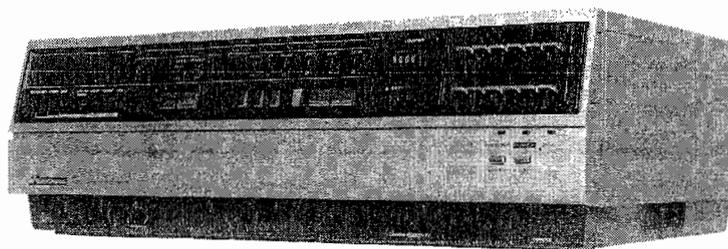
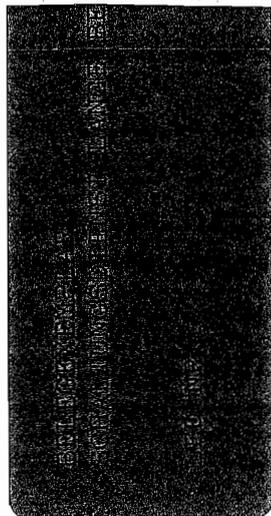


Mitsubishi VTR Service Manual Model HS-302E



V04470



VHS

Only cassettes marked VHS can be used with this video cassette recorder.

SPECIFICATION

Format	: VHS PAL standard	Video signals	
Video recording system	: Rotary, slant azimuth two-head helical scan system	Input	: 0.5 to 2.0Vp-p/75 ohms
Video signal system	: PAL colour (system B.G) and CCIR monochrome signals, 625 lines	Output	: 1.0Vp-p/75 ohms
Tape width	: 12.7mm	S/N ratio	: 43 dB
Tape speed	: 23.39mm/sec	Horizontal resolution	: Colour: More than 240 lines Monochrome: More than 290 lines
Recording time	: 240 min. (E-240 cassette)	Audio signals	
Power requirement	: Set to 220V 110/120/220/240V AC selectable (to be adjusted by your dealer), 50Hz, 48 watts (including Video Timer)	Input	: Mic -67dBs/10K ohms Line -20dBs/50K ohms
Temperature Operating	: 5°C to 40°C	Output	: Line 0dBs/1K ohm
Storage	: -20°C to 50°C	S/N ratio	: More than 40dB
Aerial input	: VHF Band channels 2 - 12 UHF Band channels 21 - 69	Frequency response	: 70Hz - 8KHz (-10 dB)
Aerial output	: Set to channel 36 Channel 34 - Channel 38 selectable (to be adjusted by your dealer)	Video timer	
		Clock	: Digital clock 24 hour display format
		Channel programmer	: 1 Event Any time any channel in two weeks
		Dimensions	: 498mm (W) x 162mm (H) x 347mm (D)
		Weight	: 13.8 kg



MITSUBISHI ELECTRIC CORPORATION

Head Office: Mitsubishi Denki Building, Marunouchi Tokyo, Japan
Cable Address: MELCO TOKYO

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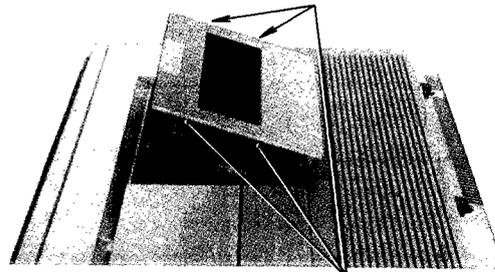
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DISMANTLING PROCEDURE:

1. Removal of cassette housing cover

Depress eject button to raise the cassette housing assembly and remove the 4 screws shown in Fig. 1. Lift the cover upward.

Fig. 1

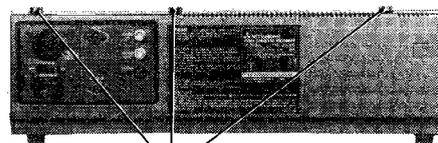


Cover retaining screws

2. Removal of top

Remove three screws retaining the cabinet top & sides are shown in Fig. 2, pull the cover up.

Fig. 2

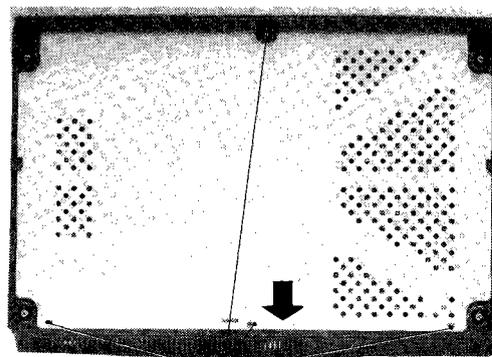


Retaining screws

3. Removal of bottom cover

Remove three screws retaining the bottom cover shown in Fig. 3, pull the cover in the direction of the arrow.

Fig. 3



Retaining screws

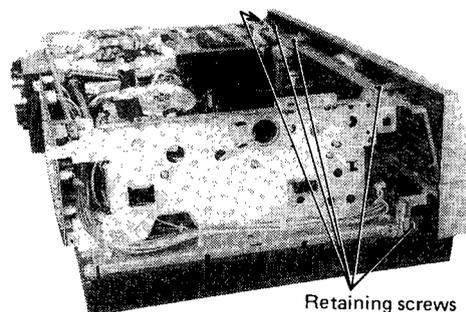
4. Removal of back cover

The back cover is held in place by the bottom and top covers. After removing the bottom and top covers as described in items 2 and 3, the back cover can be pulled off.

5. Removal of front panel

Remove five screws shown in Fig. 4, pull it in the direction of the arrow.

Fig. 4

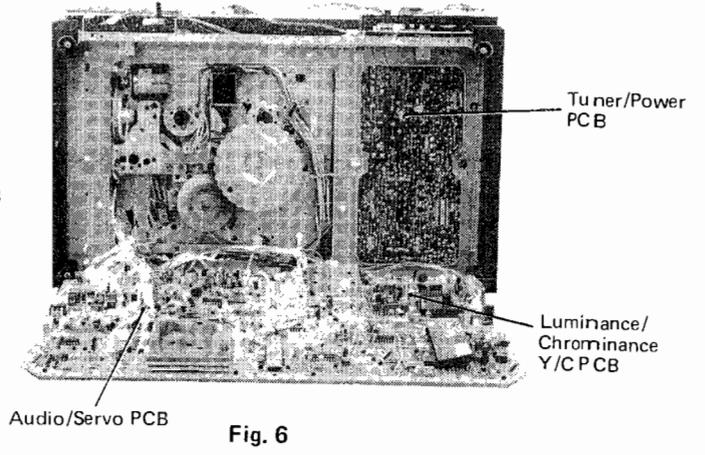
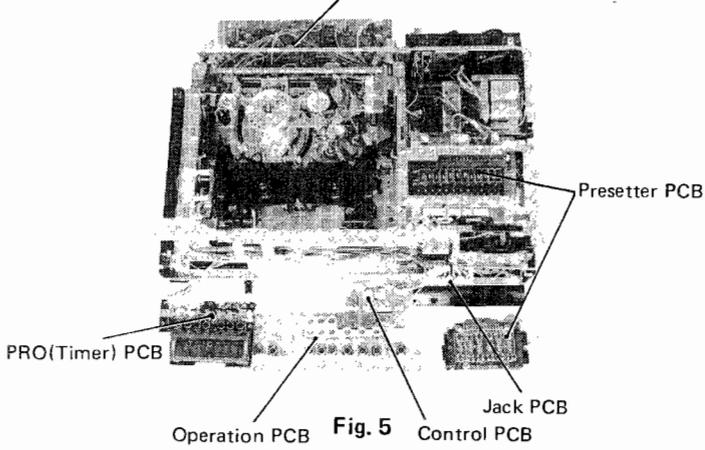


Retaining screws

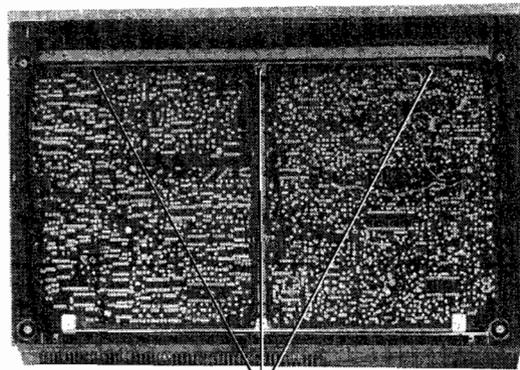
REMOVAL OF PRINTED CIRCUIT BOARDS (PCB'S)

CAUTION: Before attempting to remove or repair any PCB UNPLUG POWER CORD FROM REAR SOCKET.

Access to PCBs. Mechanism Control PCB



1. To Access the Luminance/Chrominance (Y/C) and Servo Printed Circuit Board, remove the three screws indicated with arrow marks stamped on the frame. (See Fig. 7) The Board, will now swing out.

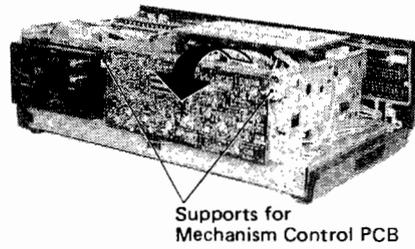


Screws for retaining Luminance/Chrominance (Y/C) PCB, Audio/Servo PCB Fig. 7

2. PCB MC (Mechanism control)

Unlock the two printed circuit board supports shown in Fig. 8, and swing the printed circuit board down.

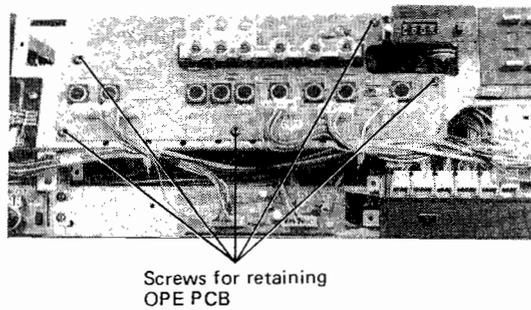
Fig. 8



3. PCB OPE (Operation)

Remove the screws retaining the printed circuit board. (See Fig. 9)

Fig. 9



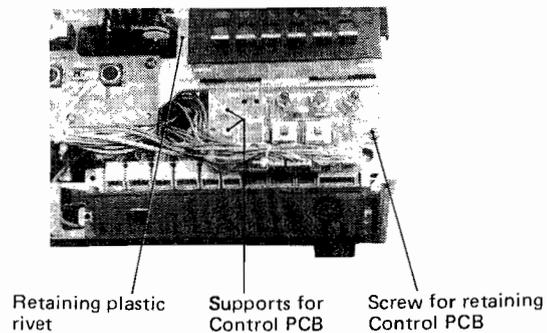
4. PCB Cont (Control)

Remove the screws retaining the printed circuit board and unlock the two supports. (See Fig. 10)

5. PCB-CH-SW

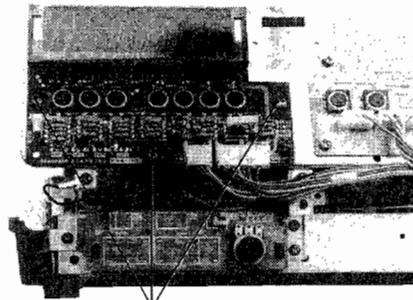
Remove the plastic rivets retaining the printed circuit board shown in Fig. 10.

Fig. 10



6. PCB-PRO (Timer/Programmer)

Remove the two screws retaining the printed circuit board shown in Fig. 11.



Screws for retaining
CH-PRO PCB

Fig. 11

7. PCB Tuner (Tuner/Power supply)

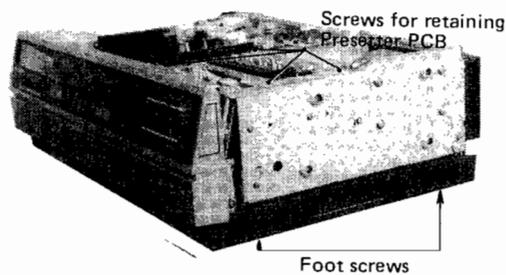
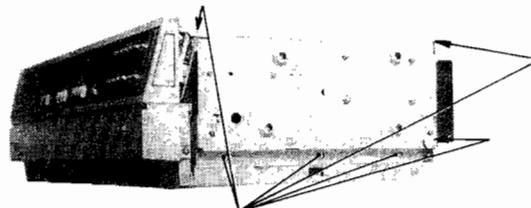


Fig. 12

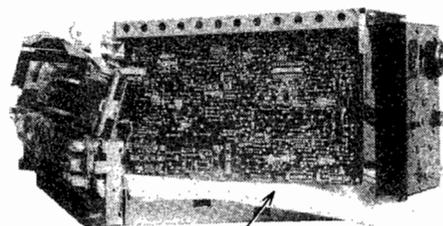
- (1) Remove the two screws retaining the right-hand feet.
- (2) Loosen the four screws retaining the Presetter printed circuit board shown in Fig. 12 and remove the Presetter printed circuit board.
- (3) Remove six screws retaining power block, and pull out the power block. (See Fig. 13)



Screw for retaining
Power block

Fig. 13

- (4) Place an insulator under the Power block assembly as shown in Fig. 14 below.



Insulator

Fig. 14

INTERCHANGING METHOD AND ADJUSTMENT

1. MECHANISM ADJUSTMENT

1-1 Cleaning

The following items require cleaning after servicing to maintain satisfactory performance.

1-1-1 Video head cleaning

- (1) Remove the cassette housing cover (Refer to item 1 on page 1)



- (2) Moisten a clean piece of chamois with isopropyl alcohol or a professional head cleaner. Hold the chamois to the drum assembly and rotate the drum clockwise by hand to clean the video heads and tape path.
[Note] Never move the chamois vertically while cleaning, otherwise the head will be damaged.
- (3) After the heads are cleaned allow the cleaned portion to dry thoroughly before running a tape. Otherwise the tape and head may be damaged.

1-1-2 Transport system

(The transport mechanism should be cleaned after every 500 Hours of use to maintain proper operation.)

1. The following components of the transport system require occasional cleaning: Tension Pole, Sub-loading Guide Roller, Full Erase Head, Impedance Rollers, Guide Rollers, Slant poles, Upper and Lower Drum assembly, Audio Erase Head, Audio/Control Head, Capstan, and Pinch Roller.
2. To clean use a small piece of gauze moistened with alcohol.
3. Use extreme care when cleaning the video heads and Drum assembly to prevent damage. Avoid touching the Drum assembly with your fingers as a deposit of oil will result. NEVER clean the Drum assembly by moving the cleaner pad vertically.
4. After cleaning the transport mechanism, allow it to dry thoroughly before loading a tape. If this is not done damage to the heads or tape may result.

1-1-3 Reel Drive System

1. Reel Disc Brake Surfaces require occasional cleaning. To clean use a small piece of gauze moistened with alcohol.

1-2 Mechanism Adjusting Jig

In order to adjust the mechanism completely, the following special jigs are necessary;

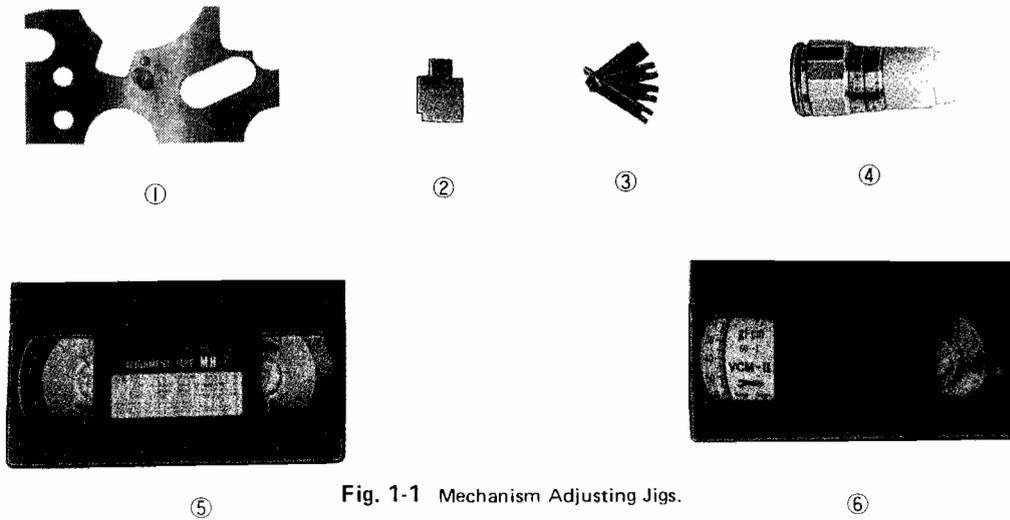


Fig. 1-1 Mechanism Adjusting Jigs.

1-2-1 Jig List

1. Master Plane jig
2. Reel disc height adjust jig
3. 0.3, 0.5, 0.7 and 1.5mm feeler gauge
4. Torque gauge, Torque gauge head
5. Alignment tape (MH-2)
6. Back tension adjust jig
7. Self-recording and playback check tape

The above-mentioned special jigs, general tools and hex, key of 1.5mm and 2mm are necessary.

1-2-2 Other Necessities

Isopropyl Alcohol, Spindle oil (Oiler), Machine grease (XLA-2), Gause, Cloth, etc.

1-3 Cassette Housing

1-3-1 Removal

1. Depress the Eject button to raise the cassette housing.
2. Remove the right and left housing screws "A" "B" "C" and grounding springs.
3. Remove the E ring of the coupling lever from the oil damper housing as shown in Fig. 1-2 (b).
4. Lift the housing being careful not to hit any other mechanical parts.

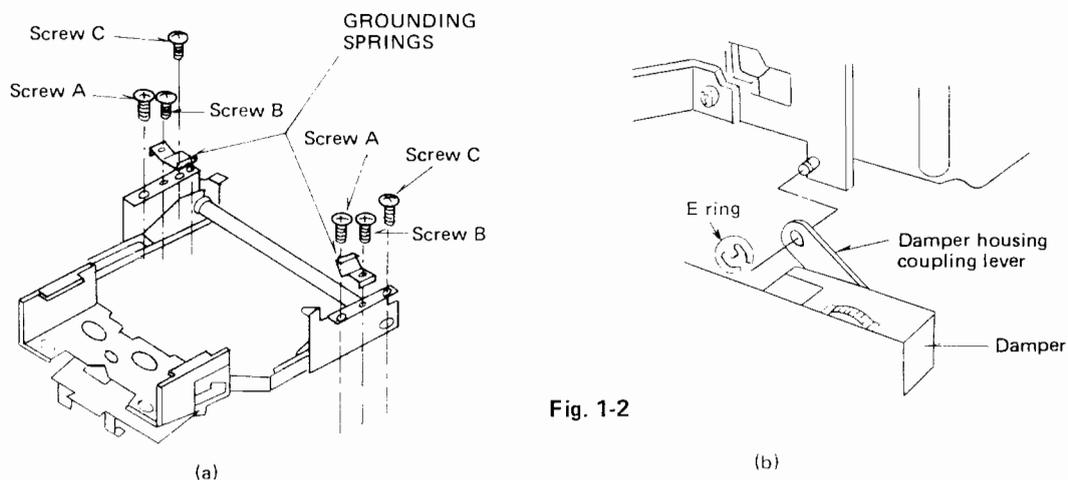


Fig. 1-2

1-3-2 How to reinstall the Cassette Housing

1. Carefully set the Cassette Housing assembly in place without touching any of the transport components (Capstan shaft, Drum assembly, etc.).
2. Install screws "A" and "C" as shown in Fig. 1-2(a) and the damper lever as shown in Fig. 1-2(b).
3. Push the Cassette Housing down until it locks in place then depress the Eject button. Do this several times to check for proper operation.
4. Insert a E-180 cassette tape into the Cassette Housing and push the housing down until it locks in place. Make sure the cassette tape is properly seated into the transport mechanism.
NOTE: Due to the wearing of the positioning holes on a cassette tape with use it is best to use a new cassette tape.
5. Install the ground springs and secure in place with screws "B". (See Fig. 1-2 (a))
6. Again check for proper operation of the Cassette Housing assembly.

1-4 Installation of Master Plane jig

1. Remove the Cassette Housing Cover and the Top Cover of the recorder.
2. Insert a Dummy Cassette in the Cassette Housing and depress the Cassette Housing to lock in place. Place the recorder in the PLAY mode.
NOTE: A Cassette cartridge with the tape removed and light path blocked used as a may be substituted for the Dummy Cassette.
3. Unplug the power cord from the A.C. source removing power from the recorder.
4. Remove the six screws securing the Cassette Housing to the recorder.
5. Install the Master Plane jig being careful not to hit the Drum assembly which may cause damage. (See Fig. 1-3 below)

Alternative Method

1. Remove the Cassette Housing Cover and the Top Cover of the recorder.
2. Remove the Cassette Housing as described in section 1-3-2.
3. Cover the "END SENSOR" with a small piece of tape and with your hand close the cassette switch.
4. Place the recorder in the PLAY Mode, then after loading has completed switch off mains at rear.
5. Install the Master Plane jig being careful not to hit the Drum assembly. (See Fig. 1-3)

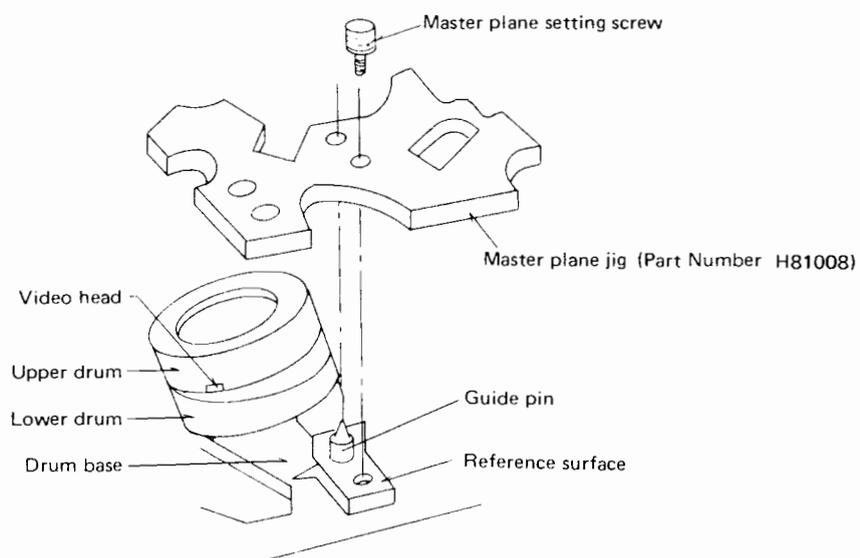


Fig. 1-3

1-5 Pinch roller Pressure Confirmation and Adjustment

1. Remove the top cover and cassette housing cover.
2. Insert a dummy cassette and place the recorder in the PLAY mode.
3. Check to see that the gap between the pinch roller and capstan shaft is $0.8\text{mm} \pm 0.2\text{mm}$. (See Fig. 1-4)
4. If the gap is less than 0.6mm bend the pause lever in the direction of arrow (a) as illustrated in Fig. 1-6. If the gap is larger than 1.0mm bend the lever in the direction of arrow (b).
5. By hand gently press the pinch roller against the capstan shaft and make sure there is less than 0.1mm variation between the capstan shaft and the surface of the pinch roller.

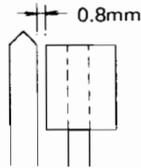


Fig. 1-4

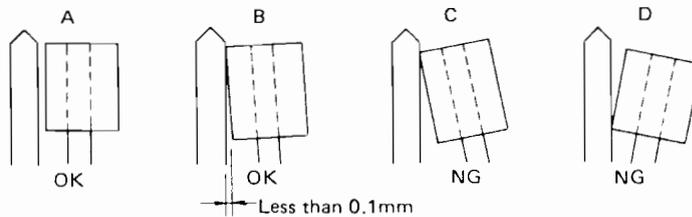


Fig. 1-5

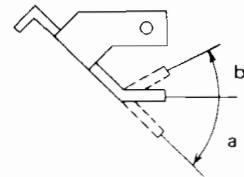


Fig. 1-6 Pause Lever

1-6 Subloading Guide Roller & Takeup Guide Pole Height

Install the master plane jig as described in section 1-4.

1-6-1 Subloading Guide Roller Height (See Fig. 1-7)

1. Place the square between the collars of the guide roller. If this is not possible, loosen the hex screw and adjust the height of the guide roller by turning the \ominus screw on top of the guide roller. Refer to "A" in Fig. 1-7 below.
2. Re-tighten the hex screw firmly.

1-6-2 Take-up Guide Pole Height (See Fig. 1-8)

1. Place the square between the collars of the guide pole. If this is not possible loosen the hex screw and adjust the height of the guide pole by turning the \oplus screw on top of the guide pole. Refer to "A" in Fig. 1-8 below.
2. Re-tighten the hex screw firmly.

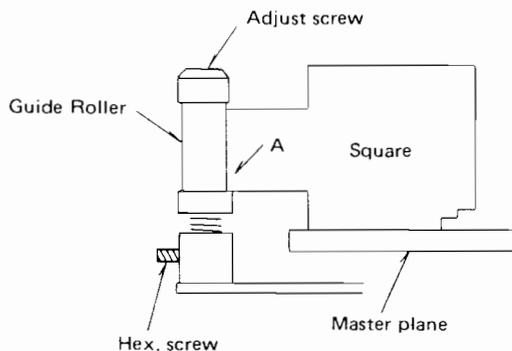


Fig. 1-7

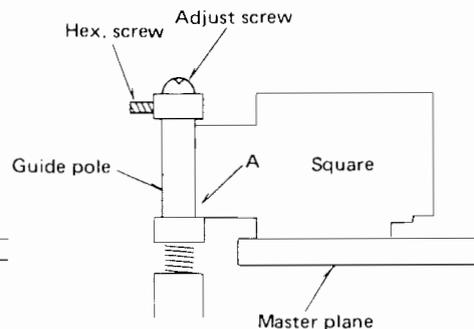


Fig. 1-8

1-7 Capstan-Shaft Adjustment

1. Install the master plane jig as described in section 1-4.
2. Apply the square to the capstan shaft from two different directions to check that the square is flush with the capstan shaft. Refer to Fig. 1-9 and 1-10 below.
3. If the capstan shaft is not perpendicular to the master plane jig (the square is not flush with the capstan shaft) problems such as tape creases, tape breakage, or audio level fluctuations may result. To adjust fit a shim between the capstan motor and base.

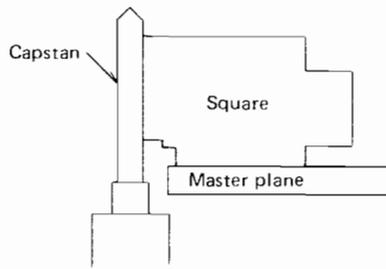


Fig. 1-9

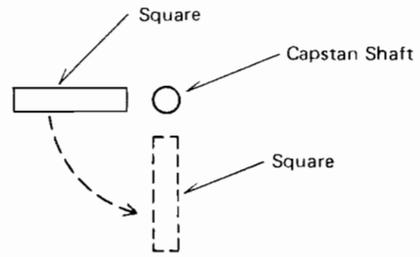


Fig. 1-10

1-8 Reel Disc Height Adjustment

1. Install the master plane jig as described in section 1-4.
2. Using the Height Adjust jig (square) check the reel height. Refer to Fig. 1-11.
3. If adjustment is necessary remove the PCB-Operation as described on page 6. Loosen the two hex screws in the base of the Reel Disc. Refer to Fig. 1-11.
4. Adjust the Reel Disc height so that the Reel Disc is lower than space A and higher than space B as shown in Fig. 1-11.
5. Tighten the hex screws and re-install the PCB-Operation.

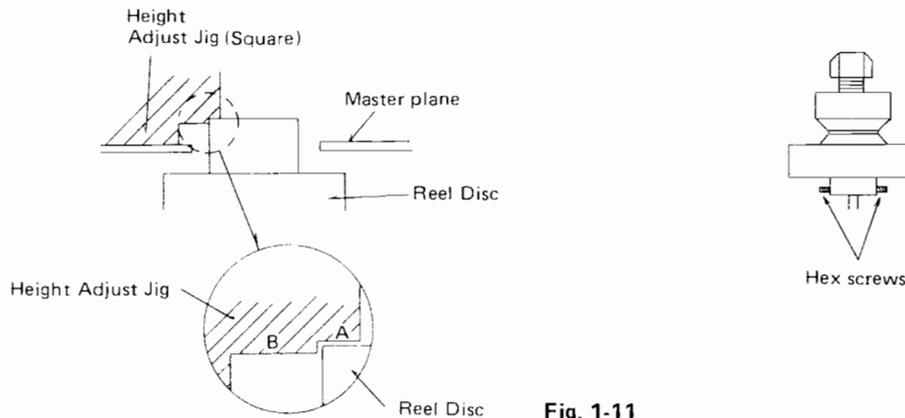
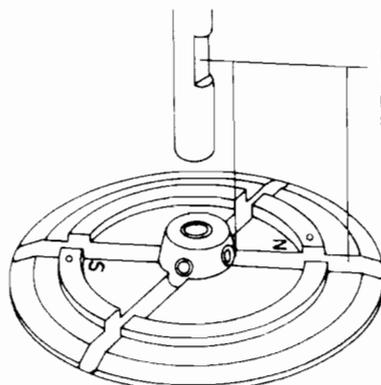


Fig. 1-11

1-9 Drum Flywheel Gap Adjustment

1. Insert the flywheel in the direction shown in Fig. 1-12 so that the gap between the magnet of the drum flywheel and PICK-UP-HEAD is 0.25mm at the thinner magnet side.
 2. Set the recorder to the play mode.
 3. Set the oscilloscope to connector SA pin ② of PCB-SERVO while observing the out put waveform adjust the gap so that the regular pulse [a] is 1.4V or more in both positive and negative directions. The head may be moved as shown in Fig. 1-14 for fine adjustment.
- ⊖ Driver in the direction as shown in the figure.
- NOTE: There is some possibility of the head position deviation when the screw is fastened again. Re-check waveform screw.



Position the flywheel so that the magnet N (marked 1) coincides with the line perpendicular to the sliced surface of the shaft and fasten the flywheel to the shaft with two hexagonal screws.

Fig. 1-12

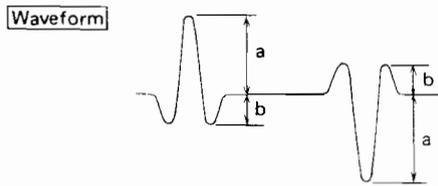


Fig. 1-13

$a > 1.40V$
 $b < 0.80V$

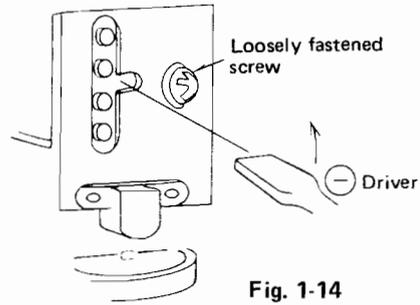


Fig. 1-14

4. Make sure that the overshoot [b] shown in Fig. 1-13 is no more than 0.8V.

1-10 Take-up and Supply Brake Performance Check

1-10-1 Adjustment Procedure

1. Remove the cassette housing assembly.
2. With the plunger of the lock solenoid (L571) pulled in check to see that the clearance between the reel discs and brakes A and B in Fig. 1-15 (a) is $1\text{mm} \pm 0.5\text{mm}$.
3. If the clearance is not correct adjust the position of the lock solenoid (L571) for a clearance of $1\text{mm} \pm 0.5\text{mm}$.
4. Check to see that the brake is applied when the unit is in the STOP mode.
5. Apply the torque meter to the reel disc. Allow the reel disc to rotate in the "thrust" direction shown in Fig. 1-15(b) and check for a meter indication of $0.5 \sim 0.7\text{kgcm}$ or more.
6. If the torque is less than 0.5kgcm , clean the brake surface and the reel disc.
7. Allow the reel disc to rotate in the escape direction shown in Fig. 1-15(b) and check for a meter indication of 0.02kgcm or more.

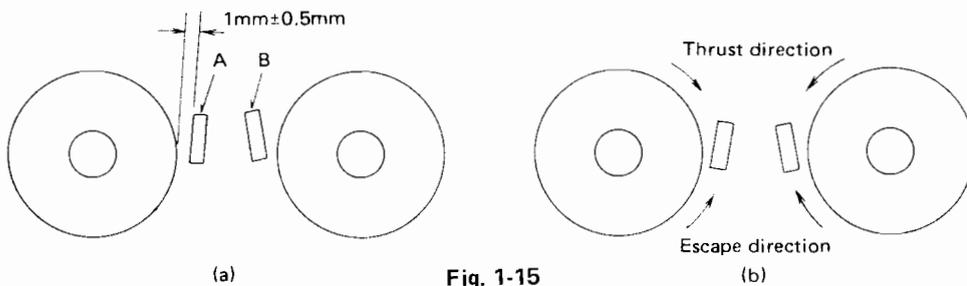


Fig. 1-15

1-11 Back-tension Check and Adjustment

1-11-1 Checking Method

1. Insert the back tension jig, and set the recorder to playback mode.
2. Check that the mean value is 36 to 38 g-cm on the supply side.

1-11-2 Adjustment Method

1. If the mean value exceeds 38 g-cm, adjust the value to 37 g-cm by bending the spring holder (A) in the direction of arrow (a) as shown in Fig. 1-16.
2. If the pointer mean value is much less than 36 g-cm, adjust the pointer mean value for 37 g-cm by bending the spring holder (A) in the direction of arrow (b).
3. The deviation of back tension value is not absolutely specified. However, if it fluctuates by more than 5 g-cm, after a stabilizing period, then a problem exists in one of the associated parts. Check and repair as required.
4. With the cassette housing assembly installed and the recorder set to PLAY mode at the start of a E-180 tape, ascertain that the tension pole does not hit the bracket of the cassette housing.
5. Ascertain that no skew distortion is observed during recording or playback.

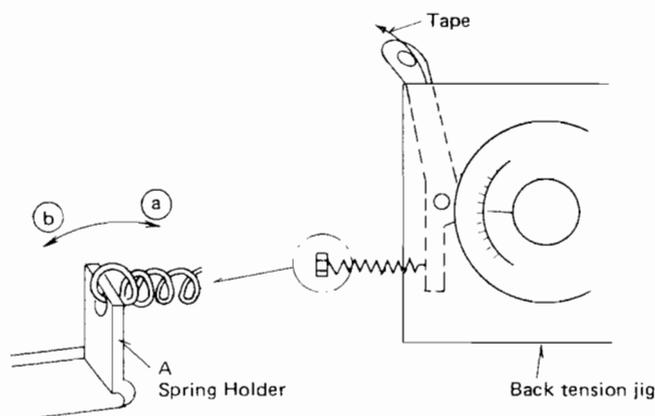


Fig. 1-16

1-12 Take-up Torque Check

1-12-1 Checking Method

1. Remove the cassette housing assembly.
2. With the tape unloaded (cover the end sensor with a small piece of black tape and close the cassette switch), set the recorder to the PLAY mode.
3. Apply a torque meter to the take-up reel disc.
4. Softly grip by hand the rotating torque meter and gradually increase the grasping power until the torque gauge pointer and scale plate rotate at the same speed in the hand, and read the torque value then indicated.
5. Ascertain that the torque meter mean reading is between 40 and 100 g-cm.
6. If the torque is not within the expected limits through the above measuring method, or the torque fluctuates largely in value check the voltage of the take-up reel motor or replace the motor. The voltage should read approximately 2V.

1-13 FF/REW Torque Check

1-13-1 Checking Method

1. Remove the cassette housing assembly.
2. Without loading a tape (cover the end and start sensors with a small piece of black tape and close the cassette switch), set the recorder to the FF/REW mode.
3. Apply the torque meter to each reel disc in turn.
4. Ascertain that the torque meter mean value is more than 250 g-cm.

NOTE: Make sure the Supply and Take-up Reel Disks rotate, that the brake is free and each disc is trying to revolve.

5. If the torque does not indicate the specified value through the above procedure, or the torque fluctuates far beyond that specified above, replace the motor in question.

1-14 Audio/Control Head Adjustment

1-14-1 Tape Running Adjustment around A/C Head

1. Check the tape path in the playback mode using a self-recorded/playback tape. It is vital for the tape to run smoothly, maintaining a clean, flat surface condition between the guide roller and the take-up impedance roller and the guide pole. The guide pole and the capstan shaft are critical.
2. If the tape is skewed (twisted) between the A/C head and the guide pole, a satisfactory picture can not be obtained. Be sure that the tape is not running on to the edge of the guide pole and no fine folds are observed in the tape.
3. If any abnormality is found, slightly adjust the head with Screws A, B and C shown in Fig. 1-17(a).
NOTE: Do not move the guide pole.
4. The A/C head should be positioned for the tape as illustrated in Fig. 1-17(b). If the height of the head deviates, adjust it with Screws A, B and C.
NOTE: It is necessary to set screw D at the location shown in Fig. 1-18.
5. Item 1-15-2 must be checked if the A/C head position is disturbed.

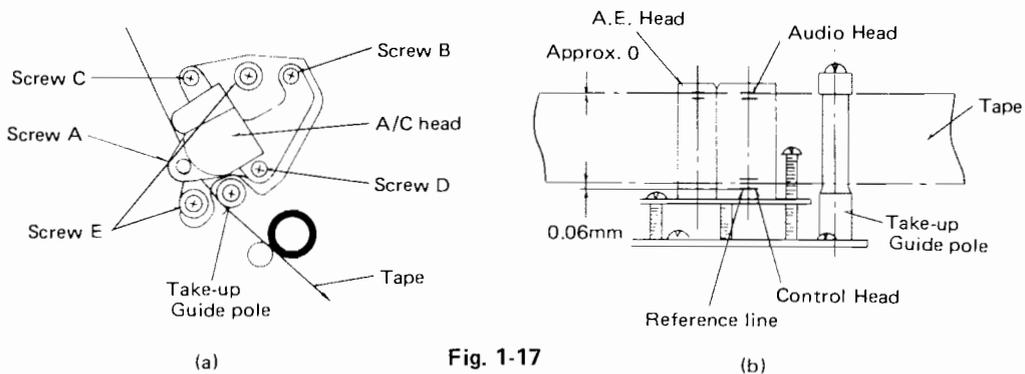


Fig. 1-17

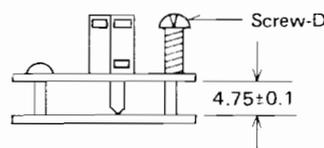


Fig. 1-18

1-14-2 Adjustments of Audio/Control Heads and Azimuth

After checking with a self recorded tape as shown in Fig. 1-17 change to an alignment tape type MH2.

Caution if the alignment tape is used with an improperly adjusted A/C head path, the tape may be damaged.

1. Replay the 6KHz section stairsteps of the alignment tape and observe the waveform at testpoint TP-3A (AUDIO OUT) of the Audio printed circuit board.
2. Turning Screws A, B and C slightly, adjust the audio output level for maximum with the relative positions as specified in Fig. 1-17(b).
3. With Screw A as a reference, adjust C for azimuth, adjust B for maximum audio output level and minimum level fluctuation consistent with un-creased tape at the guide pole portion.

NOTE: The upper and lower edges of the take-up guide pole form a reference.

If the audio level fluctuation is over 2dB p-p, the tape is being drawn near to the lower edge.

Any fold in the tape at the take-up guide pole will greatly reduce the tape life due to the large tape tension at this position.

Therefore any adjustment of the take-up guide pole must be made for the minimum amount of tape creasing.

1-15 FM Preset Adjustment

1-15-1 Adjusting Method

1. Play back the stair step section of the alignment tape.
2. Connect an oscilloscope to TP2C (P.B FM OUT) of the Y/C PCB.
3. Turning the tracking control read the maximum FM OUTPUT level at TP-2C and make note of it.
4. Set the tracking control to the click-stop position.
5. Loosen two screws E of the A/C head base shown in Fig. 1-17(a).
6. Slightly shift the whole A/C head base in the direction of the tape back or forward travel to obtain the maximum FM out put at TP-2C (approximately 1V p-p). Connect the EXT trigger of the oscilloscope to TP-4C on the PCB-SERVO (25Hz Flip-Flop Pulse). Tighten the two screws E loosened in step 5 above.
7. Ascertain that maximum output is obtained when the tracking control is set at the "click stop" position compared to other settings of the tracking control.

[Note]

- 1 Check that 'lip-sync' is correct on a pre-recorded cassette.
- 2 Follow item 2-3-5 "Tracking Preset Adj."

2. Circuit Adjustments

2-1 Power Supply (Voltage) Adjustment

2-1-1 REG 12V

1. Set the recorder to the RECORD mode.
2. Adjust VR901 so that the voltage at TP-9A (REG 12V) on PCB-TUNER is $12V \pm 0.1V$.
3. Confirm that the ripple component in the REG 12V is less than $5mV_{p-p}$ with an oscilloscope.

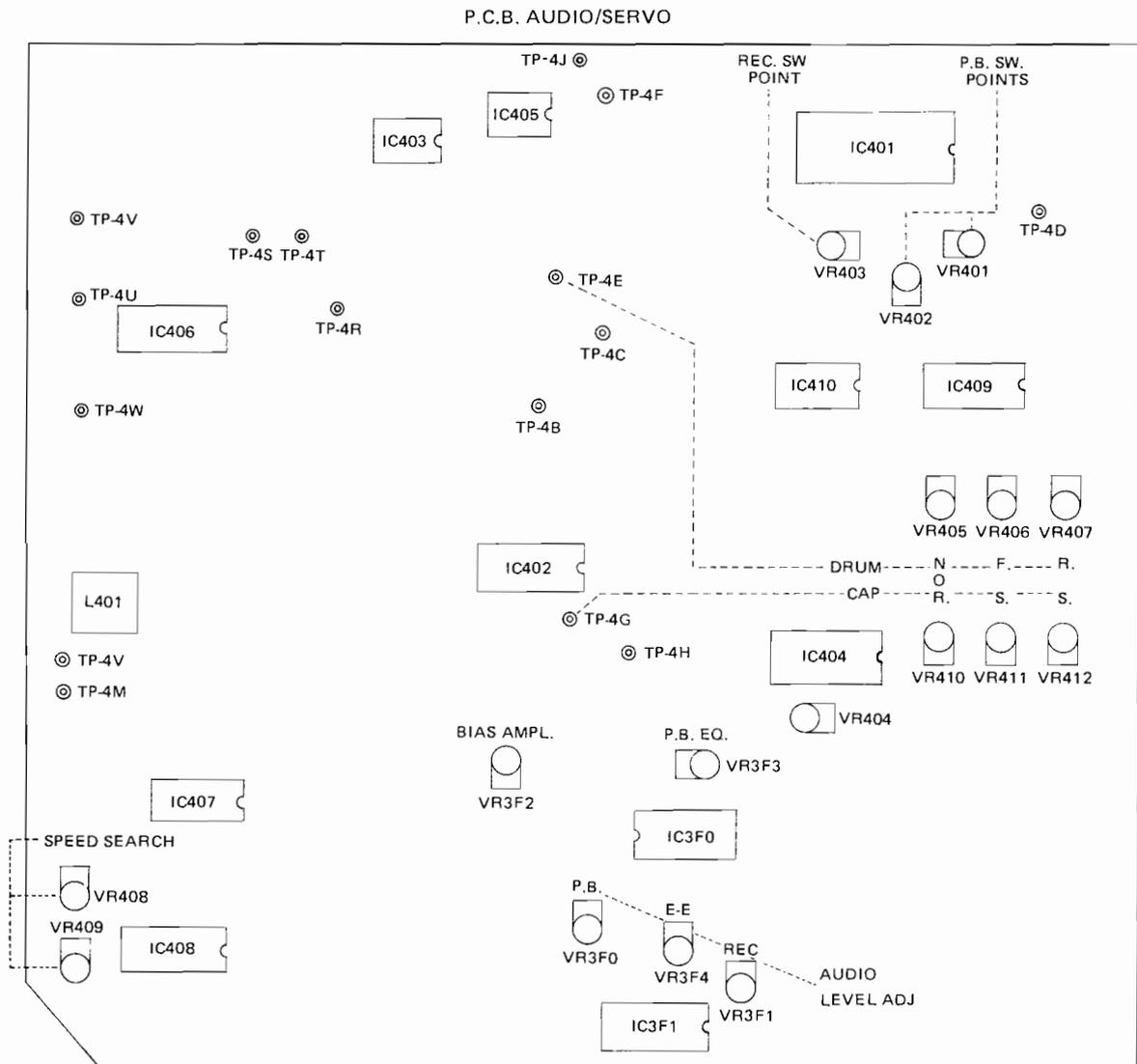
2-2 Mechanism Control Circuit Adjustment

2-2-1 Supply motor voltage

1. Turn the power switch on.
2. Cover the end sensor with a small piece of black tape.
3. Close the cassette switch by hand.
4. Set the recorder to PLAY mode.
5. Move the tension arm to allow maximum light to fall on the tension sensor (Q572).
6. Adjust VR5A1 for $2.7V \pm 0.2V$ across pins 1 and 2 of connector MP (positive at pin 2).
7. Move the tension arm to allow minimum light to fall on the tension sensor (Q572).
Check for $0 \sim 0.2V$ across pins 1 and 2 of connector MP.

2-3 Servo Circuit Adjustment

These adjustments and confirmation must be made after completion of power supply and mechanism control adjustments.



2-3-1 Drum Servo Adjustment

1. Connect a High Z meter (or scope) to TP-4E.
2. Select PLAY mode.
3. Adjust VR405 slowly to obtain a reading of $5.0V \pm 0.1V$.
4. Pressing the FS and RS buttons, adjust VR406 & VR407 respectively for a reading of $5.0V \pm 0.1V$.
5. Select STOP and allow all motors to come to a halt.
6. Re-start and check the specified voltages are re-obtained.

2-3-2 Capstan Servo Adjustment

1. Connect an Oscilloscope to TP-4G and select RECORD mode.
2. Adjust VR410 for a sampling voltage of $4.0V \pm 0.2V$. (Refer Fig. 2-1).
3. Select STOP mode, allow all motor to come to a halt.
4. Re-select RECORD mode & check the specified voltage is re-obtained.
5. Select PLAY mode.
6. Press the FS & RS buttons in turn, and adjust VR411 & VR412 respectively for a sampling voltage $4.0V \pm 0.2V$.
7. Stop unit & re-start to check sample voltage.

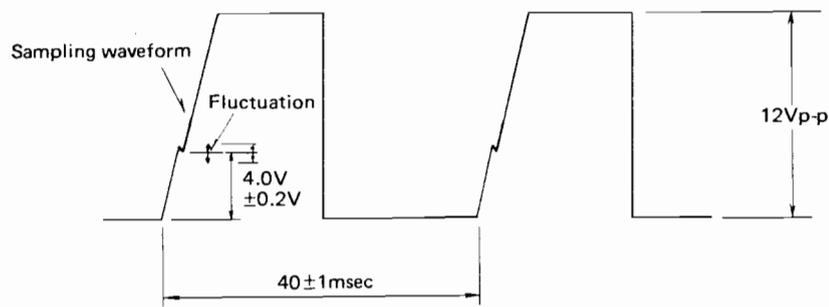


Fig. 2-1 Capstan Servo Trapezoidal wave

2-3-3 Playback Switching Point Adjustment

1. Play the stairstep section of the alignment tape.
2. Set the oscilloscope synchronizing switch to "EXT" and apply external sync from TP-4C.
3. Set the oscilloscope synchronizing slope to "-".
4. Connect the oscilloscope to the Video output socket, and adjust VR401 so that the trigger point is located at $6.5 \pm 1H$ before the vertical synchronizing signal.

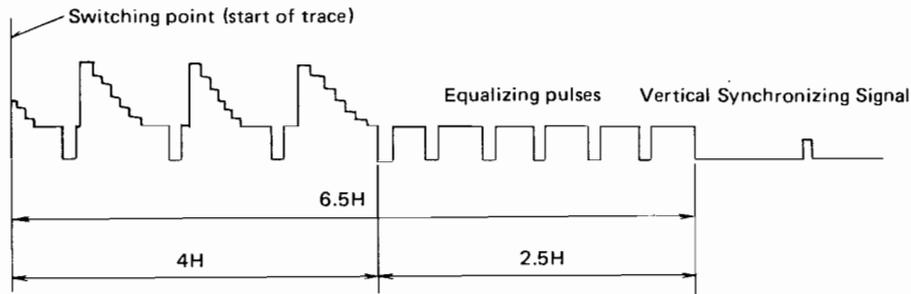


Fig. 2-2 Switching Point

5. Set the oscilloscope synchronizing slope to "+".
6. Adjust VR405 so that the trigger point is located at $6.5 \pm 1H$ before the vertical synchronizing signal.
7. Ascertain that the difference between CH1 and CH2 is less than 1H with a monitor TV.

2-3-4 Record Switching Point Adjustment

1. Set to record mode, using a T.V. broadcast signal.
2. Connect the oscilloscope as in Paragraph 2-3-3.
3. Adjust VR403 so that the trigger position is located at $6.5 \pm 1H$ before the vertical synchronizing signal. (Refer to Fig. 2-2)

2-3-5 Tracking Preset Adjustment

1. Record colour bar signal and play back.
2. Set the tracking control VR4700 at the centre click position.
3. Connect dual-trace oscilloscope CH1 to TP-4D and CH2 to TP-4B respectively, and adjust VR404 so that TP-4D pulse coincides with the rise point of TP-4A slope. (Refer to Fig. 2-3)
4. Connect the oscilloscope to TP-2C of PCB-PRE/REC, and ascertain that the tracking becomes maximum at the centre click position of the tracking control VR4700.

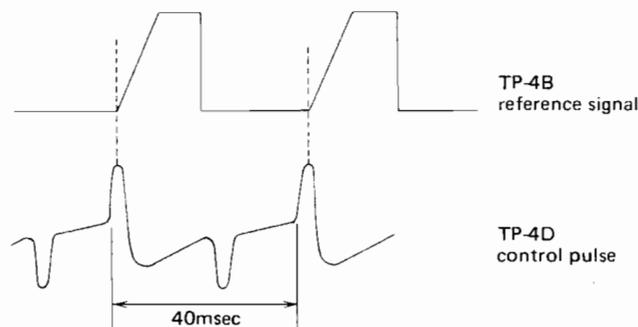


Fig. 2-3 Tracking Preset

2-4 PRE/REC Circuit Adjustment

2-4-1 Head resonance and head Q adjustments

[CH-1]

1. Insert the dummy cassette and place the recorder in the PLAY mode.
2. Connect an oscilloscope to TP-2C (FM OUT) on the PCB-Y/C.
3. Supply a sweep signal from a video sweep generator to TP-2M on the PCB-Y/C through the pad shown in Fig. 2-4.

[Note]

Adjust the level of the sweep generator to prevent the waveform displayed on the oscilloscope from being distorted.

4. Apply 1MHz and 4.6MHz markers.
5. Adjust VR203 (FM CH BALANCE) so that CH1 and CH2 waveform are overlapped together at 1MHz.

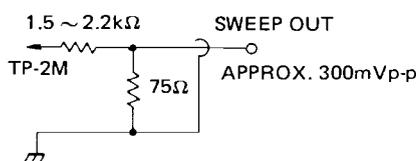


Fig. 2-4 Decoupling Pad

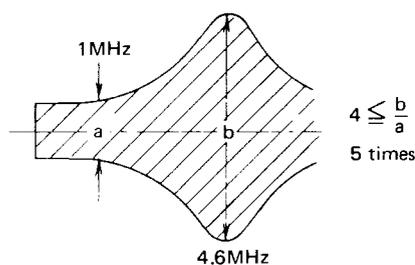


Fig. 2-5 Head Resonance and Head Q Waveform

6. Adjust VC202 (CH1 Resonance) and VC201 (CH2 Resonance) on the PCB-Y/C for maximum at 4.6MHz.
7. Adjust VR201 (CH1 Head Q) and VR202 (CH2 Head Q) on the PCB-Y/C so that the level ratio between 4.6MHz and 1MHz is 5.
8. If the ratio between CH-1 and CH-2 head Q cannot reach five, adjust to lower channel. Both responses must be equal each other with a gain more than 4.

2-4-2 FM channel balance

Refer to section 1.15 before attempting any adjustment.

1. Playback the colour bar section of an alignment tape.
2. Connect an oscilloscope to TP-2C (FM OUT) on PCB-Y/C.
3. Adjust VR203 (FM CH Balance) on PCB-Y/C so that the FM output of CH1 and CH2 are equal as shown in Fig. 2-6.



Fig. 2-6 Playback FM Output Waveform

2-4-3 Playback FM level adjustment

1. Playback the colour bar section of an alignment tape.
2. Connect an oscilloscope to TP-2L (FM IN) on PCB-Y/C and adjust VR2A2 for 0.5Vp-p signal on the oscilloscope.

2-4-4 FM record level adjustment

1. Apply a video signal (colour bar) to the unit and set it to RECORD mode.
2. Connect an oscilloscope to TP-2M on PCB-Y/C.
3. Adjust VR2A4 (FM REC Level) on PCB-Y/C so that the level of the horizontal sync signal is 4.0Vp-p as shown in Fig. 2-7.

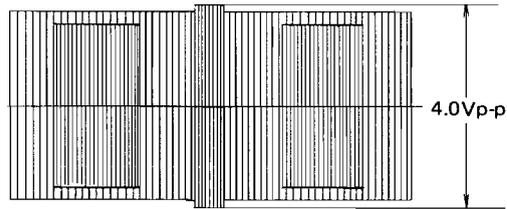
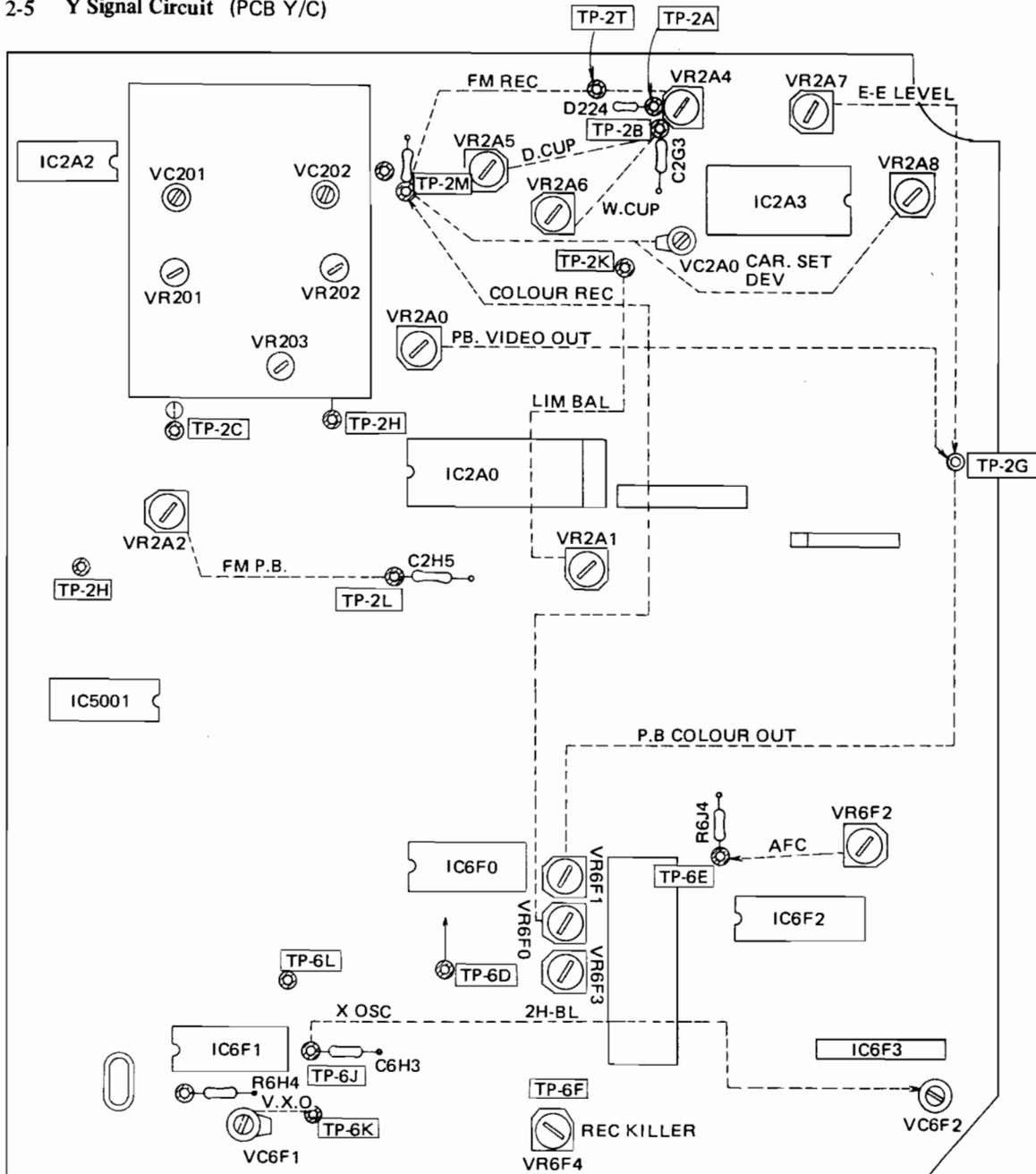


Fig. 2-7 Recording FM Waveform

2-4-5 Recording colour level adjustment

1. Apply a video signal (colour bar) to the unit and set it to RECORD mode.
2. Short circuit L203 on PCB-Y/C.
3. Connect an oscilloscope to TP-2M on PCB-Y/C.
4. Adjust VR6FO (COLOUR REC LEVEL) for a burst amplitude of 180mVp-p.

2-5 Y Signal Circuit (PCB Y/C)



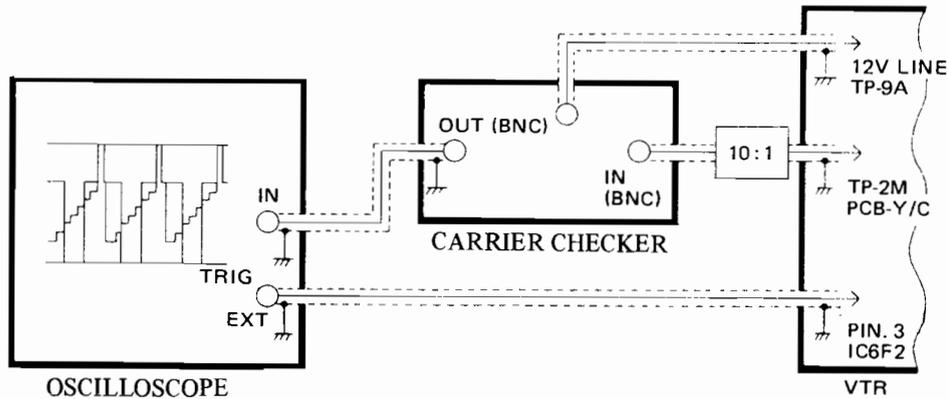
2-5-1 Carrier set, deviation adjustments

[Note]

This adjustment is to be made only when the playback waveform of the tape signal prerecorded by the same unit is compressed, or of extremely low S/N, when the carrier set and deviation adjustments have been shifted, or when any parts in the FM modulation circuit have been replaced.

Method (1)

(1) Connection



1. Connect the OUT terminal (BNC) of the carrier checker and the V input terminal of an oscilloscope by a coaxial cable (1 : 1).
2. Connect the probe of an oscilloscope to the IN terminal of the carrier checker, and connect the other end of the probe to TP-2M.
3. Connect the 12V terminal of the carrier checker to the 12V line stabilized DC power supply of the recorder.
4. Supply an external horizontal synchronizing signal (Pin number 3 of IC6F2 on PCB-Y/C) to the trigger terminal of the oscilloscope.
5. Set the sensitivity of the oscilloscope to 0.2V/Div and the sweep time to 20 μ s.

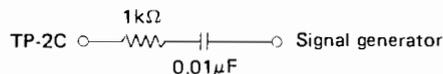
(2) Adjustment procedure

1. Supply a Video signal and set to REC mode.
2. Adjust SYNC TIP VC2A0 and WHITE PEAK VR2A8 alternately so that the response waveform 3.8MHz (sync tip) line and 4.8MHz (white peak) just touch the white lines on the oscilloscope.
3. Confirm that no tearing of the picture, etc. is observed.

Method (2)

(1) Connection

1. Connect a jumper between pin 6 of connector VG and pin 7 of connector VG on the Y/C board in order to keep the modulator and demodulation turned on at all times.
2. Connect a signal generator (sinewave) to TP-2C through a 1K Ω resistor and a 0.01 μ F capacitor.



(2) Adjustment Procedure

1. Prior to this adjustment, turn the WHITE CLIP ADJ (VR2A6) fully CW and DARK CLIP ADJ (VR2A5) fully clockwise.
2. Supply a stair-step signal to the video input on the rear panel.
3. Connect the scope to pin 23 of IC2A0 on the same board.
4. Set the frequency of signal generator to 3.8MHz \pm 30KHz.
5. Insert the cassette tape and place the unit and set to RECORD mode.
6. Adjust the FM CARRIER SET ADJ (VC2A0) for minimum carrier at sync tips.
7. Change the frequency of the signal generator from 3.8MHz to 4.8MHz \pm 30KHz.
8. Adjust the FM DEV ADJ (VR2A8) for minimum carrier at peak white.
9. Remove the jumpers.

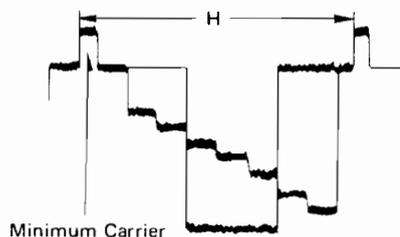


Fig. 2-9

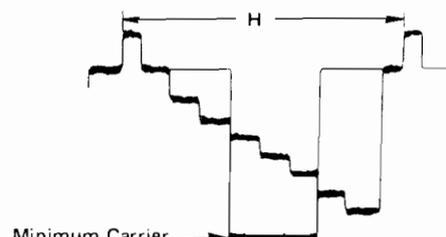


Fig. 2-10

Connect scope probe to (1V/div; 20 μ S/div.) TP-2G Place instrument in RECORD mode and make a recording.

Play back recorded tape.

Confirm that the Video Level is 1.9Vp-p \pm 0.1V.

Make white and dark clip adjustment.

2-5-2 White clip and dark clip adjustments

1. Supply a video signal (colour bar) to the unit and set to RECORD mode.
2. Connect an oscilloscope to TP-2B (PRE EMPHA OUT) on the PCB-Y/C.
3. Adjust VR2A6 (White Clip) and VR2A5 (Dark Clip) on the PCB-Y/C so that the overshoot appearing at the white peak side and the under shoot at the sync tip side are 60% and 40% of the regular signal level, as shown in Fig. 2-11.
4. If carrier deviation is shifted after the adjustment, readjust item 2-5-1.

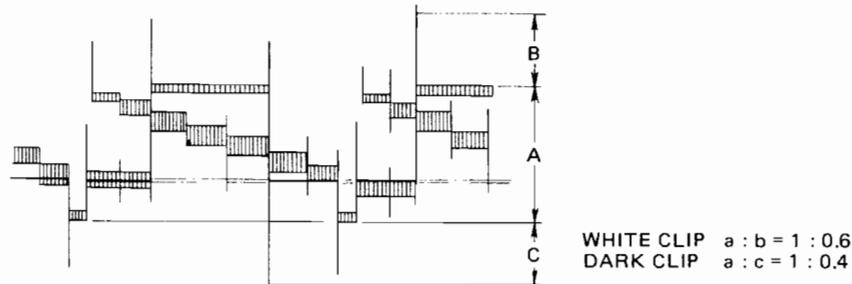


Fig. 2-11 Clipped Waveform

2-5-3 E-E output level adjustment

1. Supply a video signal (colour bar) to the recorder and set it to E-E mode.
2. Connect an oscilloscope to TP-2G (VIDEO OUT) on PCB-Y/C.
3. Adjust VR2A7 (EE level) on PCB-Y/C for 1.9Vp-p video signal on the scope.

2-5-4 Limiter Balance Adjustment

1. Play the colour bar section of the alignment tape (MH-2).
2. Connect the oscilloscope to TP-2K (DEMOM OUT) on PCB-Y/C.
3. Adjust VR2A1 (LIMITER BAL) on PCB-Y/C so that the double waveform coersides between SYNC TIP & WHITE PEAK as shown in Fig. 2-12.

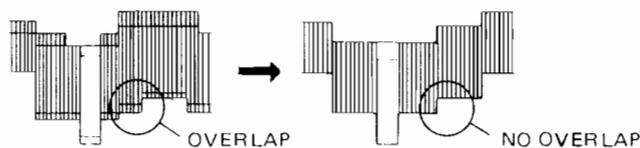


Fig. 2-12 DEMOD Output Waveform

2-5-5 Playback Video Output Adjustment

1. Play the colour bar section of the alignment tape (MH-2).
2. Connect the oscilloscope to TP-2G (VIDEO OUT) of Y/C printed circuit board.
3. Adjust VR2A0 (Y Level) of Y/C printed circuit board to obtain a video signal of 1.9 $^{+0.1}_{-0}$ Vp-p.

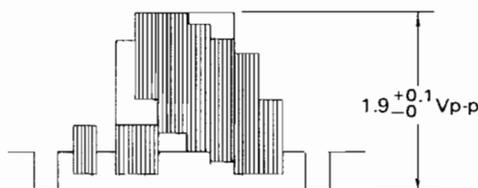


Fig. 2-13 Video Output Waveform

2-6 Chroma Signal Circuit

2-6-1 AFC Adjustment

1. Set the input selection switch to CAMERA.
2. Short circuit video in socket.
3. Connect an oscilloscope to TP-6E on PCB-Y/C and note the DC voltage.
4. Supply a video signal (color bar) and adjust VR6F2 (AFC ADJ) so that voltage now at TP-6E is equal to that noted with no signal.

2-6-2 4.435MHz VXO Adjustment

1. Set the input selection switch to CAMERA.
2. Short-circuit VIDEO-IN terminal and set to record mode.
3. Ground TP-6L through a 18K Ω resistor.
4. Connect a frequency counter to TP-6K through a probe of 10 : 1.
5. Adjust VC6F1 (VXO) so that the frequency of TP-6K is 4.435572MHz \pm 50Hz.

2-6-3 4.433MHz X'tal OSC Adjustment

1. Play back the colour bar section of the alignment tape.
2. Connect a frequency counter to TP-6J (4.433MHz X'tal OSC OUT) on PCB-Y/C.
3. Adjust VC6F2 (4.433MHz OSC) so that the frequency of TP-6J is 4.433619MHz \pm 10Hz.

2-6-4 2H-DL FILTER adjustment

1. Play the colour bar section of the alignment tape.
2. While observing the screen of the TV adjust VR6F3 for minimum colour blinds.
(Mal-adjust tracking for easier observation)

2-6-5 Playback colour output adjustment

1. Playback the colour bar signal of the alignment tape.
2. Connect an oscilloscope to TP-2G on PCB-Y/C.
3. Adjust VR6F1 (COLOUR OUT) for a burst level of 0.6Vp-p as shown in Fig. 2-14.

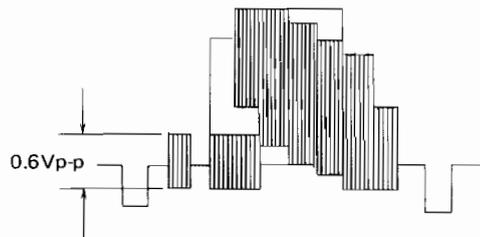


Fig. 2-14 Colour Output Waveform

2-6-6 Record colour killer adjustment

1. Apply a Video signal and set to REC mode.
2. Connect a DC voltmeter to TP-6F.
3. Adjust VR6F4 for a DC voltage of TP-6F of 3.5V.

2-7 Audio Circuit Adjustments

2-7-1 E-E Level Adjustment (0dB=0.775V r.m.s.=2.2Vp-p)

1. Set the input selection switch to CAMERA and select RECORD mode.
2. Apply 1KHz -30dB to the AUDIO IN socket.
3. Connect an oscilloscope to the AUDIO OUTPUT socket.
4. Adjust VR3A3 (E-E-LEVEL) for -10dB output.

2-7-2 Audio Level Adjustment

1. Reproduce the colour bar section of an alignment tape. (1KHz audio reference signal)
2. Connect an oscilloscope to AUDIO OUT socket.
3. Confirm that VR3F3 (PB-EQ) is set at its centre.
4. Adjust VR3A0 (PB-LEVEL) for an output level of 2.2V (0dB).

[Note]

If the level fluctuates more than ± 1 dB, check mechanical adjustment.



Fig. 2-15 Reproduced Audio Output

2-7-3 Bias Level Adjustment

1. Set the input selection switch to CAMERA.
2. Short-circuit AUDIO-IN socket, and set to Record mode.
3. Connect an AC voltmeter provided with the high-pass filter shown, across R375 on PCB-A/C, as illustrated in Fig. 2-16.

[Note]

The case of the voltmeter should not contact the Video Recorder is ground.

4. After making sure that the TV monitor, etc. are not influencing on the indication of the AC voltmeter, adjust VR3A4 (BIAS-LEVEL) for 1.2 mV r.m.s.

[Caution]

Never set to play mode with AC voltmeter connected, as damage may occur.

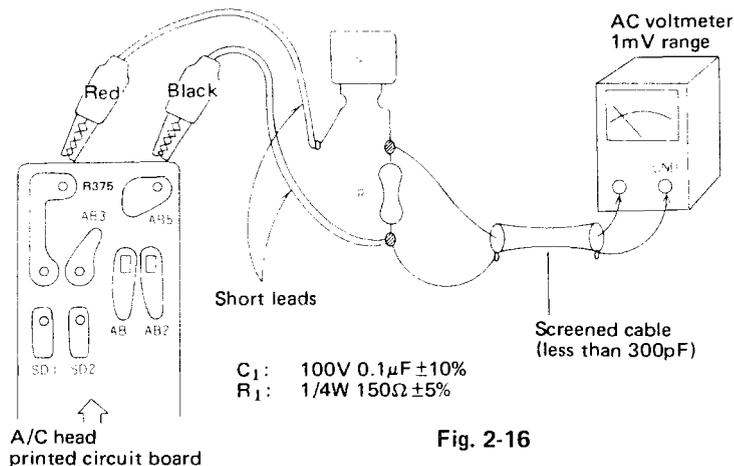


Fig. 2-16

2-7-4 Record Level Adjustment

1. Set the input selection switch to CAMERA.
2. In Audio dub mode, apply a signal of 1KHz -30dB to AUDIO-IN terminal, and a Video signal, such as colour bars to the VIDEO IN terminal. Record and play it back.
3. Monitoring the AUDIO-OUT terminal with an AC voltmeter, adjust VR3A2 (REC-LEVEL) during recording so that the meter indication is +10dB in playback.

[Note]

When the adjustment is made it is recommended that the level of REC AMP OUT is monitored at the junction of R3G0 and C3B5 to determine the amount to be added or subtracted to equalize to the level mentioned above.

2-7-5 Playback Equalizer Adjustment

1. Ascertain that no dirt exists on the audio head or no wrinkle is observed on the tape.
2. Supply 7KHz and 70Hz signals with a level of -30dB each to AUDIO- IN terminal and supply a video signal to VIDEO-IN terminal. Record and then playback.
3. Monitoring the AUDIO-OUT terminal with an AC voltmeter adjust VR3A1 (PB-EQ) so that the playback level of the 7KHz signal is -10dB .

2-8 Speed Search Circuit Adjustment

- 2-8-1
1. Set to SPEED SEARCH mode.
 2. Connect an oscilloscope to TP-4M, and adjust VR408 for a duty cycle of 50% shown in Fig. 2-17.
(In case the duty fails to be 50%, $50\pm 10\%$ is allowable.)
- 2-8-2
1. Set to the search mode.
 2. Connect the oscilloscope to TP-4N and adjust VR409 for a duty cycle of 50% shown in Fig. 2-18.
(If the duty cannot be 50%, $50\pm 10\%$ is allowable.)

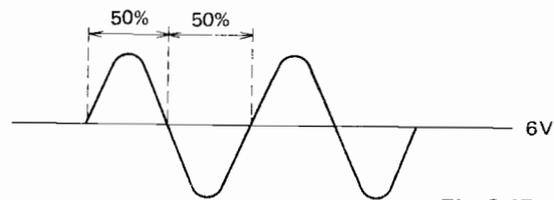


Fig. 2-17

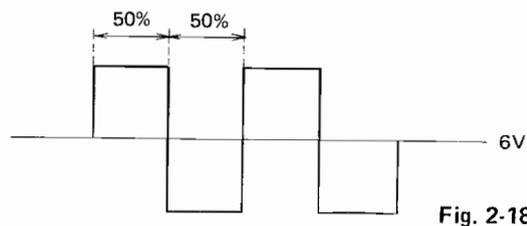
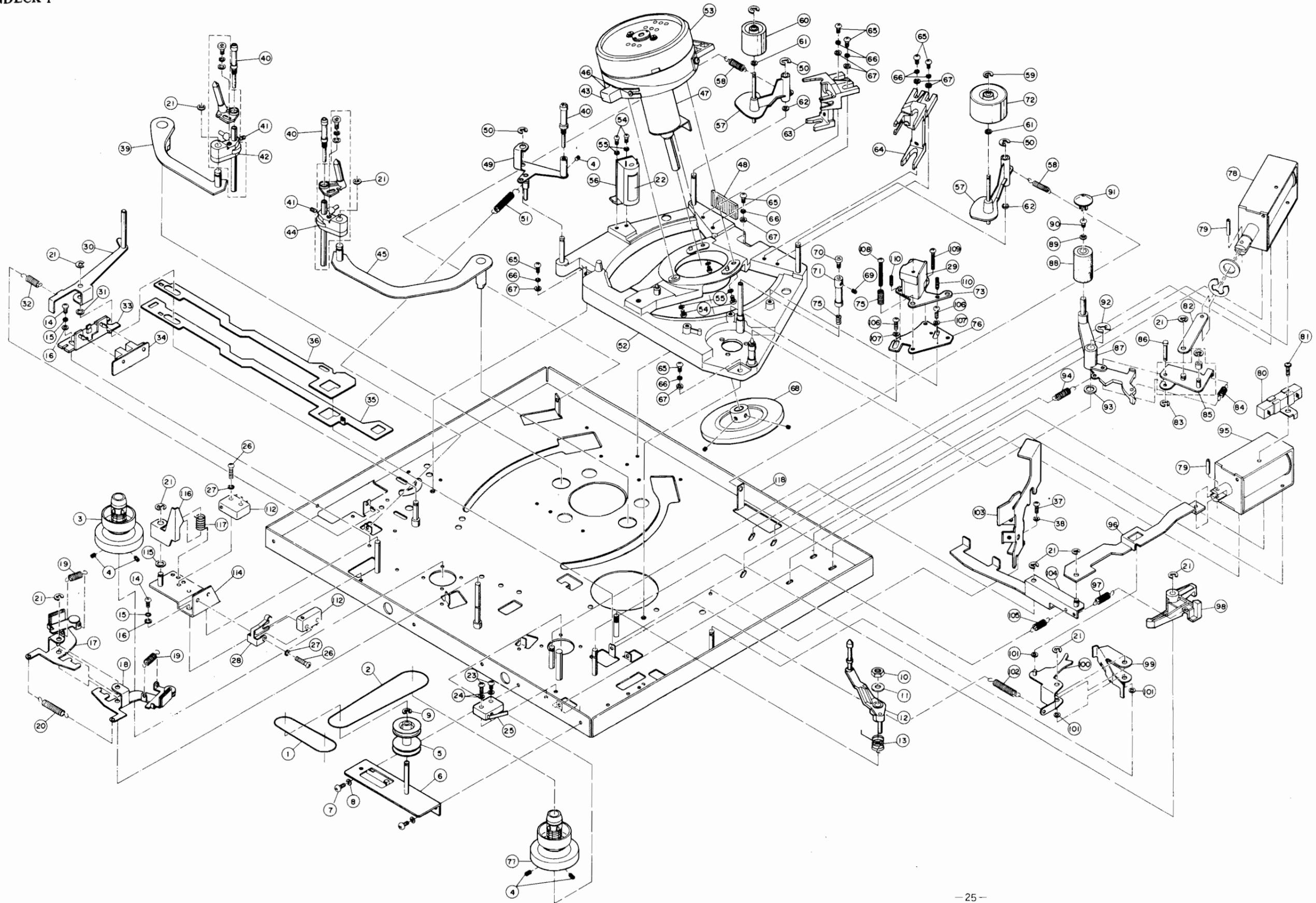
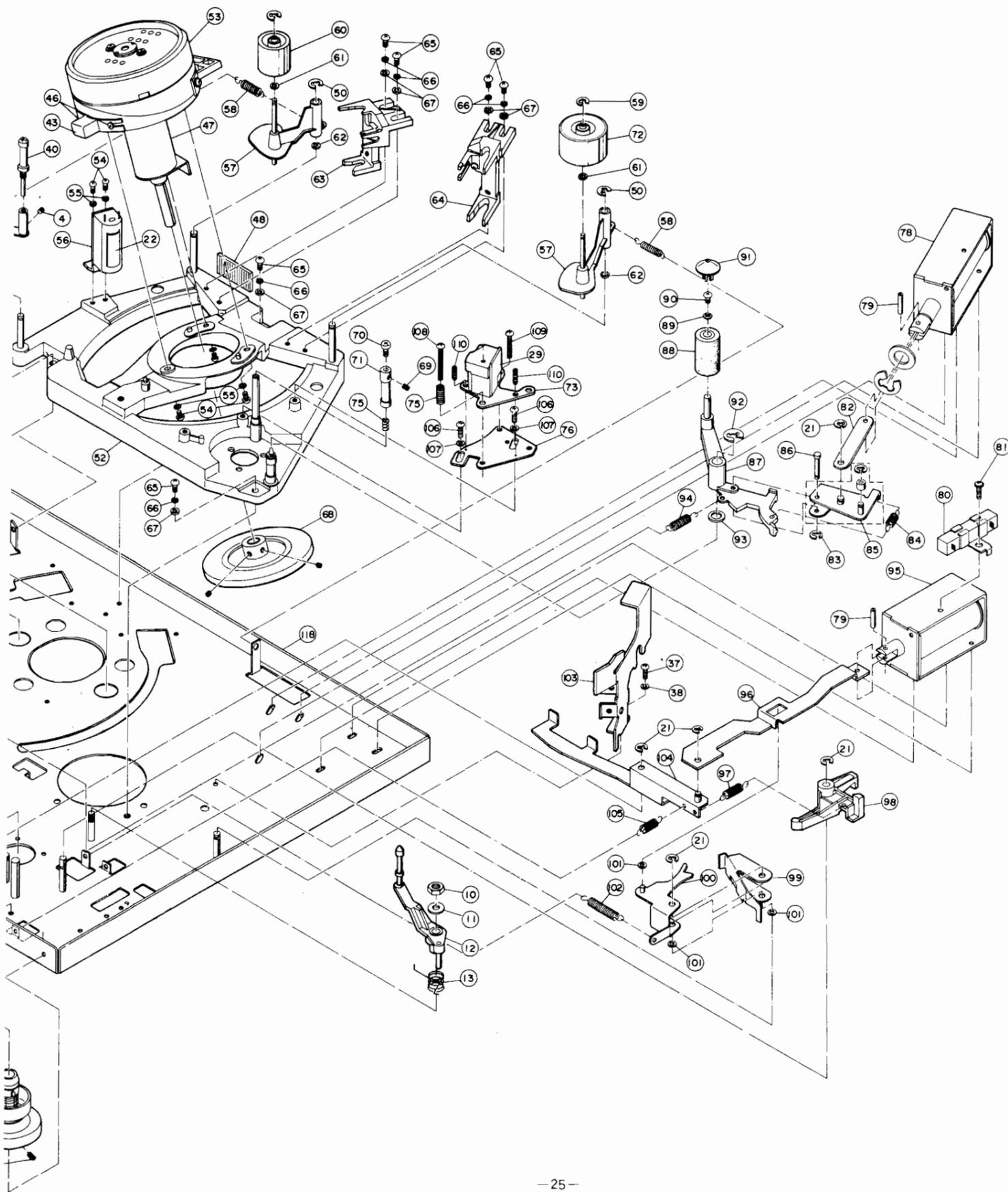


Fig. 2-18

ASSEMBLY
MAINDECK-1

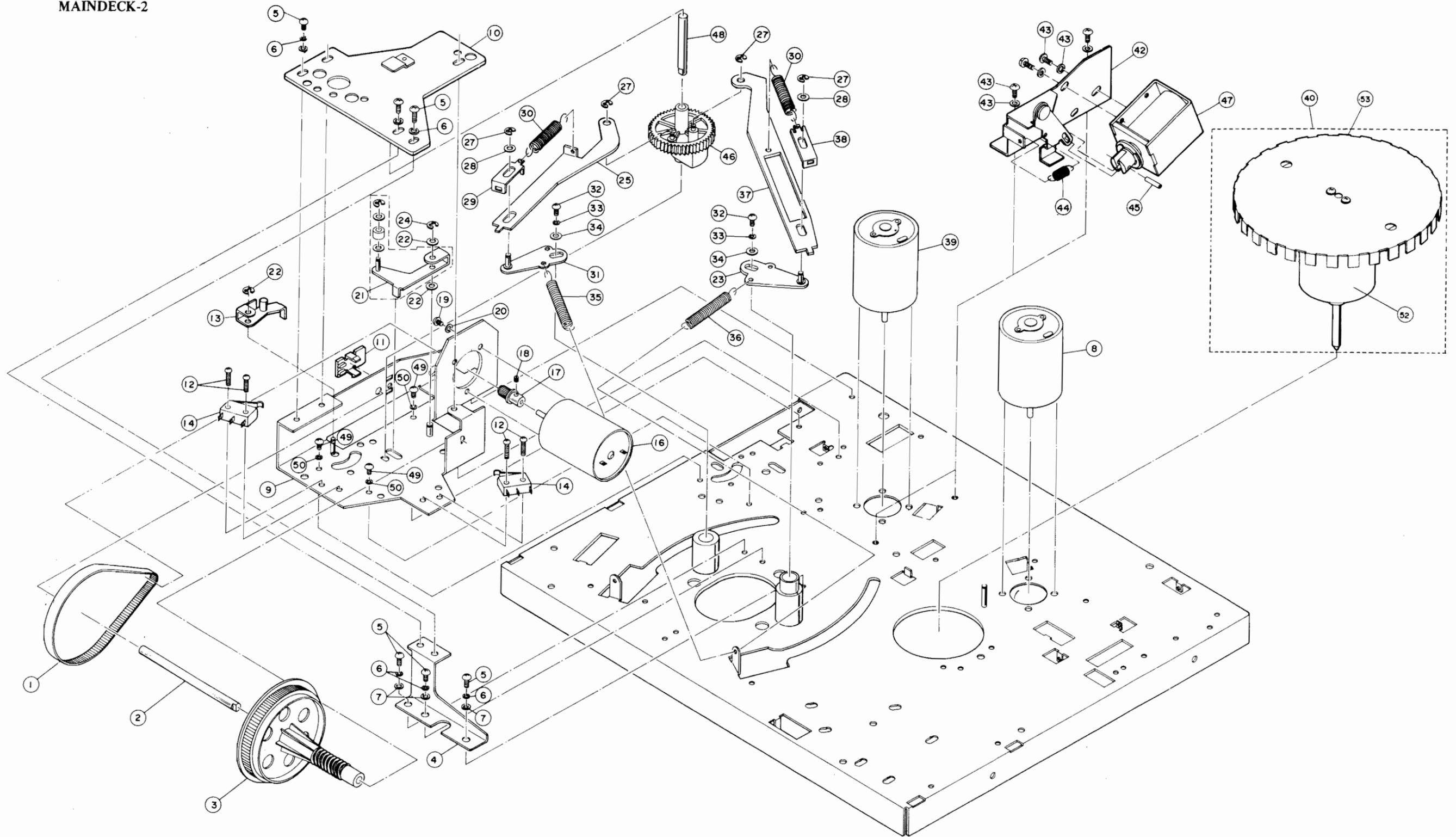


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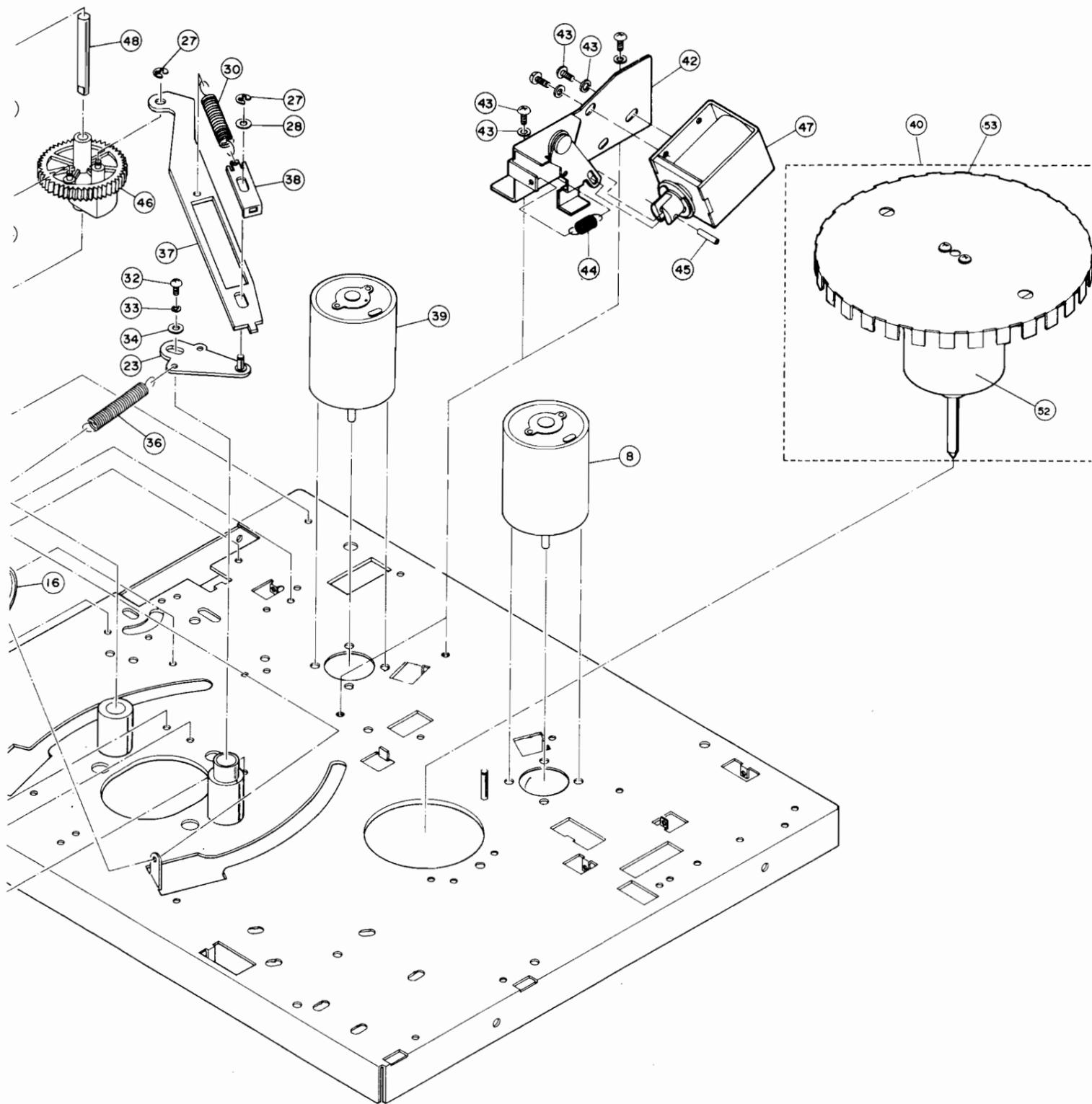


ITEM	PARTS NO.	PART NAME	DESCRIPTION	ITEM	PARTS NO.	PART NAME	DESCRIPTION
1	521D03202	Belt-C	Replacement Parts	61	552C00302	Washer-Thrust	φ2 x 0.5
2	521D03201	"	"	62	552C00308	"	5
3	522C05301	Reel-Disk (SP)	"	63	635C02901	Holder-Arm-Stp	"
4	669D05904	Set-Screw	"	64	635C02902	"	"
				65	669D20401	Screw-Sems-W	66, 67 Include
						M3 x 0.5 - 10	
5	522D13901	Pulley-Counter	"	66	"	"	"
6	594D44201	Bracket-Pulley	"	67	"	"	"
7	669D17101	Screw-Sems-M	M3X0.5X6	68	524D00701	Drum-Flywheel	"
8	"	"	"	69	669D19702	Set Screw-F	M3 x 0.5 - 4
9	685C00204	Retaining-Ring	2	70	669D19802	Screw-BS-Bind	M3 x 0.5 - 8
10	674D08101	Nut-Nylon	M3X0.5	71	630D64001	Guide-Pole	"
11	552C00408	Washer-Thrust	φ3.2-φ8-0.5	72	641D48901	T.U. Imp-Roller	"
12	635B02001	Arm-Reverse	"	73	460 P02301	Head-A/C	Replacement Parts
13	570D61901	Spring-RS	"	74	650P26100	Screw-F-FE-Pan	M2.6 x 10
14	669D17101	Screw-Sems-W	15, 16 Include	75	570D59301	Spring-A/C	"
15	"	"	"	76	594D36401	Base-Head-A/C	"
16	"	"	"	77	522 C05301	Reel-Disk(T.U)	"
17	593D98601	Brake	"	78	299P02701	Solenoid	Replacement Parts
18	593D98602	"	"	79	685D02102	Spring-Pin	3.2 x 10
19	570D51201	"	"	80	109D02502	R-CEM-W	"
20	570D51901	Spring	"	81	669D17101	Screw-Sems-M	M3 x 0.5 - 6
21	685C00206	Retaining Ring③	"	82	593D93401	Plate-Pinch-Sol.	"
22	460P02401	Head-FE	Replacement Parts	83	685C00205	Retaining-Ring	2.5
23	669D20009	Screw Sems	M2.3X0.4X12	84	570D52201	Spring	"
24	"	"	"	85	525D07601	Lever-Lock	"
25	436P00501	SW-Eject	"	86	630D66001	Pin-Lever-Lock	"
26	650P23100	Screw-F-FE-Pan	M2.3 x 10	87	525D07502	Lever-Pinch	"
27	680P22301	Washer-Spring	2.3	88	522C05501	Pinch-Roller	Replacement Parts
28	570D57801	Spring-SW	"	89	552C00309	Washer-Thrust	φ6 x 0.5
29	240 C78602	PCB-A/C-Head	"	90	669D20001	Screw-Sems	M2.6 x 0.45 - 4
30	525D08401	Arm-Tension	"	91	641D42801	Cap-Roller	"
31	552C00306	Washer-Thrust	φ4 x 0.5	92	685C00208	Retaining-Ring	5
32	570D51901	Spring	"	93	552 C00309	Washer-Thrust	φ6 x 0.5
33	641 C20301	Holder-T-Sens	"	94	570D52101	Spring	"
34	268P00901	Photo-Interrupter	Replacement Parts	95	299P02801	Solenoid	Replacement Parts
35	594D51701	Lever-PH	"	96	593D93301	Plate-Lock-Sol.	"
36	594D51801	Lever-RS	"	97	570D52501	Spring	"
37	669D17101	Screw-Sems-M	M3X0.5X6	98	525C02201	Lever-SW	"
38	"	"	"	99	591 C75801	Lever-Pause	"
39	525D07301	Arm-TU-L	"	100	525D08101	Arm-Lock	"
40	522 C05402	Guide-Roller	"	101	552C00306	Washer-Thrust	φ4 x 0.5
41	669D19701	Set-Screw-F	M3 x 0.5 - 3 F. Point	102	570D52301	Spring	"
42	589 D02304	S-Tape-Guide	"	103	928 C05102	Assy-PWB-Tape-Sens	"
43	265P05701	Posistor	Replacement Parts	104	525D07701	Brake-Off-Lever	"
44	589 D02204	T.U.-Tape-Guide	"	105	570D52001	Spring	"
45	525D07101	Arm-S-L	"	106	669D17102	Screw-Sems-W	M3X0.8-8
46	669D19803	Screw-BS-Bind	M3 x 0.5 - 4	107	"	"	"
47	928 B00703	Assy-Lower-Drum	"	108	650P26200	Screw-F-FE-PAN	M2.6X20
48	299 P03502	Sensor-H	Replacement Parts	109	650P26100	"	M2.6X10
49	525D07901	Guide-Lever	"	110	669D20209	Set-Screw	M3X0.5-8
50	685C00207	Retaining-Ring	4				
51	570D52601	Spring	"	112	436P00208	SW-Micro	Replacement Parts
52	948C00602	Assy-Drum-Base	"	114	591C61801	Bracket-SW	"
53	928 B00803	Assy-Upper-Drum	"	115	552C00306	Washer-Thrust	φ4 x 0.5
54	669D17302	Screw-Sems	55 Include	116	594D25001	Lever-SW	"
				117	570D57701	Spring	"
				118	591 C69703	Assy-Plate-Deck	"
				119	630D61901	Shaft	"
55	"	"	"				
56	593D93001	F.E. Bracket	"				
57	641 C21201	Arm-Imp-Roller	"				
58	570D56501	Spring-Imp-Arm	"				
59	685C00203	Retaining-Ring	1.5				
60	641 D48801	S. Imp-Roller	"				

ASSEMBLY
MAINDECK-2



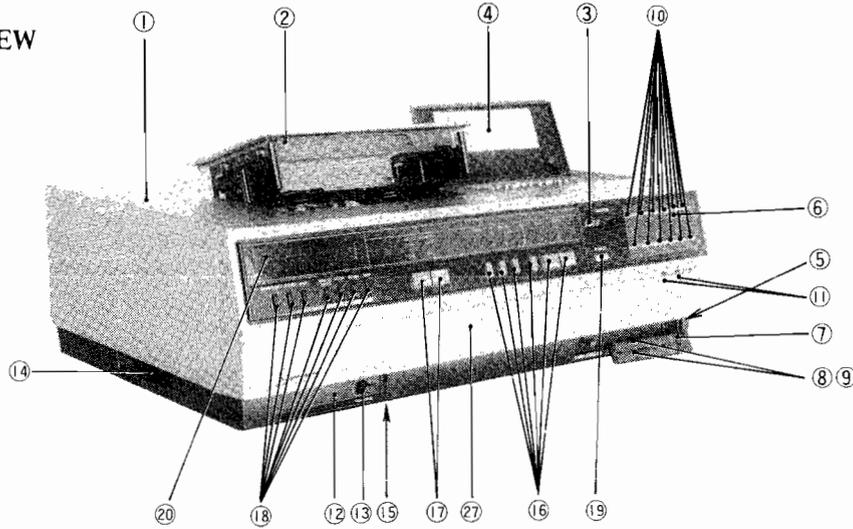
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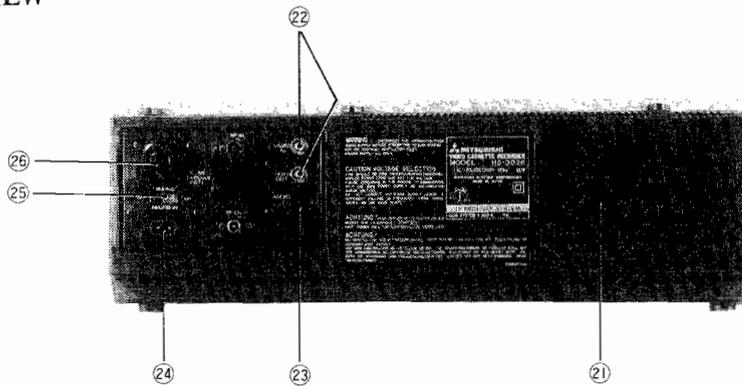
ITEM	PARTS NO.	PART NAME	DESCRIPTION	ITEM	PARTS NO.	PART NAME	DESCRIPTION
1	521C00601	Belt-NS	Replacement Parts				
2	630D64301	Shaft-W-P					
3	522C05201	Worm-Pulley					
4	594D00601	Pillar-W-B					
5	669D17101	Screw-Sems-W	Include 6 , 7				
6	"	"					
7	"	"					
8	288 P03201	Motor DM-4904M2	Replacement Parts				
9	288 P02804	Bracket-Worm					
10	590 B61602	Plate-W-B					
11	591 C06806	Stopper-Shaft					
12	641D49001	Screw-SEMS	M2.3 x 0.4 x 12				
13	669D20009	ARM-CAM-RS	2.3				
14	436P00209	SW-Micro	Replacement Parts				
16	288P02901	Motor M Y-15B2A	Replacement Parts				
17	522D12301	Pulley-M					
18	669D05904	Set-Screw	M3 - 0.5 x 4				
19	669D17101	Screw-Sems-W	Include 20				
20	"	"					
21	525D06601	Arm-Cam-C-L					
22	552C00304	Washer-Thrust	φ3 x 0.5				
23	525D08202	Arm-L					
24	685C00204	Retaining-Ring	φ2				
25	591 C68302	Rod-T-U					
26	683D10001	Washer					
27	685C00206	Retaining-Ring	φ3				
28	683D10001	Washer					
29	593D95701	Hanger-T-U					
30	570D52701	Spring					
31	525D08201	Arm-L					
32	669D17104	Screw-Sems	Include 33 , 34				
33	"	"					
34	"	"					
35	570D53001	Spring					
36	570D52401	"					
37	591 C68301	Rod-S					
38	593D95801	Hanger-S					
39	288 P02805	Motor DM-4915M1	Replacement Parts				
40	928 B05003	Assy-Cap-Motor					
41	593D96101	Holder-MC					
42	594D41301	Braket-Sol					
43	669D17101	Screw-Sems-W	M3X0.5X6				
44	570D59901	Spring-EJ					
45	685D02101	Spring-Pin	3.2X10				
46	520C01001	Wheel-Loading					
47	299P03701	Solenoid					
48	630D64501	Shaft-W-L	φ6				
49	669D17308	Screw-Sems	Include 50				
50	"	"					
52	288 P02702	Motor-CP					
53	948 C05702	Assy-Flywheel-CP					

PARTS LIST

1. FRONT VIEW

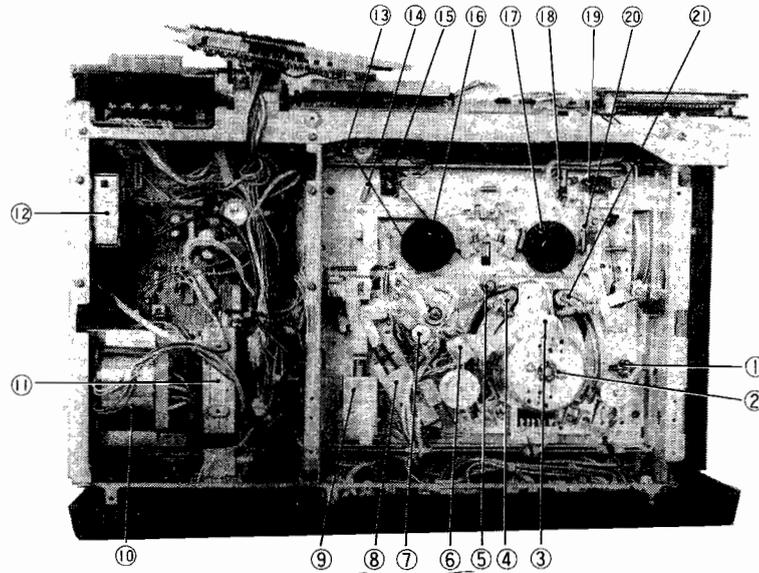


2. REAR VIEW

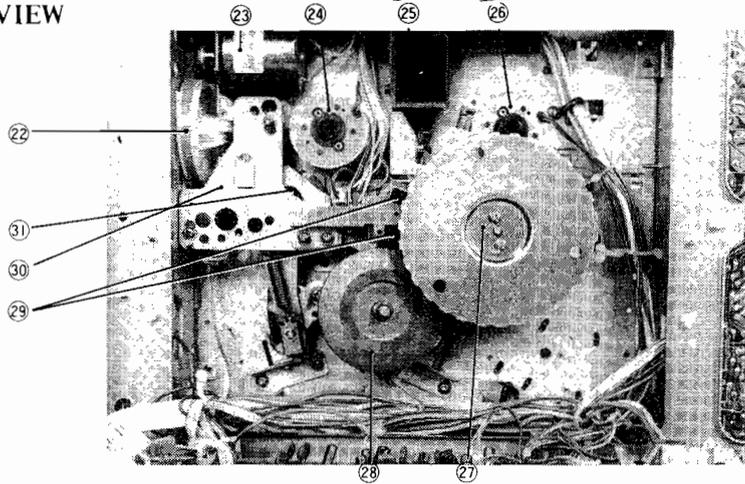


ITEM	PARTS NO.	PARTS NAME	DESCRIPTION	ITEM	PARTS NO.	PARTS NAME	DESCRIPTION
1	701 B03306	UNIT-TOP COVER		15	590A11001	PANEL-BOTTOM	REW,FF, PAUSE, REC, PLAY, STOP SPEED SEARCH (REW, FWD)
2	702 B30404	HOUSING-CASSETTE COVER		16	704 C22501	BUTTON-OPE-B	
3	702 C33701	COVER-COUNTER		17	704 C22401	BUTTON-OPE-A	
4	702D13502	DOOR-TOP		18	704 C22601	BUTTON-TIMER	
5	761 B05901	UNDER-GUARD-R		19	704D80001	BUTTON-EJECT	
6	761 D29501	PLATE-IND-CH		20	761 C16101	COVER-TIMER	VIDEO IN VIDEO OUT AUDIO
7	761 D29601	CASE-CH-NO		21	700 B07301	UNIT-BACK	
8	760D26503	TAPE-DIAL		22	452D10601	CONNECTOR-BNC	
9	760D26504	"		23	449D02302	SOCKET-DIN-5P	
10	704 D79901	BUTTON-CH-SW		24	451 C03201	POWER-JACK-CEE	
11	704 D78201	KNOB-PUSH-P	POWER, PROG REC	25	433 C01702	SW-SEESAW	
12	712 B07705	INLAY-VR		26	459 P00105	VOLTAGE-SELECTOR	
13	704 D77301	KNOB-TRACKING		27	701 A18806	UNIT-FRONT	
14	761 B06001	UNDER-GUARD-L					

3. TOP VIEW



4. BOTTOM VIEW



ITEM	SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION	ITEM	SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION	
1	T371	460 P02401	F.E. Head	TPH-499	☆ 16		522 C05301	Reel Disk (T.U)	SS-54 Rec Protector QN1122	
☆ 2		928 B00804	Upper Drum		17		522 C05302	Reel Disk (S.P)		
3	RP970	265 P05701	Posistor		18	S570	436 P00208	Sw-Cassette		
4		948 C01804	Assy T.U.-Tape-Guide		19	S571	"	Sw-Error		
5	PL570	253 P02201	Cassette Lamp		20	Q572	268 P00901	Photo-Interrupter		
6	T370	460 P02301	A/C Head		21		948 C01803	Assy S-Tape-Guide		
7		522 C05501	Pinch-Roller		22		521 C00601	Loading Belt		MY-1582A DM-4915M1
8	L571	299 P02701	Pinch-Solenoid		23	M572	288 P02901	Loading Motor		
9	L570	299 P02801	Lock-Solenoid		24	M571	288 P02805	S. Motor		
10	T971	350 P18003	Power-Trans		25	L572	299 P03701	Eject-Solenoid		
11	TU01	295 P21203	Tuner-TV		☆ 26	M570	288 P03201	T.U. Motor		
12		295 P96801	RF-Converter				288 P02804	Assy-Capstan Motor		
13		521 D03202	Counter-Belt		27	M471	928 B05003	Pick Up Head		QN1122 SS-5GL13-4
14		521 D03201	Counter Belt		28	T470	460 P02501	Photo-interrupter		
15	S574	436 P00501	SW-Eject		SS-5GL111-4	29		268 P00901		Sw. After Loading
					30	S572	436 P00209	Sw. UN. Loading	"	
					31	S573	"		"	

5. ELECTRICAL PARTS

SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION	SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION
INTEGRATED CIRCUITS							
IC71	266 P01001	MPC574J-AB		Q2A1	260 P17102	2SC710-CD/ 2SC2724-C	
IC101	266 P10601	IC-M5186P		Q2A2	"	"	
IC201	266 P76702	AN6320N		Q2A3	260 P10505	2SC535-A,B,C	
IC2A0	266 P79601	AN6332		Q2A7	260 P16503	2SA628-E/ 2SA1115-E	
IC2A2	263 P01102	TC4011BP/ MC14011BC		Q2A8	"	"	
IC2A3	266 P79301	AN6310		Q2A9	260 P28103	2SC-1213-C	
IC3A0	266 P32302	M5144P		Q2B0	260 P16604	2SA673-D/ 2SA950-Y	
IC3F0	266 P33201	AN262		Q2B6	260 P36001	2SA628A-E,F / 2SA1115-E	
IC3F1	263 P06602	TC4066BP/ MC14066BCP		Q3F3	260 P28103	2SC1213-C	
IC401	266 P76101	AN6340		Q3F4	"	"	
IC402	266 P76202	AN6341N		Q3F5	260 P33804	2SC2603-E,F	
IC403	266 P72505	UPC1458C/ MC1458		Q401	260 P25601	2SA1115-E,F	
IC404	263 P01809	TC4018BP/ MC14018BCP		Q402	260 P33804	2SC2603-E, F	
IC405	266 P74401	TL082CP		Q403	"	"	
IC406	266 P72704	UPC339C/ LM339CN		Q404	"	"	
IC407	263 P01302	TC4013BP/ MC14013BCP		Q405	"	"	
IC408	263 P04902	TC4049BP		Q406	260 P25601	2SA1115-E,F	
IC409	263 P52002	TC4520BP/ MC14520BCP		Q407	260 P33804	2SC2603- E,F	
IC410	263 P06602	TC4066BP/ MC14066BCP		Q408	"	"	
IC5A0	266 P97501	TMS1300-2143		Q409	"	"	
IC5A1	263 P06602	TC4066BP/ MC14066BCP		Q410	260 P40401	2SB647-C	
IC5A2	"	"		Q411	260 P42701	2SC1826- O,Y	
IC5001	263 P01102	TC4011BP/ MC14011BC		Q412	"	"	
IC5004	266 P97701	M50122P		Q413	260 P33804	2SC2603-E,F	
IC6F0	266 P79701	AN6360		Q414	260 P24701	2SC1162-C	
IC6F1	266 P99501	AN6371		Q415	260 P33804	2SC2603-E,F	
IC6F2	266 P79901	AN6362		Q416	260 P24701	2SC1162-C	
IC6F3	266 P80001	AN6342N		Q417	260 P33804	2SC2603-E,F	
IC6F4	266 P62101	MPC741C		Q418	260 P22801	2SC1096-LM	
IC8F0	266 P96901	TMS-1070-2811		Q419	260 P33804	2SC2603-E,F	
TRANSISTORS				Q420	"	"	
Q71	260 P16604	2SA673-D		Q421	"	"	
Q72	260 P17704	2SC711A- F,G		Q422	"	"	
Q74	260 P07704	2SC712-D		Q423	"	"	
Q102	260 P41904	2SC2724-C, D		Q424	"	"	
Q103	260 P25601	2SA1115-E, F		Q425	260 P24701	2SC1162-C	
Q131	260 P17102	2SC-710-CD/ 2SC2724-C		Q426	"	"	
Q201	260 P17102	2SC-710-CD/ 2SC2724-C		Q427	"	"	
Q202	"	"		Q428	260 P25601	2SA1115-E,F	
Q203	"	"		Q429	"	"	
Q204	260 P16603	2SA673-C		Q430	"	"	
Q205	260 P28103	2SC1213-C/ 2SC2274-E		Q431	"	"	
Q206	260 P10505	2SC535-A,B,C		Q432	"	"	
Q2A0	260 P16503	2SA628-E/ 2SA1115-E		Q433	"	"	
				Q434	260 P17901	2SA715-C	
				Q435	"	"	
				Q436	"	"	
				Q437	260 P33804	2SC2603-E,F	
				Q438	260 P25601	2SA1115-E,F	
				Q439	260 P33804	2SC2603-E,F	
				Q441	260 P25601	2SA1115-E,F	
				Q442	"	"	
				Q443	"	"	
				Q444	260 P33804	2SC2603-E,F	
				Q445	"	"	
				Q446	260 P25601	2SA1115-E,F	
				Q447	"	"	
				Q448	260 P33804	2SC2603-E,F	
				Q449	"	"	
				Q450	"	"	

SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION	SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION
TRANSISTORS							
Q451	260 P33804	2SC2603-E,F		Q6F6	260 P17102	2SC710-CD	
Q452	260 P25601	2SA1115-E,F		Q6F7	"	"	
Q453	"	"		Q6F8	260 P17706	2SC711A-E,F	
Q454	"	"		Q6G0	"	"	
Q501	260 P25604	2SA1115-F		Q71	260 P16604	2SA673-D	
Q502	"	"		Q7E1	260 P36001	2SA628A-E,F	
Q570	260 P45101	TR PHOTO	PN202S	Q7E2	260 P17703	2SC711A-G	
Q571	"	"	"	Q7E3	"	"	
Q572	268 P00901	PHOTO-INTER- RUPTER	ON1122	Q8F0	260 P33806	2SC2603-F,G	
Q5A0	260 P33804	2SC2603-E,F		Q8F1	260 P25601	2SA1115-E,F	
Q5A1	"	"		Q8F2	260 P33804	2SC2603-E,F	
Q5A2	260 P19901	2SD667C		Q8F3	260 P25601	2SA1115-E,F	
Q5A3	260 P40401	2SB647-C		Q8F4	"	"	
Q5A4	"	"		Q8F5	260 P33804	2SC2603-F,G	
Q5A5	260 P19901	2SD667-C		Q902	260 P33806	2SC2603-F,G	
Q5A6	260 P33804	2SC2603-E,F		Q903	"	"	
Q5A7	"	"		Q904	260 P35101	2SC1514 (VC)	
Q5A8	260 P25604	2SA1115-F		Q905	260 P35301	2SC1515K	
Q5A9	260 P33806	2SC2603-F,G		Q906	260 P40401	2SB647-C	
Q5C0	260 P33803	2SC2603-F		Q907	260 P39201	2SC1983	
Q5C1	260 P33806	2SC2603-F,G		Q909	260 P40401	2SB647-C	
Q5C2	260 P25604	2SA1115-F		Q971	260 P39201	2SC1983	
Q5C3	260 P25604	2SA1115-F		DIODES & OTHERS			
Q5C5	260 P28104	2SC1213-D		D77	264 P04502	1S2076A	
Q5C6	260 P39201	2SC1983		D101	264 P04501	1S2076	
Q5C7	260 P33804	2SC2603-E,F		D102	"	"	
Q5C8	260 P42701	2SC1826-O,Y		D201	"	"	
Q5C9	260 P39201	2SC1983		D2A0	"	"	
Q5D0	260 P38701	2SC2236-O,Y		D2A1	"	"	
Q5D1	260 P16604	2SA673-D/ 2SA950-Y		D2A2	"	"	
Q5D2	260 P33804	2SC2603-E,F		D2A3	"	"	
Q5D3	"	"		D2A4	"	"	
Q5D4	"	"		D2B0	264 P12301	1SS16	
Q5D5	"	"		D2B1	"	"	
Q5D6	"	"		D3F2	264 P04501	1S2076/1S2472	
Q5D7	"	"		D3F3	"	"	
Q5D8	260 P39201	2SC1983		D3F4	"	"	
Q5D9	260 P25604	2SA1115-F		D401	264 P04501	1S2076/1S2472	
Q5E0	260 P25604	2SA1115-F		D402	"	"	
Q5E1	"	"		D403	"	"	
Q5E2	"	"		D404	"	"	
Q5T5	260 P17706	2SC711A-E,F		D405	"	"	
Q5T6	260 P45101	TR-PHOTO	PN202-S	D406	"	"	
Q5001	260 P17706	2SC711A-E,F		D407	"	"	
Q5002	"	"		D408	"	"	
Q5003	260 P36001	2SA628A-E,F		D409	"	"	
Q5004	260 P17704	2SC711A-F,G		D410	"	"	
Q5005	260 P17102	2SC710-C,D		D411	"	"	
Q5006	260 P17704	2SC711A-F,G		D412	"	"	
Q5200	260 P33806	2SC2603-F,G		D413	"	"	
Q5201	"	"		D414	"	"	
Q6F0	260 P17102	2SC710-CD		D415	"	"	
Q6F2	260 P16503	2SA628-E		D416	"	"	
Q6F3	260 P17703	2SC710A-G		D417	"	"	
Q6F4	"	"		D418	264 P10102	RM-1Z (V)	
				D419	"	"	
				D420	264 P04501	1S2076	

SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION	SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION
DIODES & OTHERS				D5C0	264 P04501	1S2076/1S2472	
D421	264 P04501	1S2076		D5C1	"	"	
D422	"	"		D5C3	"	"	
D423	"	"		D5C4	"	"	
D424	"	"		D5C6	"	"	
D425	"	"		D5C7	"	"	
D426	"	"		D5C8	"	"	
D427	"	"		D5D0	264 P10102	RM-1Z	
D428	"	"		D5D1	264 P04501	1S2076/1S2472	
D429	"	"		D5D2	264 P09305	HZ-11C	
D430	"	"		D5D3	264 P04501	1S2076/1S2472	
D431	"	"		D5D4	"	"	
D432	"	"		D5D5	"	"	
D433	"	"		D5D6	"	"	
D434	"	"		D5D7	"	"	
D435	"	"		D5D8	"	"	
D436	"	"		D5D9	"	"	
D437	"	"		D5E0	264 P04501	1S2076/1S2472	
D438	"	"		D5E1	"	"	
D439	"	"		D5E2	"	"	
D440	"	"		D5E3	"	"	
D441	"	"		D5E4	"	"	
D442	"	"		D5E5	"	"	
D443	"	"		D5E6	"	"	
D444	"	"		D5E7	"	"	
D445	"	"		D5E8	264 P10102	RM-1Z	
D446	"	"		D5E9	264 P04501	1S2076/1S2472	
D447	"	"		D5F0	264 P04501	1S2076/1S2472	
D449	"	"		D5F1	"	"	
D450	"	"		D5F2	"	"	
D451	"	"		D5F4	"	"	
D452	"	"		D5F5	"	"	
D453	"	"		D5F6	"	"	
D454	"	"		D5F7	"	"	
D455	"	"		D5F9	264 P10301	EQA01-06	
D456	"	"		D5G0	264 P04501	1S2076/1S2472	
D457	"	"		D5G1	"	"	
D501	264 P21301	LN21RP-HL		D5G2	"	"	
D502	"	"		D5G3	"	"	
D503	"	"		D5G4	"	"	
D504	"	"		D5G5	"	"	
D505	"	"		D5T5	264 P23701	TLR-123	
D506	"	"		D5001	264 P04501	1S2076/1S2472	
D508	264 P04501	1S2076		D5002	"	"	
D509	"	"		D5003	"	"	
D510	"	"		D5004	264 P22102	MZ308B	
D511	"	"		D5005	264 P04501	1S2076/1S2472	
D512	"	"		D5006	"	"	
D513	"	"		D5200	264 P21301	LN21 RP-HL	
D514	"	"		D5201	"	"	
D515	"	"		D5202	"	"	
D516	"	"		D6F0	764 P04501	1S2076/1S2472	
D517	"	"		D6F2	"	"	
D518	"	"		D6F3	"	"	
D519	"	"		D6F7	"	"	
D5A0	264 P04501	1S2076/1S2472		D6F8	"	"	
D5A1	"	"		D6F9	"	"	
D5A2	"	"					
D5A3	"	"					
D5A4	"	"					
D5A5	"	"					
D5A7	"	"					
D5A8	"	"					
D5A9	"	"					

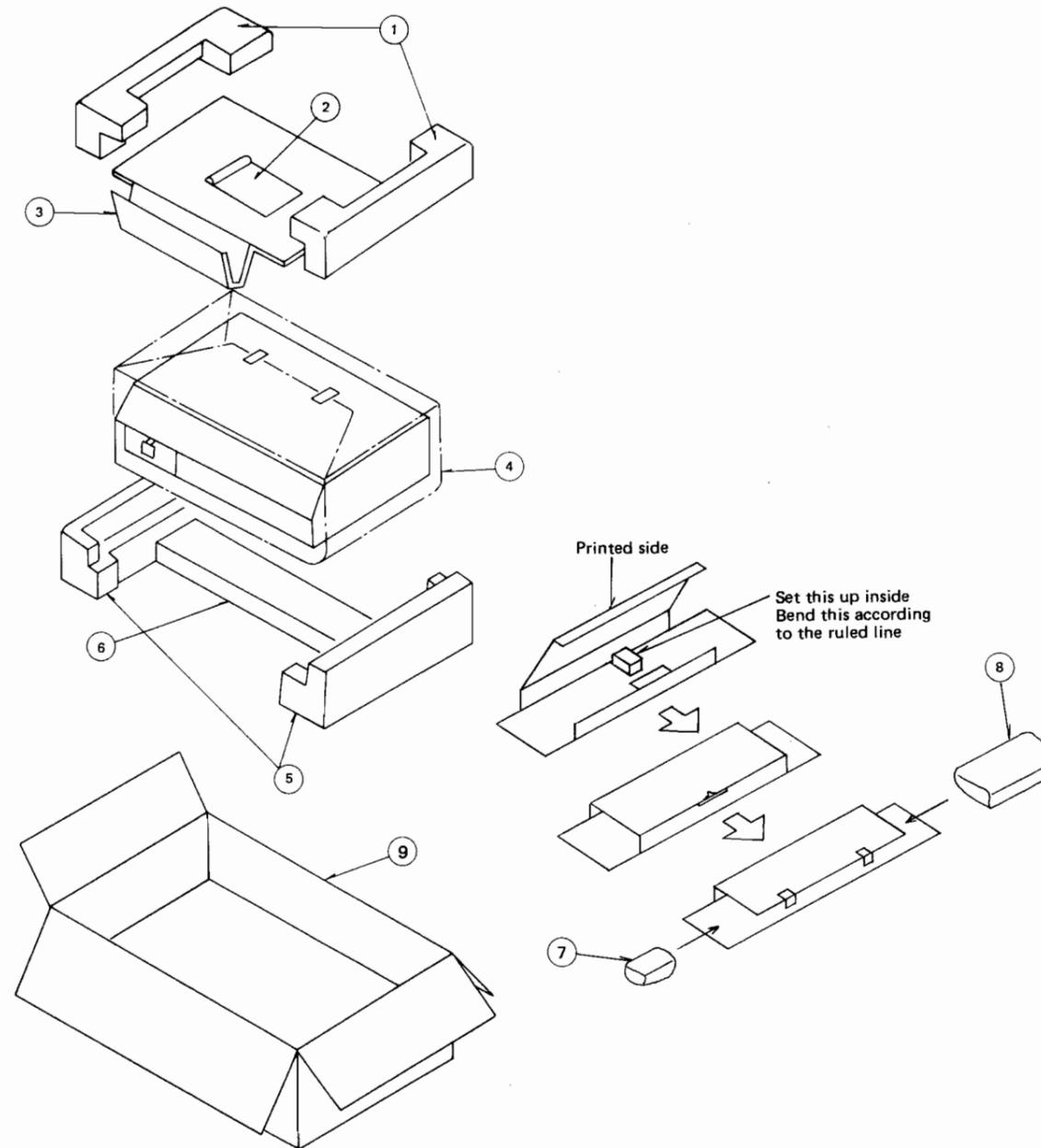
SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION	SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION
DIODES & OTHERS				D901	264 P18503	M4C-31-25	
D6G0	264 P04501	1S2076/1S2472		D902	264 P10103	RM-1 (V)	
D6G1	"	"		D903	"	"	
D6G2	"	"		D904	264 P10302	EQA01-11	
D6G3	"	"		D905	264 P10301	EQA01-06	
D6G4	"	"		D906	264 P04501	1S2076/1S2472	
D6G5	"	"		D907	264 P10105	RM-1B	
D7A1	264 P04502	1S2076A		D908	264 P10306	EQA01-16R	
D7A2	"	"		D909	264 P10103	RM-1 (V)	
D7A3	"	"		D912	264 P18503	M4C-31-25	
D7A4	"	"		D913	264 P10503	EQB01-12	
D7A5	"	"		D916	264 P10301	EQA01-06	
D7A6	"	"		CF3A0	264 P01402	CERAMIC-FILTER	SFE-5.5MA
D7A7	"	"		CF6F0	296 P02101	CERAMIC-FILTER	SFE-5.06MHz-MA
D7A8	"	"		CF8A0	299 P03601	CERAMIC OSCILLATOR	
D7A9	"	"		Z571	299 P03502	SENSOR-H	299P03502/ 299P04101
D7B1	"	"		RP5A1	265 P06301	POISTOR	PTH62BD3R3M
D7B2	"	"		X6F1	285 P01401	CRYSTAL	
D7B3	"	"		X6F2	285 P01101	QUARTZ-CRYSTAL-UNIT	4.43 MHz
D7E5	"	"		FILTERS & DELAY-LINE			
D7F1	"	"		LPF2A0	409 P14401	LOW-PASS-FILTER	LC-1128
D7F2	"	"		LPF2A1	409 P12301	"	
D7F3	"	"		LPF2A2	409 P13901	"	X-1044H
D7F4	"	"		LPF6F0	409 P13801	LOW-PASS-FILTER	
D7F5	"	"		LPF6F1	409 P13101	"	LC-929A
D7F6	"	"		BPF6F0	409 P14101	BAND-PASS-FILTER	X-1074A
D7F7	"	"		BPF6F1	"	"	"
D7F8	"	"		DL2A0	337 P03301	DELAY-LINE	
D7F9	"	"		DL2A1	337 P01102	"	
D7G1	"	"		DL6F0	337 P03602	"	ADL-CF544
D7G2	"	"		TRANSFORMERS & COILS			
D7G3	"	"		L91	325 C08103	COIL-PEAKING	10MH-K
D7C1	264 P24802	LN-31GCP-LH		L102	"	"	"
D7C2	"	"		L103	323 P15401	COIL-VIF	
D7C3	"	"		L104	323 P15801	"	
D7C4	"	"		L105	320 P03401	COIL-TRAP	
D7C5	"	"		L133	323 P15101	COIL-VIF	
D7C6	"	"		L134	323 P15602	COIL-VIF-TRAP	CO-SND 33.4MH
D7C7	"	"		L135	323 P11804	COIL-VIF-DET-TRAP	
D7C8	"	"		L136	320 P02004	COIL-TRAP	
D7C9	"	"		L137	323 P15501	"	
D7D1	"	"		L138	327 P05201	COIL-SIF	6MHz
D7D2	"	"		L139	325 C08103	COIL-PEAKING	10MH-K
D7D3	"	"		L151	349 P14601	COIL-TAKE-OFF	TKACT-25155
D8F0	264 P04501	1S2076/1S2472					
D8F1	"	"					
D8F2	"	"					
D8F3	"	"					
D8F4	"	"					
D8F5	"	"					
D8F6	"	"					
D8F7	"	"					
D8F8	"	"					
D8F9	"	"					
D8G0	264 P19308	MZ309-B2					
D8G1	264 P04501	1S2076/1S2472					
D8G2	264 P19305	MZ303B					

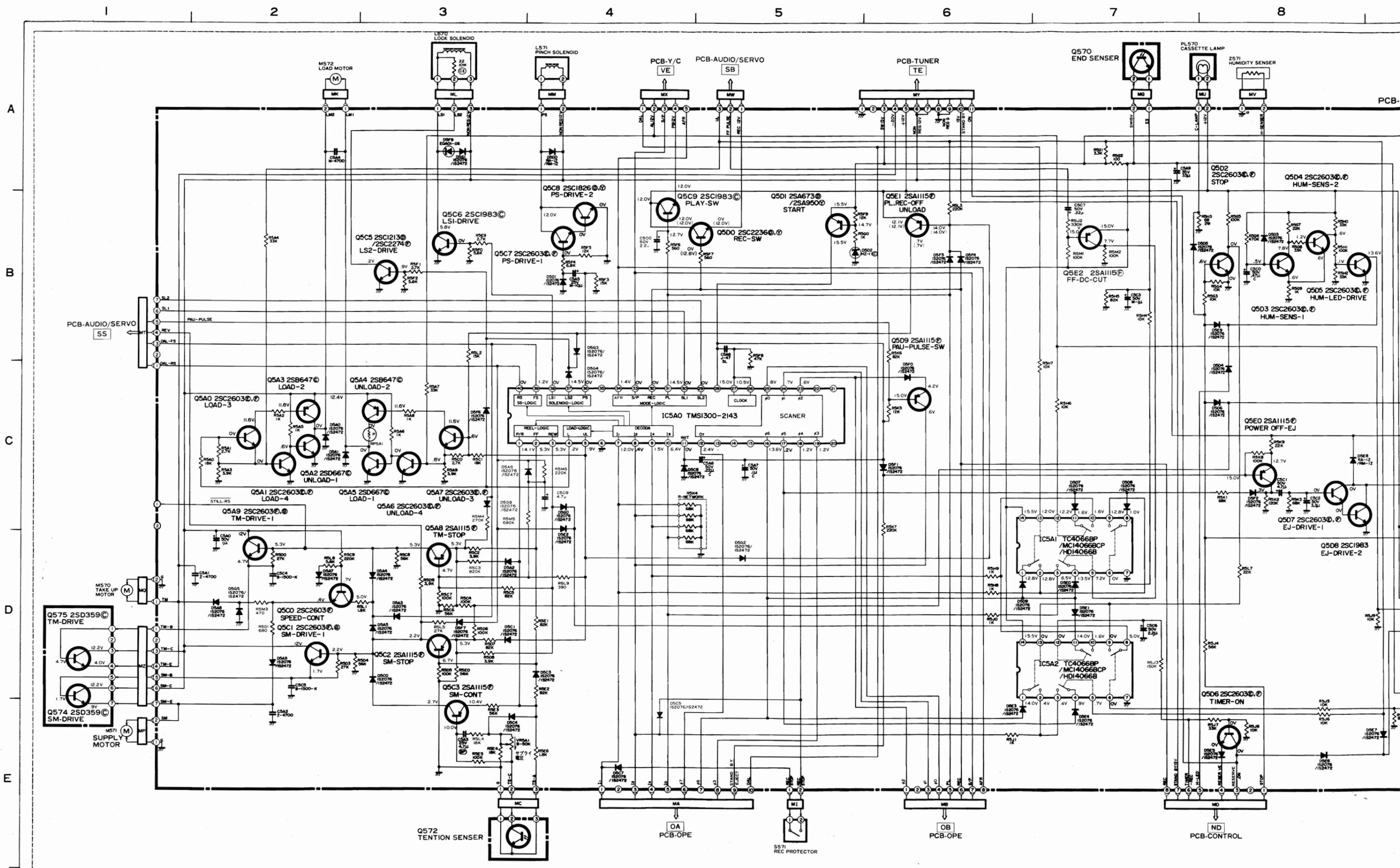
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TRANSFORMERS & COILS				VC2A0	202 P20205	C-TRIMMER	250V 5-50P
L201	325 C08608	COIL-PEAKING	27MH-J	VC6F1	202 P20202	"	250V 3P-23P
L202	325 C08205	"	100MH-K	VC6F2	202 P20205	"	250V 5P-50P
L203	325 C08702	"	56MH-J	R4F9	102 P03301	R-WIRE-P	2W 0.47-K
L204	325 C08208	"	180MH-K	R574	109D04501	R-CEMENT-WIRE	10W 22-K
L205	325 C08005	"	2.2MH-J	R5K4	109 P04903	R-NET WORK	1/8W 68K-JX4
L206	325 C08607	"	22MH-J	R971	109D03408	R-CEMENT-WIRE	10W 2.7-K
L207	325 C08603	"	10MH-J	VR101	127 C02004	VR-SEMIFIXED	1/5W B1K
L208	325 C08307	"	1000MH-J	VR201	"	"	" "
L209	325 C08607	"	22MH-J	VR202	"	"	" "
L210	325 C08005	"	2.2MHK	VR203	127 C02005	"	1/5W B2K
L211	325 C10005	"	"	VR2A0	127 C02004	VR-SEMIFIXED	1/5W B1K
L2A0	325 C10303	COIL-PEAKING	470MH-K	VR2A1	127 C02101	"	" B50K
L2A1	325 C10103	"	10MH-K	VR2A2	127 C02007	"	" B5K
L2A2	325 C10303	"	470MH-K	VR2A4	127 C02005	"	" B2K
L2A3	325 C10103	"	10MH-K	VR2A5	127 C02007	"	" B5K
L2A4	325 C10207	"	150MH-K	VR2A6	"	"	" "
L2A5	325 C10004	"	1.8MH-K	VR2A7	127 C02009	"	" B20K
L2A6	325 C10106	"	18MH-K	VR2A8	127 C02007	"	" B5K
L2A7	325 C10205	"	100MH-K	VR3F0	127 C02009	"	1/5W B20K
L2A9	"	"	"	VR3F1	127 C02008	"	" B10K
L2B1	325 C10205	COIL-PEAKING	100MH-K	VR3F2	127 C02101	"	" B50K
L2B3	"	"	"	VR3F3	127 C02007	"	" B5K
L3A0	327 P05201	COIL-SIF	6MHz	VR3F4	"	"	" "
L3F0	321 C01102	COIL-RF	4700MH-J	VR401	127 C02102	"	1/5W B100K
L3F1	321 C01004	COIL-FILTER	100MHK-J	VR402	"	"	" "
L3F2	321 C01008	COIL-RF	2200MH-J	VR403	"	"	" "
L401	409 P11701	LINE-CHOKE		VR404	127 C02102	"	" "
L471	411 P00104	LEAD-FERRITE		VR405	127 C02101	"	" B50K
L472	"	"		VR406	"	"	" "
L6F0	325 C10303	COIL-PEAKING	470MH-K	VR407	"	"	" "
L6F2	325 C10209	"	220MH-K	VR408	127 C02102	"	1/5W B100K
L6F3	325 C10102	"	8.2MH-K	VR409	"	"	" "
L6F4	"	"	"	VR410	"	"	" "
L6F5	325 C10109	"	33MH-K	VR411	"	"	" "
L6F8	325 C10701	"	47MH-J	VR412	"	"	" "
L6F9	325 C10702	"	56MH-J	VR4700	120 C19801	VR-PWB	1/5B-100K 20S
L6G0	325 C10209	"	220MH-K	VR5A1	129D04701	VR-SEMIFIXED	1/10W B-50K-M
L6G3	325 C10205	"	100MH-K	VR6F0	127 C02005	"	1/5W B2K
L6G4	325 C10008	"	3.9MH-K	VR6F1	"	"	" "
L6G5	325 C10007	"	3.3MH-K	VR6F2	127 C02003	"	" "
L6G7	325 C10205	"	100MH-K	VR6F3	127 C02008	"	1/5W B10K
T131	323 P15201	TRANS-VIF		VR6F4	127 C02009	"	" B20K
T132	323 P15301	"		VR7A1	129 P01404	VR-CH-PRESETTER	B20K
T3F0	409 P08702	T-OSC	712RSL-1143	VR7A2	"	"	" "
CAPACITORS & RESISTORS				VR7A3	"	"	" "
C471	189 P03706	C-CERAMIC	E50V, 1000-P	VR7A4	"	"	" "
C472	"	"	"	VR7A5	"	"	" "
C928	189 D06901	C-ELECTROLYTIC	H25V, 4700M 105	VR7A6	"	"	" "
C941	189 D06902	"	H35V, 4700M 125	VR7A7	"	"	" "
VC101	202 P20205	C-TRIMMER	250V 5-50P	VR7A8	"	"	" "
VC201	"	"	"	VR7A9	"	"	" "
VC202	"	"	"				

SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION	SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION
CAPACITORS & RESISTORS							
VR7B1	129 P01404	VR-CH-PRESETTER	B20K	F901	283 D02401	FUSE	1A-T
VR7B2	"	"	"	F902	283 D02407	"	400MA-T
VR7B3	"	"	"	K3A0	283 D02405	"	2A-T
VR901	127 C02004	VR-SEMIFIXED	1/5W B-1K		283 D02409	"	T2, 5A
					287 P02001	RELAY	ME-12
PRINTED CIRCUIT							
	928 B05807 928 B05808	PCB-Mechanism		L570	299 P02801	SOLENOID	LOCK-Solenoid
	928 B06903	PCB-TUNER/ POWER		L571	299 P02701	"	Pinch-Solenoid
	928 B08102 928 B08202	PCB-CONT PCB-OPER- ATION		L572	299 P03701	"	Eject-Solenoid
	928 B08505	PCB-PRESET- TER		M471	288 P02702	MOTOR-CP	
	928 B08601 928 B08701	PCB-Y/C PCB-AUDIO- SERVO		M570	288 P02804 288 P03201	TU-MOTOR	
	928 B08801 928 B07803 928 B10102	PCB-PRO PCB-SENS PCB-CH-SW		M571	288 P02805	S-MOTOR	PM-4915M1
	928 C09701	PCB-JACK		M572	288 P02901	Loading MOTOR	MY-15B2A
				PL570	253 P02201	PILOT-LAMP	BQ063-30203A
				V8F0	253 P02601 501 P00602 540 C01004	TUBE-FLUOR COUNTER-S LEAD-CLAMPER- N	6-LT-612A2
				TU01	295 P21203	TUNER, TV	
					928 B00703	ASSY-LOWER- DRUM	
					641 C21301	ASSY-OIL- DAMPER	
					282 P00303 939 P03202	BOOSTER TX-WIRE- REMOCON	
MISCELLANEOUS				ACCESSORY-A			
	224 D06501	HOUSING- CONNECTOR	2P		871 C05807	IB-VTR	English
	224 D06601	"	3P		871 C05808	"	German
	242 C20901	AC-POWER- CORD			871 C05809	"	Swedish
	299 D07701	BRUSH			871 C05900	"	French
S501	432 P04501	SW-KEY-BOARD	FF OPERATION		840 D02001	TOP-CLOTH	
S502	"	"	PL "		831 D11002	PACKING-BAG	
S503	"	"	STOP "		831 C05907	ENVELOPE	
S504	"	"	REW "		760 B04201	LABEL-NUMBER	
S505	"	"	REC "	ACCESSORY-B			
S506	"	"	PUSE/STILL OPERATION		242 C20901	AC-POWER- CORD	
S507	"	"	FS OPERATION		242 D23101	CABLE	
S508	"	"	RS "		831 D11005	PACKING-BAG	
S510	"	"	EJECT "		851 D60601	LABLE-CORD	
S571	431 C03201	SW-SLIDE					
S5200	432 P03601	SW-PUSH	POWER-SW				
S5201	"	"	RESERVE-SW				
S7A2	432 P04402	SW-PUSH	S7A1~S7B3 12 POSITION				
S7B4	434 C01501	SW-LEVER	AFT				
S8F0	432 P04501	SW-KEY-BOARD	OFF				
S8F1	"	"	ON				
S8F2	"	"	CLOCK				
S8F3	"	"	MIN				
S8F4	"	"	10 MIN				
S8F5	"	"	1 HOUR				
S8F6	"	"	DAY				
S973	433 C01702	SW-SEESAW	MAIN-POWER-SW				

SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION	SYMBOL NO.	PARTS NO.	PARTS NAME	DESCRIPTION
1	803 A05503	Cushion		7	939P03202	TX-WIRE-REMOCON	
2	—	Accessory-A		8	—	Accessory-B	
3	802D17701	SHEET-TOP		9	802C37909	Packing-Case	
4	831 D17301	Packing-Bag					
5	803 A05501	Cushion					
6	829C03101	Box-Accessory					

6. PACKING PARTS





A

B

C

D

E

PCB-I

PCB-CONTROL

PCB-OPE

PCB-TUNER

PCB-AUDIO/SERVO

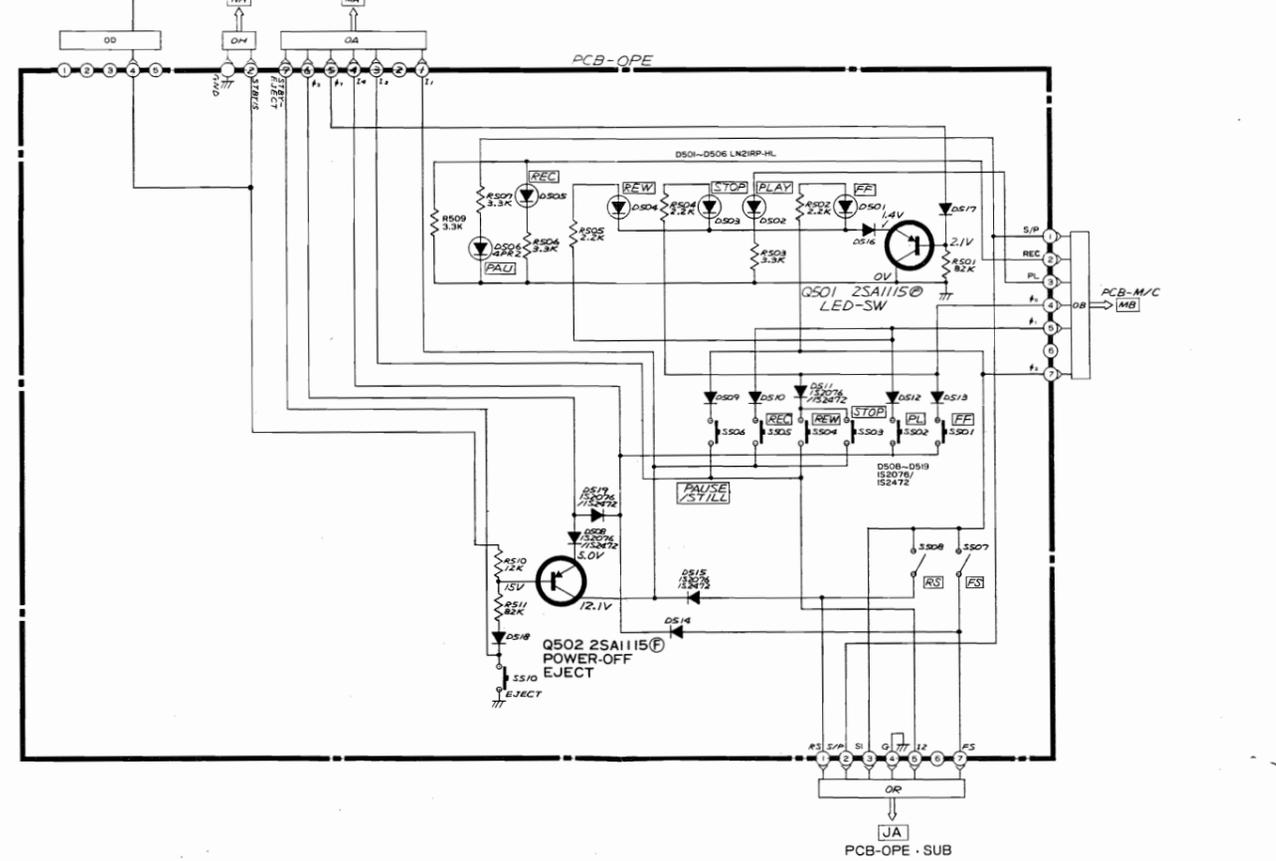
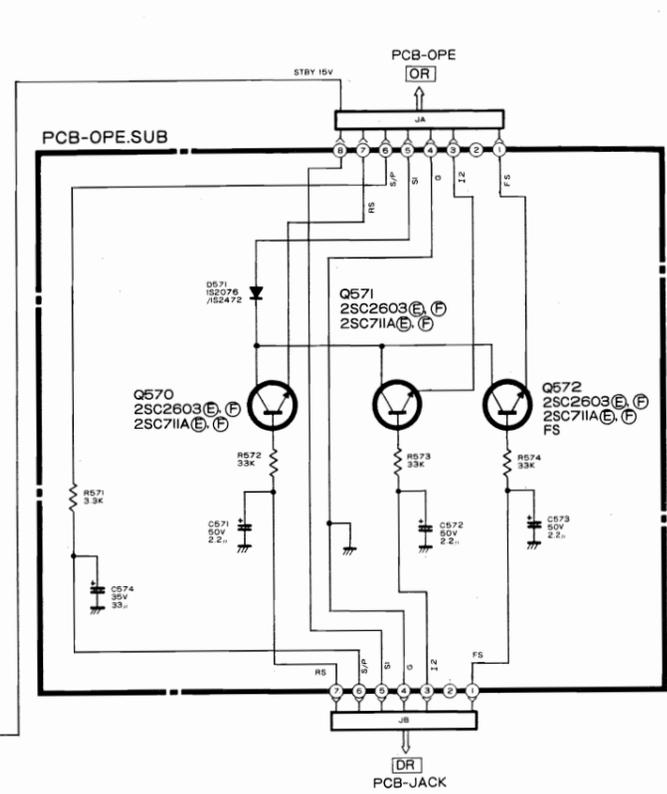
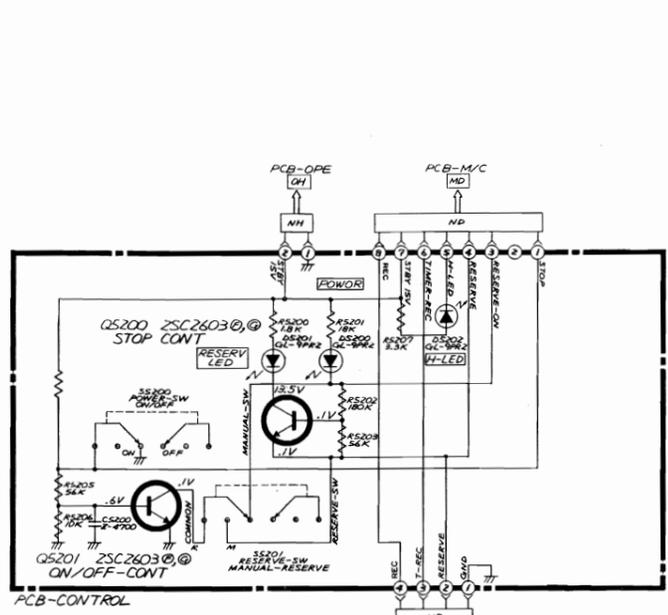
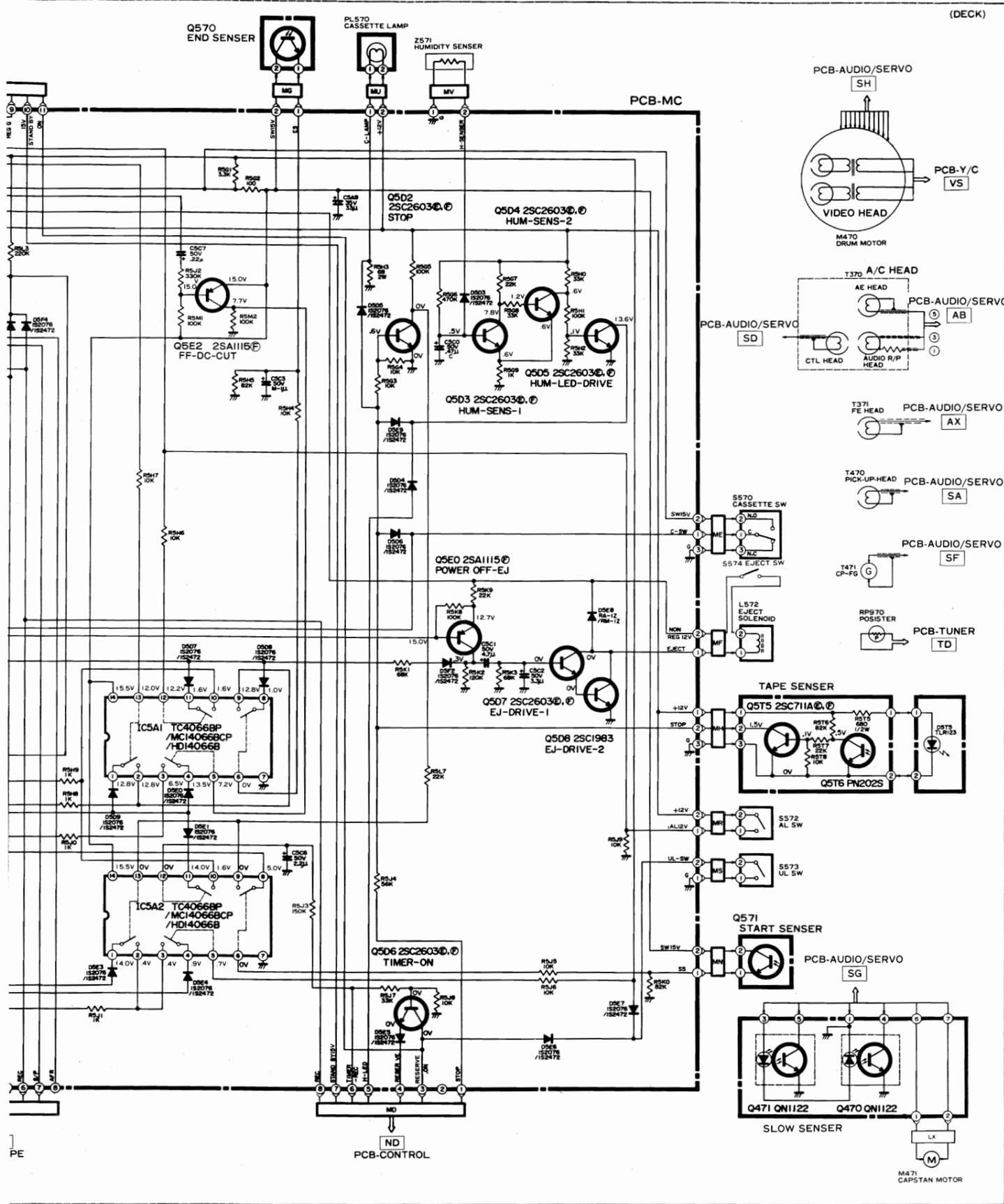
PCB-AUDIO/SERVO

PCB-Y/C

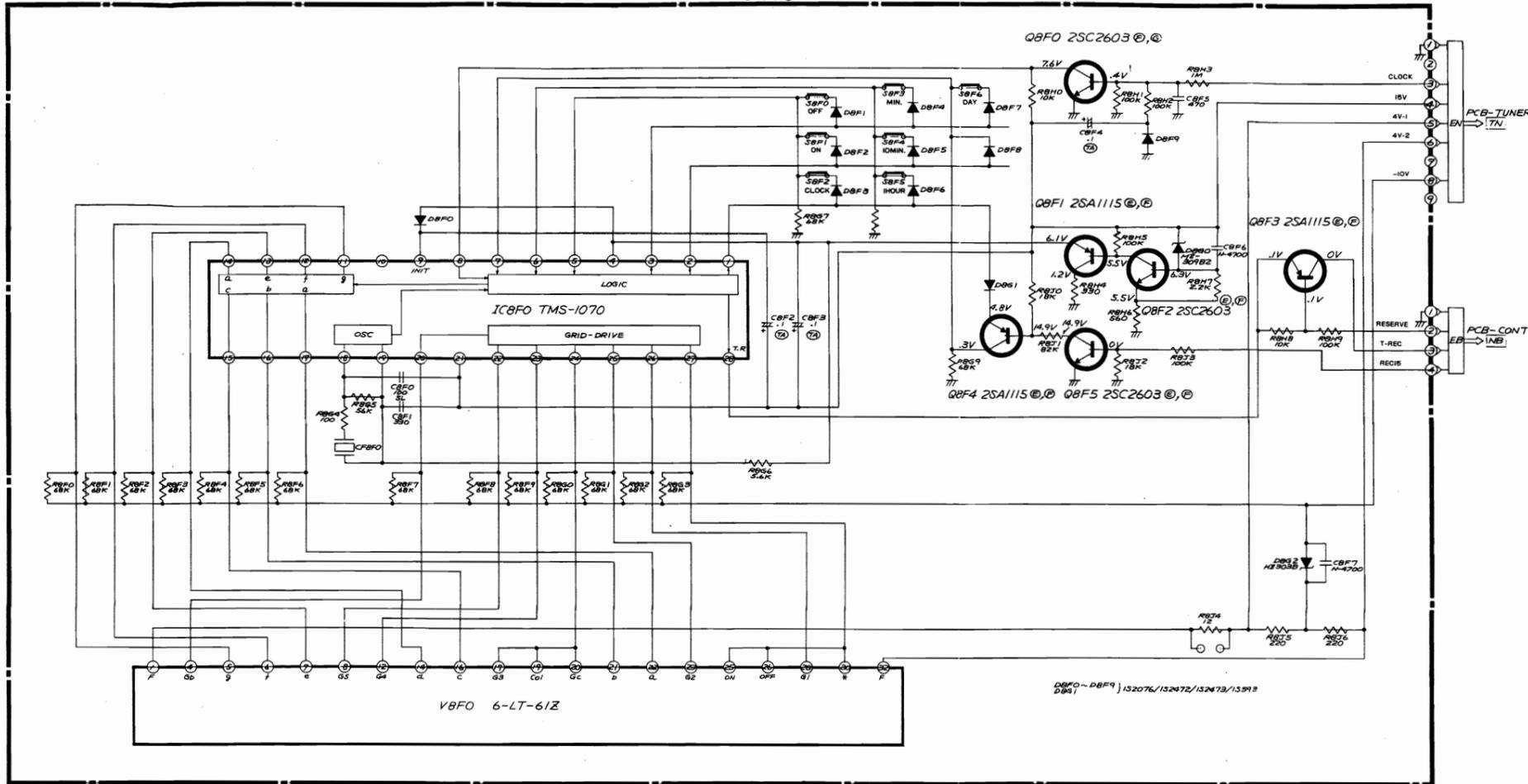
PCB-OPE

PCB-AUDIO/SERVO

PCB-I



PCB-PRO



SCHEMATIC DIAGRAM

HINWEIS 1:

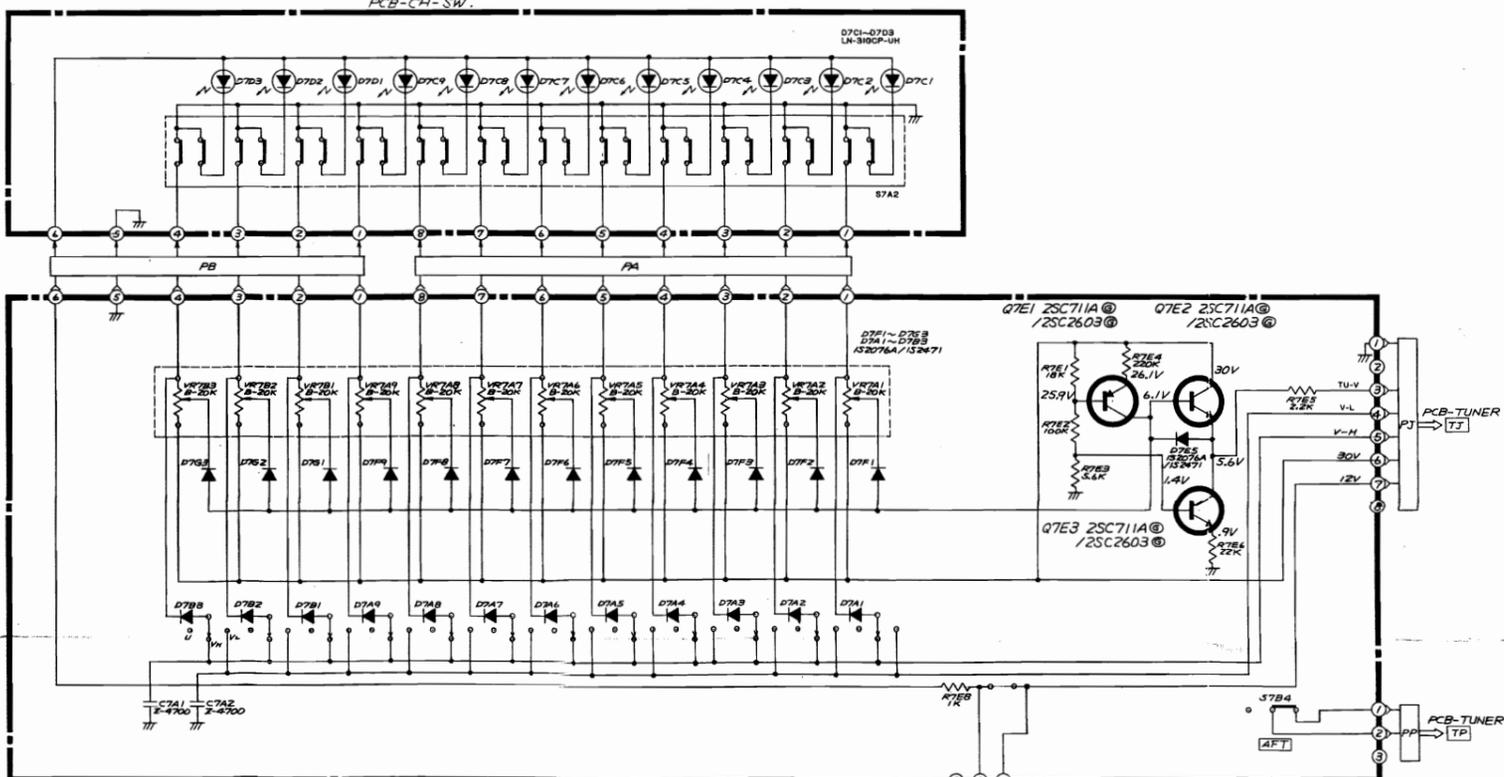
- Die Bezeichnung "Ohm" wurde im Schaltplan weggelassen, so daß K gleich 1000 Ohm und M gleich 1000 kOhm bedeuten.
- Die Wattzahl der nicht bezeichneten Widerstände beträgt 0,25 Watt.
- Nicht bezeichnete Widerstände sind Kohlewiderstände oder feste Kompositwiderstände.
- Die folgenden Symbole werden für Widerstände verwendet:
 - CE : Verklebte Widerstände
 - MB : Metalloxid-Schichtwiderstände
 - W : Drahtspulen-Widerstände
- Die Toleranz der nicht bezeichneten Widerstände beträgt: ± 5%, K = ± 10%, M = ± 20%
- Die Werte der nicht bezeichneten Kondensatoren sind wie folgt:
 - a) µF für Zahlen unter 1
 - b) pF für Zahlen über 1
- Nicht bezeichnete Kondensatoren sind Keramik-Kondensatoren, mit der Ausnahme von Elektrolyt-Kondensatoren.
- Die folgenden Symbole werden für Kondensatoren verwendet:
 - ALM : Aluminium-Elektrolyt-Kondensatoren
 - MF : Polyester-Kondensatoren
 - PP : Polypropylen-Schichtkondensatoren
 - TAN : Tantal-Kondensatoren
 - * : Elektrolyt-Kondensatoren
- Die Gleichstrom-Betriebsspannung der nicht bezeichneten Kondensatoren beträgt 50 V.
- Die Toleranz der nicht bezeichneten Kondensatoren beträgt: ± 10%, J = ± 5%, M = ± 20%, P = +100% -0%, C = ± 0,25 pF, D = ± 0,5 pF, F = ± 1 pF, Z = +80% -20%
- Keramik-Kondensatoren mit den Bezeichnungen RH, UJ, SL usw. sind Temperatur-Kompensations-Kondensatoren.

BESONDERE SYMBOLE	
	Zener-Diode
	Regelkondensator
	Posistor
	Thermistor
	Schmelzwiderstand
	Varistor
	Kristalleinheit
	Luftspalt
	Auf der Leiterbahnseite der Leiterplatte angebrachtes Teil (Widerstand)
	Keramikfilter

HINWEIS 2:

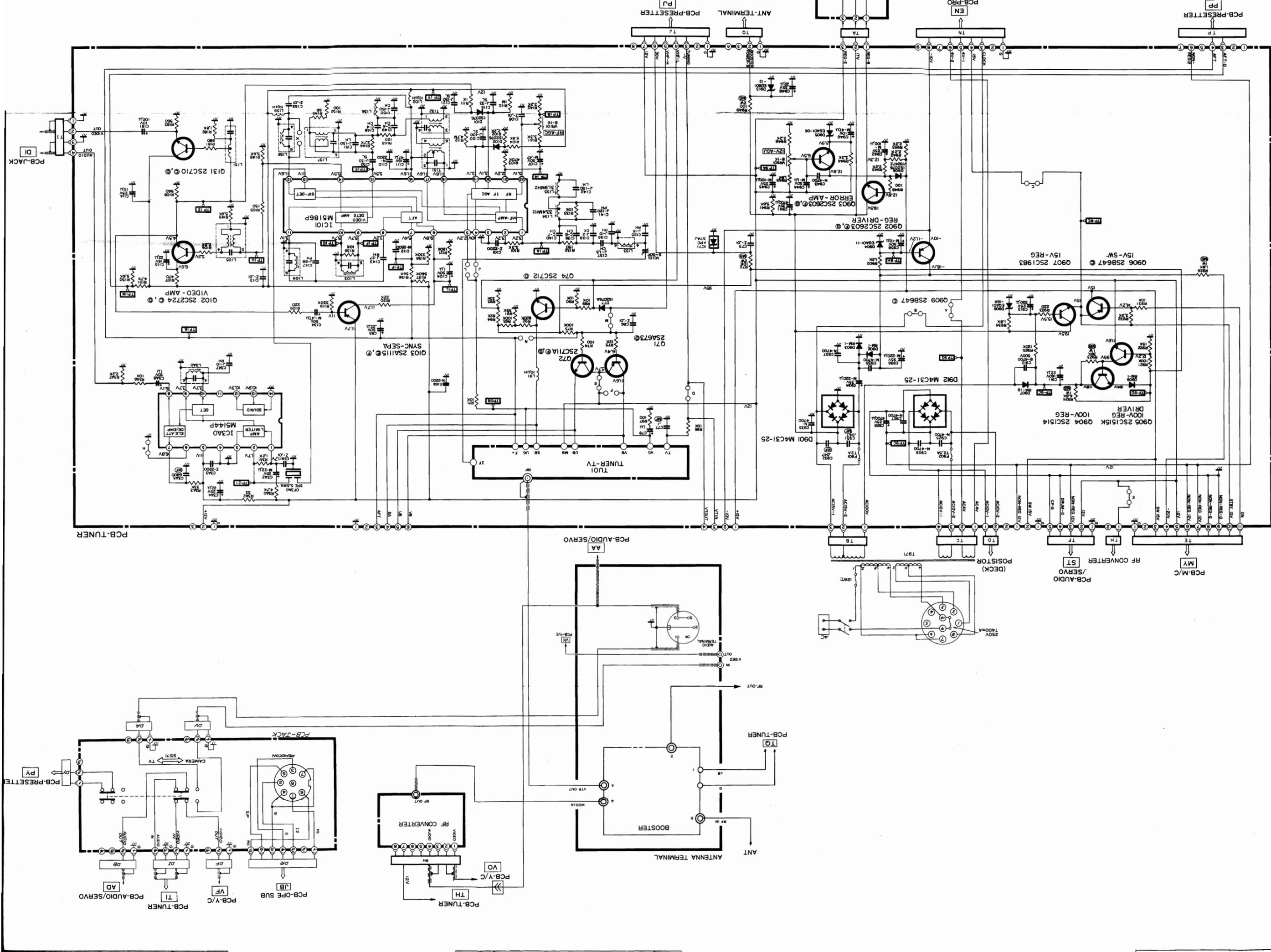
- Die Gleichspannungen wurden mit einem Röhrenvoltmeter an den angegebenen Punkten gemessen.
- Die Oszilloskope wurden bei auf Normalbild eingestellten Reglern aufgenommen.
- Dies ist nur ein grundlegender Schaltplan. Abhängig von technischen Verbesserungen könnte der tatsächliche Schaltplan der Geräte anders aussehen.

PCB-CH-SW.

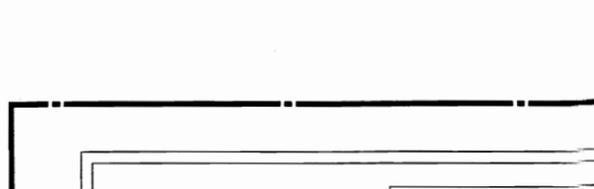
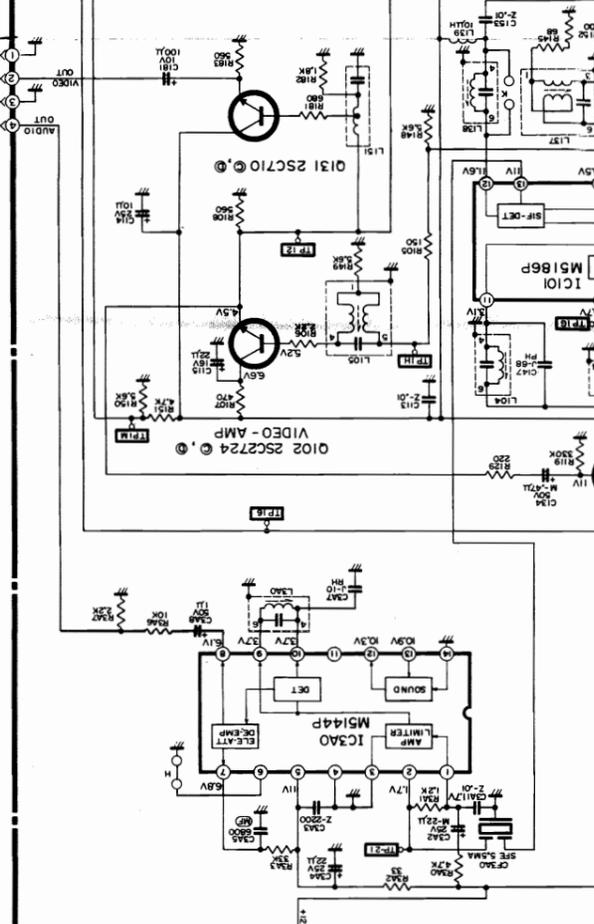
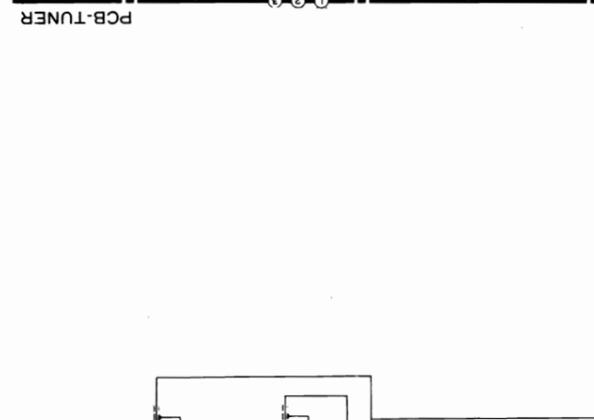
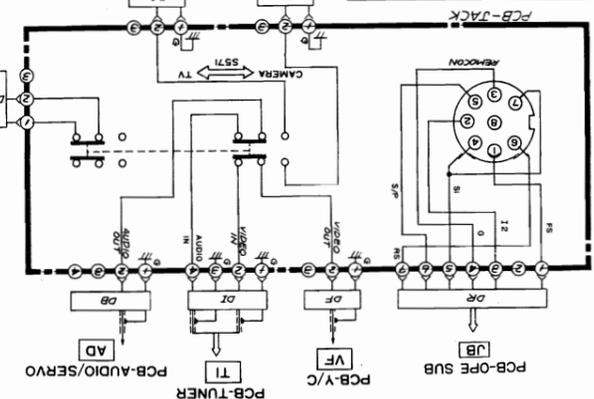
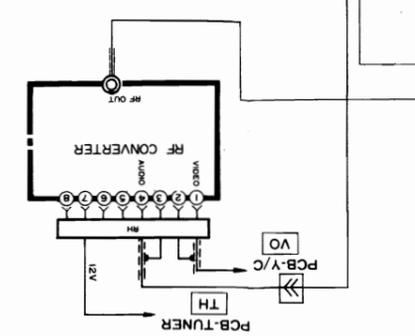
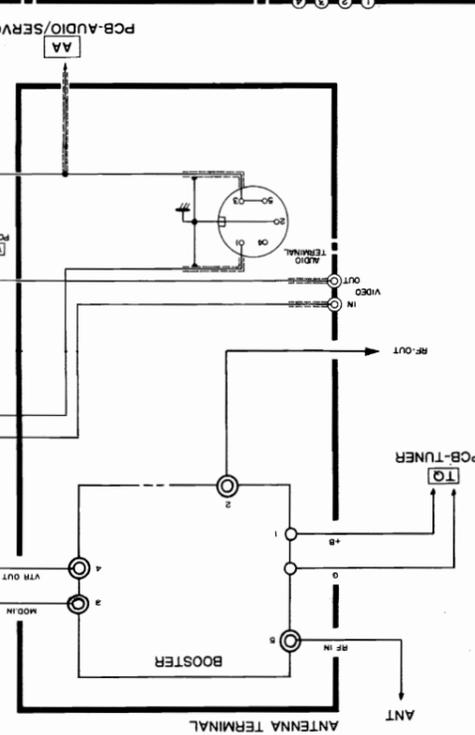


PCB-PRESETTER

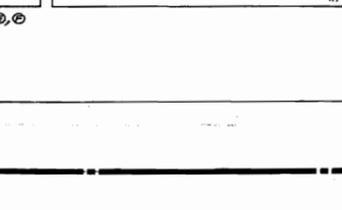
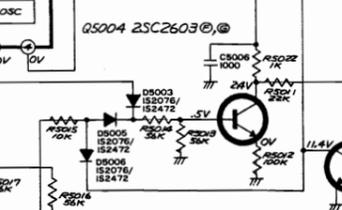
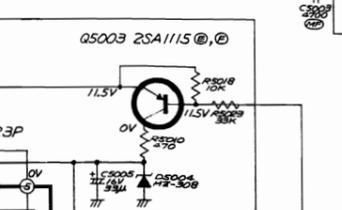
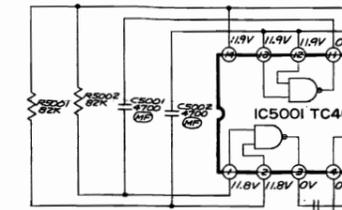
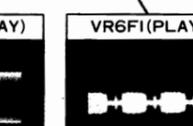
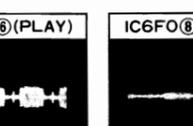
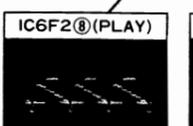
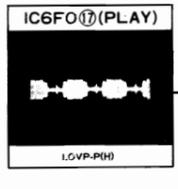
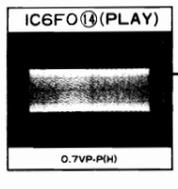
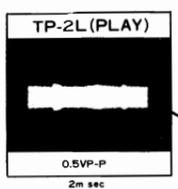
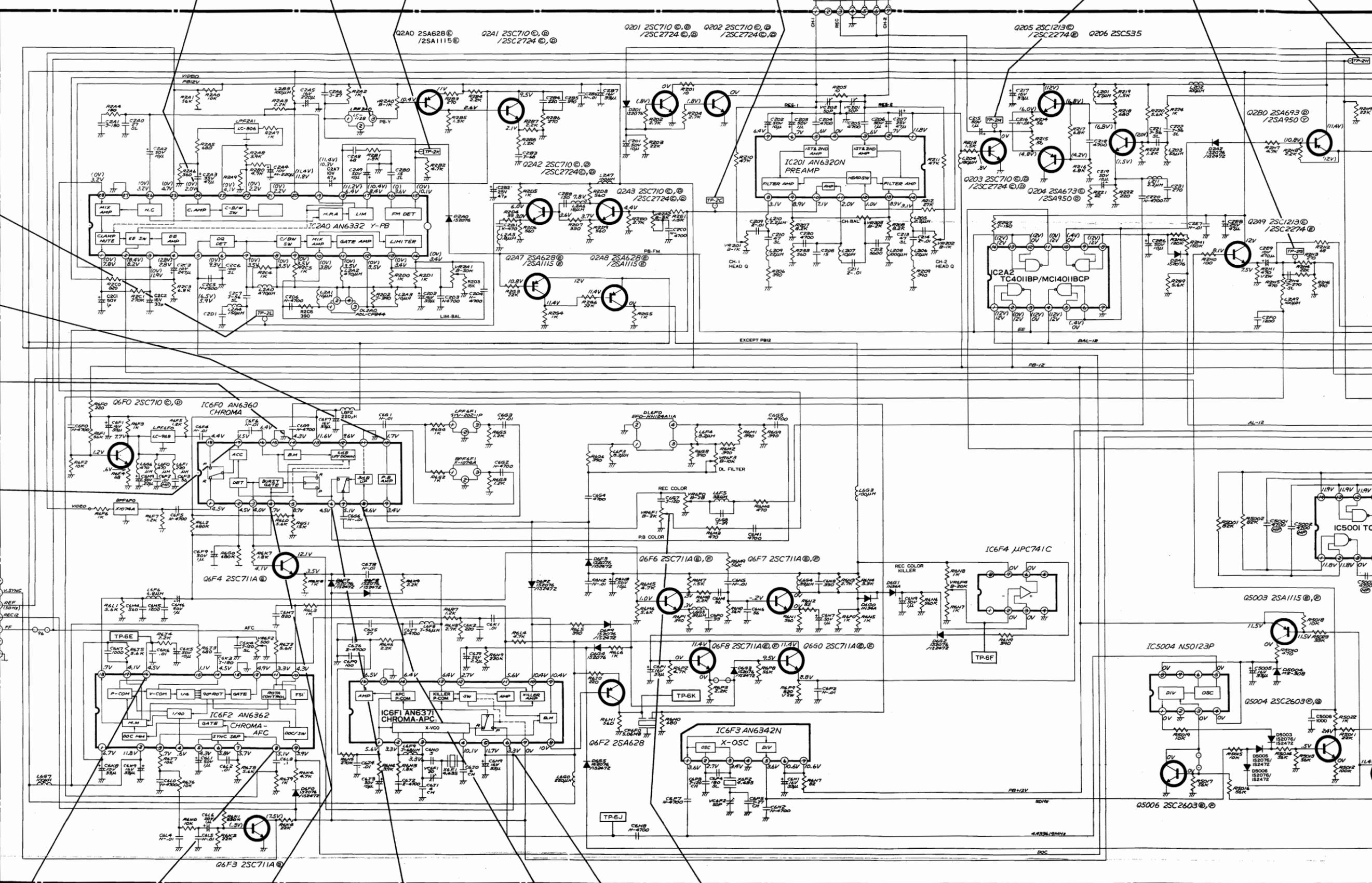
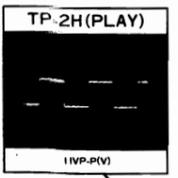
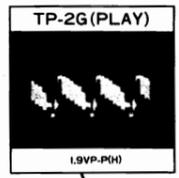
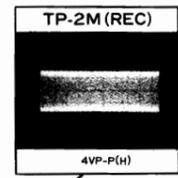
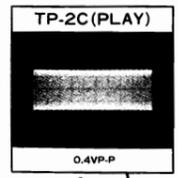
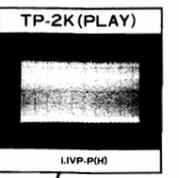
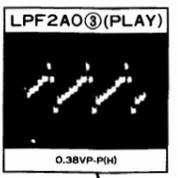
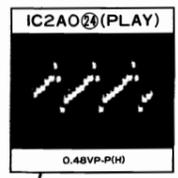
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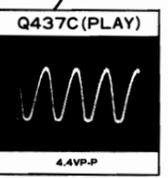
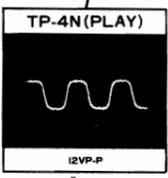
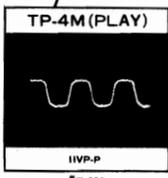
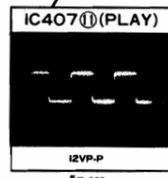
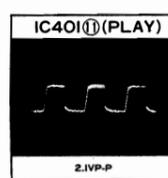
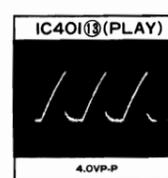
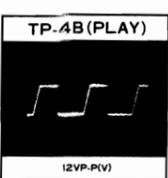
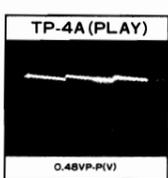
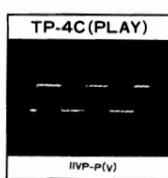
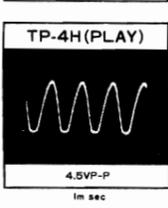
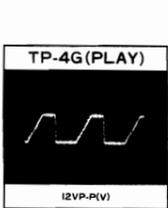
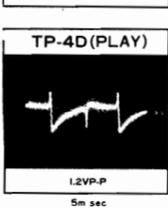
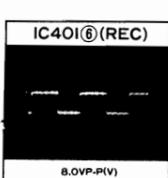
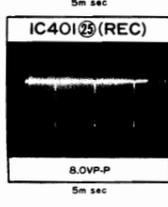
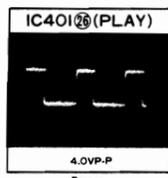
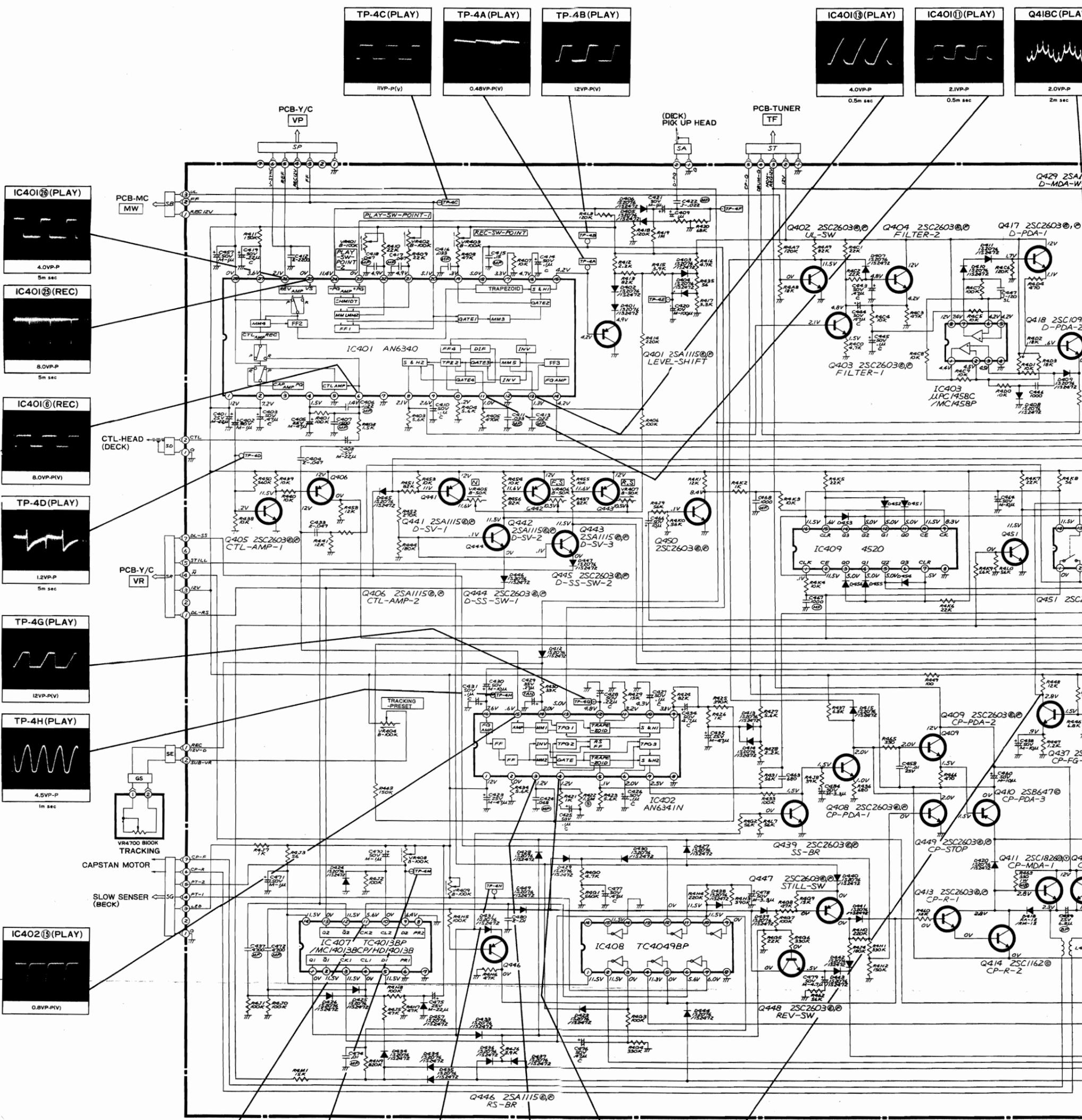


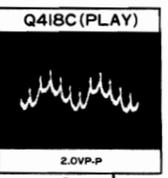
A
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D
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A
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F



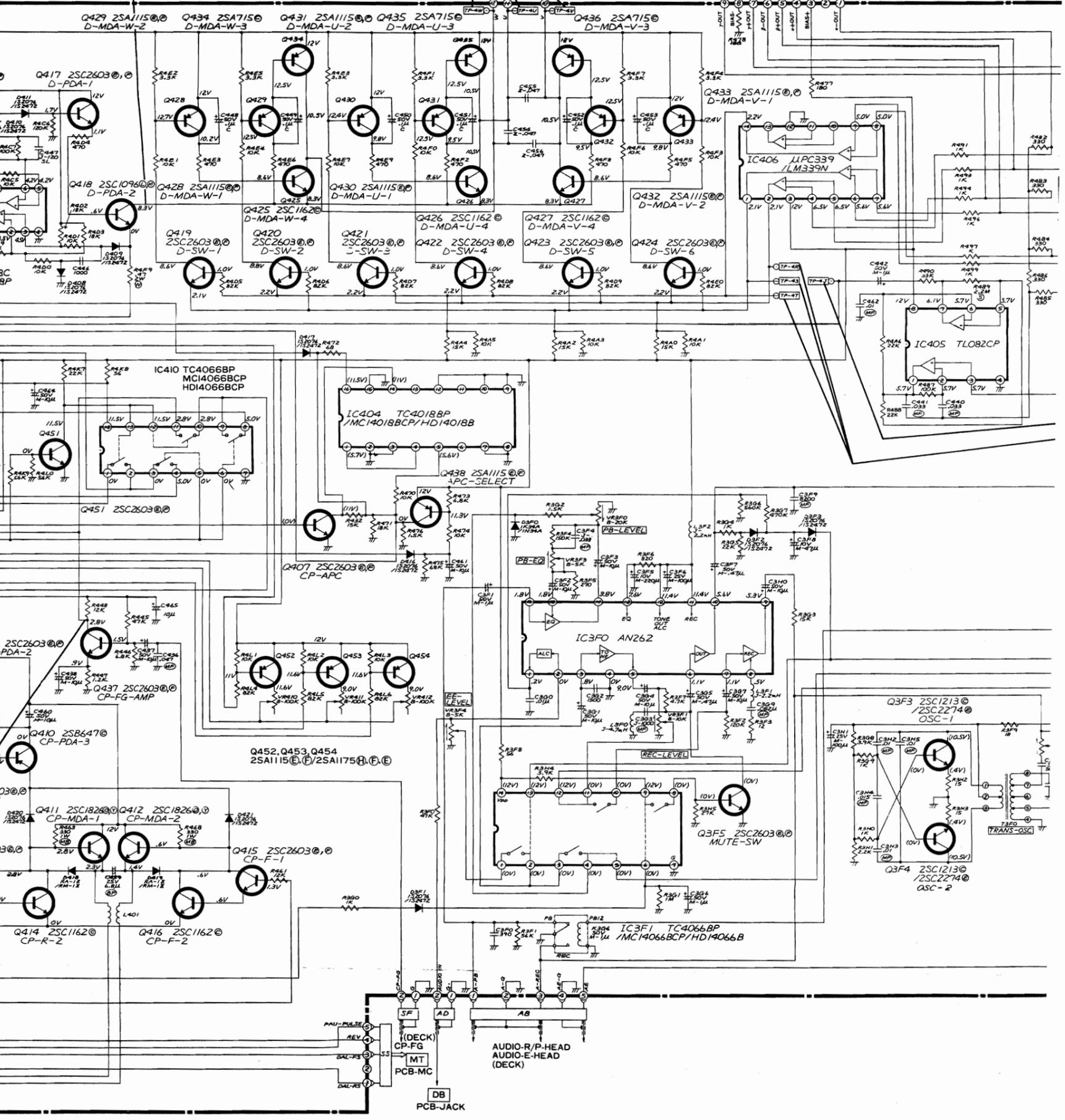


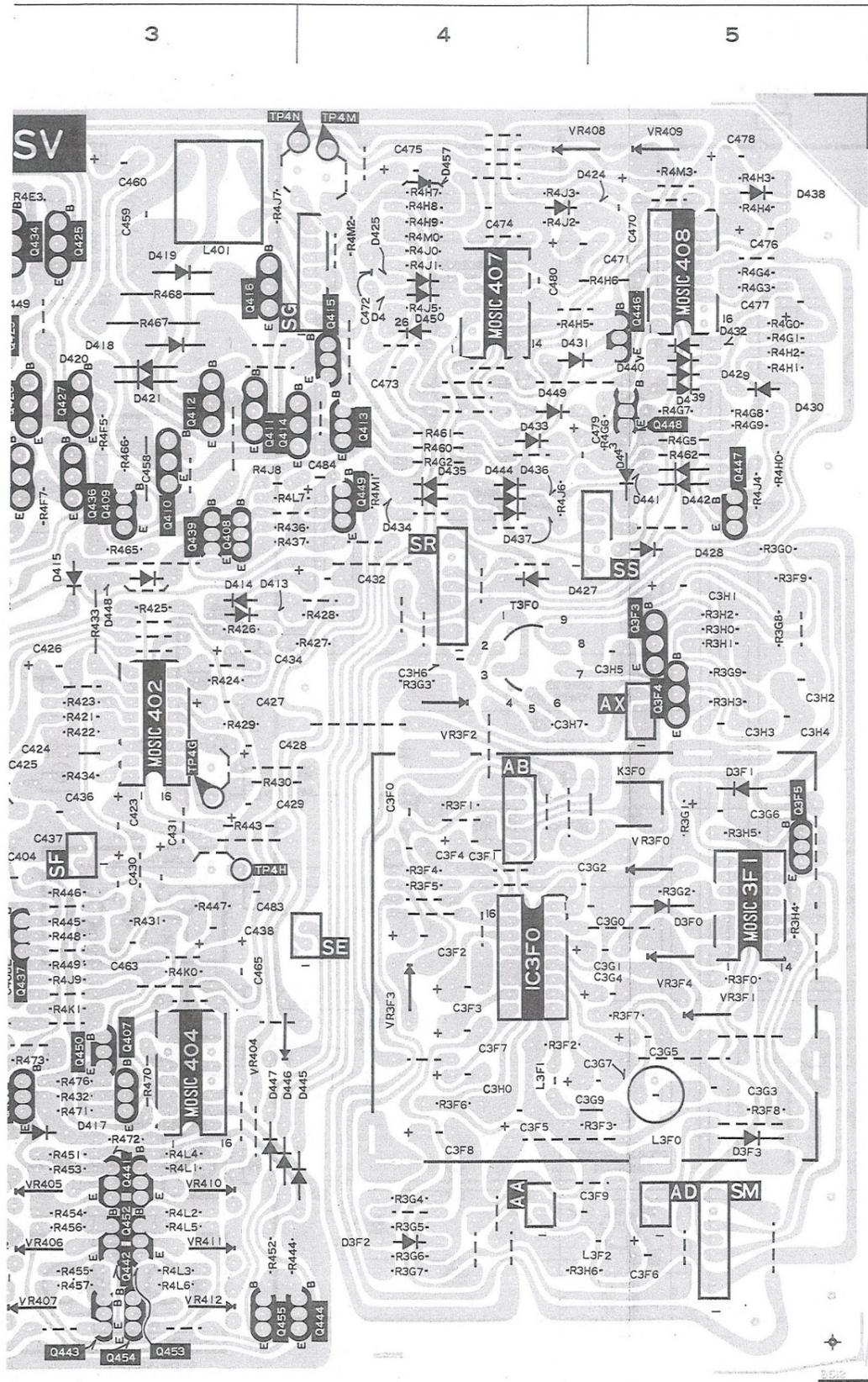


TP-4U
TP-4V
TP-4W

(DECK)
DRUM MOTOR

PCB-AUD



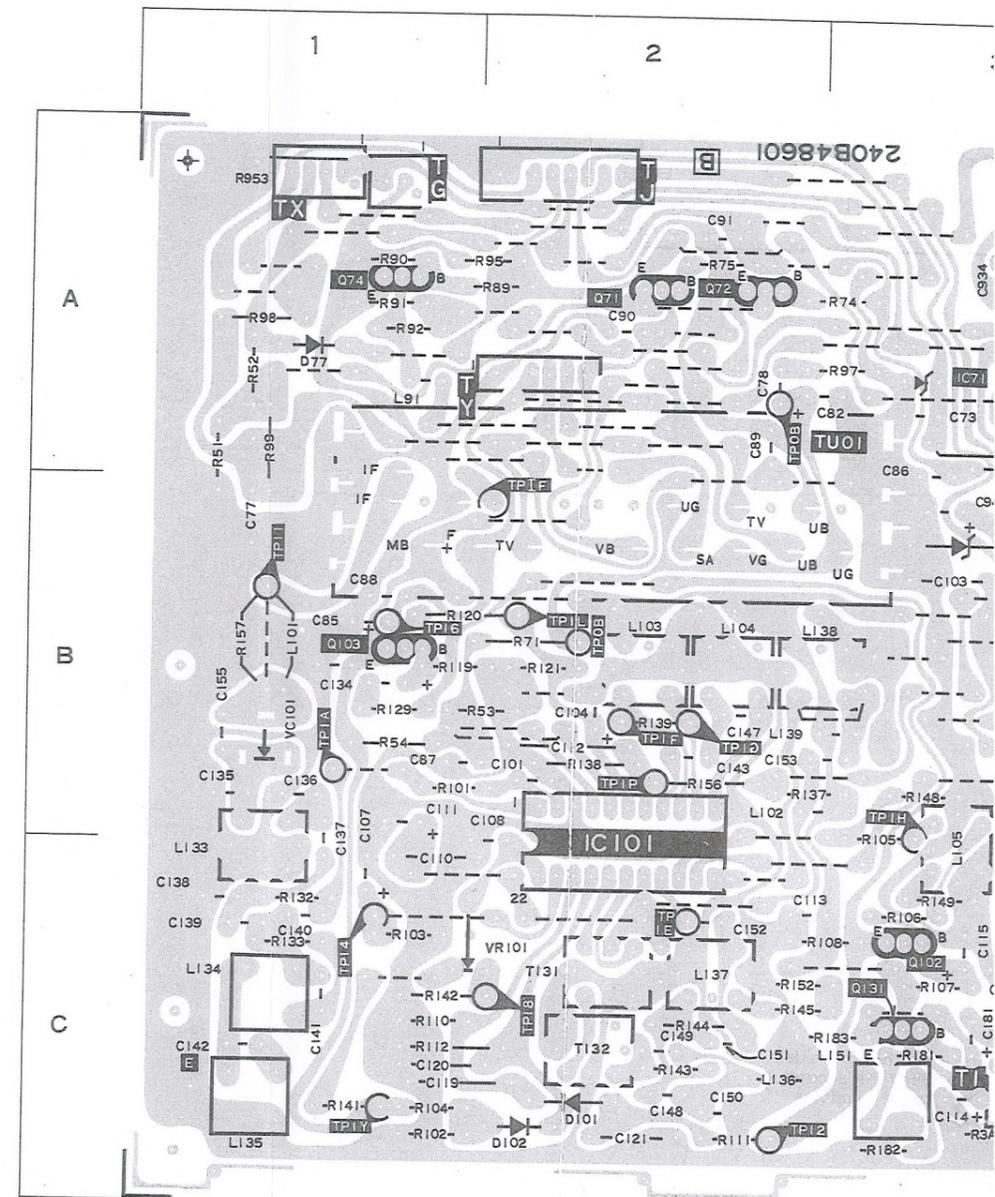
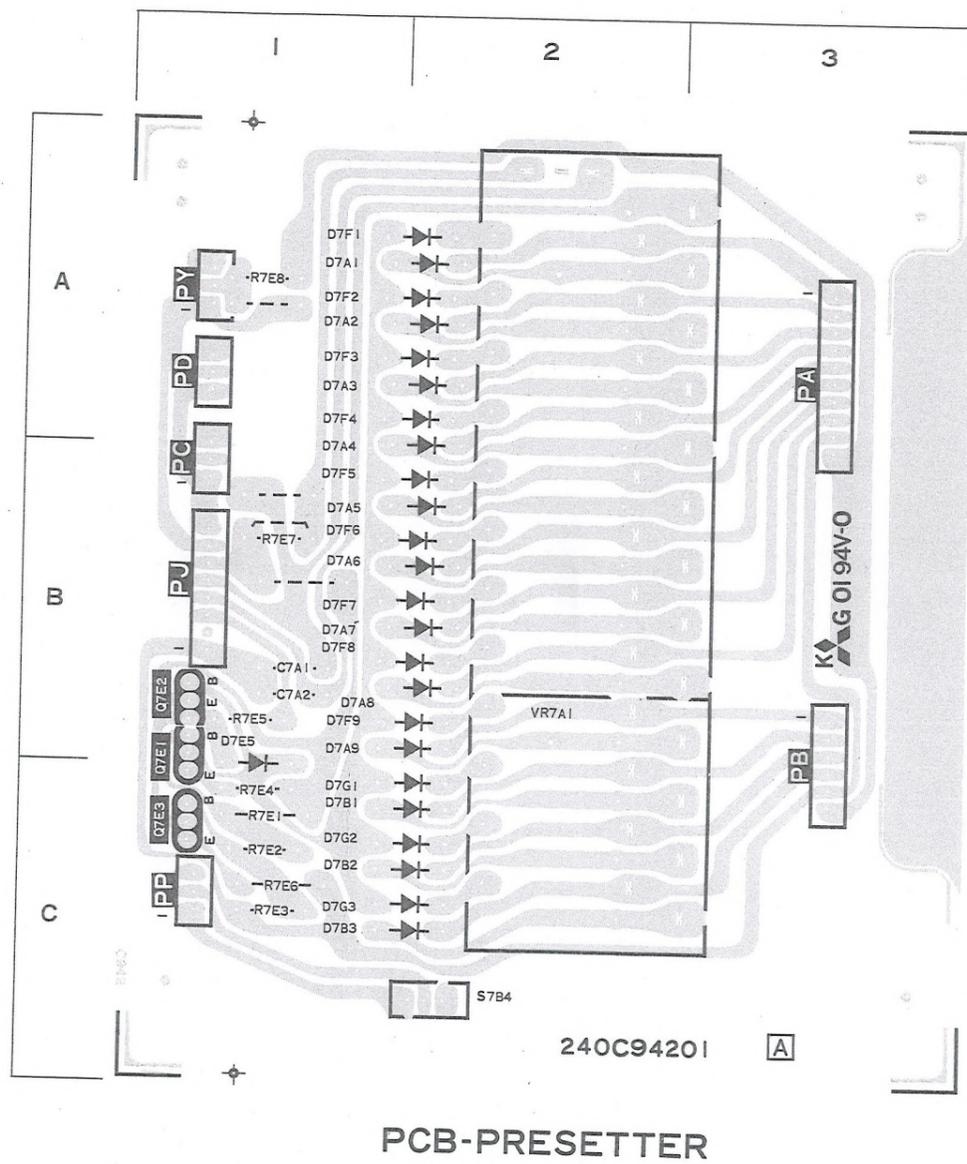
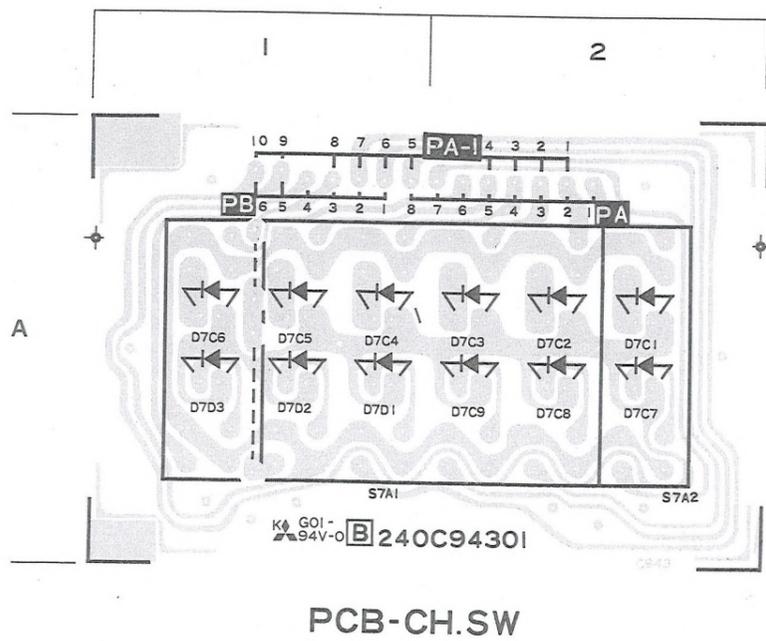


PCB-AUDIO/SERVO

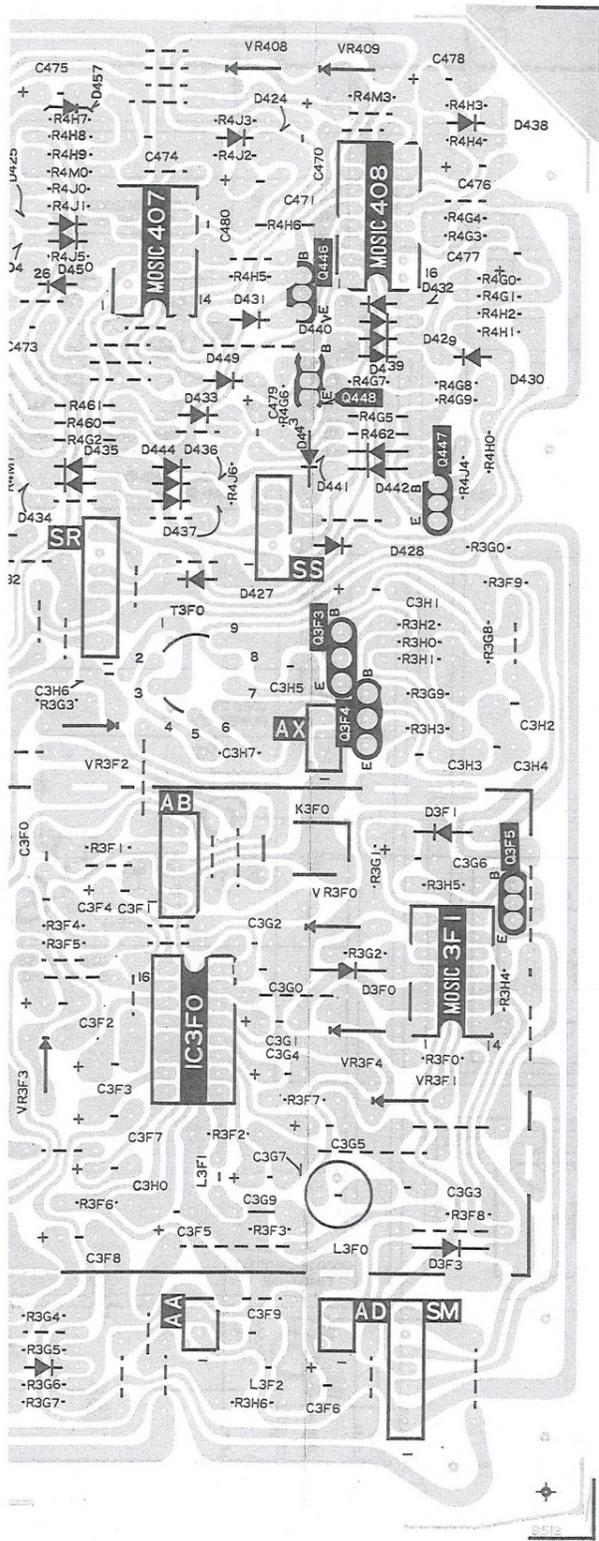
SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS
TP-4B	C-2	TP-4R	B-2	IC402	B-3	Q3F3	B-5
TP-4C	C-2	TP-4S	A-2	IC403	B-1	Q3F4	B-5
TP-4D	D-1	TP-4T	B-2	IC404	D-3	Q3F5	C-5
TP-4E	C-2	TP-4U	A-2	IC405	C-1	Q401	C-2
TP-4F	C-1	TP-4V	A-1	IC406	A-2	Q402	C-2
TP-4G	C-3	TP-4W	A-2	IC407	A-4	Q403	C-2
TP-4H	C-3			IC408	A-5	Q404	C-2
TP-4J	C-1	IC3F0	C-4	IC409	D-2	Q405	D-2
TP-4M	A-4	IC3F1	C-5	IC410	C-2	Q406	D-2
TP-4N	A-4	IC401	D-1			Q407	D-3

SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS
Q408	B-3	Q418	A-2	Q428	A-2	Q438	D-3
Q409	B-3	Q419	A-2	Q429	A-2	Q439	B-3
Q410	B-3	Q420	A-2	Q430	B-2	Q441	D-3
Q411	A-3	Q421	B-2	Q431	B-2	Q442	D-3
Q412	A-3	Q422	B-2	Q432	B-2	Q443	D-3
Q413	B-4	Q423	B-2	Q433	B-2	Q444	D-4
Q414	B-4	Q424	B-2	Q434	A-3	Q446	A-5
Q415	A-4	Q425	A-3	Q435	B-3	Q447	B-5
Q416	A-3	Q426	A-3	Q436	B-3	Q448	A-5
Q417	B-1	Q427	A-3	Q437	C-3	Q449	B-4

SYMBOL NO.	ADDRESS
Q450	C-3
Q451	D-2
Q452	D-3
Q453	D-3
Q454	D-3
Q455	D-3



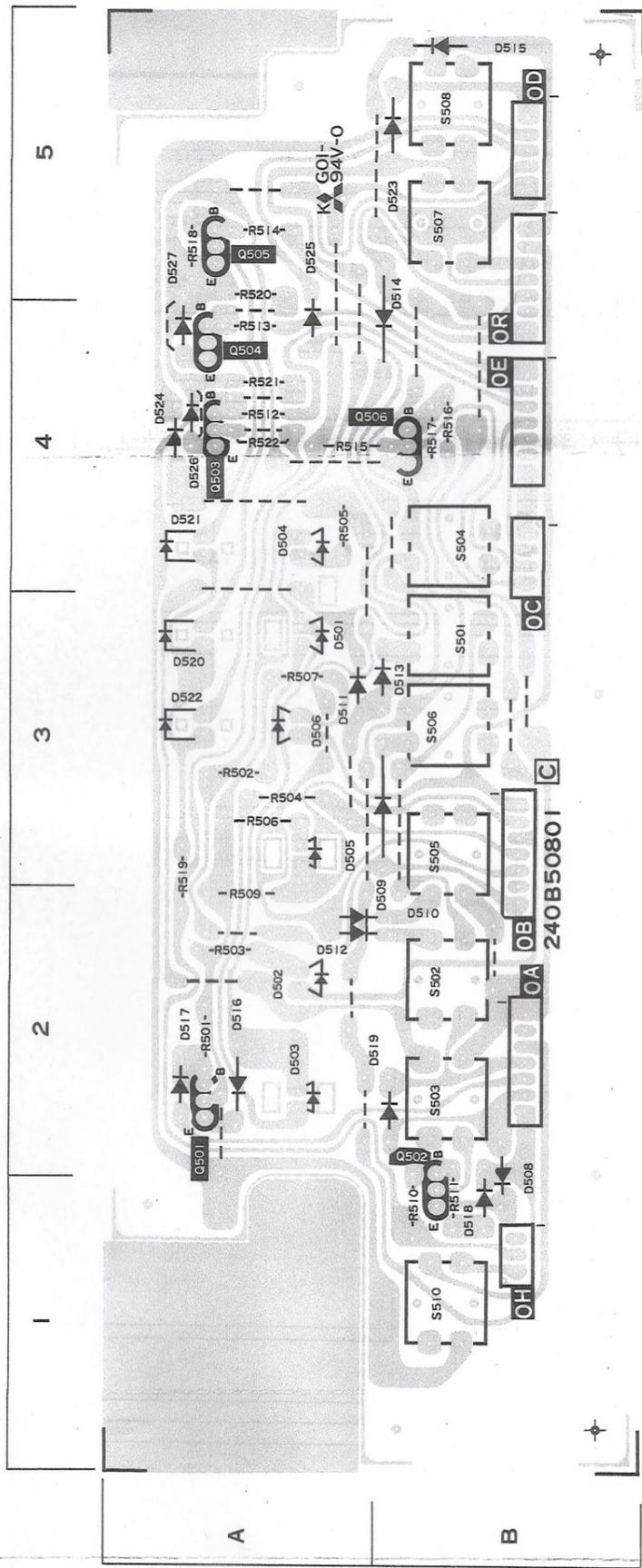
SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS
TP-11	B-1	TP-1A	B-1	TP-1P	B-2
TP-12	C-2	TP-1E	C-2	TP-1Y	C-1
TP-14	C-1	TP-1F	B-2	TP-9A	C-4
TP-16	B-1	TP-1G	B-2	TP-9C	B-4
TP-18	C-2	TP-1H	B-3	TP-9D	B-5
TP-21	C-3	TP-1L	B-2	TP-9E	C-4
TP-0B	B-2	TP-1M	C-5	TP-9H	B-4



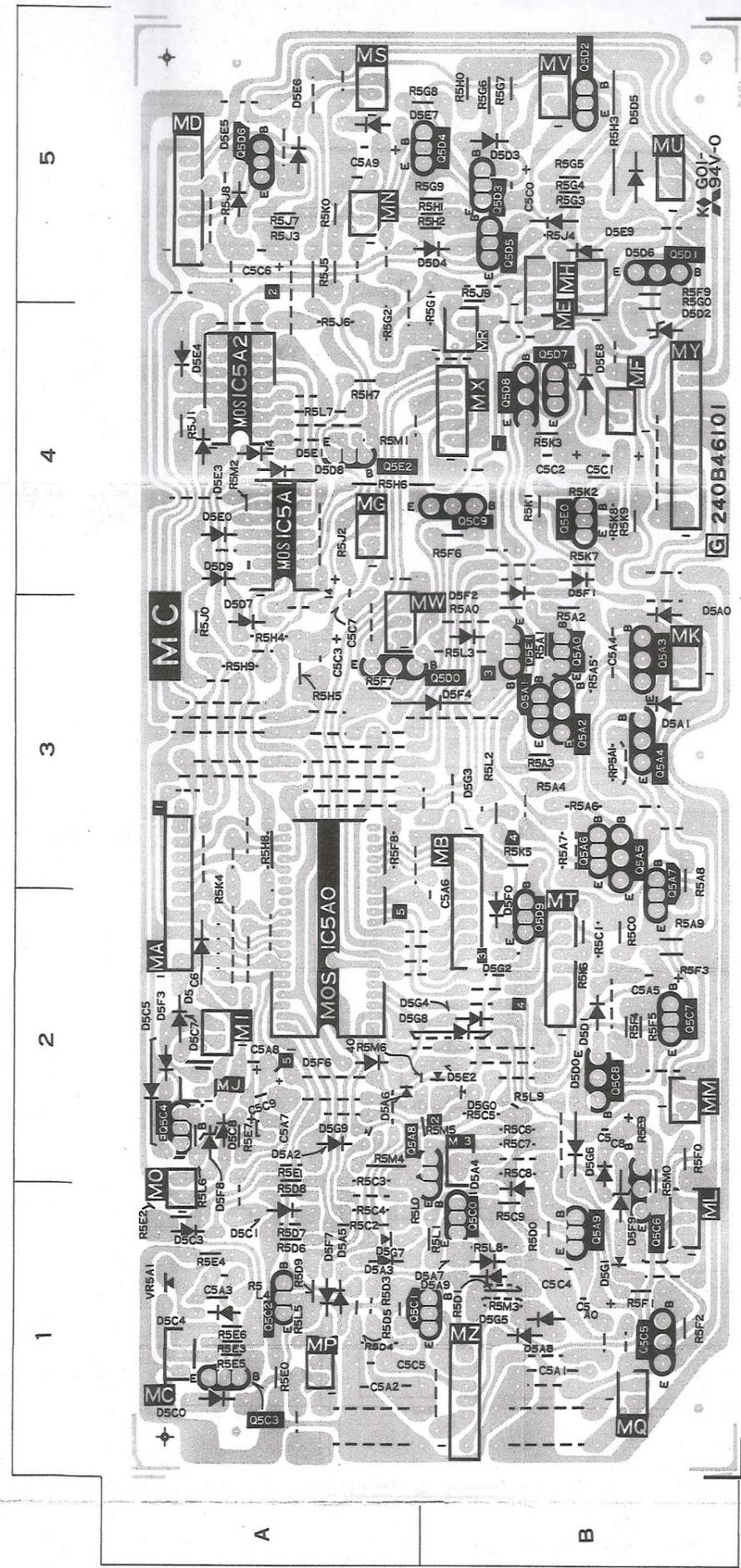
SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS
TP-4B	C-2	TP-4R	B-2	IC402	B-3	Q3F3	B-5
TP-4C	C-2	TP-4S	A-2	IC403	B-1	Q3F4	B-5
TP-4D	D-1	TP-4T	B-2	IC404	D-3	Q3F5	C-5
TP-4E	C-2	TP-4U	A-2	IC405	C-1	Q401	C-2
TP-4F	C-1	TP-4V	A-1	IC406	A-2	Q402	C-2
TP-4G	C-3	TP-4W	A-2	IC407	A-4	Q403	C-2
TP-4H	C-3			IC408	A-5	Q404	C-2
TP-4J	C-1	IC3F0	C-4	IC409	D-2	Q405	D-2
TP-4M	A-4	IC3F1	C-5	IC410	C-2	Q406	D-2
TP-4N	A-4	IC401	D-1			Q407	D-3

SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS
Q408	B-3	Q418	A-2	Q428	A-2	Q438	D-3
Q409	B-3	Q419	A-2	Q429	A-2	Q439	B-3
Q410	B-3	Q420	A-2	Q430	B-2	Q441	D-3
Q411	A-3	Q421	B-2	Q431	B-2	Q442	D-3
Q412	A-3	Q422	B-2	Q432	B-2	Q443	D-3
Q413	B-4	Q423	B-2	Q433	B-2	Q444	D-4
Q414	B-4	Q424	B-2	Q434	A-3	Q446	A-5
Q415	A-4	Q425	A-3	Q435	B-3	Q447	B-5
Q416	A-3	Q426	A-3	Q436	B-3	Q448	A-5
Q417	B-1	Q427	A-3	Q437	C-3	Q449	B-4

SYMBOL NO.	ADDRESS
Q450	C-3
Q451	D-2
Q452	D-3
Q453	D-3
Q454	D-3
Q455	D-3

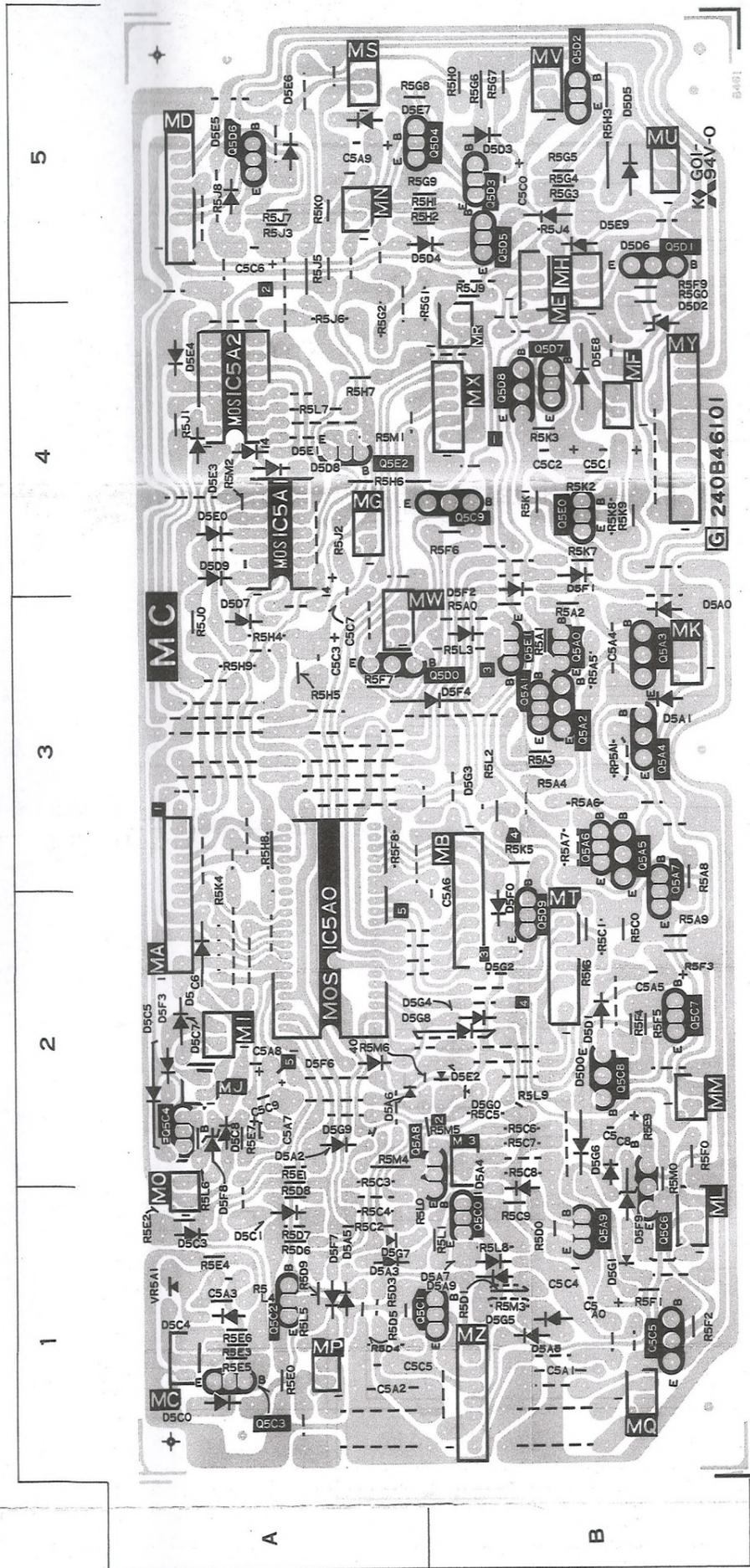


PCB-OPE



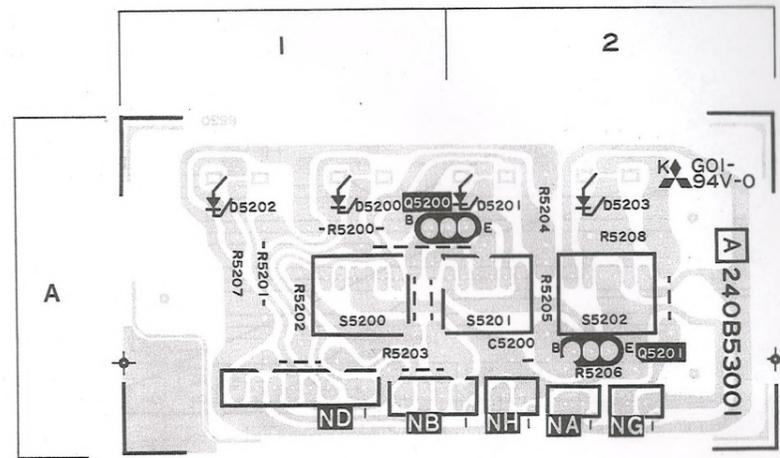
PCB-MC

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IC5A0	A-2	Q5A3	B-3	Q5C0	B-1	Q5D4	B-2	Q5E1	A-5	Q5E1	B-3
IC5A1	A-4	Q5A4	B-3	Q5C1	B-1	Q5D5	B-2	Q5E2	D-5	Q5E2	A-4
IC5A2	A-4	Q5A5	B-3	Q5C2	A-1	Q5D6	B-4		A-5		
		Q5A6	B-3	Q5C3	A-1	Q5D7	A-3		B-4		
Q5A0	B-3	Q5A7	B-3	Q5C4	A-2	Q5D8	D-5		B-4		
Q5A1	B-3	Q5A8	B-2	Q5C5	B-1	Q5D9	D-5		B-2		
Q5A2	B-3	Q5A9	B-1	Q5C6	B-1	Q5E0	D-5		B-4		



PCB-MC

SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS	SYMBOL NO.	ADDRESS
IC5A0	A-2	Q5A3	B-3	Q5C0	B-1	Q5C7	B-2	Q5D4	A-5	Q5E1	B-3
IC5A1	A-4	Q5A4	B-3	Q5C1	B-1	Q5C8	B-2	Q5D5	D-5	Q5E2	A-4
IC5A2	A-4	Q5A5	B-3	Q5C2	A-1	Q5C9	B-4	Q5D6	A-5		
Q5A0	B-3	Q5A6	B-3	Q5C3	A-1	Q5D0	A-3	Q5D7	B-4		
Q5A1	B-3	Q5A7	B-3	Q5C4	A-2	Q5D1	D-5	Q5D8	B-4		
Q5A2	B-3	Q5A8	B-2	Q5C5	B-1	Q5D2	D-5	Q5D9	B-2		
		Q5A9	B-1	Q5C6	B-1	Q5D3	D-5	Q5E0	B-4		



PCB-CONT

