

Service Manual

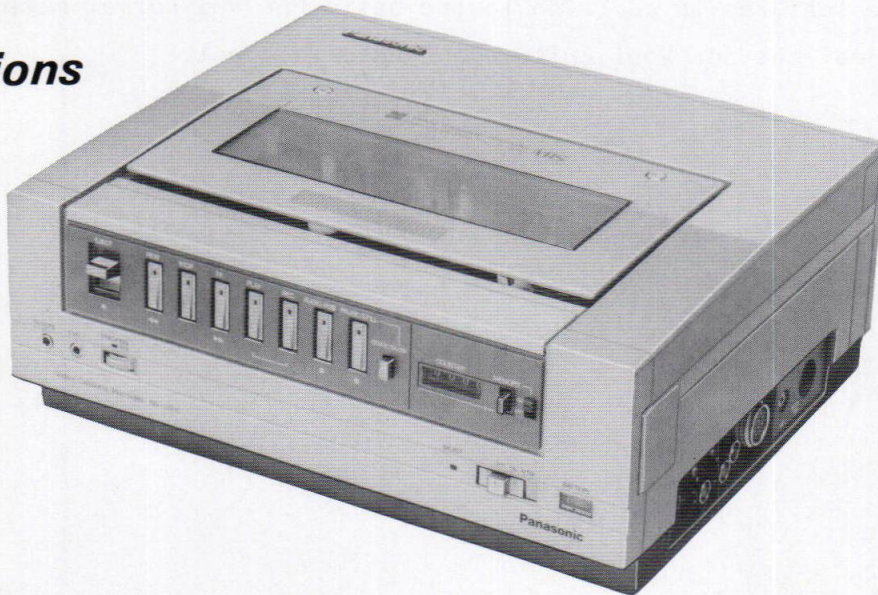
Portable Video Cassette Recorder

Vol. 1

Panasonic VHS

NV-3000-E-B

**Summary
Operating
Instructions**



SPECIFICATIONS

Power Source:	12 V DC Battery LCR-1812E, LCR-3012VBE Prog. Tuner Unit NV-V300 AC Adaptor NV-B30	Output Level:	Video: VIDEO OUT Jack (BNC) 1.0Vp-p, 75Ω unbalanced Audio: AUDIO OUT Jack (RCA) -6dB, 600Ω unbalanced RF Modulated: UHF channel 36 (±4)
Power Consumption:	Approx. 5.6W at Record mode Approx. 9.5W at Play mode	Weight:	5.3kg without battery pack
Television System:	CCIR: 625 lines, 50 fields PAL colour signal	Dimensions:	291(W) × 114(H) × 249(D)mm
Video Recording		Accessories Supplied:	1 pc. Remote controller, VSQ0146 1 pc. Earphone, VBE0002 2 pcs. DIN-DIN coaxial cable, VJA0130 1 pc. Audio input attenuator, VJP1164 1 pc. Connection cord for auxiliary battery pack, VJA0148 1 pc. Carrying case: VFC0005
	System: 2 rotary heads, helical scanning system Luminance: FM azimuth recording Colour signal: converted subcarrier phase shift recording	Optional Accessories:	Video cassette tape: NV-E240 Approx. 344m 240 min. NV-E180 Approx. 258m 180 min. NV-E120 Approx. 174m 120 min. NV-E60 Approx. 88m 60 min. Battery pack, LCR-1812E, LCR-3012VBE AC adaptor, NV-B30 14 Day 8 programme Timer, NV-V300 Colour video camera, WV-2600E, WV-3000E, WV-3200E Car battery cord, NV-C24
Audio Track:	1 track		
Tape Format:	Tape width 12.7 mm high density tape		
Tape Speed:	23.39mm/s		
Record/Playback Time:	180 min. with NV-E180 240 min. with NV-E240		
FF/REW Time:	Less than 6 min. with NV-E180		
Heads:	Video: 2 rotary heads Audio/Control: 1 stationary head Erase: 1 full track erase 1 audio track erase for audio dubbing		
Input Level:	Video: VIDEO IN connector (BNC) 1.0Vp-p, 75Ω unbalanced CAMERA/TUNER IN connector (10P) 1.0Vp-p, 75Ω unbalanced Audio: MIC IN Jack -70dB, 600Ω unbalanced		

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

Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

INTRODUCTION

This service manual contains technical information which will allow service technicians to understand and service the Panasonic portable PAL VHS Video Tape Recorder Model NV-3000.

The NV-3000 has many special features as shown below.

These features in addition to the basic PAL VHS Format make the unit an ideal one for your culture and entertainment.

CONTENTS

SPECIFICATIONS	Cover
INTRODUCTION	1
FEATURES	2
CONTROLS AND COMPONENTS	3
FUNCTION OF CONTROLS AND COMPONENTS.....	4
POWER SOURCE	5
CAMERA RECORDING.....	5
PLAYBACK.....	6
AUDIO DUBBING	6

FEATURES

1. **4 hours recording/playback possible with new tape NV-E240**

New system for high-density recording allows up to 4 hours recording on a single tape.

2. **Compact and lightweight**

The use of integrated circuitry has resulted in a truly compact, lightweight video cassette recorder that is extremely convenient and easy to carry.

3. **Three power source system**

The recorder can use any of 3 power sources; a battery pack, a car battery, or household plug socket by utilising the optional accessories, car battery cord NV-C24, AC Adaptor NV-B30 or the Programmable Tuner/Timer NV-V300. By using a portable video camera (optional), you can make a live recording either indoors or outdoors.

4. **Fine editing function**

When a recording is paused, the tape will automatically rewind slightly. When recording is resumed the tape reaches its normal playing speed before switching to record this cutting to a minimum any interference.

5. **Battery-saving camera feature**

A stand-by switch on the colour video camera WV-3200E allows conservation of the battery pack during recording.

6. **Multi-motion playback at your option**

Playback at normal speed, quick/slow-motion, frame-by-frame and still-frame pictures can operate during playback. You can stop the tape temporarily during recording, too. The Remote Controller permits you to operate these effects from a distance.

7. **Built-in "MEMORY" feature**

By simply setting the Memory Switch and the Tape Counter, before recording, the tape will automatically stop during rewind for subsequent playback.

8. **Head and capstan servo**

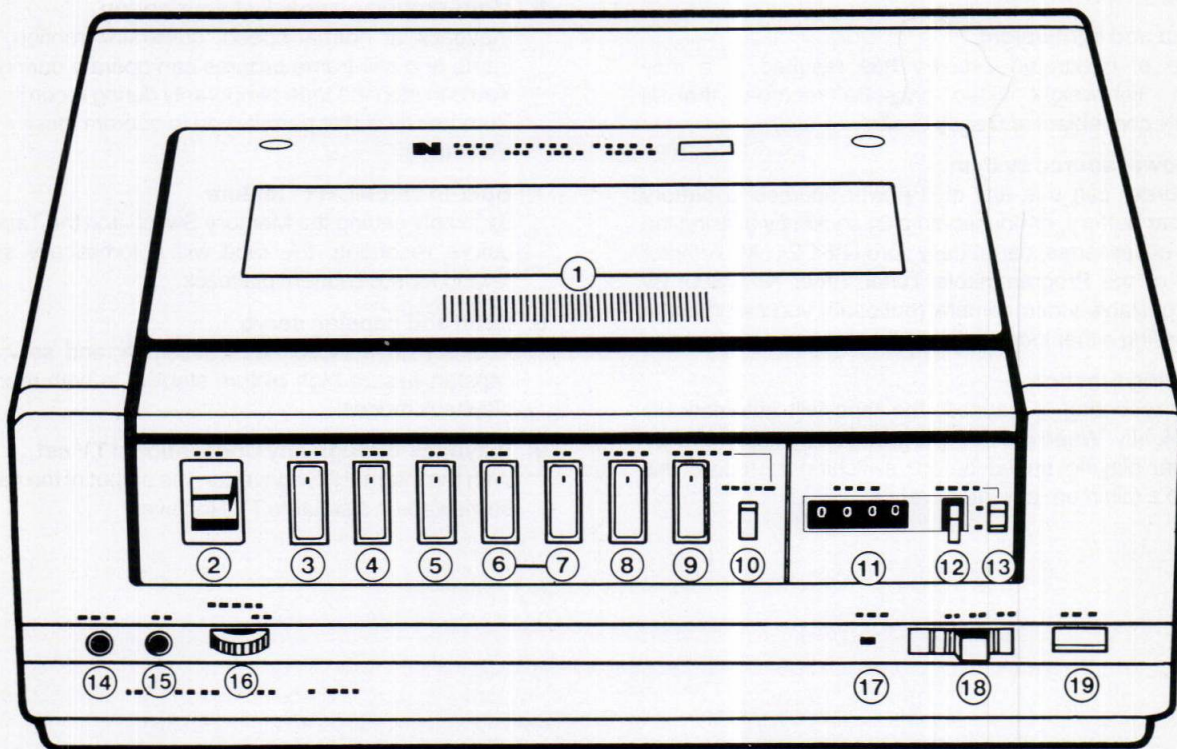
A direct drive video head assembly and servocontrolled capstan assure high picture stability in both recording and playback modes.

9. **Playback through any Conventional TV set**

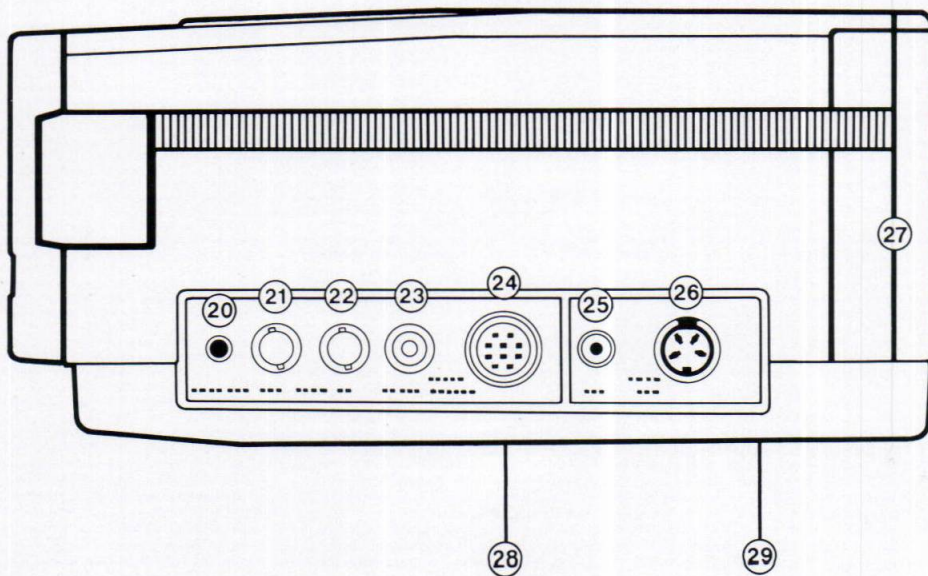
With the internal RF converter, the output of the recorder can be viewed on a suitable TV Receiver.

CONTROLS AND COMPONENTS

TOP and FRONT



SIDE



FUNCTION OF CONTROLS AND COMPONENTS

TOP and FRONT

- ① **Cassette Holder**
For insertion of the video cassette.
- ② **Eject Key [EJECT]**
Press to raise the cassette holder.
- ③ **Rewind Button [REW]**
Push to rewind the tape.
- ④ **Stop Button [STOP]**
Push to stop the tape. **STOP** must be pushed between FF REW modes.
- ⑤ **Fast Forward Button [FF]**
Push to fast forward wind the tape.
- ⑥ **Play Button [PLAY]**
Push to play back a recorded tape.
- ⑦ **Record Button [REC]**
Push together with **PLAY** to record.
- ⑧ **Audio Dubbing Button [AUDIO DUB]**
Push together with **PLAY** to record your own soundtrack on a previously recorded tape in place of the original soundtrack by using either a microphone or your own component audio system.
- ⑨ **Pause Button [PAUSE/STILL]**
Push to temporarily stop tape for avoiding recording unwanted material of a programme or to view a still-frame picture during playback.
Push again to release this mode.
- ⑩ **QUICK/SLOW BUTTON [QUICK/SLOW]**
When this button is pushed without letting go during playback, the picture will play in fast forward motion at 3.5 times normal speed. Pushing this button during playback of a still-frame picture, a frame-by-frame picture appears on the screen. You can view slow-motion pictures at 1/5 of normal playback pushing without letting go this button.
- ⑪ **Tape Counter [COUNTER]**
Indicates how far the tape has moved. It is very useful for locating a desired part of the tape.
- ⑫ **Reset Button**
Push to reset the tape counter to "0000".

- ⑬ **Memory Switch [MEMORY]**
This switch is convenient for rewinding a tape automatically to the beginning of the part that you want to replay. Reset the Tape Counter to "0000" before the start of recording and set this switch to ON. After the recording is finished push **REW**, and the tape will automatically rewind to the point at which the Tape Counter was previously set ("0000"). By pushing **PLAY** you can now see the segment which you just recorded.
Notes:
 - The tape will actually stop rewinding at around "9998" in order not to miss the beginning of the playback.
 - For ordinary operation, **MEMORY** Switch should be set to OFF. If it is ON, the tape will always stop at a point around "9998" when the tape is rewind. To continue rewinding the tape, then, push **REW** Button once again.

- ⑭ **Remote Control Jack [REMOTE]**
The Remote Controller connects here to allow temporary pause during recording and to operate the multimotion playback (still-frame, frame-by-frame and quick/slow-motion) from a distance.

- ⑮ **Earphone Jack [EAR]**
Connect the earphone here to monitor the audio signal.

- ⑯ **Tracking Control [TRACKING]**
When playing prerecorded tapes or those recorded on other units and distortion bars appear on your TV screen, turn this control slowly in either direction until the picture clears up. It should usually be left in the centre position.



Noisy Picture

- ⑰ **Moisture Indicator Lamp [MOIST]**
When excessive moisture is present inside the recorder, this lamp lights up when the power is first switched on; it then goes out about 5 seconds later. Do not operate the recorder. Turn the power switch off and wait until the lamp ceases to light up when the power switch is turned on again. The moisture disappears within a few hours. Remove the cassette for fast removal of moisture. When the lamp ceases to light it is safe to operate the recorder.

- ⑱ **VTR Switch [VTR]**
Turns the recorder power on and off.
 - If you turn the recorder off after pushing **STOP**, wait for a few seconds until the tape is retracted into the cassette.

- ⑲ **Battery Meter [BATTERY]**
Indicates the charging capacity of the battery pack of the recorder when **POWER** is ON. If the needle points to the red range, the battery pack must be recharged or replaced with a fully-charged pack.

SIDE

- ⑳ **Audio Output Connector [AUDIO OUT],**
- ㉑ **Video Output Connector [VIDEO OUT]**
These are for connections to a TV monitor. Not used with an ordinary TV set.

- ㉒ **Video Input Connector [VIDEO IN]**
For connection of a video camera or other video input signal to be recorded.

- ㉓ **RF Output Connector [RF OUT]**
This is the signal output connector from the built-in RF converter of the recorder.

- ㉔ **Tuner/Camera Input Terminal [TUNER/CAMERA]**
For connection of Video Cameras with a 10-pin Camera Cable or the optional Programmable Tuner/Timer.

- ㉕ **Microphone Input Jack [MIC]**
For connection of a microphone or the audio input attenuator (included).

- ㉖ **DC Power Input Terminal [DC IN]**
For connection of an external DC power source such as the Programmable Tuner/Timer (optional), AC Adaptor (optional), car battery cord (optional), or connection cord for an auxiliary battery pack.

- ㉗ **Battery Compartment**
Place the battery pack in this compartment.

- ㉘ **RF Converter**
Allows you to play back the recorded material and to monitor camera recording on your TV set through an unused broadcast channel.

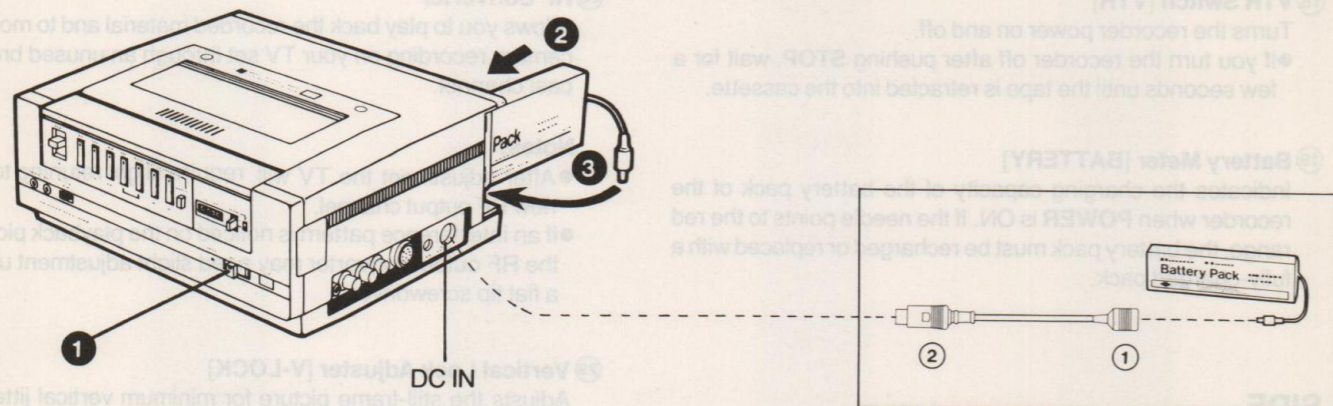
Notes:

- After adjustment the TV will require slight retuning to the new RF output channel.
- If an interference pattern is noticed on the playback picture the RF output converter may need slight adjustment using a flat tip screwdriver.

- ㉙ **Vertical Lock Adjuster [V-LOCK]**
Adjusts the still-frame picture for minimum vertical jitter on your TV. To reduce the jitter, remove the rubber cap and carefully adjust using a flat-tip screwdriver. After completing the V-LOCK adjustment, remember to re-install the rubber cap.

POWER SOURCES

(1) BATTERY PACK (OPTIONAL ACCESSORY)



How to insert the battery back

- 1 VTR to OFF.
- 2 Remove the battery compartment cover and insert the battery pack into the battery compartment.
- 3 Connect the battery pack's plug to the recorder's jack, and then reattach the cover.

HINTS TO ASSURE BEST SERVICE FROM THE BATTERY PACK

A fully charged battery pack will provide power for approximately 60 minutes of continuous recording at room temperature. The type of camera used and the ambient temperature affect this time capacity.

The nature of the battery pack is the same as that of a car battery, i.e. the lower the temperature, the shorter the useful operation time, e.g., the useful operation time of the battery pack at 0°C (32°F) will be reduced by about half the operating time under normal temperature conditions.

Notes about storage

- The battery pack will naturally discharge while it is in storage. Be sure, therefore, to recharge it at least once every 6 months.
- Store the battery pack in a cool, dry, and dark place.
- Do not drop it or subject it to strong impact shocks.
- Always charge the battery pack soon after use. Discharging for a long time may make the life of the battery pack shorter and recharging impossible.

Notes about use

- Be careful not to put the battery pack into fire or to short-circuit it.

- Do not use any other chargers than specified.
- Do not use the battery pack for other appliances than specified.
- Do not replace or repair the plug and lead wires.
- Do not use the recorder and battery pack below 0°C or above +40°C (32°F or 104°F).
- Should the battery pack be broken and the internal electrolyte containing sulfuric acid be spilt over skin or cloth, be sure to immediately wash in water or neutralize with ammonium water or sodium bicarbonate.
- Charge the Battery Pack before and after each use.
- The useful operation time of the battery pack will gradually decrease after several discharges and recharges. The battery pack is no longer serviceable if the operation time is too short even after a sufficient charge.

Refer to the Operating Instructions of the AC Adaptor NV-B30 and the Programmable Tuner/Timer NV-V300 on how to recharge the battery pack.

CAMERA RECORDING

Prepare for camera recording as shown below.

This recorder can make indoor and outdoor recordings with an optional video camera, but will also work with most other type Video Cameras with a 10-pin camera cable.

- 1 Select the power source to be used depending upon the objective.
- 2 Connect the camera to the **TUNER/CAMERA** socket.
- 3 Connect your TV set to **RF OUT** with the supplied RF Coaxial Cable.
- 4 Turn on TV and select the RF output playback channel.

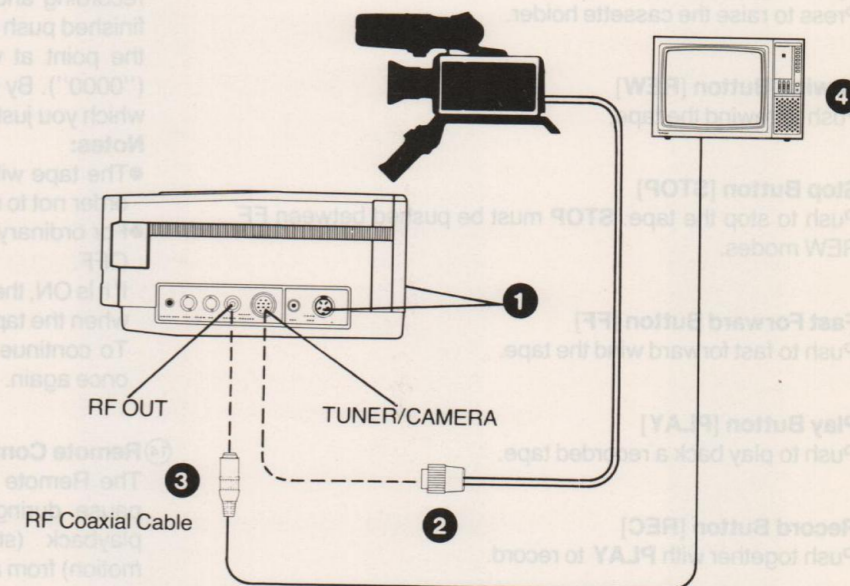
Note that you cannot monitor the recording when using the battery pack of the recorder as a power source.

Notes

- For camera recording, it is necessary that the video camera is warmed up prior to recording.
- When the Video Camera is being connected to the recorder, be sure to turn the **VTR** switch OFF.

Indoor use of the camera may require additional lighting.

If an external microphone (optional) is connected to **MIC IN**, the sound through the microphone will take priority over the built-in microphone of the camera.



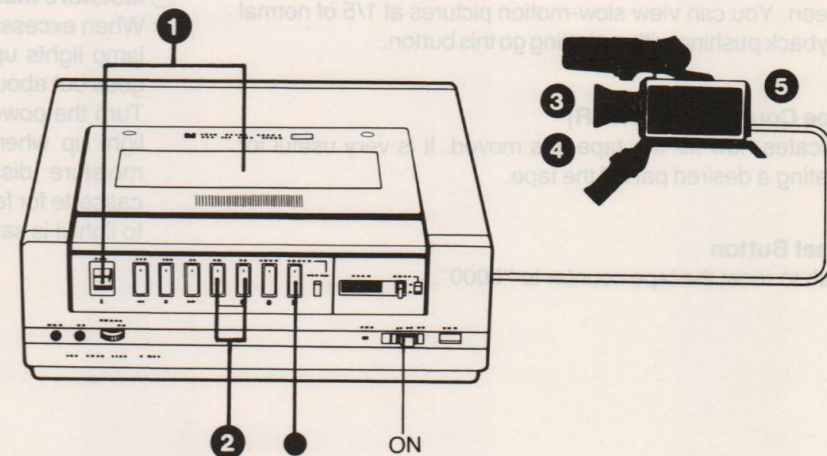
OPERATION

- 1 Insert a cassette.
 - If the cassette tab is removed no recording can be performed.
- 2 Push **REC** together with **PLAY**, and the recorder will go into the standby mode.
- 3 Make necessary adjustments on the camera.
- 4 Press the camera's Start/Stop Switch, and recording will start. To stop the tape temporarily during recording, press the Start/Stop Switch once again.
- 5 If you leave the camera in the pause mode for a long period, set the Standby Switch of the camera to **STANDBY**. This switch is for saving power of the battery pack.
- For better joining of one recorded scene to the next, first push **PAUSE/STILL** and then the Standby Switch. If **PAUSE/STILL** is not pushed first there will be a distortion in the playback picture between cuts.

Notes:

- The recorder will release the Pause mode after approx. 5 minutes and stop automatically.
- When joining a new recording to already recorded material from the stop mode, first play back the last part of the already recorded material in order to confirm its end point, and then start recording after stopping the tape temporarily in the pause mode.

If you want to immediately review the tape you have recorded, you can do so with the electronic viewfinder of the camera by pushing **PLAY**. You can also listen to the sound by connecting an earphone to **EAR**. Refer to the Operating Instructions of the camera for full details of the camera operation.



WITH AN ORDINARY VIDEO CAMERA

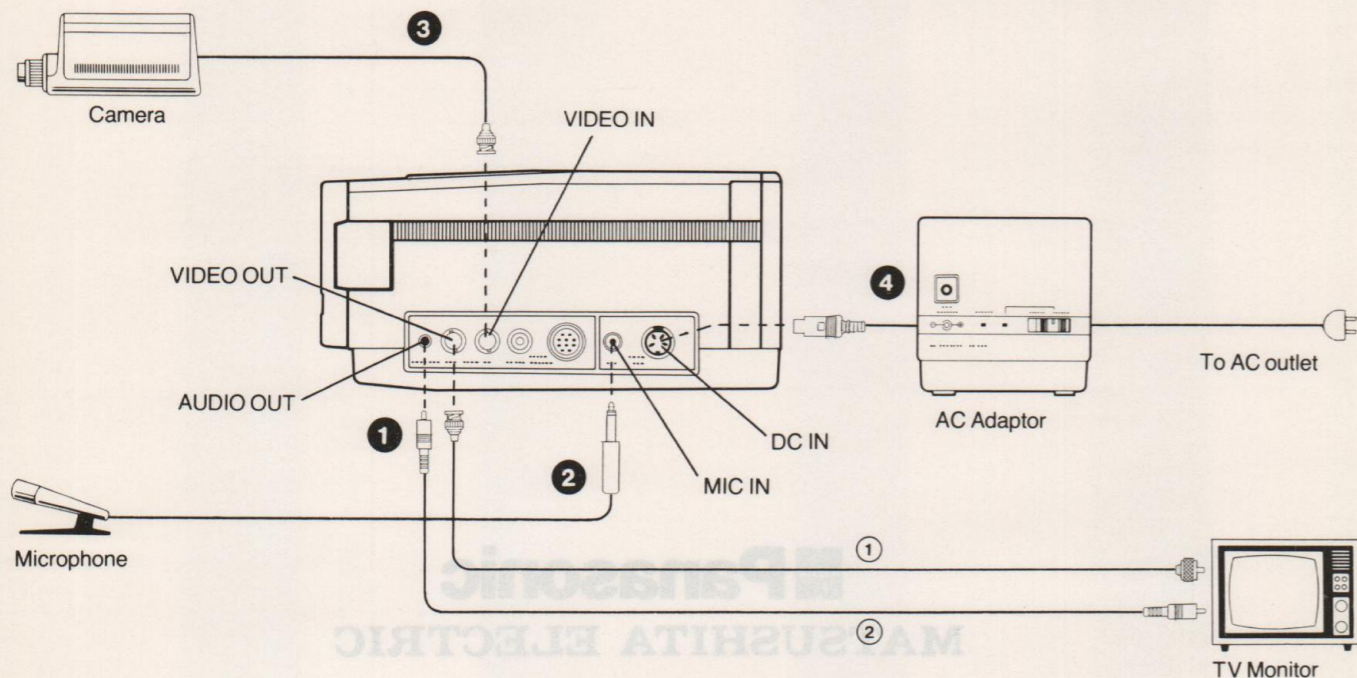
Connect as shown below.

Make sure that **VTR** is OFF.

- 1 Connect the TV monitor to **VIDEO OUT** and **AUDIO OUT** with coaxial cable ① and audio cable ② (not supplied).
- 2 Connect the microphone to **MIC IN**.

- 3 Connect the camera to **VIDEO IN** with coaxial cable.
- 4 Connect the AC Adaptor (optional) to **DC IN**.

The signal being recorded can be monitored during recording by viewing the TV monitor.



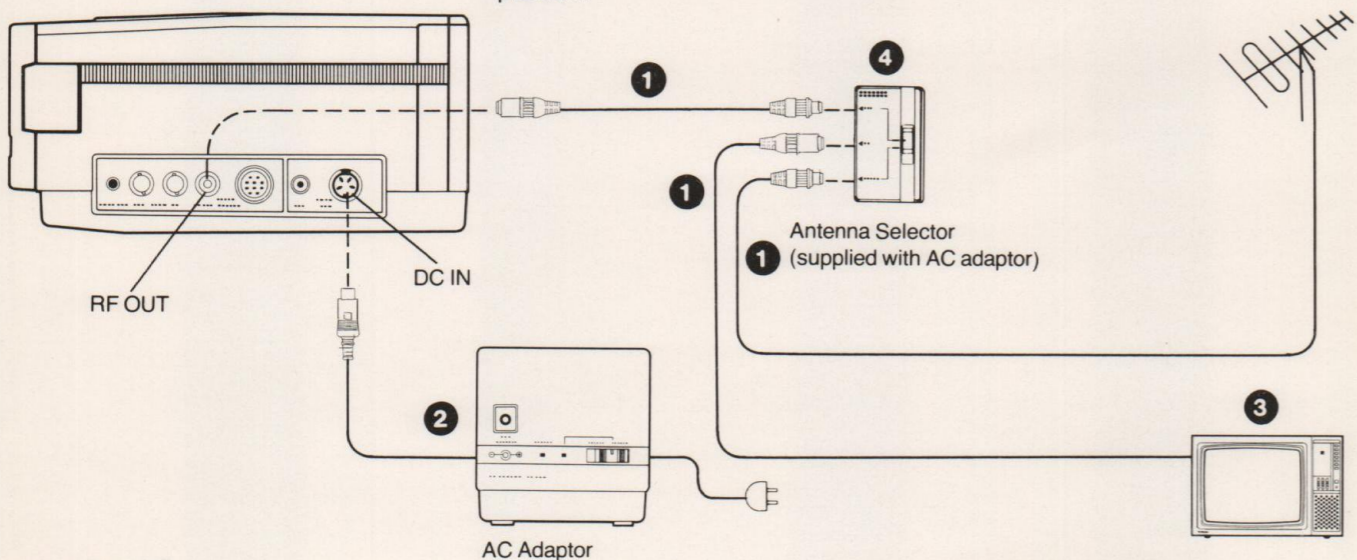
PLAYBACK

Connect as shown below.

Make sure that **VTR** is OFF.

- 1 Connect the "VTR" position of the Antenna Selector to **RF OUT** and the "TV" position to the TV set with the supplied coaxial cables. Connect the external antenna to the "ANTENNA" position.

- 2 Connect the AC Adaptor to **DC IN** and plug in the AC Adaptor.
- 3 Turn TV on and select a channel for RF Output.
- 4 Switch the Antenna Selector to "VTR" for playback. (Switch to "ANTENNA" to watch TV.)



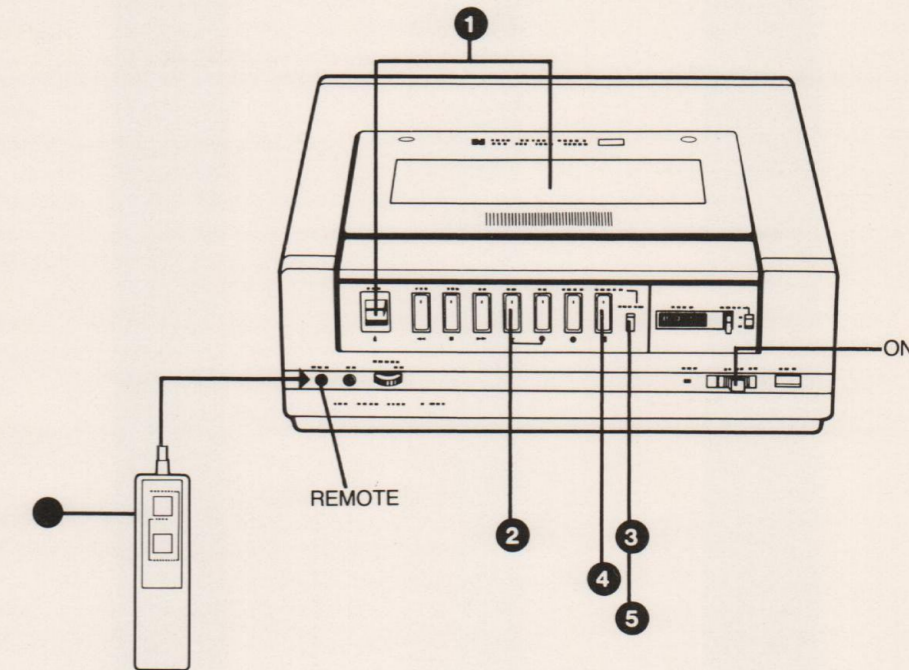
OPERATION

- 1 Insert a cassette.
- 2 Push **PLAY**.
- 3 Keeping on pushing **QUICK/SLOW**, you can view pictures in fast-forward motion at 3.5 times normal speed.
- 4 Push **PAUSE/STILL** to view a still-frame picture. The stability of the still-frame picture can be adjusted by using the Vertical Lock Adjuster.
- 5 Push **QUICK/SLOW** to view frame-by-frame pictures. If you keep this button depressed you can view slow-motion pictures. Push **PAUSE/STILL** again to release the tape from ④ mode.

Notes:

- Frame-by-frame and slow-motion playbacks are operative only during still-frame playback.
- If you leave the recorder in PAUSE for approx. 5 minutes, the recorder will automatically stop.
- Audio will not be heard during STILL-FRAME and QUICK/SLOW playback.

- A slight distortion may appear on the screen during STILL-FRAME and QUICK/SLOW playback.
- Connect the Remote Controller to **REMOTE** to control operations ③, ④ and ⑤ from a distance.



AUDIO DUBBING

Your own soundtrack can be substituted to a previously recorded tape by using a microphone, tape recorder, or your own component audio system. Note that the original soundtrack will be automatically erased during audio dubbing.

- 1 Insert a cassette.
 - If the cassette tab is removed no dubbing can be performed.
- 2 Play back the tape to which you want to add new sound.
- 3 Push **AUDIO DUB** together with **PLAY**.

Notes:

- When an audio dub is made the previous audio track is erased so that new audio can be recorded.
- When a microphone is used for dubbing do not get it near the speaker of TV while the dub is being made. A howling noise (feedback) may occur.

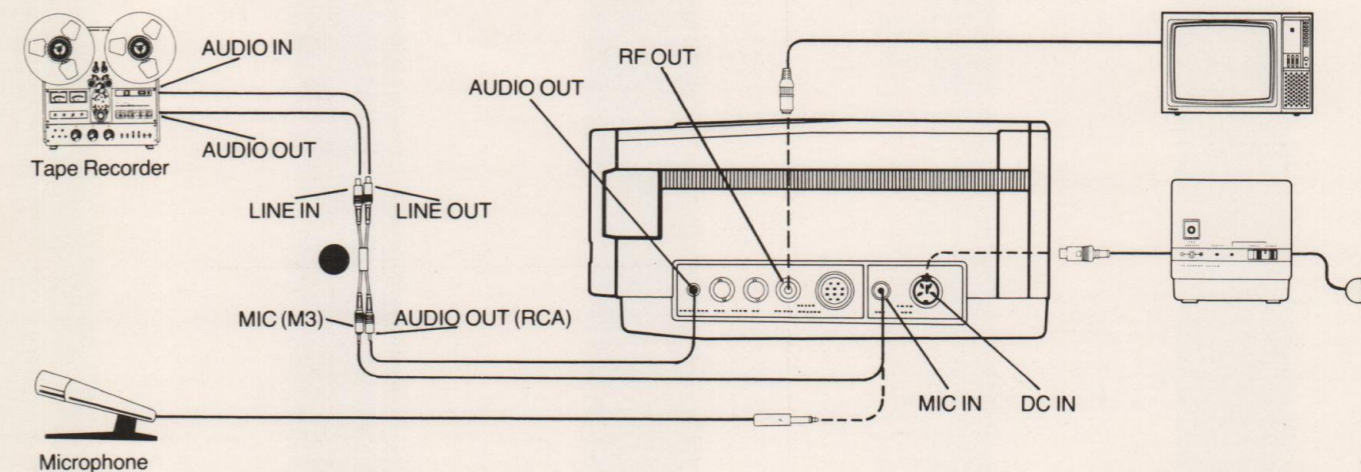
Audio Input Attenuator

Use the Audio Input Attenuator for matching of the audio input level and the plugs when something other than a microphone (optional) is used.

Notes:

- First connect the RCA-pin plug (gray) with **AUDIO OUT** and then the M3 plug (red) to **MIC IN**.
- The RCA-pin plug (gray) must be connected to the recorder to prevent hum.

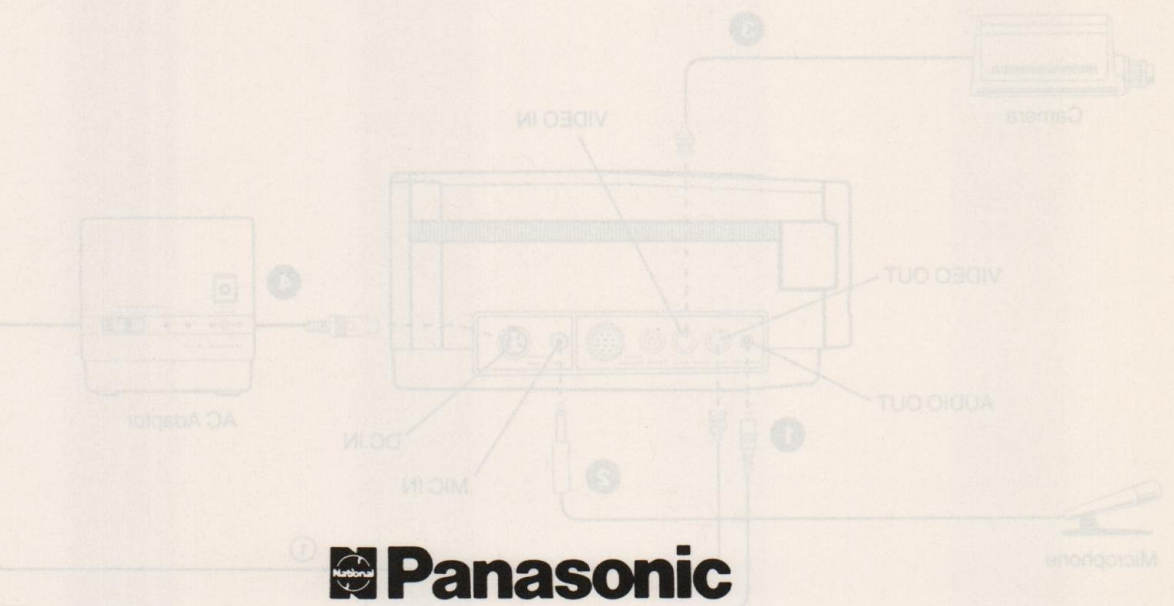
Connect as shown below.



③ Connect the camera coaxial cable.
 ② Connect the AC Adaptor to the TV monitor.
 The signal being monitored during recording.

Make sure that VTR is OFF.
 ④ Connect the TV monitor to VIDEO OUT and AUDIO OUT with coaxial cable ① and audio cable ② (not supplied).
 ③ Connect the microphone to MIC IN.

Connect as shown below.



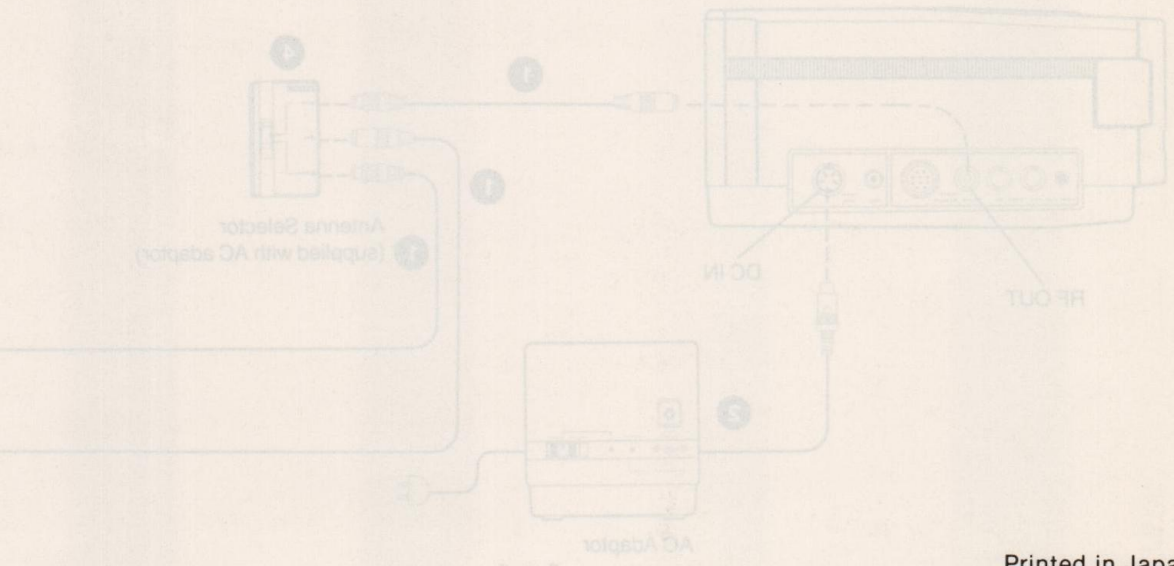
National Panasonic
MATSUSHITA ELECTRIC

PLAYBACK

④ Connect the AC Adaptor plug in the AC Adaptor.
 ③ Turn TV on and set Output.
 ② Switch the Antenna Selector to the "ANTENNA" position for playback. (Switch TV to watch TV.)

Make sure that VTR is OFF.
 ④ Connect the "VTR" position of the Antenna Selector to RF OUT and the "TV" position to the TV set with the supplied coaxial cables. Connect the external antenna to the "ANTENNA" position.

Connect as shown below.



Service Manual

Portable Video Cassette Recorder

Vol. 2

Panasonic VHS

NV-3000-E-B

***Mechanical Adjustment
Procedures
Electrical Adjustment
Procedures***



SPECIFICATIONS

Power Source:	12V DC Battery LCR-1812E, LCR-3012VBE Prog. Tuner Unit NV-V300 AC Adaptor NV-B30
Power Consumption:	Approx. 5.6W at Record mode Approx. 9.5W at Play mode
Television System:	CCIR: 625 lines, 50 fields PAL colour signal
Video Recording	System: 2 rotary heads, helical scanning system Luminance: FM azimuth recording Colour signal: converted subcarrier phase shift recording
Audio Track:	1 track
Tape Format:	Tape width 12.7mm high density tape
Tape Speed:	23.39mm/s
Record/Playback Time:	180 min. with NV-E180 240 min. with NV-E240
FF/REW Time:	Less than 6 min. with NV-E180
Heads:	Video: 2 rotary heads Audio/Control: 1 stationary head Erase: 1 full track erase 1 audio track erase for audio dubbing
Input Level:	Video: VIDEO IN connector (BNC) 1.0Vp-p, 75Ω unbalanced CAMERA/TUNER IN connector (10P) 1.0Vp-p, 75Ω unbalanced Audio: MIC IN Jack -70dB, 600Ω unbalanced

Output Level:	Video: VIDEO OUT Jack (BNC) 1.0Vp-p, 75Ω unbalanced Audio: AUDIO OUT Jack (RCA) -6dB, 600Ω unbalanced RF Modulated: UHF channel 36 (± 4)
Weight:	5.3kg without battery pack
Dimensions:	291(W) × 114(H) × 249(D)mm
Accessories Supplied:	1 pc. Remote controller, VSQ0146 1 pc. Earphone, VBE0002 2 pcs. DIN-DIN coaxial cable, VJA0130 1 pc. Audio input attenuator, VJP1164 1 pc. Connection cord for auxiliary battery pack, VJA0148 1 pc. Carrying case: VFC0005
Optional Accessories:	Video cassette tape: NV-E240 Approx. 344m 240 min. NV-E180 Approx. 258m 180 min. NV-E120 Approx. 174m 120 min. NV-E60 Approx. 88m 60 min. Battery pack, LCR-1812E, LCR-3012VBE AC adaptor, NV-B30 14 Day 8 programme Timer, NV-V300 Colour video camera, WV-2600E, WV-3000E, WV-3200E Car battery cord, NV-C24

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

CONTENTS

SPECIFICATIONS	Cover
MECHANICAL ADJUSTMENT PROCEDURES	2-1
DISASSEMBLY OF CABINET PARTS	2-1
1. Disassembly Flowchart	2-1
2. Detailed Disassembly Method	2-1
REPLACEMENT PROCEDURES	2-5
1. Replacement of the Video Head Disc	2-5
2. Replacement and Adjustment of D.D Cylinder Unit	2-5
ADJUSTMENT PROCEDURES	2-6
1. Position Adjustment of Cassette Guide Pin	2-6
2. Position Adjustment of Pressure Roller	2-6
3. Confirmation of Pressing Force of Pressure Roller	2-7
4. Confirmation of Tape Speed	2-7
5. Position Adjustment of Tension Post	2-8
6. Measurement and Adjustment of Back Tension	2-9
7. Confirmation/Adjustment of Brake Torque	2-10
8. Confirmation of Takeup Torque	2-10
9. Position Adjustment of Safety Switch	2-11
10. Adjustment of Cassette Holder	2-11
11. Height Adjustment of Reel Table	2-12
12. Height Adjustment of Tape Guide Posts	2-13
13. Tape Interchangeability Adjustment	2-14
14. Adjustment of Takeup Detector	2-16
15. Adjustment of Cam Gear and Mode Select Switch	2-17
16. Replacement of Battery Fuse	2-20
Servicing Fixtures & Tools	2-22
ELECTRICAL ADJUSTMENT PROCEDURES	2-23
1. TEST EQUIPMENT	2-23
2. ADJUSTMENT PROCEDURES	2-23
2-1. A.V.R. Section	2-23
2-2. System Control Section	2-24
2-3. Servo Section	2-25
2-4. Still & Slow Section	2-28
2-5. Audio Section	2-30
2-6. Video Section	2-31
LOCATION OF TEST POINTS AND CONTROLS	2-36
ADJUSTMENT OF RF CONVERTER	2-38

MECHANICAL ADJUSTMENT PROCEDURES

DISASSEMBLY OF CABINET PARTS

1. DISASSEMBLY FLOWCHART

This flowchart indicates disassembly steps of the cabinet parts and the PC Boards in order to find the item(s) necessary for servicing. When reassembling, perform the step(s) in the reverse order.

- Notes:
1. Since this model is designed very compactly and uses locking tabs instead of mounting screws, work with extreme care for servicing.
 2. Final adjustment is required when the Cassette Guide was replaced.

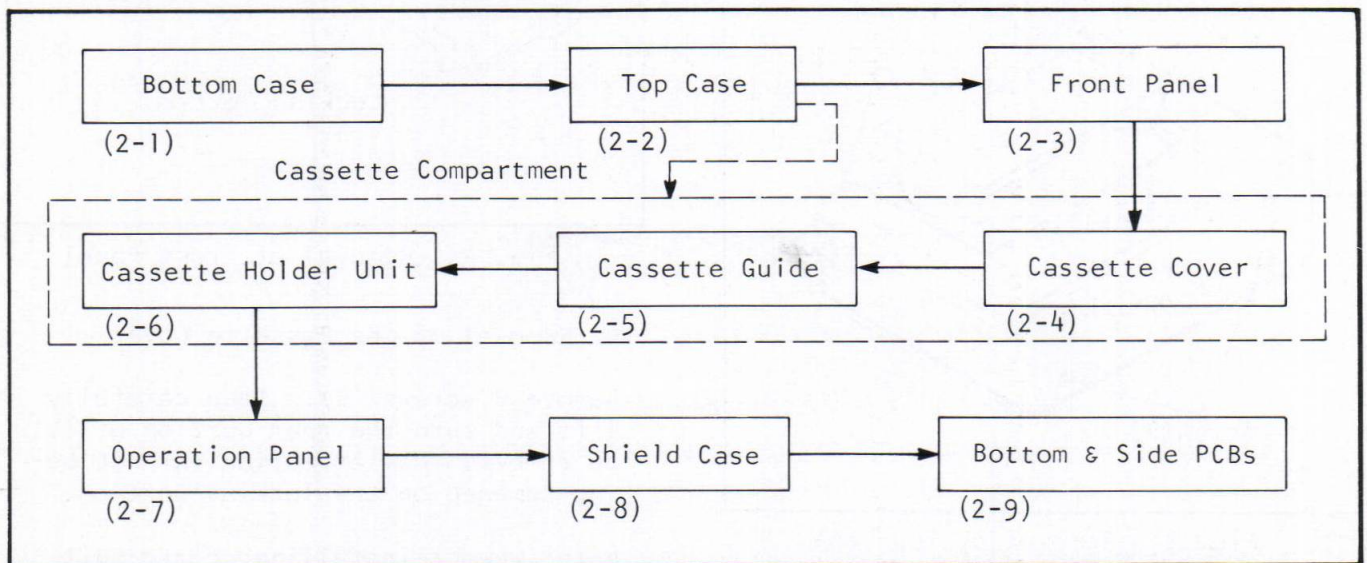


Fig. 1 Disassembly Flowchart

2. DETAILED DISASSEMBLY METHOD

2-1. Removal of the Bottom Case

1. Place the deck upside down so the Bottom Case faces upward.
2. Remove 4 screws (A). Then remove the Bottom Case by lifting the rear portion of it.

Note: When reinstalling, first insert the locking portion into the slot of the front panel.

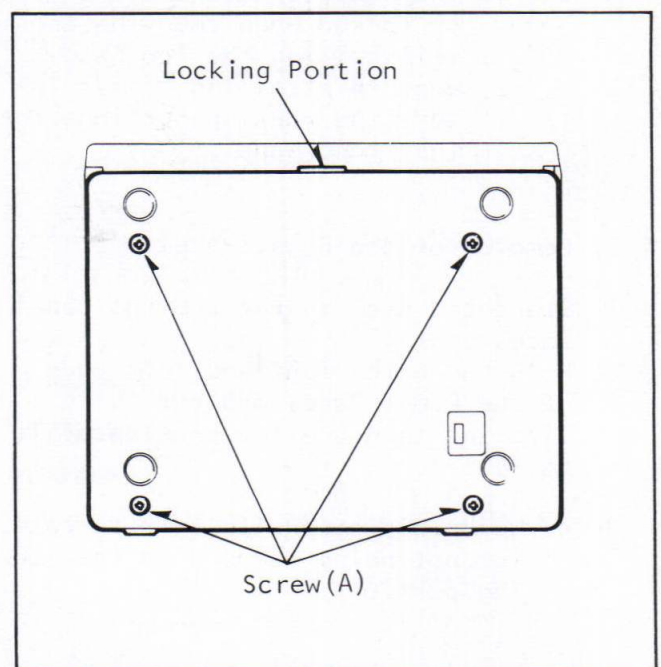


Fig. 2 Removal of Bottom Case

2-2. Removal of the Top Case

1. Turn the deck over again so the Cassette Cover faces upward. And press the Eject Button to raise the Cassette Compartment.
2. Remove 2 screws (B). Then carefully lift the rear portion and pull toward the rear of deck to remove.

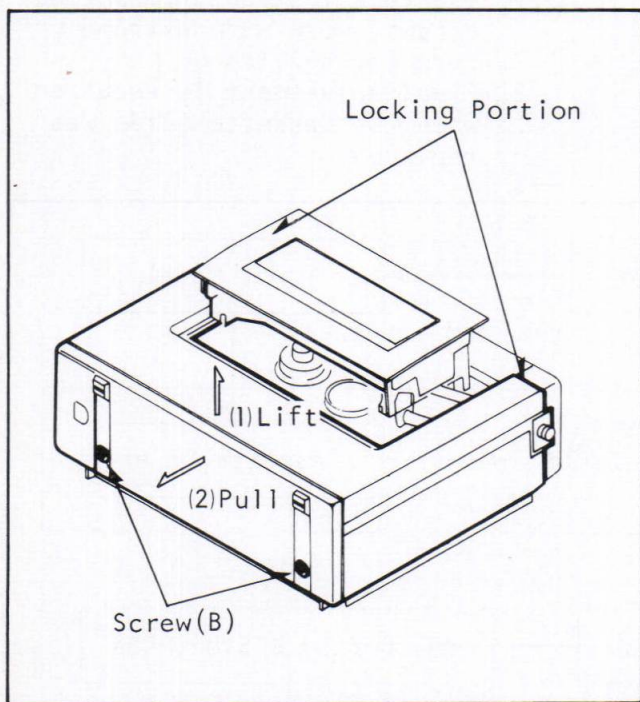


Fig. 3 Removal of Top Case

- Notes:
1. The Cassette Compartment must be raised when removing and reinstalling the Top Case.
 2. When reinstalling, first insert the locking portions into the front panel.

2-3. Removal of the Front Panel

1. Stand the deck so the control panel faces upward.
2. Hold the both right and left ends of the Front Panel and carefully lift and turn the top portion of it to remove.

Note: Work this step with extreme care for not being damaged on the locking portions.

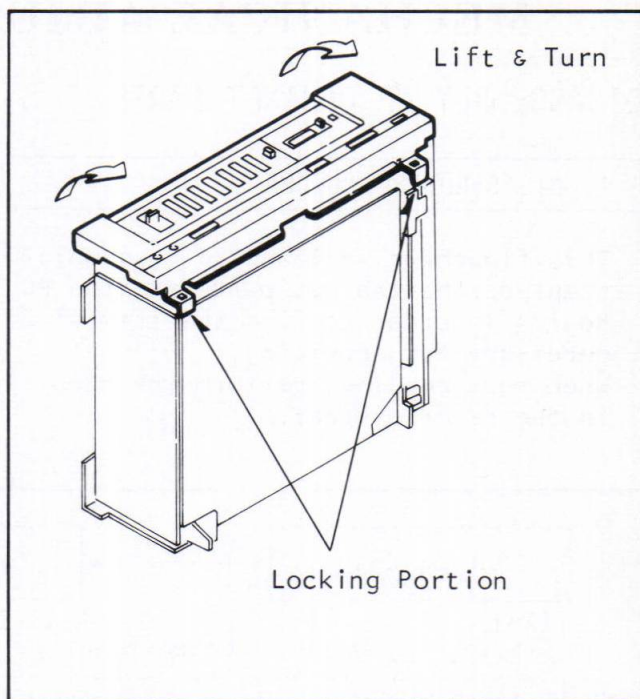


Fig. 4 Removal of Front Panel

2-4. Removal of the Cassette Cover

Remove 2 screws (C). Then carefully lift and turn the rear portion of it to remove. Pay attention for not being damaged on the locking portion.

Note: When reinstalling, first suit the locking portion of the cassette cover to the tab on the cassette holder unit.

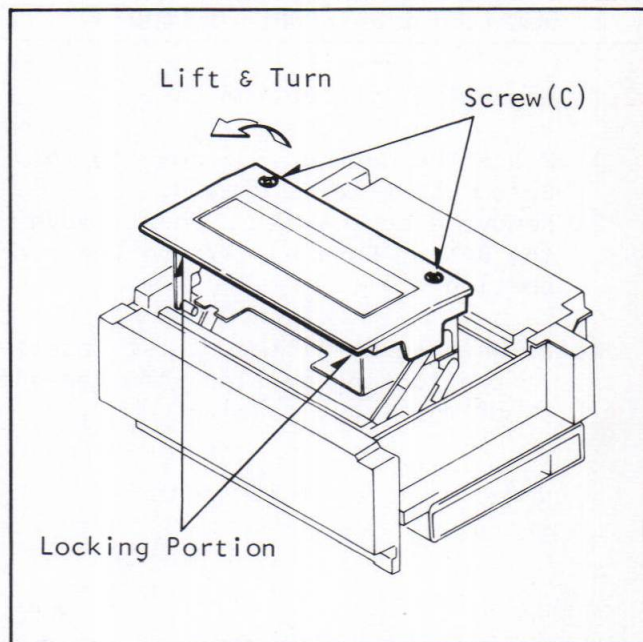


Fig. 5 Removal of Cassette Cover

2-5. Removal of the Cassette Guide

Remove 2 screws (D) and Cassette Guide.

Note: When reinstalling, insert the cassette tape and ensure the clearance between tape and projections on cassette guide is more than 1 mm. Then tighten 2 screws (D).

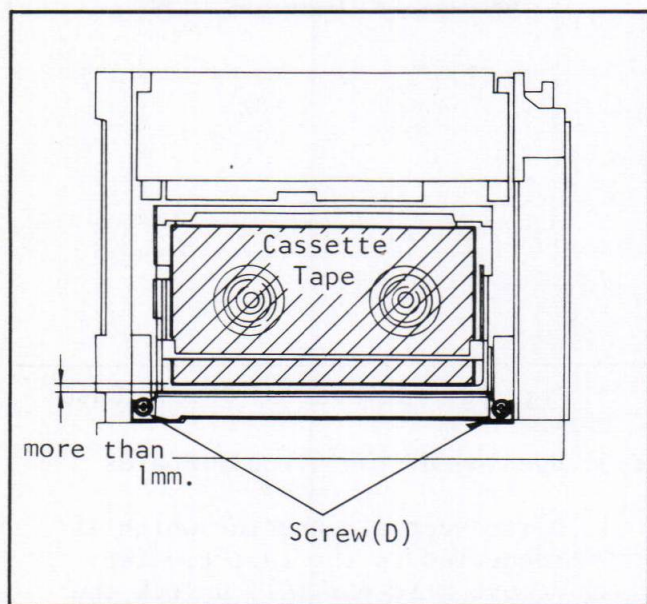


Fig. 6 Removal of Cassette Guide

Note: When reinstalling, ensure the pin located at left lower portion is engaged with the connecting rod.

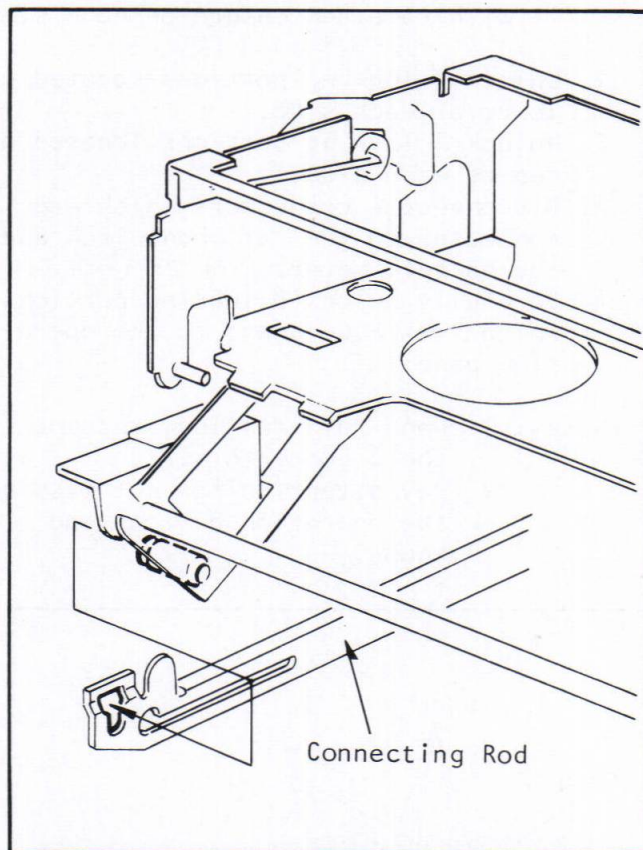


Fig. 8 Note for Installation

2-6. Removal of the Cassette Holder Unit

Remove 4 red screws (E) and the Cassette Holder Unit. Do not remove 2 screws located between 4 screws (E).

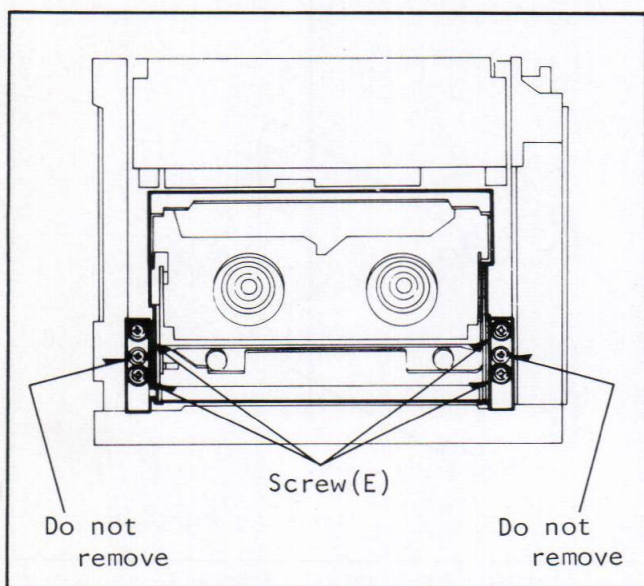


Fig. 7 Removal of Cassette Holder

2-7. Removal of the Operation Panel

Note: As the space of this portion is very compressed, especially work with care and ensure on each step.

1. Unlock 2 locking portions located on lower of each side.
2. Unlock 2 locking portions located on top of each side.
3. Disconnect 2 connectors which are connected to the ear phone jack and the battery meter.
4. Carefully unlock 8 locking portions which lock P.C. Board to the operation panel.

- Notes:
1. When reinstalling, reconnect the 2 connectors.
 2. Pay attention for not missing the operation buttons and knobs.

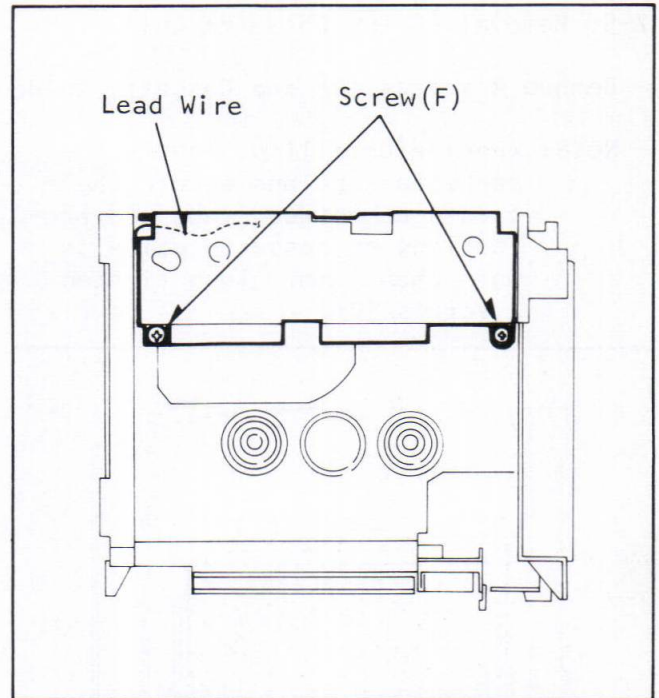


Fig. 10 Removal of Shield Case

2-9. Opening of the Circuit Boards

1. Disconnect a connector which is connected to the tape counter.
2. Remove 2 screws (G), unlock the 2 locking portions and carefully open the P.C. Board. Support the P.C. Boards with your hand to prevent them laying down.
3. Then carefully lay down the P.C. Boards.

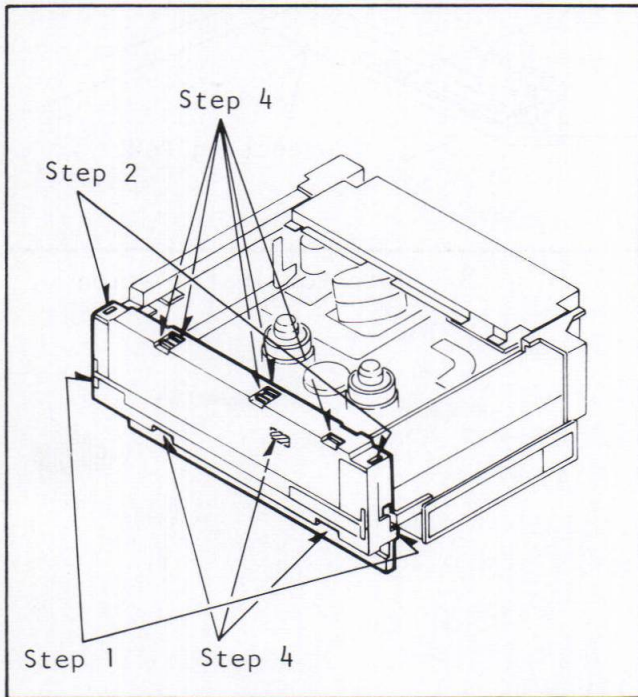


Fig. 9 Removal of Operation Panel

2-8. Removal of the Shield Case

Remove 2 screws (F) and the shield case.

Note: When reinstalling, ensure the red lead wire is restored around dumper correctly.

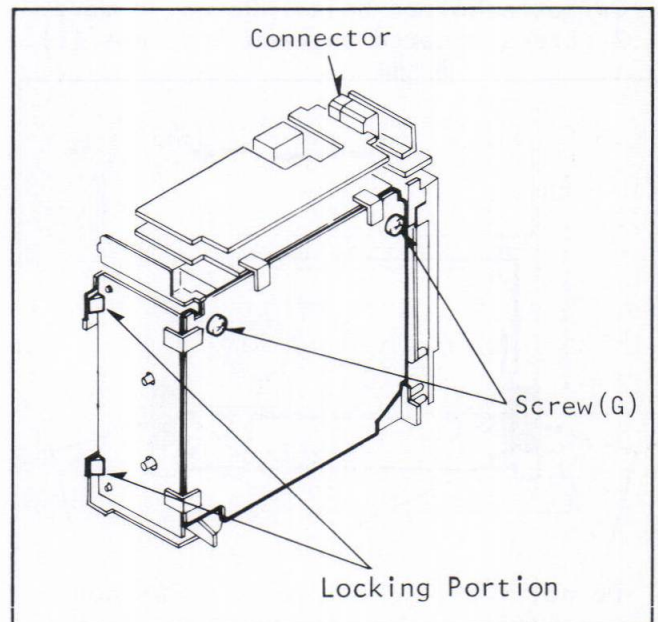


Fig. 11 Circuit Boards

- Notes:
1. Place the cloth or any other soft materials under the P.C. Boards for preventing them being damaged while servicing.
 2. When reinstalling, ensure the connectors are reconnected and any electrical components are not damaged.

REPLACEMENT PROCEDURES

1. REPLACEMENT OF THE VIDEO HEAD DISC

1. Remove the Bottom Case, Top Case, Cassette Compartment and the Shield Case. (Refer to the section of "DISASSEMBLY METHOD", Item 2-1, 2-2, 2-6 and 2-8).
2. Unscrew the screw (A) and remove the brush unit.
3. Unscrew the screw (B) and remove the wire guide.
4. Unsolder the 4 lead wires of the video heads from the head relay board and remove the Video Head Disc (Upper Cylinder).
5. Clean the flange, bottom and rotative surface of the new Video Head Disc with a soft cloth dampened with alcohol or freon liquid.
6. Place the new Video Head Disc on the head disc base so that the screw holes match.
7. Solder the 4 lead wires to the head relay board, be sure to match the colour of the wires and tighten the 2 screws (B) with the wire guide.
8. Place the brush unit with a screw (A).

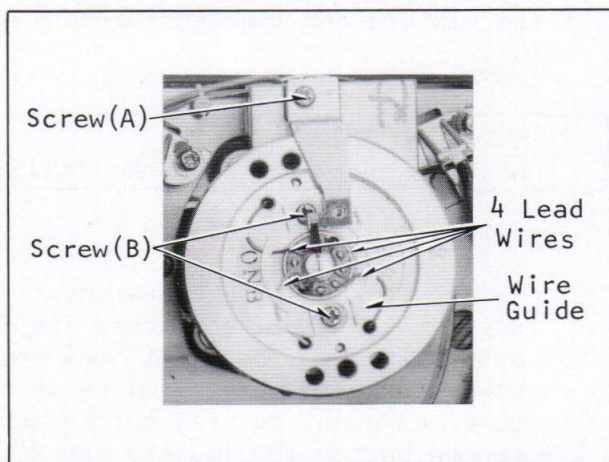


Fig. 12

2. REPLACEMENT AND ADJUSTMENT OF DD CYLINDER UNIT

A. Replacement Procedure

1. Remove the Bottom Case, Top Case, Cassette Compartment and the Shield Case. (Refer to the section of "DISASSEMBLY METHOD", Item 2-1, 2-2, 2-6 and 2-8.)
2. Open the circuit boards. (Refer to section of "DISASSEMBLY METHOD", Item 2-9.)
3. Disconnect the connectors P002 and P003 on the Luminance section.
4. Disconnect the connector P001 on the Cylinder Drive P.C. Board (VJB02113).
5. Unscrew the 3 screws (A) securing the DD Cylinder Unit and remove them from the chassis.
6. Clean the surface of the new DD Cylinder Unit with a soft cloth dampened with alcohol or freon liquid.
7. Mount the new DD Cylinder Unit and reverse the above steps to complete the installation.

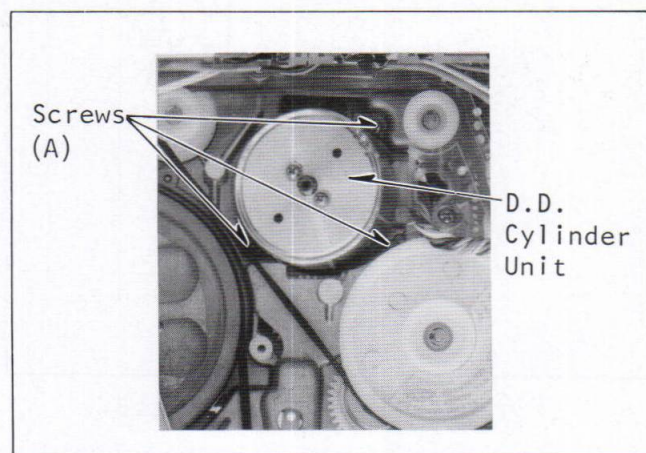


Fig. 13

B. Adjustment Procedure

After the DD Cylinder Unit was replaced, the tape interchangeability should be checked. (Refer to section of "TAPE INTERCHANGEABILITY ADJUSTMENT" item 12.)

ADJUSTMENT PROCEDURES

1. POSITION ADJUSTMENT OF CASSETTE GUIDE PIN

This adjustment is required only when the cassette guide pin was replaced or it's mounting screw was loosened.

Equipment Required:

Capstan Reference Plate ... (VFK0141)

1. Remove the Bottom Case, Top Case, Cassette Compartment and the Shield Case. (Refer to the section of "DISASSEMBLY METHOD", Items 2-1, 2-2, 2-6 and 2-8.)
2. Remove the 2 screws (A) and the Loading Motor Drive P.C. Board.

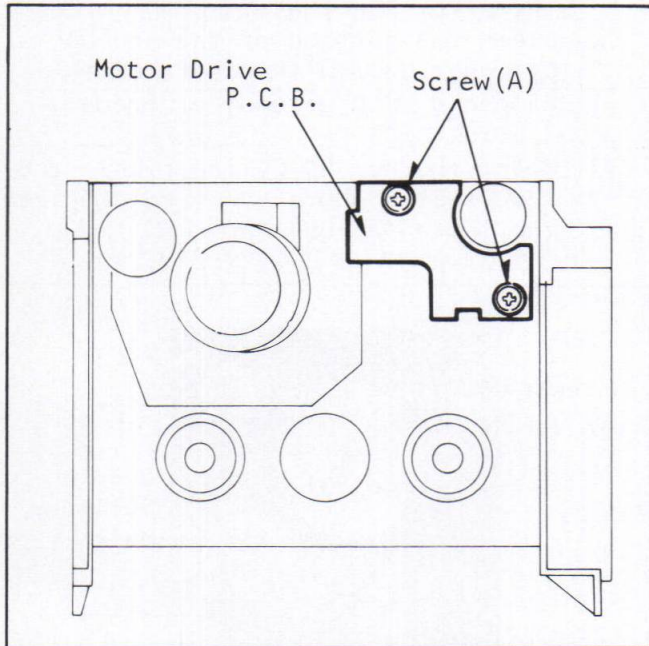


Fig. 14 Motor Drive P.C.B.

3. Remove the Opener Unit by removing the screw (B) and the Pressure Roller Unit by removing the Retaining Ring & Spring.

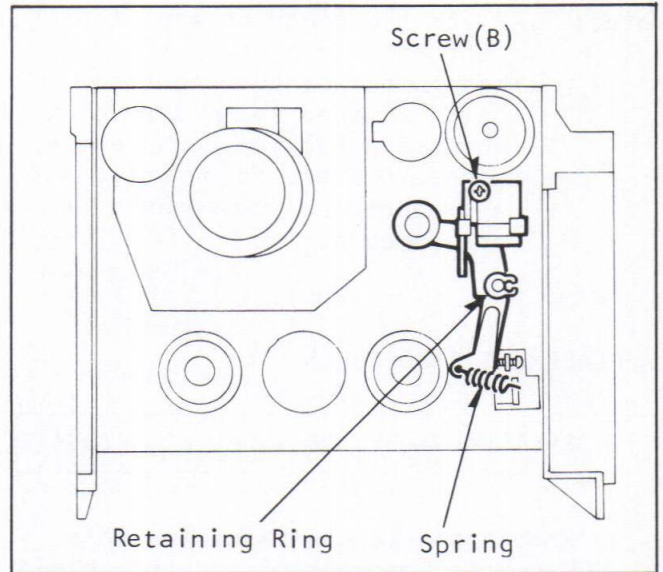


Fig. 15 Opener & Pressure Roller

4. Place the Capstan Reference Plate (VFK0141), set the cassette guide pin into the hole of the plate.

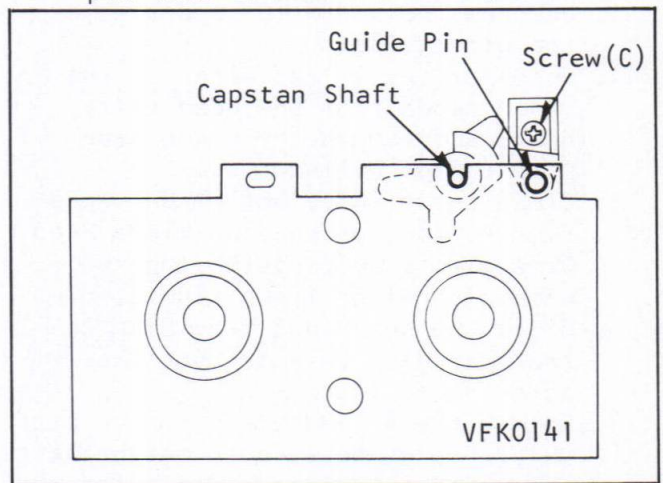


Fig. 16 Adjustment of Guide Pin

5. Move the fixture so the capstan shaft fits snugly in the notch of the fixture and tighten the screw (C).

2. POSITION ADJUSTMENT OF PRESSURE ROLLER

Specification: 1.2 ± 0.3 mm

1. Remove the Cassette Compartment. Blind the photo transistors (Q6551 & Q6552), push the eject lock lever down, turn the safety switch on by hand and push the play button and record button to simulate the REC mode.

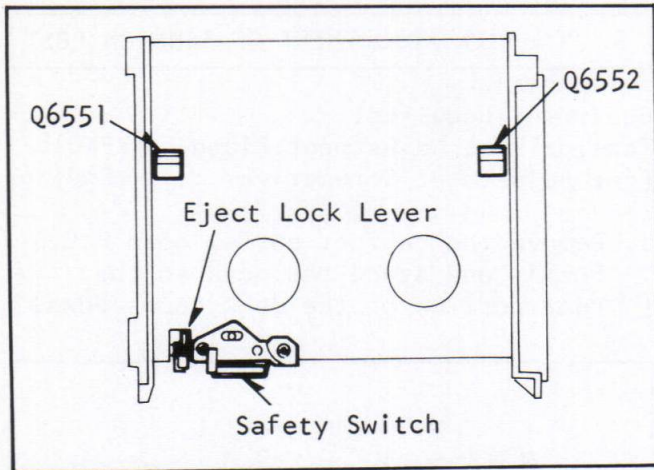


Fig. 17 Simulation of REC-PAUSE

2. Continuously push the pause button to simulate the REC-PAUSE mode.
3. Confirm the clearance between the capstan shaft and pressure roller is within the specification.
4. If it is out of spec., adjust it by turning a screw (A) to obtain the specified clearance.

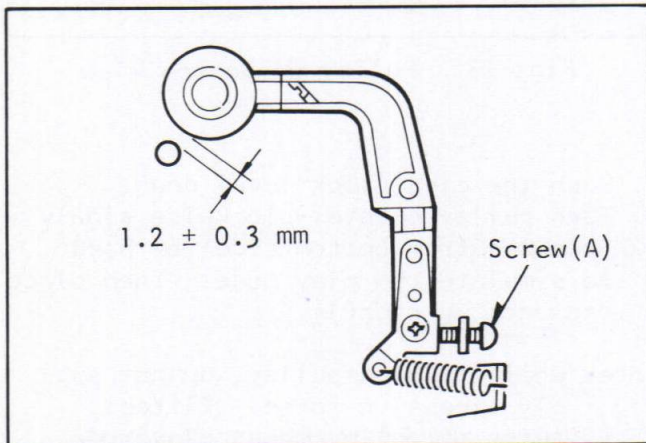


Fig. 18 Spec. of Clearance

3. CONFIRMATION OF PRESSING FORCE OF PRESSURE ROLLER

Equipment Required:
Fan-Type Tension Gauge (VFK66)

1. Playback the cassette tape.
2. Set a Fan-Type Tension Gauge to the part (A) of Main Pressure Arm Unit.
3. Press the Arm with the Gauge, in the direction indicated by the arrow as shown below.

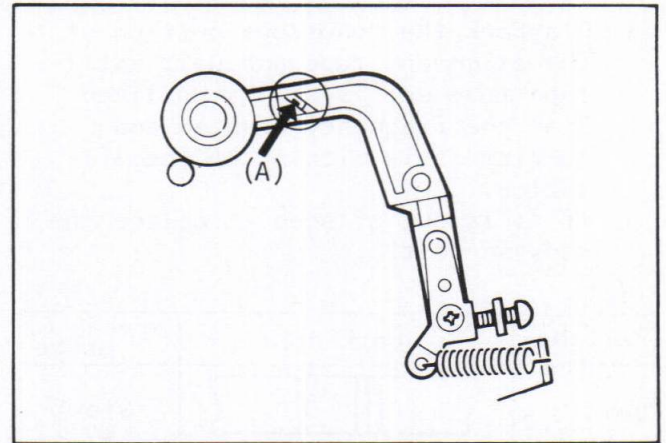


Fig. 19

4. Confirm that reading of the Tension Gauge is $1,600 \pm 350$ g at the moment of tape stop.

4. CONFIRMATION OF TAPE SPEED

Equipment Required:
Frequency Counter
VHS Alignment Tape ... VFM8100H3D
Specification: 600 ± 1.5 Hz

1. Remove the Bottom Case, Top Case and the Front Panel.
2. Connect the frequency counter to the collector of Q2008 on the Servo section (VJB0399).

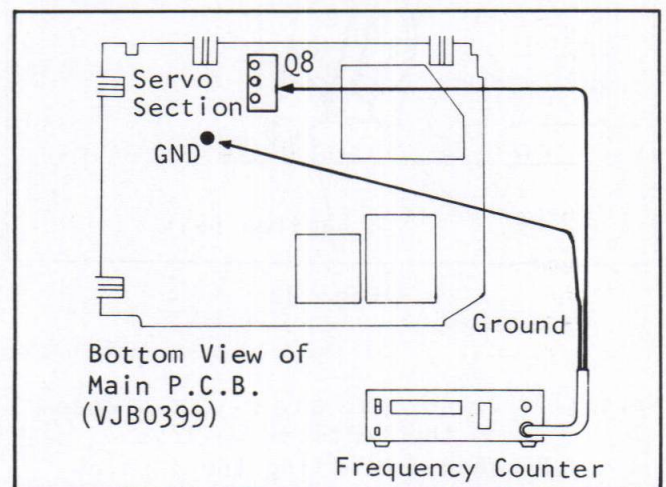


Fig. 20 Location of Q2008

3. Playback the monoscope portion of the alignment tape and wait until tape movement is well stabilized.
4. Read the frequency counter and confirm it is within the specification.
5. If it is out of spec., replace the capstan belt.

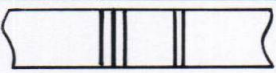
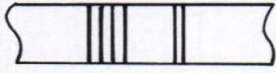

Part No.	Marking	Speed Range
VDV0121A		Slow
VDV0121B		Center
VDV0121C		Fast

Fig. 21

6. When to replace the Capstan Belt, first remove 2 screws (A), Thrust Holder, and the Fast Wind Belt. Then change the capstan belt to obtain the correct speed. (VDV0121A, VDV0121B, VDV0121C)

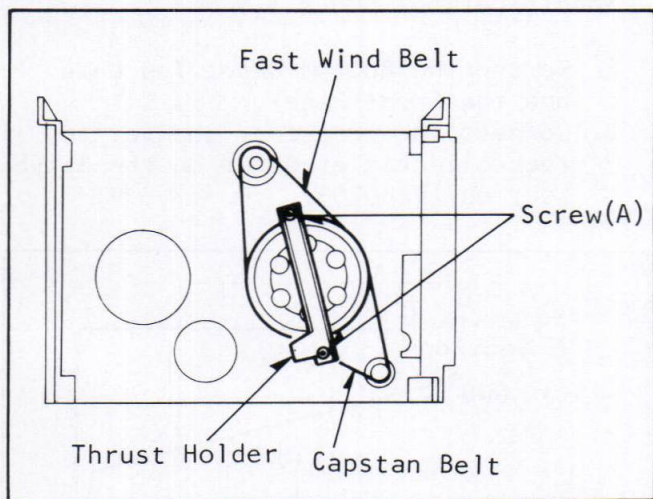


Fig. 22

- Notes:
1. Do not put any oil or grease on the belts or pulleys.
 2. When installing the capstan belt, make sure that the marked side comes outside.

5. POSITION ADJUSTMENT OF TENSION POST

Equipment Required:
 Tension Post Adjustment Plate ..(VFK0187)
 Fine Adjustment Screwdriver(VFK0136)

1. Remove the cabinet parts, open P.C. Boards and stand the deck so the rear portion of the deck faces down.

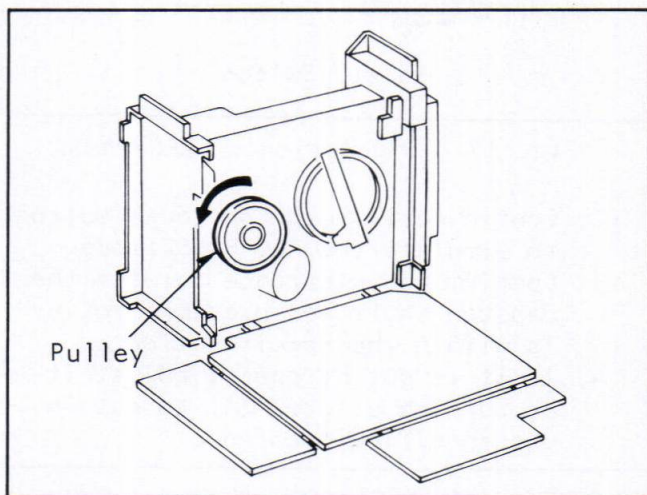


Fig. 23 Pulley on Bottom View

2. Push the eject lock level down.
3. Turn pulley counter-clockwise slowly (viewing from bottom side) by hand to simulate the play mode. Then place the deck up-rightly.

Note: While turning pulley, do not supply excessive force. Fifteen turns of pulley makes play mode (from the start, posts are just moved, to loading completion).

4. Place the adjustment plate, slightly loosen a screw securing the tension band bracket.
5. Insert the fine adjustment screwdriver into the hole and move the tension band bracket in either of direction so the tension post just touches the fixture.

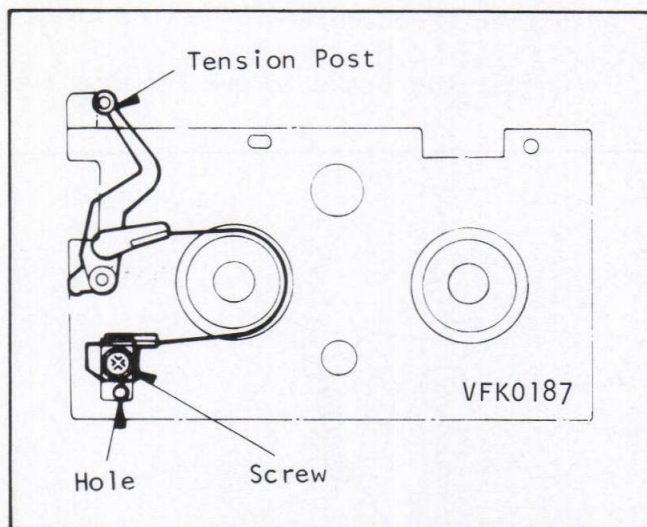


Fig. 24 Adjustment of Tension Post

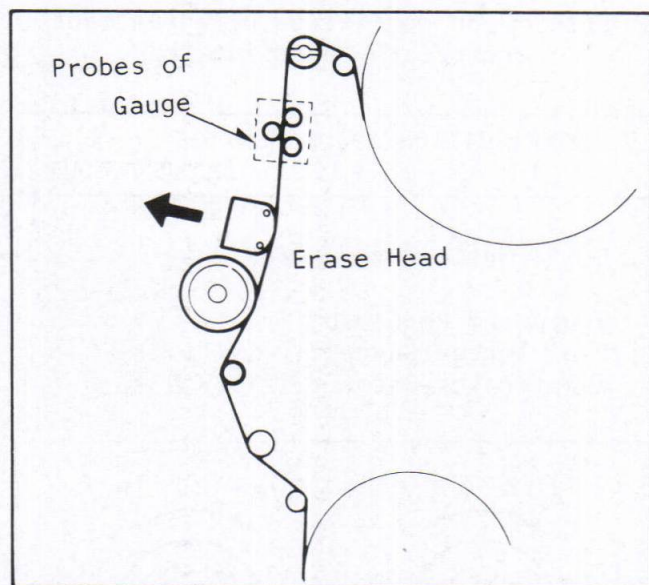


Fig. 25 Measurement of Back Tension

6. MEASUREMENT AND ADJUSTMENT OF BACK TENSION

A. Measurement Procedure

Equipment Required:
 Back Tension Meter (Tentelometer)
 VHS Cassette Tape (120 Minutes Tape)

Specification: 25 ~ 30 g

1. Remove the Bottom Case, Top Case, Cassette Compartment and the Shield Case.
2. Pull the erase head in the direction indicated by the arrow and hold it by adhesive tape.
3. Playback the cassette tape from its beginning and wait until tape running has stabilized. (For approx. 10 to 20 seconds)
4. Insert tension meter in tape path and confirm reading.
5. If the reading is out of spec., continuously perform the adjustment procedure.

Notes: 1. Make sure that the three probes of the meter are all in good contact with tape, but out of contact with any parts while measuring.
 2. It is recommended to be measured three times as tension meter is very sensitive.

B. Adjustment Procedure

Equipment Required:
 Fine Adjustment Screwdriver ..(VFK0136)

1. Loosen a screw (A) and insert the fine adjustment screwdriver into the hole (B).
2. Move the adjustment plate in either of direction indicated by the arrow to obtain the specified tension. Turn the driver clockwise to lower tension, counter-clockwise to raise it.
3. Tighten the screw (A) and varify tension with the meter once again.
4. Reinstall the shield case and cabinet parts.

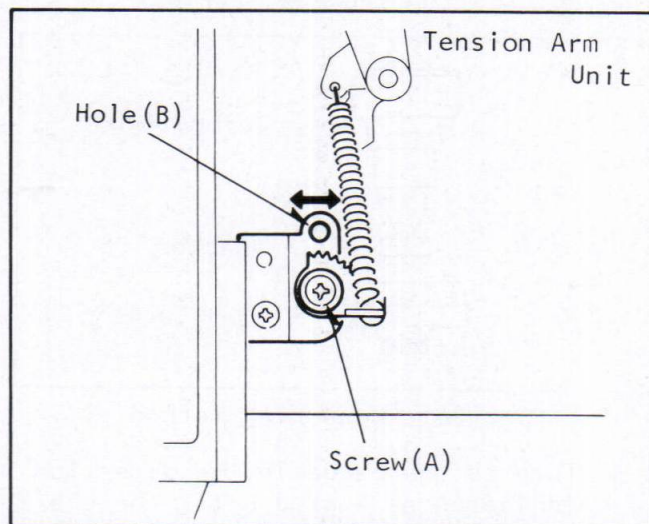


Fig. 26 Adjustment of Back Tension

Note: Upon completion of adjustment, remove the adhesive tape.

7. CONFIRMATION/ADJUSTMENT OF BRAKE TORQUE

A. Confirmation Procedure

Equipment Required:
 Dial Torque Gauge ... (VFK0133)
 Adaptor for Gauge ... (VFK0134)

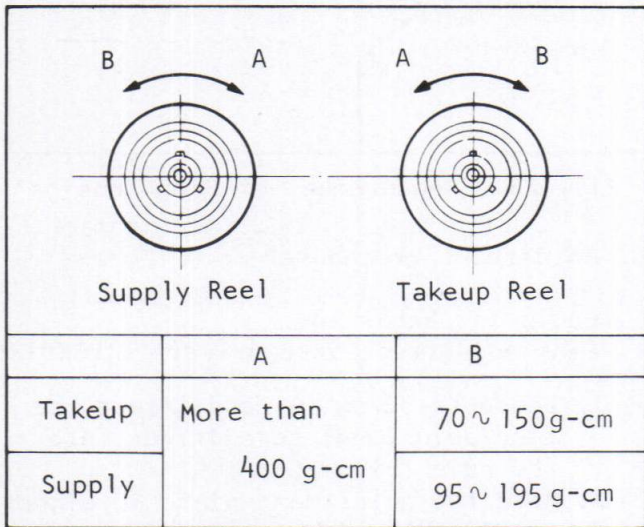


Fig. 27 Spec. of Brake Torque

1. Attach the adaptor to the torque gauge.
And place the deck in STOP mode.
2. Place the torque gauge on the reel table. The weight of gauge should not rest on the reel table.

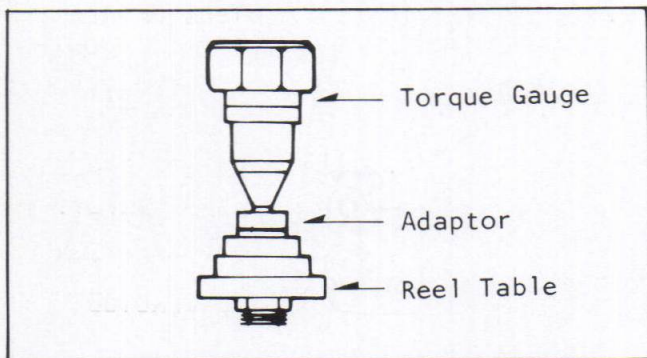


Fig. 28 Measuring Method

3. Turn torque gauge in the direction indicated as A or B until the brake begins slipping.
Read the torque when it begins slipping.

B. Adjustment Procedure

To adjust the brake torque, change the notch.

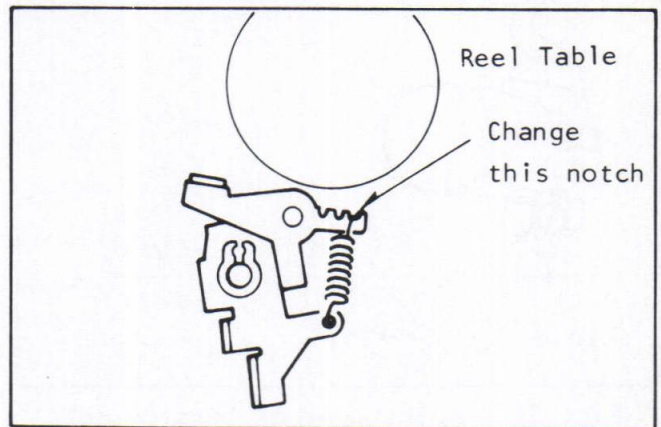


Fig. 29 Adjustment of Torque

Note: If proper brake torque could not be obtained by changing the spring position, clean the rotating surface of the reel table with soft cloth and confirm torque before replace it.

8. CONFIRMATION OF TAKEUP TORQUE

Equipment Required:
 Dial Torque Gauge ... (VFK0133)
 Adaptor for Gauge ... (VFK0134)

Specifications:
 in PLAY mode 130 ~ 180 g-cm
 in F.F., REWIND modes
 more than 400 g-cm

1. Attach the adaptor to the torque gauge.
2. Blind the takeup and supply photo transistors (Q6552 and Q6551) with opaque paper. Lower the cassette up unit (without cassette cover), and turn power switch on.
3. Set a torque gauge to the Takeup Reel Table, push the play button and read torque on gauge. Also work for F.F. mode by pushing the F.F. button.

Note: While measuring, the weight of gauge should not rest on the reel table.

4. Set a torque gauge to the Supply Reel Table, push the rewind button for confirmation of the rewind mode.
5. Remove the opaque paper and reinstall the cassette cover.

Note: There are no adjustment here. If the torque readings are off considerably, rollers or idlers or reel tables may need replacement.

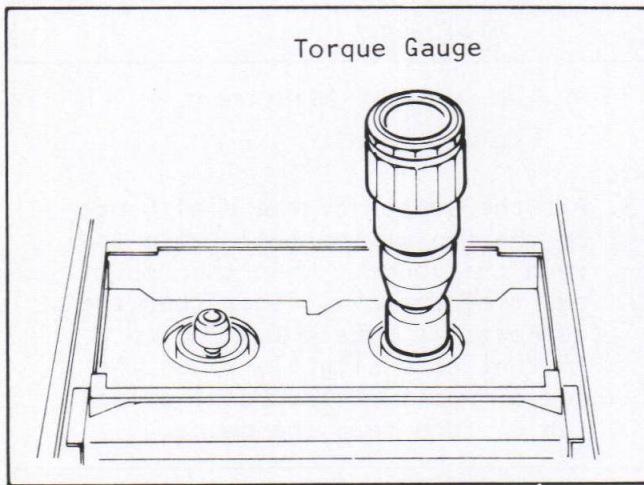


Fig. 30 Measuring Method

9. POSITION ADJUSTMENT OF SAFETY SWITCH

This adjustment is required only when the safety Switch was replaced or mounting screw were loosened.

Equipment Required:
Cassette Holder Fixture ... (VFK0188)

1. Remove the Bottom Case, Top Case, Cassette Compartment and Front Panel. And open the operation panel. (Refer to the section of "DISASSEMBLY METHOD", Items 2-1, 2-2, 2-3, 2-4, 2-5 and 2-6.)
2. Place the fixture, just slightly loosen 2 screws (A) by about half turn.

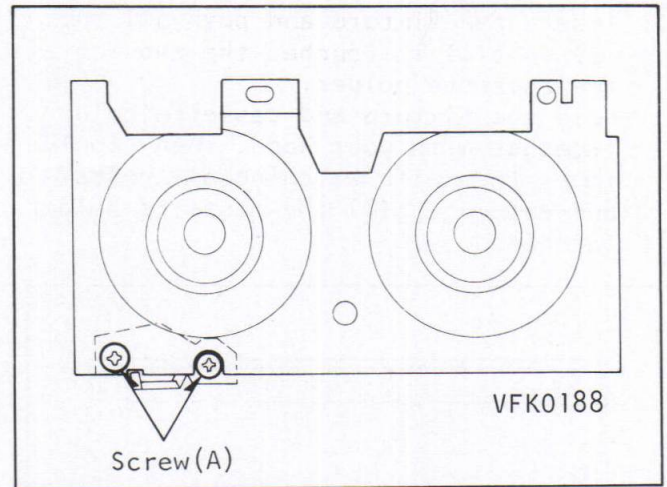


Fig. 31 Adjustment of Safety SW -- (1)

3. Turn the switch base counter-clockwise and then slowly turn clockwise until switch turns on (it clicks). Tighten 2 screws.

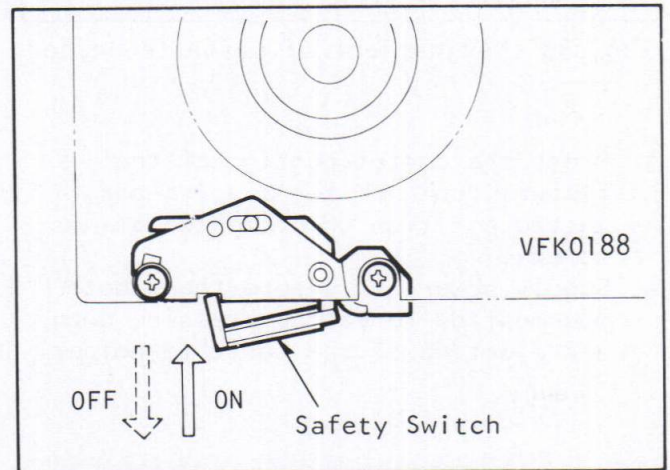


Fig. 32 Adjustment of Safety SW -- (2)

10. ADJUSTMENT OF CASSETTE HOLDER

This adjustment is required only when the screw (A) was removed accidentally.

Equipment Required:
Cassette Holder Fixture ... VFK0188

Note: Before adjustment, ensure the cassette lock lever is unlatched.

1. Remove the Cassette Guide and slightly loosen 6 screws (A) and (B). Keep the cassette holder ejected condition.

2. Insert the fixture and push all the way in till it touches the tabs on the cassette holder. Hold the fixture and cassette holder together with your hand, then slowly lower them with watching all holes and cut-outs till the cassette holder latches.

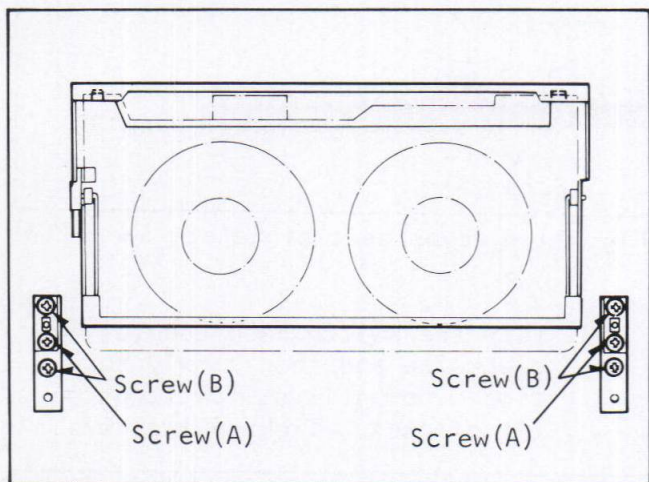


Fig. 33 Adjustment of Cassette Holder

3. Press the center portion of the fixture down not for missing adjusted position then tighten 6 screws.
4. Supply power and ensure the smooth movement by repeating pressing down and ejecting of the cassette holder.

11. HEIGHT ADJUSTMENT OF REEL TABLES

Equipment Required:
 Post Adjustment Plate (VFK0138)
 Reel Table Height Fixture (VFK0139)
 Retaining Ring Remover, 3 mm .. (VFK0144)
 Hex. Wrench, 1.5 mm (VFK76)

1. Place the Post Adjustment Plate, set the U-shaped block and place it on the adjustment plate.
2. Fit the sensor of the dial gauge on the cut-out portion of the adjustment plate and set the pointer of gauge to 0 (zero).

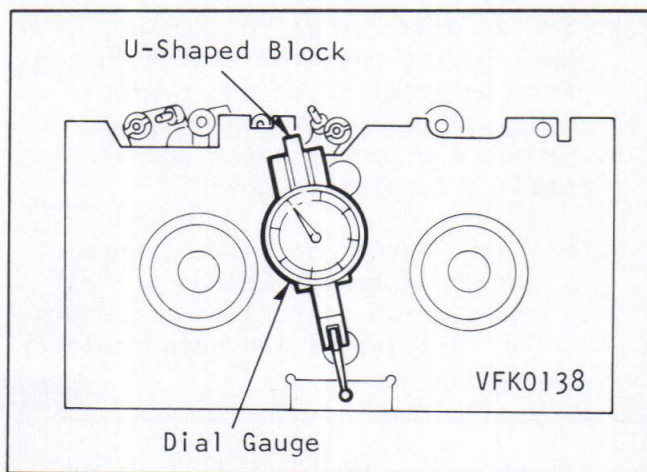


Fig. 34 Height Adjustment -- (1)

3. Fit the sensor of the dial gauge on the top of the reel table and read the gauge. When the top of the reel table is lower than the cut-out, it does not. In that case slightly press the sensor until it touches the reel table, then read the gauge.

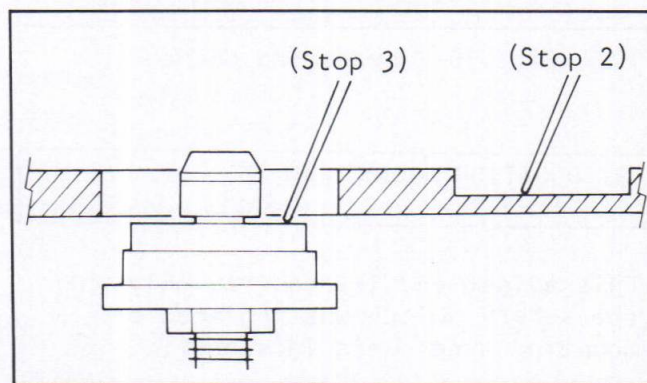


Fig. 35 Height Adjustment -- (2)

4. Confirm that the difference of the readings between steps 2 and step 3 is within specification. If it is out of spec., then adjust the height of the reel table. (The washer is available in sizes of 0.13 mm, 0.25 mm and 0.5 mm of thickness).
5. To replace the washer, remove the counter belt 1, retaining ring and takeup reel table for maintenance the takeup reel table. Remove the 2 retaining rings, tension post unit and supply reel table for maintenance the supply reel table.

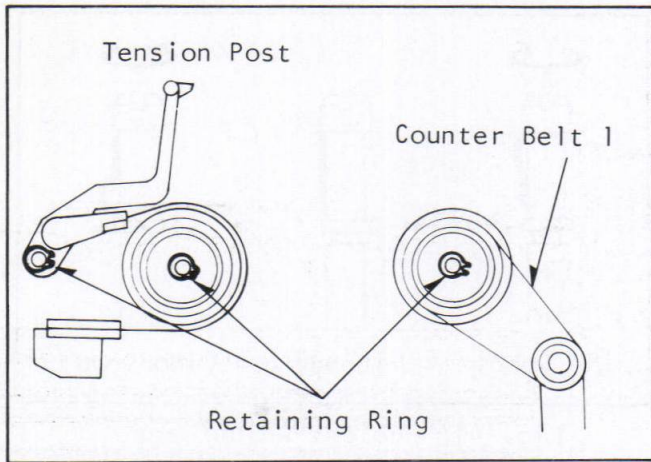


Fig. 36 Height Adjustment -- (3)

12. HEIGHT ADJUSTMENT OF TAPE GUIDE POSTS

Equipment Required:

- Post Adjustment Plate (VFK0138)
 - Post Adjustment Screwdriver ... (VFK0137)
 - Block Gauge (VFK0139)
 - Hex. Wrench, 0.9 mm (VFK0146)
 - Nut Driver, 6 mm
- (Purchase from local supplier)

This procedure is just the pre-adjustment of the "TAPE INTERCHANGEABILITY ADJUSTMENT" for 4 tape guide posts, if does not by itself constitute the final interchangeability adjustment.

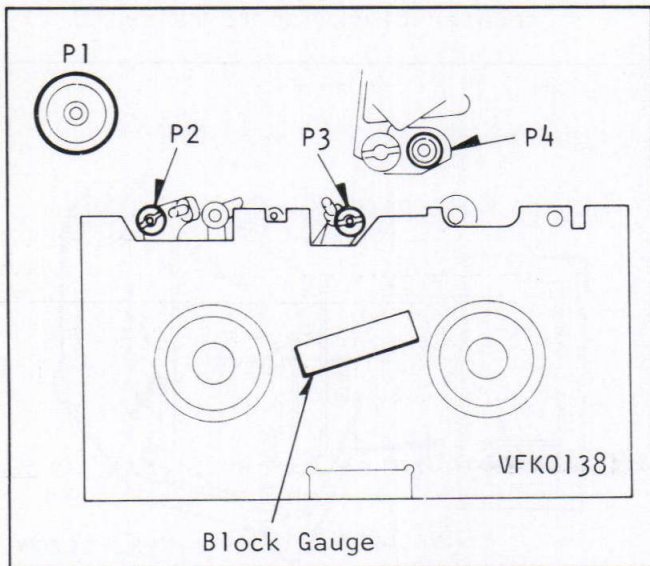


Fig. 37 Location of Posts

1. Place the post adjustment plate on the 4 cassette support pins correctly and put the block gauge on it. And fit the block gauge against each post

for confirmation that the post is positioned lower or higher against the adjustment plate.

2. Loosen the locking hex. screws of posts (P2 & P3), then rotate the top of post counter clockwise with post adjustment screwdriver to raise them as is the condition (C) shown below.
3. Then slightly press the block gauge against the post sleeve and rotate the top of the post clockwise with post adjustment screwdriver until to obtain the condition (A) shown below.

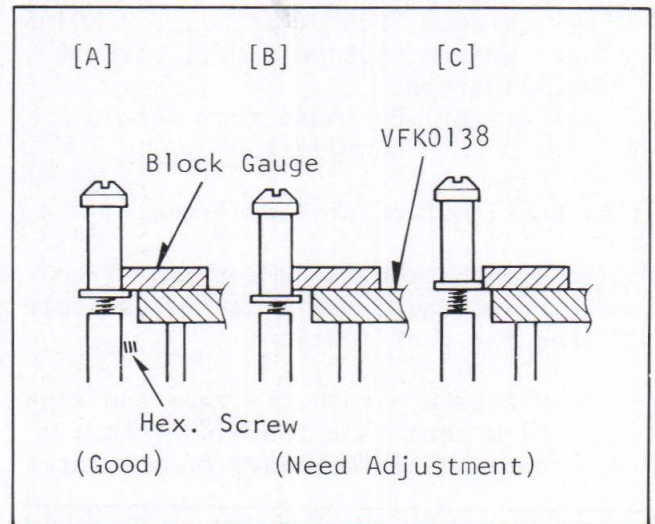


Fig. 38 Height Adjustment

4. Make the same adjustment for posts (P1 & P4) with nut driver. (Remove the post cap for P4 by turning it counter-clockwise).

Note: When the post cap is reinstalled, the direction of it should be as shown below viewing from the direction indicated by the arrow.

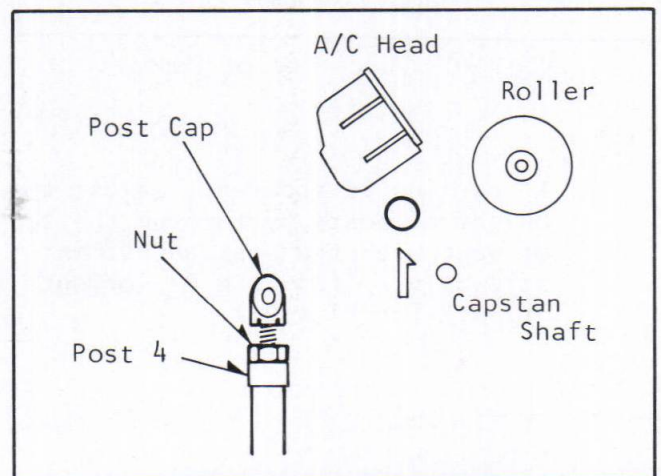


Fig. 39 Installation of Post Cap

13. TAPE INTERCHANGEABILITY ADJUSTMENT

Note: To perform these adjustment/confirmation procedures, make sure that the tracking control is set into the detent (fixed) position.

Equipment Required:

- VHS Alignment Tape VFM8100H3D
- H. Position Adj. Fixture ... VFK0189
- Post Adj. Screwdriver VFK0137
- Hex. Wrench, 0.9 mm VFK0146
- Hex. Wrench, 1.5 mm VFK76
- Oscilloscope
- Nut Driver (Purchase from local supplier)

13-A. Confirmation of Tape Travel

To prevent the alignment tape from being damaged, use a normal cassette tape for confirmation.

1. Playback a cassette tape and confirm that tape travels without curling at the edges of the tape.

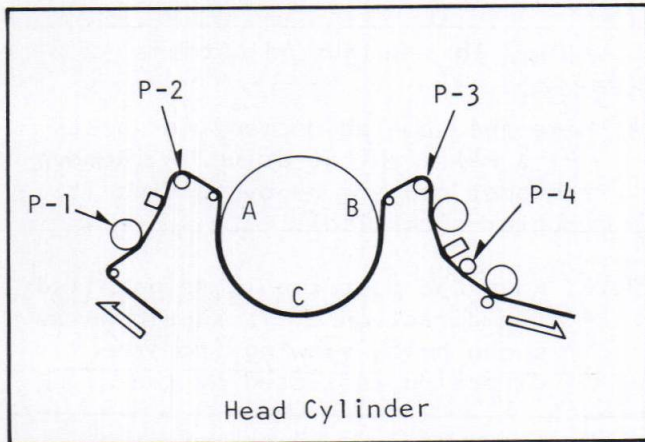


Fig. 40 Location of Posts

2. If curling is apparent, adjust the height of posts by turning the top of post with the post adjustment screwdriver (for P2 & P3) or nut driver (for P1 & P4).

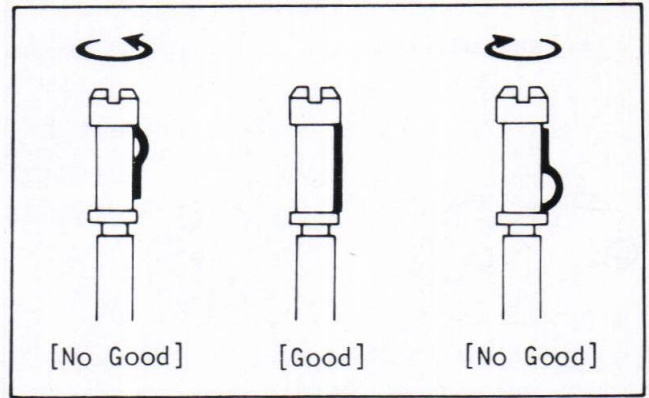


Fig. 41 Height Adjustment

13-B. Confirmation of A/C Head Height

This confirmation is required when the A/C Head was replaced and to adjust the height of it preliminary. For final adjustment, perform next item 13-C.

1. Looking at the lower edge of the control head with the tape running, ensure the lower edge of tape runs along the lower edge of the control head.
2. If it doesn't, just slightly turn the nut (A) in either directions to correct it. Turn it clockwise to lower the head, counter-clockwise to raise it.

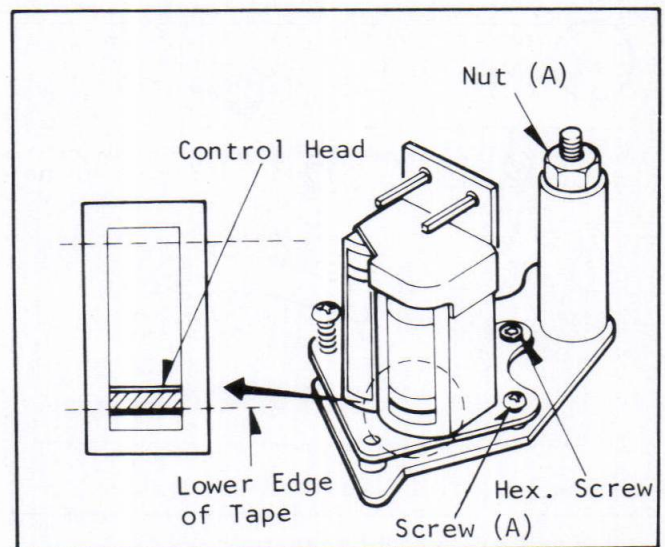


Fig. 42 A/C Head Pre-Adjustment

13-C. Height Adjustment of A/C Head

1. Connect the oscilloscope to the audio output jack on the side of the deck.
2. Playback the alignment tape, VFM8100H3D.
3. Adjust the screw (A) and the Hex. screw in the Fig. 43 to obtain the maximum output level.

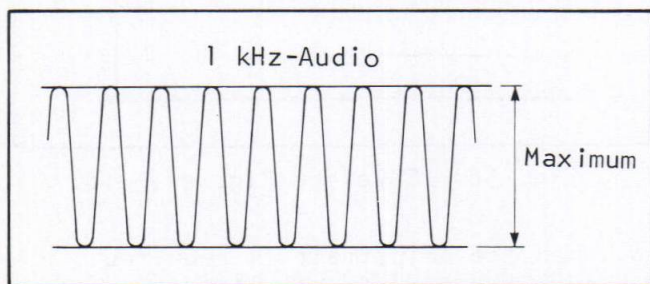


Fig. 43 A/C Head Adjustment -- (1)

13-D. Confirmation of Tilt of A/C Head

This procedure should be confirmed after the height adjustment of P4.

1. Playback the tape and confirm the tape runs between lower and top limiters of post. And confirm the condition of tape running.
2. If the waving or frilling is apparent on the lower or top edge of the tape, correct it by turning a hex. screw located on the A/C Head Base. (See Fig. 42.)

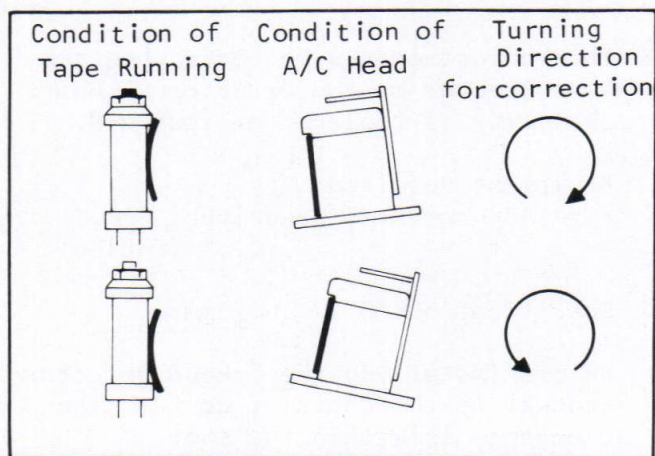


Fig. 44 A/C Head Adjustment -- (2)

13-E. Horizontal Position Adjustment of A/C Head

1. Connect the oscilloscope to the Test Point, TP3012 located next to Pin No. 12 of IC3003.
2. Playback the alignment tape, VFM8100H3D, and confirm the RF envelope figure.
3. If the adjustment is required, set the H-position screwdriver into the slot of the adjustment nut and rotate in either of direction to obtain the maximum envelope output.

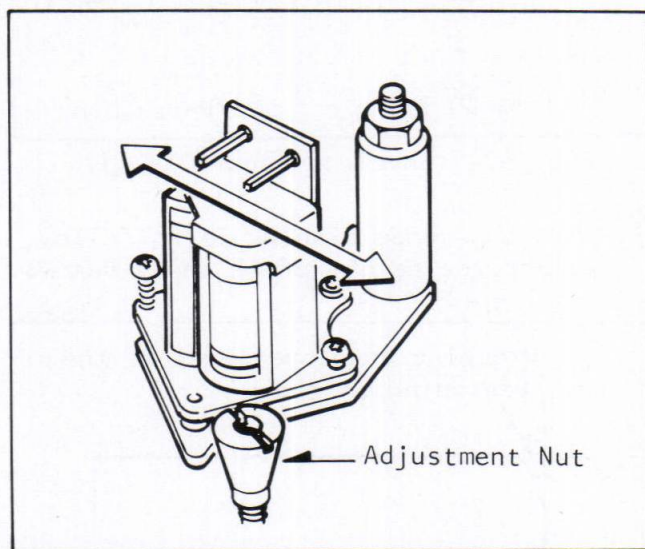


Fig. 45 A/C Head Adjustment -- (3)

13-F. Confirmation/Adjustment of Envelope Output

1. Connect the oscilloscope to the Test Point, TP3012.

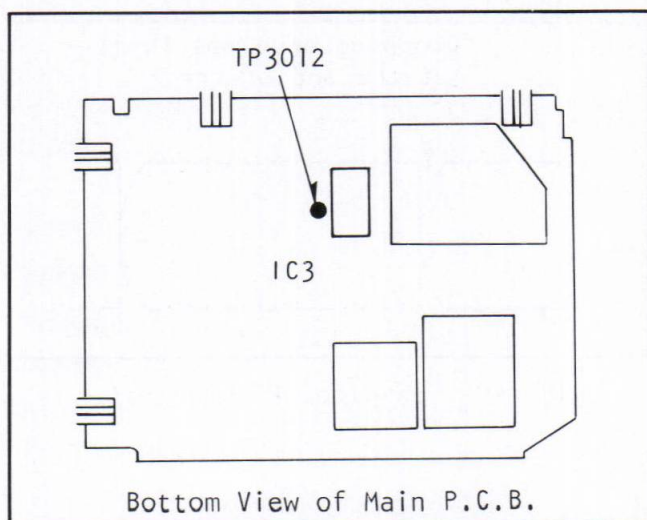


Fig. 46 Location of TP3012

- Playback the monoscope portion of the alignment tape, VFM8100H3D and adjust the posts P2 & P3 by watching the scope display so the envelope figure becomes as flat as possible. ($V1/V-max \geq 0.7$, $V2/V-max \geq 0.8$)

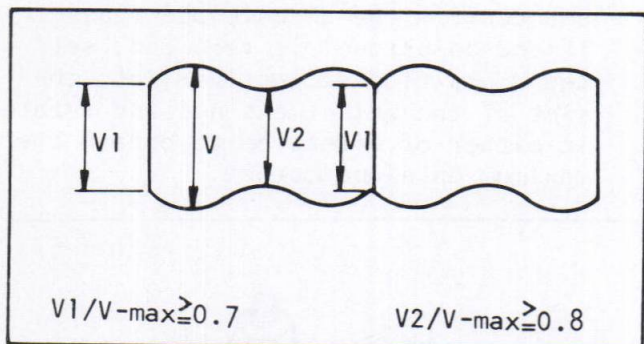


Fig. 47 Envelope Figure -- (1)

- When the scope display is as follow, adjust the height of P2 shown below.

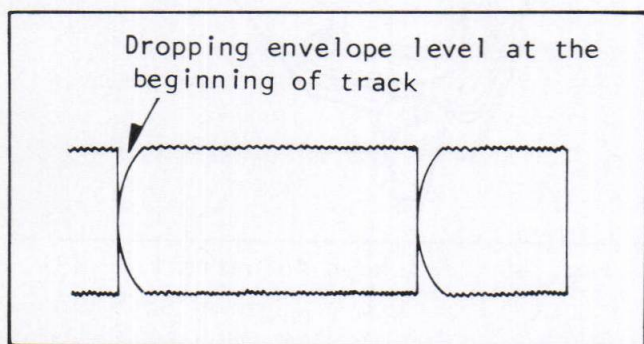


Fig. 48 Envelope Figure -- (2)

- When the scope display is as follow, adjust the height of P3 shown below.

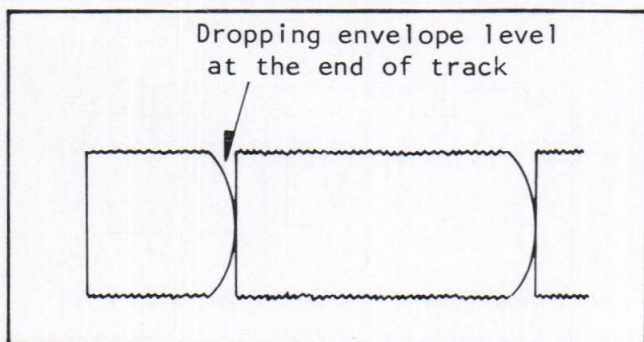


Fig. 49 Envelope Figure -- (3)

- The scope display with P2 and P3 adjusted correctly should become as shown below.

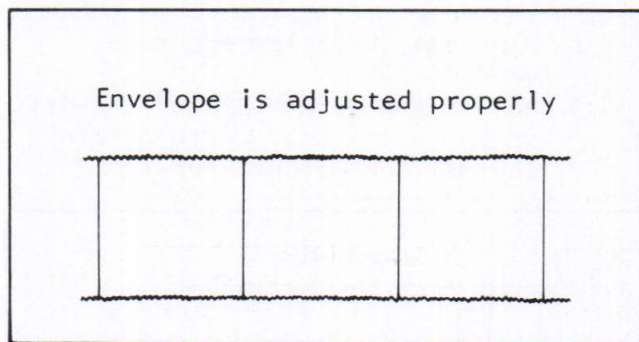


Fig. 50 Envelope Figure -- (4)

- When the adjustment is required, turn the top of post with the post adjustment screwdriver.

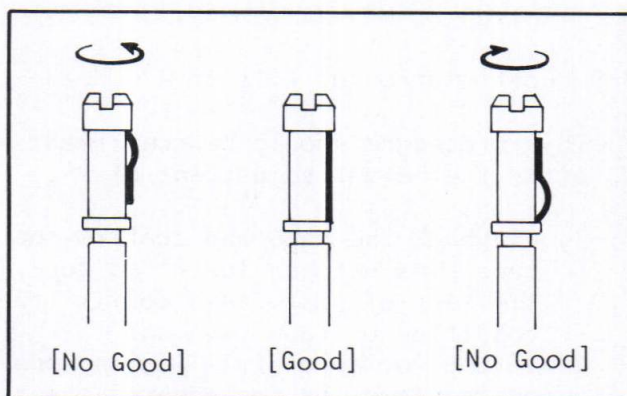


Fig. 51 Height Adjustment

14. ADJUSTMENT OF TAKEUP DETECTOR

This adjustment is required when the Tape Counter or the Detector PC Board (Hall IC) is replaced or loosened.

Equipment Required:
 Fine Adjustment Screwdriver, 3mmφ
 (VFK0136)

Specification: 0.2 ~ 0.7 mm

Before installing the Takeup Detector Bracket to the chassis, confirm the clearance is within the spec. If it is out of spec., slightly loosen a screw (A) and adjust the position of the Detector PC Board with the Fine Adjustment Screwdriver to obtain the specified clearance.

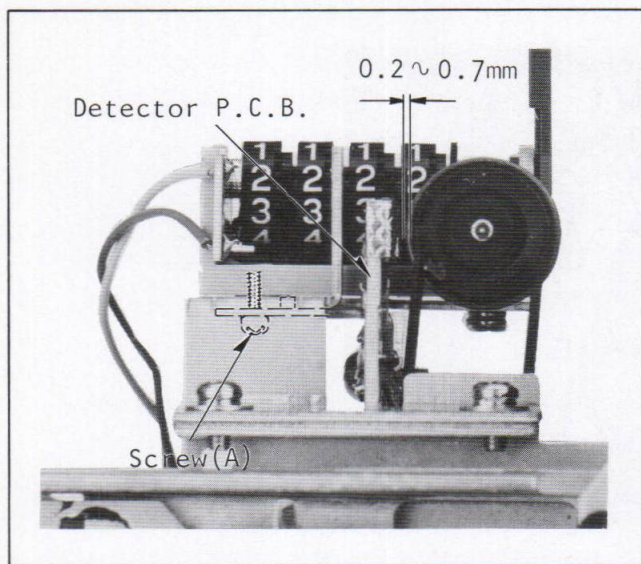


Fig. 52 Adjustment of Takeup Detector

15. ADJUSTMENT OF CAM GEAR AND MODE SELECT SWITCH

General Condition

The mechanism of this model is mostly engaged to the electrical circuit, System Control Circuit, through the mode select switch. Therefore the relation between the mode switch and the cam gear decides all further mechanical movement of the mechanical parts such as levers, gears, rollers and so on. If the adjustment of this item is performed improperly, the deck will be unloaded or compulsorily stopped. And it will result being damaged at any mechanical or electrical parts.

Note: The step 11 of this procedure describes the adjustment of case that mode select switch is replaced.

Adjustment Procedures:

1. Turn loading gear clockwise until the post 2 and 3 were fully unloaded. The small projection on the loading gear will be top portion at the unloading condition.



Fig. 53 Adjustment Procedure -- (1)

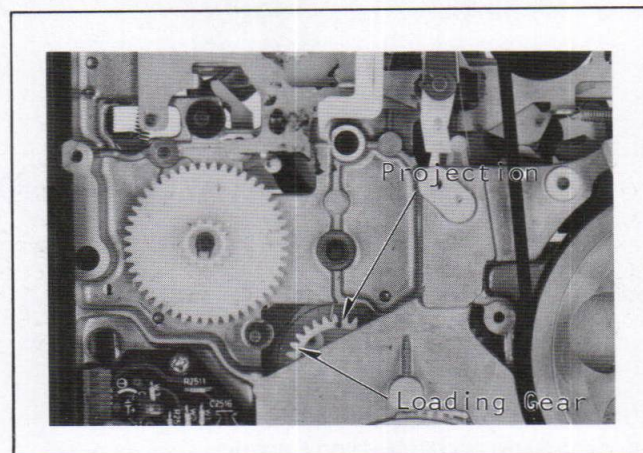


Fig. 54 Adjustment Procedure -- (2)

2. Install the action gear so the hole on the action gear meets the projection on the loading gear. Ensure that the loading gear is still fully unloaded condition.

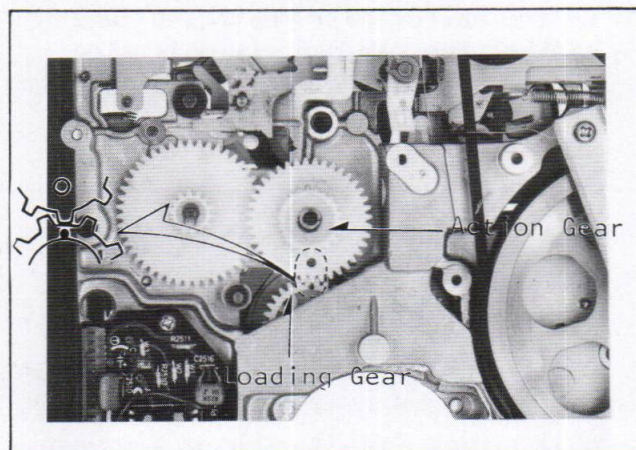


Fig. 55 Adjustment Procedure -- (3)

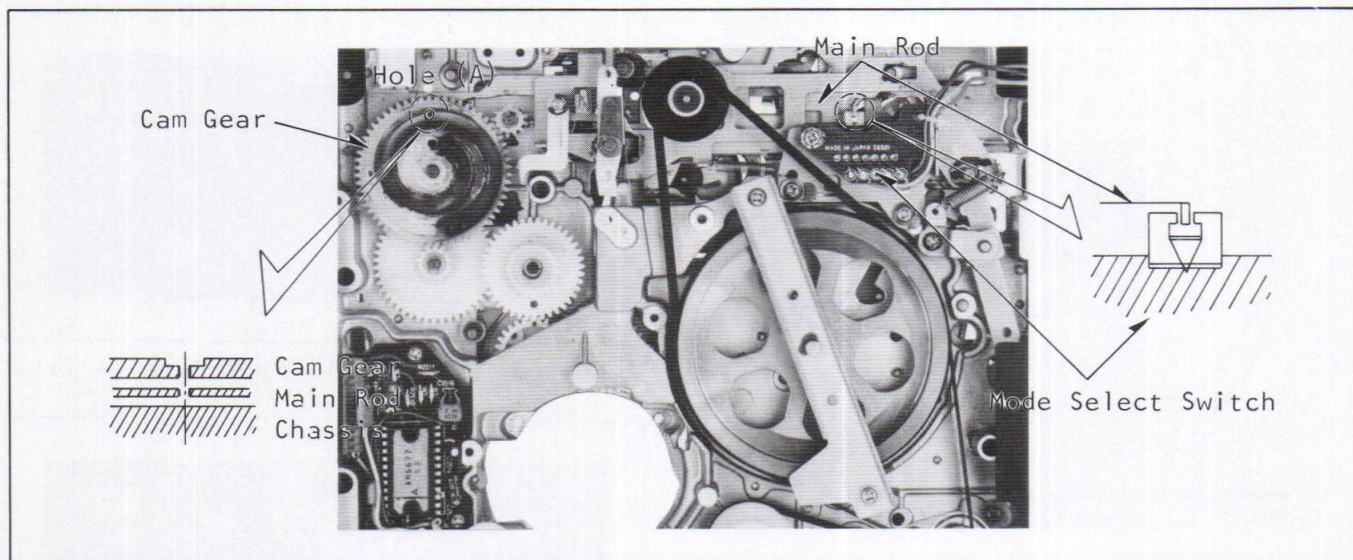


Fig. 56 Adjustment Procedure -- (4)

3. Slowly slide the main rod so the V-shaped mark meets the V-shaped mark of the mode select switch. This results main rod and mode select switch simulated stop (unloading completion) mode.
4. Insert the cam gear so the hole (A) on the gear meets the hole on the main rod. To meet the two holes easier, use the small hex. wrench (VFK75) or metal pin. Also ensure the two V-shaped marks are fixed and the simple slot side of the cam gear is apparent.
5. Install the sector gear so the pin on the sector gear meets the inner slot of the cam gear (simple slot side). And install 2 retaining rings to mount cam gear and sector gear.

6. Final figure should become as illustrated below, and at the same time two V-shaped marks are fixed at the mode select switch.

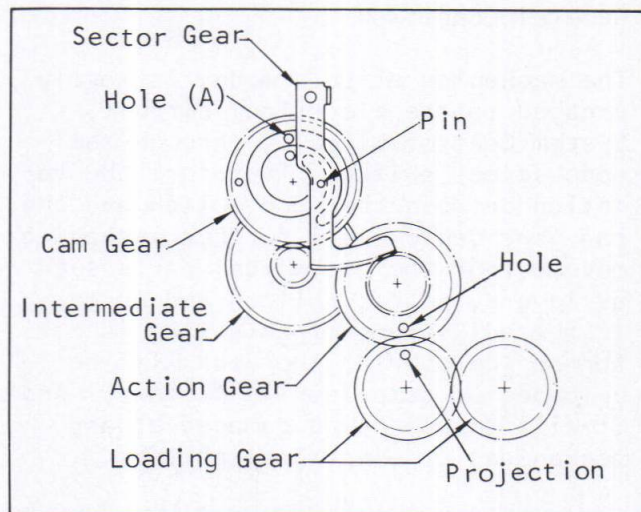


Fig. 58 Adjustment Procedure -- (6)

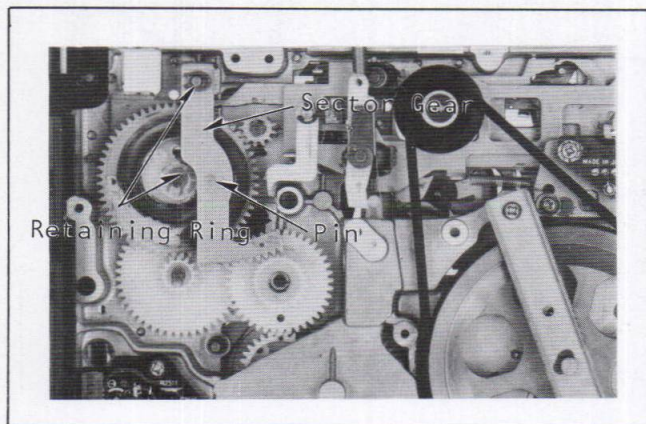


Fig. 57 Adjustment Procedure -- (5)

7. Install the gear protector and tighten the nut for mounting it. And install the large gear so the teeth of it contact the outer teeth of the intermediate gear. Then install a retaining ring to mount it.

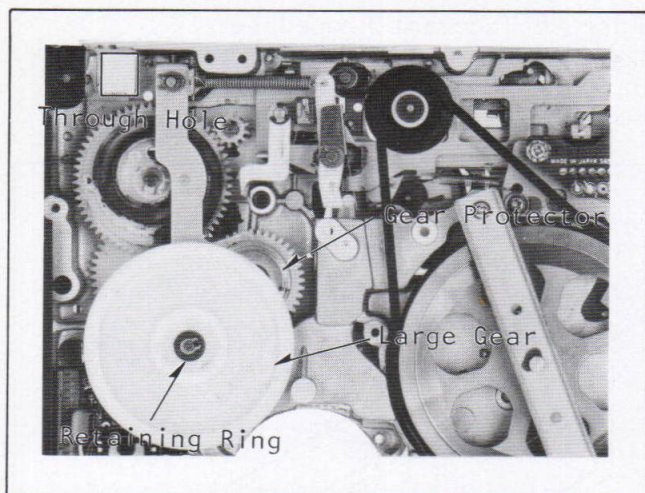


Fig. 59 Adjustment Procedure -- (7)

8. Before installing the Cassette Lock Detector Unit, confirm that the Lock Lever Unit is set unlocked condition.
9. Then install the Cassette Lock Detector Unit from the through hole on the chassis. And while installing, perform that the indicated portion of the main rod is set between two tabs as shown below. Turn pulley in either direction to obtain the best position for performing this step.

10. Tighten 2 screws (B), install the belt and belt cover and tighten a screw (C). Turn the large pulley in both direction to confirm the smooth movement of this mechanism.

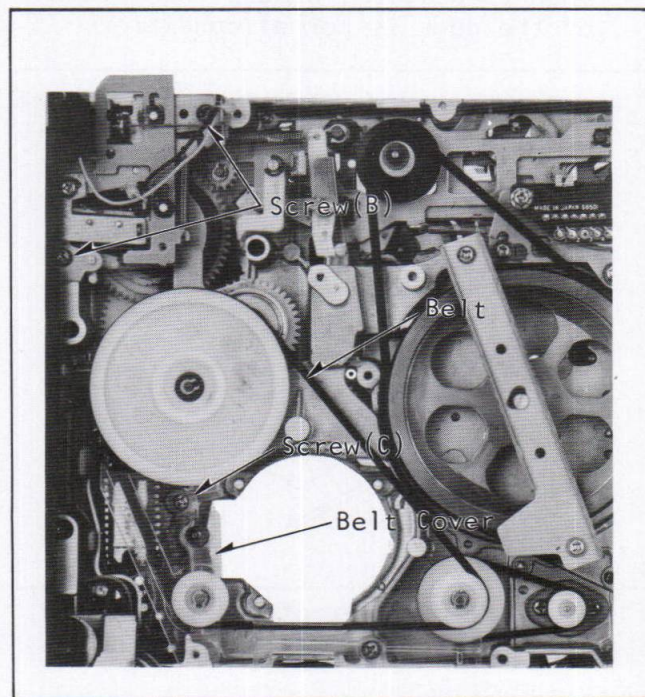


Fig. 61 Adjustment Procedure -- (9)

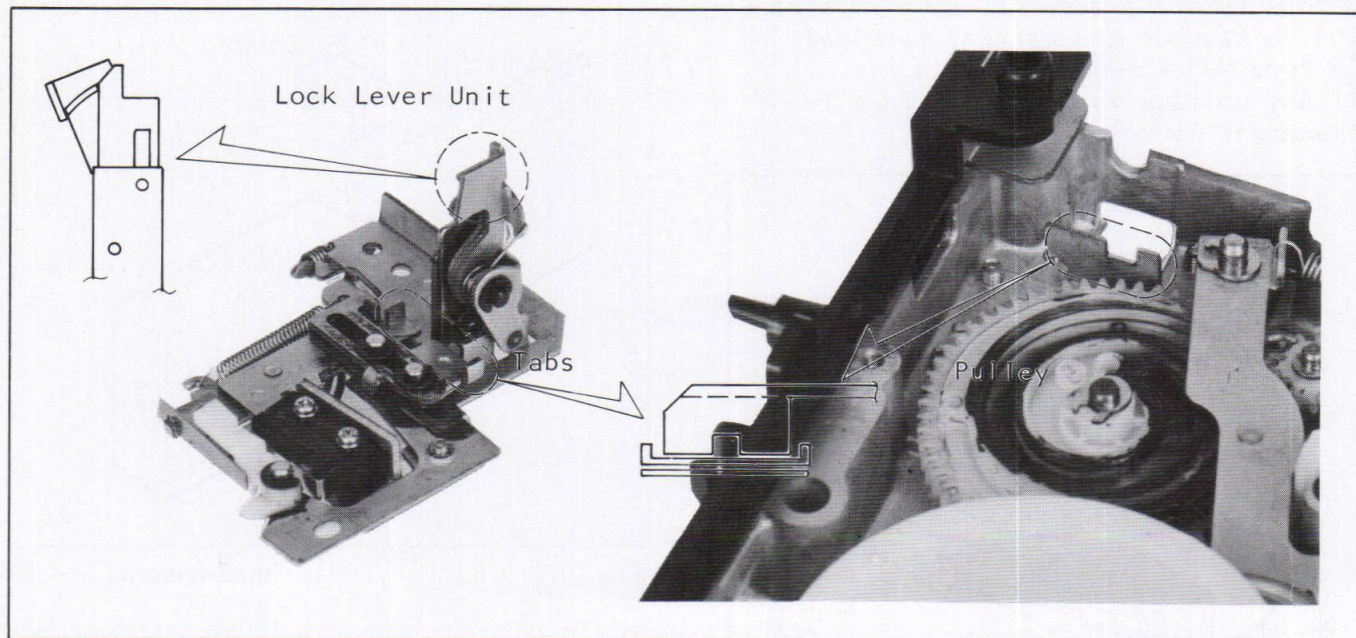


Fig. 60 Adjustment Procedure -- (8)

- Fix the main rod in the unloading completion condition, meet the V-shaped notch of the switch and the tab on the main rod then tighten 2 screws (A). Upon completion, ensure the movement of the deck is normal condition.

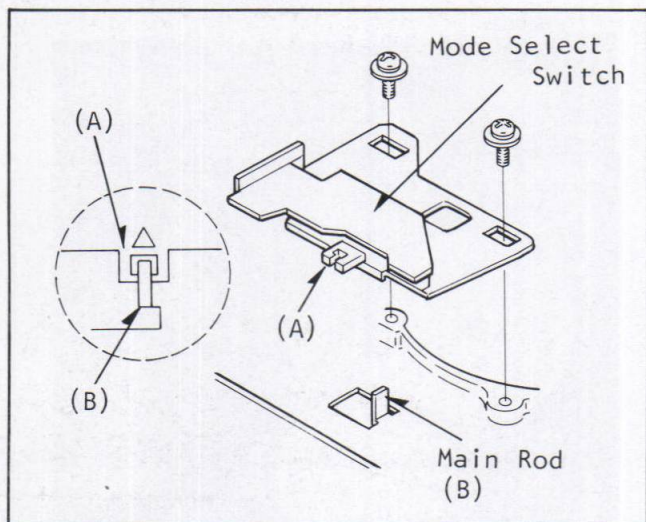


Fig. 62 Adjustment of Mode Select SW.

Fuse Replacement Procedure:

- Cut the outer label with a knife as indicated.

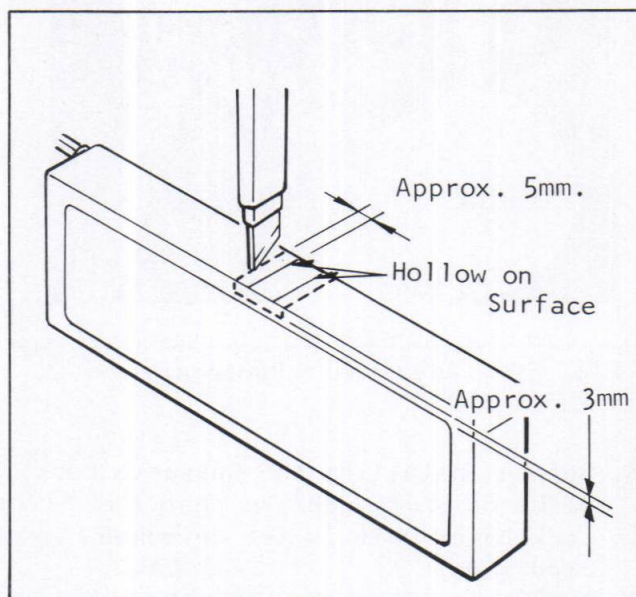


Fig. 64 Battery Fuse Replacement -- (1)

- Remove the label and lift the plastic cover.

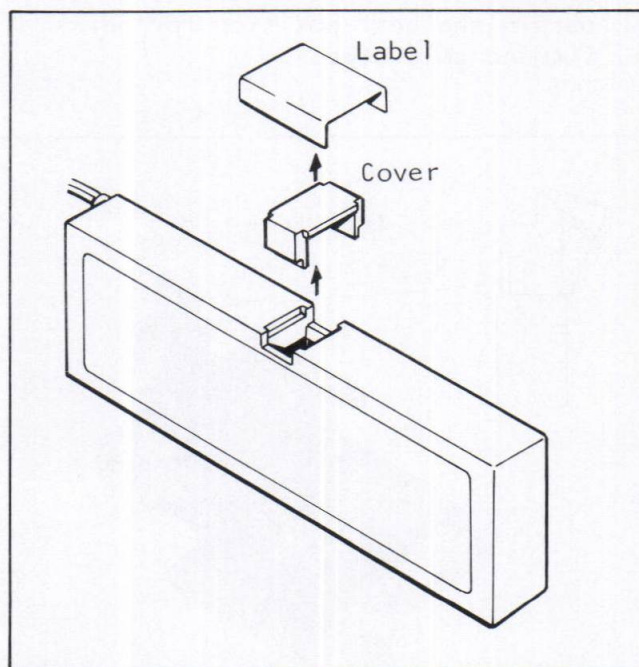


Fig. 65 Battery Fuse Replacement -- (2)

16. REPLACEMENT OF BATTERY FUSE

CONFIRMATION:

Before fuse replacement, confirm that the voltage of the battery terminal is zero "0".

If any voltage is measured, fuse replacement is not required.

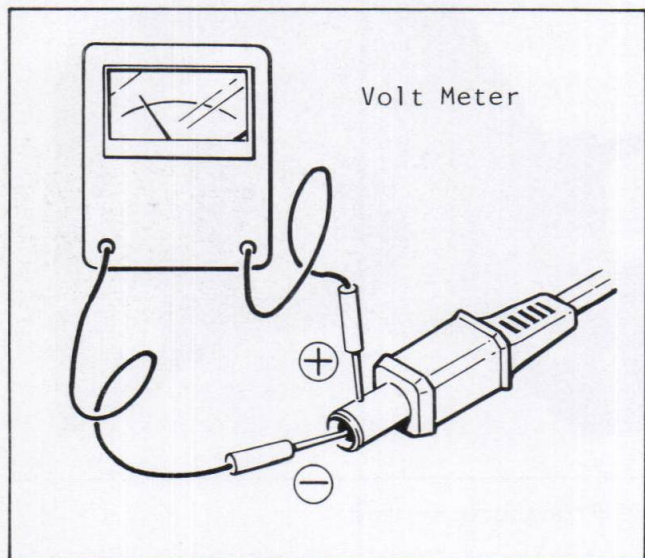


Fig. 63 Pre-Confirmation

3. Bend the gray lead wire to the outside with long nose pliers. Carefully pull out the 2 black wires and continue to pull out the fuse.

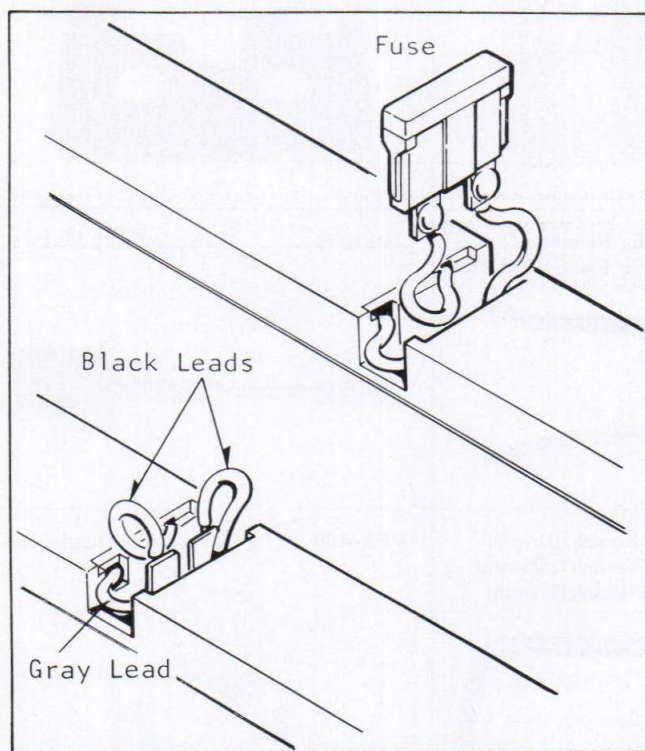


Fig. 66 Battery Fuse Replacement -- (3)

Note: While this step is being performed, be careful not to damage the lead wires or the fuse.

4. Unsolder the 2 Lead wires and remove the fuse. Replace the fuse which is read and marked with a "10" in white paint. When resoldering. Do not supply excessive heat and use corrosive type solder.

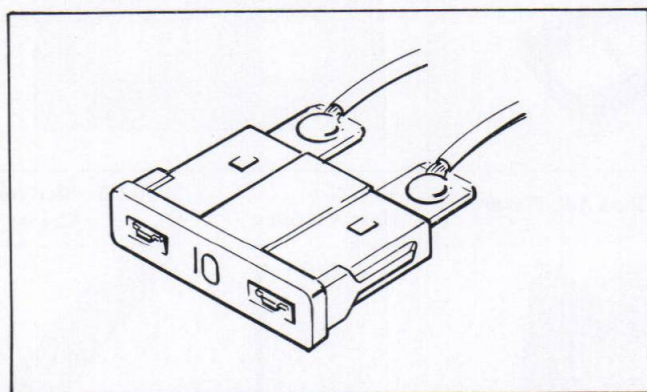


Fig. 67 Battery Fuse Replacement -- (4)

5. Restore the fuse and lead wires within the fuse compartment and confirm the voltage at the battery terminal.
6. Install the plastic cover. No specific direction for installation is required. Confirm that the plastic cover is flush and not lifted by the wires within the fuse compartment.
7. Replace the label as indicated.

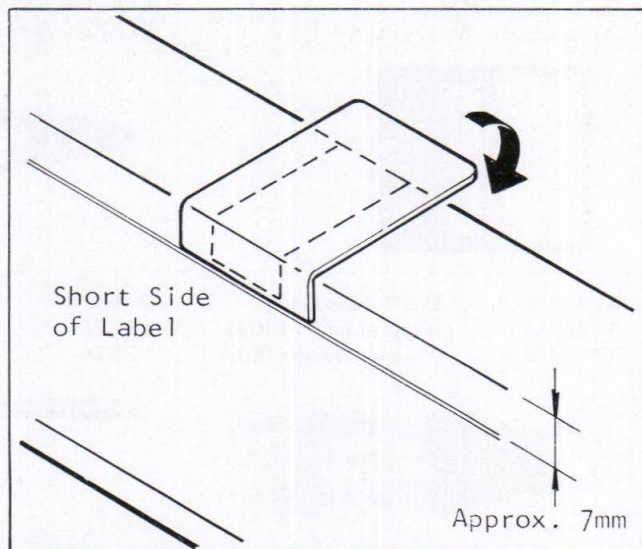

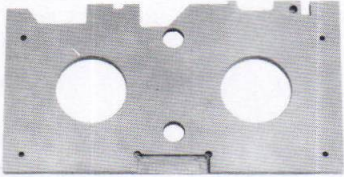
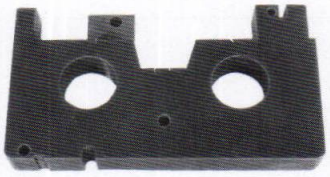
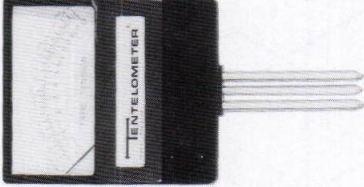
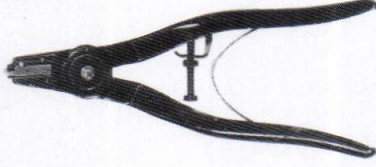


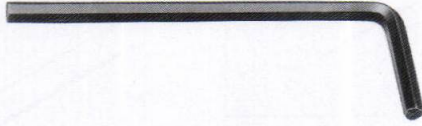


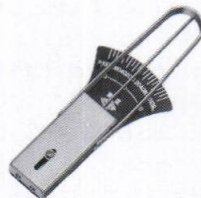


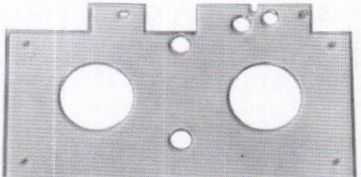
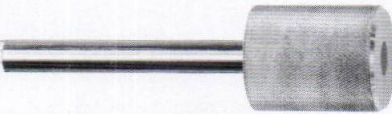





Fig. 68 Battery Fuse Replacement -- (5)

Servicing Fixtures & Tools

<p>VFM8100H3D VHS Alignment Tape</p> 	<p>VFK0138 Post Adjustment Plate</p> 	<p>VFK0188 Cassette Holder Fixture</p> 	
<p>Back Tension Meter (Tentelometer, Made in U.S.A.)</p> 	<p>VFK0144 Retaining Ring Remover (3mm) VFK0145 Retaining Ring Remover (4mm)</p> 	<p>VFK0189 H-Portion Adj. Fixture</p> 	
<p>VFK0133 Dial Torque Gauge VFK0134 Adaptor for VFK0133 VFK0180 (Plastic Clamper Only)</p> 	<p>VFK0146 Hex. Wrench (0.9mm) VFK0175 Hex. Wrench (1.25mm) VFK0176 Hex. Wrench (1.5mm)</p> 	<p>VFK0139 Reel Table Height Jig</p> 	
<p>VFK0135 Eccentric Screwdriver</p> 	<p>VFK0184 Head Tester</p> 	<p>VFK66 Fan Type Tension Gauge</p> 	
<p>VFK0136 Fine Adjustment Screwdriver</p> 	<p>VFK0185 Cleaning Cassette Tape</p> 	<p>VFK0141 Capstan Reference Plate</p> 	
<p>VFK0137 Post Adjustment Screwdriver</p> 	<p>VFK0187 Tension Post Adj. Fixture</p> 	<p>VFK27 Head Cleaning Stick</p> 	<p>MOR265 Morlytone Grease</p> 

ELECTRICAL ADJUSTMENT PROCEDURES

This section provides complete electrical adjustment procedures which may be required for electronic circuits of PAL VHS video cassette recorder.

1. Test Equipment

To perform the electrical adjustments completely, the following equipment is required.

1. VTVM (Vacuum Tube Volt Meter) or high impedance digital voltmeter
Voltage Range: 0.001 - 50 V
2. Dual-trace Oscilloscope
Voltage Range: 0.005 - 50 V/Div.
Frequency Range: DC - 10 MHz
Probes: 10:1, 1:1
3. Frequency Counter
Frequency Range: 0 - 10 MHz
4. Signal Generator
Sinewave: 0 - 10 MHz
5. Sweep Generator
Frequency Range: 0 - 10 MHz
6. Color TV Receiver or Monitor
7. Plastic Tip Driver
8. VHS Alignment Tape
VFM8100H3D

2. Adjustment Procedures

These adjustment procedures consist of the following sections.

1. A.V.R Section
2. System Control Section
3. Servo Section
4. Slow/Still Section
5. Audio Section
6. Video Section

2-1. A.V.R Section

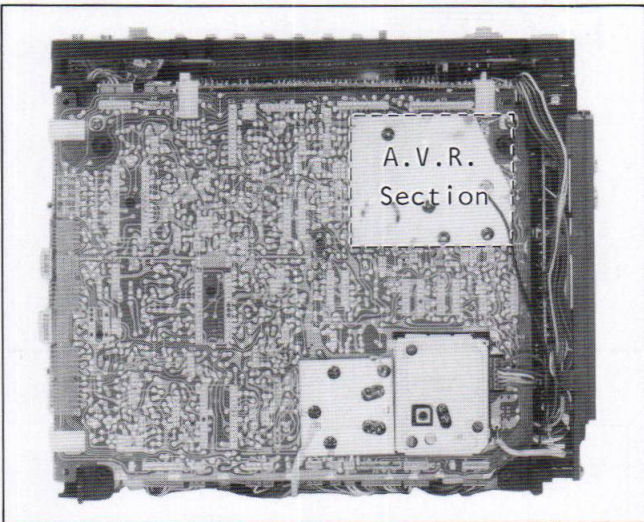


Fig.1.

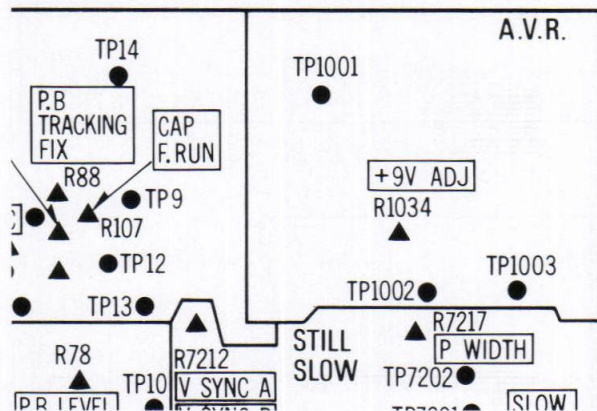


Fig.2.

2-1-1. +9V, +5V Regulator Adjustment

Test Points: TP1001, TP1002

Adjustment: R1024 (9V ADJ)

1. Supply the video signal to the Video Input on the right side panel or tune in a local on-air TV program.
2. Connect the VTVM to TP1001 on the Power Supply section.
3. Place the unit in REC·PLAY mode and make a recording.
4. Adjust the 9V ADJ (R1024) for 9.1 ± 0.1 V DC.
5. Connect the VTVM to TP1002 on the same section.
6. Confirm that the voltage is 5.1 ± 0.4 V DC.

2-2. System Control Section

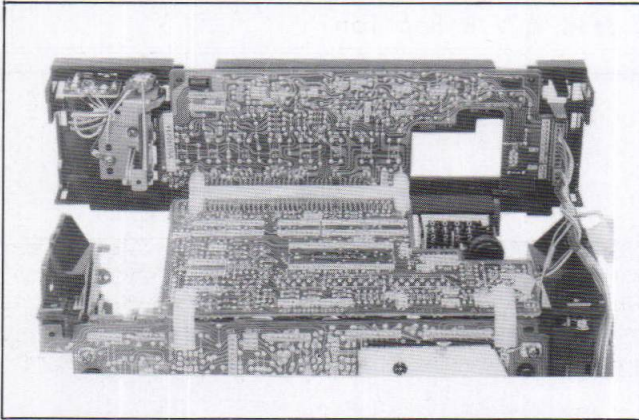


Fig.3.

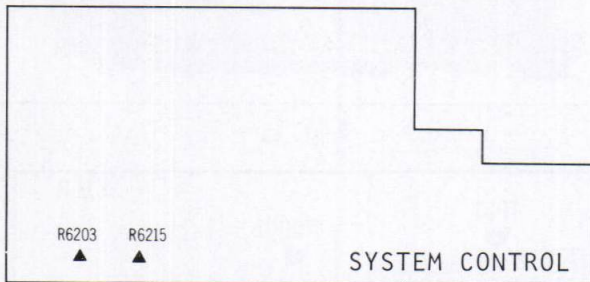


Fig.4.

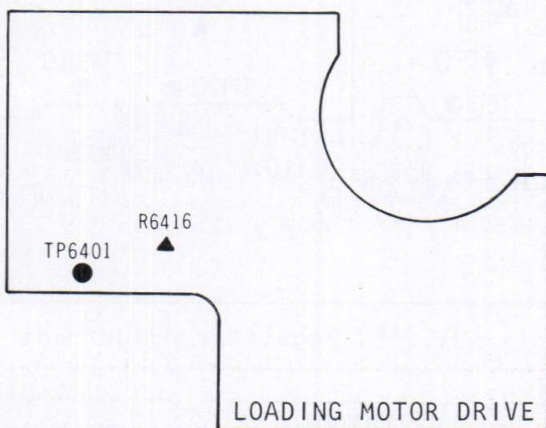


Fig.5.

2-2-1. UNDER CUT Adjustment

Test Point: Connector S4-4 (System Control Section)

Adjustment: R6215 (UNDER CUT)

1. Connect a resistor $33\text{ k}\Omega$ to R107 (AC Adaptor, NV-B30) or R115 (Tuner Unit, NV-V300) in parallel.
2. Connect the AC Adaptor, NV-B30 or the Tuner Unit, NV-V300 to the VCR, NV-3000.
3. Turn the UNDER CUT (R6215) on the system control circuit board (VJB 06115) to fully clockwise.
4. Supply a video signal to the Video Input on the right side panel or tune in a local on-air TV program.
5. Insert a cassette and make a recording.
6. Adjust the CHARGE LEVEL R113 (AC Adaptor, NV-B30) or R122 (Tuner Unit, NV-V300) for $10.2 \pm 0.1\text{ V DC}$.
7. Slowly adjust the UNDER CUT (R6215) until the point which places the unit in STOP mode.
8. Remove the resistor $33\text{ k}\Omega$.
9. Then adjust the CHARGE LEVEL R113 (AC Adaptor, NV-B30) or R122 (Tuner Unit, NV-V300) for $12 \pm 0.05\text{ V}$.

2-2-2. Battery Meter Adjustment

Adjustment: R6203 (METER)

1. Connect a resistor $33\text{ k}\Omega$ to R107 (AC Adaptor, NV-B30) or R115 (Tuner Unit, NV-V300) in parallel.
2. Connect the AC Adaptor, NV-B30 or the Tuner Unit, NV-V300 to the VCR, NV-3000.
3. Supply a video signal to the Video Input on the right side panel or tune in a local on-air TV program.
4. Insert a cassette and make a recording.
5. Adjust the CHARGE LEVEL R113 (AC Adaptor, NV-B30) or R122 (Tuner Unit, NV-V300) for $10.7 \pm 0.1\text{ V DC}$.
6. Adjust the METER (R6203) on the system control circuit board (VJB 06115) so that the indicator becomes on the black line between red zone and green zone of the Battery Meter.
7. Remove the resistor $33\text{ k}\Omega$.
8. Then adjust the CHARGE LEVEL R113 (AC Adaptor, NV-B30) or R122 (Tuner Unit, NV-V300) for $12 \pm 0.05\text{ V DC}$.

2-2-3. Short Rewind Voltage Adjustment

Test Point: TP6401

Adjustment: R6416 (S.R.VR)

1. Supply a video signal to the Video Input on the right side panel or tune in a local on-air TV program.
2. Place the unit in the REC·PLAY mode.
3. Connect the scope or VTVM to TP6401 on the Loading Motor Drive circuit board (VJB06100).
Use the scope in DC mode.
4. Press the Pause button. During short rewind, adjust the S.R.VR (R6416) so that the voltage is 4.3 - 4.5 V DC.
5. Remove the scope or VTVM from TP6401.

2-3. Servo Section

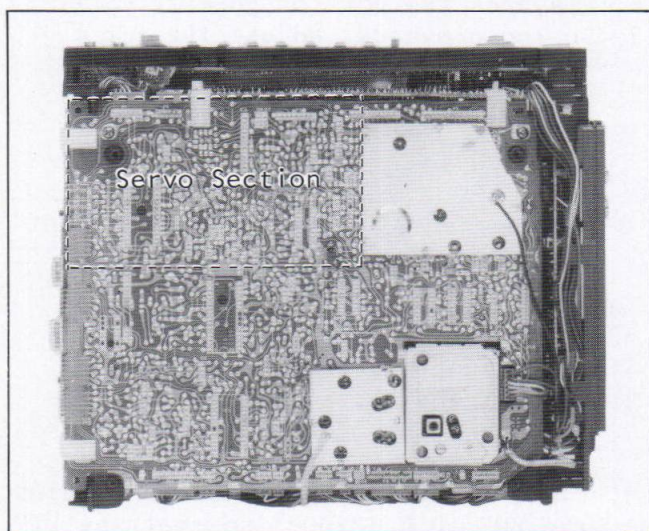


Fig.6.

2-3-1. PG Shifter Adjustment

Test Points: TP8001, TP2004

Adjustments: R2013 (PG SHIFT B)
R2015 (PG SHIFT A)

1. Connect a jumper between TP3006 and TP3007 on the Luminance section of Main circuit board (VJB0399).
Use a jumper as short as possible.
2. Connect the scope CH1 to TP8001 on the Chrominance circuit board (VJB 0862) and CH2 to TP2004 on the servo section of Main circuit board.
Use TP2004 as scope trigger.
3. Play back the monoscope pattern of the alignment tape (VFM8100H3D) and set the scope to the CHOP mode.
Then expand the switching position of the envelope.

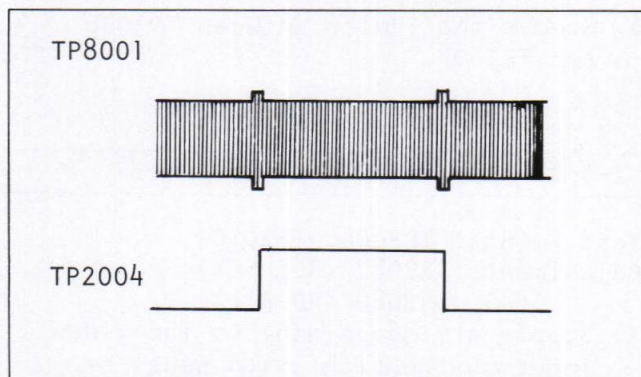


Fig.8.

4. Now adjust the PG SHIF A (R2015) on the Servo section of Main circuit board so that the rising edge of the switching pulse in the center of the overlapped of RF signal.

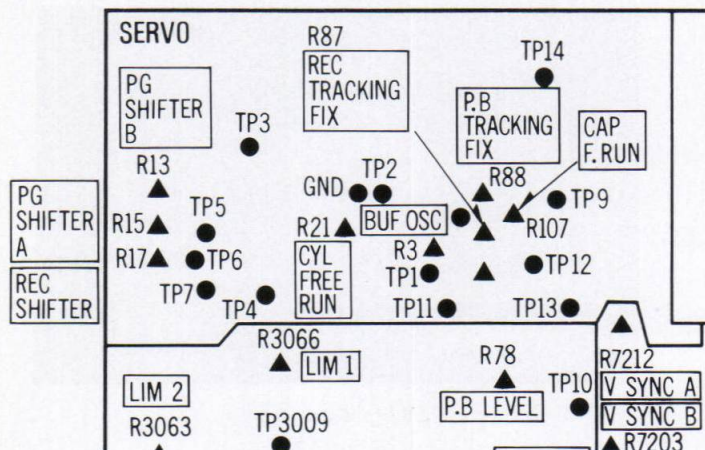


Fig.7.

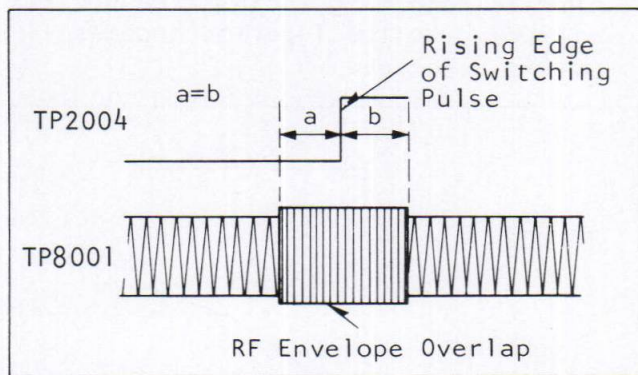


Fig.9.

- Adjust the PG SHIFT B (R2013) on the Servo section of Main circuit board so that difference between the leading edge and trailing edge is as shown below.
Switch the scope selector on the scope to either + (plus) or - (minus) and adjust for less than 10 μ sec.

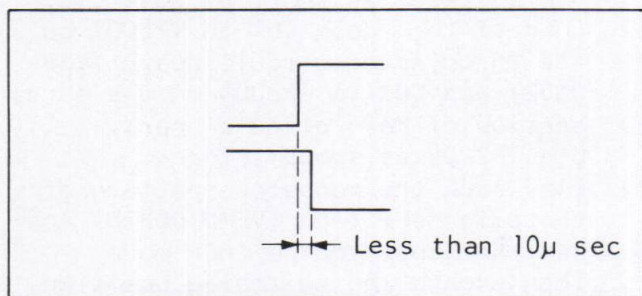


Fig.10.

- Remove the jumper between TP3006 and TP3007.

2-3-2. Tracking Fix Adjustment

Test Points: TP2004, TP2010
Adjustments: R2087 (REC FIX)
R2088 (PB FIX)

- Supply a video signal to the Video Input on the right side panel or tune in a local on-air TV program.
- Insert a cassette and make a recording.
- Set the Tracking Control in the front panel to the center detent point. Connect the scope CH1 to TP2004 and CH2 to TP2010 on the servo section and expand sweep. Use TP2004 for trigger of the scope.
- During Recording, adjust the REC FIX (R2087), so the T period becomes 0.4 ± 0.3 msec.

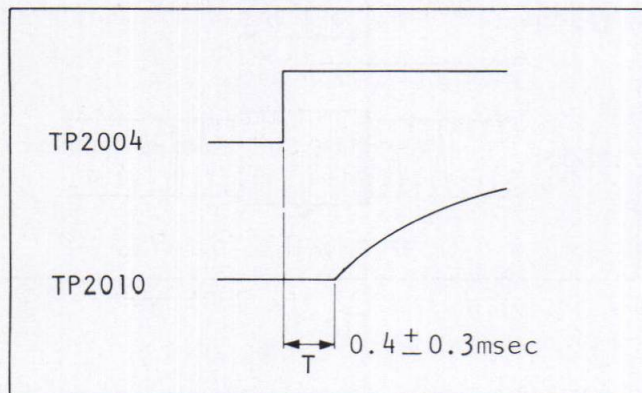
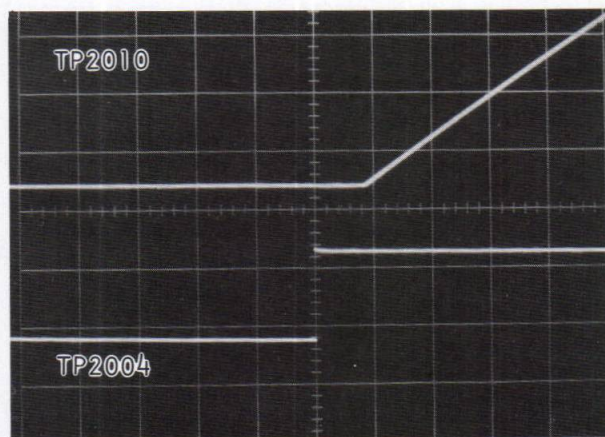


Fig.11.



TP2010 : 2V/div.
TP2004 : 5V/div. 5msec./div.

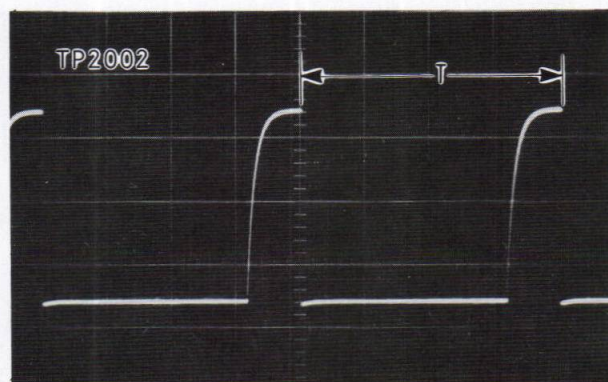
Fig.12.

- Then, make a recording for a few minutes.
- Playback the portion just recorded.
- During playback, adjust the P.B.FIX (R2088), so the T period becomes $0.4 + 0.3$ msec.

2-3-3. Buffer OSC Frequency Adjustment

Test Point: TP2002
Adjustment: R2003 (BUF. OSC)

- Don't supply a any video signal.
- Connect the scope to TP2002 on the Servo section of Main circuit board (VJB0399).
- Place the unit in REC mode and adjust the BUF. OSC (R2003) so that the "T" is 21.0 ± 0.2 msec.



2V/5msec.div.

Fig.13.

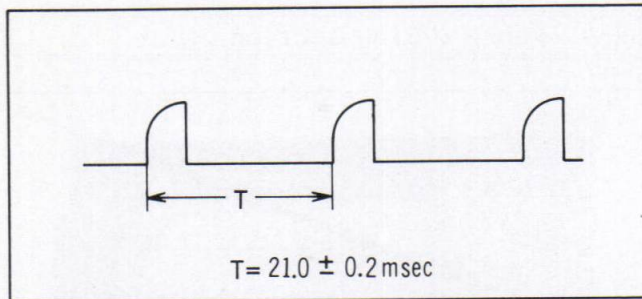


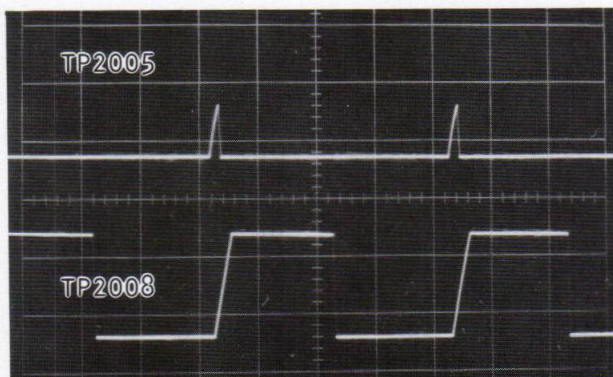
Fig.14.

4. Supply a video signal to the Video Input on the right side panel or tune in a local on-air TV program.
5. Confirm that the "T" is 20msec.

2-3-4. Cylinder Free Run Adjustment

Test Points: TP2005, TP2007, TP2008
Adjustment: R2021 (CYL. F. R.)

1. Supply a video signal to the Video Input on the right side panel or tune in a local on-air TV program.
2. Insert a cassette and make a recording.
3. Connect the scope CH1 to TP2005 and CH2 to TP2008 on the Servo section of Main circuit board (VJB0399). Set the scope to the CHOP mode.
4. Pre-adjust the CYL.F.R. (R2021) on the same section so that the two waveforms are locked.



5V/10msec.div.

Fig.15.

5. Connect the VTVM to TP2007 on the same section.
6. Adjust the CYL.F.R. (R2021) for 3.5 ± 0.1 V DC.
7. Remove the scope and the VTVM.

2-3-5. Capstan Free-Run Adjustment

Test Points: TP2010, TP2012, TP2013
Adjustment: R2107 (CAP. F.R.)

1. Supply a video signal to Video Input on the right side panel or tune in a local on-air TV program.
2. Insert a cassette and make a recording.
3. Connect the scope CH1 to TP2010 and CH2 to TP2012 on the servo section. Set the scope to the CHOP mode.
4. Pre-adjust the CAP. F.R. (R2107) on the same section so the two waveforms are locked.



5V/10msec.div.

Fig.16.

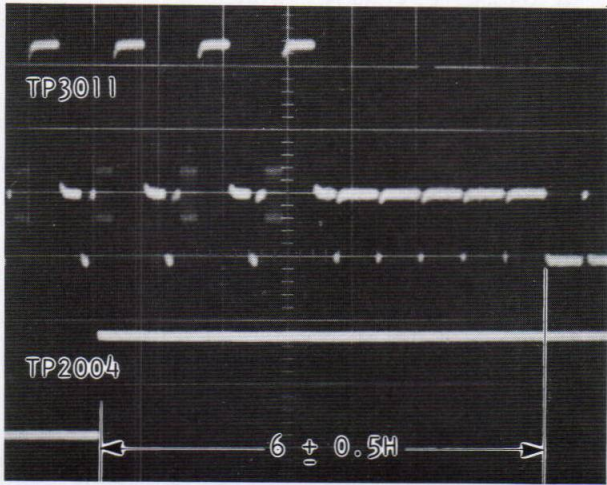
5. Connect the VTVM to TP2013 on the same section.
6. Adjust the CAP. F.R. (R2107) for 3.5 ± 0.1 V DC.

2-3-6. REC Shifter Adjustment

Test Points: TP2004, TP3011
Adjustment: R2017 (REC SHIF)

1. Supply a video signal to the Video Input on the right side panel or tune in a local on-air TV program.
2. Insert a cassette and make a recording.
3. Connect the scope CH1 to TP2004 on the Servo section and CH2 to TP3011 on the Luminance section. Set the scope to the CHOP mode.

- Also set the scope to the Delay mode or expand the vertical interval of the signal at TP3011.



TP3011: 0.5V div.
 TP2004: 5V div. 5msec.div.

Fig.17.

- Change the scope selector on the scope from "+" to "-" and make sure that the other switching point is also $6 \pm 0.5 H$ before the beginning of the vertical sync.
 If the tolerance is more or less than $6 \pm 0.5 H$ readjust the switching Flip-Flop Duty Cycle. (Refer to item 2-3-1. PG Shifter Adjustment).
- Remove the scope.

2-4. Still & Slow section

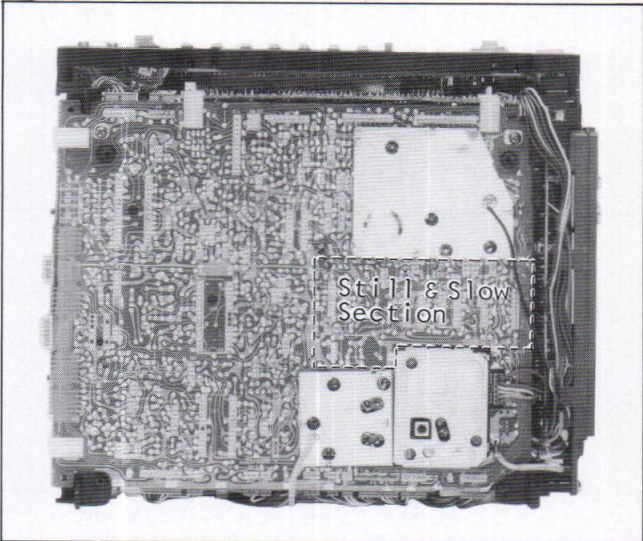


Fig.18.

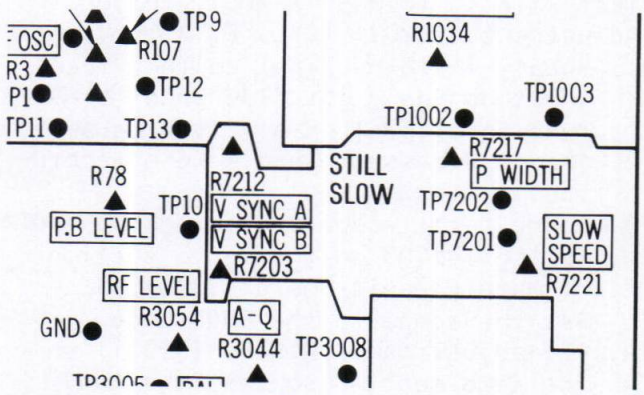


Fig.19.

2-4-1. Pulse Width Adjustment

Test Points: TP2701, TP2702
 Adjustments: R2717 (PULSE WIDTH)
 R2721 (SLOW SPEED)

- Supply a video signal to the Video Input on the right side panel or tune in a local on-air TV program.
- Insert a cassette and make a recording for a few minutes.
- Playback the portion just recorded and set in still mode.
- Press the Cue & Slow button and hold it down.
- Connect the scope to TP2702 on the Still & Slow section.
 External trigger to TP2004.
- Adjust the Pulse Width (R2717) so that the T portion is $4.0 \pm 0.1\text{msec}$.

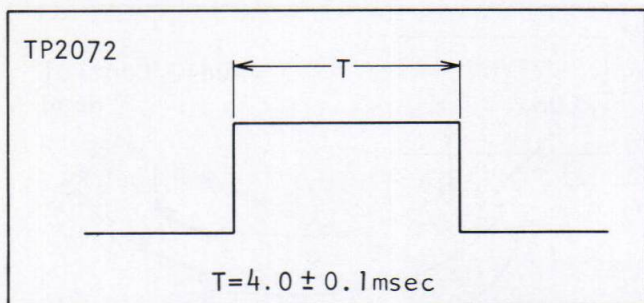


Fig.20.

7. Change the scope from TP2702 to TP2701 on the same section.
8. Adjust the Slow Speed (R2721) so that the T portion is $9.5 \pm 0.1\text{msec}$.

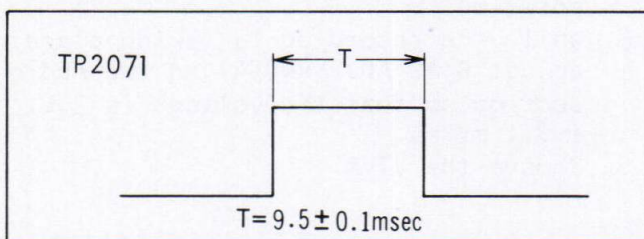


Fig.21

2-4-2. V. Sync Phase Adjustment in Still mode

Test Points: TP2004, TP3011
 Adjustments: R2703 (V-SYNC B)
 R2712 (V-SYNC A)

1. Supply a video signal to Video Input on the right side panel or tune in a local on-air TV program.
2. Insert a cassette and make a recording for a few minutes.
3. Playback the portion just recorded.
4. During playback, place the unit in Still mode.
5. Connect the oscilloscope CH1 to TP3011 and CH2 TP2004 and expand the V sync portion.
6. Adjust V-SYNC B (R2703) and V-SYNC A (R2712) as shown in Fig. 22.
7. If vertical jitter appears on a TV screen even though above adjustment is performed, readjust V-SYNC A (R2712) again until the vertical jitter is removed.

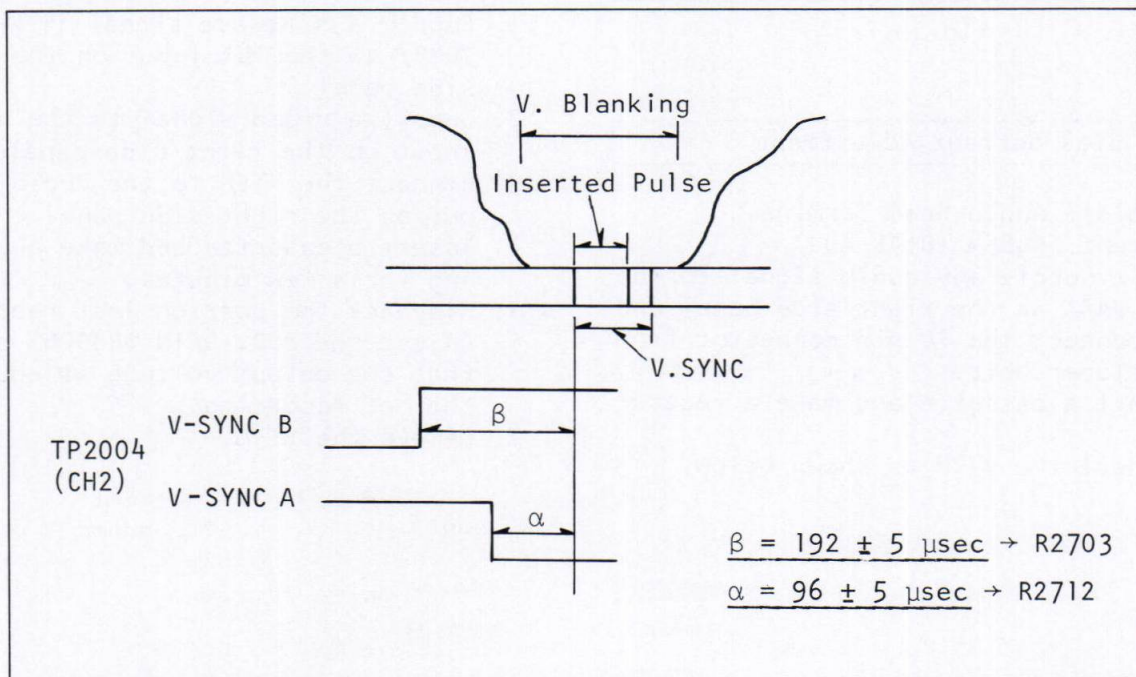


Fig.22.

2-5. Audio Section

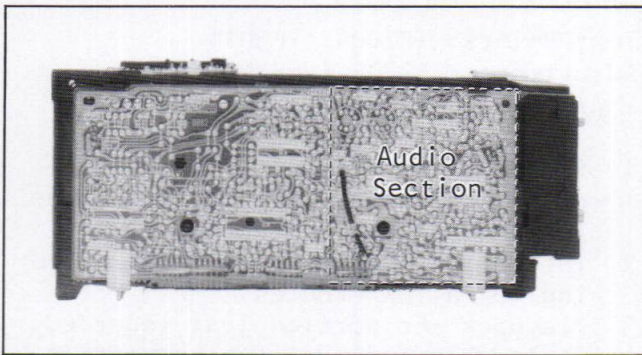


Fig.23.

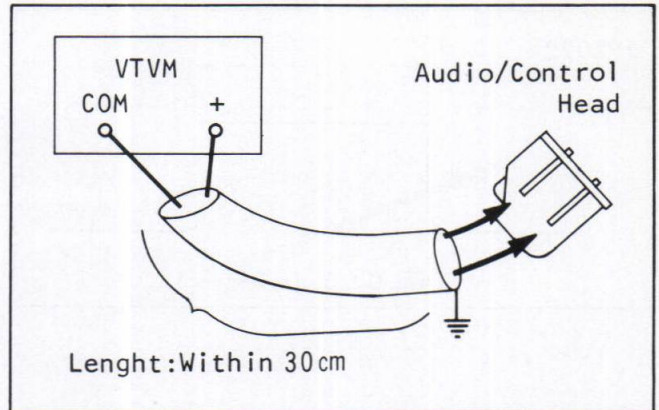


Fig.25.

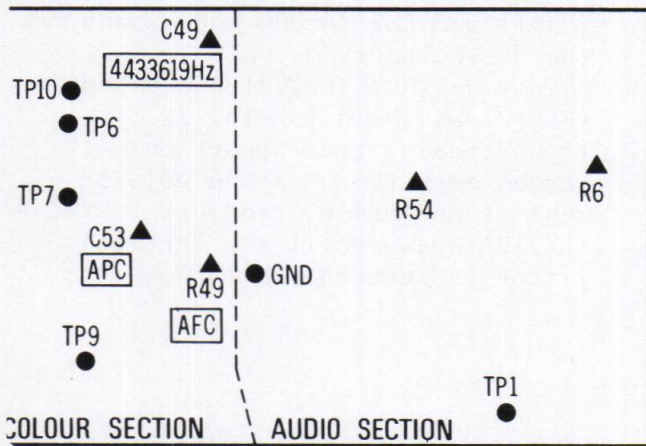


Fig.24.

4. Set the VTVM to AC voltage input position.
5. While the recording is taking place, adjust BIAS ADJ (R4054) on the Audio section so that the voltage is 3.6 ± 0.1 mVrms.
6. Remove the VTVM.

2-5-2. Playback Gain Adjustment

Test Point: Audio Out

Adjustment: R4006 (P.B. GAIN)

1. Supply a sinewave signal (1 kHz - 70dB) to the Mic Input on the right side panel.
2. Supply a video signal to the Video Input on the right side panel.
3. Connect the VTVM to the Audio Output on the right side panel.
4. Insert a cassette and make a recording for a few minutes.
5. Playback the portion just recorded.
6. Adjust the P.B. GAIN (R4006) so that the output voltage is equal to that of recording.
7. Remove the VTVM.

2-5-1. Bias Current Adjustment

Test Point: Audio Head Terminal

Adjustment: R4054 (BIAS ADJ)

1. Don't supply any audio signal to the MIC JACK on the right side panel and disconnect the 10 pin connector from the Tuner Unit.
2. Insert a cassette and make a recording.
3. Connect the VTVM as shown below.

2-6. Video Section

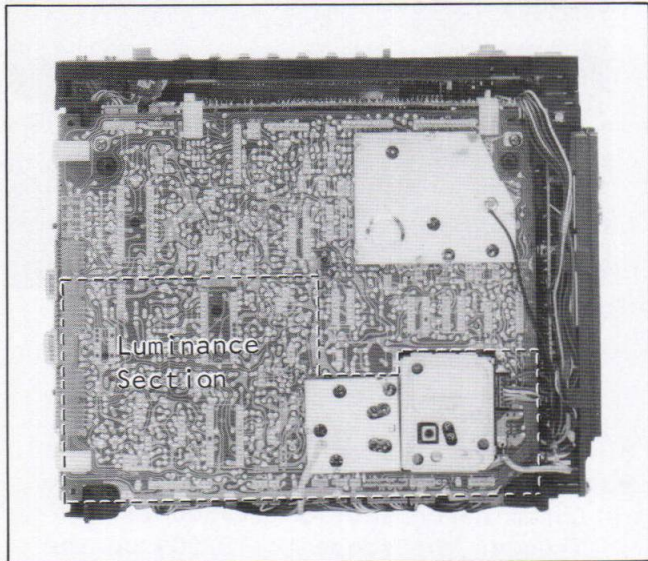


Fig.26.

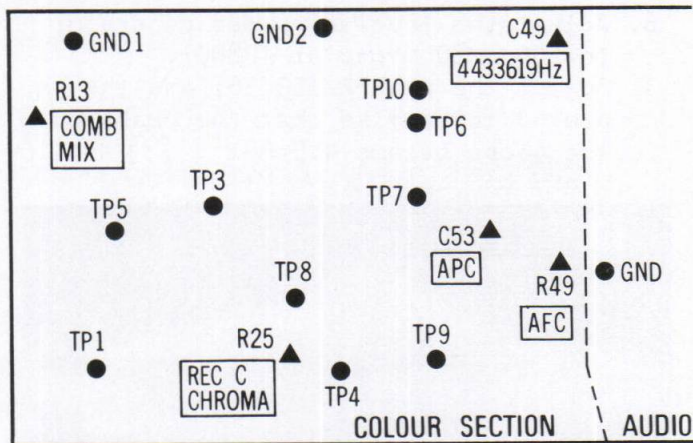


Fig.29.

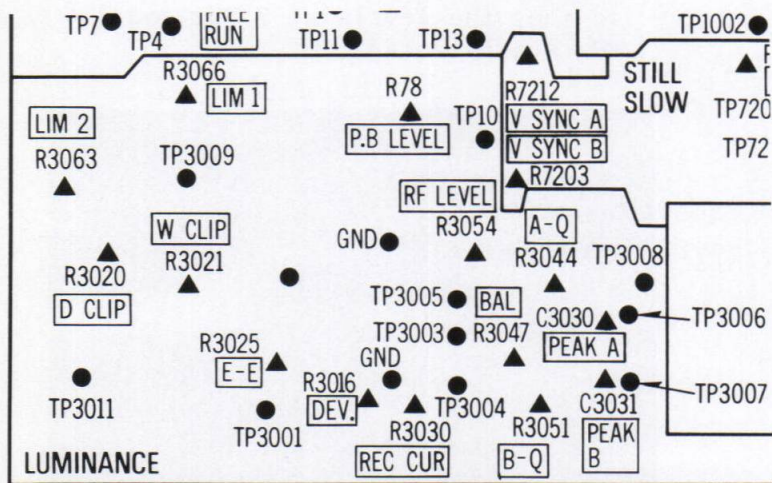


Fig.27.

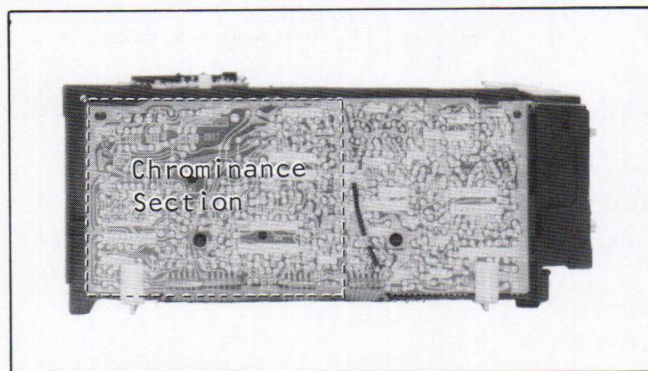


Fig.28.

2-6-1. Head Amp Peak Frequency

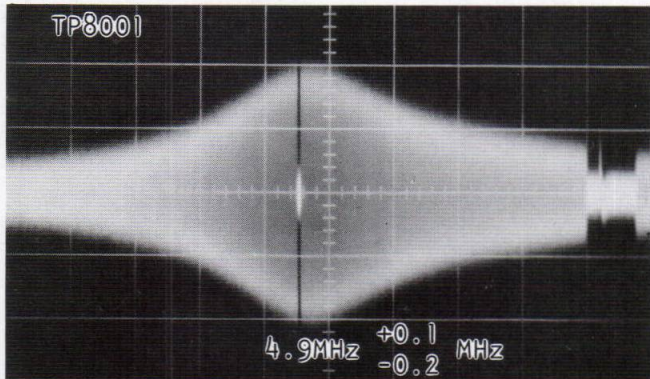
Test Points: TP8001

Adjustments: C3030 (PEAK-A)

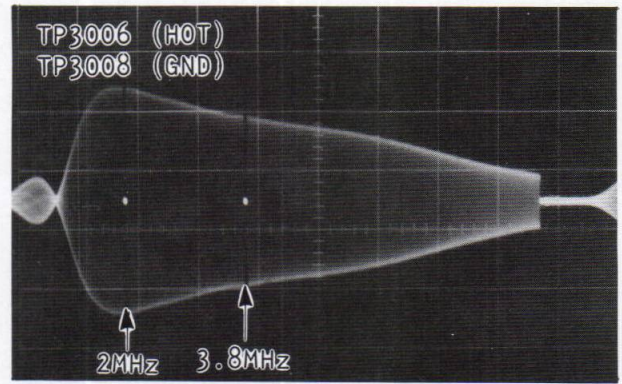
C3031 (PEAK-B)

1. Do not supply any video or RF signal on the right side panel.
2. Turn the controls as follows. (All controls are on the Luminance Section)
 - R3047 Center
 - R3051 Fully Clockwise
 - R3044 Fully Counter-clockwise
 - R3054 Center
3. Connect the sweep generator to TP3005 on the Luminance section (VJB0399).
4. Connect the scope to TP8001 on the Chrominance section (VJB0862).
5. Blind the Supply and Take up photo transistors by two pieces of black paper and place the unit in the PLAY mode without a tape.

6. Adjust the level of sweep generator to 200 ± 50 mVp-p at TP8001.
7. Adjust the peak-A (C3030) and the peak-B (C3031) so that the peaks on the scope become $4.9 \text{ MHz} \pm \begin{smallmatrix} 0.1 \\ 0.2 \end{smallmatrix} \text{ MHz}$.



50mV/2msec.div.
Fig.30.



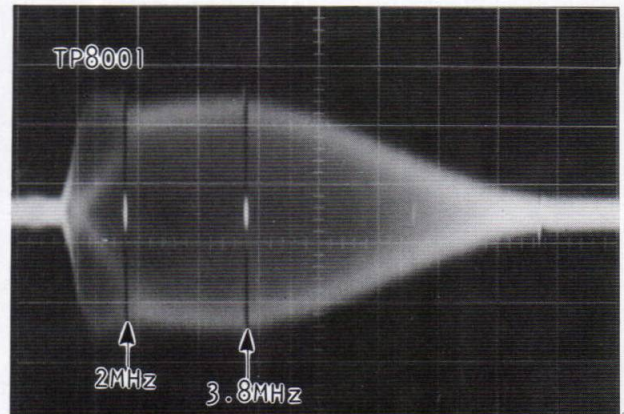
50 mV/div. 2 msec div
Fig.31.

8. Play back the portion just recorded.
9. Connect the scope to TP8001 on the Chrominance section (VJB0862). Trigger the scope to TP2004 on the Servo section (VJB0399).
10. Adjust the Q-A (R3044) and Q-B (R3051) so that the levels at 2 MHz and 3.8 MHz are balanced.

2-6-2. Head Amp Frequency Responce and Balance Adjustment

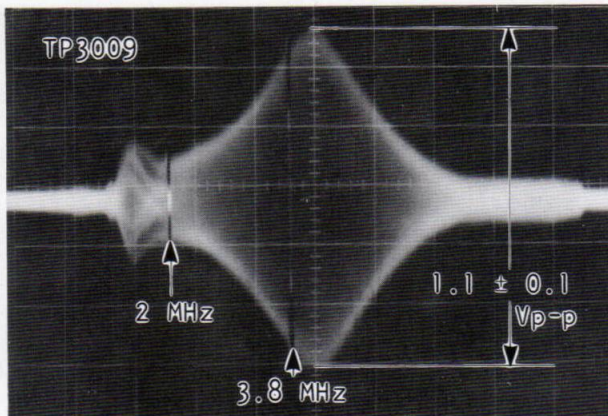
Test Points: TP3006, TP3008, TP3009, TP8001
Adjustments: R3044 (Q-A)
R3047 (MIX BAL.)
R3051 (Q-B)
R3054 (RF LEVEL)

1. Supply the composite sync signal from the sweep generator to the Video Input on the right side panel.
2. Connect the jumper between TP3003 and GND on the Luminance section (VJB0399).
3. Connect the sweep generator to TP3004. Put the marker on 2 MHz and 3.8 MHz.
4. Connect the scope between TP3006 (Hot) and TP3008 (GND).
5. Set the RF LEVEL (R3054) to the center position.
6. Insert a cassette and make a recording for a few minutes.
7. Adjust the sweep gain so that the 3.8 MHz portion becomes 150 mVp-p.



0.1 V/div. 2 msec/div.
Fig.32.

11. Then adjust the MIX BAL. (R3047) so that the both channel outputs are balanced.
12. Connect the scope to TP3009.
13. Adjust the RF LEVEL (R3054) so that the peak level becomes 1.1 ± 0.1 Vp-p.



0.2V/2msec.div.
Fig.33.

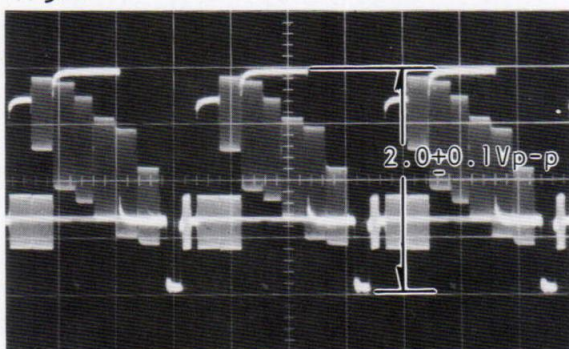
2-6-3. E-E Level Adjustment

Test Point: TP3011

Adjustment: R3025 (E-E LEVEL)

1. Supply a video signal (1 Vp-p) to the Video Input on the right side panel.
2. Connect the scope to TP3011 on the Luminance section (VJB0399).
3. Place the unit in STOP mode.
4. Adjust the E-E LEVEL (R3025) on the Luminance section so that the video level is 2.0 ± 0.1 Vp-p.

TP3011



0.5V/20µsec.div.
Fig.34.

2-6-4. Sync Tip and Deviation Adjustment

Test Point: TP3002, TP3003

Adjustments: C3011 (SYNC TIP FREQ)
R3016 (DEVIATION)

1. Do not supply any video signal to the Video Input.
2. Connect the frequency counter to TP3003 on the Luminance section (VJB0399).
3. Insert a video cassette tape and place the unit in REC mode.
4. Adjust the SYNC TIP FREQ (C3011) so that the indication of frequency counter becomes 3.8 ± 0.1 MHz.
5. Supply a colour bar signal to the Video Input.
6. Connect the scope to TP3002.
7. Place the unit in REC mode.
8. Adjust the DEVIATION (R3016) so that the output level at TP3002 which is from white level to sync tip level becomes 0.5 ± 0.1 Vp-p as shown below.

TP3002

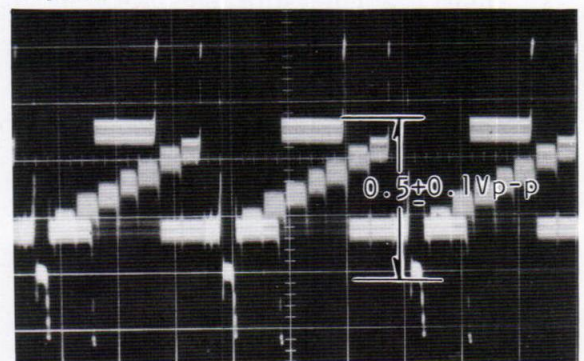


Fig.35.

2-6-5. White and Dark Clip Adjustment

Test Point: TP3002

Adjustments: R3020 (DARK CLIP)
R3021 (WHITE CLIP)

1. Supply a colour bar signal to the Video Input on the right side panel.
2. Connect the scope to TP3002 on the Luminance section (VJB0399). Set the scope to 0.2 V/div, 20 µsec/div.
3. Place the unit in REC.PLAY mode.
4. Adjust the DARK CLIP (R3020) and WHITE CLIP (R3021) on the same section so the overshoot and undershoot are as shown below.

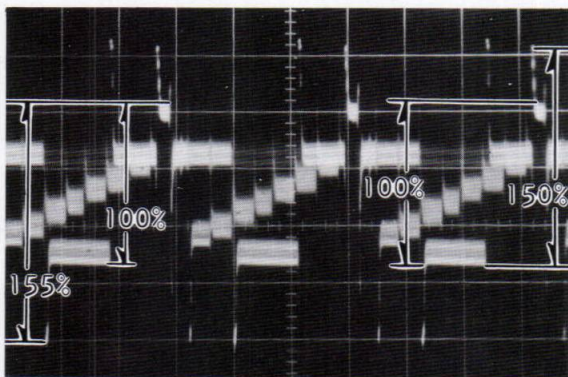


Fig.36.

TP3006

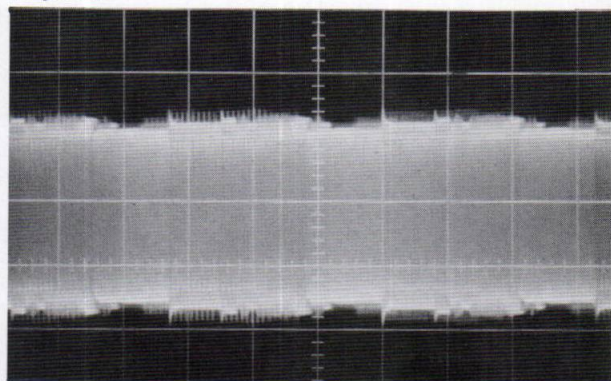


Fig.38.

2-6-6. Recording Current Adjustment

Test Points: TP3006, TP3008

Adjustments: R3030 (REC CURR)
R8025 (REC CHROMA)

1. Supply a colour bar signal to the Video Input on the right side panel or tune in a local on-air TV program.
2. Connect the scope to TP3006 (HOT) and TP3008(GND) on the Luminance section (VJB0399).
3. Insert a cassette and make a recording for a few minutes.
4. Turn the REC CURR (R3030) fully counter clockwise.
5. Adjust the REC CHROMA (R8025) on the Chrominance section so that the level of cyan portion is 32 ± 2 mVp-p.

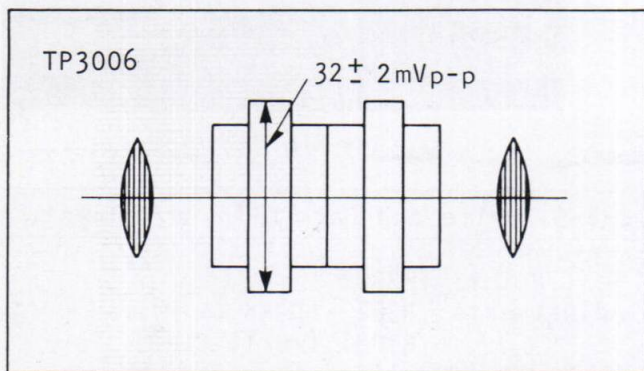


Fig.37.

6. Then slowly turn the REC CURR (R3030) on the Luminance section so that the V sync portion of the envelope at TP3006 becomes 150 ± 5 mVp-p.

TP3006

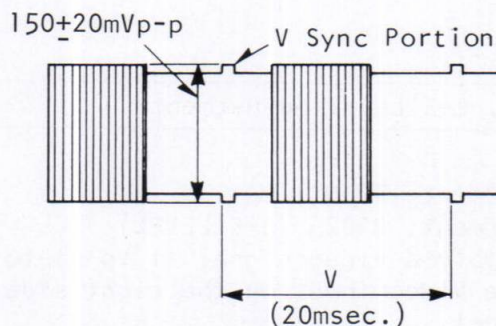


Fig.39.

2-6-7. Limiter Balance Adjustment

Test Point: TP3011

Adjustments: R3066 (LIM BAL 1)
R3063 (LIM BAL 2)

1. Supply a stairstep signal to the Video Input on the right side panel or turn in a local on-air B/W TV program.
2. Insert a cassette and make a recording for a few minutes.
3. Playback the portion just recorded.
4. Connect the scope to TP3011 on the Luminance section (VJB0399).
5. Turn the LIM BAL 2 (R3063) at the center position.
6. During playback, adjust the LIM BAL 1 (R3066) on the same board so that the carrier at sync tips becomes minimum at TP3011.
7. Turn the Tracking Control on the front panel for the poorest tracking. (Worst playback image)
8. During playback, adjust the LIM BAL 2 (R3063) on the Luminance section for minimum noise on the TV screen.

2-6-8. 4.43 MHz Crystal Oscillator Adjustment

Test Point: TP8010

Adjustment: C8049 (FREQ ADJ)

1. Playback the blank tape.
2. Connect the frequency counter to TP8010 on the chrominance section (VJB0862).
3. Adjust the FREQ ADJ (C8049) so that the frequency at TP8010 becomes 4.433619 MHz \pm 10 Hz.

2-6-9. AFC Adjustment

Test Point: TP8009

Adjustment: R8031 (AFC)

1. Don't supply any video signal to the Video Input on the right side panel.
2. Place the unit in STOP mode.
3. Connect the frequency counter to TP8009 on the Chrominance section (VJB0862).
4. Adjust the AFC (R8031) so that the frequency at TP8009 becomes 15.625 kHz \pm 50 Hz.
5. Supply a colour bar signal on the Video Input on the right side panel.
6. Confirm the frequency at TP8009 is 15.625 kHz \pm 1 Hz.

2-6-10. APC 4.43 MHz VX0 Adjustment

Test Point: TP8007

Adjustment: C8053 (APC)

1. Connect a jumper between TP8005 and GND.
2. Connect a jumper between TP8006 and GND.
3. Supply a colour bar signal to the Video Input on the right side panel.
4. Insert a cassette and place the unit in RECORD mode.
5. Connect the frequency counter to TP8007.
6. Adjust the APC (C8053) so that the frequency at TP8007 becomes 4.433619 MHz \pm 20 Hz.
7. Remove the jumpers.

2-6-11. Comb Filter Adjustment

Test Point: TP3011

Adjustment: R8013 (COMB MIX)

1. Supply a colour bar signal to the Video Input on the right side panel.
2. Place the unit in RECORD mode and make a recording.
3. Connect the scope to TP3011 on the Luminance section (VJB0399).
4. Playback the portion just recorded.
5. Turn the Tracking Control on the front panel for the poorest tracking. (Worst playback image)
6. During playback, adjust the COMB MIX (R8013) on the Chrominance section (VJB0862) as shown in Fig. 40.

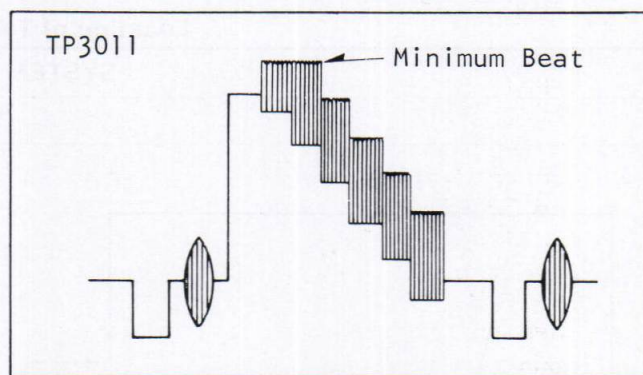
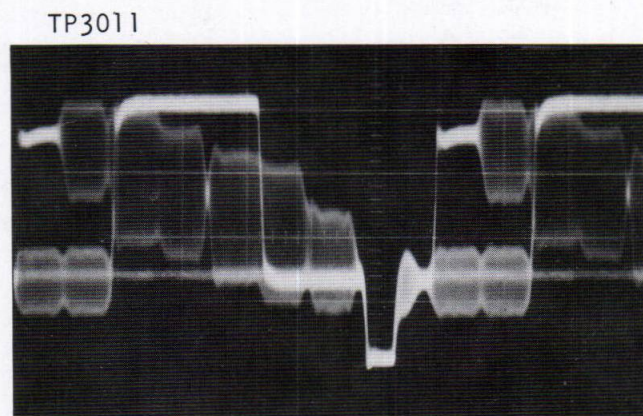


Fig.40.



0.2V/10µsec.div.
Fig.41.

2-6-12. Playback level Adjustment

Test Point: TP3011

Adjustment: R3078 (P.B. LEVEL)

1. Supply a colour bar signal to the Video Input on the right side panel.
2. Insert a cassette and make a recording for a few minutes.
3. Connect the scope to TP3011 on the Luminance section (VJB0399).
4. Playback the portion just recorded.
5. During playback, adjust the P.B. LEVEL (R3078) so the video level becomes 2.0 ± 0.1 Vp-p as shown Fig. 42.
6. Then confirm the level of cyan portion is 1.1 ± 0.1 Vp-p as shown in Fig. 42.

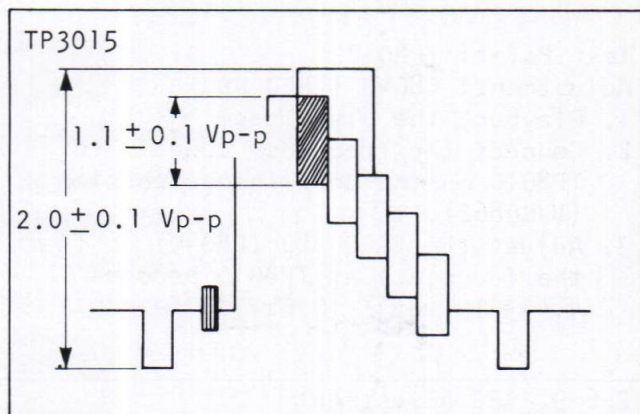
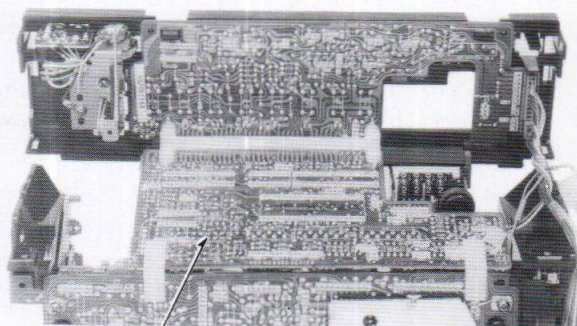
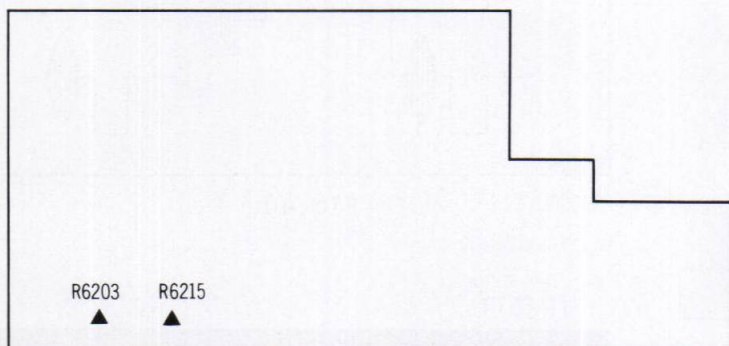


Fig.42.

Location of Test Points and Controls (1)

SYSTEM CONTROL BOARD

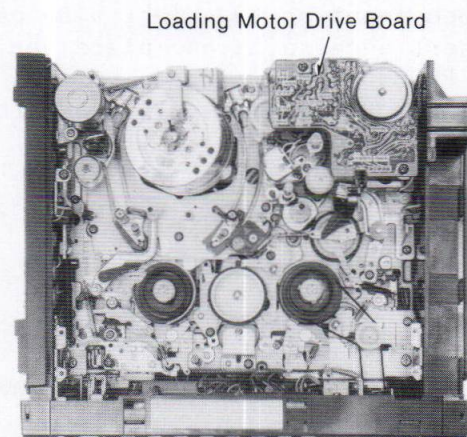
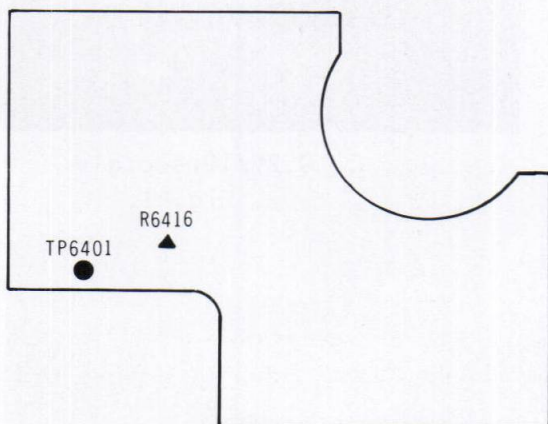
(VEP06115A)



System Control Board

LOADING MOTOR DRIVE BOARD

(VEP06100B)

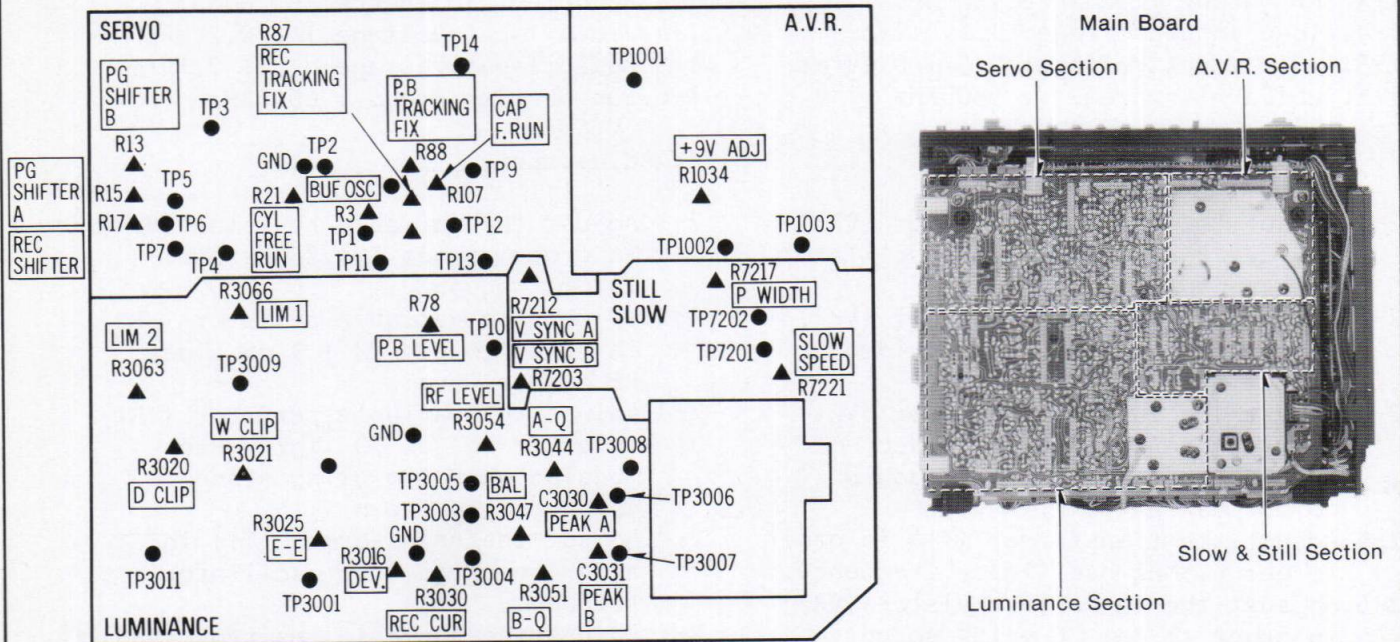


Loading Motor Drive Board

Location of Test Points and Controls (2)

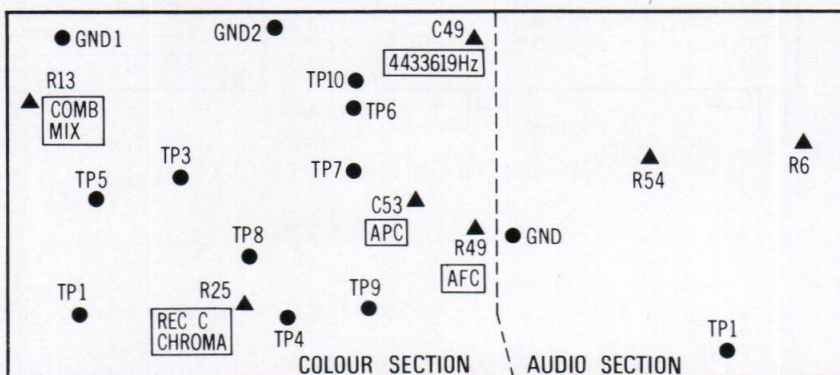
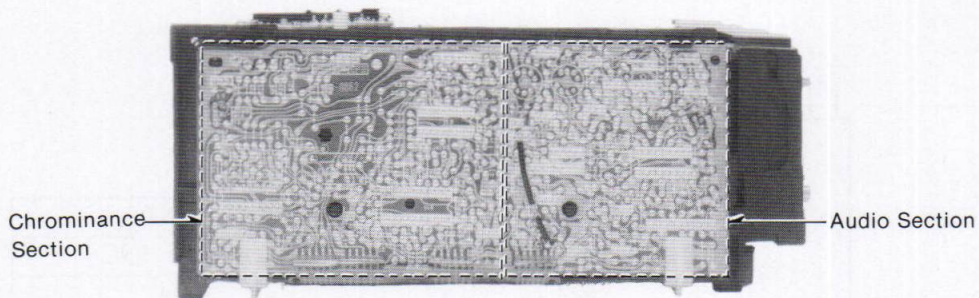
MAIN (A.V.R./SERVO/LUMINANCE PROCESS/SLOW & STILL BOARD)

(VEP0399A/B)



CHROMINANCE PROCESS/AUDIO BOARD

(VEP0862A)



ADJUSTMENT OF MODEL ENC-17354 RF CONVERTER

ADJUSTMENT OF MODEL ENC-17355 RF CONVERTER

1. Rating

- 1-1.Channel: CH36 (591.25MHz)
- 1-2.Supply Voltage: $9 \pm 0.1V$
- 1-3. RF Output Impedance: 75Ω unbal
- 1-4.Video Input Voltage: $1 \pm 0.2Vp-p$
- 1-5.Audio Input Voltage: $0.5 \pm 0.1Vrms$
- 1-6.Sub Carrier Freq. : 5500KHz

2. Adjustment

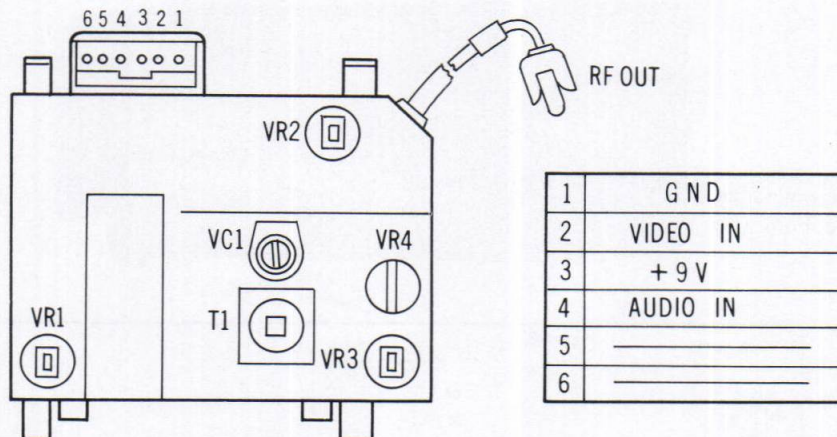
- 2-1.Adjsut the variable resistor (VR4) in order to get 591.25MHz oscillator frequency.
- 2-2.Adjust the variable resistor (VR2) in order to get 73 ± 3 dB video-RF output level.
- 2-3.Adjust the variable resistor (VR1) in order to get $70 \pm 5\%$ video modulation ratio using standard colour bar pattern.
- 2-4.Adjust the transformer (T1) in order to get 5.5MHz oscillator frequency.
- 2-5.Adjsust the variable resistor (VR3) in order to get $70 \pm 10\%$ sound modulation ratio using 1KHz sine wave.

1. Rating

- 1-1.Channel: CH36 (591.25MHz)
- 1-2.Supply Voltage: $9 \pm 0.1V$
- 1-3 RF Output Impedance: 75Ω unbal
- 1-4.Video Input Voltage: $1 \pm 0.2Vp-p$
- 1-5.Audio Input Voltage: $0.5 \pm 0.1Vrms$
- 1-6.Sub Carrier Freq. : 6000KHz

2. Adjustment

- 2-1.Adjust the variable resistor (VR4) in order to get 591.25MHz oscillator frequency.
- 2-2.Adjust the variable resistor (VR2) in order to get 73 ± 3 dB video RF output level.
- 2-3.Adjust the variable resistor (VR1) in order to get $70 \pm 10\%$ video modulation ratio using standard colour bar pattern.
- 2-4.Adjsut the transformer (T1) in order to get 6.0MHz oscillator frequency.
- 2-5.Adjust the variable resistor (VR3) in order to get $70 \pm 10\%$ sound modulation ratio using 1 KHz sine wave.



 **Panasonic**
MATSUSHITA ELECTRIC

Service Manual

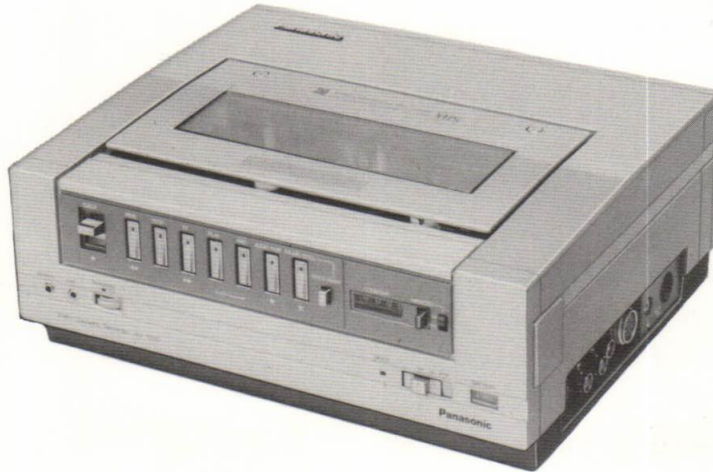
Vol. 3
VIDEO SERVICE CENTER
 T.V.

 Breemarsweg 110^c 7553 HT Hengelo (O) Telefoon 074-914274

Portable Video Cassette Recorder

Panasonic VHS
NV-3000-E-B

Block Diagrams
Schematic Diagrams



SPECIFICATIONS

Power Source: 12V DC
 Battery LCR-1812E, LCR-3012VBE
 Prog. Tuner Unit NV-V300
 AC Adaptor NV-B30

Power Consumption: Approx. 5.6W at Record mode
 Approx. 9.5W at Play mode

Television System: CCIR: 625 lines, 50 fields
 PAL colour signal

Video Recording
 System: 2 rotary heads, helical scanning system
 Luminance: FM azimuth recording
 Colour signal: converted subcarrier phase shift recording

Audio Track: 1 track

Tape Format: Tape width 12.7mm high density tape

Tape Speed: 23.39mm/s

Record/Playback Time: 180 min. with NV-E180
 240 min. with NV-E240

FF/REW Time: Less than 6 min. with NV-E180

Heads: Video: 2 rotary heads
 Audio/Control: 1 stationary head

Erase: 1 full track erase
 1 audio track erase for audio dubbing

Input Level: Video: VIDEO IN connector (BNC)
 1.0Vp-p, 75Ω unbalanced
 CAMERA/TUNER IN connector (10P) 1.0Vp-p, 75Ω unbalanced
 Audio: MIC IN Jack
 -70dB, 600Ω unbalanced

Output Level: Video: VIDEO OUT Jack (BNC)
 1.0Vp-p, 75Ω unbalanced
 Audio: AUDIO OUT Jack (RCA)
 -6dB, 600Ω unbalanced

RF Modulated: UHF channel 36 (±4)

Weight: 5.3kg without battery pack

Dimensions: 291(W) × 114(H) × 249(D)mm

Accessories Supplied: 1 pc. Remote controller, VSQ0146
 1 pc. Earphone, VBE0002
 2 pcs. DIN-DIN coaxial cable, VJA0130
 1 pc. Audio input attenuator, VJP1164
 1 pc. Connection cord for auxiliary battery pack, VJA0148
 1 pc. Carrying case: VFC0005

Optional Accessories: Video cassette tape:
 NV-E240 Approx. 344m 240 min.
 NV-E180 Approx. 258m 180 min.
 NV-E120 Approx. 174m 120 min.
 NV-E60 Approx. 88m 60 min.
 Battery pack, LCR-1812E, LCR-3012VBE
 AC adaptor, NV-B30
 14 Day 8 programme Timer, NV-V300
 Colour video camera, WV-2600E,
 WV-3000E, WV-3200E
 Car battery cord, NV-C24

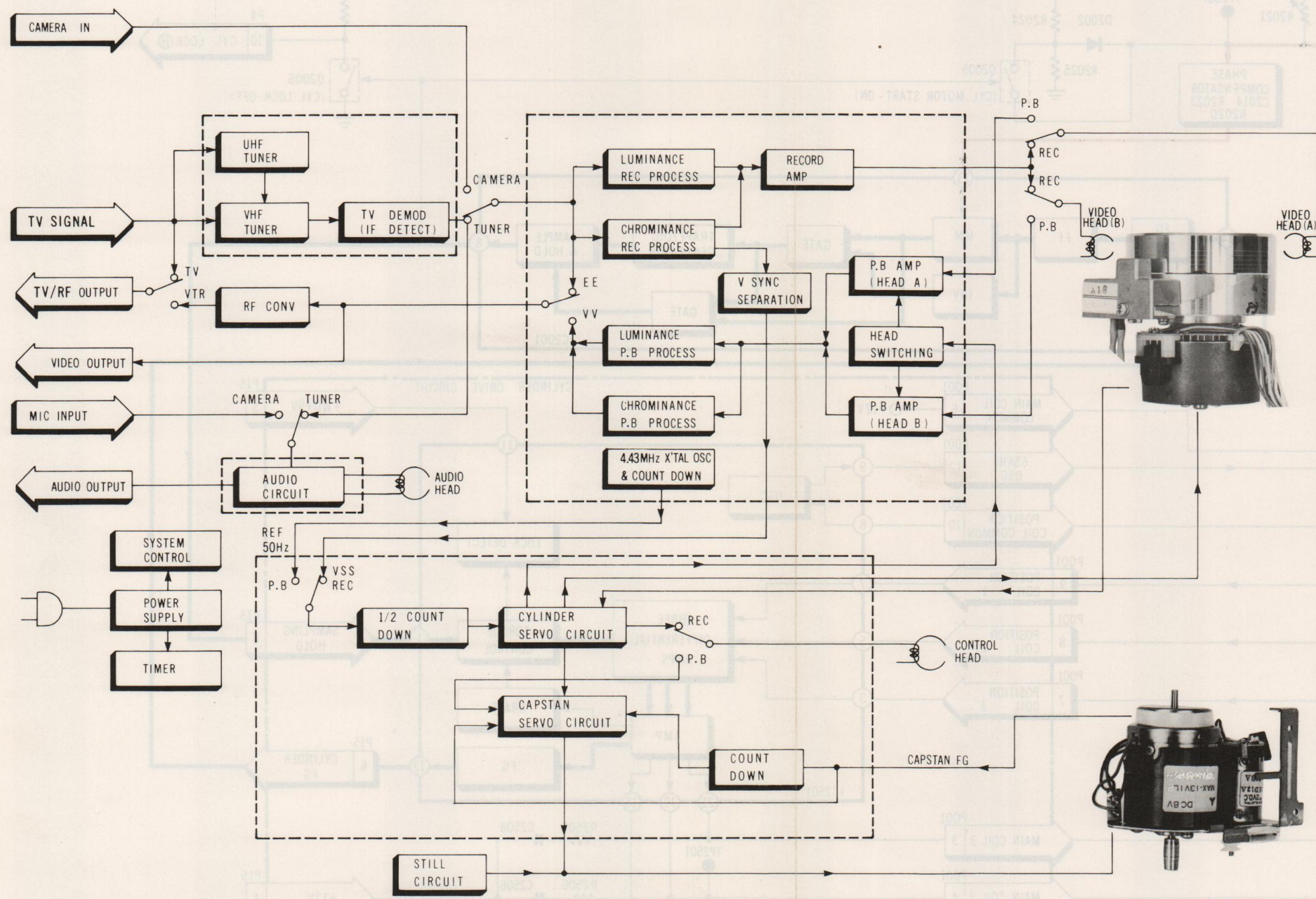
Weight and dimensions shown are approximate.
 Specifications are subject to change without notice.

Matsushita Electric Trading Co., Ltd.
 P.O. Box 288, Central Osaka Japan

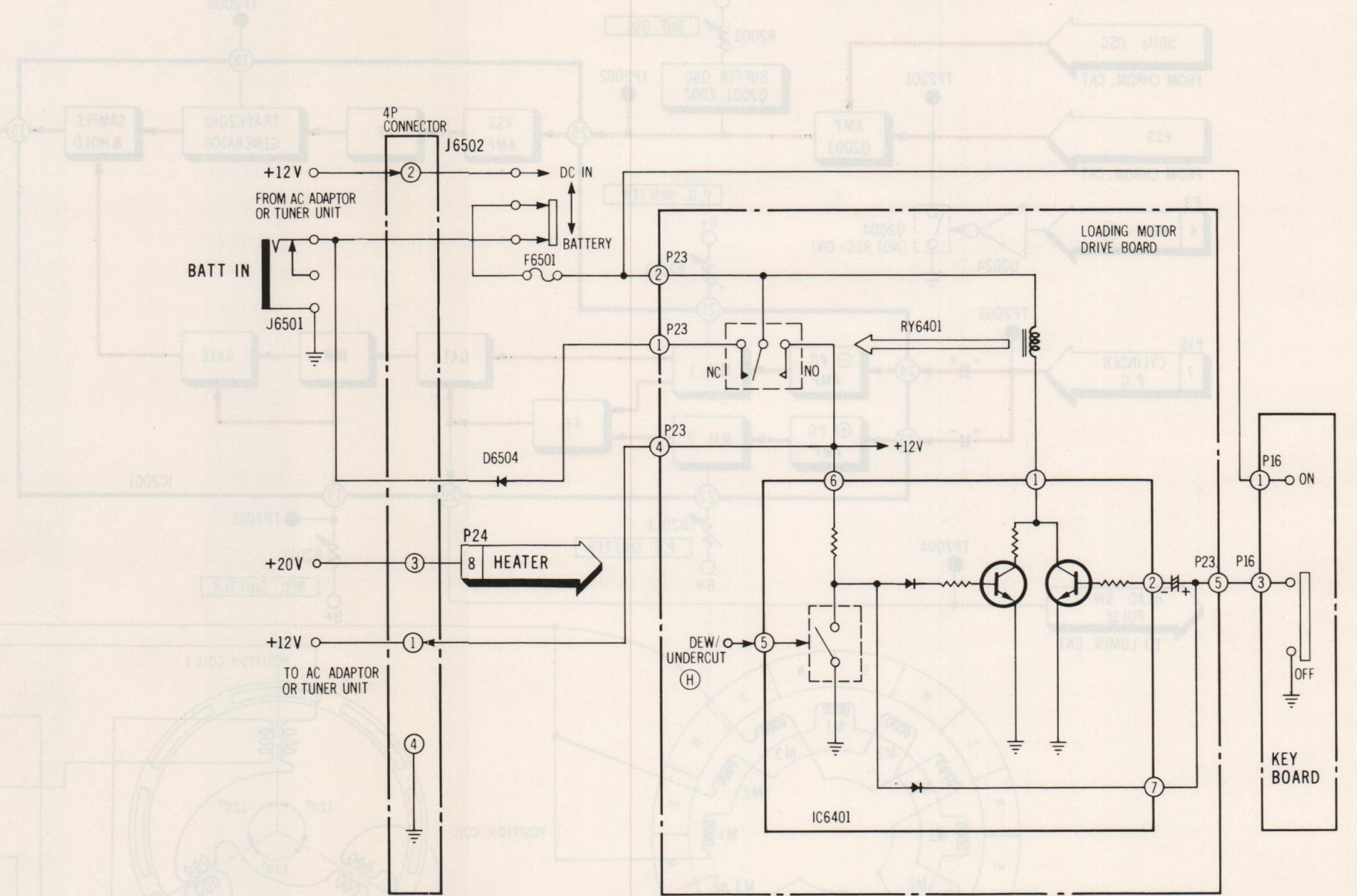
CONTENTS

SPECIFICATIONS	Cover
BLOCK DIAGRAMS	3-1
Overall	3-1
B+ Power Supply	3-1
Cylinder Servo	3-2
Capstan Servo	3-3
A.V.R.	3-3
Luminance Process	3-4
Chrominance Process	3-5
Still	3-6
Audio	3-6
System Control	3-7
Microprocessor MN1405VQ Timing Chart	3-8
RF Converter	3-11
SCHEMATIC & CIRCUIT BOARD DIAGRAM	3-12
System Control	3-12
Audio	3-14
Colour Process	3-14
Servo & A.V.R.	3-16
D.D Cylinder Drive	3-18
Slow & Still	3-19
Luminance Process	3-19
Key Board	3-20
Loading Motor Drive	3-21
Jack Board	3-22
RF Converter	3-23
Circuit Board Layout	3-24
Interconnection	3-25

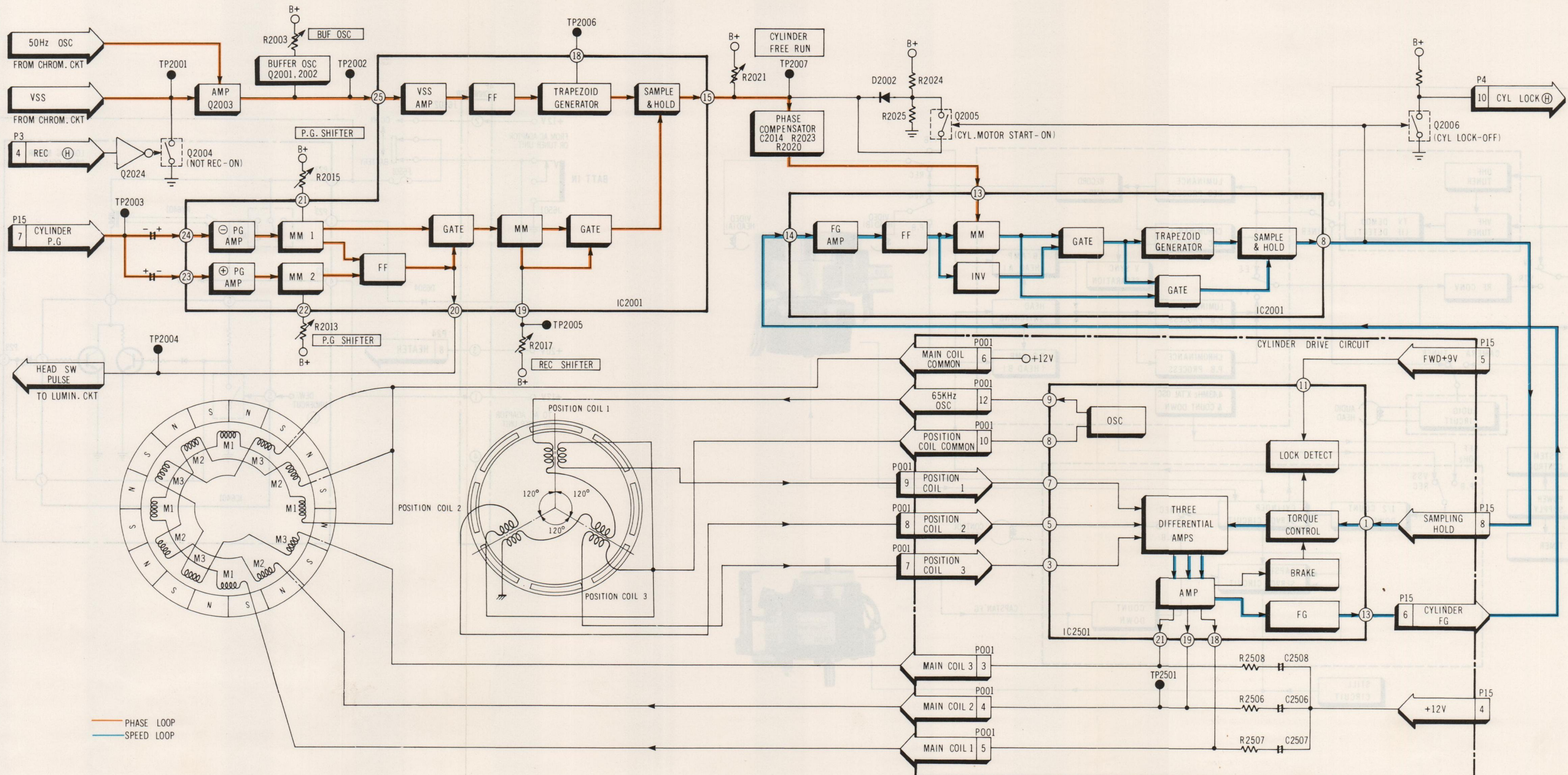
OVERALL BLOCK DIAGRAM



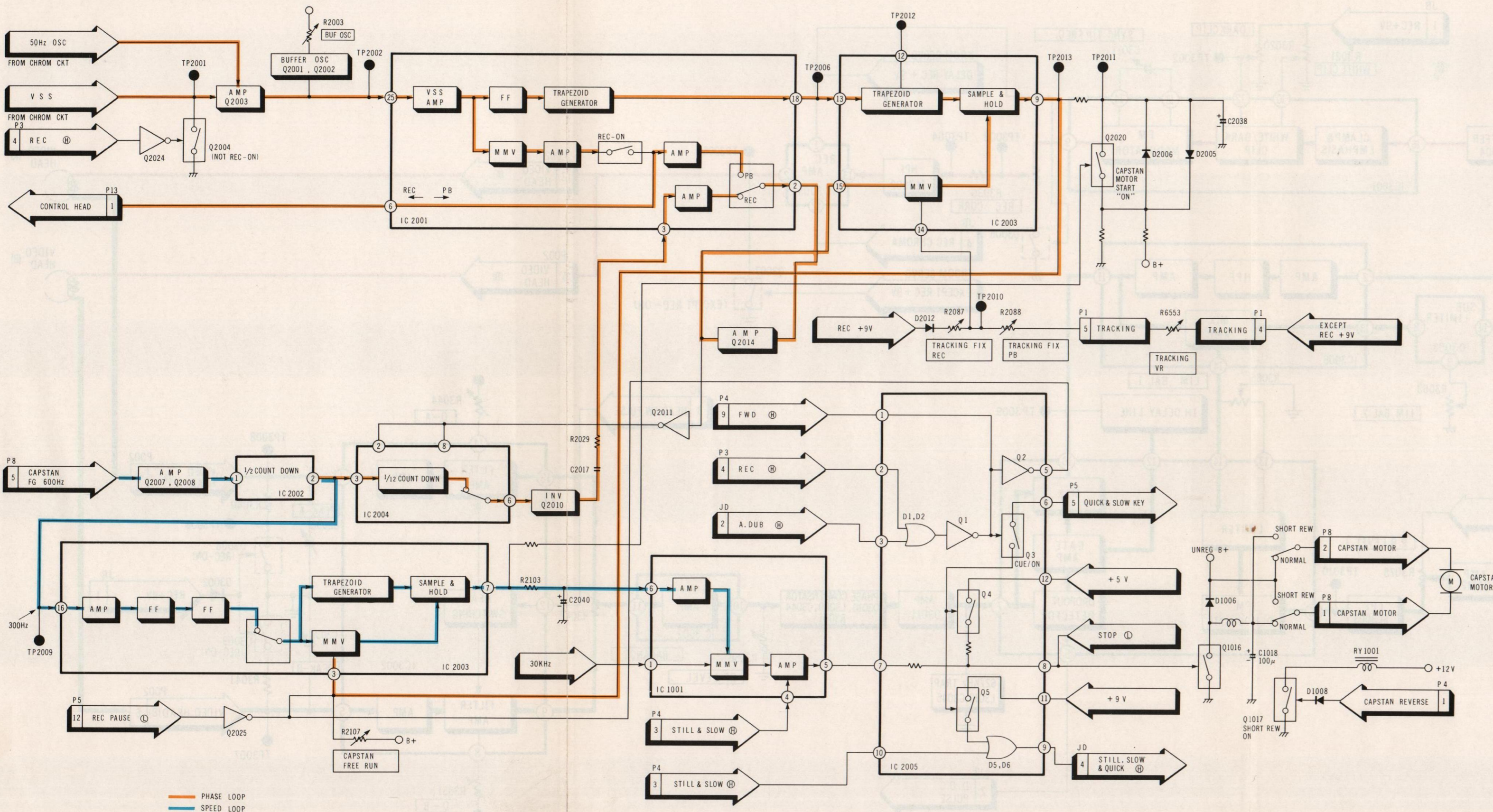
B + POWER SUPPLY BLOCK DIAGRAM



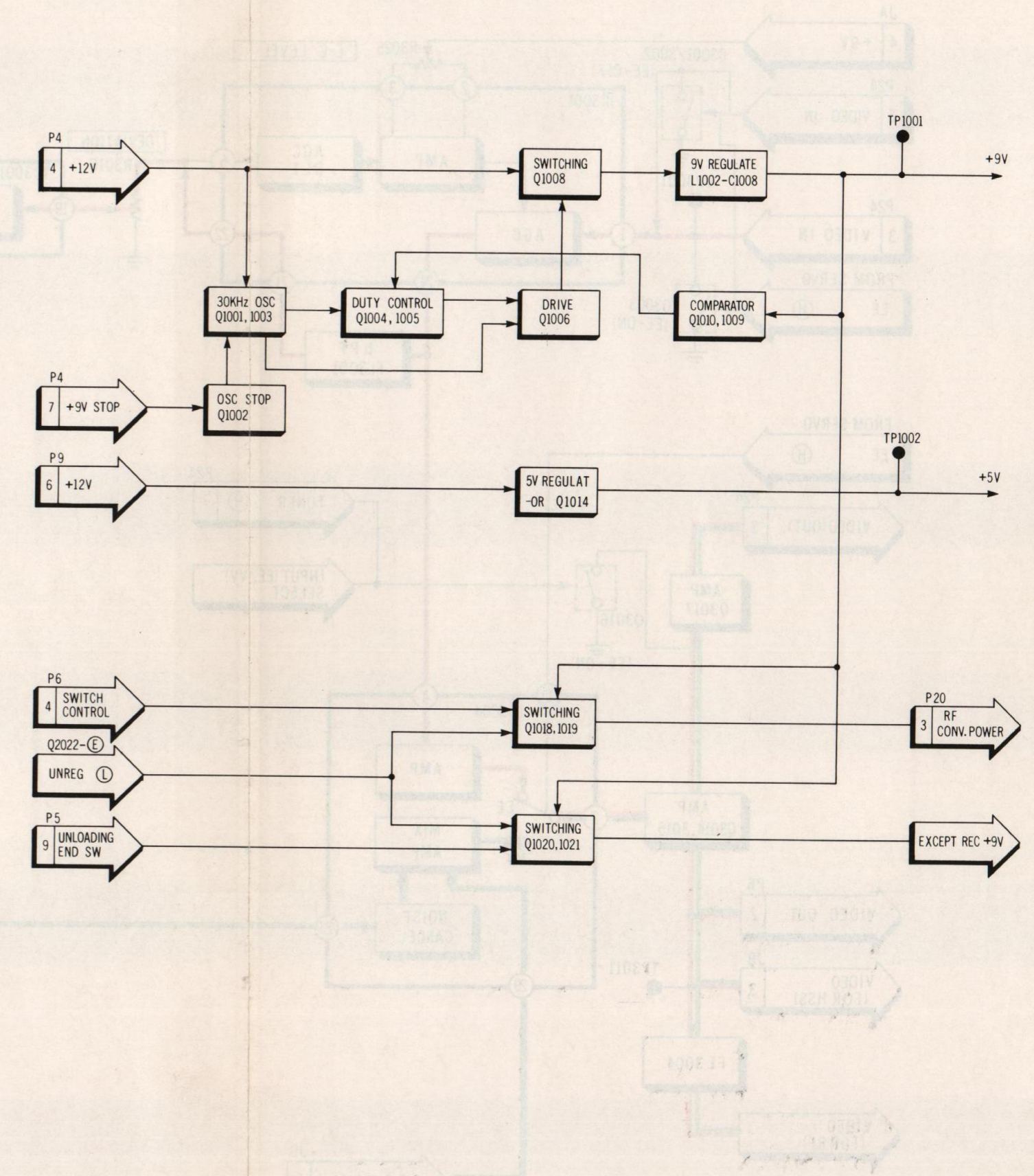
CYLINDER SERVO BLOCK DIAGRAM



CAPSTAN SERVO BLOCK DIAGRAM

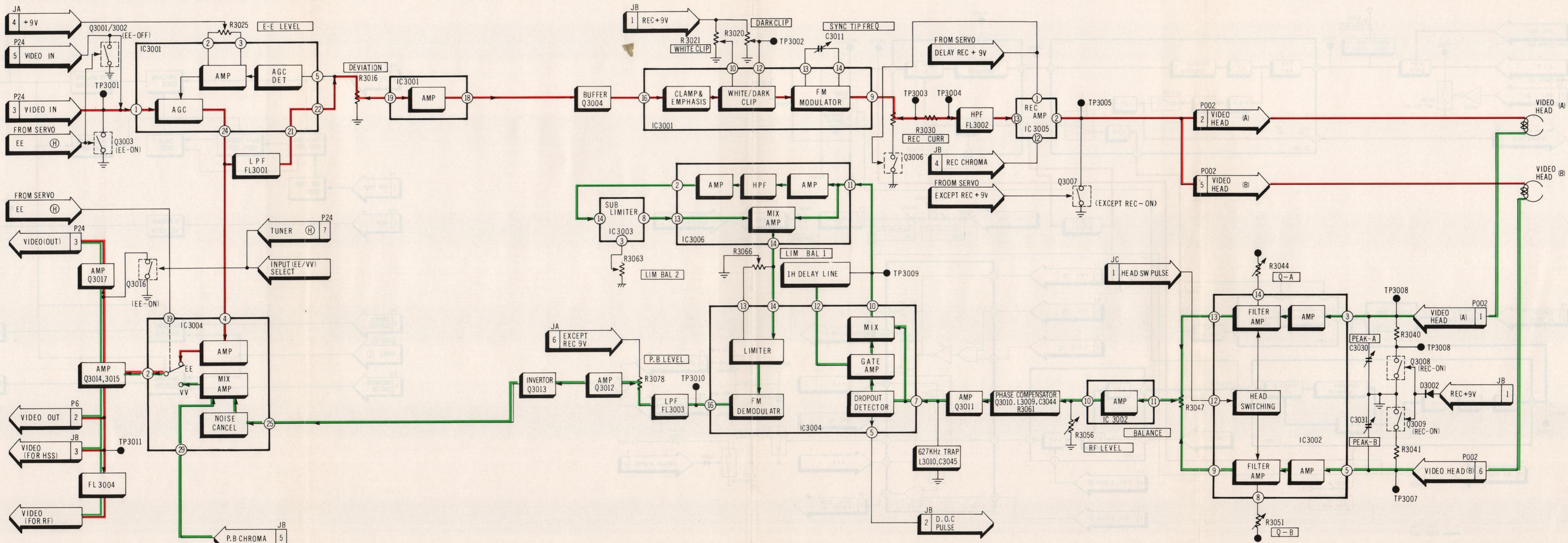


A.V.R. BLOCK DIAGRAM



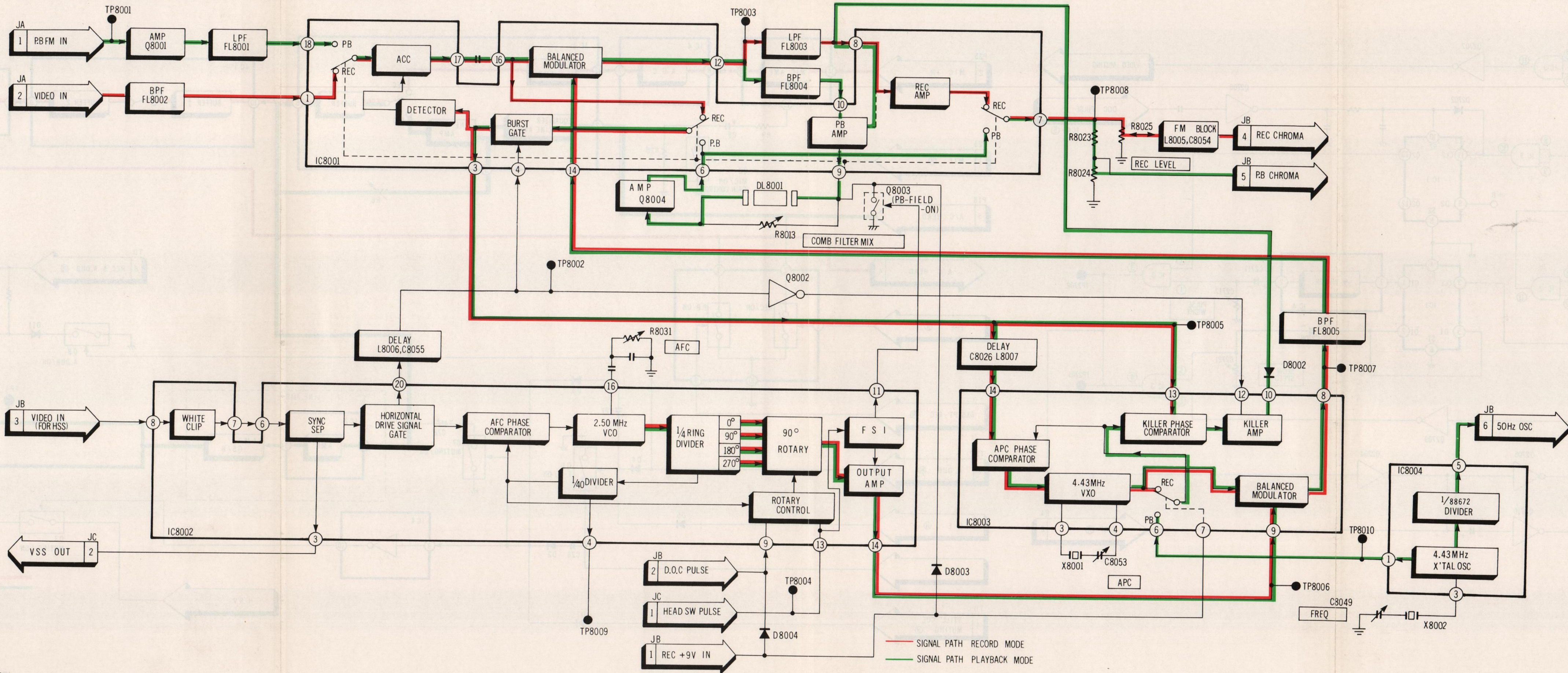
LUMINANCE PROCESS BLOCK DIAGRAM

CASTAN SERVO BLOCK DIAGRAM

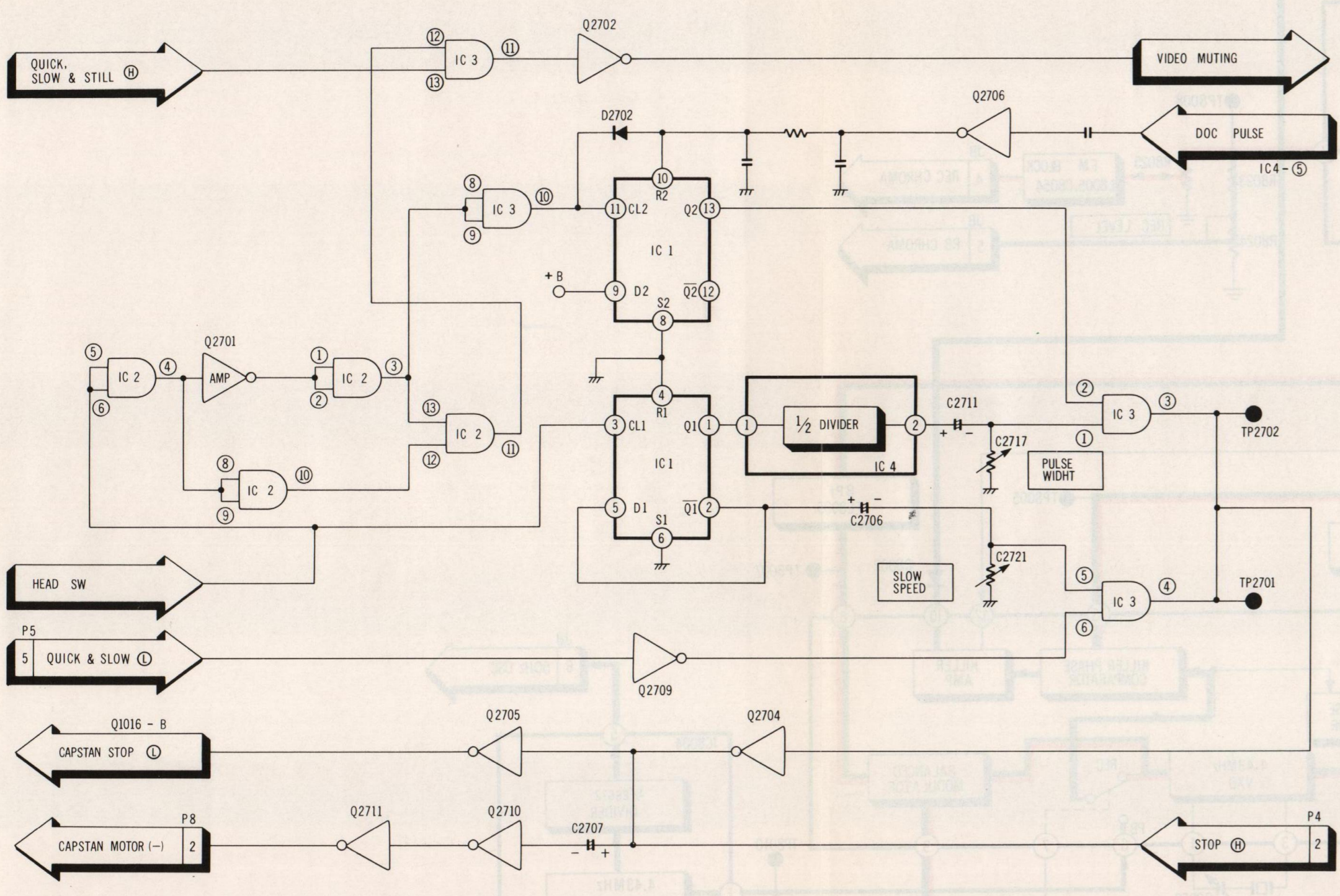


— SIGNAL PATH RECORD MODE
 — SIGNAL PATH PLAYBACK MODE

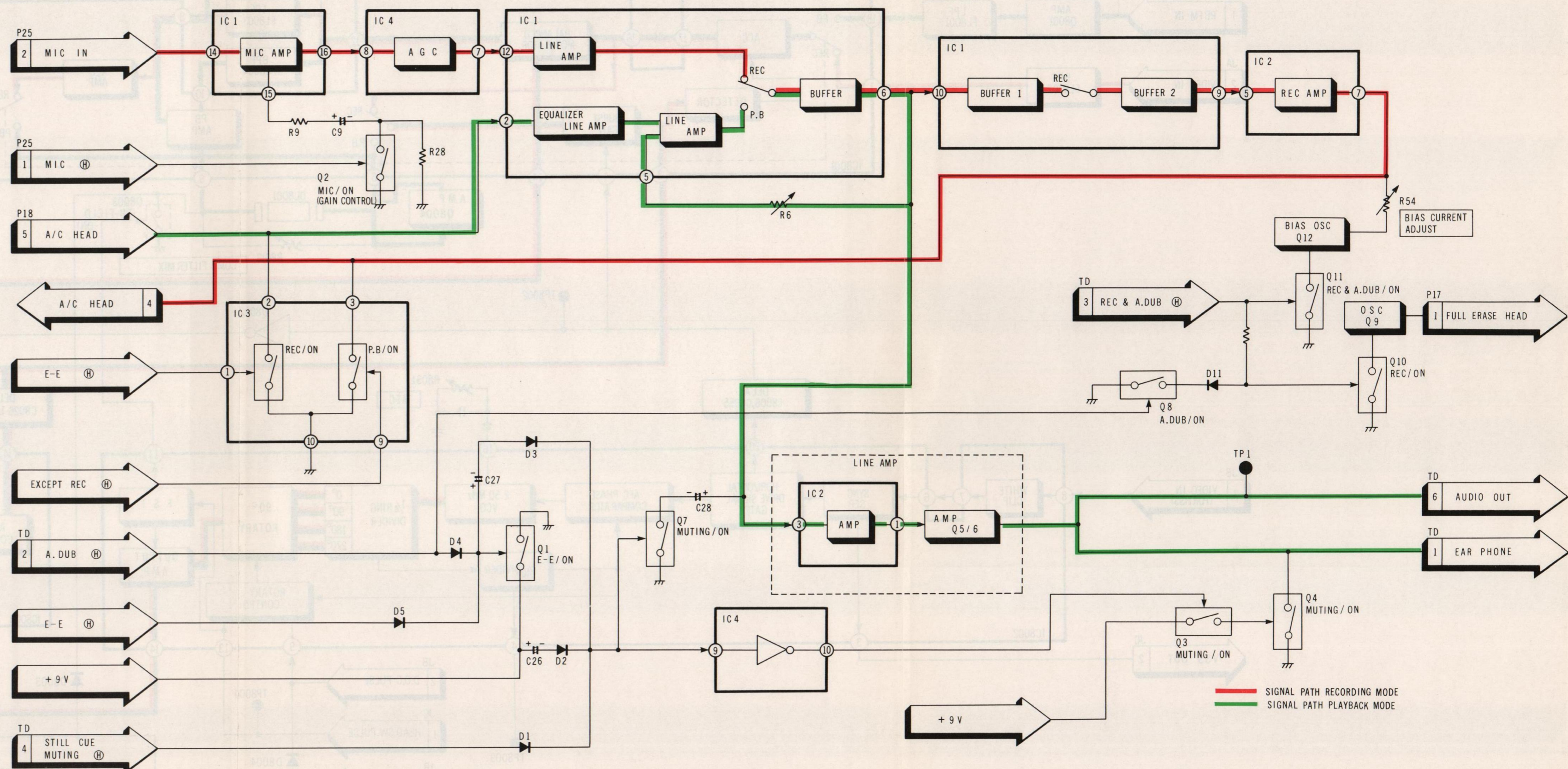
CHROMINANCE PROCESS BLOCK DIAGRAM



STILL BLOCK DIAGRAM

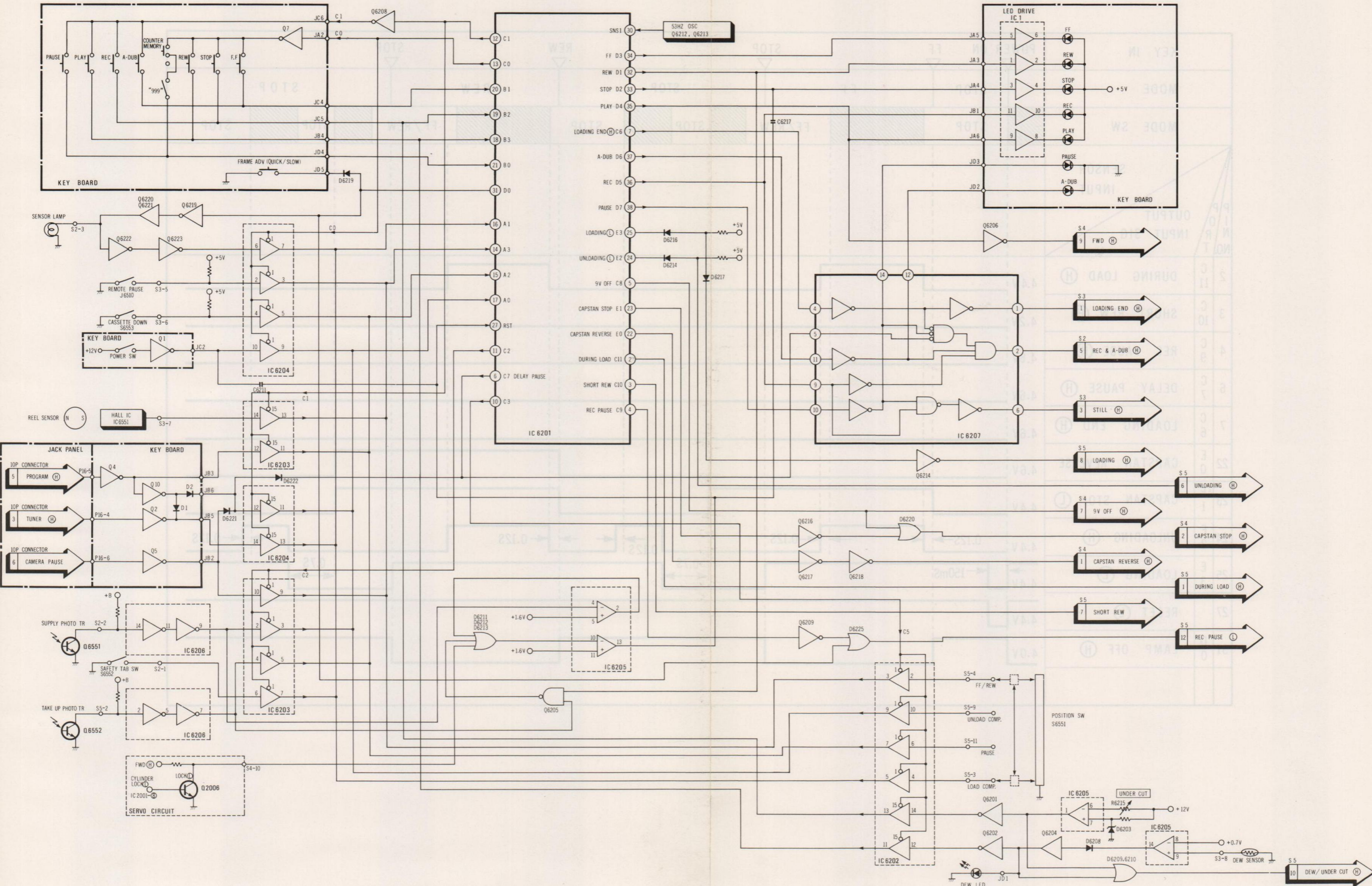


AUDIO BLOCK DIAGRAM



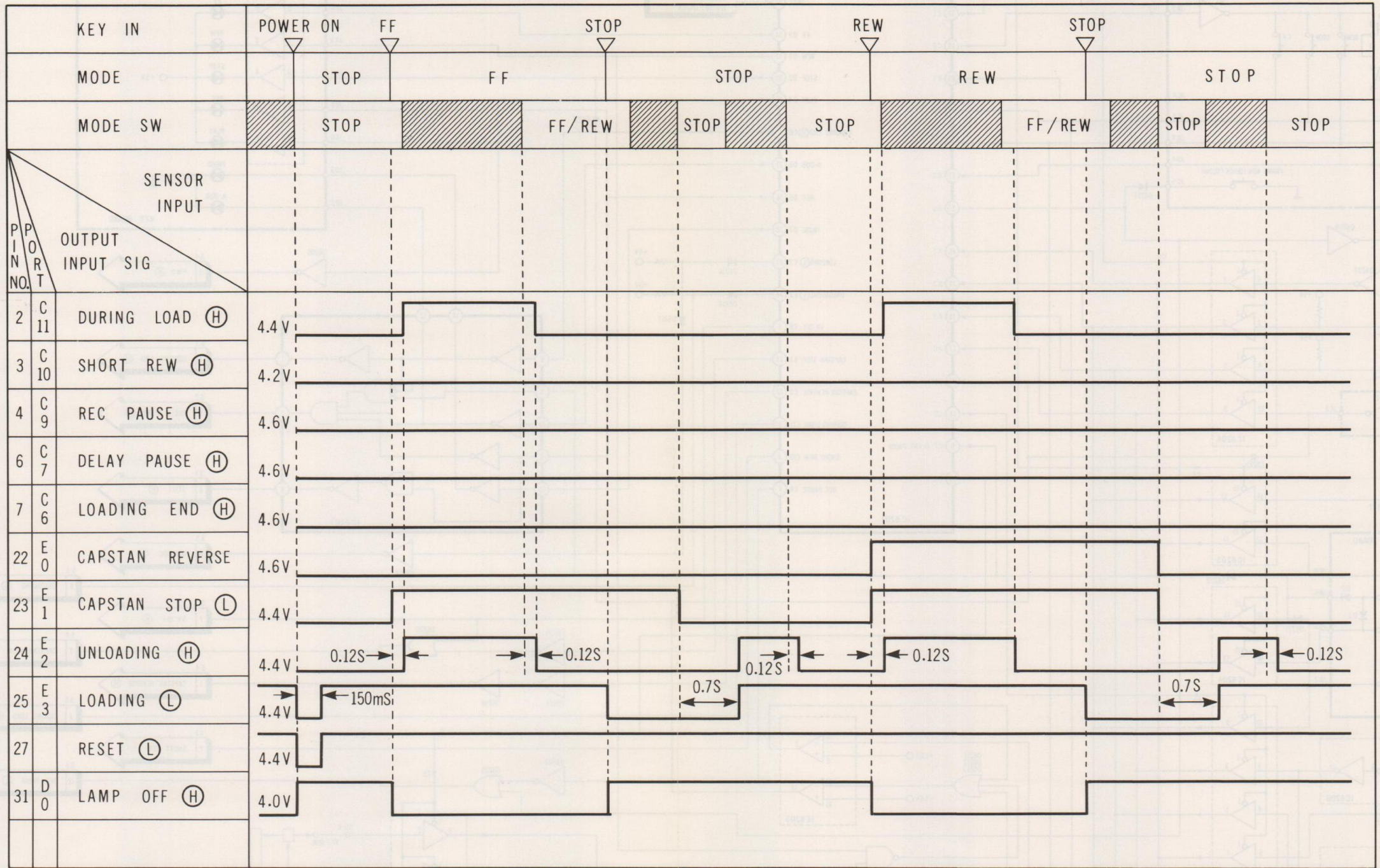
SYSTEM CONTROL BLOCK DIAGRAM

MICROPROCESSOR MNT1405VQ TIMING CHART (1)



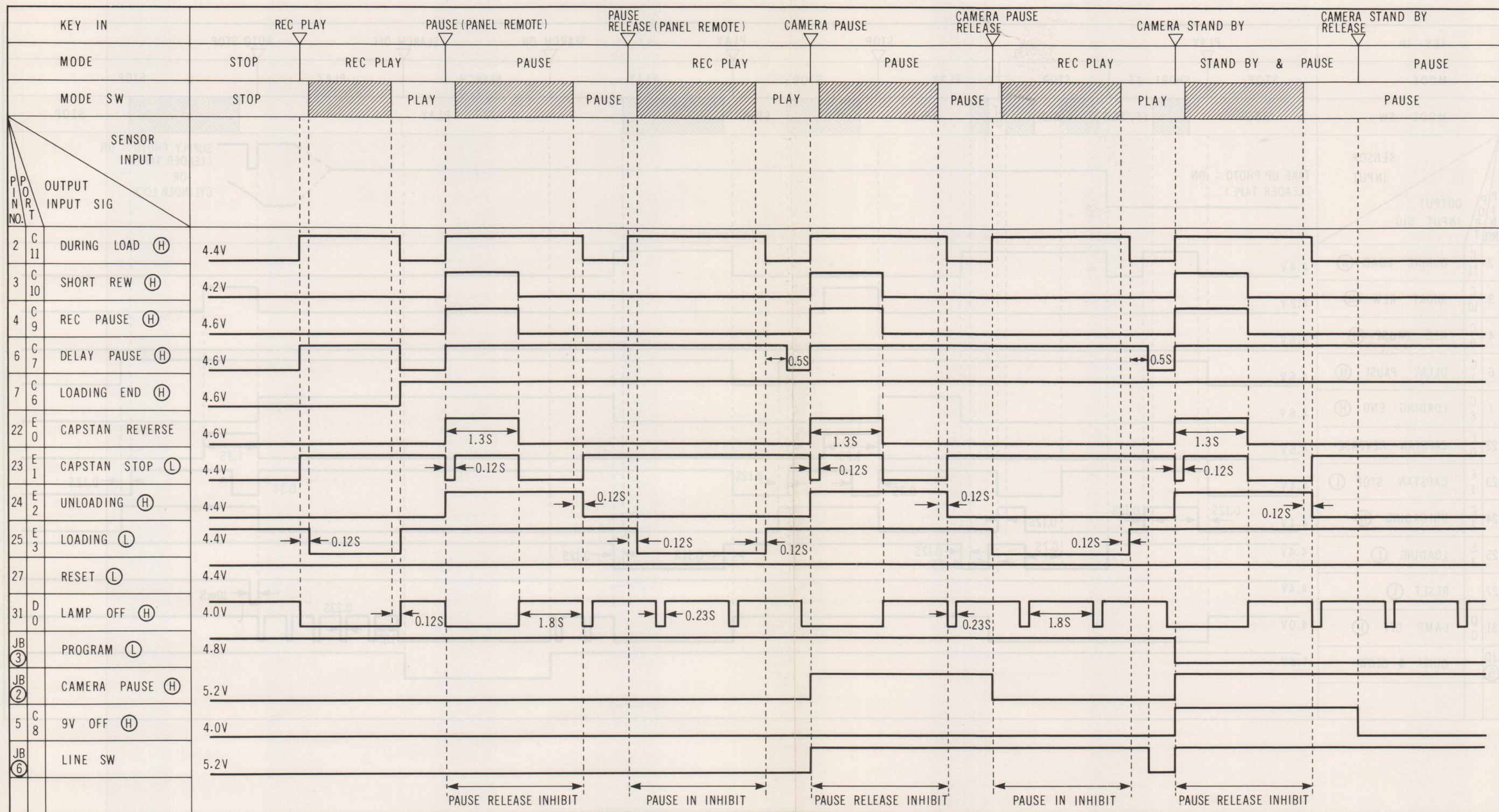
MICROPROCESSOR MN1405VQ TIMING CHART (1)

CONTROL BLOCK DIAGRAM



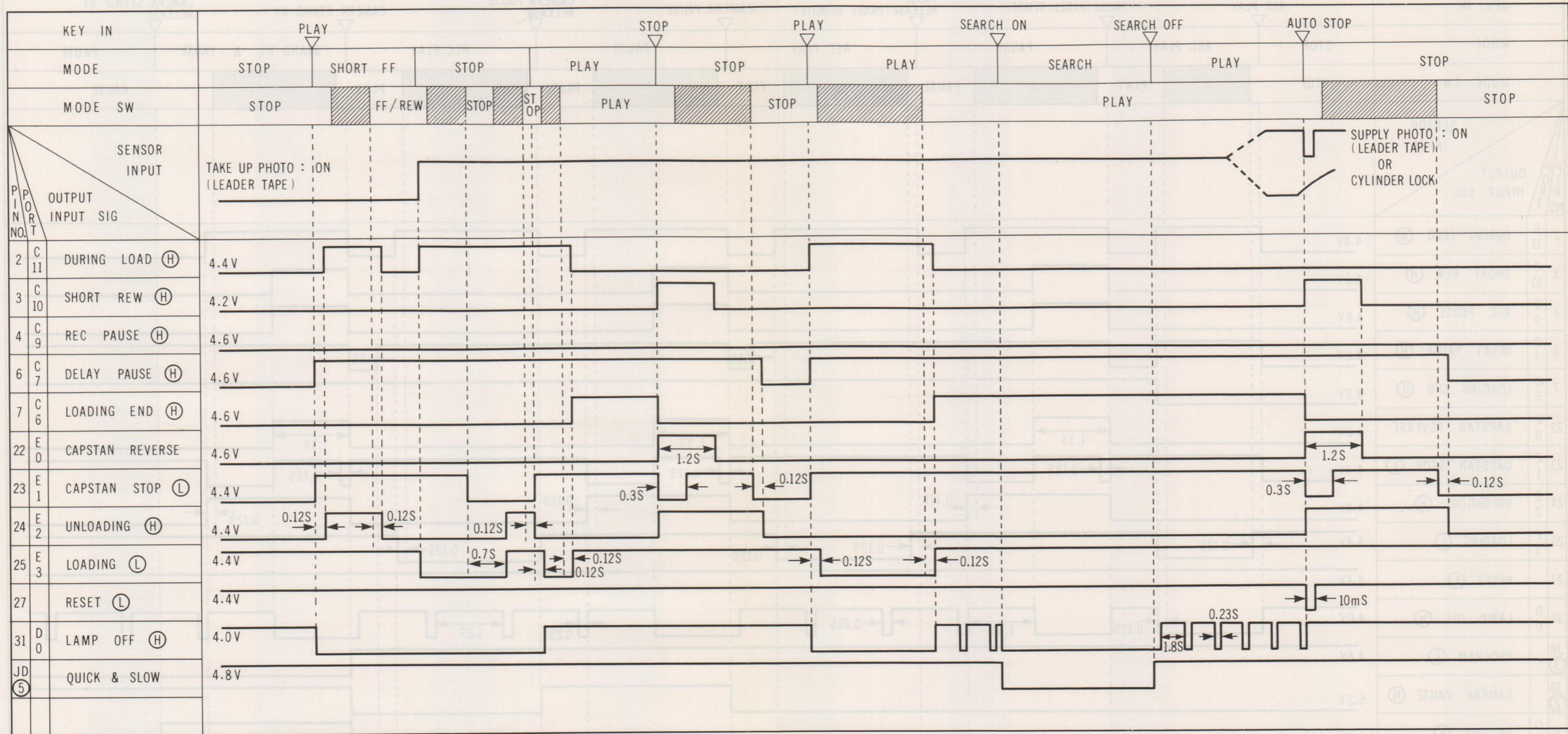
MICROPROCESSOR MN1405VQ TIMING CHART (2)

MICROPROCESSOR MN1405VQ TIMING CHART (2)

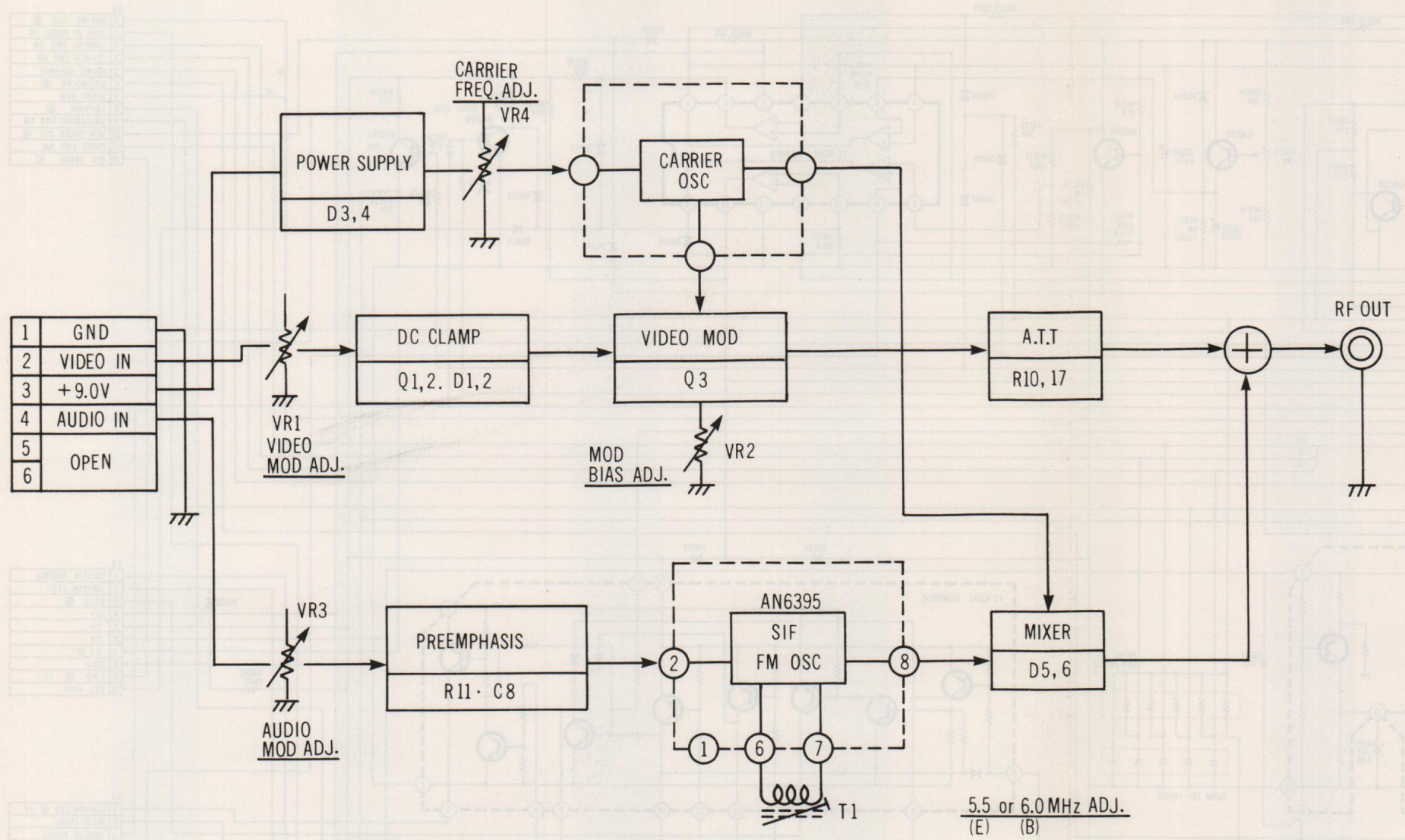


MICROPROCESSOR MN1405VQ TIMING CHART (3)

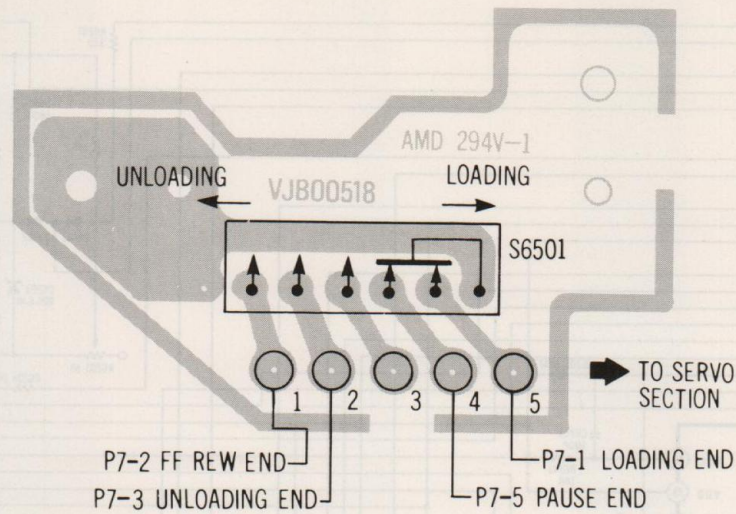
MICROPROCESSOR MN1405VQ TIMING CHART (3)



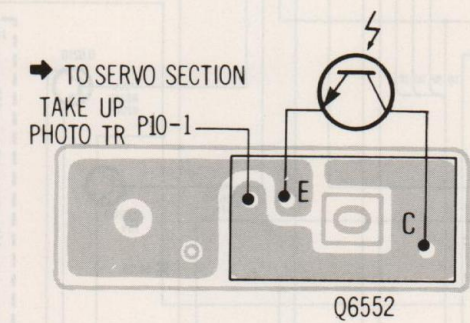
RF CONVERTER BLOCK DIAGRAM



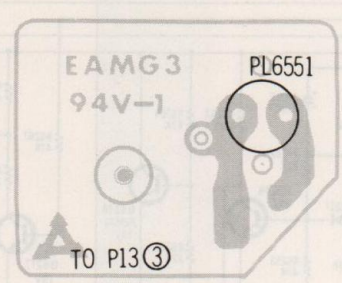
MODE SELECT SW CIRCUIT BOARD (VJB00518)



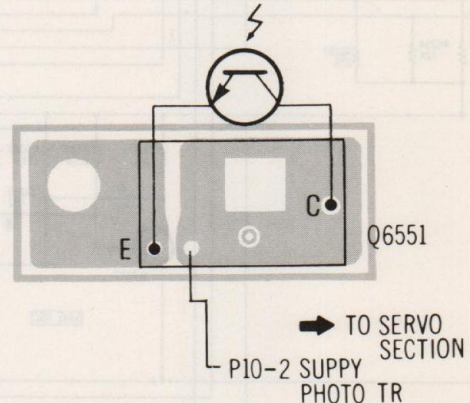
TAKEUP PHOTO TR CIRCUIT BOARD (VJB00520)



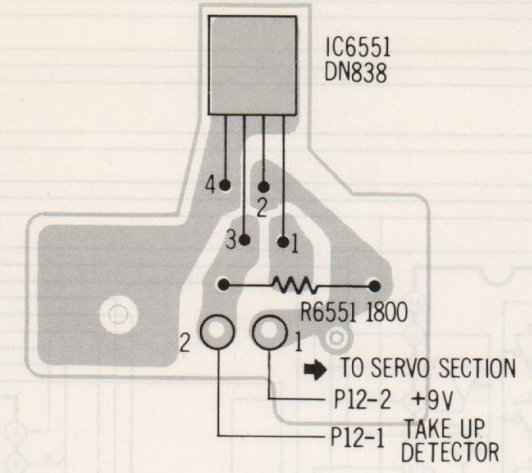
SENSOR LAMP CIRCUIT BOARD (VJB00519)



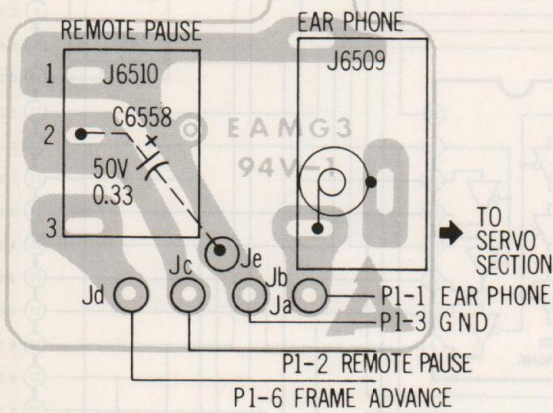
SUPPLY PHOTO TR CIRCUIT BOARD (VJB00521)



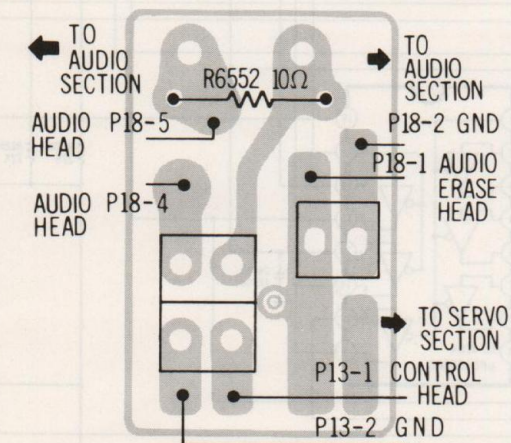
TAKEUP DETECTOR CIRCUIT BOARD (VJB00522)



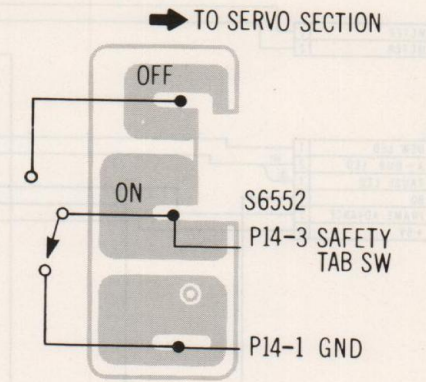
REMOTE PAUSE/EARPHONE JACK CIRCUIT BOARD (VJB00523)



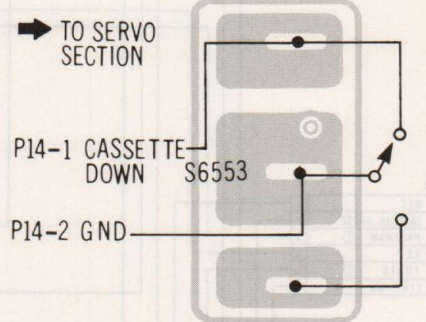
A/C HEAD CIRCUIT BOARD (VJB00524)



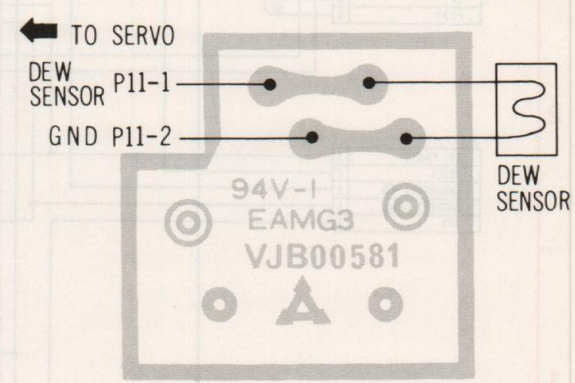
SAFETY TAB SW CIRCUIT BOARD (VJB00525)



CASSETTE DOWN SW CIRCUIT BOARD (VJB00526)

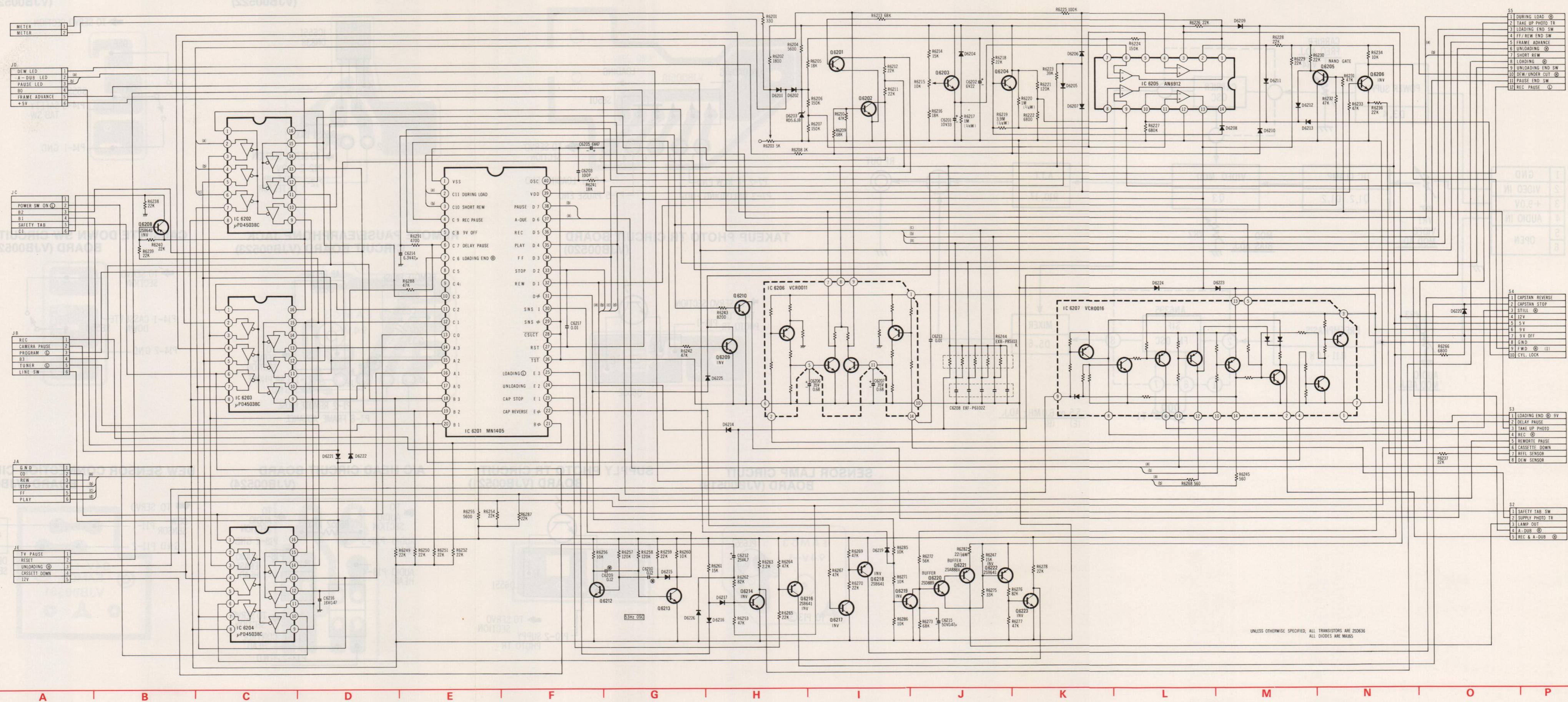


DEW SENSOR CONNECTION CIRCUIT BOARD (VJB00581)



SYSTEM CONTROL SCHEMATIC DIAGRAM

RF CONVERTER BLOCK DIAGRAM



METER

1	METER
2	METER

J1

1	DEW LED
2	A-DUB LED
3	PAUSE LED
4	B1
5	FRAME ADVANCE
6	+5V

J2

1	POWER SW ON
2	B2
3	B1
4	SAFETY TAB
5	C1
6	

J3

1	REC
2	CAMERA PAUSE
3	PROGRAM
4	B3
5	TUNER
6	LINE SW

J4

1	GND
2	CD
3	REW
4	STOP
5	FF
6	PLAY

J5

1	TV PAUSE
2	RESET
3	UNLOADING
4	CASSETT DOWN
5	LVZ

S5

1	DURING LOAD
2	TAKE UP PHOTO TR
3	LOADING END SW
4	FF/REW END SW
5	FRAME ADVANCE
6	UNLOADING
7	SHORT REW
8	LOADING
9	UNLOADING END SW
10	DEW/UNDER CUT
11	PAUSE END SW
12	REC PAUSE

S4

1	GND
2	VIDEO IN
3	+8.0V
4	AUDIO IN
5	9V
6	5V
7	9V OFF
8	GND
9	FWD
10	CYL. LOCK

S3

1	LOADING END
2	DELAY PAUSE
3	TAKE UP PHOTO
4	REC
5	REW/STOP
6	CASSETT DOWN
7	REFL SENSOR
8	DEW SENSOR

S2

1	SAFETY TAB SW
2	SUPPLY PHOTO TR
3	LAMP OUT
4	A-DUB
5	REC & A-DUB

UNLESS OTHERWISE SPECIFIED, ALL TRANSISTORS ARE 2SD636
ALL DIODES ARE MA165

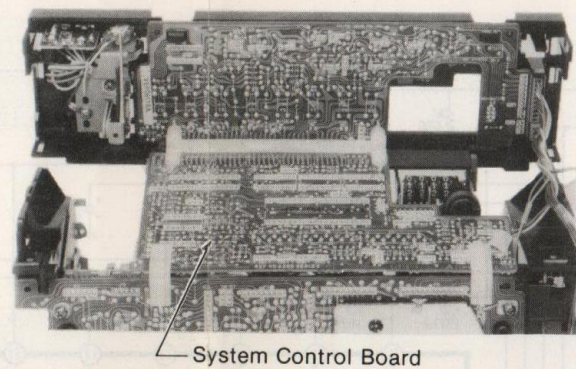
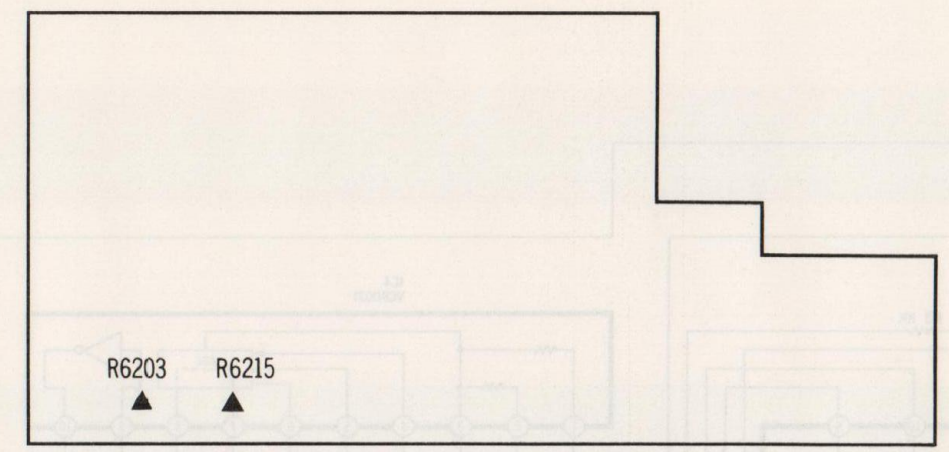
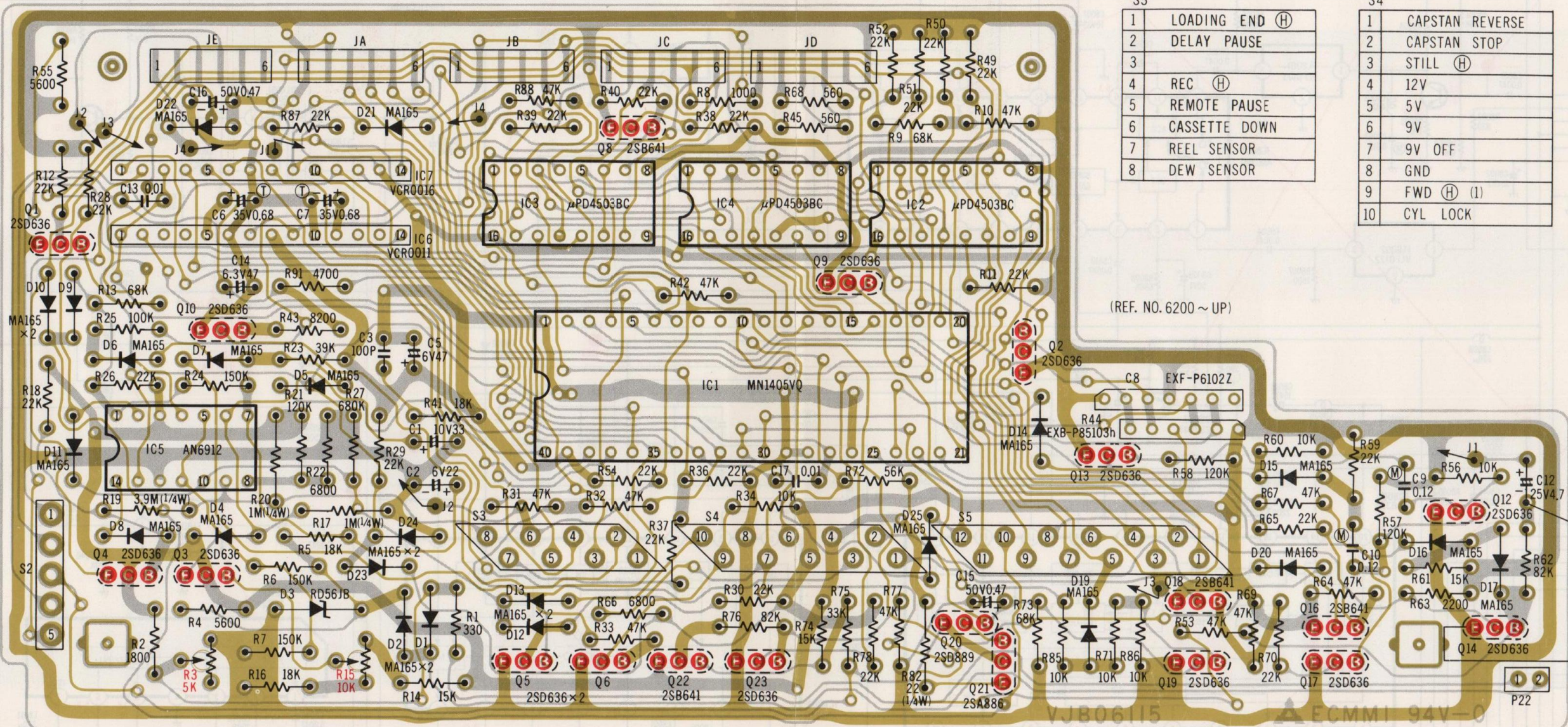
SYSTEM CONTROL CIRCUIT BOARD (VEP06115A)

COLOUR PROCESS SCHEMATIC DIAGRAM

JE		JA		JB		JC		JD	
1	REMOTE PAUSE	1	GND	1	REC	1	POWER SW ON Ⓛ	1	DEW LED
2		2	C ₀	2	CAMERA PAUSE	2	B ₂	2	A-DUB LED
3		3	REW	3	PROGRAM Ⓛ	3	B ₁	3	PAUSE LED
4		4	STOP	4	B ₃	4	B ₀	4	B ₀
5		5	FF	5	TUNER Ⓛ	5	SAFETY TAB	5	FRAME ADVANCE
6		6	PLAY	6	LINE SW	6	C ₁	6	+5V

S3		S4		S5	
1	LOADING END Ⓜ	1	CAPSTAN REVERSE	1	DRIVING LOAD Ⓜ
2	DELAY PAUSE	2	CAPSTAN STOP	2	TAKE UP PHOTO TR
3		3	STILL Ⓜ	3	LOADING END SW
4	REC Ⓜ	4	12V	4	FF/REW END SW
5	REMOTE PAUSE	5	5V	5	FRAME ADVANCE
6	CASSETTE DOWN	6	9V	6	UNLOADING Ⓜ
7	REEL SENSOR	7	9V OFF	7	SHORT REW
8	DEW SENSOR	8	GND	8	LOADING Ⓜ
		9	FWD Ⓜ (1)	9	UNLOADING END SW
		10	CYL LOCK	10	DEW/UNDER CUT Ⓜ
				11	PAUSE END SW
				12	REC PAUSE Ⓛ

P22	
1	METER
2	METER



SYSTEM CONTROL DC VOLTAGE CHART

REF. NO.	Q1			Q2			Q3			Q4			Q5		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP	0	5.34	0.05	0	5.34	0.06	6.03	12.89	6.54	0.17	12.89	0.65	0	0	0.66
PLAY	0	5.34	0.05	0	5.34	0.06	5.97	12.79	6.49	0.17	12.79	0.65	0	0	0.66
REC	0	5.33	0.05	0	5.34	0.06	5.99	12.82	6.5	0.17	12.82	0.65	0	0	0.66
F.F	0	5.34	0.05	0	5.34	0.06	5.96	12.76	6.47	0.16	12.76	0.64	0	0	0.66
REW	0	5.33	0.05	0	5.34	0.06	5.95	12.74	6.46	0.16	12.74	0.65	0	0	0.64
REF. NO.	Q6			Q8			Q9			Q10			Q12		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP	0	0.03	0.65	5.37	0.2	5.31	0	3.63	0.01	0	0.12	0.3	0	2.24	-0.4
PLAY	0	5.25	0.15	5.37	0.19	5.32	0	3.65	0.01	0	0.98	0.01	0	2.24	-0.4
REC	0	4.92	0.15	5.36	0.12	5.32	0	8.82	0.01	0	8	0.01	0	2.24	-0.4
F.F	0	0.03	0.65	5.36	0.12	5.32	0	3.22	0.01	0	0.11	0.3	0	2.24	-0.4
REW	0	0.03	0.65	5.36	0.12	5.32	0	3.22	0.01	0	0.11	0.3	0	2.24	-0.4
REF. NO.	Q13			Q14			Q16			Q17			Q18		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP	0	2.57	-0.6	0	0.03	0.7	5.35	5.34	4.68	0	5.32	0.04	5.35	0	5.34
PLAY	0	2.57	-0.6	0	0.03	0.69	5.35	5.02	5.32	0	5.32	0.04	5.35	0	5.33
REC	0	2.57	-0.6	0	0.02	0.69	5.35	5.02	5.32	0	5.32	0.04	5.35	0	5.33
F.F	0	2.57	-0.6	0	0.02	0.69	5.35	5.02	5.32	0	5.32	0.04	5.35	0	5.33
REW	0	2.57	-0.6	0	0.02	0.69	5.35	5.03	5.32	0	0.01	0.63	5.35	5.33	5.33
REF. NO.	Q19			Q20			Q21			Q22			Q23		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP	0	0.01	0.63	0	12.4	0.01	12.9	0	12.4	12.9	12.9	12.2	0	0.01	0.64
PLAY	0	0.01	—	—	—	—	—	—	—	12.8	12.8	12	0	0.01	0.64
REC	0	—	—	—	—	—	—	—	—	12.8	12.8	12.1	0	0.01	0.64
F.F	0	4.84	0.01	4.25	9.88	4.84	10.51	4.25	9.88	12.8	12.7	12	0	0.01	0.64
REW	0	4.85	0	4.25	9.87	4.85	10.48	4.25	9.87	12.8	12.7	12	0	0.01	0.64
REF. NO.	(S5-6)			(S4-8)											
	E	C	B	E	C	B									
STOP	0	0.67	0	0	5.36	0									
PLAY	0	0.67	0	0	5.36	0									
REC	0	0.67	0	0	5.35	0									
F.F	0	0.67	0	0	5.36	0									
REW	0	0.67	0	0	5.35	0									

System Control	
Q6201	A-2
Q6202	D-2
Q6203	D-2
Q6204	A-1
Q6205	B-1
Q6206	B-1
Q6208	B-2
Q6209	C-2
Q6210	A-2
Q6211	E-1
Q6212	D-2
Q6213	E-1
Q6216	E-1
Q6217	E-1
Q6218	D-1
Q6219	D-1
Q6220	C-1
Q6221	D-1
Q6222	C-1
Q6223	C-1
IC6201	C-2
IC6202	C-2
IC6203	B-2
IC6204	C-2
IC6205	A-1
IC6206	A-2
IC6207	A-2

IC1					
	STOP	PLAY	REC	F.F	REW
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0
5	0.09	0.09	0.09	0.09	0.09
6	0.02	0.02	0.02	0.02	0.02
7	0.02	4.65	4.65	0.02	0.02
8	0.02	0.02	0.02	0.02	0.02
9	0.02	0.02	0.02	0.02	0.02
10	5.12	5.21	5.2	5.22	5.22
11	5.12	5.21	5.2	5.22	5.22
12	5.15	5.23	5.22	5.22	5.22
13	5.14	5.22	5.22	5.21	5.21
14	0.8	—	—	0.42	0.41
15	0.84	0.34	0.34	0.47	0.47
16	0.57	0.34	0.34	0.33	0.33
17	0.02	0.18	0.18	0.16	0.16
18	0.23	0.13	0.13	0.12	0.12
19	0.22	0.13	0.13	0.12	0.12
20	0.01	0.01	0.01	0	0
21	0.01	0	0	0	0
22	0.04	0.04	0.04	0.04	4.64
23	0.06	5.36	5.36	5.35	5.35
24	0.09	0.09	0.09	0.09	0.09
25	5.35	5.35	5.35	5.35	5.35
26	0	0	0	0	0
27	5.38	5.38	5.37	5.38	5.38
28	0	0	0	0	0
29	0	0	0	0	0
30	2.59	2.59	2.59	2.59	2.59
31	4.07	4.08	4.14	0.04	0.04
32	4.61	4.61	4.6	4.61	0.13
33	0.14	5.33	5.32	5.33	5.33
34	5.33	5.33	5.33	0.15	5.33
35	4.31	0.15	0.15	4.23	4.31
36	4.73	4.73	0.16	4.73	4.73
37	5.38	5.38	5.37	5.38	5.38
38	5.36	5.36	5.36	5.36	5.36
39	5.34	5.34	5.34	5.34	5.34
40	2.02	2.02	2.02	2.02	2.02

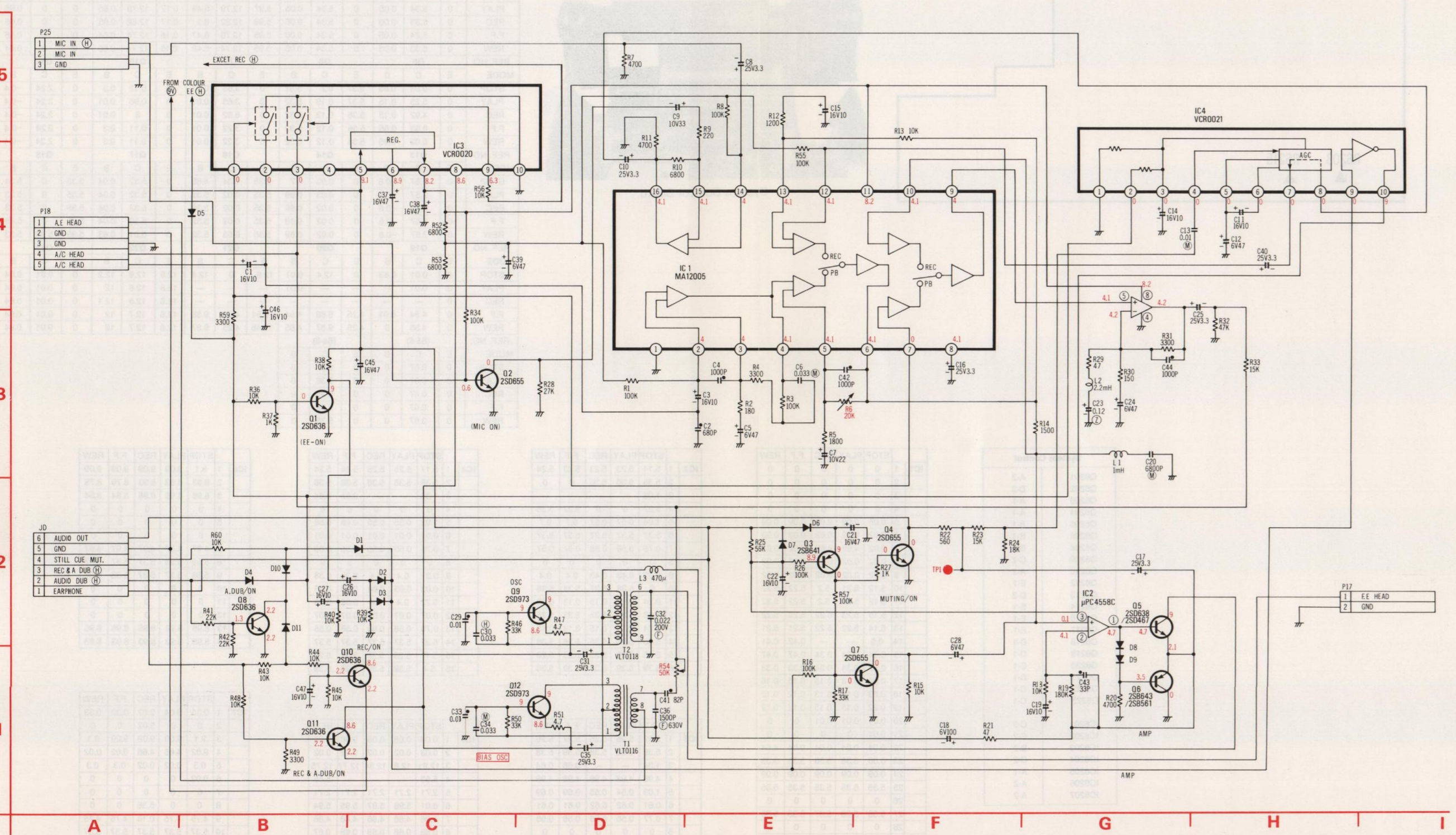
IC2					
	STOP	PLAY	REC	F.F	REW
1	5.14	5.23	5.23	5.23	5.24
2	5.38	5.38	5.38	5.38	0
3	1.08	—	—	—	—
4	5.37	0	0	5.37	5.36
5	1.04	0.57	0.57	0.7	0.7
6	5.37	5.37	5.37	5.37	5.37
7	0.78	0.58	0.58	0.57	0.57
8	0	0	0	0	0
9	0.23	0.43	0.43	0.4	0.4
10	0	5.38	5.37	5.38	5.38
11	0.24	0.15	0.15	0.13	0.13
12	5.36	5.36	5.35	5.35	5.35
13	0.24	0.15	0.15	0.13	0.13
14	5.36	5.36	5.35	5.36	5.36
15	5.16	5.25	5.25	5.26	5.26
16	5.39	5.39	5.38	5.39	5.38

IC4					
	STOP	PLAY	REC	F.F	REW
1	5.17	5.25	5.25	5.24	5.24
2	8.93	8.93	8.93	8.79	8.79
3	1.33	—	—	0.65	0.64
4	0	0	0	0	0
5	1.02	0.55	0.55	0.68	0.68
6	0.01	0.01	0.01	0.01	0.01
7	0.76	0.55	0.55	0.55	0.55
8	0	0	0	0	0
9	0.21	0.4	0.4	0.38	0.38
10	0.03	0.03	0.03	0.03	0.03
11	0.22	0.4	0.4	0.39	0.39
12	0.07	0.07	0.07	0.07	0.07
13	0.76	0.56	0.56	0.55	0.55
14	5.37	5.37	5.37	5.37	5.37
15	5.17	5.25	5.25	5.25	5.25
16	5.4	5.39	5.39	5.39	5.39

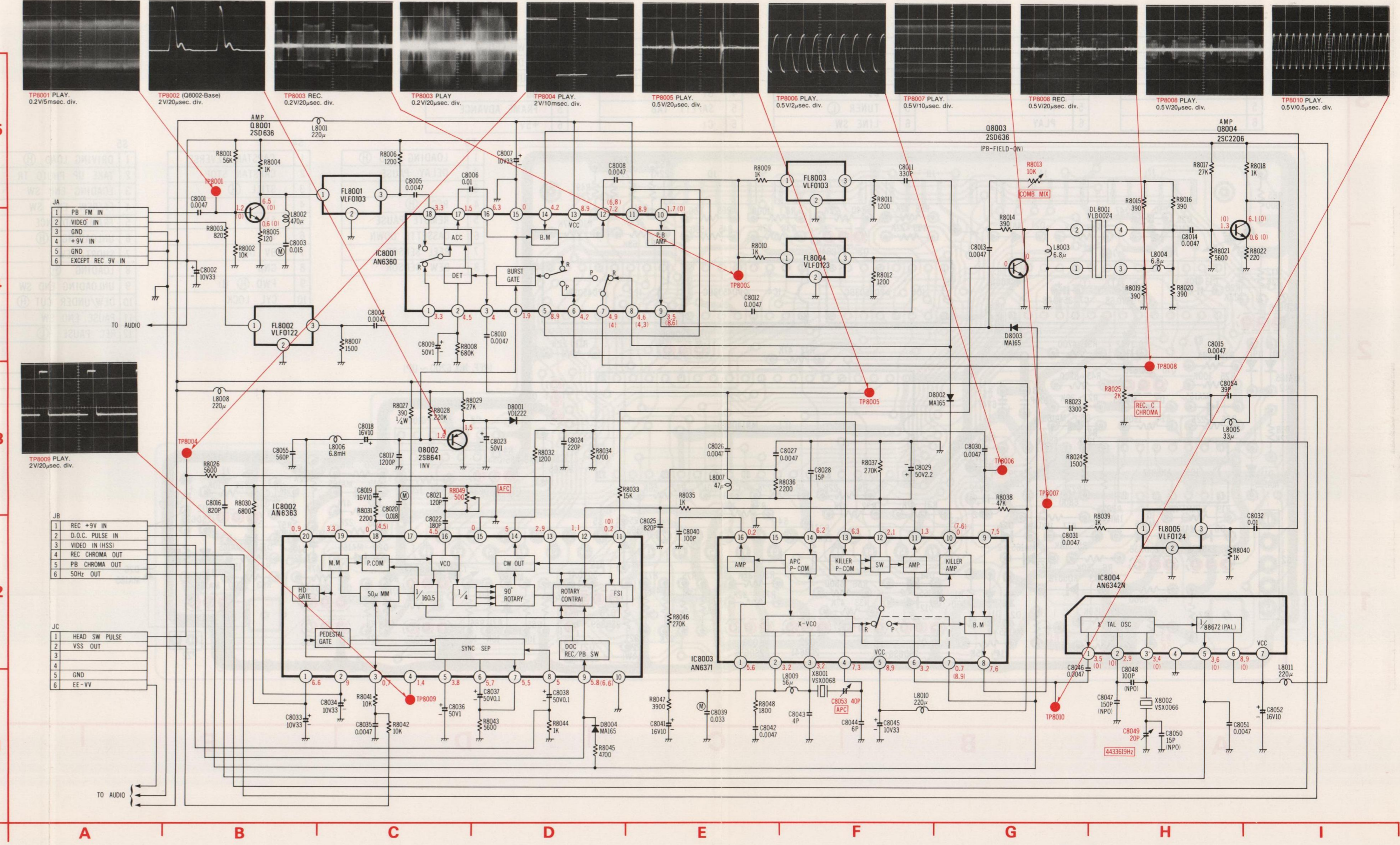
IC6					
	STOP	PLAY	REC	F.F	REW
1	9.1	9.09	9.09	9.09	9.09
2	8.93	8.93	8.93	8.79	8.79
3	8.96	8.96	8.96	8.84	8.84
4	0	0	0	0	0
5	0	0	0	0	0
6	0	0	0	0	0
7	4.97	4.97	4.97	4.97	4.97
8	5.38	5.38	5.37	5.37	5.37
9	5.38	5.37	5.37	5.38	5.37
10	0	0	0	0	0
11	0	0	0	0	0
12	0	0	0	0	0
13	8.96	8.96	8.95	8.96	8.96
14	8.93	8.93	8.93	8.93	8.93

IC7					
	STOP	PLAY	REC	F.F	REW
1	0.33	9.04	9.02	0.33	0.33
2	0	0	5.02	0	0
3	9.1	9.09	9.09	9.09	9.1
4	0.02	4.66	4.66	0.02	0.02
5	0.3	0.02	0.02	0.3	0.3
6	0.02	0	0	0	0
7	0	0	0	0	0
8	0	0	5.36	0	0
9	4.75	4.75	0.16	4.75	4.75
10	5.37	5.37	5.37	5.37	5.37
11	5.38	5.38	5.38	5.38	5.38
12	0	0	0.09	0	0
13	5.38	5.38	5.38	5.38	5.38
14	0.34	0	0	0.34	0.34

AUDIO SCHEMATIC DIAGRAM



COLOUR PROCESS SCHEMATIC DIAGRAM



JA

1	PB FM IN
2	VIDEO IN
3	GND
4	+9 IN
5	GND
6	EXCEPT REC 9V IN

JB

1	REC +9V IN
2	D.O.C. PULSE IN
3	VIDEO IN (HSS)
4	REC CHROMA OUT
5	PB CHROMA OUT
6	50Hz OUT

JC

1	HEAD SW PULSE
2	VSS OUT
3	
4	
5	GND
6	EE-VV

JD

1	EARPHONE
2	AUDIO DUB (H)
3	REC & A DUB (H)
4	STILL CUE MUT.
5	GND
6	AUDIO OUT

P17

1	F.E HEAD
2	GND

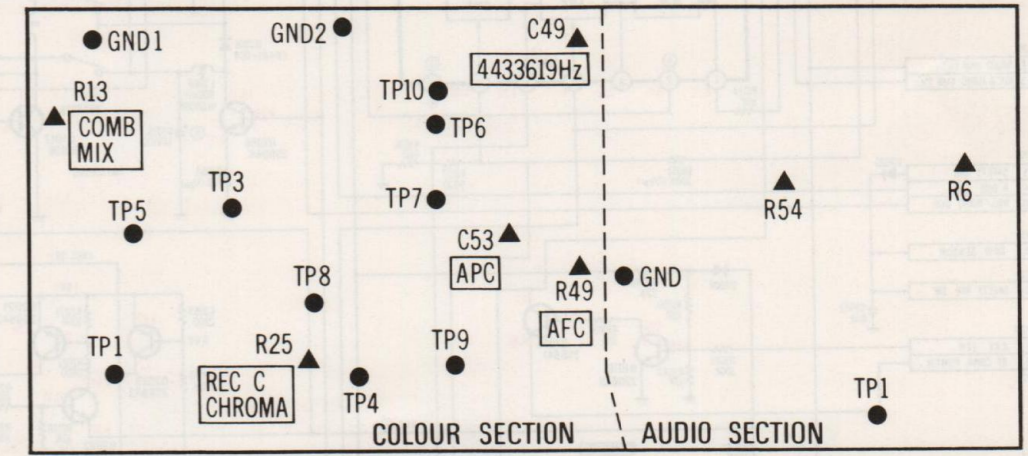
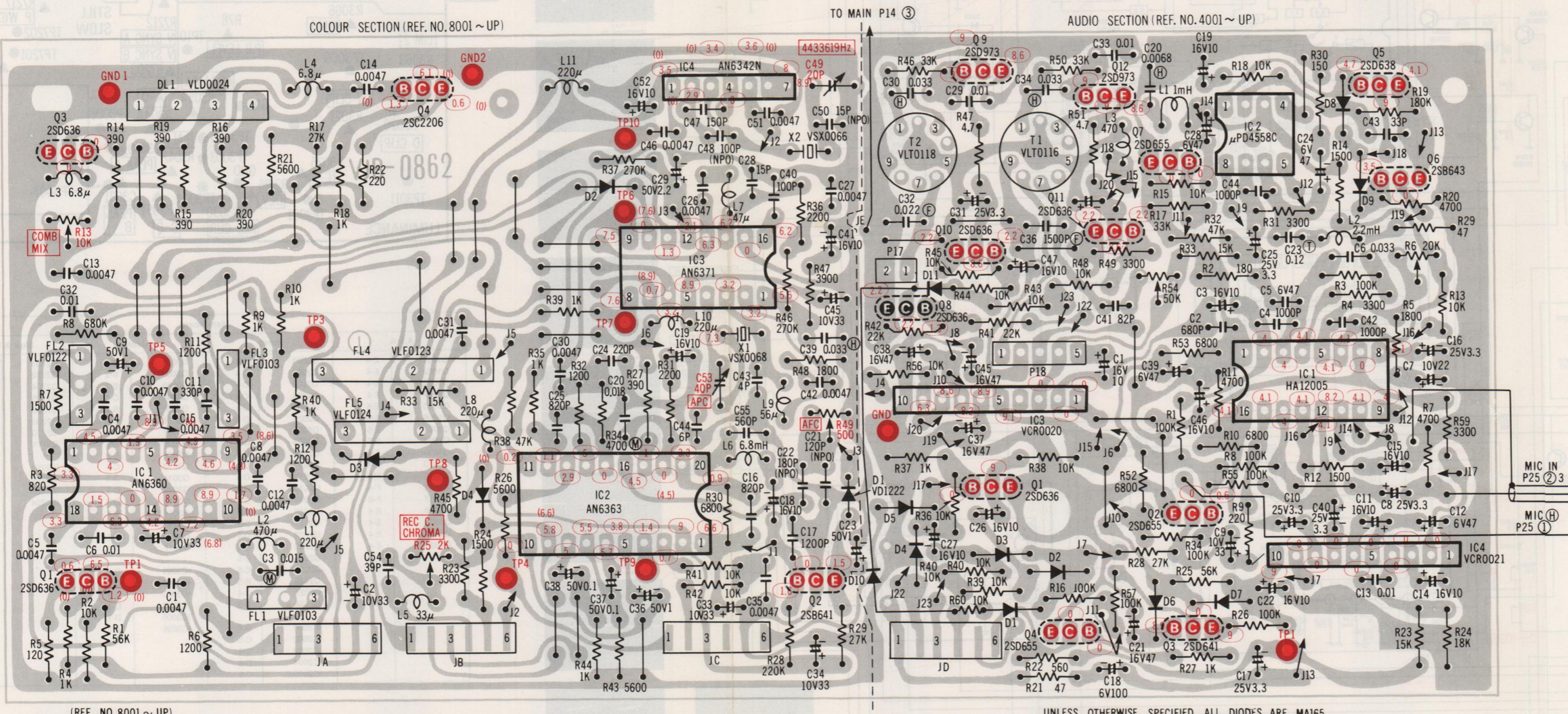
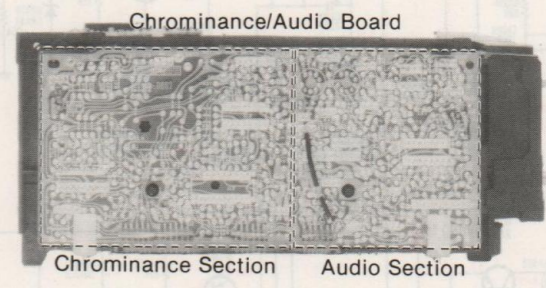
P18

1	A.E HEAD
2	GND
3	GND
4	A/C HEAD
5	A/C HEAD

P25

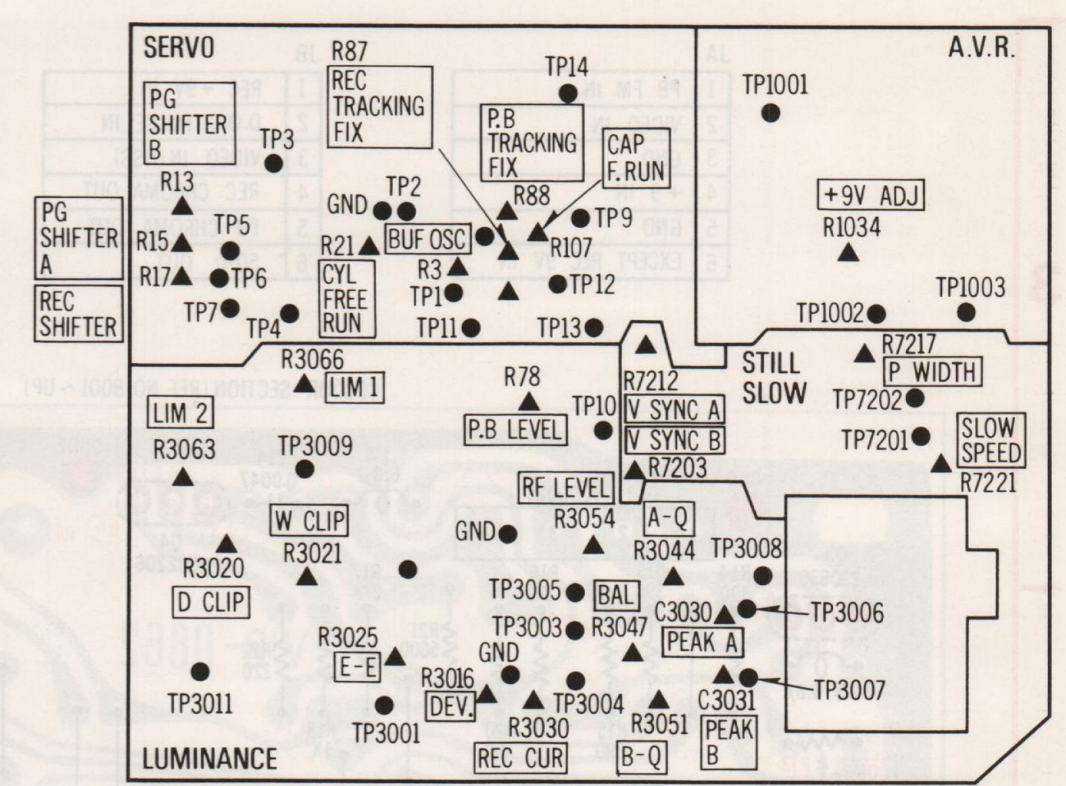
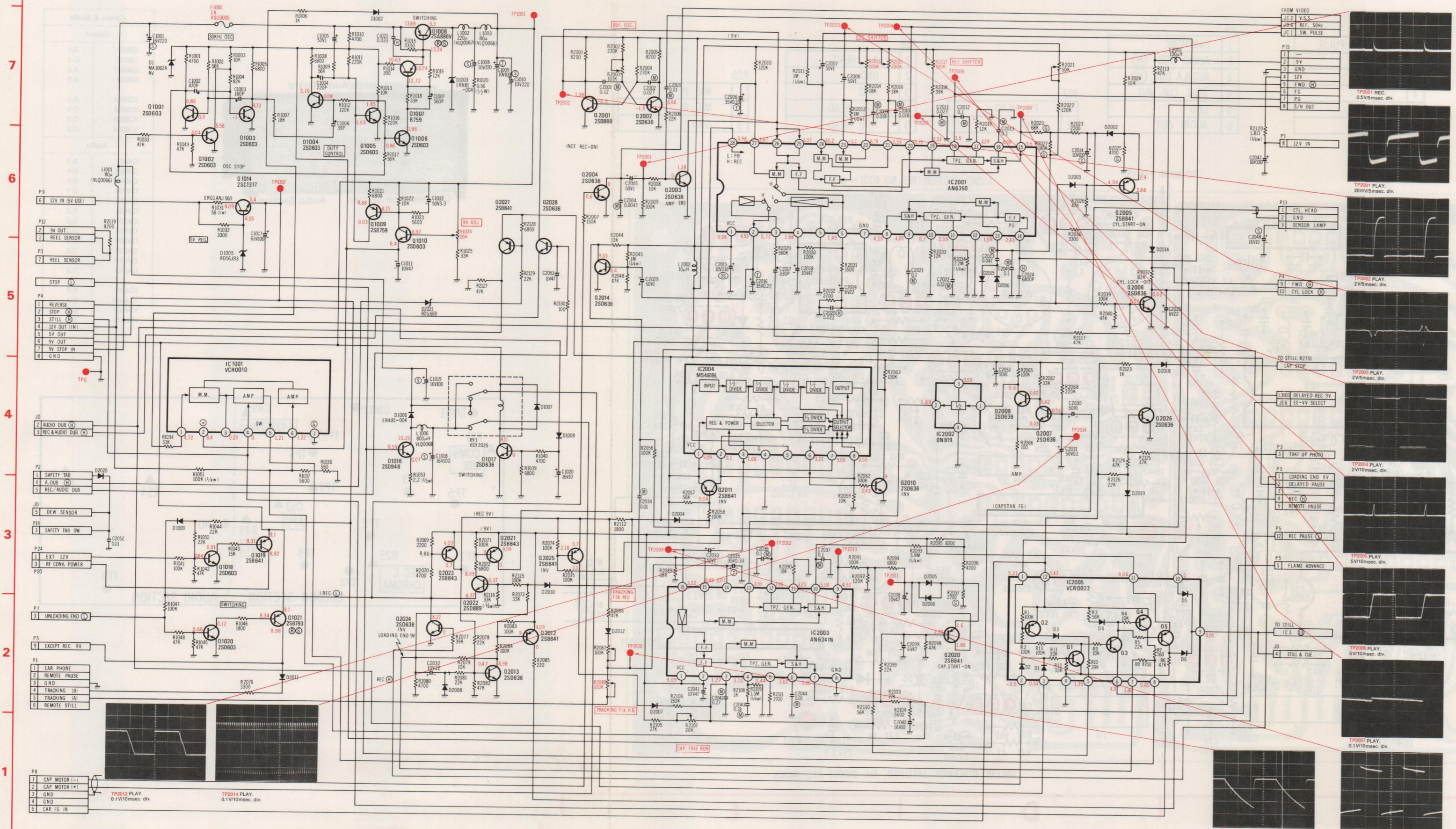
1	MIC IN
2	MIC IN
3	GND

Colour & Audio	
Colour	
Q8001	A-1
Q8002	C-1
Q8003	A-2
Q8004	B-3
IC8001	A-1
IC8002	C-1
IC8003	C-2
IC8004	C-3
Audio	
Q4001	D-1
Q4002	E-1
Q4003	E-1
Q4004	D-1
Q4005	E-3
Q4006	E-2
Q4007	E-2
Q4008	D-2
Q4009	D-3
Q4010	D-2
Q4011	D-2
Q4012	D-3
IC4001	E-2
IC4002	E-3
IC4003	D-2
IC4004	E-1

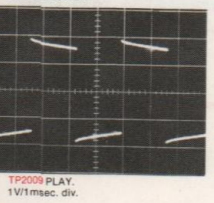
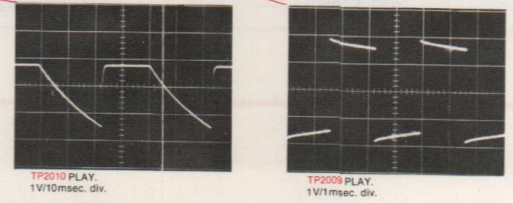


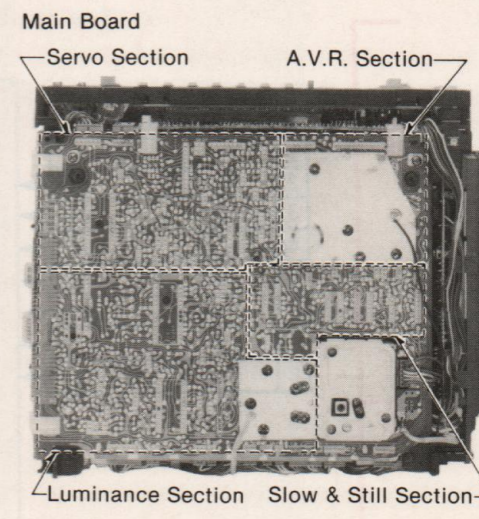
A.V.R./SERVO SCHEMATIC DIAGRAM

COLOUR PROCESSOR AUDIO CIRCUIT BOARD (VEP082A)

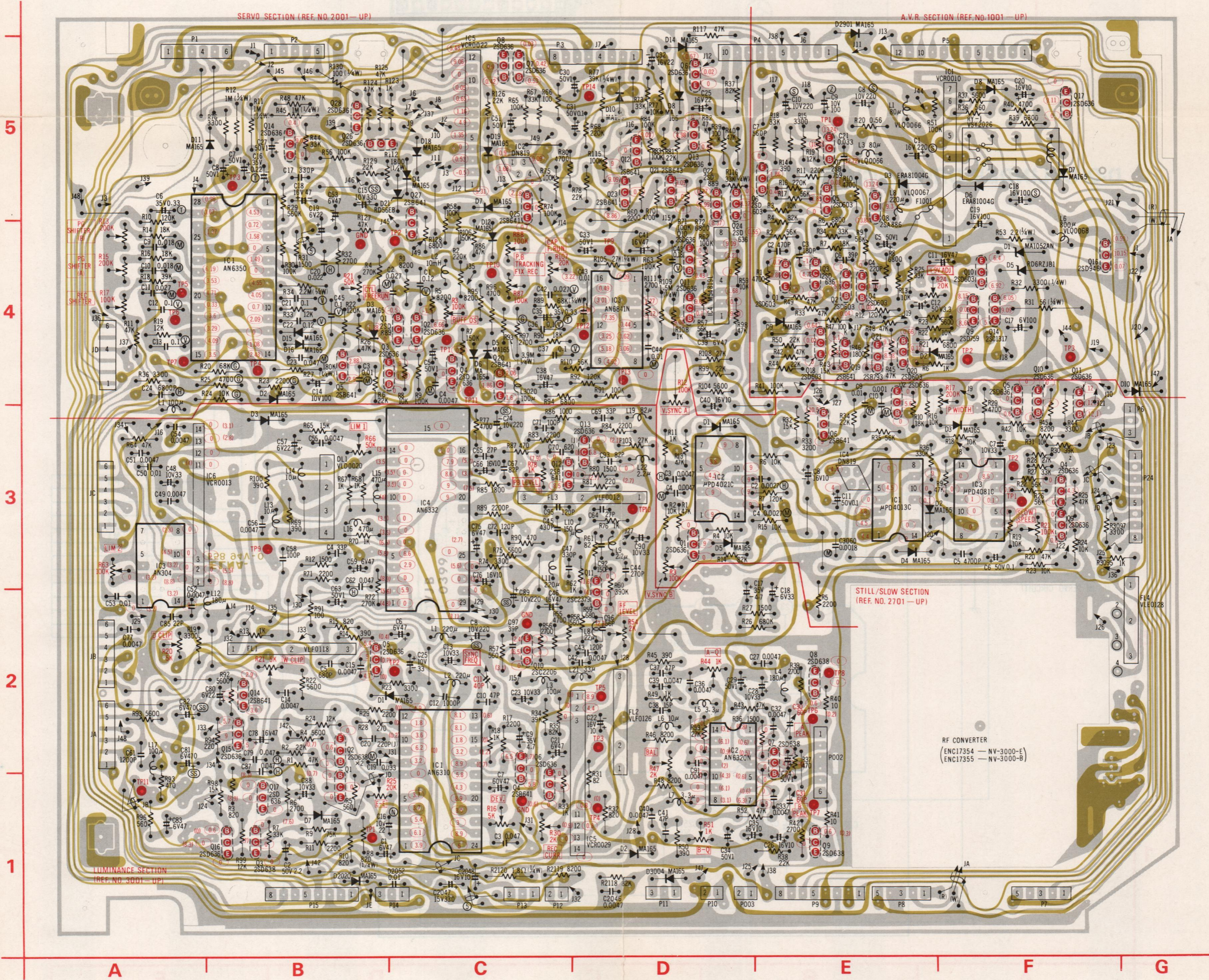


Main Board							
A.V.R.		Servo		Luminance		Slow & Still	
Q1001	E-4	Q2001	C-4	Q3001	B-1	Q2701	D-3
Q1002	E-4	Q2002	C-4	Q3002	B-2	Q2702	E-3
Q1003	E-4	Q2003	C-4	Q3003	B-1	Q2704	F-3
Q1004	E-4	Q2004	C-4	Q3004	C-1	Q2705	F-3
Q1005	E-5	Q2005	B-4	Q3005	B-2	Q2706	E-3
Q1006	E-5	Q2006	D-5	Q3006	C-1	Q2709	F-3
Q1007	E-5	Q2007	C-5	Q3007	E-2	Q2710	F-3
Q1008	E-5	Q2008	C-5	Q3008	E-2	Q2711	F-3
Q1009	F-4	Q2010	D-4	Q3009	E-1		
Q1010	F-4	Q2011	D-4	Q3010	C-2	IC2701	E-3
Q1014	F-4	Q2012	D-5	Q3011	D-3	IC2702	D-3
Q1016	F-4	Q2013	D-5	Q3012	C-3	IC2703	F-3
Q1017	F-5	Q2014	B-5	Q3013	D-3	IC2704	E-3
Q1018	E-4	Q2020	C-4	Q3014	B-2		
Q1019	E-4	Q2021	D-5	Q3015	B-2		
Q1020	E-4	Q2022	D-5	Q3016	B-1		
Q1021	E-4	Q2023	D-5	Q3017	B-1		
		Q2024	D-5				
		Q2025	C-5	IC3001	C-1		
		Q2026	B-5	IC3002	D-1		
		Q2027	C-4	IC3003	A-3		
		Q2028	B-5	IC3004	C-3		
				IC3005	D-1		
				IC3006	A-3		

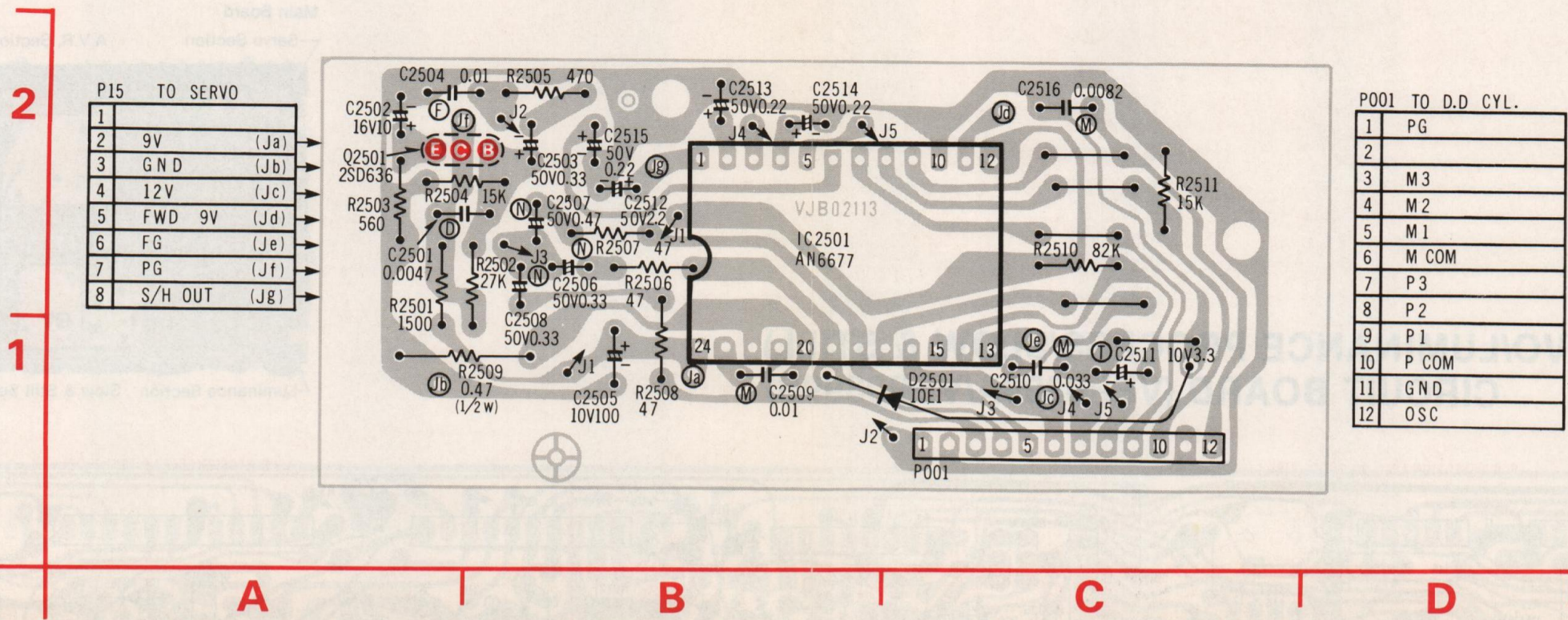




MAIN (A.V.R./SERVO/LUMINANCE PROCESS/SLOW & STILL) CIRCUIT BOARD (VEP0399A/VEP0399B)



D-D CYLINDER DRIVE CIRCUIT BOARD (VEP02113A)



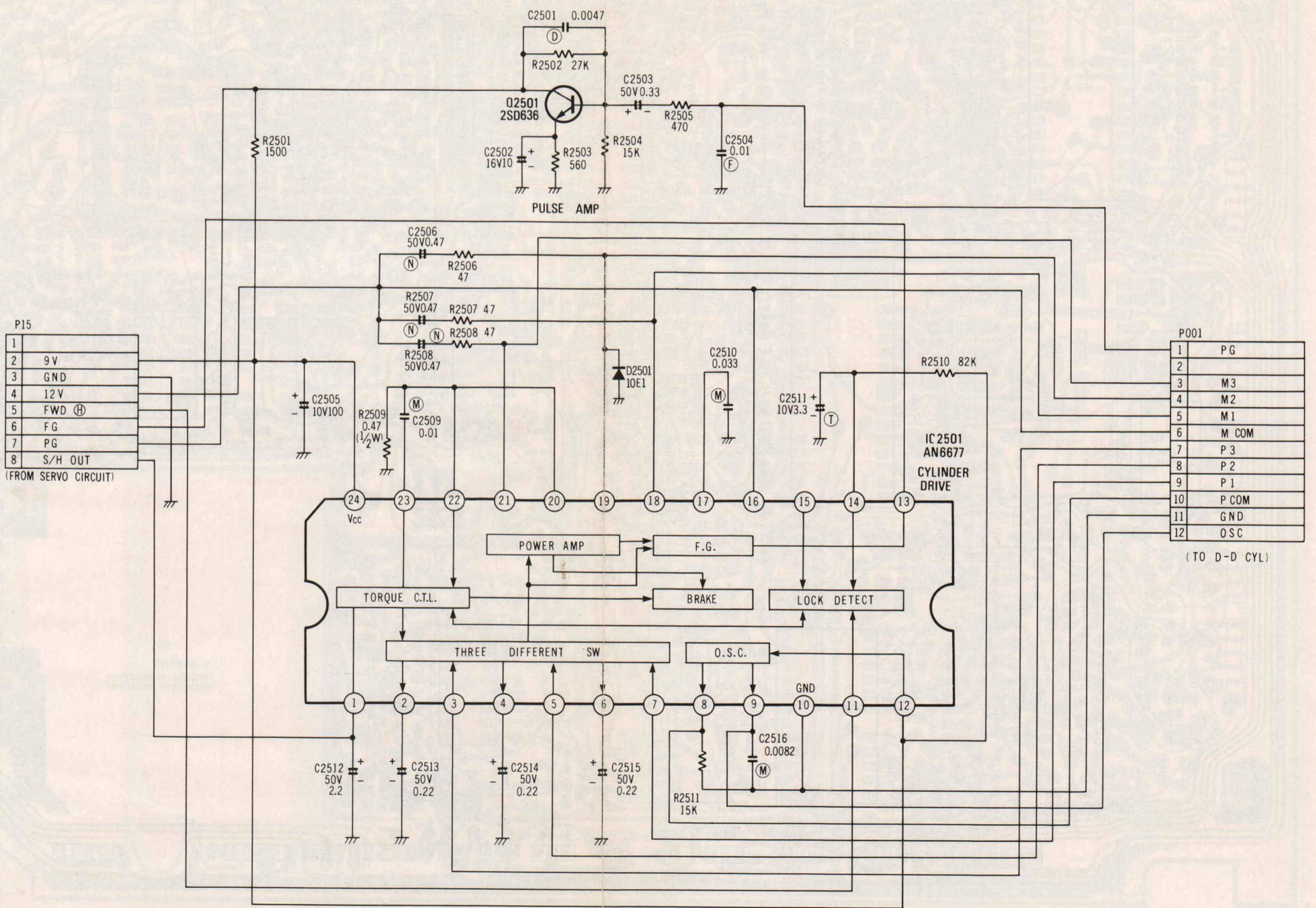
P15 TO SERVO

1	
2	9V (Ja)
3	GND (Jb)
4	12V (Jc)
5	FWD 9V (Jd)
6	FG (Je)
7	PG (Jf)
8	S/H OUT (Jg)

P001 TO D.D. CYL.

1	PG
2	
3	M3
4	M2
5	M1
6	M COM
7	P3
8	P2
9	P1
10	P COM
11	GND
12	OSC

D-D CYLINDER DRIVE SCHEMATIC DIAGRAM



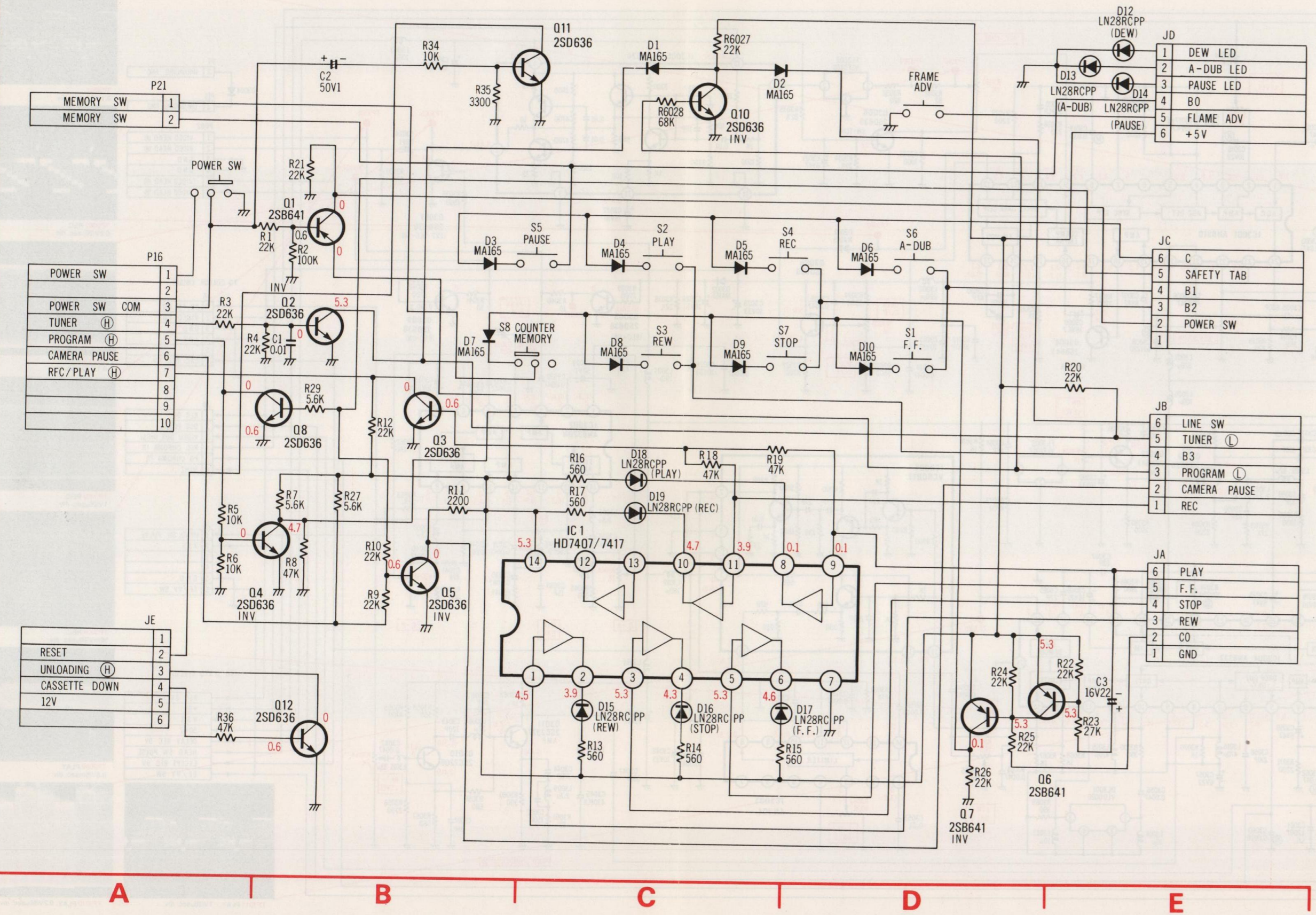
P15 (FROM SERVO CIRCUIT)

1	
2	9V
3	GND
4	12V
5	FWD ⊕
6	FG
7	PG
8	S/H OUT

P001 (TO D-D CYL)

1	PG
2	
3	M3
4	M2
5	M1
6	M COM
7	P3
8	P2
9	P1
10	P COM
11	GND
12	OSC

KEY BOARD SCHEMATIC DIAGRAM



3

2

1

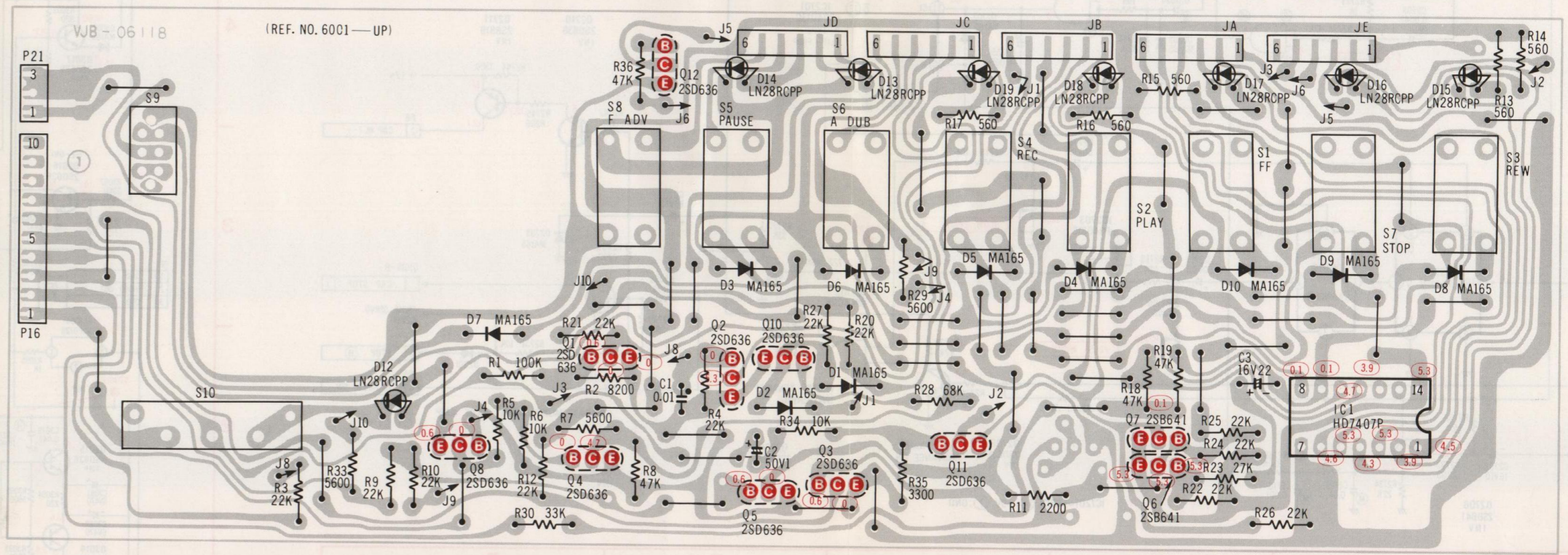
A B C D E

MARJAIQ CITAMICHS 2230320 VIMAMUJ

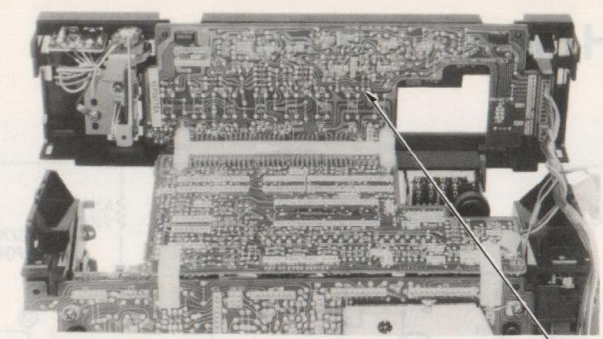
KEY BOARD (VEP06118A)

2

1



A B C D E



Key Board

Key Board	
Q6001	C-1
Q6002	C-1
Q6003	D-1
Q6004	C-1
Q6005	C-1
Q6006	E-1
Q6007	E-1
Q6008	B-1
Q6010	C-1
Q6011	D-1
Q6012	C-2

JA	
6	PLAY
5	F.F.
4	STOP
3	REW
2	CO
1	GND

JB	
6	LINE SW
5	TUNER (L)
4	B3
3	PROGRAM (L)
2	CAMERA PAUSE
1	REC

JC	
6	C
5	SAFETY TAB
4	B1
3	B2
2	POWER SW
1	

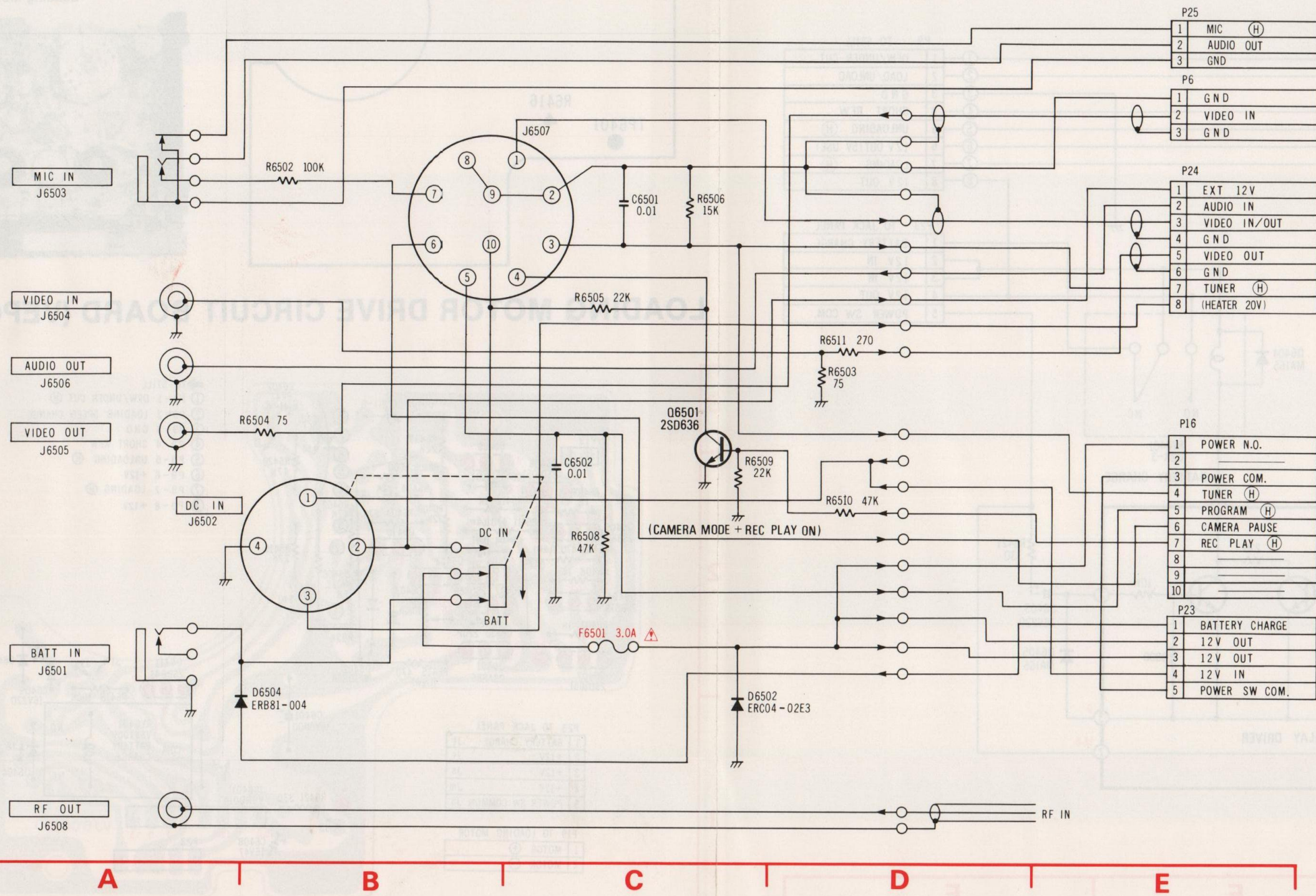
JD	
6	DEW LED
5	A-DUB LED
4	PAUSE LED
3	BO
2	FLAME ADV
1	+5V

JE	
6	RESET
4	UNLOADING (H)
3	CASSETTE DOWN
2	12V
1	NC

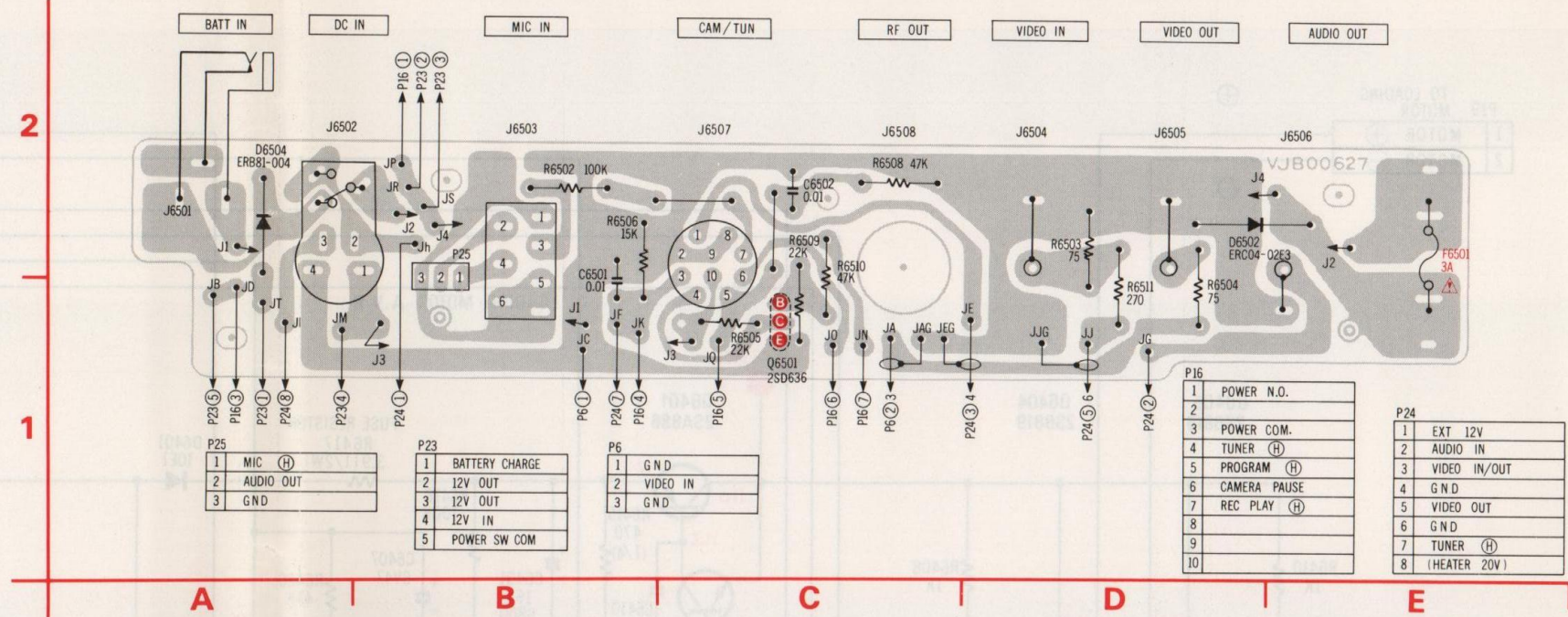
P21	
1	MEMORY SW
2	MEMORY SW

P16	
1	POWER SW
2	
3	POWER SW COM
4	TUNER (H)
5	PROGRAM (H)
6	CAMERA PAUSE
7	REC/PLAY (H)
8	
9	
10	

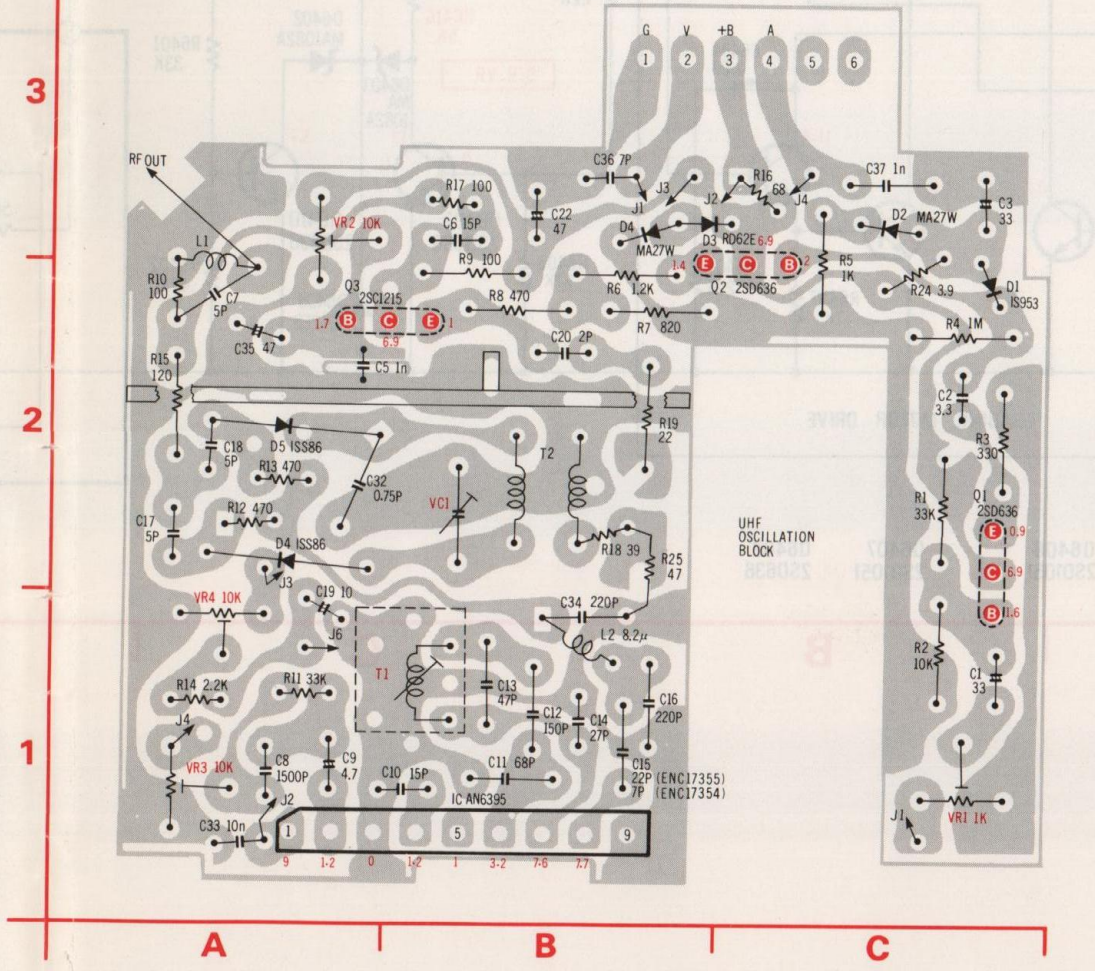
JACK BOARD SCHEMATIC DIAGRAM



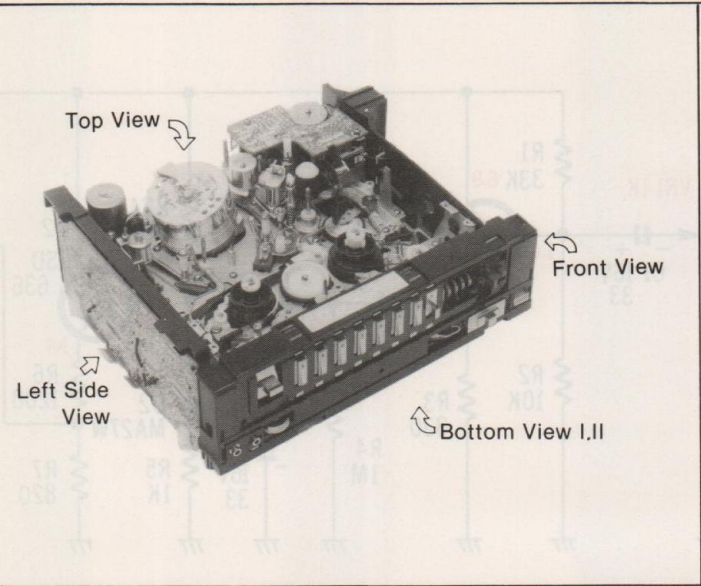
JACK BOARD (VEP00627)



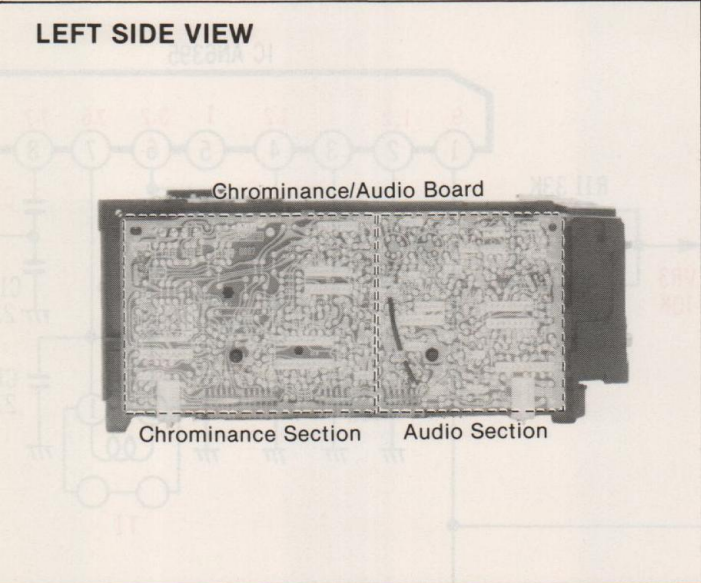
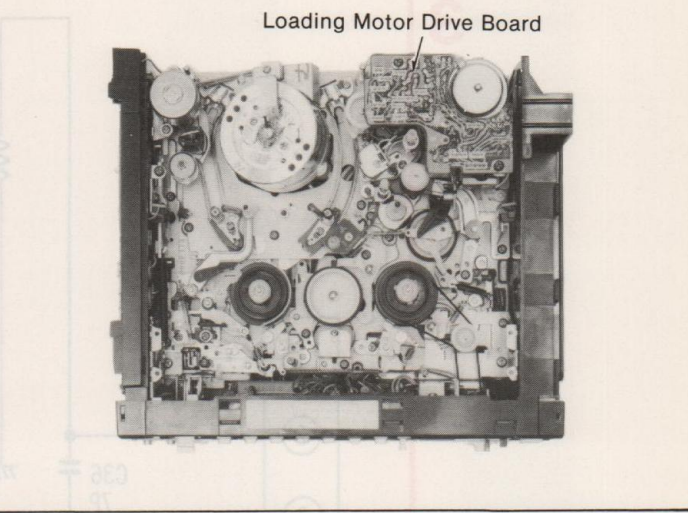
RF CONVERTER CIRCUIT BOARD (ENC17354/ENC17355)



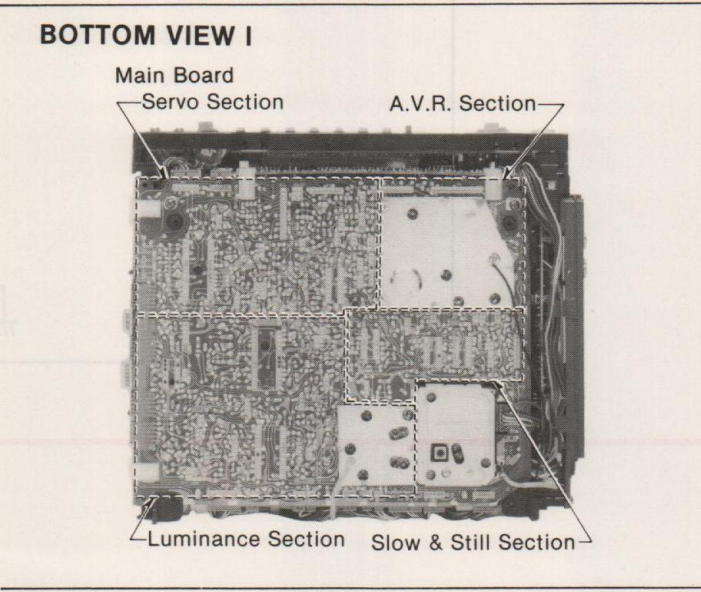
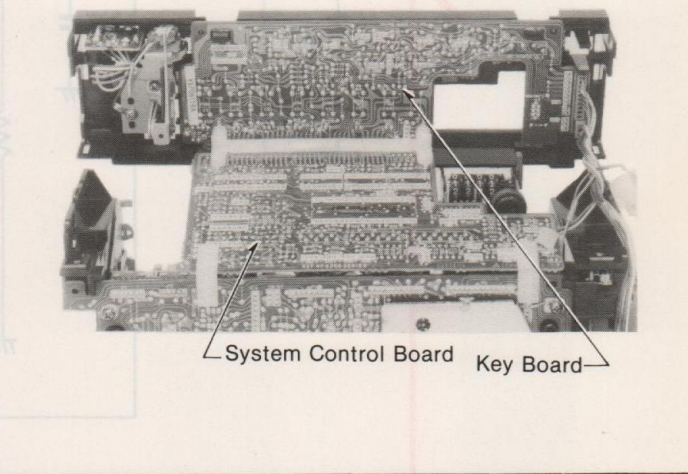
CIRCUIT BOARD LAYOUT



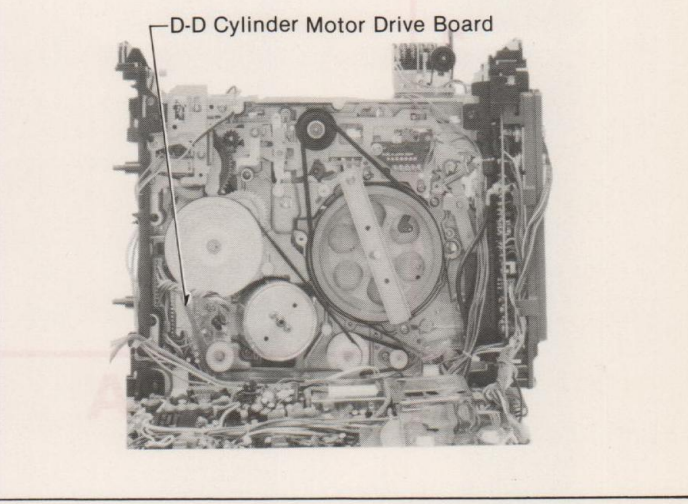
TOP VIEW



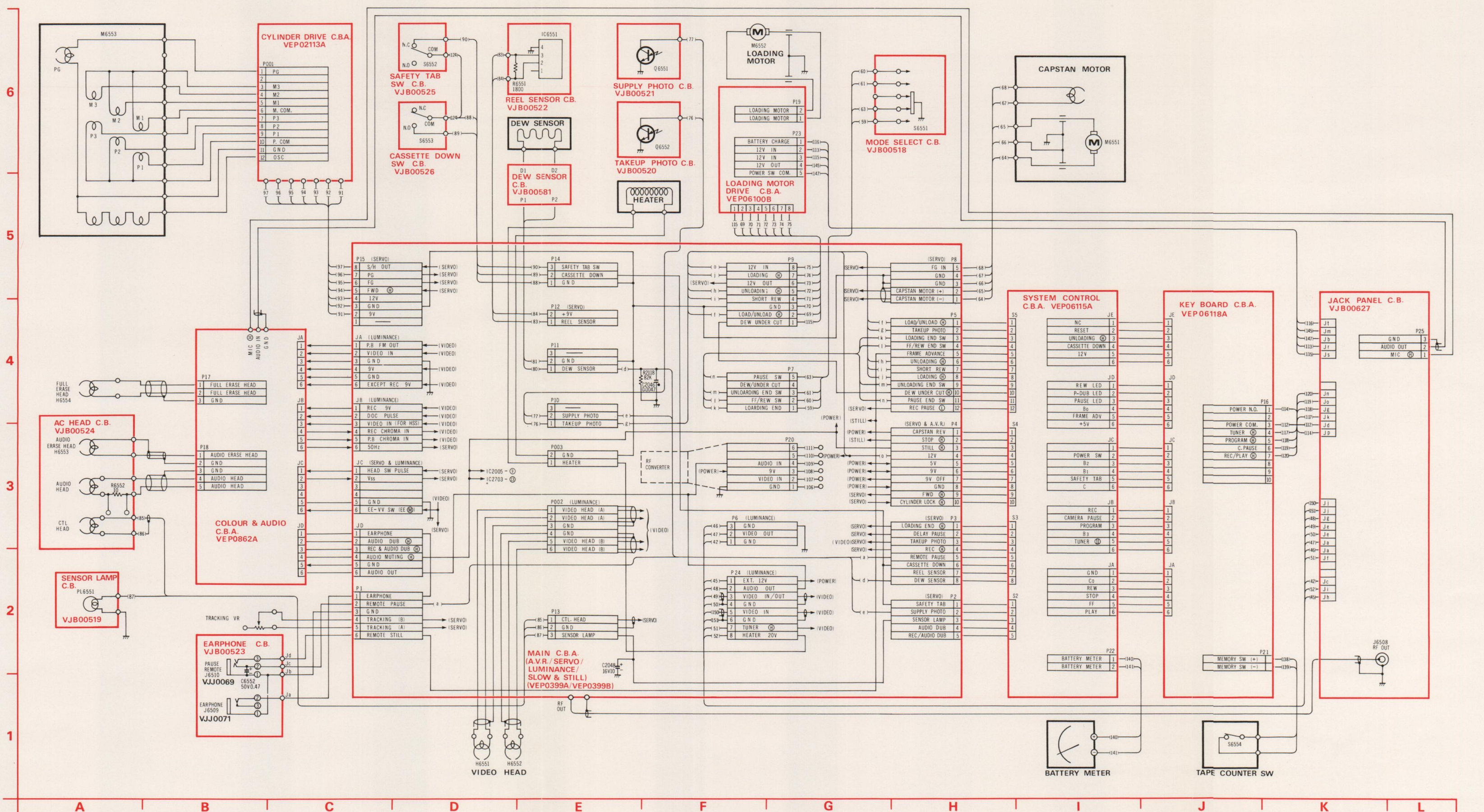
FRONT VIEW



BOTTOM VIEW II



www.freeservicemanuals.info
NV-3000 INTERCONNECTION SCHEMATIC DIAGRAM



 **Panasonic**
MATSUSHITA ELECTRIC

Service Manual

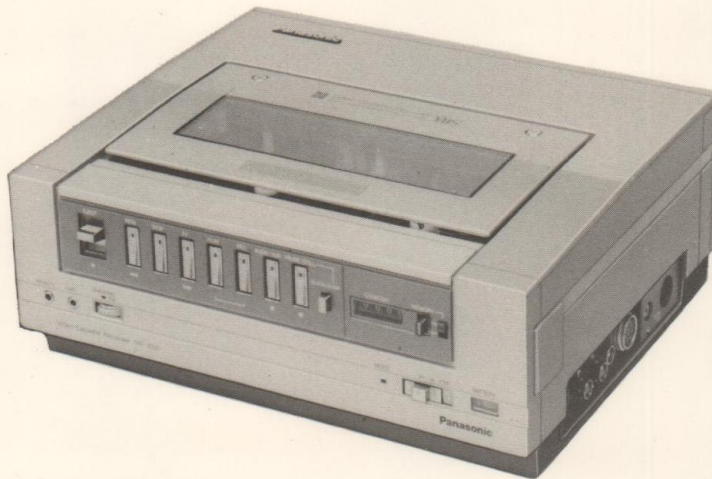
Portable Video Cassette Recorder

Vol. 4

Panasonic VHS

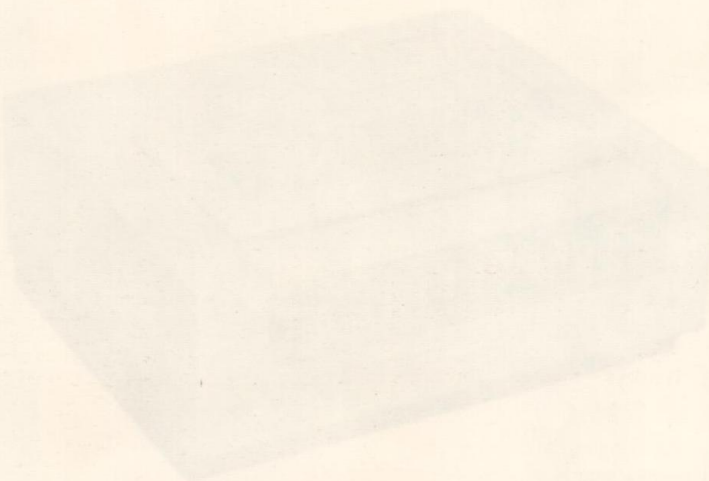
NV-3000-E-B

Exploded Views Replacement Parts List



SPECIFICATIONS

Power Source:	12V DC Battery LCR-1812E, LCR-3012VBE Prog. Tuner Unit NV-V300 AC Adaptor NV-B30	Output Level:	Video: VIDEO OUT Jack (BNC) 1.0Vp-p, 75Ω unbalanced Audio: AUDIO OUT Jack (RCA) -6dB, 600Ω unbalanced
Power Consumption:	Approx. 5.6W at Record mode Approx. 9.5W at Play mode	Weight:	5.3kg without battery pack
Television System:	CCIR: 625 lines, 50 fields PAL colour signal	Dimensions:	291(W) × 114(H) × 249(D)mm
Video Recording		Accessories Supplied:	1 pc. Remote controller, VSQ0146 1 pc. Earphone, VBE0002 2 pcs. DIN-DIN coaxial cable, VJA0130 1 pc. Audio input attenuator, VJP1164 1 pc. Connection cord for auxiliary battery pack, VJA0148 1 pc. Carrying case: VFC0005
System:	2 rotary heads, helical scanning system	Optional Accessories:	Video cassette tape: NV-E240 Approx. 344m 240 min. NV-E180 Approx. 258m 180 min. NV-E120 Approx. 174m 120 min. NV-E60 Approx. 88m 60 min. Battery pack, LCR-1812E, LCR-3012VBE AC adaptor, NV-B30 14 Day 8 programme Timer, NV-V300 Colour video camera, WV-2600E, WV-3000E, WV-3200E Car battery cord, NV-C24
Luminance:	FM azimuth recording		
Colour signal:	converted subcarrier phase shift recording		
Audio Track:	1 track		
Tape Format:	Tape width 12.7mm high density tape		
Tape Speed:	23.39mm/s		
Record/Playback Time:	180 min. with NV-E180 240 min. with NV-E240		
FF/REW Time:	Less than 6 min. with NV-E180		
Heads:	Video: 2 rotary heads Audio/Control: 1 stationary head Erase: 1 full track erase 1 audio track erase for audio dubbing		
Input Level:	Video: VIDEO IN connector (BNC) 1.0Vp-p, 75Ω unbalanced CAMERA/TUNER IN connector (10P) 1.0Vp-p, 75Ω unbalanced Audio: MIC IN Jack -70dB, 600Ω unbalanced		
		Weight and dimensions shown are approximate. Specifications are subject to change without notice.	



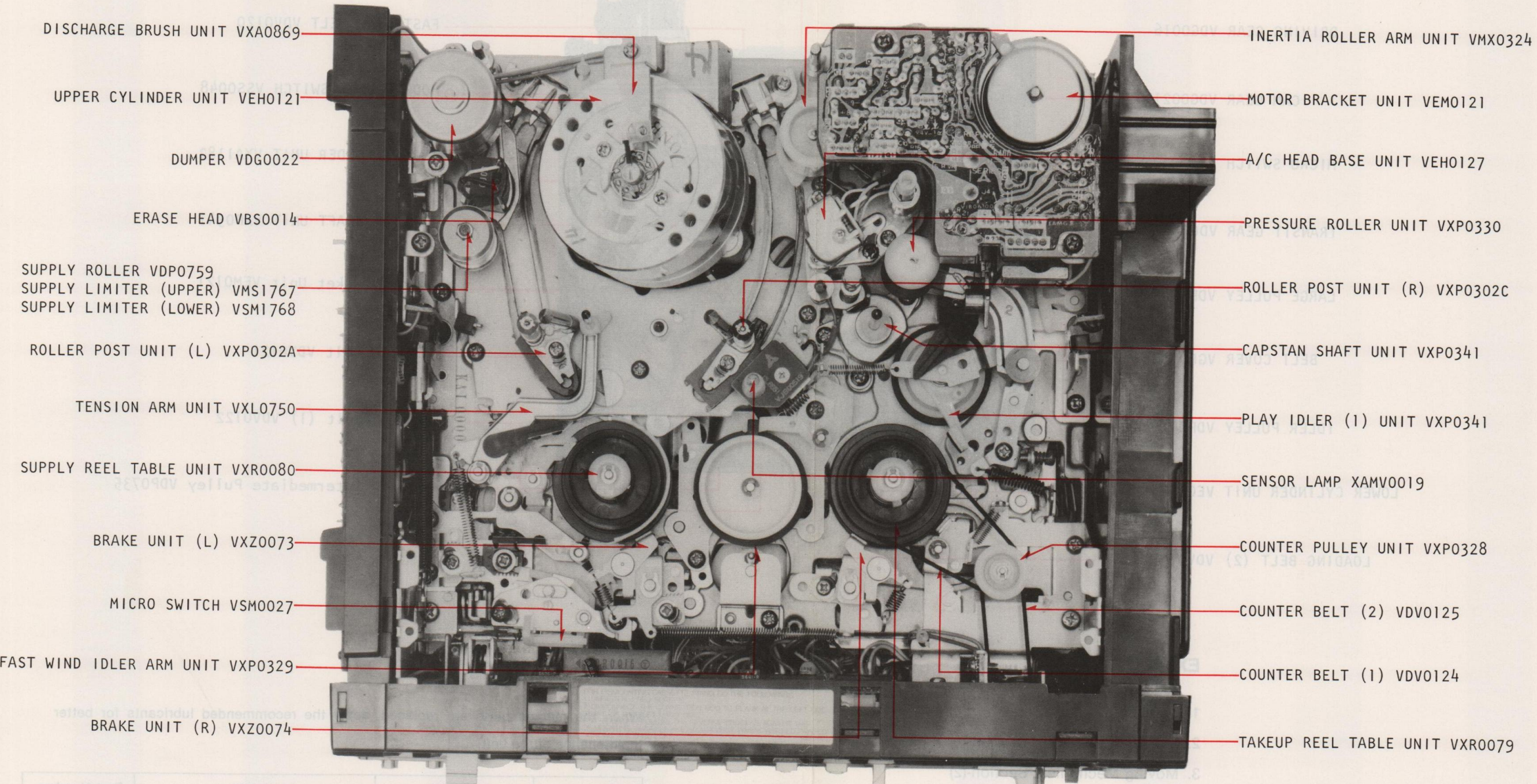
CONTENTS

SPECIFICATIONS	Cover
INNER PARTS LOCATION	4-1
TOP VIEW	4-1
BOTTOM VIEW	4-2
EXPLODED VIEW	4-3
1. Transport Section	4-3
2. Moving Mechanism Section-(1)	4-4
3. Moving Mechanism Section-(2)	4-5
4. Moving Mechanism Section-(3)	4-6
5. Chassis Frame Section	4-7
6. Casing Parts Section	4-8
7. Packing Parts & Accessory Section	4-9
MECHANICAL REPLACEMENT PARTS LIST	4-10
ELECTRICAL REPLACEMENT PARTS LIST	4-13

INNER PARTS LOCATION

BOTTOM VIEW

TOP VIEW



DISCHARGE BRUSH UNIT VXA0869

UPPER CYLINDER UNIT VEH0121

DUMPER VDG0022

ERASE HEAD VBS0014

SUPPLY ROLLER VDP0759
 SUPPLY LIMITER (UPPER) VMS1767
 SUPPLY LIMITER (LOWER) VSM1768

ROLLER POST UNIT (L) VXP0302A

TENSION ARM UNIT VXL0750

SUPPLY REEL TABLE UNIT VXR0080

BRAKE UNIT (L) VXZ0073

MICRO SWITCH VSM0027

FAST WIND IDLER ARM UNIT VXP0329

BRAKE UNIT (R) VXZ0074

INERTIA ROLLER ARM UNIT VMX0324

MOTOR BRACKET UNIT VEM0121

A/C HEAD BASE UNIT VEH0127

PRESSURE ROLLER UNIT VXP0330

ROLLER POST UNIT (R) VXP0302C

CAPSTAN SHAFT UNIT VXP0341

PLAY IDLER (1) UNIT VXP0341

SENSOR LAMP XAMV0019

COUNTER PULLEY UNIT VXP0328

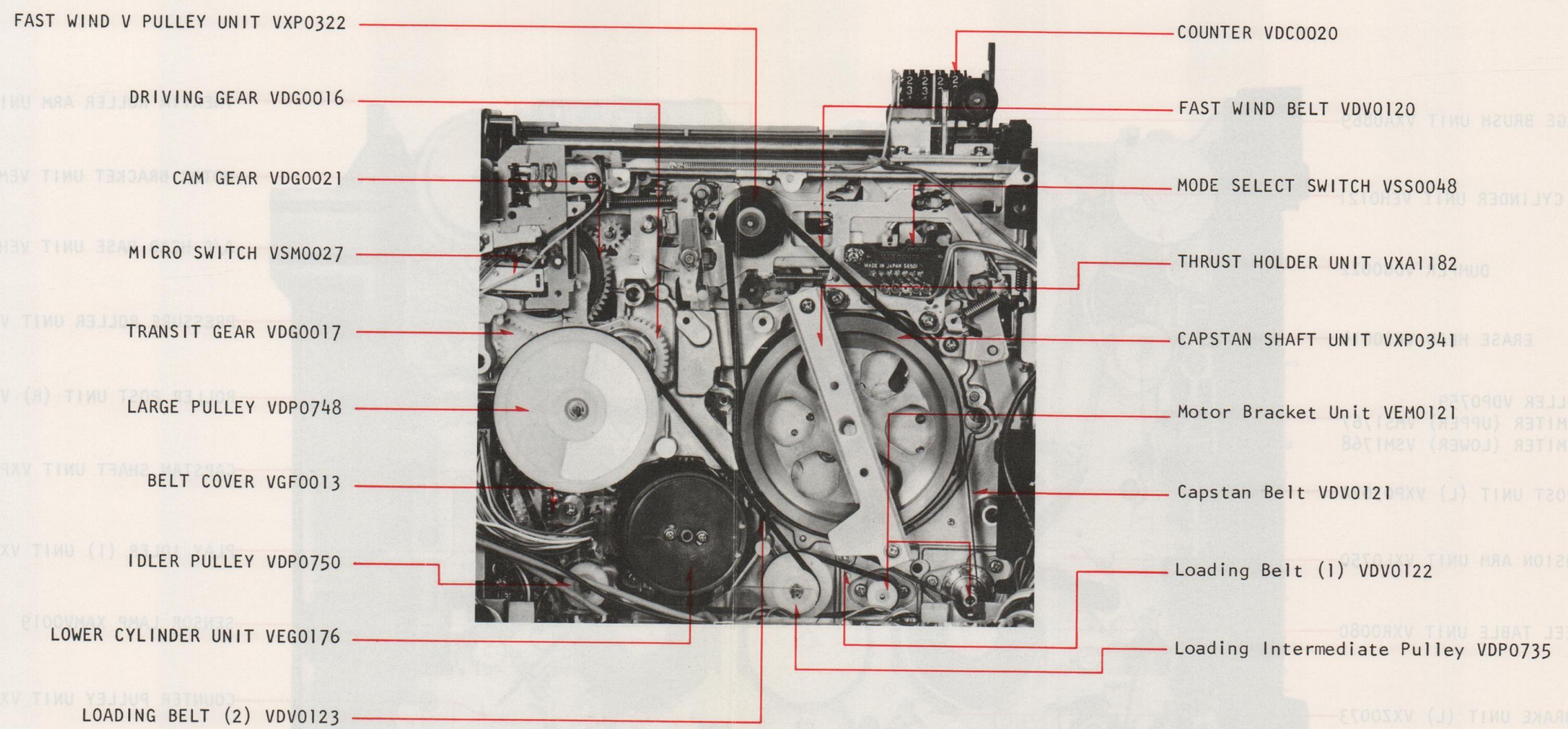
COUNTER BELT (2) VDV0125

COUNTER BELT (1) VDV0124

TAKEUP REEL TABLE UNIT VXR0079

Part Number	Availability	Kind of Lubricant	Mark
MOR285	Available From Factory	Molybdenum Grease	x x x
	Purchase From Local Supplier	Spindle Oil	o o o

BOTTOM VIEW



EXPLODED VIEW

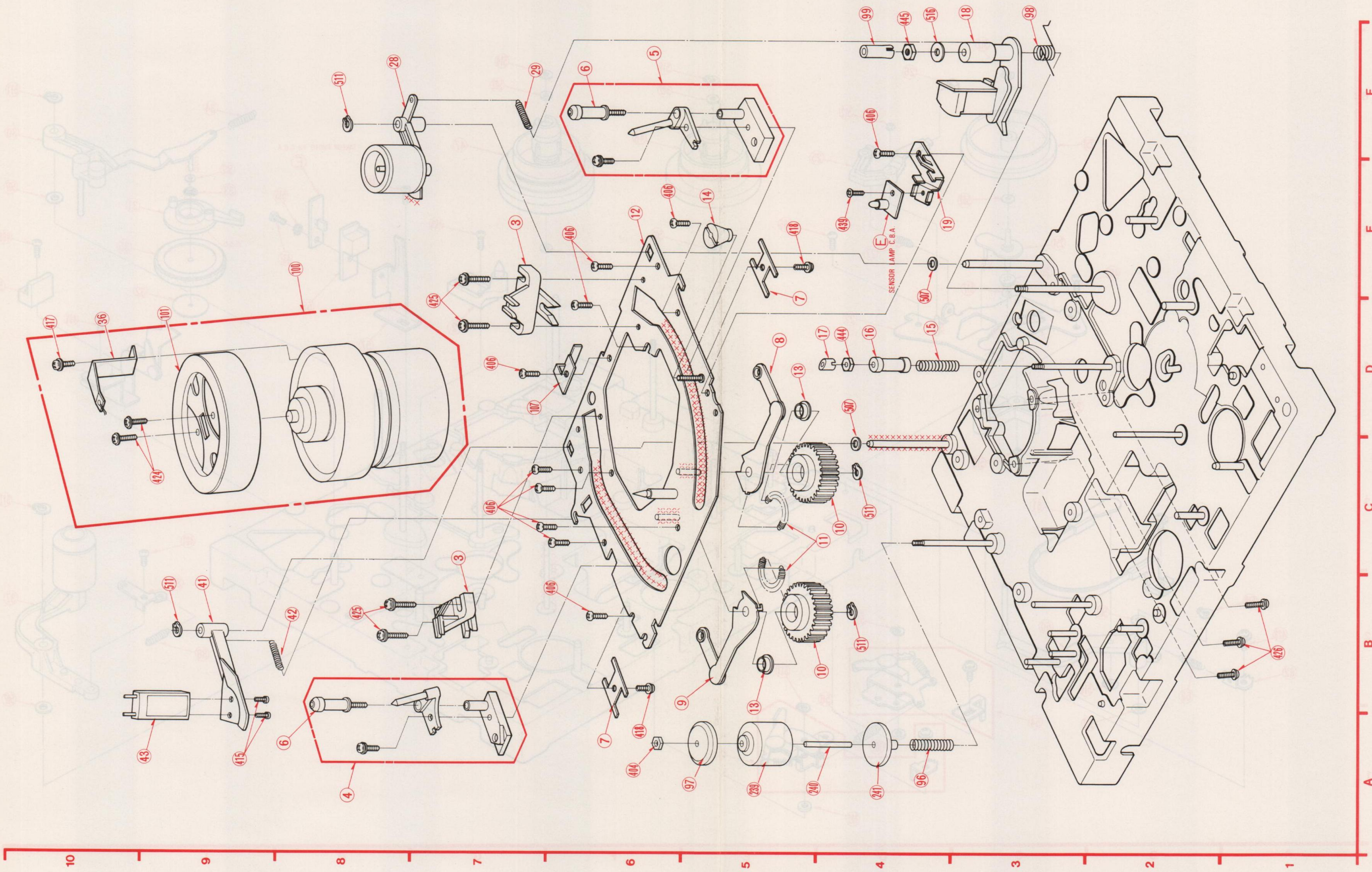
1. Transport Section
2. Moving Mechanism Section-(1)
3. Moving Mechanism Section-(2)
4. Moving Mechanism Section-(3)
5. Chassis Frame Section
6. Casing Parts Section
7. Packing Parts & Accessory Section

LUBRICATION POINTS

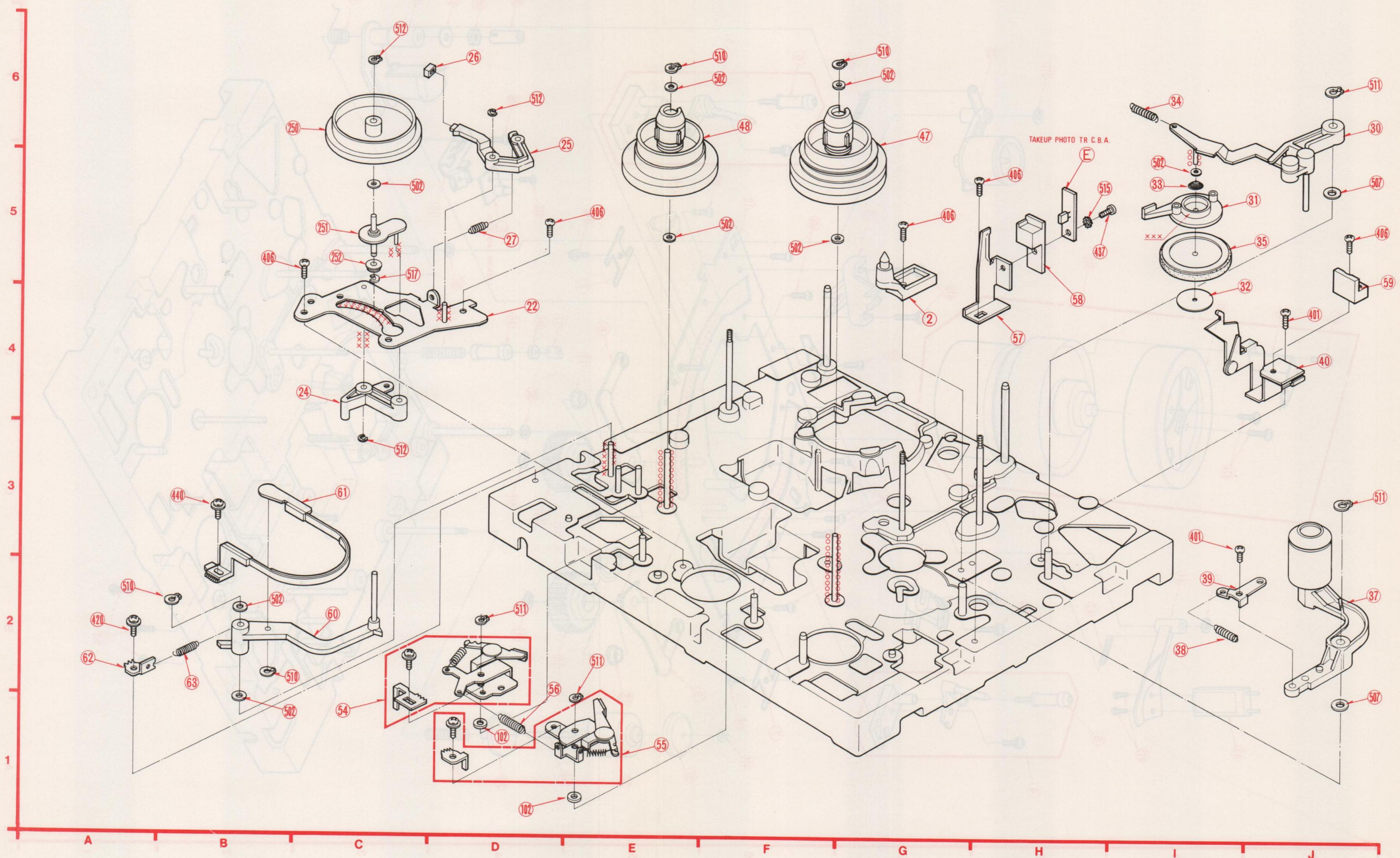
When the marked parts are replaced, apply the recommended lubricants for better maintenance of the unit.

Marks	Kind of Lubricant	Availability	Part Number
× × ×	Morlytone Grease	Available From Factory	MOR265
○ ○ ○	Spindle Oil	Purchase From Local Supplier	—

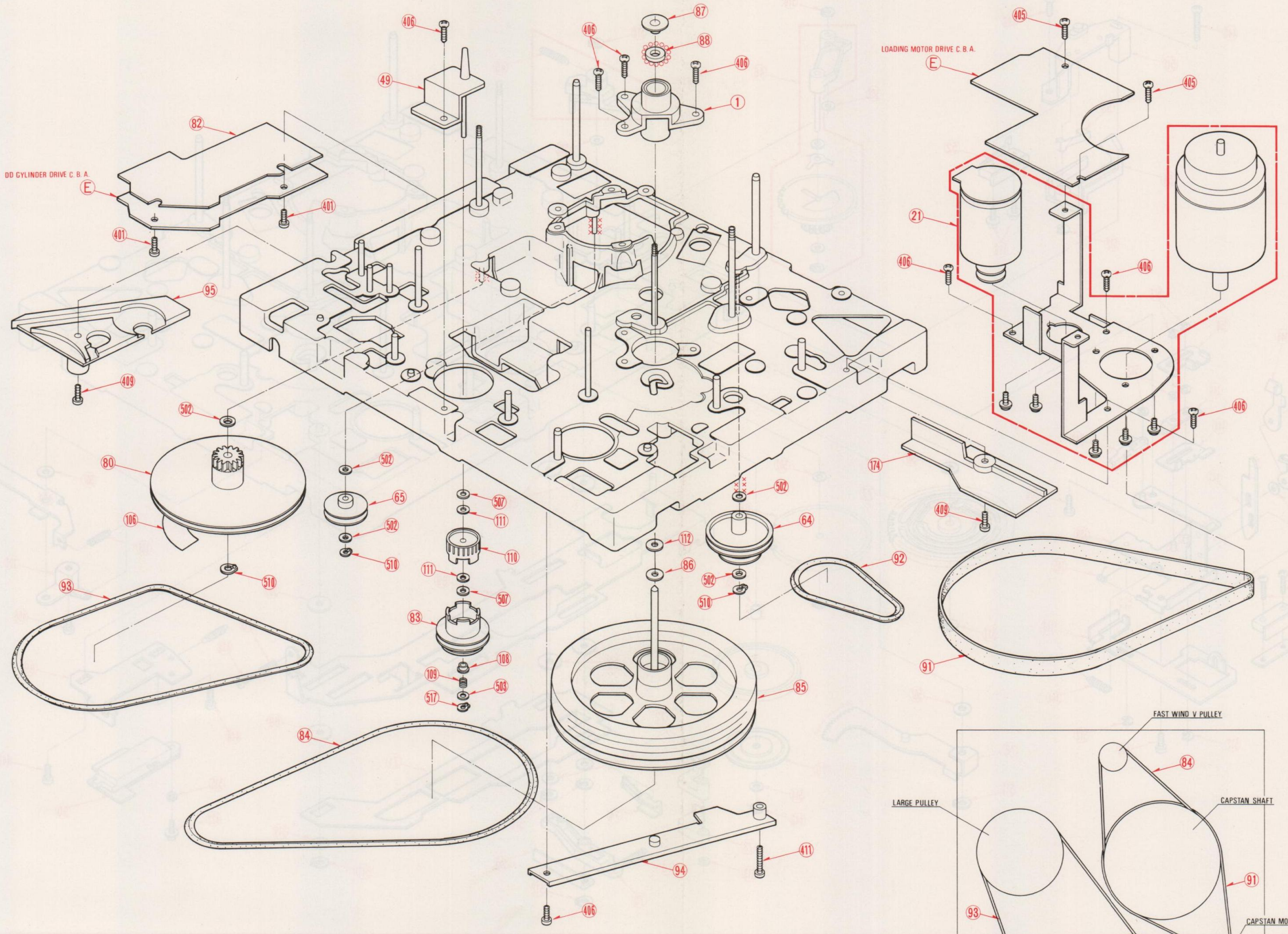
1 Transport Section



2 Moving Mechanism Section-(1)

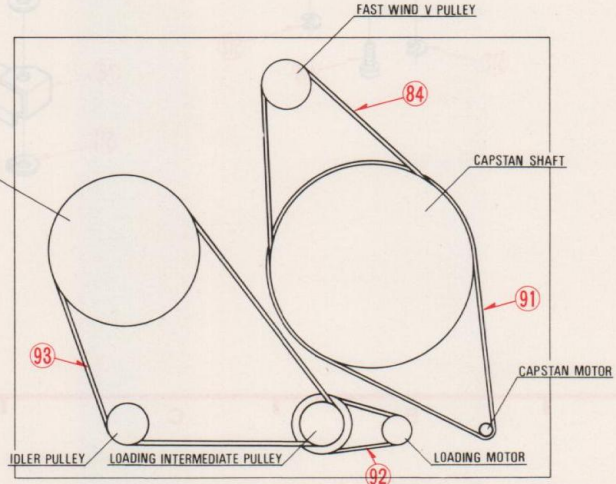


3 Moving Mechanism Section-(2)



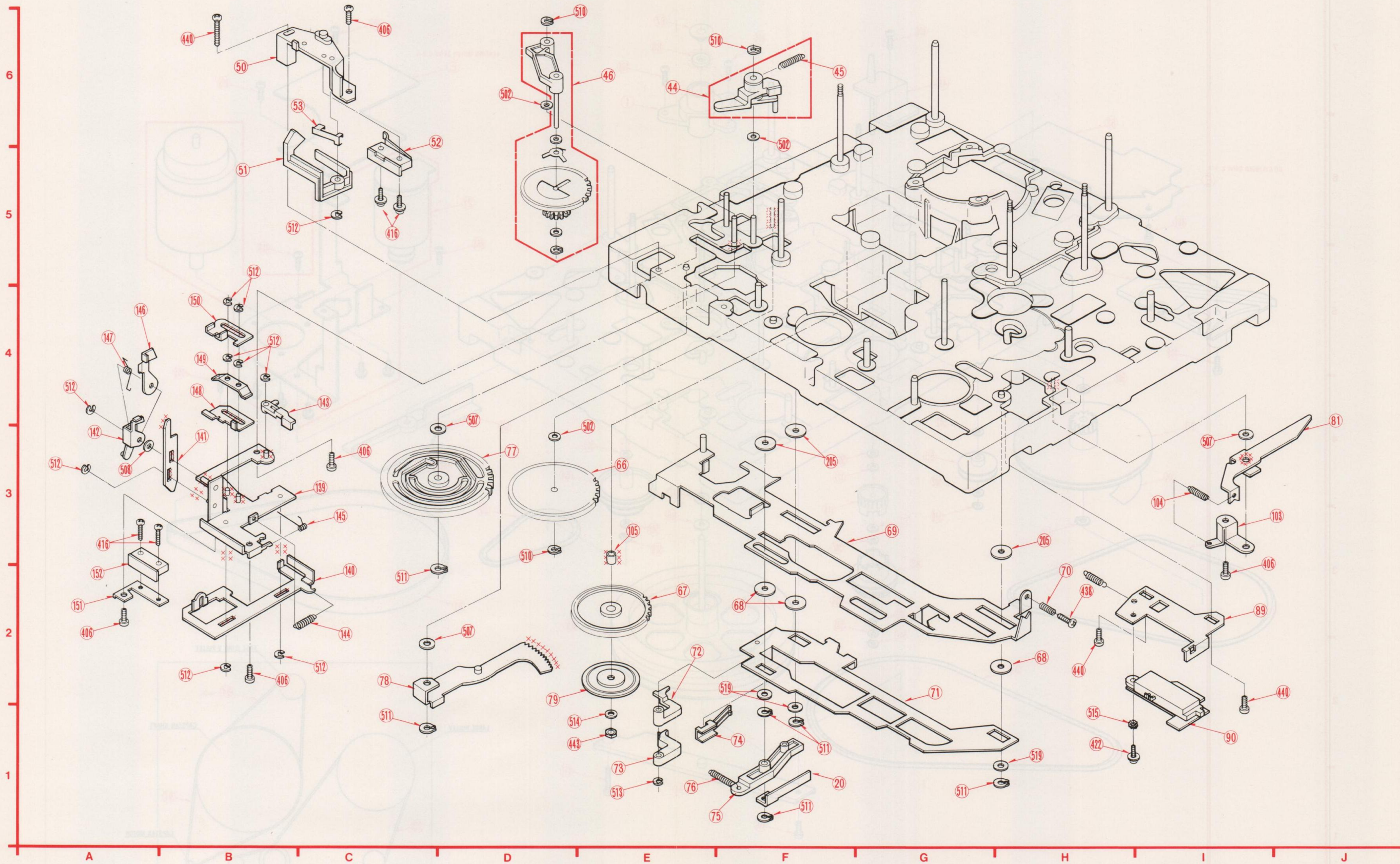
LOADING MOTOR DRIVE C. B. A.

DD CYLINDER DRIVE C. B. A.



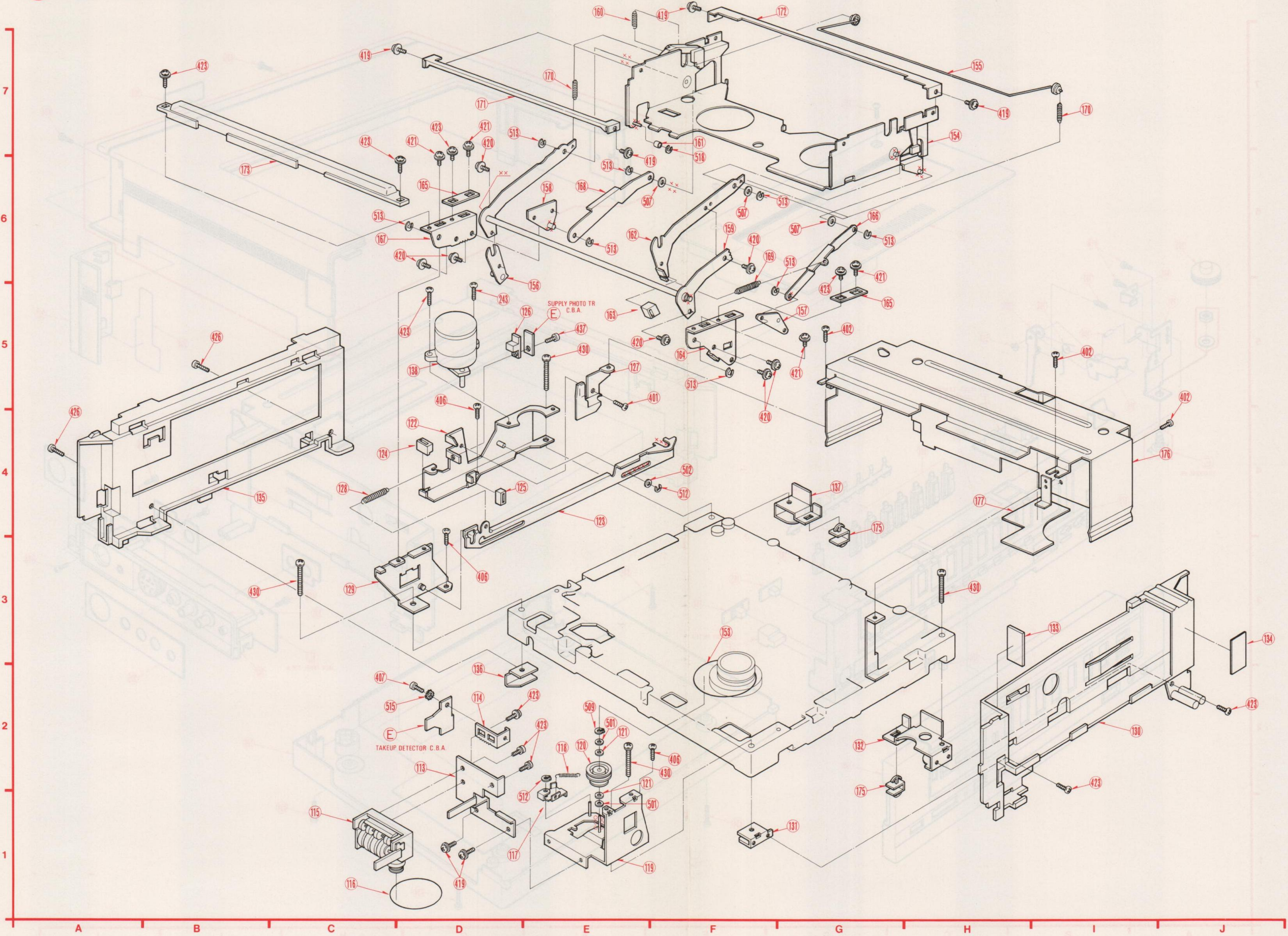
4 Moving Mechanism Section-(3)

Moving Mechanism Section-(2)



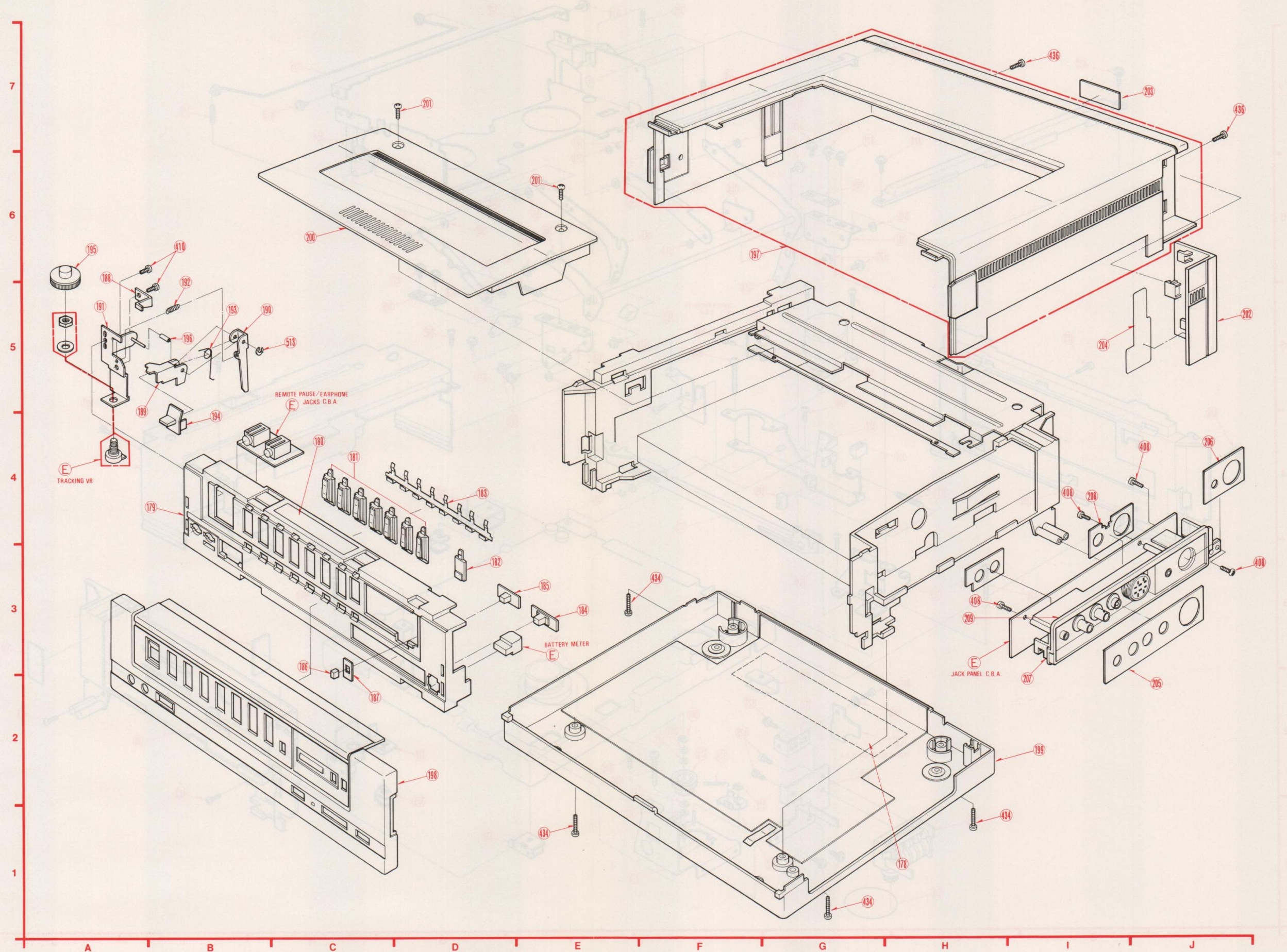
5 Chassis Frame Section

Chassis Frame Section



6 Casing Parts Section

Chassis Frame Section



MECHANICAL REPLACEMENT PARTS LIST

Model No. NV-3000-E-B

Notes:

1. * Be sure to make your orders of replacement parts according to this list.
- * "⊕" in Remarks column indicates new parts.



Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		MECHANICAL CHASSIS UNIT		
1 (3)	VXD0054	Metal Unit	1	
2 (2)	VXA1172	Place Fix Bracket Unit	1	
		LOADING BASE UNIT		
		CONSIST OF		
3 (1)	VMD0100	1. Post Stopper	2	
4 (1)	VXP0302A	2. Roller Post Unit (L)	1	
5 (1)	VXP0302C	3. Roller Post Unit (R)	1	
210 (1)	VXA1191	4. Inclind Base Unit (S)	1	
211 (1)	VXA1084	5. Inclind Base Unit (B)	1	
212 (1)	VXA1189	6. Shaft Holder Unit (S)	1	
213 (1)	VXA1190	7. Shaft Holder Unit (T)	1	
7 (1)	VMA3997	8. Shaft Holder Spring	2	
8 (1)	VXL0754	9. Loading Arm Unit (R)	1	
9 (1)	VXL0753	10. Loading Arm Unit (L)	1	
10 (1)	VXP0325	11. Loading Gear Unit	2	
11 (1)	VMB0669	12. Loading Spring	2	
12 (1)	VXA1295	13. Loading Base 1 Unit	1	
13 (1)	VMX0257	14. Arm Sleeve	2	
14 (1)	VHN0014	15. Adjust Nut	1	
425 (1)	XYN3+F10FXS	16. Screw With Washer, 3x10	4	
511 (1)	XUEV4FP	17. Retaining Ring, 4	2	
418 (1)	XYN3+C4FXS	18. Screw With Washer, 3x4	2	
420 (1)	XTV3+6FFXS	19. Screw With Washer, 3x6	2	
15 (1)	VMB0699	Post Spring (P4)	1	
16 (1)	VMX0280	Post Sleeve B	1	
17 (1)	VMX0271	Post Cap (P4)	1	
		A/C HEAD UNIT		
		CONSIST OF		
18 (1)	VEH0127	1. A/C Head Base Unit	1	
19 (1)	VMA4097	2. Sensor Lamp Angle	1	
E (1)	Elec. Part	3. Sensor Lamp C.B.A.	1	
439 (1)	XSS26+6FXS	4. Screw, 2.6x6	1	
20 (4)	VMB0700	Fast Wind Lever Spring	1	
21 (3)	VEM0121	Motor Bracket Unit	1	
E (4)	Elec. Part	Loading Motor Drive C.B.A.	1	
		FAST WIND IDLER BASE UNIT		
		CONSIST OF		
22 (2)	VMA1198	1. Guide Base Unit	1	
24 (2)	VXL0769	3. Fast Wind Idler Lever Unit	1	
25 (2)	VML1026	4. Friction Lever	1	
26 (2)	VMG0210	5. Friction Rubber	1	
27 (2)	VMB0664	6. Friction Lever Spring	1	
512 (2)	XUC25FP	7. Retaining Ring, 3	2	
28 (1)	VMX0324	Inertia Roller Arm Unit	1	
29 (1)	VMB0667	Roller Arm Spring	1	
30 (2)	VXL0763	Play idler Lever Unit	1	
31 (2)	VXP0332	Pause Brake Pulley Unit	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
32 (2)	VMX0261	Idler Washer	1	
33 (2)	VMB0683	Play Idler Coil Spring	1	
34 (2)	VMB0681	Idler Spring	1	
35 (2)	VXP0331	Play Idler (1) Unit	1	
502 (2)	XWXV3D	Washer	1	
36 (1)	VXA0869	Discharge Brush Unit	1	
37 (2)	VXP0330	Pressure Roller Unit	1	
38 (2)	VMB0679	Pressure Spring	1	
39 (2)	VMA4098	Spring Hook	1	
40 (2)	VXA1175	Opener Unit	1	
		FAST WIND IDLER ARM UNIT		
		CONSIST OF		
250 (2)	VXP0329	FF Idler Unit	1	
251 (2)	VXL0760	FF Idler Arm Unit	1	
252 (2)	VDP0746	Guide Roller	1	
512 (2)	XUC25FP	Retaining Ring	1	
502 (2)	XWXV3D	Washer	1	
517 (2)	XUC15FP	Retaining Washer	1	
		ERASE HEAD UNIT		
		CONSIST OF		
41 (1)	VML1032	1. Erase Head Lever	1	
42 (1)	VMB0665	2. Erase Head Lever Spring	1	
43 (1)	VBS0014	3. Erase Head	1	
415 (1)	XYN2+C4FXS	4. Screw With Washer, 2x4	2	
44 (4)	VXZ0072	Soft Brake Unit	1	
45 (4)	VMB0659	Soft Brake Spring	1	
46 (4)	VXP0326	Takeup Gear Unit	1	
47 (2)	VXR0079	Takeup Reel Table Unit	1	
48 (2)	VXR0080	Supply Reel Table Unit	1	
49 (2)	VXA1176	Fast Wind Pulley Bracket Unit	1	
		MIS-ERASE PROTECTION UNIT		
		CONSIST OF		
50 (4)	VXA1185	1. Cassette Support Unit	1	
51 (4)	VML1062	2. Sensing Lever	1	
52 (4)	VSM0027	3. Micro Switch	1	
53 (4)	VMB0708	4. Actuator Spring	1	
416 (4)	XYN3+C10FXS	5. Screw With Washer, 3x10	2	
512 (4)	XUC25FP	6. Retaining Ring, 2.5	1	
		MAIN BRAKE UNIT		
		CONSIST OF		
54 (2)	VXZ0073	1. Brake Unit (L)	1	
55 (2)	VXZ0074	2. Brake Unit (R)	1	
56 (2)	VMB0661	3. Brake Arm Spring	1	
		PHOTO TR. BRACKET UNIT		
		CONSIST OF		
57 (2)	VMA4096	1. Holder Angle	1	
E (2)	Elec. Part	2. Takeup Sensor C.B.A.	1	
58 (2)	VMD0091	3. Tr. Holder	1	
437 (2)	XSN3+8FXS	4. Screw	1	
515 (2)	XWC38F	5. Toothed Lock Washer, 3	1	
59 (2)	VEK1129	Dew Sensor Unit	1	
		TENSION ARM BAND UNIT		
		CONSIST OF		
60 (2)	VXL0750	1. Tension Arm Unit	1	
61 (2)	VXZ0076	2. Tension Band Unit	1	
62 (2)	VMA4089	3. Adjust Hook	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks	Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
63 (2)	VMB0666	4. Tension Spring	1		102 (2)	VMX0259	Spacer	2	
510 (2)	XUEV3FP	5. Retaining Ring, 3	1		103 (4)	VMA4095	Lever Holder	1	
420 (2)	XYN3+F5FXS	6. Screw With Washer, 3x5	1		104 (4)	VMB0749	Kick Lever Spring	1	
64 (3)	VDP0735	Loading Intermediate Pulley	1		105 (4)	VMX0268	Driving Gear Sleeve	1	
65 (3)	VDP0750	Idler Pulley	1		106 (3)	VQL1055	Pulley Caution Label	1	
66 (4)	VDG0017	Transit Gear	1		107 (1)	VMA4122	Lead Wire Holder	1	
67 (4)	VDG0016	Driving Gear	1		108 (3)	VMX0269	Bearing Cap	1	
68 (4)	VMX0122	Slide Washer A	6		109 (3)	VMB0707	Pre-load Spring	1	
					110 (3)	VXP0342	Fast Wind Pulley B Unit	1	
					111 (3)	VMX0278	Stainless Washer, 4	2	
		MAIN ROD LATCH UNIT							
		CONSIST OF			112 (3)	VMX0265	Capstan Shaft Washer	1	
69 (4)	VXA1193	1. Main Rod	1						
70 (4)	VMB0680	2. Adjust Spring	1						
71 (4)	VXL0797	3. Sub Rod Unit	1				COUNTER UNIT CONSIST OF		
72 (4)	VML1114	4. Kick Lever (A)	1		113 (5)	VMA4144	1. Counter Angle	1	
73 (4)	VML1115	5. Kick Lever (B)	1		114 (5)	VMA4102	2. Sensor Mount Angle	1	
74 (4)	VMB0744	6. Kick Lever Spring	1		E (5)	Elec. Part	3. Takeup Sensor C.B.A.		
513 (4)	XUC3FP	7. Retaining Ring	1		115 (5)	VDC0020	4. Counter	1	
438 (4)	XSN3+10FXS	8. Screw, 3x10	1		116 (5)	VDV0125	5. Counter Belt 2	1	
75 (4)	VML1035	Fast Wind Release Arm	1		117 (5)	VXZ0087	6. Soft Brake (T) Unit	1	
76 (4)	VMB0746	Release Arm Spring	1		118 (5)	VMB0757	7. Soft Brake Spring	1	
77 (4)	VDG0021	Cam Gear	1		423 (5)	XYN3+F8FXS	8. Screw With Washer	3	
78 (4)	VXL0752	Sector Gear Unit	1		419 (5)	XTV3+6FFXS	9. Screw With Washer	2	
79 (4)	VMA4088	Cap Plate	1		407 (5)	XTV3+8FFXS	10. Tapping Screw	1	
E (3)	Elec. Part	Cylinder Drive C.B.A.			515 (5)	XWC3BF	11. Washer	1	
80 (3)	VDP0748	Large Pulley	1		512 (5)	XUC25FP	12. Retaining Ring	2	
81 (4)	VML1040	Kick Lever	1						
82 (3)	VMZ0295	Insulation Sheet	1				CHASSIS ANGLE UNIT (R)		
83 (3)	VXP0322	Fast Wind V Pulley Unit	1				CONSIST OF		
84 (3)	VDV0120	Fast Wind Belt	1		119 (5)	VXA1195	1. Chassis Angle Unit	1	
85 (3)	VXP0341	Capstan Shaft Unit	1		120 (5)	VXP0328	2. Counter Pulley Unit	1	
86 (3)	VMA3999	Thrust Spring	1		509 (5)	XUEV2FP	3. Washer	1	
87 (3)	VMX0251	Oil Seal	1		501 (5)	XWXV2A	4. Washer	2	
88 (3)	VMD0104	Oil Pool	1		121 (5)	VMX0272	5. Washer	2	
		MODE SELECT SW. UNIT					SENSOR ANGLE UNIT		
		CONSIST OF					CONSIST OF		
89 (4)	VMA4094	1. Switch Holder	1		122 (5)	VXA1199	1. Sensor Angle Unit	1	
90 (4)	VSS0048	2. Mode Select Switch	1		123 (5)	VMM0070	2. Connecting Rod	1	
515 (4)	XWC3BF	3. Toothed Lock Washer, 3	1		124 (5)	VMG0207	3. Stopper Rubber A	1	
422 (4)	XYN3+F10FXS	4. Screw With Washer, 3x10	1		125 (5)	VMG0206	4. Stopper Rubber B	1	
					126 (5)	VMD0092	5. Transistor Holder	1	
91 (3)	VDV0121	Capstan Belt	1		E (5)	Elec. Part	6. Supply Sensor C.B.A.	1	
92 (3)	VDV0122	Loading Belt 1	1		127 (5)	VMA4149	7. Transistor Holder Guard	1	
93 (3)	VDV0123	Loading Belt 2	1		128 (5)	VMB0674	8. Holder Spring	1	
94 (3)	VXA1182	Thrust Holder Unit	1		437 (5)	XSN3+8FFXS	9. Bind Screw	1	
95 (3)	VGF0013	Belt Cover	1		401 (5)	XTV3+6FFXS	10. Tapping Screw	1	
96 (1)	VMB0754	Supply Limiter Spring	1		512 (5)	XUC25FP	11. Retaining Ring	1	
97 (1)	VMS1767	Supply Limiter (Upper)	1		515 (5)	XWC3BF	12. Washer	1	
98 (1)	VMB0668	A/C Head Height Spring	1		502 (5)	XWXV3D	13. Washer	1	
99 (1)	VMX0256	Stopper Snap	1		129 (5)	VXA1197	14. Chassis Angle Unit (L)	1	
		CYLINDER UNIT					RIGHT FRAME UNIT		
		CONSIST OF					CONSIST OF		
100 (1)	VEG0176	1. Cylinder Unit	1		130 (5)	VMD0102	1. Right Frame	1	
101 (1)	VEH0121	2. Upper Cylinder Unit	1		131 (5)	VMA4116	2. Mech Angle F-R	1	
424 (1)	XYN3+B10BWS	3. Screw With Washer, 3x10	1		132 (5)	VMA4118	3. Mech Angle R-R	1	
					134 (5)	VQL1139	4. Fuse Replacement Label	1	
					423 (5)	XYN3+F8FXS	5. Screw With Washer, 3x8	2	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks	Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		LEFT FRAME UNIT			177 (5)	VMZ0297	Shield Cover (Top)	1	
		CONSIST OF			178 (6)	VQL1118	Caution Label	1	
135 (5)	VMD0103	1. Left Frame	1		408 (6)	XTV3+10BFX	Tapping Screw, 3x10	1	
136 (5)	VMA4117	2. Mech Angle F-L	1		409 (3)	XTV3+10FFXS	Tapping Screw, 3x10	1	
137 (5)	VMA4119	3. Mech Angle R-L	1		421 (5)	XYN3+F6FXRS	Screw With Washer, 3x6	4	
423 (5)	XYN3+F8FXS	4. Screw With Washer, 3x8	2						
138 (5)	VVG0022	Dumper	1		423 (5)	XYN3+F6FXS	Screw With Washer, 3x8	2	
					402 (5)	XTV3+6FFXRS	Tapping Screw, 3x6	2	
					417 (1)	XYN3+F5FXS	Screw With Washer, 3x5	1	
		CASSETTE LOCK UNIT							
		CONSIST OF							
139 (4)	VXA1204	1. Eject Angle Unit	1				CONTROL PANEL UNIT		
140 (4)	VXA1207	2. Eject Rod Unit	1				CONSIST OF		
141 (4)	VMA4100	3. Stopper	1		179 (6)	VMD0101	1. Control Panel	1	
142 (4)	VXA1205	4. Lock Lever Unit	1		180 (6)	VQL1140	2. Service Level	1	
143 (4)	VML1157	5. Actuator Lever	1		181 (6)	VXU0175	3. Operation Button A	7	
					182 (6)	VGU0198	4. Operation Button B	1	
144 (4)	VMB0677	6. Eject Spring	1		183 (6)	VMB0685	5. Button Spring	1	
145 (4)	VMB0673	7. Stopper Spring	1						
146 (4)	VXA1210	8. Main Lock Lever	1		184 (6)	VGT0160	6. Power Switch Knob	1	
147 (4)	VMB0671	9. Main Lock Lever Spring	1		E (6)	Elec. Part	7. Ear Phone Jack C.B.A.	1	
148 (4)	VMA4152	10. Obstruction Rod B	1		E (6)	Elec. Part	8. Battery Meter	1	
					186 (6)	VGT0161	9. Memory Switch Knob	1	
149 (4)	VMB0705	11. Rod Hold Spring	1		187 (6)	VGQ0148	10. Memory Switch Cover	1	
150 (4)	VMA4151	12. Obstruction Rod A	1						
419 (4)	XYN3+C6FXS	13. Screw With Washer, 3x6	1		188 (6)	VMB0709	11. Earth Spring	2	
508 (4)	XWX4065	14. Washer	1		410 (6)	XTV3+10BFX	12. Tapping Screw, 3x12	2	
512 (4)	XUC25FP	15. Retaining Ring	9						
		SWITCH ANGLE UNIT					EJECT LEVER UNIT		
		CONSIST OF					CONSIST OF		
151 (4)	VMA4103	1. Switch Mount Plate	1		189 (6)	VML1048	1. Eject Lever (A)	1	
152 (4)	VSM0027	2. Micro Switch	1		190 (6)	VML1049	2. Eject Lever (B)	1	
416 (4)	XYN2+C10FX	3. Retaining Ring	2		191 (6)	VXA1171	3. Eject Lever Angle Unit	1	
153 (5)	VDO0124	Counter Belt (1)	1		192 (6)	VMB0686	4. Eject Lever Spring A	1	
430 (5)	XYN4+F30FXS	Screw With Washer, 4x30	4		193 (6)	VMB0687	5. Eject Lever Spring B	1	
406 (5)	XTV3+8FFXS	Tapping Screw, 3x8	5		194 (6)	VGU0199	6. Eject Button	1	
423 (5)	XYN3+F8FXS	Screw With Washer, 3x8	2		E (6)	Elec. Part	7. Tracking VR	1	
					195 (6)	VGT0151	8. Tracking VR Knob	1	
					196 (6)	VMX0262	9. Eject Lever Collar	1	
		CASSETTE UP UNIT			513 (6)	XUC3FP	10. Retaining Ring	1	
		CONSIST OF			197 (6)	VYK0227	11. Top Case Unit	1	
154 (5)	VXA1265	1. Cassette Up Unit	1		198 (6)	VYP0488	12. Front Panel Unit	1	
160 (5)	VMB0678	2. Discriminating Lever	1		199 (6)	VYK0230	13. Bottom Case Unit	1	
		Spring			200 (6)	VGP0048	14. Cassette Cover	1	
161 (5)	VHX0247	3. Lock Collar	1						
162 (5)	VML1098	4. Main Arm (L)	1		201 (6)	VHD0042	15. Decoration Screw	2	
					202 (6)	VKF0048	16. Battery Cover	1	
163 (5)	VMG0215	5. Stand Cushion	1		434 (6)	XSB3+16FXKS	17. Screw With Washer, 3x16	4	
164 (5)	VMA4002	6. Holder Angle (R)	1		436 (6)	XSB3+6FCWS	18. Screw With Washer	2	
165 (5)	VMA3990	7. Holder Adjustment Plate	2						
166 (5)	VML1111	8. Sub Arm (R)	1						
167 (5)	VMA4003	9. Holder Angle (L)	1		203 (6)	VQLS0184	Guide Label	1	
					204 (6)	VQL1183	Battery Terminal Label	1	
168 (5)	VML1110	10. Sub Arm (L)	1		205 (6)	VGN1514	Jack Plate Decoration A	1	
169 (5)	VMB0735	11. Holder Spring (R)	1		206 (6)	VGN1517	Jack Plate Decoration B	1	
170 (5)	VMB0730	12. Cassette Holding Spring	1		207 (6)	VJJ0076	Jack Plate	1	
171 (5)	VMA4300	13. Cassette Compartment	1						
		Support Angle (Front)			208 (6)	VMA4120	10P Jack Angle B	1	
					209 (6)	VQL1121	Fuse Caution Label	1	
172 (5)	VMA4301	14. Cassette Compartment	1		223 (7)	VFC0005	Carrying Case	1	NV-300CE/B
					224 (7)	VPN0631	Left Cushion	1	
					227 (7)	VPN0630	Right Cushion	1	
173 (5)	VGQ0135	Cassette Guide	1						
174 (3)	VGFO019	Lead Wire Holder	1		228 (7)	VQF0556	Fan Bag Kit	1	NV-3000E
175 (5)	VKC0033	Clip	2		(7)	VQF0557	Fan Bag Kit	1	NV-3000B
E (6)	Elec. Part	Jack Plate Unit	1		229 (7)	VPN0586	Accessory Case	1	
176 (5)	VYF0160	Shield Case	1		230 (7)	VJP1164	Audio Input Attenuator	1	
					231 (7)	VJA0148	Connection Cable	1	

ELECTRICAL REPLACEMENT PARTS LIST

Model No. NV-3000-E/B



Notes:

1. * Be sure to make your orders of replacement parts according to this list.
2. **IMPORTANT SAFETY NOTICE**
Components identified by Δ have special characteristics important for safety. When replacing any of these components, use only the original ones.
3. Unless otherwise specified.
All resistors are in OHMS (Ω), 1/8W \pm 5% carbon. K=1,000 Ω , M=1,000K Ω .
All capacitors are in MICROFARADS (μ F), \pm 10% P= μ F.

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
233 (7)	VBE0002	Earphone	1	
236 (7)	VSQ0146	Remote Control	1	
237 (7)	VPG0808	Packing Case	1	NV-3000E
(7)	VPG0853	Packing Case	1	NV-3000B
239 (1)	VDP0759	Supply Roller	1	
240 (1)	VMX0288	Collar	1	
241 (1)	VMS1768	L Supply Limiter (Lower)	1	
242 (4)	VMB0677	Eject Spring	1	
243 (5)	VHD0052	Screw	1	
244 (7)	VPF0140	Polyethylene Bag	1	
444 (1)	XNG3B	Nut	2	
426 (1)	XYN3+C10FXS	Screw	3	
411 (3)	XTV3+18FFXS	Screw	1	
440 (2)	XYE3+BF8FX	Screw	1	
516 (1)	XWG4FX	Washer	1	
445 (1)	XNG4	Nut	1	
507 (1)	XWXV4D9	Washer	2	
245 (6)	VMA4197	BNC Jack Angle	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
	VEP0399A	MAIN CIRCUIT BOARD ASS'Y	1	
	VEP0862A	COLOUR/AUDIO CIRCUIT BOARD ASS'Y	1	
	VEP06115A	SYSTEM CONTROL CIRCUIT BOARD ASS'Y	1	
	VEP06118A	KEY BOARD ASS'Y	1	
	VEP06100B	LOADING MOTOR DRIVE CIRCUIT BOARD ASS'Y	1	
	VEP02113A	D.D.CYLINDER DRIVE CIRCUIT BOARD ASS'Y	1	
	VJB00627	JACK BOARD	1	
	VJB00518	MODE SELECT SW BOARD	1	
	VJB00519	SENSOR LAMP BOARD	1	
	VJB00520	TAKEUP PHOTO TR BOARD	1	
	VJB00521	SUPPLY PHOTO TR BOARD	1	
	VJB00522	TAKEUP DETECTOR BOARD	1	
	VJB00523	REMOTE PAUSE/EARPHONE JACKS BOARD	1	
	VJB00524	A/C HEAD BOARD	1	
	VJB00525	SAFETY TAB SW BOARD	1	
	VJB00526	CASSETTE DOWN SW BOARD	1	
	VJB00581	DEW SENSOR CONNECTION BOARD	1	
	ENC17354	RF Converter Unit	1	NV-3000-E
	ENC17355	RF Converter Unit	1	NV-3000-B
		MAIN CIRCUIT BOARD ASS'Y (AVR/SERVO/STILL & SLOW /LUMINANCE)		
		AVR Section		
		Integrated Circuit		
IC1001	VCR0010		1	
		Transistors		
Q1001-Q1006	2SD603		6	
Q1007	2SB759		1	
Q1008	2SA886V		1	
Q1009	2SB759		1	
Q1010	2SD603		1	
Q1014	2SC1317		1	
Q1016	2SD946		1	
Q1017	2SD636		1	
Q1018	2SD603		1	
Q1019	2SB641		1	
Q1020	2SD603		1	
Q1021	2SB793		1	
		Diodes		
D1001	MA1062		1	
D1002	MA165		1	
D1003	ERAB1004G		1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks	Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
D1005	RD6R2J81		1		C1017	ECEAJK101	Electrolytic 6.3V 100	1	
	or 5R6J83				C1018,1019	ECEA1CS101	Electrolytic 16V 100	2	
D1006	ERAB1004G		1		C1020	ECEA1CK100	Electrolytic 16V 10	1	
D1007-1010	MA165		4		C1021	VCY25333KX	0.033	1	
		Resistors							
R1001	ERD10TJ472		4.7K	1					
R1002	ERD10TJ563		56K	1			Coils		
R1003	ERD10TJ103		10K	1	L1001	VLQ0066		1	
R1004	ERD10TJ823		82K	1	L1002	VLQ0067		1	
R1005	ERD10TJ682		6.8K	1	L1003	VLQ0066		1	
R1006	ERD10TJ102		1K	1	L1006	VLQ0068		1	
R1007	ERD10TJ183		18K	1					
R1008	ERD10TJ682		6.8K	1			Relay		
R1009	ERD10TJ563		56K	1					
R1010	ERD10TJ472		4.7K	1	RY1001	VSY2026		1	
R1011	ERD10TJ224		220K	1					
R1012	ERD10TJ124		120K	1			Miscellaneous		
R1013	ERD10TJ103		10K	1	TP1001,1002	VJH0096Z	Check Terminal	2	
R1014	ERD10TJ391		390	1	TP1003	VJH0096Z	Check Terminal	1	
R1015	ERD10TJ332		3.3K	1	F1001	VEK0983	Fuse Unit	1	▲
R1016	ERD10TJ224		220K	1					
R1017	ERD10TJ563		56K	1					
R1018	ERD10TJ333		33K	1					
R1019	ERD10TJ123		12K	1					
R1020	ERX12AUJR56	Metal	1/2W 0.56	1					
R1021	ERD10TJ682		6.8K	1					
R1022	ERD10TJ103		10K	1					
R1023	ERD10TJ562		5.6K	1					
R1024	EVN38CA00B24	Variable	20K	1					
R1025	ERD10TJ333		33K	1					
R1031	ERGIANJ560	Metal	1W 56	1					
R1032	ERD25VJ332		1/4W 3.3K	1					
R1033	ERD10TJ473		47K	1			Servo Section		
R1034	ERD10TJ333		33K	1					
R1036	ERD10TJ561		560	1					
R1037	ERD10TJ562		5.6K	1					
R1039	ERD10TJ682		6.8K	1			Integrated Circuits		
R1040	ERD10TJ472		4.7K	1	IC2001	AN6350		1	
R1041	ERD10TJ104		100K	1	IC2002	DN819		1	
R1042	ERD10TJ473		47K	1	IC2003	AN6341N		1	
R1043	ERD10TJ153		15K	1	IC2004	M54819L		1	
R1044	ERD10TJ223		22K	1	IC2005	VCRO022		1	
R1045	ERD10TJ473		47K	1					
R1046	ERD10TJ182		1.8K	1					
R1047	ERD10TJ104		100K	1					
R1048,1049	ERD10TJ473		47K	2			Transistors		
R1050	ERD10TJ223		22K	1	Q2001	2SD889		1	
R1051	ERD25VJ104		1/4W 100K	1	Q2002	2SD636		1	
R1053	ERX12AUJ2R2	Metal	1/2W 2.2	1	Q2003	2SD636-R		1	
					Q2004	2SD636		1	
					Q2005	2SB641		1	
					Q2006-2008	2SD636		3	
					Q2010	2SD636		1	
					Q2011,2012	2SB641		2	
					Q2013	2SD636		1	
					Q2014	2SD636		1	
					Q2020	2SB641		1	
					Q2021	2SB643		1	
					Q2022	2SD946		1	
					Q2023	2SB643		1	
					Q2024	2SD636		1	
					Q2025	2SB641		1	
					Q2026	2SD636		1	
					Q2027	2SB641		1	
					Q2028	2SD636		1	
		Capacitors							
C1001	ECEA1CS221	Electrolytic 16V	220	1					
C1002	ECK21H471KB	Ceramic 50V	470P	1					
C1003	ECCD1H181KN	Ceramic 50V	180P	1					
C1004	ECK21H221KB	Ceramic 50V	220P	1					
C1005	ECEA1HK010	Electrolytic 50V	1	1					
C1006	ECC21H390K	Ceramic 50V	39P	1					
C1007	ECK21H561KB	Ceramic 50V	560P	1					
C1008	ECEA1AS221	Electrolytic 10V	220	1					
C1009	ECEA1O2100	Electrolytic 10V	10	1					
C1010	ECEA1AS221	Electrolytic 10V	220	1					
C1011	ECEA1AK470	Electrolytic 10V	47	1					
C1012	ECEA1HK3R3	Electrolytic 50V	3.3	1					

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks	Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
IC3004	AN6332		1		R3045	ERD10TJ391		390	1
IC3005	VCR0024		1		R3046	ERD10TJ822		8.2K	1
IC3006	VCR0013		1		R3047	EVN38CA00B23	Variable	2K	1
					R3048	ERD10TJ822		8.2K	1
					R3249	ERD10TJ102		1K	1
					R3050	ERD10TJ391		390	1
		Transistors			R3051	EVN38CA00B13	Variable	1K	1
Q3001	2SD636		1		R3052	ERD10TJ473		47K	1
Q3002,3003	2SD638		2		R3053	ERD10TJ273		27K	1
Q3004	2SB641		1		R3054	EVN38CA00B23	Variable	2K	1
Q3005,3006	2SD636		2		R3055	ERD10TJ472		4.7K	1
Q3007-3009	2SD638		3		R3056	ERD10TJ272		2.7K	1
Q3010	2SC2206		1		R3057,3058	ERD10TJ561		560	2
Q3011	2SC2377		1		R3059	ERD10TJ681		680	1
Q3012	2SB641		1		R3060	ERD10TJ391		390	1
Q3013	2SD636		1		R3061	ERD10TJ820		82	1
Q3014	2SB641		1		R3062	ERD10TJ102		1K	1
Q3015-3017	2SD636		3		R3063	EVN38CA00B15	Variable	100K	1
					R3064	ERD10TJ473		47K	1
					R3065	ERD10TJ153		15K	1
		Diodes			R3066	EVN38CA00B54	Variable	50K	1
D3001-3004	MA165		4		R3067,3068	ERD10TJ102		1K	2
D3007	MA165		1		R3069	ERD10TJ391		390	1
					R3070	ERD10TJ102		1K	1
					R3071	ERD10TJ222		2.2K	1
					R3072	ERD10TJ274		270K	1
					R3073	ERD10TJ471		470	1
		Resistors			R3074	ERD10TJ332		3.3K	1
R3001	ERD10TJ473		47K	1	R3075	ERD10TJ562		5.6K	1
R3002	ERD10TJ223		22K	1	R3076	ERD10TJ102		1K	1
R3003	ERD10TJ821		820	1	R3077	ERD10TJ472		4.7K	1
R3004	ERD10TJ562		5.6K	1	R3078	EVN38CA00B13	Variable	1K	1
R3005	ERD10TJ561		560	1	R3080	ERD10TJ152		1.5K	1
R3006	ERD10TJ272		2.7K	1	R3081	ERD10TJ271		220	1
R3007	ERD10TJ333		33K	1	R3083,3084	ERD10TJ222		2.2K	2
R3008	ERD25VJ821	1/4W	820	1	R3085	ERD10TJ182		1.8K	1
R3009	ERD10TJ750		75	1	R3086	ERD25VJ102		1K	1
R3010	ERD10TJ821		820	1	R3087	ERD10TJ471		470	1
R3011	ERD10TJ222		2.2K	1	R3089	ERD10TJ222		2.2K	1
R3012	ERD10TJ152		1.5K	1	R3090	ERD10TJ471		470	1
R3013	ERD10TJ102		1K	1	R3091	ERD10TJ101		100	1
R3014	ERD10TJ391		390	1	R3092,3093	ERD10TJ562		5.6K	2
R3015	ERD10TJ821		820	1	R3094	ERD10TJ221		220	1
R3016	EVN38CA00B53	Variable	5K	1	R3095	ERD10TJ102		1K	1
R3017	ERD10TJ222		2.2K	1	R3096	ERD10TJ561		560	1
R3018	ERD10TJ102		1K	1	R3097	ERD10TJ332		3.3K	1
R3019	ERD10TJ332		3.3K	1	R3098	ERD10TJ153		15K	1
R3020,3021	EVN38CA00B53	Variable	5K	2	R3099	ERD10TJ123		12K	1
R3022	ERD10TJ562		5.6K	1	R3100	ERD10TJ391		390	1
R3023	ERD25VJ332	1/4W	3.3K	1	R3103	ERD10TJ273		27K	1
R3024	ERD10TJ123		12K	1					
R3025	EVN38CA00B24	Variable	20K	1					
R3026	ERD10TJ684		680K	1					
R3027	ERD10TJ152		1.5K	1					
R3028	ERD10TJ271		270	1					
R3029	ERD10TJ222		2.2K	1					
R3030	EVN38CA00B23	Variable	2K	1			Capacitors		
R3031	ERD10TJ820		82	1	C3001	ECEA0JK470	Electrolytic 6.3V	47	1
R3032	ERD25VJ821	1/4W	820	1	C3002	ECEA1HK2R2	Electrolytic 50V	2.2	1
R3033	ERD10TJ102		1K	1	C3003	VCY25473KX		0.047	1
R3034	ERD10TJ393		39K	1	C3004	ECCDIH330KN	Ceramic 50V	33P	1
R3035	ERD10TJ823		82K	1	C3005	ECKDIH681KN	Ceramic 50V	680P	1
R3036	ERD10TJ152		1.5K	1	C3006,3007	ECEA0JK470	Electrolytic 6.3V	47	2
R3037	ERD10TJ471		470	1	C3008	ECEA1ASS221	Electrolytic 10V	220	1
R3038	ERD10TJ223		22K	1	C3009	ECEA1VK4R7	Electrolytic 35V	4.7	1
R3039	ERD10TJ272		2.7K	1	C3010	ECCDIH470KCN	Ceramic 50V	47P	1
R3040,3041	ERD10TJ100		10	2	C3011	ECV1Z40X53N	Trimmer		1
R3042	ERD10TJ272		2.7K	1	C3012	ECKDIH102ZFN	Ceramic 50V	1000P	1
R3043	ERD10TJ473		47K	1	C3013	ECEA1AK330	Electrolytic 10V	33	1
R3044	EVN38CA00B13	Variable	1K	1	C3014	ECKDIH472ZFN	Ceramic 50V	4700P	1
					C3015	ECKDIH472ZF	Ceramic 50V	4700P	1

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		COLOUR/AUDIO CIRCUIT BOARD ASS'Y		
		Colour Section		
		Integrated Circuits		
IC8001	AN6360		1	
IC8002	AN6363		1	
IC8003	AN6371		1	
IC8004	AN6342N		1	
		Transistors		
Q8001	2SD636		1	
Q8002	2SB641		1	
Q8003	2SD636		1	
Q8004	2SC2206		1	
		Diodes		
D8001	VD1222		1	
D8002-8004	MA165TA5		3	
		Resistors		
R8001	ERD10TJ563	56K	1	
R8002	ERD10TJ103	10K	1	
R8003	ERD10TJ821	820	1	
R8004	ERD10TJ102	1K	1	
R8005	ERD10TJ121	180	1	
R8006	ERD10TJ122	1.2K	1	
R8007	ERD10TJ152	1.5K	1	
R8008	ERD10TJ684	680K	1	
R8009,8010	ERD10TJ102	1K	2	
R8011,8012	ERD10TJ122	1.2K	2	
R8013	EVN38CA00B14	14K	1	
R8014-8016	ERD10TJ391	390	3	
R8017	ERD10TJ273	27K	1	
R8018	ERD10TJ102	1K	1	
R8019,8020	ERD10TJ391	560	2	
R8021	ERD10TJ562	5.6K	1	
R8022	ERD10TJ221	220	1	
R8023	ERD10TJ332	3.2K	1	
R8024	ERD10TJ152	1.5K	1	
R8025	EVN38CA00B23	2K	1	
R8026	ERD10TJ562	5.6K	1	
R8027	ERD25TJ391	390	1	
R8028	ERD10TJ224	220K	1	
R8029	ERD10TJ273	27K	1	
R8030	ERD10TJ682	6.8K	1	
R8031	ERD10TJ222	2.2K	1	
R8032	ERD10TJ122	1.2K	1	
R8033	ERD10TJ153	15K	1	
R8034	ERD10TJ472	4.7K	1	
R8035	ERD10TJ102	1K	1	
R8036	ERD10TJ222	2.2K	1	
R8037	ERD10TJ274	270K	1	
R8038	ERD10TJ473	47K	1	
R8039,8040	ERD10TJ102	1K	2	
R8041,8042	ERD10TJ103	10K	2	
R8043	ERD10TJ562	5.6K	1	
R8044	ERD10TJ102	1K	1	
R8045	ERD10TJ472	4.7K	1	
R8046	ERD10TJ274	270K	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
R8047	ERD10TJ392	3.9K	1	
R8048	ERD10TJ182	1.8K	1	
R8049	EVN38CA00B52	Variable	500	1
		Capacitors		
C8001	ECKZ1H472ZF	Ceramic 50V 0.047	1	
C8002	ECEAIAK330	Electrolytic 10V 33	1	
C8003	ECQM1H153KZ	Mylar 50V 0.0015	1	
C8004,8005	ECKZ1H472ZF	Ceramic 50V 0.047	2	
C8006	ECKF1H103ZF	50V 0.001	1	
C8007	ECEAIAK330	Electrolytic 10V 33	1	
C8008	ECKZ1H472ZF	Ceramic 50V 0.047	1	
C8009	ECEA1HK010	Electrolytic 50V 1	1	
C8010	ECKD1H472ZF	Ceramic 50V 0.047	1	
C8011	ECKZ1H331HB	Ceramic 50V 33	1	
C8012	ECHD1H472ZF	Ceramic 50V 0.047	1	
C8013	ECKZ1H472ZF	Ceramic 50V 0.047	1	
C8014,8015	ECKD1H472ZF	Ceramic 50V 0.047	2	
C8016	ECKD1H821KBN	Ceramic 50V 82P	1	
C8017	ECKD1H122KBN	Ceramic 50V 0.012	1	
C8018	ECEA1CK100	Electrolytic 16V 10	1	
C8019	ECEA1CK100	Electrolytic 16V 10	1	
C8020	ECQM1H183KZ	Mylar 50V 0.0018	1	
C8021	ECCD1H121KCN	Ceramic 50V 120P	1	
C8022	ECCD1H181KCN	Ceramic 50V 180P	1	
C8023	ECEA1HK010	Electrolytic 50V 1	1	
C8024	ECCD1H221KN	Ceramic 50V 220P	1	
C8025	ECKD1H821KBN	Ceramic 50V 82P	1	
C8026	ECKZ1H472ZF	Ceramic 50V 0.047	1	
C8027	ECKD1H472ZF	Ceramic 50V 0.047	1	
C8028	ECCZ1H150K	Ceramic 50V 15P	1	
C8029	ECEA1HK2R2	Electrolytic 50V 2.2	1	
C8030,8031	ECKZ1H472ZF	Ceramic 50V 0.047	2	
C8032	ECKD1H103ZFN	Ceramic 50V 0.01	1	
C8033,8034	ECEAIAK330	Electrolytic 10V 33	2	
C8035	ECKD1H472ZFN	Ceramic 50V 0.047	1	
C8036	ECEA1HK010	Electrolytic 50V 1	1	
C8037	ECEA1HK0R1	Electrolytic 50V 01	1	
C8038	ECEA1HK0R1	Electrolytic 50V 01	1	
C8039	ECQV05333JZW	Mylar 50V 0.01	1	
C8040	ECCD1H101KN	Ceramic 50V 100P	1	
C8041	ECEA1CK100	Electrolytic 16V 10	1	
C8042	ECKZ1H472ZF	Ceramic 50V 0.047	1	
C8043	ECCZ1H040DC	Ceramic 50V 4P	1	
C8044	ECCZ1H060DC	Ceramic 50V 6P	1	
C8045	ECEAIAK330	Electrolytic 10V 33	1	
C8046	ECKZ1H472ZF	Ceramic 50V 0.047	1	
C8047	ECCD1H151KCN	Ceramic 50V 150P	1	
C8048	ECCD1H101KCN	Ceramic 50V 100	1	
C8049	ECV1ZW20X53N	Trimmer 20P	1	
C8050	ECCZ1H150KC	Ceramic 50V 15P	1	
C8051	ECKZ1H472ZF	Ceramic 50V 0.047	1	
C8052	ECEA1CK100	Electrolytic 16V 10	1	
C8053	ECV1ZW40X53N	Trimmer 40P	1	
C8054	ECCD1H390KN	Ceramic 50V 39	1	
C8055	ECKD1H561KBN	Ceramic 50V 560P	1	
		Coils		
L8001	VLQEL06F221K	220u	1	
L8002	VLQEL06F471K	470u	1	
L8003,8004	VLQEL06R6R8J	6.8u	2	
L8005	VLQEL06R330K	33u	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks	Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
R6247	ERD10TJ153		15K 1				KEY BOARD ASS'Y		
R6249-6252	ERD10TJ223		22K 4						
R6253	ERD10TJ473		47K 1						
R6254	ERD10TJ223		22K 1				Integrated Circuits		
R6255	ERD10TJ562		5.6K 1		IC6001	HD7407P		1	
R6256	ERD10TJ103		10K 1						
R6257, 6258	ERD10TJ124		120K 2						
R6259	ERD10TJ223		22K 1						
R6260	ERD10TJ103		10K 1				Transistors		
R6261	ERD10TJ153		15K 1						
R6262	ERD10TJ823		82K 1		Q6001-6005	2SD636		5	
R6263	ERD10TJ222		2.2K 1		Q6006, 6007	2SB641		2	
R6264	ERD10TJ473		47K 1		Q6008	2SD636		1	
R6265	ERD10TJ223		22K 1		Q6010-6012	2SD636		3	
R6266	ERD10TJ682		6.8K 1						
R6267	ERD10TJ473		47K 1						
R6268	ERD10TJ561		560 1						
R6269	ERD10TJ473		47K 1				Diodes		
R6270	ERD10TJ223		22K 1		D6001-6010	MA165		10	
R6271	ERD10TJ103		10K 1		D6012	LN48YCPP	L.E.D	1	
R6272	ERD10TJ563		56K 1		D6013-6019	LN28RCPP	L.E.D	7	
R6273	ERD10TJ683		68K 1						
R6275	ERD10TJ333		33K 1						
R6276	ERD10TJ823		82K 1				Resistors		
R6277	ERD10TJ473		47K 1		R6001	ERD10TJ104		100K 1	
R6278	ERD10TJ223		22K 1		R6002	ERD10TJ822		8.2K 1	
R6282	ERD25TJ220		22 1		R6003, 6004	ERD10TJ223		22K 2	
R6285, 6286	ERD10TJ103		10K 2		R6005, 6006	ERD10TJ103		10K 2	
R6287	ERD10TJ223		22K 1		R6007	ERD10TJ562		5.6K 1	
R6288	ERD10TJ473		47K 1		R6008	ERD10TJ473		47K 1	
R6291	ERD10TJ472		4.7K 1		R6009, 6010	ERD10TJ223		22K 2	
					R6011	ERD10TJ222		2.2K 1	
					R6012	ERD10TJ223		22K 1	
		Capacitors			R6013-6017	ERD10TJ561		560 5	
C6201	ECEA1AK330	Electrolytic 10V	33 1		R6018, 6019	ERD10TJ473		47K 2	
C6202	ECEAOJK220	Electrolytic 6.3V	22 1		R6020-6022	ERD10TJ223		22K 3	
C6203	ECCD1H101KN	Ceramic 50V 100P	1		R6023	ERD10TJ273		27K 1	
C6205	ECEAOJK470	Electrolytic 6.3V	47 1		R6024, 6025	ERD10TJ223		22K 2	
C6206, 6207	ECSF35ER68E	Electrolytic 35V 0.68	2		R6026, 6027	ERD10TJ223		22K 2	
C6208	EXFP6102Z		1		R6028	ERD10TJ683		68K 1	
C6209, 6210	ECQV05124JZA	Mylar 50V 0.12	2		R6029, 6033	ERD10TJ562		5.6K 2	
C6212	ECEA1EK4R7	Electrolytic 25V 4.7	1		R6034	ERD10TJ103		10K 1	
C6213	ECKD1H103ZFN	Ceramic 50V 0.01	1		R6035	ERD10TJ332		3.3K 1	
C6214	ECEAOJK470	Electrolytic 6.3V	47 1		R6036	ERD10TJ473		47K 1	
C6215, 6216	ECEA1HKR47	Electrolytic 50V 0.47	2						
C6217	ECKD1H103ZFN	Ceramic 50V 0.01	1				Capacitors		
					C6001	ECKF1H103ZF	Ceramic 50V 0.01	1	
					C6002	ECEA1HK010	Electrolytic 50V	1 1	
		Miscellaneous			C6003	ECEA1CK220	Electrolytic 25V	22 1	
P22	VJPI141	2P Pin Header	1						
	VJP06115		1				Switches		
	VKC0033	Hing	2		S6001-6008	EVQPXR04K	Function Sw.	8	
	VEK0792	5P Connector	1		S6009	ESD14121	Memory Sw.	1	
	VEK0793	8P	1		S6010	ESD14118	Power Sw.	1	
	VEK0794	10P	1						
	VEK0795	12P	1						
							Miscellaneous		
						VJPI107	10P Bottom Entry	1	
					P21	VJPI157	3P Bottom Entry	1	
						KL-02	LED Spacer	8	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		LOADING MOTOR DRIVE		
		CIRCUIT BOARD ASS'Y		
		Integrated Circuit		
IC6401	VCR0014		1	
		Transistors		
Q6401	2SA886V		1	
Q6402	2SD889		1	
Q6403	2SD636	(ORC2021R.S.E)	1	
Q6404,6405	2SB819		2	
Q6406	2SD636		1	
Q6407,6408	2SD1051		2	
Q6409,6410	2SD636		2	
Q6411	2SB641	(OR2SA937)	1	
		Diodes		
D6401	10E1LF		1	
D6402,6403	MA1082A		1	
D6404,6405	MA165		2	
D6406	RD12EB		1	
D6407	HZ2LL-B		1	
		Resistors		
R6401	ERD10TJ333		33K 1	
R6402	ERD10TJ473		47K 1	
R6403	ERD10TJ273		27K 1	
R6404	ERD10TJ223		22K 1	
R6405	ERD10TJ562		5.6K 1	
R6406	ERD10TJ223		22K 1	
R6407,6408	ERD10TJ102		1K 2	
R6409	ERD25TJ471		470 1	
R6410	ERD10TJ102		1K 1	
R6411	ERD25TJ471		470 1	
R6412	ERD25TJ102		1K 1	
R6413	ERD10TJ223		22K 1	
R6415	ERD25TJ471		470 1	
R6416	EVN38CA00853	Variable	5K 1	
R6417	ERQ12HJ3R9		3.9 1	
R6418	ERD10TJ104		100K 1	
R6419	ERD10TJ223		22K 1	
R6420	ERD10TJ473		47K 1	
R6421	ERD25VJ331		330 1	
		Capacitors		
C6401	ECET16R682	Electrolytic 16V	6800 1	
C6404,6405	ECKD1H1032FN	Ceramic 50V	0.01 2	
C6407	ECEA0JK470	Electrolytic 6.3V	47 1	
C6408	ECEA1CK470	Electrolytic 16V	47 1	
C6409	ECEA1CS221	Electrolytic 16V	220 1	
C6410	ECKD1H221KB	Ceramic 50V	220P 1	
		Miscellaneous		
TP6401,6402	VJH00962	Check Point	2	
RY6401	VSY1009	Reley	1	
P19	VJP1148	2P Pin Header	1	
P23	VJP1143	5P Pin Header	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		D.D. CYLINDER DRIVE		
		CIRCUIT BOARD ASS'Y		
		Integrated Circuit		
IC2501	AN6677		1	
		Transistor		
Q2501	2SD636		1	
		Diode		
D2501	10E1		1	
		Resistors		
R2501	ERD10TJ152		1.5K 1	
R2502	ERD10TJ273		27K 1	
R2503	ERD10TJ561		560 1	
R2504	ERD10TJ153		15K 1	
R2505	ERD10TJ471		470 1	
R2506-2508	ERD10TJ470		47 3	
R2509	ERX12ANJR47	Metal	1	
R2510	ERD10TJ823		82K 1	
R2511	ERD10TJ153		15K 1	
		Capacitors		
C2501	ECKD1H472MDN	Ceramic 50V	4700P 1	
C2502	ECEA1CK100	Electrolytic 16V	10 1	
C2503	ECEA1HKR33	Electrolytic 50V	0.33 1	
C2504	ECKD1H103ZFN	Ceramic 50V	0.01 1	
C2505	ECEA1ASS101	Electrolytic 10V	100 1	
C2506-2508	ECEA1HKNR47	Electrolytic 50V	0.47 1	
C2509	ECQM1H103KZW	Mylar 50V	0.01 1	
C2510	ECQM1H333KZW	Mylar 50V	0.033 1	
C2511	ECSF10E3R3KZ	Tatalum 10V	3.3 1	
C2512	ECEA1HKR22	Electrolytic 50V	2.2 1	
C2513-2515	ECEA1HKR22	Electrolytic 50V	0.22 3	
C2516	ECQM1H822KZW	Mylar 50V	8200P 1	
		12P Pin Header		
P001	VJP1147			

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks	Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Jack Panel							
					F6501	XBA1C30NU100	Fuse	1	⚠
		Transistor					SENSOR LAMP C.B.		
Q6501	2SD636		1		PL6551	VAMV0019	Sensor Lamp	1	
		Diodes					TAKEUP DETECTOR C.B.		
D6502	ERC0402E3		1		IC6551	DN838	Hall IC	1	
D6504	ERB81004		1				REMOTE PAUSE/EARPHONE JACK C.B.		
		Resistors							
R6502	ERD25TJ104		100K 1						
R6503,6504	ERD25TJ750		75 2		J6509	VJJ0071	Earphone Jack	1	
R6505	ERD25TJ223		22K 1		J6510	VJJ0069	Remote Control Jack	1	
R6506	ERD25TJ153		15K 1				TAKEUP PHOTO TR C.B.		
R6508	ERD25TJ473		47K 1						
R6509	ERD25TJ223		22K 1						
R6510	ERD25TJ473		47K 1		Q6552	PN150NV	Photo Transistor	1	
R6511	ERD25TJ271		270 1				SUPPLY PHOTO TR C.B.		
		Capacitors							
C6501,6502	ECKD1H103ZFN	Ceramic 50V 0.01	2		Q6551	PN150NV	Photo Transistor	1	
		Miscellaneous							
J6501	VJJ0070	Battery Jack	1				ELECTRICAL PARTS LOCATED ON CHASSIS		
J6502	VJS1163	4P Jack	1						
J6504,6505	VJS1170	BNC Connector	2						
J6507	VJS1081-1	10P Jack	1						
J6508	VJS1172	RCA-DIN Connector	1						
	VJJ0076	Jack Board	1			ESD14118	Power Switch	1	
	VGN1514	Name Plate A	1		S6554	ESD14121	Memory Switch	1	
	VGN1517	Name Plate B	1		S6551	VSS004G	Mode Select Switch	1	
	TJC6320	Fuse Holder	2		S6552	VSH0027	Safety Tab Switch	1	
P25	VJP1149	3P Pin Header	1		S6553	VSI10027	Cassette Down Switch	1	
	VJR0019	Lug Board	1			VJJ0069	Remote Control Jack	1	
	QJT0015	Oval Lug	1		R6553	EVJ4A312B15	Tracking Control 100K	1	
	XTV3+10BFX	Screw	3			VSES02	Battery Meter	1	
	XSS26+8FXS	Screw	2			VEKS0274	Dew Detector Unit	1	
	VMA4120	Bracket	1						
	VMA4197	Bracket	1						
	VJS1141	Housing	1						
	VJS1142	Housing	3						
	VJS1143	Housing	1						
	VJS1146	Housing	1						

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		RF CONVERTER		
		Integrated Circuit		
IC1	AN6395		1	
		Transistors		
Q1, 2	2SD636T/R		2	
Q3, 4	2SC1215R		2	
		Diodes		
D1	1S953		1	
D2	MA27W		1	
D3	RD62E		1	
D4	MA27B		1	
D5, 6	1SS86		2	
D7	MA320		1	
		Resistors		
R1	ERD10TJ333	33K	1	
R2	ERD10TJ103	10K	1	
R3	ERD10TJ331	330	1	
R4	ERD10TJ105	1M	1	
R5	ERD10TJ102	1K	1	
R6	ERD10TJ122	1.2K	1	
R7	ERD10TJ821	820	1	
R8	ERD10TJ471	470	1	
R9, 10	ERD10TJ101	100	2	
R11	ERD10TJ333	33K	1	
R12, 13	ERD10TJ471	470	2	
R14	ERD25VJ222	2.2K	1	
R15	ERD10TJ121	120	1	
R16	ERD25FJ680	68	1	
R17	ERD10TJ101	100	1	
R18	ERD10TJ390	39	1	
R19	ERD10TJ220	22	1	
R20	ERD25TJ682	6.8K	1	
R21	ERD10TJ682	6.8K	1	
R22	ERD10TJ751	750	1	
R23	ERD10TJ682	6.8K	1	
R24	ERD10TJ392	3.9K	1	
R25	ERD10TJ470	47	1	
VR1	EVN38CA00B13	Variable Resistor	1K	1
VR2, 3	EVN38CA00B14	Variable Resistor	10K	2
VR4	EVMG46S05B14	Variable Resistor	10K	1
		Capacitors		
C1	ECEA1CK330	Electrolytic 16V	33	1
C2	ECEA1HK3R3	Electrolytic 50V	3.3	1
C3	ECEA1CK330	Electrolytic 16V	33	1
C5	CX2102PF	Ceramic	1000P	1
C6	ECCD1H150K	Ceramic	15P	1
C7	ECCD1H050K	Ceramic	5P	1
C8	ECCD1H152K	Ceramic	1500P	1
C9	ECEA1EK4R7	Electrolytic 25V	4.7	1
C10	ECCD1H150K	Ceramic	15P	1
C11	ECCD1H680K	Ceramic	68P	1
C12	ECCD1H151K	Ceramic	150P	1
C13	ECCD1H470K	Ceramic	47P	1
C14	ECCD1H270K	Ceramic	27P	1
C15	ECCD1H070D	Ceramic	7P	1 NV-3000-E
C16	ECCD1H221K	Ceramic	220P	1
C17, 18	ECCD1H050C	Ceramic	5P	2
C19	ECEA1EK100	Electrolytic 25V	10	1
C20	ECCD1H020C	Ceramic	2P	1

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
C21	ECCD1H102P	Ceramic	1000P	1
C22	ECEA1CK470	Electrolytic	47	1
C23	ECCD1H0R5CC	Ceramic	0.5P	1
C24	CX2060CC	Ceramic	6P	1
C25	CP20R1VA01	Stator Board		1
C26	ECCD1H180K	Ceramic	18P	1
C27	CX2331K	Ceramic	330P	1
C28, 29	CY2102MES	Ceramic	1000P	2
C30, 31	CY2020MES	Ceramic	2P	2
C32	ECCD1H0R75U	Ceramic	0.75P	1
C33	ECKD1H103PF	Ceramic	0.01	1
C34	ECCD1H221K	Ceramic	220P	1
C35	ECEA1CK470	Electrolytic 16V	47	1
C36	ECCD1H070K	Ceramic	7P	1
C37	ECCD1H102K	Ceramic	1000P	1
VC1	ECV1ZW04X53N	Trimmer		1
C15	ECCD1H220K	Ceramic	22P	1 NV-3000-B
		Coils		
L1	LB162609VU03	Chok Coil		1
L2	FL3HBR2K	Chok Coil		1
L3	LB162609VU03	Chok Coil		1
		Transformers		
T1	VLT0327			1
T2	BRNA010V			1
		Miscellaneous		
	BPC69AV12FYZ	Print Board		1
	VJP1144	6 Pin Connector		1

 **Panasonic**
MATSUSHITA ELECTRIC