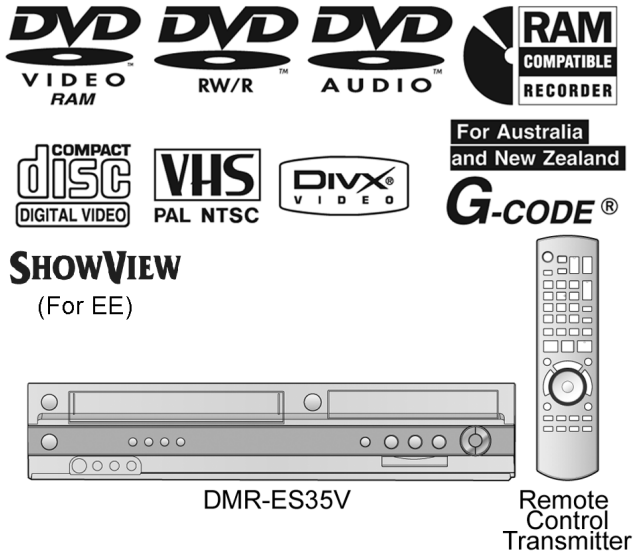
ORDER NO. MD0605164CE

Service Manual

DVD Recorder



DMR-ES35VGN
DMR-ES35VGC
DMR-ES35VGCS
DMR-ES35VEE

Vol. 1

Colour

(S).....Silver Type

Notes: This model's RAM/Digital P.C.B. Module are - RFKNES35VGC, RFKNES35VGCS, RFKNES35VGN, RFKNES35VEE.

Caution:
Pairing of RAM Drive and Digital P.C.B. as "RAM/ Digital P.C.B. Module" have to be replaced together. If the pairing is changed, RAM Drive unit has to be re-aligned. Because the alignment data for RAM Drive Unit is stored in Digital P.C.B..

Panasonic®

⚠ WARNING

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

CONTENTS

1 Safety Precautions

1.1. GENERAL GUIDELINES

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, ensure that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, check for leakage current checks to prevent from being exposed to shock hazards.

1.1.1. LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Using an ohmmeter measure the resistance value, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1MΩ and 5.2Ω.
   When the exposed metal does not have a return path to the chassis, the reading must be ∞ .

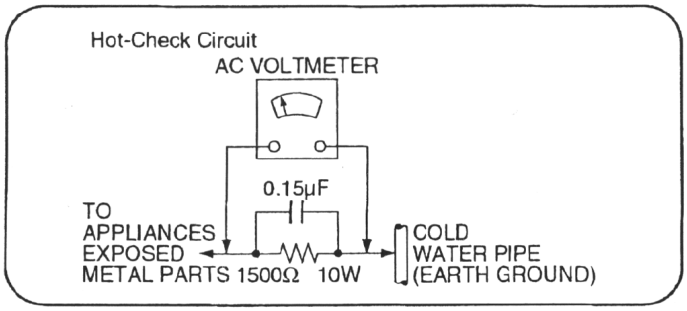


Figure. 1

1.1.2. LEAKAGE CURRENT HOT CHECK (See Figure 1.)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5kΩ, 10 watts resistor, in parallel with a 0.15μF capacitors, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliamp. should the measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and re-checked before it is returned to the customer.

1.2. Caution for AC Mains Lead (For GC only)

Caution for AC Mains Lead
(For Saudi Arabia)

For your safety, please read the following text carefully.

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

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local dealer.

CAUTION!

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

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

IMPORTANT

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

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

THIS PLUG IS NOT WATERPROOF—KEEP DRY.

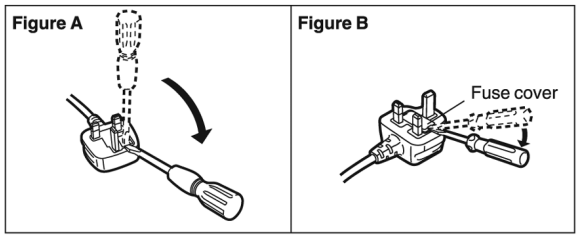
Before use

Remove the connector cover.

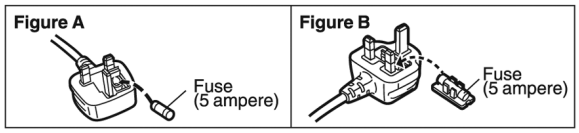
How to replace the fuse

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

1. Open the fuse cover with a screwdriver.



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



1.3. Before Repair and Adjustment

Disconnect AC power, discharge Power Supply Capacitors C11101, C11104, C11105 and C11106 through a 10Ω, 1W resistor to ground.

DO NOT SHORT-CIRCUIT DIRECTLY (with a screwdriver blade, for instance), as this may destroy solid state devices.

After repairs are completed, restore power gradually using a variac, to avoid overcurrent.

1.4. Protection Circuitry

The protection circuitry may have operated if either of the following conditions are noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of the amplifier are used.

If this occurs, follow the procedure outlines below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note:

When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

2 Prevention of Electro Static Discharge (ESD) to Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor “chip” components. The following techniques should be used to help reduce the incidence of component damage caused by electro static discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equiped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equiped with ES devices, place the assembly on a conductive surface such as aluminium foil, to prevent electrostatic charge build up or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as “anti-static (ESD protected)” can generate electrical charge to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminium foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   Caution

   Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are imporant for safety.
These parts are marked by ⚠ in the schematic diagrams, Exploded Views and replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

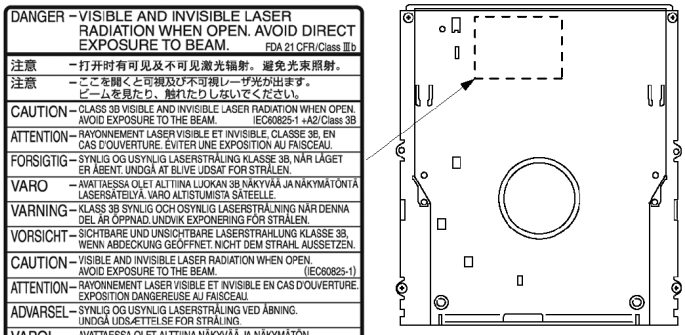
3 Precaution of Laser Diode

CAUTION:

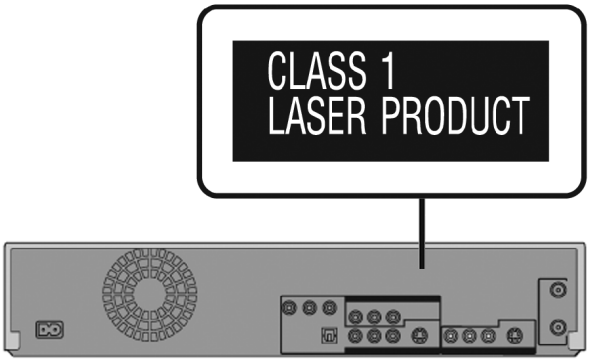
This product utilizes a laser diode with the unit turned “on”, invisible laser radiation is emitted from the pickup lens.
Wave length: 662 nm (DVDs)/780 nm (CDs)
Maximum output radiation power from pickup: 100 μ W/VDE
Laser radiation from the pickup lens is safety level,but be sure the followings:

1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.

DANGER –	VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM. FDA 21 CFR/Class IIIb
注意	– 打开时有可见及不可见激光辐射。避免光束照射。
注意	– ここを開くと可視及び不可視レーザ光が出ます。ビームを見たり、触れたりしないでください。
CAUTION –	CLASS 3B VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO THE BEAM. IEC60825-1 +A2/Class 3B
ATTENTION –	RAYONNEMENT LASER VISIBLE ET INVISIBLE, CLASSE 3B, EN CAS D'OUVERTURE. ÉVITER UNE EXPOSITION AU FAISCEAU.
FORSIGTIG –	SYNLIG OG USYNLIG LASERSTRÅLING KLASSE 3B, NÅR LÅGET ER ÅBENT. UNDGÅ AT BLIVE UDSAT FOR STRÅLEN.
VARO	– AVATTAESSA OLET ALTTIINA LUOKAN 3B NÄKYVÄÄ JA NÄKYMÄTÖNTÄ LASERSÄTEILYÄ. VARO ALTISTUMISTA SÄTEELLE.
VARNING –	KLASS 3B SYNLIG OCH OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. UNDVIK EXPONERING FÖR STRÅLEN.
VORSICHT –	SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG KLASSE 3B, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.
CAUTION –	VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO THE BEAM. (IEC60825-1)
ATTENTION –	RAYONNEMENT LASER VISIBLE ET INVISIBLE EN CAS D'OUVERTURE. EXPOSITION DANGEREUSE AU FAISCEAU.
ADVARSEL –	SYNLIG OG USYNLIG LASERSTRÅLING VED ÅBNING. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VARO!	– AVATTAESSA OLET ALTTIINA NÄKYVÄÄ JA NÄKYMÄTÖN LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING –	SYNLIG OCH OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. BETRAKTA EJ STRÅLEN.
VORSICHT –	SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.
ADVARSEL –	SYNLIG OG USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES. UNNGÅ EKSPONERING FOR STRÅLEN.



(Inside of product)



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

4 Handling the Lead free Solder

4.1. General description about Lead Free Solder (PbF)

The lead free solder has been used in the mounting process of all electrical components on the printed circuit boards used for this equipment in considering the globally environmental conservation.

The normal solder is the alloy of tin (Sn) and lead (Pb). On the other hand, the lead free solder is the alloy mainly consists of tin (Sn), silver (Ag) and Copper (Cu), and the melting point of the lead free solder is higher approx.30 degrees C (86°F) more than that of the normal solder.

Definition of PCB Lead Free Solder being used

The letter of “PbF” is printed either foil side or components side on the PCB using the lead free solder. (See right figure)	PbF

Service caution for repair work using Lead Free Solder (PbF)

- The lead free solder has to be used when repairing the equipment for which the lead free solder is used.
  (Definition: The letter of “PbF” is printed on the PCB using the lead free solder.)
- To put lead free solder, it should be well molten and mixed with the original lead free solder.
- Remove the remaining lead free solder on the PCB cleanly for soldering of the new IC.
- Since the melting point of the lead free solder is higher than that of the normal lead solder, it takes the longer time to melt the lead free solder.
- Use the soldering iron (more than 70W) equipped with the temperature control after setting the temperature at 350±30 degrees C (662±86°F).

Recommended Lead Free Solder (Service Parts Route.)

- The following 3 types of lead free solder are available through the service parts route.
  RFKZ03D01K----------(0.3mm 100g Reel)
  RFKZ06D01K----------(0.6mm 100g Reel)
  RFKZ10D01K----------(1.0mm 100g Reel)

Note

* Ingredient: Tin (Sn), 96.5%, Silver (Ag) 3.0%, Copper (Cu) 0.5%, Cobalt (Co) / Germanium (Ge) 0.1 to 0.3%

5 Service Navigation

5.1. Service Information

This service manual contains technical information which will allow service personnel's to understand and service this model.
Please place orders using the parts list and not the drawing reference numbers.

If the circuit is changed or modified, this information will be followed by supplement service manual to be filed with original service manual.

1) This service manual does not contain the following information, because of the impossibility of sevicing at component level.

   * Schematic Diagram, Block Diagram and P.C.B. layout of RAM/Digital P.C.B. Module.
   * Parts List for individual parts of RAM/Digital P.C.B. Module.
   * Exploded View and Parts List for individual parts of RAM/Digital P.C.B. Module.

2) The following category are recycle module part. Please send them to Central Repair Center.

   * RAM/Digital P.C.B. Module (ES35VGC:RFKNES35VGC, ES35VGCS:RFKNES35VGCS, ES35VGN:RFKNES35VGN, ES35VEE : RFKNES35VEE)

5.2. CAUTION FOR DivX

Please give the information “Warning for Customers who use the DivX Video-on-Demand content.” always to the customer together with the product, if you have to exchange EEPROM, P.C.B. including EEPROM or the product itself.
Also attach these information to every service part (EEPROM or P.C.B. including EEPROM).
This complete Information is needed for every customer who is using the DivX Video-on-Demand Serivce.

Appendix:

* Parts that memorize user's information are only on the EEPROM.
* The registration of Registration Code is possible for half a year up to 6 recorders up to 10 recorders a year.

Every replacement of EEPROM or P.C.B. including EEPROM spends one of this.

- Registration Code is memorized in the EEPROM (RFKFxxxxxxx)
- If the Power & Digital I/F P.C.B. or the EEPROM will be changed a new Registration Code different from the previous one will be generated.
- In this case the customer, who is useing DivX Video-on-Demand sercive, can not longer play any content that was or is purchased under that old registration code.
- Therefore the customer will need to register a new registration code.

*Copy this page and cut on the dotted line and give the lower half to your customer.

Warning for Customers who use the DivX Video-on-Demand content.

1. The registration code has been changed for the repair of the product or the product exchange.
2. Obtain and register a new registration code, otherwise you will no longer be able to play DivX Video-on-Demand content.
3. Follow the procedure on the DivX Video-on-Demand web site to register at http://vod.divx.com/

   * If you do not use the DivX Video-on-Demand content, please ignore this warning.

6 Specifications

(For GN/GC/GCS)

Power supply:	For Asia and the Middle East AC 220 V to 240 V, 50/60 Hz For Australia and New Zealand AC 220 V to 240 V, 50 Hz		
Power consumption:	Approx. 26 W		
Standby mode:		Display ON	Display Off
Quick Start On	Approx.	7.0 W	6.8 W
Quick Start Off	Approx.	2.6 W	2.5 W

Recordable discs:

DVD-RAM: Ver. 2.0
Ver. 2.1/3X-SPEED DVD-RAM Revision 1.0
Ver. 2.2/5X-SPEED DVD-RAM Revision 2.0

DVD-R: for General Ver. 2.0
for General Ver. 2.0/4X-SPEED DVD-R Revision 1.0
for General Ver. 2.x/8X-SPEED DVD-R Revision 3.0
for General Ver. 2.x/16X-SPEED DVD-R Revision 6.0
for DL Ver. 3.0
for DL Ver. 3.x/4X-SPEED DVD-R for DL Revision 1.0

DVD-RW: Ver. 1.1
Ver. 1.1/2X-SPEED DVD-RW Revision 1.0
Ver. 1.2/4X-SPEED DVD-RW Revision 2.0

+R: Ver. 1.0/2.4X-SPEED
Ver. 1.1/4X-SPEED
Ver. 1.2/8X-SPEED
Ver. 1.3/16X-SPEED
for DL Ver. 1.0/4X-SPEED

+RW: Ver. 1.1
Ver. 1.2/4X-SPEED

Recording system:

DVD-RAM: DVD Video Recording format
DVD-R: DVD-Video format
DVD-R DL (Dual Layer):
DVD-Video format
DVD-RW: DVD-Video format
+R
+R DL (Double Layer)
+RW

Recording time:

Max. 8 hours (using 4.7 GB disc)
XP: Approx. 1 hour SP: Approx. 2 hours
LP: Approx. 4 hours EP: Approx. 6 hours or 8 hours

Playable discs:

DVD-RAM: DVD Video Recording format
DVD-R: DVD-Video format, DivX
DVD-R DL (Dual Layer):
DVD-Video format
DVD-RW: DVD-Video format, DVD Video Recording format
+R
+R DL (Double Layer)
+RW
DVD-Video, DVD-Audio
CD-Audio (CD-DA), Video CD
CD-R/CD-RW (CD-DA, Video CD, DivX, MP3, JPEG)

Optical pick-up:

System with 1 lens, 2 integration units
(662 nm wavelength for DVDs, 780 nm wavelength for CDs)

LASER Specification:

Class 1 LASER Product
Wave Length: 780 nm (CDs)
662 nm (DVDs)
Laser Power: No hazardous radiation is emitted with the safety protection

Television system:

TV system: PAL system, 625 lines, 50 fields
NTSC system, 525 lines, 60 fields

Antenna reception input:

For Asia and the Middle East

VHF: CH R1 to R12 (PAL-DK, SECAM-DKK1)
E2 to E12 (PAL-BGH, SECAM-BG)
CH 1 to 12 (PAL-D)
75 ohm

UHF: CH 21 to 69 (PAL-DK, SECAM-DKK1)
E21 to E69 (PAL-BGH, SECAM-BG, PAL-I)
CH 13 to 57 (PAL-D)
75 ohm

CATV: CH 44 MHz to 470 MHz (PAL-DK, SECAM-DKK1)
CH S01 to S05, M1 to M10, U1 to U10, S21 to S41
(PAL-BGH, SECAM-BG) (PAL-D)
75 ohm

For Australia and New Zealand

VHF: CH 0 to 12 (Australia),
CH 1 to 11 (NZ),
75 ohm

UHF: CH 28 to 69 (Australia),
CH 21 to 69 (NZ),
75 ohm

CATV: 45 MHz to 470 MHz (Australia),
44 MHz to 470 MHz (NZ),
75 ohm

Video system:

Recording system: (for DVD)
MPEG2 (Hybrid VBR)

Input: LINE (pin jack)×2 1.0 Vp-p; 75 Ω
S connector×2 Y: 1.0 Vp-p; 75 Ω
C: 0.286 Vp-p; 75 Ω

Output:
(for DVD PRIORITY 1) LINE (pin jack)×2 1.0 Vp-p; 75 Ω
S connector×2 Y: 1.0 Vp-p; 75 Ω
C: 0.286 Vp-p; 75 Ω

Component video output:
(for DVD PRIORITY) Y, PB, PR ×1 Y: 1.0 Vp-p; 75 Ω
(480i/480p) NTSC PB: 0.7 Vp-p; 75 Ω
(576i/576p) PAL PR: 0.7 Vp-p; 75 Ω

Audio system:

Recording system: (for DVD)
Dolby Digital (2 ch)

Analog Input: LINE (pin jack)×2
Reference input: 309 mVrms
FS: 2 Vrms (1 kHz, 0 dB)
Input impedance: 22 kΩ

Analog Output:
(for DVD PRIORITY 1) LINE (pin jack)×2
Reference output: 309 mVrms
FS: 2 Vrms (1 kHz, 0 dB)
Output impedance: 1 kΩ
(Load impedance: 10 kΩ)

Number of channels: (for DVD)
Recording: 2 channels
Playback: 2 channels

Number of track: (for VHS)
HiFi: 2 track
Normal: 1 track

Digital Output:
(for DVD PRIORITY 1) Digital audio optical output connector×1
(PCM, Dolby Digital, DTS)

VHS

Recording format: VHS Video Cassette System Standard with FM audio
Heads: 4 Helical Scan Heads for Video
2 Helical Scan Heads for FM audio
1 Fixed Head for Normal audio

Tape Speed/Recording Time:
SP: 23.39 mm/s, 240 min (with E-240 cassette)
LP: 11.7 mm/s, 480 min (with E-240 cassette)
EP: 7.8 mm/s, 720 min (with E-240 cassette)

FF/REW Time: FF/REW: Approx. 60 s (with E-180 cassette)
Jet RW: Approx. 50 s (with E-180 cassette)

DV Input: IEEE 1394 Standard, 4 Pin×1

Region code
For Asia
3
For Australia and New Zealand
4
For the Middle East
2

Clock unit: Quartz-controlled 24-hour digital display

Operating temperature range:
5 °C to 40 °C (41 °F to 104 °F)

Operating humidity range:
10% to 80% RH (no condensation)

Dimensions: Approx. 430 mm (W)×84 mm (H)×343 mm (D)

Mass: Approx. 5.4 kg

DVD (DivX), CD (DivX):
DivX 3.11, 4.x, 5.x
GMC (Global Motion Compensation) is not supported

DVD (DivX), CD (DivX): Common items
Maximum number of folders:
300 Recognizable folders per disc on this unit
(including the root folder)
Maximum number of files:
200 Recognizable DivX files per disc on this unit※1

CD (MP3):
Format: ISO9660 level 1 or 2 (except for extended formats), Joliet
Compatible compression rate:
32 kbps to 320 kbps
Compatible sampling rate:
16 kHz, 22.05 kHz, 24 kHz, 32 kHz, 44.1 kHz, 48 kHz
This unit is not compatible with ID3 tags

CD (JPEG):
Format: ISO9660 level 1 or 2 (except for extended formats), Joliet
Compatible pixels:
Between 34 x 34 and 6144 x 4096 pixels
Sub Sampling 4:2:2 or 4:2:0
This unit is not compatible with MOTION JPEG

CD (MP3), CD (JPEG): Common items
Maximum number of folders:
300 Recognizable folders per disc on this unit
(including the root folder)
Maximum number of MP3 files:
3000 Recognizable MP3 files per disc on this unit※1
Maximum number of JPEG files:
3000 Recognizable JPEG files per disc on this unit※1
Compatible pixels:
Between 34 x 34 and 6144 x 4096 pixels
This unit is compatible with multi-session.
This unit is not compatible with packet writing.

※1 Total number of recognizable files including MP3, JPEG, DivX and other type of files is 4000.

Quick Start for Recording (Quick Start: ON)
1 Sec. Quick Start for Recording on DVD-RAM*
* From the power off state, recording on DVD-RAM starts about 1 second after first pressing the Power button and then sequentially pressing the REC button (Quick Start Mode).

Note

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

(For EE)

Power supply:	AC 220 V to 240 V, 50Hz		
Power consumption:	Approx. 26 W		
Standby mode:		Display ON	Display Off
Quick Start On	Approx.	7.0 W	6.8 W
Quick Start Off	Approx.	2.6 W	2.5 W

Recordable discs:

DVD-RAM: Ver. 2.0
Ver. 2.1/3X-SPEED DVD-RAM Revision 1.0
Ver. 2.2/5X-SPEED DVD-RAM Revision 2.0

DVD-R: for General Ver. 2.0
for General Ver. 2.0/4X-SPEED DVD-R Revision 1.0
for General Ver. 2.x/8X-SPEED DVD-R Revision 3.0
for General Ver. 2.x/16X-SPEED DVD-R Revision 6.0
for DL Ver. 3.0
for DL Ver. 3.x/4X-SPEED DVD-R for DL Revision 1.0

DVD-RW: Ver. 1.1
Ver. 1.1/2X-SPEED DVD-RW Revision 1.0
Ver. 1.2/4X-SPEED DVD-RW Revision 2.0

+R: Ver. 1.0/2.4X-SPEED
Ver. 1.1/4X-SPEED
Ver. 1.2/8X-SPEED
Ver. 1.3/16X-SPEED
for DL Ver. 1.0/4X-SPEED

+RW: Ver. 1.1
Ver. 1.2/4X-SPEED

Recording system:

DVD-RAM: DVD Video Recording format
DVD-R: DVD-Video format
DVD-R DL (Dual Layer):
DVD-Video format
DVD-RW: DVD-Video format
+R
+R DL (Double Layer)
+RW

Recording time:

Max. 8 hours (using 4.7 GB disc)
XP: Approx. 1 hour SP: Approx. 2 hours
LP: Approx. 4 hours EP: Approx. 6 hours or 8 hours

Playable discs:

DVD-RAM: DVD Video Recording format
DVD-R: DVD-Video format, MP3, JPEG, DivX
DVD-R DL (Dual Layer):
DVD-Video format
DVD-RW: DVD-Video format, DVD Video Recording format
+R
+R DL (Double Layer)
+RW
DVD-Video, DVD-Audio
CD-Audio (CD-DA), Video CD
CD-R/CD-RW (CD-DA, Video CD, SVCD, MP3, JPEG, DivX formatted disc)
SVCD

Optical pick-up:

System with 1 lens, 2 integration units
(662 nm wavelength for DVDs, 780 nm wavelength for CDs)

LASER Specification:

Class 1 LASER Product
Wave Length: 780 nm (CDs)
662 nm (DVDs)
Laser Power: No hazardous radiation is emitted with the safety protection

Television system:

TV system: PAL system, 625 lines, 50 fields
NTSC system, 525 lines, 60 fields

Antenna reception input:

VHF: CH R1 to R12 (PAL-DK, SECAM-DKK1),
E2 toE12 (PAL-BGH, SECAM-BG),
CH 1 to 12 (PAL-D)
75 ohm

UHF: CH 21 to 69 (PAL-DK, SECAM-DKK1),
E21 to E69 (PAL-BGH, SECAM-BG, PAL-I),
CH 13 to 57 (PAL-D)
75 ohm

CATV: CH 44 MHz to 470 MHz (PAL-DK, SECAM-DKK1),
CH S01 to S05, M1 to M10, U1 to U10, S21 to S41
(PAL-BGH, SECAM-BG) (PAL-D)
75 ohm

Video system:

Recording system: (for DVD)
MPEG2 (Hybrid VBR)

Input:	LINE (pin jack)×2		1.0 Vp-p; 75 Ω
	S connector×2	Y:	1.0 Vp-p; 75 Ω
		C:	0.286 Vp-p; 75 Ω
Output:			
	LINE (pin jack)×2		1.0 Vp-p; 75 Ω
(for DVD PRIORITY 1)	S connector×1	Y:	1.0 Vp-p; 75 Ω
		C:	0.286 Vp-p; 75 Ω
Component video output:			
(for DVD PRIORITY)	Y, PB, PR ×1	Y:	1.0 Vp-p; 75 Ω
	(480i/480p) NTSC	PB:	0.7 Vp-p; 75 Ω
	(567i/567p) PAL	PR:	0.7 Vp-p; 75 Ω

Audio system:

Recording system: (for DVD)
Dolby Digital (2 ch)

Analog Input: LINE (pin jack)×2
Reference input: 309 mVrms
FS: 2 Vrms (1 kHz, 0 dB)
Input impedance: 22 kΩ

Analog Output:
(for DVD PRIORITY 1) LINE (pin jack)×2
Reference output: 309 mVrms
FS: 2 Vrms (1 kHz, 0 dB)
Output impedance: 1 kΩ
(Load impedance: 10 kΩ)

Number of channels: (for DVD)
Recording: 2 channels
Playback: 2 channels

Number of track: (for VHS)
HiFi: 2 track
Normal: 1 track

Digital Output:
(for DVD PRIORITY 1) Digital audio optical output connector×1
(PCM, Dolby Digital, DTS)

VHS

Recording format: VHS Video Cassette System Standard with FM audio

Heads: 4 Helical Scan Heads for Video
2 Helical Scan Heads for FM audio
1 Fixed Head for Normal audio

Tape Speed/Recording Time:
SP: 23.39 mm/s, 240 min (with E-240 cassette)
LP: 11.7 mm/s, 480 min (with E-240 cassette)
EP: 7.8 mm/s, 720 min (with E-240 cassette)

FF/REW Time: FF/REW: Approx. 60 s (with E-180 cassette)
Jet RW: Approx. 50s (with E-180 cassette)

DV Input: IEEE 1394 Standard, 4 Pin×1

Region code 5

Clock unit: Quartz-controlled 24-hour digital display

Operating temperature range:
5 °C to 40 °C (41 °F to 104 °F)

Operating humidity range:
10% to 80% RH (no condensation)

Dimensions: Approx. 430 mm (W)×84 mm (H)×343 mm (D)

Mass: Approx. 5.4 kg

DVD (DivX), CD (DivX):
DivX 3.11, 4.x, 5.x
GMC (Global Motion Compensation) is not supported

DVD (DivX), CD (DivX): Common items
Maximum number of folders:
300 Recognizable folders per disc on this unit
(including the root folder)
Maximum number of DivX files:
200 Recognizable DivX files per disc on this unit※1

DVD (MP3), CD (MP3):
Format: ISO9660 level 1 or 2 (except for extended formats), Joliet
Compatible compression rate:
32 kbps to 320 kbps
Compatible sampling rate:
16 kHz, 22.05 kHz, 24 kHz, 32 kHz, 44.1 kHz, 48 kHz
This unit is not compatible with ID3 tags

DVD (JPEG) CD (JPEG):
Format: ISO9660 level 1 or 2 (except for extended formats), Joliet
Compatible pixels:
Between 34 x 34 and 6144 x 4096 pixels
Sub Sampling 4:2:2 or 4:2:0
This unit is not compatible with MOTION JPEG

DVD (MP3) DVD (JPEG), CD (MP3), CD (JPEG): Common items
Maximum number of folders:
300 Recognizable folders per disc on this unit
(including the root folder)
Maximum number of MP3 files:
3000 Recognizable MP3 files per disc on this unit※1
Maximum number of JPEG files:
3000 Recognizable JPEG files per disc on this unit※1
Compatible pixels:
Between 34 x 34 and 6144 x 4096 pixels
This unit is compatible with multi-session.
This unit is not compatible with packet writing.

※1 Total number of recognizable files including MP3, JPEG, DivX and other type of files is 4000.

SVCD:
Maximum number of folders:
IEC62107
This unit is not compatible with "ChaojiVCD" available on the market including CVD, DVCD and SVCD that do not conform to IEC62107.

Quick Start for Recording (Quick Start: ON)
1 Sec. Quick Start for Recording on DVD-RAM*
* From the power off state, recording on DVD-RAM starts about 1 second after first pressing the Power button and then sequentially pressing the REC button (Quick Start Mode).

Note

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

7 Accessories

Note : Refer to Replacement Parts List (Section 22) for the part number.

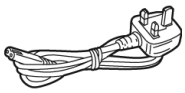
Remote control (For GC/GCS)

Remote control (For GN)

Remote control (For EE)

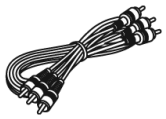
AC Cord (For GN)

AC Cord (For GC/GCS/EE)



AC Cord (For GC)

RF coaxial cable

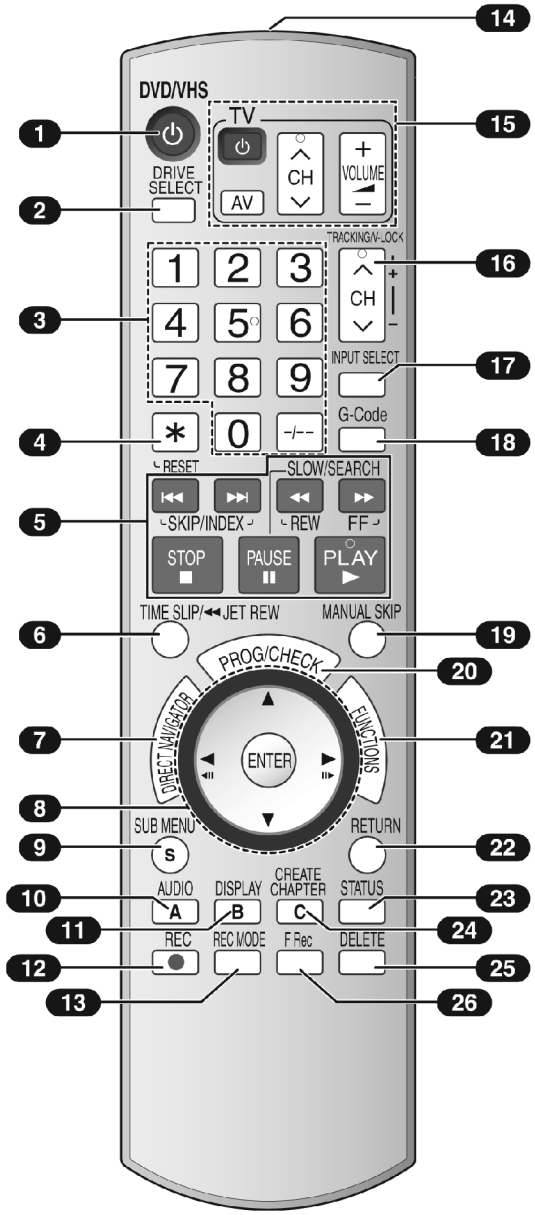


Audio/Video cable

8 Operation Instructions Procedures

8.1. Remote Control Operation (For GN/GC/GCS)

Remote control



■ [DRIVE SELECT] button ❷

DVD

- Before performing DVD operations, be sure to press [DRIVE SELECT] to select the DVD. Also, make sure the DVD indicator lights up on the unit.

VHS

- Before performing VHS operations, be sure to press [DRIVE SELECT] to select the VHS. Also, make sure the VHS indicator lights up on the unit.

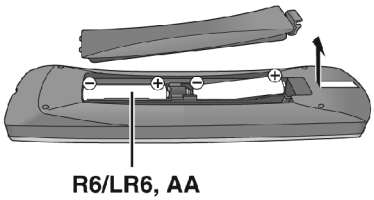
❶ **Turn the unit on**
❷ **Select drive (DVD or VHS)**
❸ **Select channels and title numbers etc./Enter numbers**
❹ **Cancel/Reset the tape counter**
❺ **Basic operations for recording and play**
❻ **Skip the specified time**
Jet rewind button (◀◀JET REW)
❼ **Show Top menu/Direct Navigator**
❽ **Selection/Enter, Frame-by-frame**
❾ **Show sub menu**
❿ **Select audio/Release and put in standby/**
Delete a program position
⓫ **Show DISPLAY menu**
Add a blank programme position
⓬ **Start recording**
⓭ **Change recording mode**
⓮ **Transmission window**
⓯ **TV operations**
⓰ **Channel select**
TRACKING/V-LOCK
⓱ **Input select (AV1, AV2 and DV)**
⓲ **For Australia and New Zealand Show G-CODE screen**
⓳ **Skip 30 seconds forward**
⓴ **Show timer recording programming screen**
㉑ **Show FUNCTIONS window**
㉒ **Return to previous screen**
㉓ **Show status messages**
㉔ **Create chapters/Move a programme position**
㉕ **Delete items**
㉖ **Start Flexible Recording**

Notes

- To stop them from being pressed accidentally, buttons such as [●, REC] do not protrude as much as other buttons.
- The word "button" is not used in these operating instructions so "Press the [ENTER] button." is shown as "Press [ENTER]."
- You can use this remote control to operate your TV if you set the TV manufacturer code.

■ About batteries

- Insert so the poles (+ and −) match those in the remote control.
- Do not use rechargeable type batteries.



R6/LR6, AA

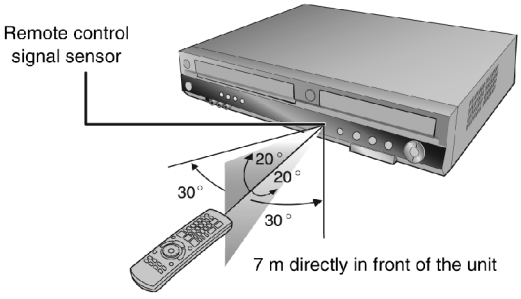
Do not:

- mix old and new batteries.
- use different types at the same time.
- heat or expose to flame.
- take apart or short circuit.
- attempt to recharge alkaline or manganese batteries.
- use batteries with the covering peeled off.

Mishandling of batteries can cause electrolyte leakage which can damage items the fluid contacts and may cause a fire.
Remove the batteries if the remote control is not going to be used for a long period of time. Store in a cool, dark place.

■ How to use the remote control

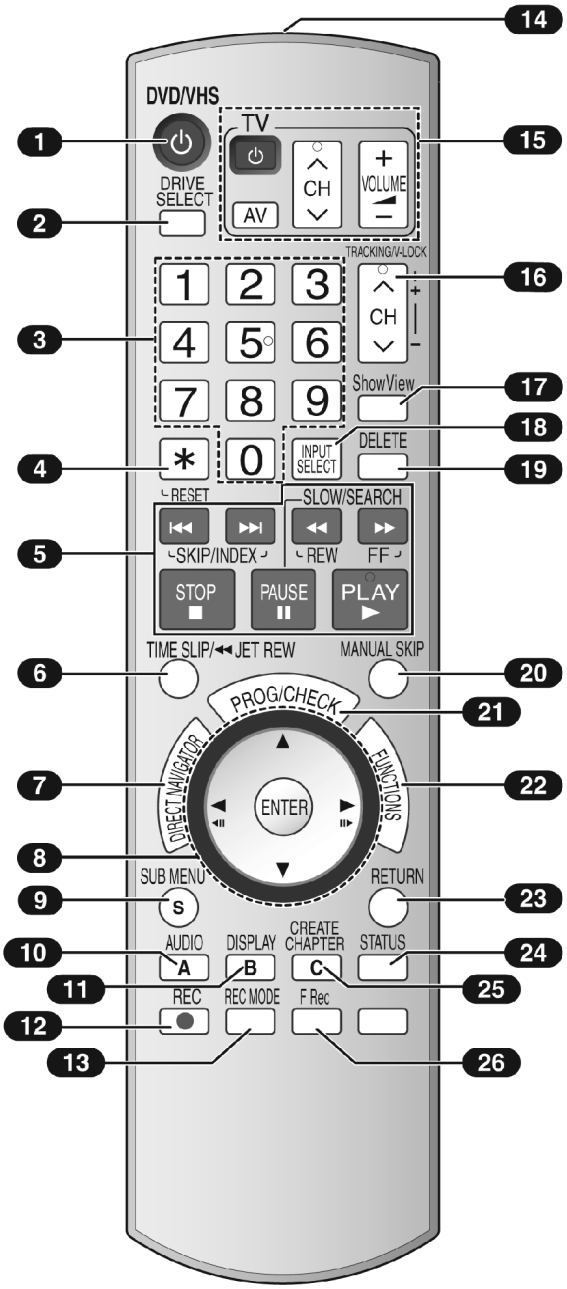
Aim at the sensor, avoiding obstacles, at a maximum range of 7 m directly in front of the unit.



Notes

- Keep the transmission window and the unit's sensor free from dust.
- Operation can be affected by strong light sources, such as direct sunlight, inverter fluorescent lamps and the glass doors on cabinets.
- If you cannot operate the unit or TV using the remote control after changing the batteries, please re-enter the codes.

8.2. Remote Control Operation (For EE)



■ [DRIVE SELECT] button 2

DVD

- Before performing DVD operations, be sure to press [DRIVE SELECT] to select the DVD. Also, make sure the DVD indicator lights up on the unit.

VHS

- Before performing VHS operations, be sure to press [DRIVE SELECT] to select the VHS. Also, make sure the VHS indicator lights up on the unit.

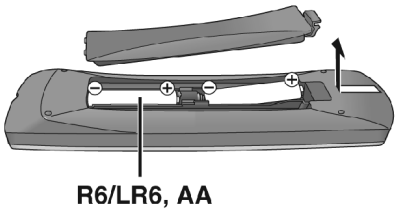
1. **Turn the unit on**
2. **Select drive (DVD or VHS)**
3. **Select channels and title numbers etc./Enter numbers**
4. **Cancel/Reset the tape counter**
5. **Basic operations for recording and play**
6. **Skip the specified time**
   Jet rewind button (◀◀JET REW)
7. **Show Top menu/Direct Navigator**
8. **Selection/Enter, Frame-by-frame**
9. **Show sub menu**
10. **Select audio**
    Release and put in standby
    Delete a program position
11. **Show DISPLAY menu**
    Add a blank programme position
12. **Start recording**
13. **Change recording mode**
14. **Transmission window**
15. **TV operations**
16. **Channel select**
    TRACKING/V-LOCK
17. **Show SHOWVIEW screen**
18. **Input select (AV1, AV2 and DV IN)**
19. **Delete items**
20. **Skip 30 seconds forward**
21. **Show timer recording programming screen**
22. **Show FUNCTIONS window**
23. **Return to previous screen**
24. **Show status messages**
25. **Create chapters**
    Move a programme position
26. **Start Flexible Recording**

Notes

- Buttons such as [●, REC] do not protrude as much as other buttons to stop them from being pressed accidentally.
- The word "button" is not used in these operating instructions so "Press the [ENTER] button." is shown as "Press [ENTER]."
- You can use this remote control to operate your TV if you set the TV manufacturer code.

■ About batteries

- Insert so the poles (+ and −) match those in the remote control.
- Do not use rechargeable type batteries.



R6/LR6, AA

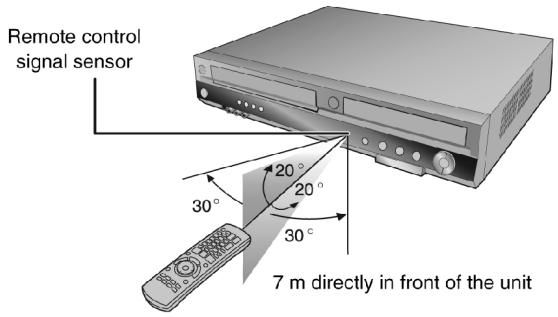
Do not:

- mix old and new batteries.
- use different types at the same time.
- heat or expose to flame.
- take apart or short circuit.
- attempt to recharge alkaline or manganese batteries.
- use batteries if the covering has been peeled off.

Mishandling of batteries can cause electrolyte leakage which can damage items the fluid contacts and may cause a fire.
Remove if the remote control is not going to be used for a long period of time. Store in a cool, dark place.

■ How to use the remote control

Aim at the sensor, avoiding obstacles, at a maximum range of 7 m directly in front of the unit.

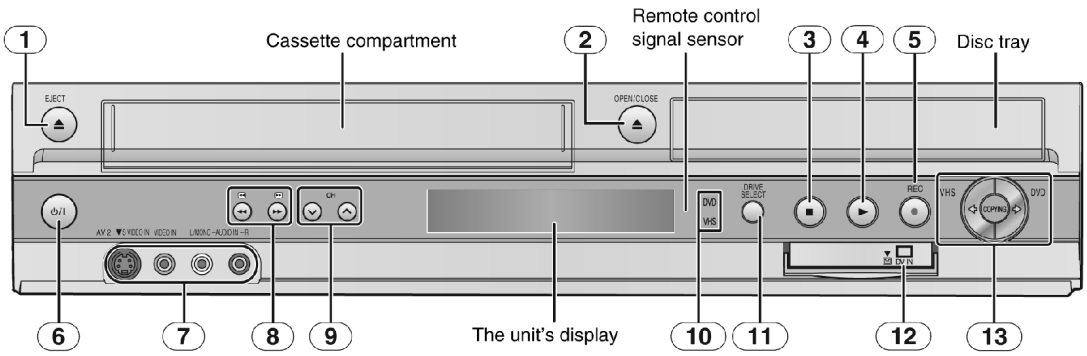


Notes

- Keep the transmission window and the unit's sensor free from dust.
- Operation can be affected by strong light sources, such as direct sunlight, inverter fluorescent lamps and the glass doors on cabinets.
- If you cannot operate the unit or TV using the remote control after changing the batteries, please re-enter the codes.

8.3. Main Unit Operation

Main unit



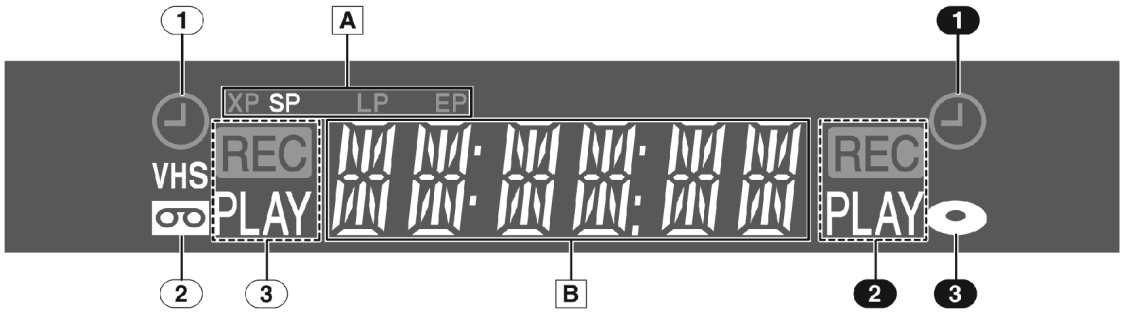
(1) **Cassette eject button (⏏, EJECT)**
(2) **Disc tray open/close button (⏏, OPEN/CLOSE)**
(3) **Stop button (■)**
(4) **Play button (▶)**
(5) **Recording button (●, REC)**
(6) **Standby/on switch (⏻/I)**
Press to switch the unit from on to standby mode or vice versa.
In standby mode, the unit is still consuming a small amount of power.
(7) **AV2 input terminals (AV2)**
(8) **DVD-SEARCH**
VHS-REW/FF buttons (◀◀, ▶▶)
(9) **Channel up/down**
Tracking/V-Lock buttons (CH, ∨, ∧)
(10) **DVD/VHS drive indicator**
- Lights when the DVD or VHS drive is selected.

(11) **DRIVE SELECT button**
- The selected drive changes each time you press [DRIVE SELECT].

(12) **Connector for a digital video (DV) camcorder**
(13) **One Touch Transfer (copying) operation button**
- **From VHS to DVD**
- **From DVD to VHS**

8.4. Main Unit Panel Display

The unit's display



Common to DVD/VHS

A Recording mode indicator

DVD:

- XP SP LP EP (all on): FR mode

VHS:

- SP: When recording or playing in Normal mode.
- LP: When recording or playing in Long play mode.
- EP: When recording or playing in Extra long play mode.

B Main display

- Current time
- Disc recording and play counter
- VHS recording and play counter
- Miscellaneous messages, etc.

VHS

(1) Timer recording indicator (🕘)

On:
When a timer recording programme is registered and a recordable video cassette is inserted.

Flashes:
When the unit cannot record a timer recording programme (e.g. there is no video cassette, etc.).

(2) Tape indicator

(3) Tape operation status

DVD

❶ Timer recording indicator (🕘)

On:
When a timer recording programme is registered and a recordable disc is inserted.

Flashes:
When the unit cannot record a timer recording programme (e.g. there is no disc, etc.).

❷ Disc operation status

❸ Disc indicator

8.5. Disc Information

8.5.1. Discs for recording & play

Discs you can use for recording and play [12 cm/8 cm]

Disc type	DVD-RAM ●4.7 GB/9.4 GB, 12 cm ●2.8 GB, 8 cm	DVD-R ●4.7 GB, 12 cm ●1.4 GB, 8 cm	DVD-R DL*1 (dual layer on single side) ●4.7 GB, 12 cm	DVD-RW ●4.7 GB, 12 cm ●1.4 GB, 8 cm	+R*2 ●4.7 GB, 12 cm	+R DL*1 (double layer on single side) ●4.7 GB, 12 cm	+RW ●4.7 GB, 12 cm
Logo					–	–	–
Indicated in these instructions with	RAM	-R before finalization DVD-V after finalization	-R DL before finalization DVD-V after finalization	-RW(V) before finalization DVD-V after finalization	+R before finalization DVD-V after finalization	+R DL before finalization DVD-V after finalization	+RW
Recording format	DVD Video Recording format	DVD-Video format			+VR format		
Main use*3	Re-writable discs	One time recording discs (recordable until the disc is full)	One time recording discs (recordable until the disc is full)	Re-writable discs	One time recording discs (recordable until the disc is full)	One time recording discs (recordable until the disc is full)	Re-writable discs
Compatibility							
Usable high speed recording disc*4	Up to 5x	Up to 16x	Up to 4x	Up to 6x	Up to 16x	Up to 2.4x	Up to 4x*5
Play on other player	Only on DVD-RAM compatible players. (It is not possible to finalize the disc.)	Only after finalizing the disc.	Only after finalizing the disc*6.	Only after finalizing the disc.	Only after finalizing the disc.	Only after finalizing the disc.	Yes. (It is not possible to finalize the disc.)
What you can do on this unit (√: Possible, ×: Impossible)							
Chasing playback	√	×	×	×	×	×	×
Recording broadcasts that allow one copy	√ *7	×	×	×	×	×	×
Recording both M 1 and M 2 of bilingual broadcast	√	× Only one is recorded. Bilingual Audio Selection	× Only one is recorded. Bilingual Audio Selection	× Only one is recorded. Bilingual Audio Selection	× Only one is recorded. Bilingual Audio Selection	× Only one is recorded. Bilingual Audio Selection	× Only one is recorded. Bilingual Audio Selection
Recording 16:9 aspect picture	√	× (The picture is recorded in 4:3 aspect.)	× (The picture is recorded in 4:3 aspect.)	× (The picture is recorded in 4:3 aspect.)	× (The picture is recorded in 4:3 aspect.)	× (The picture is recorded in 4:3 aspect.)	× (The picture is recorded in 4:3 aspect.)
Entering text	√	√	√	√	√	√	√
Deleting titles	√	√ (Available space does not increase after deleting.)	√ (Available space does not increase after deleting.)	√ (Disc space increases only when the last recorded title is deleted.)	√ (Available space does not increase after deleting.)	√ (Available space does not increase after deleting.)	√ (Disc space increases only when the last recorded title is deleted.)
Creating playlists	√	×	×	×	×	×	×

*1 You can record onto the second layer of dual- or double-layer discs after closing the first layer. However you will no longer be able to record to the first layer.

*2 You may not be able to use +R recorded on this unit in another Panasonic DVD recorder and vice versa. Once the disc is finalized, however, it can be played in the other unit.

*3 The amount of the recordable disc space does not increase even if the program is deleted when you use a one time recording disc.

*4 This unit can use the high-speed recording discs shown in the chart, but using them will not shorten the recording time.

*5 It is possible to play 8x recording speed discs recorded on other equipment.

*6 Playable on DVD-R DL compatible equipment.

*7 CPRM (compatible discs only)

- The explanations concerning discs are indicated by DVD and those concerning video cassettes are indicated by VHS.
- We recommend using Panasonic discs. We recommend using DVD-RAM discs with cartridges to protect them from scratches and dirt.
- Discs from other manufactures may not be recorded or played due to the condition of the recording.
- You cannot record programmes that allow "One time only recording" to CPRM compatible DVD-R, DVD-R DL and DVD-RW on this unit. You can record other programmes in the DVD-Video format.
- You can use high speed recording compatible discs on this unit.
- This unit cannot record to discs containing both PAL and NTSC signals. Play of discs recorded with both PAL and NTSC on another unit is not guaranteed.

The manufacturer accepts no responsibility and offers no compensation for loss of recorded or edited material due to a problem with the unit or recordable media, and accepts no responsibility and offers no compensation for any subsequent damage caused by such loss.
Examples of causes of such losses are

- A disc recorded and edited with this unit is played in a DVD Recorder or computer disc drive manufactured by another company.
- A disc used as described above and then played again in this unit.
- A disc recorded and edited with a DVD Recorder or computer disc drive manufactured by another company is played in this unit.

8.5.2. Discs for playing

Play-only discs [12 cm/8 cm]

Disc type	DVD-Video	DVD-Audio	DVD-RW (DVD Video Recording format)	CD		Video CD
Logo	DVD VIDEO / DVD VIDEO	DVD AUDIO	DVD RW	COMPACT disc DIGITAL AUDIO	–	COMPACT disc DIGITAL VIDEO
Indicated in these instructions with	DVD-V	DVD-A	-RW(VR)	CD		VCD
Instructions	High quality movie and music discs	High fidelity music discs ● Played on this unit in 2 channels	DVD-RW* recorded on another DVD Recorder ● You can play programmes that allow "One time only recording" if they have been recorded to a CPRM compatible disc. ● By formatting the disc, you can record to it in DVD-Video format and play it on the unit. It may be necessary to finalize the disc on the equipment used for recording.	Recorded audio and music (including CD-R/RW*)	CD-R* and CD-RW* with DivX video contents, music recorded in MP3 and still pictures (JPEG and TIFF).	Recorded music and video (including CD-R/RW*)

* Play may be impossible on some DVD-RW (DVD Video Recording format), CD-R or CD-RW discs due to the condition of the recording.

- You can play DivX video contents recorded on DVD-R and DivX video contents, still pictures (JPEG/TIFF), CD-DA, Video CD and MP3 format data recorded on CD-R/RW.
  Close the session or finalize the disc after recording on the computer.
- The producer of the disc can control how discs are played. So you may not always be able to control play as described in these operating instructions. Read the disc's instructions carefully.

Note about using a DualDisc

The digital audio content side of a DualDisc does not meet the technical specifications of the Compact Disc Digital Audio (CD-DA) format so play may not be possible.

Regarding DVD-Audio

Some multi-channel DVD-Audio will prevent down-mixing of all or part of their contents if this is the manufacturer's intention. Tracks that are prevented from being down-mixed will not play properly on this unit (e.g. audio is played from the front two channels only). Refer to the disc's jacket for more information.

Regarding recording formats

■ DVD Video Recording format

This is a recording method which allows you to record and edit TV broadcasts and so on.

- Digital broadcasts that allow "One time only recording" can be recorded to a CPRM compatible disc. You can record to CPRM compatible DVD-RAM on this unit.
- Play is only possible on a compatible DVD player.

Use a DVD-RAM to record in DVD Video Recording format.

■ DVD-Video format

This recording method is the same as commercially available DVD-Video.

- Digital broadcasts that allow "One time only recording" cannot be recorded.
- These can be played on a DVD player. However programmes recorded on this unit must be finalized to be played on other DVD players.

Use a DVD-R, DVD-R DL or DVD-RW to record in DVD-Video format.

■ +VR (+R/+RW Video Recording) format

This is a method for recording moving pictures to +R/+RW discs. You can play back discs recorded in this method in a similar way as contents recorded in the DVD-Video format.

- Digital broadcasts that allow "One time only recording" cannot be recorded.
- After finalizing the disc or creating the top menu, you can play the disc on DVD players and other equipment.

Discs that cannot be played

- 2.6/5.2 GB DVD-RAM, 12 cm
- 3.95/4.7 GB DVD-R for Authoring
- DVD-R recorded in DVD Video Recording format
- DVD-R (DVD-Video format), DVD-R DL, DVD-RW (DVD-Video format), +R, +R DL recorded on another unit and not finalized (Finalize)
- For Asia
  DVD-Video with a region number other than "3" or "ALL"
- For Australia and New Zealand
  DVD-Video with a region number other than "4" or "ALL"
- For the Middle East
  DVD-Video with a region number other than "2" or "ALL"
- Blu-ray, DVD-ROM, +R 8cm, CD-ROM, CDV, CD-G, Photo CD, CVD, SVCD, SACD, MV-Disc, PD, etc.

Concerning logo marks

DOLBY DIGITAL	**Dolby Digital** This is a method of coding digital signals developed by Dolby Laboratories. Not only stereo (2 channel) audio, these signals can also be multi-channel audio. A large amount of audio information can be recorded on one disc by this method.
DIGITAL dts SURROUND	**DTS Digital Surround** This surround system is used in many movie theatres around the world. The separation between channels is good and the compression ratio is low, so realistic sound effects are possible.

Which Disc Types is Playable on What TV

When you use a discs recorded in either PAL or NTSC, refer to this table.

TV type	Disc	Playable*1
Multi-system TV	PAL	√
	NTSC	√*2
NTSC TV	PAL	×
	NTSC	√*3
PAL TV	PAL	√
	NTSC	√*4(PAL 60)

*1 Playable (√: Possible, ×: Impossible)
*2 If you select "NTSC" in "TV System", the picture may be clearer.
*3 Select "NTSC" in "TV System".
*4 If your TV is not equipped to handle PAL 525/60 signals the picture will not be displayed correctly.

Optional accessories

(Product numbers correct as of April 2006. These may be subject to change.)

DVD-RAM

9.4 GB, double-sided, cartridge type:
LM-AD240ME (compatible with high speed recording 5×)
LM-AD240LE (compatible with high speed recording 3×)
4.7 GB, single-sided, cartridge type:
LM-AB120ME (compatible with high speed recording 5×)
LM-AB120LE (compatible with high speed recording 3×)
4.7 GB, single-sided, non-cartridge:
LM-AF120ME (compatible with high speed recording 5×)
LM-AF120LE (compatible with high speed recording 3×)

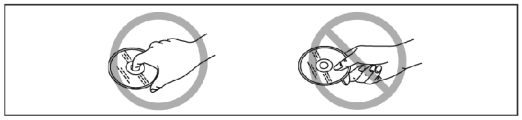
DVD-R

4.7 GB, single-sided, non-cartridge:
LM-RF120ME (compatible with high speed recording 8×)
LM-RF120LE (compatible with high speed recording 4×)

Disc handling

■ How to hold a disc

Do not touch the recorded surface.

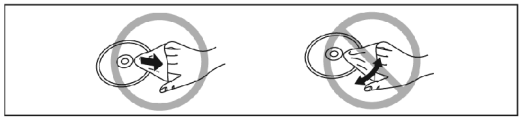


■ Concerning non-cartridge discs

Be careful about scratches and dirt.

■ If there is dirt or condensation on the disc

Wipe with a damp cloth and then wipe dry.



■ Handling precautions

- Do not attach labels or stickers to the discs. (This may cause disc warping and unbalanced rotation, rendering it unusable.)
- Write on the label side of the disc only with a soft, oil-based felt pen. Do not use ballpoint pens or other hard writing implements.
- Do not use record cleaning sprays, benzine, thinner, static electricity prevention liquids or any other solvent.
- Do not use scratch-proof protectors or covers.
- Do not drop, stack, or cause impact to discs. Do not place objects on them.
- Do not use the following discs:
  - Discs with exposed adhesive from removed stickers or labels (rental discs etc.).
  - Discs that are badly warped or cracked.
  - Irregularly shaped discs, such as heart shapes.

- Do not place in the following areas:
  - In direct sunlight.
  - In very dusty or humid areas.
  - Near a heater.
  - Locations susceptible to significant differences in temperature (condensation can occur).
  - Where static electricity or electromagnetic waves occur.
- To protect discs from scratches and dirt, return them to their cases or cartridges when you are not using them.

Maintenance

The precision parts in the unit are readily affected by the environment, especially temperature, humidity and dust. Cigarette smoke can also cause malfunction or breakdown.

To clean the unit, wipe with a soft, dry cloth.

- Never use alcohol, paint thinner or benzine to clean the unit.
- Before using chemically treated cloth, carefully read the instructions that came with the cloth.

Observe the following points to ensure continued listening and viewing pleasure.

Dust and dirt may adhere to the unit's lens over time, making it impossible to record or play discs.
Use the **DVD lens cleaner** about once every year depending on the frequency of use and the operating environment.
Carefully read the lens cleaner's instructions before use.

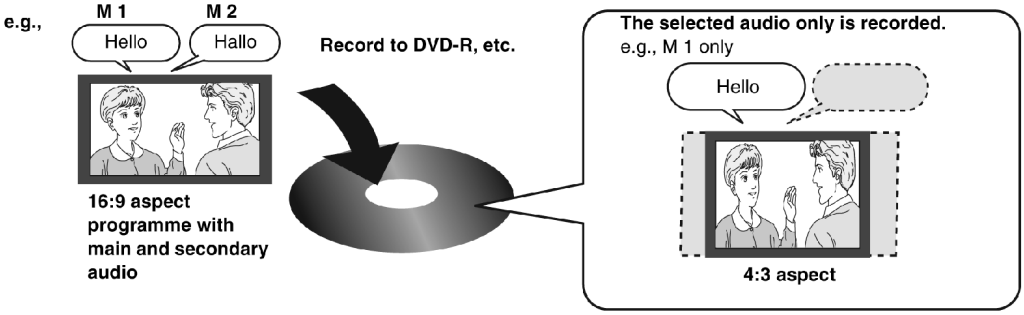
DVD lens cleaner: RP-CL720E

Using DVD-R, DVD-R DL, DVD-RW, +R, +R DL and +RW on this unit

Restrictions with DVD-R, etc.*

- 16:9 aspect programmes are recorded in 4:3 aspect.
- The main (M 1) or secondary audio (M 2) only can be recorded for bilingual broadcasts.
- Playing the disc on other DVD players is not possible before finalizing.

* DVD-R, DVD-R DL, DVD-RW, +R, +R DL and +RW are collectively referred to as "DVD-R, etc." on this page.



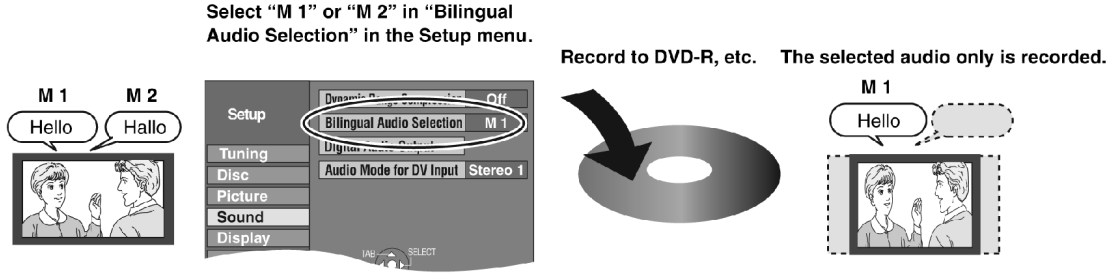
Therefore, follow the steps below when you use DVD-R, etc.

■ When recording a bilingual programme to DVD-R, etc.

Select the audio to record before recording or transferring (copying).

Some television programmes are broadcast with main (M 1) and secondary audio (M 2). You have to select the audio recording type before recording or transferring (copying) them to DVD-R, etc.

- When recording from a TV tuner



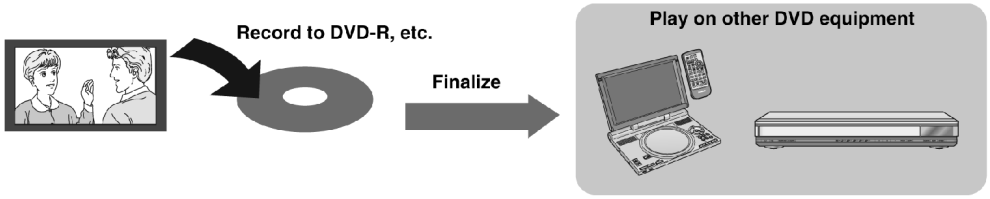
- When recording from the external equipment
  - Select M 1 or M 2 on the external equipment.

■ Playing the disc on other DVD players

The disc must be finalized after recording or transferring (copying).

It is necessary to finalize DVD-R, etc. on this unit after recording or transferring (copying) titles to them. You can then play them as a commercially sold DVD-Video. However the discs become play-only and you can no longer record or transfer (copy).*

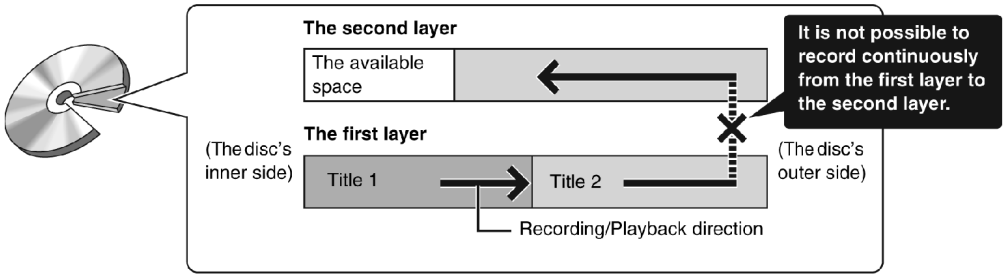
* You can record and transfer (copy) again if you format DVD-RW and +RW.



■ Recording to a DVD-R DL and +R DL

DVD-R DL and +R DL discs have two layers of recordable surfaces on one side.

It is not possible to record continuously from the first layer to the second layer. Recording stops when the space on the first layer becomes full. You must close the first layer to start recording on the second layer. Closing makes the first layer unavailable for recording (editing is still available). You cannot cancel closing. Make certain before proceeding



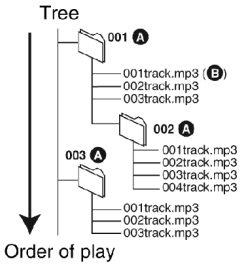
8.5.3. Data playable format (DivX, MP3, JPEG, TIFF)

Regarding DivX video contents, MP3 and still pictures (JPEG/TIFF)

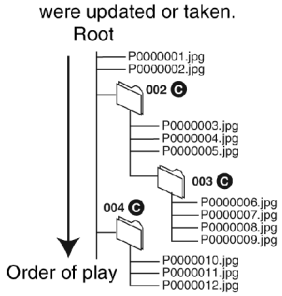
- Compatible formats: ISO9660 level 1 or 2 (except for extended formats) and Joliet
- This unit is compatible with multi-session but reading or play of the disc may take time if there are a lot of sessions.
- Operation may take time to complete when there are many files (tracks) and/or folders (groups) and some files (tracks) may not display or be playable.
- The English alphabet and Arabic numbers are displayed correctly. Other characters may not be displayed correctly.
- The display order on this unit may differ from how the order is displayed on a computer.
- Depending on how you create the disc (writing software), files (tracks) and folders (groups) may not play in the order you numbered them.
- This unit is not compatible with packet-write format.
- Depending on the recording, some items may not be playable.

- You can play MP3 and still pictures (JPEG/TIFF) on this unit by making folders as shown below. However depending on how you create the disc (writing software), play may not be in the order you numbered the folders.
- When the highest level folders are "DCIM" folders, they are displayed first on the tree.

Structure of MP3 folders
Prefix with 4-digit numbers in the order you want to play them.



Structure of still pictures (JPEG/TIFF)
Files inside a folder are displayed in the order they were updated or taken.



Ⓐ Folder = Group
Ⓑ File = Track
Ⓒ Folder

DivX[*1]

Playable discs	-R CD
File format	DivX ● Files must have the extension ".DIVX", ".divx", ".AVI" or ".avi".
Maximum number of folders	300 (including the root folder)
Maximum number of files	200[*2]
Supported version	DivX ver.2.11, 4.x, 5.x Video - Number of streams: 1 - Codec: DIV3, DIV4, DIX, DV50 - Picture size: 32 x 32 to 720 x 576 - FPS (Frames Per Second): Up to 30 fps Audio - Number of streams: Up to 8 - Format: MP3, Dolby Digital (AC3), MPEG - Multi channel: Dolby Digital (AC3) is possible, MPEG multi is 2 ch conversion.

MP3[*3]

Playable discs	CD
File format	MP3 ● Files must have the extension ".mp3" or ".MP3".
Maximum number of folders	300 (including the root folder)
Maximum number of files	3000[*2]
Bit rate	32 kbps to 320 kbps
Sampling frequency	16kHz/22.05 kHz/24 kHz/32kHz/44.1kHz/48 kHz

Still pictures (JPEG/TIFF)[*4][*5]

Playable discs	CD
File format	JPEG, TIFF[*4] (non-compressed RGB chunky format) ● Files must have the extension ".jpg", ".JPEG", ".tif" or ".TIF"
Number of pixels	34 x 34 to 6144 x 4096 (Sub sampling is 4:2:2 or 4:2:0)
Maximum number of folders	300 (including the root folder)
Maximum number of files	3000[*2]

[*1] GMC (Global Motion Compensation) is not supported.
[*2] The total number of recognizable DivX, MP3, JPEG and other types of files is 4000.
[*3] This unit is not compatible with ID3 tags.
[*4] The operation may take more time to complete when playing TIFF format still pictures.
[*5] MOTION JPEG is not supported.

8.6. ABOUT DivX

8.6.1. GENERAL

DivX is a new video compressing format that is applied

MPEG-4 technology to improve quality and the compressibility and it is developed by the DivXNetworks, Inc., Video file of high resolution and the high picture quality can be made thought it is a high compressibility.

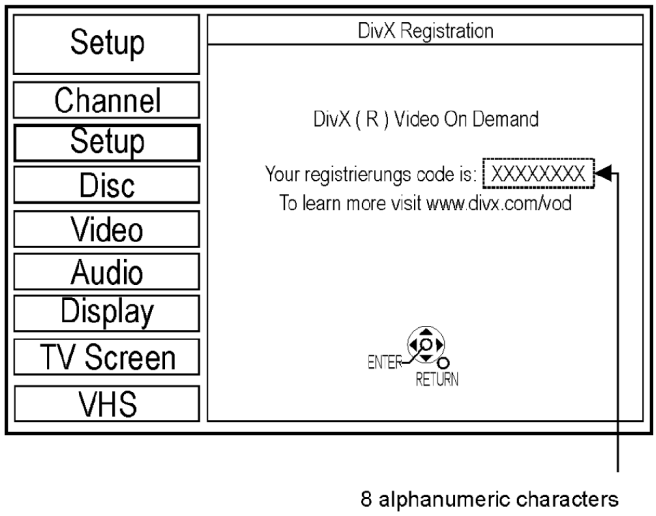
DivX codec is necessary for converting video to DivX file and playback files made.

8.6.2. OPERATING INSTRUCTIONS ABOUT DivX VIDEO-ON-DEMAND CONTENT

DivX Video-on-Demand (VOD) content is encrypted for copyright protection. In order to play DivX VOD content on this unit, you first need to register the unit.

Follow the online instructions for purchasing DivX VOD content to enter unit I s registration code and register unit. Visit www.divx.com/vod for mor information.

Display unitIs registration code:



8 alphanumeric characters

- We recommend that you make a note of this code for future reference.
- After playing DivX VOD content for first time, another registration code is then displayed in “DivX Registration”. do not use this registration code to purchase DivX VOD content. If you use this code to purchase DivX VOD content and the play content on this unit, you will no longer be able to play any content that you purchased using previous code.
- If you purchase DivX VOD content using a registration code different from this unitIs code, you will not be able to play this content. (“Authorization Error” is displayed.)

Some DivX VOD content can only be played a set number of times.

When you play this content, remaining number of plays is displayed. You cannot play this content when number of remaining plays is zero. (“Rental Expired” is displayed.)

When playing this content

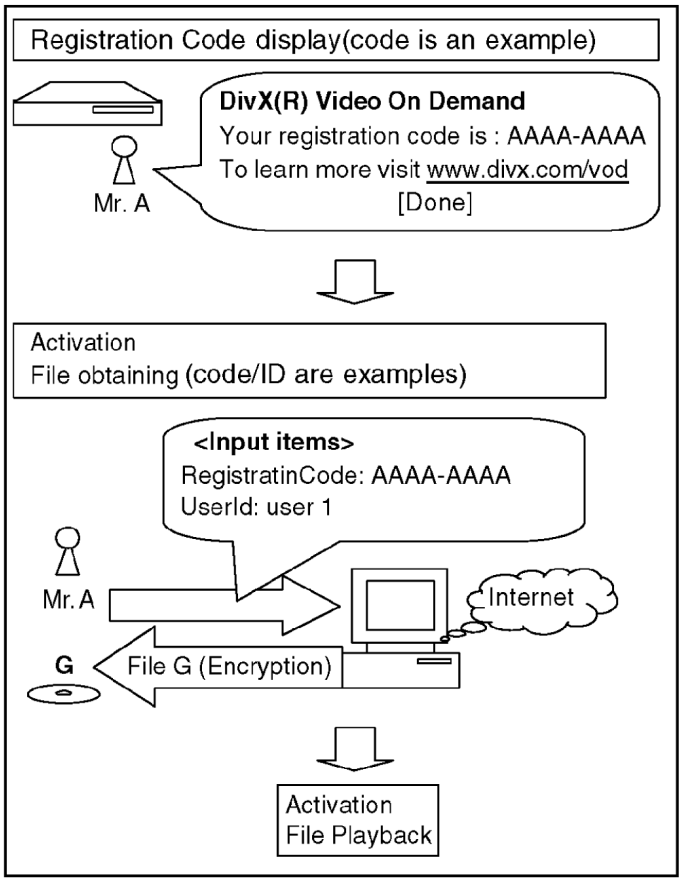
- Number of remaining plays is reduced by one if
  - – you press [POWER]
  - – you press [STOP]
  - – you press [backwards SKIP], [backwards SLOW / SEARCH] or [forwards SLOW / SEARCH] etc. and arrive at another content or start of content being played.
  - – scheduled [DRIVE SELECT] to change drive

* Resume functions do not work.

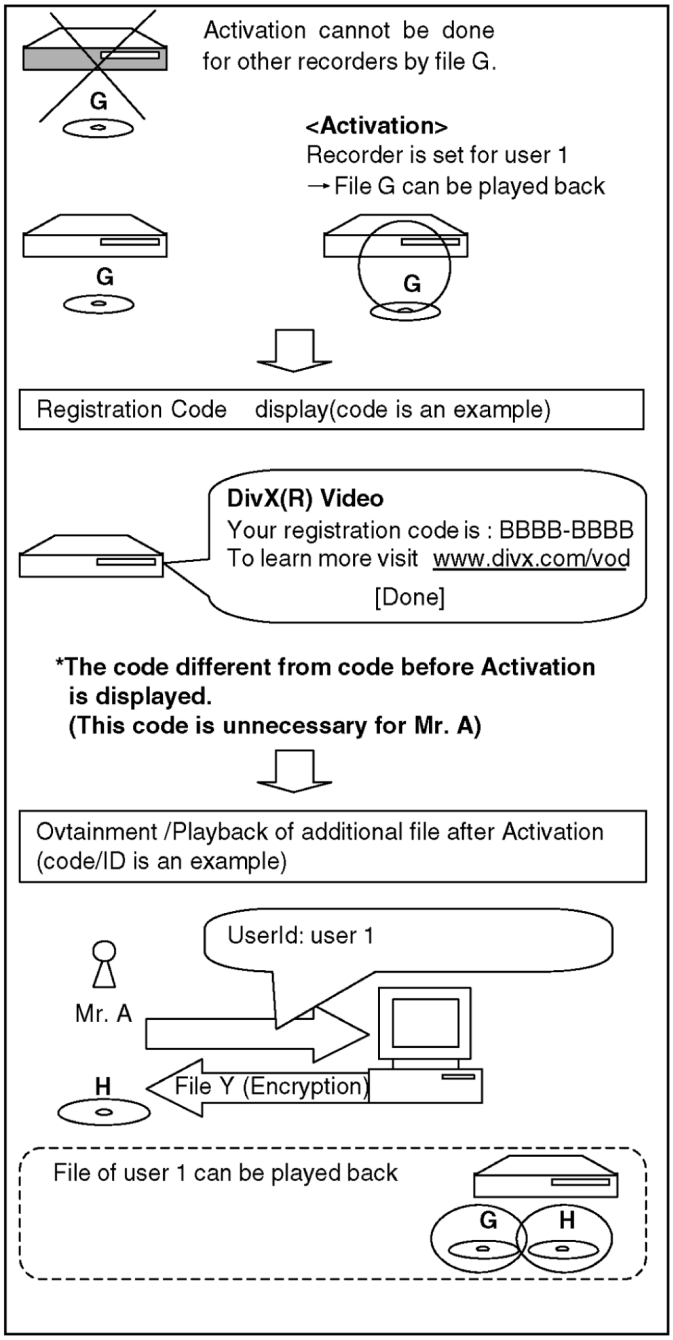
Typical Playback procedure of DivX VOD (Video On Demand):

Case 1	When DivX VOD is used newly.
Case 2	When EEPROM or P.C.B. includin EEPROM was replaced for repairing.
Case 3	When recorder was exchanged to another recorder for repairing.
Case 4	When customer own second recorder.
Case 5	When owner of recorder was changed to another.

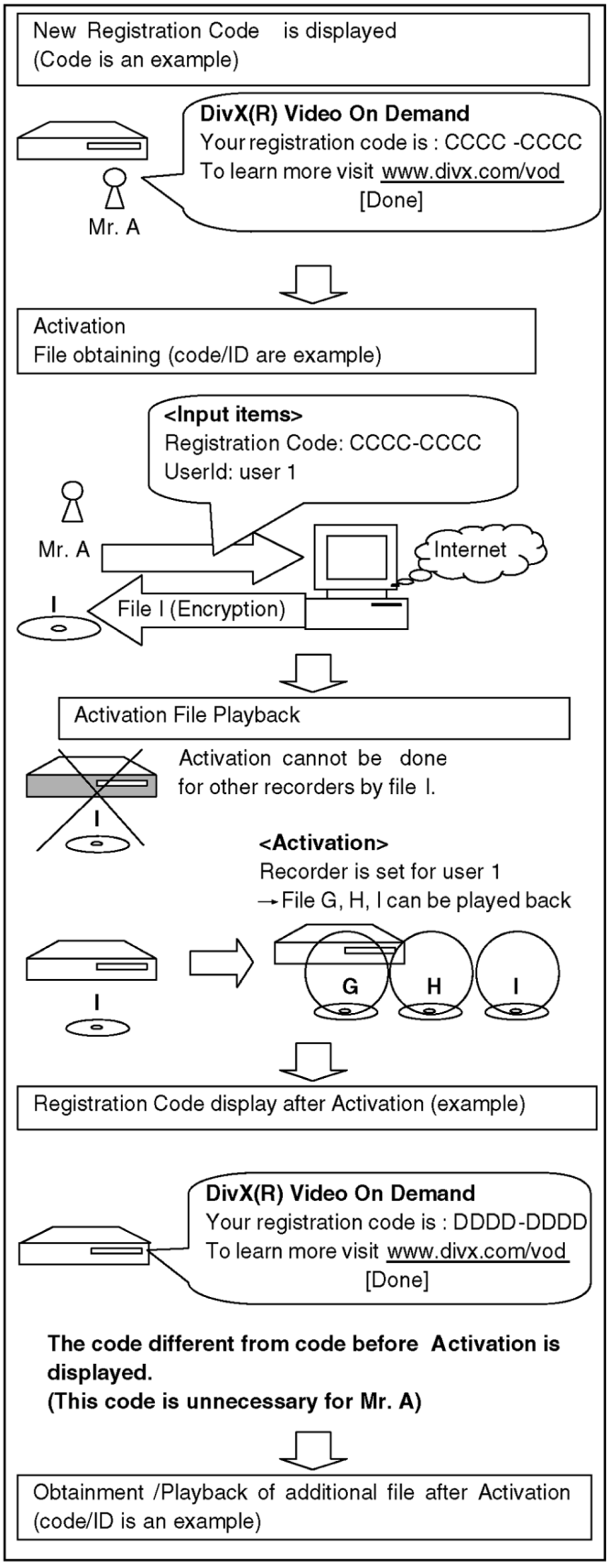
CASE 1 **WHEN DivX IS USED NEWLY**



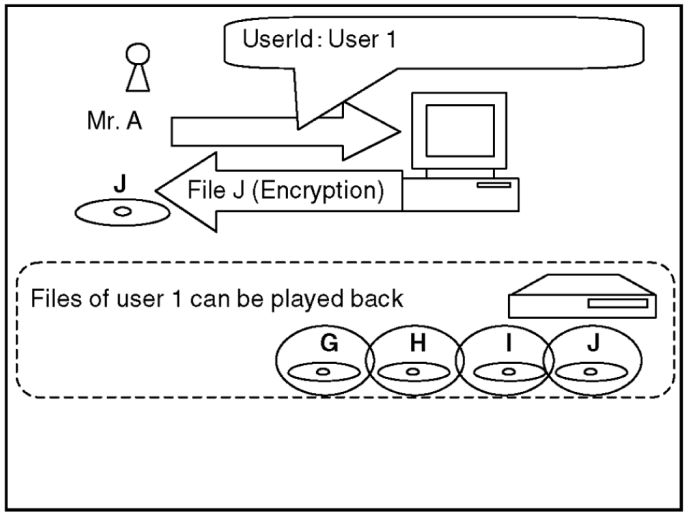
Case 1



CASE 2	WHEN EEPROM OR P.C.B. INCLUDING EEPROM WAS REPLACED FOR REPAIRING
CASE 3	WHEN RECORDER WAS EXCHANGED TO ANOTHER RECORDER FOR REPAIRING



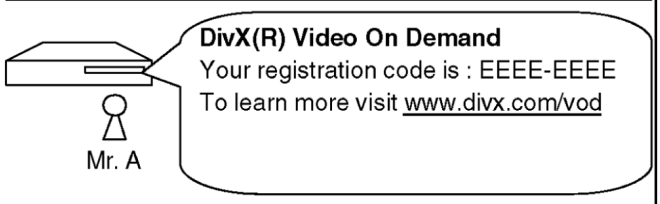
Case 2



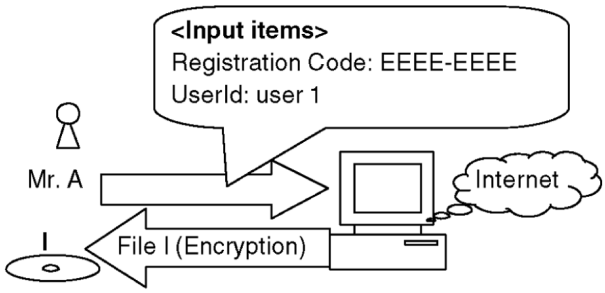
Case 3

CASE 4 **WHEN CUSTOMER OWN SECOND RECORDER**

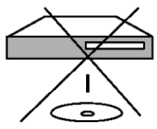
Registration Code display of sec ›nd recorder (code is an example)



Activation
File obtaining (code/ID are example)

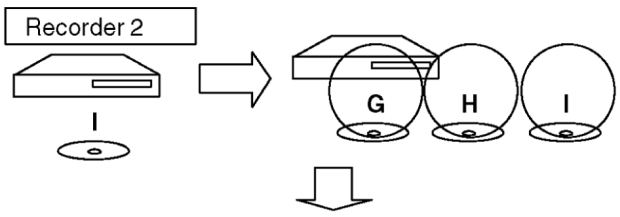


Activation
File Playback

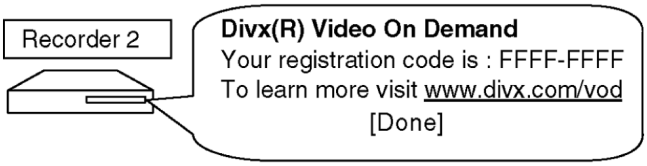


Activation cannot be done for other recorders by file I.

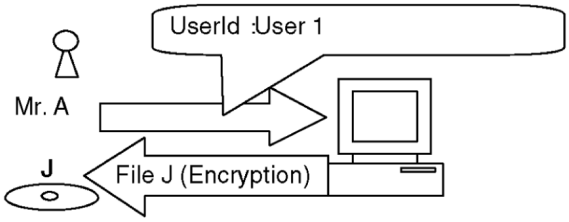
Recorder is set for user 2
→files G, H, I

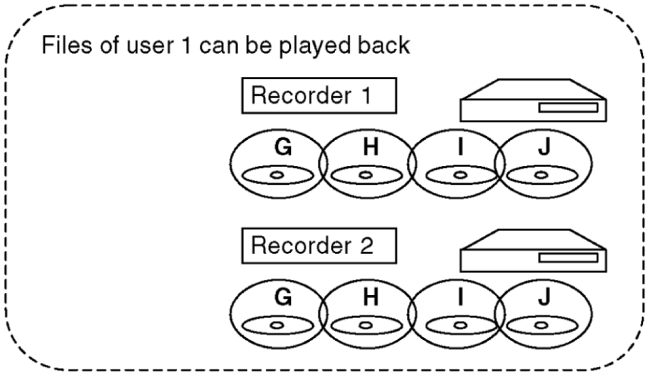


Registration Code display after Activation (example)



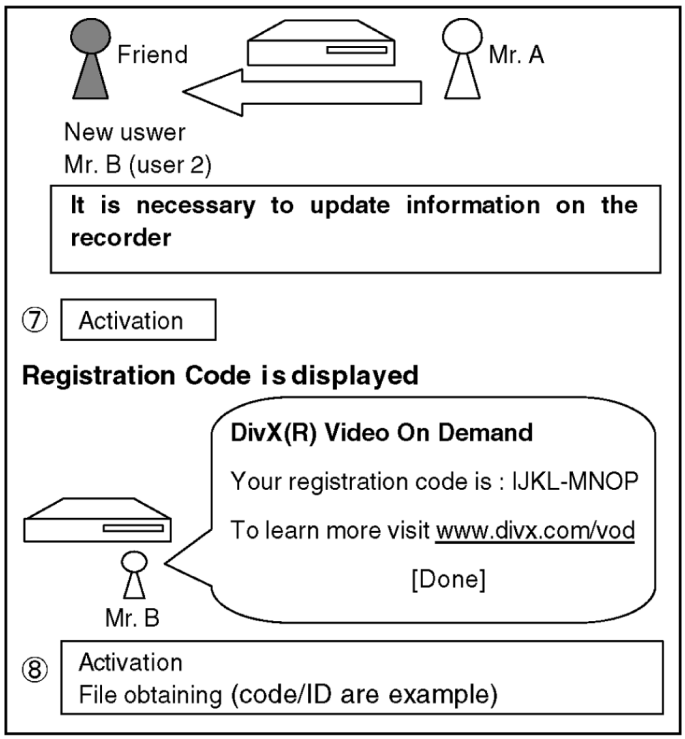
Obtainment /Playback of additional file after Activation (code/ID is an example)



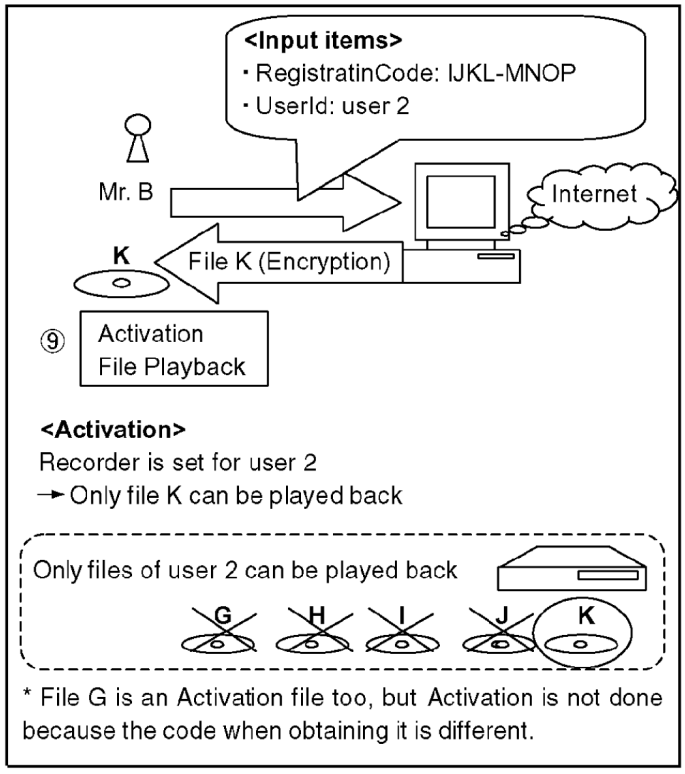


Case 4

CASE 5	WHEN OWNER OF RECORDER WAS CHANGED TO ANOTHER



Case 5



FILE KIND

(There are two kinf of Activation files as follows too.)

・Rental: There is a playback limitation

・Purchase: Unrestricted

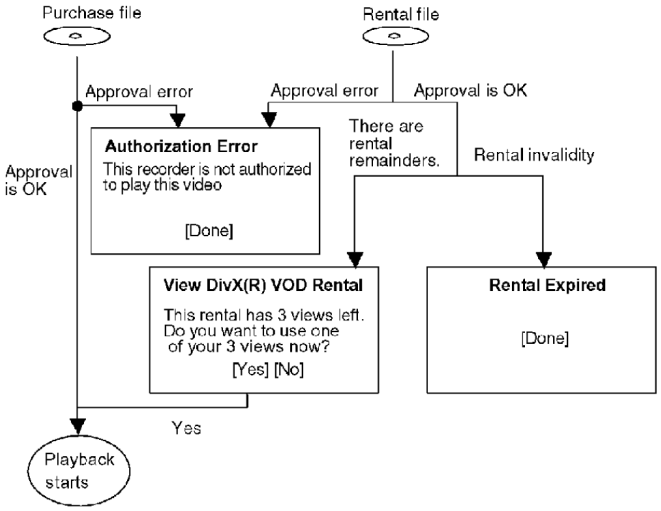
Also there is next file as DRM files besides the above-mentioned.

・Base:
It is not necessary to approve though the contents is being endode.
If it is recorder/player for DRM, any can play back. (It is the same as usual DivX file when seeing from user.)

SCREEN SHIFT (Error display)

Wheter approval is OK or not.

Wheter the recorder is corresponding to User information on the file or not.



8.6.3. ABOUT DivX DRM

Divx file includes file to which DRM(Digital Right Management) is applied and file not applied.

This item is a content that relates only in treating file

to which DRM is applied.

1. Registration Code display function
2. UserIs registration and approval function
3. Rental management function

1) Registration Code display function

Registration Code is alphanumeric character sequence

8 bytes inputted as recorder information, in case a use

purchases or renta DivX DRM file in a network.Registration code is a character sequence generated

at random, and differs in each recorder.Moreover, Registration code is updated by new user

authentication ever if same recorder.

2) UserIs registration and approval function

- Only one user can register for one recorder. If userIs registration is not done with the recorder, DivX file cannot be played back.
- UserIs registration is performed only when a DivX DRM file is first chosen by recorder
- DivX DRM file that can perform userIs registration is only a file that is registered Registration Code and purchased or rented.
- User authentication is performed whenever DivX DRM file is played back. Error message is displayed when failing in userIs registration and approval.

3) Rental management function

There are purchase file without registration of number of playback and rental files with registration of number of playback as Divx file. Number of playback of rental file is counted by the recorder. When rental file is played, remaining number of times that can be played back will be shown to users, recorder requests users to input yes or no. Following specifications have been installed for the rental files in the purpose to clarify the count condition of number of times of playback.

- Conditions on counting number of times of play.

1. When a file was opened successfully. (At the time of playback start)
2. When you have done review operation from the start. (Skip to file head)
   – At this time, remaining number of times that can be played back and confirmation message

   [Do you play really?] are displayed.
   – When the playback point has been skipped to the top of title, number of playback is not counted if the top of title was not recognized.
   – Even if the power failure occurs after start of playback of rental file, number of times of playback counted at start of the playback is held as it is.

   (Though playback stops by power failure,

   the number of times of playback is not counted.)

When it has reached head of title, the playback is ended, and screen becomes DivX menu (There is no resume) and then cursor is located on title that has been played back.Then if the same file was continuously played back, it begins to playback from the file head.

Note:

Above mentioned stored user information and number of times of playback are not erased by update of firmware or by initialization by test mode.

8.7. Connection to other Devices

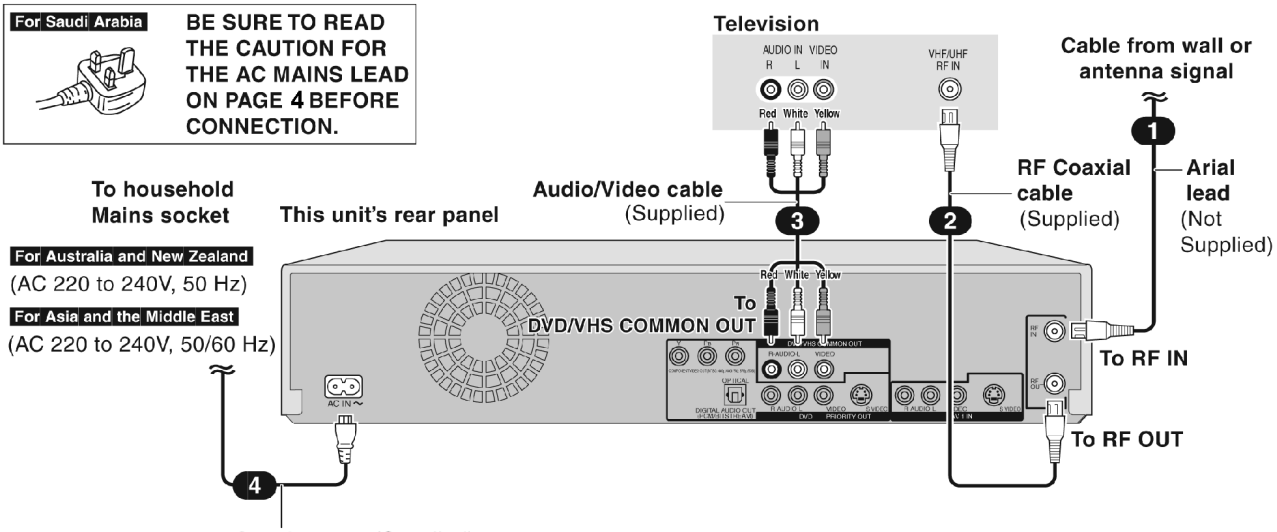
8.7.1. Connection to TV (For GN/GC/GCS)

- **Please read "Caution for AC Mains Lead"**
- Before connection, turn off all equipment and read the appropriate operating instructions.

Connecting a TV

For Saudi Arabia

BE SURE TO READ THE CAUTION FOR THE AC MAINS LEAD ON PAGE 4 BEFORE CONNECTION.



AC mains lead (Supplied)
Connect only after all other connections are complete.

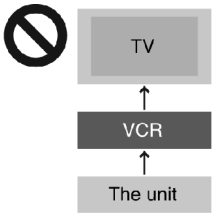
For the Middle East
Use the AC mains lead that matches the socket for your area you live in.

■ Connect as following steps

1. Aerial lead (not supplied)
2. RF Coaxial cable (supplied)
3. Audio/Video cable (supplied)
4. AC mains leads (supplied)

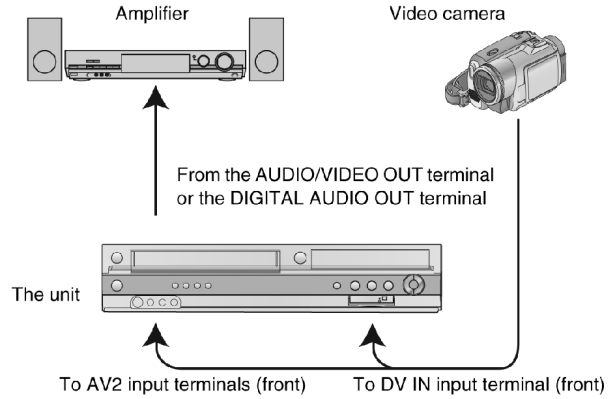
■ Connect the unit directly to the television

If you connect the unit to the television through an AV selector or a video cassette recorder, the video signals will be affected by copyright protection and the picture may not be shown correctly.



- When connecting the unit to a television with a built-in VCR, connect to the input terminals on the television, not the VCR.

■ Connection examples with other equipment



For your reference

- The equipment connections described are examples.
- Peripheral equipment and optional cables are sold separately unless otherwise indicated.

■ When the unit is not to be used for a long time

To save power, unplug it from the household mains socket. The unit consumes a small amount of power even when it is turned off.

Standby power consumption

		FL Display	
		Bright/Dim	Auto
Quick Start	On	Approx. 7.0 W	Approx. 6.8 W
	Off	Approx. 2.6 W	Approx. 2.5 W

- When "Power Save" is set to "On", the "Quick Start" function does not work.

■ Quick Start

1 Sec. Quick Start for Recording on DVD-RAM*

* From the power off state, recording on DVD-RAM starts about 1 second after first pressing the [⏻, DVD/VHS] and then sequentially pressing the [●, REC] (Quick Start Mode).

8.7.2. Connection to amplifier / system component

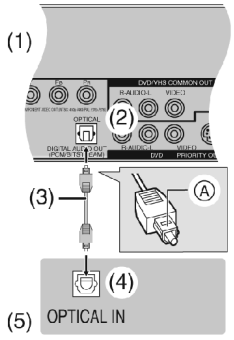
Connecting an amplifier or system component

■ Connecting an amplifier with a digital input terminal

To enjoy multi-channel surround sound on DVD-Video,

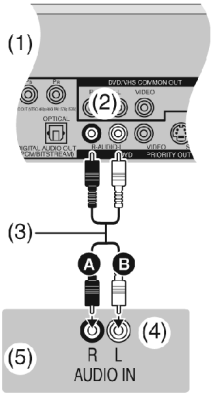
- Connect an amplifier with a built-in Dolby Digital or DTS decoder displaying the logos on the right.
- Change the settings in "Digital Audio Output".
- Before purchasing an optical digital audio cable (not supplied), check the terminal shape of the connected equipment.
- You cannot use any amplifier with a DTS Digital Surround decoder not suited to DVD.
- Even if the unit is connected as illustrated, the output of DVD-Audio will only be in 2 channels.

(1) Rear panel of the unit
(2) Optical digital output terminal
(3) **Optical digital audio cable** (not supplied)
Do not bend when connecting.
Ⓐ Insert fully, with this side facing up.
(4) Optical digital input terminal
(5) Amplifier's rear panel



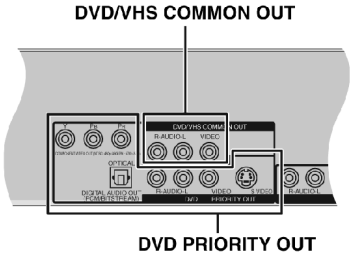
■ Connection to an analog stereo amplifier

(1) Rear panel of the unit
(2) Audio output terminals (L/R)
(3) Audio cable (not supplied)
Ⓐ Red (R)
Ⓑ White (L)
(4) Audio input terminals (L/R)
(5) Amplifier's rear panel



DVD output and DVD/VHS output

The unit has DVD/VHS COMMON OUT terminals and DVD PRIORITY OUT terminals.



DVD/VHS COMMON OUT

- For DVD/VHS COMMON OUT terminals, both DVD and VHS signals can be output.

DVD PRIORITY OUT

- This is the dedicated terminal to enjoy pictures played on DVD in higher picture quality.
- The DVD PRIORITY OUT terminals can also output the VHS signal. However this is not possible during DVD recording or DVD timer recording.

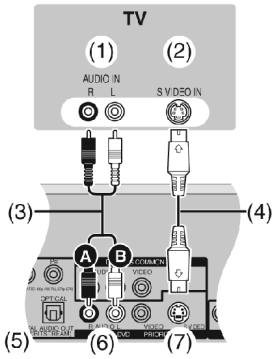
To enjoy even higher fidelity

■ Connection to the TV's S Video terminal

S VIDEO OUT terminal

The S VIDEO OUT terminal achieves a more vivid picture than the VIDEO OUT terminal. (Actual results depend on the TV.)
After connecting the unit to the TV, connect the S Video cable as illustrated below.

(1) Audio input terminals (L/R)
(2) S Video input terminal
(3) Audio cable (not supplied)
Ⓐ Red (R)
Ⓑ White (L)
(4) S Video cable (not supplied)
(5) Rear panel of the unit
(6) Audio output terminals (L/R)
(7) S Video output terminal



■ Connection to the TV's component video terminals

COMPONENT VIDEO OUT terminal

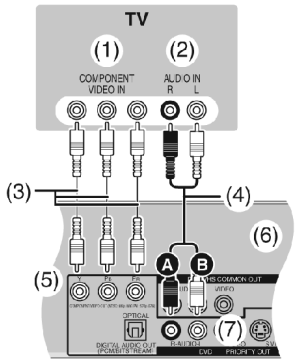
These terminals can be used for either interlace or progressive output and provide a purer picture than the S VIDEO OUT terminal.
Connection using these terminals outputs the colour difference signals (P_B/P_R) and luminance signal (Y) separately in order to achieve high fidelity in reproducing colours.
If the TV is compatible with progressive output, a high quality picture can be output because the unit's component video output terminal outputs a progressive output signal.

- **For progressive output**

After connecting the unit to the TV, connect the video cable as illustrated below.

- Connect to terminals of the same colour.

(1) Component input terminals
(2) Audio input terminals (L/R)
(3) Video cables (not supplied)
(4) Audio cable (not supplied)
Ⓐ Red (R)
Ⓑ White (L)
(5) Rear panel of the unit
(6) Component video output terminals
(7) Audio output terminals (L/R)

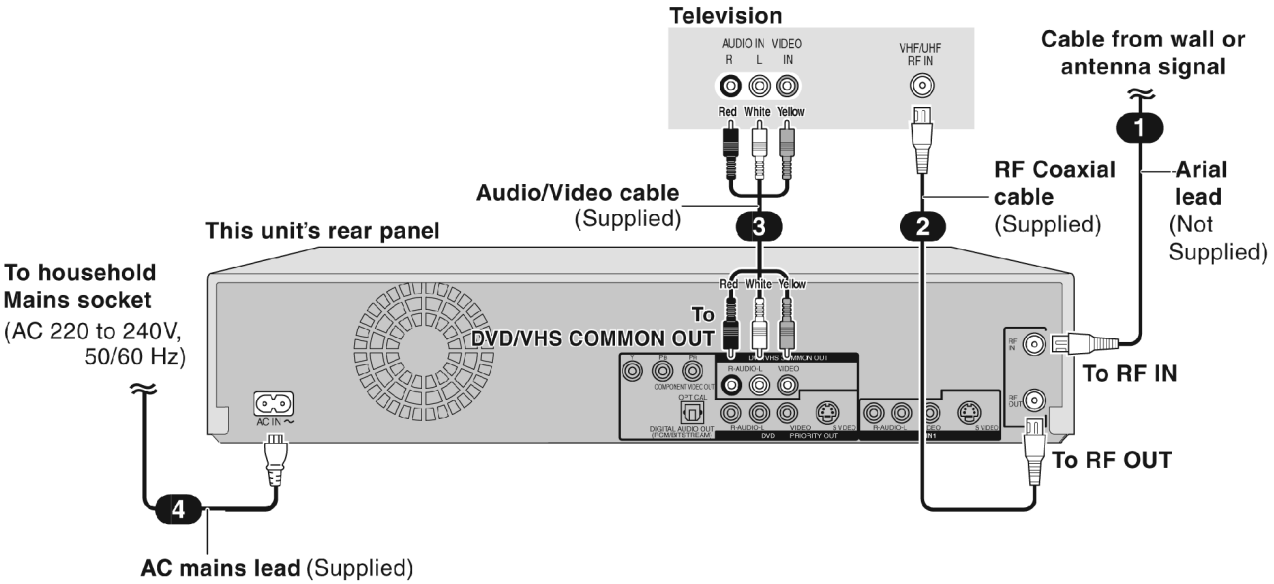


8.8. Connection to other Devices

8.8.1. Connection to TV (For EE)

- **Please read "IMPORTANT SAFETY INSTRUCTIONS".**
- Before connection, turn off all equipment and read the appropriate operating instructions.

Connecting a TV

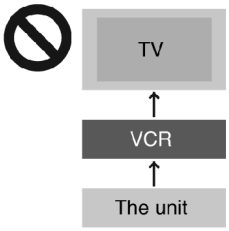


■ Connect as following steps

1. Aerial lead (not supplied)
2. RF Coaxial cable (supplied)
3. Audio/Video cable (supplied)
4. AC mains leads (supplied)

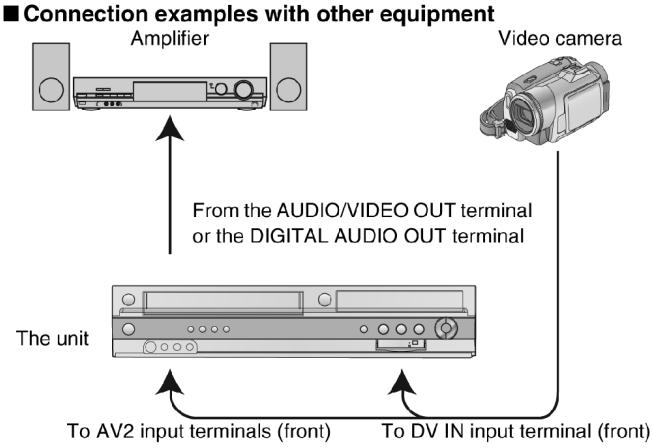
■ Connect the unit directly to the television

If you connect the unit to the television through an AV selector or a video cassette recorder, the video signals will be affected by copyright protection and the picture may not be shown correctly.



- When connecting the unit to a TV with a built-in VCR, connect to the input terminals on the TV, not the VCR.

■ Connection examples with other equipment



For your reference

- The equipment connections described are examples.
- Peripheral equipment and optional cables are sold separately unless otherwise indicated.

■ When the unit is not to be used for a long time

To save power, unplug it from the household mains socket. The unit consumes a small amount of power even when it is turned off.

Standby power consumption

		FL Display	
		Bright/Dim	Auto
Quick Start	On	Approx. 7.0 W	Approx. 6.8 W
	Off	Approx. 2.6 W	Approx. 2.5 W

- When "Power Save" is set to "On", the "Quick Start" function does not work.

■ Quick Start

1 Sec. Quick Start for Recording on DVD-RAM*

* From the power off state, recording on DVD-RAM starts about 1 second after first pressing the [⏻, DVD/VHS] and then sequentially pressing the [●, REC] (Quick Start Mode).

8.8.2. Connection to amplifier / system component

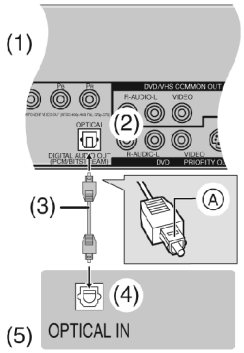
Connecting an amplifier or system component

■ Connecting an amplifier with a digital input terminal

To enjoy multi-channel surround sound on DVD-Video,

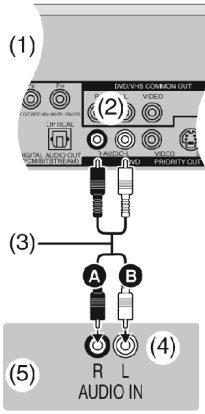
- Connect an amplifier with a built-in Dolby Digital or DTS decoder displaying the logos on the right.
- Change the settings in "Digital Audio Output".
- Before purchasing an optical digital audio cable (not supplied), check the terminal shape of the connected equipment.
- You cannot use any amplifier with a DTS Digital Surround decoder not suited to DVD.
- Even if using this connection, output will be only 2 channels when playing DVD-Audio.

(1) Rear panel of the unit
(2) Optical digital output terminal
(3) **Optical digital audio cable** (not supplied)
Do not bend when connecting.
Ⓐ Insert fully, with this side facing up.
(4) Optical digital input terminal
(5) Amplifier's rear panel



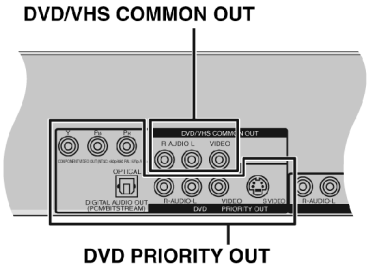
■ Connection to an analog stereo amplifier

(1) Rear panel of the unit
(2) Audio output terminals (L/R)
(3) Audio cable (not supplied)
Ⓐ Red (R)
Ⓑ White (L)
(4) Audio input terminals (L/R)
(5) Amplifier's rear panel



DVD output and DVD/VHS output

The unit has DVD/VHS COMMON OUT terminals and DVD PRIORITY OUT terminals.



DVD/VHS COMMON OUT

- For DVD/VHS COMMON OUT terminals, both DVD and VHS signals can be output.

DVD PRIORITY OUT

- This is the dedicated terminal to enjoy pictures played on DVD in higher picture quality.
- The DVD PRIORITY OUT terminals can also output the VHS signal. However this is not possible during DVD recording or DVD timer recording.

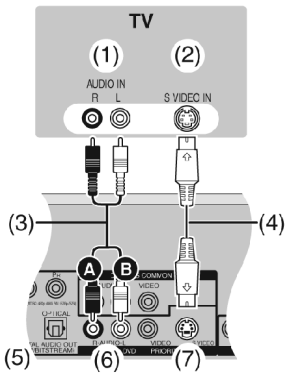
To enjoy even higher fidelity

■ Connection to the TV's S Video terminal

S VIDEO OUT terminal

The S VIDEO OUT terminal achieves a more vivid picture than the VIDEO OUT terminal. (Actual results depend on the TV.)
After connecting the unit to the TV connect the S Video cable as illustrated below.

(1) Audio input terminals (L/R)
(2) S Video input terminal
(3) Audio cable (not supplied)
Ⓐ Red (R)
Ⓑ White (L)
(4) S Video cable (not supplied)
(5) Rear panel of the unit
(6) Audio output terminals (L/R)
(7) S Video output terminal



■ Connection to the TV's component video terminals

COMPONENT VIDEO OUT terminal

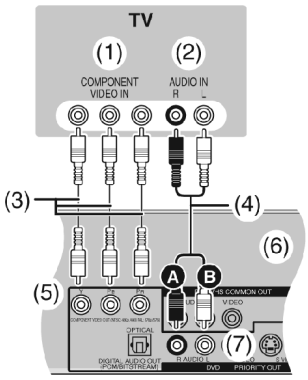
These terminals can be used for either interlace or progressive output and provide a purer picture than the S VIDEO OUT terminal.
Connection using these terminals outputs the colour difference signals (P_B/P_R) and luminance signal (Y) separately in order to achieve high fidelity in reproducing colours.
If the TV is compatible with progressive output, a high quality picture can be output because the unit's component video output terminal outputs a progressive output signal.

- **For progressive output**

After connecting the unit to the TV connect the video cable as illustrated below.

- Connect to terminals of the same colour.

(1) Component input terminals
(2) Audio input terminals (L/R)
(3) Video cables (not supplied)
(4) Audio cable (not supplied)
Ⓐ Red (R)
Ⓑ White (L)
(5) Rear panel of the unit
(6) Component video output terminals
(7) Audio output terminals (L/R)



9 Operation Instructions

9.1. (DVD) Taking out the Disc from RAM-Drive Unit when the Disc cannot be ejected by OPEN/CLOSE button

9.1.1. (DVD) Forcible Disc Eject

9.1.1.1. (DVD) When the power can be turned off.

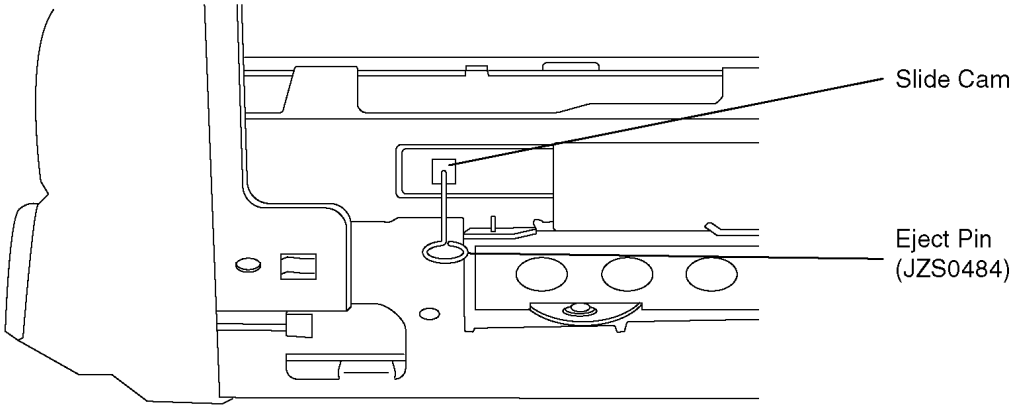
1. Turn off the power and press [STOP], [CH UP] keys on the front panel simultaneously for 5 seconds.

9.1.1.2. (DVD) When the power can not be turned off.

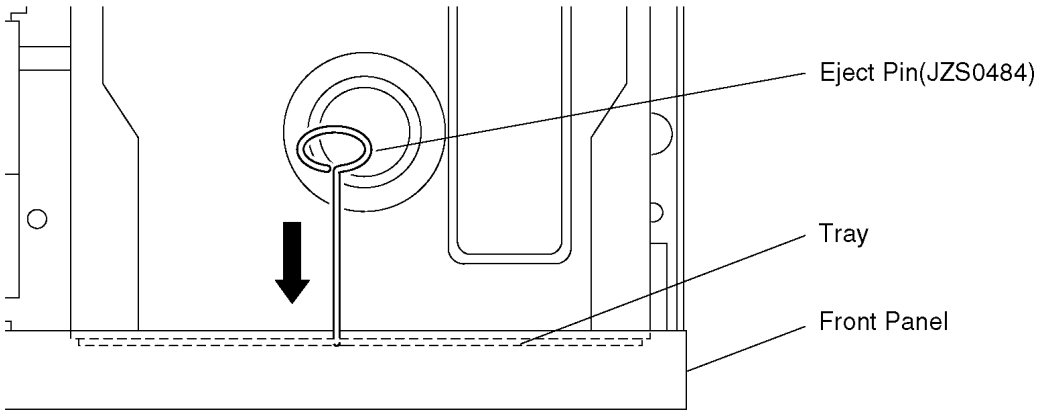
1. Press [POWER] key on the front panel for over 10 seconds to turn off the power forcibly, and press [STOP] [CH UP] keys on the front panel simultaneously for 5 seconds.

9.1.2. (DVD) When the Forcible Disc Eject can not be done.

1. Turn off the power and pull out AC cord.
2. Remove the Top Case.
3. Push in SLIDE CAM by Eject Pin(JZS0484) or minus screw driver (small) to eject tray slightly.



4. Push out Tray by Eject Pin (JZS0484) or minus screw driver (small).



9.2. (VHS) Removing Cassette Tape manually

When the cassette tape could not be uninstalled from an electrical malfunction, there are 2 ways to remove a cassette tape.

9.2.1. (VHS) Removal by compulsory unloading.

If Service Mode can be activated when the power can not be turned on, this operation is able.

1. Press [STOP] and [EJECT] button simultaneously for more than 3 seconds and set the Service Mode to 7.
2. Press [STOP] button in order to unload the mechanism. (Pay attention to tape slack)

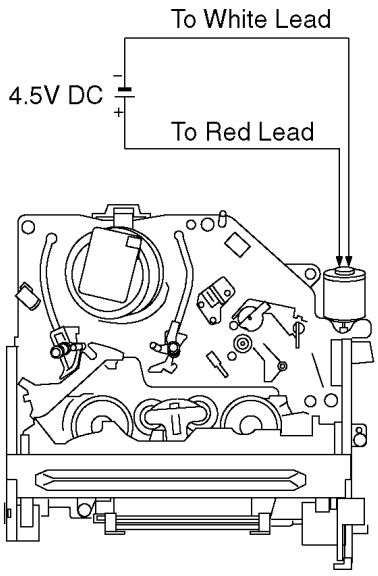
   Service Mode Display:

   7 ** ** (STOP) → 7 0L ** (EJECT)

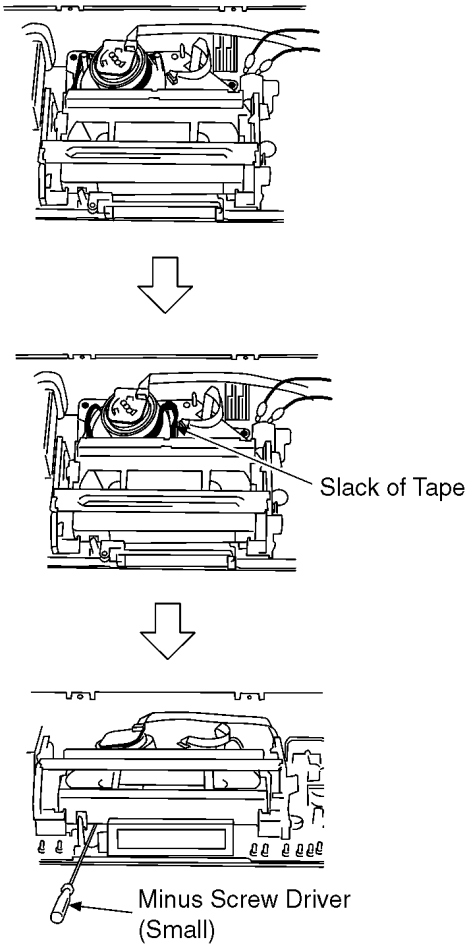
9.2.2. (VHS) Removal by manual operation by rotating the Loading Motor with the batteries.

1. Disconnect the AC plug, and remove the Top Panel and the Front Panel by referring to the Disassembly Procedures.
2. Connect three batteries (1.5V spec.) to the Loading Motor in series for supplying 4.5V to rotate the Loading Motor as shown below.

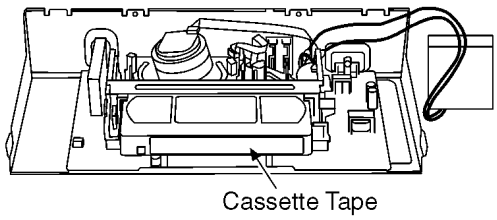
   CONNECTION for UNLOADING



3. Stop unloading just before unloading will be completed as shown below, and then the tape becomes slack as shown below.
4. Rotate the S-Reel by a small minus screwdriver to remove the slack tape as shown below.

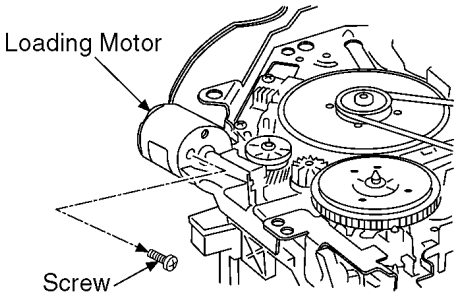


5. Then unload again to remove the cassette tape as shown below.

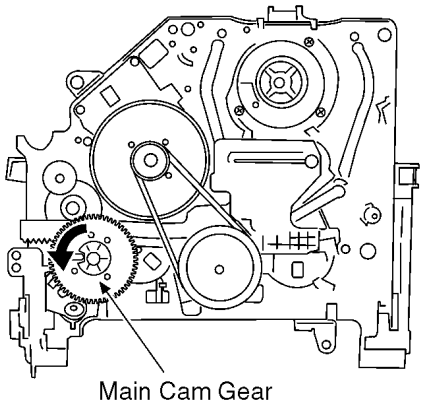


9.2.3. (VHS) Take out Cassette Tapemanually after removing the mechanism

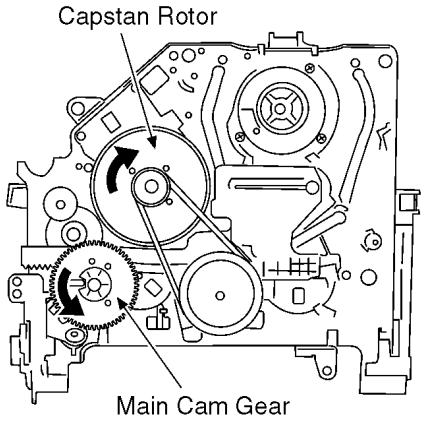
1. Disconnect the AC plug, and remove the Top Case, Front Panel and the Mechanism by referring to **"12 Assembling and Disassembling"**
2. Remove the Screw and remove the Loading Motor as shown below.



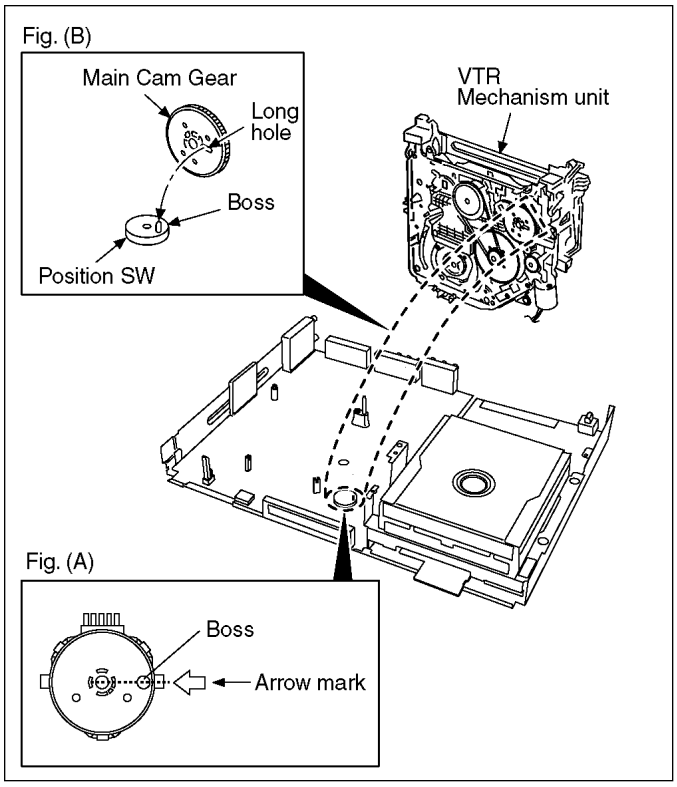
3. Rotate the Main Cam Gear counter-clockwise until just before the unloading will be completed as shown below. .



4. Rotate the Capstan Motor clockwise to remove the slack tape as shown below.
5. Rotate the Main Cam Gear counter-clockwise again to remove the cassette-tape as shown below.



6. Attach Loading Motor and tighten the screw.
7. Set the Position Switch to EJECT POSITION certainly and attach the mechanism to chassis as shown below.



10 Service Mode

10.1. (DVD) Self-Diagnosis and Special Mode Setting

10.1.1. (DVD) Self-Diagnosis Functions

Self-Diagnosis Function provides information for errors to service personnel by “Self-Diagnosis Display” when any error has occurred.

U, H** and F** are stored in memory and held.**

You can check latest error code by transmitting [0] [1] of Remote Controller in Service Mode.

Automatic Display on FL will be cancelled when the power is turned off or AC input is turned off during self-diagnosis display is ON.

Error Code	Diagnosis contents	Description	Monitor Display	Automatic FL display
U30	Remote control code error	Display appears when main unit and remote controller codes are not matched.	No display	DVD ＊ “*” is remote controller code of the main unit. Display for 5 seconds.
U59	Abnormal inner temperature detected	Display appears when the drive temperature exceeds 70°C. The power is turned off forcibly. For 30 minutes after this, all key entries are disabled. (Fan motor operates at the highest speed for the first 5 minutes. For the remaining 25 minutes, fan motor is also stopped.) The event is saved in memory as well.	No display	U59 “U59 is displayed for 30 minutes.
U61	The unit is carrying out its recovery process. (with no disc in the disc tray)	・The unit detected an error while recording or playing with no disc in the disc tray. The unit is carrying out its recovery process. This process restores the unit to normal operation. The unit is not broken. Wait until the message disappears.	No display	U61
U88	The unit is carrying out its recovery process. (with a disc in the disc tray)	・The unit detected an error while recording or playing with a disc in the disc tray. The unit is carrying out its recovery process. This process restores the unit to normal operation. The unit is not broken. Wait until the message disappears.	No display	U88
U99	Hang-up	Displayed when communication error has occurred between Main microprocessor and Timer microprocessor.	No display	U99 Displayed is left until the [POWER] key is pressed.
H19	Inoperative fan motor	When inoperative fan motor is detected after powered on, the power is turned off automatically. The event is saved in memory.	No display	No display
F00	No error information	Initial setting for error code in memory (Error code Initialization is possible with error code initialization and main unit initialization.)	No display	No display
F09	Serial Communication Error between VHS Microprocessor and Timer Microprocessor.	Please confirm Serial Communication terminal of Microprocessor. **NOTE:** If F09 appears just after updating Firmware, pull off and insert AC plug, then it will disappear.	No display	F09
F34	Initialization error when main microprocessor is started up for program recording	When initialization error is detected after starting up main microprocessor for program recording, the power is turned off automatically. The event is saved in memory.	No display	No display
F58	Drive hardware error	When drive unit error is detected, the event is saved in memory.	No display	No display
F60	DVD module has not been started.	Defect of Digital P.C.B. Mode: No change	No display	F60

Error Code	Diagnosis contents	Description	Monitor Display	Automatic FL display
UNSUP-PORT	Unsupported disc error	*An unsupported format disc was played, although the drive starts normally. *The data format is not supported, although the media type is supported. *Exceptionally in case of the disc is dirty.	**"This disc is incompatible."**	UNSUP ↓ PORT Display for 5 seconds.
NO READ	Disc read error	*A disc is flawed or dirty. *A poor quality failed to start. *The track information could not be read.	**"Cannot read. Please check the disc."**	NOREAD
HARD ERR	Drive error	The drive detected a hard error.	"**DVD drive** error."	Display for 5 seconds. HARD ↓ ERR
SELF CHECK	Restoration operation	Since the power cord fell out during a power failure or operation, it is under restoration operation. *It will OK, if a display disappears automatically. If a display does not disappear, there is the possibility that defective Digital P.C.B. / RAM drive.	No display	SELF ↓ CHECK
PLEASE WAIT	Unit is in termination process	Unit is in termination process now. "BYE" is displayed and power will be turned off. In case "Quick Start" of setup menu is ON, it is displayed in restoration operation for AC off.	No display	PLEASE ↓ WAIT
UNFOR-MAT	Unformatted disc error	You have inserted an unformatted DVD-RAM or DVD-RW that is unformatted or recorded on other equipment.		UNFOR ↓ MAT
IR ERR	IR communication error	[IR ERR] is display when communication between Timer microprocessor and IR microprocessor fails.	No display	IR ERR
No REC	Recording is impossible	[No REC] is displayed when recording isimpossible due to the defect, dirt or woundof media.	No display	NOREC

10.1.2. (DVD) Special Modes Setting

Item		FL display	Key operation
Mode name	Description		Front Key
TEST Mode	*All the main unit´s parameters (include tuner) are initialized.	TM AV1	Press [VHS to DVD COPYING], [REC] and [OPEN/CLOSE] keys simultaneously for five seconds when power is off.
Rating password	The audiovisual level setting password is initialized to "Level 8".	INIT	Set DRIVE SELECT to [DVD]. While the tray is open, press [REC] and [PLAY] simultaneously for 5 seconds.
Service Mode	Setting every kind of modes for servicing. *Details are described in "**10.1.3. (DVD) Service Modes at a glance**".	SERV	When the power is off, press [VHS to DVD COPYING], [OPEN/CLOSE] and [STOP] keys simultaneously for 5 seconds.
Forced disc eject	Removing a disc that cannot be ejected. The tray will open and unit will shift to P-off mode. *When Timer REC is ON, execute " Forced disc eject " after releasing Timer REC. While Demonstration Lock is being set, this Forced disc eject function is not accepted. If this command was executed while TIMER REC is being set, TIMER REC setting will turn to OFF.	The display before execution leaves. ******	When the power is off, press [STOP] and [CH UP] keys simultaneously for 5 seconds.
Forced power-off	When the power button is not effective while power is ON, turn off the power forcibly. *When Timer REC is ON, execute "Forced Power-off" after releasing Timer REC.	Display in P-off mode.	Press [POWER] key over than 10 seconds.

Item		FL display	Key operation
Mode name	Description		Front Key
Child lock/unlock	Set or release “Child Lock”.	X HOLD	Press [ENTER] and [RETURN] by remote controller simultaneously until [X-HOLD] is displayed.
NTSC/PAL system select	To switch PAL/NTSC altemately.	The display before execution leaves. ******	While the power is on (E-E mode), press [STOP] and [OPEN/CLOSE] simultaneously for 5 seconds.
Aging	Perform sequence of modes as * Aging Description shown below continually. **Caution:** **All programs in DVD-RAM disc will be deleted because Formatting is done once in Aging process.**	Display following the then mode.	When the power is ON, press [CH DOWN], [VHS to DVD COPYING] and [OPEN/CLOSE] simultaneously for over 5 seconds and less than 10 seconds. **NOTE1:** If Unit has not turned into Aging mode by operations shown above, execute TEST MODE once and re-execute operation shown above. (*All the main unit’s parameters include tuner are initialized by TEST mode.) **NOTE2:** If the unit has hung-up because of pressing keys for over 10 seconds, once turn off the power, and re-execute this command. *When releasing Aging mode, press [POWER] key.
Aging Contents (Example): Format→REC→STOP→PLAY→CUE→REV→PLAY→PAUSE * CLOSE←OPEN←STOP←PLAY←R-SLOW←SLOW← *XP mode ・・・・・repeat twice SP mode ・・・・・repeat 4 times LP mode ・・・・・repeat 8 times EP mode ・・・・・repeat 12 times			
Demonstration lock/unlock	Ejection of the disc is prohibited. The lock setting is effective until unlocking the tray and not released by “Main unit initialization” of service mode.	*When lock the tray. LOCK “LOCK” is displayed for 3 seconds.	When the power is on, press [STOP] and [POWER] keys simultaneously for 5 seconds. **Note:** When a disc is not in tray, this setting is not effective.
		*When unlock the tray. UNLOCK “UNLOCK” is displayed for 3 seconds.	When the power is on, press [STOP] and [POWER] keys simultaneously for 5 seconds.
		*When press OPEN/CLOSE key while the tray being locked. LOCK Display “LOCK” for 3 seconds.	Press [OPEN/CLOSE] key while the tray being locked.
Progressive initialization	The progressive setting is initialized to Interlace.	The display before execution leaves. ******	When the power is on (E-E mode), press [STOP] and [VHS to DVD COPYING] simultaneously for 5 seconds.
ATP re-execution	Re-execute ATP.	Display at ATP executing. ******	When the power is on (E-E mode), press [CH UP] and [CH DOWN] simultaneously for 5 seconds.

10.1.3. (DVD) Service Modes at a glance

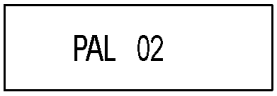
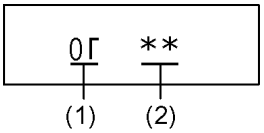
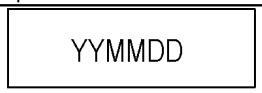
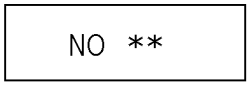
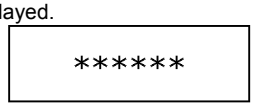
Service mode setting: While the power is off, press **[STOP], [VHS to DVD COPYING] and [OPEN / CLOSE]** simultaneously for five seconds (OPERATION SELECT should be set to DVD).

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
Release Items	Item of Service Mode executing is cancelled.	SERV	Press [0] [0] or [Return] in service mode.
Error Code Display	Last Error Code of U/H/F held by Timer is displayed on FL. *Details are described in **"10.1.1. (DVD) Self-Diagnosis Functions".**	♣□□ *♣ shows U/H/F. □□ shows number. If any error history dose not exist, [F00] is displayed.	Press [0] [1] in service mode
ROM Version Display	1. Region code (displayed for 5 sec.) 2. Main firm version (displayed for 5 sec.) 3. Timer firm version (displayed for 5 sec.) 4. Drive firm version (displayed for 5 sec.) 5. ROM correction version (displayed for 5 sec.) 6. VHS Microprocessor version (displayed for 5 sec.) 7. VHS ROM correction version (left displated)	1. NO* 2. ****** 3. ****** 4. **** 5. *** 6. **** 7. ** "" are version displays.	Press [0] [2] in service mode
White Picture Output	White picture is output as component Output from AV Decoder. *White picture (Saturation rate : 100%) *It is enable to switch Interlace/Progressive by "I/P switch: [1] [4]"	*Initial mode is "Interlace". WHIT I	Press [1] [1] in service mode.
		Switch Interlace/Progressive WHIT	Press [1] [4] in White Picture Output mode. *I/P are switched alternately.
Magenta Picture Output	Magenta picture is output with Component Output from AV Decoder. *Magenta picture (Saturation rate: 100%) *It is enable to switch Interlace/Progressive by "I/P switch: [1] [4]"	*Initial mode is "Interlace". MAGE I	Press [1] [2] in service mode.
		Switch Interlace/Progressive MAGE	Press [1] [4] in Magenta Picture Output mode. *I/P are switched alternately.
RTSC Return in XP (A & V)	L1 input signal is encoded (XP), decoded (XP) and output decoded signal to external without DISC recording and DISC playback.	Initial mode: EE2/ Interlace/ XP/ Audio 48kHz EE2	Press [1] [3] in service mode.
		Switch Interlace/Progressive EE2P48	Press [1] [4] in RTSC Return XP mode. *I/P are switched alternately.
		Audio 44.1 kHz/ 48 kHz Switch EE2P44	Press [2] [4] in RTSC Return XP mode. *48 kHz / 44.1 kHz are switched alternately.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
I/P Switch	Switch Interlace and Progressive in EE mode. *Initial setting is “Interlace”. *This command is effective during executing “White Picture Output”, “Magenta Picture Output” and “RTSC Return in XP (A & V)” modes.	Initial mode is Interlace SERV P Switch Interlace/Progressive SERV I	Press [1] [4] in I/P Switch mode. *I/P are switched alternately.
Audio Mute (XTMUTE)	Check whether mute is applied normally by the timer microprocessor.	T MUTE	Press [2] [1] in service mode.
Audio Mute (XDMUTE)	Check whether mute is applied normally by the Digital P.C.B..	D MUTE	Press [2] [2] in service mode.
Audio Pattern Output	The audio pattern stored in the internal memory is output (Lch: 1kHz/-18dB) (Rch: 400Hz/-18dB) *Audio sound clock switching operation of DAC can be confirmed by sub command [2] [4].	Initial mode (Audio 48kHz) AU 48	Press [2] [3] in service mode.
		Audio 44.1kHz/48kHz switching AU 44	Press [2] [4] in Audio Pattern Output mode. *48 kHz / 44.1 kHz are switched alternately.
Laser Used Time Indiction	Check laser used time (hours) of drive.	***** I(*****) is the used time display in hour. ILaser used time of DVD/ CD in Playback/Recording mode is counted.	Press [4] [1] in service mode.
Delete the Laser Used Time	Laser used time stored in the memory of the unit is deleted.	CLR	Press [9] [5] in service mode.

<table>
<tr><th colspan="2">Item</th><th rowspan="2">FL display</th><th rowspan="2">Key operation
(Remote controller key)</th></tr>
<tr><th>Mode name</th><th>Description</th></tr>
<tr><td>RAM Drive Last Error</td><td>RAM Drive error code display.
*For details about the drive error code, refer to the Service Manual for the specific RAM Drive.</td><td>1. Error Number is displayed for 5 seconds.
NO **
2. Time when the error has occurred is displayed for 5 seconds.
DDHHMM
DD: Day
hh: Hour
mm: Minute
3. Last Drive Error (1/2) is displayed for 5 seconds.
******
4. Last Drive Error (2/2) is displayed for 5 seconds.
******
5. Error occurring Disc type is displayed for 5 seconds.
******
6. Disc Maker ID is displayed for 5 seconds.
******
7. Factor of Drive Error occurring is left displayed
******</td><td>Press [4] [2] in service mode.
When “INFO******” is being displayed, past 19 error histories can be displayed by pressing [0] [1] - [1] [9]

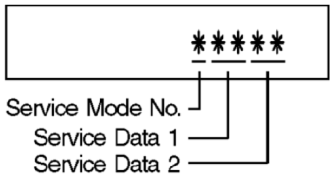
In case that the maker cannot be identified, display is black out.</td></tr>
<tr><td>Delete the Last Drive Error</td><td>Delete the Last Drive Error information stored on the DVD RAM-Drive.</td><td>CLR</td><td>Press [9] [6] in service mode.</td></tr>
<tr><td>Laser power confirmation</td><td>Drive state is judged based on difference between laser power value at shipping and present laser power value.</td><td>CHK *
* is judgment result
<table><tr><th>*</th><th>Power value difference</th><th>Evaluation</th></tr><tr><td>0</td><td>1mW or less</td><td>Very good.</td></tr><tr><td>1</td><td>2mW or less</td><td>Good.</td></tr><tr><td>2</td><td>3mW or less</td><td>Bad.</td></tr><tr><td>3</td><td>4mW or more</td><td>Very bad.</td></tr></table>If DVD-RAM disc in not inserted, [NO DISC] is displayed.
If power value study was filed, [ERROR] is displayed.</td><td>1. Insert DVD-RAM disc into RAM Drive in service mode. (Other media are assumed to be non-correspondence.)
2. Press [4] [4].</td></tr>
<tr><td>Turn on all FL/LEDs</td><td>All segments of FL and all LEDs are turned on.</td><td>All segments are turned on.</td><td>Press [5] [1] in service mode.</td></tr>
<tr><td>S1 signal output</td><td>Forcibly superimpose the S1 signal (approx. 4.5V DC) on the EE chroma signal, and check the output on the S terminal.</td><td>S1 OUT</td><td>Press [5] [2] in service mode.</td></tr>
<tr><td>S2 signal output</td><td>Forcibly superimpose the S2 signal (approx. 2V DC) on the EE chroma signal, and check the output on the S terminal.</td><td>S2 OUT</td><td>Press [5] [3] in service mode.</td></tr>
<tr><td>AV4(V)/AV1(RGB) I/O Setting</td><td>Set input to AV4 (V) and set output to AV1 (RGB) for I/O checking</td><td>PAL 01</td><td>Press [8] [0] in service mode.</td></tr>
</table>

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
AV2(Y/C)/AV1(V) I/OSetting	Set input to AV2 (Y/C) and set output to AV1 (V) for I/O checking		Press [8] [0] in service mode.
Front connection inspection	Press all front keys and check the connection between Main P.C.B. and Front key Switches.	 (1) Each time a key is pressed, segment turned on increases one by one. (2) Total umber of keys that have been pressed.	Press [5] [4] in service mode.
Production Date Display	Display the date when the unit was produced.	 YY: Year MM: Month DD: Day	Press [6] [1] in service mode.
Display the accumlated working time	Display the accumulated unit´s working time.	 (Indicating unit: Second)	Press [6] [4] in service mode.
Display the Error History	Display the Error History stored on the unit.	Display reason of error for 5 seconds.  01: Defect of Digital P.C.B. (AV DEC / MAIN CPU) 02: Defect of RAM Drive. 03: Defect of Disc. 04: Defect of Digital P.C.B. or Communication Error. 05: Defect of Digital P.C.B. (AV DEC / MAIN CPU) Display the time when the error has occurred for 5 seconds.  DD: Day hh: Hour mm: Minute Accumulated working time till occuring of the error is left displayed.  (Indicating unit: Second)	Press [6] [5] in service mode. Then press [0] [1] ~ [1] [9], the past 19 error histories are displayed.
Delete the Error History	Delete Error History information stored on the unit.		Press [9] [7] in service mode.
Tray OPEN/CLOSE Test	The RAM drive tray is opened and closed repeatedly.	 “*” is number of open/close cycle times.	Press [9] [1] in service mode *When releasing this mode, press the [POWER] button of Remote Controller more than 10 seconds.
Error code initialization	Initialization of the last error code held by timer (Write in F00)		Press [9] [8] in service mode.

Item		FL display	Key operation
Mode name	Description		(Remote controller key)
Initialize Service	Last Drive Error, Error history and Error Codes stored on the unit are initialized to factory setting.	CLR	Press [9] [9] in service mode.
PB HIGH Signal Output	8 pin of AV 1 Jack (PB HIGH terminal) is High (approx. 11V DC).	PB HI	Press [5] [2] in service mode.
PB MIDDLE Signal Output	8 pin of AV 1 Jack (PB HIGH terminal) is Middle (approx. 5.5V DC)	PB MID	Press [5] [3] in service mode.
Finishing service mode	Release Service Mode.	Display in STOP (E-E) mode. ******	Press power button on the front panel or Remote controller in service mode.
AV2(V)/AV1(Y/C) I/O Setting	Set input to AV2 (V) and set output to AV1 (Y/C) for I/O checking	PAL 03	Press [8] [2] in service mode.
AV2(RGB)/AV1(V) I/OSetting	Set input to AV2 (RGB) and set output to AV1 (V) for I/O checking	PAL 04	Press [8] [3] in service mode.
P50(H) Output	Timer Microprocessor IC7504-76 output High signal for AV1-pin 10 passing through inverter (approx. 0V DC at AV1-pin 10).	When OK. P50HOK When NG. P50HNG	Press [8] [4] in service mode.
P50(L) Output	Timer Microprocessor IC7504-76 output Low signal for AV1-pin 10 passing through inverter (approx. 4.4V DC at AV1-pin 10).	When OK. P50LOK When NG. P50LNG	Press [8] [5] in service mode.
Tray OPEN/CLOSE Test	The RAM drive tray is opened and closed repeatedly.	****** “*” is number of open/close cycle times.	Press [9] [1] in service mode*When releasing this mode, press the [POWER] button of Remote Controller more than 10 seconds.
Error code initialization	Initialization of the last error code held by timer (Write in F00)	CLR	Press [9] [8] in service mode.
Initialize Service	Last Drive Error, Error history and Error Codes stored on the unit are initialized to factory setting.	CLR	Press [9] [9] in service mode.
Finishing service mode	Release Service Mode.	Display in STOP (E-E) mode. ******	Press power button on the front panel or Remote controller in service mode.

10.2. (VHS) Self-Diagnosis and Special Mode Setting

10.2.1. (VHS) SPECIAL MODES SETTING

Item		FL display	Key operation
Mode name	Description		Front Key
Tracking Center	Tape Tracking is adj usted to center FIX position.	No display.	During PLAYBACK, press [VHS CH UP] and [VHS CH DOWN] keys simultaneously.
VHS Service Mode	In order to make service easy, a part of inside information of a microprocessor is displayed on FIP. *Details are described in **"10.2.2. VHS Service Mode"**.		Press [STOP], and [EJECT] keys simultaneously for three seconds when power is off. Set Drive to VHS.
Releasing EXT LINK & Timer Program	Releasing Continuation EXT LINK & Continuation Timer Program	No display.	While in EXT LINK or Timer REC mode, press [VHS STOP] key for 3 seconds.
Eject	Ejecting Cassette Tape	No display.	While in other than Timer REC mode, press [STOP] key for 3 seconds or press [STOP] key of the Remote Controller for 3 seconds in VHS mode.

10.2.2. (VHS) SERVICE MODES

(Service Mode Setting)

1. When power is OFF, press [STOP] and [EJECT] keys simultaneously for 3 seconds to into Service Mode and set Drive to VHS.
2. In Service Mode, press [STOP] and [EJECT] keys simultaneously to add Service Number.

Service Mode Number	Contents	Contents of Indication on minute	Contents of Indication on second	Remarks
0	Indication for the inner data of IC6001	VHS mode (Real time)	Process number of the mechanism movement (Real time)	
1	Indication for the inner data of IC6001	Tape beginning and ending detection data (Real time)	Key code (Real time)	
		00: Both tape beginning and ending have not been detected 01: Tape ending is detecting now 02: Tape beginning is detecting now 03: Both tape beginning and ending are detecting now	Indicate the receiving code when the key of VCR or remote controller being operated.	
2	Indication for the inner data of IC6001	Mechanism position (Real time)	Ordering for the Motors (Real time)	The following functions are prohibited to operate the mechanism without cassette tape. ●Tape beginning and ending detection. ●Reel lock detection ●Tape detection and tape position detection Press the EJET key for over 3 seconds in this mode, and then the VCR is shifted into the special modes, such as PG Adjustment, Model Code Setting, and so on. The orders for the motors are asfollows.
		0L: EJECT position 02: DOWN position 03: RREW position 04: LOAD position 05: REV position 06: PLAY position 07: POFF position 08: STOP_R position 09: STOP_F position 0- : FF/REW position 0_ : Intermediate between each positions	0*, 2*: CYL off, CAP off 1*: CYL off, CAP on (fwd) 3*: CYL off, CAPon (rev) 8*, A*: CYL on, CAP off 9*: CYL on, CAPon (fwd) B*: CYL on, CAP on (rev) *0: Motor off *1:Loading *2: Unloading *3: Break (Load + Unload)	
3	Self-diagnosis history (1st)	1st history of error number	"- -" is displayed.	
4	Self-diagnosis history (2nd)	2nd history of error number	"- -" is displayed	
5	Self-diagnosis history (3rd)	3rd history of error number	"- -" is displayed	
6	Indication for the inner data of IC6001	Servo data (4 digits) (Real time)		

Service Mode Number	Contents	Contents of Indication on minute	Contents of Indication on second	Remarks
7	Manual mechanism operation	Mechanism position (Real time) 0L: EJECT position 02: DOWN position 03: RREW position 04: LOAD position 05: REV position 06: PLAY position 07: POFF position 08: STOP_R position 09: STOP_F position 0- : FF/REW position 0 _: Intermediate between each positions	Ordering for the Motors 0*, 2*: CYL off, CAP off 1*:CYL off, CAP on (fwd) 3*: CYL off, CAPon (rev) 8*, A*: CYL on, CAP off 9*: CYL on, CAPon (fwd) B*: CYL on, CAP on (rev) *0: Motor off *1:Loading *2: Unloading *3: Break (Load + Unload)	Press the following key; PLAY key: Loading STOP key: Unloading

10.2.3. (VHS) SELF-DIAGNOSIS FUNCTIONS

This model has a self-diagnosis. If the VHS section detects trouble during installation or during use, the power is automaticallyturned off or become power-save mode and it is memorized into the EEPROM (IC37501) as error code of two-digit number. It ismemorized error code can be displayed in "second" display portion (the last 2 digits of the FIP) by placing the unit is Service ModeNumber 2 when turning on the Service Information Display as for example "01" or "02" etc. as below. If a second error occurs, themost recent error will be memorized and can be displayed in Service Mode Number 2. It can be memorized until 3 self-diagnosishistories in maximum.In order to erase the memorized error code, press STOP and EJECT buttons on the Front Panel simultaneously over 5 secondsduring turning on Service Information Display mode.

10.2.3.1. MEMORY OF THE SELF-DIAGNOSIS HISTORY

***This is effective only in Service Mode 3, 4, 5.**

10.2.3.1.1. ERROR NUMBERS AT A GLANCE

Memory No. (Error Code)	Reason
01	The cylinder could not be started. (Error of the cylinder or the cylinder driver.)
02	The CAP FG could not be detected.
03	Mechanism lock during without the unloading and the cassette-up.
04	Mechanism lock during unloading
05	S-reel pulse cannot be detected during unloading. (Error of the S-reel circuit or the Capstan circuit)
06	Mechanism lock during the Cassette-up.
09	Communication error between VHS Microprocessor (IC6001) and Timer Microprocessor (IC9704).
15	S-reel pulse cannot be detected when a cassette tape is inserted. (Error of the S-reel circuit or the Capstan circuit)
16	Detection of the Cylinder lock during the constant rotation
17	Detection of S-reel lock during the constant tape running
18	Detection of T-reel lock during the constant tape running
2* Refer to following table	An error while the PG Automatic Adjustment
80	An exceptional ejection depends on a accidental error

Note:

2* is as follows.

20	NG1 in the PG Shifter Automatic Adjustment (The cylinder rotation is unstable during the automatic adjustment.)
21	NG2 in the PG Shifter Automatic Adjustment (The vertical sync signal is lacked while over 5 seconds on the alignment tape.)
22	NG3 in the PG Shifter Automatic Adjustment (The installing position of Heads to the cylinder is our of specification.
23	NG4 in the PG Shifter Automatic Adjustment (The servo is not locked to the cylinder for more than 10 sec.)

10.2.3.1.2. MEMORY FOR THE SELF-DIAGNOSIS HISTORY

3. The self-diagnosis result is memorized the state of the moment of detecting.

4. There are the histories from number 1 to number 3.

5. The latest error is memorized on history number 1, and then the old histories are shifted to the history number 2 and 3.The error code memorized in the history number 2 and 3 is over-written by shift.

6. If the latest error is the same with the history number 1 (2nd-latest), it is not memorized.(The same error code is not memorized

in succession)

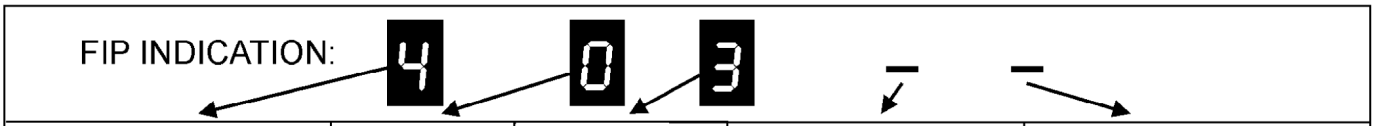
10.2.3.1.3. CLEAR FOR THE SELF-DIAGNOSIS HISTORY

1. Press STOP and EJECT buttons simultaneously over 5 seconds during turning on Service Information Display mode.

10.2.3.1.4. INDICATION OF THE SELF-DIAGNOSIS HISTORY

The self-diagnosis histories can be indicated on the FIP with Service Mode number 3 to 5.

The procedure of service mode setting and indication format are the same as usual.



Hour of one-digit	Minute of two-digit	Minute of one-digit	Second of two-digit	Second of one-digit
Service mode number	Error code		—	—
3	Error code of history 1 (the latest)		—	—
4	Error code of history 2 (2nd latest)		—	—
5	Error code of history 3 (3nd latest)		—	—

The Error code of history 1, 2 and 3 can be indicated by selecting the Service mode 3, 4 and 5.
In case of no error code in the memory, it is indicated as "00".

11 Service Fixture & Tools

(For DVD)

Part Number	Description	Compatibility
RFKZ0168	Extension Cable (Digital I/F P.C.B. - FAN / 3 Pin)	Same as E50 / ES30V Series
RFKZ0327	Extension Cable (Main P.C.B. - Digital I/F P.C.B. / 15 Pin / 40 mm)	
RFKZ0240	Extension Cable (Main P.C.B. - Digital I/F P.C.B. / 19 Pin / 40 mm)	Same as ES75V / ES30V Series
RFKZ0368	Extension Cable (Main P.C.B. - Digital I/F P.C.B. / 11 Pin / 40 mm)	New
RFKZ0239	Extension Cable (Main P.C.B. - Panel P.C.B. / 12 Pin)	Same as E75V / ES30V Series
RFKZ0239	Extension Cable (Main P.C.B. - Front Jack P.C.B. / 10 Pin)	Same as E75V / ES30V Series
RFKZ0365	Extension Cable (Main P.C.B. - RAM / Digital P.C.B. Module / 64 Pin)	Same as ES15 Series
JZS0484	Eject Pin	Same as ES15 / E50 Series
RFKZ03D01K	Lead Free Solder (0.3mm/100g Reel)	Same as ES15 Series
RFKZ06D01K	Lead Free Solder (0.6mm/100g Reel)	Same as ES15 Series
RFKZ10D01	Lead Free Solder (1.0mm/100g Reel))	Same as ES15 Series
RFKZ0316	Solder Remover (Lead free 10W temperature Solder/180g)	Same as ES15 Series
RFKZ0328	Flux	Same as ES15 Series
RFKZ0329	Bottle of Flux	Same as ES15 Series

(For VHS)

Part Number	Description	Compatibility
VFJ8125H3F	NTSC VHS Alignment Tape	Same as E75V / ES30V
VFK0329	Post Adjustment Screwdriver	Same as E75V / ES30V
VFK0330	Fine Adjustment Gear Driver	Same as E75V / ES30V

12 Assembling and Disassembling

12.1. Caution

“ATTENTION SERVICER”

Some chassis components may be have sharp edges. Be careful when disassembling and servicing.

1. This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.
2. For reassembly after operation checks or replacement, reverse the respective procedures.
   Special reassembly procedures are described only when required.
3. Select items from the following index when checks or replacement are required.
4. Refer to the Parts No. on the page of “Replacement Parts List” (Section 22), if necessary.

Caution:
Original screws should be used.

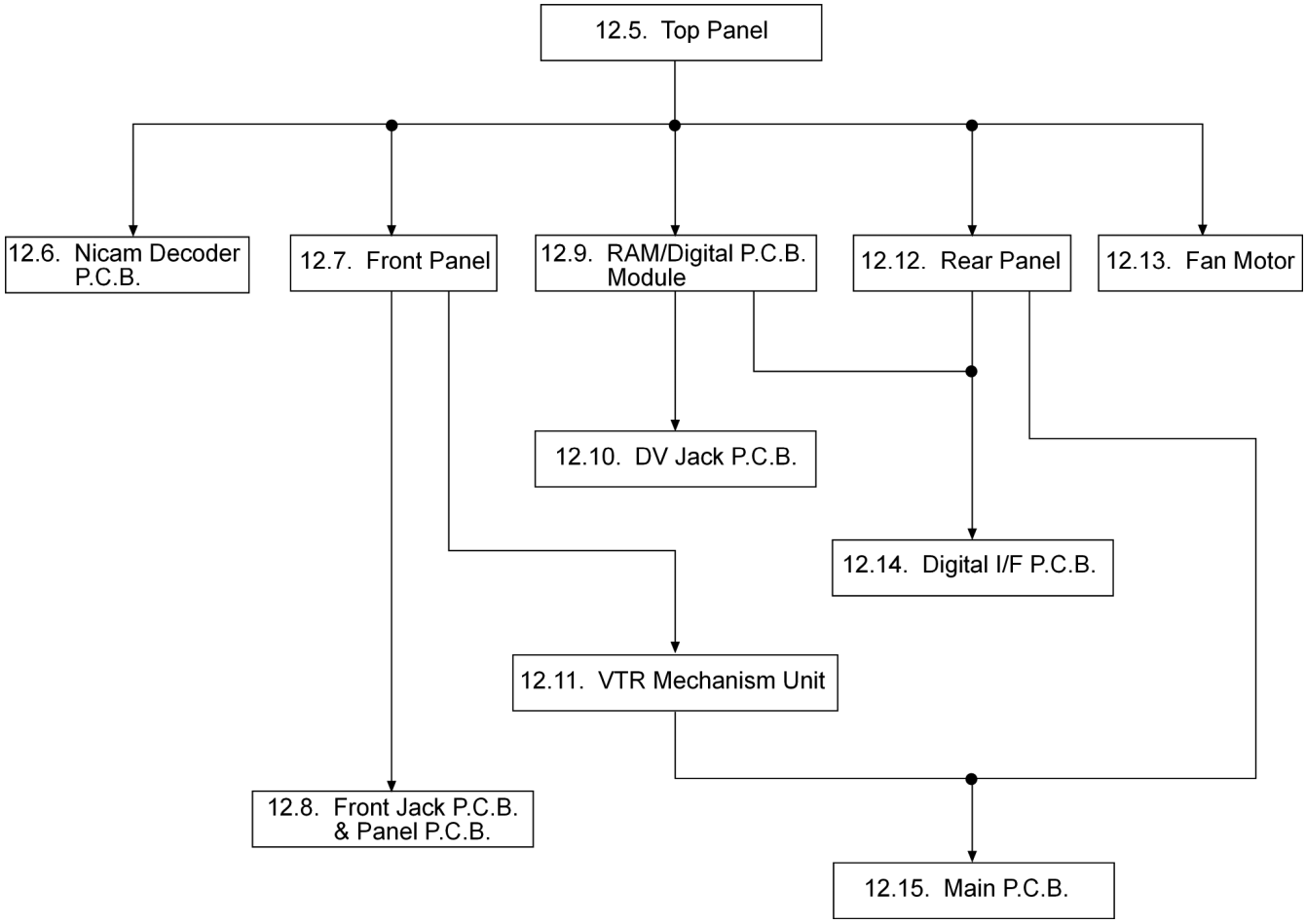
Below is the list of disassembly sections

- **Disassembly of Top Panel**
- **Disassembly of Nicam Decoder P.C.B.**
- **Disassembly of Front Panel**
- **Disassembly of Panel P.C.B. & Front Jack P.C.B.**
- **Disassembly of RAM/Digital P.C.B. module**
- **Disassembly of DV Jack P.C.B.**
- **Disassembly of VTR Mechanism Unit**
- **Disassembly of Rear Panel**
- **Disassembly of Fan Motor**
- **Disassembly of Digital I/F P.C.B.**
- **Disassembly of Main P.C.B.**

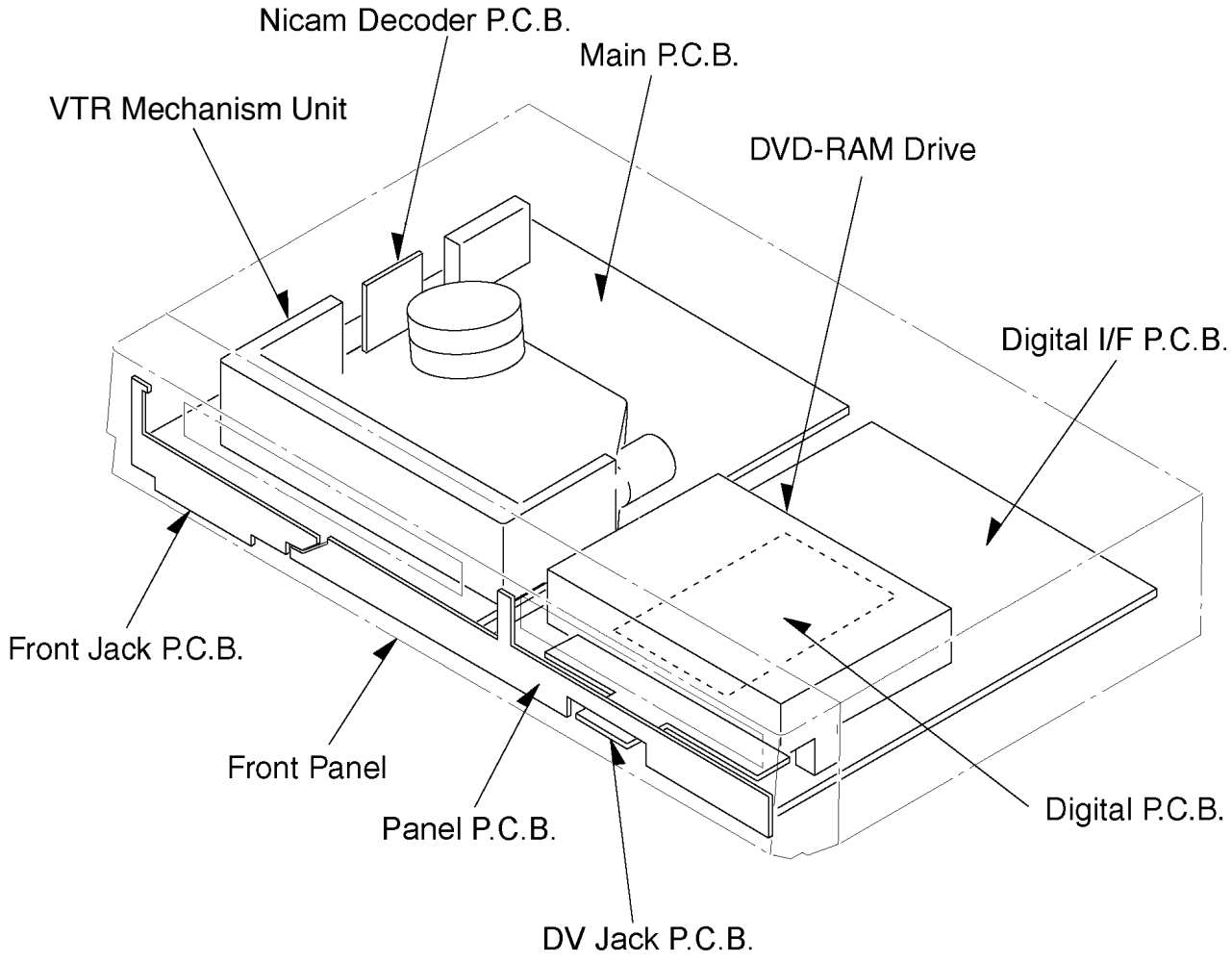
12.2. Disassembly Flow Chart

The following chart is the procedure for disassembling the casing and inside parts for internal inspection when carrying out the servicing.

To assemble the unit, reverse the steps shown in the chart below.



12.3. Main Parts Location Diagram



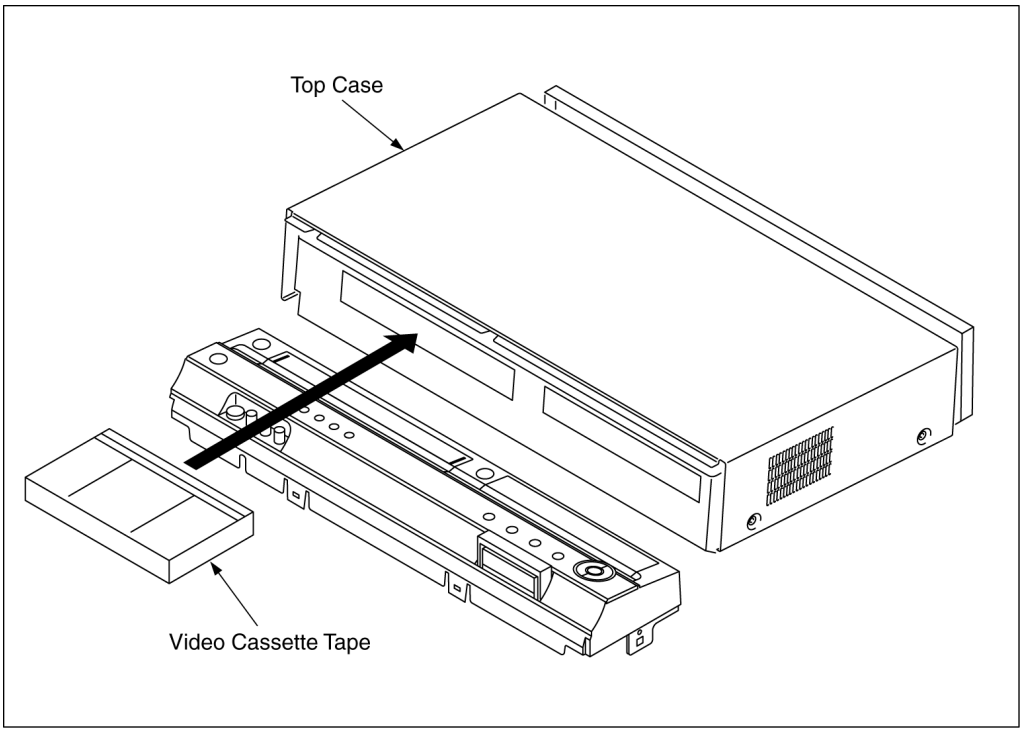
12.4. Caution with inserting cassette tape when disassembling the unit

Note1:

For description of the disassembling procedure, see the section 12.5.

Note2:

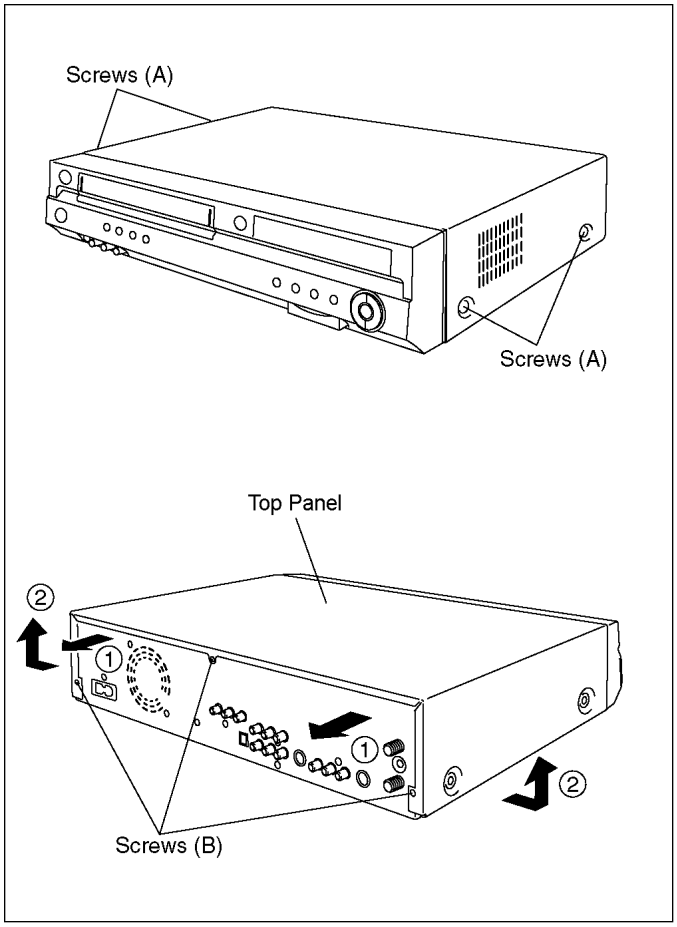
Video Cassette might not enter when a strong lighting is applied to VHS Mechanism when Video Cassette is inserted. Please weaken the lighting or cover with the top panel etc.



12.5. Disassembly of Top Panel

Step 1 : Remove 4 Screws (A) and 3 Screws (B).

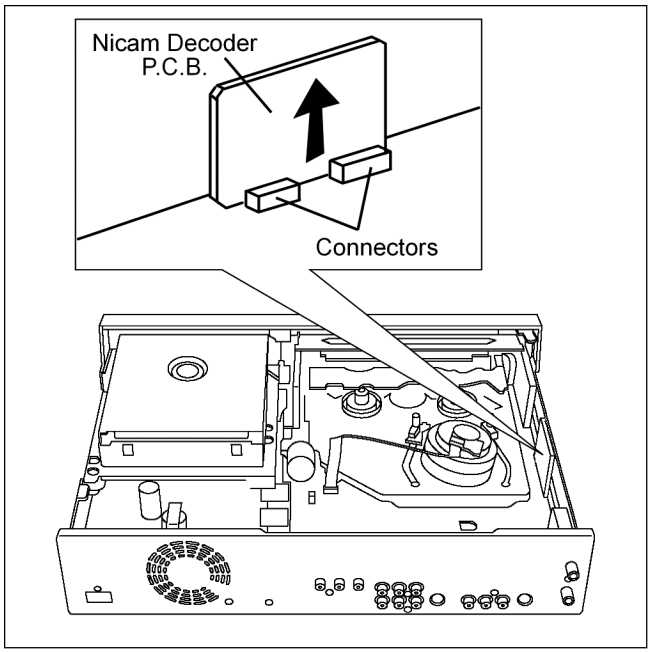
Step 2 : Slide Top Panel rearward and open the both ends at rear side of the Top Panel a little and lift the Top Panel in the direction of the arrows.



12.6. Disassembly of Nicam Decoder P.C.B.

・Follow the (step 1) - (step 2) of item 12.5.

Step 1 : Disconnect 2 connectors to remove Nicam Decoder P.C.B. as arrow shown.



12.7. Disassembly of Front Panel

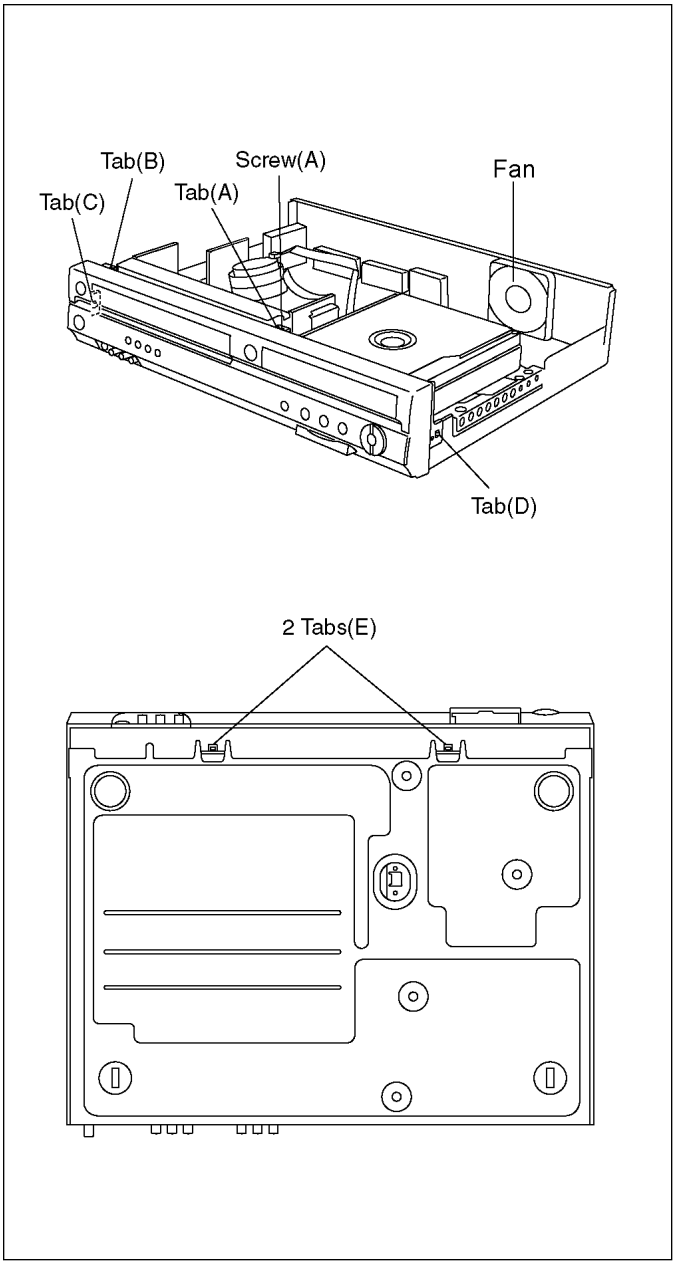
・Follow the (step 1) - (step 2) of item 12.5.

Step 1 : Remove 1 screw (A).

Step 2 : Unlock tab (A) and tab (B) simultaneously.

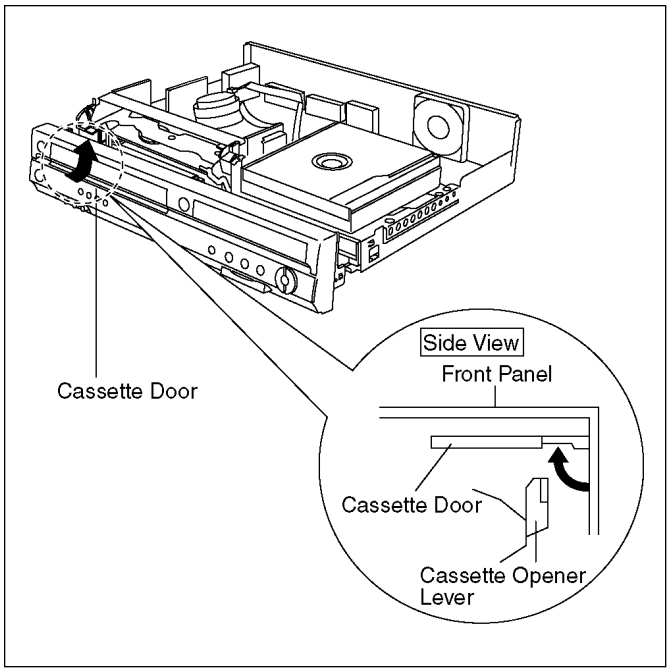
Step 3 : Unlock tab (C) and tab (D) simultaneously.

Step 4 : Unlock 2 tabs (E) respectively, and pull out Front Panel with connector slightly.



Note:

When attaching Front Panel, in order to hook Cassette Door Opener Lever to Cassette Door, push up cassette door in the direction of arrow and insert a front panel.



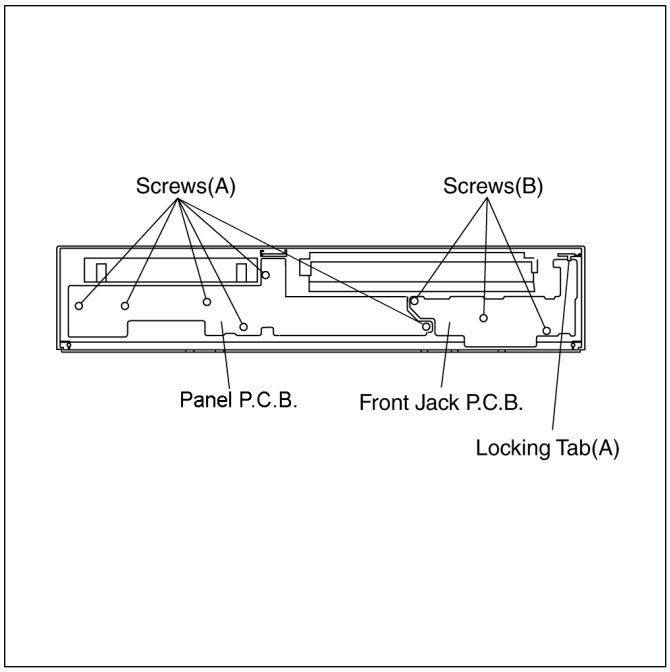
12.8. Disassembly of Front Jack P.C.B. & Panel P.C.B.

・Follow the (step 1) - (step 2) of item 12.5.

・Follow the (step 1) - (step 4) of item 12.7.

Step 1 : Remove 6 screws (A) to remove Panel P.C.B.

Step 2 : Remove 3 screws (B) and unlock Locking Tab (A) to remove Front Jack P.C.B.

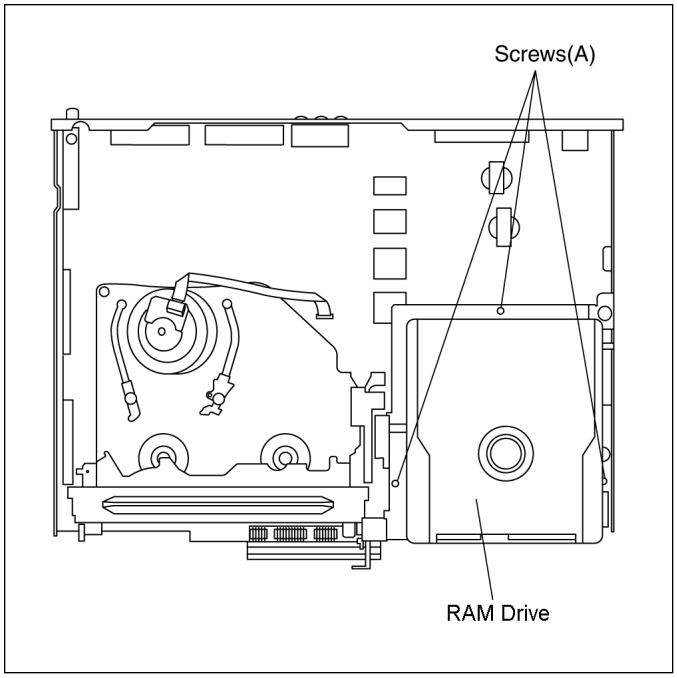


12.9. Disassembly of RAM / Digital P.C.B. Module

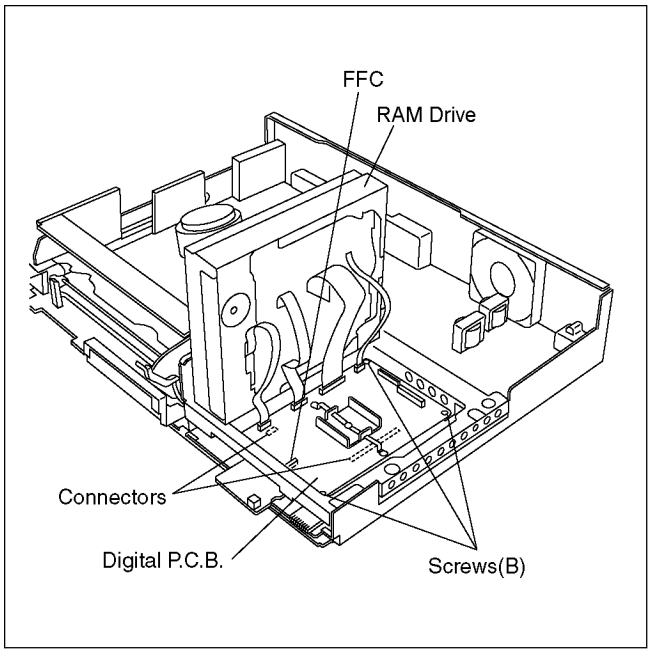
- Follow the (step 1) - (step 2) of item 12.5.
- Follow the (step 1) - (step 4) of item 12.7.

Caution:
Pairing of RAM Drive and Digital P.C.B. as "RAM/ Digital P.C.B. Module" have to be replaced together. If the pairing is changed, RAM Drive unit has to be re-aligned. Because the alignment data for RAM Drive Unit is stored in Digital P.C.B..

Step 1 : Remove 3 Screws (A).

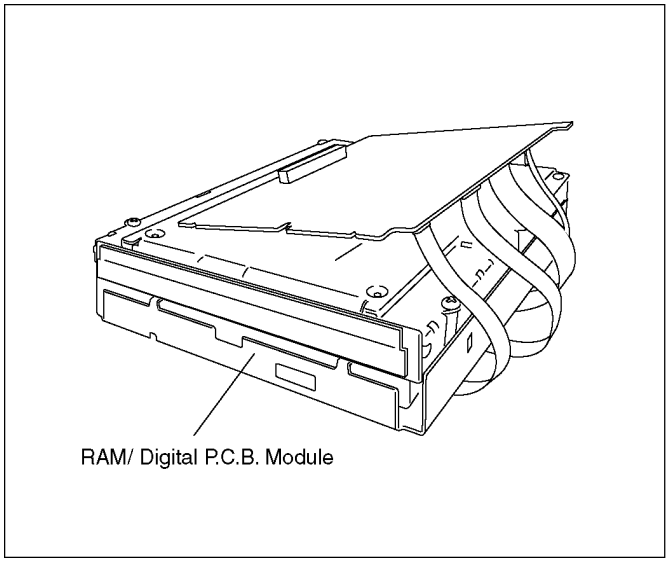


Step 2 : With holding RAM drive as below illustration, remove 3 screws (B) and disconnect FFC.
And lift up Digital P.C.B. slightly so to disconnect connectors to remove Digital P.C.B..



Note: Handle the RAM Drive with care. Please put on anti-static strap when handling the drive unit

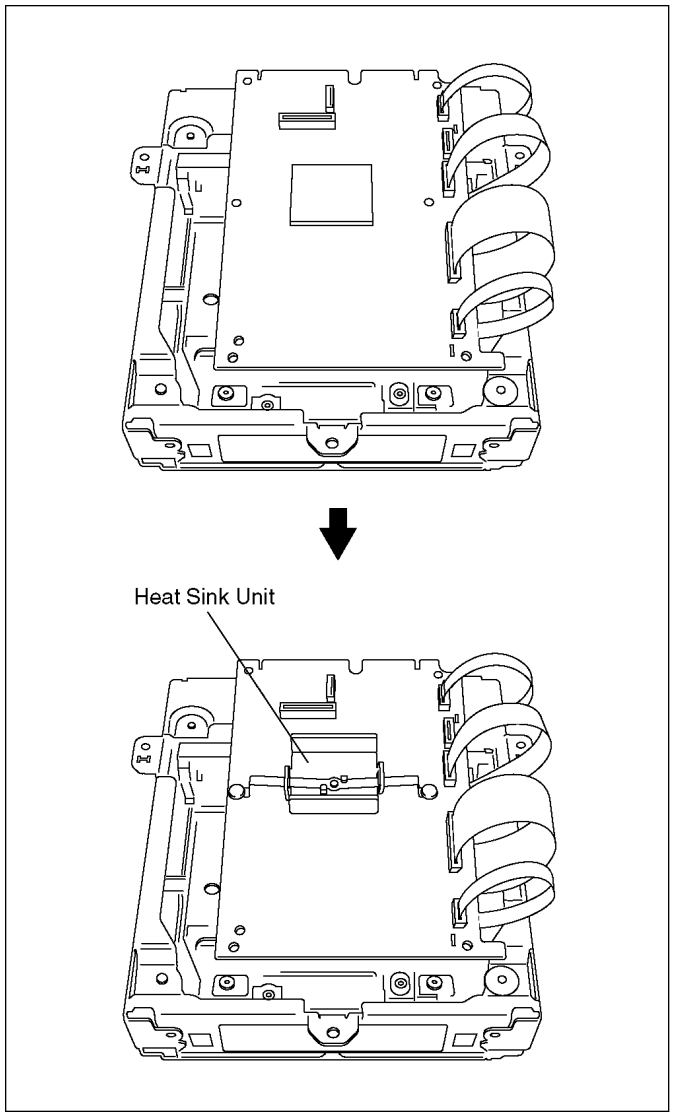
Step 3 : Place the Digital P.C.B. on RAM Drive and remove RAM/Digital P.C.B. Module.



Note:

RAM/Digital P.C.B. Module as service part has no heat sink unit.

Before returning to customer, heat sink unit should be installed on Digital P.C.B..

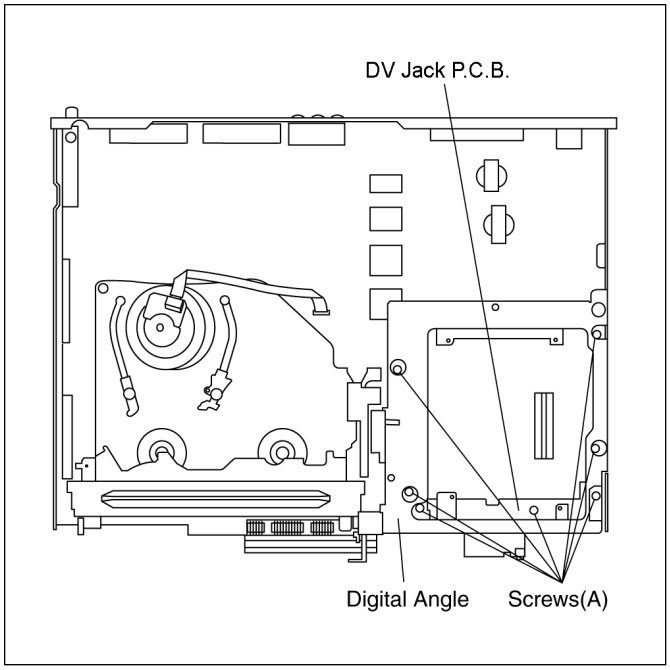


12.10. Disassembly of DV Jack P.C.B.

- Follow the (step 1) - (step 2) of item 12.5.
- Follow the (step 1) - (step 4) of item 12.7.
- Follow the (step 1) - (step 2) of item 12.9.

Step 1 : Remove 7 Screws (A).

Step 2 : Remove DV Jack P.C.B. with Digital Angle.



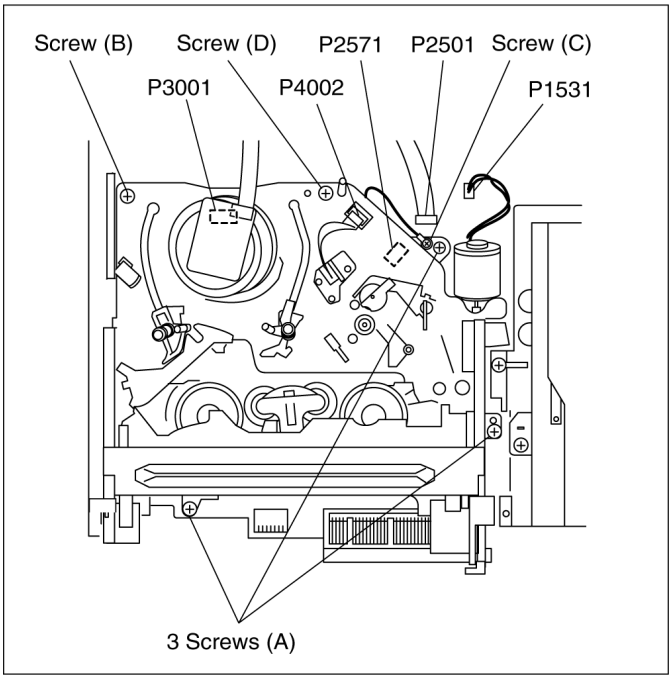
12.11. Disassembly of VTR Mechanism Unit

- Follow the (step 1) - (step 2) of item 12.5.
- Follow the (step 1) - (step 4) of item 12.7.

Step 1 : Disconnect 3 Connectors (P1531, P2501 and P4002).

Step 2 : Remove 3 Black Screws (A), Screw (B) , Screw (C) and Screw (D).

Step 3 : Lift up VTR Mechanism Unit perpendicularly so to disconnect Connectors (P2571 and P3001).

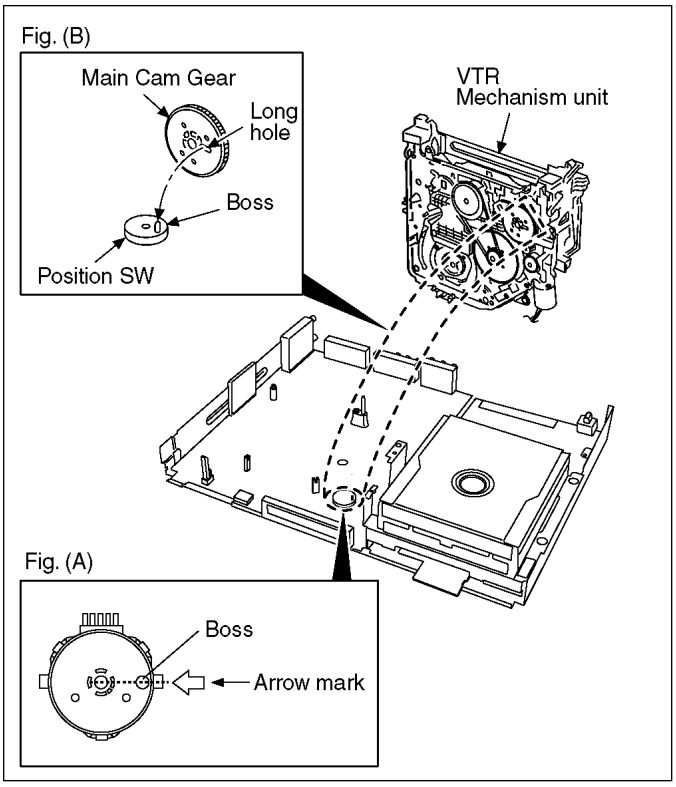


Note:

Pay attention to stiff connections of P2571 and P3001, when removing VTR Mechanism Unit.

12.11.1. Caution for attaching VTR Mechanism Unit

Step 1 : Attach VTR Mechanism Unit so that Boss of Position SW is put into long hole of Main Cam Gear, refer to Fig. (B).



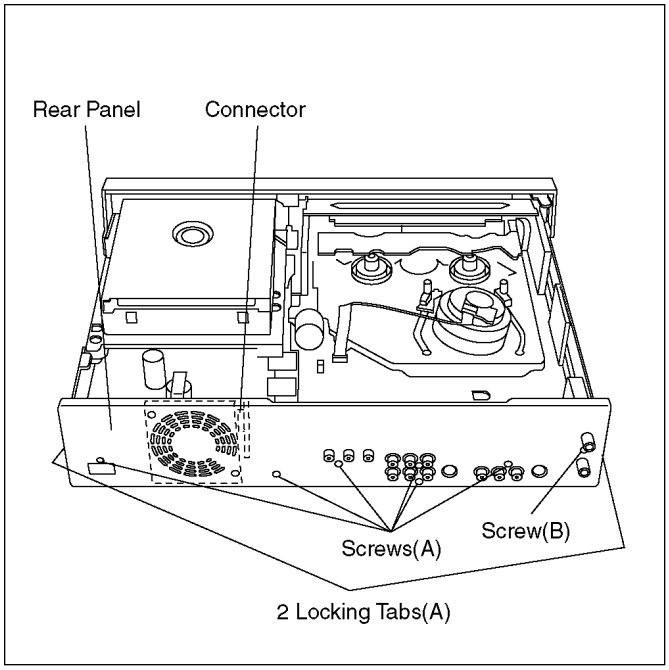
12.12. Disassembly of Rear Panel

・Follow the (step 1) - (step 2) of item 12.5.

Step 1 : Disconnect Fan Connector.

Step 2 : Remove 6 Screws (A) and 1 Screw (B).

Step 3 : Unlock 2 Locking Tabs (A) to remove panel Cabinet with Fan Motor.

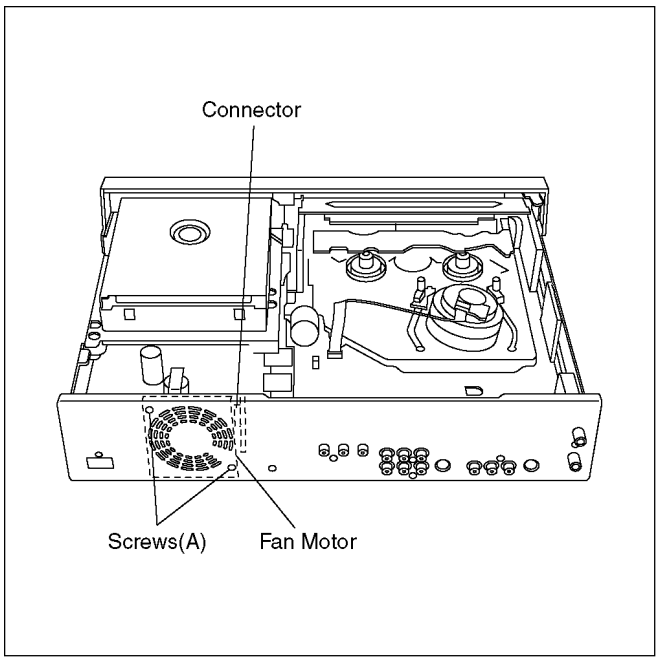


12.13. Disassembly of Fan Motor

・Follow the (step 1) - (step 2) of item 12.5.

Step 1 : Disconnect Fan Connector.

Step 2 : Remove 2 Screws (A) to Remove Fan Motor.



12.14. Disassembly of Digital I/F P.C.B.

・Follow the (step 1) - (step 2) of item 12.5.

・Follow the (step 1) - (step 4) of item 12.7.

・Follow the (step 1) - (step 2) of item 12.9.

・Follow the (step 1) - (step 2) of item 12.10.

・Follow the (step 1) - (step 3) of item 12.12.

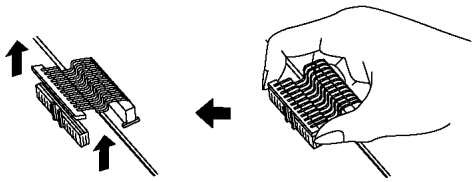
Step 1 : Disconnect 5 Connectors (A).

Step 2 : Remove the 2 Screws (A).

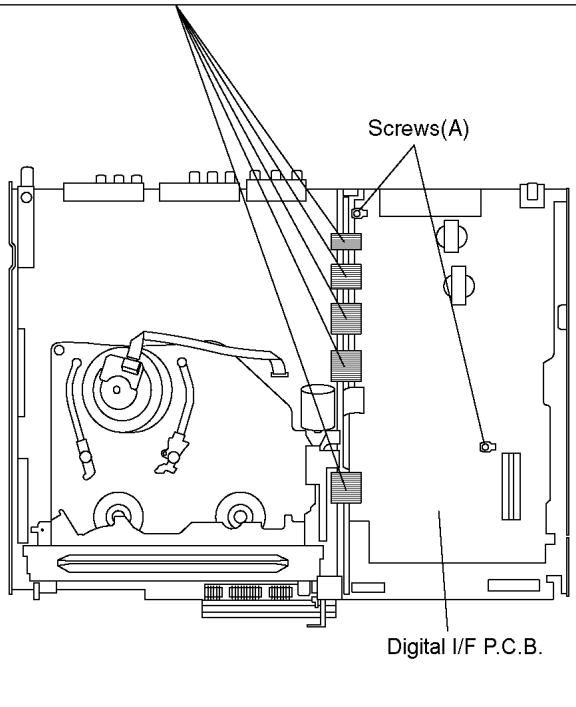
Step 3 : Remove Digital I/F P.C.B.

5 Connectors (A)

Note:
If connection of 5 Connectors (A) are tight, remove connectors after removing VTR Mechanism (refer to 12.11.) once.



Hold thumb and index finger and remove connector vertically.

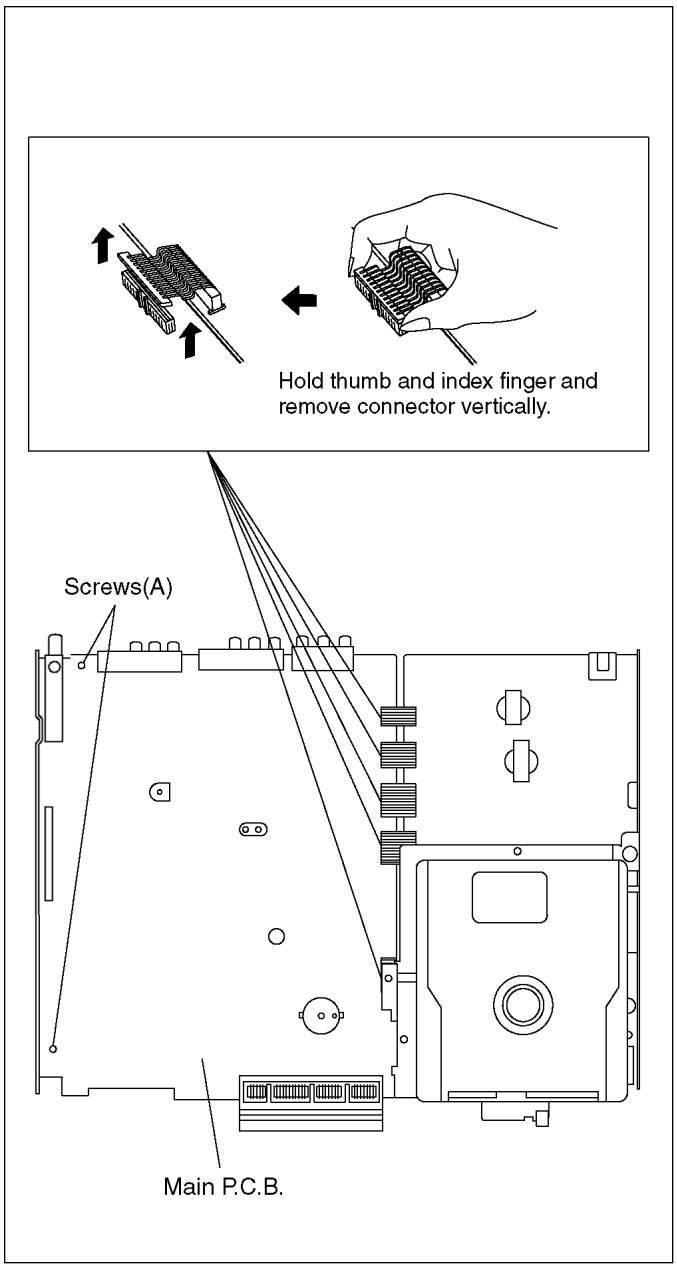


12.15. Main P.C.B.

- Follow the (step 1) - (step 2) of item 12.5.
- Follow the (step 1) - (step 4) of item 12.7.
- Follow the (step 1) - (step 3) of item 12.11.
- Follow the (step 1) - (step 3) of item 12.12.

Step 1 : Disconnect 5 Connectors.

Step 2 : Remove 2 Screws (A) and remove Main P.C.B.



13 Measurements and Adjustments

13.1. Service Positions

Note:

For description of the disassembling procedure, see the section 12.

13.1.1. Checking and Repairing of RAM / Digital P.C.B. Module

1. Top Cabinet

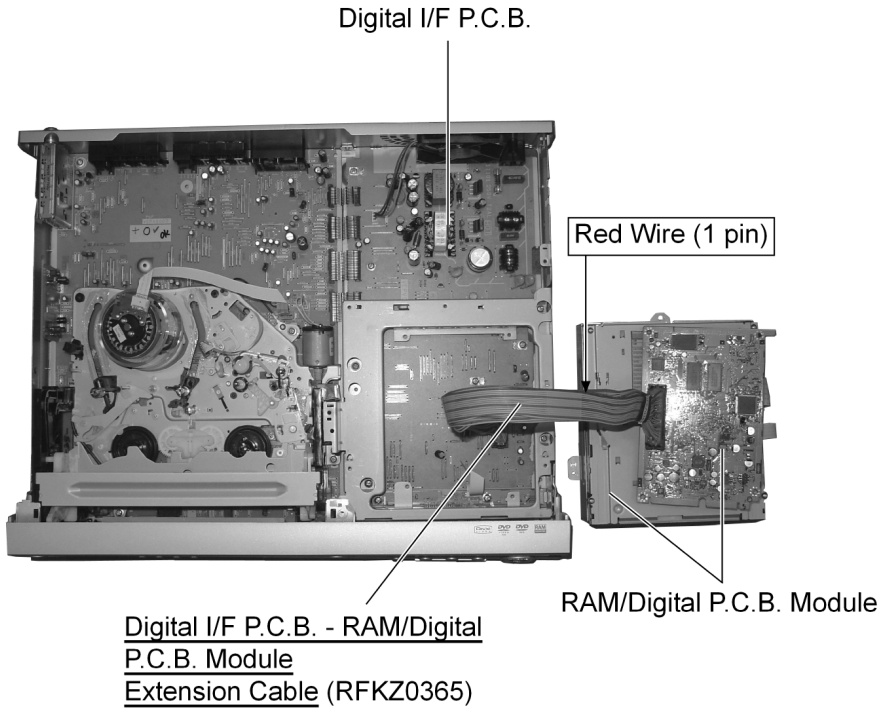
- Remove 4 Screws (A) on side
- Remove 3 Screws (B) on rear panel
- Remove Top Cabinet

2. RAM/Digital P.C.B. Module

- Remove 3 Screws (A) fixing DVD Drive and lift up DVD Drive slighty
- With holding DVD drive, remove 3 Screws (B) fixing Digital P.C.B. and disconnect 2 FFCs
- Left up Digital P.C.B. slighty so to disconnect connectors between Digital P.C.B. and Digital I/F P.C.B.
- Remove RAM/Digital P.C.B. Module and put it beside chassis

- Connect Extension Cables *between RAM/Digital P.C.B. Module and Digital I/F P.C.B. with (RFKZ0365),

Caution:
Red wire in the extension cable should be connected to (1) pin.



13.1.2. Checking and Repairing of Panel, Front Jack and Digital I/F P.C.B.

1. Top Cabinet

- Remove 4 Screws (A) on side
- Remove 3 Screws (B) on rear panel
- Remove Top Cabinet

2. Front Panel

- Remove 1 screw (A) on center
- Unlock 4 Locking Tabs (A),(B),(C),(D)
- Unlock 2 Locking Tabs (E) on bottom to remove Front Panel

3. Remove Rear Panel

- Disconnect Fan Connector
- Remove 6 Screws (A) and 1 Screw (B) fixing Rear Panel
- Unlock 2 Locking Tabs to remove Rear Panel with Fan Motor

4. Fan Motor

- Remove 2 Screws (A) and Remove Fan Motor

5. RAM/Digital P.C.B. Module

- Remove 3 Screws (A) fixing DVD Drive and lift up DVD Drive slighty
- With holding DVD drive, remove 3 Screws (B) fixing Digital P.C.B. and disconnect 2 FFCs
- Left up Digital P.C.B. slighty so to disconnect connectors between Digital P.C.B. and Digital I/F P.C.B.
- Remove RAM/Digital P.C.B. Module and put it beside chassis

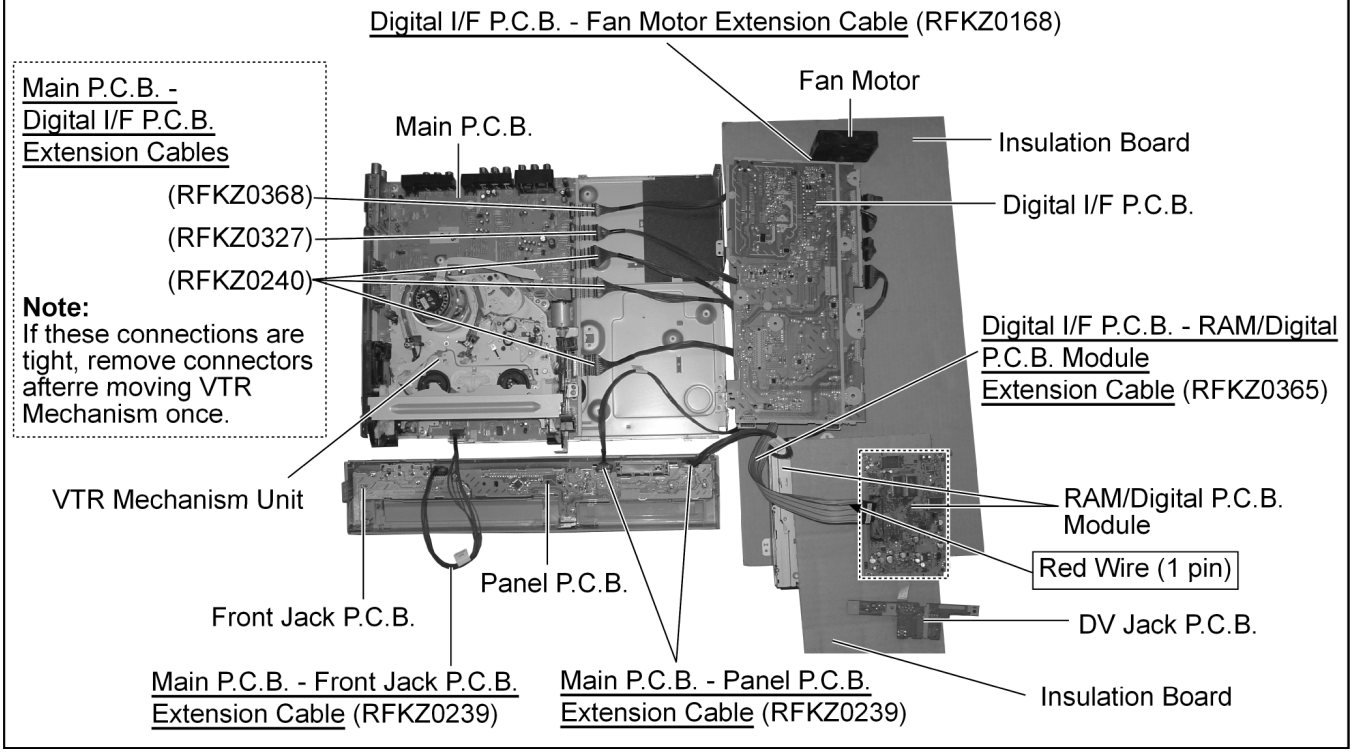
6. DV Jack P.C.B. with Digital Angle

- Remove 7 Screws (A) fixing Digital P.C.B.
- Remove DV Jack P.C.B. with Digital Angle

7. Digital I/F P.C.B.

- Remove 5 Connectors (A) between Main P.C.B. and Digital I/F P.C.B.
- Remove 2 Screws (A) from Digital I/F P.C.B.
- Remove Digital I/F P.C.B.
- Put an insulated sheet on DVD Drive, and the foil side the Digital I/F P.C.B. faces up
- Connect Extension Cables
  *between Main P.C.B. and Digital I/F P.C.B. with (RFKZ0327 / RFKZ0240 x 3 / RFKZ0368),
  *between Main P.C.B. and Front Jack P.C.B. with (RFKZ0239),
  *between Main P.C.B. and Panel P.C.B. with (RFKZ0239),
  *between Digital I/F P.C.B. and Fan Motor with (RFKZ0168),
  *between RAM/Digital P.C.B. Module and Digital I/F P.C.B. with (RFKZ0365),
  Connect an original cable between RAM/Digital P.C.B. Module and DV Jack P.C.B.

Caution:
Red wire in the extension cable should be connected to (1) pin.



13.1.3. Checking and Repairing of Main P.C.B.

1. Top Cabinet

- Remove 4 Screws (A) on side
- Remove 3 Screws (B) on rear panel
- Remove Top Cabinet

2. Front Panel

- Remove 1 screw (A) on center
- Unlock 4 Locking Tabs (A),(B),(C),(D)
- Unlock 2 Locking Tabs (E) on bottom to remove Front Panel

3. Remove Rear Panel

- Disconnect Fan Connector
- Remove 6 Screws (A) and 1 Screw (B) fixing Rear Panel
- Unlock 2 Locking Tabs to remove Rear Panel with Fan Motor

4. Fan Motor

- Remove 2 Screws (A) and Remove Fan Motor

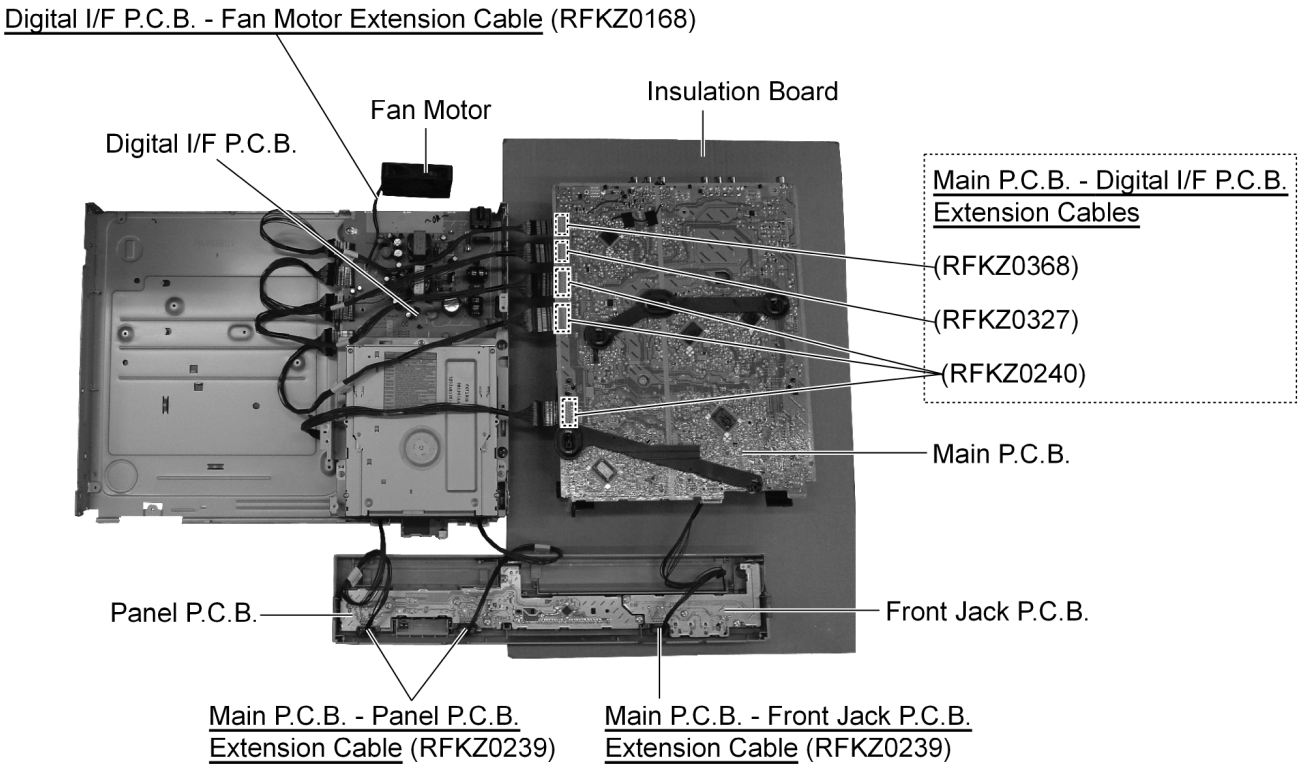
5. VTR Mechanism Unit

- Disconnect 3 Connectors
- Remove 3 Screws (A), Screw (B), Screw (C), Screw (D)
- Lift up VTR Mechansim Unit to remove it

6. Main P.C.B.

- Disconnect 5 Connectors (A) between Main P.C.B. and Digital I/F P.C.B.
- Remove 2 screws (A) fixing Main P.C.B. to remove Main P.C.B.
- Attach VTR Mechanism Unit on to Main P.C.B.
- Tighten Screw (C) with Earth Wire
- Tighten Screw (D) beside Screw (C)
- Insert 1 Connector and 2 FFCs
- Hold Main P.C.B. with VTR Mechanism, make it upside-down, and put it
- Connect Extension Cables
  *between Main P.C.B. and Digital I/F P.C.B. with (RFKZ0327 / RFKZ0240 x 3 / RFKZ0368),
  *between Main P.C.B. and Front Jack P.C.B. with (RFKZ0239),
  *between Main P.C.B. and Panel P.C.B. with (RFKZ0239),
  *between Digital I/F P.C.B. and Fan Motor with (RFKZ0168),

Caution:
Red wire in the extension cable should be connected to (1) pin.



13.2. Caution for Replacing Parts

13.2.1. Notice for replacing parts of VHS Mechanism

13.2.1.1. Regarding change of parts of VHS mechanism

The following parts are not compatible with past R4 Mechanism. Use parts of exclusive use.

Ref. No.	Part Name	Part Number		Pcs	
		Current	Previous		
101	RDD CYLINDER ASS'Y	VEG1699KIT	VEG1642KIT	1	*1 For GC/GCS/GN
101	RDD CYLINDER ASS'Y	VEG1701KIT	VEG1643KIT	1	*1 For EE
101-1	FPC HOLDER	VMD5464	VMD4983	1	
102	CAPSTAN MOTOR	VEM0800T	VEM0750T	1	
105	INTERMEDIATE GEAR	VDG1686	VDG1510	1	
106	MAIN CAM GEAR	VDG1685	VDG1511	1	
114	OPENER PIECE	VMD5466	VMD4252	1	
116	MAIN LEVER	VML3934	VML3624	1	
117	PINCH CHARGE ARM	VML3933	VML3626	1	
122	AC HEAD ASS'Y	L1AE00000044	L1AE00000036	1	
130	T BRAKE ARM	VXL3343	VXL3113	1	
135	SIDE PLATE L	VMD5468	VMD4255	1	
136	SIDE PLATE R	VMD5469	VMD4254	1	
137	CASSETTE HOLDER UNIT	VXA8265	VXA7110	1	
139	SECTOR GEAR	VXA8323	VXA7311	1	

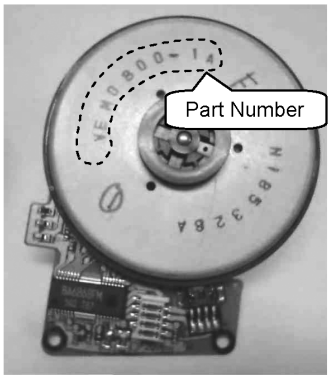
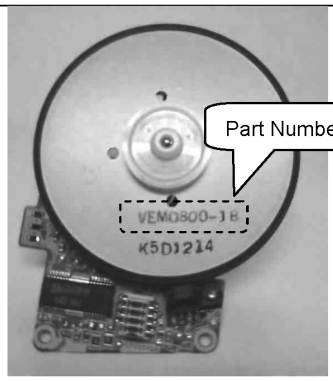
*1: Part Number of RDD CYLINDER ASS'Y is different depending on the model.

Capstan Motor (VEM0800T) used for current R4 Mechanism is not compatible with Capstan Motor (VEM0750T) of previous R4 Mechanism.

Therefore, confirm part number by Service Manual of individual models and use part of exclusive use.

13.2.2. Notice for Replacing Capstan Motor

[VEM0800-1A] is printed on capstan motor of replacement part.
[VEM0800-1B] is printed on capstan motor of product.
Though printed part numbers differ between product and replacement part, **[VEM0800-1A] and [VEM800-1B] have compatibility.**

Replacement Part **"VEM0800-1A"** or **"VEM0800-1B"**	Product **"VEM0800-1B"**
Bottom  	Bottom 
Top 	Top 

13.2.3. Items that should be done after replacing parts

✓: Necessary — : Unnecessary

	Reset IC6001 * Note 1	Reset IC7501 * Note 1	Obtain and register a new registration code * Note 2	PG Shifter Automatic Adjustment * Note 3	X-VALUE & LINEARITY (P2 and P3 Posts) Adjustment * Note 4
DD Cylinder	—	—	—	✓	✓
Main P.C.B.	✓	—	—	—	—
IC6001	✓	—	—	—	—
IC7501	—	✓	—	—	—
Power and Digital I/F P.C.B.	—	✓	✓	✓	—
IC37501(EEPROM)	—	—	✓	✓	—

*** Note 1:**

Resetting object	Condition of power	Short Terminal
IC6001	POWER ON	TL6004 (Reset_L) and TL6002 (GND)
IC7501	POWER ON	IC7504-4 (Reset_L) and GND

*** Note 2:**

Please will always pass the customer "Warning for Customers Who Use the DivX Video-on-Demand content." with the product and get it when you unavoidably exchange EEPROM or P.C.B. including EEPROM (When the product is exchanged, it is the same.).

You must use print attached to service part (EEPROM or P.C.B. including EEPROM) or must use copy of print below as "Warning for Customers who use the DivX Video-on-Demand content."Information needed without fail for the customer for whom it is used continuing DivX Video-on-Demand Service to "Manual for the customer" is recorded.

Appendix:* Parts that memorize user's information are only EEPROM.* The registration of Registration Code is possible for half a year up to 6 recorders up to 10 recorders a year. Replacement of EEPROM or P.C.B. including EEPROM spends one of this.

Registration Code is memorized in EEPROM (RFKxxxxxx).
Model without VHS: on Main P.C.B.Model with VHS: on Digital I/F P.C.B. (Power & DVD I/F/P.C.B.)If exchange above P.C.B. or EEPROM, new registration Code differ from previous Registration Code will be generated.In this case if your customer uses DivX Video-on-Demand service, he/she will no longer be able to play any content that he/she purchased under that same registration code.Therefore your customer will need to obtain and register the new registration code.

*Copy this page and cut on the dotted line and give the lower half to your customer.

Warning for Customers who use the DivX Video-on-Demand content.

1. The registration code has been changed for the repair of the product or the product exchange.
2. Obtain and register a new registration code, otherwise you will no longer be able to play DivX Video-on-Demand content.
3. Follow the procedure on the DivX Video-on-Demand web site to register at
   http://vod.divx.com/
   * If you do not use the DivX Video-on-Demand content, please ignore this warning.

***Note3:**

PG Shifter Automatic Adjustment Procedure

<table>
<tr><th colspan="3">PROCEDURE</th><th>F.I.P. DISPLAY</th></tr>
<tr><td colspan="3">Turn on the Service Mode.
1. Set Drive Select to VHS and press the [STOP] and [EJECT] key simultaneously for more than 3 seconds.</td><td>00000</td></tr>
<tr><td colspan="3">Activate the Service Mode 2. (Auto tracking will be turned off)
2. Press the [STOP] and [EJECT] key simultaneously twice.</td><td>20000</td></tr>
<tr><td colspan="3">Put it in PG adjustment mode.
3. Press the EJECT key for more than 3 seconds.</td><td>2 00</td></tr>
<tr><td colspan="3">Set it adjustment No.1.
4. Press the CH UP key once.</td><td>2 100</td></tr>
<tr><td colspan="3">Insert the alignment cassette tape (VFJ8125H3F).
5. The PG Shifter Adjustment starts automatically.</td><td>2 100</td></tr>
<tr><td colspan="3">6. This value displays that PG Adjustment data is memorizing in EEPROM.</td><td>For example
0 557</td></tr>
<tr><td rowspan="5">Result</td><td>Success</td><td>Cassette tape is ejected automatically.</td><td>2 100</td></tr>
<tr><td rowspan="4">Error</td><td>NG1 in the PG Shifter Automatic Adjustment (The cylinder rotation is unstable during the automatic adjustment.)</td><td>F20</td></tr>
<tr><td>NG2 in the PG Shifter Automatic Adjustment (The vertical sync signal is lacked while over 5 seconds on the alignment tape.)</td><td>F21</td></tr>
<tr><td>NG3 in the PG Shifter Automatic Adjustment (The installing position of Heads to the cylinder is out of specification.</td><td>F22</td></tr>
<tr><td>NG4 in the PG Shifter Automatic Adjustment (The servo is not locked to the cylinder for more than 10 sec.)</td><td>F23</td></tr>
<tr><td colspan="3">Exit from Service Mode.
7. Press [STOP] and [EJECT] keys simultaneously in 6 times.
* Then the FIP becomes normal indication.</td><td>10:00
(Normal Indication)</td></tr>
</table>

***Note4:**

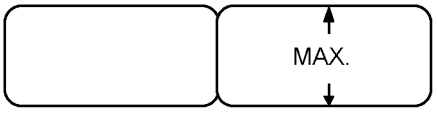
X-VALUE & LINEARITY (P2 and P3 Posts) Adjustment Procedure

1. Set the Auto Tracking to off.
   (1) Set Drive Select to VHS and press the [STOP] and [EJECT] keys simultaneously for more than 3 seconds to enter Service Mode.
   (2) Press [STOP] and [EJECT] keys simultaneously twice to activate Service Mode 2, and then Auto-Tracking is turned off.
2. Perform the X-VALUE ADJUSTMENT

X-VALUE ADJUSTMENT

1. After turning off the Auto tracking, playback the alignment Tape and press [CH UP] and [CH DOWN] keys simultaneously to adjust the tracking to FIX value.
2. Adjust A/C Head Base so that the envelope becomes maximum level. (It is described on "**5-2. Tape Interchangeability Adjustment**" in "**R4 Mechanism**" that is separated volume.)

Alignment Tape	VFJ8125H3F
Test Point of Playback Envelope	TW3001 (or TW4502)



Playback Envelope

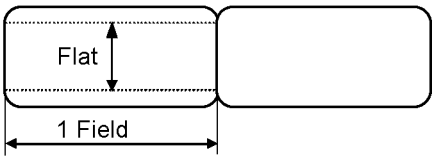
LINEARITY ADJUSTMENT

1. After turning off the Auto tracking, playback the alignment Tape and press [CH UP] and [CH DOWN] keys simultaneously to adjust the tracking to FIX value.

Caution:
When using aligment tapes without tab for inhibiting REC, press [PLAY] button after inserting tape.

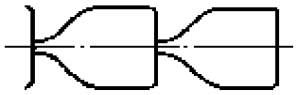
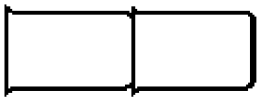
2. Adjust the LINEARITY so that the envelope is flat when moving tracking to (+) and (-) directions.

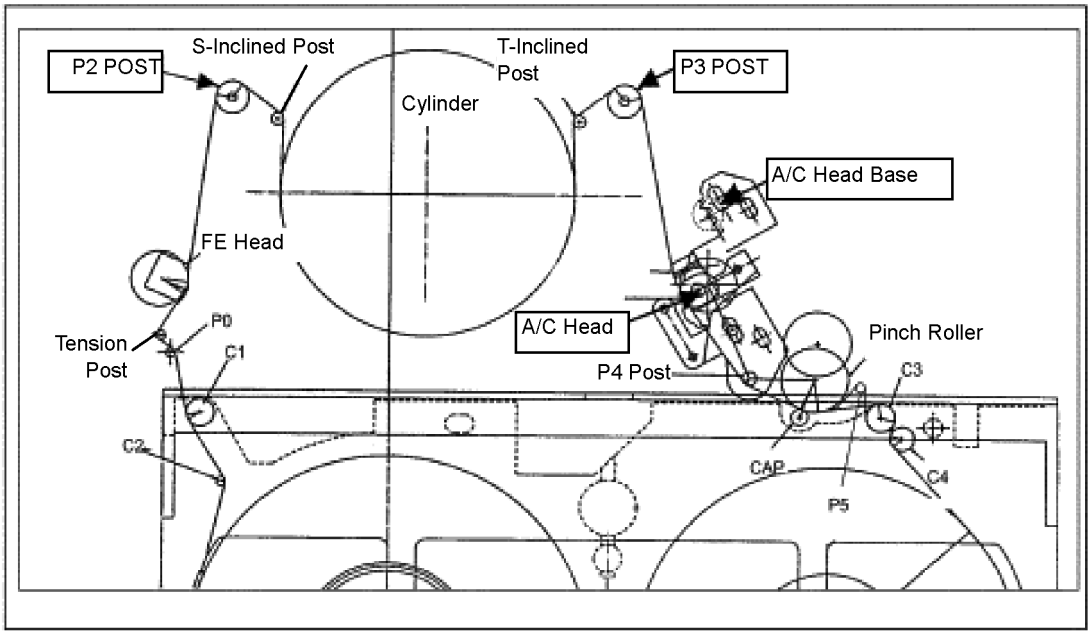
Alignment Tape	VFJ8125H3F
Test Point of Playback Envelope	TW3001 (or TW4502)

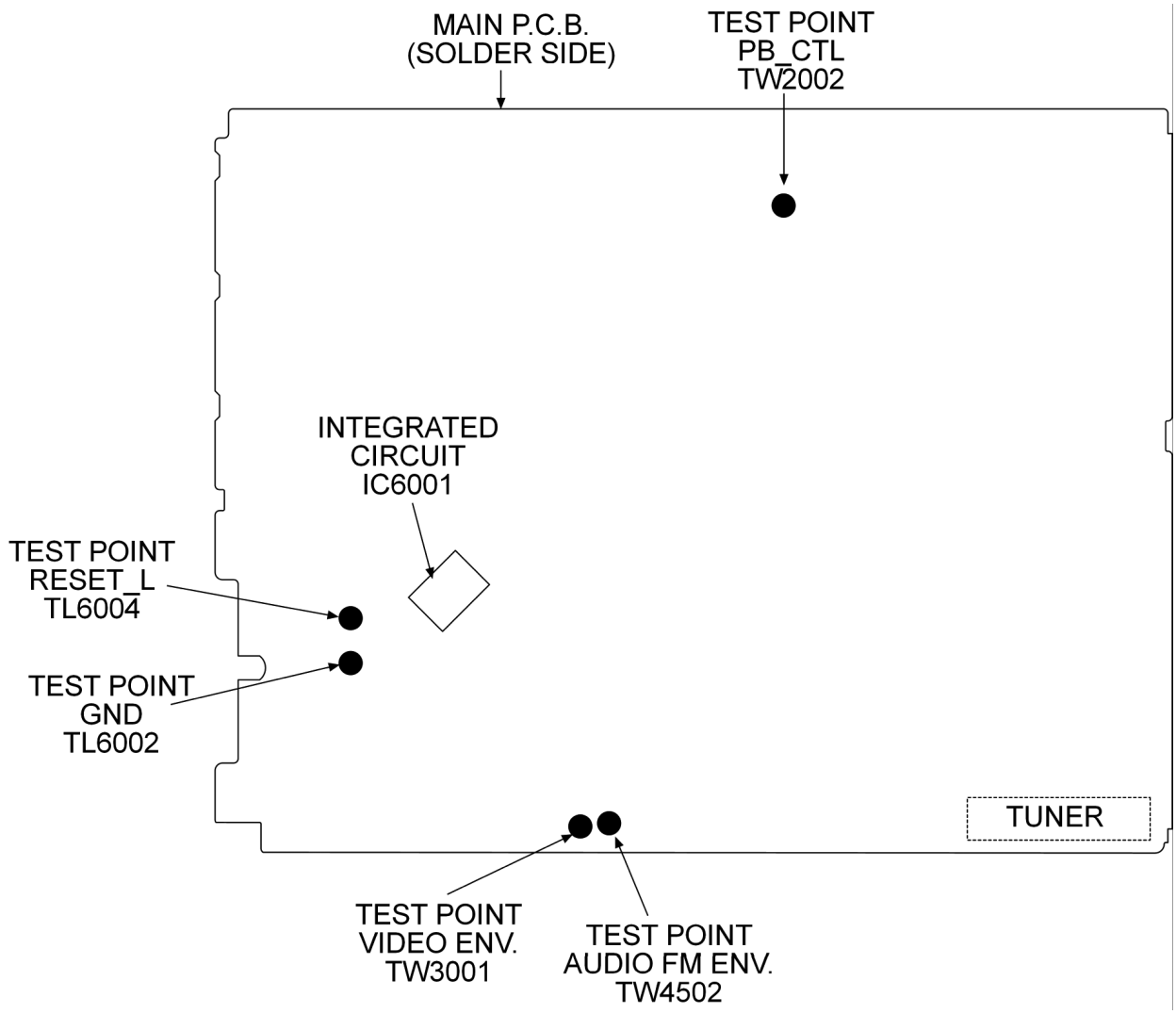


Playback Envelope

- Main symptoms and Adjustment point

Envelope	Post Name	Adjustment Method
	P2 Post 	Turn P2 Post counter-clockwise (Approx. 1/2 revolution)
	P2 Post 	Turn P2 Post clockwise (Approx. 1/4 revolution)
	P3 Post 	Turn P3 Post clockwise (Approx. 1/2 revolution)
	P3 Post 	Turn P3 Post counter-clockwise (Approx. 1/4 revolution)
	P2 Post  / P3 Post 	Turn P2 Post clockwise (Less than 1 revolution) Turn P3 Post counter-clockwise (Less than 1revolution)





13.3. Standard Inspection Specifications after Making Repairs

After making repairs, we recommend performing the following inspection, to check normal operation.

No.	Procedure	Item to Check
1	Turn on the power, and confirm items pointed out.	Items pointed out should reappear.

<table>
<tr><th>No.</th><th>Procedure</th><th>Item to Check</th></tr>
<tr><td>2</td><td>Insert RAM disc.</td><td>The Panasonic RAM disc should be recognized.</td></tr>
<tr><td>3</td><td>Enter the EE (TU IN / AV IN - AV OUT) mode.</td><td>No abnormality should be seen in the picture, sound or operation.</td></tr>
<tr><td>4</td><td>Perform auto recording and playback for one minute using the RAM disc.</td><td>No abnormality should be seen in the picture, sound or operation.
*Panasonic DVD-RAM disc should be used when recording and playback.</td></tr>
<tr><td>5</td><td>If a problem is caused by a VCD, DVD-R, DVD-Video, Audio-CD, or MP3, playback the test disc.</td><td>No abnormality should be seen in the picture, sound or operation.</td></tr>
<tr><td>6</td><td>Models with DV Input Jack: In case of that the trouble is caused by DV terminal.</td><td>Models with DV Input Jack;
1) DV terminal: Check to be able to record from DVC.</td></tr>
<tr><td>7</td><td>After checking and making repairs, upgrade the firmware to the latest version.</td><td>Make sure that [UPDOK] appears in the FL display.</td></tr>
<tr><td></td><td colspan="2">
Caution for updating Firmware.
Firmware of this model is compulsively changed even if new version has already been installed in product.
UNFORMAT in not displayed.
Please confirm firm version of the product before update, to avoid making down version.
step1. Confirm firm version of the product.
a). Press [VHS to DVD COPYING] + [STOP] buttons of product simultaneously for 5 seconds to turn it in Service mode.
b). Press [0] [2] of the remote controller.
Region code/ MAIN firm version/ TIMER firm version/ DRIVE firmware version/ ROM Correction version is displayed in this order.
step 2. Compare Main firm version and Drive firm version of FL display with versions of updating disc.

For Example:
<table>
<tr><th colspan="2">Versions of updating disc</th><th colspan="2">Versions of FL display</th><th rowspan="2">Judgment of updating disc</th><th rowspan="2">Descriptions</th></tr>
<tr><th>Main firm</th><th>Drive firm</th><th>Main firm</th><th>Drive firm</th></tr>
<tr><td>3090U5</td><td>S126</td><td>3090U5</td><td>S155</td><td rowspan="2">NG</td><td rowspan="2">If this updating disc was used, the product will be made down version.
1. Download latest firmware from TSN System and burn it to CD-R or CD-RW.
2. Update product with this download latest firmware.</td></tr>
<tr><td>3010C5</td><td>S155</td><td>3040C5</td><td>S155</td></tr>
<tr><td>3090U5</td><td>S155</td><td>3090U5</td><td>S126</td><td rowspan="2">OK</td><td rowspan="2">If this updating disc was used, the product will be made up version.</td></tr>
<tr><td>3040C5</td><td>S155</td><td>3010C5</td><td>S155</td></tr>
</table>
</td></tr>
<tr><td>8</td><td>Transfer [9][9] in the service mode setting, and initialize the service settings (return various settings and error information to their default values. The laser time is not included in this initialization).</td><td>Make sure that [CLR] appears in the FL display.
After checking it, turn the power off.</td></tr>
</table>

Use the following checklist to establish the judgement criteria for the picture and sound.

Item	Contents	Check	Item	Contents	Check
Picture	Block noise		Sound	Distorted sound	
	Crosscut noise			Noise (static, background noise, etc.)	
	Dot noise			The sound level is too low.	
	Picture disruption			The sound level is too high.	
	Not bright enough			The sound level changes.	
	Too bright				
	Flickering color				
	Color fading				

14 Miscellaneous

14.1. Abbreviations

14.1.1. DVD

INITIAL/LOGO		ABBREVIATIONS
A	A0~UP	ADDRESS
	ACLK	AUDIO CLOCK
	AD0~UP	ADDRESS BUS
	ADATA	AUDIO PES PACKET DATA
	ALE	ADDRESS LATCH ENABLE
	AMUTE	AUDIO MUTE
	AREQ	AUDIO PES PACKET REQUEST
	ARF	AUDIO RF
	ASI	SERVO AMP INVERTED INPUT
	ASO	SERVO AMP OUTPUT
	ASYNC	AUDIO WORD DISTINCTION SYNC
B	BCK	BIT CLOCK (PCM)
	BCKIN	BIT CLOCK INPUT
	BDO	BLACK DROP OUT
	BLKCK	SUB CODE BLOCK CLOCK
	BOTTOM	CAP. FOR BOTTOM HOLD
	BYP	BYPATH
	BYTCK	BYTE CLOCK
C	CAV	CONSTANT ANGULAR VELOCITY
	CBDO	CAP. BLACK DROP OUT
	CD	COMPACT DISC
	CDSCK	CD SERIAL DATA CLOCK
	CDSRDATA	CD SERIAL DATA
	CDRF	CD RF (EFM) SIGNAL
	CDV	COMPACT DISC-VIDEO
	CHNDATA	CHANNEL DATA
	CKSL	SYSTEM CLOCK SELECT
	CLV	CONSTANT LINEAR VELOCITY
	COFTR	CAP. OFF TRACK
	CPA	CPU ADDRESS
	CPCS	CPU CHIP SELECT
	CPDT	CPU DATA
	CPUADR	CPU ADDRESS LATCH
	CPUADT	CPU ADDRESS DATA BUS
	CPUIRQ	CPU INTERRUPT REQUEST
	CPRD	CPU READ ENABLE
	CPWR	CPU WRITE ENABLE
	CS	CHIP SELECT
	CSYNCIN	COMPOSITE SYNC IN
	CSYNCOUT	COMPOSITE SYNC OUT
D	DACCK	D/A CONVERTER CLOCK
	DEEMP	DEEMPHASIS BIT ON/OFF
	DEMPH	DEEMPHASIS SWITCHING
	DIG0~UP	FL DIGIT OUTPUT
	DIN	DATA INPUT
	DMSRCK	DM SERIAL DATA READ CLOCK
	DMUTE	DIGITAL MUTE CONTROL
	DO	DROP OUT
	DOUT0~UP	DATA OUTPUT
	DRF	DATA SLICE RF (BIAS)
	DRPOUT	DROP OUT SIGNAL
	DREQ	DATA REQUEST
	DRESP	DATA RESPONSE
	DSC	DIGITAL SERVO CONTROLLER
	DSLF	DATA SLICE LOOP FILTER
	DVD	DIGITAL VIDEO DISC

INITIAL/LOGO		ABBREVIATIONS
E	EC	ERROR TORQUE CONTROL
	ECR	ERROR TORQUE CONTROL REFERENCE
	ENCSEL	ENCODER SELECT
	ETMCLK	EXTERNAL M CLOCK (81MHz/40.5MHz)
	ETSCLK	EXTERNAL S CLOCK (54MHz)
F	FBAL	FOCUS BALANCE
	FCLK	FRAME CLOCK
	FE	FOCUS ERROR
	FFI	FOCUS ERROR AMP INVERTED INPUT
	FEO	FOCUS ERROR AMP OUTPUT
	FG	FREQUENCY GENERATOR
	FSC	FREQUENCY SUB CARRIER
	FSCK	FS (384 OVER SAMPLING) CLOCK
G	GND	COMMON GROUNDING (EARTH)
H	HA0~UP	HOST ADDRESS
	HD0~UP	HOST DATA
	HINT	HOST INTERRUPT
	HRXW	HOST READ/WRITE
I	IECOUT	IEC958 FORMAT DATA OUTPUT
	IPFRAG	INTERPOLATION FLAG
	IREF	I (CURRENT) REFERENCE
	ISEL	INTERFACE MODE SELECT
L	LDON	LASER DIODE CONTROL
	LPC	LASER POWER CONTROL
	LRCK	L CH/R CH DISTINCTION CLOCK
M	MA0~UP	MEMORY ADDRESS
	MCK	MEMORY CLOCK
	MCKI	MEMORY CLOCK INPUT
	MCLK	MEMORY SERIAL COMMAND CLOCK
	MDATA	MEMORY SERIAL COMMAND DATA
	MDQ0~UP	MEMORY DATA INPUT/OUTPUT
	MDQM	MEMORY DATA I/O MASK
	MLD	MEMORY SERIAL COMMAND LOAD
	MPEG	MOVING PICTURE EXPERTS GROUP
O	ODC	OPTICAL DISC CONTROLLER
	OFTR	OFF TRACKING
	OSCI	OSCILLATOR INPUT
	OSCO	OSCILLATOR OUTPUT
	OSD	ON SCREEN DISPLAY
P	P1~UP	PORT
	PCD	CD TRACKING PHASE DIFFERENCE
	PCK	PLL CLOCK
	PDVD	DVD TRACKING PHASE DIFFERENCE
	PEAK	CAP. FOR PEAK HOLD
	PLLCLK	CHANNEL PLL CLOCK
	PLLOK	PLL LOCK
	PWMCTL	PWM OUTPUT CONTROL
	PWMDA	PULSE WAVE MOTOR DRIVE A
	PWMOA, B	PULSE WAVE MOTOR OUT A, B

INITIAL/LOGO		ABBREVIATIONS
R	RE	READ ENABLE
	RFENV	RF ENVELOPE
	RFO	RF PHASE DIFFERENCE OUTPUT
	RS	(CD-ROM) REGISTER SELECT
	RSEL	RF POLARITY SELECT
	RST	RESET
	RSV	RESERVE
S	SBI0, 1	SERIAL DATA INPUT
	SBO0	SERIAL DATA OUTPUT
	SBT0, 1	SERIAL CLOCK
	SCK	SERIAL DATA CLOCK
	SCKR	AUDIO SERIAL CLOCK RECEIVER
	SCL	SERIAL CLOCK
	SCLK	SERIAL CLOCK
	SDA	SERIAL DATA
	SEG0~UP	FL SEGMENT OUTPUT
	SELCLK	SELECT CLOCK
	SEN	SERIAL PORT ENABLE
	SIN1, 2	SERIAL DATA IN
	SOUT1, 2	SERIAL DATA OUT
	SPDI	SERIAL PORT DATA INPUT
	SPDO	SERIAL PORT DATA OUTPUT
	SPEN	SERIAL PORT R/W ENABLE
	SPRCLK	SERIAL PORT READ CLOCK
	SPWCLK	SERIAL PORT WRITE CLOCK
	SQCK	SUB CODE Q CLOCK
	SQCX	SUB CODE Q DATA READ CLOCK
	SRDATA	SERIAL DATA
	SRMADR	SRAM ADDRESS BUS
	SRMDT0~7	SRAM DATA BUS 0~7
	SS	START/STOP
	STAT	STATUS
	STCLK	STREAM DATA CLOCK
	STD0~UP	STREAM DATA
	STENABLE	STREAM DATA INPUT ENABLE
	STSEL	STREAM DATA POLARITY SELECT
	STVALID	STREAM DATA VALIDITY
	SUBC	SUB CODE SERIAL
	SBCK	SUB CODE CLOCK
	SUBQ	SUB CODE Q DATA
	SYSCLK	SYSTEM CLOCK
T	TE	TRACKING ERROR
	TIBAL	BALANCE CONTROL
	TID	BALANCE OUTPUT 1
	TIN	BALANCE INPUT
	TIP	BALANCE INPUT
	TIS	BALANCE OUTPUT 2
	TPSN	OP AMP INPUT
	TPSO	OP AMP OUTPUT
	TPSP	OP AMP INVERTED INPUT
	TRCRS	TRACK CROSS SIGNAL
	TRON	TRACKING ON
	TRSON	TRAVERSE SERVO ON

INITIAL/LOGO		ABBREVIATIONS
V	VBLANK	V BLANKING
	VCC	COLLECTOR POWER SUPPLY VOLTAGE
	VCDCONT	VIDEO CD CONTROL (TRACKING BALANCE)
	VDD	DRAIN POWER SUPPLY VOLTAGE
	VFB	VIDEO FEED BACK
	VREF	VOLTAGE REFERENCE
	VSS	SOURCE POWER SUPPLY VOLTAGE
W	WAIT	BUS CYCLE WAIT
	WDCK	WORD CLOCK
	WEH	WRITE ENABLE HIGH
	WSR	WORD SELECT RECEIVER
X	X	X´ TAL
	XALE	X ADDRESS LATCH ENABLE
	XAREQ	X AUDIO DATA REQUEST
	XCDROM	X CD ROM CHIP SELECT
	XCS	X CHIP SELECT
	XCSYNC	X COMPOSITE SYNC
	XDS	X DATA STROBE
	XHSYNCO	X HORIZONTAL SYNC OUTPUT
	XHINT	XH INTERRUPT REQUEST
	XI	X´ TAL OSCILLATOR INPUT
	XINT	X INTERRUPT
	XMW	X MEMORY WRITE ENABLE
	XO	X´ TAL OSCILLATOR OUTPUT
	XRE	X READ ENABLE
	XSRMCE	X SRAM CHIP ENABLE
	XSRMOE	X SRAM OUTPUT ENABLE
	XSRMWE	X SRAM WRITE ENABLE
	XVCS	X V-DEC CHIP SELECT
	XVDS	X V-DEC CONTROL BUS STROBE
	XVSYNCO	X VERTICAL SYNC OUTPUT

14.1.2. VHS

443NT [L]	4.43 NTSC Ⓛ	BIL	BILINGUAL
A. COMP	AUDIO COMPONENT SIGNAL	BIL [L]	BILINGUAL Ⓛ
A. COMPO	AUDIO COMPONENT SIGNAL	BIL. [H]	BILINGUAL Ⓗ
A. D.P [L]	AUDIO DUBBING PAUSE Ⓛ	BIL/M1 [L]	BILINGUAL Ⓛ
A. D/L [L]	AUDIO DUBBING PAUSE Ⓛ	BS CLOCK	BS CLOCK
A. DEF [S]	AUDIO DEFEAT	BS DATA	BS DATA
A. DEF [S] [L]	AUDIO DEFEAT	BS LCH IN	BS L CHANNEL INPUT
A. DUB P [L]	AUDIO DUBBING PAUSE Ⓛ	BS MIX [H]	BS MIX Ⓗ
A. DUB [H]	AUDIO DUBBING Ⓗ	BS MON [H]	BS MONITOR Ⓗ
A. ERASE	AUDIO ERASE	BS MONI [H]	BS MONITOR Ⓗ
A. H. SW	AUDIO HEAD SWITCHING PULSE	BS RCH IN	BS R CHANNEL INPUT
A. HEAD [R]	AUDIO HEAD (REC)	BS VIDEO	BS VIDEO SIGNAL
A. HEAD [W]	AUDIO HEAD (PLAY)	BS VIDEO/BS1	BS VIDEO SIGNAL
A. IN [L]	AUDIO INPUT (L)	BS [H]	BS Ⓗ
A. IN [R]	AUDIO INPUT (R)	BS. LEVEL	BS LEVEL
A. MUT [H]	AUDIO MUTE Ⓗ	BS. M [H]	BS MONITOR Ⓗ
A. MUTE [H]	AUDIO MUTE Ⓗ	BS/VTR [H]	BS/VTR Ⓗ
A. OUT [L]	AUDIO OUTPUT (L)	BUS CLK	BUS CLOCK
A. OUT [R]	AUDIO OUTPUT (R)	BUS LSN	BUS LISTEN
A. RF OUT	AUDIO RF SIGNAL OUTPUT	BUS TLK	BUS TALK
A/VS/S. DATA	AV SW/SERIAL DATA	BUZZER	BUZZER
AC ONLINE	AC ONLINE	CAP EC	CAPSTAN TORQUE CONTROL
AC. O/EE. H	AC ONLINE/EE Ⓗ	CAP M GND	CAPSTAN MOTOR GND
AFC S C	AFC S CURVE	CAP. ET	CAPSTAN TORQUE CONTROL
AFC [S]	AFC S CURVE	CAP. FG1	CAPSTAN FG1 PULSE
AFC. DEF	AFC DEFEAT	CAP. FG2	CAPSTAN FG2 PULSE
ARFC OUT	AUDIO RF SIGNAL OUTPUT	CAS. SW	CASSETTE SW
ART. V	ARTIFICIAL VERTICAL SYNC SIGNAL	CCN	PLAYBACK CONTROL SIGNAL (–)
ART. V. MM	ARTIFICIAL VERTICAL SYNC SIGNAL MONO MULTI	CCP	PLAYBACK CONTROL SIGNAL (+)
		CHM	CONTROL SIGNAL (+)
ART. V/H/N	ARTIFICIAL VERTICAL SYNC SIGNAL Ⓗ/NORMAL	CHP	CONTROL SIGNAL (–)
		CINEM [L]	CINEMA Ⓛ
AT. V/H/N	ARTIFICIAL VERTICAL SYNC SIGNAL	CINEMA [L]	CINEMA Ⓛ
ATSW/TEST/NOR/SE	TEST/NORMAL/SERVICE	CINEMA/MIX	CINEMA/MIX
AUDIO IN [L]	AUDIO INPUT (L)	CKL	RATCH LOCK
AUDIO IN [R]	AUDIO INPUT (R)	CKS	SHIFT LOCK
AUDIO OUT [L]	AUDIO OUTPUT (L)	CL	CLOCK
AUDIO OUT [R]	AUDIO OUTPUT (R)	CLK	CLOCK
AUDIO SELECT [H]	AUDIO SELECT Ⓗ	CLK (C.G)	CLOCK
AUDIO. L	AUDIO (L)	CLOCK. IN	CLOCK INPUT
AUDIO. R	AUDIO (R)	CLP	CLAMP
AV CNT	AV CONTROL	COL/B/W/NOR	COLOUR/BLACK & WHITE/NORMAL
AV CTL	AV CONTROL	COLOR [H]	COLOUR Ⓗ
AV CTL/S. CLK	AV CONTROL/SERIAL CLOCK	CONV	CONVERTOR
AV. C.M.	AV CONTROL MODE	CS	CHIP SELECT
AVCNT/METER. R	AV CONTROL/LEVEL METER (R)	CTL GND	CONTROL GND
AVSW/METER. L	AV SW/LEVEL METER (L)	CTL HEAD [+]	CONTROL HEAD (+)
B MODE. H	B MODE Ⓗ	CTL HEAD [–]	CONTROL HEAD (–)
B.G.P	BURST GATE PULSE	CTL [+]	CONTROL HEAD (+)
BACKUP 5V	BACK UP 5V	CTL [–]	CONTROL HEAD (–)
BAND. U.E.	BAND U	CUE BIAS	CUE BIAS
BANDVL. D	BAND VL	CURRENT LIM	CURRENT LIMMITER
BI/MI [L]	BILINGUAL/MIX Ⓛ	CYL ET	CYLINDER TORQUE CONTROL

CYL GND	CYLINDER GND	FULL. E. 12V	FULL ERASE 12V
D.F.M. REC [H]	DELAIED FM RECORDING Ⓗ	GND [A]	GND (ANALOG)
D. FM REC [L]	DELAIED FM RECORDING Ⓛ	GND [TU]	GND (TUNER)
D. GND	DIGITAL GND	GND/N. SW. 12V	GND/NON SW 12V
D. REC [H]	DELAYED RECORDING Ⓗ	H. SYNC	HORIZONTAL SYNC
D4/S. LED	D4/STILL LED	H. AMP. SW	HEAD AMP SW PULSE
D4/STILLED	D4/STILL LED	H. P <R>	HEAD PHONE (R)
DAC [CLK]	TUNER DAC (CLOCK)	H. P <L>	HEAD PHONE (L)
DAC/FSCS	TUNER DAC/FS CHIP SELECT	H. P GND	HEAD PHONE GND
DAREC [H]	DELAYED AUDIO RECORDING Ⓗ	H. P OUT [L]	HEAD PHONE OUTPUT (L)
DATA	DATA	H. P OUT [R]	HEAD PHONE OUTPUT (R)
DECODER [L]	DECODER (L)	H. SW	HEAD SW PULSE
DECODER [R]	DECODER (R)	HEAD PHONE [L]	HEAD PHONE (L)
DEW	DEW	HEAD PHONE [R]	HEAD PHONE (R)
DEW SNS	DEW SENSOR	HEAD SW	HEAD SW
DFMRE [H]	DELAYED FM AUDIO RECORDING Ⓗ	HEATER [+]	HEATER (+)
E. REC 5V	EXCEPT RECORDING 5V	HEATER [–]	HEATER (–)
EC	ERROR TORQUE CONTROL	HSS	HORIZONTAL SYNC SIGNAL
ECR	ERROR TORQUE CONTROL REFERENCE VOLTAGE	HTR [+]	HEATER (+)
		HTR [–]	HEATER (–)
EDT TRIG [L]	EDIT TRIGGER Ⓛ	I RFE	REFERENCE CURRENT
EDIT [H]	EDIT Ⓗ	ICL	CONTROL AGC CIRCUIT
EE [H]	EE Ⓗ	IF	INTERMEDIATE FREQUENCY
EE [H]/INS [M]	EE Ⓗ/INSERT Ⓜ	IN SELA1	INPUT SELECT A1 POSITION
EE. VV. TR	EE/VV/TRICK PLAY	IN SELA2	INPUT SELECT A2 POSITION
EJECT. PO	EJECT POSITION	IN SELA3	INPUT SELECT A3 POSITION
EJECT/VDET	EJECT/REVERSE SLOW LOCK	INS L/R [L]	INSERT Lch/Rch Ⓛ
ENV. SEL	ENVELOPE SELECT	INS. [H]	INSERT Ⓗ
ENVE. OUT	ENVELOPE OUTPUT	INSEL A1	INPUT SELECT A1 POSITION
ENVE. SEL	ENVELOPE SELECT	INSEL A2	INPUT SELECT A2 POSITION
ENV SELECT	ENVELOPE SELECT	INSERT	INSERT
EP [H]	LP Ⓗ	INSERT [H]	INSERT Ⓗ
EP/LP [H]	LP Ⓗ	IO CS	INPUT/OUTPUT CHIP SELECT
EP/LP/SP	LP/SP	JOG1	JOG1
EP/SS [H]	LP/SLOW/STILL/STOP Ⓗ	JOG S3 LED/FOWRD	JOG LED/FORWARD LED
EPROMCS	EPROM CHIP SELECT	JOG/F. LED	JOG LED/FORWARD LED
EX. REC 5V	EXCEPT RECORDING 5V	JSB [H]	JSB Ⓗ
FF/REW [L]	FIRST FORWARD/REWIND Ⓛ	JST. CLCK	JUST CLOCK
FG1 IN	FG1 PULSE INPUT	JST. CLK	JUST CLOCK
FG2 IN	FG2 PULSE INPUT	JST. CLOCK	JUST CLOCK
FILTER ADJUSTMENT	FILTER ADJUSTMENT	L. OUT	Lch OUTPUT
FLY ERASE [H]	FLYING ERASE HEAD ON Ⓗ	L. CH [H]	Lch Ⓗ
FLY ON [H]	FLYING ERASE HEAD ON Ⓗ	L. CH [L]	Lch Ⓛ
FLY. E [H]	FLYING ERASE HEAD ON Ⓗ	LED (MAIN)	LED (MAIN)
FM MUT [H]	FM AUDIO MUTE Ⓗ	LED (STEREO)	LED (STEREO)
FM MUTE [H]	FM AUDIO MUTE Ⓗ	LED (SUB)	LED (SUB)
FM OUT [L]	FM OUTPUT (L)	LED CKL	LED SERIAL CLOCK
FM OUT [R]	FM OUTPUT (R)	LED CKS	LED SERIAL CLOCK
FM PACK OUT [L]	FM PACK OUTPUT (L)	LED DATA	LED SERIAL DATA
FM PACK OUT [R]	FM PACK OUTPUT (R)	LINE IN 1 [L]	LINE INPUT 1 (L)
FM/BS SEL [L]	FM/BS SELECT (L)	LINE IN 1 [R]	LINE INPUT 1 (R)
FM/BS SEL [R]	FM/BS SELECT (R)	LINE IN 2 [L]	LINE INPUT 2 (L)
FS. CLK	FS CLOCK	LINE IN 2 [R]	LINE INPUT 2 (R)
FUL. E [H]	FULL ERASE HEAD ON Ⓗ	LINE IN V	LINE INPUT VIDEO
FULL. E [H]	FULL ERASE HEAD ON Ⓗ	LINE IN [L]	LINE INPUT (L)

LINE IN [R]	LINE INPUT (R)
LINE OUT [L]	LINE OUTPUT (L)
LINE OUT [R]	LINE OUTPUT (R)
LP [H]	LP Ⓗ
LPTRI [L]	LP TRICK PLAY Ⓛ
Lch/A. DUB	Lch/AUDIO DUBBING
M GND	MOTOR GND
M REG	MOTOR REGULATOR
MAIN OUT	MAIN OUTPUT
MAIN [L]	MAIN Ⓛ
MAIN/MONO	MAIN/MONAURAL
MAX IN	MAXIMAM INPUT
MES [H]	MESECAM Ⓗ
MESE [H]	MESECAM Ⓗ
MESE [L]	MESECAM Ⓛ
METER 5V	LEVEL METER 5V
METER [L]	LEVEL METER (L)
METER [R]	LEVEL METER (R)
METER. L/AVS	LEVEL METER (L)
METER. R/AVC	LEVEL METER (R)
MI/BI [L]	MIX Ⓗ/BILIGUAL
MIC GND	MIC GND
MIC IN	MIC INPUT
MIC IN [L]	MIC INPUT (L)
MIC IN [R]	MIC INPUT (R)
MIC [H]	MIC Ⓗ
MIX [H]	MIX Ⓗ
MIX [H]/CINEMA [L]	MIX Ⓗ/CINEMA SOUND Ⓛ
MIX/CINE	MIX Ⓗ/CINEMA SOUND Ⓛ
MIX/CINEMA [L]	MIX Ⓗ/CINEMA SOUND Ⓛ
MN. H/M. L	MONAURAL Ⓗ/MAIN Ⓛ
MN. H/MAI. L	MONAURAL Ⓗ/MAIN Ⓛ
MN2/MES. L	MONAURAL 2/MESECAM Ⓛ
MODE SEL	AUDIO MODE SELECT
MODE SW	AUDIO MODE SW
MODE. S. IN	AUDIO MODE SELECT INPUT
MODE. S. OUT	AUDIO MODE SELECT OUTPUT
MONO [H]	MONAURAL Ⓗ
MONO [H]/MAIN [L]	MONAURAL Ⓗ/MAIN Ⓛ
MONO2 [L]	MONAURAL 2
MONO2/MESE [FM(L)]	MONAURAL 2/MESECAM (FM Ⓛ)
MOTOR GND	MOTOR GND
MUTE	MUTE
N. A. REC [L]	NORMAL AUDIO RECORDING
N. SW 12V	NON SW 12V
N. SW. 5. DET	NON SW 5V DETECT
NICAM	NICAM
NICAM [L]	NICAM Ⓛ
NOL [H]	PAL Ⓗ/4.43 NTSC Ⓜ/3.58 NTSC Ⓛ
NOR/SOFT [H]	NORMAL/SOFT TAPE PLAY Ⓗ
NORMAL [H]	NORMAL Ⓗ
NR BIAS	NR BIAS
NTSC [L]	NTSC Ⓛ
OCH	CONTROL AGC CIRCUIT
OUT	OUTPUT
P-OFF [H]	POWER OFF Ⓗ
P-OFF [L]	POWER OFF Ⓛ
P. FAIL	POWER FAILURE DETECT
P. OFF [H]	POWER OFF Ⓗ
P. OFF [L]	POWER OFF Ⓛ
PAL [H]	PAL Ⓗ
PAL [L]/NTSC [H]	PAL Ⓛ/NTSC Ⓗ
PB ADJ OUT	PLAYBACK ADJUST OUTPUT
PB OUT	PLAYBACK OUTPUT
PB. H	PLAYBACK Ⓗ
PFG	PG/FG
PHOTSN +B	PHOTO SENSOR +B
PICT. CNT	PICTURE CONTROL
PLAY LED/RVS LED	PLAY LED/REVERSE LED
PLAY. PO	PLAY POSITION
PLAY/R. LED	PLAY LED/REVERSE LED
PLY/DEW	PLAY/DEW Ⓗ
POWER OFF [L]	POWER OFF Ⓛ
PREROLL [H]	PREROLL Ⓗ
PWRFAIL	POWER FAILURE DETECT
R. CH [H]	Rch Ⓗ
R. CH [L]	Rch Ⓛ
R. ST	RESET
R/S/F	REVERSE Ⓗ/STOP Ⓜ/FORWARD Ⓛ
RCH [H]	Rch Ⓗ
REC 12V	RECORDING 12V
REC CHROMA	RECORDING CHROMINANCE SIGNAL
REC H	RECORDING Ⓗ
REC IN	RECORDING INPUT
REC OUT [L]	RECORDING OUTPUT Ⓛ
REC START	RECORDING START
REC VR [C]	RECORDING VOLUME (COMMON)
REC VR [L]	RECORDING VOLUME (L)
REC VR [R]	RECORDING VOLUME (R)
REC Y	RECORDING LUMINANCE SIGNAL
REC [H]	RECORDING Ⓗ
REC. C	RECORDING CHROMINANCE SIGNAL
REC. Y	RECORDING LUMINANCE SIGNAL
REC/EE CTL	RECORDING/EE CONTROL
REEL-T	REEL PULSE (TAKE-UP)
REEL-S	REEL PULSE (SUPPLY)
REGULATOR FILTER	REGULATOR FILTER
RESET	RESET
REV M F/R	REVIEW MOTOR FORWARD/REVERSE
REV M V1	REVIEW MOTOR V1
REV M V2	REVIEW MOTOR V2
REV MOTOR F/R	REVIEW MOTOR FORWARD/REVERSE
REV MOTOR V1	REVIEW MOTOR V1
REV MOTOR V2	REVIEW MOTOR V2
REV MOTOR [+]	REVIEW MOTOR (+)
REV MOTOR [–]	REVIEW MOTOR (+)
REV. M. GND	REVIEW MOTOR GND
RF. CHROMA	RF CHROMINANCE SIGNAL

RF OUT	RF OUTPUT
RF Y	RF LUMINANCE SIGNAL
RF. Y. IN	RF LUMINANCE SIGNAL INPUT
RF. Y. OUT	RF LUMINANCE SIGNAL OUTPUT
ROTAR. SW	ROTARY SW
ROTARY	ROTARY SW
RST	RESET
RST [L]	RESET Ⓛ
Rch/INST	Rch/INSERT
S IN	SERIAL DATA INPUT
S OUT	SERIAL DATA OUTPUT
S-PHOTO	SUPPLY PHOTO TRANSISTOR
S-RL. PLS	SUPPLY REEL PULSE
S. CLK	SERIAL CLOCK
S. CLK/AV	SERIAL CLOCK/AV
S. DATA	SERIAL DATA
S. DATA/A	SERIAL DATA
S. PHOTO	SUPPLY PHOTO TRANSISTOR
S. TAB [L]	SAFETY TAB SW ON Ⓛ
S/P/N	SECAM/PAL/NTSC
SC IN	SERIAL CLOCK INPUT
SC OUT	SERIAL CLOCK OUTPUT
SCK SELECT	SERIAL CLOCK SELECT
SEL OUT [L]	SELECT OUTPUT (L)
SEL OUT [R]	SELECT OUTPUT (R)
SHUTTLE 1	SHUTTLE 1
SIF	SOUND INTERMEDIATE FREQUENCY
SLMUT [H]	INPUT SELECT MUTE Ⓗ
SLNID [+]	SOLENOID (+)
SLNID [–]	SOLENOID (–)
SLW TR. MM	SLOW TRACKING MONO MULTI
SLW TR. REF	SLOW TRACKING REFERENCE VOLTAGE
SNS. GND	SENSOR GND
SOFT [H]	SOFT TAPE PLAY Ⓗ
SOFT [H]/NORMAL	SOFT TAPE PLAY Ⓗ/NORMAL Ⓗ
SOLENOID ON [L]	SOLENOID ON Ⓛ
SP [H]	SP Ⓗ
SP/L/SLP	SP/LP
SSS [L]	SLOW/STILL/STOP
STEREO LED	STEREO LED
STEREO [H]	STEREO Ⓗ
STEREO [L]	STEREO Ⓛ
STOP. PO	STOP POSITION
STOP/5V	STOP POSITION/5V
STOP1/TAPE SEL	STOP1 POSITION/TAPE SELECT
STOP1/PAL:ST	STOP1 POSITION/PAL
STOP2. PO	STOP 2 POSITION
STOP2/S-TAB	STOP 2 POSITION/SAFETY TAB SW
STREO [H]	STEREO Ⓗ
SUB BIAS	SUB BIAS
SUB. SW	SUB SW
SVHS CAS [L]	S-VHS CASSETTE Ⓛ
SW. 5. DET	SW 5V DETECT
SYNC [L]	SYNC Ⓛ
SYSCON 5V	SYSTEM CONTROL 5V
SYSTEM	SYSTEM SW
T-PHOTO	TAKE-UP PHOTO TRANSISTOR
T-RL. PLS	TAKE-UP REEL PULSE
T. BUSCLK	TIMER BUS CLOCK
T. BUSLSN	TIMER BUS LISTEN
T. BUSTLK	TIMER BUS TALK
T. END [L]	TAPE END Ⓛ
T. PHOTO	TAKE-UP PHOTO TRANSISTOR
TAPE END [L]	TAPE END Ⓛ
TAPE END [L]/CAM	TAPE END Ⓛ/CAMERA PAUSE
TEST	TEST MODE
TPZ	TRAPEZOIDAL WAVE CIRCUIT
TRIC [L]	TRIC PLAY Ⓛ
TRICK [L]	TRIC PLAY Ⓛ
TRK. ENV	AUTO TRACKING ENVELOPE DETECT
TU. AUDIO	TUNER AUDIO
TU. GND	TUNER GND
TU. V. IN	TUNER VIDEO SIGNAL INPUT
TU. VIDEO	TUNER VIDEO
TUN NOR IN	TUNER NORMAL INPUT
TUN R	TUNER AUDIO (R)
TUN. AUDIO IN	TUNER AUDIO INPUT
TUNER 12V	TUNER 12V
TUNER L	TUNER AUDIO (L)
TUNER V IN	TUNER VIDEO SIGNAL INPUT
TUNER [L]	TUNER AUDIO (L)
TUNER [N]	TUNER AUDIO (NORMAL)
TUNER [R]	TUNER AUDIO (R)
TUNER. 12	TUNER 12V
TUOFF [H]	TUNER OFF Ⓗ
TV. AUDIO	TV AUDIO
TV/VTR	TV/VTR
TXTON [L]	TEXT ON Ⓛ
U. REG45V	UNREGULATOR 45V
UNREG	UNREGULATOR
UNREG19V	UNREGULATOR 19V
V. REF	REFERENCE VOLTAGE
V. EE [H]	VIDEO EE Ⓗ
V. EE [L]	VIDEO EE Ⓛ
VCO REF	REFERENCE OSCILLATER
VD. IN	VIDEO SIGNAL INPUT
VD. OUT	VIDEO SIGNAL OUTPUT
VIDEO EE [L]	VIDEO EE Ⓛ
VIDEO IN	VIDEO SIGNAL INPUT
VIDEO OUT	VIDEO SIGNAL OUTPUT
VM	MOTOR VOLTAGE
VM DOWN [L]	MOTOR VOLTAGE DOWN Ⓛ
VSS	VERTICAL SYNC SIGNAL
VTR [H]	VTR Ⓗ
VTR. 12V	VTR 12V
X IN	OSCILLATOR INPUT
X OUT	OSCILLATOR OUTPUT

15 Voltage Measurement and Waveform Chart

Note:

- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard.

  Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
- Circuit voltage and waveform described herein shall be regarded as reference information when probing defect point because it may differ from actual measuring value due to difference of Measuring instrument and its measuring condition and product itself.

15.1. Voltage Measurement

15.1.1. PANEL P.C.B

PANEL P.C.B																				
Ref No.	IC7502																			
MODE	1	2	3																	
STOP	4.7	0	4.9																	
Ref No.	Q7702																			
MODE	E	C	B																	
STOP	0	4.5	0																	

15.1.2. P59001 Connector

Ref No.	P59001																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	3.1	12.6	4.8	12.6	3.3	0	4.8	0	3.3	5.1	3.3	5.1	5.0	3.3	1.8	3.1	2.5	4.7	2.5	3.3
PLAY	3.1	12.6	4.8	12.6	3.3	0	4.8	0	3.3	5.1	3.3	5.1	5.0	3.3	1.8	3.1	2.5	4.7	2.5	3.3
STOP	3.1	12.6	4.8	12.6	3.3	0	4.8	0	3.3	5.1	3.3	5.1	5.0	3.3	1.8	3.2	2.5	4.7	2.5	3.3
Ref No.	P59001																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	0	3.3	0	3.3	0	3.3	2.5	-	2.5	3.3	0	1.6	0	0	0	4.9	0	3.3	0.5	4.8
PLAY	0	3.3	0	3.3	0	3.3	2.5	-	2.5	3.3	0	1.6	0	0	0	4.9	0	3.3	0.5	4.8
STOP	0	3.3	0	3.3	0	3.3	2.5	-	2.5	3.3	0	1.6	0	0	0	4.9	0	3.3	0.5	4.8
Ref No.	P59001																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	0	0	0.9	3.3	0	3.3	0.9	3.9	0	3.9	0.5	12.4	0	12.4	0.9	12.4	0	12.4	2.9	12.4
PLAY	0	0	0.9	3.3	0	3.3	0.9	3.9	0	3.9	0.5	12.4	0	12.4	0.9	12.4	0	12.4	2.9	12.4
STOP	0	0	0.9	3.3	0	3.3	0.9	3.9	0	3.9	0.5	12.4	0	12.4	0.9	12.4	0	12.4	2.9	12.4
Ref No.	P59001																			
MODE	61	62	63	64																
REC	0	12.4	2.3	5.0																
PLAY	0	12.4	2.3	5.0																
STOP	0	12.4	2.3	5.0																

15.1.3. Digital I/F P.C.B

DIGITAL I/F P.C.B

Ref No.	IC11201									IC11301						IC11502				
MODE	1	2	3	4	5	6	7	9		1	2	3	4	5		1	2	3		
REC	-0.2	1.5	0	6.3	6.2	0	12.6	-446		2.2	2.2	0	12.7	-280		7.8	2.5	0		
PLAY	-0.2	1.5	0	6.3	6.2	0	12.6	-446		2.2	2.2	0	12.7	-280		7.8	2.5	0		
STOP	-0.2	1.5	0	6.3	6.2	0	12.6	-446		2.2	2.2	0	12.7	-280		7.8	2.5	0		
Ref No.	IC11601									IC11701										
MODE	1	2	3	4	5	6	7	8		1	2	3								
REC	12.6	4.5	1.2	1.2	1.2	0	5.7	12.6		4.4	2.5	0								
PLAY	12.6	4.5	1.2	1.2	1.2	0	5.7	12.6		4.4	2.5	0								
STOP	12.6	4.5	1.2	1.2	1.2	0	5.7	12.6		4.4	2.5	0								
Ref No.	IC11720									IC11801										
MODE	1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8			
REC	-14.8	0	-16.7	-18.1	-11.3	0	0	-11.3		12.4	4.5	1.2	1.2	0.8	0	7.7	12.4			
PLAY	-14.8	0	-16.7	-18.1	-11.3	0	0	-11.3		12.4	4.5	1.2	1.2	0.8	0	7.7	12.4			
STOP	-14.8	0	-16.7	-18.1	-11.3	0	0	-11.3		12.4	4.5	1.2	1.2	0.8	0	7.7	12.4			
Ref No.	IC31501						IC31503													
MODE	1	2	3	4	5		1	2	3	4	5	6	7	8						
REC	5.9	0	4.1	5.9	5.0		3.3	-	1.3	0	4.7	-	-	3.8						
PLAY	5.9	0	4.1	5.9	5.0		3.3	-	1.3	0	4.7	-	-	3.8						
STOP	5.9	0	4.1	5.9	5.0		3.3	-	1.3	0	4.7	-	-	3.8						
Ref No.	IC37001									IC37501										
MODE	1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8			
REC	5.8	1.8	1.8	0	1.8	1.8	1.8	12.4		0	0	0	0	4.9	4.9	0.5	4.9			
PLAY	5.8	1.8	1.8	0	1.8	1.8	1.8	12.4		0	0	0	0	4.9	4.9	0.5	4.9			
STOP	5.8	1.8	1.8	0	1.8	1.8	1.8	12.4		0	0	0	0	4.9	4.9	0.5	4.9			
Ref No.	IC45001																			
MODE	1	2	3	4	5															
REC	1.2	0	4.7	5.9	5.0															
PLAY	1.2	0	4.7	5.9	5.0															
STOP	1.2	0	4.7	5.9	5.0															
Ref No.	Q11101					Q11301					Q11502									
MODE	1	2	3	4		1	2	3	4		E	C	B							
REC	8.8	7.8	0	1.5		5.4	4.4	0	2.2		0	7.8	0							
PLAY	8.8	7.8	0	1.5		5.4	4.4	0	2.2		0	7.8	0							
STOP	8.8	7.8	0	1.5		5.4	4.4	0	2.2		0	7.8	0							
Ref No.	Q11601									Q11602										
MODE	1	2	3	4	5	6	7	8		1	2	3	4	5	6					
REC	12.6	12.6	12.6	6.3	12.6	12.6	12.6	12.6		11.9	11.9	5.7	12.6	12.0	12.0					
PLAY	12.6	12.6	12.6	6.3	12.6	12.6	12.6	12.6		11.9	11.9	5.7	12.6	12.0	12.0					
STOP	12.6	12.6	12.6	6.3	12.6	12.6	12.6	12.6		11.9	11.9	5.7	12.6	12.0	12.0					
Ref No.	Q11801							Q37001												
MODE	1	2	3	4	5	6		1	2	3										
REC	5.2	5.2	7.7	12.4	5.2	5.2		12.4	12.4	11.7										
PLAY	5.2	5.2	7.7	12.4	5.2	5.2		12.4	12.4	11.7										
STOP	5.2	5.2	7.7	12.4	5.2	5.2		12.4	12.4	11.7										
Ref No.	QR11501				QR11601				QR11602				QR11603							
MODE	E	C	B		E	C	B		E	C	B		E	C	B					
REC	0	0	4.8		0	0	4.8		0	0	4.7		0	4.2	0					
PLAY	0	0	4.8		0	0	4.8		0	0	4.7		0	4.2	0					
STOP	0	0	4.8		0	0	4.8		0	0	4.7		0	4.2	0					

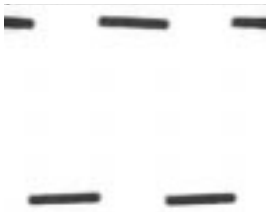
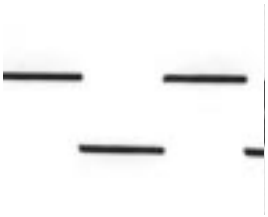
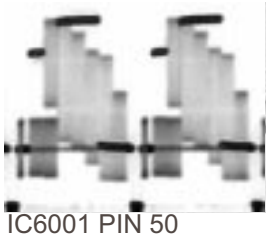
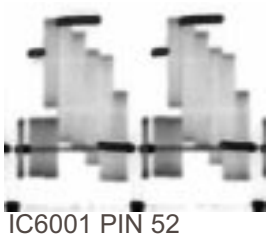
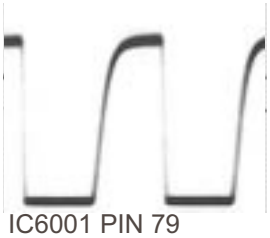
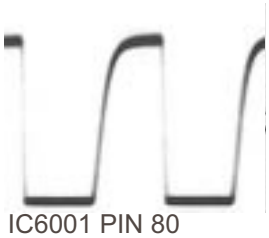
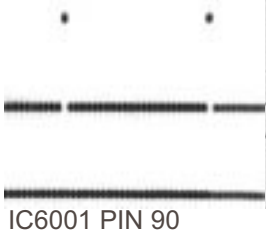
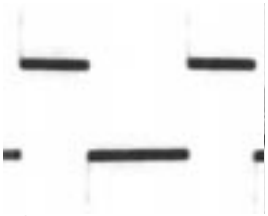
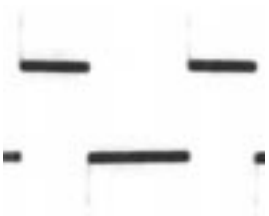
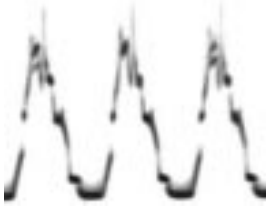
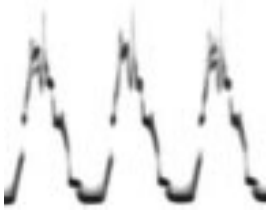
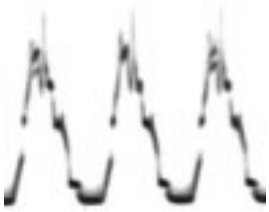
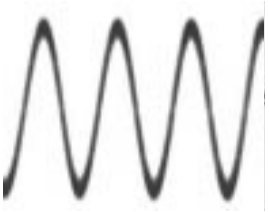
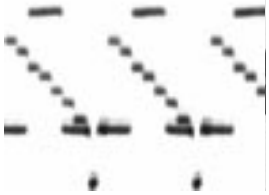
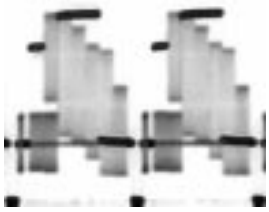
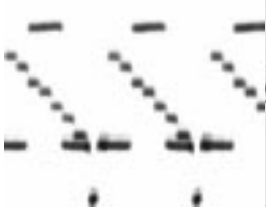
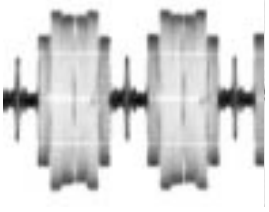
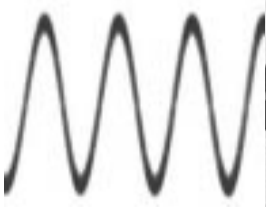
15.1.4. MAIN P.C.B

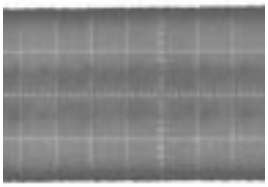
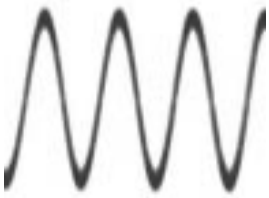
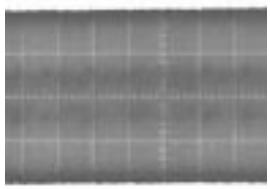
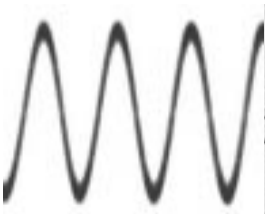
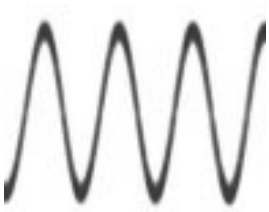
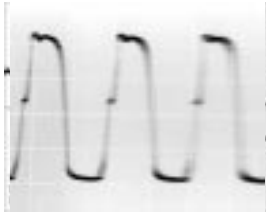
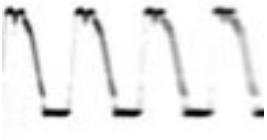
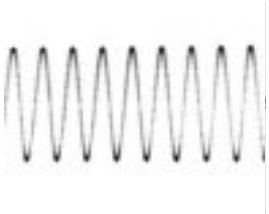
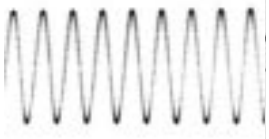
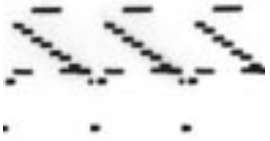
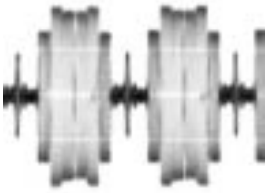
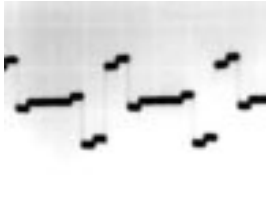
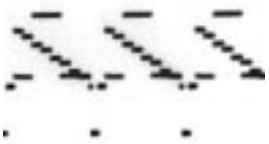
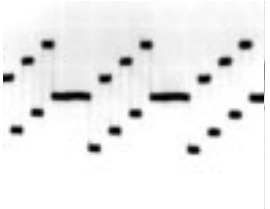
MAIN P.C.B																				
Ref No.	IC1511					IC1512					IC2001									
MODE	1	2	3	4		1	2	3	4		1	2	3	4						
REC	1.2	2.4	0.2	0		0	1.2	4.9	0		5.1	0	4.6	5.8						
PLAY	1.2	2.4	0.1	0		0	1.2	4.9	0		5.1	0	4.6	5.8						
STOP	1.2	2.4	0.2	0		0	1.2	4.9	0		5.1	0	4.6	5.8						
Ref No.	IC2501																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	12.2	0.1	0	0.1	0	0	16.1	0	2.8	1.6	1.6	0.6	1.5	2.4	2.5	2.5	2.5	1.3	5.0	3.8
PLAY	12.2	0.1	0	0.1	0	0	16.2	0	2.8	1.6	1.6	0.6	1.5	2.4	2.5	2.5	2.5	1.3	5.0	3.6
STOP	12.2	0.1	0	0.1	0	0	16.2	0	2.8	1.6	1.6	0.6	1.5	2.4	2.5	2.5	2.5	1.3	5.0	3.6
Ref No.	IC2501																			
MODE	21	22	23	24	25	26	27													
REC	12.2	3.8	3.8	0	3.8	0	0													
PLAY	12.2	3.6	3.6	0	3.6	0	0													
STOP	12.2	3.6	3.6	0	3.6	0	0													
Ref No.	IC3001																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	0	0	0	5.1	2.1	2.6	2.8	1.9	1.9	2.3	2.6	1.5	0	2.8	2.7	2.0	2.7	2.0	2.7	0
PLAY	0	0	0	5.1	2.1	2.6	2.8	1.9	1.9	2.3	2.6	1.5	0	2.8	2.7	2.0	2.7	2.0	2.7	0
STOP	0	0	0	5.1	2.1	2.6	2.8	1.9	1.9	2.3	2.6	1.5	0	2.8	2.7	2.0	2.7	2.0	2.7	0
Ref No.	IC3001																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	2.7	5.0	2.3	0.1	0	2.9	0	0	2.4	2.8	0.4	2.2	2.0	1.7	3.0	2.3	3.0	2.1	1.4	2.1
PLAY	2.7	5.0	2.3	0.1	0	2.9	0	0	2.4	2.8	0.4	2.2	2.0	1.7	3.0	2.3	3.0	2.1	1.4	2.1
STOP	2.7	5.0	2.3	0	0	3.0	0	0	2.4	2.8	0.4	2.2	2.1	1.7	3.0	2.3	3.0	2.1	1.5	2.1
Ref No.	IC3001																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	2.5	2.0	2.1	0	3.2	3.2	5.0	5.0	3.1	5.0	1.9	5.0	2.6	0	1.9	0	2.2	2.2	5.0	5.0
PLAY	2.5	2.0	2.1	0	3.2	3.2	5.0	5.0	3.1	5.0	1.9	5.0	2.6	0	1.9	0	2.2	2.2	5.0	5.0
STOP	2.5	2.0	2.1	0	3.2	3.2	5.0	5.0	0	5.0	1.9		2.6	0	1.9	0	2.2	2.2	5.0	5.0
Ref No.	IC3001																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
REC	4.0	2.3	2.2	2.4	2.2	2.4	2.2	1.2	2.0	2.7	0	5.0	0	2.4	2.8	2.2	2.8	0	0	2.6
PLAY	4.0	2.3	2.2	2.4	2.2	2.4	2.2	1.2	2.0	2.7	0	5.0	0	2.4	2.8	2.2	2.8	0	0	2.6
STOP	4.0	2.3	2.2	2.4	2.2	2.4	2.2	1.2	0	2.7	0	0	2.9	2.4	2.7	2.2	2.8	5.0	0	2.4
Ref No.	IC3001																			
MODE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
REC	0.7	0	3.2	4.9	2.4	2.3	2.4	0	0	0	0	5.1	0.5	2.6	2.5	2.5	0	2.3	0	2.6
PLAY	0.7	0	3.2	4.9	2.4	2.3	2.4	0	0	0	0	5.1	0.5	2.6	2.5	2.5	0	2.3	0	2.6
STOP	0.7	0	3.2	5.0	2.3	2.3	2.3	0	2.3	2.3	2.3	5.1	0.6	2.5	2.5	2.5	0	2.3	0	2.6
Ref No.	IC3002																			
MODE	1	2	3	4	5															
REC	5.7	4.6	5.1	2.7	0															
PLAY	5.7	4.6	5.1	2.7	0															
STOP	5.7	4.6	5.1	2.7	0															
Ref No.	IC3701																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	2.3	0	2.3	0	1.8	0	2.3	0	1.8	2.8	2.3	0	1.7	5.0	1.7	4.2	2.9	0	2.1	0
PLAY	2.3	0	2.3	0	1.8	0	2.3	0	1.8	2.8	2.3	0	1.7	5.0	1.7	4.2	2.9	0	2.1	0
STOP	2.3	0	2.3	0	1.8	0	2.3	0	1.8	2.8	2.3	0	1.7	5.0	1.7	4.2	2.9	0	2.1	0
Ref No.	IC3701																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	2.5	5.0	0.4	2.4	2.0	2.5	5.0	2.5	2.0	2.4	0	2.5	0	2.4	2.4	2.4	5.0	2.2	2.3	2.2
PLAY	2.5	5.0	0.4	2.4	2.0	2.5	5.0	2.5	2.0	2.4	0	2.5	0	2.4	2.4	2.4	5.0	2.2	2.3	2.2
STOP	2.5	5.0	0.4	2.4	2.0	2.5	5.0	2.5	2.0	2.4	0	2.5	0	2.4	2.4	2.4	5.0	2.2	2.3	2.2
Ref No.	IC3701																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	2.3	1.3	2.3	0	2.9	4.9	3.5	2.3	2.9	5.0	2.3	0	4.5	4.5	9.0	4.5	0.5	4.6	4.6	4.6
PLAY	2.3	1.3	2.3	0	2.9	4.9	3.5	2.3	2.9	5.0	2.3	0	4.5	4.5	9.0	4.5	0.5	4.6	4.6	4.6
STOP	2.3	1.3	2.3	0	2.9	4.9	3.5	2.3	2.9	5.0	2.3	0	4.5	4.5	9.0	4.5	0.5	4.6	4.6	4.6
Ref No.	IC3701																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
REC	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.5	4.5	4.5	4.5	4.5	0	4.5	0	4.5	5.0	4.5	5.0	4.5
PLAY	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.5	4.5	4.5	4.5	4.5	0	4.5	0	4.5	5.0	4.5	5.0	4.5
STOP	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.5	4.5	4.5	4.5	4.5	0	4.5	0	4.5	5.0	4.5	5.0	4.5
Ref No.	IC4501																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	2.3	0	2.3	0	0	2.5	2.1	0	0	0	0	2.1	0	0	0	2.7	0.6	2.6	2.6	2.1
PLAY	2.3	0	2.3	0	0	2.5	2.1	0	0	0	0	2.1	0	0	0	2.7	0.6	2.6	2.6	2.1
STOP	2.3	0	2.3	0	0	2.5	2.1	0	0	0	0	2.1	0	0	0	2.7	0.6	2.6	2.6	2.1
Ref No.	IC4501																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	2.0	2.1	0	2.1	5.1	2.1	0	4.3	3.9	3.7	1.1	2.5	2.6	0.8	2.6	0	2.0	0	0	5.1
PLAY	2.0	2.1	0	2.1	5.1	2.1	0	4.3	3.9	3.7	1.1	2.5	2.6	0.8	2.6	0	2.0	0	0	5.1
STOP	2.1	2.1	0	2.1	5.1	2.1	0	4.3	1.8	1.8	0	2.6	2.6	0.8	2.6	0	2.0	0	0	5.1
Ref No.	IC4501																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	0	2.9	2.4	3.3	1.6	2.5	2.5	2.5	3.6	2.5	5.1	0.1	5.9	0	0	0	5.9	12.1	6.0	0
PLAY	0	2.9	2.4	3.3	1.6	2.5	2.5	2.5	3.6	2.5	5.1	0.1	5.9	0	0	0	5.9	12.1	6.0	0
STOP	0	2.9	2.4	3.3	1.6	2.5	1.6	2.5	3.6	2.5	5.1	0.1	6.0	0	0	0	6.0	12.1	6.1	0

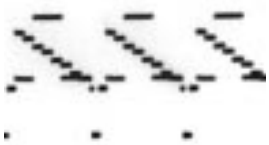
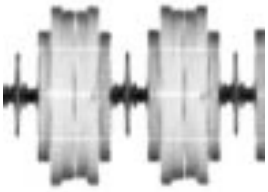
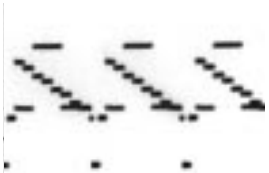
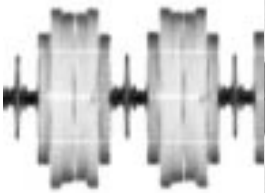
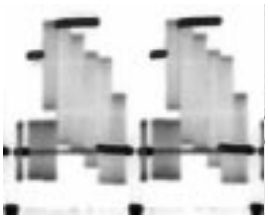
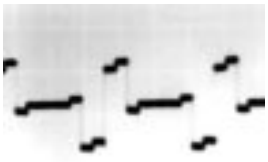
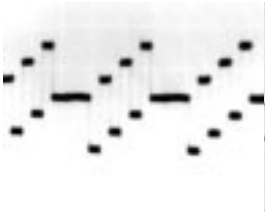
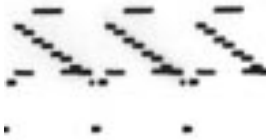
Ref No.	IC4501																			
MODE	61	62	63	64																
REC	2.5	2.4	2.5	2.5																
PLAY	2.5	2.4	2.5	2.5																
STOP	2.6	2.4	2.5	2.5																
Ref No.	IC4801																			
MODE	1	2	3	4	5															
REC	4.6	0	1.2	8.9	12.2															
PLAY	4.6	0	1.2	8.9	12.2															
STOP	4.6	0	1.2	8.9	12.2															
Ref No.	IC6001																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	0	0	0	0	4.9	4.9	4.8	4.6	3.2	0	4.7	4.9	0	4.9	3.8	0	4.8	0	0	4.8
	0	0	0	0	4.9	4.9	4.8	4.6	3.2	0	0	0	0	4.9	3.8	0	4.8	2.4	0	4.8
STOP	4.8	0	0	0	4.9	4.9	4.8	4.6	3.3	0	0	0	0	4.9	3.8	0	4.8	2.4	0	0
Ref No.	IC6001																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	4.9	0	4.3	2.0	0	4.8	0	0	4.9	0	4.8	4.8	0	4.9	1.5	1.3	4.9	-	-	0
PLAY	4.9	0	4.3	2.0	0	4.8	0	0	4.9	0	4.8	4.8	0	4.9	1.5	1.3	4.9	-	-	0
STOP	4.9	0	4.3	2.0	0	0	0	0	4.9	0	4.8	4.8	0	4.9	1.5	1.3	4.9	-	-	0
Ref No.	IC6001																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	0	0	0	4.7	4.7	0	1.4	2.1	0	1.7	5.0	1.7	5.1	2.1	1.7	2.0	0	0	0	0
PLAY	0	0	0	4.7	4.7	0	1.4	2.1	0	1.7	5.0	1.7	5.1	2.1	1.7	2.0	0	0	0	0
STOP	0	0	0	4.7	4.7	0	0	2.1	0	1.7	5.0	1.7	5.1	2.1	2.2	2.0	0	0	0	0
Ref No.	IC6001																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
REC	0	0	0	0	0	0	0	4.0	2.2	4.2	4.2	4.1	0.1	0	4.6	2.5	2.4	4.8	4.8	4.5
	0	0	0	0	0	0	0	4.0	2.2	4.2	4.2	4.1	0.1	0	4.6	2.5	2.4	4-8	4.8	0.2
STOP	0	0	0	0	0	0	0	4.0	2.2	4.2	4.2	4.1	0.1	0	4.6	0	2.4	4.8	5.0	0.2
Ref No.	IC6001																			
MODE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
REC	0	0	0	0	0	2.5	2.5	0	0	1.3	2.5	2.5	0	2.3	2.8	2.5	2.5	5.1	4.9	0
	0	0	0	0	0	2.5	2.5	0	0	1.3	2.5	2.5	0	2.3	2.8	2.5	2.5	5.1	4.9	0
STOP	0	0	0	0	0	2.6	2.6	0	0	1.3	2.5	2.5	0	2.5	2.5	2.5	2.5	5.1	4.9	0
Ref No.	IC6002						IC6301													
MODE	1	2	3	4	5		1	2	3	4										
REC	4.9	4.9	0	-	-		5.0	0	4.6	5.7										
PLAY	4.9	4.9	0	-	-		5.0	0	4.6	5.7										
STOP	4.9	4.9	0	-	-		5.0	0	4.6	5.7										
Ref No.	IC7301																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	-	0.6	2.7	0.5	2.4	2.4	4.5	0	2.5	2.5	0	0	2.8	2.7	2.2	-	3.4	3.4	5.0	-
PLAY	-	0.6	2.7	0.7	2.4	2.4	4.5	0	2.5	2.5	0	0	2.8	2.7	2.2	-	3.4	3.4	5.0	-
STOP	-	0.6	2.7	0.7	2.4	2.4	4.5	0	2.5	2.5	0	0	2.8	2.7	2.2	-	3.4	3.4	5.0	-
Ref No.	IC7301																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32								
REC	2.2	3.4	2.2	5.0	-	1.7	5.0	1.7	2.2	2.2	-	2.2								
PLAY	2.2	3.4	2.2	5.0	-	1.7	5.0	1.7	2.2	2.2	-	2.2								
STOP	2.2	3.4	2.2	5.0	-	1.7	5.0	1.7	2.2	2.2	-	2.2								
Ref No.	IC7402																			
MODE	1	2	3	4	5	6	7	8												
REC	5.0	-	0	3.2	4.9	-	-	5.7												
PLAY	5.0	-	0	3.2	4.9	-	-	5.7												
STOP	5.0	-	0	3.2	4.9	-	-	5.7												
Ref No.	IC7501																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REC	4.8	4.8	0	4.8	4.8	4.8	4.7	4.8	4.8	-	-	0	2.1	2.3	0	4.8	4.8	4.8	4.0	0
PLAY	4.8	4.8	0	4.8	4.8	4.8	4.7	4.8	4.8	-	-	0	2.1	2.3	0	4.8	4.8	4.8	4.0	0
STOP	4.8	4.8	0	4.8	4.8	4.8	4.7	4.8	4.8	-	-	0	2.1	2.3	0	4.8	4.8	4.8	4.0	0
Ref No.	IC7501																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REC	0.4	4.6	4.7	4.9	4.8	4.8	4.8	0.5	4.8	3.7	3.8	4.1	3.2	4.8	4.8	4.8	0	0	4.8	-26.8
PLAY	0.4	4.6	4.7	4.9	4.8	4.8	4.8	0.5	4.8	3.7	3.8	4.1	3.2	4.8	4.8	4.8	0	0	4.8	-26.8
STOP	0.4	4.6	4.7	4.9	4.8	4.8	4.8	0.5	4.8	3.7	3.8	4.1	3.2	4.8	4.8	4.8	0	0	4.8	-26.8
Ref No.	IC7501																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
REC	-26.8	-22.5	-22.7	-22.7	-22.5	-22.5	-22.5	-22.5	-22.5	-18.3	-14.1	-26.6	-26.6	-26.6	-14.1	-14.2	-14.2	-22.4	-14.2	-18.3
PLAY	-26.8	-22.5	-22.7	-22.7	-22.5	-22.5	-22.5	-22.5	-22.5	-18.3	-14.1	-26.6	-26.6	-26.6	-14.1	-14.2	-14.2	-22.4	-14.2	-18.3
STOP	-26.8	-22.5	-22.7	-22.7	-22.5	-22.5	-22.5	-22.5	-22.5	-18.3	-14.1	-26.6	-26.6	-26.6	-14.1	-14.2	-14.2	-22.4	-14.2	-18.3
Ref No.	IC7501																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
REC	-26.5	-26.5	-26.7	-14.6	-26.8	0	4.7	0	0	4.8	4.8	4.8	0	0	0	0	0	0	0	0
PLAY	-26.5	-26.5	-26.7	-14.6	-26.8	0	4.7	0	0	4.8	4.8	4.8	0	0	0	0	0	0	0	0
STOP	-26.5	-26.5	-26.7	-14.6	-26.8	0	4.7	0	0	4.8	4.8	4.8	0	0	0	0	0	0	0	0
Ref No.	IC7501																			
MODE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
REC	0	0	4.3	0	0	2.6	0	2.3	0	-26.9	0	0	0	2.6	0	0	4.8	4.8	0	4.6
PLAY	0	0	4.3	0	0	2.6	0	2.3	0	-26.9	0	0	0	2.6	0	0	4.8	4.8	0	4.6
STOP	0	0	4.3	0	0	2.6	0	2.3	0	-26.9	0	0	0	2.6	0	0	4.8	4.8	0	4.6

Ref No.	Q1501			Q1502			Q3001				Q3004				Q4001					
MODE	E	C		E	C		E	C	B		E	C	B		E	C	B			
REC	0	4.6		0	4.9		1.6	5.0	2.2		1.7	5.1	3.4		-19.4	10.4	-28.1			
PLAY	0	4.7		0	4.9		1.6	5.0	2.2		1.7	5.1	3.4		0	0	0.7			
STOP	0	4.7		0	4.9		1.6	5.0	2.2		1.7	5.1	3.4		0	0	0.7			
Ref No.	Q4002				Q4081				Q4082				Q4084				Q4501			
MODE	E	C	B		E	C	B		E	C	B		E	C	B		E	C	B	
REC	-19.4	0	-28.1		5.7	5.6	4.9		0	5.1	-0.6		5.7	5.6	4.9		12.4	12.3	11.7	
PLAY	0	0	0.7		5.7	0.3	5.7		0	0.3	0.3		5.7	0.4	5.7		12.4	12.3	11.7	
STOP	0	0	0.7		5.7	0.3	5.7		5.7	0.4	5.7		5.7	0.4	5.7		12.4	12.3	11.7	
Ref No.	Q4502				Q6801				Q7401				Q7402							
MODE	E	C	B		E	C	B		E	C	B		E	C	B					
REC	5.1	5.7	5.8		0	12.5	0		2.4	0	1.7		0	0.1	0.6					
PLAY	5.1	5.7	5.8		0	12.5	0		2.4	0	1.7		0	0.1	0.6					
STOP	5.1	5.7	5.8		0	12.5	0		2.4	0	1.7		0	0.1	0.6					
Ref No.	QR4001				QR4082				QR4501				QR4801							
MODE	E	C	B		E	C	B		E	C	B		1	2	3	4	5			
REC	5.1	-28.1	4.8		0	0.1	4.8		0	0	4.6		0	0	1.8	0	4.6			
PLAY	5.1	5.0	0		0	5.7	0		0	0	4.6		0	0	1.8	0	4.6			
STOP	5.1	5.0	0		0	5.7	0		0	0	4.6		0	0	1.8	0	4.6			
Ref No.	QR4802						QR4803						QR4804							
MODE	1	2	3	4	5		1	2	3	4	5		E	C	B					
REC	0	0	-0.3	0	-0.5		5.8	5.8	0	0	0		5.8	-0.5	5.8					
PLAY	0	0	-0.3	0	-0.5		5.8	5.8	0	0	0		5.8	-0.5	5.8					
STOP	0	0	-0.3	0	-0.5		5.8	5.8	0	0	0		5.8	-0.5	5.8					
Ref No.	QR4805						QR4806						QR4807							
MODE	1	2	3	4	5		1	2	3	4	5		E	C	B					
REC	0	0	-0.3	0	-0.5		0	0	-0.1	0	-0.6		4.8	4.7	0					
PLAY	0	0	-0.3	0	-0.5		0	0	-0.1	0	-0.6		4.8	4.7	0					
STOP	0	0	-0.3	0	-0.5		0	0	-0.1	0	-0.6		4.8	4.7	0					
Ref No.	QR4808						QR4809				QR6801									
MODE	1	2	3	4	5		E	C	B		E	C	B							
REC	0	0	4.7	0	4.7		0.1	-0.6	0		12.6	0	12.5							
PLAY	0	0	4.7	0	4.7		0.1	-0.6	0		12.6	0	12.5							
STOP	0	0	4.7	0	4.7		0.1	-0.6	0		12.6	0	12.5							

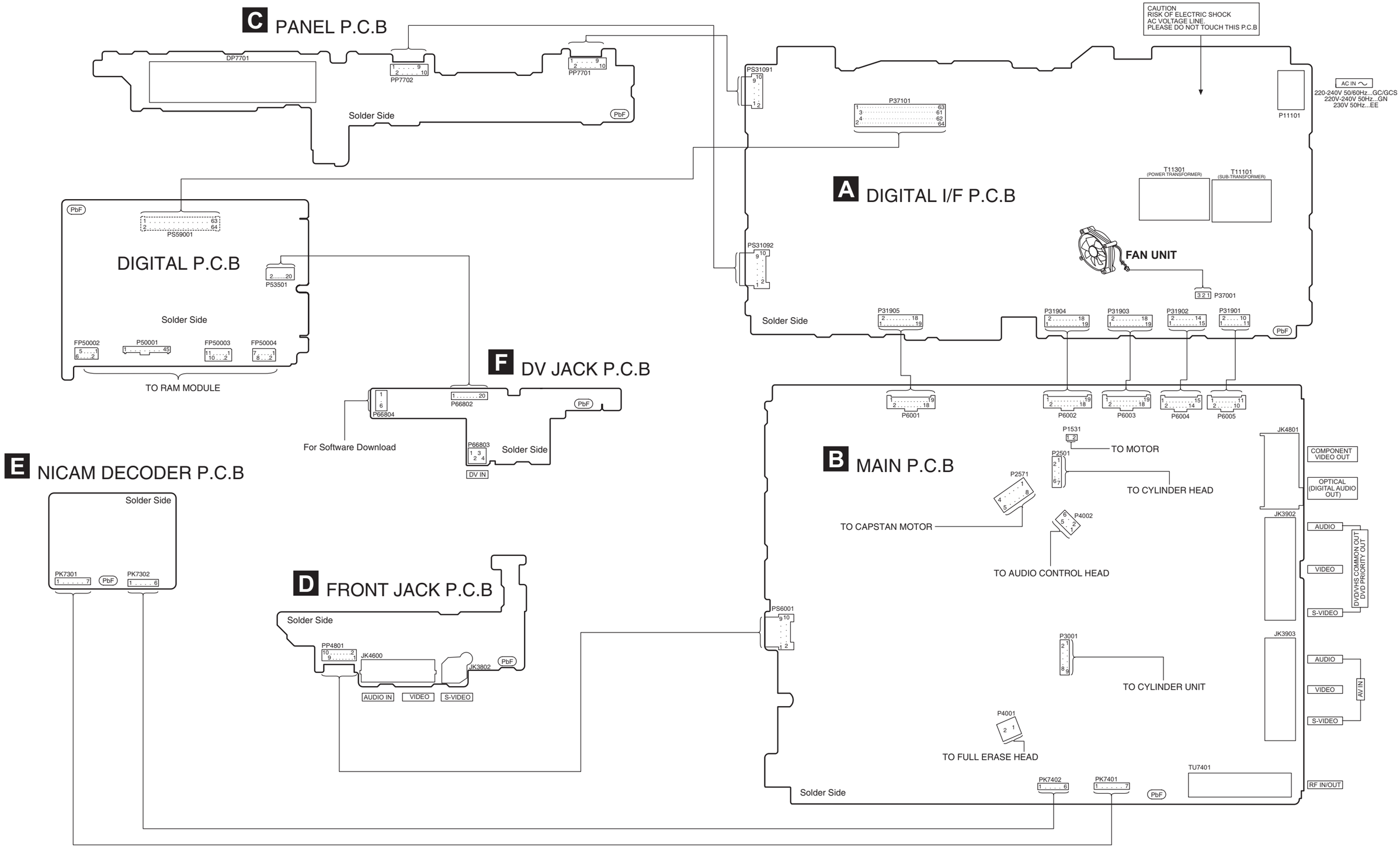
15.2. Waveform Chart

 IC6001 PIN 18 REC 5.0Vp-p (10msec.div)	 IC6001 PIN 19 PLAY 5.0Vp-p (5msec.div)	 IC6001 PIN 50 REC/PLAY 2.2Vp-p (20usec.div)	 IC6001 PIN 52 REC/PLAY 2.2Vp-p (20usec.div)
 IC6001 PIN 79 FF/REW 5.0Vp-p (1msec.div)	 IC6001 PIN 80 FF/REW 5.0Vp-p (1msec.div)	 IC6001 PIN 86 PLAY 0.7Vp-p (0.5msec.div)	 IC6001 PIN 90 REC 5.0Vp-p (10msec.div)
 IC6001 PIN 94 REC 2.4Vp-p (10msec.div)	 IC6001 PIN 95 REC 2.4Vp-p (10msec.div)	 IC6001 PIN 97 PLAY 4.4Vp-p (5msec.div)	 IC2501 PIN 22 PLAY 8.0Vp-p (2msec.div)
 IC2501 PIN 23 PLAY 8.0Vp-p (2msec.div)	 IC2501 PIN 25 PLAY 8.0Vp-p (2msec.div)	 IC3001 PIN 6 REC/PLAY 0.9Vp-p (2msec.div)	 IC3001 PIN 19 REC 1.0Vp-p (20usec.div)
 IC3001 PIN 29 REC/PLAY 2.4Vp-p (20usec.div)	 IC3001 PIN 36 REC/PLAY 0.5Vp-p (20usec.div)	 IC3001 PIN 57 REC/PLAY 0.2Vp-p (20usec.div)	 IC3001 PIN 67 REC/PLAY 0.5Vp-p (0.5usec.div)

 IC3001 PIN 80 REC/PLAY 0.5Vp-p (10msec.div)	 IC3001 PIN 86 REC 1.4Vp-p (20usec.div)	 IC3001 PIN 98 REC 1.5Vp-p (1msec.div)	 IC4501 PIN 21 REC 1.1Vp-p (20usec.div)
 IC4501 PIN 53 REC/PLAY 1.6Vp-p (0.5msec.div)	 IC4501 PIN 57 REC/PLAY 1.6Vp-p (0.5msec.div)	 IC11201 PIN 9 STOP 300Vp-p (5usec.div)	 T11101 PIN 1 STOP 10Vp-p (2msec.div)
 T11101 PIN 4 STOP 36Vp-p (5usec.div)	 T11301 PIN 6 STOP 300Vp-p (5usec.div)	 T11301 PIN 8 STOP 25Vp-p (5usec.div)	 P59001 PIN 17 REC/PLAY 0.8Vp-p (1msec.div)
 P59001 PIN 19 REC/PLAY 0.8Vp-p (1msec.div)	 P59001 PIN 27 REC/PLAY 1.0Vp-p (1msec.div)	 P59001 PIN 29 REC/PLAY 1.0Vp-p (1msec.div)	 P59001 PIN 39 REC/PLAY 1.0Vp-p (20usec.div)
 P59001 PIN 43 REC/PLAY 0.8Vp-p (20usec.div)	 P59001 PIN 47 REC/PLAY 0.6Vp-p (20usec.div)	 P59001 PIN 51 REC/PLAY 1.0Vp-p (20usec.div)	 P59001 PIN 55 REC/PLAY 0.6Vp-p (20usec.div)

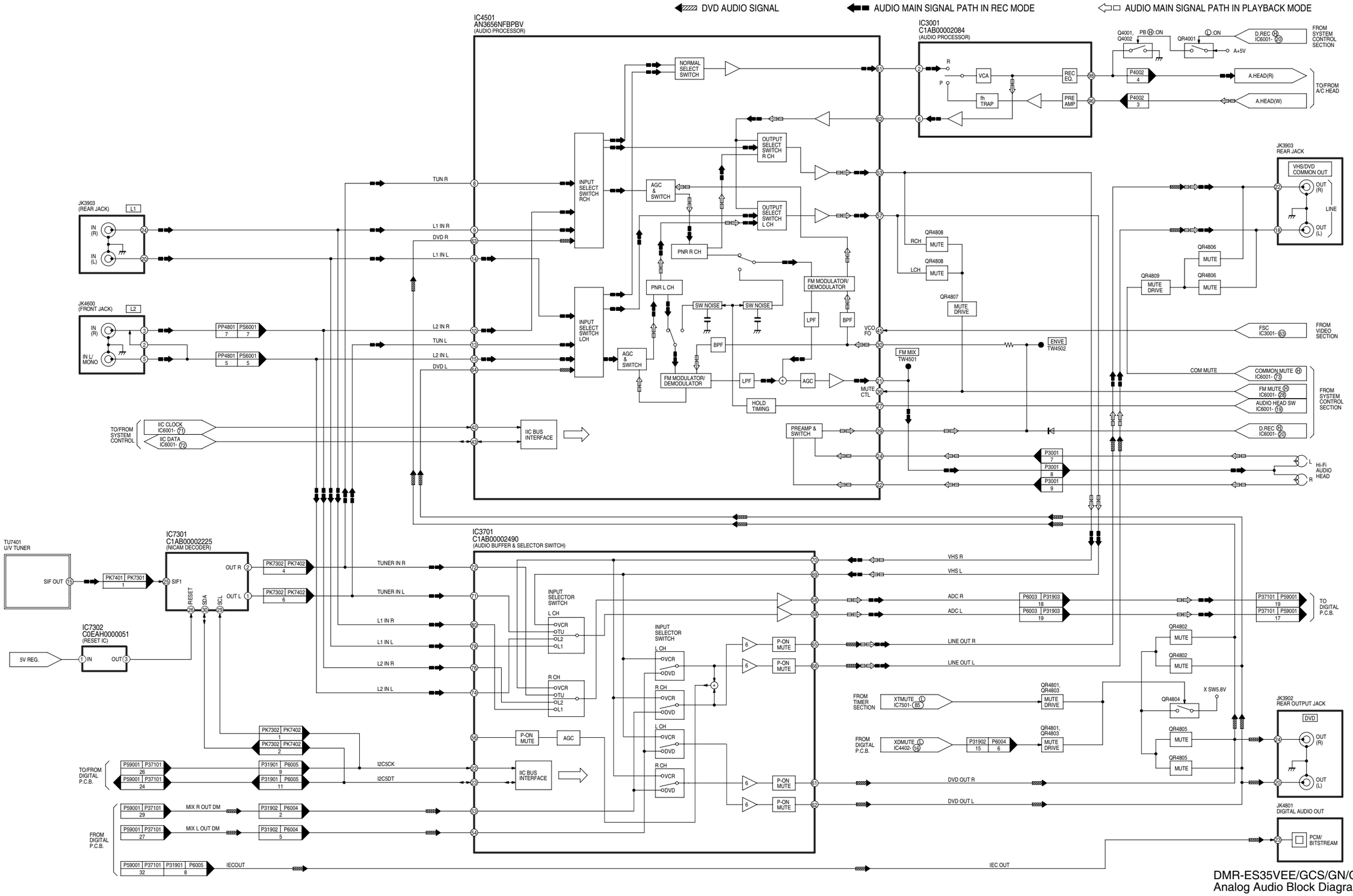
 P59001 PIN 59 REC/PLAY 1.0Vp-p (20usec.div)	 P59001 PIN 63 REC/PLAY 0.8Vp-p (20usec.div)	 JK3902 PIN 3 REC/PLAY 2.0Vp-p (20usec.div)	 JK3902 PIN 4 REC/PLAY 1.5Vp-p (20usec.div)
 JK3902 PIN 16 REC/PLAY 2.0Vp-p (20usec.div)	 JK4801 PIN 18 REC/PLAY 1.2Vp-p (20usec.div)	 JK4801 PIN 19 REC/PLAY 1.2Vp-p (20usec.div)	 JK4801 PIN 20 REC/PLAY 2.0Vp-p (20usec.div)

16 Wiring Diagram



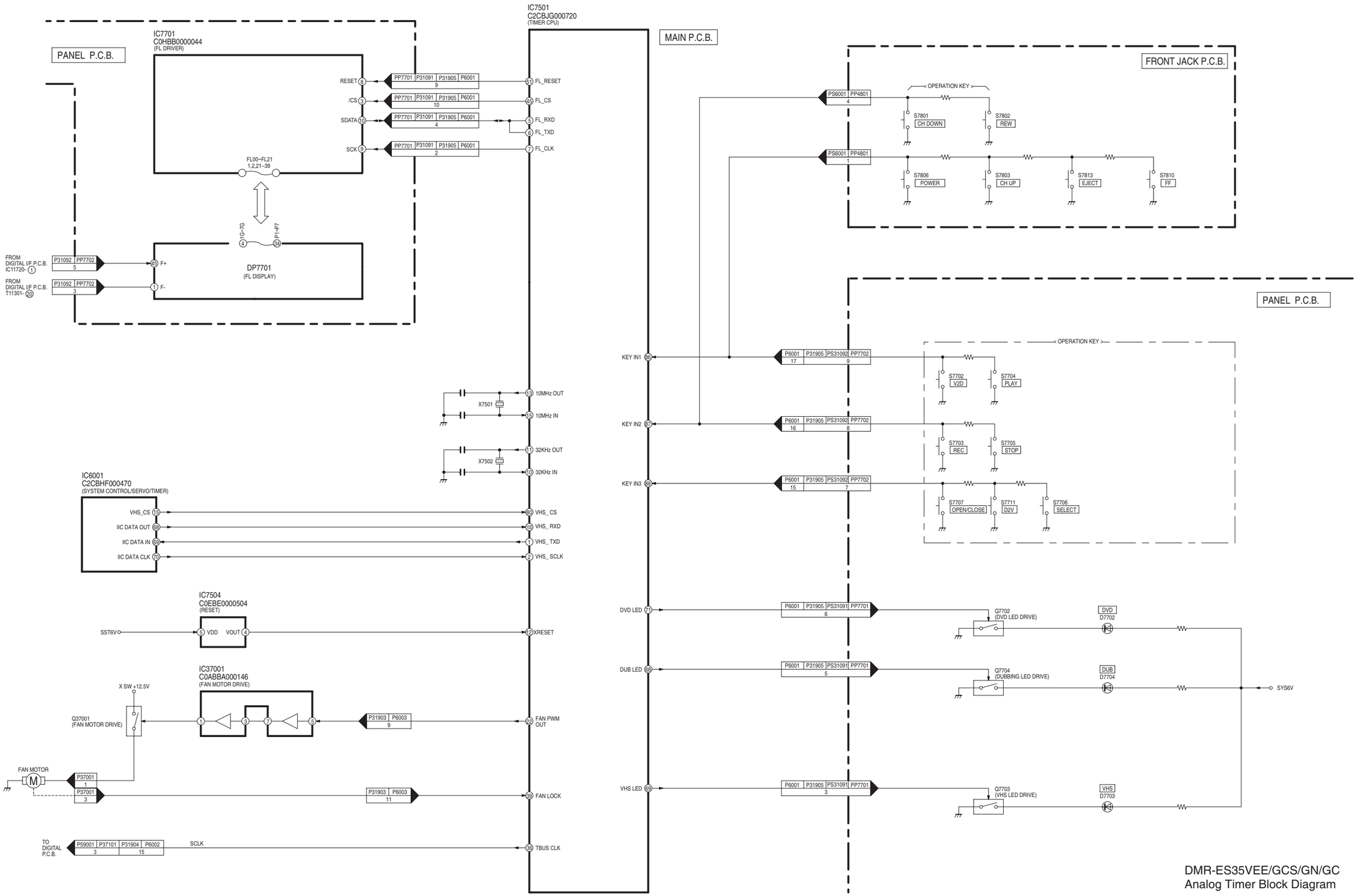
17 Block Diagram

17.1. Analog Audio Block Diagram



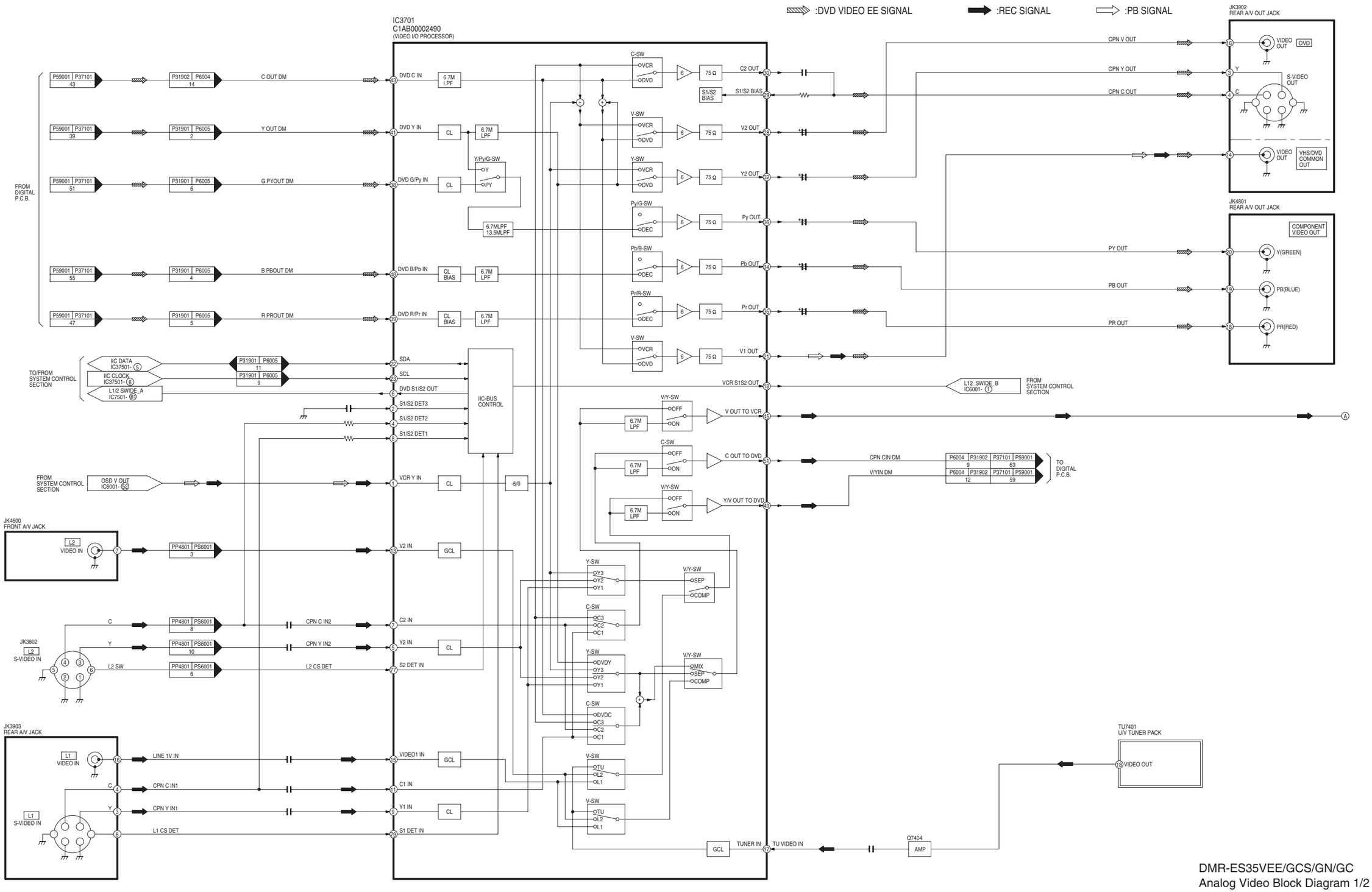
DMR-ES35VEE/GCS/GN/GC
Analog Audio Block Diagram

17.2. Analog Timer Block Diagram

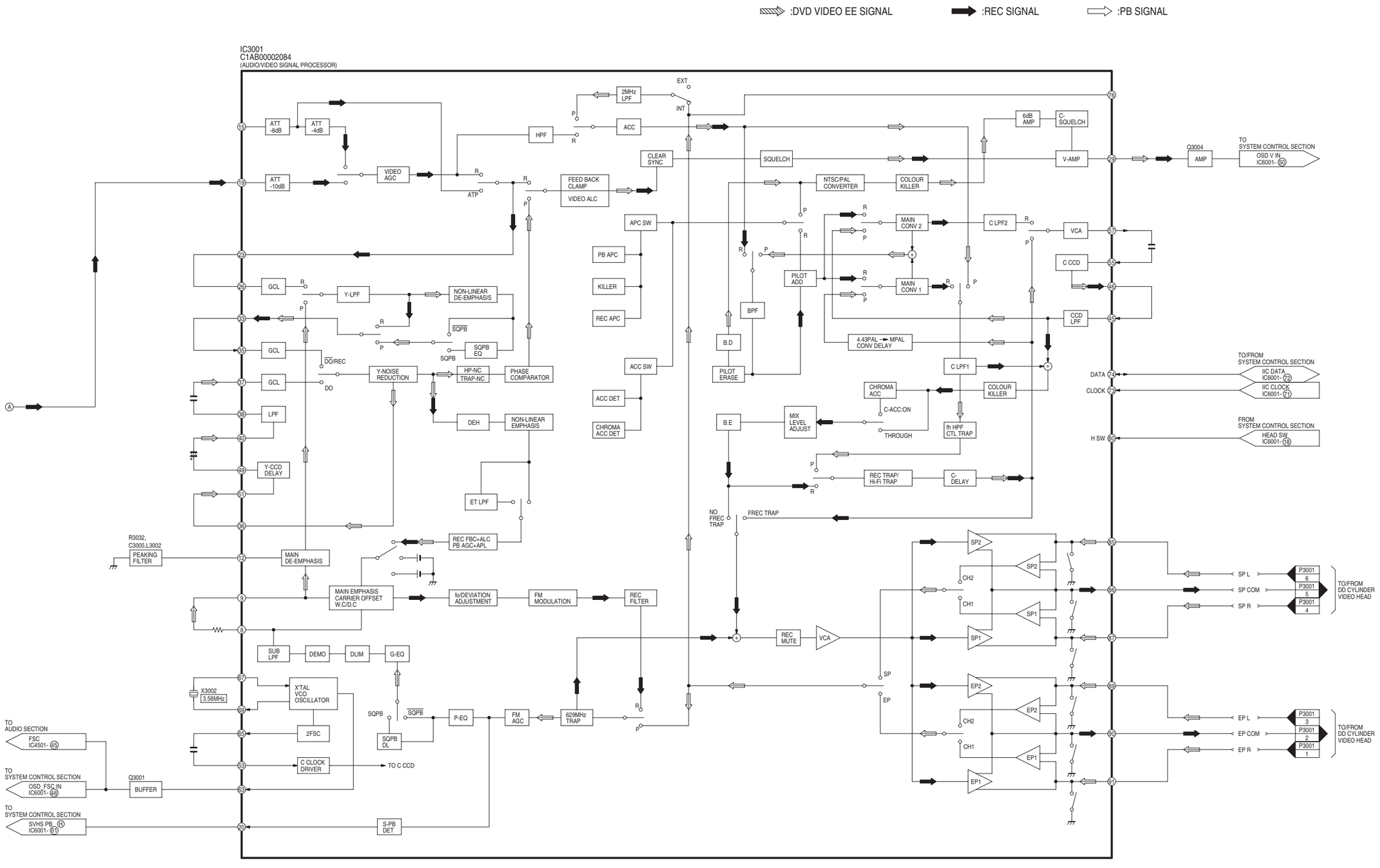


DMR-ES35VEE/GCS/GN/GC
Analog Timer Block Diagram

17.3. Analog Video Block Diagram

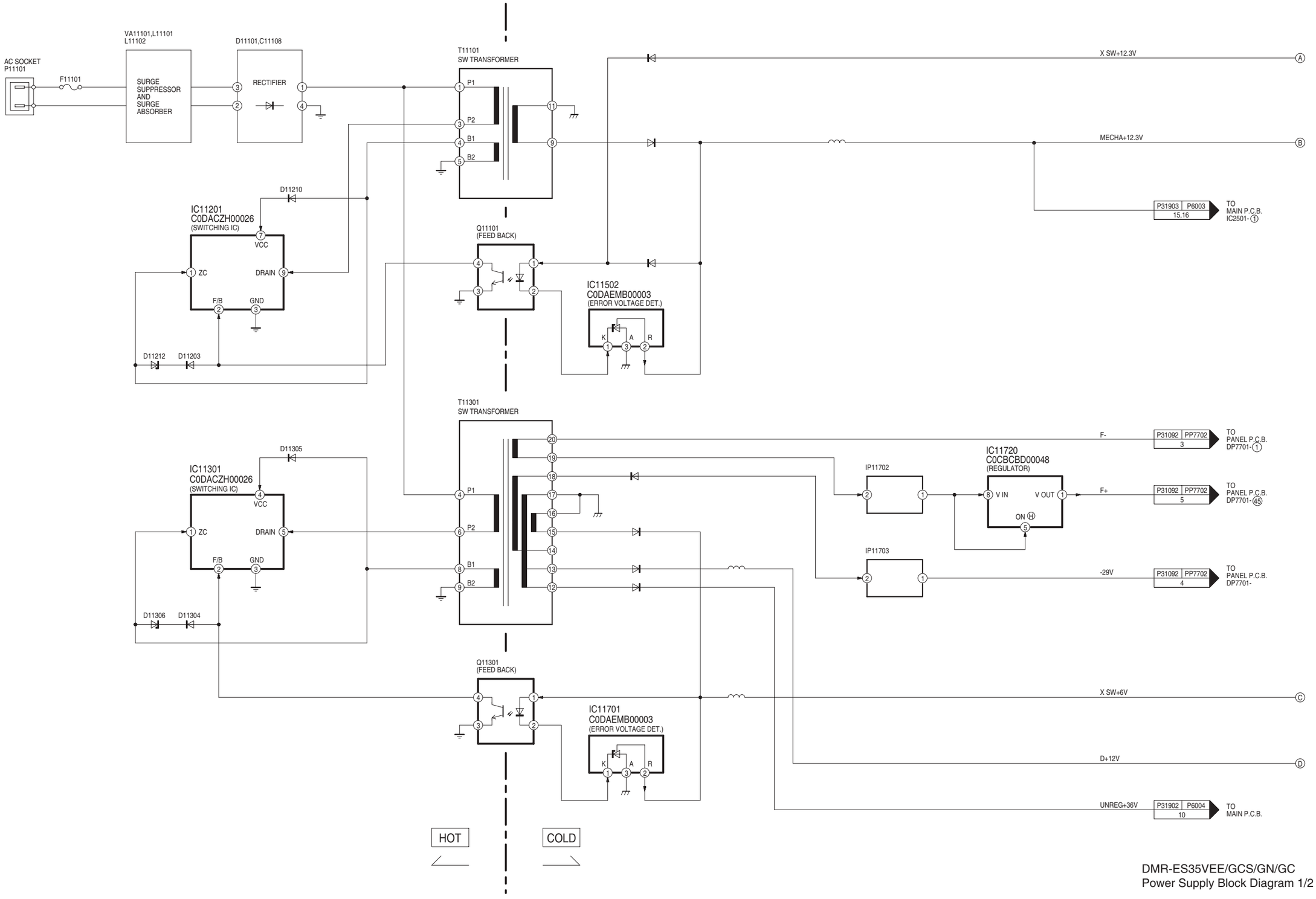


DMR-ES35VEE/GCS/GN/GC
Analog Video Block Diagram 1/2

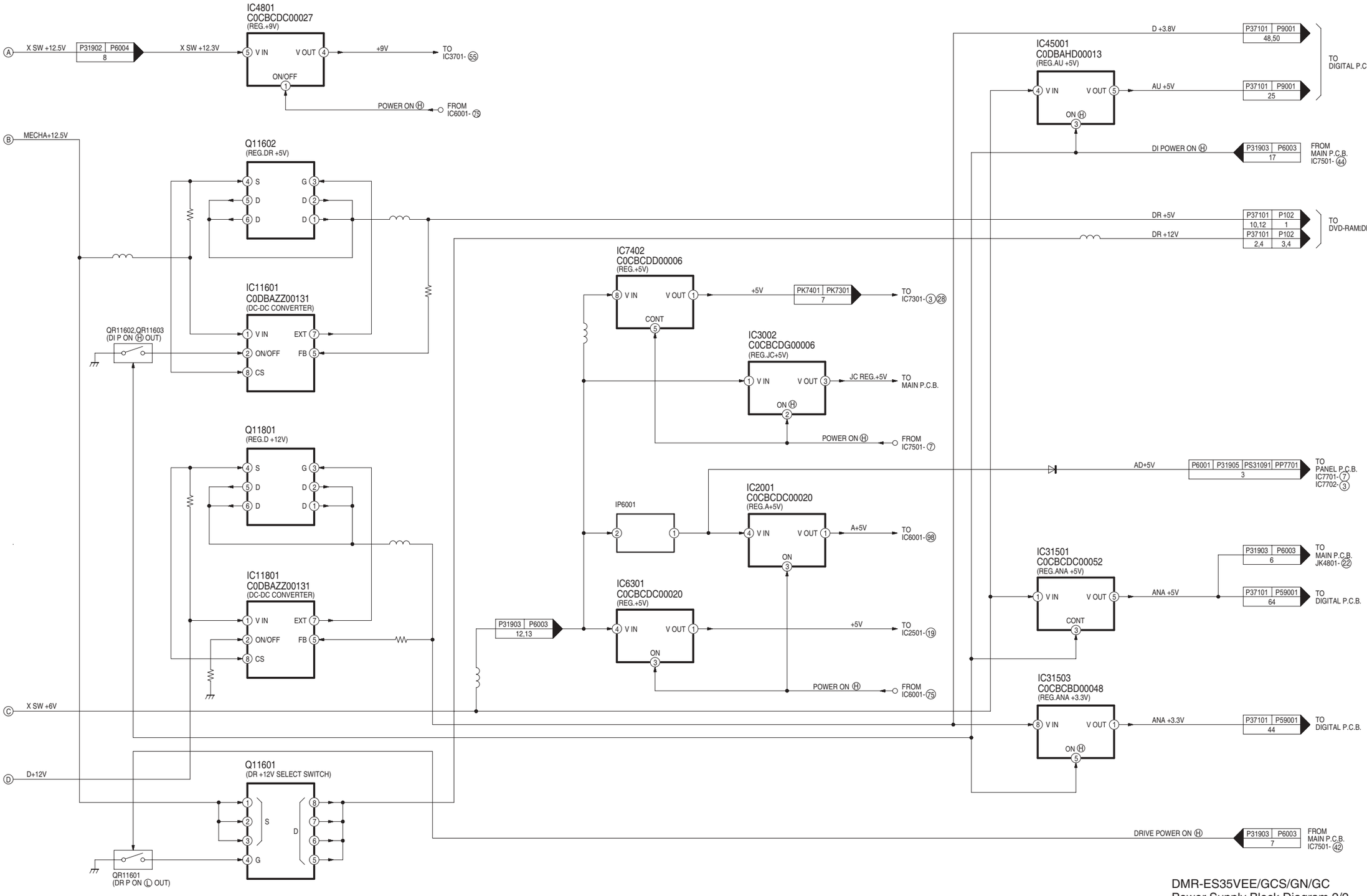


DMR-ES35VEE/GCS/GN/GC
Analog Video Block Diagram 2/2

17.4. Power Supply Block Diagram

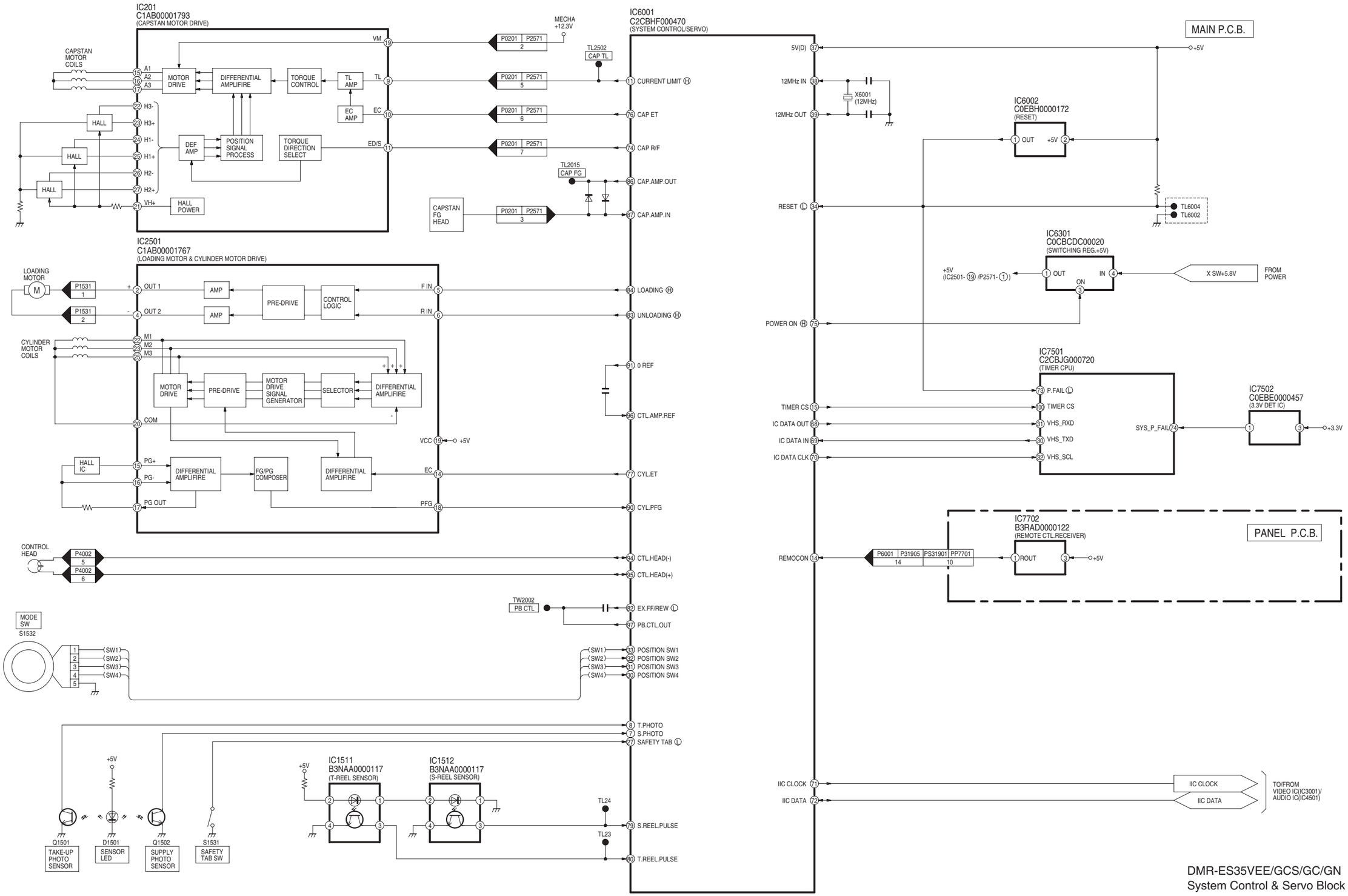


DMR-ES35VEE/GCS/GN/GC
Power Supply Block Diagram 1/2



DMR-ES35VEE/GCS/GN/GC
Power Supply Block Diagram 2/2

17.5. System Control & ServoBlock Diagram



DMR-ES35VEE/GCS/GC/GN
System Control & Servo Block Diagram

18 Notes of Schematic Diagram

(All schematic diagrams may be modified at any time with the development of new technology)

Note :

S1531	Safety TAB switch
S1532	MODE switch
S7701	V2D switch
S7702	STOP switch
S7703	SELECT switch
S7704	D2V switch
S7705	REC switch
S7706	OPEN/CLOSE switch
S7707	PLAY switch
S7801	CH DWN switch
S7802	REW switch
S7803	CH UP switch
S7806	POWER switch
S7810	FF switch
S7813	EJECT switch

- **Importance safety notice :**

  Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer´s specified parts shown in the parts list.

Caution !

IC, LSI and VLSI are sensitive to static electricity.

Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminium foil.
- Put a conductive mat on the work table.
- Ground the soldering iron.
- Do not touch the pins of IC, LSI or VLSI with fingers directly.

19 Schematic Diagram

19.1. DIGITAL IF CIRCUIT

SCHEMATIC DIAGRAM - 1

A DIGITAL IF (POWER) CIRCUIT

: - B SIGNAL LINE

: +B SIGNAL LINE

P:Digital IF (Power): Schematic Diagram 1
IF:Digital IF (DVD_IF): Schematic Diagram 2-5

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
SLIGHTLY DIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS.ONLY THE SAME TYPE.

DMR-ES35VEE/GCS/GC/GN DIGITAL IF (POWER) CIRCUIT

SCHEMATIC DIAGRAM - 2

A DIGITAL IF (DVD_IF) CIRCUIT

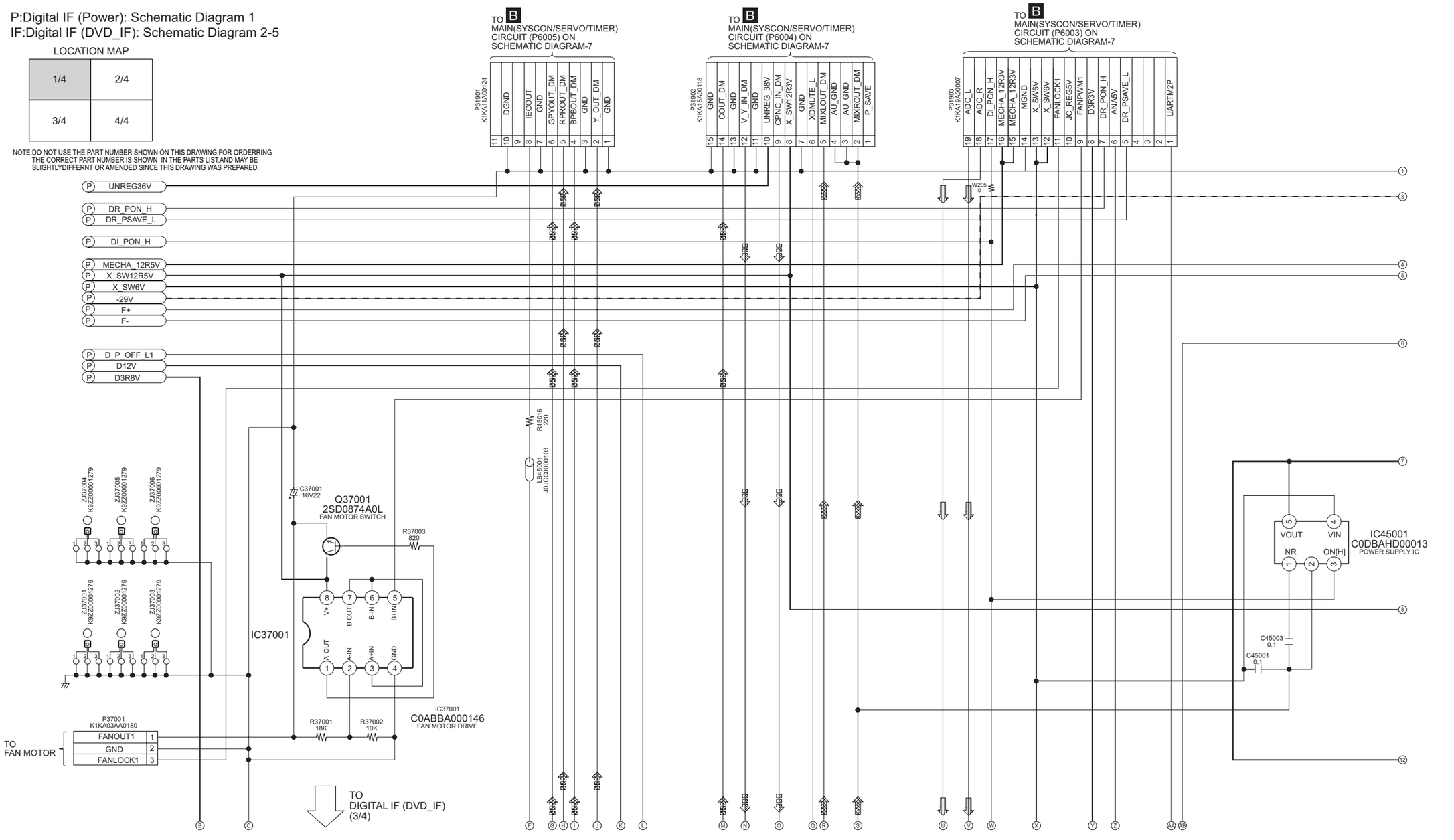
—— : -B SIGNAL LINE
—— : +B SIGNAL LINE
: DVD PLAYBACK VIDEO SIGNAL LINE
: DVD RECORDING VIDEO SIGNAL LINE
: DVD PLAYBACK AUDIO SIGNAL LINE
: DVD RECORDING AUDIO SIGNAL LINE

P:Digital IF (Power): Schematic Diagram 1
IF:Digital IF (DVD_IF): Schematic Diagram 2-5

LOCATION MAP

1/4	2/4
3/4	4/4

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.



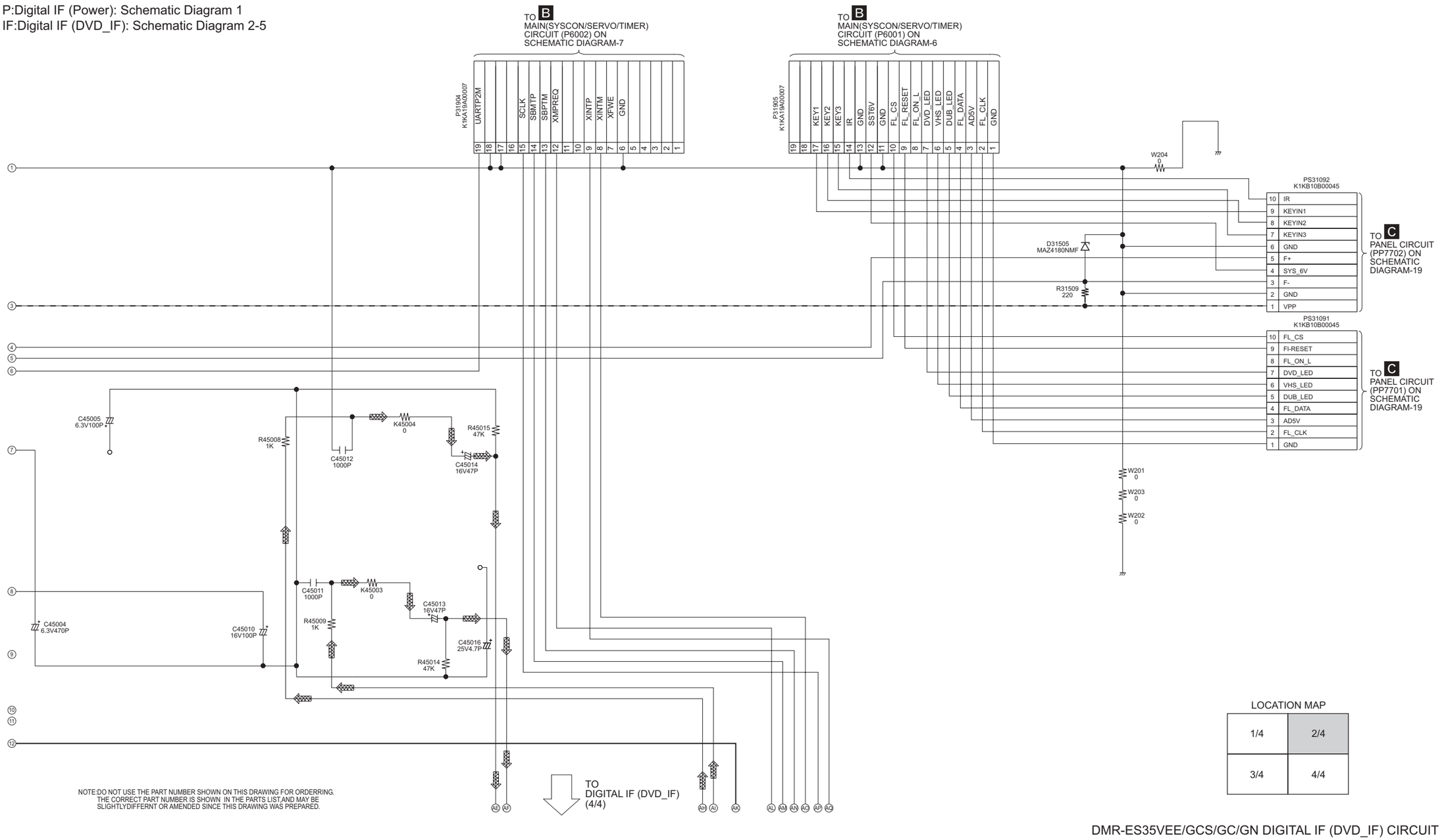
DMR-ES35VEE/GCS/GC/GN DIGITAL IF (DVD_IF) CIRCUIT

SCHEMATIC DIAGRAM - 3

A DIGITAL IF (DVD_IF) CIRCUIT

: -B SIGNAL LINE
: +B SIGNAL LINE
: DVD PLAYBACK AUDIO SIGNAL LINE

P:Digital IF (Power): Schematic Diagram 1
IF:Digital IF (DVD_IF): Schematic Diagram 2-5



NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
SLIGHTLY/DIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

LOCATION MAP

1/4	2/4
3/4	4/4

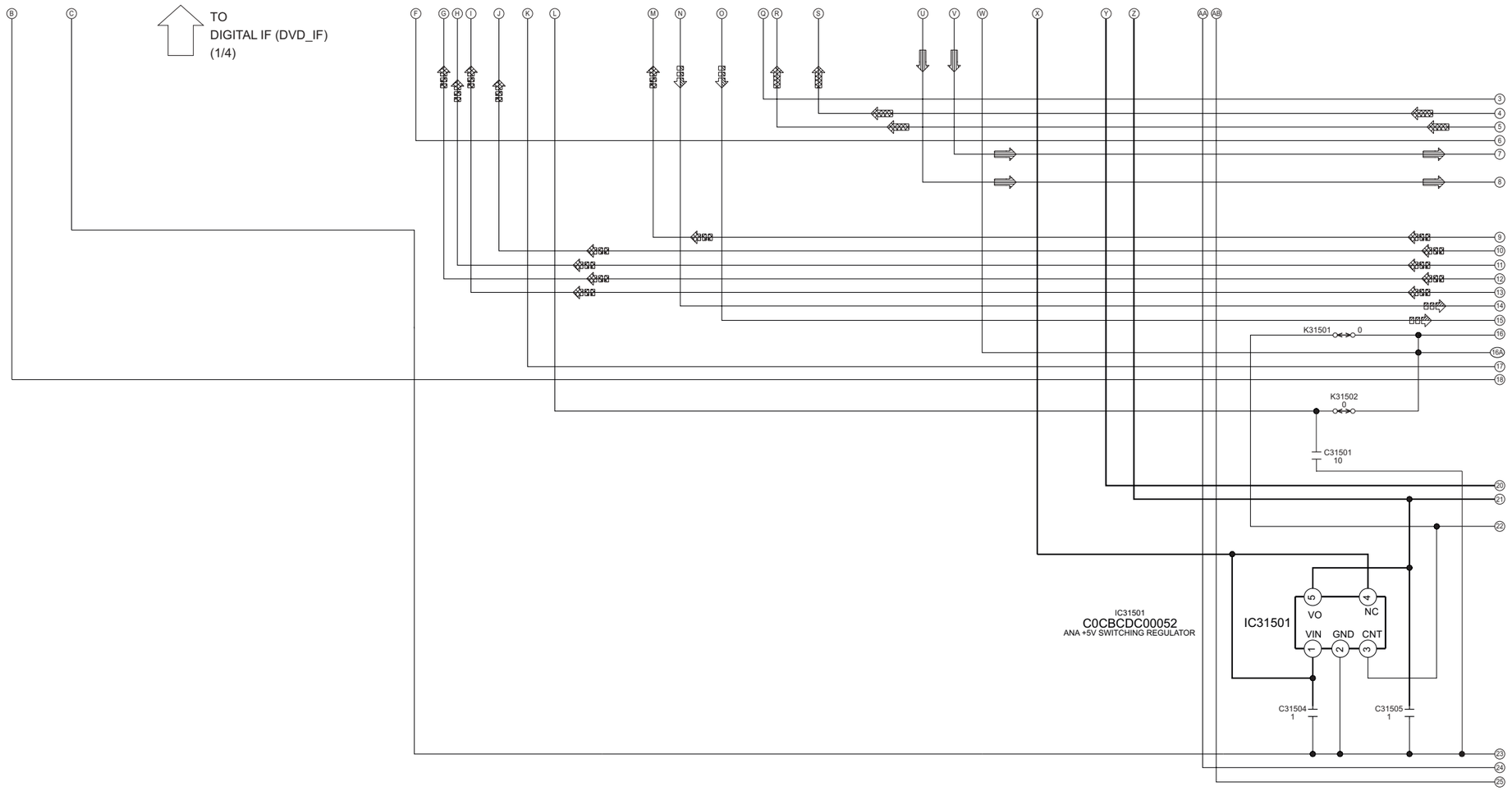
DMR-ES35VEE/GCS/GC/GN DIGITAL IF (DVD_IF) CIRCUIT

6 | 7 | 8 | 9 | 10

SCHEMATIC DIAGRAM - 4

A DIGITAL IF (DVD_IF) CIRCUIT

: -B SIGNAL LINE
: +B SIGNAL LINE
: DVD PLAYBACK VIDEO SIGNAL LINE
: DVD RECORDING VIDEO SIGNAL LINE
: DVD PLAYBACK AUDIO SIGNAL LINE
: DVD RECORDING AUDIO SIGNAL LINE



LOCATION MAP

1/4	2/4
3/4	4/4

P:Digital IF (Power): Schematic Diagram 1
IF:Digital IF (DVD_IF): Schematic Diagram 2-5

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

DMR-ES35VEE/GCS/GC/GN DIGITAL IF (DVD_IF) CIRCUIT

SCHEMATIC DIAGRAM - 5

A DIGITAL IF (DVD_IF) CIRCUIT

—— : -B SIGNAL LINE
—— : +B SIGNAL LINE
: DVD PLAYBACK VIDEO SIGNAL LINE
: DVD RECORDING VIDEO SIGNAL LINE
: DVD PLAYBACK AUDIO SIGNAL LINE
: DVD RECORDING AUDIO SIGNAL LINE

TO DIGITAL IF (DVD_IF) (2/4)

TO K DIGITAL (MODE SELECT SECTION) CIRCUIT (VOL 2) (P59001)

P37101
K1KY64A00002

LB37005 J0JKB0000032
LB37006 0
LB37013 J0JKB0000032
LB37001 J0JHC0000048
LB37002 J0JHC0000048
LB37009 J0JKB0000032
LB37011 J0JKB0000032
LB37003
LB37004
LB37004,LB37003 J0JHC0000048
LB37007 0

R45001 0
R45002 0
C45008 16V10
C45007 16V10
R33501 4.7K
R33502 4.7K
R33503 4.7K
R33504 4.7K
R33505 4.7K
R37004 100
R37010 100
R37009 100
R37005 100
R37006 100
R37007 100
R37014 100
R37015 0

C31503 10
C37013 0.1
C37011 0.1
C37012 0.1
C31506 1
C31507 1
C31508 0.01
C37501 0.1

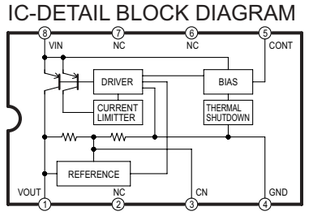
IC31503
C0CBCBD00048
ANA +3.3V SWITCHING REGULATOR IC
8 VIN, 7 NC, 6 NC, 5 ON/[H], 1 V OUT, 2 NC, 3 CN, 4 GND

IC37501
EEPROM (NOT SUPPLIED)
1 NC, 2 NC, 3 NC, 4 VSS, 8 VCC, 7 /VE, 6 SCK, 5 SDA

R37502 4.7K
R37503 4.7K
R37521 4.7K

DR12V (P)
DR_GND (P)
DR5V (P)

IC31503
ANA +3.3V SWITCHING REG.
IC-DETAIL BLOCK DIAGRAM



P:Digital IF (Power): Schematic Diagram 1
IF:Digital IF (DVD_IF): Schematic Diagram 2-5

LOCATION MAP

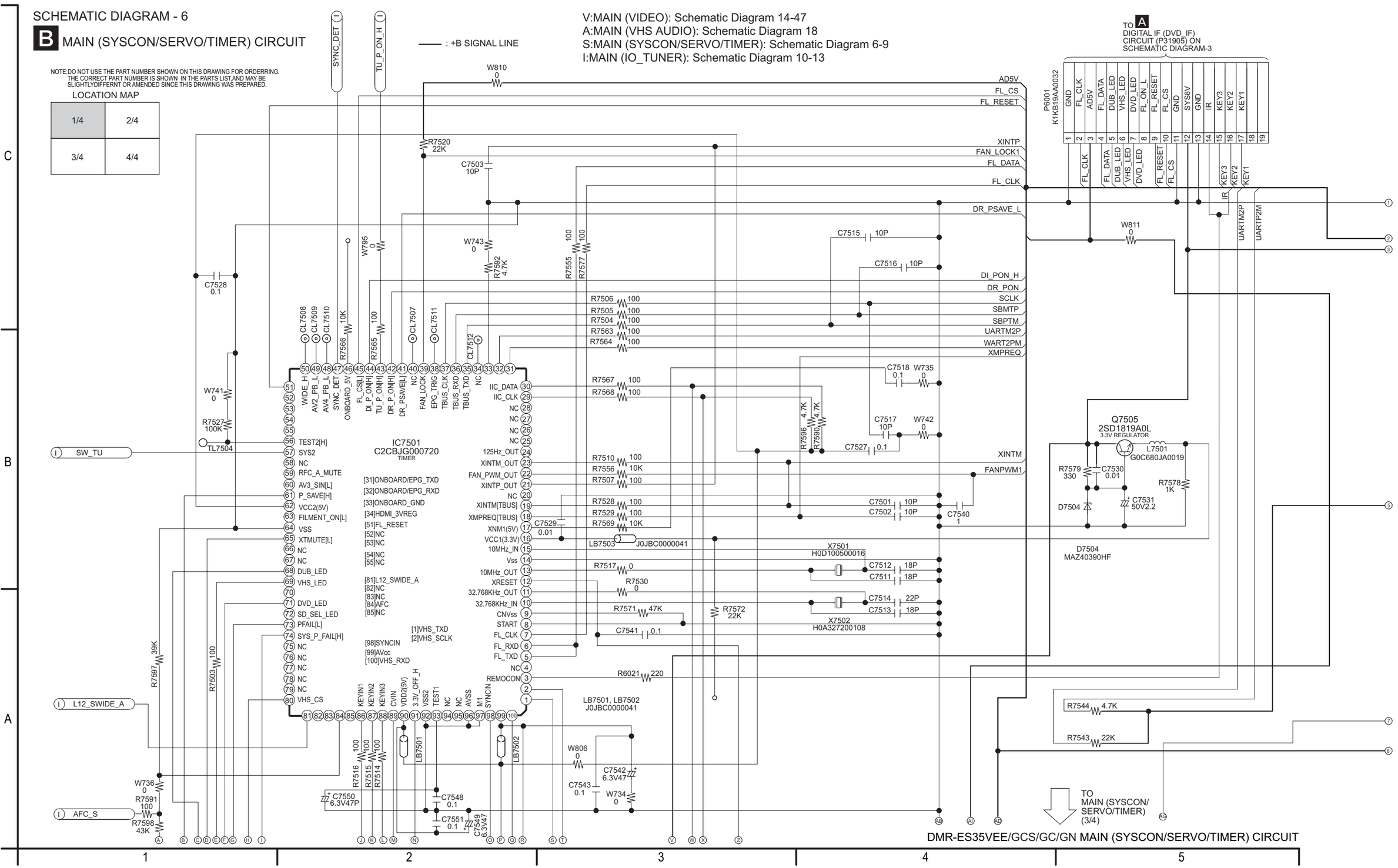
1/4	2/4
3/4	4/4

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

DMR-ES35VEE/GCS/GC/GN DIGITAL IF (DVD_IF) CIRCUIT

6 | 7 | 8 | 9 | 10

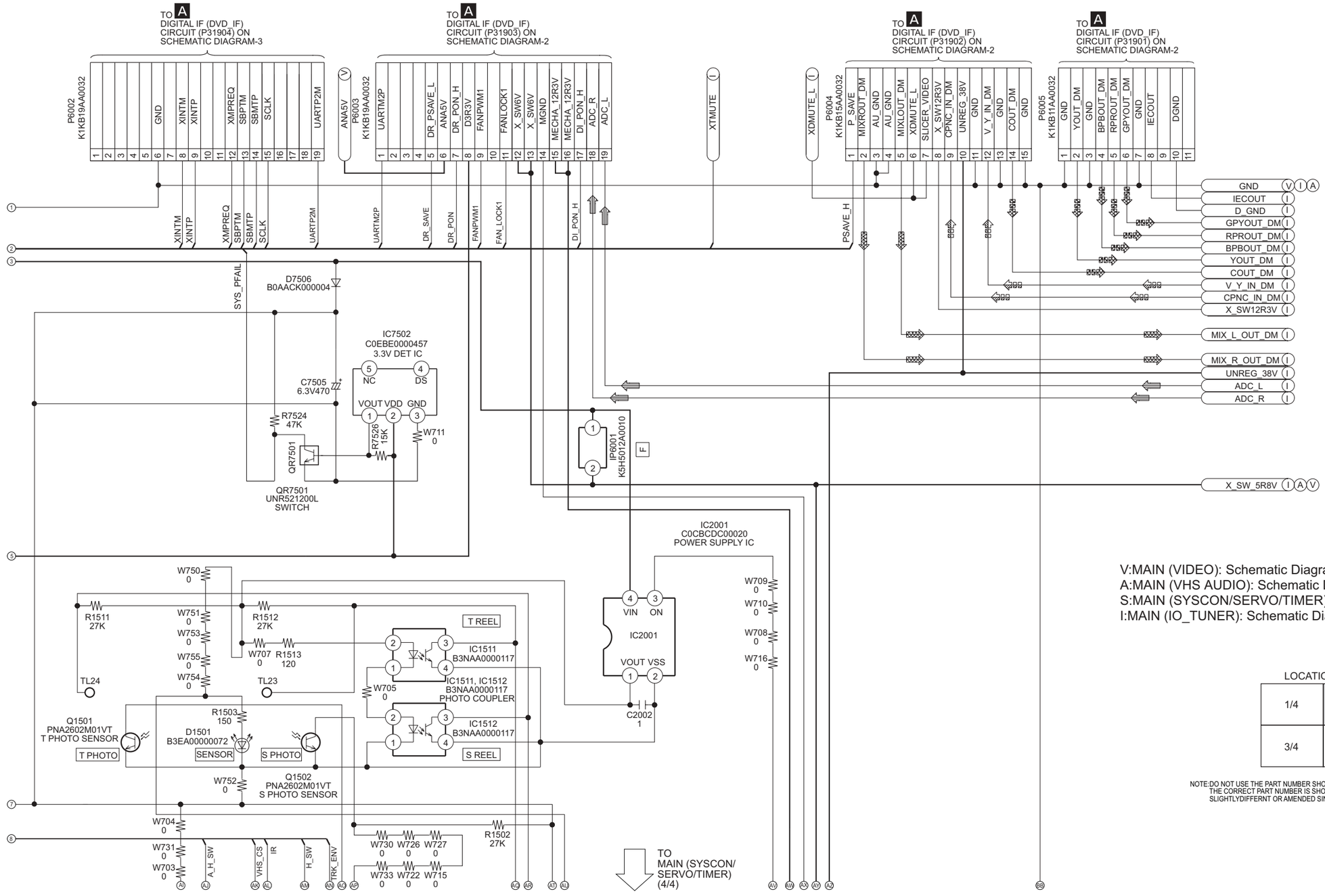
19.2. MAIN CIRCUIT



SCHEMATIC DIAGRAM - 7

B MAIN (SYSCON/SERVO/TIMER) CIRCUIT

: -B SIGNAL LINE
: +B SIGNAL LINE
: DVD PLAYBACK VIDEO SIGNAL LINE
: DVD RECORDING VIDEO SIGNAL LINE
: DVD PLAYBACK AUDIO SIGNAL LINE
: DVD RECORDING AUDIO SIGNAL LINE



V:MAIN (VIDEO): Schematic Diagram 14-47
A:MAIN (VHS AUDIO): Schematic Diagram 18
S:MAIN (SYSCON/SERVO/TIMER): Schematic Diagram 6-9
I:MAIN (IO_TUNER): Schematic Diagram 10-13

LOCATION MAP

1/4	2/4
3/4	4/4

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST AND MAY BE SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

DMR-ES35VEE/GCS/GC/GN MAIN (SYSCON/SERVO/TIMER) CIRCUIT

6 | 7 | 8 | 9 | 10

SCHEMATIC DIAGRAM - 8

B MAIN (SYSCON/SERVO/TIMER) CIRCUIT

——— : -B SIGNAL LINE
——— : +B SIGNAL LINE
: MAIN VIDEO SIGNAL LINE
: MAIN AUDIO SIGNAL LINE

TO MAIN (SYSCON/ SERVO/TIMER) (1/4)

I2CSCK
I2CSDT
PSAVE_H
DUB_LED
XTMUTE
VHS_LED
DVD_LED
PFAIL_L
VHS_CS
SYS_PFAIL
CVIN2
SYNCIN
KEY3
KEY2
KEY1
R6032 100
R6015 100
W812 0
D7501 B0AACK000004
R7511 8.2K
R7512 8.2K
R7513 8.2K
C7519 0.01
C7508 0.01
C7509 0.01
W737 0
W739 0
W740 0
PFAIL
IC6002 C0EBH0000172 RESET IC
SAFETY TAB SW
S1531 K0C111A00006
C6003 0.1
TL6002
TL6004
FM_MUTE_H
BIAS_H
S_TAB[L]
BIAS[H]
PB_XS[H]
MODE SW
S1532 K0ZZ00000598
POS.SW3
POS.SW2
POS.SW1
RESET[L]
32KHz.IN
32KHz.OUT
+5V[D]
12MHz.IN
12MHz.OUT
GND[OSC]
DUB_H
SVHS[H]
32K.START[L]
NUB[GND]
FSC.LPF
OSD.FSC IN
OSD[GND]
CVIN
[28]FM_MUTE
[29]CH_SW
[30]POS.SW4
[51]KILLER
[52]CVOUT
[53]OSD5V
R6201 3.3K
C6019 0.1
W706 0
C6001 18P
X6001
R6002 1K
C6002 22P
X6001 H0D120500009
R6018 1K
C6020 50V0.1
R6031 22K
R6001 1K
C6008 1
C6009 0.01
C6104 0.01
R6016 1K
C6101 10V220
R6118 47K
EE ONLY
C6105 0.01
L6102 G0C1R5JA0019
R6101 1M
R6103 180
R6102 470
C6102 1
C6103 560P
R6017 2.2K
C6015 0.033
C6016 1000P
FOR EE ONLY
R6116 1.5K
C6114 33P
L6014
L6014 G0C330JA0019
Q6106
C6116 0.1
L6105
L6105 G0C680JA0019
W745 0
Q6106 2SB1218A0L SWITCH
R9783 100K
QR9703 UNR521200L SWITCH
PFAIL_L
IC7504 C0EBE0000504 RESET IC
R7519 180
C7521 6.3V100
C7520 0.47
C7504 0.1
R7509 3.3K
W813 0
W738 0
W809 0
W808 0
W807 0
VHS_RXD
VHS_TXD
VHS_CLK
PS6001 K1KB10B00053
CPN_Y_IN2 10
GND 9
CPN_CIN2 8
L2_RIN 7
L2SW 6
L2_LIN 5
KEY2 4
L2_VIN2 3
GND 2
KEY1 1
TO F FRONT JACK CIRCUIT (PP4801) ON SCHEMATIC DIAGRAM-20
C6100 0.1
L2_V_IN
L2_IN_L
L2_DET
L2_IN_R
CPN_C_IN2
CPN_Y_IN2
SLICER_VIDEO
R7585 1K
Q7507
Q7506, Q7507 2SD1819A0L SWITCH
C7558 1
R7581 1K
Q7506
R7580 15K
R7586 3.9K
C7557 1
Q7508
R7594 1.5K
Q7509
Q7508, Q7509 2SB1218A0L AMPLIFIER
C7559 100P
R7584 100K
R7583 100K
C7556 0.1
R7582 5.6K
C7555 0.1
C7554 0.1
C7553 560P
C7552 560P
OSD_VIDEO_IN
A_H_SW
H_SW
TRK_ENV
MESECAMDET_H
L12_SWIDE_B
ART_V_H_N
ABS_NORM_L
BIAS_H
FM_MUTE_H
DREC_H
JC_REC5V
FSC
OSD_V_OUT

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS.ONLY THE SAME TYPE.

V:MAIN (VIDEO): Schematic Diagram 14-47
A:MAIN (VHS AUDIO): Schematic Diagram 18
S:MAIN (SYSCON/SERVO/TIMER): Schematic Diagram 6-9
I:MAIN (IO_TUNER): Schematic Diagram 10-13

LOCATION MAP

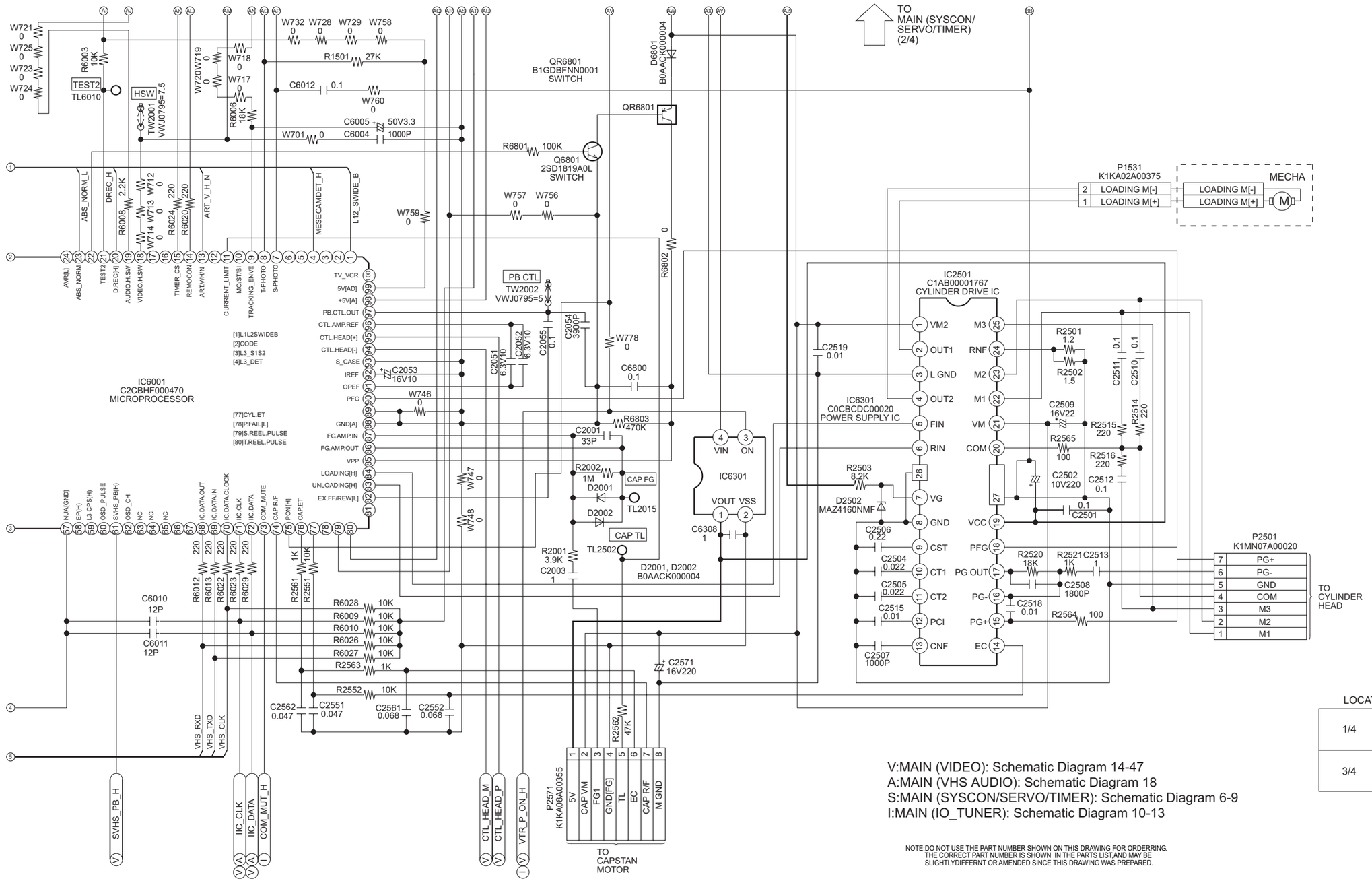
1/4	2/4
3/4	4/4

DMR-ES35VEE/GCS/GC/GN MAIN (SYSCON/SERVO/TIMER) CIRCUIT

SCHEMATIC DIAGRAM - 9

B MAIN (SYSCON/SERVO/TIMER) CIRCUIT

—— : +B SIGNAL LINE



LOCATION MAP

1/4	2/4
3/4	4/4

V:MAIN (VIDEO): Schematic Diagram 14-47
A:MAIN (VHS AUDIO): Schematic Diagram 18
S:MAIN (SYSCON/SERVO/TIMER): Schematic Diagram 6-9
I:MAIN (IO_TUNER): Schematic Diagram 10-13

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

DMR-ES35VEE/GCS/GC/GN MAIN (SYSCON/SERVO/TIMER) CIRCUIT

6 | 7 | 8 | 9 | 10

SCHEMATIC DIAGRAM - 10

B MAIN (IO_TUNER) CIRCUIT

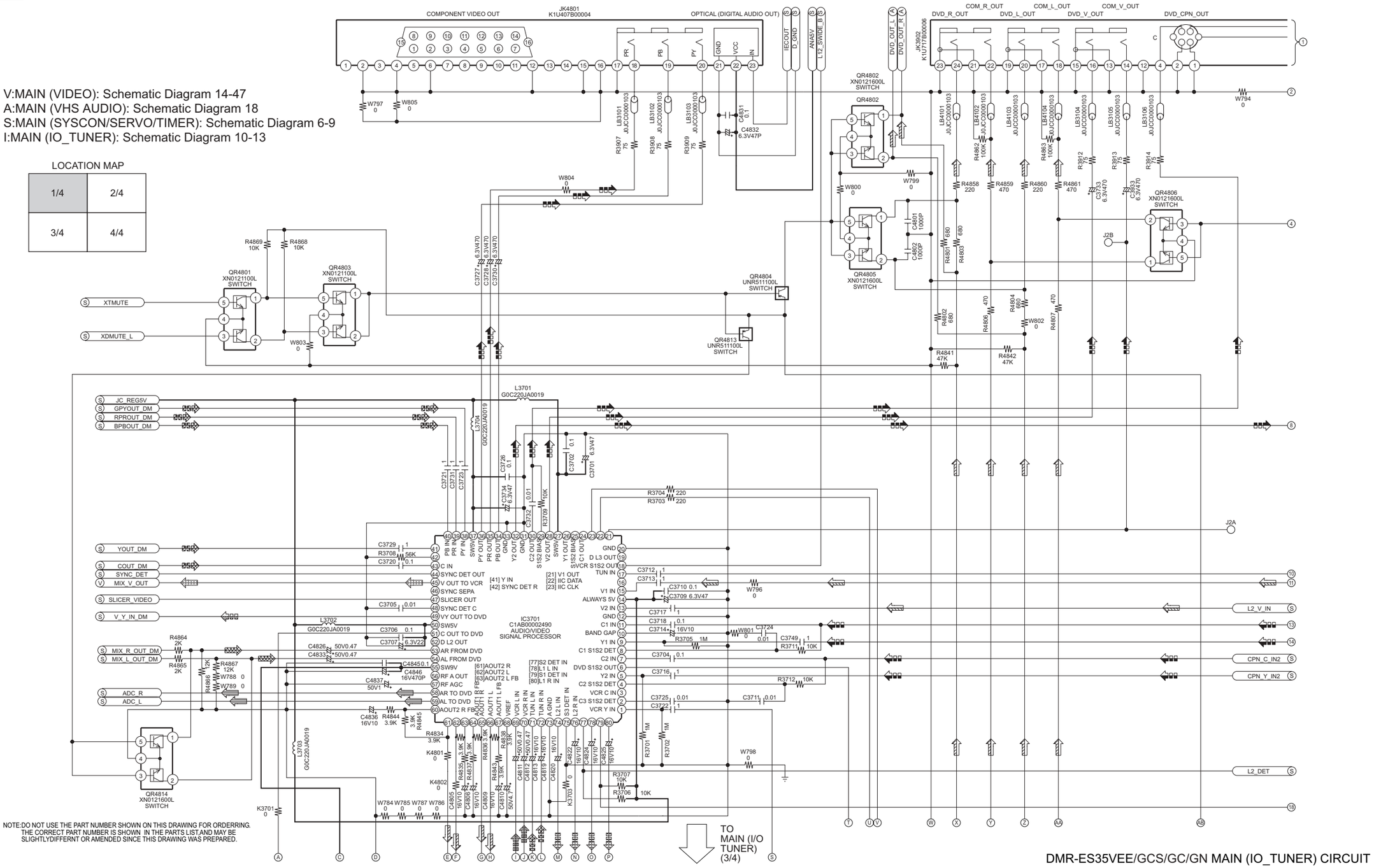
—— : -B SIGNAL LINE : DVD PLAYBACK VIDEO SIGNAL LINE : DVD PLAYBACK AUDIO SIGNAL LINE : MAIN VIDEO SIGNAL LINE : VCR PLAYBACK VIDEO SIGNAL LINE : VCR PLAYBACK AUDIO SIGNAL LINE : TV TUNER AUDIO SIGNAL LINE

—— : +B SIGNAL LINE : DVD RECORDING VIDEO SIGNAL LINE : DVD RECORDING AUDIO SIGNAL LINE : MAIN AUDIO SIGNAL LINE : VCR RECORDING VIDEO SIGNAL LINE : VCR RECORDING AUDIO SIGNAL LINE : NICAM AUDIO SIGNAL LINE

V:MAIN (VIDEO): Schematic Diagram 14-47
A:MAIN (VHS AUDIO): Schematic Diagram 18
S:MAIN (SYSCON/SERVO/TIMER): Schematic Diagram 6-9
I:MAIN (IO_TUNER): Schematic Diagram 10-13

LOCATION MAP

1/4	2/4
3/4	4/4



NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

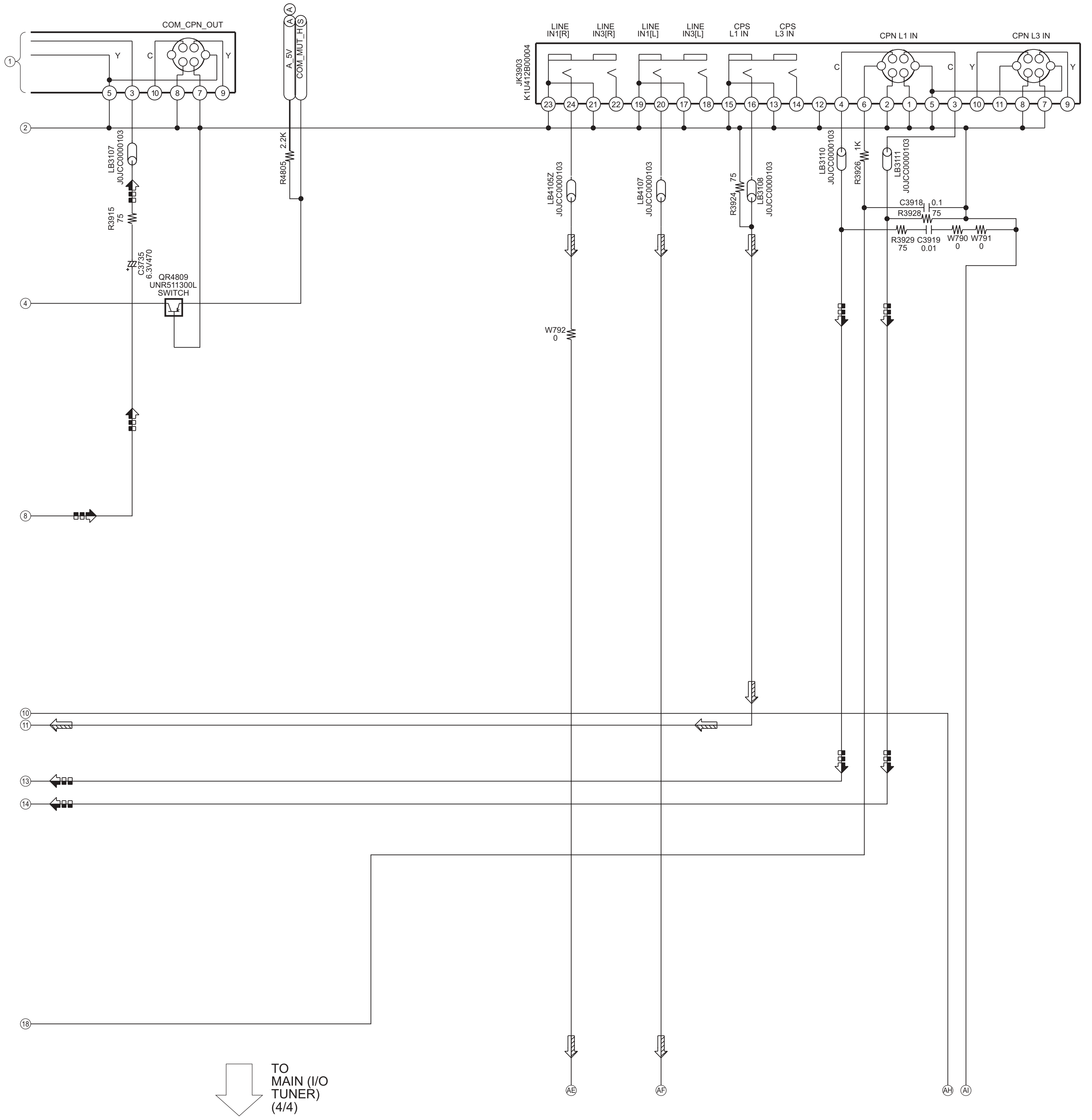
DMR-ES35VEE/GCS/GC/GN MAIN (IO_TUNER) CIRCUIT

SCHEMATIC DIAGRAM - 11

B MAIN (IO_TUNER) CIRCUIT

: -B SIGNAL LINE : DVD PLAYBACK VIDEO SIGNAL LINE : DVD PLAYBACK AUDIO SIGNAL LINE : MAIN VIDEO SIGNAL LINE : VCR PLAYBACK VIDEO SIGNAL LINE : VCR PLAYBACK AUDIO SIGNAL LINE : TV TUNER AUDIO SIGNAL LINE

: +B SIGNAL LINE : DVD RECORDING VIDEO SIGNAL LINE : DVD RECORDING AUDIO SIGNAL LINE : MAIN AUDIO SIGNAL LINE : VCR RECORDING VIDEO SIGNAL LINE : VCR RECORDING AUDIO SIGNAL LINE : NICAM AUDIO SIGNAL LINE



LOCATION MAP

1/4	2/4
3/4	4/4

V:MAIN (VIDEO): Schematic Diagram 14-47
A:MAIN (VHS AUDIO): Schematic Diagram 18
S:MAIN (SYSCON/SERVO/TIMER): Schematic Diagram 6-9
I:MAIN (IO_TUNER): Schematic Diagram 10-13

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

DMR-ES35VEE/GCS/GC/GN MAIN (IO_TUNER) CIRCUIT

6 7 8 9 10

SCHEMATIC DIAGRAM - 12

B MAIN (IO_TUNER) CIRCUIT

——— : -B SIGNAL LINE ——— : +B SIGNAL LINE

: DVD PLAYBACK VIDEO SIGNAL LINE : DVD RECORDING VIDEO SIGNAL LINE

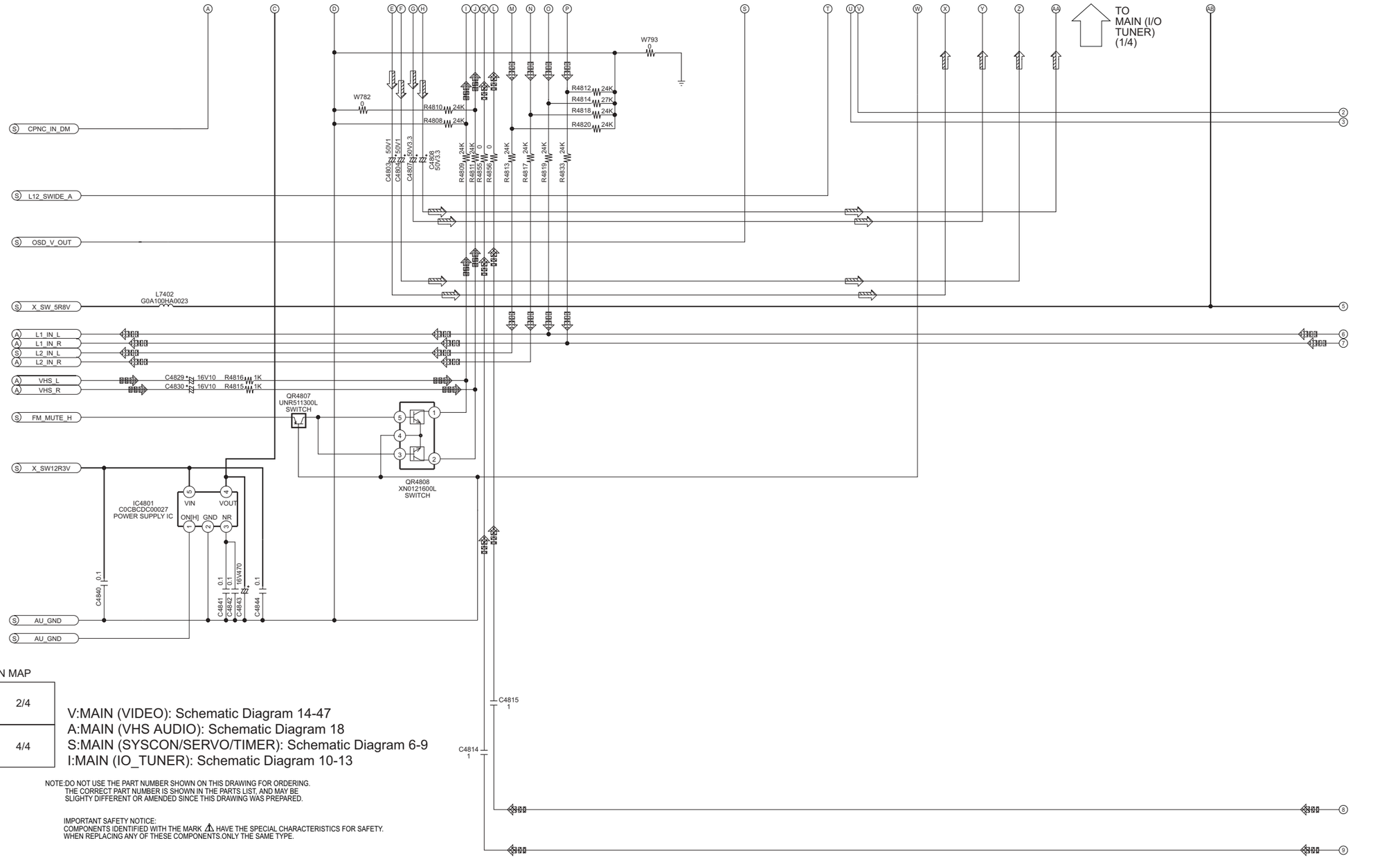
: DVD PLAYBACK AUDIO SIGNAL LINE : DVD RECORDING AUDIO SIGNAL LINE

: MAIN VIDEO SIGNAL LINE : MAIN AUDIO SIGNAL LINE

: VCR PLAYBACK VIDEO SIGNAL LINE : VCR RECORDING VIDEO SIGNAL LINE

: VCR PLAYBACK AUDIO SIGNAL LINE : VCR RECORDING AUDIO SIGNAL LINE

: TV TUNER AUDIO SIGNAL LINE : NICAM AUDIO SIGNAL LINE



LOCATION MAP

1/4	2/4
3/4	4/4

V:MAIN (VIDEO): Schematic Diagram 14-47
A:MAIN (VHS AUDIO): Schematic Diagram 18
S:MAIN (SYSCON/SERVO/TIMER): Schematic Diagram 6-9
I:MAIN (IO_TUNER): Schematic Diagram 10-13

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST, AND MAY BE SLIGHTY DIFFERENT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

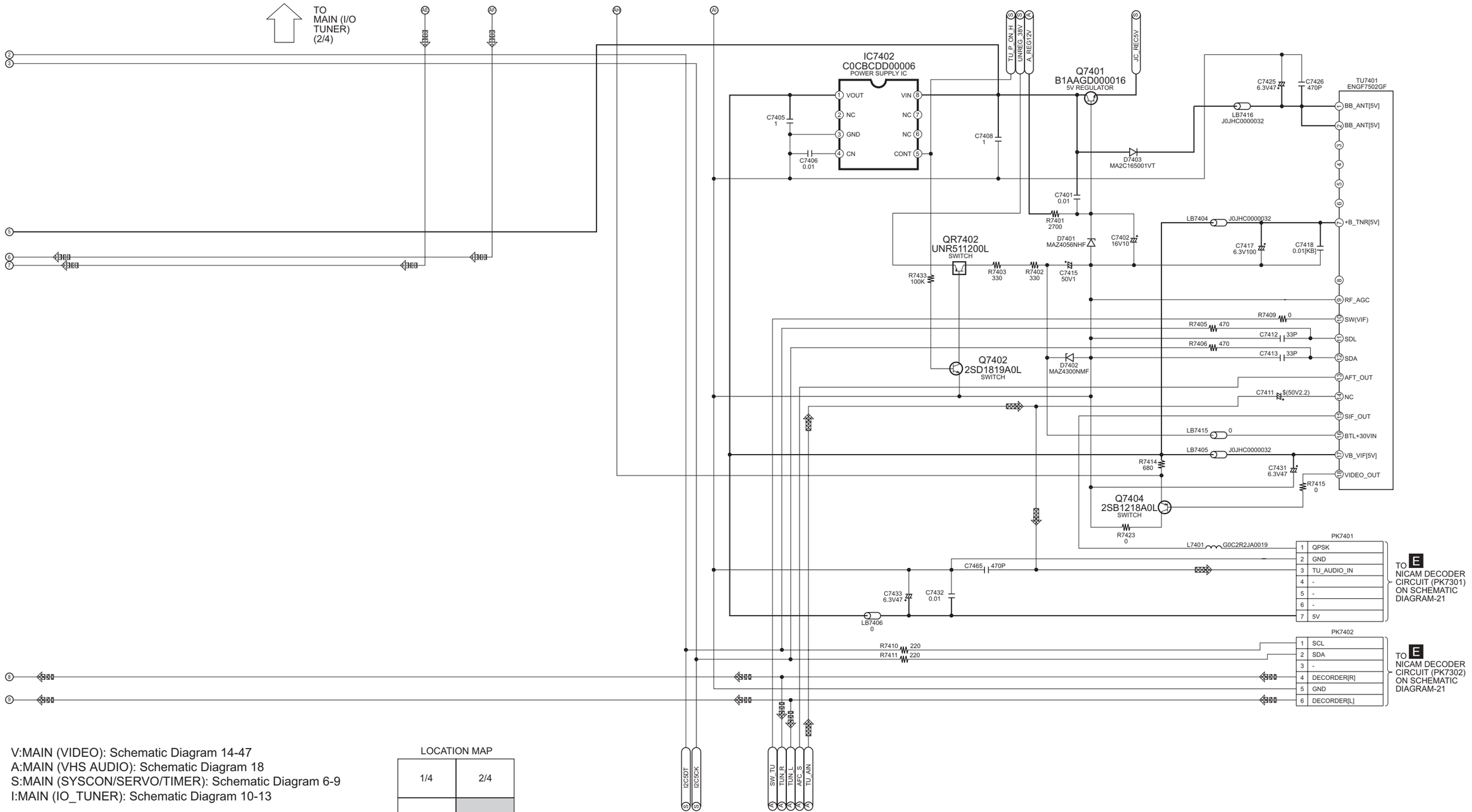
IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY. WHEN REPLACING ANY OF THESE COMPONENTS.ONLY THE SAME TYPE.

DMR-ES35VEE/GCS/GC/GN MAIN (IO_TUNER) CIRCUIT

SCHEMATIC DIAGRAM - 13

B MAIN (IO_TUNER) CIRCUIT

: -B SIGNAL LINE : +B SIGNAL LINE : DVD PLAYBACK VIDEO SIGNAL LINE : DVD RECORDING VIDEO SIGNAL LINE : DVD PLAYBACK AUDIO SIGNAL LINE : DVD RECORDING AUDIO SIGNAL LINE : MAIN VIDEO SIGNAL LINE : MAIN AUDIO SIGNAL LINE : VCR PLAYBACK VIDEO SIGNAL LINE : VCR RECORDING VIDEO SIGNAL LINE : VCR PLAYBACK AUDIO SIGNAL LINE : VCR RECORDING AUDIO SIGNAL LINE : TV TUNER AUDIO SIGNAL LINE : NICAM AUDIO SIGNAL LINE



V:MAIN (VIDEO): Schematic Diagram 14-47
A:MAIN (VHS AUDIO): Schematic Diagram 18
S:MAIN (SYSCON/SERVO/TIMER): Schematic Diagram 6-9
I:MAIN (IO_TUNER): Schematic Diagram 10-13

LOCATION MAP

1/4	2/4
3/4	4/4

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

DMR-ES35VEE/GCS/GC/GN MAIN (IO_TUNER) CIRCUIT

6 7 8 9 10

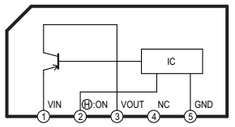
SCHEMATIC DIAGRAM - 14

B MAIN (VIDEO) CIRCUIT —— : +B SIGNAL LINE

V:MAIN (VIDEO): Schematic Diagram 14-47
A:MAIN (VHS AUDIO): Schematic Diagram 18
S:MAIN (SYSCON/SERVO/TIMER): Schematic Diagram 6-9
I:MAIN (IO_TUNER): Schematic Diagram 10-13

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

IC3002
JC +5V SWITCHING REG.
IC-DETAIL BLOCK DIAGRAM



S X_SW_5R8V
S BIAS_H
S GND
S JC_REG5V
S VIR_P_ON_H

IC3002
C0CBCDG00006
+5V SWITCHING REG

D3001 B0AACK000004
R3006 1K
R3005 2.7K
R3010 6.8K
C3042 6.3V47
C3051 1
C3043 1
C3052 6.3V47P

Q4082 2SD0602ARL SWITCH
Q4081 2SD1992A0A SWITCH
T4081 G2A472C00003
C4082 470P
R4081 10K
R4082 3.3K
C4086 0.033
C4081 0.022
C4084 1800P
Q4084 2SB0710A0L SWITCH
L4081 G0C221KA0065
R4086 2.2K
R4087 2.2K
R4083 0
C4083 6.3V47
QR4082 UNR521300L SWTICH
W702 0

LOCATION MAP

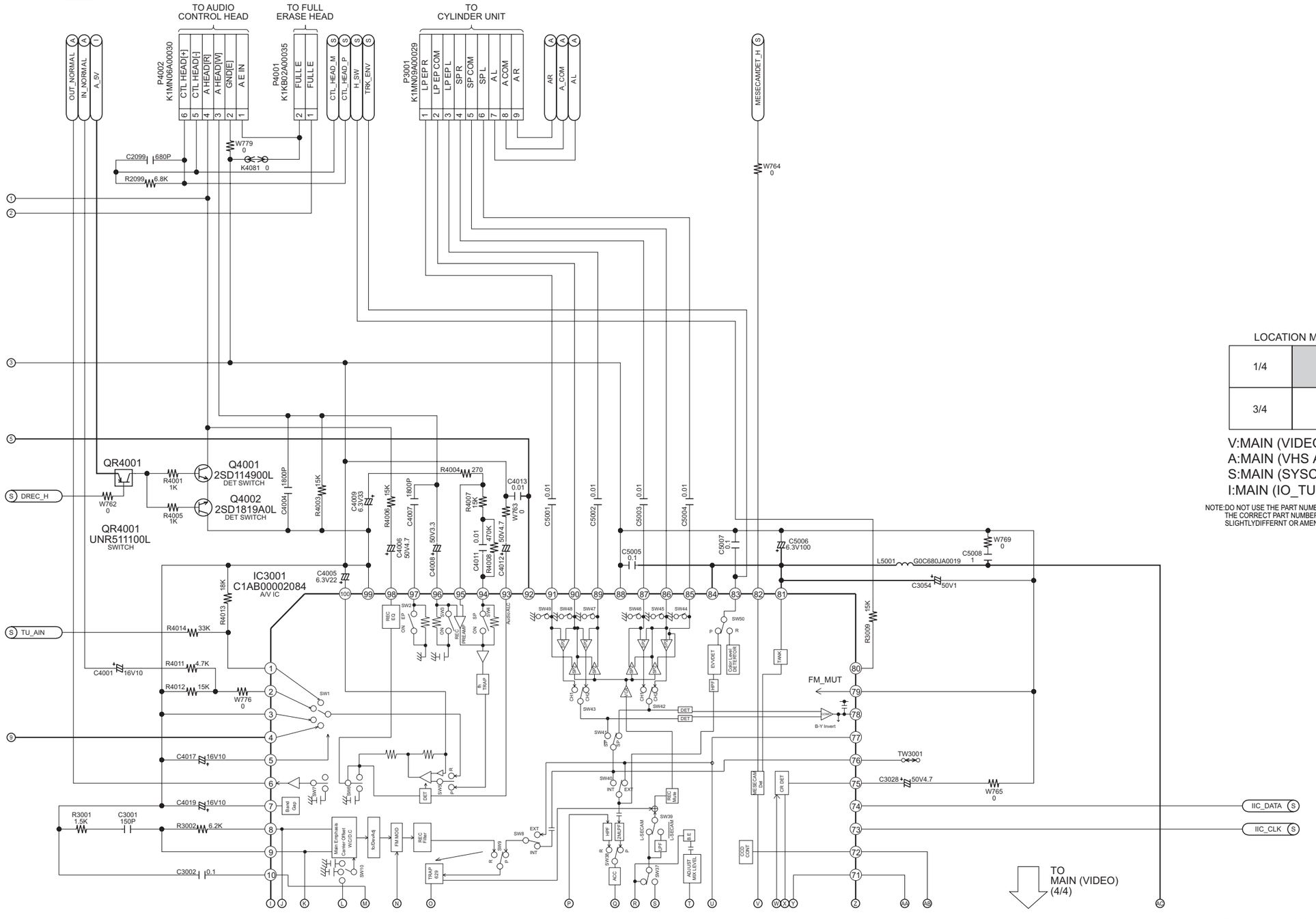
1/4	2/4
3/4	4/4

TO
MAIN (VIDEO)
(3/4)

DMR-ES35VEE/GCS/GC/GN MAIN (VIDEO) CIRCUIT

SCHEMATIC DIAGRAM - 15

B MAIN (VIDEO) CIRCUIT —— : +B SIGNAL LINE



LOCATION MAP

1/4	2/4
3/4	4/4

V:MAIN (VIDEO): Schematic Diagram 14-47
A:MAIN (VHS AUDIO): Schematic Diagram 18
S:MAIN (SYSCON/SERVO/TIMER): Schematic Diagram 6-9
I:MAIN (IO_TUNER): Schematic Diagram 10-13

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

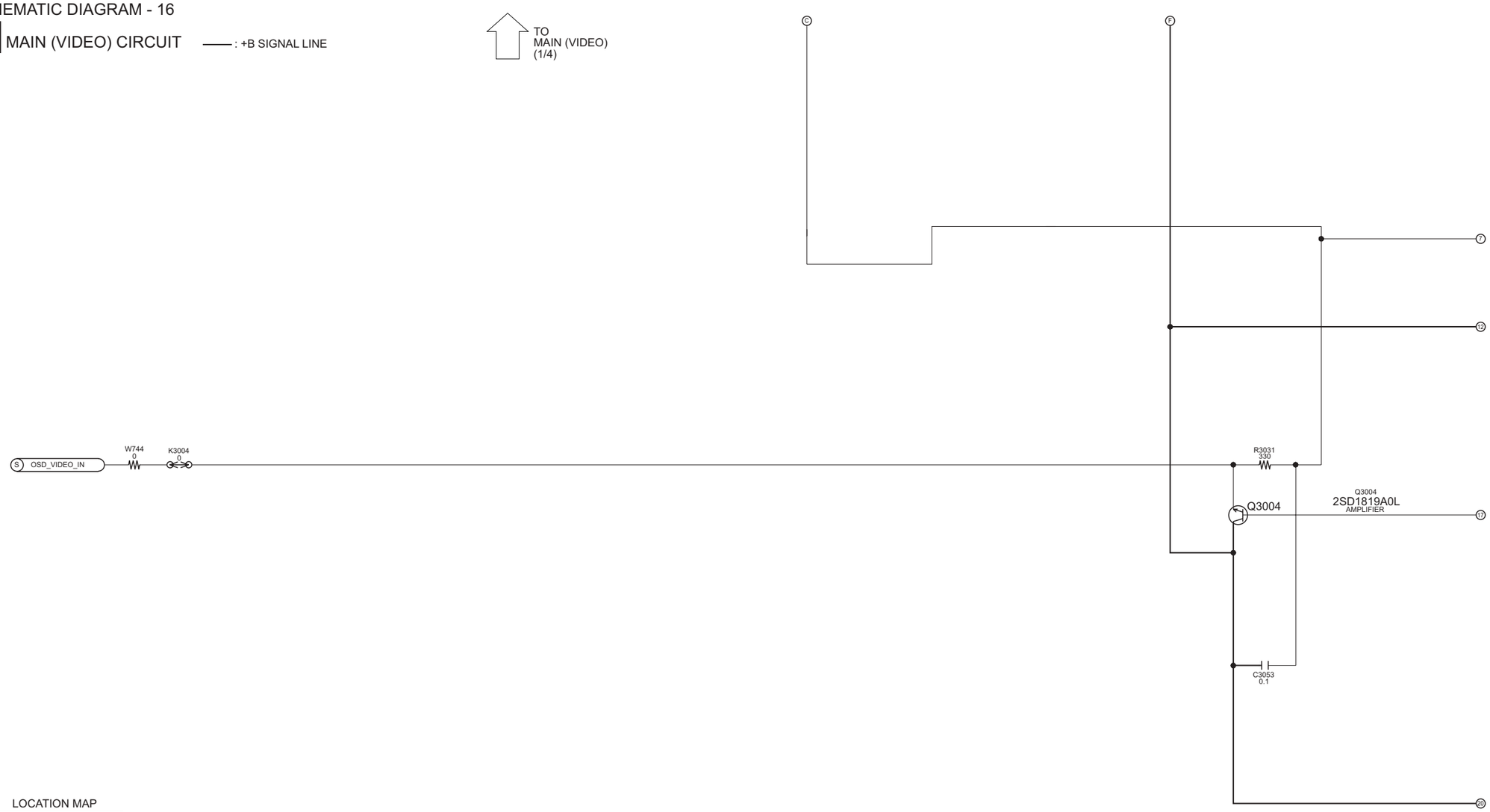
DMR-ES35VEE/GCS/GC/GN MAIN (VIDEO) CIRCUIT

6 | 7 | 8 | 9 | 10

SCHEMATIC DIAGRAM - 16

B MAIN (VIDEO) CIRCUIT —— : +B SIGNAL LINE

TO
MAIN (VIDEO)
(1/4)



LOCATION MAP

1/4	2/4
3/4	4/4

V:MAIN (VIDEO): Schematic Diagram 14-47
A:MAIN (VHS AUDIO): Schematic Diagram 18
S:MAIN (SYSCON/SERVO/TIMER): Schematic Diagram 6-9
I:MAIN (IO_TUNER): Schematic Diagram 10-13

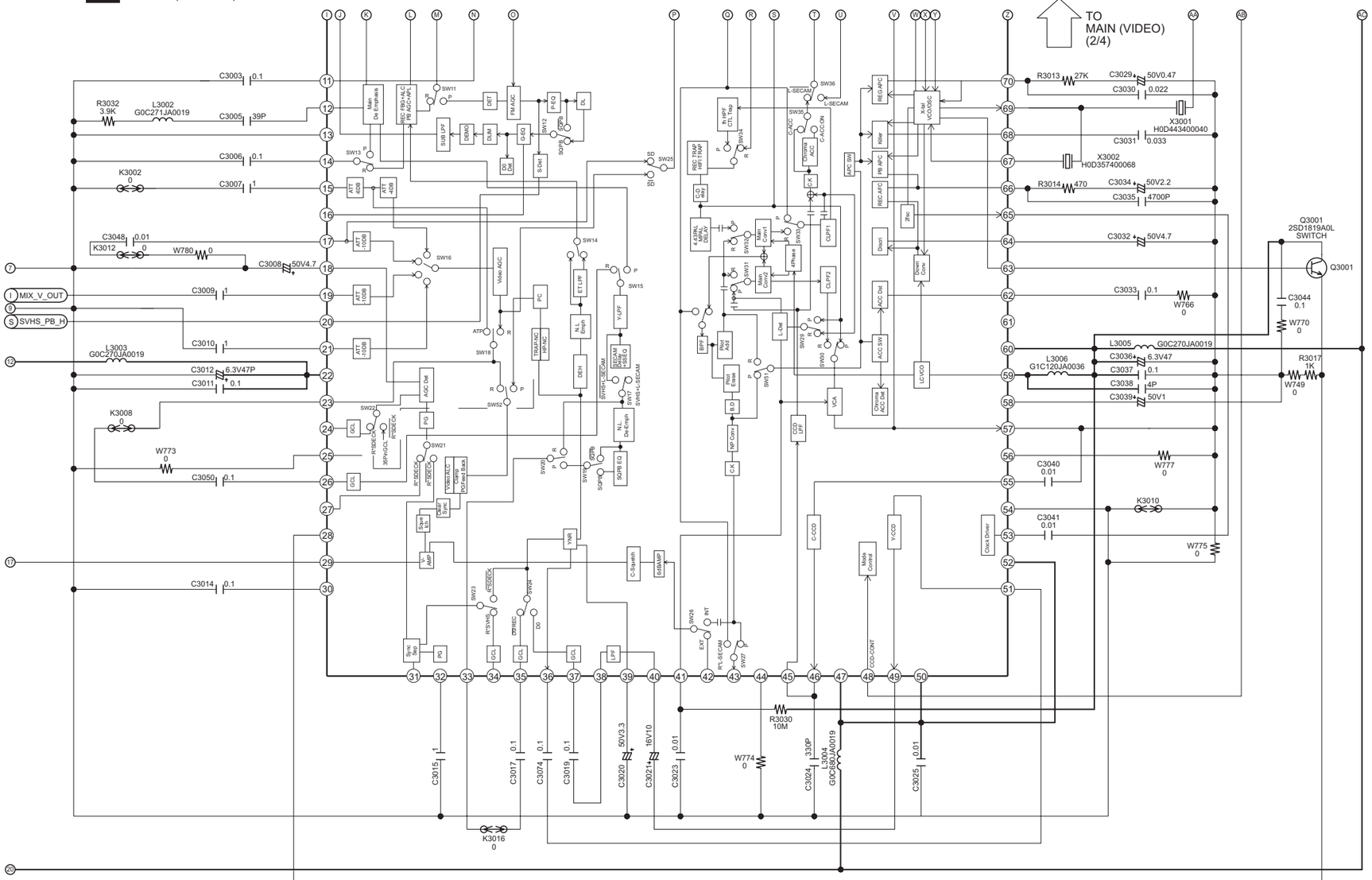
NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

DMR-ES35VEE/GCS/GC/GN MAIN (VIDEO) CIRCUIT

SCHEMATIC DIAGRAM - 17

B MAIN (VIDEO) CIRCUIT

—— : +B SIGNAL LINE



LOCATION MAP

1/4	2/4
3/4	4/4

V:MAIN (VIDEO): Schematic Diagram 14-47
A:MAIN (VHS AUDIO): Schematic Diagram 18
S:MAIN (SYSCON/SERVO/TIMER): Schematic Diagram 6-9
I:MAIN (IO_TUNER): Schematic Diagram 10-13

NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING. THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE SLIGHTLYDIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

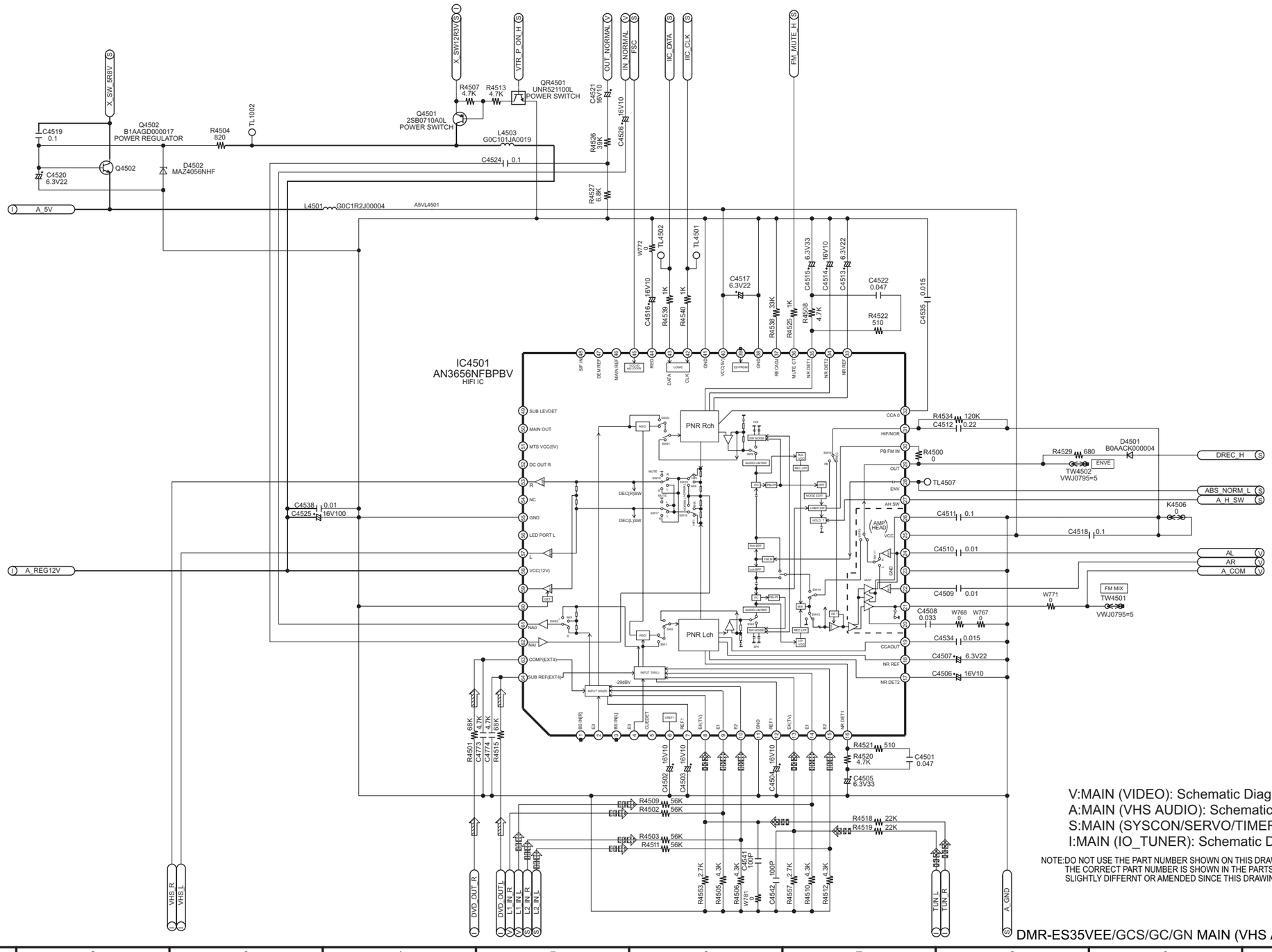
DMR-ES35VEE/GCS/GC/GN MAIN (VIDEO) CIRCUIT

6 | 7 | 8 | 9 | 10

SCHEMATIC DIAGRAM - 18

B MAIN (VHS AUDIO) CIRCUIT

—— : -B SIGNAL LINE ——— : +B SIGNAL LINE : VCR PLAYBACK AUDIO SIGNAL LINE : VCR RECORDING AUDIO SIGNAL LINE : TV TUNER AUDIO SIGNAL LINE : NICAM AUDIO SIGNAL LINE : MAIN AUDIO SIGNAL LINE



V:MAIN (VIDEO): Schematic Diagram 14-47
A:MAIN (VHS AUDIO): Schematic Diagram 18
S:MAIN (SYSCON/SERVO/TIMER): Schematic Diagram 6-9
I:MAIN (IO_TUNER): Schematic Diagram 10-13

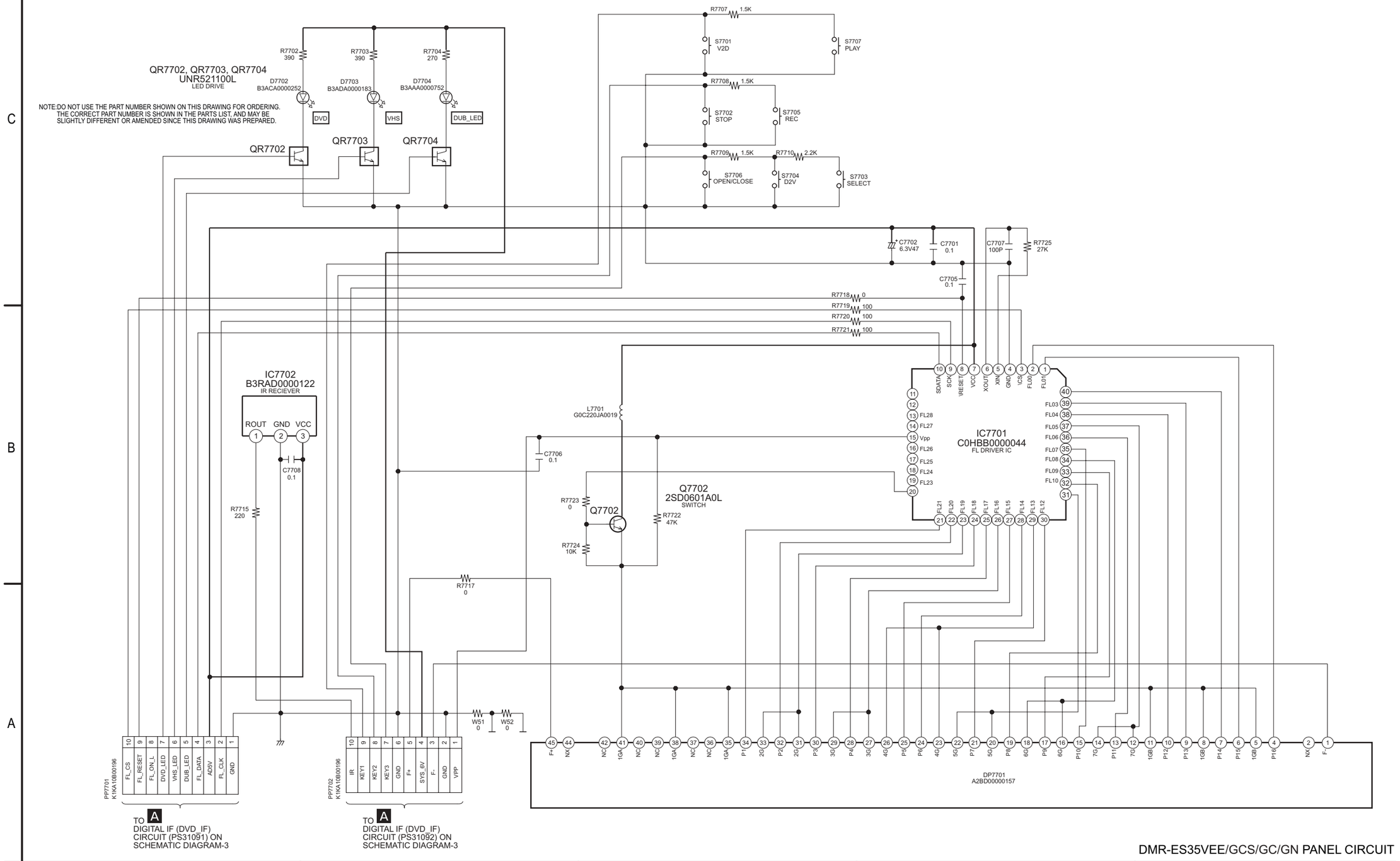
NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
SLIGHTLY DIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

DMR-ES35VEE/GCS/GC/GN MAIN (VHS AUDIO) CIRCUIT

19.3. PANEL CIRCUIT

SCHEMATIC DIAGRAM - 19

C PANEL CIRCUIT —— : +B SIGNAL LINE



DMR-ES35VEE/GCS/GC/GN PANEL CIRCUIT

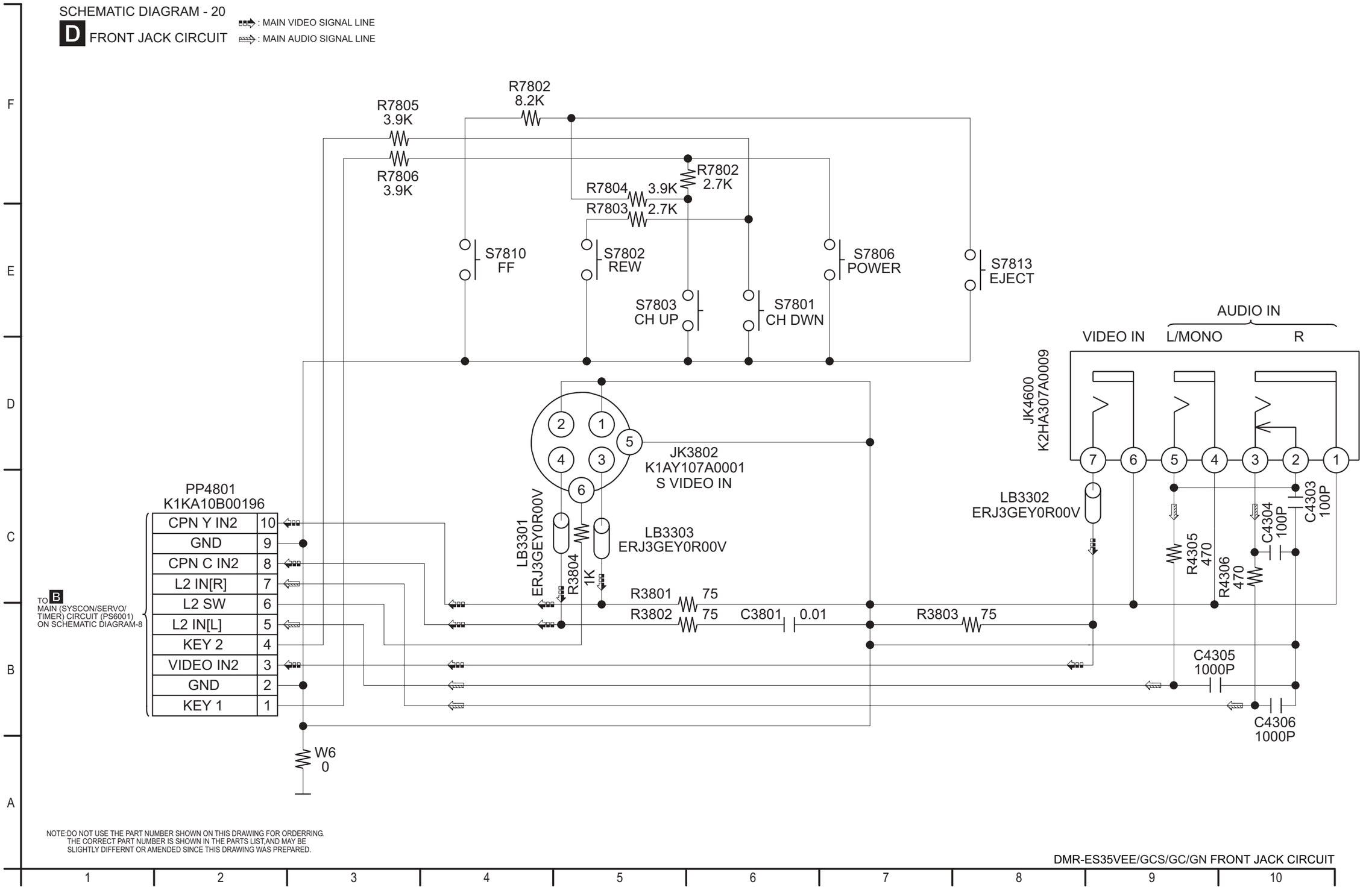
19.4. FRONT JACK CIRCUIT

SCHEMATIC DIAGRAM - 20

D FRONT JACK CIRCUIT

: MAIN VIDEO SIGNAL LINE

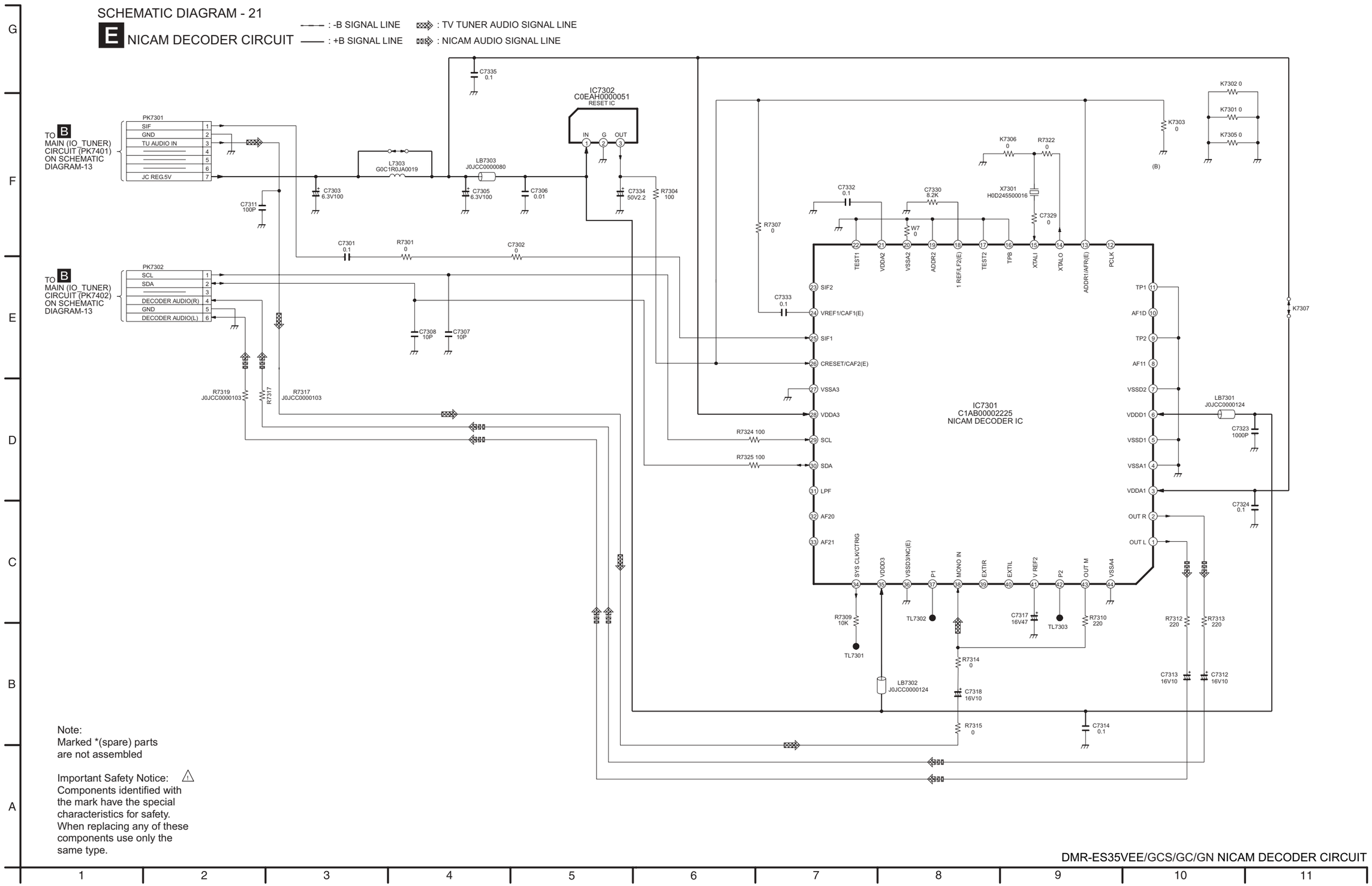
: MAIN AUDIO SIGNAL LINE



NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
SLIGHTLY DIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

DMR-ES35VEE/GCS/GC/GN FRONT JACK CIRCUIT

19.5. NICAM DECODER CIRCUIT



Note:
Marked *(spare) parts are not assembled

Important Safety Notice: ⚠
Components identified with the mark have the special characteristics for safety. When replacing any of these components use only the same type.

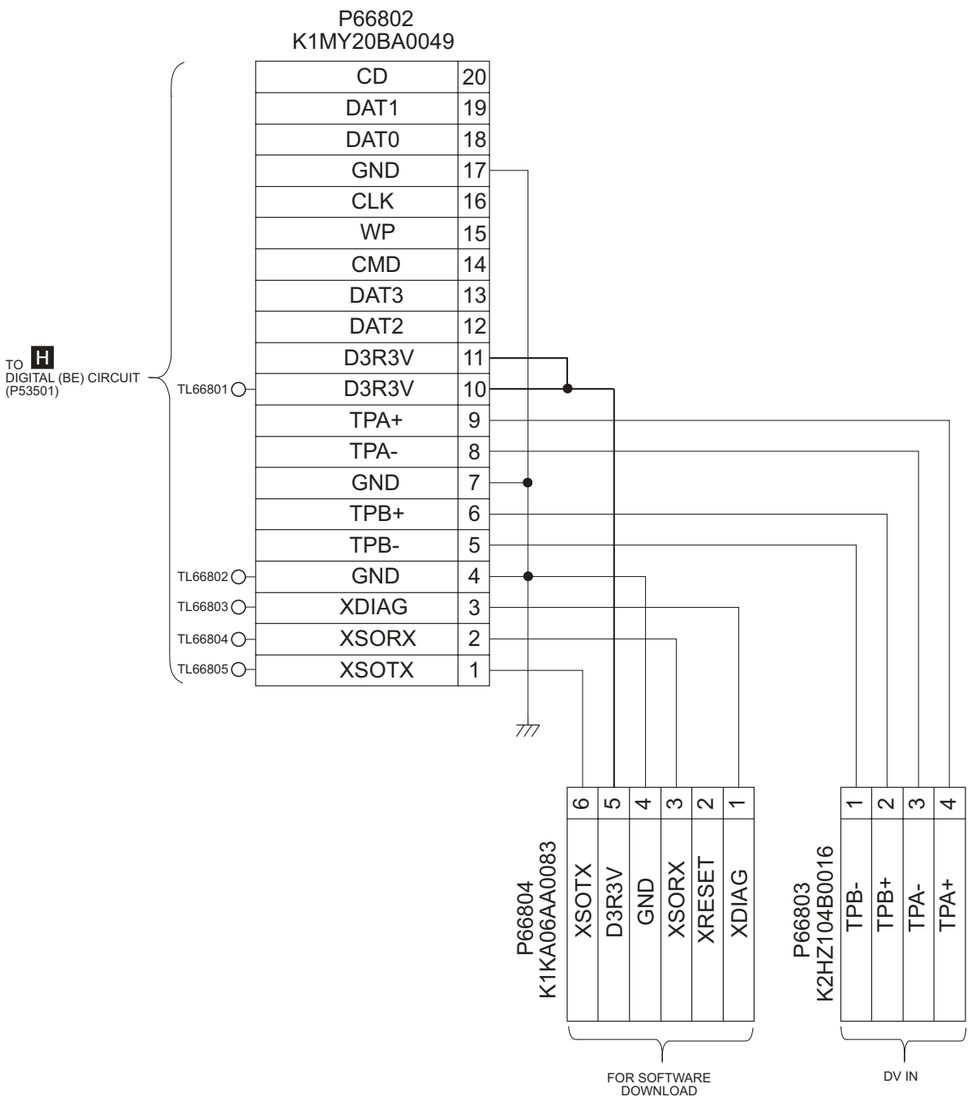
DMR-ES35VEE/GCS/GC/GN NICAM DECODER CIRCUIT

19.6. DV JACK CIRCUIT

SCHEMATIC DIAGRAM - 22

F DV JACK CIRCUIT

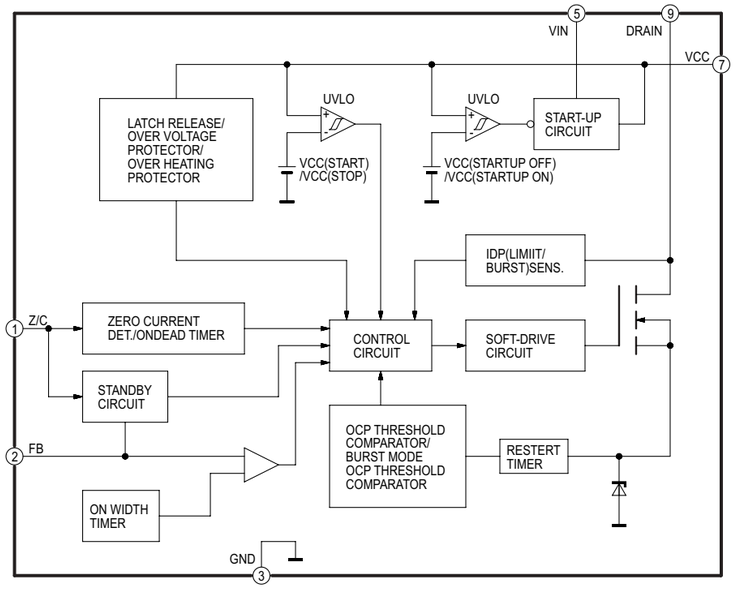
——: +B SIGNAL LINE



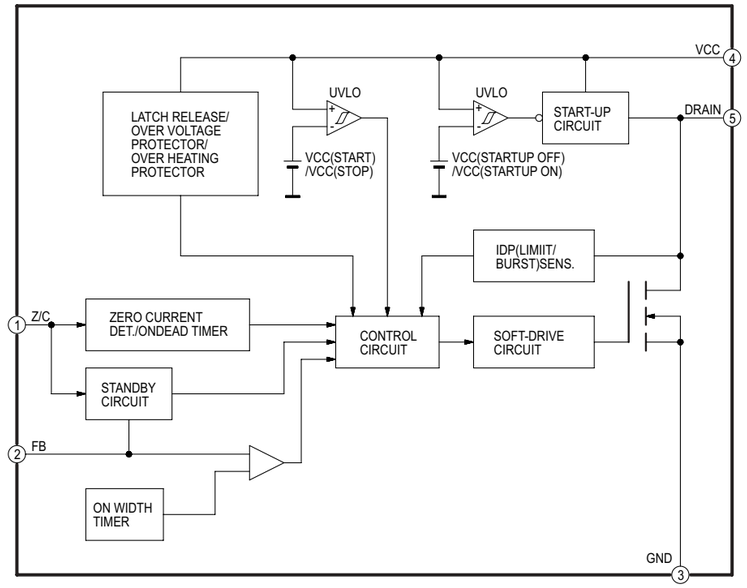
NOTE:DO NOT USE THE PART NUMBER SHOWN ON THIS DRAWING FOR ORDERRING.
THE CORRECT PART NUMBER IS SHOWN IN THE PARTS LIST,AND MAY BE
SLIGHTLY DIFFERNT OR AMENDED SINCE THIS DRAWING WAS PREPARED.

DMR-ES35VEE/GCS/GC/GN DV JACK CIRCUIT

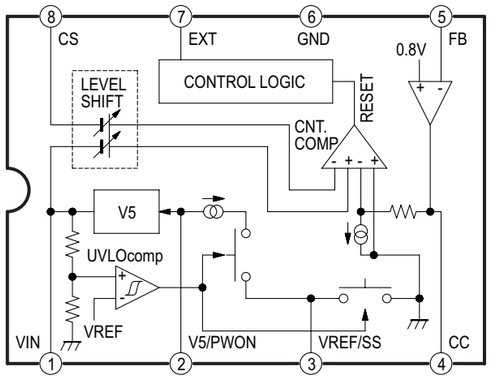
IC11201
SWITCHING IC
IC-DETAIL BLOCK DIAGRAM



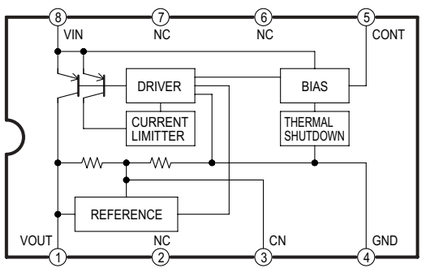
IC11301
SWITCHING IC
IC-DETAIL BLOCK DIAGRAM



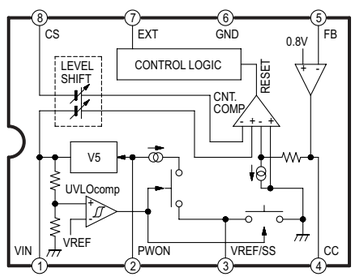
IC11601
DR +5V SWITCHING REGULATOR
IC-DETAIL BLOCK DIAGRAM



IC11720
F+ SWITCHING REGULATOR
IC-DETAIL BLOCK DIAGRAM

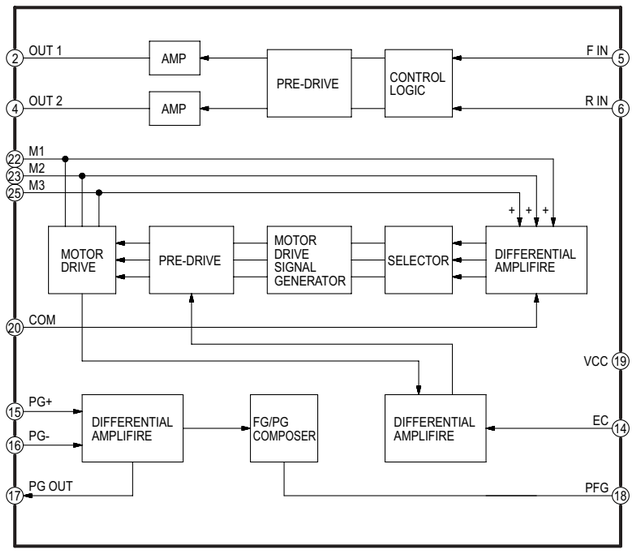


IC11801
D +3.8V SWITCHING REGULATOR
IC-DETAIL BLOCK DIAGRAM

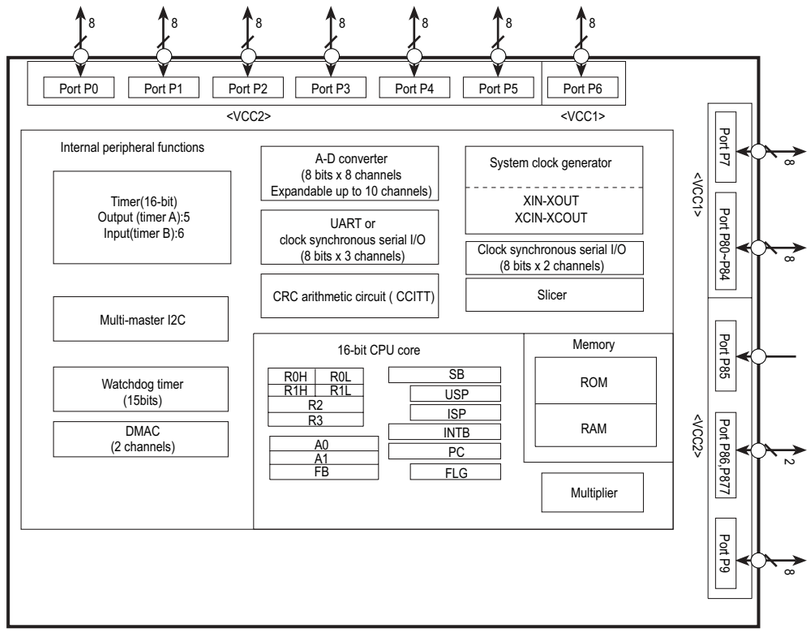


IC11201 Detail Block Diagram
IC11301 Detail Block Diagram
IC11601 Detail Block Diagram
IC11720 Detail Block Diagram
IC11801 Detail Block Diagram
DMR-ES35VEE/GCS/GN/GC IC-Detail Block Diagram

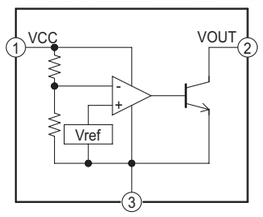
IC2501
LOADING/CYLINDER MOTOR DRIVE
IC-DETAIL BLOCK DIAGRAM



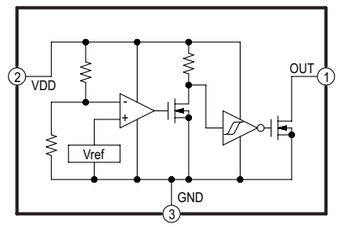
IC7501
MICRO PROCESSOR
IC-DETAIL BLOCK DIAGRAM



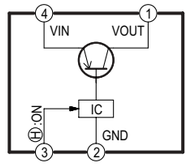
IC6002
RESET
IC-DETAIL BLOCK DIAGRAM



IC7504
RESET
IC-DETAIL BLOCK DIAGRAM

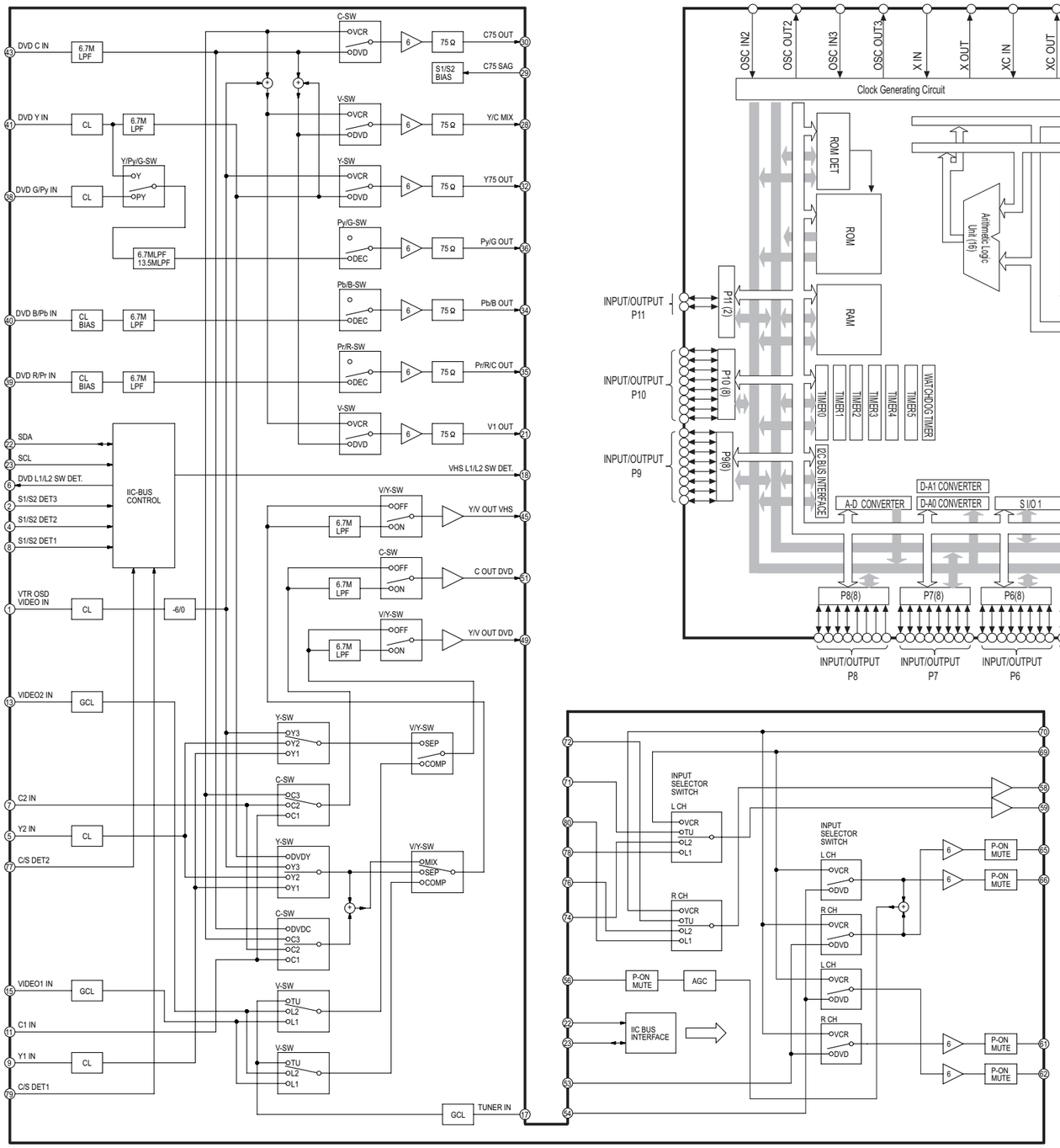


IC2001,6301
+5V SWITCHING REG.
IC-DETAIL BLOCK DIAGRAM

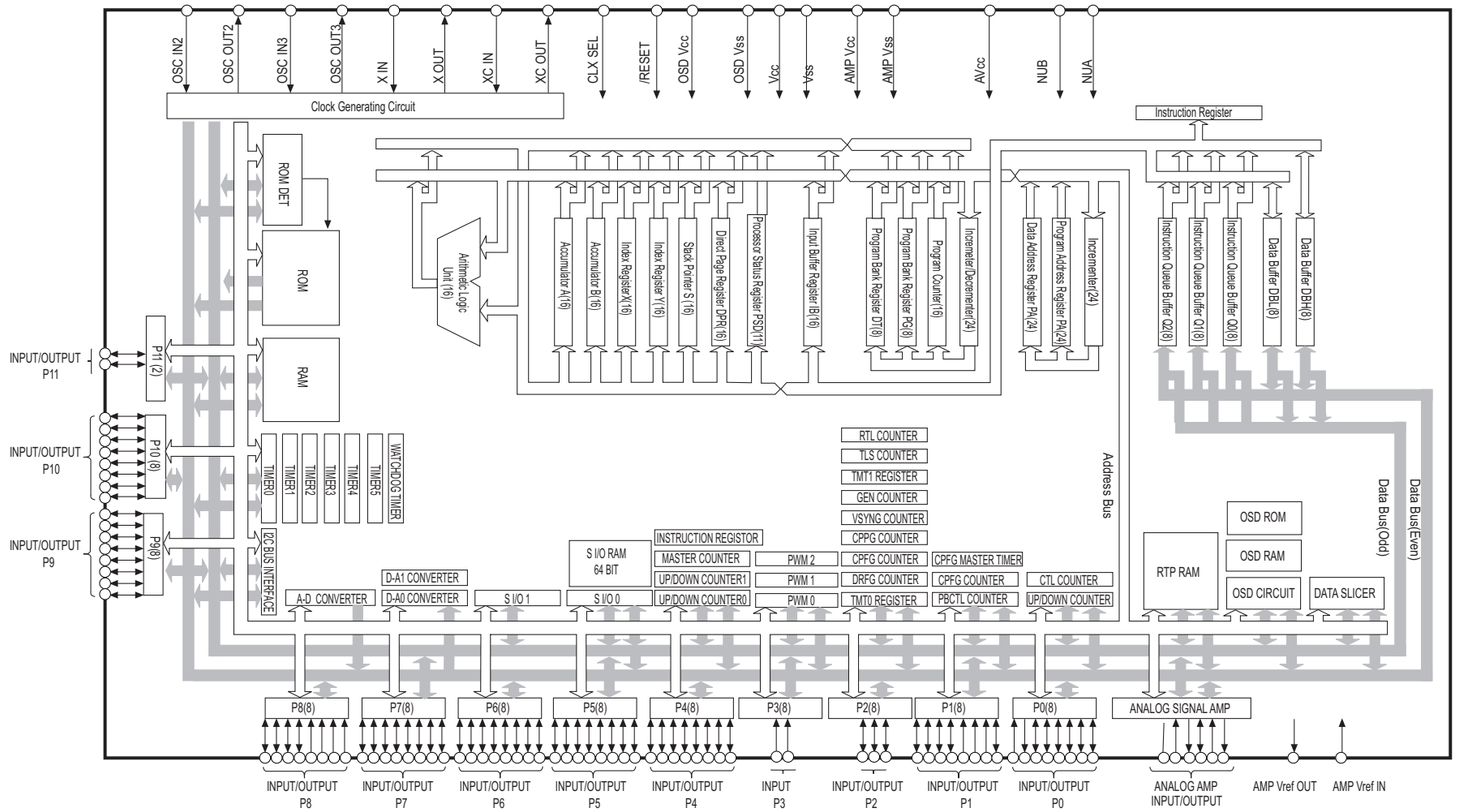


IC2001 Detail Block Diagram
IC2501 Detail Block Diagram
IC6002 Detail Block Diagram
IC6301 Detail Block Diagram
IC7501 Detail Block Diagram
IC7504 Detail Block Diagram
DMR-ES35VEE/GCS/GN/GC IC-Detail Block Diagram

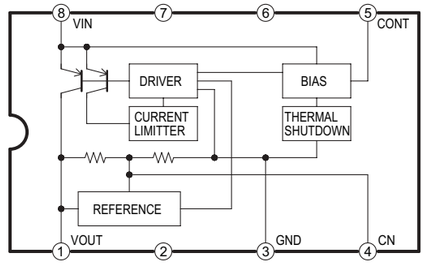
IC3701
VIDEO/AUDIO PROCESSOR
IC-DETAIL BLOCK DIAGRAM



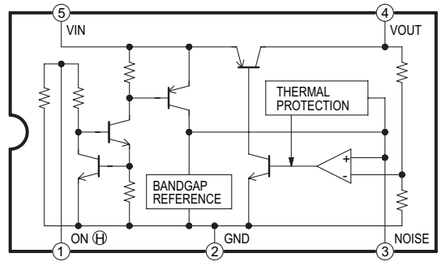
IC6001
MICRO PROCESSOR
IC-DETAIL BLOCK DIAGRAM



IC7402
TU +5V SWITCHING REG.
IC-DETAIL BLOCK DIAGRAM

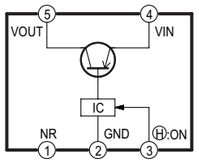


IC4801
AU +9V SWITCHING REG.
IC-DETAIL BLOCK DIAGRAM

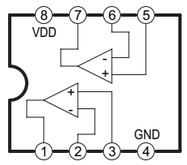


IC3701 Detail Block Diagram
IC4801 Detail Block Diagram
IC6001 Detail Block Diagram
IC7402 Detail Block Diagram
DMR-ES35VEE/GCS/GC/GN IC-Detail Block Diagram

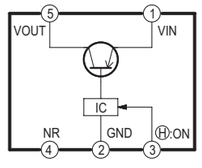
IC45001
X SW+6V SWITCHING REG.
IC-DETAIL BLOCK DIAGRAM



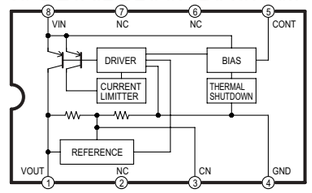
IC37001
FAN MOTOR DRIVE
IC-DETAIL BLOCK DIAGRAM



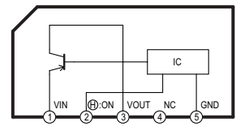
IC31501
ANA +5V SWITCHING REG.
IC-DETAIL BLOCK DIAGRAM



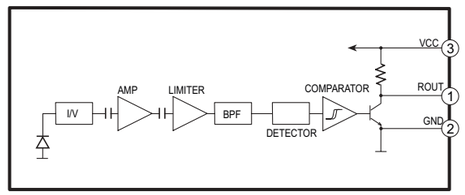
IC31503
ANA +3.3V SWITCHING REG.
IC-DETAIL BLOCK DIAGRAM



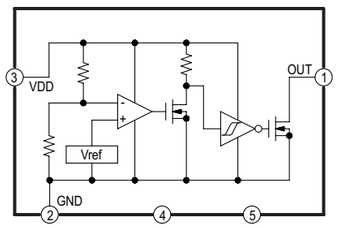
IC3002
JC +5V SWITCHING REG.
IC-DETAIL BLOCK DIAGRAM



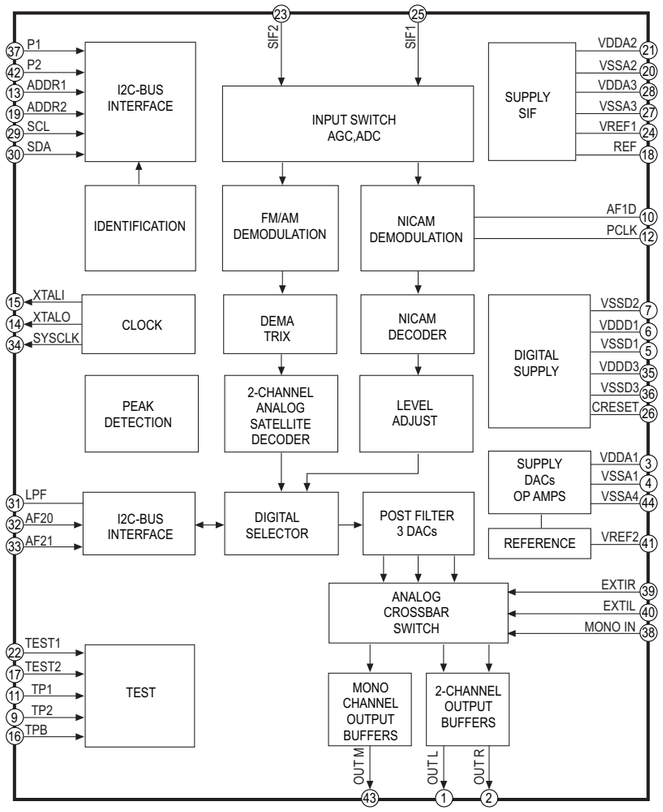
IC7702
IR RECEIVER
IC-DETAIL BLOCK DIAGRAM



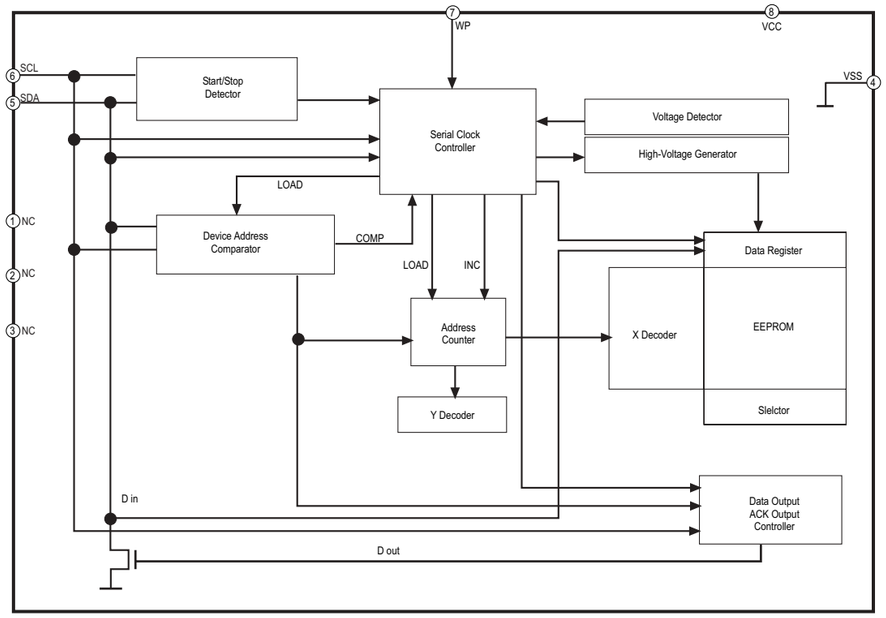
IC7502
VOLTAGE DETECTOR
IC-DETAIL BLOCK DIAGRAM



IC7301(NICAM/A2)
NICAM DECODER
IC-DETAIL BLOCK DIAGRAM



IC37501
EEPROM
IC-DETAIL BLOCK DIAGRAM

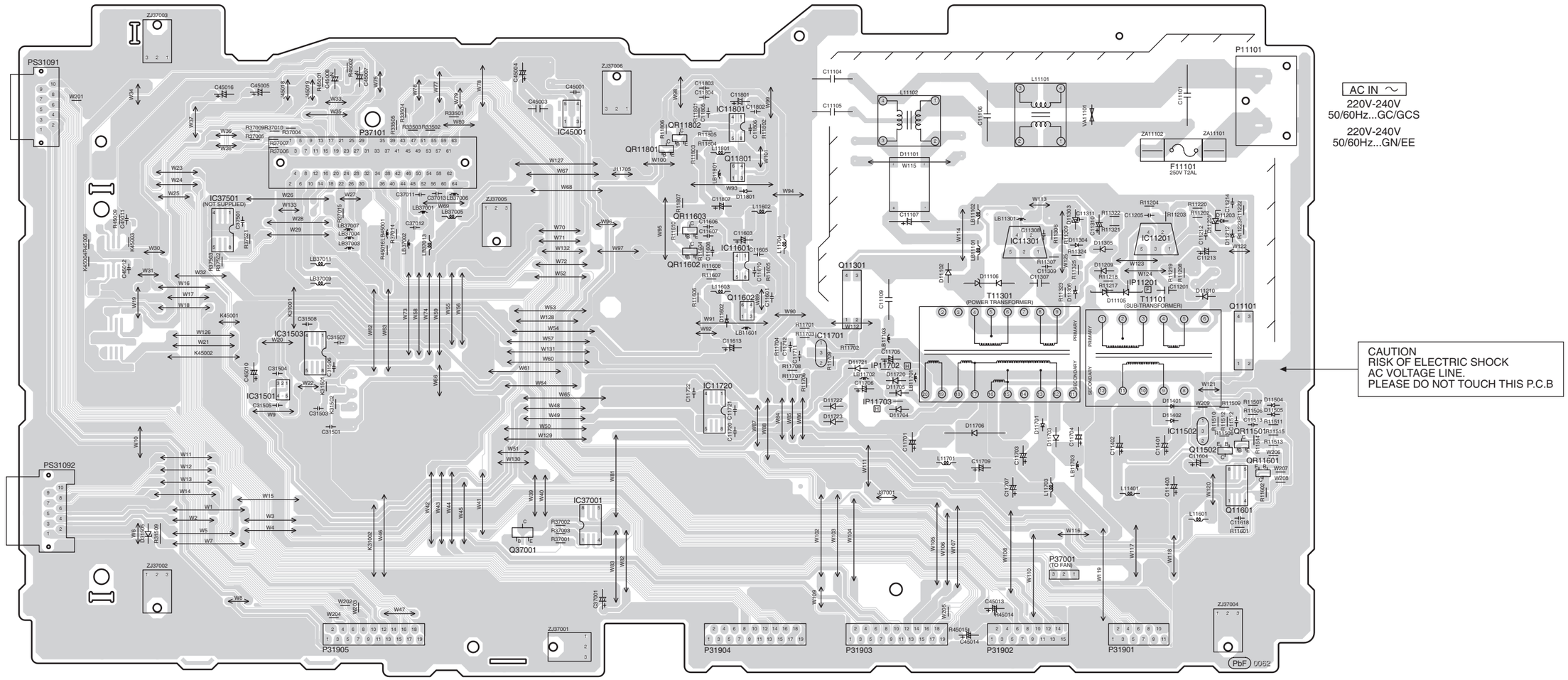


IC45001 Detail Block Diagram
IC37001 Detail Block Diagram
IC31501 Detail Block Diagram
IC31503 Detail Block Diagram
IC37501 Detail Block Diagram
IC3002 Detail Block Diagram
IC7702 Detail Block Diagram
IC7502 Detail Block Diagram
IC7301 Detail Block Diagram
DMR-ES35VEE/GCS/GN/GC IC-Detail Block Diagram

20 Printed Circuit Board

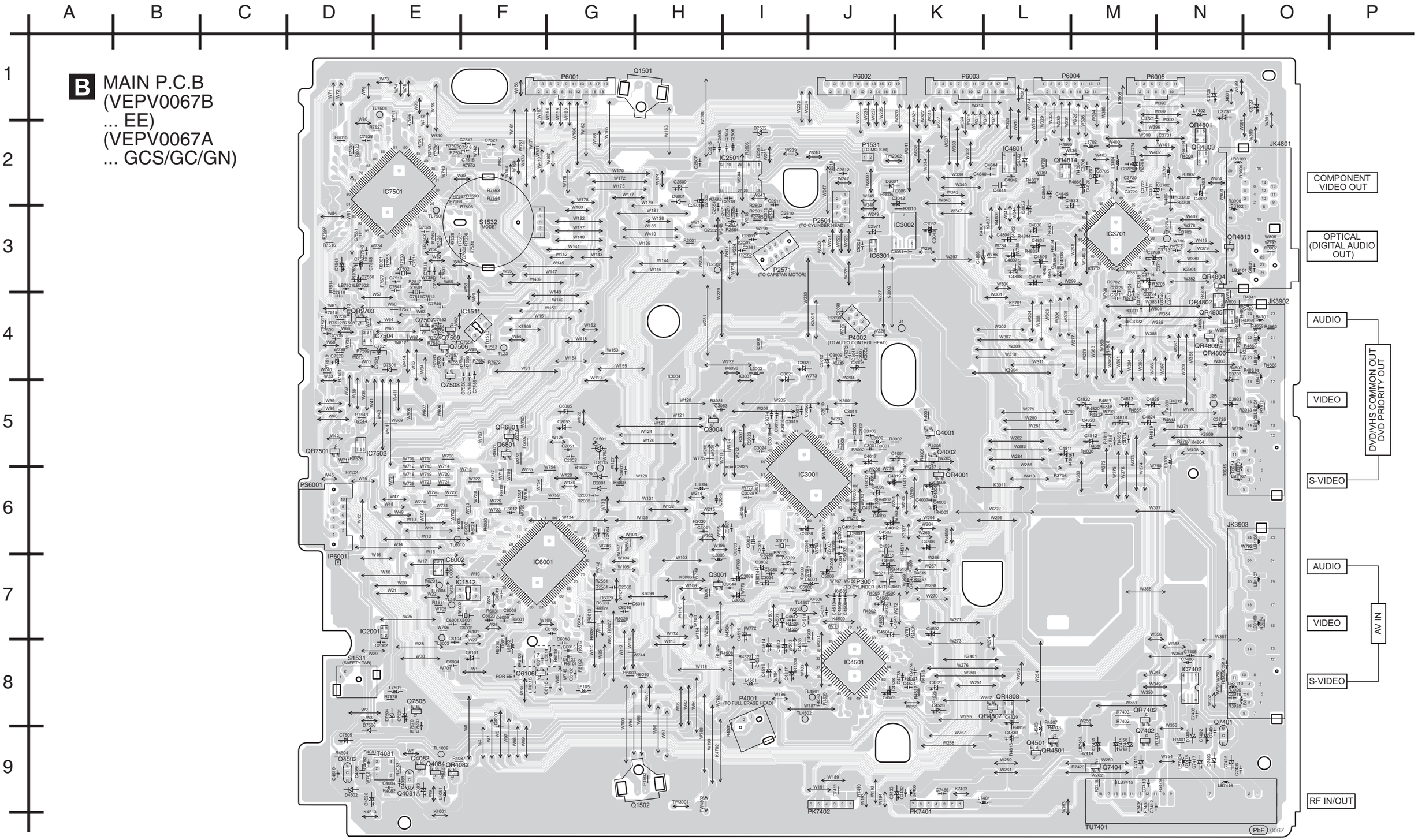
20.1. DIGITAL I/F P.C.B

A DIGITAL I/F P.C.B (RFKBV0063A)



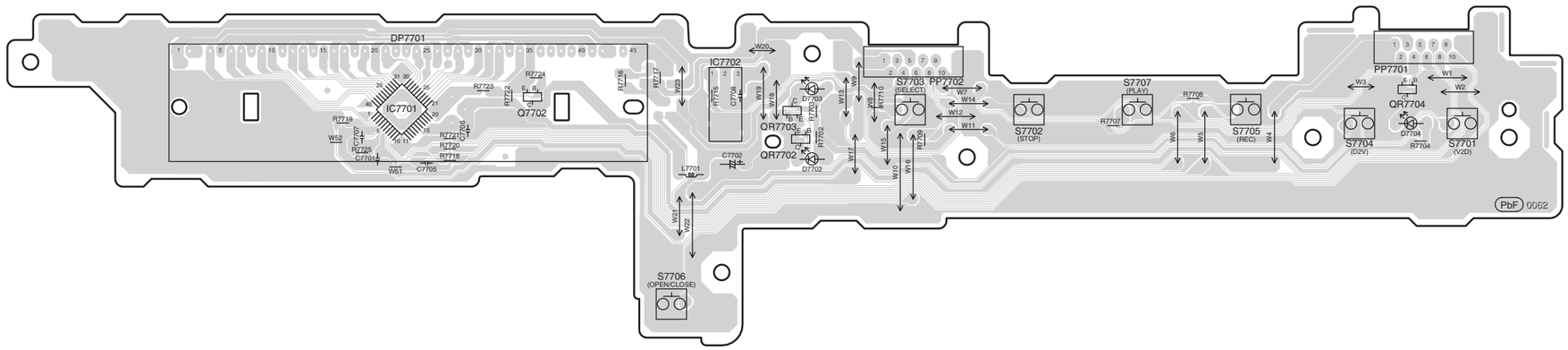
20.2. MAIN P.C.B

B MAIN P.C.B
(VEPV0067B
... EE)
(VEPV0067A
... GCS/GC/GN)

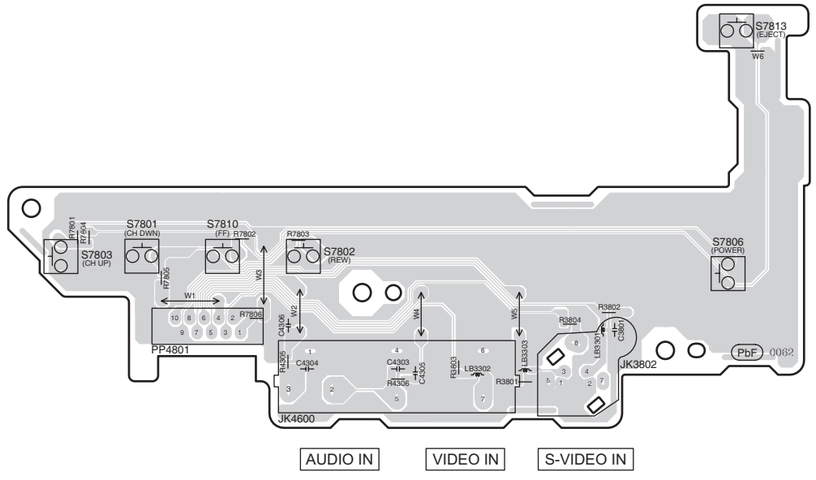


20.3. PANEL P.C.B, FRONT JACK P.C.B, NICAM DECODER P.C.B and DV JACK P.C.B

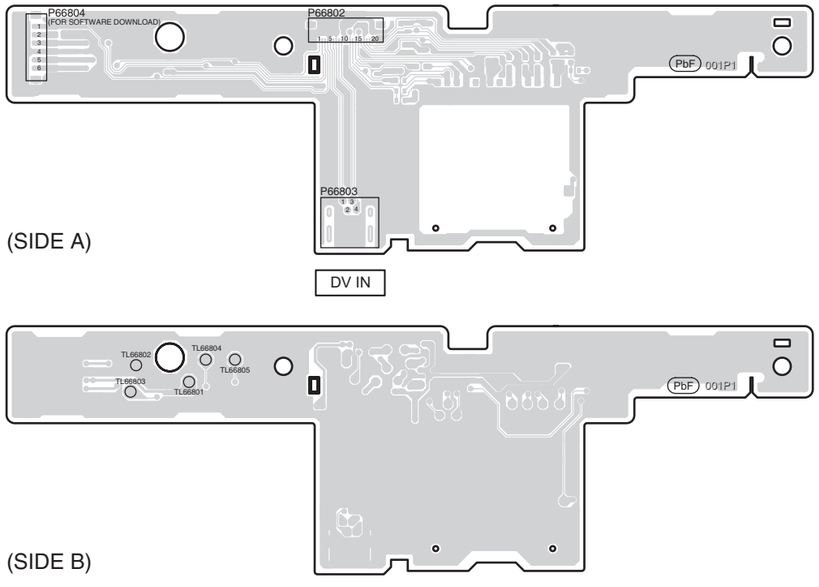
C PANEL P.C.B (VEPV0065A)



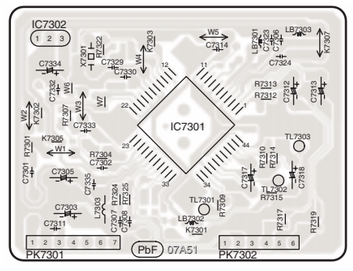
D FRONT JACK P.C.B (VEPV0064A)



F DV JACK P.C.B (VEP001P1C)

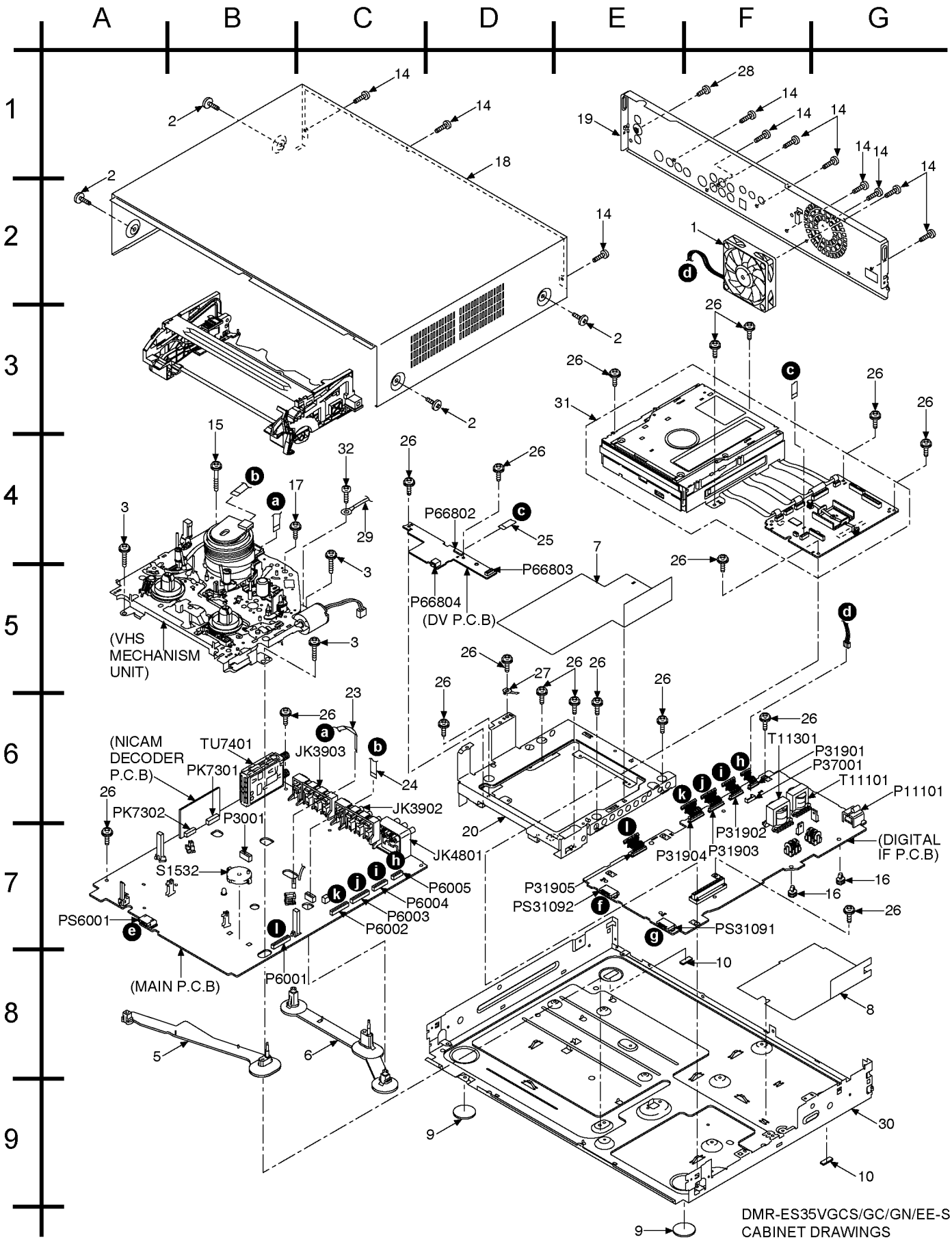


E NICAM DECODER P.C.B (VEP07A51D)

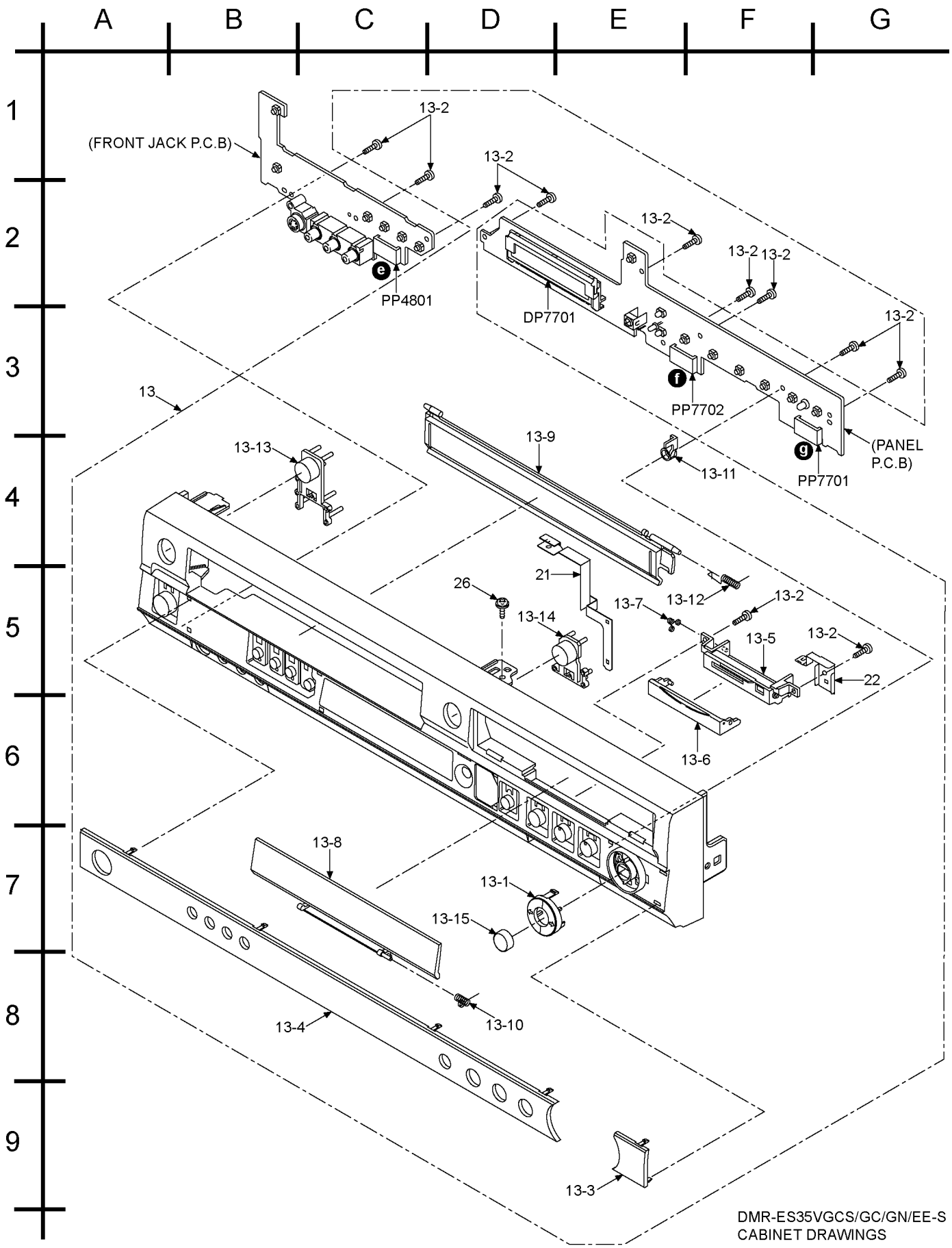


21 Exploded Views

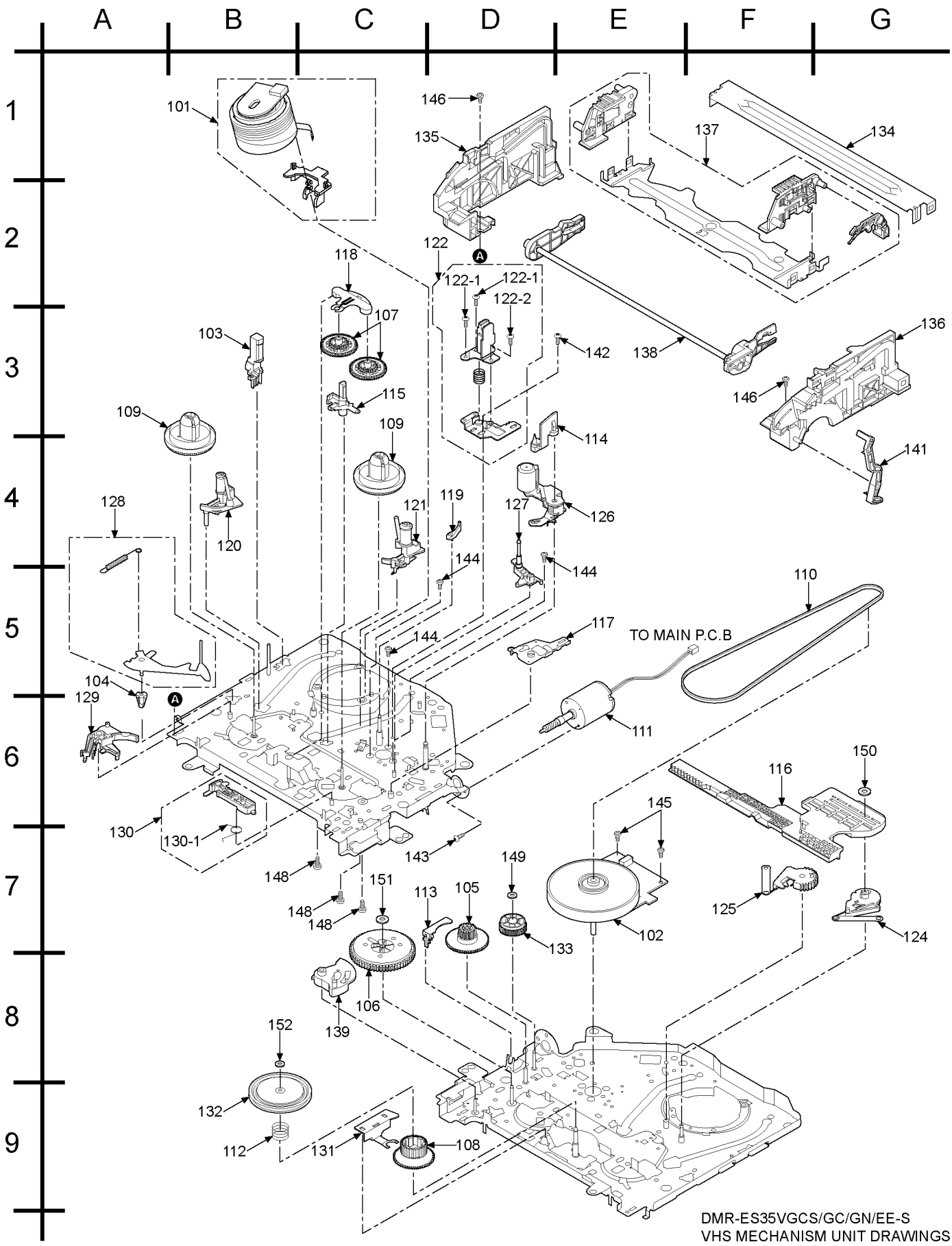
21.1. Casing Parts & Mechanism Section1



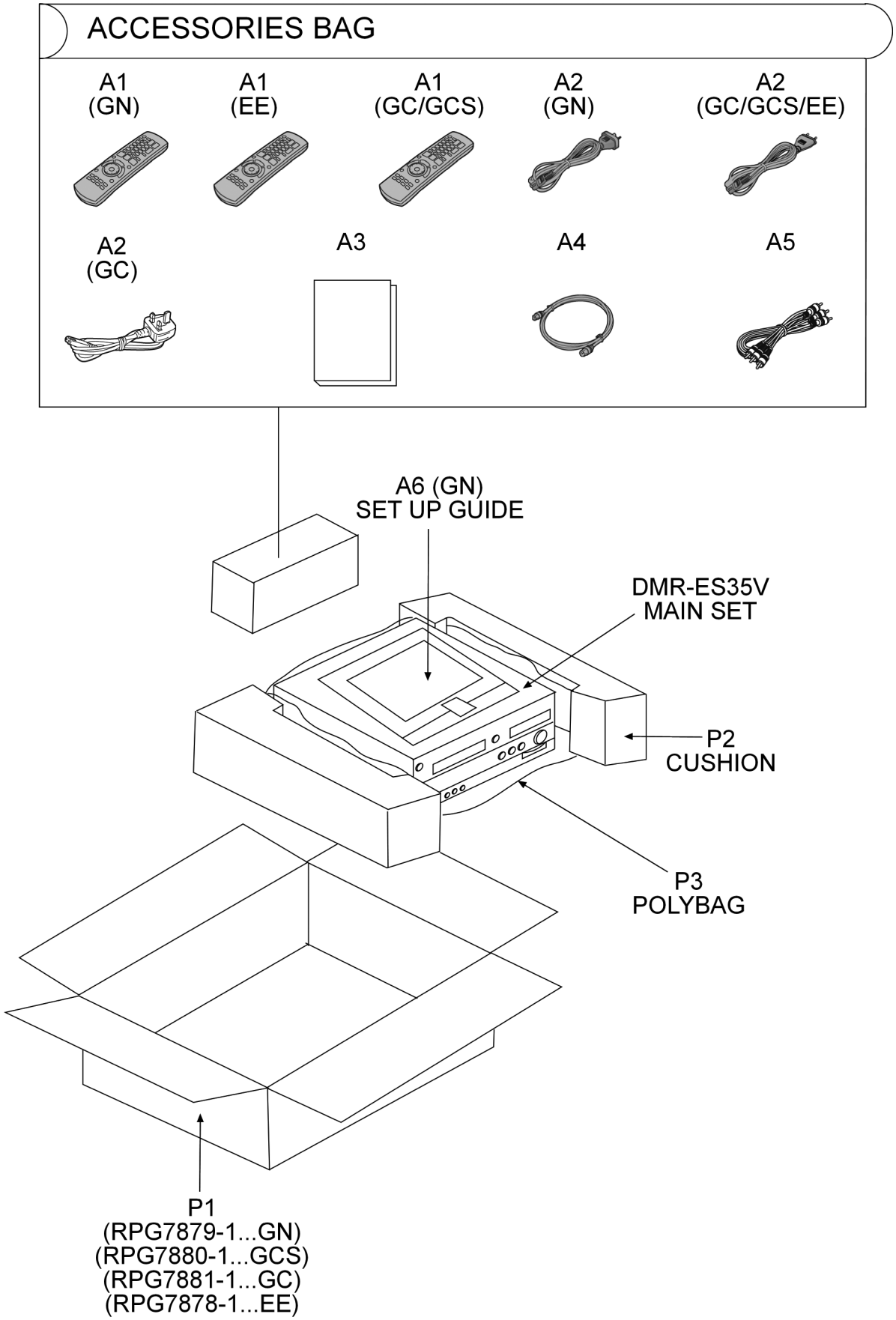
21.2. Casing Parts & Mechanism Section 2



21.3. VHS Mechanism Section



21.4. Packing


ACCESSORIES BAG
A1 (GN)
A1 (EE)
A1 (GC/GCS)
A2 (GN)
A2 (GC/GCS/EE)
A2 (GC)
A3
A4
A5
A6 (GN) SET UP GUIDE
DMR-ES35V MAIN SET
P2 CUSHION
P3 POLYBAG
P1 (RPG7879-1...GN) (RPG7880-1...GCS) (RPG7881-1...GC) (RPG7878-1...EE)

22 Replacement Parts List

Notes:

- Important safety notice:

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

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

  When replacing any of these components, be sure to use only manufacturer's specified parts shown in the parts list.
- The parenthesized indications in the Remarks columns specify the areas or colour. (Refer to the cover page for area or colour)

  Parts without these indications can be used for all areas.
- Warning: This product uses a laser diode. Refer to "Precaution of Laser Diode".
- Capacitor values are in microfarads (μF) unless specified otherwise, P= Pico-farads (pF), F= Farads.
- Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM).
- The marking (RTL) indicates that the Retention Time is limited for this items. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of a availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.
- [M] Indicates in the Remarks columns indicates parts supplied by **PAVCSG.**
- [SPG] Indicates in the Remarks columns indicates parts supplied by **PAVC**.
- Reference for O/I book languages are as follows:

Ar:	Arabic	Du:	Dutch	It:	Italian	Sp:	Spanish
Cf:	Canadian French	En:	English	Ko:	Korean	Sw:	Swedish
Cz:	Czech	Fr:	French	Po:	Polish	Co:	Traditional Chinese
Da:	Danish	Ge:	German	Ru:	Russian	Cn:	Simplified Chinese
Pe:	Persian	Ur:	Ukraine				

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	L6FALCCE0016	SMALL DC FAN MOTOR	[M]
2	RHD30113	SCREW	[M]
3	RHDC0023	SCREW	[M]
5	RMX0354	MECHA SPACER	[M]
6	RMX0355	MECHA SPACER	[M]
7	RMZ0839-1	BARRIER	[M]
8	RMZV0028	P BARRIER	[M]
9	RKA0178-X	LEG	[M]
10	VKA0382	LEG CUSHION (1)	[M]
13	RYPV0152-S	FRONT PANEL ASS'Y	[M]GN
13	RYPV0153-S	FRONT PANEL ASS'Y	[M]GCS
13	RYPV0155-S	FRONT PANEL ASS'Y	[M]GC
13	RYPV0151-S	FRONT PANEL ASS'Y	[M]EE
13-1	RGUV0148-S	DUB BUTTON	[M]
13-10	RMB0857	TRAY DOOR SPRING	[M]
13-11	RMRV0039	TRAY DOOR STOPPER	[M]
13-12	VMB2521	BLINDER SPRING	[M]
13-13	RGUV0146-S	EJECT BUTTON	[M]
13-14	RGUV0147-S	OPEN BUTTON	[M]
13-15	RKW0781B-Q	DUB WINDOW	[M]
13-2	RHD26045-L	SCREW	[M]
13-3	RKWV0063-Q1	FR WINDOW	[M]
13-4	RKWV0061B-Q1	FRONT WINDOW	[M]
13-5	RGKV0143-H1	SD SLOT	[M]
13-6	RKFV0058-S1	SD DOOR	[M]
13-7	RMB0821-1	SD SPRING	[M]
13-8	RKFV0056-S1	TRAY DOOR	[M]
13-9	RKFV0057A-S	BLINDER PANEL	[M]
14	RHD30119-S	SCREW	[M]
15	VHD1770	SCREW	[M]
16	VKC0295	PCB SPACER	[M]
17	XTW3+10PN	SCREW MECHA	[M]
18	RKM0588-S	TOP PANEL	[M]
19	RGRV0050C-B3	REAR PANEL	[M]GN
19	RGRV0050C-C4	REAR PANEL	[M]GCS
19	RGRV0050C-D3	REAR PANEL	[M]GC

Ref. No.	Part No.	Part Name & Description	Remarks
19	RGRV0050C-A3	REAR PANEL	[M]EE
20	RMAV0036	DVD ANGLE	[M]
21	RMBV0047	EARTH SPRING	[M]
22	RMBV0048	EARTH SPRING	[M]
23	RWJV0034	DD CYLINDER BENDING	[M]
24	RWJV0033	AC HEAD BENDING FFC	[M]
25	RWJV0047	SD/DV FFC	[M]
26	RHD30111-3	SCREW	[M]
27	RMC0632	EARTH SPRING	[M]
28	XSN3+4FJ	SCREW	[M]
29	VEE0U97	EARTH WIRE UNIT	[M]
30	RMK0661	CHASSIS FRAME	[M]
31	RFKNES35VEE	RAM/DIGITAL P.C.B. ASS'Y	[M] EE
31	RFKNES35VGN	RAM/DIGITAL P.C.B. ASS'Y	[M] GN
31	RFKNES35VGC	RAM/DIGITAL P.C.B. ASS'Y	[M] GC
31	RFKNES35VGCS	RAM/DIGITAL P.C.B. ASS'Y	[M] GCS
32	XTV26+5FFJ	STATOR SCREW	[M]
		VHS MECHANISM UNIT	
101	VEG1699KIT	RDD CYLINDER	[M] GC/GCS/ GN
101	VEG1701KIT	RDD CYLINDER	[M] EE
102	VEM0800-1B	CAPSTAN UNIT	[M]
103	L1AZ00000004	FE HEAD UNIT	[M]
104	VDB1431	TENSION ARM BOSH	[M]
105	VDG1686	INTERMEDIATE GEAR 2	[M]
106	VDG1685	MAIN CAM GEAR 3	[M]
107	VDG1512-1	IDLER GEAR	[M]
108	VDG1514-3	CHANGE GEAR	[M]
109	VDR0372A	REEL TABLE	[M]
110	VDV0391-2	CAPSTAN BELT	[M]
111	VEM0797A	LOADING MOTOR U 2	[M]
112	VMB3550A	CHANGING GEAR SPRING	[M]
113	VMD4987	WORM BEARING 2	[M]
114	VMD5466	OPENER DIECE 2	[M]
115	VMD4253-1	LED PRISM (PS)	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
116	VML3934	MAIN LEVER 2	[M]
117	VML3933	PINCH CHARGE ARM 2	[M]
118	VML3632	IDLER ARM	[M]
119	VMX3092	P4 CAP	[M]
120	VXA7105-3	S SHAFT HOLDER UNIT	[M]
121	VXA7106-3	T SHAFT HOLDER UNIT	[M]
122	L1AE00000044	AC HEAD UNIT	[M]
122-1	VHD1066-2	A/C SCREW	[M]
122-2	VHD1185	STEEL MACHINE SCREW	[M]
124	VXL3107	S LOADING ARM UNIT	[M]
125	VXL3108	T LOADING ARM UNIT	[M]
126	VXL3109-7	PINCH ARM UNIT	[M]
127	VXL3110	P5 ARM UNIT	[M]
128	VXL3111-1	TENSION ARM UNIT	[M]
129	VXL3252	S BRAKE ARM 2 UNIT	[M]
130	VXL3343	T BRAKE ARM 2 UNIT	[M]
130-1	VMB3548-2A	T BRAKE SPRING	[M]
131	VXL3124-2	CHANGING LEVER UNIT	[M]
132	VXP2133-2	CENTER CLUTH UNIT	[M]
133	VXP2168	TORQUE CLUTCH UNIT	[M]
134	VMA0L25	TOP PLATE	[M]
135	VMD5468	SIDE PLATE L2	[M]
136	VMD5469	SIDE PLATE R3	[M]
137	VXA8265	CASSETTE HOLDER UNIT	[M]
138	VXL3160	MAIN SHAFT UNIT	[M]
139	VXA8323	SECTOR GEAR 2 UNIT	[M]
141	VML3706-3	OPENER LEVER	[M]
142	VHD1044-1	A/C SET SCREW	[M]
143	XYN3+C4FJ	MOTOR FIXING SCREW	[M]
144	XTN26+7JFJ	SCREW	[M]
145	XTV26+5FFJ	STATOR SCREW	[M]
146	XTV26+8FFJ	SCREW	[M]
148	VHD1117-1	CYLINDER SCREW	[M]
149	VMX2208	CUT WASHER	[M]
150	VMX3114	CUT WASHER	[M]
151	VMX2699	CUT WASHER	[M]
152	VMX3196	CUT WASHER(C)	[M]
		Printed Circuit Board	
	RFKBV0063AT	DIGITAL I/F P.C.B	[M] RTL
	VEP001P1C	DV JACK P.C.B	[M] RTL
	VEP07A51D	NICAM DECODER P.C.B	[M] RTL
	VEPV0064A	FRONT JACK P.C.B	[M] RTL
	VEPV0065A	PANEL P.C.B	[M] RTL
	VEPV0067A	MAIN P.C.B	[M] RTL GCS/GC/GN
	VEPV0067B	MAIN P.C.B	[M] RTL EE
		INTEGRATED CIRCUITS	
IC1511	B3NAA0000117	PHOTO COUPLER	[M]
IC1512	B3NAA0000117	PHOTO COUPLER	[M]
IC2001	C0CBCDC00020	IC POWER SUPPLY	[M]
IC2501	C1AB00001767	IC CYLINDER DRIVE	[M]
IC3001	C1AB00002084	IC A/V	[M]
IC3002	C0CBCDG00006	IC +5V SWITCHING REG	[M]
IC3701	C1AB00002490	IC AUDIO/VIDEOSIGNAL PROCESSOR	[M]
IC4501	AN3656NFBPBV	IC HI FI	[M]
IC4801	C0CBCDC00027	IC POWER SUPPLY	[M]
IC6001	C2CBHF000470	IC MICROPROCESSOR	[M]
IC6002	C0EBH0000172	IC RESET	[M]
IC6301	C0CBCDC00020	IC POWER SUPPLY	[M]
IC7301	C1AB00002225	IC NICAM DECODER	[M]
IC7302	C0EAH0000051	IC RESET	[M]
IC7402	C0CBCDD00006	IC POWER SUPPLY	[M]
IC7501	C2CBJG000720	IC TIMER	[M]
IC7502	C0EBE0000457	IC 3.3V DET	[M]
IC7504	C0EBE0000504	IC RESET	[M]
IC7701	C0HBB0000044	IC FL DRIVER	[M]
IC7702	B3RAD0000122	IR RECEIVER	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
IC11201	C0DACZH00026	IC VOLTAGE REGULATOR	[M]
IC11301	C0DACZH00026	IC VOLTAGE REGULATOR	[M]
IC11502	C0DAEMB00003	IC SHUNT REGULATOR	[M]
IC11601	C0DBAZZ00131	IC DC TO DC CONVERTER	[M]
IC11701	C0DAEMB00003	IC SHUNT REGULATOR	[M]
IC11720	C0CBCBD00048	IC DC TO DCCONVERTER	[M]
IC11801	C0DBAZZ00131	IC DC TO DCCONVERTER	[M]
IC31501	C0CBCDC00052	IC ANA +5V SWITCHING REGULATOR	[M]
IC31503	C0CBCBD00048	IC ANA +3.3V SWITCHING REGULATOR	[M]
IC37001	C0ABBA000146	FAN MOTOR DRIVE	[M]
IC37501	RFKFM6016KT	IC EEPROM	[SPG]
IC45001	C0DBAHD00013	IC POWER SUPPLY	[M]
		TRANSISTORS	
Q1501	PNA2602M01VT	TRANSISTOR	[M]
Q1502	PNA2602M01VT	TRANSISTOR	[M]
Q3001	2SD1819A0L	TRANSISTOR	[M]
Q3004	2SD1819A0L	TRANSISTOR	[M]
Q4001	2SD114900L	TRANSISTOR	[M]
Q4002	2SD1819A0L	TRANSISTOR	[M]
Q4081	2SD1992A0A	TRANSISTOR	[M]
Q4082	2SD0602ARL	TRANSISTOR	[M]
Q4084	2SB0710A0L	TRANSISTOR	[M]
Q4501	2SB0710A0L	TRANSISTOR	[M]
Q4502	B1AAGD000017	TRANSISTOR	[M]
Q6106	2SB1218A0L	TRANSISTOR	[M]EE
Q6801	2SD1819A0L	TRANSISTOR	[M]
Q7401	B1AAGD000017	TRANSISTOR	[M]
Q7402	2SD1819A0L	TRANSISTOR	[M]
Q7404	2SB1218A0L	TRANSISTOR	[M]
Q7505	2SD1819A0L	TRANSISTOR	[M]
Q7506	2SD1819A0L	TRANSISTOR	[M]
Q7507	2SD1819A0L	TRANSISTOR	[M]
Q7508	2SB1218A0L	TRANSISTOR	[M]
Q7509	2SB1218A0L	TRANSISTOR	[M]
Q7702	2SD0601A0L	TRANSISTOR	[M]
Q11101	B3PBA0000402	TRANSISTOR	[M] ⚠
Q11301	B3PBA0000402	TRANSISTOR	[M] ⚠
Q11502	2SD0601AHL	TRANSISTOR	[M] ⚠
Q11601	B1DHED000008	TRANSISTOR	[M]
Q11602	B1DHDD000022	TRANSISTOR	[M]
Q11801	B1DHDD000022	TRANSISTOR	[M]
Q37001	2SD0874A0L	TRANSISTOR	[M]
QR4001	UNR511100L	DIGITAL TRANSISTOR	[M]
QR4082	UNR521300L	DIGITAL TRANSISTOR	[M]
QR4501	UNR521100L	DIGE TRANSISTOR	[M]
QR4801	XN0121100L	DIGITAL TRANSISTOR	[M]
QR4802	XN0121600L	DIGITAL TRANSISTOR	[M]
QR4803	XN0121100L	DIGITAL TRANSISTOR	[M]
QR4804	UNR511100L	DIGITAL TRANSISTOR	[M]
QR4805	XN0121600L	DIGITAL TRANSISTOR	[M]
QR4806	XN0121600L	DIGITAL TRANSISTOR	[M]
QR4807	UNR511300L	DIGITAL TRANSISTOR	[M]
QR4808	XN0121600L	DIGITAL TRANSISTOR	[M]
QR4809	UNR511300L	DIGITAL TRANSISTOR	[M]
QR4813	UNR511100L	DIGITAL TRANSISTOR	[M]
QR4814	XN0121600L	DIGITAL TRANSISTOR	[M]
QR6801	B1GDBFNN0001	DIGITAL TRANSISTOR	[M]
QR7402	UNR511200L	DIGITAL TRANSISTOR	[M]
QR7501	UNR521200L	CHIP TRANISTOR	[M]
QR7702	UNR521100L	TRANSISTOR	[M]
QR7703	UNR521100L	TRANSISTOR	[M]
QR7704	UNR521100L	TRANSISTOR	[M]
QR9703	UNR521200L	TRANSISTOR	[M]
QR11501	UNR521100L	TRANSISTOR	[M] ⚠
QR11601	UNR521300L	DIGITAL TRANSISTOR	[M]
QR11602	UNR521300L	DIGITAL TRANSISTOR	[M]
QR11603	UNR521300L	DIGITAL TRANSISTOR	[M]
QR11801	UNR521300L	DIGITAL TRANSISTOR	[M] ⚠

Ref. No.	Part No.	Part Name & Description	Remarks
QR11802	UNR521300L	DIGITAL TRANSISTOR	[M] ⚠
		DIODES	
D1501	B3EA00000072	DIODE	[M]
D2001	B0AACK000004	DIODE	[M]
D2002	B0AACK000004	DIODE	[M]
D2502	MAZ4160NMF	DIODE	[M]
D3001	B0AACK000004	DIODE	[M]
D4501	B0AACK000004	DIODE	[M]
D4502	MAZ4056NHF	DIODE	[M]
D6801	B0AACK000004	DIODE	[M]
D7401	MAZ4056NHF	DIODE	[M]
D7402	MAZ4300NMF	DIODE	[M]
D7403	MA2C165001VT	DIODE	[M]
D7501	B0AACK000004	DIODE	[M]
D7504	MAZ40390HF	DIODE	[M]
D7506	B0AACK000004	DIODE	[M]
D7702	B3ACA0000252	DIODE	[M]
D7703	B3ADA0000183	DIODE	[M]
D7704	B3AAA0000752	DIODE	[M]
D11101	B0EDKT000009	DIODE	[M]
D11102	B0AAGR000003	DIODE	[M]
D11105	B0BB20000004	DIODE	[M]
D11106	B0BB20000004	DIODE	[M]
D11201	MAZ73000BC	DIODE	[M]
D11203	MA2J11100L	DIODE	[M]
D11209	B0AADM000003	DIODE	[M] ⚠
D11210	B0AADM000003	DIODE	[M]
D11212	MAZ81200ML	DIODE	[M]
D11303	MAZ73000BC	DIODE	[M]
D11304	MA2J11100L	DIODE	[M]
D11305	B0AADM000003	DIODE	[M]
D11306	MAZ81200ML	DIODE	[M]
D11401	B0JCNG000003	DIODE	[M]
D11402	B0JCNG000003	DIODE	[M]
D11504	MA2J11100L	DIODE	[M] ⚠
D11505	MA2J11100L	DIODE	[M]
D11602	B0JCPD000021	DIODE	[M]
D11701	B0JCNG000003	DIODE	[M]
D11703	B0AADM000003	DIODE	[M]
D11704	B0AADM000003	DIODE	[M]
D11705	B0JAME000025	DIODE	[M]
D11706	B0JAQE000004	DIODE	[M]
D11720	B0EAKL000062	DIODE	[M]
D11721	B0EAKL000062	DIODE	[M]
D11722	B0AACK000004	DIODE	[M]
D11723	B0AACK000004	DIODE	[M]
D11801	B0JCPD000021	DIODE	[M]
D31505	MAZ4180NMF	DIODE	[M]
DP7701	A2BD00000157	DISPLAY TUBES	[M]
		SWITCHES	
S1531	K0C111A00006	SW SAFETY TAB	[M]
S1532	K0ZZ00000598	SW MODE	[M]
S7701	EVQ11G07K	SW V2D	[M]
S7702	EVQ11G07K	SW STOP	[M]
S7703	EVQ11G07K	SW SELECT	[M]
S7704	EVQ11G07K	SW D2V	[M]
S7705	EVQ11G07K	SW REC	[M]
S7706	EVQ11G07K	SW OPEN/CLOSE	[M]
S7707	EVQ11G07K	SW PLAY	[M]
S7801	EVQ11G07K	SW CH DWN	[M]
S7802	EVQ11G07K	SW REW	[M]
S7803	EVQ11G07K	SW CH UP	[M]
S7806	EVQ11G07K	SW POWER	[M]
S7810	EVQ11G07K	SW FF	[M]
S7813	EVQ11G07K	SW EJECT	[M]
		CONNECTOR	

Ref. No.	Part No.	Part Name & Description	Remarks
PK7301	K1MM07B00002	7P CONNECTER	[M]
PK7302	K1MM06B00002	6P CONNECTER	[M]
PP4801	K1KA10B00196	10P CONNECTOR	[M]
PP7701	K1KA10B00196	10P CONNECTOR	[M]
PP7702	K1KA10B00196	10P CONNECTOR	[M]
PS6001	K1KB10B00053	10P CONNECTOR	[M]
PS31091	K1KB10B00045	10P CONNECTOR	[M]
PS31092	K1KB10B00053	10P CONNECTOR	[M]
P1531	K1KA02A00375	LOADING MOTOR WIRE	[M]
P2501	K1MN07A00020	7P CONNECTOR	[M]
P2571	K1KA08A00355	8P CONNECTOR	[M]
P3001	K1MN09A00029	9P CONNECTOR	[M]
P4001	K1KB02A00035	2P CONNECTOR	[M]
P4002	K1MN06A00030	6P CONNECTOR	[M]
P6001	K1KB19AA0032	19P CONNECTOR	[M]
P6002	K1KB19AA0032	19P CONNECTOR	[M]
P6003	K1KB19AA0032	19P CONNECTOR	[M]
P6004	K1KB15AA0032	15P CONNECTOR	[M]
P6005	K1KB11AA0032	11P CONNECTOR	[M]
P31901	K1KA11A00124	11P CONNECTOR	[M]
P31902	K1KA15A00118	15P CONNECTOR	[M]
P31903	K1KA19A00007	19P CONNECTOR	[M]
P31904	K1KA19A00007	19P CONNECTOR	[M]
P31905	K1KA19A00007	19P CONNECTOR	[M]
P37001	K1KA03AA0180	3P CONNECTOR	[M]
P37101	K1KY64A00002	64P CONNECTOR	[M]
P66802	K1MY20BA0049	20P CONNECTOR	[M]
P66803	K2HZ104B0016	JACK DV	[M]
P66804	K1KA06AA0083	6P CONNECTOR	[M]
		COILS & TRANSFORMERS	
L3002	G0C271JA0019	CHOKE COIL	[M]
L3003	G0C270JA0019	COIL	[M]
L3004	G0C680JA0019	COIL	[M]
L3005	G0C270JA0019	COIL	[M]
L3006	G1C120JA0036	CHIP COIL	[M]
L3701	G0C220JA0019	COIL	[M]
L3702	G0C220JA0019	COIL	[M]
L3703	G0C220JA0019	COIL	[M]
L3704	G0C220JA0019	COIL	[M]
L4081	G0C221KA0065	COIL	[M]
L4501	G0C1R2J00004	COIL	[M]
L4503	G0C101JA0019	RF CHOKE COIL	[M]
L5001	G0C680JA0019	COIL	[M]
L6014	G0C330JA0019	COIL	[M]EE
L6102	G0C1R5JA0019	COIL	[M]
L6105	G0C680JA0019	COIL	[M]
L7303	G0C1R0JA0019	COIL	[M]
L7401	G0C2R2JA0019	COIL	[M]
L7402	G0A100HA0023	COIL	[M]
L7501	G0C680JA0019	COIL	[M]
L7701	G0C220JA0019	COIL	[M]
L11101	G0B233D00001	LINE FILTER	[M]
L11102	G0B233D00001	LINE FILTER	[M] ⚠
L11401	G0A100H00025	COIL	[M]
L11601	G0A220GA0026	COIL	[M]
L11602	G0A100HA0023	COIL	[M]
L11603	G0A150ZA0030	COIL	[M]
L11701	G0A100HA0023	COIL	[M]
L11703	G0A100HA0023	COIL	[M]
L11704	G0A100HA0023	COIL	[M]
L11801	G0A220ZA0030	COIL	[M]
LB3101	J0JCC0000103	BEED CORE	[M]
LB3102	J0JCC0000103	BEED CORE	[M]
LB3103	J0JCC0000103	BEED CORE	[M]
LB3104	J0JCC0000103	BEED CORE	[M]
LB3105	J0JCC0000103	BEED CORE	[M]
LB3106	J0JCC0000103	BEED CORE	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
LB3107	J0JCC0000103	BEED CORE	[M]
LB3108	J0JCC0000103	BEED CORE	[M]
LB3110	J0JCC0000103	BEED CORE	[M]
LB3111	J0JCC0000103	BEED CORE	[M]
LB3301	ERJ3GEY0R00V	CHIP JUMPER	[M]
LB3302	ERJ3GEY0R00V	CHIP JUMPER	[M]
LB3303	ERJ3GEY0R00V	CHIP JUMPER	[M]
LB4101	J0JCC0000103	BEED CORE	[M]
LB4102	J0JCC0000103	BEED CORE	[M]
LB4103	J0JCC0000103	BEED CORE	[M]
LB4104	J0JCC0000103	BEED CORE	[M]
LB4105	J0JCC0000103	BEED CORE	[M]
LB4107	J0JCC0000103	BEED CORE	[M]
LB7301	J0JCC0000124	CHIP COIL	[M]
LB7302	J0JCC0000124	CHIP COIL	[M]
LB7303	J0JCC0000080	CHIP COIL	[M]
LB7404	J0JHC0000032	BEED CORE	[M]
LB7405	J0JHC0000032	BEED CORE	[M]
LB7406	ERJ3GEY0R00V	CHIP JUMPER	[M]
LB7415	ERJ3GEY0R00V	CHIP JUMPER	[M]
LB7416	J0JHC0000032	BEED CORE	[M]
LB7501	J0JBC0000041	CHIP INDUCTOR	[M]
LB7502	J0JBC0000041	CHIP INDUCTOR	[M]
LB7503	J0JBC0000041	CHIP INDUCTOR	[M]
LB11101	J0JKB0000003	BEED CORE	[M]
LB11102	J0JKB0000003	BEED CORE	[M]
LB11103	J0JHC0000048	CHIP COIL	[M]
LB11301	J0JHC0000048	CHIP COIL	[M]
LB11601	J0JHC0000048	CHIP COIL	[M]
LB11701	J0JHC0000048	CHIP COIL	[M]
LB11702	J0JHC0000048	CHIP COIL	[M]
LB11703	J0JHC0000048	CHIP COIL	[M]
LB11801	J0JHC0000048	CHIP COIL	[M]
LB37001	J0JHC0000048	CHIP COIL	[M]
LB37002	J0JHC0000048	CHIP COIL	[M]
LB37003	J0JHC0000048	CHIP COIL	[M]
LB37004	J0JHC0000048	CHIP COIL	[M]
LB37005	J0JKB0000032	FILTER FOR EMI/EMC	[M]
LB37006	ERJ3GEY0R00V	CHIP JUMPER	[M]
LB37007	ERJ3GEY0R00V	CHIP JUMPER	[M]
LB37009	J0JKB0000032	FILTER FOR EMI/EMC	[M]
LB37011	J0JKB0000032	FILTER FOR EMI/EMC	[M]
LB37013	J0JKB0000032	FILTER FOR EMI/EMC	[M]
LB45001	J0JCC0000103	BEED CORE	[M]
T4081	G2A472C00003	VARIABLE COILS	[M] ⚠
T11101	G4DYA0000038	TRANSFORMER	[M] ⚠
T11301	G4DYA0000039	TRANSFORMER	[M] ⚠
TU7401	ENGF7502GF	TV TUNER	[M]
VA11101	ERZVA5V471	ZENER	[M] ⚠
ZA11101	EYF52BCY	FUSE CLIP	[M]
ZA11102	EYF52BCY	FUSE CLIP	[M]
ZJ37001	K9ZZ00001279	EARTH PLATE	[M]
ZJ37002	K9ZZ00001279	EARTH PLATE	[M]
ZJ37003	K9ZZ00001279	EARTH PLATE	[M]
ZJ37004	K9ZZ00001279	EARTH PLATE	[M]
ZJ37005	K9ZZ00001279	EARTH PLATE	[M]
ZJ37006	K9ZZ00001279	EARTH PLATE	[M]
		OSCILLATORS	
X3001	H0D443400040	CRYSTAL OSCILLATOR	[M]
X3002	H0D357400068	CRYSTAL OSCILLATOR	[M]
X6001	H0D120500009	CRYSTAL OSCILLATOR	[M]
X7301	H0D245500016	CRYSTAL OSCILLATOR	[M]
X7501	H0D100500016	CRYSTAL RESONATORS	[M]
X7502	H0A327200108	CRYSTAL RESONATORS	[M]
		FUSES	

Ref. No.	Part No.	Part Name & Description	Remarks
F11101	K5D202BK0005	FUSE	[M] ⚠
IP6001	K5H5012A0010	IC PROTECTOR	[M] ⚠
IP11201	K5H5012A0010	IC PROTECTOR	[M] ⚠
IP11702	K5H1022A0011	IC PROTECTOR	[M] ⚠
IP11703	K5H1022A0011	IC PROTECTOR	[M] ⚠
		JACKS	
JK3802	K1AY107A0001	JACK	[M]
JK3902	K1U717B00006	I/O JACK	[M]
JK3903	K1U412B00004	I/O JACK	[M]
JK4600	K2HA307A0009	I/O JACK	[M]
JK4801	K1U407B00004	I/O JACK	[M]
P11101	K2AA2B000015	JK AC INLET	[M] ⚠
		CHIP JUMPERS	
W6	ERJ3GEY0R00V	CHIP JUMPER	[M]
W7	ERJ3GEY0R00V	CHIP JUMPER	[M]
W51	ERJ6GEY0R00V	CHIP JUMPER	[M]
W52	ERJ3GEY0R00V	CHIP JUMPER	[M]
W201	ERJ3GEY0R00V	CHIP JUMPER	[M]
W202	ERJ3GEY0R00V	CHIP JUMPER	[M]
W203	ERJ3GEY0R00V	CHIP JUMPER	[M]
W204	ERJ3GEY0R00V	CHIP JUMPER	[M]
W205	ERJ3GEY0R00V	CHIP JUMPER	[M]
W206	ERJ6GEY0R00V	CHIP JUMPER	[M]
W207	ERJ6GEY0R00V	CHIP JUMPER	[M]
W208	ERJ6GEY0R00V	CHIP JUMPER	[M]
W209	ERJ6GEY0R00V	CHIP JUMPER	[M]
W701	ERJ3GEY0R00V	CHIP JUMPER	[M]
W702	ERJ3GEY0R00V	CHIP JUMPER	[M]
W703	ERJ8GEY0R00V	CHIP JUMPER	[M]
W704	ERJ8GEY0R00V	CHIP JUMPER	[M]
W705	ERJ3GEY0R00V	CHIP JUMPER	[M]
W706	ERJ3GEY0R00V	CHIP JUMPER	[M]
W707	ERJ8GEY0R00V	CHIP JUMPER	[M]
W708	ERJ8GEY0R00V	CHIP JUMPER	[M]
W709	ERJ8GEY0R00V	CHIP JUMPER	[M]
W710	ERJ6GEY0R00V	CHIP JUMPER	[M]
W711	ERJ3GEY0R00V	CHIP JUMPER	[M]
W712	ERJ8GEY0R00V	CHIP JUMPER	[M]
W713	ERJ6GEY0R00V	CHIP JUMPER	[M]
W714	ERJ8GEY0R00V	CHIP JUMPER	[M]
W715	ERJ8GEY0R00V	CHIP JUMPER	[M]
W716	ERJ8GEY0R00V	CHIP JUMPER	[M]
W717	ERJ8GEY0R00V	CHIP JUMPER	[M]
W718	ERJ8GEY0R00V	CHIP JUMPER	[M]
W719	ERJ6GEY0R00V	CHIP JUMPER	[M]
W720	ERJ8GEY0R00V	CHIP JUMPER	[M]
W721	ERJ6GEY0R00V	CHIP JUMPER	[M]
W722	ERJ8GEY0R00V	CHIP JUMPER	[M]
W723	ERJ6GEY0R00V	CHIP JUMPER	[M]
W724	ERJ8GEY0R00V	CHIP JUMPER	[M]
W725	ERJ8GEY0R00V	CHIP JUMPER	[M]
W726	ERJ6GEY0R00V	CHIP JUMPER	[M]
W727	ERJ8GEY0R00V	CHIP JUMPER	[M]
W728	ERJ8GEY0R00V	CHIP JUMPER	[M]
W729	ERJ8GEY0R00V	CHIP JUMPER	[M]
W730	ERJ8GEY0R00V	CHIP JUMPER	[M]
W731	ERJ8GEY0R00V	CHIP JUMPER	[M]
W732	ERJ6GEY0R00V	CHIP JUMPER	[M]
W733	ERJ8GEY0R00V	CHIP JUMPER	[M]
W734	ERJ6GEY0R00V	CHIP JUMPER	[M]
W735	ERJ3GEY0R00V	CHIP JUMPER	[M]
W736	ERJ3GEY0R00V	CHIP JUMPER	[M]
W737	ERJ3GEY0R00V	CHIP JUMPER	[M]
W738	ERJ6GEY0R00V	CHIP JUMPER	[M]
W739	ERJ3GEY0R00V	CHIP JUMPER	[M]
W740	ERJ6GEY0R00V	CHIP JUMPER	[M]
W741	ERJ6GEY0R00V	CHIP JUMPER	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
W742	ERJ6GEY0R00V	CHIP JUMPER	[M]
W743	ERJ6GEY0R00V	CHIP JUMPER	[M]
W744	ERJ3GEY0R00V	CHIP JUMPER	[M]
W745	ERJ6GEY0R00V	CHIP JUMPER	[M]
W746	ERJ3GEY0R00V	CHIP JUMPER	[M]
W747	ERJ3GEY0R00V	CHIP JUMPER	[M]
W748	ERJ3GEY0R00V	CHIP JUMPER	[M]
W749	ERJ3GEY0R00V	CHIP JUMPER	[M]
W750	ERJ8GEY0R00V	CHIP JUMPER	[M]
W751	ERJ8GEY0R00V	CHIP JUMPER	[M]
W752	ERJ6GEY0R00V	CHIP JUMPER	[M]
W753	ERJ8GEY0R00V	CHIP JUMPER	[M]
W754	ERJ8GEY0R00V	CHIP JUMPER	[M]
W755	ERJ8GEY0R00V	CHIP JUMPER	[M]
W756	ERJ8GEY0R00V	CHIP JUMPER	[M]
W757	ERJ8GEY0R00V	CHIP JUMPER	[M]
W758	ERJ6GEY0R00V	CHIP JUMPER	[M]
W759	ERJ8GEY0R00V	CHIP JUMPER	[M]
W760	ERJ3GEY0R00V	CHIP JUMPER	[M]
W761	ERJ3GEY0R00V	CHIP JUMPER	[M]
W762	ERJ3GEY0R00V	CHIP JUMPER	[M]
W763	ERJ3GEY0R00V	CHIP JUMPER	[M]
W764	ERJ3GEY0R00V	CHIP JUMPER	[M]
W765	ERJ3GEY0R00V	CHIP JUMPER	[M]
W766	ERJ3GEY0R00V	CHIP JUMPER	[M]
W767	ERJ6GEY0R00V	CHIP JUMPER	[M]
W768	ERJ3GEY0R00V	CHIP JUMPER	[M]
W769	ERJ6GEY0R00V	CHIP JUMPER	[M]
W770	ERJ3GEY0R00V	CHIP JUMPER	[M]
W771	ERJ3GEY0R00V	CHIP JUMPER	[M]
W772	ERJ3GEY0R00V	CHIP JUMPER	[M]
W773	ERJ6GEY0R00V	CHIP JUMPER	[M]
W774	ERJ6GEY0R00V	CHIP JUMPER	[M]
W775	ERJ3GEY0R00V	CHIP JUMPER	[M]
W776	ERJ6GEY0R00V	CHIP JUMPER	[M]
W777	ERJ3GEY0R00V	CHIP JUMPER	[M]
W778	ERJ6GEY0R00V	CHIP JUMPER	[M]
W779	ERJ6GEY0R00V	CHIP JUMPER	[M]
W780	ERJ3GEY0R00V	CHIP JUMPER	[M]
W781	ERJ3GEY0R00V	CHIP JUMPER	[M]
W782	ERJ3GEY0R00V	CHIP JUMPER	[M]
W784	ERJ3GEY0R00V	CHIP JUMPER	[M]
W785	ERJ6GEY0R00V	CHIP JUMPER	[M]
W786	ERJ3GEY0R00V	CHIP JUMPER	[M]
W787	ERJ6GEY0R00V	CHIP JUMPER	[M]
W788	ERJ3GEY0R00V	CHIP JUMPER	[M]
W789	ERJ3GEY0R00V	CHIP JUMPER	[M]
W790	ERJ3GEY0R00V	CHIP JUMPER	[M]
W791	ERJ3GEY0R00V	CHIP JUMPER	[M]
W792	ERJ6GEY0R00V	CHIP JUMPER	[M]
W793	ERJ3GEY0R00V	CHIP JUMPER	[M]
W794	ERJ3GEY0R00V	CHIP JUMPER	[M]
W795	ERJ3GEY0R00V	CHIP JUMPER	[M]
W796	ERJ3GEY0R00V	CHIP JUMPER	[M]
W797	ERJ3GEY0R00V	CHIP JUMPER	[M]
W798	ERJ3GEY0R00V	CHIP JUMPER	[M]
W799	ERJ3GEY0R00V	CHIP JUMPER	[M]
W800	ERJ3GEY0R00V	CHIP JUMPER	[M]
W801	ERJ3GEY0R00V	CHIP JUMPER	[M]
W802	ERJ6GEY0R00V	CHIP JUMPER	[M]
W803	ERJ6GEY0R00V	CHIP JUMPER	[M]
W804	ERJ3GEY0R00V	CHIP JUMPER	[M]
W805	ERJ3GEY0R00V	CHIP JUMPER	[M]
W806	ERJ8GEY0R00V	CHIP JUMPER	[M]
W807	ERJ8GEY0R00V	CHIP JUMPER	[M]
W808	ERJ8GEY0R00V	CHIP JUMPER	[M]
W809	ERJ8GEY0R00V	CHIP JUMPER	[M]
W810	ERJ6GEY0R00V	CHIP JUMPER	[M]
W811	ERJ6GEY0R00V	CHIP JUMPER	[M]
W812	ERJ6GEY0R00V	CHIP JUMPER	[M]
W813	ERJ6GEY0R00V	CHIP JUMPER	[M]
		PACKING MATERIALS	

Ref. No.	Part No.	Part Name & Description	Remarks
P1	RPG7878-1	PACKING CASE	[M]EE
P1	RPG7879-1	PACKING CASE	[M]GN
P1	RPG7880-1	PACKING CASE	[M]GCS
P1	RPG7881-1	PACKING CASE	[M]GC
P2	RPN1860	CUSHION	[M]
P3	VPF1122-1	POLYBAG	[M]
		ACCESSORIES	
A1	EUR7659YK0	REMOTE CONTROL	[M]EE
A1	EUR7659YJ0	REMOTE CONTROL	[M]GN
A1	EUR7659YL0	REMOTE CONTROL	[M]GCS/GC
A1-1	UR76EC5903A	R/C BATTERY COVER	[M]
A2	K2CJ2DA00008	AC CORD	[M]GN ⚠
A2	K2CQ2CA00006	AC CORD	[M]GCS/GC/EE ⚠
A2	K2CT3CA00004	AC CORD	[M]GC ⚠
A3	RQTV0136-1	O/I BOOK (En)	[M] GC/GCS/GN
A3	RQTV0137-1	O/I BOOK (En)	[M]GC
A3	RQTV0138-1	O/I BOOK (En)	[M]GCS
A3	RQTV0139-1	O/I BOOK (Ru/Ur)	[M]EE
A3	RQTV0140-1	O/I BOOK (En)	[M]EE
A4	K1TWACC00001	RF CABLE	[M]
A5	K2KA6BA00003	PHONE CABLE	[M]
A6	RQCAV0013	SET UP GUIDE	[M]GN
		RESISTORS	
R1501	D0GB273JA007	27K 1/16W	[M]
R1502	D0GB273JA007	27K 1/16W	[M]
R1503	D0AE151JA048	150 1/4W	[M]
R1511	D0GB273JA007	27K 1/16W	[M]
R1512	D0GB273JA007	27K 1/16W	[M]
R1513	ERJ6GEYJ121V	120 1/10W	[M]
R2001	D0GB392JA007	3.9K 1/16W	[M]
R2002	D0GB105JA007	1M 1/16W	[M]
R2099	ERJ3GEYJ682V	6.8K 1/16W	[M]
R2501	ERJ6GEYJ1R2V	1.2 1/10W	[M]
R2502	ERJ6GEYJ1R5V	1.5 1/10W	[M]
R2503	ERDS2TJ822T	8.2K 1/4W	[M]
R2514	D0GB221JA041	220 1/16W	[M]
R2515	D0GB221JA041	220 1/16W	[M]
R2516	D0GB221JA041	220 1/16W	[M]
R2520	D0GB183JA007	18K 1/16W	[M]
R2521	ERJ3GEYJ102V	1K 1/16W	[M]
R2551	ERJ3GEYJ103V	10K 1/16W	[M]
R2552	ERJ3GEYJ103V	10K 1/16W	[M]
R2561	ERJ3GEYJ102V	1K 1/16W	[M]
R2562	D0GB473JA041	47K 1/16W	[M]
R2563	ERJ3GEYJ102V	1K 1/16W	[M]
R2564	D0GB101JA007	100 1/16W	[M]
R2565	D0GB101JA007	100 1/16W	[M]
R3001	D0GB152JA007	1.5K 1/16W	[M]
R3002	ERJ3GEYJ622V	6.2K 1/16W	[M]
R3005	D0GB272JA007	2.7K 1/16W	[M]
R3006	ERJ3GEYJ102V	1K 1/16W	[M]
R3009	D0GB153JA007	15K 1/16W	[M]
R3010	ERJ3GEYJ682V	6.8K 1/16W	[M]
R3013	D0GB273JA007	27K 1/16W	[M]
R3014	D0GB471JA041	470 1/16W	[M]
R3017	ERJ3GEYJ102V	1K 1/16W	[M]
R3030	D0GB106JA007	10M 1/16W	[M]
R3031	D0GB331JA007	330 1/16W	[M]
R3032	D0GB392JA007	3.9K 1/16W	[M]
R3701	D0GB105JA007	1M 1/16W	[M]
R3702	D0GB105JA007	1M 1/16W	[M]
R3703	D0GB221JA041	220 1/16W	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
R3704	D0GB221JA041	220 1/16W	[M]
R3705	D0GB105JA007	1M 1/16W	[M]
R3706	ERJ3GEYJ103V	10K 1/16W	[M]
R3707	ERJ3GEYJ103V	10K 1/16W	[M]
R3708	D0GB563JA007	56K 1/16W	[M]
R3709	ERJ3GEYJ103V	10K 1/16W	[M]
R3711	ERJ3GEYJ103V	10K 1/16W	[M]
R3712	ERJ3GEYJ103V	10K 1/16W	[M]
R3801	ERJ3GEYJ750V	75 1/16W	[M]
R3802	ERJ3GEYJ750V	75 1/16W	[M]
R3803	ERJ3GEYJ750V	75 1/16W	[M]
R3804	ERJ3GEYJ102V	1K 1/16W	[M]
R3907	ERJ3GEYF750V	75 1/16W	[M]
R3908	ERJ3GEYF750V	75 1/16W	[M]
R3909	ERJ3GEYF750V	75 1/16W	[M]
R3912	ERJ3GEYF750V	75 1/16W	[M]
R3913	ERJ3GEYF750V	75 1/16W	[M]
R3914	ERJ3GEYF750V	75 1/16W	[M]
R3915	ERJ3GEYF750V	75 1/16W	[M]
R3924	ERJ3GEYJ750V	75 1/16W	[M]
R3926	ERJ3GEYJ102V	1K 1/16W	[M]
R3928	ERJ3GEYJ750V	75 1/16W	[M]
R3929	ERJ3GEYJ750V	75 1/16W	[M]
R4001	ERJ3GEYJ102V	1K 1/16W	[M]
R4003	D0GB153JA007	15K 1/16W	[M]
R4004	D0GB271JA007	270 1/16W	[M]
R4005	ERJ3GEYJ102V	1K 1/16W	[M]
R4006	D0GB153JA007	15K 1/16W	[M]
R4007	D0GB153JA007	15K 1/16W	[M]
R4008	D0GB474JA041	470K 1/16W	[M]
R4011	D0GB472JA041	4.7K 1/16W	[M]
R4012	D0GB153JA007	15K 1/16W	[M]
R4013	D0GB183JA007	18K 1/16W	[M]
R4014	D0GB333JA007	33K 1/16W	[M]
R4081	ERJ3GEYJ103V	10K 1/16W	[M]
R4082	D0GB332JA007	3.3K 1/16W	[M]
R4083	ERJ3GEY0R00V	0 1/16W	[M]
R4086	D0GB222JA041	2.2K 1/16W	[M]
R4087	D0GB222JA041	2.2K 1/16W	[M]
R4305	D0GB471JA041	470 1/16W	[M]
R4306	D0GB471JA041	470 1/16W	[M]
R4500	ERJ3GEY0R00V	0 1/16W	[M]
R4501	D0GB683JA007	68K 1/16W	[M]
R4502	D0GB563JA007	56K 1/16W	[M]
R4503	D0GB563JA007	56K 1/16W	[M]
R4504	ERDS2TJ821T	820 1/4W	[M]
R4505	ERJ3GEYJ432V	4.3K 1/16W	[M]
R4506	ERJ3GEYJ432V	4.3K 1/16W	[M]
R4507	D0GB472JA041	4.7K 1/16W	[M]
R4508	D0GB472JA041	4.7K 1/16W	[M]
R4509	D0GB563JA007	56K 1/16W	[M]
R4510	ERJ3GEYJ432V	4.3K 1/16W	[M]
R4511	D0GB563JA007	56K 1/16W	[M]
R4512	ERJ3GEYJ432V	4.3K 1/16W	[M]
R4513	D0GB472JA041	4.7K 1/16W	[M]
R4515	D0GB683JA007	68K 1/16W	[M]
R4518	D0GB223JA041	22K 1/16W	[M]
R4519	D0GB223JA041	22K 1/16W	[M]
R4520	D0GB472JA041	4.7K 1/16W	[M]
R4521	ERJ3GEYJ511V	510 1/16W	[M]
R4522	ERJ3GEYJ511V	510 1/16W	[M]
R4525	ERJ3GEYJ102V	1K 1/16W	[M]
R4526	D0GB393JA007	39K 1/16W	[M]
R4527	ERJ3GEYJ682V	6.8K 1/16W	[M]
R4529	ERJ3GEYJ681V	680 1/16W	[M]
R4534	D0GB124JA007	120K 1/16W	[M]
R4538	D0GB333JA007	33K 1/16W	[M]
R4539	ERJ3GEYJ102V	1K 1/16W	[M]
R4540	ERJ3GEYJ102V	1K 1/16W	[M]
R4553	D0GB272JA007	2.7K 1/16W	[M]
R4557	D0GB272JA007	2.7K 1/16W	[M]
R4801	ERJ3GEYJ681V	680 1/16W	[M]
R4802	ERJ3GEYJ681V	680 1/16W	[M]
R4803	ERJ3GEYJ681V	680 1/16W	[M]
R4804	ERJ3GEYJ681V	680 1/16W	[M]
R4805	D0GB222JA041	2.2K 1/16W	[M]
R4806	D0GB471JA041	470 1/16W	[M]
R4807	D0GB471JA041	470 1/16W	[M]
R4808	D0GB243JA007	24K 1/16W	[M]
R4809	D0GB243JA007	24K 1/16W	[M]
R4810	D0GB243JA007	24K 1/16W	[M]
R4811	D0GB243JA007	24K 1/16W	[M]
R4812	D0GB273JA007	27K 1/16W	[M]
R4813	D0GB243JA007	24K 1/16W	[M]
R4814	D0GB273JA007	27K 1/16W	[M]
R4815	ERJ3GEYJ102V	1K 1/16W	[M]
R4816	ERJ3GEYJ102V	1K 1/16W	[M]
R4817	D0GB243JA007	24K 1/16W	[M]
R4818	D0GB243JA007	24K 1/16W	[M]
R4819	D0GB243JA007	24K 1/16W	[M]
R4820	D0GB243JA007	24K 1/16W	[M]
R4833	D0GB243JA007	24K 1/16W	[M]
R4834	D0HB392ZA002	3.9K 3W	[M]
R4835	D0HB392ZA002	3.9K 3W	[M]
R4836	D0HB392ZA002	3.9K 3W	[M]
R4837	D0HB392ZA002	3.9K 3W	[M]
R4838	D0HB392ZA002	3.9K 3W	[M]
R4841	D0GB473JA041	47K 1/16W	[M]
R4842	D0GB473JA041	47K 1/16W	[M]
R4843	D0HB392ZA002	3.9K 3W	[M]
R4844	D0HB392ZA002	3.9K 3W	[M]
R4845	D0HB392ZA002	3.9K 3W	[M]
R4855	ERJ3GEY0R00V	0 1/16W	[M]
R4856	ERJ3GEY0R00V	0 1/16W	[M]
R4858	D0GB221JA041	220 1/16W	[M]
R4859	D0GB471JA041	470 1/16W	[M]
R4860	D0GB221JA041	220 1/16W	[M]
R4861	D0GB471JA041	470 1/16W	[M]
R4862	D0GB104JA007	100K 1/16W	[M]
R4863	D0GB104JA007	100K 1/16W	[M]
R4864	D0HB202ZA002	2K 3W	[M]
R4865	D0HB202ZA002	2K 3W	[M]
R4866	D0HB123ZA002	12K 3W	[M]
R4867	D0HB123ZA002	12K 3W	[M]
R4868	ERJ3GEYJ103V	10K 1/16W	[M]
R4869	ERJ3GEYJ103V	10K 1/16W	[M]
R6001	ERJ3GEYJ102V	1K 1/16W	[M]
R6002	ERJ3GEYJ102V	1K 1/16W	[M]
R6003	ERJ3GEYJ103V	10K 1/16W	[M]
R6006	D0GB183JA007	18K 1/16W	[M]
R6008	D0GB222JA041	2.2K 1/16W	[M]
R6009	ERJ3GEYJ103V	10K 1/16W	[M]
R6010	ERJ3GEYJ103V	10K 1/16W	[M]
R6012	D0GB221JA041	220 1/16W	[M]
R6013	D0GB221JA041	220 1/16W	[M]
R6015	D0GB101JA007	100 1/16W	[M]
R6016	ERJ3GEYJ102V	1K 1/16W	[M]
R6017	D0GB222JA041	2.2K 1/16W	[M]
R6018	ERJ3GEYJ102V	1K 1/16W	[M]
R6020	D0GB221JA041	220 1/16W	[M]
R6021	D0GB221JA041	220 1/16W	[M]
R6022	D0GB221JA041	220 1/16W	[M]
R6023	D0GB221JA041	220 1/16W	[M]
R6024	D0GB221JA041	220 1/16W	[M]
R6026	ERJ3GEYJ103V	10K 1/16W	[M]
R6027	ERJ3GEYJ103V	10K 1/16W	[M]
R6028	ERJ3GEYJ103V	10K 1/16W	[M]
R6029	D0GB221JA041	220 1/16W	[M]
R6031	D0GB223JA041	22K 1/16W	[M]
R6032	D0GB101JA007	100 1/16W	[M]
R6101	D0GB105JA007	1M 1/16W	[M]
R6102	D0GB471JA041	470 1/16W	[M]
R6103	D0GB181JA007	180 1/16W	[M]
R6116	D0GB152JA007	1.5K 1/16W	[M]EE
R6118	D0GB473JA041	47K 1/16W	[M]EE
R6201	D0GB332JA007	3.3K 1/16W	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
R6801	D0GB104JA007	100K 1/16W	[M]
R6802	ERJ3GEY0R00V	0 1/16W	[M]
R6803	D0GB474JA041	470K 1/16W	[M]
R7301	ERJ3GEY0R00V	0 1/16W	[M]
R7304	D0GB101JA007	100 1/16W	[M]
R7307	ERJ3GEY0R00V	0 1/16W	[M]
R7309	ERJ3GEYJ103V	10K 1/16W	[M]
R7310	D0GB221JA041	220 1/16W	[M]
R7312	ERJ3GEYF221V	220 1/16W	[M]
R7313	ERJ3GEYF221V	220 1/16W	[M]
R7314	ERJ3GEY0R00V	0 1/16W	[M]
R7315	ERJ3GEY0R00V	0 1/16W	[M]
R7317	J0JCC0000103	INDUCTOR	[M]
R7319	J0JCC0000103	INDUCTOR	[M]
R7322	ERJ3GEY0R00V	0 1/16W	[M]
R7324	D0GB101JA007	100 1/16W	[M]
R7325	D0GB101JA007	100 1/16W	[M]
R7401	D0GB272JA007	2.7K 1/16W	[M]
R7402	D0AE331JA048	330 1/4W	[M]
R7403	D0AE331JA048	330 1/4W	[M]
R7405	D0GB471JA041	470 1/16W	[M]
R7406	D0GB471JA041	470 1/16W	[M]
R7409	ERJ3GEY0R00V	0 1/16W	[M]
R7410	D0GB221JA041	220 1/16W	[M]
R7411	D0GB221JA041	220 1/16W	[M]
R7414	ERJ3GEYJ681V	680 1/16W	[M]
R7415	ERJ3GEY0R00V	0 1/16W	[M]
R7423	ERJ3GEY0R00V	0 1/16W	[M]
R7433	D0GB104JA007	100K 1/16W	[M]
R7503	D0GB101JA007	100 1/16W	[M]
R7504	D0GB101JA007	100 1/16W	[M]
R7505	D0GB101JA007	100 1/16W	[M]
R7506	D0GB101JA007	100 1/16W	[M]
R7507	D0GB101JA007	100 1/16W	[M]
R7509	D0GB332JA007	3.3K 1/16W	[M]
R7510	D0GB101JA007	100 1/16W	[M]
R7511	ERJ3GEYJ822V	8.2K 1/16W	[M]
R7512	ERJ3GEYJ822V	8.2K 1/16W	[M]
R7513	ERJ3GEYJ822V	8.2K 1/16W	[M]
R7514	D0GB101JA007	100 1/16W	[M]
R7515	D0GB101JA007	100 1/16W	[M]
R7516	D0GB101JA007	100 1/16W	[M]
R7517	ERJ3GEY0R00V	0 1/16W	[M]
R7519	D0GB181JA007	180 1/16W	[M]
R7520	D0GB223JA041	22K 1/16W	[M]
R7524	D0GB473JA041	47K 1/16W	[M]
R7526	D0GB153JA007	15K 1/16W	[M]
R7527	D0GB104JA007	100K 1/16W	[M]
R7528	D0GB101JA007	100 1/16W	[M]
R7529	D0GB101JA007	100 1/16W	[M]
R7530	ERJ3GEY0R00V	0 1/16W	[M]
R7543	D0GB223JA041	22K 1/16W	[M]
R7544	D0GB472JA041	4.7K 1/16W	[M]
R7555	D0GB101JA007	100 1/16W	[M]
R7556	ERJ3GEYJ103V	10K 1/16W	[M]
R7563	D0GB101JA007	100 1/16W	[M]
R7564	D0GB101JA007	100 1/16W	[M]
R7565	D0GB101JA007	100 1/16W	[M]
R7566	ERJ3GEYJ103V	10K 1/16W	[M]
R7567	D0GB101JA007	100 1/16W	[M]
R7568	D0GB101JA007	100 1/16W	[M]
R7569	ERJ3GEYJ103V	10K 1/16W	[M]
R7571	D0GB473JA041	47K 1/16W	[M]
R7572	D0GB223JA041	22K 1/16W	[M]
R7577	D0GB101JA007	100 1/16W	[M]
R7578	ERJ3GEYJ102V	1K 1/16W	[M]
R7579	D0GB331JA007	330 1/16W	[M]
R7580	ERJ3GEYG153V	15K 1/16W	[M]
R7581	ERJ3GEYJ102V	1K 1/16W	[M]
R7582	ERJ3GEYG562V	5.6K 1/16W	[M]
R7583	D0GB104JA007	100K 1/16W	[M]
R7584	D0GB104JA007	100K 1/16W	[M]
R7585	ERJ3GEYJ102V	1K 1/16W	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
R7586	D0GB392JA007	3.9K 1/16W	[M]
R7590	D0GB472JA041	4.7K 1/16W	[M]
R7591	ERJ3GEYG101V	100 1/16W	[M]
R7592	D0GB472JA041	4.7K 1/16W	[M]
R7594	ERJ3GEYG152V	1.5K 1/16W	[M]
R7596	D0GB472JA041	4.7K 1/16W	[M]
R7597	ERJ3GEYG393V	39K 1/16W	[M]
R7598	ERJ3GEYJ433V	43K 1/16W	[M]
R7702	D0GB391JA041	390 1/16W	[M]
R7703	D0GB391JA041	390 1/16W	[M]
R7704	D0GB271JA007	270 1/16W	[M]
R7707	D0GB152JA007	1.5K 1/16W	[M]
R7708	D0GB152JA007	1.5K 1/16W	[M]
R7709	D0GB152JA007	1.5K 1/16W	[M]
R7710	D0GB222JA041	2.2K 1/16W	[M]
R7715	D0GB221JA041	220 1/16W	[M]
R7717	ERJ3GEY0R00V	0 1/16W	[M]
R7718	ERJ3GEY0R00V	0 1/16W	[M]
R7719	D0GB101JA007	100 1/16W	[M]
R7720	D0GB101JA007	100 1/16W	[M]
R7721	D0GB101JA007	100 1/16W	[M]
R7722	D0GB473JA041	47K 1/16W	[M]
R7723	ERJ3GEY0R00V	0 1/16W	[M]
R7724	ERJ3GEYJ103V	10K 1/16W	[M]
R7725	D0GB273JA007	27K 1/16W	[M]
R7801	D0GB272JA007	2.7K 1/16W	[M]
R7802	ERJ3GEYJ822V	8.2K 1/16W	[M]
R7803	D0GB272JA007	2.7K 1/16W	[M]
R7804	D0GB392JA007	3.9K 1/16W	[M]
R7805	D0GB392JA007	3.9K 1/16W	[M]
R7806	D0GB392JA007	3.9K 1/16W	[M]
R9783	D0GB104JA007	100K 1/16W	[M]
R11202	ERJ6GEYJ103V	10K 1/10W	[M]
R11203	ERJ6GEYG153V	15K 1/10W	[M]
R11204	ERJ6GEYG301V	300 1/10W	[M]
R11208	ERJ6GEYJ220V	22 1/10W	[M]
R11217	ERJ6GEYJ100V	10 1/10W	[M] ⚠
R11218	ERJ6GEYJ100V	10 1/10W	[M] ⚠
R11219	ERJ6GEYJ220V	22 1/10W	[M]
R11220	ERJ6GEYJ822V	8.2K 1/10W	[M]
R11222	ERJ6GEYG271V	270 1/10W	[M]
R11223	ERJ6GEYG153V	15K 1/10W	[M]
R11307	ERJ6GEYJ103V	10K 1/10W	[M]
R11308	ERJ6GEYG133V	13K 1/10W	[M]
R11309	ERJ6GEYG201V	200 1/10W	[M]
R11321	ERJ6GEYJ6R8V	6.8 1/10W	[M]
R11322	ERJ6GEYJ6R8V	6.8 1/10W	[M]
R11323	ERJ6GEYJ103V	10K 1/10W	[M]
R11324	ERJ6GEYG821V	820 1/10W	[M]
R11325	ERJ6GEYG133V	13K 1/10W	[M]
R11506	ERJ6GEYJ242V	2.4K 1/10W	[M]
R11507	ERJ6GEYJ102V	1K 1/10W	[M]
R11508	ERJ6GEYJ103V	10K 1/10W	[M] ⚠
R11509	ERJ6GEYJ102V	1K 1/10W	[M]
R11510	ERJ6GEYG563V	56K 1/10W	[M]
R11511	ERJ6GEYJ103V	10K 1/10W	[M]
R11512	ERJ6GEYG242V	2.4K 1/10W	[M]
R11513	ERJ6GEYG301V	300 1/10W	[M]
R11514	ERJ6GEYG912V	9.1K 1/10W	[M]
R11515	ERJ6GEYJ472V	4.7K 1/10W	[M] ⚠
R11601	ERJ6GEYJ472V	4.7K 1/10W	[M]
R11602	ERJ6GEYJ472V	4.7K 1/10W	[M]
R11604	ERJ6GEYJ513V	51K 1/10W	[M]
R11605	D1BFR0150001	0.FR 1/16W	[M]
R11606	ERJ6RBD153V	15K 1/10W	[M]
R11607	ERJ6RBD911V	910 1/10W	[M]
R11608	ERJ6RBD512V	5.1K 1/10W	[M]
R11610	ERJ6GEYJ103V	10K 1/10W	[M]
R11701	ERJ6GEYJ681V	680 1/10W	[M]
R11702	ERJ6GEYJ102V	1K 1/10W	[M]
R11703	ERJ6GEYJ102V	1K 1/10W	[M]
R11704	ERJ6GEYJ103V	10K 1/10W	[M]
R11706	ERJ6GEYG242V	2.4K 1/10W	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
R11707	ERJ6GEYG821V	820 1/10W	[M]
R11708	ERJ6GEYG101V	100 1/10W	[M]
R11709	ERJ6GEYG242V	2.4K 1/10W	[M]
R11801	ERJ6GEYJ513V	51K 1/10W	[M]
R11802	D1BFR0270001	0.FR 1/16W	[M]
R11803	ERJ6RBD221V	220 1/10W	[M]
R11804	ERJ6RBD123V	12K 1/10W	[M]
R11805	ERJ6RBD562V	5.6K 1/10W	[M]
R11806	ERJ6GEYJ103V	10K 1/10W	[M] ⚠
R11807	ERJ6GEYJ471V	470 1/10W	[M]
R31509	D0AE221JA048	220 1/4W	[M]
R33501	D0GB472JA041	4.7K 1/16W	[M]
R33502	D0GB472JA041	4.7K 1/16W	[M]
R33503	D0GB472JA041	4.7K 1/16W	[M]
R33504	D0GB472JA041	4.7K 1/16W	[M]
R33505	D0GB472JA041	4.7K 1/16W	[M]
R37001	D0GB183JA007	18K 1/16W	[M]
R37002	ERJ3GEYJ103V	10K 1/16W	[M]
R37003	D0GB821JA007	820 1/16W	[M]
R37004	D0GB101JA007	100 1/16W	[M]
R37005	D0GB101JA007	100 1/16W	[M]
R37006	D0GB101JA007	100 1/16W	[M]
R37007	D0GB101JA007	100 1/16W	[M]
R37009	D0GB101JA007	100 1/16W	[M]
R37010	D0GB101JA007	100 1/16W	[M]
R37014	D0GB101JA007	100 1/16W	[M]
R37015	ERJ3GEY0R00V	0 1/16W	[M]
R37502	D0GB472JA041	4.7K 1/16W	[M]
R37503	D0GB472JA041	4.7K 1/16W	[M]
R37521	D0GB472JA041	4.7K 1/16W	[M]
R45001	ERJ3GEY0R00V	0 1/16W	[M]
R45002	ERJ3GEY0R00V	0 1/16W	[M]
R45008	ERJ3GEYJ102V	1K 1/16W	[M]
R45009	ERJ3GEYJ102V	1K 1/16W	[M]
R45014	D0GB473JA041	47K 1/16W	[M]
R45015	D0GB473JA041	47K 1/16W	[M]
R45016	D0GB221JA041	220 1/16W	[M]
K2597	ERJ3GEY0R00V	CHIP JUMPER	[M]
K3002	ERJ3GEY0R00V	CHIP JUMPER	[M]
K3004	ERJ3GEY0R00V	CHIP JUMPER	[M]
K3008	ERJ3GEY0R00V	CHIP JUMPER	[M]
K3010	ERJ3GEY0R00V	CHIP JUMPER	[M]
K3012	ERJ3GEY0R00V	CHIP JUMPER	[M]
K3016	ERJ3GEY0R00V	CHIP JUMPER	[M]
K3701	ERJ3GEY0R00V	CHIP JUMPER	[M]
K3703	ERJ3GEY0R00V	CHIP JUMPER	[M]
K4081	ERJ3GEY0R00V	CHIP JUMPER	[M]
K4506	ERJ3GEY0R00V	CHIP JUMPER	[M]
K4801	ERJ3GEY0R00V	CHIP JUMPER	[M]
K4802	ERJ3GEY0R00V	CHIP JUMPER	[M]
K7301	ERJ3GEY0R00V	CHIP JUMPER	[M]
K7302	ERJ3GEY0R00V	CHIP JUMPER	[M]
K7303	ERJ3GEY0R00V	CHIP JUMPER	[M]
K7305	ERJ3GEY0R00V	CHIP JUMPER	[M]
K31501	ERJ3GEY0R00V	CHIP JUMPER	[M]
K31502	ERJ3GEY0R00V	CHIP JUMPER	[M]
K45003	ERJ3GEY0R00V	CHIP JUMPER	[M]
K45004	ERJ3GEY0R00V	CHIP JUMPER	[M]
		CAPACITORS	
C2001	ECJ1VC1H330J	33P 50V	[M]
C2002	F1H0J1050010	1 6.3V	[M]
C2003	ECJ1VF1A105Z	1 10V	[M]
C2051	F1J0J106A014	10 6.3V	[M]
C2052	F1J0J106A014	10 6.3V	[M]
C2053	ECEA1CKS100B	10 16V	[M]
C2054	F1H1H392A013	3900P 50V	[M]
C2055	F1H1C104A008	0.1 16V	[M]
C2099	ECJ1VC1H681J	680P 50V	[M]
C2501	F1H1C104A008	0.1 16V	[M]
C2502	ECA1AAK221XB	220 10V	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
C2504	F1H1E223A002	0.022 25V	[M]
C2505	F1H1E223A002	0.022 25V	[M]
C2506	ECJ1VB1A224K	0.22 10V	[M]
C2507	F1H1H102A219	1000P 50V	[M]
C2508	ECJ1VB1H182K	1800P 50V	[M]
C2509	ECA1CAK220XB	22 16V	[M]
C2510	F1H1C104A041	0.1 16V	[M]
C2511	F1H1C104A041	0.1 16V	[M]
C2512	F1H1C104A041	0.1 16V	[M]
C2513	ECJ1VF1A105Z	1 10V	[M]
C2515	F1H1H103A220	0.01 50V	[M]
C2518	F1H1H103A220	0.01 50V	[M]
C2519	F1H1H103A220	0.01 50V	[M]
C2551	ECJ1VB1C473K	0.047 16V	[M]
C2552	ECJ1VB1C683K	0.068 16V	[M]
C2561	ECJ1VB1C683K	0.068 16V	[M]
C2562	ECJ1VB1C473K	0.047 16V	[M]
C2571	ECA1CAM221XB	220 16V	[M]
C3001	ECJ1VC1H151J	150P 50V	[M]
C3002	F1H1C104A041	0.1 16V	[M]
C3003	F1H1C104A041	0.1 16V	[M]
C3005	ECJ1VC1H390J	39P 50V	[M]
C3006	F1H1C104A041	0.1 16V	[M]
C3007	F1H0J1050010	1 6.3V	[M]
C3008	ECA1HAK4R7XB	4.7 50V	[M]
C3009	F1H0J1050010	1 6.3V	[M]
C3010	F1H0J1050010	1 6.3V	[M]
C3011	F1H1C104A041	0.1 16V	[M]
C3012	F2A0J470A245	47P 6.3V	[M]
C3014	F1H1C104A041	0.1 16V	[M]
C3015	F1H0J1050010	1 6.3V	[M]
C3017	F1H1C104A041	0.1 16V	[M]
C3019	F1H1C104A041	0.1 16V	[M]
C3020	ECA1HAK3R3XB	3.3 50V	[M]
C3021	ECA1CAK100XB	10 16V	[M]
C3023	F1H1H103A219	0.01 50V	[M]
C3024	ECJ1VC1H331J	330P 50V	[M]
C3025	F1H1H103A220	0.01 50V	[M]
C3028	ECA1HAK4R7XB	4.7 50V	[M]
C3029	ECA1HAKR47XB	0.47 50V	[M]
C3030	F1H1E223A002	0.022 25V	[M]
C3031	F1H1C333A071	0.033 16V	[M]
C3032	ECA1HAK4R7XB	4.7 50V	[M]
C3033	F1H1C104A041	0.1 16V	[M]
C3034	ECA1HAK2R2XB	2.2 50V	[M]
C3035	ECJ1VB1H472K	4700P 50V	[M]
C3036	F2A0J470A245	47P 6.3V	[M]
C3037	F1H1C104A041	0.1 16V	[M]
C3038	ECJ1VC1H040C	4P 50V	[M]
C3039	ECA1HAK010XB	1 50V	[M]
C3040	F1H1H103A220	0.01 50V	[M]
C3041	F1H1H103A220	0.01 50V	[M]
C3042	ECA0JAK470XB	47 6.3V	[M]
C3043	F1H0J1050010	1 6.3V	[M]
C3044	F1H1C104A041	0.1 16V	[M]
C3048	F1H1H103A219	0.01 50V	[M]
C3050	F1H1C104A041	0.1 16V	[M]
C3051	F1H0J1050010	1 6.3V	[M]
C3052	F2A0J470A245	47P 6.3V	[M]
C3053	F1H1C104A041	0.1 16V	[M]
C3054	ECA1HAK010XB	1 50V	[M]
C3074	F1H1C104A041	0.1 16V	[M]
C3701	F2A0J470A245	47P 6.3V	[M]
C3702	F1H1C104A008	0.1 16V	[M]
C3704	F1H1C104A041	0.1 16V	[M]
C3705	F1H1H103A219	0.01 50V	[M]
C3706	F1H1C104A008	0.1 16V	[M]
C3707	ECEA0JKA220B	22 6.3V	[M]
C3709	F2A0J470A245	47P 6.3V	[M]
C3710	F1H1C104A041	0.1 16V	[M]
C3711	F1H1H103A220	0.01 50V	[M]
C3712	F1H0J1050010	1 6.3V	[M]
C3713	F1H0J1050010	1 6.3V	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
C3714	ECA1CAK100XB	10 16V	[M]
C3716	F1H0J1050010	1 6.3V	[M]
C3717	F1H0J1050010	1 6.3V	[M]
C3718	F1H1C104A041	0.1 16V	[M]
C3720	F1H1C104A041	0.1 16V	[M]
C3721	F1H0J1050010	1 6.3V	[M]
C3722	F1H0J1050010	1 6.3V	[M]
C3723	F1H0J1050010	1 6.3V	[M]
C3724	F1H1H103A220	0.01 50V	[M]
C3725	F1H1H103A220	0.01 50V	[M]
C3726	F1H1C104A008	0.1 16V	[M]
C3727	ECA0JM471B	470 6.3V	[M]
C3728	ECA0JM471B	470 6.3V	[M]
C3729	F1H0J1050010	1 6.3V	[M]
C3730	ECA0JM471B	470 6.3V	[M]
C3731	F1H0J1050010	1 6.3V	[M]
C3732	F1H1H103A220	0.01 50V	[M]
C3733	ECA0JM471B	470 6.3V	[M]
C3734	F2A0J470A245	47P 6.3V	[M]
C3735	ECA0JM471B	470 6.3V	[M]
C3749	F1H0J1050010	1 6.3V	[M]
C3801	F1H1H103A220	0.01 50V	[M]
C3918	F1H1C104A041	0.1 16V	[M]
C3919	F1H1H103A220	0.01 50V	[M]
C3933	F2A0J471A247	470P 6.3V	[M]
C4001	F2A1C1000018	10P 16V	[M]
C4004	ECJ1VB1H182K	1800P 50V	[M]
C4005	ECEA0JKA220B	22 6.3V	[M]
C4006	ECA1HAK4R7XB	4.7 50V	[M]
C4007	ECJ1VB1H182K	1800P 50V	[M]
C4008	ECA1HAK3R3XB	3.3 50V	[M]
C4009	ECEA0JKA330B	33 6.3V	[M]
C4011	F1H1H103A219	0.01 50V	[M]
C4012	ECA1HAK4R7XB	4.7 50V	[M]
C4013	F1H1H103A220	0.01 50V	[M]
C4017	ECA1CAK100XB	10 16V	[M]
C4019	ECA1CAK100XB	10 16V	[M]
C4081	F1H1E223A002	0.022 25V	[M]
C4082	F1H1H471A219	470P 50V	[M]
C4083	F2A0J470A245	47P 6.3V	[M]
C4084	ECJ1VB1H182K	1800P 50V	[M]
C4086	ECQB1H333JF3	0.033 50V	[M]
C4303	F1H1H101A230	100P 50V	[M]
C4304	F1H1H101A230	100P 50V	[M]
C4305	F1H1H102A219	1000P 50V	[M]
C4306	F1H1H102A219	1000P 50V	[M]
C4501	ECQB1H473JF3	0.047 50V	[M]
C4502	ECA1CAK100XB	10 16V	[M]
C4503	ECA1CAK100XB	10 16V	[M]
C4504	ECA1CAK100XB	10 16V	[M]
C4505	ECEA0JKA330B	33 6.3V	[M]
C4506	ECA1CAK100XB	10 16V	[M]
C4507	ECEA0JKA220B	22 6.3V	[M]
C4508	F1H1C333A071	0.033 16V	[M]
C4509	F1H1H103A220	0.01 50V	[M]
C4510	F1H1H103A220	0.01 50V	[M]
C4511	F1H1C104A041	0.1 16V	[M]
C4512	ECJ1VB1A224K	0.22 10V	[M]
C4513	ECEA0JKA220B	22 6.3V	[M]
C4514	ECA1CAK100XB	10 16V	[M]
C4515	ECEA0JKA330B	33 6.3V	[M]
C4516	ECA1CAK100XB	10 16V	[M]
C4517	ECEA0JKA220B	22 6.3V	[M]
C4518	F1H1C104A008	0.1 16V	[M]
C4519	F1H1C104A008	0.1 16V	[M]
C4520	ECEA0JKA220B	22 6.3V	[M]
C4521	ECA1CAK100XB	10 16V	[M]
C4522	ECQB1H473JF3	0.047 50V	[M]
C4524	F1H1C104A041	0.1 16V	[M]
C4525	ECA1CAK101XB	100 16V	[M]
C4526	ECA1CAK100XB	10 16V	[M]
C4534	ECQB1H153JF3	0.015 50V	[M]
C4535	ECQB1H153JF3	0.015 50V	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
C4538	F1H1H103A220	0.01 50V	[M]
C4541	F1H1H101A230	100P 50V	[M]
C4542	F1H1H101A230	100P 50V	[M]
C4773	D0GB472JA041	4.7K 1/16W	[M]
C4774	D0GB472JA041	4.7K 1/16W	[M]
C4801	ECJ1VC1H102J	1000P 50V	[M]
C4802	ECJ1VC1H102J	1000P 50V	[M]
C4803	ECA1HAK010XB	1 50V	[M]
C4804	ECA1HAK010XB	1 50V	[M]
C4805	ECA1CAK100XB	10 16V	[M]
C4806	ECA1CAK100XB	10 16V	[M]
C4807	ECA1HAK3R3XB	3.3 50V	[M]
C4808	ECA1HAK3R3XB	3.3 50V	[M]
C4809	ECA1CAK100XB	10 16V	[M]
C4810	ECA1HAK4R7XB	4.7 50V	[M]
C4811	ECA1HAKR47XB	0.47 50V	[M]
C4812	ECA1HAKR47XB	0.47 50V	[M]
C4813	ECA1CAK100XB	10 16V	[M]
C4814	ECJ1VB1C105K	1 16V	[M]
C4815	ECJ1VB1C105K	1 16V	[M]
C4819	ECA1CAK100XB	10 16V	[M]
C4820	ECA1CAK100XB	10 16V	[M]
C4822	ECA1CAK100XB	10 16V	[M]
C4824	ECA1CAK100XB	10 16V	[M]
C4825	ECA1CAK100XB	10 16V	[M]
C4826	ECA1HAKR47XB	0.47 50V	[M]
C4829	ECA1CAK100XB	10 16V	[M]
C4830	ECA1CAK100XB	10 16V	[M]
C4831	F1H1C104A041	0.1 16V	[M]
C4832	F2A0J470A599	47P 6.3V	[M]
C4833	ECA1HAKR47XB	0.47 50V	[M]
C4836	ECA1CAK100XB	10 16V	[M]
C4837	ECA1HAK010XB	1 50V	[M]
C4840	F1H1C104A041	0.1 16V	[M]
C4841	ECQV1H104JL3	0.1 50V	[M]
C4842	F1H1C104A041	0.1 16V	[M]
C4843	F2A1C471A236	470P 16V	[M]
C4844	F1H1C104A041	0.1 16V	[M]
C4845	F1H1C104A041	0.1 16V	[M]
C4846	F2A1C471A236	470P 16V	[M]
C5001	F1H1H103A219	0.01 50V	[M]
C5002	F1H1H103A219	0.01 50V	[M]
C5003	F1H1H103A219	0.01 50V	[M]
C5004	F1H1H103A219	0.01 50V	[M]
C5005	F1H1C104A041	0.1 16V	[M]
C5006	F2A0J101A245	100P 6.3V	[M]
C5007	F1H1C104A008	0.1 16V	[M]
C5008	F1H0J1050010	1 6.3V	[M]
C6001	ECJ1VC1H180J	18P 50V	[M]
C6002	ECJ1VC1H220J	22P 50V	[M]
C6003	F1H1C104A008	0.1 16V	[M]
C6004	F1H1H102A219	1000P 50V	[M]
C6005	ECEA1HKS3R3B	3.3 50V	[M]
C6008	F1H0J1050010	1 6.3V	[M]
C6009	F1H1H103A220	0.01 50V	[M]
C6010	ECJ1VC1H120J	12P 50V	[M]
C6011	ECJ1VC1H120J	12P 50V	[M]
C6012	F1H1C104A008	0.1 16V	[M]
C6015	F1H1C333A071	0.033 16V	[M]
C6016	F1H1H102A219	1000P 50V	[M]
C6019	F1J1H104A578	0.1 50V	[M]
C6020	F1J1H104A578	0.1 50V	[M]
C6100	F1H1C104A008	0.1 16V	[M]
C6101	ECA1AAK221XB	220 10V	[M]
C6102	ECJ1VF1A105Z	1 10V	[M]
C6103	ECJ1VC1H561J	560P 50V	[M]
C6104	F1H1H103A220	0.01 50V	[M]
C6105	F1H1H103A220	0.01 50V	[M]
C6114	ECJ1VC1H330J	33P 50V	[M]EE
C6116	F1H1C104A041	0.1 16V	[M]
C6308	ECJ1VB1C105K	1 16V	[M]
C6801	F1H1C104A008	0.1 16V	[M]
C7301	F1H1C104A008	0.1 16V	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
C7302	ERJ3GEY0R00V	0 1/16W	[M]
C7303	F2A0J101A013	100P 6.3V	[M]
C7305	F2A0J101A013	100P 6.3V	[M]
C7306	F1H1H103A220	0.01 50V	[M]
C7307	ECJ1VC1H100D	10P 50V	[M]
C7308	ECJ1VC1H100D	10P 50V	[M]
C7311	ECJ1VC1H101J	100P 50V	[M]
C7312	F2A1C1000018	10P 16V	[M]
C7313	F2A1C1000018	10P 16V	[M]
C7314	F1H1C104A008	0.1 16V	[M]
C7317	ECEA1CKA470B	47 16V	[M]
C7318	F2A1C1000018	10P 16V	[M]
C7323	ECJ1VC1H102J	1000P 50V	[M]
C7324	F1H1C104A008	0.1 16V	[M]
C7329	ERJ3GEY0R00V	0 1/16W	[M]
C7330	ERJ3GEYJ822V	8.2K 1/16W	[M]
C7332	F1H1C104A008	0.1 16V	[M]
C7333	F1H1C104A041	0.1 16V	[M]
C7334	F2A1H2R2A013	2.2P 50V	[M]
C7335	F1H1C104A008	0.1 16V	[M]
C7401	F1H1H103A220	0.01 50V	[M]
C7402	ECA1CAK100XB	10 16V	[M]
C7405	F1H0J1050010	1 6.3V	[M]
C7406	F1H1H103A219	0.01 50V	[M]
C7408	ECJ2FB1A105K	1 10V	[M]
C7412	ECJ1VC1H330J	33P 50V	[M]
C7413	ECJ1VC1H330J	33P 50V	[M]
C7415	ECA1HAK010XB	1 50V	[M]
C7417	F2A0J101A245	100P 6.3V	[M]
C7418	F1H1H103A219	0.01 50V	[M]
C7425	F2A0J470A245	47P 6.3V	[M]
C7426	ECJ1VC1H471J	470P 50V	[M]
C7431	F2A0J470A245	47P 6.3V	[M]
C7432	F1H1H103A219	0.01 50V	[M]
C7433	F2A0J470A245	47P 6.3V	[M]
C7465	ECJ1VC1H471J	470P 50V	[M]
C7501	ECJ1VC1H100D	10P 50V	[M]
C7502	ECJ1VC1H100D	10P 50V	[M]
C7503	ECJ1VC1H100D	10P 50V	[M]
C7504	F1H1C104A008	0.1 16V	[M]
C7505	ECA0JM471B	470 6.3V	[M]
C7508	F1H1H103A220	0.01 50V	[M]
C7509	F1H1H103A220	0.01 50V	[M]
C7511	ECJ1VC1H180J	18P 50V	[M]
C7512	ECJ1VC1H180J	18P 50V	[M]
C7513	ECJ1VC1H180J	18P 50V	[M]
C7514	ECJ1VC1H220J	22P 50V	[M]
C7515	ECJ1VC1H100D	10P 50V	[M]
C7516	ECJ1VC1H100D	10P 50V	[M]
C7517	ECJ1VC1H100D	10P 50V	[M]
C7518	F1H1C104A008	0.1 16V	[M]
C7519	F1H1H103A220	0.01 50V	[M]
C7520	F4D55473A013	CAPACITOR	[M]
C7521	F2A0J101A245	100P 6.3V	[M]
C7527	F1H1H103A220	0.01 50V	[M]
C7528	F1H1C104A008	0.1 16V	[M]
C7529	F1H1H103A220	0.01 50V	[M]
C7530	F1H1H103A220	0.01 50V	[M]
C7531	ECA1HAK2R2XB	2.2 50V	[M]
C7540	ECJ1VF1A105Z	10 10V	[M]
C7541	F1H1C104A008	0.1 16V	[M]
C7542	F2A0J470A013	47P 6.3V	[M]
C7543	F1H1C104A008	0.1 16V	[M]
C7548	F1H1C104A008	0.1 16V	[M]
C7549	F2A0J470A013	47P 6.3V	[M]
C7550	F2A0J470A245	47P 6.3V	[M]
C7551	F1H1C104A008	0.1 16V	[M]
C7552	ECJ1VC1H561J	560P 50V	[M]
C7553	ECJ1VC1H561J	560P 50V	[M]
C7554	F1H1C104A008	0.1 16V	[M]
C7555	F1H1C104A041	0.1 16V	[M]
C7556	F1H1C104A041	0.1 16V	[M]
C7557	F1H0J1050010	1 6.3V	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
C7558	F1H0J1050010	1 6.3V	[M]
C7559	F1H1H101A230	100P 50V	[M]
C7701	F1H1C104A008	0.1 16V	[M]
C7702	F2A0J470A013	47P 6.3V	[M]
C7705	F1H1C104A008	0.1 16V	[M]
C7706	F1H1C104A008	0.1 16V	[M]
C7707	F1H1H101A230	100P 50V	[M]
C7708	F1H1C104A008	0.1 16V	[M]
C11101	ECQU2A683MLC	0.068 100V	[M] ⚠
C11104	F1B2G4710001	470P 250V	[M] ⚠
C11105	F1B2G4710001	470P 250V	[M] ⚠
C11106	ECQU2A223MLC	0.022 100V	[M] ⚠
C11107	F2B2G680A050	68P 250V	[M]
C11109	ECKMNA222MEV	22 10V	[M]
C11201	F1B3A101A009	100P 1000	[M]
C11205	F1J1H102A623	1000P 50V	[M]
C11212	ECJ2VC1H101J	100P 50V	[M]
C11213	F2A1E1010103	100P 25V	[M]
C11214	F1J1H222A623	2200P 50V	[M]
C11307	F1B3A101A009	100P 1000	[M]
C11308	F1J1H102A623	1000P 50V	[M]
C11309	ECJ2VC1H101J	100P 50V	[M]
C11310	F2A1V6800002	68P 35V	[M]
C11311	F1J1H222A623	2200P 50V	[M]
C11401	F2A1C1020095	1000P 16V	[M]
C11402	F2A1C1020095	1000P 16V	[M]
C11403	F2A1C5610006	560P 16V	[M]
C11512	ECJ2VB1E104K	0.1 25V	[M]
C11513	ECJ2VB1E473K	0.047 25V	[M]
C11601	F1K1C106A062	10 16V	[M]
C11603	F2A1C1210017	120P 16V	[M]
C11604	F2A1C1210017	120P 16V	[M]
C11605	F1J1C105A091	1 16V	[M]
C11606	ECJ2VB1E104K	0.1 25V	[M]
C11607	ECJ2VB1E104K	0.1 25V	[M]
C11608	ECJ2VC1H181J	180P 50V	[M]
C11610	F1J1H103A702	0.01 50V	[M]
C11613	F2A1C4710079	470P 16V	[M]
C11618	F1J1C105A091	1 16V	[M]
C11701	F2A1A2220055	2200P 10V	[M]
C11703	F2A1C5610006	560P 16V	[M]
C11704	F2A1H5600018	56P 50V	[M]
C11705	F2A1C1210017	120P 16V	[M]
C11706	F2A1H5600018	56P 50V	[M]
C11707	F2A1C1210017	120P 16V	[M]
C11709	F2A1A6810022	680P 10V	[M]
C11711	ECJ2VB1E104K	0.1 25V	[M]
C11712	ECJ2VB1E473K	0.047 25V	[M]
C11720	F1J1C105A091	1 16V	[M]
C11721	F1J1C105A091	1 16V	[M]
C11722	F1J1H103A702	0.01 50V	[M]
C11801	F2A1C1210017	120P 16V	[M]
C11802	F1J1C105A091	1 16V	[M]
C11803	ECJ2VB1E104K	0.1 25V	[M]
C11804	ECJ2VB1E104K	0.1 25V	[M]
C11805	ECJ2VC1H181J	180P 50V	[M]
C11806	F1J1H103A702	0.01 50V	[M]
C11807	F2A1A6810022	680P 10V	[M]
C31501	F1J0J106A014	10 6.3V	[M]
C31503	F1J0J106A014	10 6.3V	[M]
C31504	F1H1A105A028	1 10V	[M]
C31505	F1H1A105A028	1 10V	[M]
C31506	F1H1A105A028	1 10V	[M]
C31507	F1H0J1050010	1 10V	[M]
C31508	F1H1H103A219	0.01 50V	[M]
C37001	ECA1CAK220XB	22 16V	[M]
C37011	F1H1C104A041	0.1 16V	[M]
C37012	F1H1C104A041	0.1 16V	[M]
C37013	F1H1C104A041	0.1 16V	[M]
C37501	F1H1C104A041	0.1 16V	[M]
C45001	F1H1C104A008	0.1 16V	[M]
C45003	ECQV1H104JL3	0.1 50V	[M]
C45004	F2A0J471A247	470P 6.3V	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
C45005	F2A0J101A592	100P 6.3V	[M]
C45007	ECEA1CKN100B	10 16V	[M]
C45008	ECEA1CKN100B	10 16V	[M]
C45010	F2A1C101A699	100P 16V	[M]
C45011	F1H1H102A219	1000P 50V	[M]
C45012	F1H1H102A219	1000P 50V	[M]
C45013	F2A1C470A698	47P 16V	[M]
C45014	F2A1C470A698	47P 16V	[M]
C45016	F2A1E4R7A641	4.7P 25V	[M]