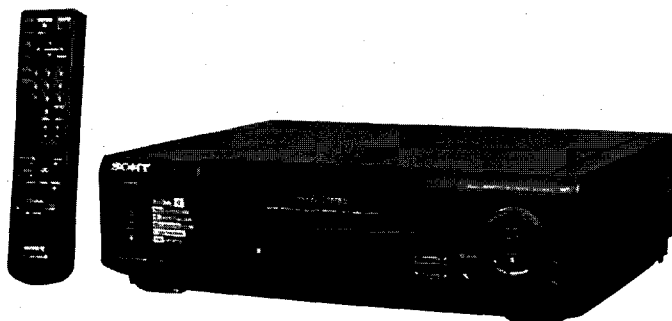


# SLV-360/390/390PX/660HF/690HF/L2MX/L2PA/L2PL/L4CS/ L4MX/L4PA/L4PL/L6HFCS/L6HFMX/L6HFPA/L6HFPL RMT-V181/V181A/V182A/V182B/V182D

## SERVICE MANUAL



**VHS**

- Refer to the **SERVICE MANUAL** of **VHS MECHANICAL ADJUSTMENTS IV** for **MECHANICAL ADJUSTMENTS**. (9-973-623-11)

**US Model**  
SLV-360/390/660HF/690HF

**Canadian Model**

SLV-360/660HF/690HF

**MEXICAN Model**

SLV-L2MX/L4MX/L6HFMX

**PANAMANIAN Model**

SLV-L2PA/L4PA/L6HFPA

**PHILIPPINE Model**

SLV-L2PL/L4PL/L6HFPL

**CHILEAN Model**

SLV-L4CS/L6HFCS

**PX Model**

SLV-390PX

**H MECHANISM**

## SPECIFICATIONS

### System

#### Format

VHS NTSC standard

#### Video recording system

Rotary head helical scanning FM system

#### Video heads

Double azimuth four heads

#### Video signal

NTSC color, EIA standards

#### Tape speed

SP: 33.35 mm/s (1 3/8 inches/s)

EP: 11.11 mm/s (7/16 inches/s)

LP: 16.67 mm/s (1 1/16 inches/s),  
playback only

#### Maximum recording/playback time

8 hrs. in EP mode (with T-160 tape)

#### Fast-forward and rewind time

Approx. 3 min. (with T-120 tape)

### Tuner section

#### Channel coverage

VHF 2 to 13

UHF 14 to 69

CATV A-8 to A-1, A to W, W+1 to W+84

#### Antenna

75-ohm antenna terminal for VHF/UHF

### Inputs and outputs

#### LINE IN

VIDEO IN, phono jack (1)

Input signal: 1 Vp-p, 75 ohms, unbalanced,  
sync negative

AUDIO IN, phono jack (2)

Input level: 327 mVrms

Input impedance: more than 47 kilohms

#### LINE OUT

VIDEO OUT, phono jack (1)

Output signal: 1 Vp-p, 75 ohms, unbalanced,  
sync negative

AUDIO OUT, phono jack (2)

Standard output: 327 mVrms

Load impedance: 47 kilohms

Output impedance: less than 10 kilohms

### Timer section

#### Clock

Quartz locked

#### Timer indication

12-hour cycle

#### Timer setting

8 programs per month (max.)

#### Power back-up

Built-in self-charging capacitor

Back-up duration: up to 3 hours at a time

US, Canadian, PX models up to 1 hour at a time

Except us, Canadian, PX models

### General

#### Power requirements

See next page.

#### Power consumption

See next page.

#### Operating temperature

5°C to 40°C (41°F to 104°F)

#### Storage temperature

-20°C to 60°C (-4°F to 140°F)

#### Dimensions

Approx. 355 × 102 × 278 mm (w/h/d)

(Approx. 14 × 4 1/8 × 11 inches) including  
projecting parts and controls

#### Mass

Approx. 4.0 kg (8 lb 13 oz)

### Supplied accessories

Remote commander (1)

Size AA (R6) batteries (2)

75-ohm coaxial cable with F-type connectors (1)

AC power cord (1)

Audio/video cable (3 phono to 3 phono) (1)

Plug adaptor (1) (SLV-660HF PX/L6HF CS/  
L6HF PL)



# VIDEO CASSETTE RECORDER SONY®

• DIFFERENT SPECIFICATIONS LIST

MODEL	SLV-360	SLV-390	SLV-390PX	SLV-660HF	SLV-690HF
SPECIFICATION					
VIDEO/AUDIO HEADS	4 HEADS	4 HEADS	4 HEADS	6 HEADS	6 HEADS
AUDIO SYSTEM	MONAURAL	MONAURAL	MONAURAL	HIFI-STEREO	HIFI-STEREO
TUNER AUDIO (STEREO) SYSTEM	—	—	—	SAP	SAP
VCR + SYSTEM	—	BUILT-IN	BUILT-IN	—	BUILT-IN
POWER REQUIREMENTS	120V AC 60Hz	120V AC 60Hz	110-240V AC 50/60Hz	120V AC 60Hz	120V AC 60Hz
POWER CONSUMPTION	24W	24W	24W	26W	26W
REMOTE COMMANDER	RMT-V181	RMT-V182D	RMT-V182D	RMT-V182B	RMT-V182A

Abbreviations

CS : Chilean model  
 MX : Mexican model  
 PA : Panamanian model  
 PL : Philippine model

MODEL	SLV-L2MX	SLV-L2PA	SLV-L2PL	SLV-L4MX	SLV-L4PA	SLV-L4CS	SLV-L4PL	SLV-L6HFMX	SLV-L6HFPA	SLV-L6HFCS	SLV-L6HFPL
SPECIFICATION											
VIDEO/AUDIO HEADS	2 HEADS			4 HEADS				6 HEADS			
AUDIO SYSTEM	MONAURAL			MONAURAL				HIFI-STEREO			
TUNER AUDIO (STEREO) SYSTEM	—			—				SAP			
VCR + SYSTEM	—			—				—			
POWER REQUIREMENTS	120V AC 60Hz		110-240V AC 50/60Hz	120V AC 60Hz		110-240V AC 50/60Hz		120V AC 60Hz		110-240V AC 50/60Hz	
POWER CONSUMPTION	18W			18W				20W			
REMOTE COMMANDER	RMT-V181			RMT-V181				RMT-V181A			

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  $\triangle$  OR DOTTED LINE WITH MARK  $\triangle$  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE  $\triangle$  SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

## SAFETY CHECK-OUT

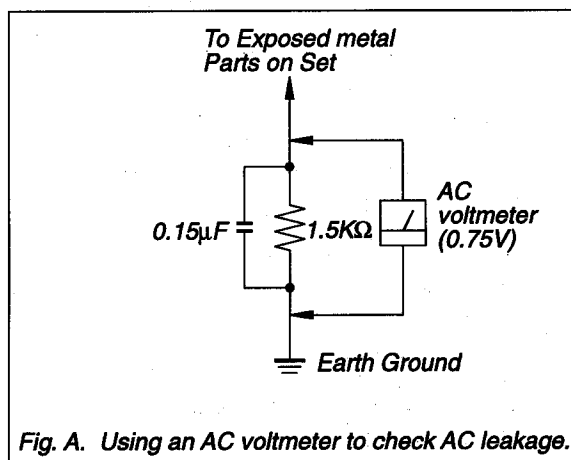
After correcting the original service problem, perform the following safety checks before releasing the set the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Check the B+ voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

### LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA TW-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75V, so analog meters must have an accurate low voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)



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**SERVICE NOTE**

**1. HOW TO RETURN THE PINCH ROLLER, GUIDE ROLLER AND ELEVATOR CAM TO STOP MODE**

- 1) Remove the VHS MD assembly from the machine. (Refer to section 2-4. Removal.)
- 2) Rotate the worm gear-1 of the cam motor beneath the MD assembly in the direction arrow (A) using a screw driver tip.

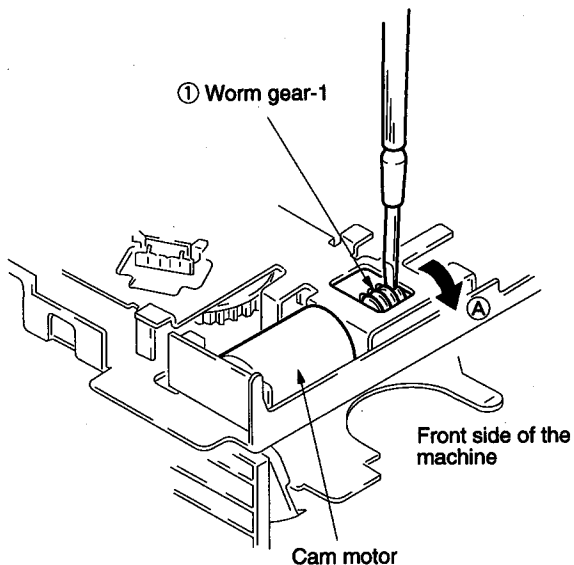


Fig. 1

**2. HOW TO RETURN A TAPE INTO CASSETTE HALF**

A tape can be rewound into a cassette half by rotating the flywheel-1 of the capstan motor in the direction of (A) with hand.

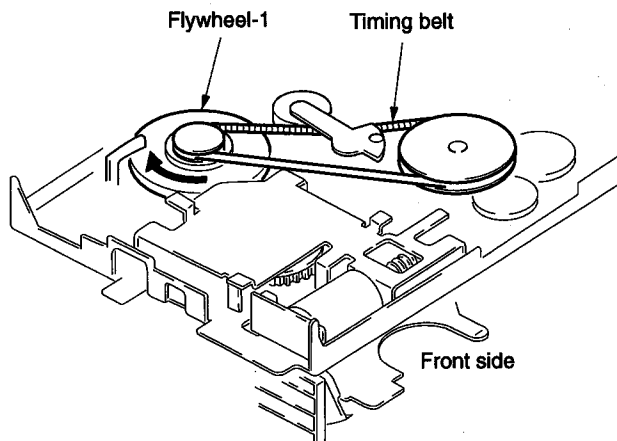


Fig. 2

**3. HOW TO REMOVE A CASSETTE FROM A MACHINE IF A CASSETTE IS LEFT IN A MACHINE IN TROUBLE**

Execute the section 2, and keep rotating the flywheel-1.

When executing section 1 to 3, take care that a tape slack should not be caught by a mechanism or a tape should not be damaged.

**4. HOW TO REMOVE DRUM ASSEMBLY**

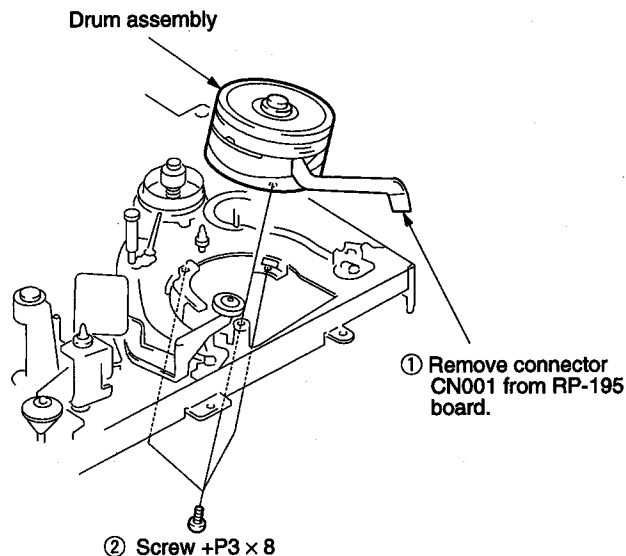


Illustration : SLV-660HF

Fig. 3

## 5. HOW TO REPLACE A ROTARY UPPER DRUM (SLV-660HF/690HF/L6HFCS/L6HFMX/L6HFPA/L6HFPL)

### 5-1. HOW TO REMOVE A ROTARY UPPER DRUM

- 1) Remove screw ① (+P3×8) and remove the ground shaft assembly ②. (Refer to Fig. 4.)
- 2) Remove soldering which is marked by arrow and remove the rotary upper drum board completely.
- 3) Remove two screws ③ (PSW3×8) and remove the rotary upper drum in the direction of A. (Refer to Fig. 5.)  
If removal is difficult, remove it while rotating it slowly.

**Note:** If removal is difficult, check again if soldering is removed completely.

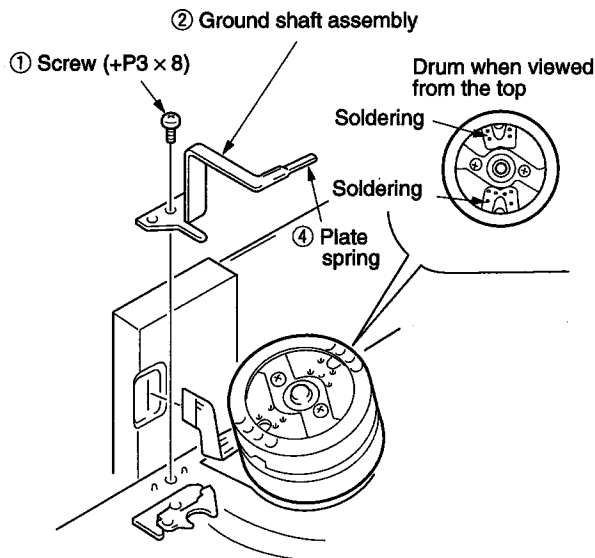


Fig. 4

### 5-2. HOW TO ATTACH A NEW ROTARY UPPER DRUM

- 1) Pay attention so that finger print or like must not be put when inserting a new upper drum into lower drum.
- 2) Align ➡ mark of the rotary upper drum board with the ➡ mark of the rotary transformer board so that the screw hole on the upper drum and that on the lower drum are aligned. (Refer to Fig. 5.)
- 3) If attaching is difficult, attach a upper drum while rotating it slowly.

**Note:** Pay attention not to damage the video heads.

Confirm that the upper drum is inserted completely.

- 4) Tighten the two screws ③ (PSW3×8). (Refer to Fig. 5.)
- 5) Fix the earth shaft ② by tightening the screw ① (+P3×8) so that protrusion at the tip of the earth shaft contacts the center of the drum shaft.

**Note:** When attaching the ground shaft assembly ②, never give force to the plate spring ④.

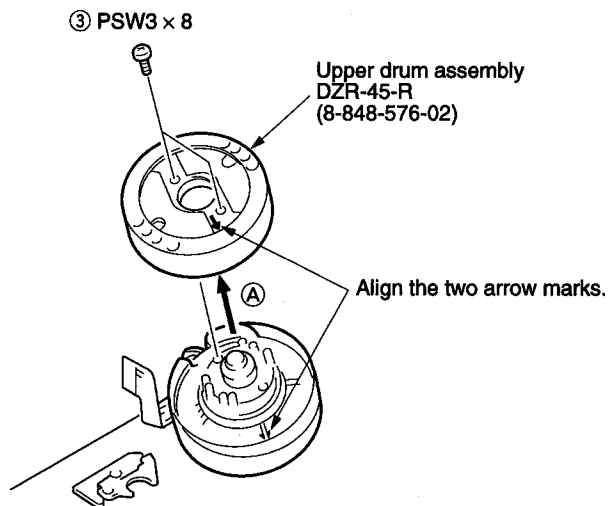


Fig. 5

## SECTION 1 GENERAL

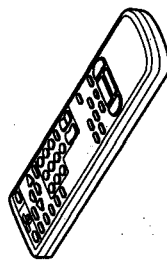
This section is extracted from the  
SLV-660HF/L6HF instruction manual.

### Step 1

## Unpacking

Check that you have received the following items with the VCR:

- Remote commander



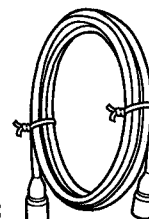
- Size AA (R6) batteries



- Audio/video cable (3-phono to 3-phono)



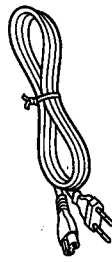
- 75-ohm coaxial cable with F-type connectors



- AC power cord



(SLV-660HF/L6HF MX/L6HF PA)



(SLV-660HF PX/L6HF CS/L6HF PL)

- Plug adaptor (SLV-660HF PX/L6HF CS/L6HF PL)



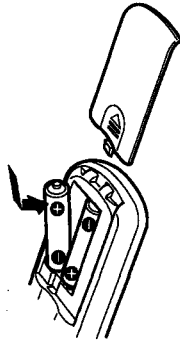
If the plug supplied with your VCR does not fit your power outlet, attach the supplied adaptor to the plug.

### Step 2

## Setting up the remote commander

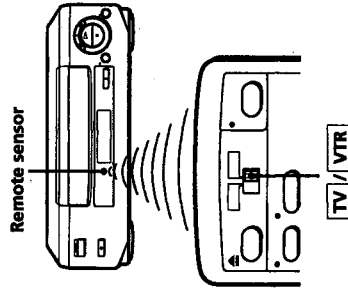
### Inserting the batteries

Insert two size AA (R6) batteries by matching the + and - on the batteries to the diagram inside the battery compartment.



### Using the remote commander

You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your Sony TV.



To operate	Set TV/VTR to
the VCR	VTR
a Sony TV	TV

### Notes

- With normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.



## Step 3

### Hookups

#### Selecting the best hookup option

There are many ways in which your VCR can be hooked up. To hook up your VCR so that it works best for you, first scan through the table below. Then use the accompanying diagrams and procedures on the following pages to set up your VCR.

If you have	Use	Refer to
TV that has audio/video input	Audio/video (A/V) hookup, then follow one of the hookups below.	Page 7
Antenna only, no cable TV	Hookup 1	Pages 8 to 9
Cable box with many scrambled channels	Hookup 2	Pages 10 to 11
No cable box or cable box with only a few scrambled channels	Hookup 3	Pages 12 to 13
Cable box with only a few scrambled channels, using an A/B switch	Hookup 4	Pages 14 to 15

After you've completed the connections, follow the instructions for setup. During setup, if you need more details on the procedure described, page numbers are provided where you can find complete, step-by-step instructions.

After you've completed the setup, you're ready to use your VCR.

Procedures differ depending on the hookup you used. For an overview, refer to "Quick reference to using the VCR" on the back cover.

#### Before you get started

- Turn off the power to all equipment.
- Do not connect the AC power cords until all of the connections are completed.
- Be sure you make connections firmly. Loose connections may cause picture distortion.
- If your TV doesn't match any of the examples provided, see your nearest Sony dealer or qualified technician.

#### Caution

Connections between the VCR's VHF/UHF connector and the antenna terminals of the TV receiver should be made only as shown in the following instructions. Failure to do so may result in operation that violates the regulations of the Federal Communications Commission regarding the use and operation of RF devices. Never connect the output of the VCR to an antenna or make simultaneous (parallel) antenna and VCR connections at the antenna terminals of your receiver.

### Audio/video (A/V) hookup

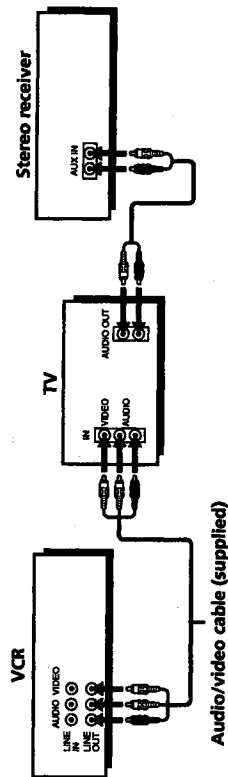
Page 7

If your TV has audio/video (A/V) input jacks, you will get a better picture and sound if you hook up your VCR using these connections. In addition, for a true "home theater" experience, you should connect the audio outputs of your VCR or TV to your stereo system. If your TV doesn't have A/V inputs, see the following pages for antenna or cable hookups.

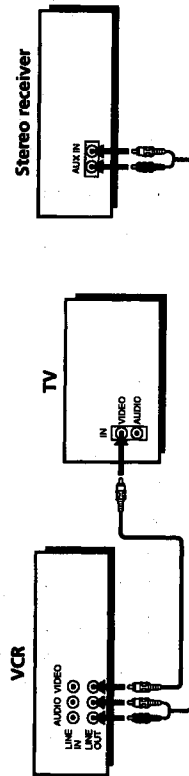
If you're not planning to use your VCR to record programs, you're finished setting up the VCR after you've made the connections shown on page 7.

If you want to record off-air or off your cable TV system, complete these connections first, and then go to the following pages for antenna or cable hookups.

#### A Use this hookup if your TV has stereo jacks



#### B Use this hookup if your TV doesn't have stereo jacks



#### Note

To play a tape in stereo, you must use the A/V connection.

#### Note to CATV system installer

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

## Hookup 1

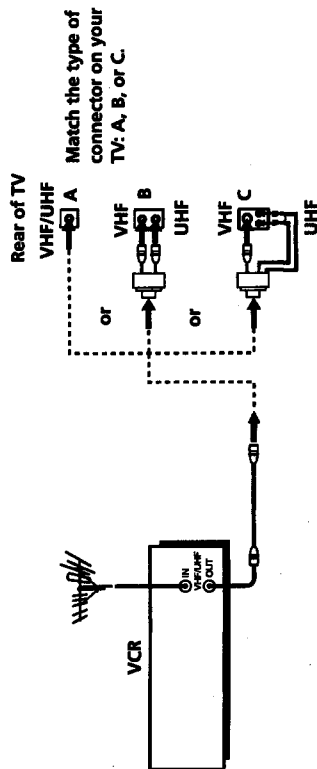
Pages 8 to 9

### Antenna hookup

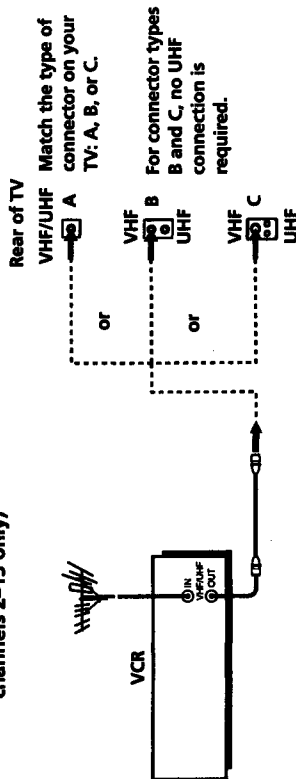
Make the following connections if you're using an antenna (if you don't have cable TV).

#### A Use this hookup if you're using:

- VHF/UHF antenna (you get channels 2-13 and channels 14 and higher)
- UHF-only antenna (you get channels 14 and higher)
- Separate VHF and UHF antennas



#### B Use this hookup if you're using a VHF-only antenna (you get channels 2-13 only)



#### If you cannot connect your antenna cable to the VCR directly

If your antenna cable is a flat cable (300-ohm twin lead cable), attach an external antenna connector (not supplied) so you can connect the cable to the VHF/UHF IN connector. If you have separate cables for VHF and UHF antennas, you should use a U/V band mixer (not supplied). For details, see page 40.

## Hookup 1: VCR setup

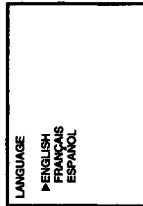
- 1 Set the RF UNIT switch to CH 3 or CH 4, whichever channel is not used in your area. If both are used, set the switch to either channel.

For details, see page 39. If you made A/V connections (page 7), you can skip this step.

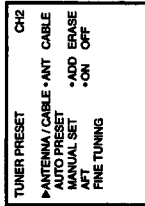
- 2 Change the on-screen display language if desired. For details, see page 17.

- 1 Press MENU and select LANGUAGE.

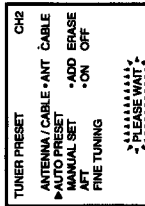
- 2 Select the language, and press EXECUTE.



- 3 Press MENU and select TUNER PRESET. Set ANTENNA/CABLE to ANT. For details, see page 18.



- 4 Preset the channels into the VCR. Select AUTO PRESET and press EXECUTE.



## Step 3: Hookups (continued)

### Hookup 2

Pages 10 to 11

#### Cable box with many scrambled channels

##### Recommended use

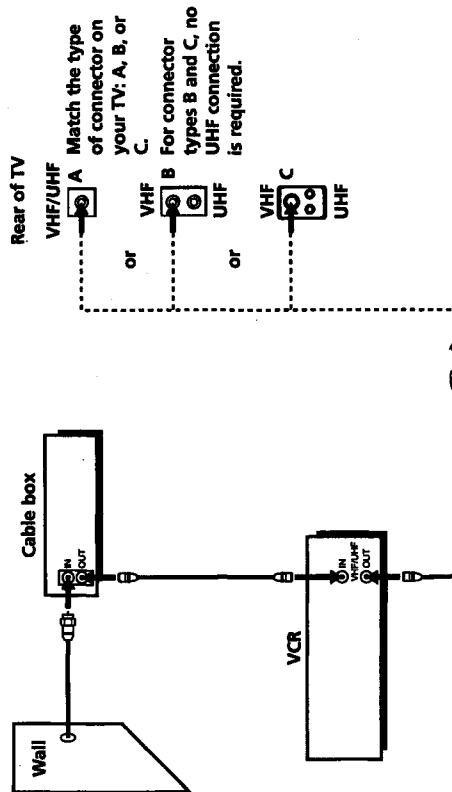
Use this hookup if your cable system scrambles all or most channels.

##### What you can do with this hookup

- Record any channel by selecting the channel on the cable box

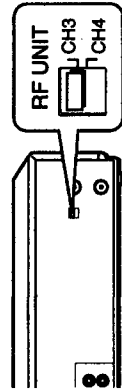
##### What you can't do

- Record one channel while watching another channel



## Getting Started

### Hookup 2: VCR setup



1 Set the RF UNIT switch to CH 3 or CH 4, whichever channel is not used in your area. If both are used, set the switch to either channel.

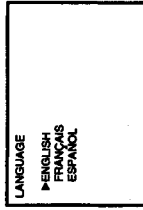
For details, see page 39. If you made A/V connections (page 7), you can skip this step.

2 Turn on your cable box.

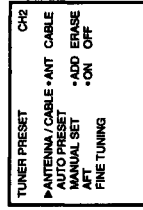
3 Change the on-screen display language if desired. For details, see page 17.

• Press MENU and select LANGUAGE.

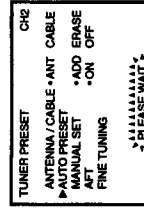
• Select the language, and press EXECUTE.



4 Press MENU and select TUNER PRESET. Set ANTENNA/CABLE to ANT. For details, see page 18.



5 Preset the channels into the VCR. Select AUTO PRESET and press EXECUTE.



### Hookup 3

Pages 12 to 13

#### No cable box, or cable box with only a few scrambled channels

##### Recommended use

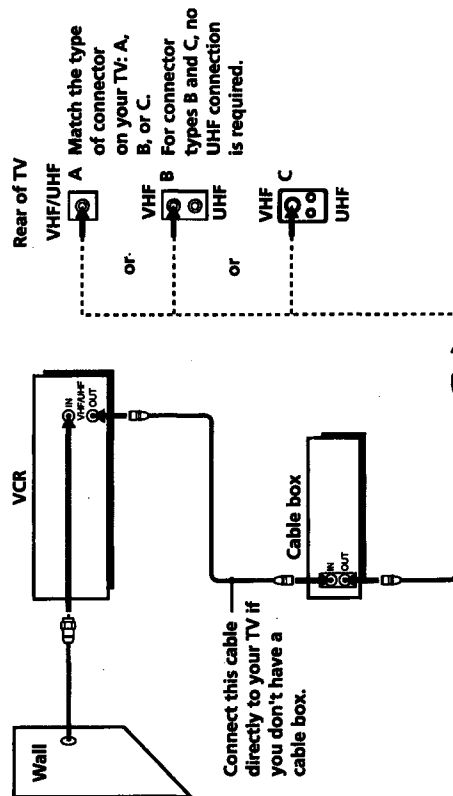
Use this hookup if you do not have a cable box. Also use this hookup if your cable system scrambles only a few channels.

##### What you can do with this hookup

- Record any unscrambled channel by selecting the channel on the VCR

##### What you can't do

- Record scrambled channels that require a cable box



### Hookup 3: VCR setup

- 1 Set the RF UNIT switch to CH 3 or CH 4, whichever channel is not used in your area. If both are used, set the switch to either channel.

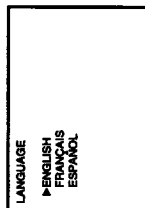
For details, see page 39. If you made A/V connections (page 7), you can skip this step.

- 2 Turn on your cable box.

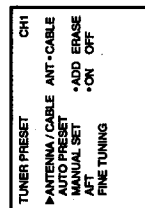
- 3 Change the on-screen display language if desired. For details, see page 17.

- 1 Press MENU and select LANGUAGE.

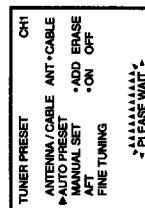
- 2 Select the language, and press EXECUTE.



- 4 Press MENU and select TUNER PRESET. Set ANTENNA/CABLE to CABLE. For details, see page 18.



- 5 Preset the channels into the VCR. Select AUTO PRESET and press EXECUTE.



## Step 3: Hookups (continued)

### Hookup 4

Pages 14 to 15

#### Cable box with only a few scrambled channels, using an A/B switch

##### Recommended use

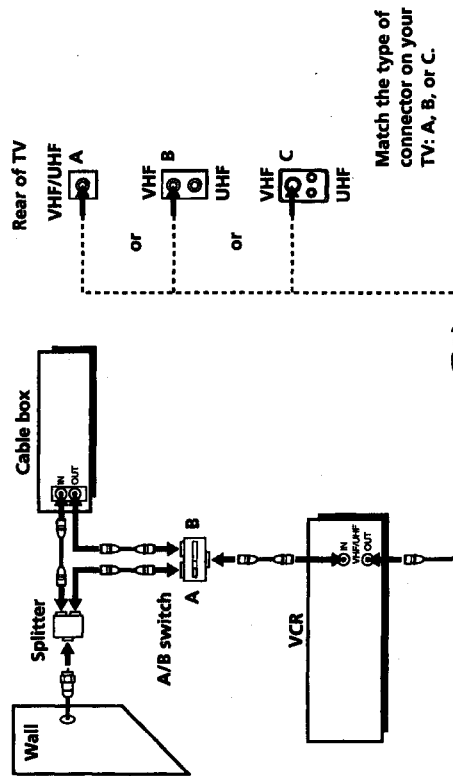
By using an A/B switch (not supplied), this hookup allows you to record both scrambled and unscrambled channels conveniently.

##### What you can do with this hookup

- Record any unscrambled channel by selecting the channel directly on the VCR (the A/B switch is set to A)
- Record any scrambled channel by selecting the channel on the cable box (the A/B switch is set to B)

##### What you can't do

- Record one scrambled channel while watching another channel (the A/B switch is set to B)



1-6

## Getting Started

### Hookup 4: VCR setup

- Set the RF UNIT switch to CH 3 or CH 4, whichever channel is not used in your area. If both are used, set the switch to either channel.

For details, see page 39. If you made A/V connections (page 7), you can skip this step.

- Set the A/B switch to "A."

- Change the on-screen display language if desired. For details, see page 17.

- Press MENU and select LANGUAGE.

- Select the language, and press EXECUTE.

LANGUAGE  
► ENGLISH  
► FRENCH  
► SPANISH

- Press MENU and select TUNER PRESET. Set ANTENNA/CABLE to CABLE. For details, see page 18.

TUNER PRESET  
► ANTENNA/CABLE ANT-CABLE  
► AUTO PRESET  
► MANUAL SET  
► ADD ERASE  
► FINE TUNING  
► ON OFF

- Preset the unscrambled channels into the VCR. Select AUTO PRESET and press EXECUTE.

TUNER PRESET  
► ANTENNA/CABLE ANT-CABLE  
► AUTO PRESET  
► MANUAL SET  
► ADD ERASE  
► FINE TUNING  
► ON OFF  
\*\*\*\*\* PLEASE WAIT \*\*\*\*\*

- Preset the cable box output channel (usually 2, 3 or 4). For details, see page 20.

#### Cable box output channel

- Press MENU and select TUNER PRESET.

- Enter the cable box output channel.

- Set MANUAL SET to ADD and press EXECUTE.

TUNER PRESET  
► ANTENNA/CABLE ANT-CABLE  
► AUTO PRESET  
► MANUAL SET  
► ADD ERASE  
► FINE TUNING  
► ON OFF

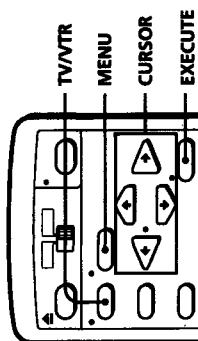
## Step 4

### Setting the clock

Set the time and date to use the timer feature for recording programs.

#### Before you start...

- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VTR to display the VTR indicator in the VCR's display window.



- 1 Press MENU, then press CURSOR  $\uparrow/\downarrow$  to move the cursor (►) to CLOCK SET and press EXECUTE.

CLOCK SET  
10/1/1998 MO 12:00M

- 2 Press CURSOR  $\uparrow/\downarrow$  to set the month.

CLOCK SET  
10/1/1998 TU 12:00M

- 3 Press CURSOR  $\rightarrow$  to flash the day and press CURSOR  $\uparrow/\downarrow$  to set the day.  
The day of the week is set automatically.

CLOCK SET  
10/1/1998 WE 12:00M

- 4 Set the year, hour and minutes in the same way as the day.



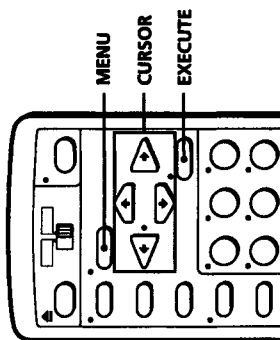
- 5 Press EXECUTE to start the clock.



## Getting Started

### Selecting a language

You can change the on-screen display language.



- 1 Press MENU, then press CURSOR  $\uparrow/\downarrow$  to move the cursor (►) to LANGUAGE and press EXECUTE.

LANGUAGE  
► ENGLISH  
FRANÇAIS  
ESPAÑOL

- 2 Press CURSOR  $\uparrow/\downarrow$  to select ENGLISH, FRANÇAIS, or ESPAÑOL, then press EXECUTE.



## Presetting channels

This VCR is capable of receiving VHF channels 2 to 13, UHF channels 14 to 69 and unscrambled CATV channels 1 to 125. First, we recommend that you preset the receivable channels in your area using automatic presetting. Then, if there are any unwanted channels, disable them manually. If you have decided which channels you wish to preset, set them directly using manual presetting.

### Before you start...

- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VTR to display the VTR indicator in the VCR's display window.

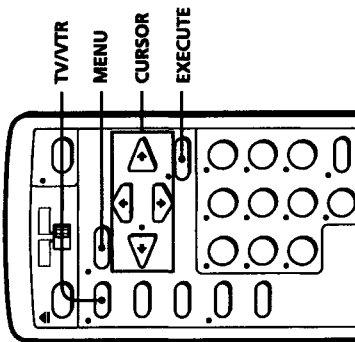
### Presetting all receivable channels automatically

- 1 Press MENU, then press CURSOR  $\uparrow/\downarrow$  to move the cursor ( $\blacktriangleright$ ) to TUNER PRESET and press EXECUTE.

TUNER PRESET	CH2
ANTENNA / CABLE	ANT CABLE
AUTO PRESET	
MANUAL SET	ADD ERASE
AFT	ON OFF
FINE TUNING	



- 2 Press CURSOR  $\uparrow/\downarrow$  to select ANTENNA/CABLE.



- 3 To preset cable TV channels:  
Press CURSOR  $\leftarrow/\rightarrow$  to set ANTENNA/CABLE to CABLE.

TUNER PRESET	CH2
ANTENNA / CABLE	ANT CABLE
AUTO PRESET	
MANUAL SET	ADD ERASE
AFT	ON OFF
FINE TUNING	

- To preset VHF and UHF channels:  
Press CURSOR  $\leftarrow/\rightarrow$  to set ANTENNA/CABLE to ANT.

TUNER PRESET	CH2
ANTENNA / CABLE	ANT CABLE
AUTO PRESET	
MANUAL SET	ADD ERASE
AFT	ON OFF
FINE TUNING	

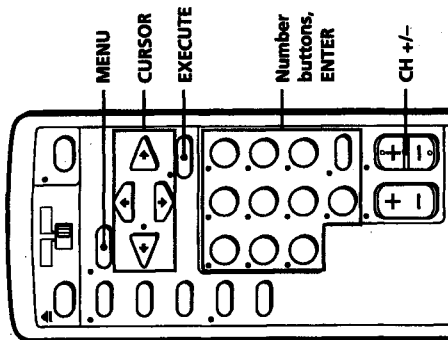
- 4 Press CURSOR  $\uparrow/\downarrow$  to select AUTO PRESET, then press EXECUTE.  
All receivable channels are preset in numerical sequence. When no more receivable channels can be found, presetting stops and the picture from the lowest numbered channel is displayed on the TV screen.

TUNER PRESET	CH2
ANTENNA / CABLE	ANT CABLE
AUTO PRESET	
MANUAL SET	ADD ERASE
AFT	ON OFF
FINE TUNING	

continued

## Presetting channels (continued)

### Presetting/disabling channels manually



- 1 Press MENU and select TUNER PRESET, then press EXECUTE.



CH2
TUNER PRESET
ANTENNA / CABLE • ANT CABLE
AUTO PRESET
MANUAL SET
AFT
FINE TUNING

- 2 To preset a channel:

- 1 Press the number buttons to enter the channel number, then press ENTER.
- 2 Press CURSOR  $\leftarrow/\rightarrow$  to set MANUAL SET to ADD.



CH2
TUNER PRESET
ANTENNA / CABLE • ANT CABLE
AUTO PRESET
MANUAL SET
AFT
FINE TUNING

- To disable a channel:

- 1 Press CH +/- to select the channel number.
- 2 Press CURSOR  $\leftarrow/\rightarrow$  to set MANUAL SET to ERASE.



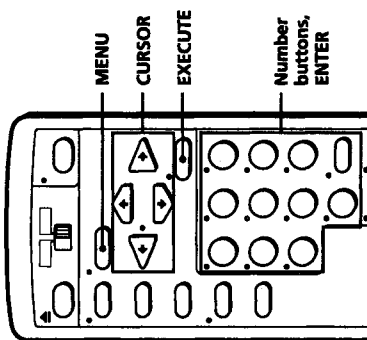
CH2
TUNER PRESET
ANTENNA / CABLE • ANT CABLE
AUTO PRESET
MANUAL SET
AFT
FINE TUNING

- 3 Repeat step 2 to preset or disable channels as required, then press EXECUTE.



### If the picture is not clear

Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture of a channel is not clear, you can also use the manual tuning function.



- 1 Press MENU and select TUNER PRESET, then press EXECUTE.



CH2
TUNER PRESET
ANTENNA / CABLE • ANT CABLE
AUTO PRESET
MANUAL SET
AFT
FINE TUNING

- 2 Press the number buttons to select the channel you want to fine-tune, then press ENTER.



Selected channel
TUNER PRESET
ANTENNA / CABLE • ANT CABLE
AUTO PRESET
MANUAL SET
AFT
FINE TUNING

- 3 Press CURSOR  $\leftarrow/\rightarrow$  to select FINE TUNING.



The fine tuning meter appears.

CH2
TUNER PRESET
ANTENNA / CABLE • ANT CABLE
AUTO PRESET
MANUAL SET
AFT
FINE TUNING

- 4 Press CURSOR  $\leftarrow/\rightarrow$  to adjust to a clearer picture, then press EXECUTE.



Note that the AFT setting switches to OFF.

CH2
TUNER PRESET
ANTENNA / CABLE • ANT CABLE
AUTO PRESET
MANUAL SET
AFT
FINE TUNING

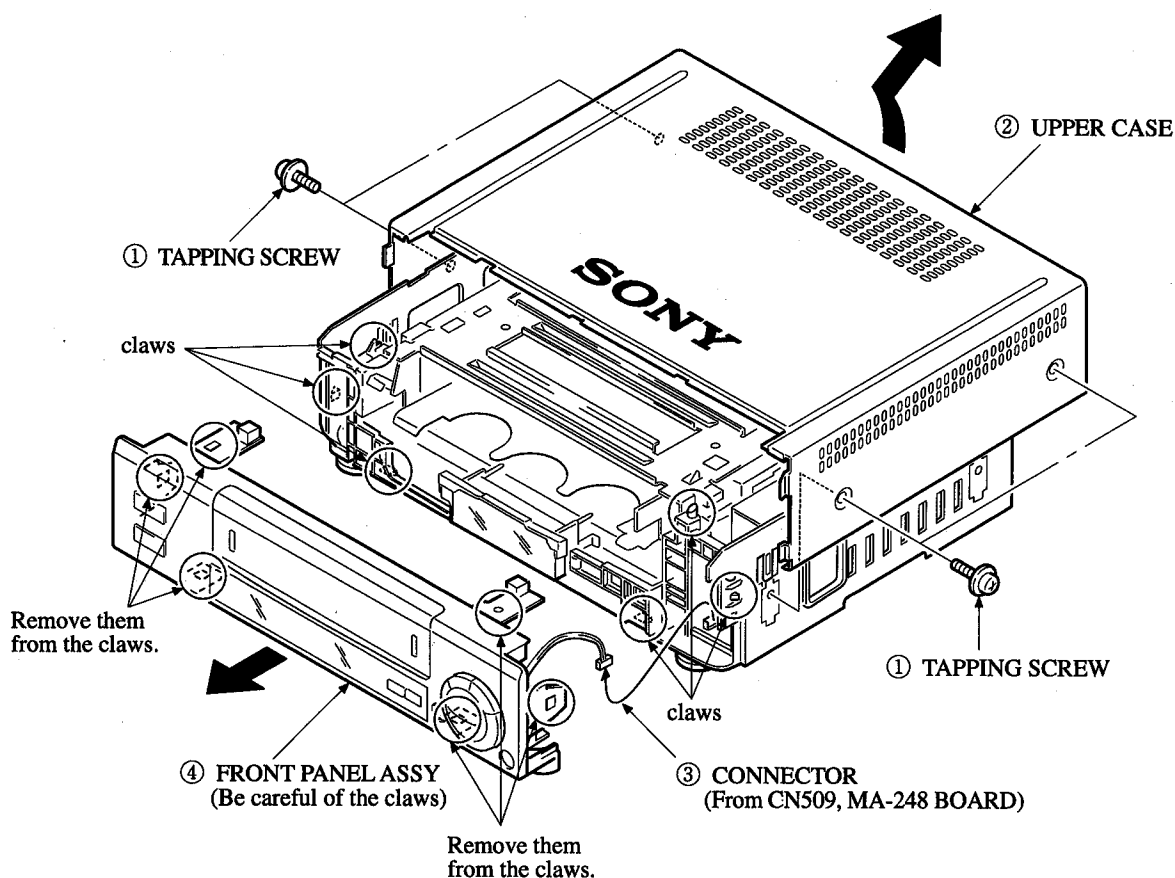


SECTION 2

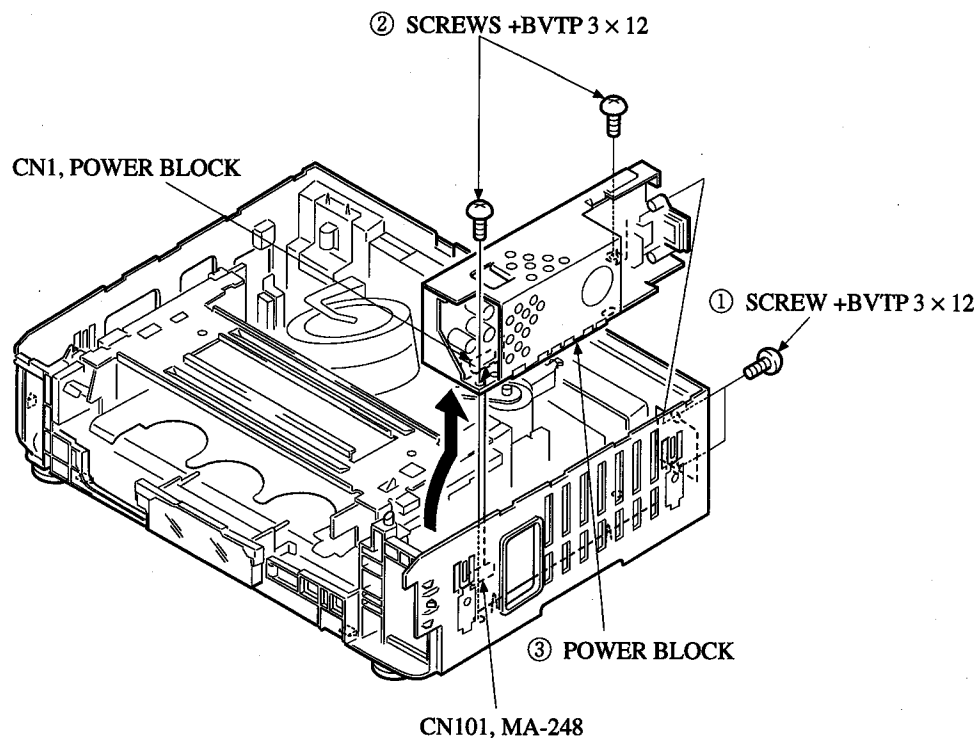
DISASSEMBLY

NOTE : Follow the disassembly procedure in the numerical order given.

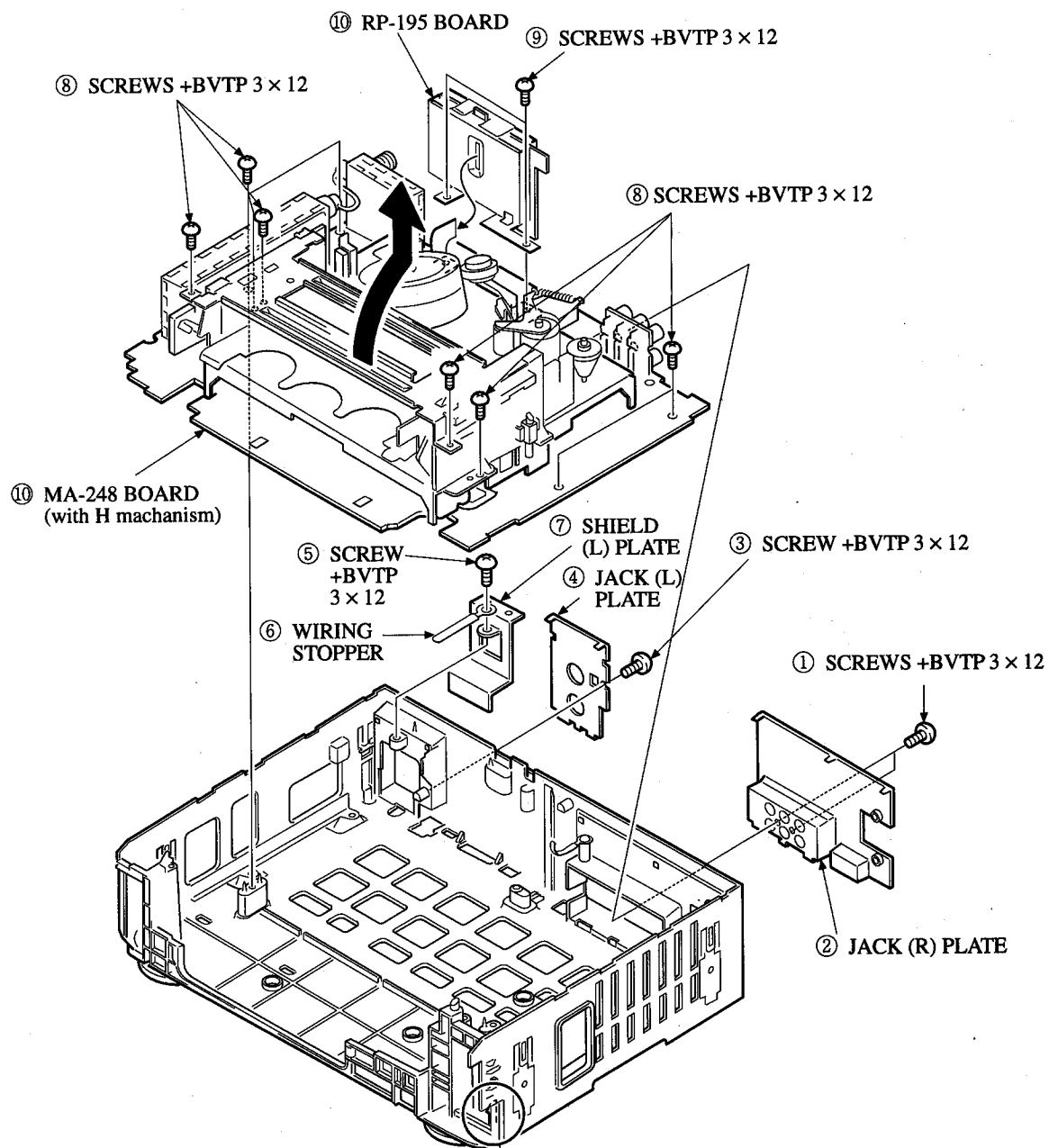
2-1. REMOVAL OF FRONT PANEL ASSY



2-2. REMOVAL OF POWER BLOCK

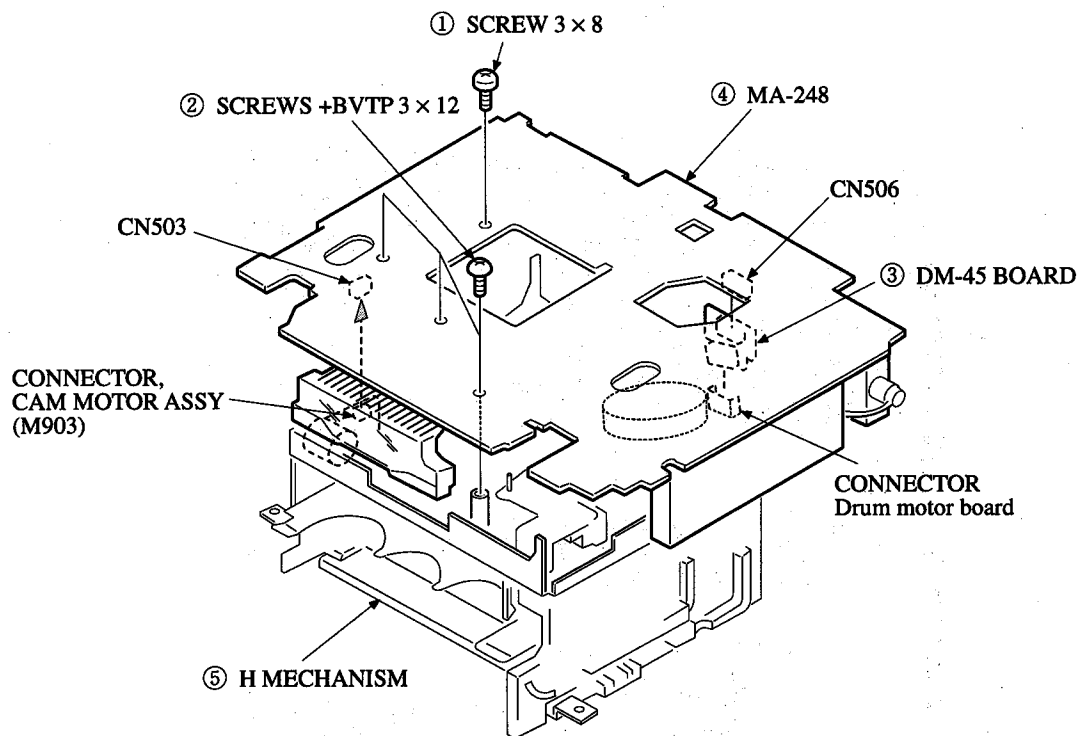


## 2-3. REMOVAL OF RP-195 BOARD and MA-248 BOARD

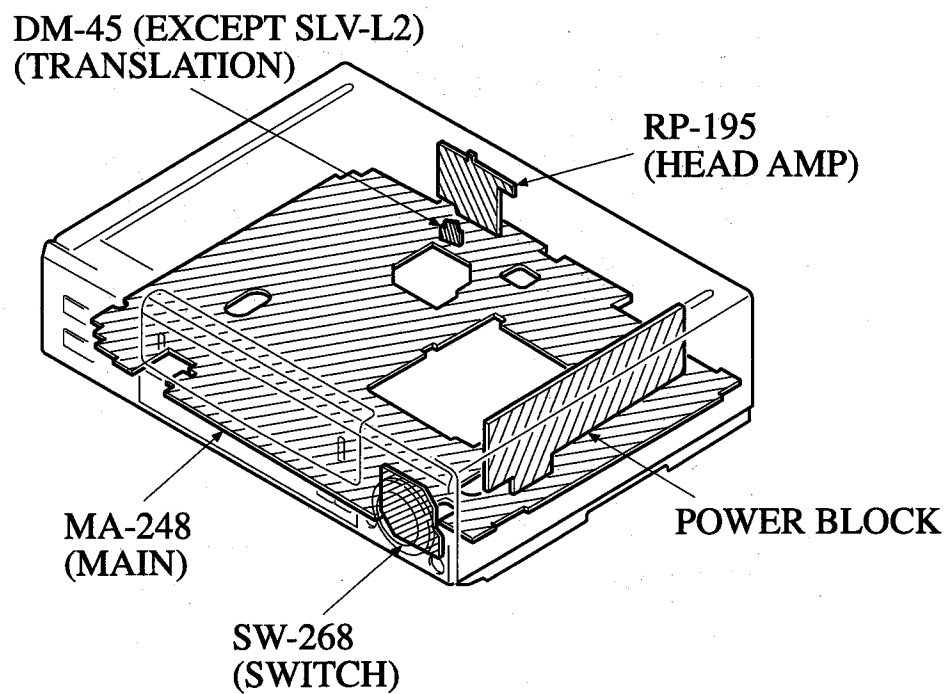


Be careful of a claw on removing MA-248 board with H mechanism ⑪.

## 2-4. REMOVAL OF H MECHANISM

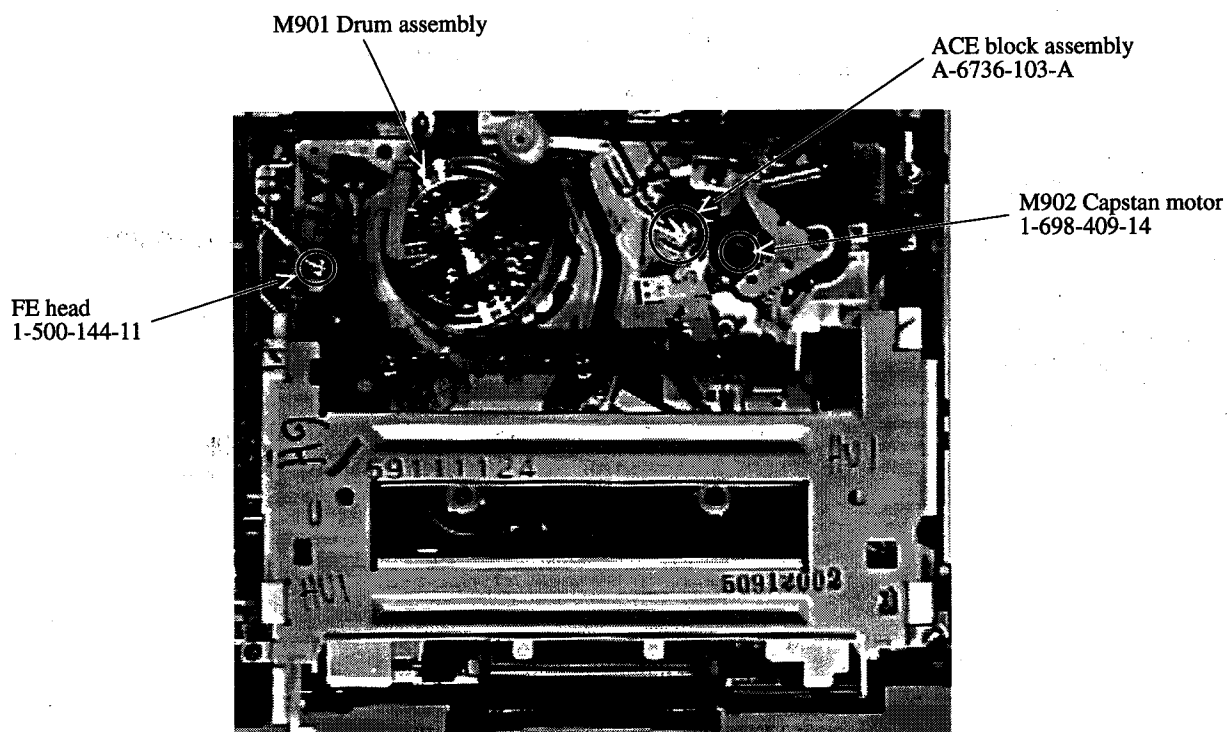


## 2-5. CIRCUIT BOARDS LOCATION

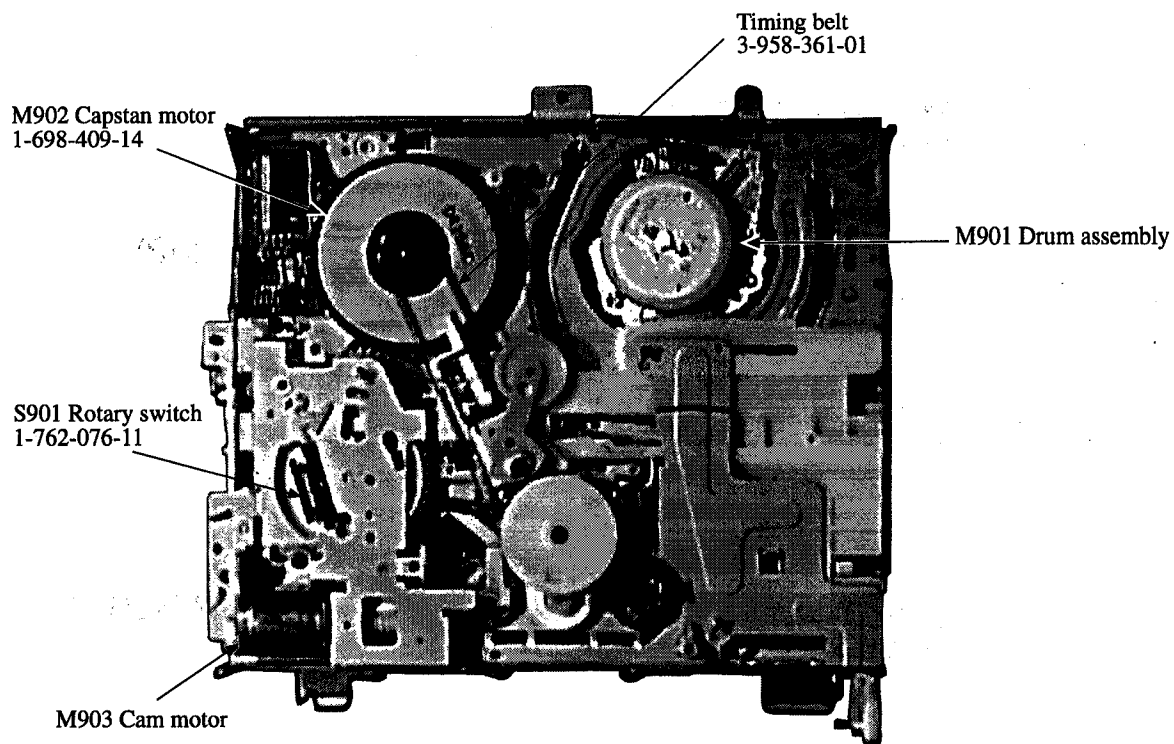


## 2-6. INTERNAL VIEWS

— Top view —

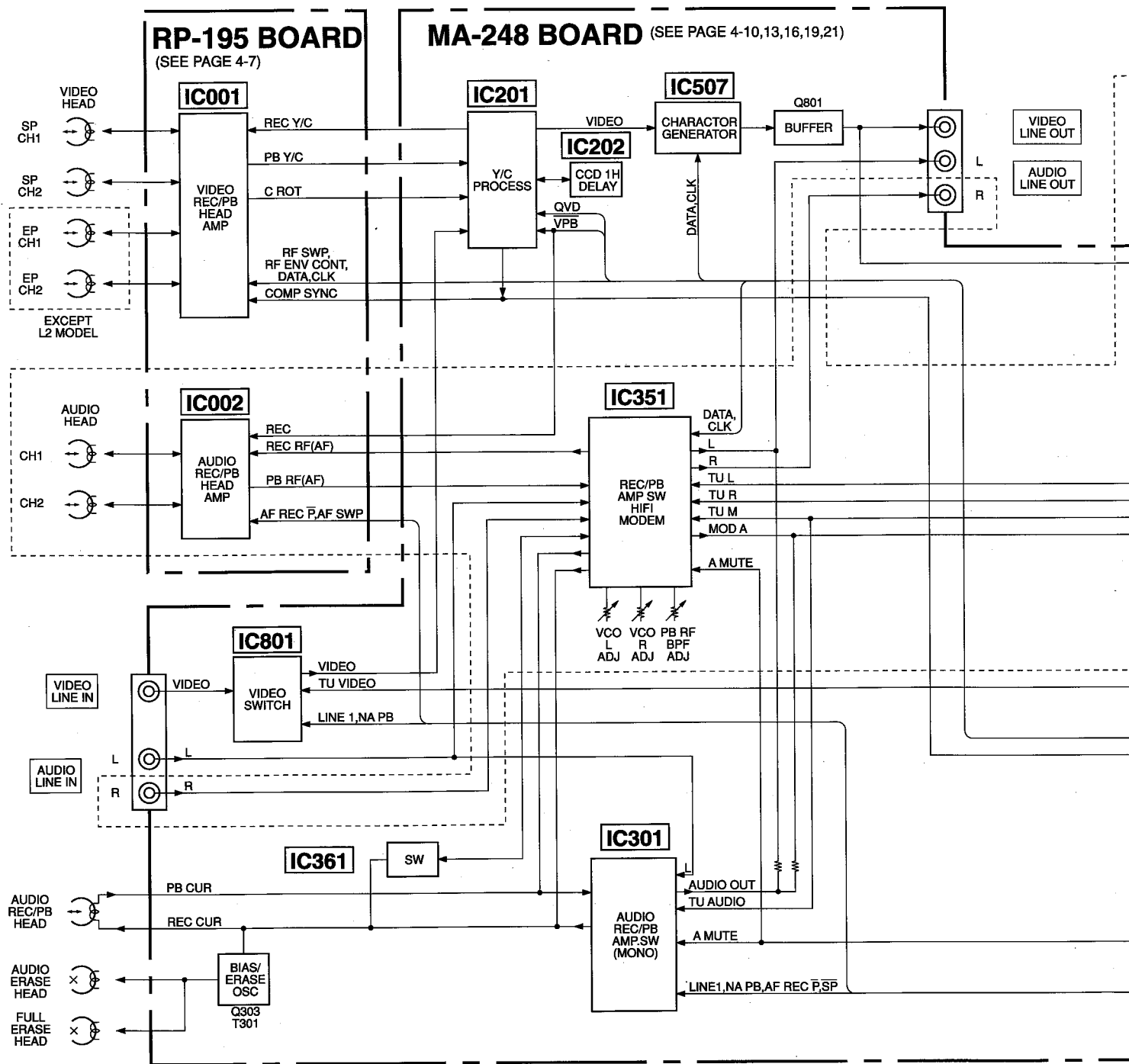


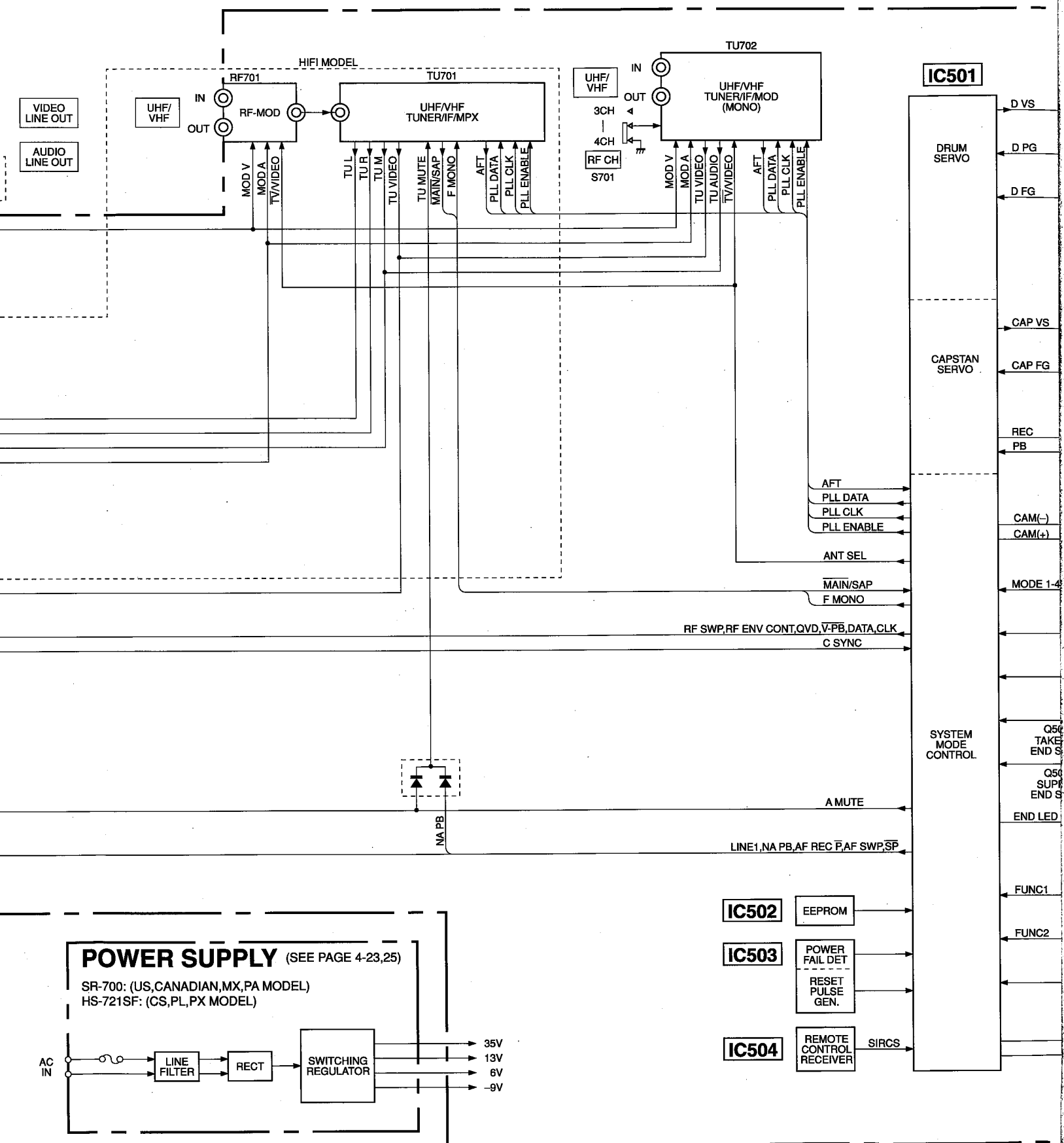
— Bottom view —

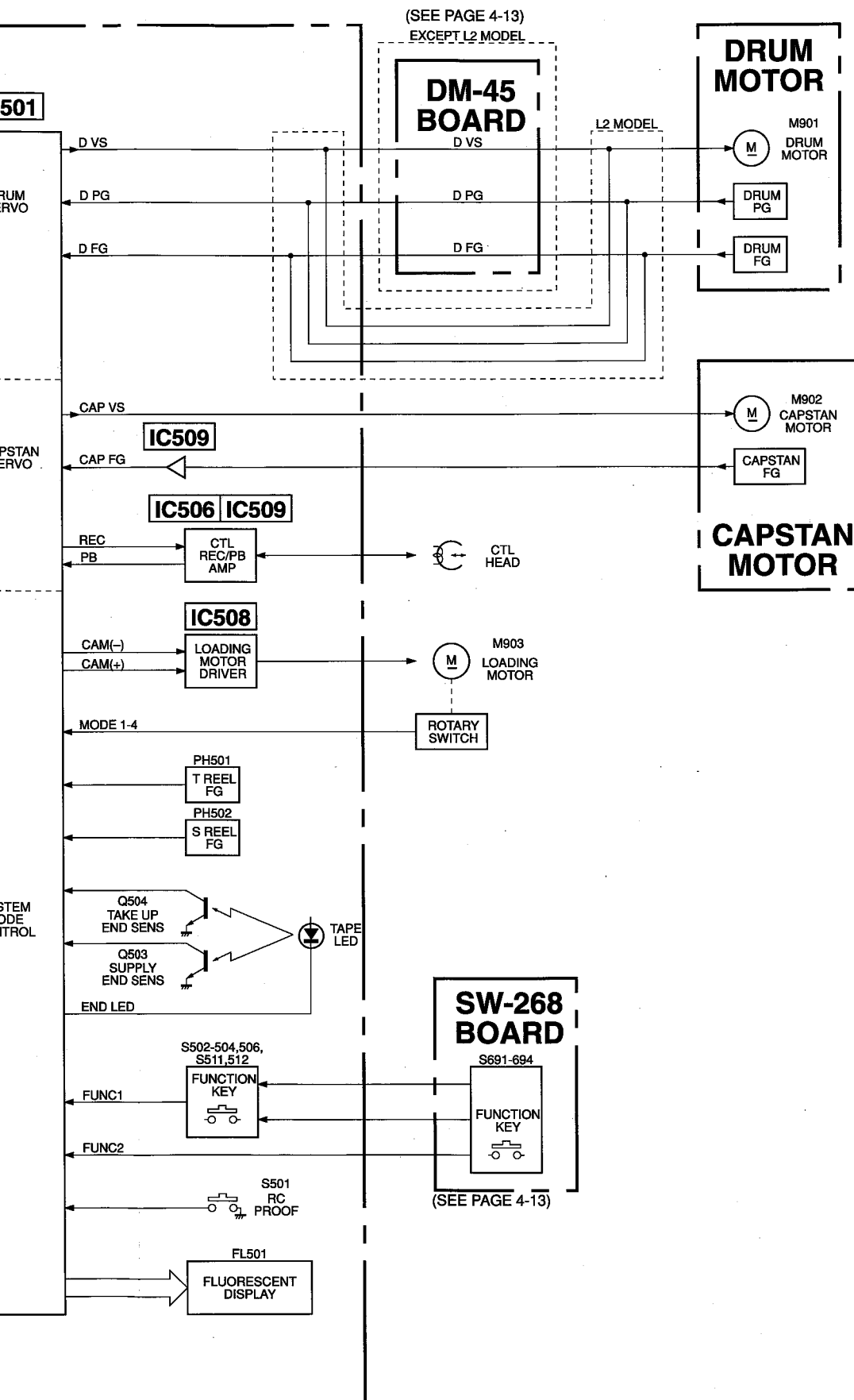


# SECTION 3 BLOCK DIAGRAM

## 3-1. OVERALL BLOCK DIAGRAM





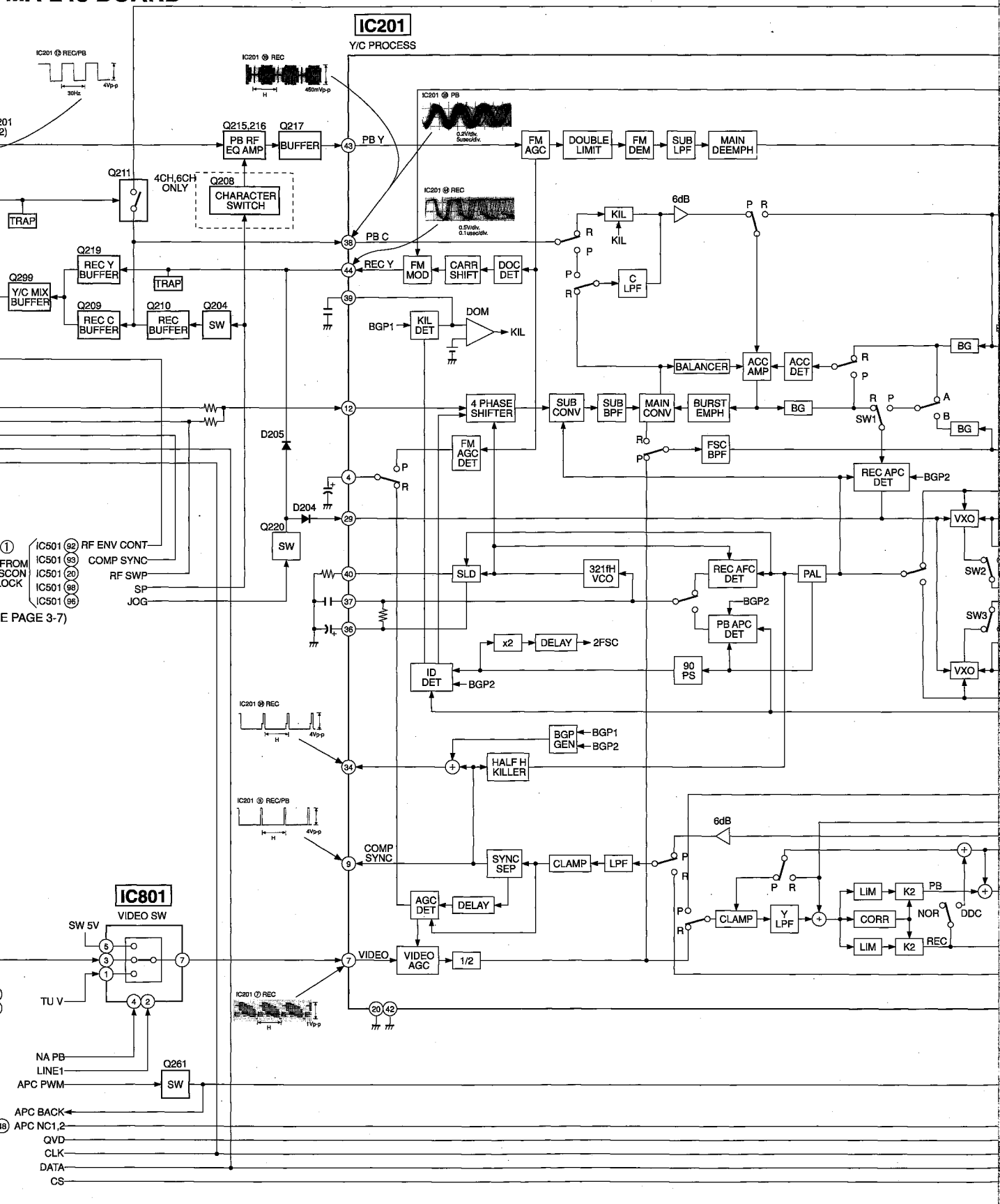


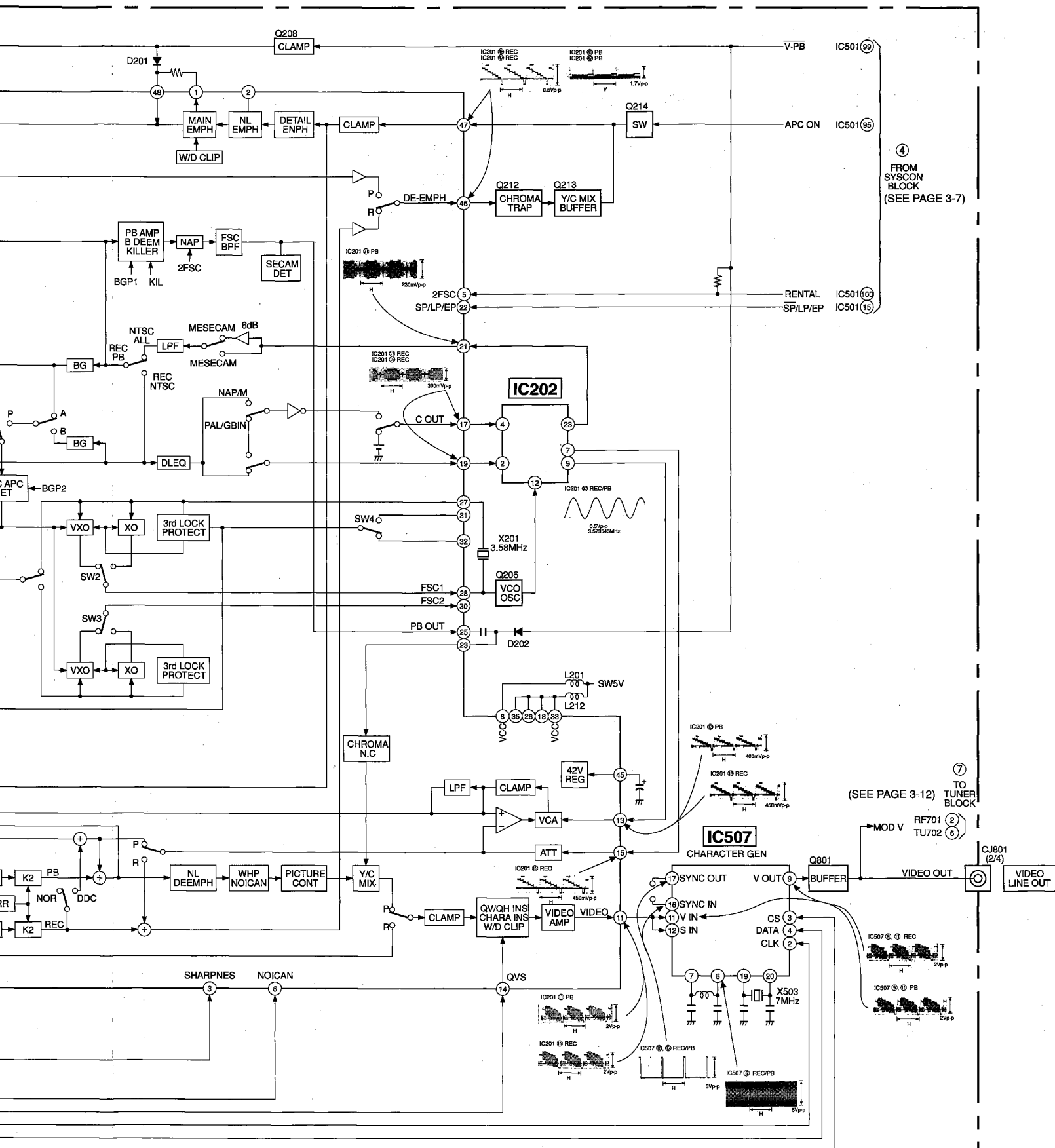




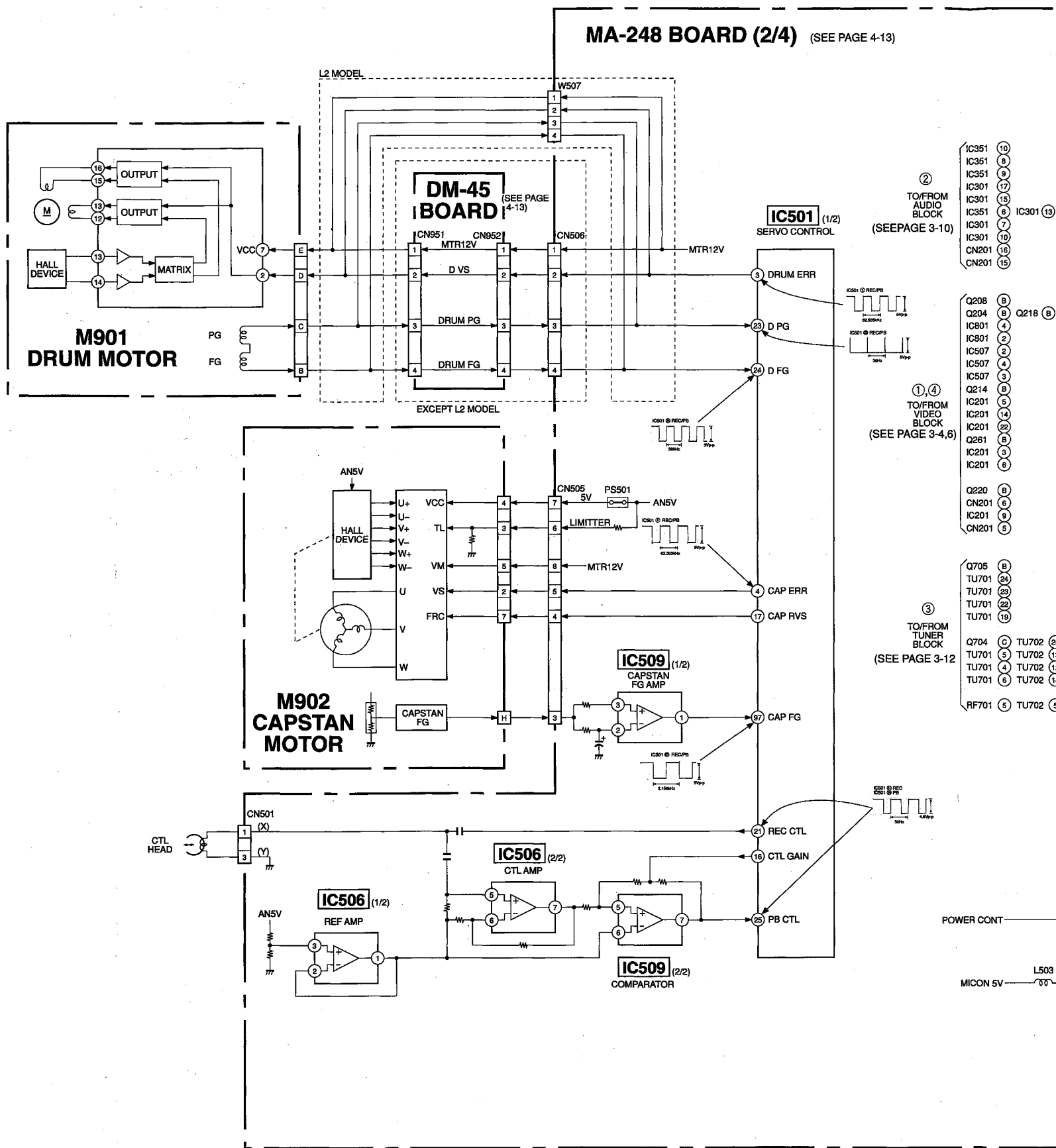
## MA-248 BOARD

(SEE PAGE 4-10)

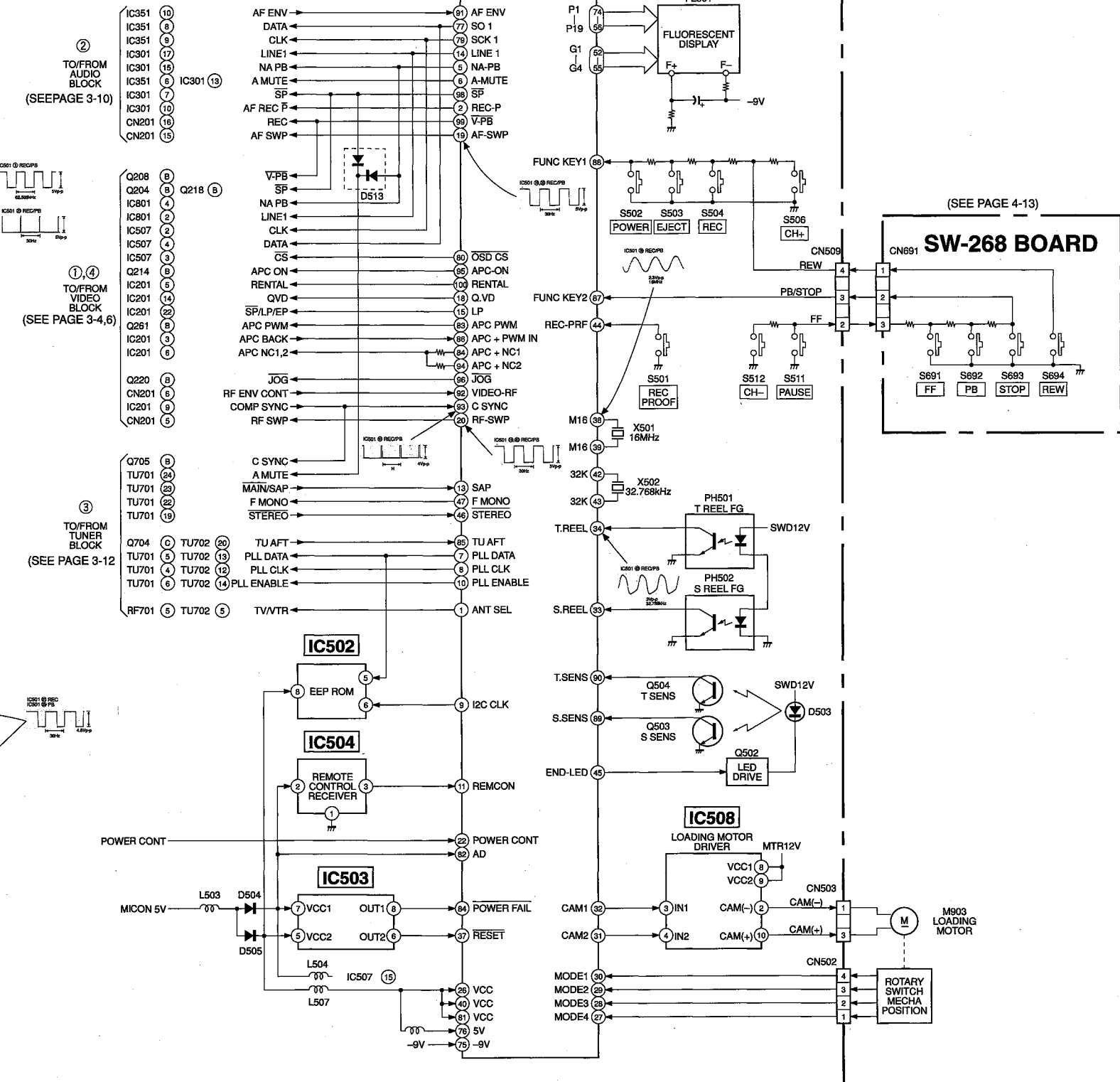




### 3-3. SERVO/SYSTEM CONTROL BLOCK DIAGRAM



PAGE 4-13)

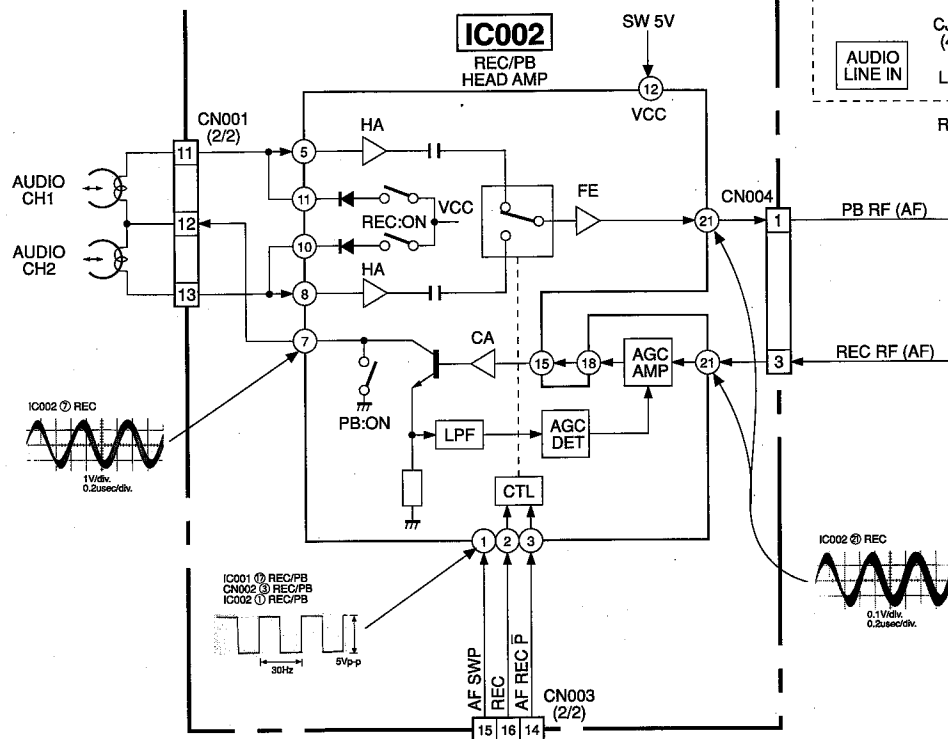


### 3-4. AUDIO BLOCK DIAGRAM

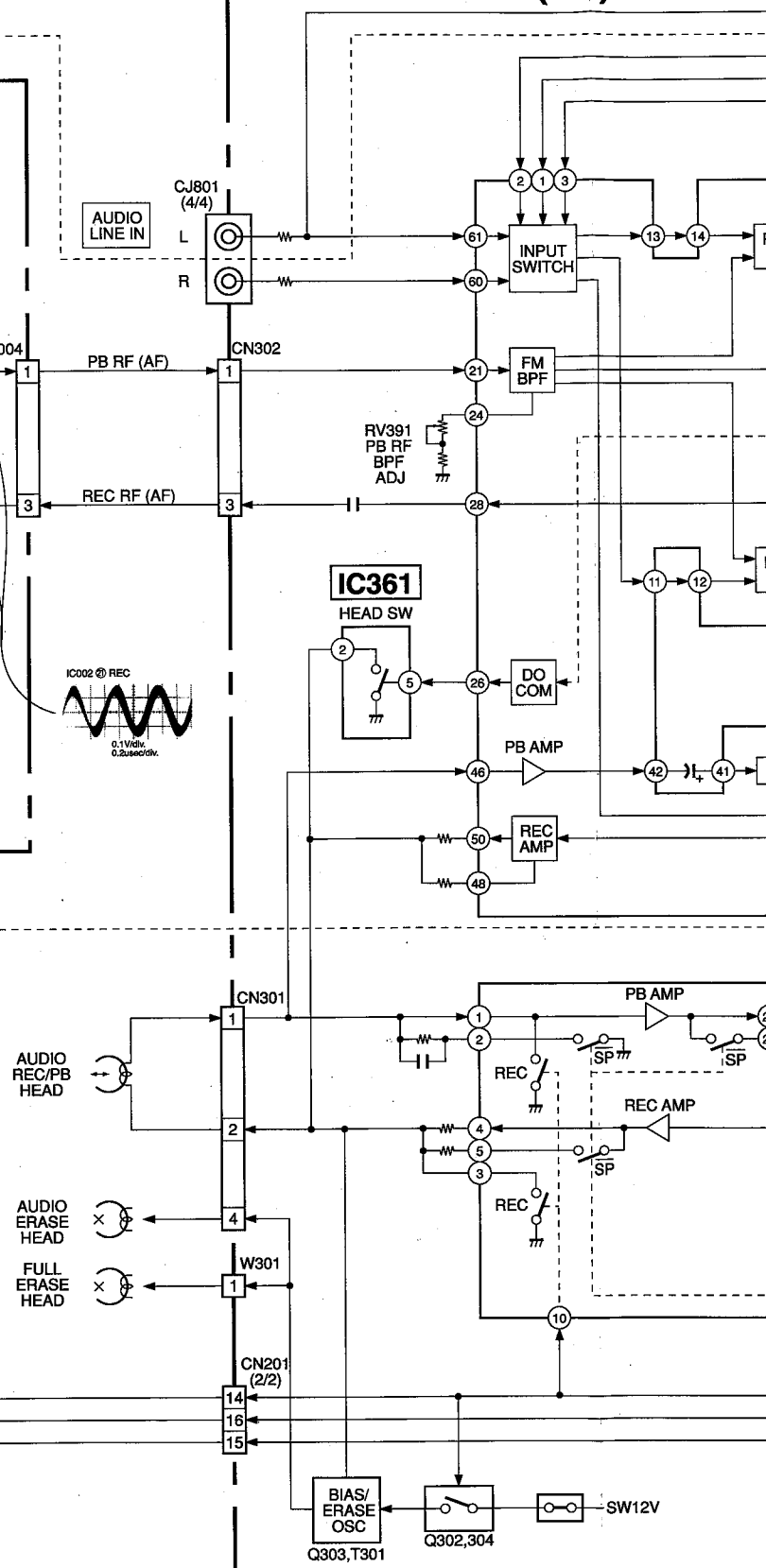
SLV-660HF/690HF/L6HF MODEL

#### RP-195 BOARD (2/2)

(SEE PAGE 4-7)



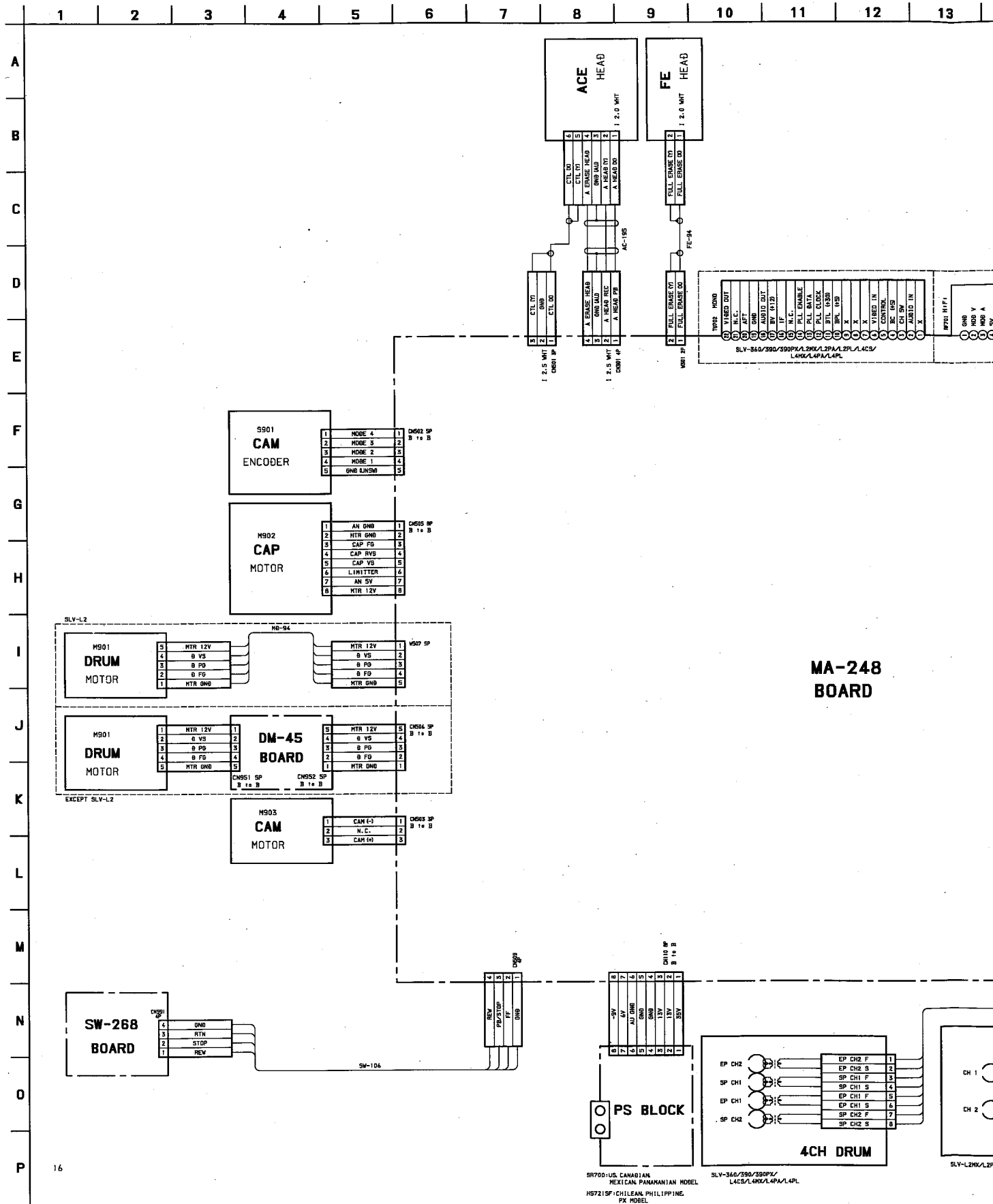
#### MA-248 BOARD (3/4) (SEE PAGE 4-16)



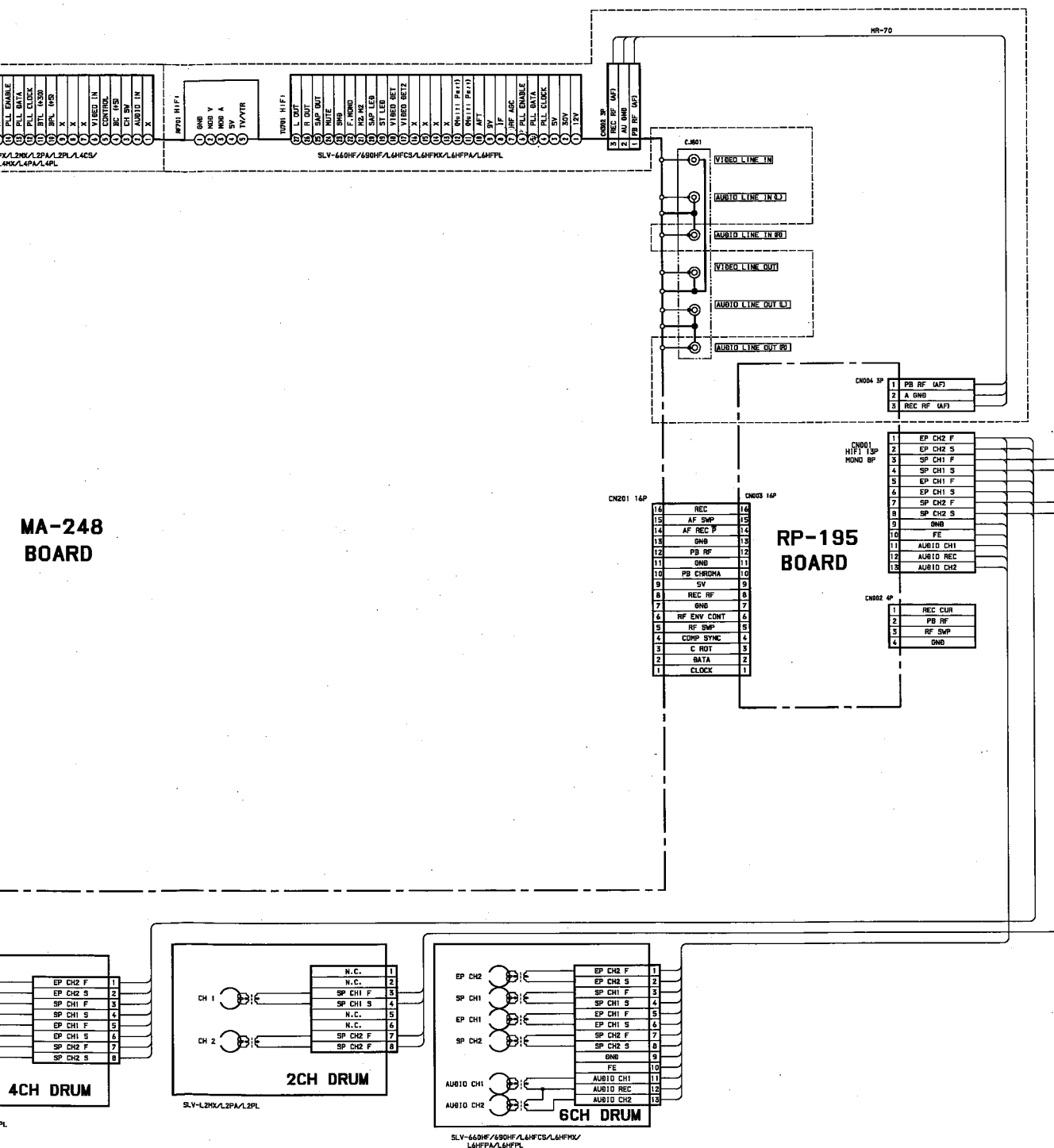
# SECTION 4

## PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

### 4-1. FRAME SCHEMATIC DIAGRAM



**MA-248**  
**BOARD**






## 4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

### THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.

(In addition to this, the necessary note is printed in each block.)






#### For printed wiring boards:

-  : Through hole is omitted.
-  : Pattern from the side which enables seeing.
-  : Pattern of the rear side.\*

#### \*Caution:

Pattern face side:	Parts on the pattern face side seen from
(Conductor Side)	the pattern face are indicated.
Pattern face side:	Parts on the parts face side seen from
(Component Side)	the parts face are indicated.

#### For schematic diagram:

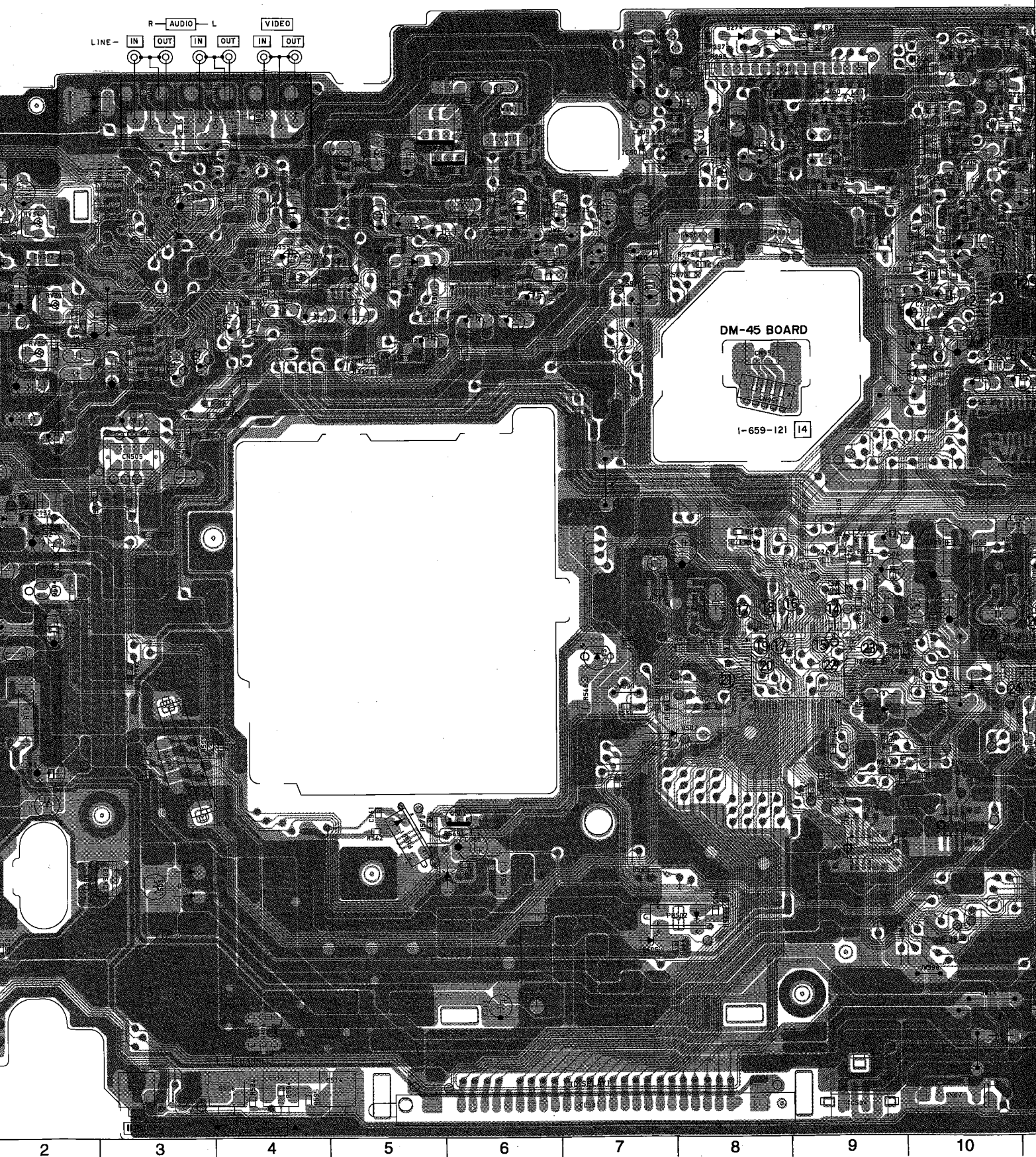
- Caution when replacing chip parts.  
New parts must be attached after removal of chip.  
Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4 W unless otherwise noted.  
Chip resistors: 1/10 W unless otherwise noted.  
kΩ: 1000kΩ, MΩ: 1000KΩ.
- All capacitors are in μF unless otherwise noted. pF: μ μF.  
50V or less are not indicated except for electrolytics and tantalums.
-  : panel designation.
-  : internal component
-  : B+Line.\*
-  : B-Line.\*
-  : IN/OUT direction of B line (+, -).\*
- Circled numbers refer to wavvforms.\*
- Readings are taken with a color-bar signal input.
- Voltage are dc between ground and measurement points.\*
- Readings are taken with a digital multimeter (DC10MΩ).\*
- Voltage variations may be noted due to normal production tolerances.\*

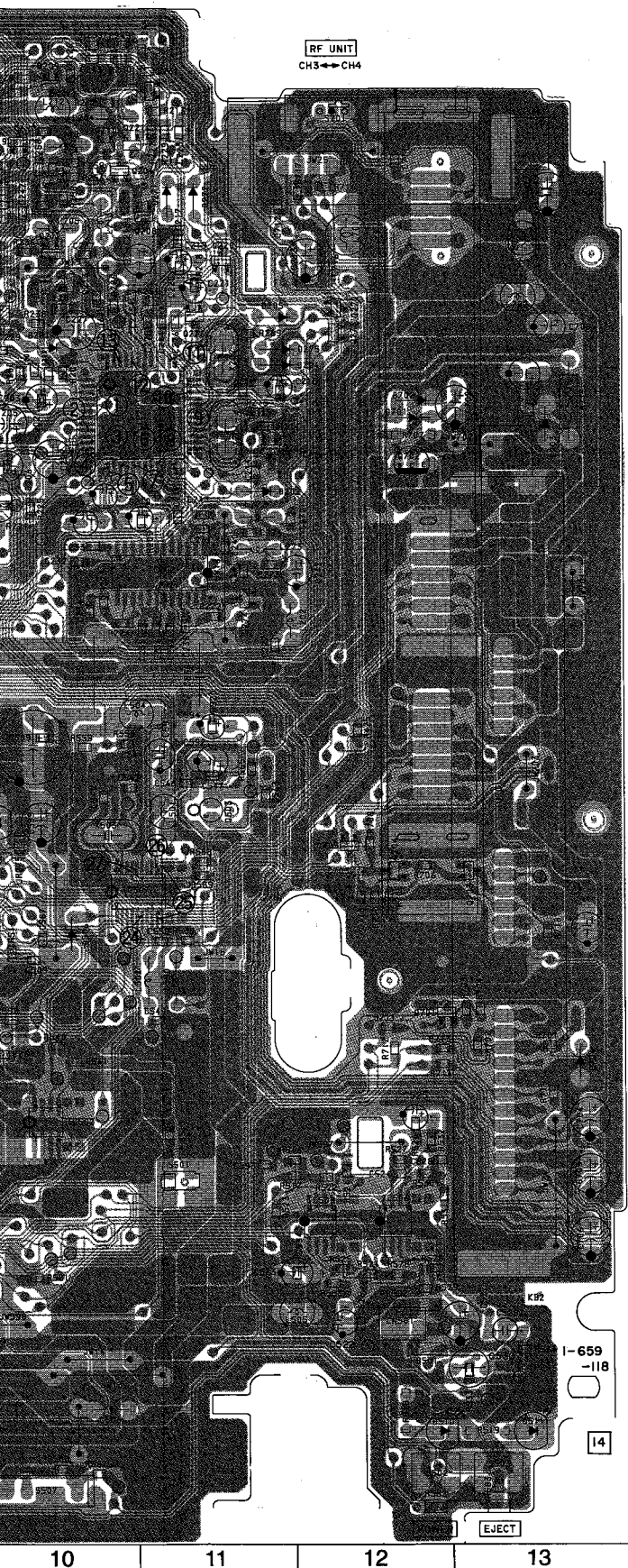
When indicating parts by reference number, please include the board name.

- \*: indicated by the color red.



There are few cases that the part printed on this diagram isn't mounted in this model.

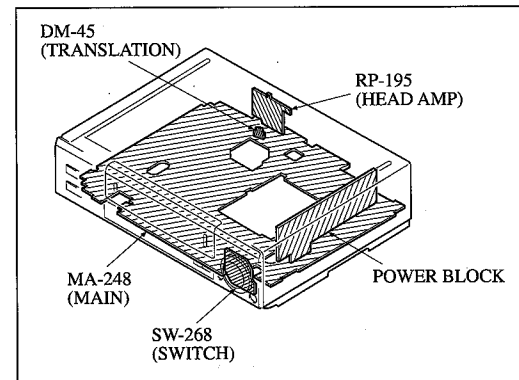




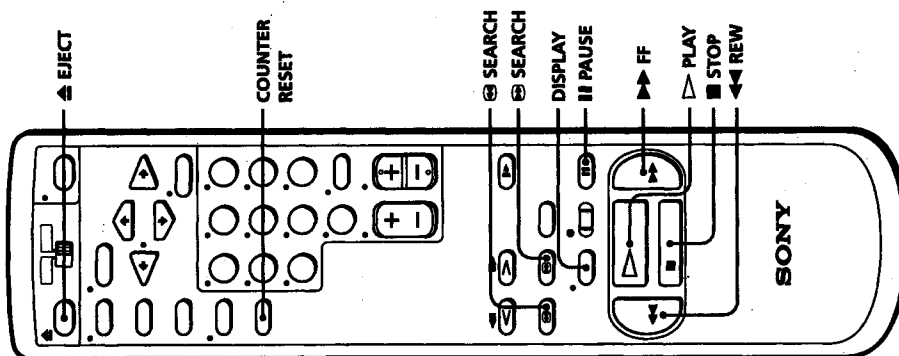
# MA-248 BOARD

# DM-45 BOARD

CN101	G-1	IC507	F-11	CN951	D-8
CN201	A-9	IC508	H-1	CN952	D-8
CN301	B-6	IC509	H-12		
CN302	C-2	IC801	B-7		
CN501	I-12				
CN502	G-3	Q131	E-1		
CN503	H-3	Q132	E-2		
CN505	E-3	Q161	F-1		
CN506	G-9	Q204	B-11		
CN509	J-1	Q206	D-11		
		Q208	B-11		
D131	E-2	Q209	A-10		
D161	E-1	Q210	B-10		
D162	E-1	Q211	A-11		
D201	C-10	Q212	B-10		
D202	D-11	Q213	C-10		
D204	C-11	Q214	C-10		
D205	C-12	Q215	B-9		
D301	C-5	Q216	B-9		
D302	C-5	Q217	B-9		
D391	C-2	Q218	C-9		
D503	G-7	Q219	B-10		
D504	H-3	Q220	C-11		
D505	H-3	Q261	E-9		
D506	G-10	Q299	B-8		
D507	G-8	Q301	C-5		
D508	G-9	Q302	B-5		
D510	J-12	Q303	B-6		
D513	F-9	Q304	B-5		
D701	D-12	Q391	C-1		
D702	D-12	Q392	C-2		
D703	D-13	Q502	H-6		
D704	G-13	Q503	F-11		
D801	B-3	Q504	F-2		
D802	A-3	Q701	G-12		
		Q702	D-12		
IC141	D-1	Q703	D-13		
IC201	D-11	Q704	F-12		
IC202	E-11	Q705	F-12		
IC301	C-6	Q801	A-7		
IC351	C-4				
IC361	C-6	RV341	C-2		
IC501	G-9	RV381	D-2		
IC502	H-10	RV391	C-2		
IC503	H-9				
IC504	J-9				
IC506	H-12				



## Playing a tape



**1** Turn on your TV and set it to the video channel.



**2** Insert a tape.  
The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed.

**3**



Press **▶** **PLAY**.

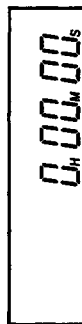
When the tape reaches the end, it will rewind automatically.

### Additional tasks

To	Press
Stop play	<b>■</b> STOP
Pause play	<b>  </b> PAUSE
Resume play after pause	<b>  </b> PAUSE or <b>▶</b> PLAY
Search forward	<b>▶▶</b> FF or <b>⊕</b> SEARCH during playback
Search backward	<b>◀◀</b> REW or <b>⊖</b> SEARCH during playback
Fast-forward the tape	<b>▶▶</b> FF during stop
Rewind the tape	<b>◀◀</b> REW during stop
Eject the tape	<b>⬆</b> EJECT

### To use the time counter

At the point on the tape that you want to find later, press COUNTER RESET. The counter in the display window resets to "00:00:00." Search for the point afterwards by referring to the counter.

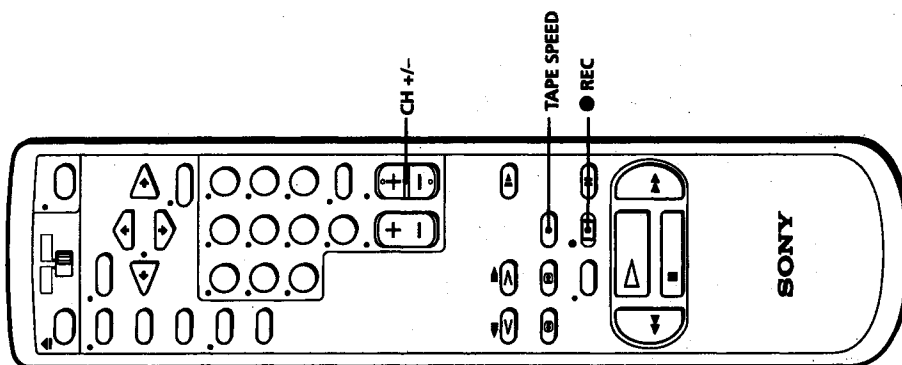


To display the counter on the TV screen, press DISPLAY.

### Notes






- Tapes recorded in the LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- The counter resets to "00:00:00" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.

## Recording TV programs



- 1 Turn on your TV and set it to the video channel.  
To record from a cable box, turn it on.

- 2 Insert a tape with its safety tab in place.

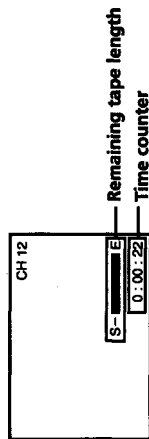
- 3 Press CH + / - to select the channel you want to record.  
  

- 4 Press TAPE SPEED to select the tape speed, SP or EP.  
EP provides recording time three times as long as SP, however, SP produces better picture and audio quality.  
  

- 5 Press REC to start recording.  


### To stop recording

Press ■ STOP.

### To check the remaining tape length

Press DISPLAY during playback or recording. The white bar indicates the approximate length of tape remaining.

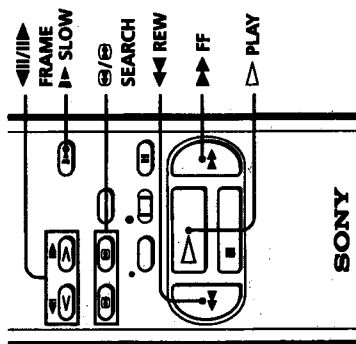


### To watch another TV program while recording

- 1 Press TV/VTR to turn off the VTR indicator in the display window.
- 2 If the TV is connected to the VCR's LINE OUT jacks, set the TV to TV input; if not, skip this step.
- 3 Select another channel on the TV.

continued

## Playing/searching at various speeds



Playback options	Operation
Fast-forward/rewind	During stop, press <b>FF</b> or <b>REW</b> .
View the picture during fast-forward or rewind	During fast-forward, keep pressing <b>FF</b> . During rewind, keep pressing <b>REW</b> .
Play at high speed	During playback or pause, press <b>SEARCH</b> or <b>SEARCH</b> . To change direction, press <b>FRAME</b> or <b>FRAME</b> .
Play in slow motion	During playback or pause, press <b>SLOW</b> . To change direction, press <b>FRAME</b> or <b>FRAME</b> .
Play frame by frame	During pause, press <b>FRAME</b> or <b>FRAME</b> . Hold the button down to play one frame each second.
Play in reverse	During playback, press <b>FRAME</b> .
Rewind and start play	During stop, press <b>PLAY</b> on the VCR while pressing <b>REW</b> on the VCR.

### To resume normal playback

Press **PLAY**.

#### Tip

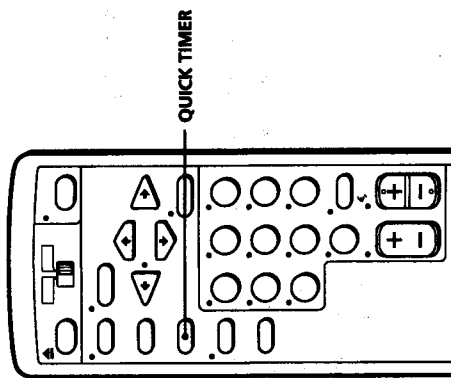
- Adjust the picture using the **TRACKING** **V**/**A** (**STILL ADJUST**) buttons on the VCR if:
  - Streaks appear while playing in slow motion.
  - The picture shakes while pausing.

#### Notes

- The sound is muted during these operations.
- Tapes recorded in the LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- The picture may have white noise:
  - when playing at high speed in reverse
  - when playing in reverse slow motion
  - when playing in reverse.

## Recording TV programs using the quick timer

After starting recording in the normal way, you can have the VCR stop recording automatically after a specified duration.



**1** While recording, press **QUICK TIMER** once.

**2** Press **QUICK TIMER** repeatedly to set the duration.

Each press advances the time in increments of 30 minutes.

→ 0:00 → 0:30 → 1:00 → 1:30 → 2:00 → 2:30 → 3:00 → 3:30 → 4:00 → 4:30 → 5:00 → 5:30 → 6:00 → 6:30 → 7:00 → 7:30 → 8:00 → 8:30 → 9:00 → 9:30 → 10:00 → 10:30 → 11:00

The duration decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

### To extend the duration

Press **QUICK TIMER** repeatedly to set to the new duration.

### To stop the VCR while recording

Press **STOP**.

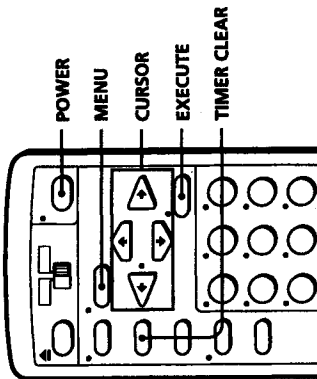
#### Tip

- You can also set the quick timer and start recording during stop mode.

## Checking/ changing/ cancelling timer settings

Before you start...

- Turn on your TV and set it to the video channel.



- 1 Press POWER to turn on the VCR.
- 2 Press MENU and select **TIMER SET/CHECK**:
  - If you want to change a setting, go on to the next step.
  - If you do not need to change the settings, press EXECUTE, then turn off the VCR to return to recording standby.

TIMER SET / CHECK		10/16 WE
DATE	TH	STOP CH
11/25	FR	11:15N 50P
MO - SA	1:00N	3:00N LP
EVERY/SU	11:55M	1:30N 42P
-/-	-/-	-/-
-/-	-/-	-/-
-/-	-/-	-/-

- 3 Press CURSOR  $\uparrow/\downarrow$  to select the setting you want to change or cancel:
  - To change the setting, press CURSOR  $\leftarrow/\rightarrow$  to flash the item you want to change, and press CURSOR  $\uparrow/\downarrow$  to reset it. Then, press CURSOR  $\Rightarrow$  repeatedly until the cursor ( $\blacktriangleright$ ) appears at the top of the line.
  - To cancel the setting, press **TIMER CLEAR**.
- 4 Press EXECUTE.

If any settings remain, turn off the VCR to return to recording standby.

### When the timer settings overlap

The program that starts first has priority and the second program starts recording only after the first program has finished. If the programs start at the same time, the program listed first in the menu has priority.



## Recording stereo and bilingual programs

### Recording stereo programs

This VCR automatically receives and records stereo programs. When a stereo program is received, the STEREO indicator lights up. If there is noise in the stereo program, set **AUTO STEREO** in the **ADVANCED OPTIONS** menu to **OFF**. The sound will be recorded in monaural (on both hi-fi and normal audio tracks) but with less noise. For details, see page 36.

### Recording bilingual programs

Normally, this VCR records only the main sound on both hi-fi and normal audio tracks. To record SAP (Second Audio Program) sound on the normal audio track, set **NORMAL AUDIO** in the **ADVANCED OPTIONS** menu to **SAP**. For details, see page 36.

### Selecting the sound while recording/playing

Press **AUDIO MONITOR** to select the desired sound. (The sound being recorded will not change.)

#### Stereo program

To listen to (when playback)	Indicator on the TV screen
Stereo	STEREO
Left channel	L
Right channel	R
Monaural sound on the normal audio track*	No indicator appears

\* Usually the mixed sound of left and right channels

#### Bilingual program

To listen to	Indicator in the display window
Main	No indicator appears
SAP (when recorded)	SAP

continued

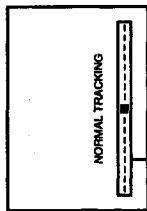


## Adjusting the picture

### Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the AUTO TRACKING indicator flashes in the display window, then lights steadily), distortion may occur if the tape was recorded in poor condition. In this case, manually adjust the tracking.

Press the TRACKING  $\nabla/\Delta$  (STILL ADJUST) buttons on the VCR to display the tracking meter. The distortion should disappear as you press one of the two buttons. To resume automatic tracking adjustment, eject the tape.



Tracking meter

### About Adaptive Picture Control (APC)

Adaptive Picture Control (APC) automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set APC to ON in the ADVANCED OPTIONS menu (with the APC indicator in the display window lit).

#### APC playback

The APC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with APC.

#### APC recording

Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the APC function (the APC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

#### Note

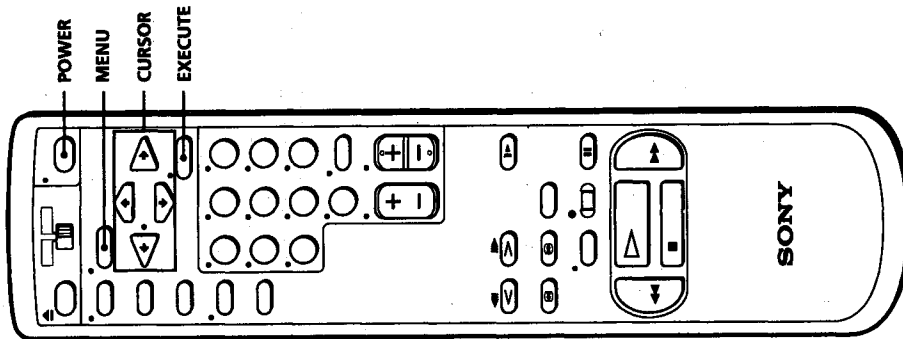
- There is a delay of a few seconds before the VCR actually starts recording while the VCR analyzes the tape. To avoid the delay, first set the VCR to recording pause (the APC indicator flashes slowly) and press  $\bullet$  REC to have the VCR analyze the tape. After the APC indicator stops flashing, press  $\blacksquare$  PAUSE to start recording immediately. If you press  $\blacksquare$  PAUSE before the APC indicator stops flashing, the APC function is cancelled.

## Recording TV programs using the timer

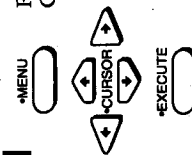
You can preset up to eight programs at a time.

### Before you start...

- Check that the VCR clock is set to the correct time.
- Turn on your TV and set it to the video channel. When using a cable box, turn it on.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.



- 1 Press MENU and select TIMER SET / CHECK, then press EXECUTE.



TIMER SET / CHECK	10/16 WE	DATE	START	STOP	CH
1	10/16	WE	10/16	10/16	10/16
2	10/16	WE	10/16	10/16	10/16
3	10/16	WE	10/16	10/16	10/16
4	10/16	WE	10/16	10/16	10/16
5	10/16	WE	10/16	10/16	10/16
6	10/16	WE	10/16	10/16	10/16
7	10/16	WE	10/16	10/16	10/16
8	10/16	WE	10/16	10/16	10/16

continued

Basic Operations

## Recording TV programs using the timer (continued)

2

Set the date, start and stop times, channel number and tape speed:



1 Press **CURSOR** → to flash each item in turn.

2 Press **CURSOR** ↑/↓ to set each item. To correct a setting, press **CURSOR** ← to return to that setting and reset.

TIMER SET / CHECK	10/16 WE	DATE, TIME	START	STOP	CH
10/16 WE	---	---	---	---	---
DATE, TIME	---	---	---	---	---
START	---	---	---	---	---
STOP	---	---	---	---	---
CH	---	---	---	---	---

To record the same program every day or the same day every week, press **CURSOR** ↓ while the date is flashing. For details, see "Daily / weekly recording" on page 29.

To record from a source connected to the LINE IN jacks, press **CURSOR** ↑/↓ to display "L" in the "CH" position.

3



Press **CURSOR** → to confirm the setting.

The cursor (▸) appears at the top of the line. To enter another setting, move the cursor to the next line and repeat step 2.

4



Press **EXECUTE**.

5



Press **POWER** to turn off the VCR.

The **TIMER** indicator on the VCR lights up and the VCR stands by for recording. When using a cable box, leave it on.

### To stop recording

To stop the VCR while recording, press **■ STOP**.

### To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press **POWER**. The **TIMER** indicator turns off and the VCR switches on. Remember to press **POWER** to reset the VCR after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV program.

### Daily/weekly recording

In step 2 above, press **CURSOR** ↓ to select the recording pattern. Each time you press **CURSOR** ↓, the indication changes as shown below.

the current date → **SU-SA** → **MO-SA** → **MO-FR** → **EVERY SA** → ..... → **EVERY MO** → **EVERY SU** → 1 month later → (cycles backward) → the current date

### Tips

- To set the channel, you can also use the **CH**+/– or number buttons.
- To set the tape speed, you can also use **TAPE SPEED**.



## Changing menu options

- 1 Press MENU and select **ADVANCED OPTIONS**.
- 2 Press CURSOR  $\uparrow/\downarrow$  to select the option to change, then press CURSOR  $\leftarrow/\rightarrow$  to change the setting.
- 3 Press EXECUTE to return to the original screen.

ADVANCED OPTIONS	
▶ AUTO STEREO	• ON OFF
NORMAL AUDIO	• MAIN SAP
APC	• ON OFF

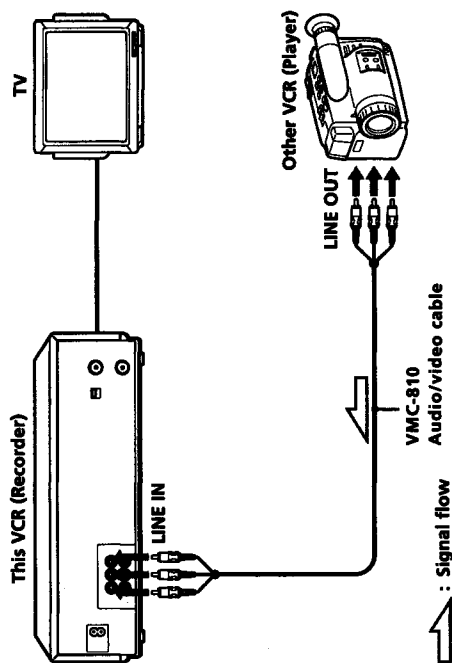
### Menu choices

Initial settings are indicated in bold print.

Menu option	Set this option to
AUTO STEREO	<b>ON</b> to receive stereo programs. <b>OFF</b> to reduce noise. The sound changes to monaural.
NORMAL AUDIO	<b>MAIN</b> to record the main sound on both hi-fi and normal audio tracks. <b>SAP</b> to record the SAP (Second Audio Program) sound on the normal audio track. The main sound is recorded on the hi-fi audio track.
APC	<b>ON</b> to switch on the APC (Adaptive Picture Control) function and improve picture quality. <b>OFF</b> to switch off APC.

## Editing with another VCR

### How to hook up to record on this VCR



### Notes

- Make sure you connect the plugs to jacks of the same color.
- If the other VCR is a monaural type, use a connecting cable like a Sony VMC-910MS.
- If you connected this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.

*continued*

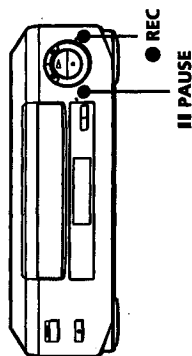
## Editing with another VCR (continued)

### Operation

#### (when recording on this VCR)

##### Before you start editing

- Turn on your TV and set it to the video channel.
- Press CH +/- to display "L" in the display window.
- Press TAPE SPEED on the remote commander to select the tape speed, SP or EP.



- 1 Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.
- 2 Insert a tape with its safety tab in place into this (recording) VCR. Search for the point to start recording and press ■ PAUSE.
- 3 Press ● REC on this VCR and set it to recording pause.
- 4 To start editing, press the || PAUSE buttons on both VCRs at the same time.

##### To stop editing

Press the ■ STOP buttons on both VCRs.

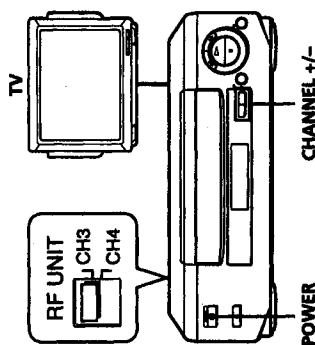
##### Note

- If you start recording following the procedure above, the VCR won't start recording with the APC function. To record a tape with the APC function, press ● REC again during recording pause in step 3 so that the VCR analyzes the tape. Then when you start recording in step 4, press || PAUSE immediately after the APC indicator stops flashing. If you press ■ PAUSE before the APC indicator stops flashing, the APC function is canceled.

## General setup information

### Setting the RF unit

When connecting the VCR to the TV using only the antenna cable, you must set the RF UNIT switch on the rear of the VCR so that the TV can receive the correct signal from the VCR.



- 1 Set the RF UNIT switch on the rear of the VCR to CH3 or CH4, whichever channel is not used in your area. If both are used, set the switch to either channel.
- 2 Press POWER to turn on the VCR.
- 3 Press TV/VTR on the remote commander to turn on the VTR indicator in the VCR's display window.
- 4 Press CHANNEL +/- to display a channel number in the display window. Select an active channel number in your area.
- 5 Turn on your TV and set it to the channel you selected in step 1 (channel 3 or 4).

The selected TV channel broadcast appears on the TV screen. If the channels change when you press CHANNEL +/-, you have made the correct setting.

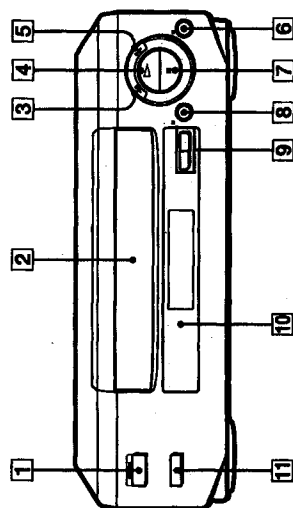
Whenever you use the VCR, set the TV to the channel selected in step 1.

*continued*

# Index to parts and controls

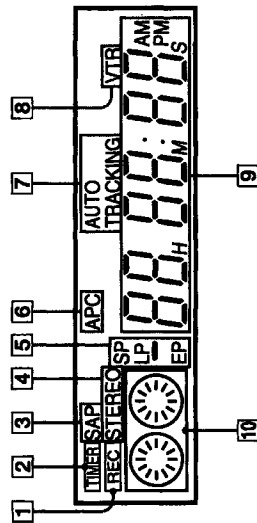
Refer to the pages indicated in parentheses ( ) for details.

## Front panel



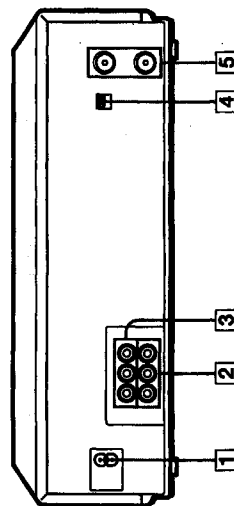
- 1 POWER switch/indicator
- 2 Tape compartment
- 3 ◀◀ REW button (23, 30)
- 4 ▷ PLAY button (23)
- 5 ▶▶ FF button (23, 30)
- 6 ● REC button (25)
- 7 ■ STOP button (23)
- 8 ■ PAUSE button (23)
- 9 CHANNEL +/-/TRACKING ▽/▲ (STILL ADJUST) buttons (24, 35)
- 10 Remote sensor (5)
- 11 ▲ EJECT button (23)

## Display window



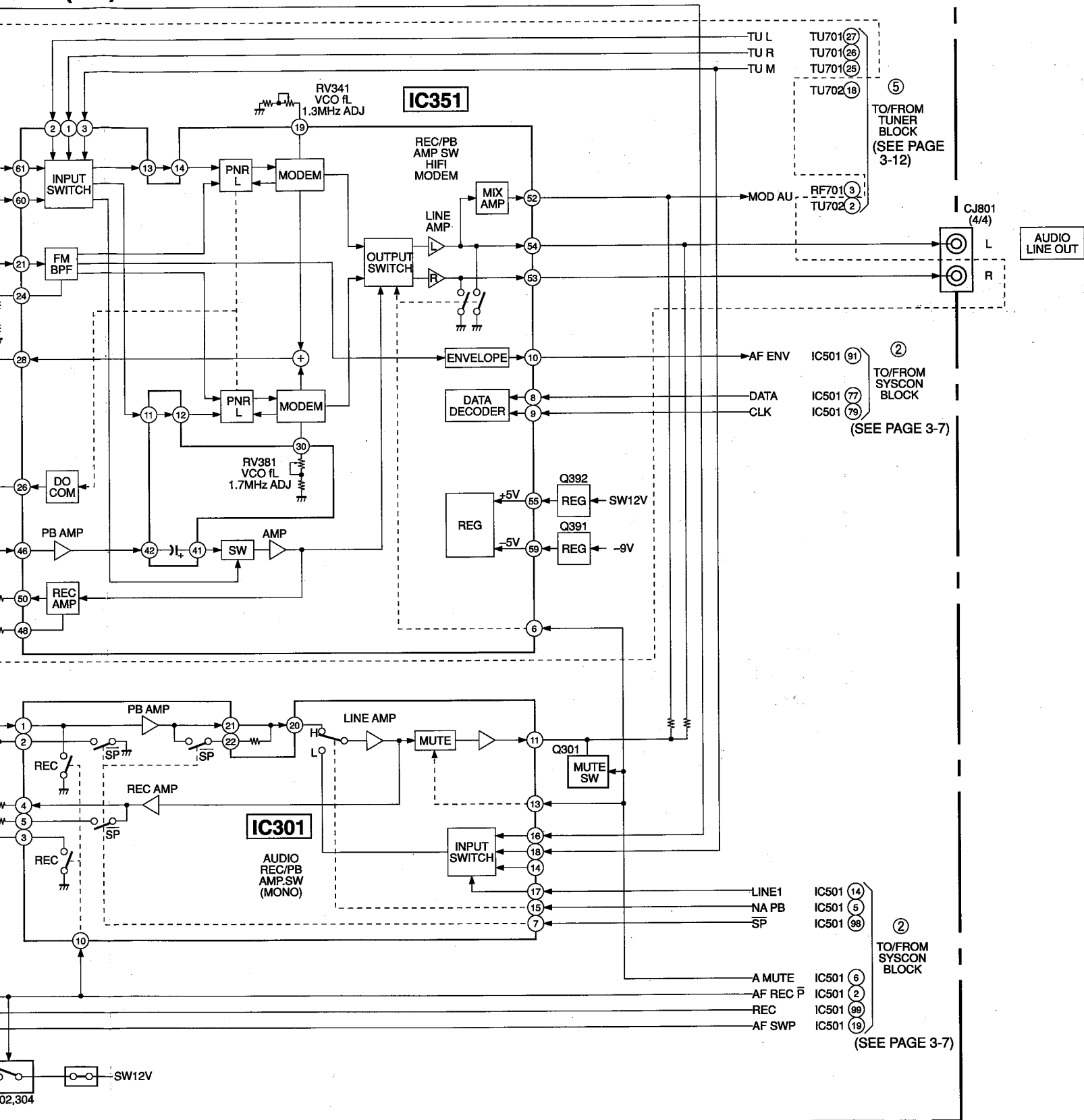
- 1 REC (recording) indicator
- 2 TIMER indicator (28)
- 3 SAP indicator (33)
- 4 STEREO indicator (33)
- 5 Tape speed indicator (25)
- 6 APC indicator (35)
- 7 AUTO TRACKING indicator (35)
- 8 VTR indicator (25)
- 9 Time counter/clock/line/channel indicator (23, 25)
- 10 Tape indicator

## Rear panel



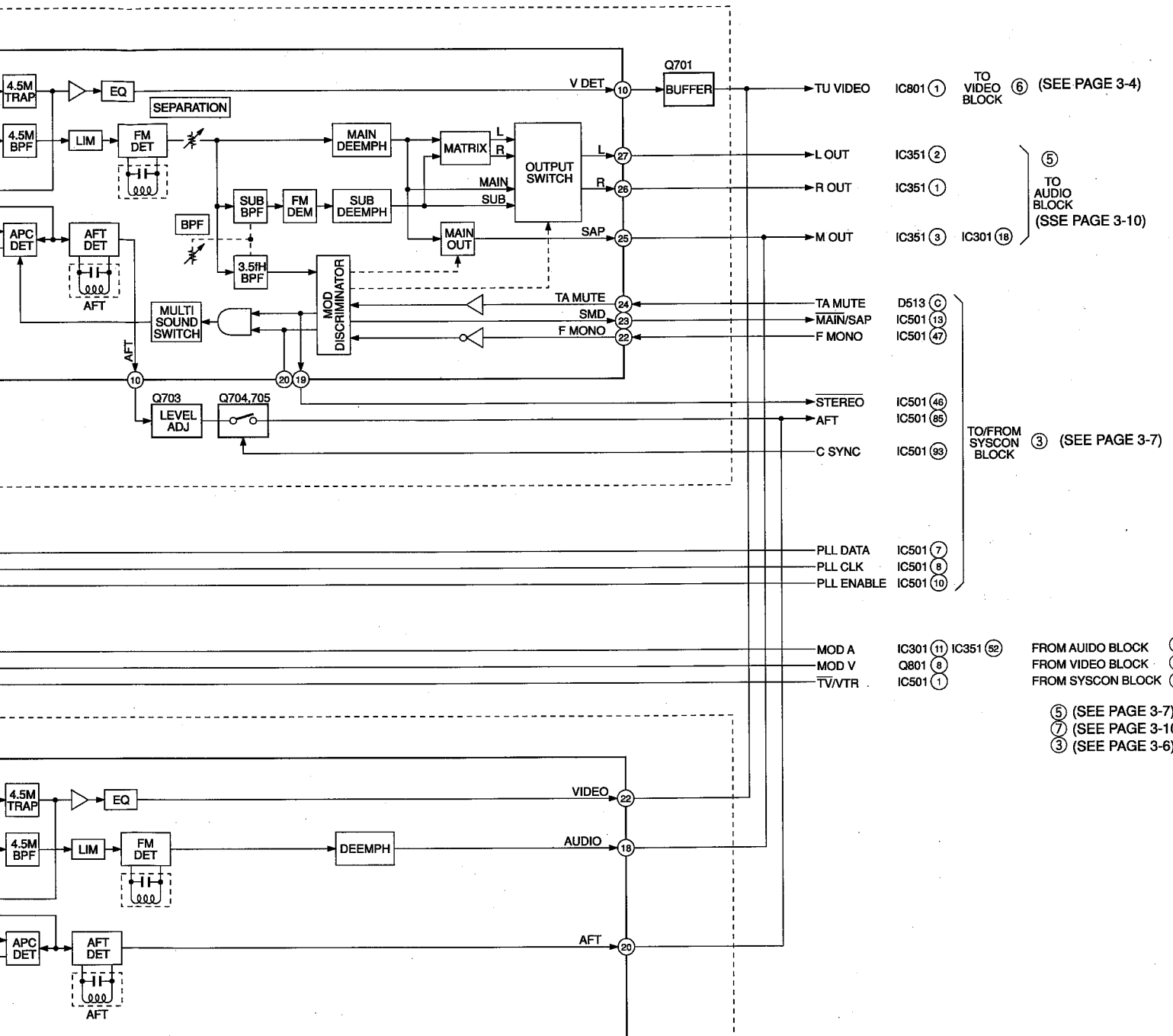
- 1 AC IN connector
- 2 LINE OUT AUDIO L/R/VIDEO jacks (7)
- 3 LINE IN AUDIO L/R/VIDEO jacks (37)
- 4 RF UNIT switch (39)
- 5 VHF/UHF IN/OUT connectors (8, 10, 12, 14)

continued



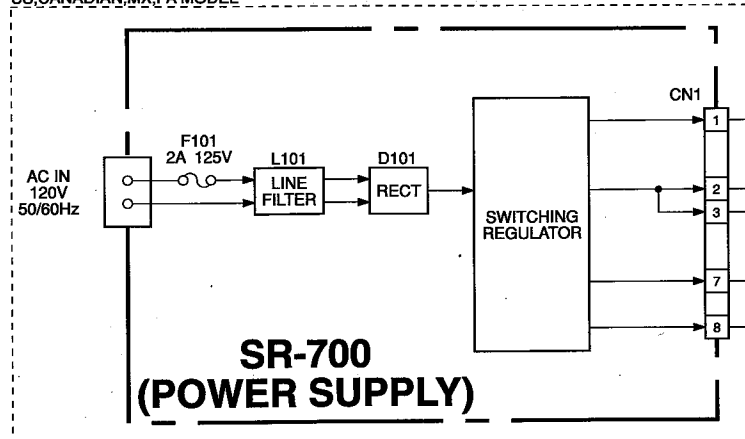
## MA-248 BOARD (4/4)



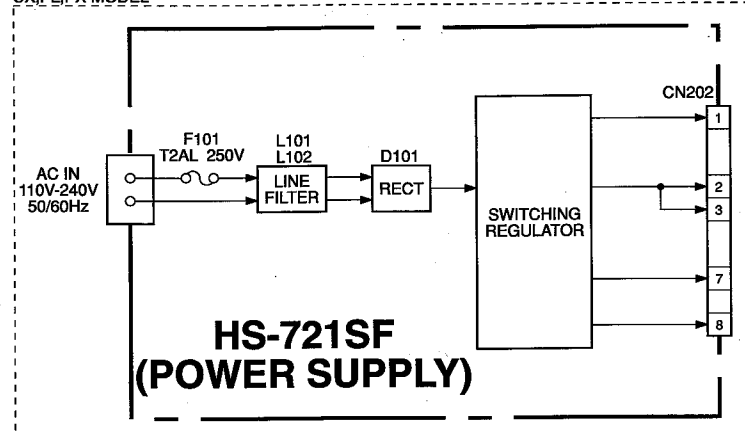


### 3-6. POWER BLOCK DIAGRAM

US,CANADIAN,MX,PA MODEL

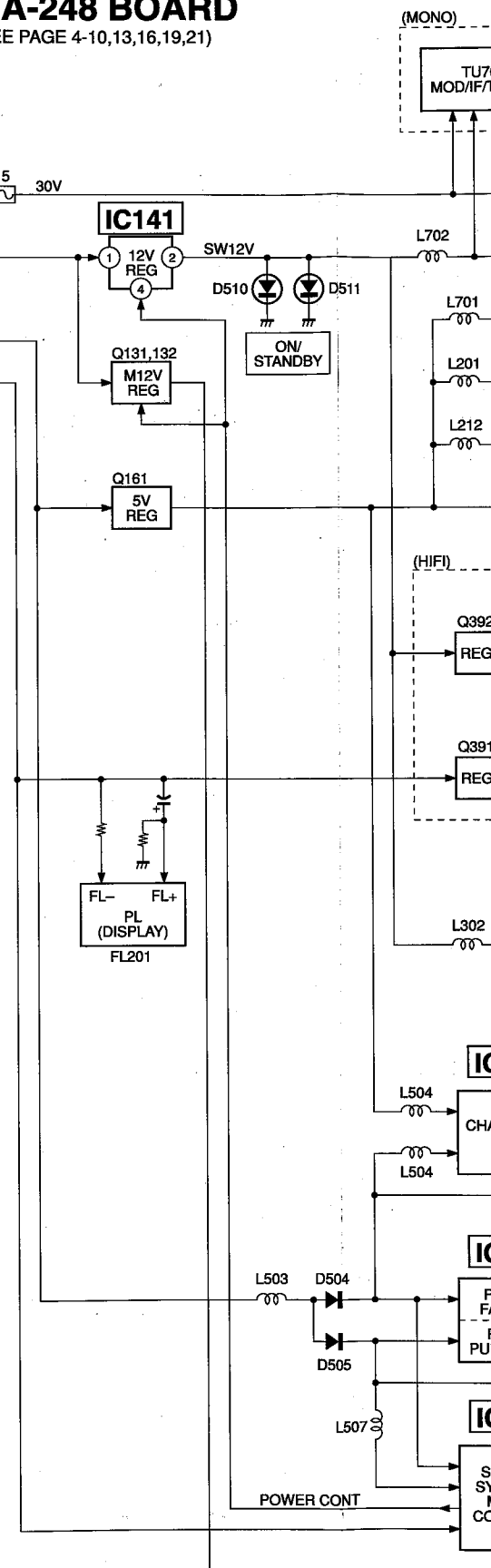


CX,PL,PX MODEL

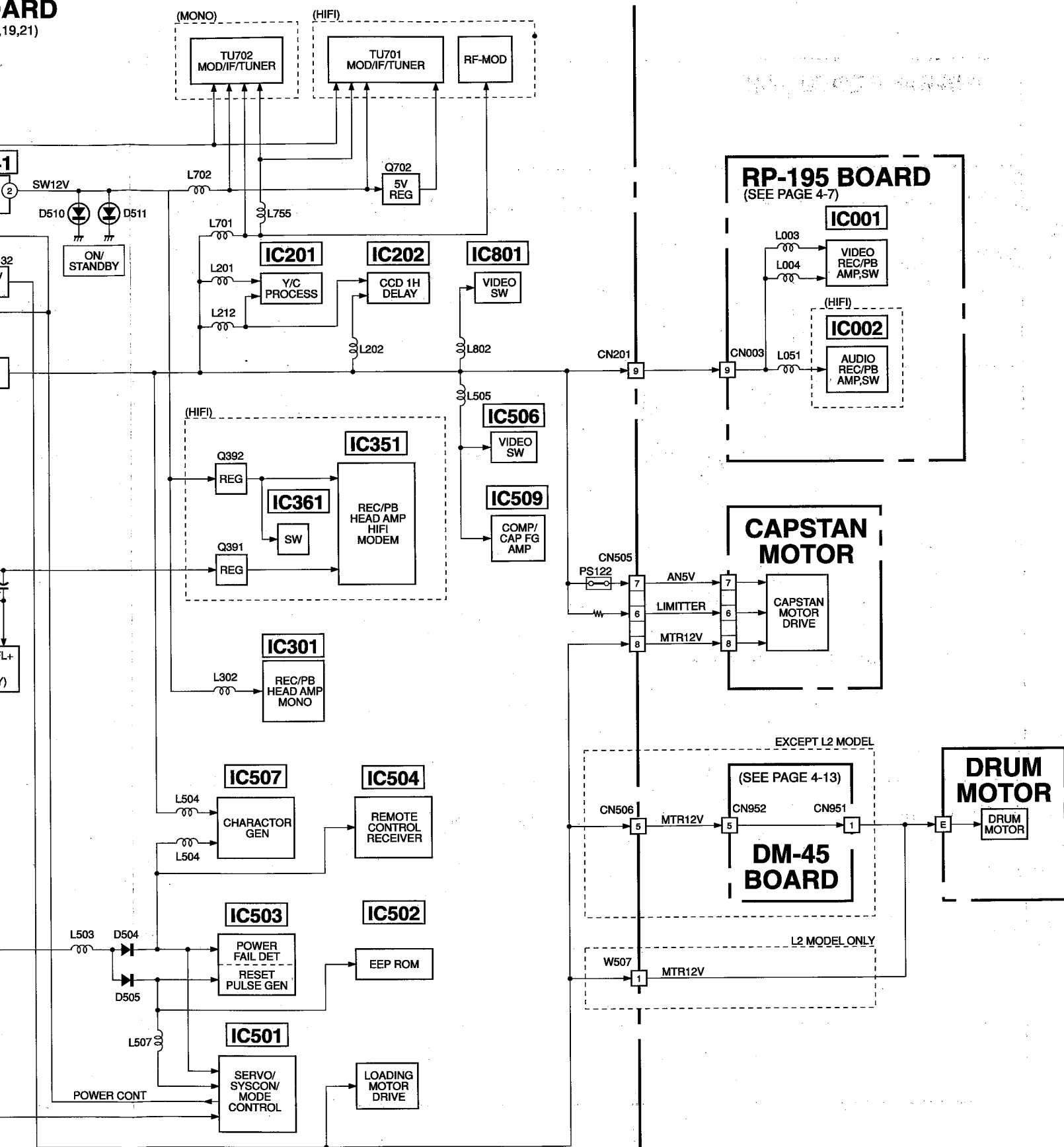


### MA-248 BOARD

(SEE PAGE 4-10,13,16,19,21)



ARD  
(19,21)



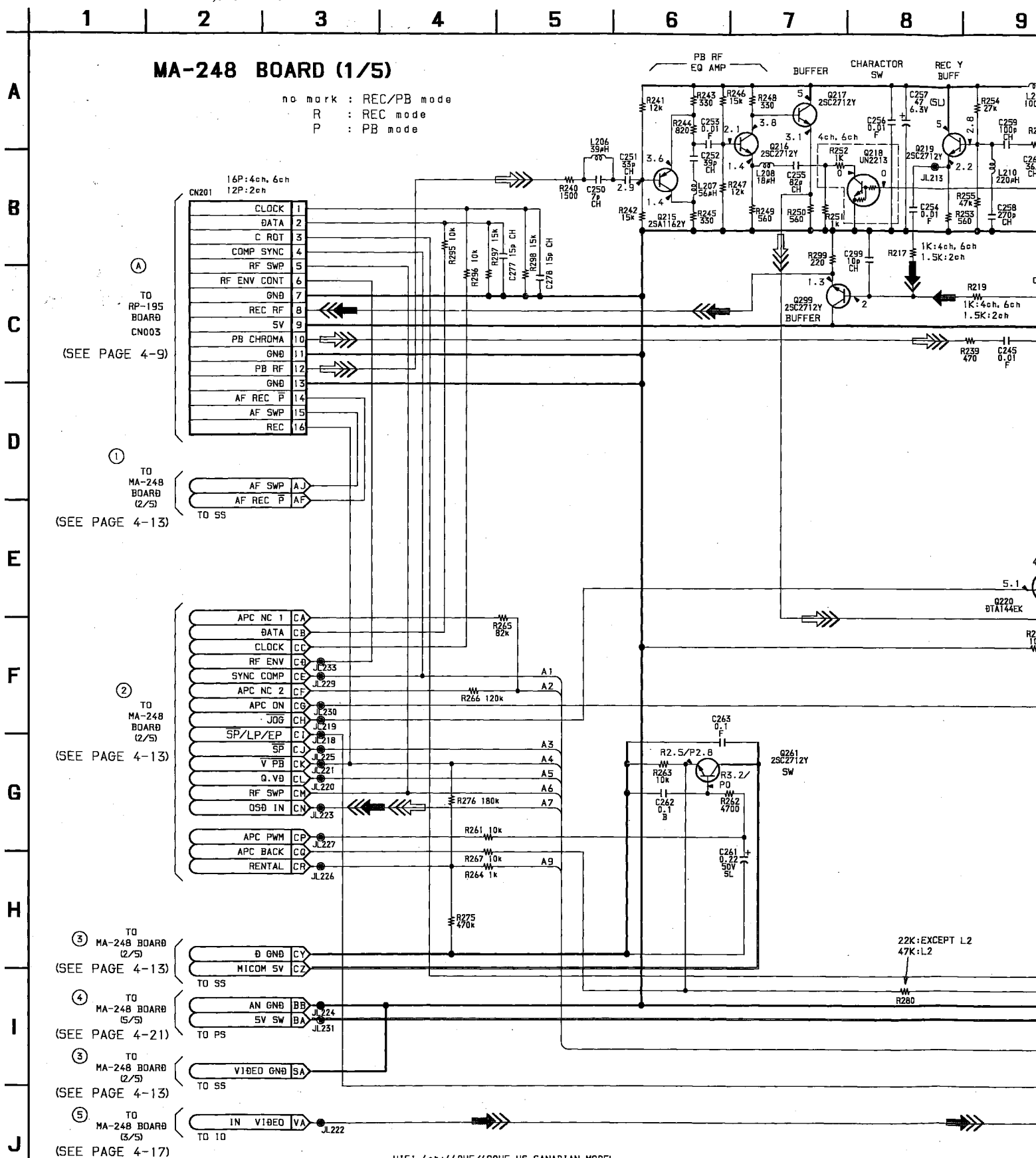


**SLV-360/390/390PX/660HF/690HF/L2MX/L2PA/L2PL/L4CS/  
L4MX/L4PA/L4PL/L6HFCS/L6HFMX/L6HFPA/L6HFPL**

### MA-248 (VIDEO) SCHEMATIC DIAGRAM

- See page 4-4 to 4-6 for the printed wiring board.

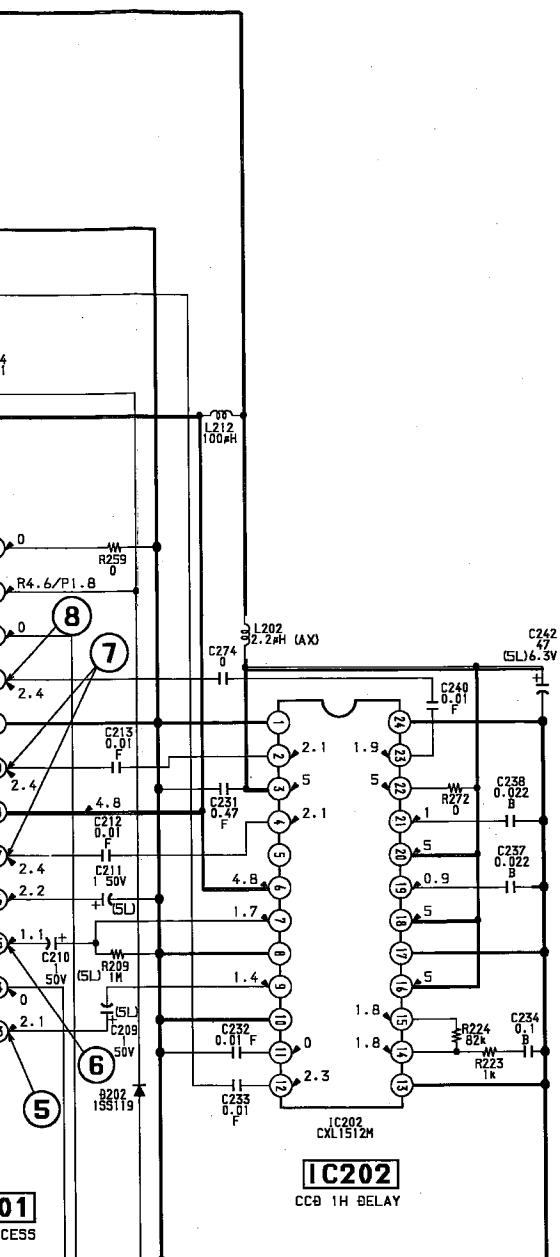
— Ref. No. : MA-248 Board: 1,000 Series —



HIFI 6ch:660HF/690HF US. CANADIAN MODEL  
HIFI 4ch:L6HF, MX, PA, CS, PL MODEL  
MONO 4ch:360 US. CANADIAN/390 US/390PX MODEL  
MONO 4ch:L4, MX, PA, CS, PL MODEL  
MONO 2ch:L2, MX, PA, PL MODEL

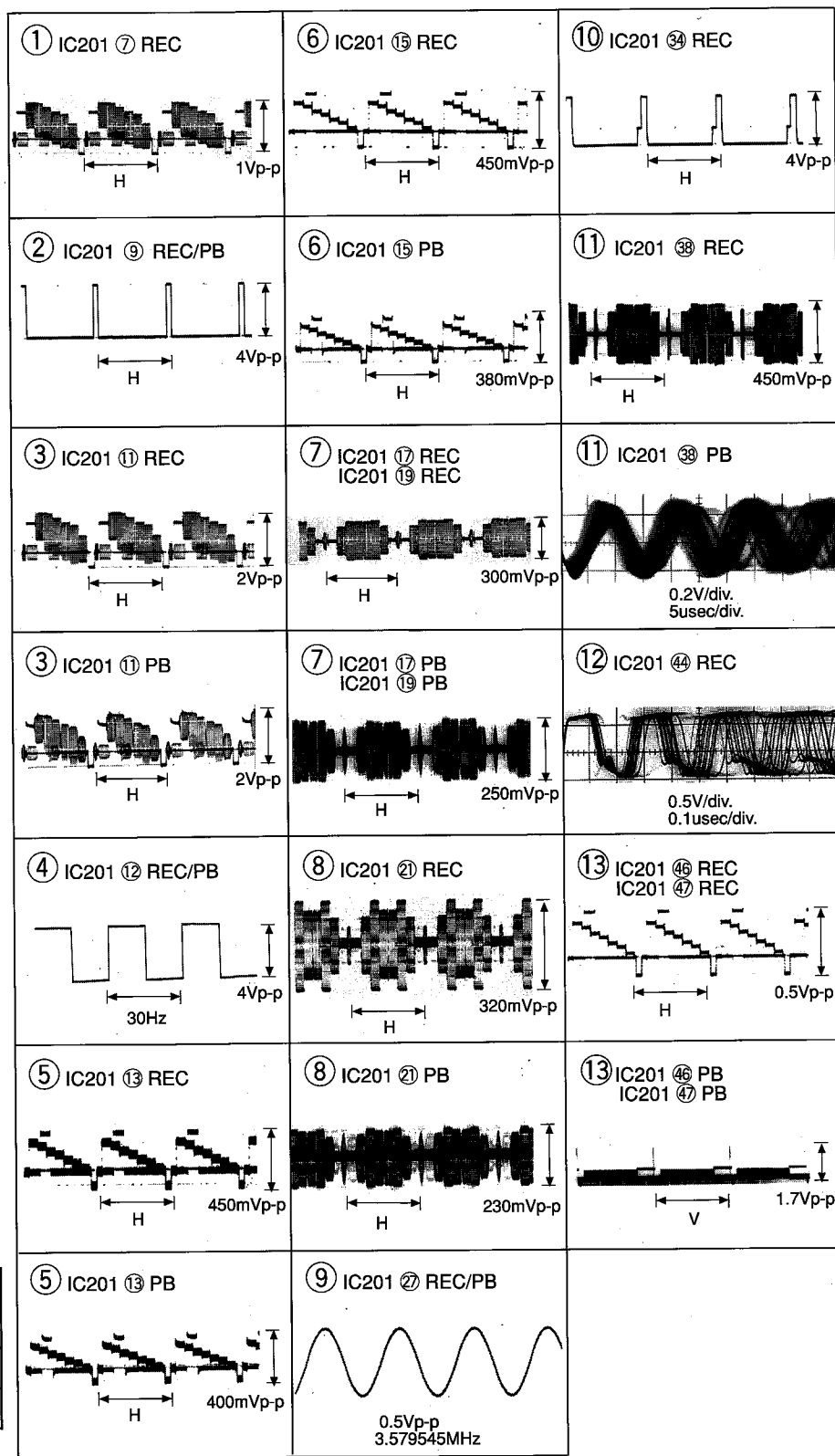


# MA-248 BOARD



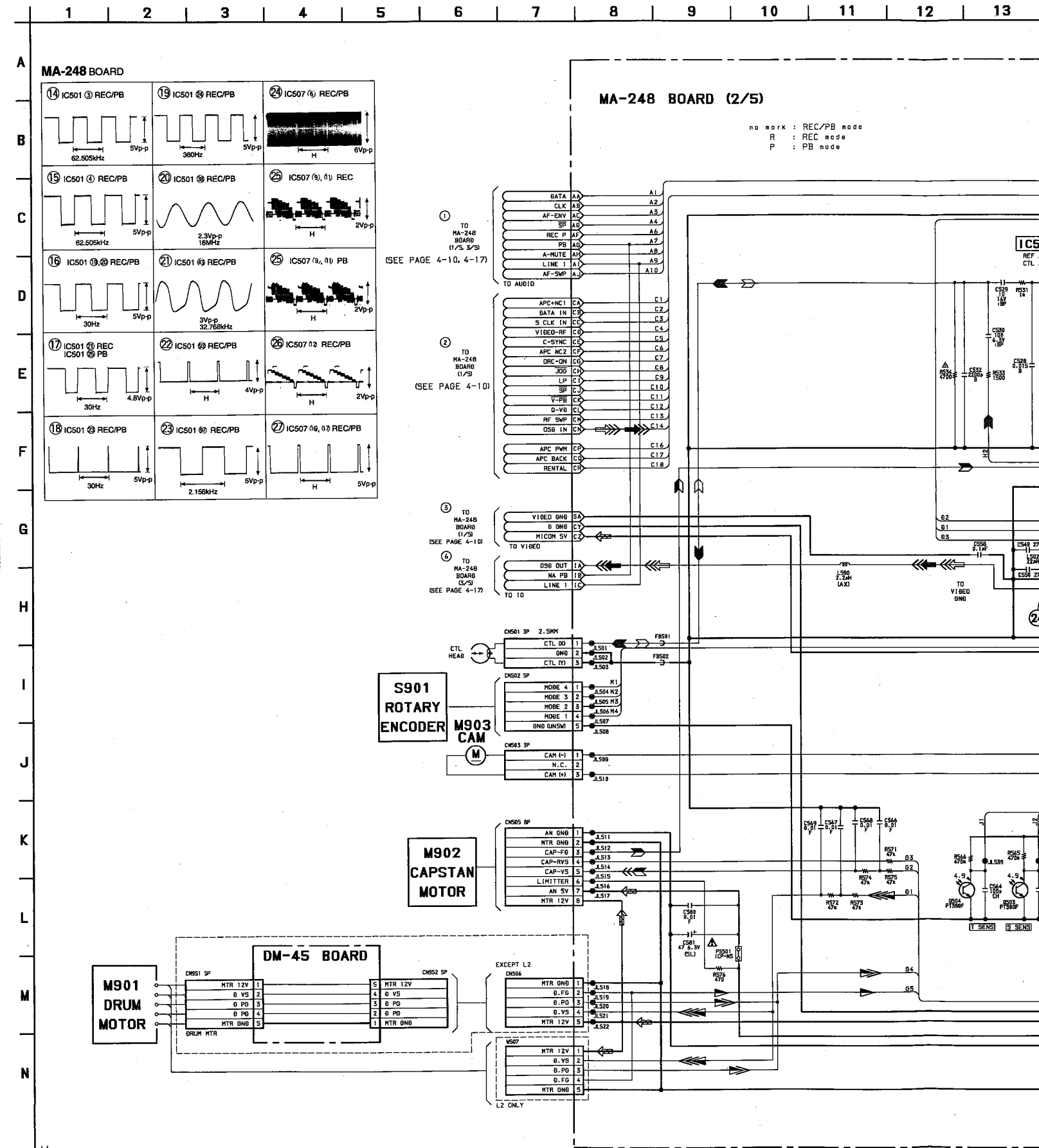
## •SIGNAL PATH

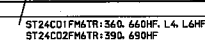
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡➡	➡➡➡	
PB			➡➡➡	



MA-248 (SERVO, SYSTEM CONTROL), SW-268 (SWITCH), DM-45 (TRANSLATION) SCHEMATIC DIAGRAMS

— Ref. No. : MA-248 Board: 1,000 Series, SW-248 Board: 2,000 Series DM-45 Board: 1,000 Series —





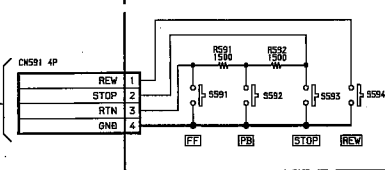
23 24 25 26 27 28 29 30 31 32 33 34

Note:  
The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety.  
Replace only with part number specified.

-SIGNAL PATH

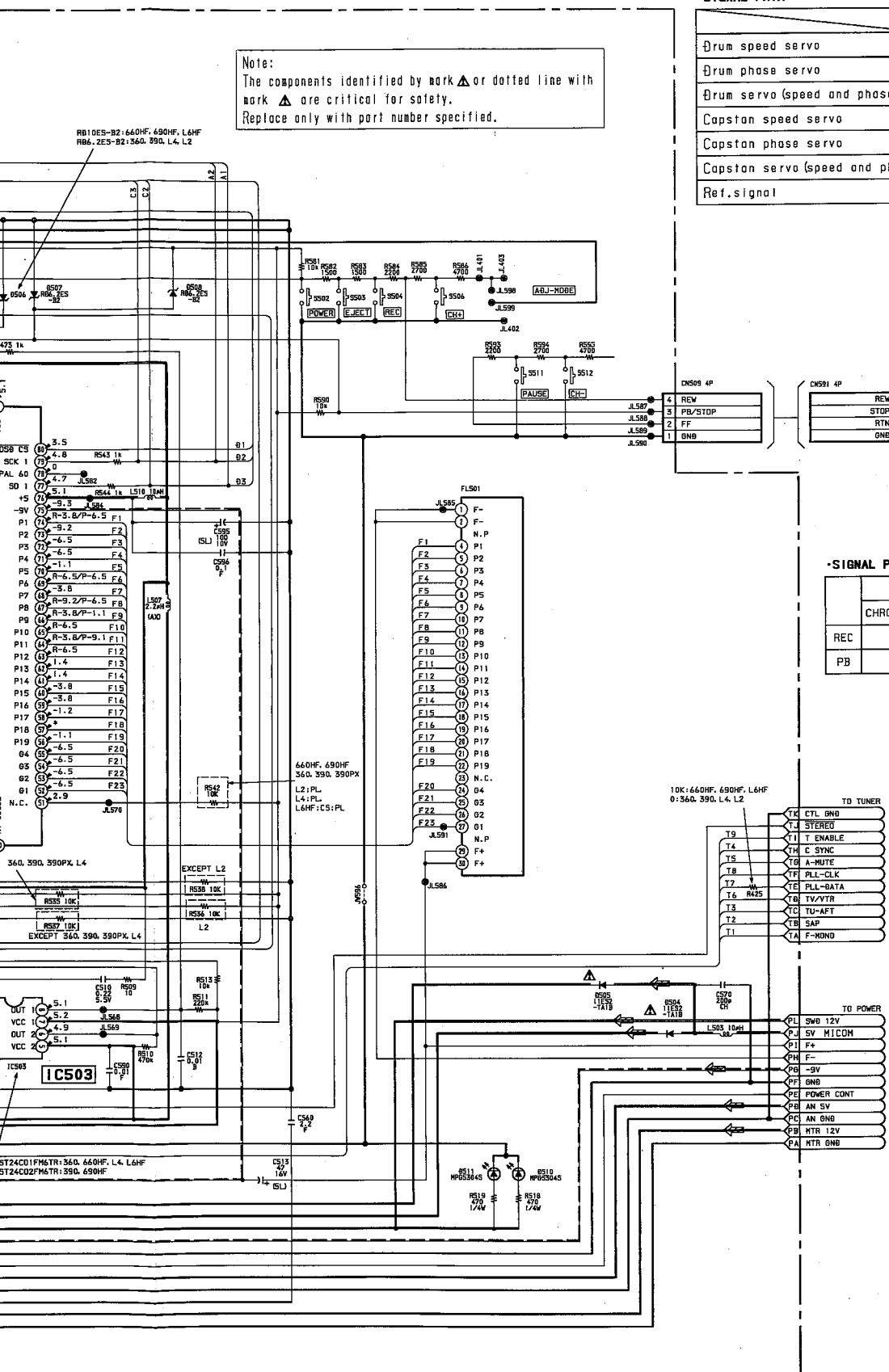
	REC	REC/PB	PB
Drum speed servo		▶	
Drum phase servo		▶▶	
Drum servo (speed and phase)		▶▶▶	
Capstan speed servo		▶	
Capstan phase servo			
Capstan servo (speed and phase)		▶▶▶	
Ref. signal	▶▶		▶▶

SW-268 BOARD



-SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			▶▶▶	
PB			▶▶▶	



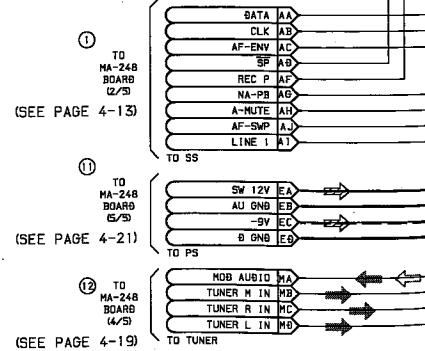
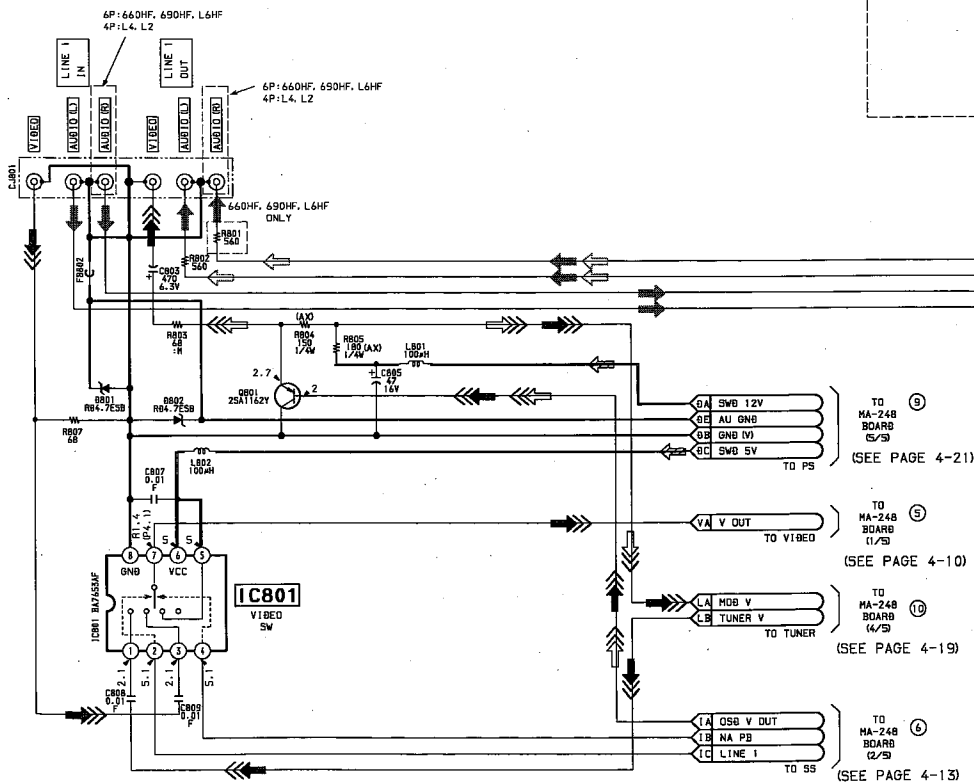
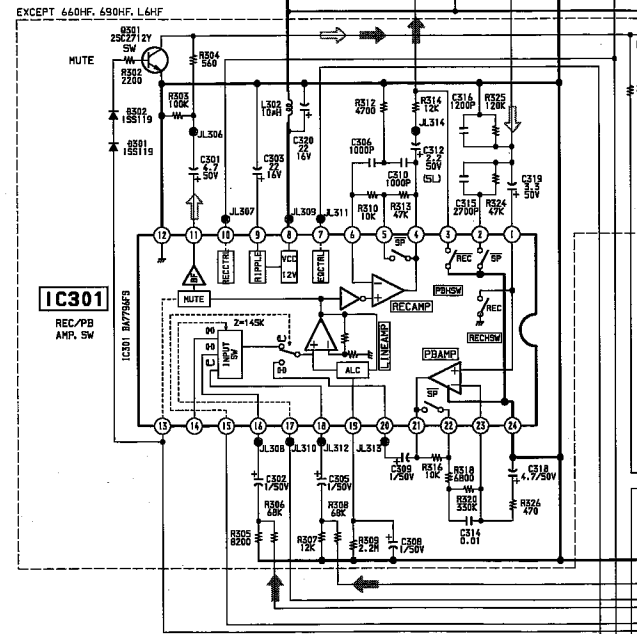
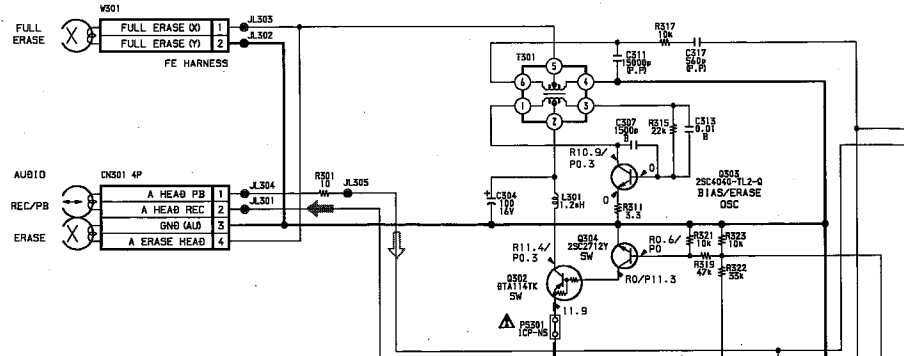
**MA-248 (AUDIO) SCHEMATIC DIAGRAM**

• See page 4-4 to 4-6 for the printed wiring board.

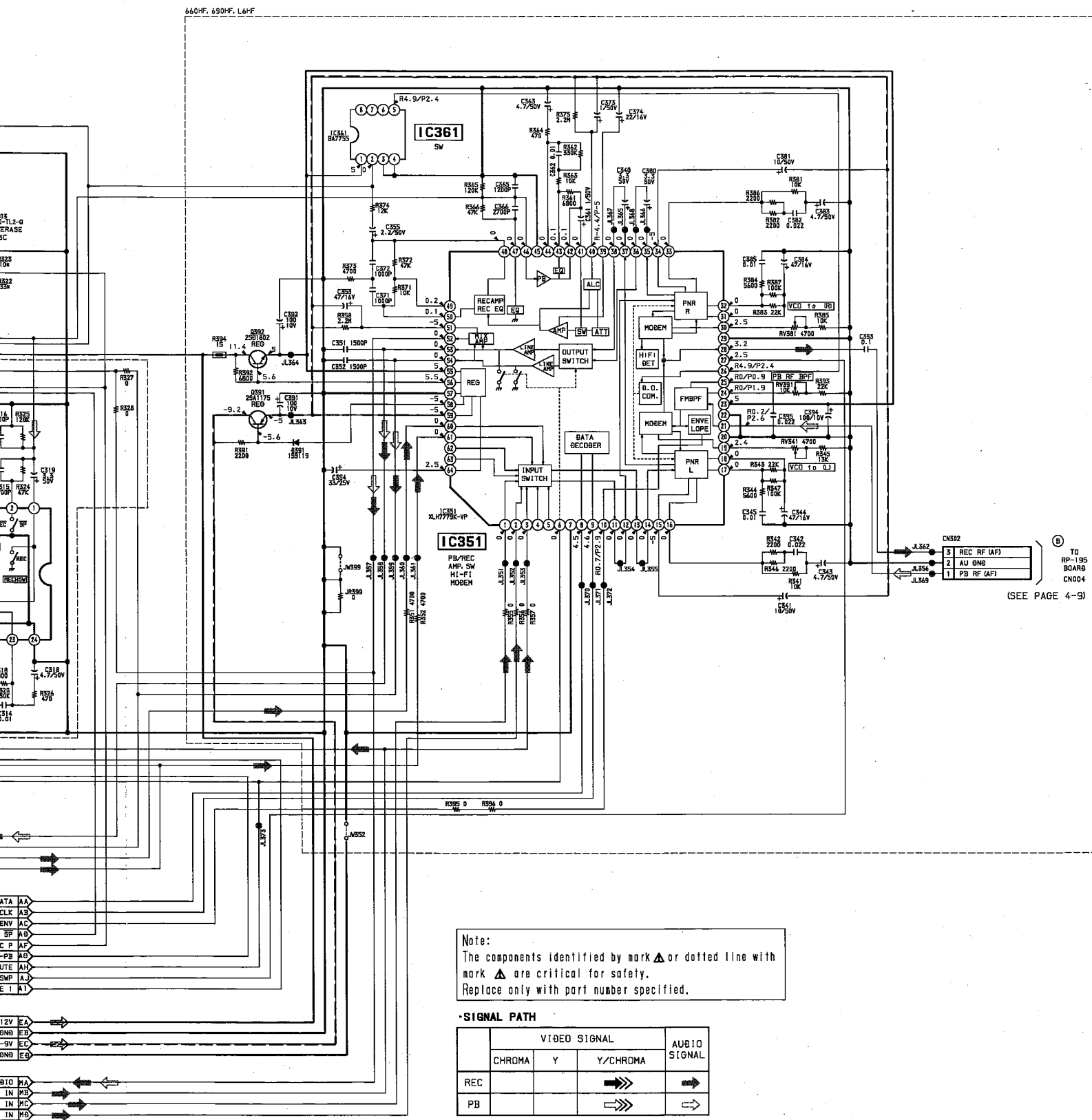
— Ref. No. : MA-248 Board: 1,000 Series —

# MA-248 BOARD (3/5)

no mark : REC/PB mode  
R : REC mode  
P : PB mode







# MA-248 (TUNER) SCHEMATIC DIAGRAM

• See page 4-4 to 4-6 for the printed wiring board.

— Ref. No. : MA-248 Board: 1,000 Series —

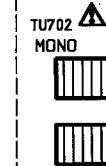
## MA-248 BOARD (4/5)

no mark : REC/PB mode

R : REC mode

P : PB mode

EXCEPT 660HF, 690HF, L6HF

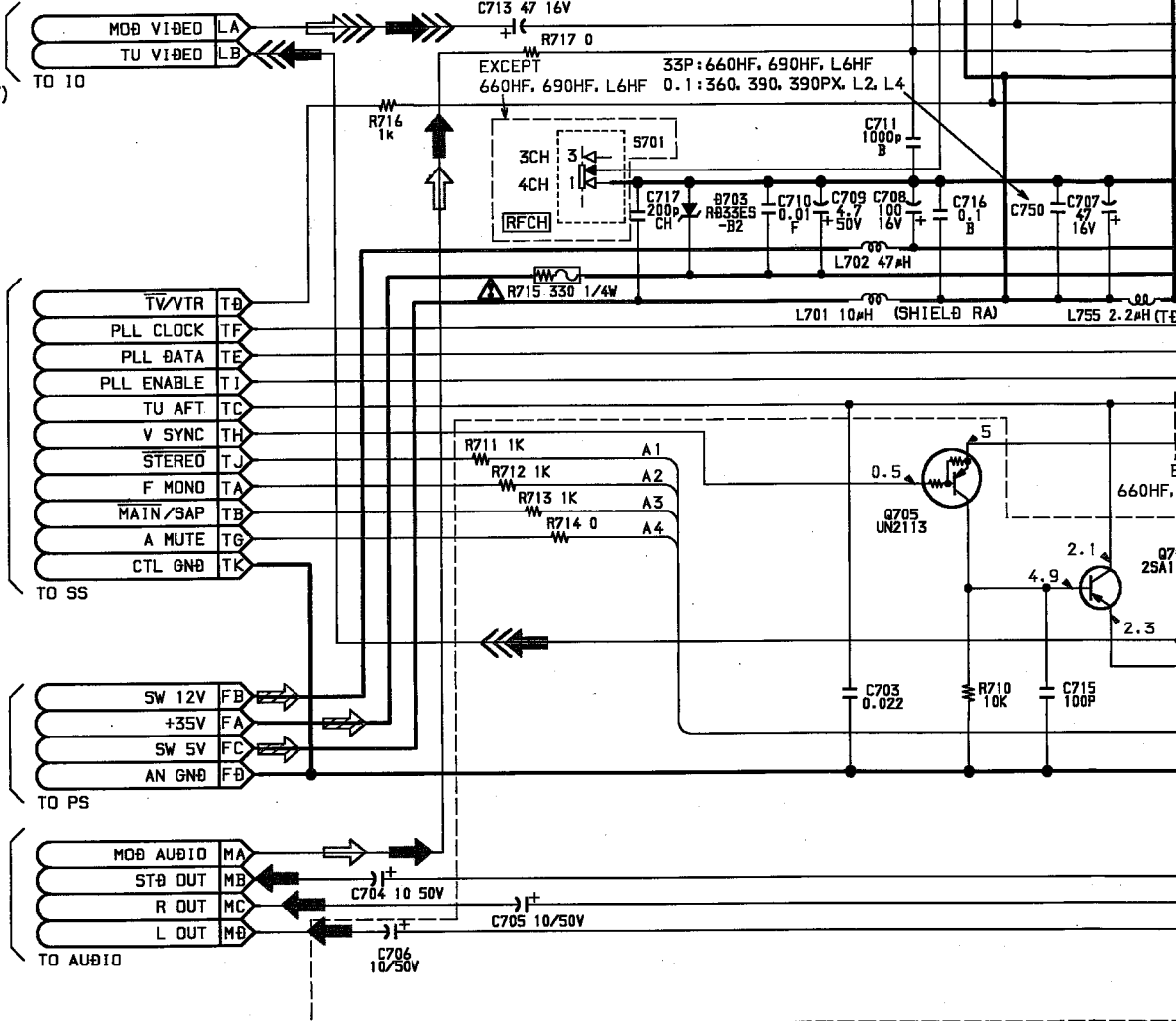


⑩ TO  
MA-248  
BOARD  
(3/5)  
(SEE PAGE 4-17)

⑦ TO  
MA-248  
BOARD  
(2/5)  
(SEE PAGE 4-15)

⑬ TO  
MA-248  
BOARD  
(5/5)  
(SEE PAGE 4-21)





⑫ TO  
MA-248  
BOARD  
(3/5)  
(SEE PAGE 4-18)



Note:  
The componen  
mark  $\Delta$  are  
Replace only

## 0HF, L6HF



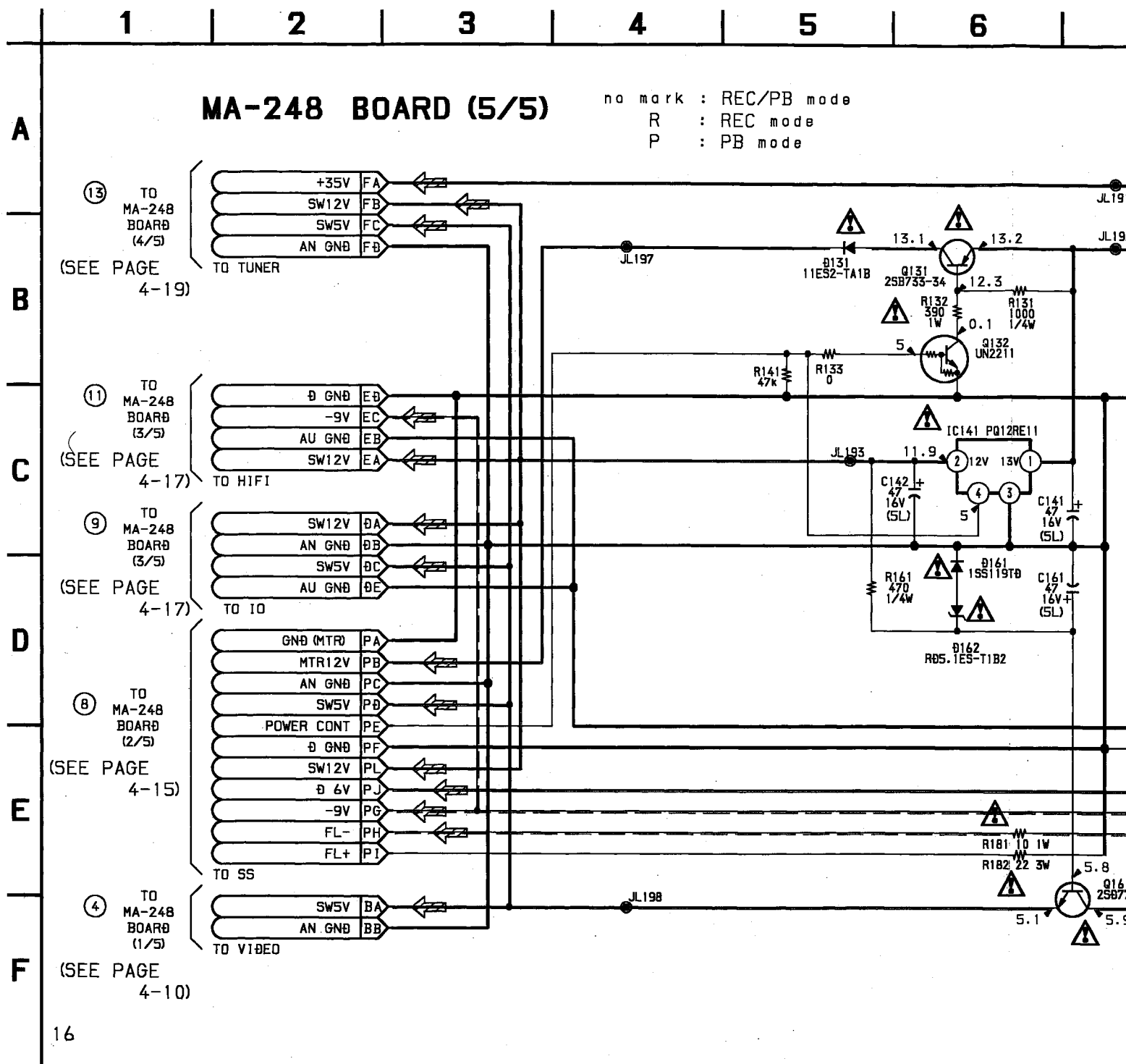
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB				

# SLV-360/390/390PX/660HF/690HF/L2MX/L2PA/L2PL/L4CS/ L4MX/L4PA/L4PL/L6HFCS/L6HFMX/L6HFPA/L6HFPL

## MA-248 (DC POWER) SCHEMATIC DIAGRAM

— Ref. No. : MA-248 Board: 1,000 Series —

• See page 4-4 to 4-6 for the printed wiring board.



6

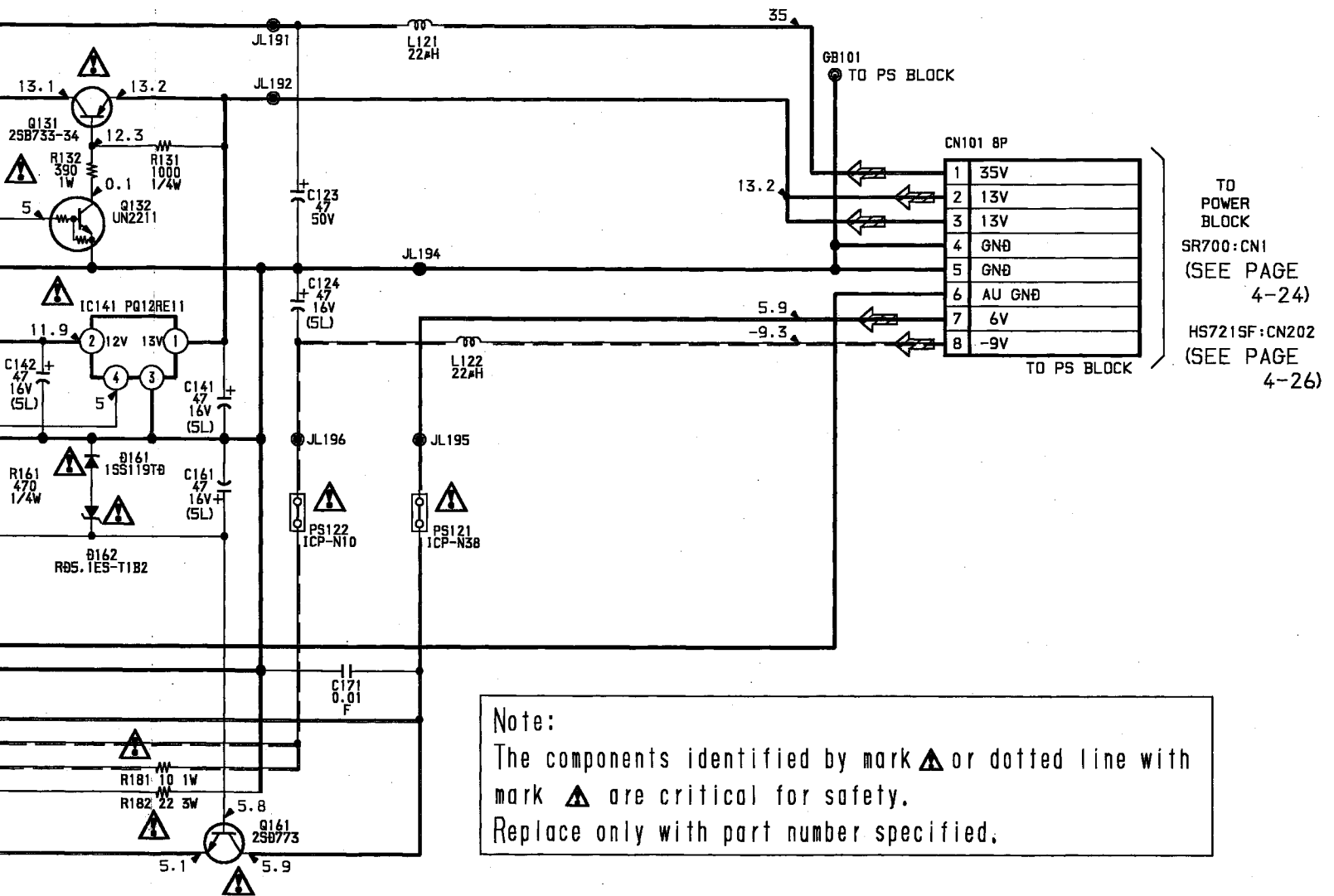
7

8

9

10

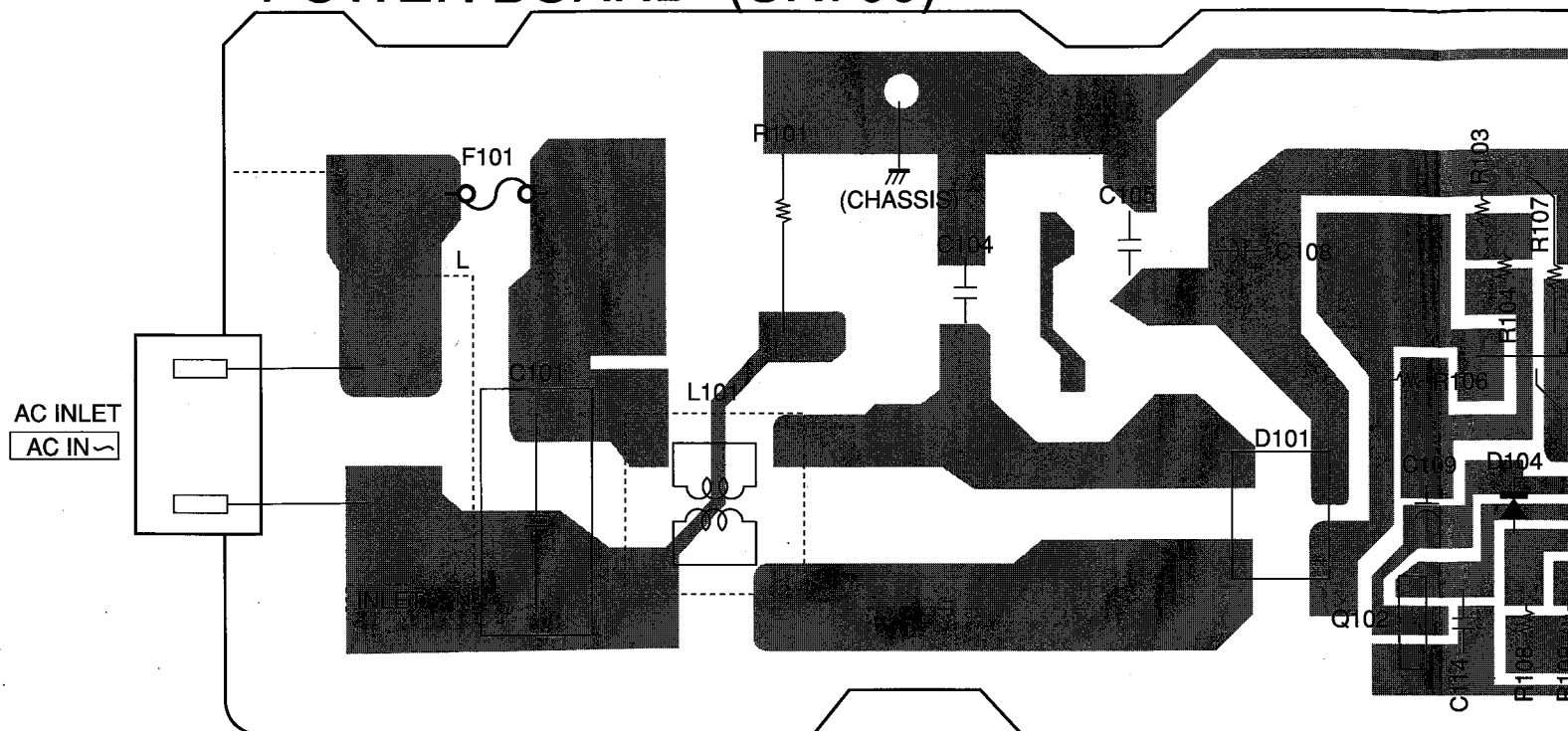
11



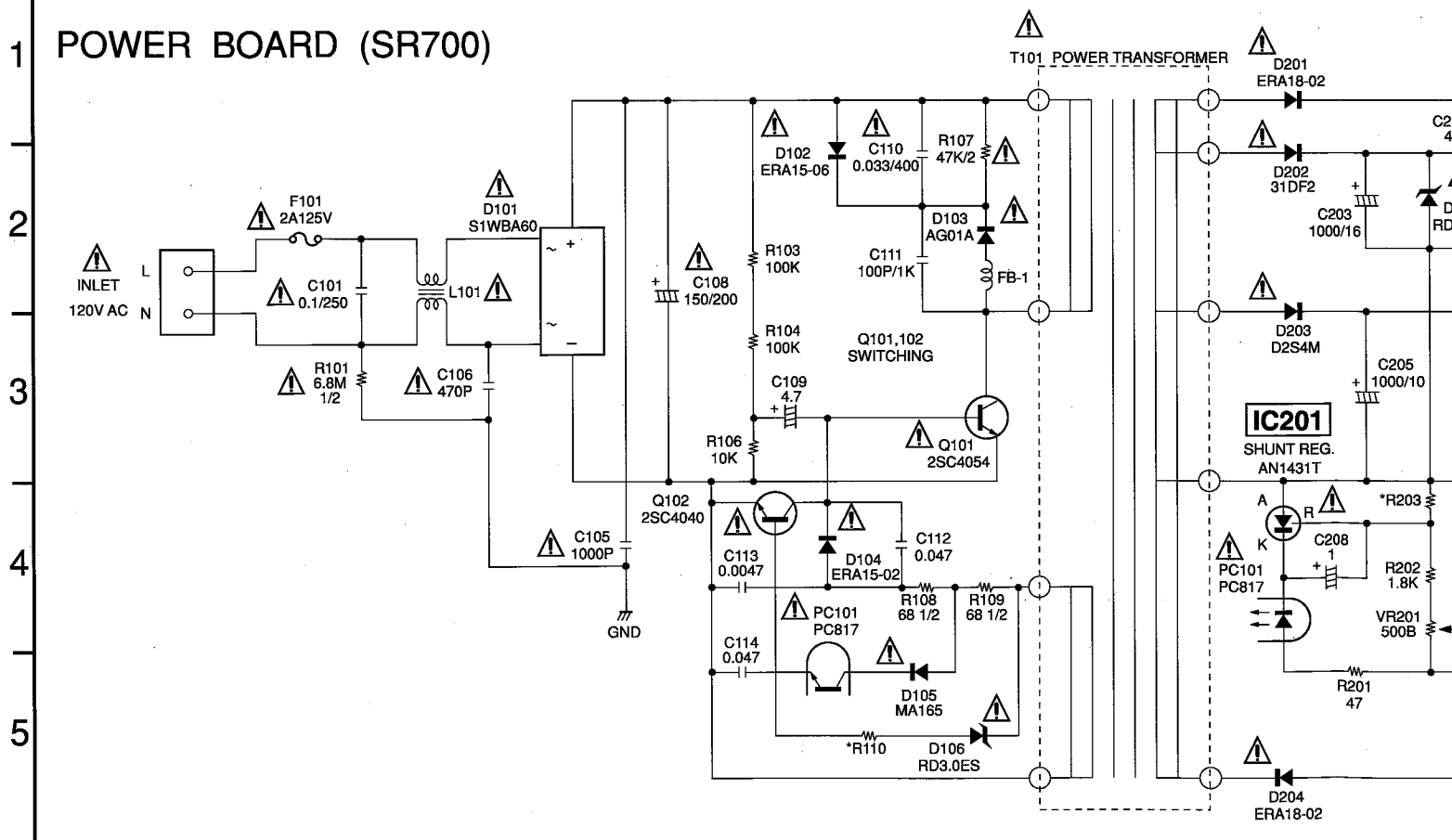
# POWER BLOCK (SR700) SCHEMATIC DIAGRAM AND PRINTED WIRING BOARD

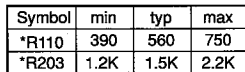
— Ref. No. : Power Board: 3,000 Series —

## POWER BOARD (SR700)



## 1 POWER BOARD (SR700)

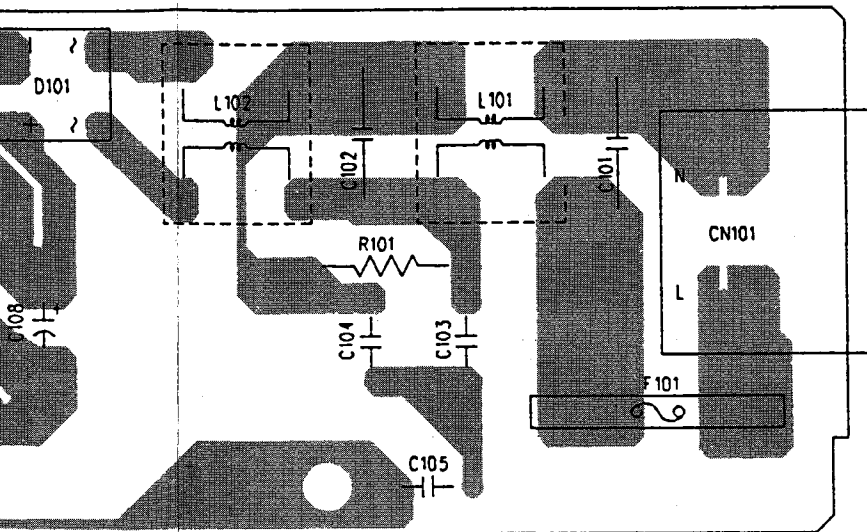








# Chilean, Philippine Model.



H | I | J | K | L

