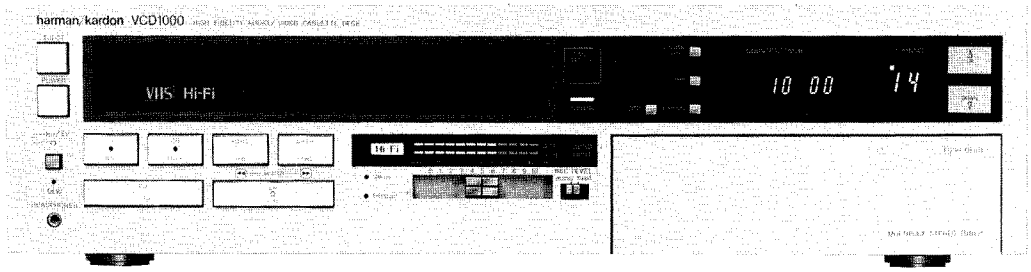
The Harman Kardon
Model VCD1000

Manual 81A

HIGH FIDELITY AUDIO/VIDEO CASSETTE DECK

Technical Manual



VCD1000

CONTENTS

VHS

THIS VIDEO CASSETTE DECK IS BASED ON THE VHS FORMAT. ONLY VIDEO CASSETTE TAPES WITH THE VHS MARK MAY BE USED WITH THIS MODEL.

harman/kardon
240 Crossways Park West, Woodbury. N.Y. 11797
T112-H15281A5 P-088410 1000 Printed in Japan.

SPECIFICATIONS

Video Section	
Television System	: EIA standard 525 lines, 60 fields NTSC-type color signal
Recording System	: 2 rotary heads, azimuth helical scanning system
Luminance Signal	: Frequency modulation recording
Color Signal	: Low frequency conversion, sub-carrier phase shift recording
Input	: 0.5 to 2.0Vp-p, 75 Ohm unbalanced RCA type jack
Output	: 1.0Vp-p, 75 Ohm unbalanced RCA type jack
Horizontal Resolution	: Approx. 250 lines
Signal-to-Noise Ratio	: Better than 43dB
Audio Section	
Track	: 1 track (Normal) 2 channels (Hi-Fi)
Frequency Response	: 70Hz—10kHz (normal in the SP mode) 20Hz—20kHz ±3dB (Hi-Fi)
Dynamic Range	: Better than 80dB (Hi-Fi)
Wow and Flutter	: 0.005% WRMS (Hi-Fi)
Input Sensitivity/ Impedance	: 50mV/30k Ohm unbalanced RCA type jack
Output Level/ Impedance	: 316mV/1k Ohm unbalanced RCA type jack
TV Tuner	: VHF input, Ch. 2—13: 75 Ohm unbalanced, F-type connector UHF input, Ch. 14—83: 300 Ohm balanced CATV A—W
RF Channel Output	: Channel 3 or 4, switchable
Tape Format	: VHS tape
Tape Speed	: SP...1-5/16″/sec. (33.35mm/sec.) LP...21/32″/sec. (16.68mm/sec.) EP...7/16″/sec. (11.12mm/sec.)
Record / Playback Time	: 160 min. with T-160 cassette (SP mode) 60 min. with T-60 cassette (SP mode) (Time is doubled in the LP mode and tripled in the EP mode.)
Fast Forward / Rewind Time	: Approx. 6 min. with T-160 cassette
Timer	: 4 programs for any channels in a 14 day period. Also, same time-everyday capability 24-hour digital type
Timer Accuracy	: Crystal oscillation
Tape Speed Switch (SP/LP/EP)	: Play back...Automatic Recording...Manual
Channel Selection	: Voltage synthesizer selector Set...16 position UP/DOWN Remote control unit...16 positions direct access
Operating Temperature	: 41°F to 104°F (5°C to 40°C)
Operating Humidity	: 35% to 80%
Dimensions (W x H x D)	: 17-1/2″×4-5/8″×15-3/8″ (443 × 118 × 390 mm)
Weight	: 22lbs. (10kg)
Power supply	: AC 120V, 60Hz
Power Consumption	: 45W

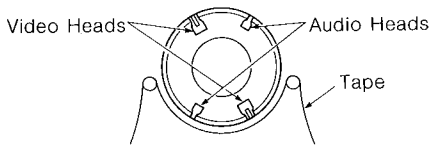
Specifications and components subject to change without notice. Overall performance will be maintained or improved.

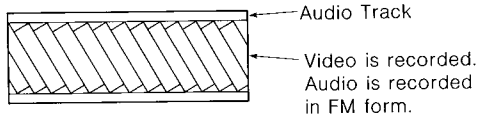
VHS HI-FI SYSTEM

In former video cassette recorders, the audio was recorded on an exclusive audio track on the tape. But since the tape speed was very slow, the frequency response, wow and flutter, and other characteristics were not very good and high fidelity recording and playback become very difficult.

In the newly developed VHS Hi-Fi system, the two channels of stereo audio are independent and are frequency modulated at a high frequency. Then they are recorded on the portion of the tape where the former video signal was recorded.

This rotating system has two exclusive audio heads added to it. There have been also other technological improvements made to protect the video signal from interference caused by the audio signal.





Employment of this VHS HI-FI System has made it possible to obtain the following improvements in characteristics over the former system:

Stereo recording – Standard 2-channel recording
Wide dynamic range – Over 80dB
Low wow and flutter – Below 0.005%

Furthermore, since monaural recording and playback is possible, the same as in the former system, compatibility with former video cassette recorders has been maintained.

With this deck, the SAP channel of an MCS broadcast can be recorded on the existing audio track. Recording this at the same time as the two hi-fi channels makes it possible to record three independent audio channels.

MCS STEREO TV BROADCAST SYSTEM

MCS (Multi–Channel Sound) Stereo TV Broadcasts and the VCD1000

With the MCS stereo TV broadcast system which is now becoming popular, hi–fi stereo audio and mono second-language programming can be broadcast simultaneously. In some cases broadcast stations only transmit stereo broadcasts, and sometimes second language programming (also called SAP or separate audio programming) is transmitted at the same time. An MCS stereo TV broadcast decorder is built into this deck and both types of programming transmission can be simultaneously received and recorded.

When the received broadcast is a stereo broadcast, the STEREO indicator will light up. In the case of second language programming, the BILINGUAL indicator will light up.

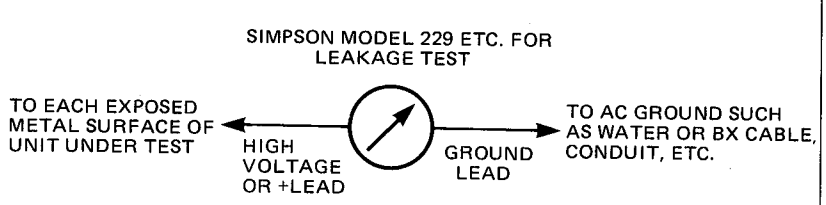
When the BILINGUAL indicator is lit, setting the NORMAL AUDIO switch to the "BIL." position will record the sub-channel audio in monaural on the normal audio track, while setting this switch to "L+R" will record the main audio channels in monaural on the normal track. Furthermore, when the NORMAL AUDIO switch is in the "BIL." position, if there is no second language programming on the received broadcast, the main channel signal will be automatically recorded on the normal track.

On the hi–fi tracks, when the main audio channels are a stereo broadcast, they will always be recorded in stereo. When it is a monaural broadcast, it will be recorded in monaural.

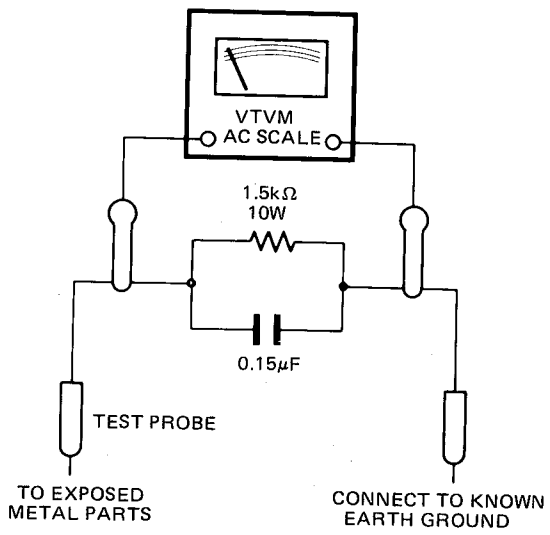
LEAKAGE TEST

Before returning the unit to the user, perform the following safety checks:

1. Inspect all lead dress to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the unit.
2. Be sure that any protective devices such as nonmetallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacity networks, mechanical insulators, etc. which were removed for servicing are properly reinstalled.



3. Be sure that no shock hazard exists; check for leakage current using Simpson Model 229 Leakage Tester, standard equipment item No. 21641, RCA Model WT540A or use alternate method as follows:
   Plug the power cord directly into a 120-volt AC receptacle (do not use an Isolation Transformer for this test). Using two clip leads, connect a 1500 Ohm, 10-watt resistor paralleled by a 0.15μF capacitor, in series with all exposed metal cabinet parts and a known earth ground, such as a water pipe or conduit. Use a VTVM or VOM with 1000 Ohms per volt, or higher, sensitivity to measure the AC voltage drop across the resistor. (See Diagram.) Move the resistor connection to each exposed metal part having a return path to the chassis (antenna, metal, cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor. (This test should be performed with the power switch in both the On and Off positions.)



A reading of 0.35 volt RMS or more is excessive and indicates a potential shock hazard which must be corrected before returning the unit to the owner.

CIRCUIT DESCRIPTION

The VCD1000 is a VHS system video cassette deck which can receive both stereo and bilingual programs. In addition to the contemporary recording system, a rotating head frequency modulation system enables hi-fi recording.
Hi-fi recording is in stereo and it is possible to play back tapes recorded on a non hi-fi deck in monaural.

HI-FI PCB

When recording, this PCB circuit frequency modulates the audio signal, which is converted into the write signal of the rotating head for hi-fi use. When playing back, the process is reversed with the demodulation of the signal from the rotating head for hi-fi use. There are two circuits, for L and R ch use, which process the audio signal.

RECORDING MODE

The audio signal that enters from the [HJ] connector passes through the LPF and the signal level is compressed by IC(HA12066) which is used for noise reduction.Then the signal passes through the pre-emphasis circuit, is frequency modulated by IC(HA11789) which is used for frequency modulation and demodulation, and is finally output from the [HS] connector to the rotating head.

PLAYBACK MODE

The FM signal from the rotating head which was input from the [HS] connector has its video signal component removed by the filtering action of IC(AN6320N). It is then demodulated by frequency modulator/demodulator IC(HA11789) and passes through the de-emphasis circuit. The signal level which was compressed by noise-reducing IC(HA12066) is extended to the original condition and is output as an audio signal from the [HC] connector.
The frequency modulated carrier frequency for hi-fi use is 1.3 MHz at the L ch, 1.7 MHz at the R ch, and the FM deviation frequency is ± 50 KHz.

VIDEO-Y/C and AUDIO PCB

This PCB contains the circuits for video signal recording and playback as well as normal audio track recording and playback and is calibrated by the input changeover and audio output changeover switching circuits.

S3A1 INPUT SELECTOR

EXT AUDIO: When the video signal is input from the built-in tuner and the audio signal is input from external audio equipment.
TUNER: When the built-in tuner is used for both the video and audio signals.
EXT: When both the video and audio signals are input from external equipment.

S3A2 AUDIO MONITOR SWITCH

STEREO: L and R ch output the hi-fi audio signal.
L/main: Only the L ch hi-fi audio signal is output.
R/sub: Only the R ch hi-fi audio signal is output.
NORMAL: Normal audio signal is output.

VIDEO RECORDING AND PLAYBACK CIRCUIT

IC2A0: M51450G.... Y signal (brightness signal), C signal (color signal), and SYNC signal separation and synthesis.
IC2A1: M51451G.... Y signal modulation/demodulation.
IC6A0: M51452G.... C signal modulation/demodulation.

RECORDING

The video signal is separated into Y, C, and SYNC signals by IC(M51450G). The Y signal is sent to M51451G, the C signal to M51452G, and the SYNC signal to the control PCB. The Y and C signals are modulated and sent to the rotating video head. The SYNC signal is used at the control PCB for control of the drum motor and other components.

PLAYBACK

The signal from the rotating video head is amplified by M51451G, the Y and C signals are separated by the filter, and after being sent to the respective ICs and demodulated, they are combined by M51450G and become a composite video signal.

AUDIO CIRCUIT

The recording and playback circuits go to the normal audio track and writing and reading go to the audio head by IC3A0 (LA7042).
Oscillation unit OSC3A0 is the oscillator for the bias of each erase head and the normal audio track.
IC3A4(TC4053) and IC3A2(TK15050) are analog switching ICs for audio changeover use.
IC3A1(LA4170) is the headphone amplifier and the two circuits for L and R ch are built in.

MCS PCB

The audio signal input from the [SS] connector is band divided by LPF3Z3 and BPF3Z1. The low region is connected to the stereo separation circuit and the medium region is connected to the sub-audio circuit.

STEREO SEPARATION CIRCUIT

The signal that passes through LPF3Z3 goes to stereo decoder IC3001(LA3350B) and LPF3Z1. The stereo decoder IC detects the stereo sub-carrier and converts it into an L−R difference signal. The compressed difference signal is extended to its original condition at broadcast time by noise-reduction IC IC3004(AN6291).
The audio signal which has passed throught LPF3Z1 is separated into left and right stereo signals by the Q3021, Q3022 matrix circuit.The separated signals pass through output amplifiers Q3023, Q3024, Q3025, and Q3026 and are output by the [SQ] connector.

LSUB-AUDIO CIRCUIT

The signal that passes through BPF3Z1 is detected by T3001, D3001, and D3002 after passing through limiter IC3002(TA7061). The signal that passes through LPF3Z4 is extended by noise-reduction IC (IC3004 : AN6291), goes through buffer amplifier Q3030/Q3031, and is output to the [SQ] connector.
The signal that passes through BPF3Z1 is checked for the presence or absence of an SAP signal by SAP signal detector IC3003(TA7133P) and is output from the [SP] connector.

POWER PCB

The AC power supply uses power transformer T971 to step down the voltage which is supplied to the PCBs via the [PD] and [PK] connectors.
15V AC and 30V AC are supplied to the [PD] connector, while 3V AC is supplied to the [PK] connector.
The [PB] connector ouputs 25V AC as is and the power is supplied to dew-preventing posistor PR970.

The AC power from the [PO] connector is changed to DC by the rectifier diodes D904, D907, and D909 and goes to IC904 (BX6087). This IC has built-in −26V, −18V, and 30V stabilizing circuits as well as a power switching circuit.

The output of power switching circuit IC904 becomes a stabilized 12 volts at each of the following: SW12V from transistor Q971 connected to the [PQ] connector, TU12V-1 from transistor Q972 connected to the [PN] connector, and TU12V-2 from transistor Q973 connected to the [PP] connector. In addition, the output of TU12V-1 becomes a stabilized 9 volts and 5 volts at the following: SW9V by IC973 connected to the [PH] connector, and SW5V by IC901 from SW9V.

Unstabilized power from D909 is supplied to the [PJ] connector and connected IC972 provides a stabilized 9 volts as STBY9V.

ON-OFF control of each of the following power supplies is possible by the IC904 power switching circuit: SW12V, TU12V-1, TU12V-2, SW9V, and SW5V. ON-OFF control is by the T-PWV and PWV signals of the [PF] connector through the power supply protection circuit made up of transistor Q906. The AC outlet connected to the [PL] connector is switched ON and OFF by transistor Q901 and relay K901 and control is by the REC-P signal of the [PA] connector.

The transistor Q907 circuit provides the standard voltage for each of the 12 volt power supplies (SW12V, TU12V-1, and TU12V-2).

The [PA] connector supplies power (3V AC, STBY 9V, −18V, −26V, and +30V) to the TIMER PCB and is connected to the [CA] connector of the TIMER PCB.

The [PC] connector supplies power (TU12V-1, +30V, and −26V) to the TUNER PCB and is connected to the [TC] connector of the TUNER PCB.

The [PF] connector supplies power (SW9V, SW12V, SW5V, and STBY5V) to the CONTROL PCB and is connected to the [MF] connector of the CONTROL PCB.

The [PG] connector supplies power (SW9V) to the HI-FI PCB and is connected to the [HG] connector of the HI-FI PCB.

The [PS] connector supplies power (TU12V-2) to the MCS PCB and is connected to the [SR] connector of the MCS PCB.

CONTROL PCB

This PCB handles the capstan motor, servo of the drum moter, control, loading motor, drive of the plunger, and recording and playback control of each PCB.

The one-chip microcomputer IC5A0(M58102-603SP) is the heart of the control PCB and functions as the logic control for such actions as recording, playback, fast forward, and rewind.

The dew sensor is connected to the [MH] connector and the rotation detector for the rewind reel is connected to the [MN] connector. The resistance of the dew sensor changes (increases) with the occurrence of dew and causes the DEW indicator to light up and the mechanism to stop.The rotation detector for the rewind reel uses a photointerruptor. A blade is attached to the reel between the LED and transistor. This interrupts the light and is detected to indicate rotation. When the light ceases to be interrupted, the reel is judged to be stopped and the mechanism will be stopped (to maintain the tape and mechanism). IC5A2(TC4030B) performs the above detection and the detected signal is sent to the microcomputer IC.

The Q5C0 and Q5C1 transistor circuit is a power-reset circuit and when the power is put on there is a system reset of the microcomputer IC.

The Q5A0/Q5A2 and Q5A1/Q5A3 transistor circuits provide PB9V and REC9V, respectively.

IC5A3 (M54534L)is used for loading motor drive.

IC5A4 (STK-6962) is used for capstan motor drive.

SERVO CIRCUITS

The signal from the control head is amplified and processed by IC4A0(AN6364) and sent to IC4A1(MN6168MBC).

The capstan motor FG signal is amplified by IC4A3(BA728) and sent to IC4A2(AN6359N) where it is processed and then sent to IC4A1.

The drum motor FG signal is amplified by IC4A2 and sent to IC4A1.

IC4A1(MN6168MBC) compares each of the FG and control signals with the standard clock which is made to oscillate by a crystal, and performs operations. The drum drive signal is output from the no. ㉗ and no. ㉘ pins, amplified by transistors Q4B0 and Q4B1 and sent to the drum PCB from the [MA] connector.

The capstan drive signal comes from the no. ② and no. ③ pins, passes through IC4A2, and is sent to capstan drive IC5A4(STK-6962).

TIMER PCB

This PCB uses the one-chip C-MOS microcomputer IC (μPD7519G).

IC8A0(μPD7519G) is a one-chip microcomputer IC used in the following: Clock, 2-week 4-program timer function, channel control of the tuner, and display. The clock uses a quarts system with a 4.19 MHz crystal.

IC701(M58653) is a nonvolatile memory IC which will not lose its contents even if the power is cut and holds the channel data of the tuner. Microcomputer IC8A0(μPD7519G) controls memory calls and writing.

THe time, timer, and channel indications are by the fluorescent display tube 11-MT-09Z.

TUNER PCB

The Tuner PCB is made up of two packs, the tuner front end pack and the IF pack.

The front end pack is an electronic tuning system and reception of VHF, UHF, and CATV is possible.

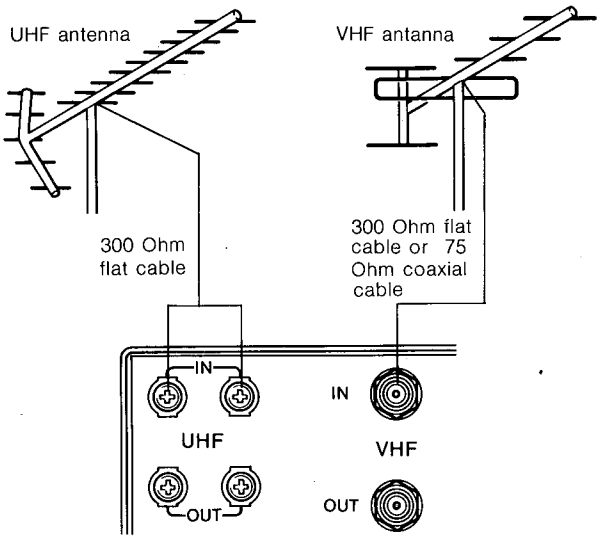
The IF pack is a system that separates the IF used for the video and the IF used for the audio. If reduces the buzz sound from the video signal of the audio and improves the sound quality.

The video IF is made up of IC1(BN5115) and the audio IF is made up of AN5130 and μPC1391H, each IC having an SAW filter.

CONNECTIONS

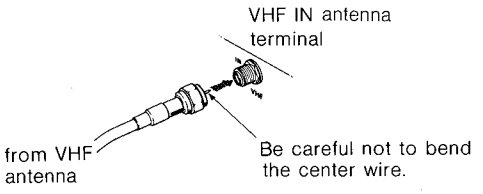
Antenna Connections

In the case of using independent antenna leads for VHF and UHF.



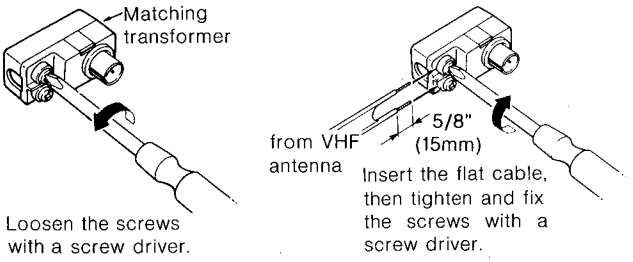
VHF antenna connections

When using 75 Ohm coaxial cable



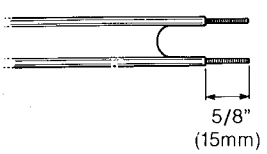
Turn the VHF antenna wire's outer connector in a clockwise direction and thread it onto the VHF IN antenna terminal on the rear panel of the VCD1000.

When using 300 Ohm flat cable



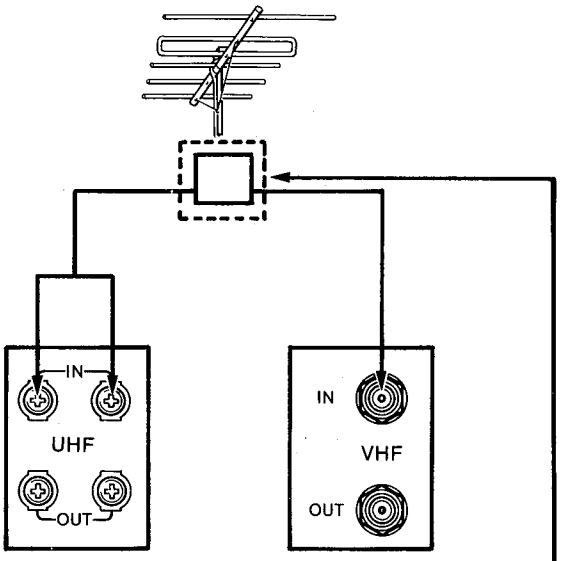
Connect the VHF antenna lead to the matching transformer as in the diagram and connect the matching transformer to the VHF IN antenna terminal on the rear panel.

UHF antenna connections



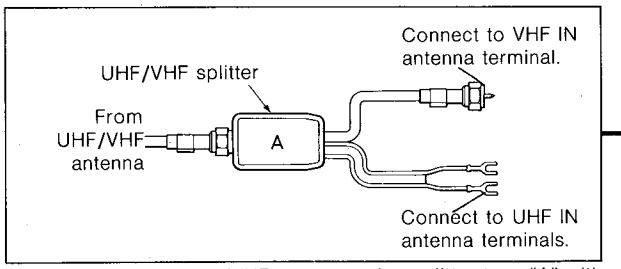
Remove the insulation from the UHF antenna leads as in the diagram and connect them to the UHF IN antenna terminals.

When using one antenna lead for both VHF and UHF

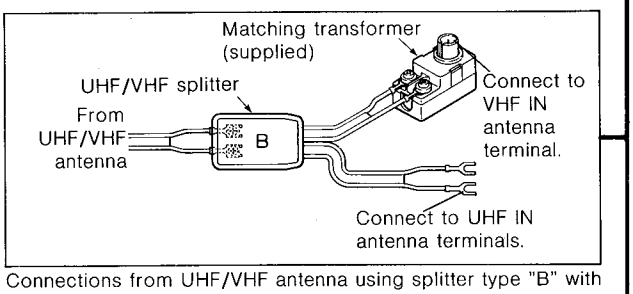


In a single antenna is used for both VHF and UHF, a UHF/VHF splitter* must be used. (*Not supplied with this unit.)

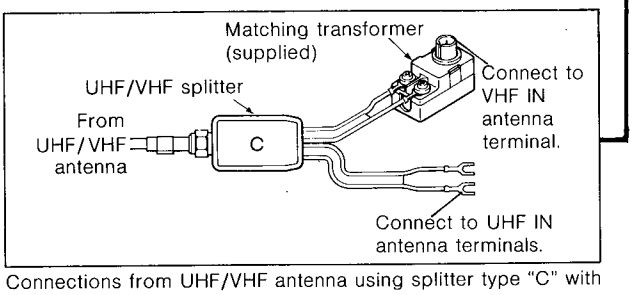
Connect as shown in illustration for the appropriate splitter type.



Connections from UHF/VHF antenna using splitter type "A" with 75 Ohm cable input, 75 Ohm VHF cable output, 300 Ohm UHF cable outputs.



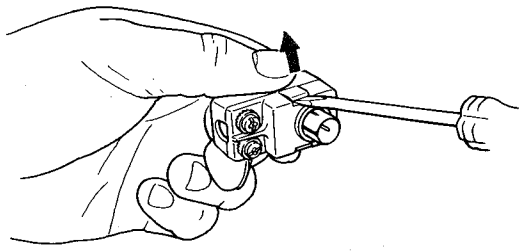
Connections from UHF/VHF antenna using splitter type "B" with 300 Ohm cable input, 300 Ohm cable outputs.



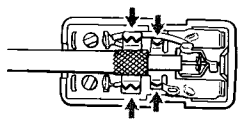
Connections from UHF/VHF antenna using splitter type "C" with 75 Ohm cable input, 300 Ohm cable outputs.

Matching transformer and 75 Ohm antenna lead connection

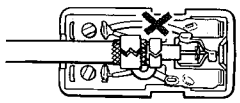
1. Remove the cover with a flat-bladed screw driver.



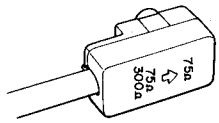
2. Insert the antenna lead, bend the fixed metal fittings with pliers or the like in the direction of the arrow and fix the antenna lead.



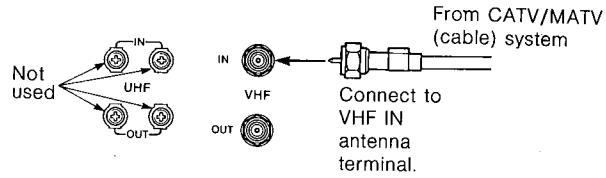
3. Cut the lead wire.



4. Put on the cover.

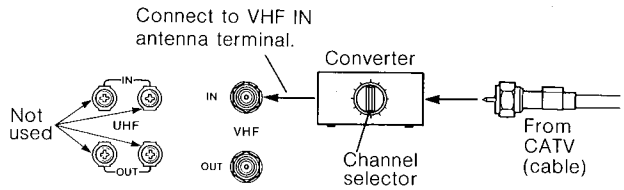


When directly connecting to a cable TV (CATV /MATV) system.



NOTE:
The VCD1000 is capable of receiving VHF/UHF channels 2—83, as well as Mid Band and Super Band CATV channels A—W. Some channels may be "scrambled" by the CATV company, requiring the use of a special converter in order to "descramble" these channels. The VCD1000 will receive these channels in their original "scrambled" state. Check with your local CATV company for information concerning the reception of these channels.

When connecting the CATV (cable) through a converter

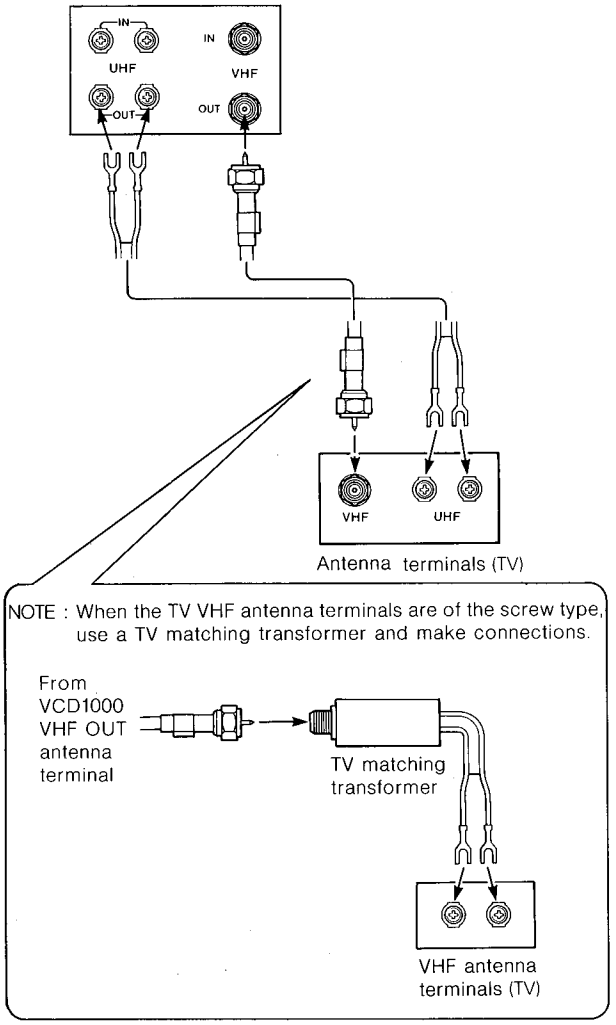


Using the CHANNEL selector on the VCD1000, select the output channel of the converter (usually channel 2, 3 or 4). In order to make "off-the-air" recordings, the VCD1000 must always be set to the converter channel. Select desired channel with converter channel selector.

NOTE:
When the VCD1000 is connected to a converter in this way, the ability to watch one channel while recording another is defeated, since all channels are selected by the converter.

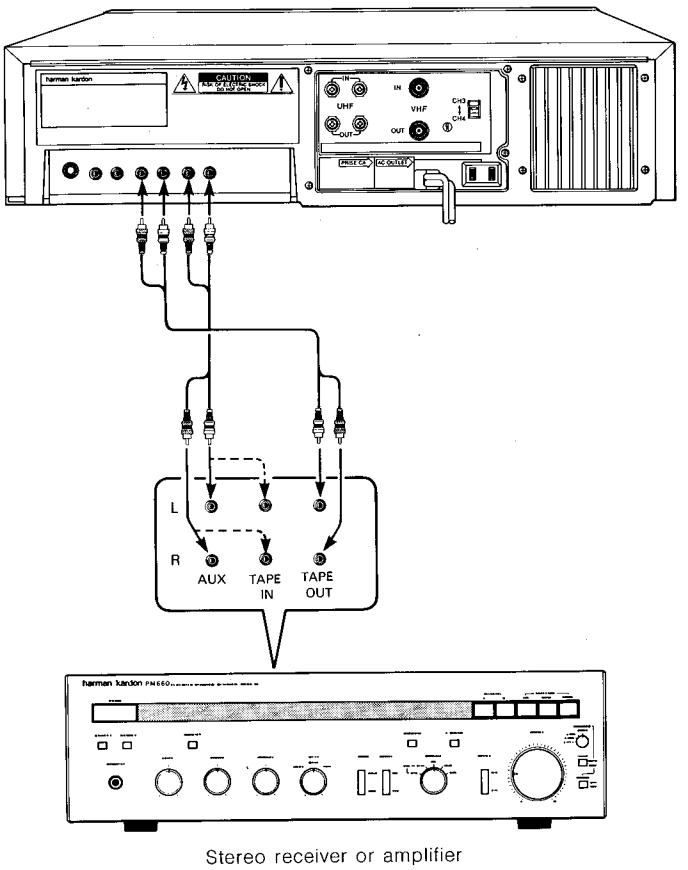
Connections to the TV

Make connections to the TV using the accessory VHF coaxial cable (75 Ohm) and UHF flat cable as in the diagram.

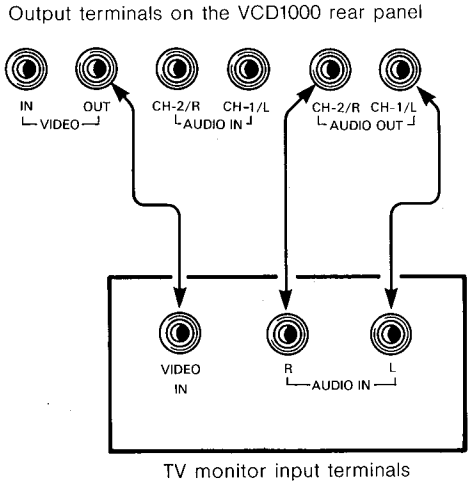


Connections to Audio Equipment

Excellent hi–fi sound can be enjoyed by connecting the VCD1000 AUDIO IN/OUT jacks to the video, AUX, or tape monitor jacks on a stereo receiver or amplifier.



When the TV monitor has VIDEO IN and AUDIO IN (L and R) terminals



DISASSEMBLY PROCEDURES

1. REMOVAL OF CABINET TOP

A. As shown in Figure 1, emove the four screws (Ⓐ, Ⓑ, Ⓒ and Ⓓ), two on each side retaining the cabinet top.

B. Gently expand the bottom edges of the cabinet top pivot cover forward, then slide, toward rear, in the direction of the arrows.

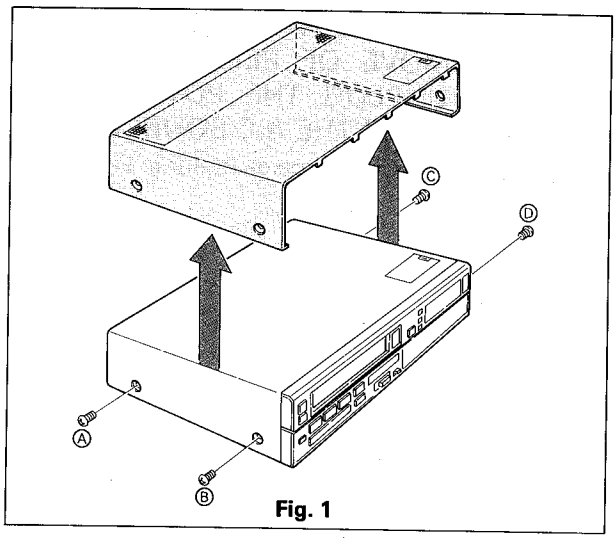


Fig. 1

2. REMOVAL OF CABINET BOTTOM

A. Remove the ten screws (Ⓐ ~ Ⓙ) retaining the cabinet bottom as shown in Fig. 2.

B. Remove the cabinet bottom.

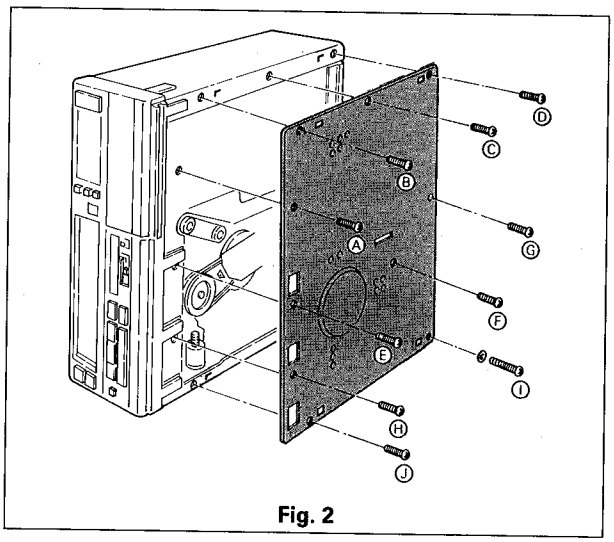


Fig. 2

3. REMOVAL OF FRONT PANEL

A. Unfasten the five retainer (Ⓐ, Ⓑ, Ⓒ, Ⓓ and Ⓔ) as shown in Fig. 3 and remove the front panel in the direction shown by the arrows.

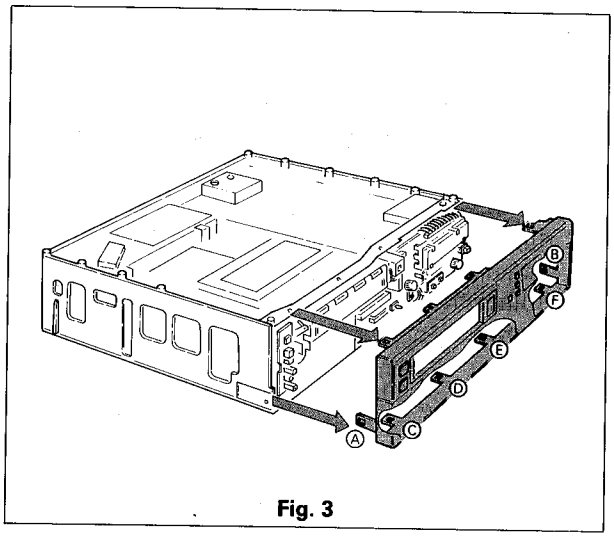


Fig. 3

REMOVAL OF PRINTED CIRCUIT BOARDS (PCBs)

CAUTION: BEFORE ATTEMPTING TO REMOVE OF REPAIR ANY PCB UNPLUG THE POWER CORD FROM THE A.C SOURCE.

Location of Printed Circuit Boards (Refer to Fig. 4)

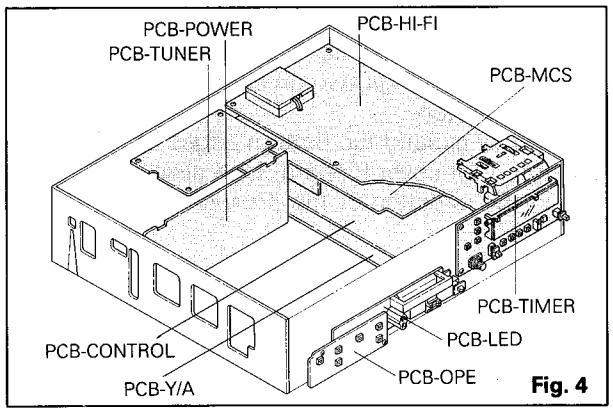


Fig. 4

1. Removal of PCB HI-FI

A. Remove the four screws (Ⓐ Ⓑ Ⓒ and Ⓓ) retaining the PCB-HI-FI as shown in Fig. 5.
B. Remove the circuit board by sliding it in the direction of the arrows.
C. When the PCB is to be serviced, mount it vertically, as shown, in the service position.

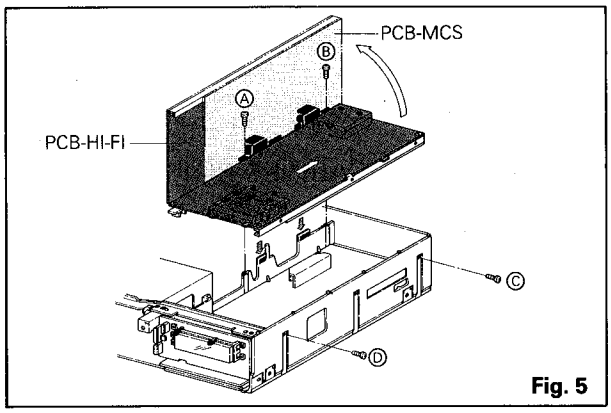


Fig. 5

2. Removal of PCB MCS

A. Mount the HI-FI circuit board vertically, as shown in Fig. 5.
B. Remove the two screws (Ⓐ and Ⓑ) retaining the PCB MCS as shown in Fig. 6.
C. Rotate the circuit board in the direction of the arrow.

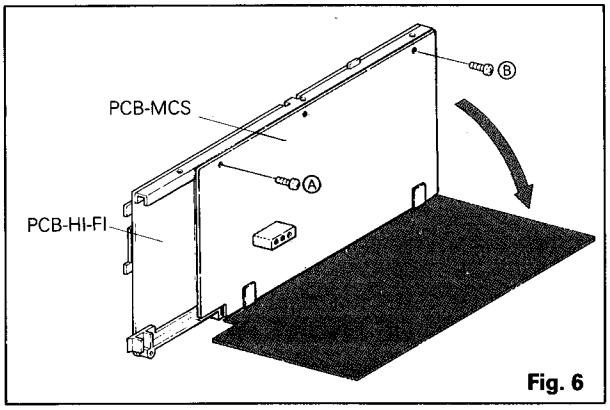


Fig. 6

3. Removal of PCB-Y/A

A. Remove the cabinet bottom.
B. Remove the front panel.
C. Remove the six screws (Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ and Ⓕ) retaining the PCB-Y/A as shown in Fig. 7.
D. Rotate the circuit board in the direction of the arrow.

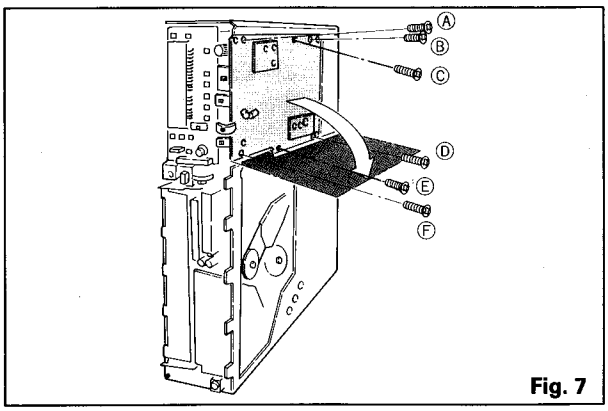


Fig. 7

4. Removal of PCB Control

A. Mount the PCB-HI-FI circuit board vertically.
B. Rotate the Y/A circuit board as described in Step 3, Page 10.
C. The PCB-Control may be serviced at this point. If the PCB-Control circuit board requires complete removal, remove five screws (Ⓐ Ⓑ Ⓒ Ⓓ and Ⓔ) as shown in Fig.8.

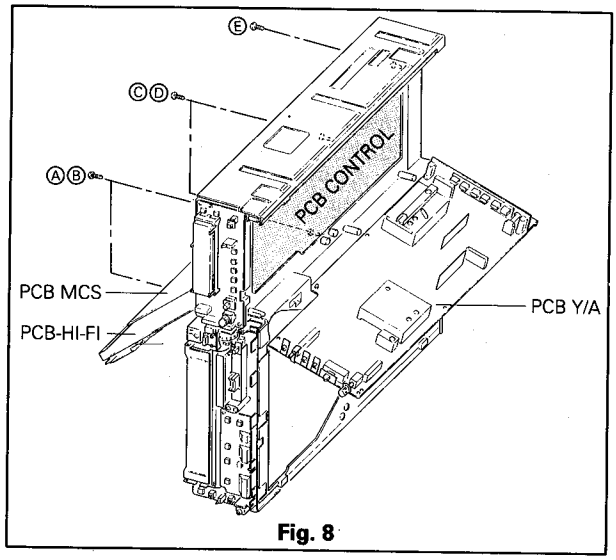


Fig. 8

5. Removal of PCB Timer

A. Remove the four screws (Ⓐ Ⓑ Ⓒ and Ⓓ) retaining the PCB Timer as shown in Fig. 9.

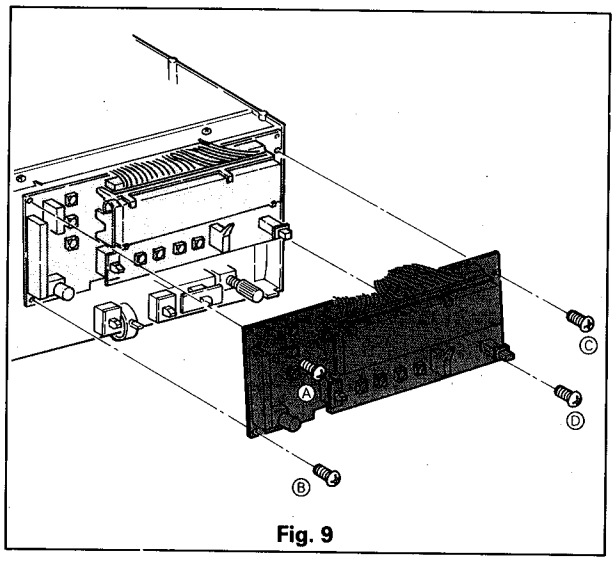


Fig. 9

6. Removal of PCB Ope

A. Remove the two screws (Ⓐ and Ⓑ) retaining the PCB OPE as shown in Fig. 10.

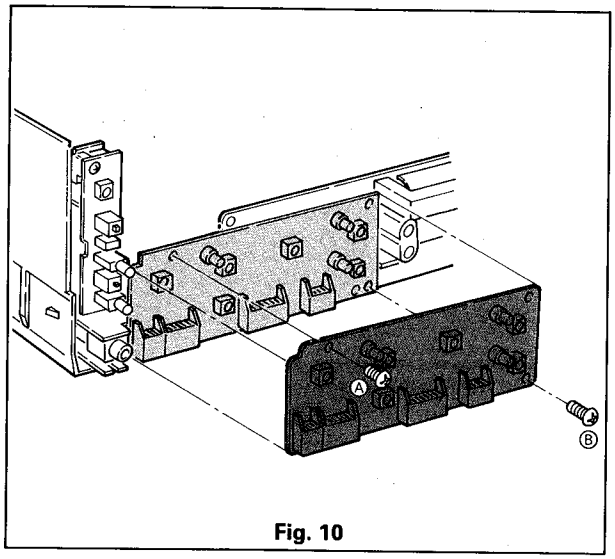


Fig. 10

7. Removal of PCB LED

A. Remove the PCB OPE, as described in Step 6, Page 11.
B. Remove the three screws (Ⓐ Ⓑ and Ⓒ) retaining the PCB LED as shown in Fig. 11.
C. Unlock the PCB SUPPORT Ⓓ shown in Fig. 11 and remove the PCB.

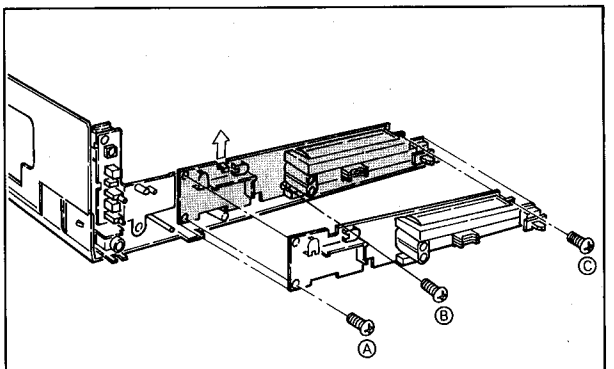


Fig. 11

8. Removal of PCB TUNER

A. Remove the four screws (Ⓐ Ⓑ Ⓒ and Ⓓ) retaining the PCB TUNER as shown in Fig. 12.
B. For ease in servicing, affix the tuner onto the stopper on Antenna terminal board, as shown in Fig. 12.

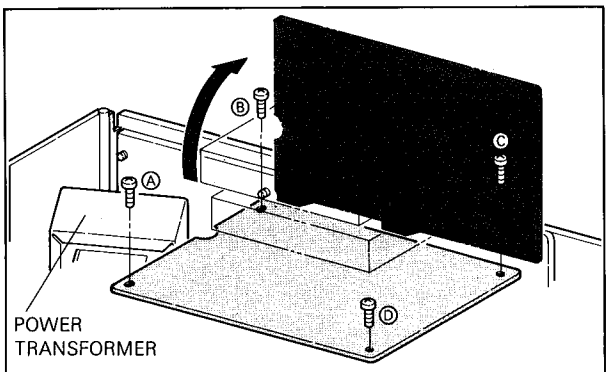


Fig. 12

9. Removal of PCB POWER

A. Remove the PCB TUNER as described in Step 8.
B. Remove the screw Ⓐ retaining the PCB TUNER Holder as shown in Fig. 13-A and remove the PCB TUNER Holder.
C. Remove the Video Head Shield cover.
D. Remove the screw Ⓑ retaining the radiator plate as shown in Fig. 13-B and remove the radiator plate.
E. Remove the power transformer by removing the 4 retaining screws (Ⓒ Ⓓ Ⓔ Ⓕ) on the power transformer and screw Ⓖ retaining the ground lead as shown in Fig. 13-B.
F. Unlock the two PCB supports (Ⓗ Ⓘ) shown in Fig. 13-B and remove the PCB.

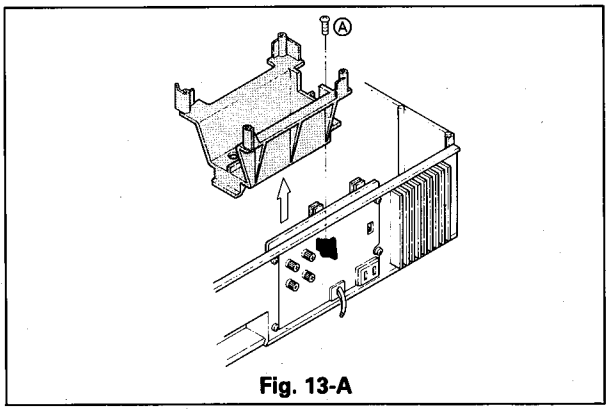


Fig. 13-A

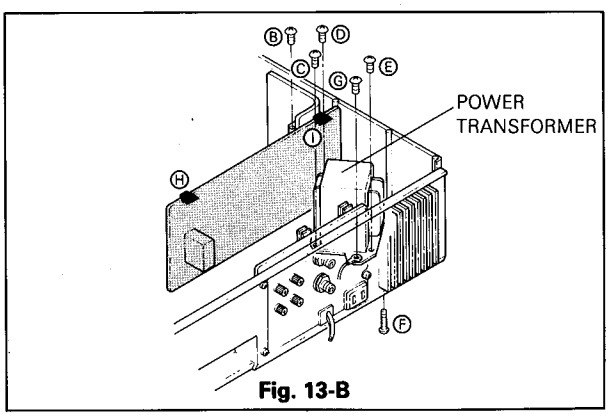


Fig. 13-B

CLEANING

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

1. VIDEO HEAD CLEANING

A. Remove the cabinet top. (Refer to item 1 on Page 9).
B. Remove the Video Head shield cover.
C. Moisten a clean piece of chamois with isopropryl alcohol or a professional head cleaning solution. 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 heads will be damaged.

D. After the heads are cleaned, allow the cleaned portion to dry thoroughly before running a tape, otherwise the tape and head may be damaged.

2. TRANSPORT SYSTEM

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

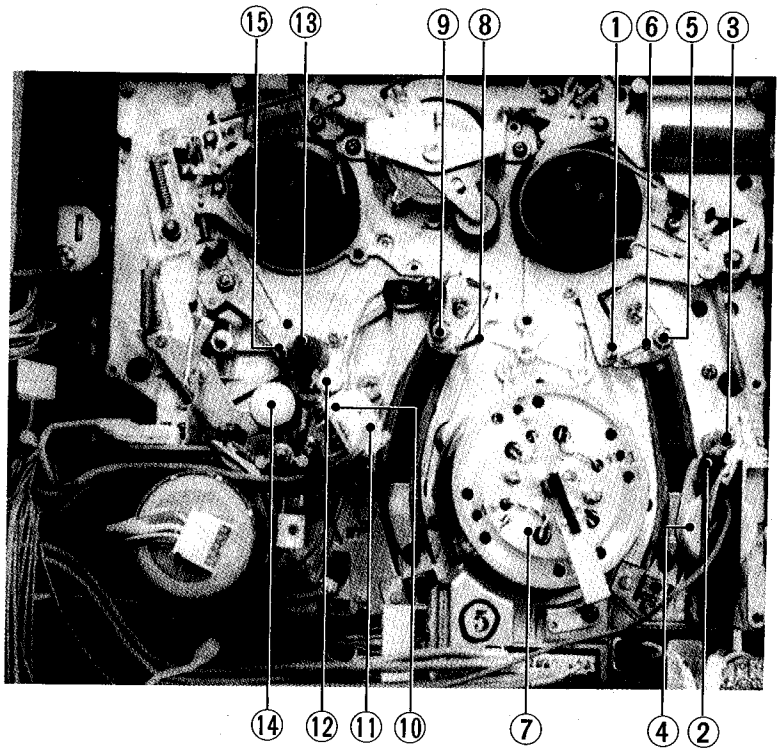
A. The following components of the transport system require occasional cleaning:

① TENSION POST
② FE HEAD
③ SP-GUIDE POST
④ S.IMPEDANCE-ROLLER
⑤ S.GUIDE ROLLER
⑥ S.SLANT POST
⑦ UPPER & LOWER DRUM
⑧ T.U SLANT POST
⑨ TU GUIDE ROLLER
⑩ A.E HEAD
⑪ A/C HEAD
⑫ TU GUIDE POST
⑬ CAPSTAN SHAFT
⑭ PINCH ROLLER
⑮ SHAFT-TU-GUIDE

B. To clean, use a small piece of gauze moistened with alcohol.
C. Use extreme care when cleaning the video heads and Drum assembly to prevent damage. Avoid touching the Drum assembly with your fingers which would deposit skin oil on it. NEVER clean the Drum assembly by moving the cleaning pad vertically.
D. After cleaning transport mechanism, allow it to dry thoroughly before loading a tape. If this is not done damage to the heads or tape may result.

3. REEL DRIVE SYSTEM

A. Reel Disc Brake Surfaces require occasional cleaning using a small piece of gauze moistened with alcohol.



INTERCHANGEABILITY METHODS AND ADJUSTMENTS

1. PICTURE CONTROL ADJUSTMENT

VCD1000 picture quality may be adjusted according to personal preference:
Using a small bladed, insulated screw driver, rotate the picture control located as shown below, to achieve the desired picture quality. Exercise caution when performing this adsustment to prevent control breakage. Do not use adjustment tool with large blade.

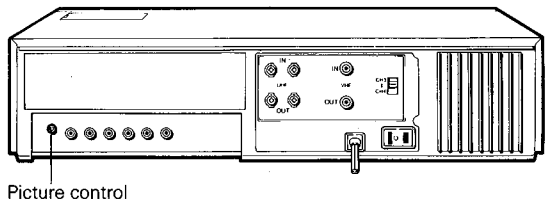


Fig. 1-1

2. REMOVAL OF PRIMARY PARTS

2-1 Replacement of Cassette Housing.

2-1-1 Removal

A. Remove the Cabinet Top, Cabinet Bottom, and Front Panel. (See Page 9).
B. Remove the video Head Shield Cover as shown in Fig. 2-1 (A).
C. Remove the three screws (Ⓐ Ⓑ and Ⓒ) retaining the Stay-Front as shown in Fig. 2-1 (A) and remove the Stay-Front.
D. Remove the Cassette Housing loading belt as shown in Fig. 2-1 (B).
E. Disconnect connectors [DG] [DQ] [DM] and [DF].
F. Removing clampers, etc., take out the leads.
G. Remove the two cassette housing set screws (Ⓐ Ⓑ) shown in Fig. 2-1 (C), then remove the cassette housing by sliding back in the direction of the arrow.

Note:
Use caution when removing cassette housing to prevent breakage to the Record Inhibit Switch.

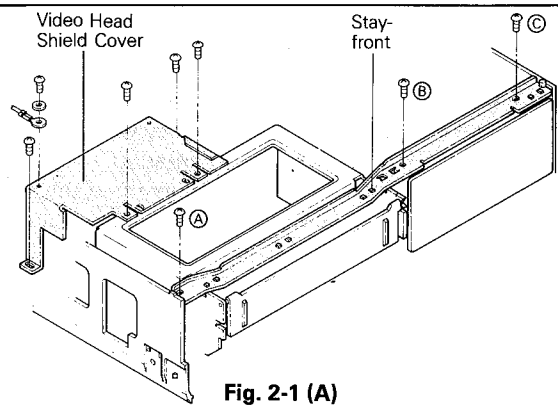


Fig. 2-1 (A)

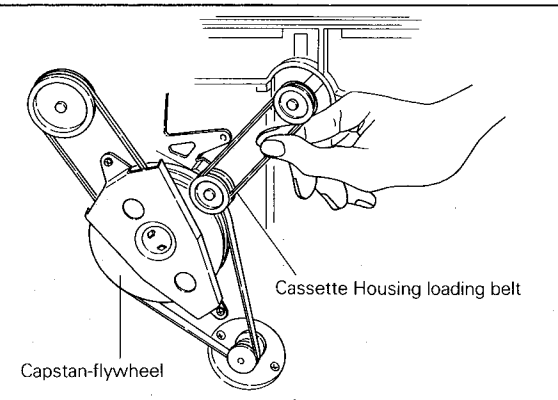


Fig. 2-1(B)

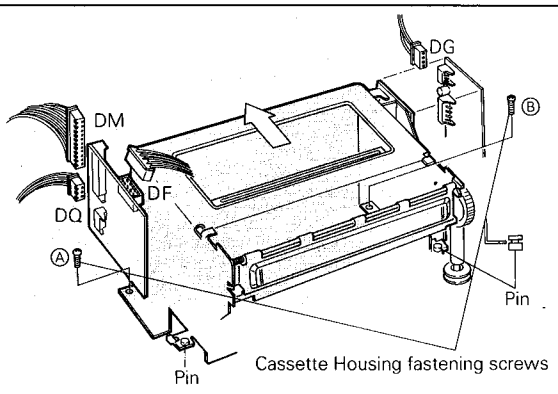


Fig. 2-1(C)

2-1-2 Replacement

To reassemble the cassette housing into the VCR adhere to the following steps. If these steps are not carried out properly, abnormal noise may be produced in the FF and REW modes or the tape may be damaged in playback.

A. Set the positioning U-holes at the right and left front of the cassette housing sides onto the pins at the front side of the main transport plate, then slide the cassette housing inside to the point where the holes for the housing set screws are matched to the screw holes on the main plate.
B. Install the two cassette housing set screws.
C. Reconnect connectors [DG] [DM] [DF] and [DQ].
D. Attach the cassette housing loading belt shown in Fig. 2-1(B).
E. Clamp the lead wires of the FE head and the A/C head.
F. Be sure that the cassette may be loaded and unloaded smoothly without abnormal noise.
G. Be sure that, in the unloaded position, the loading prevention latch attached to the bottom of the cassette housing is fastened to the housing-side strip.
H. If an irregularity is detected in steps (G) and (H) the cassette housing may be incorrectly assembled.
   Loosen the fastening screws, unfasten the cassette housing and readjust, as required.

2-2 Replacement of Drum Motor/Video Head Assembly

2-2-1 Removal of Drum Motor/Video Head Assembly

A. Remove the Video Head Shield cover.
B. Remove the posistor fastening screw as shown in Fig. 2-2 and remove the posistor.
C. Disconnect connectors [DA] and [DB] from Drum assembly.
D. Remove the three drum retaining screws as shown in Fig. 2-3. Holding the upper drum assembly, remove the complete Drum Motor/ Video head assembly by gently pulling in an upward direction.

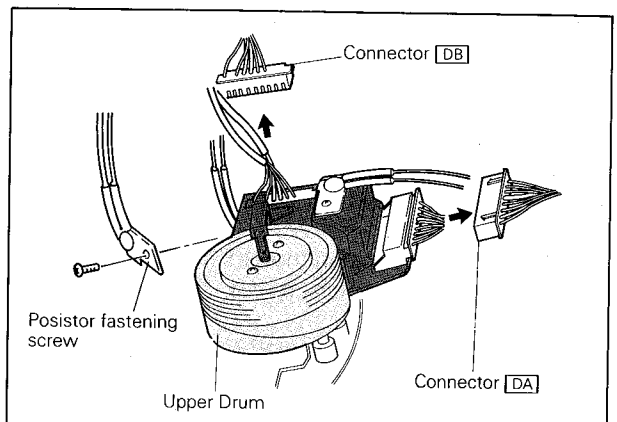


Fig. 2-2

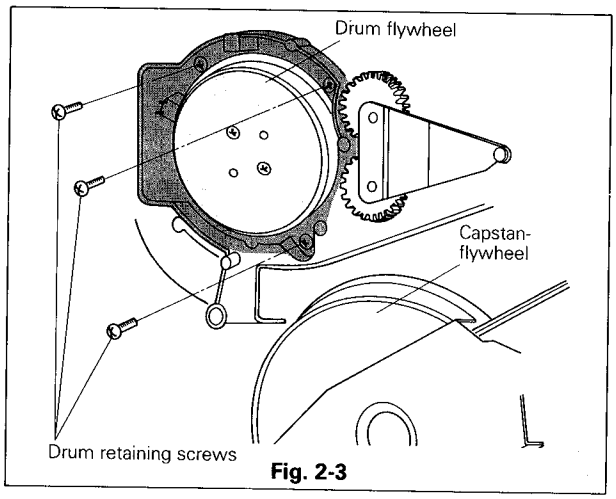


Fig. 2-3

2-2-2 Installation of Drum Motor/Video Head Assembly

During installation, avoid holding the upper drum with bare hands. If this cannot be avoided, a cleaning procedure must be performed as described in "Cleaning" section, on page 13, upon completion of installation.

A. Carefully holding the complete drum assembly (with a piece of cotton cloth), slowly insert the drum assembly into its original drum mounting position.
   Note:
   Do not apply excessive force to the video heads as damage will result.
B. Secure with the three drum retaining screws previously removed, as shown in Fig. 2-3.
C. Reconnect connectors [DA] and [DB].
D. Fasten the posistor mounting screw.
E. When the complete drum assembly has been changed, precise alignment requires checking. Check and adjust playback switching point, tracking preset, color recording level, FM recording level and interchangeability.

2-3 Replacement of Capstan Motor

A. On the underside of the transport deck, remove the Capstan belt.
B. Disconnect connector [DE] and [DK].
C. Remove the shield plate.
D. Remove the three Capstan motor retaining screws as shown in Fig. 2-4 and remove the Capstan motor.
E. Remove the Capstan motor PCB.
F. Attach the Capstan motor PCB to the new Capstan motor.
G. Fasten the Capstan motor assembly with the three Capstan motor retaining screws as shown in Fig. 2-4.
H. Attach the shield plate.
I. Connect connectors [DE] and [DK].
J. Attach the Capstan belt.

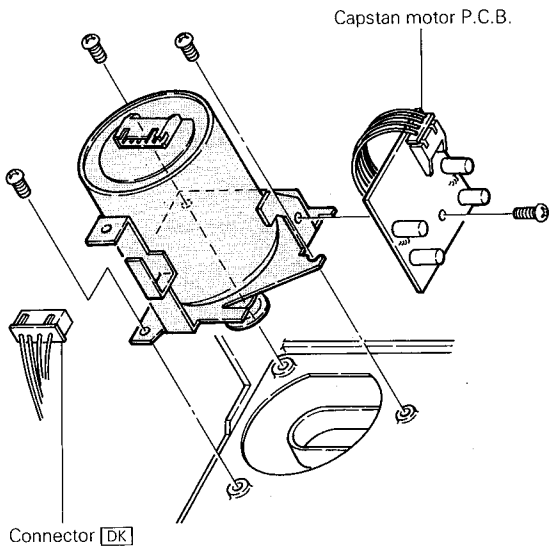


Fig. 2-4

2-4 Replacement of Capstan-Flywheel

A. On the underside of the transport deck, remove the two frame retaining set screws shown in Fig. 2-5.
B. Remove the two belts shown in Fig. 2-5.
C. From the top side of the transport deck, remove the three Capstan shaft holder retaining screws shown in Fig. 2-6. The capstan flywheel can then be removed from the underside of the transport deck.
D. Attach a new Capstan flywheel in reverse order (Ⓒ to Ⓐ).
E. When the flywheel gap adjustment is required, tighten the adjusting screw which is shown on Fig. 2-5 lightly, up to its dead end and then turn it back 1/4 to 3/4 turns.

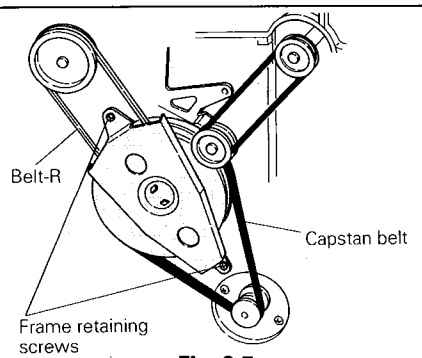


Fig. 2-5

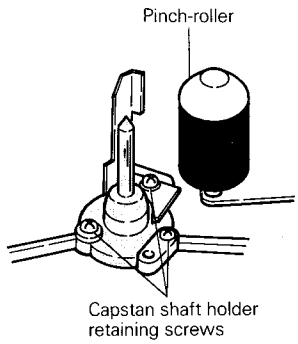


Fig. 2-6

2-5 Replacement of Loading Motor

A. Remove the two loading motor retaining screws shown in Fig. 2-7, then pull out the motor.
B. Remove the two frame retaining screws shown in Fig. 2-8, then take off the frame and the cushion.
C. Remove the two lead wires (+ brown, − red) connected to the motor.
D. Attach a new loading motor in reverse order (from Ⓒ to Ⓐ).

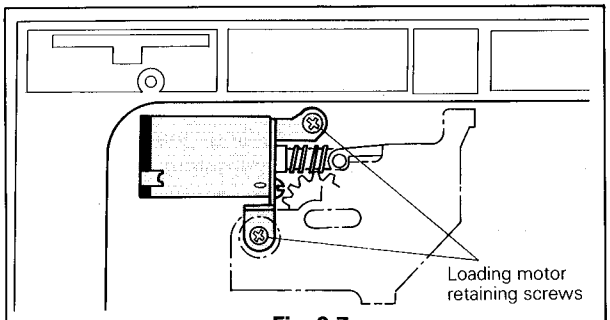


Fig. 2-7

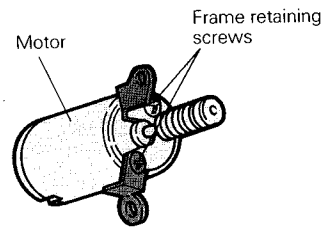


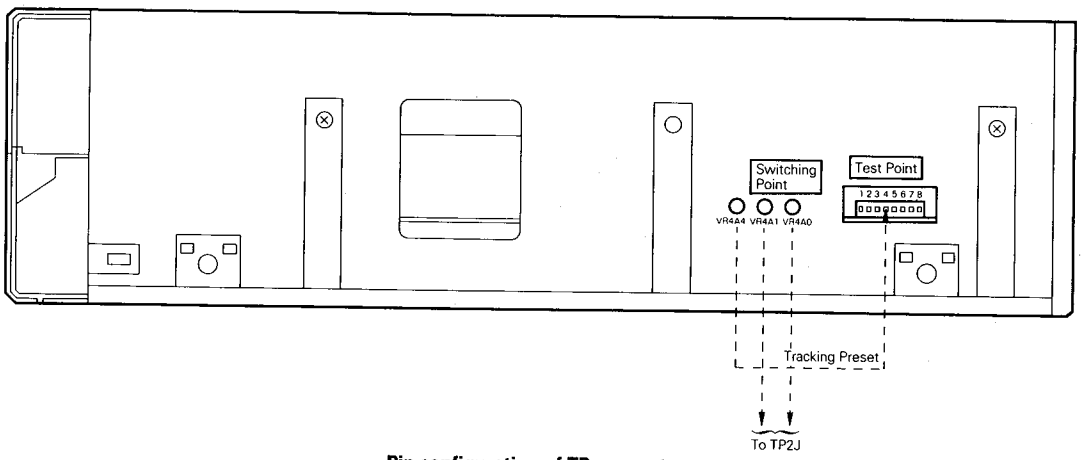
Fig. 2-8

3. ELECTRICAL ADJUSTMENT

Circuit adjustments become necessary, in most cases, due to the wear of mechanical parts or following the replacement of critical components such as the video head. Certain circuit defects can often cause circuit adjustments to vary considerably. Should this occur, be sure to determine the nature of the defect and repair prior to proceeding with adjustments.

Always use the test equipment recommended for a given adjustment procedure. If the appropriate test equipment is not available, it is recommended that adjustments NOT be attempted. Refrain from the indiscreet adjustment of circuit adjustment controls unless properly equipped to do so.

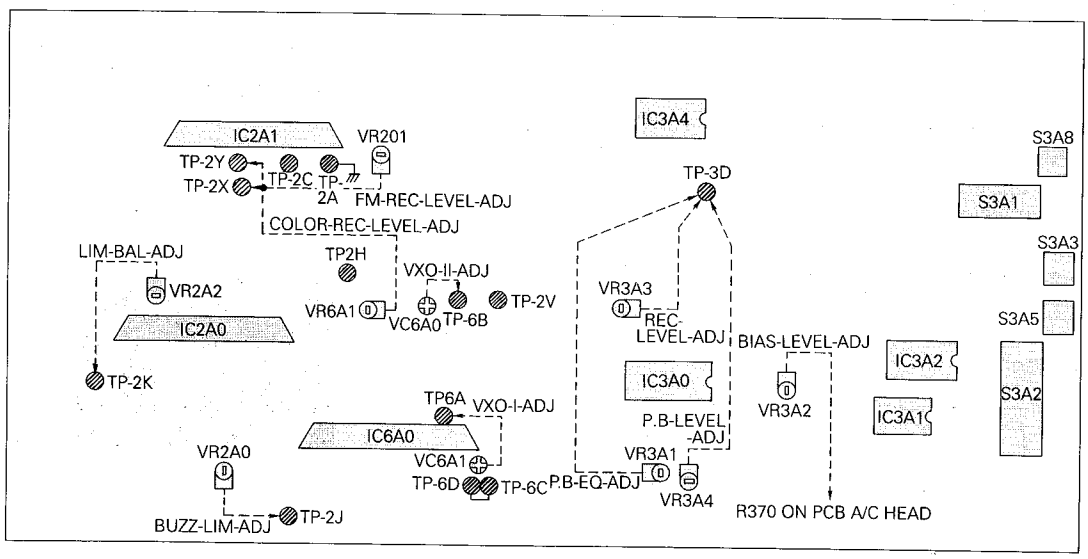
PCB CONTROL



Pin configuration of TP connector

PIN NO.	Test Point	PIN NO.	Test Point
1	CP-FG	5	DR-FF
2	D-AFC	6	GND
3	CP-AFC	7	—
4	TR-MM	8	—

PCB-Y/A



3-1 Power Supply (B power) Adjustment

3-1-1 REG 9V ADJ.

A. Set the recorder to the RECORD mode.
B. Adjust VR901 so that the voltage at test point TP-9A is 9.15 ± 0.01V.

3-2 Servo Circuit Adjustment

3-2-1 Playback Switching Point Adjustment

A. Playback the grey scale step signal of the alignment tape.
B. Connect the oscilloscope's EXT trigger to PIN NO ⑤ of connector [TP] on the PCB CONTROL.
C. Set the EXT TRIGGER to "−".
D. Set the tracking control VR8A1 to the center click-stop position.
E. Connect the oscilloscope to the video output socket and adjust VR4A0 so that the trigger point is located at 6.5 ± 1H before the vertical synchronizing signal, Fig. 3-1.
F. Set the EXT TRIGGER to "+".
G. Adjust VR4A1 so that the trigger point is located 6.5 ± 1H before the vertical sync signal, Fig. 3-1.

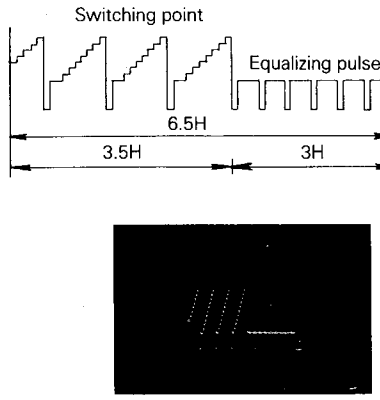


Fig. 3-1

3-2-2 Tracking Preset Adjustment

A. Supply an RF signal (color bar) to the recorder and set it to the E-E mode.
B. Set the tracking control VR8A1 at the center click stop position.
C. Connect an oscilloscope to PIN NO ④ of connector [TP].
D. Adjust VR4A4 so that the H-time shown in Fig. 3-2 is 14 msec.

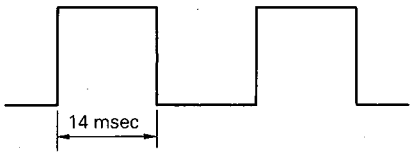


Fig. 3-2

3-3 Y/C Signal Circuit Adjustment

3-3-1 VXO-I Adjustment

A. Supply a color bar singal (RF or Video) to the recorder and set it to E-E mode.
B. Connect a frequency counter to test point TP-6A on PCB-Y/A.
C. Adjust VC6A1 (V.X.O.-I) so that the frequency of TP-6A is 3.579545MHz ± 50Hz.

3-3-2 VXO-II Adjustment

A. Supply a color bar signal (RF or Video) to the recorder and set it to E-E mode.
B. Short circuit test points TP-6C and TP-6D on PCB-Y/A.
C. Connect a frequency counter to test point TP-6B on PCB-Y/A.
D. Adjust VC6A0 (VXO-II) so that the frequency of TP6B is 3.579545MHz ± 50Hz.

3-3-3 FM Record Level Adjustment

A. Supply an RF signal (color bar) to the recorder and set it to the EP (6H) RECORD mode.
B. Connect the oscilloscope to test point TP-2Y with the probe ground attached to test point TP-2X on PCB-Y/A.
C. Adjust VR201 for a level (H. SYNC.) of 150mVp-p, as shown in Fig. 3-3.

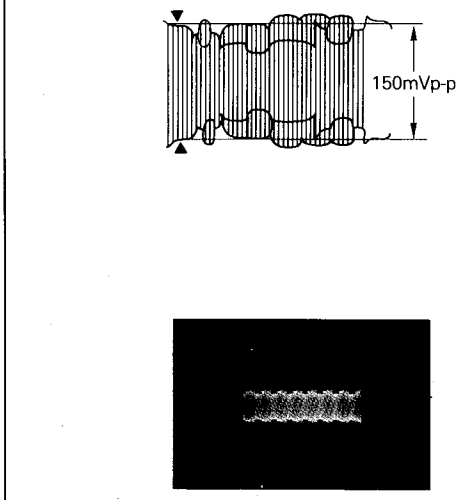


Fig. 3-3

3-3-4 Recording Color Level Adjustment

A. Supply an RF signal (color bar) to the recorder and set it to the EP (6H) RECORD mode.
B. Connect an oscilloscope to test point TP-2Y with the probe ground attached to test point TP-2X on PCB-Y/A.
C. Ground test point TP-2A on the PCB-Y/A.
D. Adjust VR6A1 for a level of 45mVp-p, as shown in Fig. 3-4.

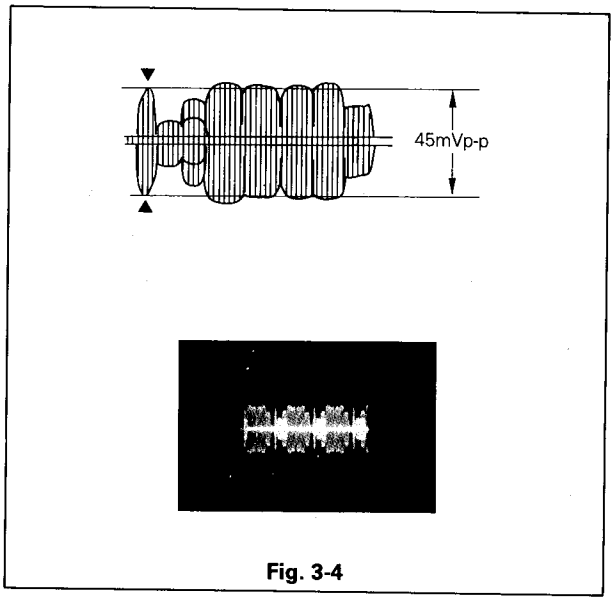


Fig. 3-4

3-3-5 Limiter Balance Adjustment

A. Playback the color bar signal of an alignment tape.
B. Connect an oscilloscope to test point TP-2K on the PCB-Y/A.
C. Referring to Fig. 3-5, adjust VR2A2 (LIM-BAL) so that the Video signal appears as shown.

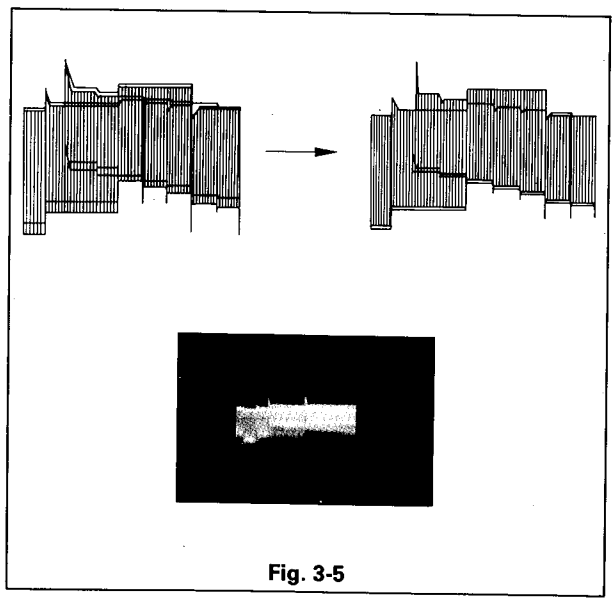


Fig. 3-5

3-3-6 Buzz Limiter Adjustment

A. Record an RF signal (color bar) in the EP (6H) mode and play it back.
B. Connect an oscilloscope to test point TP-2J on the PCB-Y/A and set recorder to the STILL mode.
C. Referring to Fig. 3-6, adjust VR2A0 so that the upper limit of the noise bar from the top end of synchronizing signal is 1.3 ± 0.05Vp-p.

Note:
Keep the horizontal axis of the oscilloscope so that two fields can be seen, and adjust the white peak to 1.3Vp-p from the top of SYNC-tip.

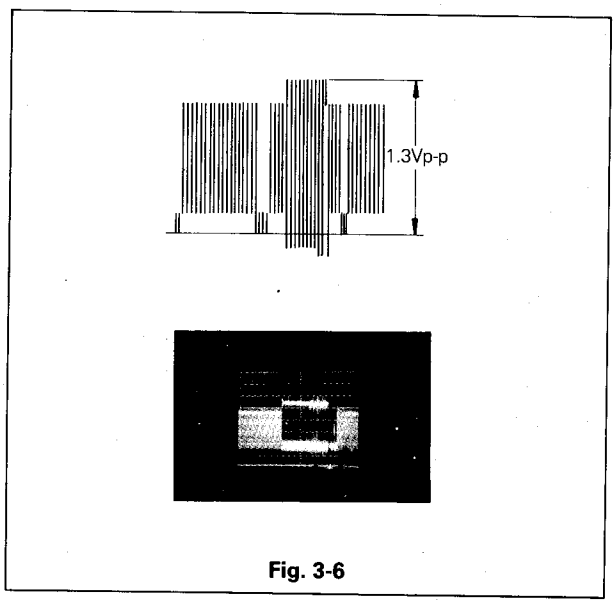


Fig. 3-6

3-4 LED Circuit Adjustment

A. Apply a 1 KHz −8dB signal to the LCH and RCH AUDIO-IN terminals.
B. Turn REC LEVEL SW ON, and set the recorder to the EE mode.
C. Adjust VR522 just until the LED-1dB on L side is ignited. (Refer to Fig. 3-7)
D. Adjust VR523 just until the LED-1dB on R side is ignited.
E. When the input levels are variable, and uniform indications on both the L and R sides cannot be achieved, minor adjustment should be alternated between the two in order to ignite both LEDs.

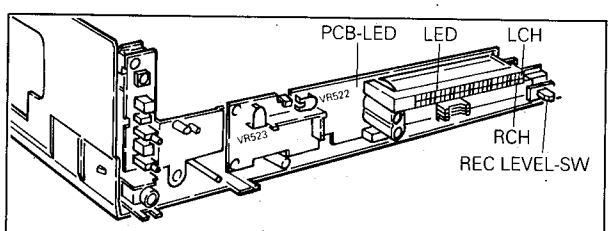


Fig. 3-7

3-5 Audio Circuit Adjustment

3-5-1 Playback Level Adjustment

* Set the AUDIO MONITOR SW to NORMAL Position

A. Playback the color bar section of an alignment tape.
B. Connect an AC voltmeter to test point TP-3D on the PCB-Y/A.
C. Preset VR3A1 (PB-EQ) to mechanical center.
D. Adjust VR3A4 (PB-LEVEL) for an output level of −8 dB.

3-5-2 Bias Level Adjustment

A. Insert a shorted RCA type Phonoplug (Refer to Fig. 3-8) into the AUDIO IN (LCH and RCH) terminals and set the recorder to 2H RECORD mode.
B. Connect an AC voltmeter with a probe (high pass filter) across resistor on A/C head board as shown in Fig. 3-8.
Note:
Be careful that the AC voltmeter housing does not touch the VCR chassis.
C. Confirm that the monitor TV etc. does not affect the indication of the AC voltmeter and then adjust VR3A2 (BIAS LEVEL) for 2.40 mV.r.m.s.
Note:
Do not set the VCR to PLAY mode with the AC voltmeter connected. (The audio amplifier will be over-loaded.)

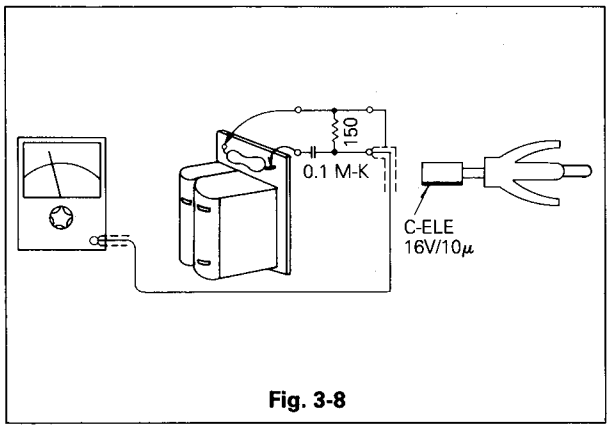


Fig. 3-8

3-5-3 Record Level Adjustment

A. Apply a 1KHz −18dB signal to the AUDIO-IN (LCH and RCH) terminals and a video signal to the VIDEO-IN terminal.
B. While monitoring test point TP-3D with an AC voltmeter adjust VR3A3 (REC-LEVEL) while recording for a playback level of −18 dB ±4dB.
C. If the playback output is insufficient even though the recording level is maximized, repeat the adjustment outlined in 3-5-2 item © for 2.10mV and repeat the above adjustment.

3-5-4 Playback Equalizer Adjustment

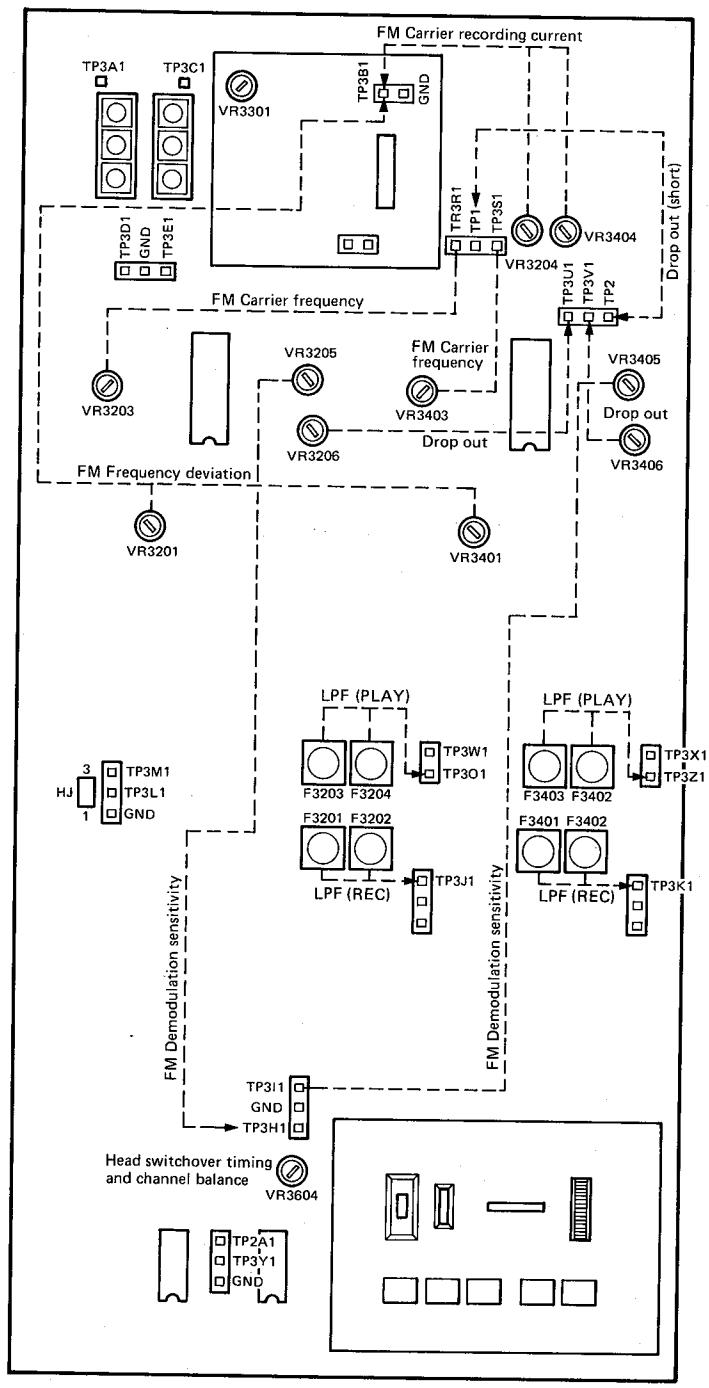
A. Before checking, clean audio head assembly.
B. Apply a 7 KHz −18dB signal to the AUDIO-IN (LCH and RCH) terminals. Record signal, then play it back.
C. Connect an AC voltmeter to testpoint TP-3D on the PCB-Y/A.
D. Adjust VR3A1 so that the relative output level of 7KHz against the EE level is equal to 0dB.

3-6 HI-FI Circuit Adjustment

● Adjust undersignated switches and selectors to the settings shown below. In addition, set the time of the clock.

RECORD LEVEL SELECTOR(REC LEVEL) ——————manual
TRACKING CONTROL KNOB(TRACKING) ——————center clip stop position
PROGRAM RECORD SWITCH(PROG.REC) ——————off
TAPE SPEED SELECTOR(TAPE SPEED ——————SP
INPUT SELECTOR(INPUT SELECT) ——————ext.
RECORDIND SOURCE SELECTOR(REC SOURCE) —audio only
AUDIO MONITOR SWITCH(AUDIO MONITOR) ——STEREO

PCB-HI-FI



3-6-1 FM Carrier Frequency Adjustment

A. Set the Record Level Control to the minimum position and the recorder to the RECORD mode.
B. Connect a frequency counter to test point TP3R1 on the HI-FI PCB and adjust VR3203 so that the frequency is 1.3 MHz ± 1 kHz. (L ch)
C. Connect a frequency counter to test point TP3S1 on the HI-FI PCB and adjust VR3403 so that the frequency is 1.7 MHz ± 1 kHz. (R ch)

3-6-2 FM Carrier Recording Current Adjustment

A. Set the Record Level Control to the minimum position and the recorder to the RECORD mode.
B. Connect a VHS HI-FI analyzer to test point TP3B1 on the HI-FI PCB.
C. Adjust VR3204 so that the L ch level becomes 40 mVp-p.
D. Adjust VR3404 so that the R ch level becomes 90 mVp-p.

3-6-3 FM Frequency Deviation Adjustment

A. Apply a 400 Hz, 100 mV signal to the AUDIO IN jack.
B. Connect an AC voltmeter to test point TP3H1 on the HI-FI PCB.
C. Adjust the Record Level Control so that the TP3H1 voltage becomes 160 mV.
D. With a VHS HI-FI analyzer connected the same as in 3-6-2 B. above, adjust VR3201 so that the deviation indication becomes 50 KHz p-p. (L ch)
E. Connect an AC voltmeter to test point TP3I1 on the HI-FI PCB.
F. Adjust the Record Level Control so that the TP3I1 voltage becomes 160 mV.
G. Adjust VR3401 so that the deviation indication on the VHS HI-FI analyzer becomes 50 kHz p-p. (R ch)

3-6-4 FM Demodulation Sensitivity Adjustment

A. Connect the output of a VHS HI-FI analyzer to test points TP3A1 (L ch) and TP3C1 (R ch) on the HI-FI PCB and set the signal frequency to 400 Hz and 50 kHz p-p.
B. Set VR3206 (L ch) and VR3406 (R ch) as far as possible in a counterclockwise direction, then load a dummy cassette and play back.
C. Connect an AC voltmeter to test point TP3H1 on the HI-FI PCB.
D. Adjust VR3205 so that the TP3H1 voltage becomes 160 mV. (L ch)
E. Connect an AC voltmeter to test point TP3I1 on the HI-FI PCB.
F. Adjust VR3405 so that the TP3I1 voltage becomes 160 mV. (R ch)

3-6-5 Head Switchover Timing and Channel Balance Adjustments

A. Play back the test tape (MN6KH2) and connect an oscilloscope to TP3D1 (L ch) or TP3E1 (R ch).
B. Connect the oscilloscope trigger to TP3Y1.
C. Adjust the TRACKING CONTROL KNOB so that the oscilloscope waveform becomes larger.
D. Adjust VR3604 to match the timing so that the waveforms of tracks A and B are continuous.
E. Match the sensitivity of the A and B heads while watching the oscilloscope.

Note:

- When the test tape (MN6KH2) is not available use a tape that has been recorded at 6 kHz and about −10 dB.
- Test tape (MN6KH2) is made for adjustment use. Since the overlap of A and B tracks is lessening, there are times when the signals at the switchover position of the heads will not become continuous. At such a time, make the adjustment so that the non-continuous time is a minimum.

3-6-6 Drop Out Adjustment

A. Short test points TP1 and TP2 on the HI-FI PCB and play back test tape NC1K.
B. Connect a DC voltmeter to test point TP3U1 on the HI-FI PCB.
C. Adjust VR3206 so that the TP3U1 voltage becomes 0.3V. (L ch)
D. Connect a DC voltmeter to test point TP3V1 on the HI-FI PCB.
E. Adjust VR3406 so that the TP3V1 voltage becomes 0.3V. (R ch)
F. Open TP1 and TP2 and check that the HI-FI indicator goes off.

3-6-7 LPF Adjustment (when recording)

A. Remove connector [HJ], connect an audio oscillator to TP3L1 (L ch) and TP3M1 (R ch), and set the output of the audio oscillator to 47. 2 kHz ± 10 Hz at 300 mVRMS.
B. Connect an DC voltmeter to test point TP3U1 on the HI-FI PCB.
C. Adjust V3201 so that the TP3J1 voltage becomes a minimum. (L ch)
D. Connect an AC voltmeter to test point TP3K1 on the HI-FI PCB.
E. Adjust F3401 so that the TP3K1 voltage becomes a minimum. (R ch)
F. Set the output of an audio oscillator to 20 kHz ± 10Hz at 100 mVRMS.
G. Connect an AC voltmeter to test point TP3J1 on the HI-FI PCB.
H. Adjust F3202 so that the TP3J1 voltage becomes a maximum. (L ch)

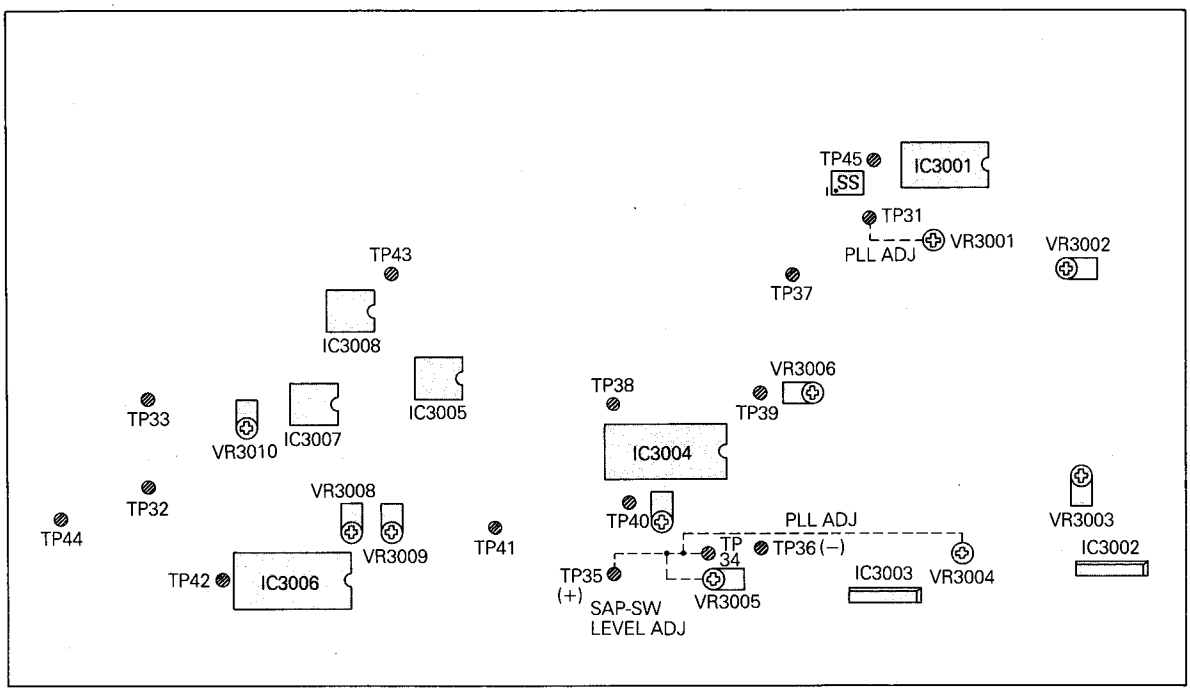
I. Connect an AC voltmeter to test point TP3K1 on the HI-FI PCB.
J. Adjust F3402 so that the TP3K1 voltage becomes a maximum. (R ch)
K. Vary the output of an audio oscillator from 1 kHz to 20 kHz and at the same time check that the variation of the AC voltmeter reading is within ± 0.2 dB for both the L and R ch.
L. When the adjustments have been completed reconnect the HJ connector.

3-6-8 LPF Adjustment (when playing back)

A. Connect an audio oscillator to test points TP3W1 (L ch) and TP3X1 (R ch) on the HI-FI PCB and set the output of the audio oscillator to 47.2 kHz ± 10 kHz at 300 mVRMS.
B. Load a dummy cassette and play back.
C. Connect an AC voltmeter to test point TP301 on the HI-FI PCB.
D. Adjust F3203 so that the TP301 voltage is a minimum. (L ch)
E. Connect an AC voltmeter to test point TP3Z1 on the HI-FI PCB.
F. Adjust F3403 so that the TP3Z1 voltage is a minimum. (R ch)
G. Set the output of an audio oscillator to 20 kHz ± 10Hz at 100 mVRMS.
H. Connect an AC voltmeter to test point TP301 on the HI-FI PCB.
I. Adjust F3204 so that the TP301 voltage becomes a maximum. (L ch)
J. Connect an AC voltmeter to test point TP3Z1 on the HI-Fi PCB.
K. Adjust F3404 so that the TP3Z1 voltage becomes a maximum. (R ch)
L. Vary the output of an audio oscillator from 1 kHz to 20 kHz and at the same time check that the variation of the AC voltmeter reading is within ± 0.2 dB for both the L and R ch.

3-7 MCS Circuit Adjustment

PCB MCS



3-7-1 PLL Adjustment

A. Ground PIN ② of connector [SS] on the PCB-MCS.
B. Connect a frequency counter to test point TP-31 on the PCB-MCS.
C. Adjust VR3001 so that the frequency at TP-31 is 15.73 KHz.
D. After adjustment remove the ground from connector [SS].

3-7-2 SAP-SW-Level Adjustment

A. Connect a DC voltmeter across test points [TP-35] and [TP-36].
[TP-35: Positive (+) TP-36: Negative (−)]
B. Adjust VR3005 so that the reading on the DC voltmeter is equal to −1 V.

3-7-3 PLL Adjustment

A. Apply a 78.67 KHz, 180 mV rms sine wave signal to PIN ② of connector [SS] on the PCB MCS.
B. Connect a DC voltmeter across test points [TP-35] and [TP-36].
[TP-35: Positive (+) TP-36: Negative (−)]
C. Adjust VR3004 so that the reading on the DC voltmeter is equal to +1 V from the fully clockwise position.

4. MECHANICAL ADJUSTMENT

4-1 Installation of Master Plane Jig

A. Remove the Cabinet Top and Front Panel of the recorder.
B. Remove the Video Head shield cover.
C. Insert a dummy cassette in the cassette housing and engage the play mode to bring about the loaded condition.
(i.e. when the VCR is loaded with either a cassette tape or dummy cassette.)
D. After loading has been completed remove the power cord from the AC source.
E. Remove the cassette housing.
F. Ensure that the surface of the transport deck is free from any dust, dirt, or foreign matter and install the master plane jig, as illustrated in Fig. 4-1.

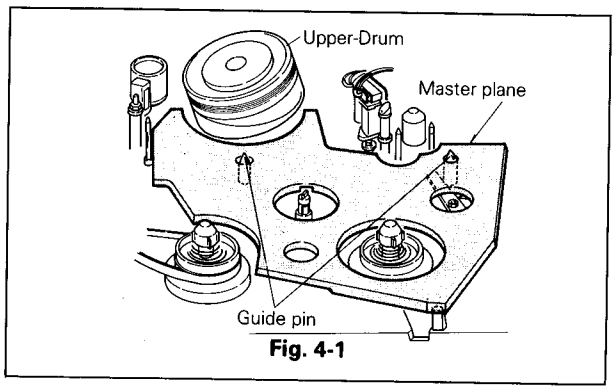


Fig. 4-1

4-2 Tension Post Position Adjustment

A. Insert a dummy cassette in the cassette housing and set the recorder to the playback mode.
B. During the playback mode, make sure that the tension post is within the range as shown in Fig. 4-2.
C. If the tension post is outside the range, move the holder shown in Fig. 4-3 and adjust the position of the tension post.
D. By using a T-120 video tape, make sure that the tape does not come in contact with the cassette case near the end of the tape in the playback mode.

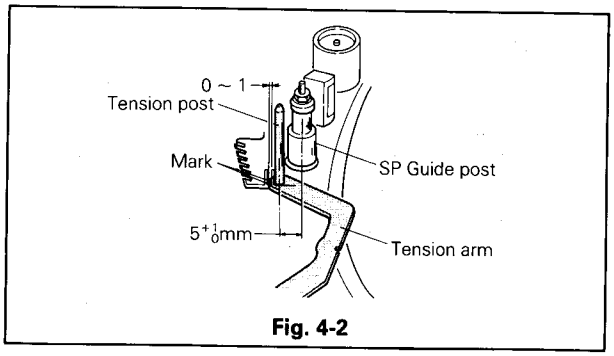


Fig. 4-2

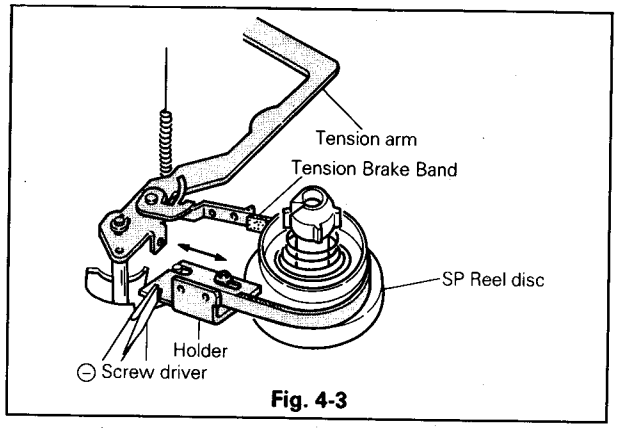


Fig. 4-3

4-3 Supply Guide Post and Take-up Guide Post Height Check and Adjustment

A. Install the master plane jig as described in 4-1.
B. By using the height adjust square, make sure that the collar at the bottom of the guide post slides under part Ⓐ of the square but not under part Ⓑ, as shown in Fig. 4-4.
In this case, use the height adjust square with the "SP" mark to check the supply guide post, and the height adjust square with the "TU" mark to check the take-up guide post.
C. If the specifications obtained in step B are not met, insert shims for adjustment.

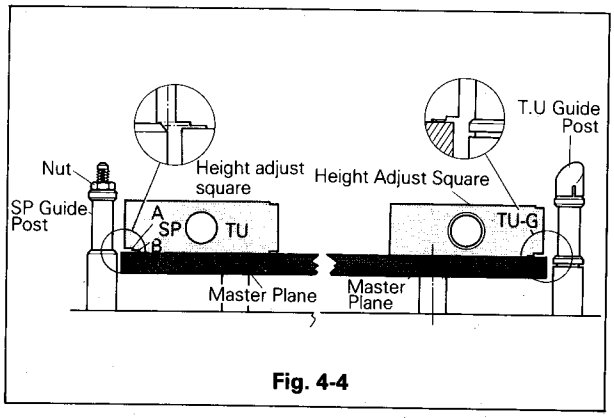


Fig. 4-4

4-4 Capstan Shaft Perpendicularity Check

A. Install the master plane jig as described in 4-1.
B. Place the "Height Adjust" Square on the master plane and apply gently to the capstan motor shaft from 2 directions (at right angles to each other) to ensure that the capstan motor shaft is nearly parallel to the jig. Maximum allowable deviation tolerance is 0.1 mm.
C. No correction is necessary if the tape travel is normal despite unsatisfactory perpendicularity. If tape crease, tape folding, and audio level variation is detected, however, the perpendicularity should be corrected by inserting shims between the Capstan holder and the main plate.

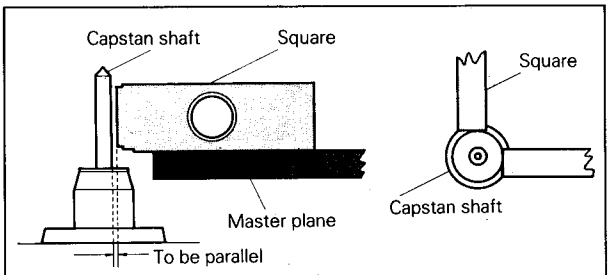


Fig. 4-5

4-5 Reel Disc Height Check and Adjustment

A. Install the master plane jig as described in 4-1.
B. Make sure that the supply reel disc and the take-up reel disc rotate smoothly when the tension brake and the take-up sub-brake are released by hand.
   * If not rotating smoothly, check to be sure they are not being hindered by the brake shoe or contact from adjacent components.
   * Make sure that the reel disc shaft if free from binding.
C. Examine the height of the reel disc with the "Height Adjust" square as illustrated in Fig. 4-6. The reel disc height should be between levels A & B of the square as illustrated.
D. Inspect the height in two directions at right angles to each other. If necessary adjust the height of the Reel discs by adding or removing poly slider washers (552C00604: 0.13 mm).

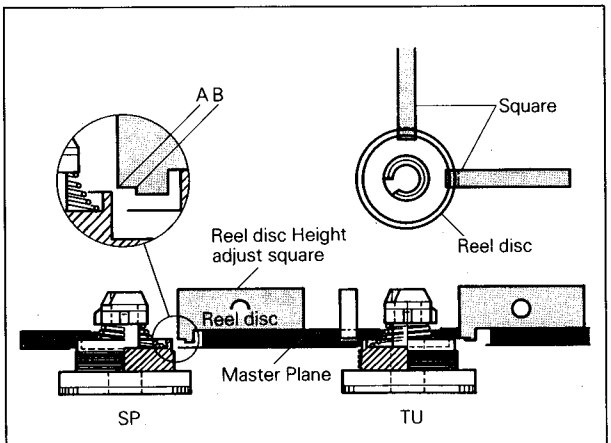


Fig. 4-6

4-6 Arm Take-up Guide Post Adjustment

A. Install the master plane jig as described in 4-1.
B. Place the "Height Adjust" Square on the master plane and be sure that the lower flange of the arm take-up guide post is level with the lower edge of the "TU-G" side of the square.
   If the flange height deviates, adjust it with the height adjust nut.

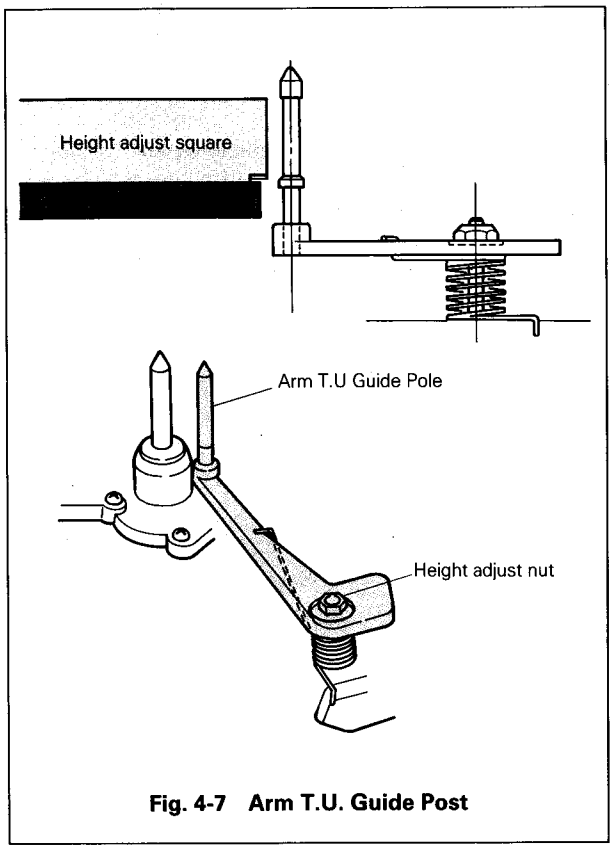


Fig. 4-7 Arm T.U. Guide Post

4-7 Operation Check of Take-up and Supply Reel Main Brake

A. Cover the "End and Start Sensors" with a small piece of black tape.
B. Be sure that the brakes are separated from the reel discs as shown in Fig. 4-8, in playback, fast forward, rewind and record mode.
C. Be sure that the brakes are applied when power supply is switched off (unloaded or standing)
D. Measure the torque with the torque meter in the thrust direction and be sure that the torque is 500^{+300}_{-200}g-cm.
   Note:
   1. Measure the torque while releasing the sub-brake shown in 4-8.
   2. Measure after rotating 2 to 3 turns in the thrust direction.
E. If the measured torque is below 300g-cm clean the contact surfaces of the brakes.
   Note:
   If measured immediately after cleaning with alcohol, etc. measurements may be incorrect because of moisture.
F. Measure the torque with the torque meter in the escape direction and be sure that the torque is 20 ~ 200g-cm.
G. Remove the black tape previously applied in step Ⓐ.

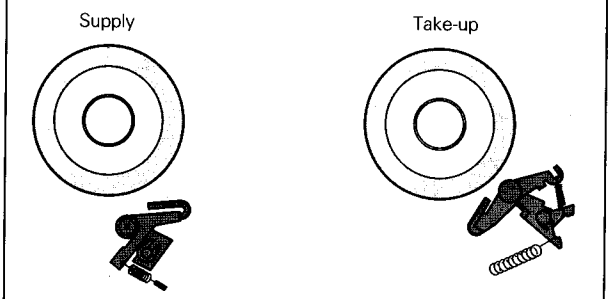


Fig. 4-8

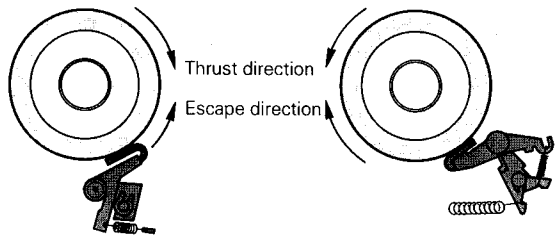


Fig. 4-9

4-8 Checking Adjustment of Take-up and Supply Sub-brake TU-2.

A. Cover the "End and Start Sensors" with a small piece of black tape.
B. Be sure that the sub brakes (Ⓐ, Ⓑ) are separated from the reel discs as shown in Fig. 4-10 in the playback and record modes.
C. During a fast forward and rewind mode, remove power and make sure that brake A and sub-brake TU-2 are effective.
D. With a torque meter, make sure that the torque in the thrust direction is 15 to 25g-cm at both supply side and take-up side.
Note:
1. Measure the torque while releasing the main brake shown in 4-7.
2. Measure after rotating 2 to 3 turns in the thrust direction.

E. If the measured torque is below 15g-cm clean the contact surfaces of the brakes.
Note:
If measured immediately after cleaning with alcohol, etc. measurements may be incorrect because of moisture.
F. Make sure that the torque in the escape direction is not more than 10 to 25g-cm at both supply side and take-up side.
G. During a reverse search mode, remove power and make sure that brake Ⓑ is effective.
H. Measure the torque with the torque meter in the thrust direction and be sure that the torque is 30 ~ 55g-cm.

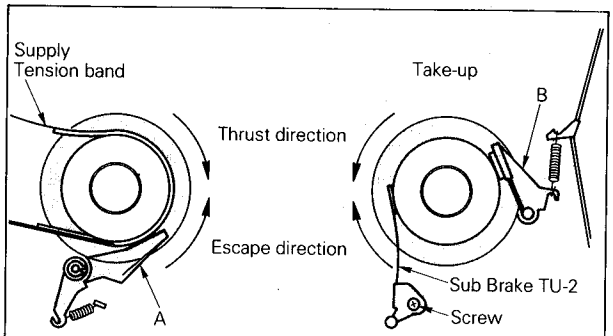


Fig. 4-10

I. If the measured torque is below 30g-cm clean the contact surface of the brakes.
J. Measure the torque with the torque meter in the escape direction and be sure that the torque is 30 ~ 50g-cm.
K. Remove the black tape previously applied in step Ⓐ.

4-9 Back Tension Check and Adjustment

A. Insert the Back tension meter and set the recorder to the playback mode.
B. Check that the mean value is 42 ± 5g-cm on the supply side.
C. If the mean value exceeds 47g-cm adjust the value to 42g-cm by adjusting the location of the spring (A) in the direction of arrow ⓐ as shown in Fig. 4-11.
D. If the pointer mean value is much less than 37g-cm, adjust it to 42g-cm by adjusting the location of the spring (A) in the direction of arrow ⓑ.
Note:
The deviation of back tension value is not absolutely specified. However, if it fluctuates by more than 5g-cm after a stabilizing period, then a problem exists in one of the associated parts. Check and repair as required.
E. Ascertain that no skew distortion is observed during recording or playback.

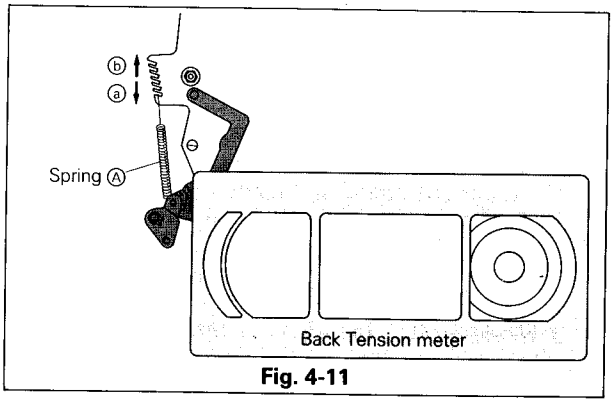


Fig. 4-11

4-10 Take-up Torque Check

A. Insert a dummy cassette in the cassette housing and set the recorder to the playback mode.
B. Apply the torque meter to the take-up reel disc.
C. Gently grip the rotating torque meter by hand. gradually increasing 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.
D. Ascertain that the torque meter center value is 100±25g-cm.
E. If the torque is not at the desired value when measured by the above method, or the torque varies greatly, check the voltage of the capstan motor, condition of the Capstan motor, condition of the reel disc and operation of the swing idler.

4-11 FF/REW Torque Check

A. Insert a dummy cassette in the cassette housing and set the recorder to the FF/REW mode.
B. Apply the torque meter to the Take-up Reel Disc (to measure FF torque) and the Supply Reel Disc (to measure REW torque).
C. While pressing the fast forward hold the torque meter by hand so that the pointer and the torque meter's scale plate rotate at the same speed. Then read the meter.
D. Do the same while pressing the rewind button.
E. Make sure that the center value of the torque meter is over 470g-cm at FF/REW.
Note:
Make sure that the supply and take-up reel discs rotate smoothly when the brake is released by hand.
F. If the torque is not at the desired value when measured by the above method or if the torque varies greatly, clean the periphery of the idler and the reel disc with Diflon or check the condition of the capstan motor.
G. Make sure that the swing idler turns under stable condition and in tight contact during quick feeding and rewinding.

4-12 Reverse Search Torque Check

A. Insert the Back tension meter and set the recorder to the Reverse Search mode.
B. Ascertain that the torque meter center value is 180 ± 30g-cm.
C. If the pointer indication varies greatly, replace the supply reel disc.
D. Though the range of variation is not specified in particular, checking and repair are necessary if variation is over 30g-cm. (Deflection of reel disc, flow, condition of swing idler etc.)

4-13 Mode Switch Installation and Adjustment

A. Match the mating marks on the mode switch as shown in Fig. 4-12.

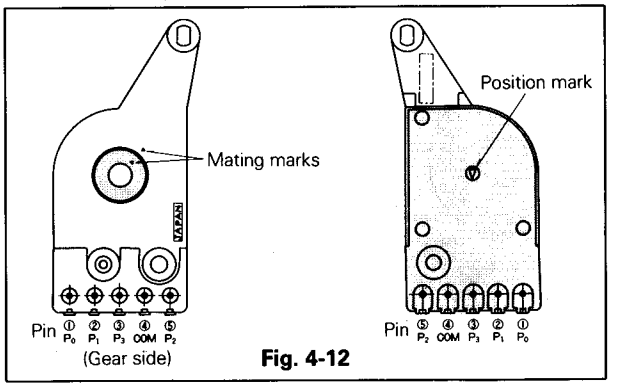


Fig. 4-12

B. With an ohmmeter set to the ×1000 range or higher, connect the ground lead to pin 4 and check continuity of each alternate pin with respect to pin 4. Turning the gear slightly, adjust for the following condition:
Pin 1 Continuity
Pin 2 Continuity
Pin 3 Continuity
Pin 5 No Continuity
These conditions should be maintained following attachment of the mode switch.
Note:
The ohmmeter should be used at a high range (×1000 or higher).
Checking with ×1 range allows current of over 40 mA and damage could result.
C. Position cam gear Ⓐ and cam gear Ⓑ, on the main plate, to the "stop" position as shown in Fig. 4-13. Assure that positioning holes are properly aligned.

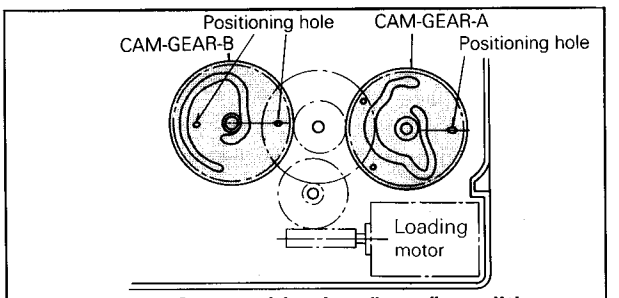


Fig. 4-13 Cam position in a "stop" condition

D. While paying close attention to prevent the gears from turning, attach the mode switch to the deck.
E. Perform continuity tests again with the ohmmeter, as described in step Ⓑ, and remove the mode switch if the position has deviated.
Repeat the steps Ⓑ through Ⓔ again to assure that the specifications outlined in step Ⓑ are met.
Note:
If the mode switch is attached improperly, the operation of the mechanism may go out of control.

4-14 Tape Path Check and Adjustment

4-14-1 Tape Run Check

A. Load a recorded tape. Repeat playback and stop several times and check the following.

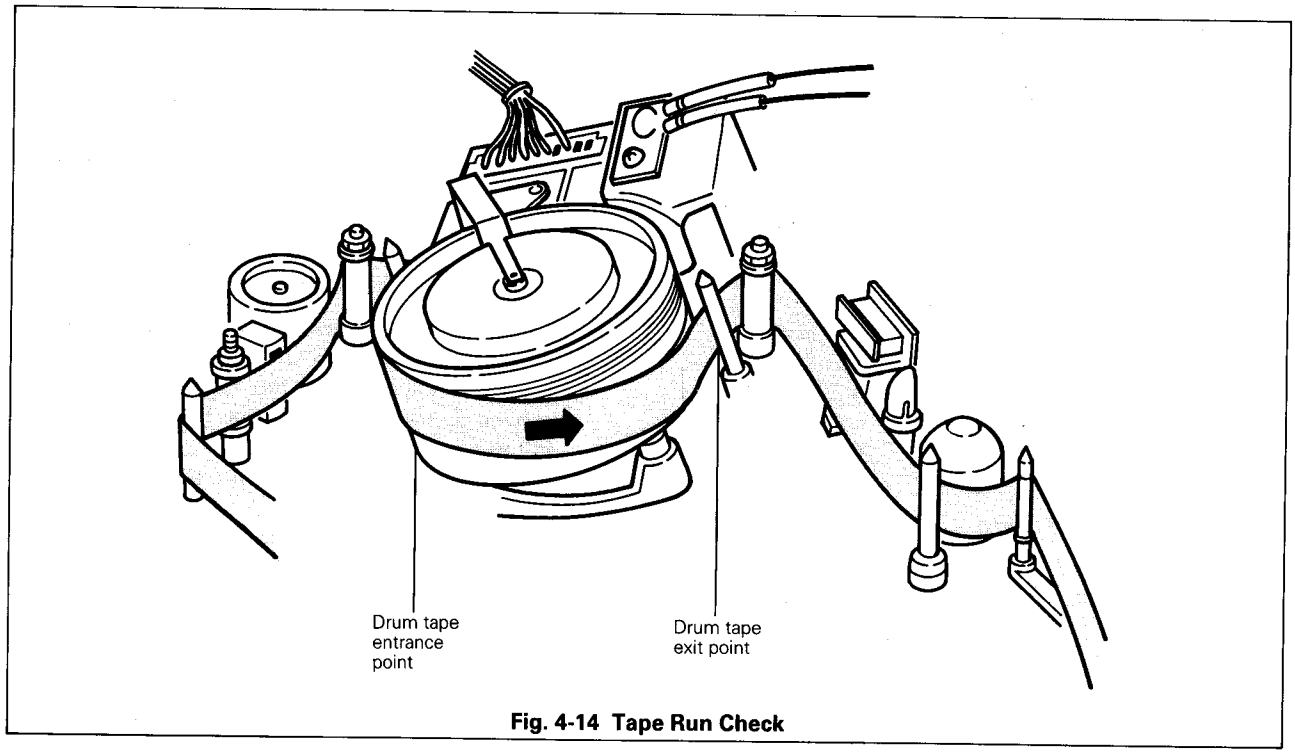


Fig. 4-14 Tape Run Check

B. Be sure that the tape does not run outside the drum lead path at the drum entrance and exit points in playback mode.

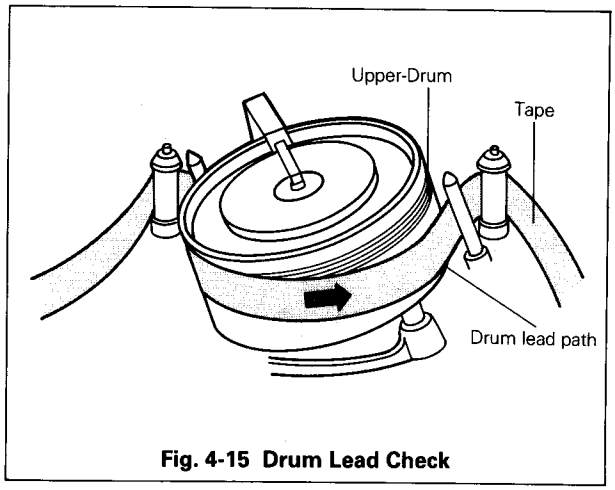


Fig. 4-15 Drum Lead Check

C. Be sure that the tape is not curled or creased at either the guide roller or the guide posts on the supply and take-up side, in loading, playback and unloading.

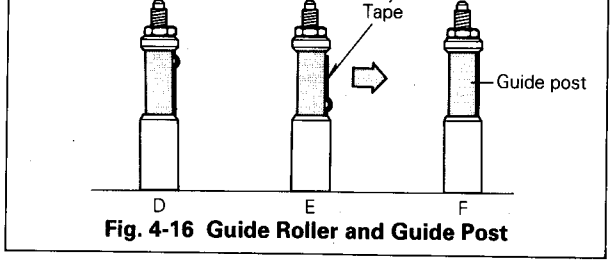


Fig. 4-16 Guide Roller and Guide Post

NOTE:

* If the tape runs above the drum lead path, a "pit-a-pat" sound is generated because the video head catches the tape edge.
* If the tape runs below the drum lead path, it will become curled or creased, and may also cause noise or instability in the picture.

D. Ensure that the tape is not damaged at areas "C" and "D" of the drum lead path where the tape is picked-up on the drum at loading and separates from the drum at unloading (check at the end of T-120 winding). Also ensure that no noise is generated.

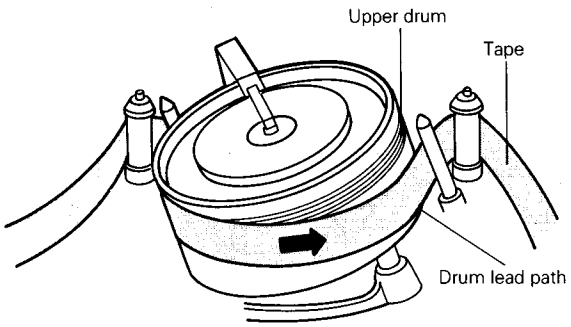


Fig. 4-17(A) Drum Lead Check [Correct condition]

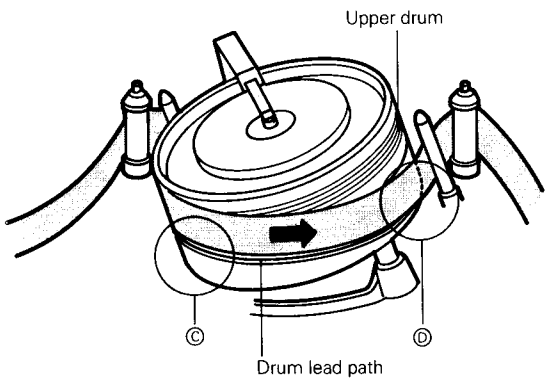


Fig. 4-17(B) Drum Lead Check [NG condition]

4-14-2 Guide Roller Height Adjustment

The following adjustment is required only when an irregularity is detected in the "Tape Run Check" stated in (4-14-1).

A. Slightly loosen the set screws of the supply and the take-up guide rollers.

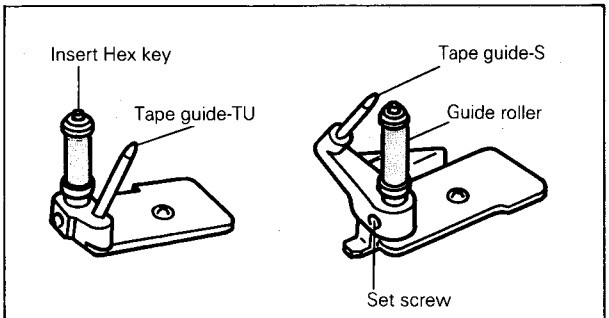


Fig. 4-18

NOTE:
Loosen the set screw just enough to be able to move the guide roller with the hex key. If loosened excessively, the guide roller may be moved by the run of the tape. In this case, screw in the set screw slightly.

B. Load the recorded tape and set the recorder to the playback mode.

C. Slowly rotate the supply guide roller with the hex key (Do not rotate more than 180° at a time) and adjust so that the tape will run smoothly over the drum, maintaining contact with the drum lead path.

D. Similarly turn the take-up guide roller and adjust the point at which the tape separates from the drum.

NOTE:
Rotate the guide roller a little at a time. Careless rotation may damage the tape.

4-14-3 Take-up Guide Post

NOTE:
The height of the take-up guide post is not adjusted at this stage, because such adjustment is made using the jig as in section 4-3, page 25.

A. Load a recorded tape and set the recorder to the playback mode.

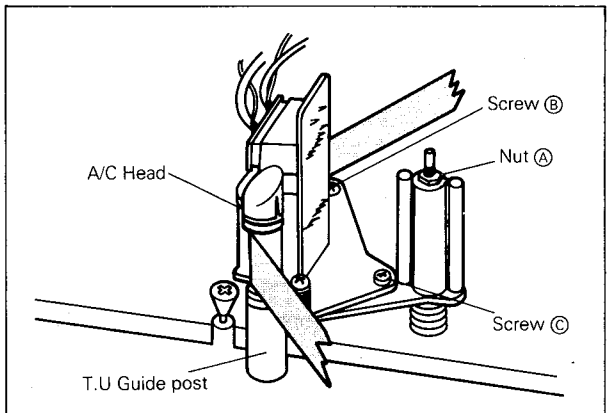


Fig. 4-19 Tape Run Adjustment at Take-up Guide Post

B. Rotate the audio/control head inclination adjusting screw (C) and adjust so that the tape will run smoothly at the take-up guide post as illustrated in Fig. 4-16 (F).
C. Be sure that the tape is not creased or twisted at the take-up guide post in playback.

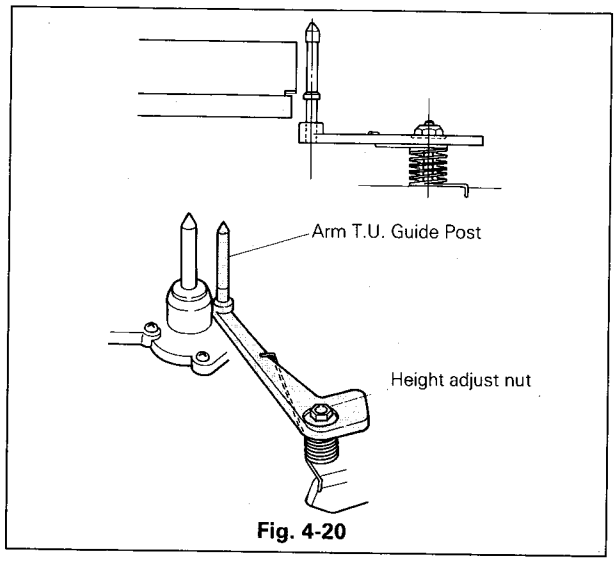


Fig. 4-20

D. Should the tape be at all creased or twisted, correct by adjusting the height of the arm take-up guide post.
NOTE:
Do not rotate the adjusting nut more than one turn.

4-15 Interchangeability Adjustment

Before running the alignment tape, check and adjust the tape path by using a recorded tape in accordance with section 4-14, page 29.

4-15-1 Check and Adjustment of FM Waveform

A. Connect the oscilloscope to test point TP-2C on the PCB-Y/A and set to the external synchronization mode. Synchronize by connecting EXT trigger to TP-2H on the PCB-HI-FI.
B. Run the alignment tape and reproduce the stair-step waveform.
C. Rotate the tracking control knob so that the FM waveform output will be maximum.
D. Read the level at a part of the waveform corresponding to (a) in Fig. 4-21. If the waveform at (a) is saw-tooth read the level at as even a point as possible, as shown at the bottom-left of Fig. 4-21.

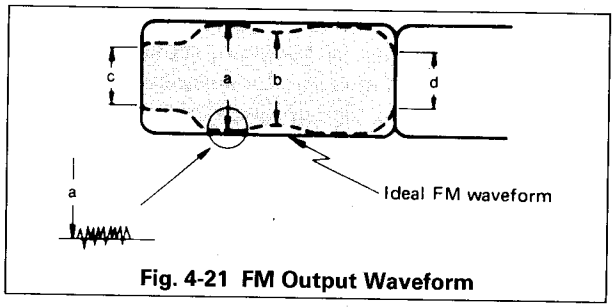


Fig. 4-21 FM Output Waveform

E. Read the level at a point corresponding to (b) of the FM waveform, shown by the broken line, and be sure that the following requirement is satisfied.

$$\frac{b}{a} \geqq 0.7 \quad \text{or} \quad 20 \log \frac{b}{a} \geqq -3 \text{ dB}$$

(b=>70% of a)

F. Similarly read the level at a point corresponding to (c) [drum meeting point] and (d) [drum exit point], and be sure that the following requirement is satisfied.

$$\frac{c}{a} \geqq 0.5 \geqq \frac{d}{a} \quad 0.5(\geqq -6 \text{ dB})$$

(c=>50% of a) (d=>50% of a)

G. If the above requirement is not satisfied, adjust the FM waveform.
H. Slightly loosen the set screws of the supply guide roller and the take-up guide roller.
I. If the FM waveform is like, for instance, "A" of Fig. 4-22, adjust the supply guide roller so that the waveform will be flat like "B".
NOTE:
Rotate the guide roller little by little to prevent the alignment tape from being damaged.
J. In addition to the waveform check, be sure that the tape is neither parted from nor creased at the guide post.

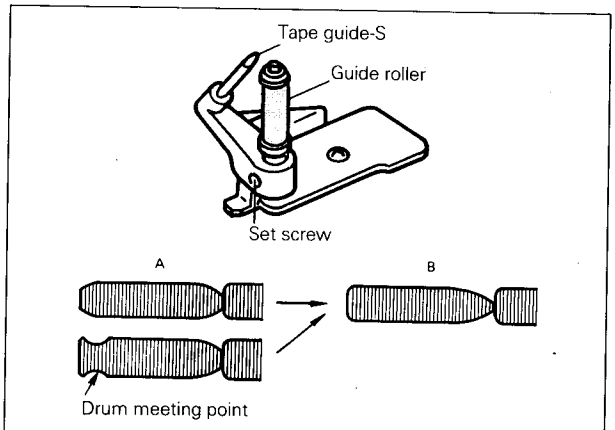


Fig. 4-22 Drum Meeting Point Waveform Adjustment

K. Adjust the waveform at the drum exit point by the same method as for the drum meeting point. If the FM waveform is like, for instance, "C" of Fig. 4-23, adjust the take-up guide roller so that the waveform will be flat like "D".

L. If the tape is parted or creased at the take-up guide post, adjust screw (C) of the audio/control head shown in Fig. 4-23.

NOTE:
Do not move the take-up guide post.

M. At the same time, rotate the audio/control head height adjusting nut (A) and adjust the head height according to the tape. Determine whether the tape should be raised or lowered according to the criteria shown in Fig. 4-23.

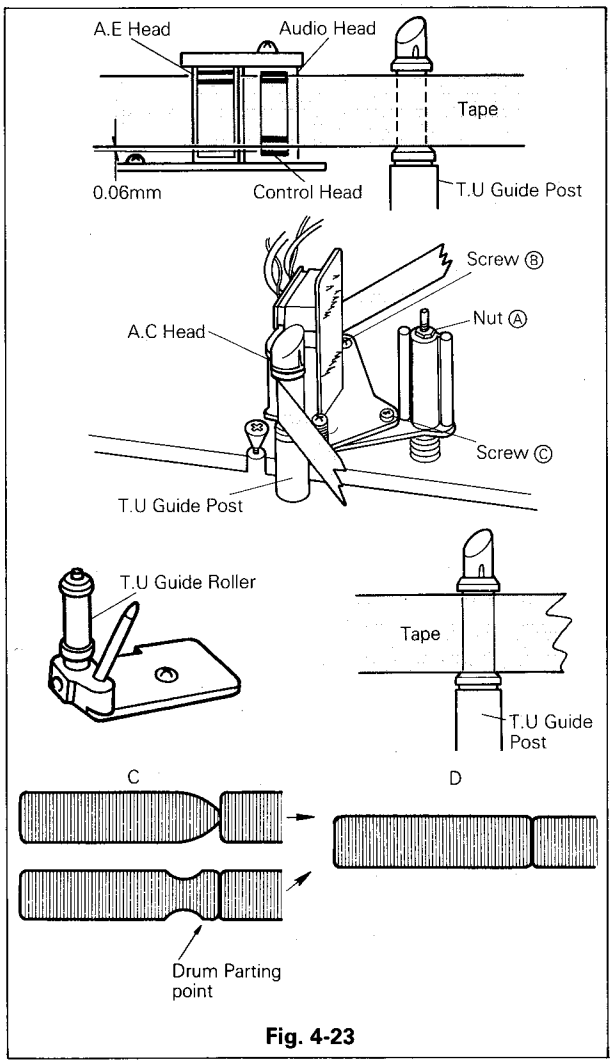


Fig. 4-23

NOTE:
At this stage, the adjustment need not be so critical and it is sufficient if the tape is correctly guided to the take-up guide post and the servo is stabilized.

4-15-2 Interchangeability Adjustment

A. Connect the oscilloscope to test point TP-2C (P-B FM OUT) on the PCB-Y/A. Set to external synchronization and synchronize by connecting EXT trigger to TP-2H on the PCB-HI-FI. Set the EXT trigger to minus (−).

B. Playback the stairstep waveform of the alignment tape.

C. Rotate the tracking control knob and be sure that the FM waveform varies linearly.

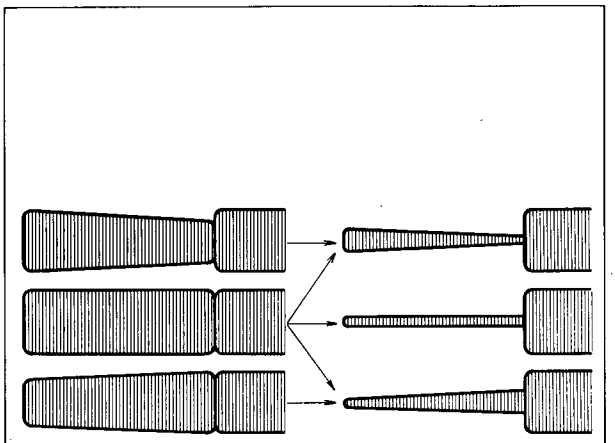


Fig. 4-24 Standard Waveform Variation

D. If non-linear FM waveform occurs as shown in Fig. 4-25 adjustment is necessary.

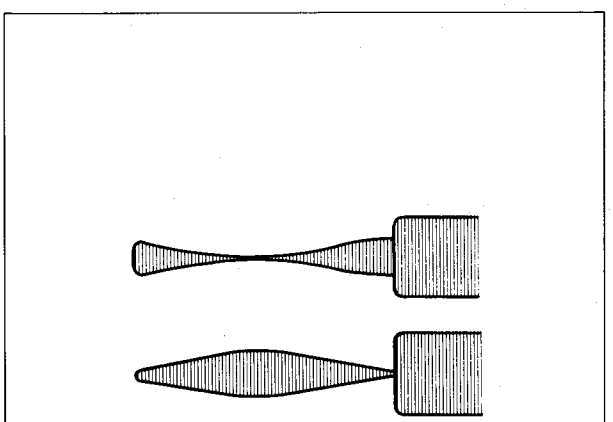


Fig. 4-25 Abnormal Waveform Variation

E. Turn the tracking control volume and adjust the FM waveform output to minimum.
F. If the FM waveform is similar to (A) or (B) in Fig. 4-26, adjust the height of the supply guide roller until it becomes like (E), (F) or (G) in Fig. 4-27.
If the FM waveform fluctuates, adjust to the minimum point of fluctuation.

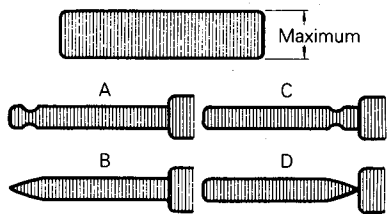


Fig. 4-26 Minimum FM Waveform Output

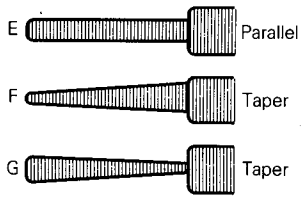


Fig. 4-27 Minimum Waveform Output (Standard waveform)

G. If the FM waveform is similar to (C) or (D) in Fig. 4-26 adjust the height of the take-up guide roller until it becomes like (E), (F) or (G) in Fig. 4-27. If the waveform fluctuates, adjust to the minimum point of fluctuation.
H. Rotate the tracking control knob from minimum to maximum FM waveform output and vice versa, and finely adjust the height of the supply and take-up guide rollers.
I. After ensuring normal maximum FM waveform output. (i.e. audio output of 7 KHz and the tape is not creased along the tape path), secure the guide rollers by tightening the set screws.
NOTE:
Secure in stop mode, and do not apply excessive force to the tape guide.
J. After tightening the set screws, check the interchangeability again.

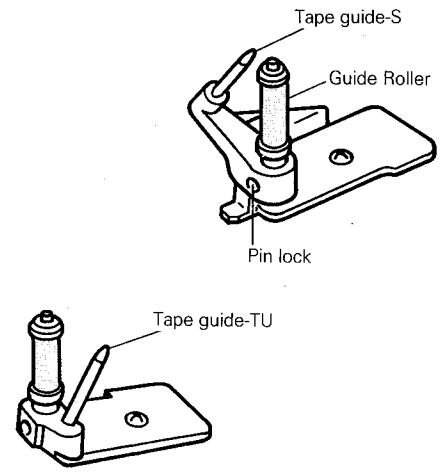


Fig. 4-28 Tightening of Set Screws

4-15-3 Control Head Phase Control Adjustment

A. Playback the stairstep waveform of the alignment tape.
B. Connect the oscilloscope to test point TP-2C (P.B. FM OUT) on the PCB-Y/A.
C. Set up in the external trigger mode by connecting TP-2H on the PCB-HI-FI, to the external trigger input.
D. Set the tracking control to the click position.
E. Rotate the phase adjusting nut (CAM SCREW) shown in Fig. 4-29 and adjust FM output to maximum.
F. Rotate the tracking knob and be sure that the FM output is maximum at the click position of the tracking knob.

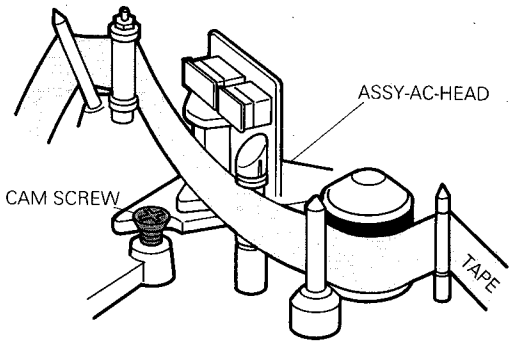


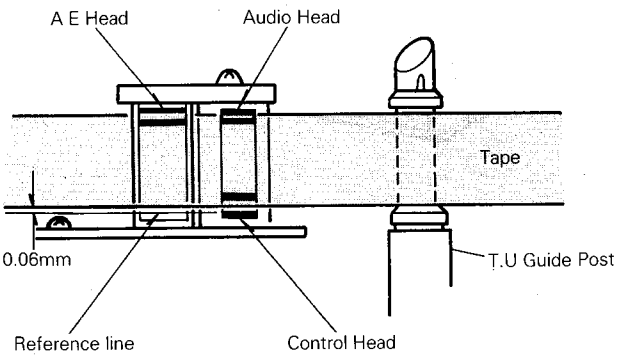
Fig. 4-29

4-15-4 Audio/Control Head Adjustment

When the audio/control head is adjusted, the phase of the control head must also be adjusted.

A. Monitor the audio-out signal with the oscilloscope and playback 7 KHz audio signal (stairstep section).

B. Rotate the nut "A" and adjust to obtain maximum audio output level and the dimensions shown in Fig. 4-30.



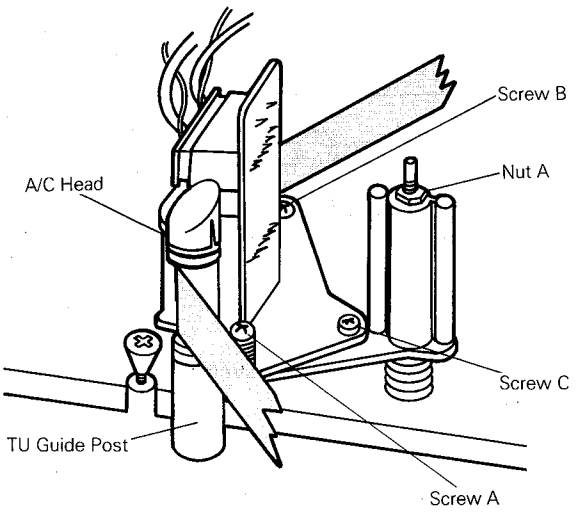


Fig. 4-30

C. Adjust the inclination adjusting screw (C) so that the tape will run along the lower edge of the take-up guide post without creasing as illustrated in Fig. 4-30.

NOTE:

Adjust so that there are absolutely no creases in the tape at the take-up guide post because the tensile force of the tape at this part is very large and creasing will significantly shorten the tape service life.

D. Screw (B) is for adjustment of the azimuth. Adjust to 7 KHz maximum audio output.

E. Be sure that audio level fluctuation is below 2 dB peak-to-peak.

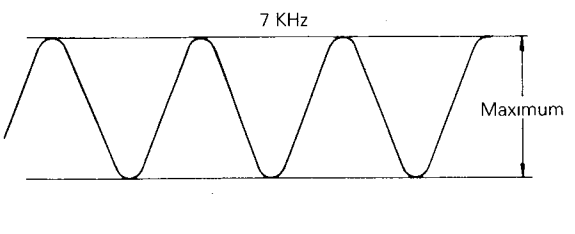


Fig. 4-31

4-15-5 Servo Circuit Adjustment

Following the completion of compatibility adjustments, check the following points.

A. Playback switching point adjustment. (See 3-2-1, page 18)

B. Tracking preset adjustment. (3-2-2, page 18)

4-15-6 Final Check

A. By using a self-recording and playback tape, record and playback the staircase and make sure that FM waveform from the self-recorded tape is approximately the same as that of the alignment tape reproduction.

B. Adjust the audio playback output level and recording level. (See 3-5-1, 3 page 20)

C. Check the Y/C signal circuit adjustments. (See 3-3, page 18)

KEY TO ABBREVIATIONS

A/C : Audio/Control
ACC : Automatic Color Control
A.E : Audio Erase
AFC : Automatic Frequency Control
AFT-D : Automatic Fine Tuning Door Switch
AGC : Automatic Gain Control
AL : After Loading
AMP : Amplifier
ANT : Antenna
A-PB : Audio-Playback
A-REC : Audio-Recording
ALC : Automatic Level Control

BPF : Band-Pass Filter
B/W : Black and White

CASS : Cassette
CP : Capstan
CP-FG : Capstan-Frequency Generator
CP-F/R : Capstan-Forward/Reverse
CP-M : Capstan-Motor
CONV : Converter
CTL : Control
C-LAMP : Cassette Lamp
C-I LAMP : Cassette Indicator Lamp

DAL : Delay-After Loading
DEMOD : Demodulator
DET : Detector
DL : Delay Line
DL-REV : Delay Reverse
DL-FWD : Delay Forward
DOC : Drop Out Compensator

EF : Emitter Follower
EMPHA : Emphasis
EQ : Equalizer
EE : Electronic-Electronic
ES : End Sensor

FE-H : Full Erase Head
FF : Flip Flop or Fast Forward
FG : Frequency generator
FL-SW : Front Loading SW
FLM : Front Loading Motor
F/R-SW : FF/Rewind Switch

G : Ground

HE-1 : Hall Element-1
HE-2 : Hall Element-2
H-LED : Humidity-LED
H-SENS : Humidity-Sensor
HPF : High-Pass Filter

LIM : Limiter
LPF : Low-Pass Filter
LM : Loading Motor

MDA : Motor Drive Amplifier
MC : Mechanical Control
MIC : Microphone
MOD : Modulator

OPE : Operation
OSC : Oscillator

PB : Play Back
PG : Pulse Generator
P/R-SW : P.B/REC-SW
PCB : Printed Circuit Board

REC : Recording
REF : Reference
RIS : Record Inhibit Switch
REW : Rewind
REG : Regulator
RS : Reverse Search

SENS : Sensor
SM : Supply Motor
S/P : Still/Pause
SS : Speed Search
STBY : Stand By
S & H : Sample & Hold
SYNC SEP : Sync Separator

TM : Take up Motor
T-REC : Timer-Recording
T.P : Test Point
TR : Transistor
TU-P : Tuner-Power

UL : Unloading

VS : Voltage Synthesizer
V.SYNC : Vertical Sync
VCO : Voltae Controlled Oscillator
VXO : Variable Crystal Oscillator

W/D : White/Dark

X'OSC : Crystal Oscillator

Y/C : Luminance/Chrominance

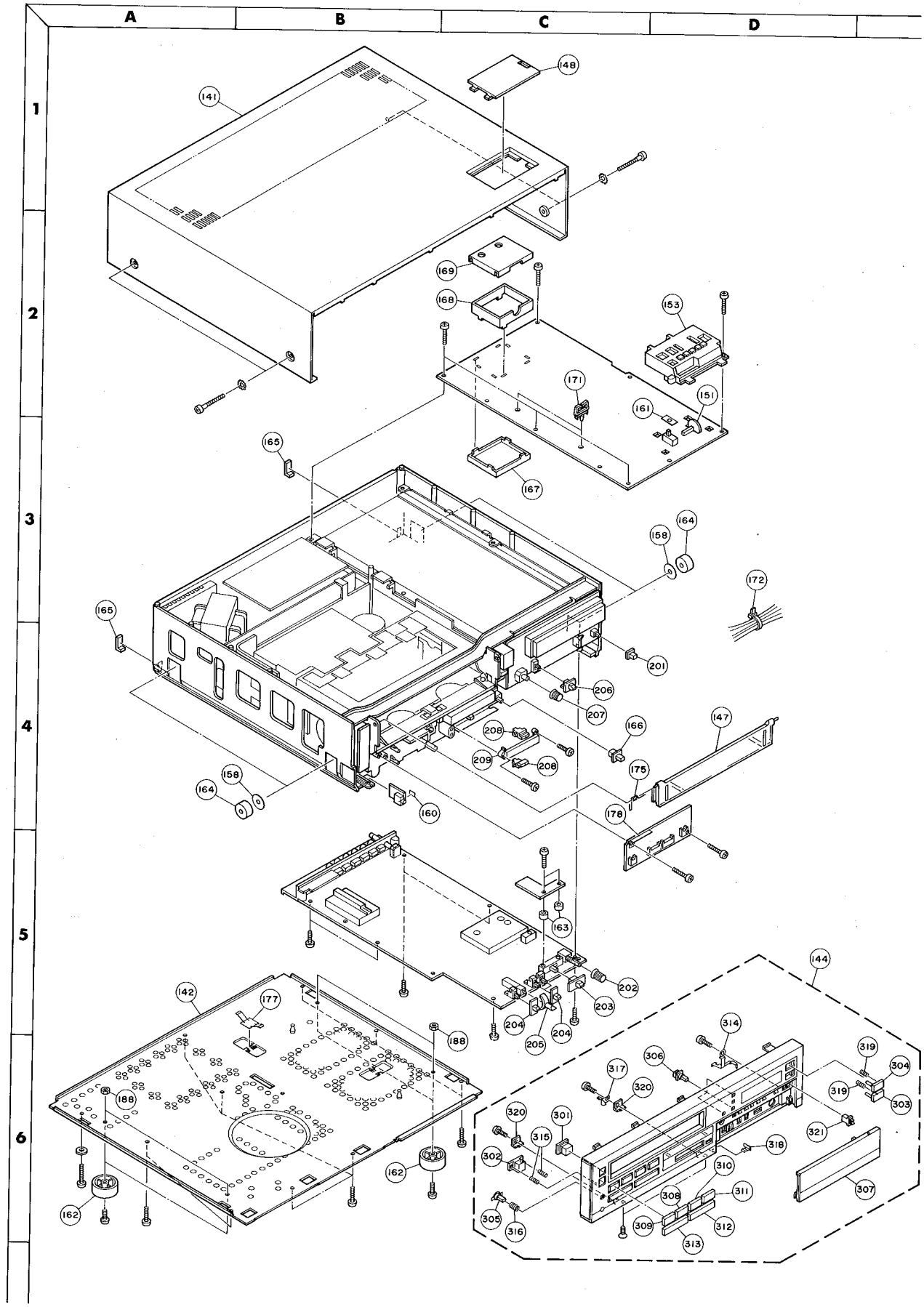
PARTS LIST

1. CABINET ASSEMBLY

Ref. No.	Part No.	Description
141	1414-05401	Cabinet Top
142	1420-00601	Cabinet Bottom
144	1440-00701	Front Panel Assembly
147	1451-02201	Lid, Cassette Door
148	1452-02301	Lid, Channel Preset Section
151	1632-13801	Knob, Tuning (Channel Preset Section)
153	1722-03101	Indication Plate, Channel Preset Section
158	2134-7019	Adhesive Sheet
160	2111-11169	Felt
161	2111-12704	Felt, Tuning Switch (Channel Preset Section)
162	1319-7138	Foot
163	2132-7016	Spacer
164	2132-7129	Spacer
165	2132-7133	Spacer
166	1642-09601VN	Knob, Rec Level
167	2217-7012	Shield Case
168	2217-7013	Shield Case
169	2217-7014	Shield Case
171	2240-7061	Holder, Wiring
172	2240-7120	Holder, Wiring
175	2651-0000206	Spring, Cassette Door
177	2653-00333	Leaf Spring, Bottom
178	2652-00337	Leaf Spring, Function PCB
188	2440-60	Special Nut, Foot
201	734D13601	Push Button, Prog. Rec
202	734D07601	Knob, Phones Level
203	734D12201	Knob, Audio Monitor
204	734D12401	Knob, Rec Source, Normal Audio, Tape Speed
205	734D02701	Knob, Input Select
206	734D12301	Knob, Timer Set
207	734D12501	Knob, Tracking
208	734D12901	Knob, Rec Level
209	702C46902	Cover, Slide

■FRONT PANEL ASSEMBLY

Ref. No.	Part No.	Description
301	A355-VCD1000A	Push Button Assembly, Eject
302	A355-VCD1000B	Push Button Assembly, Power
303	A355-VCD1000C	Push Button Assembly, DOWN Channel Selector
304	A355-VCD1000D	Push Button Assembly, UP Channel Selector
305	A662-VCD1000A	Push Button Assembly, Video/TV
306	A662-VCD1000B	Push Button Assembly, Counter/Timer, Reset, Memory, OTR
307	A443-VCD1000A	Lid Assembly, Front
308	1744-05201	Ornament, Pause
309	1744-05301	Ornament, Rec
310	1744-05401	Ornament, Rew
311	1744-05501	Ornament, F.FWD
312	1744-05601	Ornament, Play
313	1744-05701	Ornament, Stop
314	2652-00335	Leaf Spring, GND
315	2651-2101720	Spring, Power
316	2651-2101718	Spring, Video/TV
317	2652-00336	Leaf Spring
318	2652-00338	Leaf Spring
319	2651-2101719	Spring, UP/DOWN Channel Selector
320	2219-8043	Bracket, Panel
321	2430-7008	Latch, Front Lid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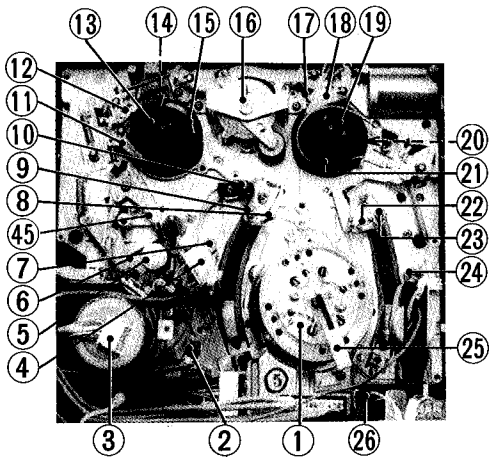
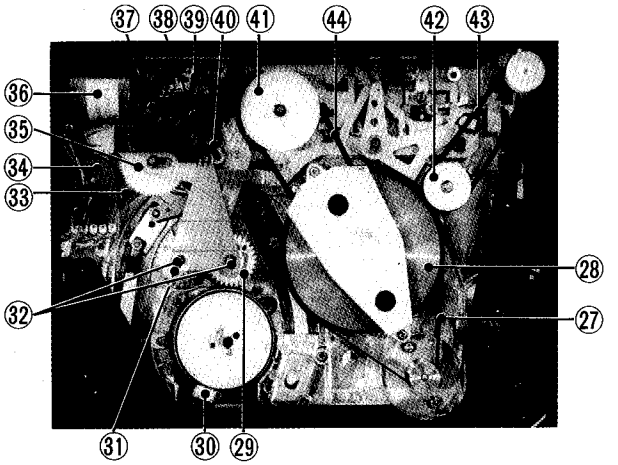
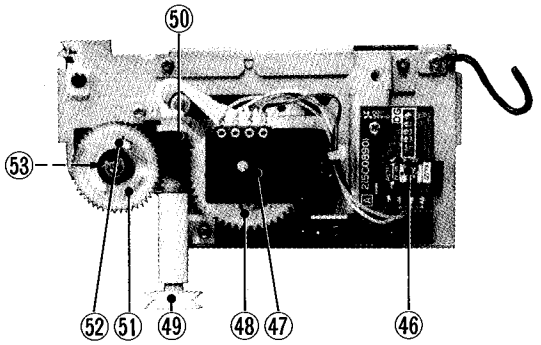
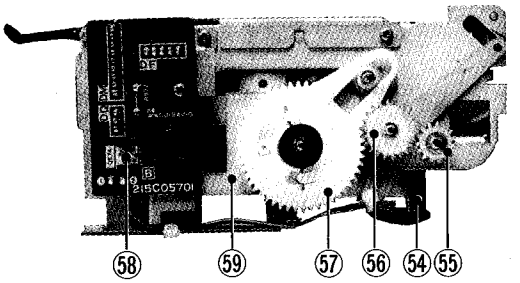
2. DECK ASSEMBLY





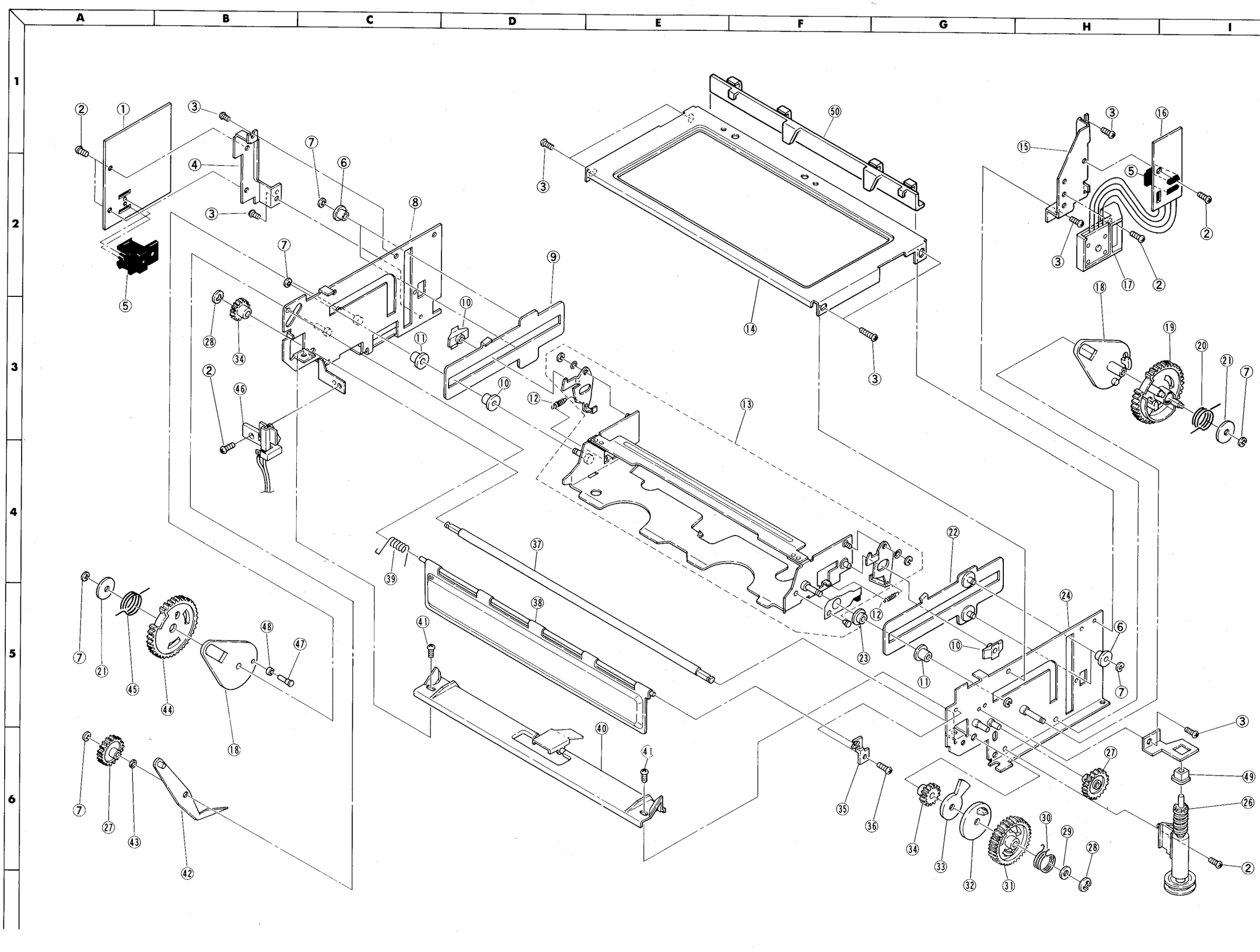




Ref. No.	Part No.	Description
1	948B09303	Assy Drum
2	299P04207	Humidity-sensor
3	288P05302	Capstan Motor (M471)
4	460P04101	Head-A/C (T370)
5	641D70801	Cap-roller
6	522C05502	Pinch-roller
7	669D30001	Screw-taper-head
8	635B02801	Tape-guide-TU
9	522B01001	Guide-roller
10	928C17203	Assy Lamp-cassette
11	641C37501	Brake-sub-TU
12	590B87601	Brake-main-TU
13	522A00102	Reel-disk (Take-up)
14	552C00604	Washer-thrust (3.00 mm x 0.13t)
15	591C95701	Brake-sub-TU2
16	522P00201	Unit-reel-idler
17	590B87501	Brake-main-S
18	641C35901	Brake-sub-S
19	522A00101	Reel-disk (Supply)
20	552C00604	Washer-thrust (3.00 mm x 0.13t)
21	592C03701	Belt-tens-brake
22	635B02701	Tape-guide-S
23	522B01001	Guide-roller
24	460P03401	Head-FE (T371)
25	299C01001	Brush
26	265P06605	Posistor (RP970)
27	521D04101	Belt-CP (Capstan)
28	524B00301	Flywheel-CP
29	525B00401	Arm-load-TU
30	460P04001	PG-Head (T470)
31	525B00501	Arm-load-S
32	685C00701	Grip-ring (ϕ3)
33	641B09301	Cam-gear-A
34	439P00701	SW-mode-selector (S570)
35	641D71101	Gear-2
36	288P05101	Loading Motor (M572)
37	641D71001	Gear-1
38	591C95601	Gear-cam-B1
39	641D78101	Gear-cam-B2
40	641B09401	Cam-gear-B
41	641C34301	Pulley-idler
42	641B10101	Idler-FL
43	521D04201	Belt-FL
44	521D04001	Belt-R
45	635B03301	Arm-TU-G
46	268P02201	Start-sens (Q573)
47	439P00802	SW-FL (Cassette-housing loading SW)
48	641C38201	Gear-cam-TU
49	641B10901	Unit-worm-F
50	641D79801	Trans gear
51	641D79701	Gear-FR
52	641D79601	Pulley-FR
53	641D79901	Gear-TU
54	439C01501	SW-leaf (S571 Rec Safety-SW)
55	641D79901	Gear-TU
56	641D79801	Trans Gear
57	641C38301	Gear-cam-SP
58	268P02201	End-sens (Q574)
59	590A14003	Assy-cassette-housing

ASSEMBLY DECK-1

Ref. No.	Part No.	Description
1	215C05701	PWB-end
2	669D20002	Screw-sems (M2.6 x 0.45 – 6)
3	669D20001	Screw-sems (M2.6 x 0.45 – 4)
4	595D08301	Holder-end
5	268P02201	Photo-transistor
6	641D79401	Roller-FD
7	685C00204	Retaining-ring
8	591B03901	Holder-side-SP
9	592C05402	Guide-horizon
10	641D83301	Slider-D
11	641D79403	Roller-FD
12	570D75001	Spring-lock-B0
13	590A13901	Box-FL
14	591B04101	Roof-FL
15	595D03101	Holder-SW-F
16	215C08901	PWB-start
17	439P00802	SW-FL
18	641D79301	Arm-FD
19	641C38201	Gear-cam-TU
20	570D75801	Spring-F-D-TU
21	552D07701	Washer-thrust (ϕ3.2 x ϕ13 x T0.5)
22	592C05401	Guide-horizon
23	641D79402	Roller-FD
24	591B04001	Holder-side-TU
25	595D06502	Holder-WO
26	641B10901	Unit-worm-F
27	641D79801	Gear-trans
28	685C00206	Retaining-ring
29	552D06501	Washer-thrust (ϕ4 x ϕ12 x T0.5)
30	570D75601	Spring-FD
31	641D79701	Gear-FR
32	641D79601	Pulley-FR
33	641D80001	Spacer-stopper
34	641D79901	Gear-TU
35	641D94201	Holder-door
36		Screw (M2.6 x 0.45 – 4)
37	630D84501	Shaft-FD
38	702C04806	Door-FL
39	570D75301	Spring-door
40	641B11001	Guide-insert
41		Screw (M2.6 x 0.45 – 6)
42	595D02401	Arm-door
43	552C00304	Washer-thrust
44	641C38301	Gear-cam-SP
45	570D75501	Spring-FD-S
46	439C01501	SW-leaf
47	630D84801	Pin
48	630D84901	Roller
49	641D83201	Holder-RM
50	641C44301	Clamper-lead-H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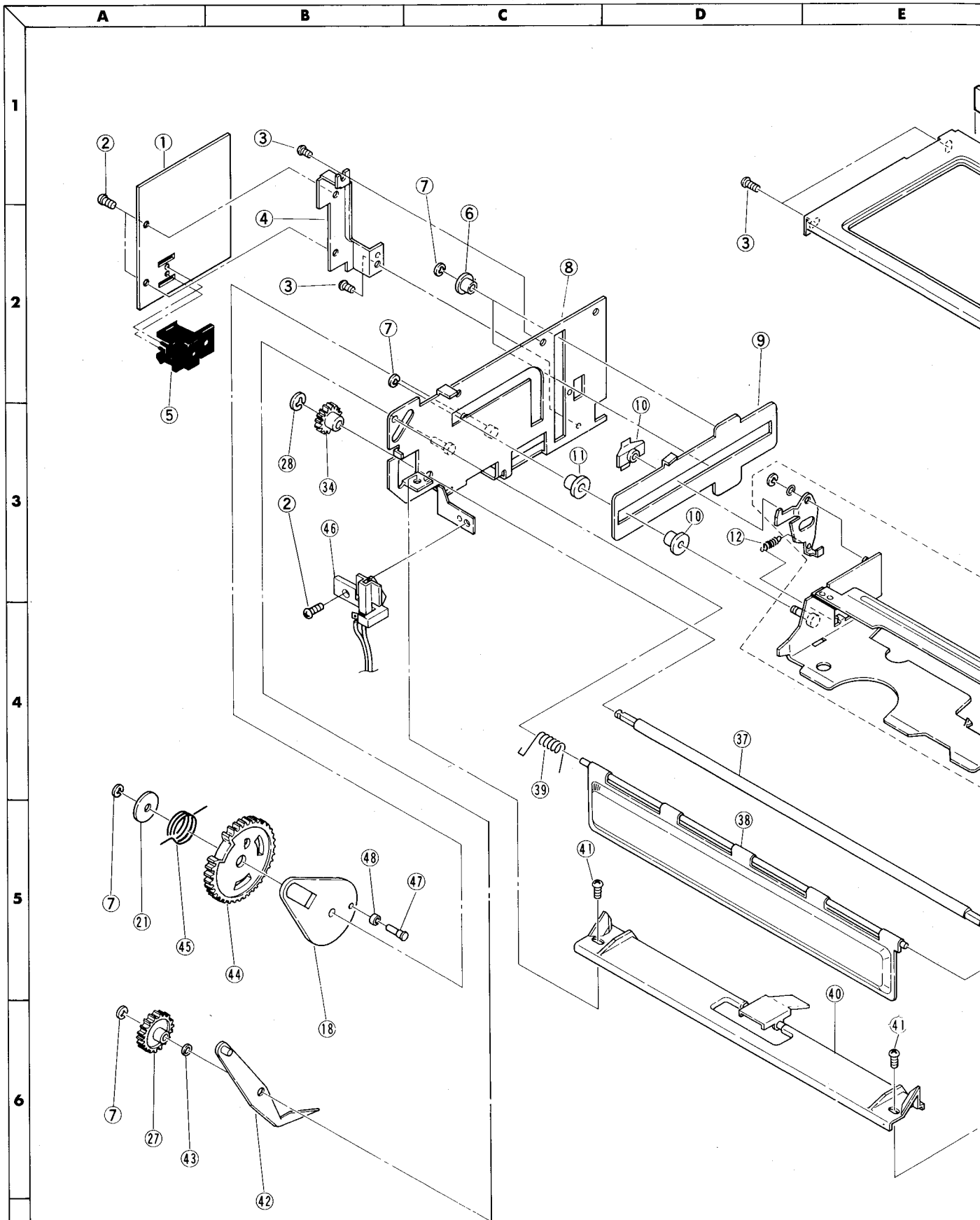
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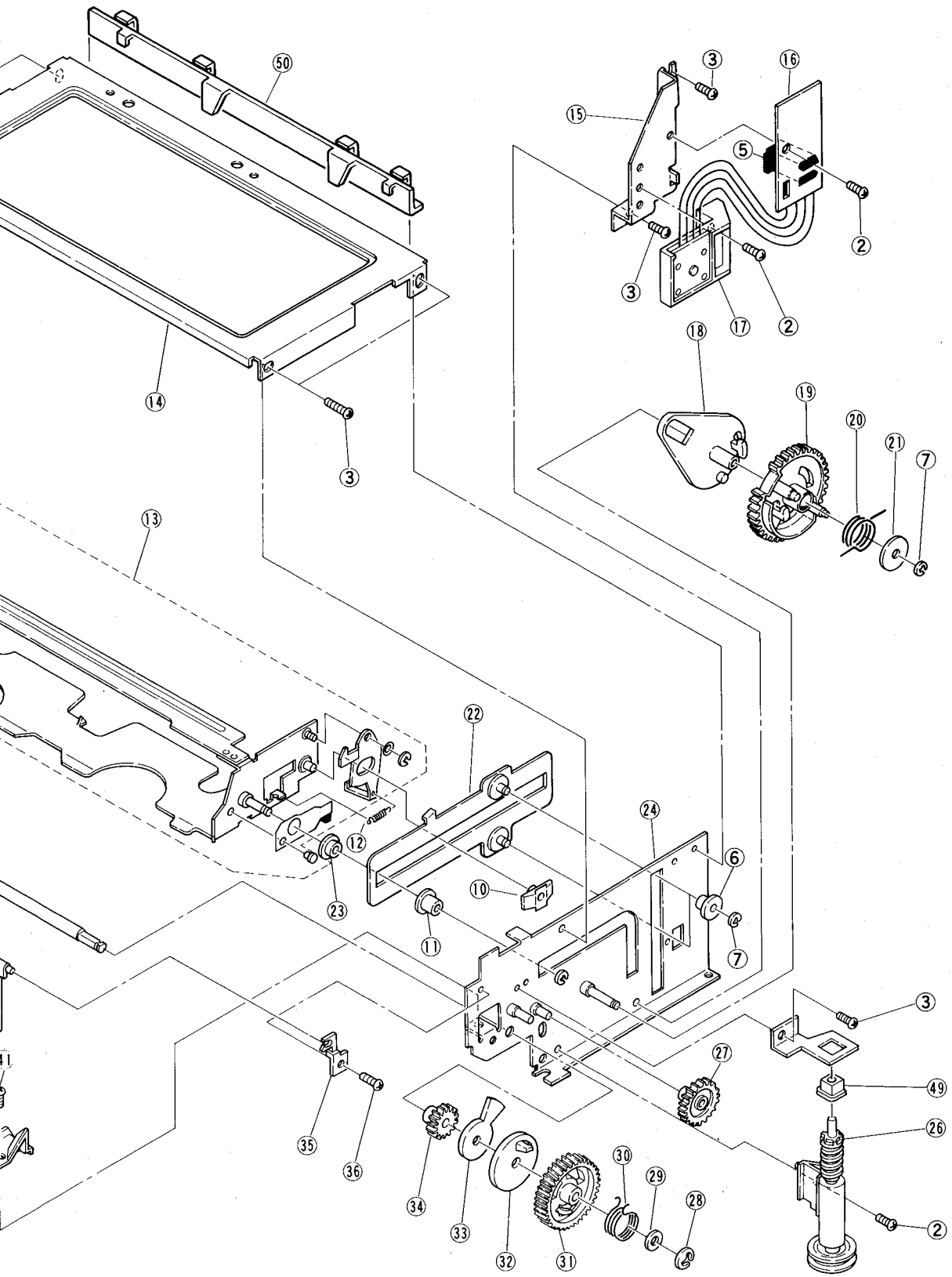
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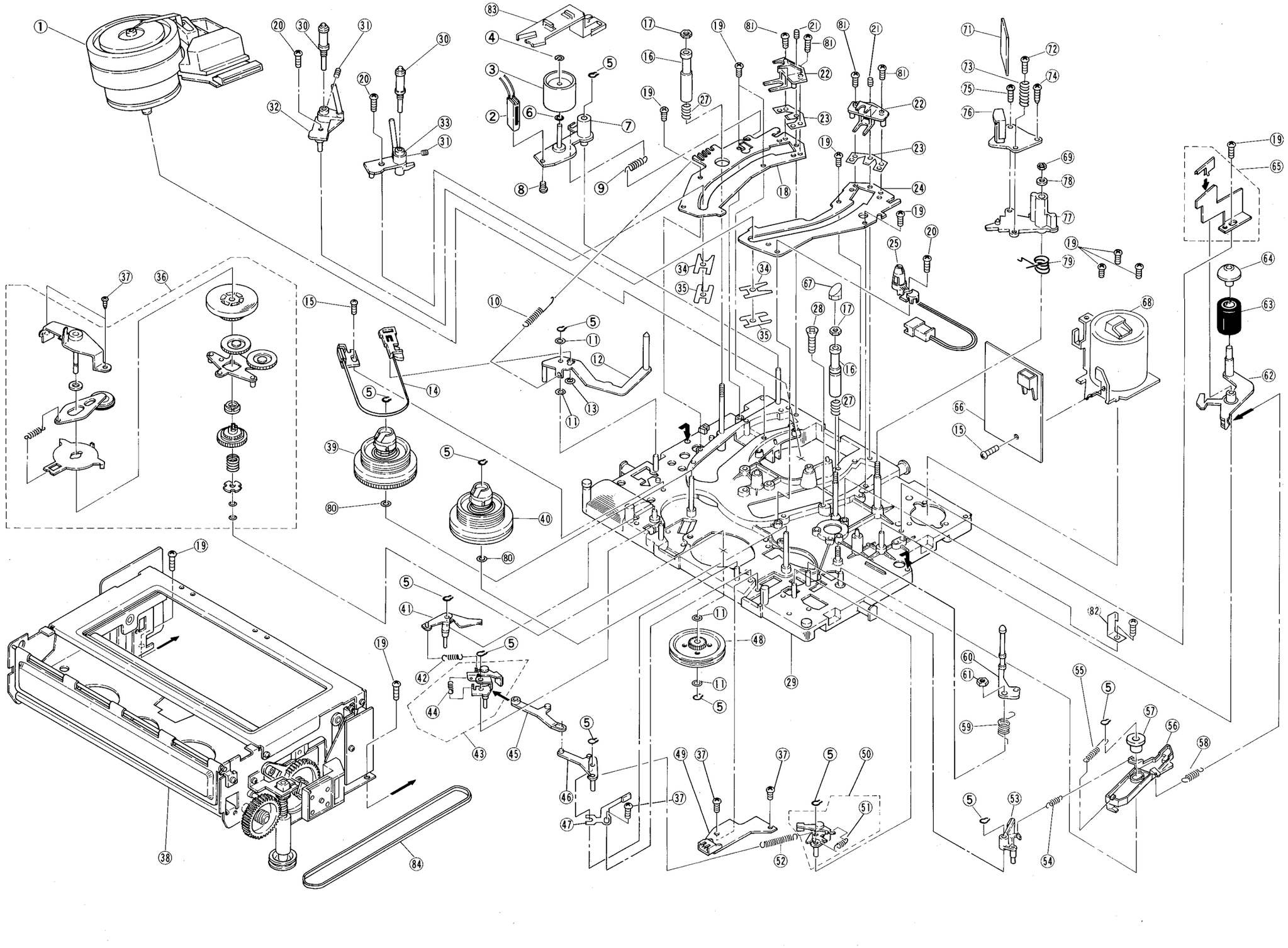
ASSEMBLY DECK-2



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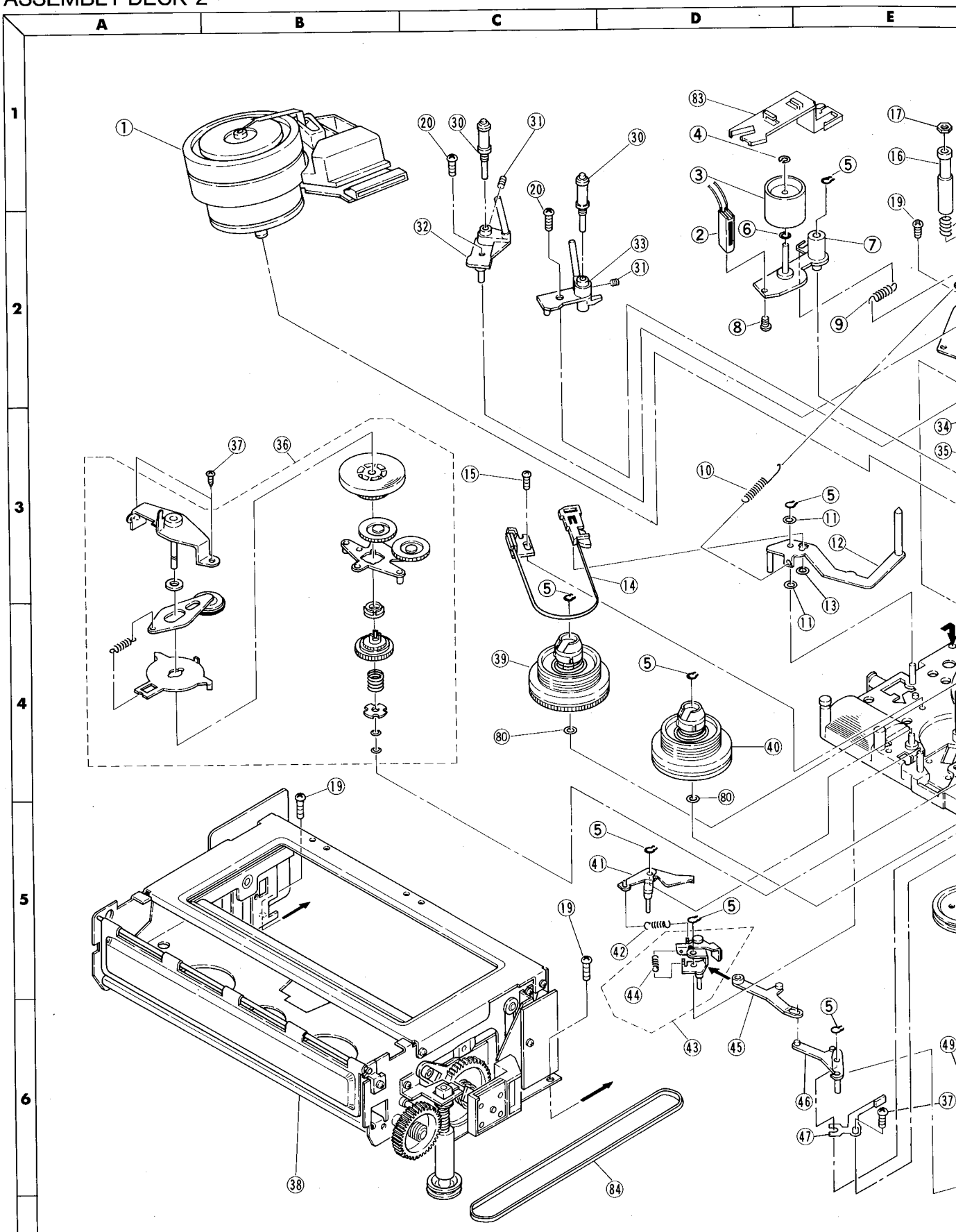

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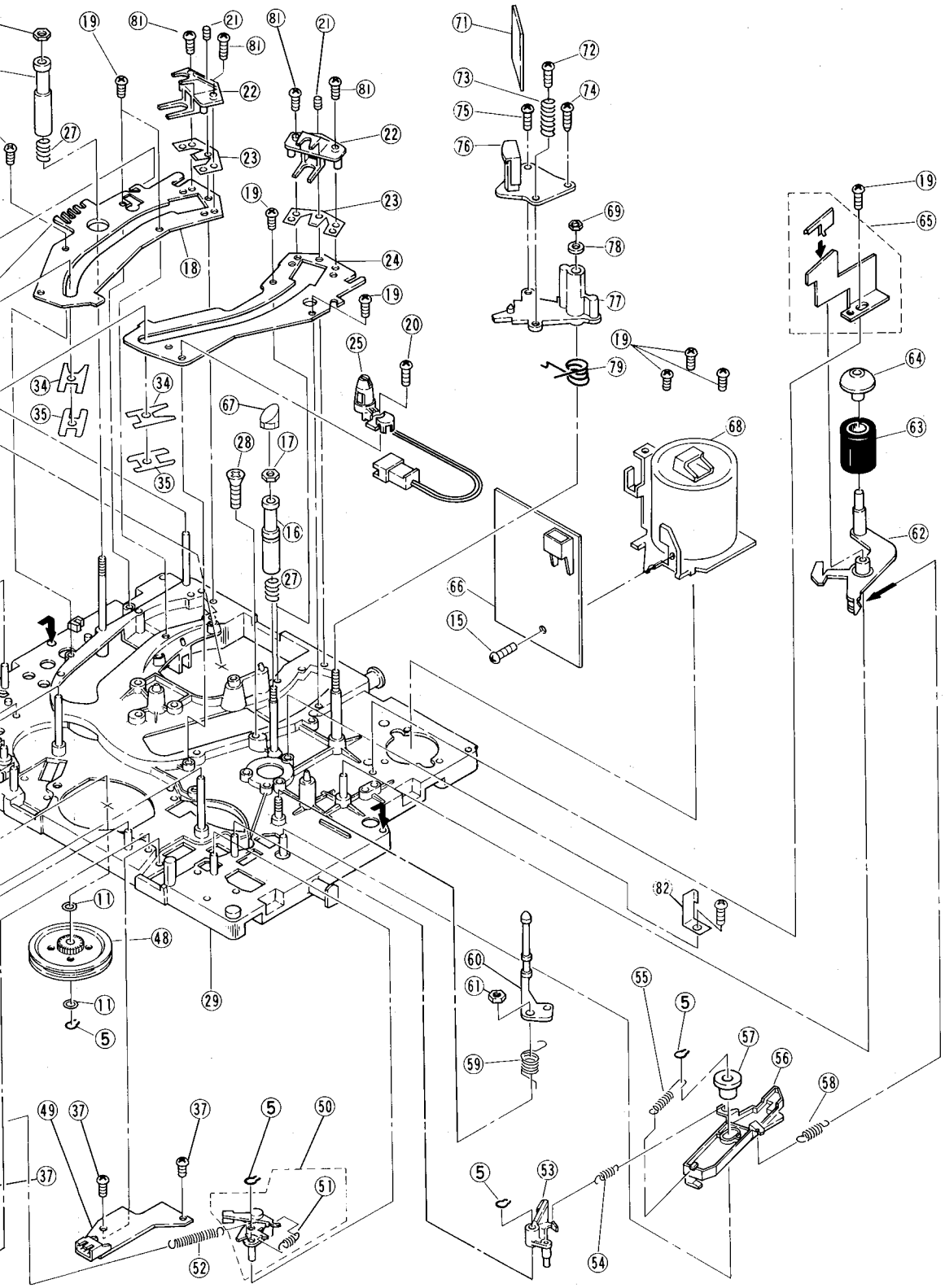
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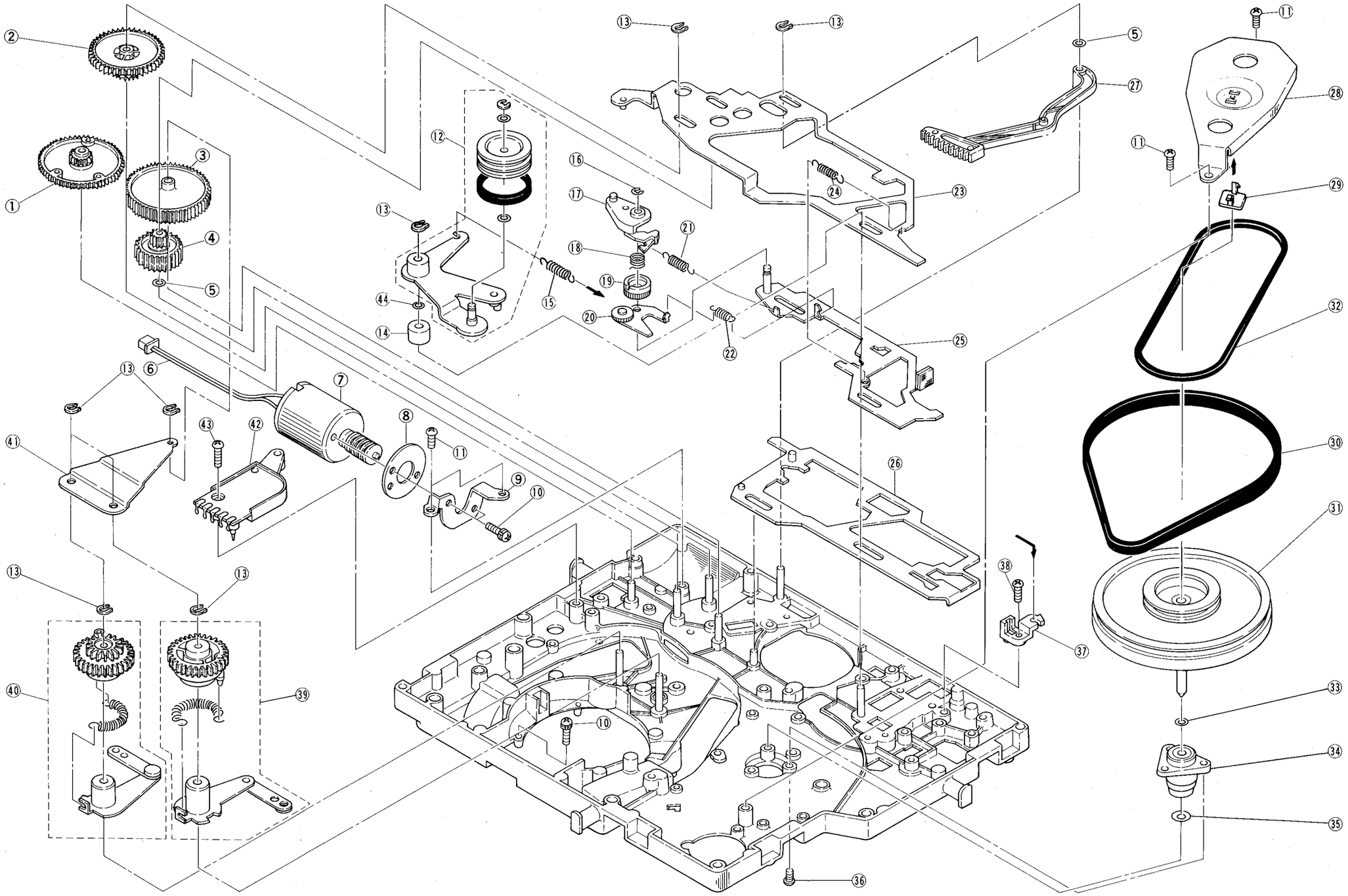
Ref. No.	Part No.	Description
1	948B09303	Assy-drum
2	460P03401	Head-FE
3	641D73901	Roller-IMP
4	552C00701	Washer-cut
5	685C00701	Grip-ring (ϕ3)
6	552C00302	Washer-thrust (ϕ2, t0.5)
7	591C95501	Arm-IMP-S
8	650P20003	Screw-F-FE-PAN (M2 x 0.4 – 3)
9	570D71601	Spring-IMP-S
10	570D71401	Spring-T
11	552C00304	Washer-thrust (ϕ3, t0.5)
12	525C02701	Arm-tension
13	552C00702	Cut-washer (ϕ2)
14	592C03701	Belt-tens-brake
15	669D22801	Screw (M2.6 – 6)
16	630D80002	Guide-pole (Supply)
17	670P33001	Nut-hex
18	590B87201	Plate-guide-S
19	669D22701	Screw (M2.6 – 6)
20	669D22702	Screw (M2.6 – 8)
21	669D19704	Set-screw-F (M3 x 0.5 – 10)
22	635C05601	Arm-stopper
23	570D69401	Spring-arm-STP
24	590B87301	Plate-guide-TU
25	928C17203	Assy-lamp-cassette
27	570D88101	Spring-G-P (Take-up)
28	669D30001	Screw-taper-head
29	948B06901	Assy-main-plate
30	522B01001	Guide-roller
31	669D19702	Set-screw (M3 x 0.5)
32	635B02701	Tape-guide-S
33	635B02801	Tape-guide-TU
34	570D77401	Spring-guide
35	595D00201	Slider
36	522P00201	Unit-reel-idler
37	669D22709	Screw (M2.6 – 4)
38	590A14003	Unit-F/L-D
39	522A00101	Reel-disk (S)
40	522A00102	Reel-disk (TU)
41	641C35901	Brake-sub-S
42	570D72101	Spring-SB-S
43	590B87501	Brake-main-S
44	570D72001	Spring-SB-M
45	641C38401	Lever-idler-sub
46	641C35801	Lever-idler
47	591C95701	Brake-sub-TU2
48	641C34301	Pulley-idler
49	928C15601	Assy-PWB-revsens-TU
50	590B87601	Brake-main-TU
51	570D79101	Spring-TUB-M
52	570D71701	Spring-L-idler
53	641C37501	Brake-sub-TU
54	570D71801	Spring-tub-S
55	570D70101	Spring-pinch
56	641B09501	Cam-lever-pinch
57	641D78601	Roller-cam-L-pinch
58	570D71901	Spring-pinch-OFF
59	570D71201	Spring-arm-TU-G
60	635B03301	Arm-TU-G

Ref. No.	Part No.	Description
61	674D08102	Nut-nylon
62	525B00601	Arm-pinch
63	522C05502	Pinch-roller
64	641D70801	Cap-roller
65	591C95801	Guide-door
66	928C19104	Assy-PWB-CP
67	641D83101	Cap-TU-G
68	288P05302	Motor-CP
69	670P13001	Nut-HEX (M3 x 4)
70	680P13001	Washer
71	215C05501	PWB-A-C
72	650P26106	Screw-F-FE-pan (M2.6 x 0.45 – 16)
73	570D59301	Spring-A-C
74	669D20603	Screw (M3 x 0.5 – 8)
75	650P26008	Screw-F-FE-pan (M2.6 x 0.45 – 8)
76	460P04101	Head
77	635C05201	Arm-A-C
78	680P13001	Washer
79	570D70301	Spring-A-C
80	552C00104	Washer-thrust (ϕ3 t0.25)
81	669D22703	Screw (M2.6 – 10)
82	595D14001	Guard-tape
83	641C44201	Cramper-lead
84	521D04201	Belt-F L

Ref. No.	Part No.	Description
1	948B09303	Assy-drum
2	460P03401	Head-FE
3	641D73901	Roller-IMP
4	552C00701	Washer-cut
5	685C00701	Grip-ring (ϕ3)
6	552C00302	Washer-thrust (ϕ2, t0.5)
7	591C95501	Arm-IMP-S
8	650P20003	Screw-F-FE-PAN (M2 x 0.4 – 3)
9	570D71601	Spring-IMP-S
10	570D71401	Spring-T
11	552C00304	Washer-thrust (ϕ3, t0.5)
12	525C02701	Arm-tension
13	552C00702	Cut-washer (ϕ2)
14	592C03701	Belt-tens-brake
15	669D22801	Screw (M2.6 – 6)
16	630D80002	Guide-pole (Supply)
17	670P33001	Nut-hex
18	590B87201	Plate-guide-S
19	669D22701	Screw (M2.6 – 6)
20	669D22702	Screw (M2.6 – 8)
21	669D19704	Set-screw-F (M3 x 0.5 – 10)
22	635C05601	Arm-stopper
23	570D69401	Spring-arm-STP
24	590B87301	Plate-guide-TU
25	928C17203	Assy-lamp-cassette
27	570D88101	Spring-G-P (Take-up)
28	669D30001	Screw-taper-head
29	948B06901	Assy-main-plate
30	522B01001	Guide-roller
31	669D19702	Set-screw (M3 x 0.5)
32	635B02701	Tape-guide-S
33	635B02801	Tape-guide-TU
34	570D77401	Spring-guide
35	595D00201	Slider
36	522P00201	Unit-reel-idler
37	669D22709	Screw (M2.6 – 4)
38	590A14003	Unit-F/L-D
39	522A00101	Reel-disk (S)
40	522A00102	Reel-disk (TU)
41	641C35901	Brake-sub-S
42	570D72101	Spring-SB-S
43	590B87501	Brake-main-S
44	570D72001	Spring-SB-M
45	641C38401	Lever-idler-sub
46	641C35801	Lever-idler
47	591C95701	Brake-sub-TU2
48	641C34301	Pulley-idler
49	928C15601	Assy-PWB-revsens-TU
50	590B87601	Brake-main-TU
51	570D79101	Spring-TUB-M
52	570D71701	Spring-L-idler
53	641C37501	Brake-sub-TU
54	570D71801	Spring-tub-S
55	570D70101	Spring-pinch
56	641B09501	Cam-lever-pinch
57	641D78601	Roller-cam-L-pinch
58	570D71901	Spring-pinch-OFF
59	570D71201	Spring-arm-TU-G
60	635B03301	Arm-TU-G

Ref. No.	Part No.	Description
61	674D08102	Nut-nylon
62	525B00601	Arm-pinch
63	522C05502	Pinch-roller
64	641D70801	Cap-roller
65	591C95801	Guide-door
66	928C19104	Assy-PWB-CP
67	641D83101	Cap-TU-G
68	288P05302	Motor-CP
69	670P13001	Nut-HEX (M3 x 4)
70	680P13001	Washer
71	215C05501	PWB-A-C
72	650P26106	Screw-F-FE-pan (M2.6 x 0.45 – 16)
73	570D59301	Spring-A-C
74	669D20603	Screw (M3 x 0.5 – 8)
75	650P26008	Screw-F-FE-pan (M2.6 x 0.45 – 8)
76	460P04101	Head
77	635C05201	Arm-A-C
78	680P13001	Washer
79	570D70301	Spring-A-C
80	552C00104	Washer-thrust (ϕ3 t0.25)
81	669D22703	Screw (M2.6 – 10)
82	595D14001	Guard-tape
83	641C44201	Cramper-lead
84	521D04201	Belt-FL

ASSEMBLY DECK-3



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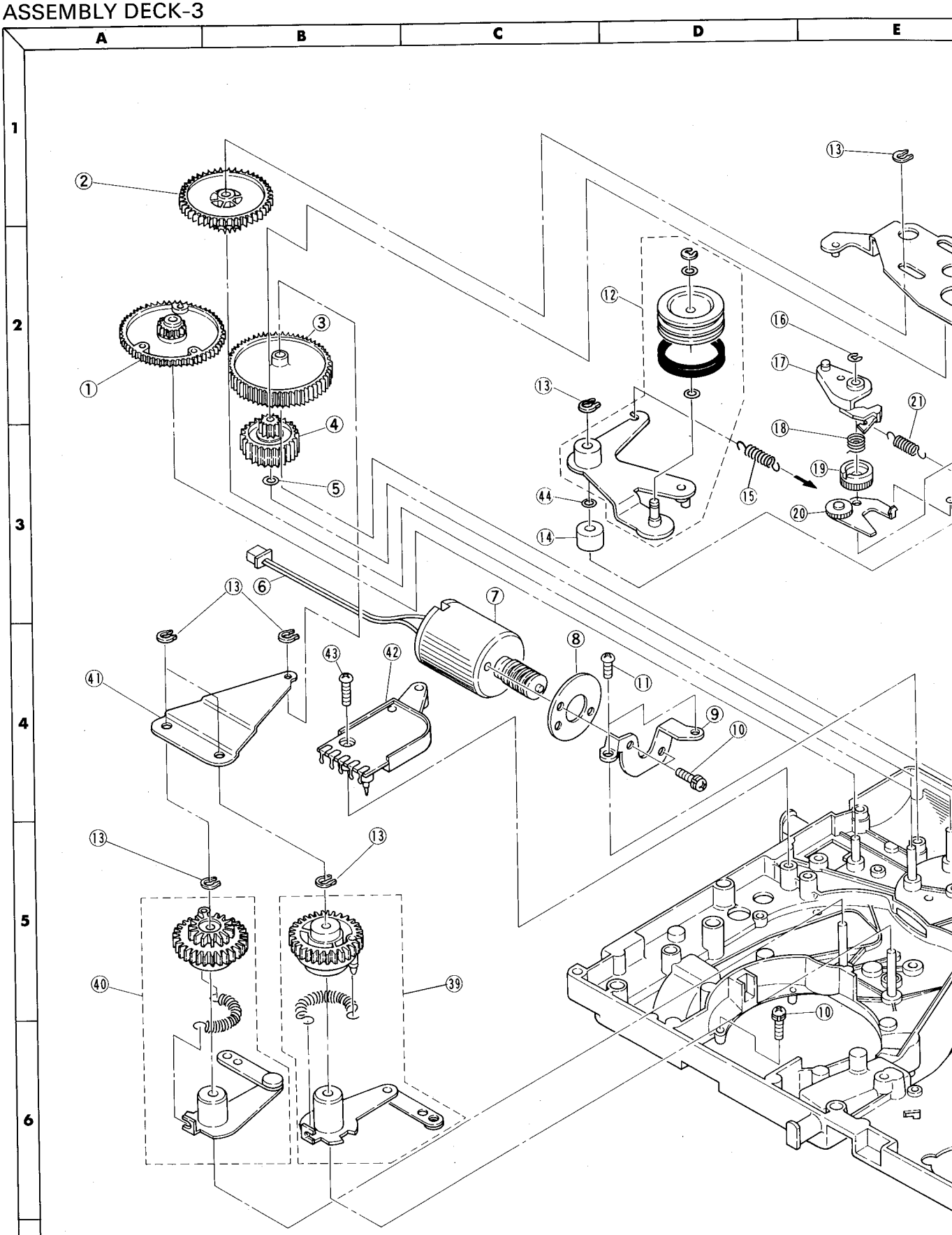

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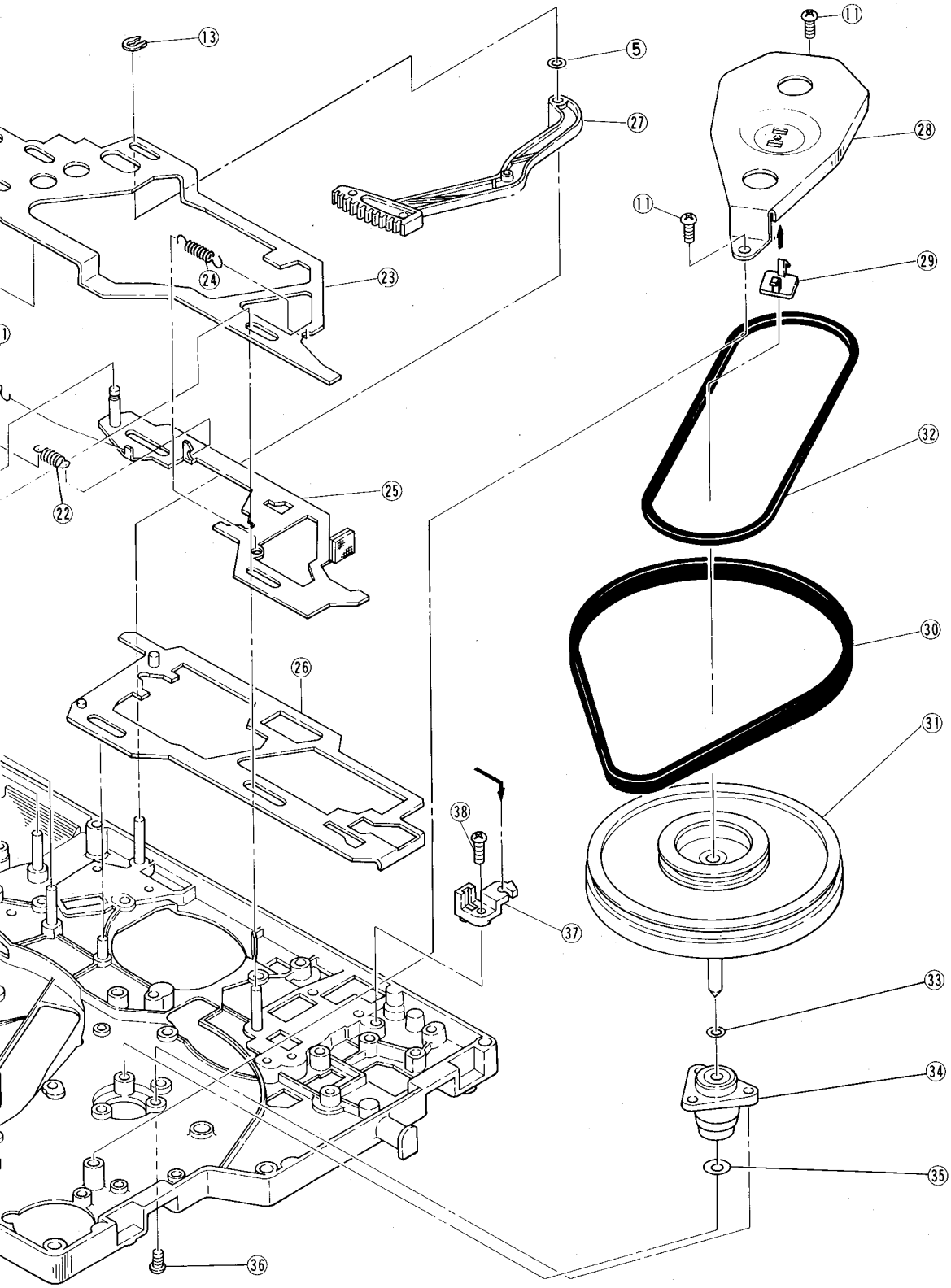


Ref. No.	Part No.	Description
1	641B09301	Cam-gear-A
2	641D71101	Gear-2
3	641B09401	Cam-gear-B
4	641D71001	Gear-1
5	552C00304	Washer-thrust
6	246B13802	Lead-connector-E
7	288P05101	Motor-loading
8	550D09301	Spacer
9	594D77401	Bracket-L-motor
10	669D17308	Screw-sems (M3 x 0.5 – 4)
11	669D22701	Screw (M2.6 x 6)
12	641B10101	Idler-FL
13	685C00701	Grip-ring
14	630D85301	Bush-cam-plate
15	570D72201	Spring-CB
16	685C00204	Retaining-ring
17	641C37401	Arm-cam-brake
18	570D70501	Spring-cam-clutch
19	641D78101	Gear-cam-B2
20	591C95601	Gear-cam-B1
21	570D73701	Spring-cam-brake
22	570D75101	Spring-CB-safety
23	590B87401	Plate-cam-A
24	570D72301	Spring-CC
25	591B03501	Plate-cam-C
26	591B00501	Plate-cam-B
27	635C05301	Arm-gear-load
28	595D08501	Holder-TH-CP
29	641D94301	Plate-thrust
30	521D04101	Belt-CP
31	524B00301	Flywheel-CP
32	521D04001	Belt-R
33	552C00105	Washer-thrust (ϕ3.6 t0.25)
34	635C04601	Holder-shaft-CP
35	641D73101	Seal-CP
36	669D20004	Screw-sems (M2.6 – 10)
37	641D71801	Hook-spring-A
38	669D22702	Screw (M2.6 – 8)
39	525B00401	Arm-load-TU
40	525B00501	Arm-load-S
41	595D09301	Washer-L
42	439P00701	SW-mode-selector
43	669D22704	Screw (M2.6 – 12)
44	552C00408	Washer-thrust (ϕ3 – 8 t0.5)

3. ELECTRICAL PARTS

Ref. No.	Part No.	Description
	CHASSIS MISCELLANEOUS	
⚠	242C49907	Power Cord
⚠	350P27201	Power Transformer
⚠	449P00608	AC Outlet
	295P12501	Tuner P.C. Board Assembly (includes: VIF Pack)
	440P06302	Antenna Terminal
	295P11401	RF Converter, Antenna Terminal
	Y/A P.C. BOARD	
	RESISTORS	
R2A3	5171-121581	120Ω, ±5%, 1W, Metal
	CONTROLS	
VR201	5101-20271920	2kΩB
VR2A0, 6A1	5101-10271920	1kΩB
VR2A1	129D11701	2kΩB
VR2A2	5101-50271920	5kΩB
VR3A1	5101-20371920	20kΩB
VR3A2	5101-10471920	100kΩB
VR3A3	5101-10371920	10kΩB
VR3A4	5101-30171920	300ΩB
VR3G0	129C09803	10kΩAx2, Phones Level
	CAPACITORS	
C201, 203, 207, 2A7, 2C5, 3G2, 3M3, 6A0, 6A4, 6B1, 6B7	5345-336C041	33μF, ±20%, 16V, Electrolytic
C204, 222, 3A2, 3A4, 3C4, 3C8, 3D2, 3D4, 3D8, 3G4, 3G5, 3J2, 3J4, 3J6, 3J7, 3J8, 3J9, 3P2, 3P3, 3P4, 6A6	5345-106F041	10μF, ±20%, 50V, Electrolytic
C209, 2A0, 2B1, 2C0, 2C3	5345-476B041	47μF, ±20%, 10V, Electrolytic
C210, 220, 2B5, 3G6, 3G7	5345-107B041	100μF, ±20%, 10V, Electrolytic
C212, 213, 3B3	5345-226D041	22μF, ±20%, 25V, Electrolytic
C216, 2C7	5345-105F041	1μF, ±20%, 50V, Electrolytic
C2B2	5342-105F041	1μF, ±20%, 50V, Electrolytic
C2C4, 3A6, 3A8, 3A9, 3C0, 3C1, 3C9	5345-475F041	4.7μF, ±20%, 50V, Electrolytic
C2C6	5345-227C014	220μF, ±20%, 16V, Electrolytic
C2C9	5345-476B041	47μF, ±20%, 10V, Electrolytic
C2D2	5345-476D041	47μF, ±20%, 25V, Electrolytic
C3A3, 3A5, 3C3, 3G3	5345-107D041	100μF, ±20%, 25V, Electrolytic
C3A7	5345-225F041	2.2μF, ±20%, 50V, Electrolytic
C3C5, 3G0, 3G1	5345-474F041	0.47μF, ±20%, 50V, Electrolytic
C3D1, 3D3, 3K0, 3K1	5345-476B0951	47μF, ±20%, 10V, Electrolytic
C3R4	5345-336B0951	33μF, ±20%, 10V, Electrolytic
C6A3	5345-224F041	0.22μF, ±20%, 50V, Electrolytic
C6A7	5345-334F041	0.33μF, ±20%, 50V, Electrolytic
C6A9	5342-225F041	2.2μF, ±20%, 50V, Electrolytic
VC6A0, 6A1	202P21005	Trimmer Capacitor, 9.8pF–60pF
	INTEGRATED CIRCUITS	
IC2A0	267P73801	M51450G
IC2A1	267P73901	M51451G
IC3A0	266P39801	LA7042
IC3A1	266P39101	LA4170
IC3A2	266P44501	TK15050
IC3A4	263P05309	TC4053BP
IC6A0	267P60201	M51452G

⚠ SAFETY RELATED COMPONENT. USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.

Ref. No.	Part No.	Description
	TRANSISTORS	
Q201, 202, 204, 206, 2A0, 2A5	5613-2724(C)	2SC2724(C) or 2SC2724(D)
Q203, 2A1	5613-1213(C)	2SC1213(C)
Q205	260P25504	2SA950(Y)
Q2A2, 3A2, 3B1	5611-1115(E)	2SA1115(E) or 2SA1115(F)
Q2A3, 2A4, 2A6, 3A3, 3A4, 3H5, 3H7, 601, 6A1, 6A2	260P45501	DTC124F
Q3A0, 3A1, 3H0, 3H1, 3H2, 3H3, 602	5613-2603(E)	2SC2603(E) or 2SC2603(F)
Q3H8	5613-2878(B)	2SC2878(B)
	DIODES	
D2A0, 3A0, 603, 604, 605	5636-1S2472	1S2472
D3R2	5631-1S2473	1S2473
D601	264C33701	MC921
	COILS	
L201, 202, 206, 2A1, 2A5, 6A0, 6A1, 6A4, 6A6, 6A7	5995-101269	100μH
L203, 211	5995-270269	27μH
L204, 205	5995-100269	10μH
L207	5995-330269	33μH
L208, 212, 2A4, 3A3	5995-221269	220μH
L214	5995-2R2269	2.2μH
L215	5995-181269	180μH
L216	5995-121269	120μH
L2A2, 6A5	5995-560269	56μH
L2A3	5995-220269	22μH
L2A6, 3A2	321C01004	1mH
L3A1	321C01105	8.2mH
L6A9	5995-471269	470μH
	MISCELLANEOUS	
BPF6A0, 6A1	409P21601	Band Pass Filter, SLC-2667
CF6A0	296P02601	Ceramic Filter, SFE 4.21MB
DF2A0	409P15501	Delay Equalizer, GZV-560-2T
DL201	337P05001	Delay Line, EGD-YN645A15A
DL6A0	337P06201	Delay Line, EFD-VR645B15G
LPF2A0	409P18402	Low Pass Filter, LC-2275A
LPF6A0, 6A1	409P21701	Low Pass Filter, SLC-2490A
OSC3A0	409P18602	Bias Osc. Block, HSSV-012
S3A1	434C01804	Lever Switch, Input Selector
S3A2	431C04401	Slide Switch, Audio Monitor
S3A3, 3A5	431C05501	Slide Switch, Normal Audio, Rec. Source
3A8	431C05601	Slide Switch, Tape Speed
X6A0, 6A1	285P01501	Quartz Crystal, HC-181U, 3.579545MHz
	MCS P.C. BOARD	
	RESISTORS	
R3026	5174-822381	8.2kΩ, ±1%, 1/4W, Metal
R3047	5174-470381	47Ω, ±1%, 1/4W, Metal
R3074	5174-562381	5.6kΩ, ±1%, 1/4W, Metal
R3096, 3119	5174-203381	2kΩ, ±1%, 1/4W, Metal
R3100, 3106, 3122,3128	5174-362381	3.6kΩ, ±1%, 1/4W, Metal
R3104, 3125	5174-512381	5.1kΩ, ±1%, 1/4W, Metal
R3105, 3126	5174-102381	1kΩ, ±1%, 1/4W, Metal
	CONTROLS	
VR3001, 3004	5101-50201929	5kΩB
VR3002, 3003	5101-10371920	10kΩB
VR3005, 3010	5101-50271920	5kΩB
VR3006, 3008	5101-20271920	2kΩB
VR3007, 3009	5101-20371920	20kΩB

Ref. No.	Part No.	Description
	CAPACITORS	
C3001, 3007, 3016, 3023, 3026, 3027, 3028, 3031, 3045, 3047, 3103, 3107, 3114, 3145, 3170	5345-106F041	10μF, ±20%, 50V, Electrolytic
C3003, 3005, 3020, 3022, 3025, 3037, 3041, 3043, 3093, 3094, 3095, 3096, 3106	5345-475F041	4.7μF, ±20%, 50V, Electrolytic
C3006	5345-335C041	3.3μF, ±20%, 16V, Electrolytic
C3012	5345-474F041	0.47μF, ±20%, 50V, Electrolytic
C3013	5345-224F041	0.22μF, ±20%, 50V, Electrolytic
C3014, 3144	5345-335F041	3.3μF, ±20%, 50V, Electrolytic
C3017, 3092	5345-227C041	220μF, ±20%, 16V, Electrolytic
C3021, 3024, 3042, 3044, 3046, 3054, 3091, 3101, 3188	5345-336C041	33μF, ±20%, 16V, Electrolytic
C3032, 3034, 3035, 3052, 3057, 3060, 3127, 3128, 3135, 3142, 3147, 3155, 3156, 3161, 3171, 3173, 3185, 3186	5345-105F041	1μF, ±20%, 50V, Electrolytic
C3033	5345-226C041	22μF, ±20%, 16V, Electrolytic
C3040	5345-475E0961	4.7μF, ±20%, 35V, Electrolytic
C3097	5342-475F041	4.7μF, ±20%, 50V, Electrolytic
C3102	5345-475E041	4.7μF, ±20%, 35V, Electrolytic
C3105	5345-336D041	33μF, ±20%, 25V, Electrolytic
C3111	5345-475D041	4.7μF, ±20%, 25V, Electrolytic
C3113	5345-475D0961	4.7μF, ±20%, 25V, Electrolytic
C3121	5342-475D041	4.7μF, ±20%, 25V, Electrolytic
C3140, 3166	5345-335D0951	3.3μF, ±20%, 25V, Electrolytic
C3143, 3168	5345-476D041	47μF, ±20%, 25V, Electrolytic
C3150, 3180	5345-106C0951	10μF, ±20%, 16V, Electrolytic
C3151	5345-476C0961	47μF, ±20%, 16V, Electrolytic
C3154, 3184	5345-104F041	0.1μF, ±20%, 50V, Electrolytic
C3157, 3158	5345-227B041	220μF, ±20%, 10V, Electrolytic
C3159	5345-336E041	33μF, ±20%, 35V, Electrolytic
C3169	5345-335F0961	3.3μF, ±20%, 50V, Electrolytic
	INTEGRATED CIRCUITS	
IC3001	266P35001	LA3350B
IC3002	266P31501	TA7061AP
IC3003	266P67001	TA7133P
IC3004, 3006	266P28101	AN6291
IC3005, 3007, 3008	266P62102	μPC741C or MA741CP
	TRANSISTORS	
Q3001, 3002, 3003, 3005, 3006, 3007, 3008, 3009, 3010, 3011, 3012, 3013, 3015, 3018, 3019, 3020, 3021, 3022, 3023, 3024, 3025, 3026, 3030, 3031, 3033, 3041, 3042, 3043, 3044	5613-2603(E)	2SC2603(E) or 2SC2603(F)
Q3004, 3017	260P45401	DTA124F
Q3014, 3016	5611-1115(E)	2SA1115(E) or 2SA1115(F)
Q3027, 3028, 3032, 3045	260P45501	DTC124F
	DIODES	
D3001, 3002, 3006, 3007, 3008	5636-1S2472	1S2472
D3003	5635-HZ9C	Zener, HZ9C
D3004, 3005	5635-HZ6C	Zener, HZ6C

Ref. No.	Part No.	Description
	TRANSFORMERS	
T3001	389P00201	MPX Det.
	MISCELLANEOUS	
BPF3Z1	409P22001	Band Pass Filter, BL-68 QA
LPF3Z1, 3Z2, 3Z4	409P21901	Low Pass Filter, BL-30 KB
LPF3Z3	409P21902	Low Pass Filter, BL-30 TF
	HI-FI P.C. BOARD	
	RESISTORS	
R3216, 3416	5178-202481	2kΩ, ±2%, 1/4W, Metal
R3241, 3441	5178-362481	3.6kΩ, ±2%, 1/4W, Metal
R3244, 3444	5178-273481	27kΩ, ±2%, 1/4W, Metal
R3246, 3446	5178-512481	5.2kΩ, ±2%, 1/4W, Metal
R3255, 3455	5178-122481	1.2kΩ, ±2%, 1/4W, Metal
	CONTROLS	
VR3201, 3204, 3401, 3404	5101-10201929	1kΩ
VR3203, 3403	5101-30101929	300Ω
VR3205, 3405	5101-10301929	10kΩ
VR3206, 3406	5101-50201929	5kΩ
VR3301	5101-20201929	2kΩ
VR3604	5101-10401929	100kΩ
VR8V0	5103-1040015	100kΩ
	CAPACITORS	
C3201, 3233, 3252, 3263 3273, 3274, 3317, 3401, 3433, 3452, 3463, 3473, 3474	5345-336B0951	33μF, ±20%, 10V, Electrolytic
C3202, 3205	5353-680534	68pF, ±1%, 500V, Mica
C3203, 3403	5359-4715851	470pF, ±5%, 100V, Polypropylene
C3206	5353-561535	560pF, ±5%, 50V, Mica
C3207, 3245, 3407, 3445	5345-476B0951	47μF, ±20%, 10V, Electrolytic
C3208, 3209, 3220, 3230, 3232, 3236, 3240, 3255, 3253, 3256, 3277, 3278, 3310, 3312, 3408, 3409, 3420, 3430, 3432, 3436, 3440, 3455, 3605, 3610	5345-107B041	100μF, ±20%, 10V, Electrolytic
C3211, 3213, 3235, 3247, 3249, 3250, 3265, 3266, 3267, 3325, 3411, 3413, 3435, 3447, 3449, 3450, 3465, 3466, 3467	5345-106C0951	10μF, ±20%, 16V, Electrolytic
C3212, 3214, 3412, 3414	5359-103541	10000pF, ±5%, 100V, Polypropylene
C3215, 3246, 3415, 3446	5359-2715851	270pF, ±5%, 100V, Polypropylene
C3216, 3416	5353-100934	10pF, ±0.5pF, 500V, Mica
C3217, 3222, 3417, 3422	5359-3315851	330pF, ±5%, 100V, Polypropylene
C3221, 3421	5359-8215851	820pF, ±5%, 100V, Polypropylene
C3234, 3434	5359-2025851	2000pF, ±5%, 100V, Polypropylene
C3237, 3437	5345-225F0951	2.2μF, ±20%, 50V, Electrolytic
C3238, 3438	5345-335F0951	3.3μF, ±20%, 50V, Electrolytic
C3244, 3444	5359-153541	15000pF, ±5%, 100V, Polypropylene
C3248, 3448	5359-1015851	100pF, ±5%, 100V, Polypropylene
C3254, 3454	5345-227A0951	220μF, ±20%, 6.3V, Electrolytic
C3260, 3262, 3460, 3462	5359-1827851	1800pF, ±2%, 100V, Polypropylene
C3261, 3461	5359-3327851	3300pF, ±2%, 100V, Polypropylene
C3264, 3464	5345-226C0951	22μF, ±20%, 16V, Electrolytic
C3268, 3270, 3468, 3470	5359-1825851	1800pF, ±5%, 100V, Polypropylene
C3269, 3469	5359-3325851	3300pF, ±5%, 100V, Polypropylene
C3305, 3313, 3316	5345-105F0951	1μF, ±20%, 50V, Electrolytic
C3402, 3405	5353-470534	47pF, ±5%, 500V, Mica
C3406	5353-391535	390pF, ±10%, 50V, Mica
C3501	5345-226D0951	22μF, ±20%, 25V, Electrolytic

Ref. No.	Part No.	Description
C3601	5345-475D0951	4.7μF, ±20%, 25V, Electrolytic
C3602	5359-1025851	1000pF, ±5%, 100V, Polypropylene
C3608	5345-477D0962	470μF, ±20%, 25V, Electrolytic
C8B0	5345-105F0961	1μF, ±20%, 50V, Electrolytic
	INTEGRATED CIRCUITS	
IC3X0, 3X3	5652-HA12066	HA12066
IC3X2, 3X5	5652-HA11789N	HA11789N
IC3Y0	5652-AN6320N	AN6320N
IC3Y1	5654-TC4030BP	TC4030BP
IC3Y2, 3Y3	5652-BA401	BA401
IC3Y4	5654-TC4013BP	TC4013BP
IC8A1	5651-B024	B024
	TRANSISTORS	
Q3201, 3202, 3204, 3207, 3210, 3211, 3216, 3217, 3221, 3223, 3224, 3226, 3231, 3307, 3310, 3401, 3402, 3404, 3407, 3410, 3411, 3416, 3417, 3421, 3423, 3424, 3431, 3502, 3503, 3601, 3603, 3605	5613-2603(E)	2SC2603(E) or 2SC2603(F)
Q3203, 3206, 3208, 3209, 3212, 3214, 3215, 3218, 3219, 3220, 3222, 3225, 3403, 3406, 3408, 3409, 3412, 3414, 3415, 3418, 3419, 3420, 3422, 3425, 3501, 3505, 3602, 3604	5611-1115(E)	2SA1115(E) or 2SA1115(F)
Q3205, 3405	5613-2878(B)	2SC2878(B)
Q3301, 3302, 3303	5613-2724(C)	2SC2724(C)
Q3306, 3308, 3309	5613-2724(C)	2SC2724(C) or 2SC2724(D)
Q3304	5613-3242(E)	2SC3242(E) or 2SC3242(F)
Q3305	5611-1282(E)	2SA1282(E) or 2SA1282(F)
	DIODES	
D3201, 3202, 3401, 3402	5636-1SS87	1SS87
D3203, 3403	5635-HZ7B2L	Zener, HZ7B2L
D3204, 3404	5635-RD3R3EB2	Zener, RD3.3EB2
D3301, 3501, 3502, 3503, 3601, 3602, 3603, 3604, 3605, 8A1, 8V0, 8V2	5631-1S2473	1S2473
	COILS	
L3201	5995-121269	120μH
L3302	5995-330269	33μH
L3301, 3303	5995-3R3269	3.3μH
L3304, 3401, 3601, 3602	5995-101269	100μH
	MISCELLANEOUS	
F3201, 3203, 3401, 3403	5933-70130	LC Components
F3301	5214-65	LC Components
F3202, 3204, 3402, 3404	5933-70230	LC Components
F3302	5214-66	LC Components
HG	4443-0201102	Connector, 2 Pos.
HJ	4443-0301102	Connector, 3 Pos.
HC	4443-0401102	Connector, 4 Pos.
HS	4443-0601114	Connector, 7 Pos.
HE, HT	4443-0701114	Connector, 8 Pos.
HD	4443-0901114	Connector, 10 Pos.
S8V0	4462-012012	Lever Switch, Band Selector
S8V1	4421-0220141	Slide Switch, Tuning
S8V2, 8V3, 8V4, 8V5, 8V6	4431-A010156	Push Switch, Channel Set, Memory, Fine

Ref. No.	Part No.	Description
	CONTROL P.C. BOARD	
	CONTROLS	
VR4A0, 4A1, 4A4	5101-104083V	100kΩB
	CAPACITORS	
C4A3, 4A5, 4B3, 4B4, 4F5, 4F6, 4F7, 4M2	5345-476-10	47μF, ±20%, 10V, Electrolytic
C4F3, 4F4, 4S0	5345-106-50	10μF, ±20%, 50V, Electrolytic
C4G0, 4M3, 4R5, 5A0, 5A1	5345-336-16	33μF, ±20%, 16V, Electrolytic
C4J3	5345-104-50	0.1μF, ±20%, 50V, Electrolytic
C4K4	5345-106-16	10μF, ±20%, 16V, Electrolytic
C4M1	5342-225-50	2.2μF, ±20%, 50V, Electrolytic
C4N0, 5E5	5345-105-50	1μF, ±20%, 50V, Electrolytic
C4P1, 5E6	5345-225-50	2.2μF, ±20%, 50V, Electrolytic
C4Q0, 5E3	5345-475-50	4.7μF, ±20%, 50V, Electrolytic
C4S1, 4S2	5345-226-10	22μF, ±20%, 10V, Electrolytic
C5C0	5345-226-25	22μF, ±20%, 25V, Electrolytic
C5C2	5345-335-50	3.3μF, ±20%, 50V, Electrolytic
C5D2	5345-105C951	0.1μF, ±20%, 50V, Electrolytic
C5E2	5345-336-16	33μF, ±20%, 16V, Electrolytic
	INTEGRATED CIRCUITS	
IC4A0	266P05902	AN6346N
IC4A1	263P80803	MN6168MBC
IC4A2	266P06002	AN6357N
IC4A3	266P44701	BA728
IC4A4	263P07702	TC4077BP
IC4A5	266P80001	AN6342N
	TRANSISTORS	
Q4A1, 4M0, 5B5, 5C0, 5C1	5611-1115(E)	2SA1115(E) or 2SA1115(F)
Q4A3, 4B0, 4B1, 4H1, 4J0, 4L1, 4N1, 4N2, 4N3, 4Q1, 4Q2, 5A0, 5A1, 5A4, 5D3, 5D6, 5D7	5613-2603(E)	2SC2603(E) or 2SC2603(F)
Q4F0, 4H2, 4L0, 4N0, 4N4, 4Q0, 5B0, 5B1, 5B2, 5B3, 5B4	260P45501	DTC124F
Q4H0	260D17102	2SB529(D) or 2SB529(E)
Q5A2, 5A3	5612-647(C)	2SB647(C)
Q5A5	5611-1115(F)	2SA1115(F)
Q5D0	5613-2603(F)	2SC2603(F)
Q5D1, 5D2	5613-2603(G)	2SC2603(G)
Q5D4	5611-673(D)	2SA673(D) or 2SA950(Y)
	DIODES	
D4A0, 4A1, 4A2, 4A3, 4A4, 4A5, 4A6, 4A7, 4A8, 4A9, 4B0, 4B1, 4B2, 4B3, 4L0, 4Q0, 4Q1, 4Q2	5632-1S2472	1S2472
D4P0	264P32702	RM-1Z
D5A0, 5A1, 5A3, 5A4, 5A5, 5B1, 5B2, 5B3, 5B4, 5B5, 5B6, 5C0, 5C1, 5C2, 5C3, 5C4, 5C5, 5C6, 5C7	5636-1S2472	1S2472
D5A2	5635-HZ9A	Zener, HZ9A
	COILS	
L4A0	5995-390269	39μH
L4A1	5995-101269	100μH
	MISCELLANEOUS	
X4A0	285P01501	Quartz Crystal, HC-181U, 3.579545MHz

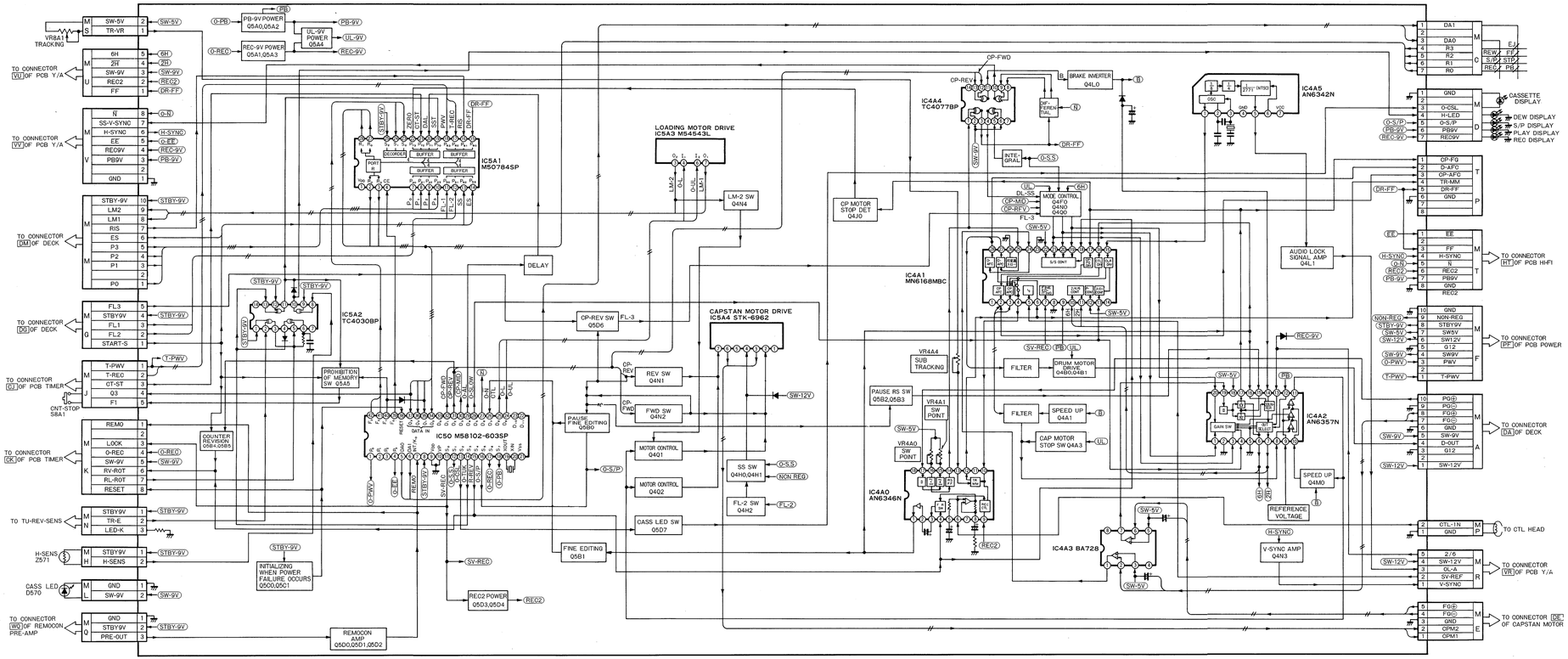
Ref. No.	Part No.	Description
	POWER P.C. BOARD	
	RESISTORS	
R918	101P225E3	R-Composition, 2.2MΩ, 1/2W
	CONTROLS	
VR901	5101-201083V	200ΩB
	CAPACITORS	
C901, 902, 903, 918, 919, 921, 928, 929	5345-476D041	47μF, ±20%, 25V, Electrolytic
C905	5345-225F041	2.2μF, ±20%, 50V, Electrolytic
C906	5345-476J0921	47μF, ±20%, 100V, Electrolytic
C909	5345-226J0921	22μF, ±20%, 100V, Electrolytic
C910, 925	5345-476F041	47μF, ±20%, 50V, Electrolytic
C913	185D05305	6800μF, 35V, Electrolytic
C917	5345-337D041	330μF, ±20%, 25V, Electrolytic
C920, 930	5345-106F041	10μF, ±20%, 50V, Electrolytic
C922	189P03304	0.047μF, AC125V, Metalized Polyester
C923	5345-477F041	470μF, ±20%, 50V, Electrolytic
C924	5345-476B041	47μF, ±20%, 10V, Electrolytic
	INTEGRATED CIRCUITS	
IC901	266P93201	NJM7805A
IC902	266P01001	μPC574J-K
IC904	267P90802	BX6087
	TRANSISTORS	
Q901, 906, 907	5613-2603(E)	2SC2603(E) or 2SC2603(F)
Q971, 972	260P43804	2SD1273(O) or 2SD1273(P)
	DIODES	
D904, 907	5636-1SS82	1SS82
D908, 910, 915, 916, 917, 918, 919, 920	5636-1S2472	1S2472
D909	264P34901	Bridge Silicon, M4B-42-13
D923	5635-HZ27C	Zener, HZ27C
D924	5635-HZ7C	Zener, HZ7C
	COILS	
L901	5995-100269	Peaking
	MISCELLANEOUS	
⚠ F901	283D03801	Fuse, 1A
⚠ F902	283D03807	Fuse, 4A
⚠ K901	287P02904	Relay, G2R-1112P-FD-V-U5
	TIMER P.C. BOARD	
	CONTROLS	
VR8A1	129D11503	100kΩB, Tracking
	CAPACITORS	
C8A0, 8A1	5345-104F041	0.1μF, ±20%, 50V, Electrolytic
C8A2	5345-224F041	0.22μF, ±20%, 50V, Electrolytic
C8C2	5345-226C041	22μF, ±20%, 16V, Electrolytic
C8C4	5345-336C041	33μF, ±20%, 16V, Electrolytic
VC8A1	202P21002	Trimmer Capacitor, 4.2pF–20pF
	INTEGRATED CIRCUITS	
IC701	266P19101	M58653P
IC8A0	266P42701	μPD7519G
	TRANSISTORS	
Q8A0, 8A1, 8A3, 8B0, 8B1, 8C6	269P45401	DTA124F
Q8A2	5613-2603(E)	2SC2613(E) or 2SC2613(F)
Q8A4	5611-1115(E)	2SA1115(E) or 2SA1115(F)

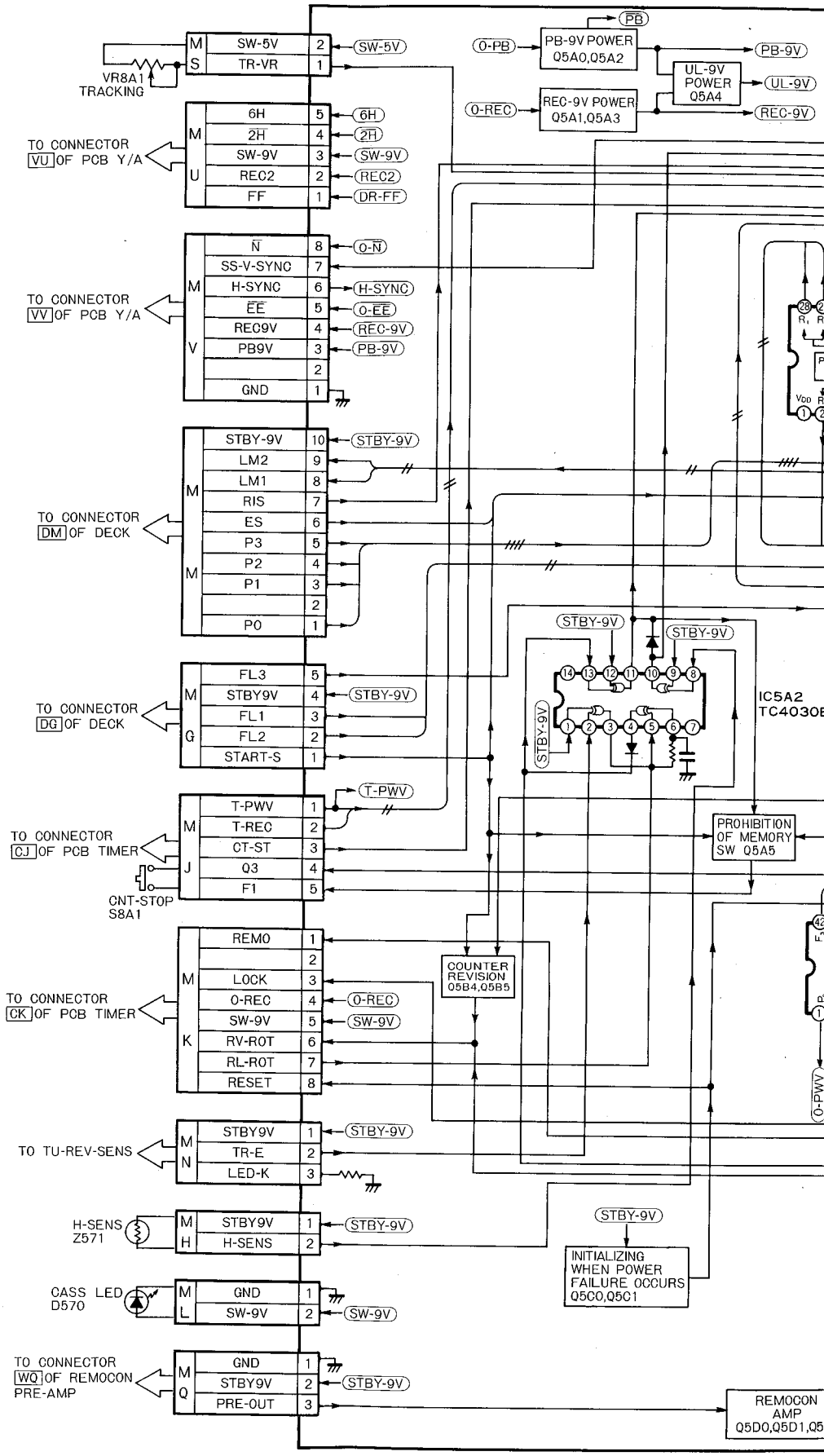
⚠ SAFETY RELATED COMPONENT. USE ONLY EXACT REPLACEMENT PART AS SPECIFIED.

Ref. No.	Part No.	Description
	DIODES	
D8A0, 8A2, 8A3, 8A4, 8A6, 8A7, 8A8, 8C1, 8D1, 8D4, 8D5, 8D6, 8D7, 8D8, 8D9, 8E0, 8E1, 8E2, 8E3, 8E4, 8E5, 8F1, 8F2, 8G0, 8G1	5636-1S2472	1S2472
D8A1, 8C0	264P19303	Zener, MZ305B
D8F0	264P19309	Zener, MZ307
	MISCELLANEOUS	
S8A1, 8A4, 8A5, 8A6, 8A7, 8A8, 8A9, 8B0, 8B1, 8B2, 8B3, 8B4	4431-A017140	Push Switch, Memory, Reset, Prog. No., Day of Week, Up, Clear, Hour, Down, 10 Min, Counter/Timer, Min, OTR
S8A2	434C01501	Lever Switch, Sub-Panel Door
S8A3	431C04602	Slide Switch, Clock/Timer
S8B5	432C03802	Slide Switch, Prog. Rec
V8A0	253P04201	Tube Flour, Counter/Timer and Channel Display
X8A0	285P02601	Quartz Crystal, 4.194304MHz
	PREAMP P.C. BOARD	
	CAPACITORS	
C8001	5345-106C041	10μF, ±20%, 16V, Electrolytic
C8010, 8012	5345-104F041	0.1μF, ±20%, 50V, Electrolytic
C8011, 8014	5345-226C041	22μF, ±20%, 16V, Electrolytic
	INTEGRATED CIRCUITS	
IC8001	266P16901	M51015L
	TRANSISTORS	
Q8001	5613-2603(E)	2SC2603(F) or 2SC2603(G)
	DIODES	
D8001	264P22601	Photo, SFH205
	DRUM-MDA P.C. BOARD	
	CAPACITORS	
C401, 402, 403, 408	5345-106C041	10μF, ±20%, 16V, Electrolytic
C407	5345-476C041	47μF, ±20%, 16V, Electrolytic
	INTEGRATED CIRCUITS	
IC401	266P05601	LB1620
	COILS	
L401	411D00901	Core Ferrite
	MISCELLANEOUS	
HE401, 402, 403	269P00603	Hall Element, H-200A
	OPERATION (A) P.C. BOARD	
	DIODES	
D512	5637-LN01201C	L.E.D., LN01201C, Red, Rec
D513	5637-LN01301C	L.E.D., LN01301C, Green, Play
D514	5637-LN01401C	L.E.D., LN01401C, Orange, Pause
	MISCELLANEOUS	
S504, 505, 506, 507, 508, 509	4431-A017140	Push Switch, Rec, Pause, REW, Play, Stop, F.FWD
	OPERATION (B) P.C. BOARD	
	DIODES	
D510	264P31306	L.E.D., SLR-34DC3, Video/TV
D511	264P31305	L.E.D., SLR-34URC3, Dew
	MISCELLANEOUS	
S501, 502	432C03801	Push Switch, Video/TV, Power
S503	4431-A017140	Push Switch, Eject

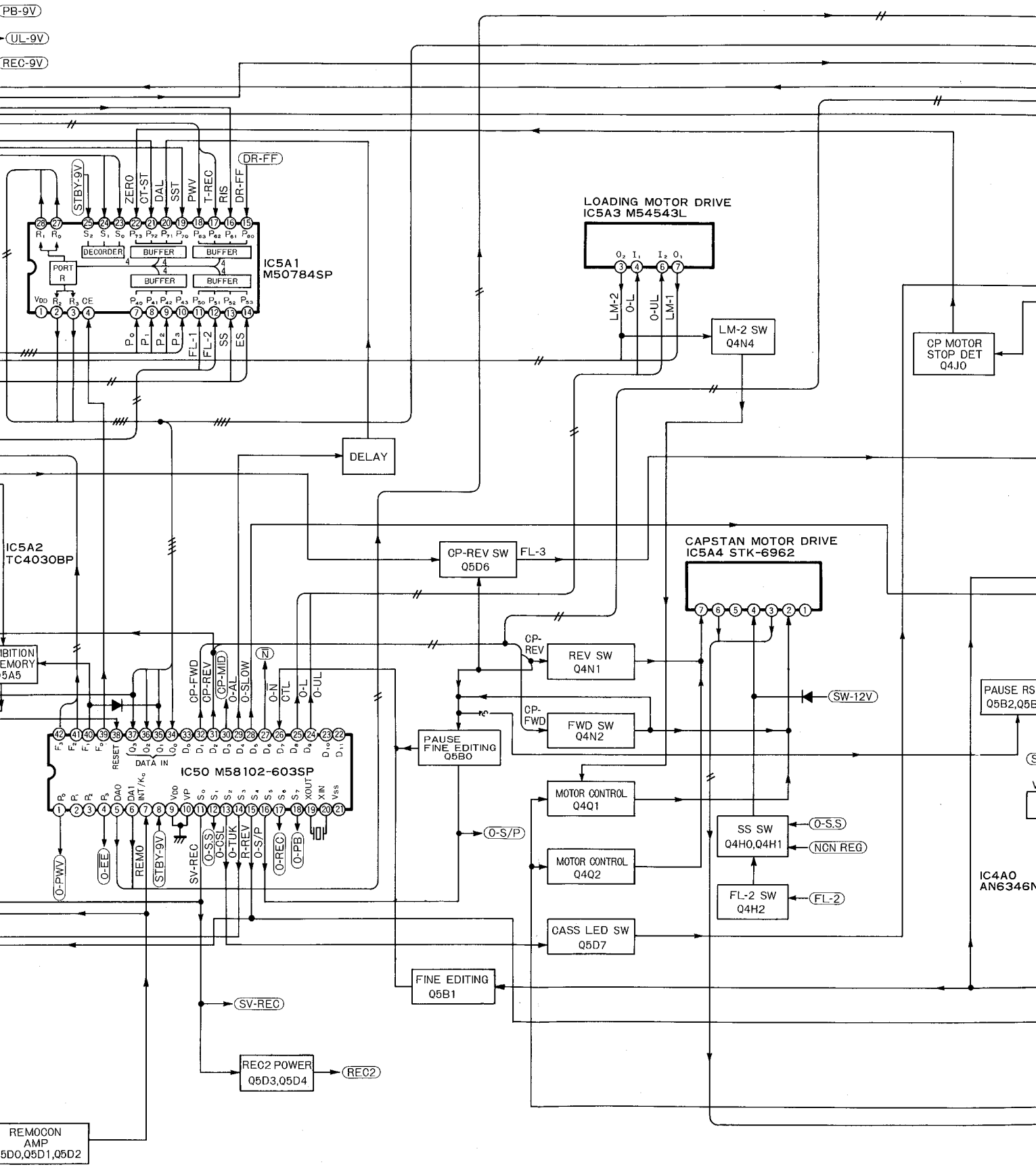
Ref. No.	Part No.	Description
	AUDIO-SUB P.C. BOARD	
	CAPACITORS	
C3R0	5345-476C041	47μF, ±20%, 16V, Electrolytic
C3R1	5345-226C041	22μF, ±20%, 16V, Electrolytic
	TRANSISTORS	
Q3M0	5611-1115(E)	2SA1115(E) or 2SA1115(F)
Q3M1, 3M2	5613-2878(B)	2SC2878(B) or 2SC3068
	DIODES	
D3R0, 3R1	5636-1S2076	1S2076
	MISCELLANEOUS	
AA	452D11105	Connector, 5 Pos.
	OUTPUT P.C. BOARD	
	CAPACITORS	
C3Q0, 3Q1, 3Q2, 3Q3	5345-336B0951	33μF, ±20%, 10V, Electrolytic
	TRANSISTORS	
Q3K0, 3K2	5613-2603(E)	2SC2603(E) or 2SC2603(F)
Q3K1, 3K3	5611-1115(E)	2SA1115(E) or 2SA1115(F)
	INPUT P.C. BOARD	
	CAPACITORS	
C3P0, 3P1, 3P2, 3P3	5345-336B0951	33μF, ±20%, 10V, Electrolytic
	TRANSISTORS	
Q3L0, 3L2	5613-2603(E)	2SC2603(E) or 2SC2603(F)
Q3L1, 3L3	5611-1115(E)	2SA1115(E) or 2SA1115(F)
	CASSETTE LOADED INDICATOR P.C. BOARD	
D515	264P38101	L.E.D., LD-001MG, Cassette
	HEADPHONES JACK P.C. BOARD	
J501	451C06601	Jack, Headphones
	LED P.C. BOARD	
	CONTROLS	
VR520, 521	129C08902	5kΩA x 2, Rec. Level
VR522, 523	127C06102	100kΩB
	CAPACITORS	
C520	5345-225F041	2.2μF, ±20%, 50V, Electrolytic
C521, 523, 531, 533	5345-475F041	4.7μF, ±20%, 50V, Electrolytic
C522, 532	5345-105F041	1μF, ±20%, 50V, Electrolytic
C534	5345-336D041	33μF, ±20%, 25V, Electrolytic
	INTEGRATED CIRCUITS	
IC501, 502	5654-LB1412M	LB1412M
	DIODES	
D520	264P24802	L.E.D., LH31GCP, Bilingual
D521	264P24903	L.E.D., SLR-54DC3, Stereo
D530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549 550, 551, 552, 553, 554, 555, 556	269P00802	LED Display, Hi-Fi, Audio Level
	MISCELLANEOUS	
S520	431C05101	Slide Switch, Rec. Level

M/C. SERVO CIRCUIT BLOCK DIAGRAM

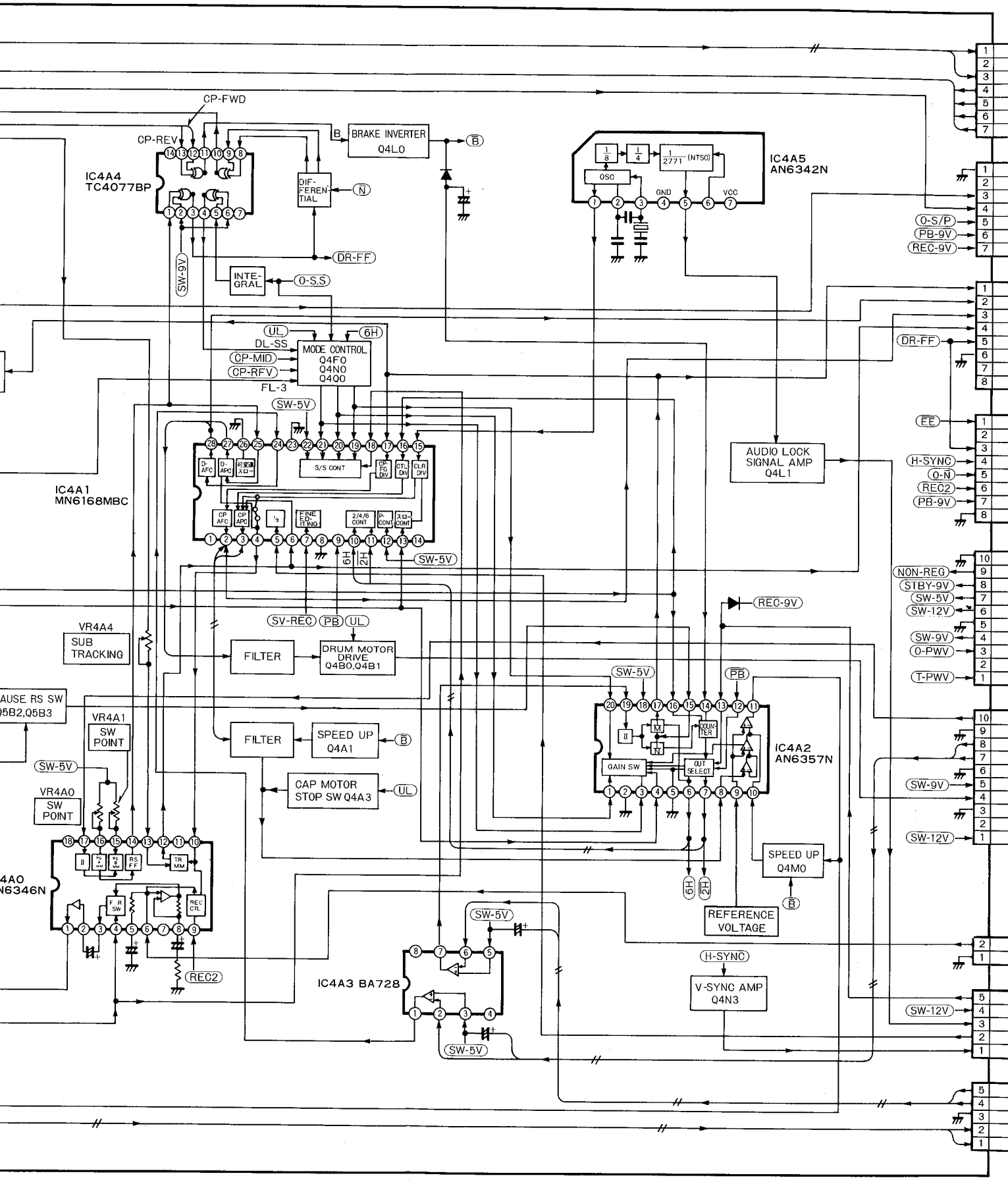


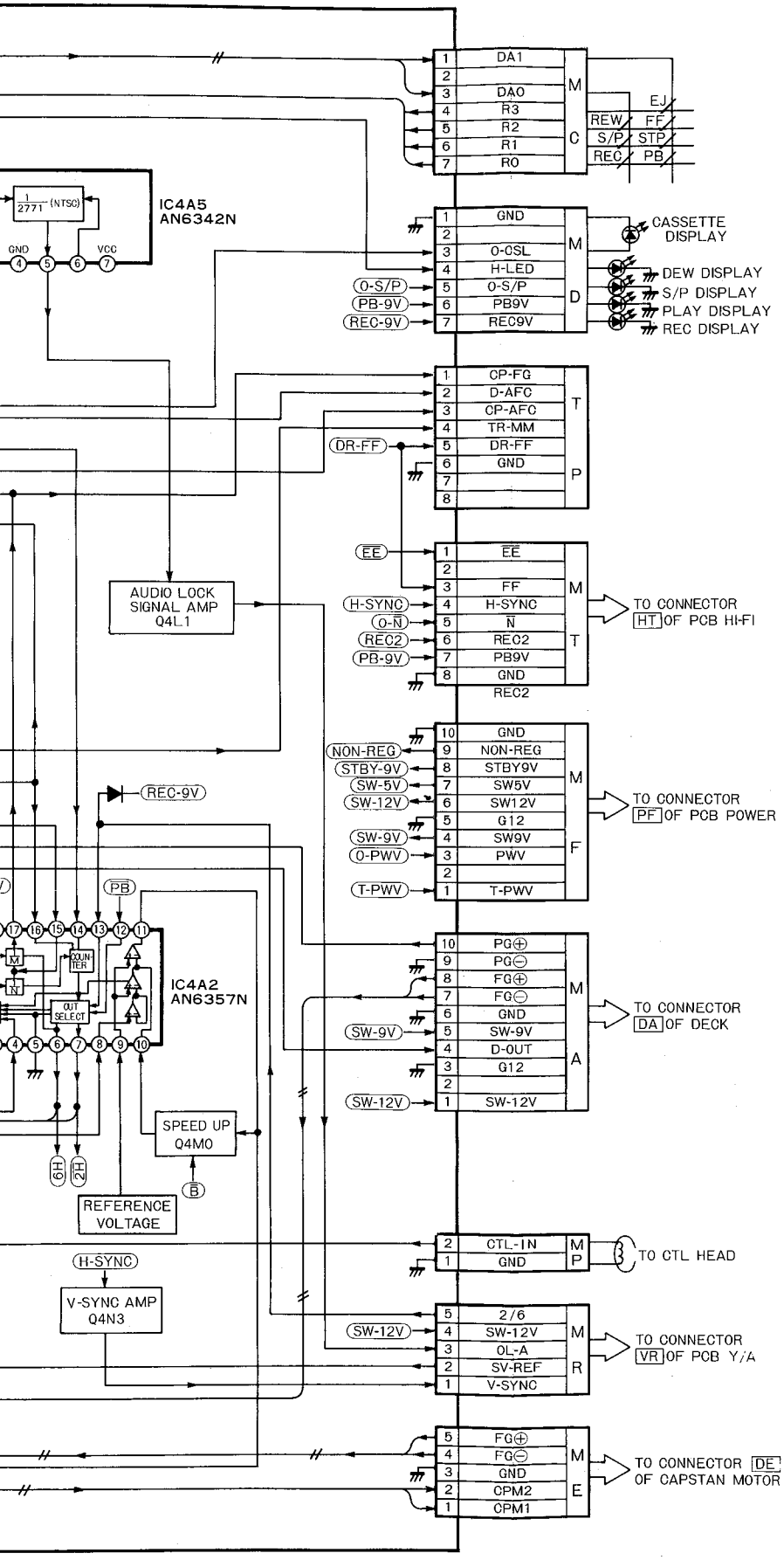

M S SW-5V 2 SW-5V
TR-VR 1
VR8A1 TRACKING
M U 6H 5 6H
2H 4 2H
SW-9V 3 SW-9V
REC2 2 REC2
FF 1 DR-FF
TO CONNECTOR VU OF PCB Y/A
M V N 8 O-N
SS-V-SYNC 7
H-SYNC 6 H-SYNC
EE 5 O-EE
REC9V 4 REC-9V
PB9V 3 PB-9V
2
GND 1
TO CONNECTOR VV OF PCB Y/A
M M STBY-9V 10 STBY-9V
LM2 9
LM1 8
RIS 7
ES 6
P3 5
P2 4
P1 3
2
P0 1
TO CONNECTOR DM OF DECK
M G FL3 5
STBY9V 4 STBY-9V
FL1 3
FL2 2
START-S 1
TO CONNECTOR DG OF DECK
M J T-PWV 1 T-PWV
T-REC 2
CT-ST 3
Q3 4
F1 5
TO CONNECTOR CJ OF PCB TIMER
CNT-STOP S8A1
M K REMO 1
2
LOCK 3
O-REC 4 O-REC
SW-9V 5 SW-9V
RV-ROT 6
RL-ROT 7
RESET 8
TO CONNECTOR CK OF PCB TIMER
M N STBY9V 1 STBY-9V
TR-E 2
LED-K 3
TO TU-REV-SENS
M H STBY9V 1 STBY-9V
H-SENS 2
H-SENS Z571
M L GND 1
SW-9V 2 SW-9V
CASS LED D570
M Q GND 1
STBY9V 2 STBY-9V
PRE-OUT 3
TO CONNECTOR WQ OF REMOCON PRE-AMP
O-PB
PB-9V POWER Q5A0,Q5A2
PB
PB-9V
UL-9V POWER Q5A4
UL-9V
O-REC
REC-9V POWER Q5A1,Q5A3
REC-9V
STBY-9V
IC5A2 TC4030E
PROHIBITION OF MEMORY SW Q5A5
COUNTER REVISION Q5B4,Q5B5
INITIALIZING WHEN POWER FAILURE OCCURS Q5C0,Q5C1
REMOCON AMP Q5D0,Q5D1,Q5
O-PWV

M/C. SERVO CIRCUIT BLOCK D

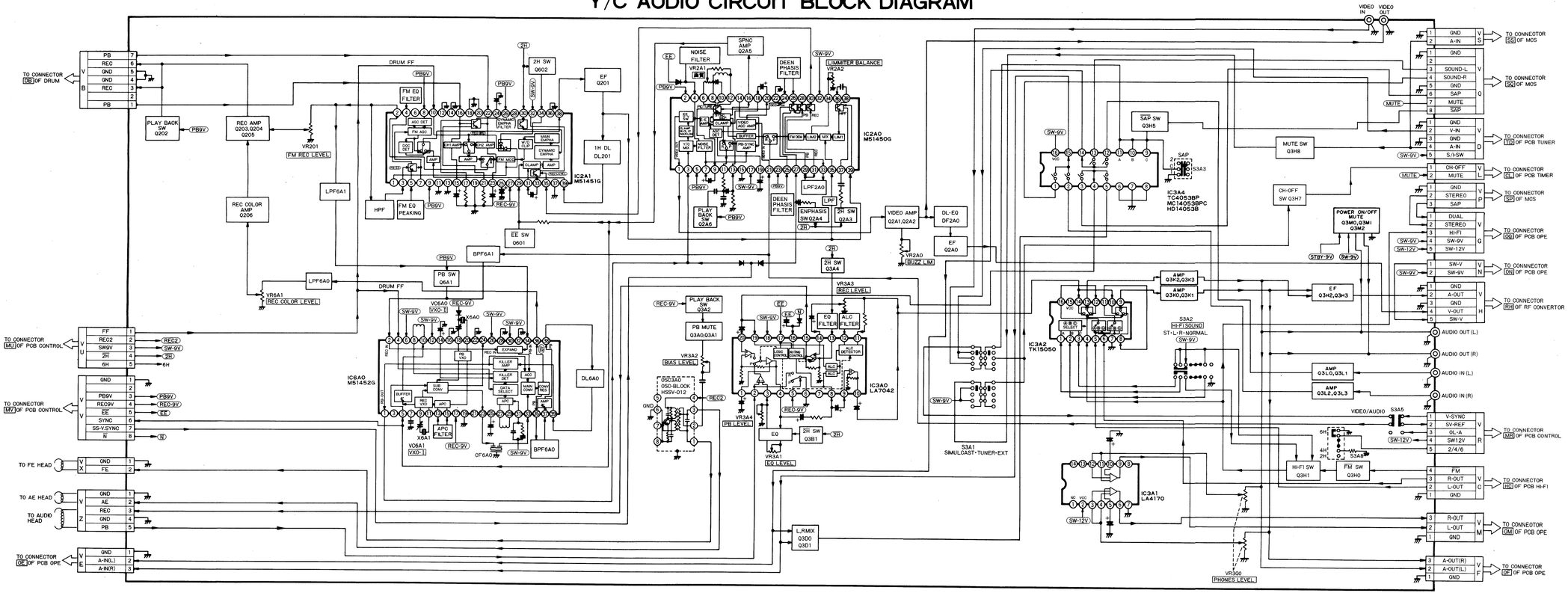


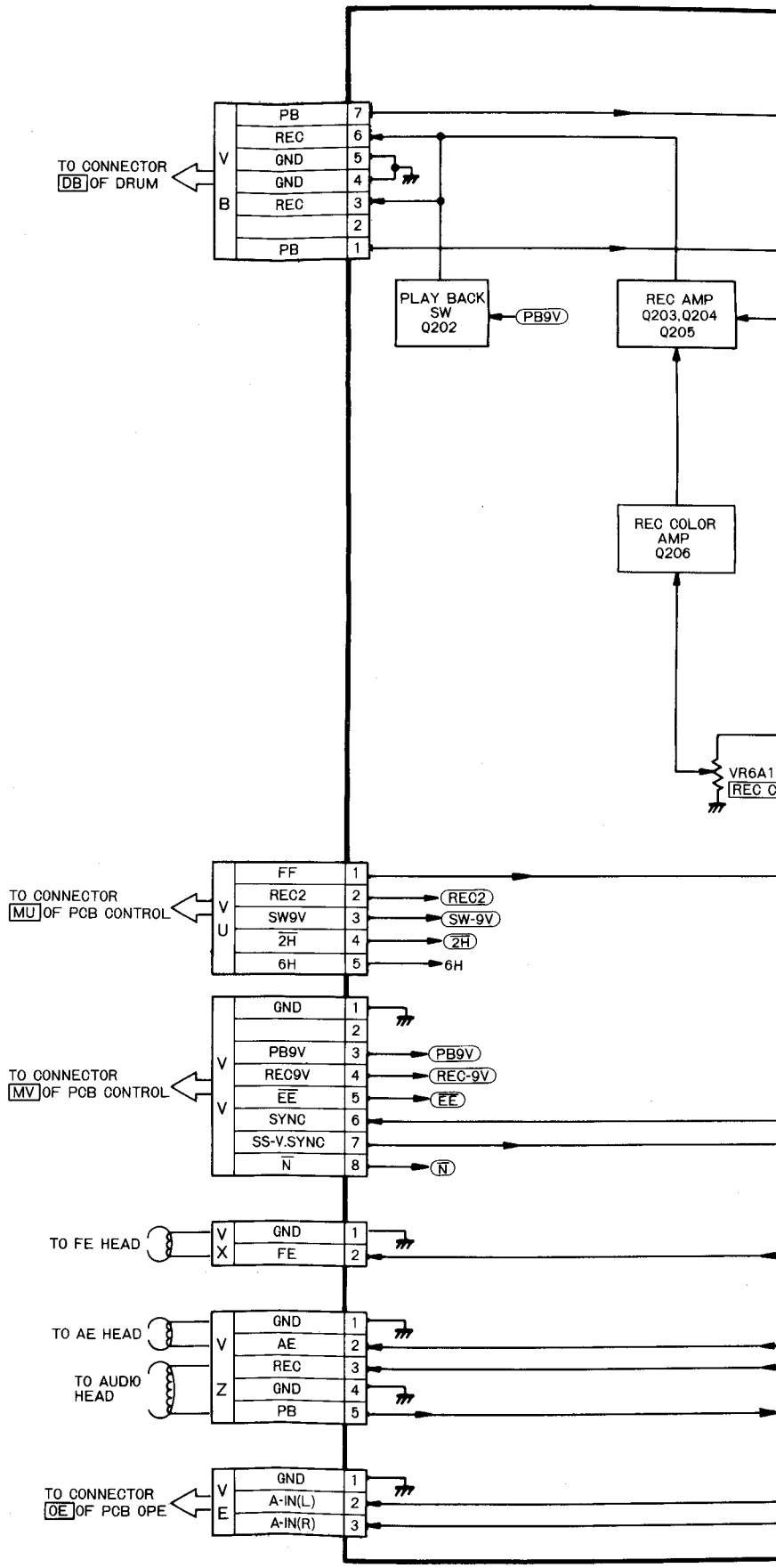
DIAGRAM


CP-FWD
CP-REV
IC4A4
TC4077BP
BRAKE INVERTER
Q4LO
DIF-
FEREN-
TIAL
DR-FF
INTE-
GRAL
O-S.S
SW-9V
IC4A5
AN6342N
OSC
GND
VCC
(NTSC)
O-S/P
PB-9V
REC-9V
UL
6H
DL-SS
CP-MID
CP-RFV
FL-3
MODE CONTROL
Q4FO
Q4NO
Q4QO
SW-5V
IC4A1
MN6168MBC
S/S CONT
AUDIO LOCK
SIGNAL AMP
Q4L1
EE
H-SYNC
O-N
REC2
PB-9V
NON-REG
STBY-9V
SW-12V
T-PWV
SV-REC
PB
VR4A4
SUB
TRACKING
FILTER
DRUM MOTOR
DRIVE
Q4BO,Q4B1
REC-9V
AUSE RS SW
Q5B2,Q5B3
VR4A1
SW
POINT
SPEED UP
Q4A1
CAP MOTOR
STOP SW Q4A3
VR4AO
SW
POINT
IC4A2
AN6357N
GAIN SW
OUT
SELECT
SPEED UP
Q4MO
REFERENCE
VOLTAGE
4AO
N6346N
REC2
IC4A3 BA728
H-SYNC
V-SYNC AMP
Q4N3

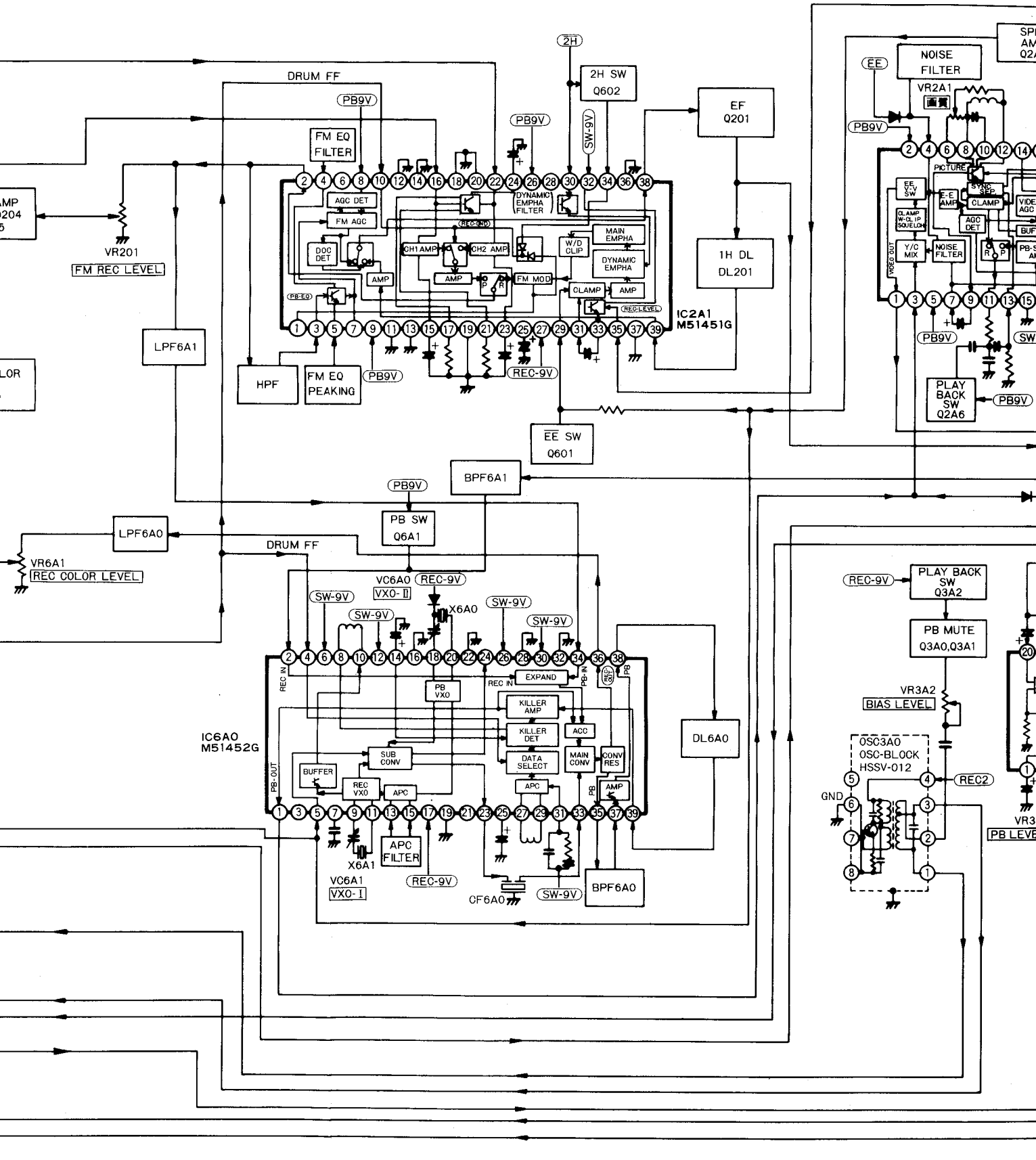

IC4A5
AN6342N
GND
VCC
IC4A2
AN6357N
AUDIO LOCK
SIGNAL AMP
Q4L1
SPEED UP
Q4M0
REFERENCE
VOLTAGE
V-SYNC AMP
Q4N3
DA1
DAO
R3
R2
R1
RO
EJ
REW
FF
S/P
STP
REC
PB
GND
O-CSL
H-LED
O-S/P
PB9V
REC9V
CASSETTE
DISPLAY
DEW DISPLAY
S/P DISPLAY
PLAY DISPLAY
REC DISPLAY
CP-FG
D-AFC
CP-AFC
TR-MM
DR-FF
EE
H-SYNC
O-N
REC2
TO CONNECTOR
HT OF PCB HI-FI
NON-REG
STBY-9V
SW-5V
SW-12V
SW-9V
O-PWV
T-PWV
TO CONNECTOR
PF OF PCB POWER
PG⊕
PG⊖
FG⊕
FG⊖
D-OUT
G12
TO CONNECTOR
DA OF DECK
CTL-IN
TO CTL HEAD
2/6
OL-A
SV-REF
V-SYNC
TO CONNECTOR
VR OF PCB Y/A
CPM2
CPM1
TO CONNECTOR DE
OF CAPSTAN MOTOR

Y/C AUDIO CIRCUIT BLOCK DIAGRAM

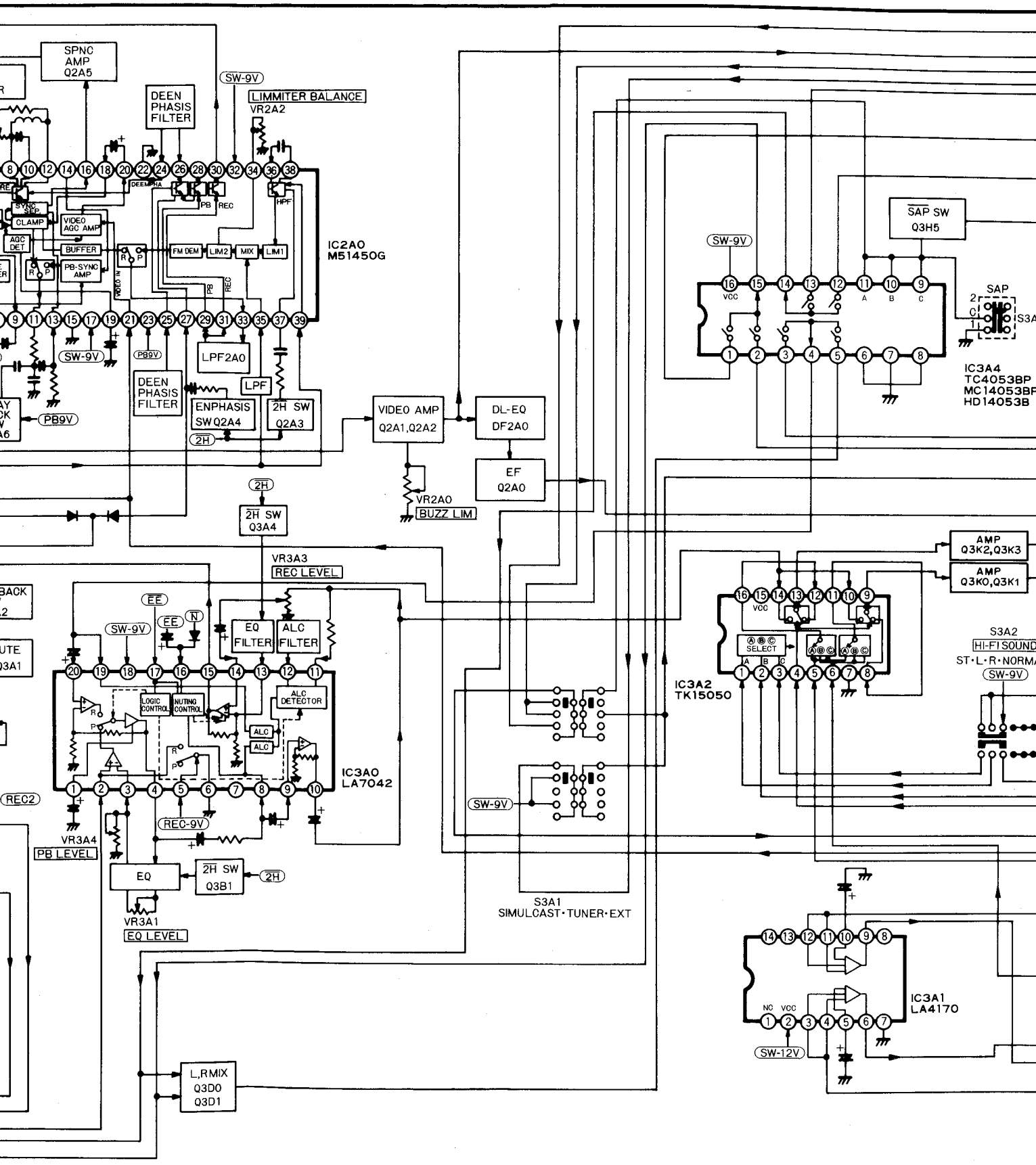


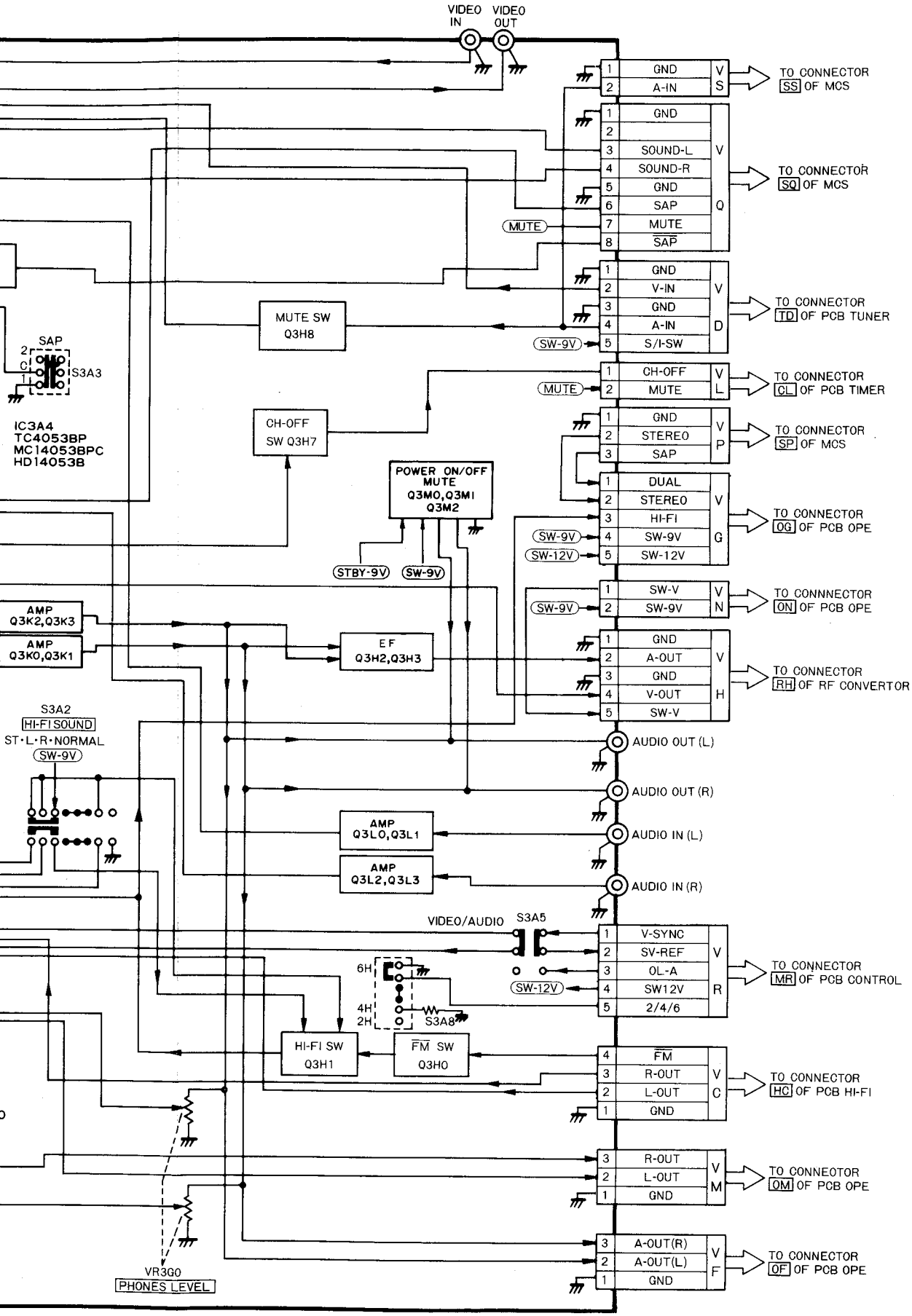

TO CONNECTOR DB OF DRUM
V B
PB 7
REC 6
GND 5
GND 4
REC 3
2
PB 1
PLAY BACK SW Q202
PB9V
REC AMP Q203,Q204 Q205
REC COLOR AMP Q206
VR6A1
REC C
TO CONNECTOR MU OF PCB CONTROL
V U
FF 1
REC2 2
SW9V 3
2H 4
6H 5
REC2
SW-9V
2H
6H
TO CONNECTOR MV OF PCB CONTROL
V V
GND 1
2
PB9V 3
REC9V 4
EE 5
SYNC 6
SS-V.SYNC 7
N 8
PB9V
REC-9V
EE
N
TO FE HEAD
V X
GND 1
FE 2
TO AE HEAD
TO AUDIO HEAD
V Z
GND 1
AE 2
REC 3
GND 4
PB 5
TO CONNECTOR OE OF PCB OPE
V E
GND 1
A-IN(L) 2
A-IN(R) 3

Y/C AUDIO CIR

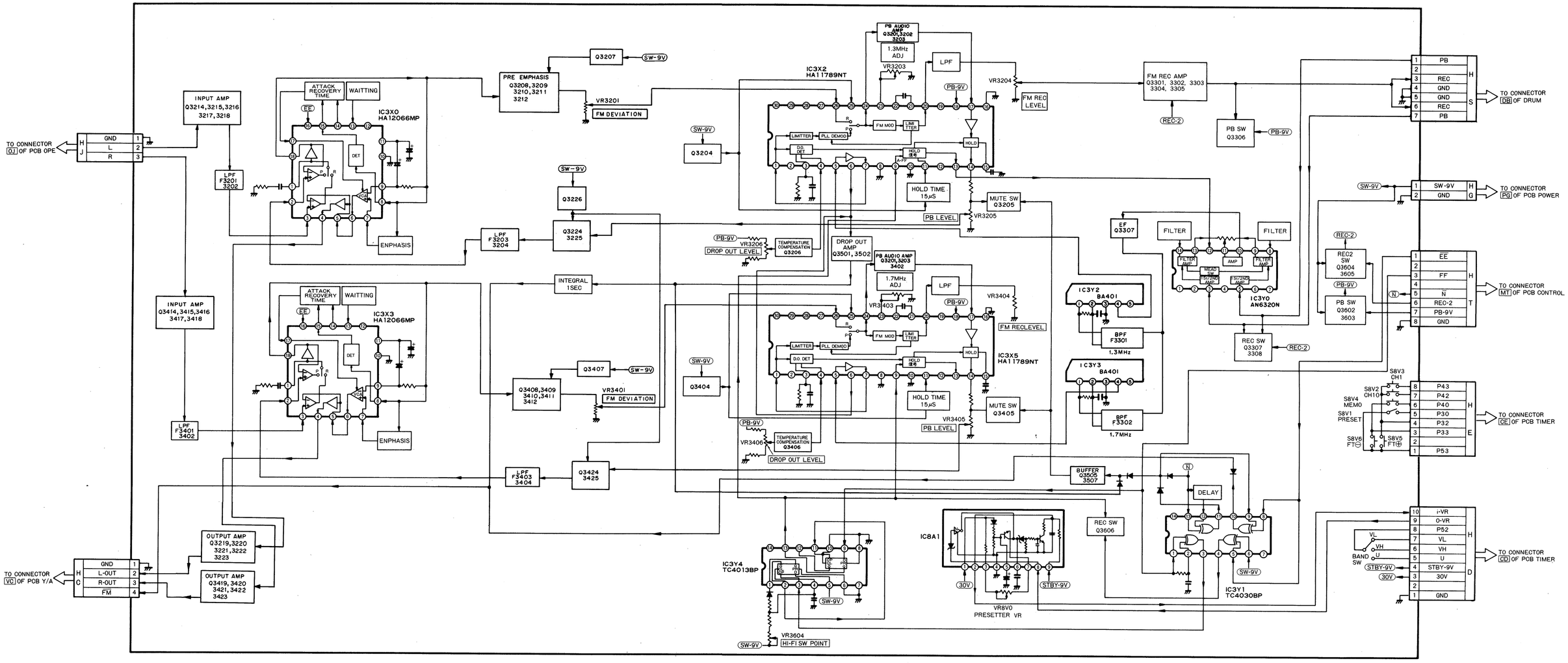

2H
2H SW
Q602
DRUM FF
PB9V
SW-9V
EF
Q201
FM EQ
FILTER
NOISE
FILTER
VR2A1
EE
PB9V
AGC DET
FM AGC
DYNAMIC
EMPHA
FILTER
REC-GND
DOC
DET
CH1 AMP
CH2 AMP
W/D
CLIP
MAIN
EMPHA
DYNAMIC
EMPHA
AMP
FM MOD
CLAMP
REC-LEVEL
PB-EQ
VR201
FM REC LEVEL
1H DL
DL201
IC2A1
M51451G
LPF6A1
HPF
FM EQ
PEAKING
REC-9V
PICTURE
SYNC
SEP
CLAMP
AGC
DET
Y/C
MIX
NOISE
FILTER
PLAY
BACK
SW
Q2A6
EE SW
Q601
BPF6A1
PB SW
Q6A1
LPF6A0
VR6A1
REC COLOR LEVEL
VC6A0
VXO-II
X6A0
REC IN
EXPAND
PB VXO
KILLER
AMP
KILLER
DET
ACC
DATA
SELECT
MAIN
CONV
CONV
RES
SUB
CONV
BUFFER
REC
VXO
APC
PB-OUT
IC6A0
M51452G
DL6A0
X6A1
APC
FILTER
VC6A1
VXO-I
CF6A0
BPF6A0
REC-9V
PLAY BACK
SW
Q3A2
PB MUTE
Q3A0,Q3A1
VR3A2
BIAS LEVEL
OSC3A0
OSC-BLOCK
HSSV-012
REC2
GND

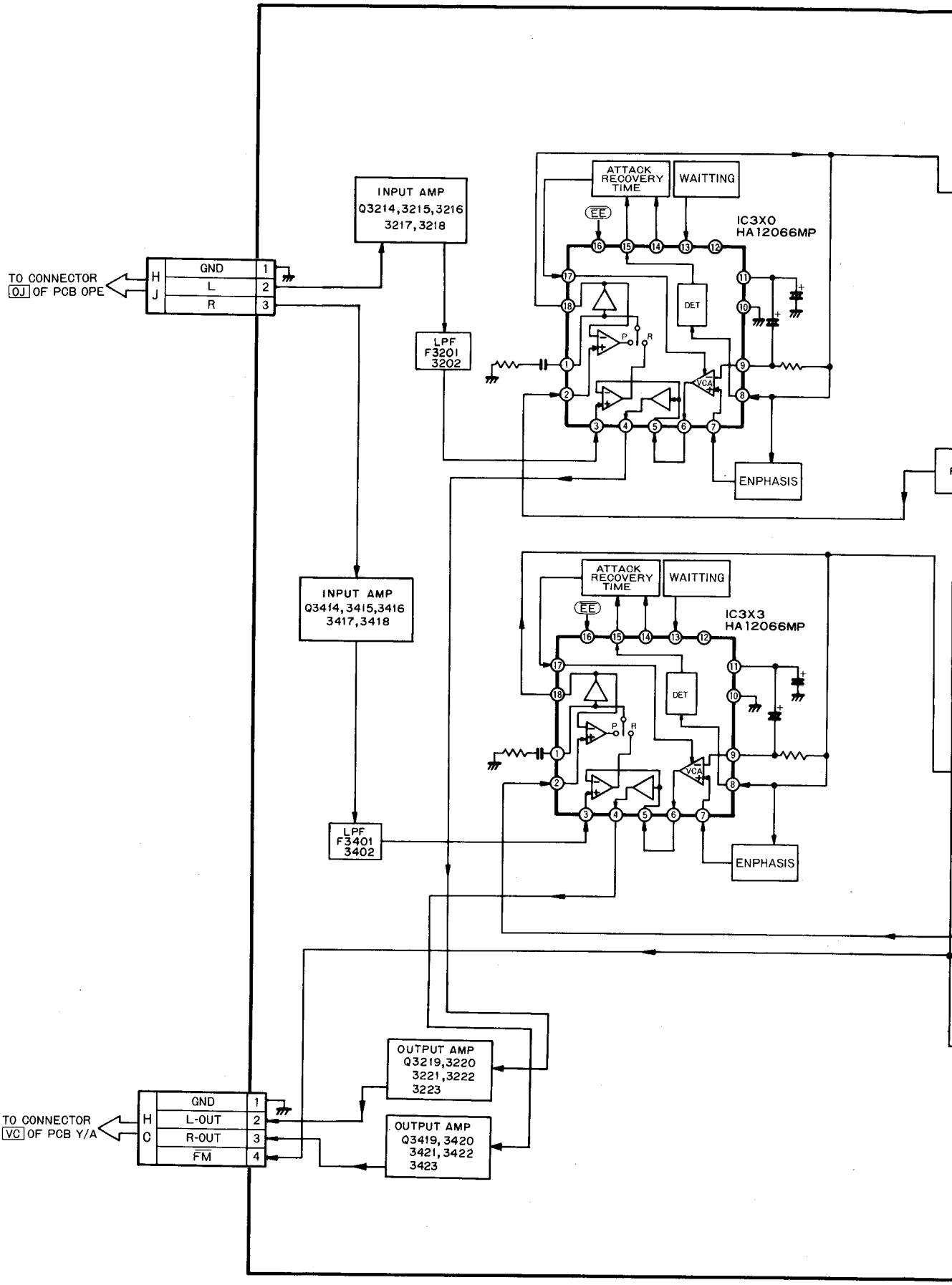
CIRCUIT BLOCK DIAGRAM



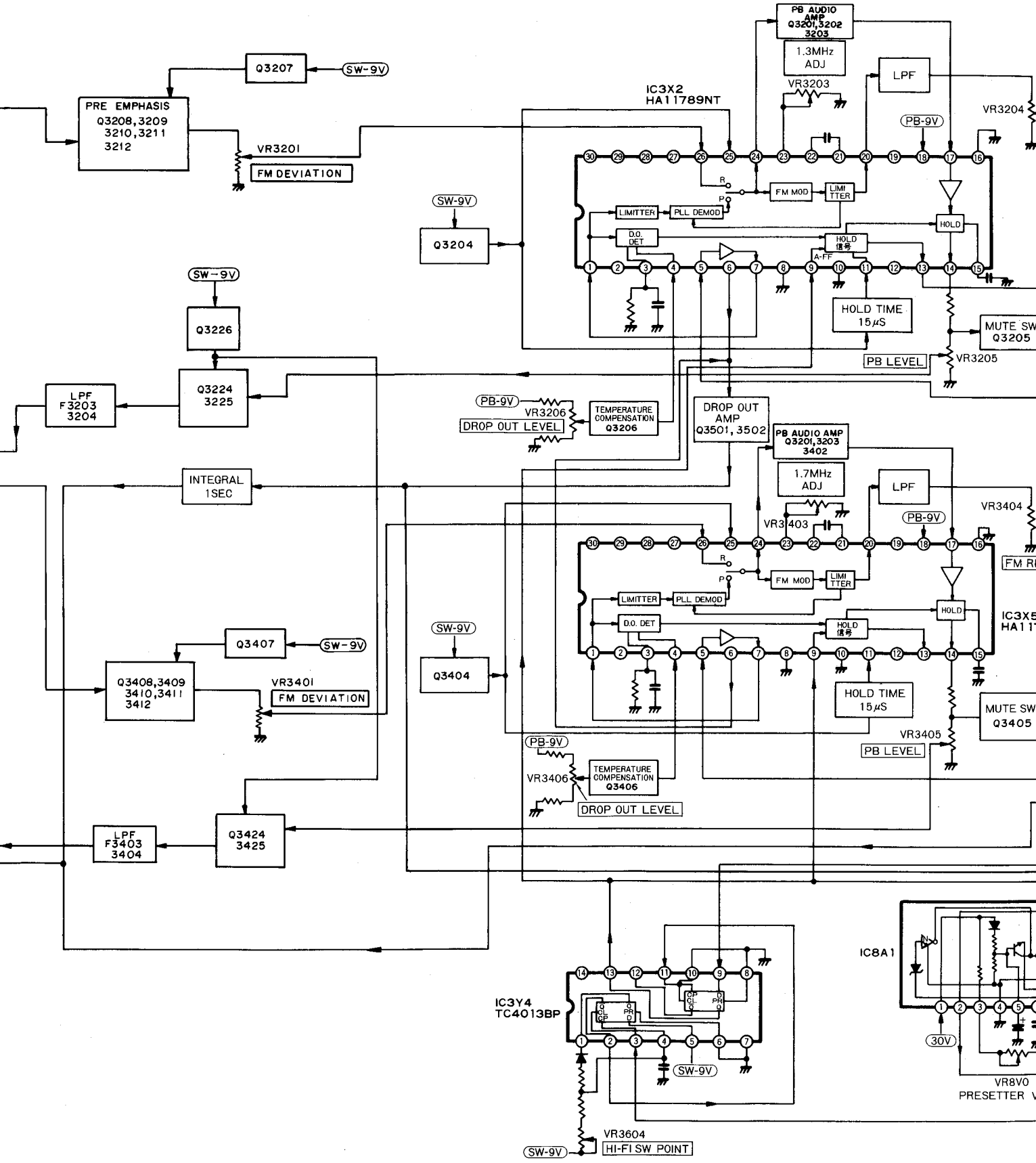

VIDEO IN
VIDEO OUT
1 GND
2 A-IN
VS
TO CONNECTOR SS OF MCS
1 GND
2
3 SOUND-L
4 SOUND-R
5 GND
6 SAP
7 MUTE
8 SAP
VQ
TO CONNECTOR SQ OF MCS
MUTE
MUTE SW Q3H8
SW-9V
1 GND
2 V-IN
3 GND
4 A-IN
5 S/I-SW
VD
TO CONNECTOR TD OF PCB TUNER
SAP
S3A3
IC3A4
TC4053BP
MC14053BPC
HD14053B
1 CH-OFF
2 MUTE
VL
TO CONNECTOR CL OF PCB TIMER
CH-OFF SW Q3H7
1 GND
2 STEREO
3 SAP
VP
TO CONNECTOR SP OF MCS
POWER ON/OFF MUTE Q3M0,Q3M1 Q3M2
1 DUAL
2 STEREO
3 HI-FI
4 SW-9V
5 SW-12V
VG
TO CONNECTOR OG OF PCB OPE
SW-9V
SW-12V
STBY-9V
SW-9V
1 SW-V
2 SW-9V
VN
TO CONNNECTOR ON OF PCB OPE
SW-9V
AMP Q3K2,Q3K3
AMP Q3K0,Q3K1
EF Q3H2,Q3H3
1 GND
2 A-OUT
3 GND
4 V-OUT
5 SW-V
VH
TO CONNECTOR RH OF RF CONVERTOR
S3A2
HI-FI SOUND
ST·L·R·NORMAL
SW-9V
AUDIO OUT (L)
AUDIO OUT (R)
AMP Q3L0,Q3L1
AUDIO IN (L)
AMP Q3L2,Q3L3
AUDIO IN (R)
VIDEO/AUDIO
S3A5
1 V-SYNC
2 SV-REF
3 OL-A
4 SW12V
5 2/4/6
VR
TO CONNECTOR MR OF PCB CONTROL
SW-12V
6H
4H
2H
S3A8
HI-FI SW Q3H1
FM SW Q3H0
4 FM
3 R-OUT
2 L-OUT
1 GND
VC
TO CONNECTOR HC OF PCB HI-FI
3 R-OUT
2 L-OUT
1 GND
VM
TO CONNEOTOR QM OF PCB OPE
VR3G0
PHONES LEVEL
3 A-OUT(R)
2 A-OUT(L)
1 GND
VF
TO CONNECTOR OF OF PCB OPE

HI-FI CIRCUIT BLOCK DIAGRAM

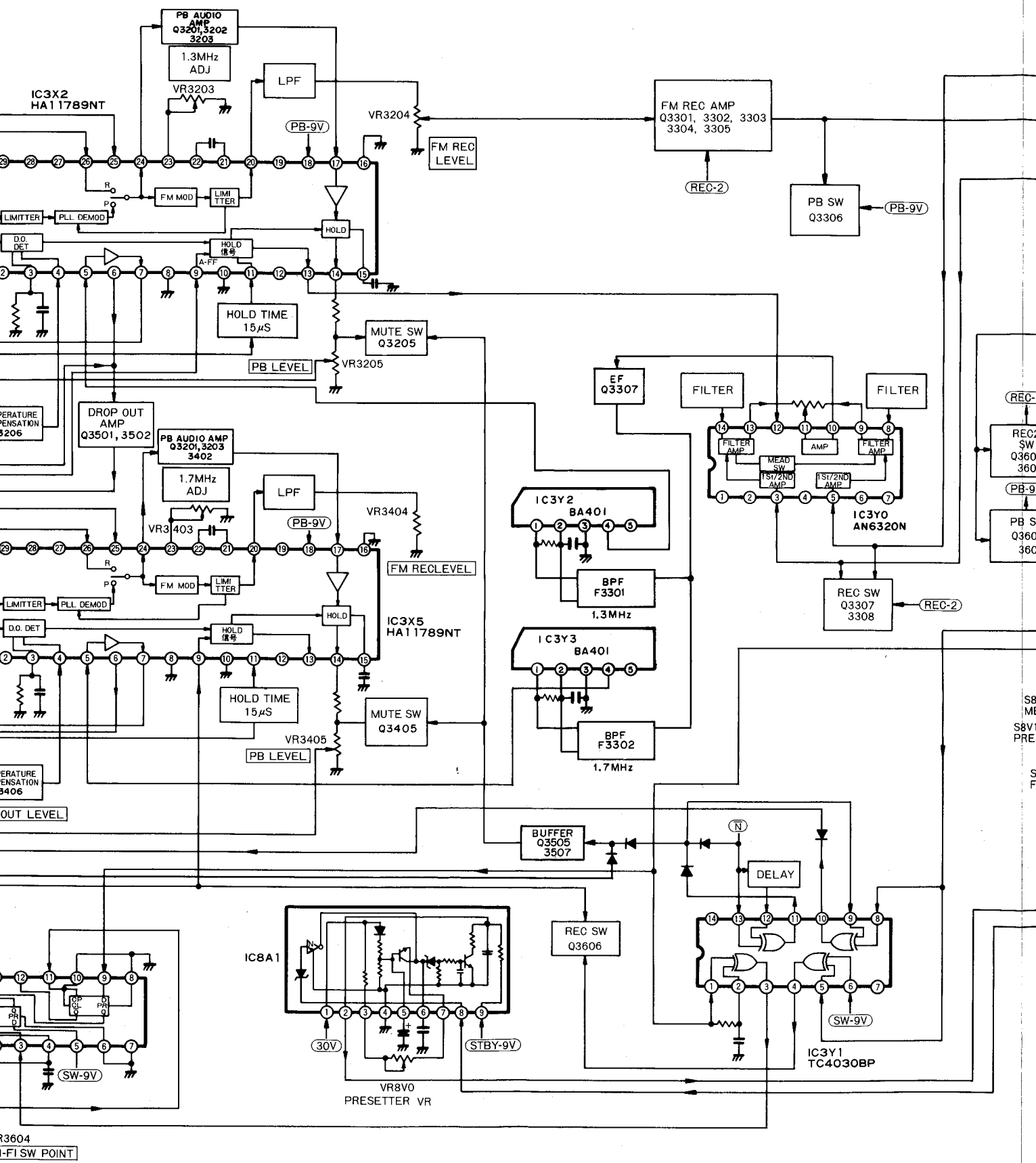


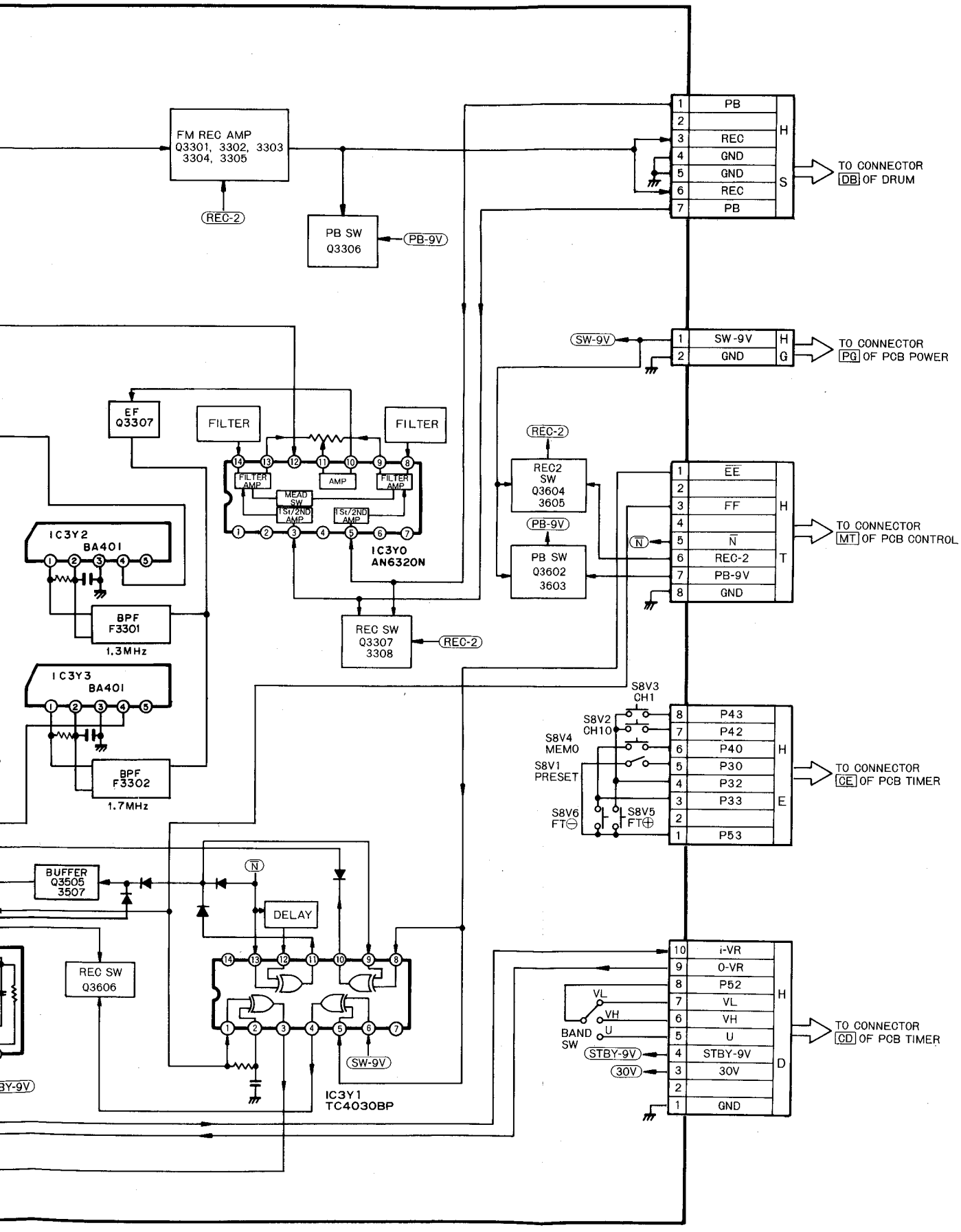

TO CONNECTOR OJ OF PCB OPE
H
J
GND 1
L 2
R 3
INPUT AMP Q3214,3215,3216 3217,3218
LPF F3201 3202
ATTACK RECOVERY TIME
WAITTING
EE
IC3X0 HA12066MP
DET
VCA
ENPHASIS
INPUT AMP Q3414,3415,3416 3417,3418
LPF F3401 3402
IC3X3 HA12066MP
OUTPUT AMP Q3219,3220 3221,3222 3223
OUTPUT AMP Q3419,3420 3421,3422 3423
TO CONNECTOR VC OF PCB Y/A
H
C
GND 1
L-OUT 2
R-OUT 3
FM 4

HI-FI CIRCUIT BLOCK DIAGRAM

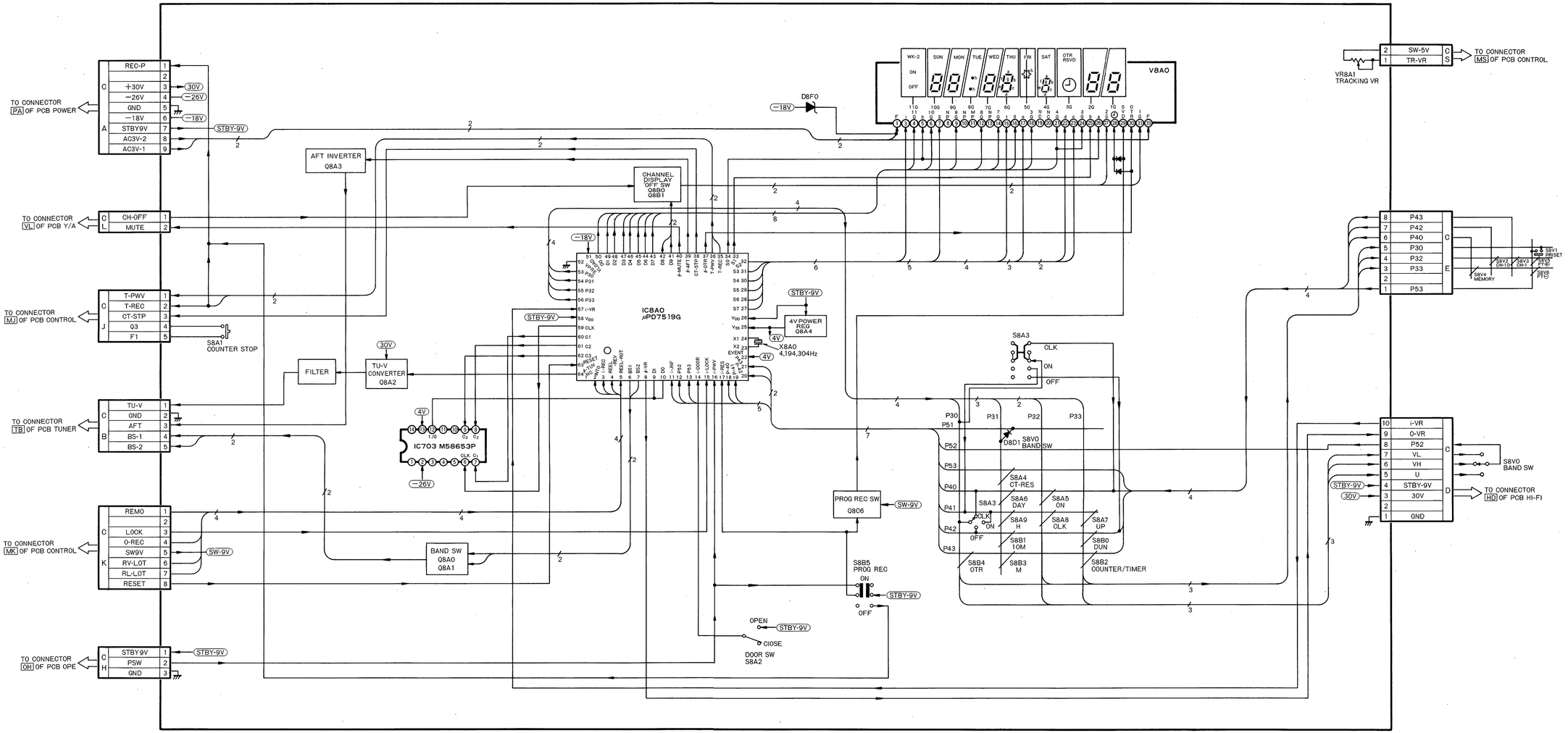


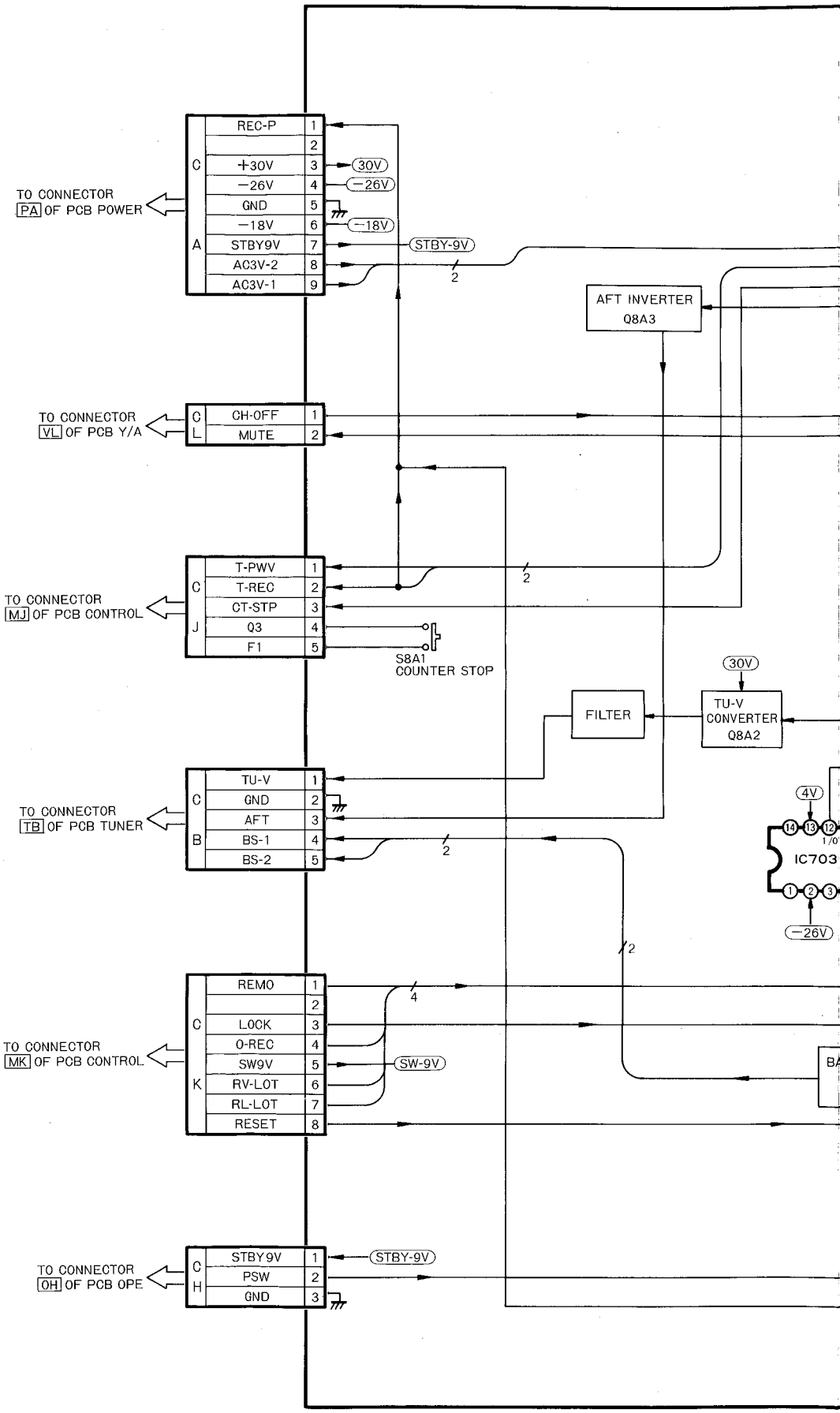
LOCK DIAGRAM



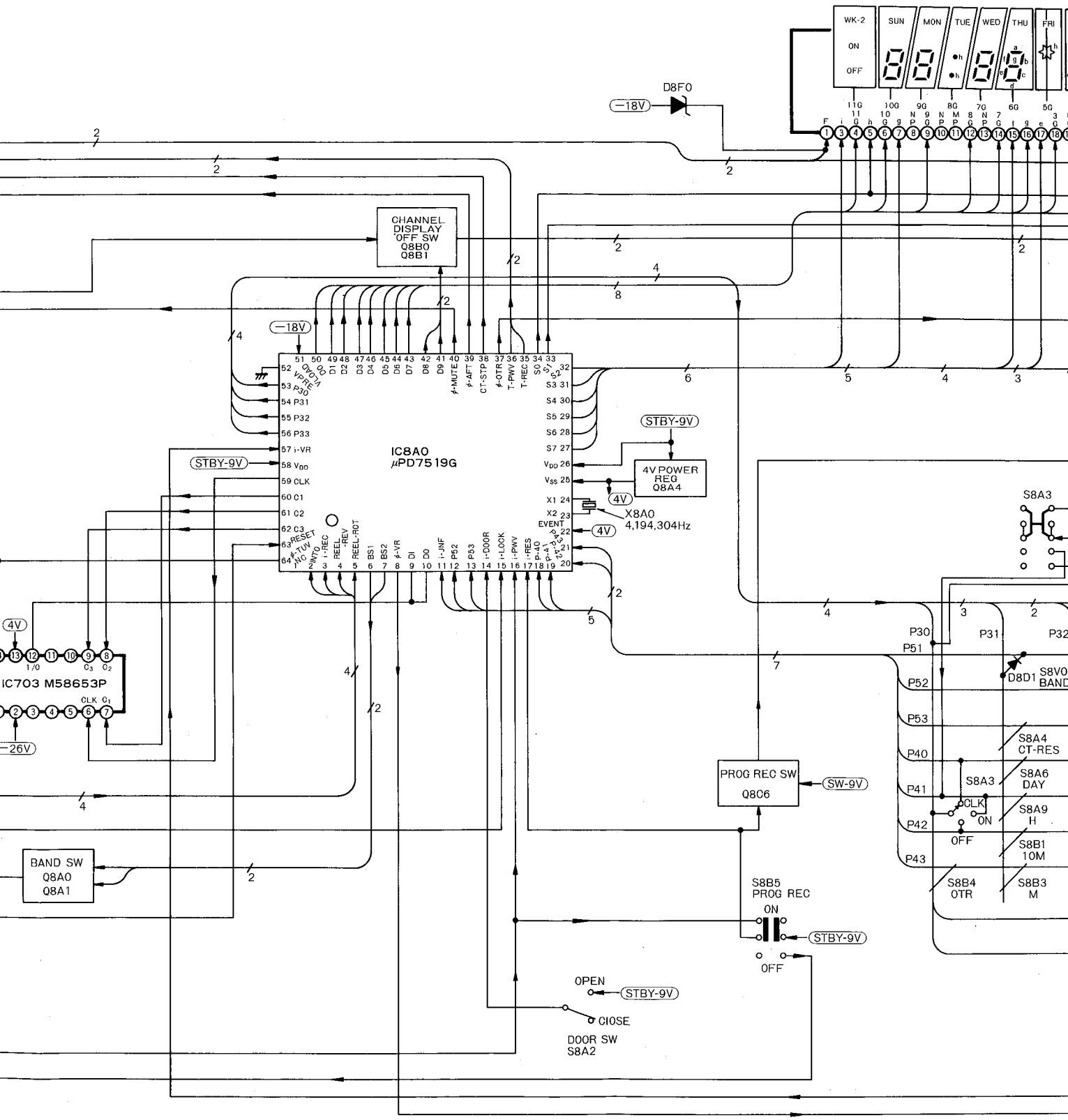

FM REC AMP
Q3301, 3302, 3303
3304, 3305
REC-2
PB SW
Q3306
PB-9V
1 PB
2
3 REC
4 GND
5 GND
6 REC
7 PB
H
S
TO CONNECTOR
DB OF DRUM
SW-9V
1 SW-9V
2 GND
H
G
TO CONNECTOR
PG OF PCB POWER
EF
Q3307
FILTER
FILTER
FILTER AMP
AMP
FILTER AMP
MEAD SW
1St/2ND AMP
1St/2ND AMP
IC3Y0
AN6320N
IC3Y2
BA401
BPF
F3301
1.3MHz
IC3Y3
BA401
BPF
F3302
1.7MHz
REC-2
REC2 SW
Q3604
3605
PB-9V
PB SW
Q3602
3603
REC SW
Q3307
3308
REC-2
N
1 EE
2
3 FF
4
5 N
6 REC-2
7 PB-9V
8 GND
H
T
TO CONNECTOR
MT OF PCB CONTROL
S8V3
CH1
S8V2
CH10
S8V4
MEMO
S8V1
PRESET
S8V6
FT⊖
S8V5
FT⊕
8 P43
7 P42
6 P40
5 P30
4 P32
3 P33
2
1 P53
H
E
TO CONNECTOR
CE OF PCB TIMER
BUFFER
Q3505
3507
N
DELAY
REC SW
Q3606
SW-9V
IC3Y1
TC4030BP
BY-9V
10 i-VR
9 0-VR
8 P52
7 VL
6 VH
5 U
4 STBY-9V
3 30V
2
1 GND
VL
VH
BAND
SW
U
STBY-9V
30V
H
D
TO CONNECTOR
CD OF PCB TIMER

TIMER. VS CIRCUIT BLOCK DIAGRAM

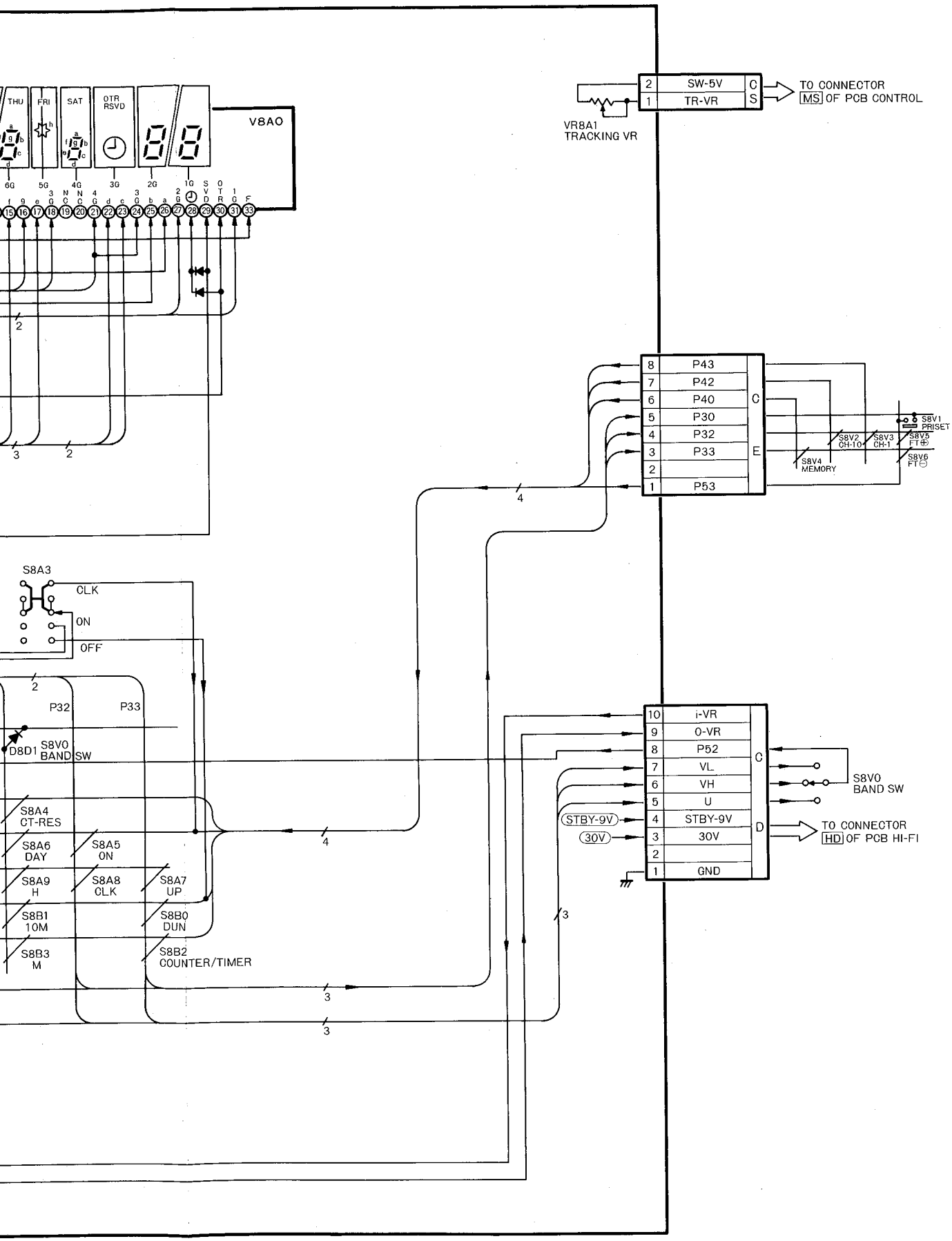



TO CONNECTOR PA OF PCB POWER
C A
REC-P 1
2
+30V 3
−26V 4
GND 5
−18V 6
STBY9V 7
AC3V-2 8
AC3V-1 9
30V
−26V
−18V
STBY-9V
2
AFT INVERTER Q8A3
TO CONNECTOR VL OF PCB Y/A
C L
CH-OFF 1
MUTE 2
TO CONNECTOR MJ OF PCB CONTROL
C J
T-PWV 1
T-REC 2
CT-STP 3
Q3 4
F1 5
2
S8A1 COUNTER STOP
30V
TU-V CONVERTER Q8A2
FILTER
TO CONNECTOR TB OF PCB TUNER
C B
TU-V 1
GND 2
AFT 3
BS-1 4
BS-2 5
2
4V
IC703
−26V
2
TO CONNECTOR MK OF PCB CONTROL
C K
REMO 1
2
LOCK 3
0-REC 4
SW9V 5
RV-LOT 6
RL-LOT 7
RESET 8
4
SW-9V
TO CONNECTOR OH OF PCB OPE
C H
STBY9V 1
PSW 2
GND 3
STBY-9V

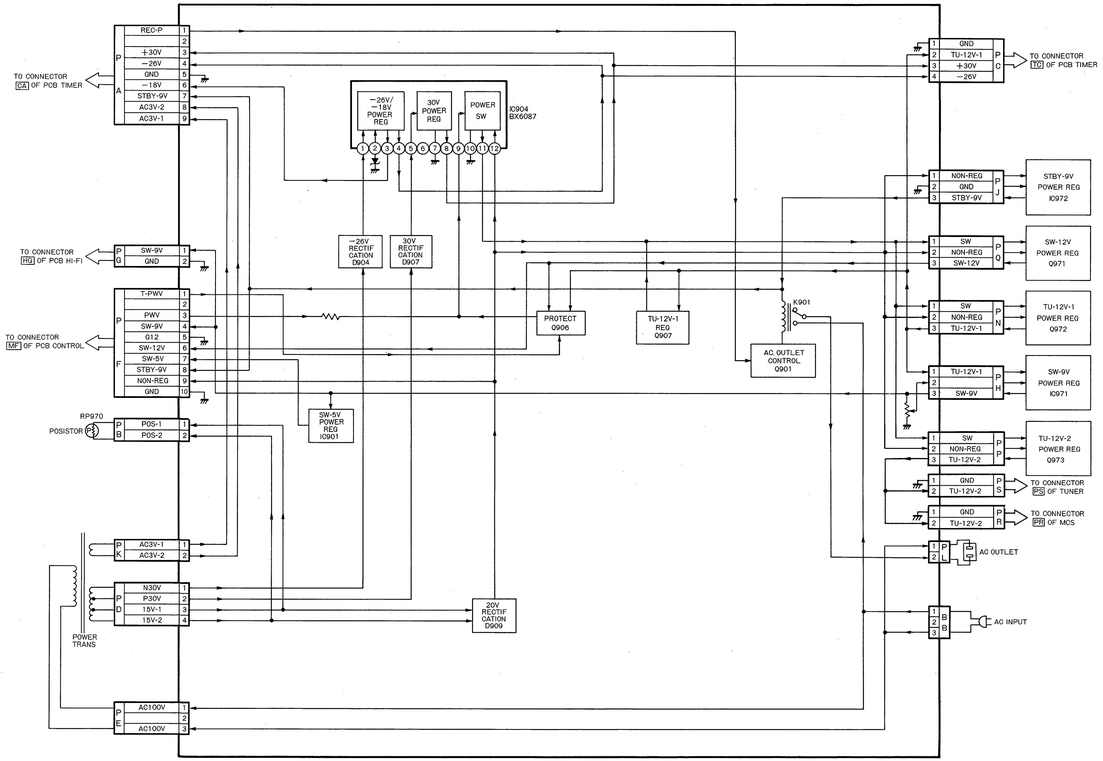
TIMER. VS CIRCUIT BLOCK DIAGRAM



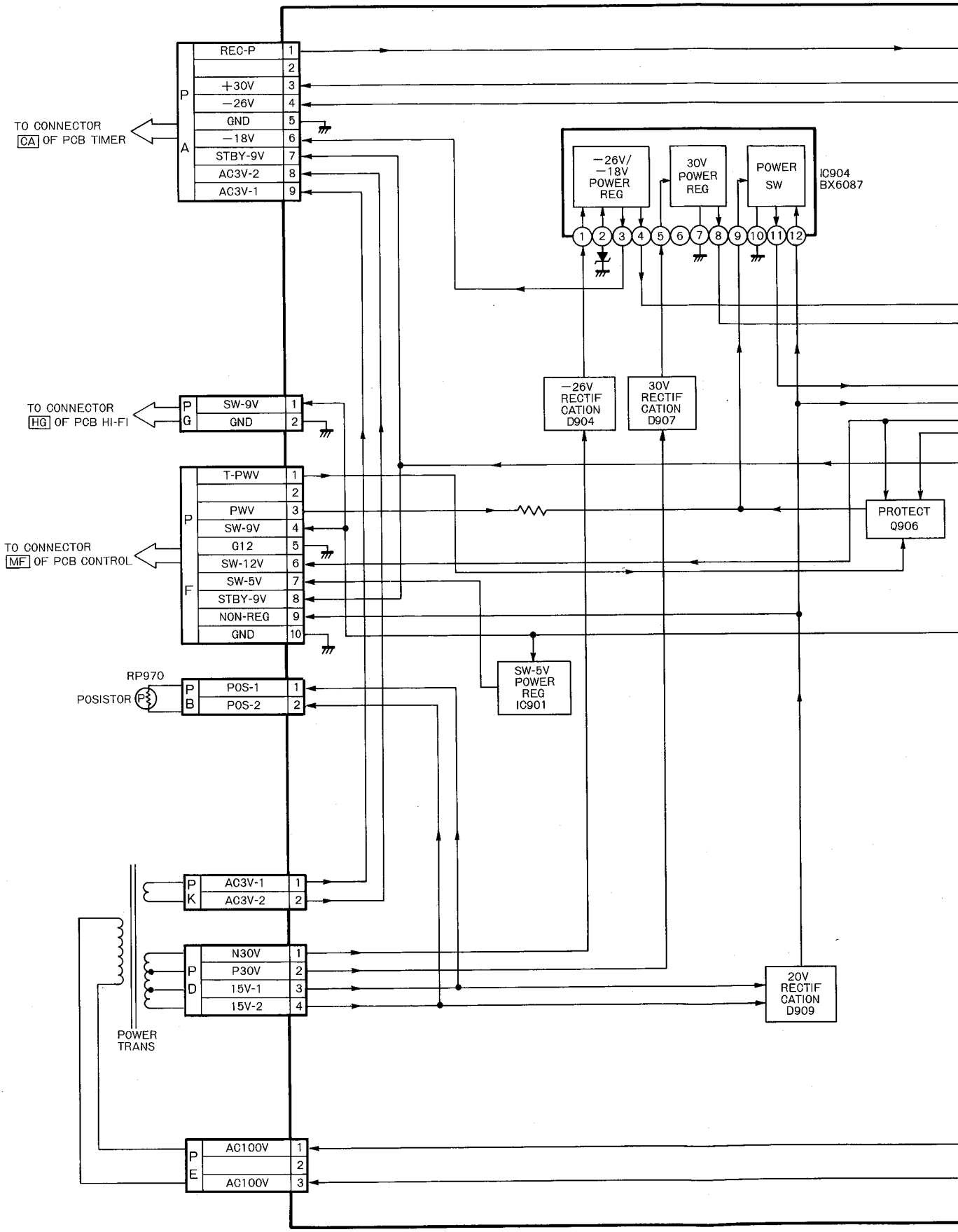
M


THU
FRI
SAT
OTR RSVD
V8A0
6G
5G
4G
3G
2G
1G
SVD
OTR
1G
F
2
3
2
2
SW-5V
TR-VR
C
S
TO CONNECTOR [MS] OF PCB CONTROL
VR8A1
TRACKING VR
P43
P42
P40
P30
P32
P33
P53
C
E
4
S8V1 PRISET
S8V2 CH-10
S8V3 CH-1
S8V5 FT⊕
S8V6 FT⊖
S8V4 MEMORY
S8A3
CLK
ON
OFF
2
P32
P33
D8D1
S8V0 BAND SW
S8A4 CT-RES
S8A6 DAY
S8A5 ON
S8A9 H
S8A8 CLK
S8A7 UP
S8B1 10M
S8B0 DUN
S8B3 M
S8B2 COUNTER/TIMER
4
3
3
i-VR
0-VR
P52
VL
VH
U
STBY-9V
30V
GND
C
D
S8V0 BAND SW
TO CONNECTOR [HD] OF PCB HI-FI
3

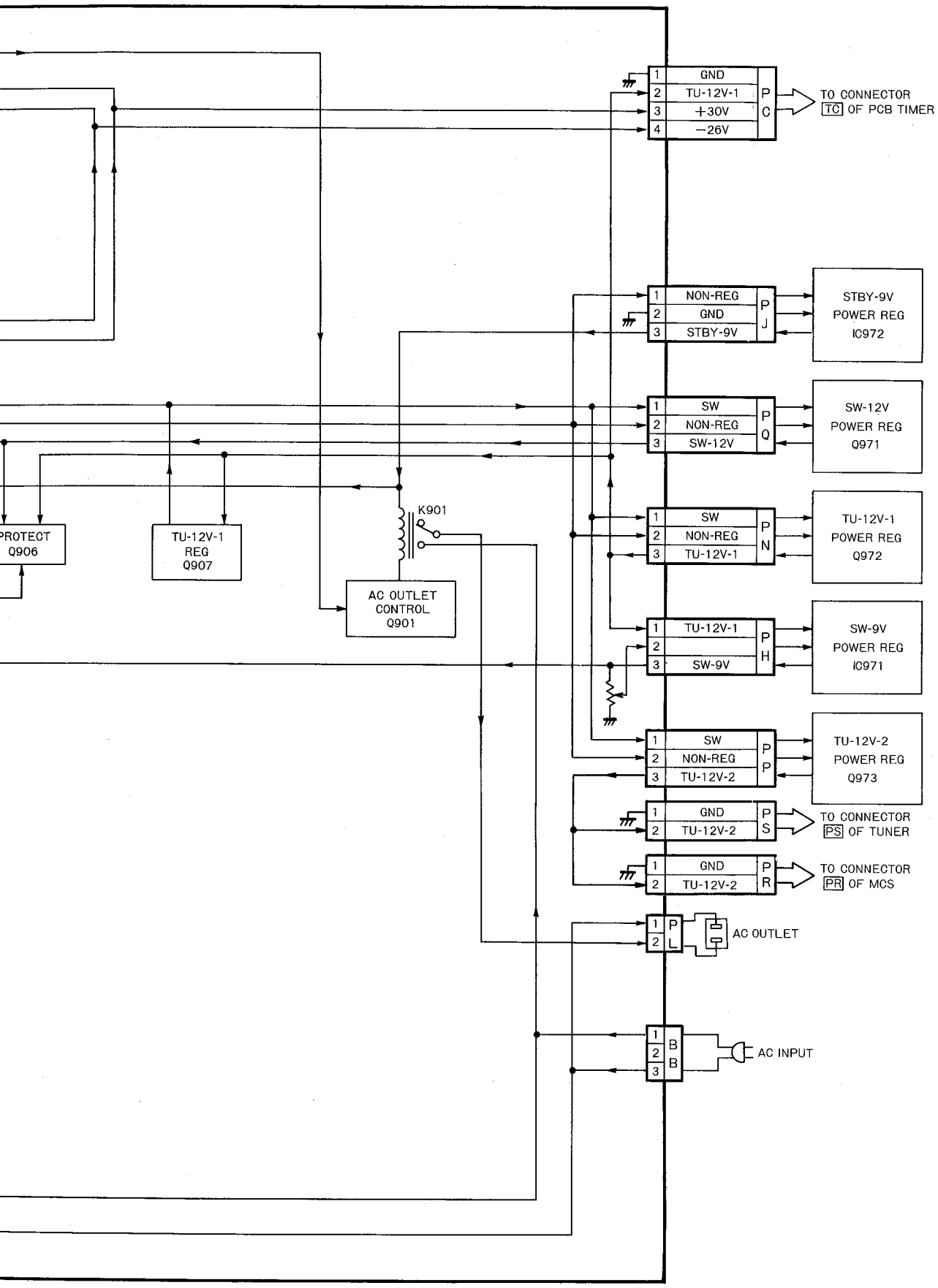
POWER CIRCUIT BLOCK DIAGRAM



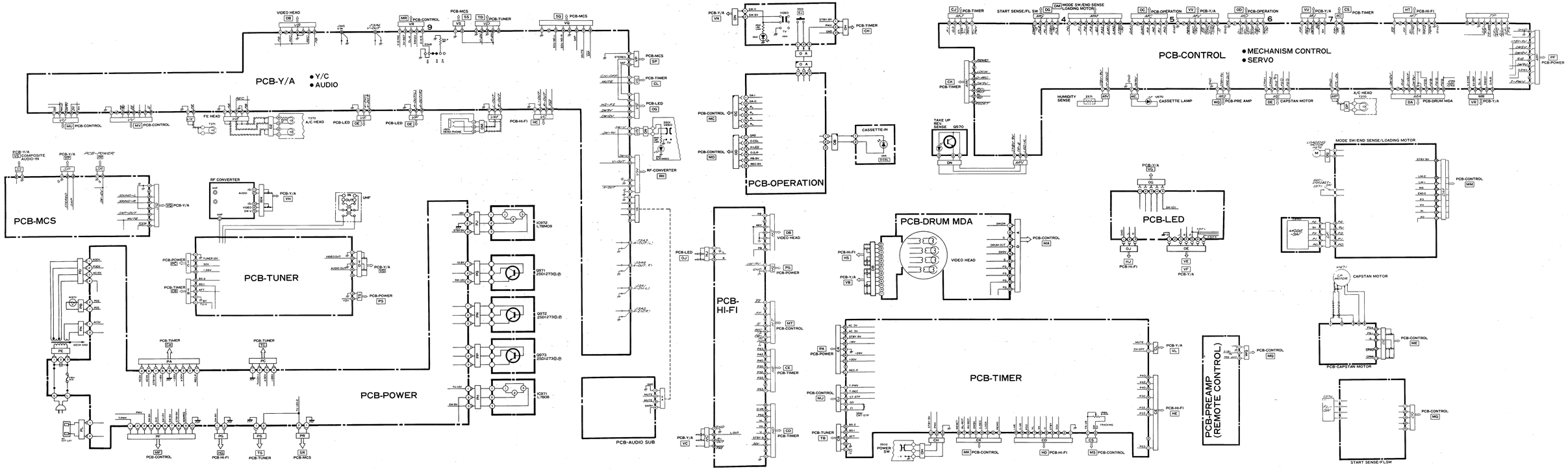
POWER CIRCUIT BLO



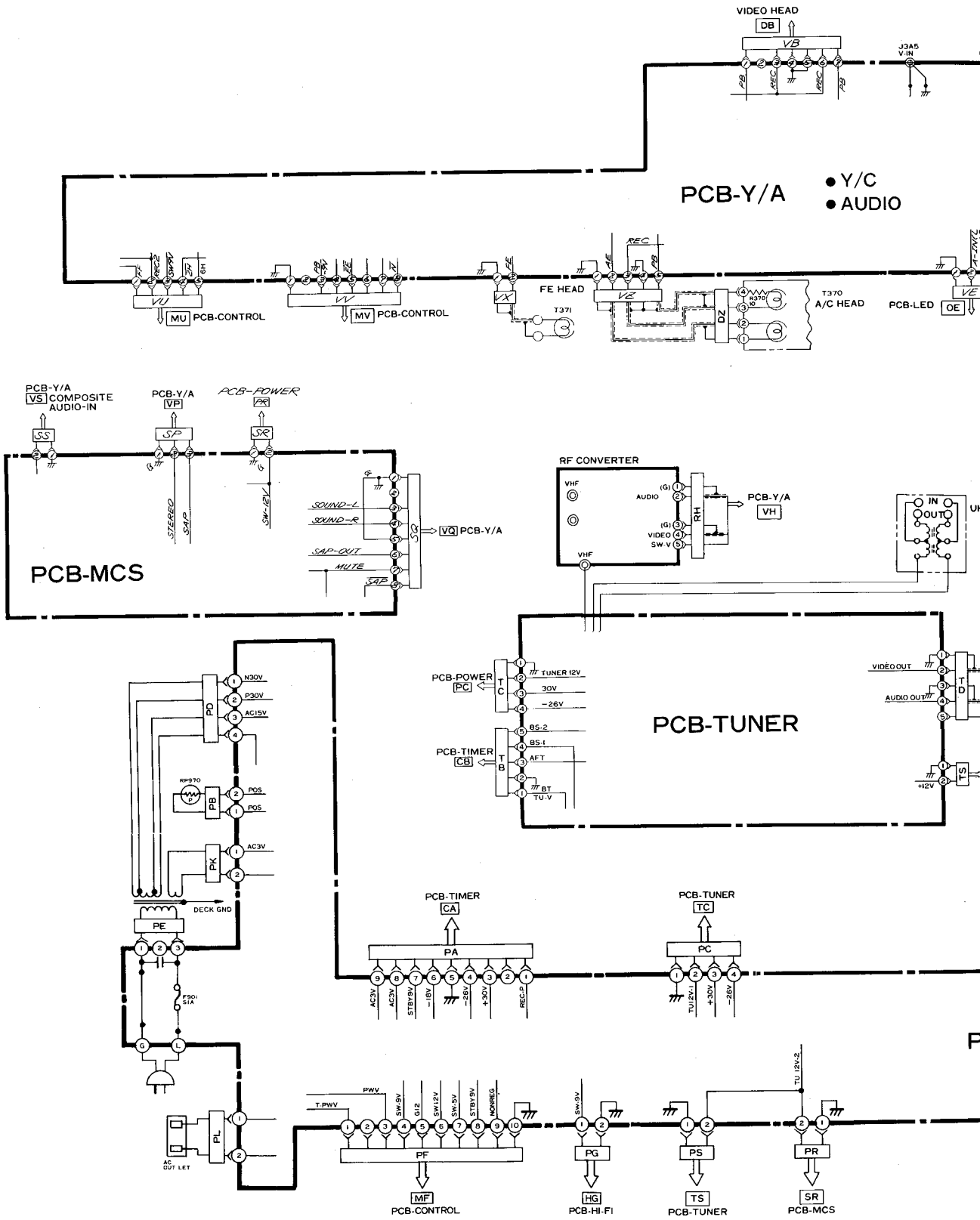
BLOCK DIAGRAM

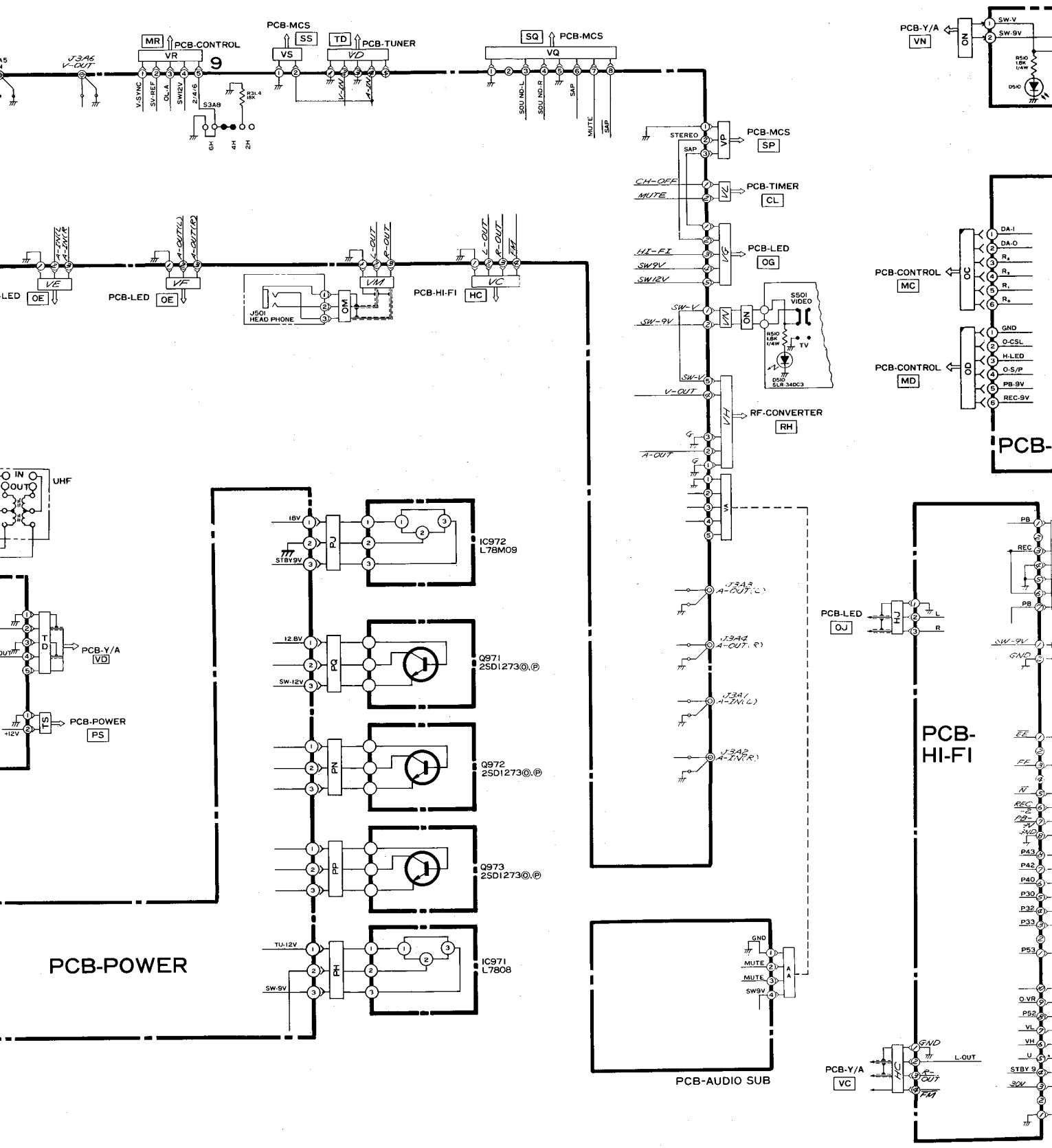


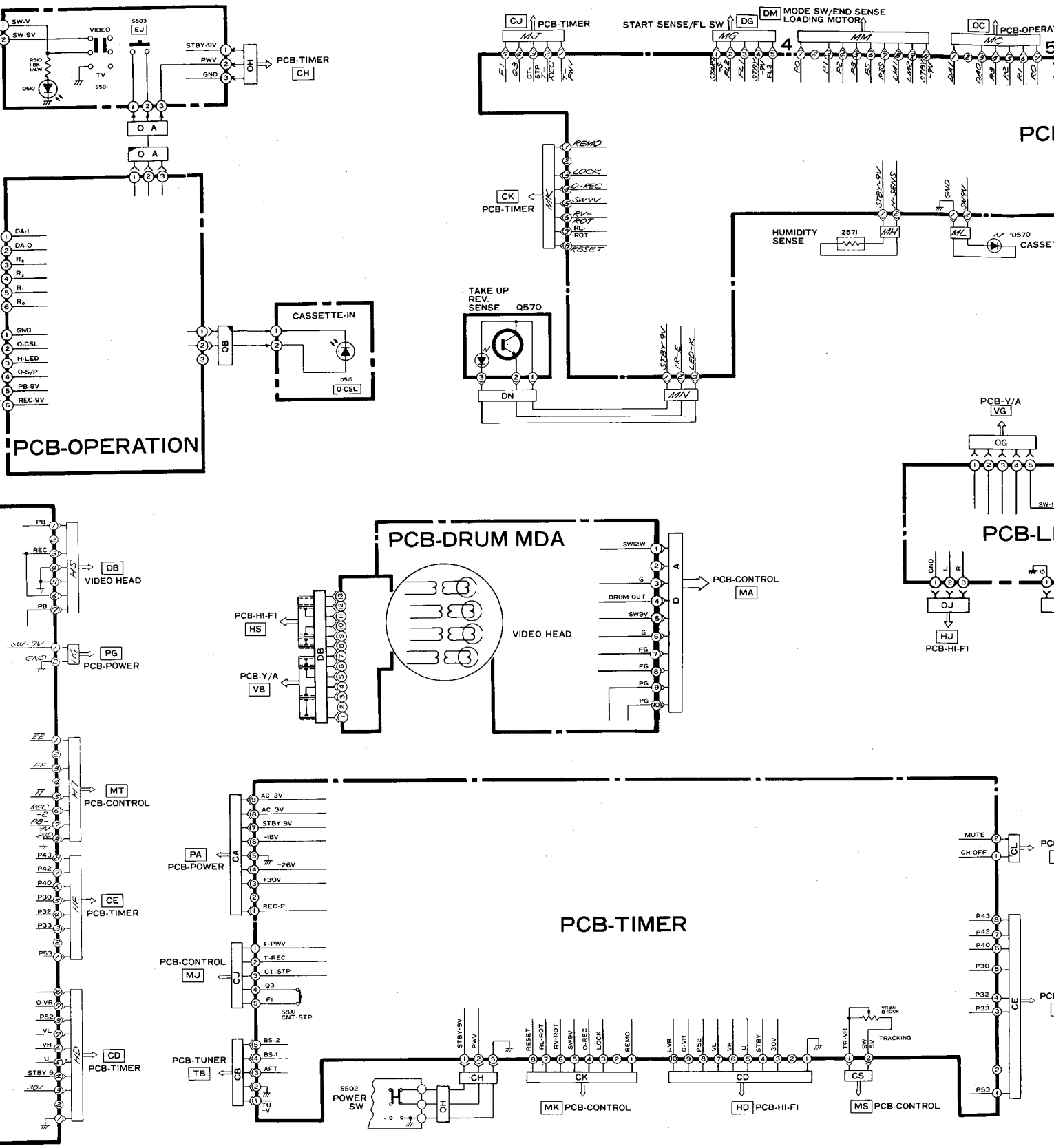
P.C.B. BLOCK DIAGRAM

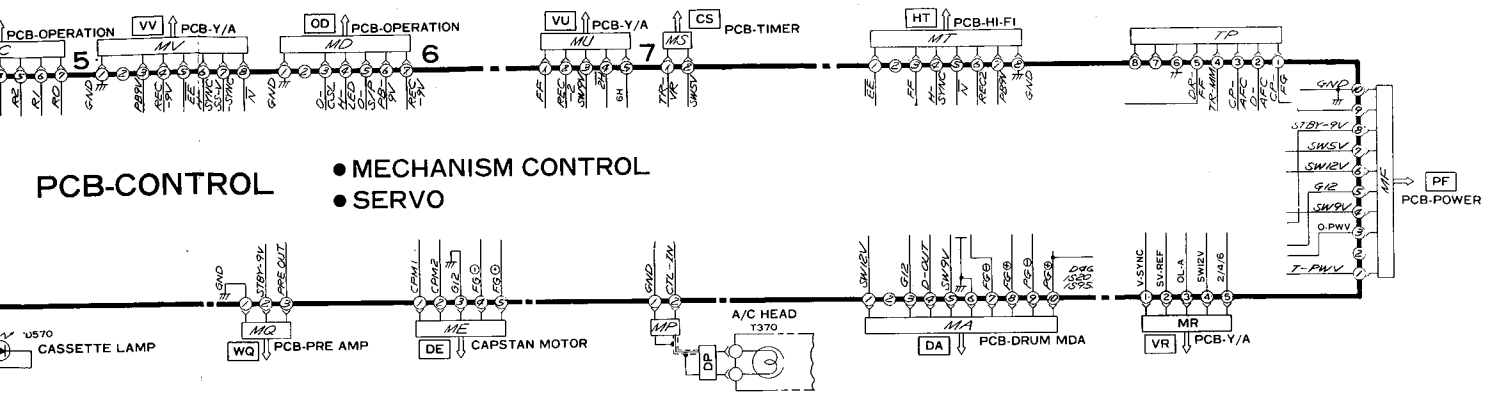


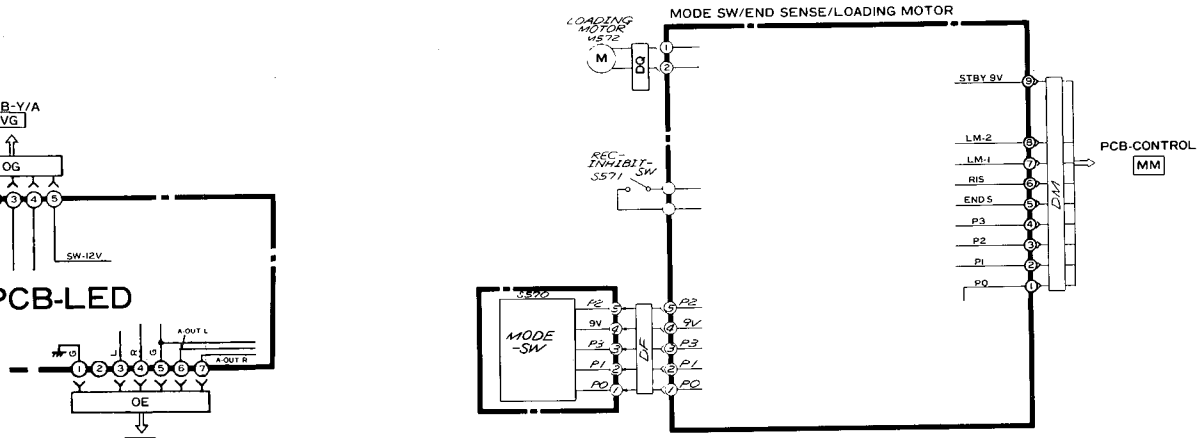
P.C.B. BLOCK DIAGRAM



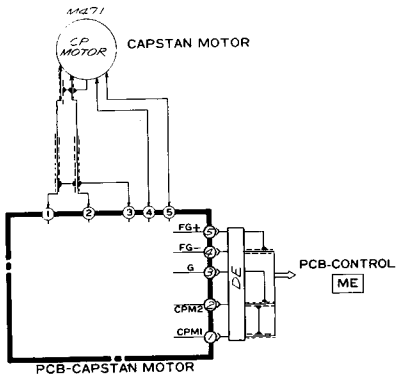

PCB-CONTROL
PCB-MCS
PCB-TUNER
PCB-MCS
PCB-Y/A
PCB-MCS
PCB-TIMER
PCB-LED
PCB-LED
PCB-HI-FI
PCB-CONTROL
PCB-CONTROL
RF-CONVERTER
UHF
PCB-Y/A
PCB-POWER
PCB-LED
PCB-Y/A
PCB-POWER
PCB-HI-FI
PCB-AUDIO SUB
IC972
L78M09
Q971
2SD1273Ⓞ,Ⓟ
Q972
2SD1273Ⓞ,Ⓟ
Q973
2SD1273Ⓞ,Ⓟ
IC971
L7808

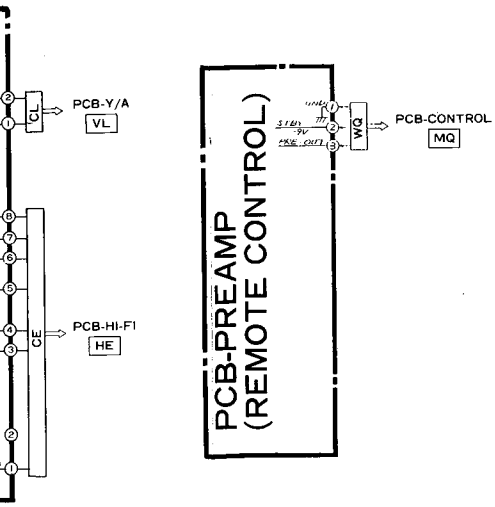

PCB-OPERATION
PCB-DRUM MDA
PCB-TIMER
VIDEO HEAD
PCB-CONTROL
PCB-POWER
PCB-TIMER
PCB-TUNER
PCB-HI-FI
PCB-Y/A
CASSETTE-IN
HUMIDITY SENSE
TAKE UP REV. SENSE Q570
START SENSE/FL SW
MODE SW/END SENSE
LOADING MOTOR
TRACKING
POWER SW

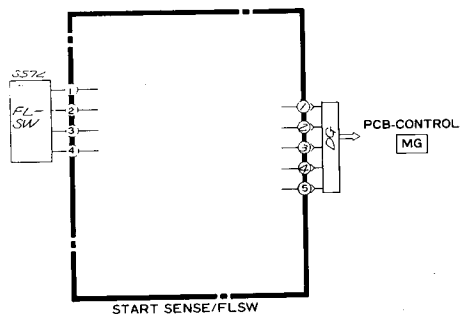

PCB-OPERATION
VV
PCB-Y/A
MV
5
OD
PCB-OPERATION
MD
6
VU
PCB-Y/A
MU
7
MS
CS
PCB-TIMER
HT
PCB-HI-FI
MT
TP
PCB-CONTROL
• MECHANISM CONTROL
• SERVO
MF
PF
PCB-POWER
CASSETTE LAMP
MQ
WQ
PCB-PRE AMP
ME
DE
CAPSTAN MOTOR
MP
A/C HEAD
T370
MA
DA
PCB-DRUM MDA
MR
VR
PCB-Y/A


MODE SW/END SENSE/LOADING MOTOR
LOADING MOTOR M572
M
DQ
REC-INHIBIT-SW S571
MODE-SW S570
DF
DM
PCB-CONTROL
MM
STBY 9V
LM-2
LM-1
RIS
END S
P3
P2
P1
P0

B-Y/A
VG
OG
SW-12V
PCB-LED
A OUT L
A OUT R
OE
VE
VF
PCB-Y/A


M471
CP MOTOR
CAPSTAN MOTOR
FG+
FG-
G
CPM2
CPMI
DE
PCB-CONTROL
ME
PCB-CAPSTAN MOTOR


CL
PCB-Y/A
VL
CE
PCB-HI-FI
HE
PCB-PRE AMP
(REMOTE CONTROL)
WQ
PCB-CONTROL
MQ


S574
FL-SW
DG
PCB-CONTROL
MG
START SENSE/FLSW

SCHEMATIC DIAGRAM

NOTE 1:

1. DC voltages were measured from points indicated to the circuit ground with a valve voltmeter.
2. The voltages parenthesised are on 2H recording mode. While those without parenthesised on 2H play back mode.

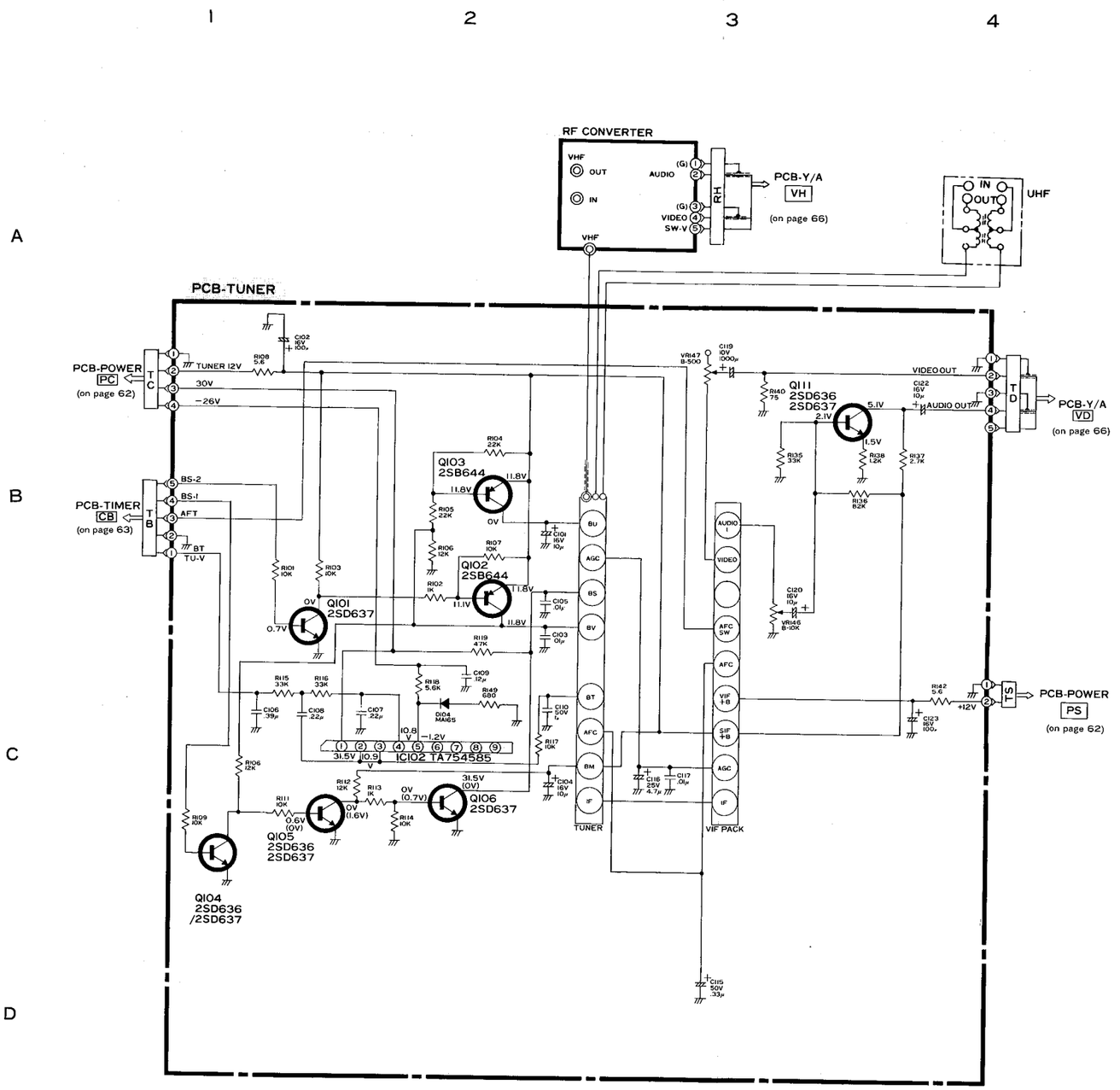
NOTE 2:

1. The unit of resistance "ohm" entirely omitted.
   Accordingly, K = 1000 ohms
   M = 1000K ohms.
2. The wattage of resistor, not specifically designated, is 1/6 watt.
3. Resistors, not specifically designated, are carbon resistors.
4. The marks of resistors are as follows.
   - (CE) : Cemented resistor
   - (MB) : Metal oxide film resistor (type B)
   - (S) : Fixed composition resistors
   - (W) : Wire wound resistor
   - (M) : Metal film resistor
5. The tolerance of resistor value, not specifically designated, is: ±5%, K = ±10% M = ±20%
6. The unit of capacitance, not specifically designated, is:
   a) μF , for numbers less than 1
   b) PF, for numbers more than 1
7. Capacitors, not specifically designated are Ceramic capacitors except electrolytic capacitors.
8. The marks of capacitors are as follows:
   - (ALM) : Aluminus electrolytic capacitor
   - (MF) : Polyester capacitor
   - (PP) : Polypropylene film capacitor
   - (TAN) : Tantalum capacitor
   - (SC) : Semiconductor Ceramic Capacitors
   - (TF) : Twin film capacitor
   - (NP) : Non polarized electrolytic capacitor
   - ⊕ : Electrolytic capacitor
9. The DC working voltage of capacitor, not specifically designated is: 50V
10. The tolerance of capacitor value, not specifically designated is: ±10%
    and J = ±5% K = ±10% M = ±20% P = $\frac{+100\%}{-\ 0\%}$
    C = ±0.25PF D = ±0.5PF F = ±1PF Z = $\frac{+80\%}{-20\%}$ N=±30%
11. Ceramic capacitors with the marks RH, UJ, SL, etc. are temperature compensating types.

SPECIFIC SYMBOL

Zener Diode	Crystal unit
Varicap	LE Diode
Posistor	Photo Diode
Thermistor	Ceramic filter
Fusible Resistor	

This is a basic schematic diagram. Some sets may be subject to modification according to engineering improvement.



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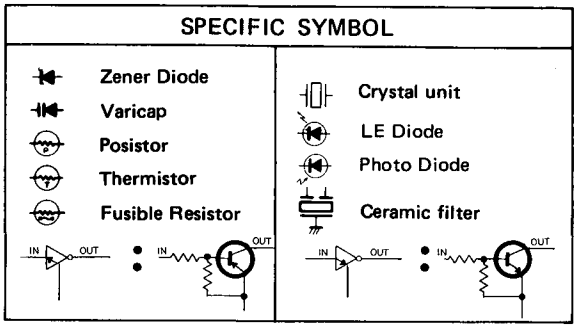
    C = ±0.25PF D = ±0.5PF F = ±1PF Z = $^{+80\%}_{-20\%}$ N=±30%
11. Ceramic capacitors with the marks RH, UJ, SL, etc. are temperature compensating types.



This is a basic schematic diagram. Some sets may be subject to modification according to engineering improvement.

A

B

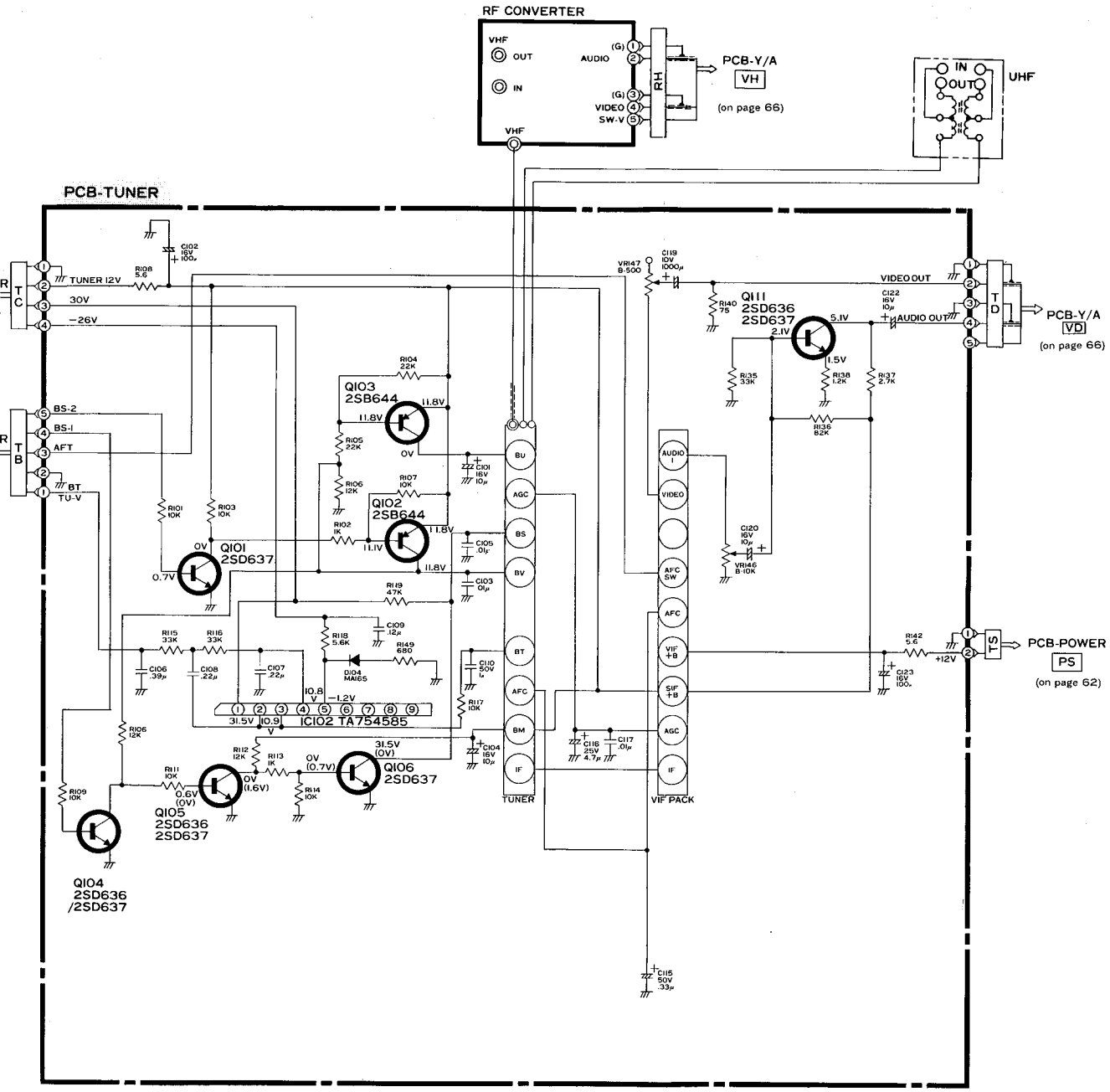
C

D

PCB-POWER [PC] ⇦ T C
(on page 62)

PCB-TIMER [CB] ⇦ T B
(on page 63)

1 2 3 4


RF CONVERTER
VHF
OUT
IN
AUDIO
VIDEO
SW-V
RH
PCB-Y/A
VH
(on page 66)
UHF
IN
OUT
PCB-TUNER
TUNER 12V
30V
-26V
BS-2
BS-1
AFT
BT
TU-V
Q101 2SD637
Q102 2SB644
Q103 2SB644
Q104 2SD636 /2SD637
Q105 2SD636 2SD637
Q106 2SD637
Q111 2SD636 2SD637
IC102 TA754585
TUNER
VIF PACK
VIDEO OUT
AUDIO OUT
PCB-Y/A
VD
(on page 66)
PCB-POWER
PS
(on page 62)
+12V

POWER

PCB-POWER

IC904 BX-6087

PCB-TIMER CA (on page 63)

PCB-TUNER TC (on page 61)

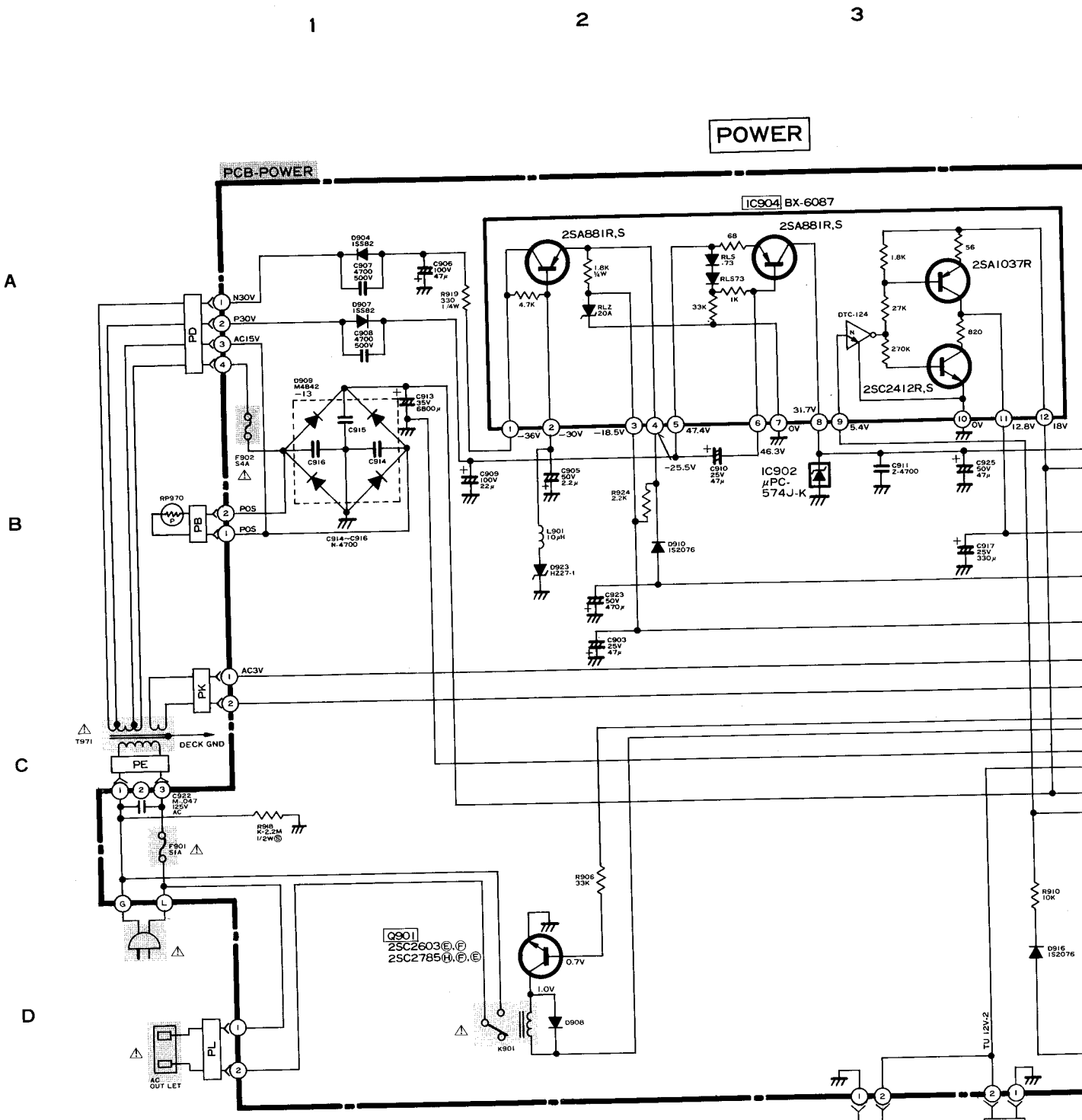
⚠ SHADED COMPONENTS HAVE SPECIAL CHARACTERISTICS IMPORTANT TO SAFETY. BEFORE REPLACING ANY OF THESE COMPONENTS READ CAREFULLY THE PRODUCT SAFETY NOTICE IN THE SERVICE MANUAL. DON'T DEGRADE THE SAFETY OF THE RECEIVERS THROUGH IMPROPER SERVICING.

PCB-TUNER (on page 61)

PCB-MCS (on page 64)

PCB-CONTROL (on page 67)

PCB-HI-FI (on page 65)



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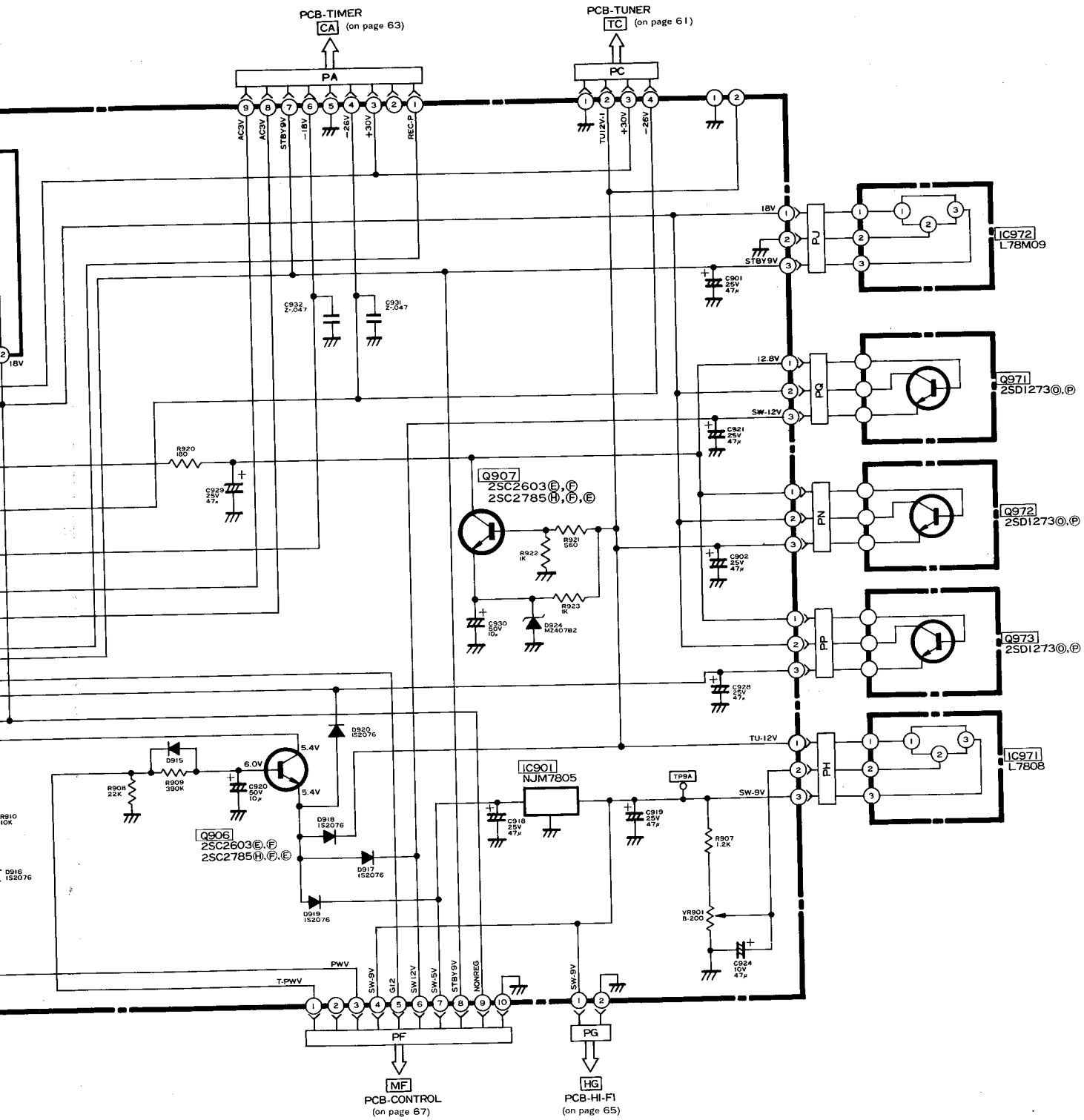
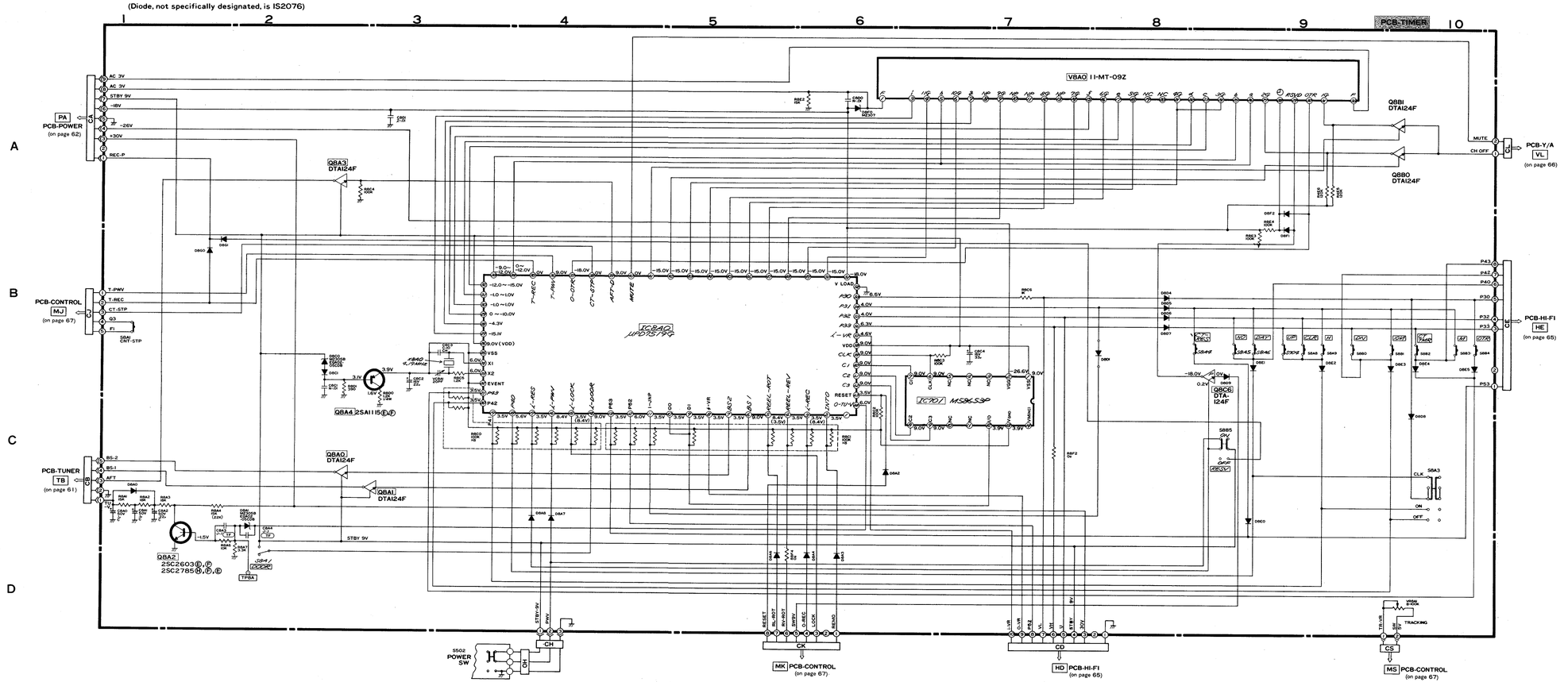
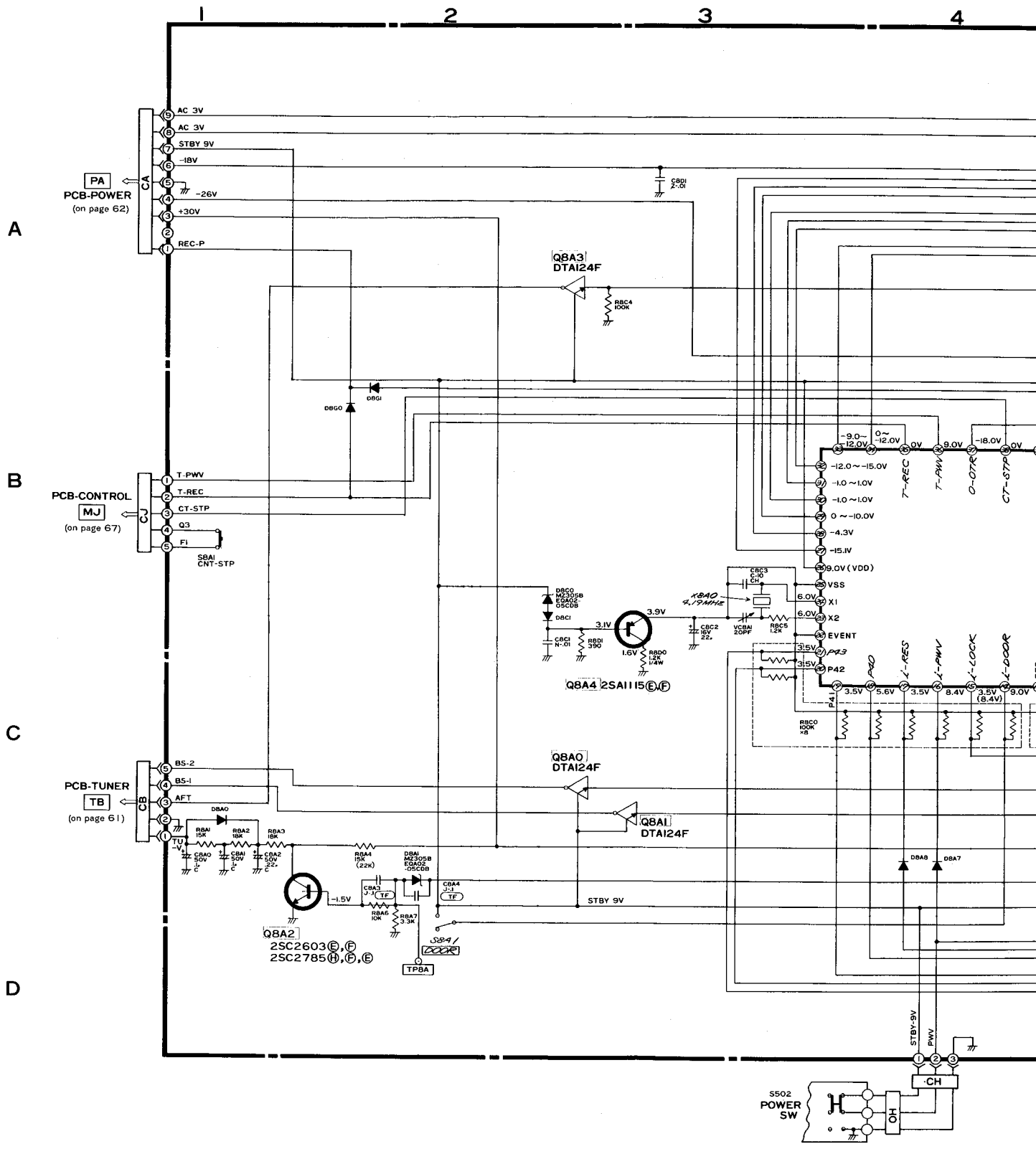
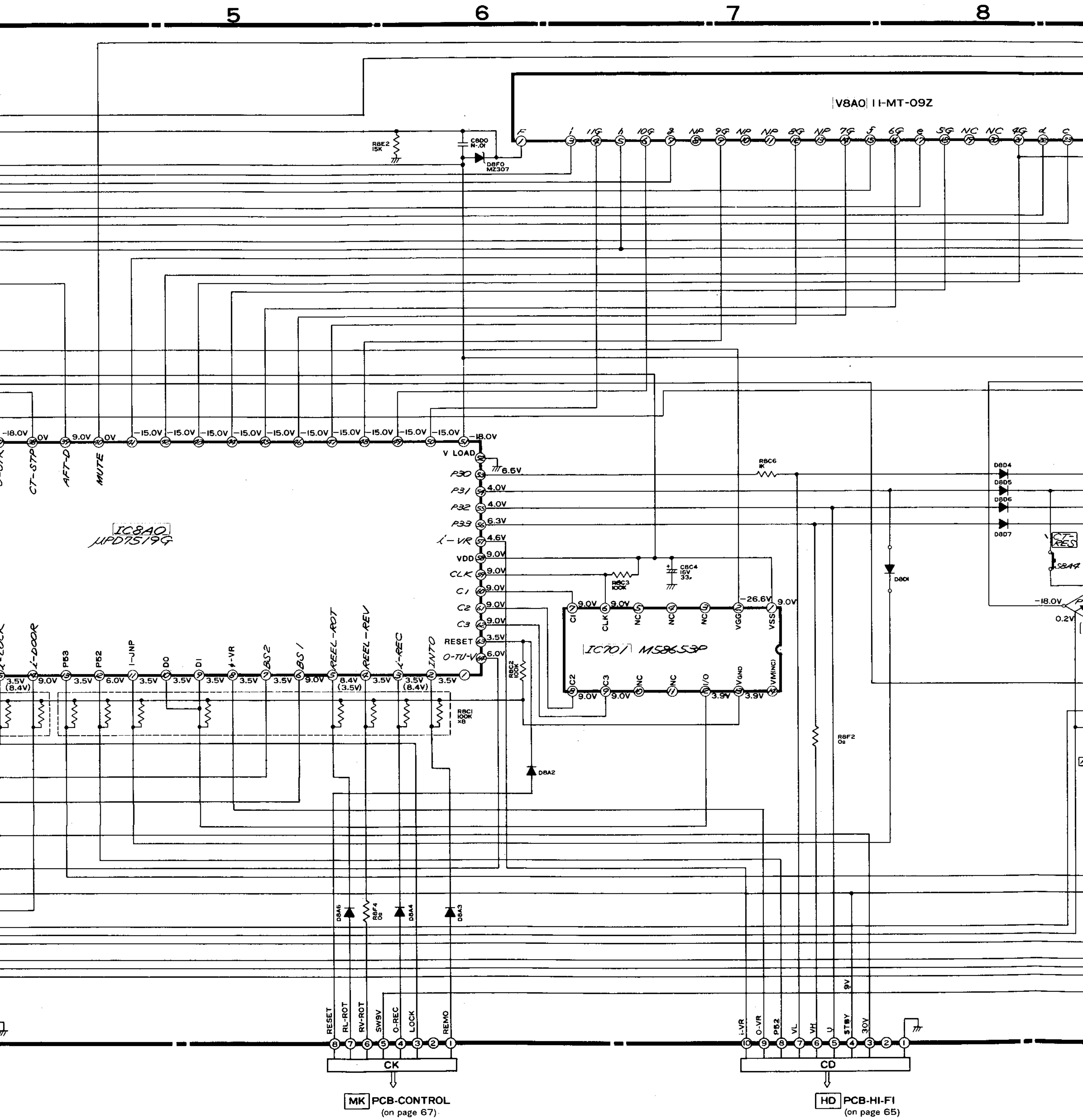

PCB-TIMER
CA (on page 63)
PCB-TUNER
TC (on page 61)
PA
PC
AC3V
AC3V
STBY9V
-18V
-26V
+30V
REC-P
TU12V
+30V
-26V
18V
STBY9V
12.8V
SW-12V
TU-12V
SW-9V
PJ
PQ
PN
PP
PH
IC972
L78M09
Q971
2SD1273O,P
Q972
2SD1273O,P
Q973
2SD1273O,P
IC971
L7808
Q907
2SC2603E,F
2SC2785H,F,E
Q906
2SC2603E,F
2SC2785H,F,E
IC901
NJM7805
TP9A
D915
D918
D917
D919
D920
D924
M240782
R908
22K
R909
390K
R910
10K
R920
180
R921
560
R922
1K
R923
1K
R907
1.2K
VR901
B-200
C901
25V
47μ
C902
25V
47μ
C918
25V
47μ
C919
25V
47μ
C920
50V
10μ
C921
25V
47μ
C924
10V
47μ
C928
25V
47μ
C929
25V
47μ
C930
50V
10μ
C931
Z-.047
C932
Z-.047
5.4V
6.0V
PWV
T-PWV
SW-9V
G12
SW-12V
SW-5V
STBY9V
NONREG
PF
PG
MF
PCB-CONTROL
(on page 67)
HG
PCB-HI-FI
(on page 65)

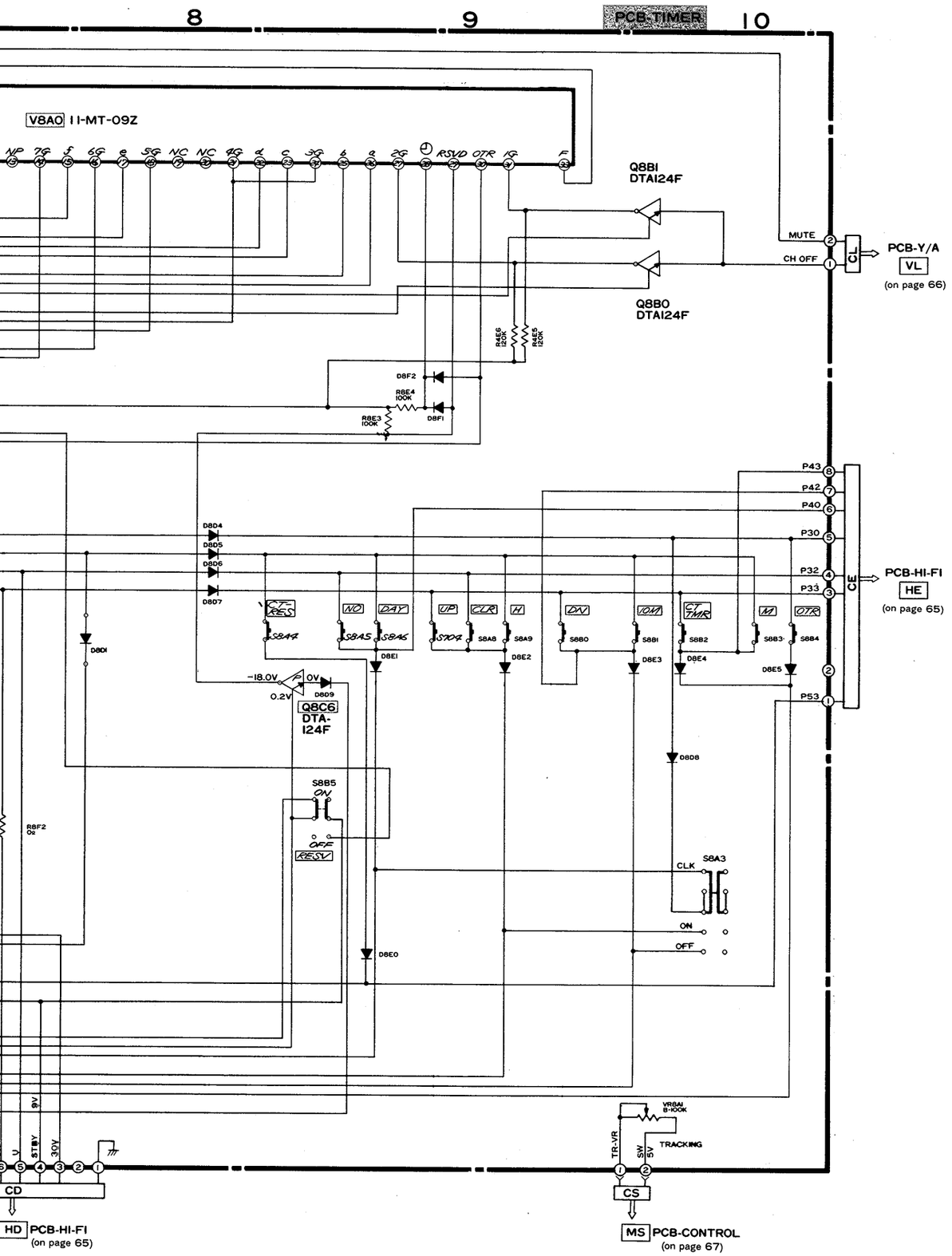

(Diode, not specifically designated, is IS2076)
PCB-TIMER
PA
PCB-POWER
(on page 62)
AC 3V
AC 3V
STBY 9V
-18V
-26V
+30V
REC-P
PCB-CONTROL
MJ
(on page 67)
T-PWV
T-REC
CT-STP
Q3
F1
SDA1
CNT-STP
PCB-TUNER
TB
(on page 61)
BS-2
BS-1
AFT
IC8A0 μPD6756
IC201 MSS530
VBA0 11-MT-09Z
Q8A0 DTA124F
Q8A1 DTA124F
Q8A2 2SA1115
Q8A3 DTA124F
Q8A4 2SA1115
Q8B0 DTA124F
Q8B1 DTA124F
Q8C6 DTA124F
PCB-Y/A
VL
(on page 66)
PCB-HI-FI
HE
(on page 65)
MUTE
CH OFF
POWER SW
S502
CH
CK
MK PCB-CONTROL
(on page 67)
CD
HD PCB-HI-FI
(on page 65)
TRACKING
CS
MS PCB-CONTROL
(on page 67)

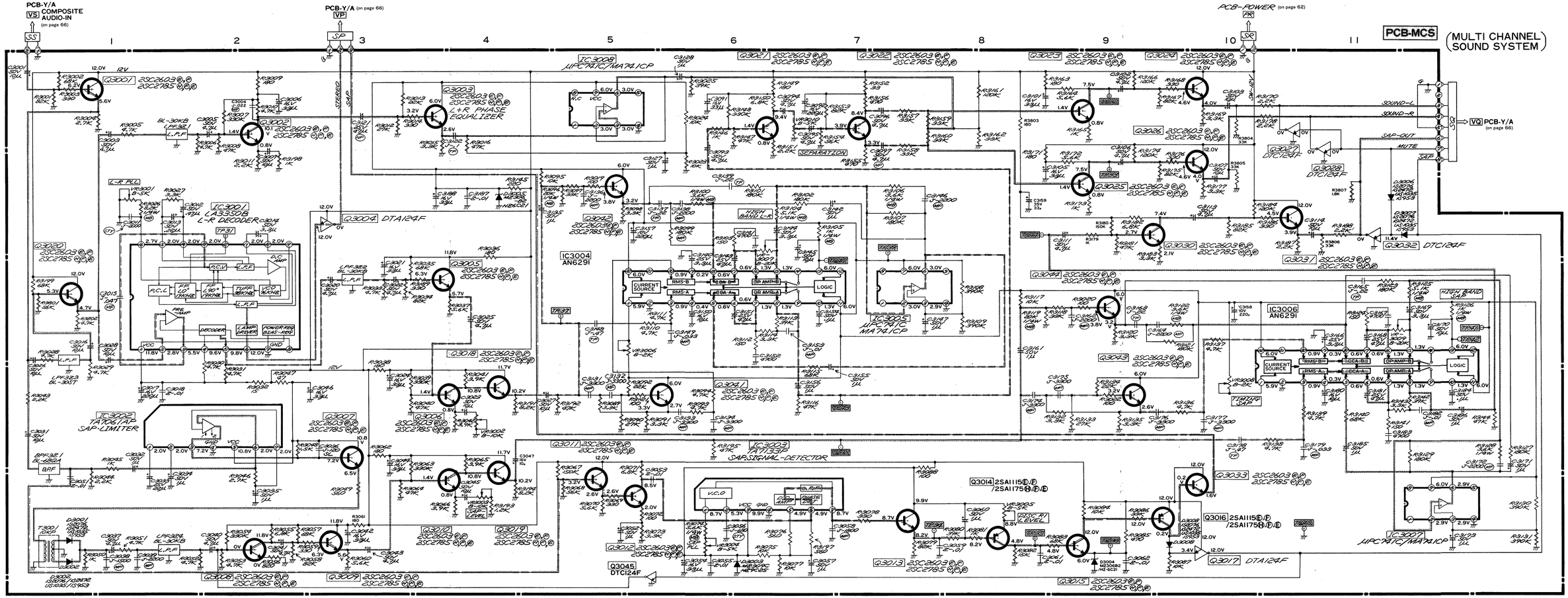
(Diode, not specifically designated, is IS2076)

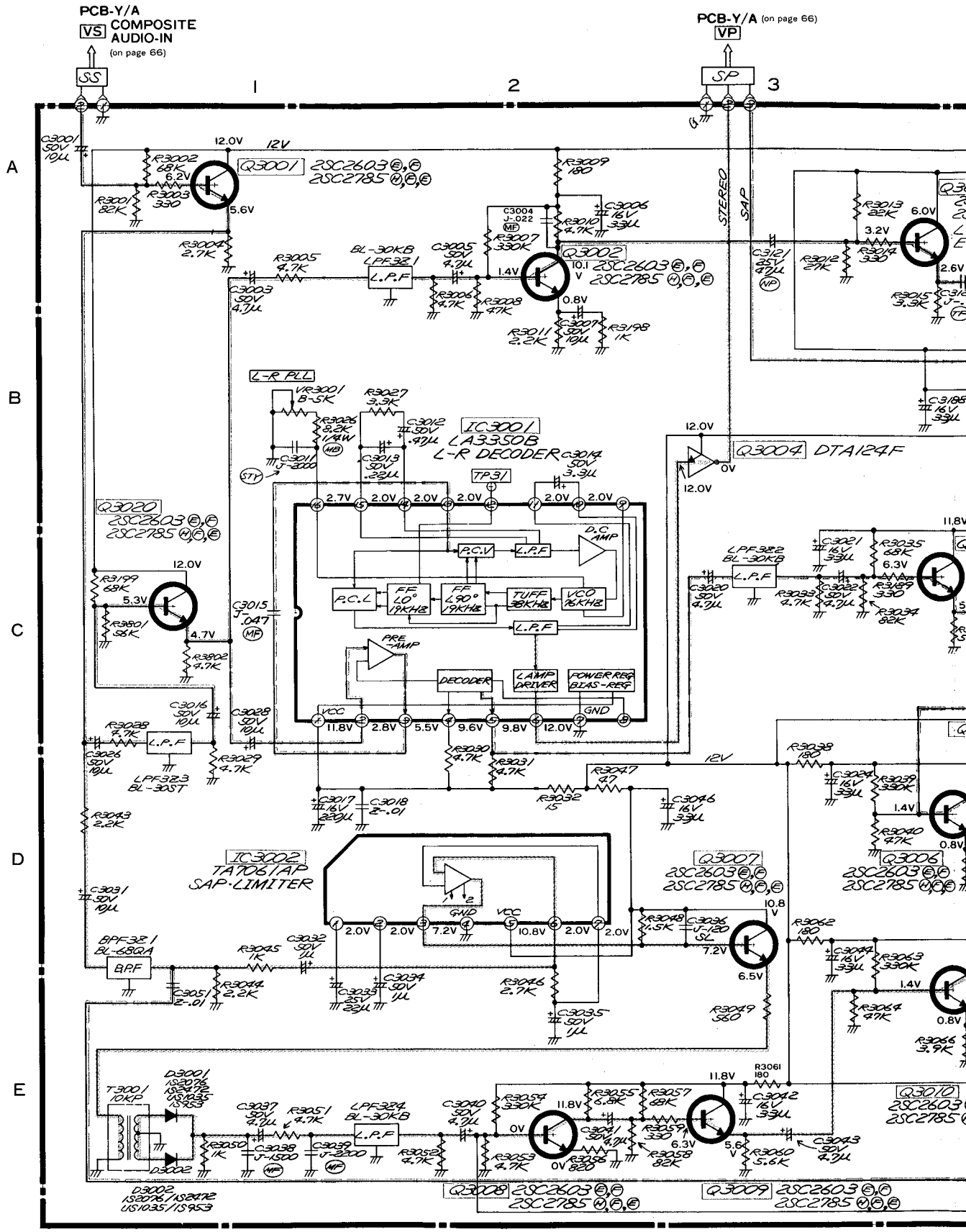


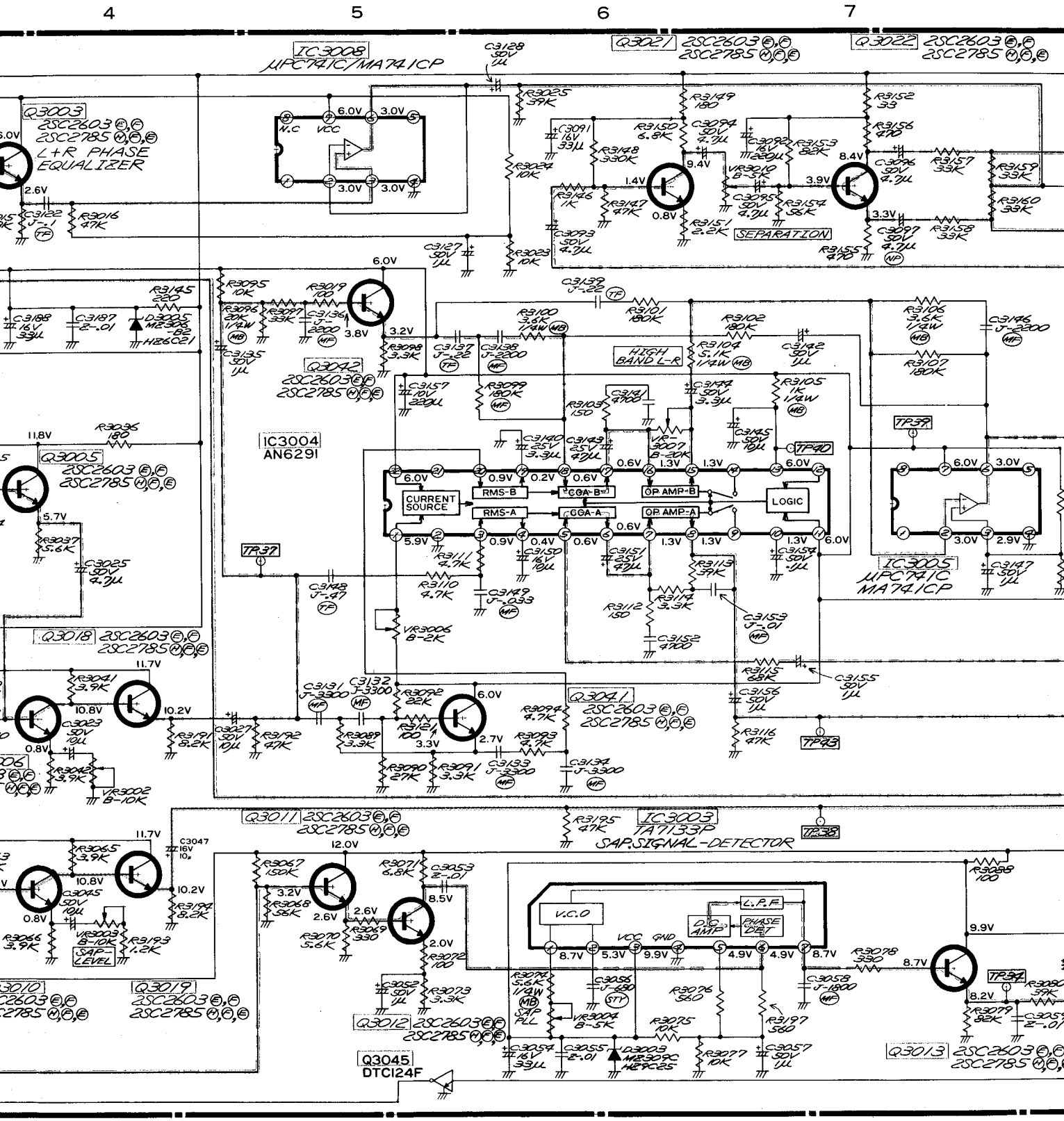


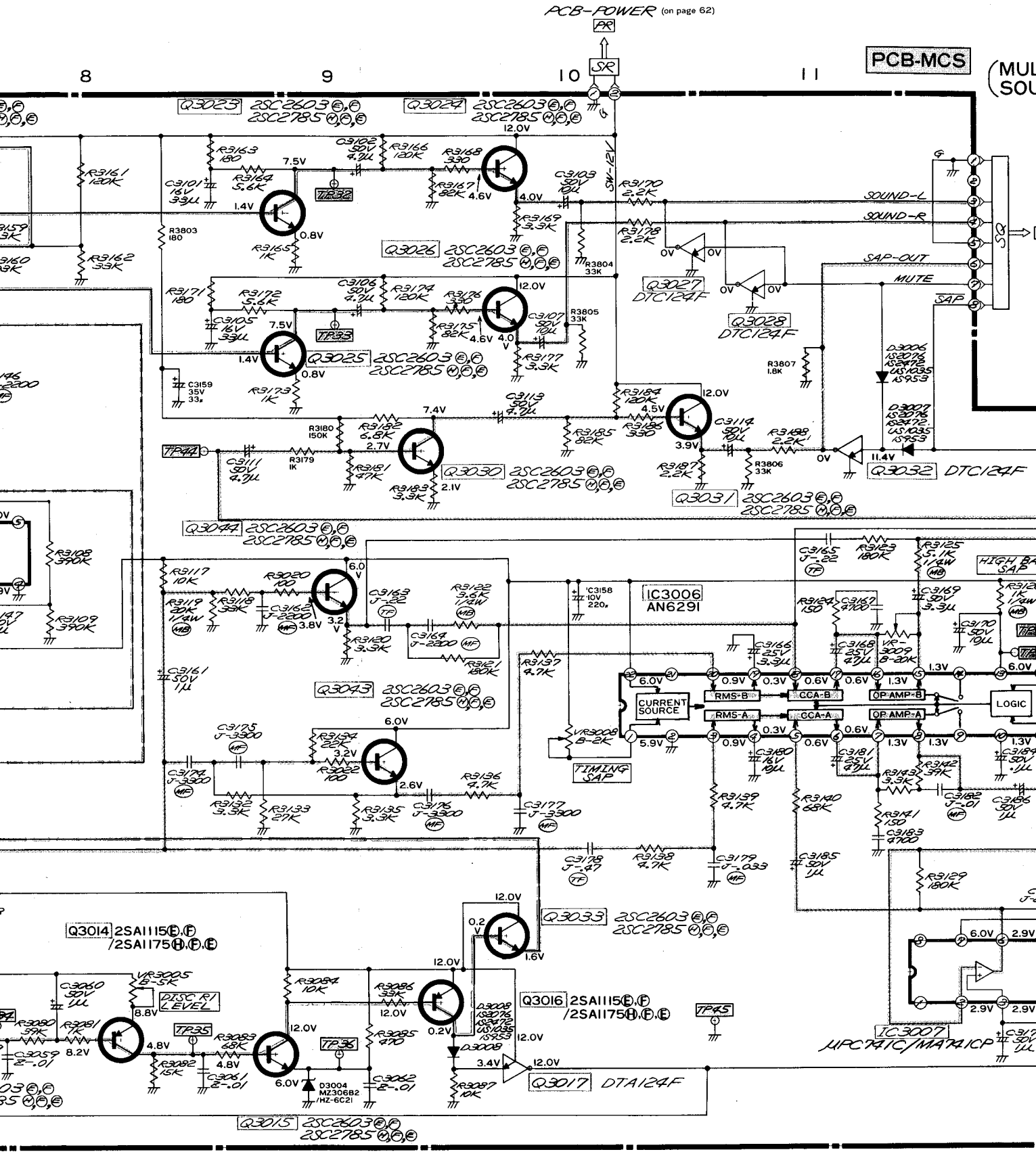
5
6
7
8
V8A0 11-MT-09Z
IC8A0 μPD7519G
IC701 M58653P
R8E2 15K
C8D0
D8F0 MZ307
R8C6 1K
D8D4
D8D5
D8D6
D8D7
D801
CT-RES
S8A4
R8C3 100K
C8C4 16V 33μ
R8C2 100K
R8C1 100K x8
D8A2
R8F2
D8A6
R8F4
D8A4
D8A3
V LOAD
P30
P31
P32
P33
i-VR
VDD
CLK
C1
C2
C3
RESET
O-TU-V
CT-STP
AFT-D
MUTE
i-DOOR
P53
P52
I-JNP
D0
D1
φ-VR
BS2
BS1
REEL-ROT
REEL-REV
i-REC
INTO
RESET
RL-ROT
RV-ROT
SW9V
O-REC
LOCK
REMO
CK
MK PCB-CONTROL
(on page 67)
i-VR
O-VR
P52
VL
VH
U
STBY
30V
9V
CD
HD PCB-HI-FI
(on page 65)

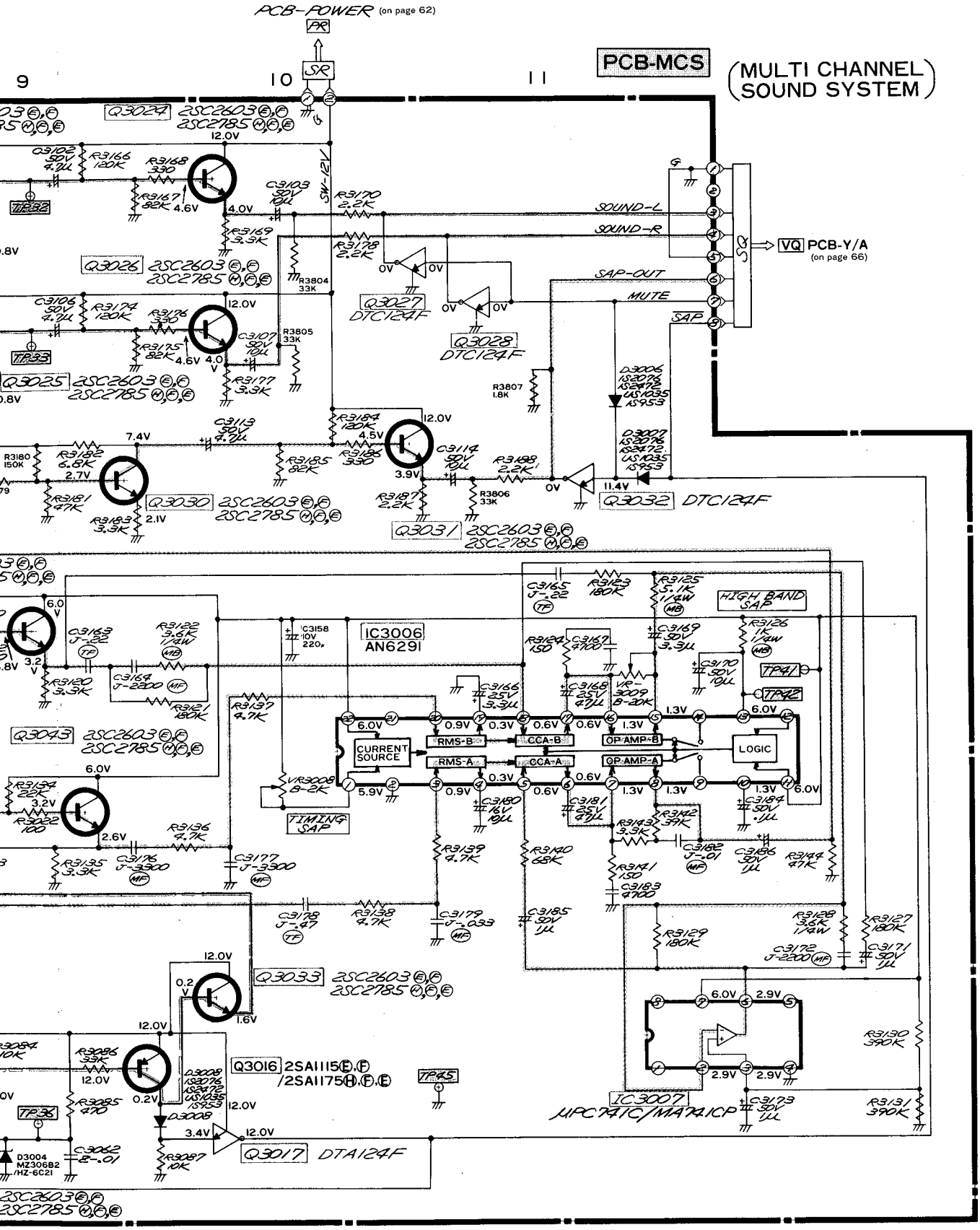

8
9
PCB-TIMER
10
V8A0 11-MT-09Z
Q8B1 DTA124F
Q8B0 DTA124F
MUTE
CH OFF
CL
PCB-Y/A
VL
(on page 66)
R8E6 120K
R8E5 120K
D8F2
R8E4 100K
R8E3 100K
D8F1
P43
P42
P40
P30
P32
P33
P53
CE
PCB-HI-FI
HE
(on page 65)
D8D4
D8D5
D8D6
D8D7
D8D1
D8E1
D8E2
D8E3
D8E4
D8E5
D8D8
D8E0
D8D9
-18.0V
0V
0.2V
Q8C6 DTA-124F
S8A7
S8A5
S8A6
S8A8
S8A9
S8B0
S8B1
S8B2
S8B3
S8B4
S8B5
ON
OFF
RESV
S8A3
CLK
ON
OFF
R8F2
9V
STBY
3.3V
CD
HD PCB-HI-FI
(on page 65)
VR8A1 B-100K
TR-VR
SW 5V
TRACKING
CS
MS PCB-CONTROL
(on page 67)

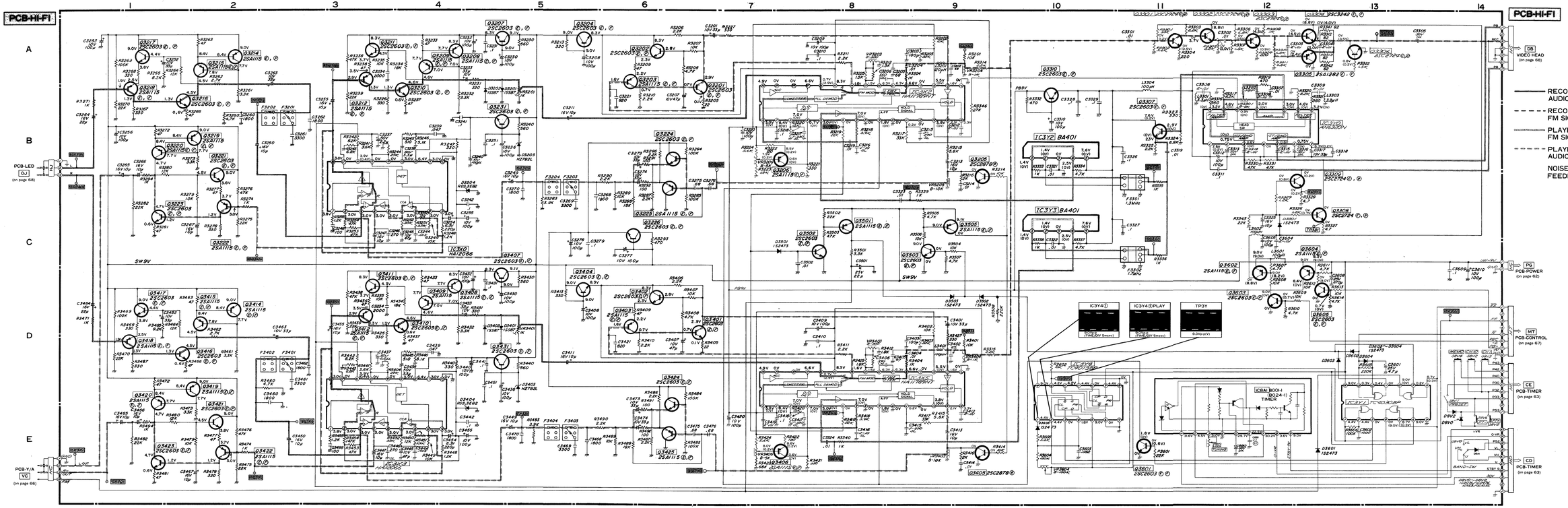

PCB-Y/A
VS
COMPOSITE
AUDIO-IN
(on page 66)
PCB-Y/A (on page 66)
VP
PCB-POWER (on page 62)
PK
PCB-MCS
(MULTI CHANNEL SOUND SYSTEM)
SS
SP
SK
1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
IC3005 MPC74IC/MA74ICP
IC3004 AN6291
IC3006 AN6291
IC3002 LA3350B L-R DECODER
IC3003 TA7135F SAP-SIGNAL-DETECTOR
IC3008 TA7045F SAP-LIMITER
IC3007 MPC74IC/MA74ICP
Q3001 2SC2603 2SC2785
Q3002 2SC2603 2SC2785
Q3003 2SC2603 2SC2785 L+R PHASE EQUALIZER
Q3004 DTA124F
Q3005 2SC2603 2SC2785
Q3006 2SC2603 2SC2785
Q3007 2SC2603 2SC2785
Q3008 2SC2603 2SC2785
Q3009 2SC2603 2SC2785
Q3010 2SC2603 2SC2785
Q3011 2SC2603 2SC2785
Q3012 2SC2603 2SC2785
Q3013 2SC2603 2SC2785
Q3014 2SA1115 2SA1175
Q3015 2SC2603 2SC2785
Q3016 2SA1115 2SA1175
Q3017 DTA124F
Q3018 2SC2603 2SC2785
Q3019 2SC2603 2SC2785
Q3020 2SC2603 2SC2785
Q3021 2SC2603 2SC2785
Q3022 2SC2603 2SC2785
Q3023 2SC2603 2SC2785
Q3024 2SC2603 2SC2785
Q3025 2SC2603 2SC2785
Q3026 2SC2603 2SC2785
Q3027 DTC124F
Q3028 DTC124F
Q3029 2SC2603 2SC2785
Q3030 2SC2603 2SC2785
Q3031 DTC124F
Q3032 2SC2603 2SC2785
Q3033 2SC2603 2SC2785
Q3034 2SC2603 2SC2785
Q3035 2SC2603 2SC2785
Q3036 2SC2603 2SC2785
Q3037 2SC2603 2SC2785
Q3038 2SC2603 2SC2785
Q3039 2SC2603 2SC2785
Q3040 2SC2603 2SC2785
Q3041 2SC2603 2SC2785
Q3042 2SC2603 2SC2785
Q3043 2SC2603 2SC2785
Q3044 2SC2603 2SC2785
Q3045 DTC124F
SOUND-L
SOUND-R
SAP-OUT
MUTE
SAP
VQ PCB-Y/A (on page 66)
L+R(MAIN) SIGNAL
L−R(SUB) SIGNAL
NR CONTROL
BILINGUAL(SAP) SIGNAL
NR CONTROL
SAP SIGNAL DETECT
STEREO SIGNAL DETECT

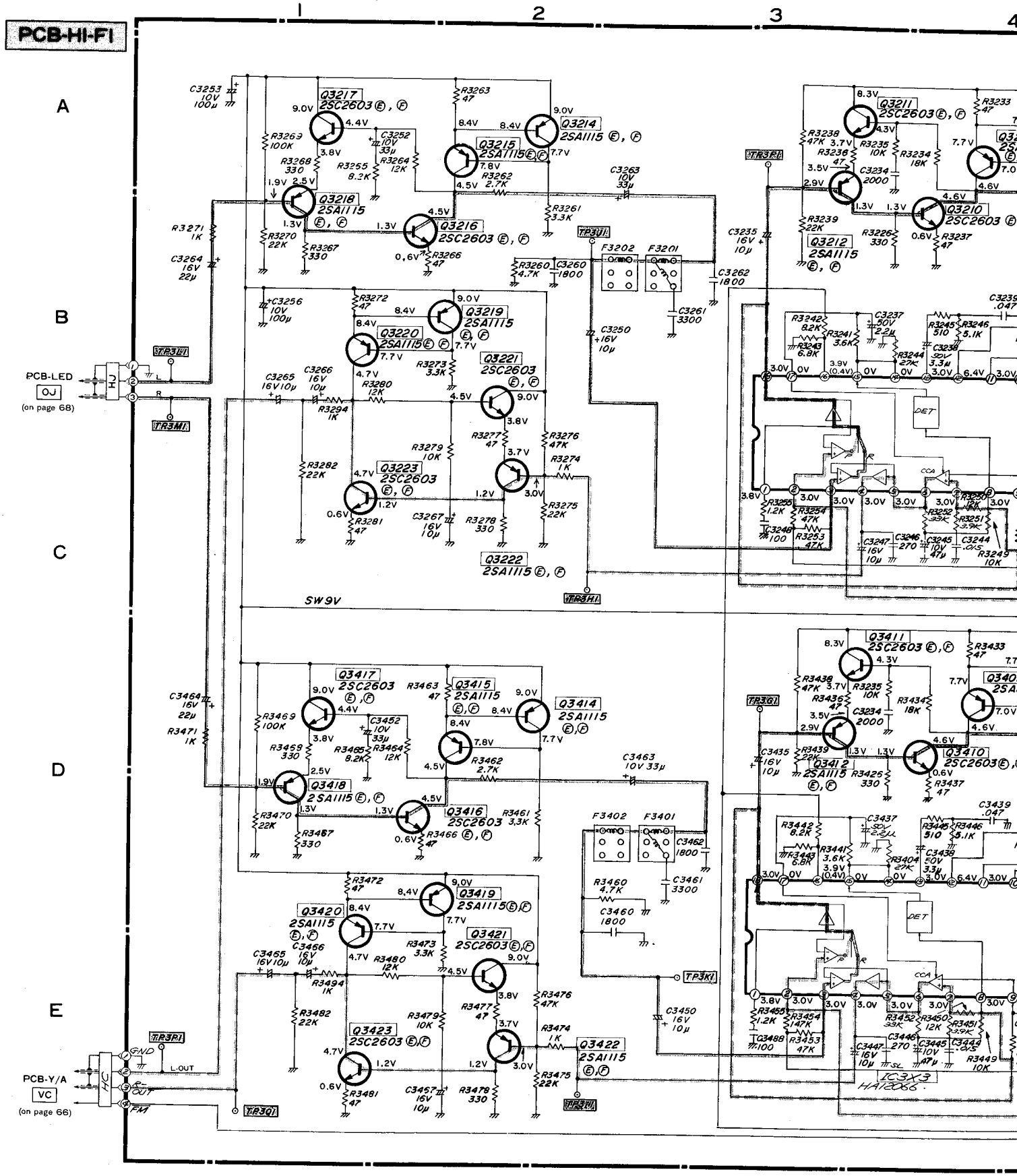

PCB-Y/A
VS COMPOSITE AUDIO-IN
(on page 66)
PCB-Y/A (on page 66)
VP
SS
SP
1
2
3
A
B
C
D
E
12V
Q3001 2SC2603 E,F 2SC2785 H,E,E
Q3002 2SC2603 E,F 2SC2785 H,E,E
Q3004 DTA124F
Q3020 2SC2603 E,F 2SC2785 H,E,E
IC3001 LA3350B L-R DECODER
L-R PLL
IC3002 TA7061AP SAP-LIMITER
Q3007 2SC2603 E,F 2SC2785 H,E,E
Q3006 2SC2603 E,F 2SC2785 H,E,E
Q3010 2SC2603 2SC2785
Q3008 2SC2603 E,F 2SC2785 H,E,E
Q3009 2SC2603 E,F 2SC2785 H,E,E
STEREO
SAP
P.C.V
P.C.L
D.C. AMP
L.P.F
FF 90° 19KHz
TUFF 38KHz
VCO 76KHz
PRE-AMP
DECODER
LAMP DRIVER
POWER REG BIAS-REG
VCC
GND
BPF
T3001 10KP
D3001 IS2076 IS2472 US1035 IS953
D3002 IS2076 IS2472 US1035 IS953

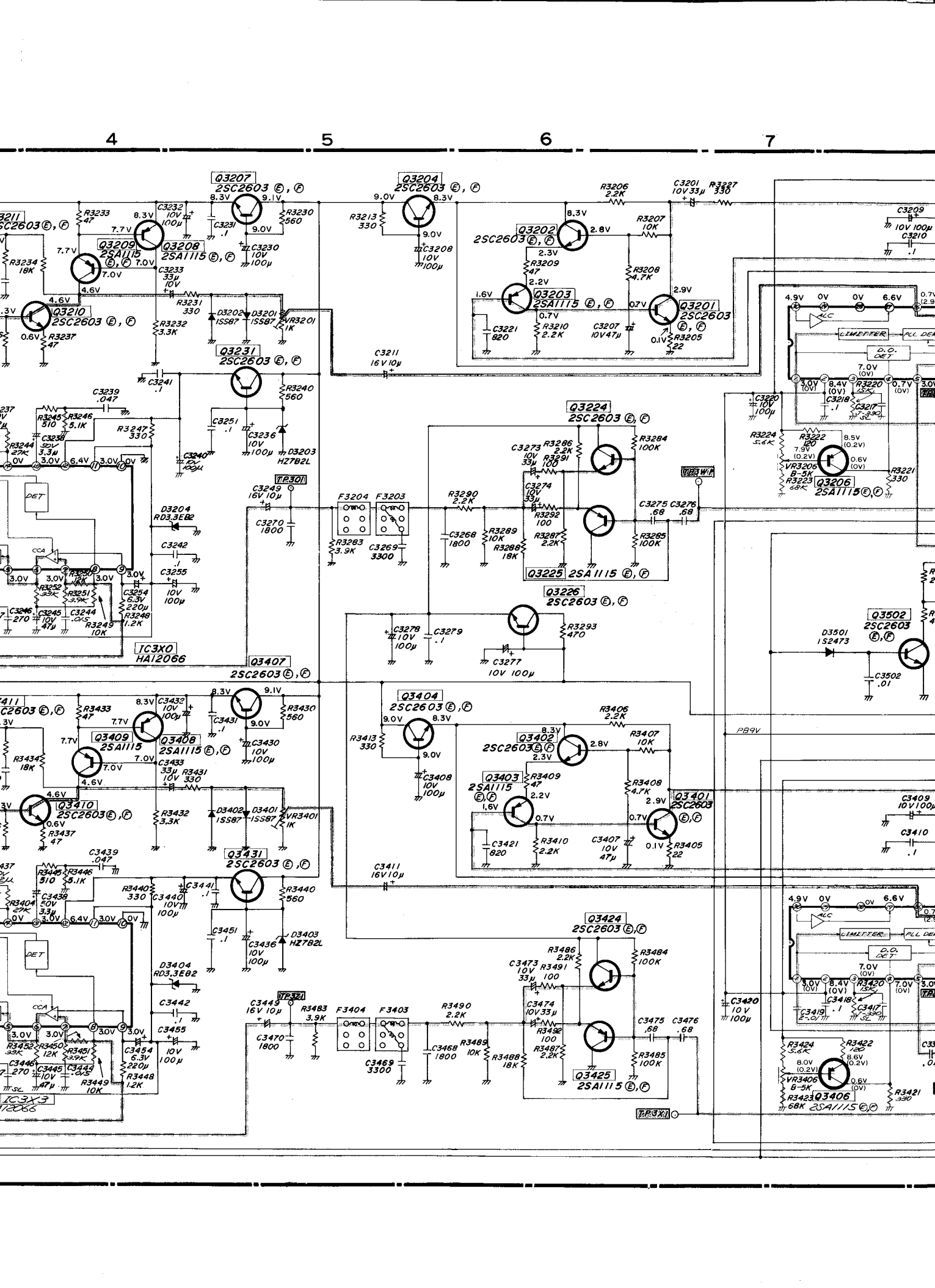

4
5
6
7
IC3008
μPC74IC/MA74ICP
Q3021 2SC2603 E,F 2SC2785 M,F,E
Q3022 2SC2603 E,F 2SC2785 M,F,E
Q3003 2SC2603 E,F 2SC2785 M,F,E
L+R PHASE EQUALIZER
SEPARATION
HIGH BAND L-R
Q3042 2SC2603 E,F 2SC2785 M,F,E
IC3004 AN6291
CURRENT SOURCE
RMS-B
RMS-A
CGA-B
CGA-A
OP AMP-B
OP AMP-A
LOGIC
Q3005 2SC2603 E,F 2SC2785 M,F,E
IC3005 μPC74IC MA74ICP
Q3018 2SC2603 E,F 2SC2785 M,F,E
Q3041 2SC2603 E,F 2SC2785 M,F,E
Q3011 2SC2603 E,F 2SC2785 M,F,E
IC3003 TA7133P SAP SIGNAL-DETECTOR
V.C.O
L.P.F.
DIG AMP
PHASE DET
SAP-LEVEL
SAP PLL
Q3010 2SC2603 E,F 2SC2785 M,F,E
Q3019 2SC2603 E,F 2SC2785 M,F,E
Q3012 2SC2603 E,F 2SC2785 M,F,E
Q3013 2SC2603 E,F 2SC2785 M,F,E
Q3045 DTC124F

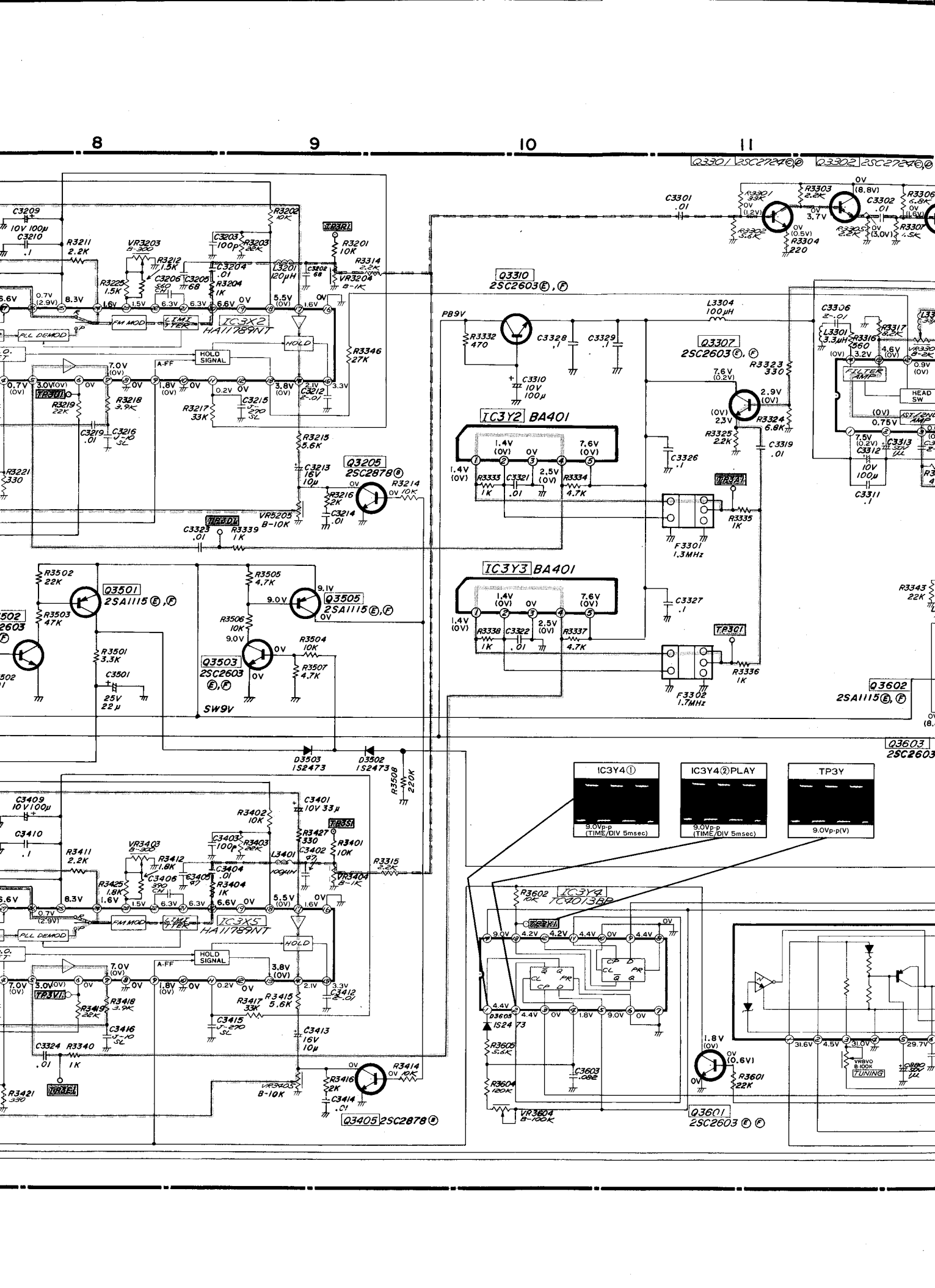

PCB-POWER (on page 62)
PR
SR
PCB-MCS
8
9
10
11
Q3023 2SC2603(E),(F) 2SC2785(M),(F),(E)
Q3024 2SC2603(E),(F) 2SC2785(M),(F),(E)
Q3026 2SC2603(E),(F) 2SC2785(M),(F),(E)
Q3025 2SC2603(E),(F) 2SC2785(M),(F),(E)
Q3030 2SC2603(E),(F) 2SC2785(M),(F),(E)
Q3031 2SC2603(E),(F) 2SC2785(M),(F),(E)
Q3044 2SC2603(E),(F) 2SC2785(M),(F),(E)
Q3043 2SC2603(E),(F) 2SC2785(M),(F),(E)
Q3033 2SC2603(E),(F) 2SC2785(M),(F),(E)
Q3015 2SC2603(E),(F) 2SC2785(M),(F),(E)
Q3027 DTC124F
Q3028 DTC124F
Q3032 DTC124F
Q3017 DTA124F
Q3014 2SA1115(E),(F) /2SA1175(H),(F),(E)
Q3016 2SA1115(E),(F) /2SA1175(H),(F),(E)
IC3006 AN6291
IC3007 μPC1471C/MA1471CP
SOUND-L
SOUND-R
SAP-OUT
MUTE
SAP
CURRENT SOURCE
RMS-B
CCA-B
OP AMP-B
RMS-A
CCA-A
OP AMP-A
LOGIC
TIMING SAP
HIGH BA SAP
DISC R/L LEVEL
TP32
TP33
TP34
TP35
TP36
TP45
D3004 MZ306B2 /HZ-6C21
D3006 D3007 D3008
+12V
L+
L—
NR
BIL
NR
SAP
STE

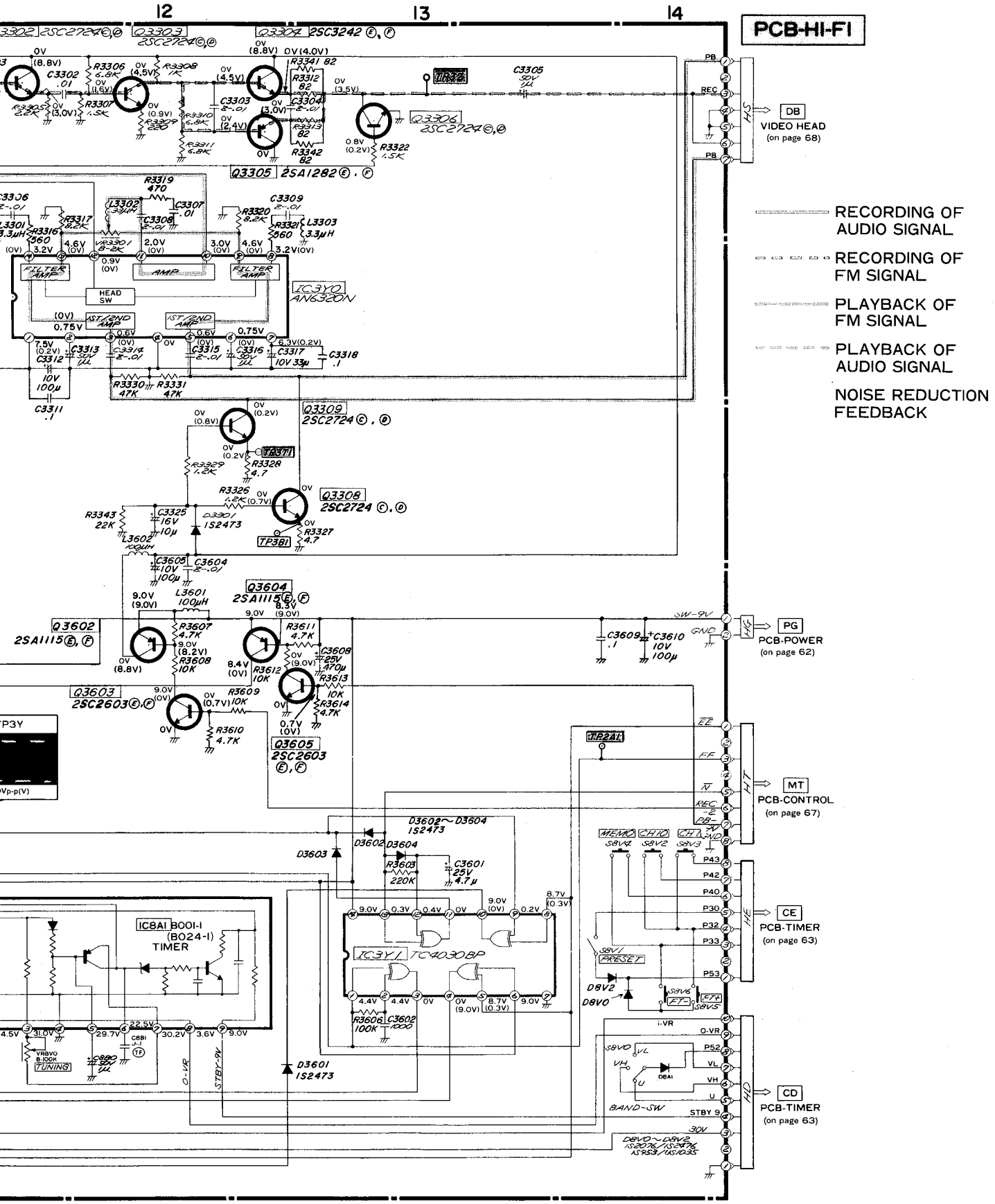

PCB-POWER (on page 62)
PR
SR
9
10
11
PCB-MCS
(MULTI CHANNEL SOUND SYSTEM)
Q3024 2SC2603 E,F 2SC2785 H,F,E
Q3026 2SC2603 E,F 2SC2785 H,F,E
Q3025 2SC2603 E,F 2SC2785 H,F,E
Q3030 2SC2603 E,F 2SC2785 H,F,E
Q3031 2SC2603 E,F 2SC2785 H,F,E
Q3032 DTC124F
Q3027 DTC124F
Q3028 DTC124F
Q3043 2SC2603 E,F 2SC2785 H,F,E
Q3033 2SC2603 E,F 2SC2785 H,F,E
Q3016 2SA1115 E,F /2SA1175 H,F,E
Q3017 DTA124F
IC3006 AN6291
IC3007 μPC74IC/MA74ICP
SW-12V
SOUND-L
SOUND-R
SAP-OUT
MUTE
SAP
VQ PCB-Y/A (on page 66)
HIGH BAND SAP
TIMING SAP
CURRENT SOURCE
RMS-B
RMS-A
CCA-B
CCA-A
OP AMP-B
OP AMP-A
LOGIC
L+R(MAIN) SIGNAL
L−R(SUB) SIGNAL
NR CONTROL
BILINGUAL(SAP) SIGNAL
NR CONTROL
SAP SIGNAL DETECT
STEREO SIGNAL DETECT

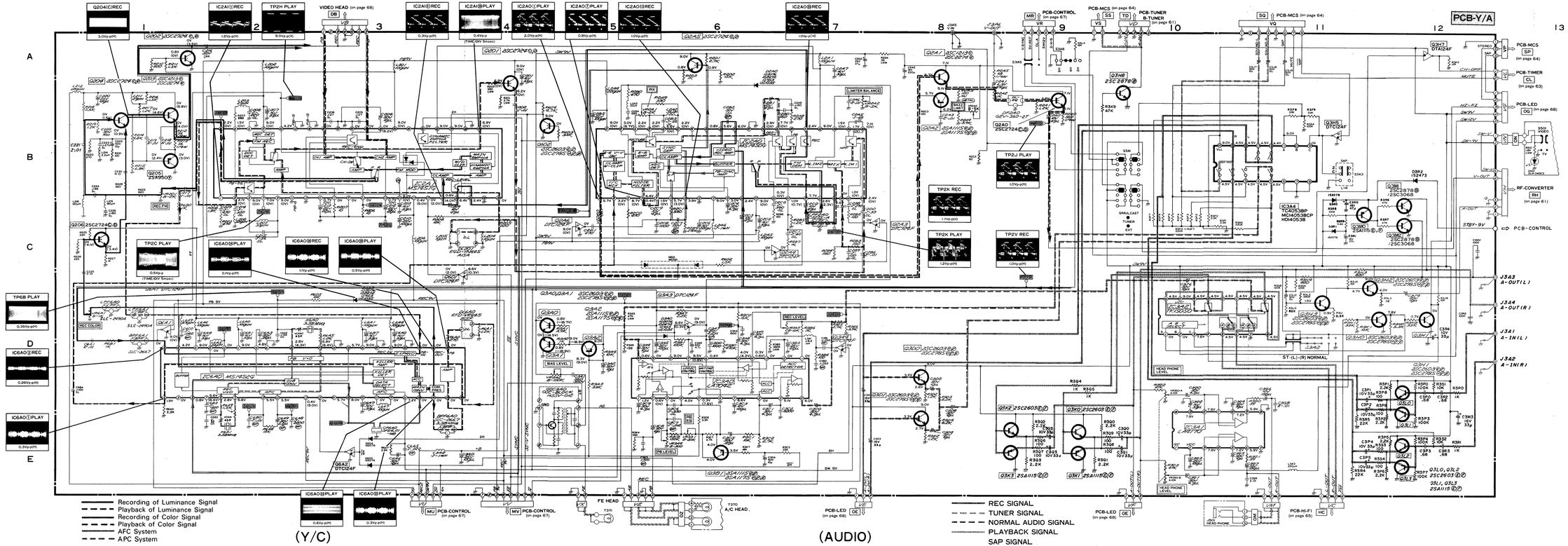

PCB-HI-FI
PCB-HI-FI
PCB-LED
OJ
(on page 68)
PCB-Y/A
VC
(on page 68)
DB
VIDEO HEAD
(on page 68)
MT
PCB-CONTROL
(on page 67)
CE
PCB-TIMER
(on page 63)
PG
PCB-POWER
(on page 62)
CD
PCB-TIMER
(on page 63)
RECORDING OF AUDIO SIGNAL
RECORDING OF FM SIGNAL
PLAYBACK OF FM SIGNAL
PLAYBACK OF AUDIO SIGNAL
NOISE REDUCTION FEEDBACK
IC3Y2 BA401
IC3Y3 BA401
IC3Y4①
IC3Y4①PLAY
TP3Y
ICBA1 800I-I (B024-I) TIMER
IC3Y1 TC74HC390AF
IC3Y5 TC74HC4538AF
IC3X0 HA12066
IC3Z0 TC74HC4538AF
SW9V
SW5V
M2.8V
M5V
M9V
M12V
M18V
P8V
P5V
P3.3V
P2.5V
P1.8V
P1.2V
M2.5V
M3.3V
M1.8V
M1.2V

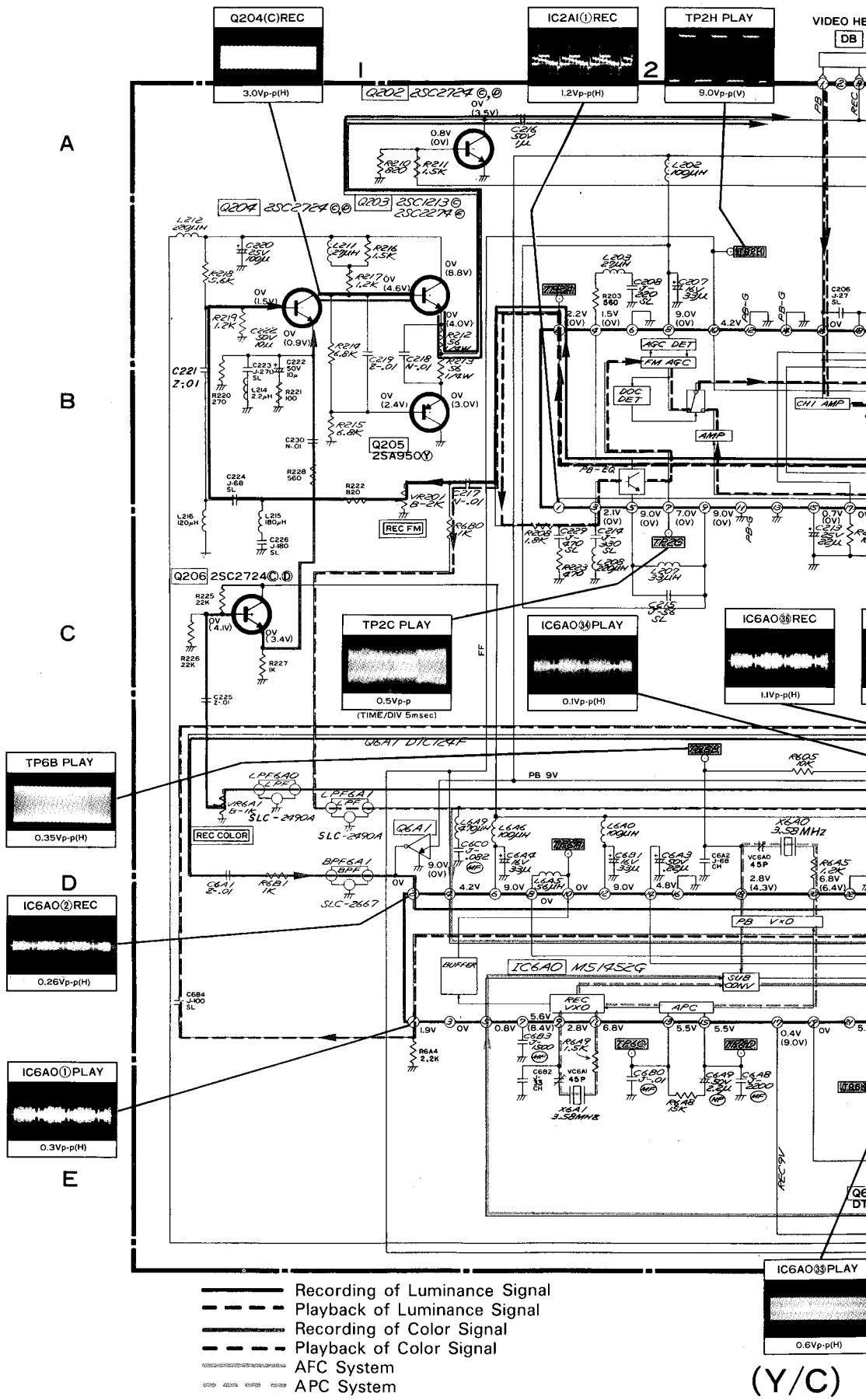

PCB-HI-FI
1
2
3
4
A
B
C
D
E
PCB-LED
OJ
(on page 68)
PCB-Y/A
VC
(on page 66)
SW9V
Q3217 2SC2603 (E), (F)
Q3218 2SA1115 (E), (F)
Q3214 2SA1115 (E), (F)
Q3215 2SA1115 (E), (F)
Q3216 2SC2603 (E), (F)
Q3211 2SC2603 (E), (F)
Q3212 2SA1115 (E), (F)
Q3210 2SC2603 (E)
Q3219 2SA1115 (E), (F)
Q3220 2SA1115 (E), (F)
Q3221 2SC2603 (E), (F)
Q3223 2SC2603 (E), (F)
Q3222 2SA1115 (E), (F)
Q3417 2SC2603 (E), (F)
Q3418 2SA1115 (E), (F)
Q3414 2SA1115 (E), (F)
Q3415 2SA1115 (E), (F)
Q3416 2SC2603 (E), (F)
Q3411 2SC2603 (E), (F)
Q3412 2SA1115 (E), (F)
Q3410 2SC2603 (E)
Q3419 2SA1115 (E), (F)
Q3420 2SA1115 (E), (F)
Q3421 2SC2603 (E), (F)
Q3423 2SC2603 (E), (F)
Q3422 2SA1115 (E), (F)
F3202
F3201
F3402
F3401
TP3U1
TP3F1
TP3J1
TP3M1
TP3H1
TP3G1
TP3K1
TP3P1
TP3Q1
DET
CCA
IC3X3
HA12066

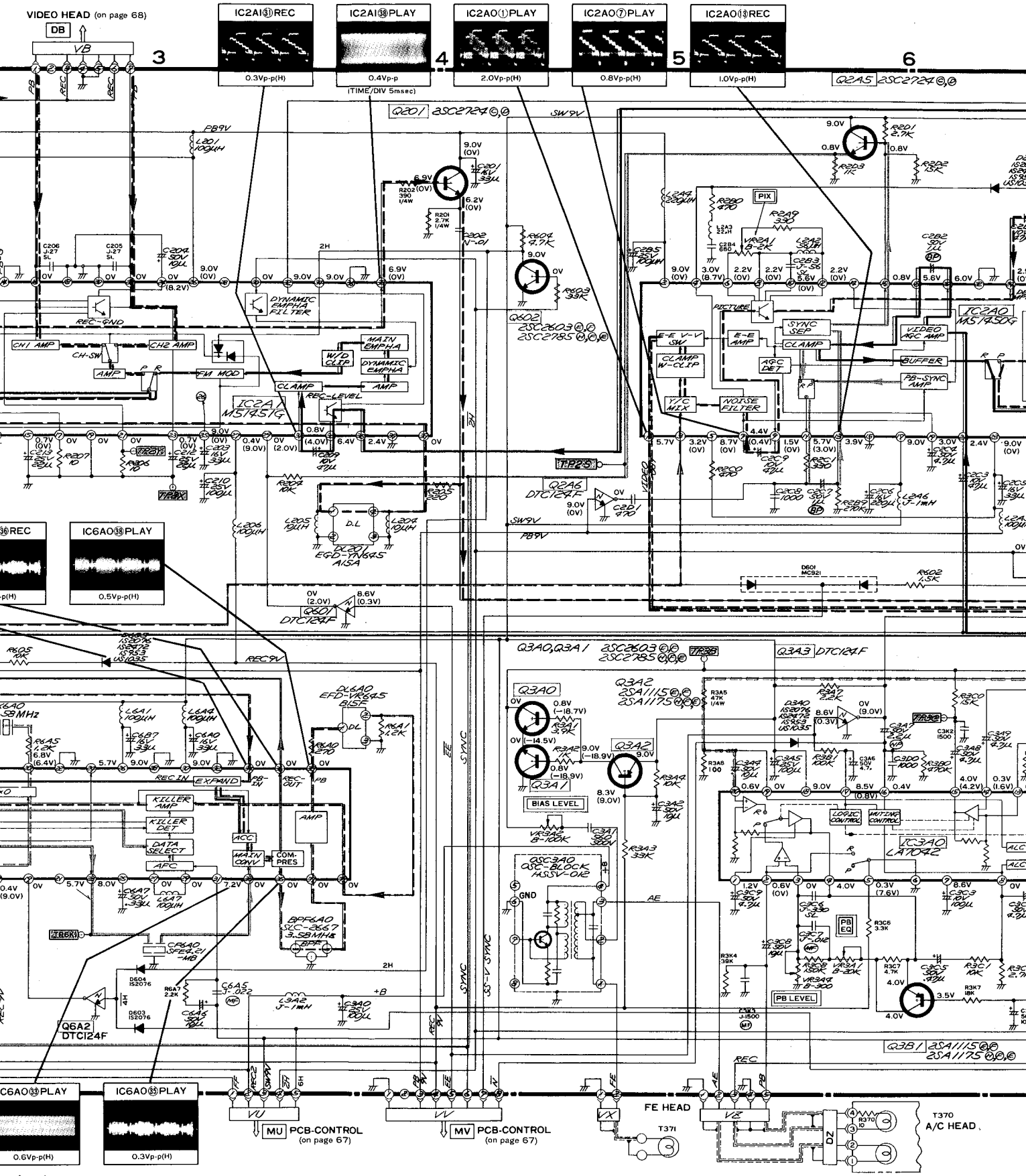

4
5
6
7
Q3207 2SC2603 E, F
Q3204 2SC2603 E, F
Q3202 2SC2603 E, F
Q3203 2SA1115 E, F
Q3201 2SC2603 E, F
Q3209 2SA1115 E, F
Q3208 2SA1115 E, F
Q3210 2SC2603 E, F
Q3231 2SC2603 E, F
Q3224 2SC2603 E, F
Q3225 2SA1115 E, F
Q3226 2SC2603 E, F
Q3206 2SA1115 E, F
Q3502 2SC2603 E, F
Q3407 2SC2603 E, F
Q3404 2SC2603 E, F
Q3402 2SC2603 E, F
Q3403 2SA1115 E, F
Q3401 2SC2603 E, F
Q3409 2SA1115
Q3408 2SA1115 E, F
Q3410 2SC2603 E, F
Q3431 2SC2603 E, F
Q3424 2SC2603 E, F
Q3425 2SA1115 E, F
Q3406 2SA1115 E, F
IC3X0 HA12066
IC3X3 HA12066
D3204 RD3.3EB2
D3203 HZ7B2L
D3403 HZ7B2L
D3404 RD3.3EB2
D3501 1S2473
VR3201 1K
VR3206 B-5K
VR3406 B-5K
F3204
F3203
F3404
F3403
TP301
TP32I
TP3X1
PB9V
DET
CCA
AGC
LIMITTER
PLL DET
D.C. DET

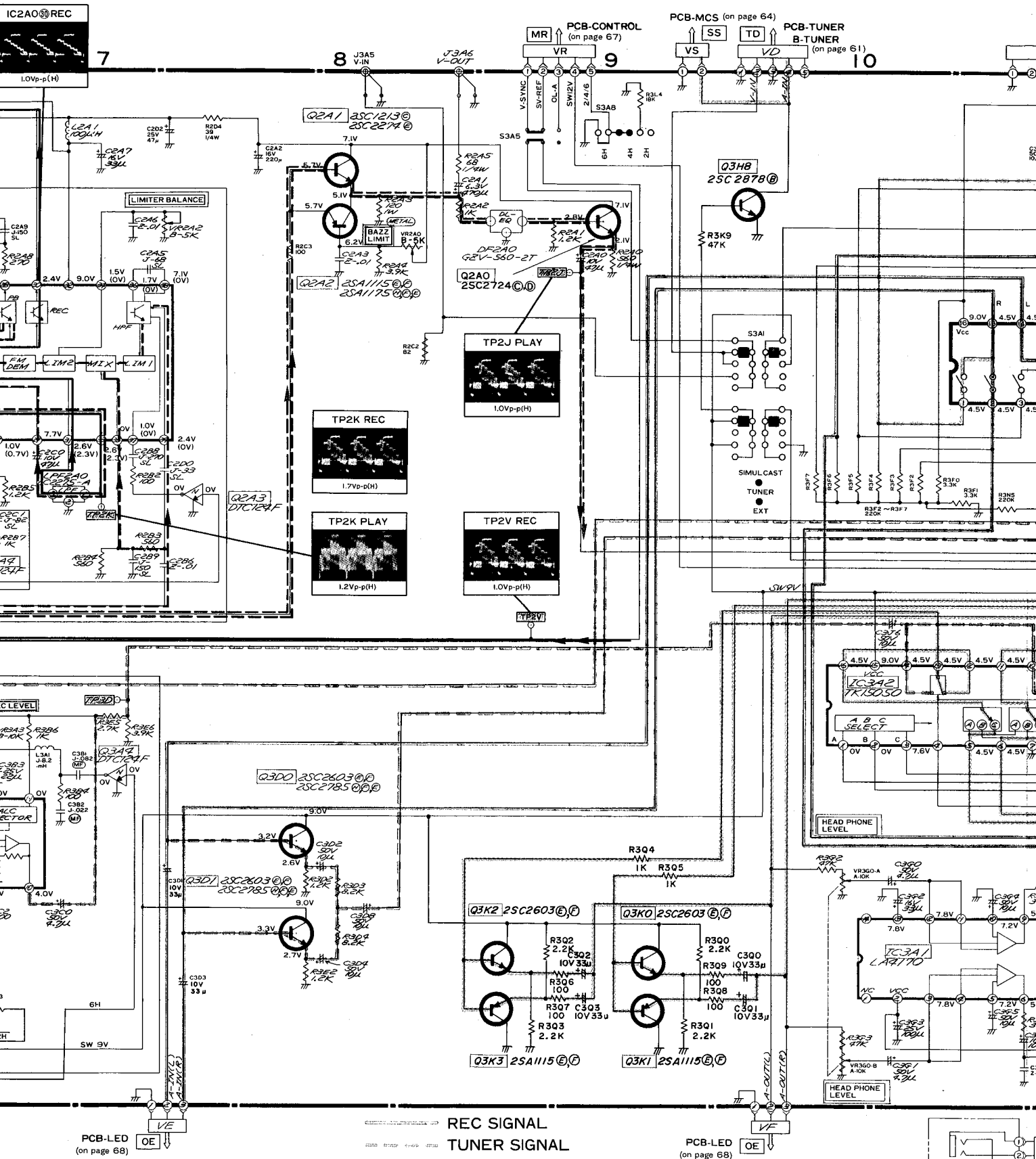

Q3301 2SC2724 E,F
Q3302 2SC2724 E,F
IC3X2 HA11759NT
IC3X5 HA11759NT
IC3Y2 BA401
IC3Y3 BA401
IC3Y4 TC4013BP
Q3310 2SC2603 E,F
Q3307 2SC2603 E,F
Q3205 2SC2878 B
Q3405 2SC2878 B
Q3501 2SA1115 E,F
Q3505 2SA1115 E,F
Q3503 2SC2603 E,F
Q3602 2SA1115 E,F
Q3603 2SC2603
Q3601 2SC2603 E F
D3503 1S2473
D3502 1S2473
D3608 1S2473
F3301 1.3MHz
F3302 1.7MHz
SW9V
PB9V
IC3Y4①
IC3Y4②PLAY
TP3Y
9.0Vp-p (TIME/DIV 5msec)
9.0Vp-p (TIME/DIV 5msec)
9.0Vp-p(V)
PLL DEMOD
FM MOD
LIMITER
HOLD
HOLD SIGNAL
A-FF
FILTER AMP
HEAD SW
TUNING


12
13
14
PCB-HI-FI
PB
REC
PB
HS
DB
VIDEO HEAD
(on page 68)
RECORDING OF AUDIO SIGNAL
RECORDING OF FM SIGNAL
PLAYBACK OF FM SIGNAL
PLAYBACK OF AUDIO SIGNAL
NOISE REDUCTION FEEDBACK
Q3302 2SC2724 E, F
Q3303 2SC2724 E, F
Q3304 2SC3242 E, F
Q3305 2SA1282 E, F
Q3306 2SC2724 E, F
Q3309 2SC2724 E, F
Q3308 2SC2724 E, F
Q3602 2SA1115 E, F
Q3604 2SA1115 E, F
Q3603 2SC2603 E, F
Q3605 2SC2603 E, F
IC3Y0 AN6320N
IC3Y1 TC4030BP
IC8A1 BOOI-I (BO24-I) TIMER
HEAD SW
FILTER AMP
AMP
1ST/2ND AMP
TP3Y
TP3T1
TP3B1
TP2A1
SW-9V
GND
HG
PG
PCB-POWER
(on page 62)
HT
MT
PCB-CONTROL
(on page 67)
HE
CE
PCB-TIMER
(on page 63)
HD
CD
PCB-TIMER
(on page 63)
MEMO
CH10
CH ▲▼
PRESET
FF
REC
PB
BAND-SW
STBY 9
30V
D3601 IS2473
D3602~D3604 IS2473
D8V0~D8V2 IS2076, IS2476, IS953, IUS1035

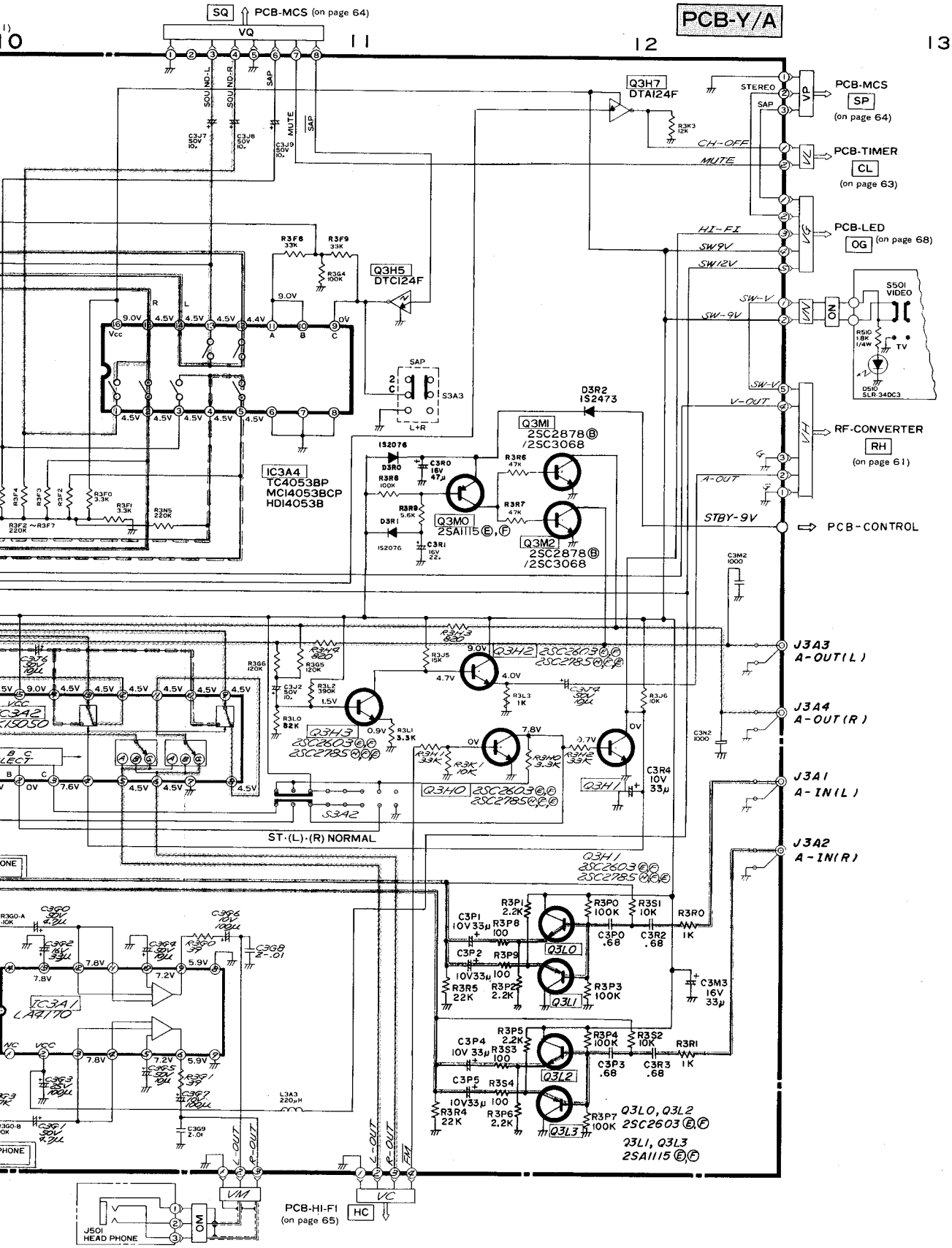

PCB-Y/A
(Y/C)
(AUDIO)
Recording of Luminance Signal
Playback of Luminance Signal
Recording of Color Signal
Playback of Color Signal
AFC System
APC System
REC SIGNAL
TUNER SIGNAL
NORMAL AUDIO SIGNAL
PLAYBACK SIGNAL
SAP SIGNAL
PCB-MCS
PCB-TIMER
PCB-LED
RF-CONVERTER
PCB-CONTROL
PCB-TUNER
PCB-HI-FI
FE HEAD
A/C HEAD
ST.-(L)-(R) NORMAL

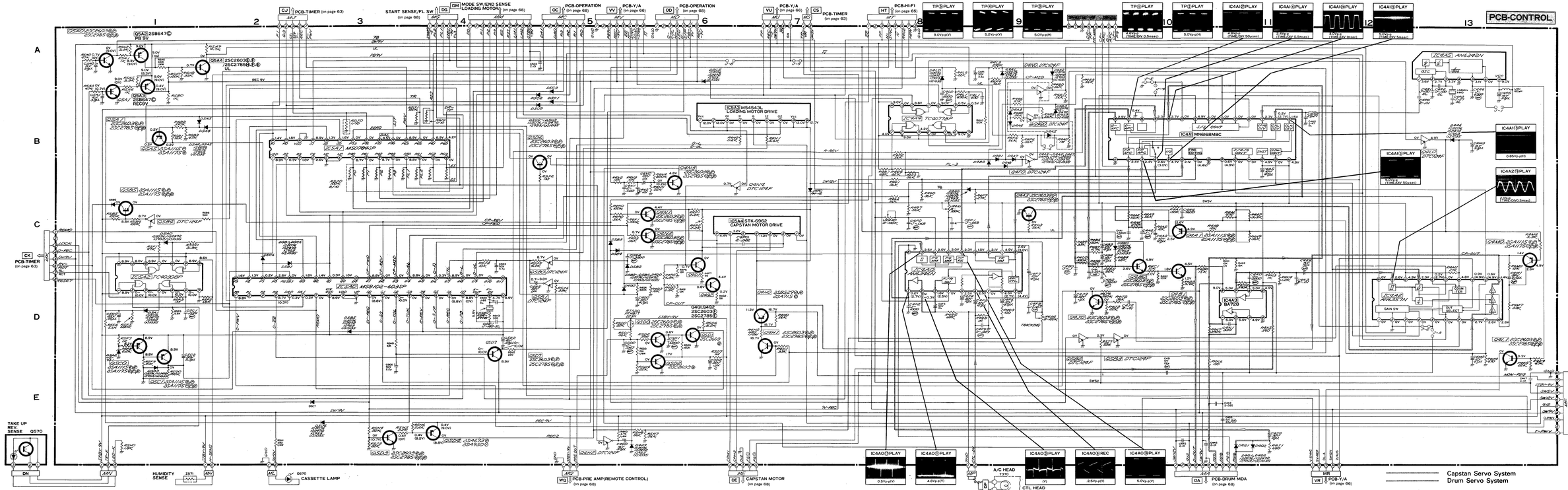

Q204(C)REC
3.0Vp-p(H)
IC2AI①REC
1.2Vp-p(H)
TP2H PLAY
9.0Vp-p(V)
VIDEO HE
DB
Q202 2SC2724 E,D
Q204 2SC2724 E,D
Q203 2SC1213 E
2SC2274 E
Q205 2SA950 Y
Q206 2SC2724 C,D
REC FM
AGC DET
FM AGC
DOC DET
CH1 AMP
AMP
TP2C PLAY
0.5Vp-p
(TIME/DIV 5msec)
IC6AO㉞PLAY
0.1Vp-p(H)
IC6AO㉟REC
1.1Vp-p(H)
TP6B PLAY
0.35Vp-p(H)
IC6AO②REC
0.26Vp-p(H)
IC6AO①PLAY
0.3Vp-p(H)
REC COLOR
SLC-2490A
SLC-2667
IC6AO M51952G
BUFFER
SUB CONV
REC VXO
APC
PB VXO
IC6AO㉝PLAY
0.6Vp-p(H)
A
B
C
D
E
1
2
Recording of Luminance Signal
Playback of Luminance Signal
Recording of Color Signal
Playback of Color Signal
AFC System
APC System
(Y/C)

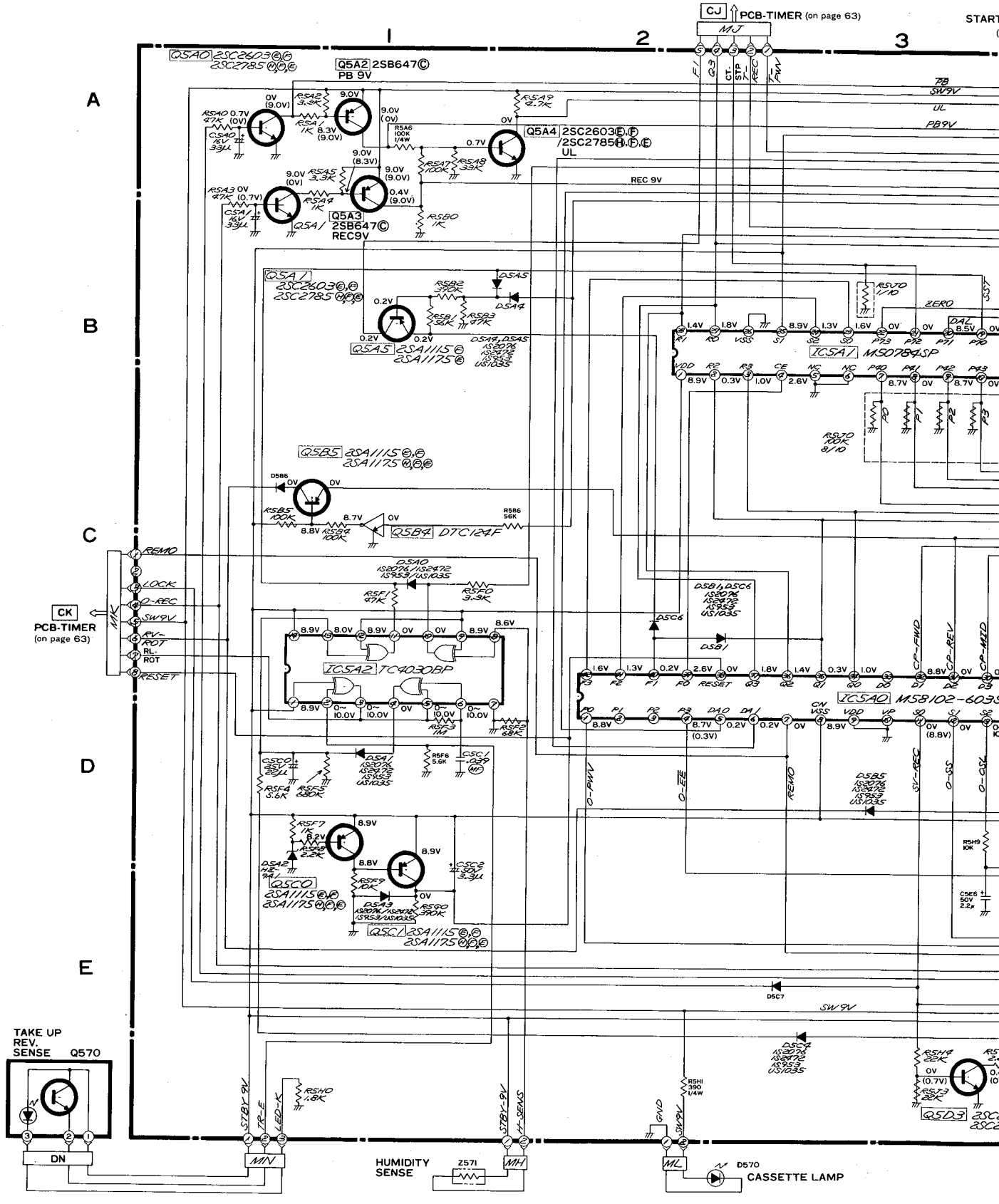

VIDEO HEAD (on page 68)
DB
VB
IC2AI㉛REC
0.3Vp-p(H)
IC2AI㉞PLAY
0.4Vp-p
(TIME/DIV 5msec)
IC2AO①PLAY
2.0Vp-p(H)
IC2AO⑦PLAY
0.8Vp-p(H)
IC2AO⑬REC
1.0Vp-p(H)
3
4
5
6
Q201 2SC2724 ©,®
Q2A5 2SC2724 ©,®
Q602 2SC2603 ©,® 2SC2785 ©,®,®
Q2A6 DTC124F
Q601 2SC2603 ©,® 2SC2785 ©,®,®
Q3A0,Q3A1 2SC2603 ©,® 2SC2785 ©,®,®
Q3A3 DTC124F
Q3A2 2SA1115 ©,® 2SA1175 ©,®,®
Q3B1 2SA1115 ©,® 2SA1175 ©,®,®
Q6A2 DTC124F
IC2AI M51951G
IC2AO M51952G
IC3AO LA7042
IC6AO㉝PLAY
0.6Vp-p(H)
IC6AO㉟PLAY
0.3Vp-p(H)
VU
MU PCB-CONTROL (on page 67)
VV
MV PCB-CONTROL (on page 67)
VX
FE HEAD
VZ
T371
T370
A/C HEAD
DZ
REC-GND
CH1 AMP
CH2 AMP
CH-SW
AMP
FM MOD
DYNAMIC EMPHA FILTER
MAIN EMPHA
W/O CLIP
DYNAMIC EMPHA
AMP
CLAMP
REC-LEVEL
PIX
PICTURE
SYNC SEP
CLAMP
E-E AMP
E-E V-V SW
CLAMP W-CLIP
AGC DET
Y/C MIX
NOISE FILTER
VIDEO AFC AMP
BUFFER
PB-SYNC AMP
D.L
DL201 EGD-YN645 A1SA
DL6A0 EFD-VR645 B1SF
BPF6A0 SCC-2667 3.58MHz
KILLER AMP
KILLER DET
DATA SELECT
AFC
ACC
MAIN CONV
COM-PRES
EXPAND
REC IN
REC-OUT
PB-IN
PB
BIAS LEVEL
PB LEVEL
PB EQ
LOGIC CONTROL
MUTING CONTROL
SSC3A0 SSC-BLOCK MSSV-012
GND
REC
PB
AE
SYNC
EE
SS-V SYNC
2H
4H
+B

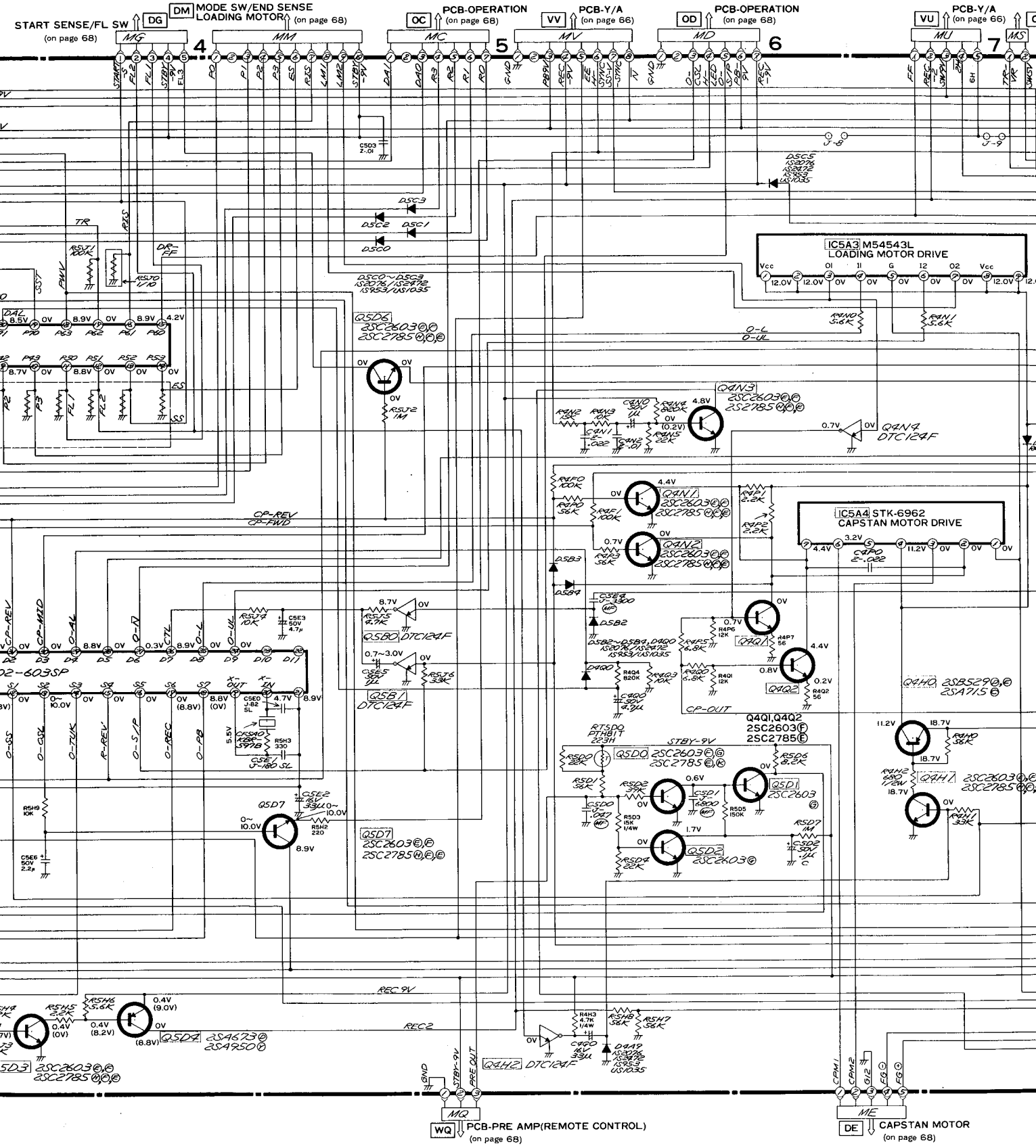

IC2A0 (30) REC
1.0Vp-p(H)
7
8
9
10
J3A5 V-IN
J3A6 V-OUT
PCB-CONTROL (on page 67)
MR
VR
PCB-MCS (on page 64)
SS
VS
TD
VD
PCB-TUNER B-TUNER (on page 61)
V-SYNC
SV-REF
OL-A
SW2V
2/4/6
S3A8
S3A5
6H
4H
2H
Q2A1 2SC1213 E 2SC2274 E
Q3H8 2SC2878 B
R3K9 47K
LIMITER BALANCE
BAZZ LIMIT
VR2A0 B-5K
Q2A2 2SA1115 E,F 2SA1175 W,X,E
DF2A0 G2V-560-2T
Q2A0 2SC2724 C,D
TP2J PLAY
1.0Vp-p(H)
TP2K REC
1.7Vp-p(H)
TP2K PLAY
1.2Vp-p(H)
TP2V REC
1.0Vp-p(H)
TP2V
S3A1
SIMULCAST
TUNER
EXT
Vcc
IC342 TK15050
A B C SELECT
HEAD PHONE LEVEL
SW9V
Q3A2 DTC124F
Q3D0 2SC2603 E,F 2SC2785 W,X,E
Q3D1 2SC2603 E,F 2SC2785 W,X,E
Q3K2 2SC2603 E,F
Q3K0 2SC2603 E,F
Q3K3 2SA1115 E,F
Q3K1 2SA1115 E,F
R3Q4 1K
R3Q5 1K
IC3A1 LA3170
6H
SW 9V
PCB-LED (on page 68)
VE
OE
VF
J501 HEAD PHONE
REC SIGNAL
TUNER SIGNAL
NORMAL AUDIO SIGNAL
PLAYBACK SIGNAL
SAP SIGNAL

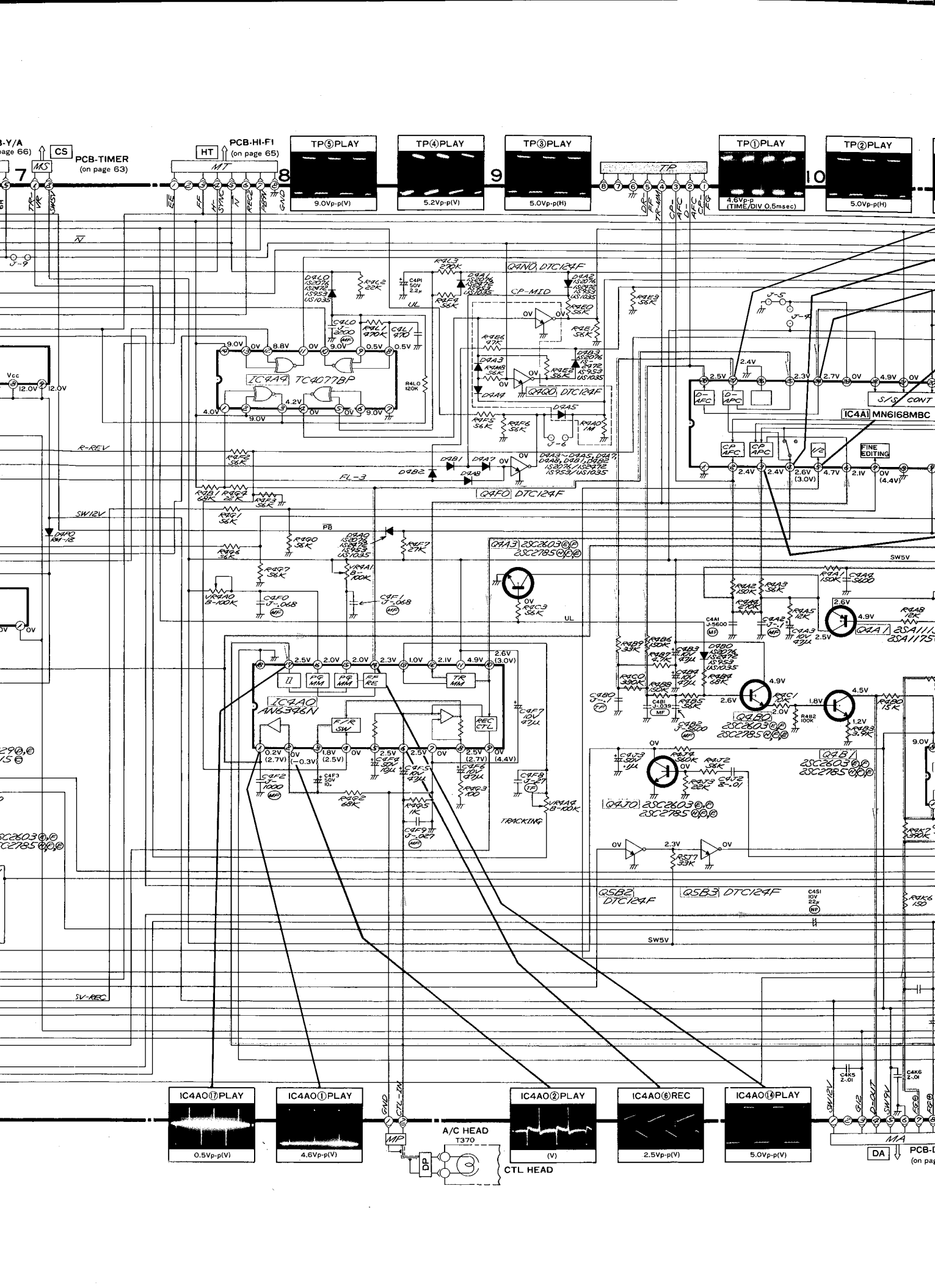
(AUDIO)

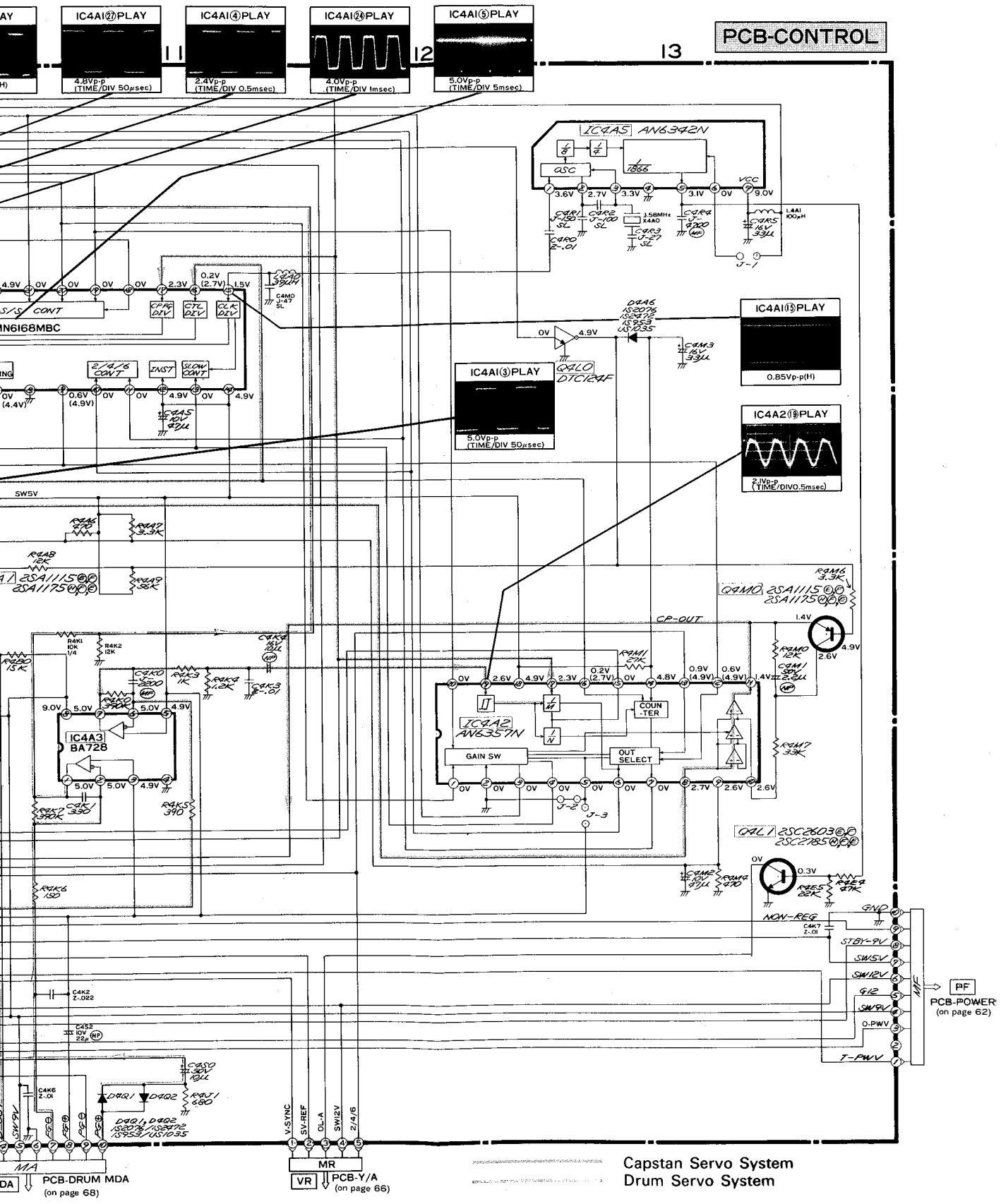

PCB-Y/A
10
11
12
13
SQ
PCB-MCS (on page 64)
VQ
SOUND-L
SOUND-R
SAP
MUTE
Q3H7
DTA124F
STEREO
SAP
VP
PCB-MCS
SP
(on page 64)
CH-OFF
MUTE
VL
PCB-TIMER
CL
(on page 63)
HI-FI
SW9V
SW12V
VG
PCB-LED
OG
(on page 68)
SW-V
SW-9V
VN
ON
S501
VIDEO
R510
1.8K
1/4W
TV
D510
SLR-340C3
Q3H5
DTC124F
R3F8
33K
R3F9
33K
R3G4
100K
9.0V
R
L
Vcc
A
B
C
SAP
S3A3
L+R
IC3A4
TC4053BP
MCI4053BCP
HDI4053B
D3R2
1S2473
Q3MI
2SC2878Ⓑ
/2SC3068
Q3MO
2SA1115Ⓔ,Ⓕ
Q3M2
2SC2878Ⓑ
/2SC3068
V-OUT
VH
RF-CONVERTER
RH
(on page 61)
A-OUT
STBY-9V
PCB-CONTROL
J3A3
A-OUT(L)
J3A4
A-OUT(R)
J3A1
A-IN(L)
J3A2
A-IN(R)
Q3H2
2SC2603Ⓔ,Ⓕ
2SC2785Ⓓ,Ⓔ,Ⓕ
Q3H3
2SC2603Ⓔ,Ⓕ
2SC2785Ⓓ,Ⓔ,Ⓕ
Q3H0
2SC2603Ⓔ,Ⓕ
2SC2785Ⓓ,Ⓔ,Ⓕ
Q3H1
2SC2603Ⓔ,Ⓕ
2SC2785Ⓓ,Ⓔ,Ⓕ
S3A2
ST·(L)·(R) NORMAL
Q3L0
Q3L1
Q3L2
Q3L3
Q3L0, Q3L2
2SC2603Ⓔ,Ⓕ
Q3L1, Q3L3
2SA1115Ⓔ,Ⓕ
L3A3
220μH
L-OUT
R-OUT
VM
VC
PCB-HI-FI
(on page 65)
HC
J501
HEAD PHONE
OM

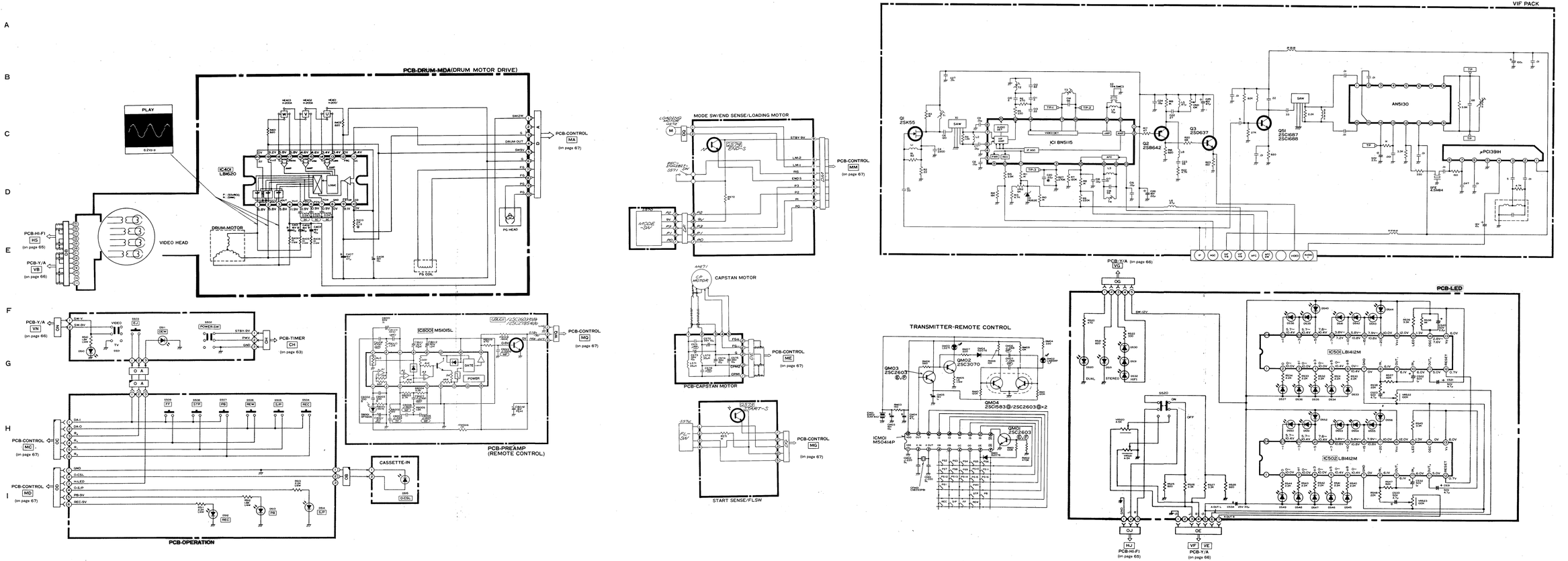

PCB-CONTROL
PCB-TIMER (on page 63)
MODE SW/END SENSE LOADING MOTOR (on page 68)
START SENSE/FL SW (on page 68)
PCB-OPERATION (on page 68)
PCB-Y/A (on page 66)
PCB-HI-FI (on page 65)
IC5A3 M54543L LOADING MOTOR DRIVE
IC5A4 STK-6962 CAPSTAN MOTOR DRIVE
IC4A0 MN6184 SERVO
IC4A1 MN6185MBC
IC4A2 BA728
IC4A3 AN6349
PCB-PRE AMP(REMOTE CONTROL) (on page 68)
CAPSTAN MOTOR (on page 68)
PCB-DRUM MDA (on page 68)
PCB-POWER (on page 62)
A/C HEAD
CTL HEAD
CASSETTE LAMP
HUMIDITY SENSE
TAKE UP REV. SENSE Q570
Capstan Servo System
Drum Servo System

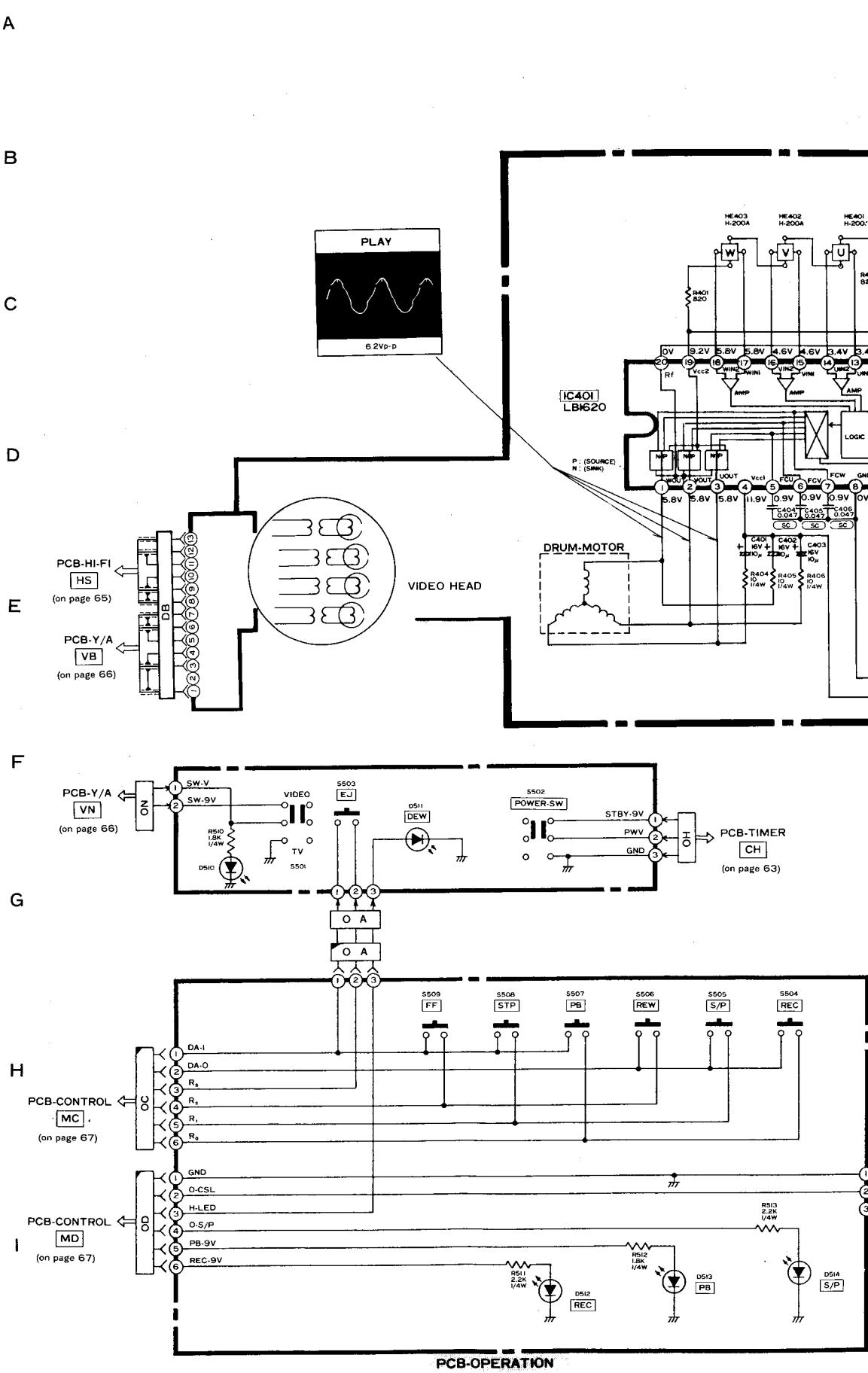

CJ
PCB-TIMER (on page 63)
MJ
START
1
2
3
A
B
C
D
E
Q5A0 2SC2603Ⓔ,Ⓕ 2SC2785Ⓗ,Ⓕ,Ⓔ
Q5A2 2SB647Ⓒ
PB 9V
Q5A4 2SC2603Ⓔ,Ⓕ /2SC2785Ⓗ,Ⓕ,Ⓔ
UL
Q5A3 2SB647Ⓒ
REC9V
Q5A1 2SC2603Ⓔ,Ⓕ 2SC2785Ⓗ,Ⓕ,Ⓔ
Q5A5 2SA1115Ⓔ,Ⓕ 2SA1175Ⓗ,Ⓕ,Ⓔ
Q5B5 2SA1115Ⓔ,Ⓕ 2SA1175Ⓗ,Ⓕ,Ⓔ
Q5B4 DTC124F
Q5C0 2SA1115Ⓔ,Ⓕ 2SA1175Ⓗ,Ⓕ,Ⓔ
Q5C1 2SA1115Ⓔ,Ⓕ 2SA1175Ⓗ,Ⓕ,Ⓔ
Q5D3 2SC
REC 9V
PB SW9V
PB9V
SW9V
STBY 9V
IC5A1 MS0784SP
IC5A2 TC4030BP
IC5A0 MS8102-603
ZERO
CK
PCB-TIMER
(on page 63)
REMO
LOCK
Q-REC
SW9V
RV-
ROT
RL-
ROT
RESET
CP-FWD
CP-REV
CP-MID
TAKE UP
REV.
SENSE Q570
DN
MN
HUMIDITY
SENSE
Z571
MH
ML
D570
CASSETTE LAMP
TR-E
LED-K
H-SENS
GND
D5C7

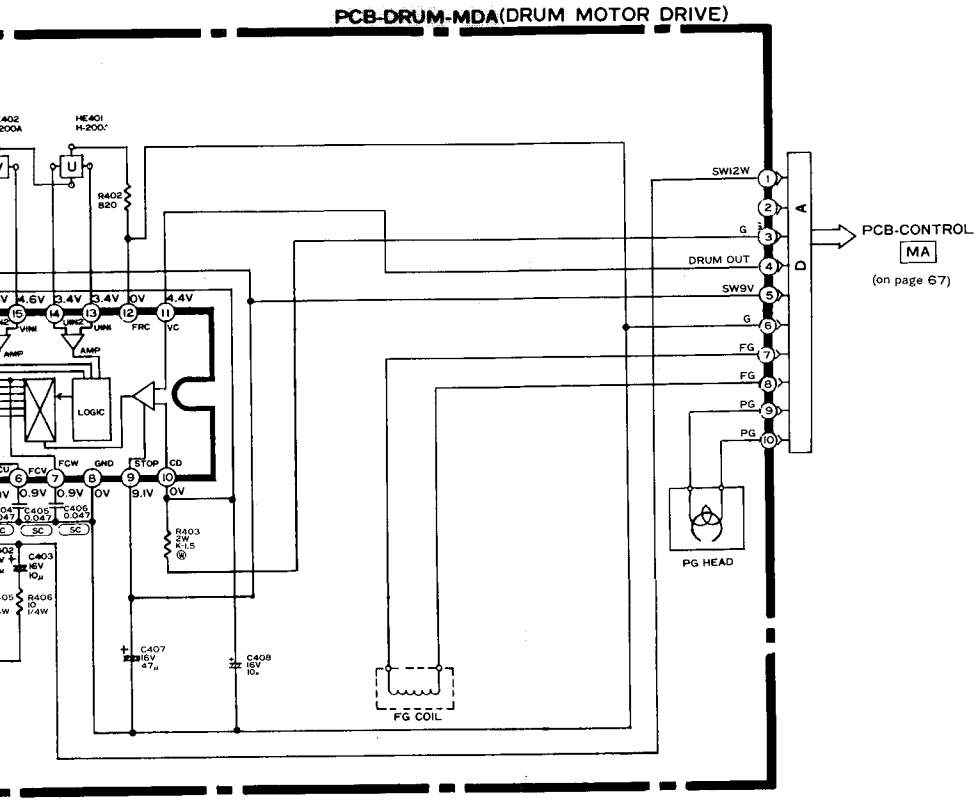

START SENSE/FL SW
(on page 68)
DG
DM MODE SW/END SENSE
LOADING MOTOR
(on page 68)
OC PCB-OPERATION
(on page 68)
VV PCB-Y/A
(on page 66)
OD PCB-OPERATION
(on page 68)
VU PCB-Y/A
(on page 66)
IC5A3 M54543L
LOADING MOTOR DRIVE
IC5A4 STK-6962
CAPSTAN MOTOR DRIVE
Q4N3 2SC2603 2SC2785
Q4N4 DTC124F
Q4N1 2SC2603 2SC2785
Q4N2 2SC2603 2SC2785
Q5B0 DTC124F
Q5B1 DTC124F
Q5D7 2SC2603 2SC2785
Q5D4 2SA673 2SA950
Q5D3 2SC2603 2SC2785
Q5D6 2SC2603 2SC2785
Q5D0 2SC2603 2SC2785
Q5D1 2SC2603
Q5D2 2SC2603
Q4Q1,Q4Q2 2SC2603 2SC2785
Q4Q2 2SB529 2SA715
Q4H1 2SC2603 2SC2785
Q4H2 DTC124F
REC 9V
REC2
STBY-9V
PRE OUT
MQ
WQ PCB-PRE AMP(REMOTE CONTROL)
(on page 68)
ME
DE CAPSTAN MOTOR
(on page 68)

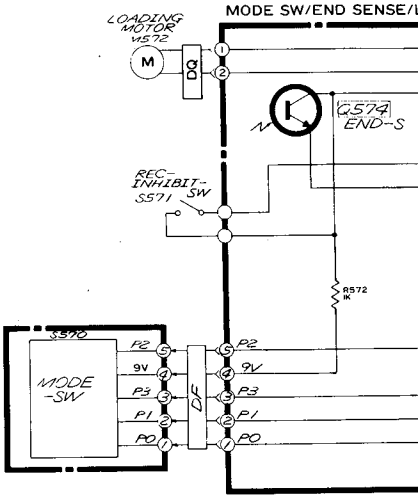

PCB-TIMER
(on page 63)
PCB-HI-FI
(on page 65)
TP⑤PLAY
9.0Vp-p(V)
TP④PLAY
5.2Vp-p(V)
TP③PLAY
5.0Vp-p(H)
TP①PLAY
4.6Vp-p
(TIME/DIV 0.5msec)
TP②PLAY
5.0Vp-p(H)
IC4A9 TC4077BP
IC4A0 AN6346N
IC4A1 MN6168MBC
Q4NO DTC124F
Q4PO DTC124F
Q4FO DTC124F
Q4A3 2SC2603 2SC2785
Q4A1 2SA1115
Q4BO 2SC2603 2SC2785
Q4B1 2SC2603 2SC2785
Q4JO 2SC2603 2SC2785
Q5B2 DTC124F
Q5B3 DTC124F
CP-MID
FL-3
TRACKING
A/C HEAD
T370
CTL HEAD
IC4A0⑦PLAY
0.5Vp-p(V)
IC4A0①PLAY
4.6Vp-p(V)
IC4A0②PLAY
(V)
IC4A0⑥REC
2.5Vp-p(V)
IC4A0④PLAY
5.0Vp-p(V)

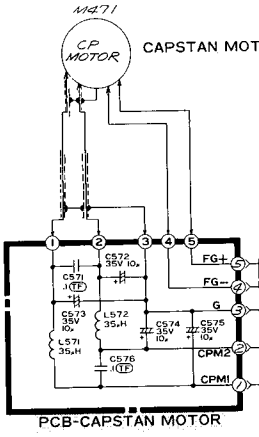

PCB-CONTROL
IC4AI㉗PLAY
4.6Vp-p (TIME/DIV 50μsec)
IC4AI④PLAY
2.4Vp-p (TIME/DIV 0.5msec)
IC4AI㉔PLAY
4.0Vp-p (TIME/DIV 1msec)
IC4AI⑤PLAY
5.0Vp-p (TIME/DIV 5msec)
11
12
13
IC4A5 AN6342N
IC4AI⑬PLAY
0.85Vp-p(H)
IC4AI③PLAY
5.0Vp-p (TIME/DIV 50μsec)
IC4A2⑲PLAY
2.1Vp-p (TIME/DIV0.5msec)
IC4A3 BA728
IC4A2 AN6357N
GAIN SW
OUT SELECT
COUN -TER
Q4MO 2SA1115
Q4LO DTC124F
Q4L1 2SC2603
2SC2785
CP-OUT
NON-REG
STBY-9V
SW5V
SW12V
G12
SW9V
O-PWV
T-PWV
PF
PCB-POWER
(on page 62)
MA
PCB-DRUM MDA
(on page 68)
MR
VR
PCB-Y/A
(on page 66)
V-SYNC
SV-REF
OL-A
SW12V
2/4/6
Capstan Servo System
Drum Servo System

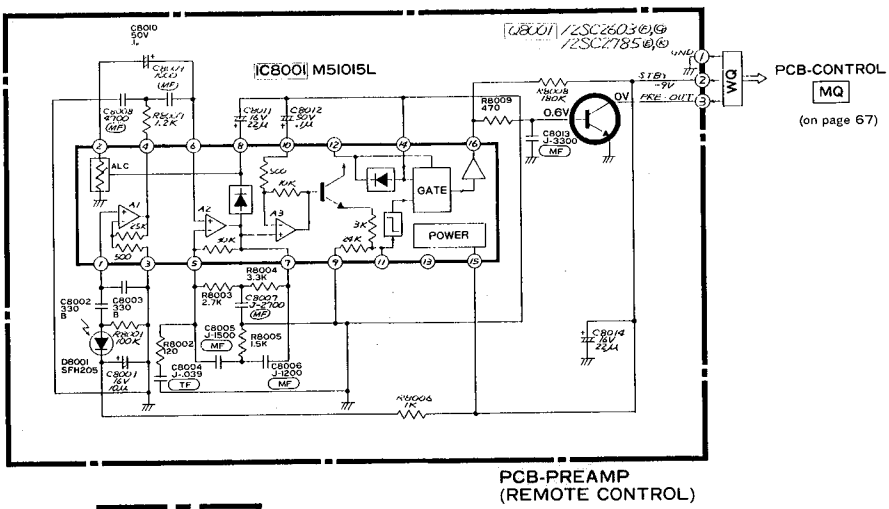

PCB-DRUM-MDA(DRUM MOTOR DRIVE)
PLAY
IC401 LB1620
DRUM-MOTOR
VIDEO HEAD
PCB-HI-FI HS (on page 65)
PCB-Y/A VB (on page 66)
PCB-CONTROL MA (on page 67)
PG HEAD
FG COIL
PCB-Y/A VN (on page 66)
PCB-TIMER CH (on page 63)
PCB-CONTROL MC (on page 67)
PCB-CONTROL MD (on page 67)
PCB-OPERATION
IC6001 M51015L
PCB-CONTROL MG (on page 67)
PCB-PREAMP (REMOTE CONTROL)
CASSETTE-IN
MODE SW/END SENSE/LOADING MOTOR
PCB-CONTROL MM (on page 67)
CAPSTAN MOTOR
PCB-CAPSTAN MOTOR
PCB-CONTROL ME (on page 67)
START SENSE/FLSW
PCB-CONTROL MG (on page 67)
VIF PACK
Q1 2SK55
IC1 BN5115
Q2 2SB642
Q3 2SD637
Q51 2SC1687 2SC1688
AN5130
μPC1398H
PCB-Y/A VG (on page 66)
TRANSMITTER-REMOTE CONTROL
IC1001 M50414P
PCB-LED
IC501 LB1412M
IC502 LB1412M
PCB-HI-FI HJ (on page 65)
PCB-Y/A VF VE (on page 66)

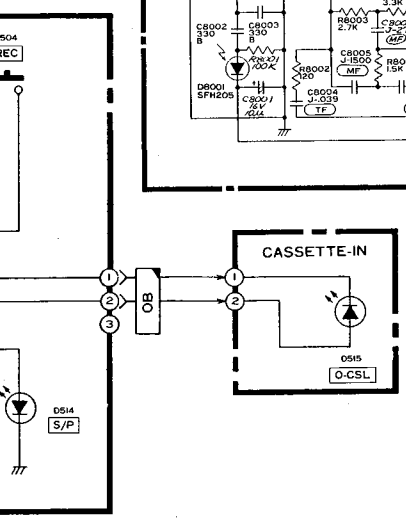

1
2
3
A
B
C
D
E
F
G
H
I
PLAY
6.2Vp-p
IC401
LB1620
DRUM-MOTOR
VIDEO HEAD
PCB-HI-FI
HS
(on page 65)
PCB-Y/A
VB
(on page 66)
PCB-Y/A
VN
(on page 66)
PCB-TIMER
CH
(on page 63)
PCB-CONTROL
MC
(on page 67)
PCB-CONTROL
MD
(on page 67)
PCB-OPERATION

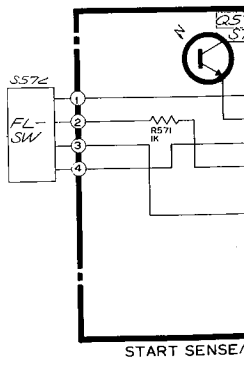

PCB-DRUM-MDA(DRUM MOTOR DRIVE)
SW12W
G
DRUM OUT
SW9V
G
FG
FG
PG
PG
PCB-CONTROL
MA
(on page 67)
PG HEAD
FG COIL
LOGIC
AMP
FCW
GND
STOP
CD
FCV
4.6V
3.4V
3.4V
0V
4.4V
0.9V
0.9V
0V
9.1V
0V

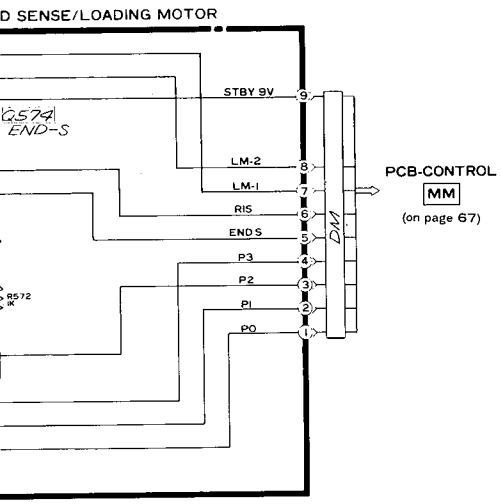

LOADING MOTOR M572
MODE SW/END SENSE/
REC-INHIBIT SW S571
S574 END-S
S570
MODE -SW
P2
9V
P3
P1
P0
DF

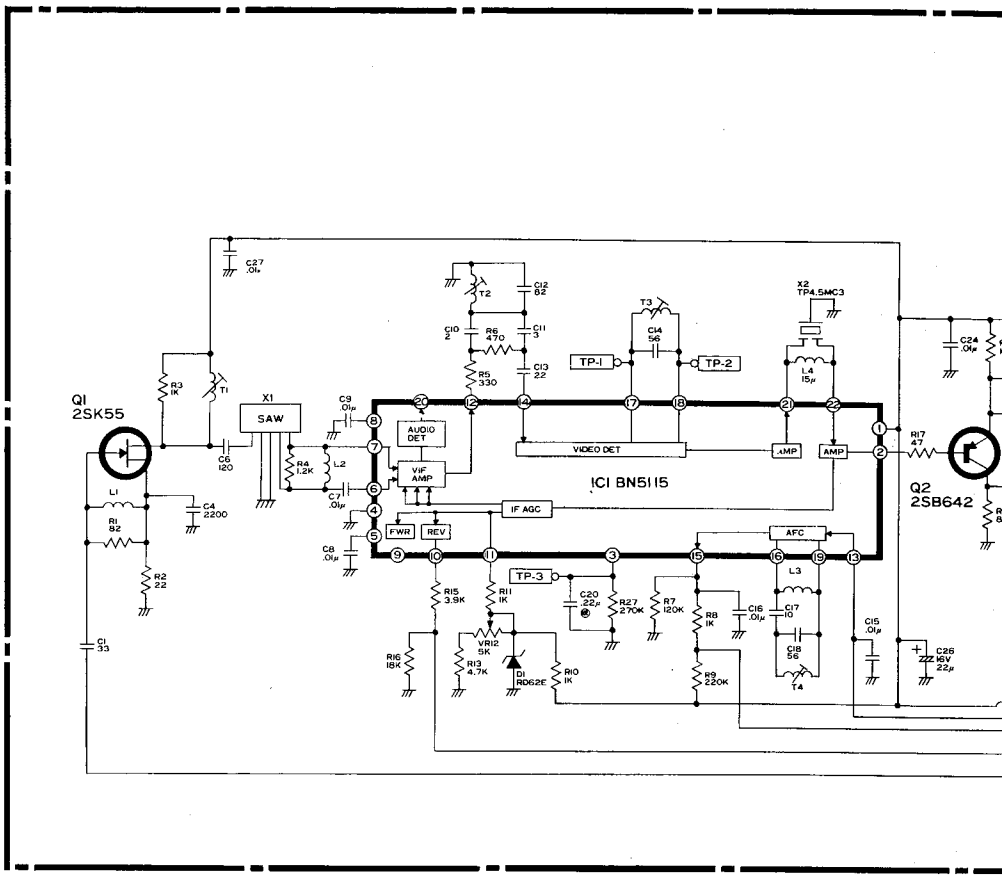

M471
CP MOTOR
CAPSTAN MOT
FG+
FG-
G
CPM2
CPM1
PCB-CAPSTAN MOTOR

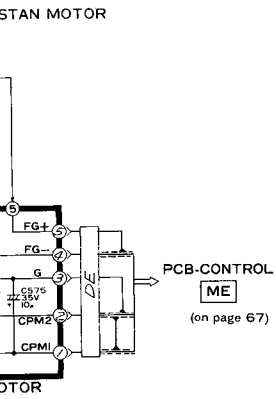

IC8001 M51015L
PCB-CONTROL
MQ
(on page 67)
ALC
GATE
POWER
PCB-PREAMP
(REMOTE CONTROL)

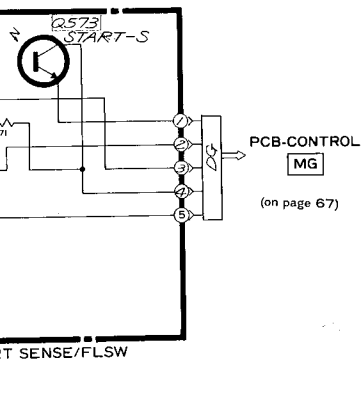

CASSETTE-IN
0515
O-CSL
0514
S/P

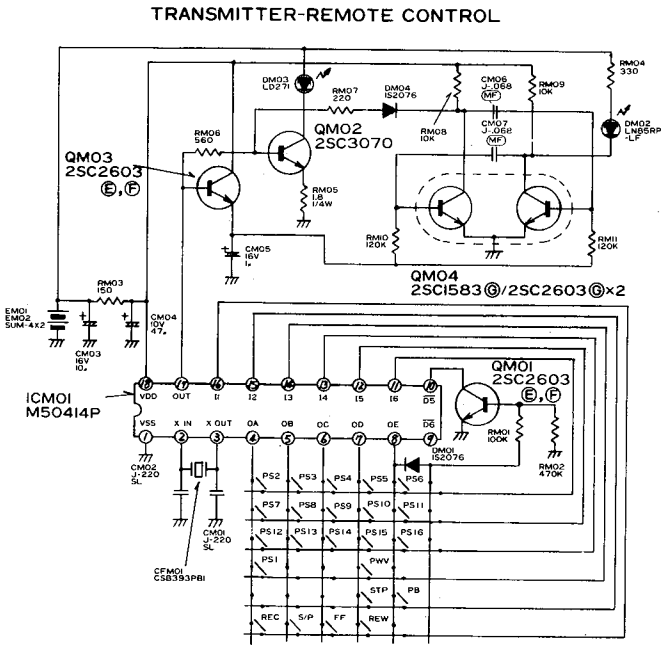

S572
FL-SW
START SENSE/

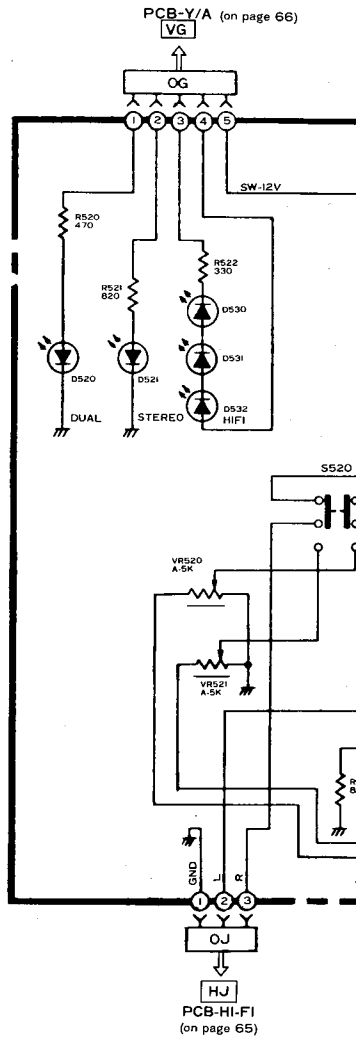

D SENSE/LOADING MOTOR
Q574 END-S
STBY 9V
LM-2
LM-1
RIS
ENDS
P3
P2
P1
P0
CN1
PCB-CONTROL
MM
(on page 67)


Q1 2SK55
X1 SAW
IC1 BN5115
AUDIO DET
VIF AMP
VIDEO DET
IF AGC
AMP
AFC
FWR
REV
TP-1
TP-2
TP-3
Q2 2SB642

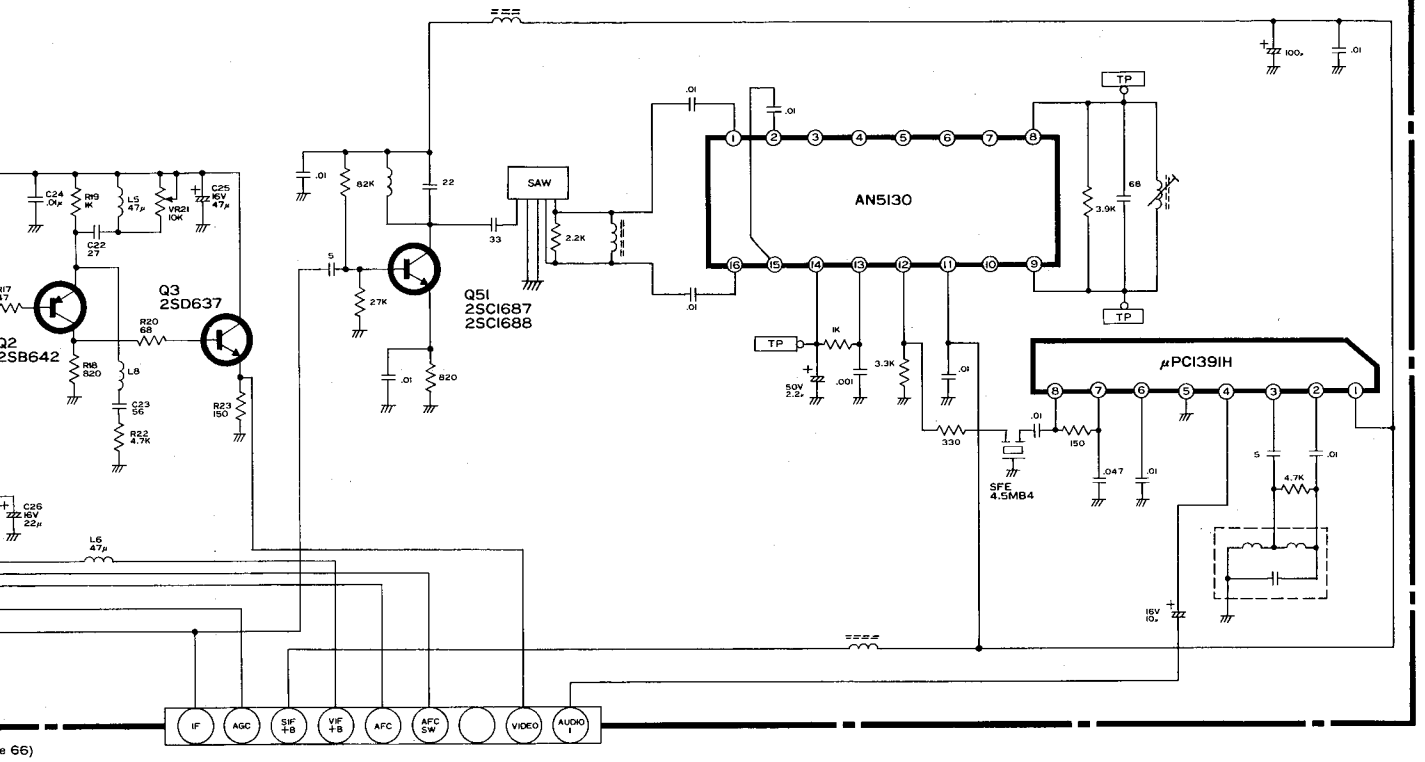

STAN MOTOR
FG+
FG-
G
CPM2
CPM1
CN5
PCB-CONTROL
ME
(on page 67)
OTOR


Q573 START-S
CN3
PCB-CONTROL
MG
(on page 67)
RT SENSE/FLSW


TRANSMITTER-REMOTE CONTROL
QM02 2SC3070
QM03 2SC2603 (E),(F)
QM04 2SC1583(G)/2SC2603(G)×2
QM01 2SC2603 (E),(F)
ICM01 M50414P

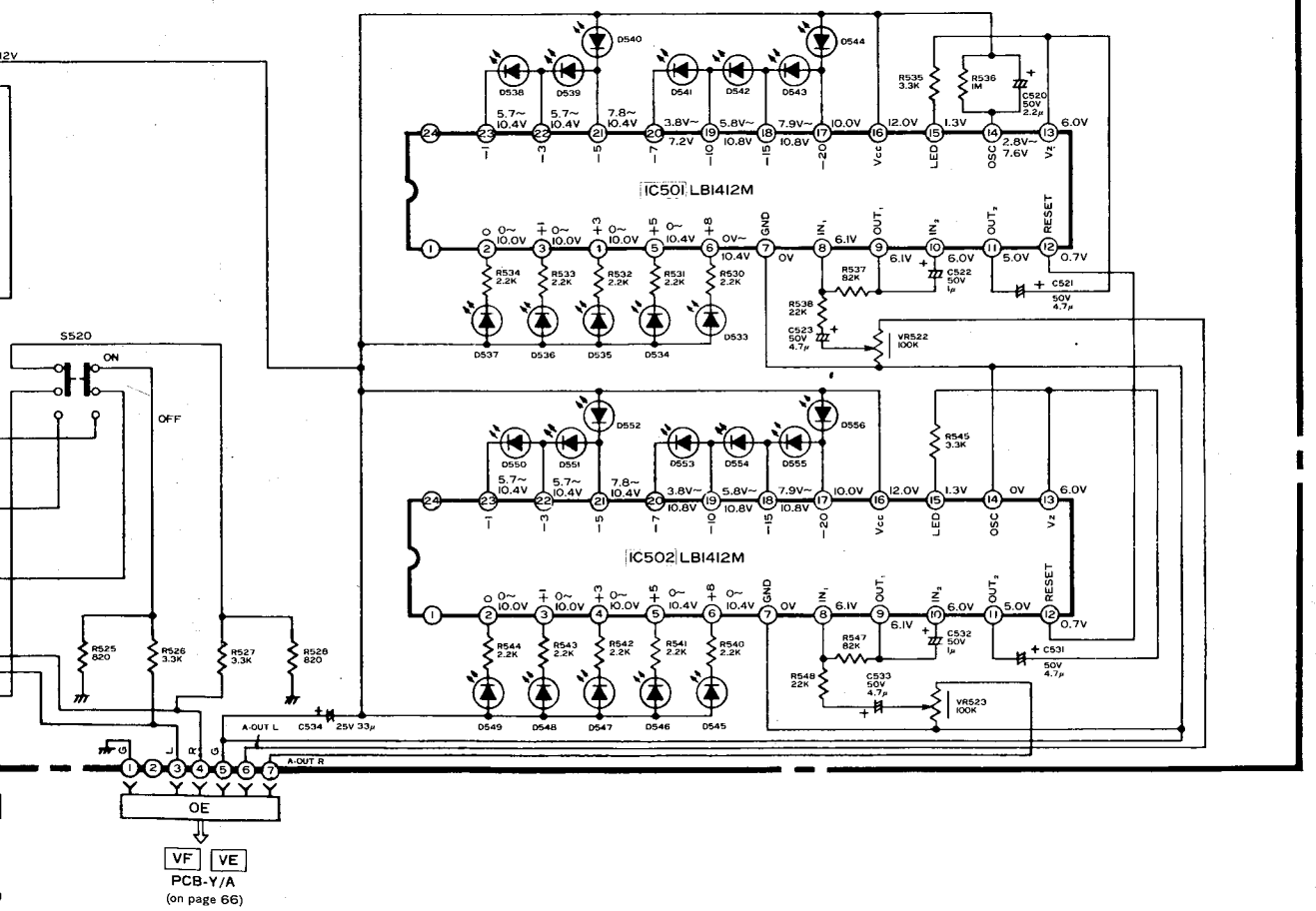

PCB-Y/A (on page 66)
VG
OG
SW-12V
DUAL
STEREO
S520
VR520 A-5K
VR521 A-5K
GND
OJ
HJ
PCB-HI-FI
(on page 65)

VIF PACK



e 66)

PCB-LED

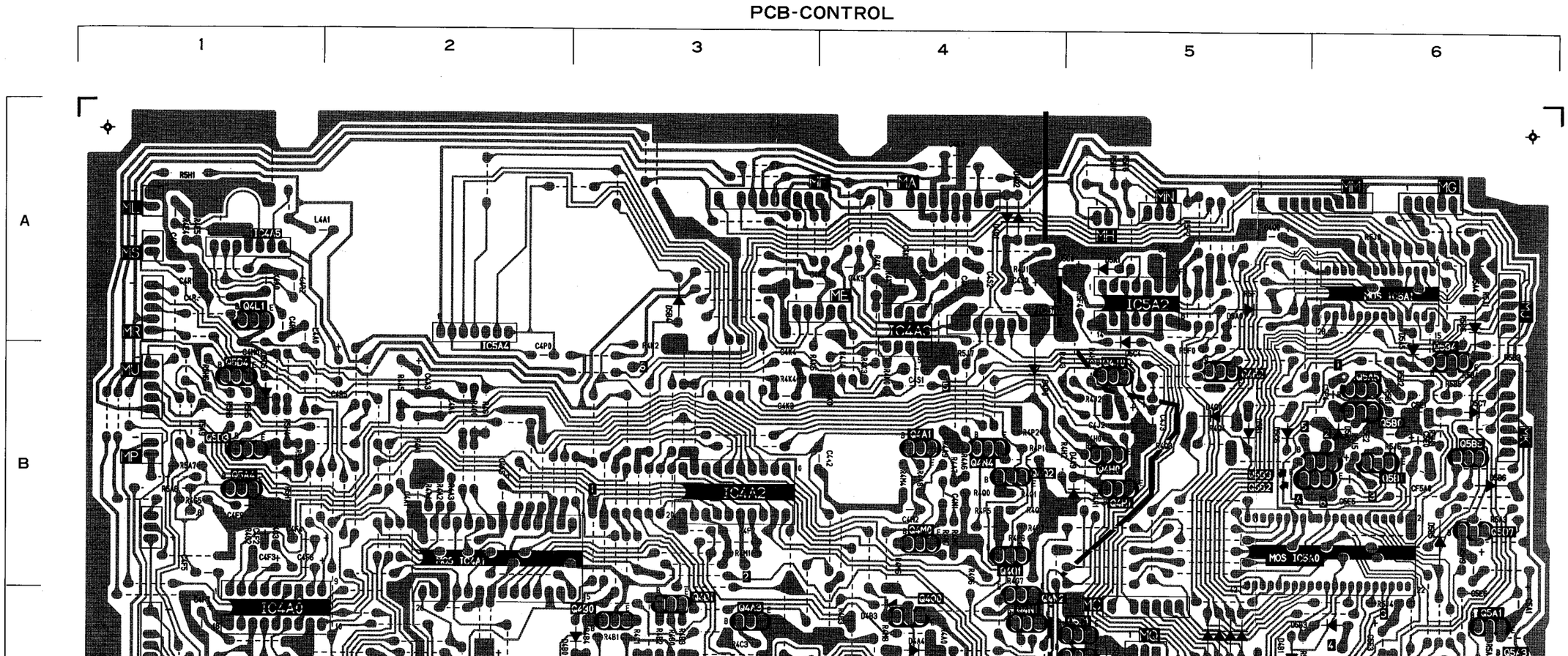


PCB-Y/A

(on page 66)

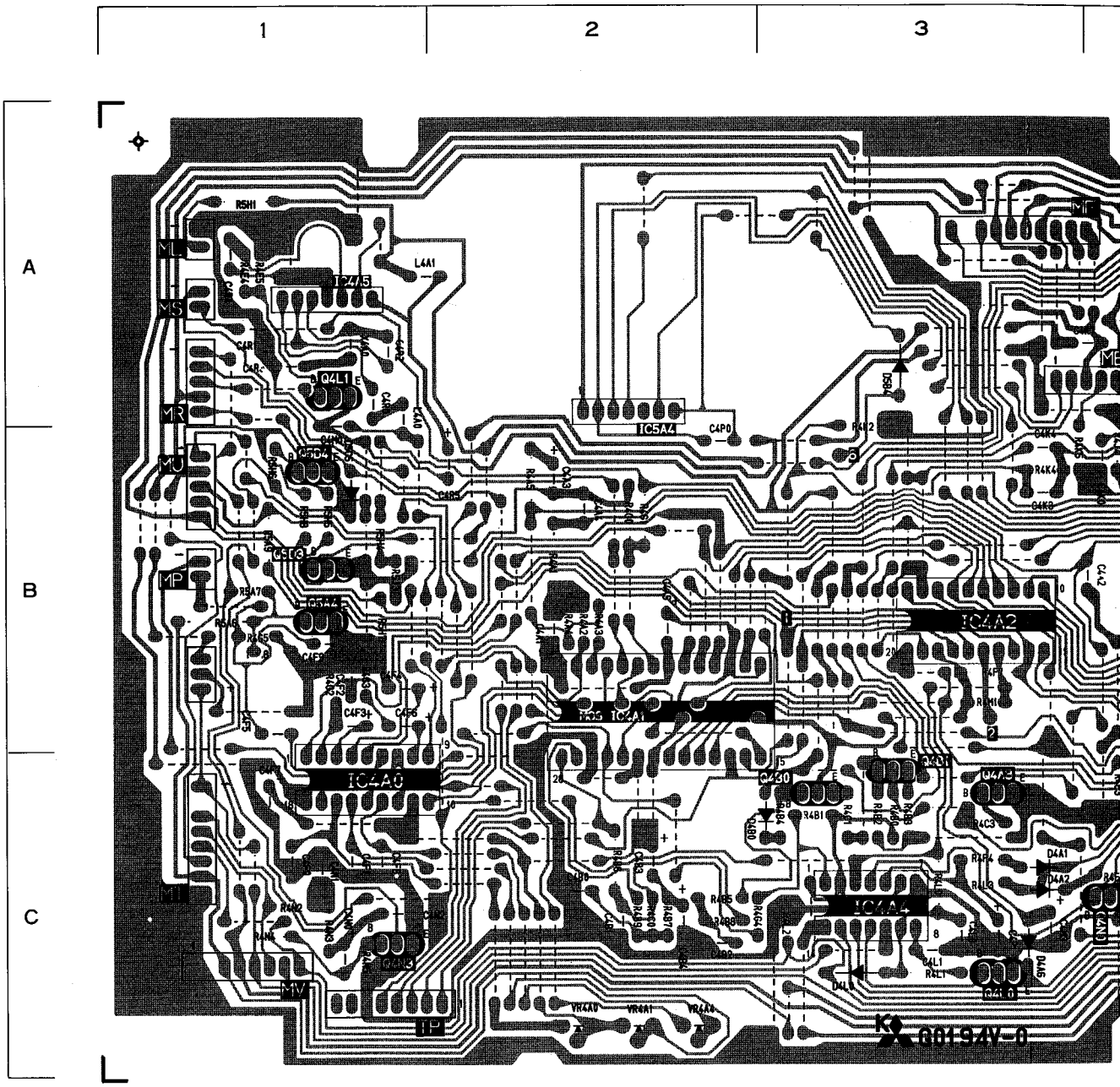
P.C.B. DIAGRAM

PCB-CONTROL

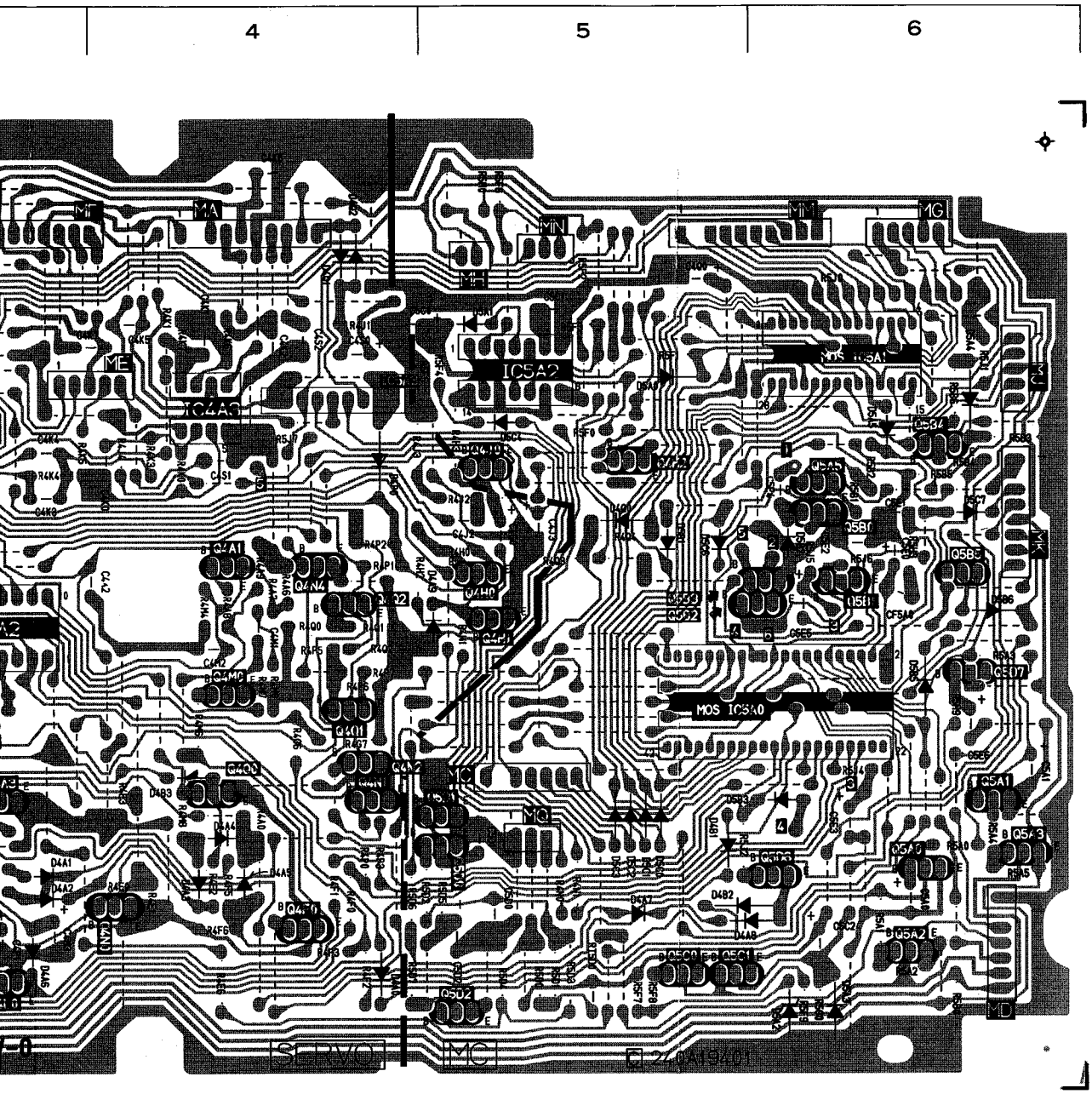


P.C.B. DIAGRAM

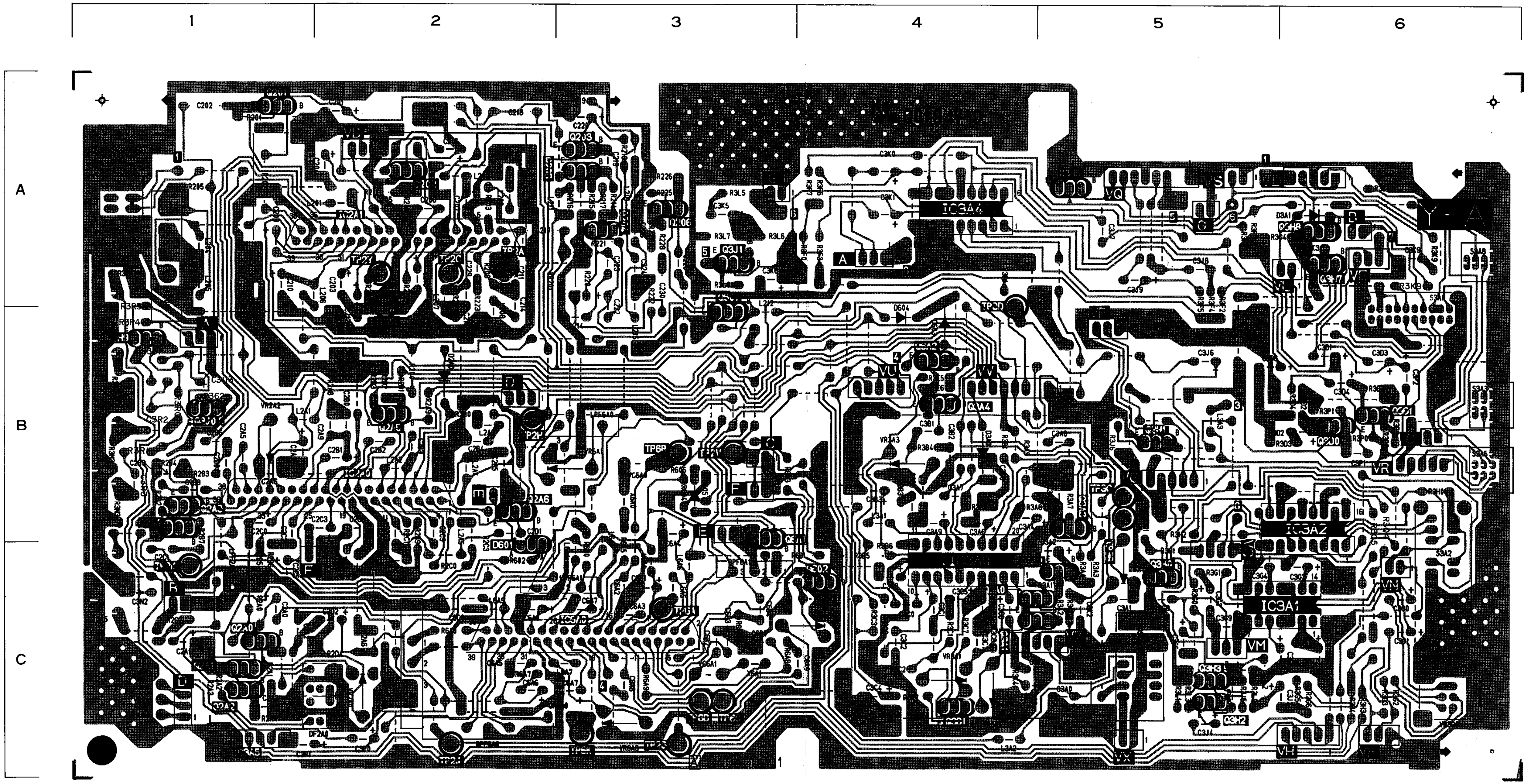
PCB-CONT



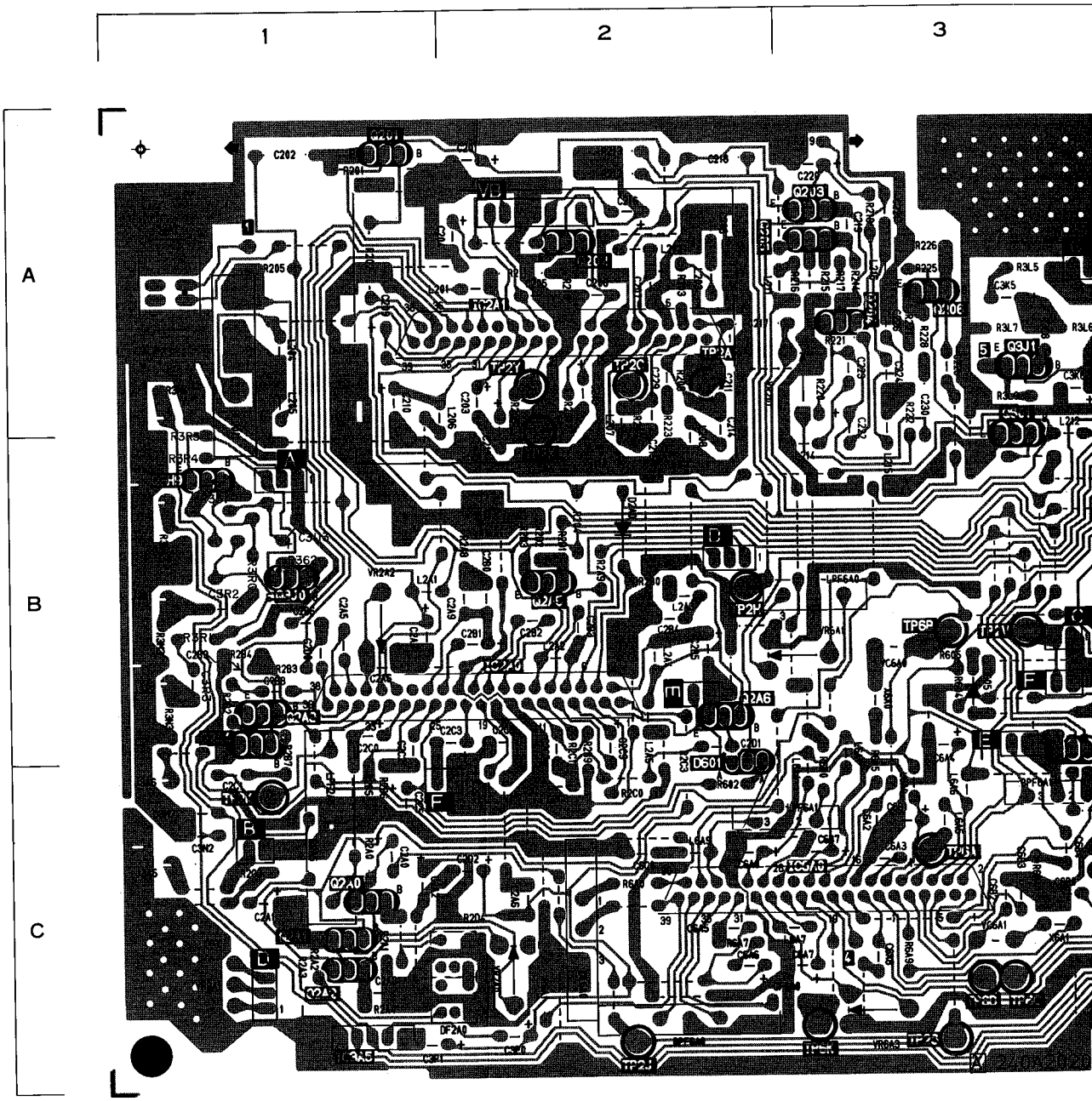
PCB-CONTROL



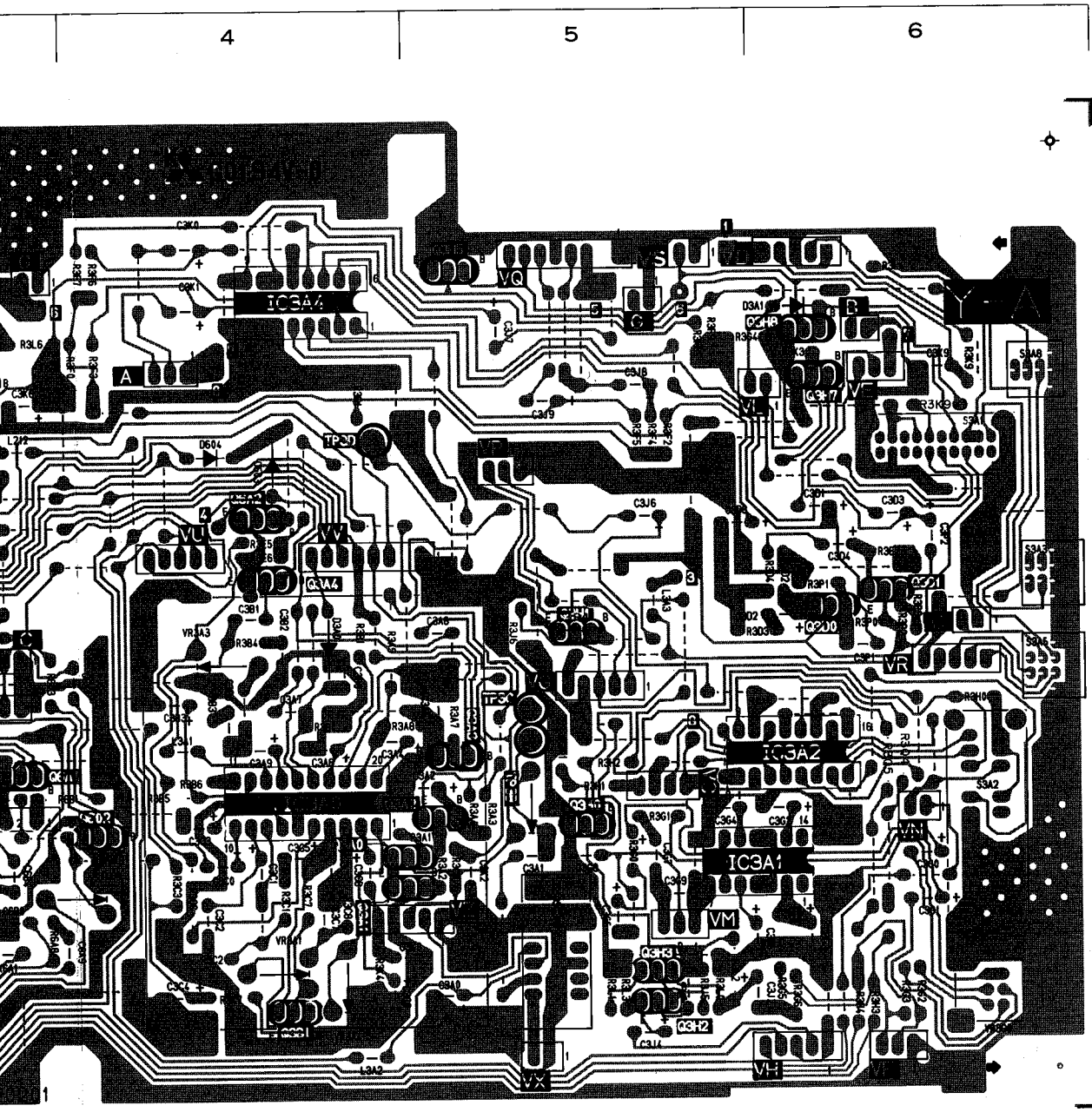
PCB-Y-A



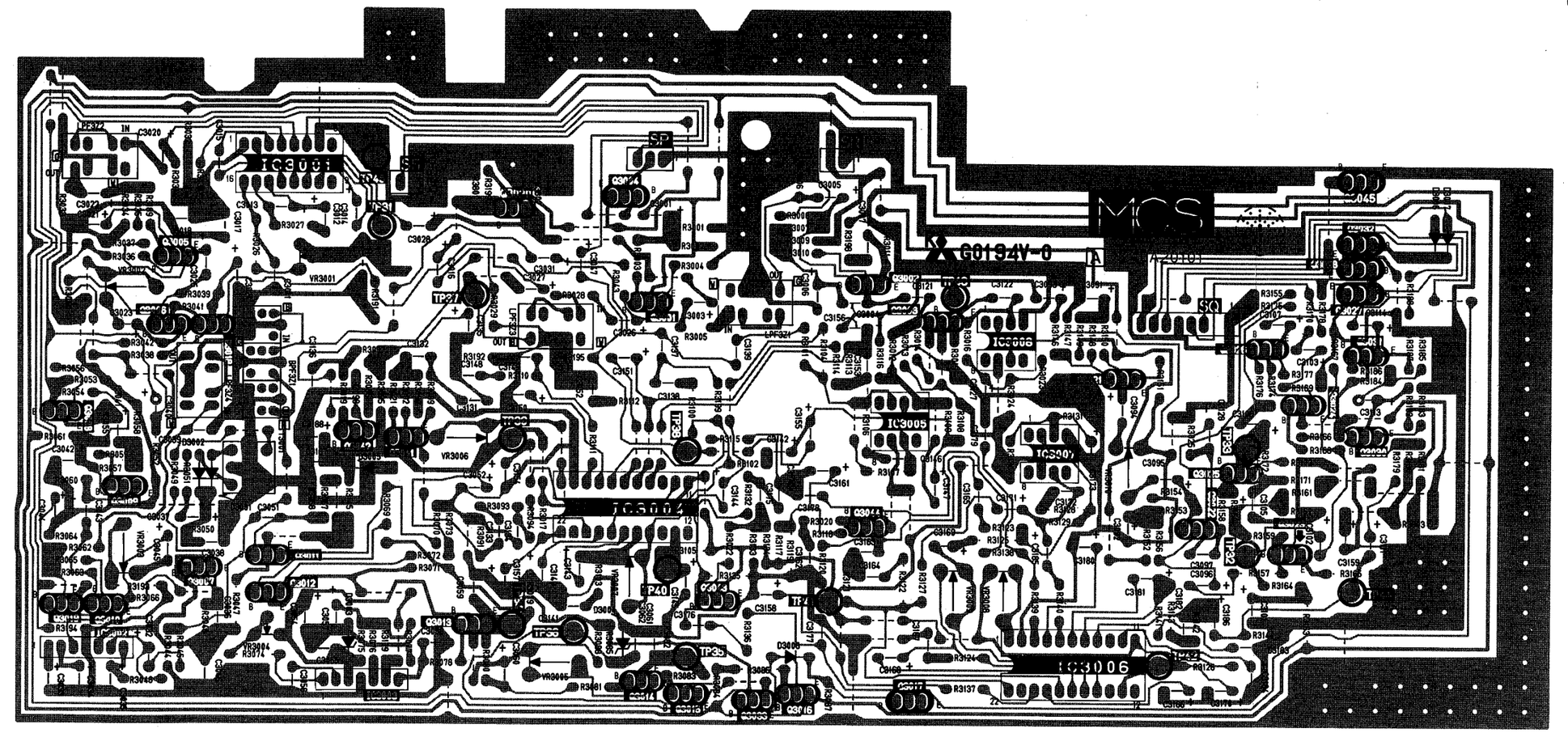
PCB



PCB-Y-A



PCB-MCS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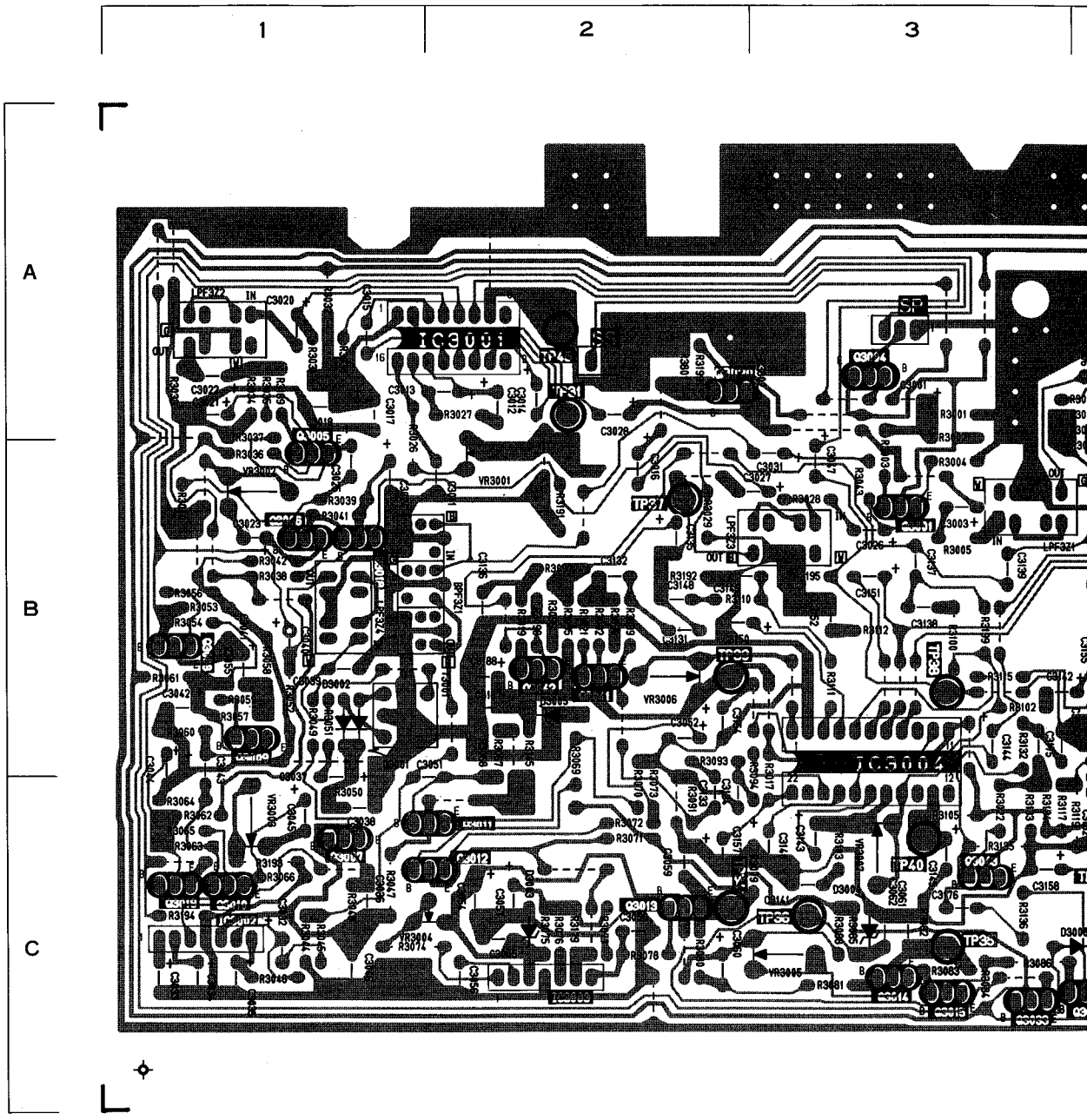
PCB-M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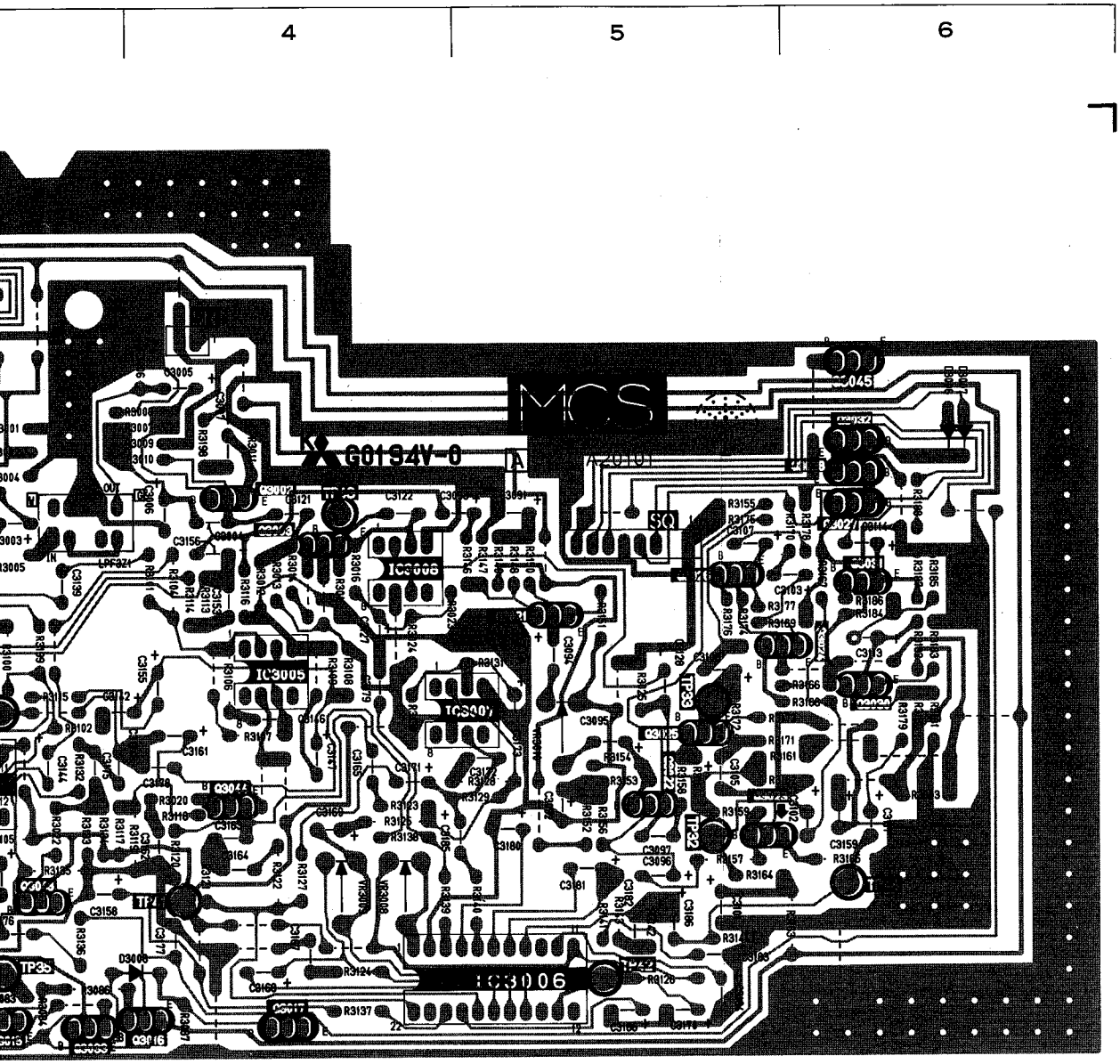
PCB-MCS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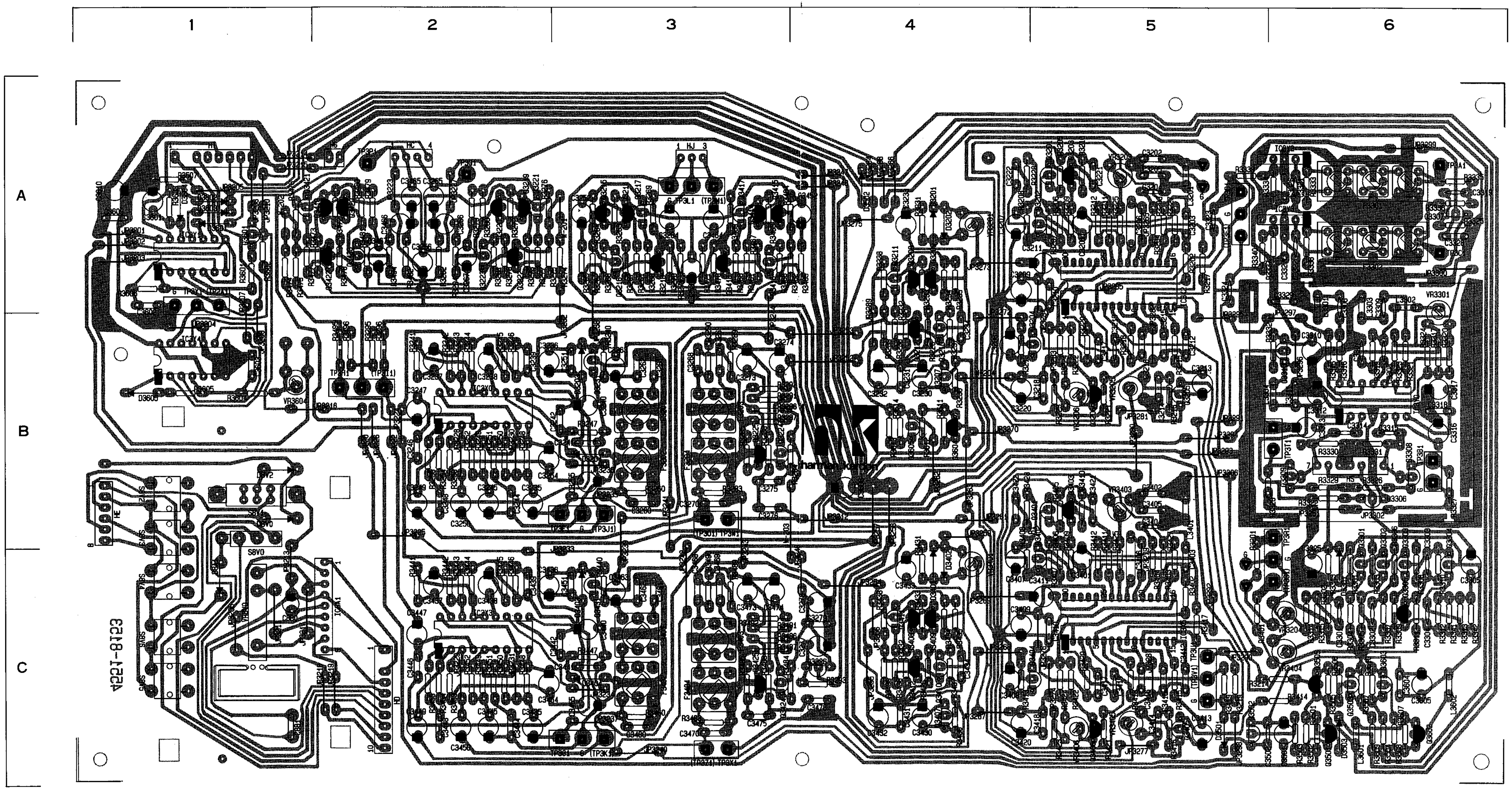
PCB-HI-FI



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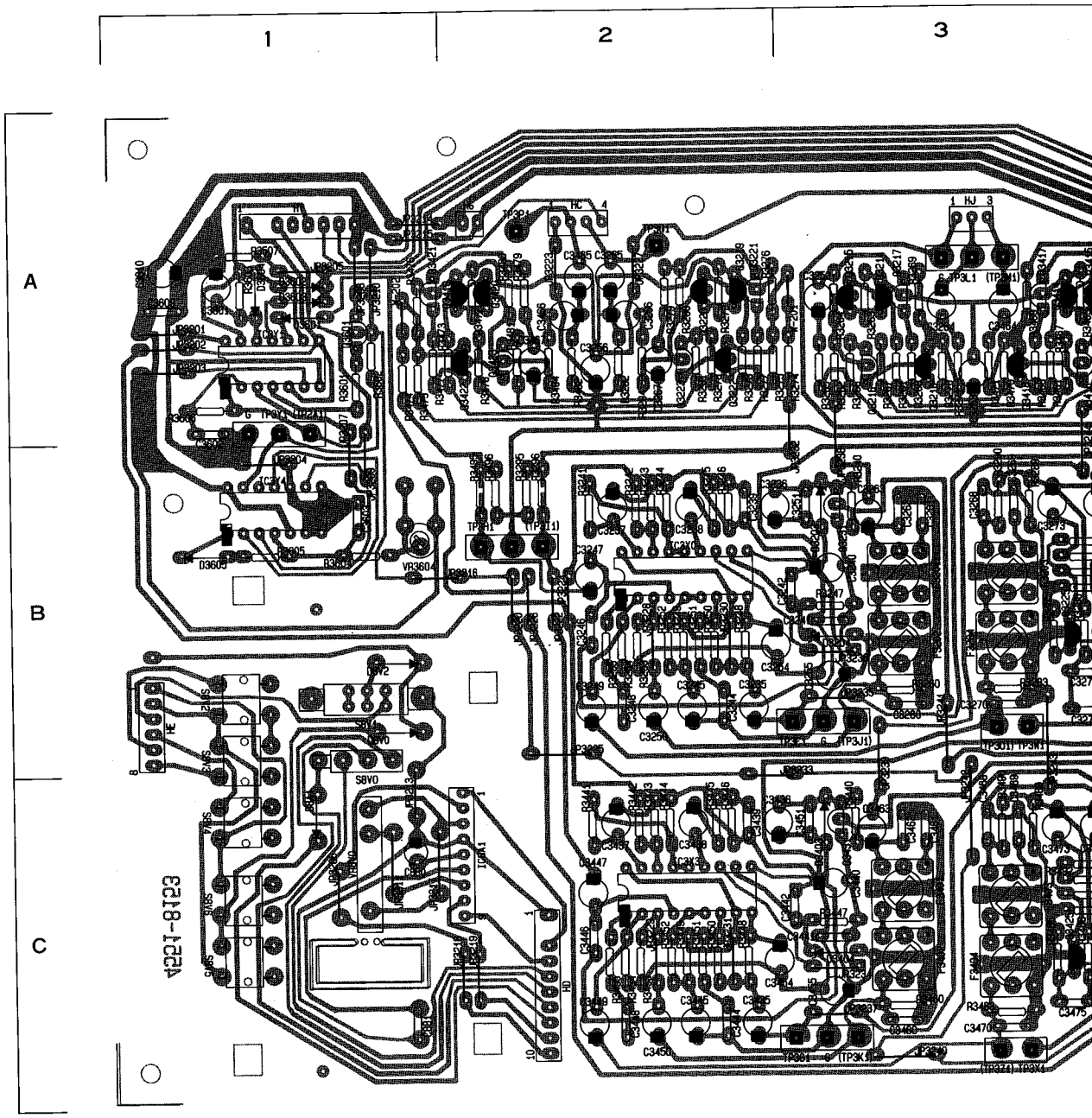
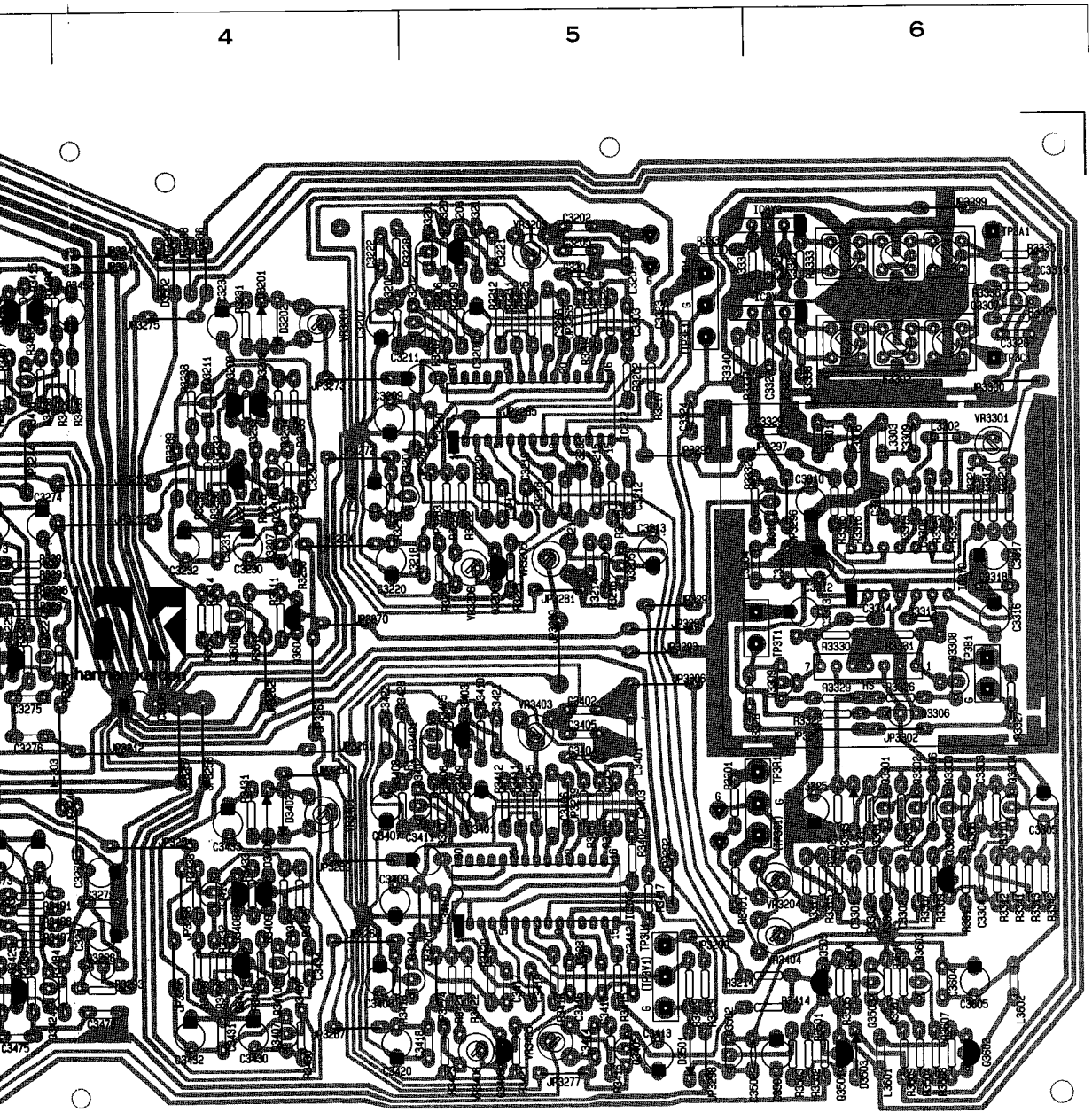
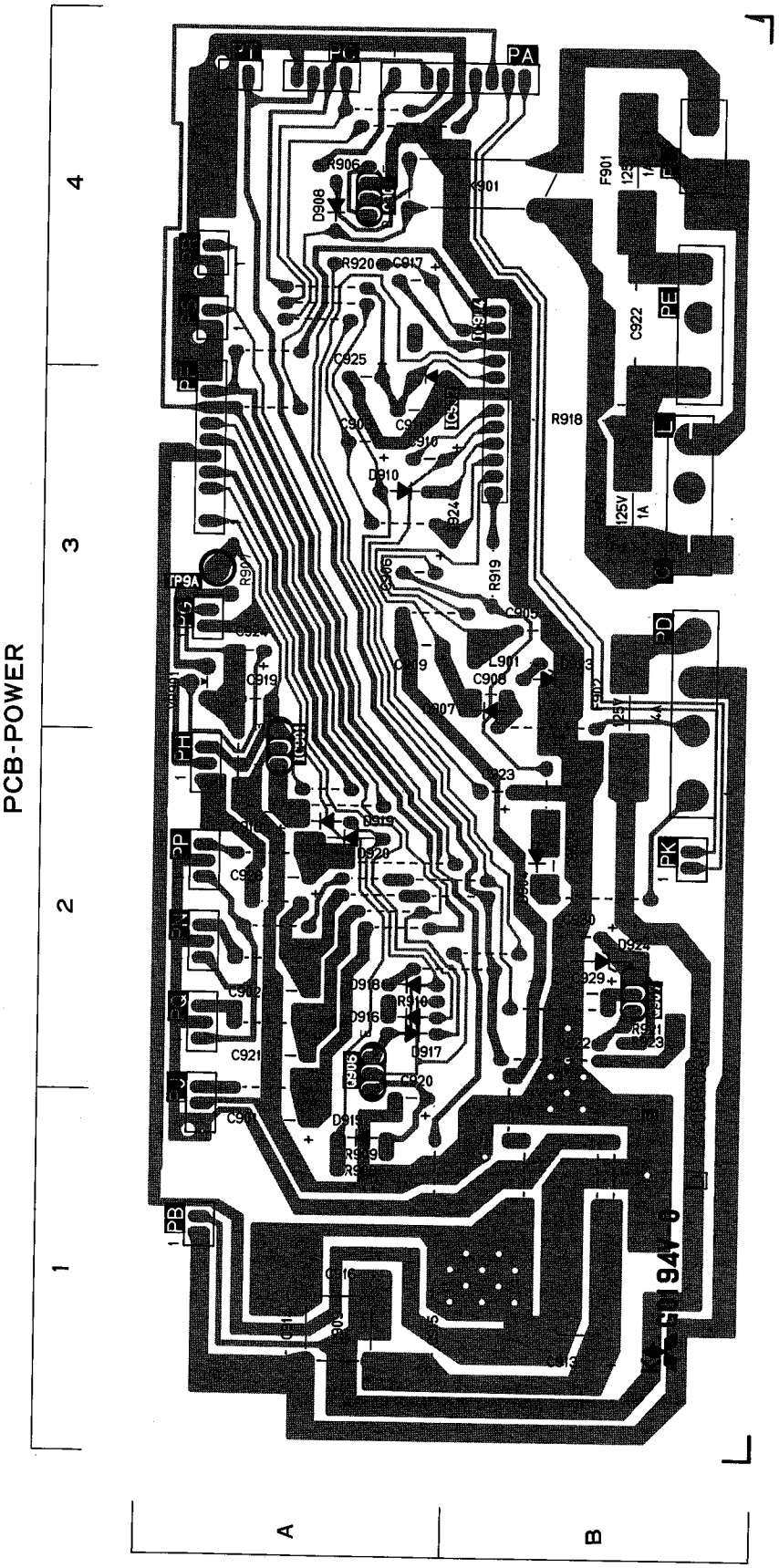


CB-HI-FI



PCB-POWER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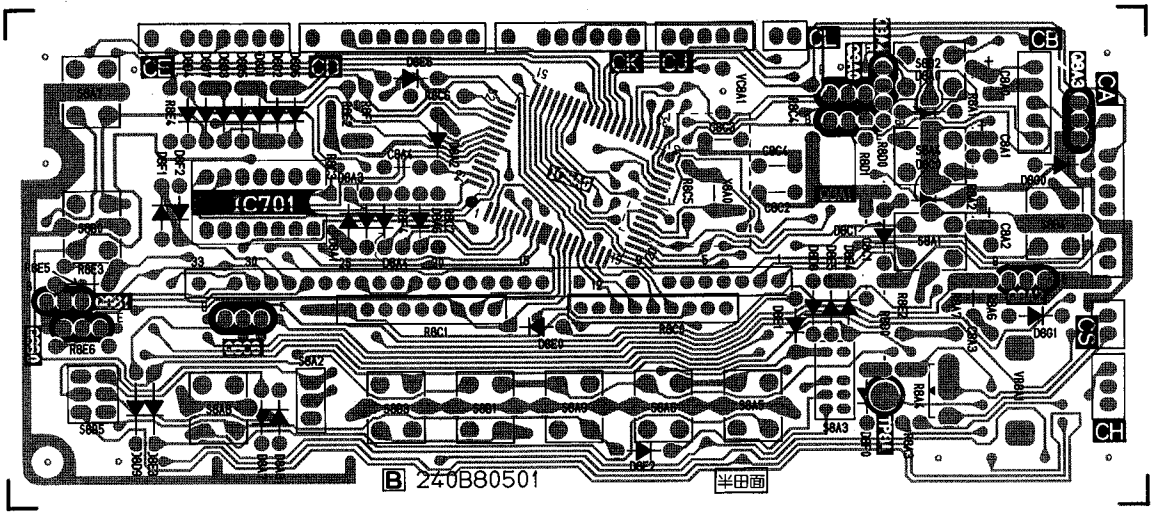
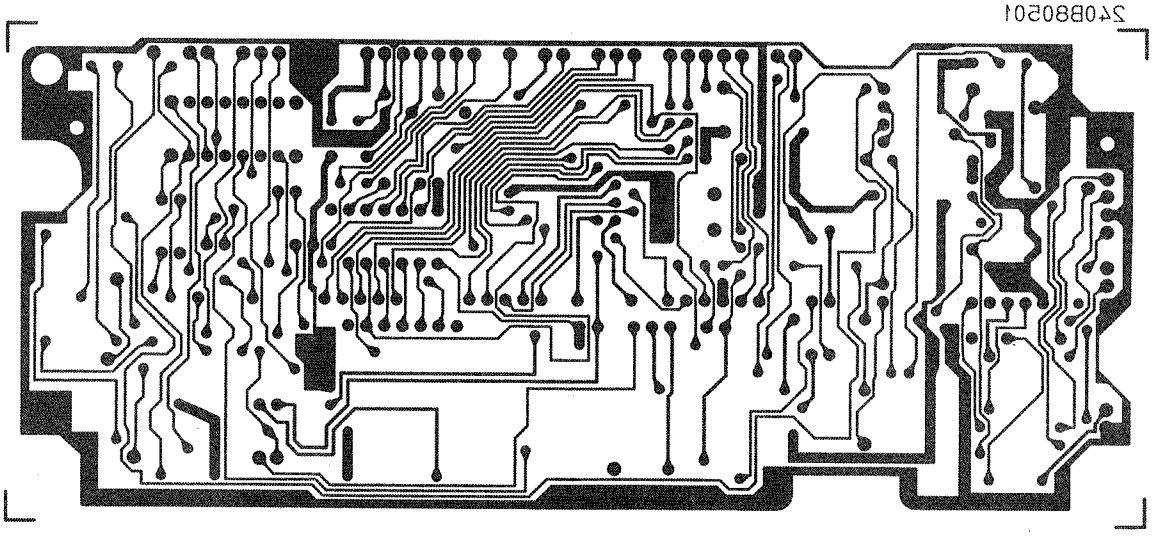
PCB-TIMER





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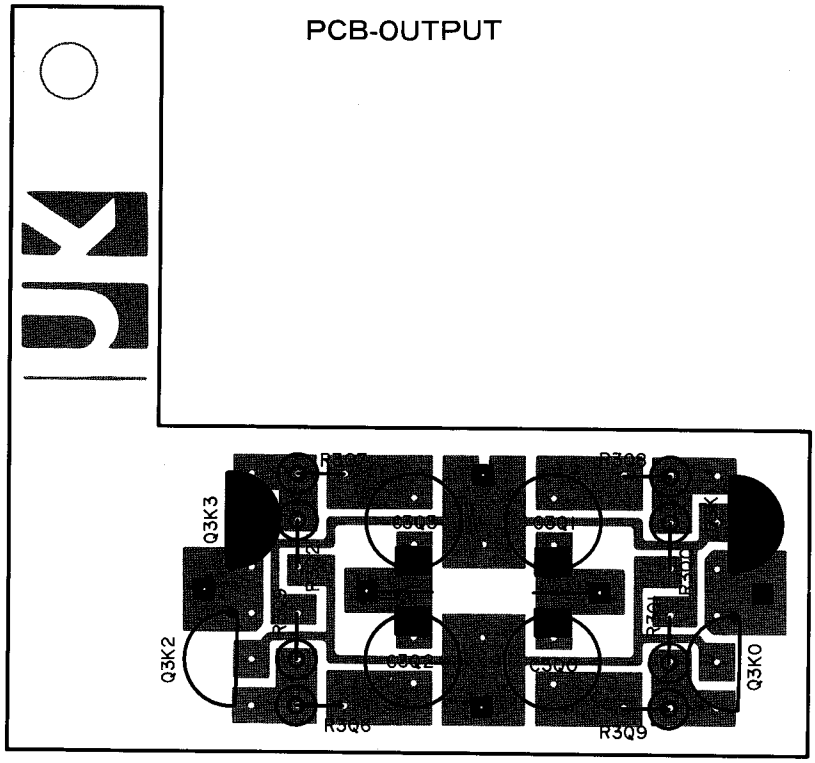
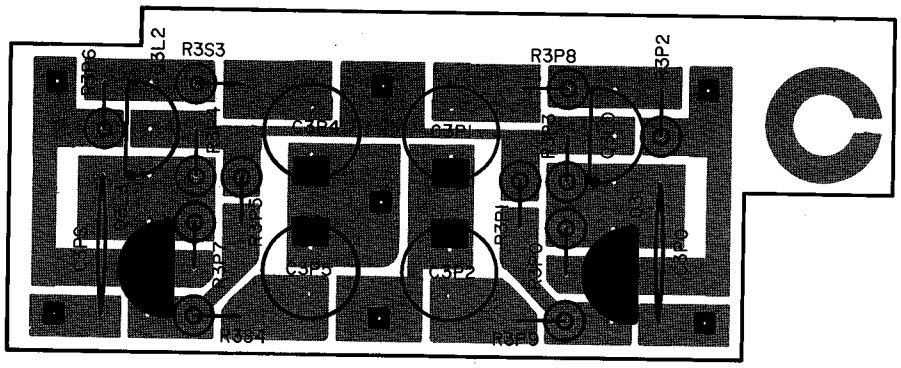
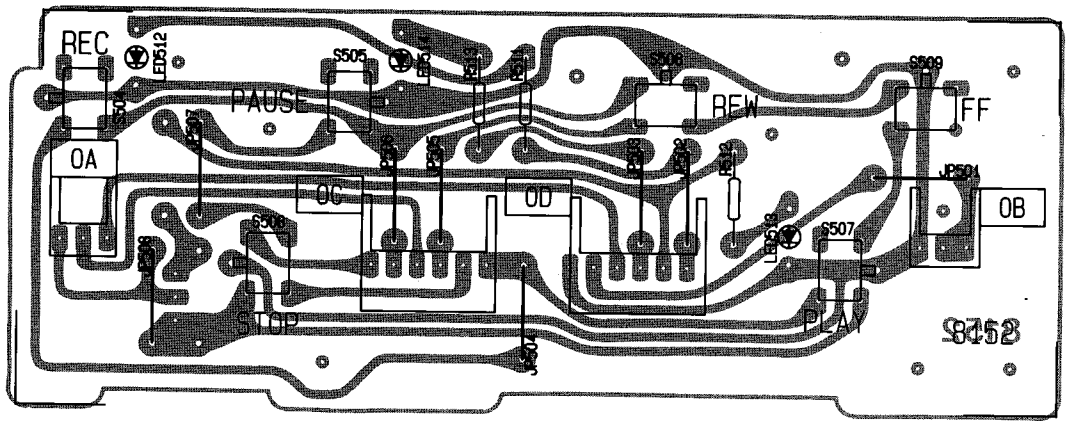
PCB-OUTPUT



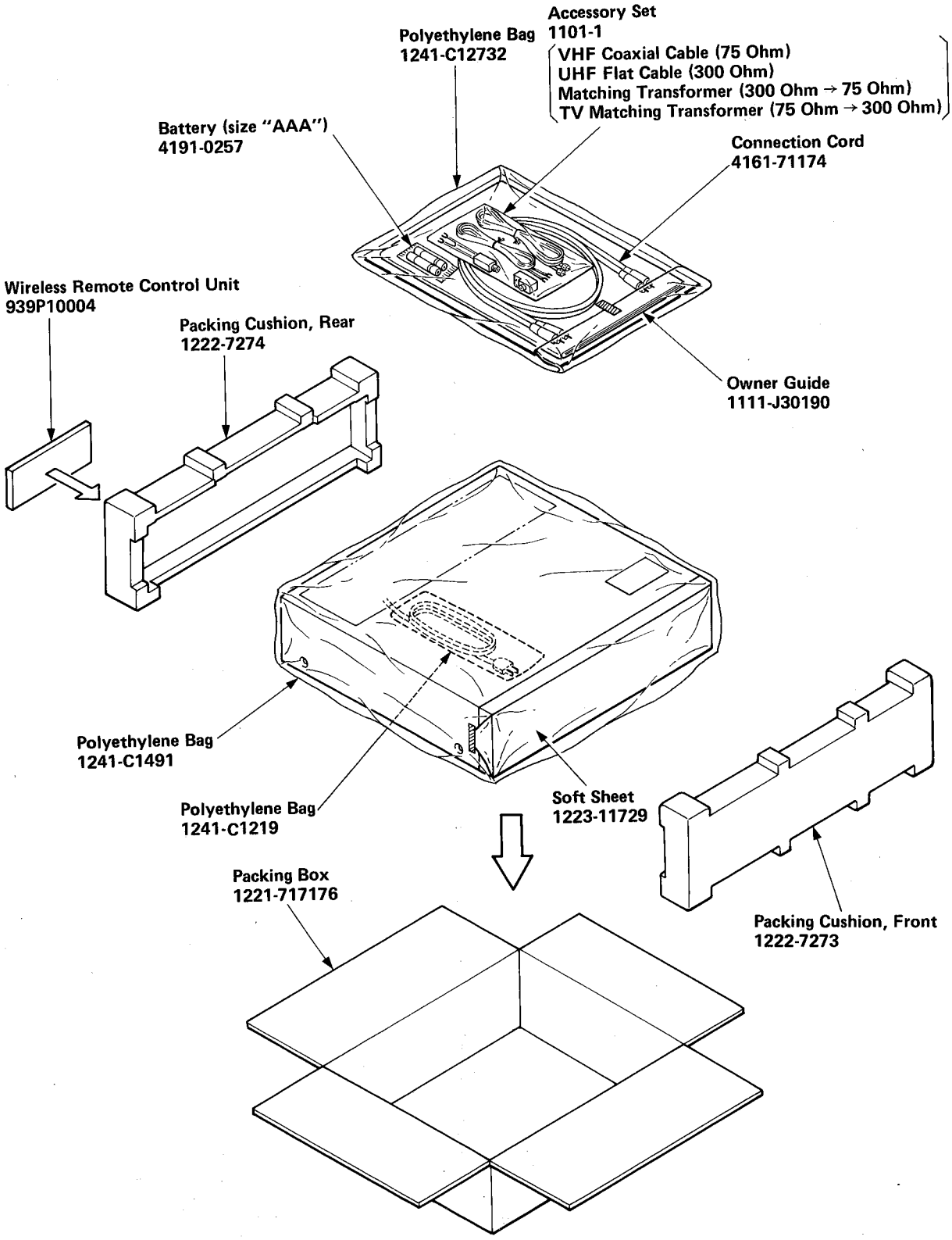
PCB-INPUT



PCB-OPERATION(A)



PACKAGE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1101-1
VHF Coaxial Cable (75 Ohm)
UHF Flat Cable (300 Ohm)
Matching Transformer (300 Ohm → 75 Ohm)
TV Matching Transformer (75 Ohm → 300 Ohm)
Polyethylene Bag
1241-C12732
Battery (size "AAA")
4191-0257
Connection Cord
4161-71174
Wireless Remote Control Unit
939P10004
Packing Cushion, Rear
1222-7274
Owner Guide
1111-J30190
Polyethylene Bag
1241-C1491
Polyethylene Bag
1241-C1219
Soft Sheet
1223-11729
Packing Box
1221-717176
Packing Cushion, Front
1222-7273