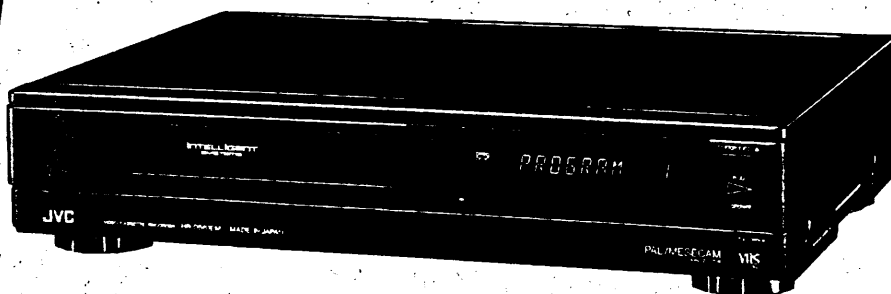
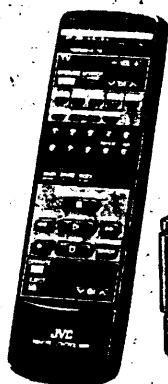


JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER VHS

HR-D561EM



SPECIFICATIONS

GENERAL

Power requirement : AC 110 - 240 V~, 50/60 Hz
Power consumption : 19 W
Temperature : 5°C to 40°C (Operating)
 : -20°C to 60°C (Storage)
Operating position : Horizontal only
Dimensions (WxHxD) : 435 x 94 x 335 mm
Weight : 5.2 kg
Format : VHS PAL standard
Tape width : 12.65 mm
Tape speed : 23.39 mm/sec
Maximum recording time : 240 min. with E-240 video cassette

VIDEO

Signal system : PAL colour and CCIR monochrome signals, 625 lines/50 fields
Recording system : Rotary two-head helical scan system
Input : 0.5 to 2.0 Vp-p, 75 ohms, unbalanced
Output : 1.0 Vp-p, 75 ohms, unbalanced
Signal-to-noise ratio : 43 dB (Rohde & Schwarz noise meter)
Horizontal resolution : 250 lines

AUDIO

Recording system : Longitudinal track
Input : Line: -8 dBs, 50k-ohms, unbalanced
Output level : -6 dBs, high impedance load
Output impedance : Less than 1k-ohm, unbalanced
Frequency range : 70 Hz to 10,000 Hz

TUNER

Tuning system : Voltage synthesized tuner
TV channel storage capacity : 48 positions (+ AUX position "AU")
Channel coverage : VHF 47 - 111 MHz
 : 111 - 300 MHz
 : UHF 470 - 862 MHz
Aerial output : UHF channel 36
 : (adjustable 32 - 40)
 : System G or K (Switchable)

TIMER

Clock reference : Quartz-crystal
Programme capacity : 1-year/8-programme timer
Memory backup time : 3 min. minimum

ACCESSORIES

Provided :
Accessories : Aerial cable
 : Infrared remote control unit
 : "R6/UM-3" battery x 2
 : Plug adapter



Design and specifications subject to change without notice.

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the  symbol and shaded () parts are critical for safety.

Replace only with specified part numbers.

Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
Caution for continued protection against fire hazard.
Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
1) Wires covered with PVC tubing
2) Double insulated wires
3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
1) Insulation Tape 3) Spacers 5) Barrier
2) PVC tubing 4) Insulation sheets for transistors

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

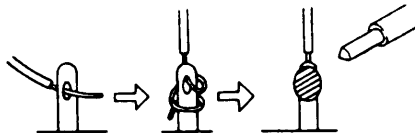


Fig. 1

7. Observe that wires do not contact heat producing parts (heat-sinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

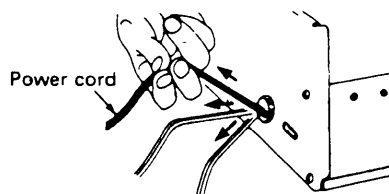


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)

In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector

In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

1) **Connector part number :** E03830-001

2) **Required tool :** Connector crimping tool of the proper type which will not damage insulated parts.

3) **Replacement procedure**

(1) Remove the old connector by cutting the wires at a point close to the connector.

Important : Do not reuse a connector (discard it).

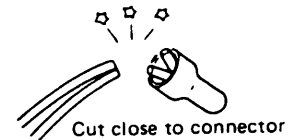


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

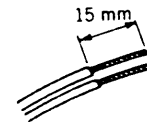


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

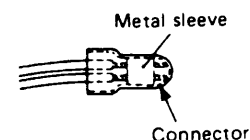


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

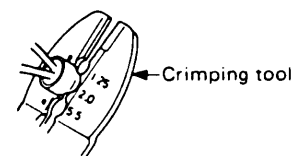


Fig. 6

(5) Check the four points noted in Fig. 7.

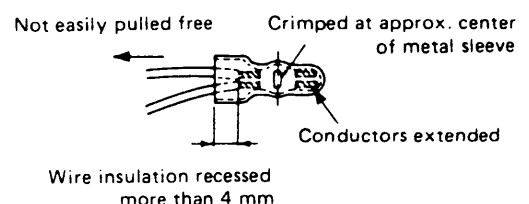


Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

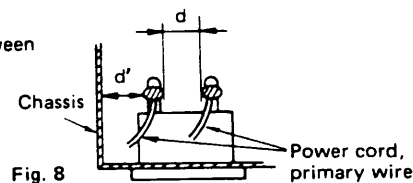
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.



4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method: (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

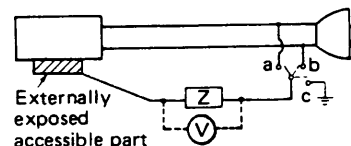


Fig. 9

5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

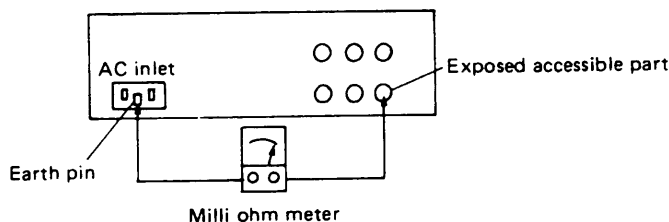


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	$Z \leq 0.1 \text{ ohm}$
Europe & Australia	$Z \leq 0.5 \text{ ohm}$

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	$R \geq 1 \text{ M}\Omega / 500 \text{ V DC}$	AC 1 kV 1 minute	$d, d' \geq 3 \text{ mm}$
100 to 240 V			AC 1.5 kV 1 minute	$d, d' \geq 4 \text{ mm}$
110 to 130 V	USA & Canada	—	AC 900 V 1 minute	$d, d' \geq 3.2 \text{ mm}$
110 to 130 V	Europe & Australia	$R \geq 10 \text{ M}\Omega / 500 \text{ V DC}$	AC 3 kV 1 minute (Class II)	$d \geq 4 \text{ mm}$
200 to 240 V			AC 1.5 kV 1 minute (Class I)	$d' \geq 8 \text{ mm (Power cord)}$ $d' \geq 6 \text{ mm (Primary wire)}$

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	$1 \text{ k}\Omega$	$i \leq 1 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	USA & Canada	$0.15 \mu\text{F}$ and $1.5 \text{ k}\Omega$	$i \leq 0.5 \text{ mA rms}$	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	$2 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$	Exposed accessible parts
		$50 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Other terminals

Table 2 Leakage current specifications for each region

for reference only. Be sure to confirm the precise values for your particular country and locality.

Note: These tables are unofficial and

NOTE: For a technical description, please refer to Technical Guide VTG82063 General.

TABLE OF CONTENTS

Section	Title	Page	Section	Title	Page
	Important Safety Precautions				
	INSTRUCTIONS				
1. DISASSEMBLY AND MECHANISM ADJUSTMENTS			4. EXPLODED VIEWS AND PARTS LIST		
1.1	DISASSEMBLY	1 - 1	4.1	PACKING ASSEMBLY <M1>	4 - 1
1.2	MACHANISM ADJUSTMENTS	1 - 4	4.2	CABINET ASSEMBLY <M2>	4 - 2
1.3	MAIN MECHANISM PARTS	1 - 5	4.3	CHASSIS ASSEMBLY <M3>	4 - 3
1.4	INSPECTION AND MAINTENANCE	1 - 7	4.4	MECHANISM ASSEMBLY <M4>	4 - 4
1.5	MAIN PARTS REMOVAL AND REPLACEMENT	1 - 8	4.5	REMOTE CONTROL UNIT <M5>	4 - 6
2. ELECTRICAL ADJUSTMENTS			5. ELECTRICAL PARTS LIST		
2.1	PREPARATION	2 - 1		SWITCH REGULATOR BOARD ASSEMBLY	
2.2	SWITCHING REGULATOR CIRCUIT	2 - 2		<01>	5 - 1
2.3	TIMER CIRCUIT	2 - 2		MAIN BOARD ASSEMBLY <03><17>	5 - 2
2.4	SERVO CIRCUIT	2 - 3		VIDEO UNIT BOARD ASSEMBLY <05>	5 - 6
2.5	VIDEO CIRCUIT	2 - 4		TUNER / IF BOARD ASSEMBLY <07>	5 - 8
2.6	AUDIO CIRCUIT	2 - 7		AUDIO CONTROL HEAD BOARD <12>	5 - 10
2.7	TUNER / IF CIRCUIT	2 - 7		TIMER / DISPLAY / SW BOARD ASSEMBLY	
3. CHARTS AND DIAGRAMS				<21>	5 - 11
3.1	CIRCUIT BOARD AND LOCATION	3 - 1		UPPER DRUM BOARD <41>	5 - 11
3.2	GENERAL INFORMATION	3 - 2		PRÉ / REC AMP BOARD ASSEMBLY <43>	5 - 11
3.3	BOARD INTERCONNECTIONS	3 - 5		DECK TERMINAL BOARD ASSEMBLY <51>	5 - 11
3.4	VIDEO BLOCK DIAGRAM	3 - 7		LOADING MDA BOARD ASSEMBLY <55>	5 - 12
3.5	PRE / REC BLOCK DIAGRAM	3 - 9		CASSETTE HOUSING BOARD <56>	5 - 12
3.6	SERVO BLOCK DIAGRAM	3 - 11	6. TECHNICAL INFORMATIONS		
3.7	AUDIO BLOCK DIAGRAM	3 - 13	6.1	CPU pin functions	6 - 1
3.8	MECHACON BLOCK DIAGRAM	3 - 15			
3.9	SWITCH REGULATOR & REGULATOR				
	(MAIN) SCHEMATIC DIAGRAMS	3 - 17			
3.10	SWITCHING REGULATOR CIRCUIT BOARD	3 - 19			
3.11	SERVO SCHEMATIC DIAGRAM	3 - 21			
3.12	SERVO (MAIN) CIRCUIT BOARD	3 - 23			
3.13	AUDIO SCHEMATIC DIAGRAM	3 - 25			
3.14	AUDIO (MAIN) CIRCUIT BOARD	3 - 27			
3.15	MECHACON SCHEMATIC DIAGRAM	3 - 29			
3.16	MECHACON (MAIN) CIRCUIT BOARD	3 - 31			
3.17	TERMINAL SCHEMATIC DIAGRAM	3 - 33			
3.18	TERMINAL (MAIN) CIRCUIT BOARD	3 - 34			
3.19	DECK TERMINAL, MODE MOTOR, CAPSTAN				
	MDA AND CASS HOUSING SCHEMATIC				
	DIAGRAMS	3 - 35			
3.20	DECK TERMINAL, LOADING MDA, CASS				
	HOUSING AND A / CTL HEAD CIRCUIT BOARDS	3 - 36			
3.21	MAIN CIRCUIT BOARD	3 - 37			
3.22	VIDEO UNIT & VIDEO (MAIN)				
	SCHEMATIC DIAGRAMS	3 - 39			
3.23	VIDEO UNIT & VIDEO (MAIN)				
	CIRCUIT BOARDS	3 - 41			
3.24	TUNER UNIT SCHEMATIC DIAGRAM	3 - 43			
3.25	TUNER UNIT CIRCUIT BOARD	3 - 45			
3.26	TIMER / DISPLAY / SW SCHEMATIC DIAGRAM	3 - 47			
3.27	TIMER / DISPLAY / SW CIRCUIT BOARD	3 - 49			
3.28	PRE / REC SCHEMATIC DIAGRAM	3 - 51			
3.29	PRE / REC CIRCUIT BOARD	3 - 53			
3.30	REMOTE CONTROL SCHEMATIC AND				
	RF CONVERTER & MIXBOOSTER				
	SCHEMATIC DIAGRAM	3 - 55			

Safety Precautions

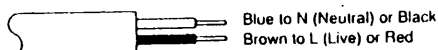
The rating plate and the safety caution are on the rear of the unit.

WARNING — DANGEROUS VOLTAGE INSIDE
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

IMPORTANT

Connection to the mains supply plug in the United Kingdom.

Do not make any connection to the Larger Terminal coded E or Green. The wires in the mains lead are coloured in accordance with the following code:



If these colours do not correspond with the terminal identifications of your plug, connect as follows:
 Blue wire to terminal coded N (Neutral) or coloured Black.
 Brown wire to terminal coded L (Live) or coloured Red.
 If in doubt — consult a competent electrician.

CAUTION

- When you are not using the recorder for a long period of time, it is recommended that you disconnect the power cord from the AC outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the AC outlet prior to connecting or disconnecting any signal lead or aerial.

IMPORTANT

- In addition to PAL B/G and PAL D/K colour television signals, this recorder can also receive SECAM B/G and SECAM D/K colour television signals. SECAM B/G and SECAM D/K colour television signals can be recorded and played back in colour as far as this same recorder is used for recording and playback.
- SECAM B/G and SECAM D/K colour television signals recorded on this recorder produce monochrome pictures if played back on another PAL or SECAM recorder.
- SECAM B/G and SECAM D/K colour television signals recorded on another PAL or SECAM recorder produce monochrome pictures if played back on this recorder.
- This recorder cannot be used in France. Use in France a recorder which is capable of receiving SECAM L colour television signals.
- SECAM L prerecorded cassettes or recordings made with a SECAM L video recorder produce monochrome pictures when played back on this recorder.

IMPORTANT: It may be unlawful to record or play back copyrighted material without the consent of the copyright owner.



- Only cassettes marked "VHS" can be used with this video recorder.
- HQ VHS is compatible with existing VHS equipment.

Omkopplaren OPERATE på denna apparat är sekundärt kopplad och skiljer inte apparaten från nätet i läge OPERATE OFF.

The OPERATE button does not completely shut off mains power from the unit, but switches operating current on and off.

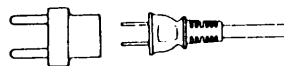
BEMÄRK: I stilling OFF er apparatet stadig forbundet med lysnettet. Hvis det ønskes fuldstændig afbrudt skal netledningen trækkes ud.

This unit is produced to comply with Directives 76/889/EEC, 82/499/EEC, 87/308/EEC and Standard IEC Publ. 65.

POWER SYSTEM

This set operates on voltage of AC 110 – 240 V~, 50/60 Hz with automatic switching.

Use the plug adapter (provided) depending on the type of your AC wall outlet.



Contents

Controls, Indicators, And Connectors.....	3
Getting To Know Your Video Recorder.....	5

Getting Started With Your Video Recorder

Making The Right Connections.....	7
Handling Video Cassettes.....	9
Setting The Clock.....	10
Setting The Tuner.....	11

Basic Operation Of Your Video Recorder

Playback.....	13
Recording.....	14
Timer-Recording.....	15
Mode Displays — What They Mean.....	17

Advanced Functions On Your Video Recorder

For Playback.....	18
For Recording.....	19
For Tape Access.....	20
For Timer-Recording.....	21
For Editing.....	22

Managing Your Video Recorder

Special Operations.....	24
List Of Display Panel Messages.....	25
Precautions.....	26
In Case Of Difficulties.....	27
Specifications.....	29
Special Note On Head Cleaning.....	29

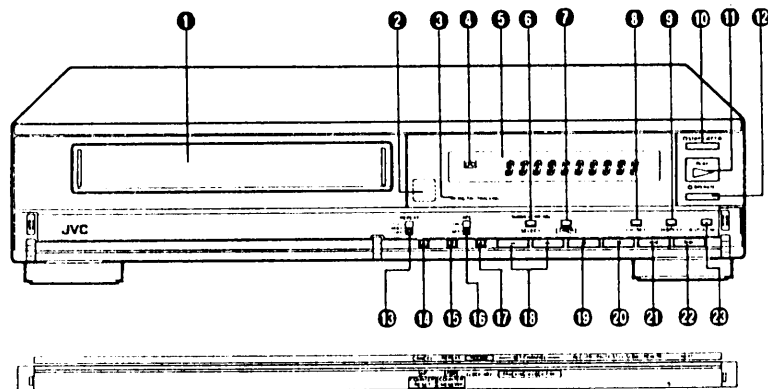
How To Use This Instruction Manual

This instruction manual has been designed with both new and experienced users in mind. The first half offers detailed, step-by-step instructions for setting up your video recorder, and on using its basic functions. The second half provides instructions on the many other functions available on your video recorder. So just by following the instructions on the "Getting Started" and "Basic Operation" sections of this manual, you can master all of your recorder's basic functions, including timer-recording. Once you're sufficiently familiar with basic operation, or if you're already an experienced video user, you can move on to the more advanced functions introduced on the following pages. Related features have all been clustered together for easy reference, and their categories (playback, recording, timer, etc.) are easily recognisable by the symbol appearing in the page header. If you ever need to refer to another page for instructions or information, you will be told so by a π mark pointing to the page number.

Remember, you must use your video recorder correctly to fully enjoy it. Please use this manual effectively. It's the surest and quickest way to unlock the full potential of your new JVC video recorder.

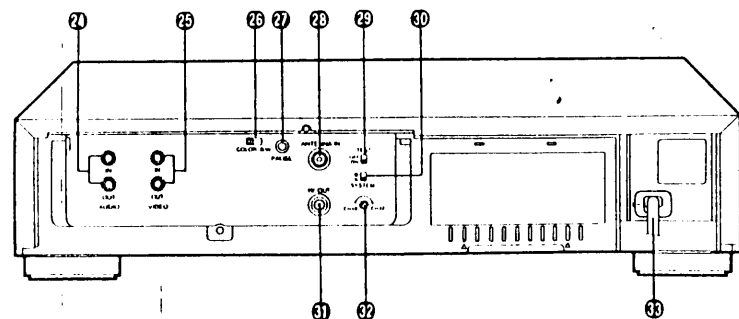
Controls, Indicators, And Connectors

Front Panel



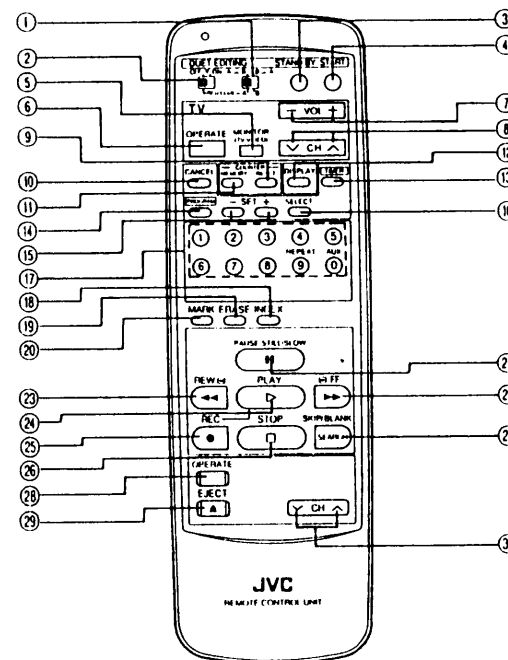
- | | | |
|--|--|---|
| 1 Cassette loading slot | 10 STOP/EJECT button | 17 PROGRAM/CLOCK ADJ. button |
| 2 Infrared beam sensor window | 11 PLAY button | 18 SET/CHANNEL/TRACKING/ V.LOCK buttons |
| 3 DIGITAL TRACKING indicator | 12 OPERATE button with LED indicator | 19 REC/ITR button |
| 4 "Cassette loaded" indicator | 13 REPEAT (FULL/INDEX/OFF) switch | 20 PAUSE/STILL/SLOW button |
| 5 Message display panel <i>see</i> p. 17, 25 | 14 CANCEL/SKIP/COUNTER RESET button | 21 REW (Rewind) button |
| 6 SUMMER TIME ADJ./SELECT button | 15 REPEAT/STORE/COUNTER MEMORY button | 22 FF (Fast Forward) button |
| 7 TIMER button | 16 AFC (Auto Frequency Control) switch | 23 DISPLAY OFF button |
| 8 CH SET button | | |
| 9 DISPLAY button | | |

Back Panel



- | | | |
|----------------------------|-------------------------|---|
| 24 AUDIO IN/OUT connectors | 28 ANTENNA IN terminal | 30 RF output channel adjustment screw <i>see</i> p. 8 |
| 25 VIDEO IN/OUT connectors | 29 TEST switch | 31 Power cord |
| 26 COLOR B/W select switch | 30 SYSTEM select switch | |
| 27 PAUSE terminal | 31 RF OUT terminal | |

Wireless Remote Control



A/B Code Changing and Duet Editing

- 1 RCU CODE A/B switch *see* p. 23
- 2 DUET EDITING ON/OFF switch *see* p. 23
- 3 DUET EDITING STAND BY button *see* p. 23
- 4 DUET EDITING START button *see* p. 23

TV Operation

(designated TV models only)

- 5 MONITOR (TV/VIDEO) button
- 6 OPERATE button
- 7 TV VOL \rightarrow / \leftarrow button
- 8 TV CH button

Timer, Tuner, and Tape Counter

- 9 COUNTER RESET button *see* p. 19, 20
- 10 CANCEL button *see* p. 21
- 11 COUNTER MEMORY button *see* p. 18, 20
- 12 DISPLAY button *see* p. 19
- 13 TIMER button *see* p. 16

Timer Programming

- 14 PROGRAM button *see* p. 15
- 15 SET \rightarrow / \leftarrow buttons *see* p. 15
- 16 SELECT button *see* p. 15

Special Functions

- 17 Multi-Purpose Numeric Keys

Tape Access

- 18 INDEX button *see* p. 20
- 19 ERASE button *see* p. 20
- 20 MARK button *see* p. 20

Tape Mode Control

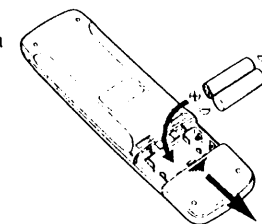
- 21 PAUSE/STILL/SLOW button
- 22 FF button
- 23 REW button
- 24 PLAY button
- 25 REC button
- 26 STOP button
- 27 SKIP/BLANK SEARCH button *see* p. 18, 20

Other Operations

- 28 OPERATE button
- 29 EJECT button
- 30 CH button

Installing Batteries

- 1 Slide the battery compartment cover in the direction of the arrow.
- 2 Insert 2 "R6/UM-3" batteries (provided) in the correct directions.
- 3 Replace the cover.



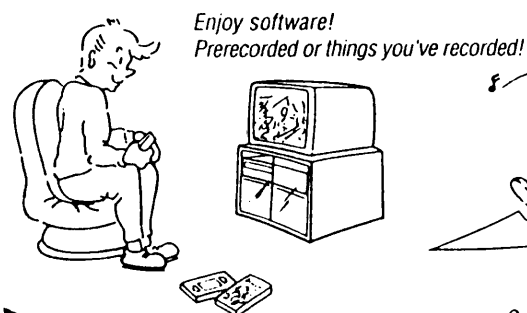
How To Use

The remote control can operate most of your video recorder's functions, as well as basic functions of designated JVC TV sets.

- Point the remote control at the sensor window.
- The maximum operating distance of the remote control is about 8 m.

Getting To Know Your Video Recorder

The 3 Basic Ways Of Using Your Video Recorder

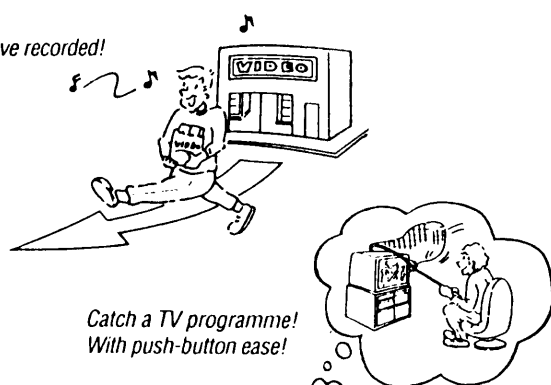


Playback

With the video recorder properly hooked-up to your TV set, viewing videos is as easy as pushing the Play button. Prerecorded VHS software is available just about anywhere, and your video recorder will let you enjoy it all. And, of course, you can enjoy those programmes you've recorded yourself too.



Record TV programmes while you're away. Watch TV programmes when you want.



Recording

Just press the Record and Play buttons together on your remote control. The recorder will record whatever it is that you're watching. In other words, you can instantly "catch" a TV programme in progress to see it again later, show it to someone else, or keep it as part of your video library. Recording is possible for 4 hours on a single E-240 cassette.



Timer-Recording

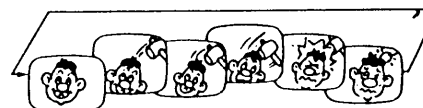
By using the built-in timer, you can set your video recorder to record TV programmes for you while you're asleep, while you're away, or while you're doing something else. Then you can watch those programmes later, whenever it's convenient, whenever you want. This is what's called "timeshifting", and now you can do it the JVC way.

Some Other Functions On Your Video Recorder



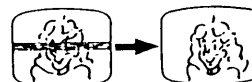
"Message" Display Panel

The video recorder "talks" to you from its message display panel. It's easy to understand what the recorder is doing at any time — a friendlier way to interact with your video deck.



Repeat Playback

Automatic repeated playback of the whole tape or a programme segment. Lets you enjoy those favourite scenes and favourite songs again and again.



Digital Tracking

Automatically controls video tracking to maintain the best video picture, even with tapes with excessive tracking variations. A must for rental software viewing.



Auto Head Cleaner

A built-in head cleaner automatically cleans the video heads and head drum whenever a tape is loaded or unloaded to reduce head clogging.



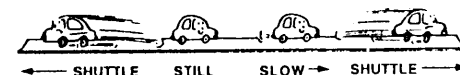
Index Search

Zooms to the index code number you specify. Easy location of index-coded programmes at the touch of a button. Index codes are automatically marked by the recorder at the beginning of each recording. With index mark/erase, you can also add or delete index codes as you wish.



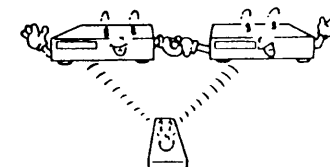
Blank Search

Lets you find the beginning of a non-recorded section automatically when you want to record on a partially-recorded tape. No more blind searching. Automatically displays the tape's remaining time too.



Still/Slow/Shuttle Search

Lets you stop the action or slow it down for a closer look at fast-moving sequences. Search for a specific scene at high speed in either direction.



Duet Editing

Synchronized editing control over two JVC video recorders using one remote control.

Making The Right Connections

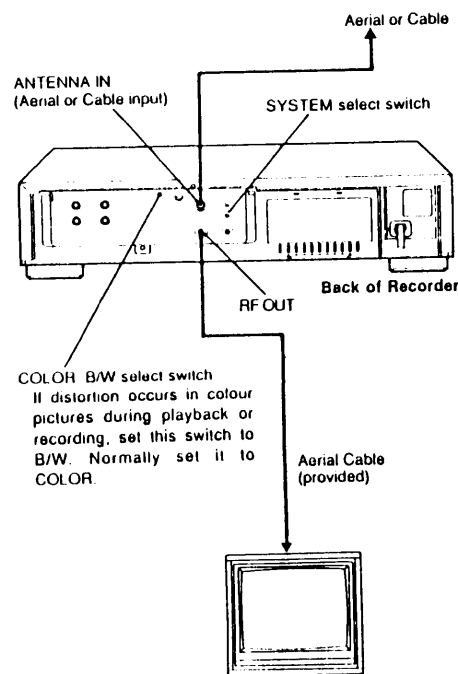
It's essential that your video recorder be properly hooked up for proper results. Follow these steps carefully. THESE STEPS MUST BE COMPLETED BEFORE ANY VIDEO OPERATION CAN BE PERFORMED.

A RECORDER-TO-TV CONNECTION

RF CONNECTION

For TV sets without AV input terminals:

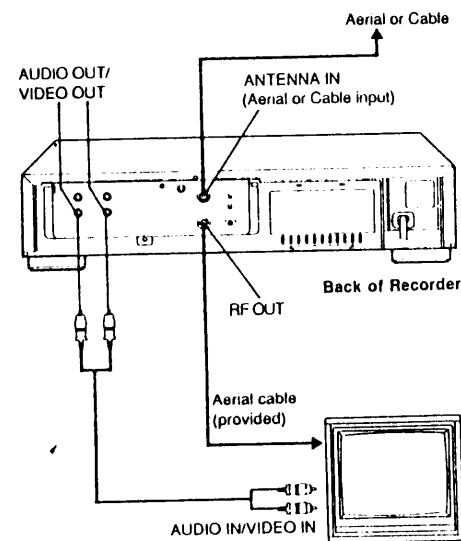
- 1 Connect the TV aerial cable to the recorder.
- 2 Connect the recorder to the TV's aerial terminal.



AV CONNECTION

For TV sets with AV input terminals:

- 1 Connect the aerial, recorder and TV as per "RF CONNECTION".
- 2 Connect the recorder to the TV's AV-IN terminals.



B SELECT TELEVISION SYSTEM

Set the SYSTEM select switch to the appropriate position according to your TV system. (Refer to the chart below.)

Major countries	Colour TV broadcast system	Switch position
Singapore, Thailand, Malaysia, Indonesia, Qatar, United Arab Emirates	PAL B/G	G
Iran, Saudi Arabia, Morocco	SECAM B/G	
China, Mongolia	PAL D/K	K
Bulgaria, Czechoslovakia, Hungary, Poland, Rumania, U.S.S.R.	SECAM D/K	

C ADJUST VIDEO CHANNEL (UHF 36)

With an RF connection, the video recorder sends picture and sound signals through the connecting cable to your TV on UHF channel 36. Fine-adjust the RF converter to match your TV.

Test Signal

- 1 Turn on the recorder.
- 2 Set the TEST switch to ON.
- 3 Set your TV to UHF channel 36 and fine-adjust it until you bring in the two vertical white bars on the screen most clearly.
- 4 Reset the TEST switch to OFF.



NOTE:

If some interference noise is seen on the screen because of broadcasts on neighbouring channels, it is necessary to shift the video channel from UHF channel 36. This is possible for UHF channels 32 through 40. Consult your JVC dealer about making this adjustment.

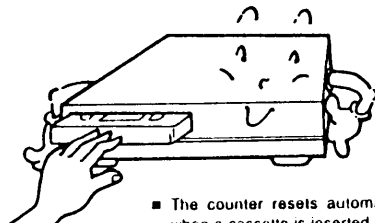
IMPORTANT:

To operate the recorder with your TV using an RF connection, it is always necessary to set your TV's channel to UHF channel 36 (or adjusted channel). With an AV connection, set the TV to the VIDEO (or AV) mode.

Handling Video Cassettes

A LOADING A CASSETTE

- 1 Insert a cassette with its label side facing you.
- If the cassette is not loaded firmly it will be ejected.



B UNLOADING A CASSETTE

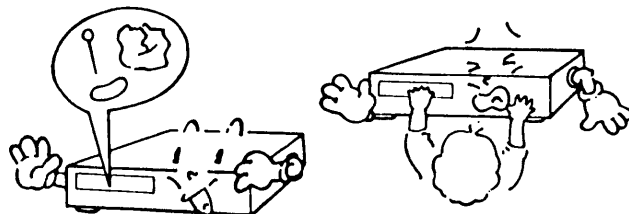
- 1 Press EJECT.
- If the cassette will not eject, check to see if "TIMER" is displayed on the message display panel. If it is, press the TIMER button to turn it off.

NOTES:

- Be sure to insert the cassette firmly into the slot; otherwise it will be automatically ejected.
- The automatic loading mechanism will operate only when the cassette is inserted correctly.

WARNING

- Do not insert fingers or foreign objects into the cassette loading slot since this could lead to injury or damage to the mechanism. Be especially careful with children.
- Do not try to pull out a cassette once automatic loading has started.



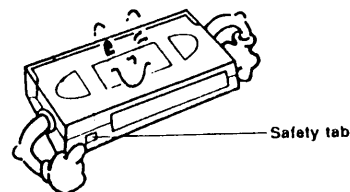
Usable Cassettes And Their Recording Times

This video recorder can record on regular VHS and Super VHS cassettes. However, it will record and play back regular VHS video signals only. It is not possible to play back a recorded Super VHS tape.

Type of Cassette	Recording/Playback Time
E-30	30 minutes
E-60	1 hour
E-90	1 hour, 30 minutes
E-120	2 hours
E-180	3 hours
E-240	4 hours

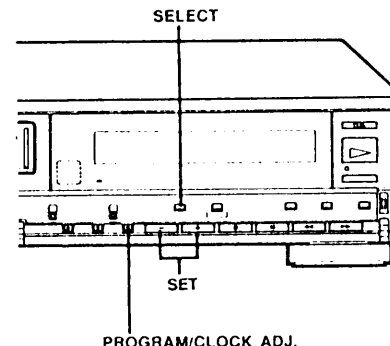
Accidental Erasure Prevention

To prevent accidental recording on a recorded cassette, remove its safety tab. To record on it later, cover the hole with adhesive tape.



Setting The Clock

Since your video recorder bases all of its timer recording start and stop "decisions" on the time kept by its built-in clock, accurate setting of this clock is crucial for proper timer-recording results.

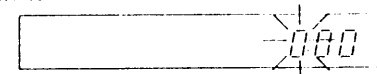


A TURN ON THE VIDEO RECORDER

- 1 Press OPERATE.

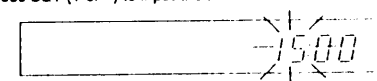
B START CLOCK SETTING

- 1 Press PROGRAM/CLOCK ADJ. until the display shows the Clock Set mode.



C INPUT THE TIME

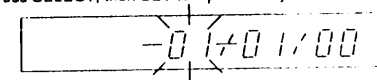
- 1 Press SET (+ or -) to input the hour.



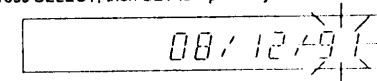
- 1 Press SELECT, and then SET (+ or -) to input the minute.

D INPUT THE DATE

- 1 Press SELECT, then SET to input the day.



- 1 Press SELECT, then SET to input the month.
- 1 Press SELECT, then SET to input the year.



E START THE CLOCK

- 1 Press PROGRAM/CLOCK ADJ.

TO MAKE CORRECTIONS

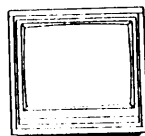
While in the Clock Set mode, use SELECT to advance through to the item you wish to correct. Input the new time or date with SET.

NOTE:

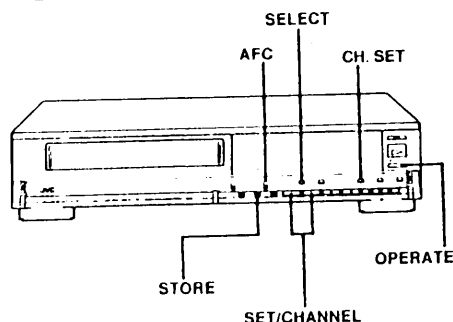
- If the day and month data is invalid (such as 31st April), the month digits are cleared automatically and the day digits will blink. Input again.
- If the year digits are automatically cleared when the PROGRAM/CLOCK ADJ. button is pressed in step 8, it is possible that you have input 29th February for a non-leap year. The day digits will blink. Input again.
- For quick "summer time" (Daylight Saving Time) adjustment, see p. 24.

Setting The Tuner

The procedure introduced here lets you assign receivable channels in your area to channel positions on your video recorder's tuner. Once stored, these can be accessed with the CHANNEL ∇/Δ button. During channel scanning, empty tuner channel positions will be skipped so you won't have to go through any "blank" channels to get to the one you want.



POWER ON;
SELECT VIDEO CHANNEL
(OR AV MODE)



Available channels in each band

Band Indicator	Channels
1	E2 - E4 S1 - S3, M1 X, Y, Z, S1
3	M2 - M10 S2 - S10 E5 - E12 U1 - U10 S11 - S12 (Morocco: M4 - M10)
U	E21 - E69

A TURN ON THE RECORDER

- 1 Press OPERATE.

PR 1

B ACCESS THE TUNER

- 2 Press CH.SET.

STORED 1
↓
BAND 1 05

Alter 5 seconds

- This indicates that the channel corresponding to band 1 and tuning voltage 05 is stored in channel position 1 (Initial setting).

C SELECT THE BAND

- 1 Press SELECT.
- 2 Press SET to select "1", "3", or "U".

"1": VHF band
"U": UHF band

- For available channels in each country, refer to the chart on the left.

BAND 3 00

Band indicator

Tuning voltage giving a rough reference of where tuning is being performed in the corresponding band.

D SEARCH FOR RECEIVABLE CHANNELS

- 1 Press SELECT.
- 2 Keep SET pressed until the desired broadcast is detected.

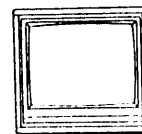
BAND 3 30

Tuning voltage indicator will count down or up.

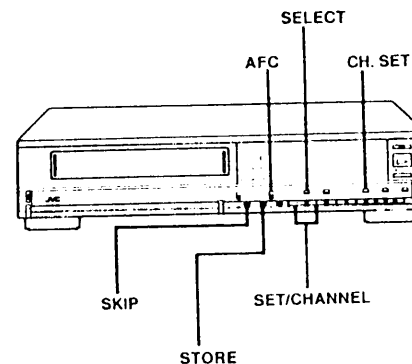
E SELECT A TUNER POSITION

- 1 Press SELECT.
- 2 Press SET to select the tuner channel position where you wish to store that broadcast.

SKIPPED 5



POWER ON;
SELECT VIDEO CHANNEL
(OR AV MODE)



F STORE THE CHANNEL

- 1 Press STORE.

STORED 5
↓
BAND 3 30

The band and tuning voltage corresponding to the stored broadcast are displayed.

G CONTINUE

- 10 Repeat steps 4 through 9 for other receivable broadcasts.

H TO CANCEL CHANNEL SET MODE

- 11 Press CH.SET.

NOTES:

- If you don't want to store the broadcast detected in step 6, simply keep SET pressed to detect another broadcast.
- Normally set the AFC switch to ON. If you wish to receive distant or weak broadcasts as well, set it to OFF.

TO DELETE STORED CHANNELS

First turn on the recorder.

- 1 Press CHANNEL to select the channel position you want to skip. (e.g. PR. 10)
- 2 Press CH. SET.

STORED 10
↓
BAND 1 26

Alter 5 seconds

- 3 Press SKIP.

SKIPPED 10
↓
BAND 1 26

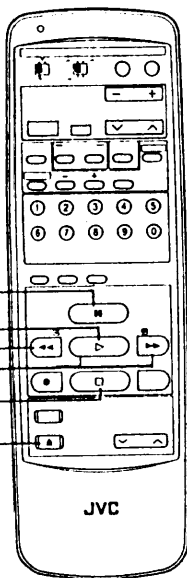
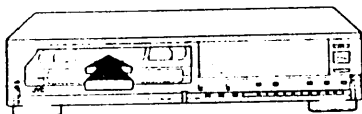
- This indicates that the channel corresponding to band 1 and tuning voltage 26 has been deleted from channel position 10.

▶ Playback

The easiest, most basic operation possible with your video recorder is tape playback. Already recorded signals on a video tape are read by your video recorder and displayed on your TV just like a TV programme.



POWER ON;
SELECT CHANNEL
UHF 36 (OR AV MODE)



PAUSE/STILL/SLOW

PLAY

REW

FF

STOP

EJECT

A TURN ON THE RECORDER

- 1 Insert a cassette.
 - The recorder power will come on automatically.
 - If the safety tab on the cassette is removed, playback will start automatically.

B TO START PLAYBACK

- 2 Press PLAY.

C TO STOP PLAYBACK

- 3 Press STOP.

D TO REWIND OR FAST-FORWARD

- 1 Press REW to rewind the tape.
- 2 Press FF to fast-forward the tape.
 - Press STOP to stop rewind or fast-forward.

E TO EJECT THE TAPE

- 1 Press EJECT.

High-Speed Forward And Reverse Search

During Playback:

- 1 Press FF for high-speed forward search.
- 2 Press REW for high-speed reverse search.
- 3 Press PLAY to resume normal playback.
 - For short searches, keep FF or REW pressed for more than 2 seconds. When released, normal playback will continue.

Still Playback And Frame Advance

During Playback:

- 1 Press PAUSE/STILL/SLOW to view a still picture.
- 2 Press again to advance the picture frame by frame.
- 3 Press PLAY to resume normal playback.

Slow Motion

During Playback:

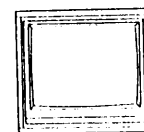
- 1 Press PAUSE/STILL/SLOW for 2 seconds.
- 2 Press again to stop the picture.
- 3 Press PLAY to resume normal playback.

NOTES:

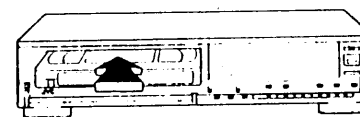
- The recorder automatically stops when still continues for more than 5 minutes.
- If the still picture is unstable (vertical jitter) use the recorder's V. LOCK buttons to correct the picture.
- During search playback, some noise bars will appear.
- If noise bars appear during playback, correct using manual tracking. (p.18).
- There is no audio during search, still, frame-by-frame, or slow motion playback.
- The recorder automatically rewinds when the end of the tape is reached.

● Recording

TV signals being received by the recorder's built-in tuner can be recorded onto a video tape. This is realtime video recording.



POWER ON;
SELECT CHANNEL
UHF 36 (OR AV MODE)



A TURN ON THE RECORDER

- 1 Insert a cassette with the safety tab in place.
 - The recorder power will come on automatically.

B CHOOSE A PROGRAMME

- 2 Press CH or the numeric keys to select the channel you wish to record.

C TO START RECORDING

- 3 Press REC and PLAY simultaneously.

D TO PAUSE RECORDING

- 1 Press PAUSE/STILL/SLOW.
- 2 Press PLAY to resume recording.

E TO STOP RECORDING

- 3 Press STOP.

To Watch Another Programme While Recording

During Record:

- 1 Use the channel controls on the TV to select the other channel you wish to view.
 - The programme selected with the TV channel controls will appear on the TV screen while the one selected with the video recorder's channel controls will be recorded on the tape.

Numeric keys

PAUSE/STILL/SLOW

PLAY

REC

STOP

CH

JVC

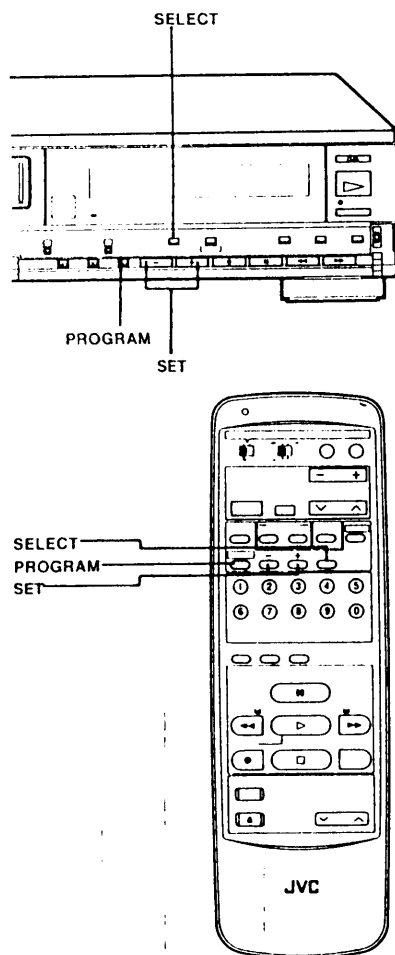
NOTES:

- To start recording with the recorder's REC/ITR button, press it once on its own. Pressing REC/ITR more than once activates the Off-Timer. (p.19).
- After pause, when recording is resumed, a few frames recorded before the pause may be overlapped by the new recording. This is meant to reduce picture distortion and is not a malfunction.
- The recorder automatically stops when record-pause continues for more than 5 minutes.
- If the Record button does not work, check to see if the cassette's safety tab has been removed.
- The channel cannot be changed while recording is in progress. To change the channel, engage the record pause mode, then change the channel.
- The recorder automatically rewinds when the end of the tape is reached during recording.



Timer-Recording

Timer-recording is one of the most useful functions of your video recorder, and, if you don't understand it, it can be one of the most complicated too. Please read the following instructions to understand how the built-in 1-year/8-event programmable timer can be used to record TV shows while you are away or sleeping. The video recorder's message display panel will conveniently guide you along each step of the way. Make sure that the message display panel shows the correct time. **TIMER PROGRAMMING IS NOT POSSIBLE UNLESS THE CLOCK HAS BEEN SET.**



A LOAD A CASSETTE

- 1 Insert a cassette with the safety tab in place.
 - The recorder power will come on automatically.

B ACCESS THE TIMER PROGRAM

- 2 Press PROGRAM.
 - You are ready to input data into Program No. 1.
 - To change the program number, press SET.

PROGRAM 1

C INPUT THE START TIME

- 3 Press SELECT, and then SET to input the hour.
- 4 Press SELECT, and then SET to input the minute.

START 12:00

D INPUT THE STOP TIME

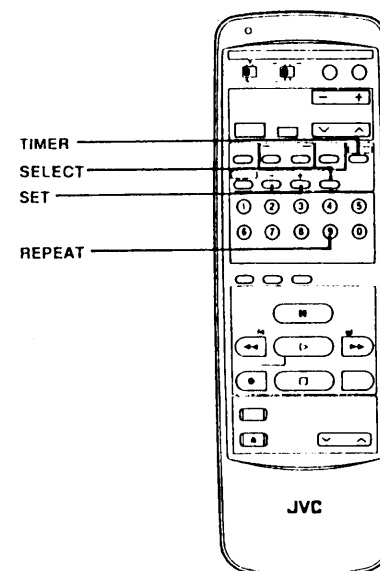
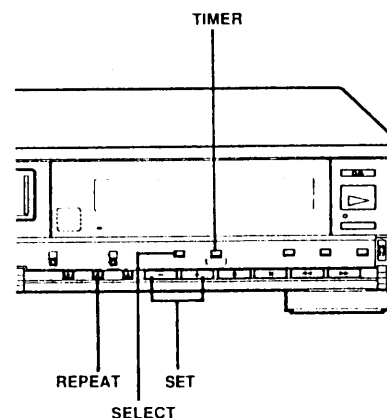
- 5 Press SELECT, and then SET to input the hour.
- 6 Press SELECT, and then SET to input the minute.

STOP 13:00

E INPUT THE DATE

- 7 Press SELECT, and then SET to input the day.
- 8 Press SELECT, and then SET to input the month.

DATE 04/12



F INPUT THE CHANNEL NUMBER

- 9 Press SELECT, and then SET to input the channel.

PR 10

G END ONE PROGRAM

- 10 Press SELECT.
 - The current program number will appear and blink.
 - To make corrections, advance with SELECT to the item you wish to change and input new data with SET.
 - If you need to set another program, press SET and repeat steps 3 through 10.

H SET TO TIMER MODE

- 11 Press TIMER.
 - The recorder will enter the timer mode and power will go off.
 - Press TIMER again to release the timer mode.

Variations In Step E (Weekly Program)

This function lets you set the recorder to timer-record at the same time on the same day every week. Use it to record weekly serials.

- First press REPEAT and then enter the date.

REPT 04/12

Variations In Step E (Daily Program)

This function lets you set the recorder to timer-record at the same time everyday. Use it to record daily serials.

- To record a daily serial starting on the day of setting, press REPEAT twice and then press SELECT until the display changes to channel setting mode.
- To record a daily serial starting on a certain day, press REPEAT twice and then enter the date.

DAILY 04/12

NOTE:

The REPEAT button rotates the date set mode among DATE, REPT, and DAILY.

Any questions? see p.21.

Mode Displays — What They Mean

Message Display Panel

The operation mode is displayed on the recorder's display panel automatically. Displayed messages are designed to be self-explanatory. Here are some of the more common displays:

DISPLAY	MODE	DISPLAY	MODE
PLAY	Play	PAUSE (with channel number)	Record-Pause
STILL	Still	FWD SEARCH	Forward Search
FF	Fast-Forward	REV SEARCH	Reverse Search
REW	Rewind	FWD SLOW	Forward Slow
REC (with channel number)	Record	EJECT	Eject
TIMER REC	Timer-Recording	STOP	Stop

For a more comprehensive list, see p.25.

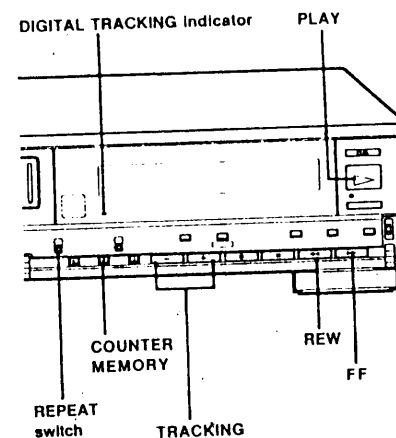
On-Screen Display

- The record-pause mode is also displayed on the TV screen in the form of a white horizontal bar.
- The bar reduces in size to let you know how long the record-pause mode has continued.
 - The record-pause mode is automatically released after about 5 minutes.



▶ For Playback

Take advantage of special functions possible with the recorder's controls or the remote control.



Repeat Playback (Recorder)

- Your video recorder can automatically play back the whole tape or an index-marked portion 5 times repeatedly.
- Set the REPEAT switch to FULL or INDEX.
 - For Index Repeat playback, locate the index code at which you wish to start playback. (Index Search, see p.20)
 - Press PLAY. Repeated playback will start. After repeating 5 times consecutively, playback will stop.
 - Be sure to reset the REPEAT switch to OFF before pressing the PLAY button again; otherwise repeat playback will resume.

Manual Tracking (Recorder)

Your video recorder is equipped with automatic tracking control; the DIGITAL TRACKING indicator lights or blinks when automatic tracking is on. If you wish to adjust tracking manually during playback:

- Press TRACKING (+ and -) simultaneously for manual override.
 - The DIGITAL TRACKING indicator will go out
- Press TRACKING (- or +) to adjust tracking when required.
- Press TRACKING (+ and -) simultaneously to return to automatic tracking.

To adjust tracking during slow motion, simply press TRACKING (- or +) to obtain the best picture.

Memory Play (Recorder and Remote Control)

For automatic start of playback after tape is rewound:

- Press REW.
 - Press PLAY within 2 seconds.
- For automatic power off after tape is rewound:
- Press REW.
 - Press OPERATE within 2 seconds.

Memory Play (Recorder and Remote Control)

For automatic start of playback beginning at counter position "0:00:00":

- Press COUNTER MEMORY.
- Press REW (or FF).
- Press PLAY within 2 seconds.

Memory Eject (Remote Control)

For automatic tape eject after tape is rewound:

- Press REW.
- Press EJECT within 2 seconds.

Skip Search (Remote Control)

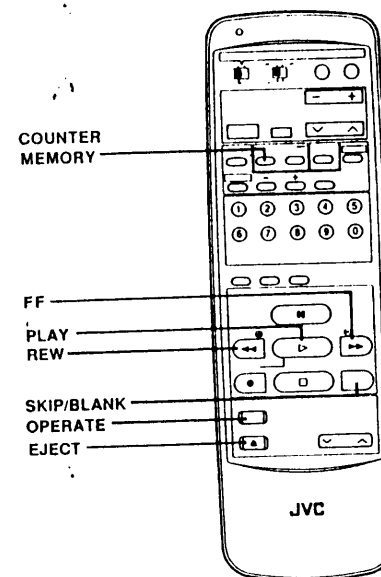
Your recorder offers a simple way of skipping over unwanted sections of recorded TV programmes.

During Playback:

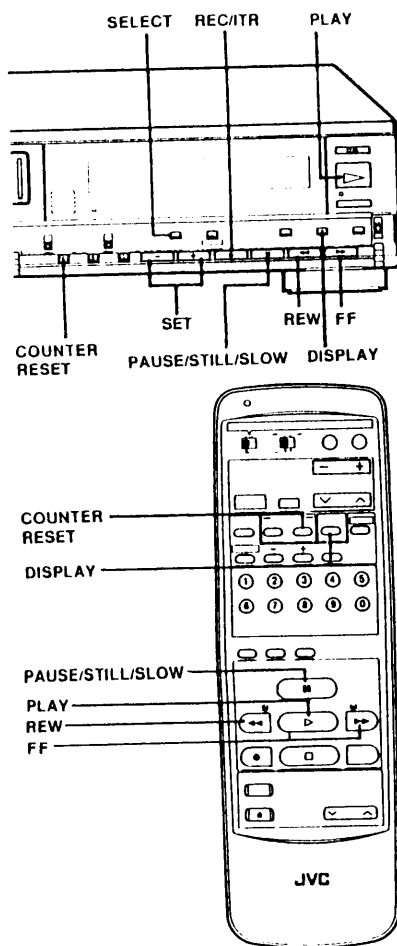
- Press SKIP/BLANK from 1 to 4 times. This fast-motions through 30-sec. to 2-min. of tape.
 - Playback resumes automatically.
 - Press PLAY to cancel a Skip Search midway.

NOTE:

When a new tape is inserted, the recorder enters the automatic tracking mode automatically.



For Recording



NOTES:

- With Retake, rainbow noise may occur in the rewind and re-recorded section.
- The remaining time is inaccurate while the display is blinking. When blinking stops, the remaining time is shown.

Instant Timer Recording (Off Timer) (Recorder)

You can start a recording and then set the recorder to shut off automatically after a set duration.

During Record:

- 1 Press REC/ITR (on the recorder). A "REC 0:30" indication appears, advising that power will switch off after 30 minutes.
- 2 Press REC/ITR again to delay the off time by 30-minute increments (up to 4 hours).
 - For a more precise setting, use the SELECT/SET buttons to set the exact time required (possible up to 4 hours and 59 minutes).

Retake (Recorder and Remote Control)

You can cut out unwanted parts of a TV programme while you're recording it.

During Record:

- 1 Press PAUSE/STILL/SLOW.
- 2 Press FF or REW for normal-speed search in the corresponding direction.
 - Release to return to Record-Pause mode.
- 3 Press PLAY when you wish to resume recording.

Remaining Tape Time Indication (Recorder and Remote Control)

When you need to know the tape's remaining time.

- 1 Press DISPLAY until "REMAIN" appears. Approximate remaining tape time is displayed.
- 2 Press COUNTER RESET and then start recording.
 - During Record, the remaining time display is shown only for 5 seconds, and then returns to the "REC" indication.

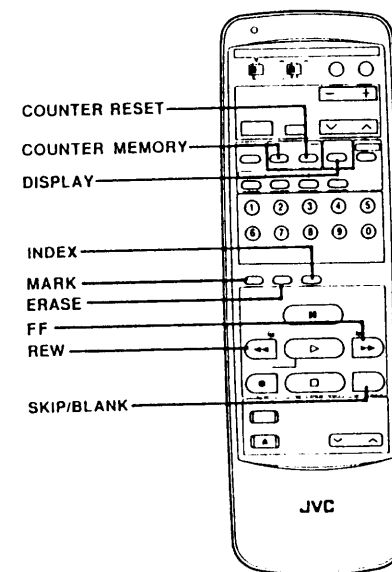
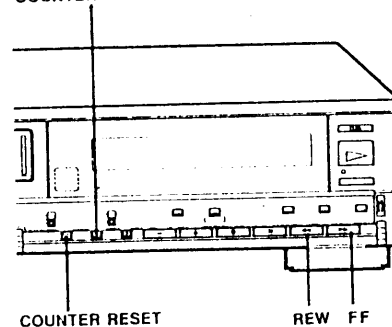
Elapsed Recording Time Indication (Recorder and Remote Control)

When you need to know the exact time of a recording.

- 1 Press DISPLAY until a counter reading appears.
- 2 Press COUNTER RESET and then start recording.
 - The counter will be reset to "0:00:00", and the display will be replaced by the Record mode display after 5 seconds.
- 3 Press DISPLAY when you want to know the elapsed recording time.

For Tape Access

COUNTER MEMORY



NOTES:

- Index codes cannot be marked or erased if the cassette's safety tab is removed. *rx* p.9.
- Press PLAY or STOP to cancel Index Search or Blank Search.
- If the end of the tape is reached during Index Search or Blank Search, the mode is cancelled and the tape is rewound to the beginning.
- When a fully recorded tape is used for re-recording new material, Blank Search can be used to detect the end of the new material.

Counter Memory (Recorder and Remote Control)

During Playback:

- 1 Press COUNTER RESET (with a counter reading on the display) at a point you wish to locate later.
 - The counter will read "0:00:00".
- 2 Press COUNTER MEMORY.
 - "M" will appear in front of the counter digits.
- 3 When you wish to return to that point, press STOP and then press REW.
 - The tape will rewind and stop at about "0:00:00" automatically.
- 4 To cancel the Counter Memory mode, press COUNTER MEMORY.

Index Search (Remote Control)

This function gives you quick access to any one of 9 index codes in either direction. Your recorder automatically marks index codes at the beginning of each recording. You can manually mark and erase index codes as well.

During Playback or Stop:

- 1 Press INDEX. "INDX 1" will be displayed.
 - If you wish to access index codes 2 through 9, press INDEX repeatedly until the correct index number is displayed.
- 2 Press FF or REW. Index Search will start in the corresponding direction.

Manual Index Mark/Erase (Remote Control)

TO MARK

During Playback or Record:

- 1 Press MARK. The recorder will mark an index code at that location.

TO ERASE

During Playback or Still:

- 1 Press ERASE. The recorder will fast-forward to the nearest index code and delete it.

Blank Search (Remote Control)

This function lets you quickly locate the blank portion of a partially recorded tape.

During Stop:

- 1 Press SKIP/BLANK.
 - The recorder automatically fast-forwards or rewinds to the end of the recorded portion of tape, and stops.
 - The tape's remaining time is automatically displayed. Press DISPLAY to return to the realtime counter display.



For Timer-Recording

Error Messages

The following error messages may appear on the message panel when you press the TIMER button to engage the Timer Standby mode. Here's why, and what you should do.

NO CASS

- Displayed for 5 seconds and the Timer Standby mode is cancelled.

WHY: There is no cassette in the recorder.

WHAT TO DO: Insert a cassette. Press TIMER again.

NO REC TRB

- Displayed for 5 seconds. The Timer Standby mode is cancelled.

WHY: The inserted cassette has its safety tab removed.

WHAT TO DO: Eject that cassette. Insert a cassette with its safety tab intact. Or cover the safety tab hole of the cassette with adhesive tape and re-insert it. Press TIMER again. r7p.9.

NO PROGRAM

- Displayed for 5 seconds. The Timer Standby mode is cancelled.

WHY: There are no preset programs in memory.

WHAT TO DO: Check the programmed data and re-program it as necessary. Press TIMER again.

Other Messages

The following messages may also be encountered during timer-recording.

TIMER (with current hour)

WHY: The recorder is in the Timer Standby mode. This is the normal display you should see when you press the TIMER button.

TIMER REC

WHY: Normal display while timer-recording is in progress.

TAPE END

WHY: If this and "TIMER REC" are alternately displayed, it means that the end of the tape was reached while timer-recording was in progress. Therefore, the preset program may not be recorded in its entirety.

SET CLOCK

WHY: This means the clock must be set. It's displayed when time-keeping is terminated due to a power failure or because the recorder's power plug was pulled from the AC outlet.

WHAT TO DO: Set the clock. r7p.10.

- If power was interrupted, it's also likely that all preset timer programming data has been erased. Please check and re-program as necessary.

On Checking And Cancelling Programs

Since executed programs are automatically cleared from memory (except those for daily and weekly serials), cases where the entire 8-event memory is full should be rare. If this should happen, check the preset programs and cancel one or more to make room for the new program(s) you wish to input.

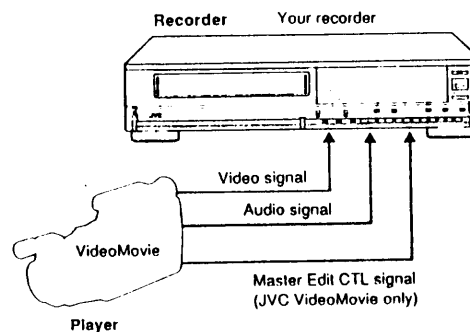
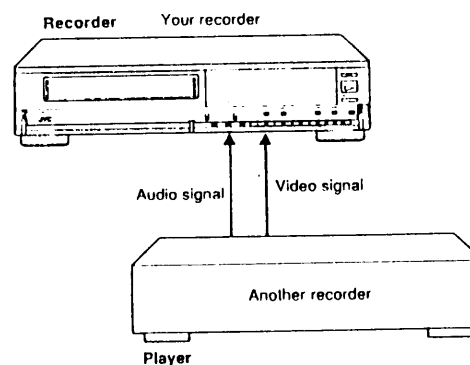
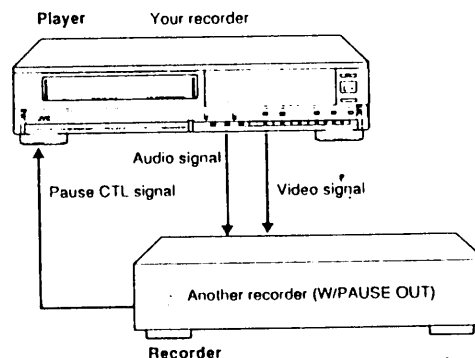
TO CANCEL A PROGRAM

- 1 Press PROGRAM.
 - Program 1 is displayed with the number blinking.
- 2 Press SELECT to review the program contents in succession.
- 3 Press CANCEL to erase the program from memory.
 - You can press CANCEL at any stage while the program is open.
 - To erase another program, press SET when a blinking program number is displayed.

Some Facts On Timer Operation

- If the end of the tape is reached during timer-recording, the cassette is automatically ejected and recorder's power is switched off with "TIMER REC" and "TAPE END" flashing alternately on the message display panel.
- When timer-recording is successfully completed, the recorder's power is automatically switched off.
- Since the timer starts and stops recording based on the time being kept by the recorder's built-in clock, the clock's time must be accurate for correct timer-recording results.

▶ For Editing



Editing To/From Another Recorder

Your video recorder can be used as either the recording deck or the source player when editing tapes. When used as the source player in combination with another video deck which is preroll-capable and equipped with a Pause Control Output terminal, your recorder's PAUSE terminal can accept preroll commands for synchronized preroll editing.

PREPARATION

- 1 Connect the player's VIDEO OUT and AUDIO OUT connectors to the recorder's VIDEO IN and AUDIO IN connectors.

OPERATION

- 2 Set the recorder to external input mode (AUX).
 - Press numeric key "0", or press CHANNEL until "AUX INPUT" appears in the channel display section.
- 3 Put the player in the Play mode.
- 4 Put the recorder in the Record mode.

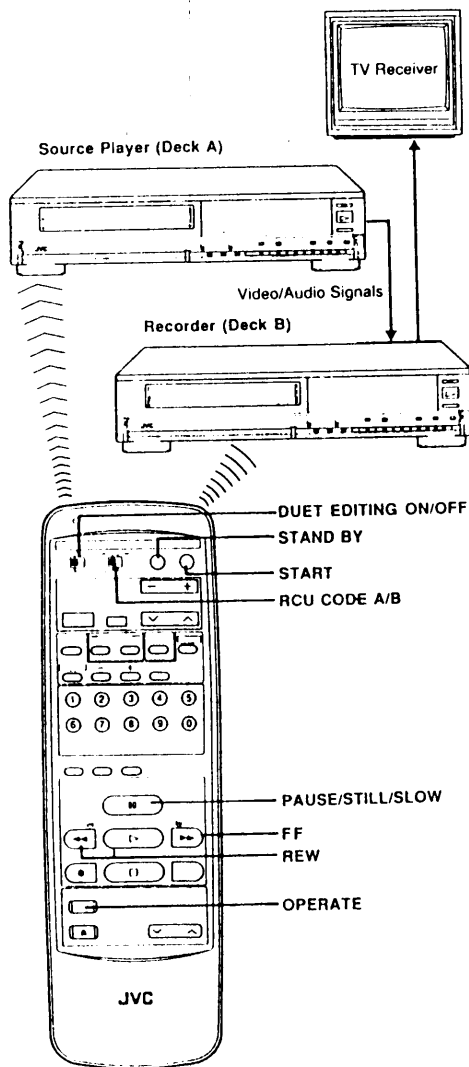
Editing From A VideoMovie

Tape-to-tape editing is also possible using a VideoMovie (equipped with playback facility) as the player and your recorder as the recording deck. In this case, the recorder's PAUSE terminal can be used to accept Master Edit Control commands from the VideoMovie.

PREPARATION

- 1 Connect the VideoMovie's AV OUT connector to the recorder's VIDEO IN and AUDIO IN connectors.
- 2 Connect the AV output cable's mini plug to the PAUSE terminal of the recorder.
 - If the VideoMovie is equipped with the Master Edit Control system, you can control the recorder using the VideoMovie's controls. See VideoMovie's instruction manual for operating procedures.
 - With this connection, you can also use the VideoMovie as a video camera for direct recording onto the recorder's tape. Put the recorder in Record-Pause and use the VideoMovie's start/stop trigger to start and pause recording. (For direct recording with a separate video camera, a camera adapter is necessary.)

▶● For Editing (cont'd)



Duet Editing

For those who have two JVC video recorders and are interested in editing, this function will simplify editing operations by delivering separate commands to two recorders simultaneously from a single remote control in the form of separate "A" and "B" control codes. (Designated JVC models only.)

PREPARATION

- 1 Connect two JVC recorders. (PAUSE connection not necessary.) ¶p.22.
- 2 Set one recorder to respond to A code signals (deck A), and the other to respond to B code signals (deck B). ¶"A/B Code Switching"
- 3 Place the two decks side by side.
- 4 Load a recorded tape into deck A, and a blank tape into deck B.

OPERATION

- 5 Set the DUET EDITING ON/OFF switch to ON.
- 6 Set the RCU CODE A/B switch to "A → B".
- 7 Press STAND BY. Deck A enters Still mode, B enters Record-Pause mode.
- 8 Search for a scene you want to edit from deck A to deck B (only deck A will move) and press PAUSE/STILL/SLOW.
- 9 Press START. Deck A enters Play mode, B enters Record mode.
- 10 Press PAUSE/STILL/SLOW. Deck A enters Still mode, B enters Record-Pause mode.
 - Repeat steps 8, 9 and 10 to continue editing.
- 11 To cancel the Duet Edit mode, set the DUET EDITING ON/OFF switch to OFF.

A/B Code Switching

The remote control's RCU CODE A/B switch is preset to the "A" position because your video recorder is initially set to respond to A code signals. You can easily modify your video recorder to respond to B code signals.

- 1 Unplug the recorder's power cord from the AC outlet.
- 2 Set the RCU CODE A/B switch to B. (The DUET EDITING ON/OFF switch should be set to OFF.)
- 3 Plug the recorder's power cord back into the AC outlet. Do not use other remote controls at this stage.
- 4 Turn the recorder power on using the remote control's OPERATE button. The recorder will now only respond to B code signals.

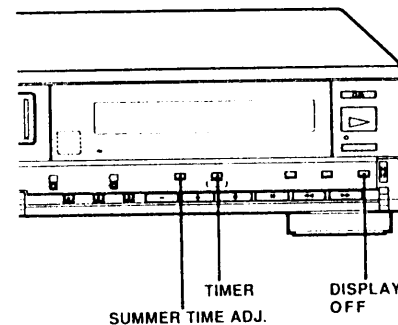
NOTE:

You can operate two recorders (A and B) independently from your remote control. Except in the Duet Edit mode, it will send either A or B code signals only, selected with the RCU CODE A/B switch.

CAUTION:

Some TV sets may malfunction in response to the B mode. If this happens switch back to the A mode.

Special Operations



Setting The Clock Forward Or Backward By One Hour (Daylight Saving Time Adjustment)

TO ADVANCE THE TIME BY ONE HOUR

- Press SUMMER TIME ADJ. (ADJUST) and quickly release.

TO SET THE TIME BACK BY ONE HOUR

- Keep SUMMER TIME ADJ. (ADJUST) pressed for more than 2 seconds.

Turning Off The Display

The fluorescent display on your JVC recorder can be switched off at any time.

- 1 Press the DISPLAY OFF button on the recorder. The lights in the display will go out.

- 2 To restore the display, press the DISPLAY OFF button again.

Locking The Recorder's Controls

To avoid unwanted operation and prevent accidental recording or other interference, use the Child Lock function.

- 1 Press the remote control's OPERATE button to turn the recorder's power off. Keep this button pressed for about 2 more seconds after the power LED indicator has gone off.

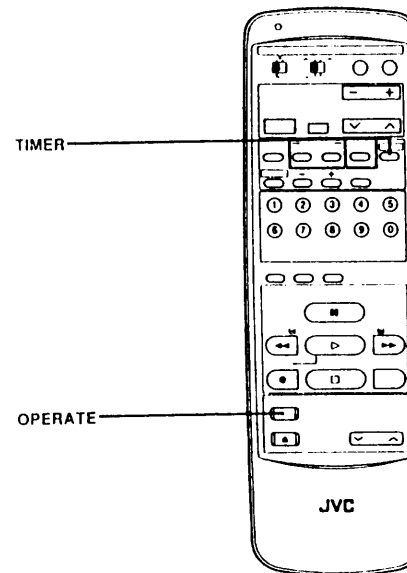
- The Child Lock indicator (1) will appear between the date and time on the display panel.

- 2 Child Lock is automatically deactivated when you switch the recorder's power on again with the remote's OPERATE button.

- Pressing the TIMER button during timer-recording also deactivates the Child Lock mode.

NOTES:

- While the Child Lock mode is engaged, make sure you keep your remote control in a safe place inaccessible to children.
- Timer-recording is possible in the Child Lock mode. After timer-recording has been performed, the Child Lock mode remains in effect.



List Of Display Panel Messages

Displayed Message	When It Appears, What It Means
During Clock Set	
12 59 30/11/91	"12 59" is input for the time. "30th November, 1991" is input for the date.
During Program Set	
PROGRAM 1 DATE 31/12	"Program 1" has been opened/ set/cancelled. "31st December" is input for the recording start date.
REPT 31/12	"Repeat" command is input for recording of a weekly serial.
DAILY 31/12	"Daily" command is input for recording of a daily serial.
START 11 00 STOP 12 30 PR 10	"11 00" is input for the recording start time. "12 30" is input for the recording stop time. "10" is input as the channel to be recorded.
During Channel Set	
BAND 1.25	Band "1", tuning voltage "25" is being received, but not stored.
SKIPPED 10	Channel position "10" is currently called up, and ready for input.
STORED 10	Received real channel has been stored in channel position "10".
During Normal Operation	
PLAY	Normal playback is in progress.
STOP	Stop mode has been engaged. Displayed for 2 seconds.
STILL	A still picture is being viewed.
FF	Fast-forwarding.
REW	Rewinding.
REC 10	Recording "Channel 10".
REC AUX	Recording "External Input".
REC 1:30	Recording with the Off Timer set to shut off in 1 hour 30 minutes.
PAUSE 10	Recording is paused.
TIMER REC	Timer-recording is in progress.
FWD SLOW	Slow motion playback is in progress.
FWD SEARCH	Forward search is in progress.
REV SEARCH	Reverse search is in progress.
SKIP	Skip Search is in progress.
BLANK	Blank Search is in progress.
INDEX + 9	Searching for the 9th index code in the forward direction.
INDEX - 4	Searching for the 4th index code in the reverse direction.
INDX MARK	Index code is being marked.
INDX ERASE	Index code is being erased.
REPEAT	Repeat playback is in progress.
PR 10	Channel 10 is being received.
AUX INPUT	Auxiliary input source is being received.
EJECT	Cassette is being ejected.

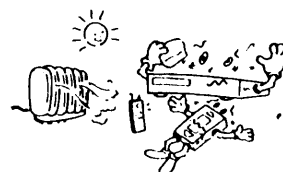
Displayed Message	When It Appears, What It Means
During Next Function Memory	
REW - OFF OFF	Will rewind to the beginning and then shut off automatically.
REW - PLAY PLAY	Will rewind to the beginning and then start playback automatically.
REW - TIMER TIMER	Will rewind to the beginning and then enter the timer mode automatically.
REW - EJECT EJECT	Will rewind to the beginning and then eject the tape automatically.
Clock and Counter Displays	
4:30:15	Tape counter reading of "4 hours, 30 minutes, 15 seconds".
M 4:30:15 REMAIN 2:24	Same as above with Counter Memory ON. 2 hours and 24 minutes of recording time remaining on the tape.
31/12 10:30	It is 31st December, 10:30. (Standard date/time display when recorder power is turned off)
31/12 10:30 TIMER 10:30	Same as above with Child Lock ON. It is 10:30 and the Timer Standby mode is engaged.
TIMER 10:30 SET CLOCK	Same as above with Child Lock ON. The clock is not set. Please set it.
SET CLOCK 10:30 TIMER REC	Same as above with Child Lock ON. End of tape was reached during timer-recording.
TAPE END	Display is turned OFF.
Error Messages	
NO CASS NO REC TAB NO-PROGRAM	There is no cassette in the recorder. The cassette's safety tab is removed. No program has been preset.
Other Messages	
GOOD MORNING	Automatic greetings when the recorder is turned on.
GOOD AFTERNOON	
GOOD EVENING	
GOOD BYE	
GOOD NIGHT	Automatic greetings when the recorder is turned off.

NOTES:

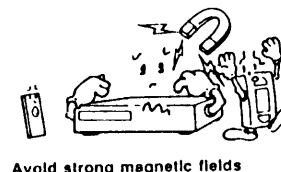
This list represents the various types of messages your recorder is capable of generating. Actual messages displayed by your recorder (esp. if date, time, channel, tape counter reading, or other variables are involved) will differ slightly from those listed here.

Precautions

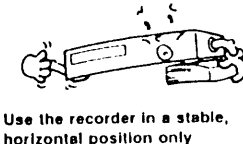
Recorder, Remote Control, And Cassette Care



Avoid extreme heat and direct sunlight



Avoid strong magnetic fields



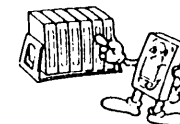
Use the recorder in a stable, horizontal position only



Avoid extreme cold



Do not block the recorder's ventilation openings



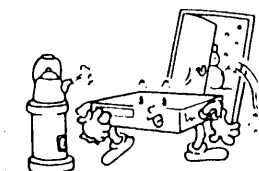
Place cassettes in cassette cases and store vertically



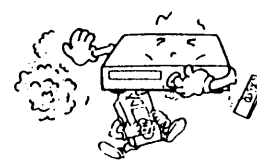
Avoid extreme humidity



Do not place anything heavy on the recorder or remote control



Beware of moisture condensation
Moisture in the air will condense on the recorder when you move it from a cold place to a warm place, or under extremely humid conditions — just as water droplets form on the surface of a glass filled with cold liquid. Moisture condensation on the head drum will cause damage to the tape. In conditions where condensation may occur, keep the recorder's power turned on for a few hours to let the moisture dry.



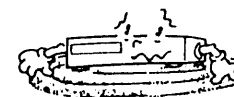
Avoid dust



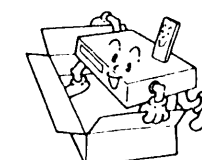
Do not place anything which might spill on top of the recorder or remote control



Avoid places subject to vibrations



Do not place the recorder on cushions, pillows, or thick carpeting



When transporting
■ Be sure to remove cassette from recorder before packing
■ Avoid violent shocks to the recorder during packing and transport

In Case Of Difficulties

POWER AND TAPE TRANSPORT PROBLEMS

Symptoms	Check points
No power is applied to the recorder.	<ul style="list-style-type: none"> Is the power cord disconnected? — Connect it.
Clock is functioning properly, but the recorder cannot be powered.	<ul style="list-style-type: none"> Is "TIMER" displayed on the display panel? — Press the TIMER button to extinguish the display.
Tape does not run during recording.	<ul style="list-style-type: none"> Is "PAUSE" displayed on the display panel? — Press the PLAY button to extinguish the display.
Tape stops during rewind or fast-forward.	<ul style="list-style-type: none"> Is the COUNTER MEMORY button pressed? — Press again to make "M" disappear from the display panel.
Tape will not rewind or fast forward.	<ul style="list-style-type: none"> Is the tape already fully rewind or fast-forwarded? — Check the cassette.

RECORDING PROBLEMS

Symptoms	Check points
Recording cannot be started.	<ul style="list-style-type: none"> Is a cassette loaded? Is the safety tab on the cassette removed? — Reseal the slot with adhesive tape.
TV broadcasts cannot be recorded.	<ul style="list-style-type: none"> Has "AUX" been selected? — Set to the desired channel.
Tape to-tape editing is not possible.	<ul style="list-style-type: none"> Is the VideoMovie or another video recorder correctly connected? Are all necessary power switches turned ON? Has "AUX" been selected? — Set to "AUX".
Camera recording is not possible.	<ul style="list-style-type: none"> Is the VideoMovie correctly connected? Has "AUX" been selected? — Set to "AUX".
Timer recording is not possible.	<ul style="list-style-type: none"> Have you set the clock correctly and programmed the timer correctly? — Check once again. Is "TIMER" displayed on the display panel? — If not, press the TIMER button to display "TIMER".

PLAYBACK PROBLEMS

Symptoms	Check points
Playback picture does not appear while the tape is running.	<ul style="list-style-type: none"> If you are using RF OUT connection, is the TV receiver's channel selector set to the correct video channel? — Set it to the RF converter channel (UHF 36). (r.p. 8) If you are using AV connection, is the TV receiver set to the AV mode? — Set it to the AV mode.
Playback is repeated.	<ul style="list-style-type: none"> Is the REPEAT switch set to either FULL or INDEX? — Set it to OFF.
Noise appears during visual search.	<ul style="list-style-type: none"> This is normal.
Noise appears during normal playback.	<ul style="list-style-type: none"> Is the automatic tracking mode engaged? — Try manual tracking. (r.p. 18) — Try manual tracking. (r.p. 18)
Noise appears during slow motion playback.	<ul style="list-style-type: none"> — Press PAUSE/STILL/SLOW a few times to remove the noise bars from the screen.
Noise appears during still playback.	<ul style="list-style-type: none"> Video heads may be dirty. — Head cleaning is necessary. Consult your JVC dealer. (r.p. 29)
Playback picture is blurred or interrupted while TV broadcasts are clear.	<ul style="list-style-type: none"> Is the SYSTEM switch set to the correct position? — Set it to the correct position for the colour TV broadcast system used in your area. (r.p. 8)
No sound accompanies the playback picture.	

OTHERS

Symptoms	Check points
Whistling or howling is heard from TV during camera recording. Clock setting is not possible.	<ul style="list-style-type: none"> Move VideoMovie or camera's microphone away from TV or reduce TV sound volume.
Some channels are skipped over when scanning channels.	<ul style="list-style-type: none"> Is "TIMER" displayed on the display panel? — Press the TIMER button to extinguish the display. Those channels are preset to be skipped over. If you need them, restore them. (r.p. 11)
Channel cannot be switched.	<ul style="list-style-type: none"> Is recording in progress? — Press the PAUSE/STILL/SLOW button, change the channel, and press the PLAY button.
Remote control does not function.	<ul style="list-style-type: none"> Are the batteries discharged? — Replace with new ones. Is the RCU CODE A/B switch set to the proper code for the video recorder being operated? — Reset the RCU CODE A/B switch to the correct setting.
Index Search does not function properly.	<ul style="list-style-type: none"> Adjacent index codes may be too close to each other. — Erase some index codes and mark new ones if necessary, with sufficient distance between any two index codes.

ATTENTION:

This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the power off and unplug the power cord. Then plug it in again and switch on. Take out the cassette. After checking the cassette, operate the unit as usual.

SECTION 1

DISASSEMBLY AND MECHANISM ADJUSTMENTS

1.1 DISASSEMBLY

1.1.1 Top cover

1. Refer to Fig. 1-1-1 and set for the EJECT (Stop) mode and disconnect VCR from AC power.
2. Take out 5 screws (A). To remove the top cover, slide in direction of arrow and lift away.

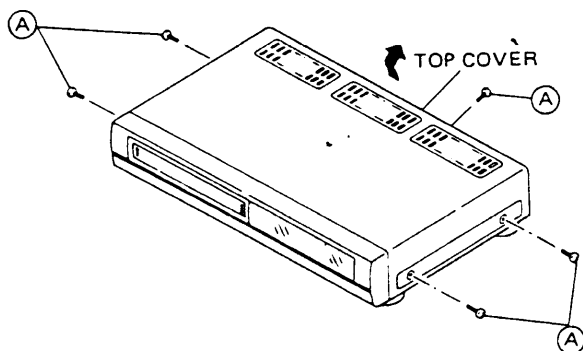


Fig. 1-1-1

1.1.2 Front panel assembly

1. Remove the top cover.
2. Carefully disengage 3 tabs (B) of the front panel assembly from the upper side of the chassis.
3. Refer to Fig. 1-1-2 and pull the front panel assembly forward you to disengage 3 tabs (C) of the front panel assembly from the bottom side of the chassis, then remove the front panel assembly.

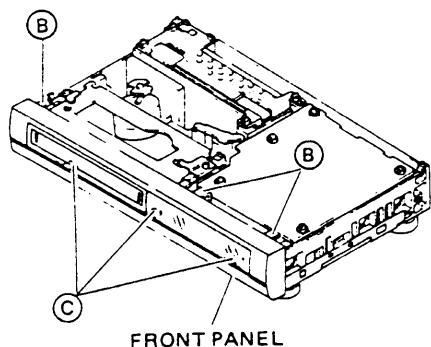


Fig. 1-1-2

1.1.3 Bottom cover

1. Remove the top cover.
2. Refer to Fig. 1-1-3 and take out 5 screws (D) and disengage 4 claws (E) from the bottom of the chassis.
3. Disengage the bottom cover from the bottom of the chassis slide in direction of arrow and disengage 2 tabs (F).

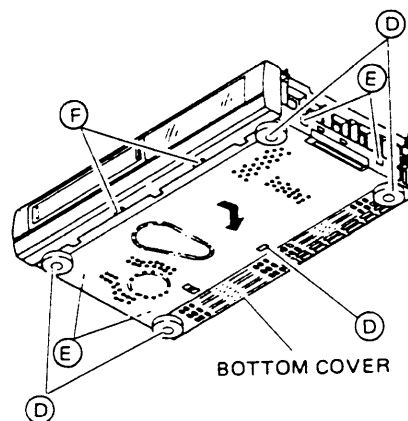


Fig. 1-1-3

1.1.4 Main board assembly

1. Remove the top cover.
2. Refer to Fig. 1-1-4 and take out 5 screws (G) and 1 screw (H) from main board assembly.
3. Remove the main board assembly in the upward direction.

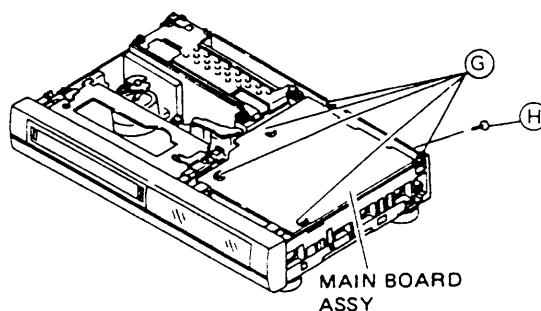


Fig. 1-1-4

1.1.5 Cassette housing

1. Remove the top cover and main board assembly.
2. Refer to Figs. 1-1-5 and 1-1-6.
Take out 4 screws (J) that secure the cassette housing. Disengage 3 tabs (K) of the front panel and pull the front panel forward where it does not interfere with removing the cassette housing.
3. Remove the cassette housing in the upward direction.

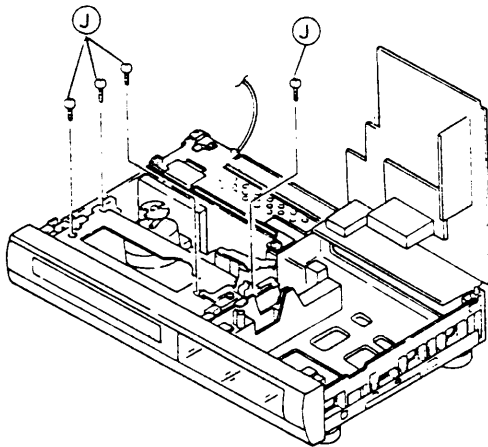


Fig. 1-1-5

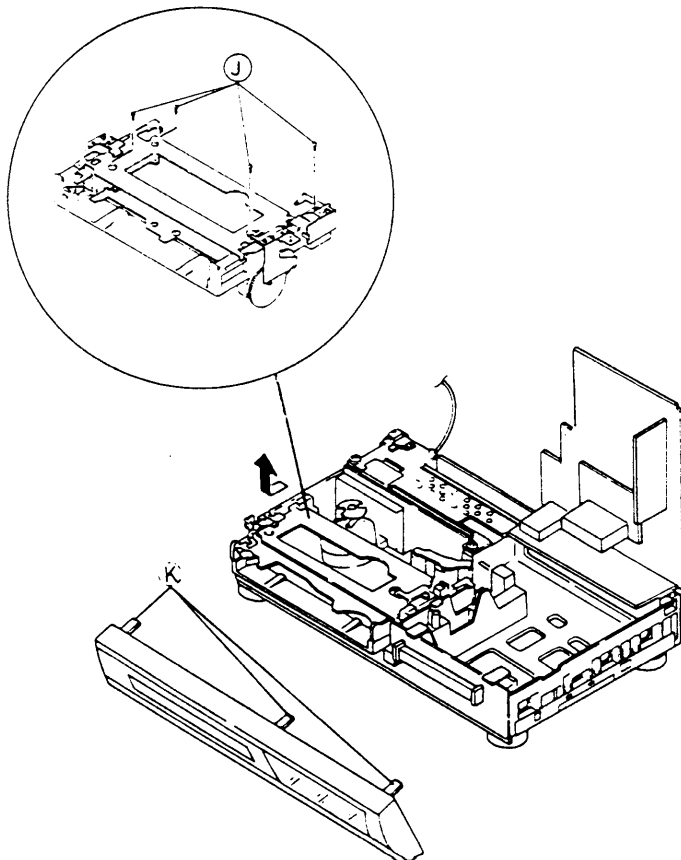


Fig. 1-1-6

1.1.6 Cassette housing installation

1. On the main deck, observe the positional relationships of the parts indicated in Fig. 1-1-7.
If necessary, turn the loading motor by hand to obtain these positions.

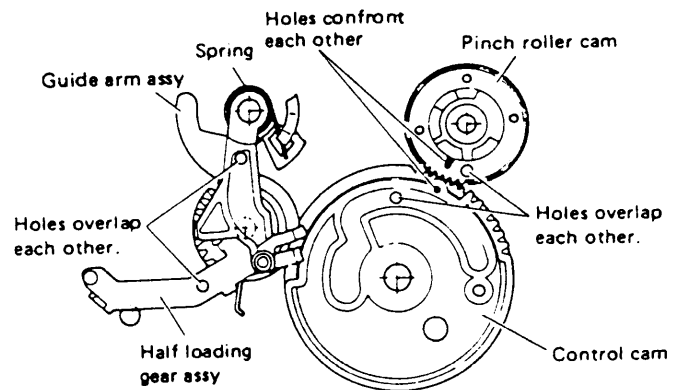


Fig. 1-1-7

2. Refer to Fig. 1-1-8 and confirm that the clutch is engaged.
If necessary, press the lever indicated by the arrow to where the clutch is locked.

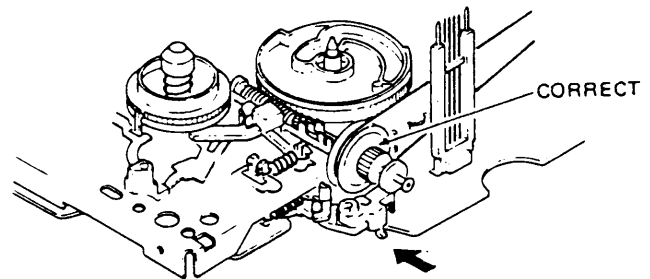


Fig. 1-1-8

3. Check that the cassette housing is in the eject state (internal holder of the cassette housing is locked in raised position).
Set the cassette housing into place and secure with 4 screws.
4. Install the front panel as shown in Fig. 1-1-9 and re-engage the tabs. Supply power and use a spare cassette to check for normal loading and eject operations.

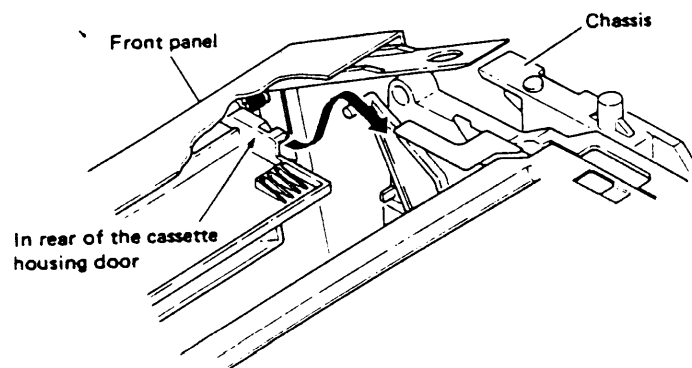


Fig. 1-1-9

5. Disconnect VCR from power, then reinstall the main board assembly and top cover.

1.1.7 Cassette housing door

1. Remove the top cover and front panel assembly.
2. Refer to Fig. 1-1-10, with a lift of cassette housing door by hand, bend center of the cassette housing door toward you, then pull out the left end from the cassette housing.
3. Refer to Fig. 1-1-10 and use care regarding the torsion spring, then pull out the right end of the cassette housing door to move it.

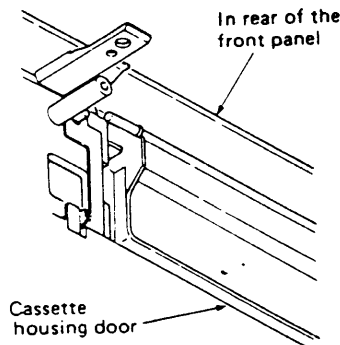


Fig. 1-1-10

1.1.9 Switching regulator board assembly

1. Remove the top cover.
2. Refer to Fig. 1-1-12 and take out 4 screws (M) from the switching regulator board assembly.
3. Remove the switching regulator board assembly in the upward direction.

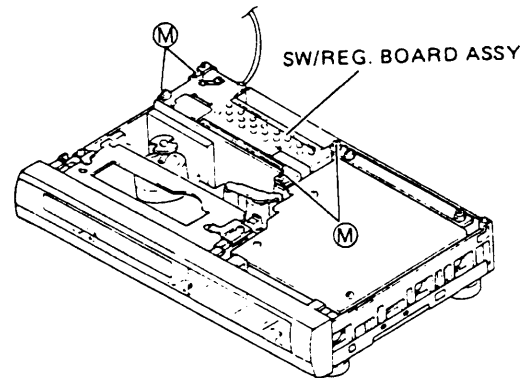


Fig. 1-1-12

1.1.8 Main-deck

1. Remove the top cover, front panel assembly and main board assembly.
2. Refer to Fig. 1-1-11 and take out 3 screws (L) from the main-deck assembly.
3. Remove the main-deck assembly in the upward direction and disconnect a connector CN1 from the DECK TERMINAL board, connectors CN1, CN2 from the Pre/Rec board, connector CN1 from the A/C head board, connector CN1 from the Loading MDA board and connector CN1 from the Drum MDA board.

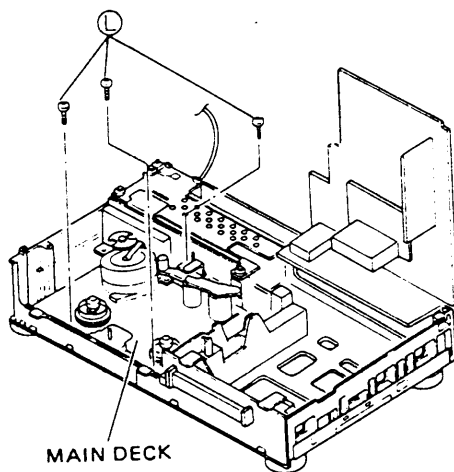


Fig. 1-1-11

1.2 MECHANISM ADJUSTMENTS

1.2.1 Precautions

1. Disconnect mainframe from AC power before soldering.
2. Avoid imparting stress to wires when disengaging connectors.
3. Determine and correct the cause of difficulty before proceeding to adjustments. Do not disturb settings unnecessarily.
4. Use care not to damage tabs, claws, etc. during repairs.
5. Install the cassette housing assembly only when the mechanism is in the Eject or Stop mode position. In the Eject mode, the internal holder of the housing is fully raised. This is fully lowered in the Stop mode.
6. When installing the front panel assembly, be sure to engage the housing door with the door lever of the cassette housing assembly. If this is omitted, the door will not open at Eject and the cassette cannot be removed.

1.2.2 Check without cassette housing

Mechanism operations can be observed easily by removing the cassette housing assembly. Note the following.

1. Disable the photo transistor sensor (END SENSOR) on the main-deck by applying an opaque cover.
2. Connect pins 2 and 3 of Main board connector CN601.
3. Select the desired modes with the operation buttons. However, notice that without tape, setting for the reverse direction modes produces the Stop mode after a few seconds due to absence of the reel sensor output.

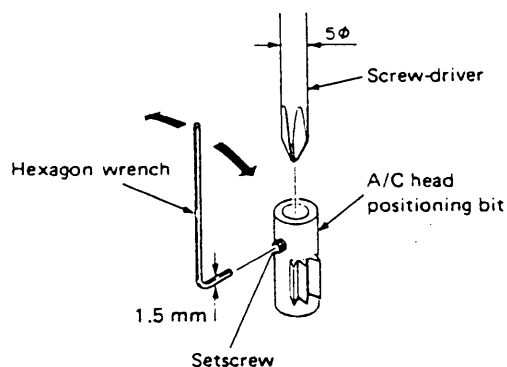


Fig. 1-2-1 A/C head positioning tool

1.2.3 Manually removing cassette tape

In event of electrical system failure that prevents the tape from being unloaded, the tape can be removed manually by the following procedure. Refer to Figs. 1-3-1, 1-3-2 and 1-3-3.

1. Disconnect power cord from AC outlet.
2. Turn the loading motor by hand so that the control cam rotates clockwise. This retracts the pole base assembly to the unloading position.
3. Continue turning to where the guide arm and half loading gear assemblies shift to beneath the cassette.
4. Turn the clutch assembly at the rear of the deck to absorb slack tape within the cassette.
5. Again turn the loading motor in the same direction to raise the cassette and remove it.

1.2.4 Test equipment

The following special tools and fixtures are required for mechanism adjustment.

1. Alignment tapes: MH-2
Stairstep signal is employed for interchangeability checks and adjustments.
2. Torque gauge : PUJ48075-2
Measures tape take-up torque.
3. Back tension cassette gauge : PUJ48076-2
Measures tape tension at the supply side.
4. A/C head positioning bit : PTU94010
 - Shifts the head base for adjusting the control head position.
 - The installation of a A/C head positioning bit on the screw-driver.

Refer to Fig. 1-2-1. Set screw-driver into the A/C head positioning bit where it does not interfere with adjusting the A/C head adjusting boss (position the screw-driver point 6 ± 2 mm from point of the A/C head positioning bit). Slightly tighten the setscrew by hexagon-wrench (1.5 mm).
5. Roller driver : PTU94002
Turns the guide roller for adjusting FM linearity.

Alignment tapes 1	Torque gauge 2	Back tension cassette gauge 3	A/C head positioning bit 4	Roller driver 5

Fig. 1-2-2 Test equipment

1.3 MAIN MECHANISM PARTS

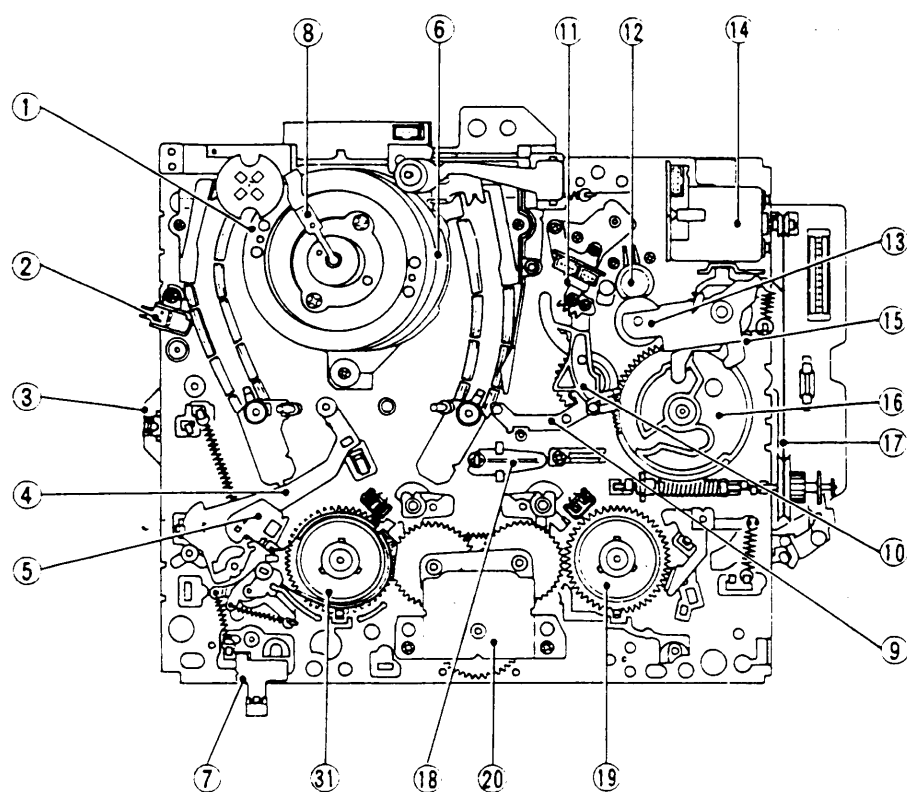


Fig. 1-3-1 Top view of main-deck

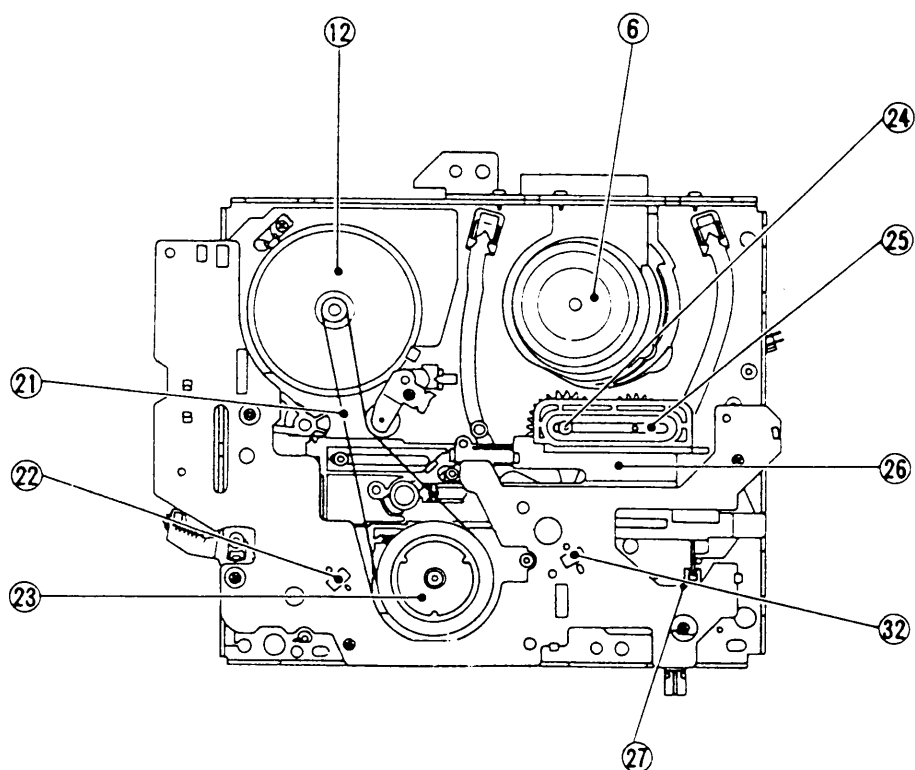


Fig. 1-3-2 Bottom view of main-deck

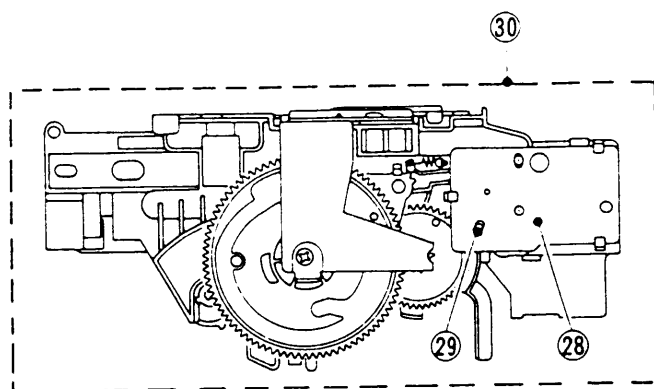


Fig. 1-3-3 Side view of cassette housing

A. Cleaning

Periodic cleaning of the tape transport system is desirable, but ordinarily not feasible in practice. Therefore, perform cleaning when a set is brought in for repairs or maintenance. Contamination of the video heads, tape guides and brushes can detract from playback picture quality and in extreme cases, even damage the tape. For cleaning, use a fine-mesh cotton cloth (about the texture of a white dress-shirt) moistened in alcohol.

- To clean the video heads, press the moistened cloth gently against the upper drum with fingertip and turn the drum by hand.
- Do not use a vertical stroke, as this may damage the heads.

B. Lubrication

Oil and grease do not normally require periodic replenishing. Apply only when replacing lubricated parts (also clean and replace lubrication of mating parts if soiled).

For parts and points to apply oil and grease, refer to the exploded views of the mechanism assembly.

Before oiling, clean with alcohol.

Apply one or two drops of oil. Avoid excess oil.

1. Table 1-1 indicates the oil and grease used in this set. Use these or recommended locally available equivalents.

Category	Part No.
Oil	COSMO-HV56
Grease	KANTO-G-31KAV

Table 1-3-1

2. Grease is not required for a replacement cassette housing assembly, as this has been applied at the factory.

Note: *Stir grease that has been stored for an extended period.*

C. Main mechanical parts

See Figs 1-3-1, 1-3-2 and 1-3-3.

No.	Symbol	Parts Name	See Section
1	M32A	Upper drum assy	1.5.1
2	M44	Full erase head	
3	51Q1	End sensor	
4	M41	Tension arm assy	1.5.4
5	M42	Tension band assy	1.5.4
6	M32C	Lower drum motor assy	1.5.2
7	M461	REC safety switch	
8	M32D	Brush assy	
9	M449	Half loading gear assy	1.5.5
10	M447	Guide arm assy	1.5.5
11	M48	A/C head	1.5.3
12	M422	Capstan motor	
13	M442	Pinch roller arm assy	
14	M434	Loading (Mode) motor assy	
15	M446	Pinch roller cam	1.5.5
16	M438	Control cam	1.5.5
17	M437	Loading belt	
18	M460	LED holder	
19	M430	Reel disk (take-up)	
20	M424	Idler gear unit	
21	M429	Reel Belt	
22	51PS1	Take up reel sensor	
23	M426	Clutch unit	1.5.6
24	M433	Take up loading arm assy	1.5.7
25	M432	Supply loading arm assy	1.5.7
26	M439	Plate assy	1.5.7
27	M462	Slide encorder (S3)	
28	56PHS3	Cassette sensor	
29	56Q2	Start sensor	
30	M36	Cassette housing assy	
31	M470	Reel disk (supply)	
32	51PS2	Supply reel sensor	

- Symbol interpretation example



Table 1-3-2

1.4 INSPECTION AND MAINTENANCE

This product employs rotary and moving parts which wear out in the course of usage. Periodic inspection, cleaning, lubrication and maintenance are therefore important for ensuring maximum performance. Worn parts must also be replaced at when required.

1.4.1 Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning, lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions. However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary.

Also note that rubber parts may deform in time, even if the set is not used.

System	No.	Parts Name	Symbol No.	Periodic servicing schedule (operation hours)							
				250	500	750	1000	1250	1500	1750	2000
Tape Transport	1	Upper drum assy	M32A	★	★	☆	○	○	○	○	○
	11	A/C head	M48	★	★	★	○	○	○	○	○
	13	pinch roller arm assy	M442	★	★	★	○	○	○	○	○
	2	Full erase head	M44	★	★	★	○	○	○	○	○
	4	Tension arm assy	M41				○	○	○	○	○
	6	Lower drum assy	M32C				○	○	○	○	○
	12	Capstan (shaft) motor	M422	★	★	★	★	★	★	★	★
	9	Half loading gear assy	M449								
	10	Guide arm assy	M447								
Drive	12	Capstan motor	M422				○	○	○	○	○
	17	Loading Belt	M437				○	○	○	○	○
	21	Reel Belt	M429				○	○	○	○	○
	19	Take-up reel disk	M430				○	○	○	○	○
	31	Supply reel disk	M470				○	○	○	○	○
	23	Clutch Unit	M426								○
	14	Loading motor assy	M434				○	○	○	○	○
		Worm clutch assy	M436								△
Others	26	Plate assy	M439								△
	5	Tension band	M42				○				○
	8	Brush	M32D				○				○

★ : Cleaning

☆ : Cleaning (or Replacement if necessary)

△ : Lubrication

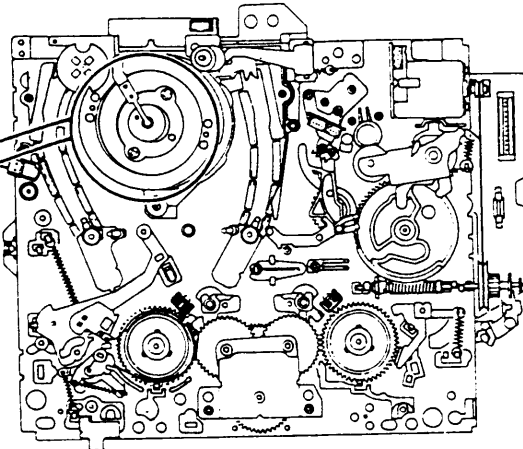
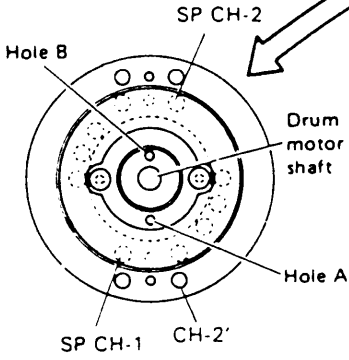

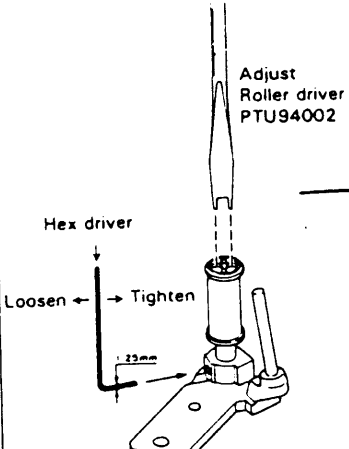
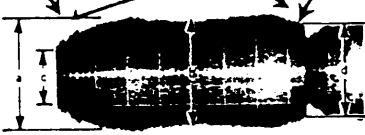
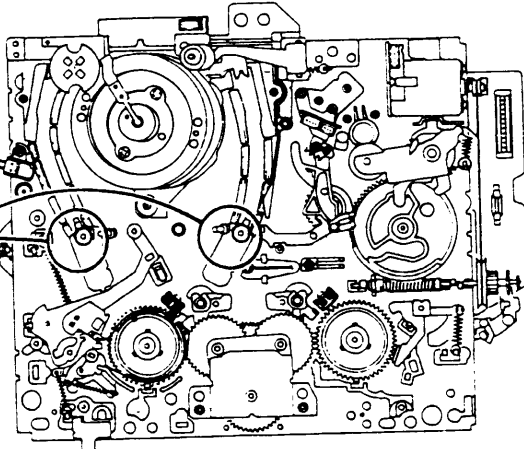
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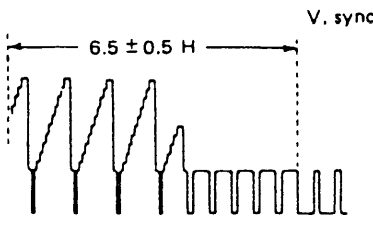
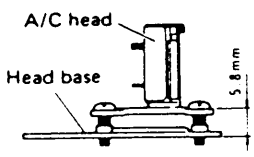
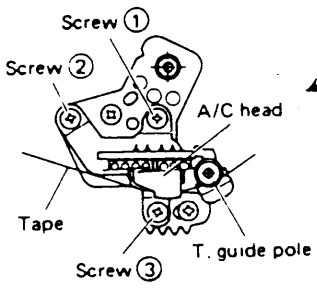
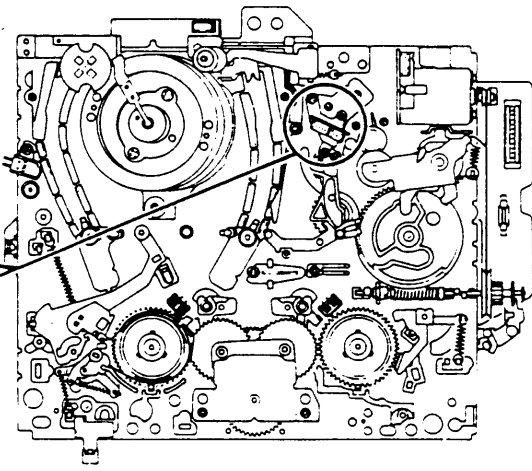
▲ : Lubrication (or Replacement if necessary)

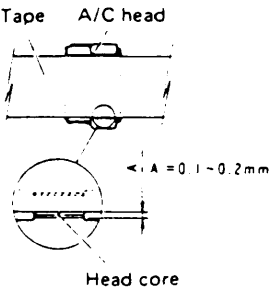
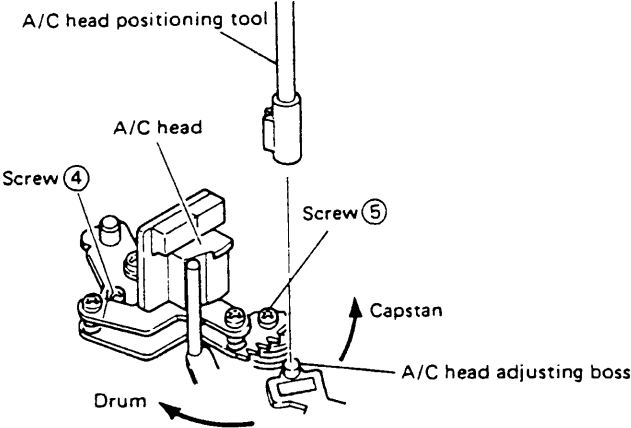
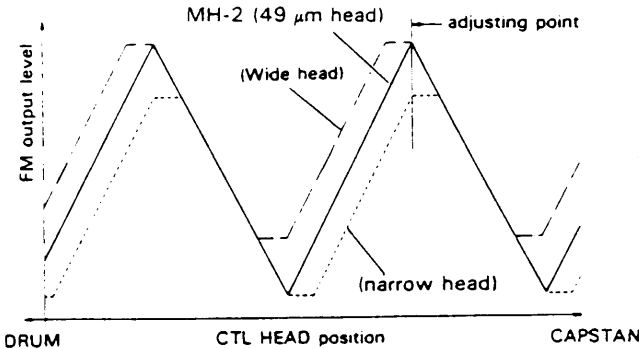
○ : Inspection or Replacement if necessary

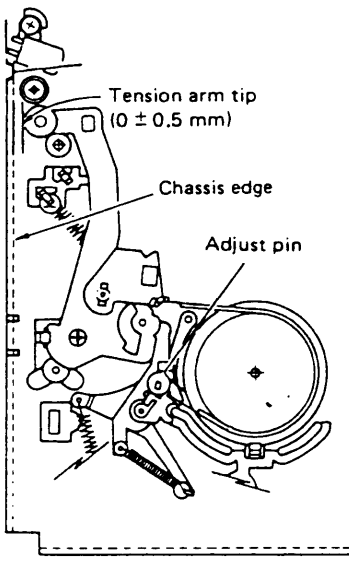
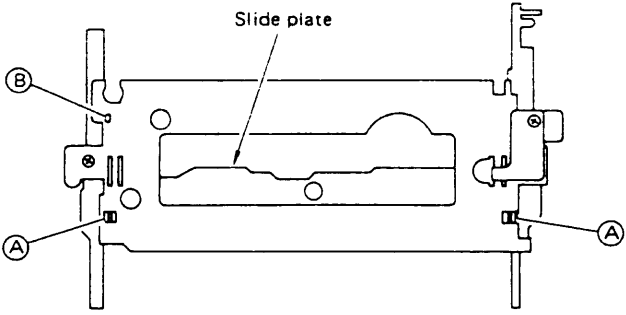
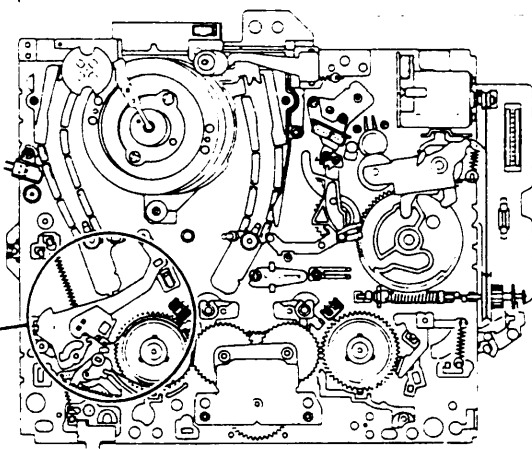
Table 1-4-1 Approximate maintenance schedule

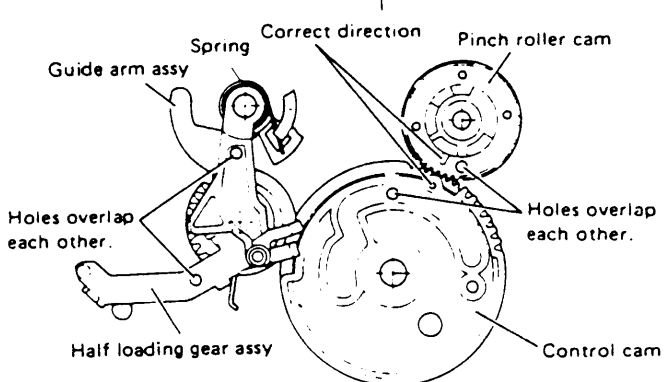
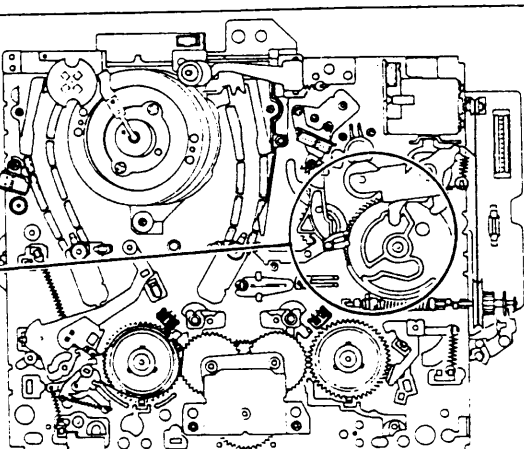
1.5 MAIN PARTS REMOVAL AND REPLACEMENT

No.	Item	Checkpoints	Adjustment and Checks
1	<p>Upper drum assembly</p> <ul style="list-style-type: none"> •Symptoms: FM signal absent, intermittent or weak on one channel; large difference in channel output levels •Cause: Worn or damaged video heads, poor response, etc. 	 <p>Fig. 1-5-2 Drum Position</p>	<p>After replacing, observe that upper drum hole A is opposite the motor axis from lower drum hole B.</p>
	 <p>Fig. 1-5-1 Drum Top View</p>	<p>Mounting direction See Fig. 1-5-1. (Symptom: no picture)</p> <p>Axis wobble See Fig. 1-5-2. (Symptom: jitter, poor FM linearity) PB FM: Main board TP206 DRUM FF: Main board TP411</p>	<p>Record and playback in SP mode. Confirm absence of large difference between channels. (Fig. 1-5-3)</p>  <p>Fig. 1-5-3 Axis wobble</p>
	 <p>Fig. 1-5-4 S.T. Pole base</p>	<p>FM linearity check See Fig. 1-5-5. (Symptom: vertical sync absent, picture noise) PB FM: Main board TP206 DRUM FF: Main board TP411</p>  <p>Fig. 1-5-5 FM linearity</p> $\frac{b}{a} \geq 0.7, \frac{c}{a} \geq 0.65, \frac{d}{a} \geq 0.65$	 <p>Fig. 1-5-6 S.T. Pole base position</p> <ol style="list-style-type: none"> 1) Play staircase signal of the MH-2 Alignment Tape. Confirm absence of obvious FM waveform loss and that operating the Tracking yields the optimum point. 2) Refer to Fig. 1-5-4, adjust for loss at the left edge (drum entry) of the FM waveform by turning the guide roller of the supply pole base. Similarly, adjust for loss at the right edge (drum exit) by turning the guide roller of the take-up pole base. <p>Note: If FM loss occurs on both channels and cannot be corrected by adjusting the guide rollers, the lower drum needs replacement.</p>

No.	Item	Checkpoints	Adjustment and Checks
	PB switching point --- •Symptom: switching noise at picture bottom.	TP210 (VIDEO OUT)  Fig. 1-5-7 PB Switching Point	1) Connect an oscilloscope to TP210. 2) Set the MH-2 alignment tape into the cassette housing. Play back the staircase segment of MH-2 alignment tape. 3) Trigger the oscilloscope externally (– slope) with the signal from TP411 (DRUM FF) of the main board. 4) Adjust R420 (PB switching point) to position the trigger point $6.5 H \pm 0.5 H$ from V. sync as shown in Fig. 1-5-7.
2	Lower drum assembly •Symptoms: Poor FM linearity, noisy rotation, jitter •Cause: Lead and bearing wear	Check FM linearity and switching point. Check control head phase (X value) Symptom: tracking error PB FM: Main board TP206 DRUM FF: Main board TP411	See above upper drum assembly items. 1) Play staircase signals of MH-2 Alignment Tape. Engage the Tracking Preset mode by pressing the + and – buttons simultaneously in the onscreen mode. Confirm that the same maximum FM waveform level is obtained as when the tracking is adjusted manually. 2) Refer to the A/C head adjustments.
3	A/C head  Fig. 1-5-8 Temporary height	 Fig. 1-5-9 Inclination/Azimuth/Height adj.	 Fig. 1-5-10 A/C HEAD position
		Temporarily set height as indicated in Fig. 1-5-8.	Set the height as indicated in Fig. 1-5-8 to facilitate tape transport checks and adjustments.
		Tilt (forward inclination) See Fig. 1-5-9. (Symptom: audio level varies greatly.)	1) Run tape, turn screw ① counterclockwise to where slight curling of the tape occurs at the lower flange of the take-up guide roller. 2) Then slowly turn the screw clockwise to where the curling ceases.
		Azimuth See Fig. 1-5-9. (Symptoms: audio low level or noisy) Audio output: Main board AUDIO OUT	1) Play staircase signal (with audio 6 kHz) of the MH-2 Alignment Tape. Observe audio output signal with oscilloscope. 2) Turn screw ② and adjust for maximum audio output level.

No.	Item	Checkpoints	Adjustment and Checks
	 <p>Fig. 1-5-11 Height</p>	<p>Height See Figs 1-5-9 and 1-5-11. (Symptom: low audio and control signal levels)</p>	<p>1) Run tape and observe the control head area. 2) Turn screws ①, ② and ③ by small and equal amounts until 0.1 to 0.2 mm of the head core bottom can be seen. Note: <i>If difficult to observe, play stairstep signal of MH-2 Alignment Tape and adjust for maximum audio output and control pulse level.</i></p>
		<p>FM linearity</p>	<p>Refer to upper drum assembly items. If adjustment is major, again check the azimuth.</p>
	 <p>Fig. 1-5-12 CTL head phase</p>	<p>Control head phase See Fig. 1-5-12 PB FM: Main board TP206 FF: Main board TP411 Digital tracking off:</p>	<p>1) Play stairstep signal of MH-2 Alignment Tape and observe the FM waveform. Set for Digital tracking off by pressing the "V CH" and "Δ CH" buttons simultaneously in the playback mode. 2) Loosen screws ④ and ⑤. Set the A/C head positioning tool on the A/C head adjusting boss as shown in Fig. 1-5-12. 3) Turn the tool first to position the A/C head fully toward the capstan. Then gradually return it toward the drum and stop at the position of maximum FM waveform output level as shown in Fig. 1-5-13. 4) Tighten screw ⑤. Remove the tool and tighten screw ④.</p>
	 <p>Fig. 1-5-13 CTL head phase</p>		<p>Note: <i>Trigger the oscilloscope externally signal from TP411 (DRUM FF). Use (+) trigger for MH-2 alignment tape. This model uses wide heads.</i></p>

No.	Item	Checkpoints	Adjustment and Checks
4	<p>Tension arm assembly Tension band assembly</p>  <p>Tension arm tip (0 ± 0.5 mm)</p> <p>Chassis edge</p> <p>Adjust pin</p> <p>Fig. 1-5-14 Tension arm assy</p>  <p>Slide plate</p> <p>Fig. 1-5-16 Cassette housing</p>	 <p>Fig. 1-5-15 Tension arm position</p> <p>Tension pole position See Fig. 1-5-14. (Symptom: poor FM waveform response)</p>	<ol style="list-style-type: none"> 1) Remove video cassette tape and set for the playback mode as following steps. 2) Disconnect VCR from AC. Slightly rotates the loading motor counterclockwise by hand, then press the lock level portion (A) of the cassette housing by hand as shown in Fig. 1-5-16. 3) Move the raised portion of the cassette housing slide plate to fully forward by hand with loading motor. At this time, again press the lock level portion (B) of the cassette housing slide plate to lower the cassette housing (internal holder of the cassette housing is locked in lowered position). 4) Cover the cassette LED with opaque material (insulated tape with black). 5) Connect VCR to AC. Press the power button on the Front panel and set for the playback mode. 6) Turn the eccentric adjust pin to align the edge of the chassis with the tension arm tip as shown in Fig. 1-5-14.
		<p>Back tension (Symptom: skew)</p>	<ol style="list-style-type: none"> 1) When the tension pole position is correctly adjusted, the back tension will assume the correct value. 2) Use the Back Tension Cassette Gauge and set for the playback mode. Confirm reading of 30 to 43. 3) Changing the tension pole position in order to vary the back tension will cause adverse effects elsewhere.

No.	Item	Checkpoints	Adjustment and Checks
5	Pinch roller cam Control cam Half loading gear assembly Guide arm assembly	 <p>Fig. 1-5-16 Control/Pinch roller cam</p> <p>Important: Do not remove or disturb parts other than those mentioned. See Fig. 1-5-16.</p>	<p>Set mechanism to Eject mode (internal holder of the cassette housing is locked in raised) position.</p>  <p>Fig. 1-5-17 Control cam position</p> <ol style="list-style-type: none"> 1) When installing the pinch roller cam, overlap the largest hole of the gear portion with the hole of the deck. 2) Set the control cam on the deck with the hole of the groove overlapped with the hole of the deck. Observe that the small hole of the control cam and the ridge of the pinch roller cam are aligned. (If the control cam does not fit readily, shift the rear plate assembly within the range of play.) 3) Install the half loading gear assembly with the hole overlapped with the hole of the deck. Secure with E-ring. 4) Install the guide assembly over the spring and with the hole overlapping that of the deck. Engage the spring correctly.
		Cassette housing assembly	Install the cassette housing assembly with the mechanism in the Eject mode. Also observe that the inner holder of the housing is raised and locked.
6	Clutch assembly	Take-up torque (Symptom: inadequate take-up torque)	<ol style="list-style-type: none"> 1) Remove cassette housing and set for playback mode (see Section 1.2). 2) Set torque gauge on the take-up reel disk. Gradually relax your grip on the gauge and read the needle indication at the point the gauge begins to rotate with the disk. Confirm indication of 60 to 100.

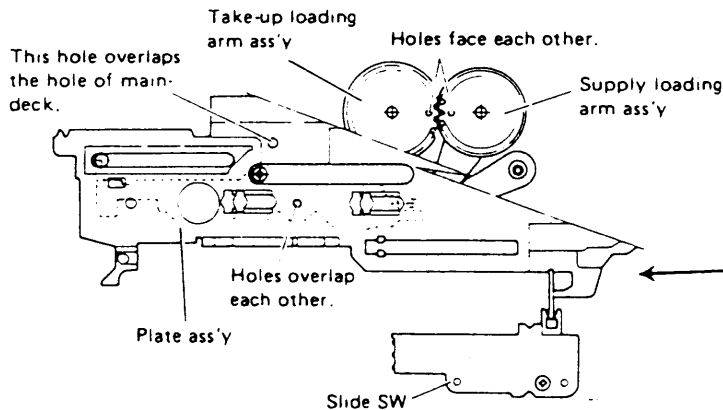
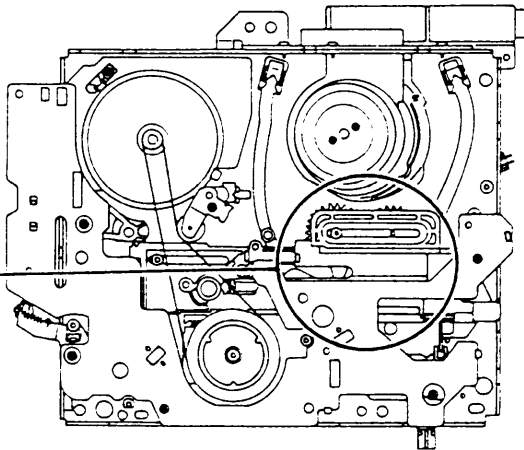
No.	Item	Checkpoints	Adjustment and Checks
7	Take-up loading arm assembly Supply loading arm assembly Plate assembly		<p>Note:</p> <ul style="list-style-type: none"> • Set mechanism to the Eject or Stop mode before removing these parts. • The flange of the plastic rivet securing the loading arm assembly and the pole base assembly can be damaged by attempting to remove it directly. Press the loading arm assembly firmly to prevent motion. Then use a narrow-shafted tool to press the rivet from the shaft end to remove it.
		<p>Mounting position alignment</p> <ul style="list-style-type: none"> • Remove the tension arm assembly to facilitate operation. <p>See Fig. 1-5-18.</p>	<p>1) Set the supply and take-up loading arm assemblies so that the holes of the gear portions are aligned, then secure to the pole base assemblies with rivets.</p> <p>2) Shift the plate assembly and install with the holes of the upper and lower components overlapped.</p>
		<p>Slide switch</p> <p>See Fig. 1-5-18.</p>	<p>Be sure to engage the slide switch slider with the edge of the plate assembly.</p>
	 <p>This diagram shows the alignment of the take-up loading arm assembly, supply loading arm assembly, and plate assembly. Labels include: 'Take-up loading arm ass'y', 'Holes face each other.', 'Supply loading arm ass'y', 'This hole overlaps the hole of main-deck.', 'Holes overlap each other.', 'Plate ass'y', and 'Slide SW'.</p>		 <p>This diagram shows the top view of the loading arm mechanism. A circular inset highlights the alignment of the gear portions of the take-up and supply loading arm assemblies. An arrow points from this inset to the 'Holes face each other.' label in Fig. 1-5-18.</p>

Fig. 1-5-18 Mounting position alignment

Fig. 1-5-19
T.S. Loading arm position

SECTION 2 ELECTRICAL ADJUSTMENTS

2.1 PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts.

It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

2.1.1 Required test equipment

1. Color television or monitor
2. Oscilloscope: wide-band, dual-trace, triggered delayed sweep
3. Frequency counter
4. Audio oscillator
5. Audio voltmeter
6. Digital voltmeter
7. Signal generator: RF/IF sweep/marker
8. Signal generator: PAL color bar, staircase, video sweeper
9. Signal generator: Audio multiplex TV signal generator
10. Recording tape
11. Alignment tape: MH-2
12. Presetting unit: PTU94008.

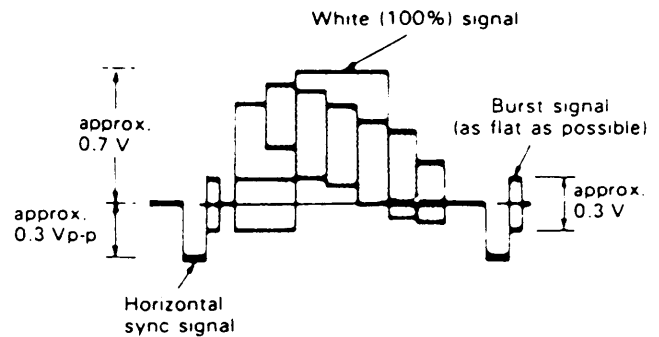


Fig. 2-1-1 Color bar signal of pattern generator

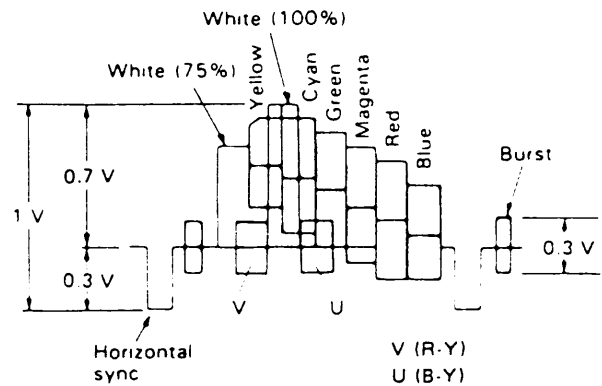


Fig. 2-1-2 Color bar signal waveform

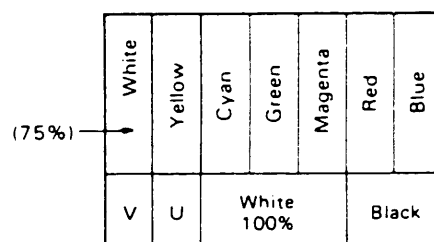
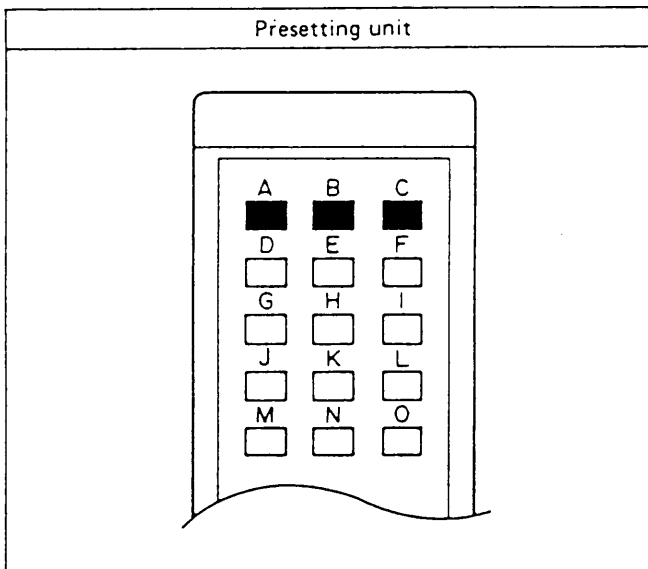


Fig. 2-1-3 Color bar pattern



Note : Use only buttons "B" and "C".
Depressing other buttons during adjustments may cause adjustmet errors.

2.1.2 Check and adjustment steps

The check and adjustment steps are provided in the following in the form of charts. For clarity, the nomenclature used in the charts is outlined below.

No.	Checks and adjustments are numbered in the recommended sequence in which they are to be performed.
Item	Name assigned to the particular check and adjustment step.
Check Point	Location to which measuring instrument (oscilloscope unless otherwise noted) is to be connected.
Adjustment Parts	Variable component (resistor, capacitor, etc.) to be adjusted in this step. Dash (—) indicates check only.
Signal & Mode	<ul style="list-style-type: none"> Input signal required to perform adjustment. Dash (—) indicates that special signal is not required. Equipment operating mode at time of check or adjustment.
Color bars	Color bars signal as video input.

Stairstep	Stairstep signal as video input.
1 kHz	1 kHz sinewave as audio input signal.
MH-2 color bars	Color bars segment of MH-2 alignment tape.
MH-2 stairstep	Stairstep segment of MH-2 alignment tape.
MH-2 1 kHz	1 kHz audio signal segment of MH-2 alignment tape.
MH-2 RF sweep	RF sweep segment of MH-2 alignment tape.
E-E	Power on and machine in Stop mode.
REC	Recording mode
PB	Playback mode
SEARCH	Search (FWDS and REVS) playback mode
SLOW	Slow motion playback mode
STILL	Pause during playback mode
SP mode	SP recording speed

Description This column provides an explanation of the step, notes and adjustment values, and reference to waveforms where applicable.

2.2 SWITCHING REGULATOR CIRCUIT

Note: Unless otherwise specified, all test points and adjustments are located on the MAIN board.

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	5V DC output voltage	• REC	• TUNER	• Q806-B • TP803 (GND)	• R811 (SWD 5V)	1) Connect a digital voltmeter between Q806-B and TP803. 2) Record in the TUNER mode, adjust R811 for 5.30 ± 0.05 V.

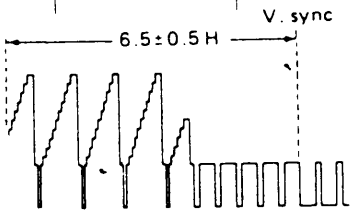
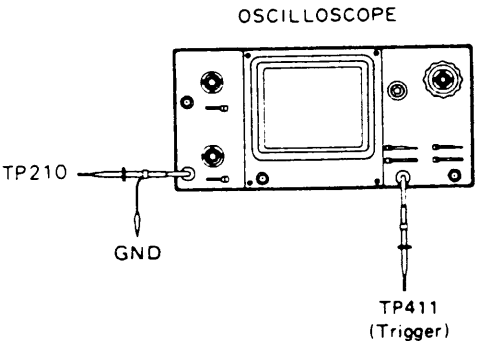
2.3 TIMER CIRCUIT

Note: Unless otherwise specified, all test points and adjustments are located on the T/D/S board.

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	Clock	• EE	• AUX	• IC1-16	• C6 (CLOCK)	Note: For below adjustments use 10:1 probe with input capacitance less than 100 pf. 1) Disconnect VCR from AC. Connect a frequency counter between IC1-16 and GND. 2) Short IC1-8 to GND, then short the leads of capacitor C3 once in order to reset IC1. 3) Connect VCR to AC. All FDP Segments are on. 4) Adjust C6 for 2048.000 ± 0.002 Hz (488.2808 to 488.2818 μ s).

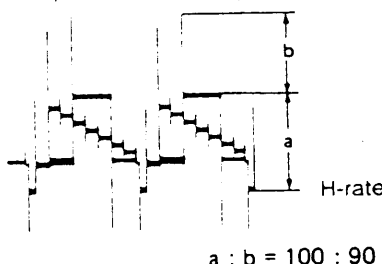
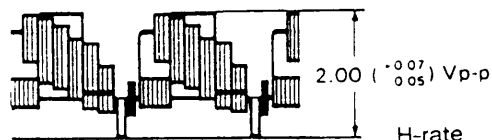
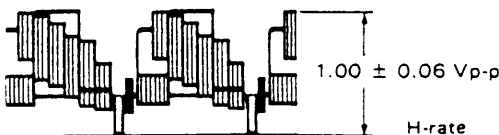
2.4 SERVO CIRCUIT

Note: Unless otherwise specified, all test points and adjustments are located on the MAIN board.

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure
1	SP PB switching point	• PB	<ul style="list-style-type: none"> • MH-2 stairstep • Trigger slope (—) • Auto tracking off 	• TP210	• R420 (PB SW POINT)	<ol style="list-style-type: none"> 1) Connect an oscilloscope to TP210. 2) Play back the stairstep segment of MH-2 alignment tape. 3) Trigger the oscilloscope externally (— slope) with the signal from TP411. 4) Adjust R420 to position the trigger point 6.5 ± 0.5 H from V. sync.
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Fig. 2-4-1 PB switching point</p> </div> <div style="text-align: center;">  <p>Fig. 2-4-2 oscilloscope</p> </div> </div>						
2	SP slow tracking preset	• REC then PB (slow)	• Tuner or colour bar	• TV monitor	• Presetting unit (PTU-94008)	<p>Note : Use only buttons "B" and "C". Depressing other buttons during the below steps may cause adjustment errors.</p> <ol style="list-style-type: none"> 1. Disconnect VCR from AC for 3 minutes to reset CPU. 2. Reconnect VCR to AC. Time display will flash to show that CPU has reset. 3. Turn power on. 4. Record a color bar signal mode. 5. Play back recorded signal in the slow mode and set FRONT panel tracking control to center position by simultaneously pressing (+) and (—) buttons. 6. Depress button "A", on presetting unit, to set VCR to code receive mode. 7. Observe monitor-TV and adjust for optimum noise condition (best tracking) by depressing "B" or "C" buttons, of presetting unit, as required. 8. Confirm that bar noise is not visible in picture. 9. Depress stop. 10. Disconnect VCR from AC for 3 minutes. 11. Reconnect VCR to AC and play tape to verify that information was stored in memory.

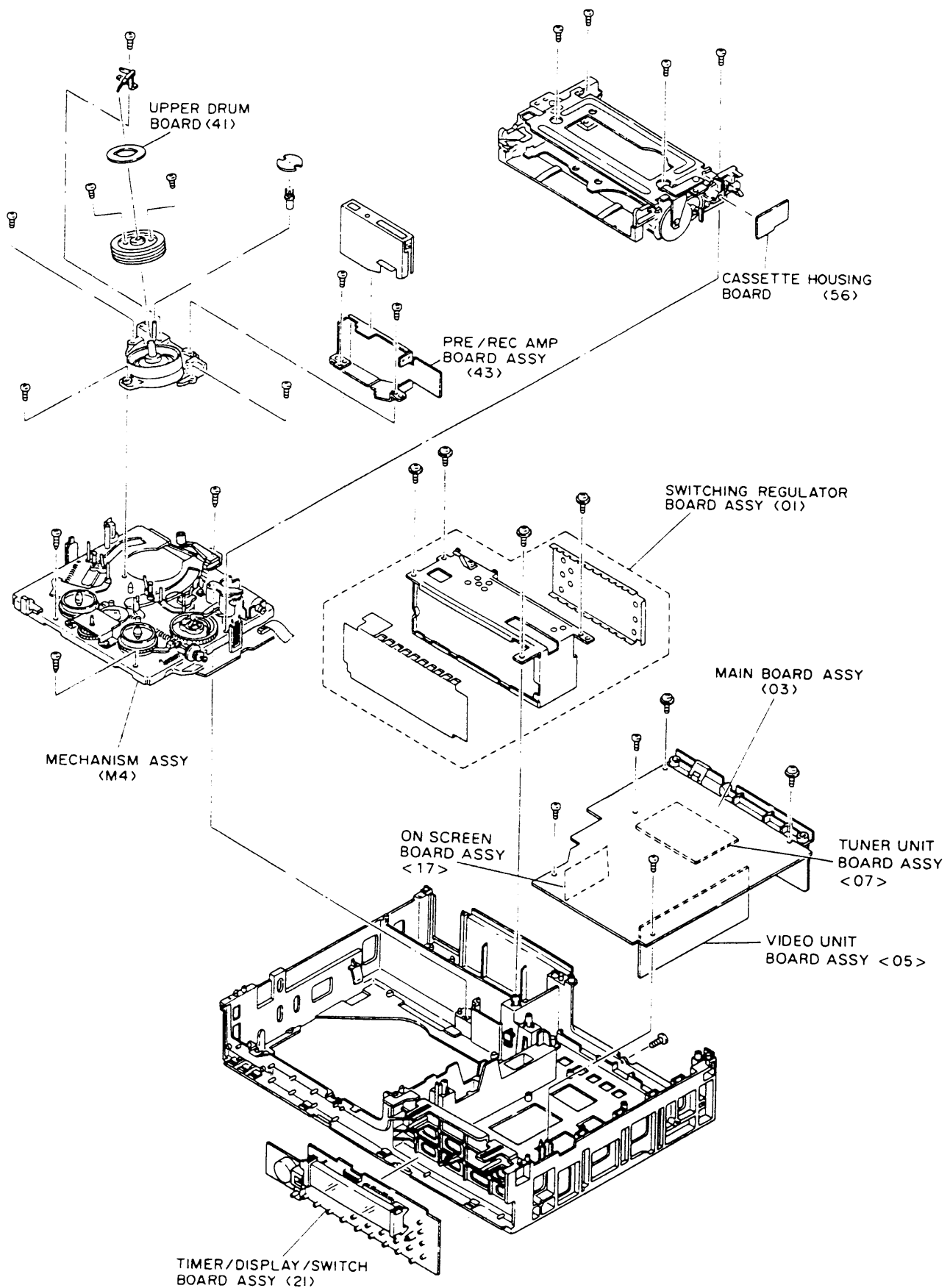
2.5 VIDEO CIRCUIT

Note: Unless otherwise specified, all test points and adjustments are located on the VIDEO unit board.

No.	Item	Mode	Signal & Setting	Measurement Point	Adjustment Parts	Adjustment Procedure		
<div>IMPORTANT: Item 1,2,3 and 4</div> <div>1. Ordinarily avoid performing these adjustments. It should be performed only if IC1 of the VIDEO UNIT board has been replaced.</div> <div>2. To adjust, replace fixed resistor with variable resistor, then adjust as required.</div>								
1	EE level & White clip	• EE	• Colour bar	• CN207-15 (Main board) • IC1-22	• R60 (EE Y LEVEL) • R64 (WHITE CLIP)	<div>1) When IC1 of the VIDEO UNIT board is replaced, it may also be necessary to replace R60 and R64 with adjustable resistors.</div> <div>2) Confirm $2.00 \left(\begin{smallmatrix} +0.07 \\ -0.05 \end{smallmatrix} \right)$ Vp-p EE level at CN207-15 and white clip of $90 \pm 4\%$ at IC1-22. If necessary, replace R60 with NVP1301-103NU and R64 with NVP1301-332NU.</div> <div>3) Supply a colour bar signal to VIDEO IN, connect one channel of a dual trace oscilloscope to CN207-15 and the other channel to IC1-22.</div> <div>4) Alternately adjust R60 and R64 for $2.00 \left(\begin{smallmatrix} +0.07 \\ -0.05 \end{smallmatrix} \right)$ Vp-p at CN207-15 and white clip of $90 \pm 4\%$ at IC1-22.</div>		
<div></div> <div>a : b = 100 : 90</div> <div>Fig. 2-5-1 White clip</div>				<div></div> <div>Fig. 2-5-2 EE Level</div>				
2	Carrier & Deviation	• EE	• AUX • No signal	• CN206-9 (Main board)	• R41 (CARRIER)	<div>1) When IC1 of the video unit board is replaced, it may also be necessary to replaced R41 and R42 with adjustable resistors.</div> <div>2) Play back a colour bar segment of MH-2 and confirm $1.00 (\pm 0.06)$ Vp-p Y level at VIDEO OUT (75Ω load). If necessary, replace R41 with NYVP1301-223NU and R42 with NVP1301-103NU..</div> <div>3) Without an incoming signal. Terminate VIDEO OUT with TV-monitor (75Ω load), connect a frequency counter to CN206-9 on the MAIN board.</div> <div>4) Adjust R41 for 3.80 ± 0.04 MHz.</div> <div>5) Play back a colour bar segment of MH-2, and confirm $1.00 (\pm 0.06)$ Vp-p at VIDEO OUT. If necessary, redplace R17 with NVP1301-222NU.</div>		
<div>IMPORTANT:</div> <div>Ordinarily avoid performing this adjustment. It should be performed only if IC1 of the VIDEO UNIT board has been replaced or if significant waveform distortion and S/N deterioration occur during recording and playback due to deficient adjustment of the carrier set and deviation.</div>				• REC then PB	• Colour bar • AUX	• TP210 Video out (Main board)	• R42 (DEVIATION)	<div>6) Record and play back a colour bar signal. If necessary, before recording, adjust R42 so that the Y level becomes $1.00 (\pm 0.06)$ Vp-p at VIDEO OUT during playback mode.</div>
<div></div> <div>Fig. 2-5-3 Carrier and deviation</div>								

SECTION 3 CHARTS AND DIAGRAMS

3.1 CIRCUIT BOARD AND LOCATION



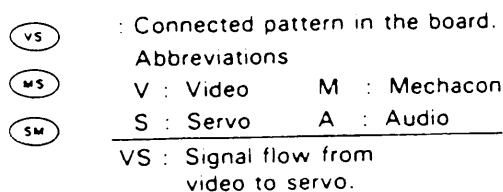
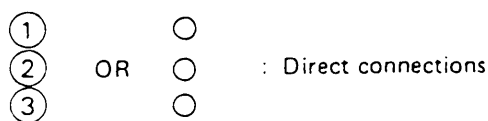
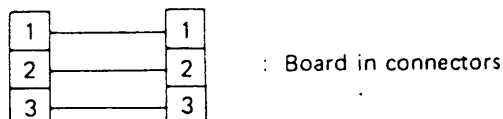
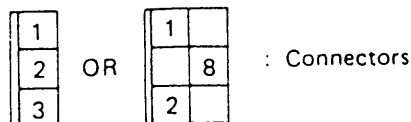
3.2 GENERAL INFORMATION

3.2.1 Connections

Note:

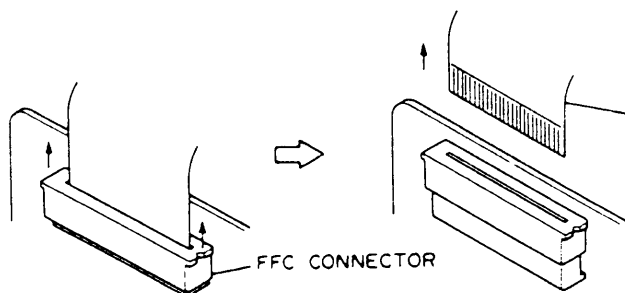
Unless otherwise specified, only signal input flow is indicated.

Connection arrows indicate only signal outputs.

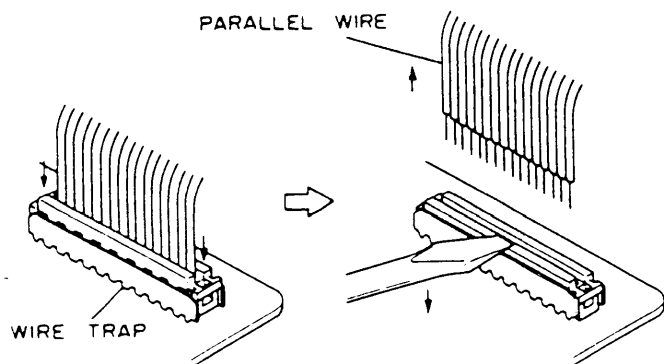


3.2.2 Disconnecting the flatwire

1. Pull the connector structure upward to release the clamp when removing or inserting the flat wire cable.



2. Depress the connector structure downward to release the clamp when removing or inserting the flat wire cable, as indicated below.



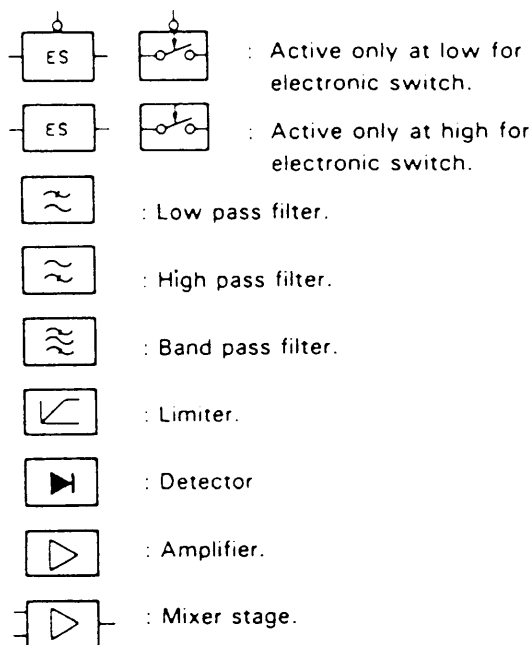
3.2.3 Indications

AUX : Active only at high.

$\overline{\text{AUX}}$: Active only at low.

$\overline{\text{AUX}}$: Active only at middle.

$\overline{\text{AUX}}$: Active only at open.

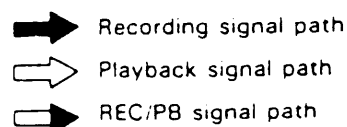


3.2.4 Schematic diagram values

Unless otherwise specified.


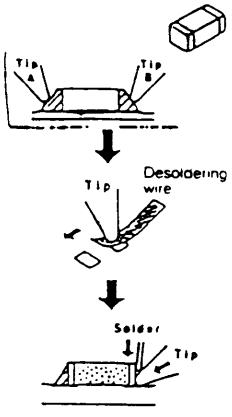







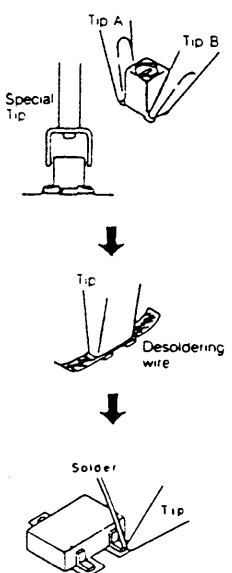









1. All resistance values are in ohms, 1/6 W or 1/8 W (refer to parts list).
2. All capacitance values are in μF , (P; PF).
3. All inductance values are in μH , (m; mH).
4. All diodes are 1SS133 or MA165, (refer to parts list).
5. Voltages are DC-measured (reference to ground) with a digital voltmeter during recording (SP mode) and playback (SP mode) with alignment tape. Where voltages differ between recording and playback, the voltage during playback is shown in parenthesis.
6. Waveforms (VIDEO System) are measured (reference to ground) with a color bar during recording (SP mode) and playback (SP mode) with alignment tape.
7. Waveforms (AUDIO System) are measured (reference to ground) with 1 kHz (-8 dBs) during recording and playback with alignment tape (1 kHz).
8. Shaded () parts are critical for safety. Replace only with specified part numbers.

3.2.5 Signal flow in the schematic


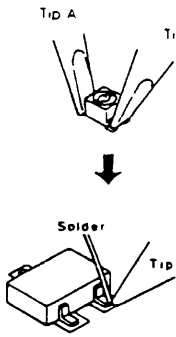






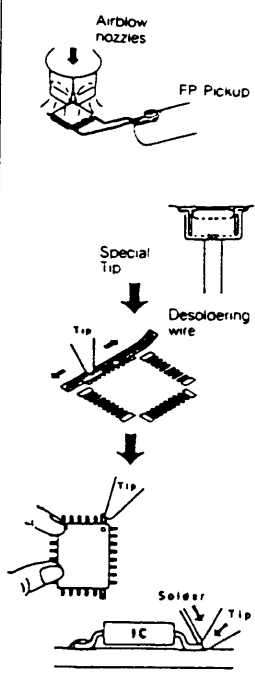











3.2.6 Basic knowledge of SMC* parts replacement

Note: For details, refer to "VIDEO SERVICE GUIDE" (VTS81001).

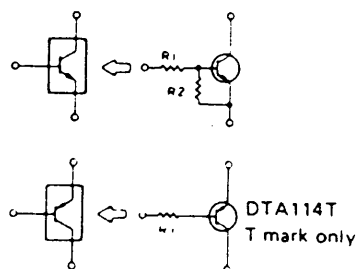
Products	Appearance	Replacement technology	Removal method	Installation method	Soldering tip types	Cautions
Thick Film Chip Resistors			<ul style="list-style-type: none"> • Use 2 soldering irons 1 Use thin tip soldering irons 2 Use soldering tip temperature of about 280°C 3 Simultaneously heat both ends of the part 4 While heating, grasp the part with the tips of the soldering irons and remove it 5 Use desoldering wire to completely remove the old solder from the part location of the board 6 A clean pattern for installing the new part is very important 	<ol style="list-style-type: none"> 1 Clean the area where the new part is to be mounted (use alcohol) 2 Apply flux 3 Set part correctly into position, prevent it from shifting 4 Bring the soldering iron tip close to the part contact without actually touching it. Melt thin (0.3 mm) solder between the tip and part so that it flows into the part contact 5 Check work quality with a magnifier 	<p>Thin tip type</p>  <p>Small flat-blade tip type</p> 	<p>Some parts can be damaged by sudden heating. Preheat the part at about 100°C for several minutes before installing it.</p> <p>Do not touch the part body with the soldering iron.</p> <p>The thin (0.3 mm) solder for miniature parts does not contain adequate flux. Supplementary flux is thus needed in most cases.</p> <p>Set the position carefully and secure the part.</p> <p>A defective trimming resistor cannot be adjusted externally. Replace with an ordinary variable resistor.</p>
Carbon Film Chip Resistors						
Metal Film Chip Resistors						
Chip Ceramic Capacitors						
Chip Trimming Resistors						
Chip Inductors			<ul style="list-style-type: none"> • Special desoldering iron 1 Select soldering tip according to part size 2 Bring the tip into contact with the soldered points 3 When the solder melts, remove the part 4 Remove the old solder with desoldering wire • 2 soldering irons 1 Use small flat-blade tips 2 Heat both ends of the part simultaneously 3 When the solder melts, grasp and remove the part with the soldering iron tips 4 Remove the old solder with desoldering wire 	<ol style="list-style-type: none"> 1 Clean the area where the new part is to be mounted (use alcohol) 2 Apply flux 3 Set part correctly into position, prevent it from shifting 4 Use sharp soldering iron tip. Bring close to the part contact without actually touching it. Melt thin solder between the tip and part so that it flows into the part contact 5 Check work quality with a magnifier 	<p>Special Soldering tip</p>  <p>Small flat-blade tip type</p>  <p>Thin tip type</p> 	<p>Use care not to damage plastic components when soldering.</p> <p>Position the part carefully. This will also affect the soldering operation.</p> <p>Use care regarding soldering iron tip and avoid rapidly heating parts.</p> <p>For larger parts, use a slightly higher temperature (about 300°C).</p> <p>Check after installing (cold solder joints, etc.).</p> <p>Use care not to damage the circuit pattern, especially when removing.</p>
Chip Resistor Networks						
Chip Tantalum Capacitors						
Chip Tantalum Electrolytic Capacitors						
Chip Aluminum Electrolytic Capacitors						
Chip Transformers						
Chip Filters						

* SMC Surface Mounted Component

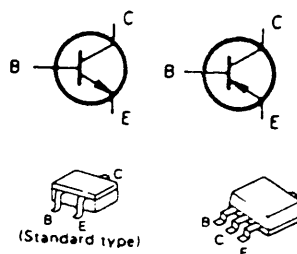
Products	Appearance	Replacement technology	Removal method	Installation method	Soldering tip types	Cautions
Chip VRs			2 soldering irons 1 Use small flat-blade tips 2 Heat the leads of the part simultaneously 3 When the solder melts grasp and remove the part with the soldering iron tips 4 Remove the old solder with desoldering wire	1 Clean the area where the new part is to be mounted (use alcohol) 2 Apply flux 3 Set part correctly into position, prevent it from shifting 4 Use sharp soldering iron tip. Bring close to the part contact without actually touching it. Melt thin solder between the tip and part so that it flows into the part contact	 	Use care not to damage the part when soldering Check for solder joints, especially miniature parts with small leads
Chip Trimmer Capacitors						
Diodes						
Transistors						
IC (SOP) (Small Outline Package)			Special desoldering iron 1 Select the tip according to the size and shape of the IC 2 "Tin" the tip with a small amount of solder 3 Set the tip squarely over the IC leads 4 When the solder melts, carefully twist the iron 5 Raise and remove the IC Shaped airblower unit 1 Select the correct nozzle 2 Select the temperature and airflow (suggested temp 7, airflow 4) 3 Engage the IC removing tool 4 Use the airblow to preheat the IC for about 5 seconds, then heat with the nozzle until the IC remover lifts the part from the board	1 Use desoldering wire to remove the previous solder 2 Clean the location with alcohol 3 Apply flux 4 Position the IC and solder two pins at opposite sides 5 Use a sharp tipped soldering iron and carefully solder each pin (After gaining experience, a thicker tip can be used for better work efficiency.) 6 Remove any solder bridges with desoldering wire 7 Inspect the work with a magnifier	Special soldering tips  Airblow nozzles  	Do not reuse removed parts Use care to avoid solder bridges. Remove any that occurs Remove the old IC carefully so as not to damage the circuit pattern Because of the many pins, cleanliness of the pattern is extremely important after removing the IC Be very precise in positioning the IC Soldering opposite pins first holds the IC in place and makes soldering the other pins easier It is important to inspect the work with a magnifier ICs (especially TSOP) are easily damaged by heat. Do not touch directly with the soldering iron
IC (SSOP) (Shrink Small Outline Package)						
IC (VSOP) (Very Small Outline Package)						
IC (QFP) (Quad Flat Package)						
IC (VOFP) (Very Small Quad Flat Package)						
IC (PLCC) (Plastic Leaded Chip Carrier)						
IC (TSOP) (Thin Small Outline Package)						

3.2.7 Semiconductors

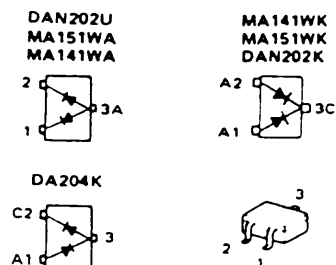
1. Digital transistor



2. Chip transistor



3. Chip diode



Note: The digital transistor includes built in resistors. It features small size and high reliability. Both PNP and NPN types are available.

Uses: Inverter, interface, driver circuits.

Pinout Table:

Pin	Signal
6 0	
5 9	
5 8	DRUM MOTOR
5 7	CAP MDA
5 6	CASSETTE HOUSING
5 5	LOADING MDA
5 4	
5 3	
5 2	
5 1	DECK TERMINAL
5 0	
4 3	PRE/REC AMP
4 1	UPPER DRUM
3 5	TUNER MEMORY
2 8	
2 7	
2 6	
2 5	
2 4	
2 3	
2 2	
2 1	TIMER/DISPLAY/SW
2 0	
1 9	
1 8	REG SUB
1 7	
1 5	
1 4	
1 3	AUDIO/CTL HEAD
1 2	
1 1	
1 0	
0 9	
0 8	TUNER UNIT
0 7	
0 6	
0 5	VIDEO UNIT
0 4	
0 3	MAIN
0 2	
0 1	SW REG
N C	NAME

Component List:

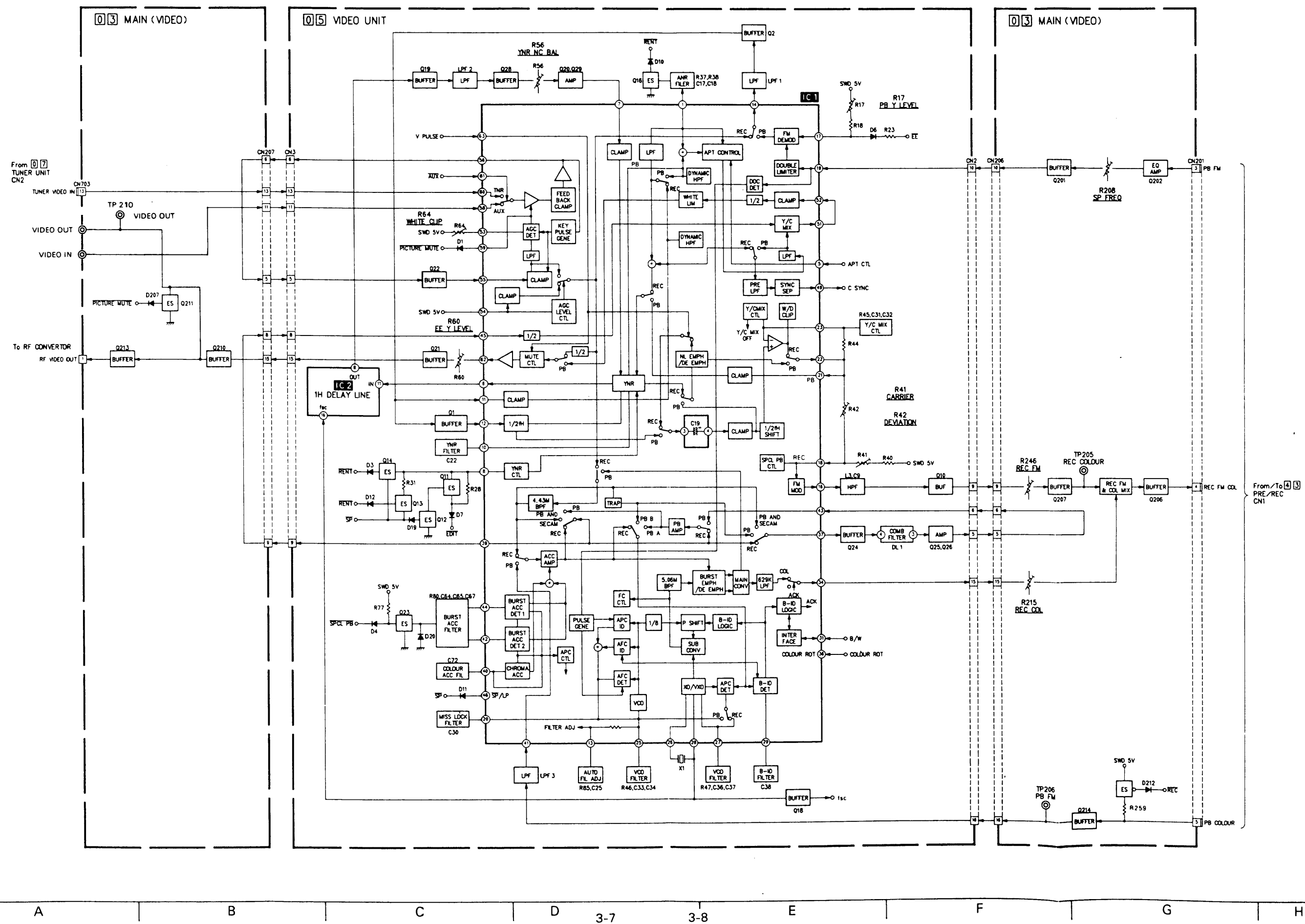
- 0 8 TUNER UNIT
- 0 1 SW REG
- 0 3 MAIN
- 0 5 VIDEO UNIT
- 0 2 1 TIMER/DISPLAY/SW
- 0 1 8 REG SUB
- 0 1 5 DECK TERMINAL
- 0 1 6 CASSETTE HOUSING
- 0 1 7 CAP MDA
- 0 1 5 LOADING MDA
- 0 1 4 U. DRUM
- 0 1 3 PRE/REC
- 0 1 2 DRUM MOTOR

Wiring Details:

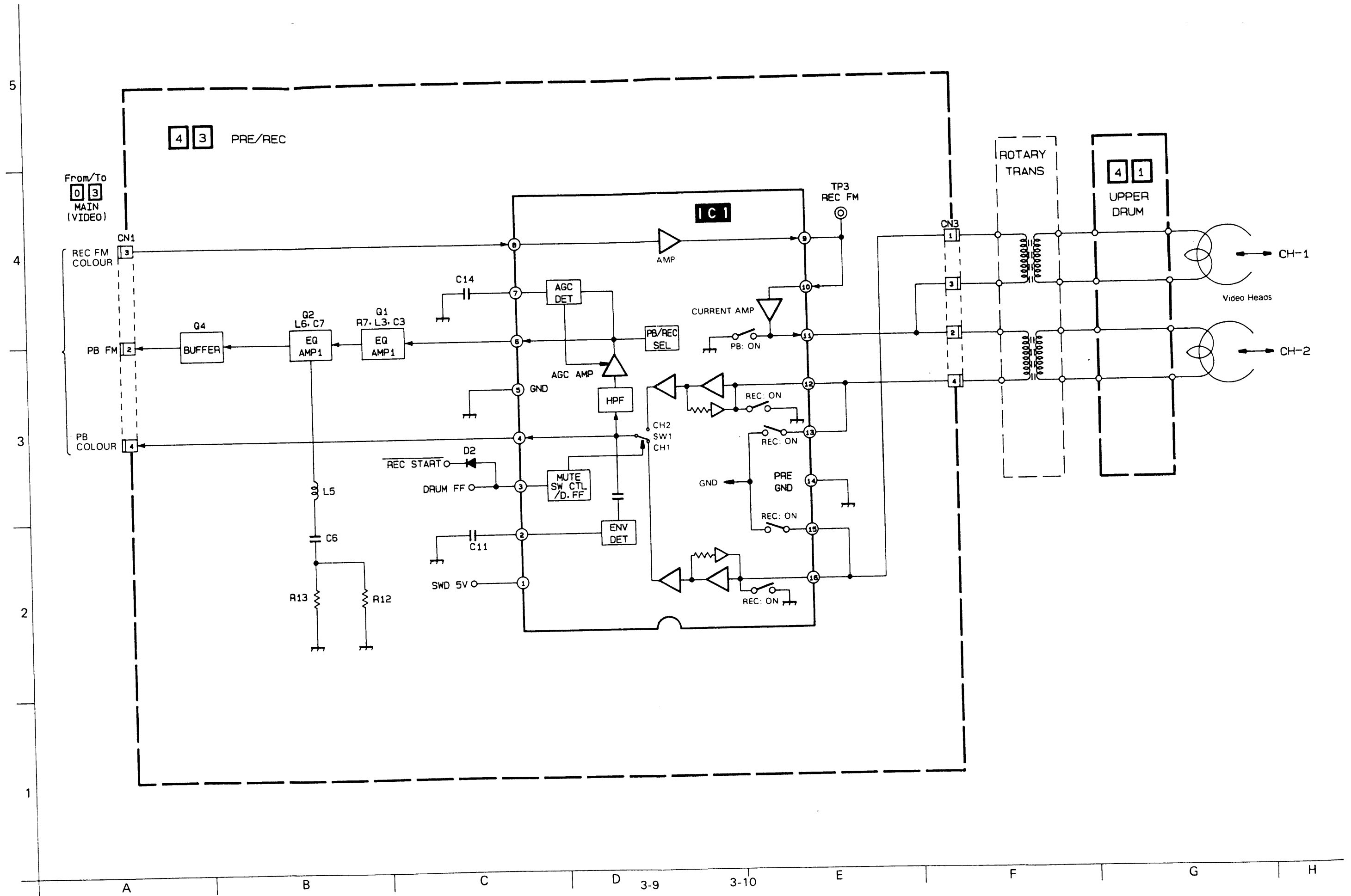
- TUNER UNIT:** Includes FRONT END, RF CONVERTER, REMOTE PAUSE, VPT ADAPTOR (REAR VIEW), VIDEO OUT/IN, AUDIO OUT/IN, and a terminal section for VIDEO and AUDIO signals.
- DRUM MOTOR:** Connected to CN1 (MOTOR 12V, GND, DRUM FG/PG, DRUM DRIVE).
- A/C HEAD:** Connected to CN1 (AE, REC/PB, CTL) and CN2 (FULL ERASE HEAD).
- U. DRUM:** Connected to CN1 (REC(-), PB/REC(+), REC(-), PB/REC(+)).
- PRE/REC:** Connected to CN1 (REC FM COLOUR, PB COLOUR, GND) and CN2 (REC FM COLOUR, PB COLOUR, GND).
- CASS HOUSING:** Connected to CN1 (CASS SENS, MOTOR 12V/17V, START SENS).
- CAP MDA:** Connected to CN1 (CAP REV, SWD 5V, CAP FG, GND, CAP SUP, CAP DRIVE, UNSV 12V).
- LOADING MDA:** Connected to CN1 (START SENS, CASS SENS, GND, MODE SENS B, REEL FG/TUI, SWD 5V, REC SAFETY, MODE SENS A, END SENS, GND, REV, CAP DRIVE, CAP FG, MOTOR 13V/17V, REEL FG/SUP, THERM, MODE SENS C).
- DECK TERMINAL:** Connected to CN1 (START SENS, CASS SENS, GND, MODE SENS B, REEL FG/TUI, SWD 5V, REC SAFETY, MODE SENS A, END SENS, GND, REV, CAP DRIVE, CAP FG, MOTOR 13V/17V, REEL FG/SUP, THERM, MODE SENS C).
- MAIN:** Includes TUNER MEMORY and various control lines like AL 5V, W.CE, W.CTL, W.DATA, GND, and GND10.
- VIDEO UNIT:** Includes various control lines like REC FM COLOUR, PB COLOUR, GND, SWD 5V, REC START, and various video signals.
- TIMER/DISPLAY/SW:** Includes various control lines like REMOTE, S CLOCK, S DATA, SWD 5V, UNSV 5 8V, GND, M/C S-CLK, M/C DATA, CTL CLOCK, and UNSV 12V.

6 0	
5 9	
5 8	DRUM MOTOR
5 7	CAP MDA
5 6	CASSETTE HOUSING
5 5	LOADING MDA
5 4	
5 3	
5 2	
5 1	DECK TERMINAL
5 0	
4 3	PRE/REC AMP
4 1	UPPER DRUM
3 5	TONER MEMORY
2 8	
2 7	
2 6	
2 5	
2 4	
2 3	
2 2	
2 1	TIMER/DISPLAY/SW
2 0	
1 9	
1 8	REG SUB
1 7	
1 5	
1 4	
1 3	
1 2	AUDIO/CTL HEAD
1 1	
1 0	
0 9	
0 8	TUNER UNIT
0 7	
0 6	
0 5	VIDEO UNIT
0 4	
0 3	MAIN
0 2	
0 1	SW REG
N C	NAME

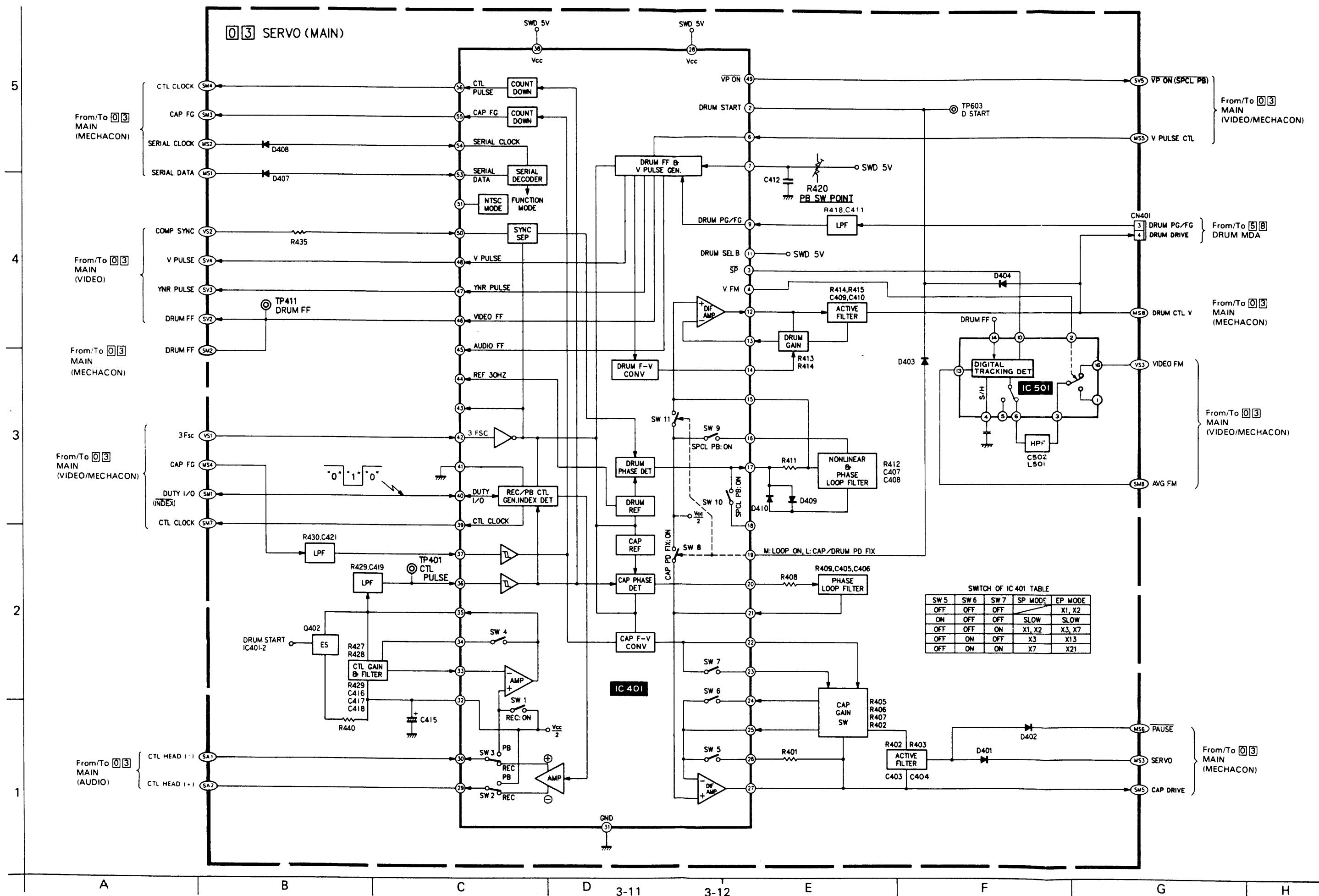
3.4 VIDEO BLOCK DIAGRAM



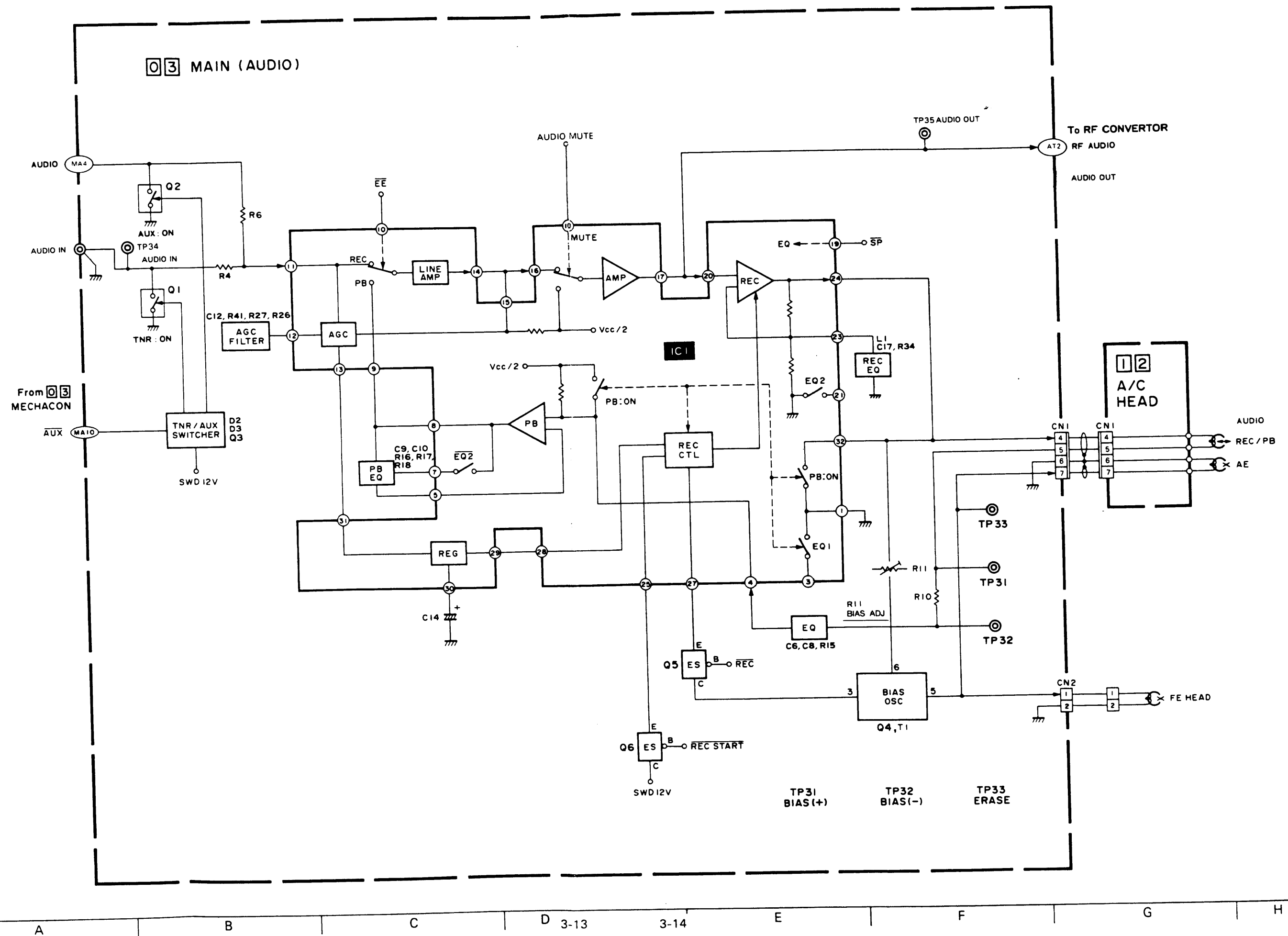
3.5 PRE/REC BLOCK DIAGRAM



3.6 SERVO BLOCK DIAGRAM



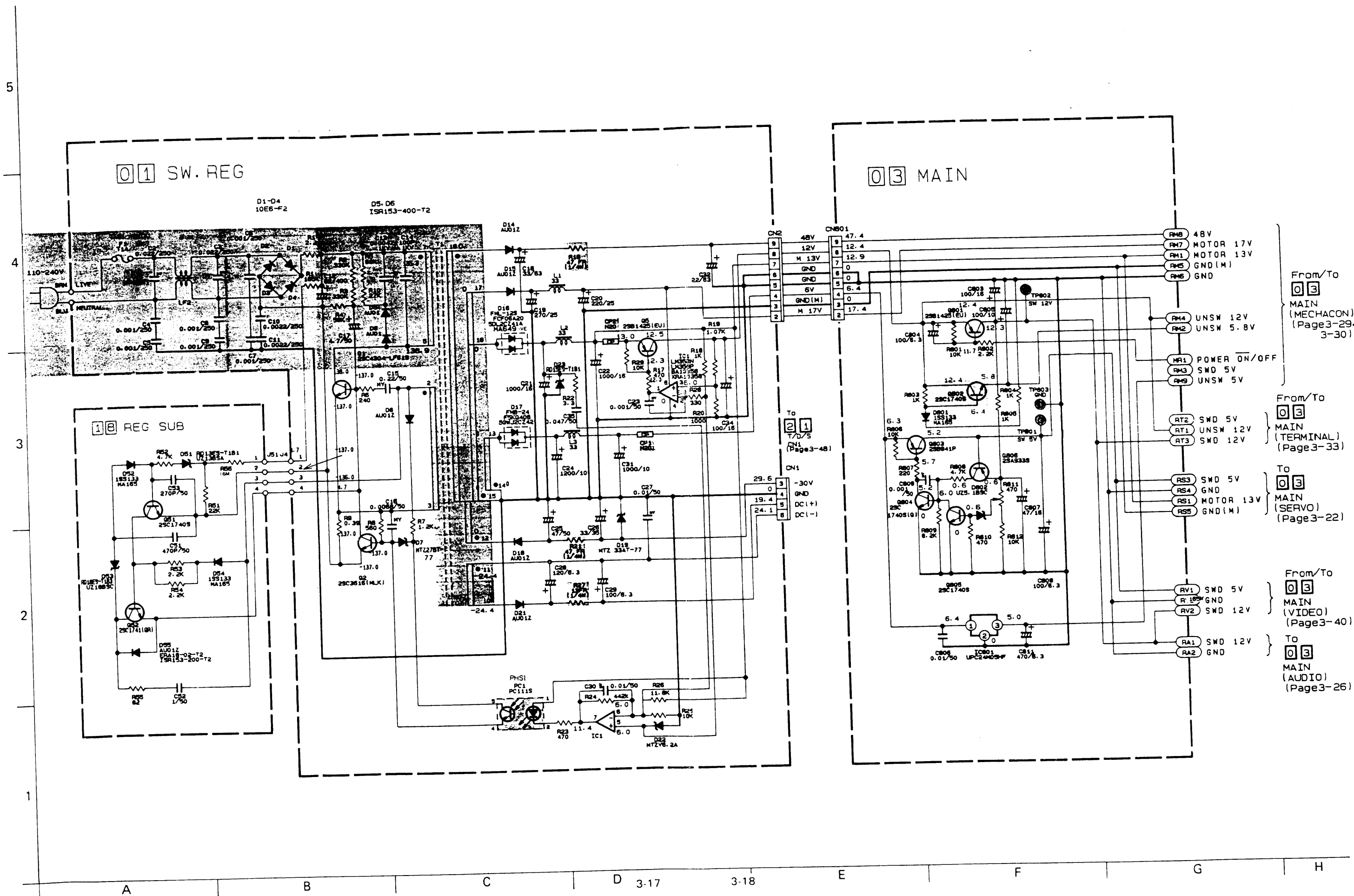
3.7 AUDIO BLOCK DIAGRAM

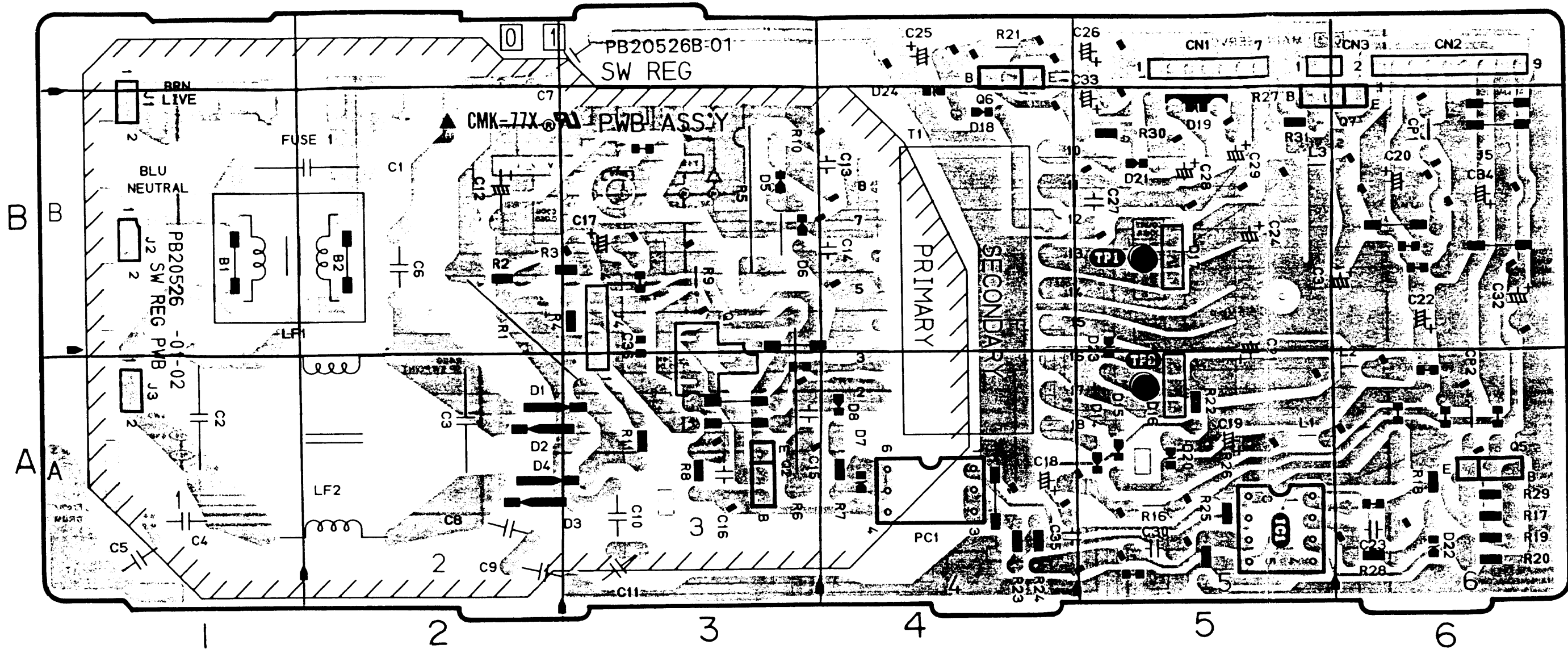


5

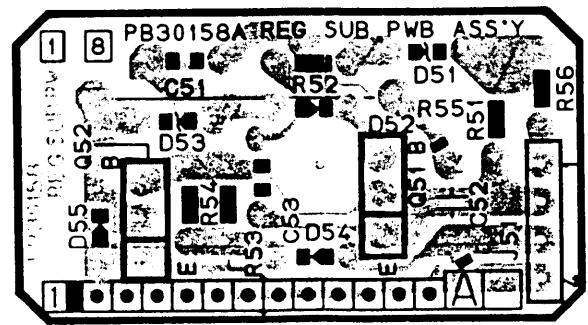


3.9 SWITCHING REGULATOR & REGULATOR (MAIN) SCHEMATIC DIAGRAMS

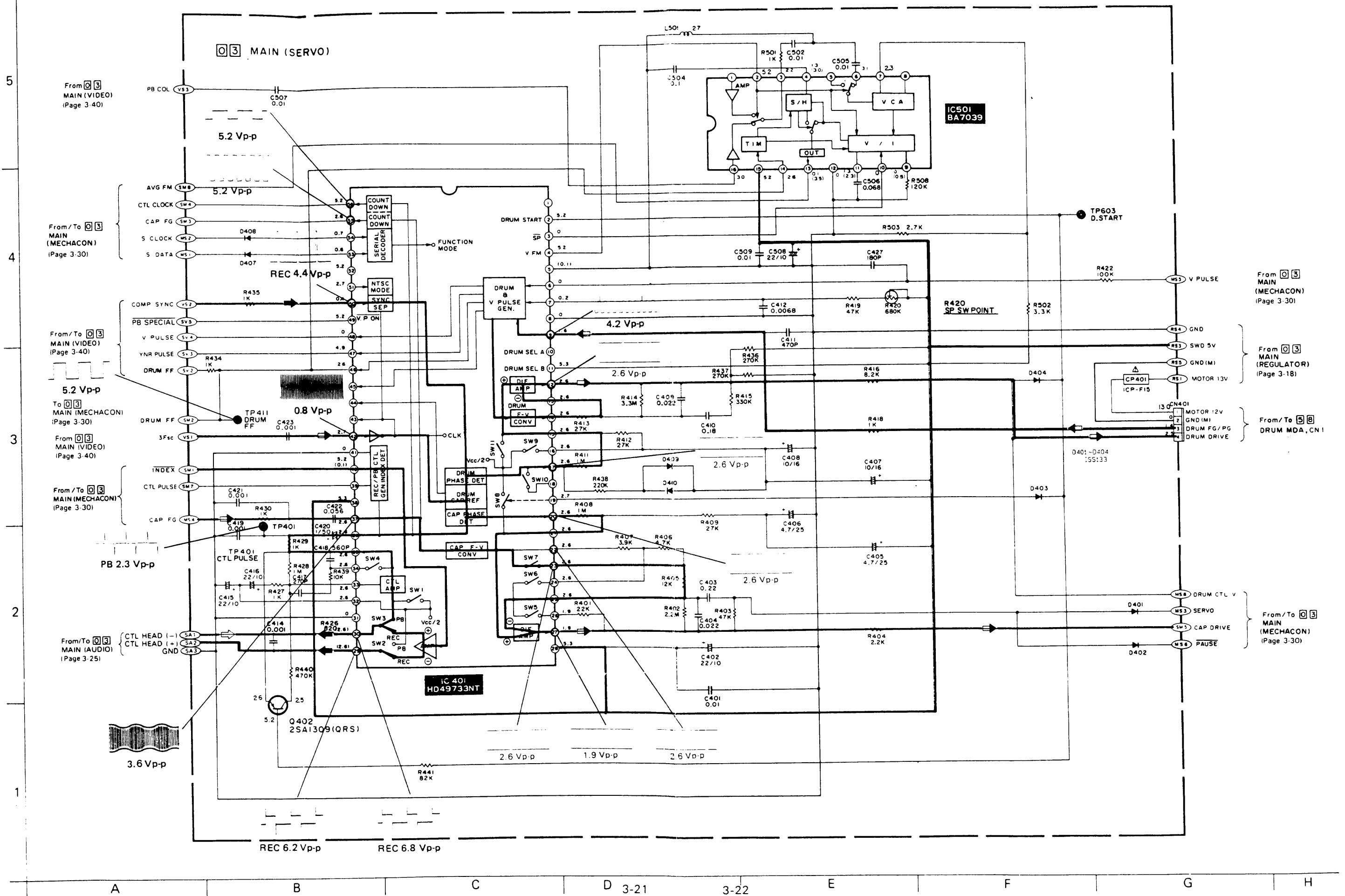




- REG SUB -

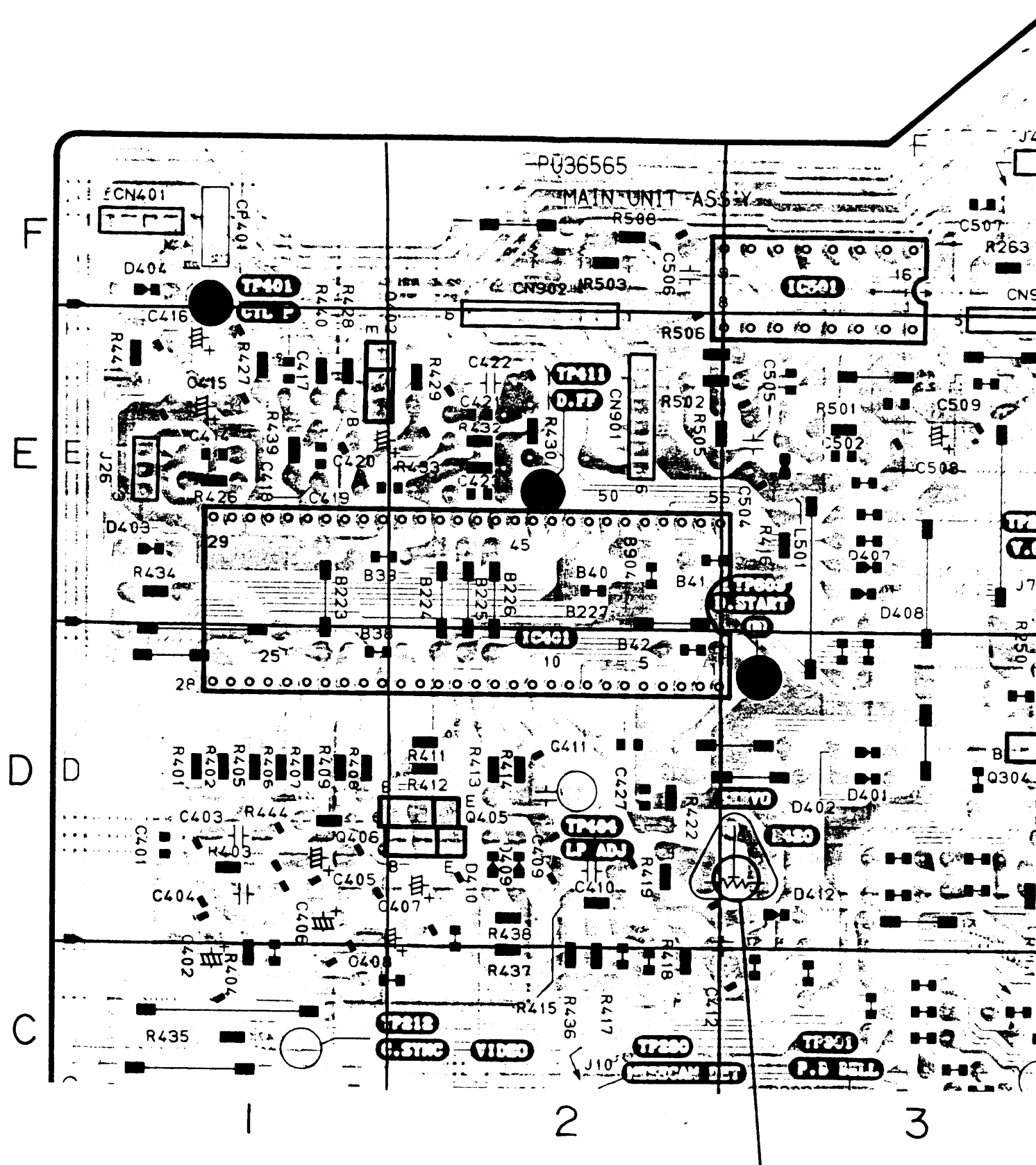
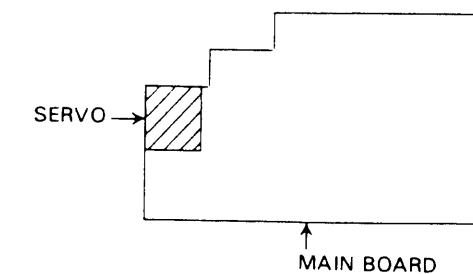


3.11 SERVO SCHEMATIC DIAGRAM



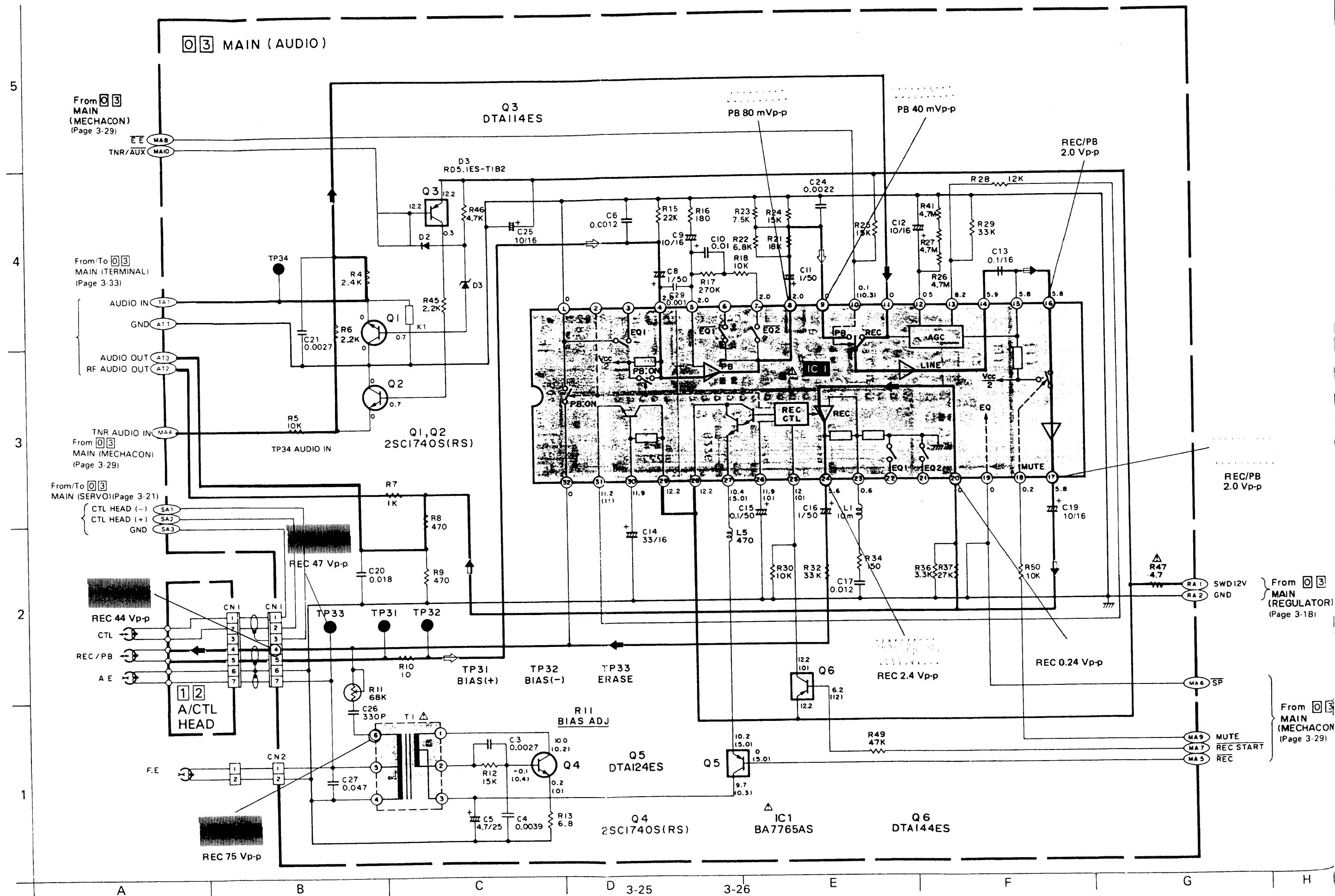
3.12 SERVO (MAIN) CIRCUIT BOARD

- MAIN board assembly is located in page 37,38

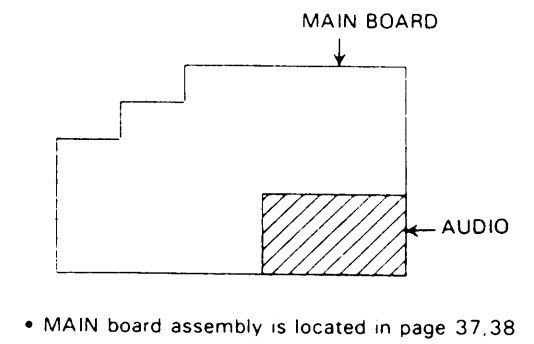


R420
SP PB SW POINT

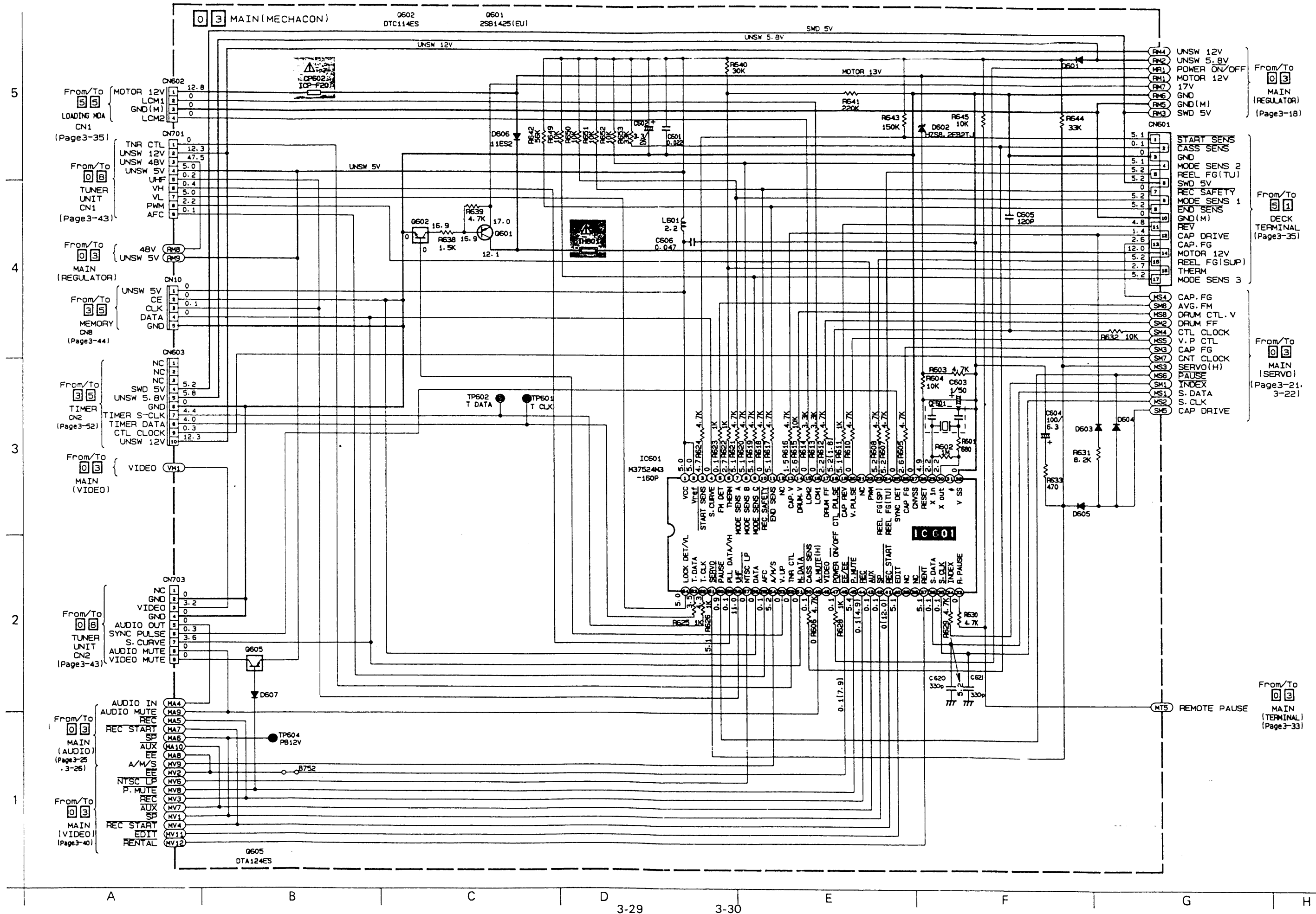
3.13 AUDIO SCHEMATIC DIAGRAM



3-28



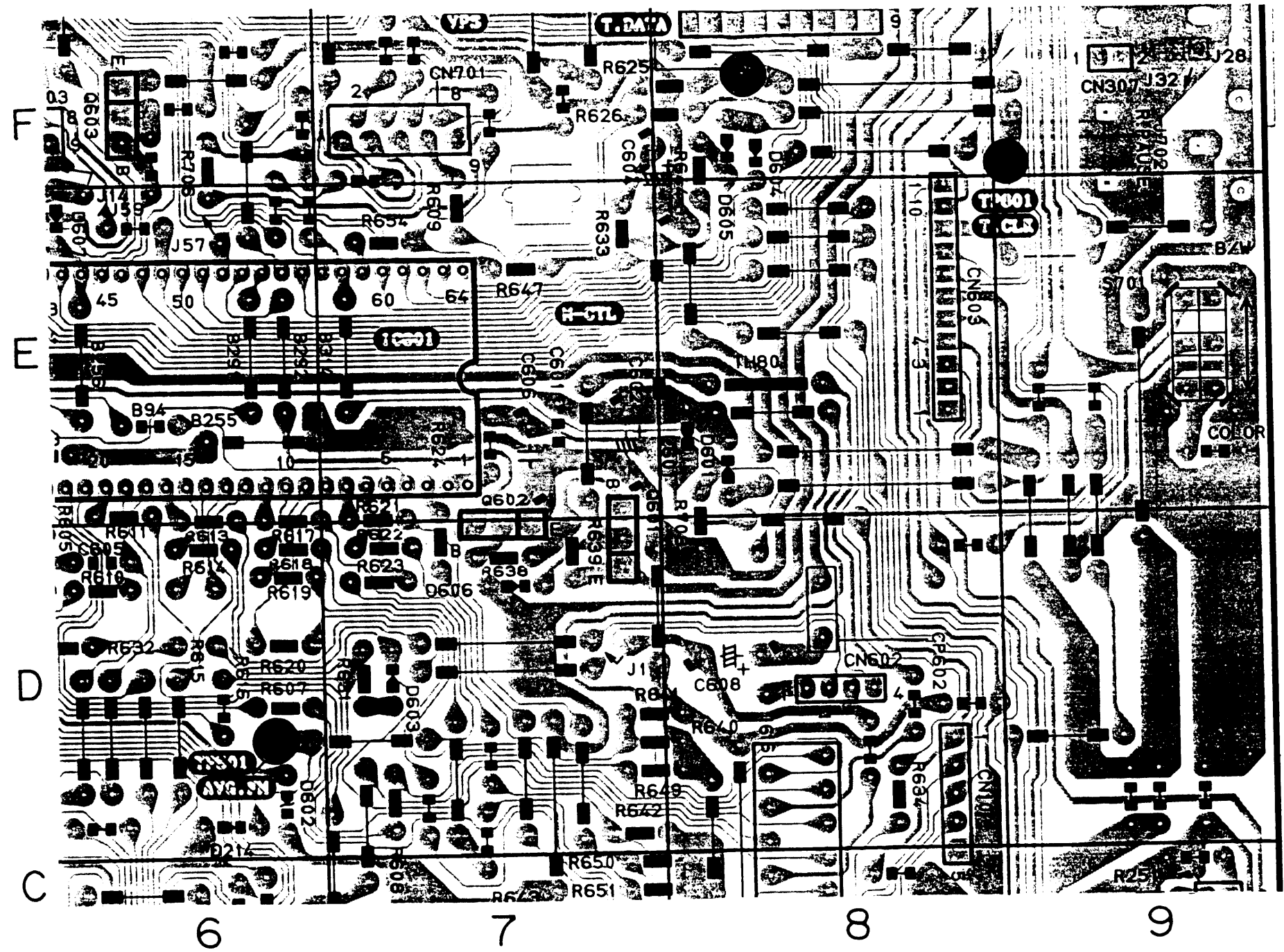
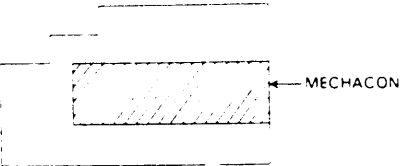
3.15 MECHACON SCHEMATIC DIAGRAM



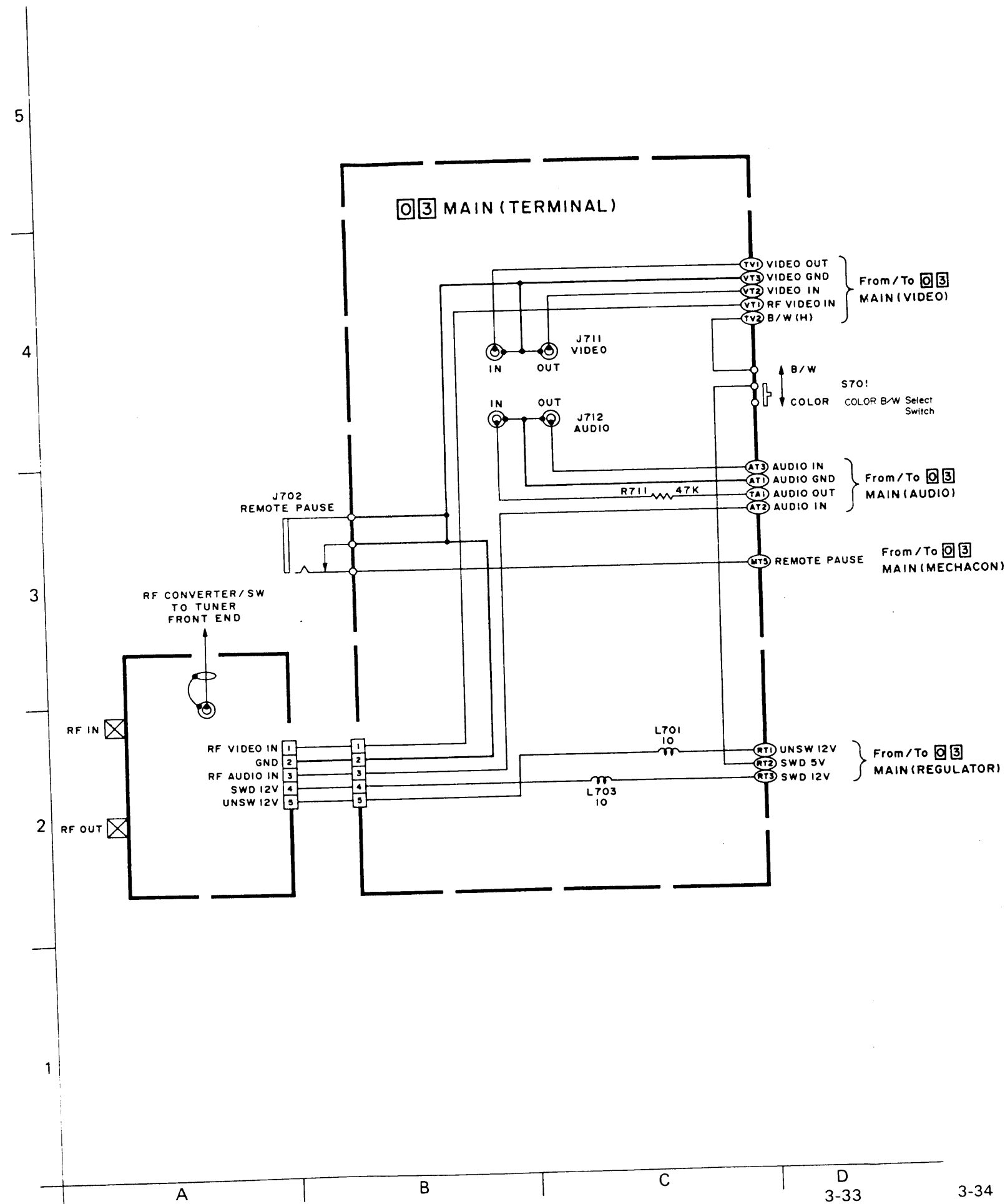
3.16 MECHACON (MAIN) CIRCUIT BOARD

• MAIN board assembly is located in page 37,38

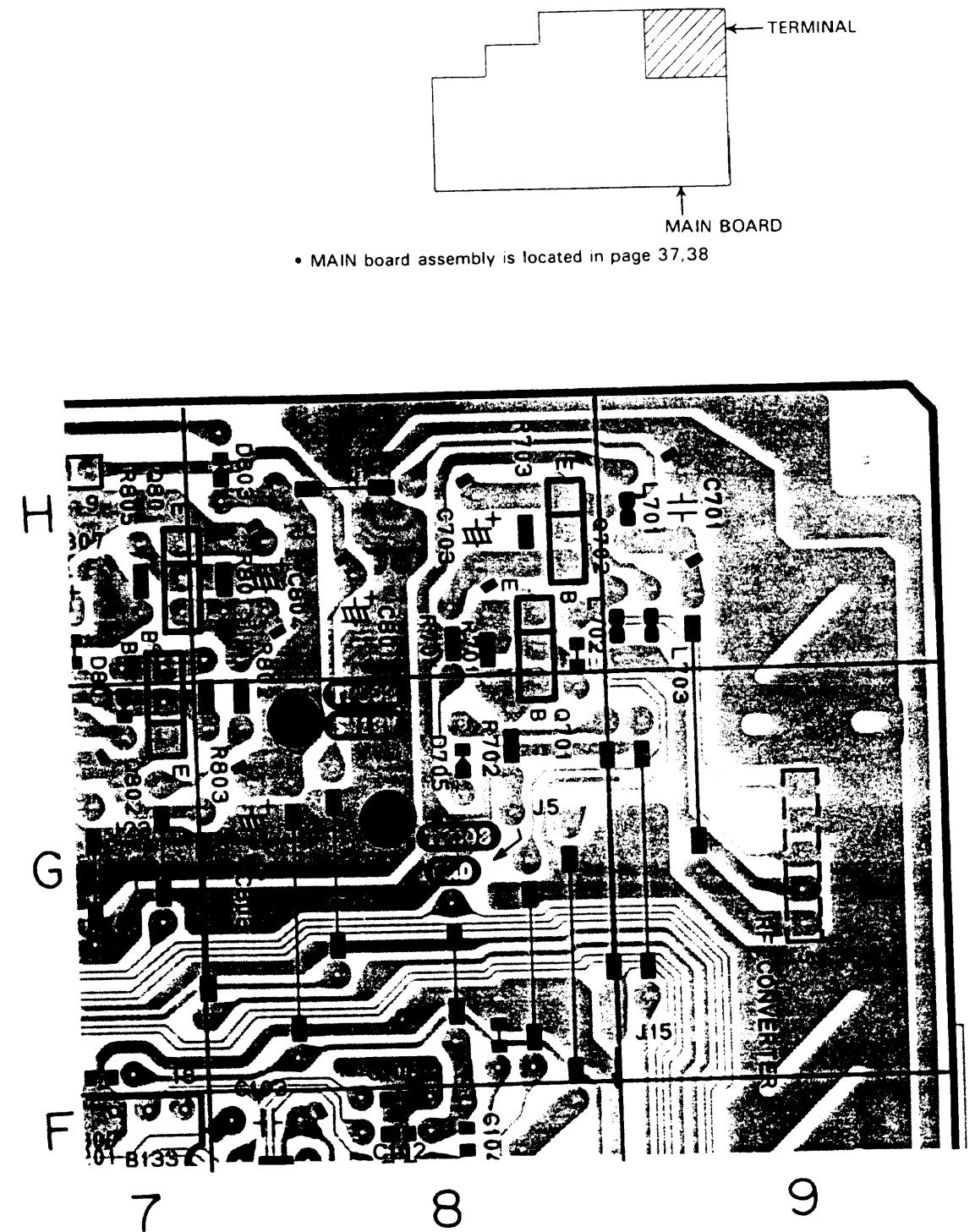
MAIN BOARD →



3.17 TERMINAL SCHEMATIC DIAGRAM

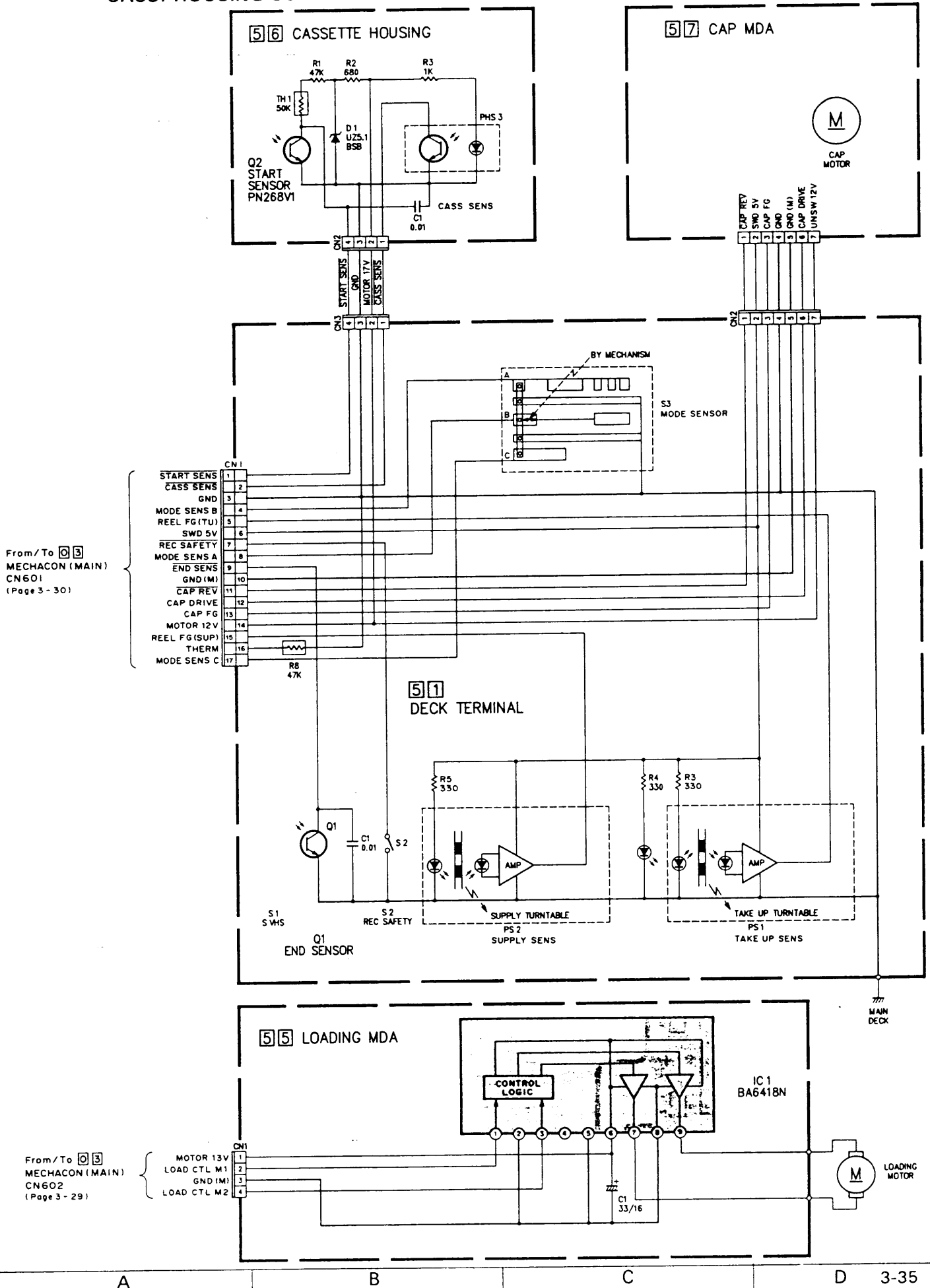


3.18 TERMINAL (MAIN) CIRCUIT BOARD

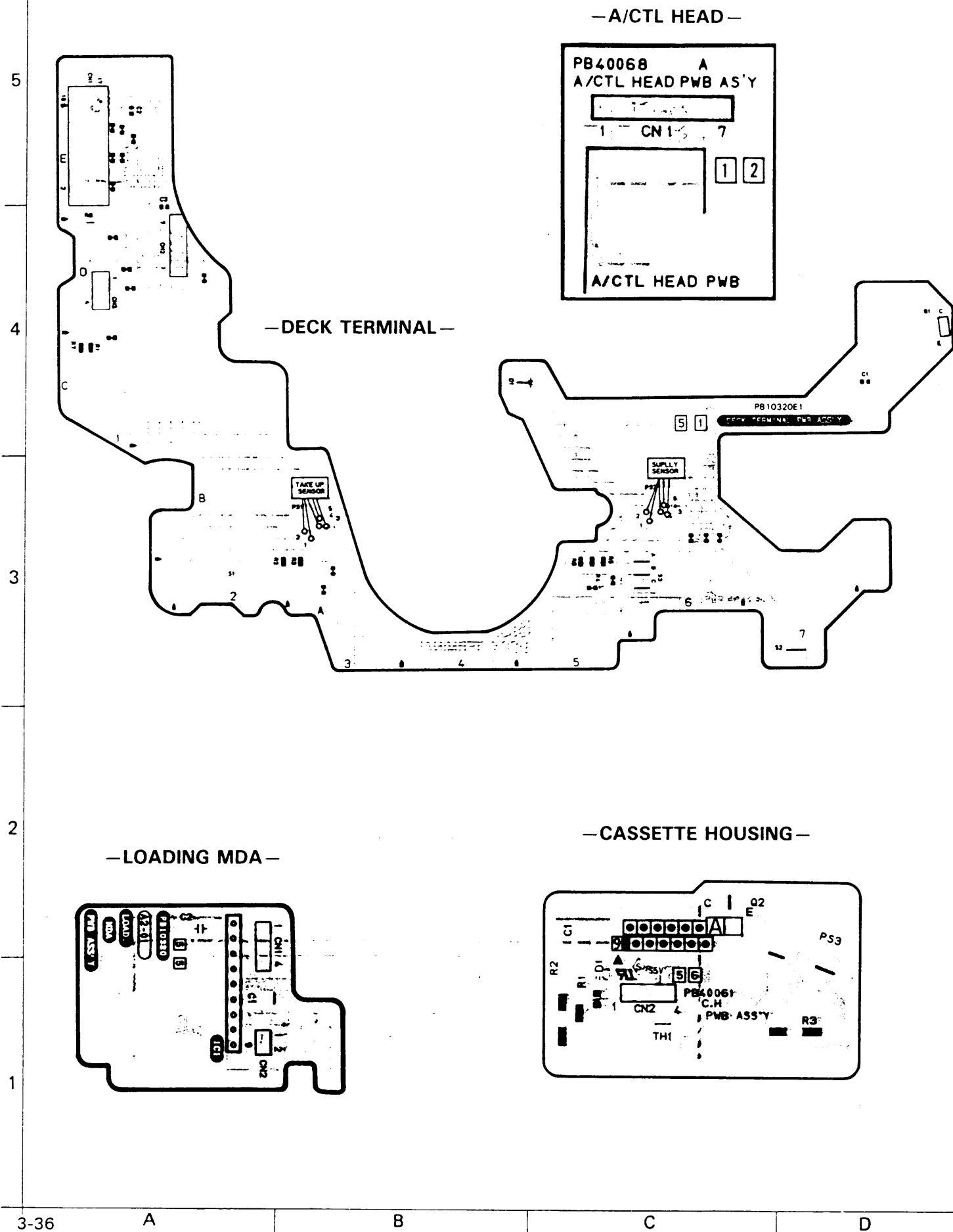


• MAIN board assembly is located in page 37,38

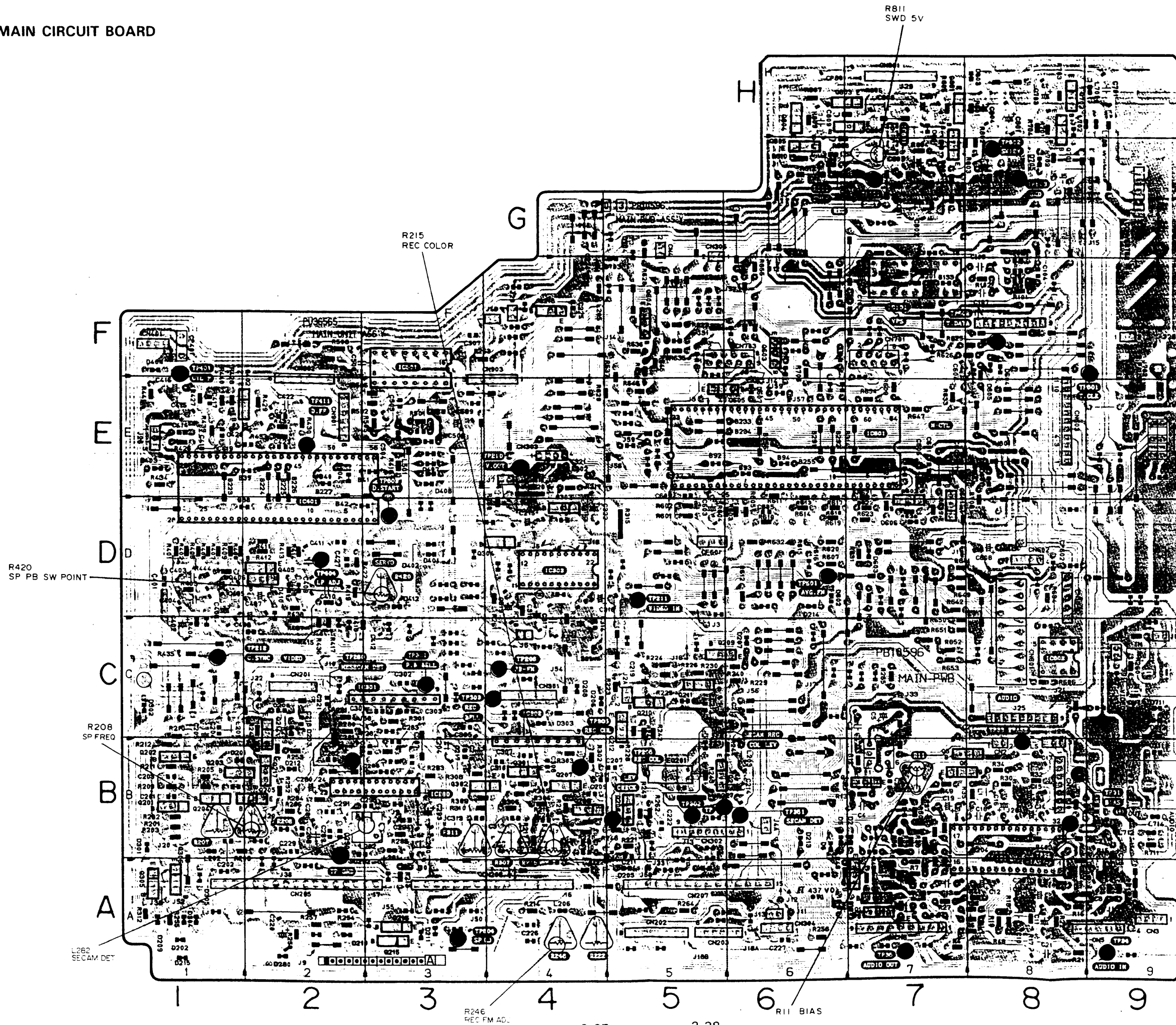
3.19 DECK TERMINAL, MODE MOTOR, CAPSTAN MDA AND CASS. HOUSING SCHEMATIC DIAGRAMS



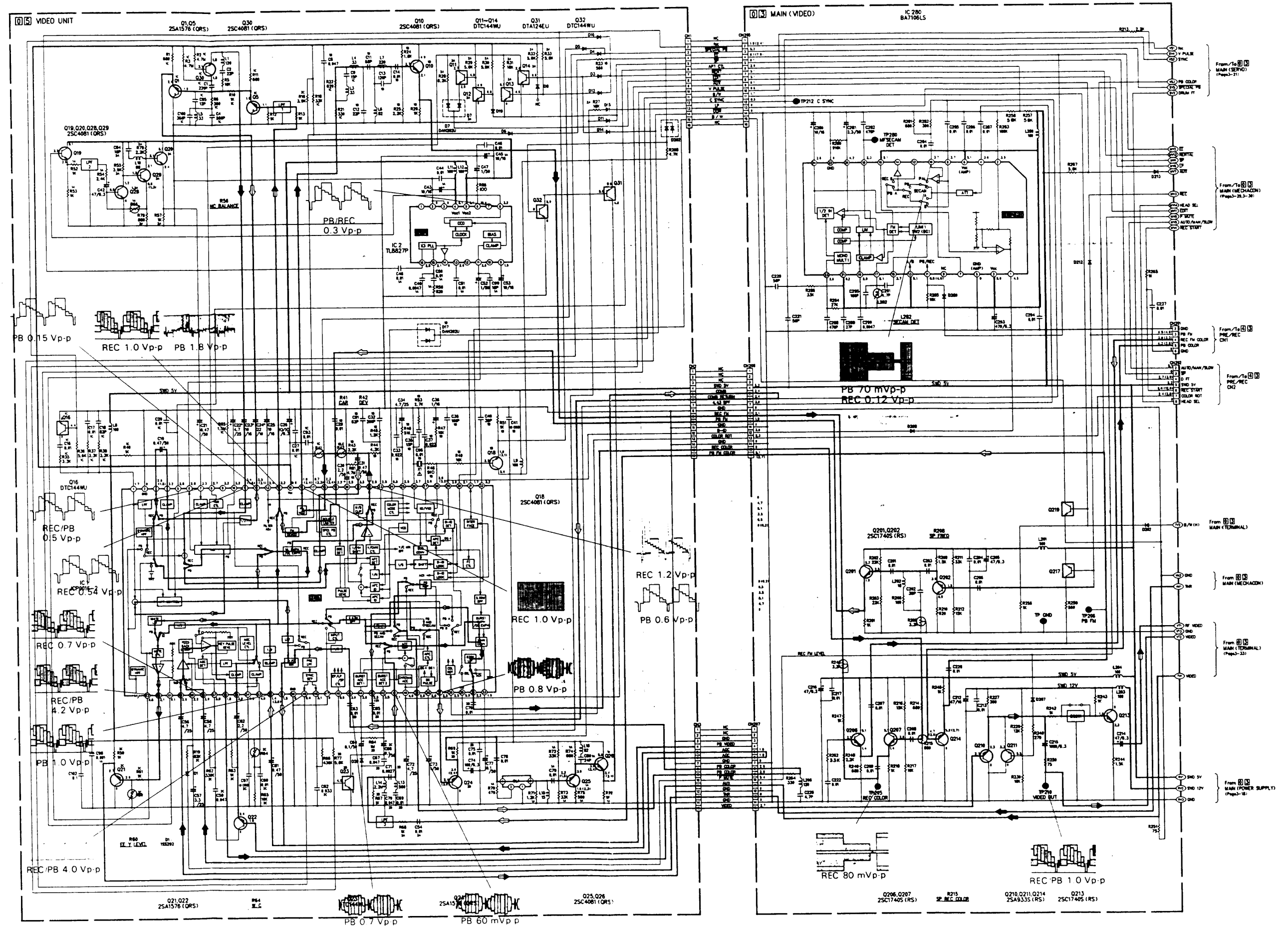
3.20 DECK TERMINAL, LOADING MDA, CASS. HOUSING AND A/CTL HEAD CIRCUIT BOARDS



3.21 MAIN CIRCUIT BOARD

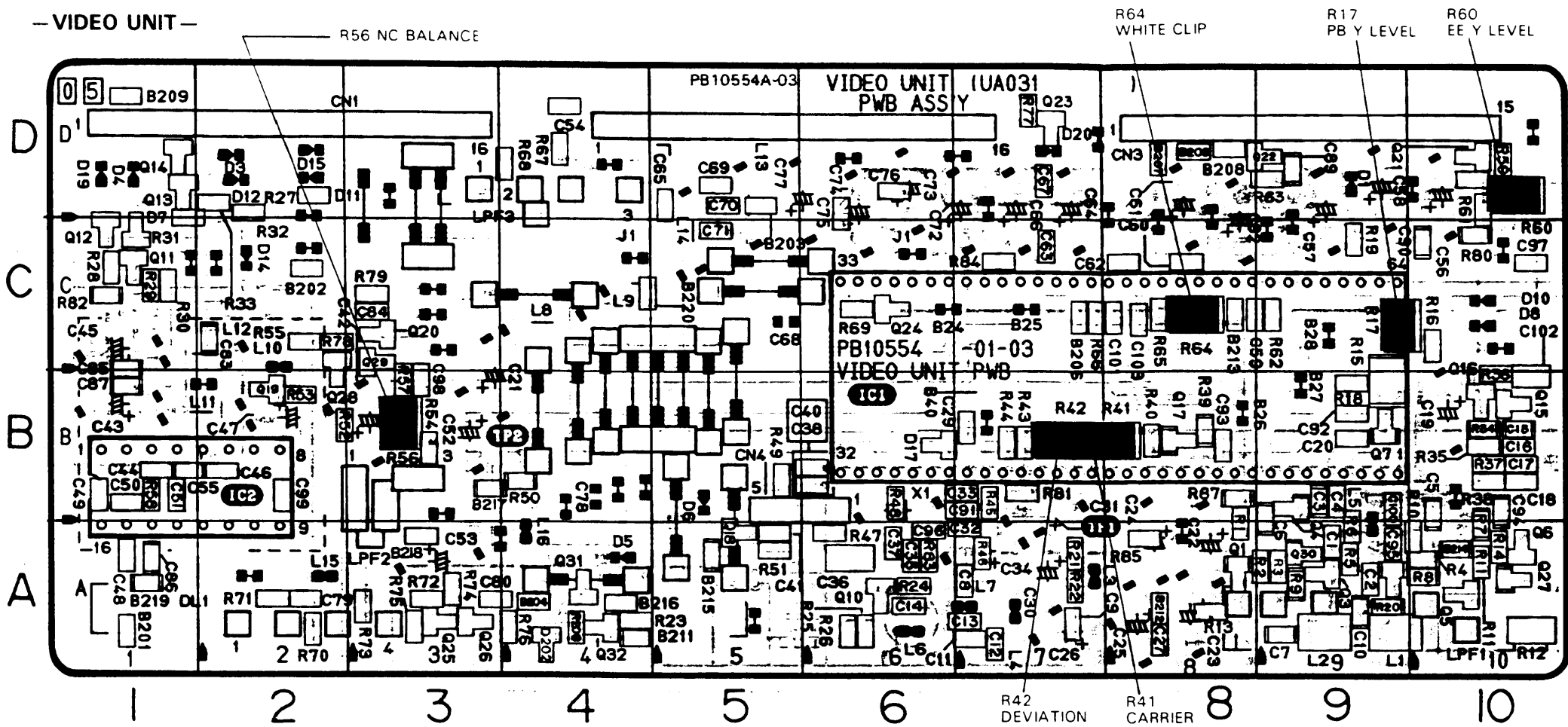


3.22 VIDEO UNIT & VIDEO (MAIN) SCHEMATIC DIAGRAMS



3.23 VIDEO UNIT & VIDEO (MAIN) CIRCUIT BOARDS

— VIDEO UNIT —



— VIDEO UNIT —

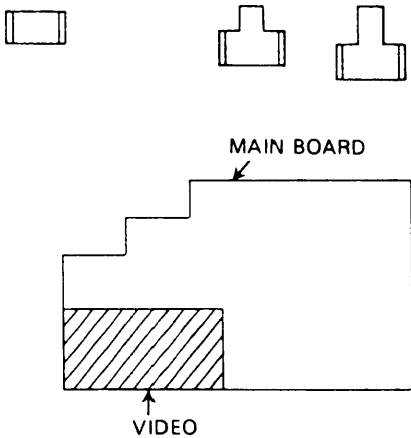
• Only chip parts

REF. No.	LOCATION	REF. No.	LOCATION	REF. No.	LOCATION	REF. No.	LOCATION	REF. No.	LOCATION
TRANSISTOR		RESISTOR		RESISTOR		RESISTOR		CAPACITOR	
Q1	A8	R1	B8	R44	B7	R79	C3	C44	B1
Q5	A10	R2	A9	R45	B7	R81	B7	C46	B2
Q10	A6	R3	A9	R46	A7	R83	A6	C48	A1
Q11	C1	R5	A9	R47	A6	R84	C7	C49	B1
Q12	C1	R6	B9	R48	B6	R85	A8	C50	B1
Q13	D1	R10	A9	R49	B5	R208	A4	C51	B1
Q14	D1	R11	A10	R51	A5			C54	D4
Q16	B10	R12	A10	R52	B2			C59	C8
Q18	A5	R13	A8	R53	B2			C60	C8
Q19	B2	R16	C10	R54	B3			C62	C8
Q20	C3	R18	B9	R55	C2			C63	C7
Q21	D10	R19	C9	R57	B3			C65	D5
Q22	D9	R21	A7	R58	B1			C67	D7
Q23	D7	R22	A7	R59	D10			C69	D5
Q24	C6	R23	A4	R61	D10			C70	D5
Q25	A3	R24	A6	R62	C9			C71	C5
Q26	A3	R25	A6	R63	D9			C75	D6
Q28	B2	R26	A6	R65	C8			C76	D6
Q29	C3	R27	D2	R66	C7			C79	A2
Q30	A9	R28	C1	R67	D4			C80	A3
		R29	C1	R68	D4			C84	C3
		R30	C1	R69	C6			C91	B7
		R31	C1	R70	A2			C93	B8
		R32	C2	R71	A2			C95	A9
		R33	D2	R72	A3			C96	A6
		R35	B10	R73	A3			C97	C10
		R36	B10	R74	A3			C98	B3
		R37	B10	R75	A3			C99	B2
		R38	B10	R76	A4			C100	B9
		R40	B8	R77	D7				
		R43	B7	R78	C2				
DIODE									
D7	C1								
D202	A4								

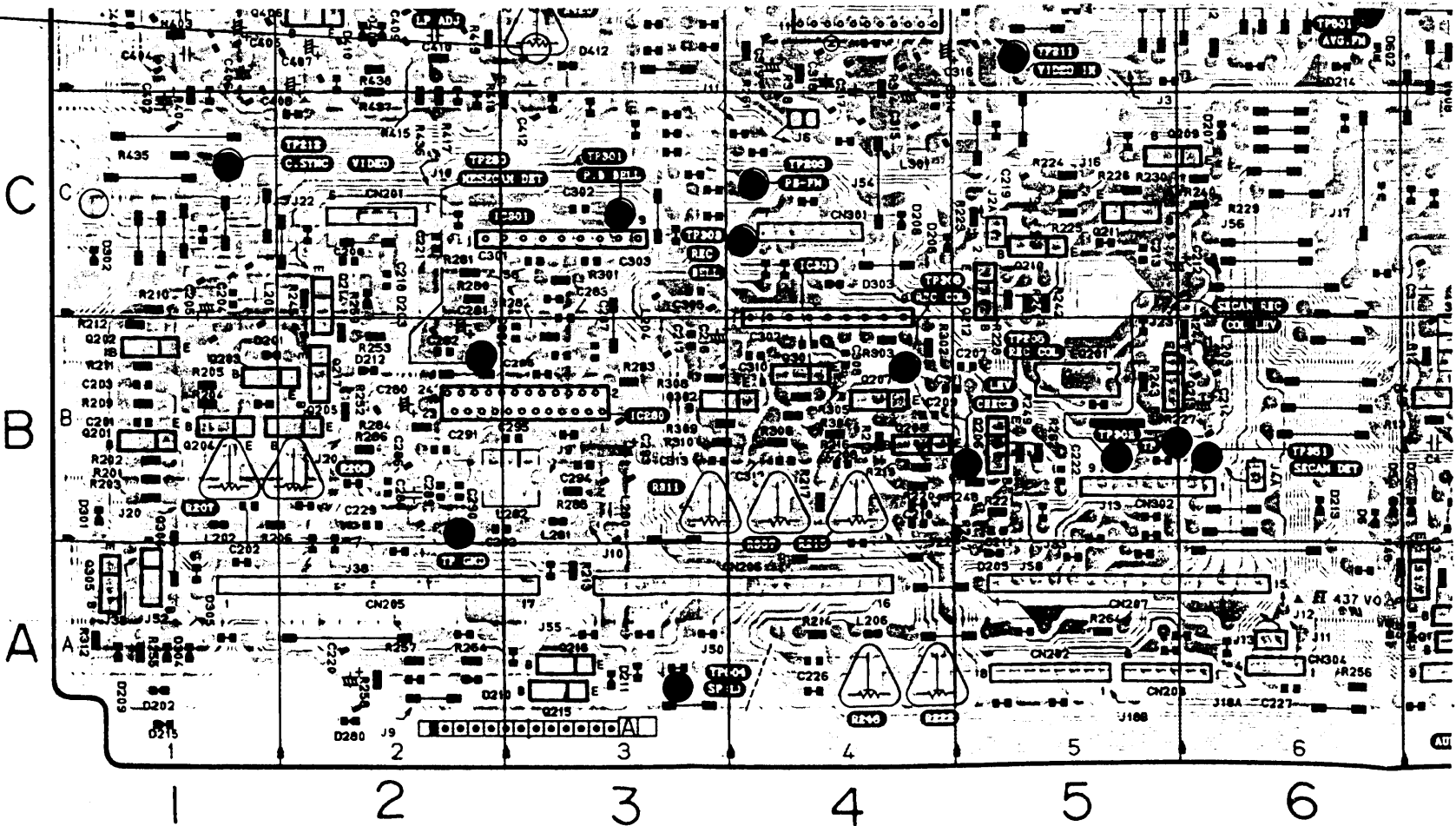
— VIDEO (MAIN) —

R420
PB SW POINT

Note: Double edging indicates not used in this model.
Examples; Resistor, Capacitor, Transistor, DIODE

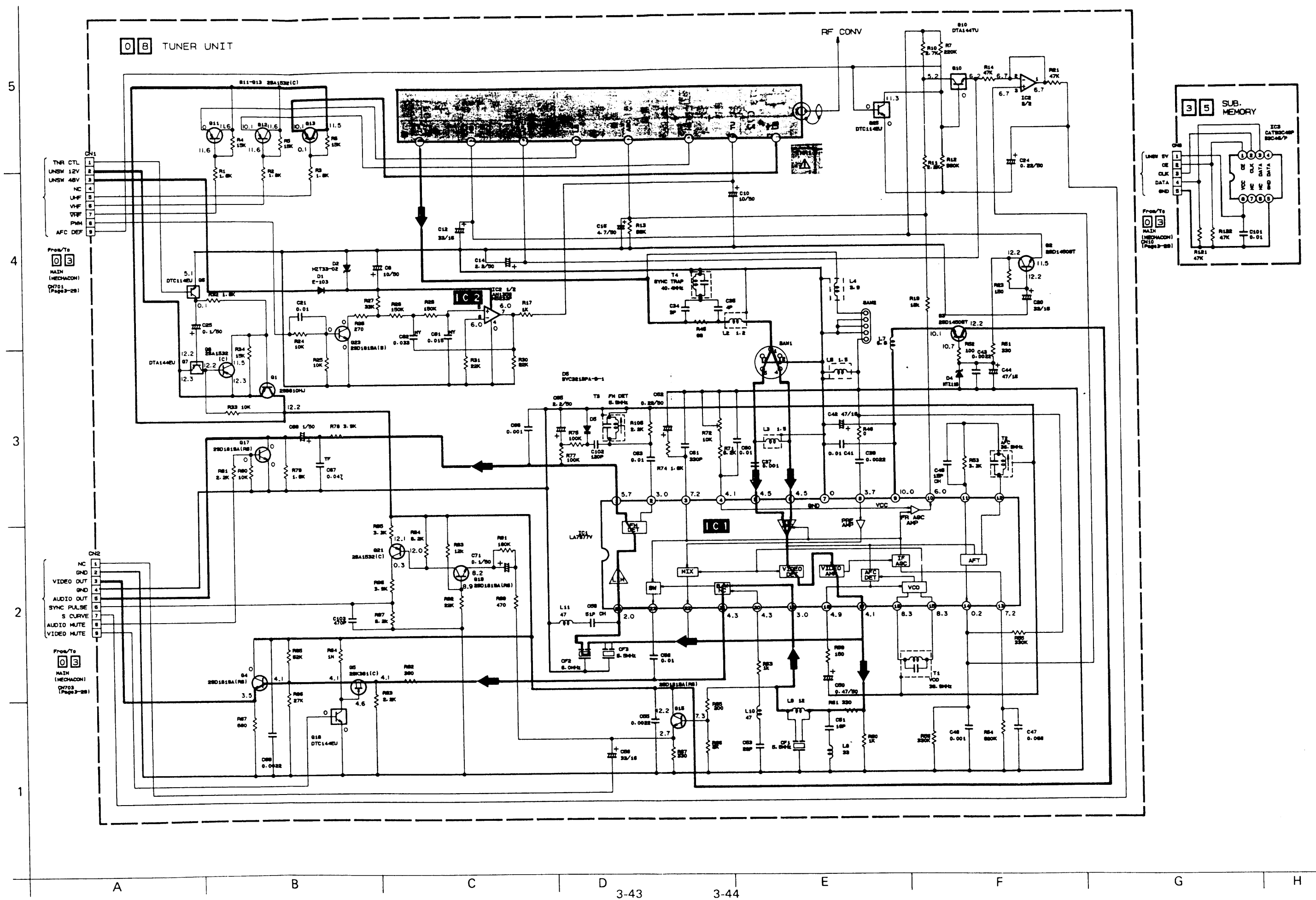


• MAIN board assembly is located in page 37,38



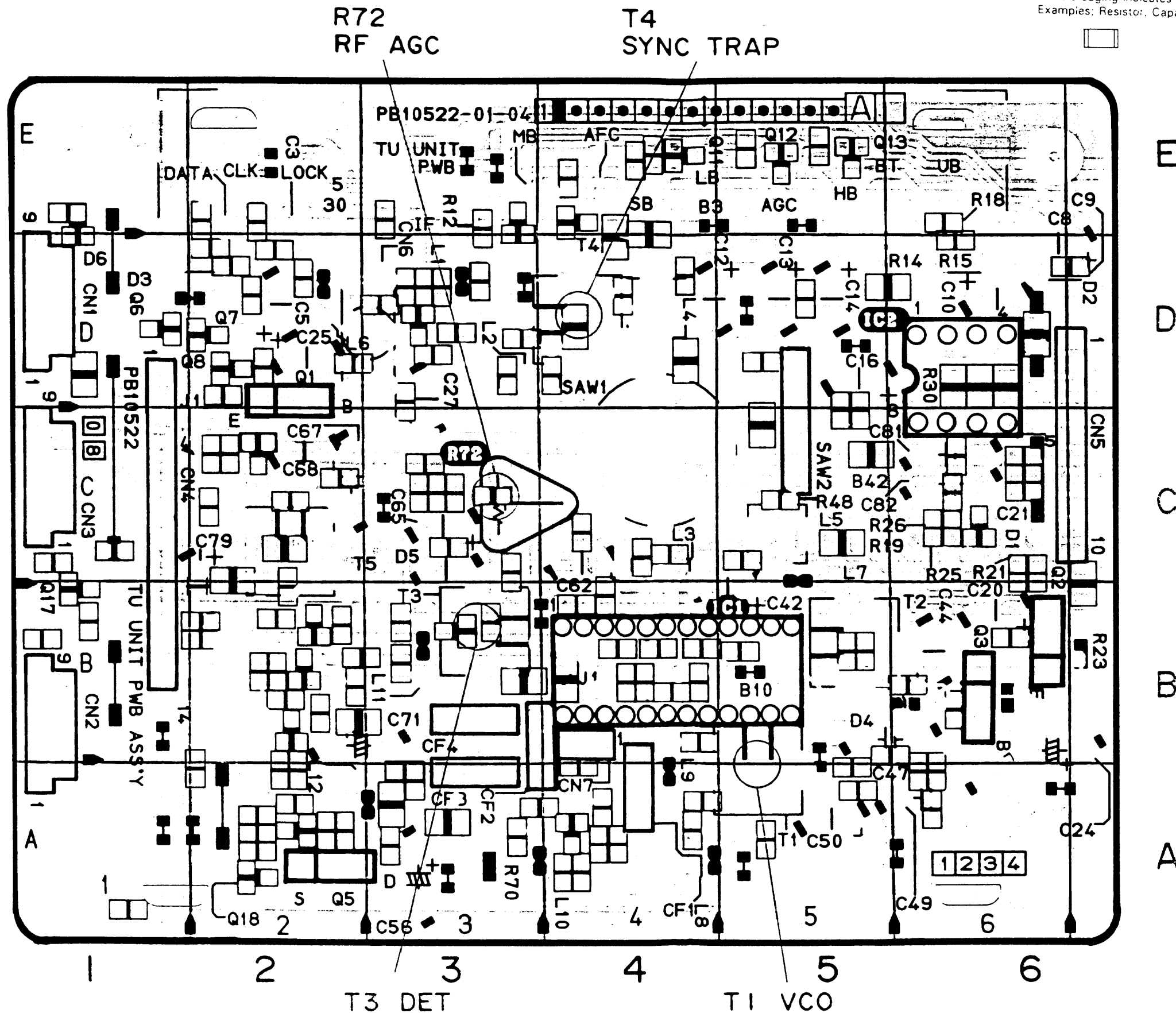
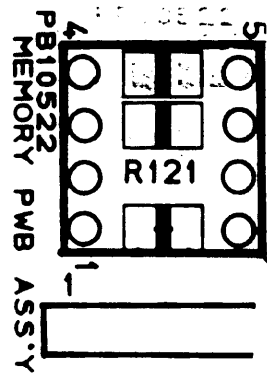
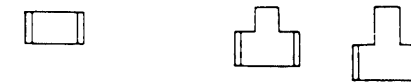
3.24 TUNER UNIT SCHEMATIC DIAGRAM

NOTE: Voltages are DC-measured with a digital voltmeter during stop and tuner mode.

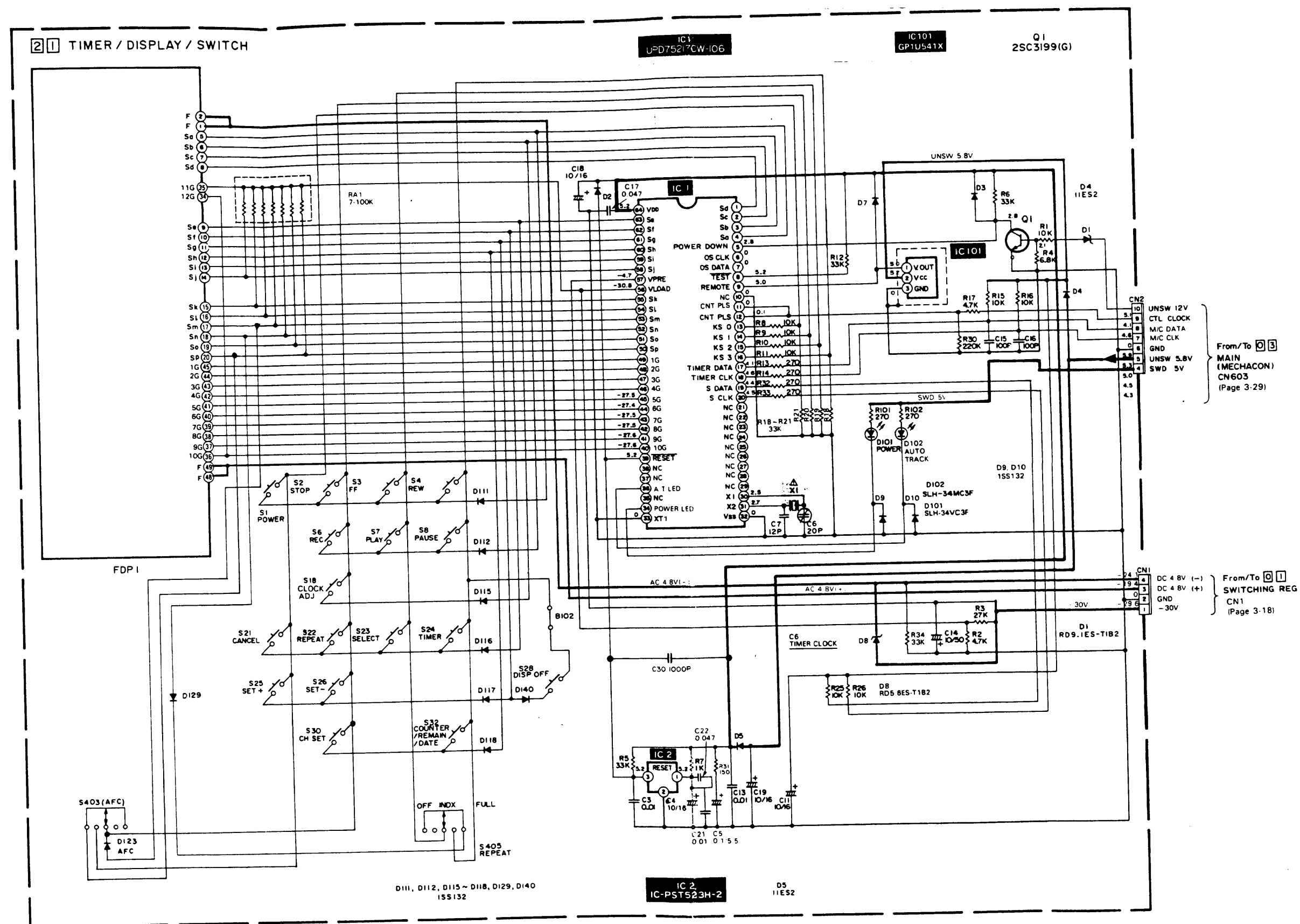


3.25 TUNER UNIT CIRCUIT BOARD

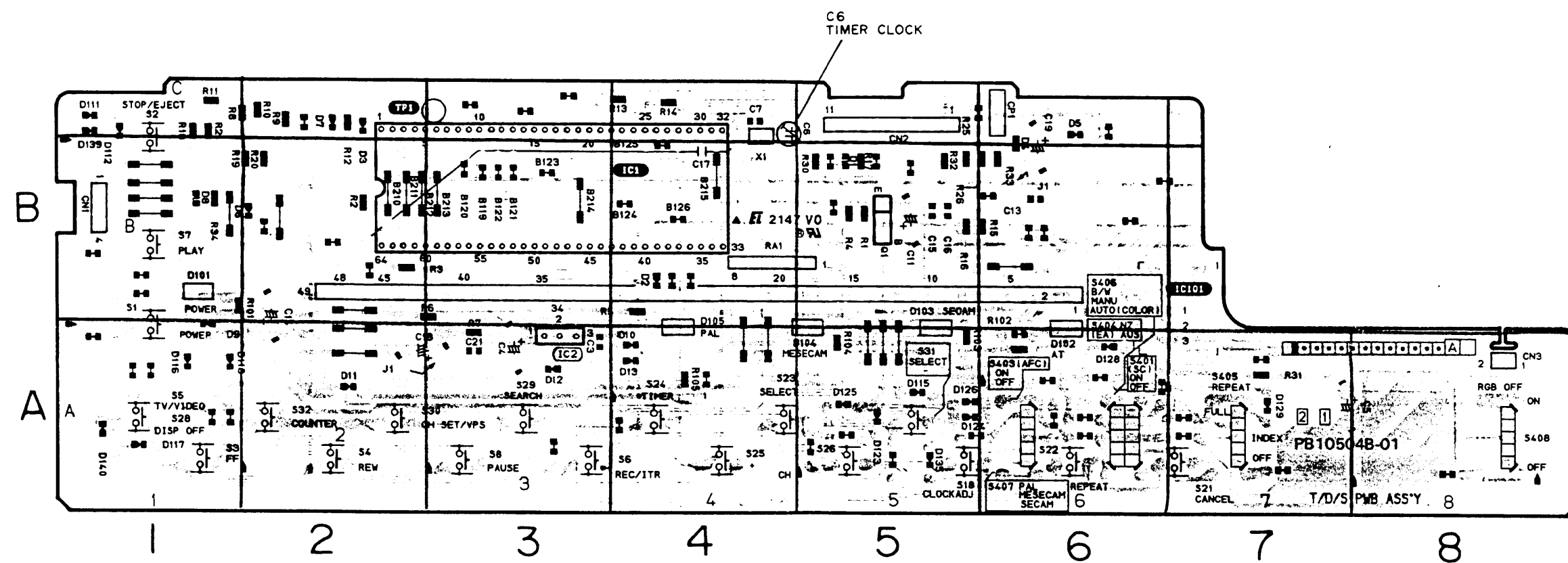
Note: Double edging indicates not used in this model.
Examples: Resistor, Capacitor, Transistor, DIODE

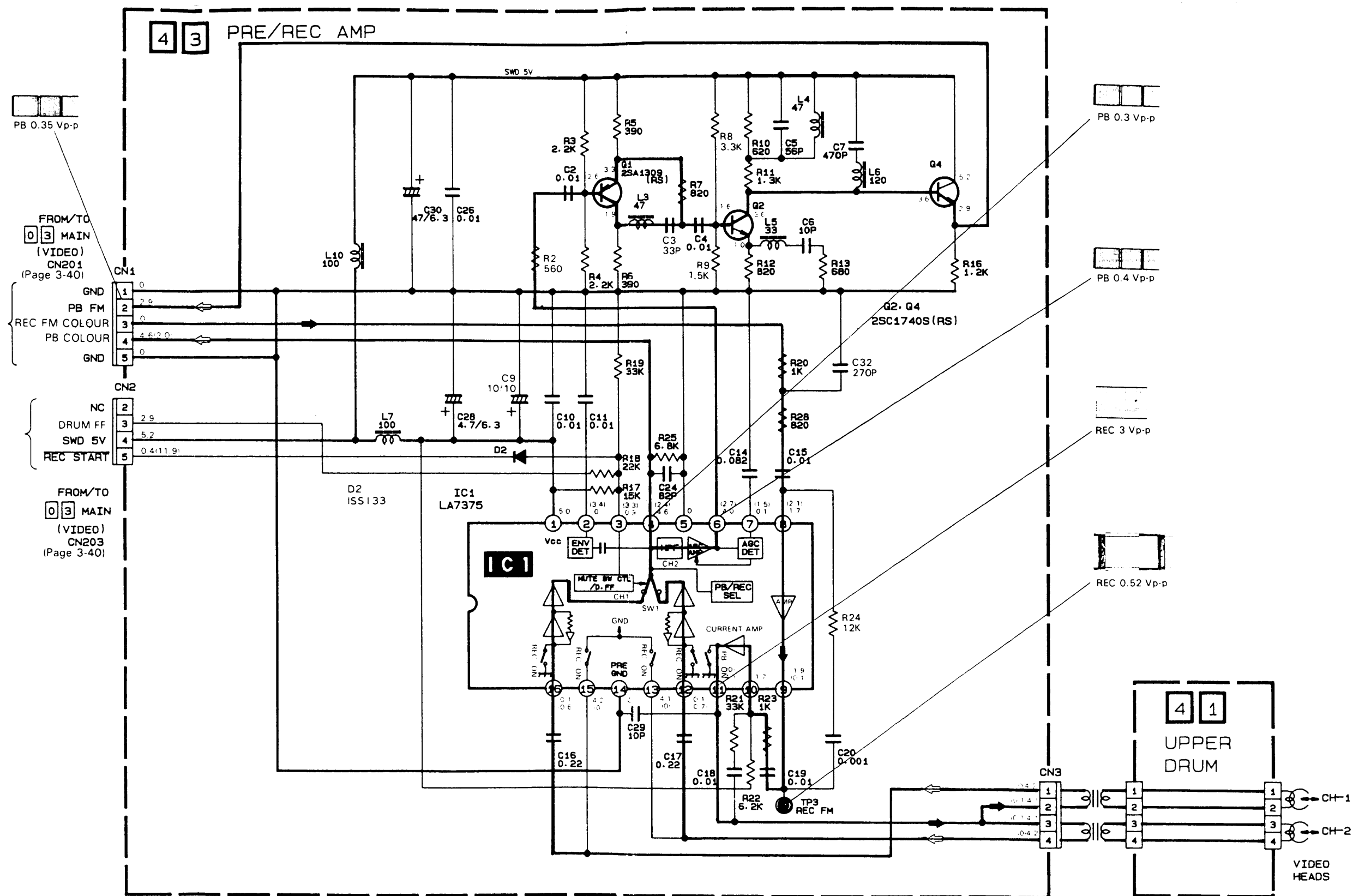


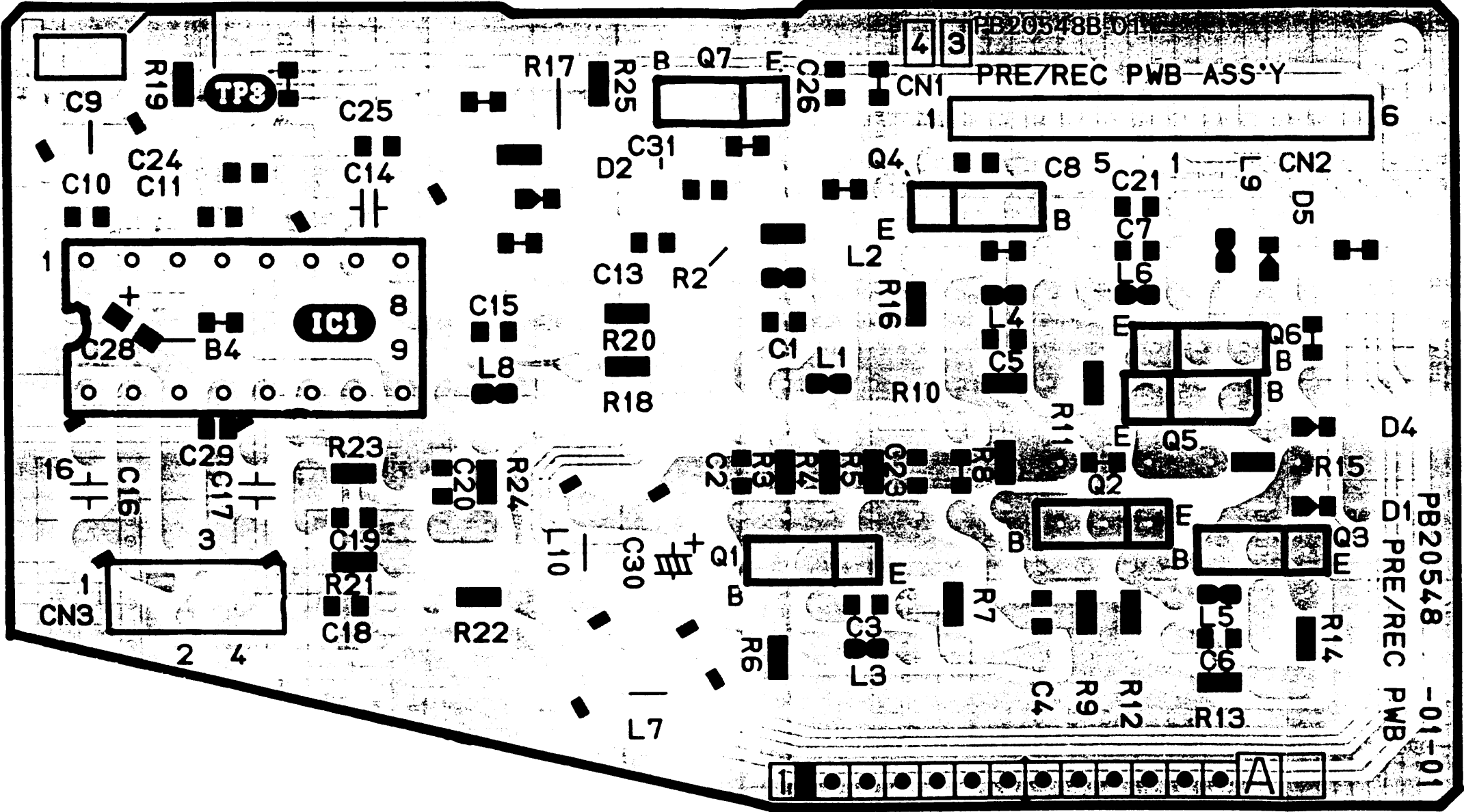
3.26 TIMER/DISPLAY/SW SCHEMATIC DIAGRAM



3.27 TIMER/DISPLAY/SW CIRCUIT BOARD





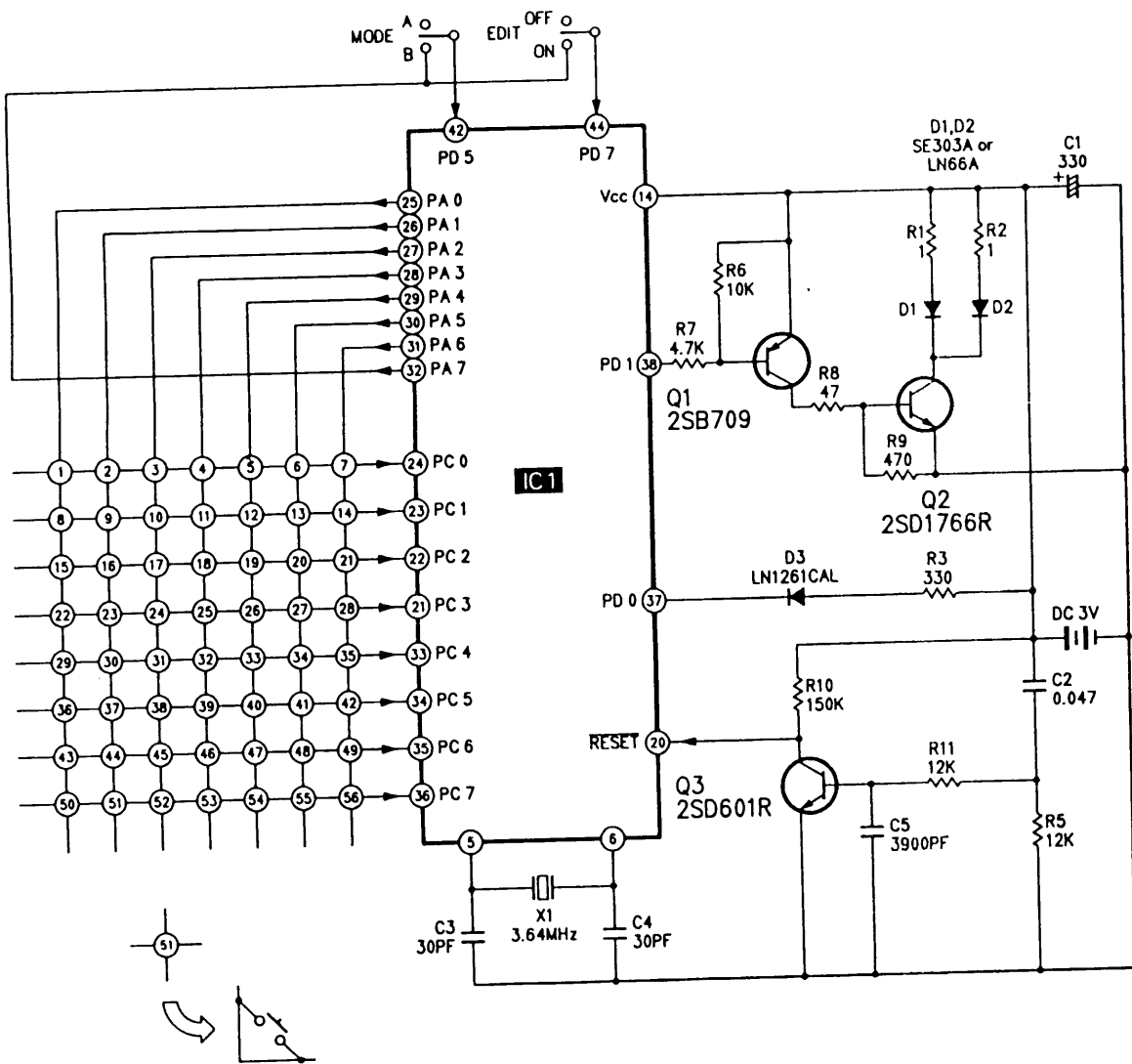


3.30 REMOTE CONTROL SCHEMATIC DIAGRAM

Note:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

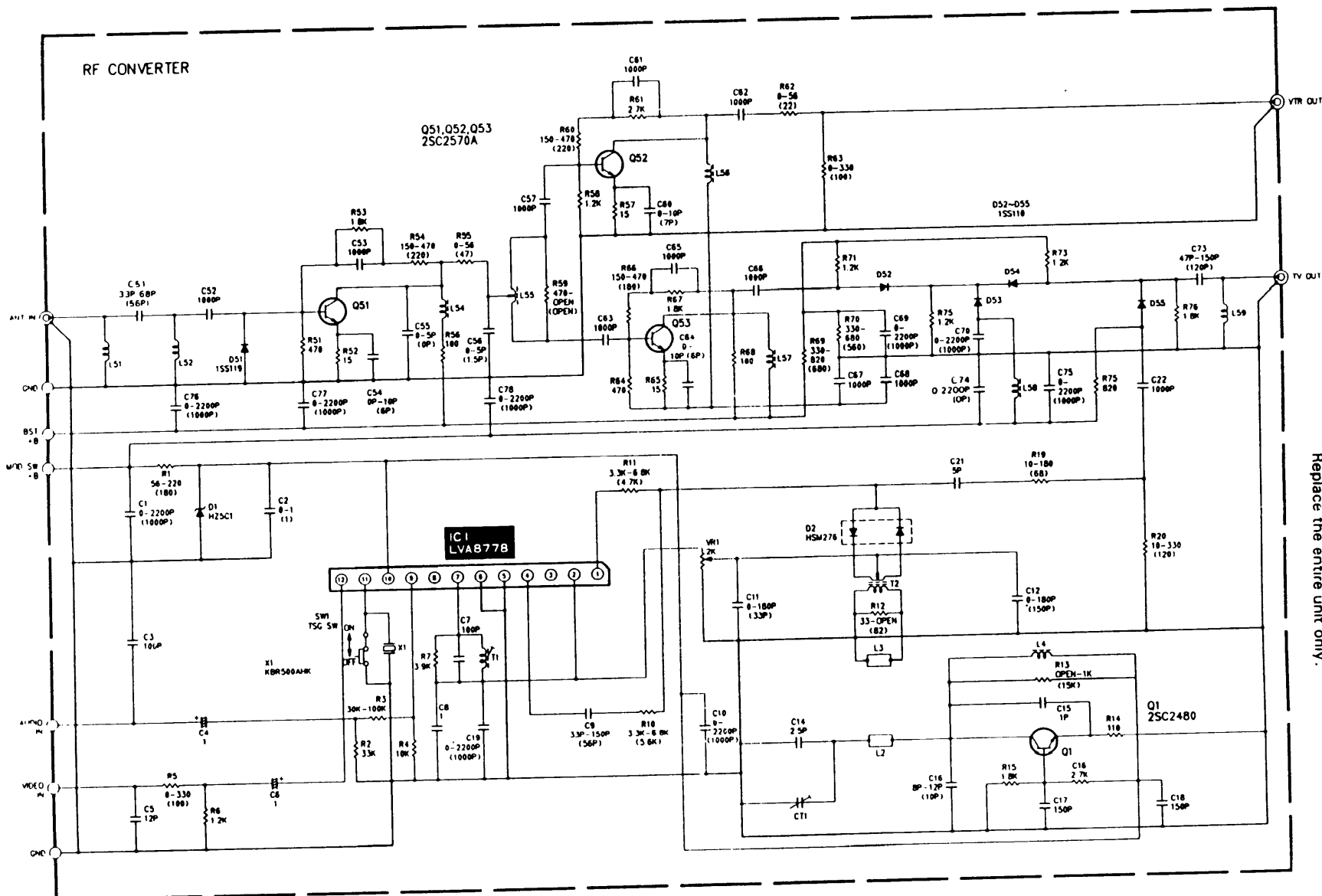
28	SP/EP	56	VOL (TV)	Λ
27	SELECT	55	VTR SEARCH	Λ
26	SET (+)	54	PAUSE	
25	RESET	53	PLAY	
24	SET (-)	52	NC	
23	POWER	51	REW	
22	CANCEL	50	VTR SEARCH	V
21	5	49	START	
20	4	48	SKIP	
19	3	47	FF	
18	2	46	STOP	
17	1	45	REC	
16	MENU	44	TV/VIDEO	
15	6	43	POWER (VTR)	
14	AUX/O	42	STANDBY	
13	9	41	CH (VTR)	Λ
12	8	40	TV MON	
11	12	39	CH (VTR)	V
10	11	38	AUDIO MON	
9	7	37	14	
8	10	36	EJECT	
7	INTRO	35	VOL (TV)	V
6	ENTER	34	CH (TV)	Λ
5	13	33	TIMER	
4	GOTO	32	DISPLAY	
3	INDEX	31	CH (TV)	V
2	ERASE	30	MONITOR	
1	MARK	29	MEMORY	
No.	KEY NAME	No.	KEY NAME	

REMOTE CONTROLLER



3.31 RF CONVERTER & MIX BOOSTER SCHEMATIC DIAGRAM

NOTES:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.



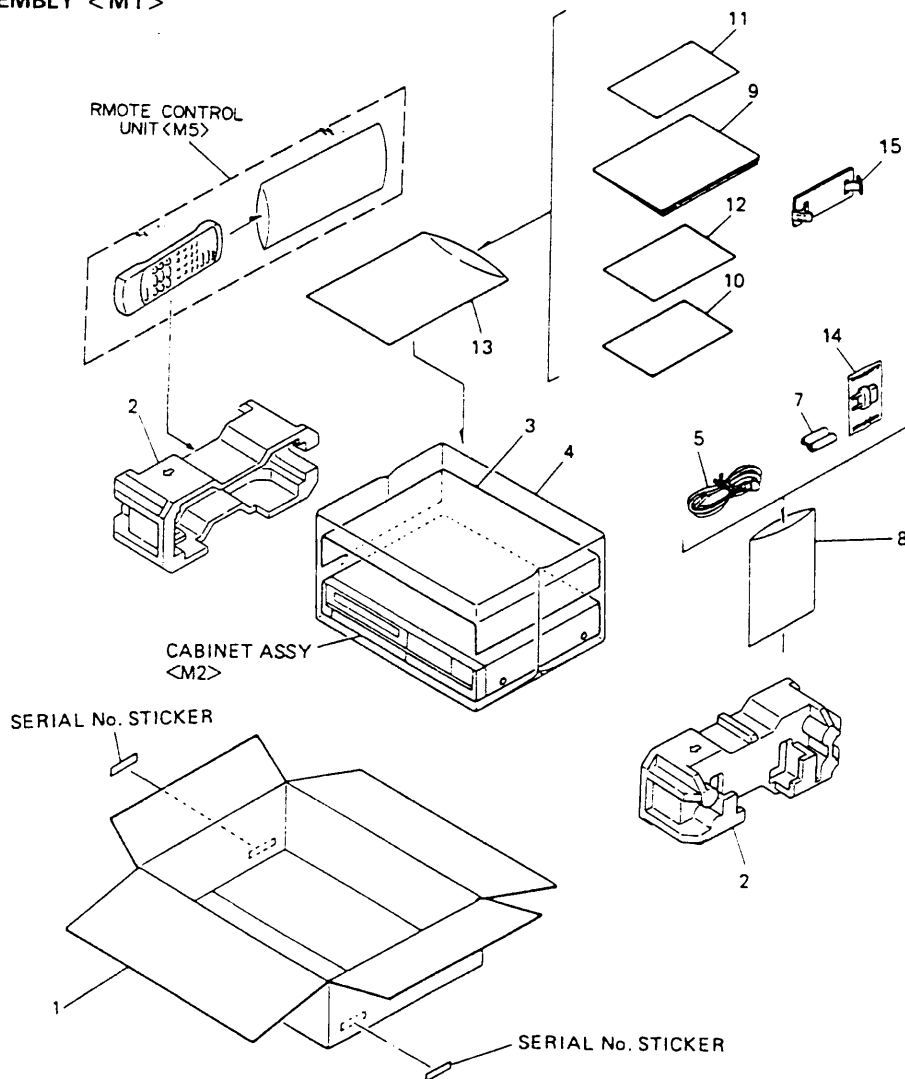
SECTION 4 EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

Parts identified by the Δ symbol are critical for safety. Replace only with specified part numbers.

NOTE: <M> indicates mechanical symbol number.

4.1 PACKING ASSEMBLY <M1>



Δ REF. No.	PART No.	PART NAME, DESCRIPTION
-------------------	----------	------------------------

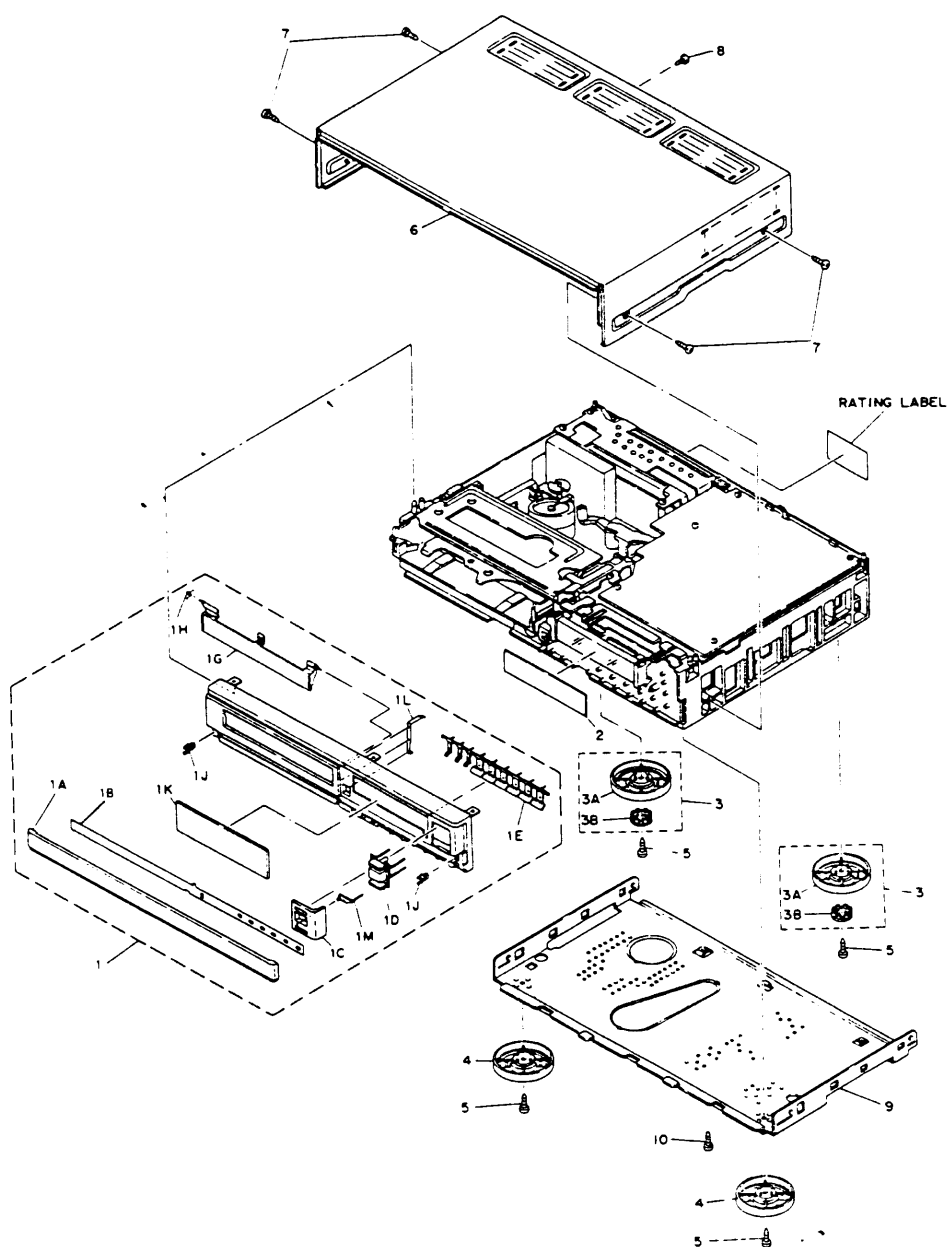
PACKING ASSEMBLY <M1>

1	PQ34184	PACKING CASE
2	PQ33989A	CUSHION ASSY
3	PQ41026-8	PROTECT SHEET
4	PQM30021-59-11	POLY BAG
5	PU59168-3	RF CABLE
	or PU59167-3	RF CABLE

Δ REF. No.	PART No.	PART NAME, DESCRIPTION
-------------------	----------	------------------------

7	UM-3DJ2P	BATTERY,X2
8	QPGA020-02005	POLY BAG
Δ 9	PU30425-1262	INSTRUCTIONS
10	TCN-3379	TAPE CATALOG
11	BT-20060	GUARANTY CARD
12	BT-20066A	E.DISTRI.LIST
13	QPGA025-03505	POLY BAG
14	QMC0271-001	CONVERSION PLUG
15	PQ31424A	HANDLE ASSY

4.2 CABINET ASSEMBLY <M2>



△ REF. No.	PART No.	PART NAME, DESCRIPTION
------------	----------	------------------------

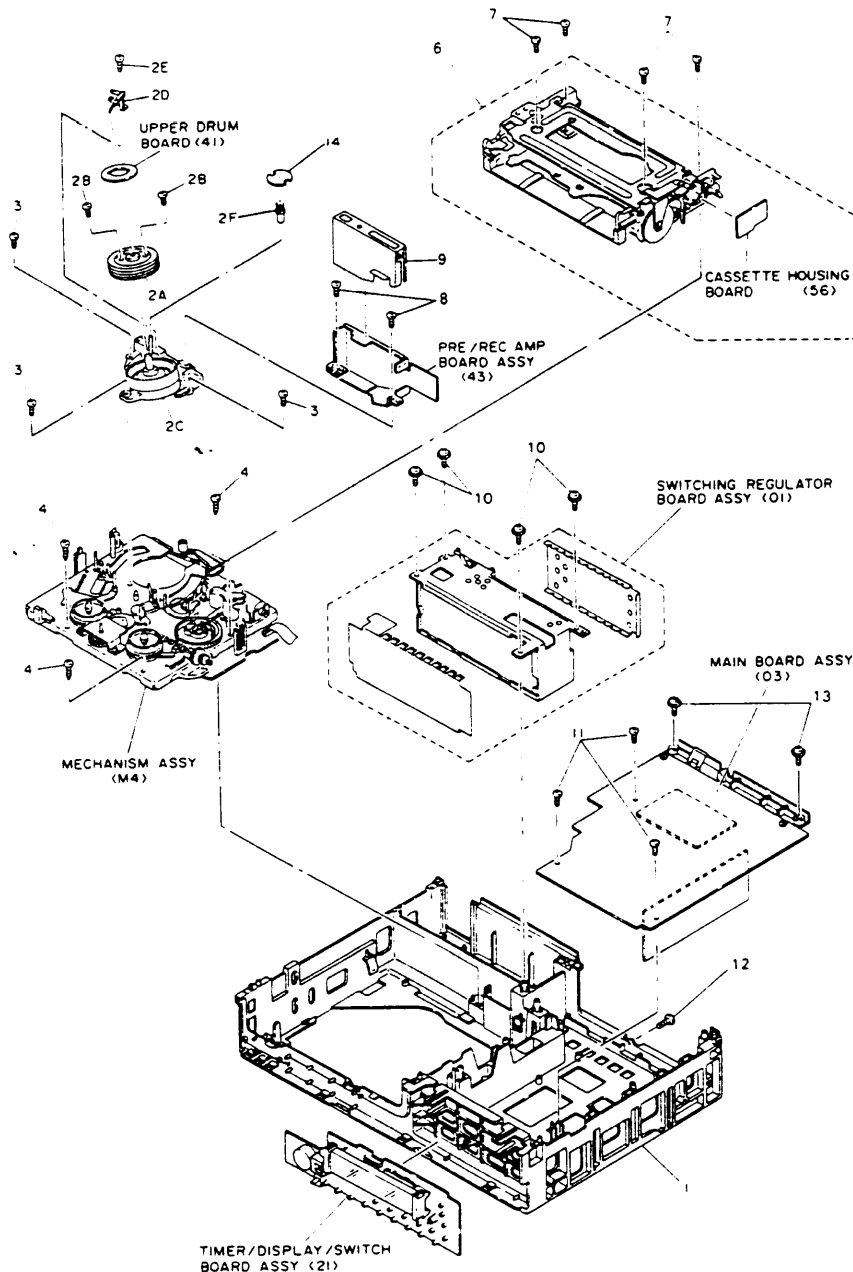
CABINET ASSEMBLY <M2>

1	PQ11071H	FRONT PANEL ASSY
1A	PQ21128H	DOOR ASSY
1B	PQ21127-7	PLATE(PROG.)
1C	PQ21213-1-2	COVER
1D	PQ21214-1-1	BUTTON(COVER)
1E	PQ21126-2	BUTTON
1G	PQ21125-6	CASSETTE HOUSING DOOR
1H	PQ45165	TORSION SPRING
1J	PU60109	CATCHER,X2
△ 1K	PQ33764	WINDOW

△ REF. No.	PART No.	PART NAME, DESCRIPTION
1L	PQ33911	PLATE(EARTH)
1M	PQ45105-1-1	INDICATOR
2	PQ45251	FILTER(FDP)
3	PQ33012D	FOOT ASSY,X2
3A	PQ33013-4	FOOT(1)
3B	PQ33014	FOOT(2)
4	PQ33013-4	FOOT(1),X2
5	SDSF3010Z	SCREW,X4 FOR FOOT
△ 6	PQ11144-1-3	TOP COVER
7	PQ43827	SPECIAL SCREW,X4 FOR TOP COVER
8	SDSF3010M	SCREW, FOR TOP COVER
△ 9	PQ11145	BOTTOM COVER
10	SDSF3010Z	SCREW, FOR BOTTOM COVER

4.3 CHASSIS ASSEMBLY <M3>

BEWARE OF BOGUS PARTS
Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.

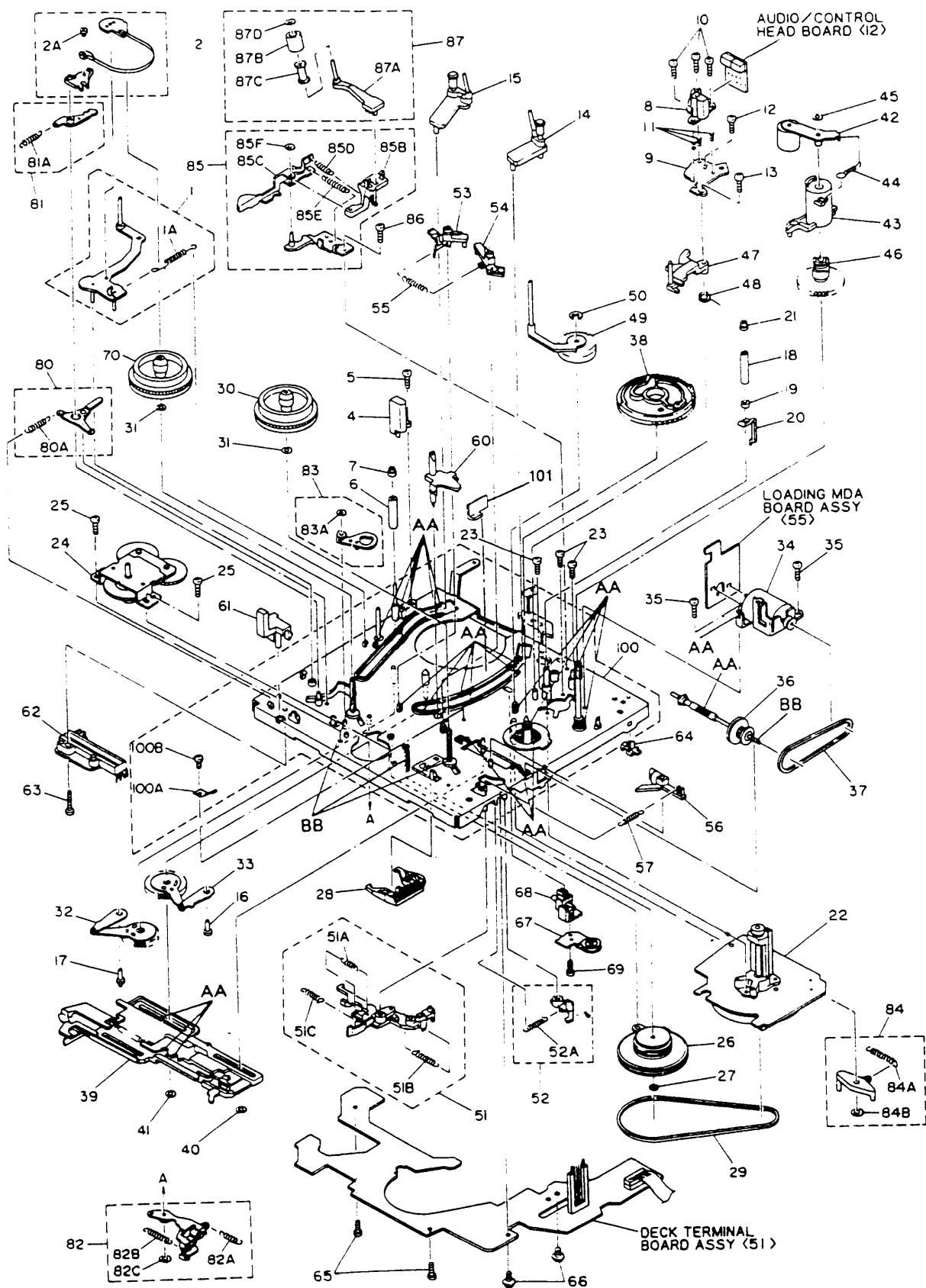


△ REF. No.	PART No.	PART NAME, DESCRIPTION

CHASSIS ASSEMBLY <M3>		
△ 1	PQ11060	BOTTOM CHASSIS
2A	PDM2008B-5	UPPER DRUM ASSEMBLY
2B	PDM4165A	DRUM SCREW ASSEMBLY, X2
2C	PDM2138G	LOWER DRUM MOTOR ASSEMBLY
2D	PDM4229A-1	BRUSH ASSY
2E	SPSG2606Z	SCREW, FOR BRUSH ASSEMBLY
2F	PDM4226A	ROLLER ASSY
3	SPST2610Z	SCREW, X3 FOR DRUM ASSY
or	SDST2610Z	SCREW, X3 FOR DRUM ASSY
4	PQ43831	SPECIAL SCREW, X3 FOR MAIN DECK

△ REF. No.	PART No.	PART NAME, DESCRIPTION
6	PUS29499D	CASSETTE HOUSING ASSY
7	SDST2608Z	SCREW, X4 FOR CASSETTE HOUSING
or	SPST2608Z	SCREW, X4 FOR CASSETTE HOUSING
8	SDSG2606Z	SCREW, X2 FOR PRE/REC BOARD
9	PQ32217-2	SHIELD CASE(2), FOR P/R BOARD
10	SDSF2610Z	SCREW, X4 FOR SW REG BOARD
11	SDSF2610Z	SCREW, X3 FOR MAIN BOARD
12	SDSF3010M	SCREW, FOR TERMINAL BOARD
13	GPSF2610Z	SCREW, X2 FOR TERMINAL BOARD
14	PQ45160	INERTIA PLATE

4.4 MECHANISM ASSEMBLY <M4>



Category	Part number	MARK
Grease	KANTO-G-31KAV	AA
Oil	COSMO-HV56	B8

NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

#△ REF No. PART No. PART NAME, DESCRIPTION

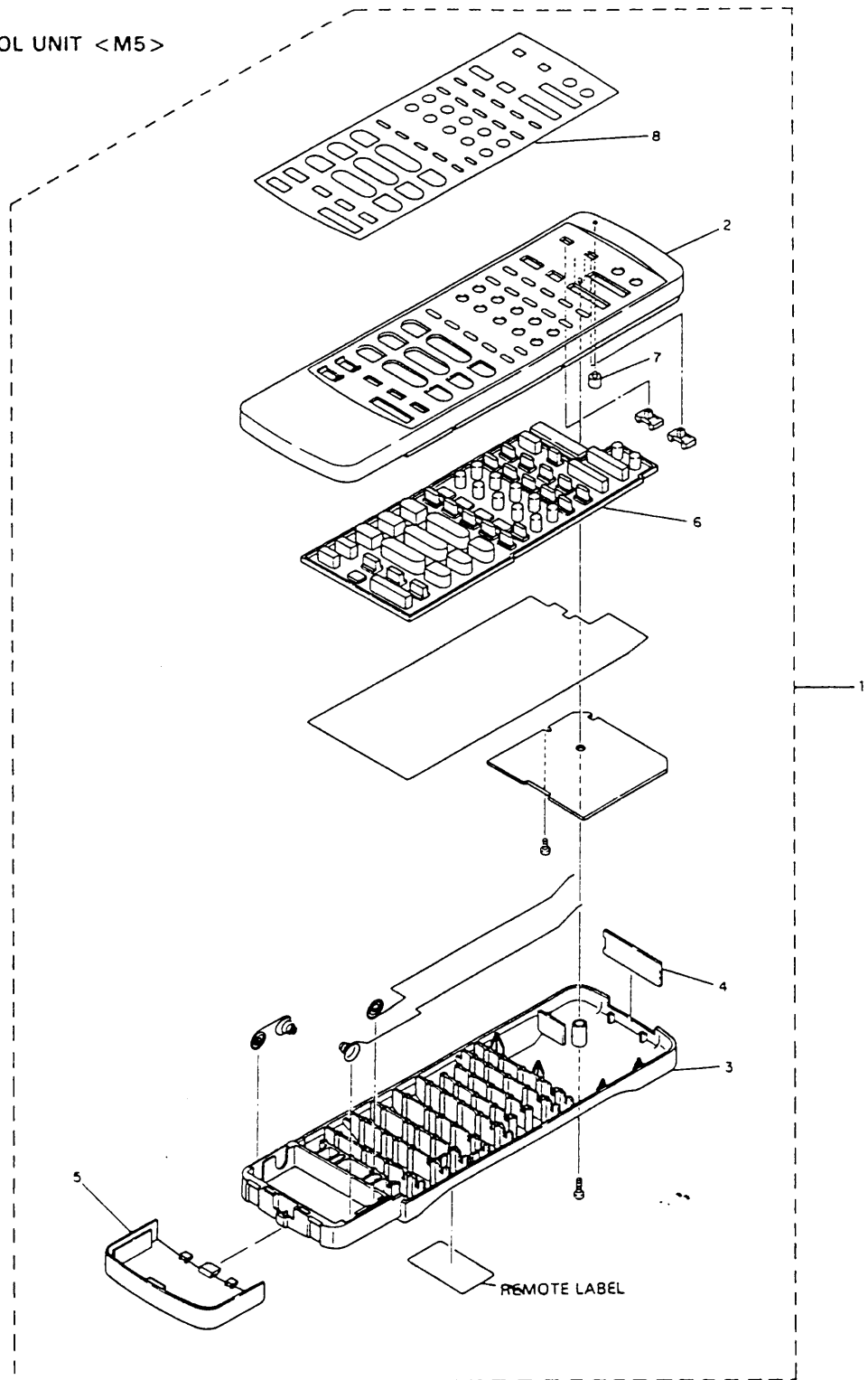
MECHANISM ASSEMBLY <M4>

1	PQ43497E-11	TENSION ARM ASSY
1A	PQ43500	TENSION SPRING
2	PQ44734A-6	TENSION BAND ASSY
2A	PQ45456	ADJUST PIN
4	PU60616	FULL ERASE HEAD
5	SDSF2614Z	SCREW
6	PQ43505-1-1	ROLLER
7	PQ43506	GUIDE POLE CAP
8	PU61002	AUDIO/CONTROL HEAD
9	PQ43509	HEAD BASE
10	PQ43687A	SPECIAL SCREW,X3
11	PQM30002-192	COMPRESSION SPRING,X3
12	SPSF2608M	SCREW
13	SPSP2606Z	SCREW
14	PU61103-2	POLE BASE(TU) ASSY
15	PU61151-2-3	POLE BASE(SUP) ASSY
16	PQ43524	STOPPER
17	PQ43525	STOPPER 2
18	PQ43526-1-3	TAPE GUIDE
19	PQ43670-1-1	GUIDE FLANGE
20	PQ43675	TAPE GUARD
21	PQ43506	GUIDE POLE CAP
△ 22	PU61003-1-2	CAPSTAN MOTOR
23	SPSG2608Z	SCREW,X3
24	PU61246	IDLER GEAR UNIT
25	SPST2606Z	SCREW,X2
26	PU61245-1-1	CLUTCH UNIT
27	PQM30017-8	SLIT WASHER
28	PQ43532B	CHANGE LEVER ASSY
29	PU61006	REEL BELT
30	PU60858-1-4	REEL DISK (TAKE-UP)
31	PQM30018-54	SPACER,X2
32	PQ43537A	LOADING ARM ASSY (SUPLY)
33	PQ43542B	LOADING ARM ASSY (TAKE-UP)
△ 34	PQ43676B-5	MODE MOTOR ASSY
	or PQ43676C-7	MODE MOTOR ASSY
35	SPST2606Z	SCREW,X2
36	PQ43548A-3	WORM CLUTCH ASSY
37	PQM30003-23	LOADING BELT
38	PQ20822-2-4	CONTROL CAM
39	PQ44581A-6	PLATE ASSY
40	PQM30017-12	SLIT WASHER
41	PQM30017-8	SLIT WASHER
42	PQ43558A-5	PINCH ROLLER ARM ASSY
	or PQ43558B	PINCH ROLLER ARM ASSY
43	PQ32415	PINCH ROLLER PRESS LEVER
44	PQM30001-233	TENSION SPRING
45	PQM30017-12	SLIT WASHER
46	PQ32416-2	PINCH ROLLER CAM
47	PQ43567A-8	GUIDE ARM ASSY
48	PQ43569-1-3	TORSION SPRING

#△ REF No. PART No. PART NAME, DESCRIPTION

49	PQ43570A-1	HALF LOADING GEAR ASSY
50	PQM30017-12	SLIT WASHER
51	PQ43575A-5	CANCEL LEVER ASSY
51A	PQM30001-273	TENSION SPRING
51B	PQM30001-237	TENSION SPRING
51C	PQM30001-274	TENSION SPRING
52	PQ43578A-2	HOOK ASSY
52A	PQM30001-238	TENSION SPRING
53	PQ43581C	MAIN BRAKE(SUPPLY) ASSY
54	PQ43582B	MAIN BRAKE(TAKE-UP) ASSY
55	PQM30001-251	TENSION SPRING
56	PQ43583A	SUB BRAKE ASSY (TAKE-UP)
57	PQM30001-298	TENSION SPRING
60	PU60621-1-2	LED HOLDER,(INCL.D1)
61	PU60624-1-4	REC SAFETY SWITCH
62	PU61247	SLIDE ENCODER,(S3)
63	SDSF2614Z	SCREW
64	PQ32516	PWB HOLDER
65	SDST2616Z	SCREW, X2
66	GPSF2608Z	SCREW, X2
67	PQ43912A-7	PULLEY ARM ASSY
68	PQ33249	PULLEY BASE
69	PQ45121A	SCREW
70	PU60859-1-4	REEL DISK (SUPPLY)
80	PQ44739A-1	LOCK LEVER 1 ASSY
80A	PQM30001-278-46	TENSION SPRING
81	PQ44741A-3	LOCK LEVER 2 ASSY
81A	PQM30001-279-52	TENSION SPRING
82	PQ44743A-7	IDLER LEVER ASSY
82A	PQM30001-344	TENSION SPRING
82B	PQM30001-301	TENSION SPRING
82C	PQM30017-5	SLIT WASHER
83	PQ44746A-2	OFF LEVER ASSY
83A	PQM30017-5	SLIT WASHER
84	PQ44585A-6	CAPSTAN BRAKE ASSEMBLY
84A	PQM30001-282-52	SPRING
84B	PQM30017-8	SLIT WASHER
85	PQ44843B	ARM BASE ASSY
85B	PQ33511-1-2	CLEANER ARM
85C	PQ44841-1-3	CANCEL LEVER
85D	PQM30001-299	TENSION SPRING
85E	PQM30001-300	TENSION SPRING
85F	PQM30017-5	SLIT WASHER
86	SPST2606Z	SCREW
87	PQ44840A-3	CLEANER BASE ASSY
87A	PQ44844A	CLEANER BASE SUB ASSY
87B	PQ44837	CLEANER
87C	PQ44838	CLEANER HOLDER
87D	PQM30017-38	SLIT WASHER
100	PQ20994B-4	MAIN DECK ASSY
	or PQ21232B	MAIN DECK ASSY
100A	PQ43849	EARTH PLATE
100B	SPST2604Z	SCREW

4.5 REMOTE CONTROL UNIT <M5>



△ REF. No.	PART No.	PART NAME, DESCRIPTION
------------	----------	------------------------

REMOTE CONTROL UNIT <M5>

△ 1	PQ10956K	REMOTE CONTROLLER
2	PQ21049-3	UPPER CASE

△ REF. No.	PART No.	PART NAME, DESCRIPTION
------------	----------	------------------------

3	PQ21052-2	LOWER CASE
4	PQ44726	IFR WINDOW
5	PQ33408-2	CAP(BATTERY)
6	PQ21040-9	BUTTON(RUBBER)
7	PQ44725	INDICATOR
8	PQ33400-10	TOP PANEL

SECTION 6

TECHNICAL INFORMATION

6.1 CPU pin functions

1. Mechacon CPU pin function (IC601)

Pin No.	Symbol	I/O format	Label	IN/OUT	Contents
1	Vcc	—	Vcc	—	For the SYSTEM CONTROL, DC 5V (AL 5V)
2	VREF	—	Vref	—	
3	DA	Analog	START SENS	I	LEADER TAPE DETECT (DET ON: L)
4	PWM	PWM	NC	—	NC
5	Port 6	N-ch OPEN DRAIN	FM DET	I	AUTO TRACKING DATA IN THERMIC CORRECTION (CAPSTAN BRAKE TIMING CONTROL)
6			THERM		
7			MODE SENS A		MECHANISM MODE DETECT
8			MODE SENS B		
9			MODE SENS C		
10	AN	Analog	REC SAFETY	—	DETECTS ERASE PROTECT TAB (TAB ABSENT: H) TRAILER TAPE DETECT (DET ON: L)
11			END SENS		
12			NC		NC
13			CAP. V	O	CAPSTAN MOTOR DRIVE VOLTAGE SERVO
14	Port 4	N-ch OPEN DRAIN	DRUM. V		DRUM MOTOR DRIVE VOLTAGE SERVO
15			LCM 2		LOADING MOTOR CONTROL
16			ECM 1		
17			DRUM FF	I	REC TIMING CONTROL, DRUM ROTATION DETECT (25 Hz)
18	Port 3	N-ch OPEN DRAIN	CTL PULSE	I	MODE DETECT (SP/LP), BLANK DETECT
19			CAP REV	O	CAPSTAN ROTATION CONTROL (REV: L)
20			V. PULSE	O	V PULSE CONTROL
21			HEAD SELECT	O	HEAD SELECT SIGNAL OUTPUT
22			NC	—	NC
23			REEL FG	I	REEL ROTATION DETECT/TAPE REMAIN
24			REEL FG (TU)		
25			SYNC DET		INPUT SIGNAL DETECT (NO SYNC: H)
26	INT-1	—	CAP FG	I	MODE (SP/LP) DETECT/BACK SPACE COUNT
27	CN Vss		CN Vss		GND
28	RESET		RESET		RESET AT CONNECT VCR TO AC
29	X IN		X IN	I	MAIN SYSTEM CLOCK
30	X OUT		X OUT	O	
31	ø		NC	—	NC
32	Vss		Vss	—	GND
33	Port 5	with Input Latch	R PAUSE	I	REMOTE PAUSE CONTROL (PAUSE ON: L)
34			INDEX	I/O	VISS DATA WRITE/DETECT
35			S. CLK	O	CLOCK
36			S. DATA	O	SERVO CONTROL DATA OUTPUT
37		High Impedance	RENT	O	RENTAL MODE: L
38			TEXT		TEXT MODE: L
39			NC	—	NC
40			EDIT	O	EDIT MODE: L
41	Port 1	N-ch OPEN DRAIN	REC START	O	REC START: L
42			AUX		INPUT SIGNAL CONTROL (AUX: L)
43			REC		REC: L
44			P MUTE		PICTURE MUTE CONTROL (MUTE ON: L)
45			EE		EE: L
46			POWER ON		POWER ON: L
47			VIDEO		VIDEO MODE: L
48					
49	Port 0	N-ch OPEN DRAIN	A. MUTE	O	AUDIO MUTE CONTROL (MUTE ON: H)
50			CASS SENS	I	CASSETTE IN/OUT DETECT
51			M DATA	I/O	MEMORY IC CONTROL (DATA READ/WRITE)
52			TNR CTL	O	TNR MODE: H
53			V. UP	O	CAPSTAN ROTATION SPEED CONTROL (V. UP: H)
54			AUTO/MAN/SLOW	O	HEAD SELECT
55			NC	—	NC
56			M CE	O	MEMORY IC CHIP ENABLE
57	Port 2	C MOS		O	
58			NC	—	NC
59			PLL DATA	O	TUNING DATA OUTPUT
60			PAUSE	O	CAPSTAN MOTOR SERVO (SERVO MODE: H)
61			SERVO		
62			T. CLK	I	CLOCK
63			T. DATA	I/O	M-CTL/TIMER CPU BUS DATA (16 BIT SERIAL)
64			PLL LOCK	I	TUNING CHECK DATA INPUT

Table 6-1 Mechacon CPU pin function

2. IC1 pin function (Timer)

Pin No.	Symbol	Label	I/O	Contents
1	S3	Sd	O	SEGMENT DISPLAY DATA OUTPUT /KEY SCAN PULSE OUTPUT /KEY SCAN PULSE OUTPUT
2	S2	Sc		
3	S1	Sb		
4	S0	Sa		
5	P00/INT4	POWER DOWN	I	POWER DOWN DETECT (P DOWN: L)
6	P01/SCK	OS CLK	—	NC
7	P02/SD	OS DATA	I	TEST POINT (TP1)
8	P03/SI	TEST		
9	P10/INT0	REMOTE	I	16 bit REMOTE DATA INPUT (A/B CODE)
10	P11/INT1	NC	—	NC
11	P12/INT2	CNT PLS	O	COUNTER DATA INPUT
12	P13/T10	CNT PLS		
13	P20	KS0	I	KEY SCAN DATA INPUT
14	P21	KS1		
15	P22	KS2		
16	P23/BUZ	KS3		
17	P30	TIMER DATA	I/O	TM (TIMER/M-CTL CPU) BUS : 16 bit SERIAL DATA : CLOCK VIDEO PROGRAMMING SYSTEM : I ² C BUS DATA : CLOCK
18	P31	TIMER CLK	I	
19	P32	SDA TA	I/O	
20	P33	SCL K	O	
21	P60	OS CE	O	ON SCREEN IC CONTROL
22	P61	OS RESET	O	
23	P62	NC	—	NC
24	P63	NC		
25	P40	NC		
26	P41	NC		
27	R42	NC		
28	P43	NC		
29	PP0	NC		
30	X1	X1	I	MAIN SYSTEM CLOCK
31	X2	X2	O	
32	Vss	Vss	—	GND
33	XT1	XT1	I	LED CONTROL (LED ON: L)
34	XT2	POWER	O	
35	P50	NC	—	NC
36	P51	AUTO TRACK	O	LED CONTROL (LED ON: L)
37	P52	NC	—	NC
38	P53	PROGRAM	O	BLUE BACK MODE: H
39	RESET	RESET	I	RESET AT CONNECT VCR TO AC
40	T0	10G	O	COLUMN DISPLAY DATA OUTPUT
41	T1	9G		
42	T2	8G		
43	T3	7G		
44	T4	6G		
45	T5	5G		
46	T6	4G		
47	T7	3G		
48	T8	2G		
49	T9	1G		
50	T10/S15/PH3	Sp	O	SEGMENT DISPLAY DATA OUTPUT /KEY SCAN PULSE OUTPUT
51	T11/S14/PH2	So		
52	T12/S13/PH1	Sn		
53	T13/S12/PH0	Sm		
54	T14/S11	Sl		
55	T15/S10	Sk		
56	VLOAD	VLOAD	I	FDP DRIVE
57	VPRE	VPRE	O	SEGMENT DISPLAY DATA OUTPUT /KEY SCAN PULSE OUTPUT /KEY SCAN PULSE OUTPUT /KEY SCAN PULSE OUTPUT /KEY SCAN PULSE OUTPUT
58	S9	Si		
59	S8	Si		
60	S7	Sh		
61	S6	Sg		
62	S6	Sf		
63	S4	Se		
64	V00	V00	—	5 V For the SYSTEM CONTROL

Table 6-2 IC1 pin function

E. & O. E. No. 82284