBC R-Y level AND TBC DIGITAL chrominance level at the same time when adjusting them.

2-4-21. TBC PLAYBACK LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
P9001-1	VR9007	SELF RECORDING AND PLAYBACK (SP MODE)	COLOUR BAR (AV1 IN)
TAPE	M. EQ.	SPEC.	
BLANK TAPE	OSCILLOSCOPE	100+ -2.5%	

1. Supply colour bar signal to the video input of AV1 and record the signal in the SP mode for a few minutes.
2. Connect the oscilloscope to P9001-3 and 1.
3. Play back the just recorded signal.
4. Read the playback level to P9001-3.
5. Adjust VR9007 until the P9001-1 level is 100 +/- 2.5% of the P9001-3 level.

TIMER Section

2-4-22. TIMER CLOCK ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP7501	C7511		
TAPE	M. EQ.	SPEC.	
	UNIVERSAL COUNTER	7812.5+ -0.015µsec	

1. Connect the universal counter to TP7501.
2. Adjust C7511 for 7812.5 +/- 0.015us.

NORMAL AUDIO Section

2-4-23. AUDIO BIAS CURRENT ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP4002 (+) TP4003 (-)	VR4001	RECORDING	
TAPE	M. EQ.	SPEC.	
BLANK TAPE	V.T.V.M.	2.4+ -0.1mVrms	

1. Connect the V.T.V.M. to TP4002 (+) and TP4003 (-). (Do not use long cable for Connection)
2. Make a short circuit between terminal of audio input and GND.
3. Place the Unit in Recording mode.
4. Adjust VR4001 until the reading of V.T.V.M. is 2.4 +/- 0.1mVrms.

Hi-Fi AUDIO Section

2-4-24. AUDIO E-E LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
AV1 OUT	VR4512	STOP	1kHz, -10dB SINEWAVE (AV1 IN)
TAPE	M. EQ.	SPEC.	
	SIGNAL GENERATOR/ V.T.V.M.	EE LEVEL = -8+ -0.5dB (380mVrms~420mVrms)	

1. Set the STEREO Mode.
2. Adjust VR4512 until the level of the (L) CH E-E level is -8 +/- 0.5dB (380 to 420mVrms).

<<Note>>

Before this adjustment, "Tape Interchangeability Adjustment" and "Audio Bias Current Adjustment" must be completed.

2-4-25. HiFi AUDIO CARRIER FREQUENCY ADJUSTMENT

TP	ADJ.	MODE	INPUT
IC4501-34 (L) IC4501-47 (R)	VR4501 (NTSC-L) VR4509 (NTSC-R)	RECORDING (SP MODE)	
TAPE	M. EQ.	SPEC.	
BLANK TAPE	FREQUENCY COUNTER	NTSC-L: 1300+ -3kHz NTSC-R: 1700+ -3kHz	

1. Put unit into the SP recording mode.
2. Connect the frequency counter to IC4501-34.
3. Adjust VR4501 until the frequency is 1300 +/- 3KHz.
4. Connect the frequency counter to IC4501-47.
5. Adjust VR4509 until the frequency is 1700 +/- 3KHz.

2-4-26. AUDIO DEVIATION ADJUSTMENT

TP	ADJ.	MODE	INPUT
BETWEEN VR4502 AND R4511 (L) BETWEEN VR4507 AND R4561 (R)	VR4502 (L) VR4507 (R)	RECORDING (SP MODE)	1kHz, -10dB (316mVp-p) (AV1 IN)
TAPE	M. EQ.	SPEC.	
BLANK TAPE	V.T.V.M.	120mVrms	

1. Set the output level of the Signal Generator to 1KHz/-10dB and supply it to both Audio Input terminals (L) and (R).
2. Adjust the recording level (Audio output) with HiFi Rec Level VR on the Front Panel until the audio outputs are 400mVrms (V.T.V.M.) at both Audio Output terminals (L) and (R).
3. Connect the V.T.V.M. between VR4502 and R4511.
4. Adjust VR4502 until the level is 120mVrms.
5. Connect the V.T.V.M. between VR4507 and R4561.
6. Adjust VR4507 until the level is 120mVrms.

2-4-27. FM BPF LEVEL ADJUSTMENT

TP	ADJ.	MODE	INPUT
IC4501-33 (L) IC4501-48 (R)	VR4550	PLAYBACK	1.505MHz 400mVp-p (PS4003-8)
TAPE	M. EQ.	SPEC.	
BLANK TAPE	SIGNAL GENERATOR/ D.V.M.	L CH=R CH	

1. Remove the P551.
2. Set the output of the signal generator to 1.505MHz and 400mVp-p, and supply it to Pin 8 of PS4003.
3. Connect the oscilloscope to the Pin 33 and Pin 48 of IC4501.
4. Play back the alignment tape.
5. Adjust VR4550 until the (L) CH level is same level of (R) CH level.
6. After this adjustment, connect P551.

2-4-28. LEVEL METER SENSITIVITY ADJUSTMENT

TP	ADJ.	MODE	INPUT
LEVEL METER	VR7501	STOP	1kHz, -10dB (AV1 IN)
TAPE	M. EQ.	SPEC.	
	SIGNAL GENERATOR	0dB INDICATOR JUST LIGHT UP	

1. Set the Audio Playback Mode to STEREO position (Both the Left and Right Indicators are lit).
2. Set the output level of the Signal Generator to 1KHz/-10dB and supply it to both Audio Input terminals (L) and (R).
3. Adjust the recording level (Line output) with HiFi Rec Level VR until the both audio output terminals (L) and (R) are 400mVrms.
4. Adjust VR7501 so that the 0dB indicator just lights up on the level meter as shown in Figure E30.

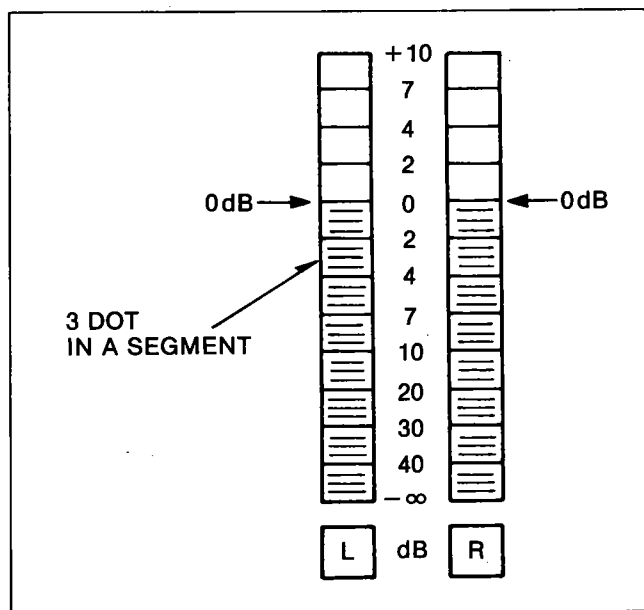
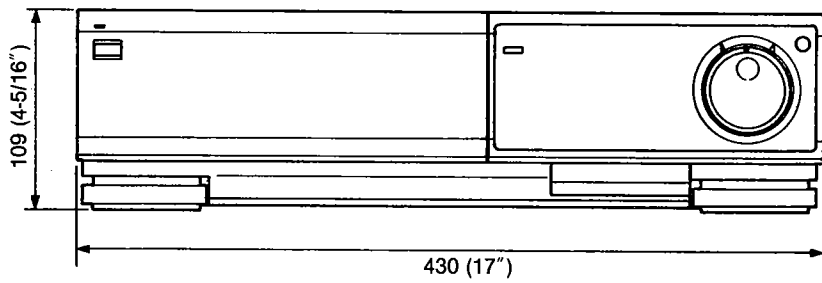
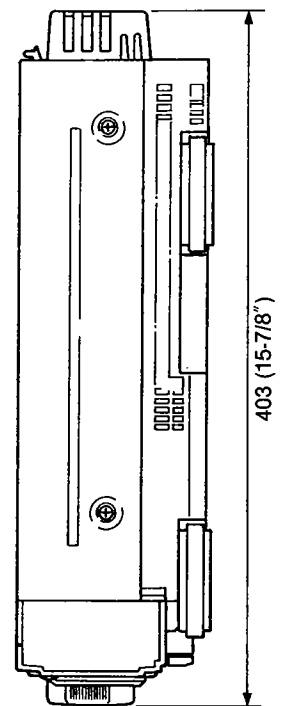
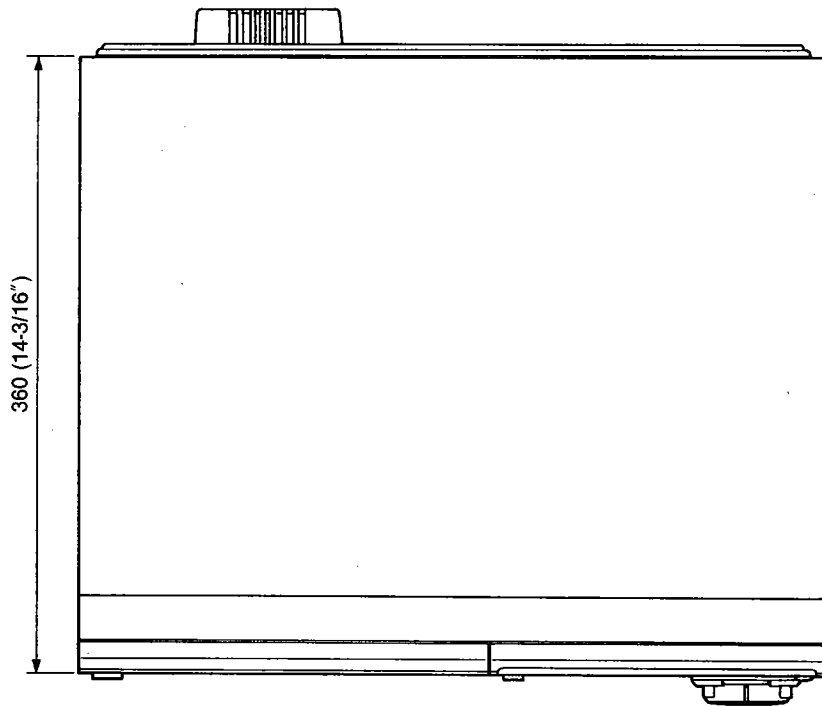


Figure E30

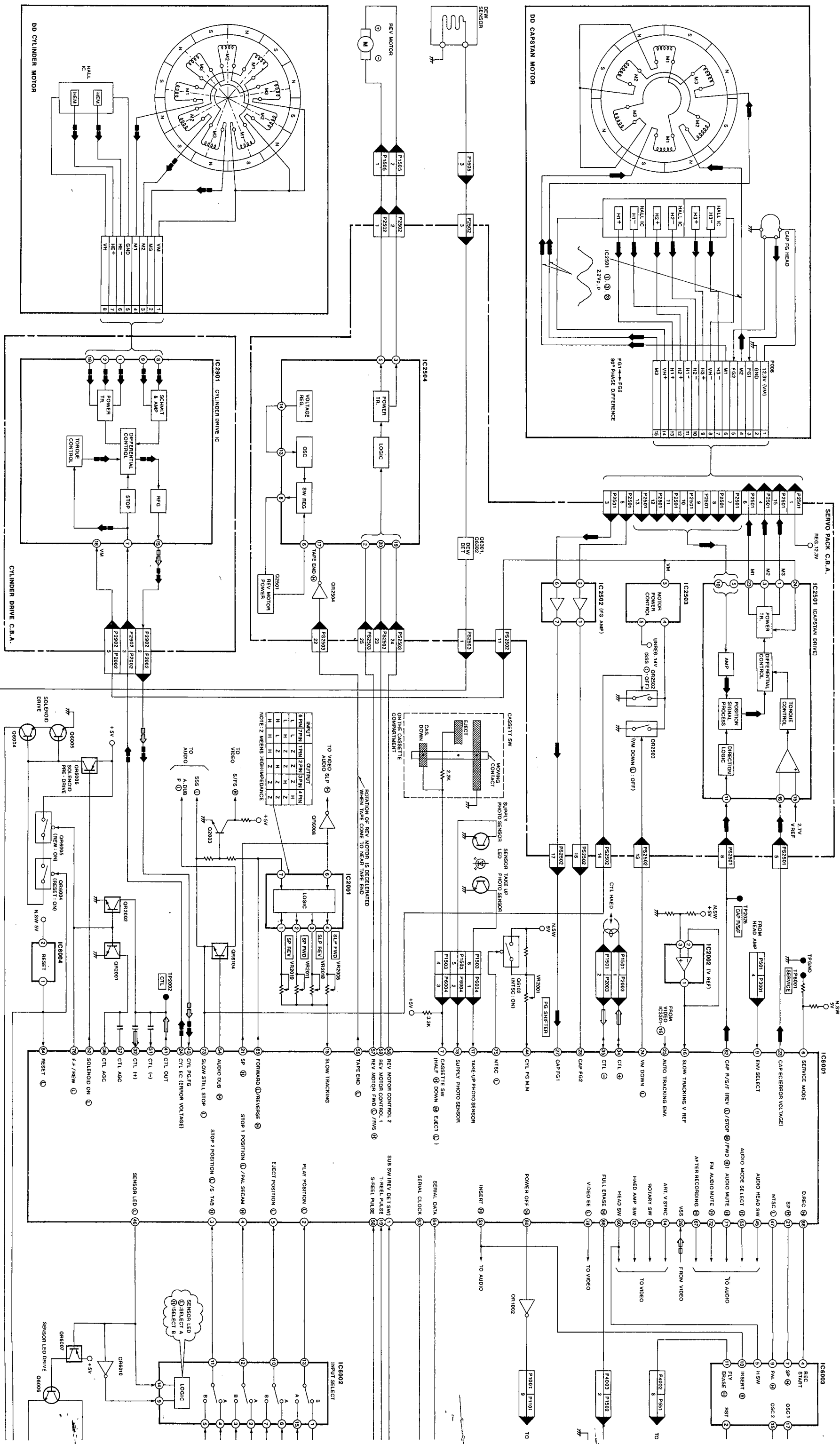
DIMENSIONS



SECTION 3

BLOCK DIAGRAMS & BLOCK DIAGRAMS

3-1. SYSTEM CONTROL & SERVO BLOCK DIAGRAM

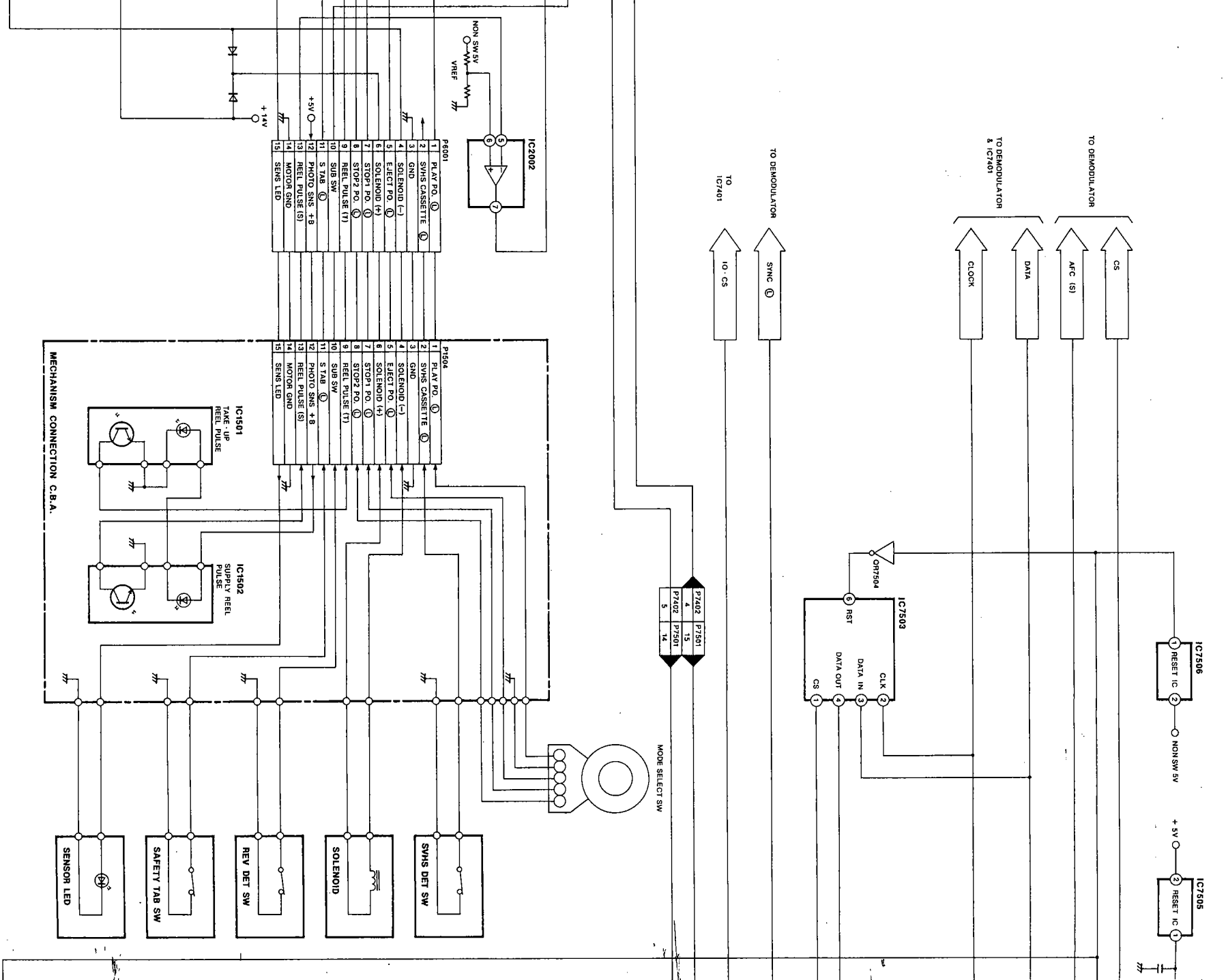
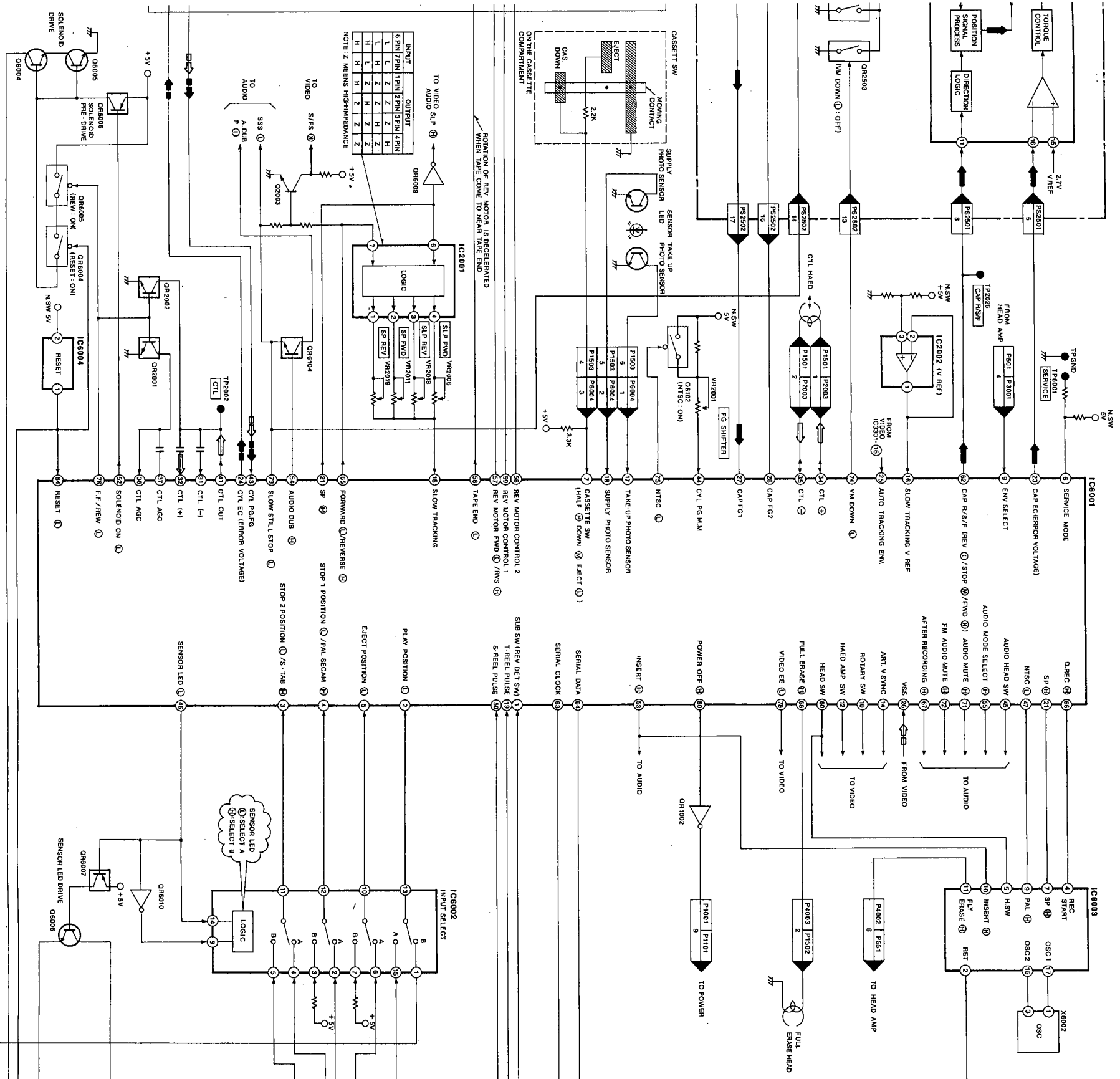


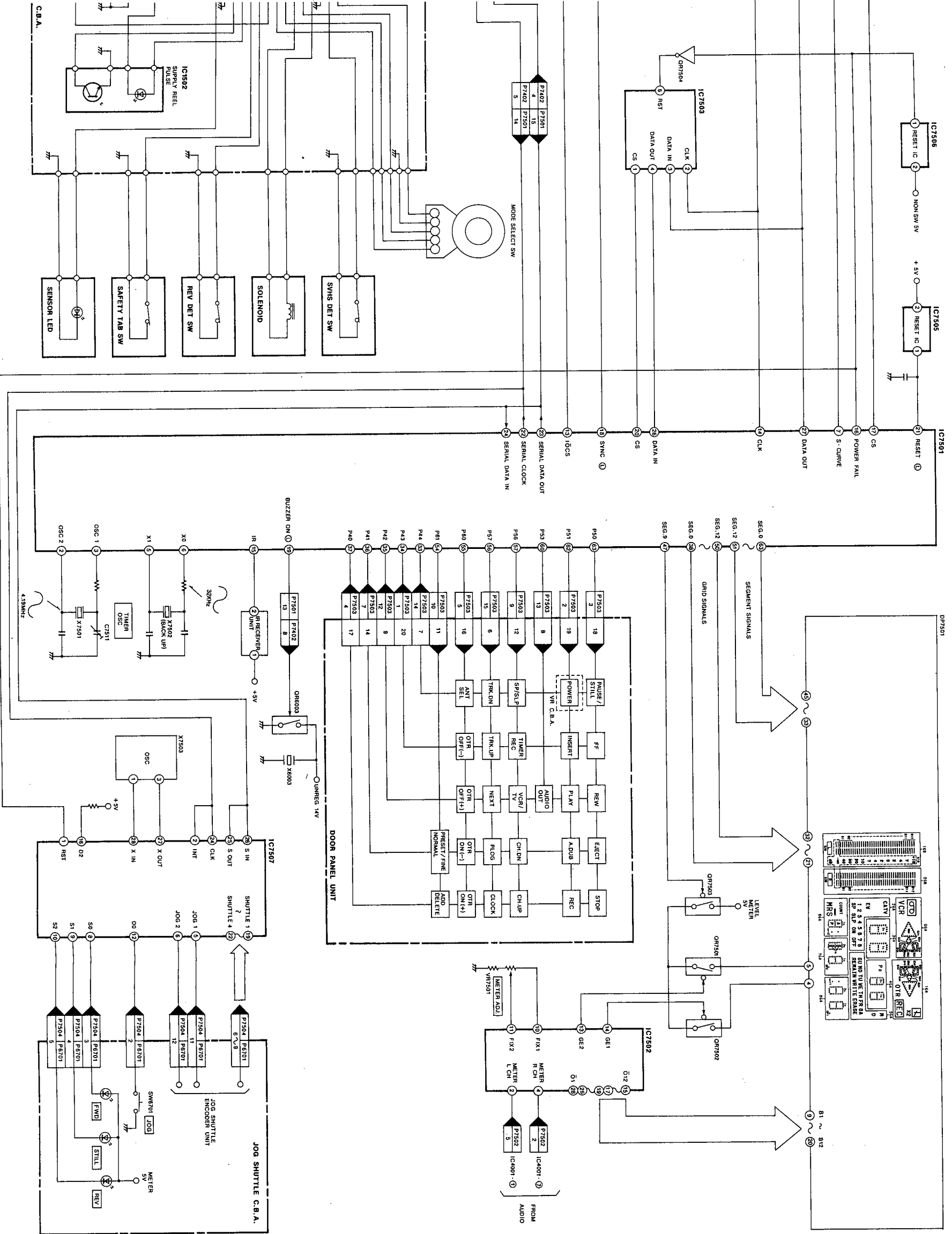
CAPSTAN SERVO SPEED LOOP
 CAPSTAN SERVO PHASE LOOP

CYLINDER SERVO SPEED LOOP
 CYLINDER SERVO PHASE LOOP

CAPSTAN SERVO SPEED LOOP

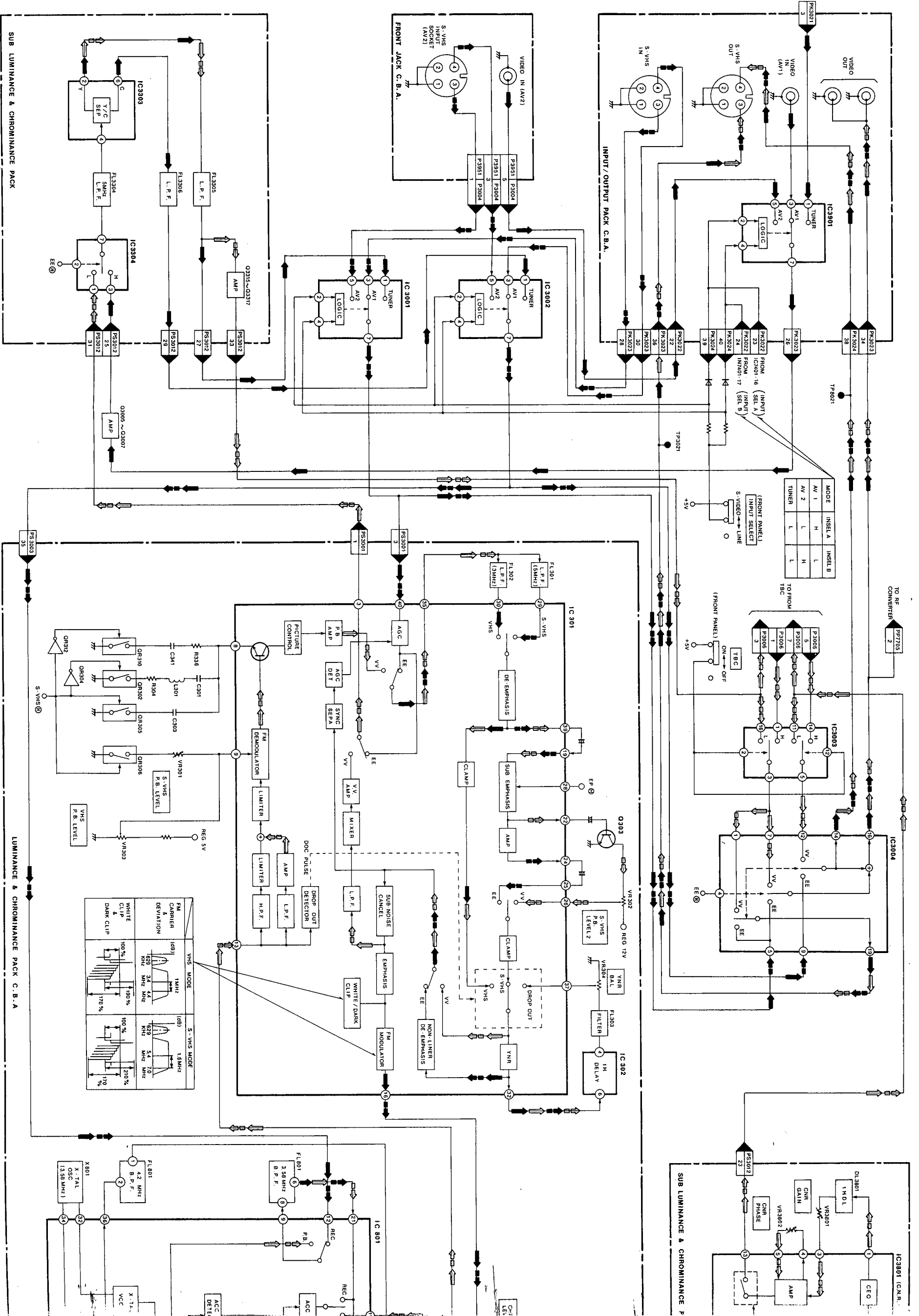
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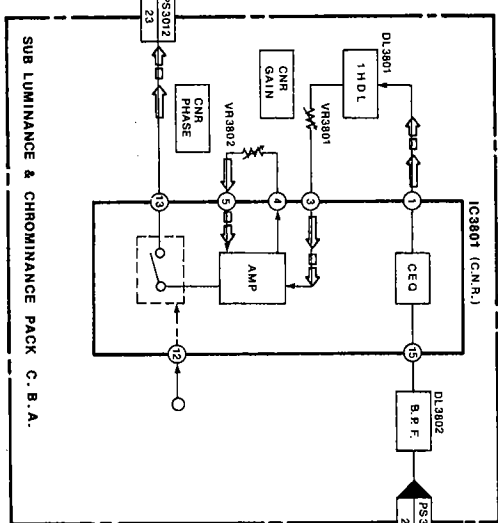
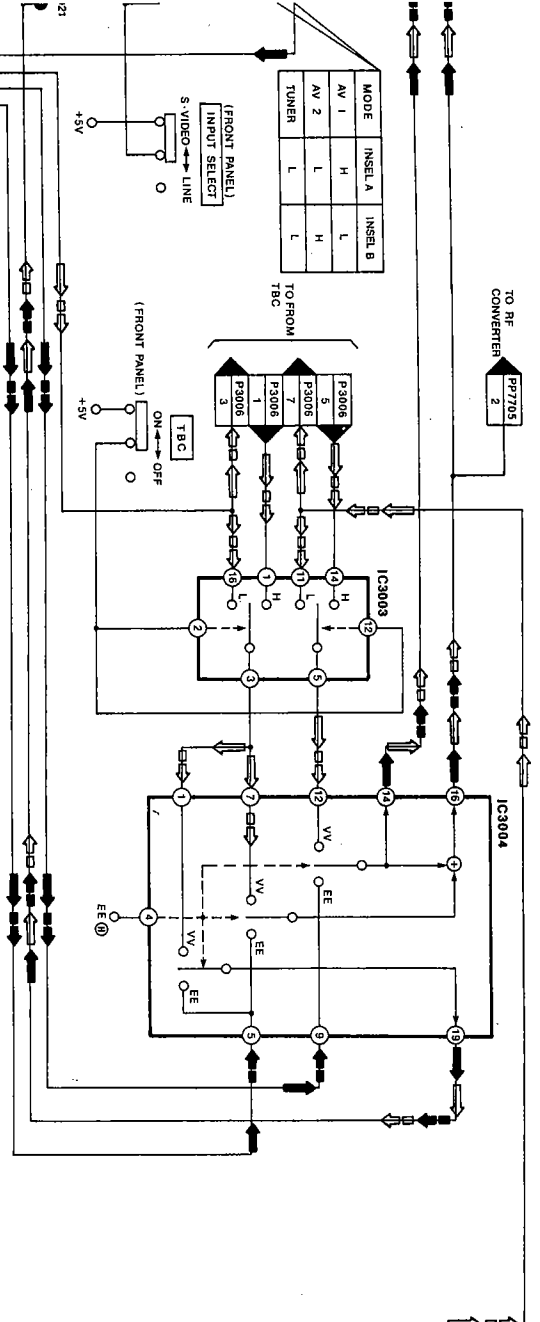




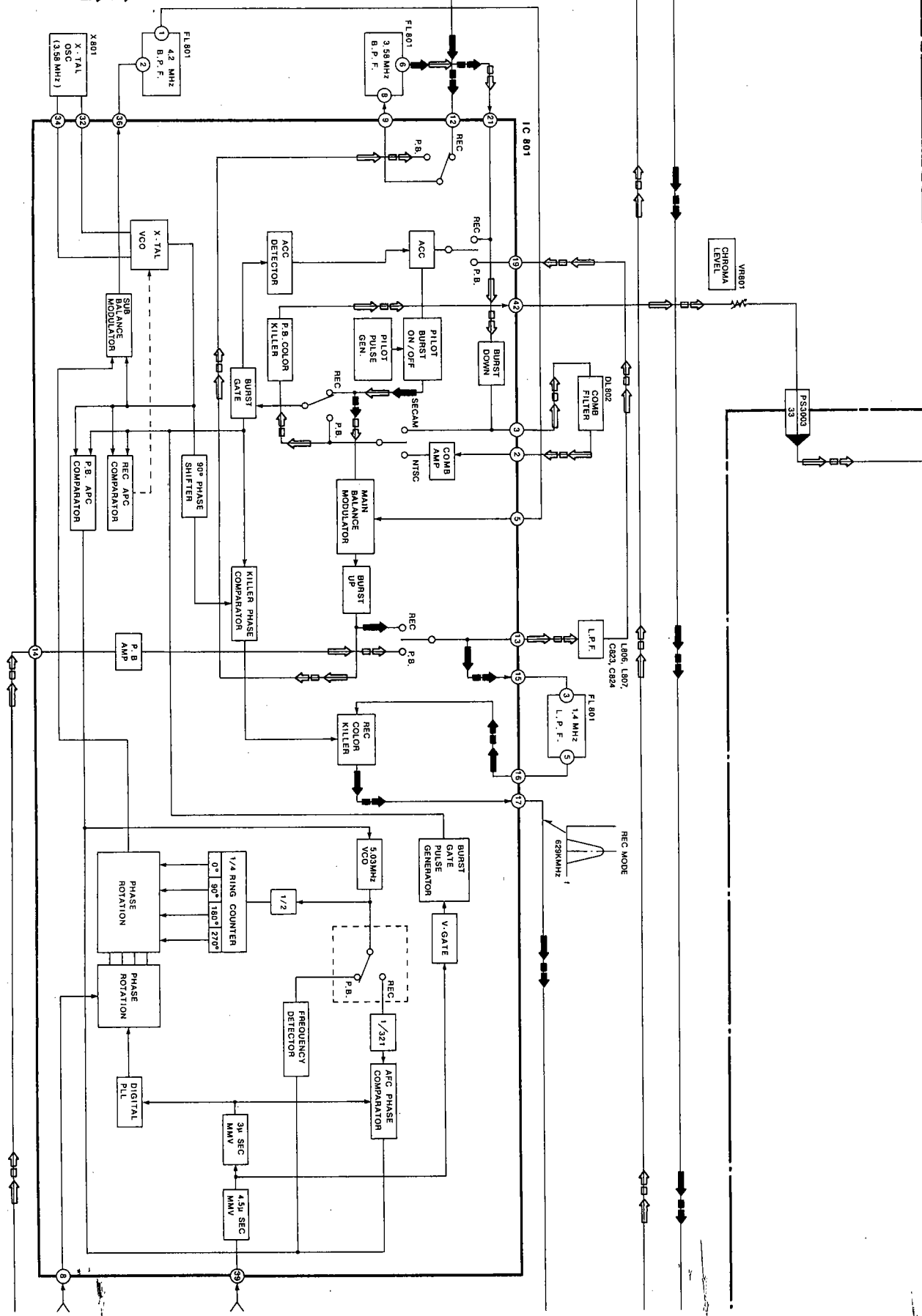
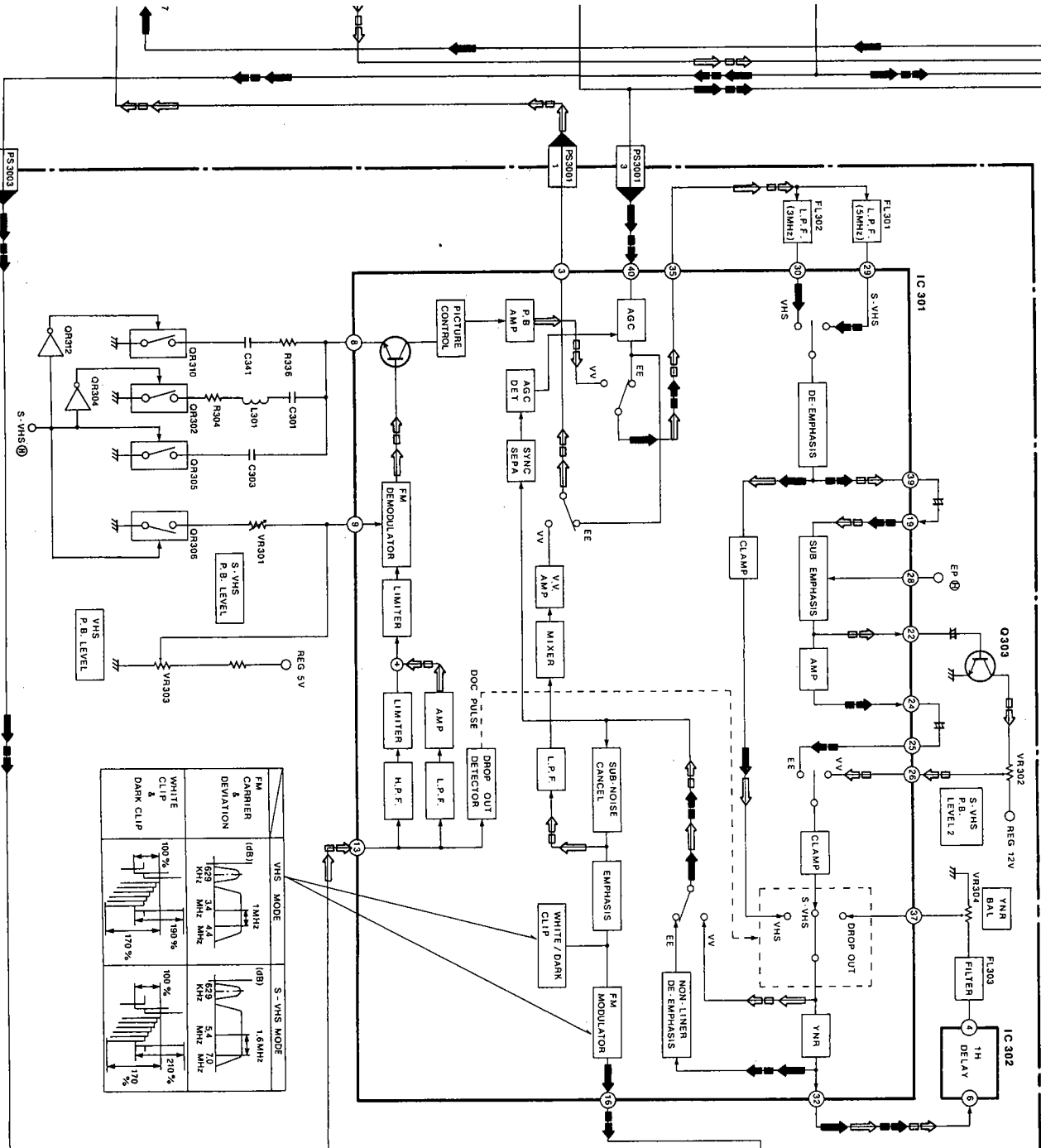
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IN	(a)	H	L																		
OUT	(b)	L	H																		
COMPARATOR 	<table border="1"> <tr><td>IN</td><td>(a)</td><td>(a) > (b)</td><td>(a) < (b)</td></tr> <tr><td>OUT</td><td>(b)</td><td>H</td><td>L</td></tr> <tr><td>OUT</td><td>(c)</td><td>H</td><td>L</td></tr> </table>	IN	(a)	(a) > (b)	(a) < (b)	OUT	(b)	H	L	OUT	(c)	H	L								
IN	(a)	(a) > (b)	(a) < (b)																		
OUT	(b)	H	L																		
OUT	(c)	H	L																		
AND CIRCUIT 	<table border="1"> <tr><td>IN</td><td>(a)</td><td>L</td><td>L</td><td>H</td><td>H</td></tr> <tr><td>IN</td><td>(b)</td><td>L</td><td>H</td><td>L</td><td>H</td></tr> <tr><td>OUT</td><td>(c)</td><td>L</td><td>L</td><td>L</td><td>H</td></tr> </table>	IN	(a)	L	L	H	H	IN	(b)	L	H	L	H	OUT	(c)	L	L	L	H		
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IN	(b)	L	H	L	H																
OUT	(c)	L	L	L	H																
OR CIRCUIT 	<table border="1"> <tr><td>IN</td><td>(a)</td><td>L</td><td>L</td><td>H</td><td>H</td></tr> <tr><td>IN</td><td>(b)</td><td>L</td><td>H</td><td>L</td><td>H</td></tr> <tr><td>OUT</td><td>(c)</td><td>L</td><td>H</td><td>H</td><td>H</td></tr> </table>	IN	(a)	L	L	H	H	IN	(b)	L	H	L	H	OUT	(c)	L	H	H	H		
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IN	(b)	L	H	L	H																
OUT	(c)	L	H	H	H																
THREE STATES BUFFER 	<table border="1"> <tr><td>IN</td><td>(a)</td><td>H</td><td>L</td><td>H or L</td></tr> <tr><td>IN</td><td>(b)</td><td>L</td><td>L</td><td>H</td></tr> <tr><td>OUT</td><td>(c)</td><td>H</td><td>L</td><td>※</td></tr> </table> <p>※ High Impedance</p>	IN	(a)	H	L	H or L	IN	(b)	L	L	H	OUT	(c)	H	L	※					
IN	(a)	H	L	H or L																	
IN	(b)	L	L	H																	
OUT	(c)	H	L	※																	
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BASE	H	L																			
TR. SW	ON	OFF																			
TR. SW (PNP TYPE) 	<table border="1"> <tr><td>BASE</td><td>H</td><td>L</td></tr> <tr><td>TR. SW</td><td>OFF</td><td>ON</td></tr> </table>	BASE	H	L	TR. SW	OFF	ON														
BASE	H	L																			
TR. SW	OFF	ON																			
R.S TYPE FLIP-FLOP 	<table border="1"> <tr><td>IN</td><td>(a)</td><td>L</td><td>L</td><td>L</td></tr> <tr><td>IN</td><td>(b)</td><td>L</td><td>L</td><td>L</td></tr> <tr><td>OUT</td><td>(c)</td><td>※</td><td>L</td><td>H</td></tr> <tr><td>OUT</td><td>(d)</td><td>◆</td><td>H</td><td>L</td></tr> </table> <p>※ Initial condition is maintained. ◆ Initial condition is reversed.</p>	IN	(a)	L	L	L	IN	(b)	L	L	L	OUT	(c)	※	L	H	OUT	(d)	◆	H	L
IN	(a)	L	L	L																	
IN	(b)	L	L	L																	
OUT	(c)	※	L	H																	
OUT	(d)	◆	H	L																	

3-2. LUMINANCE & CHROMINANCE BLOCK DIAGRAM

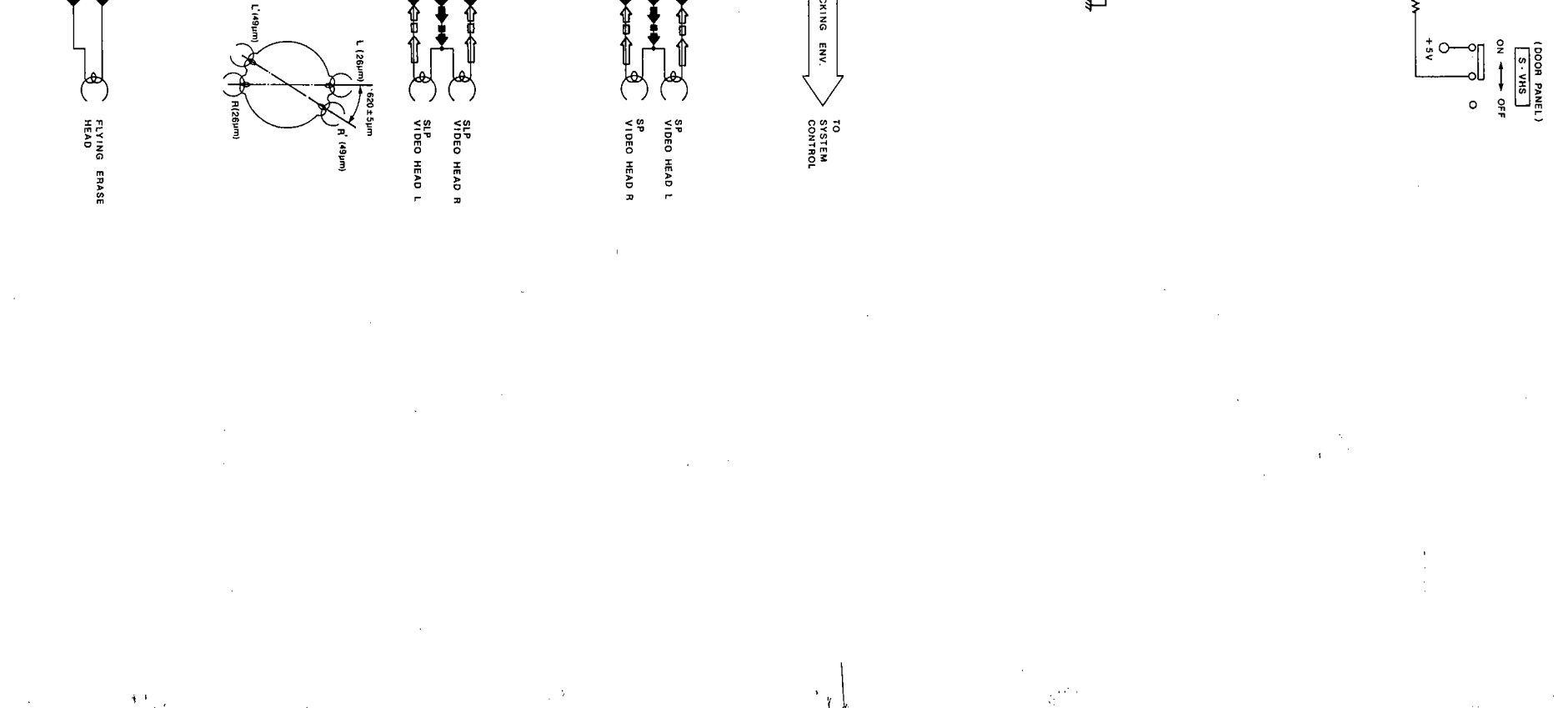
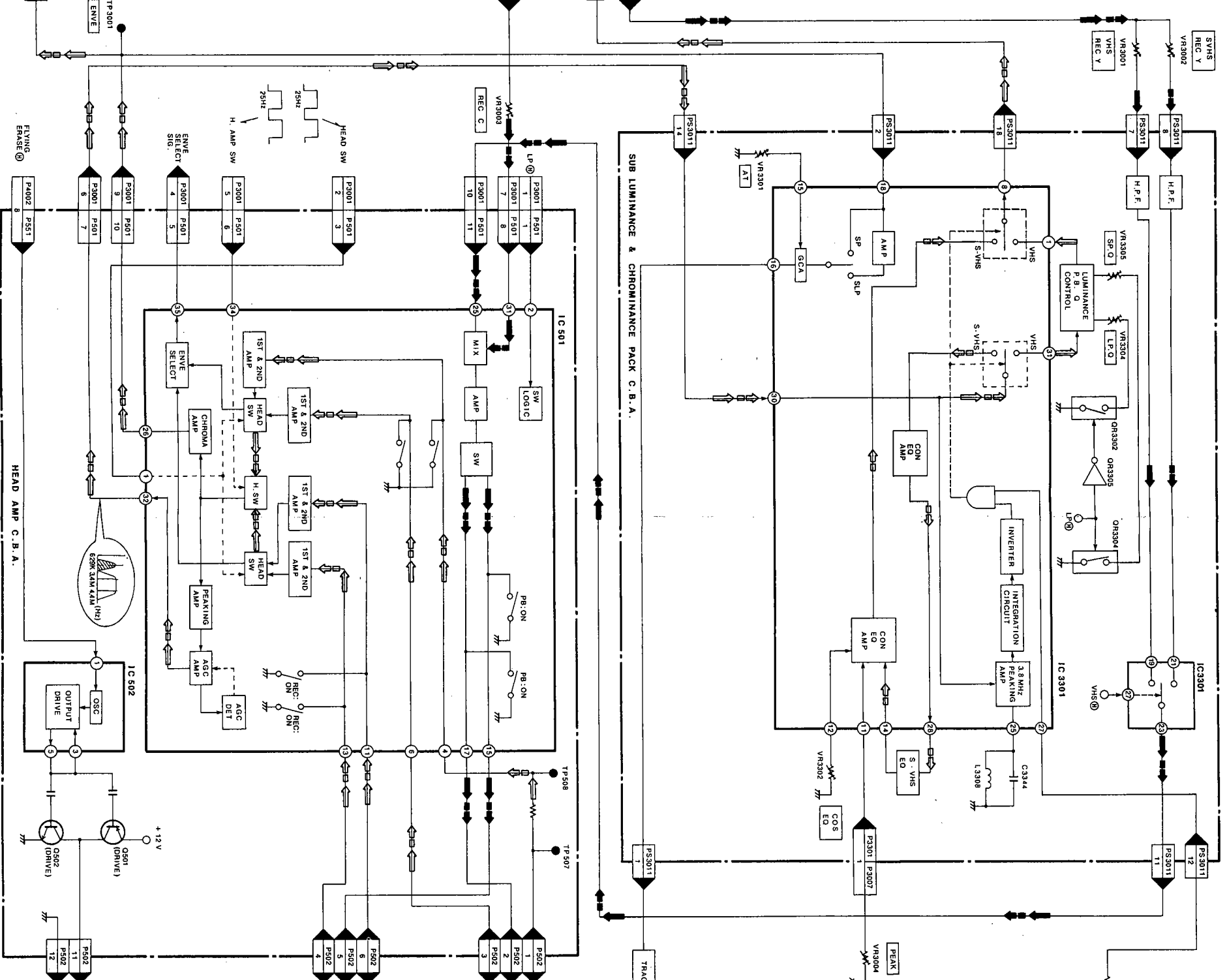
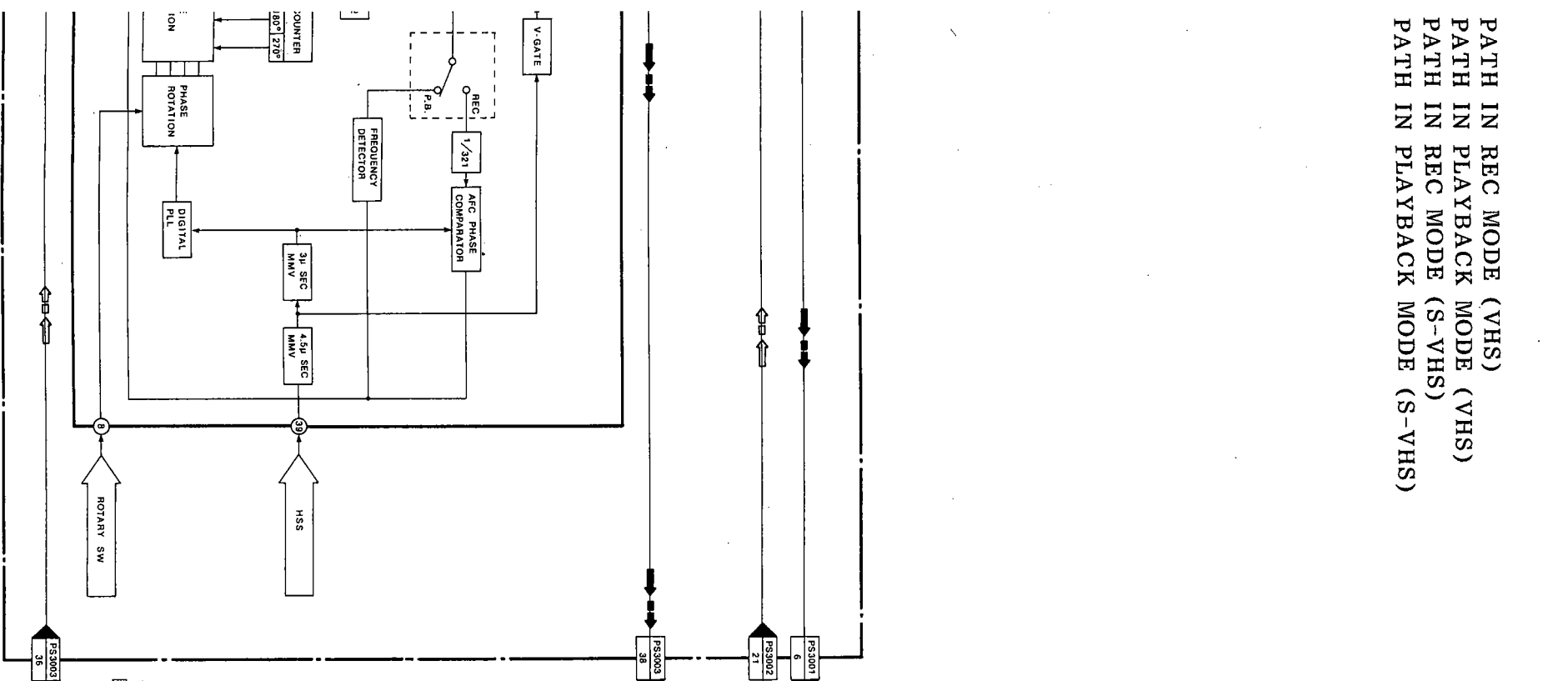




MAIN SIGNAL PATH IN REC MODE (VHS)
 MAIN SIGNAL PATH IN PLAYBACK MODE (VHS)
 MAIN SIGNAL PATH IN REC MODE (S-VHS)
 MAIN SIGNAL PATH IN PLAYBACK MODE (S-VH)

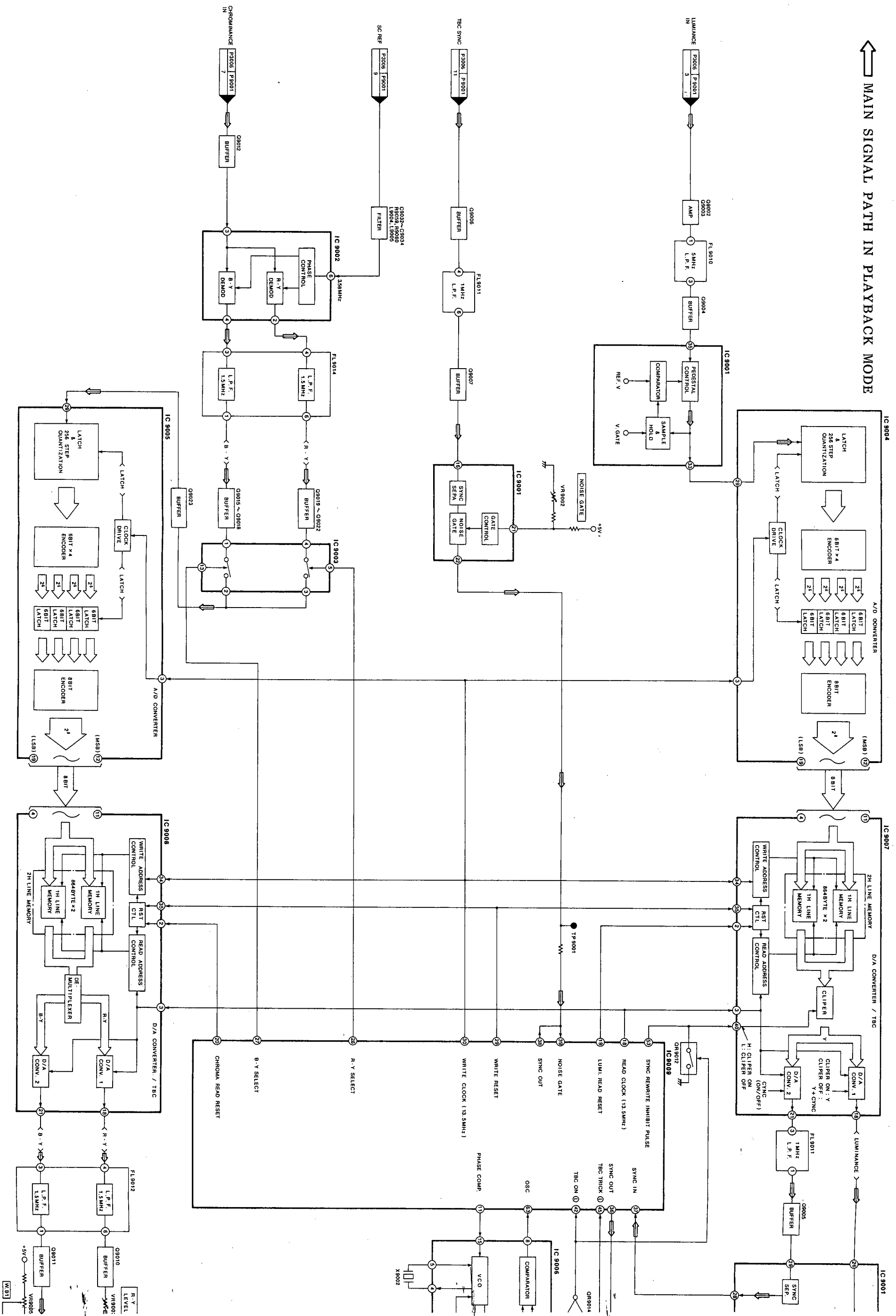


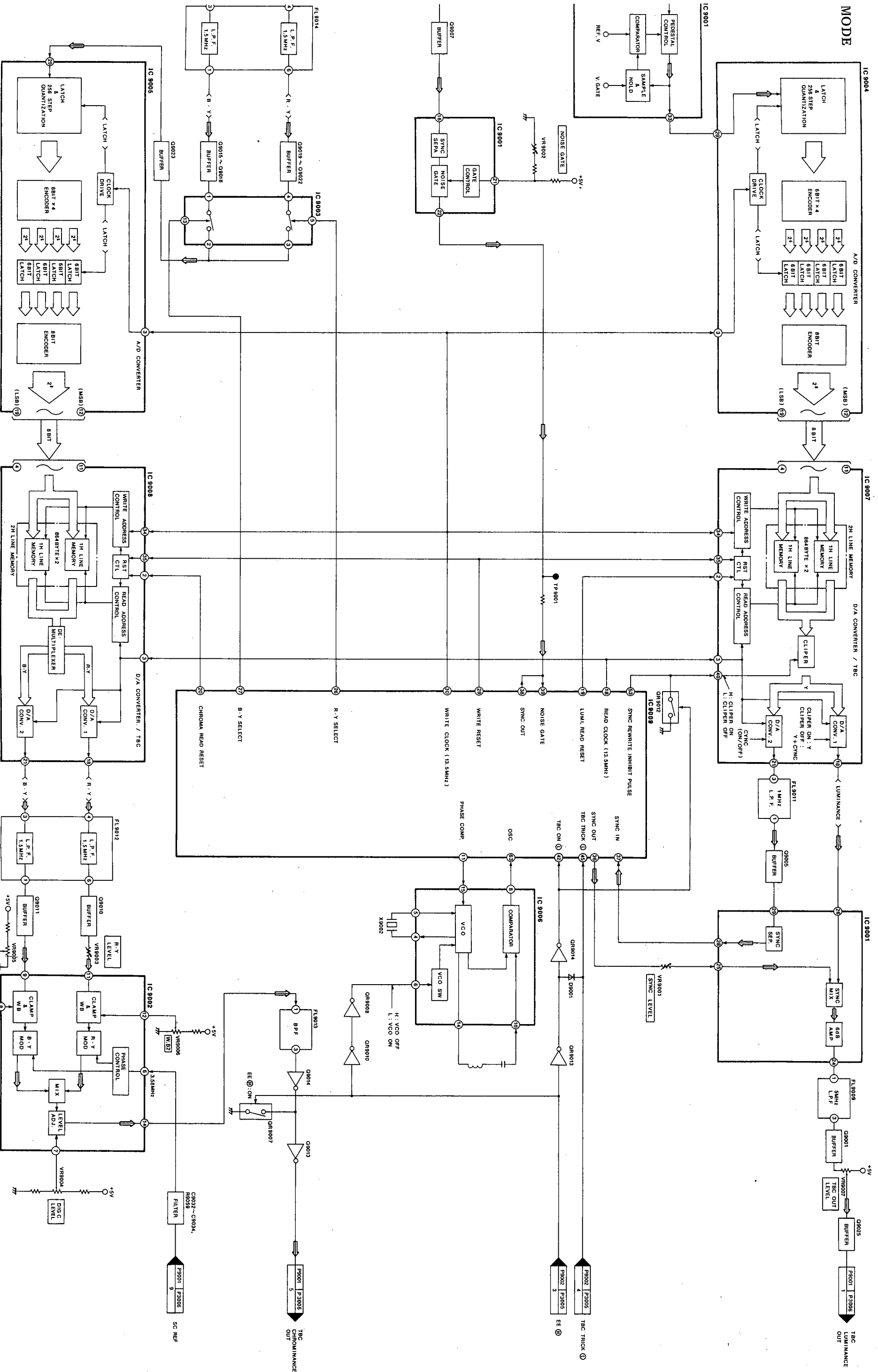
PATH IN REC MODE (VHS)
 PATH IN PLAYBACK MODE (VHS)
 PATH IN REC MODE (S-VHS)
 PATH IN PLAYBACK MODE (S-VHS)





3-3. TBC BLOCK DIAGRAM

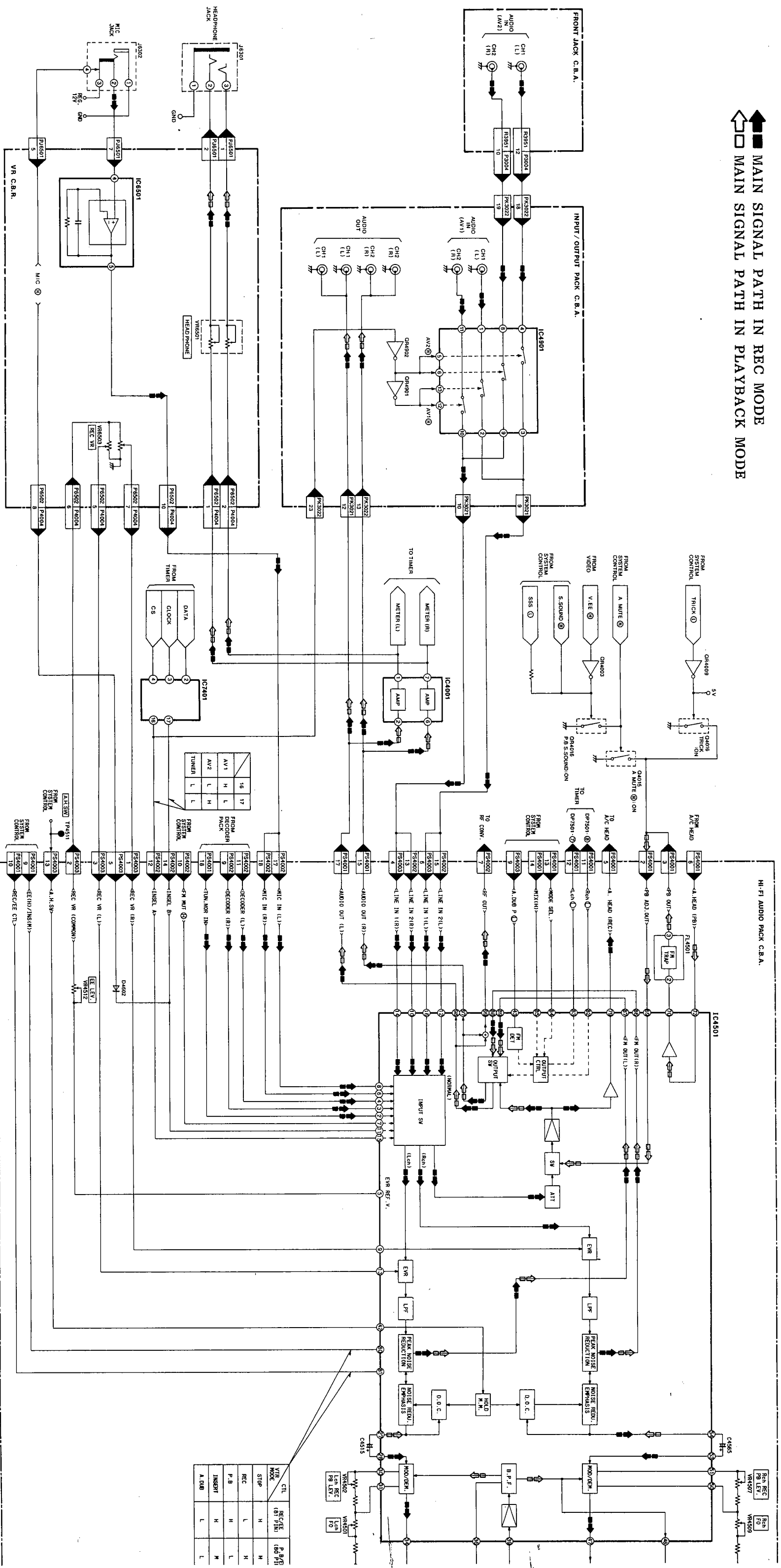
MAIN SIGNAL PATH IN PLAYBACK MODE



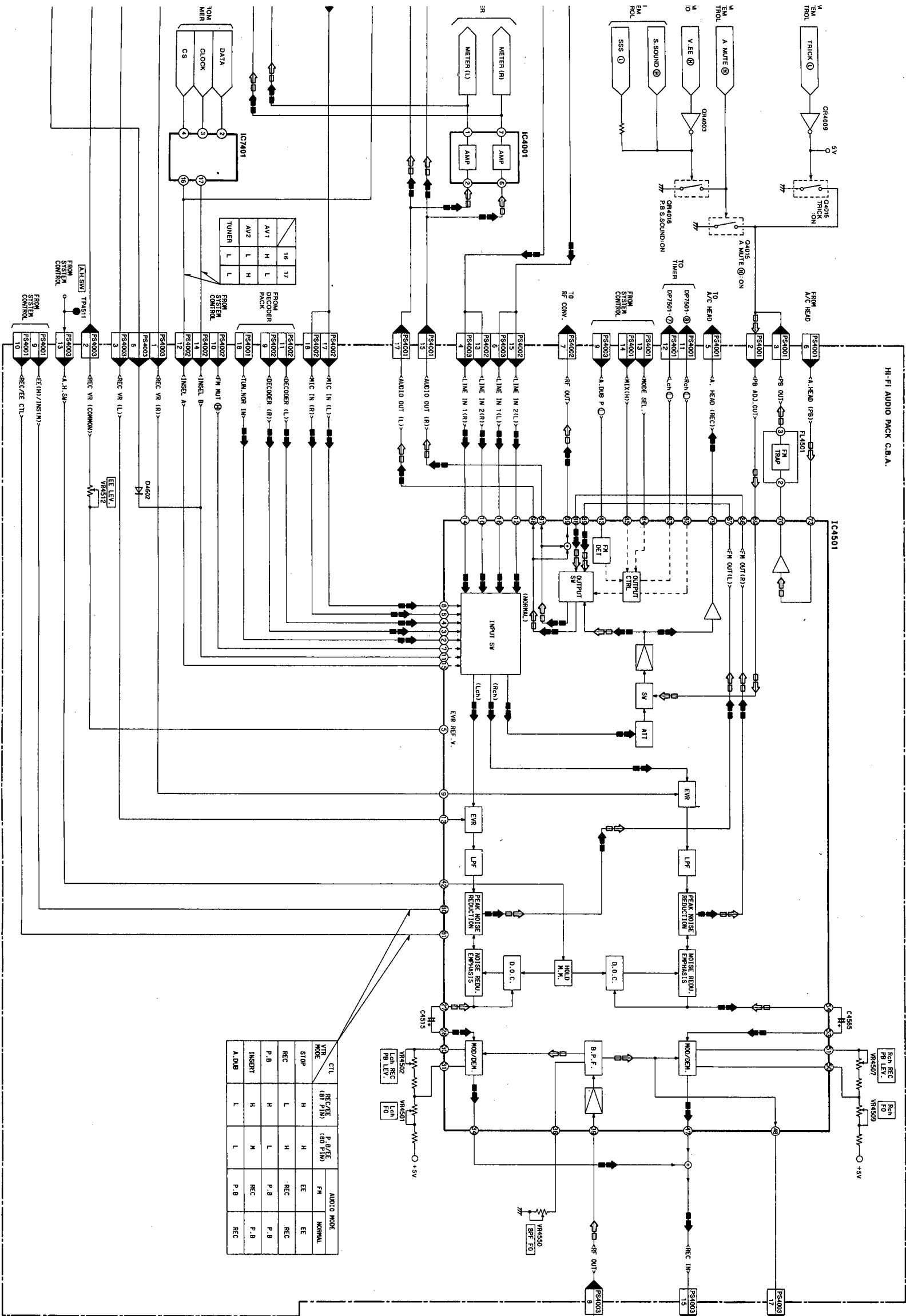


3-4. HI-FI AUDIO BLOCK DIAGRAM

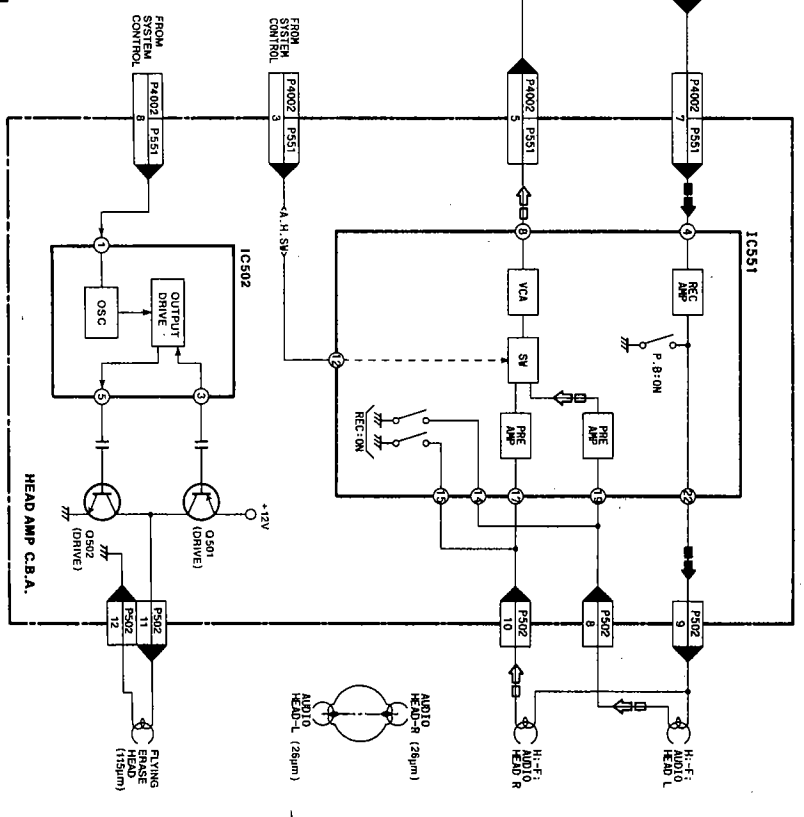
 MAIN SIGNAL PATH IN REC MODE
 MAIN SIGNAL PATH IN PLAYBACK MODE



CTL	REC/EE (BT FIN)	P.B.F. (60 P/F)
VR	H	H
STOP	L	H
REC	L	L
P.B.	H	L
JMSYST	H	H
A. DBB	L	L



CTL	REC/REC (BT PIN)	P.A. REC (60 PIN)	FM	AUDIO MODE
STOP	H	H	EE	EE
REC	L	H	REC	REC
P.B	H	L	P.B	P.B
INSERT	H	M	REC	P.B
A.DOB	L	L	P.B	REC



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

REF. NO. MODE	IC2001								IC2002																																																																							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8																																																																
STOP 2	2.4	4.9	0	0	0	5.0	0	5.0	2.5	2.5	2.5	0	2.4	4.3	3.8	5.0																																																																
PLAY	2.4	4.9	0	0	0	5.0	0	5.0	2.5	2.5	2.5	0	2.4	4.2	3.8	5.0																																																																
REC	2.4	4.9	0	0	0	5.0	0	5.0	2.5	2.5	2.5	0	2.5	4.2	3.8	4.9																																																																
F.F.	2.4	4.9	0	0	0	5.0	0	5.0	2.5	2.5	2.5	0	2.5	2.0	2.5	5.0																																																																
REW	2.4	4.9	0.1	0	0	5.0	0	5.0	2.5	2.5	2.5	0	2.5	1.8	2.5	5.0																																																																
REF. NO. MODE	IC2901																																																																															
STOP 2	11.7	11.7	0.1	1.2	0	2.5	2.4	2.5	2.4	2.6	5.0	3.6	3.7	3.8	0.8	12.0	11.7	0.1																																																														
PLAY	10.0	10.0	0.1	1.1	0	2.5	2.4	2.5	2.4	2.6	5.0	3.7	3.7	0	1.1	10.5	10.0	0.1																																																														
REC	10.0	10.0	0.1	1.2	0	2.5	2.4	2.5	2.4	2.6	5.0	3.8	3.8	3.7	1.1	10.5	10.0	0.1																																																														
F.F.	13.4	13.4	0	0.1	0	2.5	4.2	2.4	2.5	1.3	5.0	4.1	4.1	3.8	5.0	13.3	13.4	0																																																														
REW	13.4	13.4	0	0.1	0	2.5	4.2	2.4	2.5	1.3	5.0	4.1	4.1	3.8	5.0	13.3	13.4	0																																																														
REF. NO. MODE	IC6001																																																																															
STOP 2	0	0	0.3	5.0	5.0	5.0	2.0	0	0	4.4	5.0	0	0	0	0	2.5	0	3.2	0	0																																																												
PLAY	0	0	0.3	5.0	5.0	5.0	2.0	0	3.9	3.7	5.0	0	0	0	0	2.5	3.2	3.2	4.8	0																																																												
REC	0	0	0.3	5.0	5.0	5.0	2.0	0	4.5	3.0	5.0	0	0	0	0	2.5	3.2	3.2	4.9	0																																																												
F.F.	0	0.5	0.5	4.7	5.0	5.0	2.0	0	0.1	5.0	5.0	0	0	0.1	0	2.5	3.2	3.2	1.8	0																																																												
REW	0	0.5	0.5	4.7	5.0	5.0	2.0	0	0	5.0	5.0	0	0	0	0	2.5	3.2	3.2	2.6	0																																																												
REF. NO. MODE	IC6001																																																																															
STOP 2	5.0	5.0	0.1	2.4	1.7	2.5	2.4	2.4	0	2.5	2.4	2.6	4.9	0	0	0	2.5	2.5	0	2.4																																																												
PLAY	5.0	5.0	2.4	2.4	3.3	2.5	2.5	2.4	0	2.5	2.5	2.5	4.9	0	0	0	2.5	2.5	0	2.7																																																												
REC	5.0	5.0	2.5	2.4	0.9	2.4	2.4	2.4	0	2.5	0	2.6	4.9	2.3	2.7	0	2.5	2.5	0	0																																																												
F.F.	5.0	5.0	2.5	4.2	1.2	2.5	2.5	2.4	0	2.5	2.5	2.6	4.9	2.0	0	0	2.5	2.5	0	2.2																																																												
REW	5.0	5.0	2.4	4.2	1.2	2.5	2.4	2.4	0	2.5	2.5	2.6	4.9	0	0	0	2.5	2.5	0	2.8																																																												
REF. NO. MODE	IC6001																																																																															
STOP 2	2.4	5.0	1.1	2.8	0	4.7	0	5.0	0	3.8	4.0	5.0	0	0	5.0	5.0	0	0	0	4.3																																																												
PLAY	2.4	5.0	1.3	2.4	2.9	4.7	0	5.0	0	3.8	4.4	5.0	0	0	5.0	5.0	0	0	0	5.0																																																												
REC	0	0	1.1	2.5	0	4.7	0	5.0	0	3.8	3.7	5.0	0	0	5.0	5.0	0	0	0	3.0																																																												
F.F.	2.4	5.0	4.9	0	0	4.4	0	5.0	0	2.2	3.9	5.0	0	0	5.0	5.0	0	0	0.1	0																																																												
REW	2.4	5.0	4.9	0	0	4.4	0	5.0	0	2.7	4.4	5.0	0	0	5.0	5.0	0	0	0	0																																																												
REF. NO. MODE	IC6001																																																																															
STOP 2	5.0	2.0	4.2	4.2	0	0	0	0	0	0	0	0	0	4.9	0	4.9	5.0	0	5.0	0																																																												
PLAY	5.0	0	4.2	4.0	0	0	0	0	0	5.0	0	0	5.0	0	0	4.9	0	5.0	5.0	0																																																												
REC	5.0	0	4.2	0	0	5.0	4.9	4.9	4.9	5.0	0	0	5.0	0	0	4.9	5.0	0	5.0	0																																																												
F.F.	5.0	0	4.2	4.4	0	0	0	0	0	5.0	0	0	5.0	4.9	0	0	5.0	0	5.0	0																																																												
REW	5.0	5.0	4.1	4.3	0	0	0	0	0	5.0	0	0	5.0	4.9	0	0	5.0	0	5.0	0																																																												
REF. NO. MODE	IC6001																																																																															
STOP 2	0	-	-	4.2																																																																												
PLAY	0	-	-	4.2																																																																												
REC	0	-	-	4.2																																																																												
F.F.	0	-	-	4.8																																																																												
REW	0	-	-	4.8																																																																												
REF. NO. MODE	IC6002																																																																															
STOP 2	0	5.0	5.0	5.0	0.5	5.0	5.0	0	0.3	5.0	0.3	5.0	0	5.0	0	5.0																																																																
PLAY	0	5.0	5.0	5.0	0.5	5.0	5.0	0	0.3	5.0	0.3	5.0	0	4.7	0	5.0																																																																
REC	0	5.0	5.0	5.0	0.5	5.0	5.0	0	0.3	5.0	0.3	5.0	0	4.7	0	5.0																																																																
F.F.	0	0	2.3	5.0	0.5	5.0	5.0	0	1.7	5.0	0.5	4.7	1.5	4.7	5.0	5.0																																																																
REW	0	0	5.0	5.0	0.5	5.0	5.0	0	0.3	5.0	0.3	4.7	0.5	4.4	5.0	5.0																																																																
REF. NO. MODE	IC6003																																																																															
STOP 2	0	0.1	0	0	4.4	0	5.0	0	0	0	0	0.1	0.1	4.9	1.9	0	0.1	5.0																																																														
PLAY	0	0.1	0	0	1.5	0	5.0	0	0	0	0	0.1	0.1	4.9	1.9	0	0.1	5.0																																																														
REC	0	0.3	0	5.0	3.2	0	5.0	0	0	0.1	0	4.3	4.9	0	1.9	0	0.1	5.0																																																														
F.F.	0	0.1	0	0	0	0	5.0	0	0	0	0	0.1	0.1	4.9	1.9	0	0	5.0																																																														
REW	0	0.1	0	0	0	0	5.0	0	0	0	0	0.1	0.1	4.9	1.9	3.9	3.8	5.0																																																														
REF. NO. MODE	IC6004																																																																															
STOP 2	4.2	4.8	0																																																																													
PLAY	4.2	4.8	0																																																																													
REC	4.2	4.8	0																																																																													
F.F.	4.2	4.8	0																																																																													
REW	4.2	4.8	0																																																																													

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

REF. NO.	Q2001			Q2003			Q6001			Q6003			Q6004			Q6005		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP 2	5.0	5.3	5.7	0	5.0	0	4.9	5.0	5.7	13.4	13.4	5.0	0.7	13.4	0.8	-0.1	0.2	-0.1
PLAY	5.0	5.3	5.7	0	0	0.6	4.9	5.0	5.7	13.4	13.4	4.9	0.3	13.4	0.4	0	0.2	0
REC	5.0	5.3	5.7	0	0	0.6	4.9	5.0	5.7	13.4	13.4	5.6	0.7	13.4	0.9	0	1.3	0
F.F.	5.0	5.3	5.7	0	0	0.6	4.9	5.0	5.7	13.3	13.3	4.9	0.7	13.3	0.8	0	0.3	0
REW	5.0	5.3	5.7	0	0	0.6	4.9	5.0	5.7	13.3	13.3	4.9	0.6	13.4	0.7	0	0.7	0

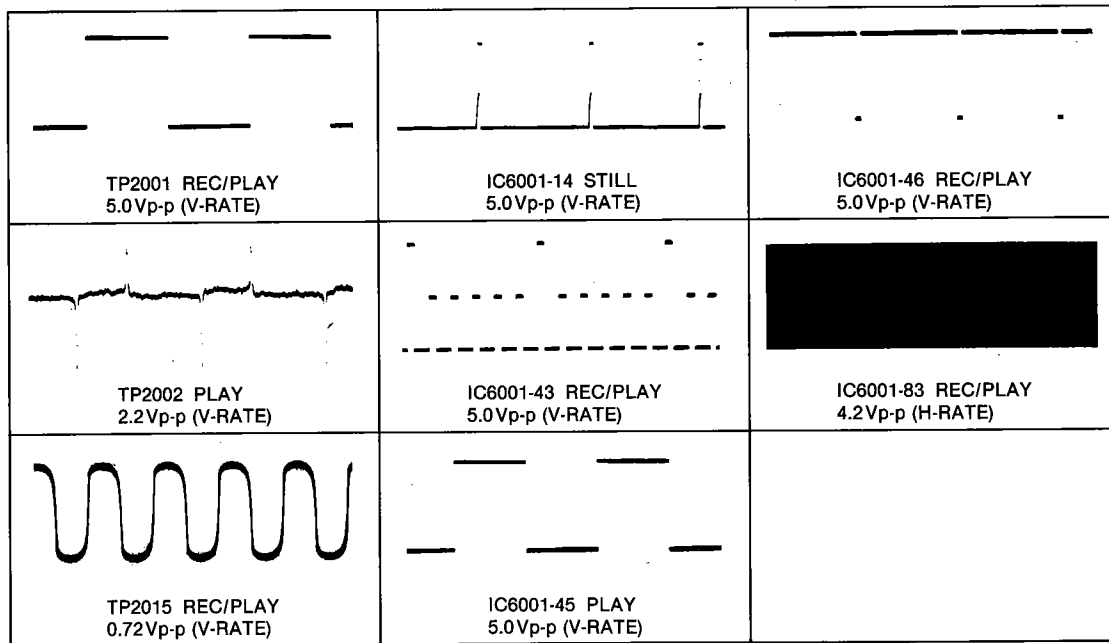
REF. NO.	Q6006			Q6007			Q6008			Q6101		
	E	C	B	E	C	B	E	C	B	E	C	B
STOP 2	0.4	13.4	0.3	4.2	4.9	4.8	0.7	0	0	4.3	4.8	0.3
PLAY	0.5	13.4	0.3	4.2	4.9	4.8	0	0	0.7	4.3	4.8	0.3
REC	0.5	13.4	0.3	4.2	4.9	4.8	0	0	0.7	4.5	4.8	0.3
F.F.	0.6	13.4	0.3	4.2	4.9	4.8	0	0	0.7	4.2	4.7	0.3
REW	0.7	13.4	0.6	4.2	4.9	4.8	0	0	0.7	3.7	4.7	0.2

REF. NO.	QR2001			QR2002			QR6001			QR6002			QR6003			QR6004		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP 2	0	0	4.9	0	0	4.9	4.9	4.9	0	4.9	4.9	0	0	0	4.8	1.4	0.1	4.2
PLAY	0	0	4.9	0	0	4.9	4.9	4.9	0	4.9	4.9	0	0	0	4.8	1.4	0	4.2
REC	0	0	4.9	0	0	4.9	4.9	4.9	0	4.9	4.9	0	0	0	4.8	1.4	0	4.2
F.F.	0	0	0	0	1.0	0	4.9	4.9	0	4.9	4.9	0	0	0	4.8	4.9	0	4.8
REW	0	0	0	0	0.9	0	4.9	4.9	0	4.9	4.9	0	0	0	4.8	4.9	0	4.8

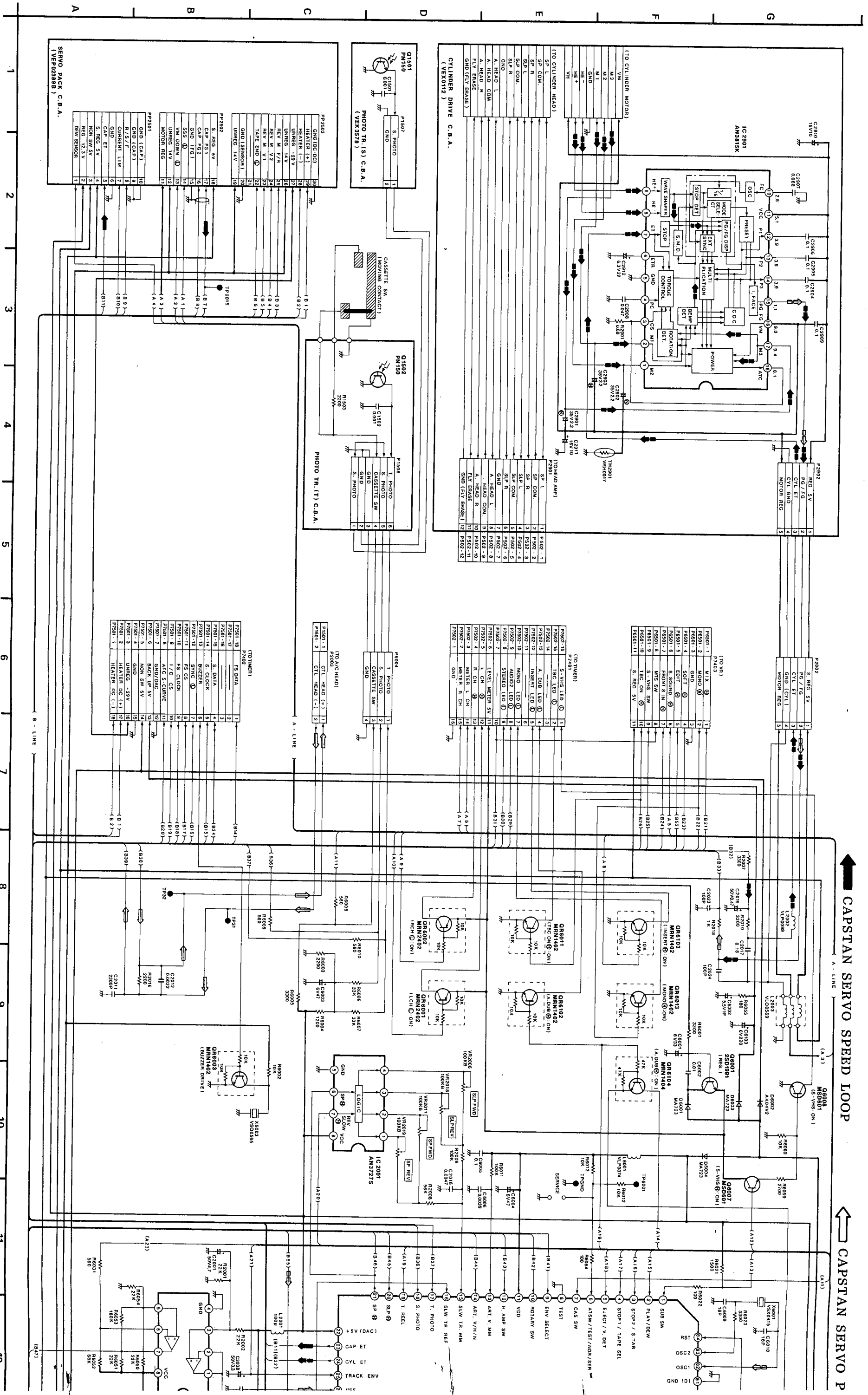
REF. NO.	QR6005			QR6006			QR6007			QR6008			QR6009			QR6010		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP 2	5.0	1.4	4.9	5.0	-0.1	5.0	5.0	0.1	4.7	5.0	0.3	5.0	0	0.1	4.2	0	0.3	5.0
PLAY	5.0	1.4	4.9	5.0	0	5.0	5.0	0.3	4.7	5.0	0.3	5.0	0	0.1	4.2	0	0.3	4.7
REC	5.0	1.4	4.9	5.0	0	5.0	5.0	0.3	4.7	5.0	0.3	5.0	0	0.1	4.2	0	0.3	4.7
F.F.	5.0	4.9	0	5.0	0	5.0	5.0	0.6	4.4	5.0	0.3	5.0	0	0.1	4.8	0	0.3	4.4
REW	5.0	4.9	0	5.0	0	5.0	5.0	0.6	4.4	5.0	0.3	5.0	0	0.1	4.8	0	0.5	4.4

REF. NO.	QR6011			QR6013			QR6101			QR6102			QR6103			QR6104		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP 2	0	3.5	0	0	3.5	0	0	0.2	4.1	0	3.4	0	0	3.4	0	0	4.6	0
PLAY	0	3.5	0	0	3.5	0	0	0.2	4.1	0	3.4	0	0	3.4	0	5.0	4.4	0
REC	0	3.5	0	0	3.5	0	0	0.3	4.1	0	3.4	0	0	3.4	0	5.0	4.5	0
F.F.	0	3.5	0	0	3.5	0	0	0	4.2	0	3.3	0	0	3.3	0	4.9	4.4	0
REW	0	3.5	0	0	3.5	0	0	0.3	4.2	0	3.3	0	0	3.3	0	4.9	4.3	0

WAVEFORM OF SYSTEM CONTROL & SERVO SECTION



3-5. SYSTEM CONTROL & SERVO SECTION IN MAIN SCHEMATIC DIAGRAM

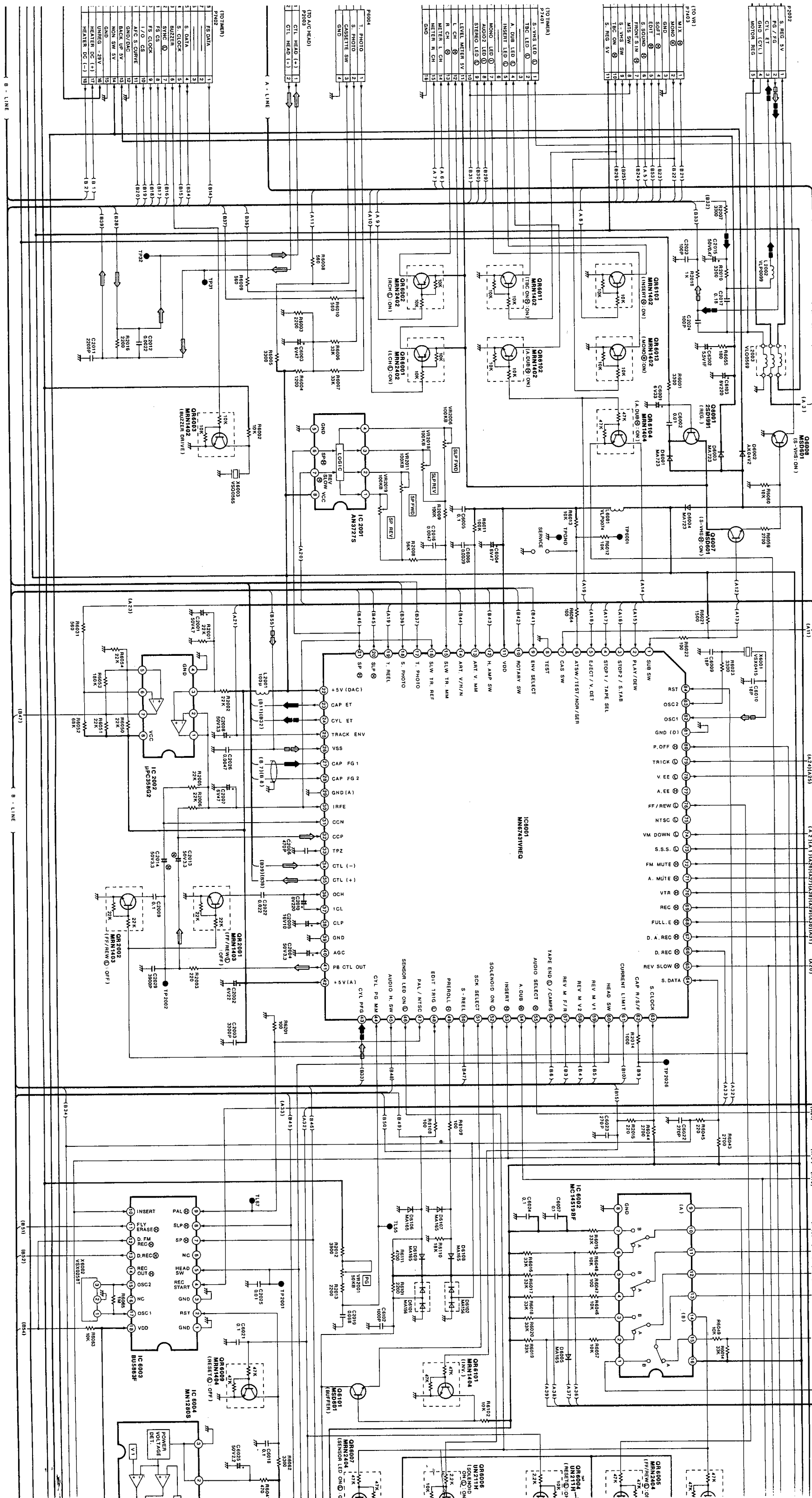


CAPSTAN SERVO SPEED LOOP

CAPSTAN SERVO PHASE LOOP

CYLINDER SERVO SPEED LOOP

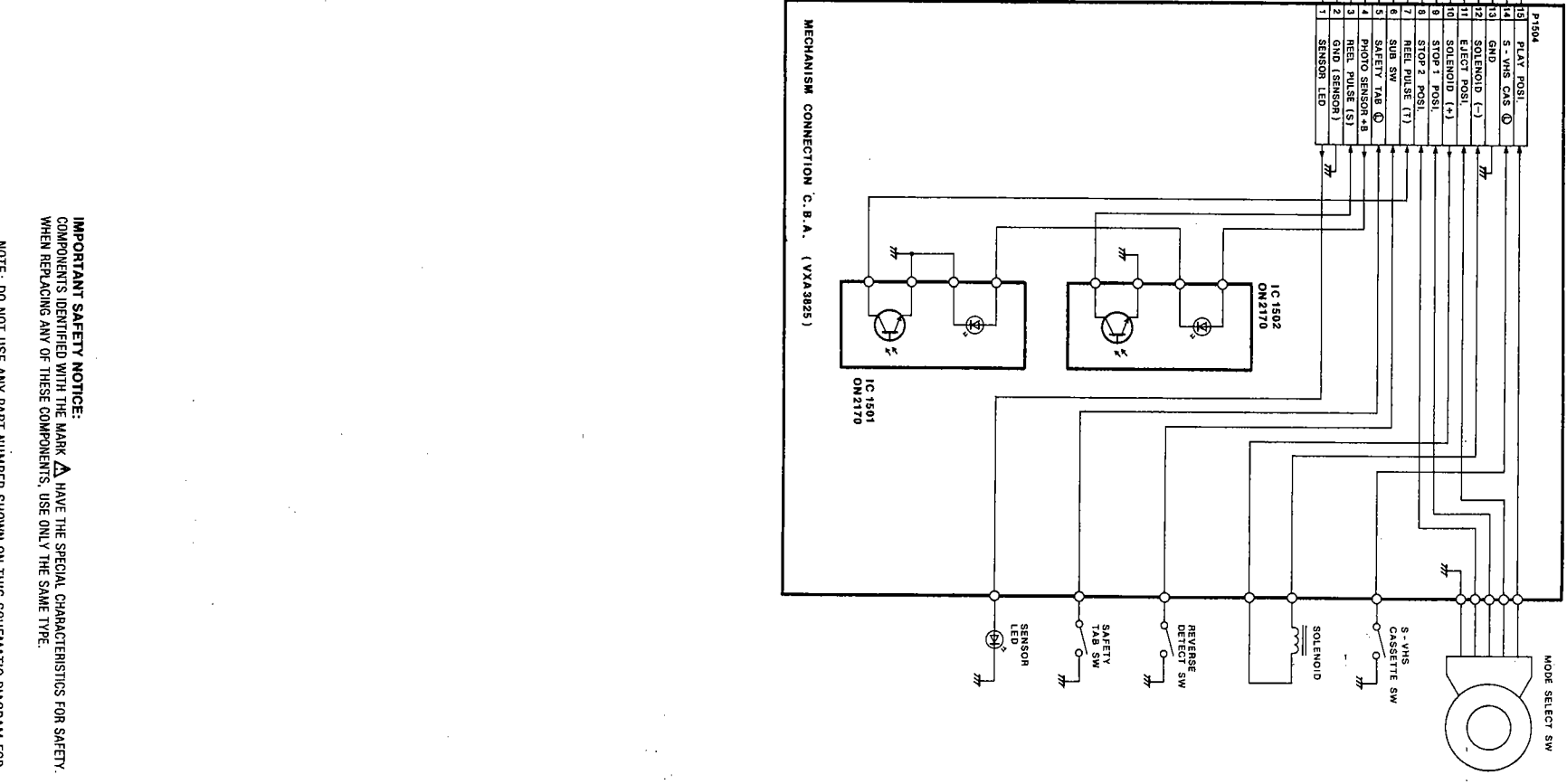
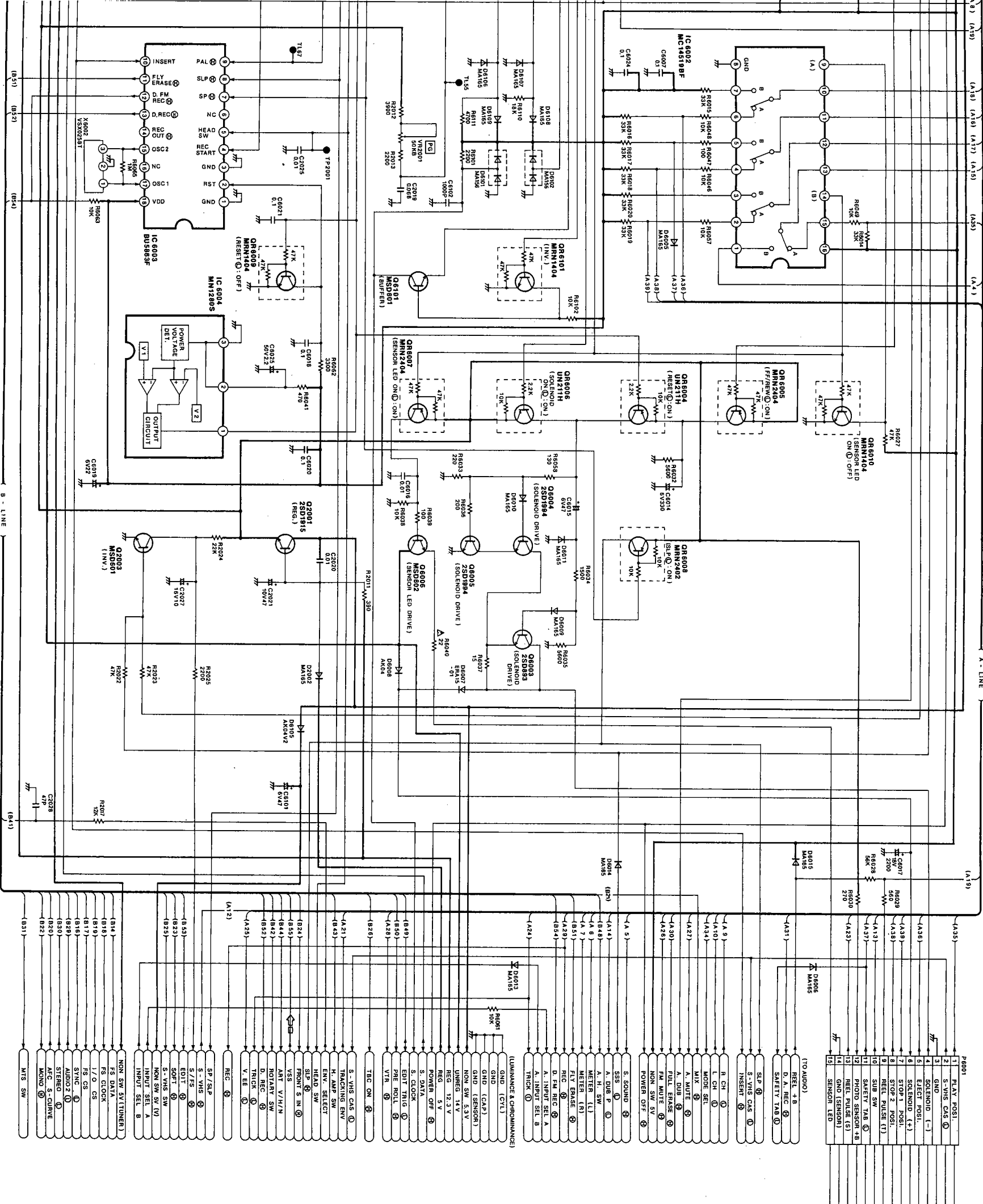
CYLINDER SERVO PHASE



6 7 8 9 10 11 12 13 14 15 16 17 18

3-20 3-21

OOP CYLINDER SERVO PHASE LOOP



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



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

3-6. LUMINANCE & CHROMINANCE SECTION IN MAIN SCHEMATIC DIAGRAM

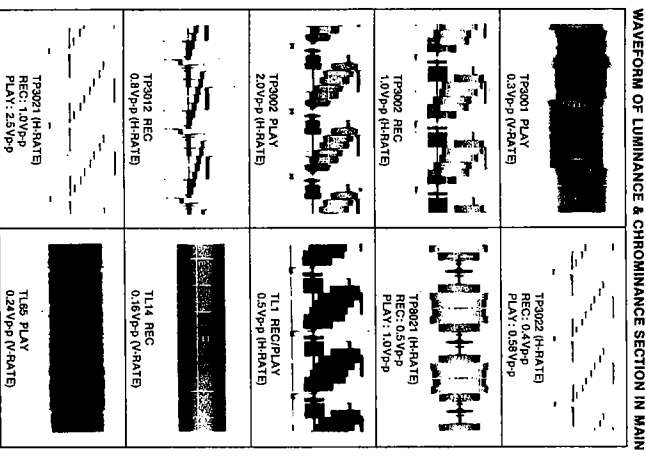
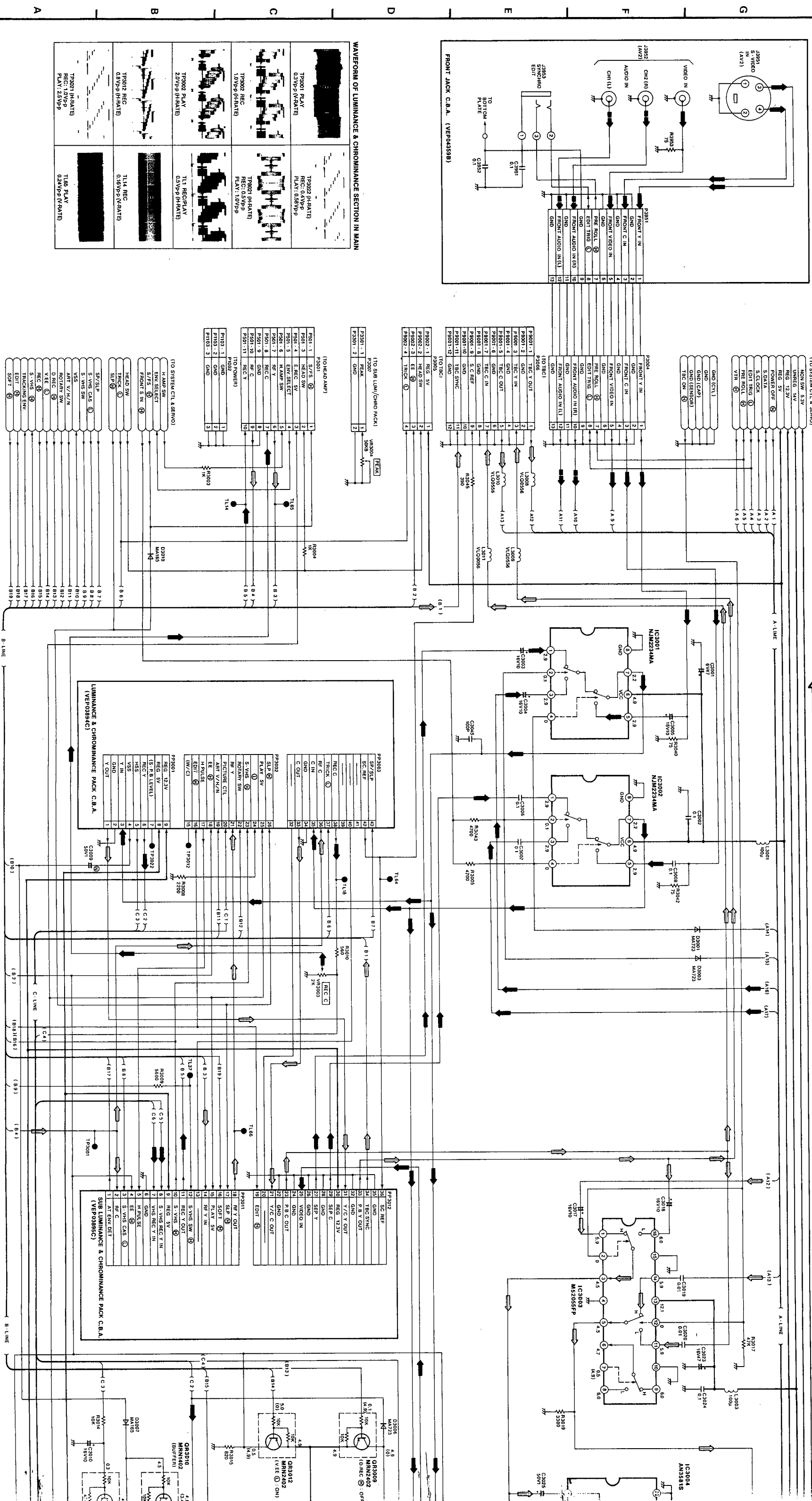
SYSTEM CONTROL & SERVO SECTION

LUMINANCE & CHROMINANCE SECTION

LUMINANCE & CHROMINANCE SECTION

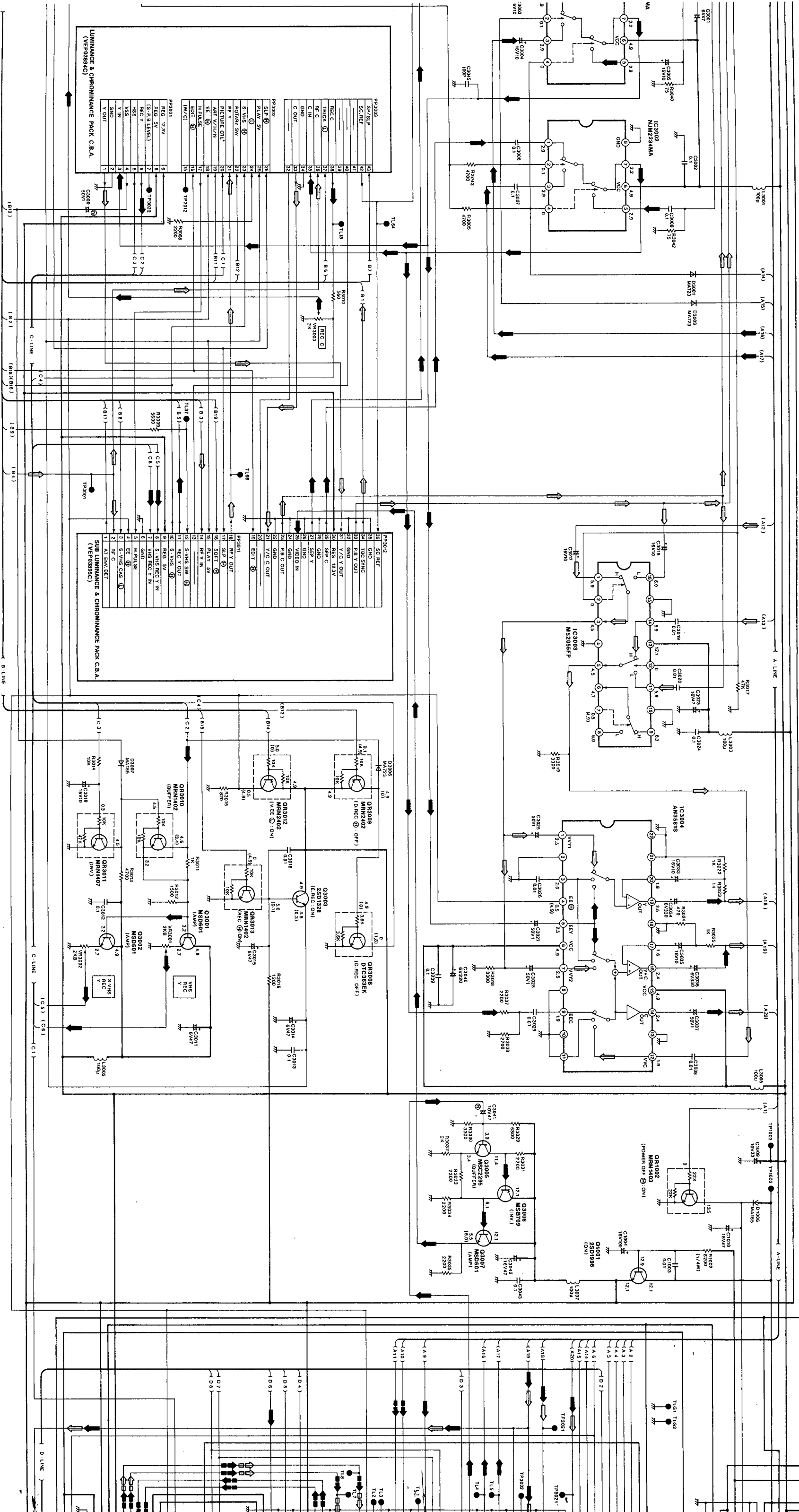
 VIDEO MAIN SIGNAL PATH IN REC MODE
 VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE

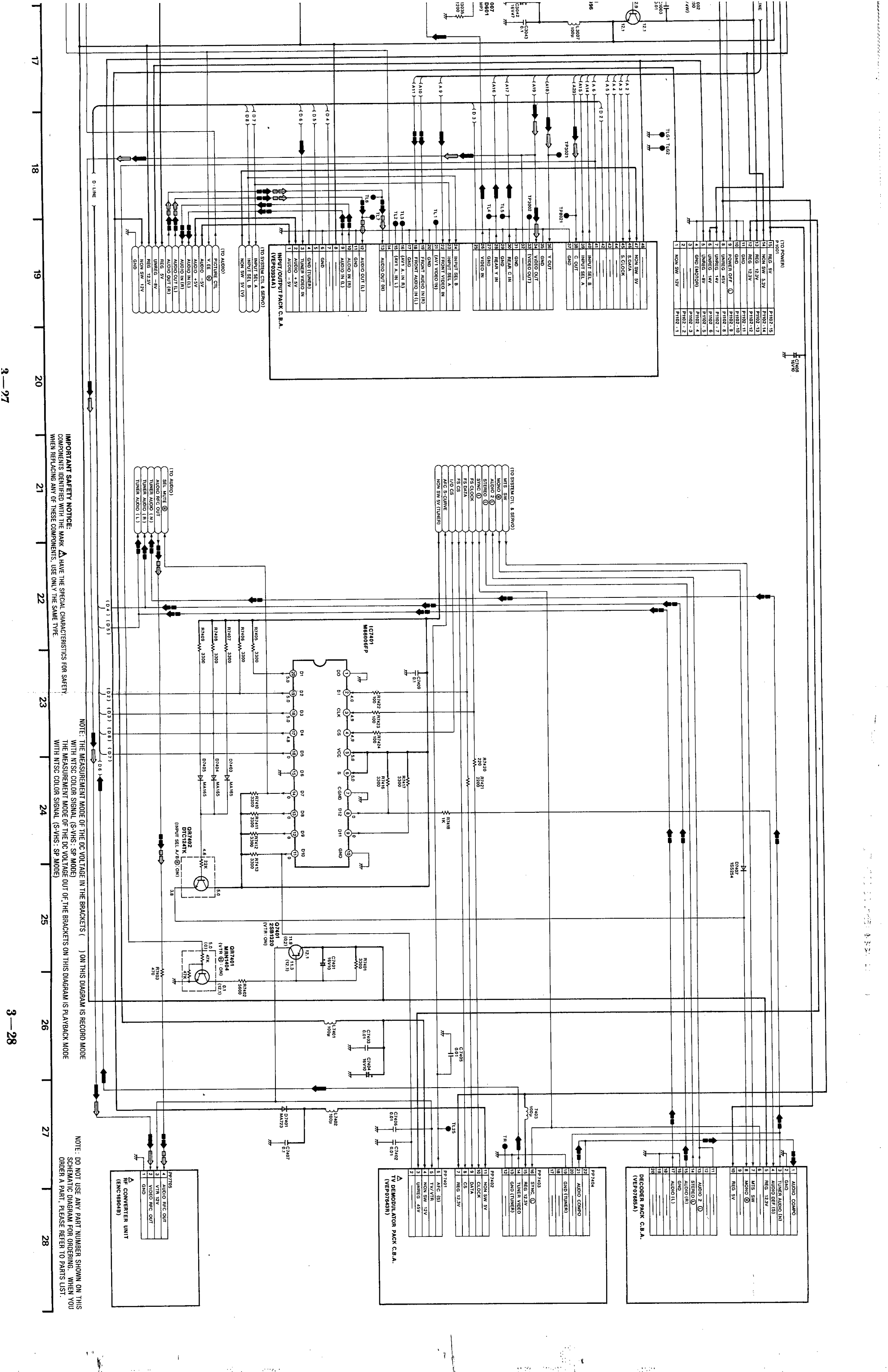
 AUDIO MAIN SIGNAL PATH IN REC MODE
 AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE



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





(TO POWER)

15	REG 5V	PT102-15
14	NON SW 5.3V	PT102-14
13	REG 12.3V	PT102-13
12	REG 12.3V	PT102-12
11	GND	PT102-11
10	GND	PT102-10
9	POWER OFF	PT102-9
8	UNREG 4.5V	PT102-8
7	UNREG 4.5V	PT102-7
6	UNREG 4.5V	PT102-6
5	UNREG 4.5V	PT102-5
4	GND (MOTOR)	PT102-4
3	GND (MOTOR)	PT102-3
2	NON SW 12V	PT102-2
1	NON SW 12V	PT102-1

(TO SYSTEM CTL. & SERVO)

1	MIS SW
2	MONO
3	AUDIO 2
4	STEREO
5	SYNC
6	FS CLOCK
7	FS DATA
8	FS CS
9	REC S-CURVE
10	NON SW (TUNER)

(TO AUDIO)

1	SEL. MUTE
2	AUDIO REC. OUT
3	TUNER AUDIO (L)
4	TUNER AUDIO (R)
5	TUNER AUDIO (L)

(TO AUDIO)

1	PICTURE CTL.
2	V.EE
3	AUDIO -5V
4	AUDIO +5V
5	AUDIO IN (L)
6	AUDIO IN (R)
7	AUDIO OUT (L)
8	AUDIO OUT (R)
9	UNREG -5V
10	REG 7.3V
11	NON SW 12V
12	GND

(TO SYSTEM CTL. & SERVO)

1	INPUT SEL. A
2	INPUT SEL. B
3	NON SW 5V (V)

(TO SYSTEM CTL. & SERVO)

1	INPUT SEL. A
2	INPUT SEL. B
3	NON SW 5V (V)

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS RECORD MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE) THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE)

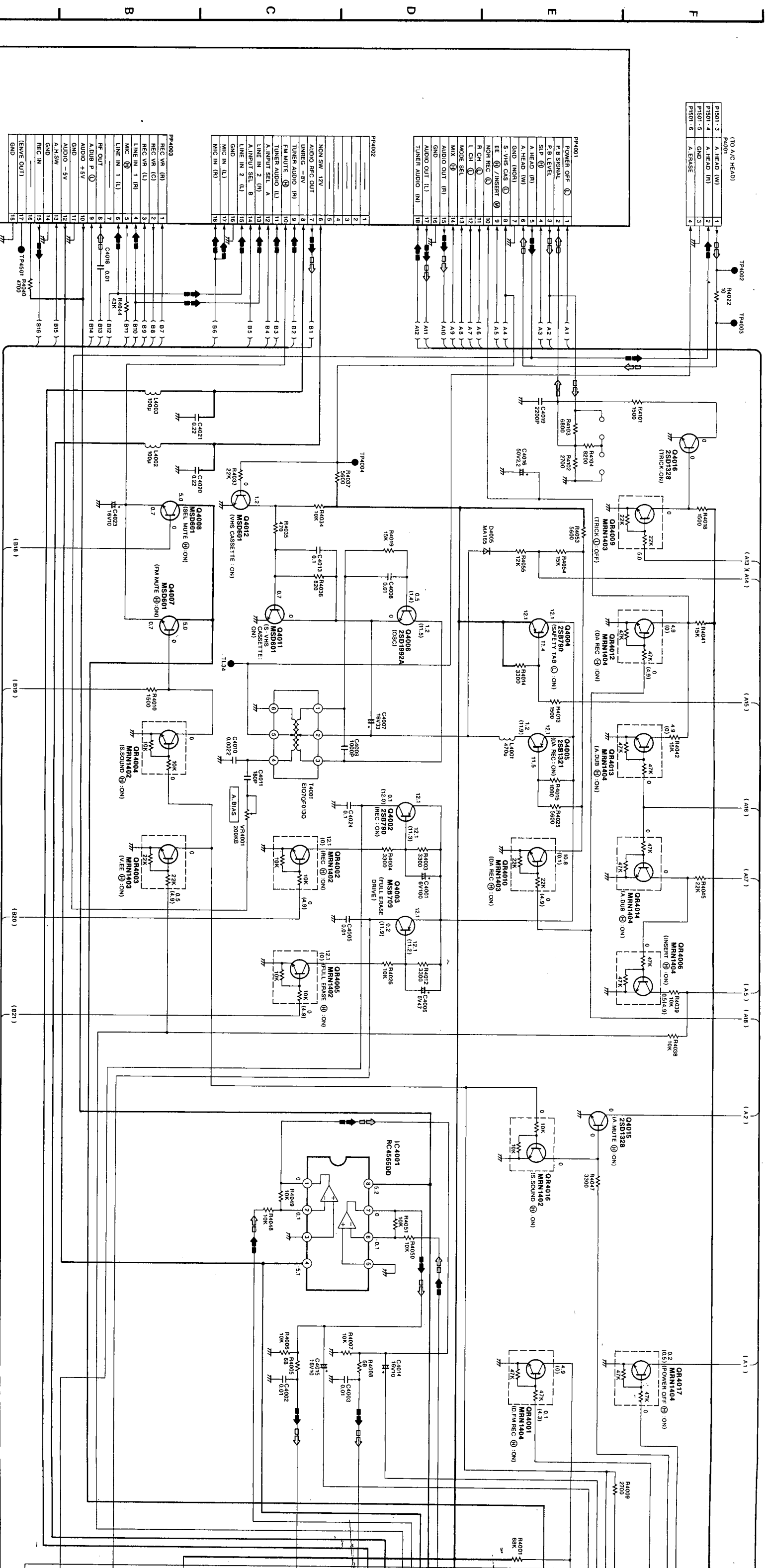
NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

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

3-7. AUDIO SECTION IN MAIN SCHEMATIC DIAGRAM

➔ MAIN SIGNAL PATH IN REC MODE

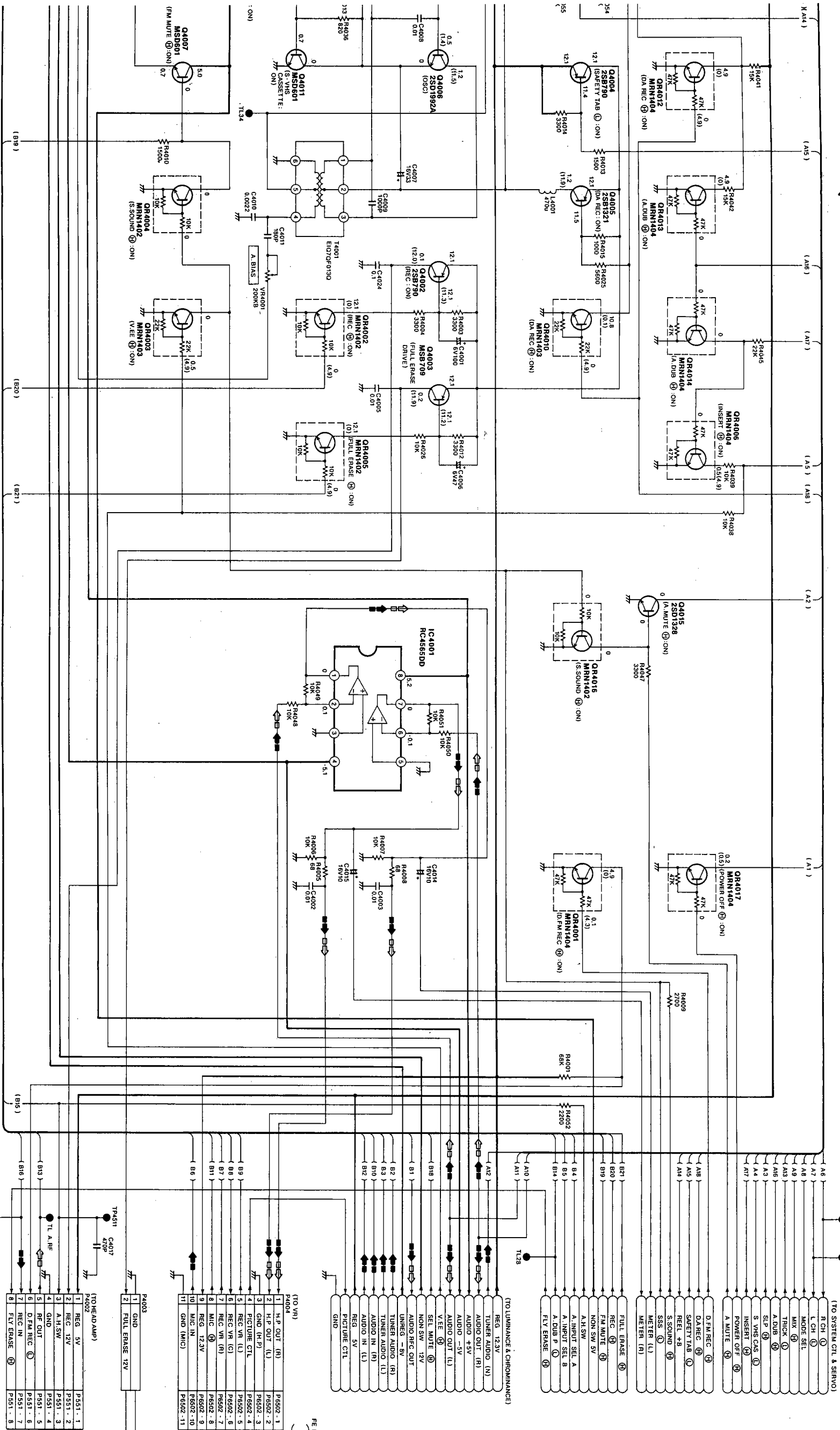
◁ MAIN SIGNAL PATH IN PLAYBACK MODE



NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS REC WITH NTSC COLOR SIGNAL (S-VHS: SP MODE)
THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK WITH NTSC COLOR SIGNAL (S-VHS: SP MODE)

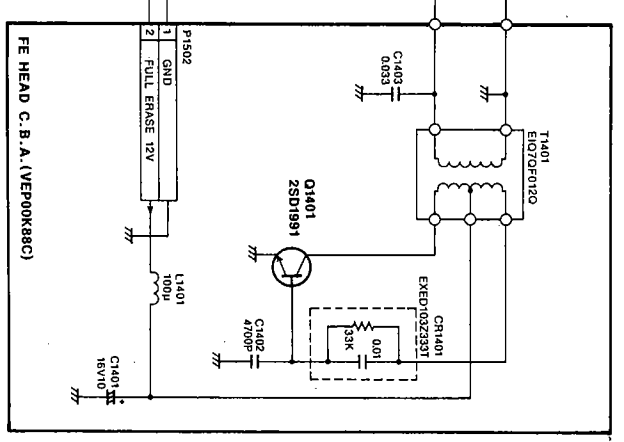
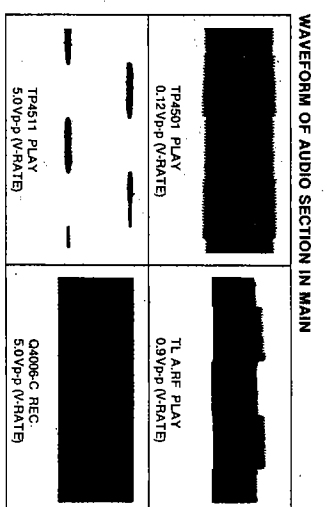
MAIN SIGNAL PATH IN REC MODE

MAIN SIGNAL PATH IN PLAYBACK MODE



NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS RECORD MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE) THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE)

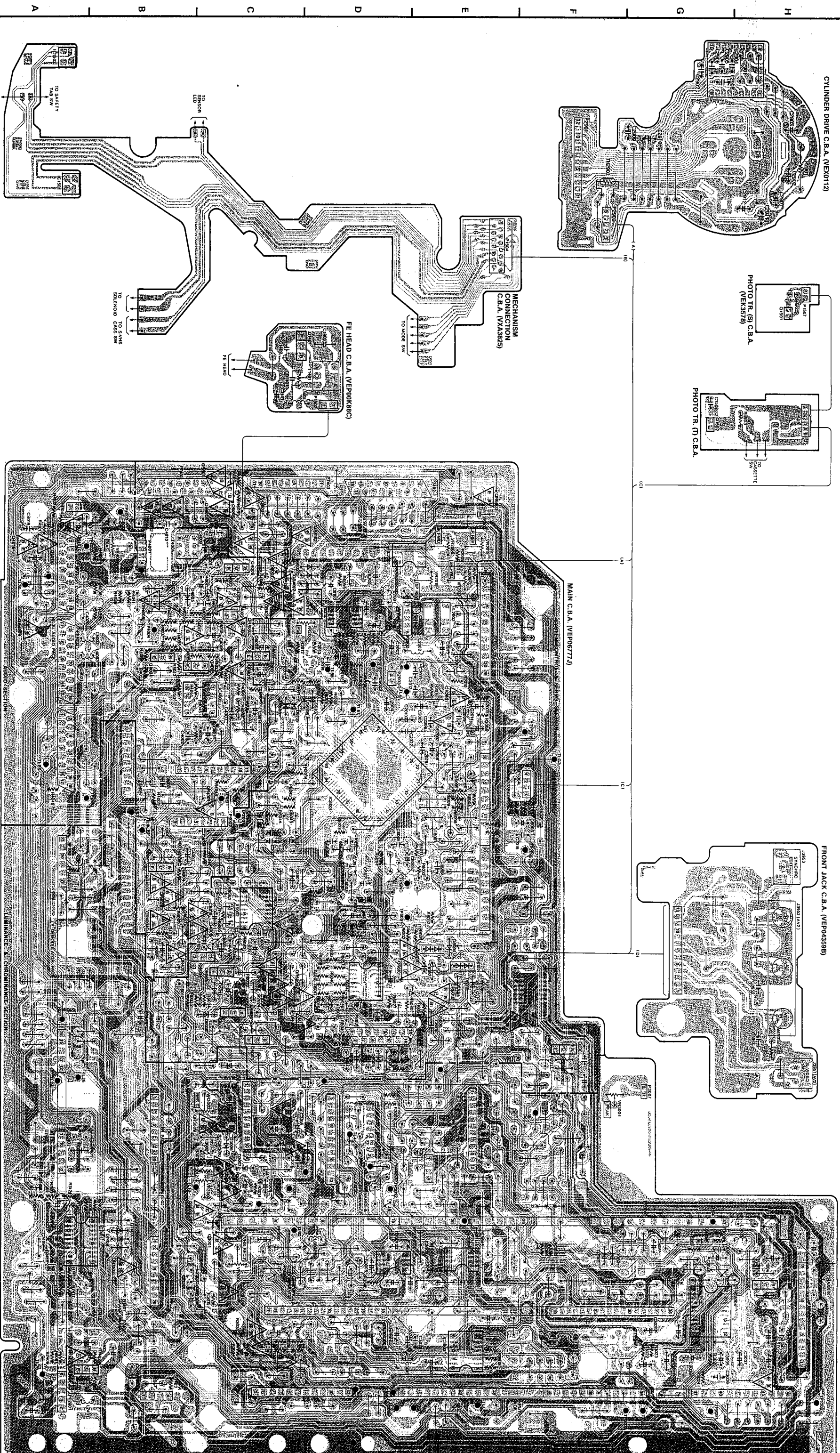
* LINE IN SIGNAL LEVEL... -10dB 1kHz



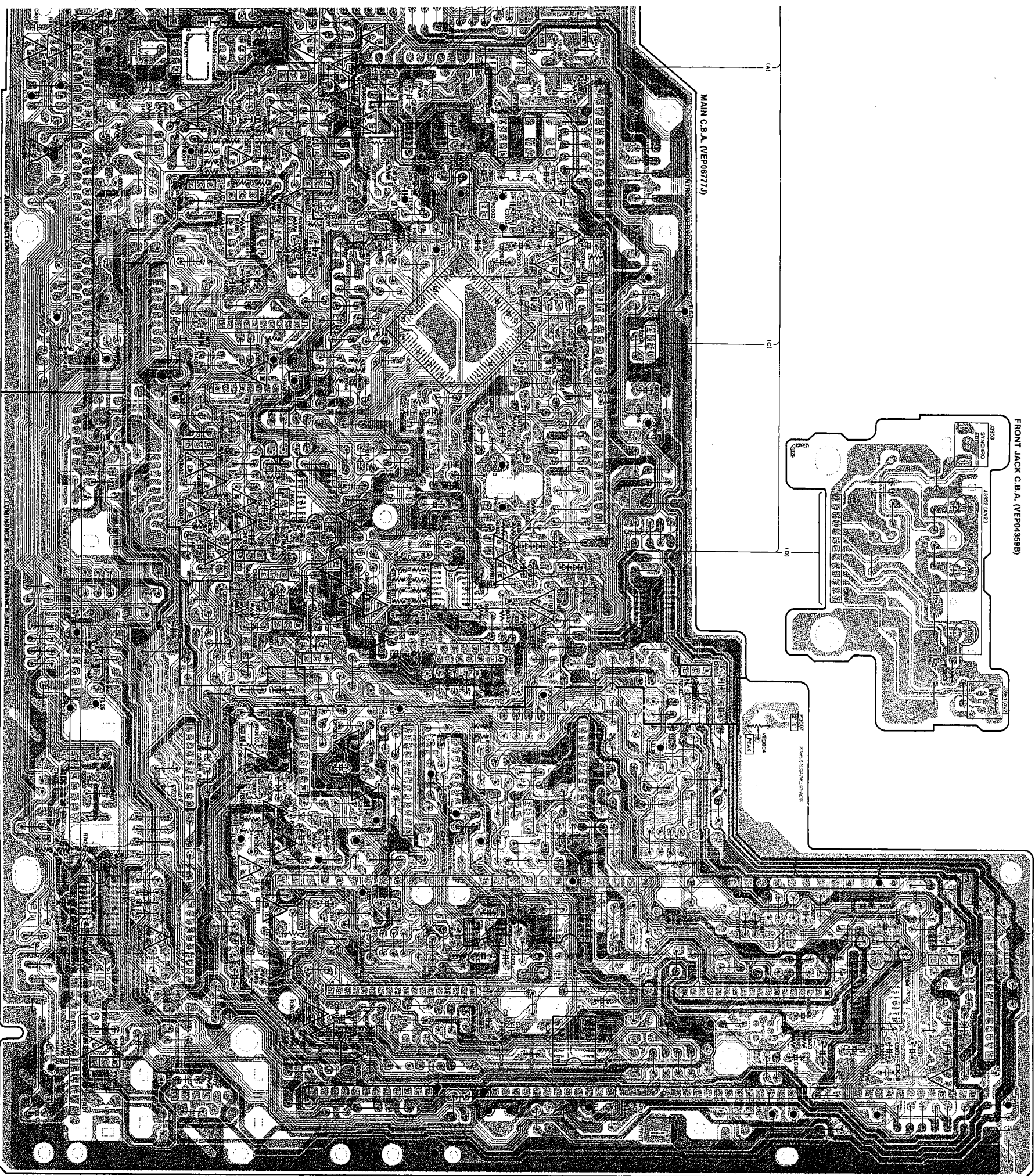
NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

5 6 7 8 9 10 11 12 13 14 15

3-8. MAIN C.B.A. (VEP06777J)



MAIN C.B.A. ADDRESS INFORMATION



FRONT JACK C.B.A. (VEP04359B)

MAIN C.B.A. (VEP06777J)

6 7 8 9 10 11 12 13

SYSTEM CONTROL & SERVO Section	
Transistor	
Q1501	H-3
Q1502	G-4
Q2001	F-10
Q2003	C-9
Q6001	C-6
Q6003	C-10
Q6004	C-10
Q6005	C-9
Q6006	E-10
Q6007	C-5
Q6008	C-5
Q6101	E-9
Transistor & Resistor	
QR2001	E-7
QR2002	E-7
QR6001	B-5
QR6002	B-5
QR6003	E-5
QR6004	C-9
QR6005	C-10
QR6006	C-10
QR6007	C-10
QR6008	E-10
QR6009	C-9
QR6010	E-10
QR6011	C-5
QR6013	C-5
QR6101	D-9
QR6102	D-5
QR6103	C-5
QR6104	C-5
Integrated Circuit	
IC1501	A-2
IC1502	A-1
IC2001	D-5
IC2002	D-6
IC2901	H-1
IC6001	D-8
IC6002	D-9
IC6003	C-9
IC6004	C-9
Test Point	
TP2001	C-8
TP2002	D-6
TP2015	F-7
TP2026	F-8
TP6001	D-9
TP GND	D-9
Adjustment	
VR2001	D-6
VR2006	E-5
VR2011	E-6
VR2018	E-5
VR2019	E-6
Connector	
P1504	E-3
P1507	H-3
P1508	H-4
P2002	D-6
P2003	D-7
P2901	F-2
P2902	F-2
P6001	D-10
P6004	F-8
P7401	B-5
P7402	B-5
P7403	D-5
PP2501	E-9
PP2502	E-7
PP2503	E-6

ADDRESS INFORMATION

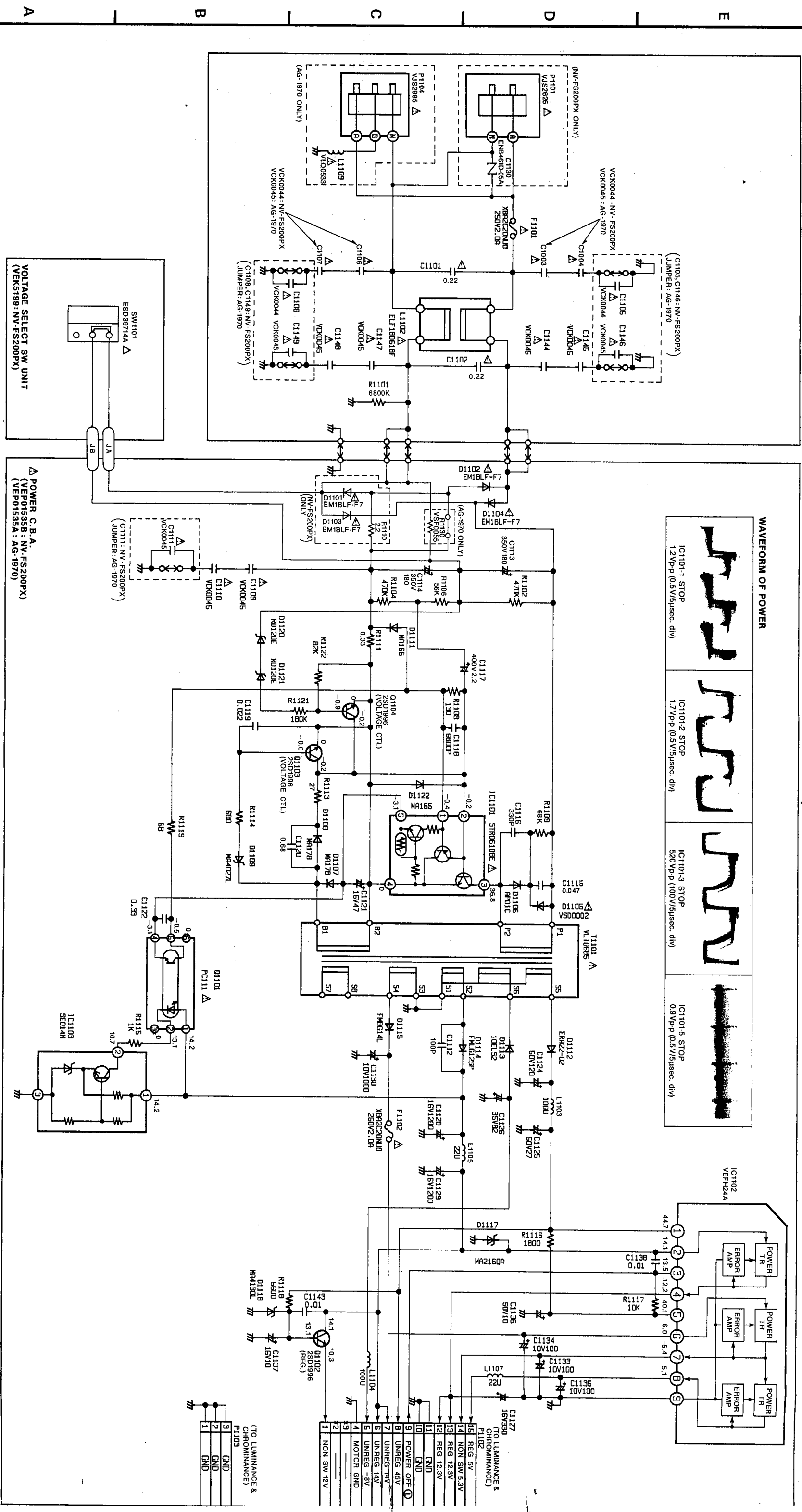
LUMINANCE & CHROMINANCE Section	
Transistor	
Q1001	H-12
Q3001	C-12
Q3002	C-12
Q3003	C-11
Q3005	C-13
Q3006	C-13
Q3007	C-13
Q7401	A-13
Transistor & Resistor	
QR1002	H-13
QR3008	C-11
QR3009	C-11
QR3010	C-11
QR3011	C-11
QR3012	C-12
QR3013	C-11
QR7401	A-13
QR7402	B-12
Integrated Circuit	
IC3001	D-12
IC3002	E-12
IC3003	E-13
IC3004	G-12
IC7401	B-12
Test Point	
TP1002	H-13
TP1003	D-11
TP3001	E-10
TP3002	F-13
TP3012	D-11
TP3021	G-13
TP3022	C-11
TP8021	G-13
Adjustment	
VR3001	C-12
VR3002	C-11
VR3003	C-11
VR3004	F-10
Connector	
P1001	H-12
P1002	H-12
P3001	C-10
P3004	D-11
P3005	D-11
P3006	E-11
P3007	E-11
P3951	G-10
PP3001	G-9
PP3002	C-12
PP3003	E-12
PP3011	G-12
PP3012	D-12
PP7401	F-12
PP7402	A-13
PP7403	A-11
PP7404	A-10
PP7705	A-8
	B-13

ADDRESS INFORMATION

AUDIO Section	
Transistor	
Q1401	C-4
Q4002	B-8
Q4003	C-8
Q4004	B-6
Q4005	C-7
Q4006	C-6
Q4007	B-9
Q4008	C-9
Q4011	C-6
Q4012	B-6
Q4015	A-5
Q4016	A-5
Transistor & Resistor	
QR4001	C-8
QR4002	B-9
QR4003	B-9
QR4004	B-9
QR4005	C-6
QR4006	B-6
QR4009	A-6
QR4010	C-7
QR4012	C-6
QR4013	C-6
QR4014	C-6
QR4016	B-9
QR4017	A-5
Integrated Circuit	
IC4001	C-7
Test Point	
TP4002	B-5
TP4003	B-5
TP4004	B-6
TP4501	B-8
TP4511	C-8
Adjustment	
VR4001	B-5
Connector	
P1502	D-4
P4001	B-5
P4002	C-8
P4003	C-7
P4004	C-6
PP4002	A-6
PP4003	A-7

ADDRESS INFORMATION

3-9. POWER SCHEMATIC DIAGRAM

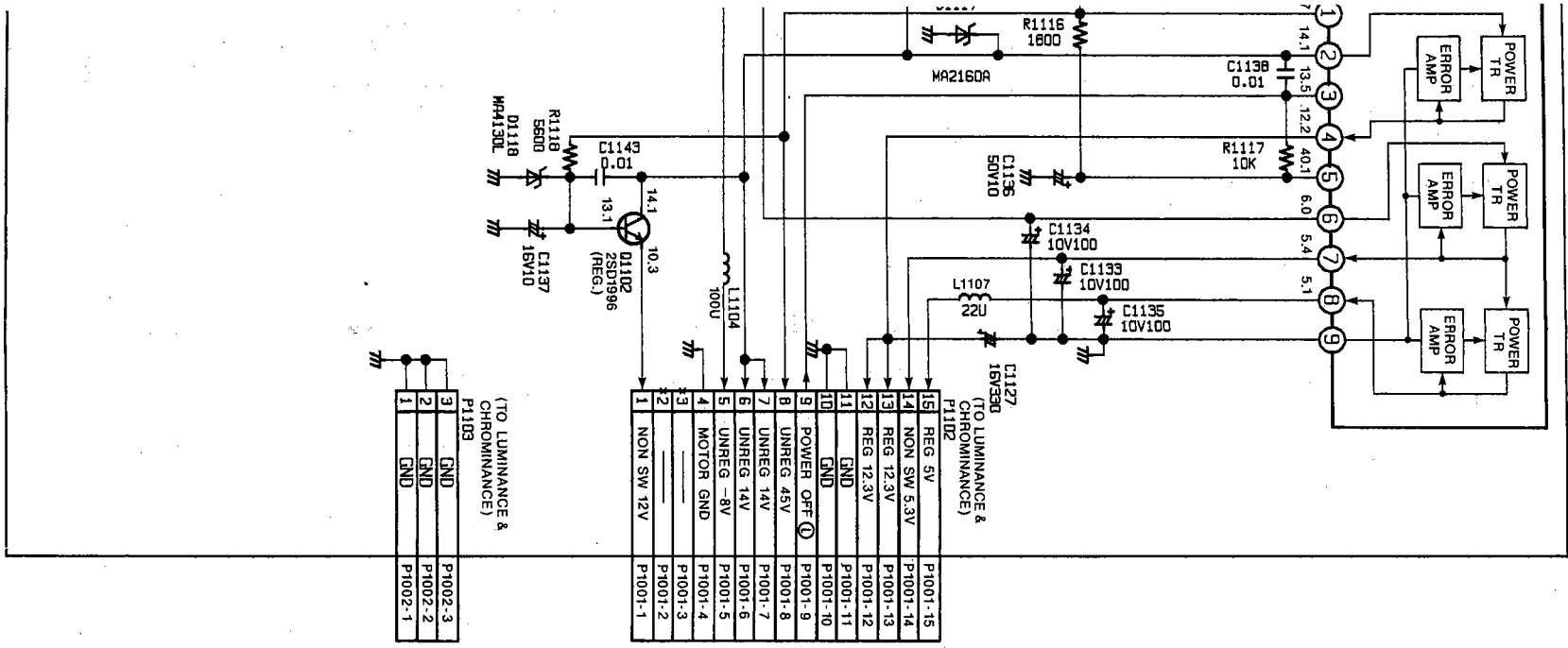


IMPORTANT SAFETY NOTICE:
 COMPONENTS IDENTIFIED BY THE SIGN Δ HAVE SPECIAL CHARACTERISTICS
 IMPORTANT FOR SAFETY WHEN REPLACING ANY OF THESE COMPONENTS. USE ONLY
 THE SPECIFIED PARTS.

NOTE 1. WHEN MEASURE THE VOLTAGE OR WAVEFORM ON THE POWER TRANSFORMER
 CIRCUIT, SET THE GND TERMINAL OF MEASURING POINT AS FOLLOWS.
 PRIMARY SIDE IC101-4
 SECONDARY SIDE TP GND OF MAIN C.B.A.
 NOTE 2. THE DC VOLTAGE INDICATED IN PRIMARY SIDE IS SHOWN THE VOLTAGE WHEN
 INPUT AC IS 110V.

NOTE: DO NOT USE ANY PART NIT
 SCHEMATIC DIAGRAM FOR C
 ORDER A PART. PLEASE REF.

3-10. POWER C.B.A. (VEP01535B: NV-FS200PX) (VEP01535A: AG-1970P)



1	NON SW 12V	P1001-1
2		P1001-2
3		P1001-3
4	MOTOR GND	P1001-4
5	UNREG -8V	P1001-5
6	UNREG 14V	P1001-6
7	UNREG 45V	P1001-7
8	UNREG 45V	P1001-8
9	POWER OFF	P1001-9
10	GND	P1001-10
11	REG 12.3V	P1001-11
12	REG 12.3V	P1001-12
13	REG 12.3V	P1001-13
14	NON SW 5.3V	P1001-14
15	REG 5V	P1001-15

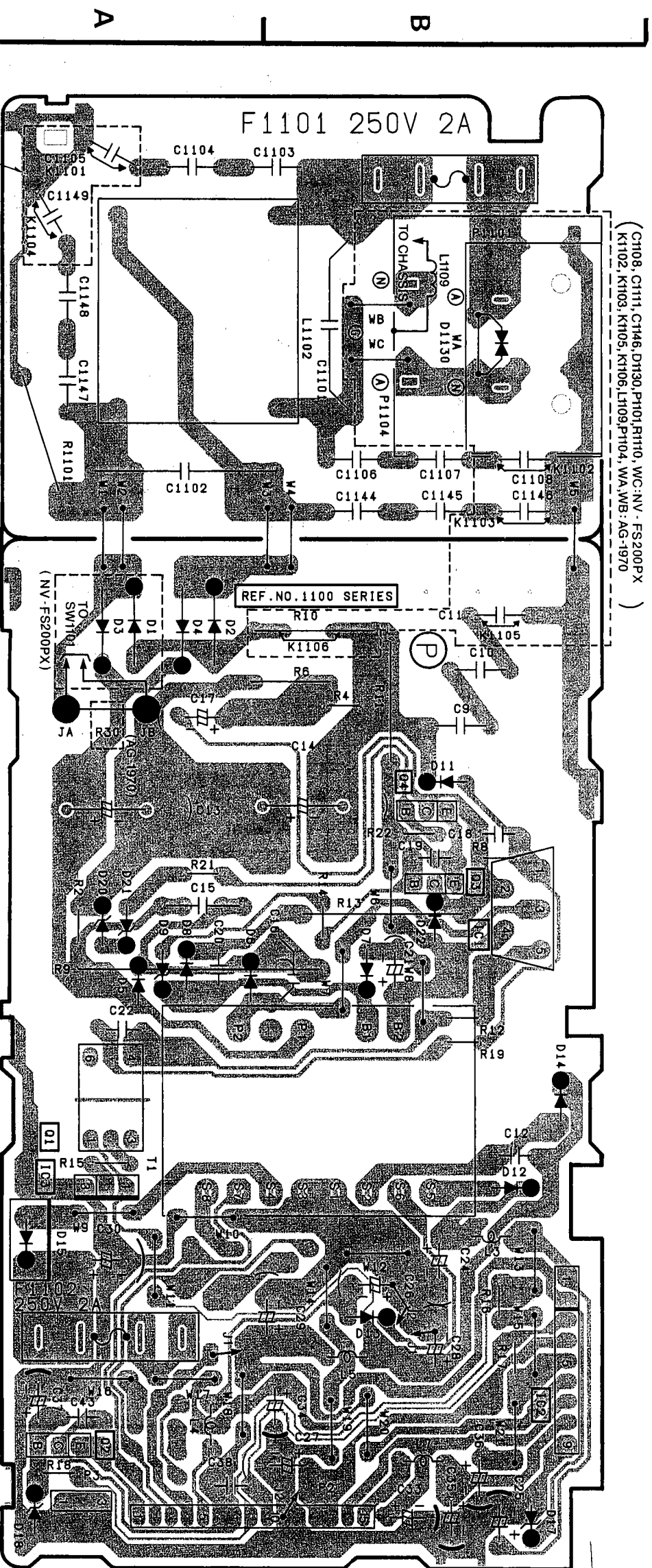
1	GND	P1002-1
2	GND	P1002-2
3	GND	P1002-3

(TO LUMINANCE & CHROMINANCE) P1003

3 TRANSFORMER OLLOWS.

VOLTAGE WHEN

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



(C1108, C1111, C1146, D1130, P1101, R1110, WC: NV-FS200PX)
(K1102, K1103, K1105, K1106, L1109, P1104, WA: WB: AG-1970)

F1101 250V 2A

REF. NO. 1100 SERIES

(NV-FS200PX)



(C1105, C1149: NV-FS200PX)
(K1101, K1104: AG-1970)

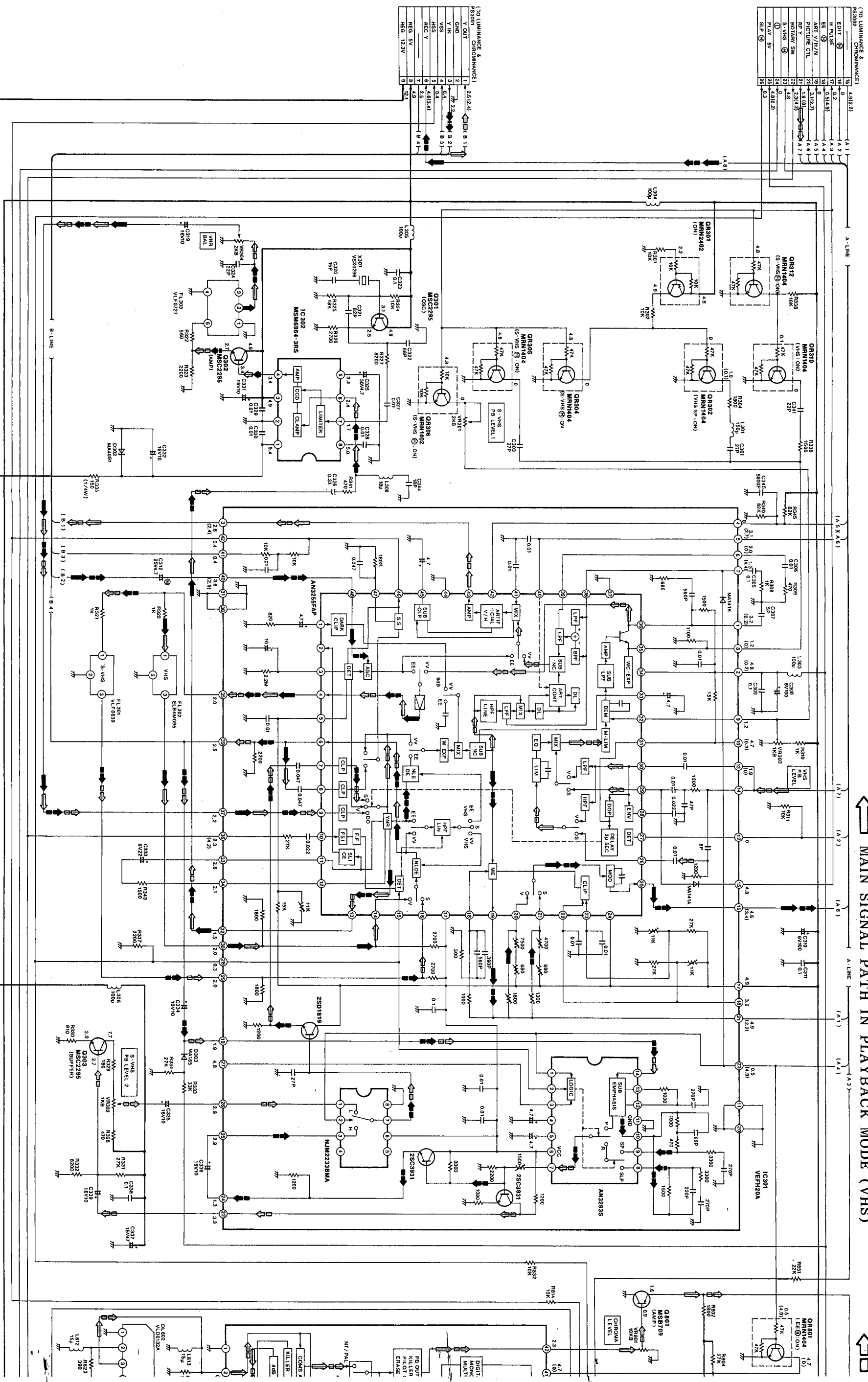
(COMPONENT SIDE)

POWER C.B.A.	
Transistor	
Q1101	A-4
Q1102	A-5
Q1103	B-3
Q1104	B-3
Integrated Circuit	
IC1101	B-3
IC1102	B-5
IC1103	A-4
Connector	
P1101	B-3
P1102	B-5
P1103	A-5
P1104	B-2

ADDRESS INFORMATION

3-11. LUMINANCE & CHROMINANCE PACK SCHEMATIC DIAGRAM

 MAIN SIGNAL PATH IN REC MODE (VHS)
 MAIN SIGNAL PATH IN PLAYBACK MODE (VHS)



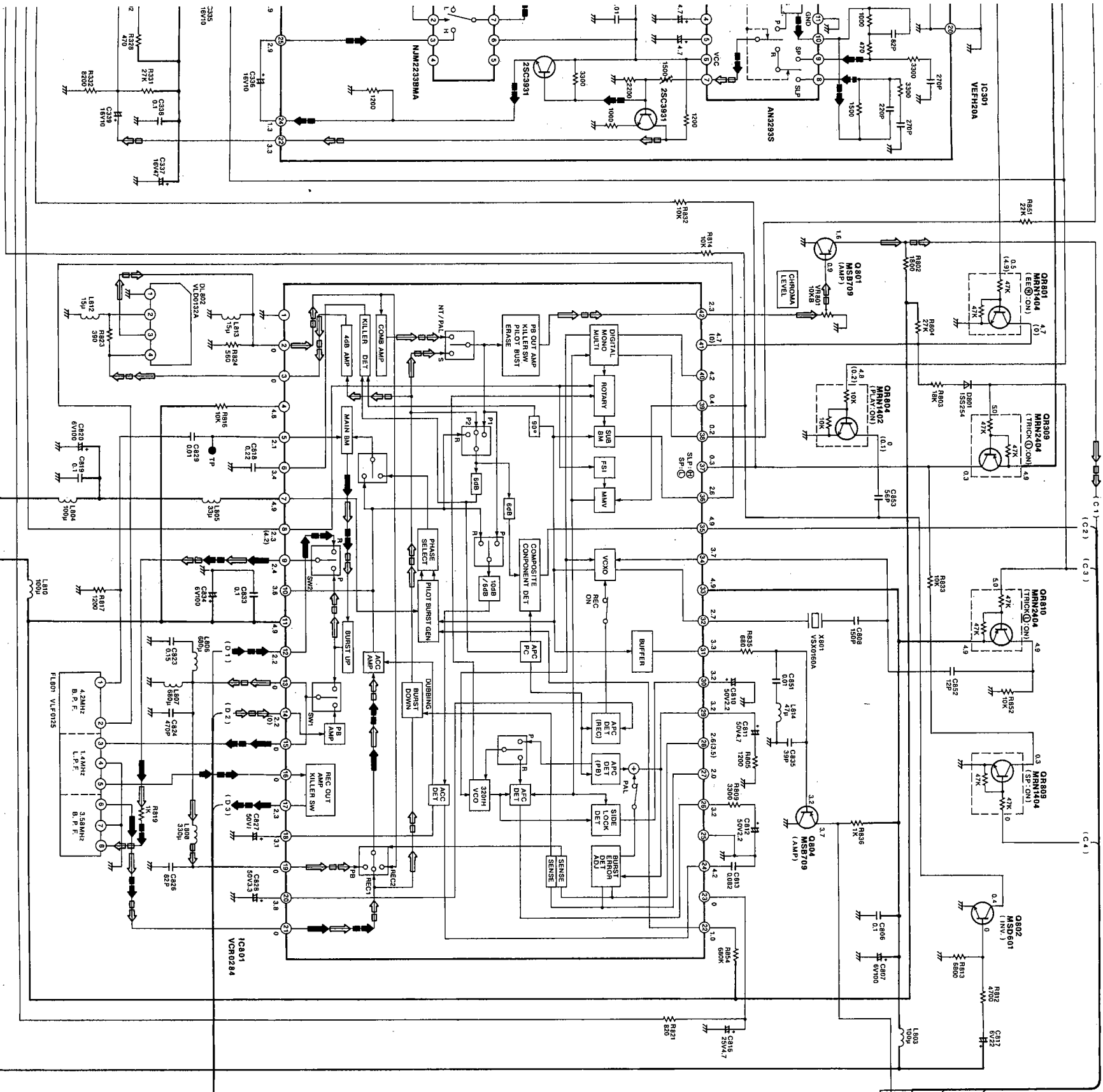
(TO LUMINANCE & CHROMINANCE)

REG 12.2V	1	28.1(2.4)	(B 1)
REG 12.2V	2	22.2(2.4)	(B 2)
REG 12.2V	3	22.2(2.4)	(B 3)
REG 12.2V	4	22.2(2.4)	(B 4)
REG 12.2V	5	22.2(2.4)	(B 5)
REG 12.2V	6	22.2(2.4)	(B 6)
REG 12.2V	7	22.2(2.4)	(B 7)
REG 12.2V	8	22.2(2.4)	(B 8)
REG 12.2V	9	22.2(2.4)	(B 9)
REG 12.2V	10	22.2(2.4)	(B 10)
REG 12.2V	11	22.2(2.4)	(B 11)

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS () ON WITH NTSC COLOR SIGNAL (S-VHS: SP MODE)

E (VHS)
K MODE (VHS)

MAIN SIGNAL PATH IN REC MODE (S-VHS)
MAIN SIGNAL PATH IN PLAYBACK MODE (S-VHS)



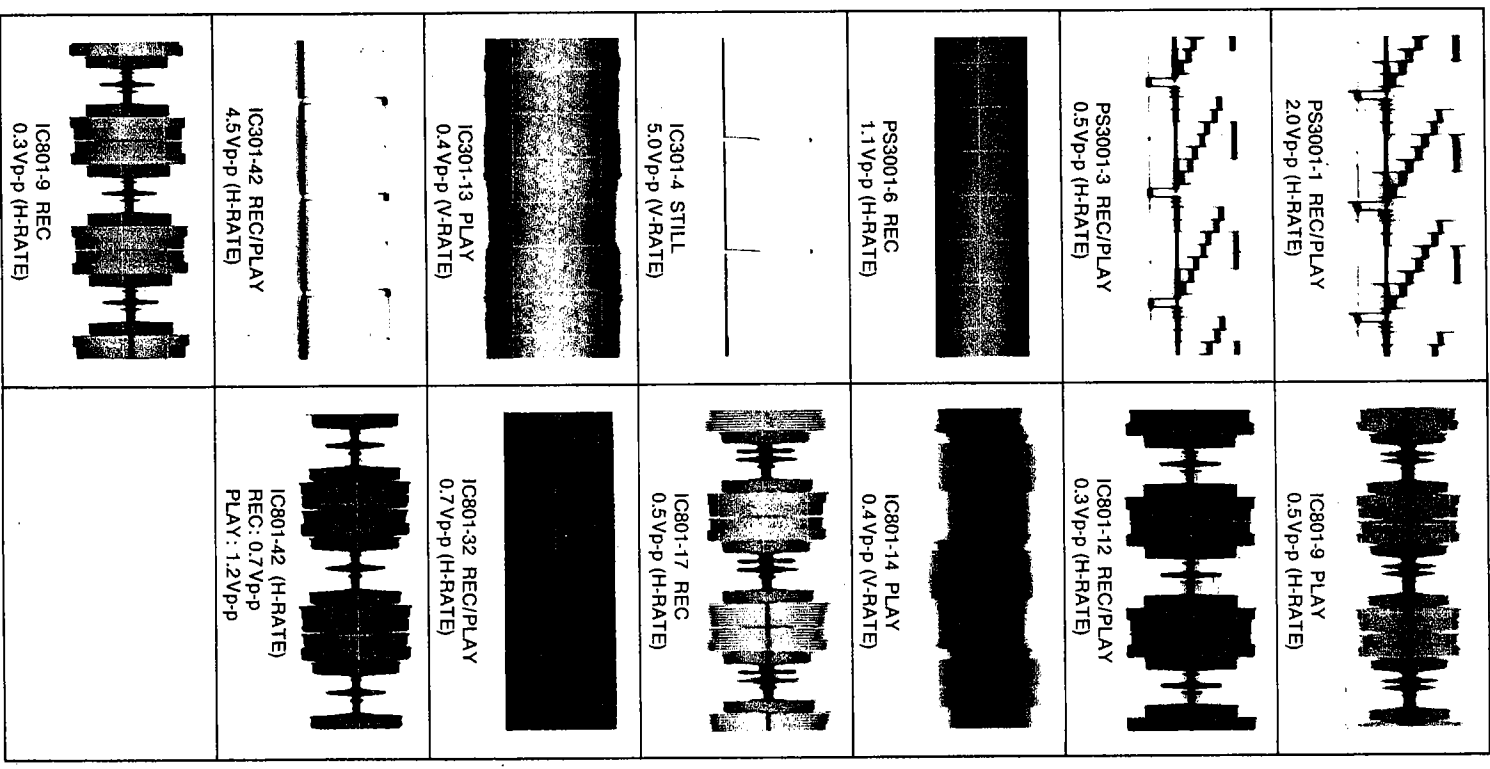
IC	FUNCTION	MEASUREMENT MODE
IC301-13	PLAY	REC MODE
IC801-9	REC	PLAYBACK MODE
IC801-12	REC/PLAY	PLAYBACK MODE
IC801-14	PLAY	PLAYBACK MODE
IC801-17	REC	PLAYBACK MODE
IC801-42	REC/PLAY	PLAYBACK MODE
IC801-9	REC	PLAYBACK MODE

THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS RECORD MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE)

THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH NTSC COLOR SIGNAL (S-VHS: SP 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.

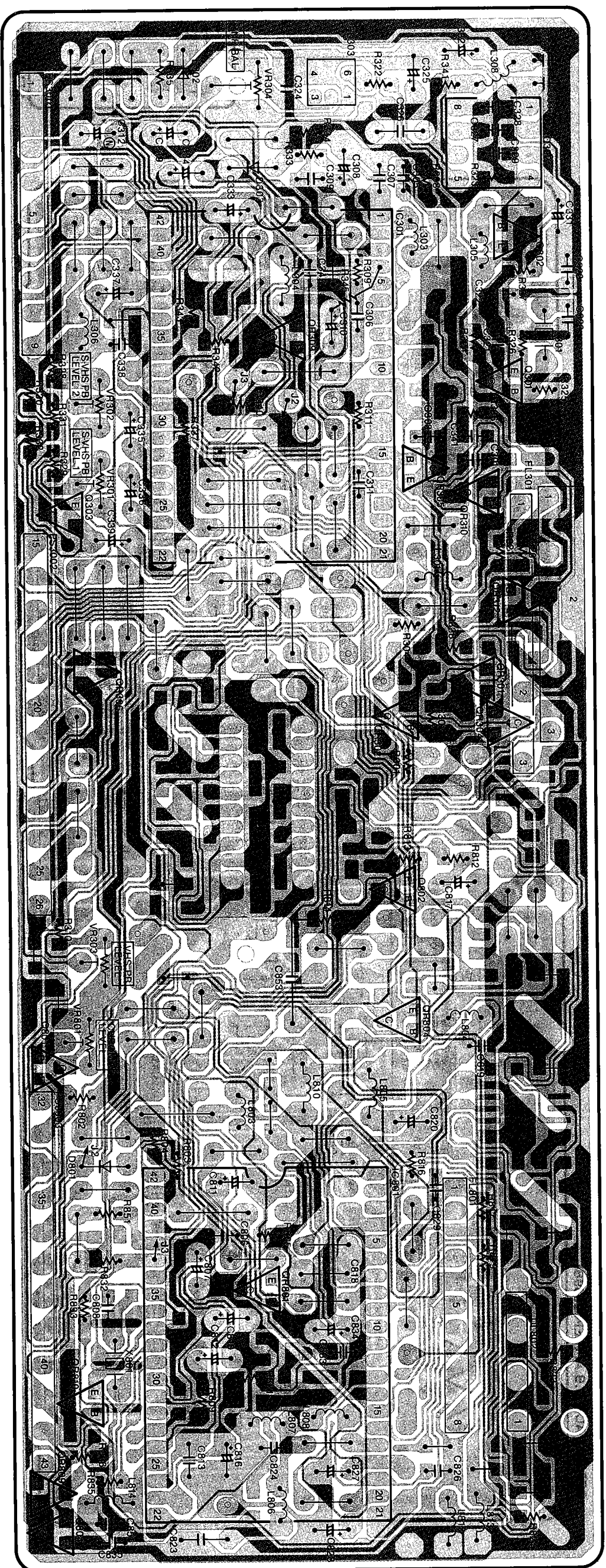
WAVEFORM OF LUMINANCE & CHROMINANCE PACK



12. LUMINANCE & CHROMINANCE PACK C.B.A. (VEP03894C)

LUMINANCE & CHROMINANCE PACK C.B.A.			
Transistor	QR809	A-7	A-7
	QR810	A-6	A-6
Integrated Circuit	IC301	B-2	B-2
	Q801	A-5	C-1
	Q802	B-4	B-5
	Q804	A-7	B-5
Transistor & Resistor	VR301	A-3	A-3
	VR302	A-2	A-2
Adjustment	VR303	A-4	A-4
	VR304	B-1	B-1
	VR801	A-5	A-5
	VR801	A-5	A-5
Connector	PS3001	A-1	A-1
	PS3002	C-3	A-3
	PS3003	B-6	A-5

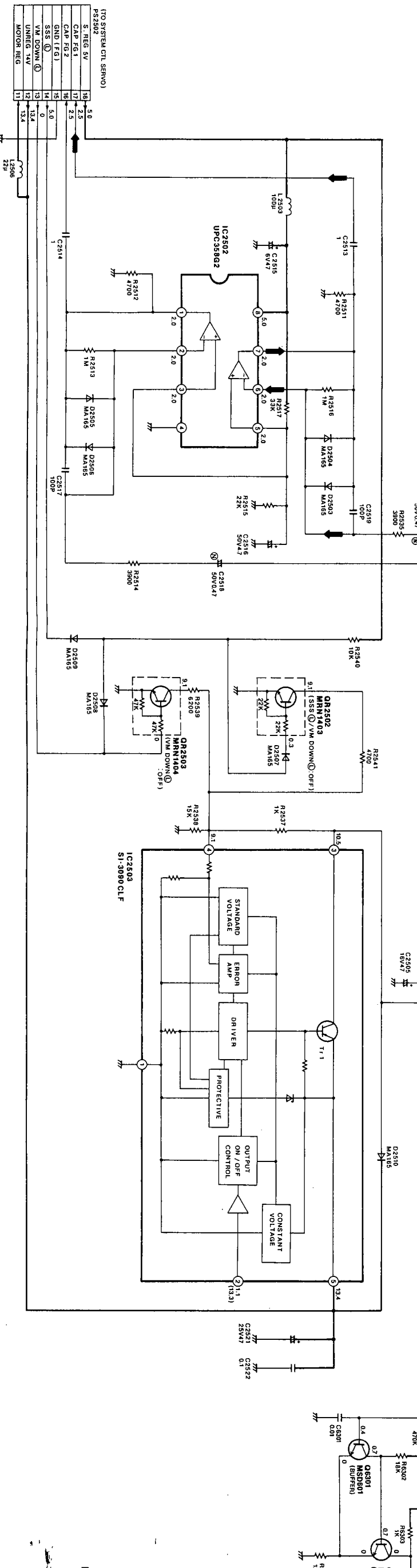
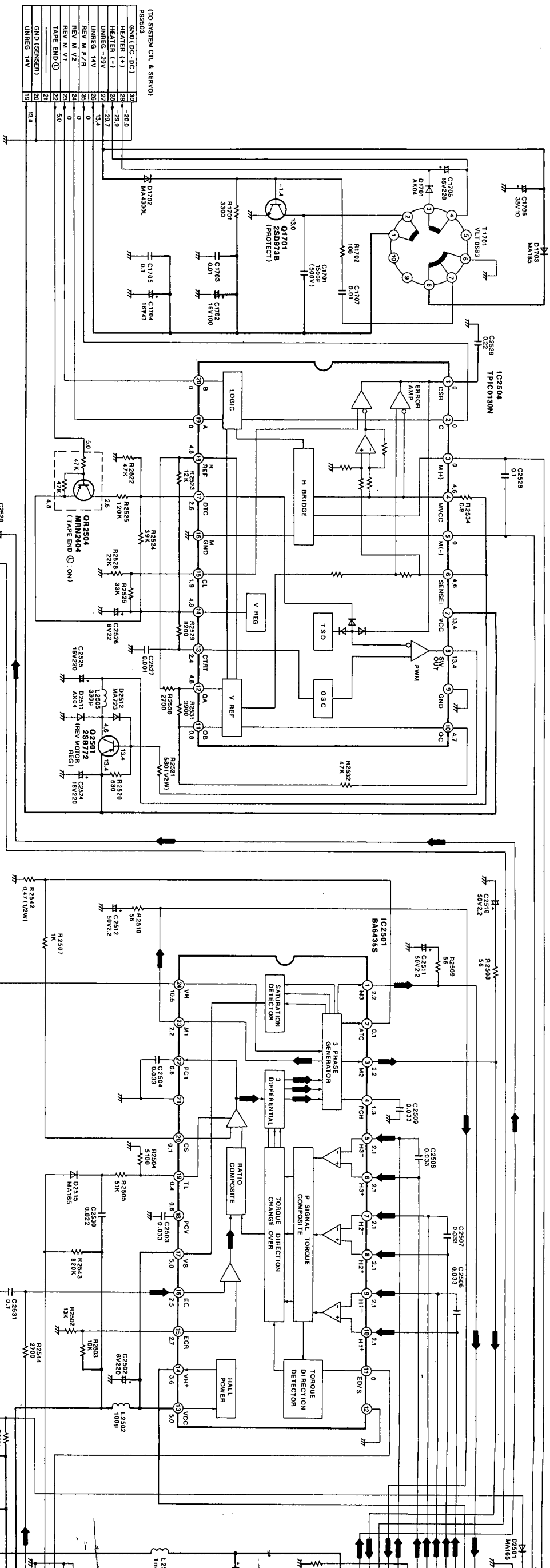
ADDRESS INFORMATION

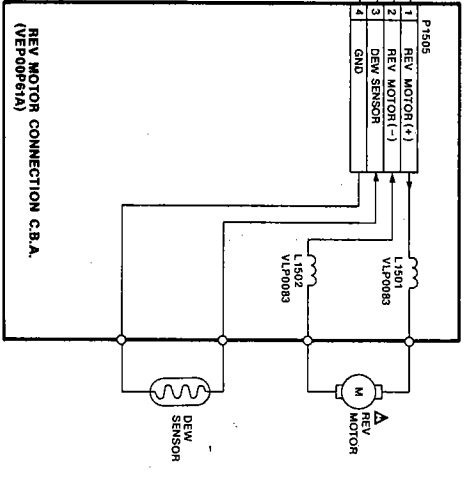
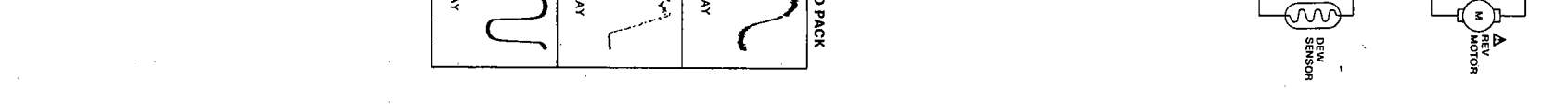
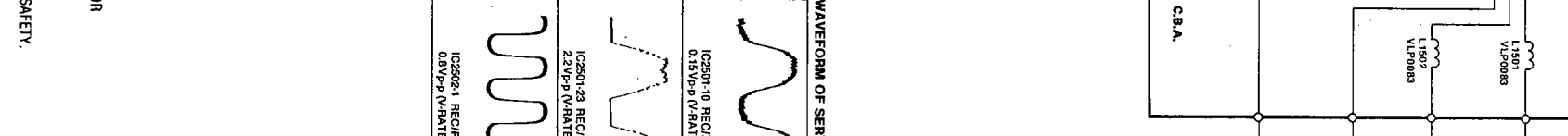
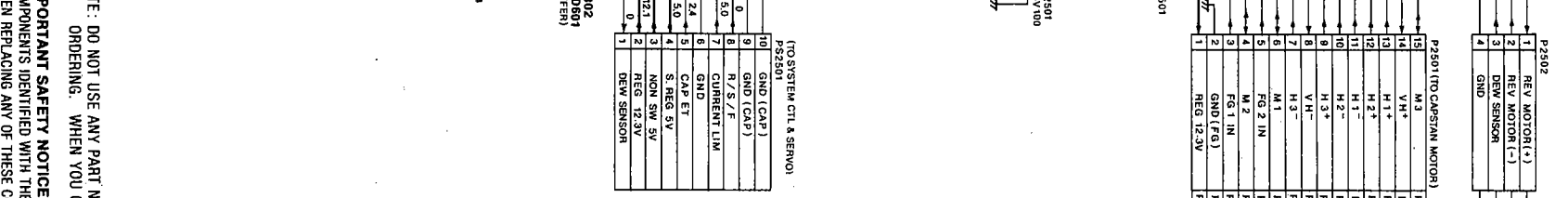
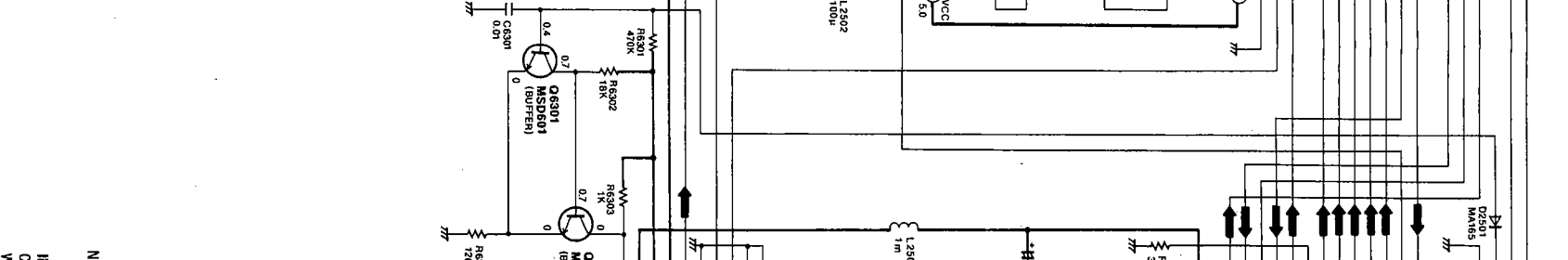
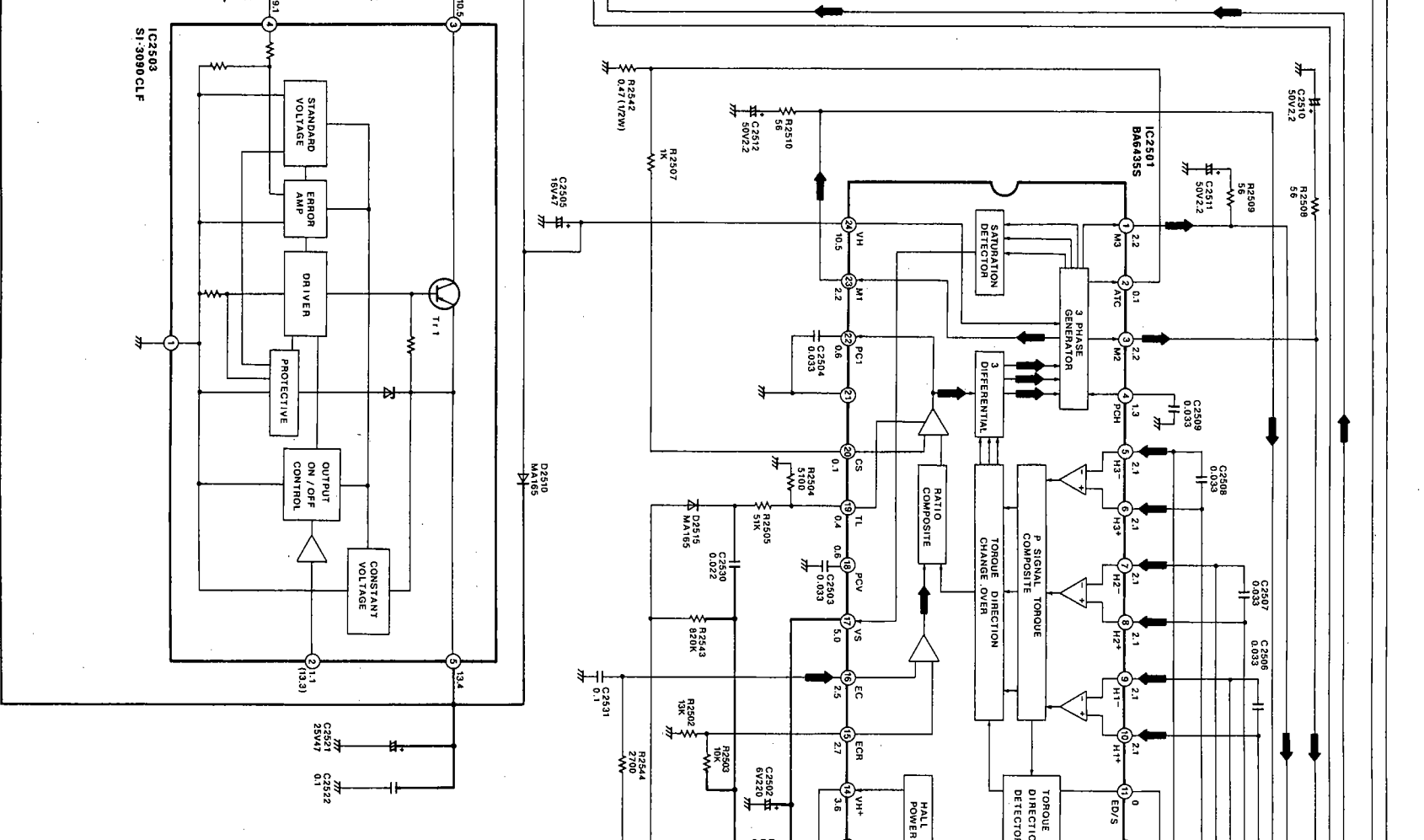
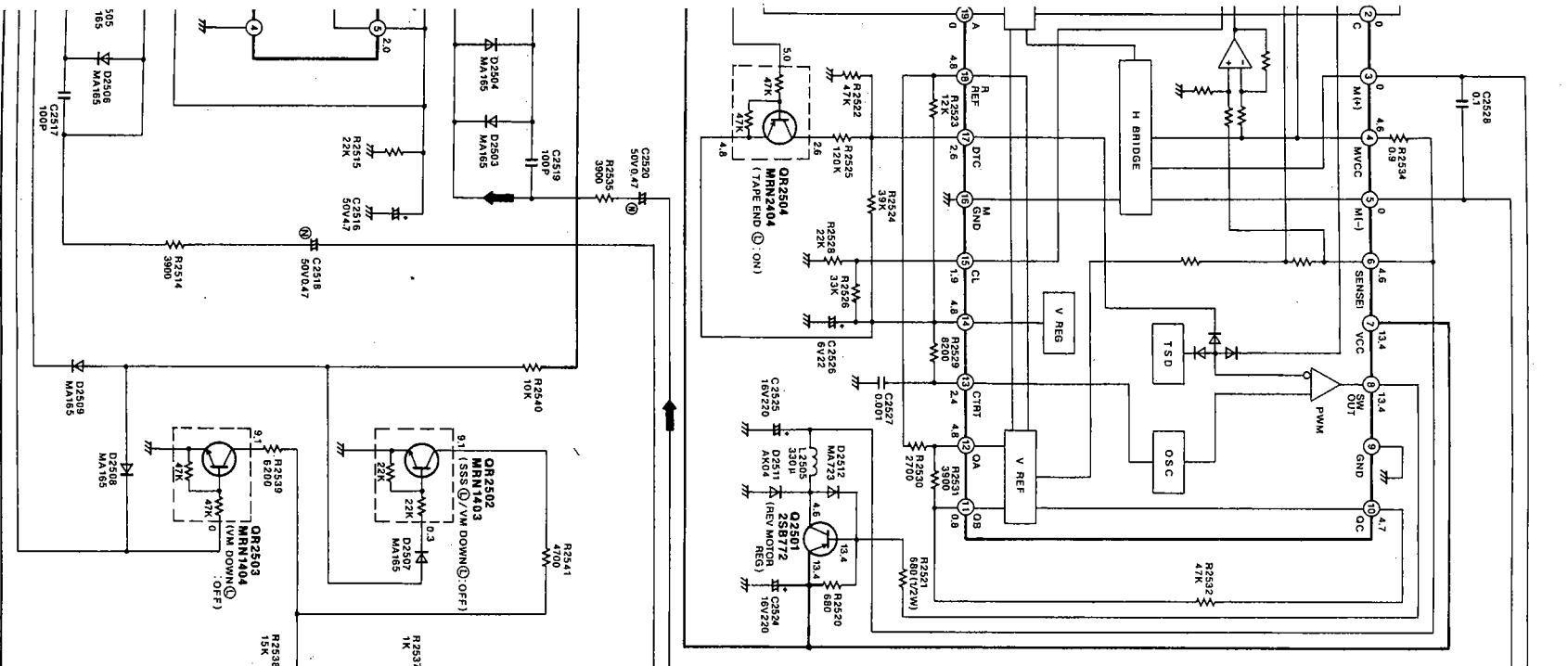


1 2 3 4 5 6 7

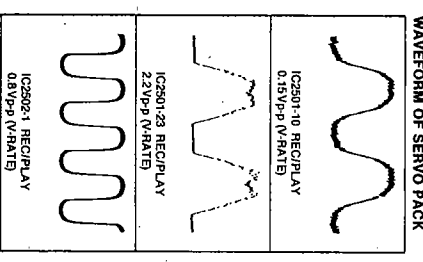
3-14. SERVO PACK SCHEMATIC DIAGRAM

← CAPSTAN SERVO SPEED LOOP





[O] SYSTEM CTL & SERVO	
10	GND (CAP)
9	GND (CAP)
8	R/S Z.F.
7	CURRENT LIM
6	GND
5	CHARGE SV
4	S. REG. SV
3	NON SW SV
2	REG. ZL SV
1	REV. SENSOR
0	GND

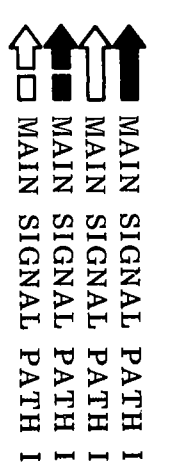
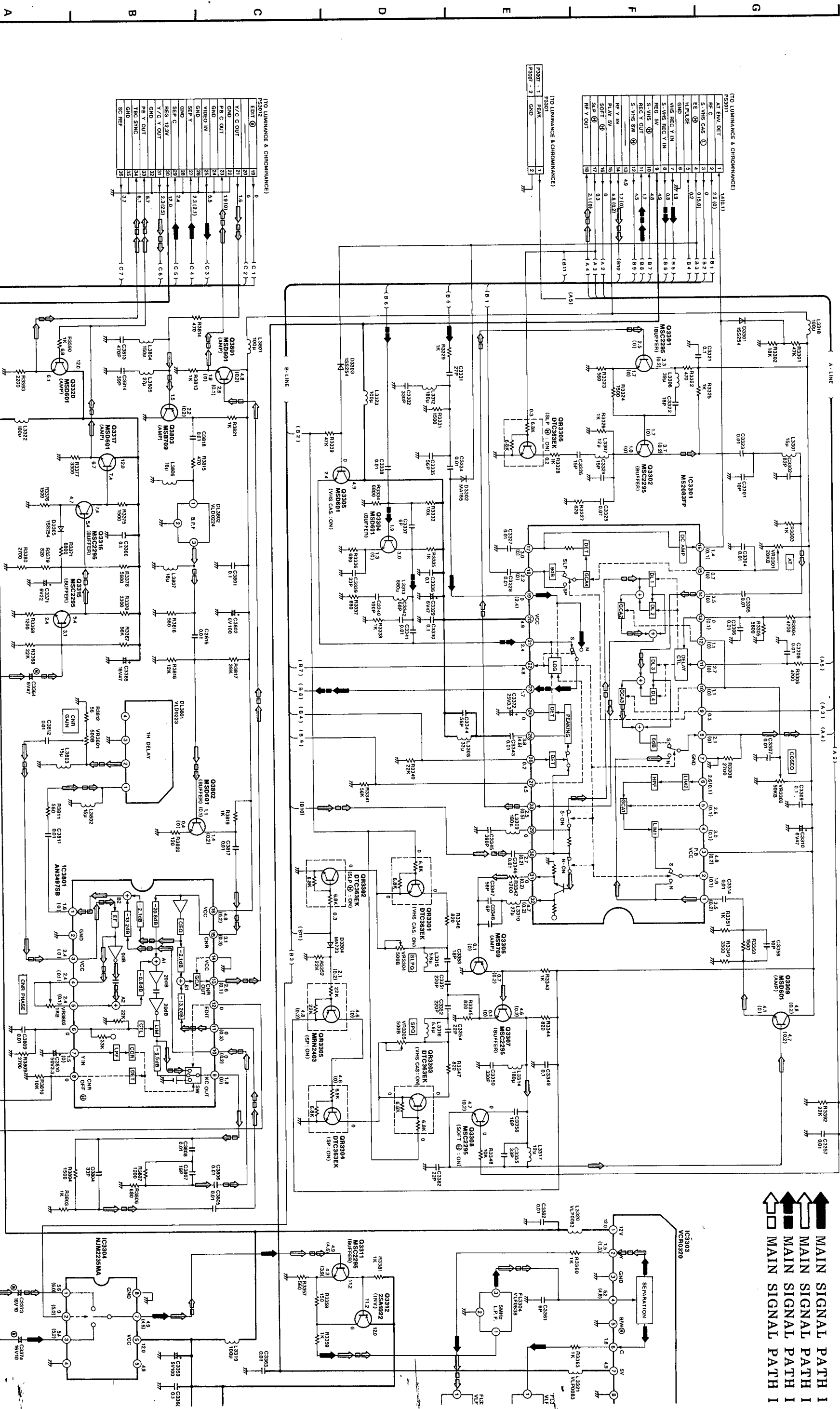


NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

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

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS RECORD MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE). THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE).

3-15. SUB LUMINANCE & CHROMINANCE PACK SCHEMATIC DIAGRAM



(TO LUMINANCE & CHROMINANCE)

AT ENV DET	1	14(C1)
RF C	2	23(0)
S-VHS CAS	3	18(2)
EE	4	0(C2)
H-FLUSE	5	0(C)
GND	6	0(C)
S-VHS REC Y IN	7	19(0)
S-VHS REC Y IN	8	18(6)
REG SV	9	4(8)
S-VHS REC Y IN	10	18(6)
S-VHS OUT	11	18(6)
S-VHS SW	12	4(8)
RF Y IN	13	17(0)
RF Y IN	14	17(0)
RF Y IN	15	17(0)
RF Y IN	16	17(0)
RF Y IN	17	17(0)
RF Y OUT	18	21(0)
RF Y OUT	19	21(0)

(TO LUMINANCE & CHROMINANCE)

PS007 - 1	1	1
PS007 - 2	2	2

(TO LUMINANCE & CHROMINANCE)

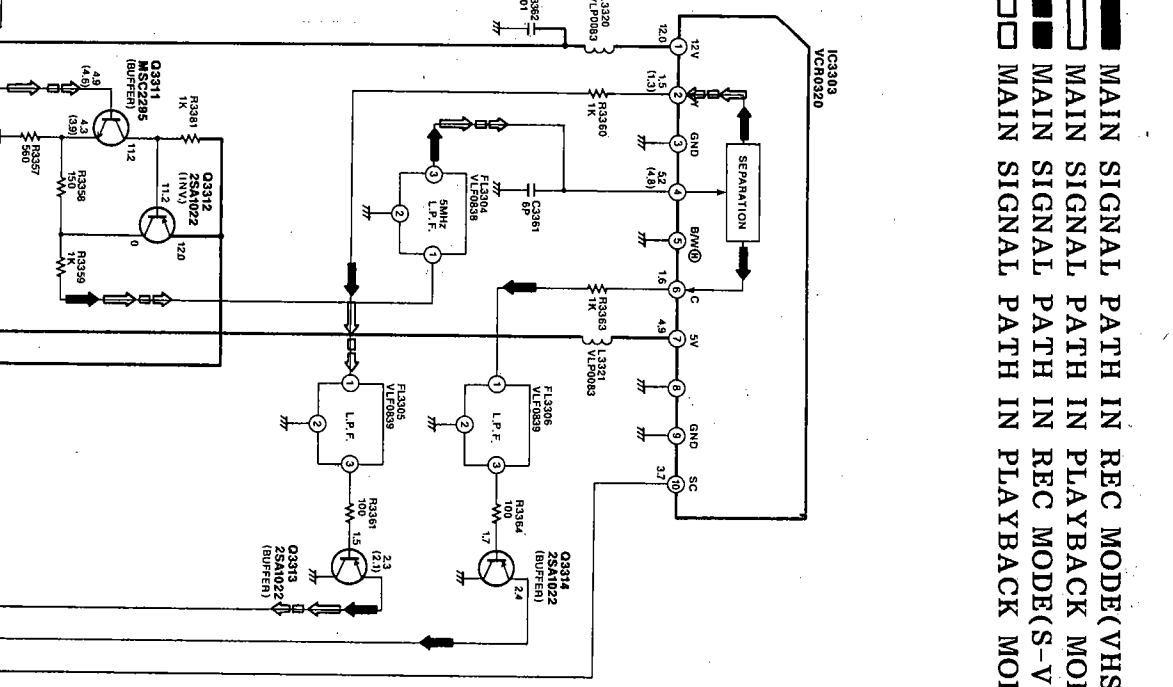
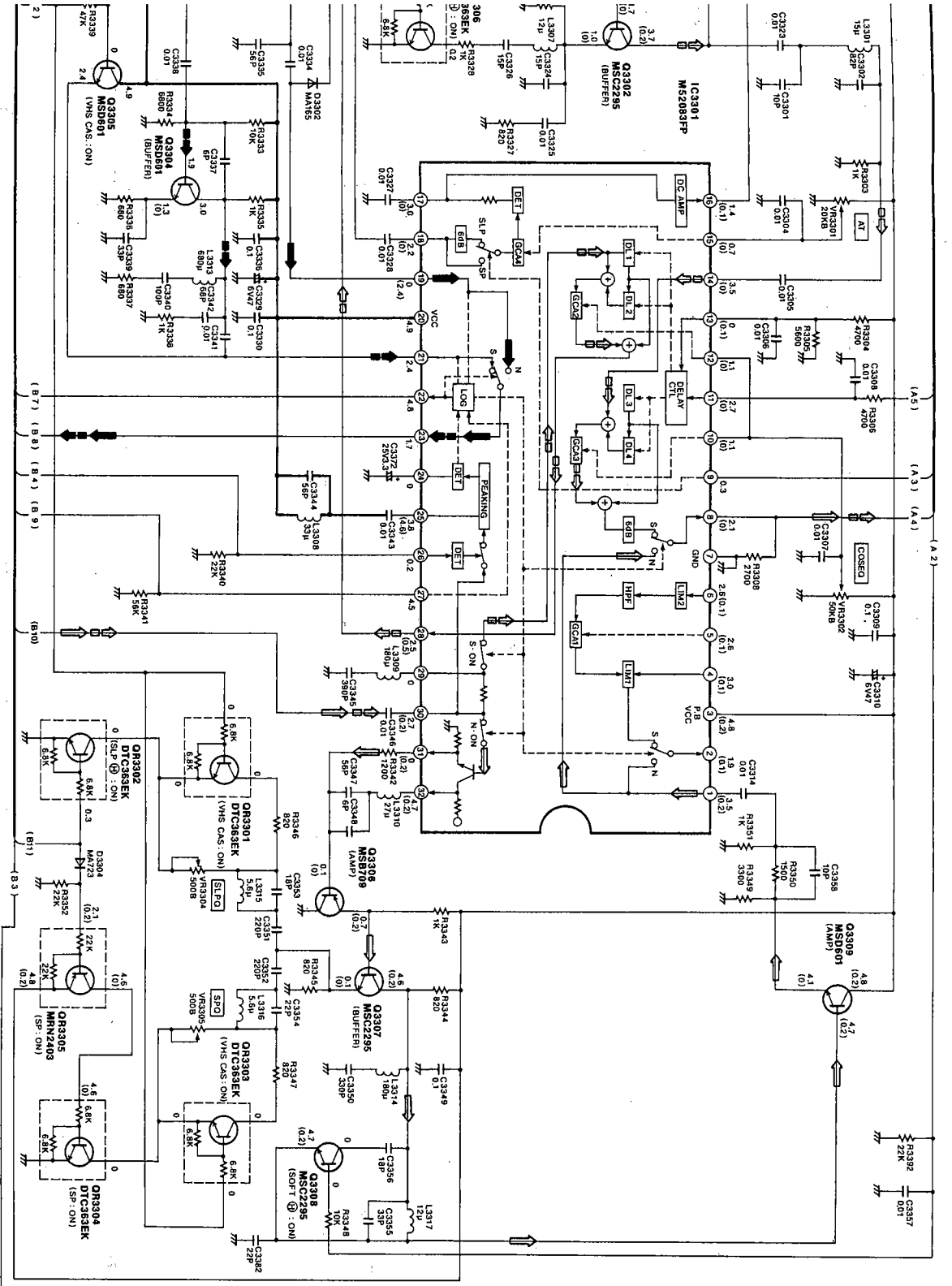
EDT	19	0
V/C OUT	20	1(5)
GND	21	0(C1)
RF C OUT	22	19(0)
RF C OUT	23	19(0)
RF C OUT	24	5(5)
RF C OUT	25	5(5)
RF C OUT	26	23(12.1)
RF C OUT	27	23(12.1)
RF C OUT	28	24
RF C OUT	29	24
RF C OUT	30	12(0)
RF C OUT	31	12(0)
RF C OUT	32	12(0)
RF C OUT	33	12(0)
RF C OUT	34	6.1
RF C OUT	35	6.1
RF C OUT	36	3.7
RF C OUT	37	3.7




NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS RECORD MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE)

THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE)

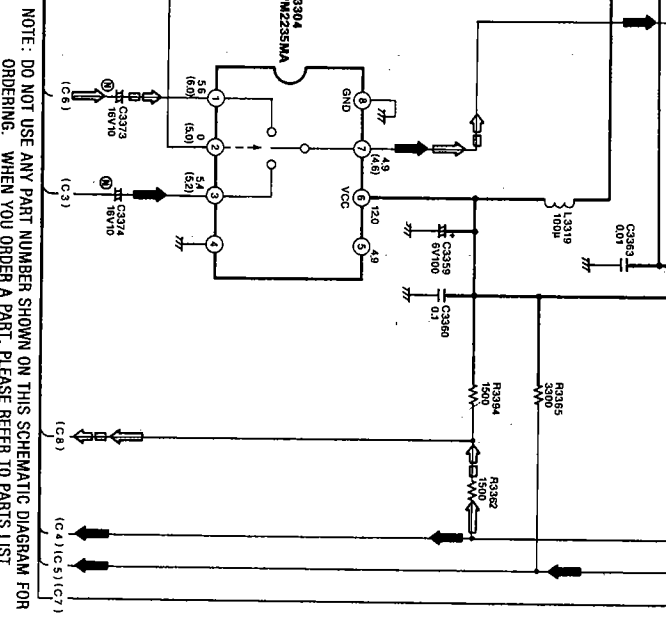
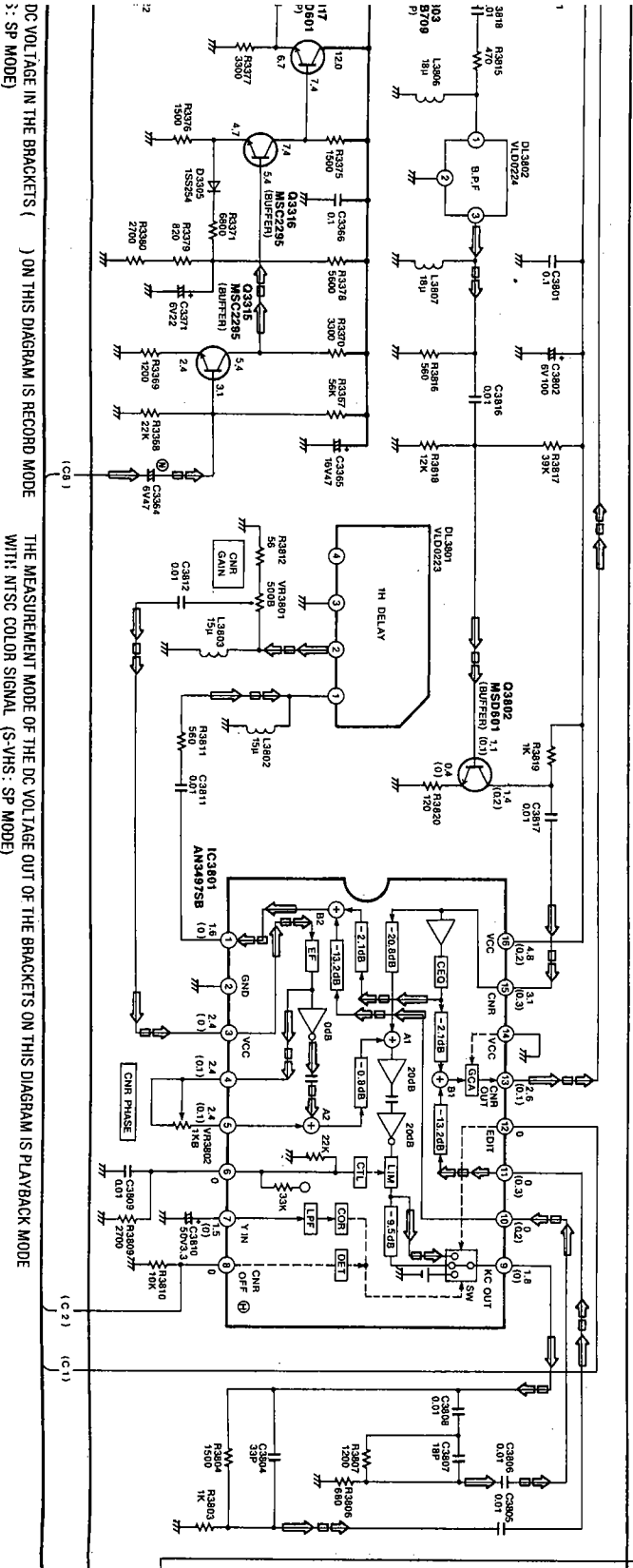
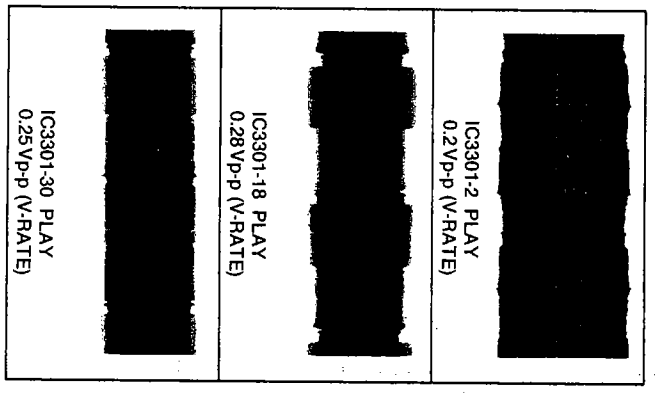
NOTE: DO NOT USE ANY PART NUMBER SHOW ORDERING WHEN YOU ORDER A PAR

SCHEMATIC DIAGRAM



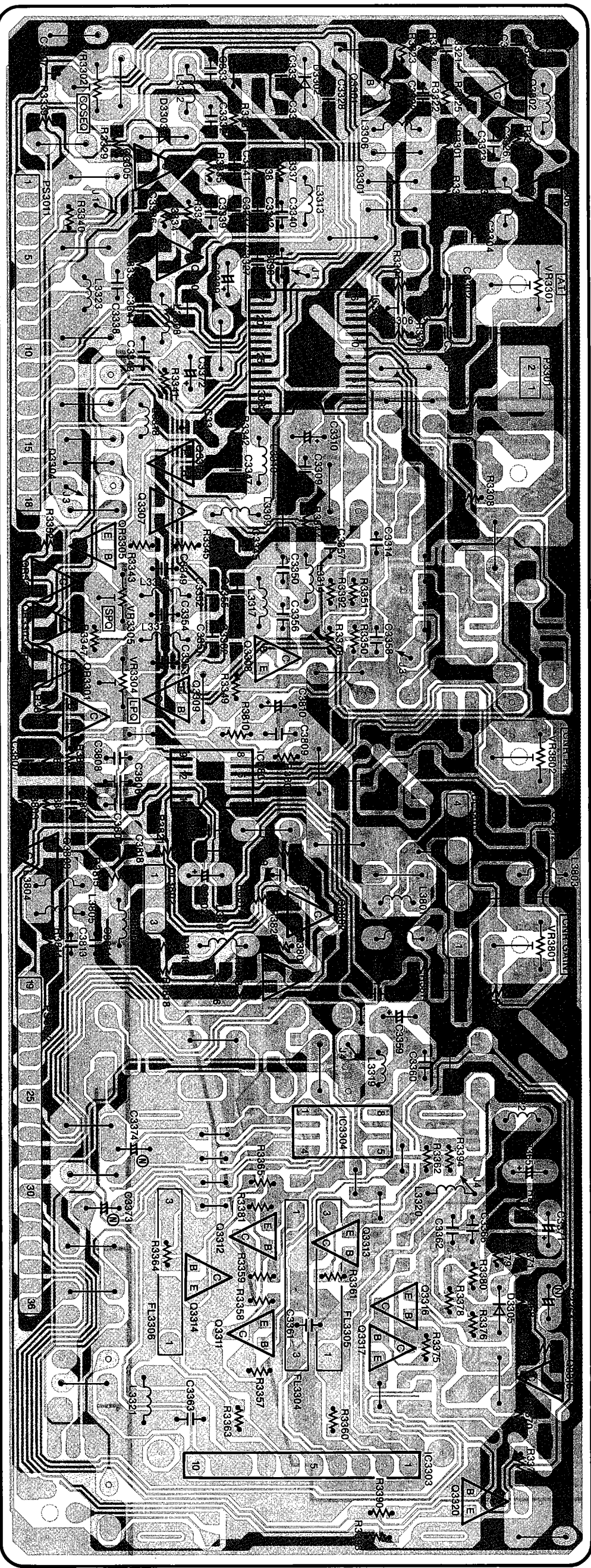
 MAIN SIGNAL PATH IN REC MODE(VHS)
 MAIN SIGNAL PATH IN PLAYBACK MODE(VHS)
 MAIN SIGNAL PATH IN PLAYBACK MODE(S-VHS)

WAVEFORM OF SUB LUMINANCE & CHROMINANCE PACK



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 WITH: VHS: SP MODE (S-VHS: SP 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.



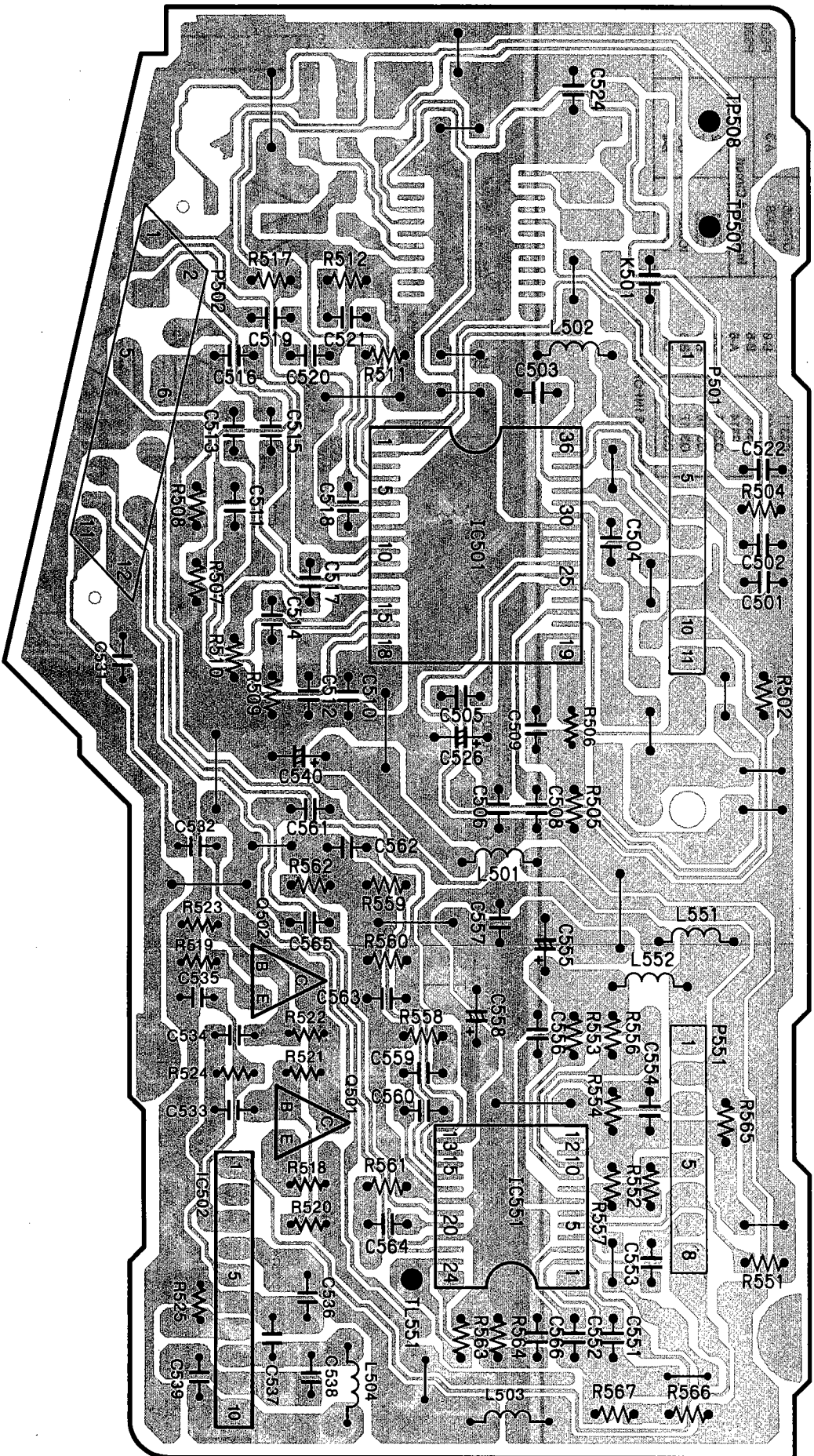
SUB LUMINANCE & CHROMINANCE PACK C.B.A.

Transistor		Adjustment	
Q3301	B-1	Q3801	B-5
Q3302	C-1	Q3802	B-4
Q3304	A-2	Q3803	A-4
Q3305	A-1	Transistor & Resistor	
Q3306	A-2	QR3301	A-3
Q3307	A-3	QR3303	A-3
Q3308	B-3	QR3304	A-3
Q3309	A-3	QR3305	A-3
Q3311	B-6	QR3306	C-1
Q3312	B-6	QR3309	A-3
Q3313	B-6	Integrated Circuit	
Q3314	A-6	IC3301	B-2
Q3315	C-6	IC3303	B-7
Q3316	B-6	IC3304	B-5
Q3317	B-6	IC3801	B-4
Q3320	C-7	Connector	
		P3301	C-2
		PS3011	A-1
		PS3012	A-5

ADDRESS INFORMATION

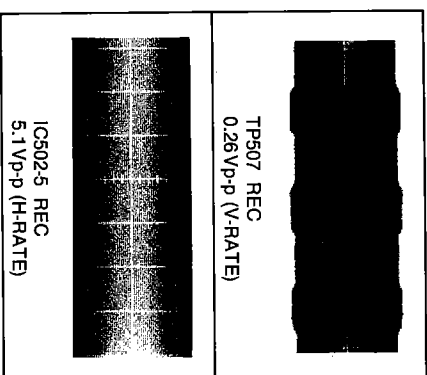
1 2 3 4 5 6

7. HEAD AMP C.B.A. (VEP05170J)



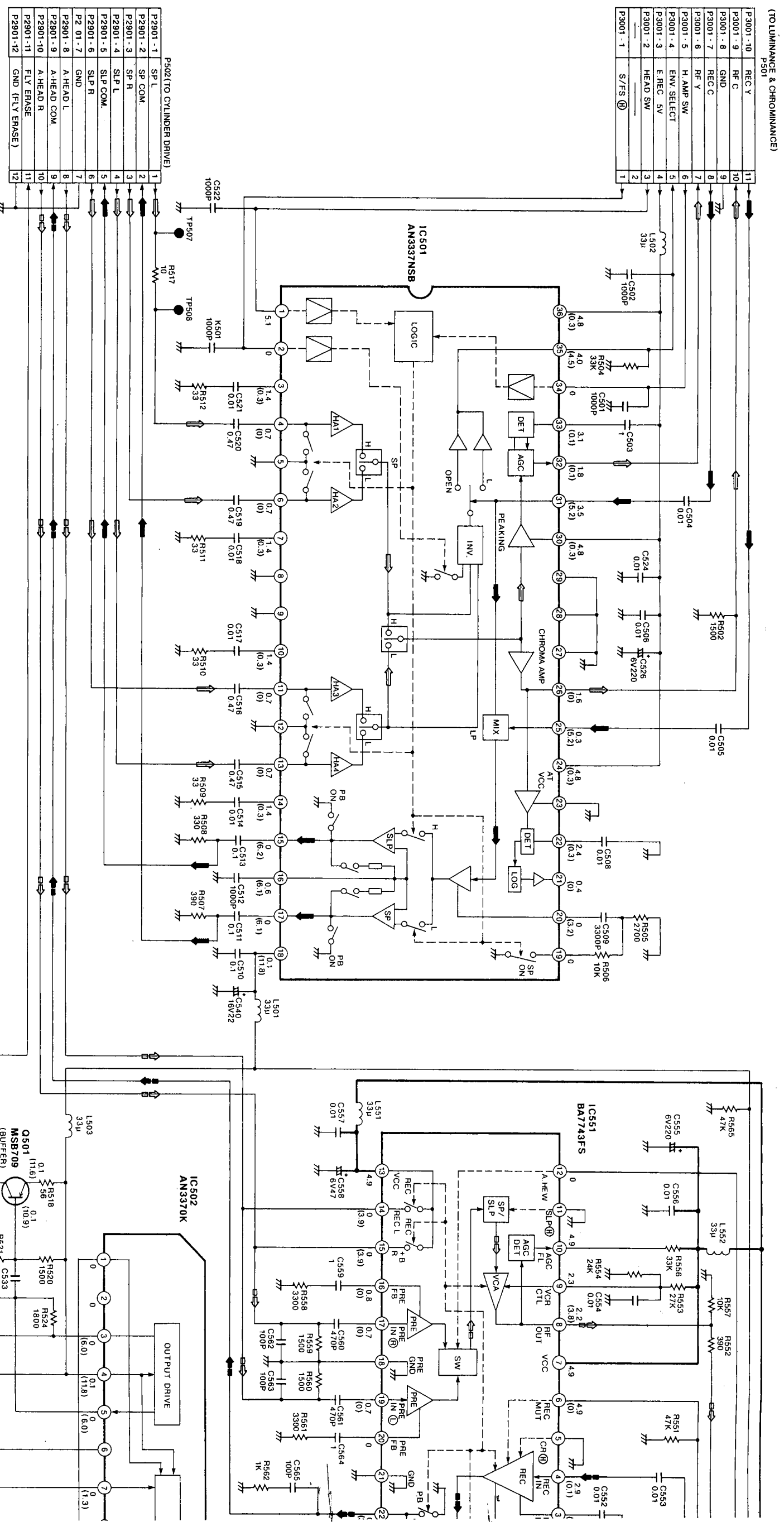
HEAD AMP C.B.A.	
Transistor	A-3 B-3
Q501 Q502	
Integrated Circuit	
IC501 IC502 IC551	B-2 A-4 B-4
Test Point	
TL551 TP507 TP508	B-4 B-1 B-1
Connector	
P501 P502 P551	B-2 A-1 B-3

ADDRESS INFORMATION



3-18. HEAD AMP SCHEMATIC DIAGRAM

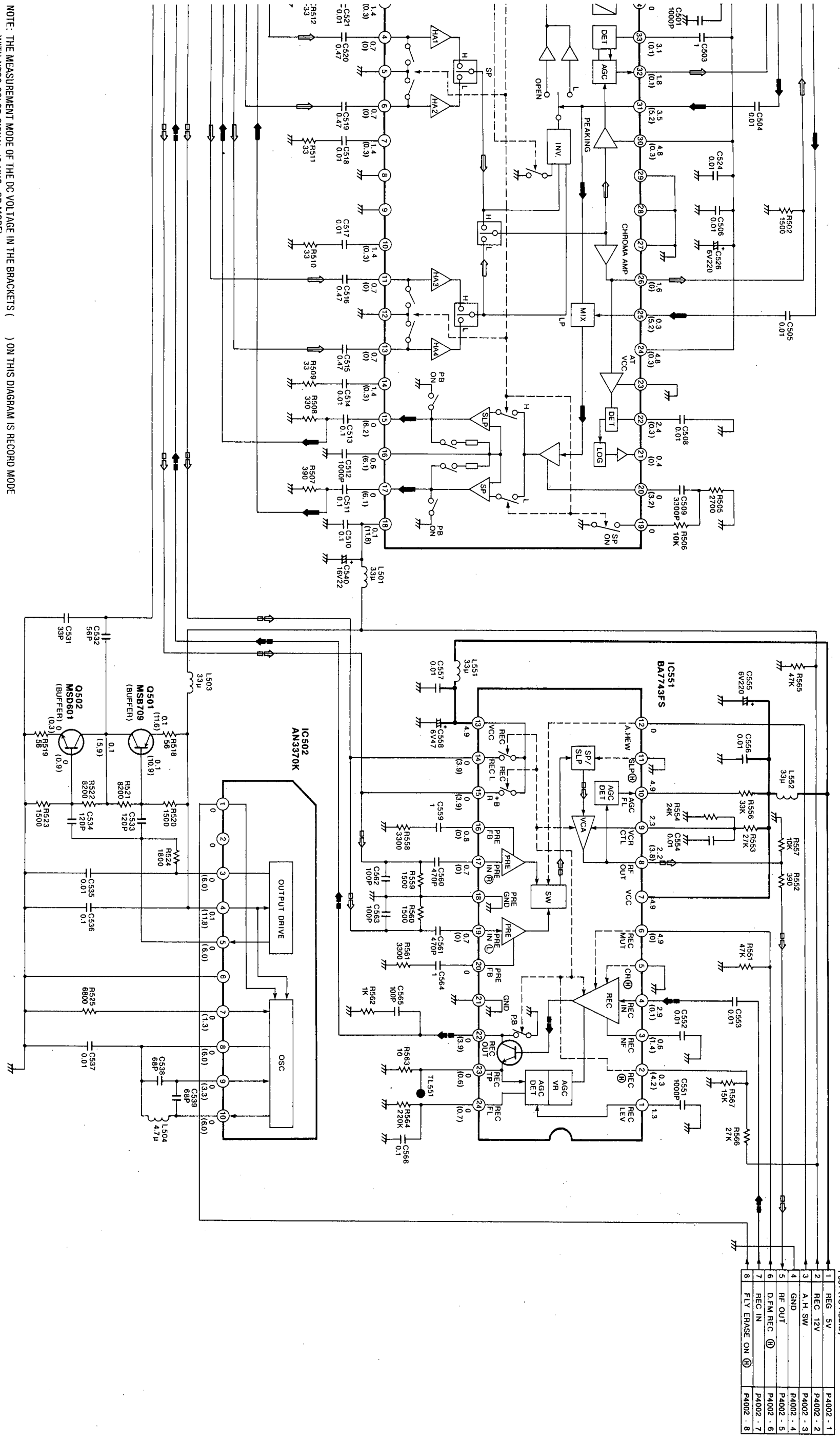
 VIDEO MAIN SIGNAL PATH IN REC MODE
 VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE
 HI-FI AUDIO MAIN SIGNAL PATH IN REC MODE
 HI-FI AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE



NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS RECORD MODE
 WITH NTSC COLOR SIGNAL (S-VHS: SP MODE)
 THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE
 WITH NTSC COLOR SIGNAL (S-VHS: SP MODE)

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

HI-FI AUDIO MAIN SIGNAL PATH IN REC MODE
 HI-FI AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE



P551 (TO AUDIO)

1	REG 5V	P4002 - 1
2	REC 12V	P4002 - 2
3	A. H. SW	P4002 - 3
4	GND	P4002 - 4
5	RF OUT	P4002 - 5
6	D.F.M REC	P4002 - 6
7	REC IN	P4002 - 7
8	FLY ERASE ON	P4002 - 8

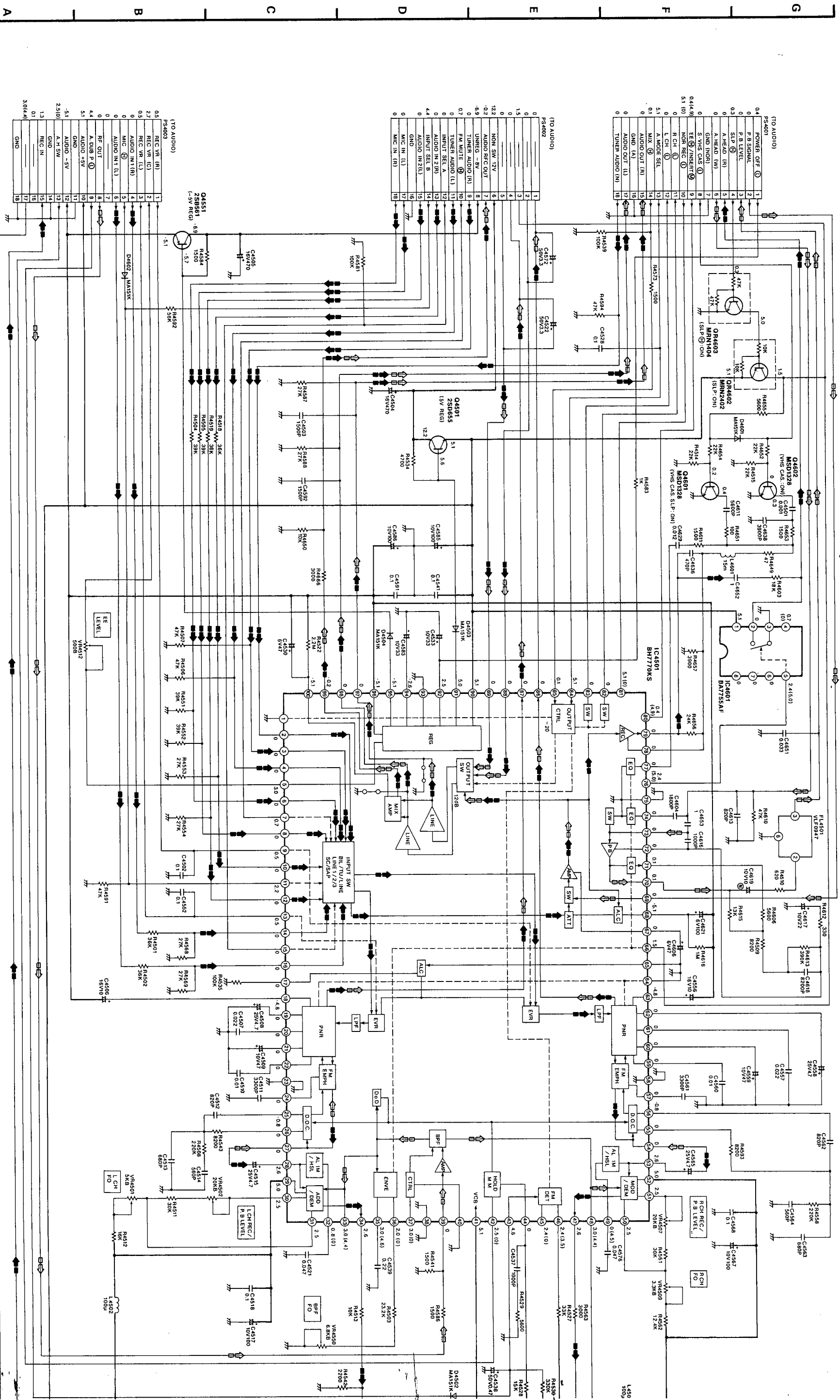
NOTE: THE MEASUREMENT MADE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS RECORD MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE) THE MEASUREMENT MADE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE)

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

3-19. HI-FI AUDIO PACK SCHEMATIC DIAGRAM

MAIN SIGNAL PATH IN REC MODE

MAIN SIGNAL PATH IN PLAYBACK MODE

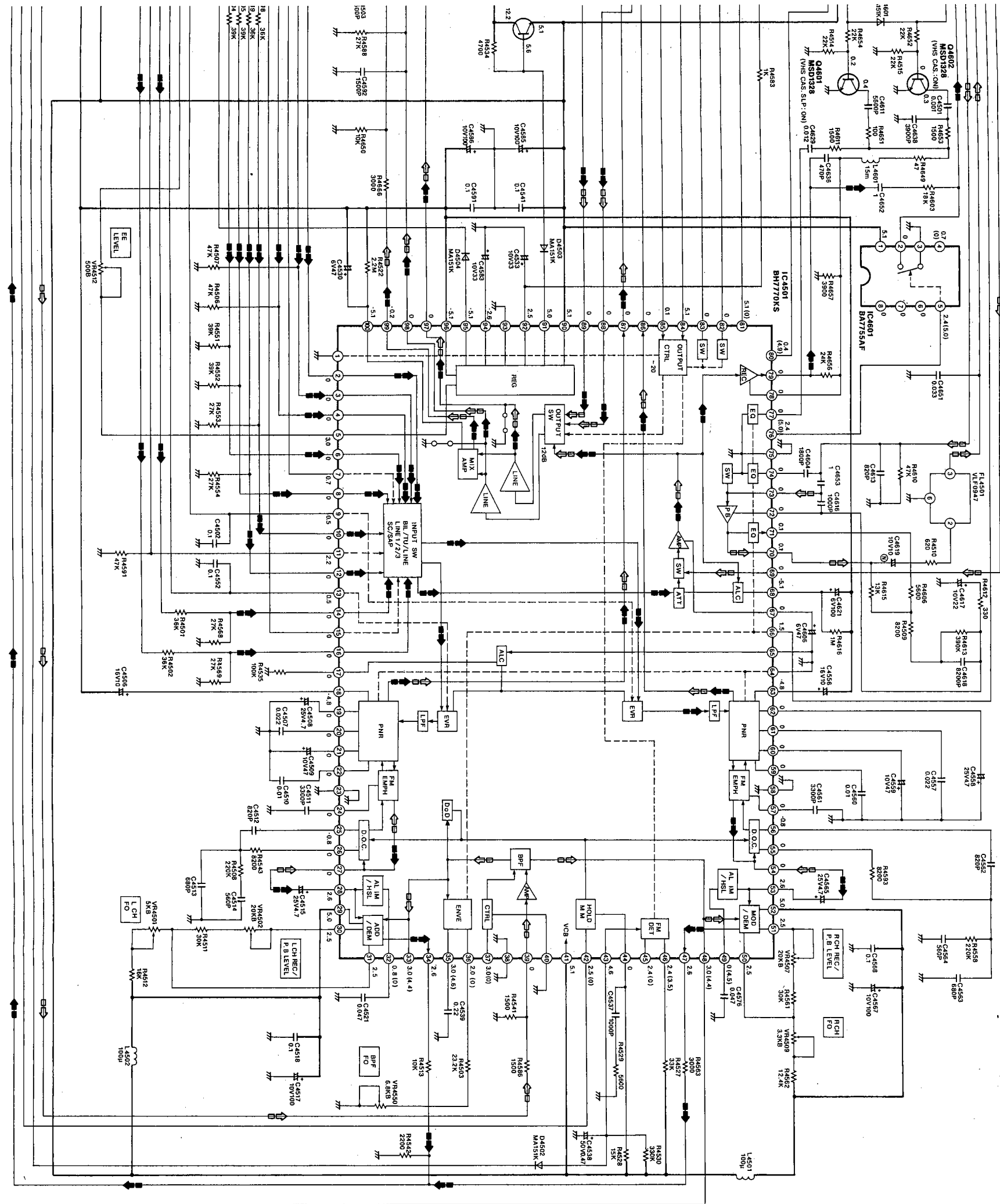


NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS RECORD MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE) THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE)

NOTE: DO NOT USE ANY PART NUMBER SHOW SCHEMATIC DIAGRAM FOR ORDERING. ORDER A PART, PLEASE REFER TO PART: LINE IN SIGNAL LEVEL... -10dB 1KHZ

MAIN SIGNAL PATH IN REC MODE

MAIN SIGNAL PATH IN PLAYBACK MODE

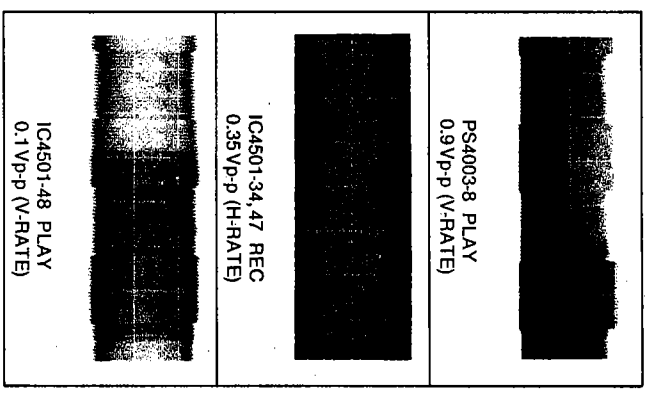


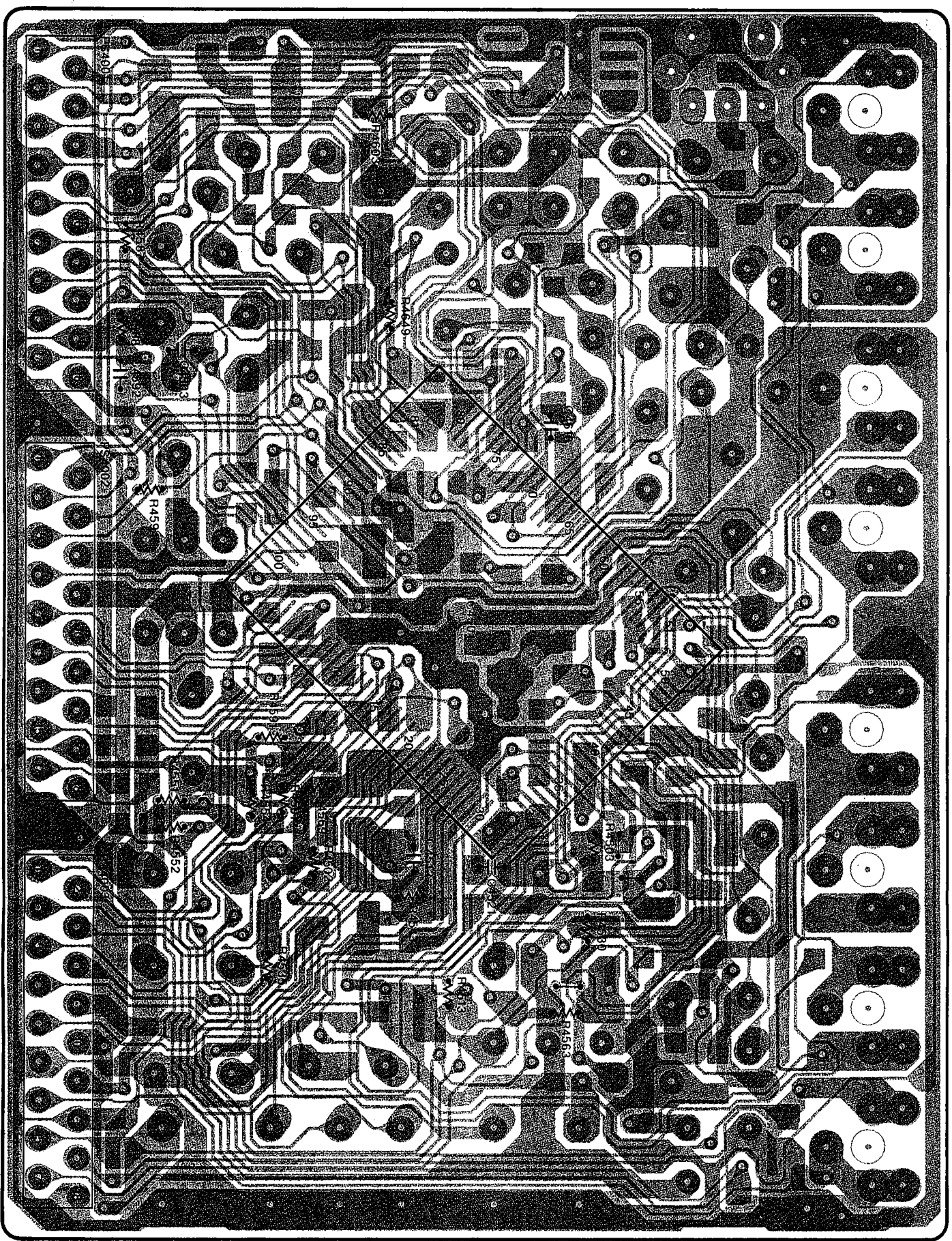
NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS RECORD MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE) THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE)

LINE IN SIGNAL LEVEL... -10dB 1kHz

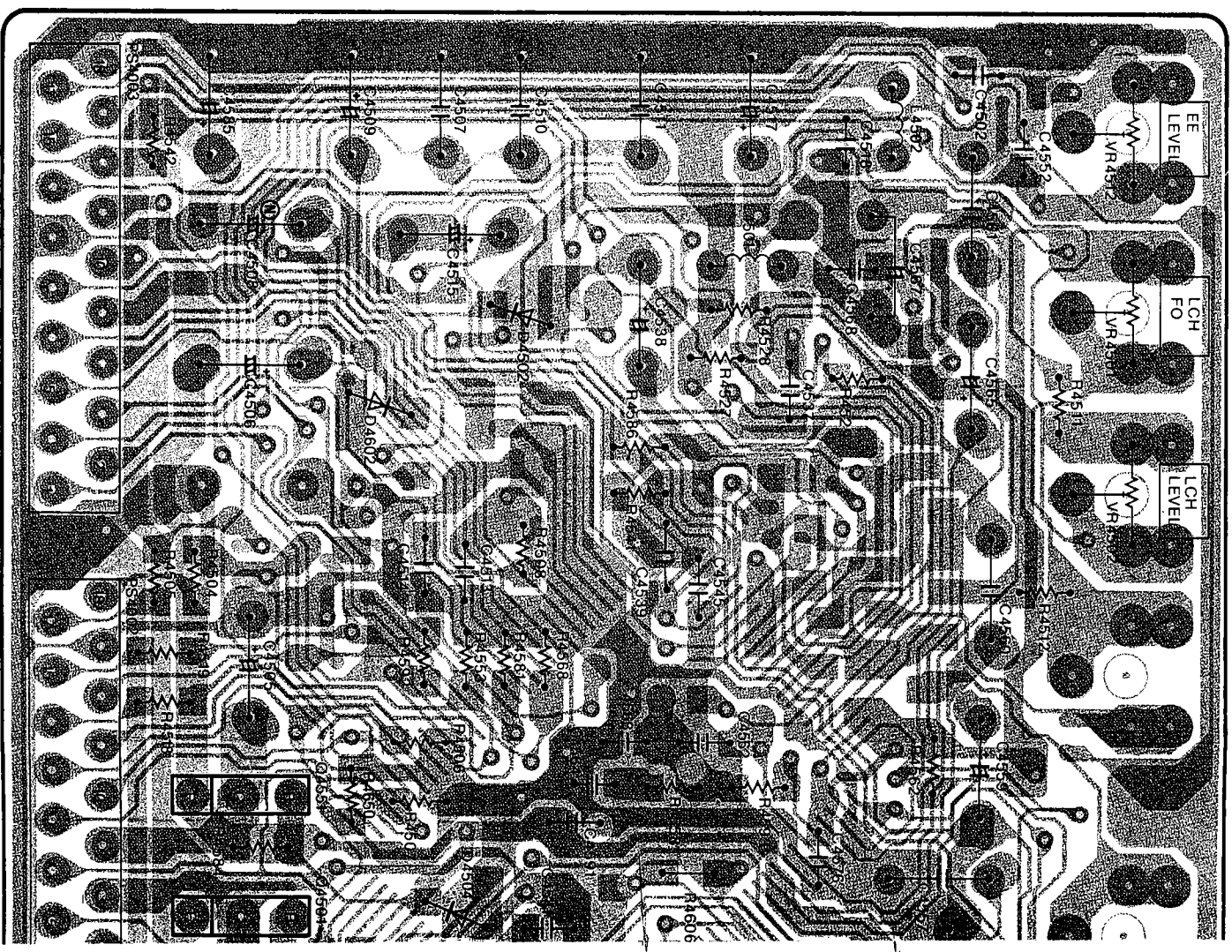
NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.

WAVEFORM OF HI-FI AUDIO PACK





(COMPONENT SIDE)



(FOIL SIDE)

1 2 3 4 5 6 7

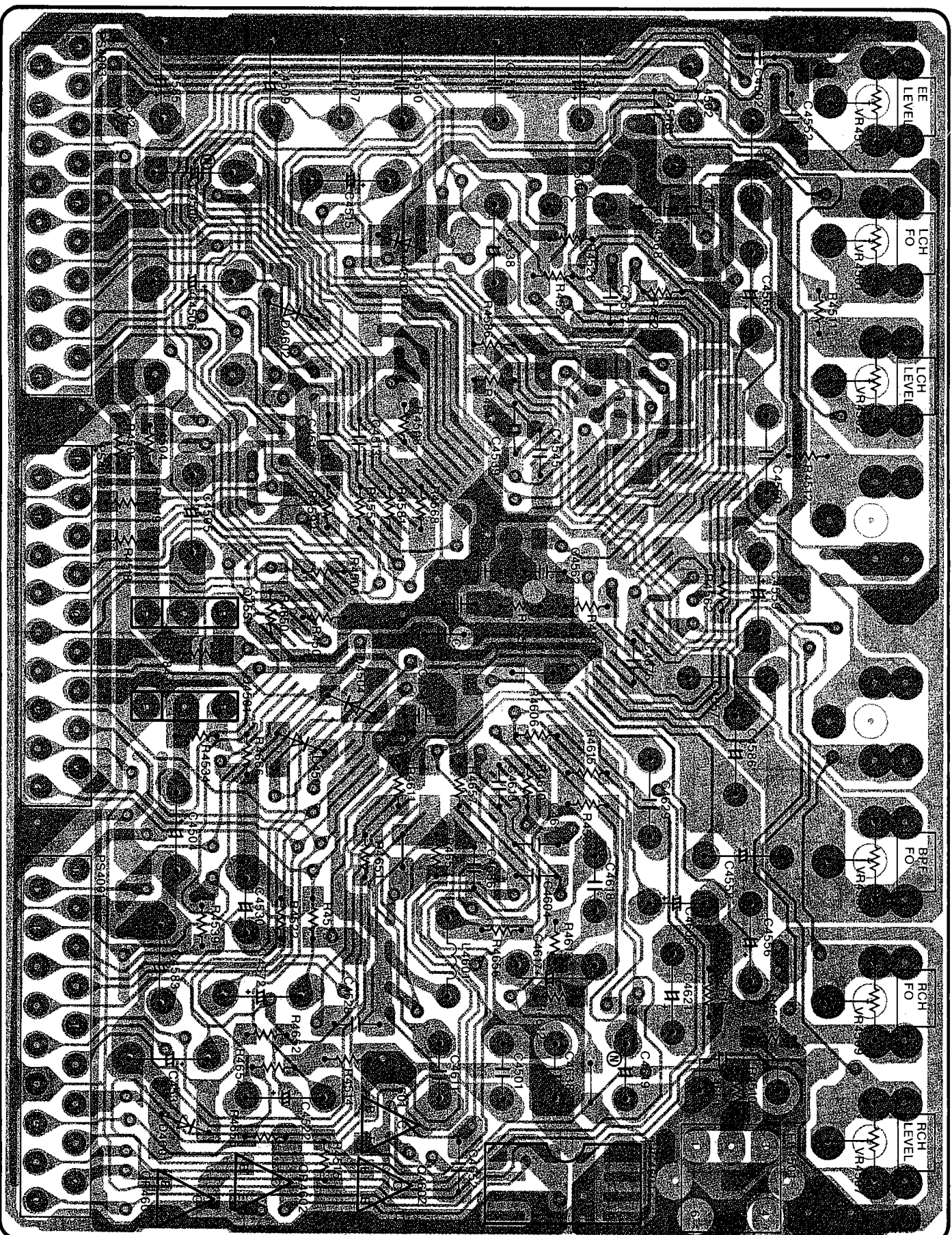
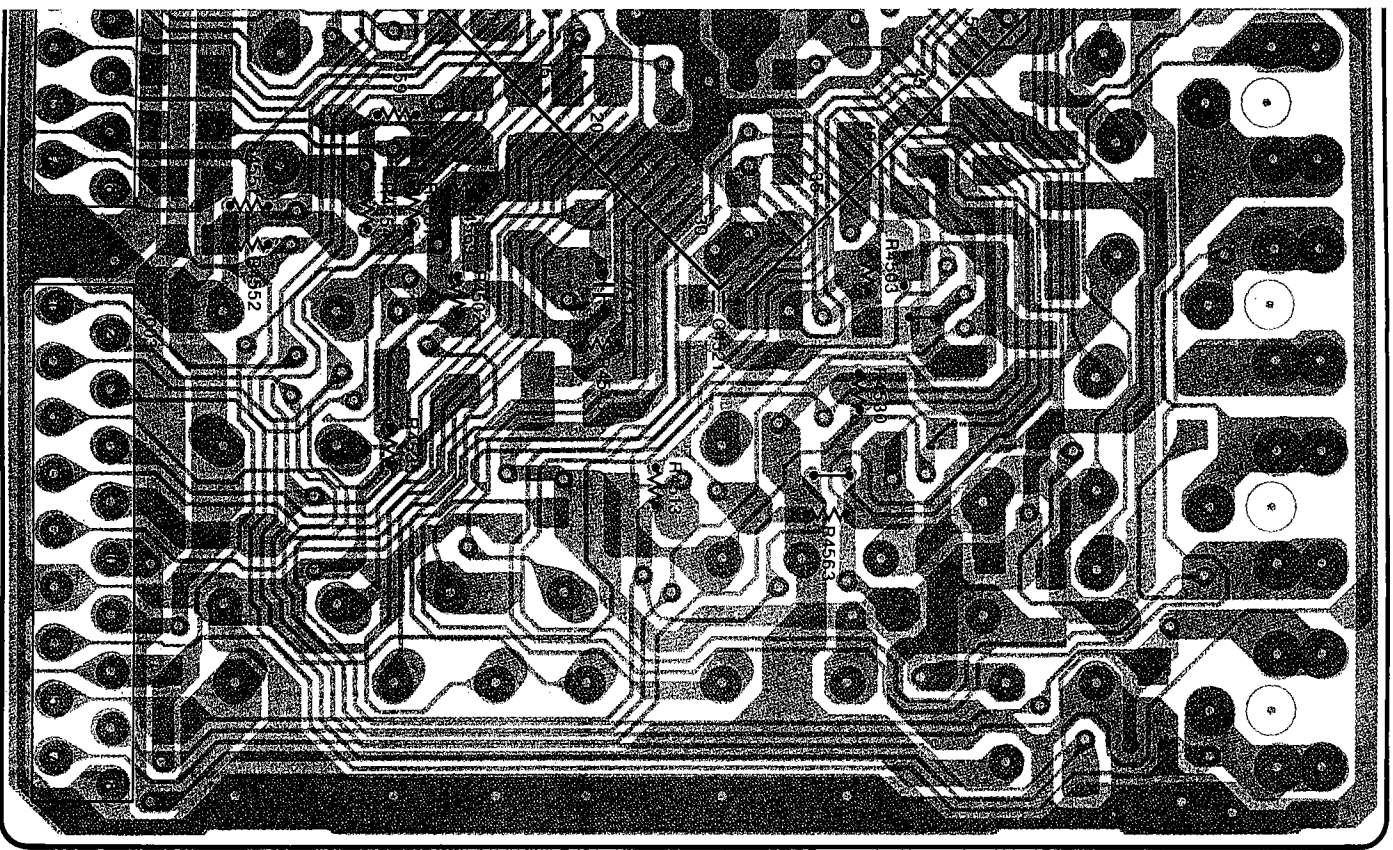
HI-FI AUDIO PACK C.B.A.	
Transistor	
Q4501	A-7
Q4551	A-7
Q4601	B-8
Q4602	B-8

Transistor & Resistor	
QPR4602	B-8
QPR4603	A-8

Integrated Circuit	
IC4501	B-3
IC4601	C-8
Adjustment	
VR4501	C-6
VR4502	C-8
VR4507	C-8
VR4509	C-8
VR4512	C-5
VR4550	C-8

Connector	
PS4001	A-1
PS4001	A-8
PS4002	A-2
PS4002	A-6
PS4003	A-4
PS4003	A-5

ADDRESS INFORMATION



3

4

5

6

7

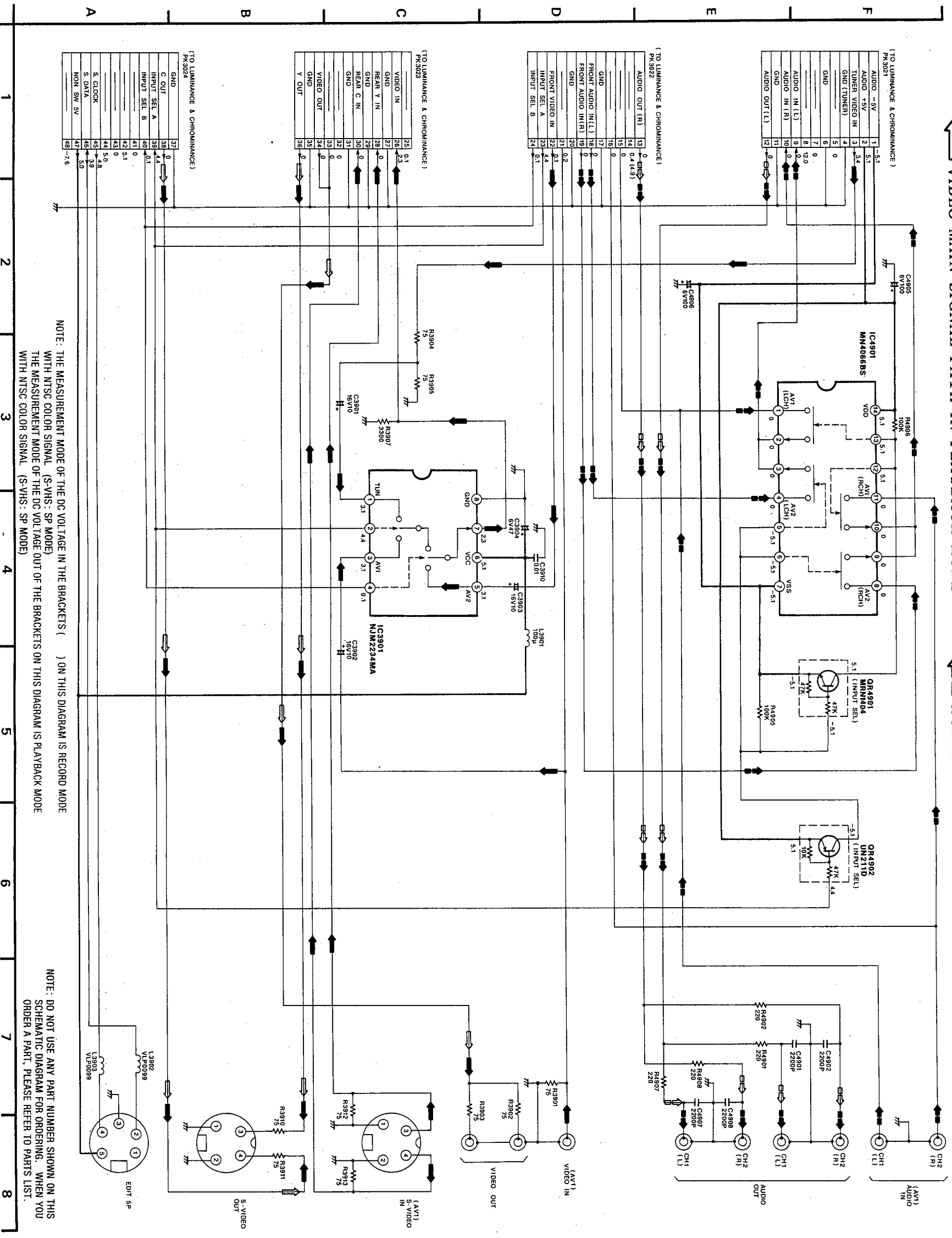
8

3-21. INPUT/OUTPUT PACK SCHEMATIC DIAGRAM

3-22. INPUT/OUTPUT PACK C.B.A. (VEP03934)

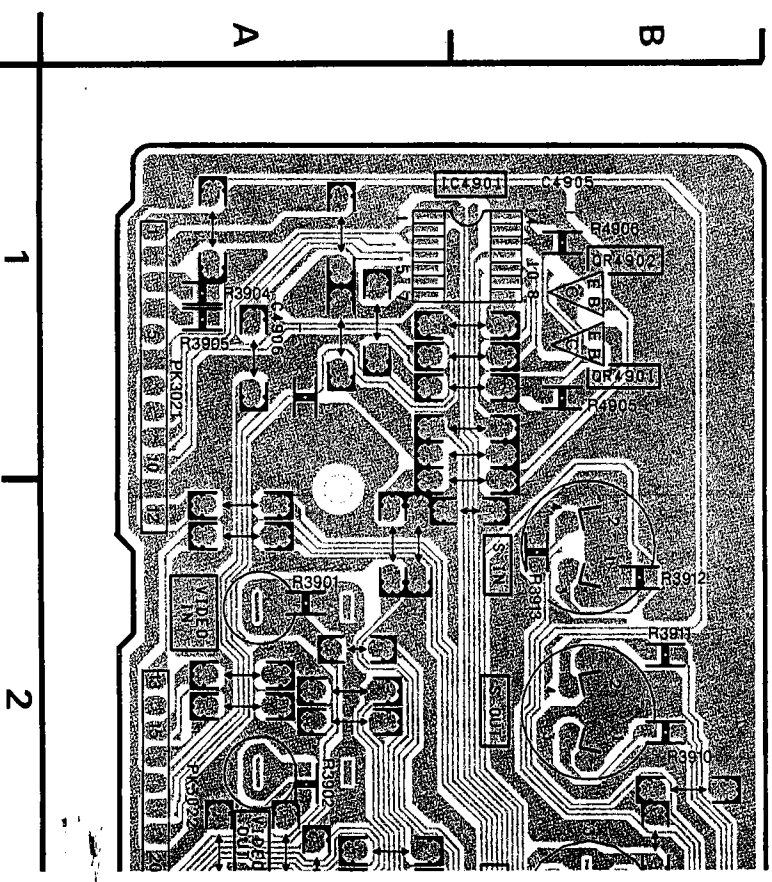
VIDEO MAIN SIGNAL PATH IN REC MODE
 VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE

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





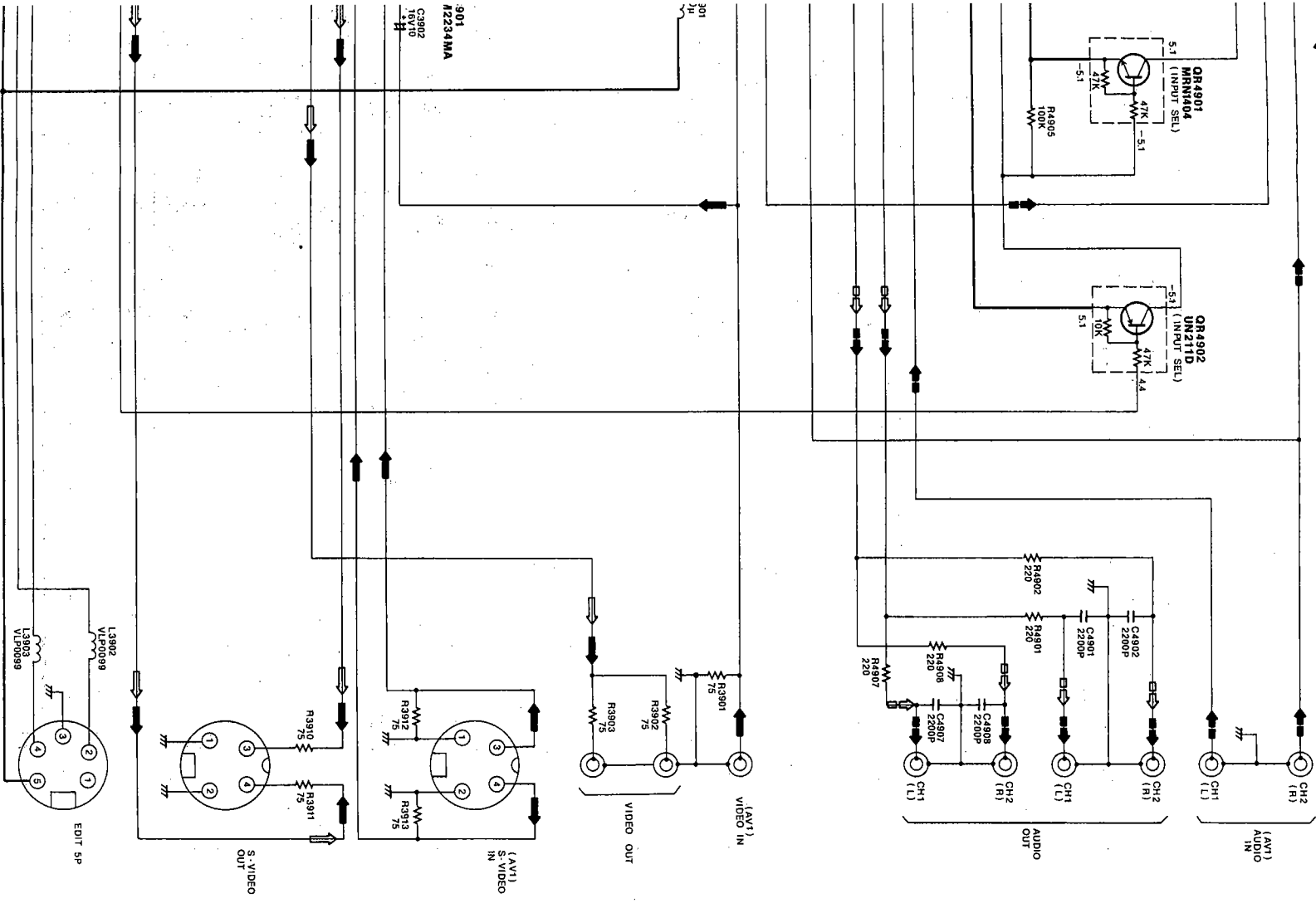
NOTE: THE MEASUREMENT MADE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS RECORD MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE) THE MEASUREMENT MADE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE)

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



3-22. INPUT/OUTPUT PACK C.B.A. (VEP03934A)

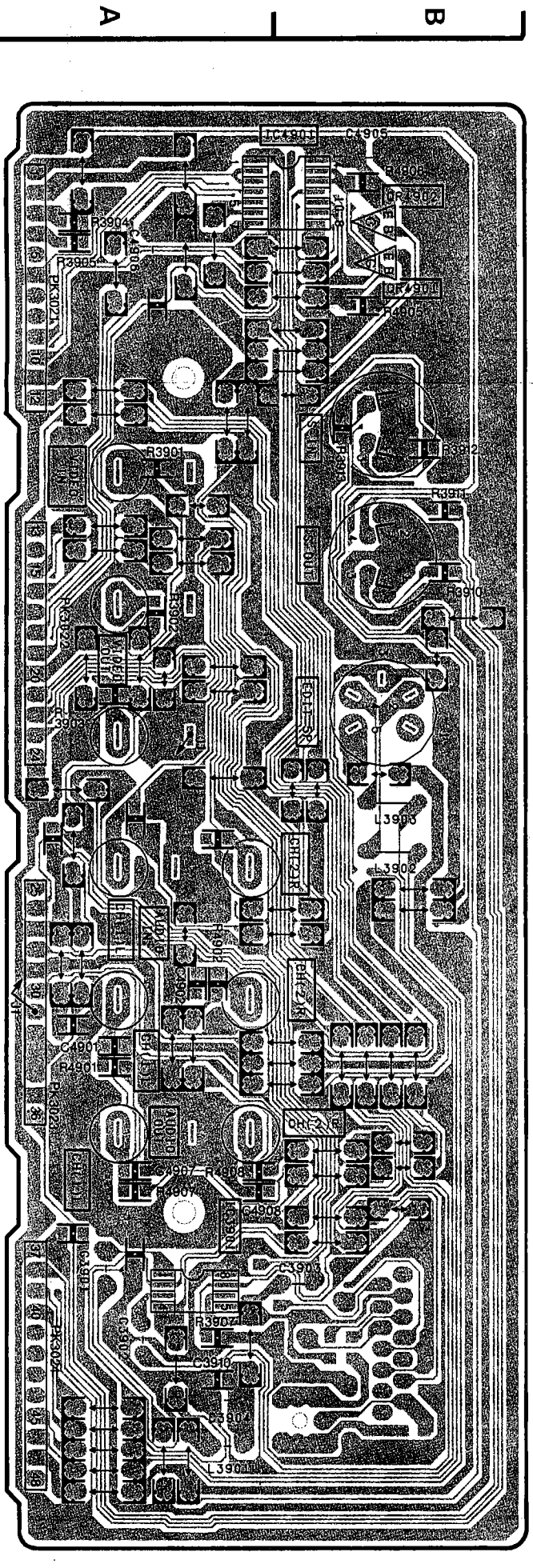
 AUDIO MAIN SIGNAL PATH IN REC MODE
 AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE



) ON THIS DIAGRAM IS RECORD MODE
 TS ON THIS DIAGRAM IS PLAYBACK MODE

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

5 6 7 8

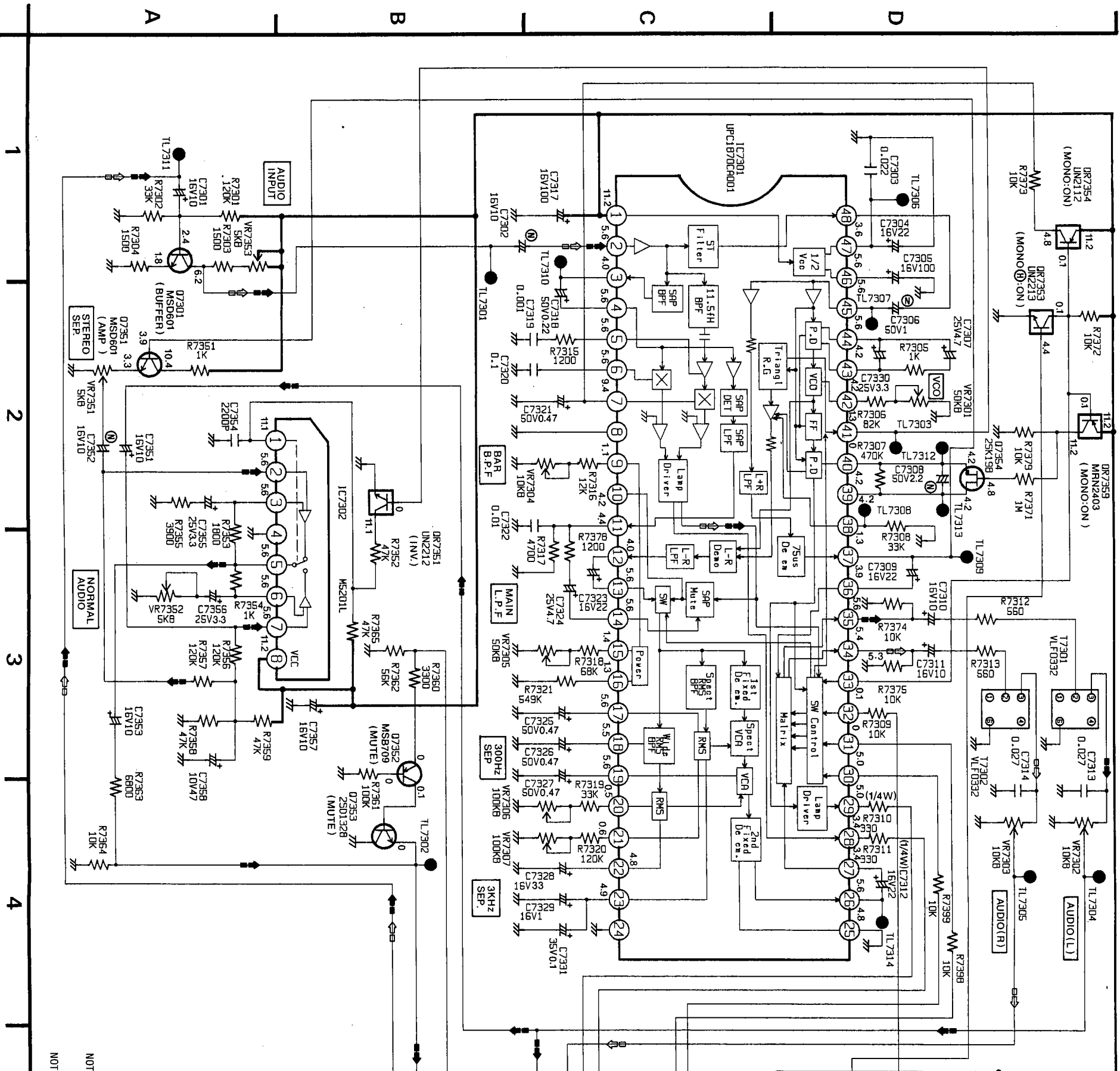


A B 1 2 3 4 5

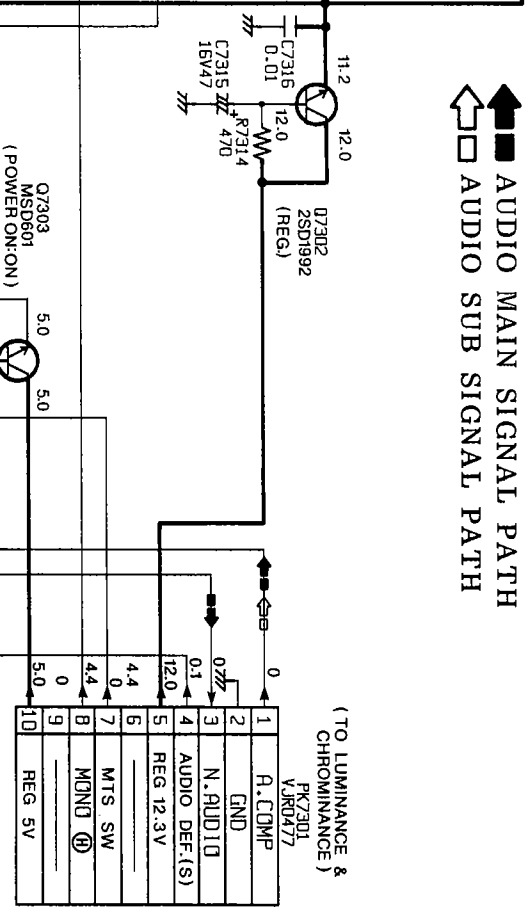
INPUT/OUTPUT PACK	
C.B.A.	
Transistor & Resistor	
OR4901	B-1
OR4902	B-1
Integrated Circuit	
IC3901	A-4
IC4901	B-1
Connector	
PK3021	A-1
PK3022	A-2
PK3023	A-4
PK3024	A-4

ADDRESS INFORMATION

3-23. DECODER PACK SCHEMATIC DIAGRAM



AUDIO MAIN SIGNAL PATH
 AUDIO SUB SIGNAL PATH

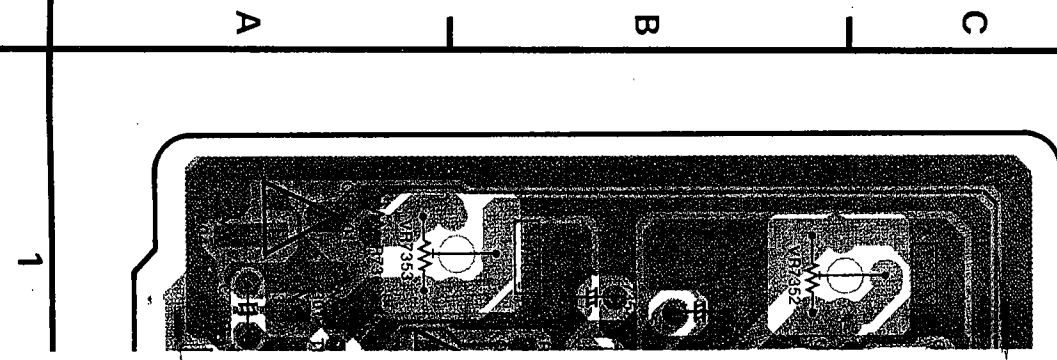


(TO LUMINANCE & CHROMINANCE)



1	R.COMP	PK7301
2	GND	VJ80477
3	N.AUDIO	
4	AUDIO DEF.(S)	
5	REG 12.3V	
6	MTS SW	
7	MONO	
8	REG 5V	
9		
10		
11		
12	AUDIO2	
13	STEREO	
14	AUDIO(R)	
15	AUDIO(L)	
16	GND	
17		
18		
19		
20		

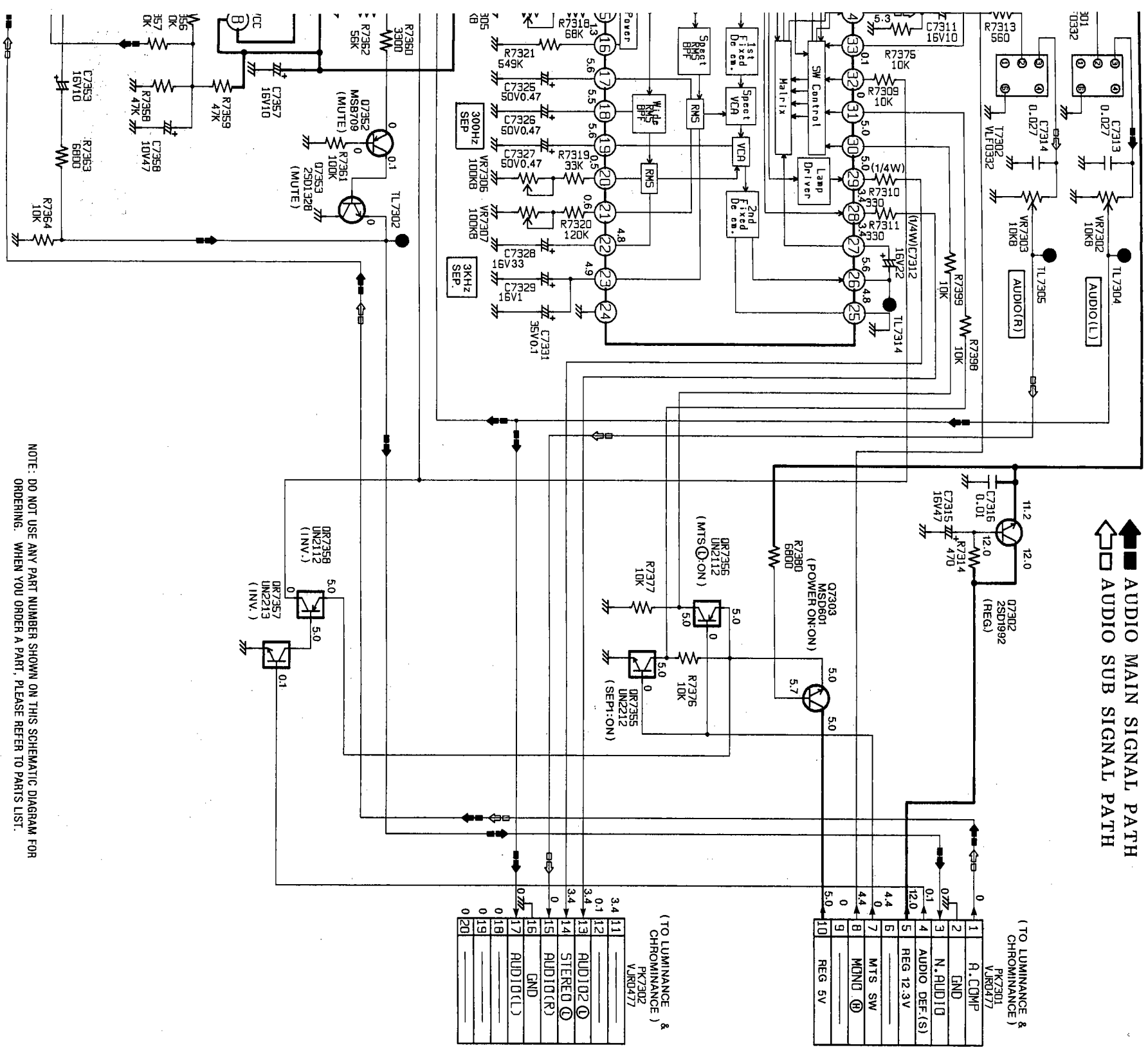
NOTE: DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING. WHEN YOU ORDER A PART, PLEASE REFER TO PARTS LIST.
 NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

3-24. DECODER P



3-24. DECODER PACK C.B.A. (VEP07685A)

 AUDIO MAIN SIGNAL PATH
 AUDIO SUB SIGNAL PATH



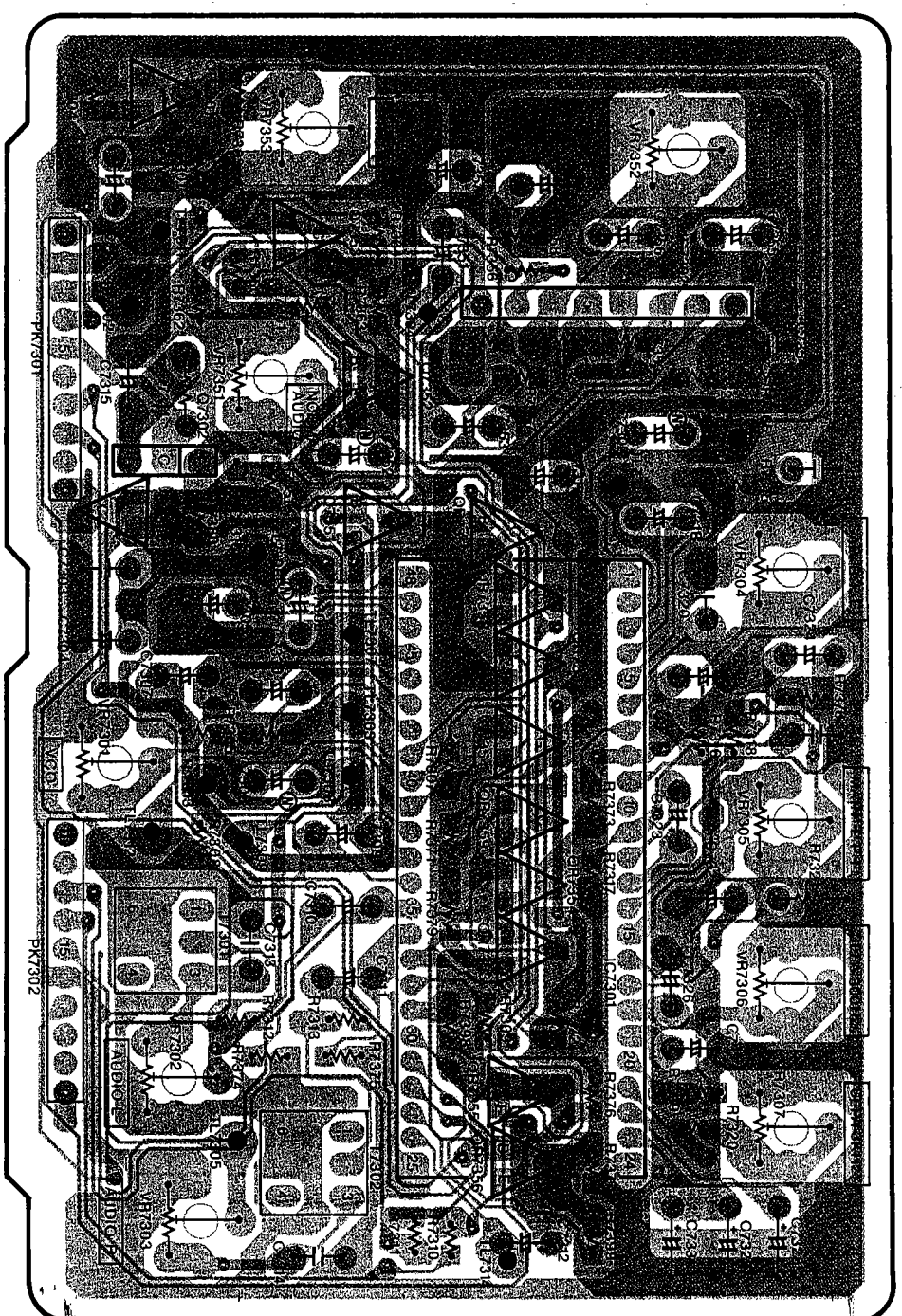
- (TO LUMINANCE & CHROMINANCE)
- | | |
|----|--------------|
| 1 | F. COMP |
| 2 | FND |
| 3 | N. AUDIO |
| 4 | AUDIO DEF(S) |
| 5 | REG 12.3V |
| 6 | MTS SW |
| 7 | MONO |
| 8 | |
| 9 | |
| 10 | REG 5V |

- (TO LUMINANCE & CHROMINANCE)
- | | |
|----|----------|
| 11 | |
| 12 | RUD102 |
| 13 | STEREO |
| 14 | RUD10(R) |
| 15 | GND |
| 16 | |
| 17 | RUD10(L) |
| 18 | |
| 19 | |
| 20 | |

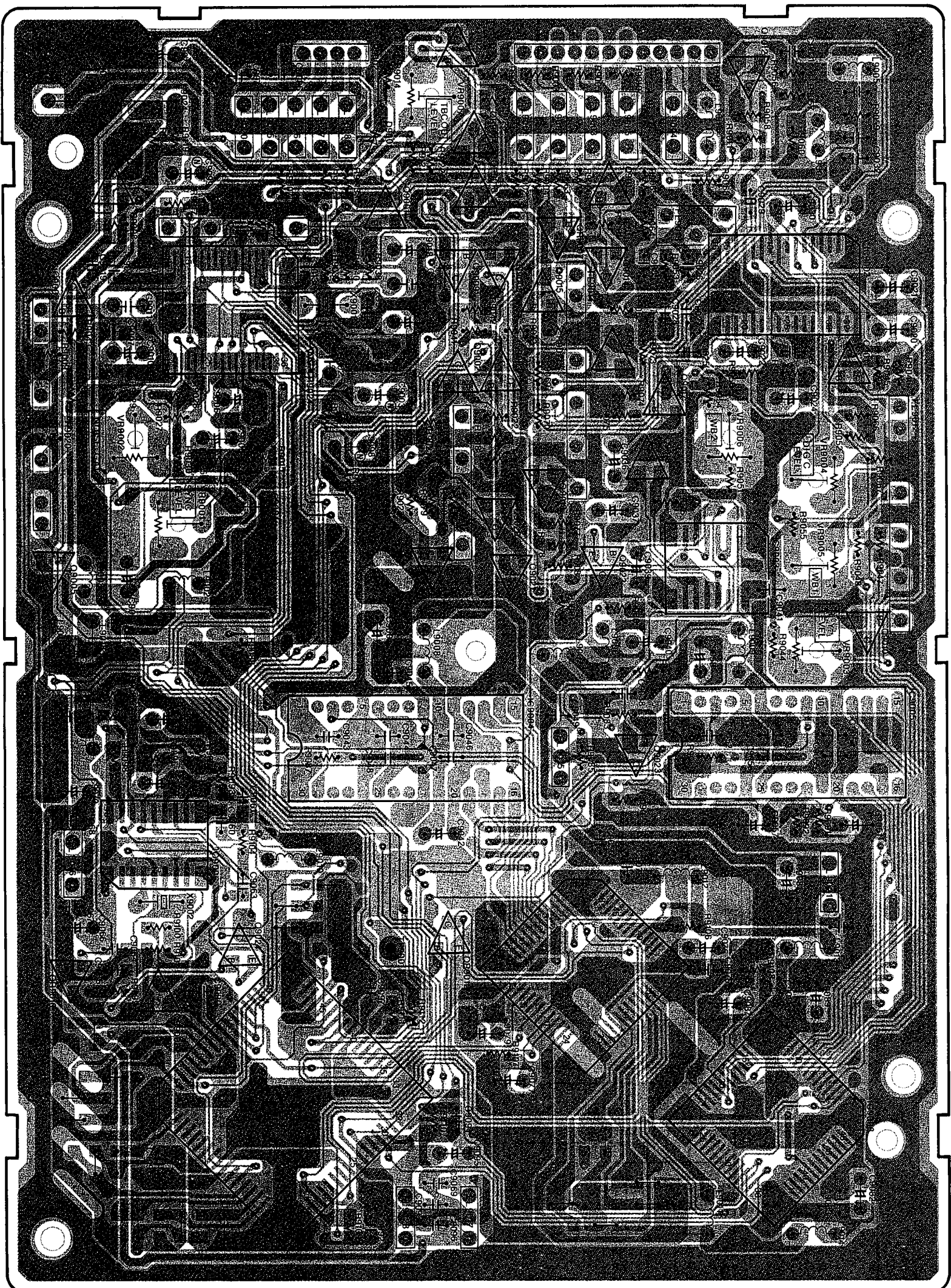
DECODER PACK C.B.A.					
Transistor	Integrated Circuit	Adjustment	Connector		
Q7302	IC7301	T/301	A-1	A-2	A-3
Q7303	IC7302	T/302	B-1	B-2	B-3
Q7351	Test Point	V/R7301	A-1	A-2	A-3
Q7352			B-1	B-2	B-3
Q7353			B-1	B-2	B-3
Q7354	TL7301	V/R7302	A-1	A-2	A-3
Transistor & Resistor	TL7302	V/R7303	A-1	A-2	A-3
	TL7303	V/R7304	B-1	B-2	B-3
	TL7304	V/R7305	B-1	B-2	B-3
	TL7305	V/R7306	B-1	B-2	B-3
QR7301	TL7306	V/R7307	A-1	A-2	A-3
QR7351	TL7307	V/R7308	B-1	B-2	B-3
QR7353	TL7308	V/R7309	B-1	B-2	B-3
QR7354	TL7309	V/R7310	A-1	A-2	A-3
QR7355	TL7310	V/R7311	A-1	A-2	A-3
QR7356	TL7311	V/R7312	A-1	A-2	A-3
QR7357	TL7312	V/R7313	A-1	A-2	A-3
QR7358	TL7313	V/R7314	A-1	A-2	A-3
QR7359	TL7314		B-1	B-2	B-3

ADDRESS INFORMATION

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.



3-25. TBC C.B.A. (VEP03893B)



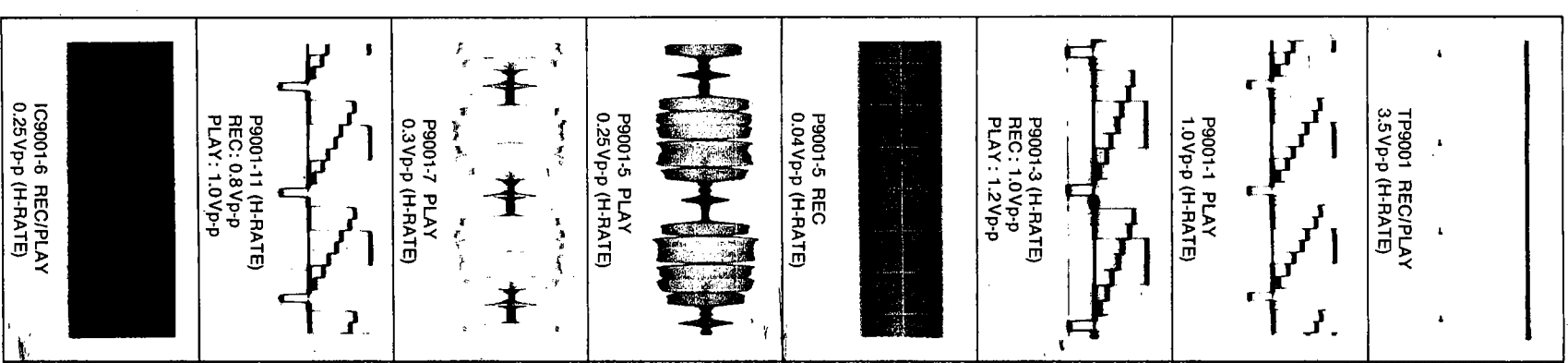
3-72

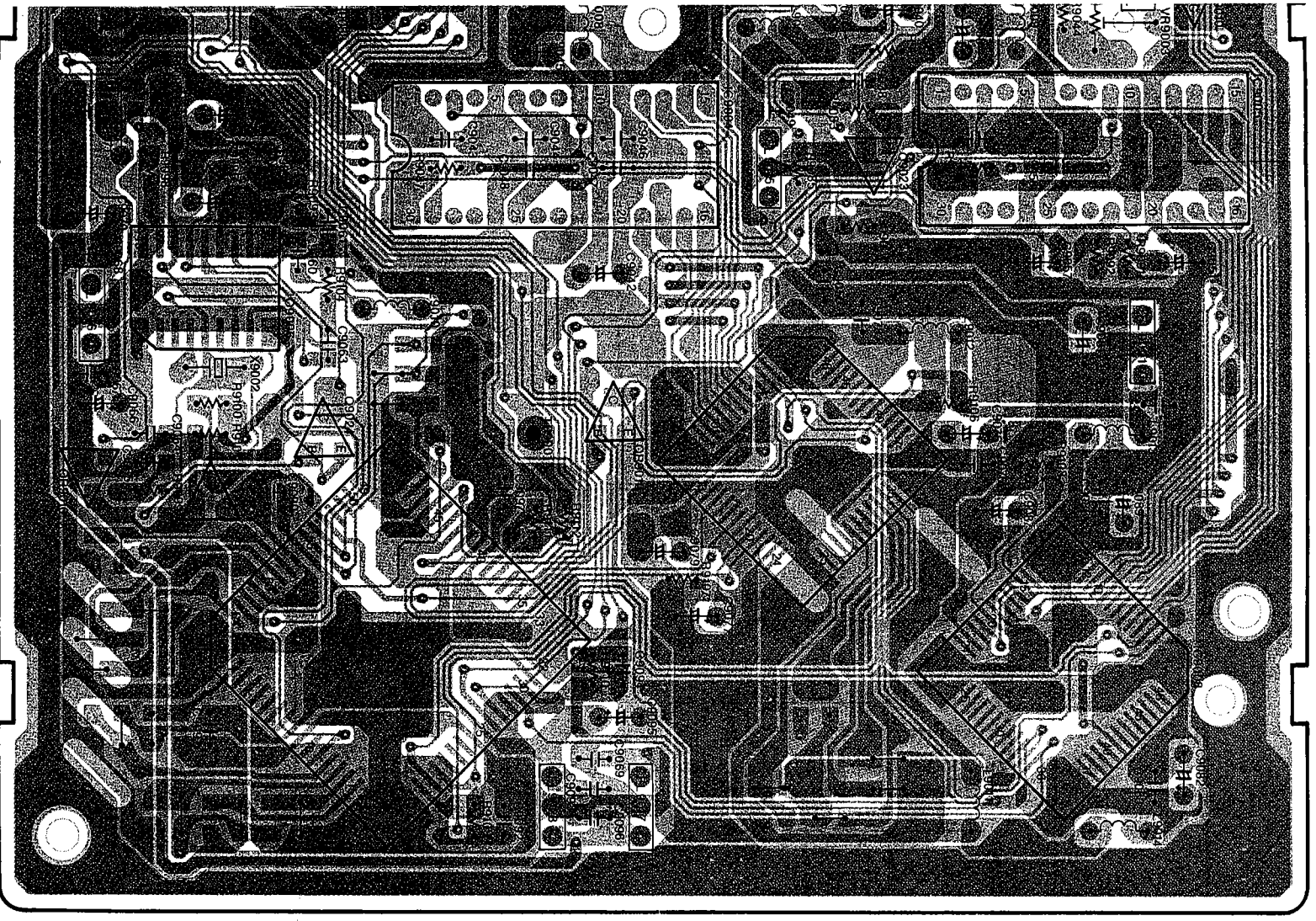
3-73

TBC C.B.A.	
Transistor	
Q9001	C-2
Q9002	C-2
Q9003	C-2
Q9004	C-3
Q9005	A-3
Q9006	A-2
Q9007	A-2
Q9008	C-2
Q9009	C-2
Q9010	E-4
Q9011	E-2
Q9012	D-1
Q9013	D-2
Q9014	D-2
Q9015	C-2
Q9016	D-2
Q9017	D-2
Q9018	D-3
Q9019	C-3
Q9020	C-3
Q9021	C-3
Q9022	D-3
Q9023	D-3
Q9024	D-4
Q9025	B-5
Q9025	C-1
Transistor & Resistor	
QR9007	C-2
QR9008	B-5
QR9010	A-5
QR9012	C-5
QR9013	C-2
QR9014	C-1
Integrated Circuit	
IC9001	B-2
IC9002	E-2
IC9003	D-3
IC9004	C-4
IC9005	E-4
IC9006	B-4
IC9007	D-5
IC9008	E-6
IC9009	B-6
Test Point	
TP9001	C-5
Adjustment	
VR9001	B-3
VR9002	A-3
VR9003	D-4
VR9004	D-3
VR9005	D-3
VR9006	D-3
VR9007	C-1
Connector	
P9001	D-1
P9002	B-1

ADDRESS INFORMATION

WAVEFORM OF TBC





4 5 6

TBC C.B.A.	
Transistor	
Q9001	C-2
Q9002	C-2
Q9003	C-2
Q9004	C-3
Q9005	A-3
Q9006	A-2
Q9007	A-2
Q9008	C-2
Q9009	C-2
Q9010	E-4
Q9011	E-2
Q9012	D-1
Q9013	D-2
Q9014	D-2
Q9015	C-2
Q9016	D-2
Q9017	D-2
Q9018	D-3
Q9019	C-3
Q9020	C-3
Q9021	C-3
Q9022	D-3
Q9023	D-4
Q9024	B-5
Q9025	C-1
Transistor & Resistor	
QR9007	C-2
QR9008	B-5
QR9010	A-5
QR9012	C-5
QR9013	C-2
QR9014	C-1
Integrated Circuit	
IC9001	B-2
IC9002	E-2
IC9003	D-3
IC9004	C-4
IC9005	E-4
IC9006	B-4
IC9007	D-5
IC9008	E-6
IC9009	B-6
Test Point	
TP9001	C-5
Adjustment	
VR9001	B-3
VR9002	A-3
VR9003	D-4
VR9004	D-3
VR9005	D-3
VR9006	D-3
VR9007	C-1
Connector	
P9001	D-1
P9002	B-1

ADDRESS INFORMATION

WAVEFORM OF TBC

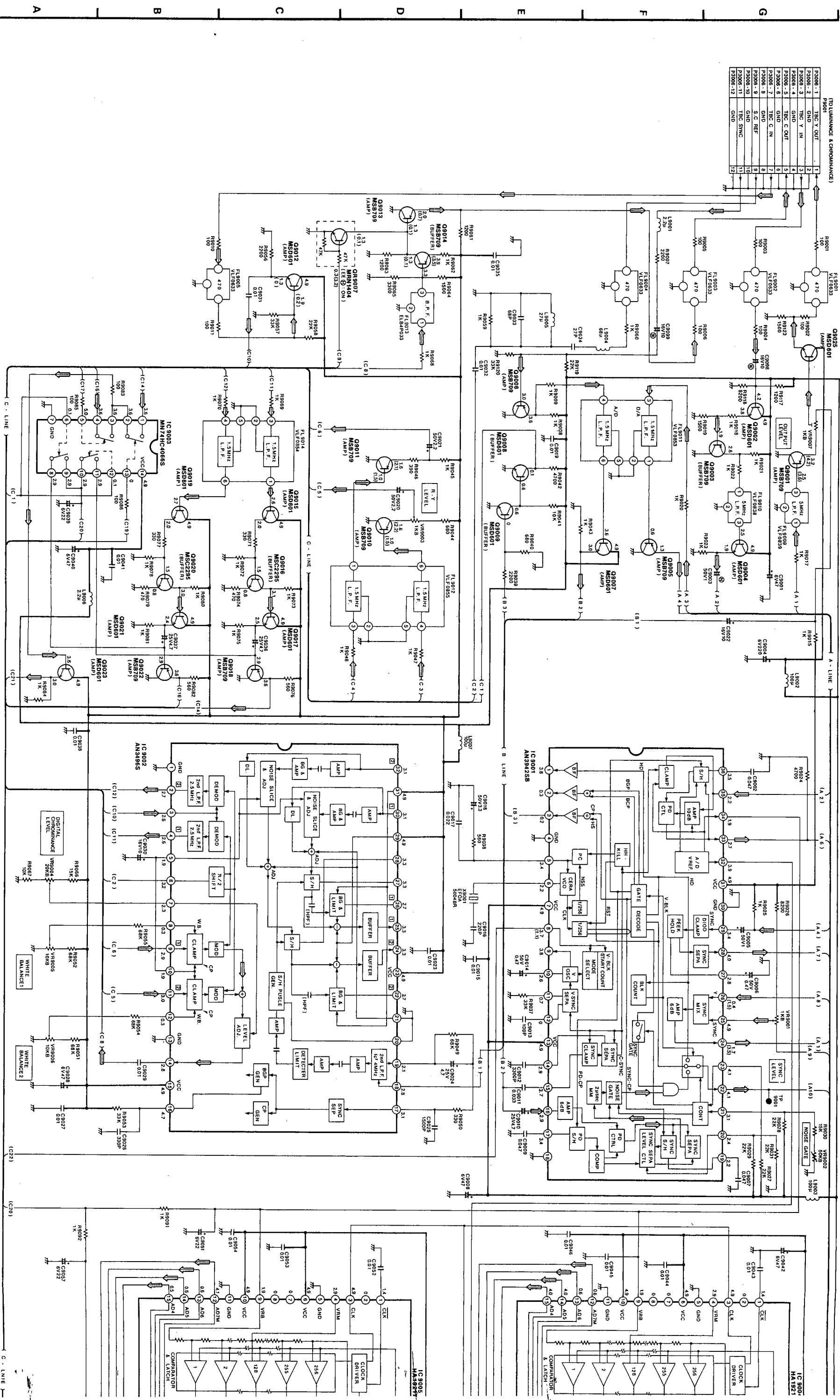
TP9001 REC/PLAY 3.5Vp-p (H-RATE)	IC9001-10 REC/PLAY 0.25Vp-p (V-RATE)	IC9002-14 REC 1.0Vp-p (V-RATE)	IC9007-3,34,35 PLAY 6.0Vp-p (H-RATE)
P9001-1 PLAY 1.0Vp-p (H-RATE)	IC9001-25 PLAY 4.5Vp-p (H-RATE)	IC9002-14 PLAY 0.2Vp-p (H-RATE)	IC9007-18 PLAY 0.7Vp-p (H-RATE)
P9001-3 (H-RATE) REC: 1.0Vp-p PLAY: 1.2Vp-p	IC9001-35 REC/PLAY 0.5Vp-p (H-RATE)	IC9003-13 PLAY 5.8Vp-p (H-RATE)	IC9007-21 PLAY 0.28Vp-p (H-RATE)
P9001-5 REC 0.04Vp-p (H-RATE)	IC9002-2 PLAY 0.5Vp-p (H-RATE)	IC9004-19 PLAY 4.0Vp-p (V-RATE)	IC9008-18 PLAY 0.5Vp-p (H-RATE)
P9001-5 PLAY 0.25Vp-p (H-RATE)	IC9002-3 PLAY 0.25Vp-p (H-RATE)	IC9004-29 (H-RATE) REC: 1.3Vp-p PLAY: 1.7Vp-p	IC9008-21 PLAY 0.3Vp-p (H-RATE)
P9001-7 PLAY 0.3Vp-p (H-RATE)	IC9002-4 PLAY 0.4Vp-p (H-RATE)	IC9005-19 PLAY 4.0Vp-p (V-RATE)	IC9008-37 PLAY 3.5Vp-p (H-RATE)
P9001-11 (H-RATE) REC: 0.8Vp-p PLAY: 1.0Vp-p	IC9002-6 REC/PLAY 0.14Vp-p (H-RATE)	IC9005-29 PLAY 0.8Vp-p (V-RATE)	
IC9001-6 REC/PLAY 0.25Vp-p (H-RATE)	IC9002-9, 11 PLAY 0.2Vp-p (H-RATE)	IC9006-4 PLAY 0.5Vp-p (H-RATE)	

3-26. TBC SCHEMATIC DIAGRAM

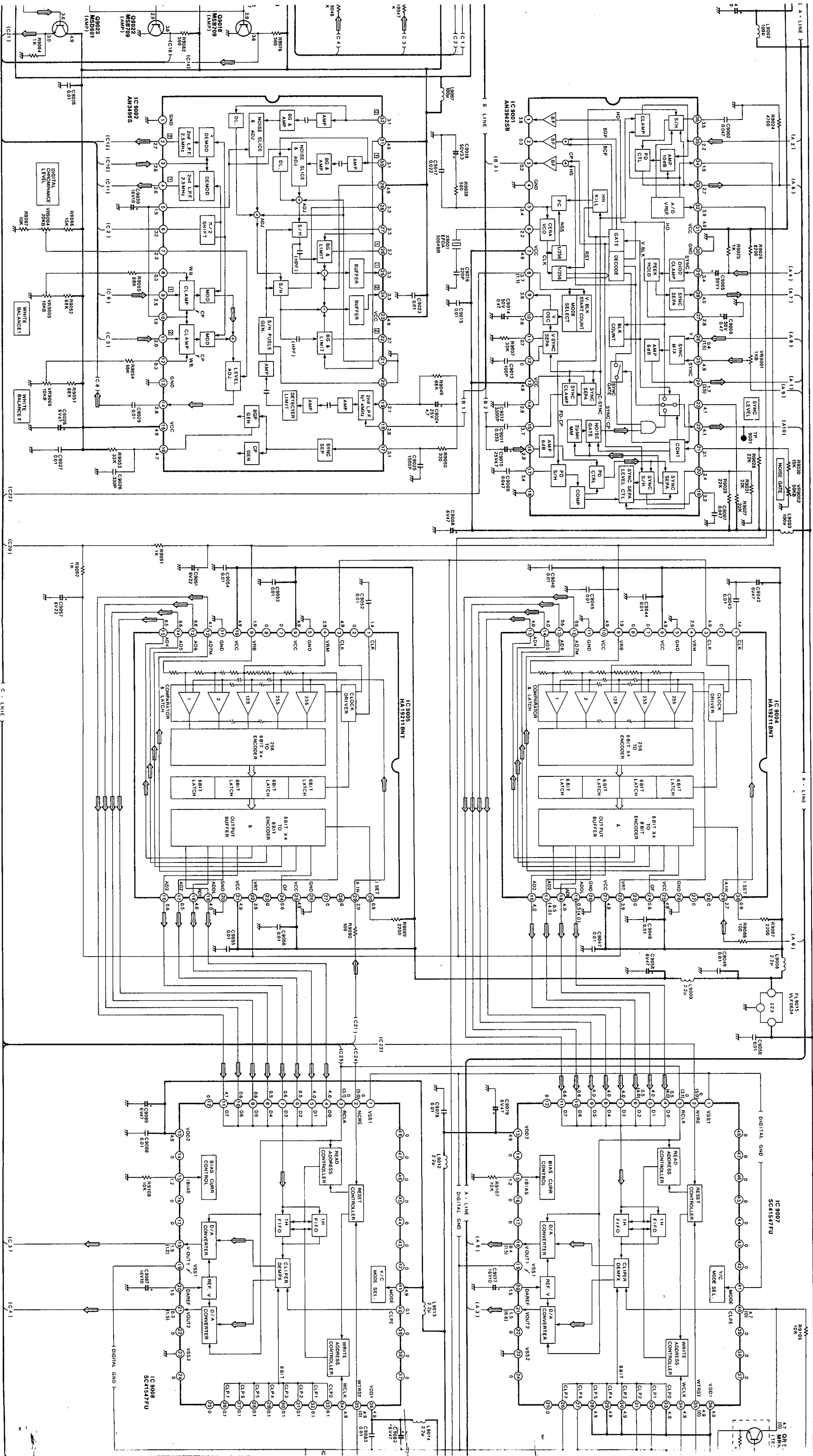
MAIN SIGNAL PATH IN PLAYBACK MODE

(TOLLUMINANCE & CHROMINANCE)

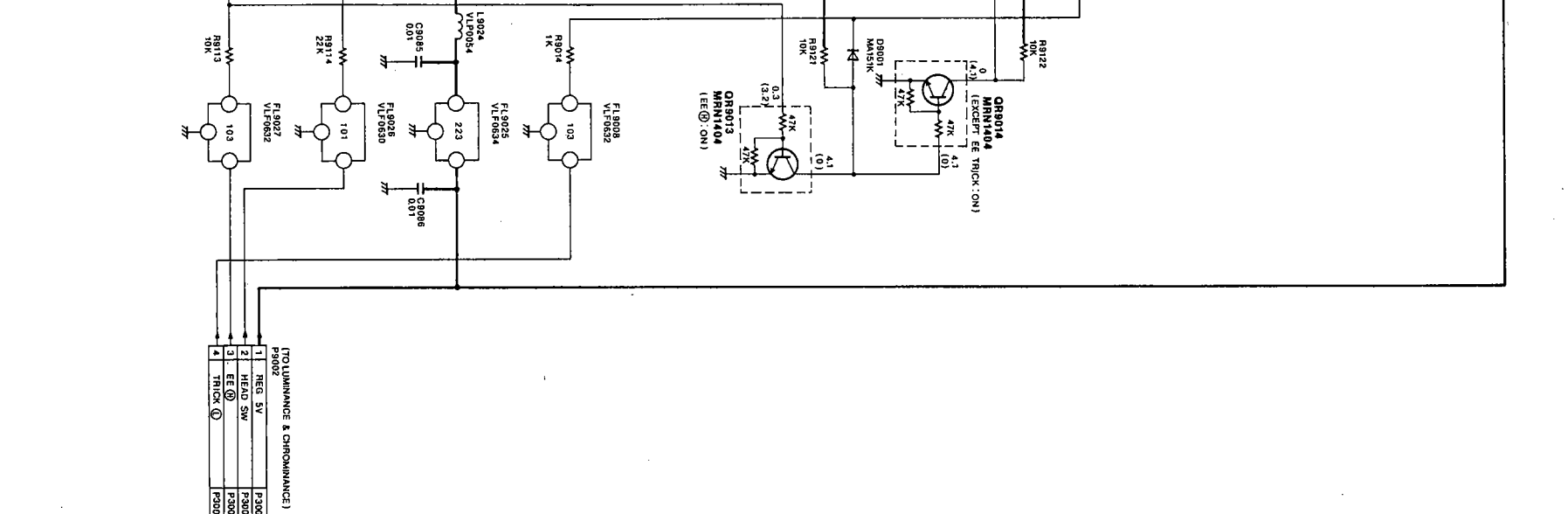
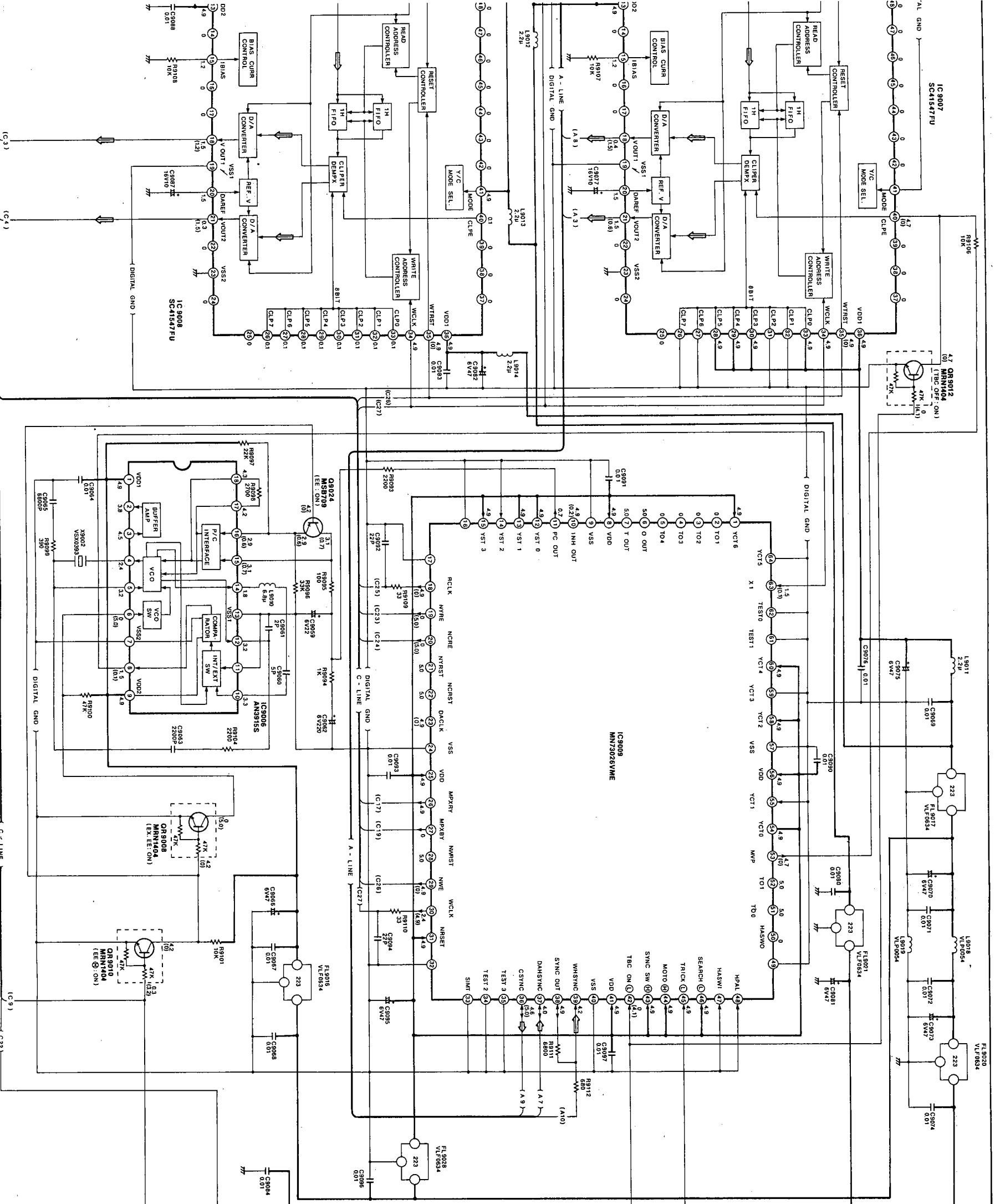
P3006-1	TBC Y OUT	1
P3006-2	TBC Y IN	2
P3006-3	TBC Y GND	3
P3006-4	TBC C OUT	4
P3006-5	TBC C GND	5
P3006-6	TBC C IN	6
P3006-7	TBC C GND	7
P3006-8	S.C REF	8
P3006-9	GND	9
P3006-10	TBC SYNC	10
P3006-11	GND	11
P3006-12	GND	12



← MAIN SIGNAL PATH IN PLAYBACK MODE



NOTE: THE MEASUREMENT MODE OF THE SC41547FU WITH NTSC COLOR SIGNAL (S-VHS).



(TOLERANCE & CHROMIANCE)

P9002	1	REG SV	P3005 - 1
	2	HEAD SW	P3005 - 2
	3	EE	P3005 - 3
	4	TRICK	P3005 - 4

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS () ON THIS DIAGRAM IS RECORD MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE) (TBC SW: ON)

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH NTSC COLOR SIGNAL (S-VHS: SP MODE) (TBC SW: ON)

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

3-27. TIMER & VR SCHEMATIC DIAGRAM

SEGMENT CONTROL SIGNAL

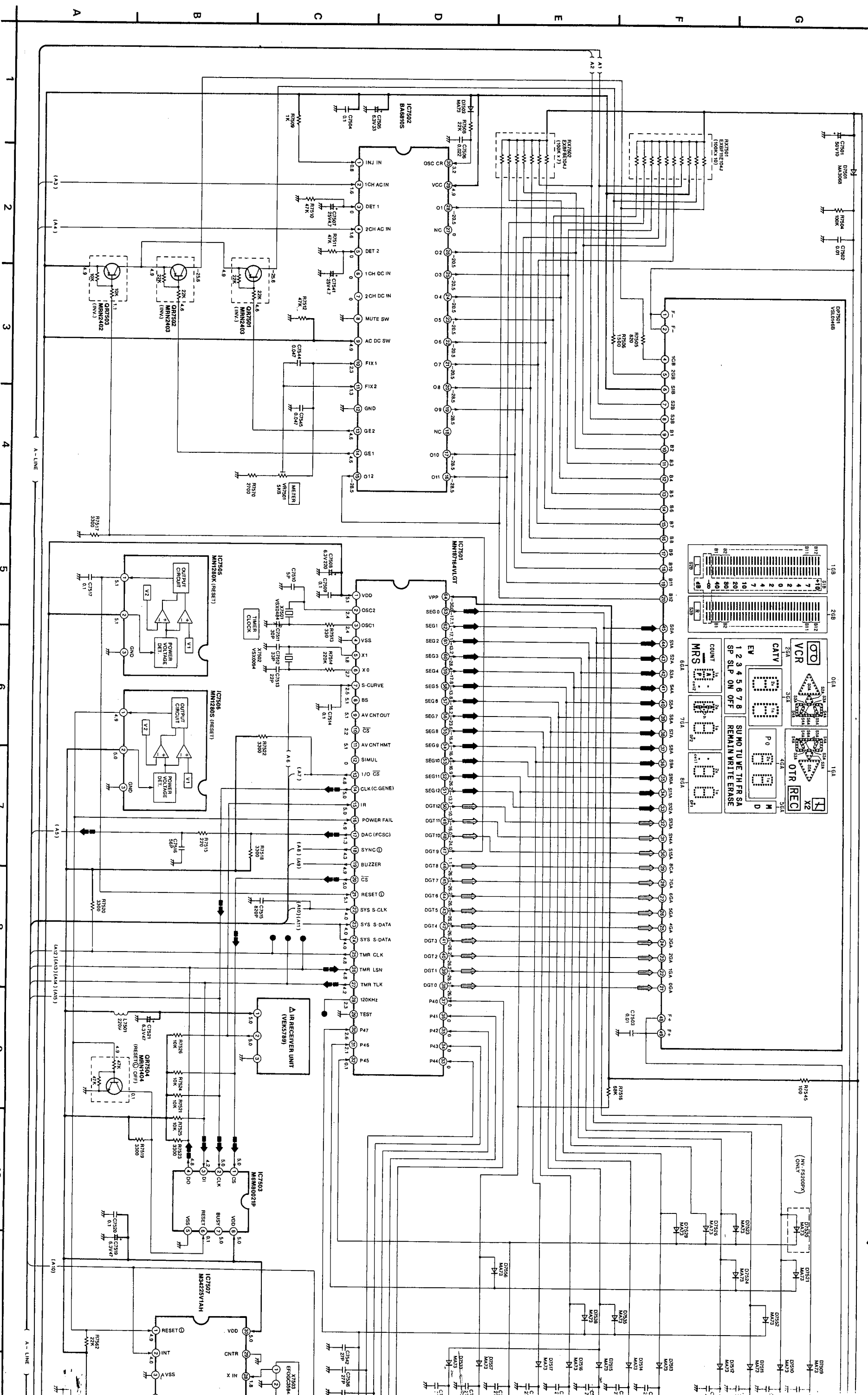
GRID CONTROL SIGNAL

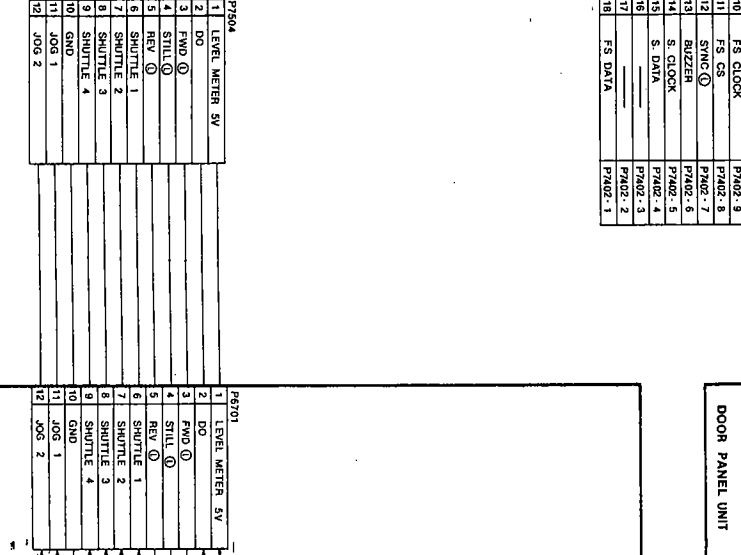
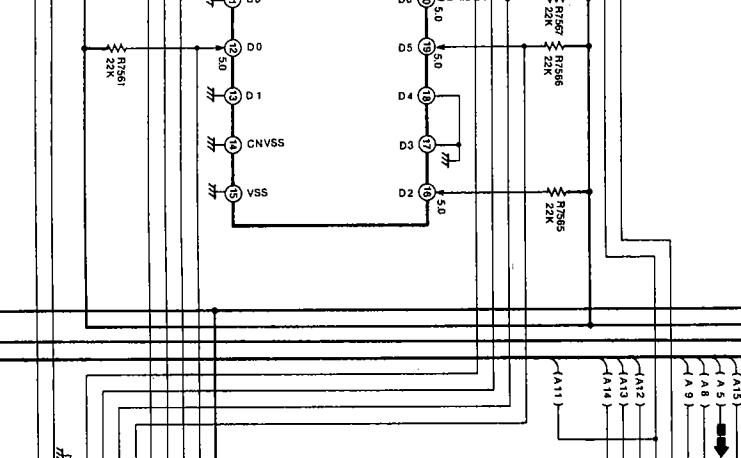
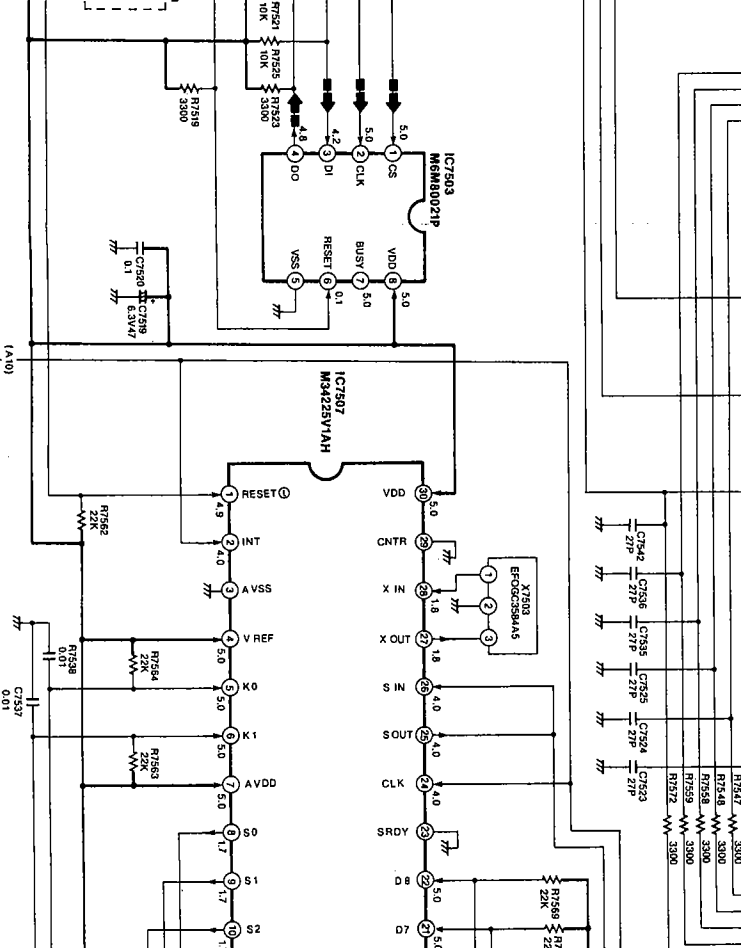
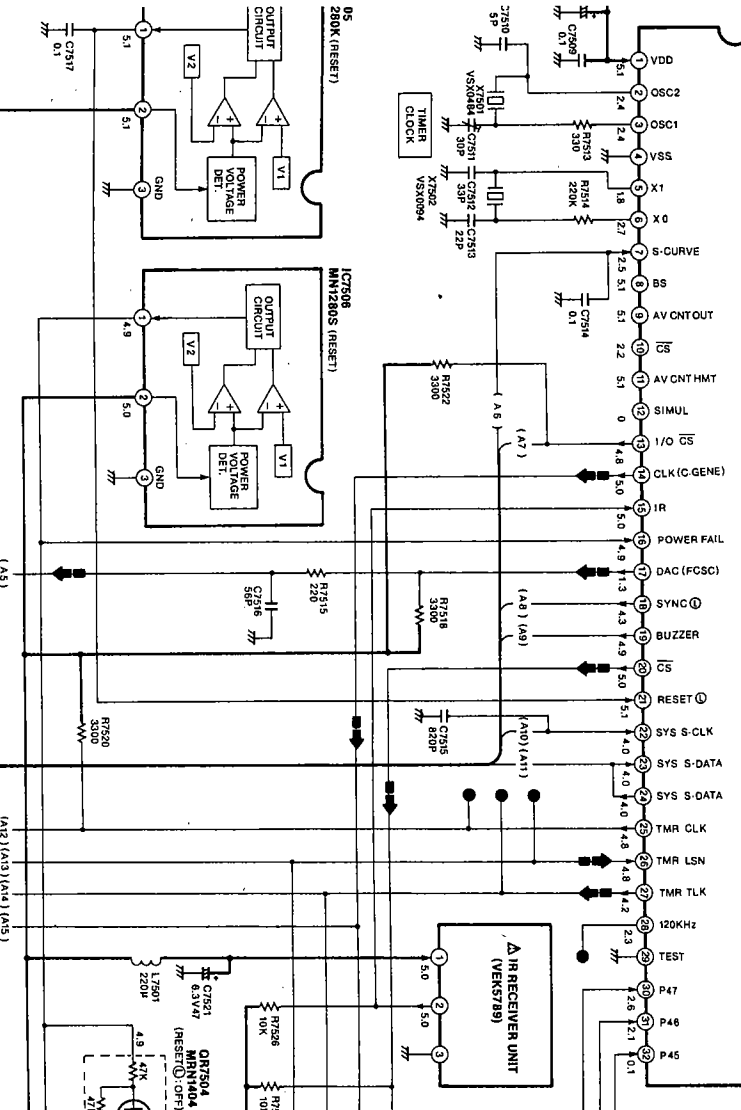
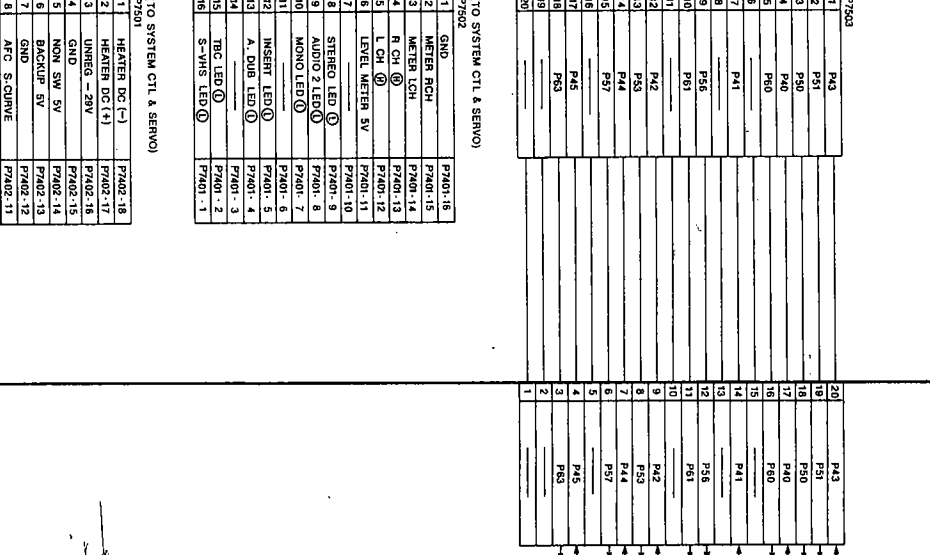
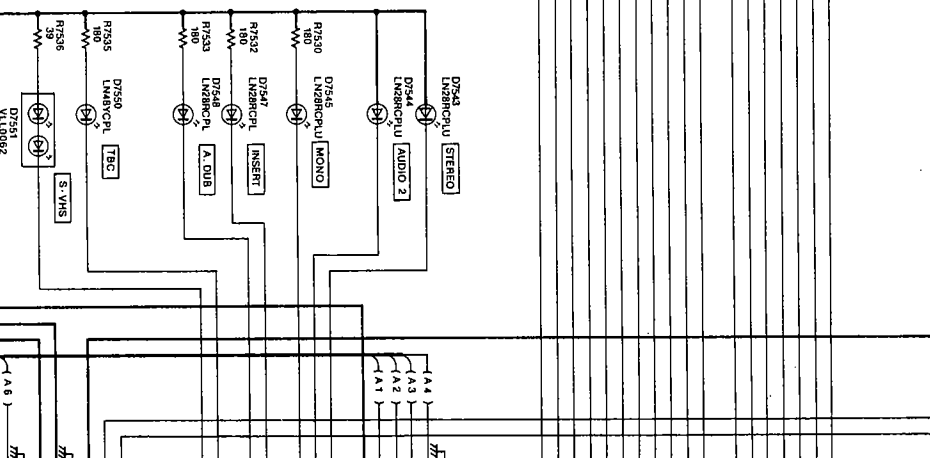
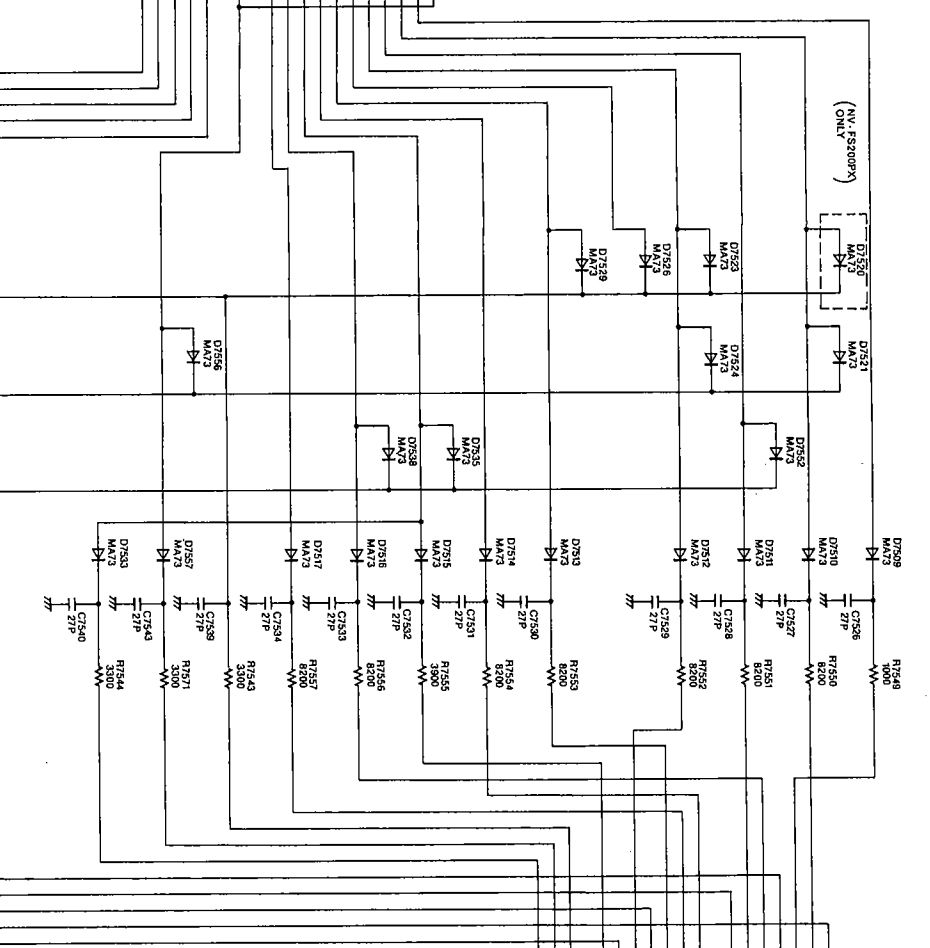
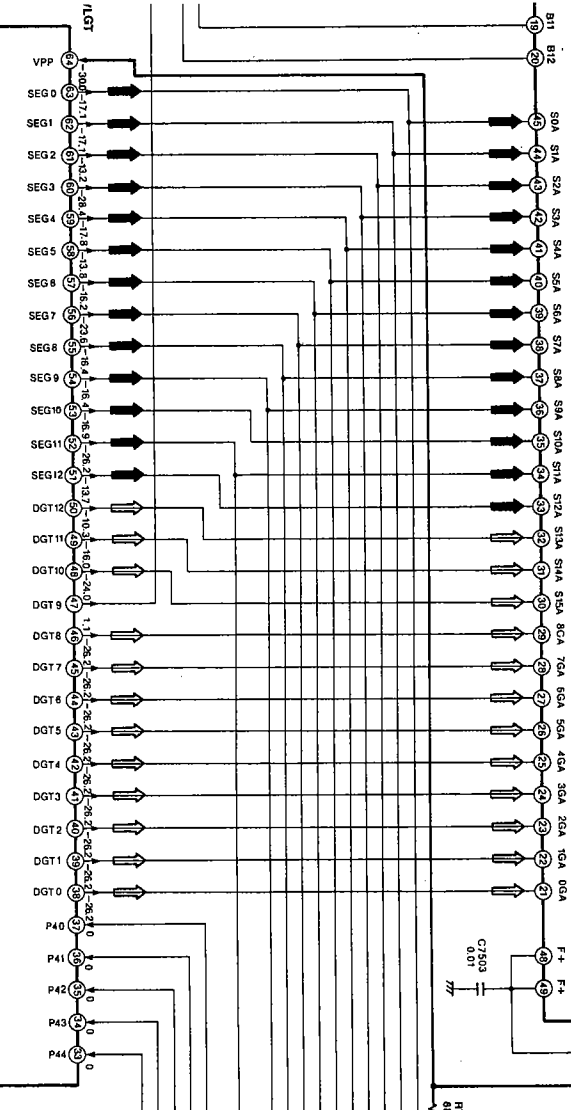
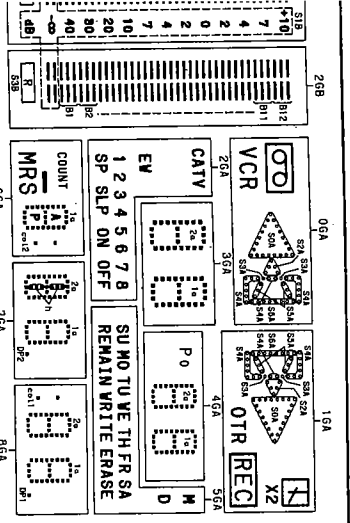
TUNE CONTROL

TBC

TIMER & VR

TIMER & VR





5 6 7 8 9 10 11 12 13 14 15 16 17

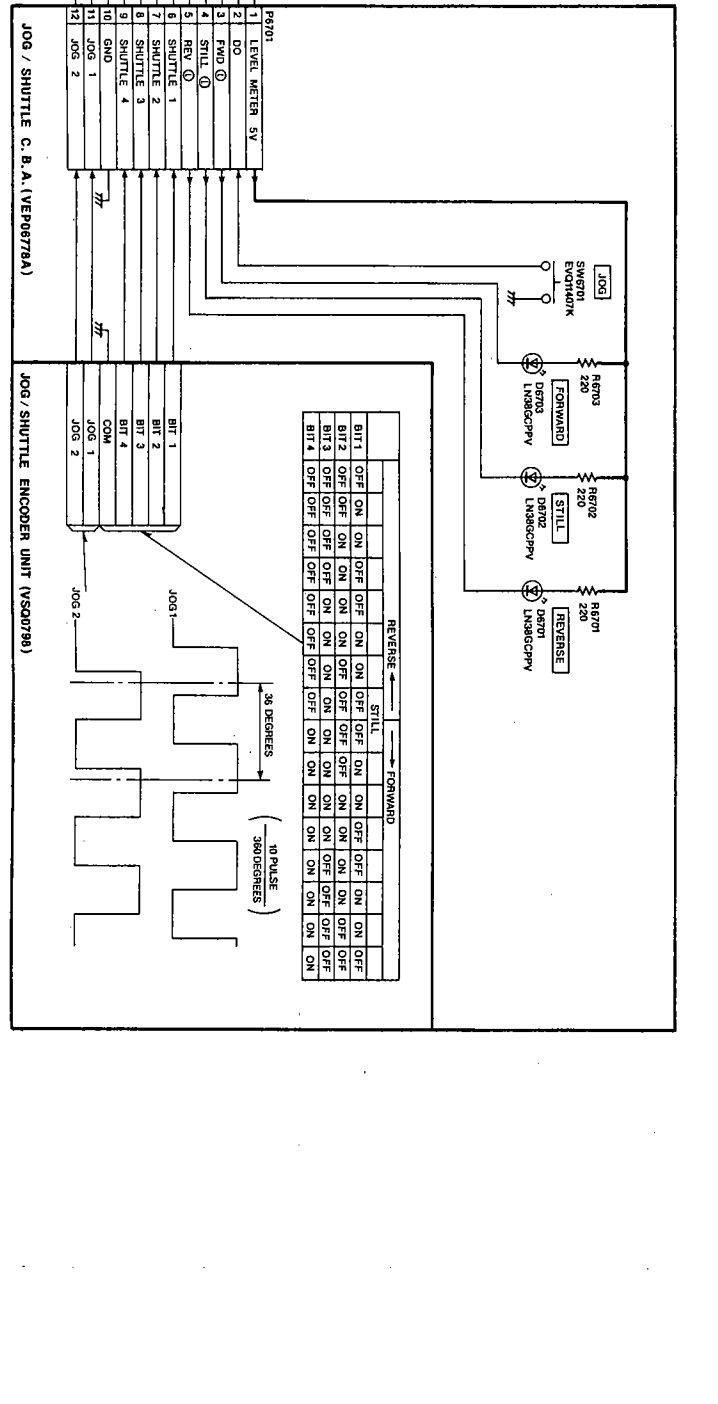
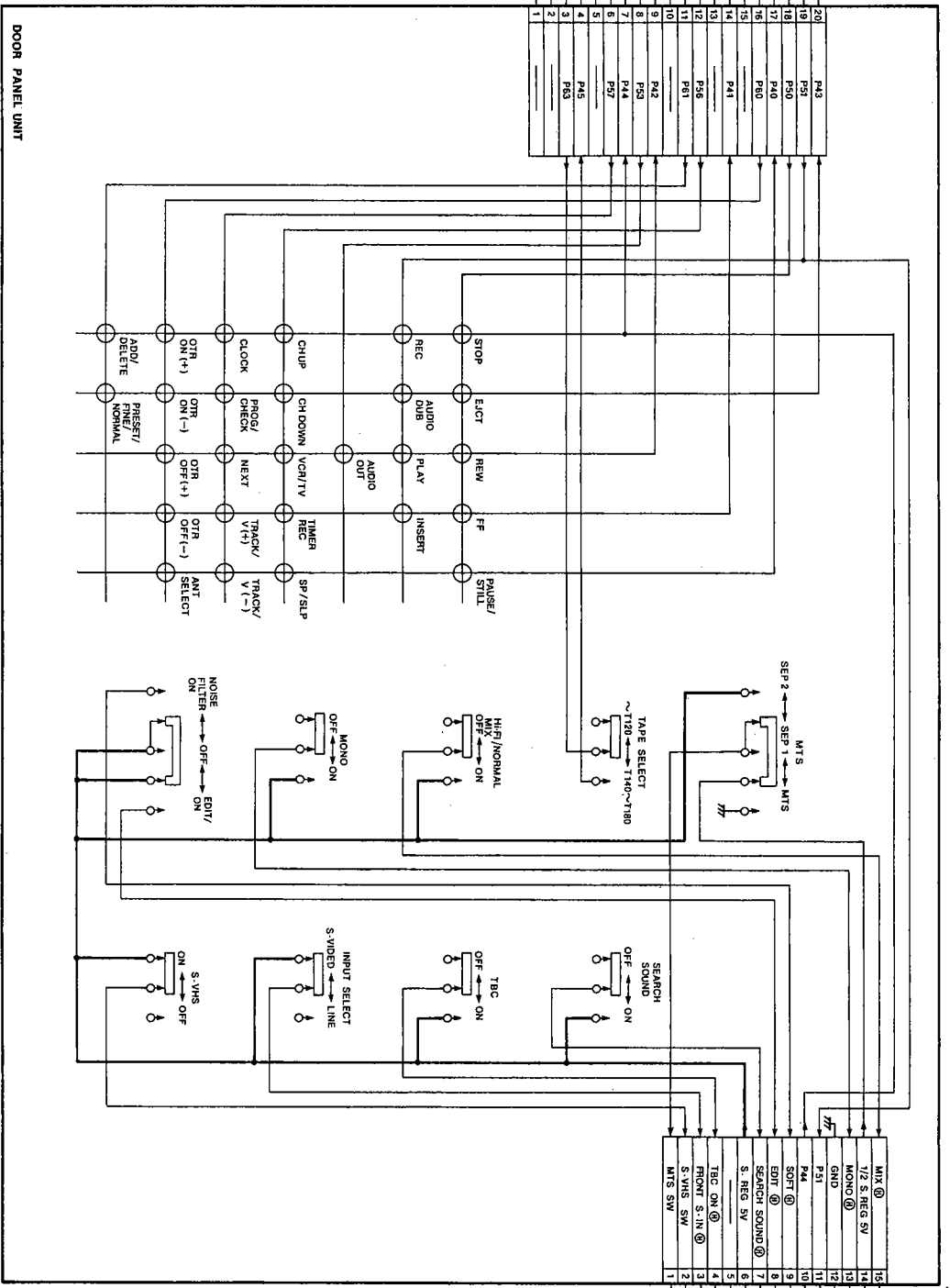
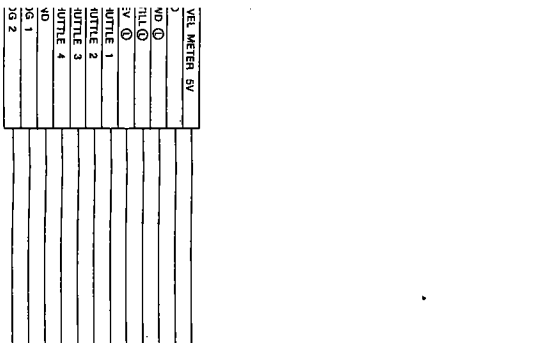
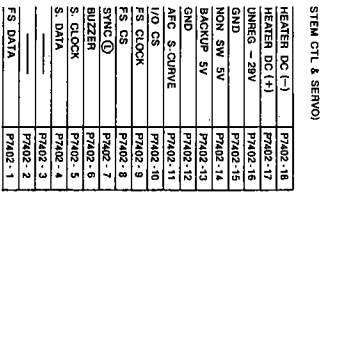
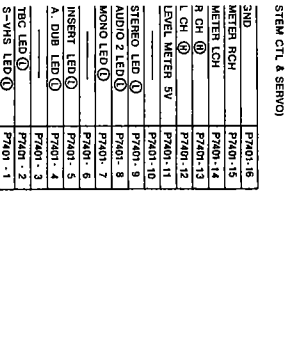
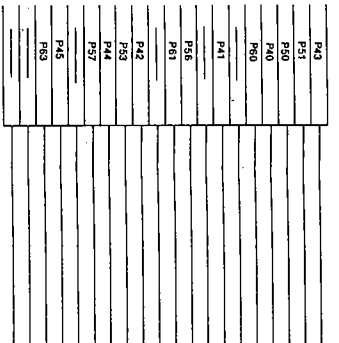
3-81 3-82

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

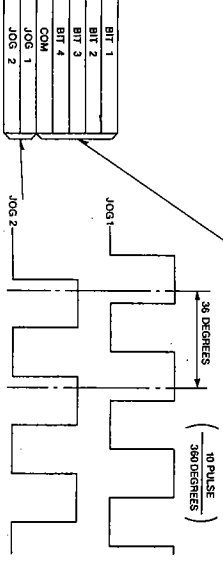
DOOR PANEL UNIT

P7601	1	LEVEL METER SV
P7602	2	DO
P7603	3	FWD
P7604	4	STILL
P7605	5	REV
P7606	6	SHUTTLE 1
P7607	7	SHUTTLE 2
P7608	8	SHUTTLE 3
P7609	9	SHUTTLE 4
P7610	10	GND
P7611	11	DOG 1
P7612	12	DOG 2

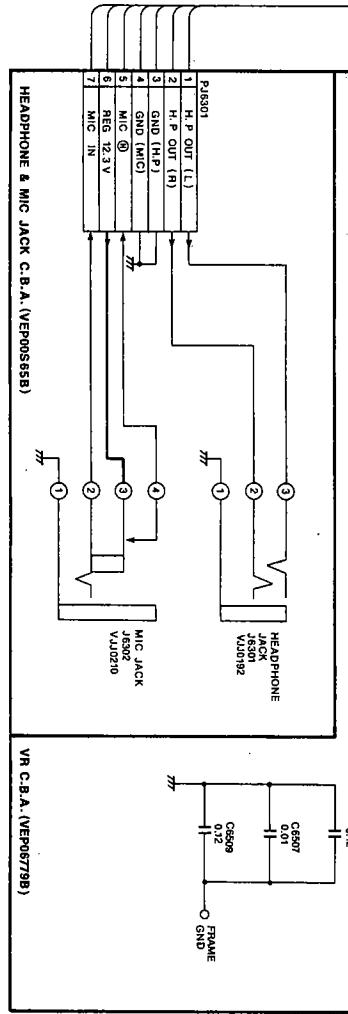
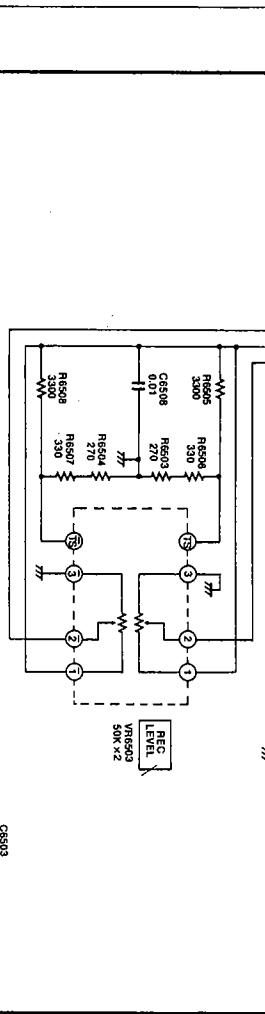
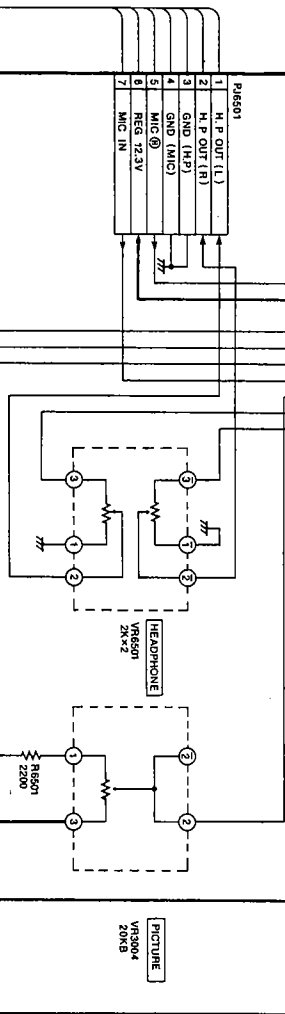
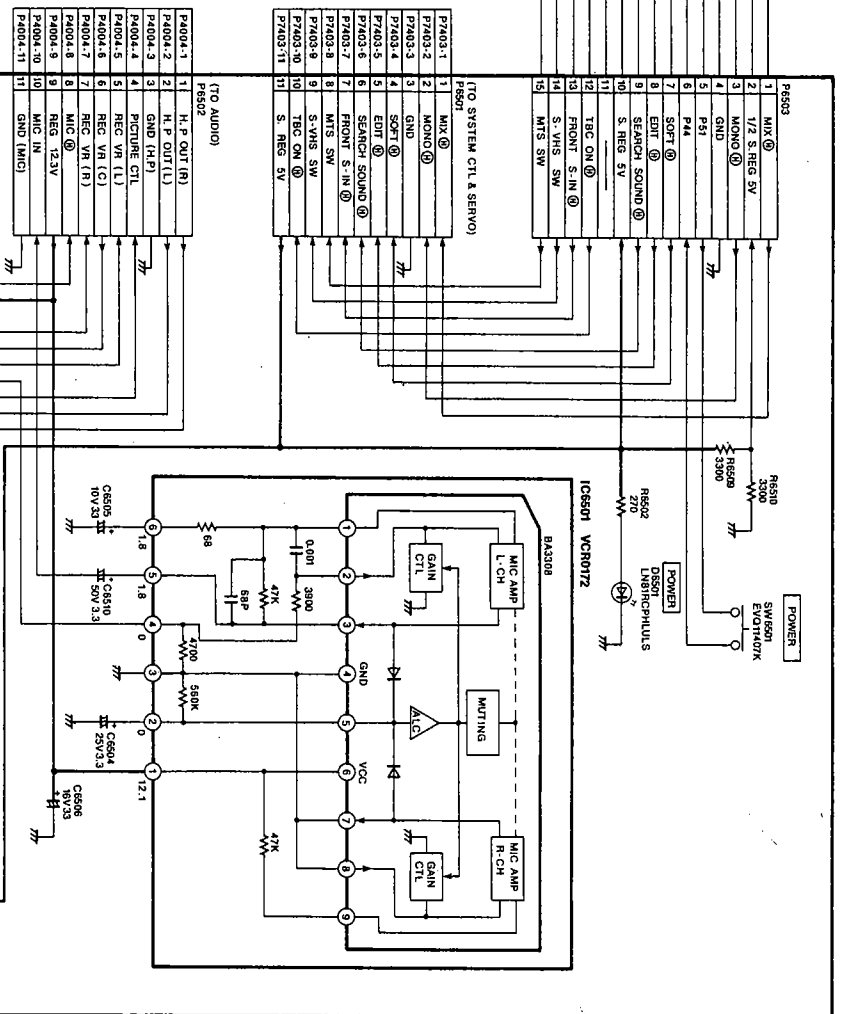
JOG / SHUTTLE C. B. A. (VE)



BIT	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
BIT 1	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
BIT 2	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
BIT 3	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
BIT 4	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF

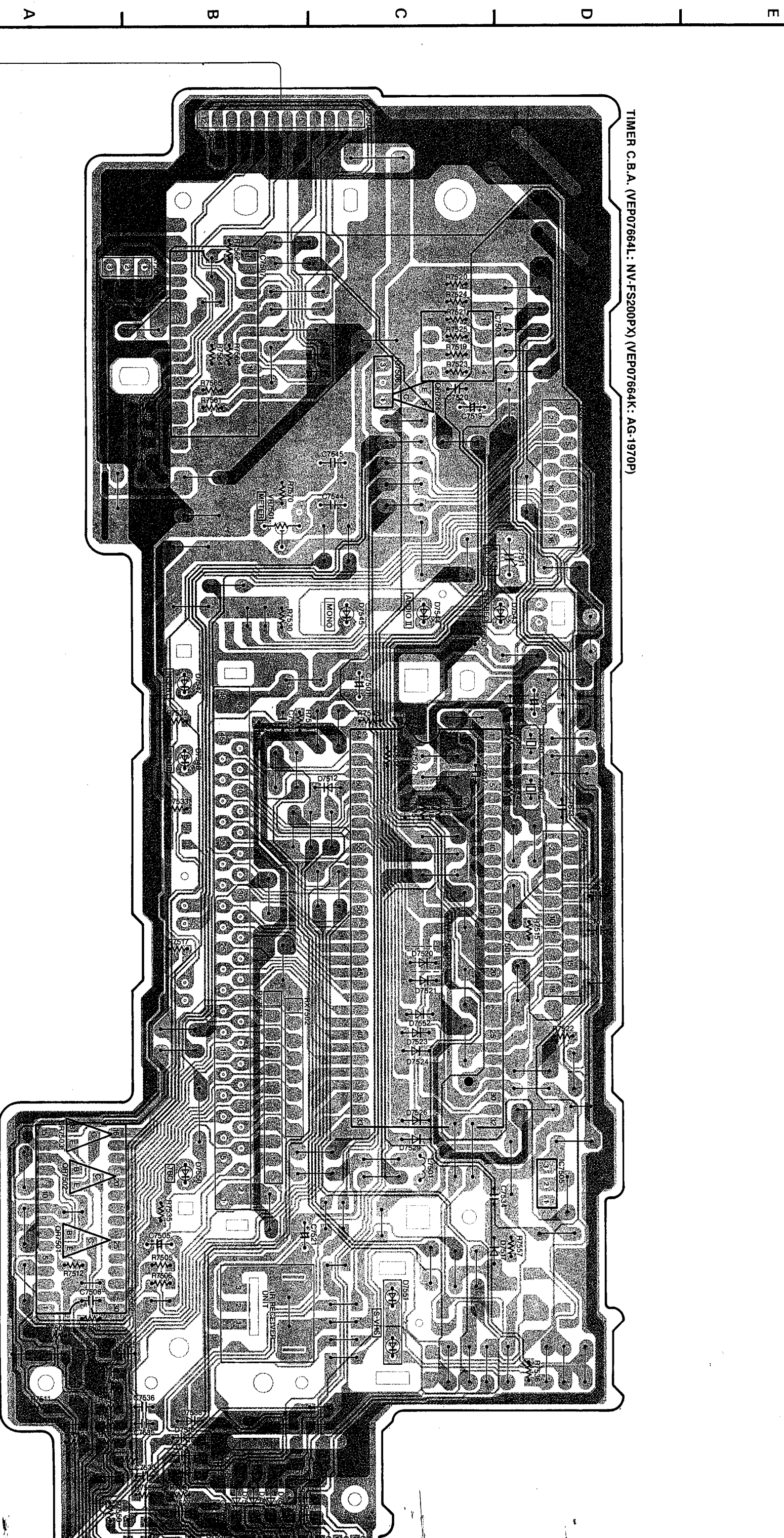


NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE. (S-VHS: SP MODE)



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

3-28. TIMER C.B.A. (VEP07664L: NV-FS200PX) (VEP07664K: AG-1970P) & VR C.B.A. (VEP06779B)



TIMER C.B.A. (VEP07664L: NV-FS200PX) (VEP07664K: AG-1970P)

A

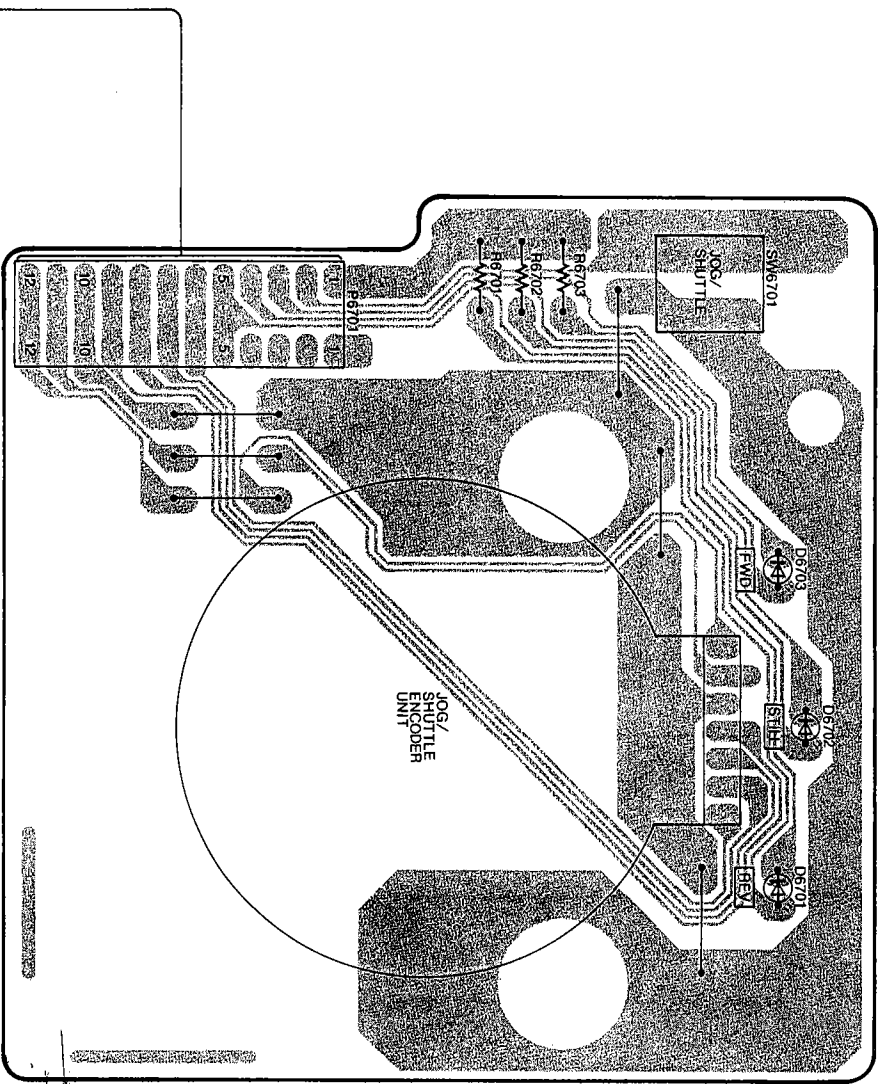
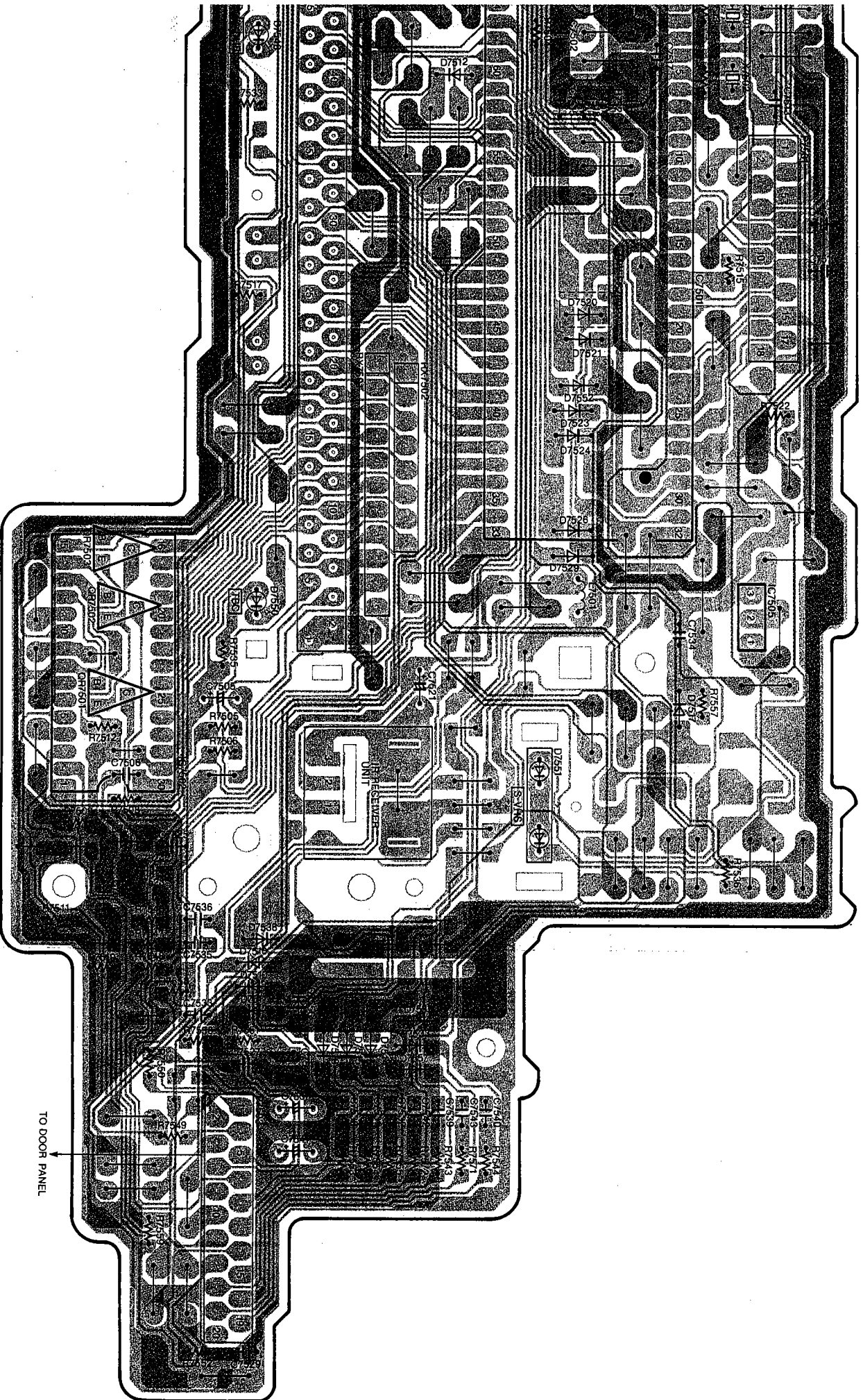
B

C

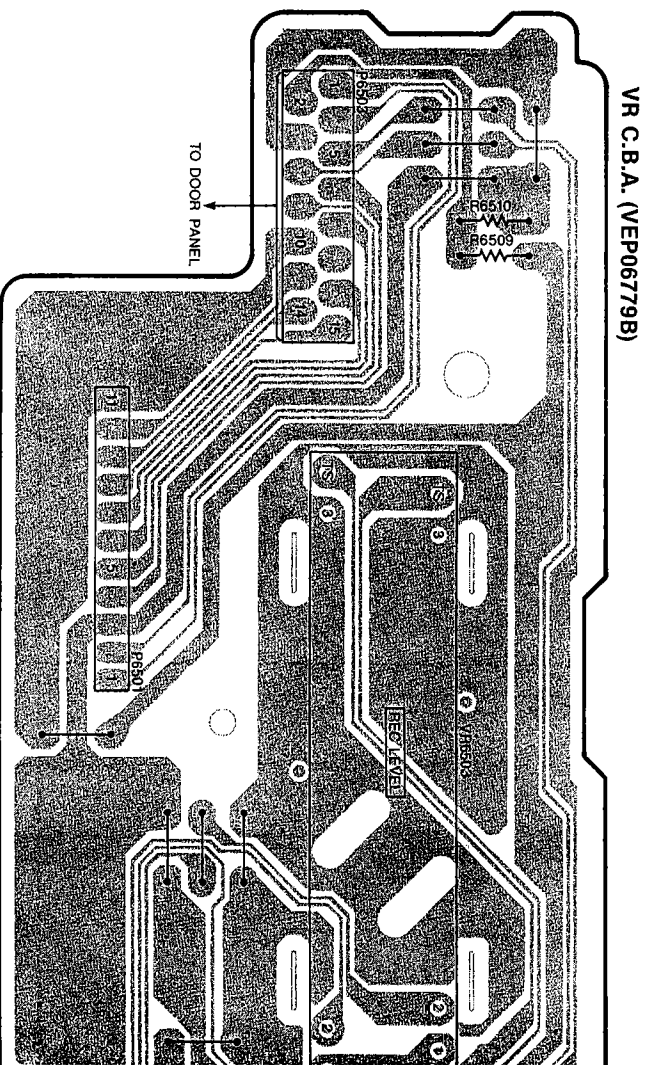
D

E

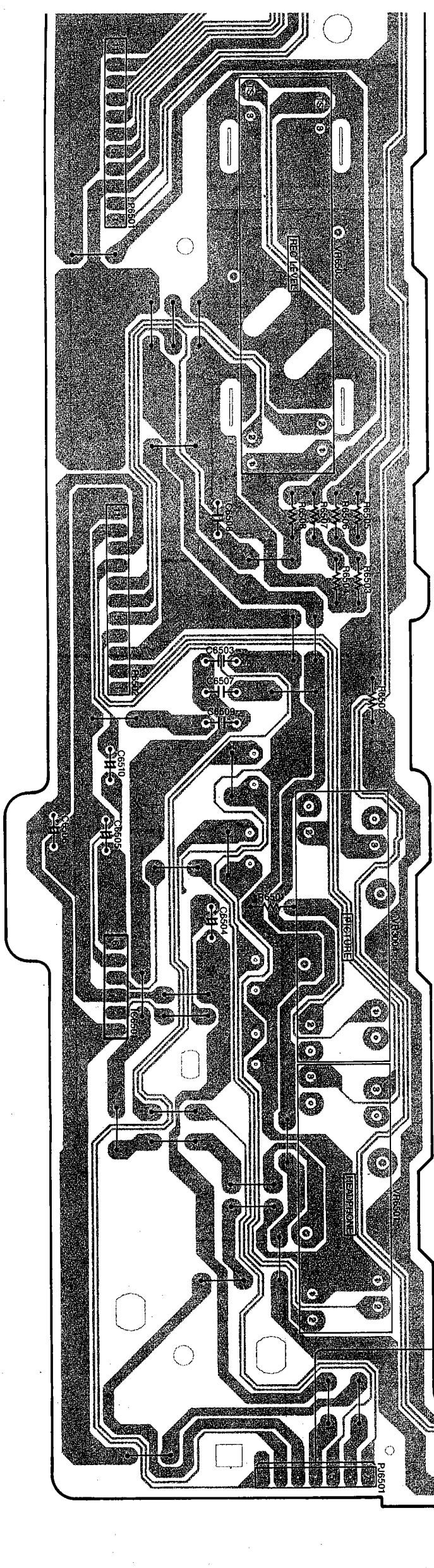
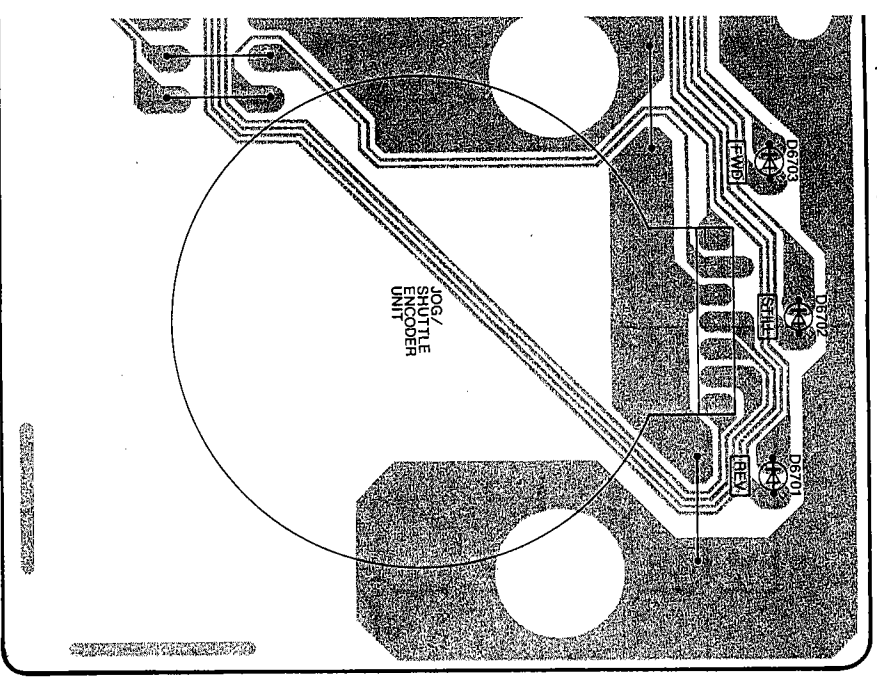
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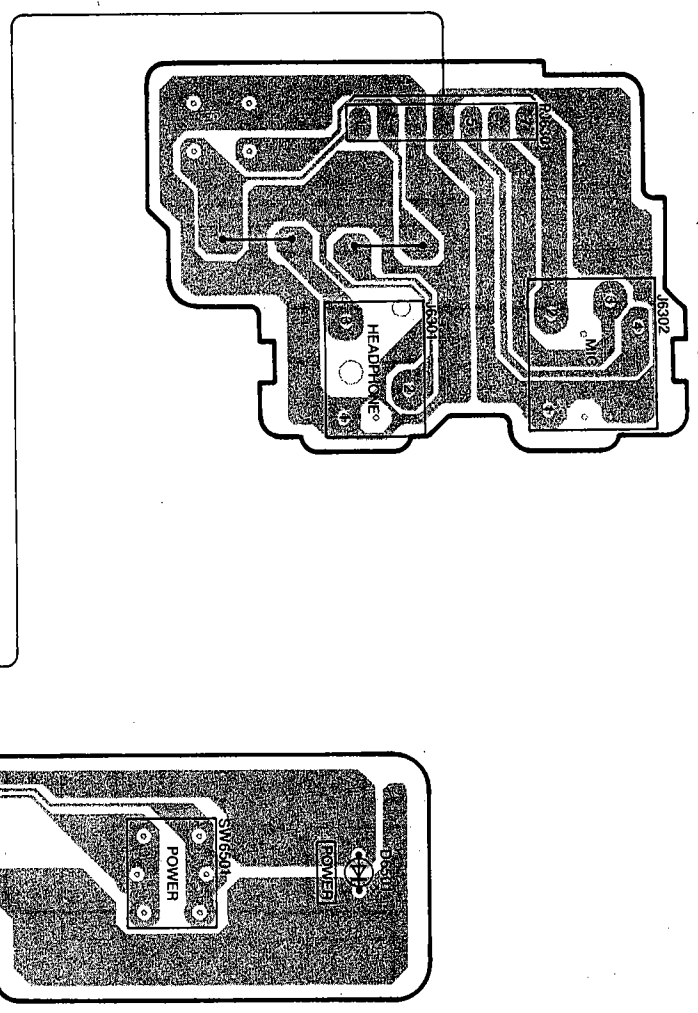
JOG SHUTTLE C.B.A. (VEP06778A)



VR C.B.A. (VEP06779B)



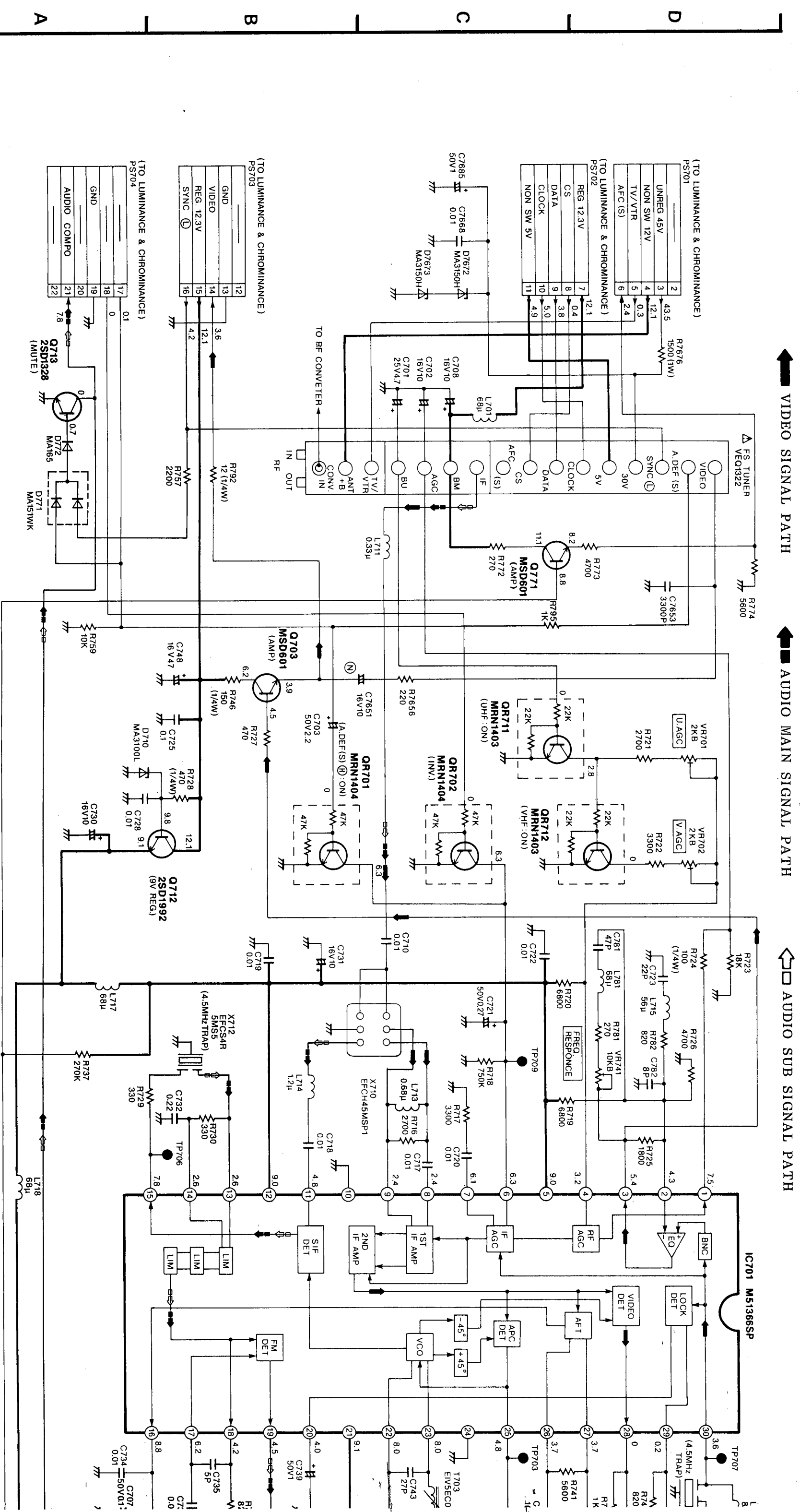
HEADPHONE & MIC
JACK C.B.A. (VEP00565B)



TIMER C.B.A. & VR C.B.A.	
Transistor & Resistor	
OR7501	A-7
OR7502	A-7
OR7503	A-6
OR7504	C-2
Integrated Circuit:	
IC6501	A-15
IC7501	C-5
IC7502	A-7
IC7503	C-2
IC7505	D-7
IC7506	C-2
IC7507	B-2
Adjustment	
C7511	D-3
VR3004	B-15
VR6501	B-16
VR6503	B-12
VR7501	B-3
Connector	
P6501	A-12
P6502	A-14
P6503	B-10
P6701	D-11
P7501	D-5
P7502	D-3
P7503	B-9
P7504	C-1
PJ6301	D-15
PJ6501	B-17

ADDRESS INFORMATION

3-29. TV DEMODULATOR PACK SCHEMATIC DIAGRAM



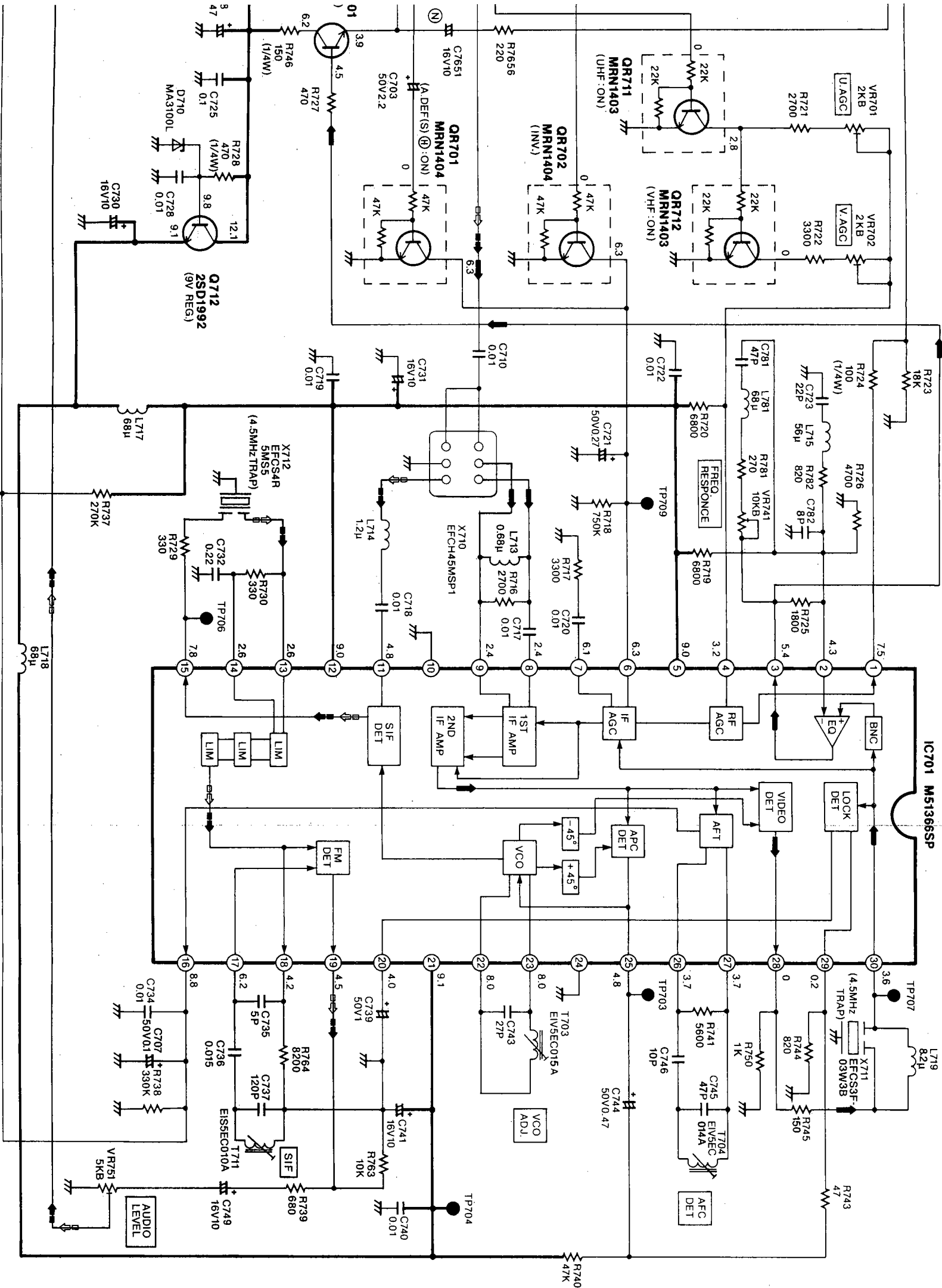
IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK Δ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

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

NOTE: DO NOT USE ANY PART NUMBER S
ORDERING. WHEN YOU ORDER A

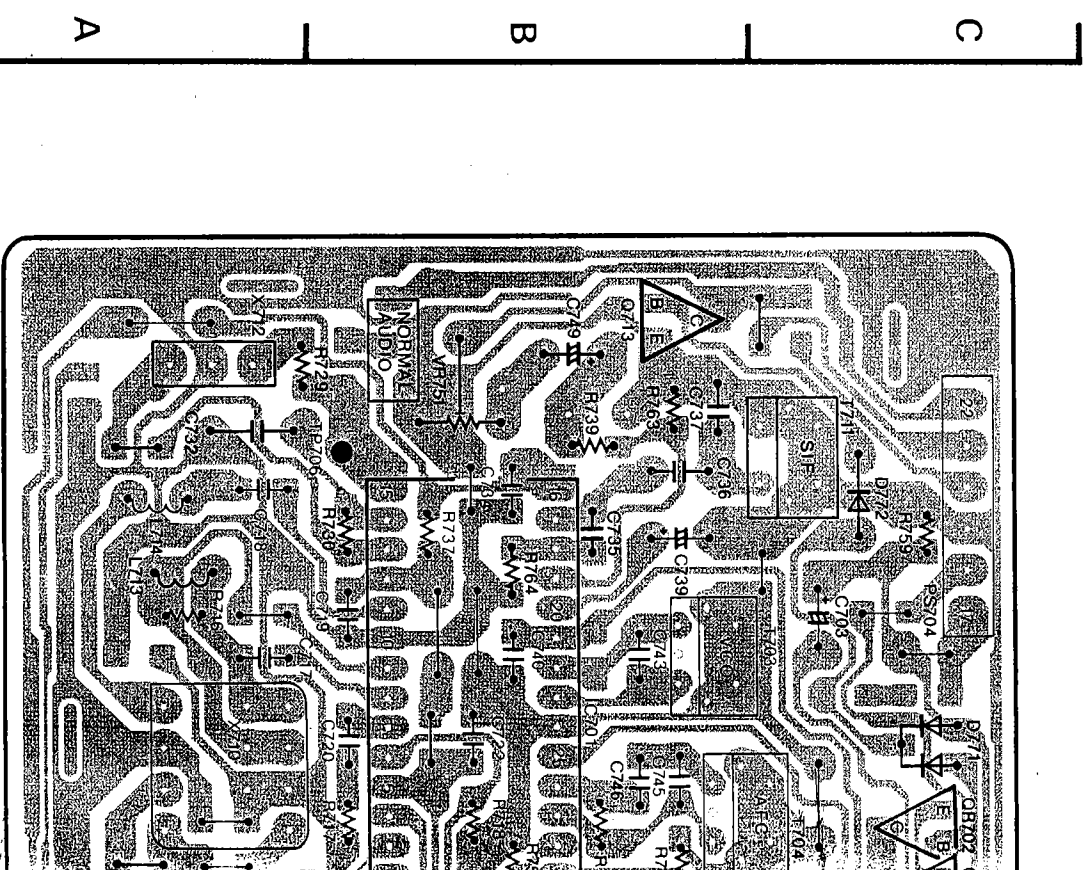
■ AUDIO MAIN SIGNAL PATH

↔ AUDIO SUB SIGNAL PATH



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

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



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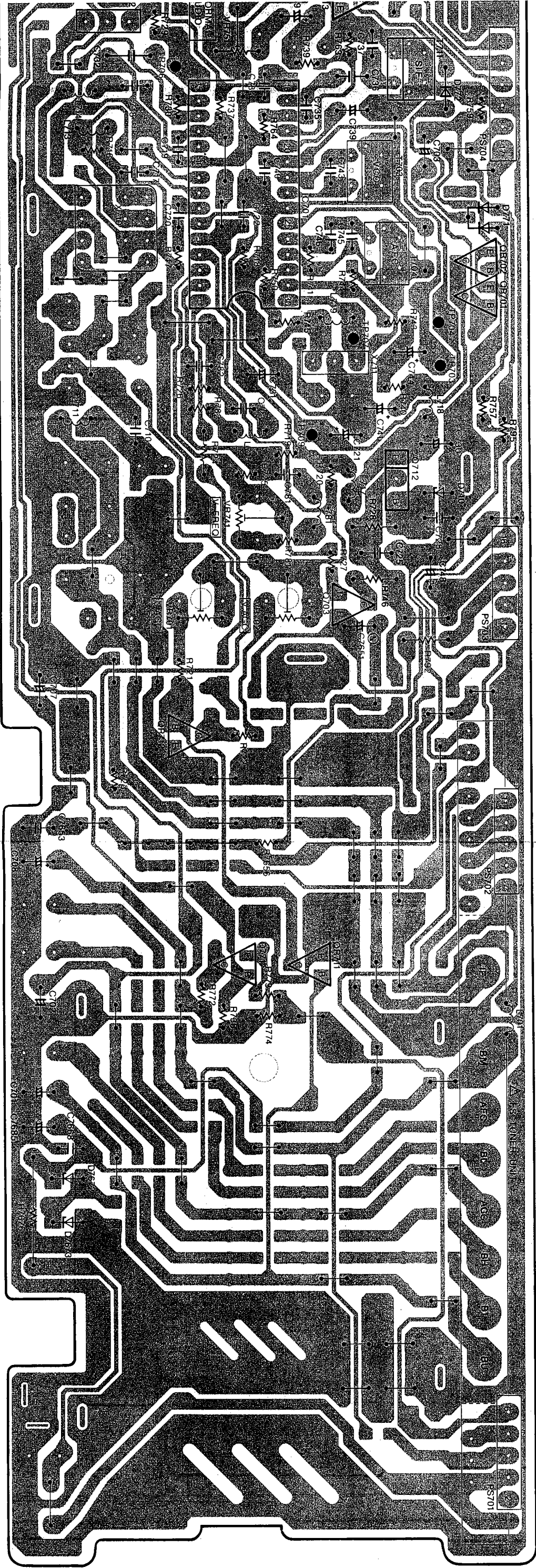
3-92

1

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TV DEMODULATOR PACK C.B.A.				
Transistor	Q703	B-4	TL706	A-1
	Q711	A-1	TL707	B-2
	Q712	B-3	TL709	B-3
	Q713	B-1	TL721	A-1
	Q714	B-4	TL722	B-2
Transistor & Resistor	Q771	B-5	Adjustment	
	T703		TL703	B-2
	T704		TL704	B-3
	T711		TL705	C-1
	VR701		TL706	B-4
Integrated Circuit	QR702	C-2	VR702	B-4
	QR703	C-2	VR741	B-4
	QR704	C-2	VR751	B-3
	QR711	B-5		B-1
	QR712	A-4		
Test Point	IC701	B-2	Connector	C-7
	TL703	B-2		C-5
	TL704	C-2		C-3
				C-1

ADDRESS INFORMATION



2

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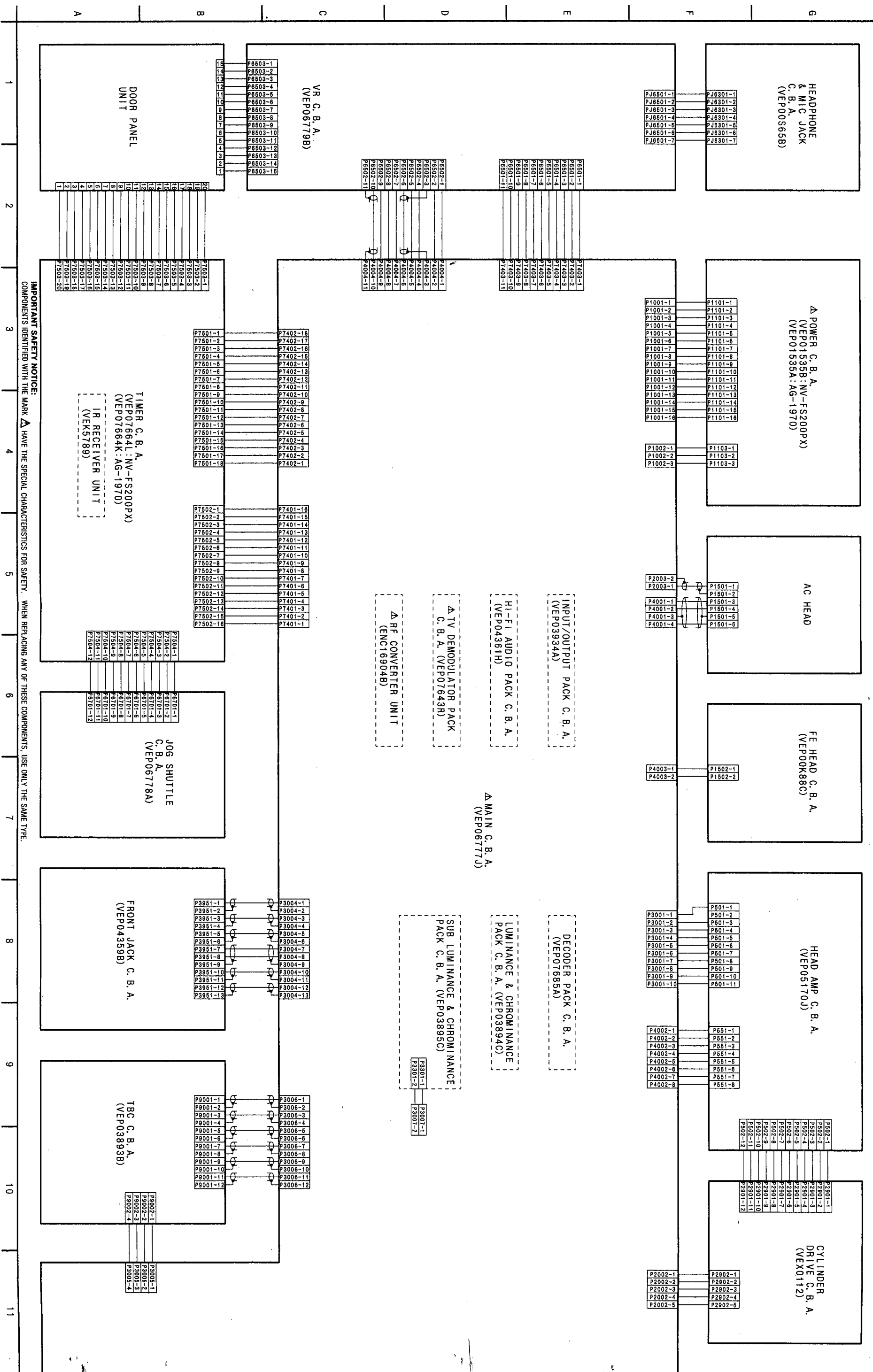
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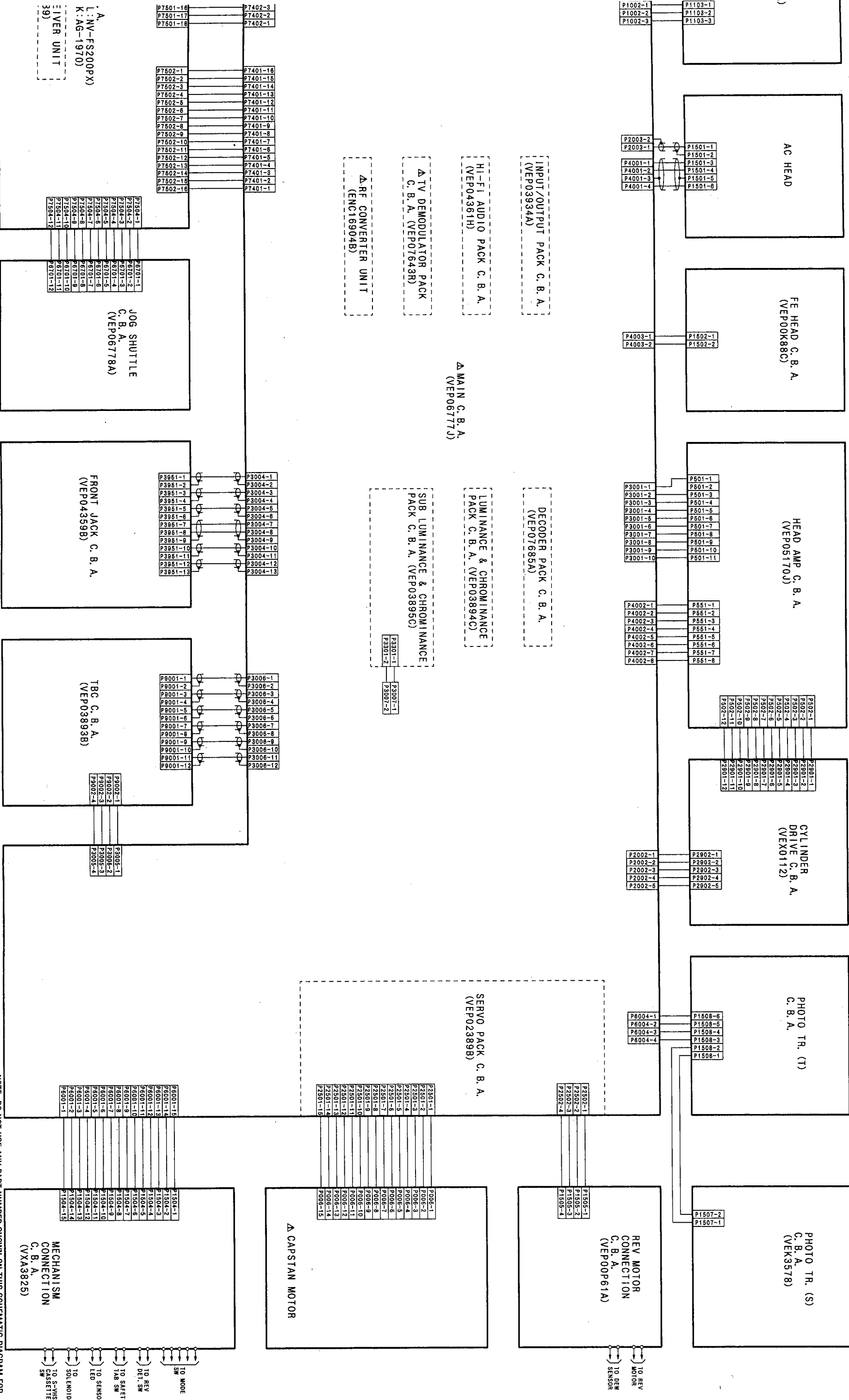
7

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3-31. INTERCONNECTION SCHEMATIC DIAGRAM



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

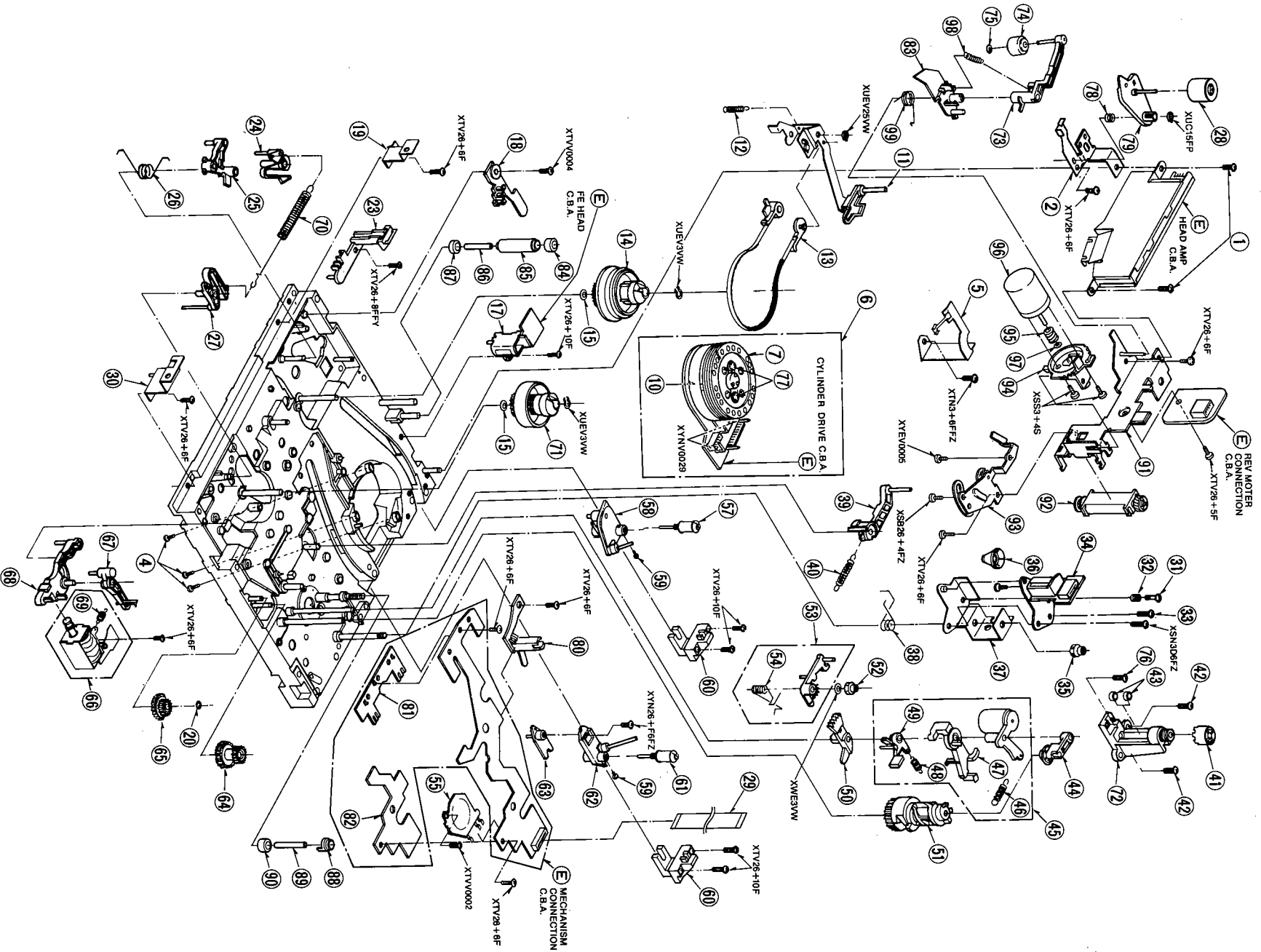


THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

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

11-11-67

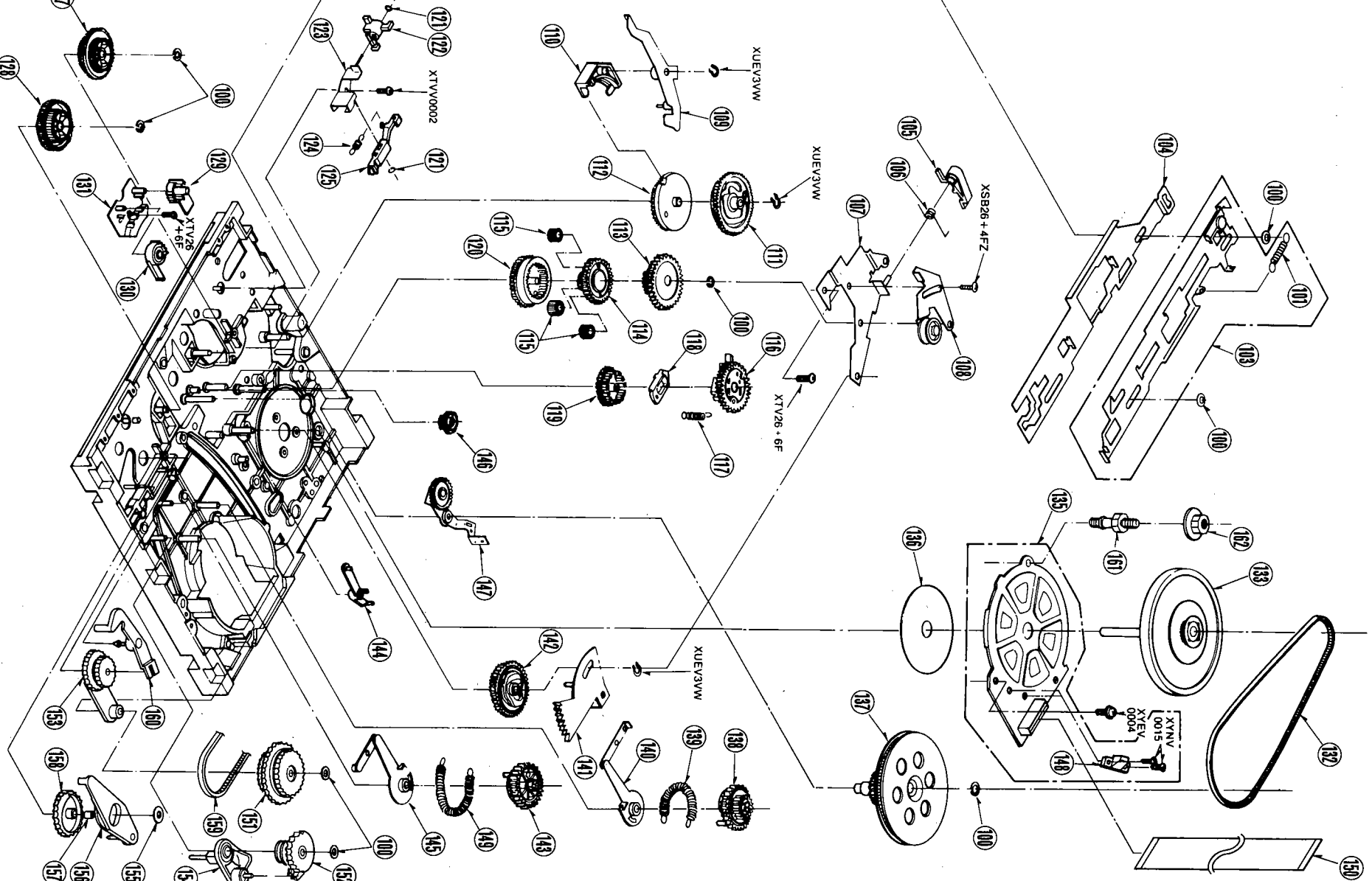
SECTION 4 EXPLODED VIEWS & PARTS LIST EXPLODED VIEW & MECHANICAL REPLACEMENT PARTS LIST CHASSIS PARTS SECTION (1)



Note: 1. * Be sure to make your orders of replacement parts according to this list.
2. 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.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1(1)	VHD0418	HEAD AMP SET SCREW	2	
2(1)	VWV7174	HEAD AMP MOUNT ANGLE	1	
4(1)	VHD0342	CYLINDER SCREW	3	
5(1)	VKA2702	EARTH PLATE UNIT	1	
6(1)	VBC0807	CYLINDER UNIT	1	(†)
7(1)	VHD0480	UPPER CYLINDER UNIT	1	
10(1)	VSC2188	CYLINDER C.B.A. SHIELD PLATE	1	
11(1)	VK11855	TENSION ARM (1) UNIT	1	
12(1)	VMB1563	TENSION SPRING	1	
13(1)	VXZ0267	TENSION BAND UNIT	1	
14(1)	VXK0179	SUPPLY REEL TRABLE UNIT	1	
15(1)	VXK1171	REEL WASHER (O. 5mm)	2	
15(1)	VWQ1239	REEL WASHER (O. 2mm)	2	
15(1)	VWQ1238	REEL WASHER (O. 2mm)	2	
17(1)	VBS0038	FE HEAD	1	
18(1)	VMD1316	TENSION SPRING HOOK	1	
19(1)	VMB6895	MOUNT ANGLE (1)	1	
20(1)	VXK1079	CUT WASHER	1	
23(1)	VBS0486	SAFETY SW	1	
24(1)	VXZ0259	SUPPLY MAIN BRAKE UNIT	1	
25(1)	VXZ0274	SUPPLY SOFT BRAKE(1)UNIT	1	
26(1)	VMB1564	SUPPLY SOFT BRAKE SPRING	1	
27(1)	VXZ0262	TAKE UP MAIN BRAKE UNIT	1	
28(1)	VXK1092	IMPEDANCE ROLLER UNIT	1	
29(1)	VWJ0357	FLEXIBLE CARD (15P)	1	(P6001-P1504)
30(1)	VMB6896	MOUNT ANGLE (†)	1	
31(1)	VHD0322	ADJUST SCREW	1	
32(1)	VMB1251	ADJUST SPRING	1	
33(1)	VHD0098	A/C HEAD (1) UNIT	1	
34(1)	VHD0082	W4 NYLON NUT	1	
35(1)	VHD0063	W4 NYLON NUT	1	
36(1)	VMB1567	HEAD BASE	1	
37(1)	VMB1857	A/C HEAD SPRING	1	
39(1)	VX11857	SUB LOADING ARM (1) UNIT	1	
40(1)	VMB1565	SUB POST SPRING	1	
41(1)	VXK0006	THRUST SCREW UNIT	1	
42(1)	VHD0317	HOUSING SCREW	2	
43(1)	VWQ1033	OIL SPNL	2	
44(1)	VWQ1353	PINCH CAM CAP	1	
45(1)	VX11858	PRESSURE ROLLER UNIT	1	
46(1)	VMB1941	PIN PRESSURE SPRING	1	
47(1)	VMB1232	PINCH PRESSURE ARM	1	
48(1)	VMB1569	PINCH PRESSURE ARM RELEASE SPRING	1	
49(1)	VW11874	PINCH LEFT ARM	1	
50(1)	VDC0597	P5 FULL OUT SECTOR GEAR	1	
51(1)	VDC0421	PINCH CAM	1	
52(1)	VHD0045	W3 NYLON NUT	1	
53(1)	VX12027	P5 UNIT	1	
54(1)	VMB2718	P5 SPRING	1	
55(1)	VSS0175	MODE SW	1	
57(1)	VXP1093	ROLLER POST (S) UNIT	1	
58(1)	VXA4106	INCLIND BASE (S)(1)UNIT	1	
59(1)	VHD0133	ROLLER POST SCREW	2	
60(1)	VMD0910	POST STOPPER	2	
61(1)	VXP1094	ROLLER POST (T) UNIT	1	
62(1)	VXA3876	INCLIND BASE(T)(1)UNIT	1	
63(1)	VXZ0687	INCLIND ADJUST PLATE UNIT	1	
64(1)	VDC0483	PINCH SPEED DOWN GEAR	1	
65(1)	VDC0664	CONNECTION GEAR	1	
66(1)	VXK3347	SOLENOID UNIT	1	
67(1)	VXZ0692	KICK ROD UNIT	1	
68(1)	VW12048	SOLENOID LEVER	1	
69(1)	VMB1553	KICK ROD SPRING	1	
70(1)	VMB2012	MAIN BRAKE SPRING	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
71(1)	VXK0176	TAKE UP REEL TRABLE UNIT	1	
72(1)	VXK0101	HOUSING UNIT	1	
73(1)	VX12086	CLEANER ARM (2) UNIT	1	
74(1)	VMB1341	CLEANER ROLLER UNIT	1	
75(1)	VMB1061	SNIP WASHER (A)	1	
76(1)	VHD0374	HOUSING SCREW	1	
77(1)	VHD0553	UPPER CYLINDER SCREW	2	
78(1)	VMD1741	IMPEDANCE ARM SPRING	1	
79(1)	VMB2308	IMPEDANCE ROLLER ARM	1	
80(1)	VXK3520	LED HOLDER UNIT	1	
81(1)	VMB7829	REINFORCEMENT PLATE (F)	1	
82(1)	VMB7830	REINFORCEMENT PLATE (R)	1	
83(1)	VMB2510	CLEANER ARM (B)	1	
84(1)	VMB1088	SUPPLY UPPER LIMITER	1	
85(1)	VDP1304	SUPPLY UPPER LIMITER	1	
86(1)	VMB1581	P1 COLLAR	1	
87(1)	VMB1533	SUPPLY LOWER LIMITER	1	
88(1)	VMB1564	P4 UPPER LIMITER	1	
89(1)	VMB1568	P4 SLEAVE	1	
90(1)	VMB1534	P4 LOWER LIMITER	1	
91(1)	VXK4318	MOTOR MOUNT PLATE UNIT	1	
92(1)	VXK3517	MOTOR WHEEL BEARING UNIT	1	
93(1)	VXK4315	TENSION PULLEY BASE (A) UNIT	1	
94(1)	VXK3564	REEL MOTOR BRACKET UNIT	1	
95(1)	VXP1208	MOTOR GEAR UNIT	1	
96(1)	VMD0320	REV MOTOR	1	
97(1)	VMB1734	MOTOR WASHER	1	
98(1)	VMB2263	MOTOR WHEEL BEARING (A)	1	
99(1)	VMB2264	CLEANER ARM SPRING (B)	1	

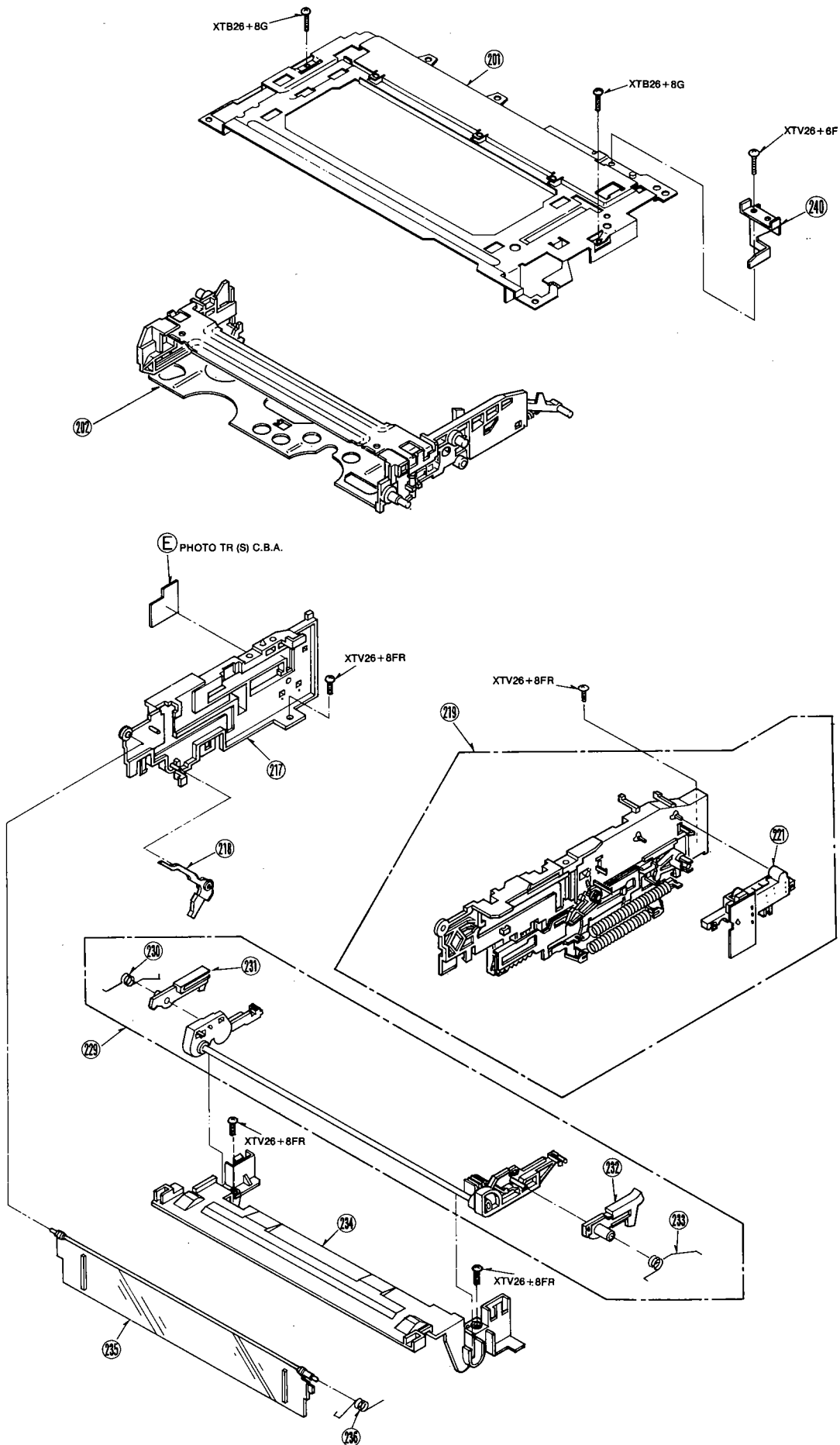


Note: 1. * Be sure to make your orders of replacement parts according to this 2. IMPORTANT SAFETY NOTICE Components identified with the mark (†) have the special characteristics for safety. When replacing any of these components, use only the same type.

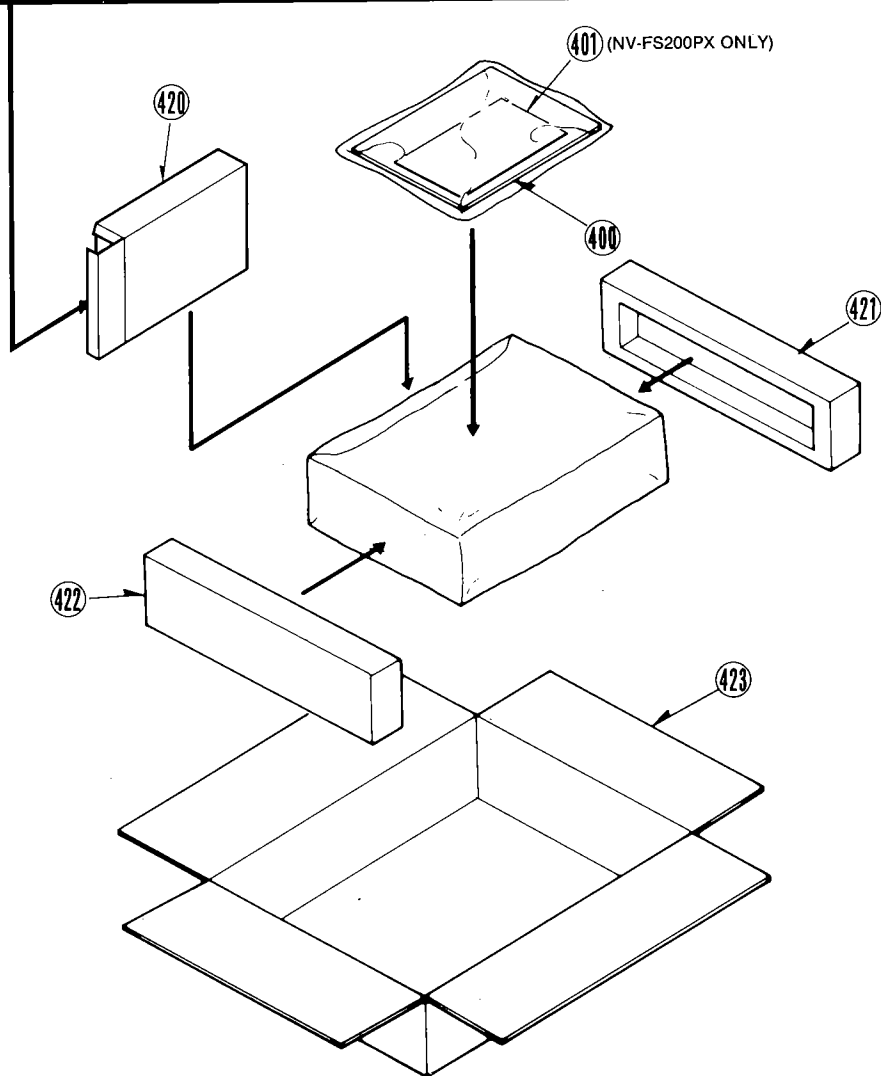
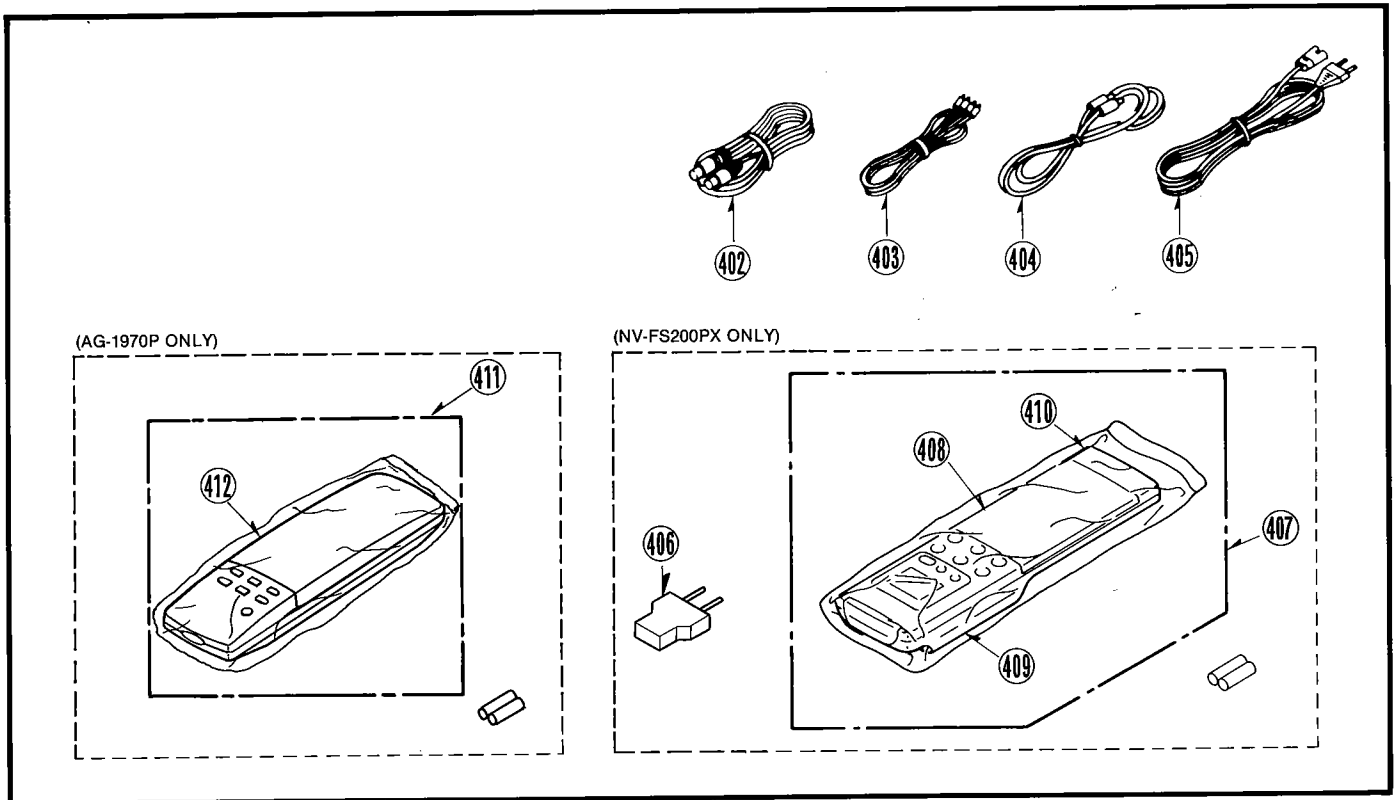
Note: 1. * Be sure to make your orders of replacement parts according to this 2. IMPORTANT SAFETY NOTICE Components identified with the mark (†) have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
100(2)	MMX1079	CUT WASHER	8	
101(2)	WMB1883	SUB LEVER SPRING	1	
103(2)	VXA3510	SUB LEVER UNIT	1	
104(2)	WMO204	MAIN LEVER	1	
105(2)	VX12088	SS BRAKE ARM UNIT	1	
106(2)	WMB1588	SS BRAKE SPRING	1	
107(2)	VXA3512	SS BRAKE BASE (1) UNIT	1	
108(2)	VXA3516	TENSION ROLLER UNIT	1	
109(2)	VX11632	CAM FOLLOWER ARM UNIT	1	
110(2)	VX11861	DETENT ARM	1	
111(2)	VDG0574	MAIN CAM GEAR	1	
112(2)	VDG0343	SUB CAM GEAR	1	
113(2)	VDG0348	CENTRE GEAR	1	
114(2)	VDG0422	RETAINER GEAR	1	
115(2)	VDG0345	PLANET GEAR	3	
116(2)	VDG0547	CLUTCH DISK	1	
117(2)	WMB1558	CLUTCH SPRING	1	
118(2)	VDG0350	LOCK SLIDE GEAR	1	
119(2)	VDG0335	DRIVE DISK	1	
120(2)	VDG0342	RING GEAR	1	
121(2)	WMO0967	CUT WASHER	2	
122(2)	VX11859	CHANGE LEVER	1	
123(2)	VXA2672	RELEASE LEVER (1) UNIT	1	
124(2)	WMB1557	RELEASE SPRING	1	
125(2)	VX11860	RELEASE LEVER	1	
127(2)	VXP1031	TAKE UP REEL GEAR UNIT	1	
128(2)	VXPO981	SUPPLY REEL GEAR UNIT	1	
129(2)	VX11858	RETURN LEVER (R)	1	
130(2)	VX11857	RETURN LEVER (L)	1	
131(2)	WMO0913	STOPPER BASE	1	
132(2)	VDX0169	TIMING BELT	1	
133(2)	VXP1113	ROTOR UNIT	1	
135(2)	VEK1097	STATOR UNIT	1	
136(2)	WMB6847	SUB PLATE	1	
137(2)	VXP1050	CENTRE PULLEY UNIT	1	
138(2)	VDG0564	LOADING GEAR (T)	1	
139(2)	WMB1555	LOADING SPRING (T)	1	
140(2)	VX11489	LOADING ARM (T)(1) UNIT	1	
141(2)	VXA3515	SECTOR GEAR UNIT	1	
142(2)	VDG0516	LOADING CAM GEAR	1	
143(2)	VDG0419	LOADING GEAR (S)	1	
144(2)	VX12266	PLAY CONTROL ARM	1	
145(2)	VX11487	LOADING ARM (S)(1) UNIT	1	
146(2)	VDG0546	INTERMEDIATE GEAR	1	
147(2)	VX11861	PLAY ARM UNIT	1	
148(2)	VBK0048	PC HEAD	1	
149(2)	WMB1746	LOADING SPRING(S)	1	
150(2)	VX106138	FLEXIBLE CARD (15P)	1	(P2501-CAEYAN)
151(2)	VXP1029	REVIEW CLUTCH UNIT	1	
152(2)	VXP1030	REVIEW RELEASE CLUTCH UNIT	1	
153(2)	VX11851	TENSION ARM UNIT	1	
154(2)	VX12197	TENSION RELEASE LEVER	1	
155(2)	MMX1536	CUT WASHER	1	
156(2)	VX12233	SUB CAM FOLLOWER	1	
157(2)	MMX1495	RUBBER STOPPER	1	
158(2)	VDG0517	SUB LEVER CAM	1	
159(2)	VDX0199	REVIEW CLUTCH TIMING BELT	1	
160(2)	VX12200	REVIEW CONTROL LEVER	1	
161(2)	VXD0431	STATOR SPACER SCREW	1	
162(2)	VXD0102	STATOR NUT	1	
201(3)	WMB8861	TOP PLATE	1	
202(3)	VXA3840	CASSETTE HOLDER UNIT	1	
217(3)	WMB1890	SIDE PLATE (L)	1	
218(3)	VX11880	OPENER LEVER	1	
219(3)	VXA4076	SIDE PLATE (R) UNIT	1	
221(3)	VXA4642	SLIDE SW UNIT	1	
229(3)	VXP0987	MAIN SHARP UNIT	1	
230(3)	WMB1836	SUB WIPER SPRING (L)	1	
231(3)	VX11878	SUB WIPER ARM (L)	1	
232(3)	VX11879	SUB WIPER ARM (R)	1	
233(3)	WMB1837	SUB WIPER SPRING (R)	1	
234(3)	WMB8787	CASSETTE GUIDE	1	
235(3)	VXF1263	BLINDER PANEL	1	
236(3)	WMB1258	BLINDER SPRING	1	
240(3)	WMB7224	CASSETTE HOLDER ANGLE	1	

③ CASSETTE UP MECHANISM SECTION



5 PACKING PARTS SECTION



4-2. ELECTRICAL REPLACEMENT PARTS LIST

Note: 1. Be sure to make your orders of replacement parts according to this list.
 2. 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. Unless otherwise specified, All resistors are in OHMS, K=1,000 OHMS. All capacitors are in MICRO-FARADS (uf), P=uuF.
 4. The P.C. Board units marked with '■' show below the main assembled parts.
 5. The marking (RTL) indicates the retention time is limited for this item. After the discontinuation of this assembly in production, it will no longer be available.

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
	VEPO6777J	MAIN C.B.A.	1	(RTL) INCLUDING THE SERVO PACK C.B.A. (VEPO2389B), INPUT/OUTPUT PACK C.B.A. (VEPO3934A), DECODER C.B.A. (VEPO7685A).
	VEPO2389B	SERVO PACK C.B.A.	1	(RTL) INCLUDED IN MAIN C.B.A. (VEPO6777J).
	VEPO3934A	INPUT/OUTPUT PACK C.B.A.	1	(RTL) INCLUDED IN MAIN C.B.A. (VEPO6777J).
	VEPO7685A	DECODER C.B.A.	1	(RTL) INCLUDED IN MAIN C.B.A. (VEPO6777J).
	VEPO3894C	LUMINANCE & CHROMINANCE PACK C.B.A.	1	(RTL)
	VEPO3895C	SUB LUMINANCE & CHROMINANCE PACK C.B.A.	1	(RTL)
	VEPO4361H	HIFI AUDIO PACK C.B.A.	1	(RTL)
	VEPO7643R	TV DEMODULATOR C.B.A.	1	(RTL)
	VEPO5170J	HEAD AMP C.B.A.	1	(RTL)
	VEPO6779B	VR C.B.A.	1	(RTL) INCLUDING THE HEAD PHONE C.B.A. (VEPO0S65B).
	VEPO0S65B	HEAD PHONE & MIC JACK C.B.A.	1	(RTL) INCLUDED IN VR C.B.A. (VEPO6779B).
	VEPO7664L	TIMER C.B.A.	1	(RTL) NV-FS200PX
	VEPO7664K	TIMER C.B.A.	1	(RTL) AG-1970P
	VEPO6778A	JOG/SHUTTLE C.B.A.	1	(RTL)
	VEPO1535B	POWER C.B.A.	1	(RTL) (!) NV-FS200PX
	VEPO1535A	POWER C.B.A.	1	(RTL) (!) AG-1970P
	VEPO3893B	TBC C.B.A.	1	(RTL)
	VEPO4359B	FRONT JACK C.B.A.	1	(RTL)

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
	VEK0112	CYLINDER DRIVE C.B.A.	1	(RTL)
	VEPO0K88C	FE HEAD C.B.A.	1	(RTL)
	VEPOOP61A	REV MOTOR CONNECTION C.B.A.	1	(RTL)
	VXA3825	MECHANISM CONNECTION C.B.A.	1	(RTL)
	VEK3578	PHOTO Tr. (S) C.B.A.	1	(RTL)
	-----	PHOTO Tr. (T) C.B.A.	1	(RTL) INCLUDED IN SLIDE SWITCH UNIT (VXA4642)
	ENC16904B	RF CONVERTER	1	(!)
	VEQ1322	TUNER	1	(!)
F1101_02	XBA2C20NUO	FUSE	2	(!)
L1109	VLQ0533	COIL	1	
	■ VEPO6777J	MAIN C.B.A.		(RTL)
		CONNECTORS		
BP1004	VJFO094	CONNECTOR	1	
		CAPACITORS		
C1003	ECUM1H1032FN	C. CAPACITOR CH 50V 0.01U	1	
C1004	ECEA1CK101	E. CAPACITOR 16V 100U	1	
C1009	ECEA1AK330	E. CAPACITOR 10V 33U	1	
C1010	ECEA1CK470	E. CAPACITOR 16V 47U	1	
C1701	ECKD2H152KB	C. CAPACITOR 500V 1500P	1	
C1702	ECA1CM101	E. CAPACITOR 16V 100U	1	
C1703	ECUM1H1032FN	C. CAPACITOR CH 50V 0.01U	1	
C1704	ECEA1CK470	E. CAPACITOR 16V 47U	1	
C1705	ECUM1H1042FN	C. CAPACITOR CH 50V 0.1U	1	
C1706	ECA1VM100	E. CAPACITOR 35V 10U	1	
C1707	ECUM1H1032FN	C. CAPACITOR CH 50V 0.01U	1	
C1708	ECA1CM221	E. CAPACITOR 16V 220U	1	
C2001	ECEA1HK4R7	E. CAPACITOR 50V 4.7U	1	
C2002	ECEA0JK220	E. CAPACITOR 6.3V 22U	1	
C2003	ECUM1H332KBN	C. CAPACITOR CH 50V 3300P	1	
C2004	ECEA1HK3R3	E. CAPACITOR 50V 3.3U	1	
C2005	ECEA1CK100	E. CAPACITOR 16V 10U	1	
C2006	ECUM1H471KBN	C. CAPACITOR CH 50V 470P	1	
C2007	ECEA0JK470	E. CAPACITOR 6.3V 47U	1	
C2008	ECEA1HK3R3	E. CAPACITOR 50V 3.3U	1	
C2009	VCYE1C104MR1	S. CAPACITOR 16V 0.1U	1	
C2010	ECEA0JK221	E. CAPACITOR 6.3V 220U	1	
C2011_12	ECUM1H222KBN	C. CAPACITOR CH 50V 2200P	2	
C2013_14	ECEA1HK3R3	E. CAPACITOR 50V 3.3U	2	
C2015	ECEA1HKR47	E. CAPACITOR 50V 0.47U	1	
C2016	EQQB1H472JH	P. CAPACITOR 50V 4700P	1	
C2017	EQQV1H184JZ	P. CAPACITOR 50V 0.18U	1	
C2019	EQQV1H683JZ	P. CAPACITOR 50V 0.068U	1	
C2020	ECUM1H1032FN	C. CAPACITOR CH 50V 0.01U	1	
C2021	ECEA1AK470	E. CAPACITOR 10V 47U	1	
C2022	ECUM1H223KBN	C. CAPACITOR CH 50V 0.022U	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C2023, 24	ECUM1H101JCN	C. CAPACITOR CH 50V 100P	2	
C2025	ECUM1H103KBN	C. CAPACITOR CH 50V 0.01U	1	
C2026	ECUM1H472KBN	C. CAPACITOR CH 50V 4700P	1	
C2027	ECEA1CK100	E. CAPACITOR 16V 10U	1	
C2028	ECUM1H470JCN	C. CAPACITOR CH 50V 47P	1	
C2029	ECQB1H392JH	P. CAPACITOR 50V 3900P	1	
C2501	ECEA1CK101	E. CAPACITOR 16V 100U	1	
C2502	ECAOJM221	E. CAPACITOR 6.3V 220U	1	
C2503, 04	ECQV1H333JZ	P. CAPACITOR 50V 0.033U	2	
C2505	ECEA1CU470	E. CAPACITOR 16V 47U	1	
C2506-09	ECQV1H333JZ	P. CAPACITOR 50V 0.033U	4	
C2510-12	ECEA1HK2R2	E. CAPACITOR 50V 2.2U	3	
C2513, 14	ECUM1C105EFN	C. CAPACITOR 16V 1U	2	
C2515	ECEAOJK470	E. CAPACITOR 6.3V 47U	1	
C2516	ECEA1HK4R7	E. CAPACITOR 50V 4.7U	1	
C2517	ECUM1H101JCN	C. CAPACITOR CH 50V 100P	1	
C2518	ECEA1HK4R7	E. CAPACITOR 50V 0.47U	1	
C2519	ECUM1H101JCN	C. CAPACITOR CH 50V 100P	1	
C2520	ECEA1HK4R7	E. CAPACITOR 50V 0.47U	1	
C2521	ECEA1EM470	E. CAPACITOR 25V 47U	1	
C2522	ECUM1H104ZFN	C. CAPACITOR CH 50V 0.1U	1	
C2524, 25	ECA1CM221	E. CAPACITOR 16V 220U	2	
C2526	ECEAOJK220	E. CAPACITOR 6.3V 22U	1	
C2527	ECUM1H102KBN	C. CAPACITOR CH 50V 1000P	1	
C2528	ECUM1H104ZFN	C. CAPACITOR CH 50V 0.1U	1	
C2529	ECUM1E224ZFN	C. CAPACITOR CH 25V 0.22U	1	
C2530	ECUM1E223KBN	C. CAPACITOR CH 25V 0.023U	1	
C2531	VCYE1C104R1S	S. CAPACITOR 16V 0.1U	1	
C3001	ECEAOJK470	E. CAPACITOR 6.3V 47U	1	
C3002	ECUM1H104ZFN	C. CAPACITOR CH 50V 0.1U	1	
C3003-05	ECEA1CK100	E. CAPACITOR 16V 10U	3	
C3006-08	ECUM1H104ZFN	C. CAPACITOR CH 50V 0.1U	3	
C3009	ECEA1HK010	E. CAPACITOR 50V 1U	1	
C3010	ECEA1CK100	E. CAPACITOR 16V 10U	1	
C3011	ECEAOJK470	E. CAPACITOR 6.3V 47U	1	
C3012, 13	ECUM1H104ZFN	C. CAPACITOR CH 50V 0.1U	2	
C3014, 15	ECEAOJK470	E. CAPACITOR 6.3V 47U	2	
C3016	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	1	
C3017, 18	ECEA1CK100	E. CAPACITOR 16V 10U	2	
C3019, 20	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	2	
C3023	ECEA1CK470	E. CAPACITOR 16V 47U	1	
C3024	ECUM1H104ZFN	C. CAPACITOR CH 50V 0.1U	1	
C3025	ECEA1HK010	E. CAPACITOR 50V 1U	1	
C3026	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	1	
C3027, 28	ECEA1HK010	E. CAPACITOR 50V 1U	2	
C3029	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	1	
C3033	ECEA1CK100	E. CAPACITOR 16V 10U	1	
C3034	ECAOJM331	E. CAPACITOR 6.3V 330U	1	
C3035	ECEA1CK100	E. CAPACITOR 16V 10U	1	
C3036	ECAOJM331	E. CAPACITOR 6.3V 330U	1	
C3037	ECEA1HK010	E. CAPACITOR 50V 1U	1	
C3038	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	1	
C3039	ECUM1H104ZFN	C. CAPACITOR CH 50V 0.1U	1	
C3040	ECAOJM221	E. CAPACITOR 6.3V 220U	1	
C3041	ECEA1AKM470	E. CAPACITOR 10V 47U	1	
C3042	ECEA1CK470	E. CAPACITOR 16V 47U	1	
C3043	ECUM1H104ZFN	C. CAPACITOR CH 50V 0.1U	1	
C3045	ECCF1H101JC	C. CAPACITOR 50V 100P	1	
C3901-03	ECEA1CK100	E. CAPACITOR 16V 10U	3	
C3904	ECEAOJK470	E. CAPACITOR 6.3V 47U	1	
C3910	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	1	
C4001	ECEAOJK101	E. CAPACITOR 6.3V 100U	1	
C4002, 03	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	2	
C4005	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	1	
C4006	ECEAOJK470	E. CAPACITOR 6.3V 47U	1	
C4007	ECEA16M33	E. CAPACITOR 16V 33U	1	
C4008	ECQB1H103JH	P. CAPACITOR 50V 0.01U	1	
C4009	ECUM1H102KBN	C. CAPACITOR CH 50V 1000P	1	
C4010	ECQP1222JZ	P. CAPACITOR 0.0022U	1	
C4011	ECCD2H181J	C. CAPACITOR 500V 180P	1	
C4013	ECQV1H104JZ	P. CAPACITOR 50V 0.1U	1	
C4014, 15	ECEA1CK100	E. CAPACITOR 16V 10U	2	
C4016	ECEA1HK2R2	E. CAPACITOR 50V 2.2U	1	
C4017	ECUM1H471KBN	C. CAPACITOR CH 50V 470P	1	
C4018	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C4019	ECUM1H222JUN	C. CAPACITOR CH 50V 2200P	1	
C4020, 21	ECUM1H224ZFM	C. CAPACITOR CH 50V 0.22U	2	
C4023	ECEA1CK100	E. CAPACITOR 16V 10U	1	
C4024	ECUM1H104ZFN	C. CAPACITOR CH 50V 0.1U	1	
C4901, 02	ECUM1H222KBN	C. CAPACITOR CH 50V 2200P	2	
C4905, 06	VCEAOJAC101	E. CAPACITOR 6.3V 100U	2	
C4907, 08	ECUM1H222KBN	C. CAPACITOR CH 50V 2200P	2	
C6001	ECEAOJK330	E. CAPACITOR 6.3V 33U	1	
C6002	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	1	
C6003, 04	ECEAOJK470	E. CAPACITOR 6.3V 47U	2	
C6005	ECQV1H104JZ	P. CAPACITOR 50V 0.1U	1	
C6006	ECQB1H392JH	P. CAPACITOR 50V 3900P	1	
C6007	ECUM1H104ZFN	C. CAPACITOR CH 50V 0.1U	1	
C6009, 10	ECUM1H180JCN	C. CAPACITOR CH 50V 18P	2	
C6014	ECAOJM331	E. CAPACITOR 6.3V 330U	1	
C6015	ECEAOJK470	E. CAPACITOR 6.3V 47U	1	
C6016	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	1	
C6017	ECA1CM222	E. CAPACITOR 16V 220U	1	
C6018	ECUM1H104ZFN	C. CAPACITOR CH 50V 0.1U	1	
C6019	ECEAOJK220	E. CAPACITOR 6.3V 22U	1	
C6020, 21	ECUM1H104ZFN	C. CAPACITOR CH 50V 0.1U	2	
C6022, 23	ECUM1H271JCN	C. CAPACITOR CH 50V 270P	2	
C6024	ECUM1H104ZFN	C. CAPACITOR CH 50V 0.1U	1	
C6025	ECEA1HK2R2	E. CAPACITOR 50V 2.2U	1	
C6101	ECEAOJK470	E. CAPACITOR 6.3V 47U	1	
C6102	ECUM1H102KBN	C. CAPACITOR CH 50V 1000P	1	
C6103	ECAOJM221	E. CAPACITOR 6.3V 220U	1	
C6301	ECUM1H103KBN	C. CAPACITOR CH 50V 0.01U	1	
C6302	EECS5R5V105	TRIMMER	1	
C7301	ECEA1CK100	E. CAPACITOR 16V 10U	1	
C7302	ECEA1CKN100	E. CAPACITOR 16V 10U	1	
C7303	ECQB1H223JH	P. CAPACITOR 50V 0.022U	1	
C7304	ECEA1CK220	E. CAPACITOR 16V 22U	1	
C7305	ECEA1CK101	E. CAPACITOR 16V 100U	1	
C7306	ECEA1HK010	E. CAPACITOR 50V 1U	1	
C7307	ECEA1EK4R7	E. CAPACITOR 25V 4.7U	1	
C7308	ECEA1HK2R2	E. CAPACITOR 50V 2.2U	1	
C7309	ECEA1CK220	E. CAPACITOR 16V 22U	1	
C7310, 11	ECEA1CK100	E. CAPACITOR 16V 10U	2	
C7312	ECEA1CK220	E. CAPACITOR 16V 22U	1	
C7313, 14	ECQB1H273JH	P. CAPACITOR 50V 0.027U	2	
C7315	ECEA1CK470	E. CAPACITOR 16V 47U	1	
C7316	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	1	
C7317	ECEA1CK101	E. CAPACITOR 16V 100U	1	
C7318	ECEA1HKR22	E. CAPACITOR 50V 0.22U	1	
C7319	ECQB1H102JH	P. CAPACITOR 50V 1000P	1	
C7320	ECQV1H104JZ	P. CAPACITOR 50V 0.1U	1	
C7321	ECEA1HKR47	E. CAPACITOR 50V 0.47U	1	
C7322	ECQB1H103JH	P. CAPACITOR 50V 0.01U	1	
C7323	ECEA1CK220	E. CAPACITOR 16V 22U	1	
C7324	ECEA1EK4R7	E. CAPACITOR 25V 4.7U	1	
C7325-27	ECEA1HKR47	E. CAPACITOR 50V 0.47U	3	
C7328	ECSF1CE335	T. CAPACITOR 16V 3.3U	1	
C7329	ECSF1CE105	T. CAPACITOR 16V 1U	1	
C7330	ECEA1EK3R3	E. CAPACITOR 25V 3.3U	1	
C7331	ECSF1VE104	T. CAPACITOR 35V 0.1U	1	
C7351	ECEA1CK100	E. CAPACITOR 16V 10U	1	
C7352	ECEA1CKN100	E. CAPACITOR 16V 10U	1	
C7353	ECEA1CK100	E. CAPACITOR 16V 10U	1	
C7354	ECUM1H222KBN	C. CAPACITOR CH 50V 2200P	1	
C7355, 56	ECEA1EK3R3	E. CAPACITOR 25V 3.3U	2	
C7357	ECEA1CK100	E. CAPACITOR 16V 10U	1	
C7358	ECEA1AK470	E. CAPACITOR 10V 47U	1	
C7401	ECEA1CK100	E. CAPACITOR 16V 10U	1	
C7402, 03	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	2	
C7404	ECEA1CK100	E. CAPACITOR 16V 10U	1	
C7405, 06	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	2	
C7407	ECUM1H104ZFN	C. CAPACITOR CH 50V 0.1U	1	
C7408	ECEA1CK100	E. CAPACITOR 16V 10U	1	
C7409	ECUM1H104ZFN	C. CAPACITOR CH 50V 0.1U	1	
		DIODES		
D1006	1SS254	DIODE	1	
D1701	AK04	DIODE	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
D1702	MA4300H	DIODE	1	
D1703	MA185	DIODE	1	
D2002	1SS254	DIODE	1	
D2501	1SS254	DIODE	1	
D2503-10	1SS254	DIODE	8	
D2511	AK04	DIODE	1	
D2512	MA723VT	DIODE	1	
D2515	1SS254	DIODE	1	
D3001	MA723VT	DIODE	1	
D3003	MA723VT	DIODE	1	
D3006	MA723VT	DIODE	1	
D3007	1SS254	DIODE	1	
D3010	1SS254	DIODE	1	
D4005	1SS254	DIODE	1	
D6001	MA723VT	DIODE	1	
D6002	AK04	DIODE	1	
D6003,04	MA723VT	DIODE	2	
D6005,06	1SS254	DIODE	2	
D6007	ERA15-01	DIODE	1	
D6008	AK04	DIODE	1	
D6009-11	1SS254	DIODE	3	
D6013-15	1SS254	DIODE	3	
D6101,02	MA156	DIODE	2	
D6105	AK04	DIODE	1	
D6106-09	1SS254	DIODE	4	
D7401	MA723VT	DIODE	1	
D7403-05	1SS254	DIODE	3	
D7407	1SS254	DIODE	1	
		CONNECTORS		
FG	VJS1231R	CONNECTOR (FEMALE)	1	
		INTEGRATED CIRCUITS		
IC2001	AN3727S	IC	1	
IC2002	UPC358G2	IC	1	
IC2501	BA6435S	IC	1	
IC2502	UPC358G2	IC	1	
IC2503	SI-3090CLF	IC	1	
IC2504	TPIC0130N	IC	1	
IC3001,02	NJM2234MA	IC	2	
IC3003	M52055FP	IC	1	
IC3004	AN3581S	IC	1	
IC3901	NJM2234MA	IC	1	
IC4001	NJM4565DD	IC	1	
IC4901	MN4066BS	IC	1	
IC6001	MN67431VREQ	IC	1	
IC6002	MC14519BF	IC	1	
IC6003	BU5863F	IC	1	
IC6004	MN1280S	IC	1	
IC7301	UPC1870CA001	IC	1	
IC7302	M5201L	IC	1	
IC7401	M66006FP	IC	1	
		COILS		
L2001	ELESQ101KA	COIL 100UH	1	
L2002	VLPO099	COIL	1	
L2003	VLQ0569	COIL	1	
L2501	ELESQ102KA	COIL 1000UH	1	
L2502,03	ELESQ101KA	COIL 100UH	2	
L2505	VLQ0558K331	COIL 330UH	1	
L2506	ELC07B009	COIL	1	
L3001-03	ELESQ101KA	COIL 100UH	3	
L3005	ELESQ101KA	COIL 100UH	1	
L3007	ELESQ101KA	COIL 100UH	1	
L3008-11	VLQ0556	COIL	4	
L3901	VLQEL05F101K	COIL 100UH	1	
L3902,03	VLPO099	COIL	2	
L4001	ELESQ471KA	COIL 470UH	1	
L4002,03	ELESQ101KA	COIL 100UH	2	
L6001	VLPO074	COIL	1	
L7401-03	ELESQ101KA	COIL 100UH	3	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
		CONNECTORS		
P001	VJS1738	CONNECTOR (FEMALE)	1	
P501	VJS1238T	CONNECTOR (FEMALE)	1	
P501	VJS1743	CONNECTOR (FEMALE)	1	
P551	VJS1741	CONNECTOR (FEMALE)	1	
P1001	VJP2593	CONNECTOR (MALE)	1	
P1001	VJS2593	CONNECTOR (FEMALE)	1	
P1101	VJS1932T	CONNECTOR (FEMALE)	1	
P1103	VJS1142	CONNECTOR (FEMALE)	1	
P1502	VJS1141	CONNECTOR (FEMALE)	1	
P2002	VJP1232T	CONNECTOR (MALE) 5P	1	
P2002	VJS1738	CONNECTOR (FEMALE)	1	
P2003	VJP1229T	CONNECTOR (MALE) 2P	1	
P2501	VJS3193B015A	CONNECTOR (FEMALE)	1	
P2502	VJP1244T	CONNECTOR (MALE) 4P	1	
P2502	VJS1231R	CONNECTOR (FEMALE)	1	
P3001	VJP3078	CONNECTOR (MALE)	1	
P3001	VJS1743	CONNECTOR (FEMALE)	1	
P3001	VJS3078	CONNECTOR (FEMALE)	1	
P3004	VJP3081	CONNECTOR (MALE)	1	
P3004	VJS3081	CONNECTOR (FEMALE)	1	
P3005	VJP1231T	CONNECTOR (MALE) 4P	1	
P3005	VJS1737	CONNECTOR (FEMALE)	1	
P3006	VJP3080	CONNECTOR (MALE)	1	
P3006	VJS3080	CONNECTOR (FEMALE)	1	
P3007	VJP1229T	CONNECTOR (MALE) 2P	1	
P3007	VJS1735	CONNECTOR (FEMALE)	1	
P3301	VJS1735	CONNECTOR (FEMALE)	1	
P3951	VJF0171T	CONNECTOR	1	
P4001	VJP3103	CONNECTOR (MALE)	1	
P4002	VJP1235T	CONNECTOR (MALE) 8P	1	
P4002	VJS1741	CONNECTOR (FEMALE)	1	
P4003	VJP1229T	CONNECTOR (MALE) 2P	1	
P4003	VJS1229T	CONNECTOR (FEMALE)	1	
P4004	VJP3079	CONNECTOR (MALE)	1	
P4004	VJS3079	CONNECTOR (FEMALE)	1	
P6001	VJS3193A015A	CONNECTOR (FEMALE)	1	
P6004	VJS2571A004	CONNECTOR (FEMALE)	1	
P6501	VJS1744	CONNECTOR (FEMALE)	1	
P6502	VJS3079	CONNECTOR (FEMALE)	1	
P7403	VJS1744	CONNECTOR (FEMALE)	1	
P7501	VJS3193A016A	CONNECTOR (FEMALE)	1	
P7502	VJS1455	CONNECTOR (FEMALE)	1	
P7503	VJP3079	CONNECTOR (MALE)	1	
P9001	VJS3080	CONNECTOR (FEMALE)	1	
P9002	VJS1737	CONNECTOR (FEMALE)	1	
PK3021-24	VJRO190	PACK PIN	4	
PK7301,02	VJRO477	PACK PIN	2	
PP2501	VJP3043G010W	CONNECTOR (MALE)	1	
PP2502	VJP3043G008W	CONNECTOR (MALE)	1	
PP2503	VJP3043G012W	CONNECTOR (MALE)	1	
PP3001	VJP3044G009W	CONNECTOR (MALE)	1	
PP3002,03	VJP3044G012W	CONNECTOR (MALE)	2	
PP3011,12	VJP3042A018W	CONNECTOR (MALE)	2	
PP4001-03	VJP3186A018	CONNECTOR (MALE)	3	
PP7401-03	VJP3043A005W	CONNECTOR (MALE)	3	
PP7404	VJP3043A006W	CONNECTOR (MALE)	1	
PP7705	VJP3043A004W	CONNECTOR (MALE)	1	
PS2501	VJS3043B010W	CONNECTOR (FEMALE)	1	
PS2502	VJS3043F008W	CONNECTOR (FEMALE)	1	
PS2503	VJS3043F012W	CONNECTOR (FEMALE)	1	
		TRANSISTORS		
Q1001	2SD1996	TRANSISTOR	1	
Q1701	2SD973B-R	TRANSISTOR	1	
Q2001	2SD1915F	TRANSISTOR	1	
Q2003	MSD601-R	TRANSISTOR	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
Q2501	2SB772	TRANSISTOR	1	
Q3001,02	MSD601-R	TRANSISTOR	2	
Q3003	2SD1328	TRANSISTOR CHIP	1	
Q3005	MSC2295-B	TRANSISTOR	1	
Q3006	MSB709-R	TRANSISTOR	1	
Q3007	MSD601-R	TRANSISTOR	1	
Q4002	2SB790	TRANSISTOR	1	
Q4003	MSB709-R	TRANSISTOR	1	
Q4004	2SB790	TRANSISTOR	1	
Q4005	2SB1321	TRANSISTOR	1	
Q4006	2SD1992A-R	TRANSISTOR	1	
Q4007,08	MSD601-R	TRANSISTOR	2	
Q4011,12	MSD601-R	TRANSISTOR	2	
Q4015,16	2SD1328	TRANSISTOR CHIP	2	
Q6001	2SD1991	TRANSISTOR	1	
Q6003	2SD893	TRANSISTOR	1	
Q6004,05	2SD1994-S	TRANSISTOR	2	
Q6006	MSD602-R	TRANSISTOR	1	
Q6007,08	MSD601-R	TRANSISTOR	2	
Q6101	MSD601-R	TRANSISTOR	1	
Q6301,02	MSD601-R	TRANSISTOR	2	
Q7301	MSD601	TRANSISTOR	1	
Q7302	2SD1992-R	TRANSISTOR	1	
Q7303	MSD601	TRANSISTOR	1	
Q7351	MSD601	TRANSISTOR	1	
Q7352	MSB709-R	TRANSISTOR	1	
Q7353	2SD1328-S	TRANSISTOR	1	
Q7354	2SK198	TRANSISTOR CHIP	1	
Q7401	2SB1320	TRANSISTOR	1	
		COMBINATION PARTS		
QR1002	MRN1403	TRANSISTOR	1	
QR2001,02	MRN1403	TRANSISTOR	2	
QR2502	MRN1403	TRANSISTOR	1	
QR2503	MRN1404	TRANSISTOR	1	
QR2504	MRN2404	TRANSISTOR	1	
QR3008	DTC363EK	TRANSISTOR-RESISTOR	1	
QR3009	MRN2402	TRANSISTOR	1	
QR3010	MRN1402	TRANSISTOR	1	
QR3011	MRN1407	TRANSISTOR	1	
QR3012	MRN2402	TRANSISTOR	1	
QR3013	MRN1402	TRANSISTOR	1	
QR4001	MRN1404	TRANSISTOR	1	
QR4002	MRN1402	TRANSISTOR	1	
QR4003	MRN1403	TRANSISTOR	1	
QR4004,05	MRN1402	TRANSISTOR	2	
QR4006	MRN1404	TRANSISTOR	1	
QR4009,10	MRN1403	TRANSISTOR	2	
QR4012-14	MRN1404	TRANSISTOR	3	
QR4016	MRN1402	TRANSISTOR	1	
QR4017	MRN1404	TRANSISTOR	1	
QR4901	MRN1404	TRANSISTOR	1	
QR4902	UN211D	TRANSISTOR-RESISTOR	1	
QR6001,02	MRN2402	TRANSISTOR	2	
QR6003	MRN1402	TRANSISTOR	1	
QR6004	UN211H	TRANSISTOR	1	
QR6005	MRN2404	TRANSISTOR	1	
QR6006	UN211H	TRANSISTOR	1	
QR6007	MRN2404	TRANSISTOR	1	
QR6008	MRN2402	TRANSISTOR	1	
QR6009,10	MRN1404	TRANSISTOR	2	
QR6011	MRN1402	TRANSISTOR	1	
QR6013	MRN1402	TRANSISTOR	1	
QR6101	MRN1404	TRANSISTOR	1	
QR6102,03	MRN1402	TRANSISTOR	2	
QR6104	MRN1404	TRANSISTOR	1	
QR7351	UN2212	TRANSISTOR-RESISTOR	1	
QR7353	UN2213	TRANSISTOR-RESISTOR	1	
QR7354	UN2112	TRANSISTOR-RESISTOR	1	
QR7355	UN2212	TRANSISTOR-RESISTOR	1	
QR7356	UN2112	TRANSISTOR-RESISTOR	1	
QR7357	UN2213	TRANSISTOR-RESISTOR	1	
QR7358	UN2112	TRANSISTOR-RESISTOR	1	
QR7359	MRN2403	TRANSISTOR-RESISTOR	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
QR7401	MRN1404	TRANSISTOR	1	
QR7402	DTC124TK	TRANSISTOR-RESISTOR	1	
		RESISTORS		
R1002	ERDS2TJ822	C.RESISTOR 1/4W 8.2K	1	
R1003,04	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	2	
R1701	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R1702	ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	1	
R1703	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
R2001,02	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	2	
R2003	ERJ6GEYJ221	M.RESISTOR CH 1/10W 220	1	
R2005,06	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	2	
R2007	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R2008	ERJ6GEY0563	M.RESISTOR CH 1/10W 56K	1	
R2009	ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R2010	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R2011	ERDS2TJ391	C.RESISTOR 1/4W 390	1	
R2012	ERJ6GEYJ392	M.RESISTOR CH 1/10W 3.9K	1	
R2013	ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1	
R2014	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R2015	ERJ6GEYJ221	M.RESISTOR CH 1/10W 220	1	
R2016	ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1	
R2017	ERJ6GEYJ123	M.RESISTOR CH 1/10W 12K	1	
R2018	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R2021	ERJ6GEY0R00	M.RESISTOR CH 1/10W 0	1	
R2022,23	ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	2	
R2024	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R2025	ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1	
R2501	ERDS2TJ330	C.RESISTOR 1/4W 33	1	
R2502	ERJ6GEYJ133	M.RESISTOR CH 1/10W 13K	1	
R2503	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R2504	ERJ6GEYJ512	M.RESISTOR CH 1/10W 5.1K	1	
R2505	ERJ6GEYJ513	M.RESISTOR CH 1/10W 51K	1	
R2507	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R2508-10	ERDS2TJ560	C.RESISTOR 1/4W 56	3	
R2511,12	ERJ6GEYJ472	M.RESISTOR CH 1/10W 4.7K	2	
R2513	ERJ6GEYJ105	M.RESISTOR CH 1/10W 1M	1	
R2514	ERJ6GEYJ392	M.RESISTOR CH 1/10W 3.9K	1	
R2515	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R2516	ERJ6GEYJ105	M.RESISTOR CH 1/10W 1M	1	
R2517	ERJ6GEYJ333	M.RESISTOR CH 1/10W 33K	1	
R2520	ERDS2TJ681	C.RESISTOR 1/4W 680	1	
R2521	ERDS1TJ681	C.RESISTOR 1/2W 680	1	
R2522	ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	1	
R2523	ERJ6GEYJ123	M.RESISTOR CH 1/10W 12K	1	
R2524	ERJ6GEYJ393	M.RESISTOR CH 1/10W 39K	1	
R2525	ERJ6GEYJ124	M.RESISTOR CH 1/10W 120K	1	
R2526	ERJ6GEYJ333	M.RESISTOR CH 1/10W 33K	1	
R2528	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R2529	ERJ6GEYJ822	M.RESISTOR CH 1/10W 8.2K	1	
R2530	ERJ6GEYJ272	M.RESISTOR CH 1/10W 2.7K	1	
R2531	ERJ6GEYJ392	M.RESISTOR CH 1/10W 3.9K	1	
R2532	ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	1	
R2534	ERSF30JR90	M.RESISTOR 0.9	1	
R2535	ERJ6GEYJ392	M.RESISTOR CH 1/10W 3.9K	1	
R2537	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R2538	ERJ6GEYJ153	M.RESISTOR CH 1/10W 15K	1	
R2539	ERJ6GEYJ622	M.RESISTOR CH 1/10W 6.2K	1	
R2540	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R2541	ERJ6GEYJ472	M.RESISTOR CH 1/10W 4.7K	1	
R2542	ERX12SJR47	M.RESISTOR 1/2W 0.47	1	
R2543	ERJ6GEYJ824	M.RESISTOR CH 1/10W 820K	1	
R2544	ERJ6GEYJ272	M.RESISTOR CH 1/10W 2.7K	1	
R3003,04	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	2	
R3005	ERJ6GEYJ472	M.RESISTOR CH 1/10W 4.7K	1	
R3008	ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1	
R3009	ERJ6GEYJ562	M.RESISTOR CH 1/10W 5.6K	1	
R3010	ERJ6GEYJ561	M.RESISTOR CH 1/10W 560	1	
R3011	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R3012	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R3013	ERJ6GEYJ472	M.RESISTOR CH 1/10W 4.7K	1	
R3014	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R3015	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R3016	ERJ6GEYJ122	M.RESISTOR CH 1/10W 1.2K	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R3018, 19	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	2		R6027	ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	1	
R3020	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1		R6028	ERJ6GEYJ563	M.RESISTOR CH 1/10W 56K	1	
R3022, 23	ERJ6GEYG102	M.RESISTOR CH 1/10W 1K	2		R6029	ERJ6GEYJ561	M.RESISTOR CH 1/10W 560	1	
R3024	ERJ6GEYG471	M.RESISTOR CH 1/10W 470	1		R6030	ERJ6GEYJ271	M.RESISTOR CH 1/10W 270	1	
R3025	ERJ6GEYG102	M.RESISTOR CH 1/10W 1K	1		R6031	ERJ6GEYJ561	M.RESISTOR CH 1/10W 560	1	
R3029	ERJ6GEYJ682	M.RESISTOR CH 1/10W 6.8K	1		R6032	ERJ6GEYJ562	M.RESISTOR CH 1/10W 5.6K	1	
R3030	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1		R6033	ERJ6GEYJ221	M.RESISTOR CH 1/10W 220	1	
R3031	ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1		R6034	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R3032	ERJ6GEYJ202	M.RESISTOR CH 1/10W 2K	1		R6035	ERJ6GEYJ562	M.RESISTOR CH 1/10W 5.6K	1	
R3033	ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1		R6036	ERJ6GEYJ201	M.RESISTOR CH 1/10W 200	1	
R3034, 35	ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	2		R6037	ERG2SJ150	M.RESISTOR 2W 15	1	
R3037	ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1		R6038	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R3038	ERJ6GEYJ272	M.RESISTOR CH 1/10W 2.7K	1		R6039	ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	1	
R3040	ERJ6GEYJ750	M.RESISTOR CH 1/10W 75	1		R6040	ERD2FCG220	C.RESISTOR 2W 22	1	(1)
R3042	ERJ6GEYJ750	M.RESISTOR CH 1/10W 75	1		R6041	ERJ6GEYJ471	M.RESISTOR CH 1/10W 470	1	
R3043	ERJ6GEYJ472	M.RESISTOR CH 1/10W 4.7K	1		R6043, 44	ERJ6GEYJ272	M.RESISTOR CH 1/10W 2.7K	2	
R3044	ERJ6GEYOR00	M.RESISTOR CH 1/10W 0	1		R6045	ERJ6GEYJ221	M.RESISTOR CH 1/10W 220	1	
R3045	ERJ6GEYJ391	M.RESISTOR CH 1/10W 390	1		R6046	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R3901-05	ERJ6GEYJ750	M.RESISTOR CH 1/10W 75	5		R6047	ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	1	
R3907	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1		R6048, 49	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	2	
R3910-13	ERJ6GEYJ750	M.RESISTOR CH 1/10W 75	4		R6050, 51	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	2	
R4001	ERJ6GEYJ683	M.RESISTOR CH 1/10W 68K	1		R6052	ERJ6GEYJ683	M.RESISTOR CH 1/10W 68K	1	
R4003, 04	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	2		R6053	ERJ6GEYJ184	M.RESISTOR CH 1/10W 180K	1	
R4005	ERDS2TJ680	C.RESISTOR 1/4W 68	1		R6054	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R4006, 07	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	2		R6055	ERJ6GEYJ181	M.RESISTOR CH 1/10W 180	1	
R4008	ERDS2TJ680	C.RESISTOR 1/4W 68	1		R6057	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R4009	ERJ6GEYJ272	M.RESISTOR CH 1/10W 2.7K	1		R6058	ERJ6GEYJ131	M.RESISTOR CH 1/10W 130	1	
R4010	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1		R6059	ERJ6GEYJ272	M.RESISTOR CH 1/10W 2.7K	1	
R4012	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1		R6060, 61	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	2	
R4013	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1		R6062	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R4014	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1		R6063	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R4015	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1		R6064	ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	1	
R4018	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1		R6101	ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1	
R4019	ERJ6GEYJ153	M.RESISTOR CH 1/10W 15K	1		R6102	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R4022	ERJ6GEYJ100	M.RESISTOR CH 1/10W 10	1		R6108, 09	ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	2	
R4025	ERJ6GEYJ562	M.RESISTOR CH 1/10W 5.6K	1		R6110	ERJ6GEYJ183	M.RESISTOR CH 1/10W 18K	1	
R4026	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1		R6111	ERJ6GEYJ472	M.RESISTOR CH 1/10W 4.7K	1	
R4033	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1		R6201	ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	1	
R4034	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1		R6301	ERJ6GEYJ474	M.RESISTOR CH 1/10W 470K	1	
R4035	ERJ6GEYJ471	M.RESISTOR CH 1/10W 470	1		R6302	ERJ6GEYJ183	M.RESISTOR CH 1/10W 18K	1	
R4036	ERJ6GEYJ821	M.RESISTOR CH 1/10W 820	1		R6303	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R4037	ERJ6GEYJ562	M.RESISTOR CH 1/10W 5.6K	1		R6304	ERJ6GEYJ121	M.RESISTOR CH 1/10W 120	1	
R4038, 39	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	2		R7301	ERJ6GEYJ124	M.RESISTOR CH 1/10W 120K	1	
R4040	ERJ6GEYJ472	M.RESISTOR CH 1/10W 4.7K	1		R7302	ERJ6GEYJ333	M.RESISTOR CH 1/10W 33K	1	
R4041, 42	ERJ6GEYJ153	M.RESISTOR CH 1/10W 15K	2		R7303, 04	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	2	
R4044	ERJ6GEYJ433	M.RESISTOR CH 1/10W 43K	1		R7305	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R4045	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1		R7306	ERJ6GEYJ823	M.RESISTOR CH 1/10W 82K	1	
R4047	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1		R7307	ERJ6GEYJ474	M.RESISTOR CH 1/10W 470K	1	
R4048-51	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	4		R7308	ERJ6GEYJ333	M.RESISTOR CH 1/10W 33K	1	
R4052	ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1		R7309	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R4053	ERJ6GEYJ562	M.RESISTOR CH 1/10W 5.6K	1		R7310, 11	ERJ6GEYJ331	M.RESISTOR CH 1/10W 330	2	
R4054	ERJ6GEYJ153	M.RESISTOR CH 1/10W 15K	1		R7312, 13	ERJ6GEYJ561	M.RESISTOR CH 1/10W 560	2	
R4055	ERJ6GEYJ123	M.RESISTOR CH 1/10W 12K	1		R7314	ERDS2TJ471	C.RESISTOR 1/4W 470	1	
R4101	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1		R7315	ERJ6GEYJ122	M.RESISTOR CH 1/10W 1.2K	1	
R4102	ERJ6GEYJ272	M.RESISTOR CH 1/10W 2.7K	1		R7316	ERJ6GEYJ123	M.RESISTOR CH 1/10W 12K	1	
R4103	ERJ6GEYJ682	M.RESISTOR CH 1/10W 6.8K	1		R7317	ERJ6GEYJ472	M.RESISTOR CH 1/10W 4.7K	1	
R4104	ERJ6GEYJ822	M.RESISTOR CH 1/10W 8.2K	1		R7318	ERJ6GEYJ683	M.RESISTOR CH 1/10W 68K	1	
R4901, 02	ERJ6GEYJ221	M.RESISTOR CH 1/10W 220	2		R7319	ERJ6GEYJ333	M.RESISTOR CH 1/10W 33K	1	
R4903, 04	ERJ6GEYOR00	M.RESISTOR CH 1/10W 0	2		R7320	ERJ6GEYJ124	M.RESISTOR CH 1/10W 120K	1	
R4905, 06	ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	2		R7321	EROS2CKF5493	M.RESISTOR 1/4W 549K	1	
R4907, 08	ERJ6GEYJ221	M.RESISTOR CH 1/10W 220	2		R7351	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R6001	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1		R7352	ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	1	
R6002	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1		R7353	ERJ6GEYJ182	M.RESISTOR CH 1/10W 1.8K	1	
R6003	ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1		R7354	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R6004	ERJ6GEYJ122	M.RESISTOR CH 1/10W 1.2K	1		R7355	ERJ6GEYJ392	M.RESISTOR CH 1/10W 3.9K	1	
R6005	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1		R7356, 57	ERJ6GEYJ124	M.RESISTOR CH 1/10W 120K	2	
R6006, 07	ERJ6GEYJ333	M.RESISTOR CH 1/10W 33K	2		R7358, 59	ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	2	
R6008-10	ERJ6GEYJ561	M.RESISTOR CH 1/10W 560	3		R7360	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R6011	ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1		R7361	ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R6012	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1		R7362	ERJ6GEYJ563	M.RESISTOR CH 1/10W 56K	1	
R6013	ERDS2TJ103	C.RESISTOR 1/4W 10K	1		R7363	ERJ6GEYJ682	M.RESISTOR CH 1/10W 6.8K	1	
R6014-20	ERJ6GEYJ333	M.RESISTOR CH 1/10W 33K	7		R7364	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R6021	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1		R7365	ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	1	
R6022	ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	1		R7371	ERJ6GEYJ105	M.RESISTOR CH 1/10W 1M	1	
R6023	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1		R7372-77	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	6	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R7378	ERJ6GEYJ122	M.RESISTOR CH 1/10W 1.2K	1	
R7379	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R7380	ERJ6GEYJ682	M.RESISTOR CH 1/10W 6.8K	1	
R7398, 99	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	2	
R7401	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R7402	ERJ6GEYJ562	M.RESISTOR CH 1/10W 5.6K	1	
R7403	ERJ6GEYJ471	M.RESISTOR CH 1/10W 470	1	
R7405-13	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	9	
R7416, 17	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	2	
R7418	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R7420, 21	ERJ6GEYJ221	M.RESISTOR CH 1/10W 220	2	
R7422-24	ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	3	
		TRANSFORMERS		
T1701	VLT0683	TRANSFORMER	1	
T4001	EIQ7QF013Q	TRANSFORMER	1	
T7301, 02	EIL7QH010Q	TRANSFORMER	2	
		VARIABLE RESISTORS		
VR2001	EVNDKAA00B54	V.RESISTOR 50K	1	
VR2006	EVNDKAA00B15	V.RESISTOR 100K	1	
VR2011	EVNDKAA00B15	V.RESISTOR 100K	1	
VR2018, 19	EVNDKAA00B15	V.RESISTOR 100K	2	
VR3001-03	EVNDKAA00B23	V.RESISTOR 2K	3	
VR3004	VRV0148B473	V.RESISTOR	1	
VR4001	EVNDKAA00B25	V.RESISTOR 200K	1	
VR7301	EVNCBAA00B54	V.RESISTOR	1	
VR7302-04	EVNCBAA00B14	V.RESISTOR	3	
VR7305	EVNCBAA00B54	V.RESISTOR	1	
VR7306, 07	EVNCBAA00B15	V.RESISTOR	2	
VR7351-53	EVNCBAA00B53	V.RESISTOR	3	
		CRYSTAL OSCILLATORS		
X6001	V SX0415	CRYSTAL OSCILLATOR	1	
X6002	V SX0258	CRYSTAL OSCILLATOR	1	
X6003	V SQ0565	CRYSTAL OSCILLATOR	1	
		MISCELLANEOUS		
	VWJ0666	FLAT CARD CABLE (16P)	1	(MAIN-TIMER)
	VWJ0667	FLAT CARD CABLE (18P)	1	(MAIN-TIMER)
	VWJ04NB0800Q	FLAT CARD CABLE	1	(P6002-P1101)
	VWC0075	HEAT SINK SPRING	1	FOR SERVO PACK C.B.A
	VSC2734	IC HEAT SINK	1	FOR SERVO PACK C.B.A
	VMZ1352	HEAT SINK COVER	1	FOR SERVO PACK C.B.A
	VEJ1231	JACK PLATE UNIT	1	FOR INPUT/OUTPUT
		LUMINANCE & CHROMINANCE		(RTL)
	VEPO3894C	PACK C.B.A.		
		CAPACITORS		
C301	ECUM1H270JCN	C.CAPACITOR CH 50V 27P	1	
C303	ECUM1H270JCN	C.CAPACITOR CH 50V 27P	1	
C305	ECUM1H1042FN	C.CAPACITOR CH 50V 0.1U	1	
C306	ECUM1H1032FN	C.CAPACITOR CH 50V 0.01U	1	
C307	ECUM1H050CCN	C.CAPACITOR CH 50V 5P	1	
C308	ECEAOJK101	E.CAPACITOR 6.3V 100U	1	
C309	ECUM1H1042FN	C.CAPACITOR CH 50V 0.1U	1	
C310	ECEAOJK101	E.CAPACITOR 6.3V 100U	1	
C311	ECUM1H1042FN	C.CAPACITOR CH 50V 0.1U	1	
C312	ECEA1EK4R7	E.CAPACITOR 25V 4.7U	1	
C319	ECEA1CK100	E.CAPACITOR 16V 10U	1	
C320	ECUM1H150JCN	C.CAPACITOR CH 50V 15P	1	
C321, 22	ECUM1H820JCN	C.CAPACITOR CH 50V 82P	2	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C323	ECUM1H1042FN	C.CAPACITOR CH 50V 0.1U	1	
C324	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	1	
C325	ECEA1HK4R7	E.CAPACITOR 50V 4.7U	1	
C326	ECQV1H334JZ	P.CAPACITOR 50V 0.33U	1	
C327-30	ECUM1H1032FN	C.CAPACITOR CH 50V 0.01U	4	
C331, 32	ECEA1CK100	E.CAPACITOR 16V 10U	2	
C333	ECEAOJK220	E.CAPACITOR 6.3V 22U	1	
C334-36	ECEA1CK100	E.CAPACITOR 16V 10U	3	
C337	ECEA1CK470	E.CAPACITOR 16V 47U	1	
C338	ECUM1H1042FN	C.CAPACITOR CH 50V 0.1U	1	
C339	ECEA1CK100	E.CAPACITOR 16V 10U	1	
C341	ECUM1H220JCN	C.CAPACITOR CH 50V- 22P	1	
C344	ECUM1H180JCN	C.CAPACITOR CH 50V 18P	1	
C345	ECUM1H562KBN	C.CAPACITOR CH 50V 5600P	1	
C806	ECUM1H1042FN	C.CAPACITOR CH 50V 0.1U	1	
C807	ECEAOJK101	E.CAPACITOR 6.3V 100U	1	
C808	ECUM1H151JCN	C.CAPACITOR CH 50V 150P	1	
C810	ECEA1HKZ2	E.CAPACITOR 50V 2.2U	1	
C811	ECEA1HK4R7	E.CAPACITOR 50V 4.7U	1	
C812	ECEA1HKZ2	E.CAPACITOR 50V 2.2U	1	
C813	ECQV1H823JZ	P.CAPACITOR 50V 0.082U	1	
C816	ECEA1EK4R7	E.CAPACITOR 25V 4.7U	1	
C817	ECEAOJK220	E.CAPACITOR 6.3V 22U	1	
C818	ECQV1H224JZ	P.CAPACITOR 50V 0.22U	1	
C819	ECUM1H1042FN	C.CAPACITOR CH 50V 0.1U	1	
C820	ECEAOJK101	E.CAPACITOR 6.3V 100U	1	
C823	ECQV1H154JZ	P.CAPACITOR 50V 0.15U	1	
C824	ECUM1H471KBN	C.CAPACITOR CH 50V 470P	1	
C826	ECUM1H820JCN	C.CAPACITOR CH 50V 82P	1	
C827	ECEA1HK010	E.CAPACITOR 50V 1U	1	
C828	ECEA1HK3R3	E.CAPACITOR 50V 3.3U	1	
C829	ECUM1H1032FN	C.CAPACITOR CH 50V 0.01U	1	
C833	ECUM1H1042FN	C.CAPACITOR CH 50V 0.1U	1	
C834	ECEAOJK101	E.CAPACITOR 6.3V 100U	1	
C835	ECUM1H390JCN	C.CAPACITOR CH 50V 39P	1	
C851	ECUM1H1032FN	C.CAPACITOR CH 50V 0.01U	1	
C853	ECCF1H560JC	C.CAPACITOR 50V 56P	1	
		DIODES		
D302	MA4091-M	DIODE	1	
D303	1SS254	DIODE	1	
D801	1SS254	DIODE	1	
		DELAYS		
DL802	VLDD132	DELAY	1	
		FILTERS		
FL301	VLFO639	FILTER	1	
FL302	ELB4M095	FILTER	1	
FL303	VLFO727	FILTER	1	
FL801	VLFO125	FILTER	1	
		INTEGRATED CIRCUITS		
IC301	VEFH20A	IC	1	
IC302	MSM6964-3RS	IC	1	
IC801	VCRO284	IC	1	
		COILS		
L301	VLQ0188J151	COIL 150UH	1	
L303	ELESQ101KA	COIL 100UH	1	
L304	VLQ0407101K	COIL 100UH	1	
L305, 06	ELESQ101KA	COIL 100UH	2	
L308	ELESQ180JA	COIL 18UH	1	
L803, 04	ELESQ101KA	COIL 100UH	2	
L805	VLQ0188J330	COIL 33UH	1	
L806, 07	ELESQ681KA	COIL 680UH	2	
L808	ELESQ331KA	COIL 330UH	1	
L810	VLQ0407101K	COIL 100UH	1	
L812, 13	VLQ0188J150	COIL 15UH	2	
L814	VLQ0188J470	COIL 47UH	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
		CONNECTORS		
PS3001	VJS3044FO09W	CONNECTOR (FEMALE)	1	
PS3002,03	VJS3044FO12W	CONNECTOR (FEMALE)	2	
		TRANSISTORS		
Q301-03	MSC2295-B	TRANSISTOR	3	
Q801	MSB709-R	TRANSISTOR	1	
Q802	MSD601-R	TRANSISTOR	1	
Q804	MSB709-R	TRANSISTOR	1	
		COMBINATION PARTS		
QR301	MRN2402	TRANSISTOR	1	
QR302	MRN1404	TRANSISTOR	1	
QR304,05	MRN1404	TRANSISTOR	2	
QR306	MRN1402	TRANSISTOR	1	
QR309	MRN2404	TRANSISTOR	1	
QR310	MRN1404	TRANSISTOR	1	
QR312	MRN1404	TRANSISTOR	1	
QR801	MRN1404	TRANSISTOR	1	
QR804	MRN1402	TRANSISTOR	1	
QR809	MRN1404	TRANSISTOR	1	
QR810	MRN2404	TRANSISTOR	1	
		RESISTORS		
R301,02	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	2	
R304	ERJ6GEYJ182	M.RESISTOR CH 1/10W 1.8K	1	
R308	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R309	ERJ6GEYJ471	M.RESISTOR CH 1/10W 470	1	
R310	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R311	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R320,21	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	2	
R322	ERJ6GEYJ561	M.RESISTOR CH 1/10W 560	1	
R323	ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1	
R324	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R325	ERJ6GEYJ183	M.RESISTOR CH 1/10W 18K	1	
R326	ERJ6GEYJ272	M.RESISTOR CH 1/10W 2.7K	1	
R327	ERJ6GEYJ822	M.RESISTOR CH 1/10W 8.2K	1	
R328	ERJ6GEYJ471	M.RESISTOR CH 1/10W 470	1	
R329	ERJ6GEYJ181	M.RESISTOR CH 1/10W 180	1	
R330	ERJ6GEYJ911	M.RESISTOR CH 1/10W 910	1	
R331	ERJ6GEYJ273	M.RESISTOR CH 1/10W 27K	1	
R332	ERJ6GEYJ822	M.RESISTOR CH 1/10W 8.2K	1	
R333	ERJ6GEYJ333	M.RESISTOR CH 1/10W 33K	1	
R334	ERJ6GEYJ273	M.RESISTOR CH 1/10W 27K	1	
R335	ERDS2TJ151	C.RESISTOR 1/4W 150	1	
R336	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R337	ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1	
R338	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R340	ERJ6GEYJ823	M.RESISTOR CH 1/10W 82K	1	
R341	ERJ6GEYJ471	M.RESISTOR CH 1/10W 470	1	
R343	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R345	ERDS2TJ823	C.RESISTOR 1/4W 82K	1	
R802	ERJ6GEYJ182	M.RESISTOR CH 1/10W 1.8K	1	
R803	ERJ6GEYJ183	M.RESISTOR CH 1/10W 18K	1	
R804	ERJ6GEYJ273	M.RESISTOR CH 1/10W 27K	1	
R805	ERJ6GEYJ122	M.RESISTOR CH 1/10W 1.2K	1	
R809	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R811	ERJ6GEYOR00	M.RESISTOR CH 1/10W 0	1	
R812	ERJ6GEYJ472	M.RESISTOR CH 1/10W 4.7K	1	
R813	ERJ6GEYJ682	M.RESISTOR CH 1/10W 6.8K	1	
R814	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R816	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R817	ERJ6GEYJ122	M.RESISTOR CH 1/10W 1.2K	1	
R819	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R821	ERJ6GEYJ822	M.RESISTOR CH 1/10W 8.2K	1	
R823	ERJ6GEYJ391	M.RESISTOR CH 1/10W 390	1	
R824	ERJ6GEYJ561	M.RESISTOR CH 1/10W 560	1	
R832,33	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	2	
R835	ERJ6GEYJ681	M.RESISTOR CH 1/10W 680	1	
R836	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R851	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
		VARIABLE RESISTORS		
VR301	EVN49CA00B23	V.RESISTOR	1	
VR302,03	EVN49CA00B13	V.RESISTOR	2	
VR304	EVMF6SA00B23	V.RESISTOR 2K	1	
VR801	EVND1AA00B14	V.RESISTOR 10K	1	
		CRYSTAL OSCILLATORS		
X301	VSK0296	CRYSTAL OSCILLATOR	1	
X801	VSK0160	CRYSTAL OSCILLATOR	1	
		VEPO3895C		
		SUB LUMINANCE & CHROMINANCE		(RTL)
		PACK C.B.A.		
		CAPACITORS		
C3301	ECUM1H100DCN	C.CAPACITOR CH 50V 10P	1	
C3302	ECUM1H820JCN	C.CAPACITOR CH 50V 82P	1	
C3304-08	ECUM1H1032FN	C.CAPACITOR CH 50V 0.01U	5	
C3309	ECUM1H1042FN	C.CAPACITOR CH 50V 0.1U	1	
C3310	ECEA0JK470	E.CAPACITOR 6.3V 47U	1	
C3314	ECUM1H1032FN	C.CAPACITOR CH 50V 0.01U	1	
C3321	ECUM1H1042FN	C.CAPACITOR CH 50V 0.1U	1	
C3322	ECUM1H180JCN	C.CAPACITOR CH 50V 18P	1	
C3323	ECUM1H1032FN	C.CAPACITOR CH 50V 0.01U	1	
C3324	ECUM1H150JCN	C.CAPACITOR CH 50V 15P	1	
C3325	ECUM1H1032FN	C.CAPACITOR CH 50V 0.01U	1	
C3326	ECUM1H150JCN	C.CAPACITOR CH 50V 15P	1	
C3327,28	ECUM1H1032FN	C.CAPACITOR CH 50V 0.01U	2	
C3329	ECEA0JK470	E.CAPACITOR 6.3V 47U	1	
C3330	ECUM1H1042FN	C.CAPACITOR CH 50V 0.1U	1	
C3331	ECUM1H270JCN	C.CAPACITOR CH 50V 27P	1	
C3332	ECUM1H331JCN	C.CAPACITOR CH 50V 330P	1	
C3334	ECUM1H1032FN	C.CAPACITOR CH 50V 0.01U	1	
C3335	ECUM1H560JCN	C.CAPACITOR CH 50V 56P	1	
C3336	ECUM1H1042FN	C.CAPACITOR CH 50V 0.1U	1	
C3337	ECUM1H060DCN	C.CAPACITOR CH 50V 6P	1	
C3338	ECUM1H1032FN	C.CAPACITOR CH 50V 0.01U	1	
C3339	ECUM1H330JCN	C.CAPACITOR CH 50V 33P	1	
C3340	ECUM1H101JCN	C.CAPACITOR CH 50V 100P	1	
C3341	ECUM1H1032FN	C.CAPACITOR CH 50V 0.01U	1	
C3342	ECUM1H680JCN	C.CAPACITOR CH 50V 68P	1	
C3343	ECUM1H1032FN	C.CAPACITOR CH 50V 0.01U	1	
C3344	ECUM1H560JCN	C.CAPACITOR CH 50V 56P	1	
C3345	ECUM1H391KCN	C.CAPACITOR CH 50V 390P	1	
C3346	ECUM1H1032FN	C.CAPACITOR CH 50V 0.01U	1	
C3347	ECUM1H390JCN	C.CAPACITOR CH 50V 39P	1	
C3349	ECUM1H1042FN	C.CAPACITOR CH 50V 0.1U	1	
C3350	ECUM1H331JCN	C.CAPACITOR CH 50V 330P	1	
C3351,52	ECUM1H221JCN	C.CAPACITOR CH 50V 220P	2	
C3353	ECUM1H180JCN	C.CAPACITOR CH 50V 18P	1	
C3354	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	1	
C3355	ECUM1H330JCN	C.CAPACITOR CH 50V 33P	1	
C3356	ECUM1H180JCN	C.CAPACITOR CH 50V 18P	1	
C3357	ECUM1H1032FN	C.CAPACITOR CH 50V 0.01U	1	
C3358	ECUM1H100DCN	C.CAPACITOR CH 50V 10P	1	
C3359	ECEA0JK101	E.CAPACITOR 6.3V 100U	1	
C3360	ECUM1H1042FN	C.CAPACITOR CH 50V 0.1U	1	
C3361	ECUM1H060DCN	C.CAPACITOR CH 50V 6P	1	
C3362,63	ECUM1H1032FN	C.CAPACITOR CH 50V 0.01U	2	
C3364	ECEA0JK470	E.CAPACITOR 6.3V 47U	1	
C3365	ECEA1CK470	E.CAPACITOR 16V 47U	1	
C3366	ECUM1H1042FN	C.CAPACITOR CH 50V 0.1U	1	
C3371	ECEA0JK220	E.CAPACITOR 6.3V 22U	1	
C3372	ECEA1EK3R3	E.CAPACITOR 25V 3.3U	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
C3373, 74	ECEA1CKN100	E. CAPACITOR 16V 10U	2	
C3382	ECUM1H220JCN	C. CAPACITOR CH 50V 22P	1	
C3801	ECUM1H104ZFN	C. CAPACITOR CH 50V 0.1U	1	
C3802	ECEAOJK101	E. CAPACITOR 6.3V 100U	1	
C3804	ECUM1H330JCN	C. CAPACITOR CH 50V 33P	1	
C3805, 06	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	2	
C3807	ECUM1H180JCN	C. CAPACITOR CH 50V 18P	1	
C3808, 09	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	2	
C3810	ECEA1HK3R3	E. CAPACITOR 50V 3.3U	1	
C3811, 12	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	2	
C3813	ECUM1H471KBN	C. CAPACITOR CH 50V 470P	1	
C3814	ECUM1H390JCN	C. CAPACITOR CH 50V 39P	1	
C3816-18	ECUM1H103ZFN	C. CAPACITOR CH 50V 0.01U	3	
		DIODES		
D3301-03	1SS254	DIODE	3	
D3304	MA723VT	DIODE	1	
D3305	1SS254	DIODE	1	
		DELAYS		
DL3801	VLDO223	DELAY	1	
DL3802	VLDO224	DELAY	1	
		FILTERS		
FL3304	VLFO838	FILTER	1	
FL3305, 06	VLFO839	FILTER	2	
		INTEGRATED CIRCUITS		
IC3301	M52083FP	IC	1	
IC3303	VCR0320	IC	1	
IC3304	NJM2235MA	IC	1	
IC3801	AN3497SB	IC	1	
		COILS		
L3301	VLQ0188J150	COIL 15UH	1	
L3306	VLQ0188J390	COIL 39UH	1	
L3307	VLQ0188J120	COIL 12UH	1	
L3308	VLQ0188J330	COIL 33UH	1	
L3309	VLQ0188J181	COIL 180UH	1	
L3310	VLQ0188J390	COIL 39UH	1	
L3312	VLQ0188J181	COIL 180UH	1	
L3313	ELESE681KA	COIL 680UH	1	
L3314	VLQ0188J181	COIL 180UH	1	
L3315, 16	VLQ0188J5R6	COIL 5.6UH	2	
L3317	VLQ0188J120	COIL 12UH	1	
L3318, 19	ELESQ101KA	COIL 100UH	2	
L3320, 21	VLPO083	FILTER	2	
L3322, 23	ELESQ101KA	COIL 100UH	2	
L3801	ELESQ101KA	COIL 100UH	1	
L3802, 03	VLQ0188J150	COIL 15UH	2	
L3804	VLQ0188J151	COIL 150UH	1	
L3805	VLQ0188J270	COIL 27UH	1	
L3806, 07	VLQ0188J180	COIL 18UH	2	
		CONNECTORS		
P3301	VJP1229T	CONNECTOR (MALE) 2P	1	
PS3011, 12	VJS3042F018W	CONNECTOR (FEMALE)	2	
		TRANSISTORS		
Q3301, 02	MSC2295-B	TRANSISTOR	2	
Q3304, 05	MSD601-R	TRANSISTOR	2	
Q3306	MSB709-R	TRANSISTOR	1	
Q3307, 08	MSC2295-B	TRANSISTOR	2	
Q3309	MSD601-R	TRANSISTOR	1	
Q3311	MSC2295-B	TRANSISTOR	1	
Q3312, 13	2SA1022	TRANSISTOR CHIP	2	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
Q3314	2SA1022	TRANSISTOR	1	
Q3315, 16	MSC2295-B	TRANSISTOR	2	
Q3317	MSD601-R	TRANSISTOR	1	
Q3320	MSD601-R	TRANSISTOR	1	
Q3801, 02	MSD601-R	TRANSISTOR	2	
Q3803	MSB709-R	TRANSISTOR	1	
		COMBINATION PARTS		
QR3301-04	DTC363EK	COMBI. TR-R	4	
QR3305	MNN2403	TRANSISTOR-RESISTOR	1	
QR3306	DTC363EK	TRANSISTOR-RESISTOR	1	
		RESISTORS		
R3301	ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	1	
R3302	ERJ6GEYJ183	M.RESISTOR CH 1/10W 18K	1	
R3303	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R3304	ERJ6GEYJ472	M.RESISTOR CH 1/10W 4.7K	1	
R3305	ERJ6GEYJ562	M.RESISTOR CH 1/10W 5.6K	1	
R3306	ERJ6GEYJ472	M.RESISTOR CH 1/10W 4.7K	1	
R3308	ERJ6GEYJ272	M.RESISTOR CH 1/10W 2.7K	1	
R3320	ERJ6GEYOR00	M.RESISTOR CH 1/10W 0	1	
R3322	ERJ6GEYJ471	M.RESISTOR CH 1/10W 470	1	
R3323	ERJ6GEYJ561	M.RESISTOR CH 1/10W 560	1	
R3324	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R3325, 26	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	2	
R3327	ERJ6GEYJ821	M.RESISTOR CH 1/10W 820	1	
R3328, 29	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	2	
R3330	ERJ6GEYOR00	M.RESISTOR CH 1/10W 0	1	
R3331	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R3333	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R3334	ERJ6GEYJ682	M.RESISTOR CH 1/10W 6.8K	1	
R3335	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R3336, 37	ERJ6GEYJ681	M.RESISTOR CH 1/10W 680	2	
R3338	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R3339	ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	1	
R3340	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R3341	ERJ6GEYJ563	M.RESISTOR CH 1/10W 56K	1	
R3342	ERJ6GEYJ821	M.RESISTOR CH 1/10W 820	1	
R3343	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R3344-47	ERJ6GEYJ821	M.RESISTOR CH 1/10W 820	4	
R3348	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R3349	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R3350	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R3351	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R3352	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R3357	ERJ6GEYJ561	M.RESISTOR CH 1/10W 560	1	
R3358	ERJ6GEYJ151	M.RESISTOR CH 1/10W 150	1	
R3359, 60	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	2	
R3361	ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	1	
R3362	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R3363	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R3364	ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	1	
R3365	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R3367	ERJ6GEYJ563	M.RESISTOR CH 1/10W 56K	1	
R3368	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R3369	ERJ6GEYJ122	M.RESISTOR CH 1/10W 1.2K	1	
R3370	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R3371	ERJ6GEYJ682	M.RESISTOR CH 1/10W 6.8K	1	
R3375, 76	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	2	
R3377	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	1	
R3378	ERJ6GEYJ562	M.RESISTOR CH 1/10W 5.6K	1	
R3379	ERJ6GEYJ821	M.RESISTOR CH 1/10W 820	1	
R3380	ERJ6GEYJ272	M.RESISTOR CH 1/10W 2.7K	1	
R3381	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R3390	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R3392	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R3393	ERJ6GEYJ222	M.RESISTOR CH 1/10W 2.2K	1	
R3394	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R3802	ERJ6GEYOR00	M.RESISTOR CH 1/10W 0	1	
R3803	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R3804	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R3806	ERJ6GEYJ681	M.RESISTOR CH 1/10W 680	1	
R3807	ERJ6GEYJ122	M.RESISTOR CH 1/10W 1.2K	1	

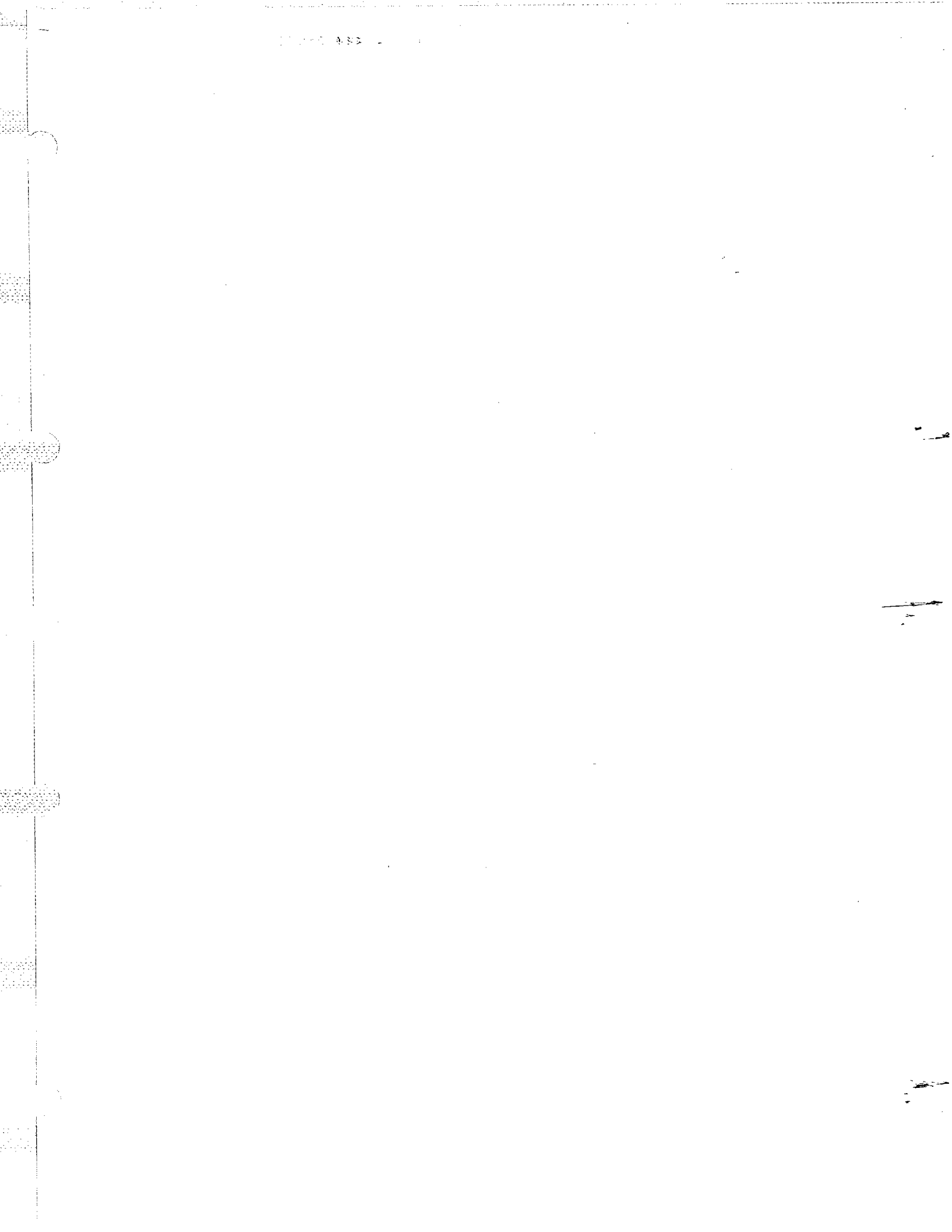
Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
P7502	VJS3193F016A	CONNECTOR (FEMALE)	1				CAPACITORS		
P7503	VJS2357A020	CONNECTOR (FEMALE)	1		C7501	ECEA1HK100	E.CAPACITOR 50V 10U	1	
P7504	VJP2621	CONNECTOR (MALE)	1		C7502,03	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2	
					C7504	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
		COMBINATION PARTS			C7505	ECEA0JKS330	E.CAPACITOR 6.3V 33U	1	
QR7501,02	MRN2403	TRANSISTOR-RESISTOR	2		C7506	ECUM1H223ZFN	C.CAPACITOR CH 50V 0.022U	1	
QR7503	MRN2402	TRANSISTOR	1		C7507	ECEA1EKS4R7	E.CAPACITOR 25V 4.7U	1	
QR7504	MRN1404	TRANSISTOR	1		C7508	ECEA0JK221	E.CAPACITOR 6.3V 220U	1	
					C7509	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
					C7510	ECUM1H050CCN	C.CAPACITOR CH 50V 5P	1	
		RESISTORS			C7511	ECRHA030E41	TRIMMER 3P	1	
R7504	ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1		C7512	ECUM1H330JCN	C.CAPACITOR CH 50V 33P	1	
R7505	ERJ6GEYJ821	M.RESISTOR CH 1/10W 820	1		C7513	ECUM1H220JCN	C.CAPACITOR CH 50V 22P	1	
R7506	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1		C7514	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
R7508	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1		C7515	ECUM1H821JCN	C.CAPACITOR CH 50V 820P	1	
R7509	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1		C7516	ECUM1H560JCN	C.CAPACITOR CH 50V 56P	1	
R7510-12	ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	3		C7517	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
R7513	ERJ6GEYJ331	M.RESISTOR CH 1/10W 330	1		C7519	ECEA0JKS470	E.CAPACITOR 6.3V 47U	1	
R7514	ERJ6GEYJ224	M.RESISTOR CH 1/10W 220K	1		C7520	ECUM1H104ZFN	C.CAPACITOR CH 50V 0.1U	1	
R7515	ERJ6GEYJ221	M.RESISTOR CH 1/10W 220	1		C7521	ECEA0JKS470	E.CAPACITOR 6.3V 47U	1	
R7516	ERJ6GEYJ683	M.RESISTOR CH 1/10W 68K	1		C7523-36	ECUM1H270JCN	C.CAPACITOR CH 50V 27P	14	
R7517-20	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	4		C7537,38	ECUM1H103ZFN	C.CAPACITOR CH 50V 0.01U	2	
R7521	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1		C7539,40	ECUM1H270JCN	C.CAPACITOR CH 50V 27P	2	
R7522,23	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	2		C7541	ECEA1EKS4R7	E.CAPACITOR 25V 4.7U	1	
R7524-26	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	3		C7542,43	ECUM1H270JCN	C.CAPACITOR CH 50V 27P	2	
R7528,29	ERJ6GEYJ000	M.RESISTOR CH 1/10W 0	2		C7544,45	ECQB1H473JH	P.CAPACITOR 50V 0.047U	2	
R7530	ERJ6GEYJ181	M.RESISTOR CH 1/10W 180	1						
R7532,33	ERJ6GEYJ181	M.RESISTOR CH 1/10W 180	2				DIODES		
R7535	ERJ6GEYJ181	M.RESISTOR CH 1/10W 180	1		D7501	MA3068	DIODE	1	
R7536	ERJ6GEYJ390	M.RESISTOR CH 1/10W 39	1		D7502	MA73	DIODE	1	
R7543,44	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	2		D7509-17	MA73	DIODE	9	
R7545	ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	1		D7521	MA73	DIODE	1	
R7546-48	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	3		D7523,24	MA73	DIODE	2	
R7549	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1		D7526	MA73	DIODE	1	
R7550-54	ERJ6GEYJ822	M.RESISTOR CH 1/10W 8.2K	5		D7529	MA73	DIODE	1	
R7555	ERJ6GEYJ392	M.RESISTOR CH 1/10W 3.9K	1		D7533	MA73	DIODE	1	
R7556,57	ERJ6GEYJ822	M.RESISTOR CH 1/10W 8.2K	2		D7535	MA73	DIODE	1	
R7558,59	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	2		D7538	MA73	DIODE	1	
R7561-69	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	9		D7543-45	LN28RCPL	DIODE	3	
R7570	ERJ6GEYJ272	M.RESISTOR CH 1/10W 2.7K	1		D7547,48	LN28RCPL	DIODE	2	
R7571,72	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	2		D7550	LN48YCPL	DIODE	1	
					D7551	VLL0062	DIODE	1	
					D7556,57	MA73	DIODE	2	
		COMBINATION PARTS					DISPLAY TUBES		
RX7501	EXBF11E104J	COMBI.R-R	1		DP7501	VSL0146	DISPLAY TUBE	1	
RX7502	EXBF8E104J	COMBI.R-R	1						
							INTEGRATED CIRCUITS		
		VARIABLE RESISTORS			IC7501	MN187164VLT	IC	1	
VR7501	EVNDXAA00B53	V.RESISTOR 5K	1		IC7502	BA6810S	IC	1	
					IC7503	M6NB0011AP	IC	1	
		CRYSTAL OSCILLATORS			IC7505	MN1280-K	IC	1	
X7501	VSX0484	CRYSTAL OSCILLATOR	1		IC7506	MN1280S	IC	1	
X7502	VSX0094	CRYSTAL OSCILLATOR	1		IC7507	M34225V1AH	IC	1	
X7503	EFOGC3584A5	CRYSTAL OSCILLATOR	1						
							COILS		
		MISCELLANEOUS			L7501	ELESQ221KA	COIL 220UH	1	
	VEK5789	IR RECEIVER UNIT	1	(RTL)					
	VJFO693	FIP HOLDER	1				CONNECTORS		
	VJFO740	LED SPACER	1		P7501	VJS3193F018A	CONNECTOR (FEMALE)	1	
	WMD1342	LED SPACER	1		P7502	VJS3193F016A	CONNECTOR (FEMALE)	1	
					P7503	VJS2357A020	CONNECTOR (FEMALE)	1	
					P7504	VJP2621	CONNECTOR (MALE)	1	
							COMBINATION PARTS		
	VEP07664K	TIMER C.B.A.		(RTL)AG-1970P	QR7501,02	MRN2403	TRANSISTOR-RESISTOR	2	
					QR7503	MRN2402	TRANSISTOR	1	
					QR7504	MRN1404	TRANSISTOR	1	

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
		RESISTORS		
R6701	ERJ6ENF1363	M.RESISTOR CH 1/10W 36K	1	
R7504	ERJ6GEYJ104	M.RESISTOR CH 1/10W 100K	1	
R7505	ERJ6GEYJ821	M.RESISTOR CH 1/10W 820	1	
R7506	ERJ6GEYJ152	M.RESISTOR CH 1/10W 1.5K	1	
R7508	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	1	
R7509	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R7510-12	ERJ6GEYJ473	M.RESISTOR CH 1/10W 47K	3	
R7513	ERJ6GEYJ331	M.RESISTOR CH 1/10W 330	1	
R7514	ERJ6GEYJ224	M.RESISTOR CH 1/10W 220K	1	
R7515	ERJ6GEYJ221	M.RESISTOR CH 1/10W 220	1	
R7516	ERJ6GEYJ683	M.RESISTOR CH 1/10W 68K	1	
R7517-20	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	4	
R7521	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	1	
R7522, 23	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	2	
R7524-26	ERJ6GEYJ103	M.RESISTOR CH 1/10W 10K	3	
R7528, 29	ERJ6GZOR00	M.RESISTOR CH 1/10W 0	2	
R7530	ERJ6GEYJ181	M.RESISTOR CH 1/10W 180	1	
R7532, 33	ERJ6GEYJ181	M.RESISTOR CH 1/10W 180	2	
R7535	ERJ6GEYJ181	M.RESISTOR CH 1/10W 180	1	
R7536	ERJ6GEYJ390	M.RESISTOR CH 1/10W 39	1	
R7543, 44	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	2	
R7545	ERJ6GEYJ101	M.RESISTOR CH 1/10W 100	1	
R7546-48	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	3	
R7549	ERJ6GEYJ102	M.RESISTOR CH 1/10W 1K	1	
R7550-54	ERJ6GEYJ822	M.RESISTOR CH 1/10W 8.2K	5	
R7555	ERJ6GEYJ392	M.RESISTOR CH 1/10W 3.9K	1	
R7556, 57	ERJ6GEYJ822	M.RESISTOR CH 1/10W 8.2K	2	
R7558, 59	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	2	
R7561-69	ERJ6GEYJ223	M.RESISTOR CH 1/10W 22K	9	
R7570	ERJ6GEYJ272	M.RESISTOR CH 1/10W 2.7K	1	
R7571, 72	ERJ6GEYJ332	M.RESISTOR CH 1/10W 3.3K	2	
		COMBINATION PARTS		
RX7501	EXBF1E104J	COMBI.R-R	1	
RX7502	EXBF8E104J	COMBI.R-R	1	
		VARIABLE RESISTORS		
VR7501	EVNDXAA00B53	V.RESISTOR 5K	1	
		CRYSTAL OSCILLATORS		
X7501	VSX0484	CRYSTAL OSCILLATOR	1	
X7502	VSX0094	CRYSTAL OSCILLATOR	1	
X7503	EFOGC3584A5	CRYSTAL OSCILLATOR	1	
		MISCELLANEOUS		
	VEK5789	IR RECEIVER UNIT	1	(RTL)
	VJF0693	FIP HOLDER	1	
	VJF0740	LED SPACER	1	
	VMD1342	LED SPACER	1	
	VEPO6778A	JOG C.B.A.		(RTL)
		DIODES		
D6701-03	LN38GCPPV	DIODE	3	
		CONNECTORS		
P6701	VJS2621	CONNECTOR (FEMALE)	1	
		RESISTORS		

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
R6701-03	ERDS2TJ221	C.RESISTOR 1/4W 220	3	
		SWITCHES		
SW6701	EVQ11407K	SWITCH	1	
		MISCELLANEOUS		
	VMX1652	LED SPACER	3	
	VSQO798	JOG ENCODER	1	
	VEPO1535B	POWER C.B.A.		(RTL) <1>NV-FS200PX
		CAPACITORS		
C1101,02	ECQU2A2244N	P.CAPACITOR 250V 0.22U	2	<1>
C1103-08	VCKO044	C.CAPACITOR	6	<1>
C1109-11	VCKO045	C.CAPACITOR 250V 1500P	3	<1>
C1112	VCF2AAC101J	P.CAPACITOR 100V 100P	1	
C1113,14	ECOS2VA181BB	CAPACITOR	2	
C1115	ECQE6473KF	P.CAPACITOR 50V	1	
C1116	VCKO106K331	C.CAPACITOR	1	
C1117	ECA2GNX2R2X	CAPACITOR	1	
C1118	ECQB1H682JF	P.CAPACITOR 50V 6800P	1	
C1119	ECQB1H223JF	P.CAPACITOR 50V 0.022U	1	
C1120	ECQV1H684JF	P.CAPACITOR 50V 0.68U	1	
C1121	ECA1CXLV470	E.CAPACITOR 16V 47U	1	
C1122	ECQV1H334JF	P.CAPACITOR 50V 0.33U	1	
C1124	ECEA1HFE121	E.CAPACITOR 50V 120U	1	
C1125,	ECEA1HFE270	E.CAPACITOR 50V 27U	1	
C1126,	ECEA1VFE820	E.CAPACITOR 35V 82U	1	
C1127	ECEA1CFE331	E.CAPACITOR 16V 330U	1	
C1128, 29	ECA1CF2102	E.CAPACITOR 16V 1000U	2	
C1130	ECA1AF2102	E.CAPACITOR 10V 1000U	1	
C1133-35	ECEA1AGE101	E.CAPACITOR 10V 100U	3	
C1136	ECEA1HGE100	E.CAPACITOR 50V 10U	1	
C1137	ECEA1CGE101	E.CAPACITOR 16V 100U	1	
C1138	ECKF1H1032F	C.CAPACITOR 50V 0.01U	1	
C1143	ECKF1H1032F	C.CAPACITOR 50V 0.01U	1	
C1144-49	VCKO045	C.CAPACITOR 250V 1500P	6	<1>
		DIODES		
D1101-04	EM1B	DIODE	4	<1>
D1105	VSD0002	DIODE	1	<1>
D1106	AP01C	DIODE	1	
D1107,08	MA178	DIODE	2	
D1109	MA4027-L	DIODE	1	
D1111	MA165VT	DIODE	1	
D1112	ERA22-02	DIODE	1	
D1113	10ELS2	DIODE	1	
D1114	FMLG12SP	DIODE	1	
D1115	FMBG14L	DIODE	1	
D1117	MA2160A	DIODE	1	
D1118	MA4130L	DIODE	1	
D1120, 21	RD120E	DIODE	2	
D1122	MA165VT	DIODE	1	
D1130	ENB461D-05A	SURGE ABSORBER 460V	1	<1>
		INTEGRATED CIRCUITS		
IC1101	STRD6108E	IC	1	<1>
IC1102	VEFH24A	HIC	1	
IC1103	SE014N	IC	1	
		COILS		
L1102	ELF18D618F	COIL	1	<1>

Ref.No.	Part No.	Part Name & Description	Pcs	Remarks	Ref.No.	Part No.	Part Name & Description	Pcs	Remarks
L1103,04	VLQEL06F101K	COIL 100UH	2		C1130	ECA1AFZ102	E.CAPACITOR 10V 1000U	1	
L1105	ELCO7B009	COIL	1		C1133-35	ECEA1AGE101	E.CAPACITOR 10V 100U	3	
L1107	ELCO7B009	COIL	1		C1136	ECEA1HGE100	E.CAPACITOR 50V 10U	1	
					C1137	ECEA1CGE101	E.CAPACITOR 16V 100U	1	
		CONNECTORS			C1138	ECKFIH103ZF	C.CAPACITOR 50V 0.01U	1	
P1101	VJS2626	CONNECTOR (FEMALE)	1	<1>	C1143	ECKFIH103ZF	C.CAPACITOR 50V 0.01U	1	
P1102	VJP1930T	CONNECTOR (MALE)	1		C1144,45	VCK0045	C.CAPACITOR 250V 1500P	2	<1>
P1103	VJP1149	CONNECTOR (MALE)	1		C1147,48	VCK0045	C.CAPACITOR 250V 1500P	2	<1>
		TRANSISTORS					DIODES		
Q1101	PC111	PHOTO COUPLER	1	<1>	D1102	EM1B	DIODE	1	<1>
Q1102-04	ZSD1996	TRANSISTOR	3		D1104	EM1B	DIODE	1	<1>
					D1105	VSD0002	DIODE	1	<1>
					D1106	AP01C	DIODE	1	
		RESISTORS			D1107,08	MA178	DIODE	2	
R1101	ERC122GK685	SOLID 1/2W 6.8M	1	<1>	D1109	MAA027-L	DIODE	1	
R1102	ERDS2TJ474	C.RESISTOR 1/4W 470K	1		D1111	MA165VT	DIODE	1	
R1104	ERDS2TJ474	C.RESISTOR 1/4W 470K	1		D1112	ERA22-02	DIODE	1	
R1106	ERDS1TJ563	C.RESISTOR 1/2W 56K	1		D1113	1OELS2	DIODE	1	
R1108	EROS2CKG1300	M.RESISTOR 1/4W 130	1		D1114	FMLG12SP	DIODE	1	
R1109	ERG3ANJ683	M.RESISTOR 3W 68K	1		D1115	FMBG14L	DIODE	1	
R1110	ERW1PKR2	W.RESISTOR 1W	1		D1117	MA2160A	DIODE	1	
R1111	ERW1PKR33	W.RESISTOR 1W	1		D1118	MA4130L	DIODE	1	
R1112	ERDS2T0	C.RESISTOR 1/4W 0	1		D1120,21	RD120E	DIODE	2	
R1113	ERG3SJ270	M.RESISTOR 3W 27	1		D1122	MA165VT	DIODE	1	
R1114	ERDS2TJ681	C.RESISTOR 1/4W 680	1						
R1115	ERDS2TJ102	C.RESISTOR 1/4W 1K	1				INTEGRATED CIRCUITS		
R1116	ERG1SJ182	M.RESISTOR 1W 1.8K	1		IC1101	STRD6108E	IC	1	<1>
R1117	ERDS2TJ103	C.RESISTOR 1/4W 10K	1		IC1102	VEFH24A	HIC	1	
R1118	ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1		IC1103	SE014N	IC	1	
R1119	ERDS2TJ680	C.RESISTOR 1/4W 68	1						
R1121	ERDS2TJ184	C.RESISTOR 1/4W 180K	1				COILS		
R1122	ERDS2TJ823	C.RESISTOR 1/4W 82K	1		L1102	ELF18D618F	COIL	1	<1>
					L1103,04	VLQEL06F101K	COIL 100UH	2	
		TRANSFORMERS			L1105	ELCO7B009	COIL	1	
T1101	VLTO685	TRANSFORMER	1	<1>	L1107	ELCO7B009	COIL	1	
		MISCELLANEOUS					CONNECTORS		
	VJF0318	FUSE HOLDER	4	<1>	P1102	VJP1930T	CONNECTOR (MALE)	1	
	VM20965	CAPACITOR COVER	4	<1>	P1103	VJP1149	CONNECTOR (MALE)	1	
							TRANSISTORS		
					Q1101	PC111	PHOTO COUPLER	1	<1>
					Q1102-04	ZSD1996	TRANSISTOR	3	
							RESISTORS		
	VEPO1535A	POWER C.B.A.		(RTL)<1>AG-1970P	R1101	ERC122GK685	SOLID 1/2W 6.8M	1	<1>
					R1102	ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
					R1104	ERDS2TJ474	C.RESISTOR 1/4W 470K	1	
		CAPACITORS			R1106	ERDS1TJ563	C.RESISTOR 1/2W 56K	1	
C1101,02	ECQU2A224M	P.CAPACITOR 250V 0.22U	2	<1>	R1108	EROS2CKG1300	M.RESISTOR 1/4W 130	1	
C1103,04	VCK0045	C.CAPACITOR 250V 1500P	2	<1>	R1109	ERG3ANJ683	M.RESISTOR 3W 68K	1	
C1106,07	VCK0045	C.CAPACITOR 250V 1500P	2	<1>	R1111	ERW1PKR33	W.RESISTOR 1W	1	
C1109,10	VCK0045	C.CAPACITOR 250V 1500P	2	<1>	R1112	ERDS2T0	C.RESISTOR 1/4W 0	1	
C1112	VCF2AAC101J	P.CAPACITOR 100V 100P	1		R1113	ERG3SJ270	M.RESISTOR 3W 27	1	
C1113,14	ECOS2VA181BB	CAPACITOR	2		R1114	ERDS2TJ681	C.RESISTOR 1/4W 680	1	
C1115	ECQE6473KF	P.CAPACITOR 50V	1		R1115	ERDS2TJ102	C.RESISTOR 1/4W 1K	1	
C1116	VCK0106K331	C.CAPACITOR	1		R1116	ERG1SJ182	M.RESISTOR 1W 1.8K	1	
C1117	ECA2GNK2R2X	CAPACITOR	1		R1117	ERDS2TJ103	C.RESISTOR 1/4W 10K	1	
C1118	ECQB1H682JF	P.CAPACITOR 50V 6800P	1		R1118	ERDS2TJ562	C.RESISTOR 1/4W 5.6K	1	
C1119	ECQB1H223JF	P.CAPACITOR 50V 0.022U	1		R1119	ERDS2TJ680	C.RESISTOR 1/4W 68	1	
C1120	ECQV1H684JF	P.CAPACITOR 50V 0.68U	1		R1121	ERDS2TJ184	C.RESISTOR 1/4W 180K	1	
C1121	ECA1CKLV470	E.CAPACITOR 16V 47U	1		R1122	ERDS2TJ823	C.RESISTOR 1/4W 82K	1	
C1122	ECQV1H334JF	P.CAPACITOR 50V 0.33U	1		R1130	VSFO055	RESISTOR	1	<1>
C1124	ECEA1HFE121	E.CAPACITOR 50V 120U	1						
C1125	ECEA1HFE270	E.CAPACITOR 50V 27U	1				TRANSFORMERS		
C1126	ECEA1VFE820	E.CAPACITOR 35V 82U	1		T1101	VLTO685	TRANSFORMER	1	<1>
C1127	ECEA1CFE331	E.CAPACITOR 16V 330U	1						
C1128,29	ECA1CFZ102	E.CAPACITOR 16V 1000U	2						





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