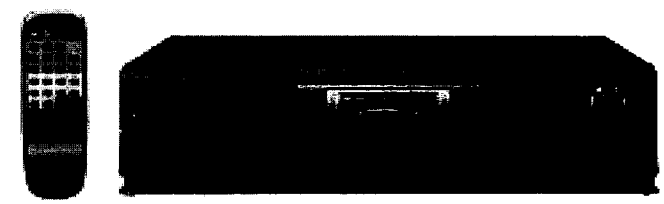
Service Manual

Mini Disc Deck



SJ-MD150

Mechanism Unit: MR3A

Colour

(K).....Black Type

Areas

(E).....Europe.

(EB).....Great Britain.

(EG).....Germany.

Specifications

System

Recording:	Minidisc digital audio system Magnetic field modulation direct overwrite
Reading:	Non-contact optical system with Semiconductor laser (λ=780 nm)
Sampling frequency:	44.1 kHz
Coding system:	ATRAC
Channel:	2 channels, stereo
Frequency response:	5 – 20,000 Hz (±0.3 dB)
S/N ratio (Play):	99 dB
Dynamic range (Play):	97 dB
Wow and flutter:	Below measurable limit

Input

Analog input (Level/Impedance):	500 mV/47 kΩ
Digital input (OPTICAL IN 1, OPTICAL IN 2):	
Wavelength;	660 nm

Output

Analog output (Level/Impedance):	2.0 V/600 Ω
Digital output (OPTICAL):	
Rated output;	–17 dBm
Wavelength;	660 nm
Headphone output level:	15 mW max. 32 Ω (adjustable)

General

Power supply:	AC 230 V – 240 V, 50 Hz
Power consumption:	13 W
Dimensions (W×H×D):	430×103×300 mm
Mass:	3.4 kg

Notes: Specifications are subject to change without notice.
Mass and dimensions are approximate.

US and foreign patents licensed from Dolby Laboratories Licensing Corporation.

⚠ WARNING

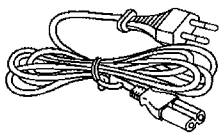
This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Technics®

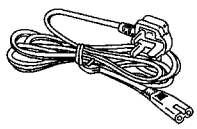
CONTENTS

1 Accessories

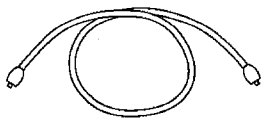
- AC power supply cord for (E), (EG) areas (RJA0043-1C).....1 pc.



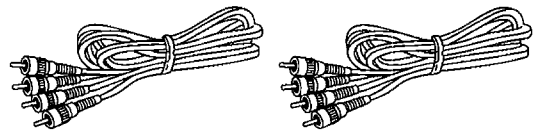
- AC power supply cord for (EB) area (RJA0044-C).....1 pc.



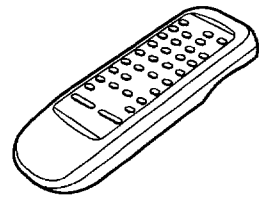
- Optical-fiber cable (RJL1X009B08).....1 pc.



- Stereo phone cables (RJL2P004B08A).....2 pcs.

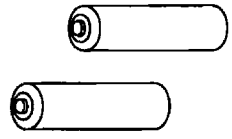


- Remote control transmitter (EUR645272).....1 pc.



- Batteries (R6, AA, UM-3).....2 pcs.

Note: There are available on sales route.



2 Handling Precautions for MD Unit

The laser diode in the MD unit (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body. So be careful of electrostatic breakdown during repair of the MD unit (optical pickup).

2.1. Handling of MD Unit (optical pickup)

1. Do not subject the MD unit (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To protect the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board (FPC board). Refer to Fig. 2-1.
3. Take care not to apply excessive stress to the flexible board (FPC board).

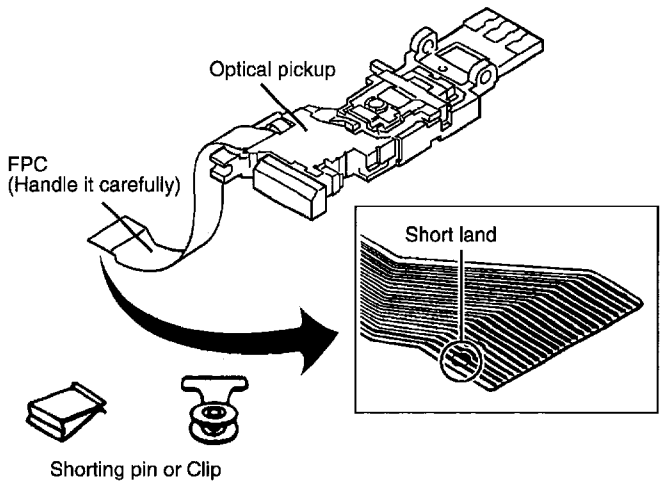


Fig. 2-1.

2.2. Grounding for electrostatic breakdown prevention

2.2.1. Human body grounding

Use the anti-static wrist strap to discharge the static electricity from your body. Refer to Fig. 2-2.

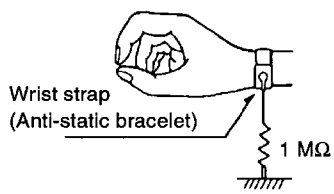


Fig. 2-2.

2.2.2. Work table grounding

Put a conductive material (sheet) or steel sheet on the area where the MD unit (optical pickup) is placed, and ground the sheet. Refer to Fig. 2-3.

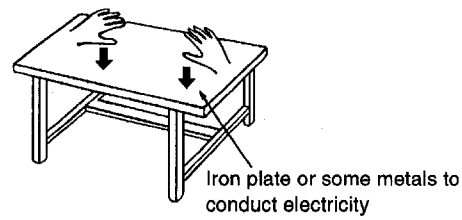


Fig. 2-3.

Caution:

The static electricity of your clothes will not be grounded through the wrist strap.

So take care not to let your clothes touch the MD unit (optical pickup).

3 Precaution of Laser Diode

CAUTION:
THIS PRODUCT UTILIZES A LASER.
USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.
Wave length: 780 nm
Maximum output radiation power from pickup: 4.9 µW/VDE

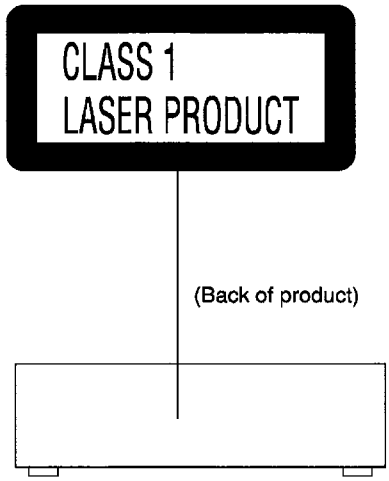
Laser radiation from the pick up unit is safety level, but be sure the followings:

1. Do not disassemble the pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not look at the focus lens using optical instruments.
3. Recommend not to look at pickup lens for a long time.

ACHTUNG: Dieses Produkt enthält eine Laserdiode. Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Lasereinheit abgestrahlt.
Wellenlänge: 780 nm
Maximale Strahlungsleistung der Lasereinheit: 4.9 µW/VDE

Die Strahlung an der Lasereinheit ist ungefährlich, wenn folgende Punkte beachtet werden:

1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Nicht mit optischen Instrumenten in die Fokussierlinse blicken.
3. Nicht über längere Zeit in die Fokussierlinse blicken.



DANGER	INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM.
ADVARSEL	USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO!	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTÖNTÄ LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING	OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.
ADVARSEL	USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. UNNGÅ EKSPONERING FOR STRÅLEN.
VORSICHT	UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.

(Inside of product)
(Indersiden at apparatet)
(Tuotteen sisällä)
(Apparatens insida)
(Produktets innside)
(Im Inneren des Gerätes)

4 Caution for AC Mains Lead

(For United Kingdom)

("EB" area code model only)

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.
A 5-ampere fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5-ampere and that it is approved by ASTA or BSI to BS1362.
Check for the ASTA mark ⓐ or the BSI mark ⓚ on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local dealer.

CAUTION!
IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.
THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt please consult a qualified electrician.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:
Blue: Neutral, Brown: Live.
As these colours may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
The wire which is coloured Blue must be connected to the terminal which is marked with the letter N or coloured Black or Blue.
The wire which is coloured Brown must be connected to the terminal which is marked with the letter L or coloured Brown or Red.

WARNING: DO NOT CONNECT EITHER WIRE TO THE EARTH TERMINAL WHICH IS MARKED WITH THE LETTER E, BY THE EARTH SYMBOL ⏚ OR COLOURED GREEN OR GREEN/YELLOW.

THIS PLUG IS NOT WATERPROOF—KEEP DRY.

Before use

Remove the connector cover.

How to replace the fuse

The location of the fuse differ according to the type of AC mains plug (figures A and B). Confirm the AC mains plug fitted and follow the instructions below.
Illustrations may differ from actual AC mains plug.

1. Open the fuse cover with a screwdriver.

Figure A

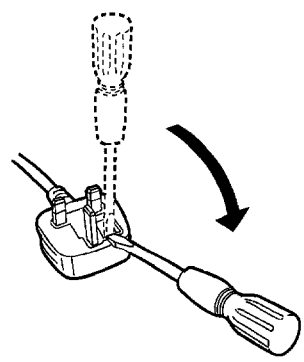
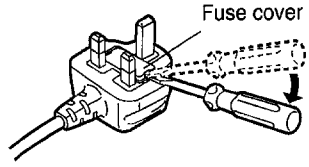


Figure B



2. Replace the fuse and close or attach the fuse cover.

Figure A

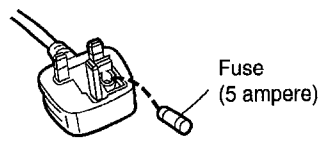
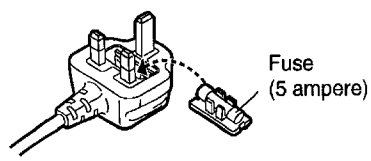
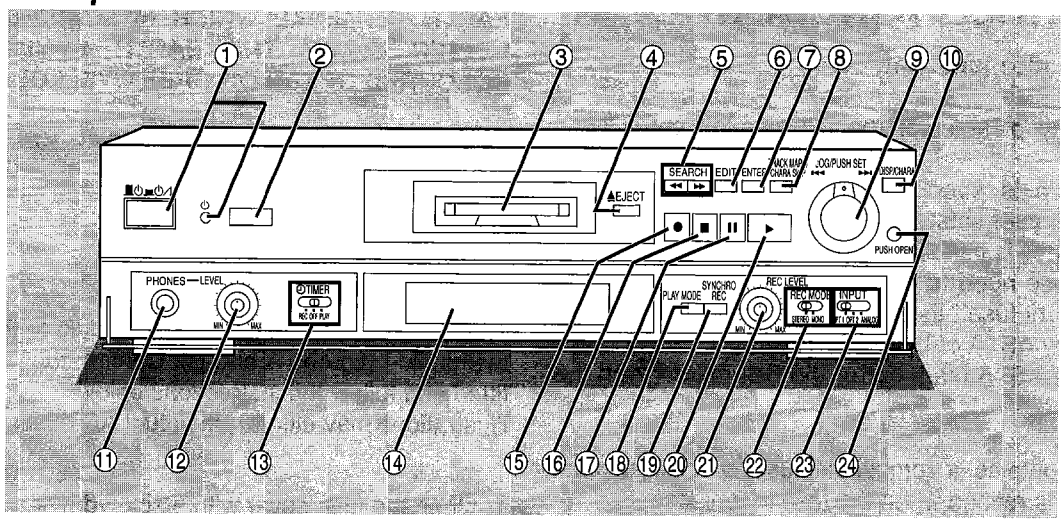


Figure B



5 Location of Controls

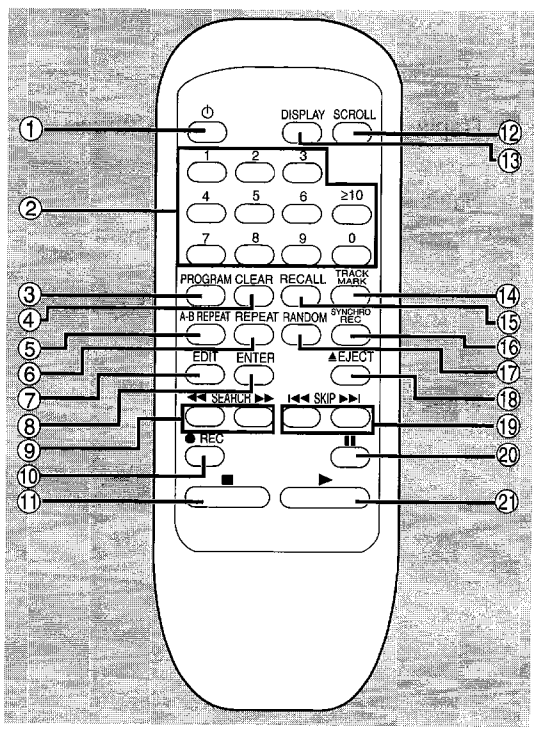
Front panel controls



No.	Name
①	**Unit on/off button (■ ⏻ ▬ ⏻ /I) and remote standby indicator (⏻)** Use this button to turn the unit on and off. ■ (off): The unit is in standby mode. ▬ (on): The unit is on. The unit can be turned on and off with the remote control. When the unit is turned off with the remote control it is in remote standby and the indicator lights. The unit is still using a small amount of power in the standby and remote standby conditions. Standby uses less power.
②	**Remote control signal sensor**
③	**MD slot**
④	**Eject button (▲ EJECT)**
⑤	**Search buttons (◀◀ , ▶▶ SEARCH)**
⑥	**Editing mode button (EDIT)**
⑦	**Enter button used in editing (ENTER)**
⑧	**Track mark mode select / Character skip button (TRACK MARK / CHARA SKIP)**
⑨	**JOG/skip dial (JOG/PUSH SET ⏮ , ⏭)**

No.	Name
⑩	**Display mode select / Character select button (DISP/CHARA)**
⑪	**Headphones jack (PHONES)**
⑫	**Headphones level control (LEVEL)**
⑬	**Timer selector (⏲ TIMER)**
⑭	**Display**
⑮	**Record button (●)**
⑯	**Stop button (■)**
⑰	**Pause button (❚❚)**
⑱	**Playback mode selector (PLAY MODE)**
⑲	**Synchro-record button (SYNCHRO REC)**
⑳	**Playback/recoding start button (▶)**
㉑	**Recording level control (REC LEVEL)**
㉒	**Recording mode selector (REC MODE)**
㉓	**Input selector (INPUT)**
㉔	**Panel open button (PUSH OPEN)** Press this button to open the transparent panel. Close the panel by hand.

The remote control



No.	Name
①	**Unit on/off button (⏻)** Use this button to turn the unit on and off when the unit's [■ ⏻ ▬ ⏻ /I] button is on (▬).
②	**Numeric buttons (1-0, ≥ 10)**
③	**Program button (PROGRAM)**
④	**Program clear button (CLEAR)**
⑤	**A-B repeat button (A-B REPEAT)**
⑥	**Repeat button (REPEAT)**
⑦	**Editing mode button (EDIT)**
⑧	**Enter button used in editing (ENTER)**
⑨	**Search buttons (◀◀ SEARCH ▶▶)**
⑩	**Record button (● REC)**
⑪	**Stop button (■)**
⑫	**Scroll button (SCROLL)**
⑬	**Display select button (DISPLAY)**
⑭	**Track mark select button (TRACK MARK)**
⑮	**Recall button (RECALL)**
⑯	**Synchro-record button (SYNCHRO REC)**
⑰	**Random play button (RANDOM)**
⑱	**Eject button (▲ EJECT)**
⑲	**Skip buttons (⏮ SKIP ⏭)**
⑳	**Pause button (❚❚)**
㉑	**Playback/recording start button (▶)**

6 Self-Diagnostic Function

This unit is equipped with a self-diagnostic function which, in the event of a malfunction, automatically display a code indicating the nature of the malfunction. Use this self-diagnostic function when servicing the unit.

6.1. Setting to the self-diagnostic function

1. Turn the power ON.
2. With no MD loaded in the unit, press and hold the STOP button (■) for at least 2 seconds. And then while still pressing the STOP button (■), press the F. SEARCH button (►►) for at least 2 seconds. The unit is set to the self-diagnostic function and is displayed "MD TEST". Then error code is displayed, if any. Refer to Fig. 6-1. For details of error codes, refer to Table 6-1.

Caution:

If more than one error exists, the display will sequentially show the respective error codes each time the F. SEARCH button (►►) is pressed.

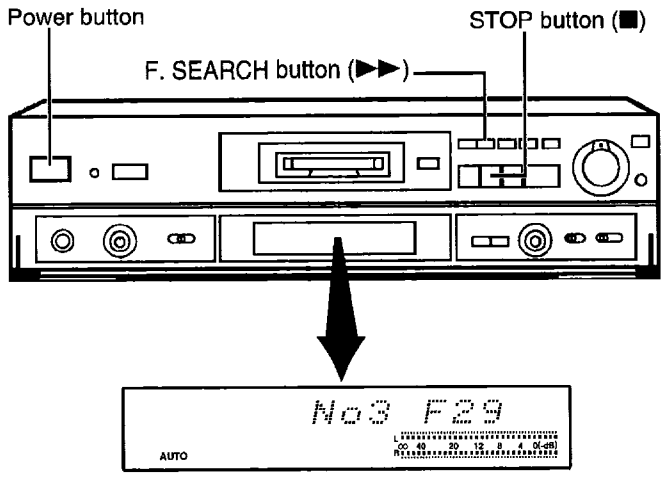


Fig. 6-1.

Table 6-1.

Error code	Symptom	Possible cause
F15	Interval till MD starts playing is too long.	• Traverse det. switch (S8) is defective; Check and replace if necessary.
F26	MD is loaded but cannot be played.	• Communications error between the servo processor IC and the microprocessor IC (system control). Check if the flexible circuit board is disconnected. • Displayed when the disc is scratched too.
F28	MD cannot be loaded.	• Confirm that the disc is not catching on anything. • The connection (flexible circuit board or connector cable) between the MD unit and the MD servo circuit board is disconnected or damaged; check and replace if necessary. • The MD unit may be malfunctioning; replace it.
F29	MD cannot be ejected.	• Confirm that the disc is not catching on anything. • The connection (flexible circuit board or connector cable) between the MD unit and the MD servo circuit board is disconnected or damaged; check and replace if necessary. • The MD unit may be malfunctioning; replace it.

6.2. Canceling the self-diagnostic function

The self-diagnostic function can be canceled by pressing the POWER button (POWER) to turn the system off. And then pressing the power button to turn it on again.

6.3. Clearing the self-diagnostic function

The contents of abnormality display are stored in memory. In order to clear the memory, continue to press the STOP button (■) for at least 5 seconds while in the self-diagnostic function. The memory will clear. Always be sure to clear this memory after completing repair.

7 Self Check Function

This unit is equipped with a self check function which can detect a part of malfunction. Use this self check function before servicing the unit and check the item as shown below.

7.1. Setting to the self check function

1. Turn the power ON.
2. With no MD loaded in the unit, press and hold the STOP button (■) for at least 2 seconds. And then while still pressing the STOP button (■), press the R. SEARCH button (◀◀) for at least 2 seconds. Then the unit is set to the self check function, the FL display is turned off. Refer to Fig. 7-1.

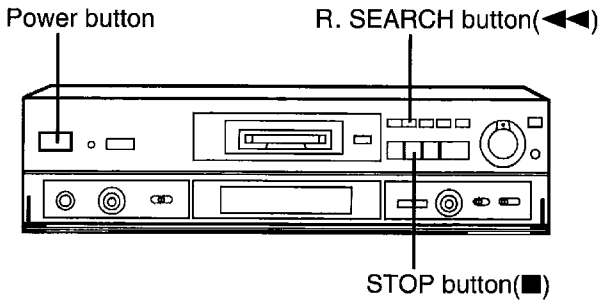
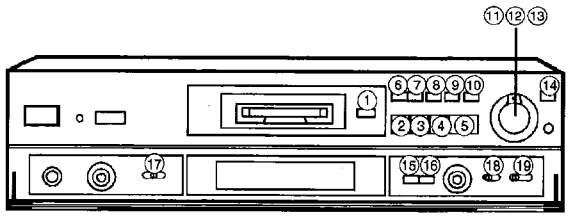


Fig. 7-1.

7.2. Checking the operation buttons

When the unit is set to self check function, press the operation buttons on the unit except the POWER button (POWER). It displayed "-" mark adapted each buttons. Refer to Fig. 7-2. and Fig. 7-3. about allotment.



⑪: Turn the JOG dial to FWD side ⑫: Turn the JOG dial to REW side
⑬: Push the JOG dial

Fig. 7-2.

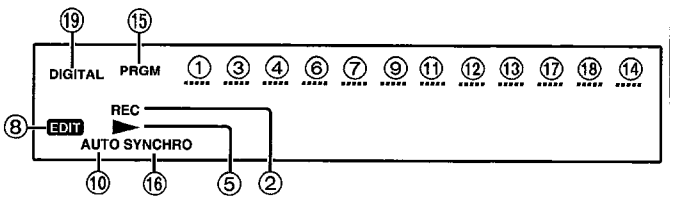


Fig. 7-3.

7.3. Checking the FL display

All buttons works normally except the POWER button (POWER), FL display and LED turns on and off at 0.5 second interval. Refer to Fig. 7-4. and Fig. 7-5.

Fig. 7-4.

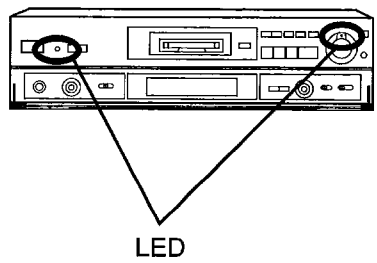


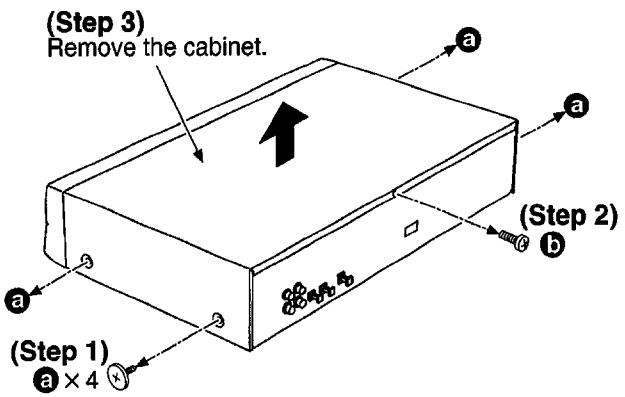
Fig. 7-5.

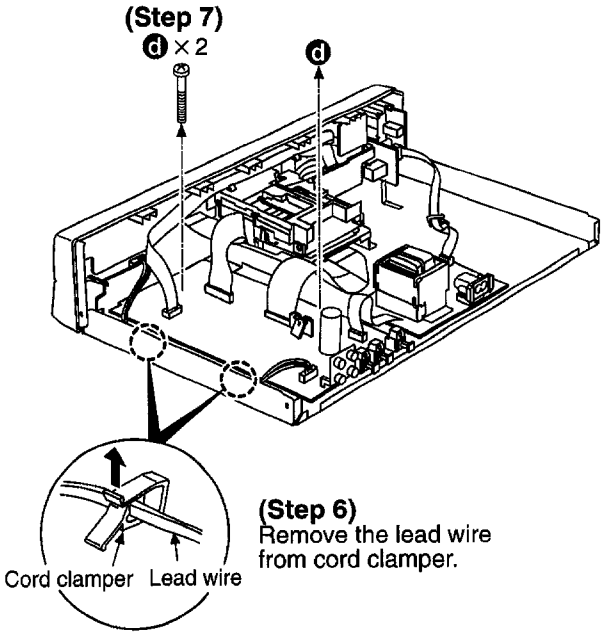
The self check function can be canceled by pressing the POWER button (POWER) or pressing and hold the STOP button (■) for at least 2 seconds.

8 Operation Checks and Component Replacement Procedures

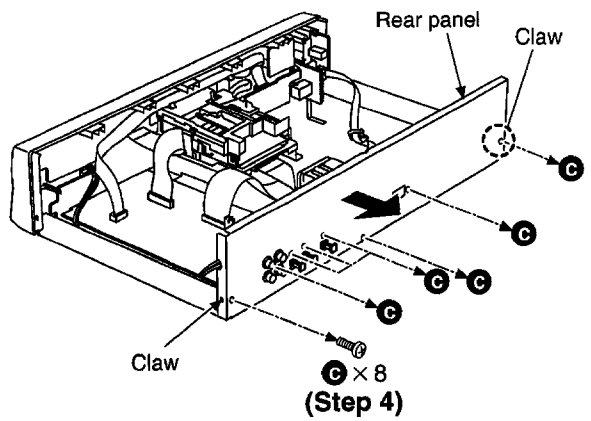
- **This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.**
- **For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.**

8.1. Checking for the main P.C.B.

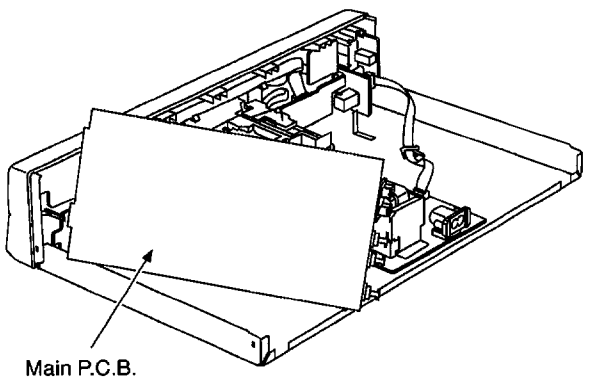




(Step 5)
Remove the 2 claws, and then remove the rear panel.

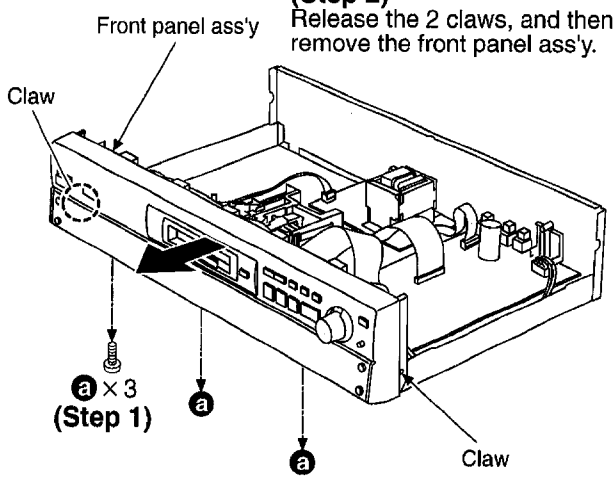


- **Check the main P.C.B. as shown below.**



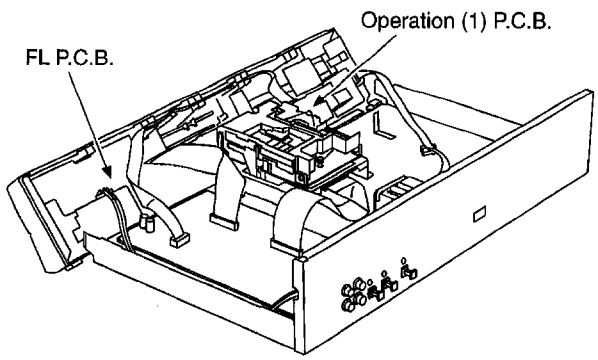
8.2. Checking for the FL P.C.B. and operation (1) P.C.B.

• Follow the **(Step 1)** - **(Step 3)** of item 8.1.



(Step 2)
Release the 2 claws, and then remove the front panel ass'y.

• **Check the FL P.C.B. and operation (1) P.C.B. as shown below.**

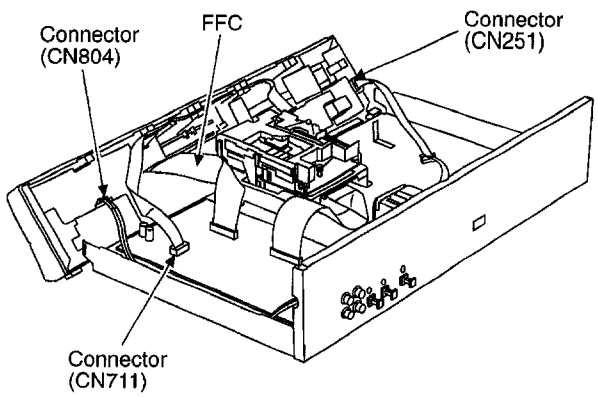


8.3. Removal of the FL P.C.B., operation (1) P.C.B., operation (2) P.C.B. and sensor P.C.B.

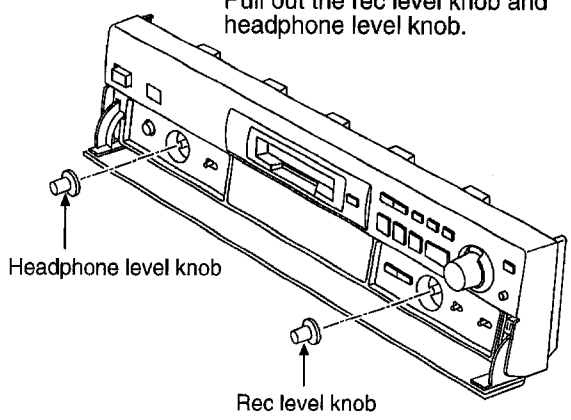
• Follow the **(Step 1)** - **(Step 3)** of item 8.1.

• Follow the **(Step 1)** , **(Step 2)** of item 8.2.

(Step 1)
Remove the 3 connectors and FFC.



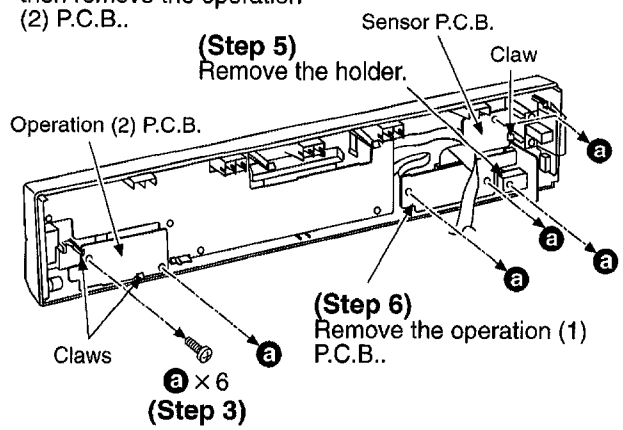
(Step 2)
Pull out the rec level knob and headphone level knob.



(Step 4)
Release the 2 claws, and then remove the operation (2) P.C.B..

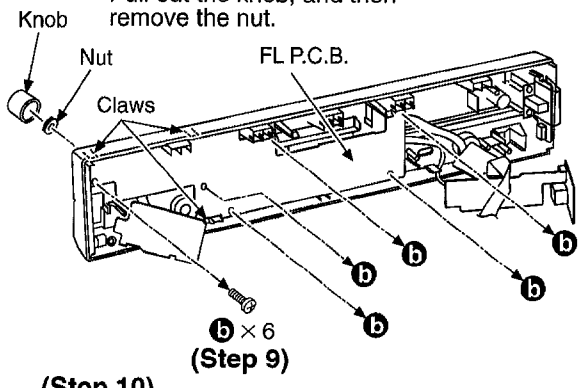
(Step 7)
Release the claw, and then remove the sensor P.C.B..

(Step 5)
Remove the holder.



(Step 6)
Remove the operation (1) P.C.B..

(Step 8)
Pull out the knob, and then remove the nut.

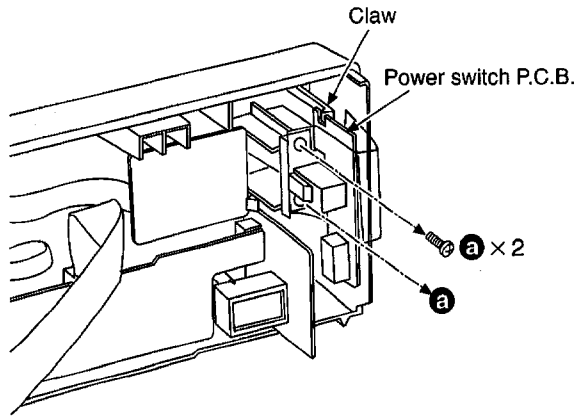


(Step 10)
Remove the 3 claws, and then remove the FL P.C.B..

8.4. Removal of the power switch P.C.B.

- Follow the **(Step 1)** - **(Step 3)** of item 8.1.
- Follow the **(Step 1)** , **(Step 2)** of item 8.2.

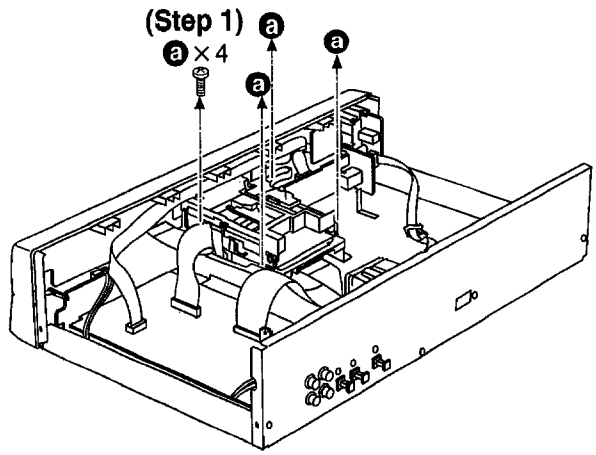
(Step 1)
Remove the 2 screws (ⓐ) and claw, and then remove the power switch P.C.B..



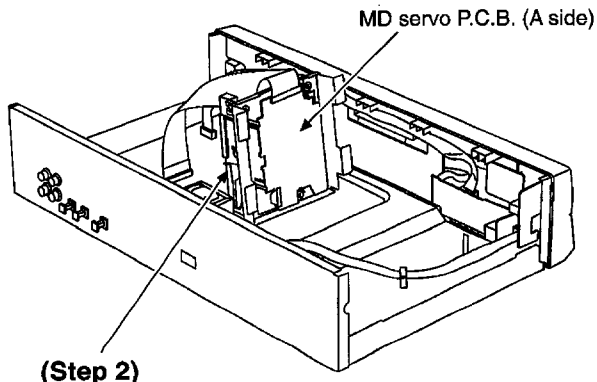
8.5. Checking for the MD servo P.C.B.

8.5.1. Checking for the MD servo P.C.B. (A side)

- Follow the **(Step 1)** - **(Step 3)** of item 8.1.



- **Check the MD servo P.C.B. (A side) as shown below.**



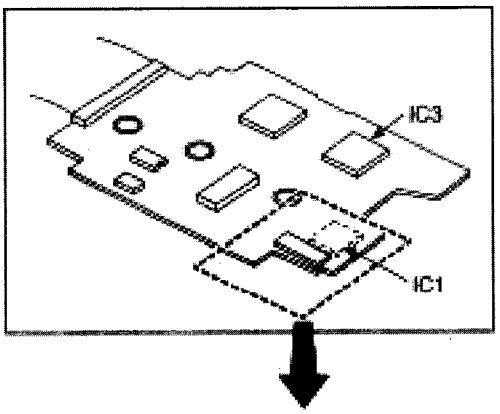
(Step 2)
Raise the MD mechanism unit.

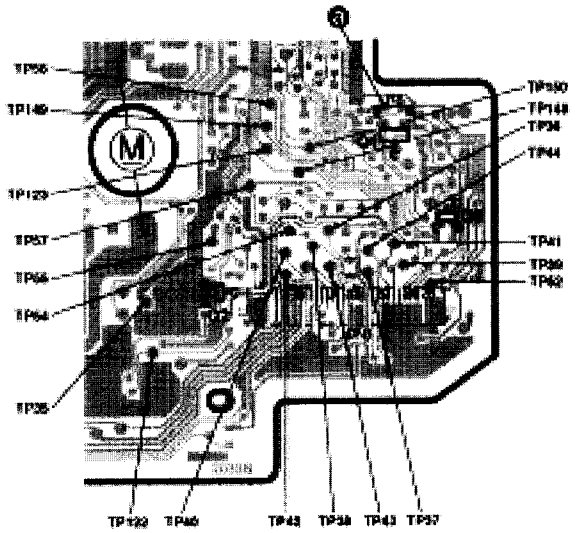
8.5.2. Checking for the MD servo P.C.B. (B side)

- Two methods for checking MD servo P.C.B. (B side) are as follows.

1. To check with test points on the side A of MD servo P.C.B..
2. To check the whole of MD servo P.C.B. (B side) with connecting the extension cable.

1. Test points for checking of MD servo P.C.B. (A side)



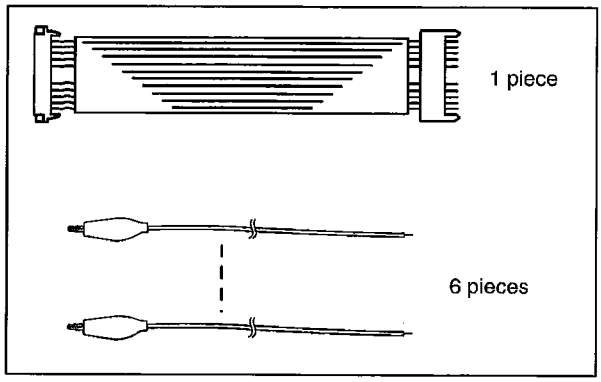


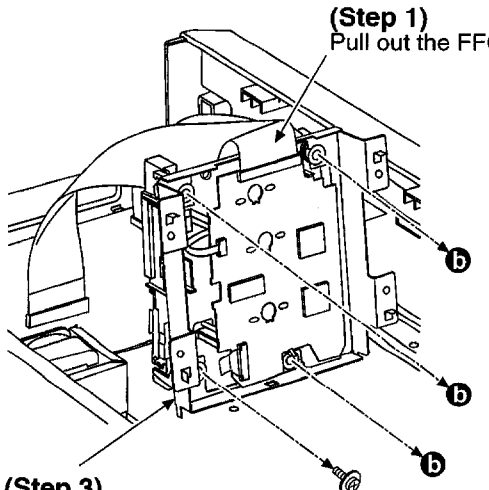
Pin No. of IC1	Test point	Pin No. of IC1	Test point
2PIN	Left side of R8 (ⓐ)	32PIN	TP52
5PIN	TP54	36PIN	Equivalent for pin 16 of IC3
11PIN	TP55	37PIN	TP35
16PIN	TP57	38PIN	TP44
21PIN	TP58	39PIN	TP37
26PIN	TP36	40PIN	TP38
27PIN	TP150	41PIN	TP43
28PIN	TP149	44PIN	TP42
29PIN	TP148	45PIN	TP40
30PIN	TP123	46PIN	TP39
31PIN	TP122	47PIN	TP41

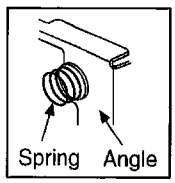
(The waveforms are noted on the schematic diagram.)

2. Checking for the whole of MD servo P.C.B. (B side) with connecting the extension cable.

Extension cable kit [RFKZJMDEK]

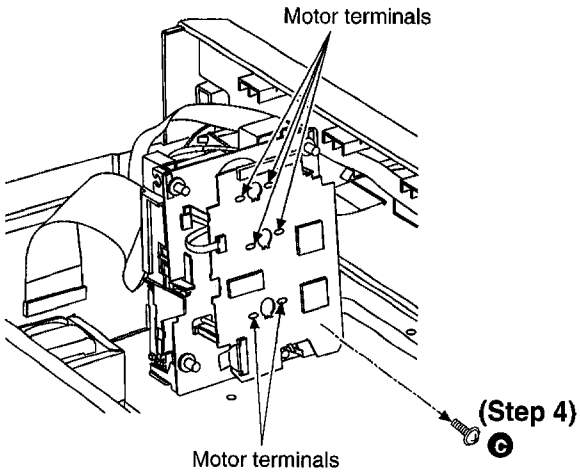




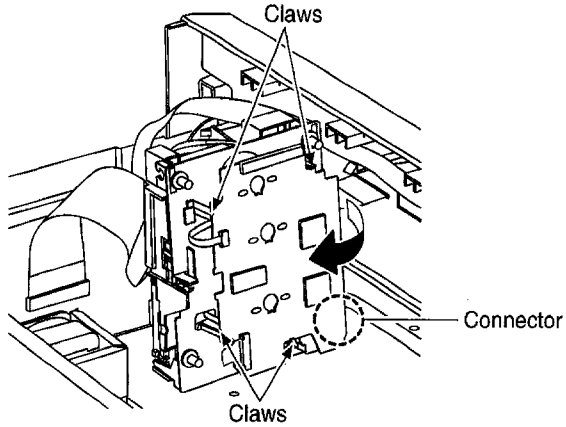


NOTE:
Be careful not to lose the spring.

(Step 5)
Unsolder the 6 motor terminals.

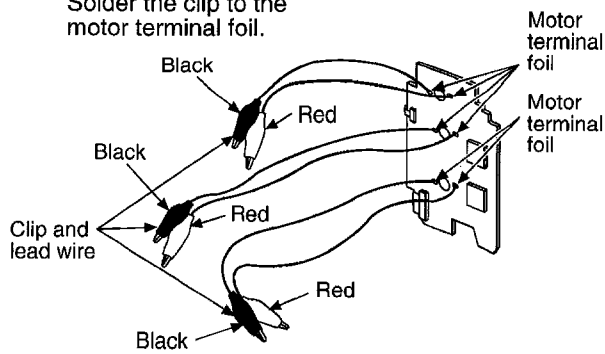


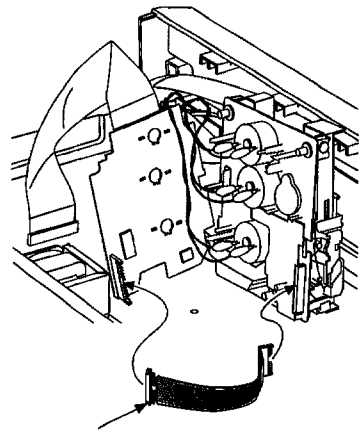
(Step 6)
Release the 4 claws.



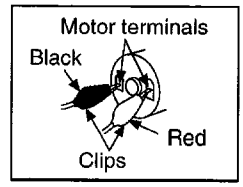
(Step 7)
Remove the connector, and then remove the MD servo P.C.B. in the direction of arrow.

(Step 8)
Solder the clip to the motor terminal foil.



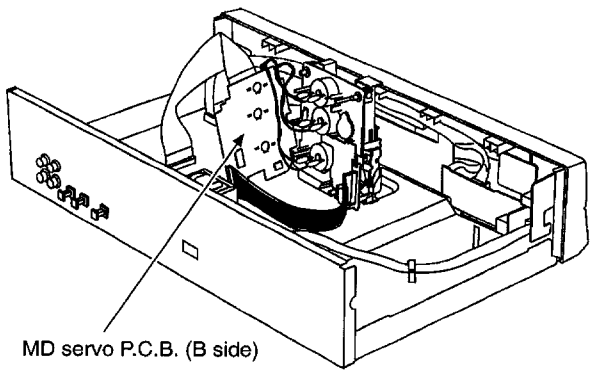


(Step 9)
Connect the clips to the motor terminals



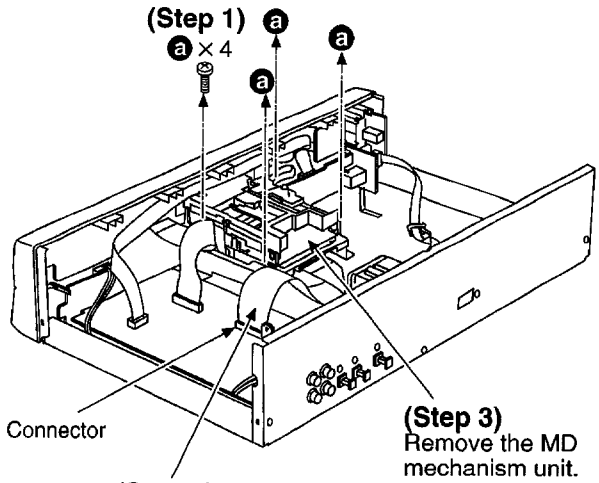
(Step 10)
Connect the extension cable to the connector.

• **Check the MD servo P.C.B. (B side) as shown below.**

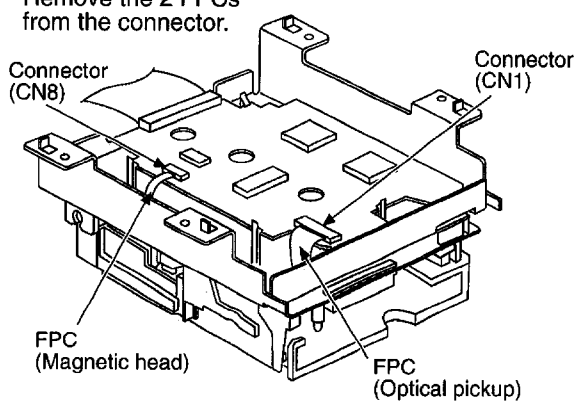


8.6. Replacement for the magnetic head and optical pickup

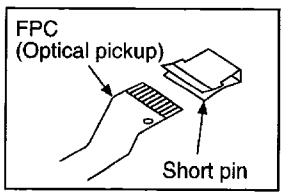
• Follow the **(Step 1)** - **(Step 3)** of item 8.1.



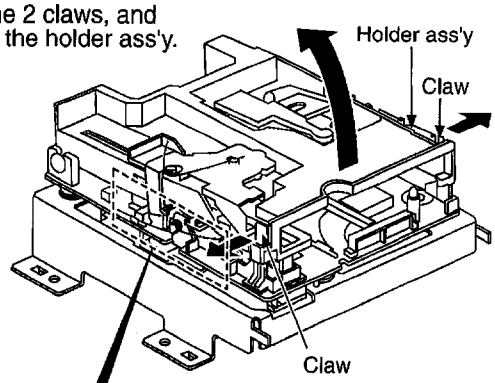
(Step 4)
Remove the 2 FPCs from the connector.



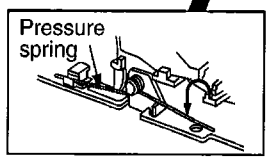
NOTE:
Insert a short pin into the traverse unit FPC borad.
(Refer to "Handling Precautions for MD unit".)



(Step 6)
Release the 2 claws, and then lift up the holder ass'y.

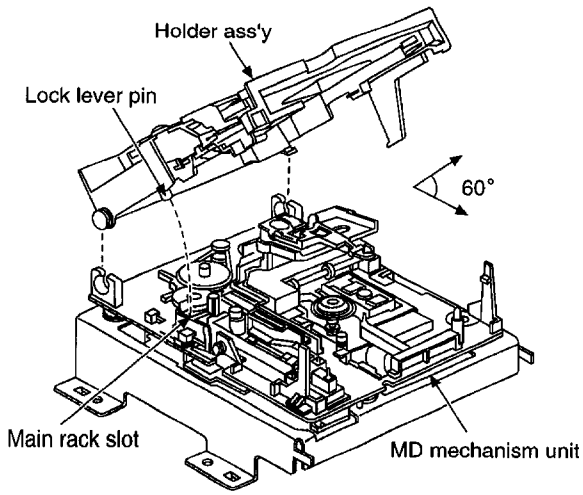


(Step 5)
Remove the pressure spring from latch.



NOTE:
When installing the holder ass'y, the pressure spring should be latched correctly.

(Step 7)
Set the holder ass'y and MD mechanism unit at a 60 degree angle, and then pull out the holder ass'y.

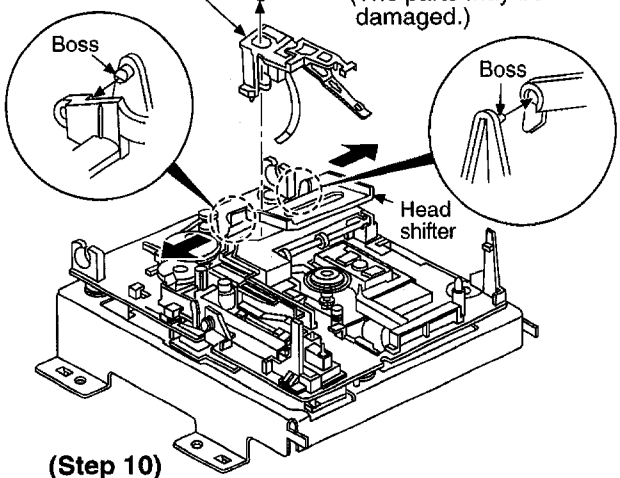


NOTE:
When installing the holder ass'y, align the lock lever pin with the main rack slot.

NOTE:
1. Take care not to damage the magnetic head.
2. Do not tighten the set screw (ⓑ) in excessive torque. (The parts may be damaged.)

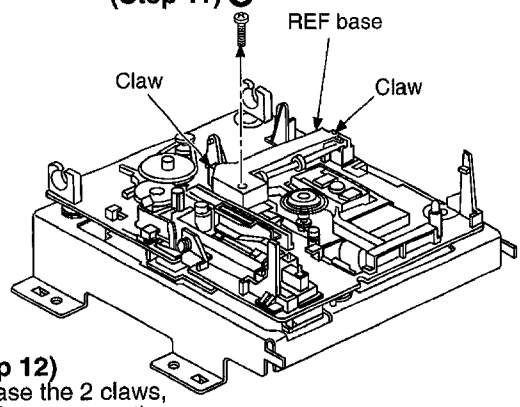
(Step 9)
Remove the magnetic head [RED0047-1].

(Step 8) ⓑ



(Step 10)
Spread the lugs of head shifter, and then release the lugs from boss.

(Step 11) ⓒ

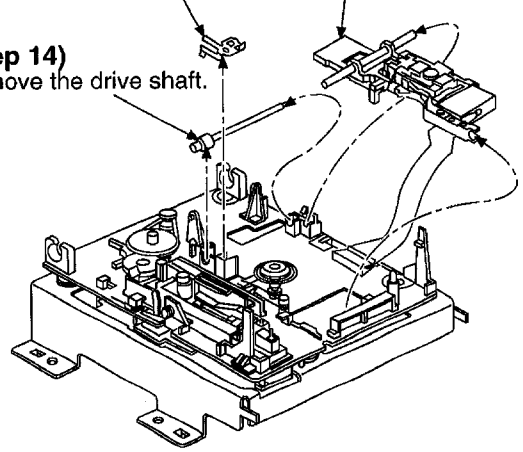


(Step 12)
Release the 2 claws, and then remove the REF base.

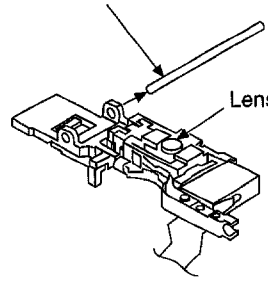
(Step 13)
Remove the thrust spring.

(Step 14)
Remove the drive shaft.

(Step 15)
Remove the optical pickup ass'y.



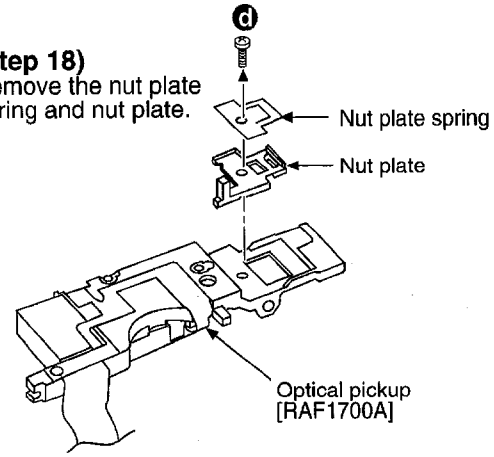
(Step 16)
Pull out the main shaft.



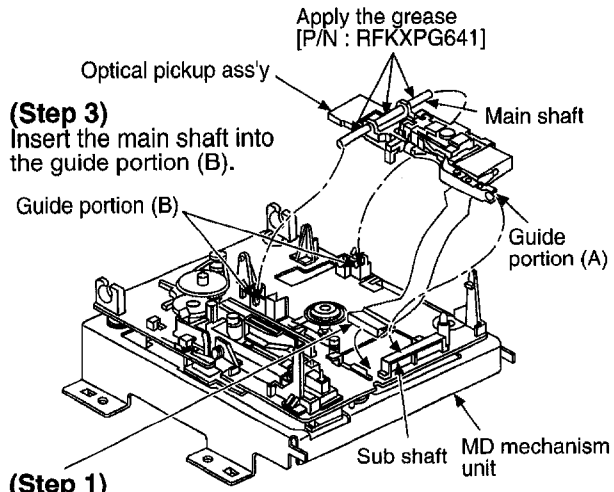
NOTE:
1. Use care to prevent damage the optical pickup, due to the precision construction.
2. Do not apply the grease on the lens of optical pickup.
3. Do not touch the lens of the optical pickup.

(Step 17) ⓓ

(Step 18)
Remove the nut plate spring and nut plate.



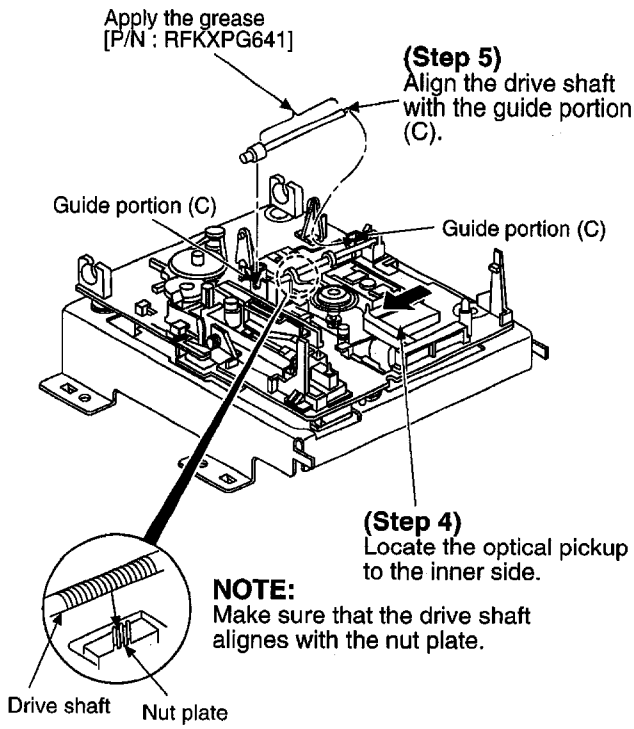
Notice for installing the optical pickup

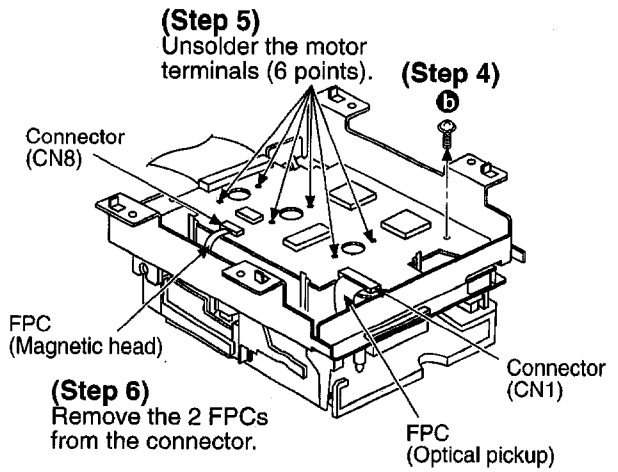


(Step 1)
Pass the FPC through the slot of MD mechanism unit.

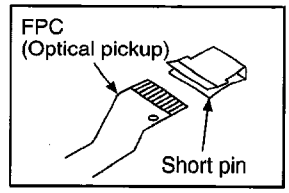
(Step 2)
Align the guide portion (A) of optical pickup with the sub shaft.

NOTE:
Take care not to bend the FPC.



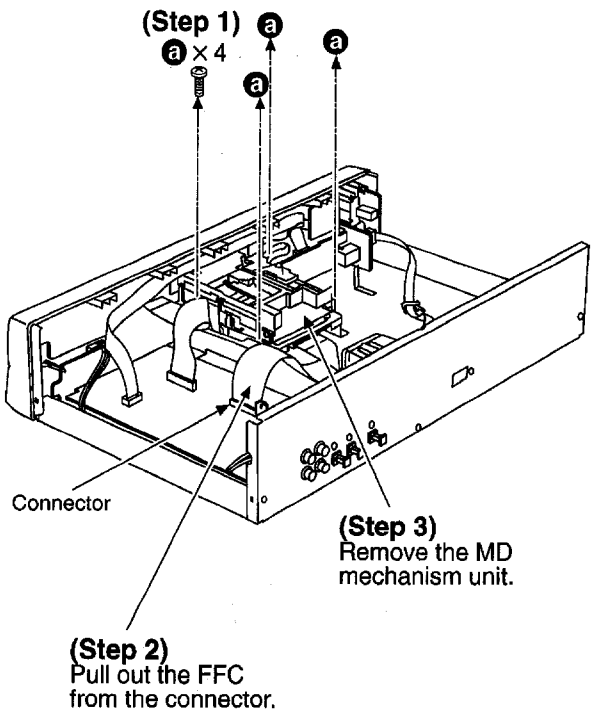


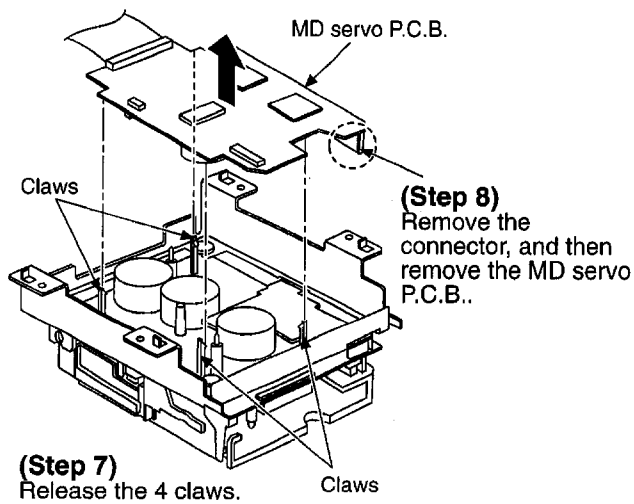
NOTE:
Insert a short pin into the traverse unit FPC borad.
(Refer to "Handling Precautions for MD unit".)

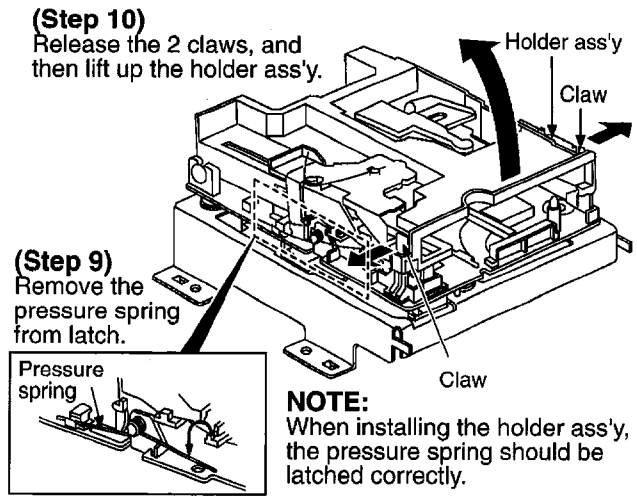


8.7. Replacement for the belt and loading motor

- Follow the **(Step 1)** - **(Step 3)** of item 8.1.

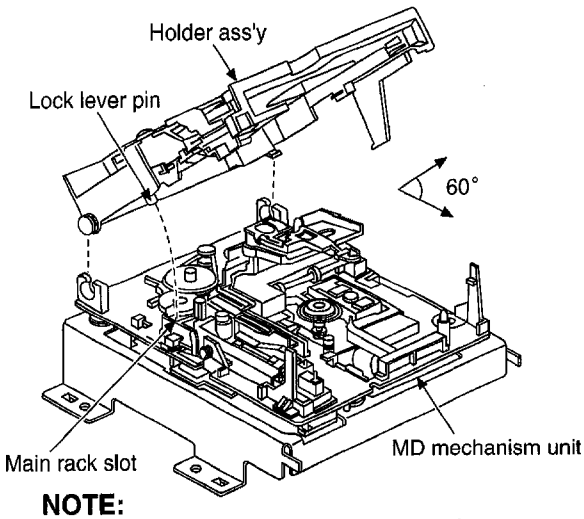




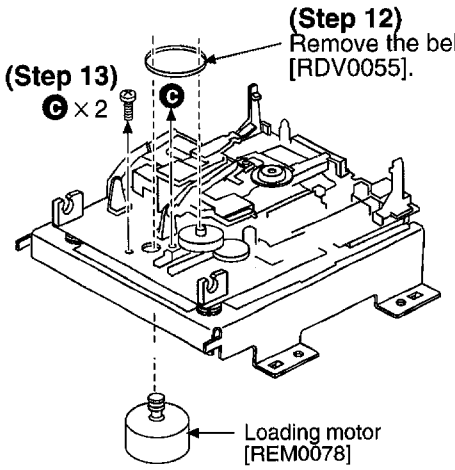


NOTE:
When installing the holder ass'y, the pressure spring should be latched correctly.

(Step 11)
Set the holder ass'y and MD mechanism unit at a 60 degree angle, and then pull out the holder ass'y.

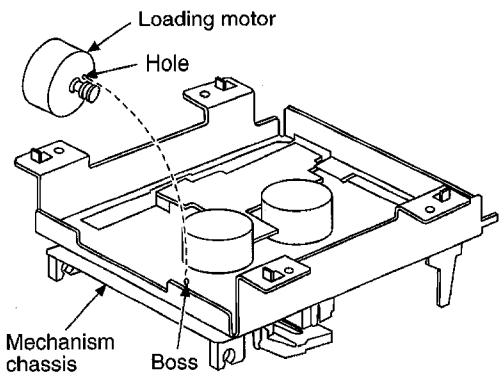


NOTE:
When installing the holder ass'y, align the lock lever pin with the main rack slot.



Notice for installing the loading motor

- Align the hole of loading motor with the boss of mechanism chassis, and then install the loading motor.



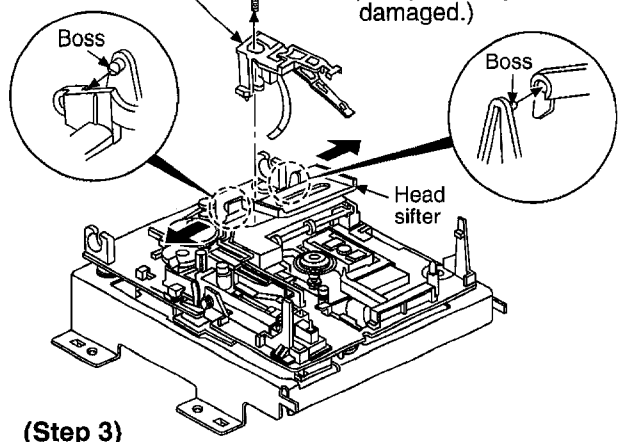
8.8. Replacement for the traverse motor

- Follow the **(Step 1)** - **(Step 3)** of item 8.1.
- Follow the **(Step 1)** - **(Step 11)** of item 8.7.

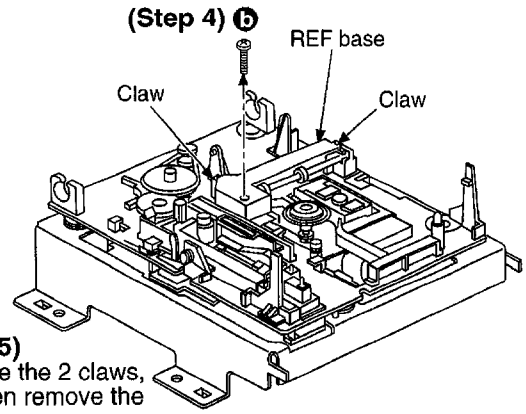
NOTE:
1. Take care not to damage the magnetic head.
2. Do not tighten the set screw (ⓐ) in excessive torque. (The parts may be damaged.)

(Step 2)
Remove the magnetic head [RED0047-1].

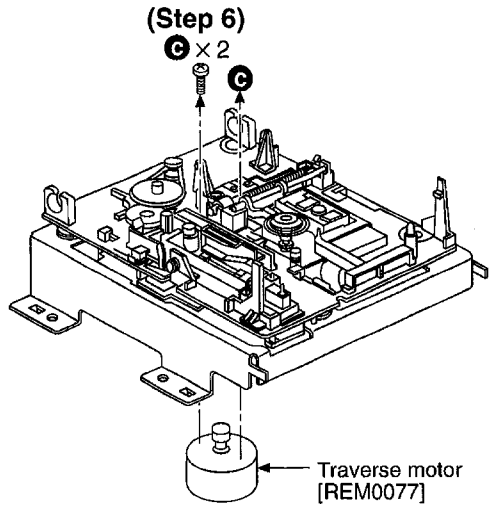
(Step 1)
ⓐ



(Step 3)
Spread the lugs of head shifter, and then release the lugs from boss.

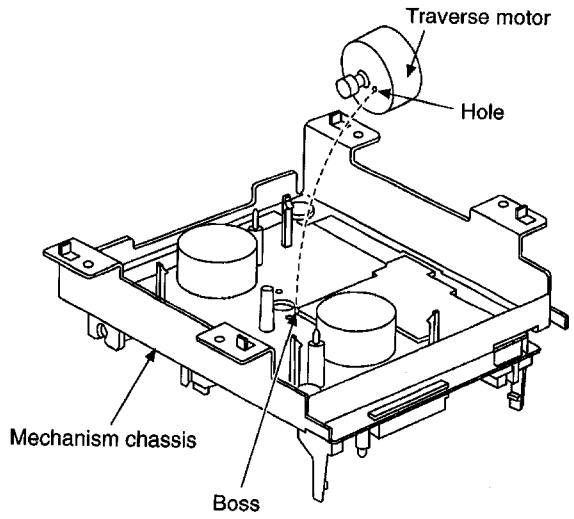


(Step 5)
Release the 2 claws, and then remove the REF base.



Notice for installing the traverse motor

- Align the hole of traverse motor with the boss of mechanism chassis, and then install the traverse motor.



9 Schematic Diagram Notes

- **This schematic diagram may be modified at any time with the development of new technology.**

Notes:

S1:	PROTECT det. switch
S2:	REFLECT det. switch
S3:	LOAD OPEN det. switch
S4:	DISC IN det. switch
S5:	LOAD PLAY/REC det. switch
S6:	LOAD PLAY det. switch
S7:	LOAD TRG det. switch
S8:	Traverse det. switch
S251:	Unit on/off switch (■⏻ ⏻ /I)
S901:	R. search switch (SEARCH ◀◀)
S902:	F. search switch (SEARCH ▶▶)
S903:	Editing mode switch (EDIT)
S904:	Enter switch used in editing (ENTER)
S905:	Track mark mode select/character skip switch (TRACK MARK/CHARA SKIP)
S906:	Display mode select/character select switch (DISP/CHARA)
S907:	Eject switch (⏏ EJECT)
S908:	Stop switch (■)
S909:	Pause switch (❚❚)
S910:	Playback/recording start switch (▶)
S911:	Record switch (●)
S912:	Synchro-record switch (SYNCHRO REC)
S913:	Playback mode selector switch (PLAY MODE)
S901A:	Timer selector switch in PLAY position (◴ TIMER)
S902A:	Input selector switch in ANALOG position (INPUT)
S903A:	Recording mode selector switch in MONO position (REC MODE)
VR1:	Laser power adjustment VR
VR801:	Headphones level contorl VR (LEVEL)
VR851:	Recording level control VR (REC LEVEL)
VR901:	JOG/skip dial VR (JOG/PUSH SET I◀◀,▶▶I)

- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

No mark	: MD Stop
( )	: MD Play
< >	: MD Rec

- Important safety notice:

Components identified by ⚠ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

- **Caution!**

IC and LSI are sensitive to static electricity.

Secondary trouble can be prevented by taking care during repair.

Cover the parts boxes made of plastics with aluminum foil.

Ground the soldering iron.

Put a conductive mat on the work table.

Do not touch the legs of IC or LSI with the fingers directly.

- Voltage and signal line

: Positive voltage line

: Negative voltage line

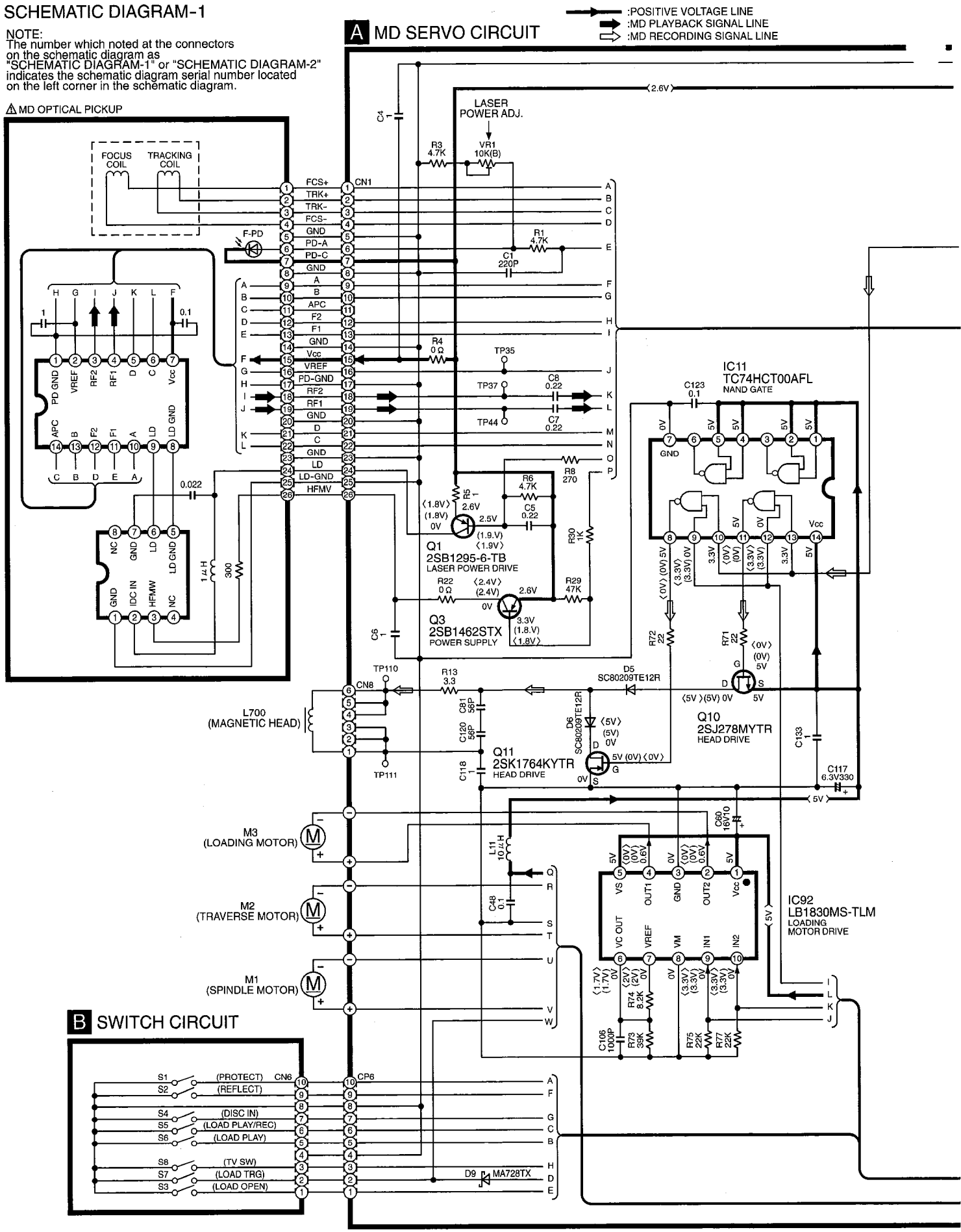
: MD playback signal line

: MD recording signal line

10 Schematic Diagram

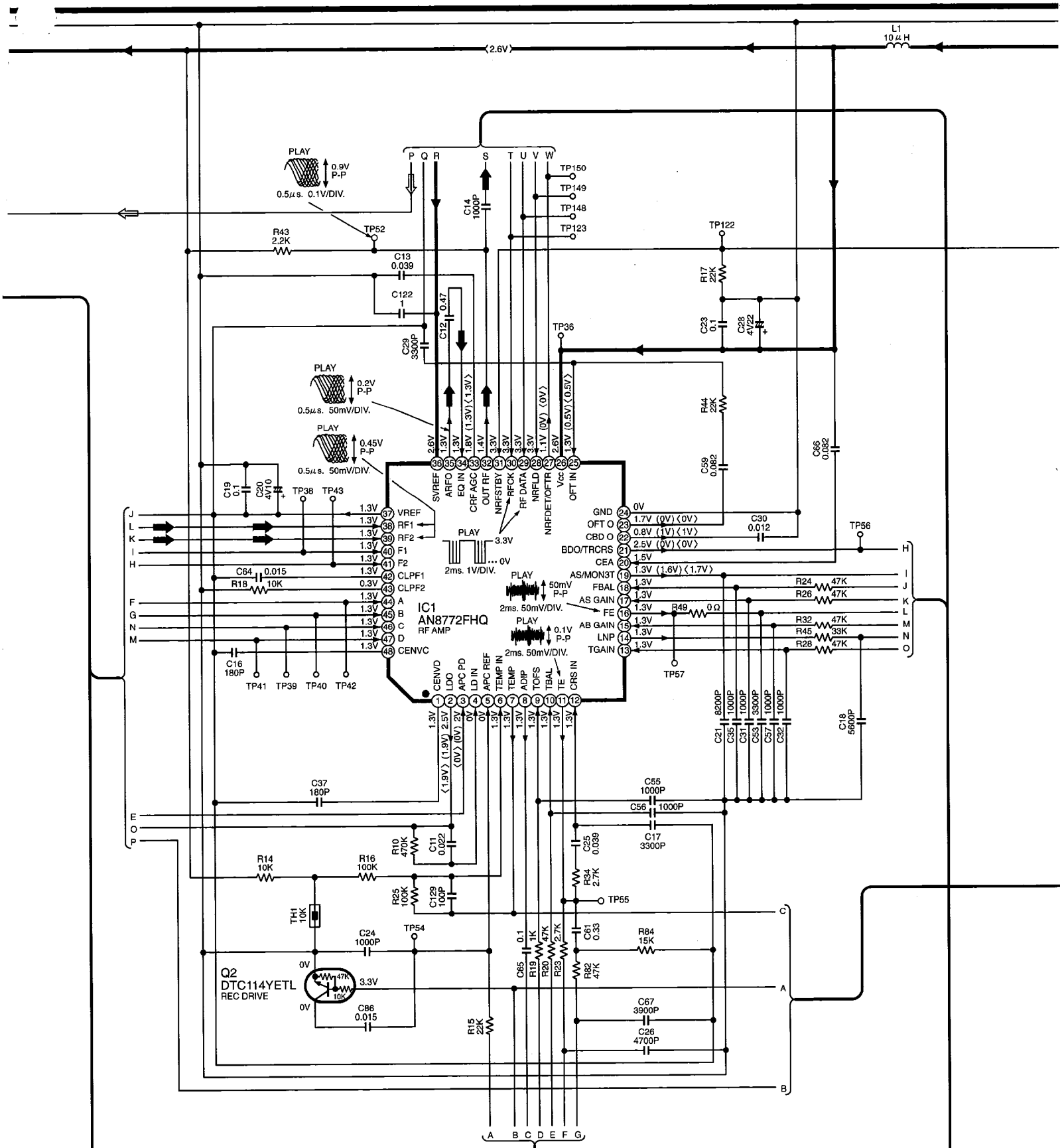
SCHEMATIC DIAGRAM-1

NOTE:
The number which noted at the connectors on the schematic diagram as "SCHEMATIC DIAGRAM-1" or "SCHEMATIC DIAGRAM-2" indicates the schematic diagram serial number located on the left corner in the schematic diagram.



SCHEMATIC DIAGRAM-2

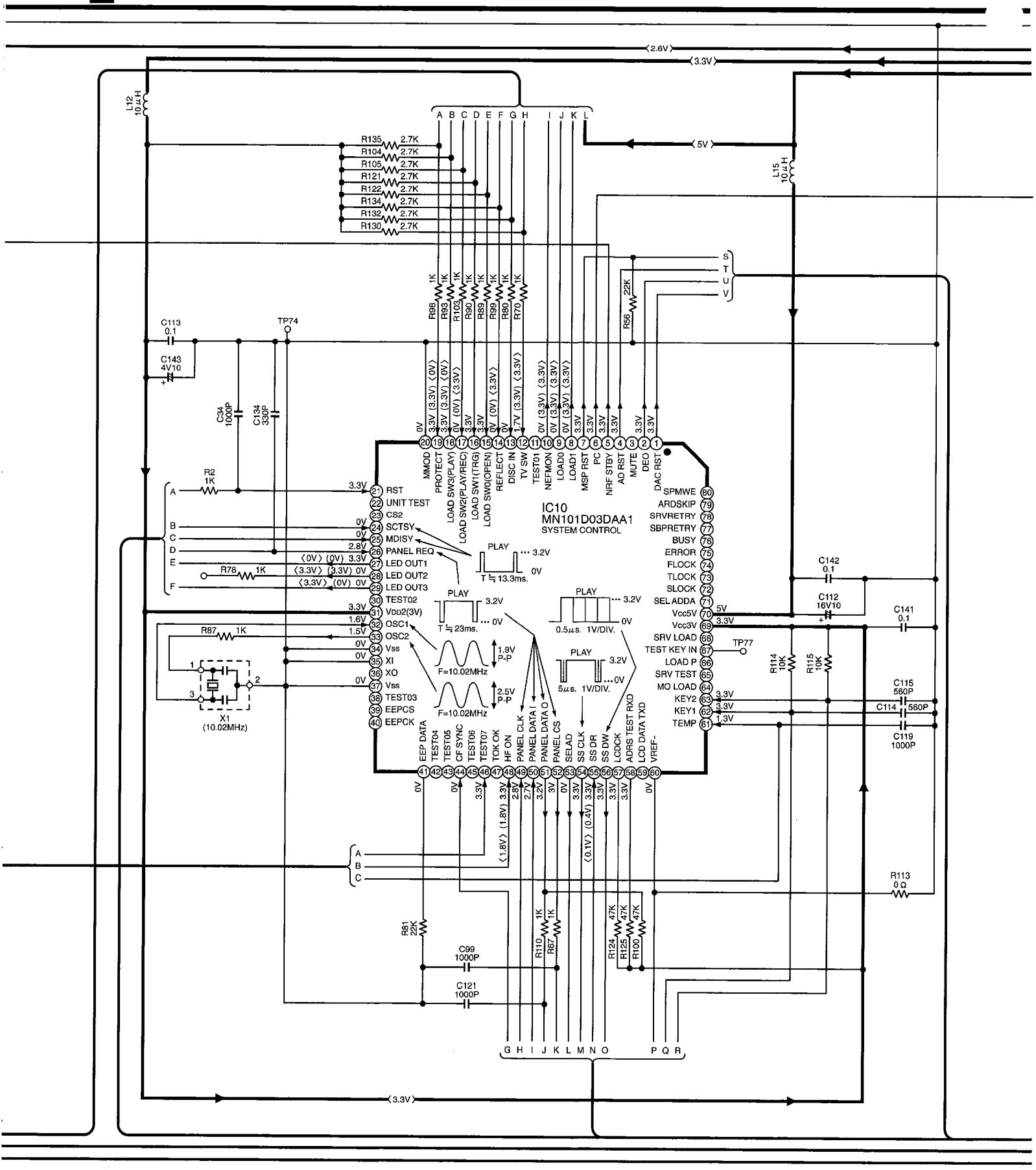
:POSITIVE VOLTAGE LINE :MD PLAYBACK SIGNAL LINE :MD RECORDING SIGNAL LINE



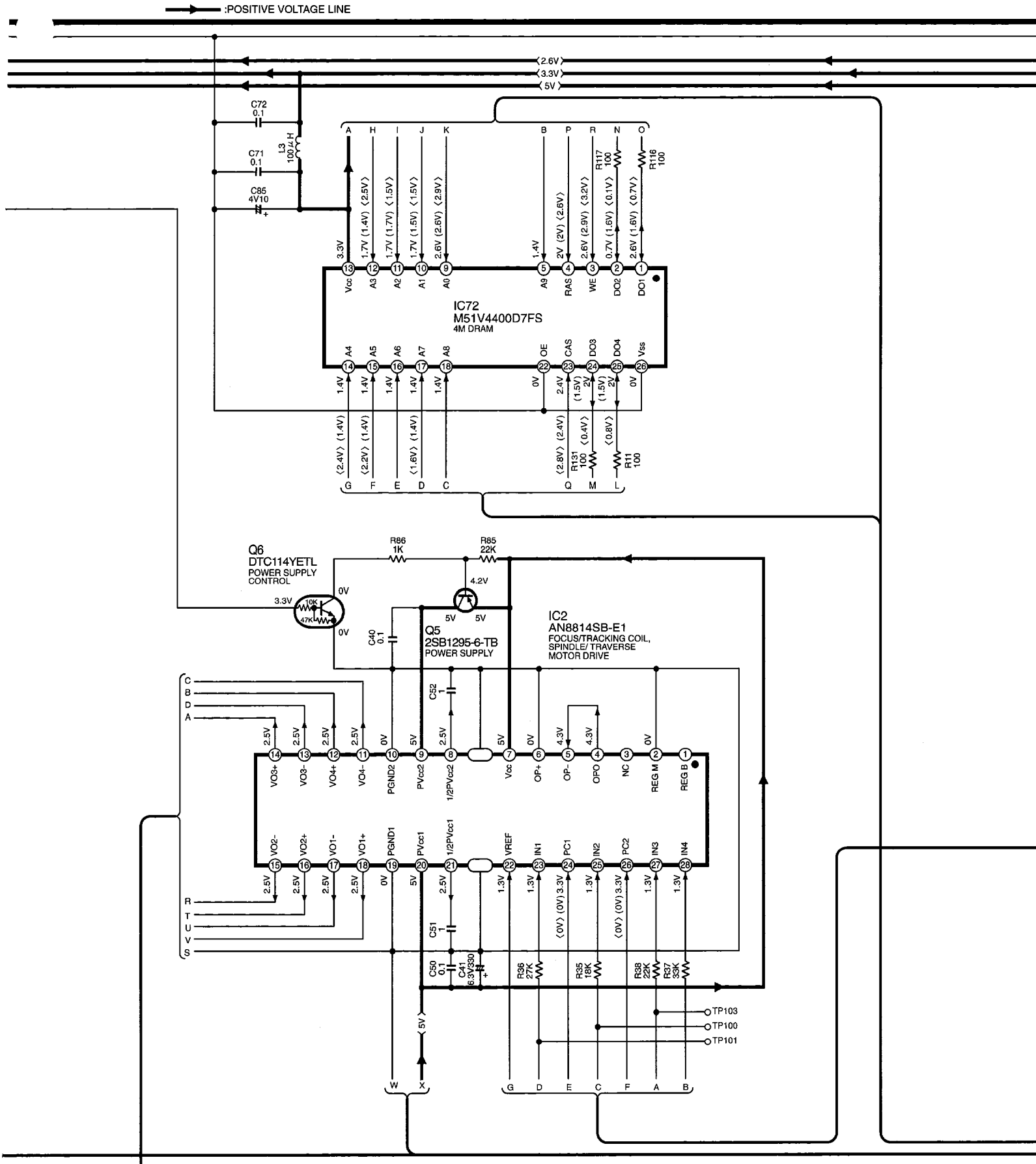
SCHEMATIC DIAGRAM-3

A MD SERVO CIRCUIT

:POSITIVE VOLTAGE LINE



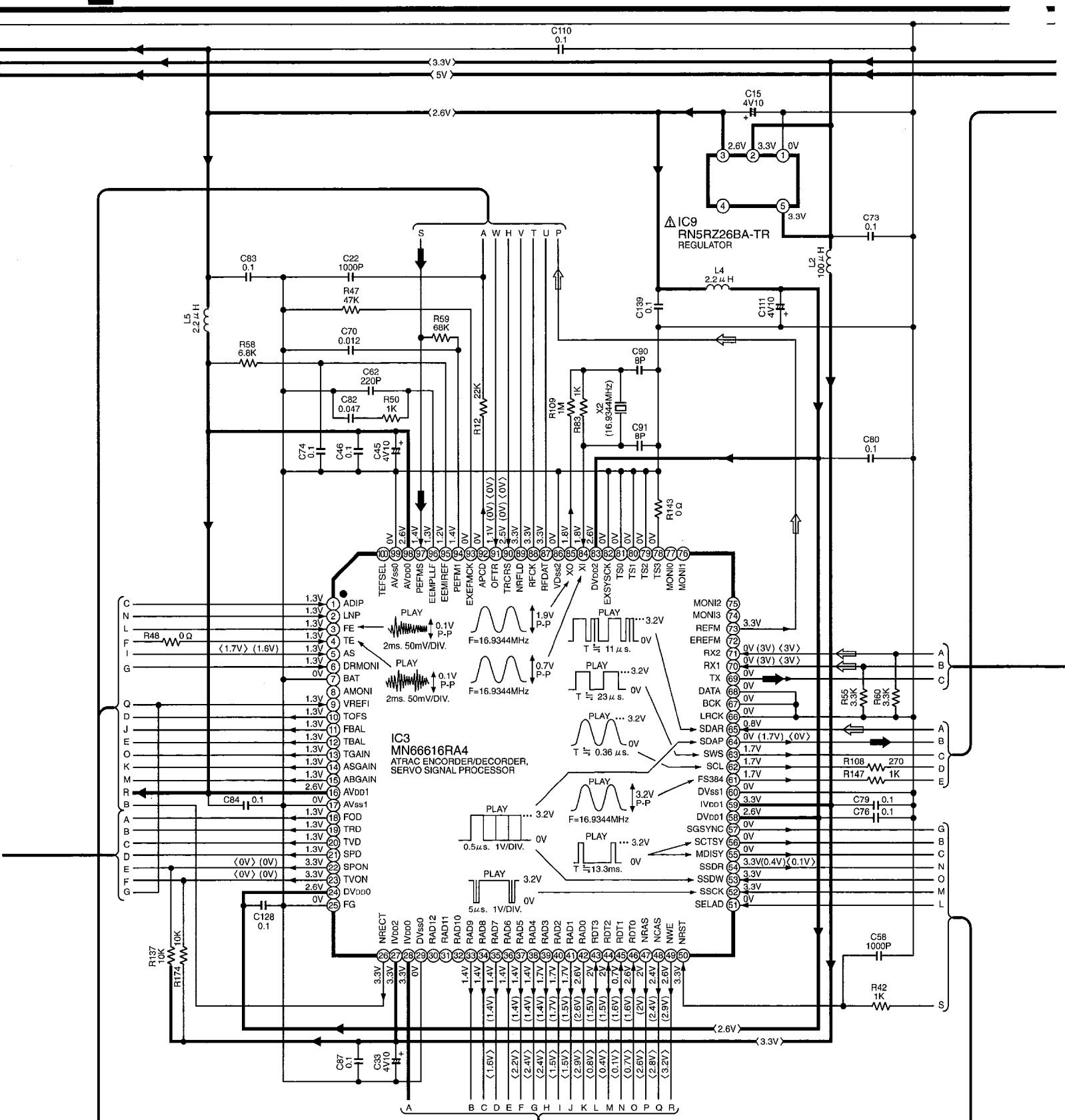
SCHEMATIC DIAGRAM-4



SCHEMATIC DIAGRAM-5

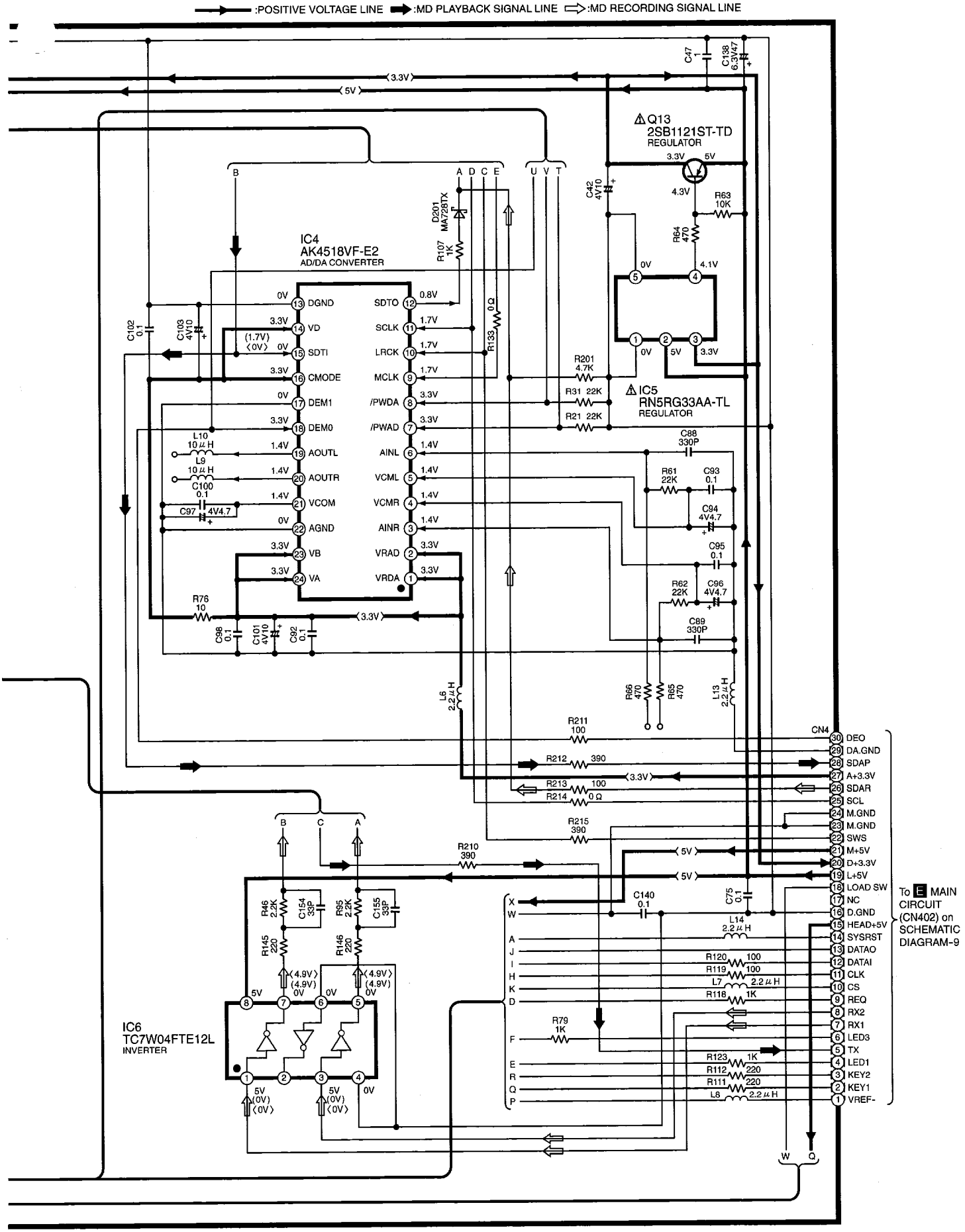
A MD SERVO CIRCUIT

:POSITIVE VOLTAGE LINE :MD PLAYBACK SIGNAL LINE :MD RECORDING SIGNAL LINE



SCHEMATIC DIAGRAM-6

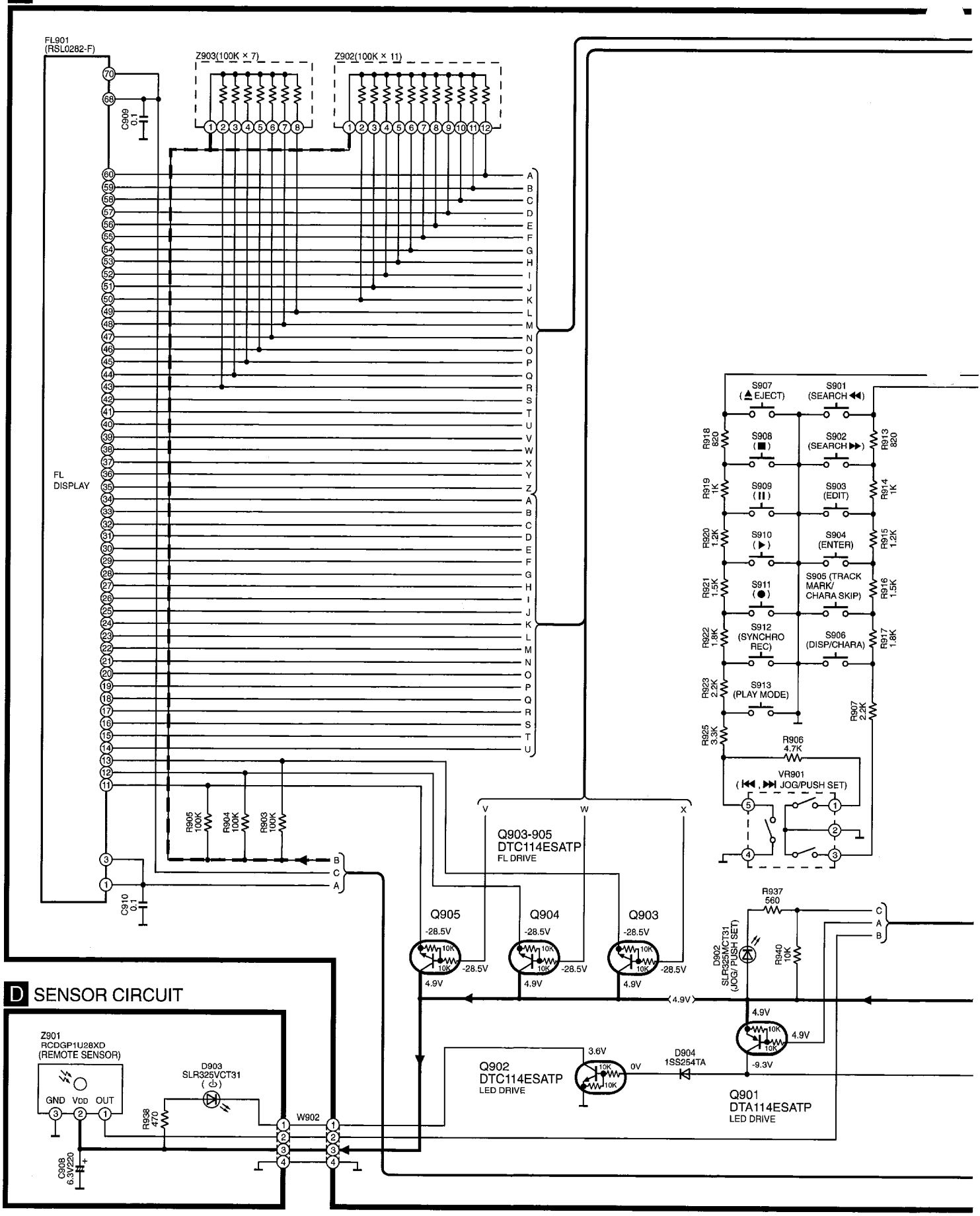
:POSITIVE VOLTAGE LINE :MD PLAYBACK SIGNAL LINE :MD RECORDING SIGNAL LINE



SCHEMATIC DIAGRAM-7

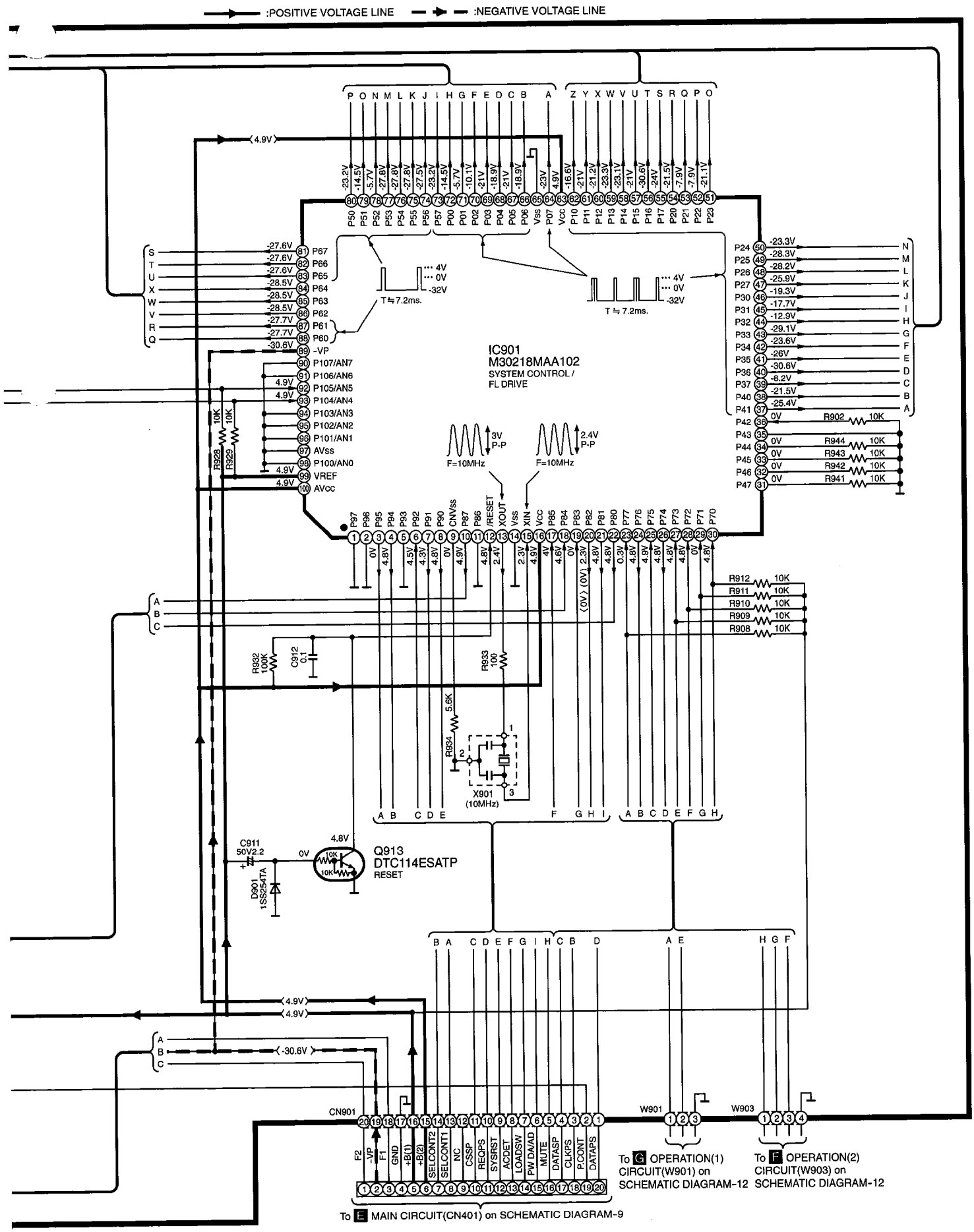
C FL CIRCUIT

:POSITIVE VOLTAGE LINE :NEGATIVE VOLTAGE LINE



D SENSOR CIRCUIT

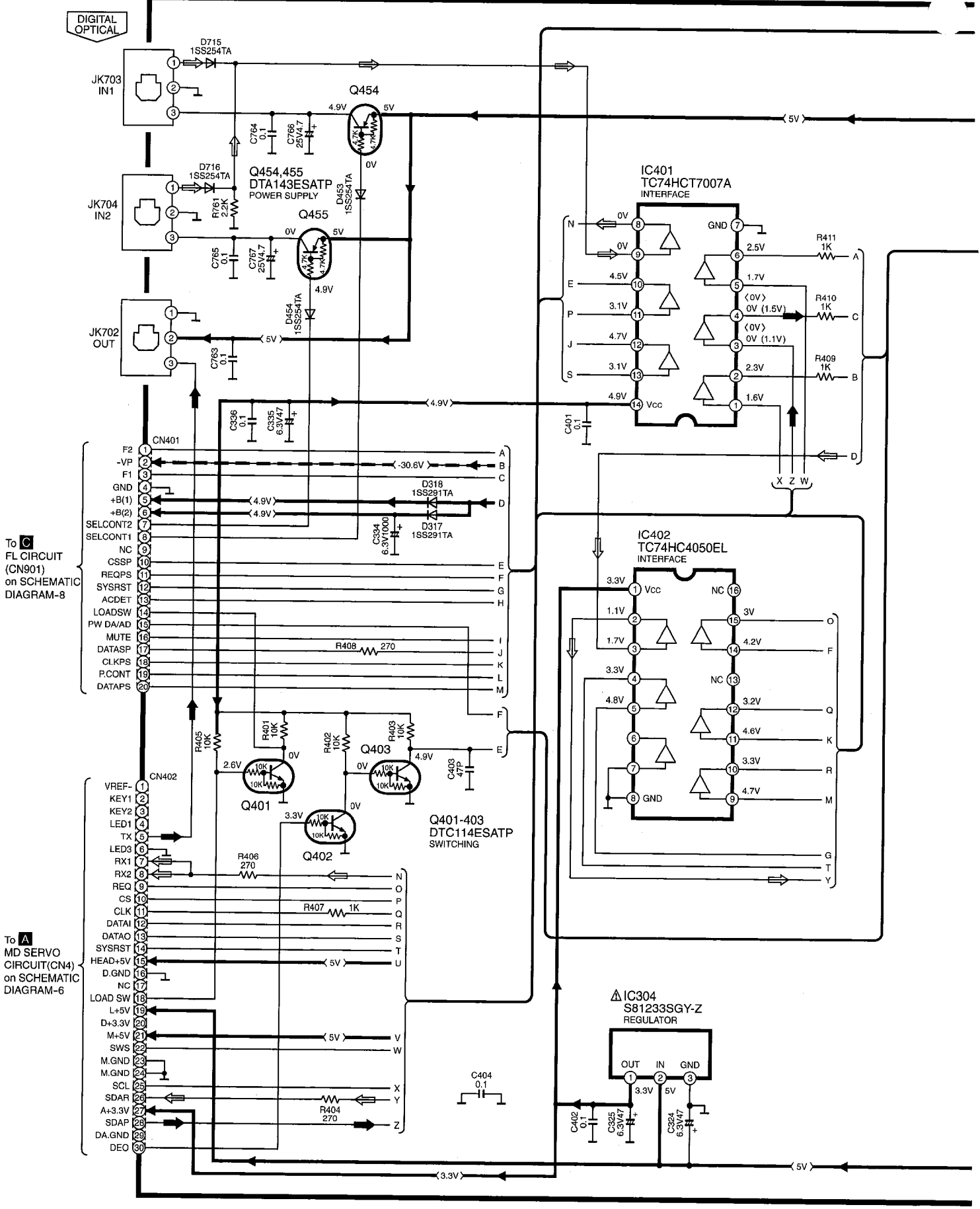
SCHEMATIC DIAGRAM-8



SCHEMATIC DIAGRAM-9

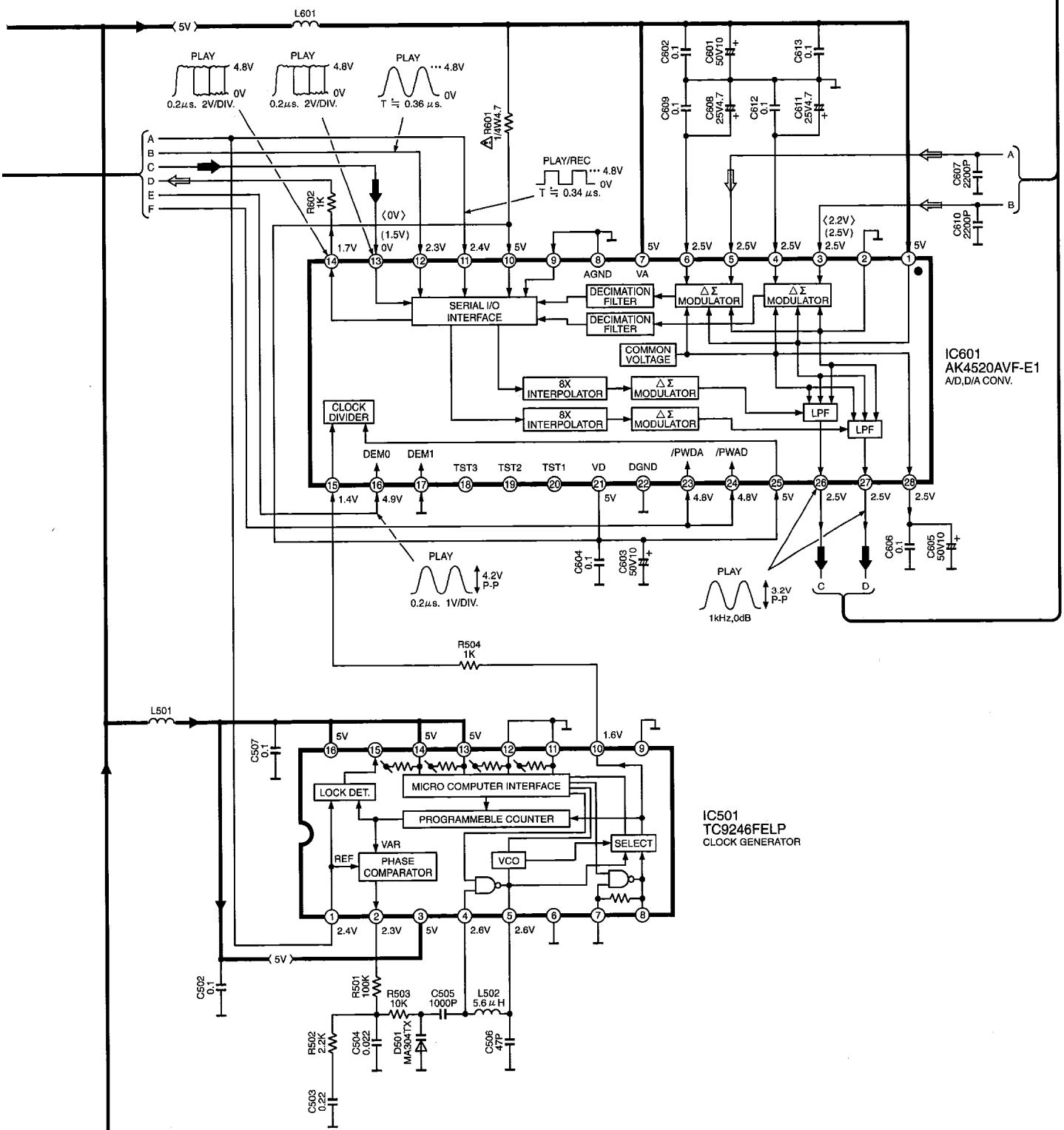
E MAIN CIRCUIT

:POSITIVE VOLTAGE LINE
:NEGATIVE VOLTAGE LINE
:MD PLAYBACK SIGNAL LINE
:MD RECORDING SIGNAL LINE



SCHEMATIC DIAGRAM-10

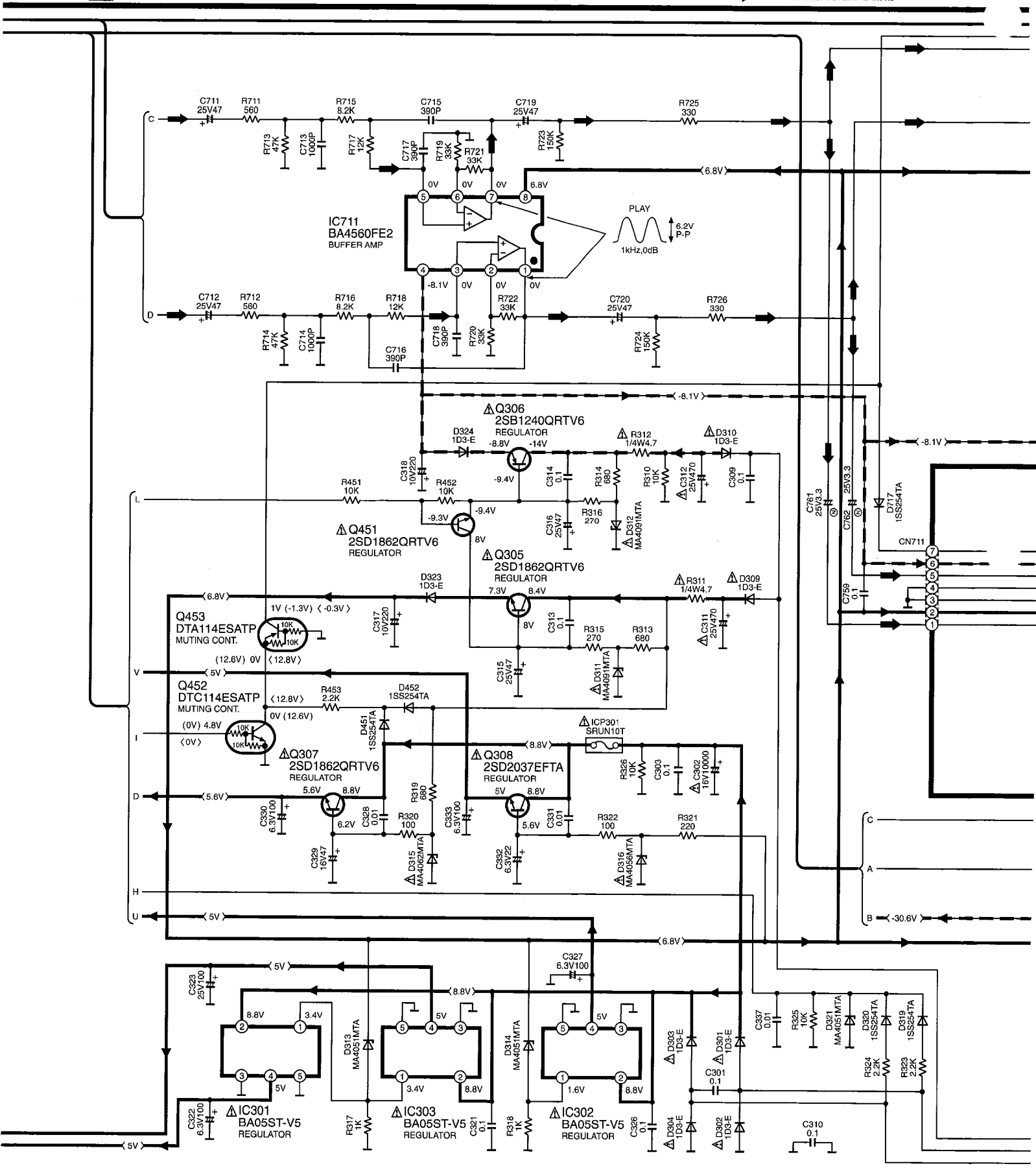
:POSITIVE VOLTAGE LINE :MD PLAYBACK SIGNAL LINE :MD RECORDING SIGNAL LINE



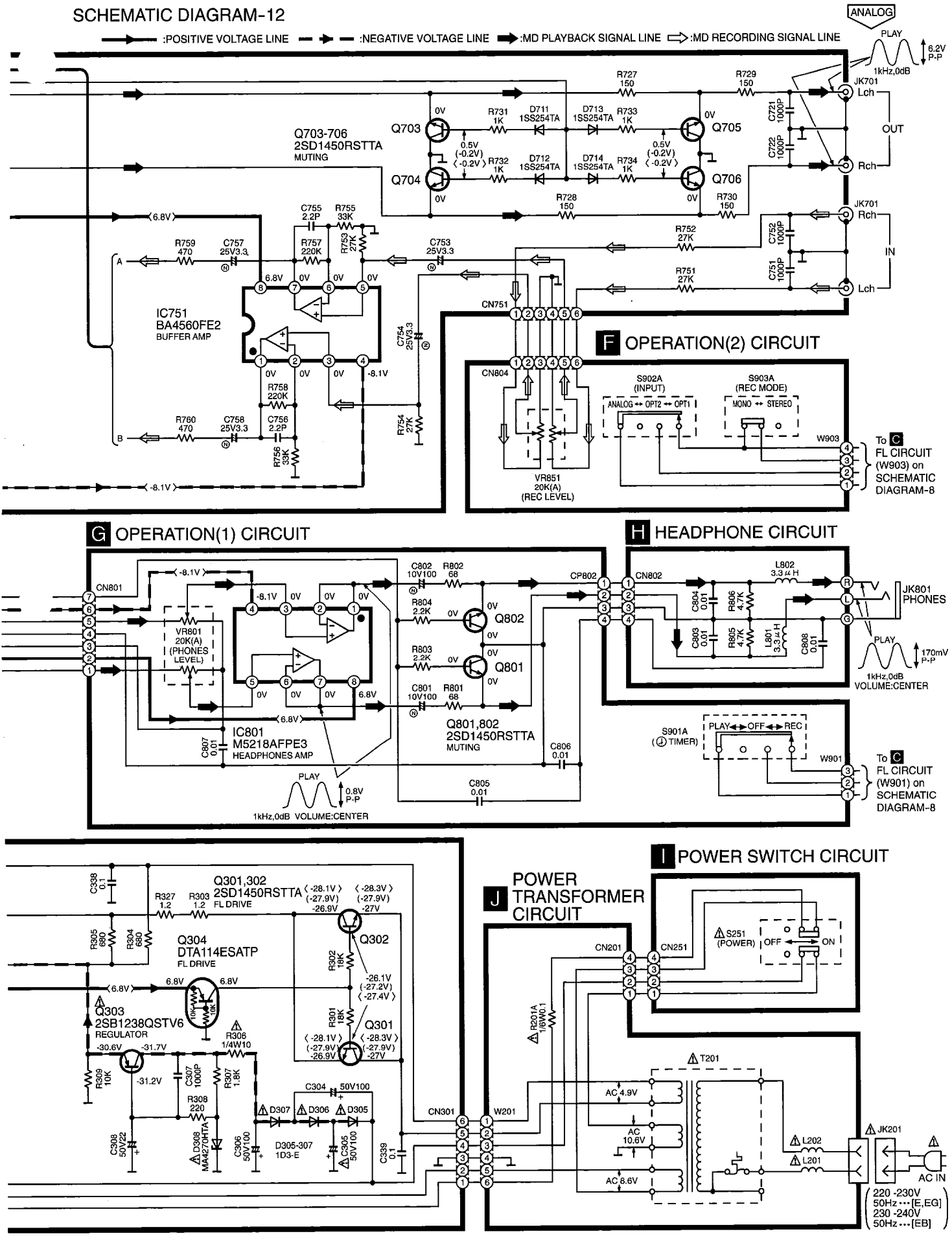
SCHEMATIC DIAGRAM-11

E MAIN CIRCUIT

:POSITIVE VOLTAGE LINE :NEGATIVE VOLTAGE LINE :MD PLAYBACK SIGNAL LINE

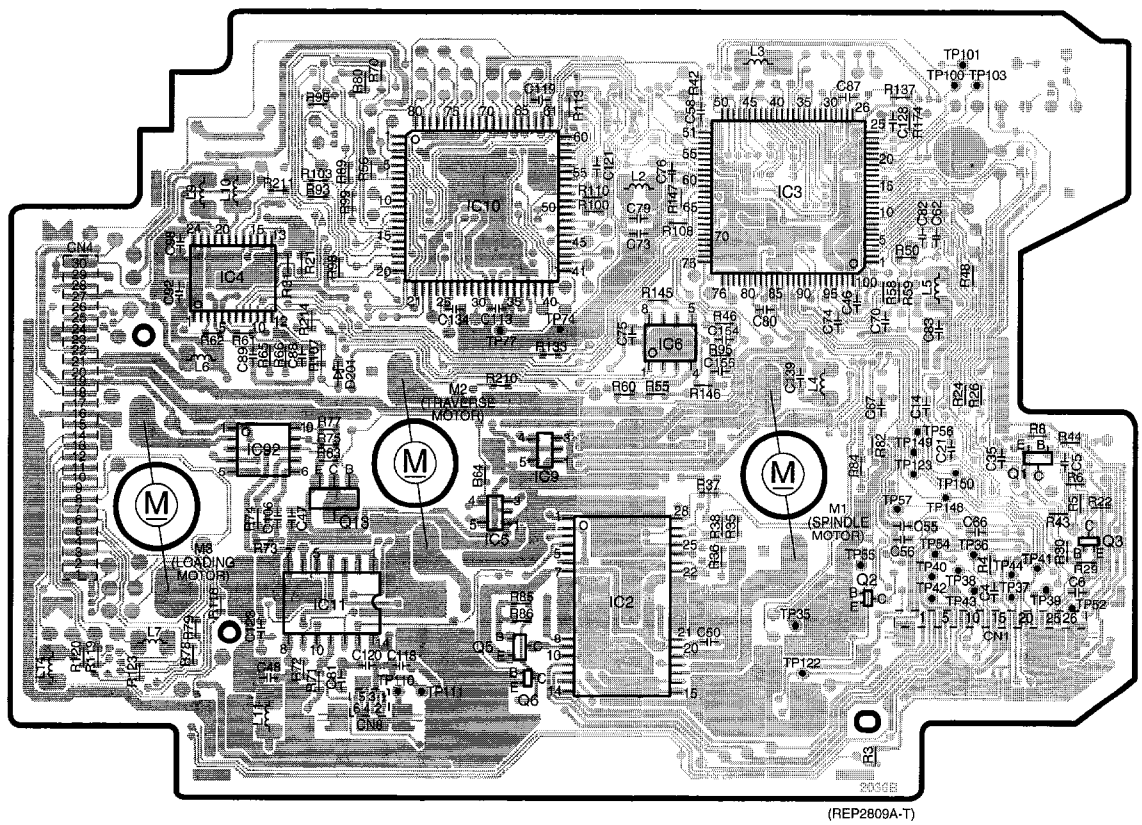


SCHEMATIC DIAGRAM-12



11 Printed Circuit Board Diagram

A MD SERVO P.C.B. (SIDE: A)

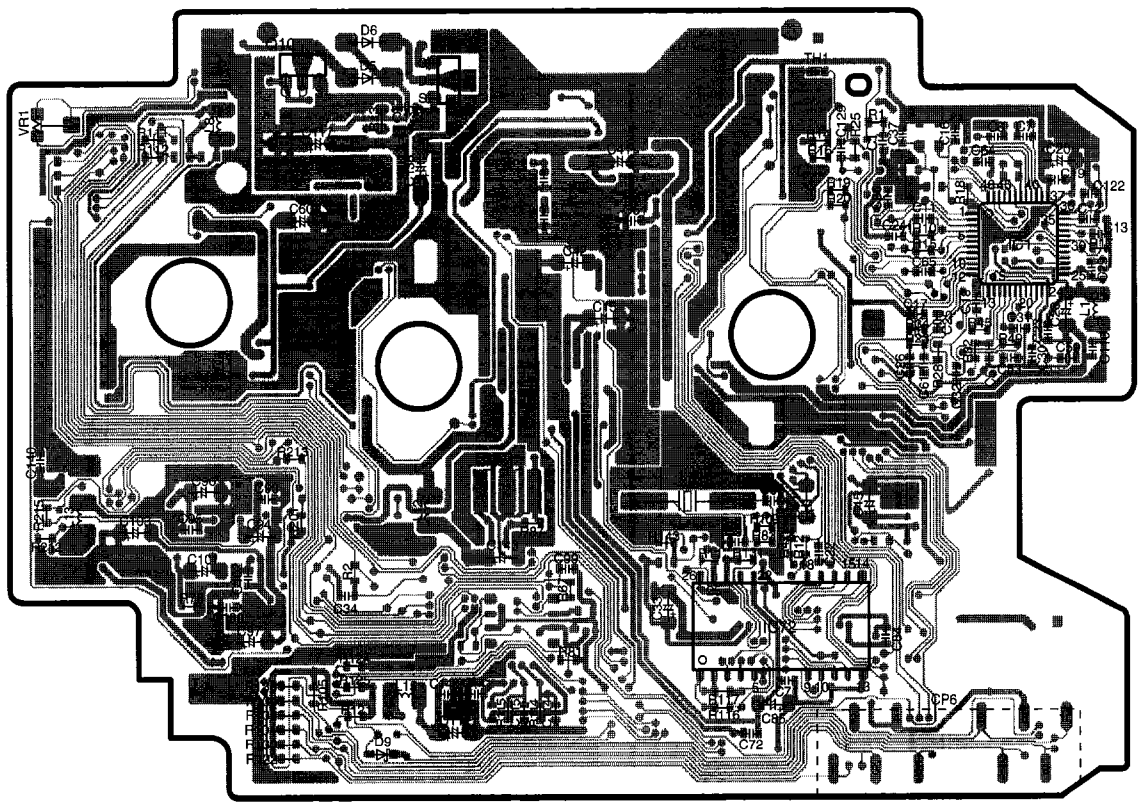


■ ELECTRICAL PARTS LOCATION

Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.
A MD SERVO P.C.B. (SIDE: A)											
IC2	4D	L14	4A	R44	3F	R82	3E	R174	2E	C79	2D
IC3	2D	CN1	4E	R46	3D	R84	3E	R210	3C	C80	3D
IC4	2B	CN4	3A	R48	2E	R85	4C	R211	2B	C81	4B
IC5	4C	CN8	4C	R50	2E	R86	4C	R214	3B	C82	2E
IC6	3D	M1	3D	R55	3D	R89	2B	C4	4E	C83	3E
IC9	3C	M2	3C	R56	2C	R90	2B	C5	3F	C87	2E
IC10	2C	M3	3B	R58	3E	R93	2B	C6	4F	C88	3B
IC11	4B	R3	5E	R59	3E	R95	3D	C14	3E	C89	3B
IC92	3B	R4	4E	R60	3D	R98	2B	C21	3E	C92	3B
Q1	3F	R5	3F	R61	3B	R99	2C	C35	3E	C98	2B
Q2	4E	R6	3F	R62	3B	R100	2D	C46	3E	C106	4B
Q3	4F	R8	3F	R63	3B	R103	2B	C47	4B	C113	3C
Q5	4C	R21	2B	R64	3C	R107	3B	C48	4B	C118	4C
Q6	4C	R22	3F	R65	3B	R108	2D	C50	4D	C119	2C
Q13	3B	R24	3E	R66	3B	R110	2D	C55	4E	C120	4C
D201	3B	R26	3E	R70	2C	R113	2D	C56	4E	C121	2D
L2	2D	R29	4F	R71	4B	R118	4B	C58	2D	C123	4B
L3	2D	R30	4F	R72	4B	R119	4A	C62	2E	C128	2E
L4	3E	R31	2B	R73	4B	R120	4A	C66	4E	C134	3C
L5	3E	R35	4D	R74	4B	R123	4B	C67	3E	C139	3E
L6	3B	R36	4D	R75	3B	R133	3C	C70	3E	C154	3D
L7	4B	R37	3D	R77	3B	R137	2E	C73	2D	C155	3D
L9	2B	R38	4D	R78	4B	R145	3D	C74	3E		
L10	2B	R42	2D	R79	4B	R146	3D	C75	3D		
L11	4B	R43	4F	R80	2C	R147	2D	C76	2D		

G H I J K L

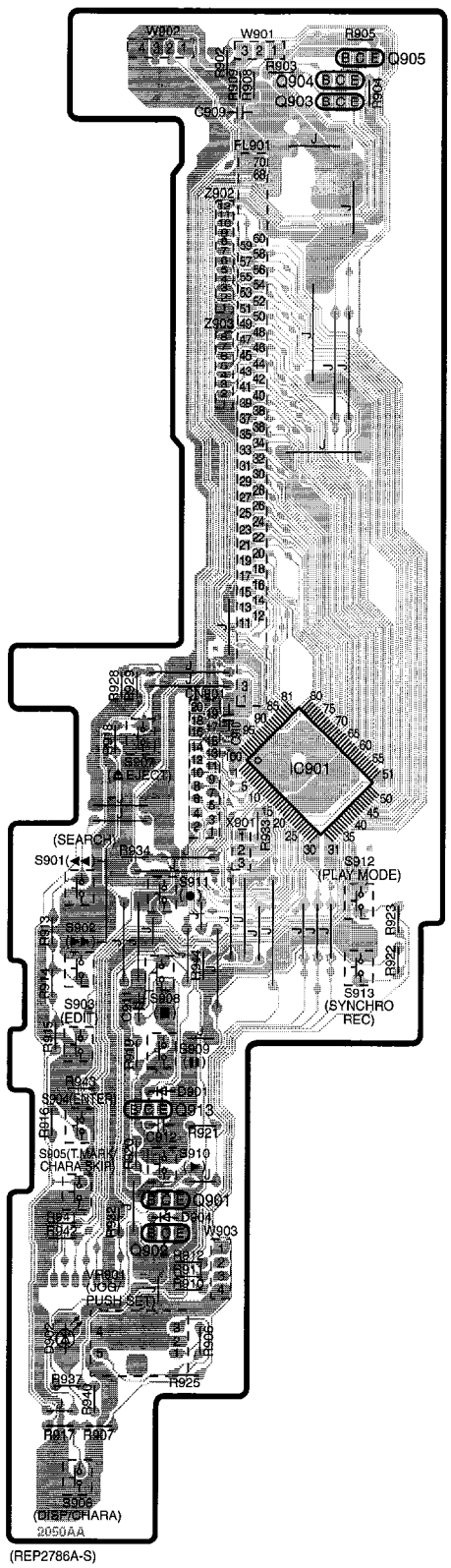
A MD SERVO P.C.B. (SIDE: B)



■ ELECTRICAL PARTS LOCATION

Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.
A MD SERVO P.C.B. (SIDE: B)											
IC1	2L	R14	2K	R111	2H	C11	2K	C41	2J	C97	4H
IC72	4J	R15	2K	R112	2H	C12	2L	C42	2J	C99	4J
Q10	2H	R16	2K	R114	4I	C13	2L	C45	3K	C100	4H
Q11	2I	R17	2L	R115	4I	C15	3J	C51	2J	C101	4H
D5	2I	R18	2K	R116	4J	C16	2K	C52	2I	C102	4H
D6	1I	R19	2K	R117	4J	C17	3K	C53	3L	C103	4H
D9	5I	R20	2K	R121	4I	C18	3K	C57	3K	C110	3L
VR1	2G	R23	3K	R122	5H	C19	2L	C59	3L	C111	3K
TH1	2K	R25	2K	R124	4I	C20	2L	C60	2H	C112	4I
L1	3L	R28	3K	R125	4I	C22	4K	C61	3K	C114	4I
L8	2H	R32	3K	R130	5H	C23	3L	C64	2K	C115	4I
L12	3I	R34	3K	R131	4J	C24	2K	C65	2K	C117	2H
L13	4G	R45	3K	R132	4H	C25	3K	C71	4K	C122	2L
L15	4I	R47	4K	R134	4H	C26	3K	C72	4J	C129	2K
X1	3I	R49	3L	R135	4H	C28	3L	C84	4K	C133	2I
X2	3J	R67	4J	R143	4J	C29	2L	C85	4J	C138	2I
CP6	5K	R76	4H	R201	4H	C30	3L	C86	2K	C140	3G
R1	2K	R81	4J	R212	4G	C31	3L	C90	3J	C141	4I
R2	4I	R83	4J	R213	3H	C32	3K	C91	4J	C142	4I
R10	2K	R87	4I	R215	4G	C33	4J	C93	3H	C143	4I
R11	4J	R104	4H	C1	2K	C34	4I	C94	4H		
R12	4K	R105	4H	C7	2L	C37	2K	C95	4H		
R13	2I	R109	4J	C8	2K	C40	2I	C96	3H		

C FL P.C.B.



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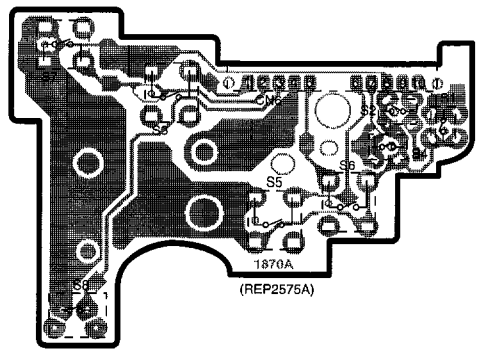
B SWITCH P.C.B.

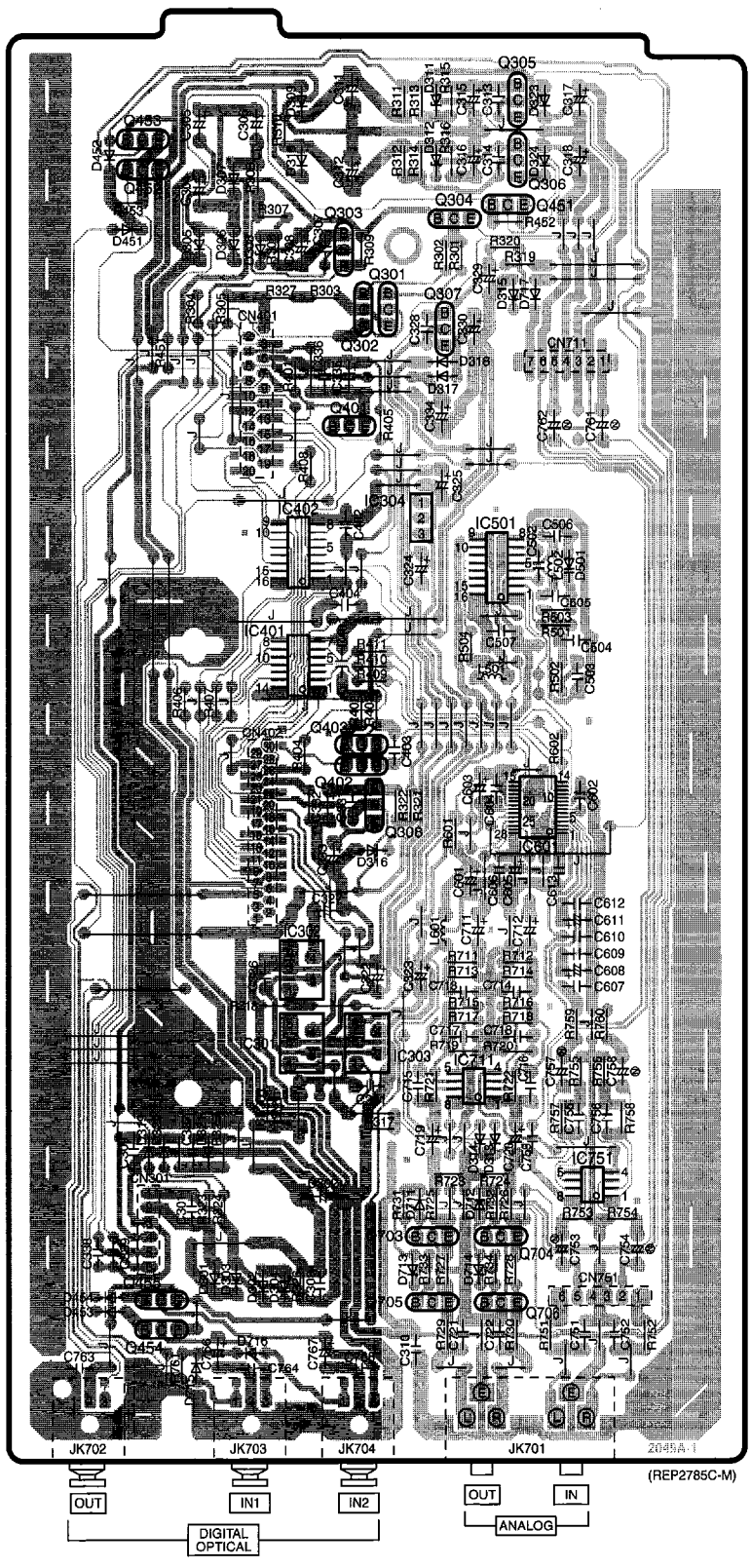


(REP2575A)

■ ELECTRICAL PARTS LOCATION

Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.
B SWITCH P.C.B.					
S1	2F	S4	2F	S7	2D
S2	2F	S5	3E	S8	3D
S3	2E	S6	3E	CN6	2E
C FL P.C.B.					
IC901	5C	S910	6B	R918	5B
Q901	7B	S911	5B	R919	6B
Q902	7B	S912	5C	R920	6B
Q903	2C	S913	6C	R921	6B
Q904	2C	CN901	5B	R922	6C
Q905	1C	W901	1B	R923	5C
Q913	6B	W902	1B	R925	7B
D901	6B	W903	7B	R928	4B
D902	7A	R902	1B	R929	4B
D904	7B	R903	1B	R932	7B
VR901	7B	R904	2C	R933	5B
Z902	2B	R905	1C	R934	5B
Z903	3B	R906	7B	R937	7A
X901	5B	R907	8B	R940	8B
FL901	3B	R908	2B	R941	7A
S901	5A	R909	2B	R942	7A
S902	6A	R910	7B	R943	6A
S903	6A	R911	7B	R944	6B
S904	6A	R912	7B	C909	2B
S905	7A	R913	5A	C910	4B
S906	8A	R914	6A	C911	6B
S907	5B	R915	6A	C912	6B
S908	6B	R916	6A		
S909	6B	R917	8A		

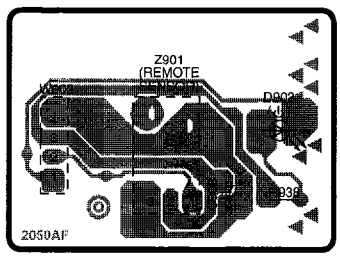
E MAIN P.C.B.



■ ELECTRICAL PARTS LOCATION

Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.
E MAIN P.C.B.					
IC301	6B	R306	2B	C307	2B
IC302	6B	R307	2B	C308	2B
IC303	6B	R308	2B	C309	6A
IC304	4C	R309	2B	C310	7C
IC401	4B	R310	2B	C311	2B
IC402	4B	R311	2C	C312	2B
IC501	4C	R312	2C	C313	2C
IC601	5C	R313	2C	C314	2C
IC711	6C	R314	2C	C315	2C
IC751	7C	R315	2C	C316	2C
Q301	3C	R316	2C	C317	2C
Q302	3B	R317	6B	C318	2C
Q303	2B	R318	6B	C321	6B
Q304	2C	R319	2C	C322	6B
Q305	2C	R320	2C	C323	6C
Q306	2C	R321	5C	C324	4C
Q307	3C	R322	5C	C325	3C
Q308	5B	R323	7B	C326	6B
Q401	3B	R324	7B	C327	5B
Q402	5B	R325	6B	C328	3C
Q403	5B	R326	7B	C329	2C
Q451	2C	R327	3B	C330	3C
Q452	2A	R401	3B	C331	5B
Q453	2A	R402	4B	C332	5B
Q454	7A	R403	4B	C333	5B
Q455	7A	R404	5B	C334	3C
Q703	7C	R405	3C	C335	3B
Q704	7C	R406	4B	C336	3B
Q705	7C	R407	4B	C337	6B
Q706	7C	R408	3B	C338	7A
D301	7B	R409	4B	C339	7A
D302	7B	R410	4B	C401	4B
D303	7B	R411	4B	C402	4B
D304	7B	R451	3A	C403	5C
D305	2B	R452	2C	C404	4B
D306	2B	R453	2A	C502	4C
D307	2B	R501	4C	C503	4C
D308	2B	R502	4C	C504	4C
D309	2B	R503	4C	C505	4C
D310	2B	R504	4C	C506	4C
D311	2C	R601	5C	C507	4C
D312	2C	R602	5C	C601	5C
D313	6C	R711	6C	C602	5C
D314	6C	R712	6C	C603	5C
D315	3C	R713	6C	C604	5C
D316	5B	R714	6C	C605	5C
D317	3C	R715	6C	C606	5C
D318	3C	R716	6C	C607	6C
D319	6A	R717	6C	C608	6C
D320	6A	R718	6C	C609	6C
D321	6B	R719	6C	C610	5C
D323	2C	R720	6C	C611	5C
D324	2C	R721	6C	C612	5C
D451	2A	R722	6C	C613	5C
D452	2A	R723	7C	C711	5C
D453	7A	R724	7C	C712	5C
D454	7A	R725	7C	C713	6C
D501	4C	R726	7C	C714	6C
D711	7C	R727	7C	C715	6C
D712	7C	R728	7C	C716	6C
D713	7C	R729	7C	C717	6C
D714	7C	R730	7C	C718	6C
D715	7B	R731	7C	C719	6C
D716	7B	R732	7C	C720	6C
D717	3C	R733	7C	C721	7C
ICP301	6B	R734	7C	C722	7C
L501	4C	R751	7C	C751	7C
L502	4C	R752	7D	C752	7D
L601	5C	R753	7C	C753	7C
CN301	7A	R754	7D	C754	7D
CN401	3B	R755	6C	C755	6C
CN402	5B	R756	6D	C756	6D
CN711	3C	R757	6C	C757	6C
CN751	7C	R758	6D	C758	6D
JK701	8C	R759	6C	C759	6C
JK702	8A	R760	6D	C761	3C
JK703	8B	R761	7B	C762	3C
JK704	8B	C301	7B	C763	7A
R301	2C	C302	7B	C764	7B
R302	2C	C303	7B	C765	7B
R303	3B	C304	2B	C766	7B
R304	3B	C305	2B	C767	7B
R305	3B	C306	2B		

D SENSOR P.C.B.



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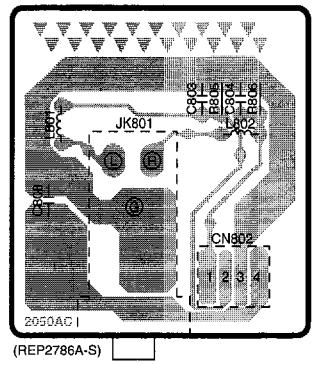
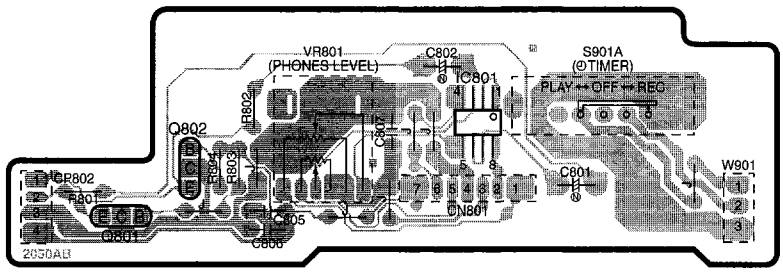
H HEADPHONE P.C.B.



(REP2786A-S)

PHONES

G OPERATION (1) P.C.B.



(REP2786A-S)

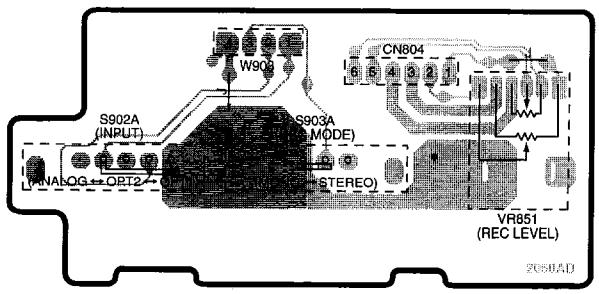
■ ELECTRICAL PARTS LOCATION

Ref. No.	Lo. No.	Ref. No.	Lo. No.	Ref. No.	Lo. No.
D SENSOR P.C.B.					
D903	2C	Z901	2B	C908	2B
W902	2B	R938	2C		
G OPERATION (1) P.C.B.					
IC801	5D	CP802	5B	C801	5D
Q801	5B	W901	5E	C802	4D
Q802	5B	R801	5B	C805	5C
VR801	5C	R802	4C	C806	5C
S901A	4D	R803	5C	C807	5C
CN801	5D	R804	5C		
H HEADPHONE P.C.B.					
L801	2D	JK801	2E	C803	2E
L802	2E	R805	2E	C804	2E
CN802	3E	R806	2E	C808	2D

A B C D E F

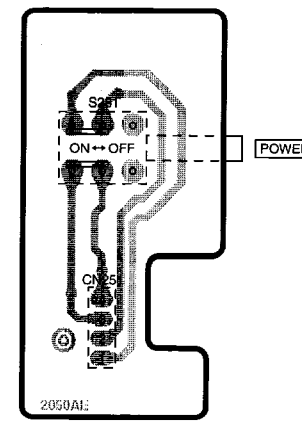
1 2 3 4 5 6 7 8

F OPERATION (2) P.C.B.



(REP2786A-S)

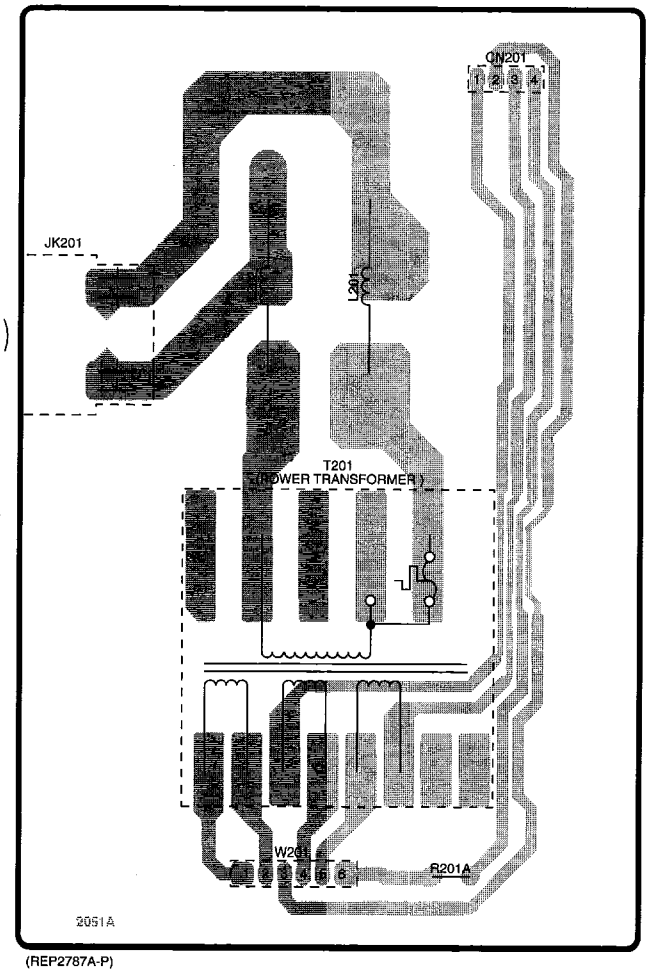
I POWER SWITCH P.C.B.



(REP2786A-S)

J POWER TRANSFORMER P.C.B.

AC IN
(220-230V 50Hz ..... [E,EG]
230-240V 50Hz ..... [EB])

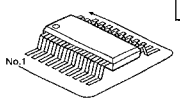
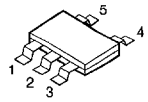
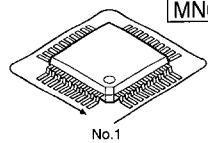
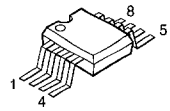
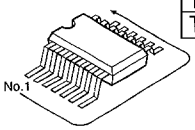
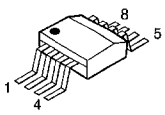
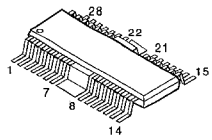
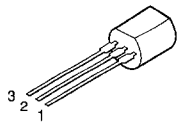
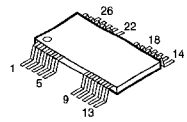
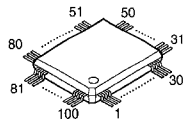
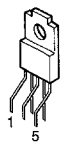
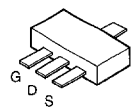
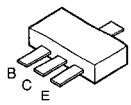
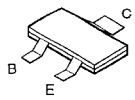
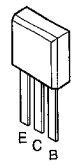
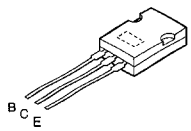
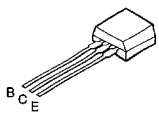
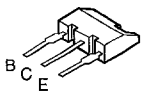
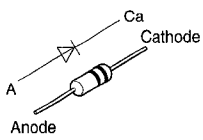
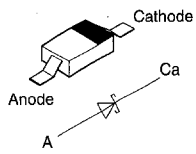
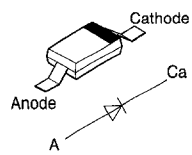
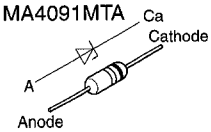
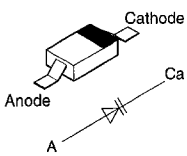
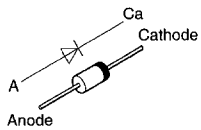
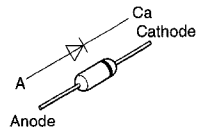
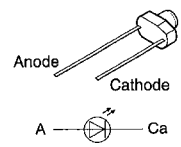
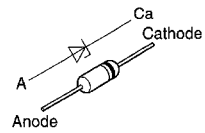


(REP2787A-P)

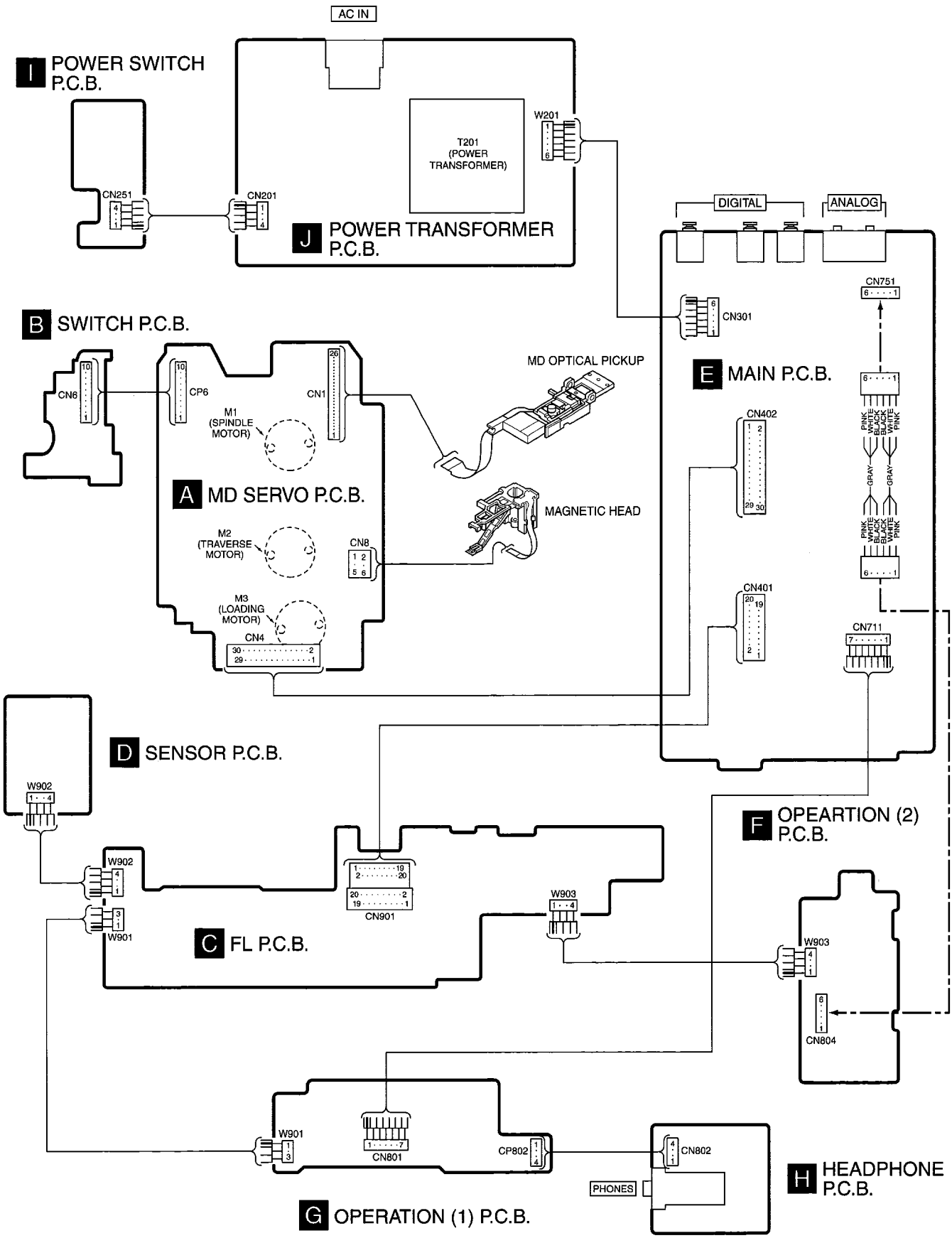
■ ELECTRICAL PARTS LOCATION

Ref. No.	Lo. No.	Ref. No.	Lo. No.
F OPERATION (2) P.C.B.			
VR851	2C	CN804	2C
S902A	2B	W903	2B
S903A	2C		
I POWER SWITCH P.C.B.			
S251	2E	CN251	3E
J POWER TRANSFORMER P.C.B.			
L201	5C	JK201	5B
L202	5C	T201	7C
CN201	4D	R201A	8D
W201	8C		

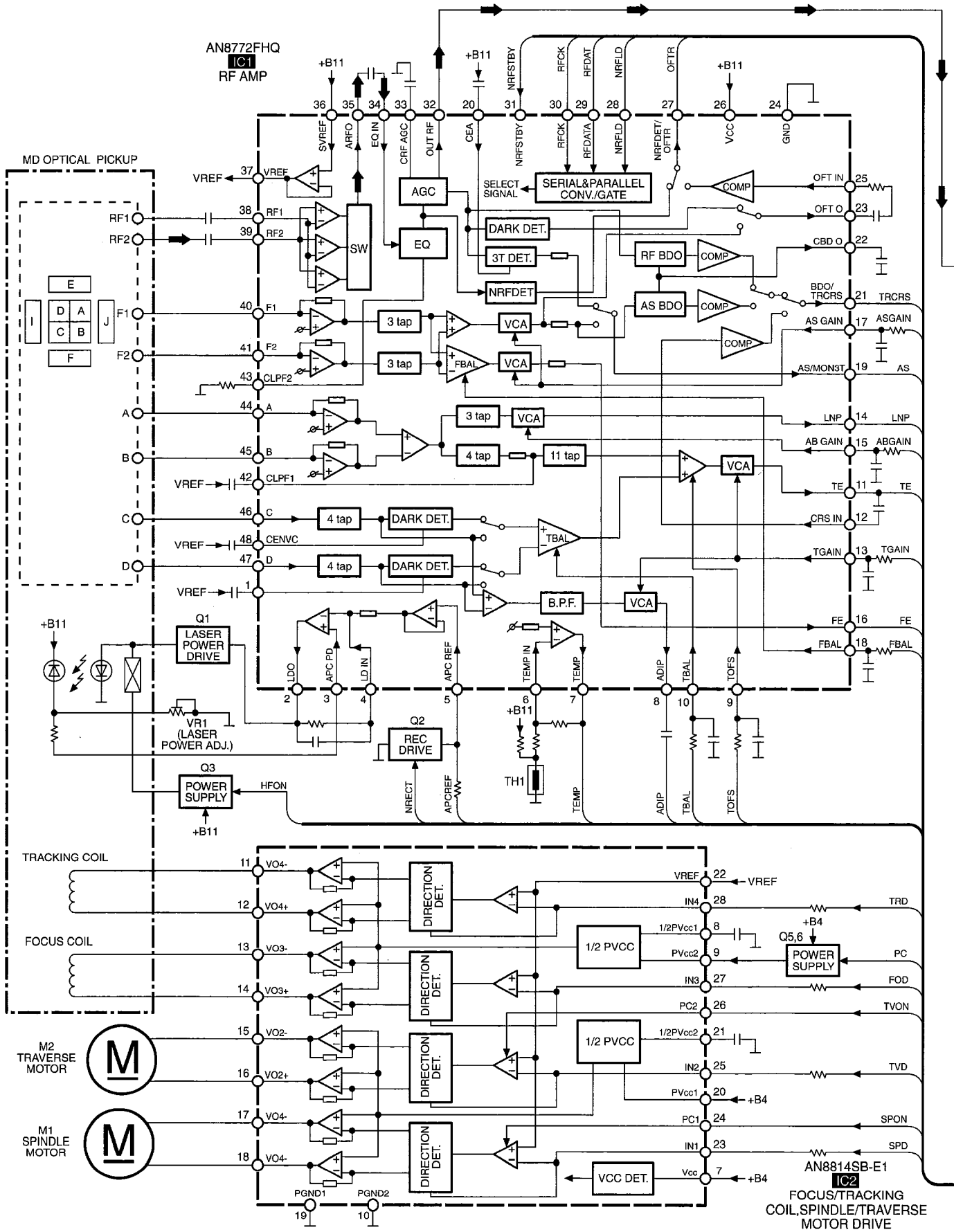
12 Type Illustration of ICs, Transistors and Diodes

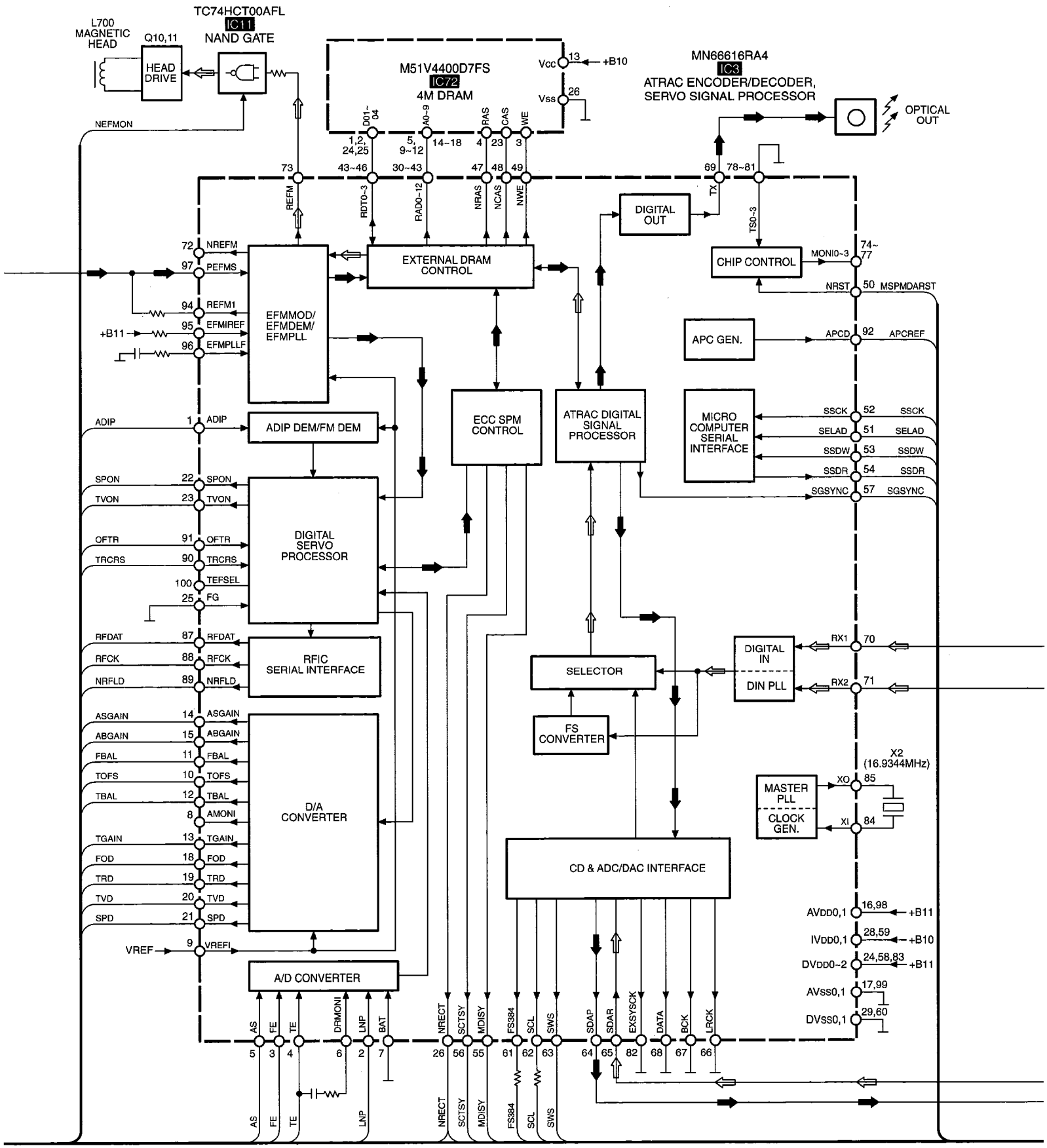
AK4518VF-E2 24PIN AK4520AVF-E1 28PIN LB1830MS-TLM 10PIN M5218AFPE3 8PIN 		RN5RG33AA-TL RN5RZ26BA-TR 	AN8772FHQ 48PIN MN101D03DAA1 80PIN MN66616RA4 100PIN 		BA4560FE2 
TC74HCT00AFL 14PIN TC74HCT7007A 14PIN TC74HC4050EL 16PIN TC9246FELP 16PIN 		TC7W04FTE12L 	AN8814SB-E1 	S81233SGY-Z 	M51V4400D7FS 
M30218MAA102 	BA05ST-V5 	2SJ278MYTR 2SK1764KYTR 	2SB1121ST-TD 	2SB1295-6-TB 2SB1462STX DTC114YETL 	2SD1450RSTTA 
2SD2037EFTA 	DTA114ESATP DTA143ESATP DTC114ESATP 	2SB1238QSTV6 2SB1240QRTV6 2SD1862QRTV6 	1SS291TA 	MA728TX 	SC80209TE12R 
MA4051MTA MA4056MTA MA4062MTA MA4091MTA 	MA304TX 	1D3-E 	1SS254TA 	SLR325MCT31 SLR325VCT31 	MA4270HTA 

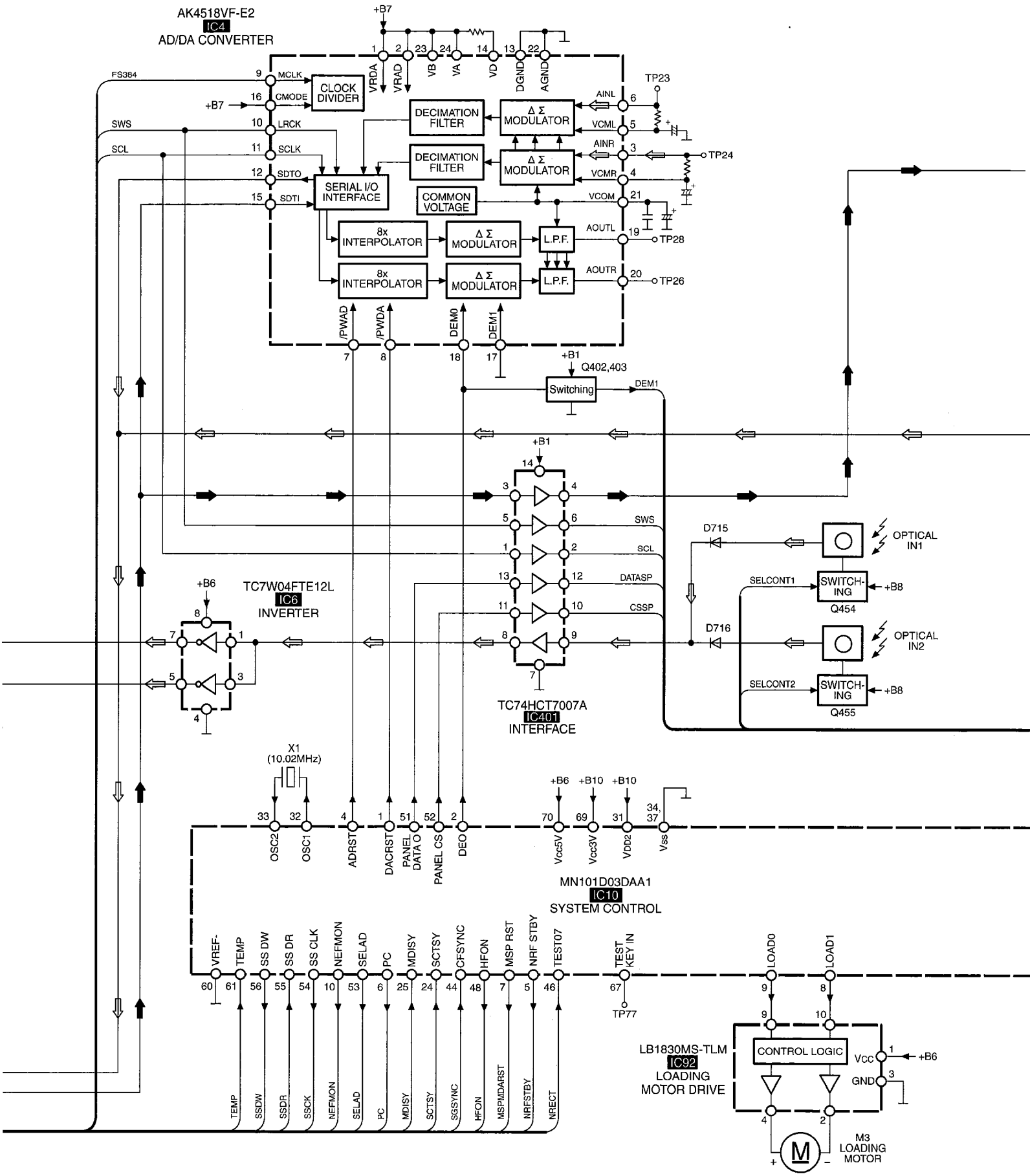
13 Wiring Connection Diagram

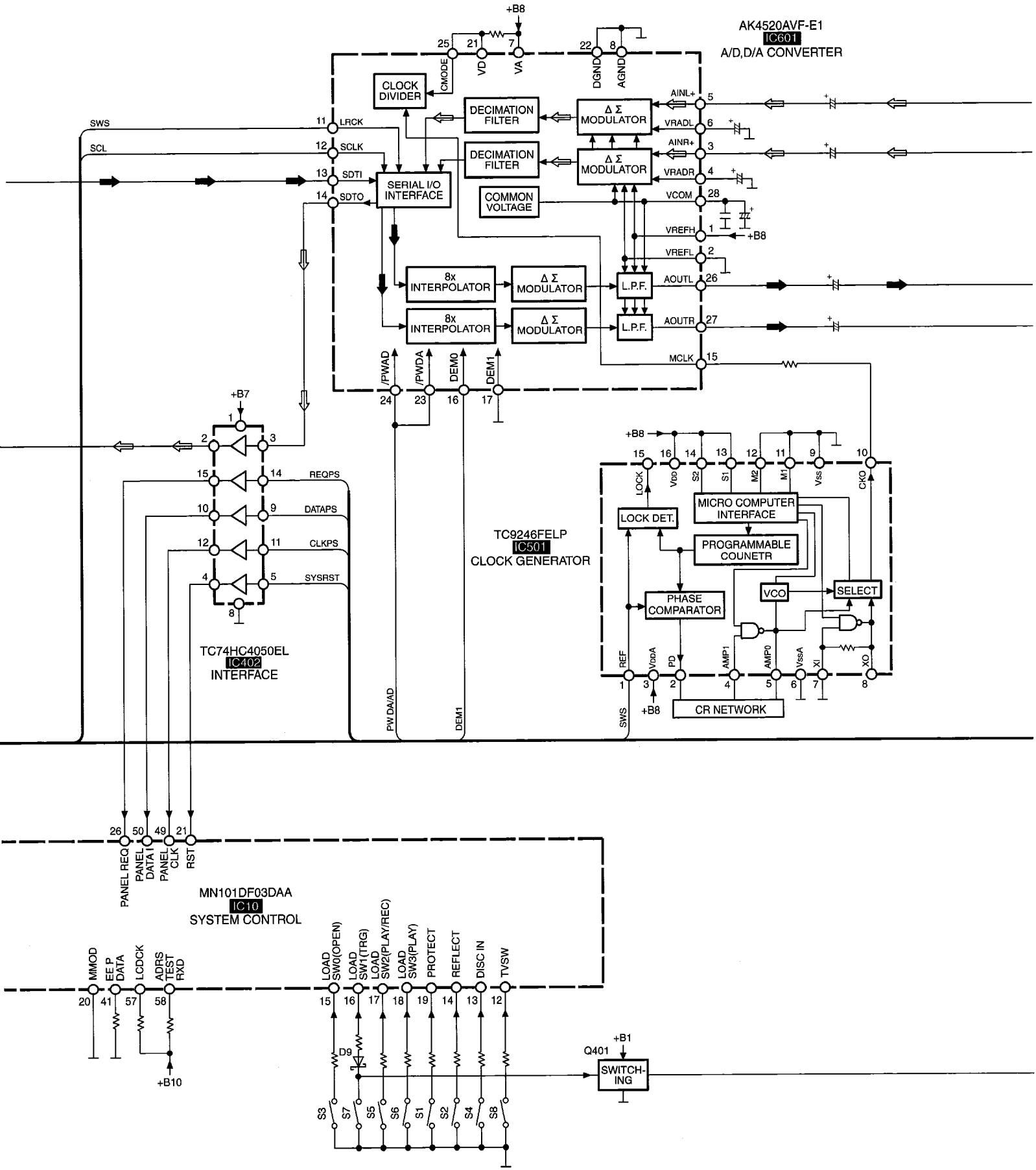


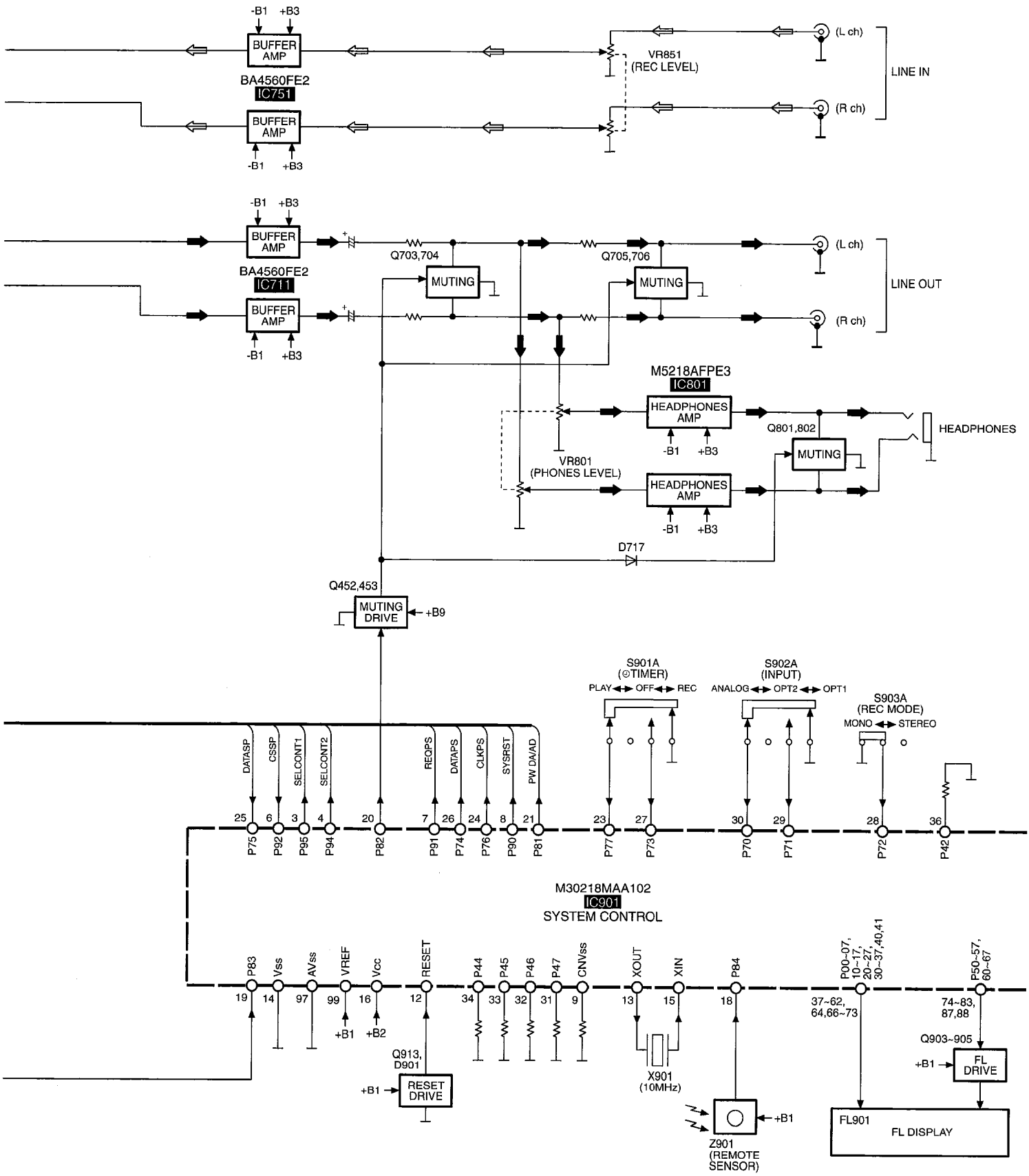
14 Block Diagram

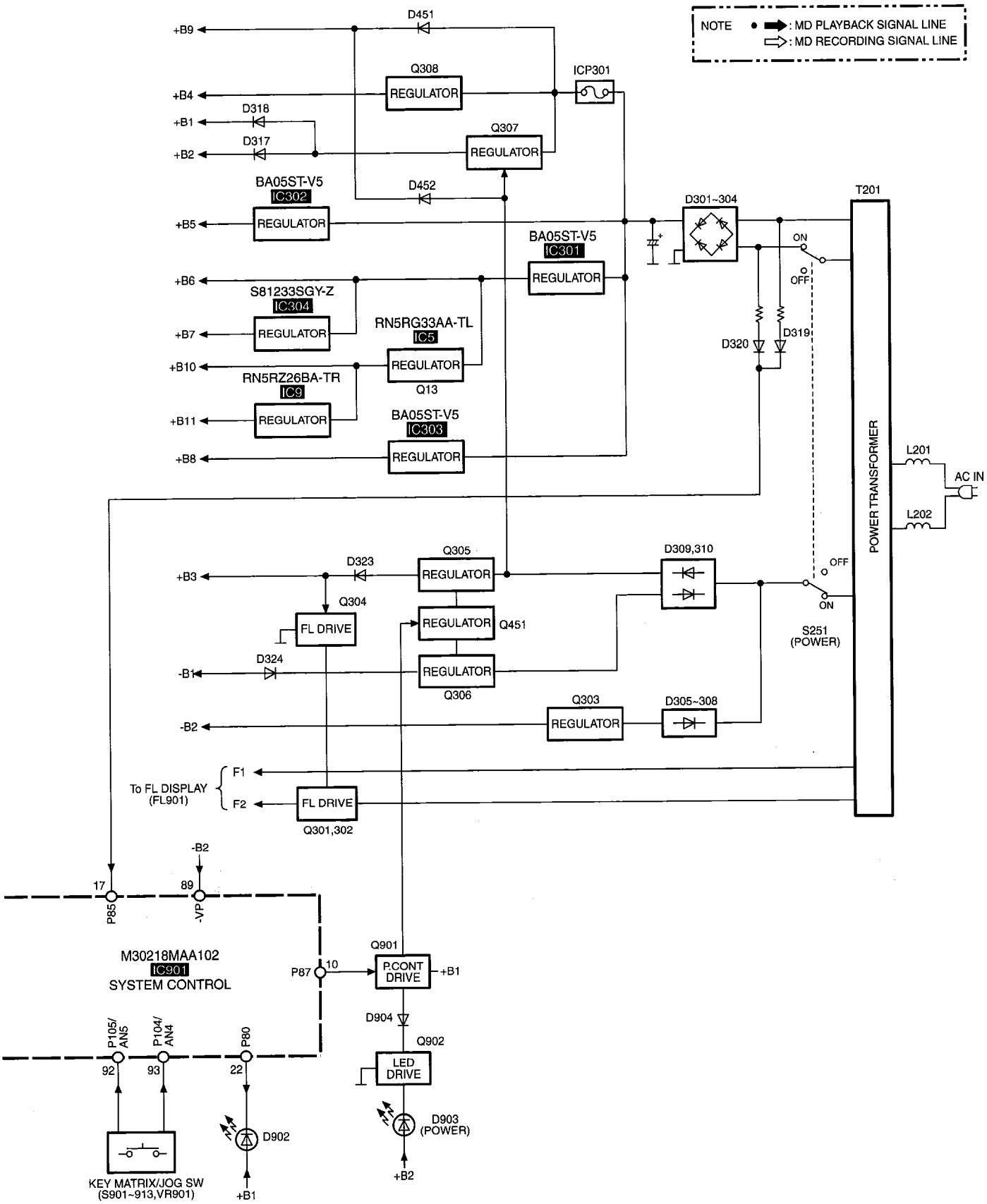



L700
MAGNETIC
HEAD
Q10,11
HEAD
DRIVE
TC74HCT00AFL
IC11
NAND GATE
NEFMON
M51V4400D7FS
IC72
4M DRAM
Vcc
13
+B10
Vss
26
D01~04
A0~9
RAS
CAS
WE
1,2,
24,25
5,
9~12
14~18
4
23
3
73
43~46
30~43
47
48
49
REFM
RDT0~3
RAD0~12
NRAS
NCAS
NWE
MN66616RA4
IC3
ATRAC ENCODER/DECODER,
SERVO SIGNAL PROCESSOR
OPTICAL
OUT
69
78~81
TX
TS0~3
DIGITAL
OUT
CHIP CONTROL
MONI0~3
74~
77
NRST
50
MSPMDARST
72
NREFM
97
PEFMS
94
REFM1
95
EFMIREF
96
EFMPLLF
+B11
EFMMOD/
EFMDEM/
EFMPLL
EXTERNAL DRAM
CONTROL
APC GEN.
APCD
92
APCREF
ADIP
1
ADIP
ADIP DEM/FM DEM
ECC SPM
CONTROL
ATRAC DIGITAL
SIGNAL
PROCESSOR
MICRO
COMPUTER
SERIAL
INTERFACE
SSCK
52
SSCK
SELAD
51
SELAD
SSDW
53
SSDW
SSDR
54
SSDR
SGSYNC
57
SGSYNC
SPON
22
SPON
TVON
23
TVON
OFTR
91
OFTR
TRCRS
90
TRCRS
100
TEFSEL
25
FG
DIGITAL
SERVO
PROCESSOR
RFDAT
87
RFDAT
RFCK
88
RFCK
NRFLD
89
NRFLD
RFIC
SERIAL INTERFACE
SELECTOR
DIGITAL
IN
DIN PLL
RX1
70
RX2
71
FS
CONVERTER
X2
(16.9344MHz)
MASTER
PLL
CLOCK
GEN.
XO
85
XI
84
ASGAIN
14
ABGAIN
15
FBAL
11
TOFS
10
TBAL
12
AMONI
8
TGAIN
13
FOD
18
TRD
19
TVD
20
SPD
21
D/A
CONVERTER
CD & ADC/DAC INTERFACE
AVDD0,1
16,98
+B11
IVDD0,1
28,59
+B10
DVDD0~2
24,58,83
+B11
AVSS0,1
17,99
DVSS0,1
29,60
VREF
9
VREFI
A/D CONVERTER
AS
FE
TE
DRMONI
LNP
BAT
NRECT
SCTSY
MDISY
FS384
SCL
SWS
SDAP
SDAR
EXSYSCK
DATA
BCK
LRCK
5
3
4
6
2
7
26
56
55
61
62
63
64
65
82
68
67
66

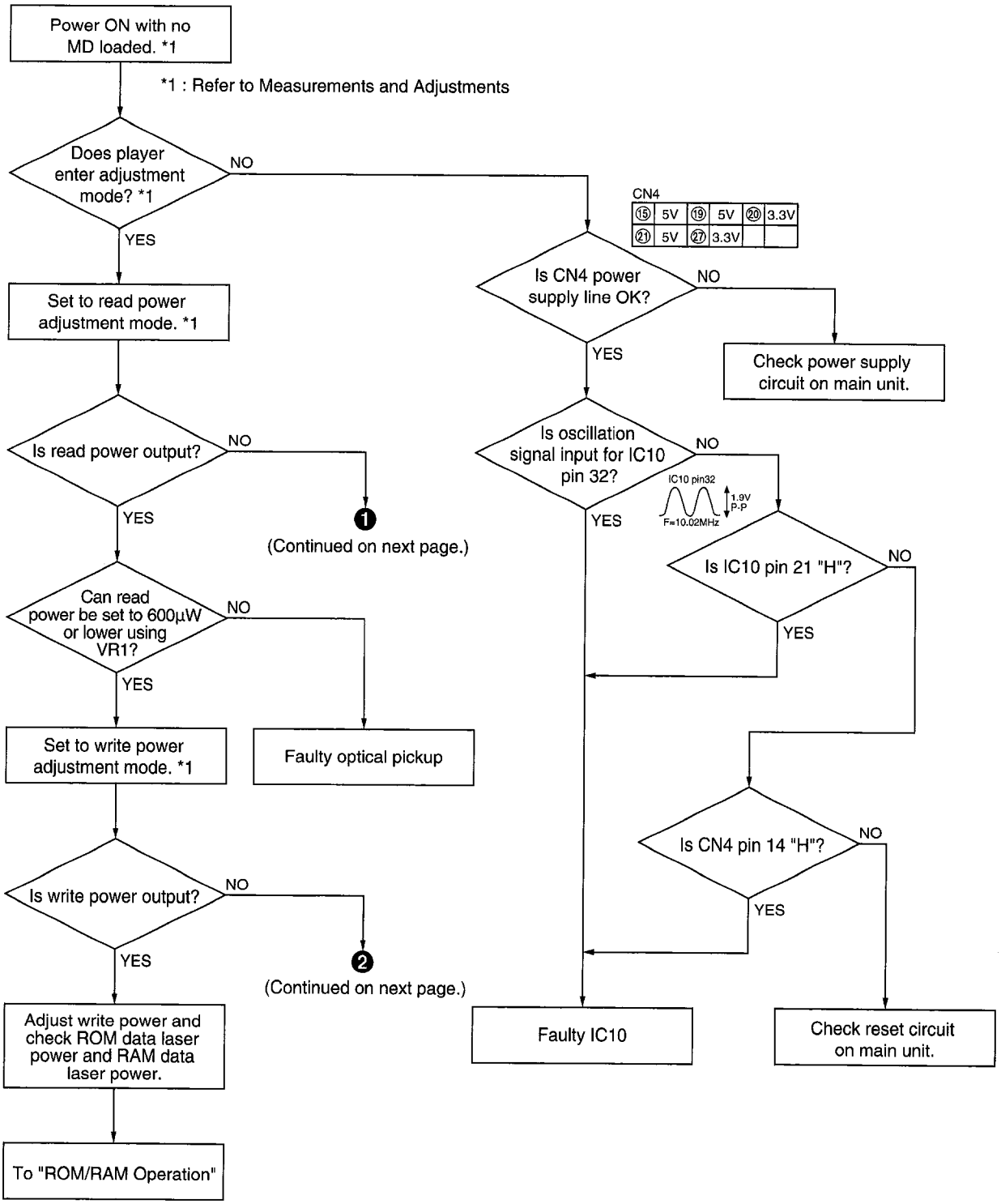

AK4518VF-E2
IC4
AD/DA CONVERTER
+B7
FS384
SWS
SCL
+B7
MCLK
CMODE
LRCK
SCLK
SDTO
SDTI
CLOCK DIVIDER
SERIAL I/O INTERFACE
VRDA
VRAD
VB
VA
VD
DGND
AGND
DECIMATION FILTER
DECIMATION FILTER
COMMON VOLTAGE
Δ Σ MODULATOR
Δ Σ MODULATOR
Δ Σ MODULATOR
Δ Σ MODULATOR
8x INTERPOLATOR
8x INTERPOLATOR
L.P.F.
L.P.F.
AINL
AINR
VCML
VCMR
VCOM
AOUTL
AOUTR
TP23
TP24
TP28
TP26
/PWAD
/PWDA
DEM0
DEM1
+B1
Q402,403
Switching
DEM1
+B1
SWS
SCL
DATASP
CSSP
+B6
TC7W04FTE12L
IC6
INVERTER
TC74HCT7007A
IC401
INTERFACE
D715
D716
OPTICAL IN1
OPTICAL IN2
SELCONT1
SELCONT2
SWITCH-ING
Q454
Q455
+B8
X1
(10.02MHz)
OSC2
OSC1
ADRST
DACRST
PANEL DATA O
PANEL CS
DEO
+B6
+B10
+B10
Vcc5V
Vcc3V
VDD2
Vss
MN101D03DAA1
IC10
SYSTEM CONTROL
VREF-
TEMP
SS DW
SS DR
SS CLK
NEFMON
SELAD
PC
MDISY
SCTSY
CFSYNC
HFON
MSP RST
NRF STBY
TEST07
TEST KEY IN
TP77
LOAD0
LOAD1
LB1830MS-TLM
IC92
LOADING MOTOR DRIVE
CONTROL LOGIC
Vcc
GND
+B6
M3
LOADING MOTOR
TEMP
SSDW
SSDR
SSCK
NEFMON
SELAD
PC
MDISY
SCTSY
SGSYNC
HFON
MSPMDARST
NRFSTBY
NRECT

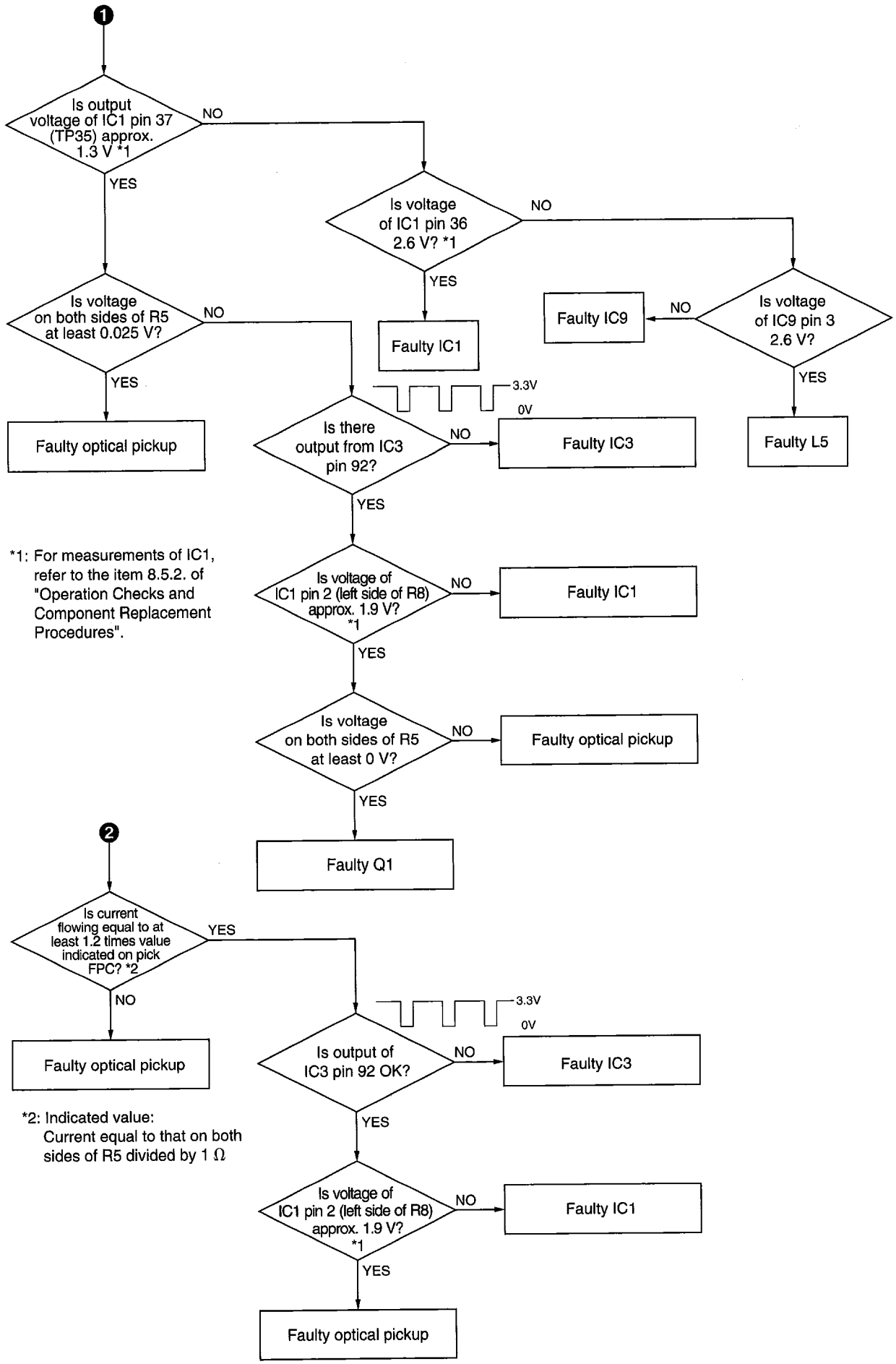

AK4520AVF-E1
IC601
A/D,D/A CONVERTER
+B8
CLOCK DIVIDER
DECIMATION FILTER
DECIMATION FILTER
ΔΣ MODULATOR
ΔΣ MODULATOR
SERIAL I/O INTERFACE
COMMON VOLTAGE
8x INTERPOLATOR
8x INTERPOLATOR
ΔΣ MODULATOR
ΔΣ MODULATOR
L.P.F.
L.P.F.
AINL+
VRADL
AINR+
VRADR
VCOM
VREFH
VREFL
AOUTL
AOUTR
MCLK
CMODE
VD
VA
DGND
AGND
LRCK
SCLK
SDTI
SDTO
SWS
SCL
/PWAD
/PWDA
DEM0
DEM1
+B7
REQPS
DATAPS
CLKPS
SYSRST
TC74HC4050EL
IC402
INTERFACE
TC9246FELP
IC501
CLOCK GENERATOR
MICRO COMPUTER INTERFACE
LOCK DET.
PROGRAMMABLE COUNETR
PHASE COMPARATOR
VCO
SELECT
CR NETWORK
LOCK
VDD
S2
S1
M2
M1
VSS
CKO
REF
VDDA
PD
AMP1
AMP0
VSSA
XI
XO
PW DA/AD
DEM1
PANEL REQ
PANEL DATA
PANEL CLK
RST
MN101DF03DAA
IC10
SYSTEM CONTROL
MMOD
EE P DATA
LCDCK
ADRS TEST RXD
LOAD SW0(OPEN)
LOAD SW1(TRG)
LOAD SW2(PLAY/REC)
LOAD SW3(PLAY)
PROTECT
REFLECT
DISC IN
TVSW
+B10
D9
+B1
Q401
SWITCH-ING
S3
S7
S5
S6
S1
S2
S4
S8

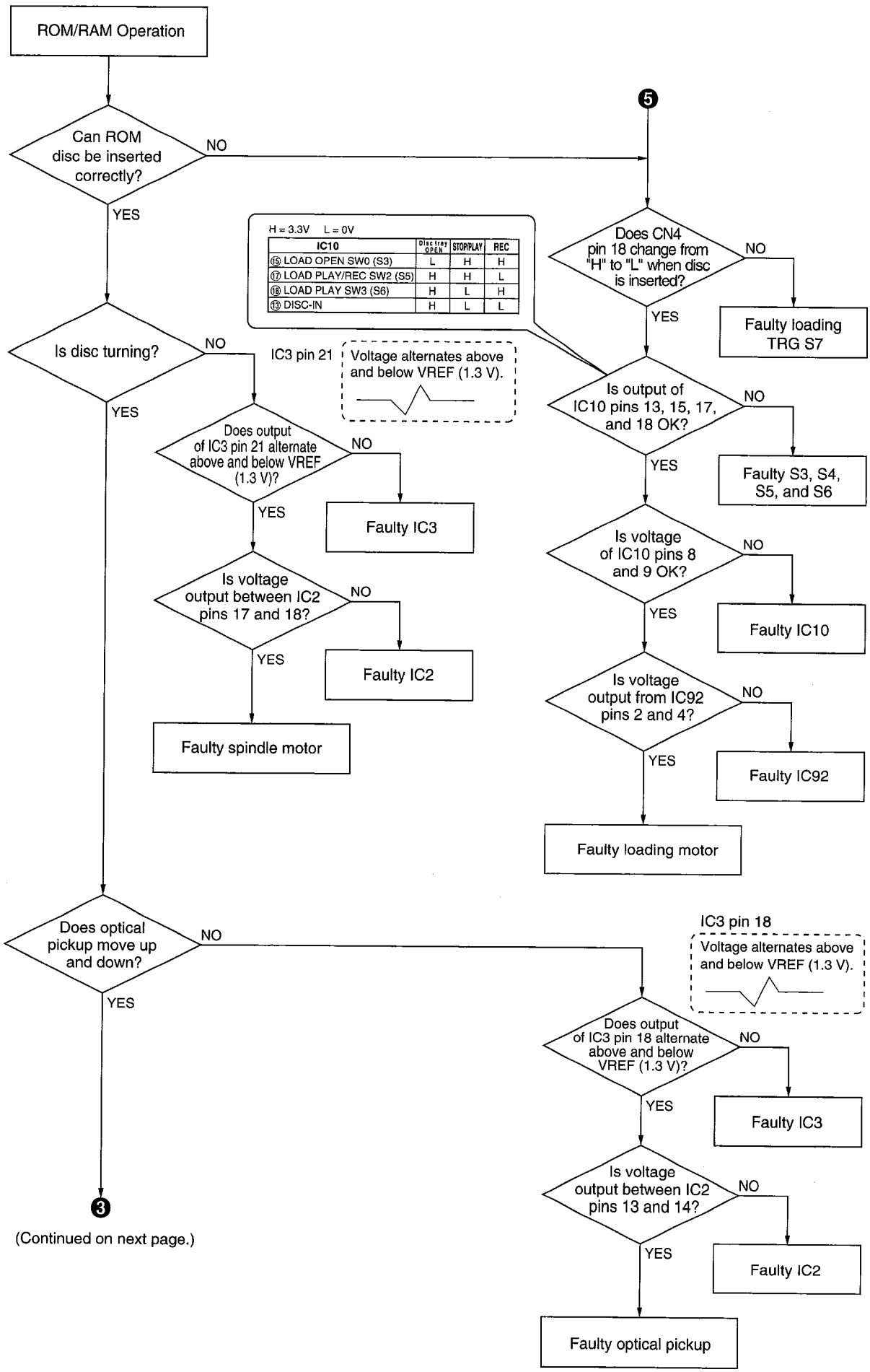

-B1 +B3
BUFFER AMP
BA4560FE2
IC751
VR851
(REC LEVEL)
(L ch)
(R ch)
LINE IN
Q703,704
Q705,706
MUTING
IC711
LINE OUT
M5218AFPE3
IC801
HEADPHONES AMP
Q801,802
VR801
(PHONES LEVEL)
HEADPHONES
D717
Q452,453
MUTING DRIVE
+B9
S901A
(TIMER)
PLAY OFF REC
S902A
(INPUT)
ANALOG OPT2 OPT1
S903A
(REC MODE)
MONO STEREO
DATASP
CSSP
SELCONT1
SELCONT2
REQPS
DATAPS
CLKPS
SYSRST
PW DA/AD
P75 P92 P95 P94 P82 P91 P74 P76 P90 P81 P77 P73 P70 P71 P72 P42
M30218MAA102
IC901
SYSTEM CONTROL
P83 Vss AVss VREF Vcc RESET P44 P45 P46 P47 CNVss XOUT XIN P84
P00~07, 10~17, 20~27, 30~37,40,41
P50~57, 60~67
+B1 +B2
Q913, D901
RESET DRIVE
X901
(10MHz)
Z901
(REMOTE SENSOR)
37~62, 64,66~73
74~83, 87,88
Q903~905
FL DRIVE
FL901
FL DISPLAY

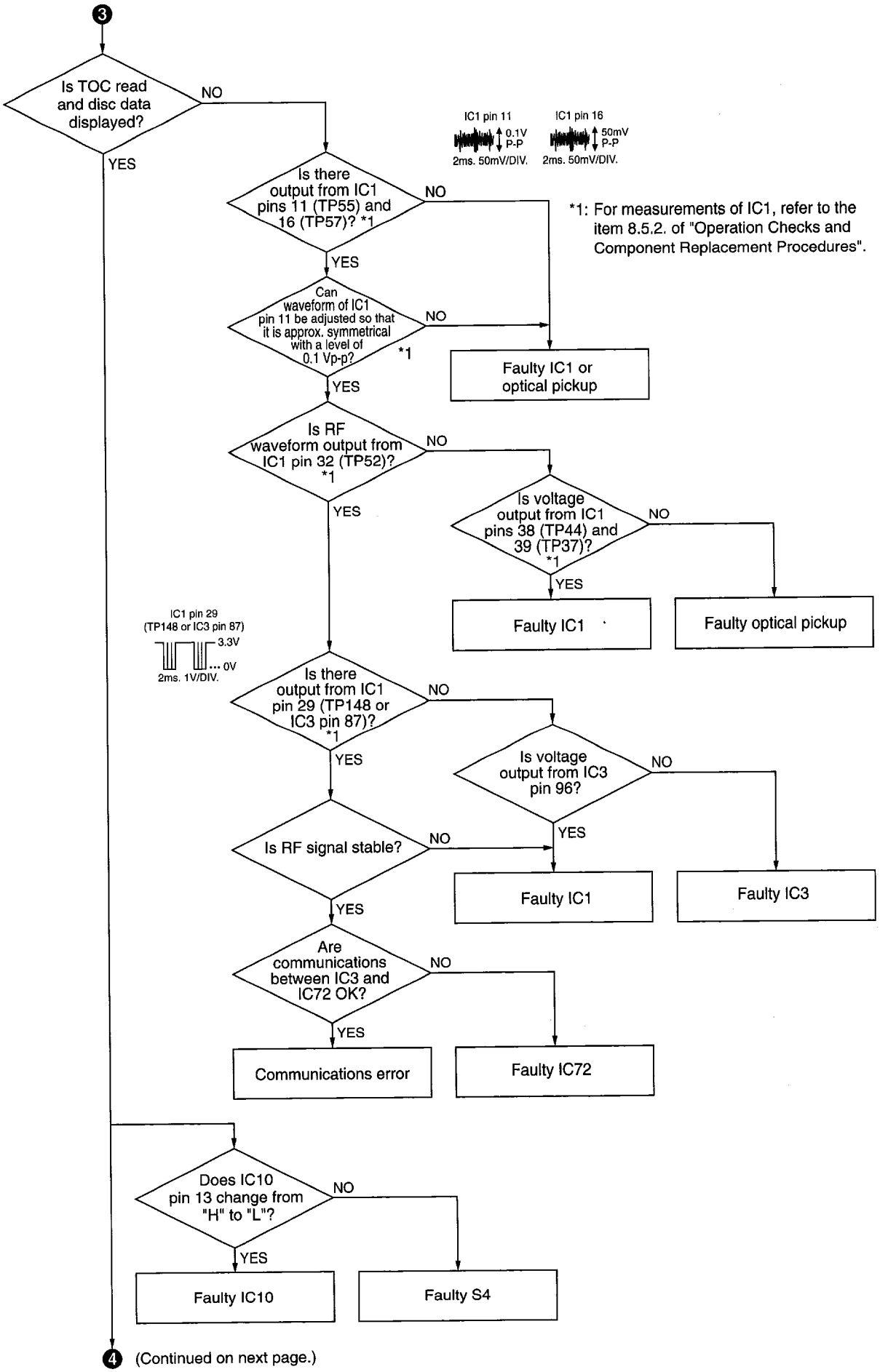

NOTE
: MD PLAYBACK SIGNAL LINE
: MD RECORDING SIGNAL LINE
+B9
D451
+B4
Q308
REGULATOR
ICP301
+B1
D318
+B2
D317
Q307
REGULATOR
BA05ST-V5
IC302
D452
+B5
REGULATOR
D301~304
T201
BA05ST-V5
IC301
+B6
REGULATOR
ON
OFF
S81233SGY-Z
IC304
+B7
REGULATOR
RN5RG33AA-TL
IC5
D320
D319
+B10
REGULATOR
Q13
RN5RZ26BA-TR
IC9
+B11
REGULATOR
BA05ST-V5
IC303
+B8
REGULATOR
L201
AC IN
L202
POWER TRANSFORMER
+B3
D323
Q305
REGULATOR
D309,310
OFF
ON
Q304
FL DRIVE
REGULATOR
Q451
S251
(POWER)
D324
-B1
REGULATOR
Q306
Q303
D305~308
-B2
REGULATOR
To FL DISPLAY
(FL901)
F1
F2
FL DRIVE
Q301,302
-B2
17
89
P85
-VP
M30218MAA102
IC901
SYSTEM CONTROL
Q901
P87
10
P.CONT
DRIVE
+B1
D904
Q902
P105/
AN5
P104/
AN4
P80
92
93
22
LED
DRIVE
D902
D903
(POWER)
KEY MATRIX/JOG SW
(S901~913,VR901)
+B1
+B2

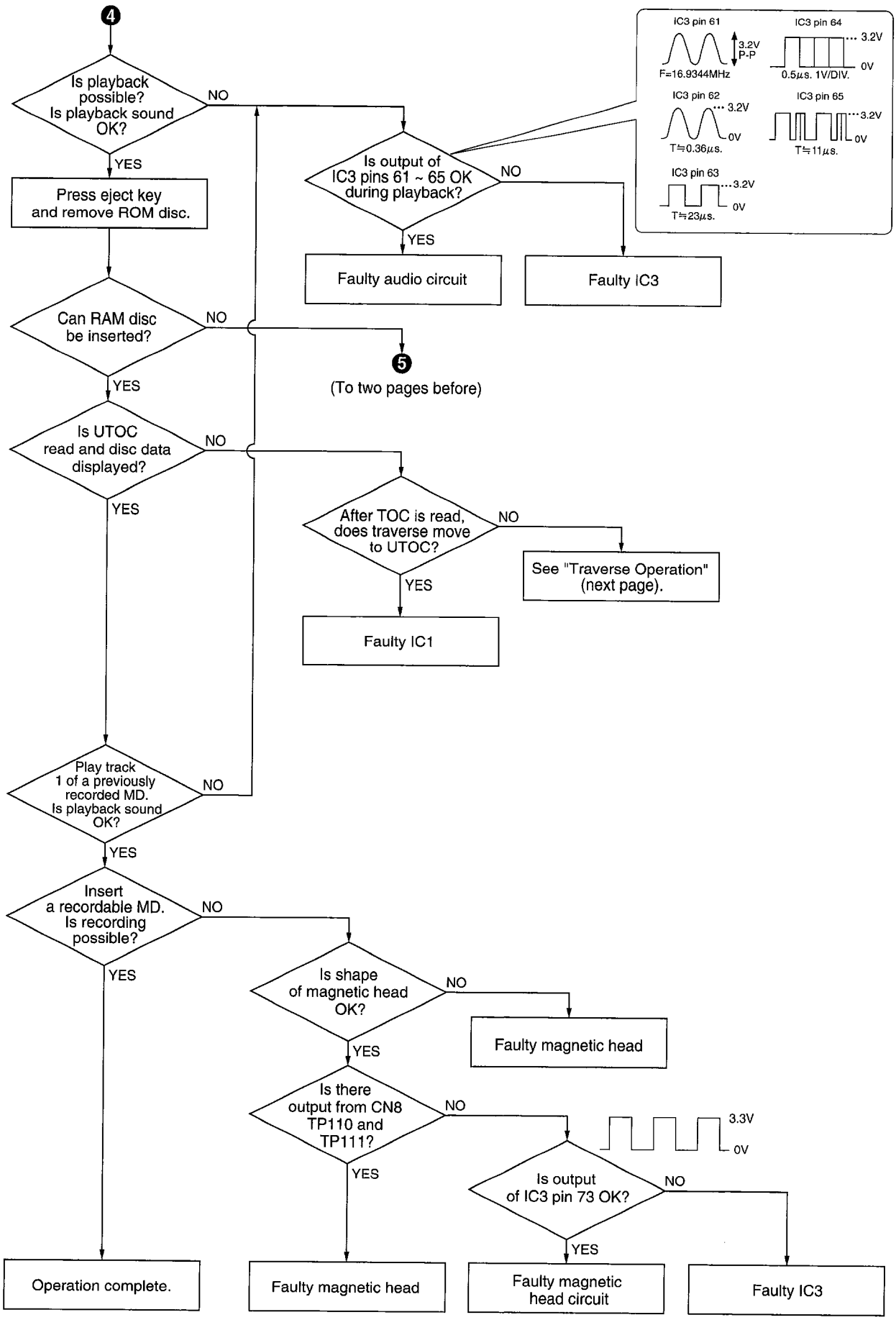
15 Troubleshooting Guide

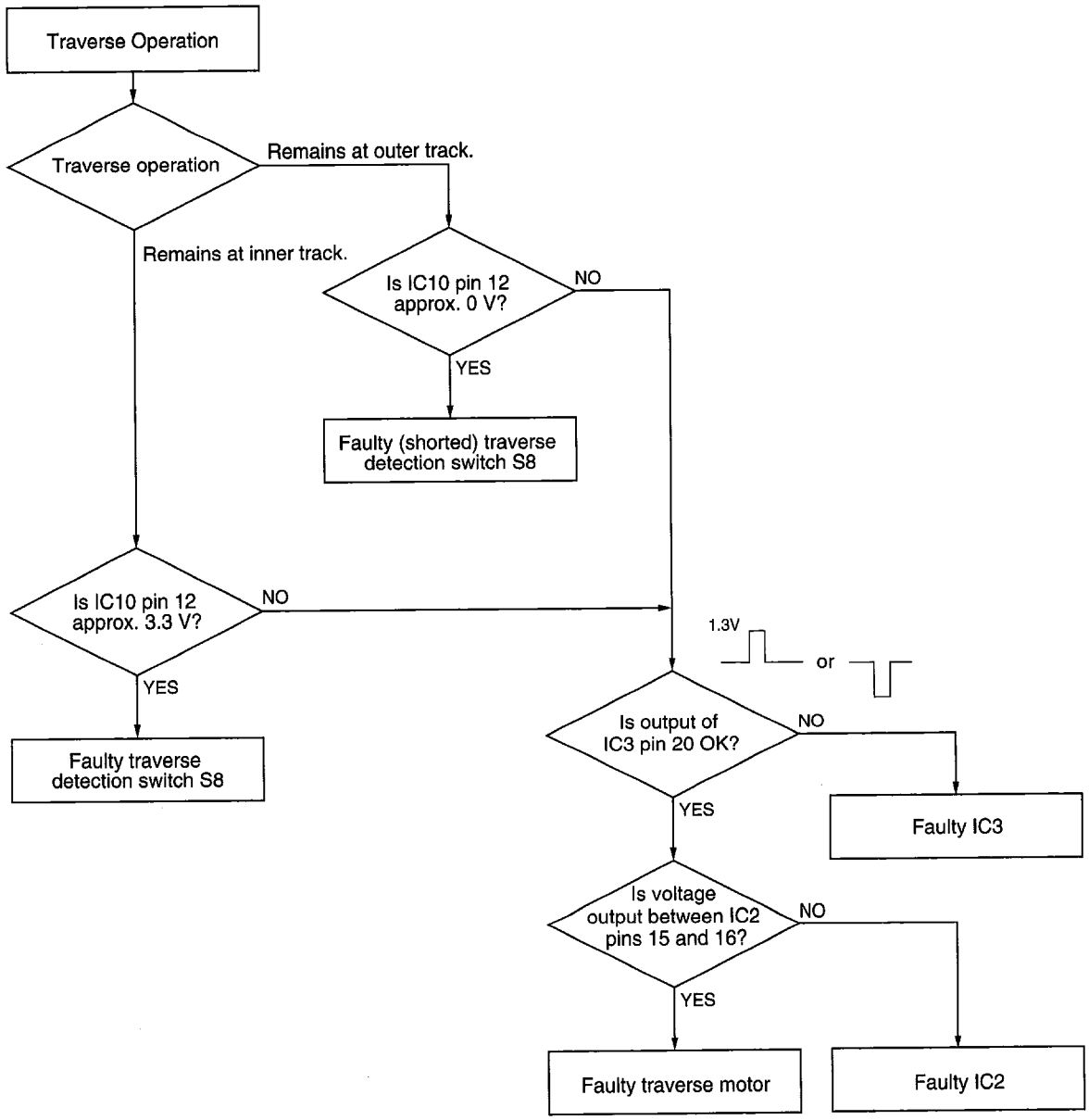



1
Is output voltage of IC1 pin 37 (TP35) approx. 1.3 V *1
NO
YES
Is voltage of IC1 pin 36 2.6 V? *1
NO
YES
Is voltage on both sides of R5 at least 0.025 V?
NO
YES
Faulty IC1
Faulty IC9
NO
Is voltage of IC9 pin 3 2.6 V?
YES
Faulty optical pickup
3.3V
0V
Is there output from IC3 pin 92?
NO
Faulty IC3
Faulty L5
YES
*1: For measurements of IC1, refer to the item 8.5.2. of "Operation Checks and Component Replacement Procedures".
Is voltage of IC1 pin 2 (left side of R8) approx. 1.9 V? *1
NO
Faulty IC1
YES
Is voltage on both sides of R5 at least 0 V?
NO
Faulty optical pickup
YES
Faulty Q1
2
Is current flowing equal to at least 1.2 times value indicated on pick FPC? *2
YES
NO
Faulty optical pickup
3.3V
0V
Is output of IC3 pin 92 OK?
NO
Faulty IC3
YES
*2: Indicated value:
Current equal to that on both sides of R5 divided by 1 Ω
Is voltage of IC1 pin 2 (left side of R8) approx. 1.9 V? *1
NO
Faulty IC1
YES
Faulty optical pickup


ROM/RAM Operation
Can ROM disc be inserted correctly?
NO
YES
5
H = 3.3V L = 0V
IC10 | Disc tray OPEN | STOP/PLAY | REC
⑯ LOAD OPEN SW0 (S3) | L | H | H
⑰ LOAD PLAY/REC SW2 (S5) | H | H | L
⑱ LOAD PLAY SW3 (S6) | H | L | H
⑲ DISC-IN | H | L | L
Does CN4 pin 18 change from "H" to "L" when disc is inserted?
NO
YES
Faulty loading TRG S7
Is disc turning?
NO
YES
IC3 pin 21
Voltage alternates above and below VREF (1.3 V).
Is output of IC10 pins 13, 15, 17, and 18 OK?
NO
YES
Faulty S3, S4, S5, and S6
Does output of IC3 pin 21 alternate above and below VREF (1.3 V)?
NO
YES
Faulty IC3
Is voltage of IC10 pins 8 and 9 OK?
NO
YES
Faulty IC10
Is voltage output between IC2 pins 17 and 18?
NO
YES
Faulty IC2
Is voltage output from IC92 pins 2 and 4?
NO
YES
Faulty IC92
Faulty spindle motor
Faulty loading motor
Does optical pickup move up and down?
NO
YES
IC3 pin 18
Voltage alternates above and below VREF (1.3 V).
Does output of IC3 pin 18 alternate above and below VREF (1.3 V)?
NO
YES
Faulty IC3
Is voltage output between IC2 pins 13 and 14?
NO
YES
Faulty IC2
Faulty optical pickup
3
(Continued on next page.)


3
Is TOC read and disc data displayed?
NO
YES
IC1 pin 11
0.1V P-P
2ms. 50mV/DIV.
IC1 pin 16
50mV P-P
2ms. 50mV/DIV.
Is there output from IC1 pins 11 (TP55) and 16 (TP57)? *1
NO
YES
*1: For measurements of IC1, refer to the item 8.5.2. of "Operation Checks and Component Replacement Procedures".
Can waveform of IC1 pin 11 be adjusted so that it is approx. symmetrical with a level of 0.1 Vp-p? *1
NO
YES
Faulty IC1 or optical pickup
Is RF waveform output from IC1 pin 32 (TP52)? *1
NO
YES
Is voltage output from IC1 pins 38 (TP44) and 39 (TP37)? *1
NO
YES
Faulty IC1
Faulty optical pickup
IC1 pin 29 (TP148 or IC3 pin 87)
3.3V
0V
2ms. 1V/DIV.
Is there output from IC1 pin 29 (TP148 or IC3 pin 87)? *1
NO
YES
Is voltage output from IC3 pin 96?
NO
YES
Is RF signal stable?
NO
YES
Faulty IC1
Faulty IC3
Are communications between IC3 and IC72 OK?
NO
YES
Communications error
Faulty IC72
Does IC10 pin 13 change from "H" to "L"?
NO
YES
Faulty IC10
Faulty S4
4
(Continued on next page.)


4
Is playback possible? Is playback sound OK?
NO
YES
Press eject key and remove ROM disc.
Is output of IC3 pins 61 ~ 65 OK during playback?
NO
YES
Faulty audio circuit
Faulty IC3
IC3 pin 61
3.2V P-P
F=16.9344MHz
IC3 pin 64
3.2V
0V
0.5μs. 1V/DIV.
IC3 pin 62
3.2V
0V
T≒0.36μs.
IC3 pin 65
3.2V
0V
T≒11μs.
IC3 pin 63
3.2V
0V
T≒23μs.
Can RAM disc be inserted?
NO
YES
5
(To two pages before)
Is UTOC read and disc data displayed?
NO
YES
After TOC is read, does traverse move to UTOC?
NO
YES
See "Traverse Operation" (next page).
Faulty IC1
Play track 1 of a previously recorded MD. Is playback sound OK?
NO
YES
Insert a recordable MD. Is recording possible?
NO
YES
Is shape of magnetic head OK?
NO
YES
Faulty magnetic head
Is there output from CN8 TP110 and TP111?
NO
YES
3.3V
0V
Is output of IC3 pin 73 OK?
NO
YES
Operation complete.
Faulty magnetic head
Faulty magnetic head circuit
Faulty IC3


Traverse Operation
Traverse operation
Remains at outer track.
Remains at inner track.
Is IC10 pin 12 approx. 0 V?
NO
YES
Faulty (shorted) traverse detection switch S8
Is IC10 pin 12 approx. 3.3 V?
NO
YES
Faulty traverse detection switch S8
1.3V
or
Is output of IC3 pin 20 OK?
NO
YES
Faulty IC3
Is voltage output between IC2 pins 15 and 16?
NO
YES
Faulty traverse motor
Faulty IC2

16 Terminal Function of ICs

16.1. IC1 (AN8772FHQ): RF Amp

Pin No.	Terminal Name	I/O	Function
1	CENVD	I	D signal detection input
2	LDO	O	LD amp output terminal
3	APC PD	I	Photo diode detection input
4	LD IN	I	LD amp input
5	APC REF	I	APC amp reference voltage input
6	TEMP IN	I	Temperature sensor amp input
7	TEMP	O	Temperature sensor amp output
8	ADIP	O	ADIP FM signal output
9	TOFS	I	Tracking error off-set adjustment input
10	TBAL	I	Tracking balance adjustment signal input
11	TE	O	Tracking error signal output
12	CRS IN	I	Track cross signal input
13	TGAIN	I	TE gain adjustment input
14	LNP	O	Lens position signal output
15	AB GAIN	I	APP signal gain adjustment input
16	FE	O	Focus error signal output
17	AS GAIN	I	AS gain adjustment input
18	FBAL	I	Focus balance adjustment input
19	AS/MON3T	O	AS signal output
20	CEA	I	3T envelope detection input
21	BDO/ TRCRS	O	BDO/Track cross signal output
22	CBD O	O	BDO detection capacitor terminal
23	OFT O	O	Off-track detection signal output
24	GND	-	GND terminal
25	OFT IN	I	Off-track detection signal input
26	V_{CC}	I	Power supply terminal
27	NRFDET/ OFTR	O	RF detect signal output/Off-track signal output
28	NRFLD	I	Serial command latch signal input
29	RF DATA	I	Serial command data signal input
30	RFCK	I	Serial command clock signal input
31	NRFSTBY	I	Standby control signal input
32	OUT RF	O	EFM signal output
33	CRF AGC	-	RFAGC capacitor connect terminal
34	EQ IN	I	EQ input
35	ARFO	O	RF amp output
36	SVREF	I	Reference signal input
37	VREF	O	Reference voltage output
38	RF1	I	RF 1 signal input
39	RF2	I	RF 2 signal input
40	F1	I	F 1 signal input
41	F2	I	F 2 signal input
42	CLPF1	I	APP correction CPF capacitor connect terminal
43	CLPF1	I	RF equalizer adjustment resistor connect terminal
44	A	I	Main beam A signal input
45	B	I	Main beam B signal input
46	C	I	Main beam C signal input
47	D	I	Main beam D signal input
48	CENVC	I	C signal detection input

16.2. IC2 (AN8814SB-E1): Focus/Tracking Coil, Spindle/Traverse Motor Drive

Pin No.	Terminal Name	I/O	Function
1	REG B	-	3.3 V external transistor control (Not used, open)
2	REG M	-	3.3 V regular output monitor (Not used, connected to GND)
3	NC	-	Not used, open
4	OPO	O	Op-amp output
5	OP-	I	Op-amp invert input
6	OP+	-	Op-amp non-invert output (Not used, connected to GND)
7	V_{CC}	I	Power supply terminal
8	$1/2PV_{CC}2$	O	$1/2PV_{CC}$ output terminal 2 (Connected to GND via capacitor)
9	$PV_{CC}2$	I	Power supply terminal for driver
10	PGND2	-	GND terminal
11	VO4-	O	Tracking coil drive output
12	VO4+	O	Tracking coil drive output
13	VO3-	O	Focus coil drive output
14	VO3+	O	Focus coil drive output
15	VO2-	O	Traverse motor drive output
16	VO2+	O	Traverse motor drive output
17	VO1-	O	Spindle motor drive output
18	VO1+	O	Spindle motor drive output
19	PGND1	-	GND terminal
20	$PV_{CC}1$	I	Power supply terminal
21	$1/2PV_{CC}1$	O	$1/2PV_{CC}$ output terminal 1 (Connected to GND via capacitor)
22	VREF	I	Reference voltage input
23	IN1	I	Spindle motor drive signal input
24	PC1	I	Power cut 1 input
25	IN2	I	Traverse motor drive signal input
26	PC2	I	Power cut 2 input
27	IN3	I	Focus drive signal input
26	IN4	I	Tracking drive signal input

16.3. IC3 (MN66616RA4): ATRAC Encoder/Decoder, Servo Signal Processor

Pin No.	Terminal Name	I/O	Function
1	ADIP	I	ADIP FM signal input
2	LNP	I	Lens position signal input
3	FE	I	Focus error signal input
4	TE	I	Tracking error signal input
5	AS	I	AS signal input
6	DRMONI	I	Drive voltage monitor input
7	BAT	I	Battery power supply terminal
8	AMONI	-	Servo analog monitor signal output (Not used, open)
9	VREFI	I	Reference voltage input
10	TOFS	O	Tracking error off-set adjustment output
11	FBAL	O	Focus balance adjustment output
12	TBAL	O	Tracking balance adjustment output
13	TGAIN	O	TE error gain adjustment output
14	ASGAIN	O	Main beam amp gain adjustment output
15	ABGAIN	O	APP adjustment output
16	$AV_{DD}1$	I	Power supply terminal
17	$AV_{SS}1$	-	GND terminal
18	FOD	O	Focus drive signal output
19	TRD	O	Tracking drive signal output
20	TVD	O	Traverse motor drive signal output
21	SPD	O	Spindle motor drive signal output
22	SPON	O	Drive IC spindle ON signal output
23	TVON	O	Drive IC traverse ON signal output
24	$DV_{DD}0$	I	Power supply terminal

Pin No.	Terminal Name	I/O	Function
25	FG	I	FG input
26	NRECT	O	Rec/Play switching signal output
27	$IV_{DD}2$	I	Power supply terminal for I/O pad
28	$IV_{DD}0$	-	Power supply terminal for I/O pad
29	$DV_{SS}0$	-	GND terminal
30 | 32	RAD12 | RAD10	-	DRAM address output (Not used, open)
33 | 42	RAD9 | RAD0	O	DRAM address output
43 | 46	RDT3 | RDT0	I/O	DRAM data input/output
47	NRAS	O	DRAM row address strobe signal output
48	NCAS	O	DRAM column address strobe signal output
49	NWE	O	DRAM write enable signal output
50	NRST	I	Reset signal input
51	SELAD	I	MSP/MDA, I/F address select signal input
52	SSCK	I	MSP/MDA, I/F clock signal input
53	SSDW	I	MSP/MDA, I/F write data input
54	SSDR	O	MSP/MDA, I/F read data output
55	MDISY	O	Leader synchronous signal output
56	SCTSY	O	ADIP synchronous noise output
57	SGSYNC	O	Frame synchronous signal output
58	$DV_{DD}1$	I	Power supply terminal
59	$IV_{DD}1$	I	Power supply terminal for I/O pad
60	$DV_{SS}1$	-	GND terminal
61	FS384	O	384 Fs output
62	SCL	O	Bit clock signal output
63	SWS	O	Word clock signal output
64	SDAP	O	Audio data signal output
65	SDAR	I	Audio data signal input
66	LRCK	I	CD word clock signal input
67	BCK	I	CD bit clock signal input
68	DATA	I	CD data signal input
69	TX	O	Digital audio interface signal output
70	RX1	I	Digital audio interface signal 1 input
71	RX2	I	Digital audio interface signal 2 input
72	EREFM	-	Not used, open
73	REFM	O	EFM modulation signal output
74	MONI3	-	Monitor signal output (Not used, open)
75	MONI2	-	Monitor signal output (Not used, open)
76	MONI1	-	Monitor signal output (Not used, open)
77	MONI0	-	Monitor signal output (Not used, open)
78	TS3	-	Reserved (Not used, connected to GND)
79	TS2	-	Reserved (Not used, connected to GND)
80	TS1	-	Reserved (Not used, connected to GND)
81	TS0	-	Reserved (Not used, connected to GND)
82	EXSYSCK	-	External system clock input (Not used, connected to GND)
83	$DV_{DD}2$	I	Power supply terminal
84	XI	I	Crystal oscillator (f=16.9344 MHz)
85	XO	O	
86	$VD_{SS}2$	-	GND terminal
87	RFDAT	O	RF serial data output
88	RFCK	O	RF serial clock output
89	NRFLD	O	RF serial load output
90	TRCRS	I	Track cross signal input
91	OFTR	I	Off-track signal input
92	APCD	O	Laser power PWM output
93	EXEFMCK	I	External FM clock input (Connected to GND via resistor)
94	PEFM1	O	EFM loop filter output
95	EEMIREF	I	EFM PLL reference current input
96	EEMPLLF	O	EFM signal output
97	PEFMS	I	EFM signal input
98	$AV_{DD}0$	I	Power supply terminal
99	$AV_{SS}0$	-	GND terminal
100	TEFSEL	-	Not used, open

16.4. IC10 (MN101D03DAA1): System Control

Pin No.	Terminal Name	I/O	Function
1	DAC RST	O	DAC reset signal output (L: reset)
2	DEO	O	DE emphasis signal output (L: DE emphasis)
3	MUTE	-	Muting signal output (Not used, open)
4	AD RST	O	AD reset signal output (L: reset)
5	NRF STBY	O	RF amp standby control signal output
6	PC	O	Power supply control output
7	MSP RST	O	Reset signal output
8	LOAD1	O	Loading motor drive 1 output
9	LOAD0	O	Loading motor drive 0 output
10	NEFMON	O	Magnetic head current output
11	TEST01	-	Test terminal (Not used, open)
12	TV SW	I	Rest detect switch signal input
13	DISC IN	I	Disc in detect switch signal input
14	REFLECT	I	Reflect detect switch signal input
15	LOADSW0 (OPEN)	I	Load OPEN detect switch signal input
16	LOADSW1 (TRG)	I	Load TRG detect switch signal input
17	LOADSW2(PLAY/REC)	I	Load PLAY/REC detect switch signal input
18	LOADSW3 (PLAY)	I	Load PLAY detect switch signal input
19	PROTECT	I	PROTECT detect switch signal input
20	MMOD	-	Not used, connected to GND
21	RST	I	Reset signal input
22	UNITTEST	-	Test signal input (Not used, open)
23	CS2	-	Test signal input (Not used, open)
24	SCTSY	I	ADIP synchronous noise input
25	MDISY	I	Header synchronous noise input
26	PANEL REQ	I	Panel I/F request signal input
27	LED OUT1	O	Drive signal output for LED drive (H: ON)
28	LED OUT2		
29	LED OUT3		
30	TEST02	-	Test terminal (Not used, open)
31	$V_{DD}2(3V)$	I	Power supply terminal
32	OSC1	I	Crystal oscillator (f=10.02 MHz)
33	OSC2	O	
34	V_{SS}	-	GND terminal
35	XI	-	Not used, connected to GND
36	XO	-	Not used, open
37	V_{SS}	-	GND terminal
38	TEST03	-	Test terminal (Not used, open)
39	EEPCS	-	EEPROM chip select signal output (Not used, open)
40	EEPCK	-	EEPROM clock signal output (Not used, open)
41	EEPDATA	-	EEPROM data signal input/output (Not used, connected to GND via resistor)
42	TEST04	-	Test terminal (Not used, open)
43	TEST05	-	Test terminal (Not used, open)
44	CF SYNC	I	MDA synchronous signal input
45	TEST06	-	Test terminal (Not used, open)
46	TEST07	I	Connected to rec/play switch signal
47	TOK OK	-	Test terminal (Not used, open)
48	HF ON	O	HF module ON signal output

Pin No.	Terminal Name	I/O	Function
49	PANEL CLK	I	PANEL I/F clock signal input
50	PANEL DATA I	I	PANEL I/F data signal input
51	PANEL DATA O	O	PANEL I/F data signal output
52	PANEL CS	O	PANEL I/F chip select signal output
53	SELAD	O	MSP/MDA, I/F address select output (H: address)
54	SS CLK	O	MSP/MDA, I/F clock output
55	SS DR	I	MSP/MDA, I/F read data input
56	SS DW	O	MSP/MDA, I/F write data output
57	LCD CK	-	LCD clock test signal output (Connected to power supply via resistor)
58	ADRS TEST RXD	-	Test terminal (Connected to power supply via resistor)
59	LCD DATA TXD	-	Test terminal (Not used, open)
60	VREF-	-	Connected to GND
61	TEMP	I	Temperature sensor input
62	KEY1	I	Operation key signal input
63	KEY2	I	Operation key signal input
64	MO LOAD	-	Test signal input (Not used, open)
65	SRV TEST	-	Test signal input (Not used, open)
66	LOAD P	-	Test signal input (Not used, open)
67	TEST KEY IN	-	Test signal input (Not used, open)
68	SRV LOAD	-	Test signal input (Not used, open)
69	V_{CC}3V	I	Power supply terminal
70	V_{CC}5V	I	Power supply terminal
71	SEL ADDA	-	AD/DA converter select signal input (Not used, open)
72	SLOCK	-	Spindle lock output (Not used, open)
73	TLOCK	-	Tracking lock output (Not used, open)
74	FLOCK	-	Focus lock test signal output (Not used, open)
75	ERROR	-	Servo error test signal output (Not used, open)
76	BUSY	-	Servo busy test signal output (Not used, open)
77	SBP RETRY	-	Spindle management retry test signal output (Not used, open)
78	SRV RETRY	-	Servo retry test signal output (Not used, open)
79	ARDSKIP	-	Address skip test signal output (Not used, open)
80	SPMWE	-	SPM test signal output (Not used, open)

16.5. IC72 (M51V4400D7FS): 4M DRAM

Pin No.	Terminal Name	I/O	Function
1	DO1	I/O	DRAM data 1 input/output
2	DO2	I/O	DRAM data 2 input/output
3	WE	I	DRAM write enable input
4	RAS	I	DRAM row address strobe input
5	A9	I	DRAM address 9 input
9	A0	I	DRAM address 0 input
10 | 12	A1 | A3	I	DRAM address 1 - 3 input
13	V_{CC}	I	Power supply terminal
14 | 18	A4 | A8	I	DRAM address 4 - 8 input
22	OE	-	DRAM output enable input (Not used, connected to GND)
23	CAS	I	DRAM column address strobe input
24	DO3	I/O	DRAM data 3 input/output
25	DO4	I/O	DRAM data 4 input/output
26	V_{SS}	-	GND terminal

16.6. IC901 (M30218MAA102): System Control/FL Display

Pin No.	Terminal Name	I/O	Function
1	P97	-	Not used, connected to GND
2	P96	-	Not used, connected to GND
3	P95	O	Digital in 1 ON signal output
4	P94	O	Digital in 2 ON signal output
5	P93	-	Not used, connected to GND
6	P92	I	Chip select signal input
7	P91	O	Request signal output
8	P90	O	Reset signal output
9	CNV_{SS}	O	Flash ROM write power supply
10	P87	O	LED drive control signal output
11	P86	-	Not used, connected to GND
12	/RESET	I	Reset signal input (L: Reset)
13	XOUT	O	Crystal oscillator output (f=10 MHz)
14	V_{SS}	-	GND terminal
15	XIN	I	Crystal oscillator input (f=10 MHz)
16	V_{CC}	I	Power supply terminal
17	P85	I	AC detect signal input
18	P84	I	Remote control signal input
19	P83	I	Load TRG det. switch signal input
20	P82	O	Audilo mute signal output (H: Mute)
21	P81	O	DA/AD power control signal output
22	P80	O	JOG LED ON/OFF signal output
23	P77	I	TIMER (PLAY) signal input
24	P76	O	Communication clock signal output for IC10
25	P75	I	Data signal input from IC10
26	P74	O	Data signal output for IC10
27	P73	I	TIMER (REC) signal input
28	P72	I	Mono/stereo select signal input
29	P71	I	Digital 1/2 select signal input
30	P70	I	Analog signal input
31 | 34	P47 | P44	-	Flash ROM data signal output (Not used, connected to GND via resistor)
35	P43	-	Not used, connected to GND
36	P42	I	Model select signal input
37 | 38	P41 | P40	O	FL segment signal output
39 | 46	P37 | P30	O	FL segment signal output
47 | 54	P27 | P20	O	FL segment signal output
55 | 62	P17 | P10	O	FL segment signal output
63	V_{CC}	I	Power supply terminal
64	P07	O	FL segment signal output
65	V_{SS}	-	GND terminal
66 | 72	P06 | P00	O	FL segment signal output
73 | 80	P57 | P50	O	FL grid signal output

Pin No.	Terminal Name	I/O	Function
81 | 88	P67 | P60	O	FL grid signal output
89	-VP	I	Power supply terminal (negative)
90	P107/AN7	-	Not used, connected to GND
91	P106/AN6	-	Not used, connected to GND
92	P105/AN5	I	Operation key signal input
93	P104/AN4	I	Operation key signal input
94	P103/AN3	-	Not used, connected to GND
95	P102/AN2	-	Not used, connected to GND
96	P101/AN1	-	Not used, connected to GND
97	AV_{SS}	-	GND terminal
98	P100/AN0	-	Not used, connected to GND
99	VREF	I	Reference voltage input
100	AV_{CC}	I	Power supply terminal

17 Measurements and Adjustments

Note:

Because this unit uses the optical magnetic recording, the unit outputs over 10 times more laser than a CD player does. In adjustment mode, the laser is always being output. Therefore, be especially careful not to look laser beam directly or to touch the laser beam when adjusting the unit and checking its operation.

17.1. Necessary instruments

- Laser power meter (LE8010)
- Test disc (Pre-mastered disc RFKV0006 or RFKV0014)
- Recordable disc available on sales route (with music recorded)
- Insulated driver for adjustment such as a ceramic driver
- Extension cable kit (RFKZJMD100EK)
- Remote control transmitter

17.2. Set to the unit to adjustment mode

1. Turn the power ON.
2. With no MD loaded in the unit, press and hold the STOP button (■) for at least 2 seconds. And then while still pressing the STOP button (■), press the F.SEARCH button (►►) for at least 2 seconds. The unit is set to the self-diagnostic function and is displayed "MD TEST". Refer to Fig. 17-1.

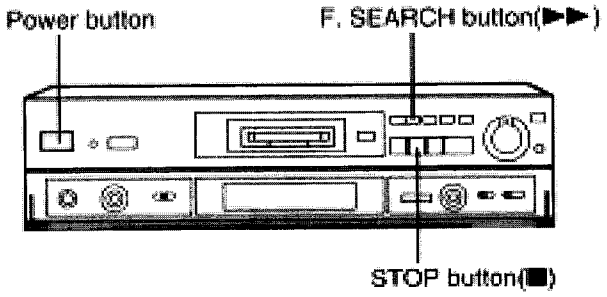


Fig. 17-1.

Caution on optical pickup:

- The optical pickup and the magnetic head are structured precisely; therefore, they are very fragile. Be careful not to touch them with the edge of laser power meter.
- The sensor of the laser power meter is a very fine part. Be careful not to touch it to the optical pickup lens.
- The focus point of the laser reaches to 180°C. Therefore, avoid using laser power for a long time because the sensor of the laser power meter may be burned.
- Do not allow the write power to even momentarily reach or exceed 5.5 mW. Doing so will result in damage to the optical pickup.
- Do not set the unit to the laser power adjustment mode with the MD loaded. Doing so may result in damage to the MD.

17.3. Laser power adjustment

Adjust each laser power: read power for reading (play) and write power for writing (record).

Caution:

1. **About handling the MD unit**
   - The magnetic head is precision unit and is very fragile. Do not deform it.
   - Laser diode in the optical pickup may be destroyed by the static electricity generated in your clothes or body. Be especially careful with the static electricity.
   - The optical pickup is structured extremely precisely. Do not subject to the strong impact or shock. Do not touch the lens.
2. **About handling the magnetic head**

   When replacing the magnetic head, do not tighten the mounting screw (RHD17022) too firmly. If the screw is tightened too much to deform the resin, the position of the head is moved, and this affects its recording operation.

   Recommended torque for mounting screw: 700±100 g cm

   Reference:

   This is the same force as using a screwdriver with a 15-mm diameter grip, you fasten the screw naturally with your thumb and index finger.
3. **About the driver for adjusting laser power**

   Use only insulated driver such as a ceramic driver. With the metal driver, it is not possible to adjust properly because of induction noise. Also, if it short-circuits with the chassis, it may destroy or damage the laser diode.

   Recommended driver: VESSEL 9000 1.8-30 (Ceramic driver)

17.3.1. Adjustment Procedure

1. With no MD loaded in the unit , press "1" on the remote control transmitter.

   "RAM LASER" will be displayed to indicate the read power adjustment mode.
2. Slide the sensor cover of the laser power meter. Refer to Fig. 17-2.

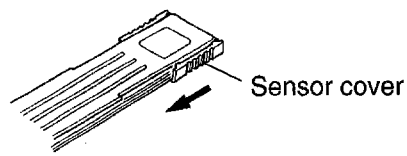


Fig. 17-2.

3. Position the sensor of the laser power meter directly above the optical pickup. Refer to Fig. 17-3. Or load the cartridge of the laser power meter into the MD mechanism. Refer to Fig. 17-4.

Caution:
Do not allow the laser power meter to come in contact with either the optical pickup or the magnetic head.

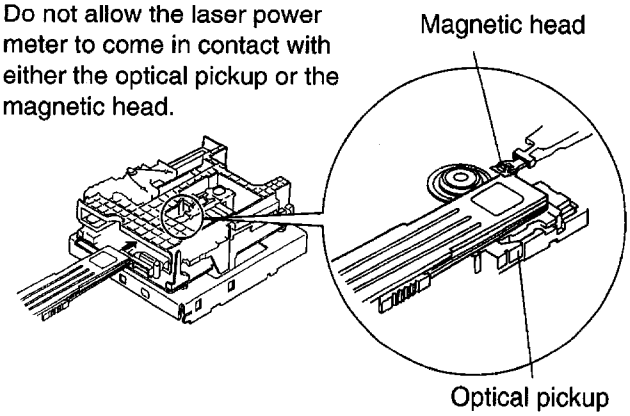


Fig. 17-3.

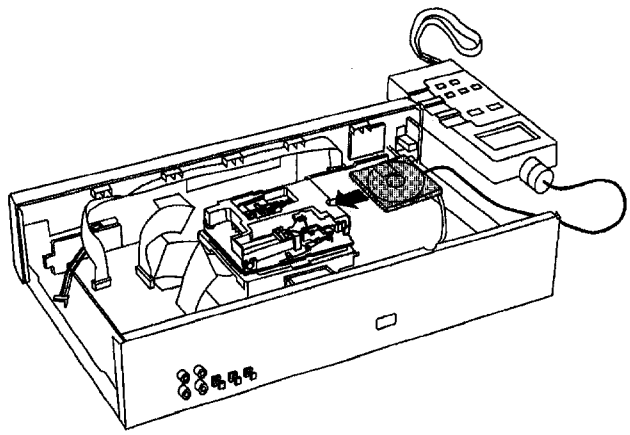


Fig. 17-4.

4. Confirm that the reading of the laser power meter is within the specified range. If it is not within the specified range, adjust by turning **VR1**. Refer to Fig. 17-5.

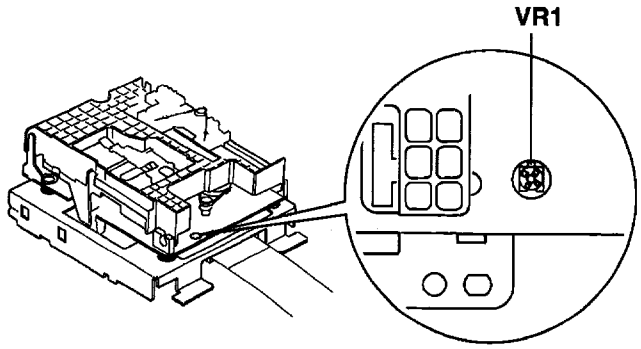


Fig. 17-5.

Specified range (read power): 600 µW or lower

Caution:

Proceeding on to the subsequent adjustment procedure with the read power exceeding 600 µW will result in damage to the optical pickup.

5. Press "2" on the remote control transmitter.

   "WRITE LASER" will be displayed to indicate the write power adjustment mode.

6. Confirm that the reading of the laser power meter is within the specified range. If it is not within the specified range, adjust by turning **VR1**. Refer to Fig. 17-5.

Specified range (write power): 4.8 mW±0.1 mW

Caution:

Do not allow the write power to even momentarily reach or exceed 5.5 mW. Doing so will result in damage to the optical pickup.

7. Press "3" on the remote control transmitter.

   "ROM LASER" will be displayed to indicate the ROM data confirmation mode.

8. Confirm that the reading of the laser power meter is within the specified range.

   Specified range (ROM data laser power):
   540 µW ~ 660 µW

9. Press "1" on the remote control transmitter.

   "RAM LASER" will be displayed to indicate the RAM data confirmation mode.

10. Confirm that the reading of the laser power meter is within the specified range.

    Specified range (RAM data laser power):
    540 µW ~ 660 µW

    If the reading in either step 8 or 10 above is not within the specified range, first switch off the power, and then reset the unit to the adjustment mode and repeat the adjustment procedure.

11. Turn the power OFF.

18 Replacement Parts List

Notes:

- Important safety notice:

  Components identified by ⚠ mark have special characteristics important for safety.

  Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

  When replacing any of components, be sure to use only manufactures specified parts shown in the parts list.

- The <IA> <IB> <IC> <ID> marks in Remarks indicate language of instruction manual.

  <IA> : English, Spanish, Swedish, Russian, Czech, Polish

  <IB> : English

  <IC> : German, Italian, French

  <ID> : Netherlands, Danish

- The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
- The marking <MAVD> indicates in Remarks colums parts that are supplied by MAVD.
- The marking [RTL] indicates that Retention Time is Limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.
- All parts are supplied by MESA.

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1	RHD30035-K1	SCREW	4	
2	RKM0152-K	TOP CABINET	1	<MAVD>
3	XTBS3+8JFZ1	SCREW	1	
4	REX0945	WIRE ASS'Y	1	<MAVD>
5	REZ1159	FLAT CABLE (30P)	1	<MAVD>
6	REZ1160	FLAT CABLE (20P)	1	<MAVD>
7	RHD30053	SCREW	3	
8	RKA0040BZ-K1	LEG BASE	4	<MAVD>
9	RYF0501-Q	DOOR UNIT	1	<MAVD>
9-1	RGK1111-K	NUT	4	
9-2	RHD26033	SCREW	4	
9-3	XTS2+4GFZ	SCREW	4	
10	RDG0449	DAMPER GEAR	2	
11	RYP0590Z-K	FRONT PANEL UNIT	1	<MAVD>
12	RGK0977-1S	MD LID	1	<MAVD>
13	RGK1112-S	ORNAMENT	1	<MAVD>
14	RGK1113-S	MD SLOT ORNAMENT	1	<MAVD>
15	RGU0890-1K	BUTTON,POWER	1	
16	RGU1709-K	BUTTON,MAIN	1	<MAVD>
17	RGU1712-K	BUTTON,OPEN	1	
18	RGU1714-S	BUTTON,PLAY MODE	1	<MAVD>
19	RGV0112-S	KNOB,SLIDE	3	<MAVD>
20	RGW0308-K	KNOB,JOG	1	<MAVD>
21	RGW0310-S	KNOB,VOLUME	2	<MAVD>
22	RHD20010	SCREW	1	
23	RHD26021	SCREW	14	
24	RHD26034	SCREW	3	
25	RHN70002	NUT	1	
26	RMB0514	SPRING	1	
27	RKG0009	MAGNET	1	
28	RME0284	SPRING	1	
29	XTBR3+20JFZ	SCREW	2	
30	XTBS3+8JFZ1	SCREW	12	
31	XTB3+10JFZ	SCREW	3	
32	XTB3+8JFZ	SCREW	4	
101	RHD17021	SCREW	1	
102	RHD17022	SCREW	1	
103	RMC0348	SPRING	1	
104	RMC0349	SPRING	1	
105	RML0515	HEAD GUIDE	1	
106	RMQ0750	BASE	1	
107	RMQ0751	NUT PLATE	1	
108	RMS0611	SHAFT	1	
109	RXJ0021	GUIDE SHAFT	1	
110	RXK0249	CHASSIS	1	
110-1	RDV0055	BELT	1	
110-2	REM0077	MOTOR 1	1	<MAVD>
110-3	REM0078	MOTOR 2	1	<MAVD>
110-4	RMB0548	SPRING	1	
110-5	RMQ0752	DETECTOR PIN 1	1	
110-6	RMQ0753	DETECTOR PIN 2	2	
110-7	XQN17+C25FZ	SCREW	4	
110-8	XYC2+FF105	SCREW	1	
111	RAF1700A	OPTICAL PICK UP	1	<MAVD> ⚠
112	XTW2+6S	SCREW	1	
113	RHD20053	SCREW	4	
114	RMB0504	SPRING	4	
115	RMG0447-K	DAMPER	4	
116	XTN17+6GFZ	SCREW	1	
117	RXQ0558	HOLDER	1	
118	RED0047	MAGNETIC HEAD	1	
A1	EUR645272	REMOTE CONTROLLER	1	<MAVD> ⚠
A1-1	UR64EC1987B	R/C BATTERY COVER	1	
A2	RJA0043-1C	AC POWER CORD	1	(E,EG) <MAVD> ⚠
A2	RJA0044-C	AC POWER CORD	1	(EB) <MAVD> ⚠
A3	RJL1X009B08	OPTICAL CABLE	1	<MAVD>
A4	RJL2P004B08A	RCA PIN CORD 2	2	
A5	RQT5409-E	OPERATING INSTRUCTIONS	1	(E) <MAVD> <IA>
A5	RQT5411-B	OPERATING INSTRUCTIONS	1	(EB) <MAVD> <IB>
A5	RQT5407-D	OPERATING INSTRUCTIONS	1	(EG) <MAVD> <IC>
A5	RQT5408-H	OPERATING INSTRUCTIONS	1	(EG) <MAVD> <ID>
A6	RQA0117	WARRANTY CARD	1	
A7	RQCB0169	SERVICE CENTER LIST	1	
C1	ECUV1H221KBV	50V 220P	1	
C4	ECUVNA105ZFV	10V 1U	1	
C5	ECUVNA224KBV	10V 0.22U	1	
C6	ECUVNA105ZFV	10V 1U	1	
C7,C8	ECUVNA224KBV	10V 0.22U	2	
C11	ECUVNE223KBV	25V 0.022U	1	
C12	ECUV0J474KBV	6.3V 0.47U	1	
C13	ECUV1C393KBV	16V 0.039U	1	
C14	ECUV1H102KBV	50V 1000P	1	
C15	ECST0GY106RR	4V 10U	1	
C16	ECUV1H181KV	50V 180P	1	
C17	ECUV1H332KBV	50V 3300P	1	
C18	ECUV1H562KBV	50V 5600P	1	
C19	ECUVNC104ZFV	16V 0.1U	1	
C20	ECST0GY106RR	4V 10U	1	
C21	ECUV1H822KBV	50V 8200P	1	
C22	ECUV1H102KBV	50V 1000P	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C23	ECUVNC104ZFV	16V 0.1U	1	
C24	ECUV1H102KBV	50V 1000P	1	
C25	ECUV1C393KBV	16V 0.039U	1	
C26	ECUV1H472KBV	16V 4700P	1	
C28	ECST0GY226RR	4V 22U	1	
C29	ECUV1H332KBV	50V 3300P	1	
C30	ECUV1E123KBV	25V 0.012U	1	
C31,32	ECUV1H102KBV	50V 1000P	2	
C33	ECST0GY106RR	4V 10U	1	
C34,35	ECUV1H102KBV	50V 1000P	2	
C37	ECUV1H181KV	50V 180P	1	
C40	ECUVNC104ZFV	16V 0.1U	1	
C41	ECEV0JA331P	6.3V 330U	1	
C42	ECST0GY106RR	4V 10U	1	
C45	ECST0GY106RR	4V 10U	1	
C46	ECUVNC104ZFV	16V 0.1U	1	
C47	ECUVNA105ZFV	10V 1U	1	
C48	ECUVNC104ZFV	16V 0.1U	1	
C50	ECUVNC104ZFV	16V 0.1U	1	
C51,52	ECUVNA105ZFV	10V 1U	2	
C53	ECUV1H332KBV	50V 3300P	1	
C55-58	ECUV1H102KBV	50V 1000P	4	
C59	ECUV1C823KBV	16V 0.082U	1	
C60	ECEV1CA100NR	16V 10U	1	
C61	ECUV0J334KBV	16V 0.33U	1	
C62	ECUV1H221KBV	50V 220P	1	
C64	ECUVNE153KBV	25V 0.015U	1	
C65	ECUVNC104KBV	16V 0.1U	1	
C66	ECUV1C823KBV	16V 0.082U	1	
C67	ECUV1H392KBV	50V 3900P	1	
C70	ECUV1E123KBV	25V 0.012U	1	
C71-76	ECUVNC104ZFV	16V 0.1U	6	
C79,80	ECUVNC104ZFV	16V 0.1U	2	
C81	ECUV1H560JCV	50V 56P	1	
C82	ECUVNC473KBV	16V 0.047U	1	
C83,84	ECUVNC104ZFV	16V 0.1U	2	
C85	ECST0GY106RR	4V 10U	1	
C86	ECUVNE153KBV	25V 0.015U	1	
C87	ECUVNC104ZFV	16V 0.1U	1	
C88,89	ECUV1H331KBV	50V 330P	2	
C90,91	ECUV1H080DCV	50V 8P	2	
C92,93	ECUVNC104ZFV	16V 0.1U	2	
C94	ECST0GY475RR	4V 4.7U	1	
C95	ECUVNC104ZFV	16V 0.1U	1	
C96,97	ECST0GY475RR	4V 4.7U	2	
C98	ECUVNC104ZFV	16V 0.1U	1	
C99	ECUV1H102KBV	50V 1000P	1	
C100	ECUVNC104ZFV	16V 0.1U	1	
C101	ECST0GY106RR	4V 10U	1	
C102	ECUVNC104ZFV	16V 0.1U	1	
C103	ECST0GY106RR	4V 10U	1	
C106	ECUV1H102KBV	50V 1000P	1	
C110	ECUVNC104ZFV	16V 0.1U	1	
C111	ECST0GY106RR	4V 10U	1	
C112	ECEV1CA100NR	16V 10U	1	
C113	ECUVNC104ZFV	16V 0.1U	1	
C114,15	ECUV1H561KBV	50V 560P	2	
C117	ECEV0JA331P	6.3V 330U	1	
C118	ECUVNA105KBN	10V 1U	1	
C119	ECUV1H102KBV	50V 1000P	1	
C120	ECUV1H560JCV	50V 56P	1	
C121	ECUV1H102KBV	50V 1000P	1	
C122	ECUVNA105ZFV	10V 1U	1	
C123	ECUVNC104ZFV	16V 0.1U	1	
C128	ECUVNC104ZFV	16V 0.1U	1	
C129	ECUV1H101JCV	50V 100P	1	
C133	ECUVNA105ZFV	10V 1U	1	
C134	ECUV1H331KBV	50V 330P	1	
C138	ECEV0JA470SR	6.3V 47U	1	
C139-42	ECUVNC104ZFV	16V 0.1U	4	
C143	ECST0GY106RR	4V 10U	1	
C154,55	ECUV1H330GCV	50V 33P	2	
C301	ECBT1H104ZF5	50V 0.1U	1	
C302	ECA1CM103E	16V 10000	1	⚠

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C303	ECBT1H104ZF5	50V 0.1U	1	
C304	ECA1HM101	50V 100U	1	
C305	ECA1HM101	50V 100U	1	⚠
C306	ECA1HM101	50V 100U	1	
C307	ECBT1H102KB5	50V 1000P	1	
C308	ECEA1HKA220B	50V 22U	1	
C309,10	ECBT1H104ZF5	50V 0.1U	2	
C311,12	ECA1EM471	25V 470U	2	⚠
C313,14	ECBT1H104ZF5	50V 0.1U	2	
C315,16	EEUPL1E470B	25V 47U	2	<MAVD>
C317,18	EEUPL1A221B	10V 220U	2	<MAVD>
C321	ECQV1H104JL3	50V 0.1U	1	<MAVD>
C322	ECEA0JKS101	6.3V 100U	1	
C323	EEUPL1E101B	25V 100U	1	<MAVD>
C324,25	ECEA0JKS470	6.3V 47U	2	
C326	ECQV1H104JL3	50V 0.1U	1	<MAVD>
C327	ECEA0JKS101	6.3V 100U	1	
C328	ECBT1C103NS5	16V 0.01U	1	
C329	ECEA1CKA470	16V 47U	1	
C330	ECEA0JKS101	6.3V 100U	1	
C331	ECBT1C103NS5	16V 0.01U	1	
C332	ECEA0JKS220	6.3V 22U	1	
C333	ECEA0JKS101	6.3V 100U	1	
C334	ECA0JM102	6.3V 1000U	1	
C335	ECEA0JKS470	6.3V 47U	1	
C336	ECBT1H104ZF5	50V 0.1U	1	
C337	ECBT1C103NS5	16V 0.01U	1	
C338,39	ECBT1H104ZF5	50V 0.1U	2	
C401,02	ECBT1H104ZF5	50V 0.1U	2	
C403	ECBT1H470J5	50V 47P	1	
C404	ECBT1H104ZF5	50V 0.1U	1	
C502	ECBT1H104ZF5	50V 0.1U	1	
C503	ECQV1H224JL3	50V 0.22U	1	
C504	ECQB1H223JM3	50V 0.022U	1	
C505	ECBT1H102KB5	50V 1000P	1	
C506	ECBT1H470J5	50V 47P	1	
C507	ECBT1H104ZF5	50V 0.1U	1	
C601	EEUPL1H100B	50V 10U	1	<MAVD>
C602	ECBT1H104ZF5	50V 0.1U	1	
C603	EEUPL1H100B	50V 10U	1	<MAVD>
C604	ECBT1H104ZF5	50V 0.1U	1	
C605	EEUPL1H100B	50V 10U	1	<MAVD>
C606	ECBT1H104ZF5	50V 0.1U	1	
C607	ECBT1C222MR5	16V 2200P	1	
C608	ECEA1EKS4R7	25V 4.7U	1	
C609	ECBT1H104ZF5	50V 0.1U	1	
C610	ECBT1C222MR5	16V 2200P	1	
C611	ECEA1EKS4R7	25V 4.7U	1	
C612,13	ECBT1H104ZF5	50V 0.1U	2	
C711,12	EEUPL1E470B	25V 47U	2	<MAVD>
C713,14	ECBT1H102KB5	50V 1000P	2	
C715-18	ECHR1H391JZ3	50V 390P	4	
C719,20	EEUPL1E470B	25V 47U	2	<MAVD>
C721,22	ECBT1H102KB5	50V 1000P	2	
C751,52	ECBT1H102KB5	50V 1000P	2	
C753,54	ECEA1EKN3R3B	25V 3.3U	2	
C755,56	ECBT1H2R2KC5	50V 2.2P	2	
C757,58	ECEA1EKN3R3B	25V 3.3U	2	
C759	ECBT1H104ZF5	50V 0.1U	1	
C761,62	ECEA1EKN3R3B	25V 3.3U	2	
C763-65	ECBT1H104ZF5	50V 0.1U	3	
C766,67	ECEA1EKS4R7	25V 4.7U	2	
C801,02	ECEA1AN101XB	10V 100U	2	
C803-08	ECBT1C103NS5	16V 0.01U	6	
C908	ECEA1AKS221	6.3V 220U	1	
C909,10	ECBT1H104ZF5	50V 0.1U	2	
C911	ECEA1HKS2R2	50V 2.2U	1	
C912	ECBT1H104ZF5	50V 0.1U	1	
CN1	RJS2A4526T	CONNECTOR(26P)	1	
CN4	RJS2A4830T	CONNECTOR(30P)	1	
CN6	RJU113W10M	CONNECTOR(10P)	1	
CN8	RJS2A4506T	CONNECTOR(6P)	1	
CN201	RJS1A6604	CONNECTOR(4P)	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
CN251	RJS4T6ZA	CONNECTOR(4P)	1	
CN301	RJS1A6606	CONNECTOR(6P)	1	
CN401	RJS1A6820	CONNECTOR(20P)	1	
CN402	RJS2A3330M	CONNECTOR(30P)	1	
CN711	RJS7T4ZA	CONNECTOR(7P)	1	
CN751	RJT029W06VT	CONNECTOR(6P)	1	
CN801	RJS7T7ZA	CONNECTOR(7P)	1	
CN802	RJU057W004	CONNECTOR(4P)	1	
CN804	RJT029W006-1	CONNECTOR(6P)	1	
CN901	RJS1A6220-1	CONNECTOR(20P)	1	
CP6	RJT113W10M	CONNECTOR(10P)	1	
CP802	RJT057W004-1	CONNECTOR(4P)	1	
D5,D6	SC80209TE12R	DIODE	2	
D9	MA728TX	DIODE	1	
D201	MA728TX	DIODE	1	
D301-07	1D3-E	DIODE	7	⚠
D308	MA4270H	DIODE	1	⚠
D309,10	1D3-E	DIODE	2	⚠
D311,12	MA4091M	DIODE	2	⚠
D313,14	MA4051M	DIODE	2	
D315	MA4062M	DIODE	1	⚠
D316	MA4056M	DIODE	1	⚠
D317,18	1SS291TA	DIODE	2	
D319,20	1SS254T-77	DIODE	2	<MAVD>
D321	MA4051M	DIODE	1	
D323,24	1D3-E	DIODE	2	
D451-54	1SS254T-77	DIODE	4	<MAVD>
D501	MA304TX	DIODE	1	
D711-17	1SS254T-77	DIODE	7	<MAVD>
D901	1SS254T-77	DIODE	1	<MAVD>
D902	SLR325MCT31	LED	1	
D903	SLR325VCT31	LED	1	
D904	1SS254T-77	DIODE	1	<MAVD>
FL901	RSL0282-F	FL	1	<MAVD>
IC1	AN8772FHQ	IC	1	
IC2	AN8814SB-E1	IC	1	
IC3	MN66616RA4	IC	1	
IC4	AK4518VF-E2	IC	1	<MAVD>
IC5	RN5RG33AA-TL	IC	1	⚠
IC6	TC7W04FTE12L	IC	1	
IC9	RN5RZ26BA-TR	IC	1	⚠
IC10	MN101D03DAA1	IC	1	
IC11	TC74HCT00AFL	IC	1	
IC72	M51V4400D7FS	IC	1	
IC92	LB1830MS-TLM	IC	1	
IC301-03	BA05ST-V5	IC	3	⚠
IC304	S81233SGY-Z	IC	1	⚠
IC401	TC74HCT7007A	IC	1	
IC402	TC74HC4050EL	IC	1	
IC501	TC9246FELP	IC	1	
IC601	AK4520AVF-E1	IC	1	<MAVD>
IC711	BA4560FE2	IC	1	<MAVD>
IC751	BA4560FE2	IC	1	<MAVD>
IC801	M5218AFPE3	IC	1	
IC901	M30218MAA102	IC	1	<MAVD>
ICP301	SRUN10	IC PROTECTOR	1	⚠
JK201	SJS9236	JACK AC INLET	1	⚠
JK701	SJF3069-4A	IN/OUT TERMINAL	1	
JK702	GP1F32T	OPTICAL OUTPUT	1	
JK703 04	GP1F32R	OPTICAL INPUT	2	
JK801	SJJD17B	HEADPHONE JACK	1	
L1	RLQU100KT-W	COIL	1	
L2,L3	RLQU101KT-W	COIL	2	
L4-L8	RLQU2R2MT-W	COIL	5	
L9-12	RLQU100KT-W	COIL	4	
L13,14	RLQU2R2MT-W	COIL	2	
L15	RLQU100KT-W	COIL	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
L201,02	SLQX400-D	COIL	2	⚠
L501	EXCELDR35V	COIL	1	
L502	ELEXT5R6KA	COIL	1	<MAVD>
L601	EXCELDR35V	COIL	1	
L801,02	ELEXT3R3KA04	COIL	2	<MAVD>
P1	RPG4856	PACKING CASE	1	<MAVD>
P2	RPF0139	PROTECTION BAG	1	
P3	SPP730	PROTECTION COVER	1	
P4	RPN1150	CUSHION	1	<MAVD>
Q1	2SB1295-6-TB	TRANSISTOR	1	
Q2	DTC114YETL	TRANSISTOR	1	
Q3	2SB1462STX	TRANSISTOR	1	
Q5	2SB1295-6-TB	TRANSISTOR	1	
Q6	DTC114YETL	TRANSISTOR	1	
Q10	2SJ278MYTR	TRANSISTOR	1	
Q11	2SK1764KYTR	TRANSISTOR	1	
Q13	2SB1121ST-TD	TRANSISTOR	1	⚠
Q301,02	2SD1450S	TRANSISTOR	2	
Q303	2SB1238QSTV6	TRANSISTOR	1	⚠
Q304	DTA114ESATP	TRANSISTOR	1	<MAVD>
Q305	2SD1862QRTV6	TRANSISTOR	1	⚠
Q306	2SB1240-P	TRANSISTOR	1	⚠
Q307	2SD1862QRTV6	TRANSISTOR	1	⚠
Q308	2SD2037EFTA	TRANSISTOR	1	⚠
Q401-03	DTC114ESATP	TRANSISTOR	3	<MAVD>
Q451	2SD1862QRTV6	TRANSISTOR	1	⚠
Q452	DTC114ESATP	TRANSISTOR	1	<MAVD>
Q453	DTA114ESATP	TRANSISTOR	1	<MAVD>
Q454,55	DTA143ESATP	TRANSISTOR	2	<MAVD>
Q703-06	2SD1450S	TRANSISTOR	4	
Q801,02	2SD1450S	TRANSISTOR	2	
Q901	DTA114ESATP	TRANSISTOR	1	<MAVD>
Q902-05	DTC114ESATP	TRANSISTOR	4	<MAVD>
Q913	DTC114ESATP	TRANSISTOR	1	<MAVD>
R1	ERJ3GEYJ472V	1/16W 4.7K	1	
R2	ERJ3GEYJ102V	1/16W 1K	1	
R3	ERJ3GEYJ472V	1/16W 4.7K	1	
R4	ERJ3GEY0R00V	CHIP JUMPER	1	
R5	ERJ3GEYJ1R0V	1/16W 1	1	
R6	ERJ3GEYJ472V	1/16W 4.7K	1	
R8	ERJ3GEYJ271V	1/16W 270	1	
R10	ERJ3GEYJ474V	1/16W 470K	1	
R11	ERJ3GEYJ101V	1/16W 100	1	
R12	ERJ3GEYJ223V	1/16W 22K	1	
R13	ERJ6GEYJ3R3V	1/8W 3.3	1	
R14	ERJ3GEYD103V	1/16W 10K	1	
R15	ERJ3GEYJ223V	1/16W 22K	1	
R16	ERJ3GEYJ104Z	1/16W 100K	1	
R17	ERJ3GEYJ223V	1/16W 22K	1	
R18	ERJ3GEYJ103Z	1/16W 10K	1	
R19	ERJ3GEYJ102V	1/16W 1K	1	
R20	ERJ3GEYJ473V	1/16W 47K	1	
R21	ERJ3GEYJ223V	1/16W 22K	1	
R22	ERJ3GEY0R00V	CHIP JUMPER	1	
R23	ERJ3GEYJ272V	1/16W 2.7K	1	
R24	ERJ3GEYJ473V	1/16W 47K	1	
R25	ERJ3GEYJ104Z	1/16W 100K	1	
R26	ERJ3GEYJ473V	1/16W 47K	1	
R28,29	ERJ3GEYJ473V	1/16W 47K	2	
R30	ERJ3GEYJ102V	1/16W 1K	1	
R31	ERJ3GEYJ223V	1/16W 22K	1	
R32	ERJ3GEYJ473V	1/16W 47K	1	

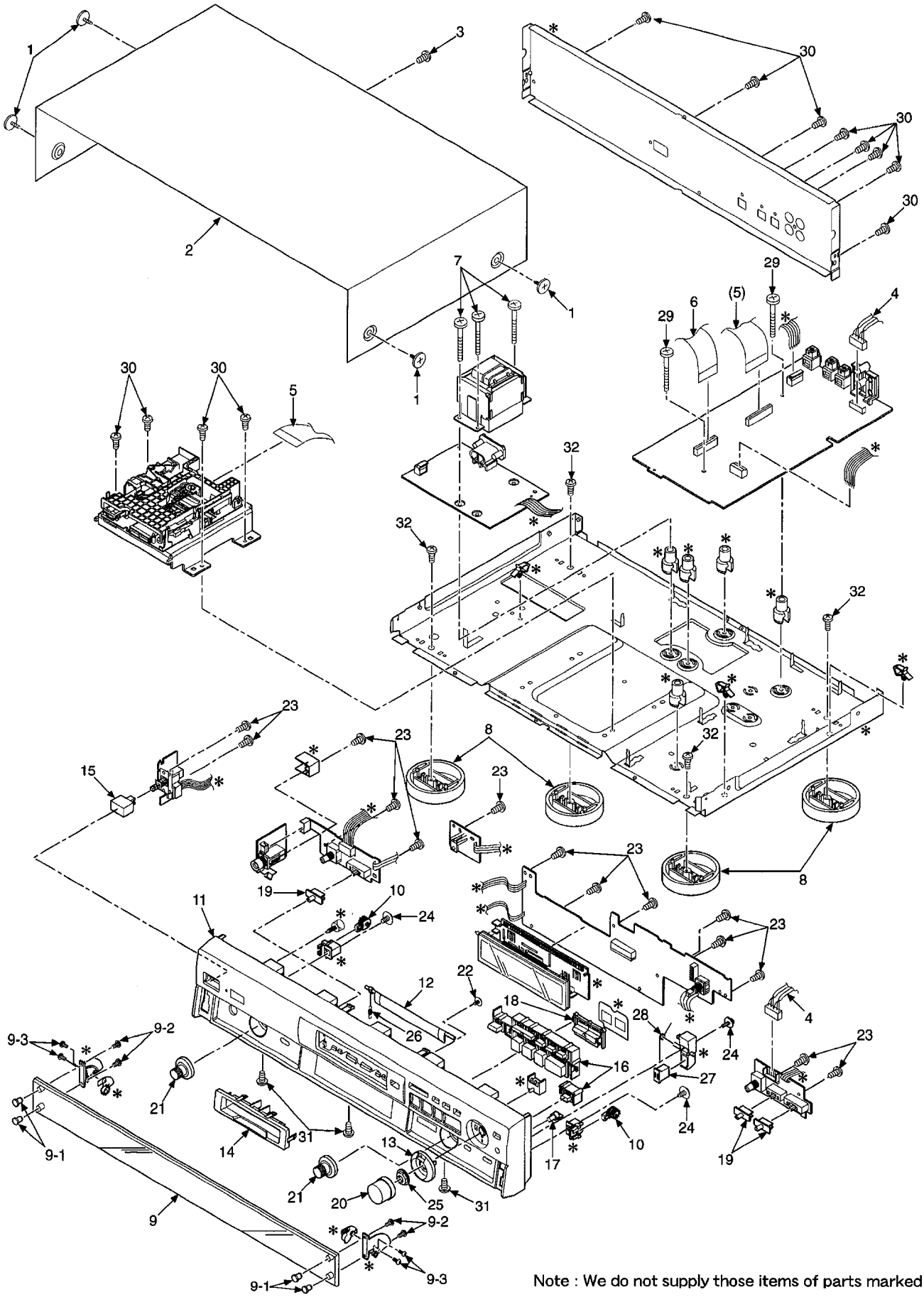
Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R34	ERJ3GEYJ272V	1/16W 2.7K	1	
R35	ERJ3GEYJ183V	1/16W 18K	1	
R36	ERJ3GEYJ273V	1/16W 27K	1	
R37	ERJ3GEYJ333V	1/16W 33K	1	
R38	ERJ3GEYJ223V	1/16W 22K	1	
R42	ERJ3GEYJ102V	1/16W 1K	1	
R43	ERJ3GEYJ222V	1/16W 2.2K	1	
R44	ERJ3GEYJ223V	1/16W 22K	1	
R45	ERJ3GEYJ333V	1/16W 33K	1	
R46	ERJ3GEYJ222V	1/16W 2.2K	1	
R47	ERJ3GEYJ473V	1/16W 47K	1	
R48,49	ERJ3GEY0R00V	CHIP JUMPER	2	
R50	ERJ3GEYJ102V	1/16W 1K	1	
R55	ERJ3GEYJ332V	1/16W 3.3K	1	
R56	ERJ3GEYJ223V	1/16W 22K	1	
R58	ERJ3GEYJ682V	1/16W 6.8K	1	
R59	ERJ3GEYJ683V	1/16W 68K	1	
R60	ERJ3GEYJ332V	1/16W 3.3K	1	
R61,62	ERJ3GEYJ223V	1/16W 22K	2	
R63	ERJ3GEYJ103Z	1/16W 10K	1	
R64-66	ERJ3GEYJ471V	1/16W 470	3	
R67	ERJ3GEYJ102V	1/16W 1K	1	
R70	ERJ3GEYJ102V	1/16W 1K	1	
R71,72	ERJ3GEYJ220V	1/16W 22	2	
R73	ERJ3GEYJ393V	1/16W 39K	1	
R74	ERJ3GEYJ822V	1/16W 8.2K	1	
R75	ERJ3GEYJ223V	1/16W 22K	1	
R76	ERJ3GEYJ100V	1/16W 10	1	
R77	ERJ3GEYJ223V	1/16W 22K	1	
R78-80	ERJ3GEYJ102V	1/16W 1K	3	
R81	ERJ3GEYJ223V	1/16W 22K	1	
R82	ERJ3GEYJ473V	1/16W 47K	1	
R83	ERJ3GEYJ102V	1/16W 1K	1	
R84	ERJ3GEYJ153V	1/16W 15K	1	
R85	ERJ3GEYJ223V	1/16W 22K	1	
R86,87	ERJ3GEYJ102V	1/16W 1K	2	
R89,90	ERJ3GEYJ102V	1/16W 1K	2	
R93	ERJ3GEYJ102V	1/16W 1K	1	
R95	ERJ3GEYJ222V	1/16W 2.2K	1	
R98,99	ERJ3GEYJ102V	1/16W 1K	2	
R100	ERJ3GEYJ473V	1/16W 47K	1	
R103	ERJ3GEYJ102V	1/16W 1K	1	
R104,05	ERJ3GEYJ272V	1/16W 2.7K	2	
R107	ERJ3GEYJ102V	1/16W 1K	1	
R108	ERJ3GEYJ271V	1/16W 270	1	
R109	ERJ3GEYJ105V	1/16W 1M	1	
R110	ERJ3GEYJ102V	1/16W 1K	1	
R111,12	ERJ3GEYJ221V	1/16W 220	2	
R113	ERJ3GEY0R00V	CHIP JUMPER	1	
R114,15	ERJ3GEYJ103Z	1/16W 10K	2	
R116,17	ERJ3GEYJ101V	1/16W 100	2	
R118	ERJ3GEYJ102V	1/16W 1K	1	
R119,20	ERJ3GEYJ101V	1/16W 100	2	
R121,22	ERJ3GEYJ272V	1/16W 2.7K	2	
R123	ERJ3GEYJ102V	1/16W 1K	1	
R124,25	ERJ3GEYJ473V	1/16W 47K	2	
R130	ERJ3GEYJ272V	1/16W 2.7K	1	
R131	ERJ3GEYJ101V	1/16W 100	1	
R132	ERJ3GEYJ272V	1/16W 2.7K	1	
R133	ERJ3GEY0R00V	CHIP JUMPER	1	
R134,35	ERJ3GEYJ272V	1/16W 2.7K	2	
R137	ERJ3GEYJ103Z	1/16W 10K	1	
R143	ERJ3GEY0R00V	CHIP JUMPER	1	
R145,46	ERJ3GEYJ221V	1/16W 220	2	
R147	ERJ3GEYJ102V	1/16W 1K	1	
R174	ERJ3GEYJ103Z	1/16W 10K	1	
R201	ERJ3GEYJ472V	1/16W 4.7K	1	
R201A	ERQ16NKWR10E	1/6W 0.1	1	⚠
R210	ERJ3GEYJ391V	1/16W 390	1	
R211	ERJ3GEYJ101V	1/16W 100	1	
R212	ERJ3GEYJ391V	1/16W 390	1	
R213	ERJ3GEYJ101V	1/16W 100	1	
R214	ERJ3GEY0R00V	CHIP JUMPER	1	
R215	ERJ3GEYJ391V	1/16W 390	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R301,02	ERDS2FJ183	1/4W 18K	2	
R303	ERDS2FJ1R2	1/4W 1.2	1	
R304,05	ERDS2FJ681	1/4W 680	2	
R306	ERD2FCG100	1/4W 10	1	⚠
R307	ERDS2FJ182	1/4W 1.8K	1	
R308	ERDS2FJ221	1/4W 220	1	
R309,10	ERDS2FJ103	1/4W 10K	2	
R311,12	ERD2FCJ4R7	1/4W 4.7	2	
R313,14	ERDS2FJ681	1/4W 680	2	⚠
R315,16	ERDS2FJ271	1/4W 270	2	
R317,18	ERDS2FJ102	1/4W 1K	2	
R319	ERDS2FJ681	1/4W 680	1	
R320	ERDS2FJ101	1/4W 100	1	
R321	ERDS2FJ221	1/4W 220	1	
R322	ERDS2FJ101	1/4W 100	1	
R323,24	ERDS2FJ222	1/4W 2.2K	2	
R325,26	ERDS2FJ103	1/4W 10K	2	
R327	ERDS2FJ1R2	1/4W 1.2	1	
R401-03	ERDS2FJ103	1/4W 10K	3	
R404	ERDS2FJ271	1/4W 270	1	
R405	ERDS2FJ103	1/4W 10K	1	
R406	ERDS2FJ271	1/4W 270	1	
R407	ERDS2FJ102	1/4W 1K	1	
R408	ERDS2FJ271	1/4W 270	1	
R409-11	ERDS2FJ102	1/4W 1K	3	
R451,52	ERDS2FJ103	1/4W 10K	2	
R453	ERDS2FJ222	1/4W 2.2K	1	
R501	ERDS2FJ104	1/4W 100K	1	
R502	ERDS2FJ222	1/4W 2.2K	1	
R503	ERDS2FJ103	1/4W 10K	1	
R504	ERDS2FJ102	1/4W 1K	1	
R601	ERD2FCJ4R7	1/4W 4.7	1	⚠
R602	ERDS2FJ102	1/4W 1K	1	
R711,12	ERDS2FJ561	1/4W 560	2	
R713,14	ERDS2FJ473	1/4W 47K	2	
R715,16	ERDS2FJ822	1/4W 8.2K	2	
R717,18	ERDS2FJ123	1/4W 12K	2	
R719-22	ERDS2FJ333	1/4W 33K	4	
R723,24	ERDS2FJ154	1/6W 150K	2	
R725,26	ERDS2FJ331	1/4W 330	2	
R727-30	ERDS2FJ151	1/4W 150	4	
R731-34	ERDS2FJ102	1/4W 1K	4	
R751-54	ERDS2FJ273	1/4W 27K	4	
R755,56	ERDS2FJ333	1/4W 33K	2	
R757,58	ERDS2FJ224	1/4W 220K	2	
R759,60	ERDS2FJ471	1/4W 470	2	
R761	ERDS2FJ222	1/4W 2.2K	1	
R801,02	ERDS2FJ680	1/4W 68	2	
R803,04	ERDS2FJ222	1/4W 2.2K	2	
R805,06	ERDS2FJ472	1/4W 4.7K	2	
R902	ERDS2FJ103	1/4W 10K	1	
R903-05	ERDS2FJ104	1/4W 100K	3	
R906	ERDS2FJ472	1/4W 4.7K	1	
R907	ERDS2FJ222	1/4W 2.2K	1	
R908-12	ERDS2FJ103	1/4W 10K	5	
R913	ERDS2FJ821	1/4W 820	1	
R914	ERDS2FJ102	1/4W 1K	1	
R915	ERDS2FJ122	1/4W 1.2K	1	
R916	ERDS2FJ152	1/4W 1.5K	1	
R917	ERDS2FJ182	1/4W 1.8K	1	
R918	ERDS2FJ821	1/4W 820	1	
R919	ERDS2FJ102	1/4W 1K	1	
R920	ERDS2FJ122	1/4W 1.2K	1	
R921	ERDS2FJ152	1/4W 1.5K	1	
R922	ERDS2FJ182	1/4W 1.8K	1	
R923	ERDS2FJ222	1/4W 2.2K	1	
R925	ERDS2FJ332	1/4W 3.3K	1	
R928,29	ERDS2FJ103	1/4W 10K	2	
R932	ERDS2FJ104	1/4W 100K	1	
R933	ERDS2FJ101	1/4W 100	1	
R934	ERDS2FJ562	1/4W 5.6K	1	
R937	ERDS2FJ561	1/4W 560	1	
R938	ERDS2FJ471	1/4W 470	1	
R940-44	ERDS2FJ103	1/4W 10K	5	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
S1,S2	RSH1A91ZA-A	SW,PROTECT/REFLECT	2	
S3	RSH1A044-1A	SW,LOAD OPEN	1	
S4	RSH1A91ZA-A	SW,DISC IN	1	
S5,S6	RSH1A044-1A	SW,LOAD PLAY/REC	2	
S7	RSH1A045-A	SW,LOAD TRG	1	
S8	RSP1A023-A	SW,TV SW	1	
S251	RSP2B023-A	SW,POWER	1	
S901	EVQ21405R	SW,PUSH	1	
S901A	RSS3A18YA-H	SW,TIMER/INPUT	1	
S902	EVQ21405R	SW,PUSH	1	
S902A	RSS3A18YA-H	SW,TIMER/INPUT	1	
S903	EVQ21405R	SW,PUSH	1	
S903A	RSS2A63ZA-H	SW,REC MODE	1	
S904-13	EVQ21405R	SW,PUSH	10	
T201	RTP1K4B033A	POWER TRANSFORMER	1	<MAVD> ⚠
TH1	RRSP33J103CW	THERMISTOR	1	
VR1	EVM3YSX50B14	VR,LASER POWER ADJ.	1	
VR801	EVJY10F01A24	VR,PHONES LEVEL	1	
VR851	EVJY10F01A24	VR,PHONES LEVEL	1	
VR901	RRV11B152A-A	VR,JOG/PUSH SET	1	
X1	RSXY10M0M02T	OSCILLATOR	1	
X2	RSXC16M9S03T	OSCILLATOR	1	
X901	RSXY10M0M01T	OSCILLATOR	1	
Z901	RCDGP1U28XD	REMOTE SENSOR	1	
Z902	EXBZ12E104J	COMPONENT COMBINATION	1	
Z903	EXBZ8E104J	COMPONENT COMBINATION	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
A	REP2809A-T	SERVO P.C.B.	1	[MAVD]
B	REP2786A-S	SWITCH P.C.B.	1	Kit with Ref.-No.C
C	REP2786A-S	FL P.C.B.	1	[MAVD]
D	REP2786A-S	SENSOR P.C.B.	1	Kit with Ref.-No.C
E	REP2785C-M	MAIN P.C.B.	1	[MAVD]
F	REP2786A-S	OPERATION(2)P.C.B.	1	Kit with Ref.-No.C
G	REP2786A-S	OPERATION(1)P.C.B.	1	Kit with Ref.-No.C
H	REP2786A-S	HEADPHONES JACK P.C.B.	1	Kit with Ref.-No.C
I	REP2786A-S	POWER SW P.C.B.	1	Kit with Ref.-No.C
J	REP2787A-P	POWER TRANSFORMER PCB	1	[MAVD]

19 Cabinet Parts Location

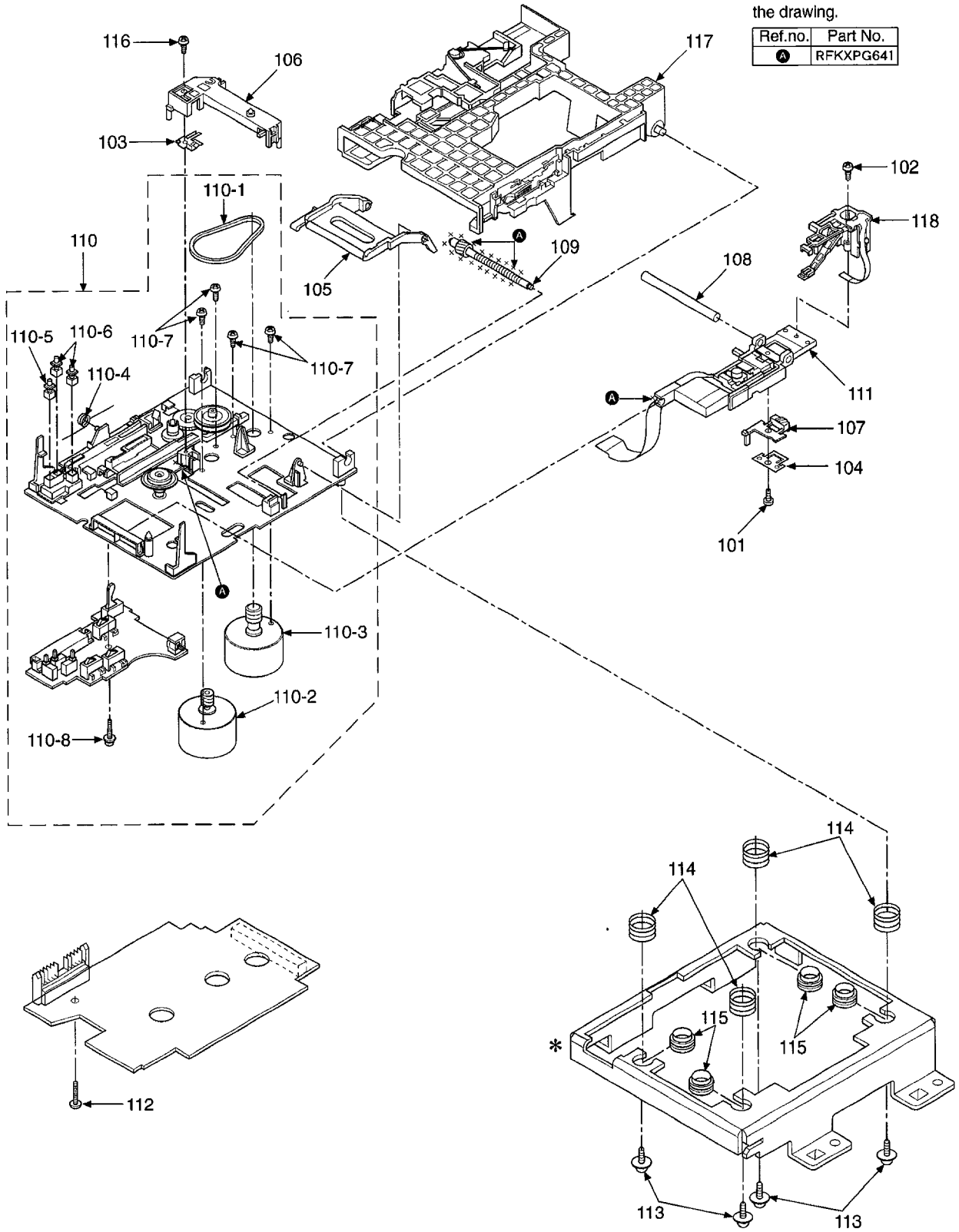


Note : We do not supply those items of parts marked ✻.

20 MD Mechanism Unit Parts Location

Note: When changing loading mechanism parts, apply the specified grease to the areas marked " ×× " as shown in the drawing.

Ref.no.	Part No.
Ⓐ	RFKXPG641



Note : We do not supply those items of parts marked ✻.

21 Packaging