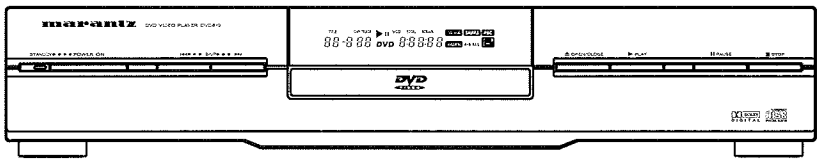
Service Manual

DVD810

DVD VIDEO PLAYER



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Please use this service manual with referring to the user guide (D.F.U.) without fail.

marantz®

model DVD810

Printed in Japan

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MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, **MARANTZ** company has created the ultimate in stereo sound. Only original **MARANTZ** parts can insure that your **MARANTZ** product will continue to perform to the specifications for which it is famous.

Parts for your **MARANTZ** equipment are generally available to our National Marantz Subsidiary or Agent.

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Parts can be ordered either by mail or by Fax.. In both cases, the correct part number has to be specified.

The following information must be supplied to eliminate delays in processing your order :

1. Complete address
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SHOCK, FIRE HAZARD SERVICE TEST :

CAUTION : After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or Front Panel of product and controls and chassis bottom.

Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verified before it is return to the user/customer.

Ref. UL Standard N0. 1492.

In case of difficulties, do not hesitate to contact the Technical Department at above mentioned address.

SECTION 1
GENERAL DESCRIPTIONS

1. TECHNICAL SPECIFICATIONS

DVD Video Player/Outputs/Supplied Accessories

[DVD Video Player]

Power supply	120V AC, 60 Hz
Power consumption	20W
Mass	3.4 kg
External dimensions	430 x 81 x 308 mm (W/H/D)
Signal system	Standard NTSC
Laser	Semiconductor laser, wavelength 650 nm
Frequency range (digital audio)	4 Hz to 20 kHz
Signal-to-noise ratio (digital audio)	More than 96 dB (EIAJ)
Audio dynamic range (digital audio)	More than 93 dB (EIAJ)
Harmonic distortion (digital audio)	Less than 0.006%
Wow and flutter	Below measurable level (less than ± 0.001% (W. PEAK)) (EIAJ)
Operating conditions	Temperature: 5 °C to 35°C, Operation status: Horizontal

[Outputs]

Video output	1.0 V (p-p), 75Ω, negative sync., pin jack x 1
S video output	(Y) 1.0 V (p-p), 75Ω, negative sync., Mini DIN 4-pin x 1 (C) 0.286 V (p-p), 75Ω
Audio output (digital audio)	0.5 V (p-p), 75Ω, pin jack x 1
Audio output (analog audio)	2.0 V (rms), 330Ω, pin jack (L, R) x 1

[Supplied Accessories]

S video cable	1
Audio /video cable	1
Remote control	1
Batteries (AA)	2

* Designs and specifications are subject to change without notice.

AUDIO SAFETY GUIDELINES FOR THE PROFESSIONAL SERVICE TECHNICIAN

Important

Proper service and repair is important to the safe, reliable operation of all MARANTZ equipment. The service procedures recommended by MARANTZ and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It also is important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. MARANTZ could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, MARANTZ has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by MARANTZ must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

Safety Checks

After the original service problem has been corrected, a complete safety check should be made. Be sure to check over the entire set, not just the areas where you have worked. Some previous servicer may have left an unsafe condition, which could be unknowingly passed on to your customer. Be sure to check all of the following:

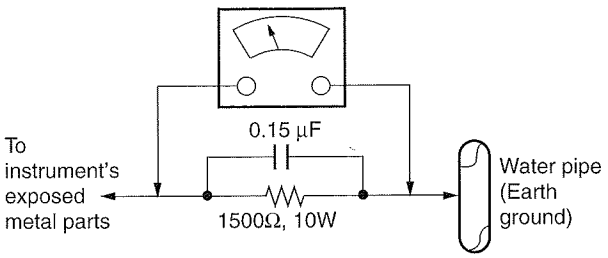
Fire and Shock Hazard

1. Be sure all components are positioned in such a way as to avoid the possibility of adjacent component shorts. This is especially important on those units which are transported to and from the service shop.
2. Never release a repaired unit unless all protective devices such as insulators, barriers, covers, strain reliefs, and other hardware have been installed according to the original design.
3. Soldering and wiring must be inspected to locate possible cold solder joints, solder splashes, sharp solder points, frayed leads, pinched leads, or damaged insulation (including the ac cord). Be certain to remove loose solder balls and all other loose foreign particles.
4. Check across-the-line components and other components for physical evidence of damage or deterioration and replace if necessary. Follow original layout, lead length, and dress.
5. No lead or component should touch a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces or edges must be avoided.
6. Critical components having special safety characteristics are identified with a by the Ref. No. in the parts list and enclosed within a broken line* (where several critical components are grouped in one area) along with the safety symbol on the schematic diagrams and/or exploded views.
   Replacement parts without the same safety characteristics may create shock, fire, or other hazards.
7. When servicing any unit, always use a separate isolation transformer for the chassis. Failure to use a separate isolation transformer may expose you to possible shock hazard, and may cause damage to servicing instruments.
8. Many electronic products use a polarized ac line cord (one wide pin on the plug). Defeating this safety feature may create a potential hazard to the servicer and the user. Extension cords which do not incorporate the polarizing feature should never be used.
9. After reassembly of the unit, always perform an ac leakage test or resistance test from the line cord to all exposed metal parts of the cabinet. Also, check all metal control shafts (with knobs removed), antenna terminals, handles, screws, etc. to be sure the unit is safe to operate without danger of electrical shock.

*Broken line

Leakage Current Cold Check

1. Unplug the ac line cord and connect a jumper between the two prongs of the plug.
2. Turn on the power switch.
3. Measure the resistance value between the jumpered ac plug and all exposed cabinet parts of the receiver, such as screw heads, antennas, and control shafts. When the exposed metallic part has a return path to the chassis, the reading should be between 1 megohm and 5.2 megohms. When the exposed metal does not have a return path to the chassis, the reading must be infinity. Remove the jumper from the ac line cord.



Leakage Current Hot Check

1. Do not use an isolation transformer for this test. Plug the completely reassembled unit directly into the ac outlet.
2. Connect a 1.5k, 10W resistor paralleled by a 0.15 µF. capacitor between each exposed metallic cabinet part and a good earth ground such as a water pipe, as shown above.
3. Use an ac voltmeter with at least 5000 ohms/volt sensitivity to measure the potential across the resistor.
4. The potential at any point should not exceed 0.75 volts. A leakage current tester may be used to make this test; leakage current must not exceed 0.5 milliamps. If a measurement is outside of the specified limits, there is a possibility of shock hazard. The receiver should be repaired and rechecked before returning it to the customer.
5. Repeat the above procedure with the ac plug reversed. (Note: An ac adapter is necessary when a polarized plug is used. Do not defeat the polarizing feature of the plug.)

Parts Replacement

1. Many electrical and mechanical parts in MARANTZ equipment have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. The use of a substitute part which does not have the same safety characteristics as the MARANTZ recommended replacement part shown in this service manual may create shock, fire, or other hazards. Under no circumstances should the original design be modified or altered without written permission from MARANTZ. MARANTZ assumes no liability, express or implied, arising out of any unauthorized modification of design. Servicer assumes all liability.
2. All ICs and many other semiconductor parts are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce the life of the part drastically.

FOR PRODUCTS CONTAINING LASER:

DANGER - Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.

CAUTION - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

CAUTION - The use of optical instruments with this product will increase eye hazard.

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2. CONFIGURATION OF DVD

2-1. Main Signal Processing Functions (Main Board)

The signal processing functions of DVD are largely divided into the following.

(1) RF signal channel reading signals from a disc (digital/serial)

(2) Program stream signal channel to slice RF signal (digital/parallel)

(3) Video signal and audio signal channel after decoding MPEG2

(4) Video signal and audio signal channel after D/A conversion

(5) Disc motor/focus/tracking servo signal channel

(6) Control (microcomputer) signal channel

(7) Operation/display signal channel

(8) Power supply channel

2-2. Functions of Each Block

(1) RF signal channel reading signals from a disc (Digital/Serial)

The RF signal read with the laser PU is converted into voltage with the IC (I/V Amp) built in the PU assembly and is applied to IC502 (TA1236).

When the double-layer DVD disc is played, the I/V Amp increases the gain about 12 dB. Because the returning laser beam quantity for the double-layer DVD disc decreases by 70% (70% lost) against the single-layer DVD disc.

IC502 corrects (amplifies) the 3T part with the DVD/CD equalizer Amp and outputs as an RF signal.

The corrected 3T part improves the pit reading accuracy against damages on a disc.

The RF signal of DVD is applied to IC201 data processor 1, while the RF signal of CD is applied to IC503 servo processor.

The RF signal of DVD applied to IC201 is data sliced and is applied to IC207 data processor 2 through the 8/16 modulation signal pickup, the 8/18 modulator, memory access with IC202 (4M-DRAM) and error correction.

The RF signal of CD applied to IC503 servo processor is data sliced and is applied to the audio system DAC of IC904 through EFM signal removal, PM demodulation, memory access with the built-in 16 kRAM and error correction.

For the memory access with DRAM/RAM in IC201 and IC503, the RF signal which is read from the laser PU and contains a component which changes with time and is previously stored and is synchronized with an exact crystal oscillation frequency to convert into an RF signal free from a component which changes with time (W/F value, not measurable) and then accessed.

(2) Program Stream Signal Channel

IC207 data processor 2 verifies the program stream signal and sends it to IC304 MEG2 decoder.

The program stream signal contains video, audio and other control information/data.

The video signal applied to IC304 MPEG2 decoder is exposed to memory/access by image frames with IC305 (16 MDRAM) in the memory interface, and the information recorded in compressed (thinned) format is decoded (embedded).

After returned to the original format, the video signal is transmitted with the audio signal and control information, and is applied to IC301 video processor through the video interface. The control information is separated in the video interface and is applied to IC601 MPU as a system information through a microcomputer.

(3) Video Signal and Audio Signal Channel after Decoding MPEG2

IC301 video processor separates the video signal and audio signal. The video signal is applied to the mixer to be added with a sub-picture (superimpose) signal or OSD (on-screen display) signal based on the information from IC601 MPU, MPU interface in IC301, and is sent to IC307 data processor 3.

IC307 data processor 3 performs signal processing for each of luminance signal, color signal and composite signal of the video signal based on the DVD format, and sends the result to IC306 video DAC.

IC306 video DAC converts the digital video signal into an analog video signal and transmits to IC308 SW as a luminance signal, a color signal and a composite signal.

The signal selected with the SW is applied to LPF through the impedance matching (emitter-follower) amplifier, to be cut in the high frequency, and then it is amplified to the standard level in the amplifier, selected with the SW and outputted as a composite signal.

The audio signal is separated through the system decoder and is applied to IC903 parallel/serial converter.

IC903 parallel/serial converter converts a serial signal into a parallel signal and applies it to IC901 AC-3 decoder. The AC-3 decodes (demodulates) the input signal by selecting the ON/OFF SW at the rear of the set, and sends it to IC904 audio system DAC as a DVD data.

The CD audio signal is supplied from IC503 servo processor directly to IC904 audio system DAC.

IC904 audio system DAC switches DVD and CD with the data I/O. The output signal is converted into an analog signal with IC905 audio DAC, and is sent to the audio out L/R through LPF and analog amplifier.

The digital signal processed with the digital encoder to match each format is coaxial/optical outputted from the data I/O.

(4) Servo signal channel

The DVD servo channel is, like a CD/LD player, composed of a focus servo, a tracking servo, a feed motor servo and a disc motor (CLV) servo.

Focus servo:	DVD/CD: Astigmatic method
Tracking servo:	DVD:Verified differential phase detect
Tracking servo:	CD: 3-beam system
Disc servo:	DVD/CD:CLV (Constant Linear Velocity)

The focus servo is common to DVD and CD. The signal from the laser PU is applied to IC502 RF-Amp.

IC502 RF Amp generator operates (A + C) - (B + D), and applies the result to IC503 servo processor as a focus error signal.

The focus control signal is controlled by the error signal in IC503 servo processor, and is applied to the drive circuit through IC506 CD/DVD selector switch to control the focus coil.

When a DVD is played, the focus point is switched for the 1st and 2nd layers.

The tracking servo is applied to IC503 servo processor through a separate error generation circuit.

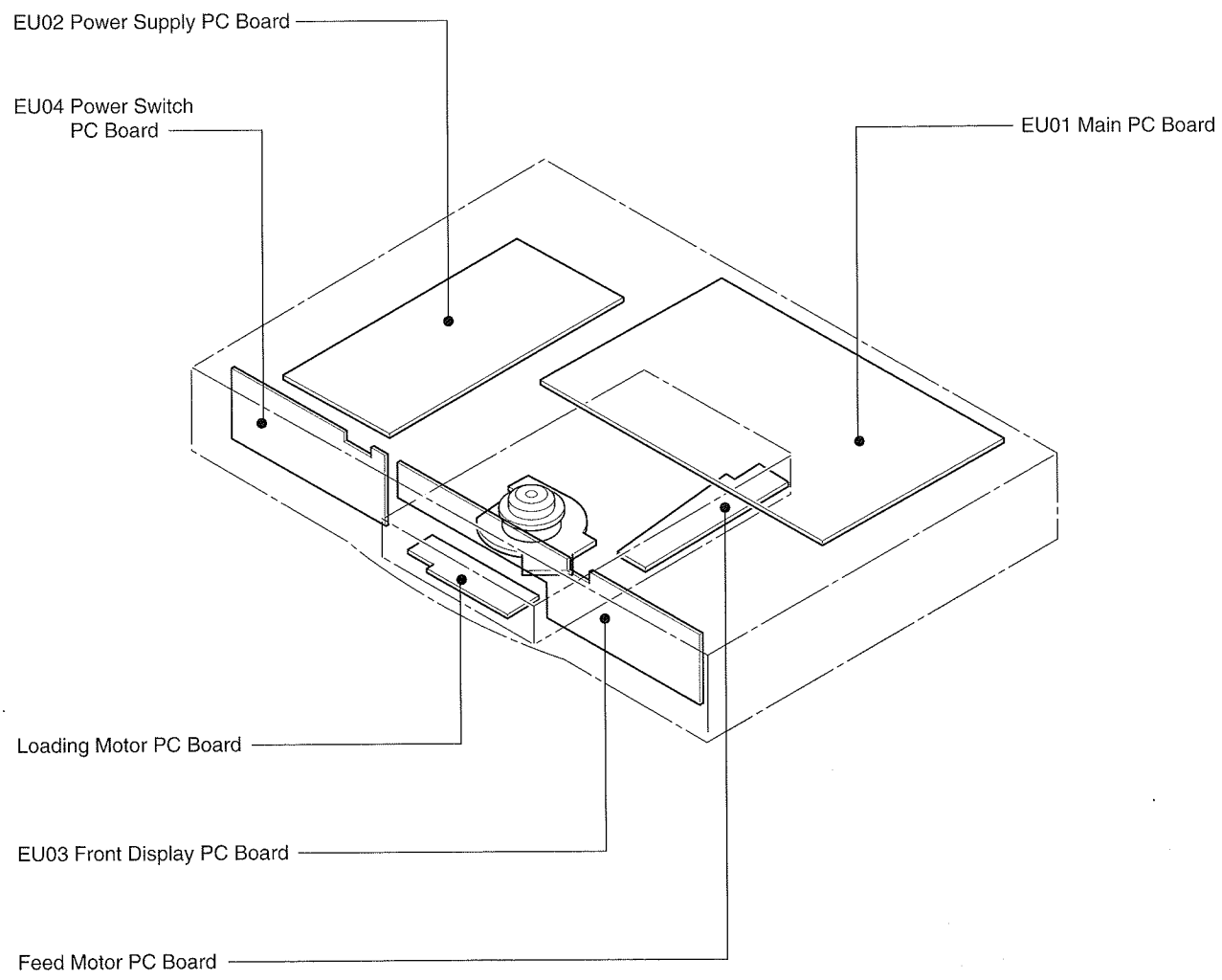
When a CD is played, the signals A to F from the laser PU are applied to IC502 RF-Amp, where E and F are operated with the generator, and the result is applied to the CD/DVDTE selector switch as a CD tracking error signal.

When a DVD is played, the signals A to D from the laser PU are applied to IC501 DVD-TE, where 3T correction and operation of (A + C) and)B + D), offset setting, phase comparing and correction of damages of a disc are performed, and the output is applied to the CD/DVDTE selector switch of IC502 RF-Amp as a DVD tracking error.

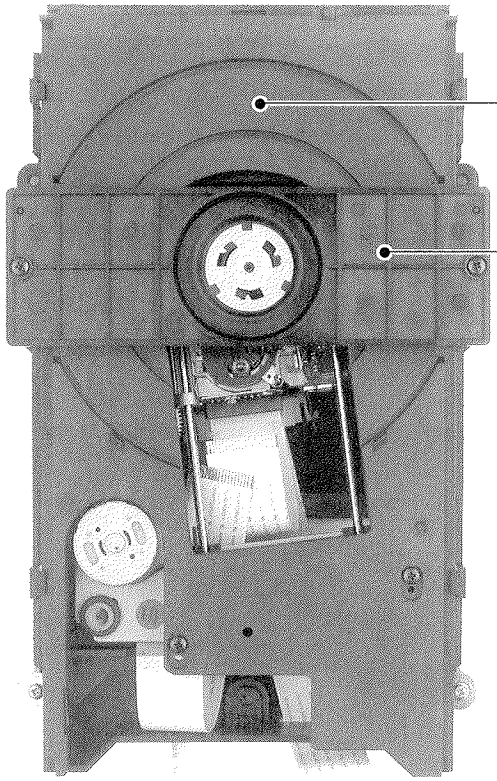
The DVD's TE signal passing through IC501 and the TE signal converted into TE for CD inside IC502 select DVD-TE or CD-TE by the switch circuit inside IC502. Then, the signal is supplied to the servo control circuit IC503. The TE signal is converted into the tracking control signal and then input to the tracking signal drive circuit in IC505 through the CD and DVD selection SW inside IC506. The tracking drive output is input to the tracking coil of the pick up and performs the tracking control.

The disc servo comprises of an independent circuit, and controls IC510 disc drive with the control signal obtained by comparing the 27 MHz clock frequency of IC301 video processor with the PLL data of CD (IC503), thereby realizing the CLV servo.

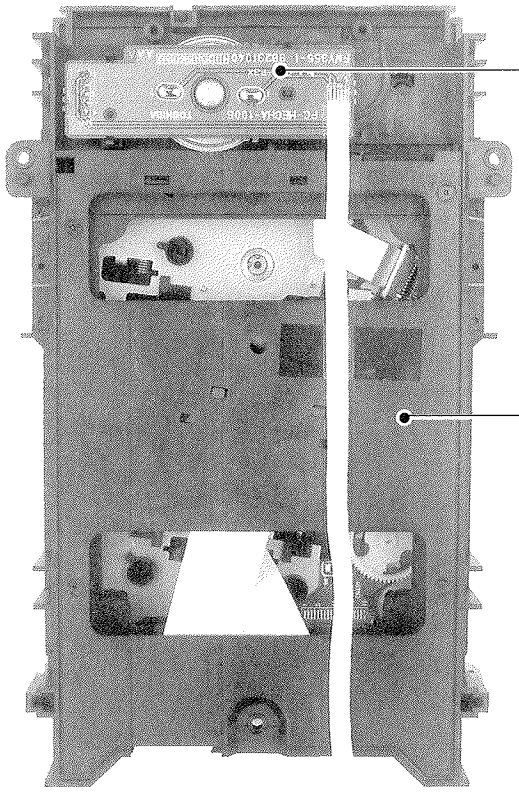
3. LOCATION OF MAIN PARTS



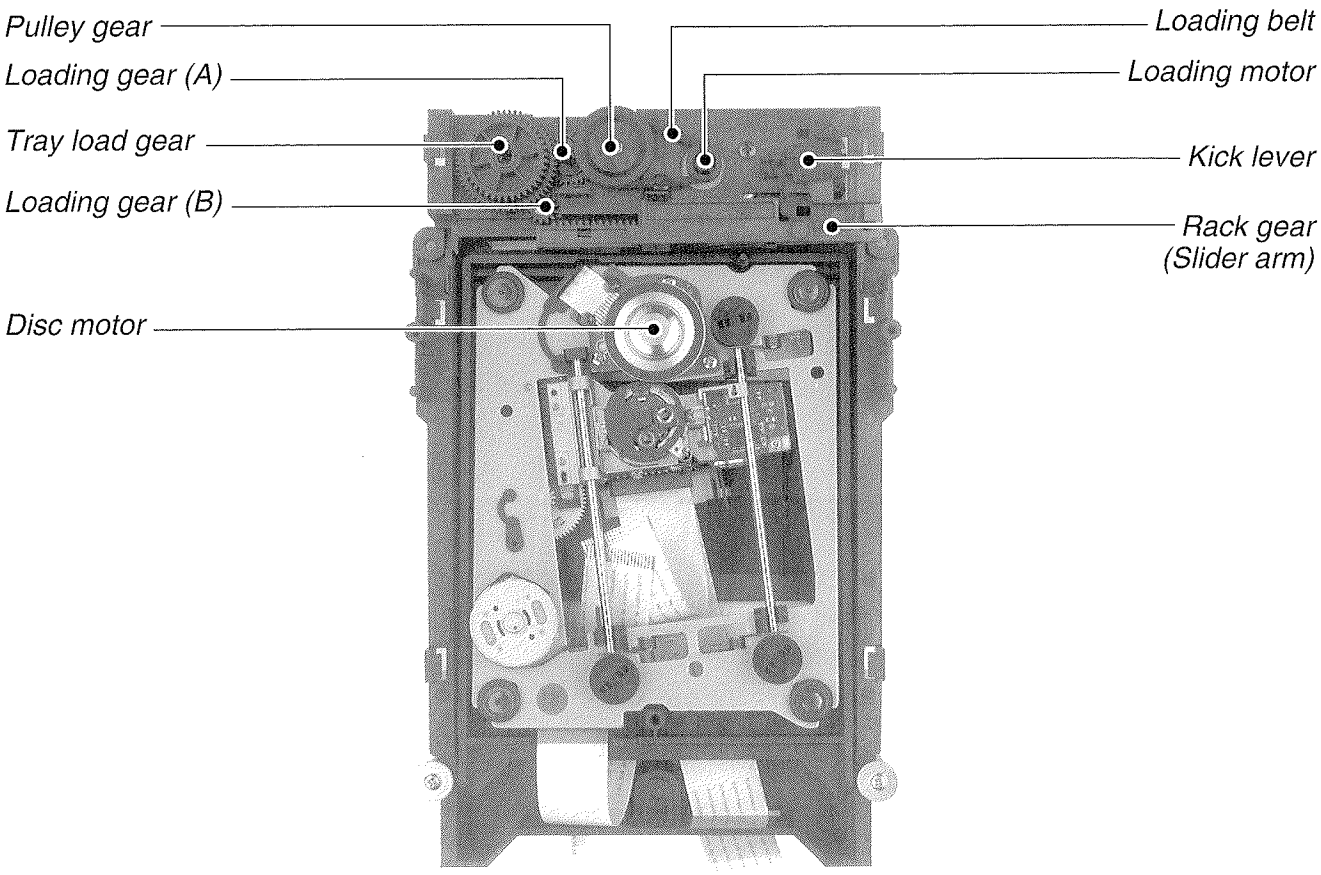
4. MECHANISM PARTS LOCATION



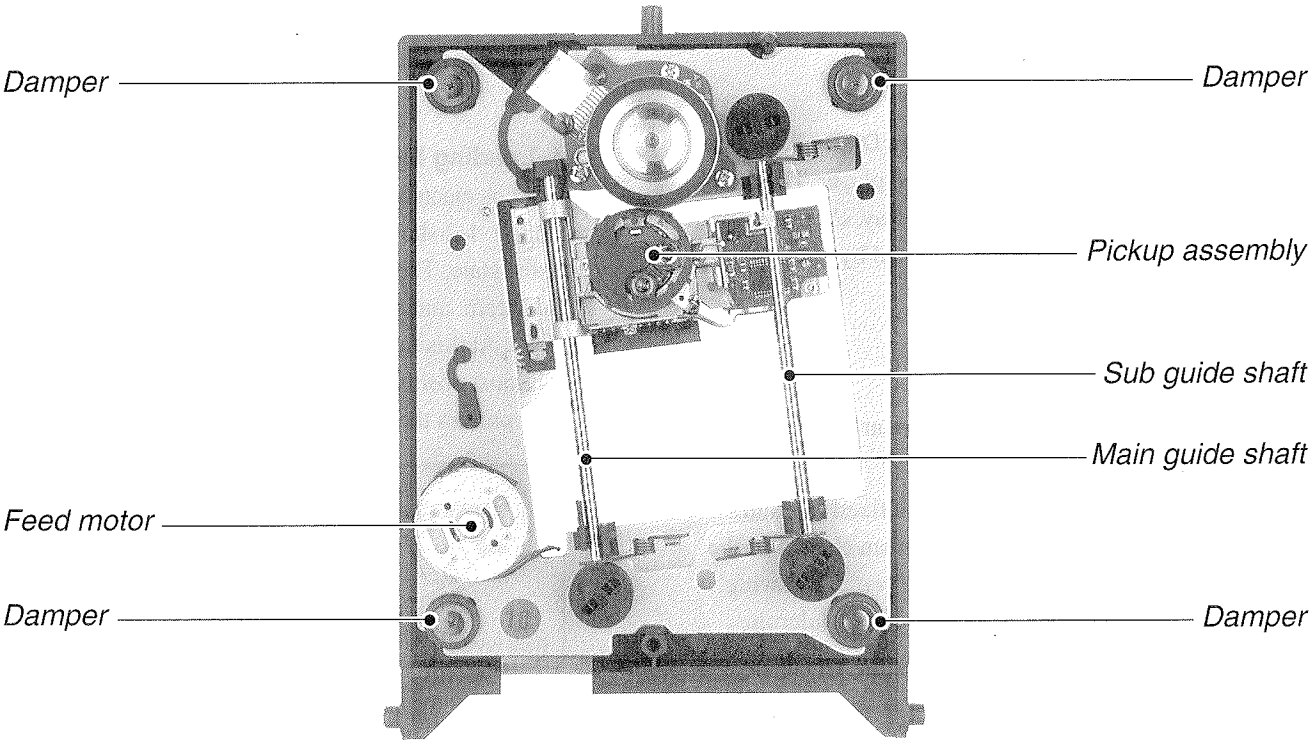
Mechanism chassis assembly (Top side)



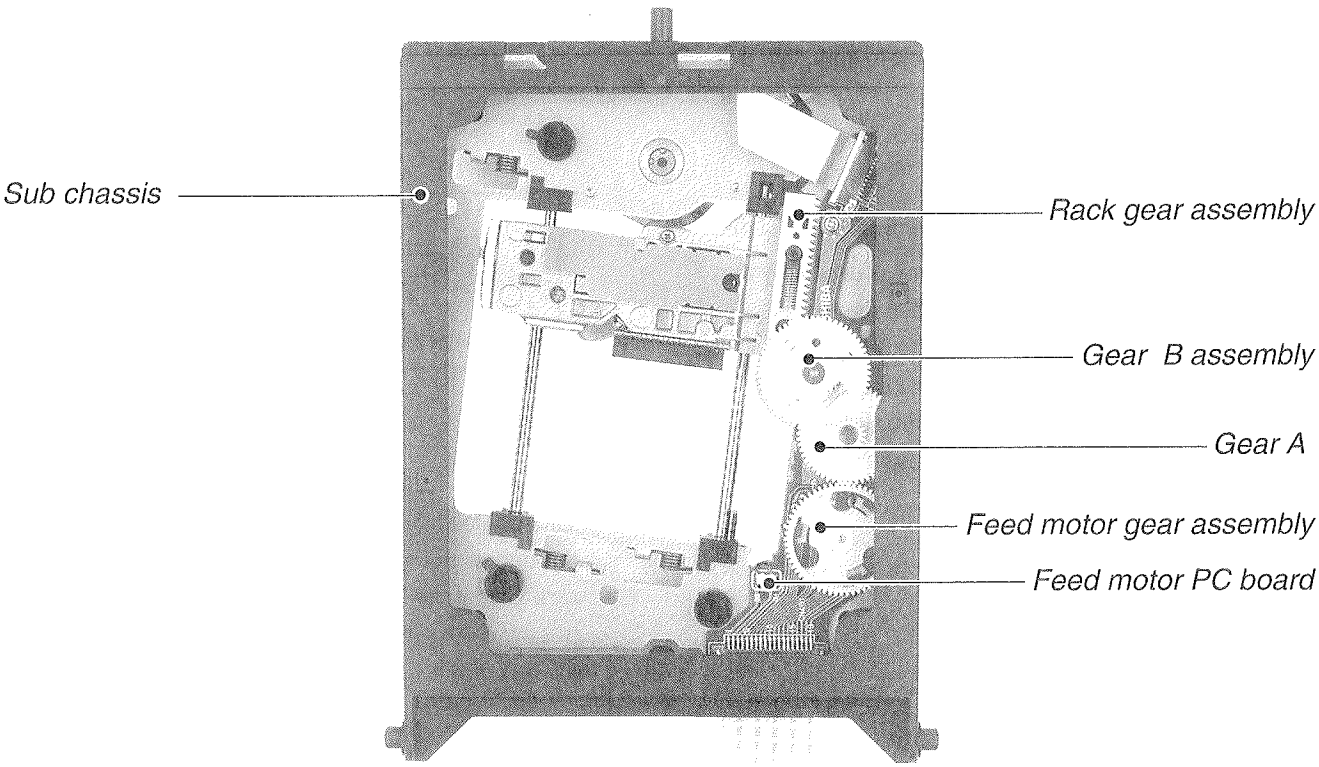
Mechanism chassis assembly (Bottom side)



Mechanism chassis assembly (Internal side)



Pickup mechanism chassis assembly (Top side)



Pickup mechanism chassis assembly (Bottom side)

5. DESCRIPTION OF MECHANISM

5-1. Mechanism Unit

5-1-1. Outline

The mechanism unit is designed to play DVD/CD of 8cm /12cm as our first model of DVD video player. The discs are loaded on the almost fully opened tray, clamped when the pickup mechanism drives, and turned by one disc motor.

5-1-2. Pickup Mechanism

1. A pickup, a pickup feed mechanism and a disc motor are assembled on a pickup chassis.
2. The pickup mechanism assembly is fixed to a sub chassis, and is secured to a mechanism chassis so the disc motor side (the front part) can vertically swing taking the rear part of the subchassis as a fulcrum.
3. The pickup is held by two guide shafts. The disc motor side of the main guide shaft is secured to the pickup chassis, and the other end is engaged with the spiral cam. The sub guide shaft is engaged with the spiral cam on both sides.
5. The pickup feed mechanism is driven by the feed motor and constructed, so that the rack gear attached to the pickup engages with the gear in the speed reduction gear series, and they drive to slide the pickup.

5-1-3. Loading Mechanism

1. Only the tray slide out from the cabinet to load a disc.
2. The rack gear at the back of the tray is driven by the tray load gear to slide the tray. When the tray is closed, the rack gear disengages from the tray load gear. At this time, the tray load gear engages with the rack of the slider cam, and slides the slider cam, raises the pickup mechanism at the cam groove of the slider cam, and clamps a disc.

5-2. Mechanism and Operation

A serial operation from playback status to eject operation is described as follows.

5-2-1. Loading Mechanism

1. A disc is ejected as follows during playing. Fig. 1-1 and Fig. 1-2 show the perspective of the tray in the closed state. The pin (1) of the sub chassis is on the slider cam, and the pickup mechanism assembly is raised. At this time, the slider cam is located at the rightmost position pulling the kick lever, and the kick lever presses the detection switch and turns on.

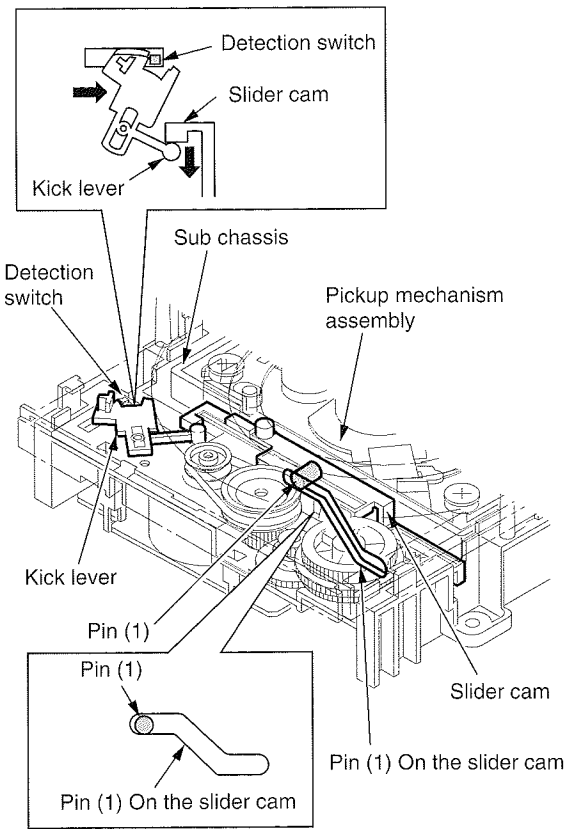


Fig. 1-1

The tray load gear engages with the slider cam through the loading gear B, and disengages from the rack gear at the back of the tray. Since the boss (2) of the sub chassis fits in the elliptic hole at the back of the tray at this time, the tray is locked.

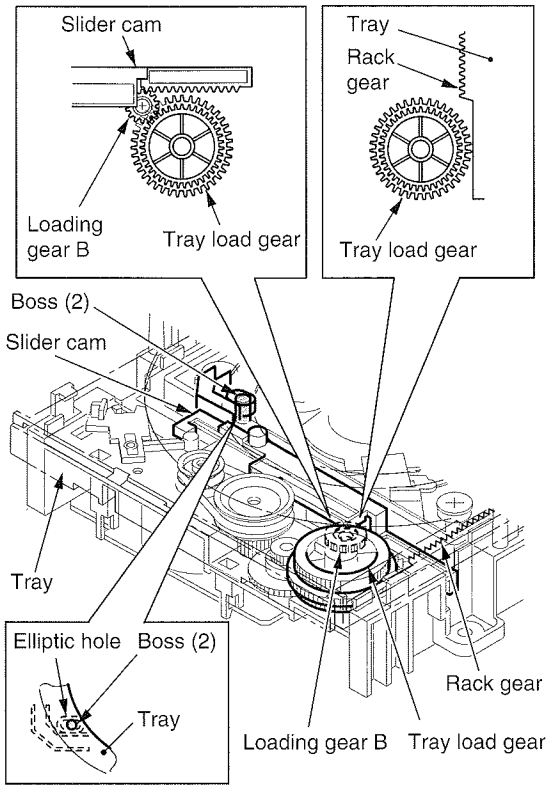


Fig. 1-2

2. Fig. 1-3 and Fig. 1-4 show the beginning of opening. First, the loading motor turns clockwise, rotates the loading gear B counterclockwise through the pulley gear, the loading gear A and the tray load gear, and moves the slider cam to the left. (Refer to Fig. 1-3.)

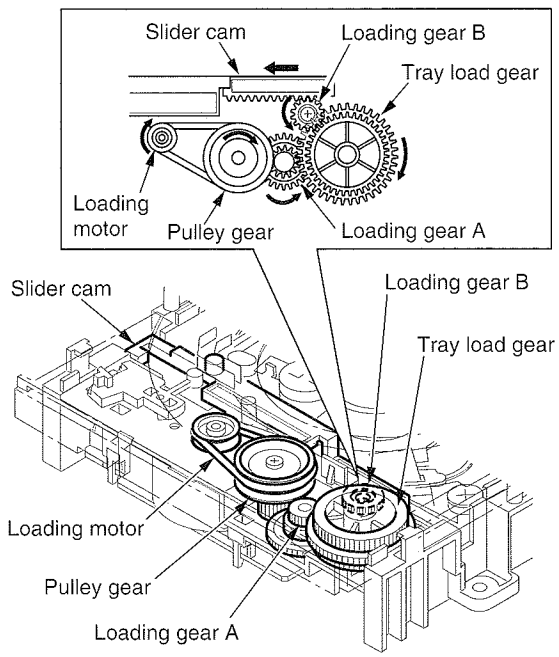


Fig. 1-3

Since the pin (1) of the sub chassis is on the slider cam, when the slider cam moves to the left, it descends along the cam surface and release the clamp. At this time, the boss (2) of the sub chassis comes out of the elliptic hole at the back of the tray, but as the boss (3) of the slider cam fits in the cam groove at the back of the tray, the tray does not move.

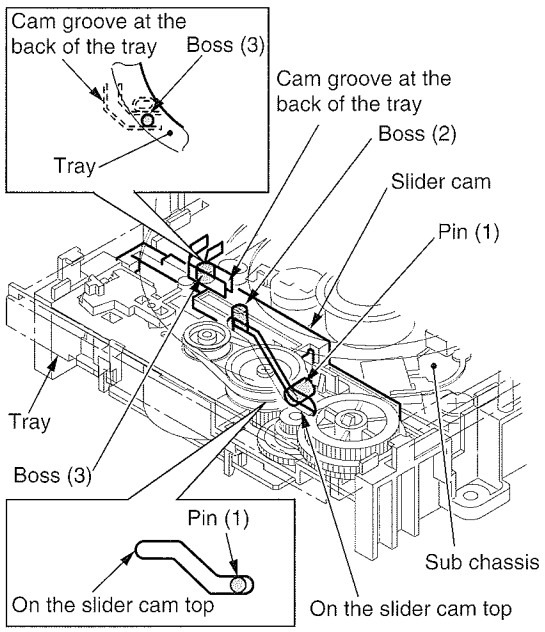


Fig. 1-4

3. Fig. 1-5 and Fig. 1-6 show the condition to move the tray. The boss (3) of the slider cam pushes the bent corner of the cam groove at the back of the tray, the tray is pushed forward, and the rack gear at the back of the tray engages with the top gear of the tray load gear.

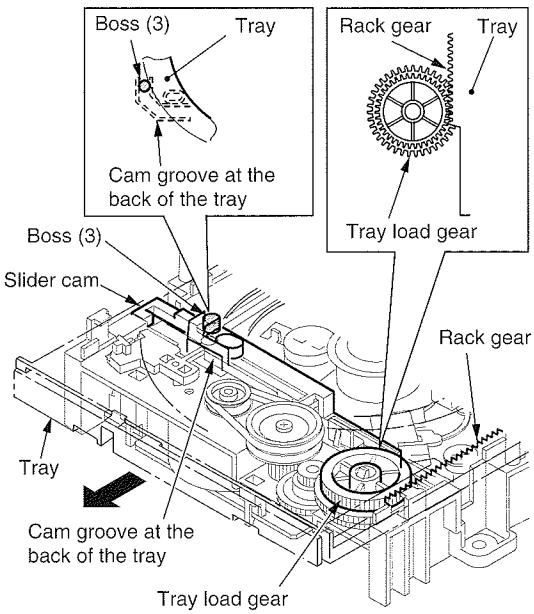


Fig. 1-5

When the tray load gear tuns further, the slider cam disengages from the loading gear B, and the free slider cam is pulled by the tension spring to the specified position.

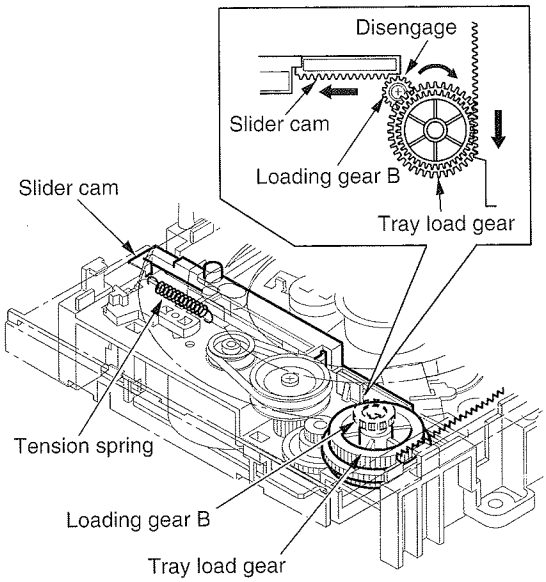


Fig. 1-6

4. Fig. 1-7 shows the end of opening the tray. The screw (1) is fixed in the rear left of the tray. This screw pushes the kick lever stopper forward, rotates it and turns on the detection switch. The detection switch turns on at 3 to 4 mm before the tray fully opens. When the loading motor is controlled to turn off by a microcomputer, the tray stops. At this time, even if the tray overruns due to the inertia of the motor, the screw (2) fixed in the rear right of the tray hits upon the stopper of the mechanism chassis to stop the tray.

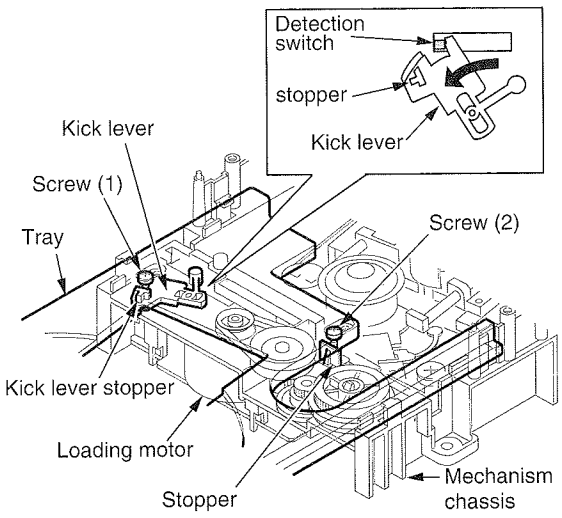


Fig. 1-7

5. When the tray closes, the mechanism moves reverse. When the operation button or the tray is pressed and the detection switch is turned off, the loading motor turns counterclockwise, the tray slides back, the slider cam moves, and the pickup mechanism assembly rises and clamps.

5-2-2. Pickup Feed Mechanism

1. Fig. 1-8 shows the pickup feed mechanism. When the feed motor turns clockwise, the gear B turns in the direction of arrow through the gear for the feed motor and the gear A, the rack gear screwed to the pickup drives, and the pickup slides from inside to outside. The gear B and the rack gear form the two-step gear construction. Combined with a compression spring, it eliminates backlash in the pickup moving direction.
2. The pickup is fitted to two guide shafts. One end of the main guide shaft is supported by the shaft holding portion provided in the pickup chassis, and the other end is pressed and held without a play on the spiral cam by a torsion spring. The sub guide shaft engages with the spiral cam at both ends, and pressed and held without a play on the cam by a torsion spring.

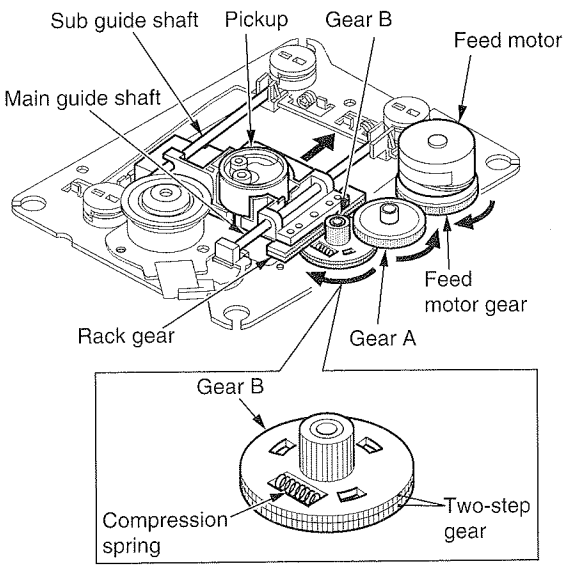


Fig. 1-8

6. DESCRIPTION OF CIRCUIT

6-1. Power Supply Circuit

6-1-1. General

The power supply circuit employs a switching regulator to stabilize five types of rectifier outputs, providing stable power supply. Each circuit description will be described in the following.

6-1-2. Input Filter Circuit-

The input filter circuit comprises C801, C802, C803, C804 and T801. It prevents inflow of noises into/from the AC line.

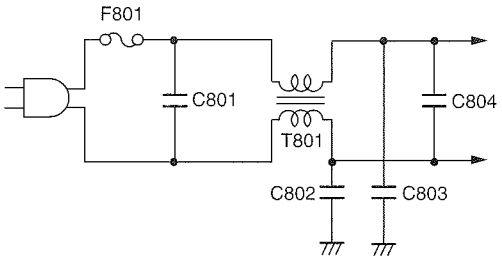


Fig. 1-9

6-1-3. Primary Rectifier/Smoothing Circuit

The primary rectifier/smoothing circuit comprises D802 – C805. It rectifies the AC input in D802 – D805, and smoothes voltage in C805. It generates approximately 160V DC and supplies it to the switching circuit.

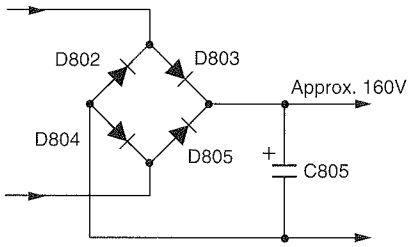


Fig. 1-10

6-1-4. Switching Circuit

Fig. 1-11 shows the switching circuit. When the power cord plug is connected, a voltage is supplied to pin 2 of Q803 through R804, R805, and Q_1 of Q803 is turned on. Then, the current is flown into Np of T802. Then, a reverse electromotive force is generated in N_D, Q_1 turns on abruptly. When Q_1 is saturated, a reverse electromotive force is generated in N_D, then Q_1 turns off abruptly. In this case, the power is supplied to the secondary side (N_S). After the power is supplied completely, Q_1 restarts. The serial operations upto now is repeated. Furthermore, 9V output on the secondary side is monitored by Q821, Q802 and R825 and the timing is controlled to obtain the constant output voltage.

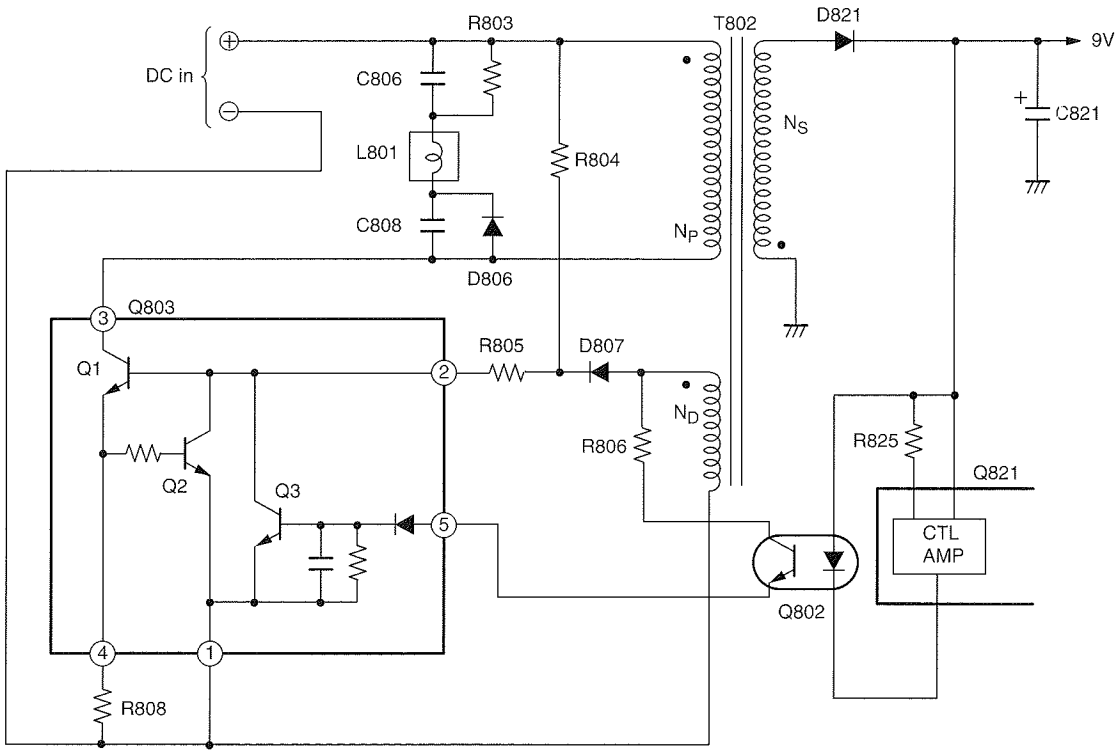


Fig. 1-11

6-1-5. Current Limiter Circuit

The current limiter circuit detects the Q_1 emitter current in Q803 and prevents flow of excessive current when the power cord plug is connected or when overloaded. This circuit operates as follows. When the Q_1 emitter current increases and the Q_2 base voltage rises, Q_2 turns on. Then, the Q_1 base bias is pulled and Q_1 is turned off. Therefore, limiting is effected to protect the elements.

6-1-6. Secondary Rectifier/Smoothing Circuit

There are five rectifier/smoothing circuits in the secondary side. They supply 9V, 6V, 4V,-36V and 4.9V rectified DC voltage, respectively.

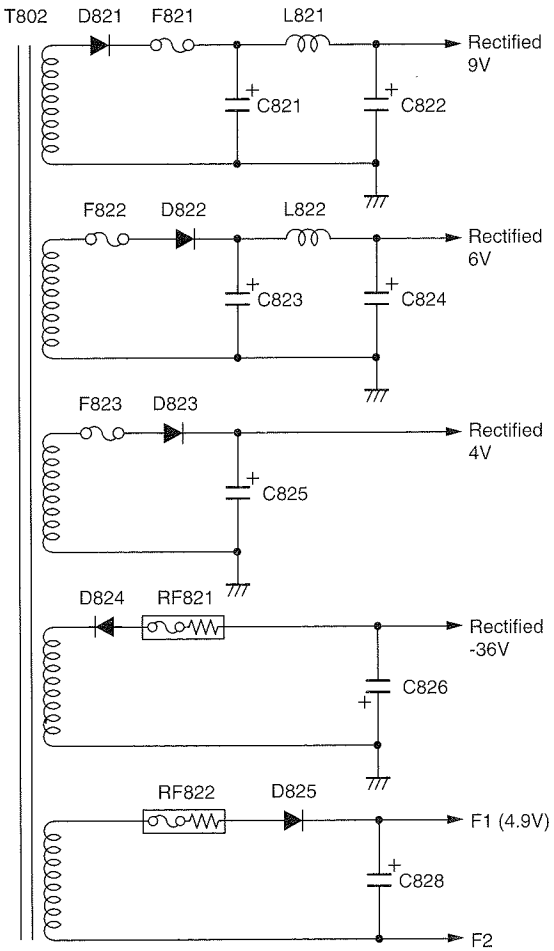


Fig. 1-12

6-1-7. Control IC: Q821

Q821 is a monolithic control IC, and comprises a control circuit of the primary circuit, a 3.3V control amplifier, an EVER5V regulator, an ANALOG 5V regulator and a 5.6V regulator. The ANALOG 5V and 3.3V control amplifier turn on and off according to the on/off signal (Po ON-OFF sig.) from the microcomputer. This IC is further provided with a current limiter for EVER 5V, ANALOG 5V and 5.6V. When the temperature of Q821 rises owing to some causes, the temperature limiter starts operating at 130 ± 20°C. Then the EVER 5V, ANALOG 5V, 5.6V output are cut.

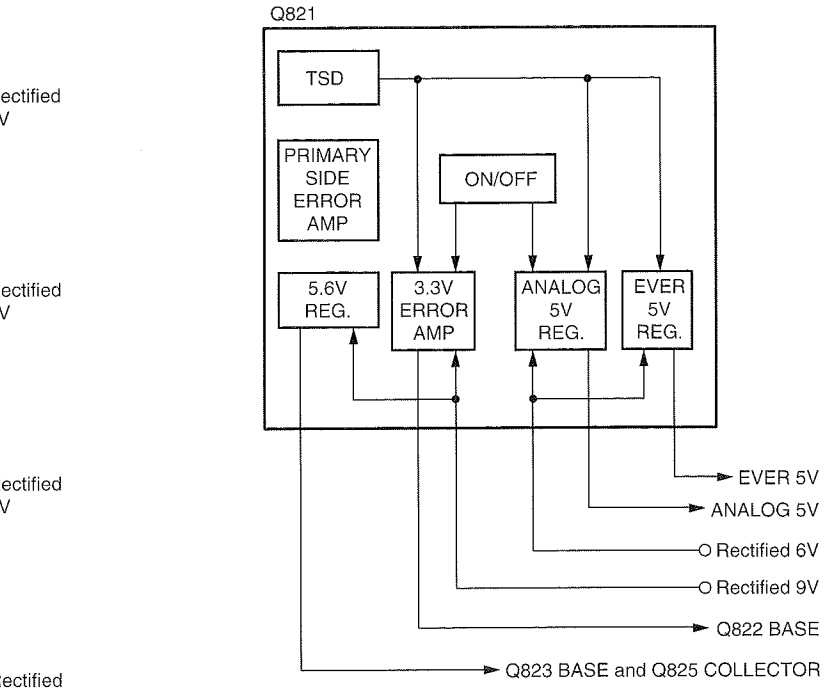


Fig. 1-13

6-1-8. 3.3V Regulator

The 3.3V circuit is comprises of error amplifiers in Q822 and Q821. This circuit gets a rectified 4V as an input, and provides 3.3V as an output, as shown in Fig. 1-14. R827 is a resistor to adjust 3.3V.

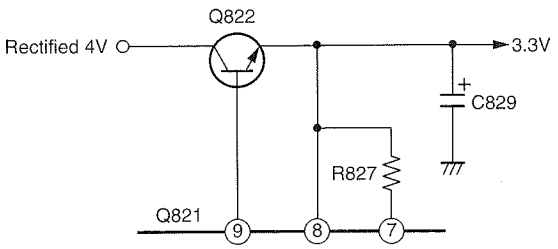


Fig. 1-14

6-1-9. DIGITAL 5V Regulator

The DIGITAL 5V circuit gets a rectified 6V as an input and provides DIGITAL 5V as an output by connecting the output (5.6V) of pin 6 of Q821 to the base of Q823, as shown in Fig. 1-15. Q825, R835, R830, D826, and D827 form the DIGITAL 5V on/off circuit. D833 protects short-circuit of DIGITAL 5V. If the DIGITAL 5V is shorted, it sets Po ON-OFF Sig to low to shut off the output.

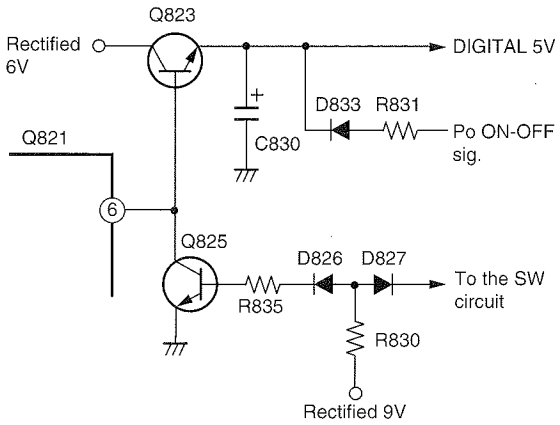


Fig. 1-15

6-1-10. 9V/8V Regulator

The 9V circuit gets a rectified 9V as an input and provides 9V as an output by turning on/off Q824, as shown in Fig. 1-16. The 8V output is obtained by dividing the 9V output by V_F (approx. 0.7V) with the diode D835. D831 and D832 protects short-circuit of 9V and 8V. The function is the same as D833 in the DIGITAL 5V circuit.

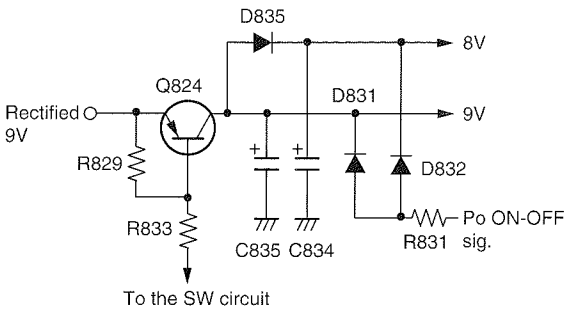


Fig. 1-16

6-1-11. 24V Regulator

The -24V circuit gets a rectified -36V as an input and provides -24V as an output through the zener diodes D836 ~ D840, as shown in Fig. 1-17.

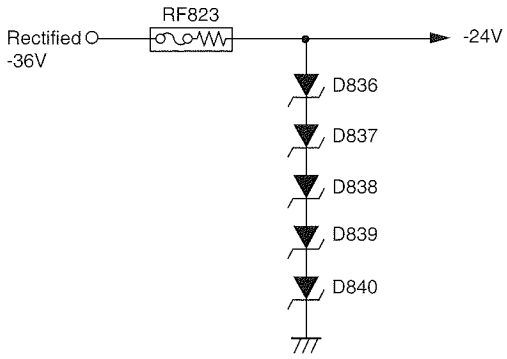


Fig. 1-17

6-1-12. SW Circuit

The SW circuit turns and off each output voltage by turning on and off Q827 by the Po ON-OFF Sig (H: ON, L: OFF), as shown in Fig. 1-18.

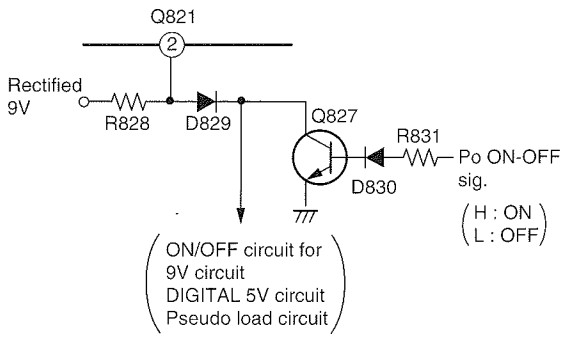


Fig. 1-18

6-1-13. Pseudo Load Circuit

The Pseudo load circuit comprises R832 and Q826, as shown in Fig. 1-19. It prevents malfunction of the power circuit due to a light load at off of power supply by turning on Q826 when the power turns off and reducing a load from the rectified 9V through R832. Q826 turns off when the power turns on.

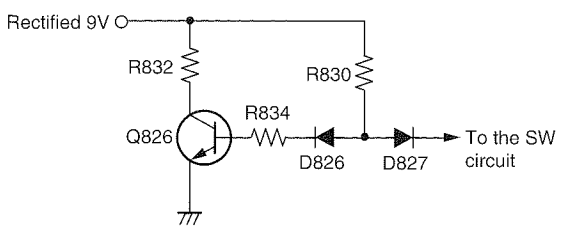


Fig. 1-19

6-1-14. Overvoltage Protection Circuit

The overvoltage protection circuit consists of D828 and Q828 as shown in Fig. 1-20. When the rectified 9V increases to 11V or more, D828 and Q828 turn on, Po ON-OFF Sig is set to low, and all outputs of the on/off system are shut off.

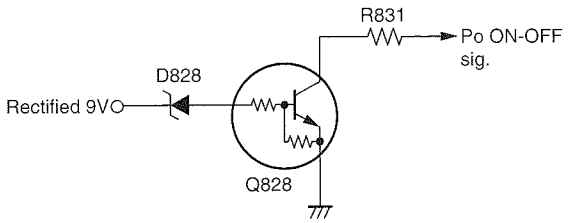


Fig. 1-20

6-2. Front Circuit

6-2-1. Outline

The front circuit provides the main microcomputer with the serial data of fluorescent/LED display control, decoding of remote control signals, reading of key inputs, etc.

6-2-2. Interface with the Main Microcomputer

Serial data is transferred in the simultaneous transmission and reception system using a serial clock. Serial transfer is started by FSTBX from the main microcomputer. A 4μs clock from the main microcomputer is used as a transfer clock.

6-2-3. Fluorescent Tube Display Control

The fluorescent tube is lit taking the divider interruption in the microcomputer as a reference timing. It adopts the dynamic display system; each grid is sequentially lit within a certain time.

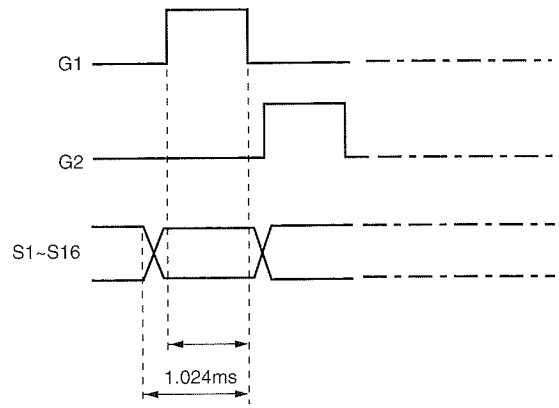


Fig. 1-21 Display timing

As for the display tube, it is lit when the grid voltage and anode voltage is +26V against -21V of the (F-) terminal voltage of the filament, and the grid voltage and anode voltage must be held at -24V to turn off the display tube.

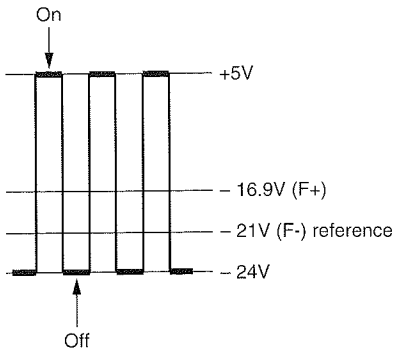


Fig. 1-22

6-2-4. Serial Transfer

<Interface with the main microcomputer>

Serial clock is supplied from the main microcomputer. The signal of inverted logic is supplied to the sub microcomputer. (Fig. 1-23) Serial transfer utilizes simultaneous transmission and reception. The main microcomputer transmit and receive serial data at the software level. The sub microcomputer performs it using the hardware. The transfer procedure is shown below.

1. The main microcomputer sets FSTBX to "L" when starting serial transfer.
2. The main microcomputer waits for 2 ms after turning FSTBX to "L", then starts serial transfer.
3. Using the software, the main microcomputer sends data at the falling edge of the clock and receives the serial data from the sub microcomputer at the falling edge of the clock.
4. The sub microcomputer uses the serial transfer function of the hardware, and receives the data from the main microcomputer.
5. When the main microcomputer terminates transmission of 11 words, the serial transfer ends.
6. The sub microcomputer sends the 0FFH data by 8 words after transferring 3 words. This data is ignored in the main microcomputer.
7. The main microcomputer sets FSTBX to "H" after transferring 11 words.

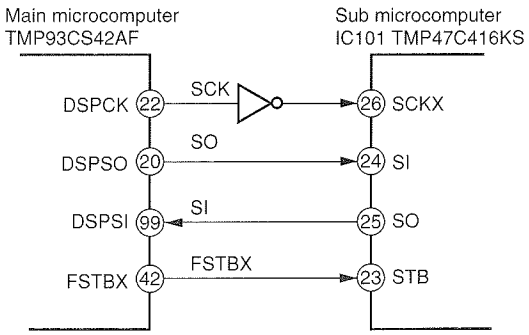


Fig. 1-23

<Serial transfer timing>

The serial transfer timing chart is shown in Fig. 1-24.

1. Transfer clock is 4μs.
2. The number of words to transfer is 10 in the main microcomputer and 3 in the sub microcomputer, 13 words in total, which is considered one cycle.
3. An interval at every 13 words is 180μs at least.
4. The transfer cycle is 20ms, and is managed in the main microcomputer.
5. The transfer system is simultaneous transmission and reception. The clock signal is the inverted output from the main microcomputer, which is supplied to the sub microcomputer.
6. Transfer is terminated by setting FSTBX to "H" after the main microcomputer receives the last word.
7. Even if transfer normally ends, the received contents are ignored if the check sum is not matched.
8. The main microcomputer starts transfer at least 2ms after detecting FSTBX set to "L".
9. The sub microcomputer interrupt transfer and ignores the received contents when FSTBX is set to "H".

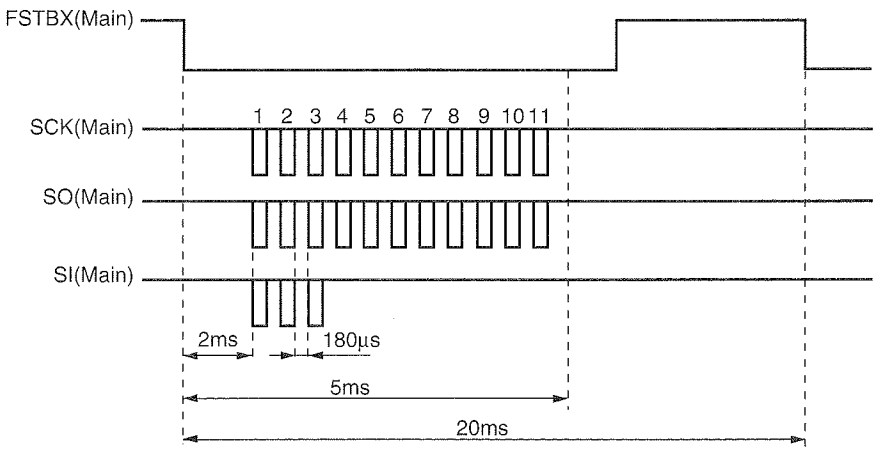


Fig. 1-24

7. TROUBLESHOOTING

Fig. 1-25 shows the troubleshooting flowchart. Basically, a defective part can be identified according to the main flowchart. As for the front circuit and the power circuit, troubleshooting can be made for each circuit. Use it when repairing each PC board.

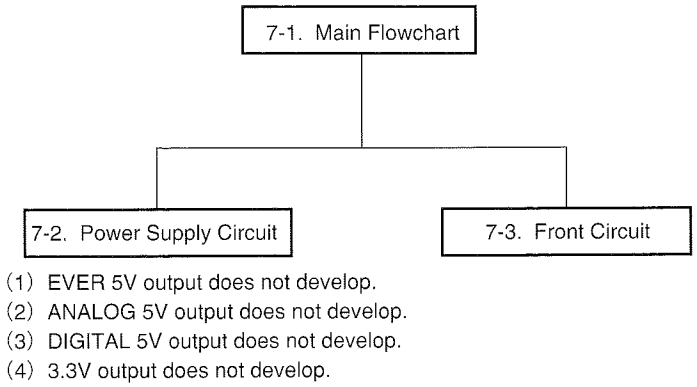


Fig. 1-25

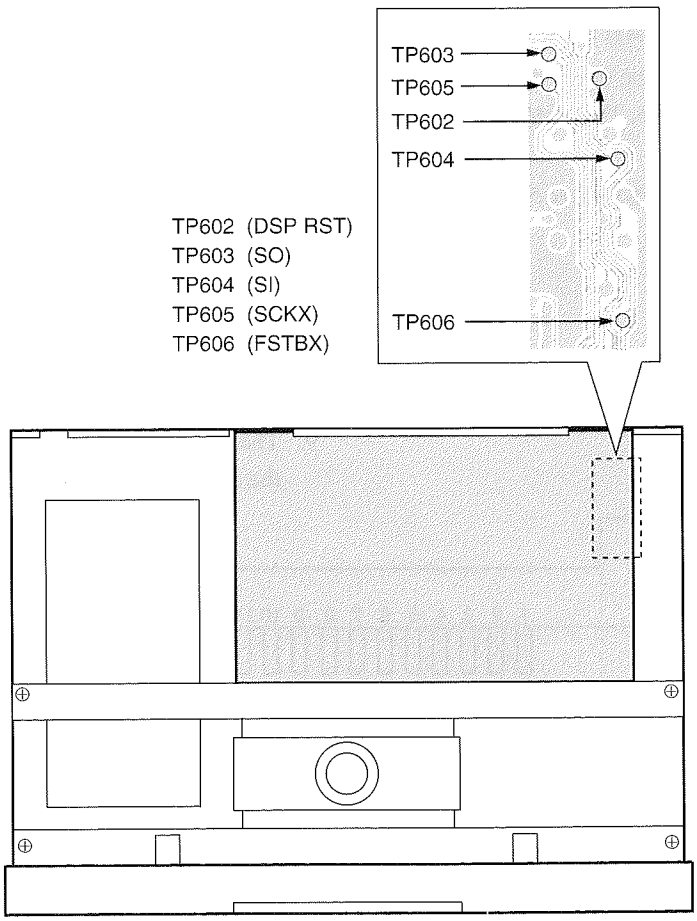
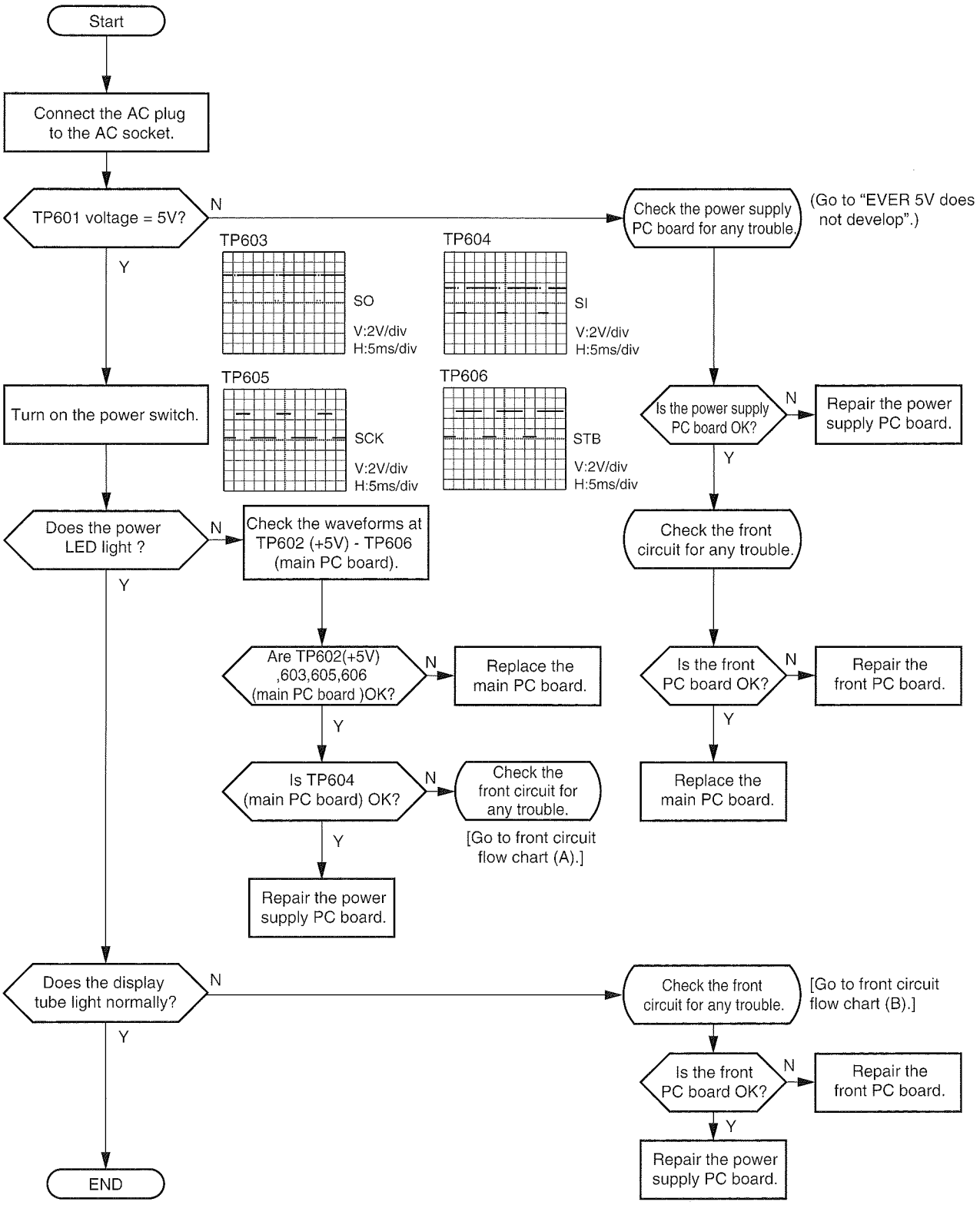


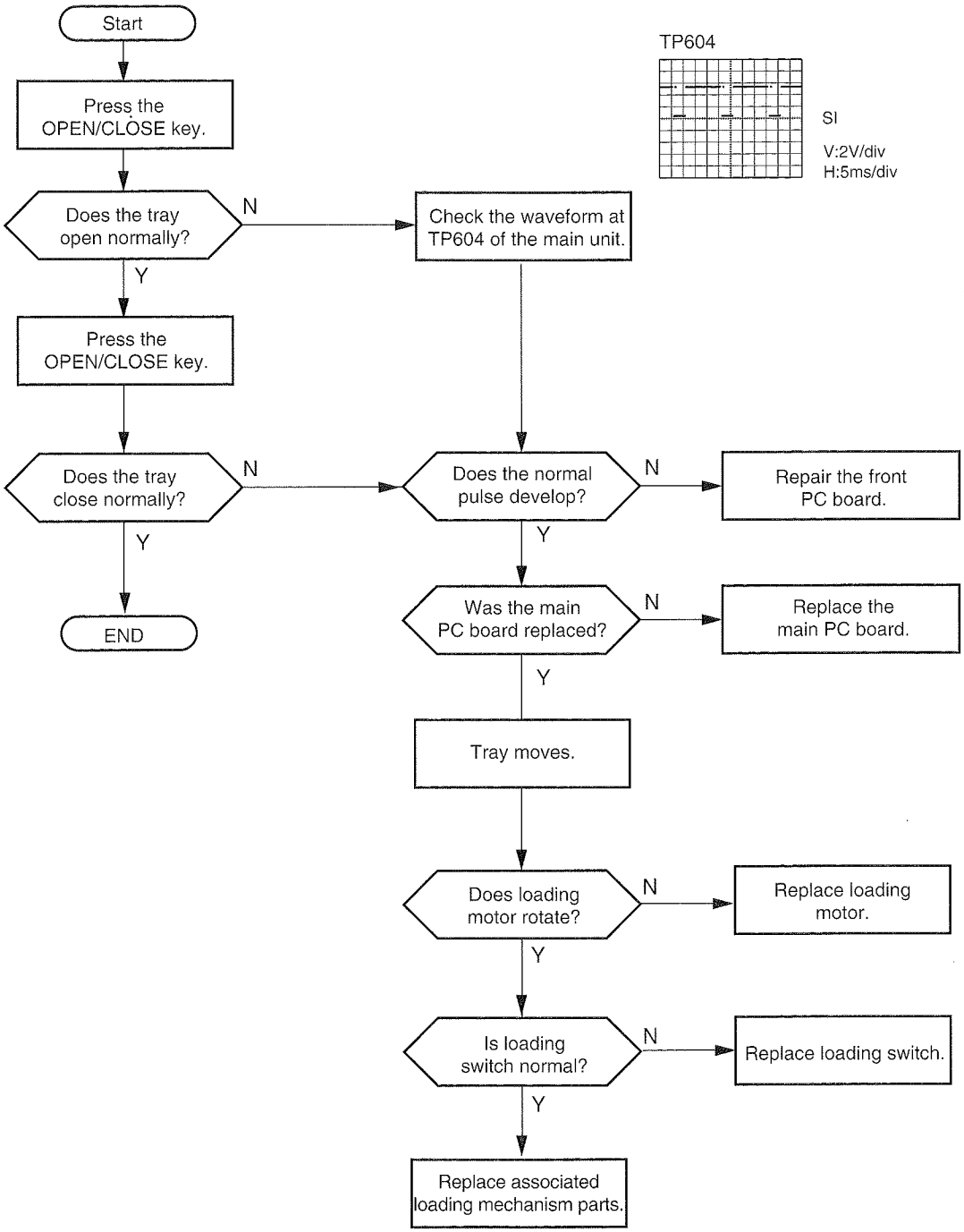
Fig. 1-26 Main PC board (Test point location)

7-1. Main Flowchart

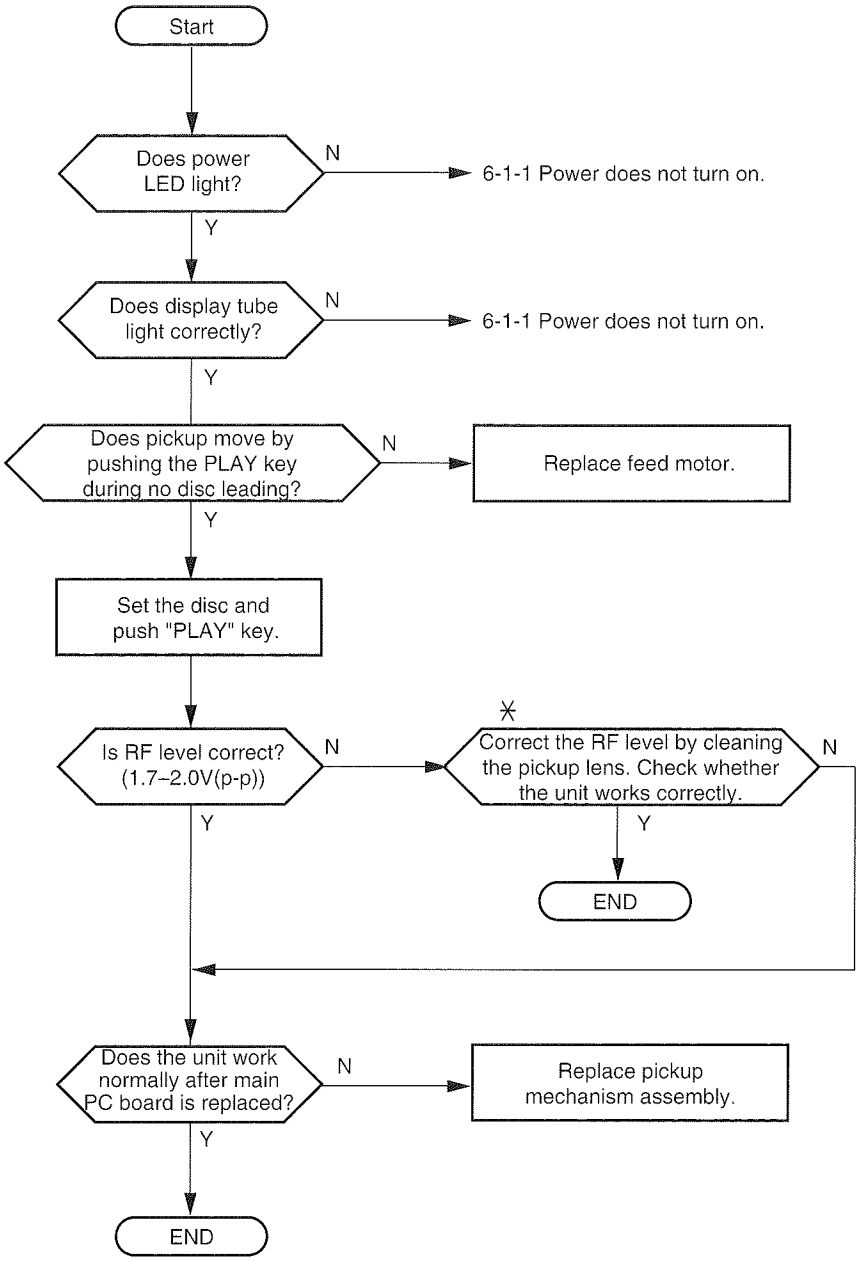
7-1-1. Power does not turn on.



7-1-2. Tray OPEN/CLOSE operation is not carried out.



7-1-3. Video, Audio, Sub video does not work correctly.



✳Note: Lens cleaning detail

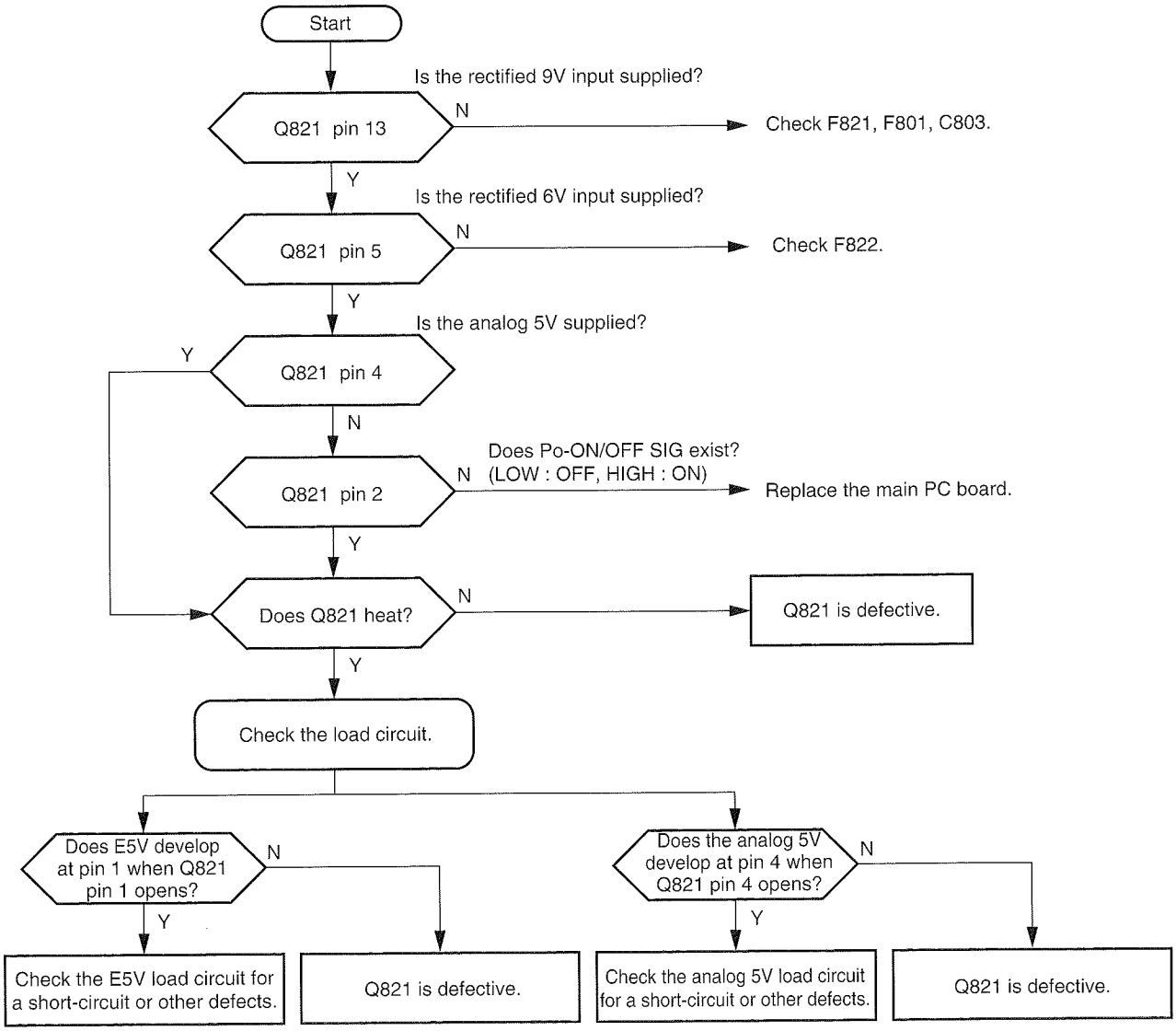
1. Be sure to perform the cleaning more then 3 times.
2. Use a new cotton bar for one cleaning.
   Do not use the used cotton bar.
3. For the cleaning liquid, use the pure alcohol (more then 95%).
4. Be sure to wipe the lens with a dried cotton bar
   after the cleaning completes.

7-2. Power Supply Circuit

7-2-1. Checking Q821 (LA5611)

LA5611 is composed of 9V regulator circuit, 3.3V regulator circuit, E5V regulator circuit, ANALOG 5V regulator circuit and 5.6V regulator circuit.

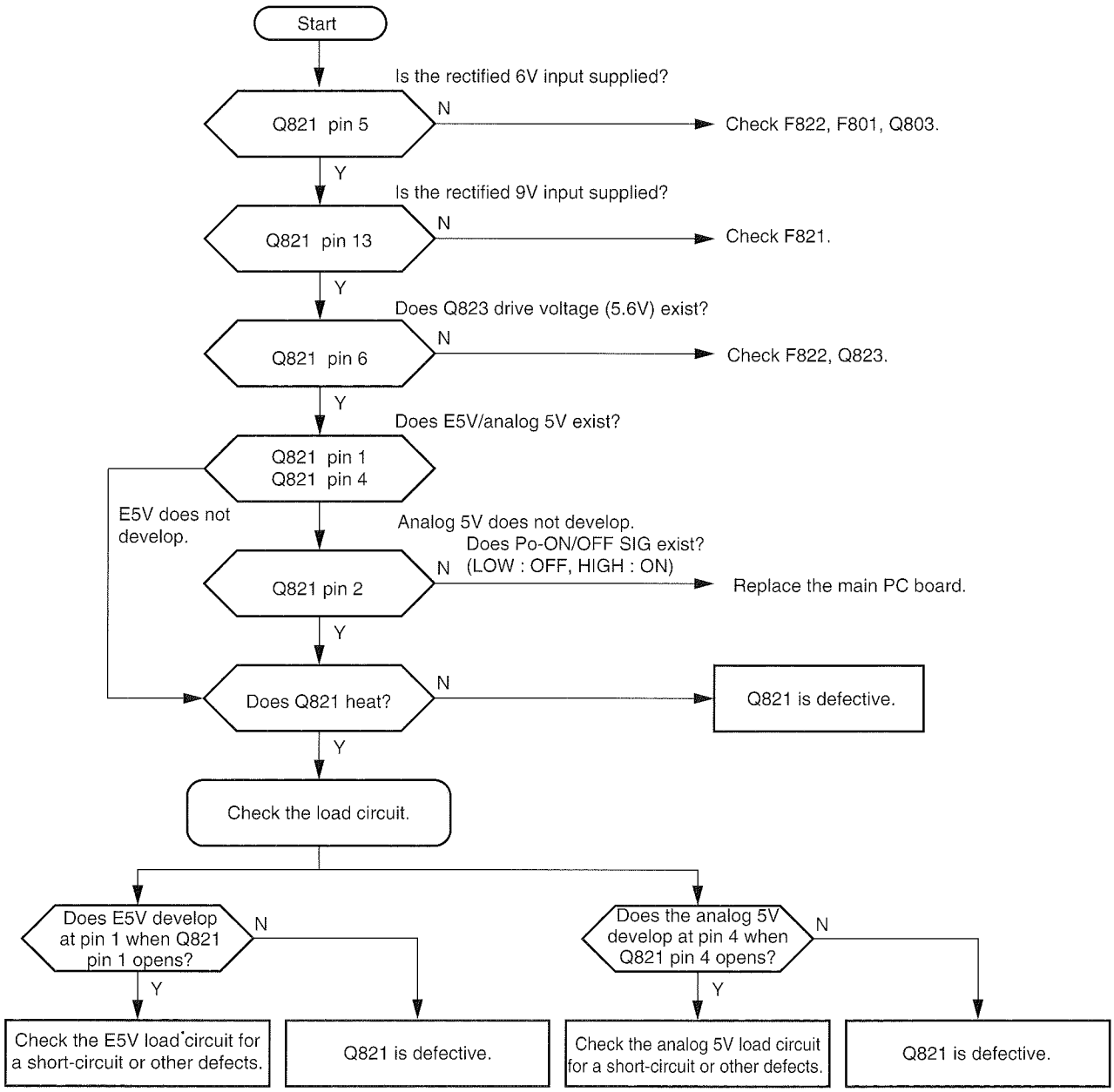
(1) EVER 5V does not develop.



Note:

- When the temperature protection circuit inside IC operates, all output voltages in Q821 are stopped.
- When the rectified 6V input is not generated, all output voltages are stopped.

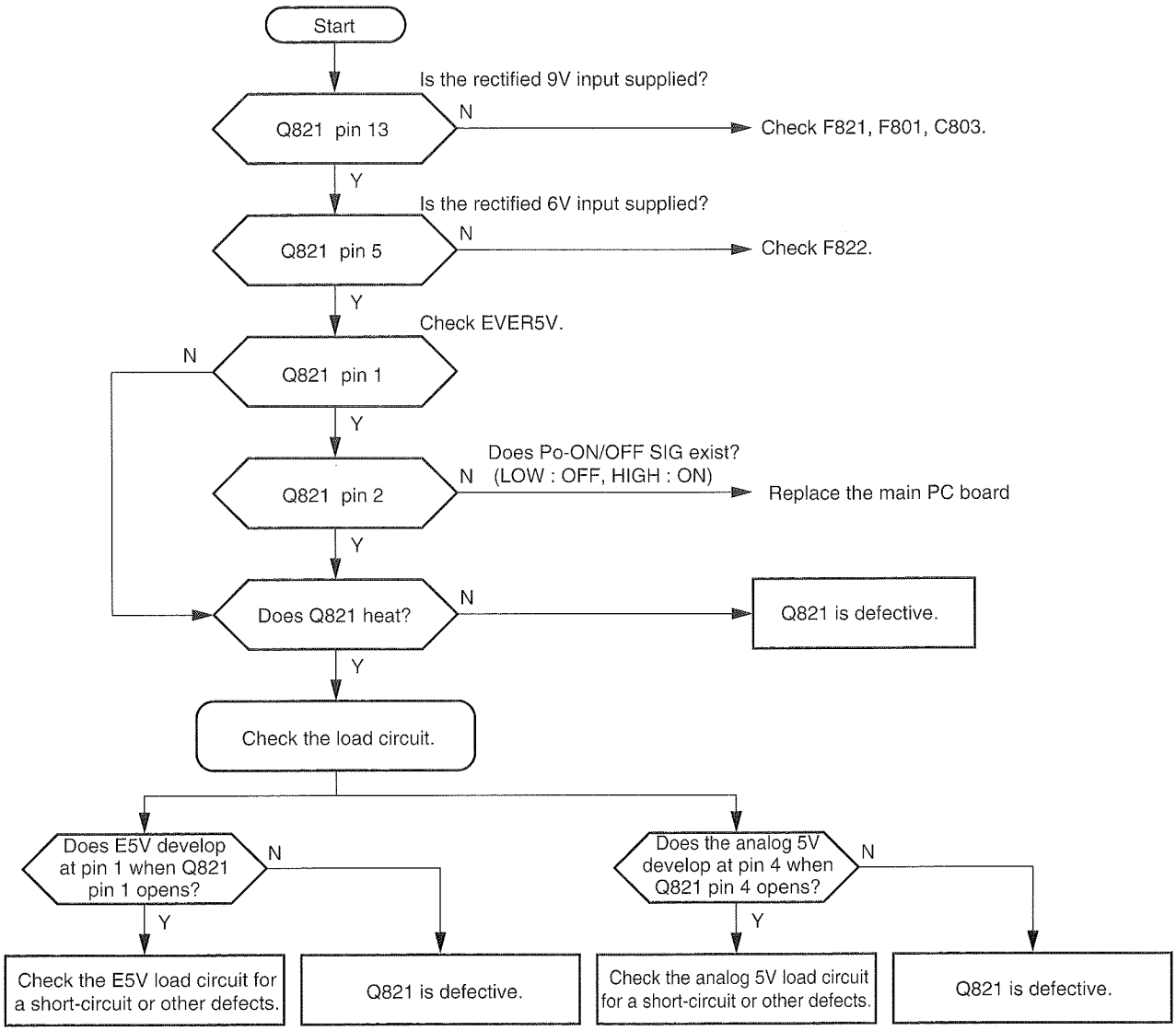
(2) DIGITAL 5V does not develop.



Note:

- When the temperature protection circuit inside IC operates, all output voltages in Q821 are stopped.
- When the rectified 6V input is not generated, all output voltages are stopped.

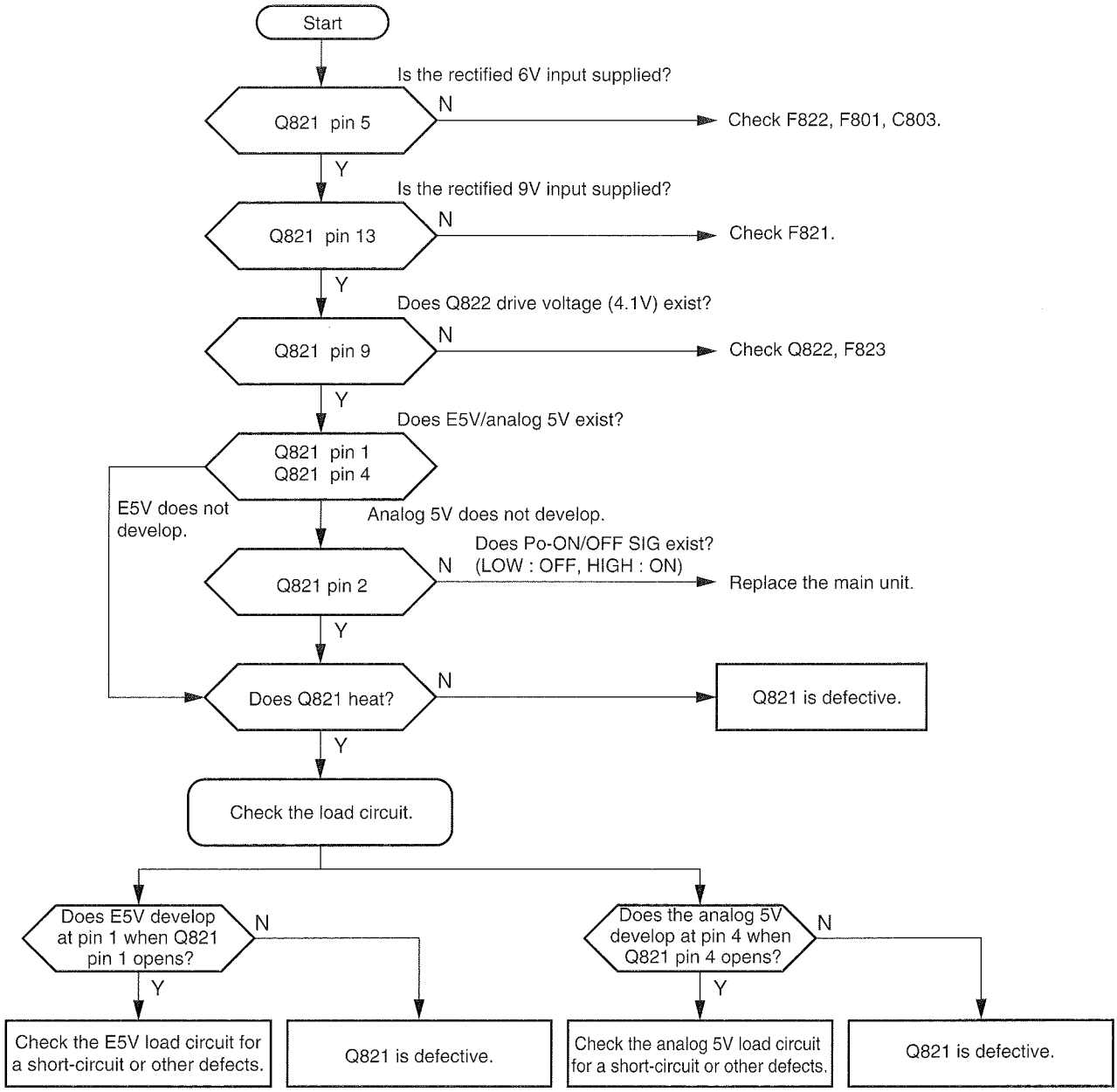
(3) ANALOG 5V does not develop.



Note:

- When the temperature protection circuit inside IC operates, all output voltages in Q821 are stopped.
- When the rectified 6V input is not generated, all output voltages are stopped.

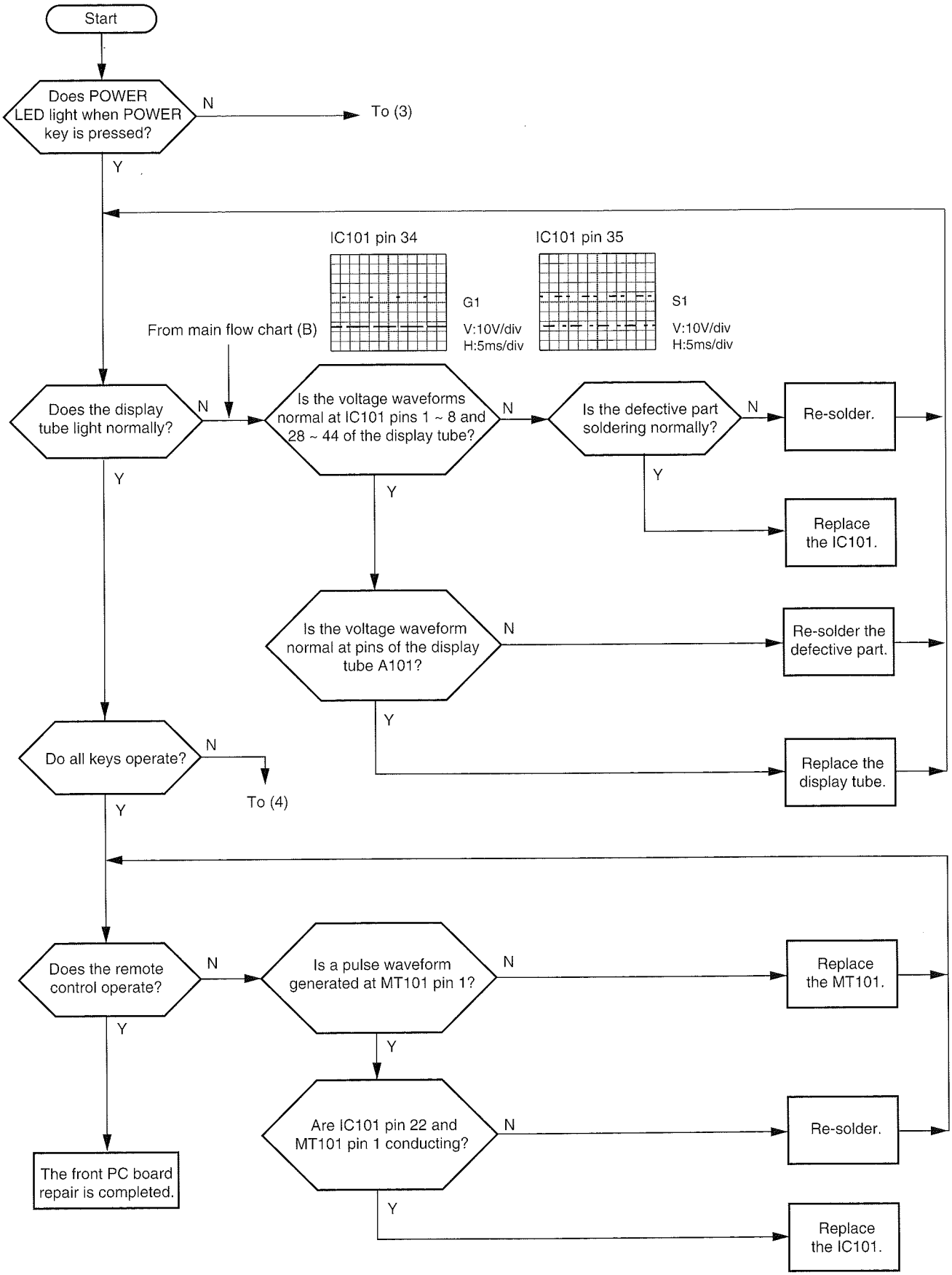
(4) 3.3V output does not develop.

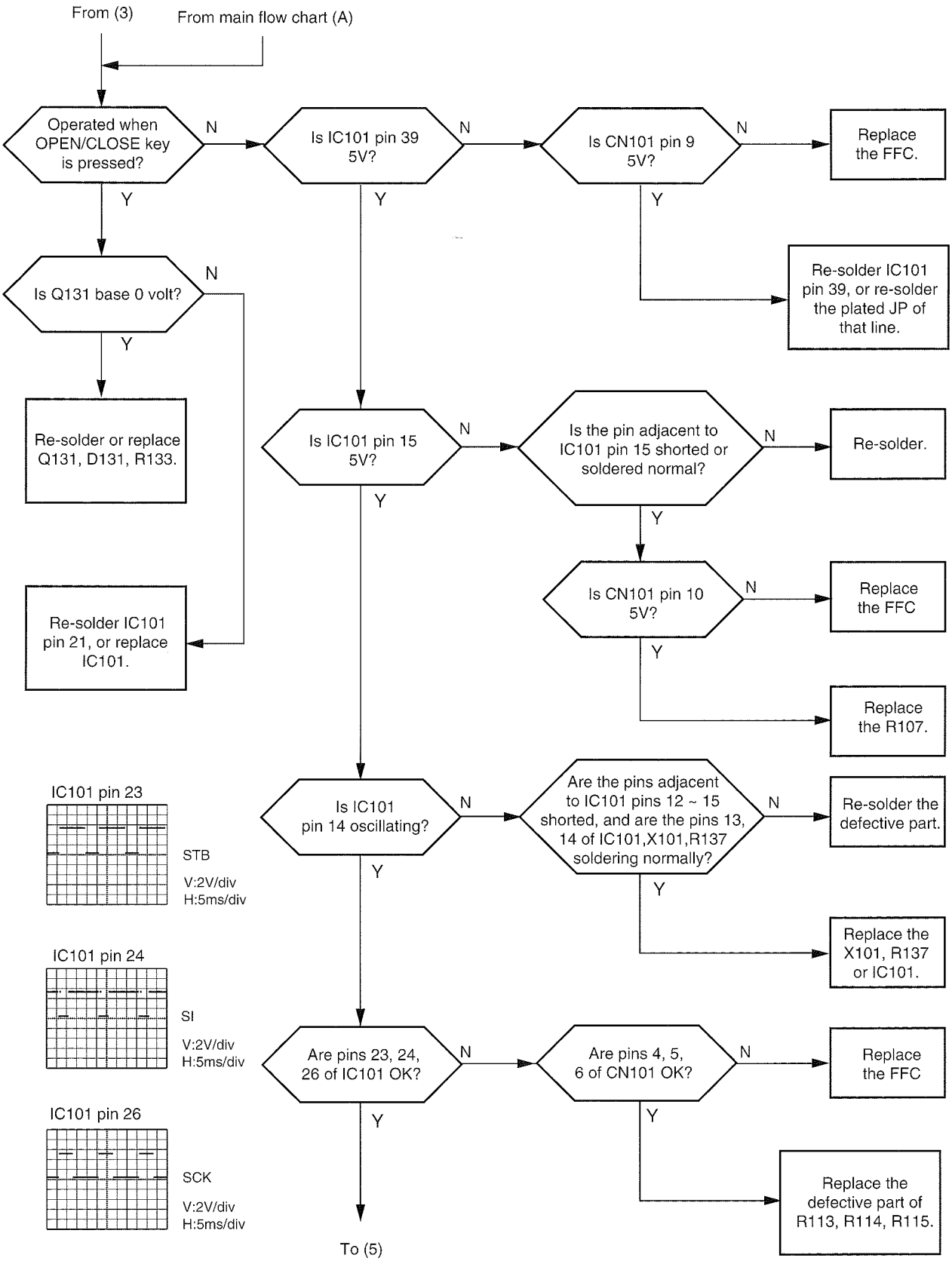


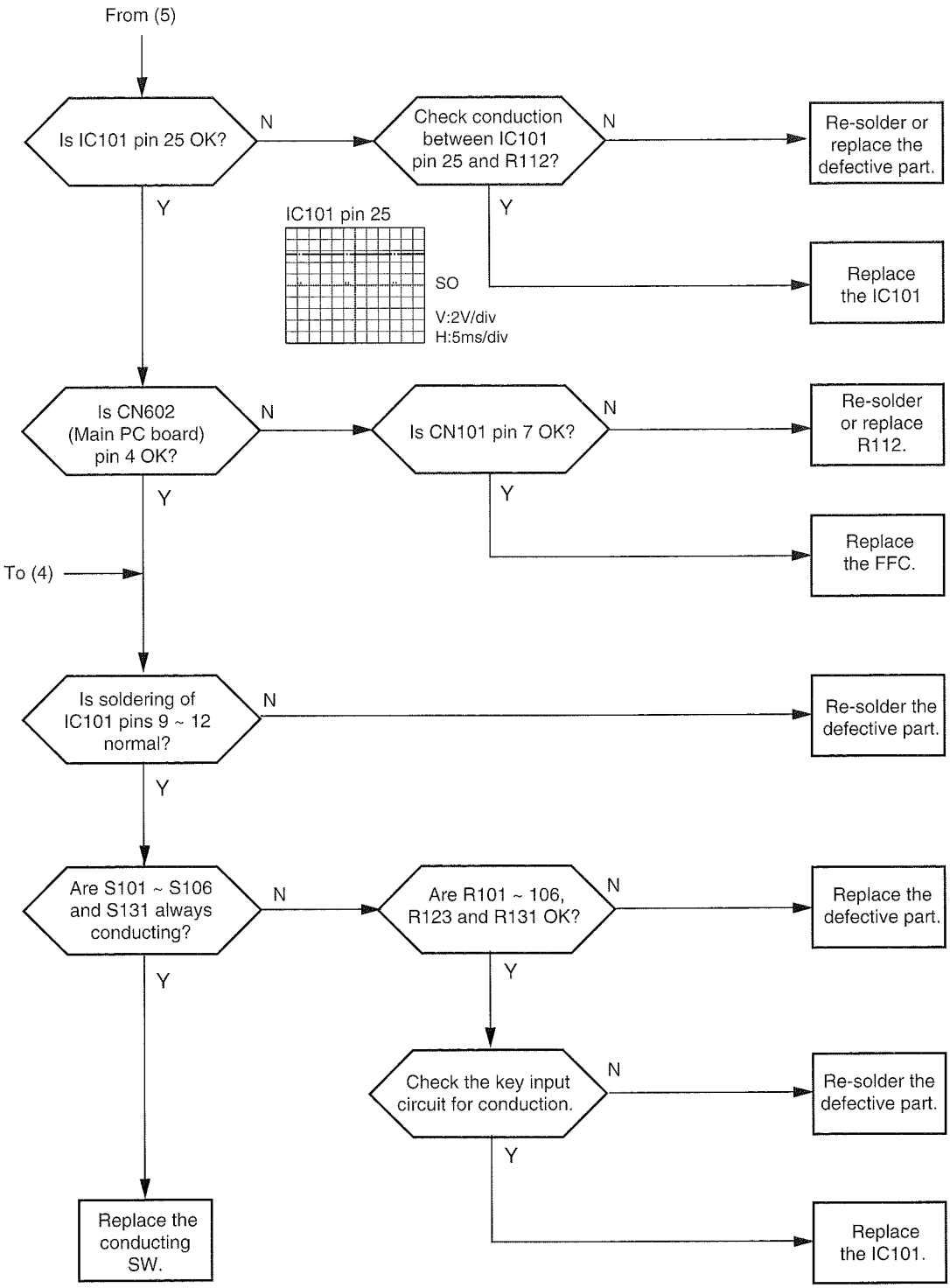
Note:

- When the temperature protection circuit inside IC operates, all output voltages in Q821 are stopped.
- When the rectified 6V input is not generated, all output voltages are stopped.

7-3. Front Circuit




From (3)
From main flow chart (A)
Operated when OPEN/CLOSE key is pressed?
N
Y
Is IC101 pin 39 5V?
N
Y
Is CN101 pin 9 5V?
N
Y
Replace the FFC.
Re-solder IC101 pin 39, or re-solder the plated JP of that line.
Is Q131 base 0 volt?
N
Y
Re-solder or replace Q131, D131, R133.
Re-solder IC101 pin 21, or replace IC101.
Is IC101 pin 15 5V?
N
Y
Is the pin adjacent to IC101 pin 15 shorted or soldered normal?
N
Y
Re-solder.
Is CN101 pin 10 5V?
N
Y
Replace the FFC
Replace the R107.
IC101 pin 23
STB
V:2V/div
H:5ms/div
IC101 pin 24
SI
V:2V/div
H:5ms/div
IC101 pin 26
SCK
V:2V/div
H:5ms/div
Is IC101 pin 14 oscillating?
N
Y
Are the pins adjacent to IC101 pins 12 ~ 15 shorted, and are the pins 13, 14 of IC101,X101,R137 soldering normally?
N
Y
Re-solder the defective part.
Replace the X101, R137 or IC101.
Are pins 23, 24, 26 of IC101 OK?
N
Y
Are pins 4, 5, 6 of CN101 OK?
N
Y
Replace the FFC
Replace the defective part of R113, R114, R115.
To (5)


From (5)
Is IC101 pin 25 OK?
N
Check conduction between IC101 pin 25 and R112?
N
Re-solder or replace the defective part.
Y
Y
IC101 pin 25
SO
V:2V/div
H:5ms/div
Replace the IC101
Is CN602 (Main PC board) pin 4 OK?
N
Is CN101 pin 7 OK?
N
Re-solder or replace R112.
Y
Y
Replace the FFC.
To (4)
Is soldering of IC101 pins 9 ~ 12 normal?
N
Re-solder the defective part.
Y
Are S101 ~ S106 and S131 always conducting?
N
Are R101 ~ 106, R123 and R131 OK?
N
Replace the defective part.
Y
Y
Check the key input circuit for conduction.
N
Re-solder the defective part.
Y
Replace the conducting SW.
Replace the IC101.

SECTION 2
PART REPLACEMENT AND ADJUSTMENT PROCEDURES

CAUTIONS BEFORE STARTING SERVICING

Electronic parts are susceptible to static electricity and may easily damaged, so do not forget to take a proper grounding treatment as required.

Many screws are used inside the unit. To prevent missing, dropping, etc. of the screws, always use a magnetized screw-driver in servicing. Several kinds of screws are used and some of them need special cautions. That is, take care of the tapping screws securing molded parts and fine pitch screws used to secure metal parts. If they are used improperly, the screw holes will be easily damaged and the parts can not be fixed.

1. REPLACEMENT OF MECHANICAL PARTS

1-1. Cabinet Replacement

1-1-1. Top Cover

1. Remove five screws (1) and remove the top cover (2).

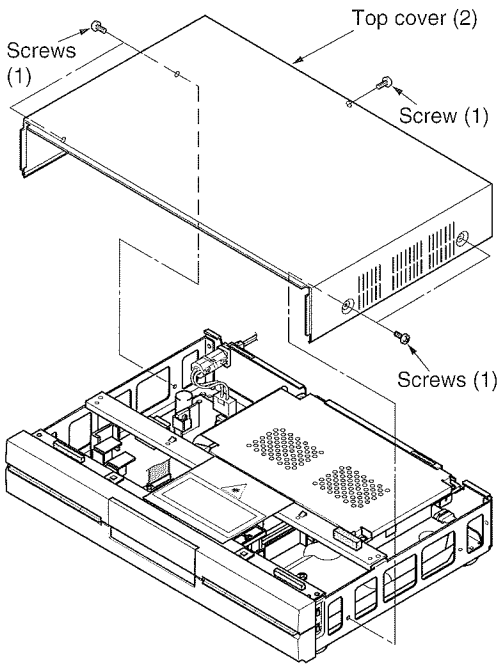


Fig. 2-1

1-1-2. Tray and Upper/Lower Shield Plates

1. Remove six screws (1) and the upper shield plate (2). (Refer to Fig. 2-2.)
2. Remove the core (3) and pull out the flexible cable (4) from the core (5). Then remove the lower shield plate (6).
3. Put the main PC board (7) vertically and connect the flexible cable (4).
4. Remove two screws (8) of the tray (9). (Refer to Fig. 2-3.)
5. Push the part (10) in figure (A) to unlock the tray (9).
6. When the tray (9) moves forward, pull out the tray (9).

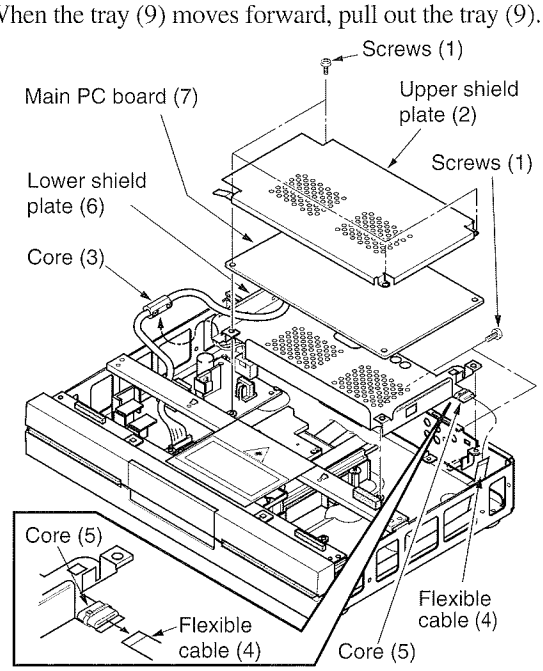


Fig. 2-2

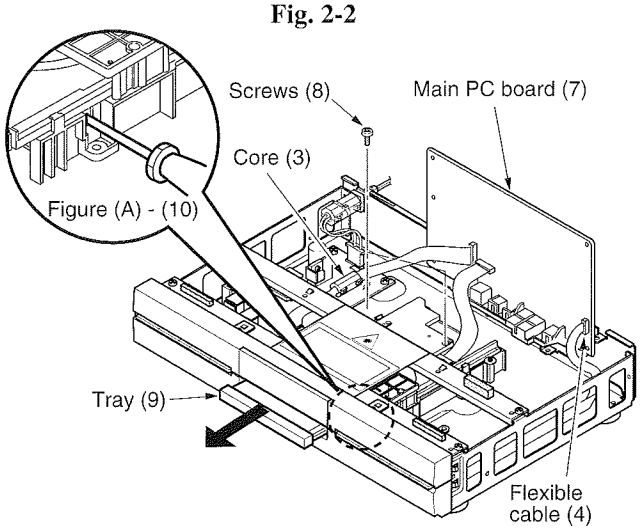


Fig. 2-3

1-1-3. Tray Panel

1. Insert a flat-blade screwdriver into the portion A between the tray and the tray panel, to unlock the two claws, and remove the tray panel.
2. To mount the tray panel, fit the panel into the groove on both sides until it clicks.

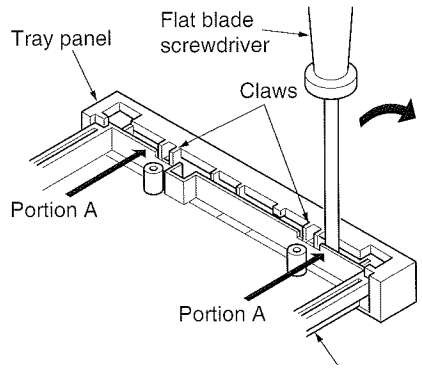


Fig. 2-4

1-1-4. Front Panel

1. Eject the tray. (If the tray does not move, take out the tray by referring to Fig. 2-3.)
2. Remove the tray panel. (Refer to item 1-1-3.)
3. Remove four screws (1). (Refer to Fig. 2-5.)
4. Remove the claw A (used at six locations), and remove the front panel (2).

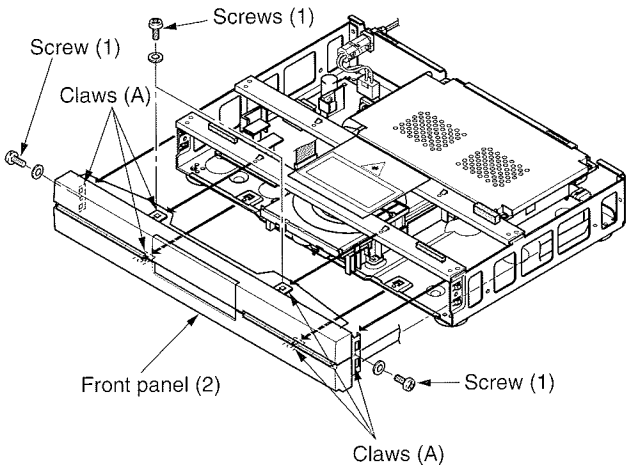


Fig. 2-5

1-1-5. Rear Panel

1. Remove the upper shield plate, main PC board and lower shield plate. (Refer to items 1-1-2 and 1-2-1.)
2. Remove the color DIF PC board (Refer to item 1-2-2).
3. Remove the power supply bush (3) and remove the three screws (1). Then, remove the rear panel (2). (Refer to Fig. 2-.6)

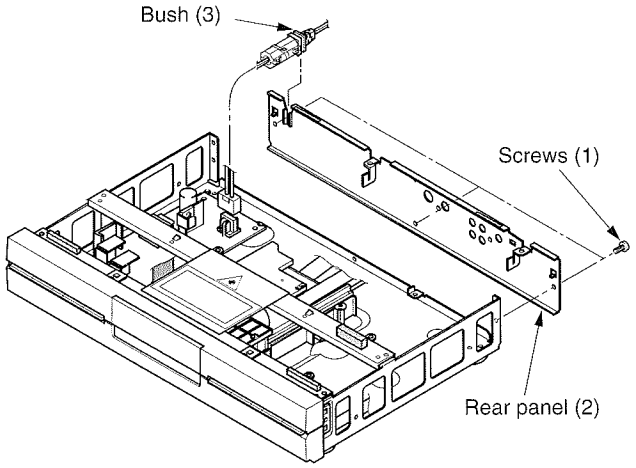


Fig. 2-6

1-2. PC Board Replacement

1-2-1. Main PC Board

Note:

- Before removing the main PC board, be sure to short-circuit the laser diode output land. After replacing the PC board, open the land after inserting the flexible connector (3). (Refer to Fig. 2-7.)

1. Remove the top cover (Refer to item 1-1-1).
2. Remove the upper shield plate. (Refer to item 1-1-2.)
3. Remove two screws (1) , and take out the main PC board (2). (Refer to Fig. 2-7.)
4. Remove the caution label (3).
5. Remove the flexible connector (4) and the connector (5) from the main PC board (2). Then, remove the main PC board (2).

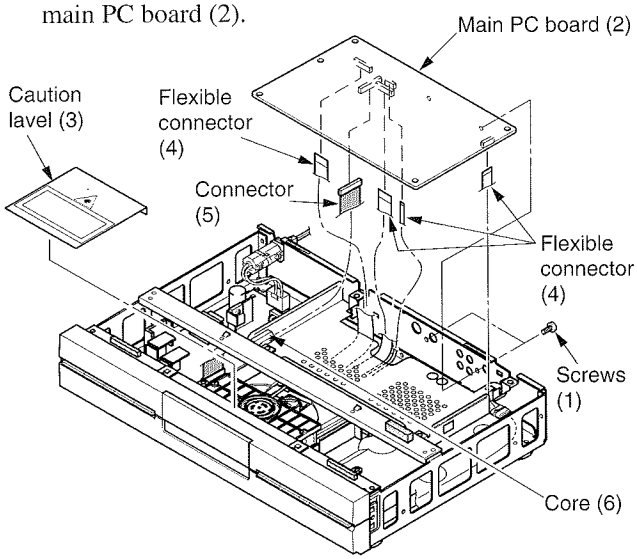


Fig. 2-7

Note
The position of laser diode output land are different depending on the unit.

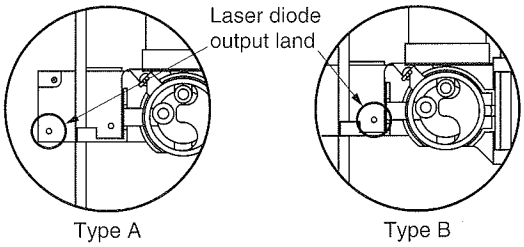


Fig. 2-8 Enlarged view of part (A)

Note:

- The core (6) has a mounting direction. So take care for the direction. (Refer to Fig. 2-9.)

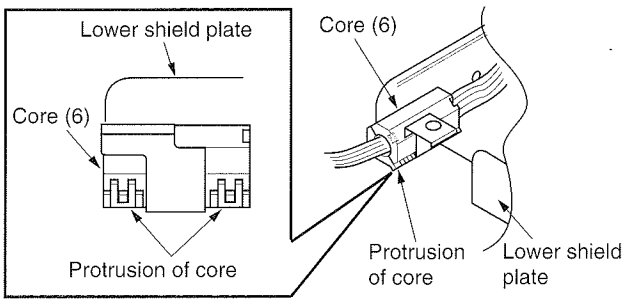


Fig. 2-9

1-2-2. Power Supply PC Board

1. Remove the upper shield plate, main PC board and lower shield plate. (Refer to items 1-1-2 and 1-2-1.)
2. Remove the caution label. (Refer to item 1-2-1.)
3. Remove two screws (1), and remove the frame (2). (Refer to Fig. 2-10.)
4. Remove four screws (4), and disconnect the power cord connector (3). Then, remove the power supply PC board (5).

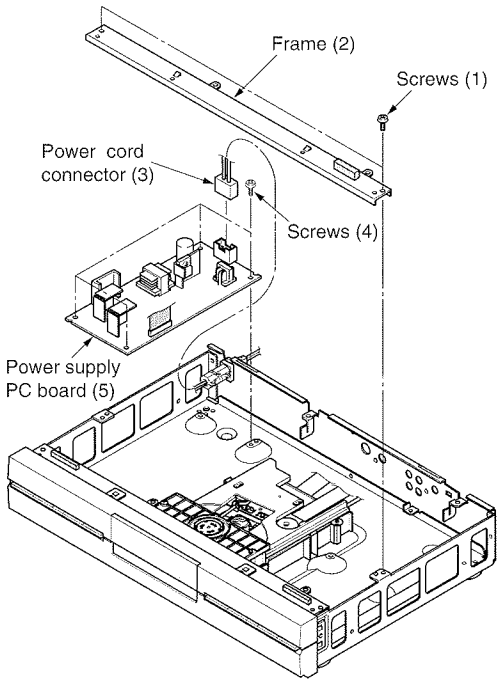


Fig. 2-10

1-2-3. Front Display PC Board and the Power Switch PC Board

1. Remove the front panel (Refer to item 1-1-3).
2. Remove six screws (1), and remove the front display PC board (2). (Refer to Fig. 2-11.)
3. Remove six screws (3), and remove the power switch PC board (4).
4. Remove the flexible connector (5) of the front display PC board (2).
5. Remove the shield sheet (6).

Note:

- When removing the shield sheet, it is necessary to remove the both side adhesive tape previously.

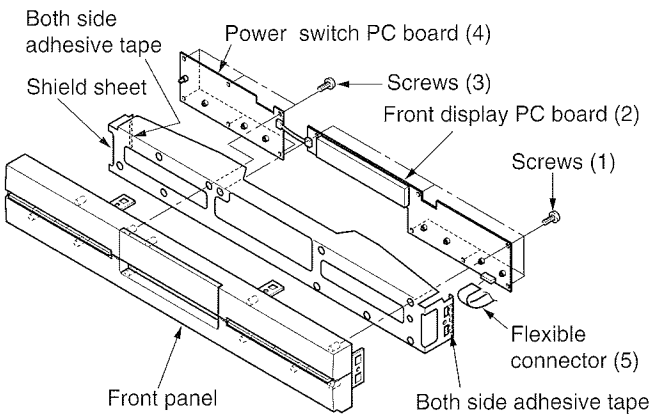


Fig. 2-11

1-3. Mechanism Parts Replacement

1-3-1. Mechanism Chassis Assembly

Note:

- Before removing the flexible connector and connector, be sure to short the laser diode output land. After replacing the mechanism chassis assembly, open the land after inserting the flexible connector and connector.

1. Remove the upper shield plate, main PC board, lower shield plate, tray and caution label. (Refer to items 1-1-2, 1-1-3 and 1-2-1.)
2. Remove two screws (1), and remove the frame (2). (Refer to Fig. 2-12.)
3. Remove three screws (3), and remove the mechanism chassis assembly (4).

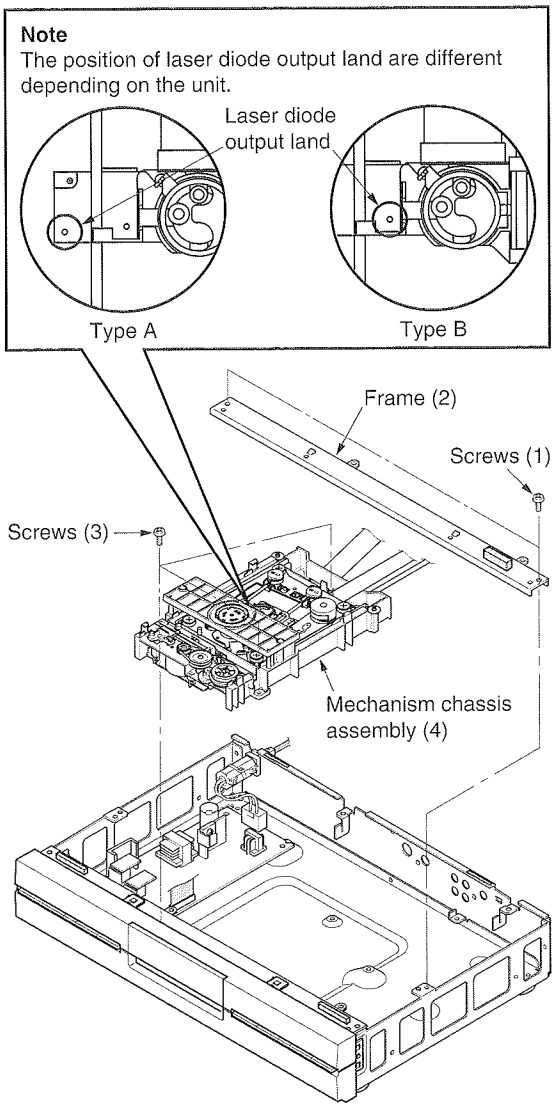


Fig. 2-12

1-3-2. Loading Motor and Detection Switch

<Removal>

1. Peel off the tape (2) which fixing the flexible connector (1).
2. Desolder the loading motor terminal.
3. Loosen three mold claws (3), and remove the loading PC board (4) (Refer to Fig. 2-13).
4. Desolder, and remove the detection switch (5).
5. Remove the loading belt (6) (Refer to Fig. 2-13).
6. Remove two screws (7), and remove the loading motor (8).

<Mounting>

1. Align the positioning hole of a new loading motor (8) to the hole into which the chassis positioning boss is inserted, and fix the motor with two screws (7). (Refer to Fig. 2-13.)
2. Perform the reverse steps of removal described above for mounting.

Notes:

- When mounting the loading motor PC board, insert the end of the detection switch (5) into the notch of the kick lever. (Refer to Fig. 2-13.)
- When mounting the loading belt (6), take care not to twist the belt or touch grease.
- Be sure to open the molded claws (3) manually when mounting the loading motor PC board (4).

  When the loading motor PC board (4) is pushed in directly without opening the molded claws (3), the molded claws (3) may be destroyed.

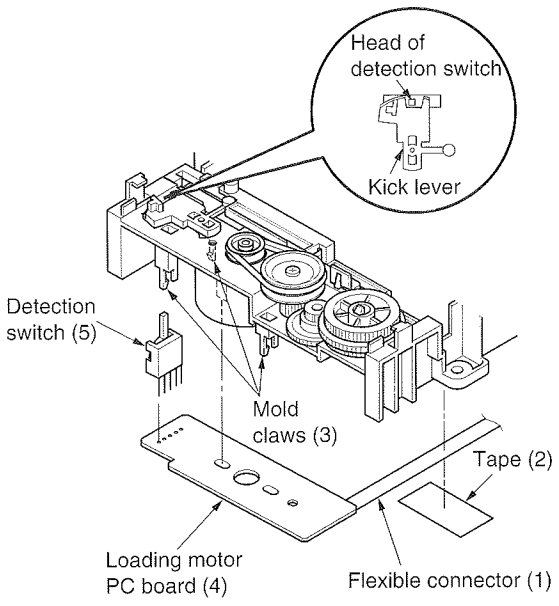


Fig. 2-13

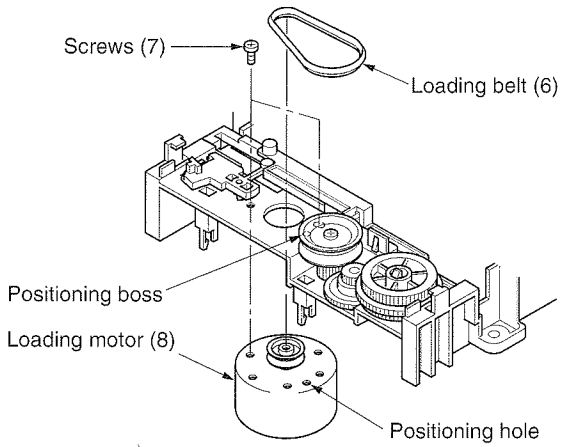


Fig. 2-14

1-3-3. Pickup Mechanism Assembly

<Removal>

1. Remove two screws (1), and remove the clamper stay (2).
2. Remove the 21-pin flexible connector (3). (This is not locked, and can be removed simply by pulling.)
3. Remove two screws (4), and remove the sub chassis (5) (with the pickup mechanism assembly).
4. Remove four screws (6), and remove the pickup mechanism assembly (7).
5. Remove the 19-pin flexible connector (8).

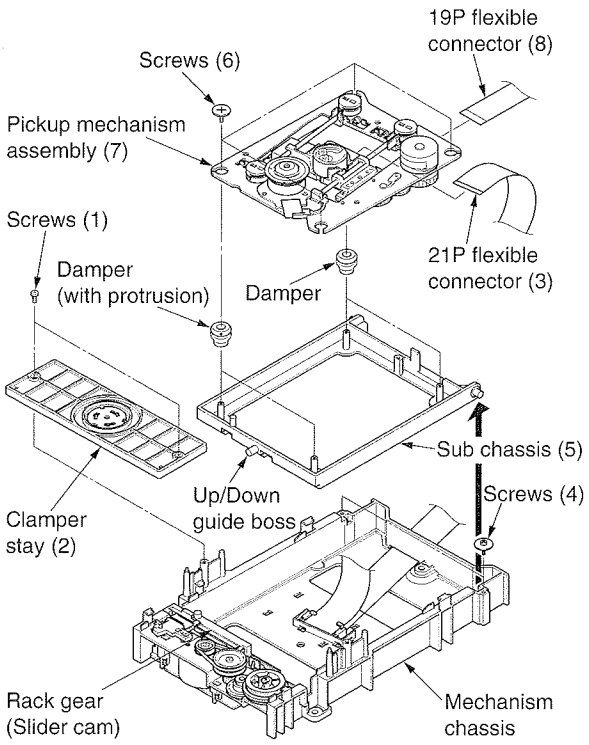


Fig. 2-15

Note:

- Removal of connector with the flexible connector lock

  Pull the connector slider in the direction of the arrow with your fingers. The connector is unlocked, and the 19-pin flexible connector (8) can be removed.

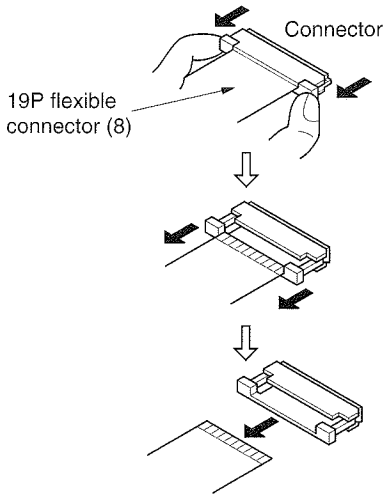


Fig. 2-16

<Mounting>

1. Replace the pickup mechanism assembly (7).
2. Face the correct side of the 19-pin flexible connector (8) up and connect it to a new pickup mechanism assembly (7). (Face the metallic side of the pickup mechanism assembly (7) up viewing it from the rear side, insert it into the connector, and lock it by sliding the connector in the direction of the arrow.)

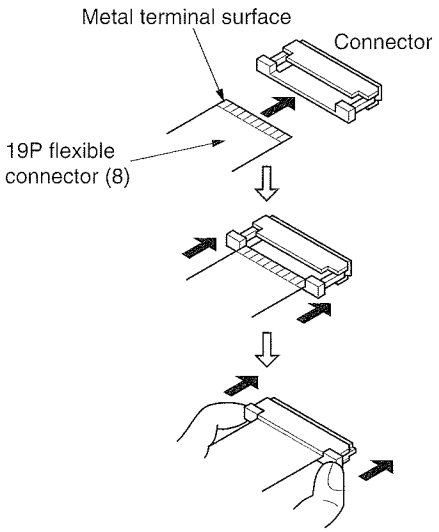


Fig. 2-17

3. Perform the reverse steps of removal described on previous page for mounting.

Note:

- When fixing the pickup mechanism assembly (7) with four screws (6), take care not to catch the damper. Push the mechanism assembly (7) down and loosen the damper, and tighten the screws (6).

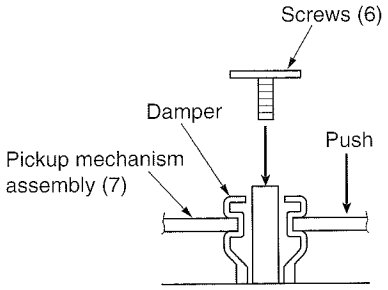


Fig. 2-18

- Use the damper with a protrusion (2 locations) in the disc motor, and use a damper without a protrusion on the rear side.

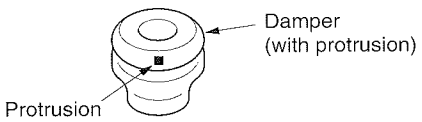


Fig. 2-19

- When mounting the sub chassis (5) (with the pickup mechanism assembly), insert the Up/Down guide boss into the cam slider Up/Down cam.

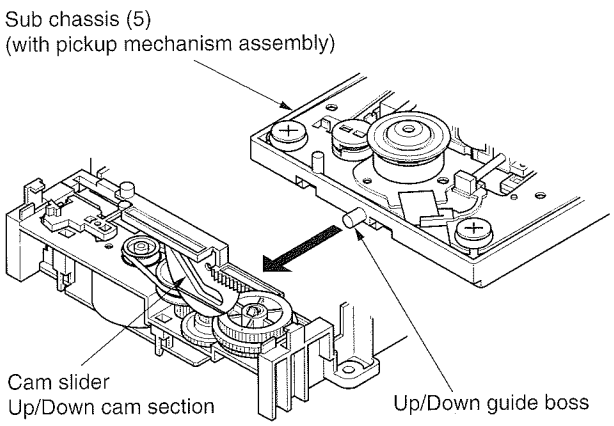


Fig. 2-20

1-3-4. Gear B Assembly, Gear A, Feed Motor Gear Assembly and Rack Gear Assembly

<Removal>

1. Remove the pickup mechanism assembly (Refer to item 1-3-3).
2. Remove the washer (1), and remove the gear B assembly (2). (Refer to Fig. 2-21.)
3. Remove one screw (3), and remove the gear A (4).

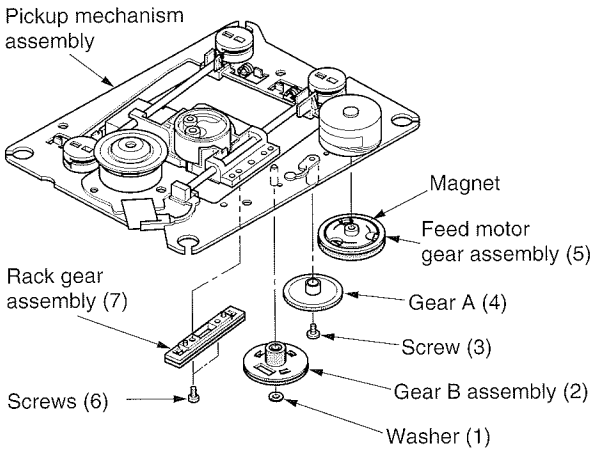


Fig. 2-21

4. Remove the feed motor gear assembly (5) using screwdrivers with care taken not to break the magnet.

Note:

- Apply lightly the screwdriver end to the gear shaft and push upward, and pull out the feed motor gear assembly (5).

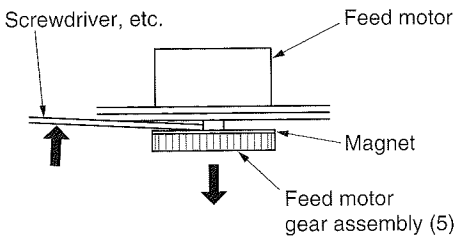


Fig. 2-22

5. Remove two screws (6), and remove the rack gear assembly (7). (Refer to Fig. 2-23.)

<Mounting>

1. Perform the reverse steps of removal described on previous page for mounting.
2. Push the pickup head (8) to the disc motor side (direction of the arrow (A)), and push and slide the upper gear of the rack gear assembly (6) (direction of the arrow (B)).
3. Align the positioning holes of the upper and lower gears of the gear B assembly (2), insert them into the gears of the gear A and the rack gear assembly (7), and fix them with the washer (1).

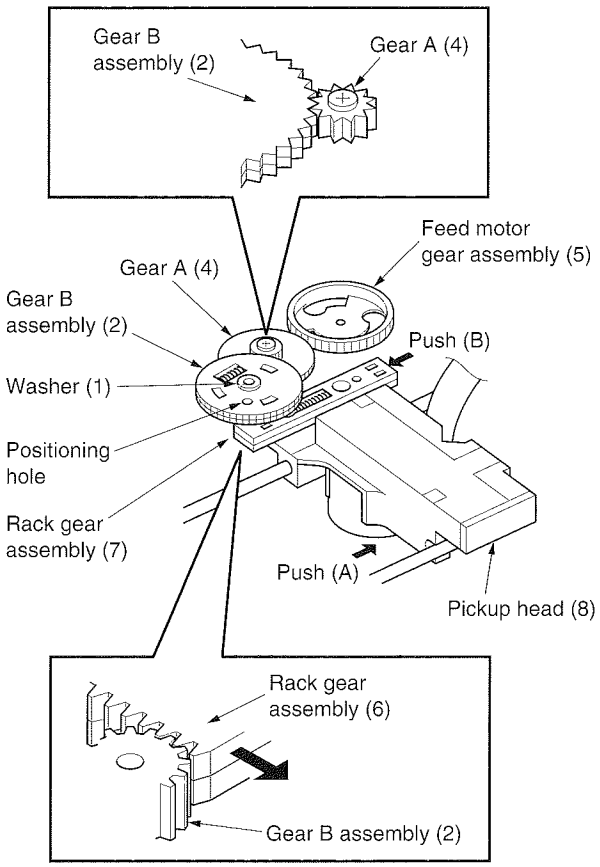


Fig. 2-23

Notes:

- Push the feed motor gear assembly (5) to fit it in position. (Refer to Fig. 2-24.)
- Fit the feed motor gear assembly (5) at the height where the clearance is 0.5 ± 0.1 mm between the feed motor gear assembly and the hall element on the feed motor PC board.
- When replacing the hall element, be sure to fit the hall element to the pattern surface of the feed motor PC board.

  Then, solder the hall element on the feed motor PC board without leaving any clearance.

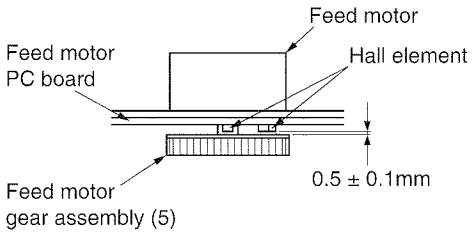


Fig. 2-24

1-3-5. Feed Motor

<Removal>

1. Remove the gear B assembly, the gear A and the feed motor gear assembly (Refer to item 1-3-4).
2. Remove two screws (1), and remove the feed motor (2). (Refer to Fig. 2-25.)
3. Desolder the feed motor lead (4) from the feed motor PC board (3).

<Mounting>

1. Solder the lead wire (4) of a new feed motor (2) to the feed motor PC board. (Pay attention to the lead wire color.)
2. Fix the feed motor (2) with two screws (1) with attention paid to the motor angle. (The motor side end of the lead wire (4) is to be aligned to the positioning concave on the pickup mechanism assembly.)
3. Fasten the feed motor lead wire (4) with a cotton tape. Use a new cotton tape.

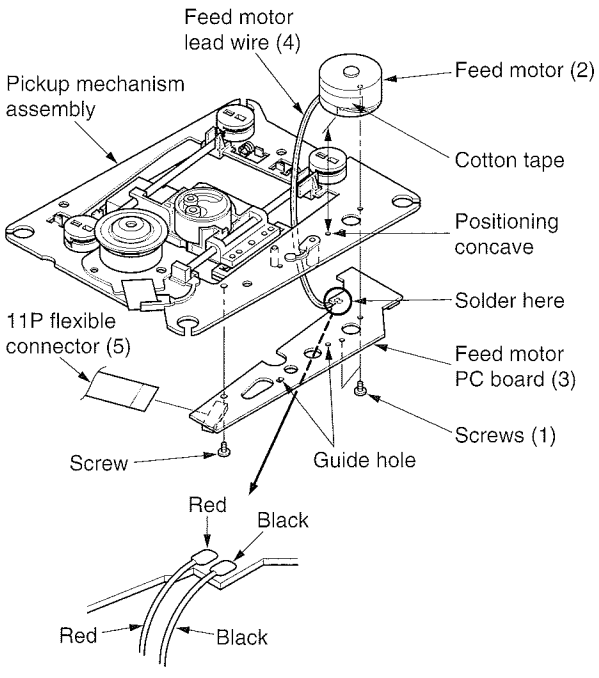


Fig. 2-25

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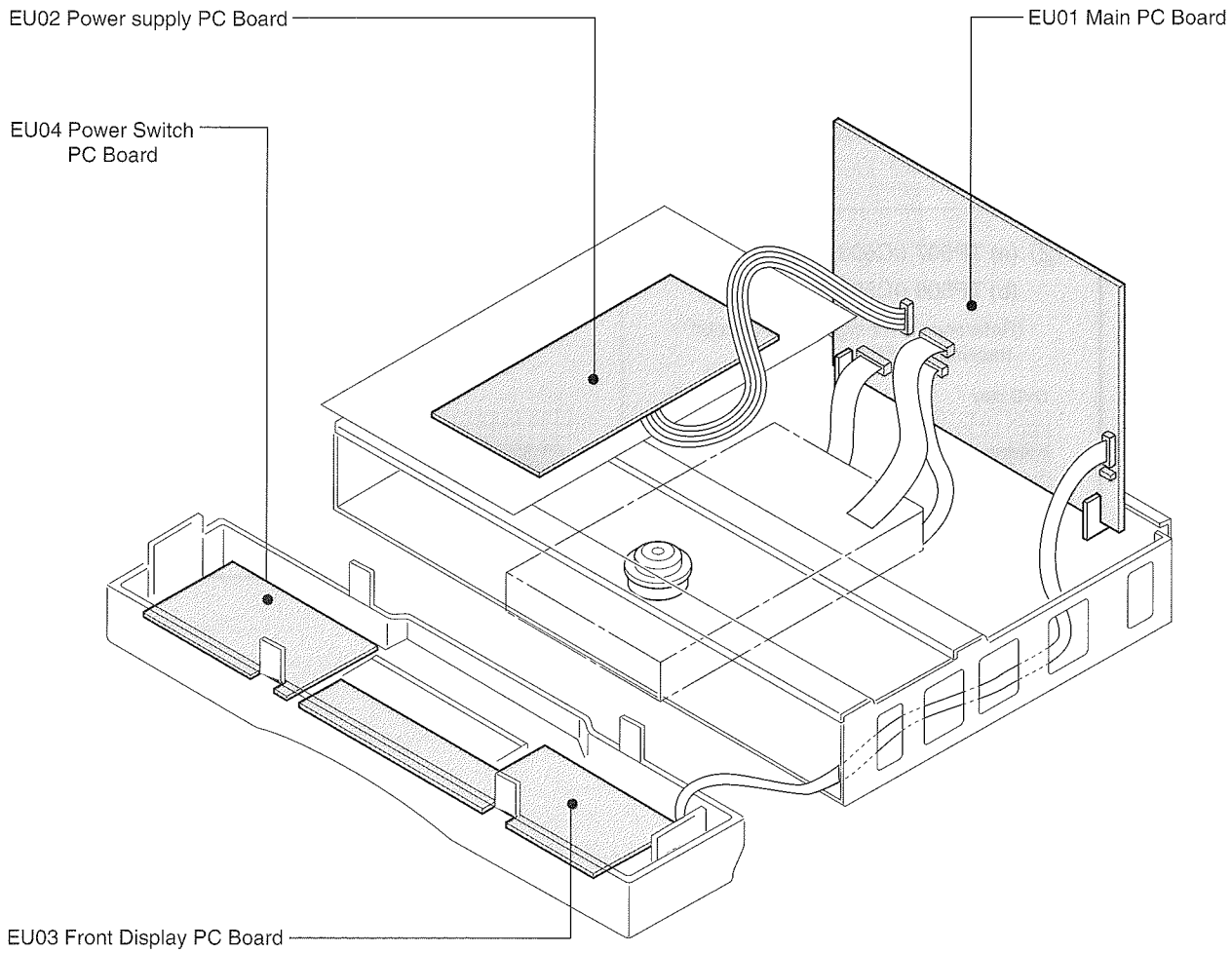
SECTION 3
SERVICING DIAGRAMS

1. STANDING PC BOARDS FOR SERVICING

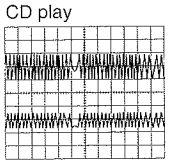


2. MAIN WAVEFORMS AND THE MEASUREMENT LOCATIONS

2-1. Main Waveforms

① (a) TP507 (IC503, Pin ㊷)
(b) TP506 (IC503, Pin ㊻)
(Reference error signal when forced tracking is OFF.)

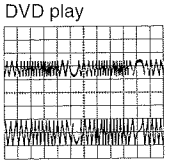
CD play



(a) RFRP
(b) TE
V:1V/div
H:10ms/div

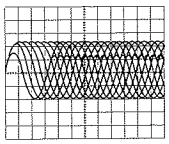
② (a) TP507 (IC503, Pin ㊷)
(b) TP506 (IC503, Pin ㊻)
(Reference error signal when forced tracking is OFF.)

DVD play



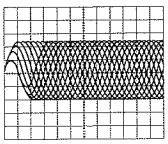
(a) RFRP
(b) TE
V:1V/div
H:5ms/div

③ TP501 (IC502, Pin ㊴)



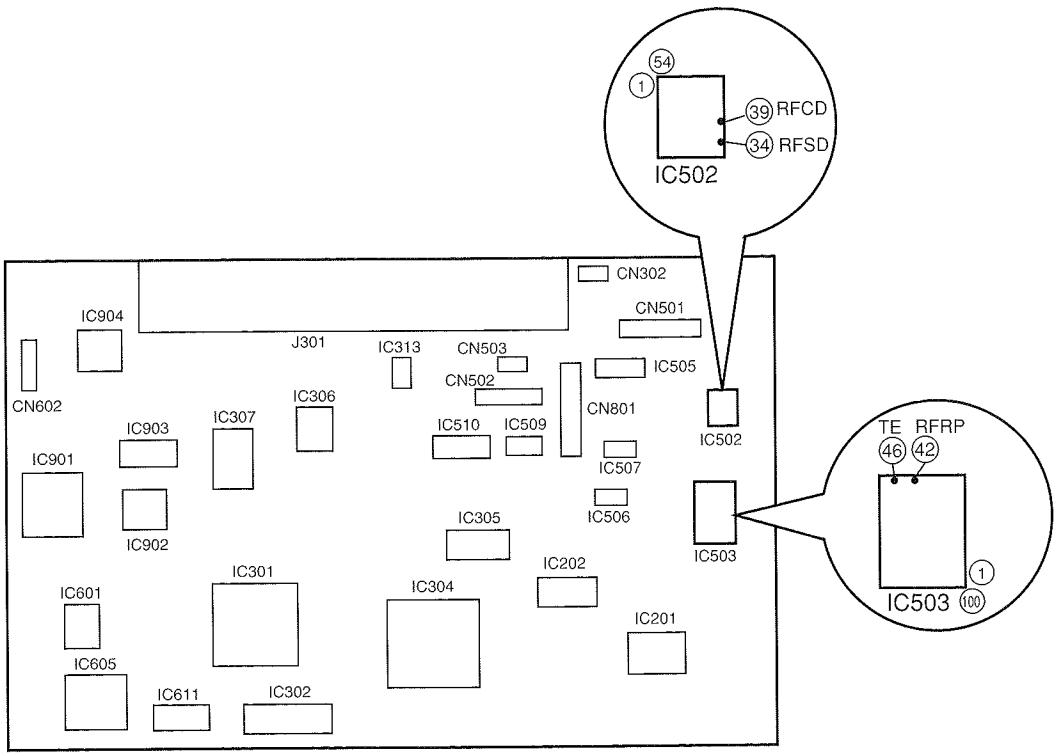
RF CD
V:0.5V/div
H:500ns/div

④ TP502 (IC502, Pin ㉞)



RF SD (DVD)
V:.5V/div
H:100ns/div

2-2. Main Waveforms Measurement Locations



3. CIRCUIT SYMBOLS AND SUPPLEMENTARY EXPLANATION

3-1. Replacing Subminiature "CHIP" Parts

3-1-1. Required Tools:

1. Fine tipped, well insulated soldering "pencil", about 30 Watts.
2. Tweezers.
3. Blower type hair dryer.

3-1-2. Soldering Cautions:

1. Do not apply heat for more than 3s.
2. Avoid using a rubbing stroke when soldering.
3. Discard removed chips; do no reuse them.
4. Supplementary cementing is not required.
5. Use care not to scratch or otherwise damage the chips.

3-1-3. Removal (Resistors, Capacitors, etc.):

1. Melt the solder at one side.

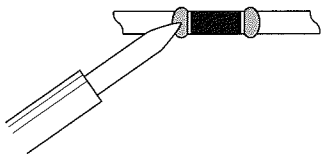


Fig. 1

2. Grasp the part with tweezers and melt the solder at the other side.

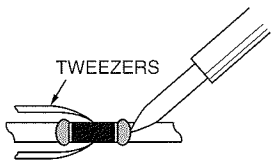


Fig. 2

3. Remove the part with a twisting motion.

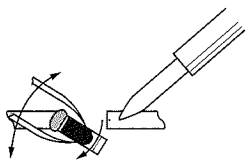


Fig. 3

3-1-4. Removal (Transistors, Diodes, etc.):

1. Melt the solder of one lead.

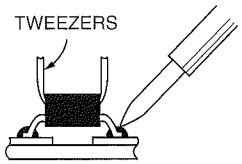


Fig. 4

2. Lift the side of that lead upward.

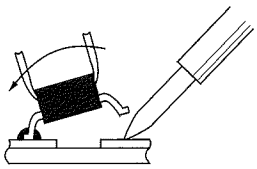


Fig. 5

3. Simultaneously heat solder the two remaining leads and lift part to remove.

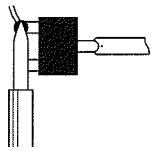


Fig. 6

3-1-5. Preheating (Except for semiconductors):

Immediately before installing new resistors or capacitors, use a blower type hair dryer and preheat the part for about two min. at approximately 150°C.

3-1-6. Replacement:

1. Presolder the contact points of the circuit pattern.

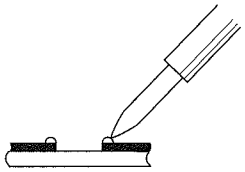


Fig. 7

2. Press the part downward with tweezers and apply the soldering pencil as indicated in the figure.

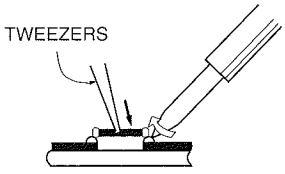


Fig. 8

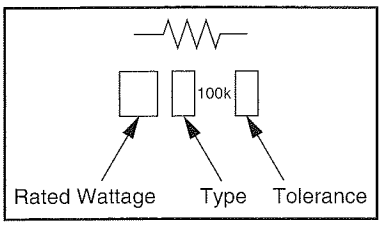
3-2. Precautions for Part Replacement

- In the schematic diagram, parts marked ⚠ (ex. ⚠ F801) are critical part to meet the safety regulations, so always use the parts bearing specified part codes (SN) when replacing them.
- Using the parts other than those specified shall violate the regulations, and may cause troubles such as operation failures, fire etc.

3-3. Solid Resistor Indication

Unit	None .....Ω K .....kΩ M .....MΩ
Tolerance	None .....±5% B .....±0.1% C .....±0.25% D .....±0.5% F .....±1% G .....±2% K .....±10% M .....±20%
Rated Wattage	(1) Chip Parts None ..... 1/16W (2) Other Parts None ..... 1/6W Other than above, described in the Circuit Diagram.
Type	None .....Carbon film S .....Solid R .....Oxide metal film W .....Metal film W .....Cement FR .....Fusible

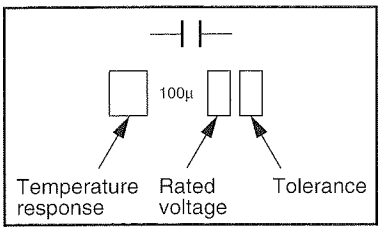
Ex. 1



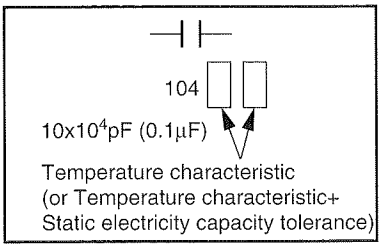
3-4. Capacitance Indication

Symbol	.....Electrolytic, Special electrolytic .....Non polarity electrolytic .....Ceramic, plastic .....Film .....Trimmer
Unit	None .....F μ .....μF p .....pF
Rated voltage	None .....50V For other than 50V and electrolytic capacitors, described in the Circuit Diagram.
Tolerance	(1) Ceramic, plastic, and film capacitors of which capacitance are more than 10 pF. None .....±5% or more B .....±0.1% C .....±0.25% D .....±0.5% F .....±1% G .....±2% (2) Ceramic, plastic, and film capacitors of which capacitance are 10 pF or less. None .....more than ±5% pF B .....±0.1 pF C .....±0.25 pF (3) Electrolytic, Trimmer Tolerance is not described.
Temperature characteristic (Ceramic capacitor)	None .....SL For others, temperature characteristics are described. (For capacitors of 0.01 μF and no indications are described as F.)
Static electricity capacity (Ceramic capacitor)	Sometimes described with abbreviated letters as shown in Ex. 3.

Ex. 2



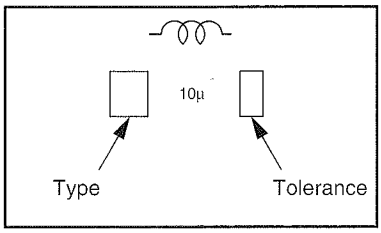
Ex. 3



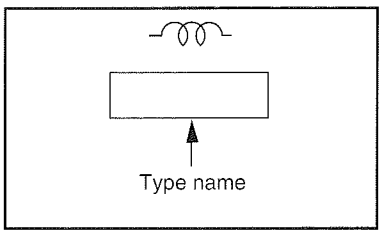
3-5. Inductor Indication

Unit	None	..... H
	µ	..... µH
	m	..... mH
Tolerance	None	..... ±5%
	B	..... ±0.1%
	C	..... ±0.25%
	D	..... ±0.5%
	F	..... ±1%
	G	..... ±2%
	K	..... ±10%
	M	..... ±20%

Ex. 4



Ex. 5



3-6. Waveform and Voltage Measurement

- The waveforms for CD/DVD and RF shown in the circuit diagrams are obtained when a test disc is played back.
- All voltage values except the waveforms are expressed in DC and measured by a digital voltmeter.

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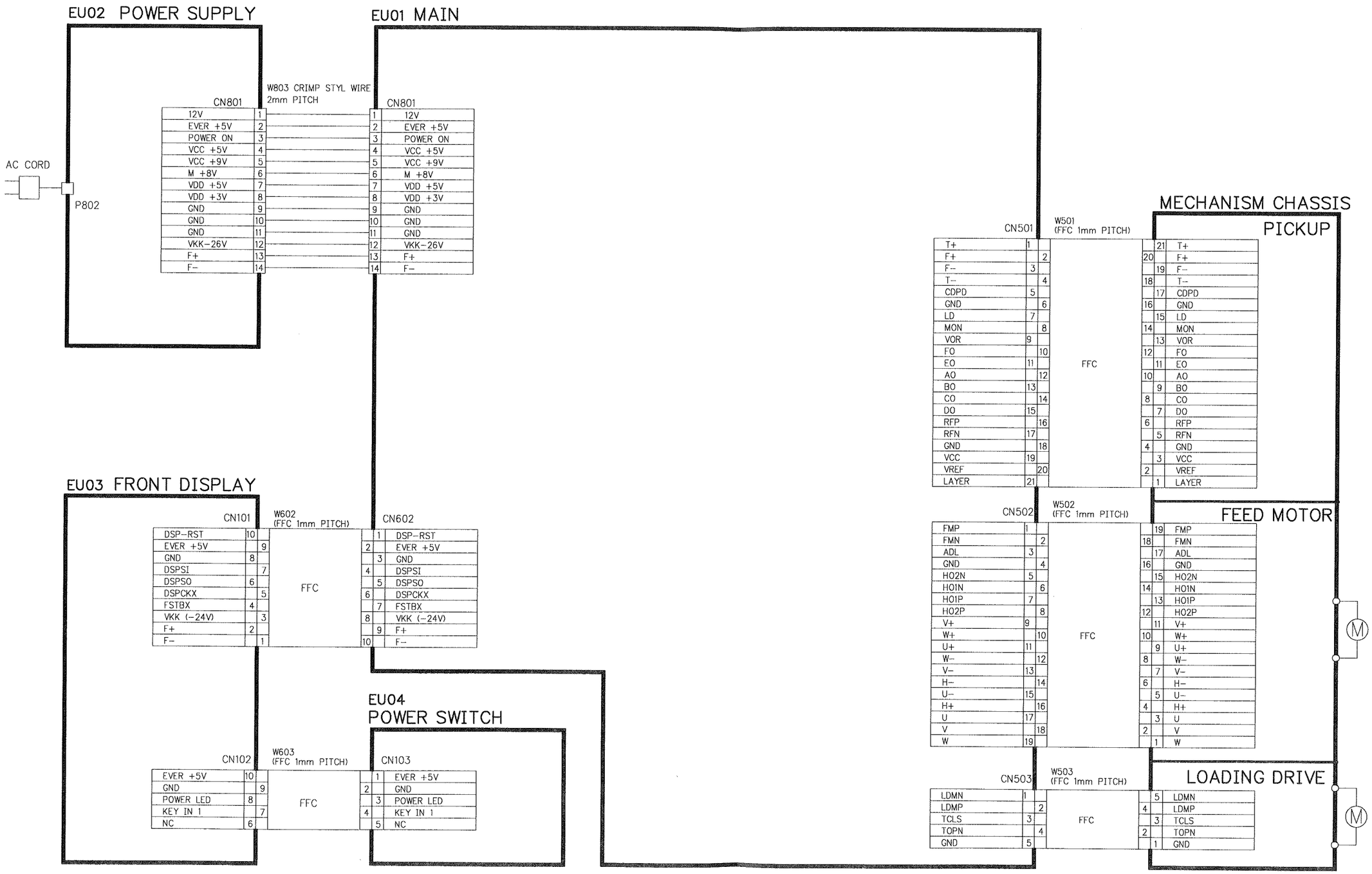
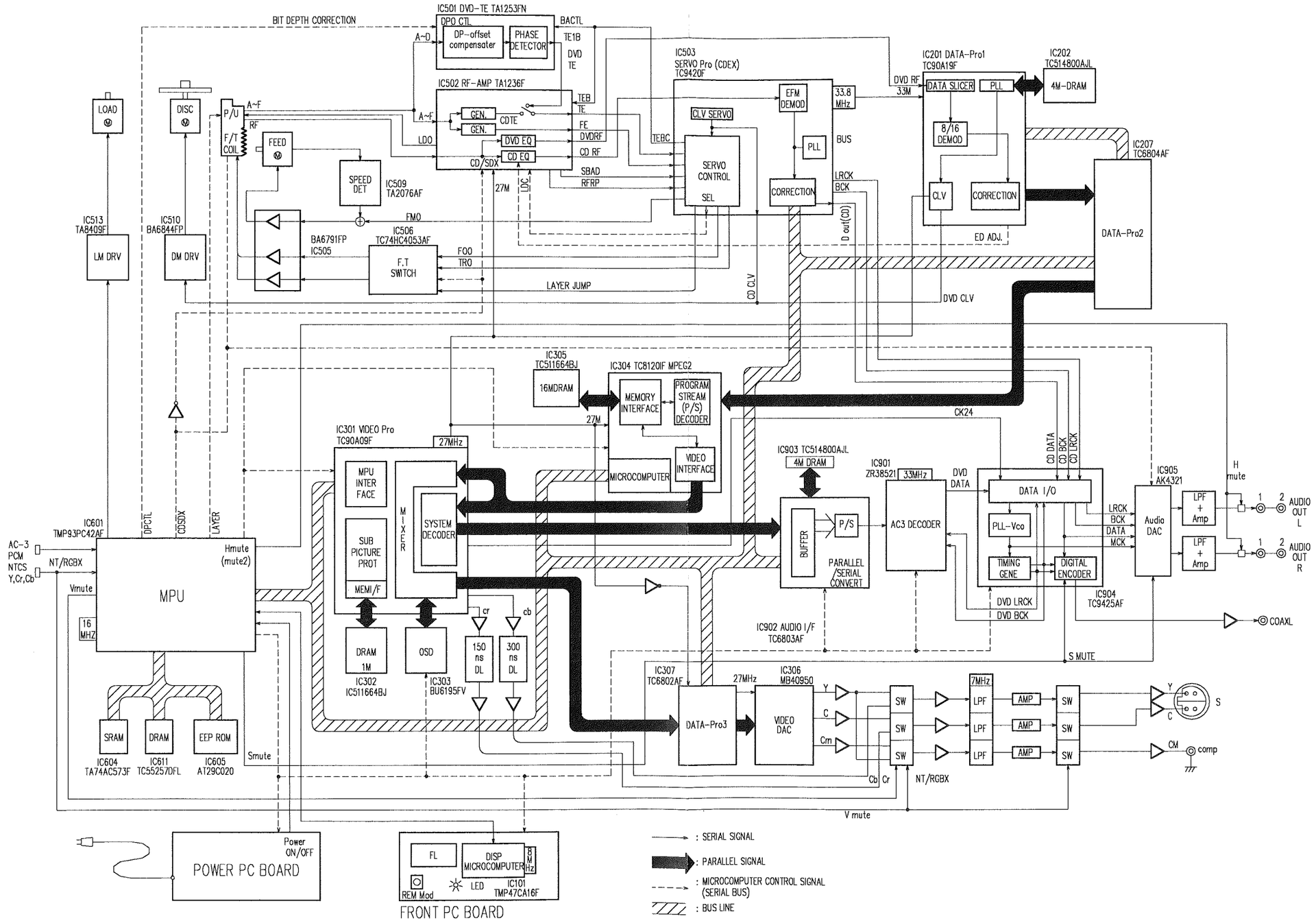
4. PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

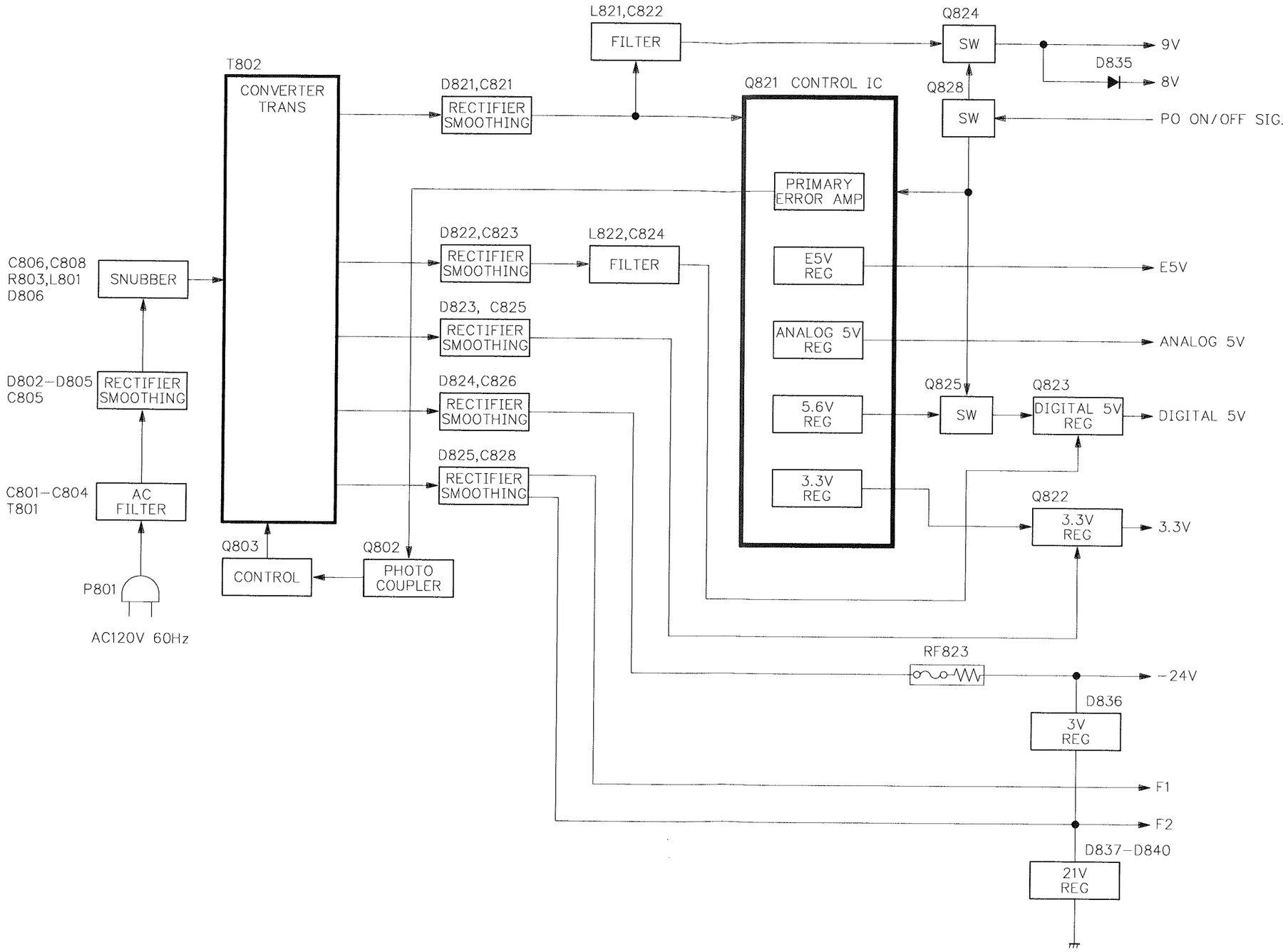


5. BLOCK DIAGRAM

5-1. Overall Block Diagram

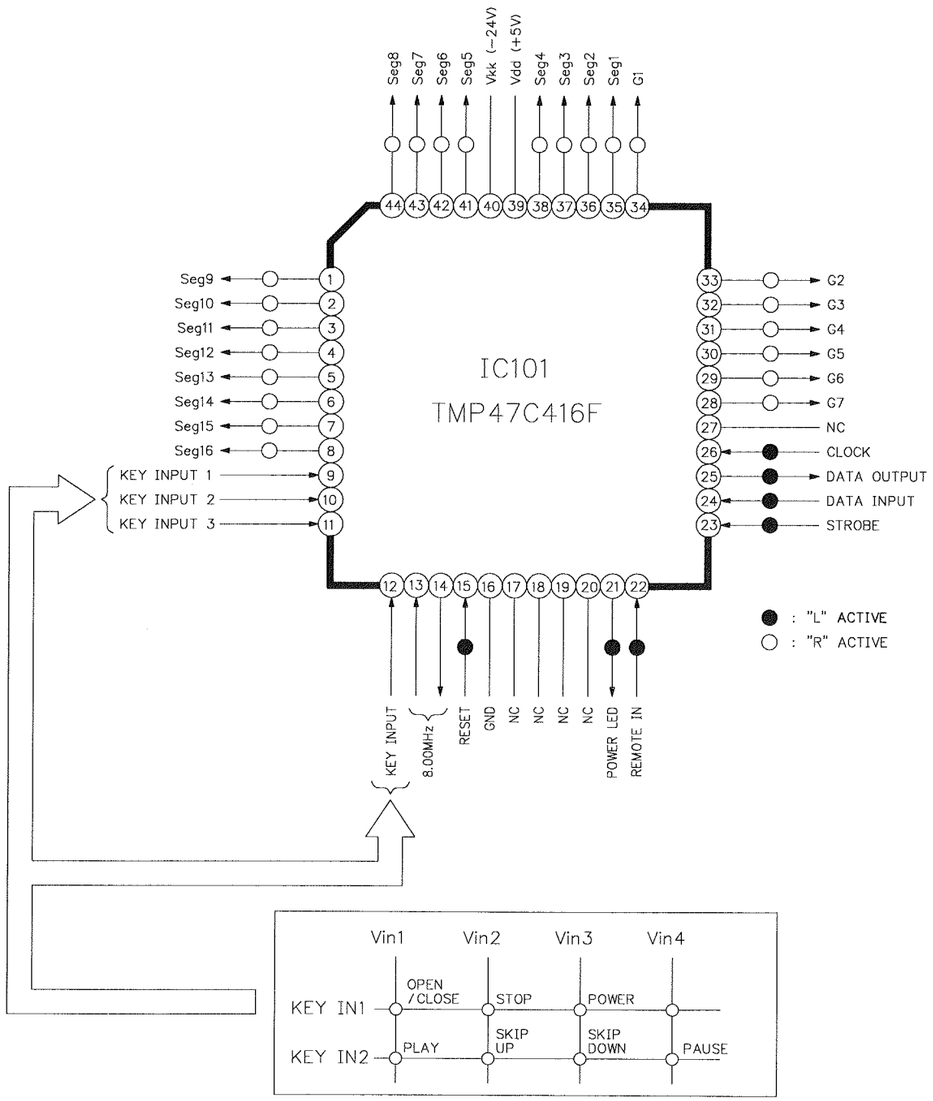


5-2. Power Supply Block Diagram

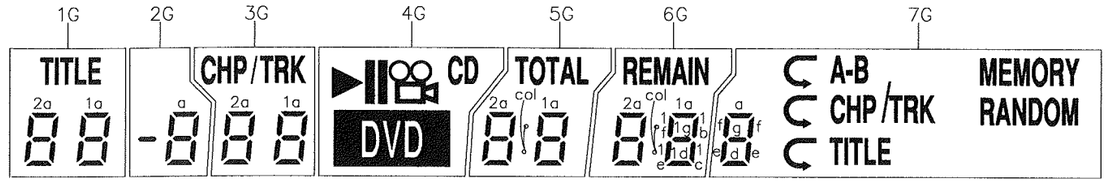


5-3. Front Block Diagram

Front Microcomputer Terminal Function



Front Display Tube

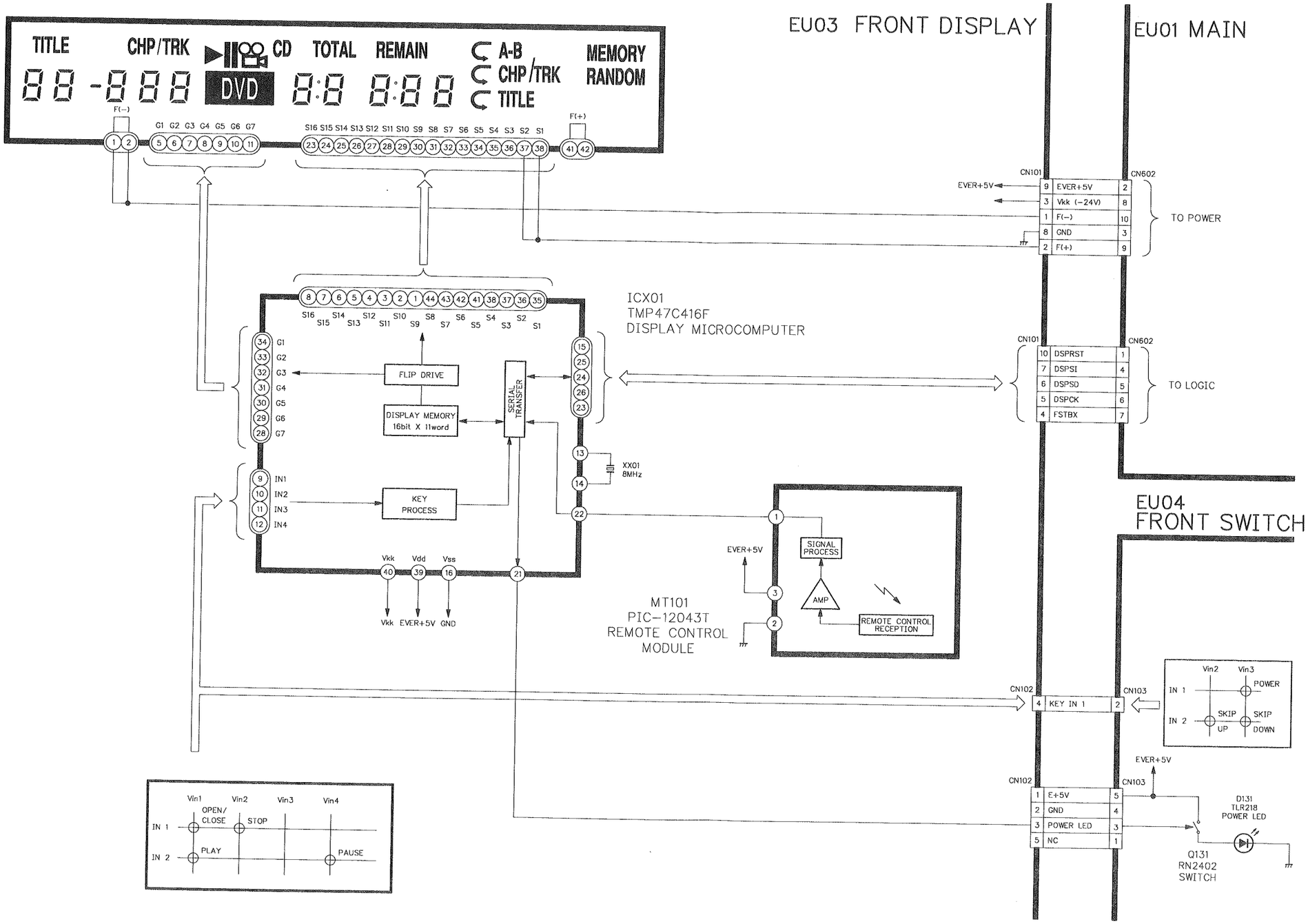


Display Pattern

ANODE CONNECTION

	1G	2G	3G	4G	5G	6G	7G
P1	1a	a	1a	CD	1a	1a	A-
P2	1b	b	1b		1b	1b	B
P3	1c	c	1c	–	1c	1c	RANDOM
P4	1d	d	1d	DVD	1d	1d	–
P5	1e	e	1e	–	1e	1e	TITLE
P6	1f	f	1f		1f	1f	MEMORY
P7	1g	g	1g		1g	1g	CHP/TRK
P8	–	–	–	–	col	col	–
P9	2a	–	2a	–	2a	2a	a
P10	2b	–	2b	–	2b	2b	b
P11	2c	–	2c	–	2c	2c	c
P12	2d	–	2d	–	2d	2d	d
P13	2e	–	2e	–	2e	2e	e
P14	2f	–	2f	–	2f	2f	f
P15	2g	–	2g	–	2g	2g	g
P16	TITLE	–	CHP/TRK	–	TOTAL	REMAIN	–

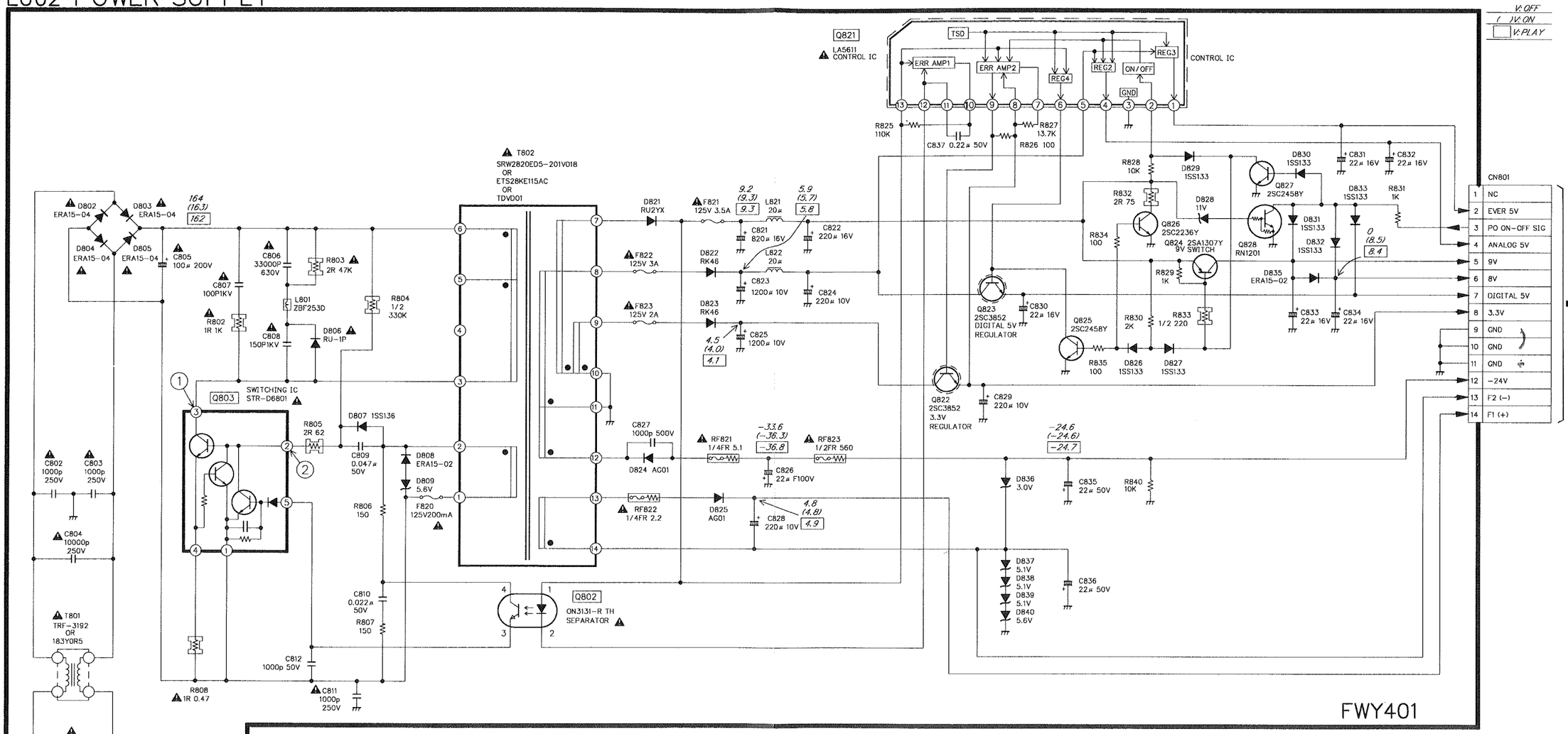
Front Block Diagram



6. CIRCUIT DIAGRAMS

6-1. Power Supply Circuit Diagram

EU02 POWER SUPPLY

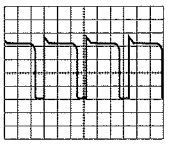
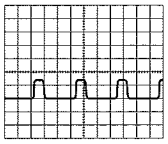


(V)

	Q821											
PIN / MODE	1	2	3	4	5	6	7	8	9	11	12	13
OFF	5.1	6.3	0	1.4	5.8	0	0	0	0	7	8.1	9.2
ON	5.1	0.7	0	5	5.6	5.7	1.3	3.3	4.1	7.3	8.2	9.3
PLAY	5.1	0.7	0	5	5.7	5.7	1.3	3.3	4.1	7.3	8.2	9.3

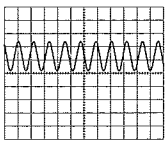
(V)

	Q822			Q823			Q824			Q825			Q826			Q827			Q828		
PIN / MODE	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
OFF	0.8	4.5	0.8	2.5	5.8	0	9.2	0	9.2	0	0	0.8	0	0	0.8	0	9.2	0	0	0	0
ON	3.3	4	4.1	5	5.6	5.7	9.3	9.2	8.5	0	5.7	0.5	0	9.3	0.5	0	0	0.7	0	1.5	0
PLAY	3.3	4.1	4.1	5	5.7	5.7	9.3	9.2	8.5	0	5.7	0.5	0	9.3	0.5	0	0	0.7	0	1.5	0

① Q803,Pin ③-④ D-2	② Q803,Pin ②-④ D-3
 AC120V ON VCE V:50V/div H:5μs/div	 AC120V ON VBE V:0.5V/div H:5μs/div

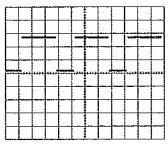
6-2. Front Circuit Diagram

① IC101,Pin ⑭ D-4



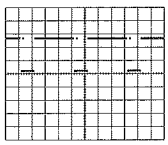
X-OUT
V:2V/div
H:100ns/div

② IC101,Pin ㉓ E-4



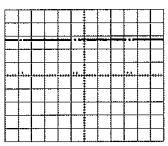
STB
V:2V/div
H:5ms/div

③ IC101,Pin ㉔ F-5



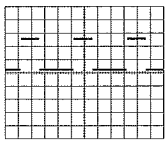
SI
V:2V/div
H:5ms/div

④ IC101,Pin ㉕ F-5



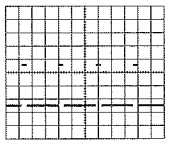
SO
V:2V/div
H:5ms/div

⑤ IC101,Pin ㉖ E-5



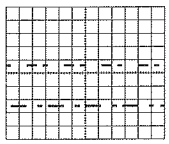
SCK
V:2V/div
H:5ms/div

⑥ IC101,Pin ㉞ E-6



G1
V:10V/div
H:5ms/div

⑦ IC101,Pin ㉟ E-6



S1
V:10V/div
H:5ms/div

1	2	3	4	5	6	7	8	9	10

A

B

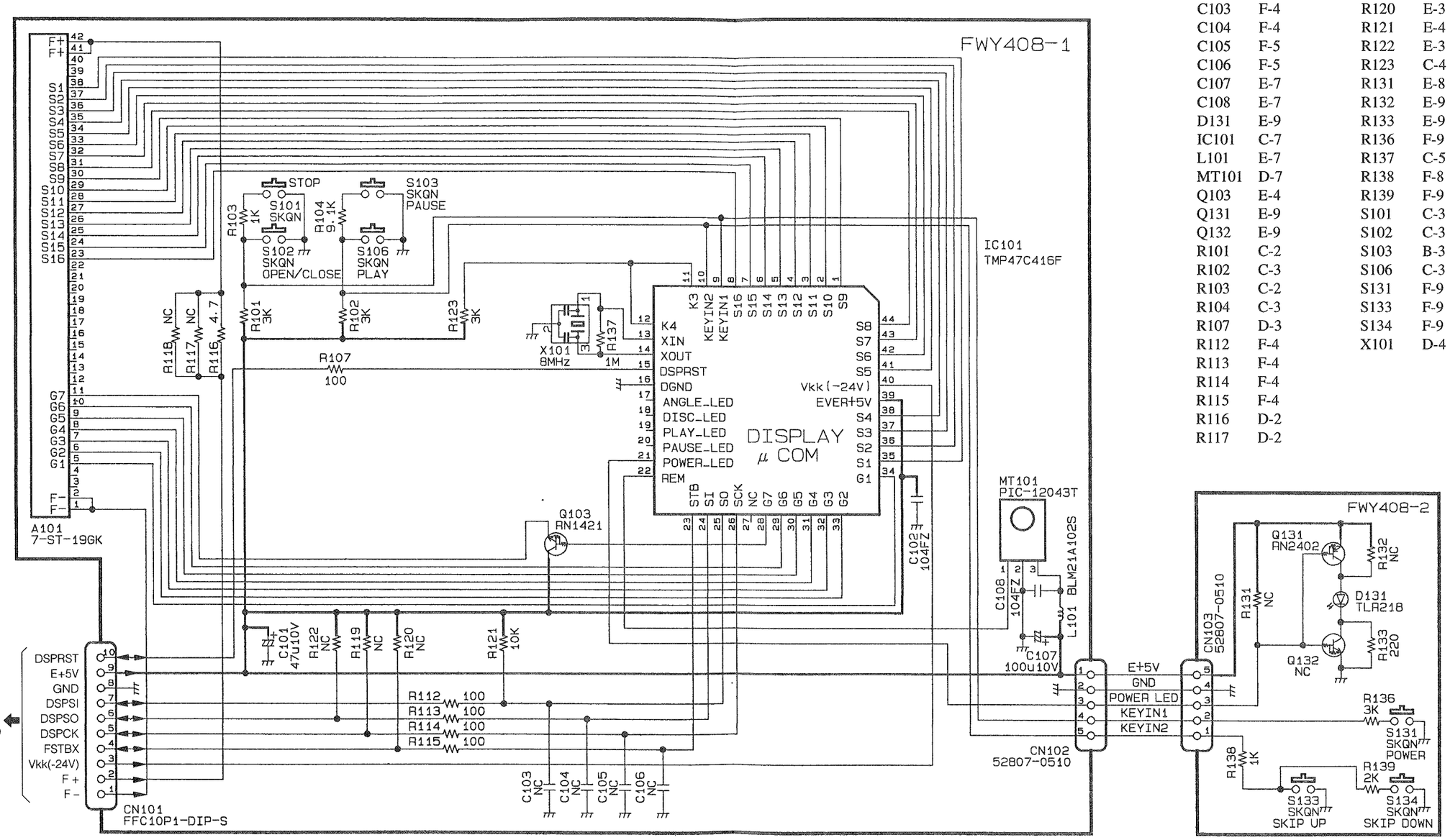
C

D

E

F

G

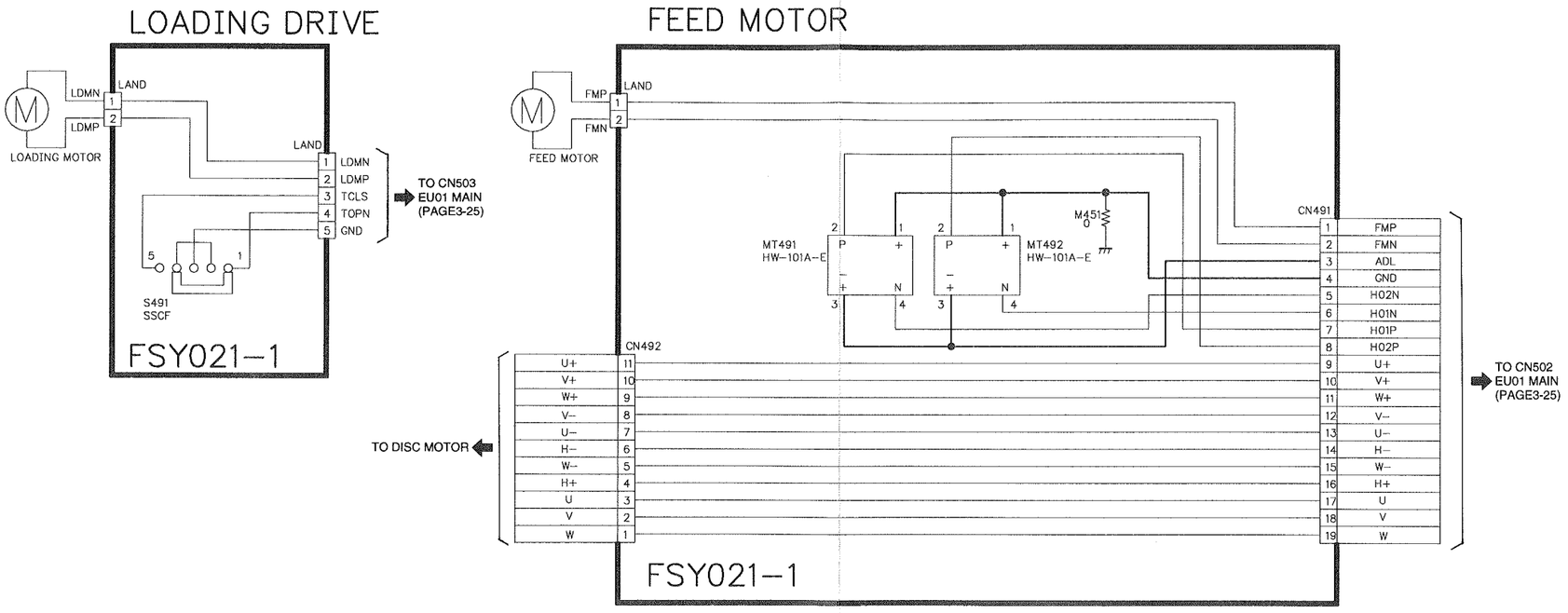


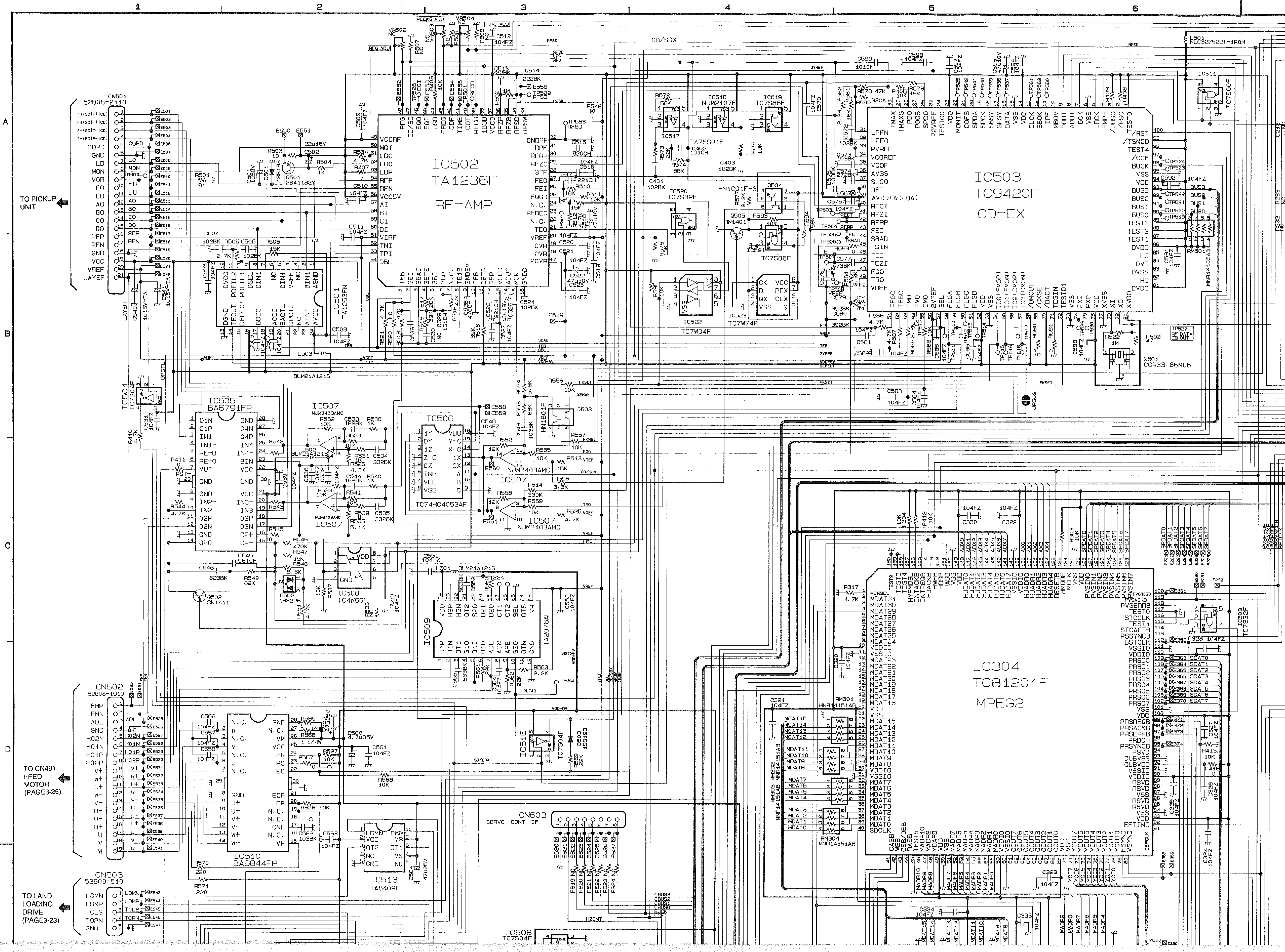
Part name	Location
C101	E-3
C102	E-6
C103	F-4
C104	F-4
C105	F-5
C106	F-5
C107	E-7
C108	E-7
D131	E-9
IC101	C-7
L101	E-7
MT101	D-7
Q103	E-4
Q131	E-9
Q132	E-9
R101	C-2
R102	C-3
R103	C-2
R104	C-3
R107	D-3
R112	F-4
R113	F-4
R114	F-4
R115	F-4
R116	D-2
R117	D-2

Part name	Location
R118	D-2
R119	E-3
R120	E-3
R121	E-4
R122	E-3
R123	C-4
R131	E-8
R132	E-9
R133	E-9
R136	F-9
R137	C-5
R138	F-8
R139	F-9
S101	C-3
S102	C-3
S103	B-3
S106	C-3
S131	F-9
S133	F-9
S134	F-9
X101	D-4

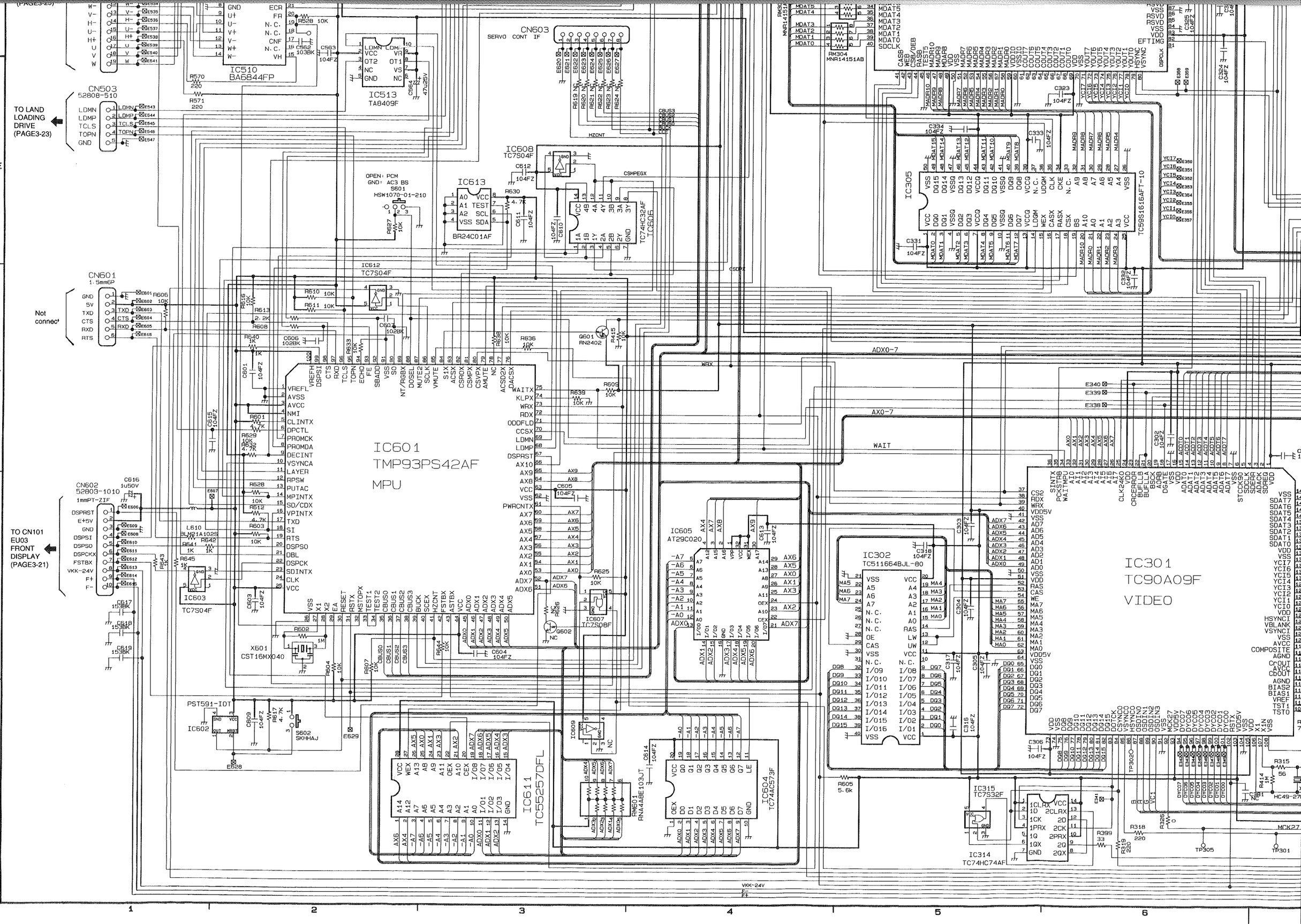
6-3. Motor Circuit Diagram

Part name	Location
M451	D-7
MT491	D-5
MT492	D-6
S491	D-2



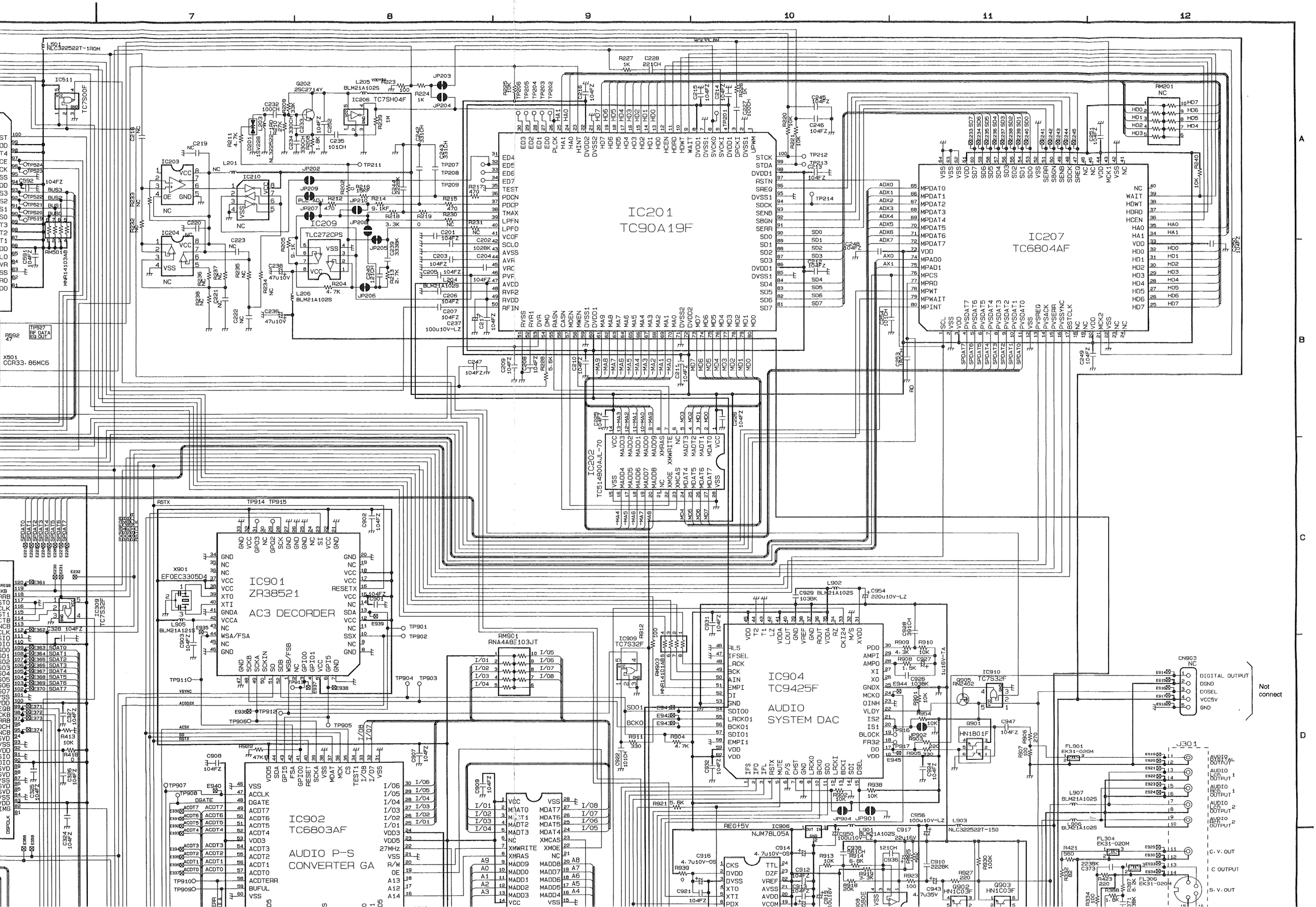


TO PICKUP UNIT
CN501 52808-2110
IC502 TA1236F RF-AMP
IC503 TC9420F CD-EX
IC501 TA1253FN
IC505 BA6791FP
IC506 TC74HC4053AF
IC507 NJM3403AMC
IC508 TC4W66F
IC509 TA2076AF
IC510 BA6844FP
IC513 TA8409F
IC516 TC7S04F
IC517
IC518 NJM2107F
IC519 TC7S86F
IC520 TC7S32F
IC521 TC7S86F
IC522 TC7W04F
IC523 TC7W74F
IC504 TC7S04F
IC511 TC7S00F
IC304 TC81201F MPEG2
IC309 TC7S32F
IC608 TC7S04F
Q501 2SA1182Y
Q502 RN1411
Q503 HN1B01F
Q504 HN1C01F-3
Q505 RN1401
D501 1SS193
D502 1SS226
D503 1SS193
X501 CCR33.86MC6
L501 NLC322522T-1R0M
L503 BLM21A121S
L601 BLM21A121S
RM301 MNR14151AB
RM302 MNR14151AB
RM303 MNR14151AB
RM304 MNR14151AB
RM501 MNR14103AB
PEEKG ADJ
RFG ADJ
TIME ADJ
CN502 52808-1910
TO CN491 FEED MOTOR (PAGE3-25)
CN503 52808-510
TO LAND LOADING DRIVE (PAGE3-23)
CN603 SERVO CONT IF
TP527 RF DATA EG OUT


IC601
TMP93PS42AF
MPU
IC611
TC55257DFL
IC301
TC90A09F
VIDEO
IC305
TC59S1616AFT-10
IC302
TC511664BJL-80
IC605
AT29C020
IC604
TC74AC573F
IC608
TC7S04F
IC612
TC7S04F
IC613
BR24C01AF
IC510
BA6844FP
IC513
TA8409F
IC603
TC7S04F
IC607
TC7S08F
IC602
PST591-IDT
IC315
TC7S32F
IC314
TC74HC74AF
CN503
52808-510
TO LAND LOADING DRIVE (PAGE3-23)
CN601
1.5mmPH
Not connect
CN602
52803-1010
TO CN101 EU03 FRONT DISPLAY (PAGE3-21)
CN603
SERVO CONT IF
X601
CST16MX040
S602
SKHHAJ
S501
HSW1070-01-210
OPEN: PCM
GND: AC3 BS
Q601
RN2402
Q602
RM304
MNR14151AB
RM601
RN4A8E103JT
TC74HC32AF
TC4066
ADX0-7
AX0-7
WAIT
WRX
CSDP1
HZCNT
CBUS3
VKK-24V

3-25

3-26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TC90A19F
IC207
TC6804AF
IC202
TC514800AJL-70
IC901
ZR38521
AC3 DECORDER
IC902
TC6803AF
AUDIO P-S
CONVERTER GA
IC904
TC9425F
AUDIO
SYSTEM DAC
IC209
TLC272CPS
IC906
NJM78L05A
IC909
TC7S32F
IC910
TC7S32F
IC511
TC7S00F
IC205
TC7SH04F
IC203
IC204
IC206
IC210
RM501
RM901
RNA4A8E103JT
RM201
X501
CCR33.86MC6
X901
EF0EC3305D4
L501
NLC322522T-1R0M
Not connect
DIGITAL OUTPUT
DGND
DOSEL
VCC5V
GND
AUDIO DIGITAL OUTPUT
AUDIO LCH OUTPUT 1
AUDIO RCH OUTPUT 1
AUDIO LCH OUTPUT 2
AUDIO RCH OUTPUT 2
C.V.OUT
C OUTPUT
S.V.OUT
TP527
RF DATA EQ OUT
REG+5V
7
8
9
10
11
12
A
B
C
D

IC902
TC6803AF

AUDIO P-S
CONVERTER GA

IC903
TC514800AJL-70

IC905 AK4321

IC307
TC6802AF

IC306
MB40950

IC303
BU61195FV

IC316
TC7SH04F

IC313
TC74HC4053AF-3

IC308
TC74HC4053AF

VIDEO/RGB SW2

TO CN801
EU02
POWER
SUPPLY
(PAGE3-18)

Not
connect

Not
connect

EX RGB IF

6-4. Main Circuit Diagram

Part name	Location	Part name	Location	Part name	Location	Part name	Location	Part name	Location	Part name	Location
C201	A-8	C310	H-7	C503	B-1	C564	E-2	C918	E-10	E242	A-11
C202	B-8	C311	G-7	C504	A-1	C570	A-4	C919	E-10	E243	A-11
C203	B-8	C312	G-7	C505	B-2	C572	A-5	C920	E-10	E244	A-11
C204	B-8	C313	G-7	C506	B-2	C573	A-5	C921	E-9	E245	A-11
C205	B-8	C314	G-7	C507	B-2	C574	A-5	C922	D-9	E301	F-12
C206	B-8	C315	G-7	C508	B-2	C575	A-4	C924	D-11	E302	F-12
C207	B-8	C316	H-5	C509	A-2	C576	A-5	C926	D-11	E303	F-12
C208	B-9	C317	G-5	C510	A-2	C577	B-5	C927	D-11	E305	F-12
C209	B-9	C318	G-5	C511	A-2	C578	B-4	C928	C-11	E306	F-12
C210	B-9	C319	H-7	C512	A-3	C579	B-5	C929	C-10	E307	F-12
C211	B-9	C320	D-5	C513	A-3	C580	B-5	C931	C-10	E308	F-12
C212	B-10	C321	D-4	C514	A-3	C581	B-5	C932	D-10	E309	F-12
C213	A-10	C323	E-6	C515	A-3	C582	B-5	C936	E-11	E310	F-12
C214	A-10	C324	E-6	C516	A-3	C583	B-5	C938	E-10	E311	F-12
C215	A-10	C325	D-6	C517	A-3	C584	B-5	C941	E-11	E312	F-12
C216	A-9	C326	D-6	C518	A-3	C585	B-5	C943	E-11	E313	G-12
C217	B-8	C327	D-6	C519	B-3	C586	B-5	C944	E-11	E314	G-12
C218	A-7	C328	C-6	C520	B-3	C588	B-6	C947	D-11	E316	G-12
C219	A-7	C329	C-5	C521	B-3	C591	B-6	C950	E-10	E318	G-12
C220	A-7	C330	C-5	C522	B-3	C592	A-6	C951	E-10	E320	G-12
C221	B-7	C331	E-5	C523	B-3	C594	A-5	C952	E-10	E321	G-12
C222	B-7	C332	E-6	C524	B-3	C595	A-5	C954	C-10	E322	G-12
C223	B-7	C333	E-5	C525	B-3	C597	A-5	C955	E-10	E323	G-12
C225	B-9	C334	E-5	C526	B-3	C598	A-5	C956	D-11	E324	G-12
C226	B-10	C335	H-9	C527	B-3	C599	A-5	CN301	F-12	E325	G-12
C227	A-10	C337	H-9	C528	B-3	C601	F-2	CN302	G-12	E326	G-12
C228	A-9	C338	G-9	C529	B-3	C603	G-2	CN501	A-1	E327	G-12
C232	A-7	C339	G-9	C530	B-3	C604	G-3	CN502	D-1	E328	G-12
C233	A-8	C340	G-9	C531	B-1	C605	G-3	CN503	E-1	E329	G-12
C234	A-7	C341	G-9	C532	C-2	C607	F-2	CN601	F-1	E330	D-7
C235	A-8	C342	F-10	C533	B-2	C609	H-2	CN602	G-1	E331	D-7
C236	B-7	C343	F-9	C534	C-2	C610	E-3	CN603	D-3	E332	D-7
C237	B-8	C344	E-9	C535	C-2	C611	E-3	CN801	E-11	E333	D-7
C238	B-7	C345	F-8	C536	B-2	C612	E-3	CN903	D-12	E334	E-7
C239	B-8	C346	F-8	C538	C-2	C613	G-4	D201	A-7	E335	E-7
C240	B-8	C347	H-7	C539	C-2	C614	H-4	D501	A-2	E336	E-7
C242	A-8	C348	G-7	C540	B-1	C615	F-1	D502	C-2	E337	E-7
C243	A-8	C353	F-11	C541	B-1	C616	G-1	D503	D-3	E338	F-6
C244	A-8	C354	F-11	C544	C-2	C617	G-1	E221	C-6	E339	F-6
C245	A-10	C359	G-11	C545	C-2	C618	G-1	E222	C-6	E340	F-6
C246	A-10	C360	G-11	C546	C-1	C619	G-1	E223	C-6	E341	H-6
C247	B-8	C361	G-11	C548	B-3	C901	C-8	E224	C-6	E342	H-6
C248	B-10	C362	G-11	C549	B-3	C902	C-8	E225	C-6	E343	H-6
C249	B-11	C363	H-11	C550	C-2	C903	D-7	E226	C-6	E344	H-6
C250	B-12	C364	H-11	C551	C-3	C904	E-7	E227	C-6	E345	H-6
C251	A-12	C366	G-11	C552	C-3	C905	E-8	E228	C-6	E346	H-6
C252	A-8	C367	G-11	C553	C-3	C906	E-8	E230	C-6	E347	H-6
C253	B-11	C371	E-12	C554	D-3	C907	D-8	E231	C-6	E348	H-6
C254	B-10	C373	E-12	C555	D-3	C908	D-7	E232	C-6	E349	H-6
C301	F-7	C378	F-12	C556	D-1	C909	D-8	E233	A-11	E350	E-6
C302	F-6	C380	H-7	C557	D-1	C910	E-11	E234	A-11	E351	E-6
C303	G-5	C381	H-7	C558	D-1	C911	E-11	E235	A-11	E352	E-6
C304	G-5	C401	A-4	C559	D-2	C912	E-10	E236	A-11	E353	E-6
C305	G-5	C402	A-4	C560	D-2	C913	E-10	E237	A-11	E354	E-6
C306	H-5	C403	A-4	C561	D-2	C914	E-10	E239	A-11	E355	E-6
C308	H-7	C501	A-2	C562	D-2	C915	E-10	E240	A-11	E356	E-6
C309	H-7	C502	A-2	C563	D-2	C916	E-10	E241	A-11	E357	E-6

Part name	Location
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L308	G-11
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L502	C-2
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L610	G-1
L901	D-10
L902	C-10
L903	D-11
L904	E-11
L905	C-7
L906	D-11
L907	D-11
Q202	A-8
Q301	G-10
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Q303	H-10
Q304	G-10
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Q309	F-11
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Q311	G-11
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Q314	H-11
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R240	A-12
R301	H-7
R302	H-7
R303	C-6
R304	C-5
R306	H-9
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R309	H-9
R310	H-9
R311	H-9
R312	B-8
R312	G-11
R313	F-11
R314	F-11
R315	H-7
R316	F-11
R317	C-5
R318	H-6
R319	H-6
R322	G-7
R323	G-7

Part name	Location	Part name	Location	Part name	Location	Part name	Location	Part name	Location	Part name	Location
R324	G-7	R405	A-5	R543	C-2	R606	F-1	R926	E-10	TP515	B-5
R325	F-11	R406	A-3	R544	C-1	R607	G-2	R927	E-11	TP516	B-5
R326	H-6	R407	A-2	R545	C-2	R608	F-2	R928	E-11	TP517	B-5
R327	F-11	R408	A-6	R546	C-2	R609	F-3	R929	E-11	TP518	B-5
R328	F-11	R409	A-6	R547	C-2	R610	F-2	R930	E-11	TP519	A-6
R330	G-11	R410	B-1	R548	C-2	R611	F-2	R938	D-10	TP520	A-6
R332	E-11	R411	C-1	R549	C-2	R612	G-2	R939	E-9	TP521	A-6
R333	E-11	R412	C-5	R551	C-2	R613	F-2	R954	D-11	TP522	A-6
R334	E-12	R413	D-6	R552	C-3	R616	F-2	RM201	A-12	TP525	A-5
R335	G-10	R414	H-7	R553	B-3	R617	H-2	RM301	D-5	TP527	A-3
R336	H-10	R415	F-3	R554	B-3	R619	E-3	RM302	D-4	TP527	B-6
R337	H-10	R416	D-6	R555	C-3	R620	E-3	RM303	D-4	TP528	A-2
R338	G-9	R420	G-9	R556	B-3	R621	E-3	RM304	D-5	TP529	B-6
R339	G-9	R421	E-11	R557	B-3	R622	E-3	RM501	B-6	TP530	B-6
R340	H-10	R422	E-12	R558	C-3	R623	E-3	RM601	H-4	TP537	A-5
R341	G-11	R423	E-12	R559	C-3	R624	E-3	RM901	D-9	TP538	A-5
R343	G-11	R424	E-12	R560	C-3	R625	G-3	RM902	F-11	TP539	A-5
R344	G-11	R501	A-1	R561	D-3	R626	G-3	RM903	D-9	TP540	A-5
R345	G-10	R502	A-3	R562	D-3	R627	E-2	RN1401	A-4	TP541	A-5
R346	G-10	R503	A-2	R563	D-3	R628	G-2	S1	E-11	TP542	A-5
R347	G-11	R504	A-2	R565	D-2	R629	F-2	S601	E-2	TP560	A-6
R349	G-11	R505	B-2	R566	D-2	R630	E-3	S602	H-2	TP561	A-5
R350	H-11	R506	B-2	R567	D-2	R632	F-2	TP201	A-10	TP562	A-6
R351	H-11	R507	A-2	R568	D-2	R633	F-2	TP202	A-9	TP563	A-3
R352	H-11	R508	A-3	R569	D-3	R636	F-3	TP203	A-9	TP564	D-3
R354	H-11	R509	A-3	R570	E-1	R638	F-3	TP204	A-9	TP570	A-1
R355	H-11	R510	A-3	R571	E-1	R639	F-3	TP205	A-9	TP901	C-8
R356	H-11	R511	A-3	R572	A-4	R640	F-2	TP206	A-9	TP902	C-8
R357	H-10	R512	A-3	R573	A-4	R641	G-1	TP207	A-8	TP902	D-8
R361	G-11	R513	C-3	R574	A-4	R642	G-1	TP208	A-8	TP903	D-8
R364	G-11	R514	C-3	R575	A-4	R643	G-1	TP209	A-8	TP904	D-8
R365	H-11	R515	B-3	R576	B-4	R644	G-3	TP211	A-8	TP905	D-8
R368	H-12	R516	B-3	R577	A-4	R645	G-1	TP212	A-10	TP906	D-7
R369	H-11	R517	B-3	R578	A-5	R901	D-11	TP213	A-10	TP907	D-7
R370	H-11	R518	B-3	R579	A-5	R902	D-9	TP214	A-10	TP908	D-7
R371	H-11	R519	B-2	R580	A-5	R902	D-10	TP301	H-7	TP909	E-7
R372	H-12	R520	B-2	R581	A-5	R903	D-11	TP302	H-6	TP910	E-7
R373	G-11	R521	B-2	R582	A-5	R905	D-11	TP303	G-7	TP911	D-7
R374	G-11	R522	B-6	R583	B-5	R906	D-11	TP304	G-7	TP912	D-7
R375	G-11	R525	C-3	R584	B-5	R907	D-11	TP305	H-6	TP913	D-8
R376	H-11	R526	C-2	R585	B-5	R908	D-11	TP307	G-11	TP914	C-7
R378	G-7	R527	D-2	R586	B-5	R909	D-11	TP308	G-11	TP915	C-7
R379	H-7	R528	D-2	R587	B-5	R910	D-11	TP309	H-11	TP916	D-11
R380	H-7	R529	B-2	R588	B-5	R911	D-9	TP501	A-3	TP917	D-11
R381	G-7	R530	B-2	R589	B-5	R912	C-9	TP502	A-3	TR523	A-6
R382	G-7	R531	C-2	R590	B-5	R913	E-10	TP503	A-4	TR524	A-6
R383	G-7	R532	B-2	R591	B-6	R915	E-10	TP504	A-4	VR502	A-2
R384	G-8	R533	C-2	R592	B-6	R916	E-10	TP505	A-4	VR503	A-3
R385	H-8	R534	A-2	R593	A-4	R917	E-10	TP506	B-4	VR504	A-3
R387	E-12	R535	A-3	R594	A-4	R918	E-10	TP507	B-4	X301	H-7
R388	E-12	R536	C-2	R595	B-4	R919	E-10	TP508	B-5	X501	B-6
R389	F-12	R537	C-2	R596	C-3	R920	E-10	TP509	B-5	X601	G-2
R393	H-10	R538	C-2	R601	F-2	R921	D-9	TP510	B-5	X901	C-7
R396	H-10	R539	C-2	R602	G-2	R922	D-7	TP511	B-5		
R397	H-10	R540	C-2	R603	G-2	R923	E-11	TP512	B-5		
R398	G-10	R541	C-2	R604	G-2	R924	E-11	TP513	B-5		
R399	H-6	R542	C-2	R605	H-5	R925	E-11	TP514	B-5		

MAIN PC BOARD ICs INFORMATION

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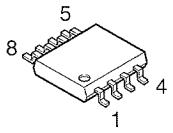

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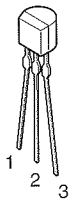

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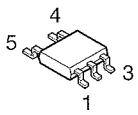

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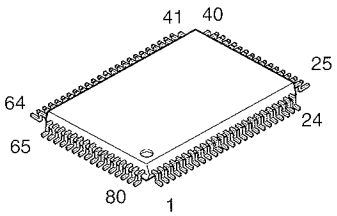

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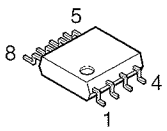

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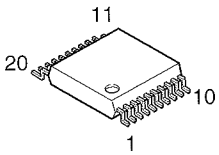

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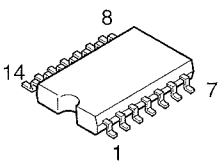

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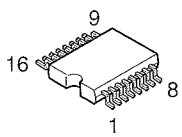

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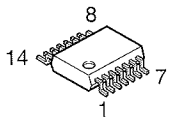

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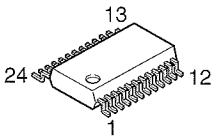

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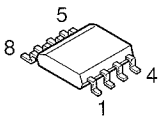

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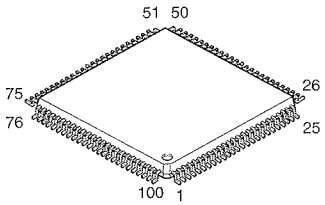

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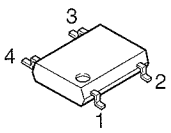

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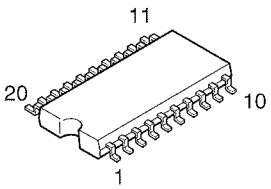

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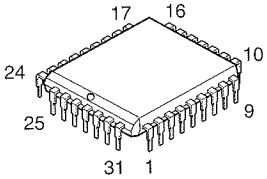

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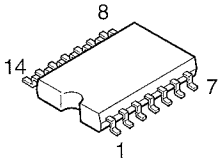

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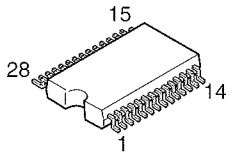

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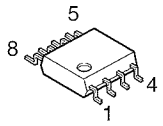

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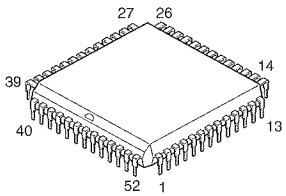
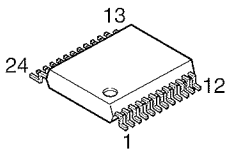


AK4321-VF



BA6791FP

Pin No.	Name	Function
1	O1N	Driver CH1 negative output
2	O1P	Driver CH1 positive output
3	IM1	Driver CH1 input
4	IN1	Input for driver CH1 gain adjustment
5	RE-B	For the base of external transistor
6	RE-O	Constant-voltage output (for the collector of external tansistor)
7	MUT	Mute control
8	GND	Ground
9	IN2–	Input for driver CH2 gain adjustment
10	IN2	Driver CH2 input
11	O2P	Driver CH2 positive output
12	O2N	Driver CH2 negative output
13	GND	Substraight ground
14	OPO	OP amp. output
15	CP–	OP amp. negative input
16	CP+	OP amp. positive input
17	O3N	Driver CH3 negative output
18	O3P	Driver CH3 positive output
19	IN3	Driver CH3 input
20	IN3–	Input for Driver CH3 gain adjustment
21	V_{CC}	V_{CC}
22	V_{CC}	V_{CC}
23	BIN	Bias amplifier input
24	IN4–	Input for driver CH4 gain adjustment
25	IN4	Driver CH4 input
26	O4P	Driver CH4 positive output
27	O4N	Driver CH4 negative output
28	GND	Substraight ground

BA6844FP

Pin No.	Name	Function
1	N.C.	No connection
2	W	Output
3	N.C	No connection
4	V	Output
5	N.C.	No connection
6	U	Output
7	N.C.	No connection
8	GND	Ground
9	U+	Hole signal input
10	U–	Hole signal input
11	V+	Hole signal input
12	V–	Hole signal input
13	W+	Hole signal input
14	W–	Hole signal input
15	V_H	Hole bias
16	N.C.	No connection
17	C_{NF}	Phase compensation capacitor connecting
18	N.C.	No connection
19	N.C.	No connection
20	FR	Rotation detection
21	E_{CR}	Output voltage control reference
22	E_C	Output voltage control
23	PS	Power save
24	FG	FG signal output
25	V_{CC}	Power supply (output resistor connecting)
26	V_M	Power supply (for motor)
27	N.C.	No connection
28	R_{NF}	Resistor connection for output current detection

MB40950PFQ

Pin No.	Name	Function
1	CLKR	R channel clock signal input
2	CLKG	G channel clock signal input
3	CLKB	B channel clock signal input
4	R1	R channel data signal input, MSB
5	R2	R channel data signal input
6	R3	R channel data signal input
7	R4	R channel data signal input
8	R5	R channel data signal input
9	R6	R channel data signal input
10	R7	R channel data signal input
11	R8	R channel data signal input
12	R9	R channel data signal input
13	R10	R channel data signal input, LSB
14	G1	G channel data signal input, MSB
15	G2	G channel data signal input
16	G3	G channel data signal input
17	G4	G channel data signal input
18	G5	G channel data signal input
19	G6	G channel data signal input
20	G7	G channel data signal input
21	G8	G channel data signal input
22	G9	G channel data signal input
23	G10	G channel data signal input, LSB
24	B1	B channel data signal input, MSB
25	B2	B channel data signal input
26	B3	B channel data signal input
27	B4	B channel data signal input
28	B5	B channel data signal input
29	B6	B channel data signal input
30	B7	B channel data signal input
31	B8	B channel data signal input
32	B9	B channel data signal input
33	B10	B channel data signal input, LSB
34	V_{CCD}	Digital power supply (+5V)
35	COMP	Phase compensation capacitor
36	VR1	Reference voltage output terminal 1
37	VRIN	Reference voltage input terminal
38	VR2	Reference voltage output terminal 2
39	AGND	Analog Ground (0V)
40	BOUT	B channel analog signal output
41	V_{CCA}	Analog power supply (+5V)
42	AGND	Analog Ground (0V)
43	GOUT	G channel analog signal output
44	V_{CCA}	Analog power supply (+5V)
45	AGND	Analog Ground (0V)
46	ROUT	R channel analog signal output
47	V_{CCA}	Analog power supply
48	DGND	Digital ground (0V)

TC59S1616AFT-10

Pin No.	Name	Function
1	V_{CC}	Power supply (+3.3V)
2	DQ0	Data I/O
3	DQ1	Data I/O
4	V_{SSQ}	Ground (for I/O buffer)
5	DQ2	Data I/O
6	DQ3	Data I/O
7	V_{CCQ}	Power supply (+3.3V) (for I/O buffer)
8	DQ4	Data I/O
9	DQ5	Data I/O
10	V_{SSQ}	Ground (for I/O buffer)
11	DQ6	Data I/O
12	DQ7	Data I/O
13	V_{CCQ}	Power supply (+3.3V) (for I/O buffer)
14	LDQM	Output disable/Write mask
15	WEX	Write enable
16	CASX	Column address strobe
17	RASX	Row address strobe
18	CSX	Chip selection
19	BS	Bank selection
20	A10	Address
21	A0	Address
22	A1	Address
23	A2	Address
24	A3	Address
25	V_{CC}	Power supply (+3.3V)
26	V_{SS}	Ground
27	A4	Address
28	A5	Address
29	A6	Address
30	A7	Address
31	A8	Address
32	A9	Address
33	N.C.	No connection
34	CKE	Clock enable
35	CLK	Clock inputs
36	UDQM	Output disable/Write mask
37	N.C.	No connection
38	V_{CCQ}	Power supply (+3.3V) (for I/O buffer)
39	DQ8	Data I/O
40	DQ9	Data I/O
41	V_{SSQ}	Ground (for I/O buffer)
42	DQ10	Data I/O
43	DQ11	Data I/O
44	V_{CCQ}	Power (+3.3V) (for I/O buffer)
45	DQ12	Data I/O
46	DQ13	Data I/O
47	VSSQ	Ground (for I/O buffer)
48	DQ14	Data I/O
49	DQ15	Data I/O
50	V_{SS}	Ground

TC511664BJL-80

Pin No.	Name	Function
1	V_{CC}	Power supply (+5V)
2	I/O1	Data I/O
3	I/O2	Data I/O
4	I/O3	Data I/O
5	I/O4	Data I/O
6	I/O5	Data I/O
7	I/O6	Data I/O
8	I/O7	Data I/O
9	I/O8	Data I/O
10	N.C.	No connection
11	V_{CC}	Power supply (+5V)
12	UW	Upper byte Write enable
13	LW	Lower byte Write enable
14	RAS	Row address strobe
15	A0	Address input
16	A1	Address input
17	A2	Address input
18	A3	Address input
19	A4	Address input
20	V_{CC}	Power supply (+5V)
21	V_{SS}	Ground
22	A5	Address input
23	A6	Address input
24	A7	Address input
25	N.C.	No connection
26	N.C.	No connection
27	N.C.	No connection
28	OE	Output enable
29	CAS	Column address storobe
30	V_{SS}	Ground
31	N.C.	No connection
32	I/O9	Data I/O
33	I/O10	Data I/O
34	I/O11	Data I/O
35	I/O12	Data I/O
36	I/O13	Data I/O
37	I/O14	Data I/O
38	I/O15	Data I/O
39	I/O16	Data I/O
40	V_{SS}	Ground

TC514800AJL-70

Pin No.	Name	Function
1	V_{CC}	Power supply (+5V)
2	MDAT0	Data I/O
3	MADT1	Data I/O
4	MADT2	Data I/O
5	MADT3	Data I/O
6	N.C.	No connection
7	XMWRITE	Write enable
8	XMRAS	Row address strobe
9	MADD9	Address input
10	MADD0	Address input
11	MADD1	Address input
12	MADD2	Address input
13	MADD3	Address input
14	V_{CC}	Power supply (+5V)
15	V_{SS}	Ground
16	MADD4	Address input
17	MADD5	Address input
18	MADD6	Address input
19	MADD7	Address input
20	MADD8	Address input
21	N.C.	No connection
22	XMOE	Output enable
23	XMCAS	Column address storobe
24	MDAT4	Address input
25	MDAT5	Address input
26	MDAT6	Address input
27	MDAT7	Address input
28	V_{SS}	Ground

TC9425F

Pin No.	Name	Function
1	IFS	Microcomputer I/F shift clock input
2	IFD	Microcomputer I/F data input
3	IFL	Microcomputer I/F latch pulse input
4	RSTX	Reset signal input (L: reset)
5	MUTE	Mute signal input (H: mute on)
6	P/S	Parallel (H)/Serial (L) mode switching
7	CHST	The number of DIT channel status input bit setting
8	GND	Digital ground
9	LRCKO	LR clock output
10	BCKO	Bit clock output
11	SDO	Data output
12	LRCKI	LR clock input
13	BCKI	Bit clock input
14	SDI	Data input
15	DSEL	Direct connection setting
16	V_{DD}	Digital power supply 1
17	DO	Digital Out output
18	FR32	FR32 output
19	BLOCK	BLOCK top position output
20	IS1	Digital Out input mode setting 1
21	IS2	Digital Out input mode setting 2
22	VLDY	Compensation flag (validity) input
23	OINH	Digital Out prohibit setting
24	MCKO	Clock output (256fs)
25	GNDX	Oscillation circuit gound
26	XO	Oscillation circuit output
27	XI	Oscillation circuit input
28	AMPO	Ampifier output (for loop filter)
29	AMPI	Ampifier input (for loop filter)
30	PDO	Phase comparator output
31	XV_{DD}	Power supply (for oscillation circuit)
32	M/S	Clock selection (master:H/slave:L)
33	CKI24	Reference clock input (24kHz)
34	RZ	R ch zero detection output
35	V_{DDA}	R ch analog power supply
36	R_{OUT}	R ch analog output
37	GND	R ch analog ground
38	V_{REF}	Reference voltage output
39	GND	L ch analog ground
40	L_{OUT}	L ch analog output
41	V_{DDA}	L ch analog power supply
42	LZ	L ch zero detection output
43	T1	Test terminal 1 (usual "L")
44	T2	Test terminal 2 (usual "L")
45	V_{DD}	Digital power supply 2

Pin No.	Name	Function
46	RLS	LR clock polarity switching ("L": SONY mode/"H":TOSHIBA mode)
47	IFSEL	Switching of input signal, reference clock, DIT output, and EMP input (L:CD/H:DVD)
48	LRCK	LR clock input (44.1kHz)
49	BCK	Bit clock input
50	AIN	Data input
51	EMPI	De-emphasis setting (H: de-emphasis filter (44.1kHz) ON)
52	DI	Digital Out (CD) input
53	GND	Digital ground 2
54	SDIO0	AC-3 decode/linear PCM data input
55	LRCKO1	LR clock output (48k)
56	BCKO1	Bit clock output (64fs)
57	SDIO1	AC-3 Bit stream (compressed signal) input
58	EMPI1	AC-3 de-emphasis switching input
59	V_{DD}	3V system power supply (for TC9424F data I/F)
60	V_{DD}	3V system power supply (for microcomputer I/F)

TC90A09F

Pin No.	Name	Function
1	V_{DD}	3.3V system digital power supply
2	SDREQ	Packet data request
3	ADACK	Packet data acknowledgement
4	SDERR	Packet data error bit
5	SDCLK	Packet data synchronous clock
6	STCCK90	System time clock
7	V_{SS}	Digital ground
8	ADAT7	Stream data output/test data input
9	ADAT6	Stream data output/test data input
10	ADAT5	Stream data output/test data input
11	ADAT4	Stream data output/test data input
12	ADAT3	Stream data output/test data input
13	ADAT2	Stream data output/test data input
14	ADAT1	Stream data output/test data input
15	ADAT0	Stream data output/test data input
16	V_{DD}	3.3V system digital power supply
17	V_{SS}	Digital ground
18	DGATE	Stream data enable signal output
19	AORB	Stream data identification signal output
20	BSCK	Stream transfer synchronous signal output
21	BUFLLA	Stream A buffer full identification signal input
22	BUFLLB	Stream B buffer full identification signal input
23	CRCER-ROR	Audio error signal output
24	V_{DD}	3.3V system digital power supply
25	CLK24KO	Clock output (for audio DAC)
26	AI7	Main MPU address (address bus) signal input
27	AI6	Main MPU address (address bus) signal input
28	AI5	Main MPU address (address bus) signal input
29	AI4	Main MPU address (address bus) signal input
30	AI3	Main MPU address (address bus) signal input
31	AI2	Main MPU address (address bus) signal input
32	AI1	Main MPU address (address bus) signal input
33	AI0	Main MPU address (address bus) signal input
34	WAITMPU	Main MPU wait
35	PCKSTRB	Packet data strobe signal
36	SINTX	Sub video processor interruption output
37	CS2	Main MPU chip selection (L: selection)
38	RDX	Main MPU Read strobe signal input
39	WRX	Main MPU Write strobe signal input
40	V_{DD5V}	5V system digital power supply
41	V_{SS}	Digital ground
42	AD7	Main MPU data (data bus) signal I/O
43	AD6	Main MPU data (data bus) signal I/O
44	AD5	Main MPU data (data bus) signal I/O
45	AD4	Main MPU data (data bus) signal I/O
46	AD3	Main MPU data (data bus) signal I/O
47	AD2	Main MPU data (data bus) signal I/O
48	AD1	Main MPU data (data bus) signal I/O
49	AD0	Main MPU data (data bus) signal I/O
50	V_{SS}	Digital ground

Pin No.	Name	Function
51	V_{DD}	3.3V system digital power supply
52	RAS	D-RAM RAS signal output
53	CAS	D-RAM CAS signal output
54	WE	D-RAM Write enable signal output
55	MA7	D-RAM address bus output
56	MA6	D-RAM address bus output
57	MA5	D-RAM address bus output
58	MA4	D-RAM address bus output
59	MA3	D-RAM address bus output
60	MA2	D-RAM address bus output
61	MA1	D-RAM address bus output
62	MA0	D-RAM address bus output
63	V_{DD5V}	5V system digital power supply
64	V_{SS}	Digital ground
65	DQ0	D-RAM data bus
66	DQ1	D-RAM data bus
67	DQ2	D-RAM data bus
68	DQ3	D-RAM data bus
69	DQ4	D-RAM data bus
70	DQ5	D-RAM data bus
71	DQ6	D-RAM data bus
72	DQ7	D-RAM data bus
73	V_{DD3}	3.3V system digital power supply
74	V_{SS}	Digital ground
75	DQ8	D-RAM data bus
76	DQ9	D-RAM data bus
77	DQ10	D-RAM data bus
78	DQ11	D-RAM data bus
79	DQ12	D-RAM data bus
80	DQ13	D-RAM data bus
81	DQ14	D-RAM data bus
82	DQ15	D-RAM data bus
83	DOTCK	Display clock (13.5MHz) for OSD
84	CSYNCO	Composite synchronous output (for NTSC)
85	VSYNCO	Synchronous signal output (for Audio/OSD), STC synchronous signal for audio processor/vertical synchronous signal output for OSD
86	HSYNCO	Hrizontal synchronous signal output for OSD
87	OSDIN0	Palette signal for OSD
88	OSDIN1	Palette signal for OSD
89	OSDIN2	Palette signal for OSD
90	OSDIN3	Palette signal for OSD
91	V_{SS}	Digital ground
92	MCK27	System clock output (27MHz)
93	V_{DD5V}	5V system power supply
94	DYCO7	Digital Y/Cb/Cr signal output (8 bit)
95	DYCO6	Digital Y/Cb/Cr signal output (8 bit)
96	DYCO5	Digital Y/Cb/Cr signal output (8 bit)

Pin No.	Name	Function
97	DYCO4	Digital Y/Cb/Cr signal output (8 bit)
98	DYCO3	Digital Y/Cb/Cr signal output (8 bit)
99	DYCO2	Digital Y/Cb/Cr signal output (8 bit)
100	DYCO1	Digital Y/Cb/Cr signal output (8 bit)
101	DYCO0	Digital Y/Cb/Cr signal output (8 bit)
102	RSTX	System clear (internal circuit reset signal input)
103	VDD5V	5V system digital power supply
104	V_{SS}	Digital ground
105	V_{DD}	3.3V system digital power supply
106	X1	X'tal input
107	X1N	X'tal output
108	V_{SS}	Digital ground
109	TST0	For test
110	TST1	For test
111	V_{REF}	Reference voltage input for DAC
112	BIAS1	Bias stabilized for DAC
113	BIAS2	Bias stabilized for DAC
114	AGND	DAC ground
115	CbOUT	Analog color difference (Cb) output
116	AV_{CC}	DAC power supply (3.3V)
117	CrOUT	Analog color difference (Cr) output
118	AGND	DAC ground
119	N.C.	No connection
120	AV_{CC}	DAC power supply (3.3V)
121	V_{SS}	Digital ground
122	VSYNCI	Vertical synchronous signal input
123	VBLANK	Video blanking signal input
124	HSYNCI	Horizontal synchronous signal input
125	V_{DD}	3.3V system digital power supply
126	YCI0	Y/Cb/Cr video data input(8 bit)
127	YCI1	Y/Cb/Cr video data input(8 bit)
128	YCI2	Y/Cb/Cr video data input(8 bit)
129	YCI3	Y/Cb/Cr video data input(8 bit)
130	YCI4	Y/Cb/Cr video data input(8 bit)
131	YCI5	Y/Cb/Cr video data input(8 bit)
132	YCI6	Y/Cb/Cr video data input(8 bit)
133	YCI7	Y/Cb/Cr video data input(8 bit)
134	V_{SS}	Digital ground
135	V_{DD}	3.3V system digital power supply
136	SDAT0	Packet data input (data bus)
137	SDAT1	Packet data input (data bus)
138	SDAT2	Packet data input (data bus)
139	SDAT3	Packet data input (data bus)
140	SDAT4	Packet data input (data bus)
141	SDAT5	Packet data input (data bus)
142	SDAT6	Packet data input (data bus)
143	SDAT7	Packet data input (data bus)
144	V_{SS}	Digital ground

Pin No.	Name	Function
1	TEST0	For test mode
2	/HSO	Playback speed mode flag output
3	/UHSO	Playback speed mode flag output
4	EMPH	Emphasis flag output of sub-code Q data(H: emphasis ON, L: emphasis OFF)
5	LRCK	Channel clock (44.1kHz) output
6	V_{SS}	Digital ground
7	BCK	Bit clock (1.4122MHz) output
8	AOUT	Audio data output
9	DOUT	Digital Out output
10	MBOV	Buffer memory over signal output
11	IPF	Compensation flag output
12	SBOK	CRCC judging result output of sub-code Q data (result OK: H)
13	CLCK	Clock I/O (for sub-code P to W data reading)
14	V_{DD}	Digital + power supply
15	V_{SS}	Digital ground
16	DATA	Sub-code P to W data output
17	SFSY	Playback system frame synchronous signal output or Servo system internal register data Read clock output
18	SBSY	Sub-code block synchronous output or Servo system internal register data latch pulse output
19	SPCK	Processor status signal Read clock (176.4kHz) output
20	SPDA	Processor status signal output
21	COFS	Correction system frame clock (7.35kHz) output
22	MONIT	LSI internal signal monitor output
23	V_{DD}	Digital + power supply
24	TESIO0	Test I/O
25	$P2V_{REF}$	2VREF terminal for PLL system
26	SPDO	VCO center frequency shift output
27	POOS	Phase difference signal output between EFM signal and PLCK signal (at 8 times speed operation)
28	PDO	Phase difference signal output between EFM signal and PLCK signal
29	TMAXS	TMAX detection result output
30	TMAX	TMAX detection result output
31	LPFN	Amplifier (for low pass filter) inverting input
32	LPFO	Amplifier (for low pass filter) output
33	PV_{REF}	VREF terminal for PLL system
34	VCO_{REF}	VCO center frequency reference level
35	VCOF	Filter terminal for VCO
36	AV_{SS}	Analog system ground
37	SLCO	Data slice level making DAC output
38	RFI	RF signal input
39	AV_{DD}	Analog system power supply
40	RFCT	RFRP signal center level input
41	RFZI	RFRP zero cross input
42	RFRP	RF ripple signal input
43	FEI	Focus error signal input

Pin No.	Name	Function
44	SBAD	Sub-beam addition signal input
45	TSIN	Input terminal (in case of tracking off mode)
46	TEI	Tracking error input
47	TEZI	Input for tracking error, zero cross
48	FOO	Focus equalizer output
49	TRO	Tracking equalizer output
50	V_{REF}	Analog reference power supply
51	RFGC	RF amplitude adjustment control signal output
52	TEBC	Tracking balance control signal output
53	FMO	Feed equalizer output
54	FVO	Speed error signal or feed search EQ output
55	DMO	Disc equalizer output
56	$2V_{REF}$	Analog reference power supply (2X V_{REF})
57	SEL	APC circuit ON/OFF signal output
58	FLGA	External flag output (for monitoring internal signal)
59	FLGB	External flag output (for monitoring internal signal)
60	FLGC	External flag output (for monitoring internal signal)
61	FLGD	External flag output (for monitoring internal signal)
62	V_{DD}	Digital + power supply
63	V_{SS}	Digital ground
64	IO0 (FMOP)	Wide use I/O port
65	IO1 (FMON)	Wide use I/O port
66	IO2 (DMOP)	Wide use I/O port
67	IO3 (DMON)	Wide use I/O port
68	/DMOUT	Mode setting to output binary PWM signals of field equalizer from IO0 and IO1 terminals and of disc equalizer from IO2 and IO3 terminals
69	/CKSE	X'tal selection
70	/DACT	DAC test mode
71	TESIN	Test input (external VCO clock input)
72	TESIO1	Test I/O
73	V_{SS}	Digital ground
74	PXI	DPS system clock oscillation circuit input
75	PXO	DPS system clock oscillation circuit output
76	V_{DD}	Digital + power supply
77	XV_{SS}	Ground for system clock oscillation circuit
78	XI	System clock oscillation circuit input
79	XO	System clock oscillation circuit output
80	XV_{DD}	+ power supply for system clock oscillation circuit
81	DVDO	D/A converting section power supply
82	RO	R channel data forward rotation output
83	DV_{SS}	D/A converting section ground

Pin No.	Name	Function
84	DVR	D/A converting section reference voltage
85	LO	L channel data forward rotation output
86	DV_{DD}	D/A converting section power supply
87	TEST1	Test mode terminal
88	TEST2	Test mode terminal
89	TEST3	Test mode terminal
90	BUS0	Data I/O (for microcomputer interface)
91	BUS1	Data I/O (for microcomputer interface)
92	BUS2	Data I/O (for microcomputer interface)
93	BUS3	Data I/O (for microcomputer interface)
94	V_{DD}	Digital + power supply
95	V_{SS}	Digital ground
96	BUCK	Clock input for microcomputer interface
97	/CCE	Chip enable signal input for microcomputer interface
98	TEST4	Test mode terminal
99	/TSMOD	Local test mode selection
100	/RST	Reset signal input

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Pin No.	Name	Function
1	TEB	Control input to change sub beam subtraction ratio at 3-beam system tracking error (TE) generation
2	SBI	Inverting input for sub-beam summing amplifier
3	SBAD	Sub-beam summing amplifier output
4	3BTE	3 beam TE signal intermediate output
5	3BIN	Amplifier inverting input for 3 beam TE level adjustment
6	3BO	Amplifier output for 3 beam TE level adjustment
7	N.C.	No connection
8	TE1B	DPD system TE signal input
9	GNDSV	Servo system ground
10	RFB	RF ripple detector
11	DETR	RF ripple detector
12	RFP	RF ripple detector
13	V_{CCD}	Power supply
14	ADJF	Filter external capacitor for DVD-EQ time constant compensation
15	MCK	Clock input for DVD-EQ time constant compensation
16	GNDD2	Ground
17	2CVR	Reference voltage smoothing external capacitor
18	2VR	Reference voltage twice output
19	CVR	Reference voltage smoothing external capacitor
20	V_{REF}	Reference voltage output
21	TEO	TE output after switching DPD/3B
22	N.C.	No connection
23	RFDEQ	Pre filter output for RF
24	N.C.	No connection
25	EQGD	Group delay characteristic control input for DVD-EQ
26	FEI	Inverting input for focus error(FE) signal output amplifier
27	FEO	FE output
28	3TF	Filter external capacitor to DVD-WV detecting signal
29	RFZC	Amplitude center voltage output of RF ripple signal
30	RFRP	RF ripple signal output
31	RPF	Filter external capacitor for RFRP signal
32	GNDRF	RF system ground
33	RPSW	Control input when selecting DVD-WV detecting signal for RFRP
34	SFSD	EQ output for DVD
35	RFZB	RFRP center level detection
36	RFZP	RFRP center level detection
37	V_{CC3}	Power supply for reference voltage
38	1B3B	Control input to select DPD or 3B for TE signal
39	RFCD	EQ output for CD
40	CD	Frequency adjustment input for CD-EQ curve
41	TIME	Frequency adjustment input for DVD-EQ curve
42	CDF	Peak gain adjustment input for CD-EQ curve
43	FREQ	DVD-EQ curve peak gain adjustment input
44	HSB	Normal /four times linear speed selecting input for CD-EQ
45	EQI	DVD/CD-EQ input
46	EQO	VCA passing Output for RFN and RFP
47	CD/SD	Selection control input for DVD/CD
48	RFG	Control input for RF signal VCA
49	V_{CCRF}	RF system power supply
50	MDI	Monitoring input for laser diode APC
51	LDC	ON/OFF control input for LD
52	LDO	External current driver control output for LD
53	LDP	Selection input for APC control polarity
54	RFP	RF signal non-inverting input from PU
55	RFN	RF signal inverting input from PU
56	V_{CC5V}	Servo system power supply
57	AI	Main beam four divisions detector A input for making focus error(FE)
58	BI	Main beam four divisions detector B input for making FE
59	CI	Main beam four divisions detector C input for making FE
60	DI	Main beam four divisions detector D input for making FE
61	V_{IRF}	2.1V reference voltage input
62	TNI	Sub-beam E input
63	TPI	Sub-beam F input
64	DBL	Single/double layer system selection input

TC6803AF

Pin No.	Name	Function
1	V_{DD5}	5V system power supply
2	A0	External memory address bus
3	A1	External memory address bus
4	A2	External memory address bus
5	A3	External memory address bus
6	A4	External memory address bus
7	A5	External memory address bus
8	V_{SS}	Ground
9	A6	External memory address bus
10	A7	External memory address bus
11	A8	External memory address bus
12	A9	External memory address bus
13	A10	External memory address bus
14	A11	External memory address bus
15	V_{DD5}	5V system power supply
16	A14	External memory address bus
17	A12	External memory address bus
18	A13	External memory address bus
19	OE	External memory output enable
20	R/W	External memory READ/WRITE control
21	V_{SS}	Ground
22	27MHz	Master clock (27MHz)
23	V_{DD5}	5V system power supply
24	V_{DD3}	3.3V system power supply
25	I/O1	External memory data bus
26	I/O2	External memory data bus
27	I/O3	External memory data bus
28	I/O4	External memory data bus
29	I/O5	External memory data bus
30	I/O6	External memory data bus
31	V_{SS}	Ground
32	I/O7	External memory data bus
33	I/O8	External memory data bus
34	TEST1	Test mode setting
35	CS	Data transfer to internal register
36	MCK	Data latch signal
37	MDAT	Transfer data (flag set) to internal register
38	V_{SS}	Ground
39	SCKA	Data transfer clock for ZR38521
40	RESET	System reset
41	GPIO0	Buffer control signal (from ZR38521) and memory selection
42	FSA	Frame synchronous signal for ZR38521
43	GPI5	Flag transfer to ZR38521
44	SDA	Transfer data to ZR38521
45	V_{DD5}	5V system power supply

Pin No.	Name	Function
45	V_{DD5}	5V system power supply
46	V_{SS}	Ground
47	ACCLK	Audio packet transfer synchronous clock(1.35MHz)
48	DGATE	Data gate signal
49	ACDT7	Audio packet data
50	ACDT6	Audio packet data
51	ACDT5	Audio packet data
52	ACDT4	Audio packet data
53	V_{DD3}	3.3V system power supply
54	ACDT3	Audio packet data
55	ACDT2	Audio packet data
56	ACDT1	Audio packet data
57	ACDT0	Audio packet data
58	ACDERR	Audio packet data error flag
59	BUFUL	Audio buffer control signal
60	V_{SS}	Ground

TC6802AF

Pin No.	Name	Function
1	ADX5	Host interface address bus input
2	ADX6	Host interface address bus input
3	ADX7	Host interface address bus input
4	GND	Ground
5	WRX	Write enable (L level active) input
6	CS2	Chip selection (L level active) input
7	V_{CC5}	5V system power supply
8	TST0	Test mode setting input
9	TST1	Test mode setting input
10	RSTX	System reset (L level active) input
11	V_{CC3}	3.3V system power supply
12	WAITMPU	Test output
13	SINTX	Test output
14	DGATE	Test output
15	GND	Ground
16	MCK270	Data transfer clock (27MHz) output to D/A converter
17	V_{CC5}	5V system power supply
18	ODDFLD	Line field identification output signal output
19	ADT2	Test output
20	ADT3	Test output
21	CRCERR	Test output
22	V_{CC3}	3.3V system power suuply
23	CSYNCO	Composite synchronous signal output
24	VSYNCO	Vertical synchronous signal output
25	AGCOX	AGC compensation circuit control signal output
26	GND	Ground
27	DCV9	Digital composite video output
28	DCV8	Digital composite video output
29	DCV7	Digital composite video output
30	DCV6	Digital composite video output
31	GND	Ground
32	DCV5	Digital composite video output
33	DCV4	Digital composite video output
34	DCV3	Digital composite video output
35	VCC5	5V system power supply
36	DCV2	Digital composite video output
37	DCV1	Digital composite video output
38	DCV0	Digital composite video output
39	DC9	Digital color output
40	GND	Ground
41	V_{CC5}	5V system power supply
42	DC8	Digital color output
43	DC7	Digital color output
44	DC6	Digital color output
45	DC5	Digital color output
46	V_{CC3}	3.3V system power supply
47	DC4	Digital color output
48	DC3	Digital color output
49	DC2	Digital color output
50	GND	Ground

Pin No.	Name	Function
51	DC1	Digital color output
52	DC0	Digital color output
53	GND	Ground
54	DY9	Digital luminance output
55	DY8	Digital luminance output
56	DY7	Digital luminance output
57	DY6	Digital luminance output
58	V_{CC5}	5V system power supply
59	DY5	Digital luminance output
60	DY4	Digital luminance output
61	DY3	Digital luminance output
62	DY2	Digital luminance output
63	V_{CC3}	3.3V system power supply
64	DY1	Digital luminance output
65	DY0	Digital luminance output
66	GND	Ground
67	HSYNCI	Test mode setting input
68	V_{CC3}	3.3V system power supply
69	MCONCLI	Test mode setting input
70	X1I	Master clock (27MHz) input
71	V_{CC5}	5V system power supply
72	YCI0	Digital video signal input
73	YCI1	Digital video signal input
74	YCI2	Digital video signal input
75	YCI3	Digital video signal input
76	YCI4	Digital video signal input
77	YCI5	Digital video signal input
78	GND	Ground
79	YCI6	Digital video signal input
80	YCI7	Digital video signal input
81	GND	Ground
82	AX0	Host interface address bus input
83	AX1	Host interface address bus input
84	AX2	Host interface address bus input
85	AX3	Host interface address bus input
86	V_{CC5}	5V system power supply
87	AX4	Host interface address bus input
88	AX5	Host interface address bus input
89	AX6	Host interface address bus input
90	GND	Ground
91	V_{CC3}	3.3V system power supply
92	AX7	Host interface address bus input
93	V_{CC5}	5V system power ssupply
94	ADX0	Host interface address bus input
95	ADX1	Host interface address bus input
96	ADX2	Host interface address bus input
97	ADX3	Host interface address bus input
98	V_{CC3}	3.3V system power supply
99	ADX4	Host interface address bus input
100	GND	Ground

Pin No.	Name	Function
1	MEMSEL	Memory selection
2	MDAT31	Memory data bus I/O
3	MDAT30	Memory data bus I/O
4	MDAT29	Memory data bus I/O
5	MDAT28	Memory data bus I/O
6	MDAT27	Memory data bus I/O
7	MDAT26	Memory data bus I/O
8	MDAT25	Memory data bus I/O
9	MDAT24	Memory data bus I/O
10	V_{DDIO}	I/O buffer power supply
11	V_{SSIO}	I/O buffer ground
12	MDAT23	Memory data bus I/O
13	MDAT22	Memory data bus I/O
14	MDAT21	Memory data bus I/O
15	MDAT20	Memory data bus I/O
16	MDAT19	Memory data bus I/O
17	MDAT18	Memory data bus I/O
18	MDAT17	Memory data bus I/O
19	MDAT16	Memory data bus I/O
20	V_{DD}	Internal cell power supply
21	V_{SS}	Internal cell ground
22	MDAT15	Memory data bus I/O
23	MDAT14	Memory data bus I/O
24	MDAT13	Memory data bus I/O
25	MDAT12	Memory data bus I/O
26	MDAT11	Memory data bus I/O
27	MDAT10	Memory data bus I/O
28	MDAT9	Memory data bus I/O
29	MDAT8	Memory data bus I/O
30	V_{DDIO}	I/O buffer power supply
31	V_{SSIO}	I/O buffer ground
32	MDAT7	Memory data bus I/O
33	MDAT6	Memory data bus I/O
34	MDAT5	Memory data bus I/O
35	MDAT4	Memory data bus I/O
36	MDAT3	Memory data bus I/O
37	MDAT2	Memory data bus I/O
38	MDAT1	Memory data bus I/O
39	MDAT0	Memory data bus I/O
40	SDCLK	Sync DRAM SYSCLK (81MHz) output
41	CASB	Memory column address strobe (L active) output
42	WEB	Memory WRITE enable (L active) output
43	CSB/OEB	Memory chip enable output
44	RASB	Memory row address strobe output
45	TEST5	Test mode setting input
46	MADR10	Memory address bus output
47	MADR9	Memory address bus output
48	MADR8	Memory address bus output

Pin No.	Name	Function
49	V_{DD}	Internal cell power supply
50	V_{SS}	Internal cell ground
51	MADR7	Memory address bus output
52	MADR6	Memory address bus output
53	MADR5	Memory address bus output
54	MADR4	Memory address bus output
55	MADR3	Memory address bus output
56	MADR2	Memory address bus output
57	MADR1	Memory address bus output
58	MADR0	Memory address bus output
59	V_{DDIO}	I/O buffer power supply
60	V_{SSIO}	I/O buffer ground
61	COUT7	No connection
62	COUT6	No connection
63	COUT5	No connection
64	COUT4	No connection
65	COUT3	No connection
66	COUT2	No connection
67	COUT1	No connection
68	COUT0	No connection
69	V_{DD}	Internal cell power supply
70	V_{SS}	Internal cell ground
71	YOUT7	YCbCr output (8 bit mode)
72	YOUT6	YCbCr output (8 bit mode)
73	YOUT5	YCbCr output (8 bit mode)
74	YOUT4	YCbCr output (8 bit mode)
75	YOUT3	YCbCr output (8 bit mode)
76	YOUT2	YCbCr output (8 bit mode)
77	YOUT1	YCbCr output (8 bit mode)
78	YOUT0	YCbCr output (8 bit mode)
79	HSYNC	Hrizontal synchronous signal I/O
80	VSYNC	Vertical synchronous signal I/O
81	DSPCLK	Display clock output (27MHz or 13.5MHz)
82	EFTIMG	Effective screen periodical output (H: Effective screen output)
83	V_{DDIO}	I/O buffer power supply
84	V_{SSIO}	I/O buffer ground
85	RSVD	Reserve
86	RSVD	Reserve
87	V_{SSIO}	I/O buffer ground
88	RSVD	Reserve
89	RSVD	Reserve
90	V_{DDIO}	I/O buffer power supply
91	V_{SSIO}	I/O buffer ground
92	$DUBV_{DD}$	Internal analog power supply
93	$DUBV_{SS}$	Internal analog ground
94	RSVD	Reserve
95	PRSYNCB	Packet synchronous signal output (L active) of stream which is outputed from PRSO
96	PRDCH	PRSO data output channel monitor output (L: Ach, H: Bch)

Pin No.	Name	Function
97	PRSERRB	PRSO error detecting compensation output (L active)
98	PRSACKB	PRSO acknowledgment output (L active)
99	PRSREQB	PRSO request input (L active)
100	V_{DD}	Internal cell power supply
101	V_{SS}	Internal cell ground
102	PRSO7	Random PES packet output (not passing through buffer)
103	PRSO6	Random PES packet output (not passing through buffer)
104	PRSO5	Random PES packet output (not passing through buffer)
105	PRSO4	Random PES packet output (not passing through buffer)
106	PRSO3	Random PES packet output (not passing through buffer)
107	PRSO2	Random PES packet output (not passing through buffer)
108	PRSO1	Random PES packet output (not passing through buffer)
109	PRSO0	Random PES packet output (not passing through buffer)
110	V_{DDIO}	I/O buffer power supply
111	V_{SSIO}	I/O buffer ground
112	BSTCLK	Bit steam input clock (Max.: 20MHz, Min.: 100kHz)
113	PSSYNCB	PS input mode: Pack synchronous signal iuput (L active), PES input mode: Audio (H)/Video (L) PES selection
114	STCACTB	System time clock active monitor output (L active)
115	TEST1	Test mode setting input
116	STCCLK	System time clock output (90kHz)
117	TEST0	Test mode setting input
118	PVSERRB	Compensation input (L active) when detecting PVSIN error
119	PVSACKB	PVSIN acknowledgment input (L active)
120	PVSREQB	PVSIN request output (L active)
121	PVSIN7	Program stream input or video PES packet/video elementary stream data input
122	PVSIN6	Program stream input or video PES packet/video elementary stream data input
123	PVSIN5	Program stream input or video PES packet/video elementary stream data input
124	PVSIN4	Program stream input or video PES packet/video elementary stream data input
125	PVSIN3	Program stream input or video PES packet/video elementary stream data input
126	PVSIN2	Program stream input or video PES packet/video elementary stream data input
127	PVSIN1	Program stream input or video PES packet/video elementary stream data input
128	PVSIN0	Program stream input or video PES packet/video elementary stream data input
129	V_{DD}	Internal cell power supply
130	V_{SS}	Internal cell ground
131	MCLK	Main clock input (27MHz)
132	HMODE	Host mode selection input (H: INTEL, L: Motorola)
133	RESETB	System reset input (L active)
134	HUADR4	Host I/F address bus input
135	HUADR3	Host I/F address bus input

Pin No.	Name	Function
136	HUADR2	Host I/F address bus input
137	HUADR1	Host I/F address bus input
138	HUADR0	Host I/F address bus input
139	V_{DDIO}	I/O buffer power supply
140	V_{SSIO}	I/O buffer ground
141	HUDAT7	Host I/F data bus I/O
142	HUDAT6	Host I/F data bus I/O
143	HUDAT5	Host I/F data bus I/O
144	HUDAT4	Host I/F data bus I/O
145	HUDAT3	Host I/F data bus I/O
146	HUDAT2	Host I/F data bus I/O
147	HUDAT1	Host I/F data bus I/O
148	HUDAT0	Host I/F data bus I/O
149	V_{DD}	Internal cell power supply
150	V_{SS}	Internal cell ground
151	HASB	Moto: address set strobe input, Intl: chip selection input
152	HDSB	Moto: data strobe input, Intl: data READ input
153	HWEB	Moto: WRITE enable input, Intl: data WRITE input
154	HDACKB	Moto: data acknowledgment output, Intl: ready output
155	TNTREQB	Interruption request output
156	INTACKB	Interruption acknowledgement input
157	HYPMDSL	Connecting toVSS side
158	TEST4	Test mode setting I/O
159	TEST3	Test mode setting I/O
160	TEST2	Test mode setting input

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Pin No.	Name	Function
1	UPWM	Wide use PWM output
2	DV_{SS1}	Digital ground
3	DPCKI	Signal process reference clock input (27 to 34MHz)
4	DVDD1	Digital power supply (3.3V)
5	SVCKI	Servo reference clock input (oscillation circuit input)
6	SVCKO	Servo reference clock output (oscillation circuit input)
7	DV_{SS1}	Digital ground
8	DV_{DD1}	Digital power supply (3.3V)
9	WAIT	Waiting
10	HDWT	MPU WRITE signal input
11	HDRD	MPU READ signal input
12	HCEN	MPU chip selection
13	HD0	MPU data bus I/O
14	HD1	MPU data bus I/O
15	HD2	MPU data bus I/O
16	HD3	MPU data bus I/O
17	HD4	MPU data bus I/O
18	HD5	MPU data bus I/O
19	HD6	MPU data bus I/O
20	HD7	MPU data bus I/O
21	DV_{SS2}	Digital ground
22	DV_{DD2}	Digital power supply
23	HINT	MPU interruption signal output (interruption: L)
24	HA0	MPU address bus input
25	HA1	MPU address bus input
26	PLCK	VCO oscillation clock I/O
27	ED0	Extension data bus I/O
28	ED1	Extension data bus I/O
29	ED2	Extension data bus I/O
30	ED3	Extension data bus I/O
31	ED4	Extension data bus I/O
32	ED5	Extension data bus I/O
33	ED6	Extension data bus I/O
34	ED7	Extension data bus I/O
35	TEST	Test mode input
36	PDON	Phase error signal output (– polarity)
37	PDOP	Phase error signal output (+ polarity)
38	TMAX	RLL detecting result output
39	LPFN	Inverting input for PLL loop filter amplifier
40	LPFO	Output for PLL loop filter amplifier
41	VCOF	VCO filter output
42	SLCO	DAC output for making data slice level
43	AV_{SS}	Analog ground
44	AVR	Non PLL system analog reference voltage (1.65V)
45	VRC	Resistor dividing point electrical potential output (for analog reference electrical potential generation)
46	PVR	PLL system analog reference voltage output (1.65V)

Pin No.	Name	Function
47	AVDD	Analog power supply (3.3V)
48	RVR2	Second reference voltage (for connecting capacitor)
49	RVDD	For power supply
50	RFIN	RF signal input
51	RV_{SS}	For ground
52	RVR1	First reference voltage (for connecting capacitor)
53	DVR	DMO reference voltage input (2.1V)
54	DMO	Disc equalizer output (3 value PWM + HiZ) for DVD
55	RASN	External RAM row address selection (negative logic)
56	CASN	External RAM column address selection (negative logic)
57	MOEN	External RAM output acknowledgement signal output
58	MWEN	External RAM READ/WRITE selection
59	DV_{SS1}	Digital ground
60	DV_{DD1}	Digital power supply
61	MA9	External RAM address bus output
62	MA8	External RAM address bus output
63	MA7	External RAM address bus output
64	MA6	External RAM address bus output
65	MA5	External RAM address bus output
66	MA4	External RAM address bus output
67	MA3	External RAM address bus output
68	MA2	External RAM address bus output
69	MA1	External RAM address bus output
70	MA0	External RAM address bus output
71	DV_{SS2}	Digital ground
72	DV_{DD2}	Digital power supply
73	MD7	External RAM data bus I/O
74	MD6	External RAM data bus I/O
75	MD5	External RAM data bus I/O
76	MD4	External RAM data bus I/O
77	MD3	External RAM data bus I/O
78	MD2	External RAM data bus I/O
79	MD1	External RAM data bus I/O
80	MD0	External RAM data bus I/O
81	SD7	MPEG data output
82	SD6	MPEG data output
83	SD5	MPEG data output
84	SD4	MPEG data output
85	DV_{SS1}	Digital ground
86	DV_{DD1}	Digital power supply
87	SD3	MPEG data output
88	SD2	MPEG data output
89	SD1	MPEG data output
90	SD0	MPEG data output
91	SERR	MPEG data reliability flag output (data error: L)
92	SBGN	MPEG output secter synchronous signal output (secter top: L)

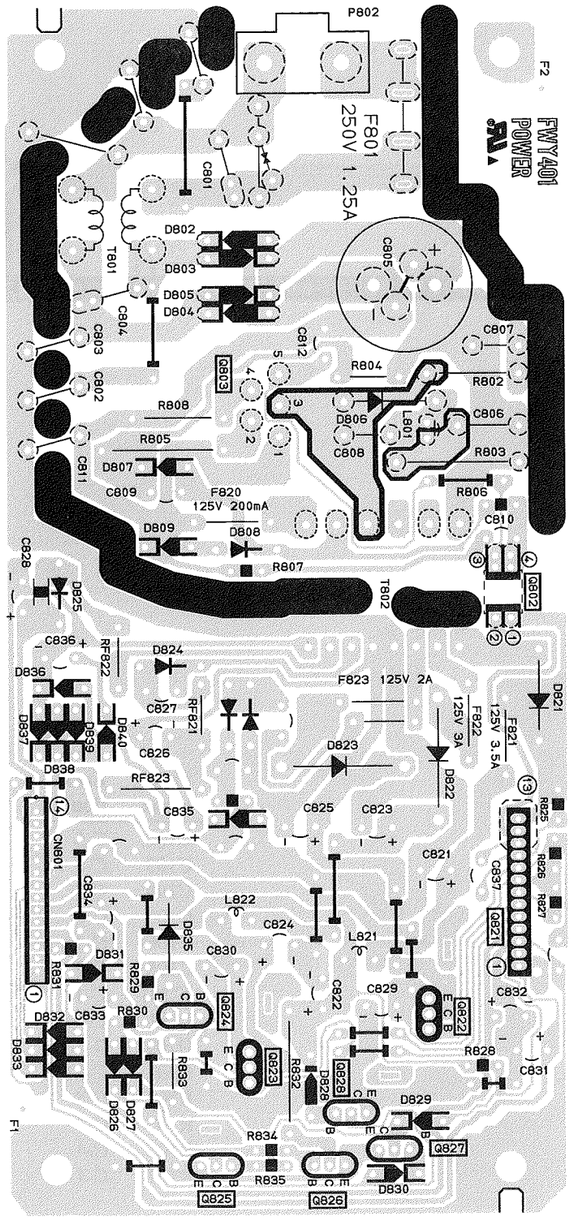
Pin No.	Name	Function
93	SENB	MPEG data effective flag output (effective: L)
94	SDCK	MPEG data transfer clock output
95	DV_{SS1}	Digital ground
96	SREQ	MPEG data request flag input (request : L)
97	RSTN	Hard reset input (reset: L)
98	DV_{DD1}	Digital power supply
99	STDA	Operation monitor data output (Output is carried out in synchronization with the falling edge of SDCK)
100	STCK	Operation monitor synchronous signal output (data top bit: L)

TA1253FN

Pin No.	Name	Function
1	AGND	Ground
2	BIN1	Four division detector B input
3	N.C.	No connection
4	V_{REF}	Reference voltage input
5	CIN1	Four division detector C input
6	N.C.	No connection
7	I_{REF}	Current source setting current input for phase difference current conversion
8	DIN1	Four division detector D input
9	DSEL	Phase difference signal off-set compensation polarity selection input
10	PDFIL1	Phase difference current voltage time constant setting external capacitor
11	PDFIL2	Phase difference current voltage time constant setting external capacitor
12	DV_{CC}	Power (+5V) input
13	DGND	Ground
14	TEOUT	Tracking error signal output
15	DEFECT	Mute control input
16	TEST2	For test
17	BDDC	BD channel HPF time constant setting external capacitor
18	TEST1	For test
19	ACDC	AC channel HPF time constant setting external capacitor
20	BACTL	Tracking error balance control input
21	DPCTL	Phase difference signal off-set compensation control input
22	N.C.	No connection
23	AIN1	Four division detector A input
24	AV_{CC}	Power (+5V) input

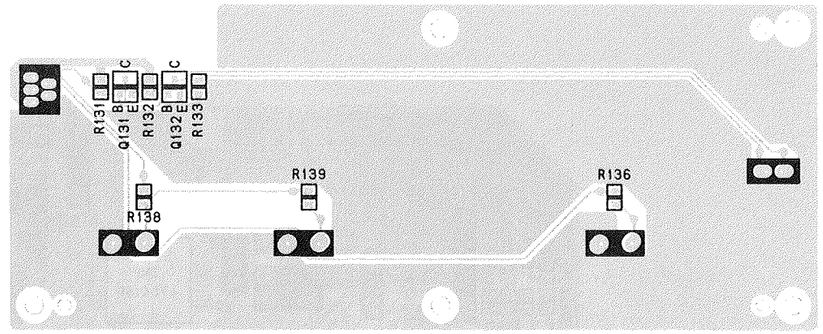
7. PC BOARDS

7-1. Power Supply PC Board



EU02 Power Supply PC Board (Bottom Side)

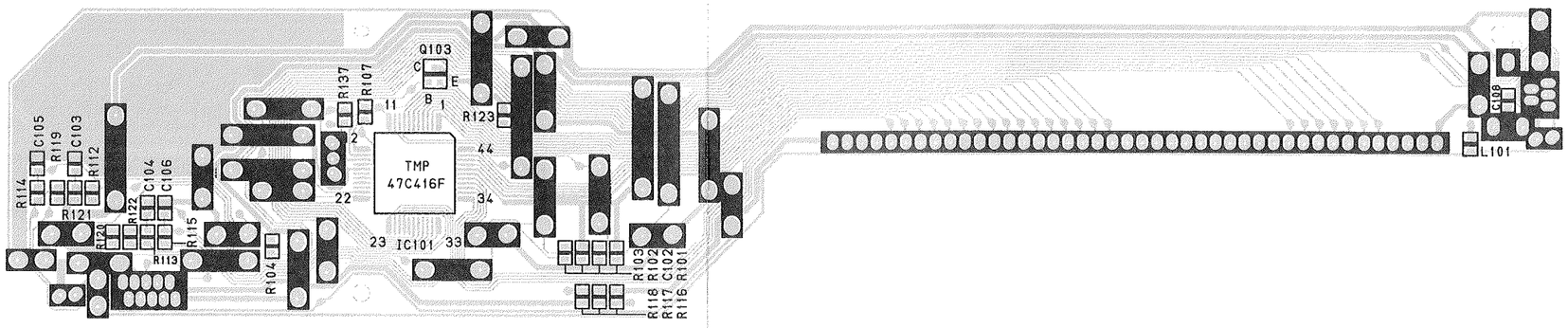
7-2. Power Switch PC Board



EU04 Power Switch PC Board (Bottom Side)

Part name	Location	Part name	Location	Part name	Location	Part name	Location	Part name	Location
C801	B-3	C834	F-2	D836	E-2	R804	C-3	Q131	B-7
C802	C-2	C835	E-3	D837	E-2	R805	D-2	Q132	B-7
C803	C-2	C836	D-2	D838	E-2	R806	D-4	R131	B-6
C804	C-2	CN801	E-2	D839	E-2	R807	D-3	R132	B-7
C805	C-3	D802	C-3	D840	E-2	R808	C-3	R133	B-7
C806	C-4	D803	C-3	F801	B-3	R825	E-4	R136	C-9
C807	C-4	D804	C-3	F820	D-3	R826	E-4	R138	C-7
C808	D-3	D805	C-3	F821	E-3	R827	F-4	R139	C-7
C809	D-2	D806	C-3	F822	E-4	R828	F-4		
C810	D-4	D807	D-2	F823	E-3	R829	F-2		
C811	D-2	D808	D-3	L801	C-4	R830	F-2		
C812	C-3	D809	D-2	L821	F-3	R831	F-2		
C821	E-4	D821	E-4	L822	F-3	R832	F-3		
C822	F-3	D822	E-4	Q802	D-4	R833	F-3		
C823	E-3	D823	E-3	Q803	C-3	R834	G-3		
C824	F-3	D824	E-3	Q821	F-4	R835	G-3		
C825	E-3	D825	D-2	Q822	F-4	RF822	E-2		
C826	E-2	D826	G-2	Q823	F-3	RF823	E-2		
C827	E-3	D827	G-2	Q824	F-3	T801	C-2		
C828	D-2	D828	F-3	Q825	G-3	T802	D-3		
C828	D-2	D829	G-4	Q826	G-3				
C829	F-3	D830	G-4	Q827	G-4				
C830	F-3	D831	F-2	Q828	F-3				
C831	F-4	D832	F-2	Q837	F-4				
C832	F-4	D833	F-2	R802	C-4				
C833	F-2	D835	F-3	R803	D-4				

7-3. Front PC Board



EU03 Front PC Board (Bottom Side)

Part name	Location	Part name	Location
C102	C-5	R112	C-3
C103	C-3	R113	C-3
C104	C-3	R114	C-2
C105	C-2	R115	C-3
C106	C-3	R116	D-5
C108	C-9	R117	D-5
IC101	C-4	R118	D-5
L101	C-9	R119	C-3
Q103	B-4	R120	C-3
R101	C-5	R121	C-3
R102	C-5	R122	C-3
R103	C-5	R123	C-4
R104	C-4	R137	C-4
R107	C-4		

Part name	Location
C201	H-14
C202	H-14
C203	H-14
C204	H-14
C205	H-14
C206	H-14
C207	H-14
C208	H-14
C209	H-13
C210	H-13
C211	H-13
C212	H-12
C213	I-12
C214	I-12
C215	I-13
C216	I-13
C217	H-14
C218	I-14
C219	I-15
C220	H-15
C221	H-15
C222	I-15
C223	I-15
C225	H-12
C226	H-13
C227	I-12
C228	I-12
C232	J-14
C233	J-14
C234	I-14
C235	J-14
C236	G-13
C237	H-14
C238	G-15
C239	H-14
C240	H-14
C242	H-15
C243	H-15
C244	H-15
C245	I-12
C246	I-12
C247	H-13
C248	H-11
C249	I-10
C250	I-11
C251	I-12
C252	J-14
C253	H-11
C254	H-11
C301	G-4
C302	H-4
C303	I-5
C304	I-5
C305	I-6
C306	I-6
C307	G-7
C308	G-7
C309	G-6
C310	G-6
C311	G-6
C312	F-6
C313	G-6
C314	G-5
C315	G-5
C316	I-6
C317	I-6
C318	I-5
C319	E-6
C320	I-10
C321	H-10
C323	G-8
C324	H-7
C325	H-8
C326	H-7
C327	H-7
C328	I-7
C329	I-9
C330	J-9
C331	F-10
C332	F-9
C333	G-10
C334	F-9
C335	E-7
C337	E-7
C338	E-7
C339	F-7
C340	E-6
C341	E-6
C342	D-5
C343	D-5
C344	E-4
C345	F-5
C346	F-5
C347	G-8
C348	G-7
C353	B-7
C354	C-8
C359	D-8
C360	D-7
C361	D-8
C362	D-8
C363	D-9
C364	D-8
C366	B-9
C367	C-9
C371	C-8
C373	C-8
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C380	G-7
C381	G-7
C401	G-12
C402	F-12
C403	F-11
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C507	C-13
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C514	D-15
C515	E-15
C516	D-15
C517	E-14
C518	E-14
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C521	D-14
C522	E-13
C523	D-14
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C564	C-11
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C584	E-13
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C592	G-14
C594	F-15
C595	F-15
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C599	E-15
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C603	G-2
C604	H-2
C605	H-3
C606	H-3
C607	H-3
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C610	H-3
C611	G-3
C612	I-3
C613	I-2
C614	I-1
C615	G-3
C616	D-1
C617	C-1
C618	C-1
C619	C-1
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C902	E-2
C903	E-2
C904	E-4
C905	F-3
C907	G-4
C908	F-4
C909	E-3
C910	C-5
C911	C-5
C912	C-3
C913	C-3
C914	B-4
C915	C-3
C916	D-3
C917	C-4
C918	C-4
C919	C-4
C920	B-3
C921	D-3
C922	D-2
C924	C-3
C926	C-2
C927	B-2
C928	B-2
C929	C-2
C931	D-2
C932	D-2
C936	C-5
C938	D-4
C941	B-5
C943	C-6
C944	C-6
C947	B-3
C950	D-4
C951	C-4
C952	C-5
C954	B-2
C955	C-4
C956	C-6
CN301	B-14
CN302	B-12
CN501	B-13
CN502	D-10
CN503	C-10
CN601	H-1
CN602	D-1
CN603	I-1
CN801	E-11
CN903	C-1
D201	J-14
D501	C-14
D502	C-12
D503	E-9
FL301	E-8
FL302	G-7
FL304	C-7
FL305	B-9
FL306	B-9
FL901	B-3
IC201	H-13
IC202	G-12
IC203	I-15
IC204	H-15
IC206	J-14
IC207	I-11
IC209	G-15
IC210	I-14
IC301	H-5
IC302	I-6
IC303	E-6
IC304	H-9
IC305	F-9
IC306	D-6
IC307	E-5
IC308	F-7
IC309	I-7
IC313	D-8
IC314	H-7
IC315	H-7
IC316	H-7
IC501	C-13
IC502	D-14
IC503	F-14
IC504	B-12
IC505	C-12
IC506	E-12
IC507	E-12
IC508	D-12
IC509	E-10
IC510	E-9
IC511	D-15
IC513	C-11
IC516	F-9
IC517	G-11
IC518	F-11
IC519	F-12
IC520	G-13
IC521	G-12
IC522	F-13
IC523	F-12
IC601	H-2
IC602	H-1
IC603	G-2
IC604	I-2
IC605	I-3
IC606	H-4
IC607	G-2
IC608	H-3
IC609	G-2
IC611	I-4
IC612	F-4
IC613	G-2
IC901	F-2
IC902	F-3
IC903	E-3
IC904	C-2
IC905	C-3
IC906	D-4
IC908	C-5
IC909	D-2
IC910	D-3
J301	B-11
L201	I-14
L203	J-14
L204	H-14
L205	J-13
L206	G-14
L301	F-7
L306	D-7
L307	C-9
L308	C-9
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L502	D-12
L503	C-14
L601	E-11
L610	D-1
L901	D-5
L902	C-2
L903	C-6
L904	C-5
L905	E-2
L906	B-5
L907	B-5
Q202	J-14
Q301	E-8

Part name	Location
Q302	E-8
Q303	E-8
Q304	D-8
Q305	D-7
Q306	E-7
Q307	D-8
Q308	D-8
Q309	C-7
Q310	C-7
Q311	C-7
Q312	C-10
Q313	C-9
Q314	C-9
Q315	C-7
Q316	G-6
Q317	B-9
Q318	E-7
Q319	F-7
Q320	G-7
Q321	G-7
Q501	C-14
Q502	C-12
Q503	E-13
Q504	F-12
Q505	F-12
Q601	H-4
Q602	G-1
Q901	B-3
Q902	C-6
Q903	C-6
Q904	C-6
Q905	D-3
R202	H-14
R204	G-14
R205	G-14
R208	I-14
R209	J-14
R210	I-14
R211	J-15
R212	H-15
R213	H-14
R214	H-15
R215	H-15
R216	H-15
R217	H-15
R218	H-15
R219	H-15
R220	I-12
R221	I-12
R223	I-12
R224	I-12
R225	I-13
R226	I-12
R227	I-12
R228	H-13
R230	H-15
R231	H-14
R232	I-14
R233	I-15
R234	I-15
R235	I-15
R236	I-15
R237	H-15
R238	H-15
R239	J-14
R240	I-12
R301	G-6
R302	G-6
R303	I-8
R304	J-9
R306	E-8
R307	E-8
R308	E-7
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R381	G-7
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R384	G-7
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R388	C-8
R389	B-14
R393	D-19
R396	E-8
R397	E-8
R398	E-8
R399	G-7
R405	E-15
R406	D-15
R407	C-14
R408	F-15
R409	F-15
R410	C-12
R411	C-13
R412	J-9
R413	I-7
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R415	H-4
R416	G-7
R420	F-7
R421	C-7
R422	C-7
R423	C-8
R424	B-8
R501	C-13
R502	D-15
R503	B-14
R504	C-14
R505	C-13
R506	C-14
R507	C-15
R508	C-15
R509	D-15
R510	E-15
R511	D-14
R512	D-14
R513	E-12
R514	E-12
R515	D-14
R516	D-13
R517	D-4
R518	D-13
R519	D-14
R520	C-14
R521	C-14
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R525	E-12
R526	D-12
R527	E-10
R528	E-9
R529	D-12
R530	D-12
R531	D-12
R532	D-13
R533	D-12
R534	C-15
R535	D-14
R536	D-12
R537	D-12
R538	D-11
R539	D-12
R540	D-12
R541	E-12
R542	D-13
R543	D-12
R544	C-12
R545	D-12
R546	D-12
R547	D-12
R548	D-11
R549	C-12
R551	C-11
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R556	F-13
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R562	D-10
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R566	E-10
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R574	F-12
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R581	E-15
R582	E-15
R583	E-14
R584	E-14
R585	E-13
R586	E-4
R587	E-13
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R592	G-13
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R594	F-12
R595	F-13
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R603	G-1
R604	H-2
R605	G-2
R606	H-3
R607	H-1
R608	H-4
R609	I-3
R610	H-3
R611	G-3
R612	F-1
R613	G-3
R616	G-1
R617	H-2
R619	H-1
R620	H-1
R621	H-1
R622	H-1
R623	H-1
R624	H-1
R625	G-2
R626	G-1
R627	H-4
R628	G-4
R629	G-3
R630	G-3
R632	G-3
R633	H-3
R636	H-4
R638	I-3
R639	H-3
R640	G-1
R641	G-1
R642	E-1
R643	E-1
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R904	D-2
R905	C-3
R906	B-3
R907	B-3
R908	C-2
R909	B-2
R910	C-2
R911	D-2
R912	F-15
R913	C-4
R914	C-4
R915	C-4
R916	C-4
R917	C-4
R918	C-4
R919	C-4
R920	C-4
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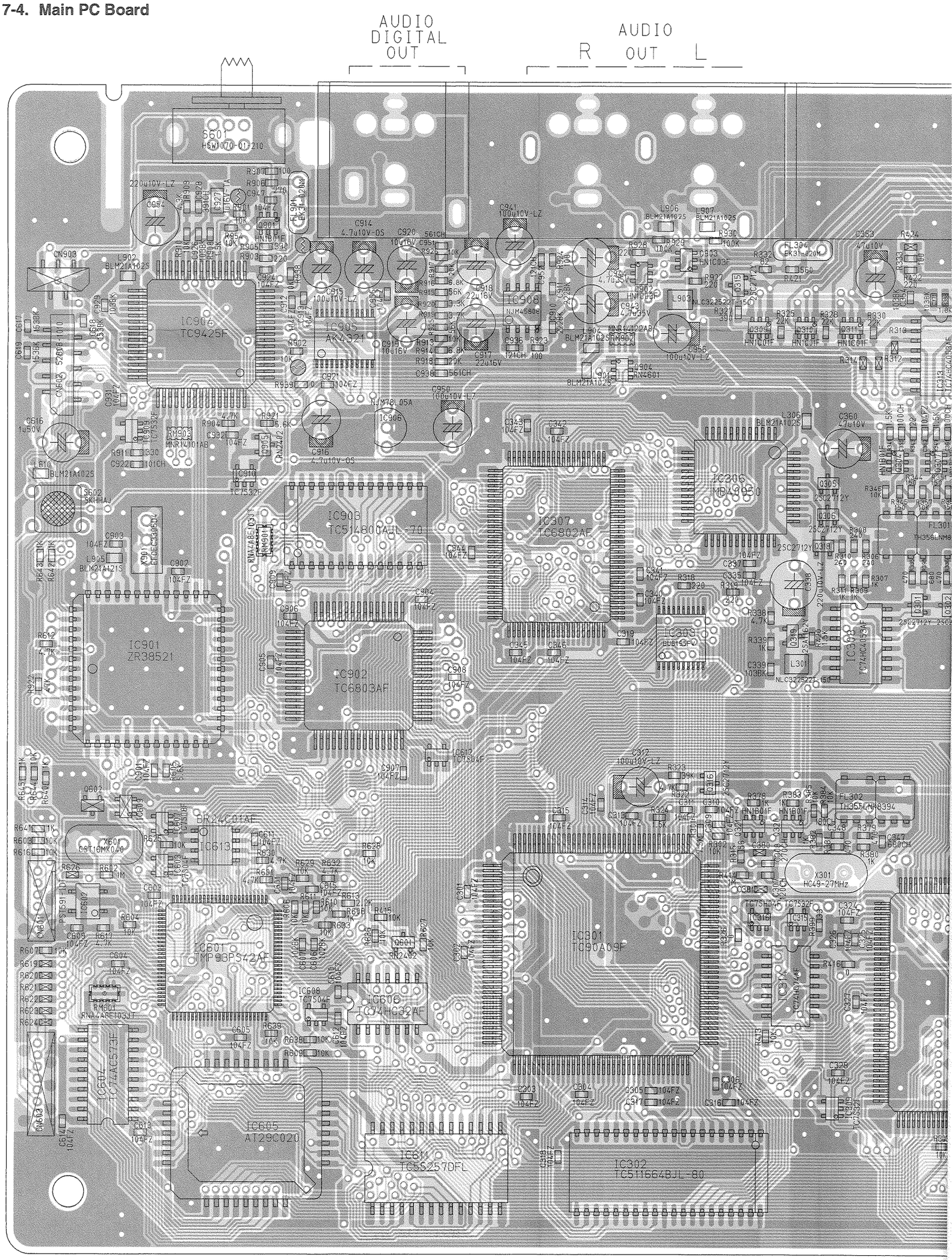
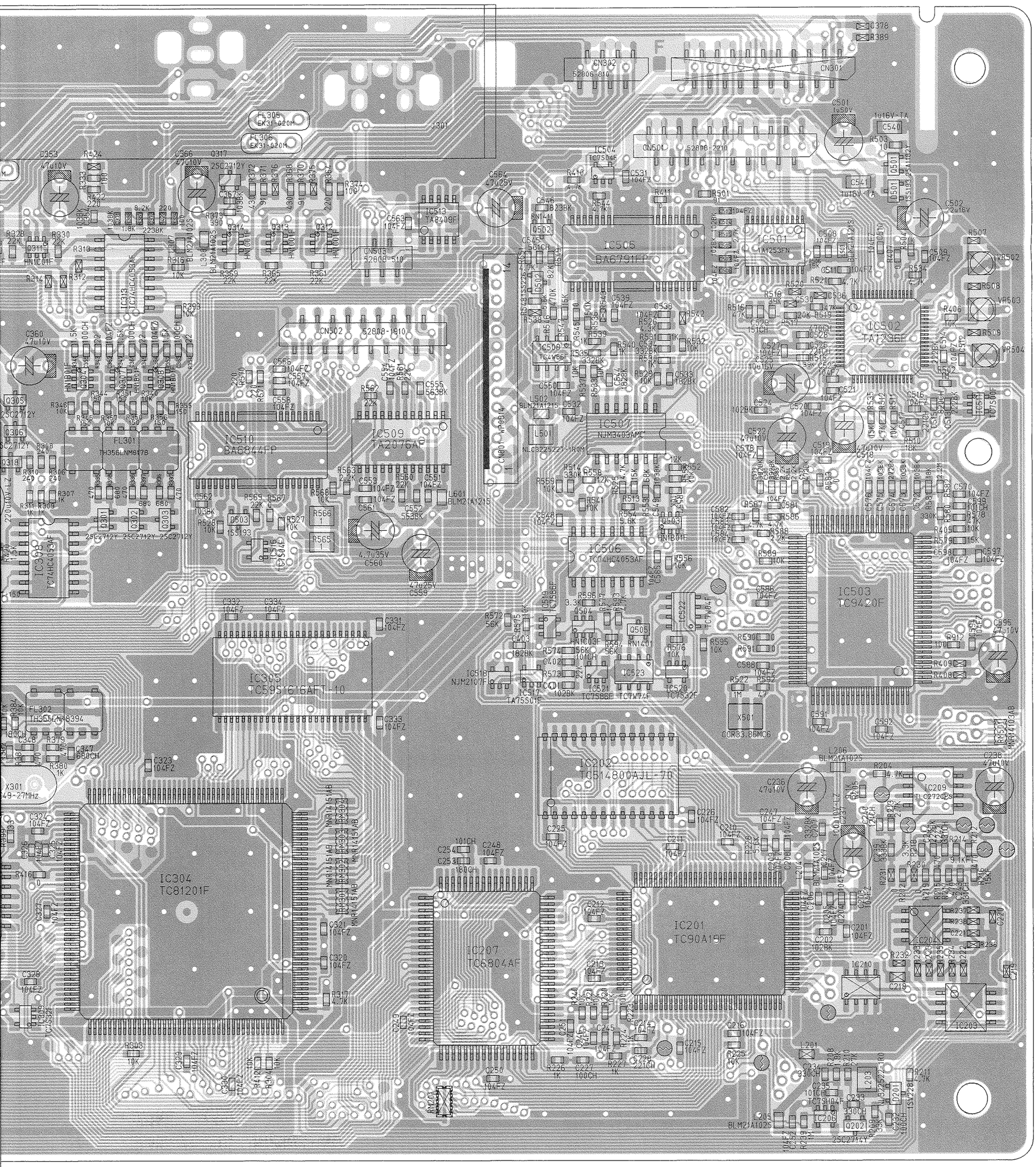
R923	C-5
R924	C-5
R925	C-4
R926	C-4
R927	C-6
R928	C-6
R929	C-6
R930	B-6
R937	E-9
R938	C-3
R939	D-3
R954	B-3
RM201	J-11
RM301	H-10
RM302	H-10
RM303	H-10
RM304	H-10
RM501	G-15
RM601	H-2
RM901	E-3
RM902	C-6
RM903	D-2
S601	B-2
S602	D-2
VR502	C-15
VR503	D-15
VR504	D-15
X301	G-7
X501	G-13
X601	G-2
X901	E-2

7-4. Main PC Board



C.V.OUT S.V.OUT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CN301
CN501 52808-2210
CN502 52808-1910
CN503 52808-510
IC506 TC74HC4053AF
IC505 BA6791FP
IC501 TA1253FN
IC502 TA1236F
IC509 TA2076AP
IC510 BA6844FP
IC507 NJM3403AMC
IC305 TC59S1616AFT-10
IC202 TC51480AJL-70
IC201 TC90A19F
IC207 TC6804AF
IC304 TC81201F
IC503 TC9420F
IC513 TA8409F
IC209 TLC272CPS
IC203
IC204
IC210
FL305 EK31-020M
FL306 EK31-020M
FL301 TH356LNM8778
FL302 TH353LNM8394
X301 49-27MHz
X501 COR3.86MC6
VR502
VR503
VR504
VR509

SECTION 4
PARTS LIST

SAFETY PRECAUTION

The parts identified by ⚠ mark are critical for safety. Replace only with part number specified.
The mounting position of replacement is to be identical with originals.
The substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

NOTICE

The part number must be used when ordering parts in order to assist in processing, be sure to include the model number and description.
Parts marked # are of chip type and mounted on original PC boards.
The parts without their parts number (described as ---- in the parts list) are not service parts.

ABBREVIATIONS

1. Integrated Circuit (IC)

2. Capacitor (Cap)

- **Capacitance Tolerance (for Nominal Capacitance more than 10pF)**

Symbol	B	C	D	F	G	J	K	M	N
Tolerance %	± 0.1	± 0.25	± 0.5	± 1	± 2	± 5	± 10	± 20	± 30

Symbol	P	Q	T	U	V	W	X	Y	Z
Tolerance %	+ 100 0	+ 30 – 10	+ 50 – 10	+ 75 – 10	+ 20 – 10	+ 100 – 10	+ 40 – 20	+ 150 – 10	+ 80 – 20

Ex. 10μF J = 10μF ± 5%

- **Capacitance Tolerance (for Nominal Capacitance 10pF or less)**

Symbol	B	C	D	F	G
Tolerance pF	± 0.1	± 0.25	± 0.5	± 1	± 2

Ex. 10pF G = 10pF ± 2pF

3. Resistor (Res)

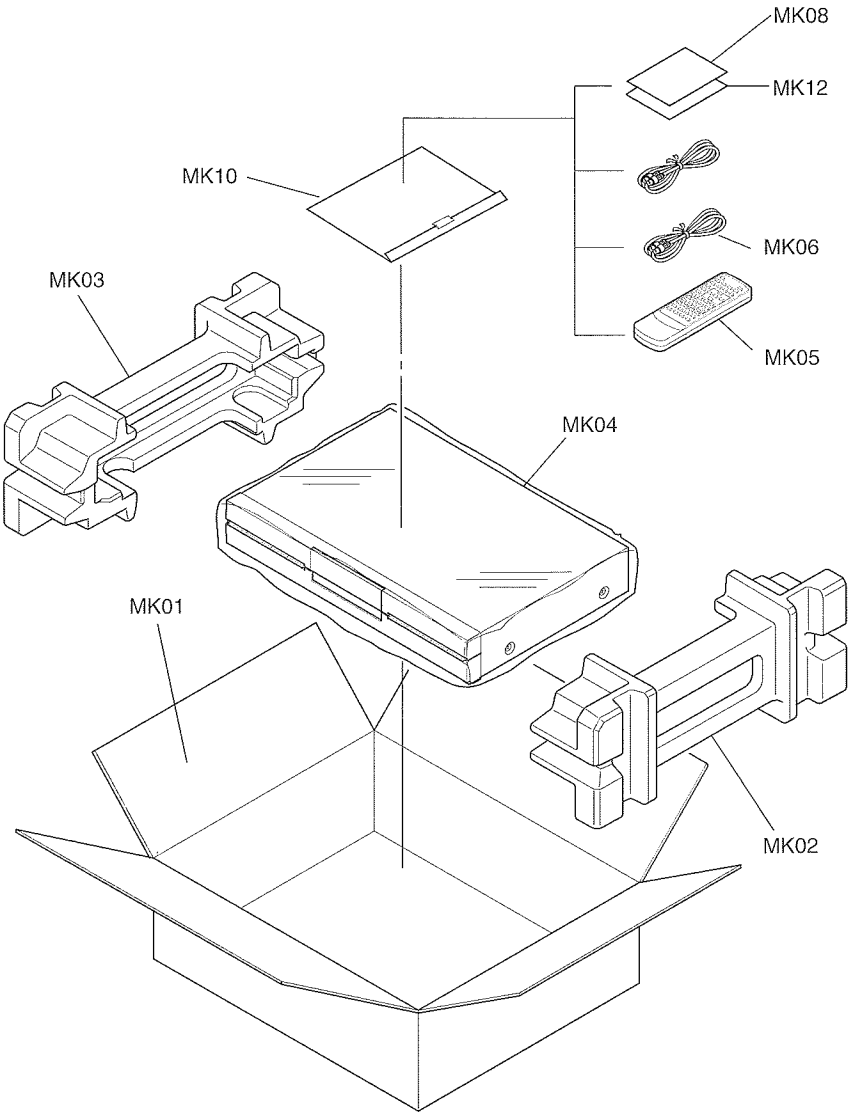
- **Resistance tolerance**

Symbol	B	C	D	F	G	J	K	M
Tolerance %	± 0.1	± 0.25	± 0.5	± 1	± 2	± 5	± 10	± 20

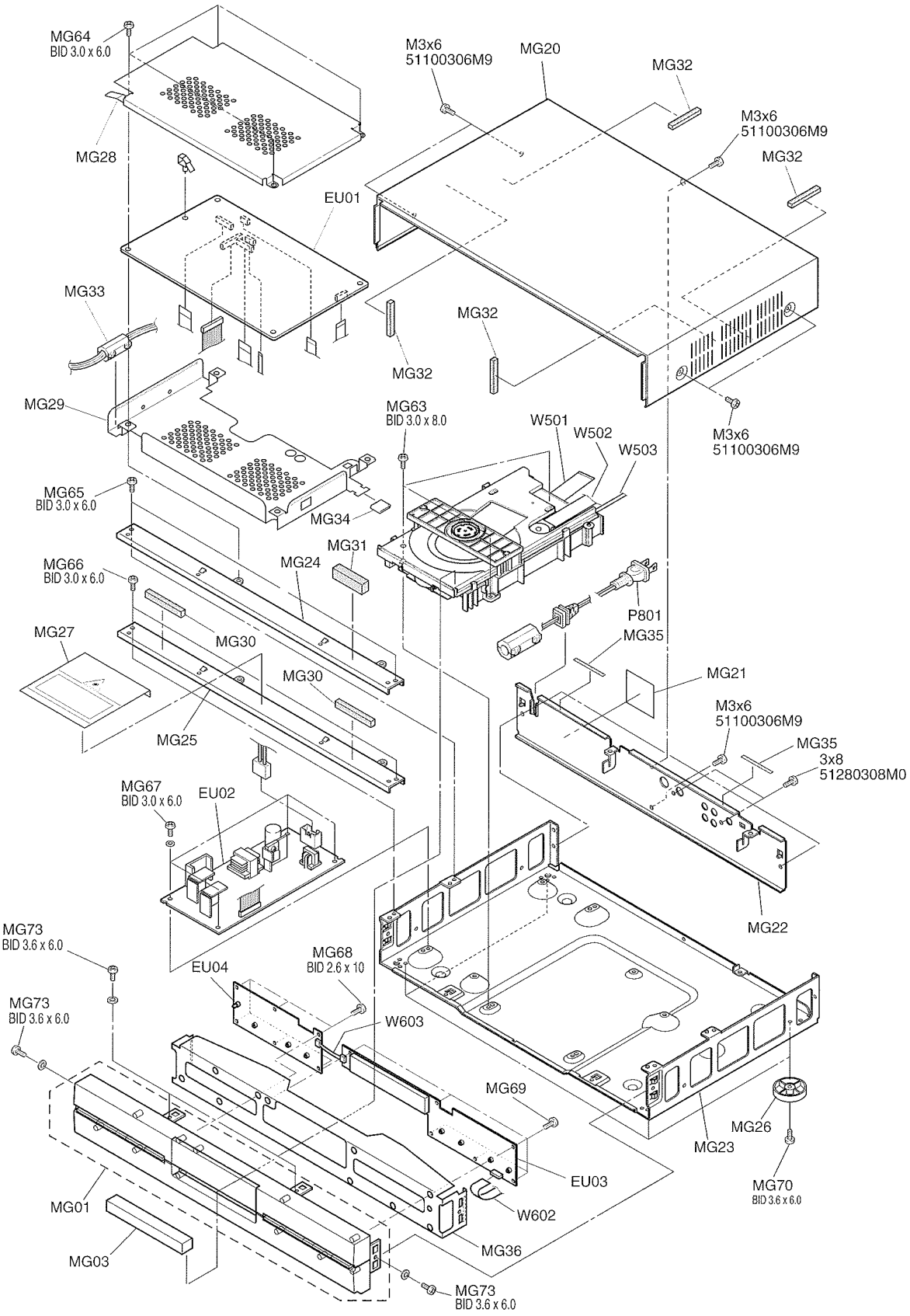
Ex. 470ΩJ = 470Ω± 5%

1. EXPLODED VIEWS

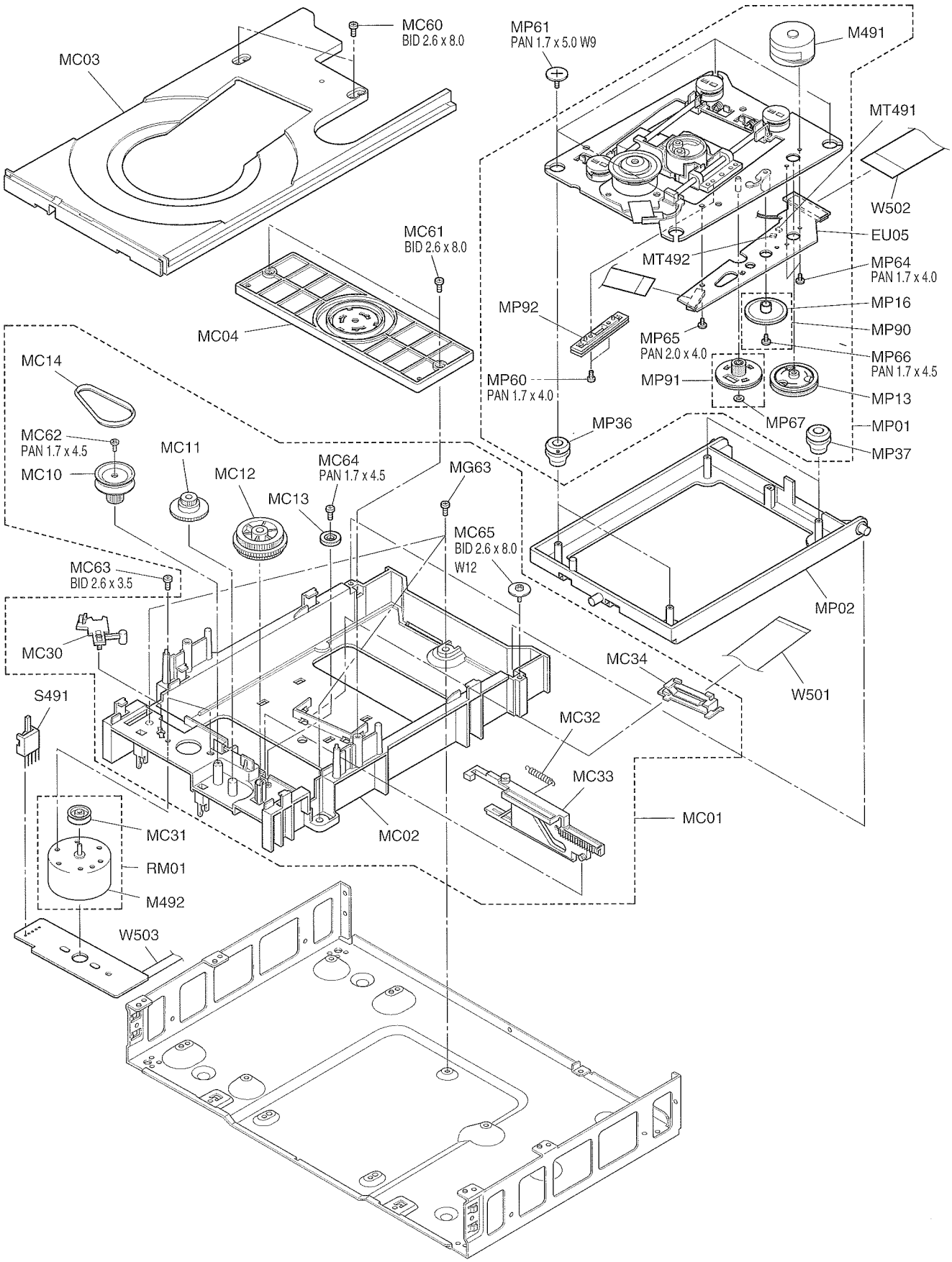
1-1. Packing Assembly



1-2. Chassis Assembly



1-3. Mechanism Assembly



2. PARTS LIST

(VERS.:VERSION, U:NORTH AMERICA, F:JAPAN, K:FAR EAST, **:EUROPE)

POS. NO	PART NO. (PCEC)	DESCRIPTION	PART NO. (MJI)
EU01	**4835 214 57105**	**PC Board Assy Main**	**QS21457105**
J301	4835 265 97449	Pin Jack AV	QS26597449
S601	4835 276 17327	Switch, Slide	QS 27617327
EU03	**4835 214 57107**	**PC Board Assy Front**	**QS21457107**
IC101	4835 209 47358	IC TMP47C416KS-H861	QS20947358
Q103	4835 130 48105	Transistor, Chip RN1421	QS13048105
A101	4835 130 97093	Display FL	QS13097093
MT101	4835 210 27054	Module, RMT PIC-12043T2	QS21027054
S101	4835 276 17328	Switch, Push	QS27617328
S102	4835 276 17328	Switch, Push	QS27617328
S103	4835 276 17328	Switch, Push	QS27617328
S104	4835 276 17328	Switch, Push	QS27617328
S105	4835 276 17328	Switch, Push	QS27617328
S106	4835 276 17328	Switch, Push	QS27617328
X101	4835 242 77306	Oscillator, Ceramic 8MHz	QS24277306
EU04	**4835 214 57108**	**PC Board Assy Power Switch**	**QS21457108**
Q131	4835 130 48104	Transistor, Chip RN2402	QS13048104
D131	4835 130 87141	Diode, LED TLR218	QS13087141
S131	4835 276 17328	Switch, Push	QS27617328
EU02	**4835 214 57106**	**PC Board Assy Power Supply (FWY401)**	**QS21457106**
⚠Q803	4835 209 47361	IC STR-D6801	QS20947361
⚠Q821	4835 209 47359	IC LA5611	QS20947359
⚠Q802	4835 209 17367	Photo Coupler ON3131-R	QS20917367
Q822	4835 130 47266	Transistor 2SC3852	QS13047266
Q823	4835 130 47266	Transistor 2SC3852	QS13047266
Q824	4835 130 47924	Transistor 2SA1307-Y	QS13047924
Q825	4835 130 47676	Transistor 2SC2458-Y	QS13047676
Q826	4835 130 48106	Transistor 2SC2236-Y	QS13048106
Q827	4835 130 47676	Transistor 2SC2458-Y	QS13047676
Q828	4835 130 48107	Transistor RN1201	QS13048107
⚠D802	4835 130 37891	Diode ERA15-04	QS13037891
⚠D803	4835 130 37891	Diode ERA15-04	QS13037891
⚠D804	4835 130 37891	Diode ERA15-04	QS13037891
⚠D805	4835 130 37891	Diode ERA15-04	QS13037891
⚠D806	4835 130 37888	Diode RU-1P	QS13037888
D807	4835 130 37893	Diode 1SS136	QS13037893
D808	4835 130 37515	Diode ERA15-02	QS13037515
D809	4835 130 37329	Diode, Zener UZ5.6BSB	QS13037329
D821	4835 130 37149	Diode RU2YX	QS13037149
D822	4835 130 37889	Diode RK46	QS13037889
D823	4835 130 37889	Diode RK46	QS13037889
D824	4835 130 37892	Diode AG01	QS13037892
D825	4835 130 37892	Diode AG01	QS13037892
D826	4835 130 37235	Diode 1SS133	QS13037235
D827	4835 130 37235	Diode 1SS133	QS13037235
D828	4835 130 37745	Diode, Zener UZ11BSB	QS13037745
D829	4835 130 37235	Diode 1SS133	QS13037235
D830	4835 130 37235	Diode 1SS133	QS13037235
D831	4835 130 37235	Diode 1SS133	QS13037235
D832	4835 130 37235	Diode 1SS133	QS13037235
D833	4835 130 37235	Diode 1SS133	QS13037235
D835	4835 130 37515	Diode ERA15-02	QS13037515
D836	4835 130 37735	Diode, Zener UZ3.0BSB	QS13037735
D837	4835 130 37017	Diode, Zener UZ5.1BSB	QS13037017
D838	4835 130 37017	Diode, Zener UZ5.1BSB	QS13037017
D839	4835 130 37017	Diode, Zener UZ5.1BSB	QS13037017
D840	4835 130 37329	Diode, Zener UZ5.6BSB	QS13037329

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POS. NO	PART NO. (PCEC)	DESCRIPTION	PART NO. (MJI)
L801	4835 157 58182	Coil, Choke ZBF253D-02	QS15758182
L821	4835 157 58181	Coil 20μH	QS15758181
L822	4835 157 58181	Coil 20μH	QS15758181
⚠C801	4835 122 47596	Cap, Ceramic 3300pF Z 250V	QS12247596
⚠C802	4835 122 47595	Cap, Ceramic 1000pF Z 250V	QS12247595
⚠C803	4835 122 47595	Cap, Ceramic 1000pF Z 250V	QS12247595
⚠C804	4835 122 47597	Cap, Ceramic 0.01μF Z 250V	QS12247597
⚠C805	4835 124 47694	Cap, Electrolytic 100μF M 200V	QS12447694
⚠C806	4835 121 47574	Cap, Plastic 0.033μF J 630V	QS12147574
⚠C807	4835 122 47598	Cap, Ceramic 100pF J 1kV	QS12247598
⚠C808	4835 122 47599	Cap, Ceramic 150pF J 1kV	QS12247599
C809	4835 121 47573	Cap, Plastic 0.047μF J 50V	QS12147573
C810	4835 121 47572	Cap, Plastic 0.022μF 50V	QS12147572
⚠C811	4835 122 47595	Cap, Ceramic 1000pF Z250V	QS12247595
C812	4835 122 47004	Cap, Ceramic 1000pF K 50V	QS12247004
C821	4835 124 47696	Cap, Electrolytic 820μF B 16V	QS12447696
C822	4835 124 47081	Cap, Electrolytic 220μF M 16V	QS12447081
C823	4835 124 47695	Cap, Electrolytic 1200μF M 10V	QS12447695
C824	4835 124 97065	Cap, Electrolytic 220μF M 10V	QS12497065
C825	4835 124 47695	Cap, Electrolytic 1200μF M 10V	QS12447695
C826	4835 124 47693	Cap, Electrolytic 22μF M 100V	QS12447693
C827	4835 122 47115	Cap, Ceramic 1000pF K 500V	QS12247115
C828	4835 125 97025	Cap, Electrolytic 220μF M 10V	QS12597025
C829	4835 125 97025	Cap, Electrolytic 220μF M 10V	QS12597025
C830	4835 124 47128	Cap, Electrolytic 22μF M 16V	QS12447128
C831	4835 124 47128	Cap, Electrolytic 22μF M 16V	QS12447128
C832	4835 124 47128	Cap, Electrolytic 22μF M 16V	QS12447128
C833		Cap, Electrolytic 47μF 16V	OA47601650
C834	4835 124 47128	Cap, Electrolytic 22μF M 16V	QS12447128
C835	4835 124 47051	Cap, Electrolytic 22μF M 50V	QS12447051
C836	4835 124 47051	Cap, Electrolytic 22μF M 50V	QS12447051
C837	4835 121 43193	Cap, Plastic 0.22μF J 50V	QS12143193
C919		Cap, Electrolytic 47μF 16V	OA47601650
C920		Cap, Electrolytic 47μF 16V	OA47601650
C941		Cap, Electrolytic 100μF 10V	OA10701050
C943		Cap, Electrolytic 47μF 16V	OA47601650
C944		Cap, Electrolytic 47μF 16V	OA47601650

NOTE: nsp = PART IS LISTED FOR REFERENCE ONLY, MARANTZ WILL NOT SUPPLY THESE PARTS.

(VERS.:VERSION, U:NORTH AMERICA, F:JAPAN, K:FAR EAST, **:EUROPE)

POS. NO	PART NO. (PCEC)	DESCRIPTION	PART NO. (MJI)
C956		Cap, Electrolytic 100µF 10V	OA10701050
⚠R802	4835 116 67153	Res, Oxide Metal 1kW J 1W	QS11667153
⚠R803	4835 116 57447	Res, Oxide Metal 47kΩ J 2W	QS11657447
R804	4835 110 47172	Res, Oxide Metal 33kΩ J 1/2W	QS11047172
R805	4835 116 57656	Res, Oxide Metal 62Ω J 2W	QS11657656
R806	4835 111 37167	Res, Carbon 150Ω J 1/6W	QS11137167
R807	4835 111 37167	Res, Carbon 150Ω J 1/6W	QS11137167
⚠R808	4835 116 57038	Res, Carbon 0.47W J 1W	QS11657038
R825	4835 110 57249	Res, Carbon 110kΩ G 1/6W	QS11057249
R826	4835 111 37161	Res, Carbon 100Ω J 1/6W	QS11137161
R827	4835 111 37512	Res, Carbon 13.7kΩ F 1/6W	QS11137512
R828	4835 111 37163	Res, Carbon 10kΩ J 1/6W	QS11137163
R829	4835 111 37162	Res, Carbon 1kΩ J 1/6W	QS11137162
R830	4835 110 57077	Res, Carbon 2kΩ J 1/6W	QS11057077
R831	4835 111 37162	Res, Carbon 1kΩ J 1/6W	QS11137162
R832	4835 116 57657	Res, Oxide Metal 75Ω J 2W	QS11657657
R833	4835 110 47086	Res, Oxide Metal 220Ω J 1/2W	QS11047086
R834	4835 111 37161	Res, Carbon 100Ω J 1/6W	QS11137161
R835	4835 111 37161	Res, Carbon 100Ω J 1/6W	QS11137161
R840	4835 111 37163	Res, Carbon 10kΩ J 1/6W	QS11137163
⚠RF821	4835 116 57658	Res, Fusible 5.1Ω F 1/4W	QS11657658
⚠RF822	4835 111 30492	Res, Fusible 2.2Ω J 1/4W	QS11130492
⚠RF823	4835 116 57659	Res, Fusible 560Ω J 1/2W	QS11657659
⚠F801	4835 253 37031	Fuse 250V, 1.25A	QS25337031
⚠F820	4835 253 37032	Protector 125V, 0.2A	QS25337032
⚠F821	4835 253 37028	Protector 25V, 3.5A	QS25337028
⚠F822	4835 253 37033	Protector 125V, 3.0A	QS25337033
⚠F823	4835 253 37029	Protector 125V, 2.0A	QS25337029
⚠P801	4835 321 17116	Mains Cord	QS32117116
⚠T801	4835 153 97055	Line Filter TRF-3192	QS15397055
⚠T802	4835 148 87361	Mains Transformer SRW2820ED5-201V018	QS14887361

(VERS.:VERSION, U:NORTH AMERICA, F:JAPAN, K:FAR EAST, **:EUROPE)

POS. NO	PART NO. (PCEC)	DESCRIPTION	PART NO. (MJI)
		P.U. Mechanism	
M491	4835 361 27154	Motor, Feed RF-300CA	QS36127154
MP01	4835 691 17075	Mechanism Assy	QS69117075
MP02	nsp	Chassis, Sub	nsp
MP13	4835 522 37349	Gear Assy Feed Motor	QS52237349
MP36	nsp	Dumper, Rubber	nsp
MP37	nsp	Dumper, Rubber Rear	nsp
MP61	nsp	Screw 1.7x0.5W9mm	nsp
MP64	nsp	Screw 1.7x4.0mm	nsp
MP66	nsp	Screw 1.7x4.5mm	nsp
MP67	nsp	Washer	nsp
MP90	4835 522 37351	Gear A	QS52237351
MP91	4835 522 37352	Gear B	QS52237352
MP92	4835 522 37353	Gear, Rack	QS52237353
MT491	4835 464 77143	Hole Element HW-101A-E	QS46477143
MT492	4835 464 77143	Hole Element HW-101A-E	QS46477143
		Loading Mechanism	
RM01	4835 361 27155	Motor Assy, Loading	QS36127155
MC01	nsp	Chassis Assy, Mechanism	nsp
MC03	4835 444 67186	Tray	QS44467186
MC14	4835 358 37151	Belt, Loading	QS35837151
MC63	nsp	Screw 2.6x3.5mm	nsp
MC65	nsp	Screw 2.6x8W12mm	nsp
S491	4835 276 17329	Switch	QS27617329
W503	4835 321 27391	Cable, FFC	QS32127391
		Cosmetic	
MG01		Front Panel	353K248010
MG03		Panel, Tray	353K063010
MG20	4835 444 27016	Top Cover	QS44427016
MG22	4835 444 47104	Panel, Rear	QS44447104
MG26		Foot	353K057010
⚠MG27	nsp	Label, Laser Caution	nsp
		Accessory	
MK05		Remote Control Unit	ZK353K0010
MK06	4835 321 27392	Cable, AV	QS32127392
⚠MK08		Owners Manual	353K851250
MK10	nsp	Bag, Polyethylene	nsp
MK12	nsp	Warranty Card	nsp
		Package	
MK01	nsp	CartonBox	353K801010
MK02	nsp	Packing (R)	nsp
MK03	nsp	Packing (L)	nsp
MK04	nsp	Bag, Polyethylene	nsp

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