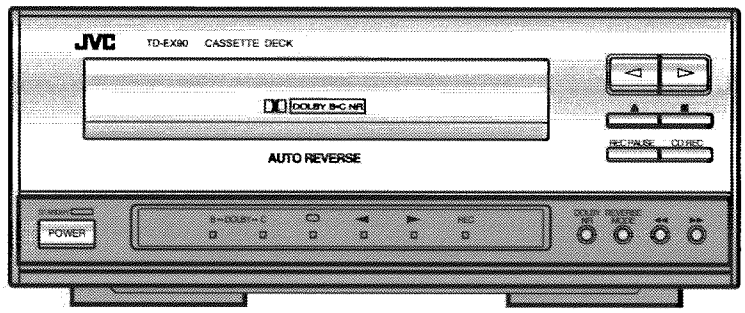
JVC

SERVICE MANUAL

CASSETTE DECK

TD-EX90



Area Suffix

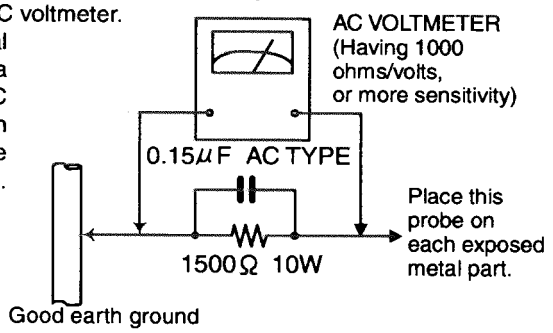
C	Canada
J	U.S.A.
U	Other Areas
UB	Hong Kong
UF	China
US	Singapore
UT	Taiwan
B	U.K
E	Continental Europe
EN	Northan Europe
EE	Eastern Europe

Contents

No.20712
July 1998

Safety Precautions

1. This design of this product contains special hardware and many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Services should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the product should not be made. Any design alterations of the product should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacture of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the Parts List of Service Manual. Electrical components having such features are identified by shading on the schematics and by (⚠) on the Parts List in the Service Manual. The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement parts shown in the Parts List of Service Manual may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard. When service is required, the original lead routing and dress should be observed, and it should be confirmed that they have been returned to normal, after re-assembling.
5. Leakage currnet check (Electrical shock hazard testing)
   After re-assembling the product, always perform an isolation check on the exposed metal parts of the product (antenna terminals, knobs, metal cabinet, screw heads, headphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.
   Do not use a line isolation transformer during this check.
   - Plug the AC line cord directly into the AC outlet. Using a "Leakage Current Tester", measure the leakage current from each exposed metal parts of the cabinet , particularly any exposed metal part having a return path to the chassis, to a known good earth ground. Any leakage current must not exceed 0.5mA AC (r.m.s.)
   - Alternate check method
     Plug the AC line cord directly into the AC outlet. Use an AC voltmeter having, 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1,500Ω 10W resistor paralleled by a 0.15μF AC-type capacitor between an exposed metal part and a known good earth ground.
     Measure the AC voltage across the resistor with the AC voltmeter.
     Move the resistor connection to eachexposed metal part, particularly any exposed metal part having a return path to the chassis, and meausre the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. voltage measured Any must not exceed 0.75 V AC (r.m.s.). This corresponds to 0.5 mA AC (r.m.s.).



Warning

1. This equipment has been designed and manufactured to meet international safety standards.
2. It is the legal responsibility of the repairer to ensure that these safety standards are maintained.
3. Repairs must be made in accordance with the relevant safety standards.
4. It is essential that safety critical components are replaced by approved parts.
5. If mains voltage selector is provided, check setting for local voltage.

⚠ ***CAUTION*** **Burrs formed during molding may be left over on some parts of the chassis. Therefore, pay attention to such burrs in the case of preforming repair of this system.**

■ Important administration points regarding safety

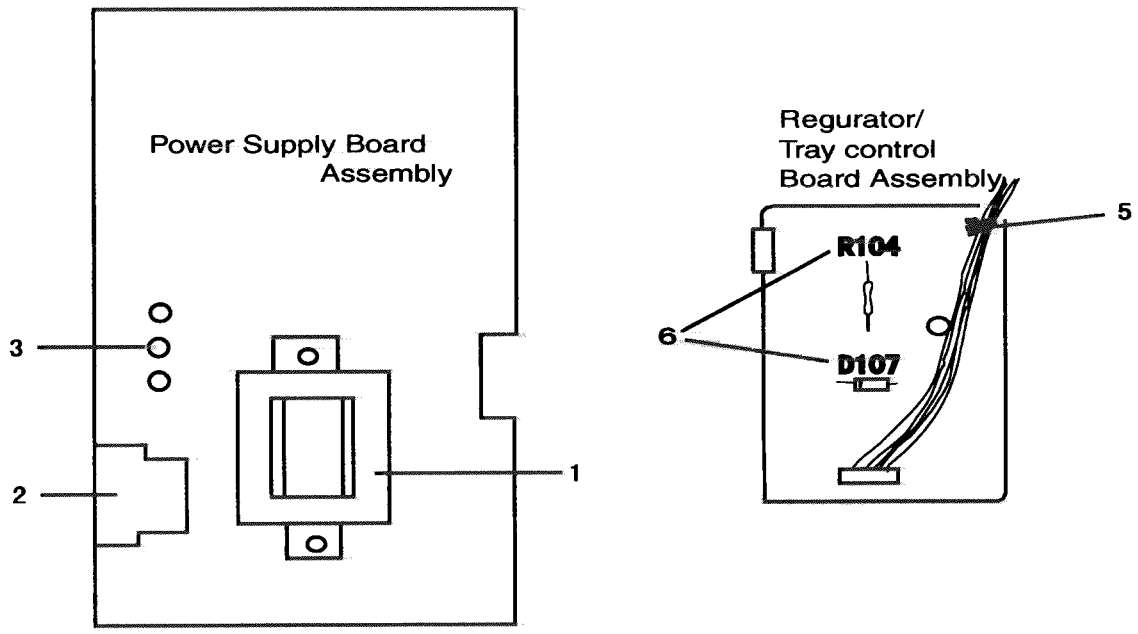
1. Power transformer making number QQT0183-003 (E/EN/B/EE version)
   Power transformer making number QQT0183-004 (U/US/UT/UF/UB version)
   Power transformer making number 71D133HD (J version)
   power transformer making number QQT0183-002 (C version)

The torque of the screw driver for the power transformer must be controlled.

2. Concerning the AC socket . the next marking must be confirmed and to avoid print circuit board pattern damage, the AC socket must not float from print circuit board. Marking number II14
3. Concerning the primary terminal and the adjacent secondary terminal on the print circuit board to provide proper creeping and spatial distance, solder must not protrude from soldering round.
4. Before installation confirm the fuse capacity indication, Ⓢ or Ⓥ marks on the holder, confirm UL ,CSA mark only for U/UT/ versions.

Ref. No.	Capacity and mark	Indication on printed circuit board	Area Suffix
F101	T500mA/250V	T500mA	B/E/EN/EE U/UB/UF/US UT
F102	T1.25A/250V	T1.25A/250V	U/UB/UF/US UT

5. Wire must be clamped or secured at the location shown in the figure so that the wire do not touch to live parts , moving parts, hot parts or shap edges.
6. Following parts are controlled as the heated parts, confirm that the flammable parts are lifted up , the parts in ( ) must be controlled.
   Diode: D107, Resistor: R104
7. The barrier must be attached on the power supply board.



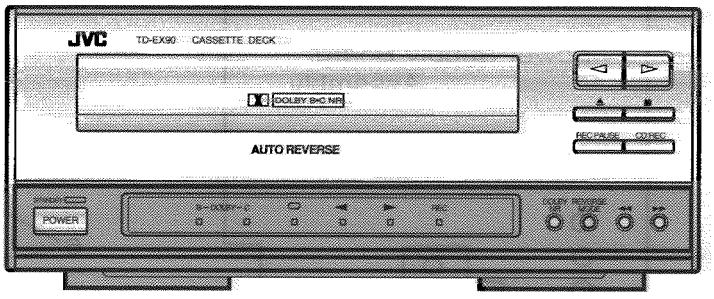
TD-EX90

Instructions

JVC

CASSETTE DECK

TD-EX90



INSTRUCTIONS

For Customer Use:

Enter below the Model No. and Serial No. which are located either on the rear, bottom or side of the cabinet. Retain this information for future reference.

Model No. _____

Serial No. _____

LVT0091-001A
[J]

Table of Contents

Welcome !

We would like to thank you for purchasing one of our JVC products. Before connecting this unit to the wall outlet, please read the instructions carefully to ensure that you obtain the best possible performance. If you have any questions, please consult your JVC dealer.

Important cautions

Installation of the Unit

- Select a place which is level, dry and neither too hot nor too cold (Between 5°C and 35°C or 41°F-95°F).
- Leave sufficient distance between the Unit and a TV.
- Be sure to place the Unit in a location with good ventilation.
- Do not use the Unit in a place subject to vibrations.
- Do not place the Unit on a carpet.
- Do not place the Unit on top of another heat-generating piece of equipment.

Power cord

- Do not handle the power cord with wet hands!
- When unplugging the Unit from the wall outlet, always pull the plug, not the power cord.

Malfunctions, etc.

- There are no user serviceable parts inside. If anything goes wrong, turn off the power immediately. If the same problem reoccurs when the power is turned on once more, turn off the power again, unplug the power cord and consult your dealer.
- Do not insert any metallic object into the Unit.

For safe use, observe the following

Avoid moisture, water and dust

Do not set your machine in moist or dusty places.

Avoid high temperatures

Do not expose your machine to direct sunlight or set near a heating device.

When you're away

When away on travel or otherwise for an extended period of time, turn off the power and pull the plug from the electrical socket.

Do not insert foreign matter into the machine

Do not insert wires, hairpins, coins, etc. into your machine.

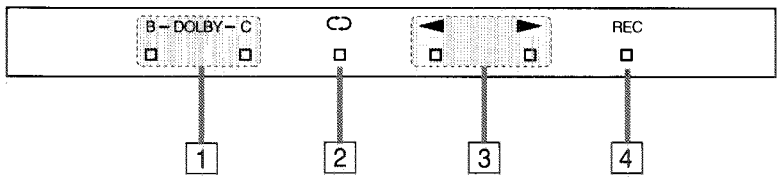
Care of the cabinet

When cleaning your machine, use a soft cloth and follow the relevant instructions on the use of chemically-coated cloths. Avoid applying benzene, thinner or other organic solvents and disinfectants. This may cause deformation or discoloring.

If water gets inside the machine

Turn off the power and pull the plug from the electrical socket, then call the store where you made your purchase. Using the machine in this state may cause a fire or electrical shock.

Display



1 **Dolby Noise Reduction indicators**
B: Lights when Dolby NR type B is selected.
C: Lights when Dolby NR type C is selected.

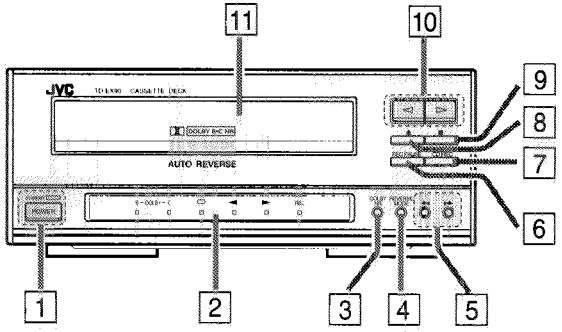
2 **Reverse mode indicators**
On: • During playback, both sides of the tape are played repeatedly.
• During recording with forward direction(►), one side of the tape will be recorded first then the other side, and stopped.
• During recording with reverse direction (◄), one side of the tape will be recorded and stopped.
Off: • Playback or recording stops at the end of the tape (one side).

3 Tape operation indicators
These indicators show the tape transport direction and operation status.
•Slow blinking: During playback or recording.
•Quick blinking: During fast forward or rewind.
•Rhythmical blinking: During search(Music Scan).

4 **Recording indicator**
The REC indicator lights in red in record-pause and record modes.

Parts Index

Front Panel



1 **POWER switch**
Press to switch the power between ON and STANDBY.
STANDBY indicator
The indicator is off while the power is ON and lights up when the power is in STANDBY mode.

2 **Indicator panel**

3 **DOLBY NR button**
Press to activate Dolby Noise Reduction. Each press switches Dolby NR to type B, type C and Off.

4 **REVERSE MODE button**
Press to switch the tape transport mode.

5 **◄◄, ►► buttons**
Press to skip to the beginning of a desired track or to fast forward or fast reverse a tape.

6 **REC PAUSE button**
Press to enter record-pause mode.

7 **CD REC button**
Press for synchronized recording with the EX series CD player.

8 **≜ button**
Press to open or close the tape tray.

9 **■ button**
Press to stop tape playback or recording.

10 **◅, ▻ buttons**
Press to start tape playback or recording.

11 **Tape tray**
A cassette tape is placed here.

Setting Up the System

Supplied Accesories

AC power cord x 1
Audio pin cords x 2
Compu Link cable x 1

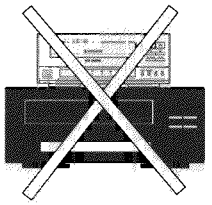
Caution for Placement

Do not place in any of the following ares.

- In direct sunlight.
- Do not place the CD player on top of the amplifer/tuner.
- In a place warmer than 35°C (95F°).
- In a bathroom, kitchen or other area with steam, humidity, or hot water.
- In a place with lots of static electricity or dust.
- In an unstable area.
- Near appliances that receive electronic wave broadcasts, such as a television.

Special attention

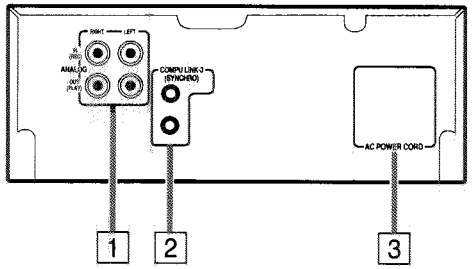
To protect from damage or malfunction,do not place this cassette deck on an amplifier or equivalent to generate heat.



Cassette deck

Amplifier

Rear Panel



[1] **ANALOG input/output jacks**
Connect to the TAPE input/output jacks of the amplifier/tuner using the provided audio pin cords.
Connect the IN (REC) jacks to the OUT (REC) jacks of the amplifier/tuner and the OUT (PLAY) jacks to its IN (PLAY) jacks.

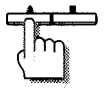
[2] **COMPU LINK-3 (SYNCHRO) jacks**
Connect each jack with the provided COMPU LINK-3 (SYNCHRO) jack of another component.
Either jack can be used for the connection.

[3] **AC POWER CORD receptacle**
Connect the provided AC power cord.

Playback

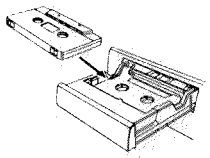
Tape playback

Three tape types including normal (Type I), High position (Type II) and Metal (Type IV) tapes can be played back. The type of tape is identified automatically by the cassette deck.

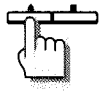


① Press ⏏.
The tape tray comes out open.

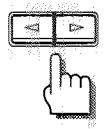
Shortcut:
Pressing ⏏ while the power is in the STANDBY mode automatically switches the power ON and opens the tape tray.



② Place a tape on the tray, with the side A facing up.
Fit in the caved-in area so that the edge where tape is exposed faces toward the inside of the unit.



③ Press ⏏.
The tape tray closes.

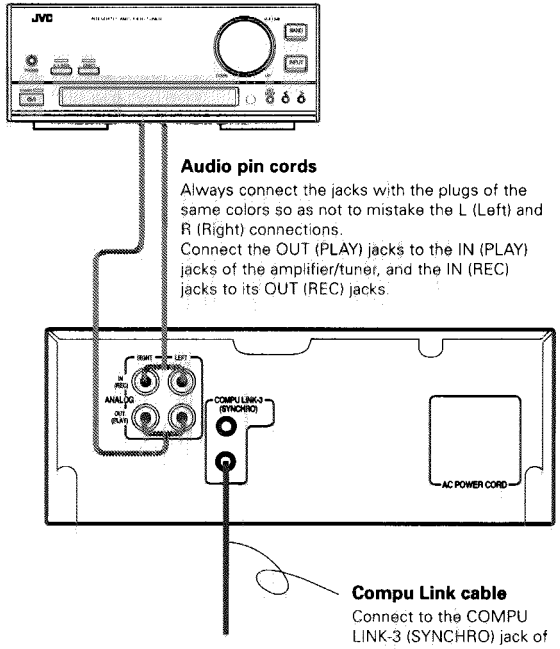


④ Press ◁ or ▷.
Playback starts.
- Pressing ▷ starts playback of side A (top side). The ► indicator blinks slowly.
  Pressing ◁ starts playback of side B (bottom side). The ◄ indicator blinks slowly.
- If ◁ or ▷ is pressed while the tape tray is open, the tape tray closes before playback starts.

Shortcut
Pressing ◁ or ▷ while the power is in the STANDBY mode automatically switches the power ON and starts playback.
Note: It will take about 6 seconds to start playing.
- Press ■ to stop playback in the middle.
- Press ⏏ to eject the tape.

Caution
Playback may be interfered with noise if there is a TV set nearby. In this case, turn off the TV or increase the distance between the TV and this unit.

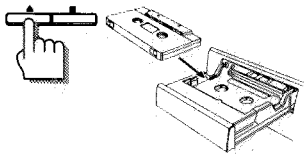
Connections



Recording

Tape recording (Basic operation)

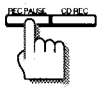
Three tape types including normal (Type I), High position (Type II) and Metal (Type IV) tapes can be recorded onto. The type of tape is identified automatically by the cassette deck.



① Load the tape for use in recording, with the side A facing up.
Press ⏏ to open the tape tray, place a tape on it and press ⏏ to close it.
- It is not possible to record onto a cassette tape with the broken accidental erasure tab. Use a cassette the tab of which is not broken.

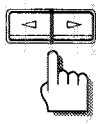
② Prepare the recording source (Tuner, CD or MD, etc.).
- To record radio broadcast, receive a station with the tuner.
- To record CDs, load the desired CDs and program tracks if required.
- To record an MD, load the desired MD and program tracks if required.
- To record a component connected to AUX, prepare it as required.

* Refer to the instruction manual of the source component for its operating procedure.



③ Select the recording source with the amplifier's input selector.

④ Press REC PAUSE.
The REC indicator lights in red to indicate record-pause mode.



⑤ Start playing the source component.
If you want to record CD or MD tracks from the first track, first perform step ⑥ below (i.e. start recording) then start playing the source.

⑥ Press ◁ or ▷.
- Pressing ▷ starts recoding on side A (top side).
- Pressing ◁ starts recoding on side B (bottom side).

The tape indicator starts blinking to indicate that the recording is under way.
- The recording level is set automatically.

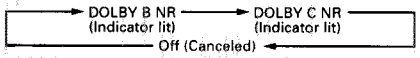
- Press ■ to stop recording.
- Press ⏏ to eject the tape.

To fast forward or rewind tape:
Press ◀◀ or ▶▶ while tape is in stop mode. The tape indicator blinks at a high speed during fast forward or rewind operation.
Fast forward
If the current tape transport direction is ▶, press ▶▶.
If the current tape transport direction is ◀, press ◀◀.
Rewind
If the current tape transport direction is ▶, press ◀◀.
If the current tape transport direction is ◀, press ▶▶.

Skipping to the beginning of music (Music Scan)
The beginning of the piece of music located before or after the current playback position can be located easily by making use of blanks between music.
Press ◀◀ or ▶▶ while tape is in play mode. The tape indicator blinks rhythmically during skip operation.
Skipping to the beginning of next music
If the current tape transport direction is ▶, press ▶▶.
If the current tape transport direction is ◀, press ◀◀.
Skipping to the beginning of current music being played
If the current tape transport direction is ▶, press ◀◀.
If the current tape transport direction is ◀, press ▶▶.
- The beginning of the desired music may not be located properly if blanks between music are too short, the blanks contain too much noise or the music itself contains very low-level or silent part.

To play both sides of tape continuously:
Press REVERSE MODE.
The reverse mode indicator (⟲) lights up when the reverse mode is on, and turns off when it is off.
When the reverse mode is on
The two sides of tape will be played continuously and repeatedly.
When the reverse mode is off
Tape stops after one side has been played.

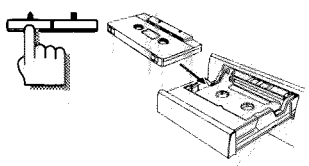
To play a tape recorded using Dolby NR:
Press DOLBY NR.
Each press switches the Dolby NR mode as shown below.



Select B or C according to the Dolby NR type used when the tape was recorded. The indicator of the selected type should light up.
The Dolby NR allows to reduce hiss noise in playback.

CD synchronized recording

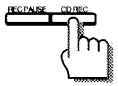
CDs can be recorded with a simple, one-touch operation. By using the features of the CD player you can easily create an original tape of your favorite music.
Be sure to make the Compu Link connection among the EX series components.



① Load the tape for use in recording.
Press ▲ to open the tape tray, place a tape on it and press ▲ to close it.
- It is not possible to record onto a cassette tape with the broken accidental erasure tab. Use a cassette the tab of which is not broken.
- If you want to record music on both sides of tape continuously, switch the reverse mode on (see page 13).
- If you want to use Dolby Noise Reduction, press DOLBY NR to select B or C (see page 13).

② Prepare the CD player.
Load CDs, press CD 1, 2 or 3 according to the disc you want to record, and press □/*CANCEL* of the CD player.
This selects the playing CD.
Now set the CD player to the program play mode, etc., as required.

* Refer to the instruction manual of the CD player for the CD player operating procedures.



③ Press CD REC.
The CD player and cassette deck start simultaneously and synchronized recording starts.
- During recording, the CD source is selected automatically by the amplifier/tuner.
- During recording, the amplifier/tuner's input source cannot be changed even by pressing its INPUT.

To stop recording:
Press □/CANCEL of the CD player to stop recording.
The cassette deck will stop after leaving a non-recorded blank of 4 seconds.
If you want to stop recording immediately, press ■ of the cassette deck.

To let recording pause temporarily:
Press REC PAUSE. The tape indicator stops blinking and lights steadily.
Press ◅ or ▻ to resume recording.

To record continuously on both sides of tape:
1. **Load a tape so that you can start recording from the ► direction.**
2. **Press REVERSE MODE to switch the reverse mode on.**
   Press so that the reverse mode indicator (⇄) lights up.
3. **Prepare recording of the associated components.**
4. **Press REC PAUSE.**
5. **Press ▻ to start recording.**
   - The recording in the reverse mode stops after completing recording in the ◄ direction. Be sure to start recording from the ► direction.
   - When the reverse mode is switched off, recording stops after having recorded onto one side of tape.

Note: The side erasure tab is removed (refer to P.19) will not be recorded even though the reverse mode is swithed on.

To record audio using Dolby NR
The Dolby NR is used to record audio to reduce hiss noise when the tape is played back later. The Dolby NR includes type B for popular use and type C for even improved noise reduction effect.

Press DOLBY NR so that either the B or C indicator lights up.

- A tape recorded using Dolby NR should be played back using the Dolby NR of the same type as that used in recording. The audio quality will be affected if a different type is used in playback.

COMPU LINK

Linked Operation of the Other Optional components (Compu Link)

The EX series components can be controlled under linked operation provided by the JVC's Compu Link remote control system.

Compu Link

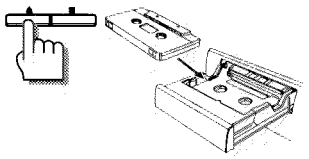
The world of single components, in which you purchase a cassette deck, CD player, amplifier and other components separately and enjoy your own composition, is an effective means for pursuit of high-quality reproduction. However, in terms of operability, the need of controlling components independently makes their control complicated and their linked operation impossible. Then, isn't it possible to combine single components and control them as simply as an integrated audio system? The Compu Link remote control system is the response to such a requirement.
The components in the JVC EX series are equipped with jacks named COMPU LINK-3 (COMPU LINK jacks). By connecting the COMPU LINK jacks of these components, they can be controlled simply with a systematized, linked operation.

Compu Link connections

Using Compu Link cables, connect the COMPU LINK jacks of EX series components. Connect so that the Compu Link cables can bridge all of the EX series components you have. The components can be connected in any order.

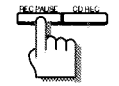
MD synchronized recording

Synchronized recording makes it possible to start cassette recording in synchronism with the playback of the MD recorder.
Be sure to make the Compu Link connection among the EX series components.

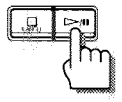


① Load the tape for use in recording.
Press ▲ to open the tape tray, place a tape on it and press ▲ to close it.
- It is not possible to record onto a cassette tape with the broken accidental erasure tab. Use a cassette the tab of which is not broken.
- If you want to record music on both sides of tape continuously, switch the reverse mode on (see page 13).
- If you want to use Dolby Noise Reduction, press DOLBY NR to select B or C (see page 13).

② Prepare the MD recorder.
Load the MD to be played.
Program MD tracks if required.
* Refer to the instruction manual of the MD recorder for the MD recorder operating procedures.



③ Press REC PAUSE.
The cassette deck enters record-pause mode.



④ Press ▷/II of the MD recorder.
Synchronized recording starts.

To stop recording:
Press □/CANCEL of the MD recorder to stop recording.
The cassette deck will stop after leaving a non-recorded blank of 4 seconds.
If you want to stop recording immediately, press ■ of the cassette deck.

Additional Information

Types of cassette tape

This cassette deck incorporates an auto tape select function. The auto tape select function uses the tape-type detection holes to distinguishes which type of tape was inserted, and sets the bias and equalizer to the optimum settings for that tape automatically.
The following types of tapes may be used with this cassette deck.

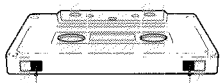
Normal tape

TYPE I
BIAS:NORMAL
EQ:120μs

Normal (No detection slots) Tab (to prevent accidental erasure)

High Position (CrO_2) tape

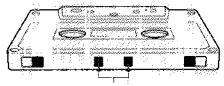
TYPE II
BIAS:HIGH
EQ:70μs



High position detection slots

Metallic tape

TYPE IV
BIAS:METAL
EQ:70μs



Metal detection slots

Caution

- Tapes longer than 90 minutes, such as C-120 or C-150 tapes, are extremely thin and stretch easily. Please note that frequent rewinding and fast forwarding of small sections of tape may cause these tapes to jam in the pinch rollers and capstans.
  Note: The use of these types of tapes is not recommended to avoid troubles.
- Certain early period metal and high position (CrO_2) tapes may not have tape-type detection slots. The cassette deck cannot obtain the correct characteristics for these tapes.
- Ferrochromite (FeCr) TYPE III tapes cannot be used with this cassette deck.

Compu Link-3 features

The Compu Link-3 system of the EX series components makes the following operations possible.

Shortcut playback

Simply selecting an input source of the amplifier/tuner starts playback of the selected source component (CD player, MD recorder or cassette deck).
Also, even if you do not touch the amplifier/tuner, starting playback of a source component sets the amplifier's input source automatically to the played component.
* Refer to the instruction manual of the amplifier/tuner.

System control from a single remote control unit

The remote control unit provided with the amplifier/tuner can also be used to control the CD player or cassette deck.

Synchronized recording

Recording can be started automatically in synchronism with the start of playback of a source component.
(See pages 14 and 15.)

Timer operation

The timer function built into the amplifier/tuner can be used to start recording or playback of other components at the reserved time of the day or switch the power to the STANDBY mode in the reserved time period.
* Refer to the instruction manual of the amplifier/tuner.

Troubleshooting

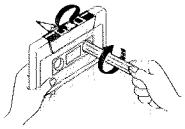
If you experience any difficulty with your cassette deck, check the following list for a possible solution before calling for service.
If you cannot solve the problem from the hints given here, or the cassette deck has been physically damaged, call a qualified person, such as your dealer, for service.

SYMPTOM	POSSIBLE CAUSE	ACTION
Recording is not possible	• The tabs on the cassette have been removed.	• Use a different cassette tape.
		• If you don't mind erasing the previously recorded material, cover the holes with tape.
	• The deck is set to pause.	• Press ◁ or ▷ to release the pause.
No sound	• Connections are incorrect or incomplete.	• Check to make sure the all equipment is connected correctly.
	• Volume control on amplifier is turned all the way down.	• Adjust the volume on the amplifier.
	• The source selector (INPUT) on the amplifier is set to a different source.	• Set the source selector (INPUT) to tape.
Music scan does not work	• The blank spaces between songs is too short.	• Try a different cassette tape.
Sound level is low or sound is intermittent	• The heads, capstans, and pinch rollers are dirty.	• Clean the heads, capstans, and pinch rollers.
Tape hiss or absence of high frequency sounds	• The play and record heads have become magnetically charged.	• Demagnetize the heads.
Previously recorded material is not erased when recorded over	• The erase head is dirty.	• Clean the erase head.
Bad sound quality or absence of high frequency sounds	• The Dolby NR setting is different from that used for recording.	• Set the Dolby NR to the same setting used for recording.
Cassette holder will not open (or close)	• The AC power cord is unplugged.	• Plug the AC power cord into a wall outlet.
Humming noise	• Cassette deck is directly above or below the amplifier/tuner.	• Move cassette deck away from amplifier/tuner.
Operation is abnormal.	• Condensation is produced inside the cassete deck immediately after starting the room heating or when it is transported from a cold to warm place.	• Unplug the power cord, wait a few hours and plug it again.
	• The microcomputer is malfunctioning due to external noise or lightning.	• Unplug the power cord then plug it in again.

Handling cassette tapes

Cautions regarding handling

Do not touch the surface of the tape or pull the tape out of the cassette.
Tape spooled loosely around the hubs is likely to jam in the pinch rollers and capstans.
Before loading the tape into the cassette holder, take up the slack in the tape as shown below.



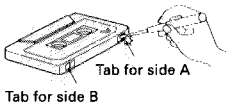
Tape storage

Place tapes in their cases for storage.
Avoid storing tapes on top of TVs or speakers, in sunlight or places of high temperature, or in humid or dusty areas.

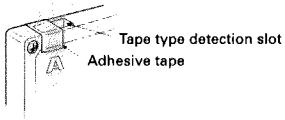
To prevent accidental erasure

Cassette tapes have tabs to prevent accidental erasure.
If you remove the tabs after making a recording, the cassette deck cannot be set to record when that tape is loaded. Remove the tabs so that valuable recordings will not be accidentally erased.

Recording (erasure) is not possible when the tabs are removed.



To make another recording on a tape whose tabs have been removed, cover the tab holes with adhesive tape.



Be careful not to cover the tape-type detection slots.

Maintenance

Cleaning the tape heads

Since the tape is always touching the heads as it travels through the tape transport, in time magnetic particles and dust build up, making the heads dirty. When the heads become extremely dirty, the sound quality becomes poor, the output level is reduced, recording doesn't work, and previously recorded sounds cannot be erased (etc.).
In order to prevent important recordings from coming out as failures, we recommend cleaning the heads, pinch rollers and capstans on a regular basis (after about every 10 hours of use), before the symptoms described above begin to appear.

Cleaning method

Clean the heads, capstans and pinch rollers using a wet-type head cleaning tape, available from an audio store. For more details, refer to the Instructions of the Head Cleaning Tape.

Demagnetizing the tape heads

After the cassette deck has been used for long period of time, the metal parts which contact the tape may become magnetically charged. When this occurs, tape hiss increases, and the high pitched sounds on recorded tapes will be erased. The same type of malfunction could also be caused by bringing a charged metal object (such as a screwdriver) near the tape heads.
We recommend demagnetizing the tape heads regularly (after about every 20 to 30 hours of use) with a commercially available tape head demagnetizer.

You may also use cassette type demagnetizers with this cassette deck. When doing so, be sure to turn the volume of the amplifier all the way down, or you may harm the amplifier or speakers.
For details, read the instructions that come with the tape head demagnetizer.

QUALITY JVC SERVICE

HOW TO LOCATE YOUR JVC SERVICE CENTER

TOLL FREE : 1-800-537-5722

Dear customer:
In order to receive the most satisfaction from your purchase, read the instruction booklet before operating the unit. In the event that repair is necessary, or for the address nearest your location, please refer to the factory service center list below or within the Continental United States, Call 1-800-537—5722 for your authorized servicer. Remember to retain you Bill of Sale for Warranty Service.

—JVC

JVC SERVICE & ENGINEERING COMPANY OF AMERICA
DIVISION OF US JVC CORP.

FACTORY SERVICE CENTER LOCATIONS

107 Little Falls Road
Fairfield, NJ 07004-2105
(201) 808-9279

1500 Lakes Parkway
Lawrenceville, GA 30243-5357
(770) 339-2522

705 Enterprise Street
Aurora, IL 60504-8149
(630) 851-7855

5665 Corporate Avenue
Cypress, CA 90630-0024
(714) 229-8011

2969 Mapunapuna Place
Honolulu, HI 96819-2040
(808) 833-5828

10700 Hammerly, Suite 110
Houston, TX77043
(713) 935-9331

230 Eliot Street
Ashland, MA 0172-2377
(508) 881-5923

14505 Commerce Way
Miami Lakes, FL 33016-1512
(305) 362-6252

890 Dubuque Avenue
South San Francisco, CA 94080-1804
(415) 871-2666

Sophisticated electronic products may require occasional service. Just as quality is a keyword in the engineering and production of the wide array of JVC products, service is the key to maintaining the high level of performance for which JVC is world famous. The JVC service and engineering organization stands behind our products.

NATIONAL HEADQUARTERS
JVC SERVICE & ENGINEERING COMPANY OF AMERICA
DIVISION OF US JVC CORP.
107 Little Falls Road
Fairfield, NJ 07004-2105

If you ship the product • • •

Pack your JVC unit in the original carton or one of equivalent size and strength. Enclose, with the unit, a letter stating the problem or symptom that exists and also a copy of the receipt or bill of sale you received when you purchased your JVC unit. Print your home return address on the outside and the inside of the carton. Send to the appropriate JVC Factory Service Center as listed above.

Don't service it yourself.

CAUTION

To prevent electrical shock, do not open the cabinet. No user serviceable parts inside.
Refer servicing to qualified service personnel.

ACCESSORIES

To purchase accessories for your JVC product, you may contact your local JVC Dealer.
Or from the 48 Continental United States call toll free : 800-882-2345

(0694)

Specifications

Audio performance

Frequency response (–20 dB recording)	Type IV tape :30 Hz to 17 kHz (40Hz to 17kHz (± 3 dB)) Type II tape :30 Hz to 16 kHz (40Hz to 16kHz (± 3 dB)) Type I tape :30 Hz to 15 kHz (40Hz to 15kHz (± 3 dB))
Signal-to-noise ratio	54 dB (S=315 Hz , k3=3% , N=A-weighted , Type IV tape) The S/N is improved by about 15 dB at 500 Hz and by max. 20 dB at 1 kHz to 10 kHz with Dolby C NR on and improved by 5 dB at 1 kHz and by 10 dB at above 5 kHz with Dolby B NR on. MOL Improved 4 dB at 10kHz

Input/Output Terminals

Wow and flutter	0.09%(WRMS)

General

ANALOG IN (REC)	Input level / Impedance : 220mV (0 VU) / 19 kohms
ANALOG OUT (PLAY)	Output level / Impedance : 300mV (0 VU) / 2.9 kohms
Format	Compact Cassette Stereo
Track System	4-track , 2channel
Tape Speed	4.8 cm/sec. (1-7/8inch/sec.)
Heads	Record/Playback : METAPERM head × 1 Erase : 2-gap ferrite haed Capstan : Electronic govemed DC moter
Motors	Tray:DC motor × 1
Fast forward / Rewind time	Approx. 120 sec. with C-60 cassette
Power requirements	AC120∿ 60Hz
Power Consumption	7watts (OPERETE ON) , 3watts (OPERETE STANDBY)
Dimensions	200 × 80 × 305 mm (W × H × D) (7-7/8 × 3-3/16 × 12-1/16 inches)
Mass	2.4 kg (5,3 lbs)

Accessories

Audio pin cord	(2)
Compu Link cable	(1)
AC power cord	(1)

Design and specifications are subject to change without notice.

JVC

VICTOR COMPANY OF JAPAN, LIMITED

JVC LIMITED WARRANTY AUDIO-1

JVC COMPANY OF AMERICA warrants this product and all parts thereof, except as set forth below ONLY TO THE ORIGINAL PURCHASER AT RETAIL to be FREE FROM DEFECTIVE MATERIAL AND WORKMANSHIP from the date of original retail purchase for the period as shown below. ("The Warranty Period.")

PARTS	LABOR
1YR	1YR

THIS LIMITED WARRANTY IS VALID ONLY IN THE FIFTY(50) UNITED STATES, THE DISTRICT OF COLUMBIA AND IN COMMONWEALTH OF PUERTO RICO.

WHAT WE WILL DO:

If this product is found to be defective, JVC will repair or replace defective parts at no charge to the original owner. Such repair and replacement services shall be rendered by JVC during normal business hours at JVC authorized service centers. Parts used for replacement are warranted only for the remainder of the Warranty Period. All products and parts thereof may be brought to a JVC authorized service center on a carry-in basis except for Television sets having a screen size 25 inches and above which are covered on an in-home basis.

WHAT YOU MUST DO FOR WARRANTY SERVICE:

Return your product to a JVC authorized service center with a copy of your bill of sale. For your nearest JVC authorized service center, please call toll free: (800)537-5722.
If service is not available locally, box the product carefully, preferably in the original carton, and ship, insured, with a copy of your bill of sale plus and letter of explanation of the problem to the nearest JVC Factory Service Center, the name and location of which will be given to you by the toll-free number.
If you have any questions concerning your JVC Product, please contact our Customer Relations Department.

WHAT IS NOT COVERED:

This limited warranty provided by JVC does not cover:

1. Products which have been subject to abuse, accident, alteration, modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, or if repaired or serviced by anyone other than a service facility authorized by JVC to render such service, or if affixed to any attachment not provided with the products, or if the model or serial number has been altered, tampered with, defaced or removed;
2. Initial installation and installation and removal for repair;
3. Operational adjustments covered in the Owner's Manual, normal maintenance, video and audio head cleaning;
4. Damage that occurs in shipment, due to act of God, and cosmetic damage;
5. Signal reception problems and failures due to line power surge;
6. Video Pick-up Tubes/CCD Image Sensor, Cartridge, Stylus(Needle) are covered for 90 days from the date of purchase;
7. Accessories;
8. Batteries (except the Rechargeable Batteries are covered for 90 days from the date of purchase).

There are no express warranties except as listed above.

THE DURATION OF ANY IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTY OF MARCHANTABILITY, IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY HEREIN.

JVC SHALL NOT BE LIABLE FOR THE LOSS OF USE THE PRODUCT, INCONVENIENCE, LOSS OR ANY OTHER DAMAGES, WHETHER DIRECT, INCIDENTAL OR CONSEQUENTIAL (INCLUDING, WITHOUT LIMITATION, DAMAGE TO TAPES, RECORDS OR DISCS) RESULTING FROM THE USE OF THIS PRODUCT, OR ARISING OUT OF ANY BREACH OF THIS WARRANTY. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, ARE LIMITED TO THE WARRANTY PERIOD SET FORTH ABOVE.

Some states do not allow the exclusion of incidental or consequential damages or limitations on how long an implied warranty last, so these limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

JVC COMPANY OF AMERICA
DIVISION OF US JVC CORP

41 Slater Drive
Elmwood Park, New Jersey 07407

REFURBISHED PRODUCTS CARRY A SEPARATE WARRANTY, THIS WARRANTY DOES NOT APPLY. FOR DETAILS OF REFURBISHED PRODUCT WARRANTY, PLEASE REFER TO THE REFURBISHED PRODUCT WARRANTY INFORMATION PACKAGED WITH EACH REFURBISHED PRODUCT.

For customer use:

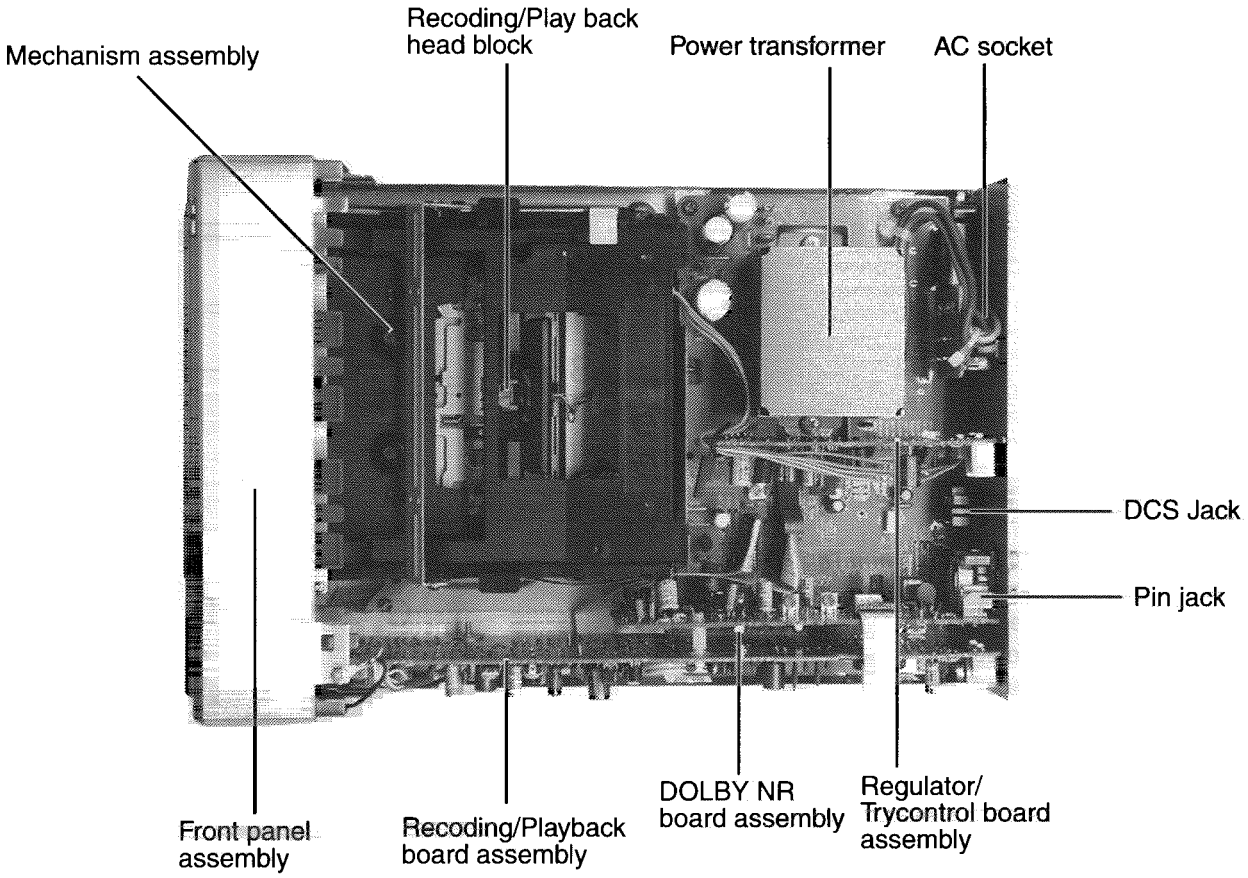
Enter below the Model No. and Serial No. which is located either on the rear, bottom or side of the cabinet. Retain this information for future reference.

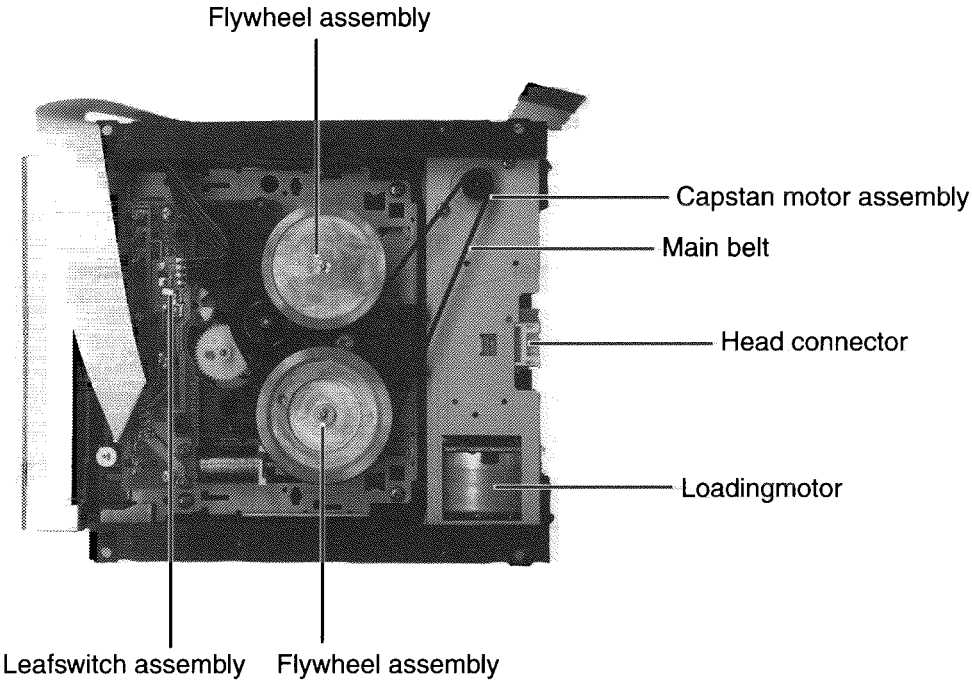
Model No.: Serial No.:

Purchase date: Name of dealer:

<<MEMO>>

Location of Main Parts





Removal of Main Parts

■ **Detaching the top cover** (Figs. 1 and 2)

1. Remove the two fixing screws (A) on the right and left.
2. Remove the three screws (B) securing the cover from the rear.
3. Remove the top cover by spreading the feet on both sides of cover outward and raising the feet.

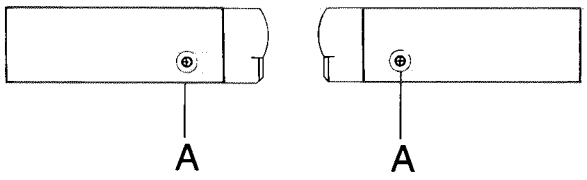


Fig. 1

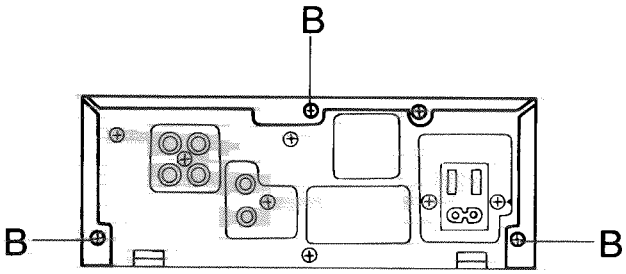


Fig. 2

■ **Detaching the rear panel** (Fig. 3)

1. Detach the top cover.
2. Remove the seven screws (C) and two screws (D) securing the rear panel.
   - 2 for the AC outlet
   - 2 for the board holder
   - 1 for the synchro connectors
   - 1 for the record/play connectors
   - 1 for the chassis

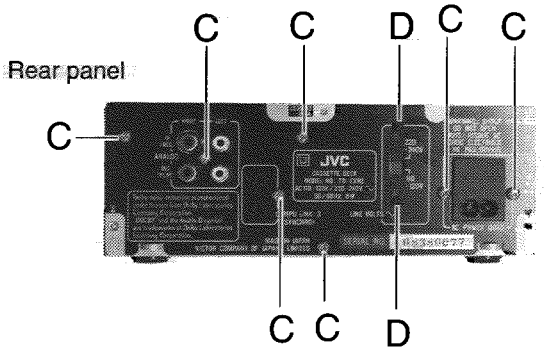


Fig. 3

■ **Detaching the front panel assembly** (Fig. 4)

1. Detach the top cover.
2. Remove the screw (E) securing the front panel ground wire.
3. Remove the two screws (F) securing the front panel from the base.
4. Unplug the card wire from connector CN703 on the power/mechanism control board, and release the pawls on both sides of the front panel and the pawl on the base to detach the front panel assembly.

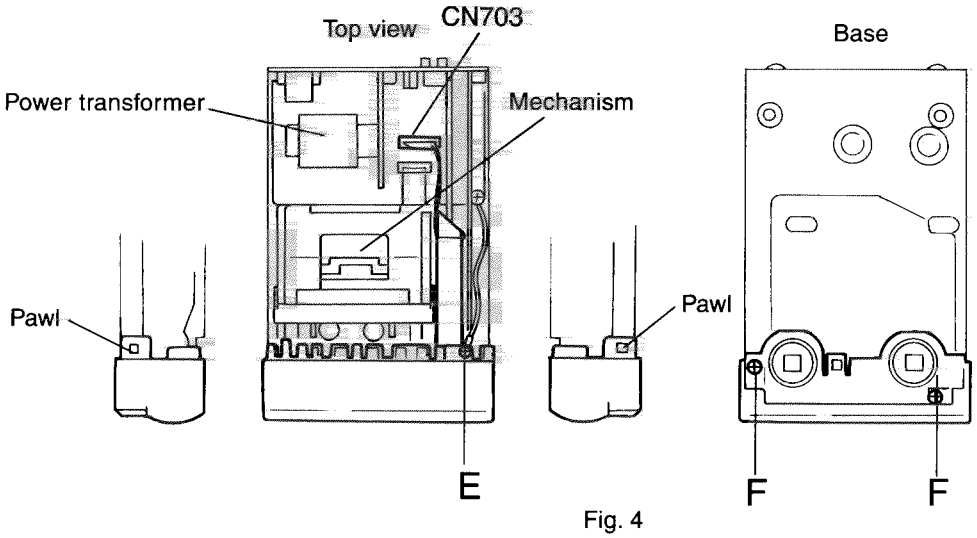


Fig. 4

■ **Detaching the cassette mechanism assembly** (Fig. 5)

1. Detach the top cover and front panel.
2. Unplug the card wire from connector CN704 on the power/mechanism control board.
3. Remove the four screws (G) securing the mechanism assembly.
4. Pull out the cassette mechanism slightly and disconnect the motor power supply connector and head wire connector.

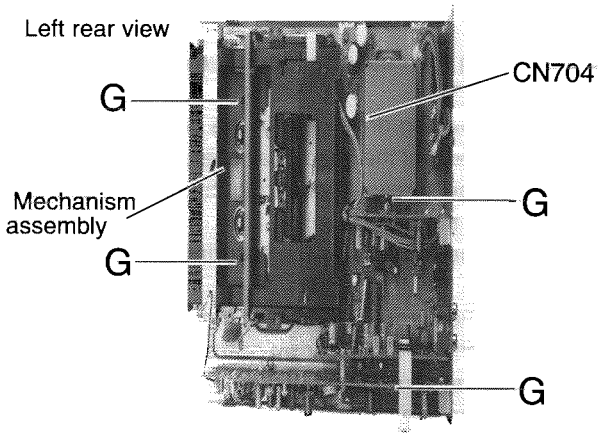


Fig. 5

■ **Detaching the regulator/tray control board assembly** (Fig. 6)

1. Disconnect connectors CN705 and CN706 on the power/mechanism control board assembly. (Pull each one out by opening its connector stopper.)

■ **Detaching the Dolby NR board assembly** (Fig. 6)

1. Unplug the card wire from connector CN404 on the upper section of the board.
2. Detach the assembly by loosening the pawls on the record/playback board connection fastener (stud).
3. Unplug connector CN702 on the power/mechanism control board.

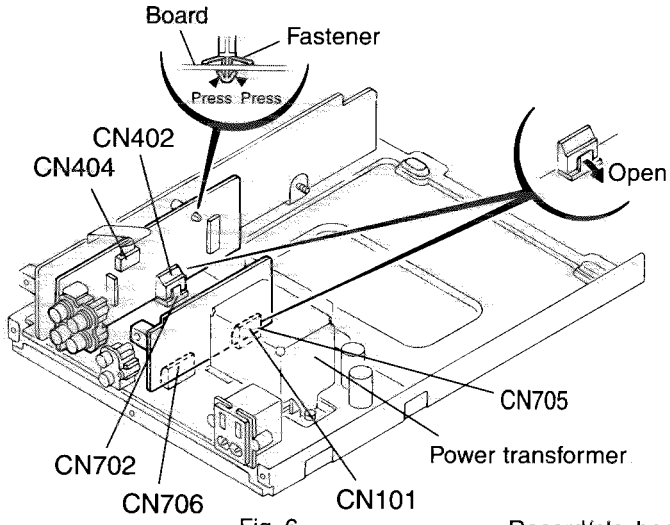


Fig. 6

■ **Detaching the record/playback board assembly** (Fig. 7)

1. Remove the screw (H) securing the chassis.
2. Unplug connector CN701 on the power/mechanism control board.

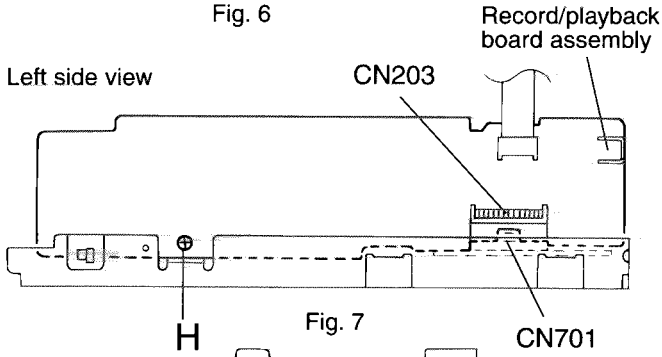


Fig. 7

■ **Detaching the power/mechanism control board assembly** (Fig. 8)

1. Remove the two screws (J) securing the power transformer. Detach the shield case first.
2. Remove the four screws (K) securing the power/mechanism control board (the transformer is detached together with the board).

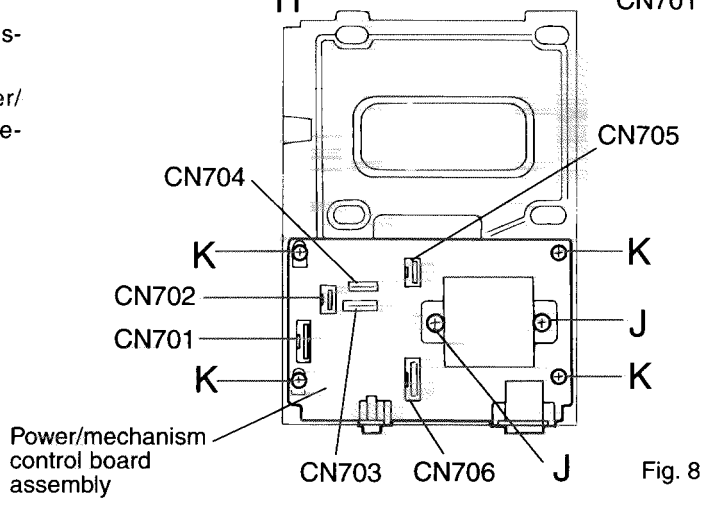


Fig. 8

<<Cassette Mechanism Section>>

■ Detaching the cassette loading mechanism

(Figs. 1 to 3)

1. Turn the loading drive gear in the direction shown by the arrow so that the head relay board can be removed.
2. Remove the screw (A) securing the head relay board (to protect the head wire).
3. Remove the two screws (B) securing the capstan motor bracket.
4. Remove the screw (D) securing the cassette stabilizer, and detach the stabilizer by pressing it from the side the securing screw is on.
5. Remove the two screws (E) securing the bracket.
6. Disconnect the capstan motor wiring and detach the cassette mechanism andcapstan motor bracket from the loading section.
7. Turn the unit over and remove the four screws (C) securing the cassette mechanism assembly.
8. Loading section
   Detach the left and right side brackets by pressing their bottoms into the unit and then pulling them towards the back. Detach the left side by turning the loading gear.
9. To detach the tray without removing the screws (D and E) securing the bracket, open the stopper's pawl as shown in the figure and release the stopper to pull out the tray.

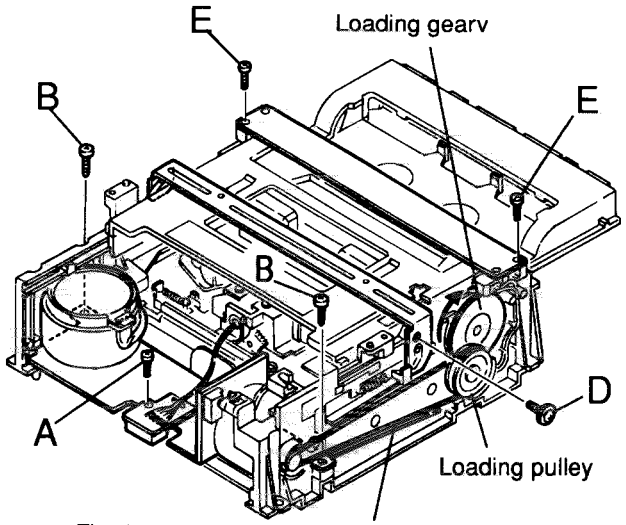


Fig. 1

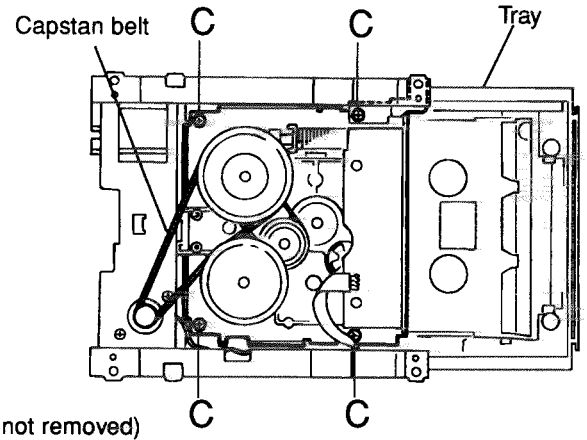


Fig. 2

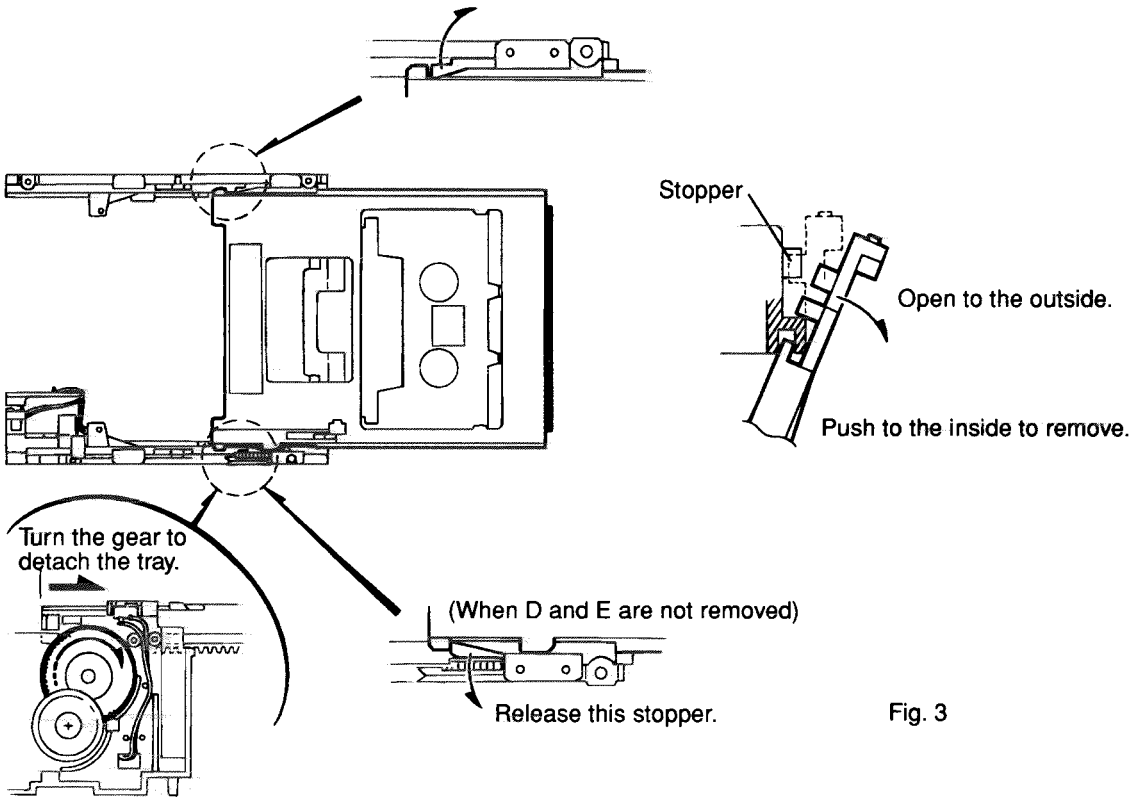


Fig. 3

■ **Detaching the capstan motor** (Fig. 4)

1. Disconnect the capstan motor wiring.
2. Remove the two screws (F) securing the capstan motor.

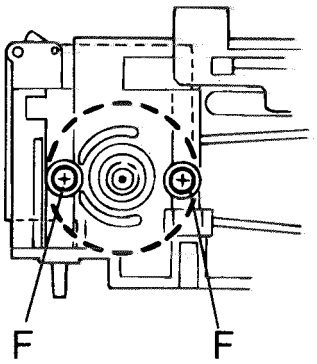


Fig. 4

■ **Detaching the mechanism** (Figs. 5 to 11)

1. Head block
   Remove the two screws (G) securing the head block (when installing, attach to the return gear arm).
2. Pinch roller assembly
   (1) Remove the pinch roller return spring (used to prevent particle build-up).
   (2) Release the hook securing the pinch roller arm and pull the assembly up.
3. Reel disk
   Press in the tip and pull out the disk.
   The stopper, reel feather, spring and reel disk are detached at the sametime.

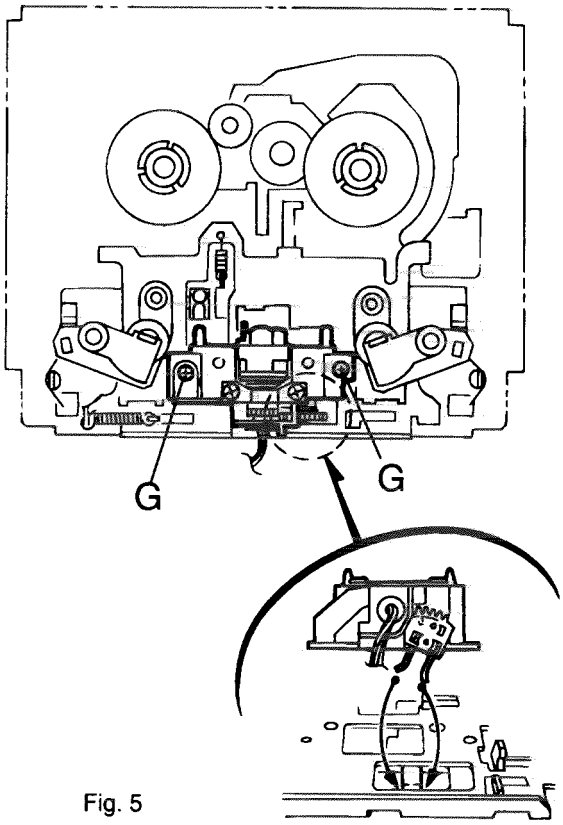


Fig. 5

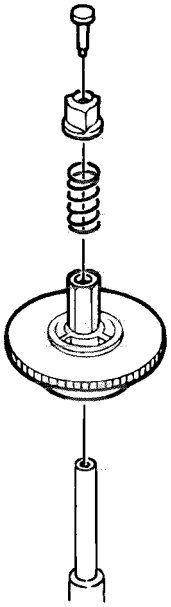


Fig. 6

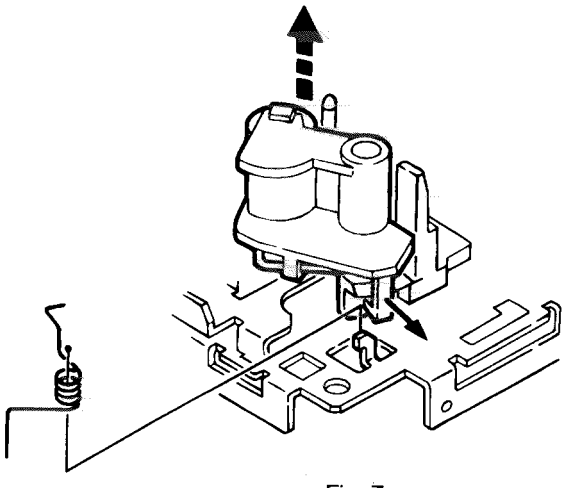


Fig. 7

4. Leaf switch replacement
   Remove the two screws (H) securing the leaf switch board.

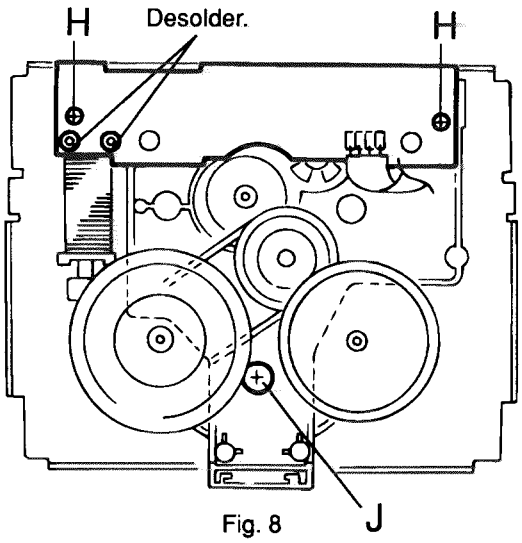


Fig. 8

5. Mechanism base
   (1) Pull out the reel disk.
   (2) Detach the brake arm.
   Pull up the brake arm by releasing the stopper on the brake arm shaft.
   (3) Remove the four switches (I) securing the mechanism base unit.
   (4) Pull out the reel idle gear.
   (5) Turn the unit over and remove the screw (J).

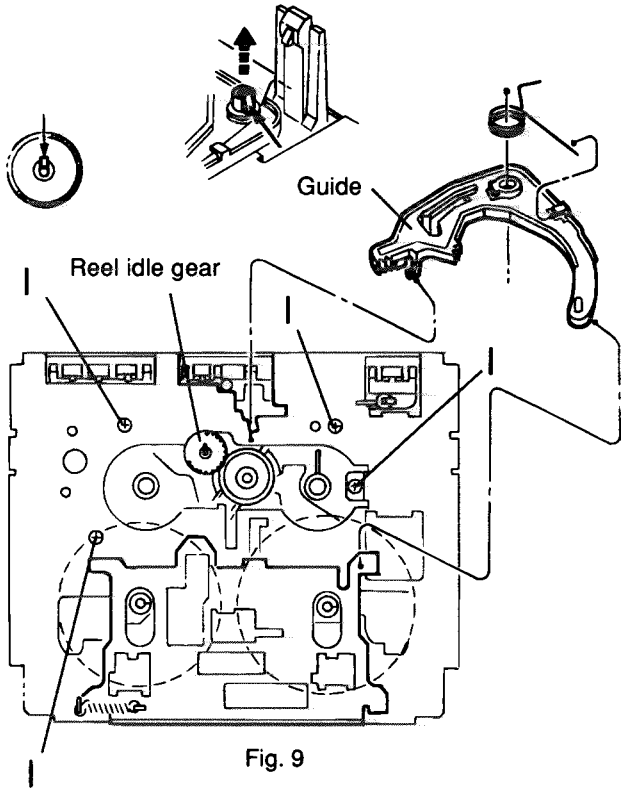


Fig. 9

■ **Detaching the flywheel**

1. Remove the C washers and washers from the capstan.
2. Pull out the flywheel.

Note: When assembling, be sure to replace the C washers and washers on the same sides they came from.

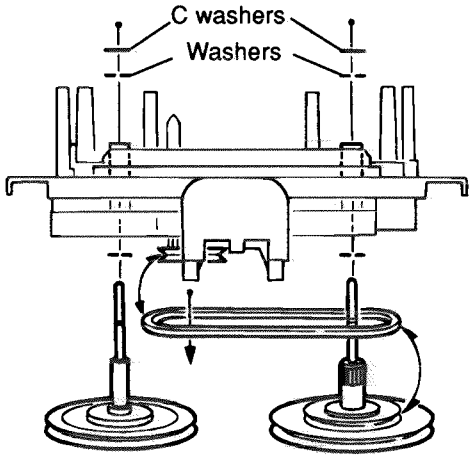


Fig. 10

Assembling (Figs. 11 to 13)

1. Set the cam gear in the position shown in the figure.
2. Set the spring as shown in the figure.
3. Set the solenoid plunger (shaft).
4. Attach to the mechanism base.
5. Slide the head return slider (white plastic) in the direction shown by the arrow to position the stud.
6. Check the positioning of the plunger.
7. Set the cam gear with the screw (K).
8. Turn the cam gear and make sure that the head base moves back and forth.

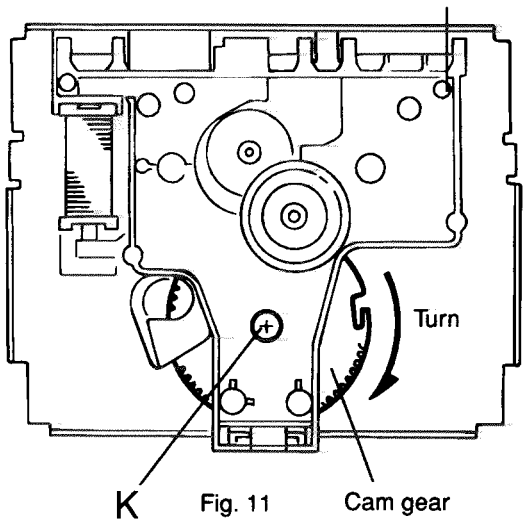


Fig. 11

Cam gear

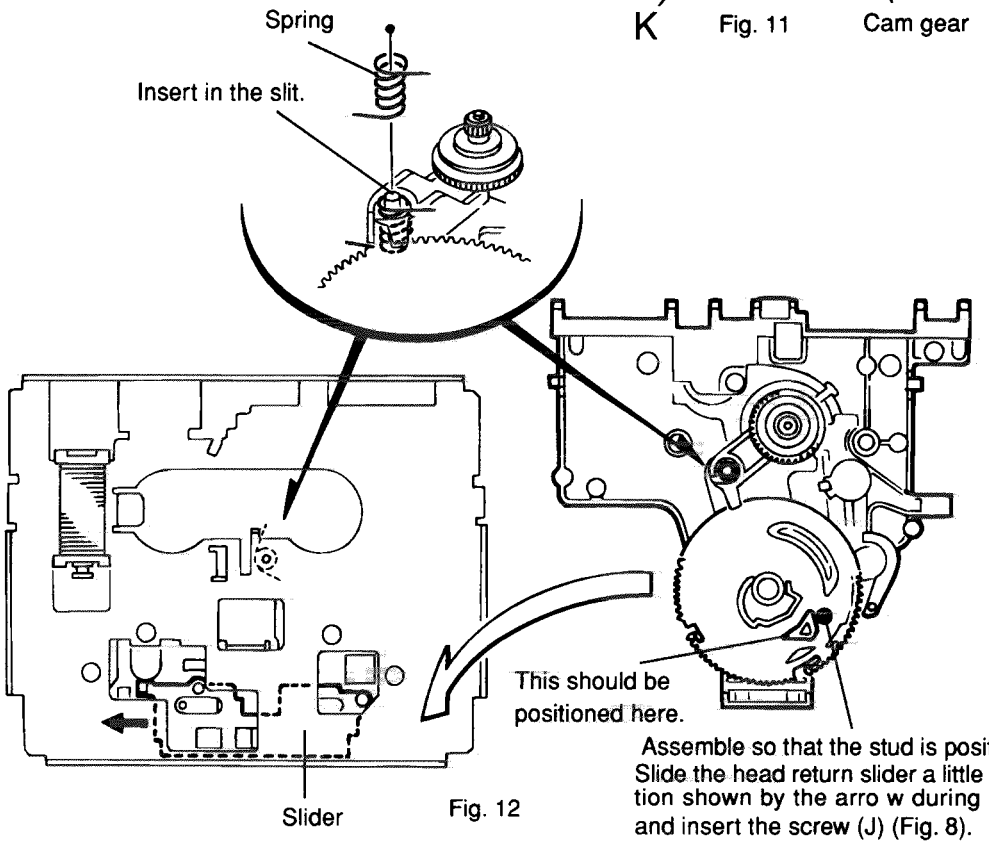


Fig. 12

Assemble so that the stud is positioned here. Slide the head return slider a little in the direction shown by the arro w during assembling and insert the screw (J) (Fig. 8).

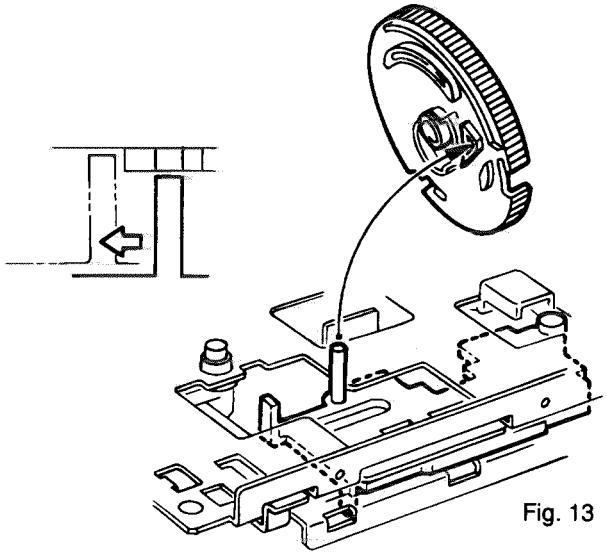


Fig. 13

Main Adjustment

1. Measuring instruments required for adjustment

(1) **Low frequency oscillator**
This oscillator should be capable of outputting 0dB (0.775V) at the 600W terminal at an oscillation frequency of 50 - 20kHz.
(2) **Attenuator** (Impedance: 600 Ω)
(3) **Electronic voltmeter**
(4) **Standard tapes for measurement**
VT712 (for measuring the tape speed and wow flatter)
VT724 (Reference level) (1kHz)
TMT735 (for measuring the playing (playback) frequency characteristics) (1kHz and 12.5kHz)
TMT6447 and TMT6448 (for music scanning)
VT705 (12.5kHz) (for adjusting the head azimuth)
(5) **Standard recording tape**
AC-225 (TDK AD), AC-514 (TDK SA), AC-713 (TDK MA) or equivalent
(Be sure to use only the standard recording (measurement) tapes specified by this division).
(6) **600 Ω** resistors and so forth (for attenuator matching)
(7) **Distortion meter** (band pass filter)
(8) **Torque gauge** (cassette)
For adjusting the torque related to CTG-N, TW211, TW2121, TW2231 and TW2241
(9) **Wow flatter meter**
(10) **Frequency counter**
(11) **M300 gauge** (Gauge M300)
(12) **Band pass filter**

2. Setting of the respective switches and volume knobs

- Dolby NR switch : OFF
- Reverse mode : ON
- Power supply switch : ON

■ Arrangement of adjusting positions

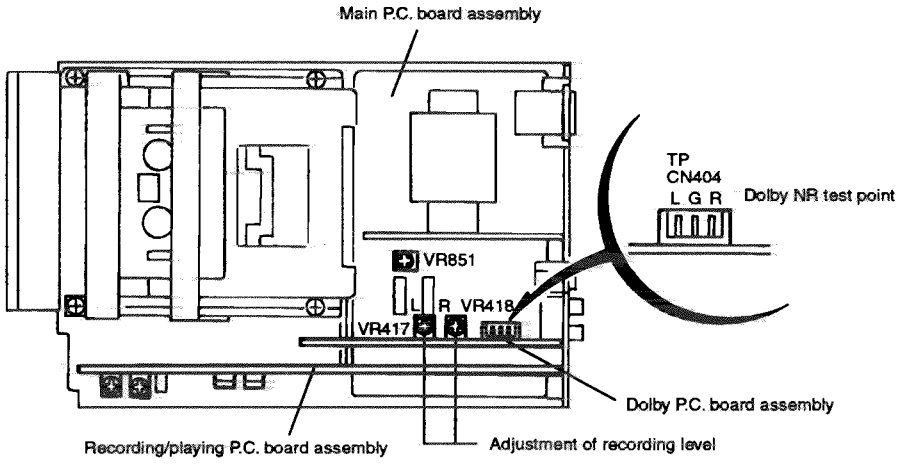


Fig. 1

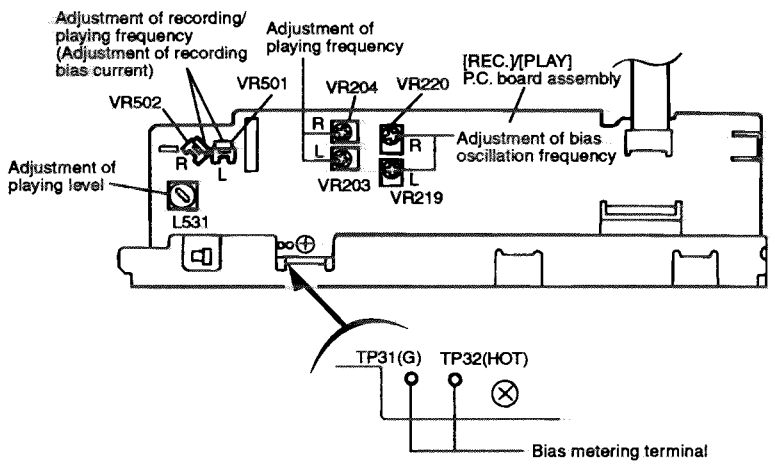
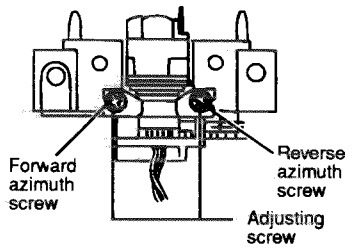


Fig. 2

■ Procedures for Adjusting the Mechanism Section

Caution for Changing the Head

1) Remove the screw provided from right above the head. At this time, peel the screw locks around the head by using a sharp-pointed device. Moreover, use the screw driver matching the corresponding screw.

	Items	Adjusting position	Adjusting position	Reference value	Remarks
1	Adjustment of head azimuth	1. Connect the voltmeter to the [LINE OUT] terminal. 2. Play the test tape VT705 (12.5kHz). 3. Adjust the head azimuth screws so that the phase difference between both the forward and reverse channels becomes maximum and the output of both of the channels becomes maximum.	Forward and reverse azimuth screws	Maximum out put (within -1dB)	
2	Adjustment of motor speed	1. Connect the frequency counter to the [LINE OUT] terminal. 2. Play the test tape VT712. 3. With VR851, adjust the counter reading to 3,000Hz.	· VR851	300 ± 10Hz	
3	Confirmation of wow flatter	1. Connect the wow flatter meter to the [LINE OUT] terminal. 2. Play the test tape VT712 (3kHz). 3. Confirm that the wow flatter value is within 0.18% (JIS WTD).		0.18% or less (JID WTD) (Both decks A and B)	
4	Confirmation of playing torque	1. Confirm the playing torque by using the torque test tape (TW2131 [FWD]) or the CTG-N gauge.		26 ~ 75 g/cm	
5	Forward feeding/ reversing torque	1. Confirm the forward feeding/ reversing torque by using the gauge as mentioned above or using the test tapes (TW2231 [FWD]/TW2241 [REV]).		70 ~ 170 g/cm (both FF/REW)	

■ Procedures for Adjusting the Electrical Circuits

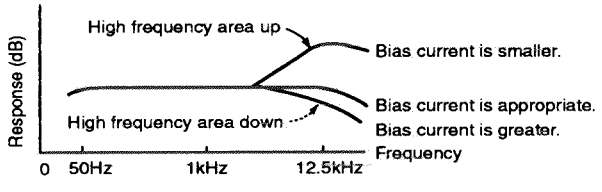
The following adjustments should be performed after adjusting the tape traveling and head angles.

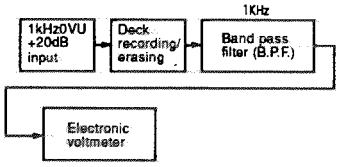
- The sequence of adjustment should in principle be according to the following order of description.
- The adjustment items denoted by asterisk should be performed whenever the head has been changed.

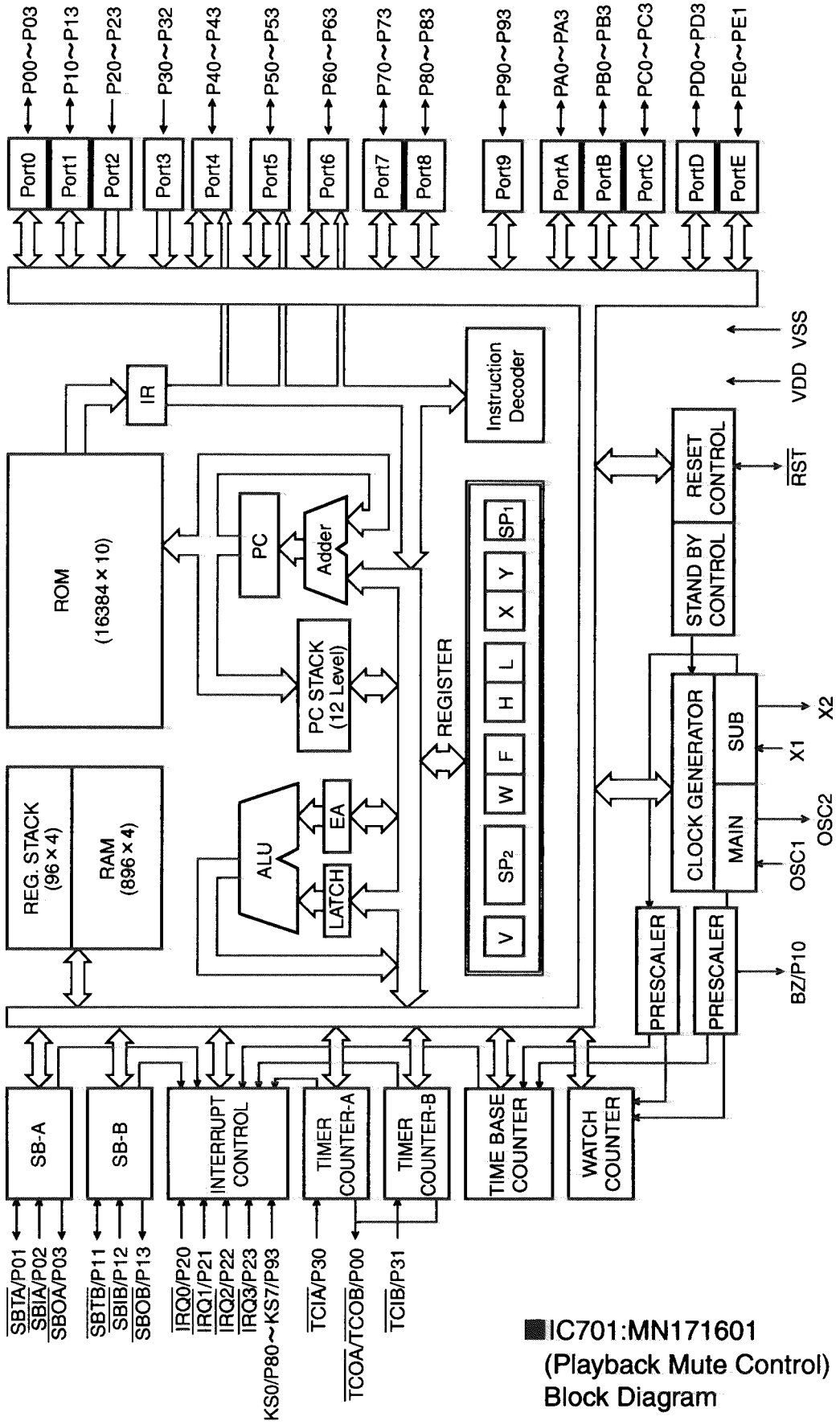
[0dBs = 0.775V]

	Items	Adjusting and confirmation methods Frequency level Deviation of output up and down values			
1	Confirmation of Dolby circuit recording (Recording mode)			Frequency level	Deviation of output up and down values
		Recording Dolby B	Input: [LINE IN] (-8dBs) Measuring points: ICD81 ⑮ and ⑯ Reference level at measuring points 400Hz Recording Dolby C -8dBs (= Cal. level)	1kHz Cal-40dB	+5.7dB ± 2 dB
				5kHz Cal-20dB	+3.5dB ± 1.5dB
				1kHz Cal 0dB	0dB ± $^{0.5}_{1}$ dB
		Recording Dolby C		1kHz Cal-40dB	+16.2dB ± $^{3}_{2}$ dB
				5kHz Cal-20dB	+2.9dB ± 2.5dB
				1kHz Cal 0dB	0 dB ± 1 dB

	Items	Adjusting position	Adjusting position	Reference value	Remarks
*2	Adjustment of playing level	1. While playing the test tape VT724 (1kHz), adjust the CN404 output to -25.5dBs with VR219 and VR220. (The L - R channel output difference should be within 0.5dB).	L : VR219 R : VR220	-25.5dBs ± 0.5dB (-25.5dBs (L-R difference: within 0.5dB)	Adjust the playing level since this level will be changed whenever the head has been changed. At this time, the impedance of electronic voltmeter should be 100 Ω or more.
*3	Adjustment of playing equalizer	While playing the test tape TMT7063 (1kHz and 12.5kHz), adjust the test point TP (CN404) output to the reference values at 1kHz and 12.5kHz outputs with VR203 (Lch) and VR204 (Rch).	L : VR203 R : VR204	With reference to 1kHz, the deviation of 12.5kHz should be 1.5 ± 0.5dB.	NR: OFF By using the test tape TMT7063 (12.5/1kHz/63Hz), confirm that 63Hz: +2dB ± 3dB with reference to 1kHz.
4	Reference value of recording input	Confirm that the input level at the test point TP (CN404) terminal is -25.5dB when 1kHz -28.2dBs has been applied to the line input.		Output level: -25.5dBs±1dB	
5	Adjustment of bias frequency	Connect the frequency counter to the test points TP31 and TP32 and adjust the bias frequency to 100kHz with	L531	100kHz ± 9kHz	Tape: CrO_2 Mode: Recording
*6	Adjustment of recording and playing frequency characteristics	Record 1kHz/12.5kHz with a normal tape, and adjust the deviation at 12.5kHz to +0 ± 0.5dB with reference to 1kHz by means of VR501 (Lch) and VR502 (Rch).	Deck [B] L : VR501 R : VR502	Normal tape: 0 ± 0.5dB Chromium/metal tape: 0 ± 4dB	Ref-20dB: [Value reduced by as much as -20dB from the reference input value] ≒ 28.2dB · The bias value in the case of chromium and metal tapes will be set by shifting the voltage with reference to that in the case of normal tape. · Unless the bias current has been adjusted correctly, the recording characteristics will become as indicated in the diagram on the left hand side.



	Items	Adjusting position	Adjusting position	Reference value	Remarks
*7	Adjustment of recording and playing sensitivity	1. While applying 1kHz -28.8dB to the line input terminal, confirm that the sensitivity level at the test point TP_____ is 0dBs. 2. While recording and playing back the above, adjust the recording signal current with VR417 (Lch) and VR418 (Rch) so that the sensitivity level becomes-25.5dBs.	L: VR417 R: VR418	Normal tape: -25.5dBs ± 0.5dB Chromium/ metal tape: -25.5dBs ± 2/2 dB	The left and right level difference of both normal and metal tape should be within 0.5dB. The sensitivity level should be adjusted with normal tape. NR: OFF Tape: Normal tape
8	Confirmation of recording and playing distortion rate	1. Record the test tapes _____ at 1kHz and reference input. 2. Check the output with a distortion meter while playing back the above test tapes, and confirm that the respective distortion rates comply with the standard value.	–	Normal tape: 3.0% or less Chromium tape: 3.0% or less Metal tape: 3.0% or less	Confirm the distortion rate after adjusting the bias current and recording level.
9	Confirmation of recording and playing S/N ratio	1. Halfway during recording at 1kHz and reference input, sample the input and perform non-signal recording. 2. While playing back the above, measure the difference between the reference recording output and non-signal recording output with an electronic voltmeter, and confirm that the measurement complies with the standard value.	–	Normal tape: 38dB or over Chromium tape: 40dB or over Metal tape: 40dB or over	
10	Confirmation of erasing rate	1. Apply 400Hz signal (Ref. + 10dB) from the [LINE IN] terminal. 2. After rewinding the above, erase a part of the recorded portion. 3. Measure the ratio of the erased portion to the recorded portion with an electronic voltmeter.	–	55dB or over	For measuring the erasing ratio, connect a band pass filter (B.P.F.) between the electronic voltmeter on the deck. 
11	Confirmation of music scanning action	1. After loading the test tape TMT6447, press the [PLAY] and [FF] buttons or [REW] button. After rewinding the tape, perform music scanning and execute the [PLAY] action. 2. After loading the test tape TMT6447, press the [PLAY] and [FF] buttons or [REW] button. In this case, be sure not to perform music scanning at the beginning of tape winding.	–	–	
12	Confirmation of NR effect	While short-circuiting the [LINE IN] terminal input, 1. Confirm the difference of noise level at self-recording and playing when the Dolby is off and Dolby B is on. 2. Confirm the difference of noise level at self-recording and playing when the Dolby is off andDolby C is on.	– –	8.5dB or over 17dB or over	In this case, use the CCIR ARM filter.



■IC701:MN171601
(Playback Mute Control)
Block Diagram

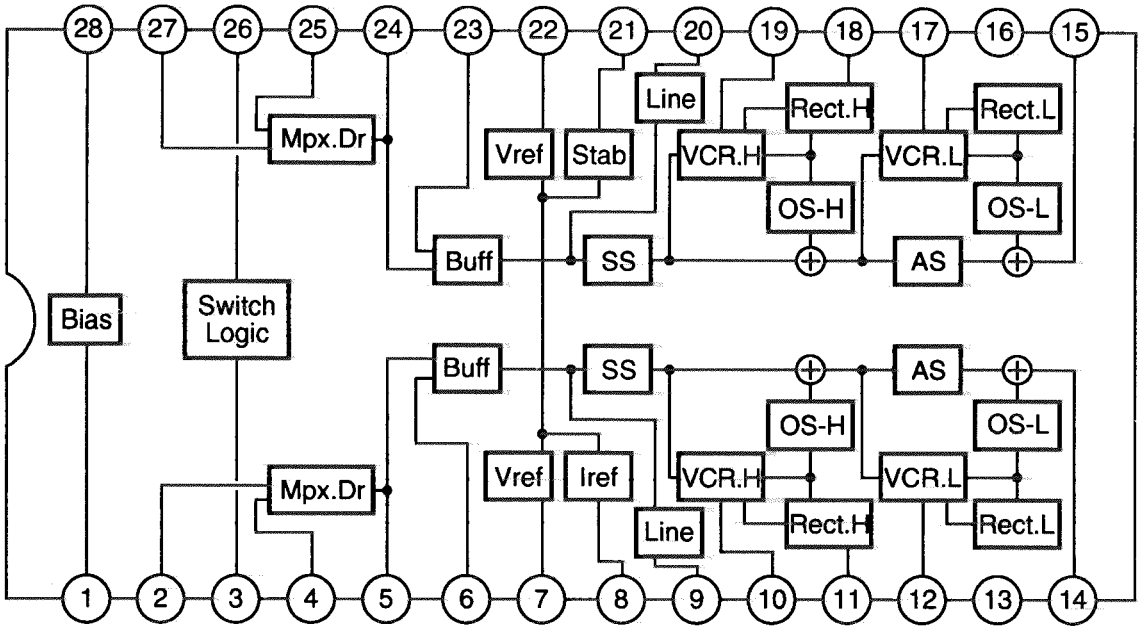
■IC701:MN171601ALTABF2(PLAYBACK MUTE CONTROL)

Pin No.	I/O	Symbol	Function
1	O(L)	REC/$\overline{PB}$	Switching to R/P head
2	I	NC	
3	I	NC	
4	I	NC	
5	I	NC	
6	I	NC	
7	I	NC	
8	I	MSI	Detecting to Music Scan
9	O(L)	METAL/$\overline{OTHER}$	Detecting to METAL
10	O(L)	CrO2/$\overline{NORM}$	Detecting to Chrome
11	O(L)	BIAS	Bias
12	O(L)	$\overline{NORM}$	Switching to playback equalizer (H=70, L=120μ)
13	O(H)	PBMUTE	Playback mute
14	O(L)	DBI/$\overline{DCI}$	Switching to DOLBY (H=B, L=C)
15	O(L)	NR OFF	Switching to ON/OFF for DOLBY (H=OFF, L=ON)
16	O(L)	$\overline{NR\ REC}$	Switching to Rec/PB (Used DOLBY IC)(H=PB, L=REC)
17	O(H)	R.MUTE	Recording mute
18	O(H)	$\overline{REVERSE}$	Indicator(Reverse)
19	O(H)	$\overline{DOLBY\ C}$	Indicator(DOLBY C)
20	O(H)	$\overline{DOLBY\ B}$	Indicator(DOLBY B)
21	O(H)	$\overline{REC\ PAUSE}$	Indicator(Rec Pause)
22	O(H)	$\overline{REV\ PLAY}$	Indicator(Rev play)
23	O(H)	$\overline{FWD\ PLAY}$	Indicator(Fwd Play)
24	O(L)	$\overline{STANDBY\ IND}$	Indicator(Stand by)
25	O(L)	NC	
26	O	$\overline{KO2}$	Key output 2
27	O	$\overline{KO1}$	Key output 1
28	O	$\overline{KO0}$	Key output 0
29	I	KI3	Key input 3
30	I	KI2	Key input 2
31	I	KI1	Key input 1
32	I	LI0	Key input 0
33	O(L)	NC	
34	O(L)	PLZ	Plunger ON
35	O(L)	CAPN	Capstan motor ON
36	O(L)	NC	

Pin No.	I/O	Symbol	Function
37	I	NC	
38	I	$\overline{REV\text{-}R\ SW}$	Detect Reverce Recording (Recording Prohibion)
39	I	$\overline{METAL\ SW}$	(REC clble=L)Detecting to METAL
40	I	$\overline{PACK\ SW}$	Tape detecting (tape in use: L) (Tape ON:L)Tape detect yes or not
41	I	$\overline{DETECT}$	Detecting to reel pulse
42	I	CrO2METAL SW	Detecting to chrome
43	I	$\overline{PLAY}$	Detecting to play
44	I	$\overline{FWD\text{-}RSW}$	(Recordable=L) Detecting to FWD Recording (Recording Prohibition)
45	O(L)	NC	
46	O(L)	POWER ON	±SW12V Switch for Power supply
47	O(L)	OPEN	Cassette tray:Open
48	O(L)	CLOSE	Cassette tray:Close
49	I	$\overline{CLOSE\ SW}$	Detecting for Cassette tray:Close
50	I	$\overline{OPEN\ SW}$	Detecting for Cassette tray:Open
51	I	RST	CPU reset input
52	O	X1	
53	I	X2(NC)	
54		VSS	
55	O	OSC2	
56	I	OSC1	
57		VDD	
58	I	NC	
59	I	NC	
60	I	NC	
61	I	NC	
62	O(H)	$\overline{DCSO}$	DSC output
63	I	$\overline{DCSI}$	DSC input
64	I	NC	

■IC401:AN7374K(DOLBY NR)

〔Circuit function block diagram〕

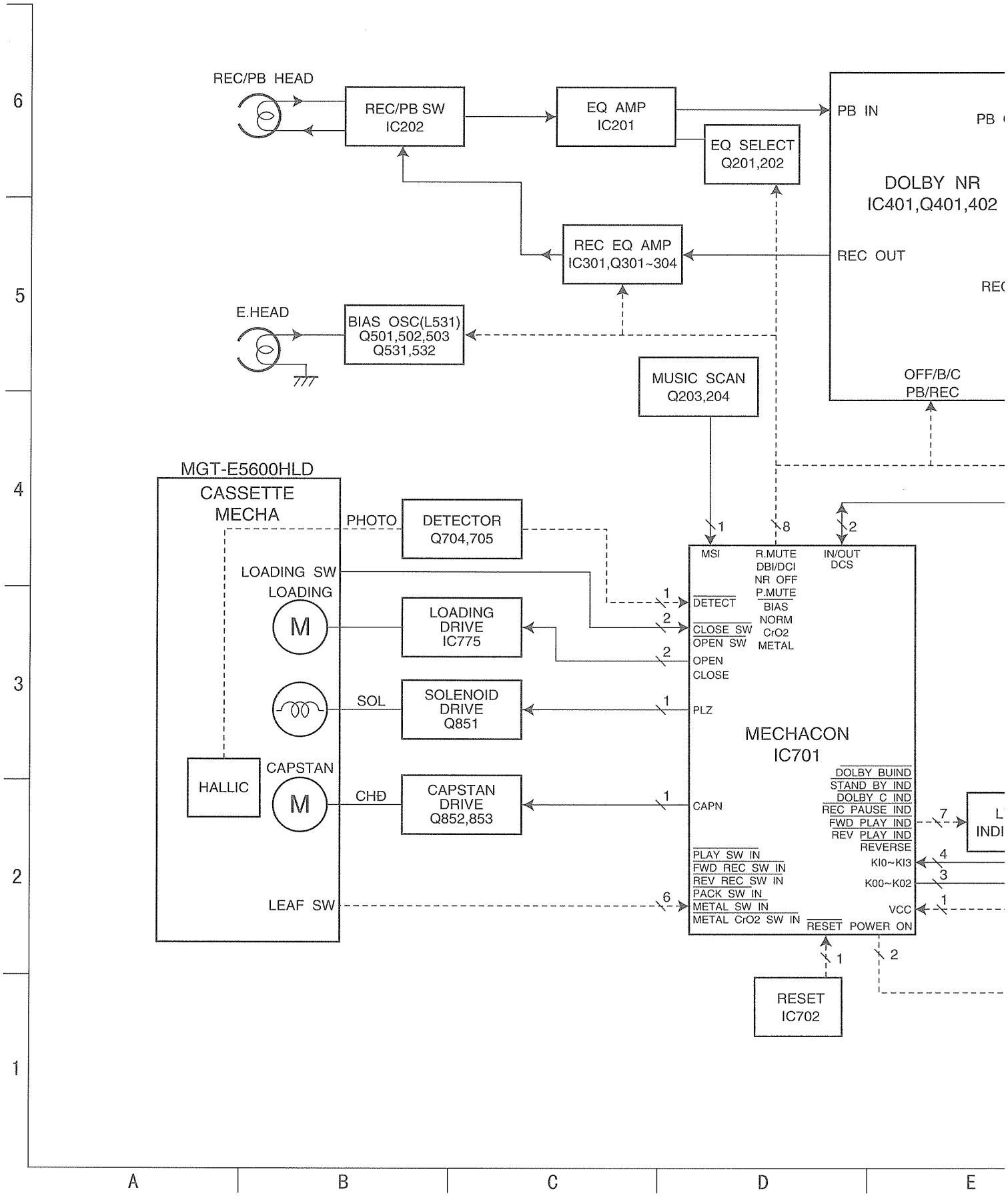


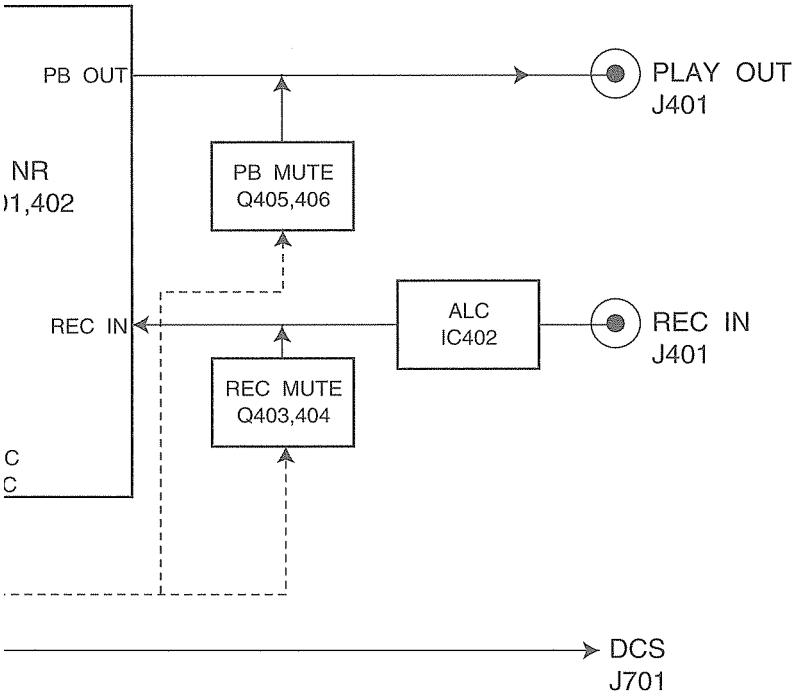
〔Pin function〕

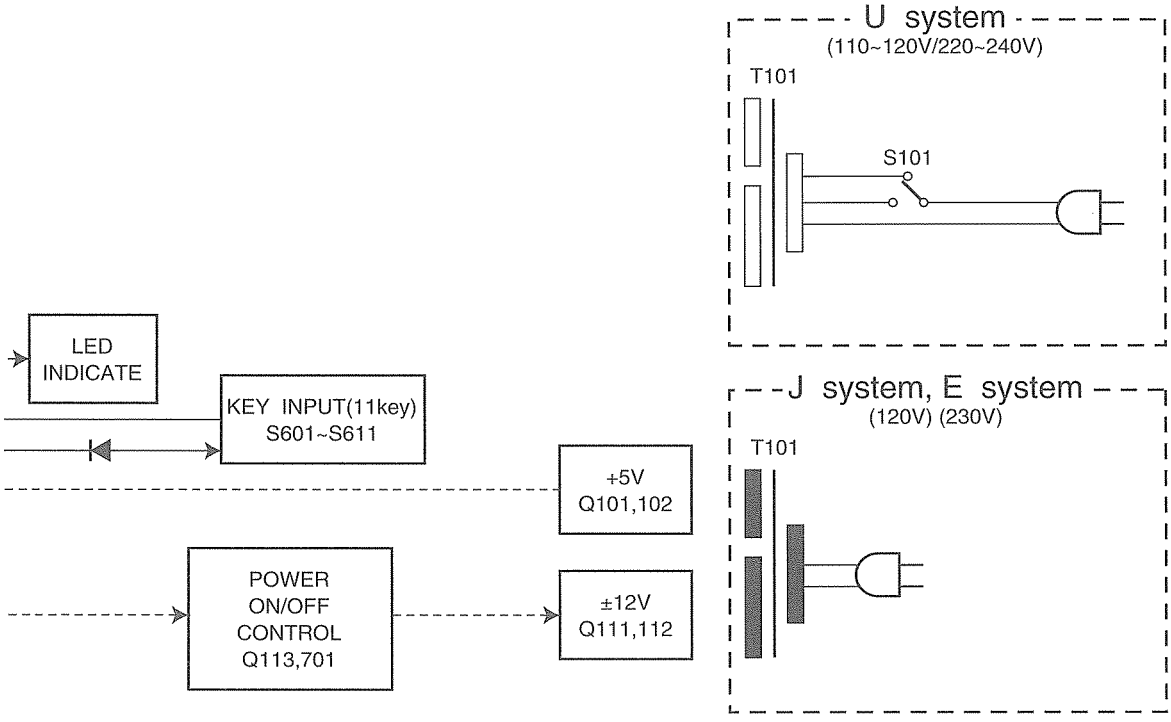
Pin No.	Portname	Description
1	GND	GND
2	RECIN-R	Ch.A REC-IN
3	OFF/B/C	C-type/B-type/OFF NR switch
4	PB IN-R	Ch.A PB-IN
5	NC	Ground
6	NC	Ground
7	NC	Ground
8	NC	Ground
9	PBOUT-R	Ch.R LINE-OUT
10	NC	Ground
11	NC	Ground
12	NC	Ground
13	NC	Ground
14	RECOUT-R	Ch.R REC-OUT
15	RECOUT-L	Ch.L REC-OUT

Pin No.	Port neme	Description
16	NC	Ground
17	NC	Ground
18	NC	Ground
19	NC	Ground
20	NC	Ground
21	NC	Ground
22	NC	Ground
23	NC	Ground
24	NC	Ground
25	PBIN-L	Ch.L PB-IN
26	PB/$\overline{\text{REC}}$	PB/REC/PBmpx Mode switch
27	RECIN-L	Ch.L REC-IN
28		Vcc +12V

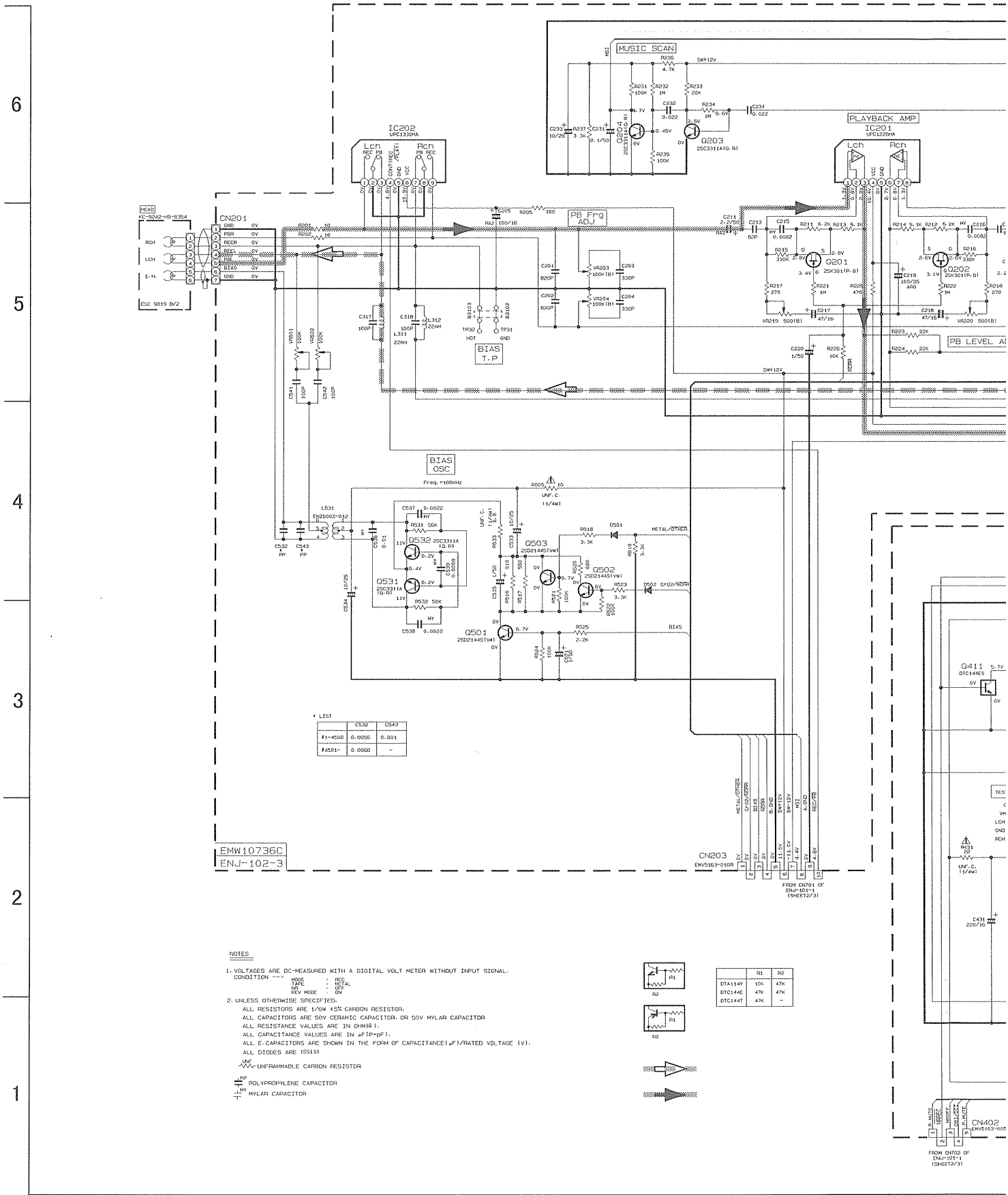
Block Diagram



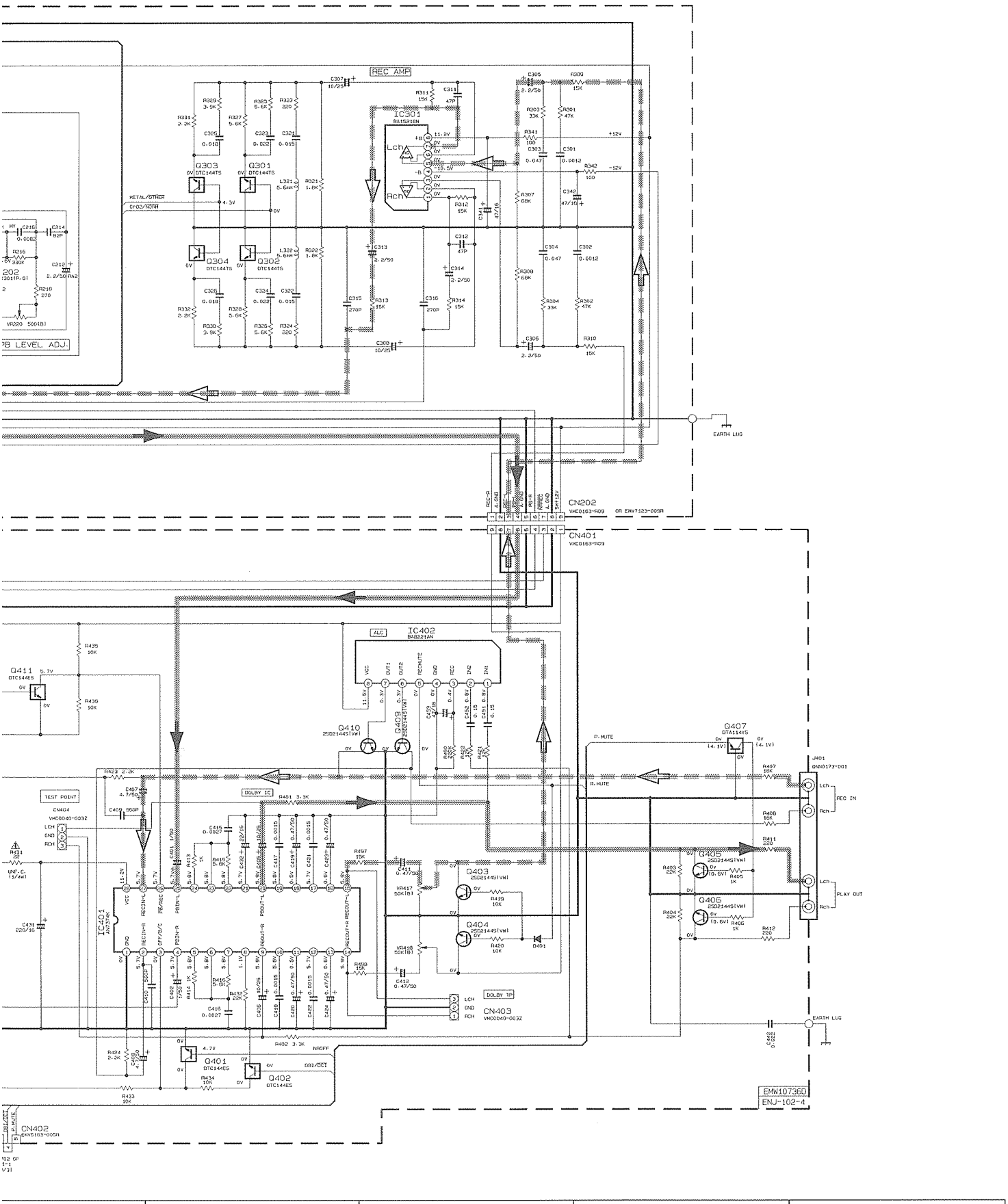

PB OUT
PLAY OUT
J401
NR
)1,402
PB MUTE
Q405,406
REC IN
ALC
IC402
REC IN
J401
REC MUTE
Q403,404
C
C
DCS
J701


U system
(110~120V/220~240V)
T101
S101
LED
INDICATE
KEY INPUT(11key)
S601~S611
+5V
Q101,102
POWER
ON/OFF
CONTROL
Q113,701
±12V
Q111,112
J system, E system
(120V) (230V)
T101

Schematic Diagrams



TD-EX90



E | F | G | H | I

NOTES

1. VOLTAGES ARE DC-MEASURED WITH A DIGITAL VOLT METER WITHOUT INPUT SIGNAL.
   CONDITION ~~~~ MODE : REC
   TAPE : METAL
   NR : OFF
   REV MODE : ON

2. UNLESS OTHERWISE SPECIFIED.
   ALL RESISTORS ARE 1/6W ±5% CARBON RESISTOR.
   ALL CAPACITORS ARE 50V CERAMIC CAPACITOR OR 50V MYLAR CAPACITOR
   ALL RESISTANCE VALUES ARE IN OHM(Ω).
   ALL CAPACITANCE VALUES ARE IN μF(P=pF).
   ALL E.CAPACITORS ARE SHOWN IN THE FORM OF CAPACITANCE(μF)/RATED VOLTAGE (V).
   ALL DIODES ARE 1SS133

UNF UNFRAMMABLE CARBON RESISTOR

PP POLYPROPYLENE CAPACITOR

MY MYLAR CAPACITOR

MARK		
REF NO	J	EXCEPT J
R117	UNF.C	UNF.P
R110	UNF.C	UNF.F
R104	UNF.C	UNF.F

CAPSTAN MOTOR CONTROL

Q851 2SC2001(L-K)

Q852 2SD400(P)(E-F)

Q853 2SC3311A(Q,R)

PHOTO DETECTOR

ESC 9019 A/2

EMW10736E
ENJ-102-5

ENJ-102-1

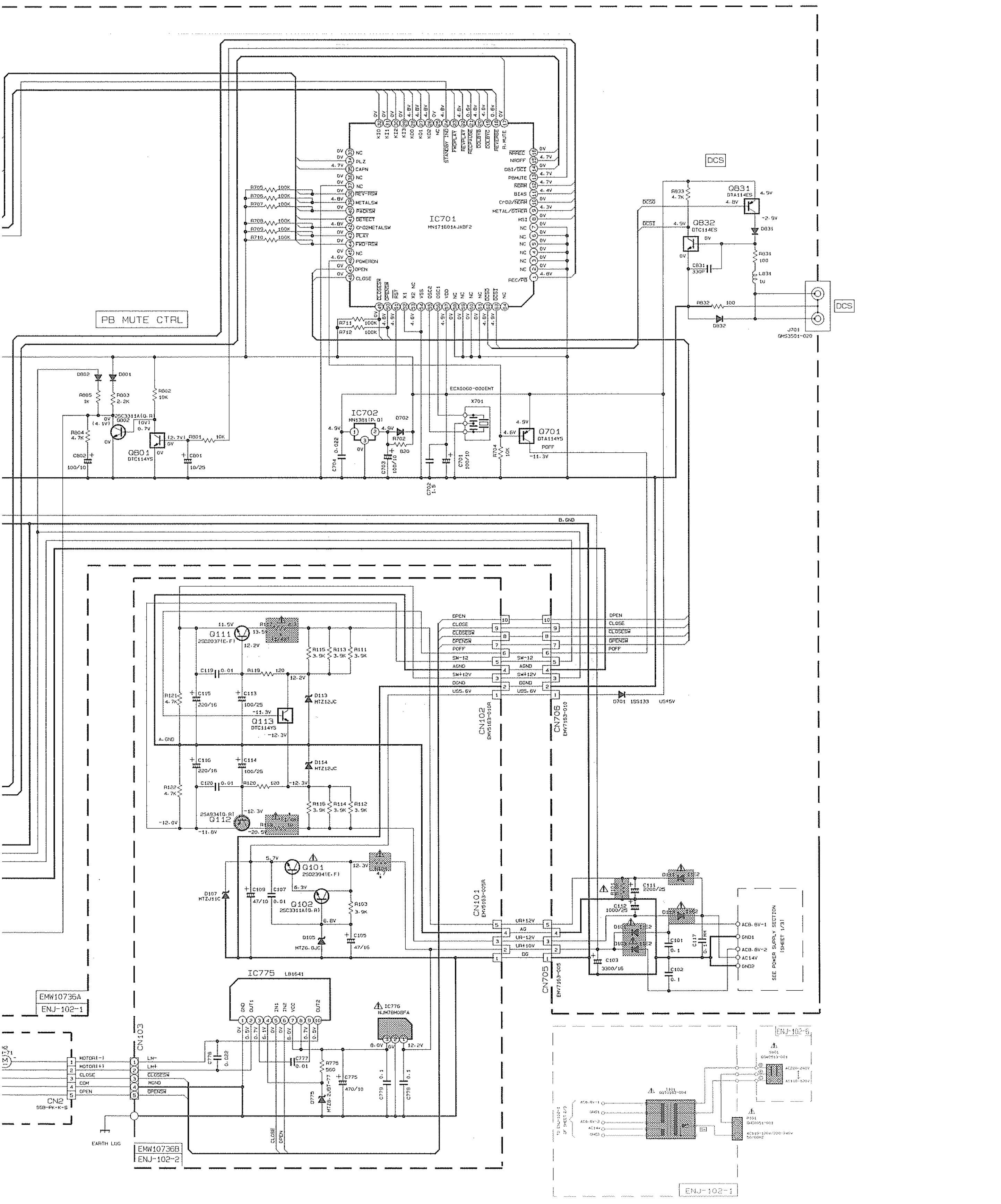
ENJ-102-1

ESD 9020

	R1	R2
DTC114Y	10K	47K
DTA114Y	10K	47K
DTA144E	47K	47K
DTC144E	47K	47K
DTA114E	10K	10K
DTC114E	10K	10K

⚠ Parts are safety assurance parts. When replacing those parts make sure to use the specified one.

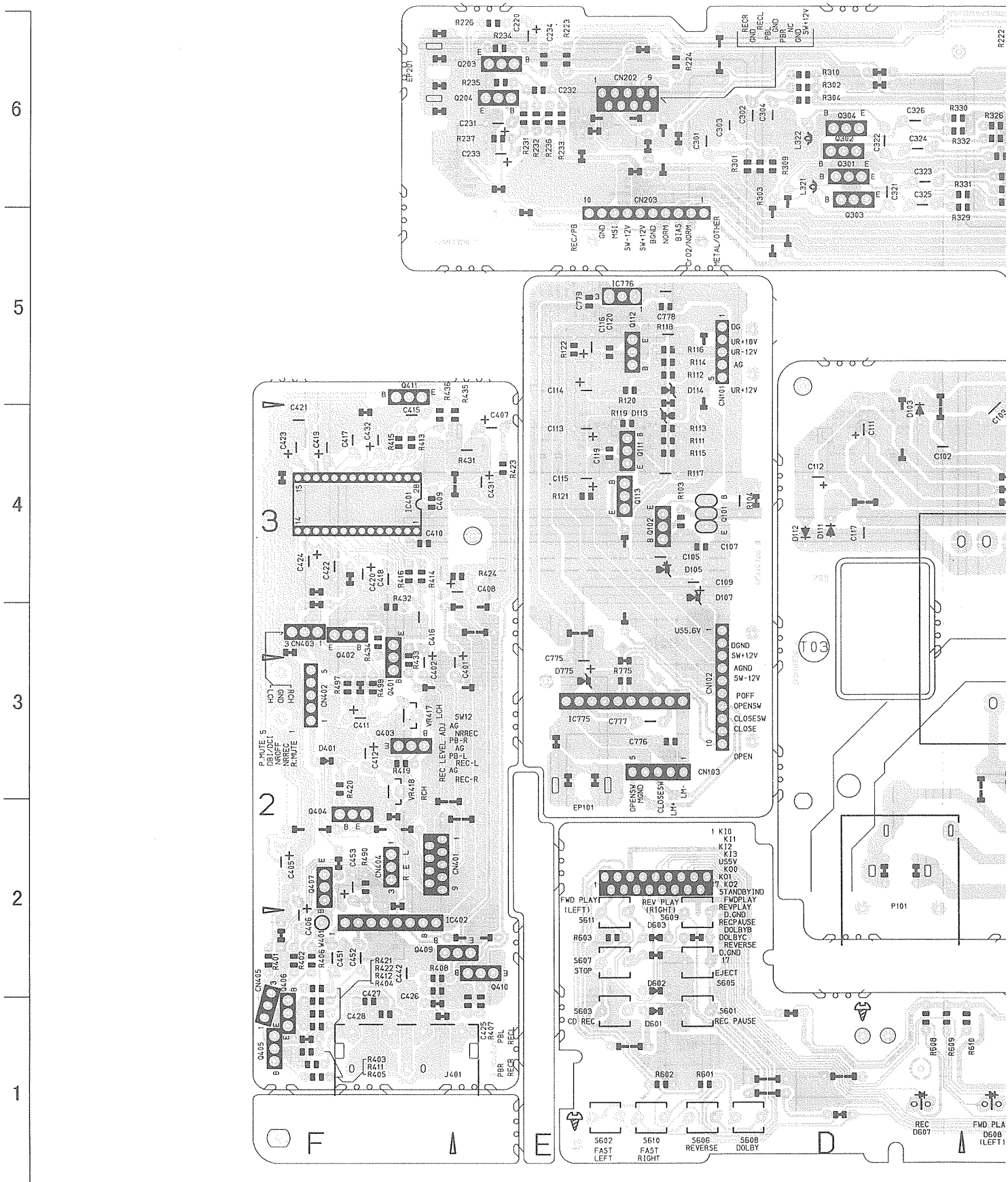
NOTE:
MARK(*) IS TO SHOW DEVIATION IN VERSIONS.
DETAILS ARE EXPLAINED NEAR THE MARK.


PB MUTE CTRL
IC701
MN171601AJABF2
IC702
MN1381(P,Q)
Q801
DTC114YS
Q701
DTA114YS
Q831
DTA114ES
Q832
DTC114ES
DCS
J701
Q111
2SD2037(E,F)
Q112
Q113
DTC114YS
Q101
2SD2394(E,F)
Q102
2SC3311A(Q,R)
CN102
CN706
CN101
CN705
IC775
LB1641
IC776
NJM78M08FA
CN103
CN2
EARTH LUG
EMW10736A
ENJ-102-1
EMW10736B
ENJ-102-2
SEE POWER SUPPLY SECTION (SHEET 1/3)
ENJ-102-1
ENJ-102-5

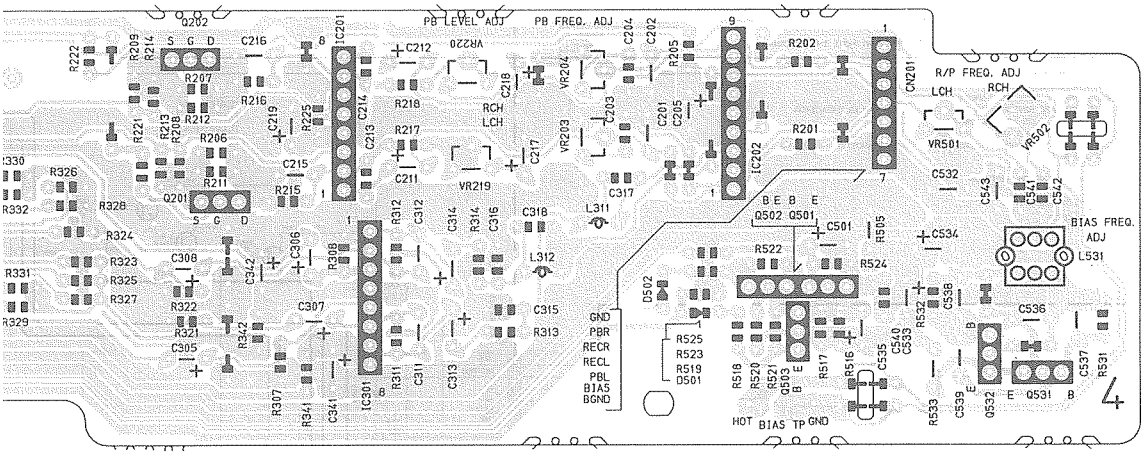
E F G H I

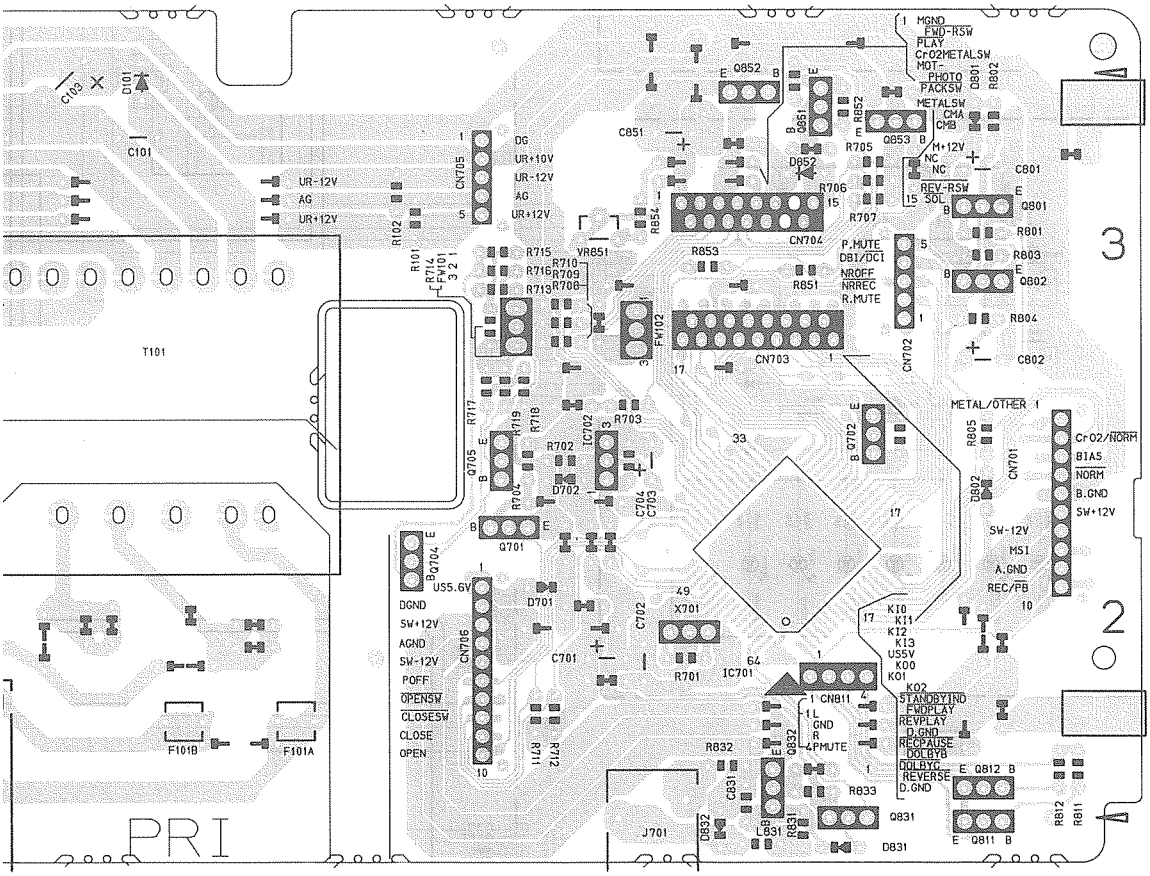
Location of P. C. Board Part

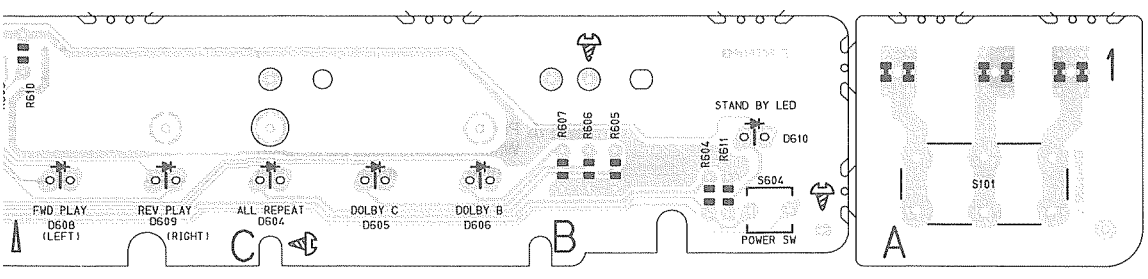
■ Main Board: Blok No. 01



TD-EX90







E | F | G | H | I

PARTS LIST

[TD-EX90]

* All printed circuit boards and its assemblies are not available as service parts.

Area Suffix

C	Canada
B	U.K.
E	Continental Europe
J	U.S.A.
EE	Eastern Europe
EN	Northern Europe
US	Singapore
UT	Taiwan
UB	Hong Kong
U	Other Areas
UF	China

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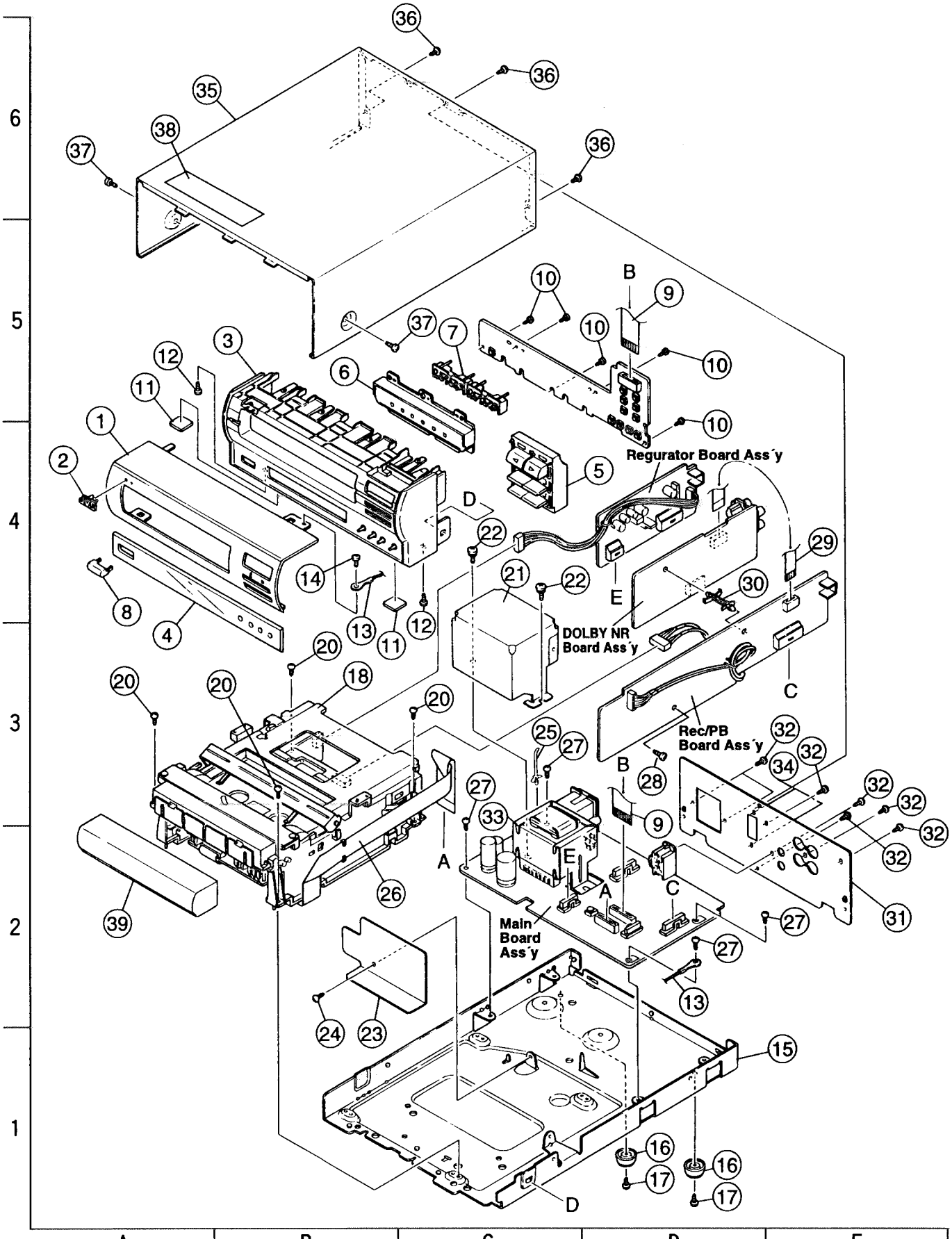
Exploded View of General Assembly and Parts List

■ **Enclosure Assembly Parts: Block No. M1**



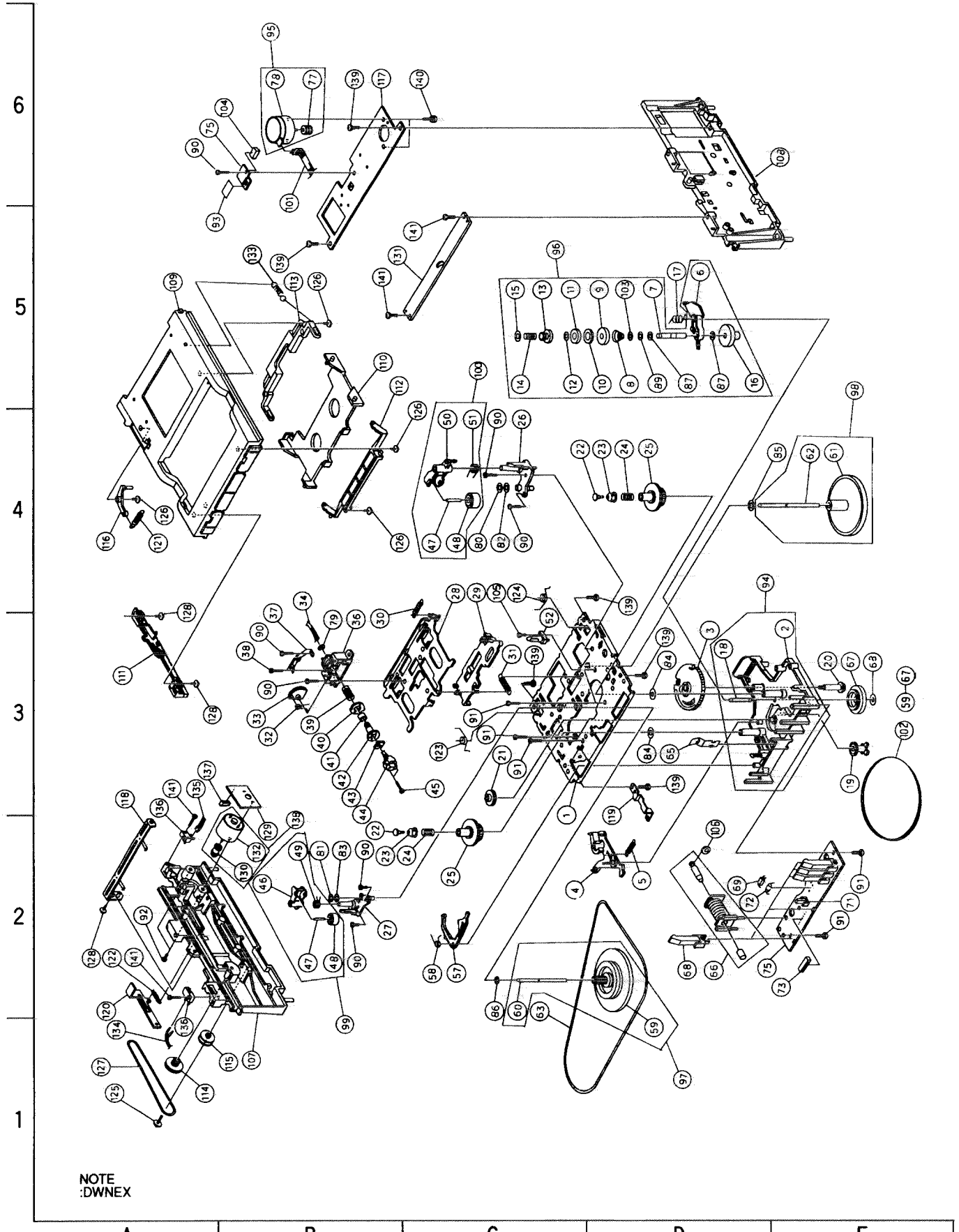
■ PARTS LIST

Block No. M1MM

⚠	Item	Parts Number	Parts Name	Q'ty	Description	Area
	1	LE20349-002A	FRONT PANEL	1		
	2	E406971-001SM	JVC MARK	1		
	3	LE10161-002A	FRONT BASE	1		
	4	LE30556-006A	WINDOW SCREEN	1		
	5	LE20361-004A	PLAY BUTTON	1		
	6	LE20351-001A	INDICATOR ESCUTCHEON	1		
	7	LE30562-001A	INDICATOR	2		
	8	LE30547-001A	POWER CAP	1		CJ
		LE30547-002A	POWER CAP	1		BEEEENUU BUFUSUT
	9	VWF1217-35TTB	FLAT WIRE	1		
	10	QYSDSF2608Z	SCREW	5		
	11	E75896-001	SPACER	2		
	12	QYSDSG3006E	T.SCREW	2		
	13	VWE240-24NTNT	LUG WIRE	1		
	14	QYSDSG3006E	T.SCREW	1		
	15	LE10162-001A	CHASSIS BASE	1		
	16	E47227-029	FOOT	2		
	17	QYSBSG3008E	T.SCREW	2		
	18	----------	CASS.MECHA ASSY	1	#301～#800	J
					#301～Running Change	J EXCEPT
	20	QYSBST3006E	TAP.SCREW	4		
	21	LV30031-001A	SHIELD COVER	1		
	22	QYSDSTL4008E	SPECIAL SCREW	2		
	23	LV40059-002A	SHIELD COVER	1		
	24	QYSBSG3008E	T.SCREW	1		
	25	E307572-001	FASTENER	1		UUBUFUSU T
	26	VWF1215-35TTB	FLAT WIRE	1		
	27	QYSBSG3008E	T.SCREW	4		
	28	QYSDSG3006E	T.SCREW	1		
	29	VWF1209-08TTB	FLAT WIRE	1		
	30	LE30643-001A	FASTENER	1		
	31	LE20352-004A	REAR PANEL	1		J
		LE20352-005A	REAR PANEL	1		C
		LE20352-006A	REAR PANEL	1		UUBUFUS
		LE20352-007A	REAR PANEL	1		UT
		LE20352-008A	REAR PANEL	1		BEEN
		LE20352-009A	REAR PANEL	1		EE
	32	QYSBSGY3008E	SPECIAL SCREW	7		
⚠	33	QQT0183-002	POWER TRANSFORMER	1	T 101	CJ
		QQT0183-003	POWER TRANSFORMER	1	T 101	BEEEEN
		QQT0183-004	POWER TRANSFORMER	1	T 101	UUBUFUSU T
	34	QYSBSG2608M	T.SCREW	2		UUBUFUSU T
	35	LE20334-002A(S)	METAL COVER	1		
	36	QYSBSGG3008E	T.SCREW	3		
	37	QYSDSG3006N	T.SCREW	2		
	38	E67000-026	CAUTION LABEL	1		
	39	LE20354-002A	CD FITTING	1		

Exploded View of Mechanism Assembly and Parts List

■ Enclosure Assembly Parts: Block No. M2



NOTE
:DWNEX

■ Mechanism Assembly Parts List

BLOCK NO. M2MM

⚠	REF.	PARTS NO.	PARTS NAME	REMARKS	QTY	SUFFIX	CLR
	1	EGS-E5A1001	CHASSIS		1		
	3	EGS-E5A3002	CAM GEAR		1		
	4	EGS-E5B3004	TRIGGER ARM		1		
	5	EGS-E5D6006	T. ARM SPRING		1		
	17	EGS-E5D6011	CRUTCH ARM SPIN		1		
	19	EGS-E5D3024	IDLER GEAR		1		
	20	EGS-E5D8002	SCREW		1		
	21	EGS-E5D3030	IDLER GEAR	(PLAY)	1		
	22	EGS-FDS3029	DESK STOPER		2		
	23	EGS-FC3037	REEL FEATHER		2		
	24	EGS-MOD6015	TENSHION SPRING		2		
	25	EGS-E5D3031	REEL GEAR		2		
	26	EGS-E5C5001	HAUSING ASS'Y		1		
	27	EGS-E5C5002	HAUSING ASS'Y		1		
	28	EGS-E5B1002	HEAD CHASSIS		1		
	29	EGS-E5C3006	HEAD R.PLATE		1		
	30	EGS-E5D6003	HEAD R.SPRING		1		
	31	EGS-E5D6002	HEAD CHASSIS SP		1		
	32	EGS-E5D6018-1	RETURN GEAR SP	RETURN	1		
	33	EGS-E5D3020	RETURN GEAR		1		
	34	EGS-E5D9009	HEAD WIRE		1		
	36	EGS-E5B3003	HEAD BASE		1		
	37	EGS-E5D1004	AZIMUTH PLATE		1		
	38	EGS-MOD8005	AZIMUTH SCREW		2		
	39	EGS-E5D6005	EARTH SPRING		1		
	40	EGS-E5D1005	HEAD PLATE		1		
	41	EGS-E5D2004	ROTARY COLLER		1		
	42	EGS-E5C3008			1		
	43	EGS-PD8011	H.WIRE CLAMP		1		
	44	EGS-92432230	ROTARY HEAD	(R/P) KC-9242	1		
	45	EGS-E5D8003	HEAD SCREW		2		
	52	EGS-E5D3023	CASSETTE GUIDE		1		
	57	EGS-E5C3007	BRAKE ARM		1		
	58	EGS-E5D6001	BRAKEARM SPRING		1		
	63	EGS-E5D4007	DRIVE BELT		1		
	64	EGS-E5D4005	CRACH BELT		1		
	65	EGS-EDS1037	PACK SPRING		1		
	66	EGS-MOD9038	SOLENOIDE ASS'Y		1		
	67	EGS-E5D3029	PULLEY GEAR		1		
	68	EGS-MOC9036	RECORDING SWITC		5		
	69	EGS-E5D9007	PHOT SENSOR		1		
	71	EGS-MOC9004	PLAY SWITCH		1		
	72	RD14BB2C222J	RESISTOR	2.2K	1		
	73	EGS-99415181	CONNECTOR	IMSA-9604S-15F	1		
	75	EGS-E5C9019	MECHA BOARD		1		
	79	EGS-8341116108	POLY WASHER	4X7X0.4CUT	1		
	80	EGS-8340419002	N.WASHER	1.9X5X0.5	1		
	81	EGS-8340421023	N. WASHER	2.19X5.5X0.5	2		
	82	EGS-8341116591	POLY WASHER	1.57X5X0.5CUT	1		
	83	EGS-8341118065	POLY WASHER	1.8X6X0.5CUT	1		
	84	EGS-8340504111	TEFRON WASHER	4.1X5.5X0.25	2		
	85	EGS-8342121030	POLY WASHER	2.1X5X0.25	1		
	86	EGS-8342123076	POLY WASHER	2.3X4X0.25	1		
	88	EGS-8341115998	POLY WASHER	1.57X4X0.5CUT	2		

BLOCK NO. M2MM

⚠	REF.	PARTS NO.	PARTS NAME	REMARKS	QTY	SUFFIX	CLR
	90	EGS-8113112005	SCREW	M2X5	7		
	91	EGS-8114512006	SCREW	M2X6	6		
	92	EGS-8115512604	SCREW	M2.6X4	2		
	93	EGS-96901033	F.TAPE		1		
	94	EGS-E5D3055	MOTOR ASS'Y	(H)	1		
	95	EGS-E5D9025	MECHA BASE ASSY		1		
	96	EGS-E5C3032	CRACH ASS'		1		
	97	EGS-E5D5007	FLYWHEEL ASS'Y	(RH-A)	1		
	98	EGS-E5D5009	FLYWHEEL ASS'Y	(LH-A)	1		
	99	EGS-E5D3035	PINCH ROLLER	ASS'Y	1		
	100	EGS-E5D3034	PINCH ROLLER	ASS'Y	1		
	101	EGS-E5D9022	MOTOR WIRE		1		
	104	EGS-99054172	CONNECTOR	S6B-PH	1		
	105	EGS-8113112004	SCREW	M2X4	1		
	106	EGS-8341140008	POLY WASHER	4X1.57X0.13CUT	1		
	107	EGS-E5A3041	GUIDE BASE		1		
	108	EGS-E5A3042	GUIDE BASE		1		
	109	EGS-E5A3043	TRAY		1		
	110	EGS-E5B3044	TRAY		1		
	111	EGS-E5B3045	SLIDER		1		
	112	EGS-E5C3046	LINK		1		
	113	EGS-E5C3047	LINK		1		
	114	EGS-E5D3050	GEAR		1		
	115	EGS-E5D3051	PULLEY GEAR		1		
	116	EGS-E5D3052	STOPER		1		
	117	EGS-E5C1009	MOTOR HOLDER		1		
	118	EGS-E5C1014	CLAMPER ASS'Y		1		
	119	EGS-E5D1012	EARTH PLATE		1		
	120	EGS-E5D1010	CLAMPER ARM		1		
	121	EGS-E5D6019	STOPER SPRING		1		
	122	EGS-E5D6020	CLAMPER ARM SP		1		
	123	EGS-E5D6021	P.RETAN SPRING	(R)	1		
	124	EGS-E5D6022	P.RETAN SPRING	(L)	1		
	125	EGS-C3D8010	SCREW		1		
	126	EGS-E1D8012	SCREW		4		
	127	EGS-E5D4008	BELT		1		
	128	EGS-E5D8011	SCREW		3		
	129	EGS-E5D9020	BOARD		1		
	131	EGS-E5D1013	GUIDE BASE		1		
	133	EGS-E5D6023	LINK SPRING		1		
	134	EGS-E5D9023	WIRE		1		
	135	EGS-E5D9024	WIRE		1		
	136	EGS-94081105	SWITCH	MPU1042OMLBO	2		
	137	EGS-99054175	CONNECTOR	S5B-PH	1		
	138	EGS-E5D9026	MOTOR ASS'Y		1		
	139	EGS-8114512606	SCRWE	M2.6X6	6		
	140	EGS-8115712635	SCREW	M2.6X3.5	2		
	141	EGS-8114512008	SCREW	M2X8	4		

■ Electrical Parts List(Deck P.C.Board)

⚠	Item	Parts Number	Description	Area
		I.C.S		
	IC201	UPC1228HA	I.C(MONO-ANALOG)	
	IC202	UPC1330HA	I.C(MONO-ANALOG)	
	IC301	BA15218N	I.C(MONO-ANALOG)	
	IC401	AN7374K	I.C(MONO-ANALOG)	
	IC402	BA8221AN	I.C(MONO-ANALOG)	
	IC701	MN171601AJABF2	I.C(M)	
	IC702	MN1381/PQ/-T	I.C(M)	
	IC775	LB1641	I.C(DIGI-OTHER)	
	IC776	NJM78M08FA	I.C(MONO-ANALOG)	
		DIODES		
	D101	11E2-T5	SILICON	
	D103	11E2-T5	SILICON	
	D105	MTZJ6.8C-T2	ZENER DIODE	
	D107	MTZJ11C-T2	ZENER	
	D111	11E2-T5	SILICON	
	D112	11E2-T5	SILICON	
	D113	MTZJ12C-T2	ZENER	
	D114	MTZJ12C-T2	ZENER	
	D401	1SS133-T2	SI.DIODE	
	D501	1SS133-T2	SI.DIODE	
	D502	1SS133-T2	SI.DIODE	
	D601	1SS133-T2	SI.DIODE	
	D602	1SS133-T2	SI.DIODE	
	D603	1SS133-T2	SI.DIODE	
	D604	SLR-342DC-T	L.E.D.	
	D605	SLR-342DC-T	L.E.D.	
	D606	SLR-342DC-T	L.E.D.	
	D607	SLR-342VC-T	L.E.D.	
	D608	SLR-342MC-T	L.E.D.	
	D609	SLR-342MC-T	L.E.D.	
	D610	SLR-342VC-T	L.E.D.	
	D701	1SS133-T2	SI.DIODE	
	D702	1SS133-T2	SI.DIODE	
	D775	MTZJ6.2B-T2	ZENER	
	D801	1SS133-T2	SI.DIODE	
	D802	1SS133-T2	SI.DIODE	
	D831	1SS133-T2	SI.DIODE	
	D832	1SS133-T2	SI.DIODE	
	D852	11E2-T5	SILICON	
		TRANSISTORS		
	Q101	2SD2394/EF/	SILICON	
	Q102	2SC3311A/QR/-T	SILICON	
	Q111	2SD2037/EF/-T	SILICON	
	Q112	2SA934/QR/-T	SILICON	
	Q113	DTC114YS-T	SILICON	
	Q201	2SK301/PQ/-T	F.E.T	
	Q202	2SK301/PQ/-T	F.E.T	
	Q203	2SC3311A/QR/-T	SILICON	
	Q204	2SC3311A/QR/-T	SILICON	
	Q301	DTC144TS-T	SILICON	
	Q302	DTC144TS-T	SILICON	
	Q303	DTC144TS-T	SILICON	
	Q304	DTC144TS-T	SILICON	
	Q401	DTC144ES-T	SILICON	
	Q402	DTC144ES-T	SILICON	
	Q403	2SD2144S/VW/-T	SILICON	
	Q404	2SD2144S/VW/-T	SILICON	
	Q405	2SD2144S/VW/-T	SILICON	
	Q406	2SD2144S/VW/-T	SILICON	
	Q407	DTA114YS-T	SILICON	
	Q409	2SD2144S/VW/-T	SILICON	
	Q410	2SD2144S/VW/-T	SILICON	
	Q411	DTC144ES-T	SILICON	
	Q501	2SD2144S/VW/-T	SILICON	
	Q502	2SD2144S/VW/-T	SILICON	
	Q503	2SD2144S/VW/-T	SILICON	
	Q531	2SC3311A/QR/-T	SILICON	
	Q532	2SC3311A/QR/-T	SILICON	
	Q701	DTA114YS-T	SILICON	
	Q704	2SC3311A/QR/-T	SILICON	
	Q705	DTA144ES-T	SILICON	

⚠	Item	Parts Number	Description	Area
	Q801	DTC114YS-T	SILICON	
	Q802	2SC3311A/QR/-T	SILICON	
	Q831	DTA114ES	DIGITAL TRANSISTOR	
	Q832	DTC114ES	DIGITAL TRANSISTOR	
	Q851	2SC2001/LK/-T	SILICON	
	Q852	2SD400MP/EF/-T	SILICON	
	Q853	2SC3311A/QR/-T	SILICON	
		CAPACITORS		
	C101	QFVC1HJ-104Z	0.1MF 50V T.FILM	
	C102	QFVC1HJ-104Z	0.1MF 50V T.FILM	
	C103	QETB1CM-338EE	3300MF 16V E.CAPACITOR	
	C105	QETB1CM-476	47MF 16V AL E.CAPACIT	
	C107	QDYB1CM-103Y	0.01MF 16V C CAPACITOR	
	C109	QETC1AM-476ZM	47MF 10V E.CAPACITOR	
	C111	QETM1EM-228	2200MF 25V AL E.CAPACIT	
	C112	QETB1EM-108	1000MF 25V AL E.CAPACIT	
	C113	QETB1EM-107	100MF 25V AL E.CAPACIT	
	C114	QETB1EM-107	100MF 25V AL E.CAPACIT	
	C115	QETC1CM-227Z	220MF 16V AL E.CAPACIT	
	C116	QETC1CM-227Z	220MF 16V AL E.CAPACIT	
	C117	QFVC1HJ-104Z	0.1MF 50V T.FILM	
	C119	QDYB1CM-103Y	0.01MF 16V C CAPACITOR	
	C120	QDYB1CM-103Y	0.01MF 16V C CAPACITOR	
	C201	QFLB1HJ-821	820PF 50V MYLAR CAPACI	
	C202	QFLB1HJ-821	820PF 50V MYLAR CAPACI	
	C203	QCBB1HK-331Y	330PF 50V CER.CAPACITO	
	C204	QCBB1HK-331Y	330PF 50V CER.CAPACITO	
	C205	QETB1CM-107	100MF 16V AL E.CAPACIT	
	C211	QTE1H28-225Z	E.CAPA. I.M	
	C212	QTE1H28-225Z	E.CAPA. I.M	
	C213	QCBB1HK-820Y	82PF 50V CER.CAPACITO	
	C214	QCBB1HK-820Y	82PF 50V CER.CAPACITO	
	C215	QFLB1HJ-822	8200PF 50V MYLAR CAPACI	
	C216	QFLB1HJ-822	8200PF 50V MYLAR CAPACI	
	C217	QETB1CM-476	47MF 16V AL E.CAPACIT	
	C218	QETB1CM-476	47MF 16V AL E.CAPACIT	
	C219	QTE1E26-107Z	E.CAPA.	
	C220	QETB1HM-105	1MF 50V AL E.CAPACIT	
	C231	QETB1HM-104	0.1MF 50V ELECTRO	
	C232	QDVB1EZ-223Y	0.022MF 25V C CAPACITOR	
	C233	QETB1EM-106	10MF 25V AL E.CAPACIT	
	C234	QDVB1EZ-223Y	0.022MF 25V C CAPACITOR	
	C301	QCB31HK-122Z	1200PF 50V CERAMIC	
	C302	QCB31HK-122Z	1200PF 50V CERAMIC	
	C303	QCF31HZ-473Z	0.047MF 50V CERAMIC	
	C304	QCF31HZ-473Z	0.047MF 50V CERAMIC	
	C305	QETB1HM-225	2.2MF 50V AL E.CAPACIT	
	C306	QETB1HM-225	2.2MF 50V AL E.CAPACIT	
	C307	QETB1EM-106	10MF 25V AL E.CAPACIT	
	C308	QETB1EM-106	10MF 25V AL E.CAPACIT	
	C311	QCS21HJ-470	47PF 50V CER.CAPACITO	
	C312	QCS21HJ-470	47PF 50V CER.CAPACITO	
	C313	QETB1HM-225	2.2MF 50V AL E.CAPACIT	
	C314	QETB1HM-225	2.2MF 50V AL E.CAPACIT	
	C315	QCBB1HK-271Y	270PF 50V CER.CAPACITO	
	C316	QCBB1HK-271Y	270PF 50V CER.CAPACITO	
	C317	QCBB1HK-101Y	100PF 50V CER.CAPACITO	
	C318	QCBB1HK-101Y	100PF 50V CER.CAPACITO	
	C321	QFLB1HJ-153	0.015MF 50V MYLAR CAPACI	
	C322	QFLB1HJ-153	0.015MF 50V MYLAR CAPACI	
	C323	QFLB1HJ-223	0.022MF 50V MYLAR CAPACI	
	C324	QFLB1HJ-223	0.022MF 50V MYLAR CAPACI	
	C325	QFLB1HJ-183	0.018MF 50V MYLAR CAPACI	
	C326	QFLB1HJ-183	0.018MF 50V MYLAR CAPACI	
	C341	QETB1CM-476	47MF 16V AL E.CAPACIT	
	C342	QETB1CM-476	47MF 16V AL E.CAPACIT	
	C401	QETB1HM-105	1MF 50V AL E.CAPACIT	
	C402	QETB1HM-105	1MF 50V AL E.CAPACIT	
	C405	QER61EM-106	10MF 25V AL E.CAPACIT	
	C406	QER61EM-106	10MF 25V AL E.CAPACIT	
	C407	QEKC1HM-475Z	4.7MF 50V ELECTRO	
	C408	QETB1HM-475E	4.7MF 50V E.CAPACITOR	

■ Electrical Parts List(Deck P.C.Board)

⚠	Item	Parts Number	Description	Area
	C409	QCBB1HK-561Y	560PF 50V CER.CAPACITO	
	C410	QCBB1HK-561Y	560PF 50V CER.CAPACITO	
	C411	QEKC1HM-474Z	0.47MF 50V ELECTRO	
	C412	QETB1HM-474	0.47MF 50V E.CAPACITOR	
	C415	QFLB1HJ-272	2700PF 50V MYLAR CAPACI	
	C416	QFLB1HJ-272	2700PF 50V MYLAR CAPACI	
	C417	QFLB1HJ-152	1500PF 50V MYLAR CAPACI	
	C418	QFLB1HJ-152	1500PF 50V MYLAR CAPACI	
	C419	QEKC1HM-474Z	0.47MF 50V ELECTRO	
	C420	QETB1HM-474	0.47MF 50V E.CAPACITOR	
	C421	QFLB1HJ-152	1500PF 50V MYLAR CAPACI	
	C422	QFLB1HJ-152	1500PF 50V MYLAR CAPACI	
	C423	QEKC1HM-474Z	0.47MF 50V ELECTRO	
	C424	QETB1HM-474	0.47MF 50V E.CAPACITOR	
	C431	QETC1CM-227Z	220MF 16V AL E.CAPACIT	
	C432	QEKC1CM-226Z	22MF 16V ELECTRO	
	C442	QCF31HZ-223Z	0.022MF 50V CERAMIC	
	C451	QFLB1HJ-154	0.15MF 50V MYLAR CAPACI	
	C452	QFLB1HJ-154	0.15MF 50V MYLAR CAPACI	
	C453	QETB1CM-476	47MF 16V AL E.CAPACIT	
	C501	QETB1HM-105	1MF 50V AL E.CAPACIT	
	C532	QFP32AJ-682Z	6800PF 100V POLY	
	C533	QETB1EM-106	10MF 25V AL E.CAPACIT	
	C534	QETB1EM-106	10MF 25V AL E.CAPACIT	
	C535	QETB1HM-105	1MF 50V AL E.CAPACIT	
	C536	QFLB1HJ-103	0.01MF 50V MYLAR CAPACI	
	C537	QFLB1HJ-222	2200PF 50V MYLAR CAPACI	
	C538	QFLB1HJ-222	2200PF 50V MYLAR CAPACI	
	C539	QFLB1HJ-682	6800PF 50V MYLAR CAPACI	
	C541	QCBB1HK-101Y	100PF 50V CER.CAPACITO	
	C542	QCBB1HK-101Y	100PF 50V CER.CAPACITO	
	C701	QETC1AM-107ZN	100MF 10V E.CAPACITOR	
	C702	QCZ0202-155	1.5MF 25V CER.RESISTOR	
	C703	QETC1AM-107ZN	100MF 10V E.CAPACITOR	
	C704	QDVB1EZ-223Y	0.022MF 25V C CAPACITOR	
	C775	QETB1AM-477	470MF 10V E.CAPACITOR	
	C776	QDVB1EZ-223Y	0.022MF 25V C CAPACITOR	
	C777	QFLB1HJ-103	0.01MF 50V MYLAR CAPACI	
	C778	QCFB1HZ-104Y	0.1MF 50V CER.CAPACITO	
	C779	QCFB1HZ-104Y	0.1MF 50V CER.CAPACITO	
	C801	QETB1EM-106	10MF 25V AL E.CAPACIT	
	C802	QETC1AM-107ZN	100MF 10V E.CAPACITOR	
	C831	QCBB1HK-331Y	330PF 50V CER.CAPACITO	
	C851	QETB1CM-107	100MF 16V AL E.CAPACIT	
		RESISTORS		
	R101	QRE141J-562Y	5.6K 1/4W R.NETWORK	
	R103	QRE141J-392Y	3.9K 1/4W R.NETWORK	
	R104	QRJ146J-4R7X	4.7 1/4W UNF.CARBON R	J
		QRZ9006-4R7X	4.7 FUSIBLE	BCEEEENU UBUFUSUT
	R111	QRE141J-392Y	3.9K 1/4W R.NETWORK	
	R112	QRE141J-392Y	3.9K 1/4W R.NETWORK	
	R113	QRE141J-392Y	3.9K 1/4W R.NETWORK	
	R114	QRE141J-392Y	3.9K 1/4W R.NETWORK	
	R115	QRE141J-392Y	3.9K 1/4W R.NETWORK	
	R116	QRE141J-392Y	3.9K 1/4W R.NETWORK	
	R117	QRJ146J-4R7X	4.7 1/4W UNF.CARBON R	J
		QRZ9006-4R7X	4.7 FUSIBLE	BCEEEENU UBUFUSUT
	R118	QRJ146J-100X	10 1/4W R.NETWORK	J
		QRZ9005-100X	10 FUSIBLE	BCEEEENU UBUFUSUT
	R119	QRE141J-121Y	120 1/4W R.NETWORK	
	R120	QRE141J-121Y	120 1/4W R.NETWORK	
	R121	QRE141J-472Y	4.7K 1/4W R.NETWORK	
	R122	QRE141J-472Y	4.7K 1/4W R.NETWORK	
	R201	QRE141J-100Y	10 1/4W R.NETWORK	
	R202	QRE141J-100Y	10 1/4W R.NETWORK	
	R205	QRE141J-101Y	100 1/4W R.NETWORK	
	R211	QRE141J-622Y	6.2K 1/4W CARBON RESIS	
	R212	QRE141J-622Y	6.2K 1/4W CARBON RESIS	
	R213	QRE141J-912Y	9.1K 1/4W R.NETWORK	
	R214	QRE141J-912Y	9.1K 1/4W R.NETWORK	

⚠	Item	Parts Number	Description	Area
	R215	QRE141J-334Y	330K 1/4W R.NETWORK	
	R216	QRE141J-334Y	330K 1/4W R.NETWORK	
	R217	QRE141J-271Y	270 1/4W R.NETWORK	
	R218	QRE141J-271Y	270 1/4W R.NETWORK	
	R221	QRE141J-105Y	1M 1/4W R.NETWORK	
	R222	QRE141J-105Y	1M 1/4W R.NETWORK	
	R223	QRE141J-223Y	22K 1/4W R.NETWORK	
	R224	QRE141J-223Y	22K 1/4W R.NETWORK	
	R225	QRE141J-471Y	470 1/4W R.NETWORK	
	R226	QRE141J-103Y	10K 1/4W CARBON RESIS	
	R231	QRE141J-104Y	100K 1/4W R.NETWORK	
	R232	QRE141J-105Y	1M 1/4W R.NETWORK	
	R233	QRE141J-223Y	22K 1/4W R.NETWORK	
	R234	QRE141J-105Y	1M 1/4W R.NETWORK	
	R235	QRE141J-104Y	100K 1/4W R.NETWORK	
	R236	QRE141J-472Y	4.7K 1/4W R.NETWORK	
	R237	QRE141J-332Y	3.3K 1/4W R.NETWORK	
	R301	QRE141J-473Y	47K 1/4W R.NETWORK	
	R302	QRE141J-473Y	47K 1/4W R.NETWORK	
	R303	QRE141J-333Y	33K 1/4W R.NETWORK	
	R304	QRE141J-333Y	33K 1/4W R.NETWORK	
	R307	QRE141J-683Y	68K 1/4W R.NETWORK	
	R308	QRE141J-683Y	68K 1/4W R.NETWORK	
	R309	QRE141J-153Y	15K 1/4W R.NETWORK	
	R310	QRE141J-153Y	15K 1/4W R.NETWORK	
	R311	QRE141J-153Y	15K 1/4W R.NETWORK	
	R312	QRE141J-153Y	15K 1/4W R.NETWORK	
	R313	QRE141J-153Y	15K 1/4W R.NETWORK	
	R314	QRE141J-153Y	15K 1/4W R.NETWORK	
	R321	QRE141J-182Y	1.8K 1/4W R.NETWORK	
	R322	QRE141J-182Y	1.8K 1/4W R.NETWORK	
	R323	QRE141J-221Y	220 1/4W R.NETWORK	
	R324	QRE141J-221Y	220 1/4W R.NETWORK	
	R325	QRE141J-562Y	5.6K 1/4W R.NETWORK	
	R326	QRE141J-562Y	5.6K 1/4W R.NETWORK	
	R327	QRE141J-562Y	5.6K 1/4W R.NETWORK	
	R328	QRE141J-562Y	5.6K 1/4W R.NETWORK	
	R329	QRE141J-392Y	3.9K 1/4W R.NETWORK	
	R330	QRE141J-392Y	3.9K 1/4W R.NETWORK	
	R331	QRE141J-222Y	2.2K 1/4W R.NETWORK	
	R332	QRE141J-222Y	2.2K 1/4W R.NETWORK	
	R341	QRE141J-101Y	100 1/4W R.NETWORK	
	R342	QRE141J-101Y	100 1/4W R.NETWORK	
	R401	QRE141J-332Y	3.3K 1/4W R.NETWORK	
	R402	QRE141J-332Y	3.3K 1/4W R.NETWORK	
	R403	QRE141J-223Y	22K 1/4W R.NETWORK	
	R404	QRE141J-223Y	22K 1/4W R.NETWORK	
	R405	QRE141J-102Y	1K 1/4W R.NETWORK	
	R406	QRE141J-102Y	1K 1/4W R.NETWORK	
	R407	QRE141J-183Y	18K 1/4W CARBON RESIS	
	R408	QRE141J-183Y	18K 1/4W CARBON RESIS	
	R411	QRE141J-221Y	220 1/4W R.NETWORK	
	R412	QRE141J-221Y	220 1/4W R.NETWORK	
	R413	QRE141J-102Y	1K 1/4W R.NETWORK	
	R414	QRE141J-102Y	1K 1/4W R.NETWORK	
	R415	QRE141J-562Y	5.6K 1/4W R.NETWORK	
	R416	QRE141J-562Y	5.6K 1/4W R.NETWORK	
	R419	QRE141J-103Y	10K 1/4W CARBON RESIS	
	R420	QRE141J-103Y	10K 1/4W CARBON RESIS	
	R421	QRE141J-123Y	12K 1/4W R.NETWORK	
	R422	QRE141J-123Y	12K 1/4W R.NETWORK	
	R423	QRE141J-222Y	2.2K 1/4W R.NETWORK	
	R424	QRE141J-222Y	2.2K 1/4W R.NETWORK	
	R431	QRJ146J-220X	22 1/4W UNF.CARBON R	
	R432	QRE141J-223Y	22K 1/4W R.NETWORK	
	R433	QRE141J-103Y	10K 1/4W CARBON RESIS	
	R434	QRE141J-103Y	10K 1/4W CARBON RESIS	
	R435	QRE141J-103Y	10K 1/4W CARBON RESIS	
	R436	QRE141J-103Y	10K 1/4W CARBON RESIS	
	R490	QRE141J-224Y	220K 1/4W R.NETWORK	
	R497	QRE141J-153Y	15K 1/4W R.NETWORK	
	R498	QRE141J-153Y	15K 1/4W R.NETWORK	

■ Electrical Parts List(Deck P.C.Board)

⚠	Item	Parts Number	Description	Area
	R505	QRJ146J-100X	10 1/4W R.NETWORK	
	R516	QRE141J-511Y	510 1/4W R.NETWORK	
	R517	QRE141J-561Y	560 1/4W R.NETWORK	
	R518	QRE141J-332Y	3.3K 1/4W R.NETWORK	
	R519	QRE141J-332Y	3.3K 1/4W R.NETWORK	
	R520	QRE141J-681Y	680 1/4W R.NETWORK	
	R521	QRE141J-104Y	100K 1/4W R.NETWORK	
	R522	QRE141J-104Y	100K 1/4W R.NETWORK	
	R523	QRE141J-332Y	3.3K 1/4W R.NETWORK	
	R524	QRE141J-104Y	100K 1/4W R.NETWORK	
	R525	QRE141J-222Y	2.2K 1/4W R.NETWORK	
	R531	QRE141J-563Y	56K 1/4W R.NETWORK	
	R532	QRE141J-563Y	56K 1/4W R.NETWORK	
	R533	QRJ146J-6R8X	6.8 1/4W R.NETWORK	
	R601	QRE141J-104Y	100K 1/4W R.NETWORK	
	R602	QRE141J-104Y	100K 1/4W R.NETWORK	
	R603	QRE141J-104Y	100K 1/4W R.NETWORK	
	R604	QRE141J-104Y	100K 1/4W R.NETWORK	
	R605	QRE141J-331Y	330 1/4W R.NETWORK	
	R606	QRE141J-331Y	330 1/4W R.NETWORK	
	R607	QRE141J-331Y	330 1/4W R.NETWORK	
	R608	QRE141J-331Y	330 1/4W R.NETWORK	
	R609	QRE141J-331Y	330 1/4W R.NETWORK	
	R610	QRE141J-331Y	330 1/4W R.NETWORK	
	R611	QRE141J-331Y	330 1/4W R.NETWORK	
	R702	QRE141J-821Y	820 1/4W R.NETWORK	
	R704	QRE141J-103Y	10K 1/4W CARBON RESIS	
	R705	QRE141J-104Y	100K 1/4W R.NETWORK	
	R706	QRE141J-104Y	100K 1/4W R.NETWORK	
	R707	QRE141J-104Y	100K 1/4W R.NETWORK	
	R708	QRE141J-104Y	100K 1/4W R.NETWORK	
	R709	QRE141J-104Y	100K 1/4W R.NETWORK	
	R710	QRE141J-104Y	100K 1/4W R.NETWORK	
	R711	QRE141J-104Y	100K 1/4W R.NETWORK	
	R712	QRE141J-104Y	100K 1/4W R.NETWORK	
	R713	QRE141J-104Y	100K 1/4W R.NETWORK	
	R714	QRE141J-104Y	100K 1/4W R.NETWORK	
	R715	QRE141J-334Y	330K 1/4W R.NETWORK	
	R716	QRE141J-105Y	1M 1/4W R.NETWORK	
	R717	QRE141J-122Y	1.2K 1/4W R.NETWORK	
	R718	QRE141J-152Y	1.5K 1/4W R.NETWORK	
	R719	QRE141J-473Y	47K 1/4W R.NETWORK	
	R775	QRE141J-561Y	560 1/4W R.NETWORK	
	R801	QRE141J-103Y	10K 1/4W CARBON RESIS	
	R802	QRE141J-103Y	10K 1/4W CARBON RESIS	
	R803	QRE141J-222Y	2.2K 1/4W R.NETWORK	
	R804	QRE141J-472Y	4.7K 1/4W R.NETWORK	
	R805	QRE141J-102Y	1K 1/4W R.NETWORK	
	R831	QRE141J-101Y	100 1/4W R.NETWORK	
	R832	QRE141J-101Y	100 1/4W R.NETWORK	
	R833	QRE141J-472Y	4.7K 1/4W R.NETWORK	
	R851	QRE141J-821Y	820 1/4W R.NETWORK	
	R852	QRE141J-473Y	47K 1/4W R.NETWORK	
	R853	QRE141J-103Y	10K 1/4W CARBON RESIS	
	R854	QRE141J-471Y	470 1/4W R.NETWORK	
	R855	QRE141J-101Y	100 1/4W R.NETWORK	
	VR203	QVP0004-104Z	100K VARIABLE	
	VR204	QVP0004-104Z	100K VARIABLE	
	VR219	QVP0004-501Z	500 VARIABLE	
	VR220	QVP0004-501Z	500 VARIABLE	
	VR417	QVP0008-503Z	50K VARIABLE	
	VR418	QVP0008-503Z	50K VARIABLE	
	VR501	QVP0008-104Z	100K VARIABLE	
	VR502	QVP0032-104	100K VARIABLE	
	VR851	QVP0004-102Z	1K VARIABLE	
		OTHERS		
		QUM023-07Z3Z3	FF FLAT WIRE	
		QWE881-18RR	VINYL WIRE	U
				UB
				UF
				US
				UT

⚠	Item	Parts Number	Description	Area
		QWE882-18RR	VINYL WIRE	U
				UB
				UF
				US
				UT
		QWE883-18RR	VINYL WIRE	U
				UB
				UF
				US
				UT
		VYH7653-001	I.C.PROTECTOR	
	J401	QNN0173-001	PIN JACK	
	J701	QNS0016-001	3.5 JACK	
	L311	QQL30BJ-223Z	INDUCTOR I.M	
	L312	QQL30BJ-223Z	INDUCTOR I.M	
	L321	QQL30BJ-562Z	INDUCTOR I.M	
	L322	QQL30BJ-562Z	INDUCTOR I.M	
	L531	QQR0588-001	OSC COIL	
	L831	QQL231K-1ROY	INDUCTOR I.M	
	P101	QNC0026-001	AC INLET	CJ
		QNC0051-001	AC INLET	BEEEENUU BUFUSUT
	S101	QSW0513-001	SLIDE SW.	UUBUFUSU T
	S601	QSW0499-001Z	PUSH SW I.M	
	S602	QSW0499-001Z	PUSH SW I.M	
	S603	QSW0499-001Z	PUSH SW I.M	
	S604	QSW0499-001Z	PUSH SW I.M	
	S605	QSW0499-001Z	PUSH SW I.M	
	S606	QSW0499-001Z	PUSH SW I.M	
	S607	QSW0499-001Z	PUSH SW I.M	
	S608	QSW0499-001Z	PUSH SW I.M	
	S609	QSW0499-001Z	PUSH SW I.M	
	S610	QSW0499-001Z	PUSH SW I.M	
	S611	QSW0499-001Z	PUSH SW I.M	
	X701	QAX0247-001Z	RESONATOR I.M	
	CN101	QGB2510K2-05	CONNECTOR	
	CN102	QGB2510K2-10	CONNECTOR	
	CN103	JC-T-D-20-PH-05	CONNECTOR WIRE ASSY	
	CN201	EWS176-009	SOCKET WIRE ASSY	
	CN202	QGF1205F1-09	CONNECTOR	
	CN203	QGB2510K2-10	CONNECTOR	
	CN401	QGF1205F1-09	CONNECTOR	
	CN402	QGB2510K2-05	CONNECTOR	
	CN403	QGA2501C3-03Z	CONNECTOR IM	
	CN404	QGA2501C3-03Z	CONNECTOR IM	
	CN601	QGF1205F1-17	CONNECTOR	
	CN701	QGB2510J1-10	CONNECT TERMINAL	
	CN702	QGB2510J1-05	CONNECTOR	
	CN703	QGF1205C1-17	CONNECTOR	
	CN704	QGF1205C1-15	CONNECTOR	
	CN705	QGB2510J1-05	CONNECTOR	
	CN706	QGB2510J1-10	CONNECT TERMINAL	
	EP101	E409182-001SM	EARTH TERMINAL	
	EP201	E409182-001SM	EARTH TERMINAL	
	EP701	QNZ0136-001Z	IM EARTH PLATE	
	EP702	QNZ0136-001Z	IM EARTH PLATE	
	ST101	QZW0010-001	STYLE PIN	
	ST201	QZW0010-001	STYLE PIN	
	TP031	QNZ0104-001	POST PIN	
	TP032	QNZ0104-001	POST PIN	

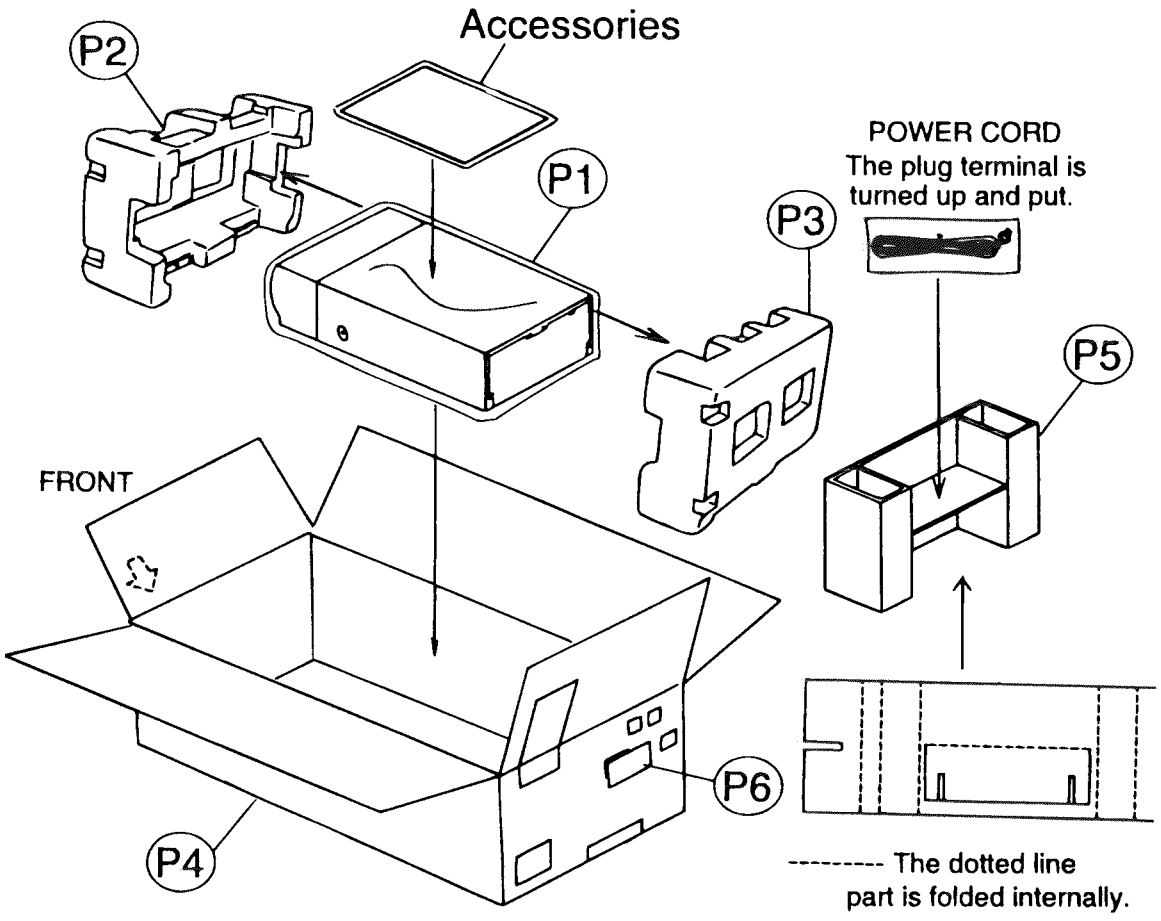
■ Accessories List

Block No. M3MM

⚠	Item	Parts Number	Parts Name	Q'ty	Description	Area
	A1	QPC02503510P	POLY BAG	1		
	A2	LVT0091-001A	INSTRUCTION BOOK	1		J
		LVT0091-002A	INSTRUCTION BOOK	1		B
		LVT0091-003A	INSTRUCTION BOOK	1		C
		LVT0091-004A	INSTRUCTION BOOK	1		EEN
		LVT0091-005A	INSTRUCTION BOOK	1		EN
		LVT0091-006A	INSTRUCTION BOOK	1		EE
		LVT0091-007B	INSTRUCTION BOOK	1		UUBUFUSUT
	A3	BT-52002-1	WARRANTY CARD	1		C
		BT-54008-1	WARRANTY CARD	1		BEEN
		BT-59011-1	WARRANTY CARD	1		UF
	A4	BT-20066A	SVC CENTER LIST	1		B
		BT-20071B	SVC CENTER LIST	1		C
		BT-59009-1	SVC CENTER LIST	1		UF
	A5	BT-20044G	SAFETY SHEET	1		J
		E43486-340B	SAFETY SHEET	1		B
	A8	BT-51006-1	REGISTER CARD	1		J
	A10	LV30258-031A	UB SHEET	1		UB
	A11	QAM0027-001	SIEMENS PLUG	1		UT
		QAM0060-001	SIEMENS PLUG	1		UUS
	A12	EWP302-023	SIGNAL CORD	2		
	A15	EWP805-001W	PLUG WIRE ASSY	1		
⚠	A16	QMPP060-183-JD	POWER CORD	1		UB
		QMPS020-183-JC	POWER CORD	1		UF
		QMP1F00-183	POWER CORD	1		CJ
		QMP39F0-183	POWER CORD	1		EEEENUUS
		QMP5520-183	POWER CORD	1		B
		QMP7530-183	POWER CORD	1		UT
	A17	E300196-172	POLY BAG	1		BUB

Packing and accessorie List

Block No. M4MM



■ Packing Materials and Parts Number

Block No. M4MM

⚠	Item	Parts Number	Parts Name	Q'ty	Description	Area
	P1	QPC03506015P	POLY BAG	1		
	P2	LE20357-001A	PACKING PAD(F)	1		
	P3	LE20358-001A	PACKING PAD(R)	1		
	P4	LV10061-001A	PACKING CASE	1		CJ
		LV10061-002A	PACKING CASE	1		EEEENUUF USUT
		LV10062-001A	PACKING CASE	1		BUB
	P5	LV30591-001A	PACKING SHEET	1		BUB
	P6	----------	CARTON LABEL	1		

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