

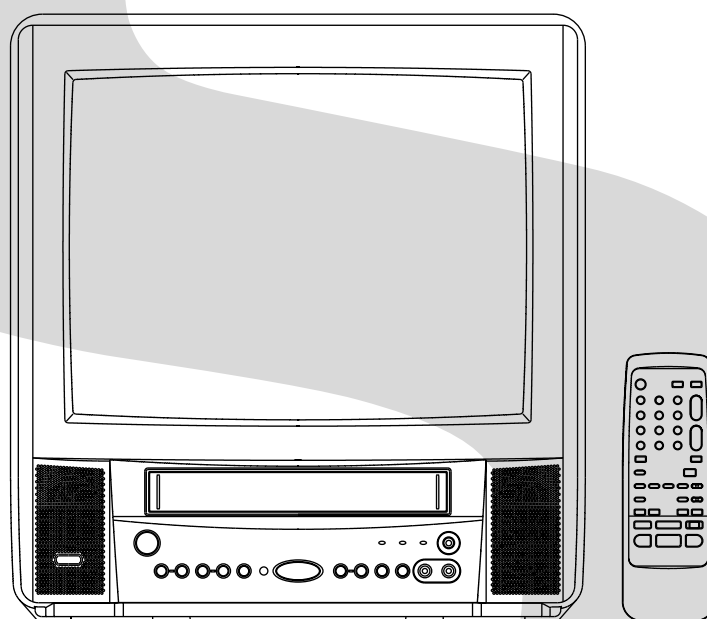
# TOSHIBA

FILE NO. 140-200014

## SERVICE MANUAL

### COLOR TELEVISION/ VIDEO CASSETTE RECORDER

# ***MV13K3CR***



## SERVICING NOTICES ON CHECKING

### 1. KEEP THE NOTICES


As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

### 2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

### 3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.

Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a  mark, the designated parts must be used.

### 4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

### 5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

### 6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.

Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.

Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

### 7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

#### (INSULATION CHECK PROCEDURE)

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the external exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note 1]**.
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

#### **[Note 1]**

If you have not the 500V insulation resistance meter, use a Tester.

#### **[Note 2]**

External exposure metal: Antenna terminal  
Earphone jack

## HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the VERSION LETTER.)

#### 1. MODEL NUMBER and VERSION LETTER

The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.

#### 2. PART NO. and DESCRIPTION

You can find it in your SERVICE MANUAL.

# GENERAL SPECIFICATIONS

G-1. Outline of the Product

13 inch (335.4 mm V): Measured diagonally  
 Color CRT 90 degree deflection  
2 -Speed 1/2" Video Cassette Recorder  
 VHS  Recorder/Player  
 VHS-C  Player

G-2. VCR Format

VHS Standard  NTSC  PAL  SECAM  PAL-M  PAL-N  
 VHS Hi-Fi Audio System

G-3. Video Recording System

:Rotary, slant azimuth two head helical scan system  
 Luminance Component :FM recording  
 Chrominance Component :Low frequency converted direct recording

G-4. Broadcasting System

US System M

G-5. Color System

NTSC  PAL  SECAM or Monochrome signal

G-6. NTSC Playback (PAL 60Hz)

Yes  No  Not Applicable

G-7. MESECAM

Yes  No  Not Applicable

G-8. Cassette Tape

VHS type video cassette tape Width 12.65mm (1/2 Inch)  
 VHS-C type video cassette tape Width 12.65mm (1/2 Inch)

G-9. Tape Speed

NTSC or PAL-M		PAL or SECAM	
<input checked="" type="checkbox"/> SP	33.35 mm/sec	<input type="checkbox"/> SP	23.39 mm/sec
<input type="checkbox"/> LP	16.67 mm/sec	<input type="checkbox"/> LP	11.69 mm/sec
<input checked="" type="checkbox"/> SLP(EP)	11.12 mm/sec		

G-10. Recording/Playback Time

NTSC or PAL-M  
 at SP Mode Max. 210 min. (with T-210 cassette)  
 at LP Mode Max. 420 min. (with T-210 cassette)  
 at SLP(EP) Mode Max. 630 min. (with T-210 cassette)  
 PAL or SECAM  
 at SP Mode Max. 300 min. (with E-300 cassette)  
 at LP Mode Max. 600 min. (with E-300 cassette)

G-11. Deck

OVD-5  OVD-6  OVD-6S

G-12. Rewind/Fast Forward Time (Approx.)

FF:1'48" / Rew:1'48"  (with T-120 cassette)  (with E-180 cassette)

G-13. Search Speed

SP 3 and 5 Times  
 LP \_\_\_\_\_ Times  
 SLP(EP) 9 and 15 Times

G-14. Slow Speed

SP \_\_\_\_\_ Times  
 LP \_\_\_\_\_ Times  
 SLP(EP) \_\_\_\_\_ Times

# GENERAL SPECIFICATIONS

G-15. Frame Advance

SP \_\_\_\_\_ Times  
 LP \_\_\_\_\_ Times  
 SLP(EP) \_\_\_\_\_ Times

G-16. Antenna Input Impedance

VHF/UHF 75 ohm unbalanced

G-17. Tuner and Receiving channel

1 Tuner System     2 Tuner System     BS Tuner

Tuner : Contactless Electric tuner

Oscar(W/O HYPER)     Oscar(W/ HYPER)     France CATV)     Others

channel coverage

2 ~ 69, 4A, A-5 ~ A-1, A ~ L, J ~ W, W+1 ~ W+84

Tuning System

Frequency syn.     Voltage syn.     Others

G-18. Preset Channel:

-- channels

G-19. Intermediate Frequency

Picture(FP) 45.75 MHz    \_\_\_\_\_ MHz    \_\_\_\_\_ MHz

Sound (FS) 41.25 MHz    \_\_\_\_\_ MHz    \_\_\_\_\_ MHz

FP-FS 4.50 MHz    \_\_\_\_\_ MHz    \_\_\_\_\_ MHz

G-20. Stereo/Dual TV Sound

Yes( NICAM     GERMAN     USA     JAPAN     JAPAN BS)     No

G-21. Video Signal

Input Level 1 Vp-p / 75 ohm

Output Level - Vp-p / - ohm

S/N Ratio 50 dB (Weighted)

Horizontal Resolution at SP Mode 220 Lines

G-22. Audio Signal

Input Level

Line - dB / - Kohm

RCA - 8 dB / 50 Kohm

Output Level

Line - dB / - Kohm

RCA - dB / - Kohm

(0dB=0.775 V rms)

S/N Ratio at SP Mode 38 dB

Harmonic Distortion : 1.5 % (1KHz)

Frequency Response : at SP Mode 100 Hz ~ 10 KHz

at LP Mode \_\_\_\_\_ Hz ~ \_\_\_\_\_ KHz

at SLP(EP) Mode 100 Hz ~ 4 KHz

Hi-Fi Model's Spes  NONE

Depth Multiplex Recording Rotary, Slant Azimuth Two Head

System Helical Scan System

Dynamic Range : More than -- dB

Wow And Flutter : Less than --- % Wrms

Channel Separation : More than -- dB

Harmonic Distortion : Less than -- %

# GENERAL SPECIFICATIONS

**G-23.Heads**

Video  2 Rotary Heads  
 FM Audio  Rotary Heads  
 Audio / Control  1 Stationary Head (  Mono  Stereo(L,R) )  
 Erase  1 Full Track Erase

**G-24.Motor:** 3 Motors

Tape/Cassette Loading  
 Cylinder (Direct Drive)  
 Capstan (Direct Drive)

**G-25.Power Source**

120 V  AC 50Hz  AC 60Hz  
 EXT DC Jack \_\_\_\_\_ V

**G-26.Power Consumption:**

70 W at AC 120 V 60 Hz(Approx.)  
 \_\_\_\_\_ W at DC \_\_\_\_\_ V  
 (at TV and VCR ON)  
 Stand by: 5 W at AC 120 V 60 Hz(Approx.)  
 Per Year: --- kWh / Year

**G-27.Dimensions(Approx.)**

362 mm(W) 369 mm(D) 382 mm(H)

**G-28.Weight(Approx.)**

Net : 12.5 Kg ( 27.6 lbs)  
 Gross: 14.5 Kg ( 32.0 lbs)

**G-29.Cabinet Material**

Cabinet Front:	<input checked="" type="checkbox"/> PS <input type="checkbox"/> ABS	<input type="checkbox"/> 94HB <input type="checkbox"/> 94V2 <input checked="" type="checkbox"/> 94V0	<input checked="" type="checkbox"/> DECABROM <input type="checkbox"/> NON-DECA
Cabinet Rear:	<input checked="" type="checkbox"/> PS <input type="checkbox"/> ABS	<input type="checkbox"/> 94HB <input type="checkbox"/> 94V2 <input checked="" type="checkbox"/> 94V0	<input checked="" type="checkbox"/> DECABROM <input type="checkbox"/> NON-DECA
Jack Panel:	<input checked="" type="checkbox"/> PS <input type="checkbox"/> ABS	<input type="checkbox"/> 94HB <input type="checkbox"/> 94V2 <input checked="" type="checkbox"/> 94V0	<input checked="" type="checkbox"/> DECABROM <input type="checkbox"/> NON-DECA

**G-30.Cassette Loading System:**

Front Cassette Loading System  Top Loading System

**G-31.Tape Counter:**

Linear Time Tape Counter

**G-32.Protector:**

Power Fuse  Dew Sensor

**G-33.Regulation**

Safety

<input type="checkbox"/> UL	<input checked="" type="checkbox"/> CSA	<input type="checkbox"/> SAA	<input type="checkbox"/> SI	<input type="checkbox"/> CE	<input type="checkbox"/> SEV
<input type="checkbox"/> BS	<input type="checkbox"/> NF	<input type="checkbox"/> NEMKO	<input type="checkbox"/> FEMKO	<input type="checkbox"/> DEMKO	<input type="checkbox"/> IEC65
<input type="checkbox"/> SEMKO	<input type="checkbox"/> NZ	<input type="checkbox"/> HOMOLO	<input type="checkbox"/> SABS	<input type="checkbox"/> CNS	<input type="checkbox"/> SISIR
<input type="checkbox"/> NOM	<input type="checkbox"/> AS3159	<input type="checkbox"/> DENTORI	<input type="checkbox"/> UNE	<input type="checkbox"/> GOST	<input type="checkbox"/> NONE

Radiation

<input type="checkbox"/> FCC	<input checked="" type="checkbox"/> DOC	<input type="checkbox"/> FTZ	<input type="checkbox"/> PTT	<input type="checkbox"/> CE	<input type="checkbox"/> SEV
<input type="checkbox"/> SABA	<input type="checkbox"/> SI	<input type="checkbox"/> NF	<input type="checkbox"/> NZ	<input type="checkbox"/> HOMOLO	<input type="checkbox"/> UNE
<input type="checkbox"/> CNS	<input type="checkbox"/> CISPR13	<input type="checkbox"/> DENTORI	<input type="checkbox"/> AS/NZS	<input type="checkbox"/> NONE	

X-Radiation

<input type="checkbox"/> DHHS	<input checked="" type="checkbox"/> HWC	<input type="checkbox"/> PTB	<input type="checkbox"/> DENTORI	<input type="checkbox"/> NONE
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**G-34.Temperature**

Operation 5 °C ~ 40 °C  
 Storage -20 °C ~ 60 °C

# GENERAL SPECIFICATIONS

G-35. Operating Humidity Less than 80 %RH

G-36. Clock and Timer

Calendar : 1990/1/1 ~ 2081/12/31  
 Built-in 1 Month 8 Events Programmable Timer  
 One Touch Recording : Max Time 5 Hours  
 Sleep Timer  Yes Max 120 Min. ( 10 Min. Step)  No  
 On/Off Timer  Yes 1 Programs  No  
 Wake Up Timer  Yes \_\_\_\_\_ Programs  No  
 Auto Shut Off 15 Minutes

G-37. Timer back up Time

More than 1/12 Minutes (at Power Off Mode)

G-38. Terminals

VHF/UHF Antenna Input  Din Type  F-Type  France Type  
 Front Video Input <RCA ø8.3>  
 Front Audio Input <RCA ø8.3>  
 Rear Video Input <RCA ø8.3>  
 Rear Audio Input <RCA ø8.3>  
 Rear Video Output <RCA ø8.3>  
 Rear Audio Output <RCA ø8.3>  
 Ear Phone Jack (ø3.5)  Head Phone Jack (Stereo & Mono, ø3.5)  
 DC Jack 12V (Center +)  AC Inlet  Ext Speaker  
 Diversity  Ear Phone  21 Pin (x\_\_\_)

G-39. Indicator

Indicator  Power (Red)  Rec/OTR (Red)  T-Rec (Red)  On Timer (\_\_\_\_)  CS (\_\_\_)  NONE

G-40. On Screen Display

Menu  Timer Rec Set  TV/CATV  Auto Ch Memory  
 Ch Set Up  Add/Delete  Guide Ch Set  
 TV Set Up  V-Chip Set  On/Off Timer  
 Picture  Audio  
 Sap On/Off  
 Auto Repeat On/Off  
 System Set Up  Clock Set ( Calender  12H  24H)  
 Language  Auto Clock On/Off  
 Standard Time  Daylight Saving Time  
 G-CODE (or SHOWVIEW or PLUSCODE) No. Entry  
 Clock/Date  CH/AV  
 Tape Counter  Tape Speed  
 Sleep Time  Tape In  
 Control Level (Vol, Bright, Cont, Color, Tint, Sharpness)  
 Control Level (Vol, Bright, Cont, Color, Sharpness)  
 Play/Stop/FF/Rew/Rec/OTR/T-Rec/Pause/Eject (Symbol Mark)  
 Auto Tracking/Manual Tracking  Caption/Text 1/2  
 Index  Repeat  
 Add/Delete  Auto Wide On/Off  
 Wide Select  Picture Position  
 Tone 1/2  Stereo  
 Muting

## GENERAL SPECIFICATIONS

G-41.OSD Language

Eng    Ger    Fre    Spa    Ita    Por    Jan

OSD Language Setting

Eng    Ger    Fre    Spa    Ita    Por    Jan    Not Applicable

G-42.Speaker

Position    Front    Side    Bottom

Size    1.5 x 2.5 inches

Imp.    8 ohm x 1 pcs

Output    Max 1.5 W  
10% 1.0 W (Typical)

G-43.EXT Speaker

Yes    \_\_\_\_\_ W    Imp \_\_\_\_\_ ohm    No

G-44.Carton

Master Carton:    Need    No Need

Content:    \_\_\_\_\_ Set

Material:    \_\_\_\_\_ / \_\_\_\_\_ Corrugated Carton

Dimensions:    \_\_\_\_\_mm(W) \_\_\_\_\_mm(D) \_\_\_\_\_mm(H)

Description of Origin    Yes    No

Gift Box

Material    Double/Brown Corrugated Carton (with Photo Label)

Double/White Corrugated Carton (with Photo Label)

Double Full Color Carton W/Photo

Dimensions:    423 mm(W) 447 mm(D) 443 mm(H)

Design:    As Per BUYER's

Description of Origin:    Yes    No

Drop Test    Natural Dropping At 1 Corner / 3 Edges / 6 Surfaces

Height    25cm    31cm    46cm    62cm    80cm

Container Stuffing:    700 Sets / 40' container

G-45.Accessories

Channel Film    Dew/AHC Caution Sheet

Owner's Manual (W/Guarantee Card) [English/French]

Remote Control Unit    AC Plug Adaptor

Rod Antenna    (One Pole    Two Pole/F-Type    DIN Type    France Type)

Loop Antenna(F-Type    DIN Type    France Type)

U/V Mixer    Quick Set-up Sheet

DC Car Cord (Center+)    Battery (UM-4 x 2)

Guarantee Card    AC Cord

Warning Sheet    AV Cord (2Pin-1Pin)

Circuit Diagram Registration Card

Antenna Change Plug    PTB Sheet

Service Facility List    300 ohm to 75 ohm Antenna Adaptor

Important Safeguard    Euro Warranty Information Sheet

ESP Card

# GENERAL SPECIFICATIONS

## G-46. Other Features

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Auto Head Cleaning   | <input type="checkbox"/> Index Search                       |
| <input checked="" type="checkbox"/> Auto Tracking  | <input checked="" type="checkbox"/> Auto Search             |
| <input checked="" type="checkbox"/> Auto Clock   |   |
| <input type="checkbox"/> VIDEO PLUS+(SHOWVIEW,G-CODE)  |   |
| <input checked="" type="checkbox"/> HQ (VHS Standard High Quality)                             |   |
| <input checked="" type="checkbox"/> Auto Power On, Auto Play, Auto Rewind, Auto Eject          |   |
| <input checked="" type="checkbox"/> Forward / Reverse Picture Search                           |   |
| <input type="checkbox"/> One Touch Playback  | <input checked="" type="checkbox"/> CATV                    |
| <input checked="" type="checkbox"/> Auto CH Memory   | <input checked="" type="checkbox"/> CM Skip(30sec x 6Times) |
| <input checked="" type="checkbox"/> Closed Caption   |   |
| <input checked="" type="checkbox"/> TV Auto Shutt off Function                                 | <input type="checkbox"/> Energy Star                        |
| <input type="checkbox"/> End Call  | <input checked="" type="checkbox"/> TV Monitor              |
| <input type="checkbox"/> V-chip( <input type="checkbox"/> USA <input type="checkbox"/> CANADA) |   |
| <input type="checkbox"/> SAP   |   |

## G-47. Switch

- |   |   |  |
|---|---|--|
| Front <input checked="" type="checkbox"/> Power<br><input checked="" type="checkbox"/> Play<br><input type="checkbox"/> Pause/Still<br><input type="checkbox"/> System Select<br><input type="checkbox"/> One Touch Playback<br>Rear <input type="checkbox"/> Color On/Off (SECAM only)<br><input type="checkbox"/> Main Power SW | <input checked="" type="checkbox"/> Channel Up<br><input checked="" type="checkbox"/> Channel Down<br><input checked="" type="checkbox"/> F.FWD/Cue<br><input checked="" type="checkbox"/> Eject/Stop<br><input type="checkbox"/> Main Power SW<br><input type="checkbox"/> Degauss | <input checked="" type="checkbox"/> Volume Up<br><input checked="" type="checkbox"/> Volume Down<br><input checked="" type="checkbox"/> Rew/Rev<br><input checked="" type="checkbox"/> Rec/OTR<br><input checked="" type="checkbox"/> Input Select<br><br><input type="checkbox"/> AC/DC |
|---|---|--|

## G-48. Magnetic Field

- |   |                                      |                                      |
|---|--------------------------------------|--------------------------------------|
| <input checked="" type="checkbox"/> BV : +0.45G | <input type="checkbox"/> BV : +0.35G | <input type="checkbox"/> BV : +0.25G |
| BH : 0.18G                                      | BH : 0.30G                           | BH : 0.30G                           |
| <input type="checkbox"/> BV : -0.15G            | <input type="checkbox"/> BV : -0.25G | <input type="checkbox"/> BV : -0.50G |
| BH : 0.15G                                      | BH : 0.15G                           | BH : 0.30G                           |

## G-49. Remote Control Unit:

- Unit: RC-DA  
 Format : NEC  
 Custom Code : 40-BF/44-BB h  
 Glow in Dark Remocon  Yes  No  
 Power Source: D.C 3 V      Battery UM - 4 x 2  
 Total 41 Keys
- |   |  |   |
|---|--|---|
| <input checked="" type="checkbox"/> 0               | <input checked="" type="checkbox"/> Power                | <input checked="" type="checkbox"/> Tracking Auto       |
| <input checked="" type="checkbox"/> 1               | <input checked="" type="checkbox"/> Rec/OTR              | <input checked="" type="checkbox"/> Tracking Up/Set +   |
| <input checked="" type="checkbox"/> 2               | <input checked="" type="checkbox"/> Play                 | <input checked="" type="checkbox"/> Tracking Down/Set - |
| <input checked="" type="checkbox"/> 3               | <input checked="" type="checkbox"/> F.Fwd                | <input checked="" type="checkbox"/> Menu                |
| <input checked="" type="checkbox"/> 4               | <input checked="" type="checkbox"/> Rew                  | <input checked="" type="checkbox"/> Enter               |
| <input checked="" type="checkbox"/> 5               | <input checked="" type="checkbox"/> Pause/Still          | <input checked="" type="checkbox"/> Cancel              |
| <input checked="" type="checkbox"/> 6               | <input checked="" type="checkbox"/> Stop                 | <input checked="" type="checkbox"/> Muting              |
| <input checked="" type="checkbox"/> 7               | <input checked="" type="checkbox"/> Eject                | <input checked="" type="checkbox"/> Volume Up           |
| <input checked="" type="checkbox"/> 8               | <input checked="" type="checkbox"/> Timer Rec            | <input checked="" type="checkbox"/> Volume Down         |
| <input checked="" type="checkbox"/> 9               | <input checked="" type="checkbox"/> TV/Caption/Text      | <input checked="" type="checkbox"/> Ch Up               |
| <input checked="" type="checkbox"/> Sleep Timer     | <input type="checkbox"/> Index                           | <input checked="" type="checkbox"/> Ch Down             |
| <input checked="" type="checkbox"/> Quick View      | <input checked="" type="checkbox"/> Zero Return          | <input checked="" type="checkbox"/> Input Select        |
| <input checked="" type="checkbox"/> TV Monitor      | <input checked="" type="checkbox"/> Counter Reset        | <input checked="" type="checkbox"/> Speed               |
| <input checked="" type="checkbox"/> Call            | <input checked="" type="checkbox"/> CM Skip(Skip Search) | <input type="checkbox"/> Audio Select(for Hi-Fi)        |
| <input type="checkbox"/> Slow(for 4Head)            | <input checked="" type="checkbox"/> Program(without V+)  |   |
| <input type="checkbox"/> VCR PLUS+/Program(with V+) |  |   |

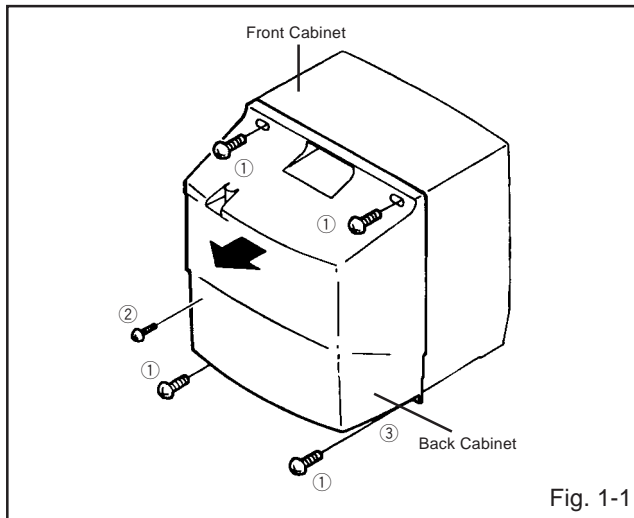


# DISASSEMBLY INSTRUCTIONS

## 1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

### 1-1: BACK CABINET (Refer to Fig. 1-1)

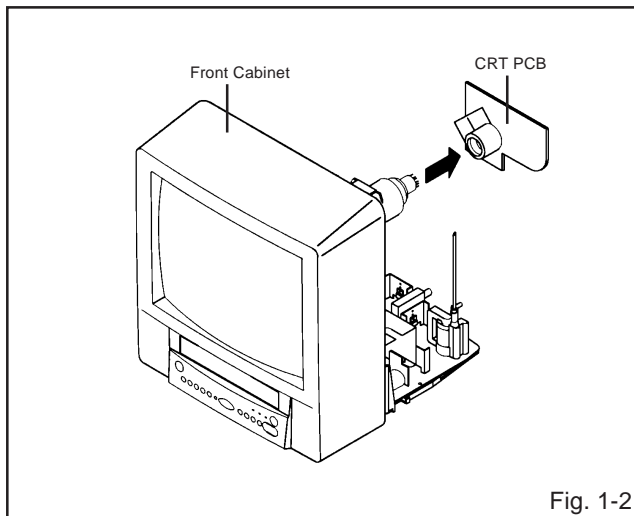
1. Remove the 4 screws ①.
2. Remove the screw ②.
3. Remove the AC cord from the AC cord hook ③.
4. Remove the Back Cabinet in the direction of arrow.



### 1-2: CRT PCB (Refer to Fig. 1-2)

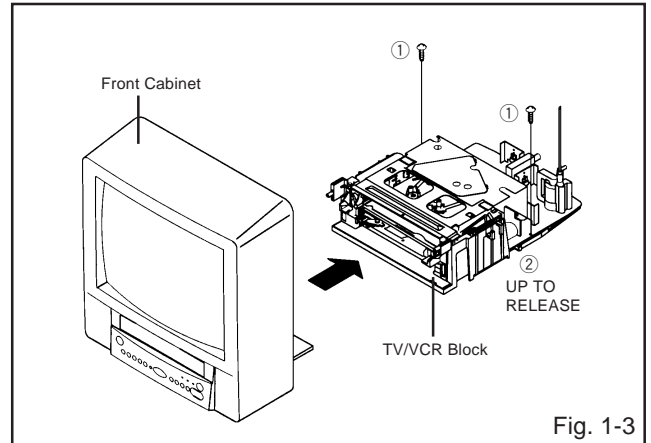
**CAUTION: BEFORE REMOVING THE ANODE CAP, DISCHARGE ELECTRICITY BECAUSE IT CONTAINS HIGH VOLTAGE. BEFORE ATTEMPTING TO REMOVE OR REPAIR ANY PCB, UNPLUG THE POWER CORD FROM THE AC SOURCE.**

1. Remove the Anode Cap. (Refer to REMOVAL OF ANODE CAP)
2. Disconnect the following connectors: (CP801 and CP851).
3. Remove the CRT PCB in the direction of arrow.



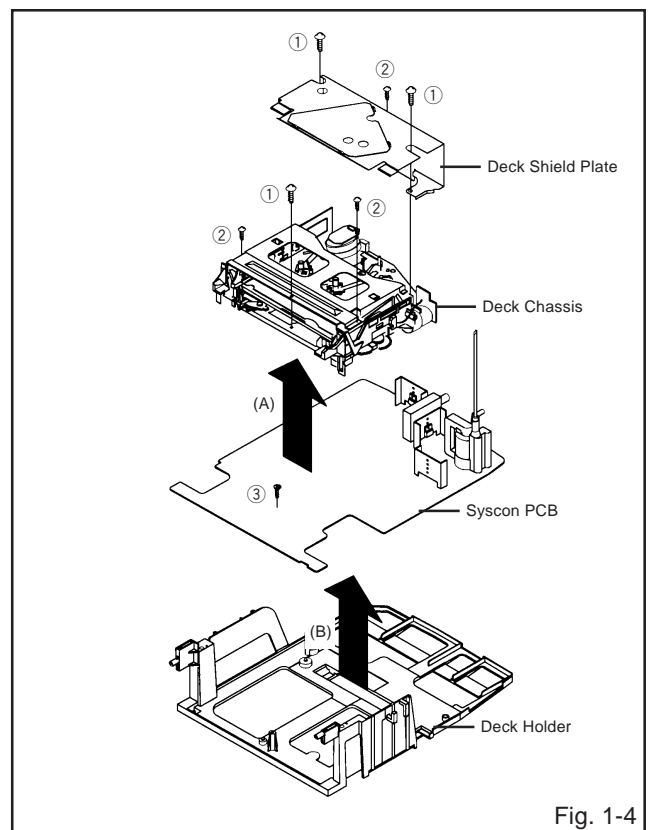
### 1-3: TV/VCR BLOCK (Refer to Fig. 1-3)

1. Remove the 2 screws ①.
2. Disconnect the following connectors: (CP352, CP353, CP354, CP401 and CP502).
3. Unlock the support ②.
4. Remove the TV/VCR Block in the direction of arrow.



### 1-4: DECK CHASSIS AND SYSCON PCB (Refer to Fig. 1-4)

1. Remove the 3 screws ①.
2. Remove the 3 screws ②.
3. Disconnect the following connectors: (CP1004, CP1005, CP1006, CP4001, CP4002 and CP4003).
4. Remove the Deck Chassis and Deck Shield Plate in the direction of arrow (A).
5. Remove the screw ③.
6. Remove the Syscon PCB in the direction of arrow (B).



# DISASSEMBLY INSTRUCTIONS

## 2. REMOVAL OF DECK PARTS

### 2-1: TOP BRACKET (Refer to Fig. 2-1)

1. Remove the 2 screws ①.
2. Slide the 2 supports ② and remove the Top Bracket.

#### NOTE

When you install the Top Bracket, install the screw (1) first, then install the screw (2).

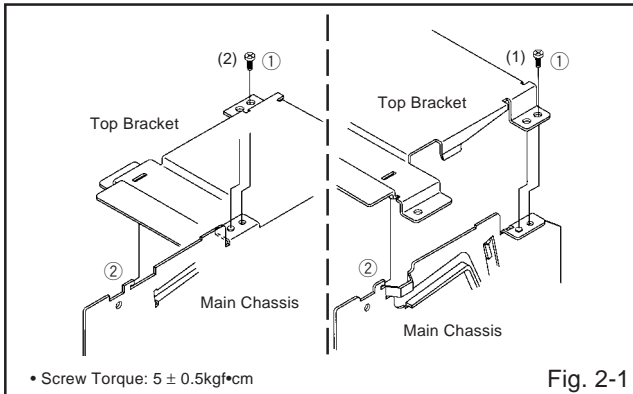


Fig. 2-1

### 2-2: FLAP LEVER/TAPE GUIDE R (Refer to Fig. 2-2)

1. Move the Cassette Holder Ass'y to the back side.
2. Remove the Polyslider Washer ①.
3. Remove the Flap Lever.
4. Unlock the 3 supports ② and remove the Tape Guide R.

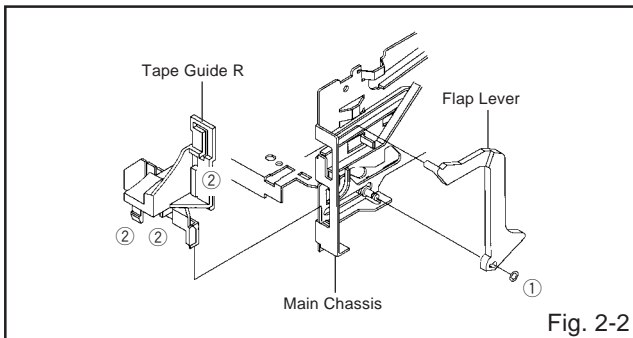


Fig. 2-2

### 2-3: TAPE GUIDE L (Refer to Fig. 2-3-A)

1. Move the Cassette Holder Ass'y to the back side.
2. Unlock the 2 supports ① and remove the Tape Guide L.
3. Remove the REC Lever. (Recorder only)

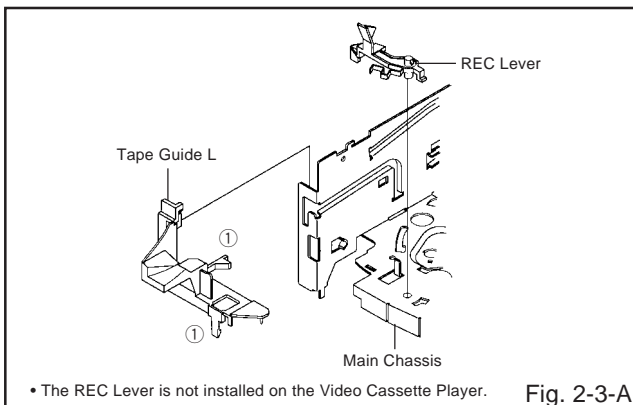


Fig. 2-3-A

#### NOTE

When you install the Tape Guide L, install as shown in the circle of Fig. 2-3-B. (Refer to Fig. 2-3-B)

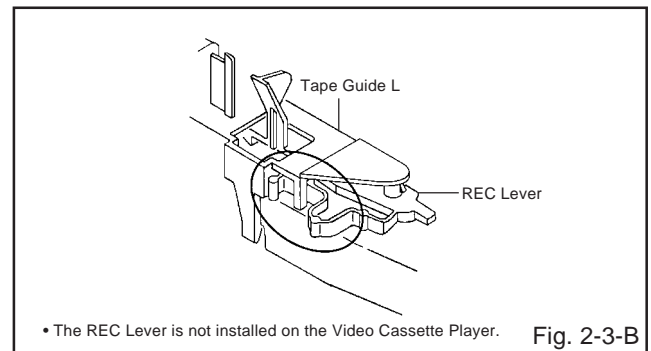


Fig. 2-3-B

### 2-4: CASSETTE HOLDER ASS'Y (Refer to Fig. 2-4)

1. Move the Cassette Holder Ass'y to the front side.
2. Push the Locker R to remove the Cassette Side R.
3. Remove the Cassette Side L.

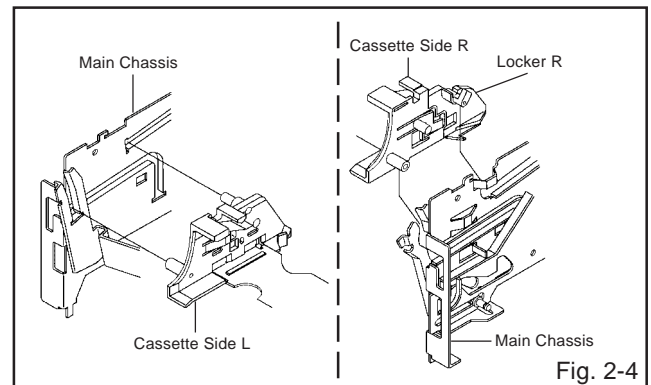


Fig. 2-4

### 2-5: CASSETTE SIDE L/R (Refer to Fig. 2-5)

1. Unlock the 4 supports ① and then remove the Cassette Side L/R.

#### NOTE

When you install the Cassette Side R, be sure to move the Locker R after installing.

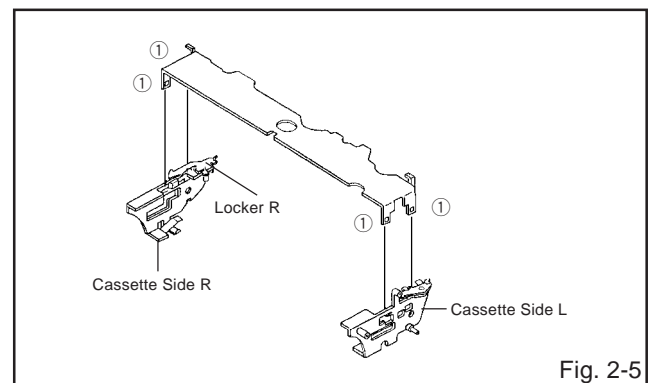


Fig. 2-5

# DISASSEMBLY INSTRUCTIONS

## 2-6: LINK ASS'Y (Refer to Fig. 2-6)

1. Set the Link Ass'y to the Eject position.
2. Remove the (A) side of the Link Ass'y first, then remove the (B) side.

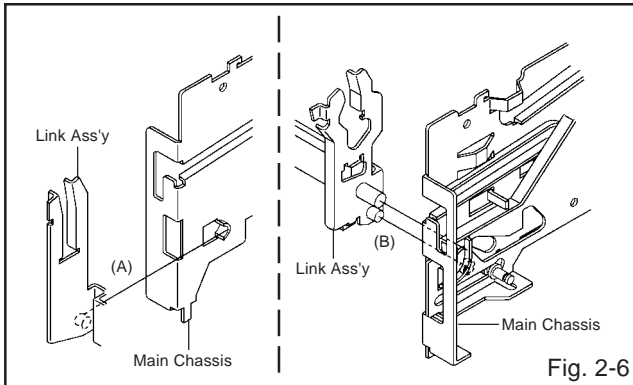


Fig. 2-6

## 2-7: LOADING MOTOR ASS'Y (Refer to Fig. 2-7)

1. Remove the Link Lever.
2. Remove the Dumper Spring.
3. Remove the 2 screws ①.
4. Unlock the support ② and remove the Loading Motor Ass'y.
5. Unlock the 2 supports ③ and remove the Deck PCB (BOT).

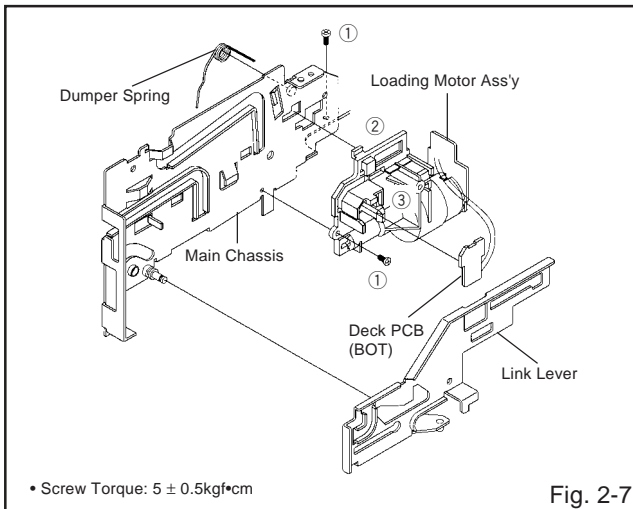


Fig. 2-7

## 2-8: SENSOR COVER L3 (Refer to Fig. 2-8)

1. Unlock the support ① and remove the Sensor Cover L3.

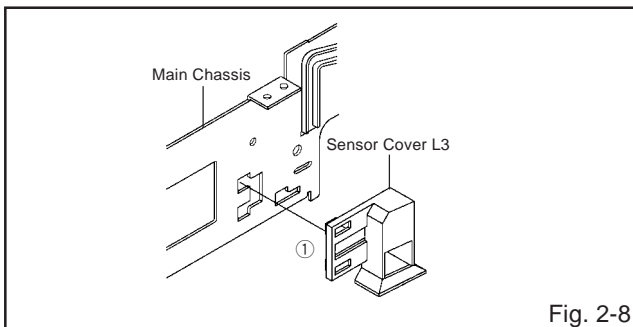


Fig. 2-8

## 2-9: TENSION ASS'Y (Refer to Fig. 2-9-A)

1. Move the Inclined S Ass'y to the back side.
2. Remove the Tension Spring.
3. Unlock the support ① and remove the Tension Arm Ass'y.
4. Remove the Tension Adjust.
5. Unlock the 2 supports ② and remove the Tension Band Ass'y.
6. Unlock the support ③ and remove the Tension Holder.
7. Remove the SS Brake Spring.
8. Remove the SS Arm Brake.

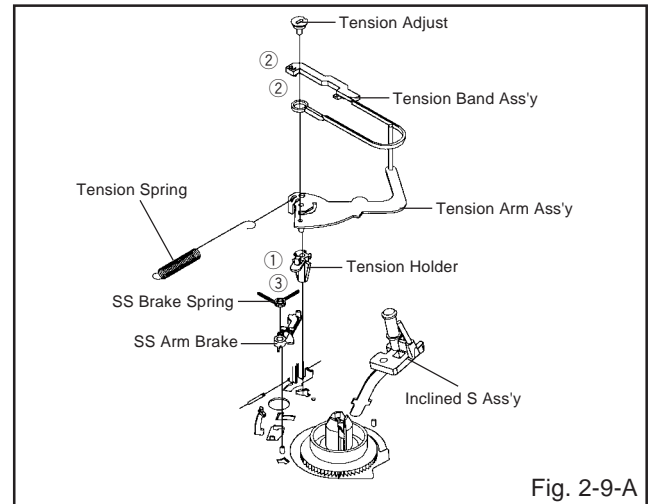


Fig. 2-9-A

### NOTE

When you install the Tension Adjust, install as shown in Fig. 2-9-B. (Refer to Fig. 2-9-B)

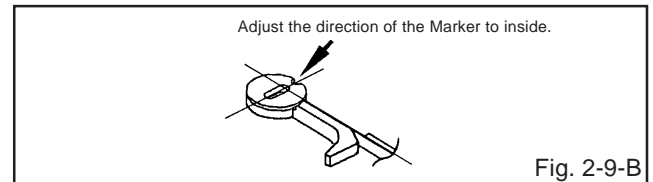


Fig. 2-9-B

## 2-10: T BRAKE ASS'Y (Refer to Fig. 2-10)

1. Remove the T Brake Spring.
2. Remove the T Brake Ass'y.

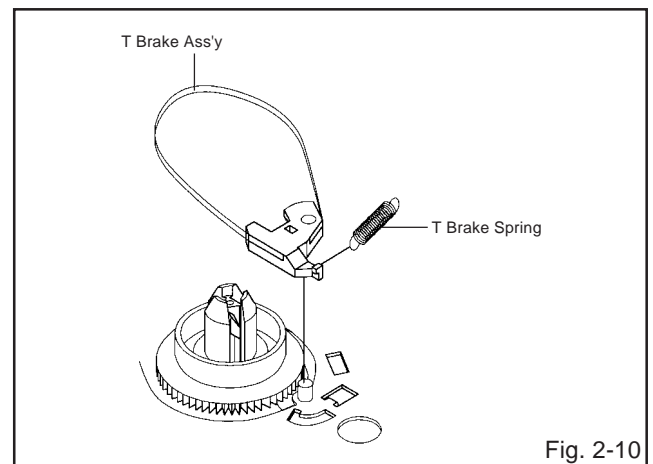


Fig. 2-10

# DISASSEMBLY INSTRUCTIONS

## 2-11: S REEL/T REEL (Refer to Fig. 2-11)

1. Remove the S Reel and T Reel.
2. Remove the 2 Polyslider Washers ①.

### NOTE

1. Take care not to damage the gears of the S Reel and T Reel.
2. The Polyslider Washer may be remained on the back of the reel.
3. Take care not to damage the shaft.
4. Do not touch the section "A" of S Reel and T Reel. (Use gloves.) (Refer to Fig. 2-11) Do not adhere the stains on it.
5. When you install the reel, clean the shaft and oil it. (If you do not oil, noise may be heard in FF/REW mode.)
6. After installing the reel, adjust the height of the reel. (Refer to MECHANICAL ADJUSTMENT)

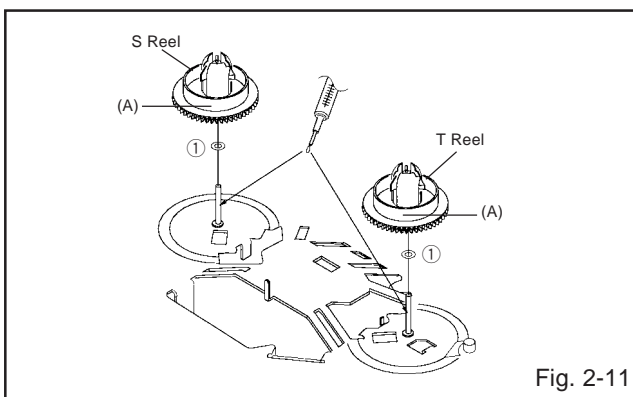


Fig. 2-11

## 2-12: PINCH ROLLER BLOCK/P5-3 ARM ASS'Y (Refer to Fig. 2-12-A)

1. Remove the P5 Spring.
2. Remove the screw ①.
3. Unlock the 2 supports ② and remove the Cassette Opener.
4. Remove the Pinch Roller Block, Pinch Roller Arm Spring, Pinch Roller Lever Ass'y and P5-3 Arm Ass'y.

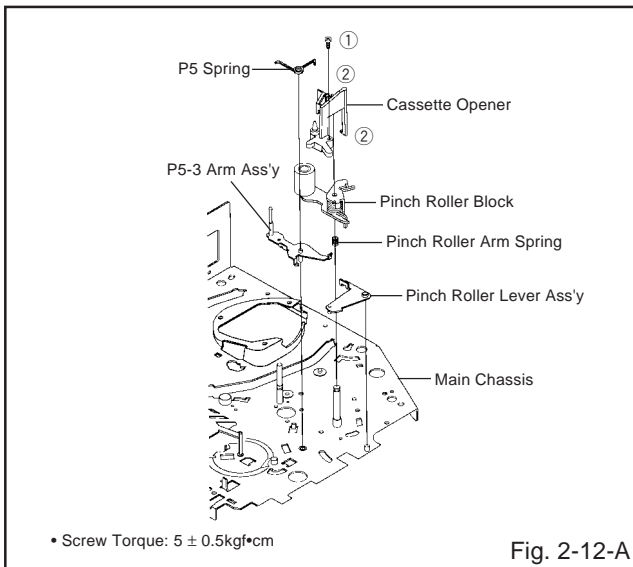


Fig. 2-12-A

### NOTE

1. Do not touch the Pinch Roller. (Use gloves.)
2. When you install the Pinch Roller Block, install as shown in the circle of Fig. 2-12-B. (Refer to Fig. 2-12-B)

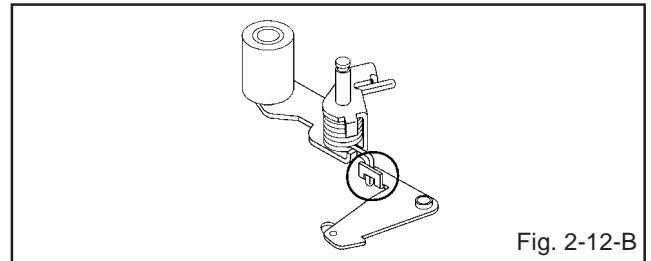


Fig. 2-12-B

## 2-13: A/C HEAD (Refer to Fig. 2-13-A)

1. Remove the screw ①.
2. Remove the A/C Head Base.
3. Remove the 3 screws ②.
4. Remove the A/C Head and A/C Head Spring.

### NOTE

1. Do not touch the A/C Head. (Use gloves.)
2. When you install the A/C Head Spring, install as shown in Fig. 2-13-B. (Refer to Fig. 2-13-B)
3. When you install the A/C Head, tighten the screw (1) first, then tighten the screw (2), finally tighten the screw (3).

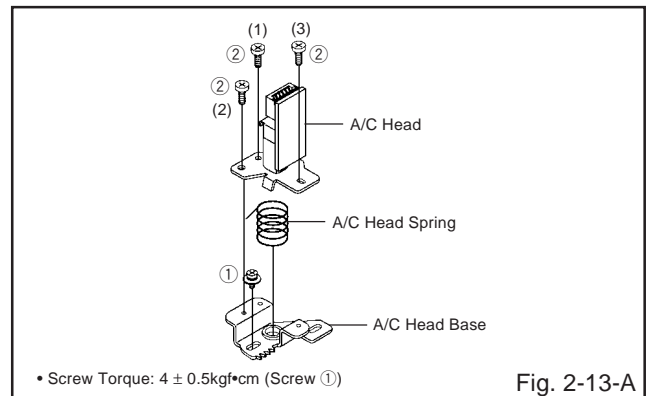


Fig. 2-13-A

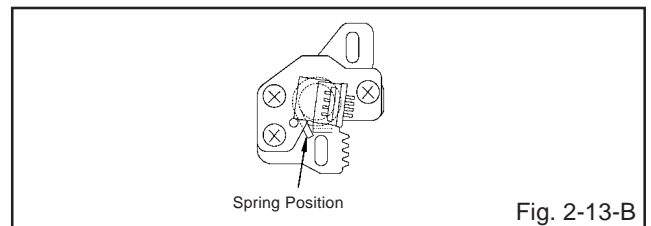


Fig. 2-13-B

## 2-14: FE HEAD (RECORDER ONLY) (Refer to Fig. 2-14)

1. Remove the screw ①.
2. Remove the FE Head.

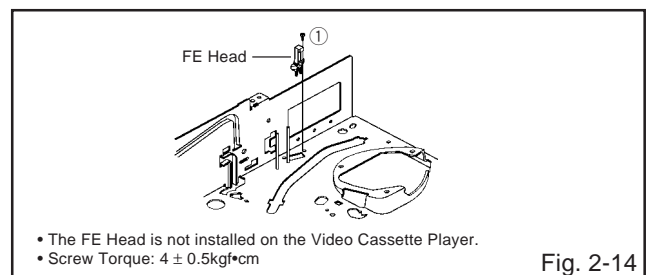


Fig. 2-14

# DISASSEMBLY INSTRUCTIONS

## 2-15: AHC ASS'Y/CYLINDER UNIT ASS'Y (Refer to Fig. 2-15)

1. Unlock the support ① and remove the AHC Ass'y.
2. Remove the 3 screws ②.
3. Remove the Cylinder Unit Ass'y.

### NOTE

When you install the Cylinder Unit Ass'y, tighten the screws from (1) to (3) in order while pulling the Ass'y toward the left front direction.

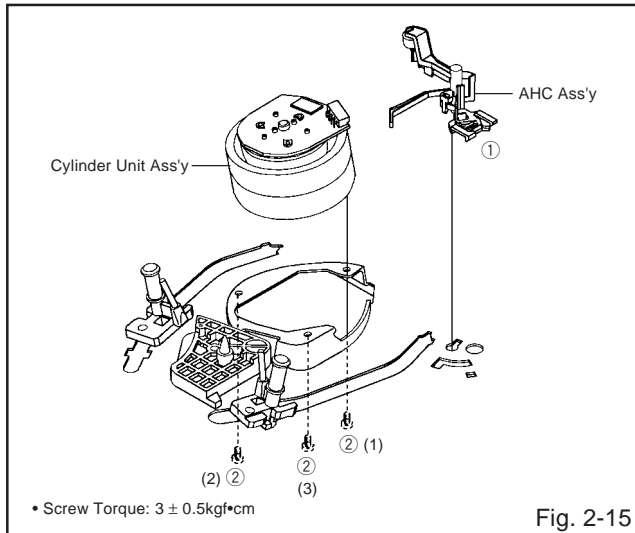


Fig. 2-15

## 2-16: CAPSTAN DD UNIT (Refer to Fig. 2-16)

1. Remove the Capstan Belt.
2. Remove the 3 screws ①.
3. Remove the Capstan DD Unit.

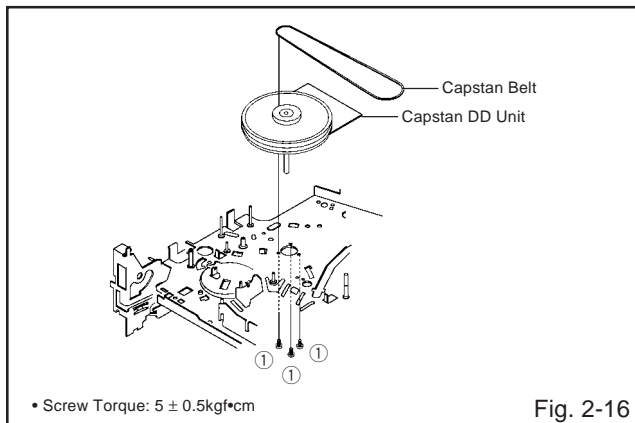


Fig. 2-16

## 2-17: MIDDLE GEAR/MAIN CAM (Refer to Fig. 2-17-A)

1. Remove the Polyslider Washer ①, then remove the Middle Gear.
2. Remove the E-Ring, then remove the Main Cam, P5 Cam and Pinch Roller Cam.
3. Remove the Polyslider Washer ②, then remove the Joint Gear.

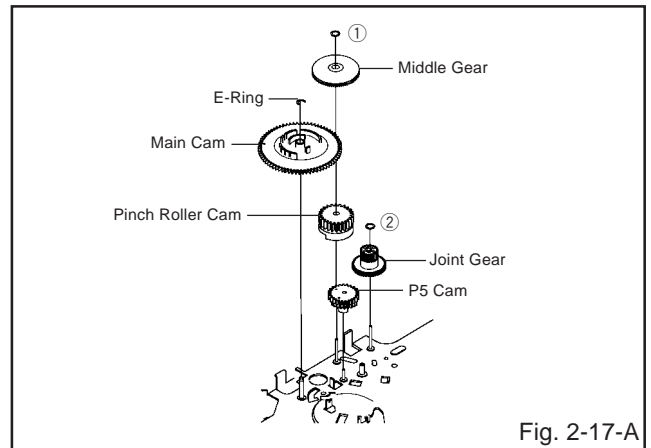


Fig. 2-17-A

### NOTE

When you install the Pinch Roller Cam, P5 Cam and Main Cam, align each marker. (Refer to Fig. 2-17-B)

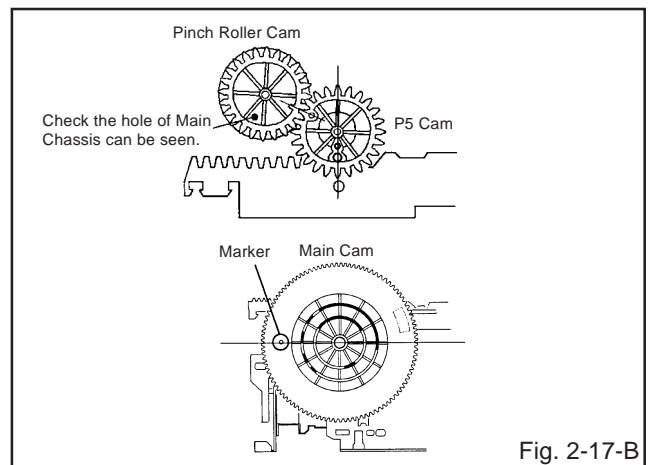


Fig. 2-17-B

## 2-18: CLUTCH ASS'Y (Refer to Fig. 2-18)

1. Remove the Polyslider Washer ①.
2. Remove the Clutch Ass'y, Ring Spring and Coupling Gear.
3. Unlock the 2 supports ② and remove the Clutch Lever.

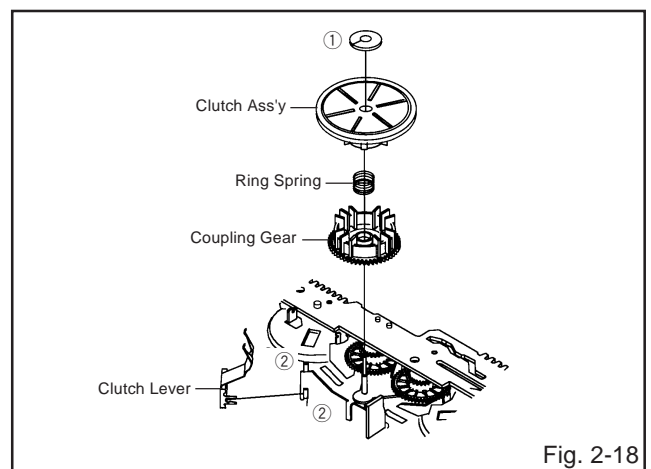
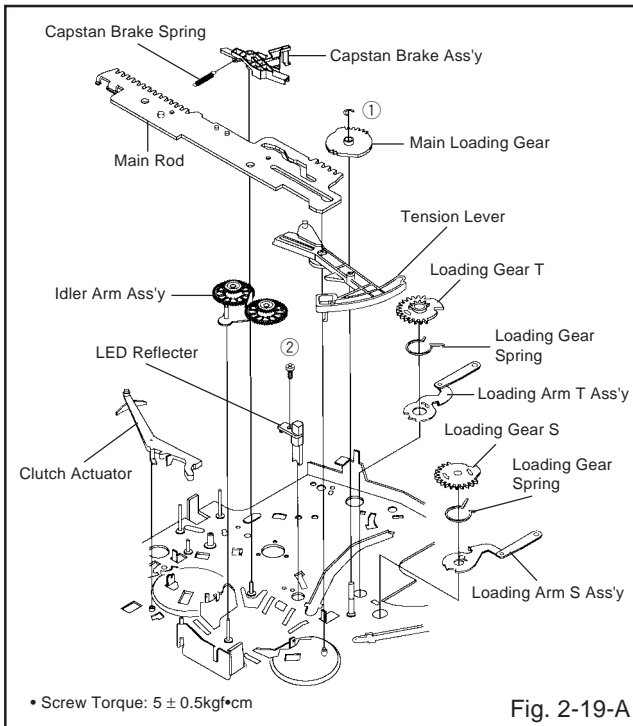


Fig. 2-18

# DISASSEMBLY INSTRUCTIONS

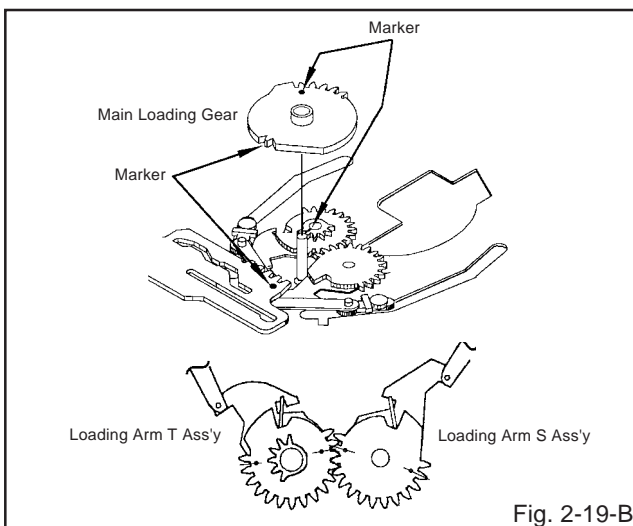
## 2-19: LOADING GEAR S/T ASS'Y (Refer to Fig. 2-19-A)

1. Remove the E-Ring ① and remove the Main Loading Gear.
2. Remove the Capstan Brake Spring.
3. Slide the Main Rod and remove the Capstan Brake Ass'y.
4. Remove the Main Rod, Tension Lever, Clutch Actuator, Idler Arm Ass'y.
5. Remove the screw ②.
6. Remove the LED Reflector.
7. Remove the Loading Arm S Ass'y and Loading Arm T Ass'y.
8. Remove the Loading Gear S and Loading Gear T.
9. Remove the Loading Gear Spring.

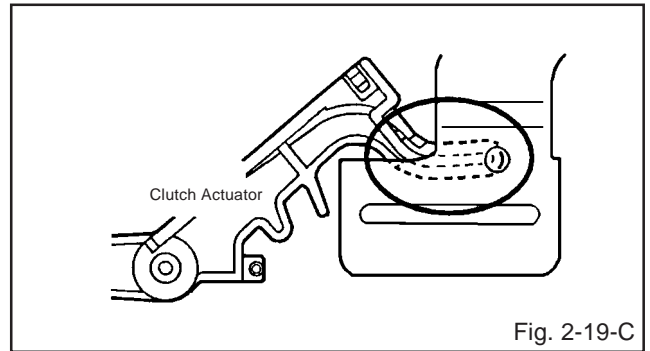


### NOTES

1. When you install the Loading Arm S Ass'y, Loading Arm T Ass'y and Main Loading Gear, align each marker. (Refer to Fig. 2-19-B)



2. When you install the Clutch Actuator, install as shown in the circle of Fig. 2-19-C. (Refer to Fig. 2-19-C)

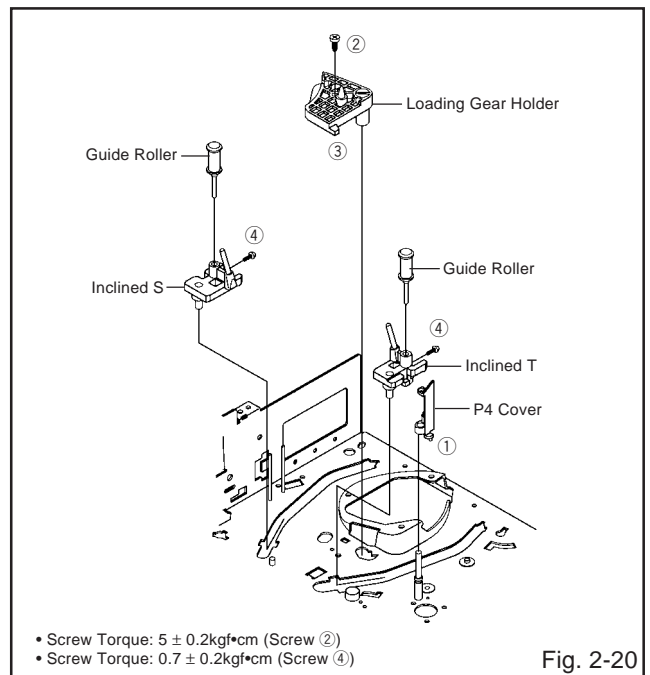


## 2-20: INCLINED S/T ASS'Y (Refer to Fig. 2-20)

1. Unlock the support ① and remove the P4 Cover.
2. Remove the screw ②.
3. Unlock the support ③ and remove the Loading Gear Holder.
4. Remove the Inclined S.
5. Remove the Inclined T.
6. Remove the 2 screws ④, then remove the Guide Roller.

### NOTE

Do not touch the roller of Guide Roller.



# DISASSEMBLY INSTRUCTIONS

## 3. REMOVAL OF ANODE CAP

Read the following **NOTED** items before starting work.

- \* After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
- \* Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

### REMOVAL

1. Follow the steps as follows to discharge the Anode Cap. (Refer to Fig. 3-1.)

Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground. While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver.

A cracking noise will be heard as the voltage is discharged.

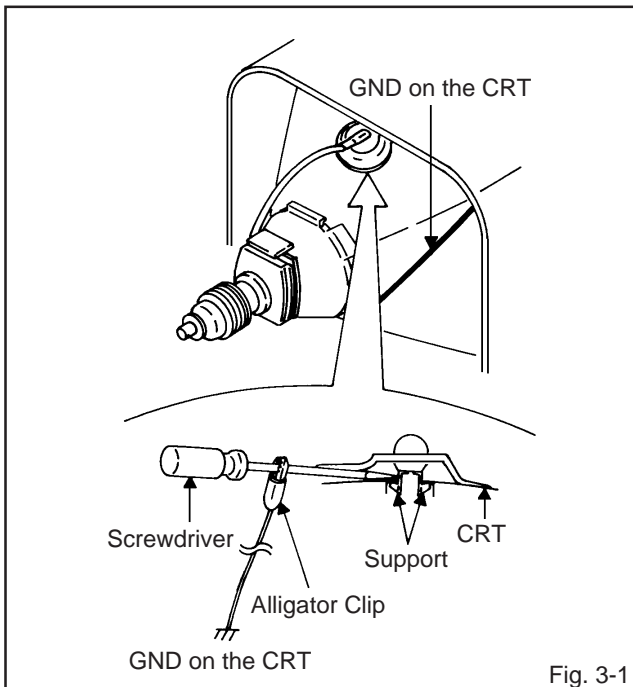


Fig. 3-1

2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support. (Refer to Fig. 3-2.)

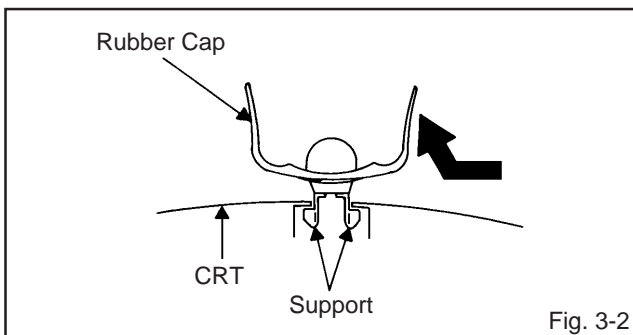


Fig. 3-2

3. After one side is removed, pull in the opposite direction to remove the other.

### NOTE

Take care not to damage the Rubber Cap.

### INSTALLATION

1. Clean the spot where the cap was located with a small amount of alcohol. (Refer to Fig. 3-3.)

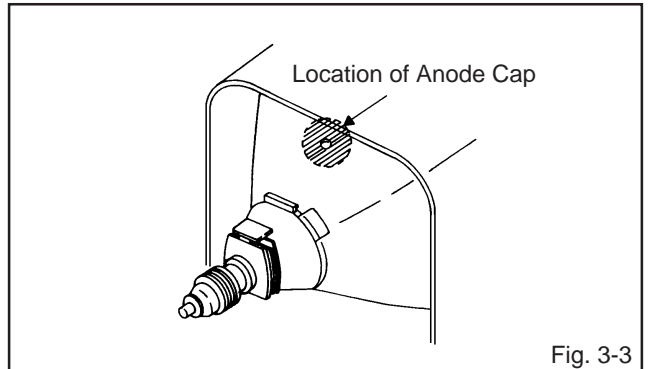


Fig. 3-3

### NOTE

Confirm that there is no dirt, dust, etc. at the spot where the cap was located.

2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. (Refer to Fig. 3-4.)

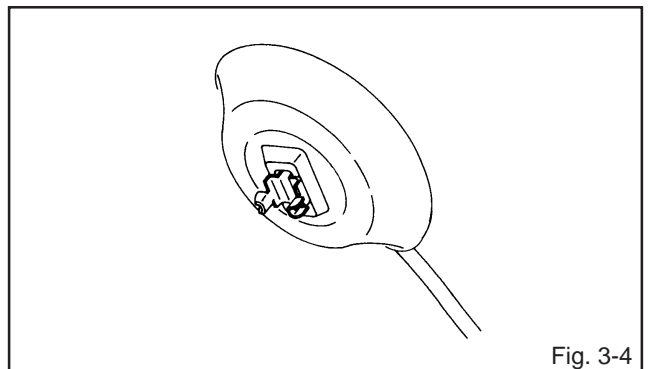


Fig. 3-4

4. Insert one end of the Anode Support into the anode button, then the other as shown in Fig. 3-5.

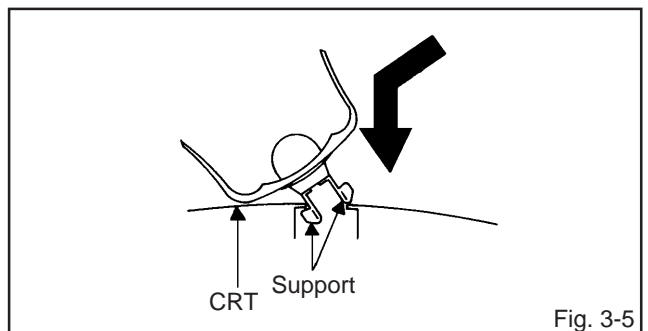


Fig. 3-5

5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

## KEY TO ABBREVIATIONS

<b>A</b>	<b>A/C</b>	: Audio/Control	<b>H.SW</b>	: Head Switch	
	<b>ACC</b>	: Automatic Color Control	<b>Hz</b>	: Hertz	
	<b>AE</b>	: Audio Erase	<b>I</b>	<b>IC</b>	: Integrated Circuit
	<b>AFC</b>	: Automatic Frequency Control		<b>IF</b>	: Intermediate Frequency
	<b>AFT</b>	: Automatic Fine Tuning		<b>IND</b>	: Indicator
	<b>AFT DET</b>	: Automatic Fine Tuning Detect		<b>INV</b>	: Inverter
	<b>AGC</b>	: Automatic Gain Control	<b>K</b>	<b>KIL</b>	: Killer
	<b>AMP</b>	: Amplifier	<b>L</b>	<b>L</b>	: Left
	<b>ANT</b>	: Antenna		<b>LED</b>	: Light Emitting Diode
	<b>A.PB</b>	: Audio Playback		<b>LIMIT AMP</b>	: Limiter Amplifier
	<b>APC</b>	: Automatic Phase Control		<b>LM, LDM</b>	: Loading Motor
	<b>ASS'Y</b>	: Assembly		<b>LP</b>	: Long Play
	<b>AT</b>	: All Time		<b>L.P.F</b>	: Low Pass Filter
	<b>AUTO</b>	: Automatic		<b>LUMI.</b>	: Luminance
	<b>A/V</b>	: Audio/Video	<b>M</b>	<b>M</b>	: Motor
<b>B</b>	<b>BGP</b>	: Burst Gate Pulse		<b>MAX</b>	: Maximum
	<b>BOT</b>	: Beginning of Tape		<b>MINI</b>	: Minimum
	<b>BPF</b>	: Bandpass Filter		<b>MIX</b>	: Mixer, mixing
	<b>BRAKE SOL</b>	: Brake Solenoid		<b>MM</b>	: Monostable Multivibrator
	<b>BUFF</b>	: Buffer		<b>MOD</b>	: Modulator, Modulation
	<b>B/W</b>	: Black and White		<b>MPX</b>	: Multiplexer, Multiplex
<b>C</b>	<b>C</b>	: Capacitance, Collector		<b>MS SW</b>	: Mecha State Switch
	<b>CASE</b>	: Cassette	<b>N</b>	<b>NC</b>	: Non Connection
	<b>CAP</b>	: Capstan		<b>NR</b>	: Noise Reduction
	<b>CARR</b>	: Carrier	<b>O</b>	<b>OSC</b>	: Oscillator
	<b>CH</b>	: Channel		<b>OPE</b>	: Operation
	<b>CLK</b>	: Clock	<b>P</b>	<b>PB</b>	: Playback
	<b>CLOCK (SY-SE)</b>	: Clock (Syscon to Servo)		<b>PB CTL</b>	: Playback Control
	<b>COMB</b>	: Combination, Comb Filter		<b>PB-C</b>	: Playback-Chrominance
	<b>CONV</b>	: Converter		<b>PB-Y</b>	: Playback-Luminance
	<b>CPM</b>	: Capstan Motor		<b>PCB</b>	: Printed Circuit Board
	<b>CTL</b>	: Control		<b>P. CON</b>	: Power Control
	<b>CYL</b>	: Cylinder		<b>PD</b>	: Phase Detector
	<b>CYL-M</b>	: Cylinder-Motor		<b>PG</b>	: Pulse Generator
	<b>CYL SENS</b>	: Cylinder-Sensor		<b>P-P</b>	: Peak-to Peak
<b>D</b>	<b>DATA (SY-CE)</b>	: Data (Syscon to Servo)	<b>R</b>	<b>R</b>	: Right
	<b>dB</b>	: Decibel		<b>REC</b>	: Recording
	<b>DC</b>	: Direct Current		<b>REC-C</b>	: Recording-Chrominance
	<b>DD Unit</b>	: Direct Drive Motor Unit		<b>REC-Y</b>	: Recording-Luminance
	<b>DEMODO</b>	: Demodulator		<b>REEL BRK</b>	: Reel Brake
	<b>DET</b>	: Detector		<b>REEL S</b>	: Reel Sensor
	<b>DEV</b>	: Deviation		<b>REF</b>	: Reference
<b>E</b>	<b>E</b>	: Emitter		<b>REG</b>	: Regulated, Regulator
	<b>EF</b>	: Emitter Follower		<b>REW</b>	: Rewind
	<b>EMPH</b>	: Emphasis		<b>REV, RVS</b>	: Reverse
	<b>ENC</b>	: Encoder		<b>RF</b>	: Radio Frequency
	<b>ENV</b>	: Envelope		<b>RMC</b>	: Remote Control
	<b>EOT</b>	: End of Tape		<b>RY</b>	: Relay
	<b>EQ</b>	: Equalizer	<b>S</b>	<b>S. CLK</b>	: Serial Clock
	<b>EXT</b>	: External		<b>S. COM</b>	: Sensor Common
<b>F</b>	<b>F</b>	: Fuse		<b>S. DATA</b>	: Serial Data
	<b>FBC</b>	: Feed Back Clamp		<b>SEG</b>	: Segment
	<b>FE</b>	: Full Erase		<b>SEL</b>	: Select, Selector
	<b>FF</b>	: Fast Forward, Flipflop		<b>SENS</b>	: Sensor
	<b>FG</b>	: Frequency Generator		<b>SER</b>	: Search Mode
	<b>FL SW</b>	: Front Loading Switch		<b>SI</b>	: Serial Input
	<b>FM</b>	: Frequency Modulation		<b>SIF</b>	: Sound Intermediate Frequency
	<b>FSC</b>	: Frequency Sub Carrier		<b>SO</b>	: Serial Output
	<b>FWD</b>	: Forward		<b>SOL</b>	: Solenoid
<b>G</b>	<b>GEN</b>	: Generator		<b>SP</b>	: Standard Play
	<b>GND</b>	: Ground		<b>STB</b>	: Serial Strobe
<b>H</b>	<b>H.P.F</b>	: High Pass Filter		<b>SW</b>	: Switch



## KEY TO ABBREVIATIONS

<b>S</b>	<b>SYNC</b>	:	Synchronization
	<b>SYNC SEP</b>	:	Sync Separator, Separation
<b>T</b>	<b>TR</b>	:	Transistor
	<b>TRAC</b>	:	Tracking
	<b>TRICK PB</b>	:	Trick Playback
	<b>TP</b>	:	Test Point
<b>U</b>	<b>UNREG</b>	:	Unregulated
<b>V</b>	<b>V</b>	:	Volt
	<b>VCO</b>	:	Voltage Controlled Oscillator
	<b>VIF</b>	:	Video Intermediate Frequency
	<b>VP</b>	:	Vertical Pulse, Voltage Display
	<b>V.PB</b>	:	Video Playback
	<b>VR</b>	:	Variable Resistor
	<b>V.REC</b>	:	Video Recording
	<b>VSF</b>	:	Visual Search Fast Forward
	<b>VSR</b>	:	Visual Search Rewind
	<b>VSS</b>	:	Voltage Super Source
	<b>V-SYNC</b>	:	Vertical-Synchronization
	<b>VT</b>	:	Voltage Tuning
<b>X</b>	<b>X'TAL</b>	:	Crystal
<b>Y</b>	<b>Y/C</b>	:	Luminance/Chrominance

## SERVICE MODE LIST

This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily.

To enter SERVICE MODE, unplug AC cord till lost actual clock time. Then press and hold Vol (-) button of main unit and remocon key simultaneously.

The both pressing of set key and remote control key will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

Set Key	Remocon Key	Operations
VOL. (-) MIN	0	Releasing of V-CHIP PASSWORD.
VOL. (-) MIN	1	Initialization of the factory. NOTE: Do not use this for the normal servicing.
VOL. (-) MIN	2	Horizontal position adjustment of OSD. NOTE: Also can be adjusted by using the Adjustment MENU. Refer to the "ELECTRICAL ADJUSTMENT" (OSD HORIZONTAL).
VOL. (-) MIN	3	Adjust the PG SHIFTER automatically. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	4	Adjust the PG SHIFTER manually. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	5	Adjusting of the Tracking to the center position. NOTE: Also can be adjusted by pressing the ATR button for more than 2 seconds during PLAY.
VOL. (-) MIN	6	POWER ON total hours and PLAY/REC total hours are displayed on the screen. Refer to the "PREVENTIVE CHECKS AND SERVICE INTERVALS" (CONFIRMATION OF USING HOURS).  Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "NOTE FOR THE REPLACING OF MEMORY IC".
VOL. (-) MIN	8	Writing of EEPROM initial data. NOTE: Do not use this for the normal servicing.
VOL. (-) MIN	9	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).

Method	Operations
Press the ATR button on the remote control for more than 2 seconds during PLAY.	Adjusting of the Tracking to the center position. Refer to the "MECHANICAL ADJUSTMENT" (GUIDE ROLLER) and "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
Make the short circuit between the test point of SERVICE and the GND.	The EOT/BOT/Reel sensor do not work at this moment. Refer to the "PREPARATION FOR SERVICING"

## PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage. Unless maintenance is properly carried out, the following service intervals may be quite shortened as harmful effects may be had on other parts. Also, long term storage or misuse may cause transformation and aging of rubber parts.

Time Parts Name	500 hours	1,000 hours	1,500 hours	2,000 hours	3,000 hours	Notes
Audio Control Head	■	■	■	■	■	Clean those parts in contact with the tape.
Full Erase Head (Recorder only)	■	■	■	■	■	
Capstan Belt			■	■	●	Clean the rubber, and parts which the rubber touches.
Pinch Roller	■	■	■	■	■ ●	
Capstan DD Unit					●	
Loading Motor					●	
Tension Band					●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	Replace when rolling becomes abnormal.
Cylinder Unit	■	■	■	■	●	Clean the Head

- : Clean  
● : Replace

### CONFIRMATION OF USING HOURS

POWER ON total hours and PLAY/REC total hours can be checked on the screen. Total hours are displayed in 16 system of notation.

**NOTE: The confirmation of using hours will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.**

1. Set the VOLUME to minimum.
2. While holding down VOLUME button on front cabinet, press key 6 on remote control simultaneously.
3. After the confirmation of using hours, turn off the power.

INIT 00 83	Initial setting content of MEMORY IC.
POWER ON 0010	POWER ON total hours.
PLAY/REC 0003	PLAY/REC total hours.

(16 x 16 x 16 x thousands digit value) + (16 x 16 x hundreds digit value) + (16 x tens digit value) + (ones digit value)

# PREVENTIVE CHECKS AND SERVICE INTERVALS

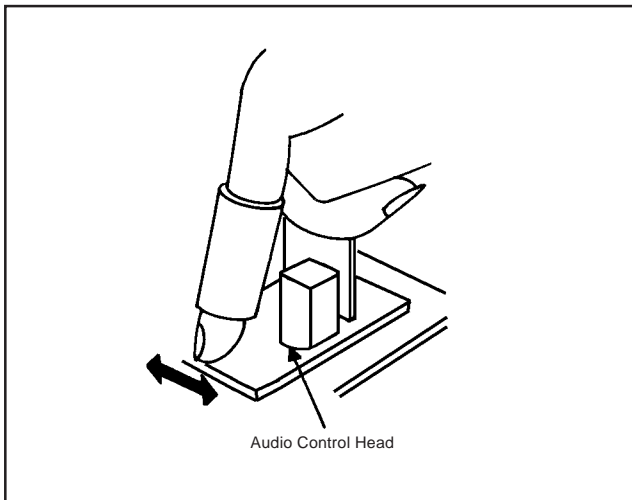
## CLEANING

### NOTE

After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

### 1. AUDIO CONTROL HEAD

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol and clean the audio control head by wiping it horizontally. Clean the full erase head in the same manner. **(Refer to the figure below.)**



### 2. TAPE RUNNING SYSTEM

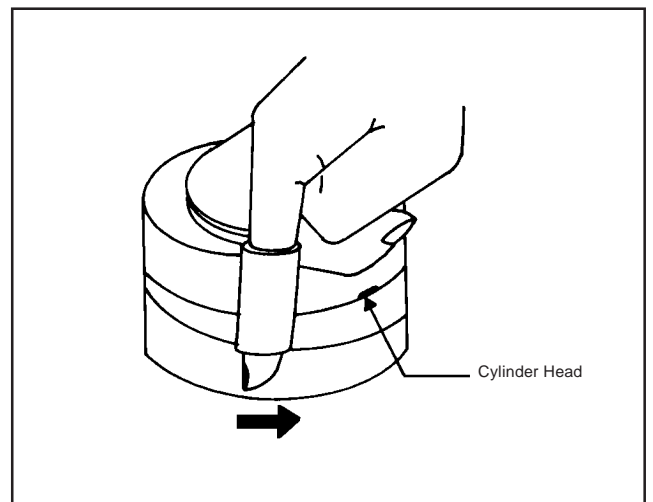
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

### 3. CYLINDER

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly. Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). **(Refer to the figure below.)**

### NOTE

Do not exert force against the cylinder head. Do not move the chamois upward or downward on the head. Use the chamois one by one.



## NOTE FOR THE REPLACING OF MEMORY IC

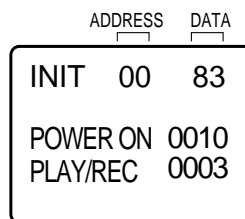
If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

**NOTE: Initial Data setting will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.**

ADDRESS	DATA	ADDRESS	DATA	ADDRESS	DATA	ADDRESS	DATA	ADDRESS	DATA
00	88	0A	10	14	00	1E	8D	28	01
01	1B	0B	94	15	00	1F	00	29	00
02	C2	0C	99	16	30	20	00		
03	63	0D	00	17	05	21	00		
04	43	0E	00	18	08	22	00		
05	14	0F	10	19	00	23	00		
06	34	10	8C	1A	A9	24	00		
07	29	11	68	1B	0F	25	00		
08	50	12	5C	1C	04	26	00		
09	38	13	53	1D	39	27	00		

**Table 1**

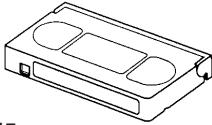
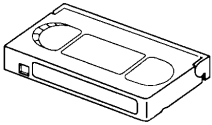
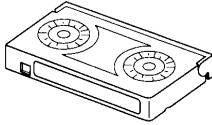
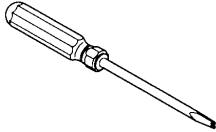
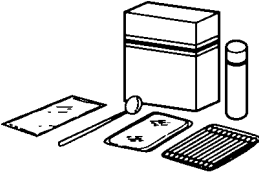


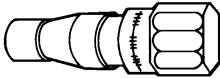
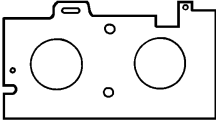
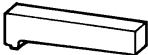
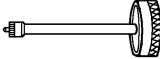
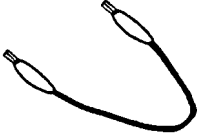
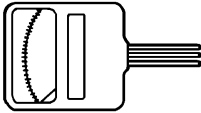
1. Enter DATA SET mode by setting VOLUME to minimum.
2. While holding down VOLUME button on front cabinet, press key 6 on remote control simultaneously. ADDRESS and DATA should appear as FIG 1.



**Fig. 1**

3. ADDRESS is now selected and should "blink". Using the SET + or - keys on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using SET + or - until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input. The unit will now have the correct DATA for the new MEMORY IC.

## SERVICING FIXTURES AND TOOLS

<p>Alignment Tape</p>  <p>ST-N5 ST-NF</p>	<p>Back tension cassette gauge</p>  <p>70909103</p>	<p>Torque cassette gauge (KT-300NR)</p>  <p>70909199</p>	<p>Taper nut driver</p>  <p>70909228</p>
<p>VTR cleaning kit</p> 	<p>VTR lubrication kit</p> 	<p>Grease</p> 	<p>JG002B Adapter JG002E Dial Torque Gauge (10~90gf•cm) JG002F (60~600gf•cm)</p> 
<p>JG022 Master Plane</p> 	<p>JG024A Reel Disk Height Adjustment Jig</p> 	<p>JG153 X Value Adjustment Screwdriver</p> 	<p>JG154 Cable</p> 
<p>Tentelometer</p> 			

Part No.	Remarks
JG002B	VSR Torque, Brake Torque (S Reel/T Reel Ass'y)
JG002E	Brake Torque (T Reel Ass'y)
JG002F	VSR Torque, Brake Torque (S Reel)
JG153	X Value Adjustment
JG022/JG024A	Reel Disk Height Adjustment
JG154	Used to connect the test point of SERVICE and GROUND

## PREPARATION FOR SERVICING

### How to use the Servicing Fixture

1. Unplug the connector CP353, CP354, then remove the TV/VCR Block from the set.
2. Remove the Operation PCB from the set, then connect it with the Syscon PCB.  
If necessary, connect CP353 (Front A/V Jack Input Terminal)
3. Short circuit between **TP1001** and **Ground** with the cable JG154.  
(Refer to **MAJOR COMPONENTS LOCATION GUIDE**)
4. The EOT, BOT and Reel Sensor do not work at this moment.  
At that time, the STOP/EJECT button is available to insert and eject the Cassette Tape.

# MECHANICAL ADJUSTMENTS

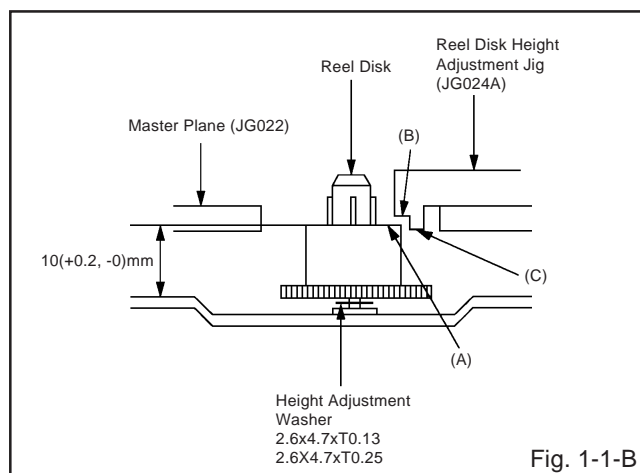
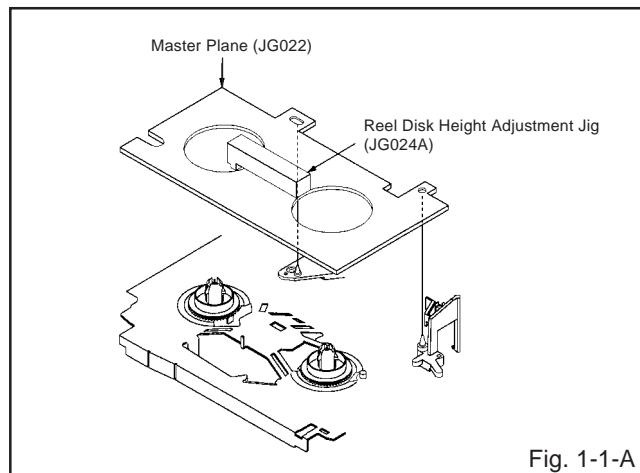
## 1. CONFIRMATION AND ADJUSTMENT

Read the following NOTES before starting work.

- Place an object which weighs between 450g~500g on the Cassette Tape to keep it steady when you want to make the tape run without the Cassette Holder. (Do not place an object which weighs over 500g.)
- When you activate the deck without the Cassette Holder, short circuit between **TP1001** and **GND**. (Refer to **ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE**) In this condition the BOT/EOT/Reel Sensor will not function.

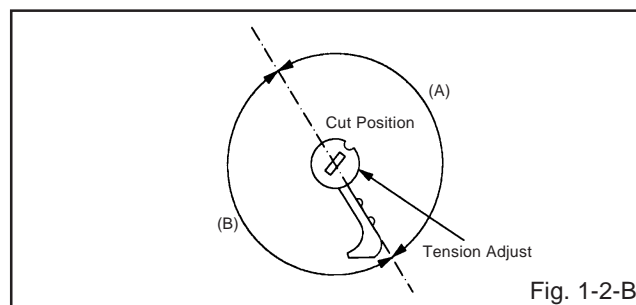
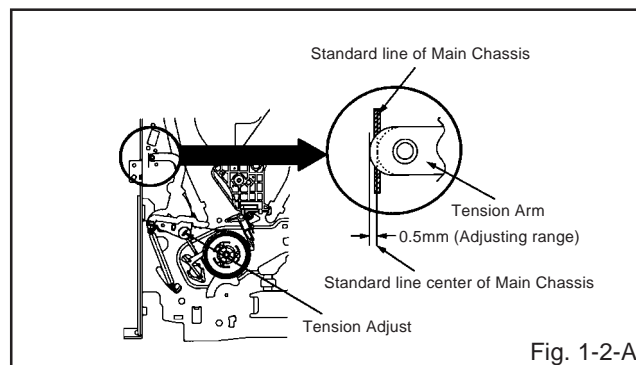
### 1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

1. Turn on the power and set to the STOP mode.
2. Set the master plane (**JG022**) and reel disk height adjustment jig (**JG024A**) on the mechanism framework, taking care not to scratch the drum, as shown in **Fig. 1-1-A**.
3. Confirm that "A" of the reel disk is lower than "B" of the reel disk height adjustment jig (**JG024A**), and is higher than "C". If it is not enough height, adjust to  $10(+0.2, -0)$  mm with the height adjustment washer.
4. Adjust the other reel in the same way.



### 1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

1. Set to the PLAY mode.
2. Adjust the Tension Adjust until the edge of the Tension Arm is positioning within 0.5mm range from the standard line center of Main Chassis. After this adjustment, confirm that the cut position is located in "A" area as shown in **Fig. 1-2-B**. If it is located in "B" area, adjust again.
3. While turning the S Reel clockwise, confirm that the edge of the Tension Arm is located in the position described above.

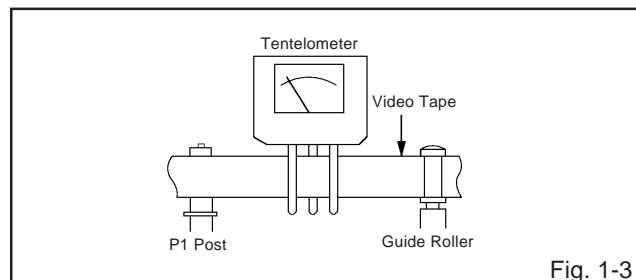


### 1-3: CONFIRMATION OF PLAYBACK TORQUE AND BACK TENSION TORQUE DURING PLAYBACK

1. Load a video tape (T-120) recorded in standard speed mode. Set the unit to the PLAY mode.
2. Install the tentelometer as shown in **Fig. 1-3**. Confirm that the meter indicates  $20 \pm 2$ gf in the beginning of playback.

#### • USING A CASSETTE TYPE TORQUE TAPE (**KT-300NR**)

1. After confirmation and adjustment of Tension Post position (Refer to item 1-2), load the cassette type torque tape (**KT-300NR**) and set to the PLAY mode.
2. Confirm that the right meter of the torque tape indicates  $60\sim 110$ gf•cm during playback in SP mode.
3. Confirm that the left meter of the torque tape indicates  $25\sim 40$ gf•cm during playback in SP mode.



# MECHANICAL ADJUSTMENTS

## 1-4: CONFIRMATION OF VSR TORQUE

1. Operate within 4~5 seconds after the reel disk begins to turn.
2. Install the Torque Gauge (JG002F) and Adapter (JG002B) on the S Reel. Set to the Rewind mode. (Refer to Fig.1-4)
3. Then, confirm that it indicates 120~180gf•cm.

### NOTE

Install the Torque Gauge on the reel disk firmly. Press the REW button to turn the reel disk.

## 1-5: CONFIRMATION OF REEL BRAKE TORQUE

(S Reel Brake) (Refer to Fig. 1-4)

1. Set to the STOP mode.
2. Move the Idler Ass'y from the S Reel.
3. Install the Torque Gauge (JG002F) and Adapter (JG002B) on the S Reel. Turn the Torque Gauge (JG002F) clockwise.
4. Then, confirm that it indicates 60~100gf•cm.

(T Reel Brake) (Refer to Fig. 1-4)

1. Set to the STOP mode.
2. Move the Idler Ass'y from the T Reel.
3. Install the Torque Gauge (JG002E) and Adapter (JG002B) on the T reel. Turn the Torque Gauge (JG002E) counterclockwise.
4. Then, confirm that it indicates 45~70gf•cm.

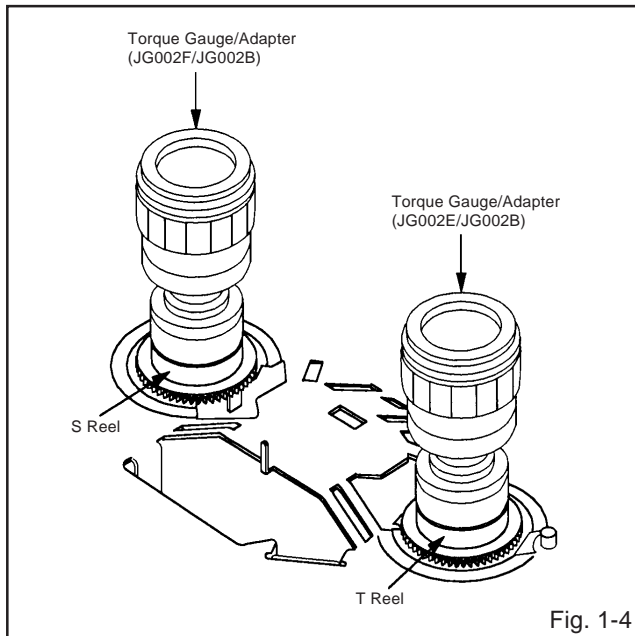


Fig. 1-4

### NOTE

If the torque is out of the range, replace the following parts.

Check item	Replacement Part
1-4	Idler Ass'y/Clutch Ass'y
1-5	T Brake Spring/Tension Spring

## 2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

### 2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape.
2. Connect CH-1 of the oscilloscope to TP4001 (Envelope) and CH-2 to TP1002 (SW Pulse).
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Trigger with SW Pulse and observe the envelope. (Refer to Fig. 2-1-A)
5. When observing the envelope, adjust the Taper Nut Driver slightly until the envelope will be flat. Even if you press the Tracking Button, adjust so that flatness is not moved so much.
6. Adjust so that the A : B ratio is better than 3 : 2 as shown in Fig. 2-1-B, even if you press the Tracking Button to move the envelope (The envelope waveform will begin to decrease when you press the Tracking Button).
7. Adjust the PG shifter during playback. (Refer to the ELECTRICAL ADJUSTMENTS)

### NOTE

After adjustment, confirm and adjust A/C head. (Refer to item 2-2)

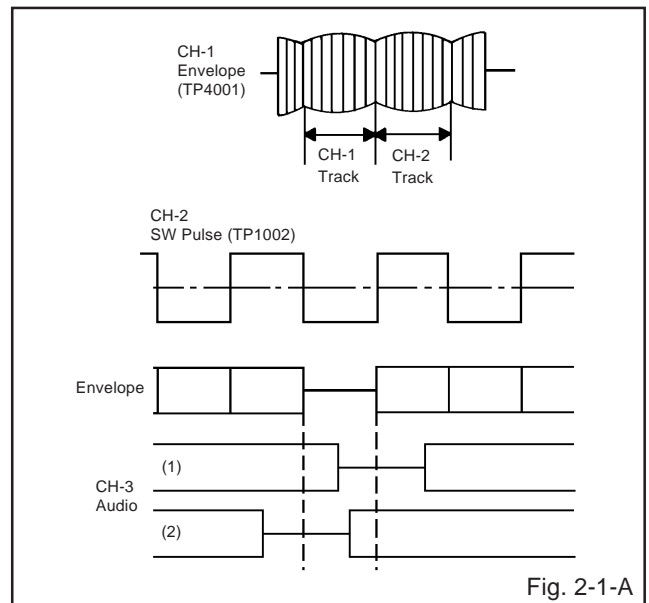


Fig. 2-1-A

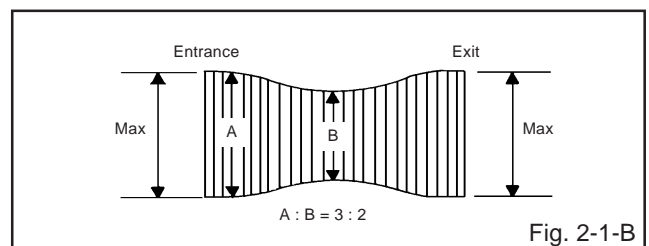


Fig. 2-1-B

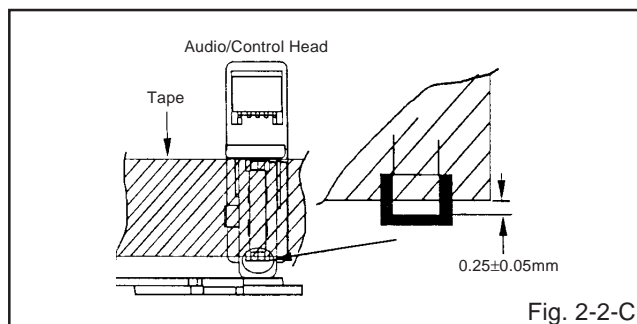
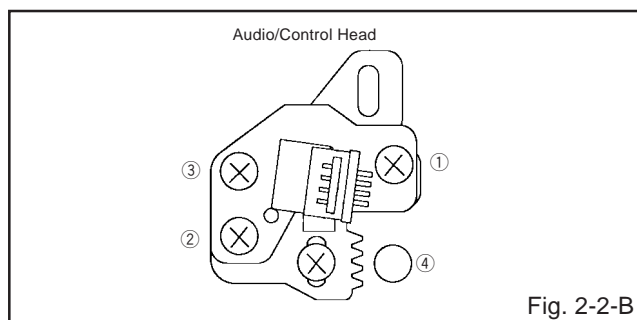
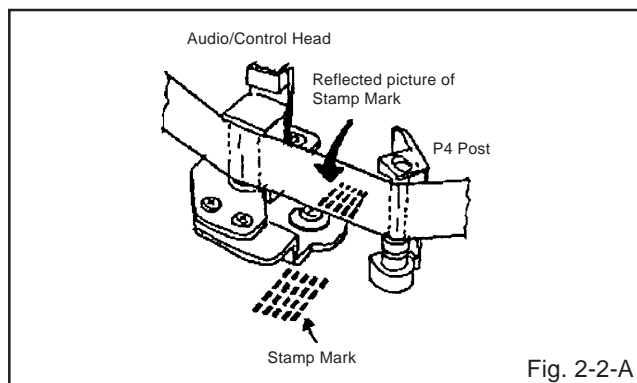


## MECHANICAL ADJUSTMENTS

### 2-2: CONFIRMATION AND ADJUSTMENT OF AUDIO/CONTROL HEAD

When the Tape Running Mechanism does not work well, adjust the following items.

1. Playback the VHS Alignment Tape.
2. Confirm that the reflected picture of stamp mark is appeared on the tape prior to P4 Post as shown in **Fig. 2-2-A**.
  - a) When the reflected picture is distorted, turn the screw ① clockwise until the distortion is disappeared.
  - b) When the reflected picture is not distorted, turn the screw ① counterclockwise until little distortion is appeared, then adjust the a).
3. Turn the screw ② to set the audio level to maximum.
4. Confirm that the bottom of the Audio/Control Head and the bottom of the tape is shown in **Fig. 2-2-C**.
  - c) When the height is not correct, turn the screw ③ to adjust the height. Then, adjust the 1~3 again.

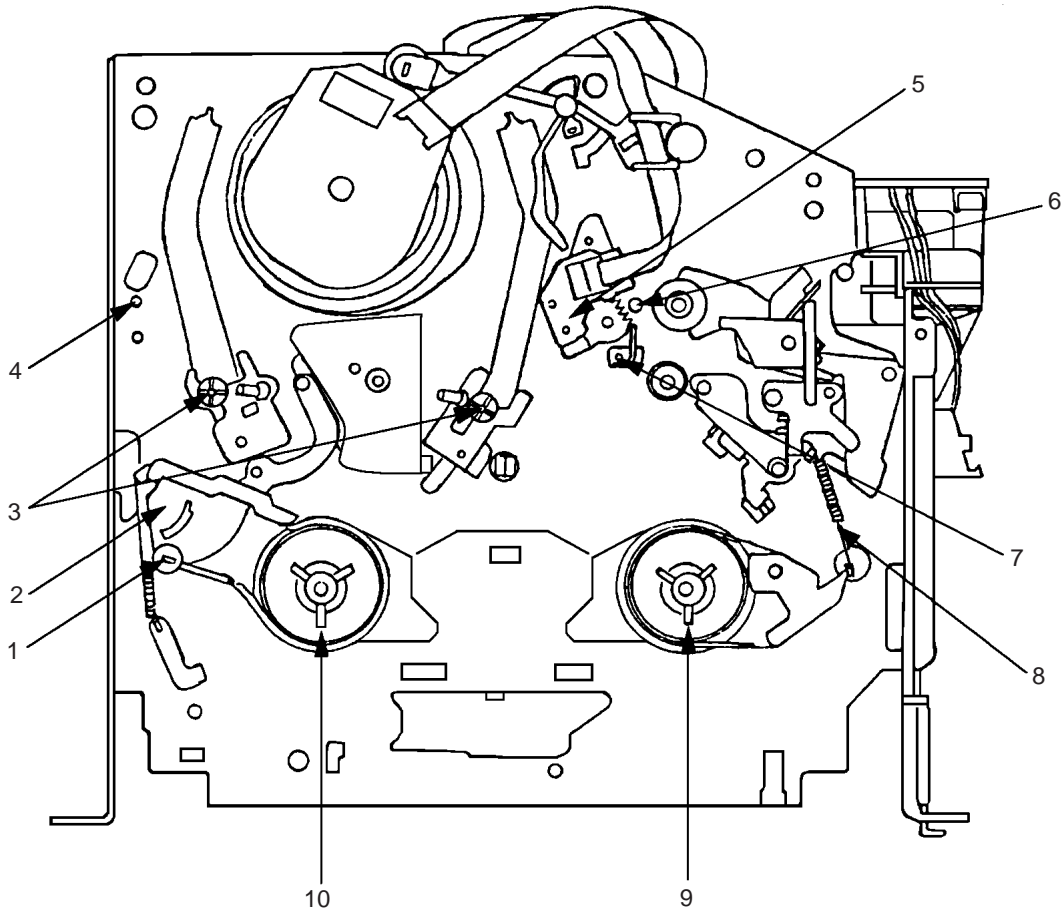


### 2-3: TAPE RUNNING ADJUSTMENT (X VALUE ADJUSTMENT)

1. Confirm and adjust the height of the Reel Disk. **(Refer to item 1-1)**
2. Confirm and adjust the position of the Tension Post. **(Refer to item 1-2)**
3. Adjust the Guide Roller. **(Refer to item 2-1)**
4. Confirm and adjust the Audio/Control Head. **(Refer to item 2-2)**
5. Connect CH-1 of the oscilloscope to **TP4001**, CH-2 to **TP1002** and CH-3 to **HOT side of Audio Out Jack**.
6. Playback the VHS Alignment Tape.
7. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
8. Set the X Value adjustment driver (**JG153**) to the ④ of **Fig. 2-2-B**. Adjust X value so that the envelope waveform output becomes maximum. Check if the relation between Audio and Envelope waveform becomes (1) or (2) of **Fig. 2-1-A**.

# MECHANICAL ADJUSTMENTS

## 3. MECHANISM ADJUSTMENT PARTS LOCATION GUIDE



- |                       |                                   |
|-----------------------|-----------------------------------|
| 1. Tension Adjust     | 6. X value adjustment driver hole |
| 2. Tension Arm        | 7. P4 Post                        |
| 3. Guide Roller       | 8. T Brake Spring                 |
| 4. P1 Post            | 9. T Reel                         |
| 5. Audio/Control Head | 10. S Reel                        |

# ELECTRICAL ADJUSTMENTS

## 1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

### CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.  
Inferior silicon grease can damage IC's and transistors.
- When replacing IC's and transistors, use only specified silicon grease.  
Remove all old silicon before applying new silicon.

### On-Screen Display Adjustment

1. Unplug the AC plug for more than 5 seconds to set the clock to the non-setting state. Then, set the volume level to minimum.
2. Press the VOL. DOWN button on the set and the Channel button (9) on the remote control simultaneously to appear the adjustment mode on the screen as shown in Fig. 1-1.

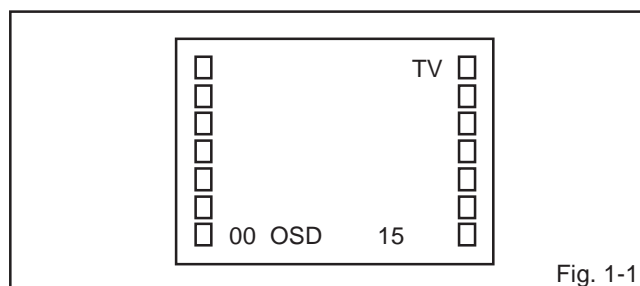


Fig. 1-1

3. Use the Channel UP/DOWN button or Channel button (0-9) on the remote control to select the options shown in Fig. 1-2.
4. Press the MENU button on the remote control to end the adjustments.

NO.	FUNCTION	NO.	FUNCTION
00	OSD H	13	BRIGHTNESS
01	CUT OFF	14	CONTRAST
02	RF AGC	15	COLOR
03	VIF VCO	16	TINT
04	H VCO	17	SHARPNESS
05	H PHASE	18	FM LEVEL
06	V SIZE	19	LEVEL
07	V SHIFT	20	SEPARATION 1
08	R DRIVE	21	SEPARATION 2
09	B DRIVE	22	TEST MONO
10	R BIAS	23	TEST STEREO
11	G BIAS	24	X-RAY TEST
12	B BIAS		

Fig. 1-2

## 2. BASIC ADJUSTMENTS (VCR SECTION)

### 2-1: PG SHIFTER

1. Connect CH-1 on the oscilloscope to TP1002 and CH-2 to pin 4 of CP1003.
2. Playback the alignment tape.
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Press the VOL. DOWN button on the set and the channel button (3) on the remote control simultaneously until the indicator REC disappears. If the indicator REC disappears, adjustment is completed.

(If the above adjustments doesn't work well:)

5. Press the VOL. DOWN button on the set and the channel button (3) on the remote control simultaneously until the indicator REC disappears.
6. When the REC indicator is blinking, press both VOL. DOWN button on the set and the channel button (4) on the remote control simultaneously and adjust the Tracking +/- button until the arising to the down of Head Switching Pulse becomes  $6.5 \pm 0.5H$ .  
(Refer to Fig. 2-1-A, B)
7. Press the Tracking Auto button.

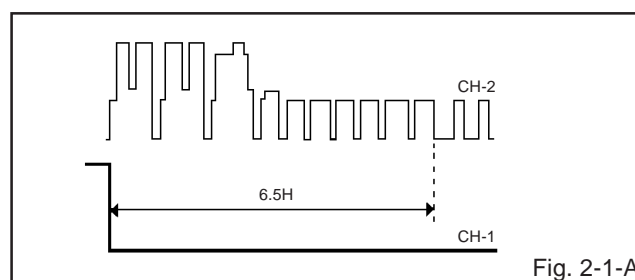


Fig. 2-1-A

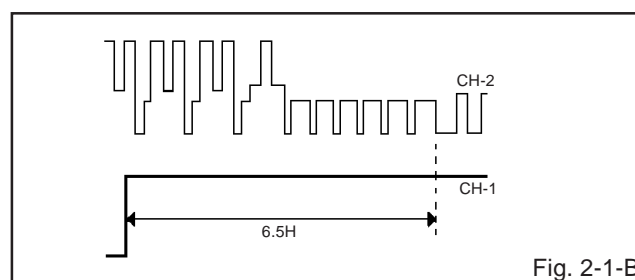


Fig. 2-1-B

### 2-2: VCO FREERUN

1. Place the set with Aging Test for more than 10 minutes.
2. Receive the VHF HIGH.
3. Disconnect the Antenna while receiving the VHF HIGH and set to the Noise screen.
4. Once turn off the Power and turn on the Power again.
5. Approx. 3 seconds later, input the Antenna again.
6. Connect the digital voltmeter between the pin 5 of CP351 and the pin 1 (GND) of CP351.
7. Activate the adjustment mode display of Fig. 1-1 and press the channel button (03) on the remote control to select "VIF VCO".
8. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is  $2.5 \pm 0.5V$ .

# ELECTRICAL ADJUSTMENTS

## 2-3: RF AGC

1. Receive a 70dB monoscope pattern.
2. Connect the digital voltmeter between the **pin 5 of CP351** and the **pin 1 (GND) of CP351**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(02)** on the remote control to select "RF AGC".
4. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is  $2.7 \pm 0.05V$ .

## (TV SECTION)

### 2-4: CONSTANT VOLTAGE

1. Connect the digital voltmeter to the **R520**.
2. Set condition is AV MODE without signal.
3. Using the remote control, set the brightness and contrast to normal position.
4. Adjust the **VR502** until the digital voltmeter is  $135 \pm 0.5V$ .

### 2-5: CUT OFF

1. Adjust the unit to the following settings.  
R BIAS=128, G BIAS=128, B BIAS=128,  
BRIGHTNESS=128, CONTRAST=100
2. Place the set with Aging Test for more than 15 minutes.
3. Set condition is AV MODE without signal.
4. Using the remote control, set the brightness and contrast to normal position.
5. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "CUT OFF".
6. Adjust the **Screen Volume** until a dim raster is obtained.

### 2-6: WHITE BALANCE

**NOTE:** Adjust after performing CUT OFF adjustment.

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the color bar pattern.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(10)** on the remote control to select "R.BIAS".
5. Using the VOL. UP/DOWN button on the remote control, adjust the R.BIAS.
6. Press the CH. UP/DOWN button on the remote control to select the "R.DRIVE", "B.DRIVE", "G.BIAS" or "B.BIAS".
7. Using the VOL. UP/DOWN button on the remote control, adjust the R.DRIVE, B.DRIVE, G.BIAS or B.BIAS.
8. Perform the above adjustments 6 and 7 until the white color is looked like a white.

### 2-7: FOCUS

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Turn the Focus Volume fully counterclockwise once.
4. Adjust the **Focus Volume** until picture is distinct.

### 2-8: HORIZONTAL PHASE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(05)** on the remote control to select "H PHASE".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

### 2-9: VERTICAL SHIFT

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(07)** on the remote control to select "V SHIFT".
4. Press the VOL. UP/DOWN button on the remote control until the horizontal line becomes fit to the notch of the shadow mask.

### 2-10: VERTICAL SIZE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(06)** on the remote control to select "V SIZE".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.

### 2-11: SUB BRIGHTNESS

1. Receive the black pattern\*. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(13)** on the remote control to select "BRIGHTNESS".
4. Press the VOL. UP/DOWN button on the remote control to adjust the screen brightness from bright to dim. Then set to the completely dim point.
5. Receive the black pattern\*. (Audio Video Input)
6. Press the TV GAME button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.

\*The Black Pattern means the whole black raster signal. Select the "RASTER" of the pattern generator, set to the OFF position for each R, G and B.

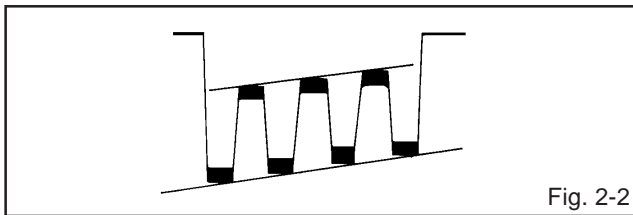
### 2-12: SUB CONTRAST

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(14)** on the remote control to select "CONTRAST".
2. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "85"
3. Press the TV GAME button on the remote control to set to the AV mode.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(14)** on the remote control.
5. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "82"

## ELECTRICAL ADJUSTMENTS

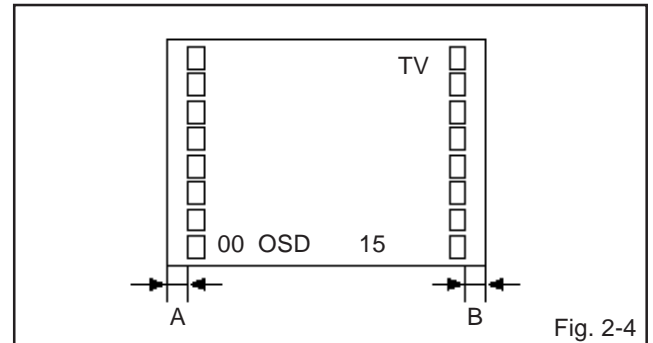
### 2-13: SUB TINT

1. Receive the color bar pattern. (RF Input)
2. Connect the synchro scope to **TP803**.
3. Using the remote control, set the brightness, contrast, color and tint to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**16**) on the remote control to select "TINT".
5. Press the VOL. UP/DOWN button on the remote control until the waveform becomes as shown in **Fig. 2-2**.
6. Receive the color bar pattern. (Audio Video Input)
7. Press the TV GAME button on the remote control to set to the AV mode. Then perform the above adjustments 2~5.



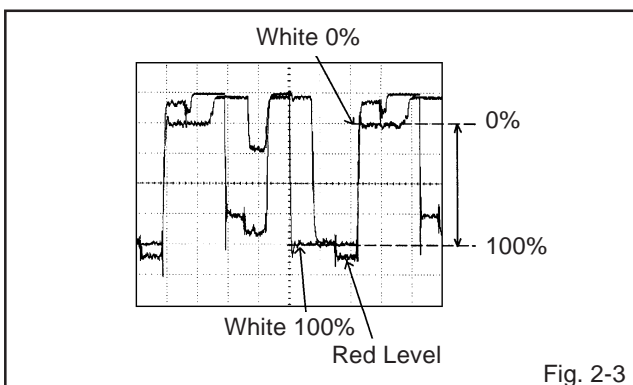
### 2-15: OSD HORIZONTAL

1. Activate the adjustment mode display of **Fig. 1-1**.
2. Press the VOL. UP/DOWN button on the remote control until the difference of A and B becomes minimum. (**Refer to Fig. 2-4**)



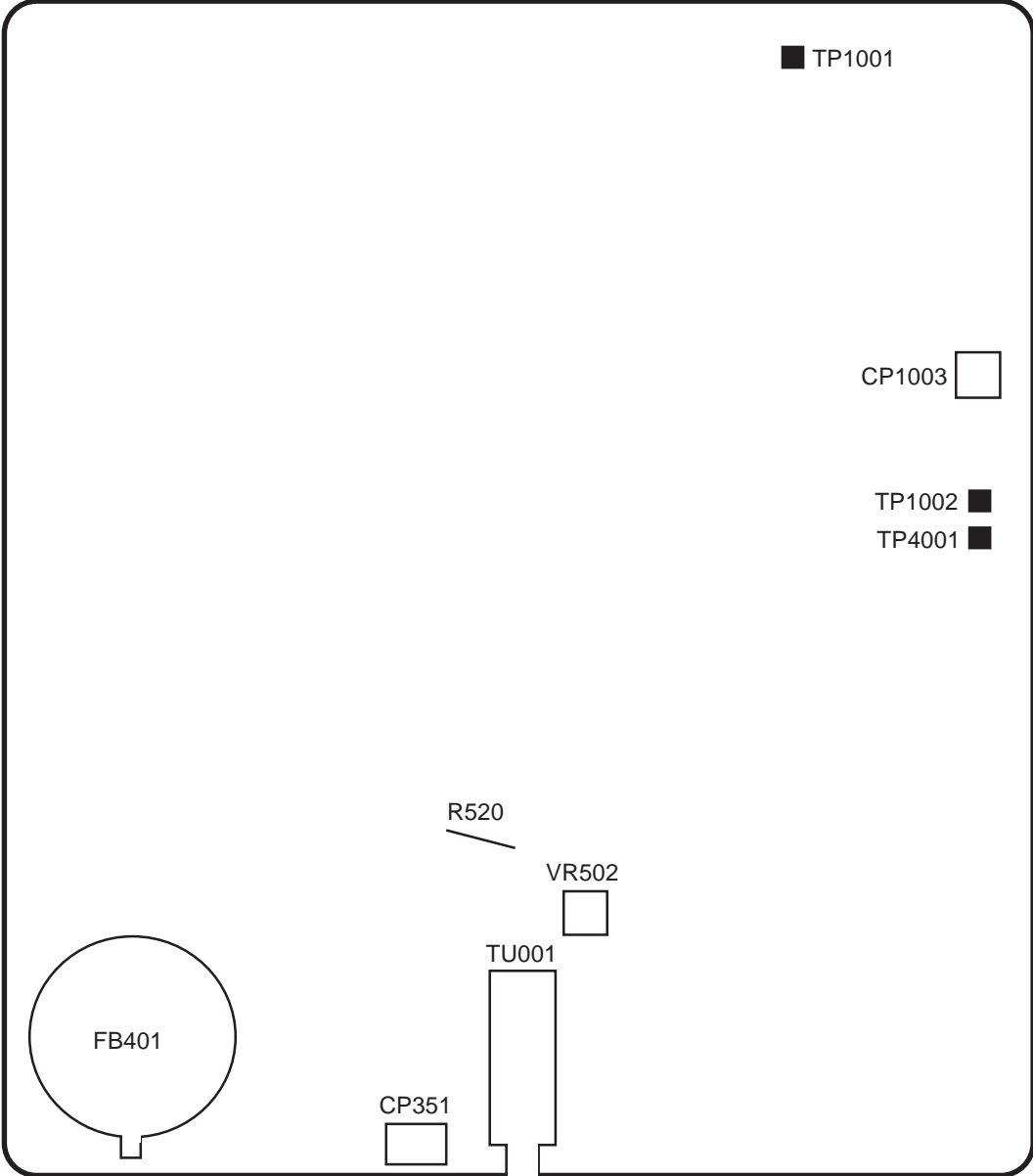
### 2-14: SUB COLOR

1. Receive the color bar pattern. (RF Input)
2. Connect the synchro scope to **TP801**.
3. Using the remote control, set the brightness, contrast, color and tint to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**15**) on the remote control to select "COLOR".
5. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 5 scales on the screen of the oscilloscope.
6. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to 110% of the white level. (**Refer to Fig. 2-3**)
7. Receive the color bar pattern. (Audio Video Input)
8. Press the TV GAME button on the remote control to set to the AV mode. Then perform the above adjustments 2~6.



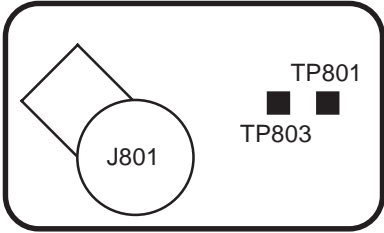
# ELECTRICAL ADJUSTMENTS

## 3. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE



FOCUS VOLUME  
SCREEN VOLUME

SYSCON



CRT

# ELECTRICAL ADJUSTMENTS

## 4. PURITY AND CONVERGENCE ADJUSTMENTS

### NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

### 4-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 4-1)**  
If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

### 4-2: PURITY

### NOTE

Adjust after performing adjustments in section 4-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.  
Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue colors.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

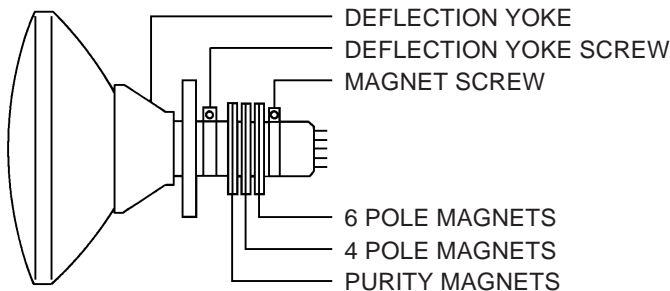


Fig. 4-1

### 4-3: STATIC CONVERGENCE

### NOTE

Adjust after performing adjustments in section 4-2.

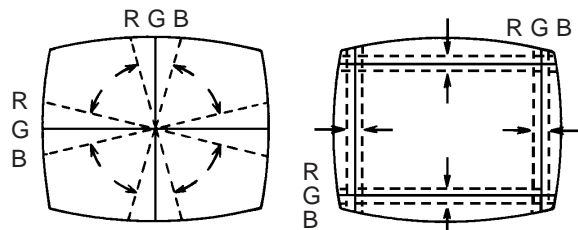
1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

### 4-4: DYNAMIC CONVERGENCE

### NOTE

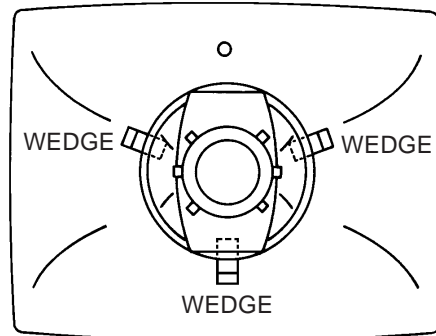
Adjust after performing adjustments in section 4-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left. **(Refer to Fig. 4-2-a)**
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke. **(Refer to Fig. 4-2-b)**



UPWARD/DOWNWARD SLANT RIGHT/LEFT SLANT

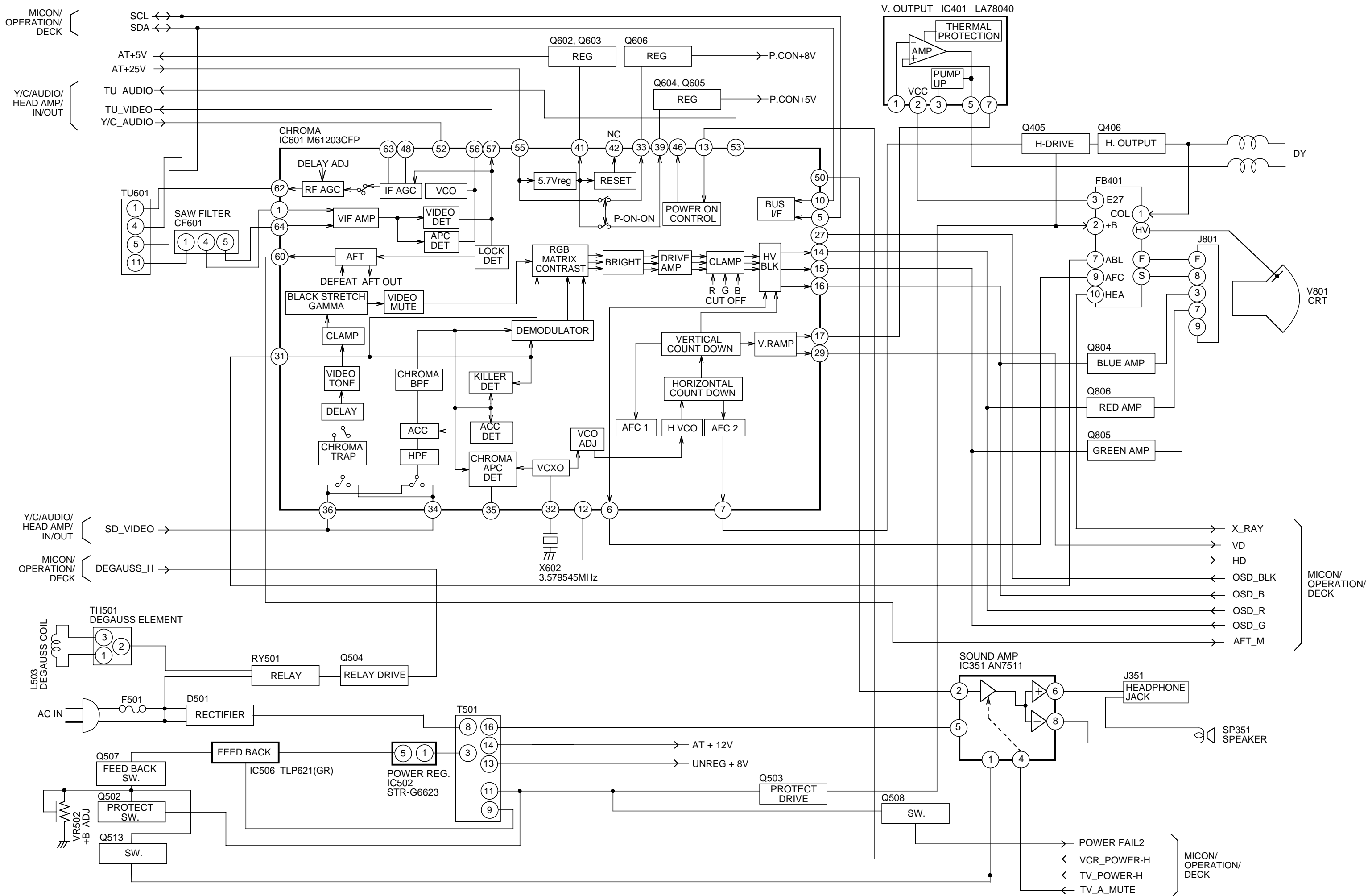
Fig. 4-2-a



WEDGE POSITION

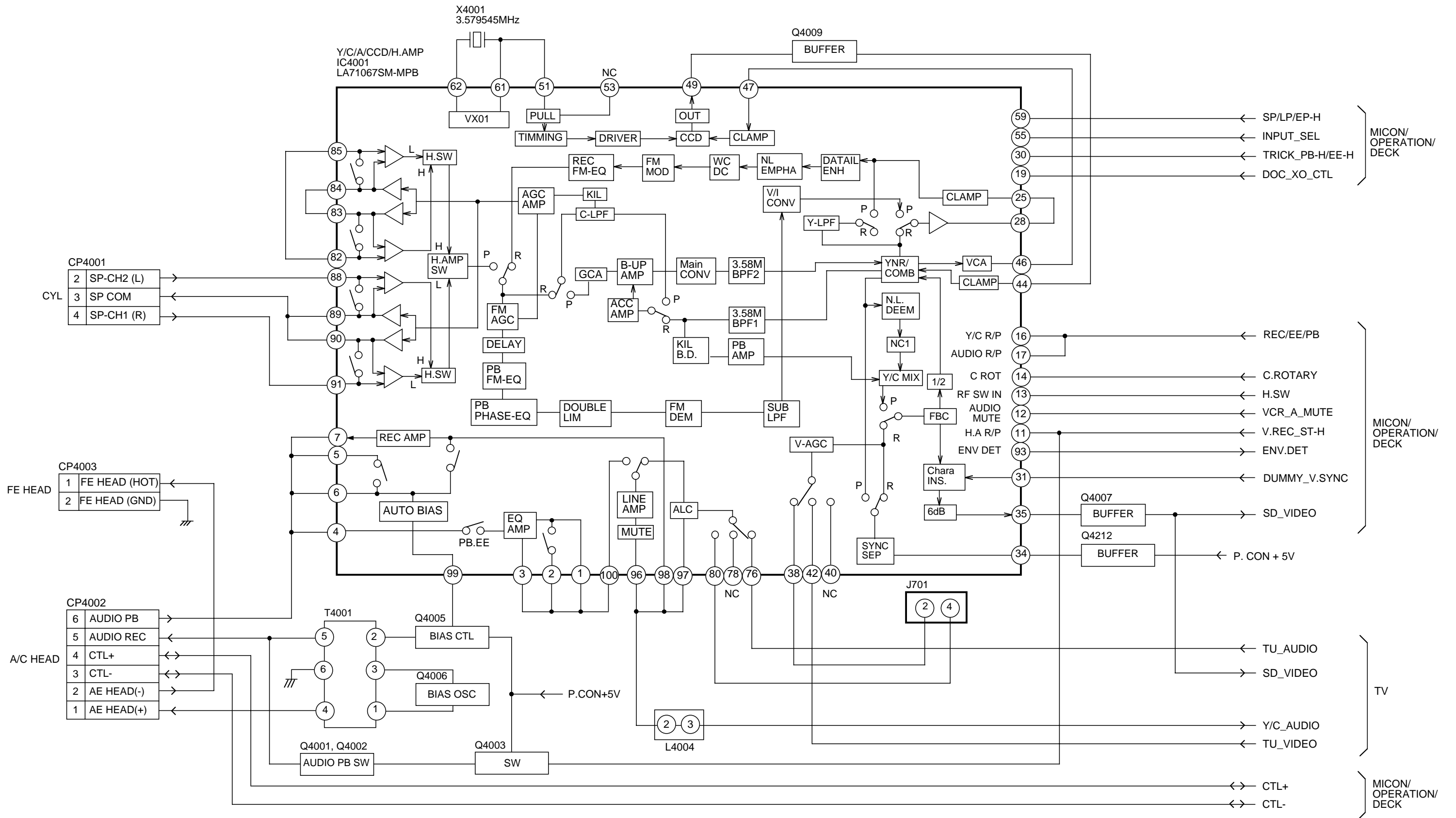
Fig. 4-2-b

# TV BLOCK DIAGRAM

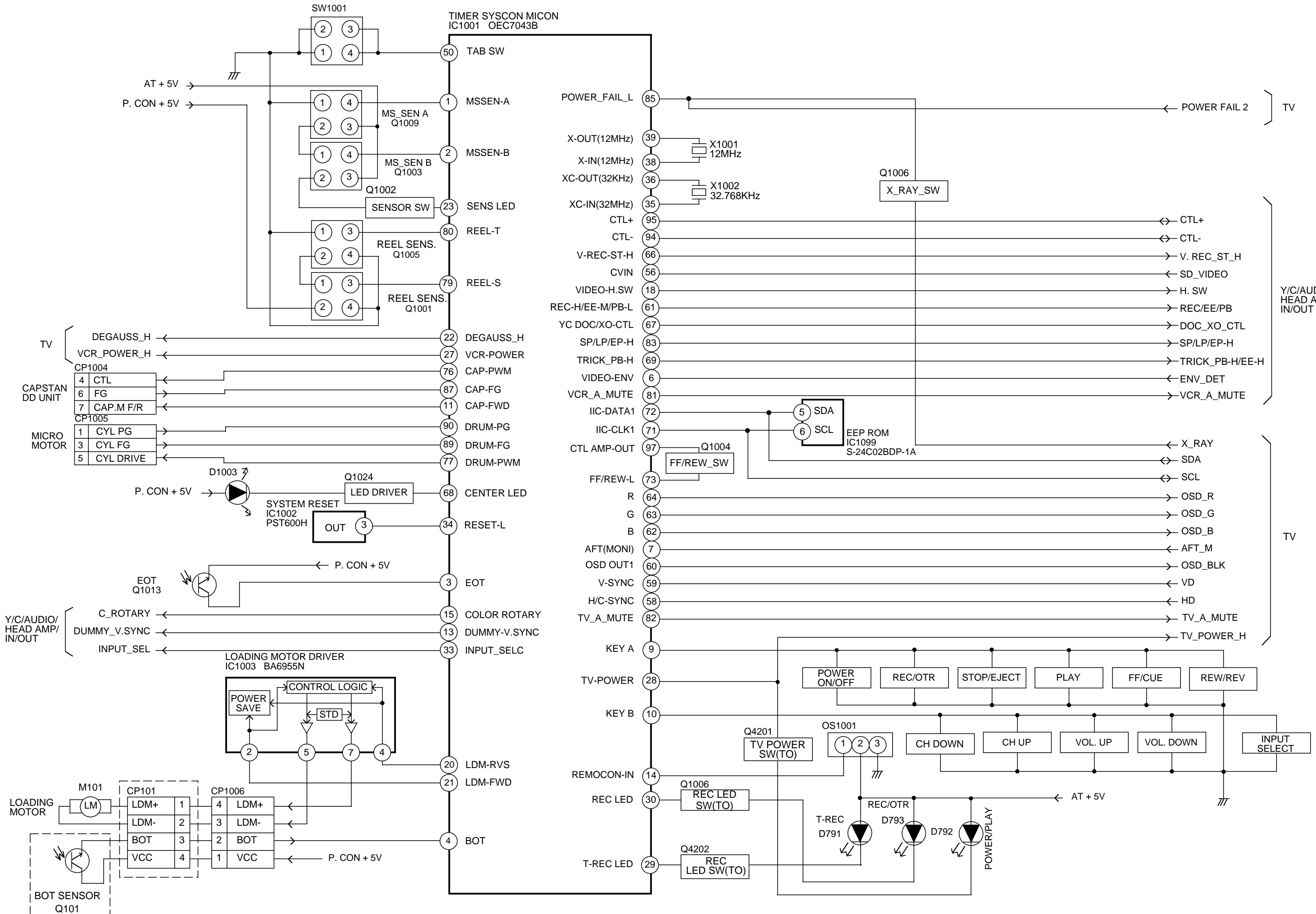




# Y/C/AUDIO/HEAD AMP/IN/OUT BLOCK DIAGRAM

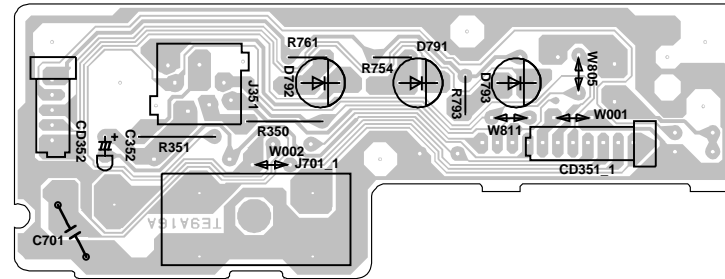


# MICON/OPERATION/DECK BLOCK DIAGRAM

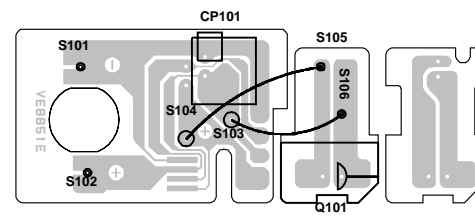


# PRINTED CIRCUIT BOARDS

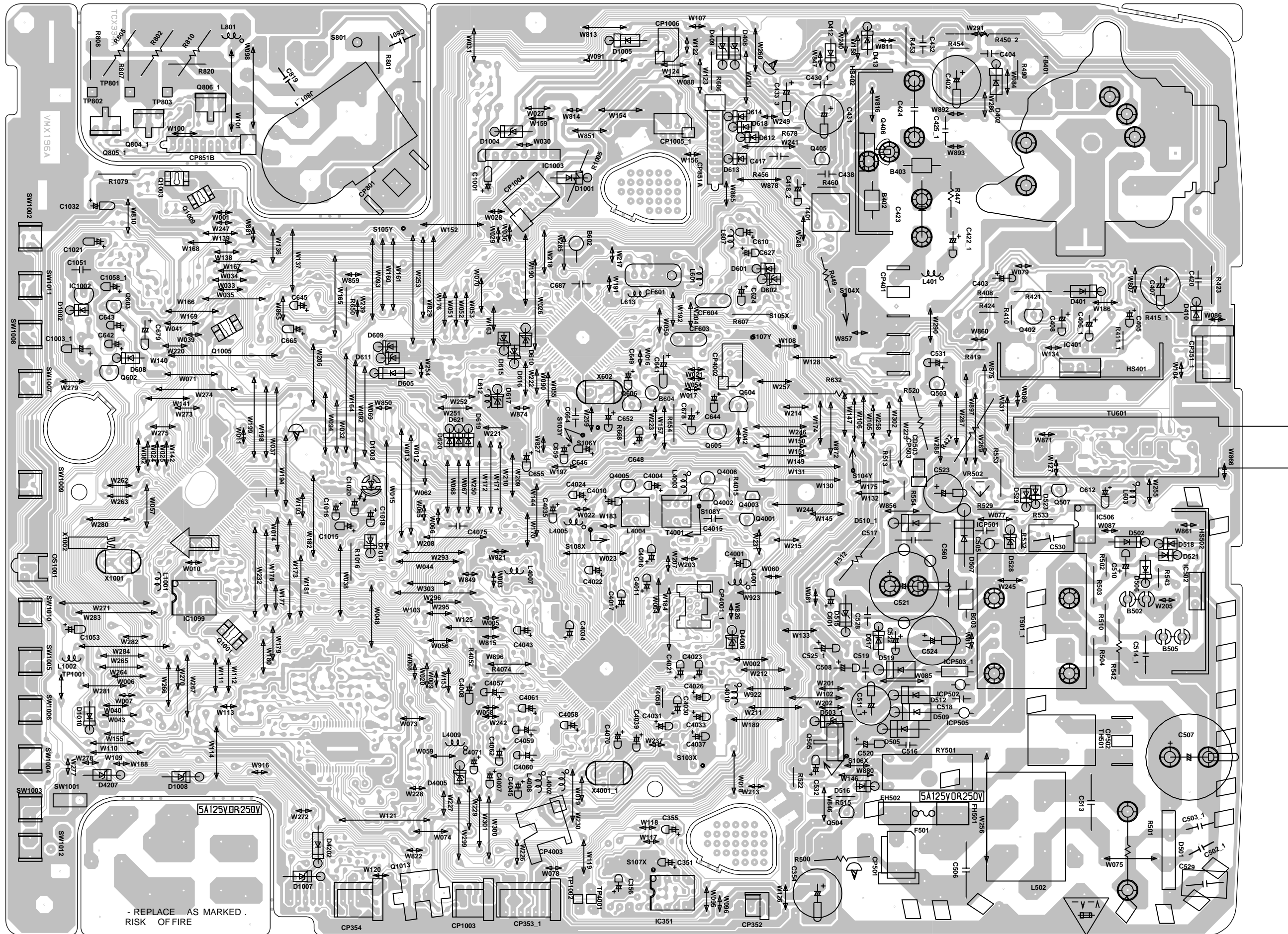
## OPERATION SOLDER SIDE



## DECK SOLDER SIDE



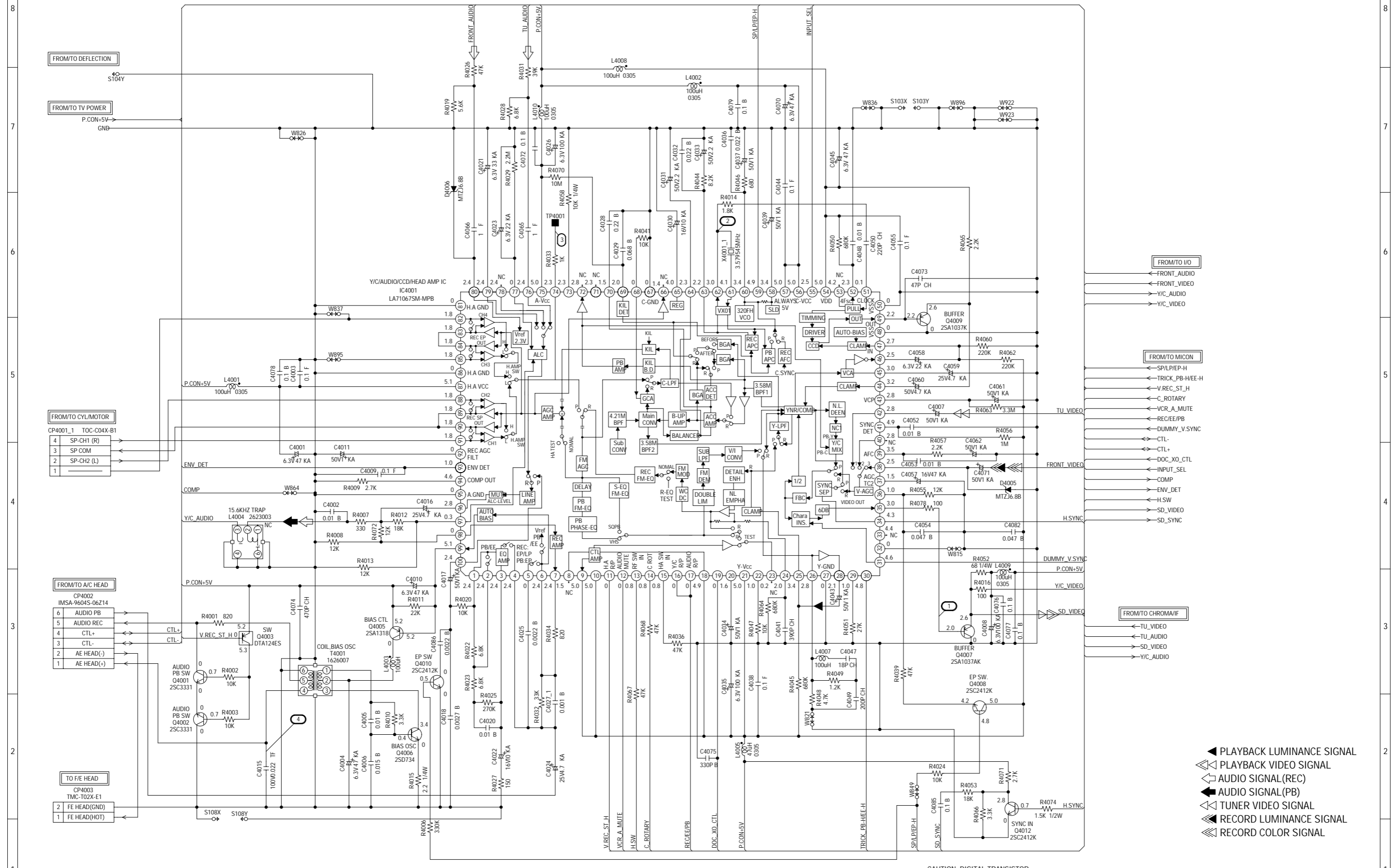
**PRINTED CIRCUIT BOARDS  
SYSCON/CRT (INSERTED PARTS)  
SOLDER SIDE**



- REPLACE AS MARKED.  
RISK OF FIRE



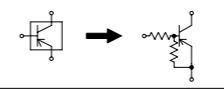
# Y/C/AUDIO/HEAD AMP SCHEMATIC DIAGRAM (SYSCON PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

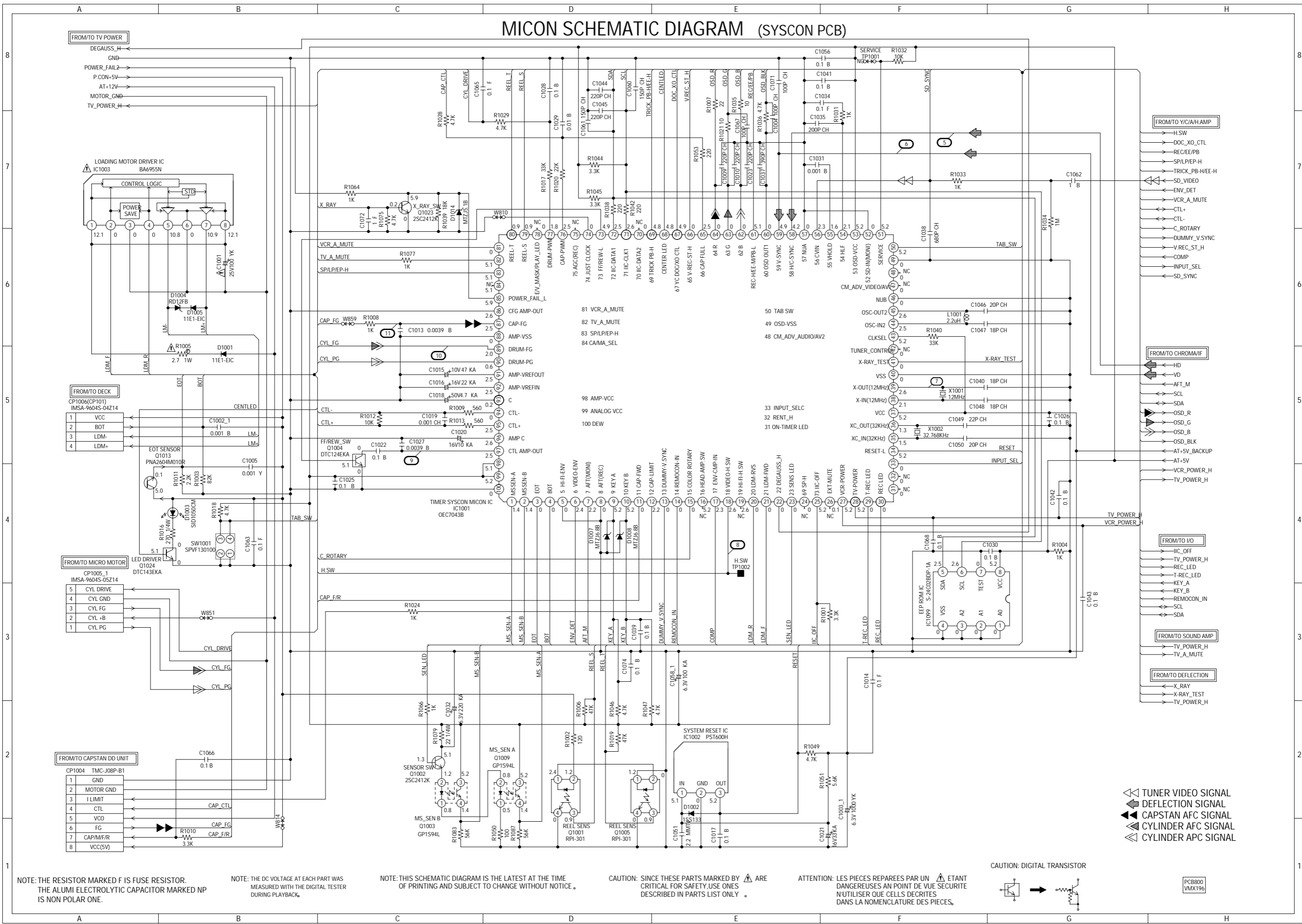
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: DIGITAL TRANSISTOR



PCB800 VMX196

# MICON SCHEMATIC DIAGRAM (SYSCON PCB)



NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR.  
THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

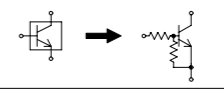
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIECES REPARÉES PAR UN ÉTANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

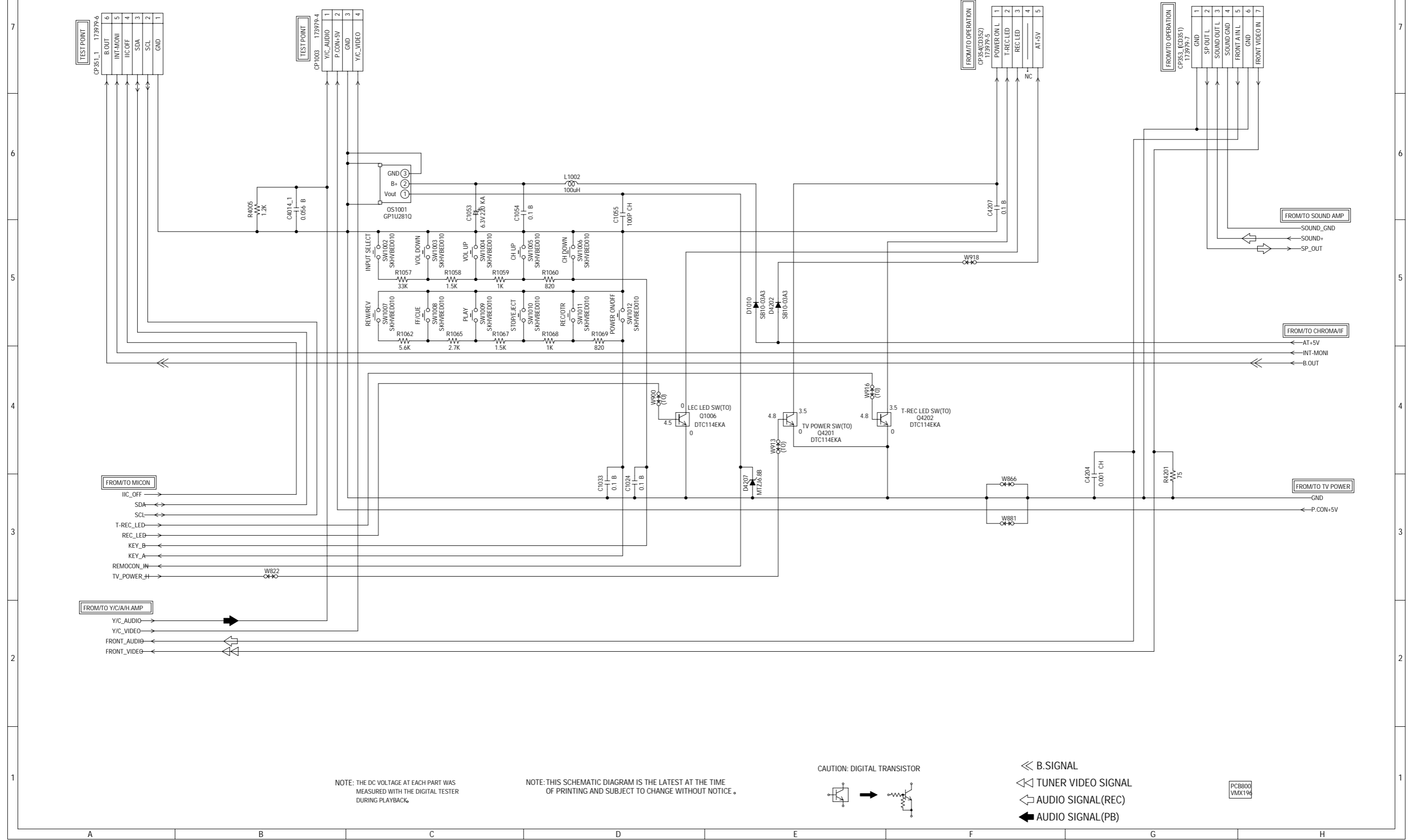
CAUTION: DIGITAL TRANSISTOR



PCB800 VMX196

# IN/OUT SCHEMATIC DIAGRAM

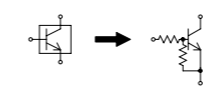
(SYSCON PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: DIGITAL TRANSISTOR

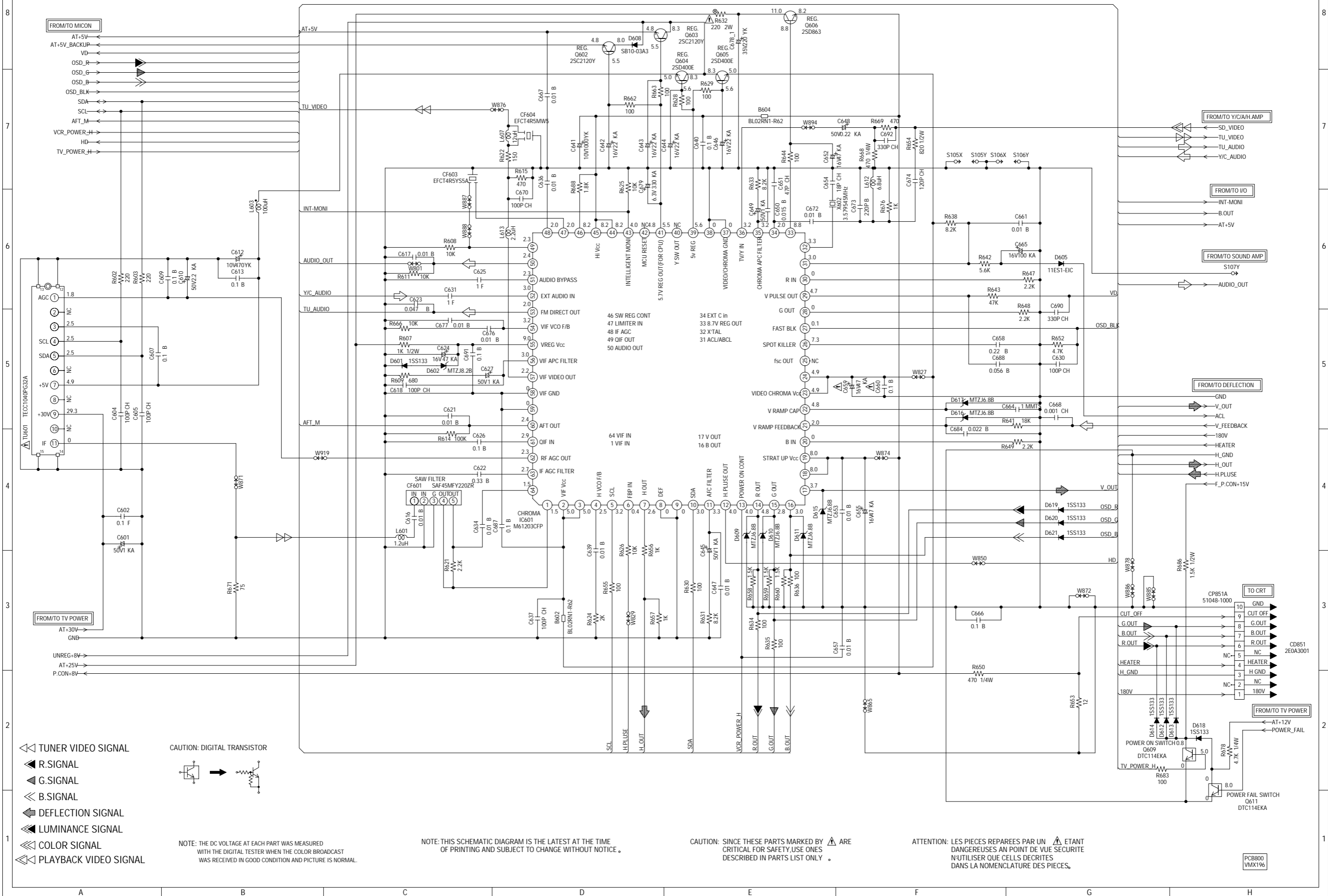


- ◄ B.SIGNAL
- ◄△ TUNER VIDEO SIGNAL
- ◄○ AUDIO SIGNAL (REC)
- ◄◻ AUDIO SIGNAL (PB)

PCB800  
VMX196



# CHROMA/IF SCHEMATIC DIAGRAM (SYSCON PCB)



- TUNER VIDEO SIGNAL
- R.SIGNAL
- G.SIGNAL
- B.SIGNAL
- DEFLECTION SIGNAL
- LUMINANCE SIGNAL
- COLOR SIGNAL
- PLAYBACK VIDEO SIGNAL

CAUTION: DIGITAL TRANSISTOR

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

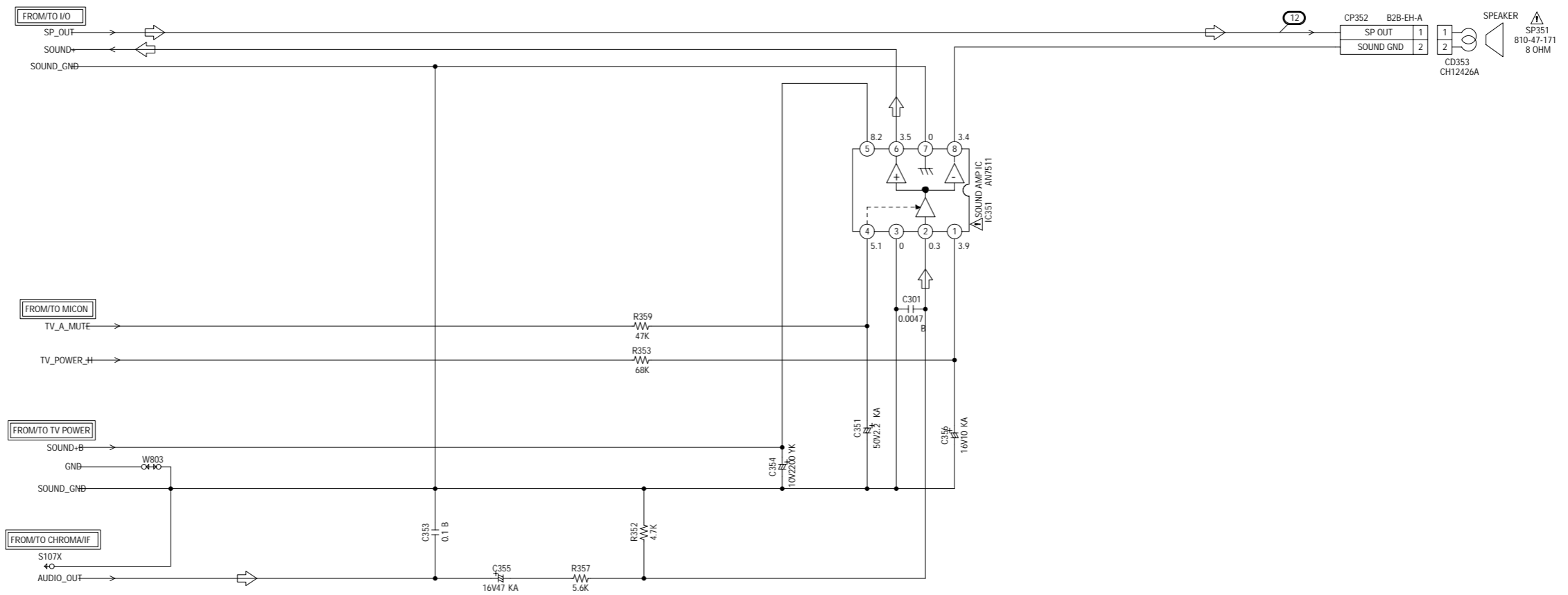
CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIÈCES RÉPARÉES PAR UN ÉTANT DANGEREUSES AN POINT DE VUE SÉCURITÉ N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

PCB800 VMX196

# SOUND AMP SCHEMATIC DIAGRAM

(SYSCON PCB)



← AUDIO SIGNAL (REC)

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIÈCES REPARÉES PAR UN ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

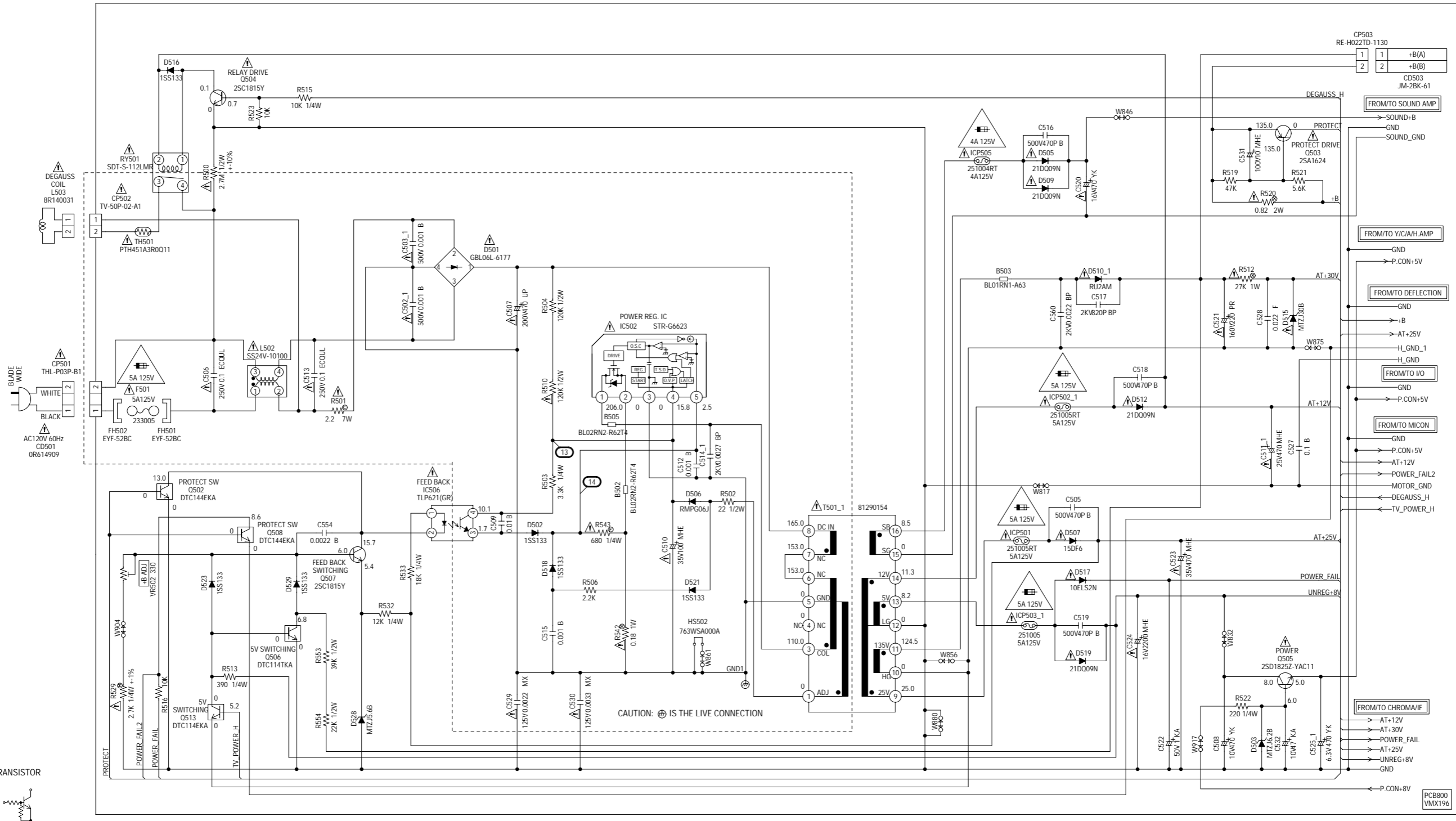
PCB800  
VMX196

# TV POWER SCHEMATIC DIAGRAM (SYSCON PCB)

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,  
REPLACE ONLY WITH THE SAME TYPE FUSE 5A 125V  
(F501,ICP501,ICP502,ICP503), AND 4A 125V(ICP505).

ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEIE  
N'UTILISER QUE DES FUSIBLE DE MEME TYPE 5A 125V  
(F501,ICP501,ICP502,ICP503), ET 4A 125V(ICP505).

CAUTION: ICP501,ICP502,ICP503 AND ICP505 ARE MANUFACTURED BY  
LITTELFUSE INC.,TYPE 251.



NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR.  
THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP  
IS NON POLAR ONE.

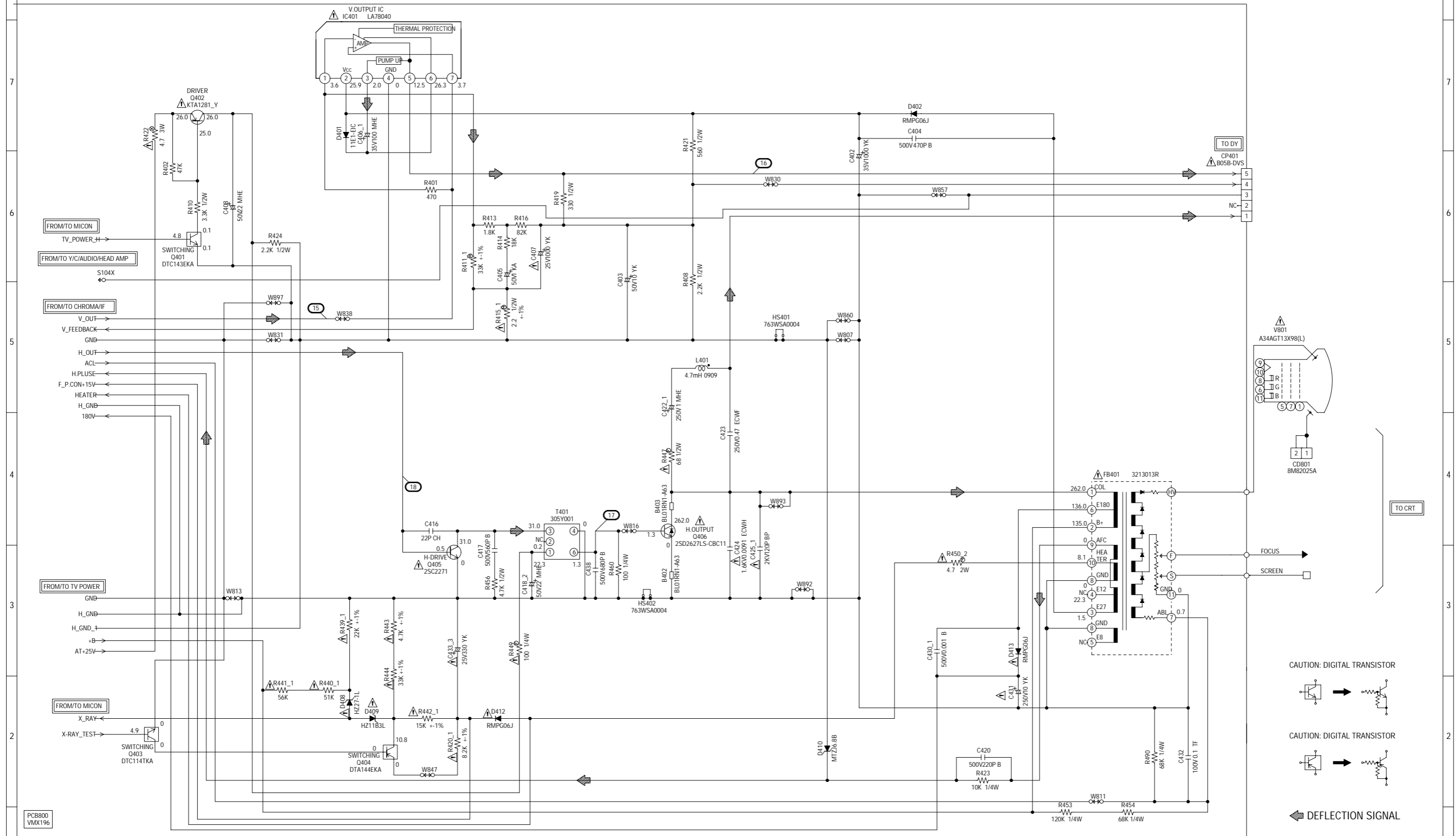
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED  
WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST  
WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME  
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: SINCE THESE PARTS MARKED BY ARE  
CRITICAL FOR SAFETY, USE ONES  
DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIECES REPARÉES PAR UN ETANT  
DANGEREUSES AN POINT DE VUE SECURITE  
N'UTILISER QUE CELLS DECRITES  
DANS LA NOMENCLATURE DES PIECES.

# DEFLECTION SCHEMATIC DIAGRAM (SYSCON PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: SINCE THESE PARTS MARKED WITH A TRIANGLE ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIÈCES RÉPARÉES PAR UN TRIANGLE ÉTANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

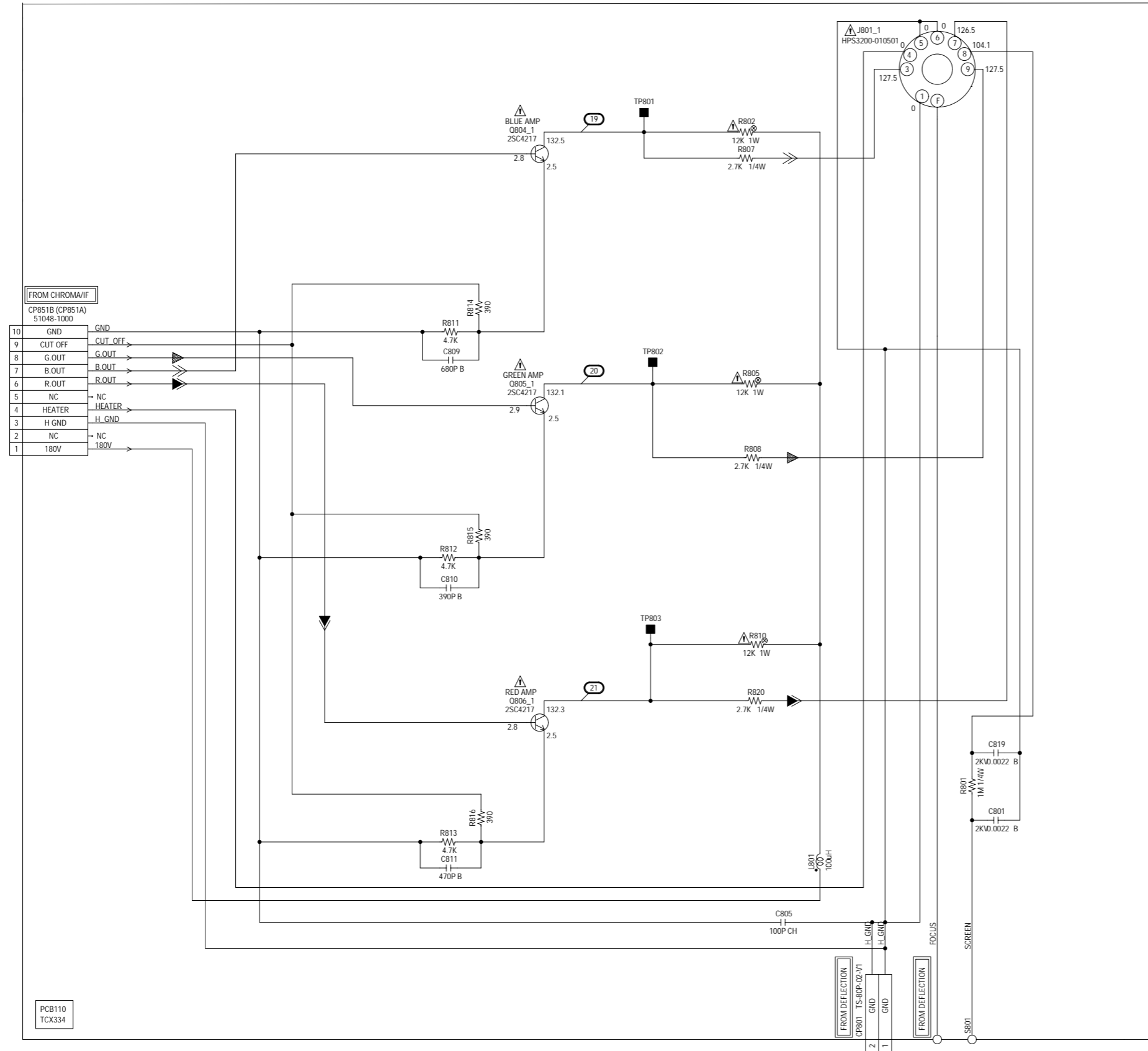
NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

CAUTION: DIGITAL TRANSISTOR

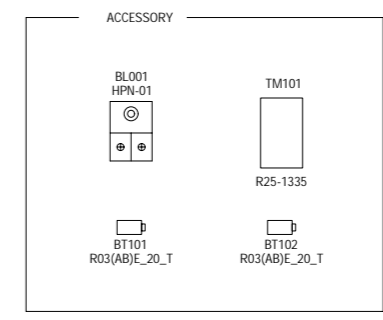
CAUTION: DIGITAL TRANSISTOR

DEFLECTION SIGNAL

# CRT SCHEMATIC DIAGRAM (CRT PCB)



FROM CHROMA/IF	
10	GND
9	CUT OFF
8	G.OUT
7	B.OUT
6	R.OUT
5	NC
4	HEATER
3	H.GND
2	NC
1	180V



◀ R.SIGNAL  
◀ G.SIGNAL  
◀ B.SIGNAL

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

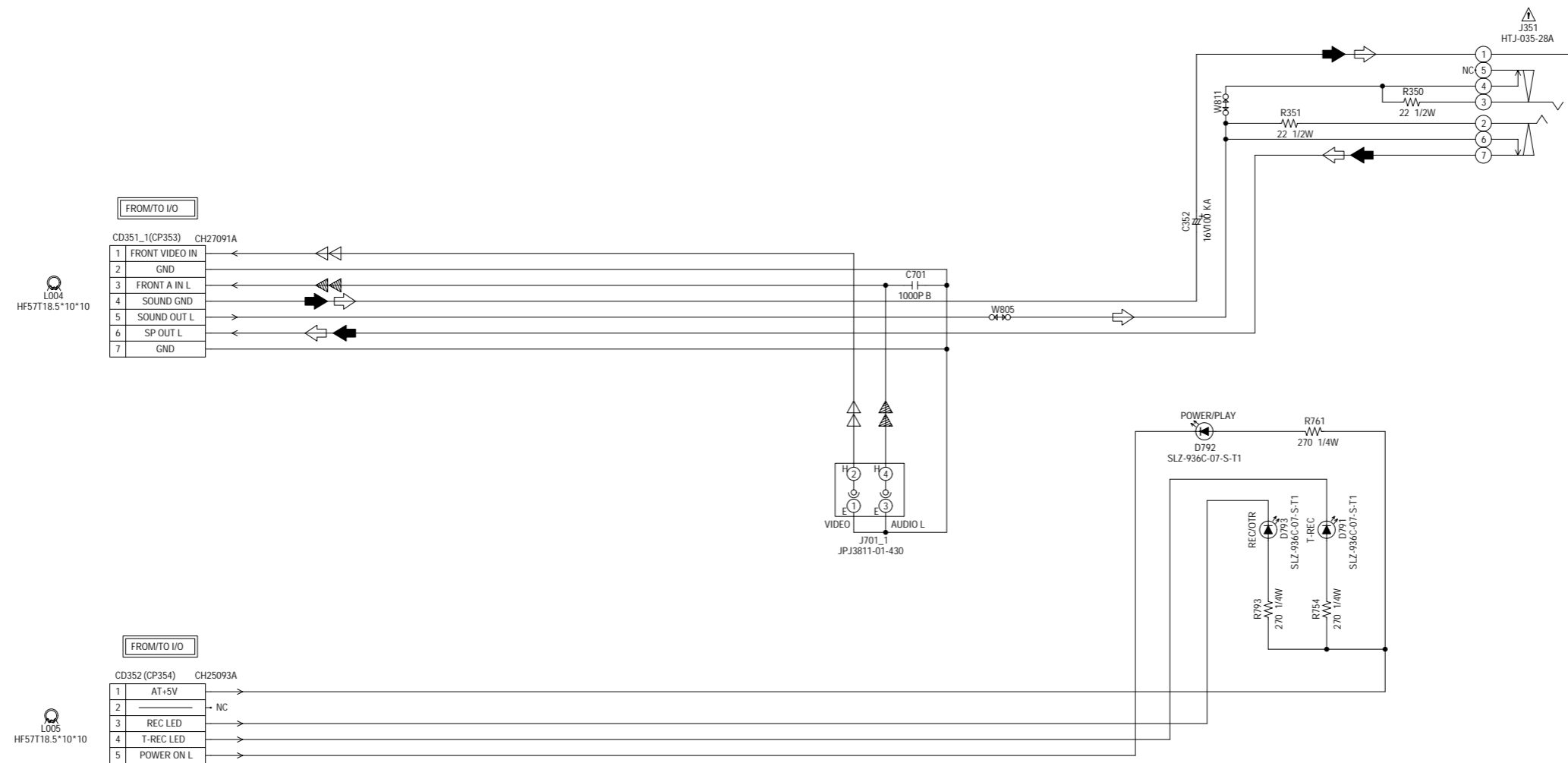
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIECES REPARÉES PAR UN ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

# OPERATION SCHEMATIC DIAGRAM

(OPERATION PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

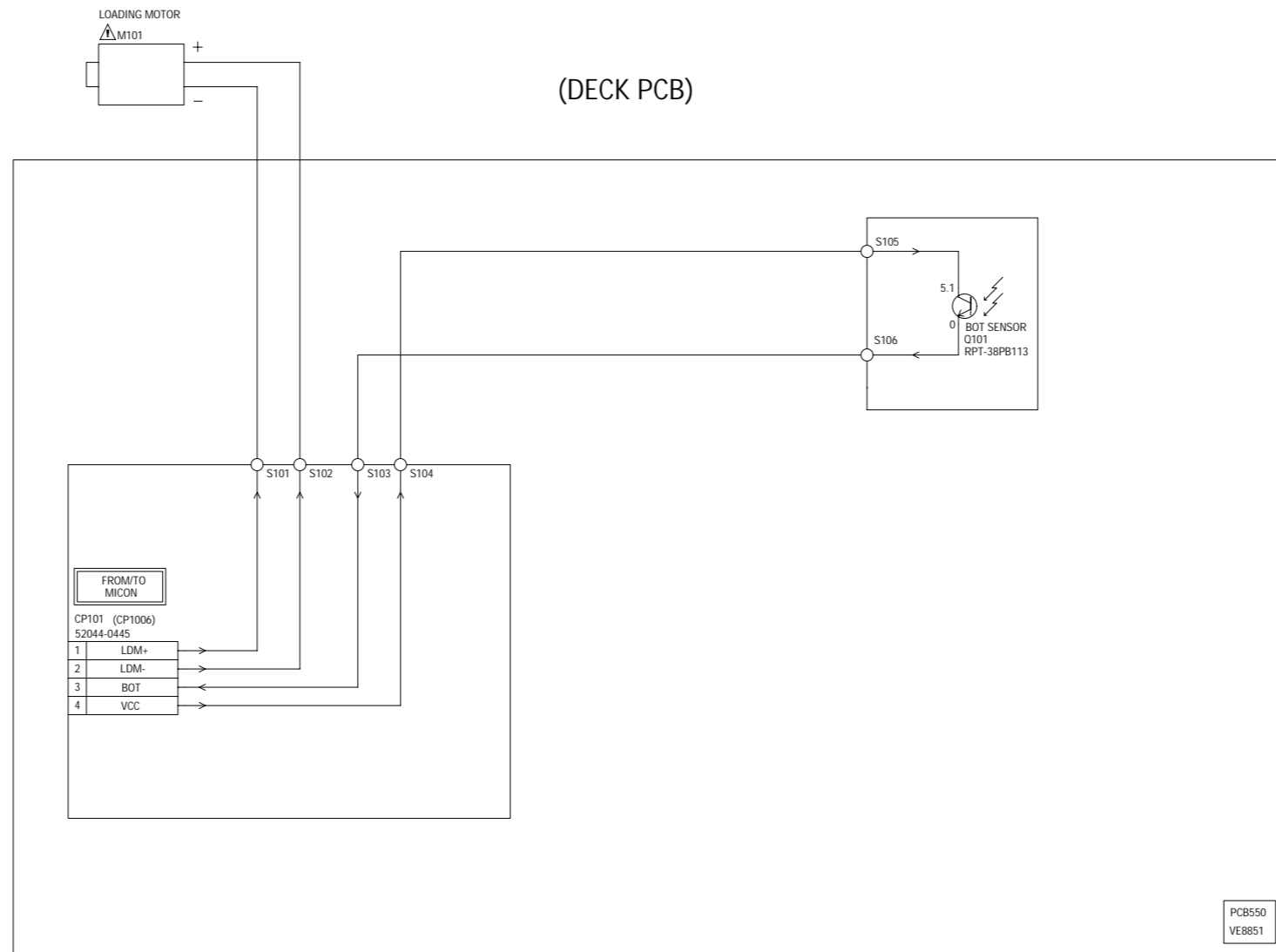
CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.


ATTENTION: LES PIECES REPARÉES PAR UN ÉTANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.


- AUDIO SIGNAL(REC)
- AUDIO SIGNAL(PB)
- TUNER VIDEO SIGNAL
- TUNER AUDIO SIGNAL

PCB030  
TE9A16

# DECK SCHEMATIC DIAGRAM



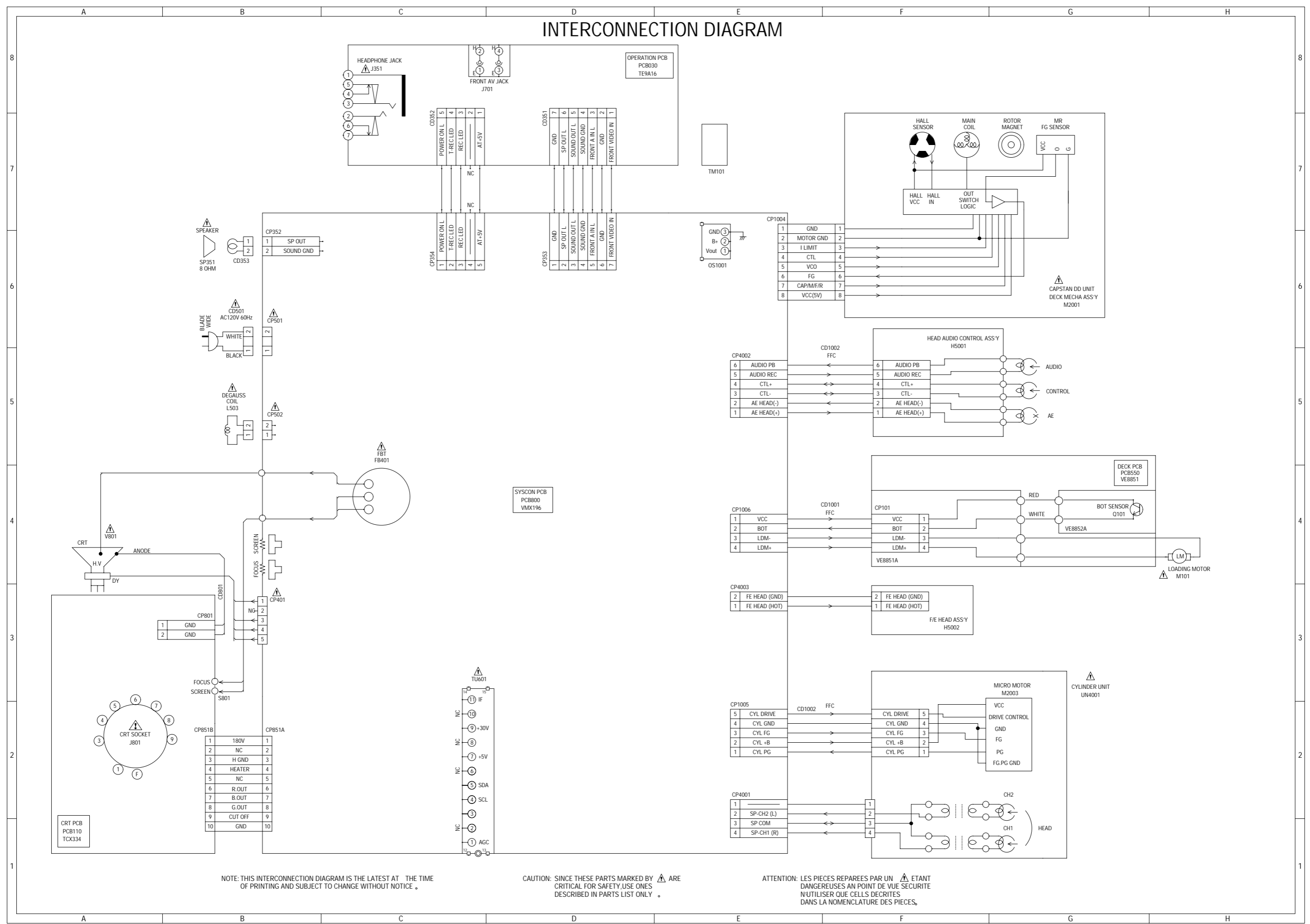
CAUTION: SINCE THESE PARTS MARKED BY  ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIÉCES REPARÉES PAR UN  ÉTANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÉCES.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

# INTERCONNECTION DIAGRAM



NOTE: THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

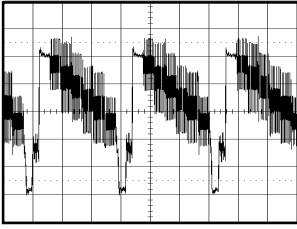
CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIECES REPARÉES PAR UN ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ, N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

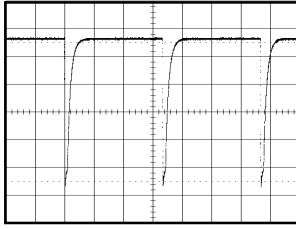


## WAVEFORMS

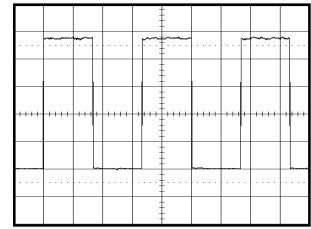
### Y/C/AUDIO/HEAD AMP



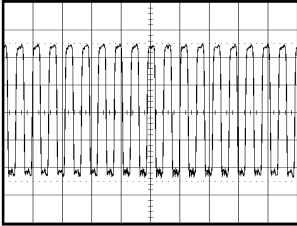
① REC/PB  
0.5V 20 $\mu$ s/div



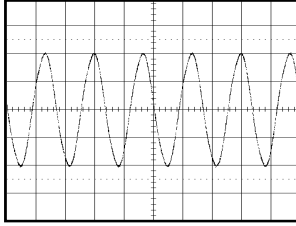
⑥ REC/PB  
1V 5ms/div



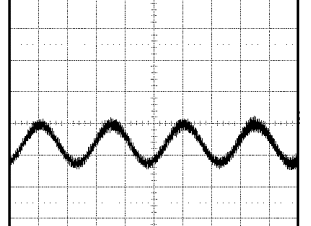
⑪ REC/PB  
1V 10ms/div



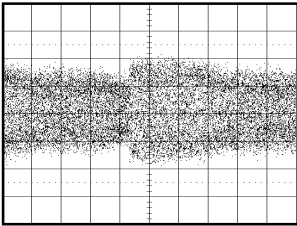
② REC/PB  
100mV 0.5 $\mu$ s/div



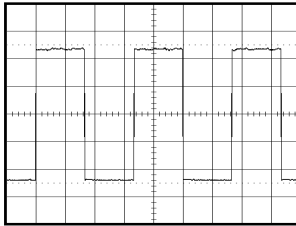
⑦ REC/PB  
1V 50ns/div



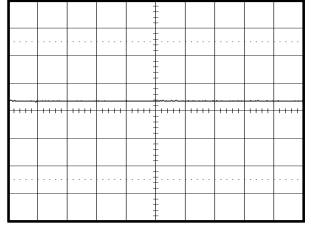
⑫ 200mV 0.1ms/div



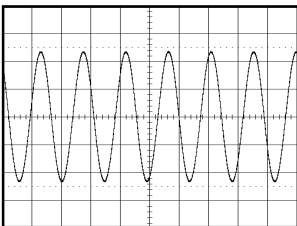
③ PB  
100mV 5ms/div



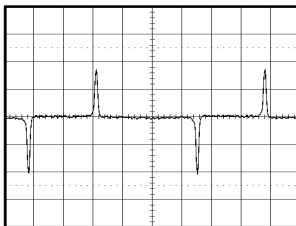
⑧ REC/PB  
1V 10ms/div



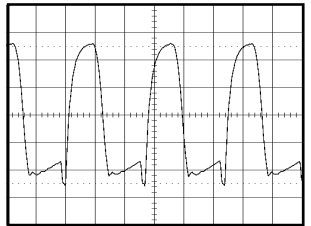
⑬ REC/PB  
5V 0.1ms/div



④ REC  
20V 10 $\mu$ s/div

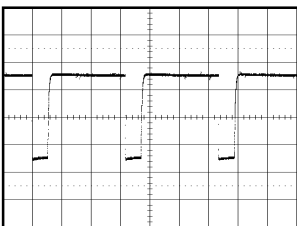


⑨ PB  
1V 2ms/div

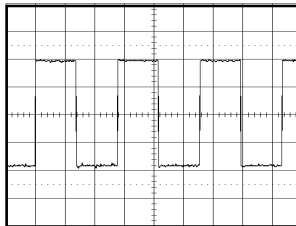


⑭ REC/PB  
0.5V 5 $\mu$ s/div

### MICON

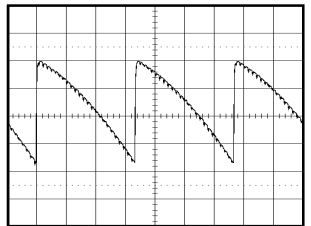


⑤ REC/PB  
2V 20 $\mu$ s/div



⑩ REC/PB  
1V 0.5ms/div

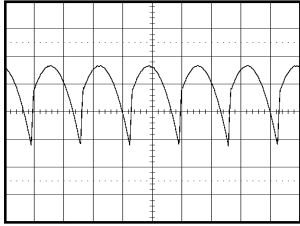
### DEFLECTION



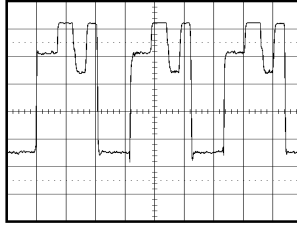
⑮ 0.5V 5ms/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

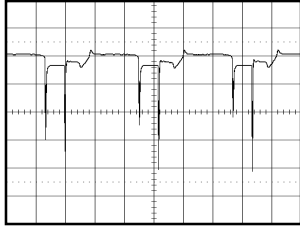
## WAVEFORMS



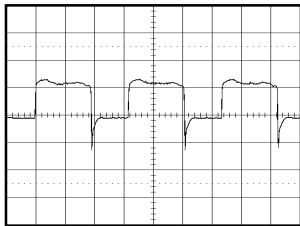
①⑥ 1V 10ms/div



②① 20.0V 20μs/div

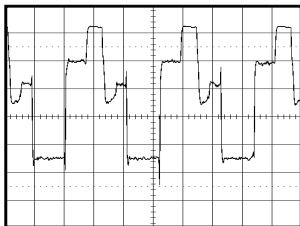


①⑦ 5V 20μs/div

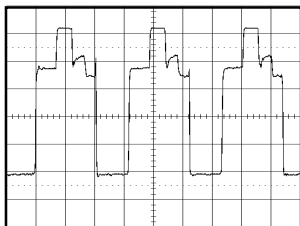


①⑧ 0.5V 20μs/div

## CRT



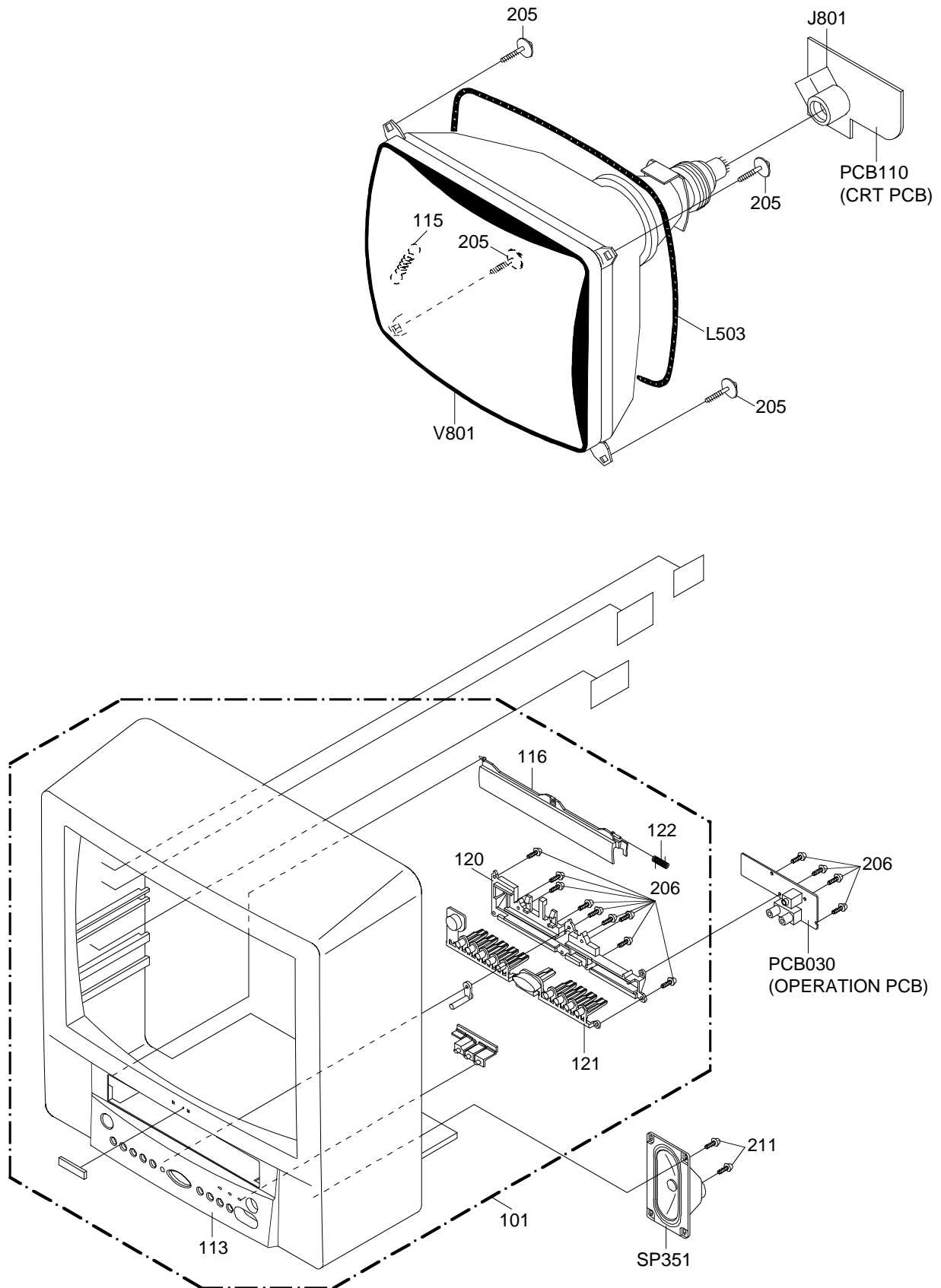
①⑨ 20.0V 20μs/div



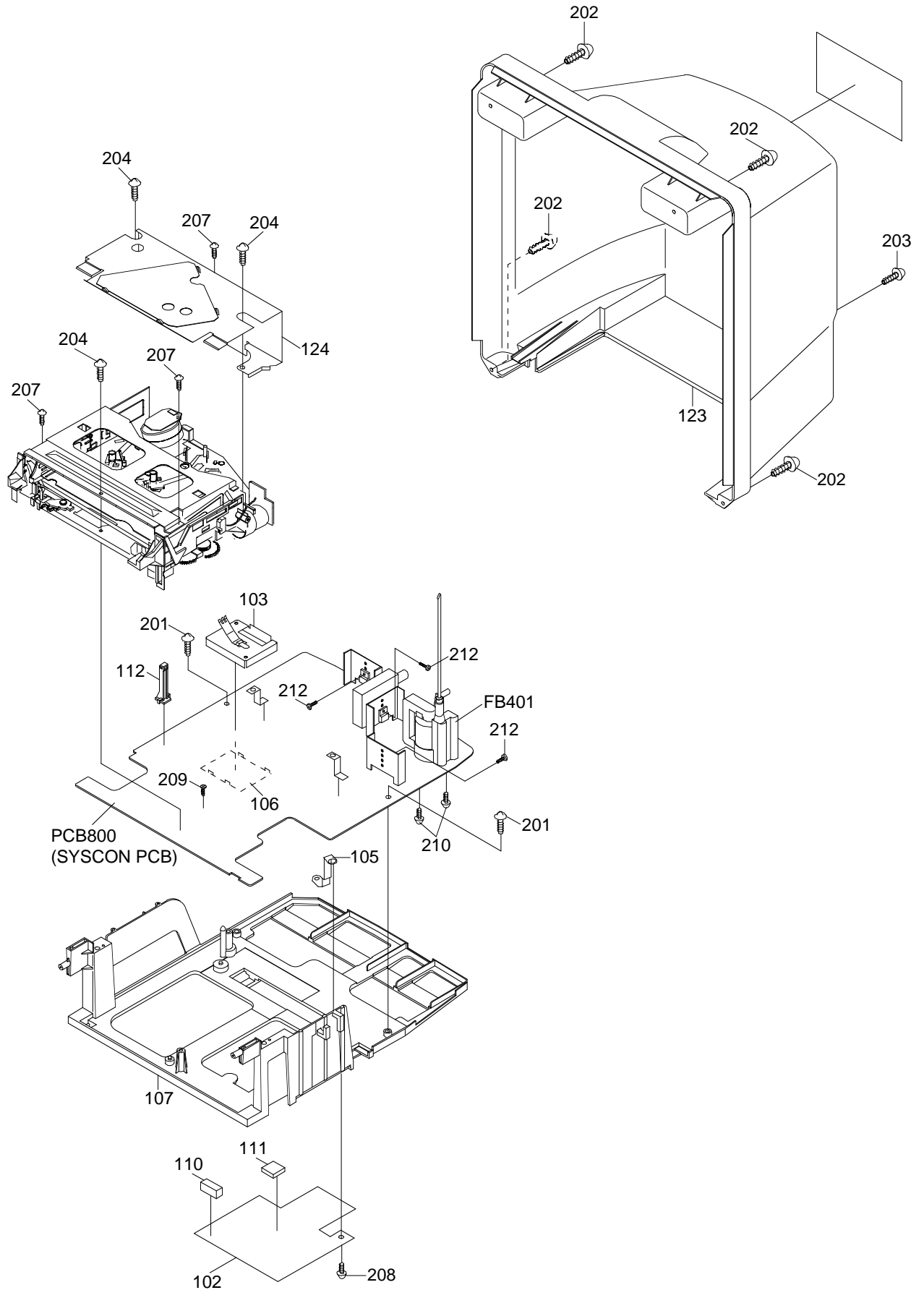
②⑩ 20.0V 20μs/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

# MECHANICAL EXPLODED VIEW

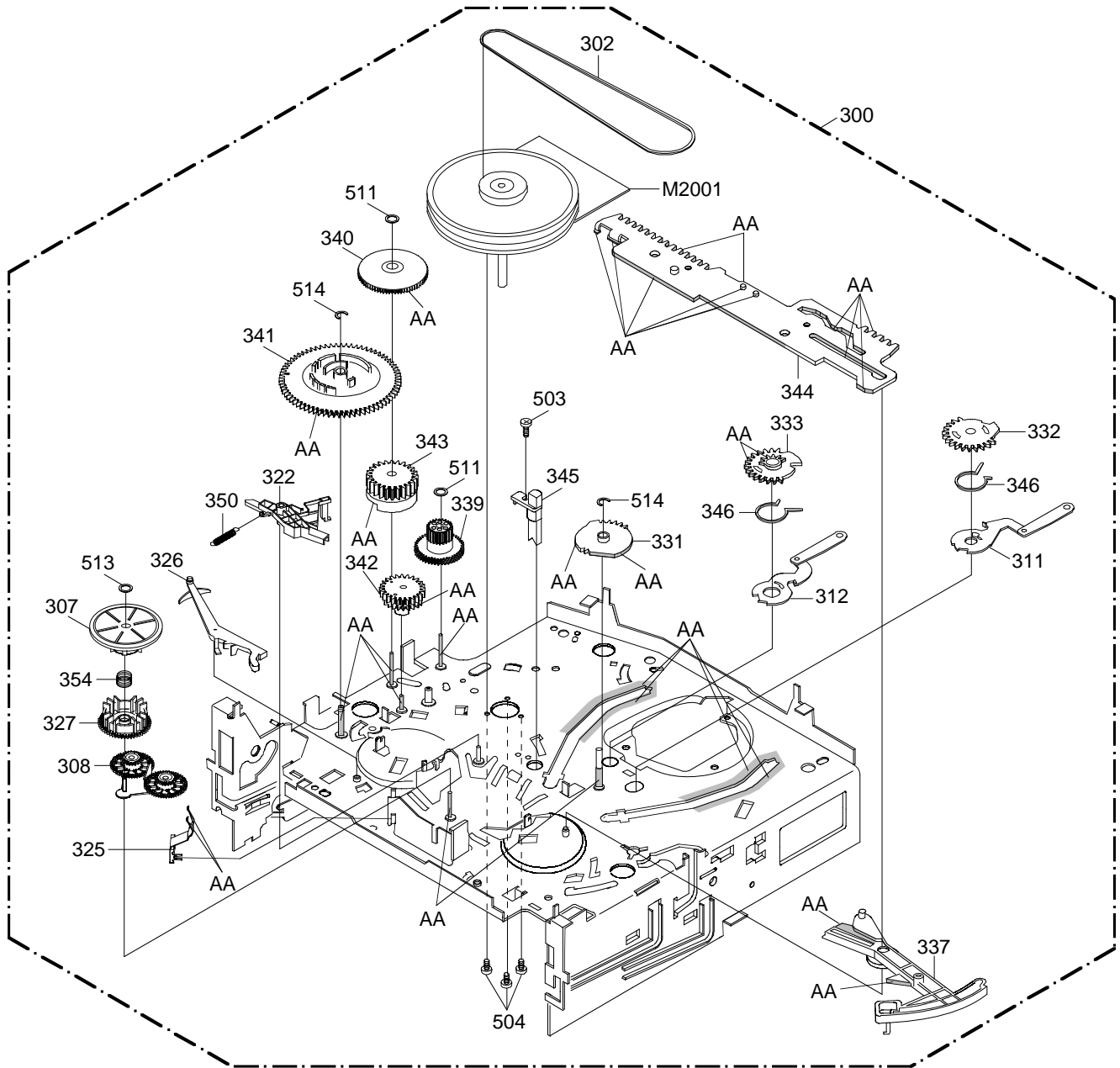


# MECHANICAL EXPLODED VIEW





# CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CLASS	MARK
GREASE	AA
OIL	BA

**NOTE:** Applying positions AA and BA for the grease or oil are displayed for this section. Check if the correct grease or oil is applied for each position.

# MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
101	BZ610106	A545D1A720	CABINET,FRONT ASS'Y	
102	BZ710248	752WSAA028	SHIELD,BOTTOM	
103	BZ710269	752WSA0213	SHIELD,CASE HEAD AMP ASS'Y	
105	BZ710235	753WSA0120	PLATE,BOTTOM-EARTH	
106	BZ710304	753WSA0131	SHIELD,COVER HEAD AMP	
107	BZ710271	761WPA0196	HOLDER,DECK	
110	BZ710251	800WFA0037	CUSHION	15x5xT=6
111	BZ710252	800WFA0038	CUSHION	10x10xT=2
112	BZ710178	85OP700036	HOLDER,EOT SENSOR	
113	BZ710168	701WPJA828	CABINET,FRONT	
115	BZ710009	741WUA0019	SPRING,EARTH	
116	BZ710169	712WPJA589	FLAP	
120	BZ710008	738WPA0014	BUTTON,BASE	
121	BZ710170	735WPJ0133	BUTTON,FRAME	
122	BZ710010	743WKA0032	SPRING,FLAP	
123	BZ710134	702WPA0632	CABINET,BACK	
124	BZ710316	752WSA0223	PLATE,DECK SHIELD ASS'Y	
201	BZ710036	8117540B04	SCREW,TAPPING(B0) TRUSS	4x20
202	BZ710035	8117540A64	SCREW,TAPPING(B0) TRUSS	4x16
203	BZ710262	8117540A04	SCREW,TAPPING(B0) TRUSS	4x10
204	BZ710034	8117140A24	SCREW,TAPPING(B0) PAN	4x12
205	BZ710321	8121F50B84	SCREW,TAPPING(B0) GW20	5x28
206	BZ710031	8110630A04	SCREW,TAP TITE(P) BRAZIER	3x10
207	BZ710030	8110630804	SCREW,TAP TITE(P) BRAZIER	3x8
208	BZ710158	8110630604	SCREW,TAP TITE(P) BRAZIER	3x6
209	BZ710028	8110330804	SCREW,TAP TITE(P) FLAT	3x8
210	BZ710019	8109630802	SCREW,TAP TITE(B) BRAZIER	3x8
211	BZ710029	8110330A04	SCREW,TAP TITE(P) FLAT	3x10
212	BZ710239	8109I30A04	SCREW,TAP TITE(B) WH7	3x10
---	BZ710305	792WHA0286	PACKAGE, TOP	
---	BZ710306	792WHA0287	PACKAGE,BOTTOM	
---	BZ710171	793WCDA685	GIFT BOX	
---	BZ614163	J545D101	INSTRUCTION BOOK	

# CHASSIS REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
300	BZ610107	A545D0A420A	DECK ASSY
301	BZ710073	85OA500022	AHC ASS'Y
302	BZ710193	85OP200290	BELT,CAPSTAN (S)
303	BZ710132	85OP900710	LEVER,REC
304	BZ710094	85OP500083	BASE,AC HEAD
305	BZ710112	85OP800324	SPRING,AC HEAD
306	BZ710194	85OA000367	MAIN CHASSIS ASS'Y (S-Z)
307	BZ710195	85OA200082	CLUTCH ASS'Y(S2)
308	BZ710196	85OA200080	ARM,IDLER ASS'Y (S)
309	BZ710197	85OP600556	ARM,SS BRAKE (S)
310	BZ710198	85OP200292	REEL,T (S)
311	BZ710063	85OA300061	LOADING ARM S ASS'Y
312	BZ710064	85OA300062	LOADING ARM T ASS'Y
313	BZ614076	85OA400210	GUIDE ROLLER ASS'Y
314	BZ710069	85OA400188	BASE,INCL S ASS'Y
315	BZ710070	85OA400196	BASE,INCL T(S) ASS'Y
316	BZ710200	85OA400199	P5-3 ARM ASS'Y(S)
317	BZ710072	85OA400205	PINCH ROLLER BLOCK
318	BZ710065	85OA400175	TENSION ARM ASS'Y
319	BZ710201	85OA400184	TENSION BAND ASS'Y (S)
320	BZ710067	85OA400178	PINCH ROLLER LEVER ASS'Y
321	BZ710311	85OA600196	BRAKE T ASSY(S)
322	BZ710203	85OA600191	CAP BRAKE ASS'Y(S)
323	BZ710076	85OA900213	LINK ASS'Y
324	BZ710077	85OA900216	LINK LEVER ASS'Y
325	BZ710204	85OP200284	LEVER,CLUTCH (S)
326	BZ710205	85OP200285	ACTUATOR,CLUTCH
327	BZ710206	85OP200298	GEAR,COUPLING(S2)
328	BZ710207	85OP200291	REEL,S (S)
329	BZ710096	85OP600541	WORM
330	BZ710105	85OP600563	BRACKET,MOTOR
331	BZ710086	85OP300178	GEAR,MAIN LOADING
332	BZ710087	85OP300179	GEAR,LOADING S
333	BZ710088	85OP300180	GEAR,LOADING T
334	BZ710208	85OP300187	HOLDER,LOADING GEAR (S-Z)
335	BZ710090	85OP400472	ADJUST,TENSION
336	BZ710093	85OP400492	HOLDER,TENSION
337	BZ710092	85OP400490	LEVER,TENSION
338	BZ710091	85OP400475	COVER,P4
339	BZ710097	85OP600543	GEAR,JOINT
340	BZ710098	85OP600544	GEAR,MIDDLE
341	BZ710209	85OP600554	CAM,MAIN (S)
342	BZ710101	85OP600546	CAM,P5
343	BZ710172	85OP600565	CAM,PINCH ROLLER
344	BZ710210	85OP600561	ROD,MAIN(S)
345	BZ710106	85OP700035	REFLECTOR,LED
346	BZ710107	85OP800318	SPRING,LOADING GEAR
347	BZ710211	85OP800334	SPRING,P5 (S)
348	BZ710212	85OP800335	SPRING,BRAKE T (S)
349	BZ710110	85OP800322	SPRING,TENSION
350	BZ710213	85OP800336	SPRING,CAP BRAKE (S)
351	BZ710118	85OP800342	SPRING,LOCKER (S)
352	BZ710113	85OP800326	SPRING,LINK
353	BZ710114	85OP800328	SPRING,DAMPER
354	BZ710115	85OP800330	SPRING,RING
355	BZ710214	85OP800337	SPRING,SS BRAKE (S)
356	BZ710119	85OP900680	OPENER,CASS
357	BZ710312	85OP900731	CASS SIDE L
358	BZ710313	85OP900732	CASS SIDE R
359	BZ710314	85OP900728	TAPE GUIDE L(P,R)
360	BZ710315	85OP900729	TAPE GUIDE R
361	BZ710216	85OP900714	COVER,SENSOR L3
362	BZ710123	85OP900688	LEVER,FLAP
363	BZ710124	85OP900690	CASS HOLDER
364	BZ710095	85OP600540	DRIVER,WORM
365	BZ710217	85OP900713	LOCKER,R2
366	BZ710127	85OP900694	SPRING,PACK
367	BZ710128	85OP900695	BRACKET, TOP
368	BZ710129	85OP900696	SPRING,CASS EARTH
369	BZ710117	85OP800341	SPRING,P/R ARM



## CHASSIS REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
501	BZ710048	8107126A04	SCREW,TAP TITE(S) PAN	2.6x10
502	BZ710049	8107226804	SCREW,TAP TITE(S) BIND	2.6x8
503	BZ710017	8107226604	SCREW,TAP TITE(S) BIND	2.6x6
504	BZ710050	8109126604	SCREW,TAP TITE(B) PAN	2.6x6
505	BZ710052	810A126804	SCREW/WASHER(A)	M2.6x8
506	BZ710053	810B126404	SCREW/WASHER(B)	M2.6x4
507	BZ710046	8102120604	SCREW,PAN	M2x6
508	BZ710045	8102120304	SCREW,PAN	M2x3
509	BZ710047	8102130304	SCREW,PAN	M3.0x3.0
510	BZ710051	810A123504	SEMS A	M2.3x5.0
511	BZ710055	82P266005N	POLYSLIDER WASHER(CUT)	2.6x6.0xT0.5
512	BZ710218	82Q2647C5N	POLYSLIDER WASHER	2.6x4.7xT0.25
513	BZ710054	82P184505N	POLYSLIDER WASHER(CUT)	1.8x4.5xT0.5
514	BZ710058	83ETW30000	E-RING	3.0
515	BZ710219	810A126504	SCREW/WASHER(A)	M2.6x5
CP101	BZ614040	069R740018	CONNECTOR PCB SIDE	52044-0445
H5001	BZ710040	1523D91034	HEAD (AUDIO CONTROL)	HVMXA1072A
H5002	BZ710041	1543D02013	HEAD (FULL ERASE)	HVFHP0032A
△ M101	BZ710044	1596P78001	MOTOR (LOADING)	MXN13FB11H
△ M2001	BZ710303	1510398032	CAPSTAN DD UNIT	F2QSB06
M2003	BZ710042	1589V11007	MICRO MOTOR	EP14BD
PCB550	BZ610053	A4C831B550	DECK PCB ASS'Y	VE8851
Q101	BZ410026	0000700320	TRANSISTOR,PHOTO	RPT-38PB113
△ UN4001	BZ610089	A545A0A500	CYLINDER UNIT ASSY	A545A0A500

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
<b>RESISTORS</b>			
△ R415	BZ210069	R426T22R2F	R,METAL 2.2 OHM 1/2W
△ R420	BZ210070	R801R7822F	RC 8.2K OHM 1/10W
R422	BZ210071	R3X28B4R7J	R,METAL OXIDE 4.7 OHM 3W
△ R439	BZ210072	R801R7223F	RC 22K OHM 1/10W
△ R440	BZ210073	R801R7513J	RC 51K OHM 1/10W
△ R441	BZ210074	R801R7563J	RC 56K OHM 1/10W
△ R442	BZ210075	R801R7153F	RC 15K OHM 1/10W
△ R443	BZ210076	R801R7472F	RC 4.7K OHM 1/10W
△ R444	BZ210077	R801R7333F	RC 33K OHM 1/10W
△ R447	BZ210021	R65582680J	R,FUSE 68 OHM 1/2W
R449	BZ210078	R65584101J	R,FUSE 100 OHM 1/4W
△ R450	BZ210079	R6558A4R7J	R,FUSE 4.7 OHM 2W
△ R500	BZ210080	R0G3K2275K	RC 2.7M OHM 1/2W
△ R501	BZ210043	R5Y2CE2R2J	R,CEMENT 2.2 OHM 7W
△ R510	BZ210081	R002T2124J	RC 120K OHM 1/2W
△ R512	BZ210082	R3X101273J	R,METAL 27K OHM 1W
△ R520	BZ210009	R3X28AR82J	R,METAL 0.82 OHM 2W
△ R529	BZ210084	R4X5T4272F	R,METAL 2.7K OHM 1/4W
△ R542	BZ210085	R33681R18J	R,METAL 0.18 OHM 1W
△ R543	BZ210086	R635U4681J	R,FUSE 680 OHM 1/4W
R632	BZ210087	R3X18A221J	R,METAL OXIDE 220 OHM 2W
△ R802	BZ210089	R3X181123J	R,METAL 12K OHM 1W
△ R805	BZ210089	R3X181123J	R,METAL 12K OHM 1W
△ R810	BZ210089	R3X181123J	R,METAL 12K OHM 1W
△ R1005	BZ210020	R615J12R7J	R,FUSE 2.7 OHM 1W
<b>CAPACITORS</b>			
C354	BZ110076	E02LF1222M	CE 2200 UF 10V
C402	BZ110077	E02L04102M	CE 1000 UF 35V
△ C407	BZ110078	E02L03102M	CE 1000 UF 25V
C423	BZ110030	P411F3474J	CMPP 0.47 UF 250V ECWF
△ C424	BZ110027	P414F9912H	CMPP 0.0091UF 1.6KV ECWH
△ C425	BZ110047	C01BBP7B2K	CC 120 PF 2KV BP
△ C431	BZ110103	E02LTD100M	CE 10 UF 250V
△ C433	BZ110079	E02LT3331M	CE 330 UF 25V
△ C502	BZ110080	C0J0B0513K	CC 0.001 UF 500V B
△ C503	BZ110080	C0J0B0513K	CC 0.001 UF 500V B
△ C506	BZ110035	P2122B104M	CMP 0.1 UF 250V ECQUL
△ C507	BZ110012	E51CGC471M	CE 470 UF 200V
C508	BZ110099	E02LT1471M	CE 470 UF 10V
△ C510	BZ110018	E5Ezt4101M	CE 100 UF 35V
△ C511	BZ110029	E5Ezt3471M	CE 470 UF 25V
△ C513	BZ110035	P2122B104M	CMP 0.1 UF 250V ECQUL
C514	BZ110004	C01BBP7K3K	CC 0.0027UF 2KV BP
C517	BZ110006	C01BBP7W2K	CC 820 PF 2KV BP
△ C520	BZ110081	E02LT2471M	CE 470 UF 16V
△ C521	BZ110013	E53VFB221M	CE 220 UF 160V
△ C524	BZ110100	E5EZ02222M	CE 2200 UF 16V
△ C529	BZ110008	C034E0JH3M	CC 0.0022UF 125V MX
△ C530	BZ110082	C034F0JL3M	CC 0.0033UF 125V MX
C560	BZ110003	C01BBP7H3K	CC 0.0022UF 2KV BP
C701	BZ110098	CHGTB0413K	CC 0.001 UF 50V B
C801	BZ110009	C13HB07H3K	CC 0.0022UF 2KV B
C819	BZ110009	C13HB07H3K	CC 0.0022UF 2KV B
△ C1001	BZ110083	E02LU3101M	CE 100 UF 25V
<b>DIODES</b>			
D401	BZ410043	D2WT011E10	DIODE,SILICON 11E1-EIC
D402	BZ410014	D2LTPG06J0	DIODE,SILICON RMPG06J-G3
△ D408	BZ410018	D94TA27011	DIODE,ZENER HZ27-1L TD
△ D409	BZ410017	D94TA11B13	DIODE,ZENER HZ11B3L TD
D410	BZ410022	D97U06R81B	DIODE,ZENER MTZJ6.8B T-77
△ D412	BZ410014	D2LTPG06J0	DIODE,SILICON RMPG06J-G3
△ D413	BZ410014	D2LTPG06J0	DIODE,SILICON RMPG06J-G3
△ D501	BZ410044	D4LZBL06L0	DIODE GBL06L-6177
D502	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
D503	BZ410066	D97U06R21B	DIODE,ZENER MTZJ6.2B T-77
△ D505	BZ410010	D28T21DQN9	DIODE SCHOTTKY 21DQ09N-TA2B1
D506	BZ410014	D2LTPG06J0	DIODE,SILICON RMPG06J-G3
D507	BZ410057	D28015DF60	DIODE,SILICON 15DF6
△ D509	BZ410010	D28T21DQN9	DIODE SCHOTTKY 21DQ09N-TA2B1
△ D510	BZ410028	D2BTRU2AM0	DIODE,SILICON RU2AM V1
△ D512	BZ410010	D28T21DQN9	DIODE SCHOTTKY 21DQ09N-TA2B1
△ D515	BZ410019	D97U03001B	DIODE,ZENER MTZJ30B T-77
D516	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
△ D517	BZ410011	D28TELS2N2	DIODE RECTIFIER 10EL52N-TA1B2
D518	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77
△ D519	BZ410010	D28T21DQN9	DIODE SCHOTTKY 21DQ09N-TA2B1
D521	BZ410006	D1VT001330	DIODE,SILICON 1SS133T-77

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
<b>DIODES</b>			
D523	BZ410006	D1VT001330	DIODE,SILICON
D528	BZ410021	D97U05R61B	DIODE,ZENER
D529	BZ410006	D1VT001330	DIODE,SILICON
D601	BZ410006	D1VT001330	DIODE,SILICON
D602	BZ410058	D97U08R21B	DIODE,ZENER
D605	BZ410059	D2WT11ES10	DIODE,SILICON
D608	BZ410008	D23U1003A3	DIODE,SCHOTTKY
D609	BZ410022	D97U06R81B	DIODE,ZENER
D610	BZ410022	D97U06R81B	DIODE,ZENER
D611	BZ410022	D97U06R81B	DIODE,ZENER
D612	BZ410006	D1VT001330	DIODE,SILICON
D613	BZ410006	D1VT001330	DIODE,SILICON
D614	BZ410006	D1VT001330	DIODE,SILICON
D615	BZ410022	D97U06R81B	DIODE,ZENER
D616	BZ410022	D97U06R81B	DIODE,ZENER
D617	BZ410022	D97U06R81B	DIODE,ZENER
D618	BZ410006	D1VT001330	DIODE,SILICON
D619	BZ410006	D1VT001330	DIODE,SILICON
D620	BZ410006	D1VT001330	DIODE,SILICON
D621	BZ410006	D1VT001330	DIODE,SILICON
D791	BZ410005	002132Q130	LED
D792	BZ410005	002132Q130	LED
D793	BZ410005	002132Q130	LED
D1001	BZ410043	D2WT011E10	DIODE,SILICON
D1002	BZ410006	D1VT001330	DIODE,SILICON
D1003	BZ410004	0010600060	LED
D1004	BZ410016	D92T1120B0	DIODE,ZENER
D1005	BZ410043	D2WT011E10	DIODE,SILICON
D1007	BZ410022	D97U06R81B	DIODE,ZENER
D1008	BZ410022	D97U06R81B	DIODE,ZENER
D1010	BZ410008	D23U1003A3	DIODE,SCHOTTKY
D1014	BZ410020	D97U05R11B	DIODE,ZENER
D4005	BZ410022	D97U06R81B	DIODE,ZENER
D4006	BZ410022	D97U06R81B	DIODE,ZENER
D4202	BZ410008	D23U1003A3	DIODE,SCHOTTKY
D4207	BZ410022	D97U06R81B	DIODE,ZENER
<b>ICS</b>			
△ IC351	BZ611001	I01DP75110	IC
△ IC401	BZ611025	I03TD80400	IC
△ IC502	BZ611041	I2BT066230	IC
△ IC506	BZ410055	0002500450	PHOTO COUPLER
IC601	BZ611037	I06FC1203C	IC
IC1001	BZ611042	I56F57043B	IC
IC1002	BZ611012	I9UJ0T600H	IC
△ IC1003	BZ611018	I07SQ69550	IC
IC1099	BZ610104	A545D1A015	IC
IC4001	BZ611023	I03F31067S	IC
<b>TRANSISTORS</b>			
Q401	BZ510019	TNYJA05001	COMPOUND TRANSISTOR
Q402	BZ510008	TB3T008920	TRANSISTOR,SILICON
Q403	BZ510022	TNYJJ05001	COMPOUND TRANSISTOR
Q404	BZ510049	TPYJD05001	COMPOUND TRANSISTOR
△ Q405	BZ510010	TC3T022710	TRANSISTOR,SILICON
△ Q406	BZ510036	TD30026270	TRANSISTOR,SILICON
Q502	BZ510045	TNYJD05001	COMPOUND TRANSISTOR
△ Q503	BZ510004	TA3T016240	TRANSISTOR,SILICON
△ Q504	BZ510012	TC5T018154	TRANSISTOR,SILICON
Q505	BZ611046	TD3Q018250	TRANSISTOR,SILICON
Q506	BZ510022	TNYJJ05001	COMPOUND TRANSISTOR
Q507	BZ510012	TC5T018154	TRANSISTOR,SILICON
Q508	BZ510045	TNYJD05001	COMPOUND TRANSISTOR
Q513	BZ510020	TNYJB05001	COMPOUND TRANSISTOR
Q602	BZ510044	TC5T021204	TRANSISTOR,SILICON
Q603	BZ510044	TC5T021204	TRANSISTOR,SILICON
Q604	BZ510042	TDWT00400E	TRANSISTOR,SILICON
Q605	BZ510042	TDWT00400E	TRANSISTOR,SILICON
Q606	BZ510050	TD3T008630	TRANSISTOR,SILICON
Q609	BZ510020	TNYJB05001	COMPOUND TRANSISTOR
Q611	BZ510020	TNYJB05001	COMPOUND TRANSISTOR
△ Q804	BZ510009	TC3F042170	TRANSISTOR,SILICON
△ Q805	BZ510009	TC3F042170	TRANSISTOR,SILICON
△ Q806	BZ510009	TC3F042170	TRANSISTOR,SILICON
Q1001	BZ410049	0002700590	PHOTO COUPLER
Q1002	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON
Q1003	BZ410003	0002G00550	PHOTO COUPLER
Q1004	BZ510021	TNYJC05001	COMPOUND TRANSISTOR
△ Q1005	BZ410049	0002700590	PHOTO COUPLER

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
<b>TRANSISTORS</b>			
Q1006	BZ510020	TNYJB05001	COMPOUND TRANSISTOR
Q1009	BZ410003	0002G00550	PHOTO COUPLER
Q1013	BZ410042	0000100380	PHOTO TRANSISTOR
Q1023	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON
Q1024	BZ510019	TNYJA05001	COMPOUND TRANSISTOR
Q4001	BZ510033	TC3T033310	TRANSISTOR,SILICON
Q4002	BZ510033	TC3T033310	TRANSISTOR,SILICON
Q4003	BZ510047	TPYTC03001	COMPOUND TRANSISTOR
Q4005	BZ510003	TA3T013180	TRANSISTOR,SILICON
Q4006	BZ510031	TD3T007340	TRANSISTOR,SILICON
Q4007	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON
Q4008	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON
Q4009	BZ510048	T6YA1037K0	TRANSISTOR,SILICON
Q4010	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON
Q4012	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON
Q4201	BZ510020	TNYJB05001	COMPOUND TRANSISTOR
Q4202	BZ510020	TNYJB05001	COMPOUND TRANSISTOR
<b>COILS &amp; TRANSFORMERS</b>			
L004	BZ310022	02A6A8A0A1	CORE,FERRITE
L005	BZ310022	02A6A8A0A1	CORE,FERRITE
L401	BZ310004	021679472K	COIL
△ L502	BZ310075	029X000087	COIL,LINE FILTER
△ L503	BZ310076	028R140031	COIL,DEGAUSS
L601	BZ310085	021LA61R2M	COIL
L603	BZ310002	021673101K	COIL
L607	BZ310038	021LA6120K	COIL
L612	BZ310068	021LA66R8K	COIL
L613	BZ310009	021LA62R2K	COIL
L801	BZ310001	021673101J	COIL
L1001	BZ310009	021LA62R2K	COIL
L1002	BZ310079	021LA6101J	COIL
L4001	BZ310041	02167F101J	COIL
L4002	BZ310041	02167F101J	COIL
L4003	BZ310001	021673101J	COIL
L4004	BZ310024	0326230038	COIL,TRAP
L4005	BZ310040	02167F470J	COIL
L4007	BZ310079	021LA6101J	COIL
L4008	BZ310041	02167F101J	COIL
L4009	BZ310041	02167F101J	COIL
L4010	BZ310041	02167F101J	COIL
T401	BZ310080	03305Y0018	TRANS,HORIZONTAL DRIVE
△ T501	BZ310081	0481290154	TRANSFORMER,SWITCHING
T4001	BZ310023	031626007S	COIL,BIAS OSC
<b>JACKS</b>			
△ J351	BZ614002	060G131014	RCA JACK
J701	BZ614001	0602101020	JACK,RCA
△ J801	BZ614004	066X120014	SOCKET,CATHODE RAY TUBE
<b>SWITCHES</b>			
SW1001	BZ612002	0508221001	SWITCH (LEAF)
SW1002	BZ612001	0504201T31	SWITCH,TACT
SW1003	BZ612001	0504201T31	SWITCH,TACT
SW1004	BZ612001	0504201T31	SWITCH,TACT
SW1005	BZ612001	0504201T31	SWITCH,TACT
SW1006	BZ612001	0504201T31	SWITCH,TACT
SW1007	BZ612001	0504201T31	SWITCH,TACT
SW1008	BZ612001	0504201T31	SWITCH,TACT
SW1009	BZ612001	0504201T31	SWITCH,TACT
SW1010	BZ612001	0504201T31	SWITCH,TACT
SW1011	BZ612001	0504201T31	SWITCH,TACT
SW1012	BZ612001	0504201T31	SWITCH,TACT
<b>VARIABLE RESISTORS</b>			
VR502	BZ210024	V1163L2BTC	VOLUME,SEMI FIXED
<b>P.C.BOARD ASSEMBLIES</b>			
PCB030	BZ610084	A545D0A03A	PCB ASSY
PCB110	BZ610085	A545D0A11A	PCB ASSY
PCB550	BZ610053	A4C831B550	SEE CHASSIS REPLACEMENT PARTS LIST
PCB800	BZ610105	A545D1A01A	PCB ASSY
<b>MISCELLANEOUS</b>			
B402	BZ310016	024AT03655	CORE,BEADS
B403	BZ310016	024AT03655	CORE,BEADS
B502	BZ310015	024AT03482	CORE,BEADS
B503	BZ310016	024AT03655	CORE,BEADS
B505	BZ310015	024AT03482	CORE,BEADS
B602	BZ310045	024AT03481	CORE,BEADS
B604	BZ310045	024AT03481	CORE,BEADS
BL001	BZ310014	023C00022A	COIL BALUN
CD351	BZ614131	06CH27091A	CORD CONNECTOR

# ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description
<b>MISCELLANEOUS</b>			
	CD352	BZ614132 06CH25093A	CORD CONNECTOR CH25093A
	CD353	BZ614096 06CH12426A	CORD CONNECTOR CH12426A
△	CD501	BZ614053 120R614909	CORD,AC 0R614909
	CD503	BZ614133 069X620040	CONNECTOR JM-2BK-61
	CD801	BZ614007 068M82025A	CORD CONNECTOR 8M82025A
	CF601	BZ613014 1022T45R72	FILTER,SAW SAF45MFY220ZR
	CF603	BZ613015 1011T4R504	FILTER,CERAMIC EFCT4R5YS5A
	CF604	BZ613016 1011T4R517	FILTER,CERAMIC EFCT4R5MW5
	CP351	BZ614135 0694260139	CONNECTOR PCB SIDE 173979-6
	CP352	BZ614019 069X120249	CONNECTOR PCB SIDE B2B-EH-A
	CP353	BZ614102 0694270139	CONNECTOR PCB SIDE 173979-7
	CP354	BZ614136 0694250139	CONNECTOR PCB SIDE 173979-5
△	CP401	BZ614020 069X450029	CONNECTOR PCB SIDE B05B-DVS
△	CP501	BZ614012 0697320039	CORD UX CONNECTOR THL-P03P-B1
△	CP502	BZ614018 069W420029	CONNECTOR PCB SIDE TV-50P-02-A1
	CP503	BZ614137 069X620030	CONNECTOR PCB SIDE RE-H022TD-1130
	CP801	BZ614017 069W320018	CONNECTOR PCB SIDE TS-80P-02-V1
	CP1003	BZ614138 0694240139	CONNECTOR PCB SIDE 173979-4
	CP1004	BZ614010 0697280590	CONNECTOR PCB SIDE TMC-J08P-B1
	CP1005	BZ614049 069J750029	CONNECTOR PCB SIDE IMSA-9604S-05Z14
	CP1006	BZ614014 069J740029	CONNECTOR PCB SIDE IMSA-9604S-04Z14
	CP4001	BZ614054 0697240600	CONNECTOR PCB SIDE TOC-C04X-B1
	CP4002	BZ614050 069J760029	CONNECTOR PCB SIDE IMSA-9604S-06Z14
	CP4003	BZ614009 0697120320	CONNECTOR PCB SIDE TMC-T02X-E1
	CP851A	BZ614139 067R010019	WIRE HOLDER 51048-1000
	CP851B	BZ614139 067R010019	WIRE HOLDER 51048-1000
	CUS011	BZ710001 800WF00004	CUSHION-A
	CUS012	BZ710002 800WF00019	CUSHION-C
	CUS013	BZ710001 800WF00004	CUSHION-A
	CUS014	BZ710001 800WF00004	CUSHION-A
	CUS015	BZ710001 800WF00004	CUSHION-A
	CUS016	BZ710001 800WF00004	CUSHION-A
	CUS017	BZ710001 800WF00004	CUSHION-A
	EL001	BZ614043 124116281A	EYE LET XRY16X28BD
	EL002	BZ614044 124120301A	EYE LET XRY20X30BD
△	F501	BZ614033 081PA05003	FUSE 233005-MB000
△	FB401	BZ310082 043213013R	TRANSFORMER,FLYBACK 3213013R
	FH501	BZ614005 06710T0006	HOLDER,FUSE EYF-52BC
	FH502	BZ614005 06710T0006	HOLDER,FUSE EYF-52BC
△	ICP501	BZ614140 083PC05003	MICRO FUSE 251005RT
△	ICP502	BZ614140 083PC05003	MICRO FUSE 251005RT
△	ICP503	BZ614036 083PC05002	MICRO FUSE 251005
△	ICP505	BZ614140 083PC04003	MICRO FUSE 251004RT
	OS1001	BZ614031 0779014002	REMOTE RECEIVER GP1U281Q
△	RY501	BZ612008 0560Q20114	RELAY SDT-S-112LMR
△	SP351	BZ614029 070C533008	SPEAKER 810-47-171
△	TH501	BZ410056 DF20A3R0Q0	DEGAUSS ELEMENT PTH451A3R0Q11
	TM101	BZ614055 076R0DA010	TRANSMITTER R25-1335
△	TU601	BZ610078 0145K00053	TUNER,VHF-UHF TECC1040PG32A
△	V801	BZ614141 098Q1404B2	CRT W/DY A34AGT13X98(L)
	X602	BZ613004 100CT3R505	CRYSTAL HC-49/C
	X1001	BZ613002 100CT01207	CRYSTAL HC-49/U-S
	X1002	BZ613006 100DA32R01	CRYSTAL DT-26
	X4001	BZ613008 100CF3R512	CRYSTAL HC-49/U
<b>RESISTOR</b>			
		RC.....	CARBON RESISTOR
<b>CAPACITORS</b>			
		CC.....	CERAMIC CAPACITOR
		CE.....	ALUMI ELECTROLYTIC CAPACITOR
		CP.....	POLYESTER CAPACITOR
		CPP.....	POLYPROPYLENE CAPACITOR
		CPL.....	PLASTIC CAPACITOR
		CMP.....	METAL POLYESTER CAPACITOR
		CMPL.....	METAL PLASTIC CAPACITOR
		CMPP.....	METAL POLYPROPYLENE CAPACITOR

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