
Service Manual

Model

CR300

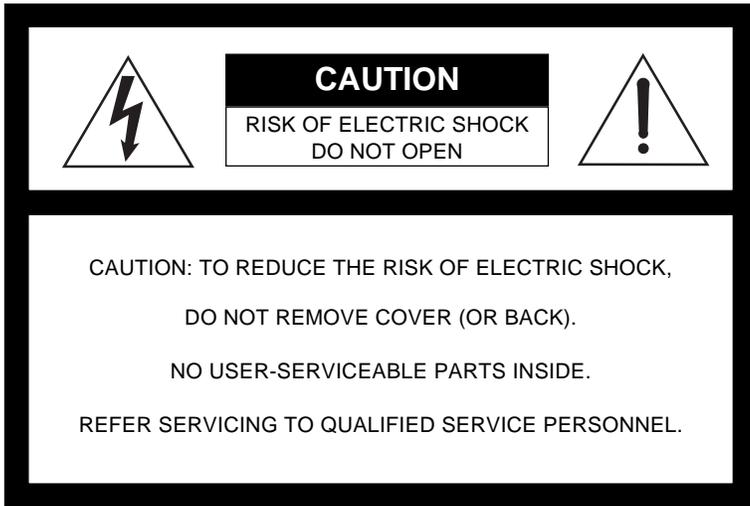
COMPACT DISC RECORDER

FOR U.S. MODELS

NECESSARY INFORMATION FOR DHHS
RULES MARKED ON THE REAR BASE AND ON
THE TOP OF CD MECHANISM AS BELOW.

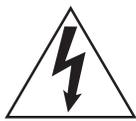
DANGER - LASER RADIATION WHEN OPEN.
AVOID DIRECT EXPOSURE TO BEAM.

Fostex[®]



CAUTION:
TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

ATTENTION:
POUR ÉVITER LES CHOCS ÉLECTRIQUES, INTRODUIRE LA LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE CORRESPONDANTE DE LA PRISE ET POUSSER JUSQU' AU FOND.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

“WARNING”

“TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.”

SAFETY INSTRUCTIONS

1. Read instructions - All the safety and operating instructions should be read before the appliance is operated.
 2. Retain instructions - The safety and operating instructions should be retained for future reference.
 3. Heed warnings - All warnings on the appliance and in the operating instructions should be adhered to.
 4. Follow instructions - All operating and use instructions should be followed.
 5. Water and Moisture - The appliance should not be used near water - for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, and the like.
 6. Carts and Stands - The appliance should be used only with a cart or stand that is recommended by the manufacturer.
-
- An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.
7. Wall or Ceiling Mounting - The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.
 8. Ventilation - The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.
 9. Heat - The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.
 10. Power Sources - The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
 11. Grounding or Polarization - The precautions that should be taken so that the grounding or polarization means of an appliance is not defeated.
 12. Power Cord Protection - Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
 13. Cleaning - The appliance should be cleaned only as recommended by the manufacturer.
 14. Nonuse Periods - The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
 15. Object and Liquid Entry - Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
 16. Damage requiring Service - The appliance should be serviced by qualified service personnel when:
 - A. The power supply cord or the plug has been damaged; or
 - B. Objects have fallen, or liquid has been spilled into the appliance; or
 - C. The appliance has been exposed to rain; or
 - D. The appliance does not appear to operate normally or exhibits a marked change in performance; or
 - E. The appliance has been dropped, or the enclosure damaged.
 17. Servicing - The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

This service manual is intended for qualified service technicians ; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.

Health & Safety Code Section 25249.6 Proposition 65

NOTICE

(FOR CANADIAN MODEL ONLY)

Fuse symbols  (fast operating fuse) and/or  (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE

(POUR MODÈLE CANADIEN SEULEMENT)

Les symboles de fusible  (fusible de type rapide) et/ou  (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

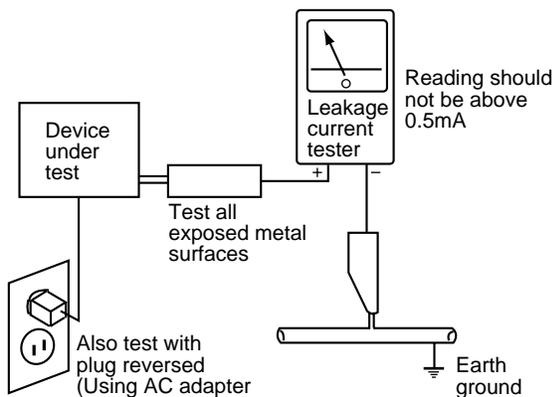
(FOR USA MODEL ONLY)

SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screw heads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

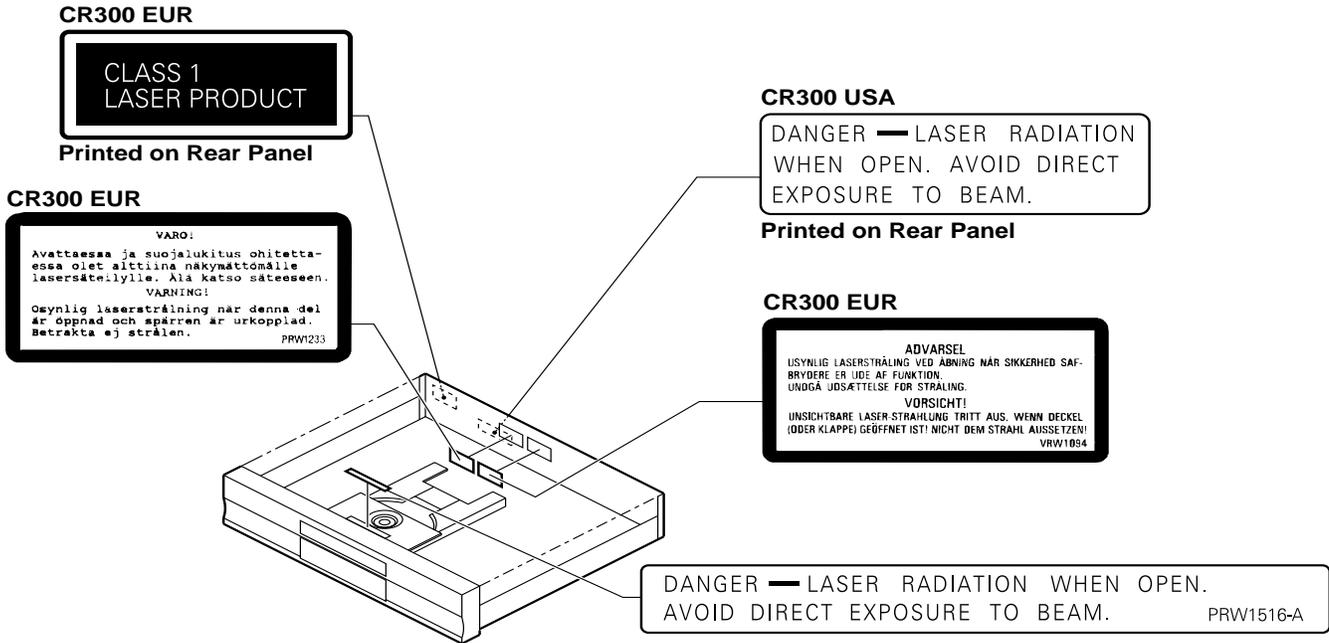
The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

IMPORTANT
 THIS PIONEER APPARATUS CONTAINS
 LASER OF CLASS IIIb.
 SERVICING OPERATION OF THE APPARATUS
 SHOULD BE DONE BY A SPECIALLY
 INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS
 MAXIMUM OUTPUT POWER: 23 mW
 WAVELENGTH: 778 - 787 nm

LABEL CHECK



Additional Laser Caution

- 1. Laser Interlock Mechanism**
 The position of the switch (S601) for detecting loading state is detected by the system microprocessor, and the design prevents laser diode oscillation when the switch (S601) is not on $\overline{\text{CLMP}}$ terminal side (CLMP signal is OFF or high level.). Thus, the interlock will no longer function if the switch (S601) is deliberately set to CLMP terminal side (low level).
 The interlock also does not function in the test mode *.
 Laser diode oscillation will continue, if pin 1 of M51593FP (IC101) on the PRE-AMP BOARD ASSY mounted on the pickup assembly is connected to GND, or pin 19 is connected to low level (ON), or else the terminals of Q101 are shorted to each other (fault condition).
- 2. When the cover is opened with the servo mechanism block removed and turned over, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam.**

* Refer to page 13.

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NOTES

- * Adjusting procedures, assembling & disassembling, exploded view, PCB assembly, parts list, circuit diagrams and general information are given in this manual to assist the service technician in maintaining the Model CR300.

CAUTION

-  Parts marked with this sign are safety critical components. They must always be replaced with identical components. Refer to the Fostex Parts List and ensure exact replacement.

1. SPECIFICATIONS

FUNCTION LIST

Automatic Disk Recognition	
Sampling Rate Converter	Automatic conversion (48 kHz, 32 kHz → 44.1 kHz) ON/OFF switchable (44.1 kHz)
Synchronous Recording	Synchronous to one song / all songs / DAT ID
Auto Stop Delay in Digital Synchro	0 sec, 10 sec, off
Copy Bit Setting	No restriction / one time only / prohibited
Auto Track Increment	6 levels
Manual Track Increment	
REC MUTE	
Fade In / Fade Out	Fade time: 6 sec, 9 sec, 12 sec, 18 sec
PREVIOUS	End section of previous track can be played back while in REC PAUSE mode
Erase Mode (CD-RW)	Last Track, All Track, Disc, TOC
Direct Search	Operational through remote controller only
Track Search	
Manual Search	
One Song / All Song / Program Repeat	Operational through remote controller only
Program Playback	
Skip Playback	
Sampling Monitor	
Displayed Time	Elapsed playback time, Remaining playback time, Total remaining playback time, Total playback time, Elapsed recording time, Remaining recording time, Total recording time
Laser Hour Meter	
Margin Display	
Auto Pause	
Auto Power Calibration	
Remote Controller On / Off	
Digital Out On / Off	
Balanced Input Sensitivity Switching	+ 4 dBu / -10 dBV

DISPLAY

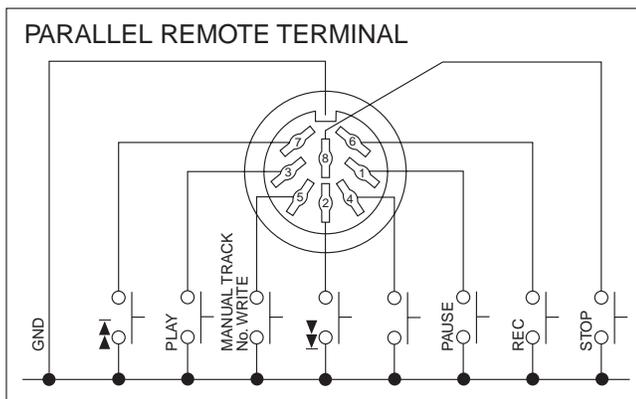
FL Display	Play, Pause, REC (Rec), RPT-1 (Repeat, 1-Repeat), AUTO TRACK (Auto Track No.), PGM (Program), FADER (Fader), SKIP ON (Skip ON/OFF), 32/44/48 (Input sampling frequency), SYNC (Digital Synchronous Recording), CD-RW/FINALIZE (Disc Type)
LED Display	Track number, Level meter, Elapsed playback time, Remaining playback time, Total remaining playback time, Total playback time, Elapsed recording time, Remaining recording time, Total recording time

INPUT/OUTPUT TERMINAL

Audio Input (Input Impedance)	RCA pin (27 k Ω or more) Balanced XLR-3 (10 k Ω)
Audio Output (Output Impedance)	RCA pin (1 k Ω) Balanced XLR-3 (1 k Ω or less)

INPUT/OUTPUT TERMINAL (continued)

Digital Input (Input Impedance)	Optical EIAJ CP-1201 TYPE2 Coaxial RCA IEC958 (75 Ω) AES/EBU XLR-3 (110 Ω)
Digital Output (Output Impedance)	Optical EIAJ CP-1201 TYPE2 Coaxial RCA IEC958 (75 Ω)
Headphone Output	∅ 6 (1/4 inch) standard stereo phone jack
Paralell Remote Control	DIN 8-pin



DIMENSIONS & WEIGHT

Maximum Dimensions	482 (W) x 105 (H) x 393 (D) mm 19 (W) x 4 - 1/8 (H) x 15 - 1/2 (D) inch
Weight (w/o package)	7.0 kg (15.4 lb)

POWER REQUIREMENT

Power Supply	AC120 V, 60 Hz AC220 ~ 230 V, 50/60 Hz
Power Consumption	24 W

AUDIO UNIT CHARACTERISTICS

CD Playback (Analog RCA Output)	
Frequency Response	4 Hz ~ 20 kHz ± 1.0 dB (EIAJ)
S/N	100 dB or more (EIAJ)
Dynamic Range	90 dB or more (EIAJ)
Total Harmonic Distortion	0.01 % or less (EIAJ)
Channel Separation	90 dB or more (EIAJ)
De-emphasis Deviation	0 ± 1.5 dB or less (EIAJ)
Level Difference between Channels	1 dB or less (EIAJ)
Output Voltage	2.0 ± 0.3 Vrms (Load impedance: 10 kΩ, EIAJ)
Monitor (Analog RCA Input → Analog RCA Output)	
Frequency Response	4 Hz ~ 20 kHz ± 1.0 dB (EIAJ)
S/N	83 dB or more (EIAJ)
Dynamic Range	83 dB or more (EIAJ)
Total Harmonic Distortion	0.01 % or less (EIAJ)
Maximum Input Level	3.2 Vrms or more (EIAJ)
Minimum Input Level	0.4 Vrms or less (EIAJ)

AUDIO UNIT CHARACTERISTICS (continued)**Record & Playback (Analog RCA Input → Analog RCA Output)**

Frequency Response	4 Hz ~ 20 kHz ± 1.0 dB (EIAJ)
S/N	83 dB or more
Dynamic Range	83 dB or more
Total Harmonic Distortion	0.01 % or less

Monitor (Digital Coaxial Input → Analog RCA Output)

Frequency Response	4 Hz ~ 20 kHz ± 1.0 dB (EIAJ)
S/N	95 dB or more (EIAJ)
Dynamic Range	90 dB or more (EIAJ)
Total Harmonic Distortion	0.01 % or less (EIAJ)
Maximum Input Level	0.6 Vp-p or more (EIAJ)
Minimum Input Level	0.2 Vp-p or less (EIAJ)

Record & Playback (Digital Coaxial Input → Analog RCA Output)

Frequency Response	4 Hz ~ 20 kHz ± 1.0 dB (EIAJ)
S/N	95 dB or more
Dynamic Range	90 dB or more
Total Harmonic Distortion	0.01 % or less

CD Playback (Analog XLR-3 +4 dBu Output)

Frequency Response	4 Hz ~ 20 kHz + 1.0, -1.5 dB (EIAJ)
S/N	100 dB or more (EIAJ)
Dynamic Range	90 dB or more (EIAJ)
Total Harmonic Distortion	0.01 % or less (EIAJ)
Channel Separation	90 dB or more (EIAJ)
De-emphasis Deviation	0 ± 1.5 dB or less (EIAJ)
Level Difference between Channels	1 dB or less (EIAJ)
Output Voltage	20 ± 1.5 dBm (Load impedance: 100 kΩ, EIAJ)
Output Voltage (-10 dBV)	8 ± 1.0 dBm (Load impedance: 100 kΩ, EIAJ)

Monitor (Analog XLR-3 +4 dBu Input → Analog XLR-3 +4 dBu Output)

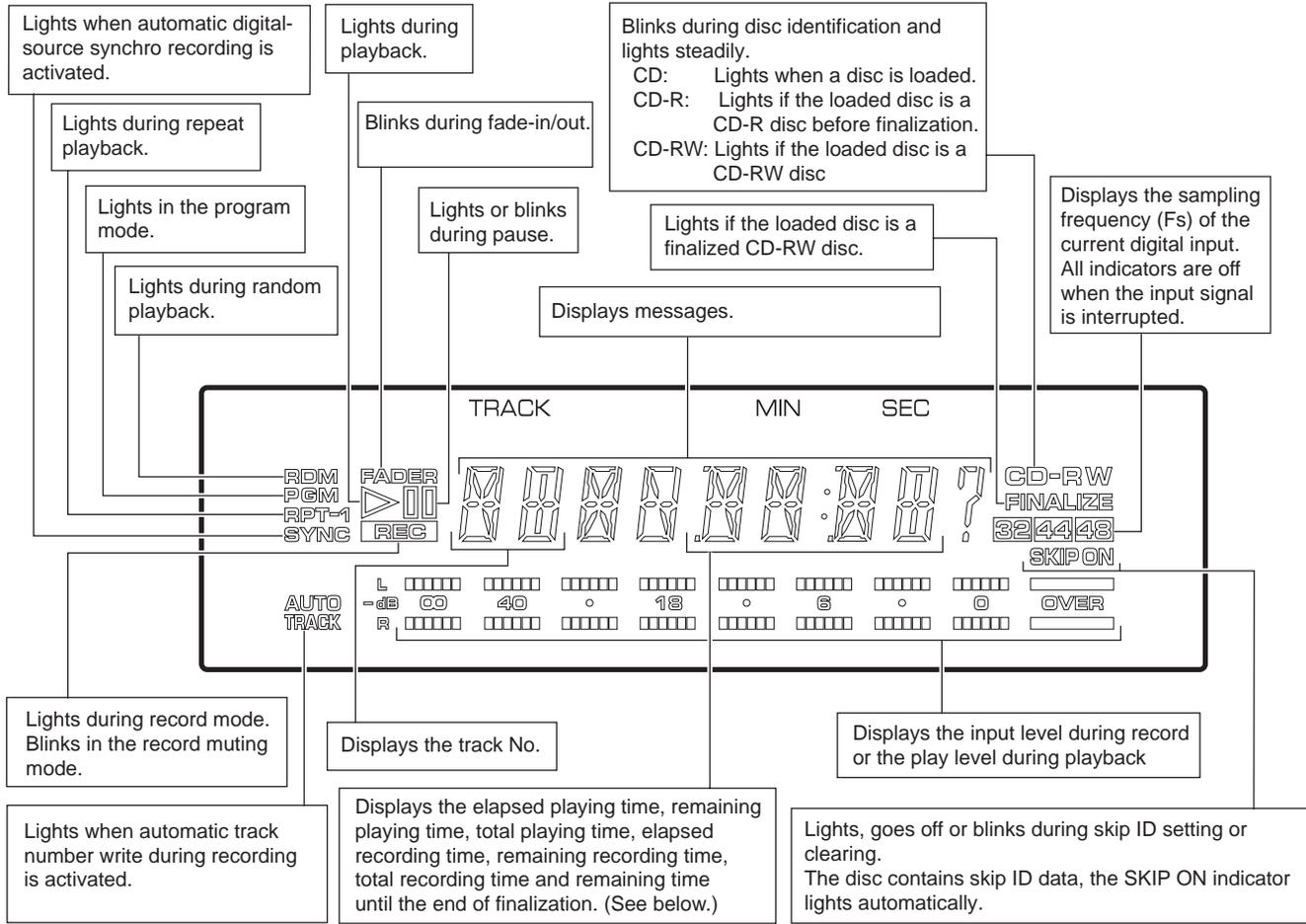
Frequency Response	4 Hz ~ 20 kHz + 1.0, -1.5 dB (EIAJ)
S/N	83 dB or more (EIAJ)
Dynamic Range	83 dB or more (EIAJ)
Total Harmonic Distortion	0.01 % or less (EIAJ)
Maximum Input Level	13 Vrms or more (EIAJ)
Minimum Input Level (-10 dBV)	0.4 Vrms or less (EIAJ)

Record & Playback (Analog XLR-3 +4 dBu Input → Analog XLR-3 +4 dBu Output)

Frequency Response	4 Hz ~ 20 kHz + 1.0, -1.5 dB (EIAJ)
S/N	83 dB or more
Dynamic Range	83 dB or more
Total Harmonic Distortion	0.01 % or less

Specifications and appearance are subject to change without notice for product improvement.

< DISPLAY PANEL >



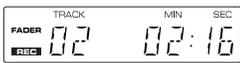
Switching the time display

The following operation allows you to check the recording time information during recording or playing time information during playback. Every time the TIME button is pressed, the time information contents are switched in the order of (A)→(B)→(C)→(D)→(A)•••.

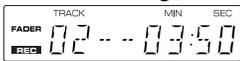
The display mode varies depending on whether the current operation is recording or playing back (in the order of (A)→(B)→(C)→(A)→••• during recording).

During recording

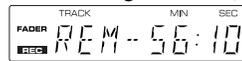
(A): Elapsed recording time (2 min. 16 sec. after the start of track No. 2)



(C): Total recording time (3 min. 50 sec. of 2-track recording)

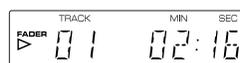


(B): Remaining recording time (56 min. 10 sec. remaining on the disc)

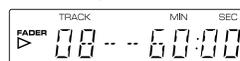


During playback

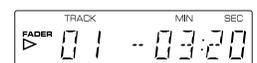
(A): Elapsed playing time (2 min. 16 sec. after the start of track No. 1)



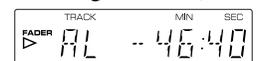
(D): Total playing time (60 min. 0 sec. for 8 tracks)



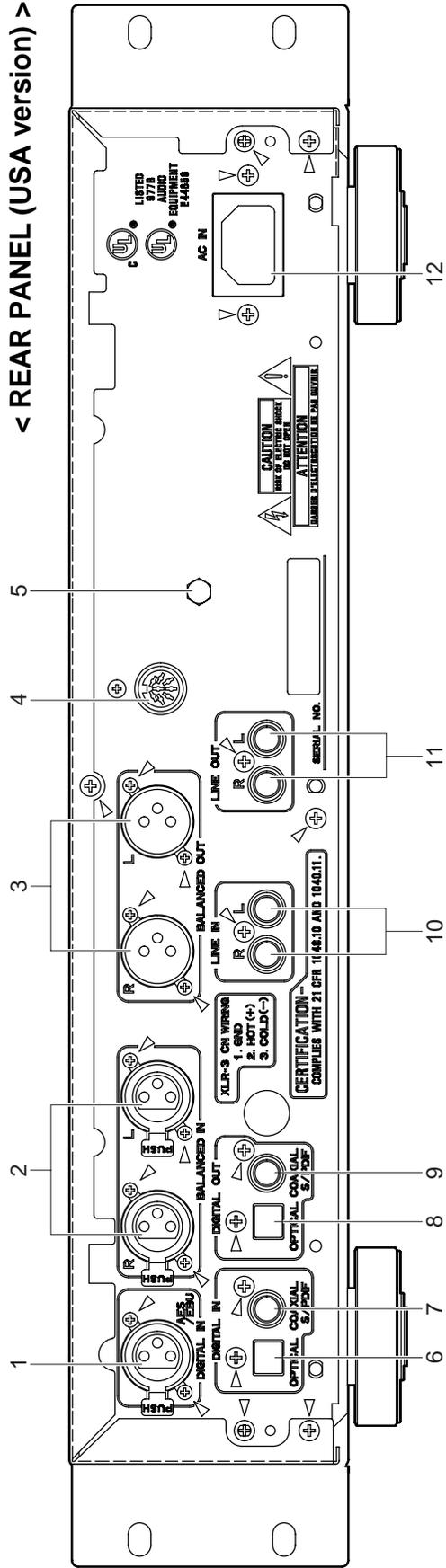
(B): Remaining playing time of track being played (3 min. 20 sec. remaining for track No.1)



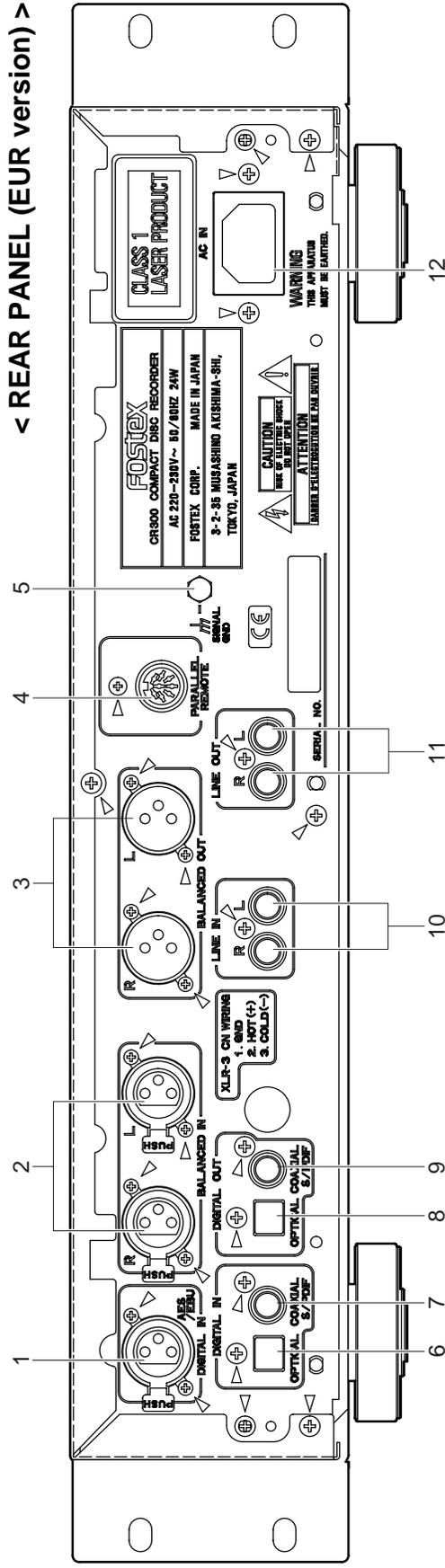
(C): Remaining playing time of all track on disc being played (46 min. 40 sec. remaining on the disc)



< REAR PANEL (USA version) >

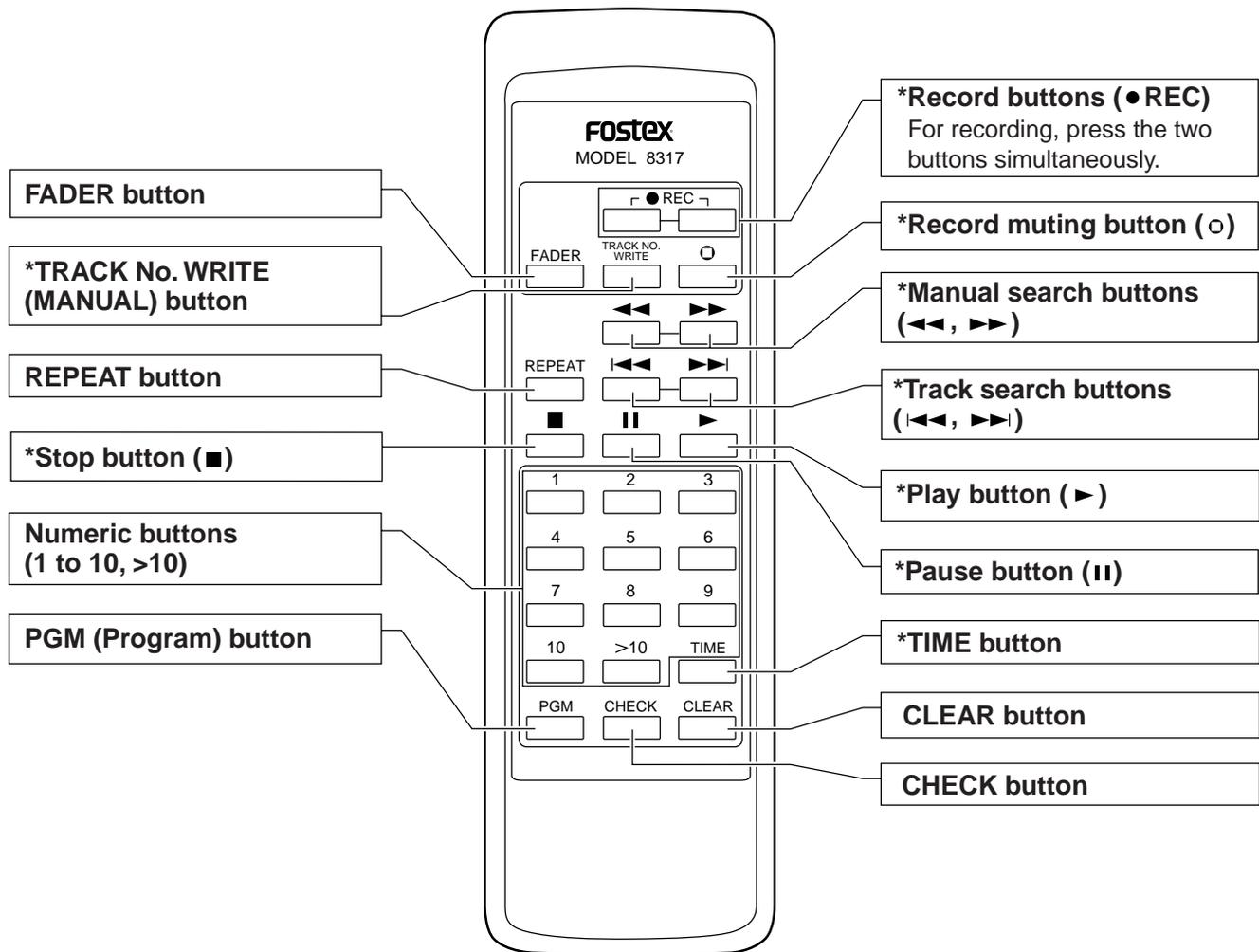


< REAR PANEL (EUR version) >

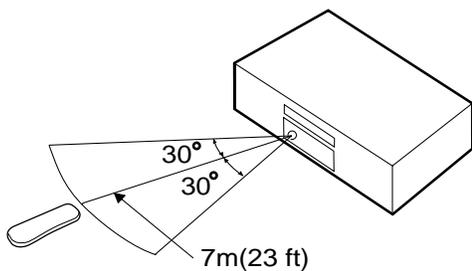


- 1. AES/EBU digital input [AES/EBU DIGITAL IN]
- 2. XLR balanced input [BALANCED IN]
- 3. XLR balanced output [BALANCED OUT]
- 4. Parallel remote connector
- 5. Earth terminal
- 6. Optical digital input [S/P DIF OPTICAL DIGITAL IN]
- 7. Coaxial digital input [S/P DIF COAXIAL DIGITAL IN]
- 8. Optical digital output [S/P DIF OPTICAL DIGITAL OUT]
- 9. Coaxial digital output [S/P DIF COAXIAL DIGITAL IN]
- 10. Line input [LINE IN]
- 11. Line output [LINE OUT]
- 12. AC inlet [AC IN]

< REMOTE CONTROL UNIT MODEL 8317 >



● Remote controllable range



- Remote control may be impossible if there is an obstacle between the remote control unit and main unit or if the remote control unit is operated at too great of an angle from the remote control sensor.
- Erroneous operation may occur if strong light such as direct sunlight or fluorescent lamp light is incident to the remote control sensor.
- The main unit may operate erroneously if it is used near equipment radiating infrared rays or if it is used near control unit of other equipment is used near the unit. On the contrary, if this remote control unit is operated near another piece of equipment which can be control wit infrared rays, the equipment may operate erroneously.
- Replace batteries when the remote controllable range decreases noticeably.

3. ADJUSTMENT PROCEDURES

3-1. TEST DISCS

When adjusting the servo system, the following CD test discs should be used.

- STD-903 or equivalent
- STD-914 or equivalent

3-2. TEST EQUIPMENT

(1) Laser Power Meter

The following power meter manufactured by Advantest Corporation, LEADER Corporation or equivalent:

- TQ8210 + TQ82017 (Advantest Corporation)
- TQ8215 + TQ82021 (Advantest Corporation)
- TQ8215 + TQ82010 + TQ82017 (Advantest Corporation)
- LE8010 (LEADER Corporation)

- (2) Audio Analyzer
- (3) Oscilloscope
- (4) Distortion Factor Meter
- (5) CD Jitter Meter
- (6) Block Error Rate Counter

3-3. TEST MODE

3-3-1. Test Mode

For adjustment, set the unit to the Test Mode. Referring to the Fig. 1 on the right, turn on the unit with the Test Mode short-circuit pattern on the FUNCTION PCB Ass'y to enter the Test Mode. In the Test Mode, all the displays (FL, LEDs) on the unit should be lit. If not, turn the power off and repeat the same steps again.

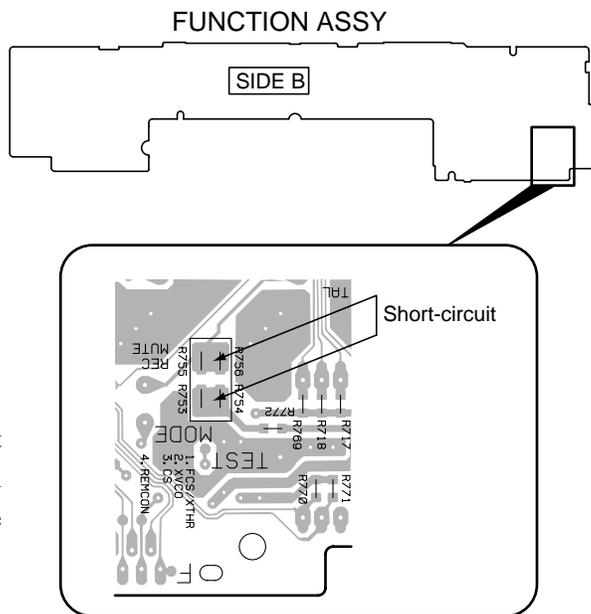


Fig. 1 Enter the Test mode

3-3-2. Operation in Test Mode

In the Test Mode, the following adjustment functions are assigned to the buttons, as explained in the Fig. 2 & 3.

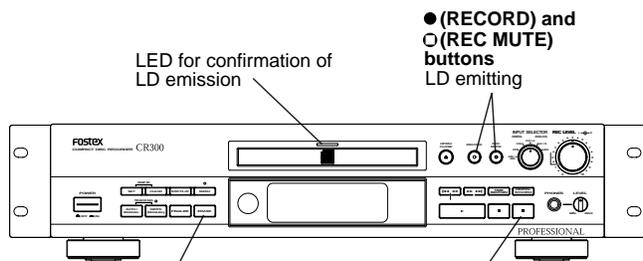


Fig.2 During adjustment of LD power (Input selector: analog)

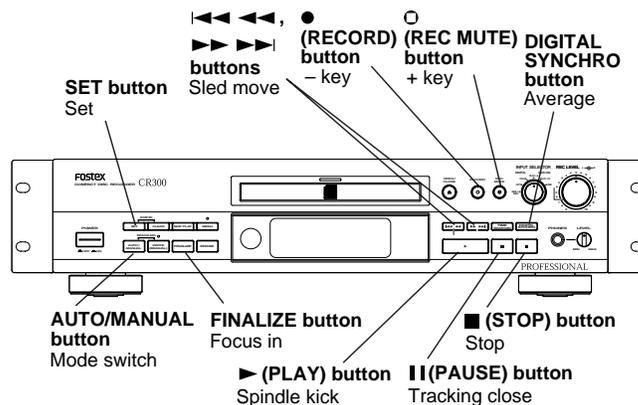
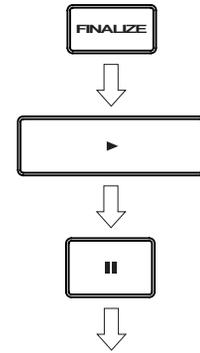


Fig.3 During adjustment of servo system (Input selector: optical)

3-3-3. How to Playback a Disc in Test Mode

In the Test Mode, since each servo circuit operates independently, playing back a disc requires that you operate the keys in the correct order to close the servo circuits. Here is the key operation sequence for playing back a disc in the Test Mode. Wait at least 2 ~ 3 seconds between each of these operations.



3-4. ADJUSTMENT 1 (LASER DIODE POWER ADJUSTMENT)

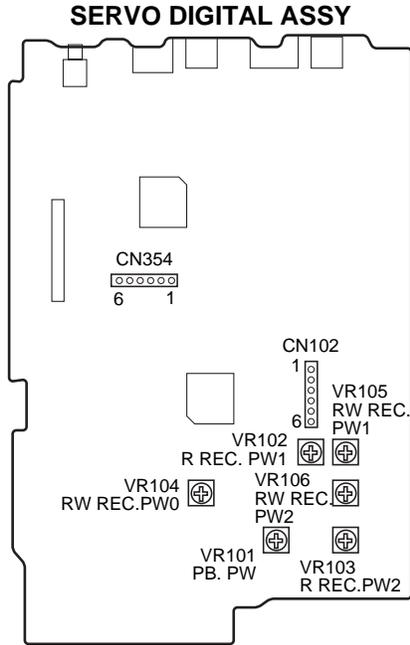


Fig. 4 Adjustment points

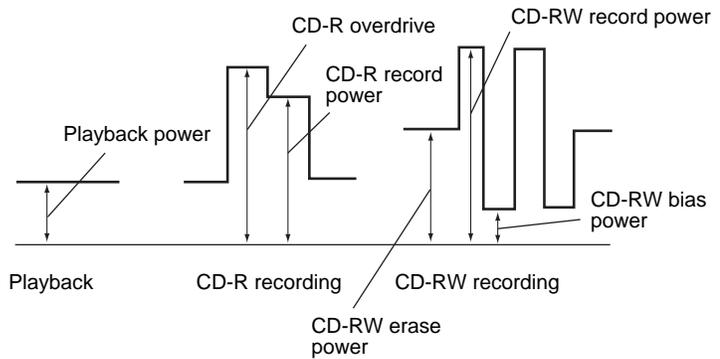
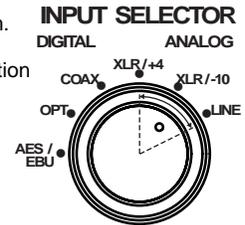


Fig.5 Output power of the laser diode

- Note 1: Attach the remote sensor of the laser power meter to a point angled away about 10 degrees against the pickup lens and where the maximum power is detected, so that there will be no light reflected onto the pickup.
- Note 2: When adjusting with VR101 to VR106, first turn them completely counter-clockwise and then adjust clockwise, so that the value to be reached is not exceeded.
- Note 3: Set the wavelength of laser power meter to 780 nm.
- Note 4: The following adjustments 1 through 3 must be done with the Input Selector set to the Analog position (LD power adjustment mode).



3-4-1. Playback Power Adjustment

**DANGER - LASER RADIATION WHEN OPEN.
AVOID DIRECT EXPOSURE TO BEAM.**

Test Point	Pickup objective lens
Adjustment Point	VR101 (PB. PW)
Adjustment Value	0.60 mW ± 0.05 mW

[Procedure]

- (1) Check that “CD” is displayed on the FL display. If “CD-R” or “CD-RW” is displayed, press the STOP button repeatedly until “CD” is displayed.
- (2) Press the RECORD button. The LED for confirmation of LD emission will light in orange.
- (3) Press the REC MUTE button. The LED for confirmation of LD emission will light in red. The LD is emitting in this status.
- (4) Turn VR101 clockwise until the adjustment value to be reached is obtained.
- (5) Press the STOP button to shut off the LD.

3-4-2. CD-R Record Power Adjustment

**DANGER - LASER RADIATION WHEN OPEN.
AVOID DIRECT EXPOSURE TO BEAM.**

Test Point	Pickup objective lens
Adjustment Point	VR102 (R REC. PW1), VR103 (R REC. PW2)
Adjustment Value	VR102: 4.60 mW \pm 0.1 mW VR103: Addition of 0.1 mW \pm 0.01 mW to the adjustment value of VR102
<p>[Procedure]</p> <ol style="list-style-type: none"> (1) Turn VR102 and VR103 fully counterclockwise to set their power output to minimum. (2) Press the ERASE button once so that “CD-R” appears on the FL display. If the indication is “CD” or “CD-RW”, press the ERASE button repeatedly until “CD-R” is displayed on the FL display. (3) Press the RECORD button. The LED for confirmation of LD emission will light in orange. (4) Press the REC MUTE button. The LED for confirmation of LD emission will light in red. The LD is emitting in this status. <p>CD-R record power adjustment</p> <ol style="list-style-type: none"> (5) Turn VR102 clockwise until the adjusted value is 4.60 mW \pm 0.1 mW. <p>CD-RW overdrive power adjustment</p> <ol style="list-style-type: none"> (6) Turn VR103 clockwise until the adjusted value becomes adjusted value at Step 5 above + (0.1 mW \pm 0.01 mW). (7) Press the STOP button to shut off the LD. 	

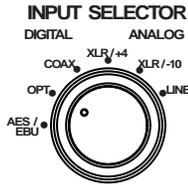
3-4-3. CD-RW Record Power Adjustment

**DANGER - LASER RADIATION WHEN OPEN.
AVOID DIRECT EXPOSURE TO BEAM.**

Test Point	Pickup objective lens
Adjustment Point	VR104 (RW REC. PW0), VR106 (RW REC. PW2), VR105 (RW REC. PW1)
Adjustment Value	VR104: 0.40 mW \pm 0.05 mW VR106: 2.40 mW \pm 0.1 mW VR105: 5.90 mW \pm 0.1 mW
<p>[Procedure]</p> <ol style="list-style-type: none"> (1) Turn VR104, VR105 and VR106 fully counterclockwise to set their power output to minimum. (2) Press the ERASE button twice so that “CD-RW” appears on the FL display. If the indication is “CD” or “CD-R”, press the ERASE button repeatedly until “CD-RW” is displayed on the FL display. (3) Press the RECORD button. The LED for confirmation of LD emission will light in orange. (4) Press the REC MUTE button. The LED for confirmation of LD emission will light in red. The LD is emitting in this status. (5) Turn the VR104 clockwise until the adjusted value is 0.40 mW \pm 0.05 mW. <p>CD-RW record power adjustment</p> <ol style="list-style-type: none"> (6) Turn VR106 clockwise until the adjusted value is 2.40 mW \pm 0.1 mW. <p>CD-RW erase power adjustment</p> <ol style="list-style-type: none"> (7) Turn VR105 clockwise until the adjusted value is 5.90 mW \pm 0.1 mW. (8) Press the STOP button to shut off the LD. 	

3-5. ADJUSTMENT 2 (SERVO SYSTEM ADJUSTMENT)

For servo adjustment, set the INPUT SELECTOR to OPTICAL.



Use the RECORD and REC MUTE buttons to make the adjustments.



To register an adjustment, press the (SKIP ID) SET button.



To reset the adjusted values to the initial settings, press and hold the (SKIP ID) CLEAR button for 4 seconds.

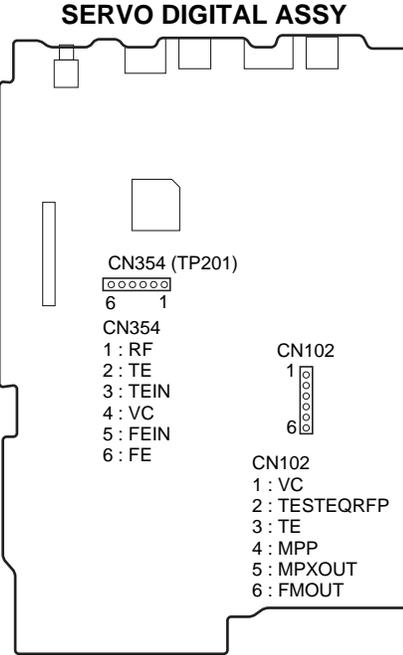


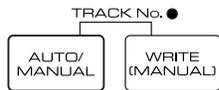
Fig. 6 Adjustment points

3-5-1. Focus Offset Adjustment

Test Point	CN354 - pin 6 (FE)
Adjustment Point	RECORD and REC MUTE buttons
Adjustment Value	0 mW ± 10 mW

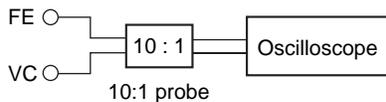
[Procedure]

(1) Press the AUTO/MANUAL button until “01_F4” appears on the FL display.



(2) Adjust with the RECORD and REC MUTE buttons until the value for Pin 6 of CN354 is 0 mV ± 10 mV.

(3) Press the SET button to register the adjustment. Once the adjustment is registered with the SET button, “?” will disappear.



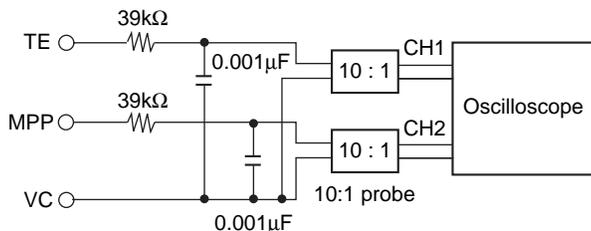
3-5-2. M-S Mix Ratio Adjustment

Test Point	CN102 - pin 3 (TE) and pin 4 (MPP)
Adjustment Point	RECORD and REC MUTE buttons
Adjustment Value	Adjust until the value of output signal from pin 3 (TE) and pin 4 (MPP) of CN102 are the same, or the differential output of these signals is minimal.

[Procedure]

- (1) Press the AUTO/MANUAL button so that "02_F3" appears on the FL display.
- (2) Press the FINALIZE button for focus-in.
- (3) Press the PLAY button for CAV-servo spindle kick (the status where the spindle rotates with the focus servo on and tracking servo off).
- (4) Adjust with the RECORD and REC MUTE buttons until the value to be reached is obtained.
- (5) Press the SET button to register the adjustment.
Once the adjustment is registered with the SET button, "?" on the FL display will disappear.
- (6) Press the STOP button to stop the unit.

NOTE: For adjustment, use the following circuits.



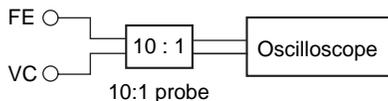
NOTE: Adjustment must be done around mid-radius on a disc.

3-5-3. Tracking Offset Adjustment

Test Point	CN354 - pin 2 (TE) or CN102 - pin 3 (TE)
Adjustment Point	RECORD and REC MUTE buttons
Adjustment Value	0 mV ± 10 mV

[Procedure]

- (1) Press the AUTO/MANUAL button so that "03_F6" appears on the FL display.
- (2) Press the RECORD and REC MUTE buttons until the above adjustment value to be reached is obtained.
- (3) Press the SET button to register the adjustment.
Once the adjustment is registered with the SET button, "?" on the FL display will disappear.



NOTE: Perform the adjustment in STOP mode.

This adjustment is possible with the low-pass filter used in adjustment 5 above attached.

3-5-4. Focus Bias Adjustment

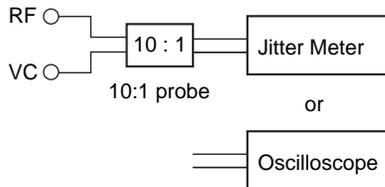
Test Point	CN354 - pin 1 (RF)
Adjustment Point	DIGITAL SYNCHRO, RECORD and REC MUTE buttons
Adjustment Value	Adjust until the RF jitter is minimal or that the eye pattern of the RF waveform is most open.

[Procedure]

- (1) Press the DIGITAL SYNCHRO button in Stop mode.

NOTE: Make sure that the unit is in Stop mode.

- (2) Check that “48” appears on the FL display.
- (3) Press the AUTO/MANUAL button so that “04_34” appears on the FL display.
- (4) Press the FINALIZE button for focus-in.
- (5) Press the PLAY button for CAV-servo spindle kick.
- (6) Press the PAUSE button to close the tracking servo, then set the unit to Playback mode.
- (7) Adjust with the RECORD and REC MUTE buttons until the above adjustment value to be reached is obtained.
Press the SET button to register the adjustment. Once the adjustment is registered with the SET button, “?” on the FL display will disappear.
- (8) Press the STOP button to stop the unit.



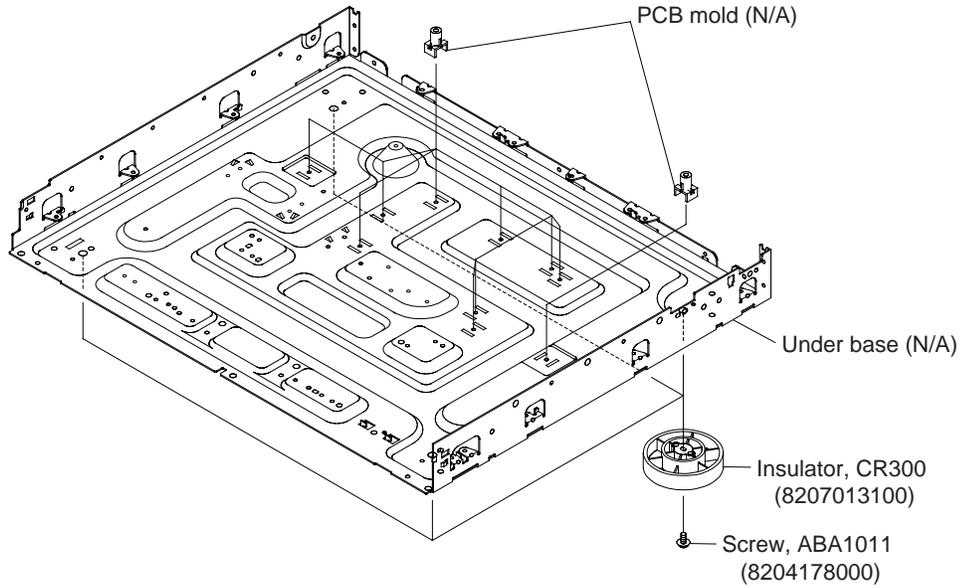
NOTE: Perform the adjustment in STOP mode.

This adjustment is possible with the low-pass filter used in adjustment 5 above attached.

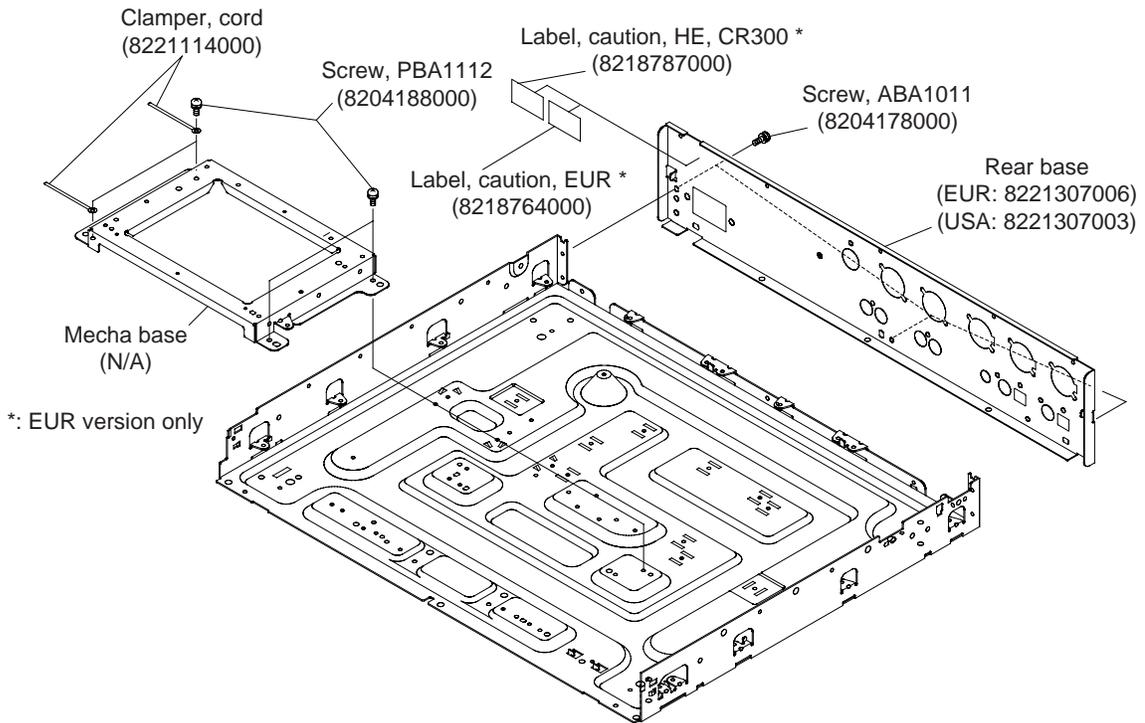
4. ASSEMBLING & DISASSEMBLING

Please refer to the following drawings for assembling & disassembling the CR300.

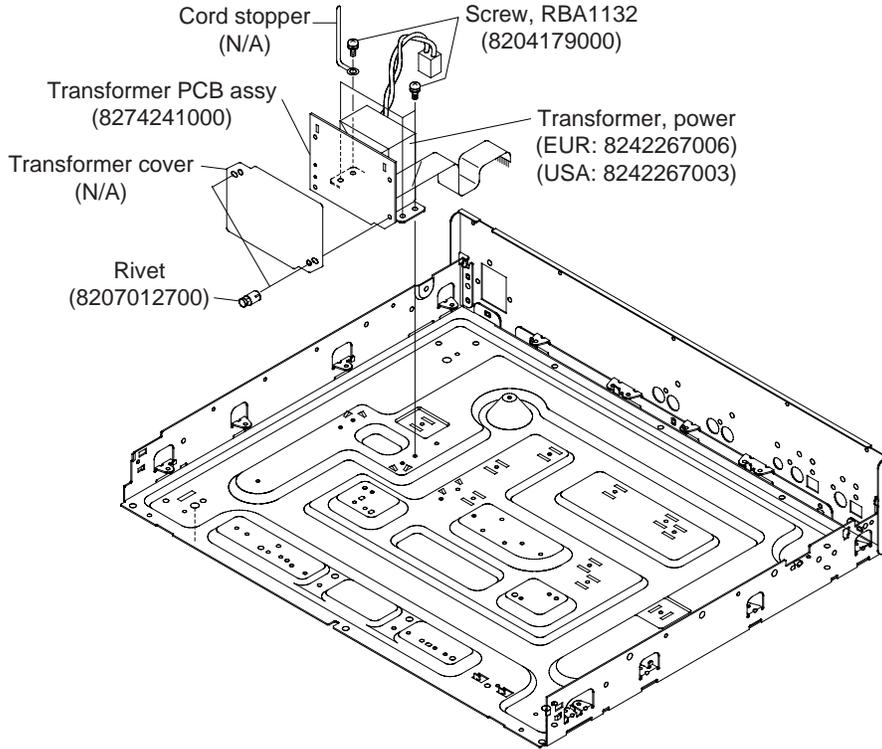
4-1. Under Base, PCB Mold & Insulator



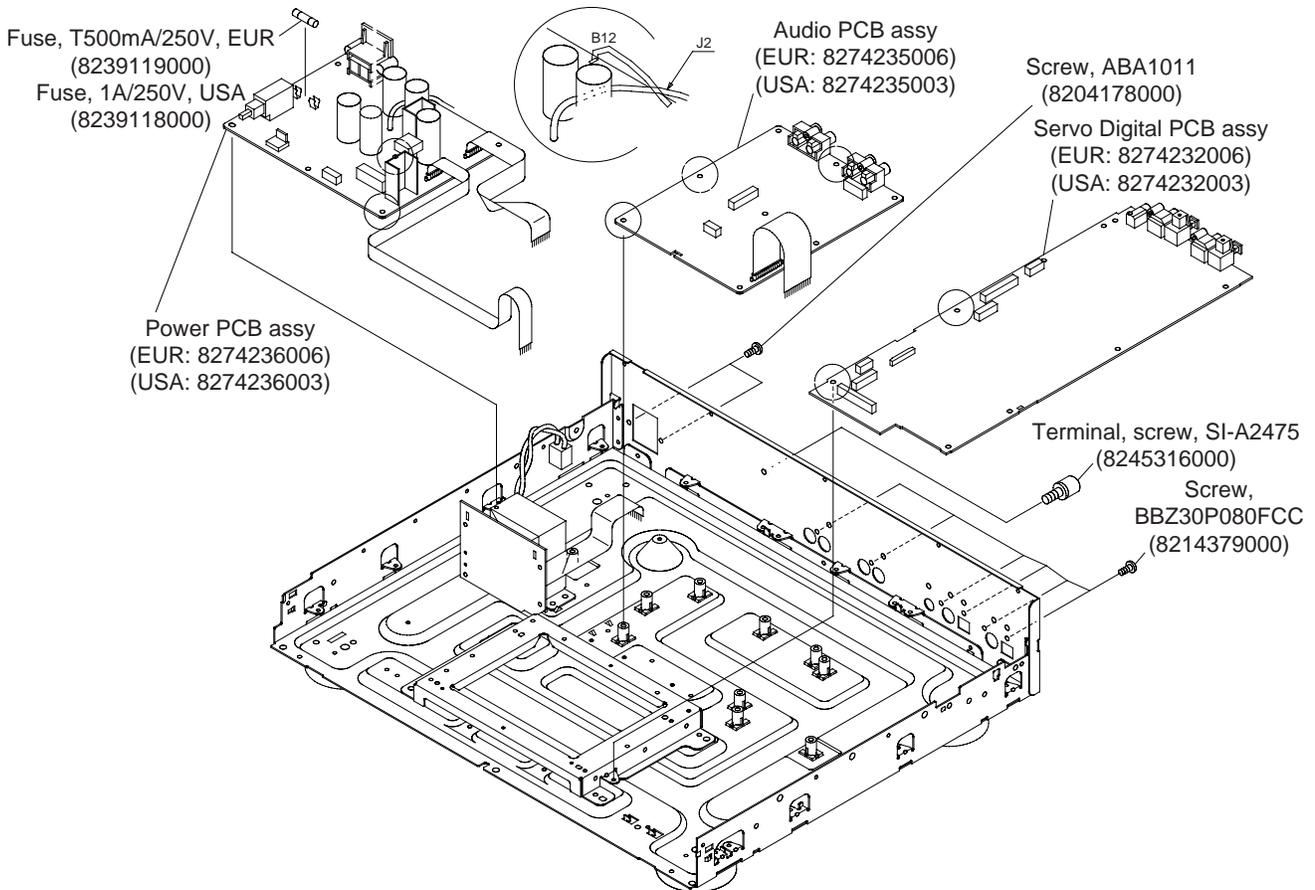
4-2. Under Base, Mecha Base & Rear Base



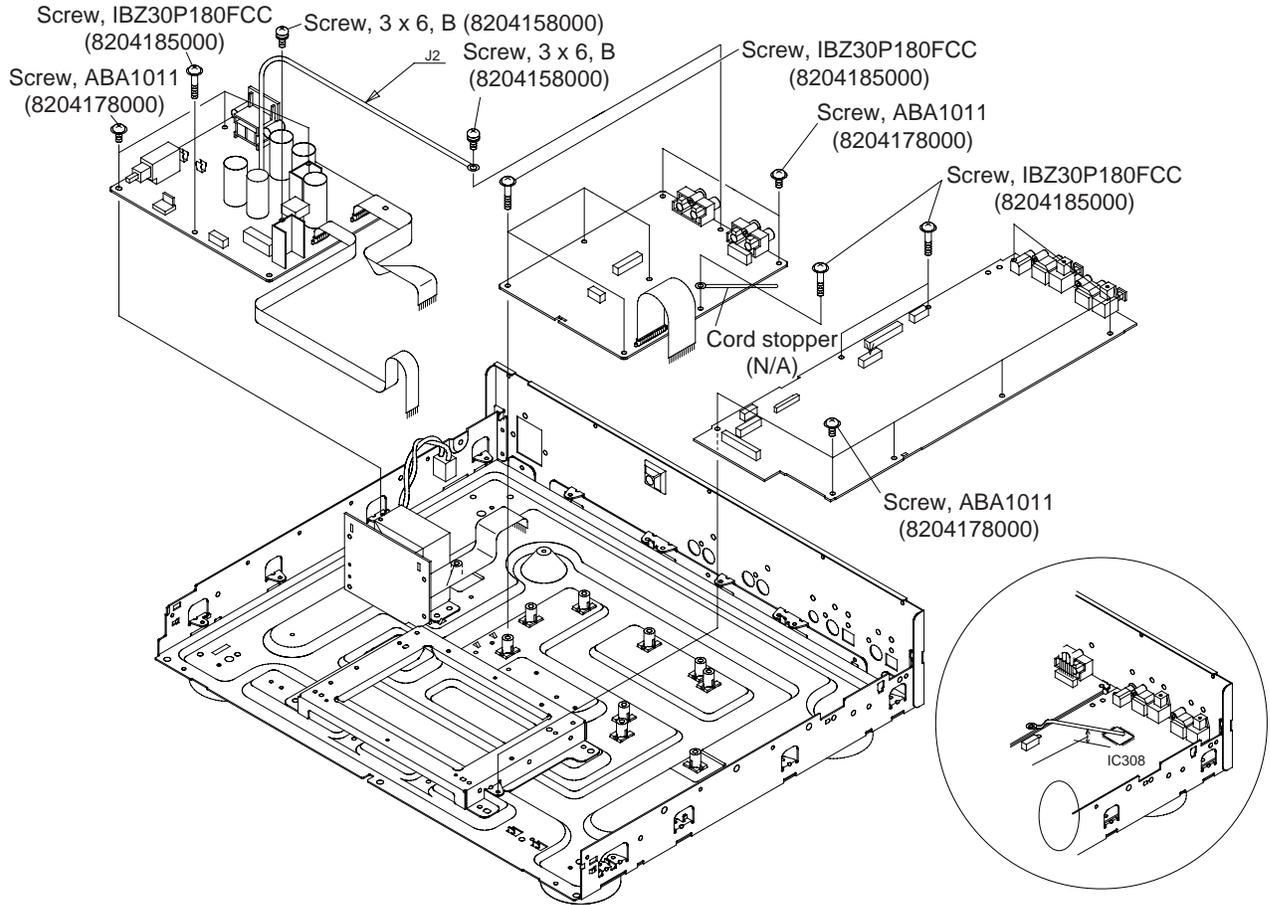
4-3. Transformer PCB Assy



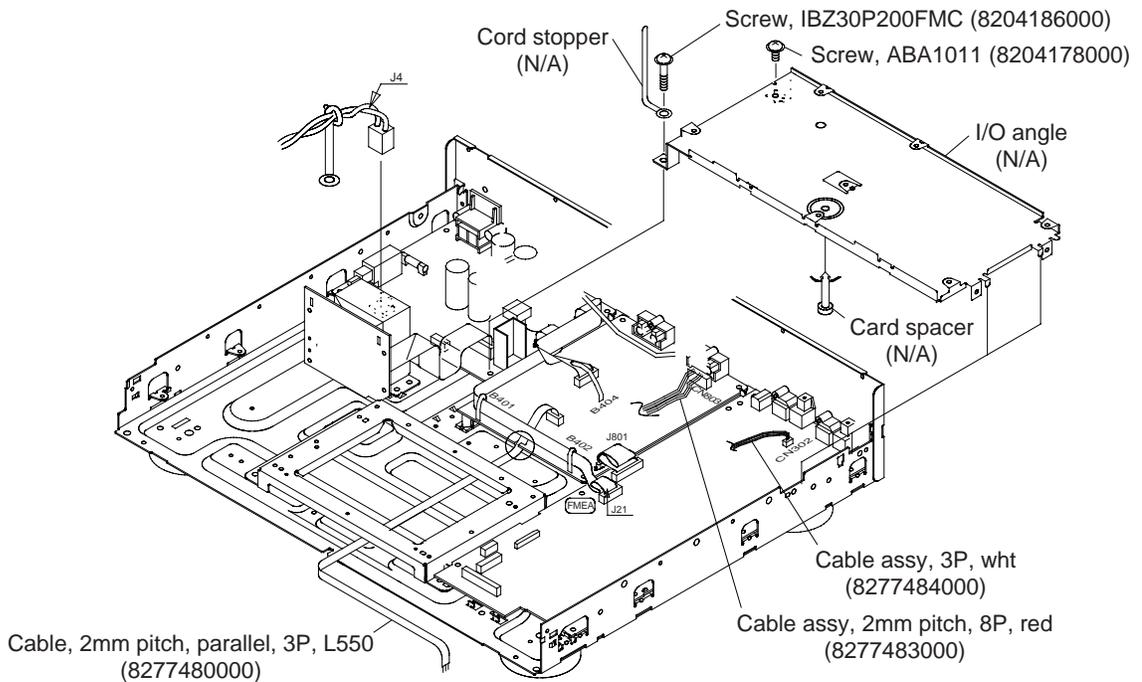
4-4. Power, Audio & Servo Digital PCB Assys



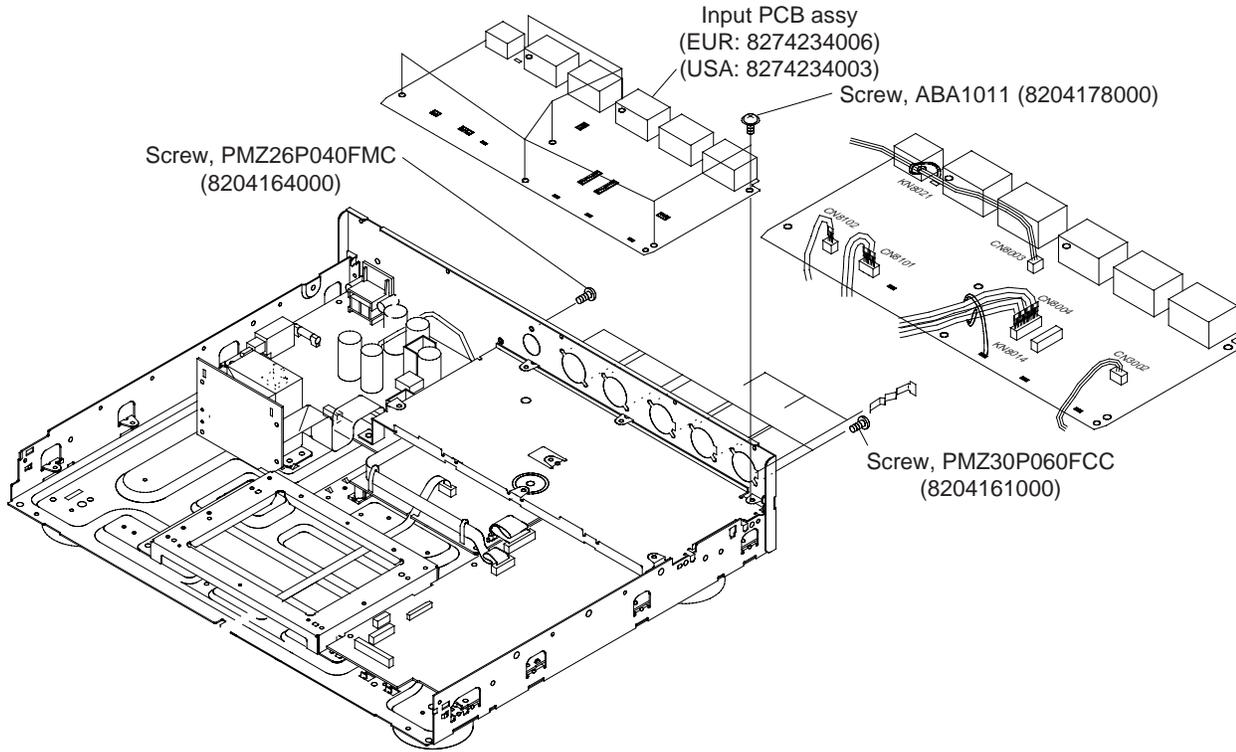
4-5. Power, Audio & Servo Digital PCB Assys Wiring



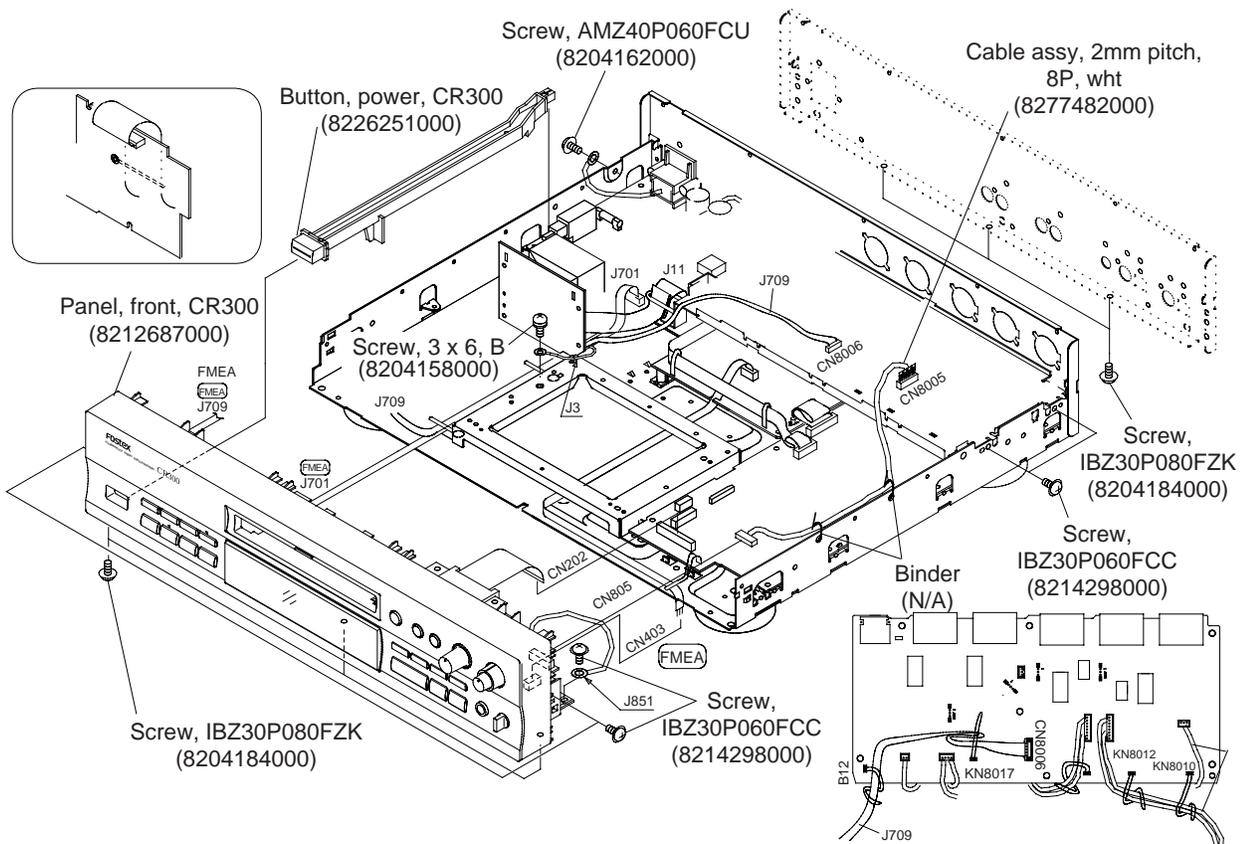
4-6. I/O Angle



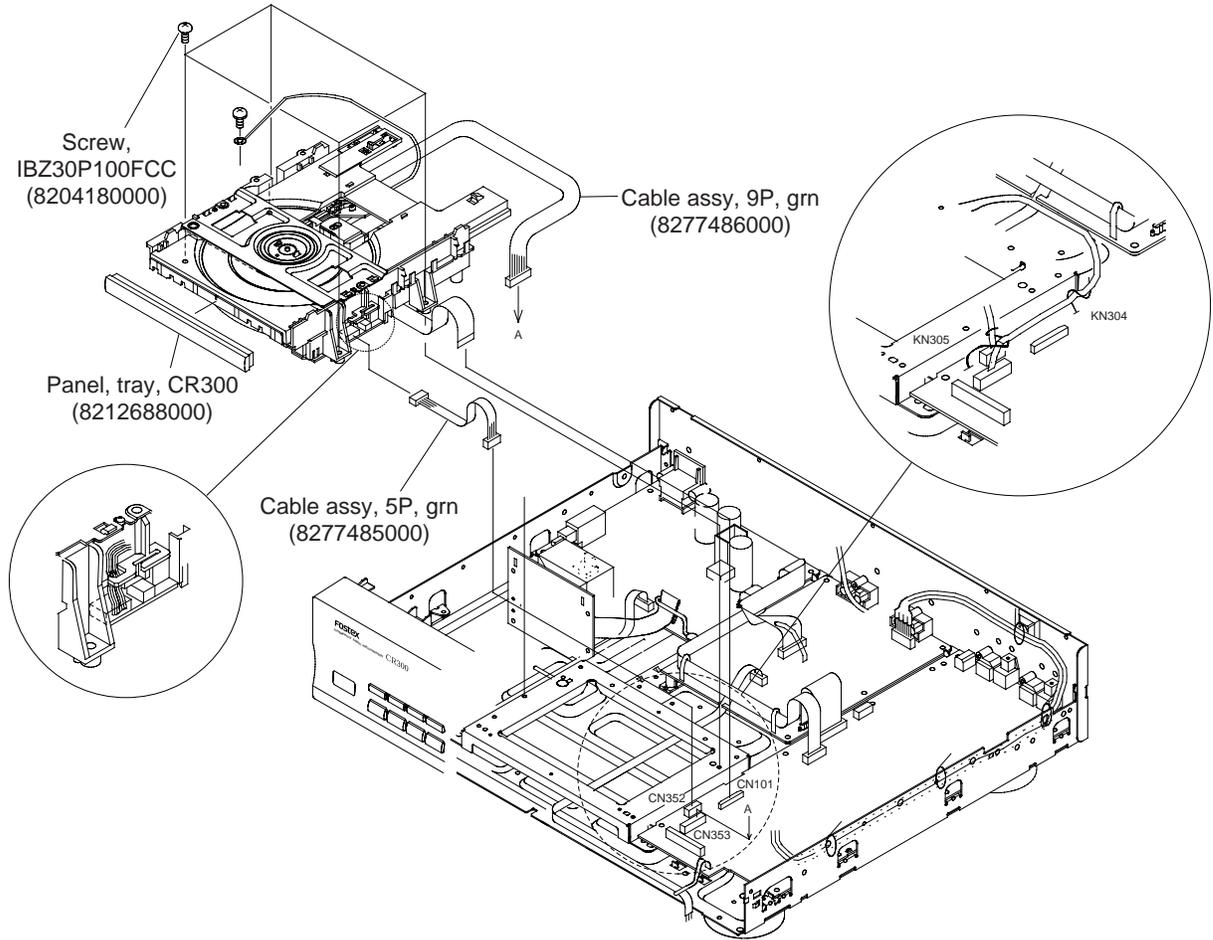
4-7. Input PCB Assy



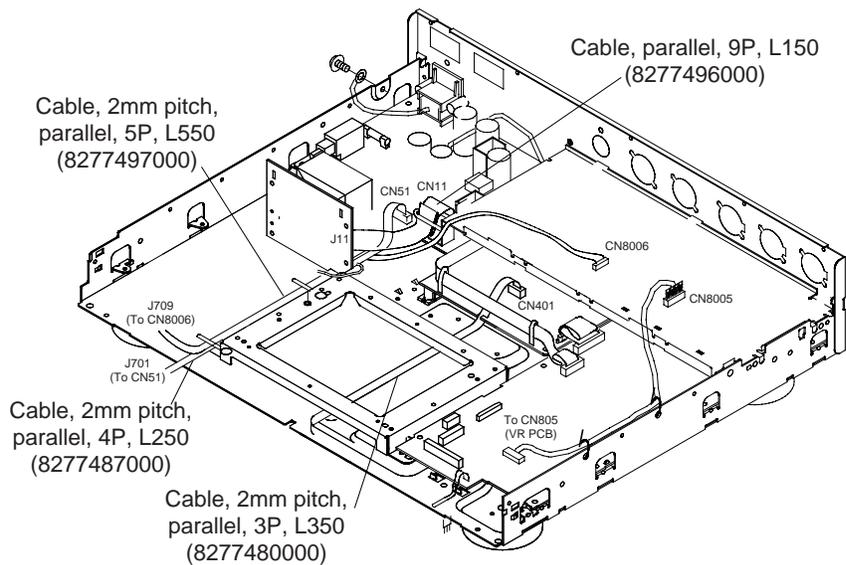
4-8. Input PCB Assy Wiring & Front Panel



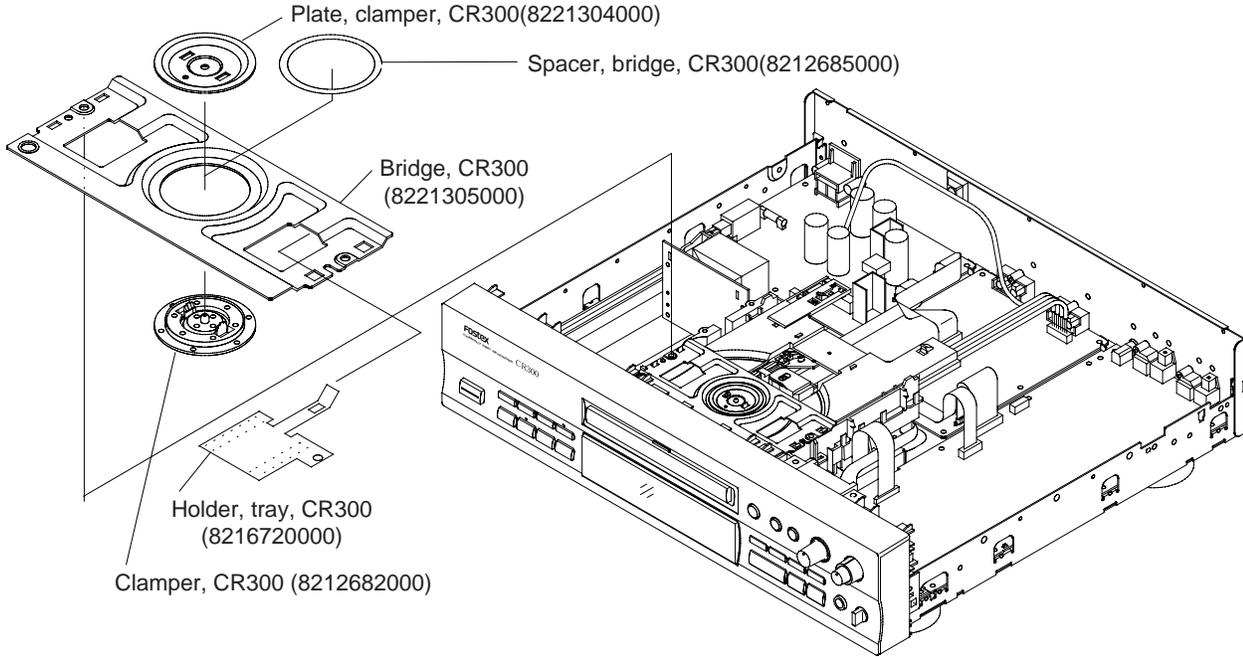
4-9. Mechanism Assy Wiring



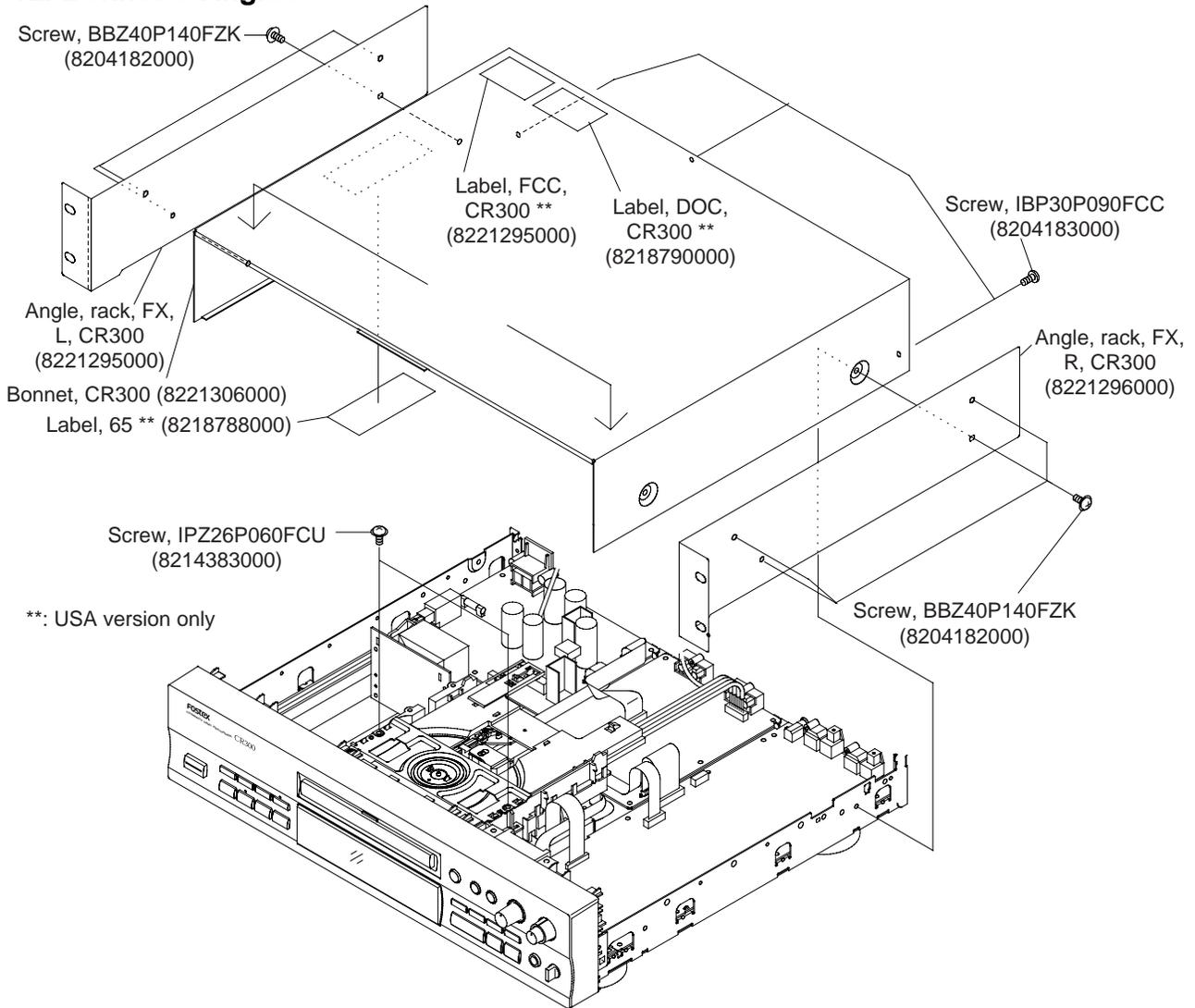
4-10. Input, Power, Front PCB Assy Wiring



4-11. Bridge, Clamper, etc.



4-12. Bonnet & Angles



** : USA version only

5. EXPLODED VIEWS, PCB ASSEMBLY & PARTS LIST

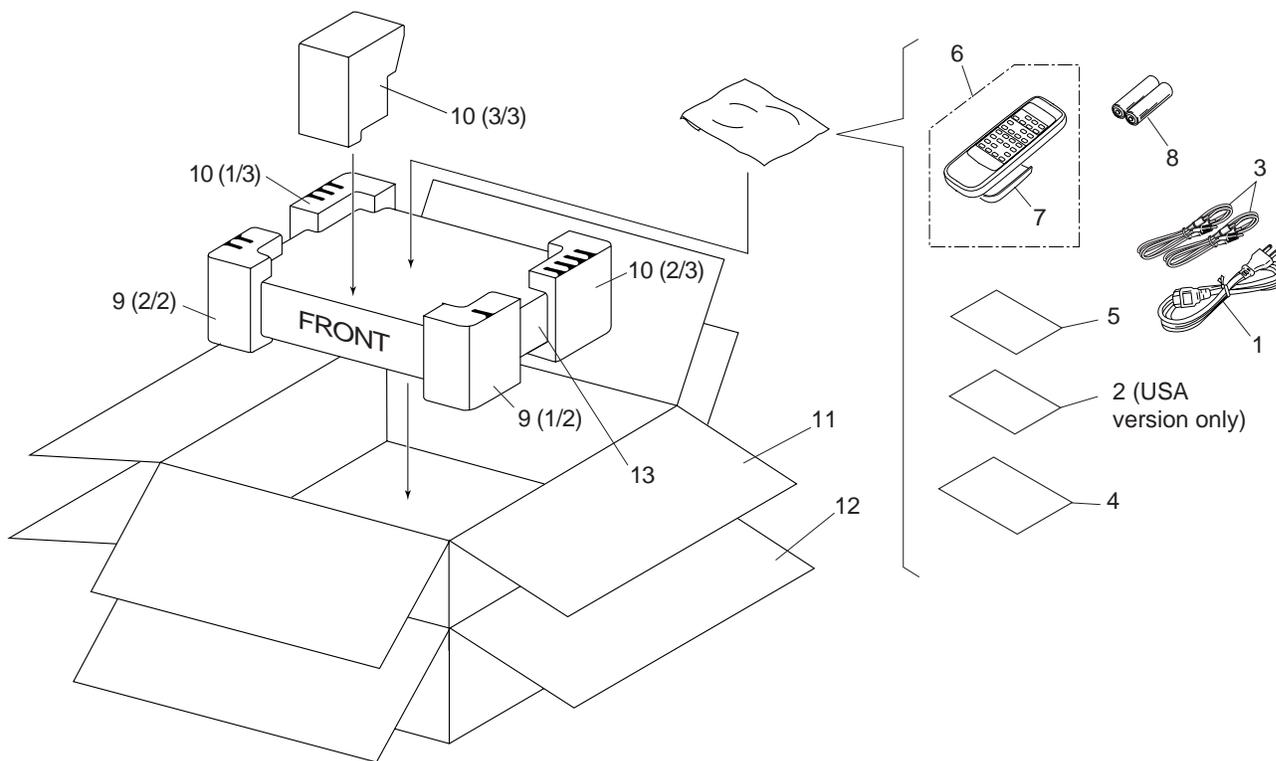
NOTE: •Parts marked by “N/A” are generally unavailable.

- The \triangle mark found on some component parts indicate the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
- Screws adjacent to \blacktriangledown mark on the product are used for disassembly.

5-1. EXPLODED VIEWS

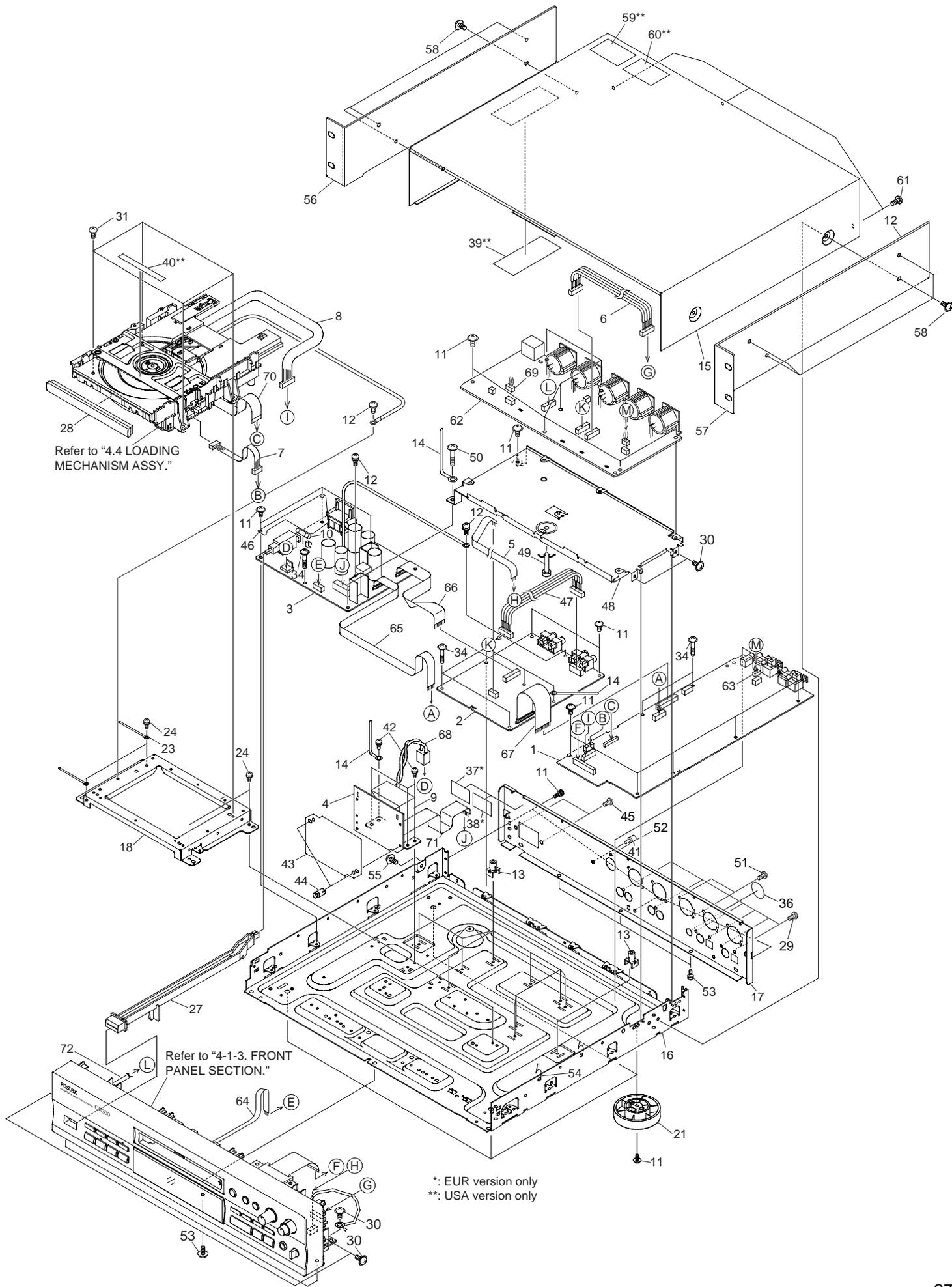
5-1-1. PACKING MATERIAL & ACCESSORY

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
\triangle 1	8276 9100 00	Cord, power, AC, USA	7	N/A	Cover, battery
	8276 9110 00	Cord, power, AC, EUR	8	N/A	Battery, dry cell, manganese, UM-4
2	8288 8901 00	Card, warranty, USA	9	8228 4600 00	Protector, front, CR300
3	8276 9120 00	Audio cable, RCA	10	8228 4610 00	Protector, rear/top, CR300
4	8288 4370 00	Owner's manual, ENG, CR300	11	8228 7300 00	Carton, inner, CR300
5	N/A	Caution, CD-R, EUR	12	8228 9090 00	Carton, outer, CR300
	N/A	Caution, CD-R, USA	13	8228 5750 00	Sheet, CR300
6	8270 8290 00	Remote control unit, Model 8317			



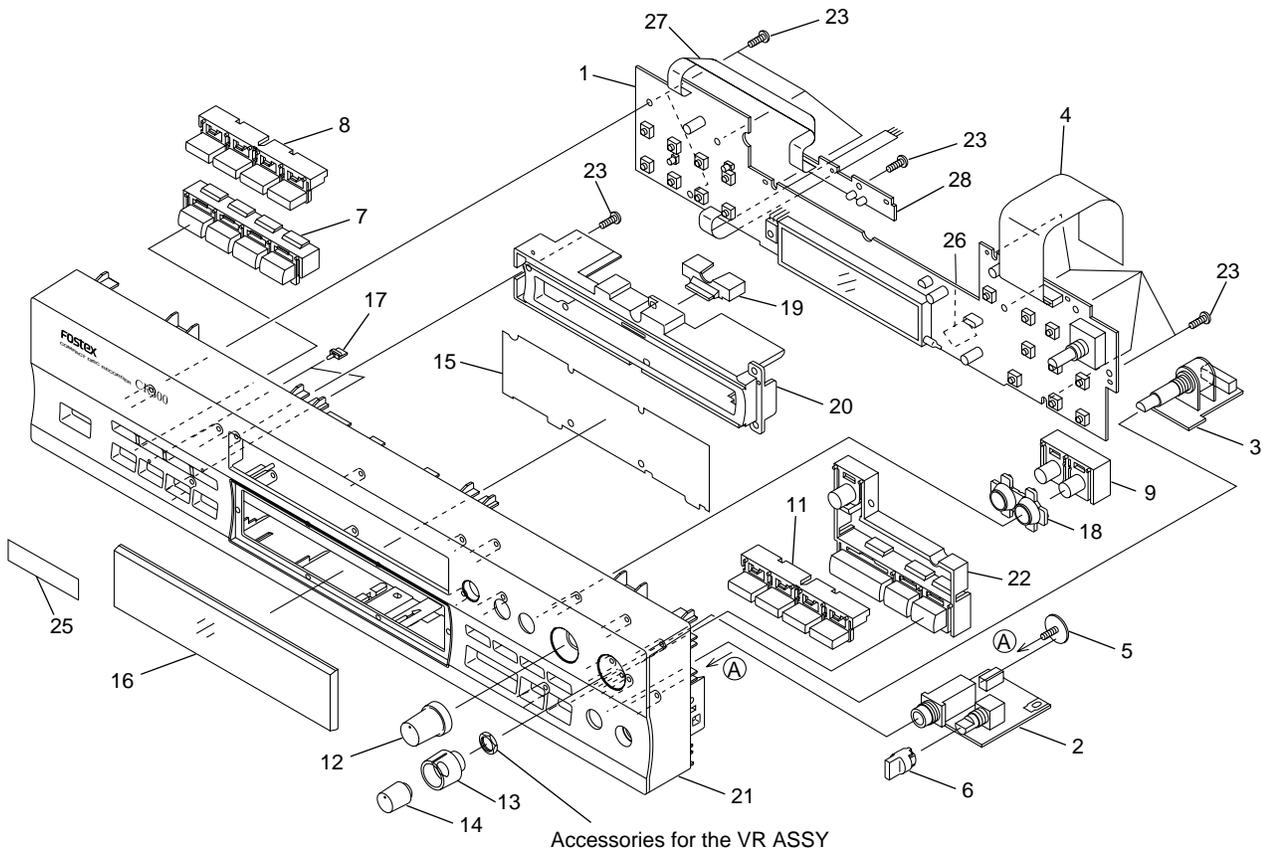
5-1-2. OVERALL EXPLODED VIEW

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
△ 1	8274 2320 06	PCB assy, Servo Digital, EUR, CR300	43	N/A	Transformer cover
	8274 2320 03	PCB assy, Servo Digital, USA, CR300	44	8207 0127 00	Rivet
2	8274 2350 06	PCB assy, Audio, EUR, CR300	45	8204 1810 00	Screw, BBZ40P080FCC
	8274 2350 03	PCB assy, Audio, USA, CR300	46	8216 7210 00	Cover, fuse, CR300
△ 3	8274 2360 06	PCB assy, Power, EUR, CR300	47	8277 4830 00	Cable assy, 2mm pitch, 8P, red
	8274 2360 03	PCB assy, Power, USA, CR300	48	N/A	I/O angle
△ 4	8274 2410 00	PCB assy, Transformer, CR300	49	N/A	Card spacer
5	8277 4800 00	Cable, 2mm pitch, parallel, 3P, L350	50	8204 1860 00	Screw, IBZ30P200FMC
6	8277 4820 00	Cable assy, 2mm pitch, 8P, wht	51	8204 1610 00	Screw, PMZ30P060FCC
7	8277 4850 00	Cable assy, 5P, grn	52	8204 1640 00	Screw, PMZ26P040FMC
8	8277 4860 00	Cable assy, 9P, grn	53	8204 1840 00	Screw, IBZ30P080FZK
△ 9	8242 2670 06	Transformer, power, EUR, CR300	54	N/A	Binder
	8242 2670 03	Transformer, power, USA, CR300	55	8204 1620 00	Screw, AMZ40P060FCU
△ 10	8239 1190 00	Fuse, T500mA/250V, EUR	56	8221 2950 00	Angle, rack, FX, L, CR300
	8239 1180 00	Fuse, 1A/125V, USA	57	8221 2960 00	Angle, rack, FX, R, CR300
11	8204 1780 00	Screw, ABA1011	58	8204 1820 00	Screw, BBZ40P140FZK
12	8204 1580 00	Screw, 3 x 6, B	59	8218 7890 00	Label, FCC, CR300
13	N/A	PCB mold	60	8218 7900 00	Label, DOC, CR300
14	N/A	Cord stopper	61	8204 1830 00	Screw, IBP30P090FCC
15	8221 3060 00	Bonnet, CR300	62	8274 2340 06	PCB assy, Input, EUR, CR300
16	N/A	Under base		8274 2340 03	PCB assy, Input, USA, CR300
17	8221 3070 06	Base, rear, EUR, CR300	63	8277 4840 00	Cable assy, 3P, wht
	8221 3070 03	Base, rear, USA, CR300	64	8277 4870 00	Cable, 2mm pitch, parallel, 4P, L250
18	N/A	Mecha base	65	8277 4890 00	Cable, 2mm pitch, parallel, 6P, L300
19	...		66	8277 4900 00	Cable, 2mm pitch, parallel, 8P, L200
20	...		67	8277 4910 00	Cable, 2mm pitch, parallel, 15P, L100
21	8207 0131 00	Insulator, CR300	68	8277 4920 00	Cable assy, 2P
22	...		69	8277 4930 00	Cable assy, 2mm pitch, 6P
23	8221 1140 00	Clamper, cord	70	8277 4940 00	Cable, 32P, FCC/30V
24	8204 1880 00	Screw, PBA1112	71	8277 4960 00	Cable, parallel, 9P, L150
25	...		72	8277 4970 00	Cable, 2mm pitch, parallel, 5P, L550
26	...				
27	8226 2510 00	Button, power, FX, CR300			
28	8212 6880 00	Panel, tray, CR300			
29	8214 3790 00	Screw, BBZ30P080FCC			
30	8214 2980 00	Screw, IBZ30P060FCC			
31	8204 1800 00	Screw, BBZ30P100FCC			
32	...				
33	...				
34	8204 1850 00	Screw, IBZ30P180FCC			
35	...				
36	8218 7680 00	Label, black			
37	8218 7870 00	Label, caution, HE, CR300			
38	8218 7640 00	Label, caution, EUR			
39	8218 7880 00	Label, 65, CR300			
40	N/A	Laser caution label			
41	8245 3160 00	Terminal, screw, SI-A2475			
42	8204 1790 00	Screw, RBA1132			



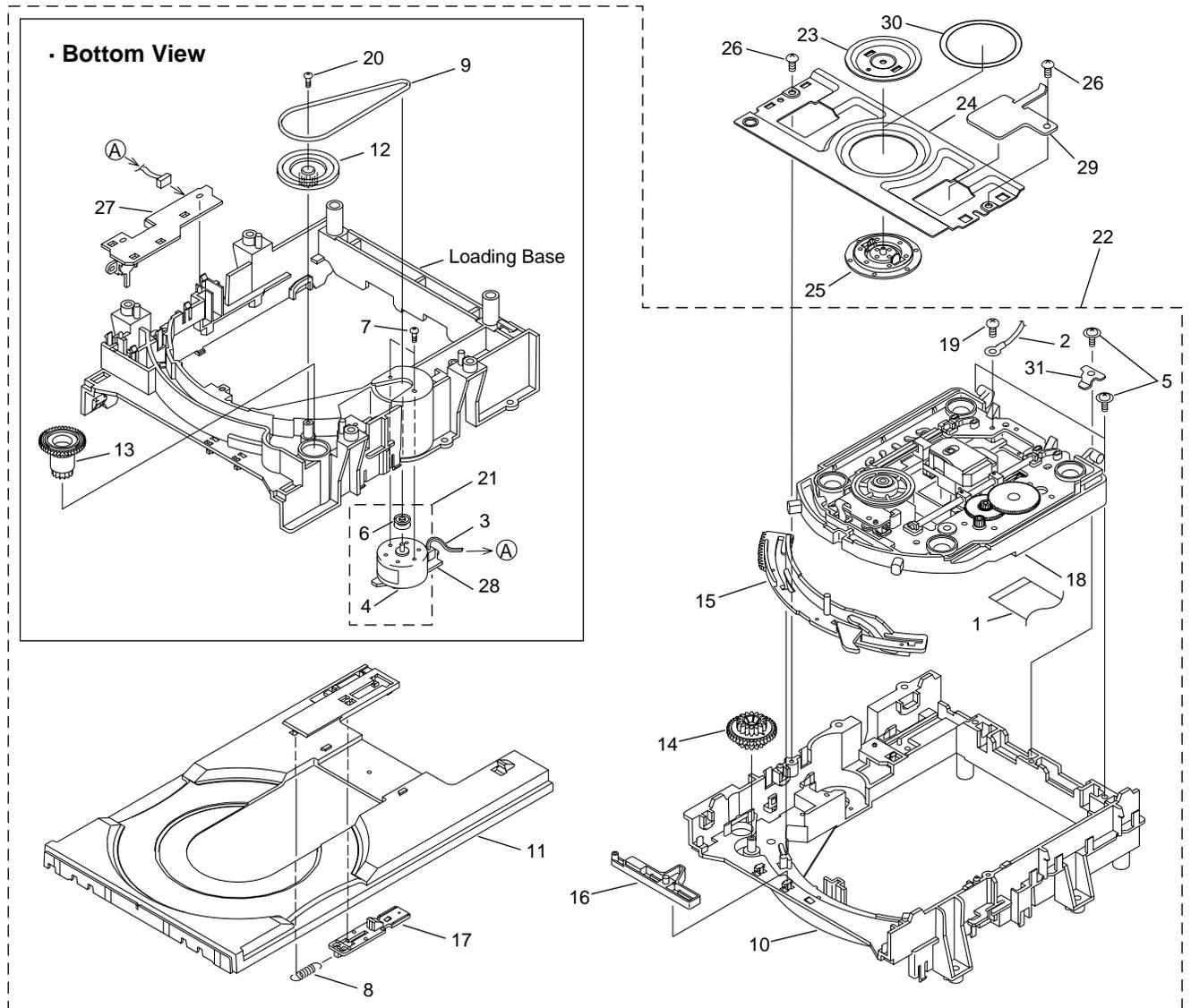
5-1-3. FRONT PANEL SECTION

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	8274 2380 00	PCB assy, Function A, CR300	16	8212 6660 00	Window, FL, CR300
2	8274 2390 00	PCB assy, HP, CR300	17	8212 6670 00	Lens, LED, CR300
3	8274 2400 00	PCB assy, VR, CR300	18	8226 2600 00	Ring, REC, CR300
4	8277 4810 00	Cable, 22P F.F.C/60V	19	8212 6680 00	Lens, operation, CR300
5	8204 1770 00	Screw with washer, ABA1005	20	8212 6860 00	Panel, sub, CR300
6	8226 2540 00	Knob, headphone, FX, CR300	21	8212 6870 00	Panel, front, CR300
7	8226 2550 00	Button, mode, FX, CR300	22	8226 2590 00	Button, play, FX, CR300
8	8226 2560 00	Button, manual, FX, L, CR300	23	8204 1870 00	Screw, PPZ30P100FMC
9	8226 2580 00	Button, REC, FX, CR300	24	...	
10	...		25	N/A	Getter label, USA
11	8226 2570 00	Button, manual, FX, R, CR300	26	8236 0841 00	IC, EPROM, CR300
12	8226 2610 00	Knob assy, VOL, CR300	27	8277 4880 00	Cable, 2mm pitch, parallel, 5P, L150
13	8226 2520 00	Knob, REC, FX, L, CR300	28	8274 2420 00	PCB assy, Function B, CR300
14	8226 2530 00	Knob, REC, FX, R, CR300			
15	8216 7180 00	Sheet, FL, CR300			



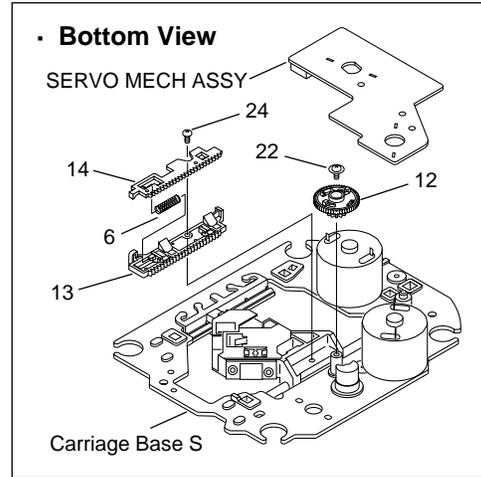
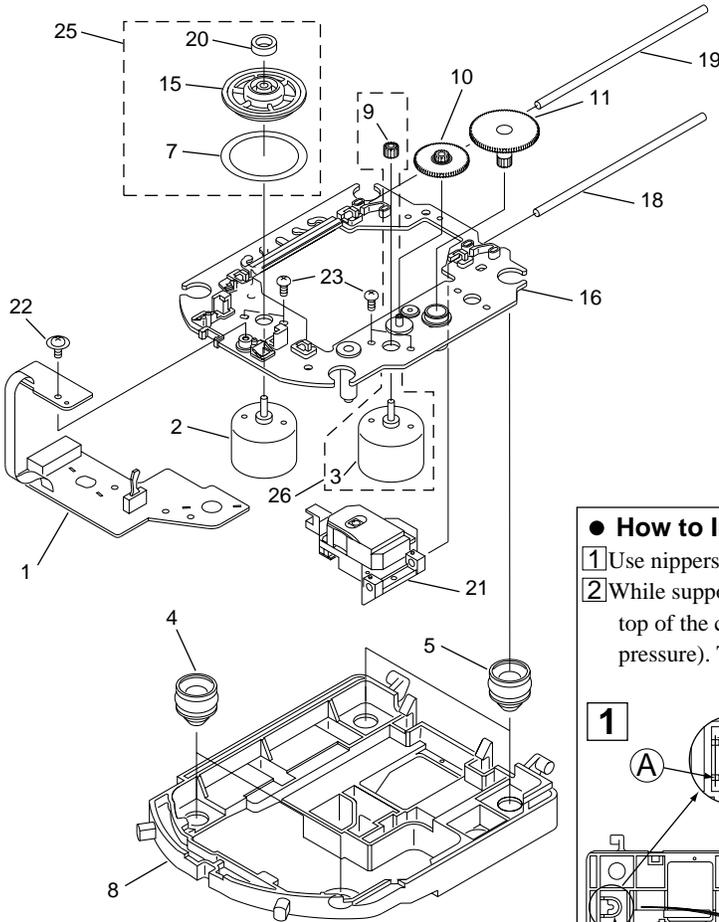
5-1-4. LOADING MECHANISM SECTION

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	8277 4940 00	Cable, 32P, FCC/30V	16	8212 6830 00	Plate, lock, CR300
2	N/A	Earth lead unit	17	8212 6840 00	Stopper, tray, CR300
3	8277 4950 00	Cable assy, 2P, CR300	18	N/A	CD-RW servo mecha assy
4	8249 0430 00	DC motor, CR300	19	8204 1510 00	Screw, BBZ26P040FMC
5	8204 1900 00	Screw, DBA1055	20	8214 3840 00	Screw, IPZ20P080FMC
6	N/A	Motor pulley	21	8260 5710 00	Loading motor assy, CR300
7	8204 1910 00	Screw, VBA1055	22	N/A	Loading mechanism assy
8	8214 3920 00	Spring, tray stopper, CR300	23	8221 3040 00	Plate, clamper, CR300
9	8216 7190 00	Belt, rubber, CR300	24	8221 3050 00	Bridge, CR300
10	8212 6760 00	Base, loading, CR300	25	8212 6820 00	Clamper, CR300
11	8212 6770 00	Tray, CR300	26	8214 3830 00	Screw, IPZ26P060FCU
12	8212 6780 00	Pulley, gear, CR300	27	N/A	Loading A assy
13	8212 6790 00	Gear, loading, CR300	28	N/A	Loading B assy
14	8212 6800 00	Gear, drive, CR300	29	8216 7200 00	Holder, tray, CR300
15	8212 6810 00	Cam, drive, CR300	30	8212 6850 00	Spacer, bridge, CR300
			31	8221 3080 00	Stopper, CR300



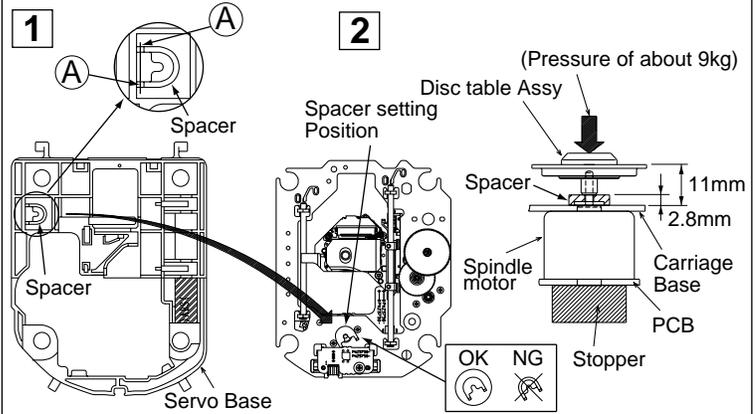
5-1-5. SERVO MECHANISM SECTION

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	N/A	PCB assy, Servo Mech	14	8212 6750 00	Stopper, rack, CR300
2	8260 5670 00	DC motor assy, CR300	15	N/A	Disc table
3	N/A	DC motor	16	8221 3030 00	Base, carriage, S, CR300
4	8216 7160 00	Rubber, float, A, CR300	17	...	
5	8216 7170 00	Rubber, float, B, CR300	18	8223 3000 00	Bar, guide, CR300
6	N/A	Rack spring	19	8223 3010 00	Bar, guide, sub, CR300
7	N/A	Mirror sheet	20	N/A	Magnet
8	8212 6690 00	Base, servo, CR300	21	8260 5680 00	Pickup, CD-R, CR300
9	8212 6700 00	Gear, pinion, CR300	22	8204 1930 00	Screw, IPZ20P060FMC
10	8212 6710 00	Gear, A, CR300	23	8204 1940 00	Screw, PMZ20P030FMC
11	8212 6720 00	Gear, B, CR300	24	8204 1890 00	Screw, JGZ17P030FMC
12	8212 6730 00	Gear, C, CR300	25	8260 5690 00	Disc table assy, CR300
13	8212 6740 00	Rack, CR300	26	8260 5700 00	Carriage motor assy, CR300



● How to Install the Disc Table

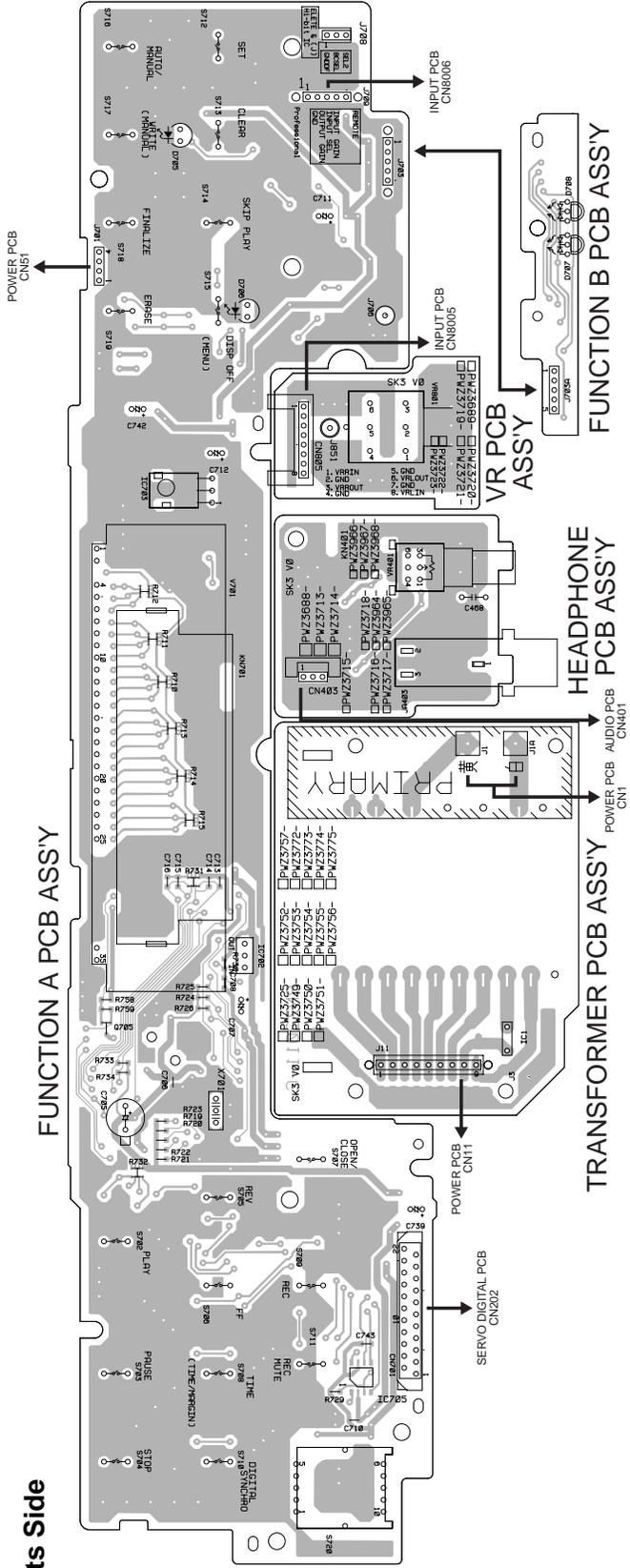
- 1 Use nippers or other tool to cut the two sections marked (A) in figure 1.
- 2 While supporting the spindle motor shaft with the stopper, put spacer on top of the carriage base, and stick the disc table on top (takes about 9kg pressure). Take off the spacer.



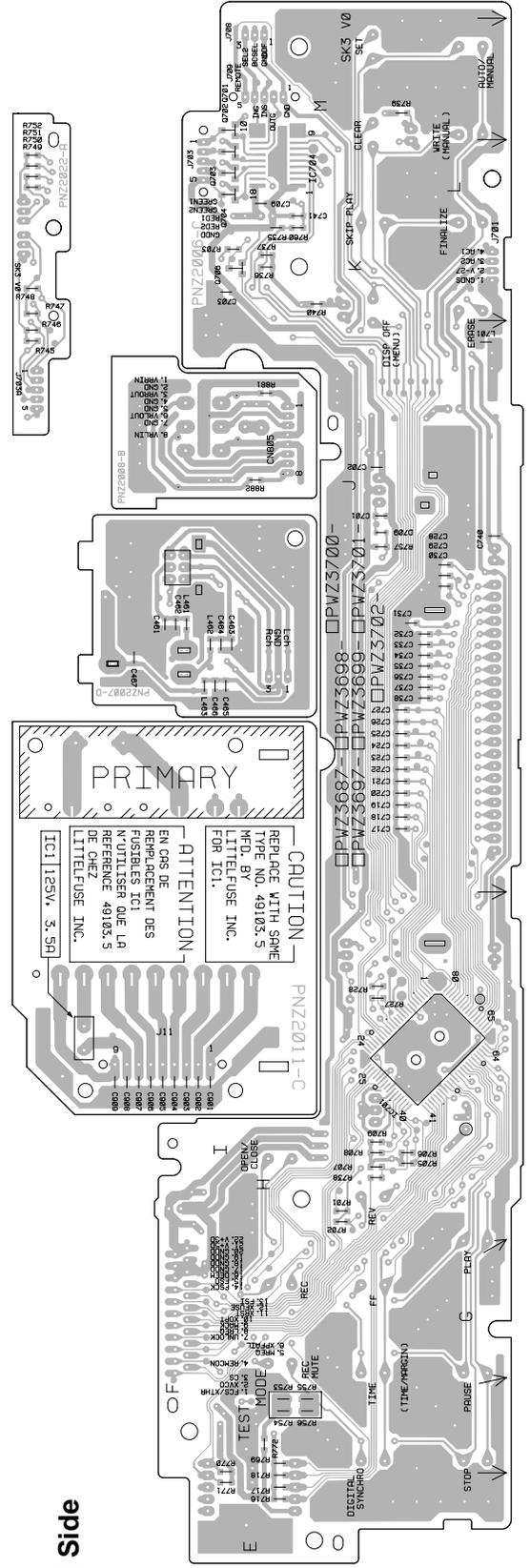
5-2. PCB ASSEMBLIES

5-2-1. FUNCTION, TRANSFORMER, VR & HEADPHONE PCBs

● Parts Side

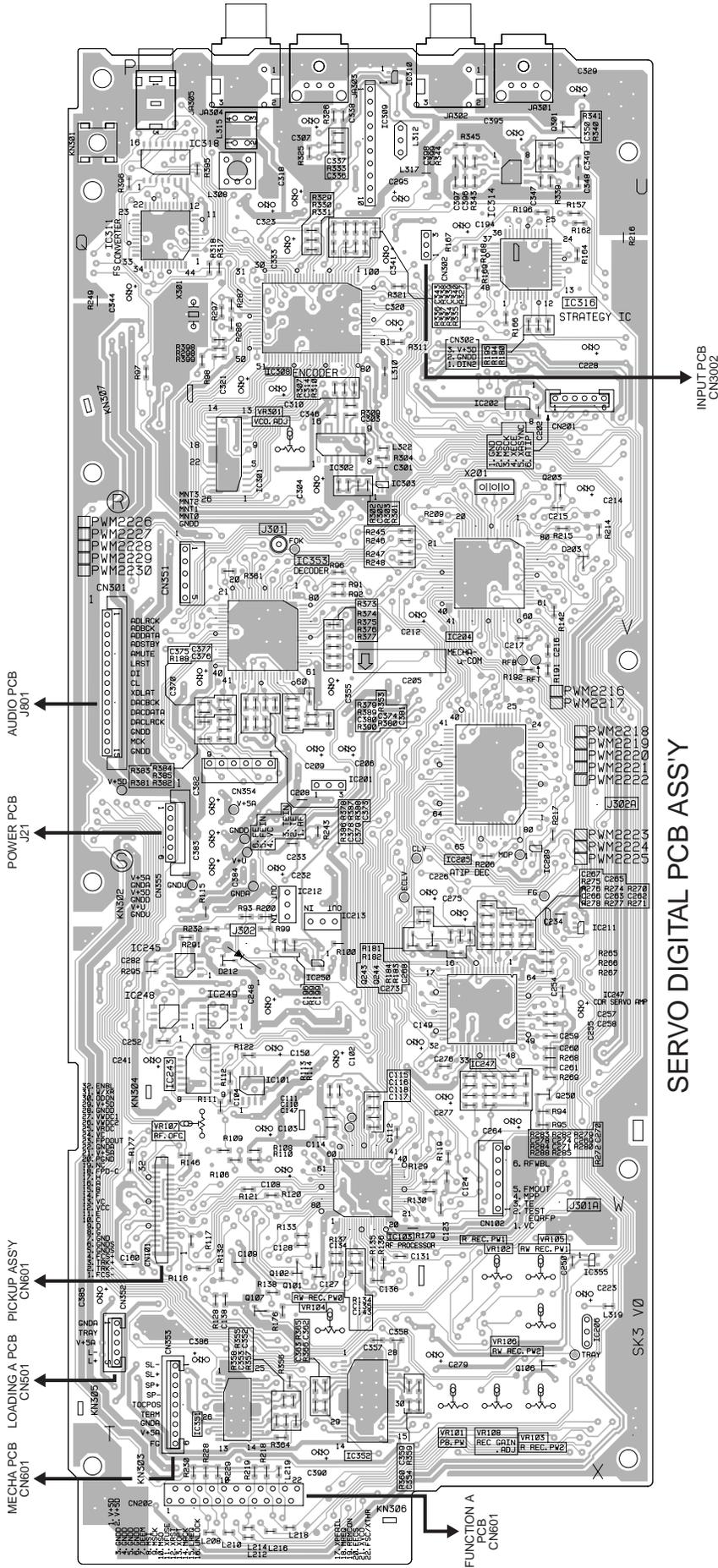


● Foil Side



5-2-2. SERVO DIGITAL PCBs

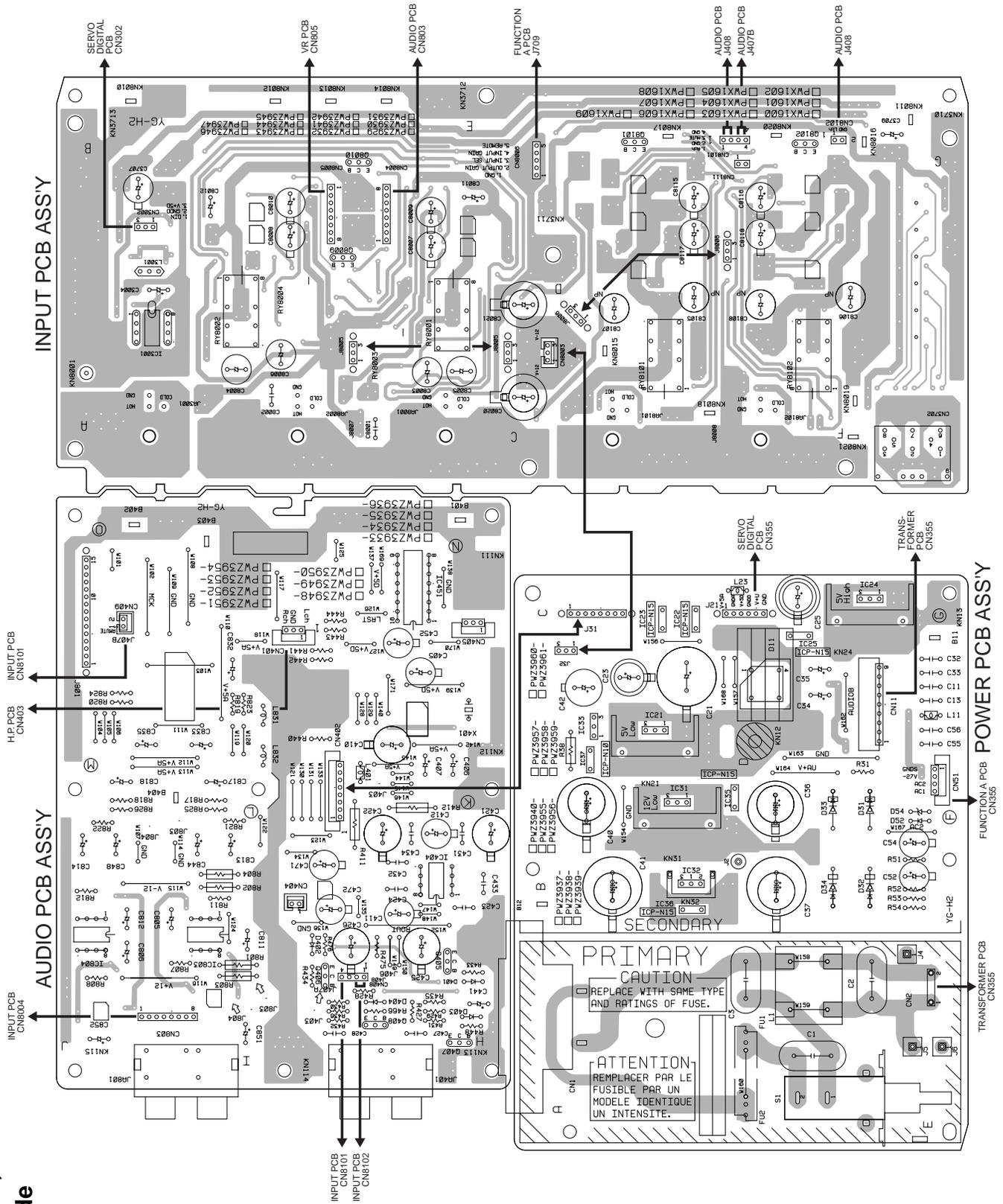
- Parts side



SERVO DIGITAL PCB ASS'Y

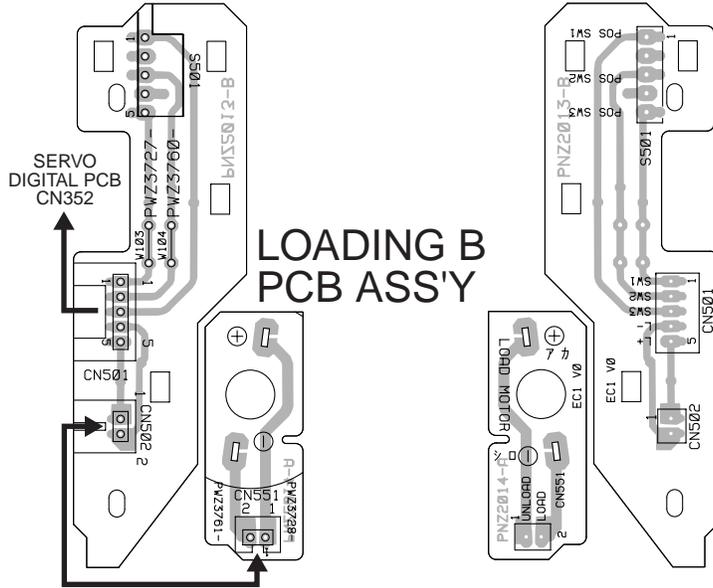
5-2-3. AUDIO, INPUT & POWER PCBs

● Parts side



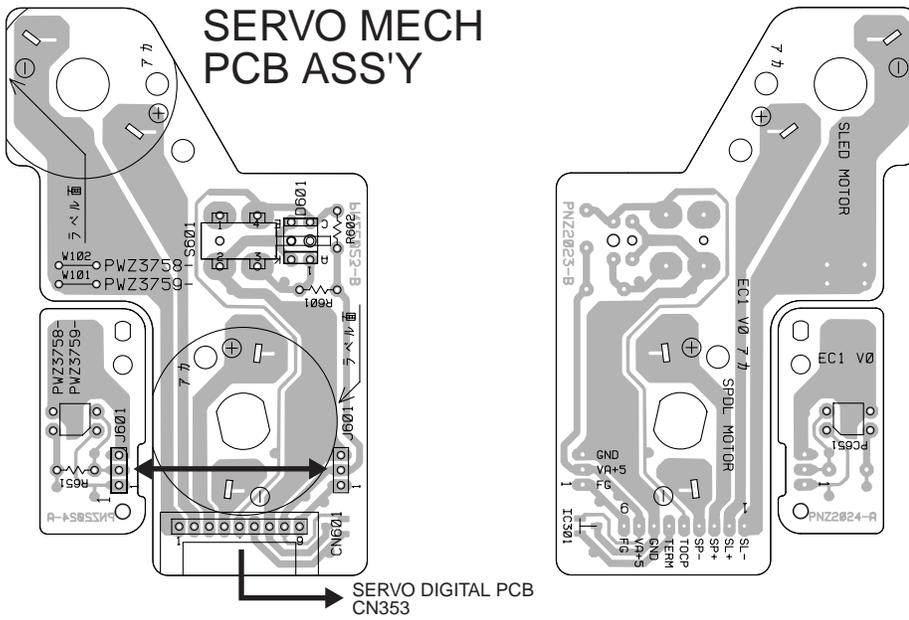
5-2-4. LOADING A / B & SERVO MECH PCBs

LOADING A PCB ASS'Y

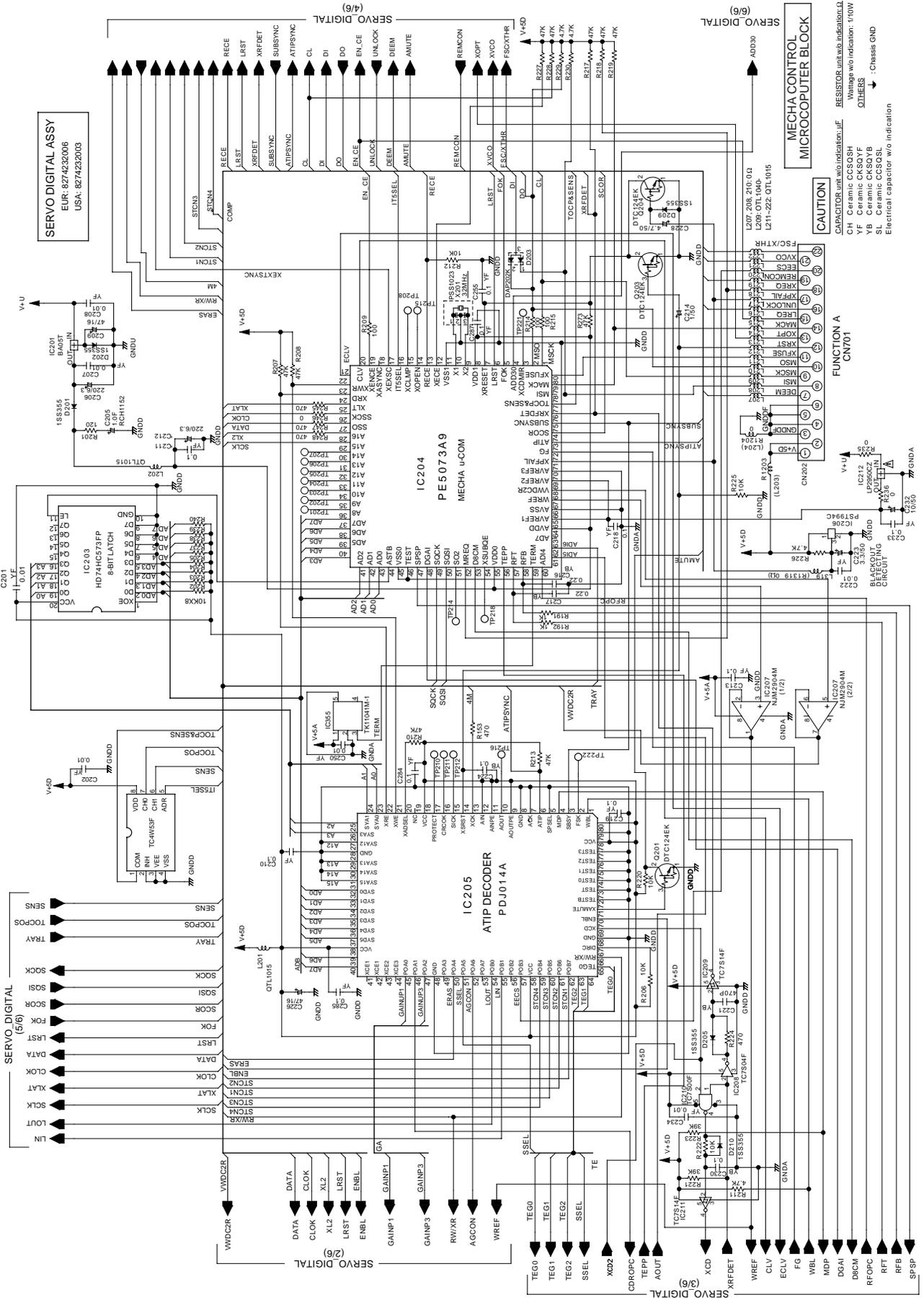


LOADING B PCB ASS'Y

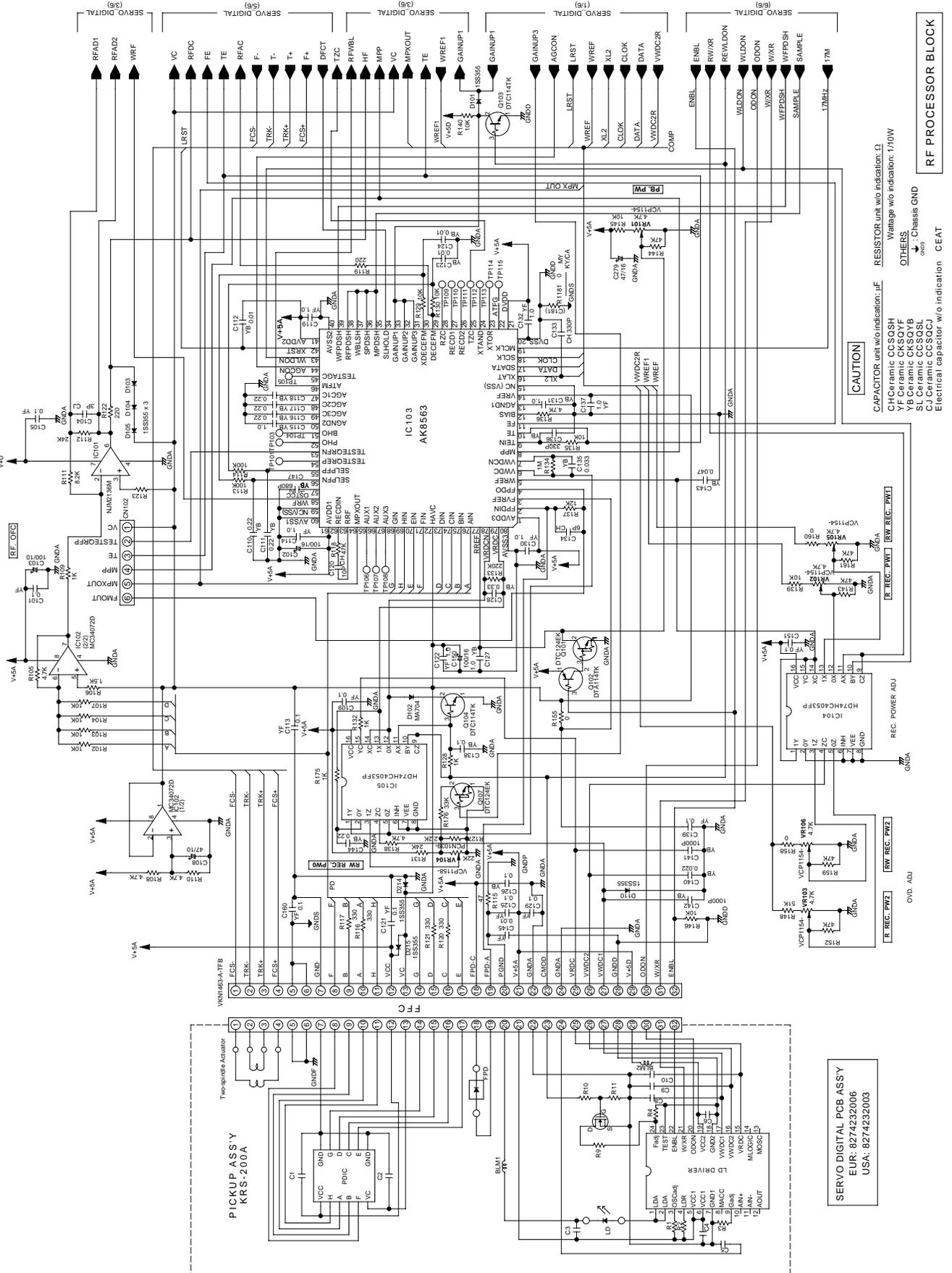
SERVO MECH PCB ASS'Y



6-2. SERVO DIGITAL PCB
6-2-1. MECHA & MICROCOMPUTER BLOCK (1/6)



6-2-2. RF PROCESSOR BLOCK (2/6)



CAUTION

CAPACITOR unit w/o indication: μF
 RESISTOR unit w/o indication: Ω

C1.Ceramic CC80SH
 V.C.Ceramic CK80YF
 YB.Ceramic CK80YB
 SL.Ceramic CC80SL
 C.J.Ceramic CC80CJ

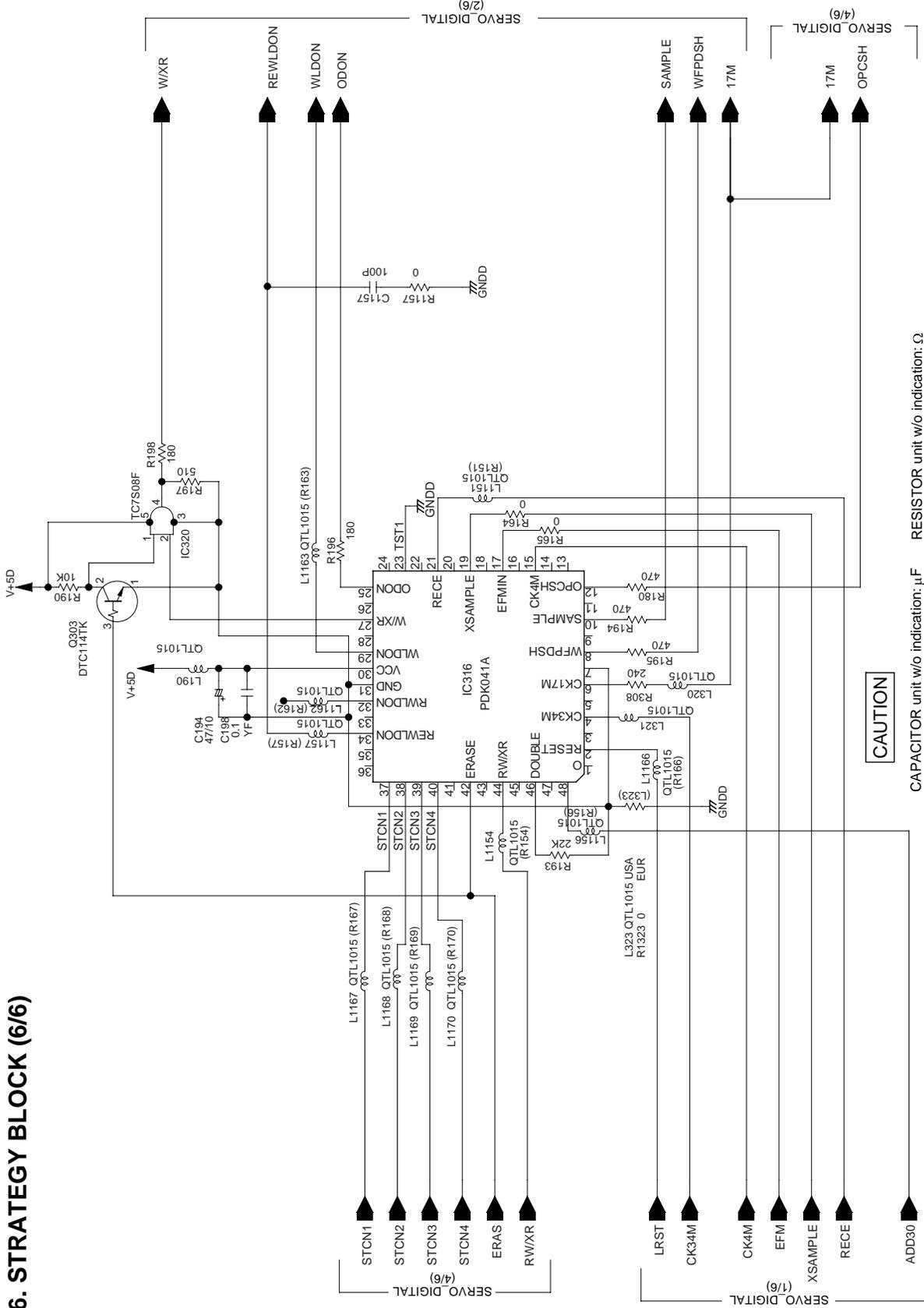
Electrical capacitor w/o indication CEAT

Wattage w/o indication: 1/10W
 OTHERS
 $\frac{1}{2}$ W Chassis GND

RF PROCESSOR BLOCK

SERVO DIGITAL PCB ASS'Y
 EUR: 8274232006
 USA: 8274232003

6-2-6. STRATEGY BLOCK (6/6)



STRATEGY BLOCK

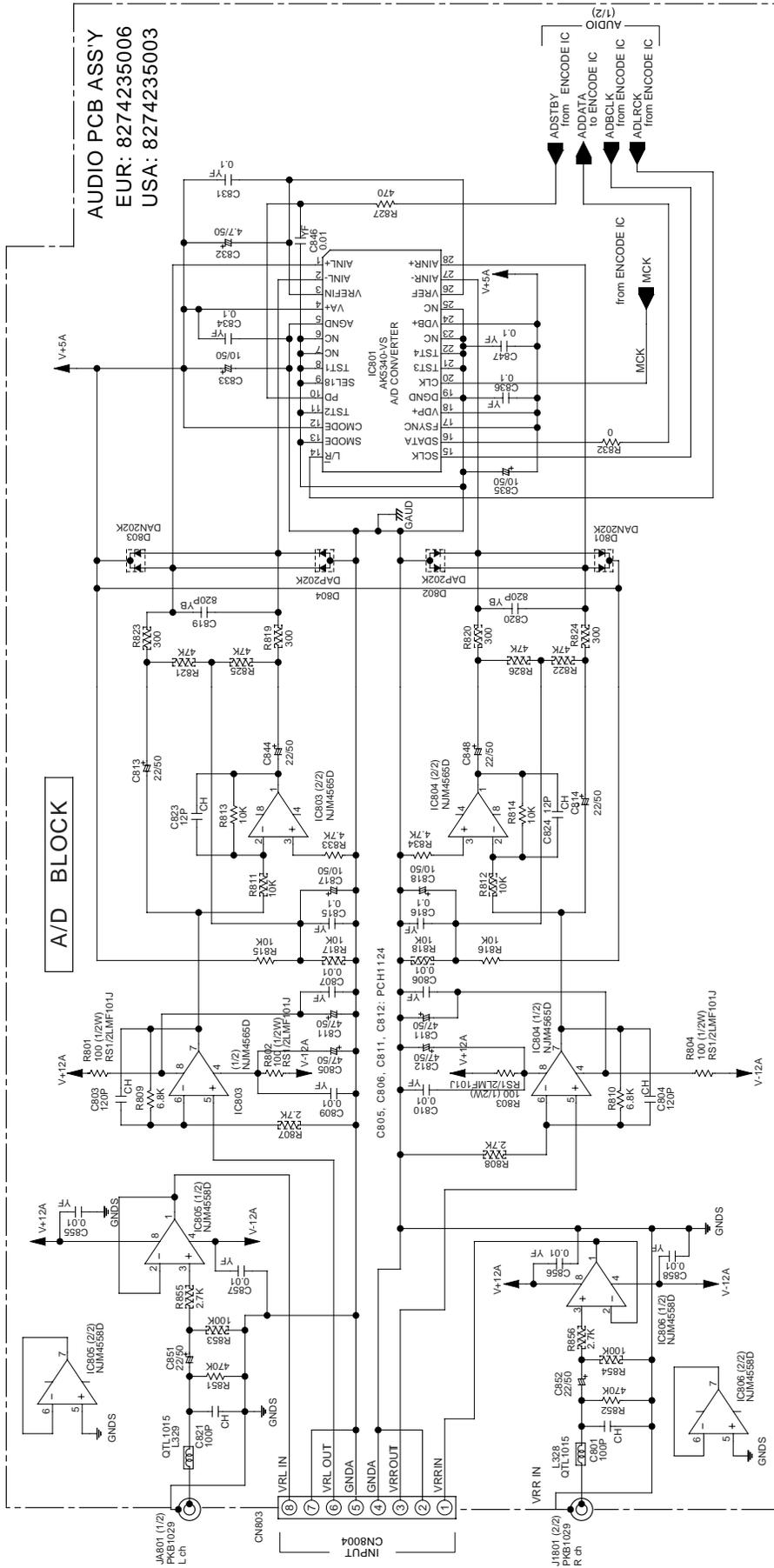
SERVO DIGITAL PCB ASS'Y
 EUR: 8274232006
 USA: 8274232003

CAUTION

CAPACITOR unit w/o indication: μ F
 RESISTOR unit w/o indication: Ω
 Wattage w/o indication: 1/10W
 OTHERS
 \downarrow : Chassis GND
 \downarrow : GND

CH Ceramic CCSQSH
 YF Ceramic CKSQYF
 YB Ceramic CKSQYB
 SL Ceramic CCSQSL
 CJ Ceramic CCSQCJ
 Electrical capacitor w/o indication CEAT

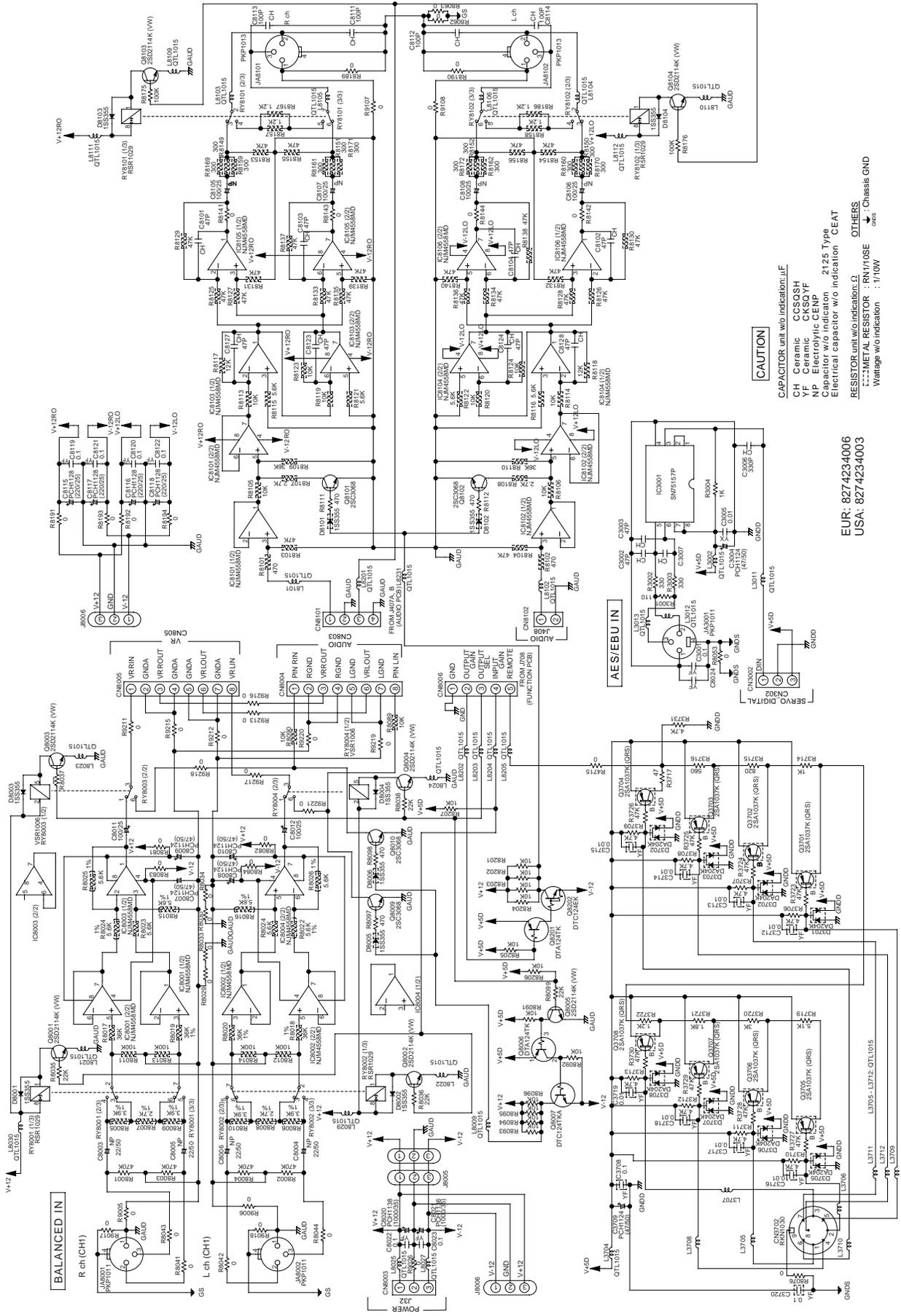
6-3-2. AUDIO (AD BLOCK) & VR PCBs



CAUTION

- CAPACITOR unit w/o indication: μF
- CH Ceramic CCSQSH
 - YF Ceramic CXSQYF
 - YB Ceramic CKSQYB
- Electrical capacitor w/o indication CEAT
- RESISTOR unit w/o indication: Ω
- : 1/4W
 Wattage w/o indication: 1/10W
- OTHERS**
- \downarrow : Chassis GND

6-4. INPUT PCB

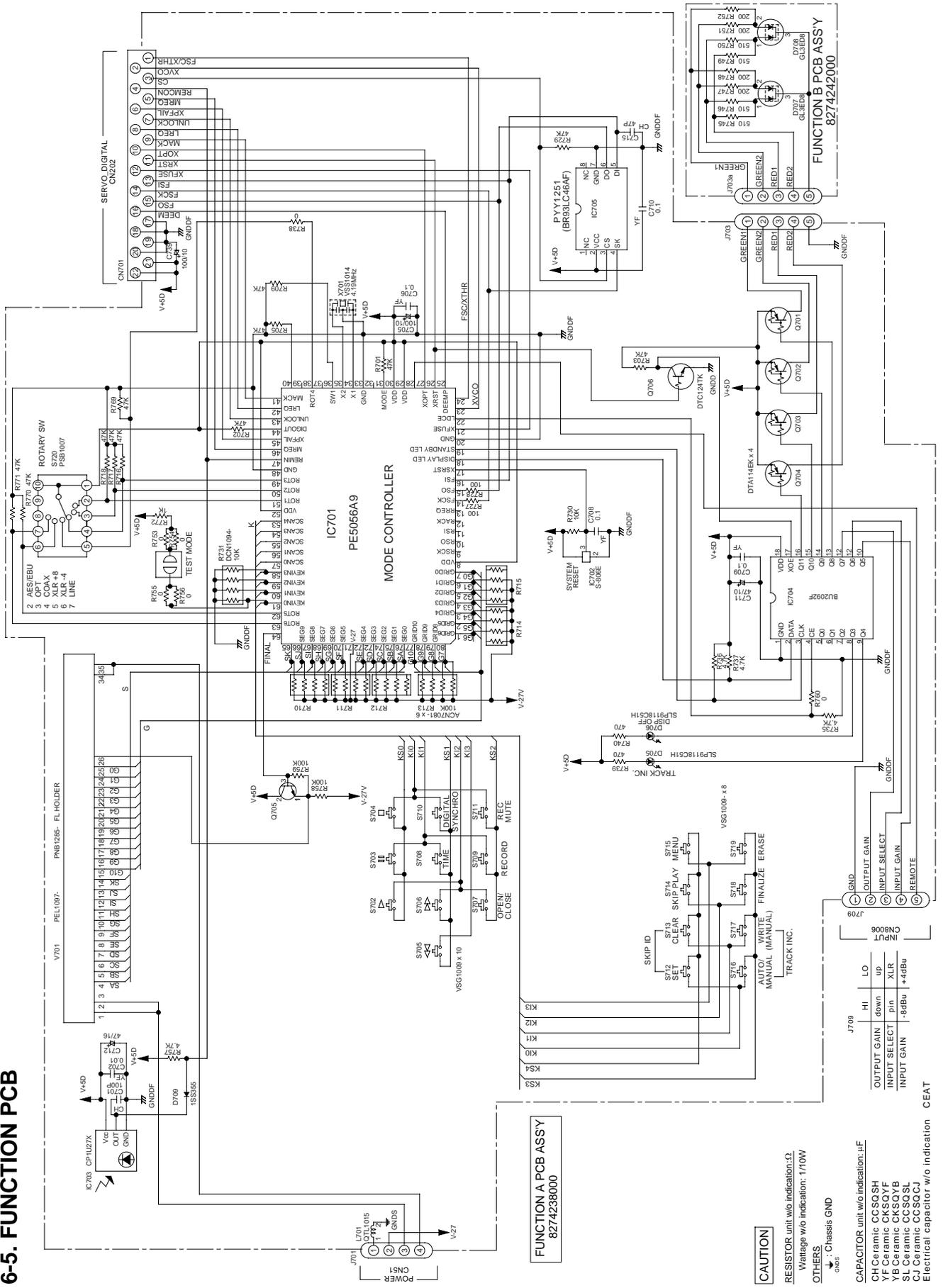


CAUTION

CAPACITOR unit w/o indication: uF
 CH Ceramic
 CCSQSH Ceramic
 NP Electrolytic
 CENF Electrolytic
 Capacitor w/o indication 2125 Type
 Electrical capacitor w/o indication CEAT
 RESISTOR unit w/o indication: Ω
 METAL RESISTOR : RN1/10SE OTHERS
 Warrage w/o indication : 1/10W ↓ : Chassis GND

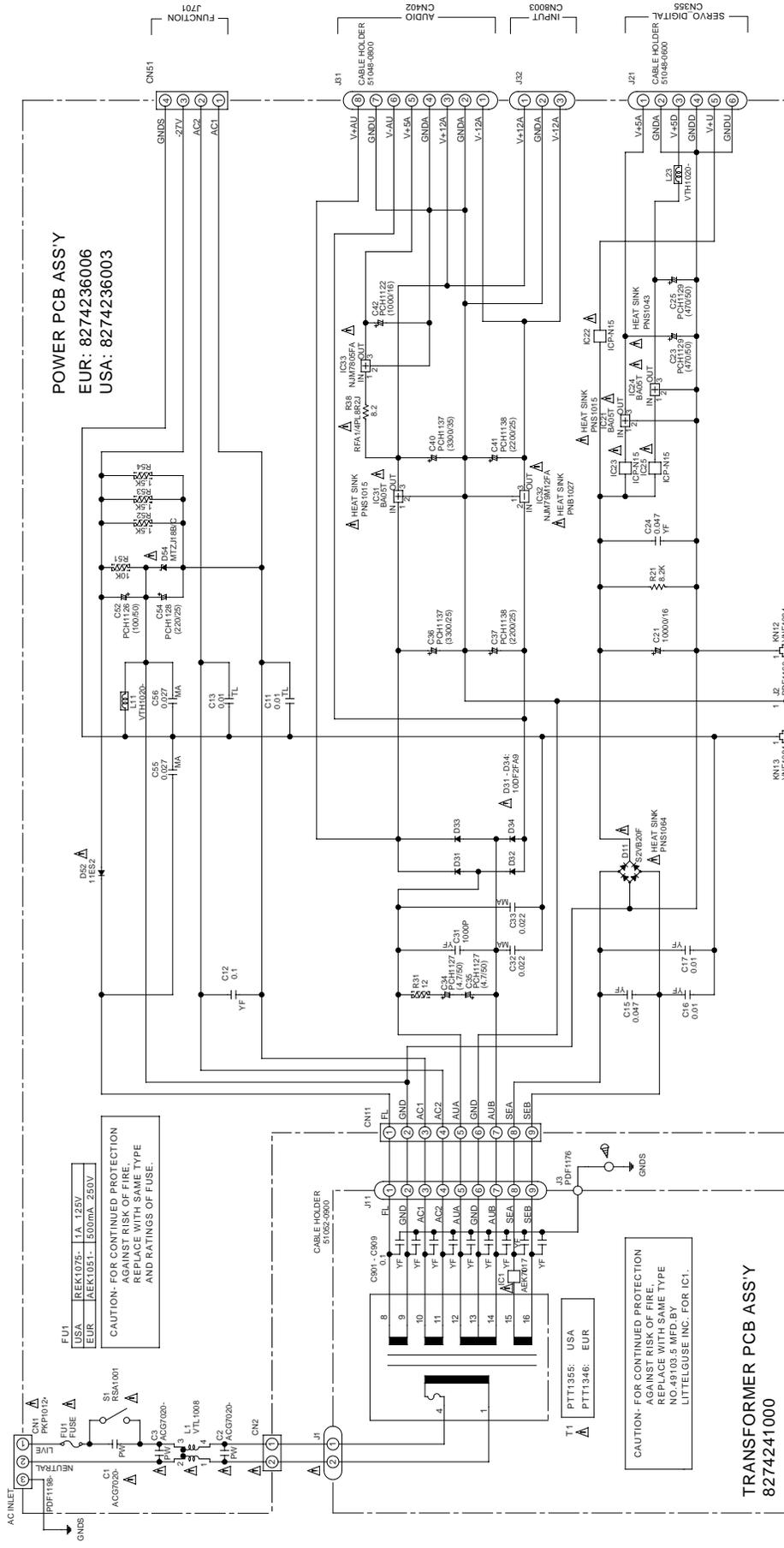
EUR: 8274234006
 USA: 8274234003

6-5. FUNCTION PCB

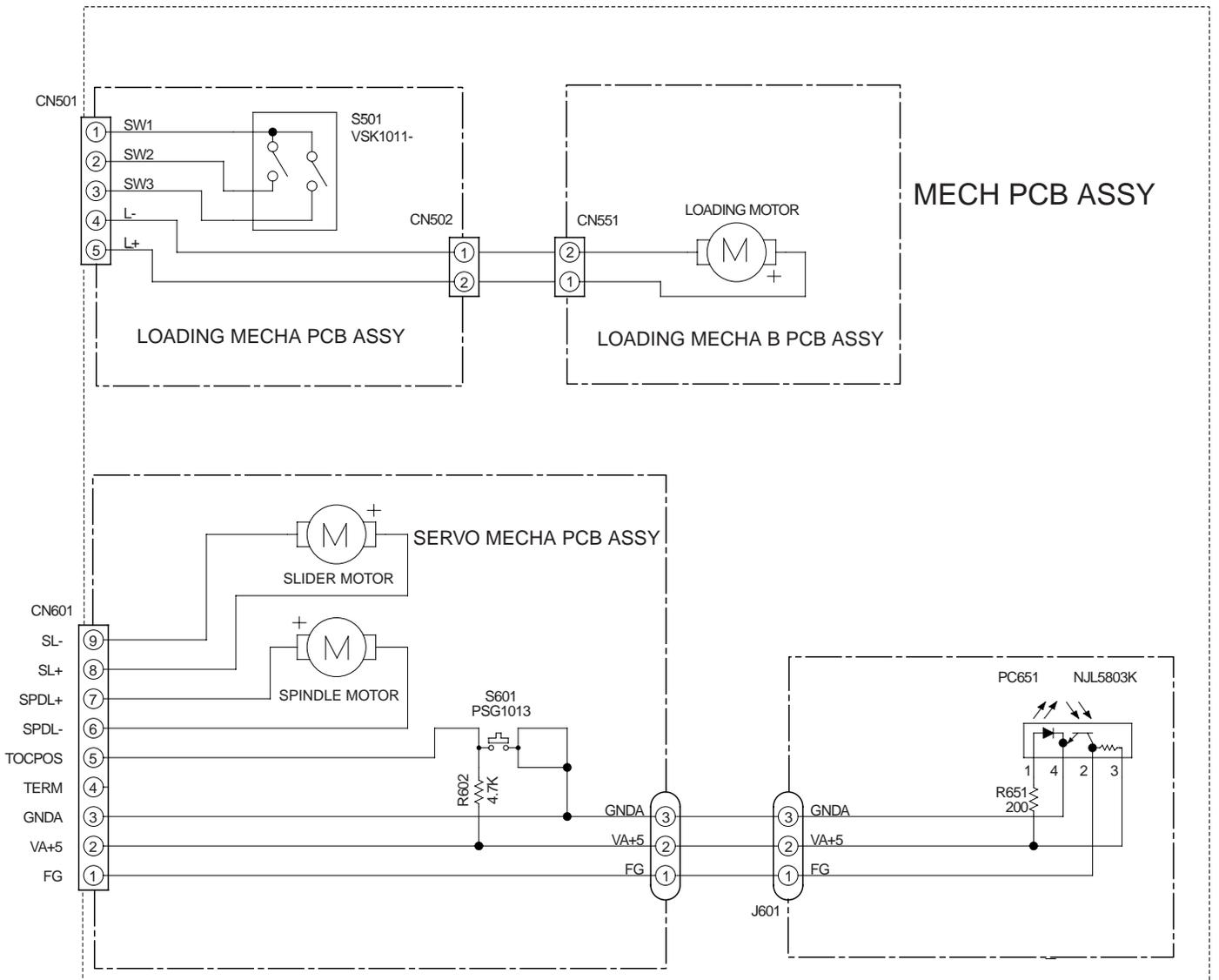


CAUTION
 RESISTOR unit w/o indication: Ω
 Wattage w/o indication: 1/10W
 OTHERS
 ↓ : Chassis GND
 CAPACITOR unit w/o indication: μF
 CH Ceramic CC50SH
 YF Ceramic CK50YF
 YB Ceramic CK50YB
 SL Ceramic CC50SL
 CJ Ceramic CC50CJ
 Electrical capacitor w/o indication CEAT

6-6. POWER & TRANSFORMER PCBs



6-7. LOADING A / B & SERVO MECH PCBs



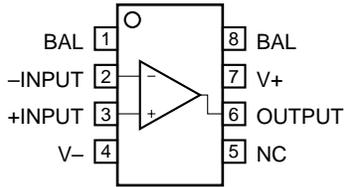
7. GENERAL INFORMATION

7-1. IC

The information shown in the list is the basic one and may not correspond exactly to that shown in the circuit diagrams.

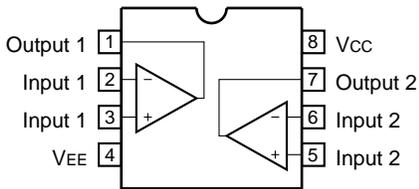
■ NJM2136M (SERVO DIGITAL PCB ASSY: IC101, Operational Amplifier)

• Pin Assignment

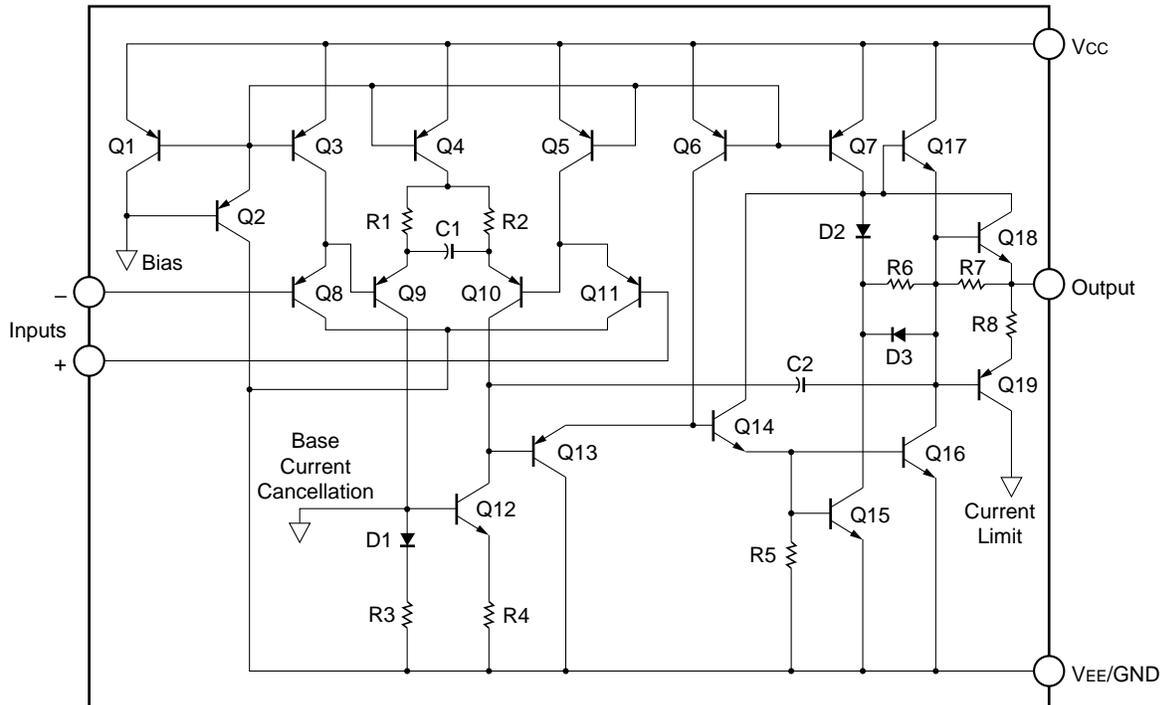


■ MC34072D (SERVO DIGITAL PCB ASSY: IC102, Operational Amplifier)

• Pin Assignment

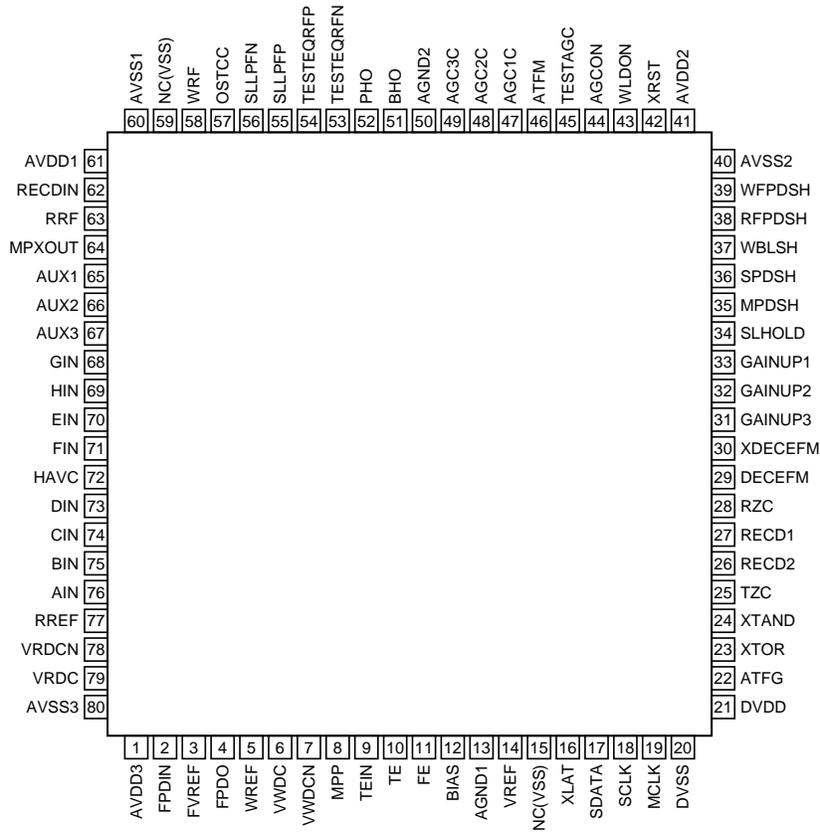


• Block Diagram

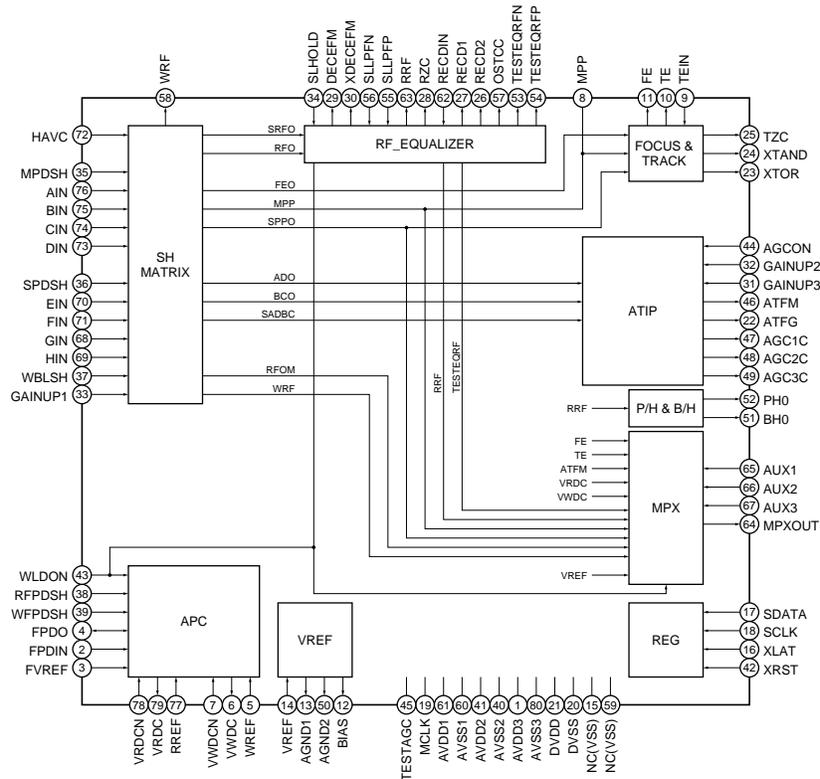


AK8563 (SERVO DIGITAL PCB ASSY: IC103, RF Processor IC)

• Pin Assignment



• Block Diagram

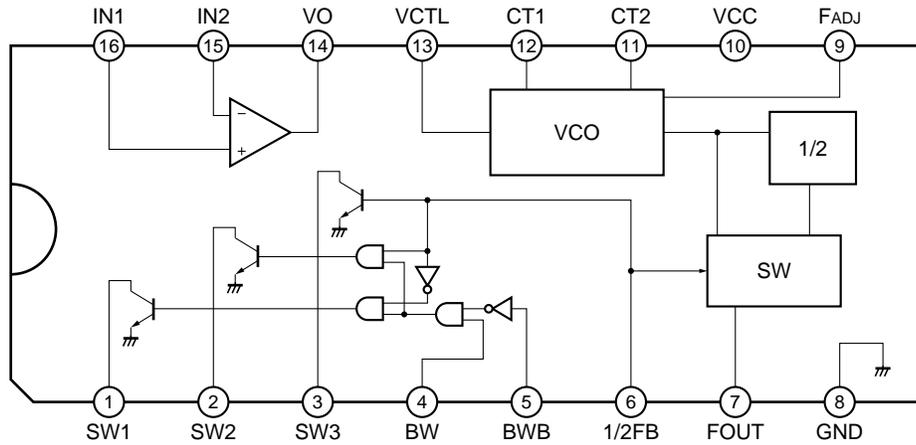


• Pin Function

No.	Pin Name	I/O	Function	No.	Pin Name	I/O	Function
1	AVDD3	I	Analog positive power supply pin	41	AVDD2	I	Analog positive power supply pin
2	FPDIN	I	Laser monitor diode connection pin	42	XRST	I	Register reset "L": Initialize the register
3	FVREF	I	Reference voltage input for APC	43	WLDON	I	Write LD control input "L": Set Write APC set-value to zero, "H": LD ON
4	FPD0	I/O	Laser monitor output (connect a resistor for I/V conversion between this pin and FPDIN (pin 2))/ Laser monitor voltage input	44	AGCON	I	Wobble AGC enable input "H": AGC ON, "L": AGC reset
5	WREF	I	Power setting voltage input for Write APC	45	TESTAGC	O	Test pin
6	VWDC	O	Laser driver control output for Write	46	ATFM	O	Wobble signal output
7	VWDCN	I	Laser driver control amp. (-) for Write	47	AGC1C	O	External capacitor connection pin for AGC response speed setting
8	MPP	O	Main push-pull signal output	48	AGC2C	O	
9	TEIN	I	Input for tracking signal process	49	AGC3C	O	
10	TE	O	Tracking error signal output	50	AGND2	O	Decoupling pin for internal reference voltage
11	FE	O	Focus error signal output	51	BH0	O	Bottom-level output of RRF signal
12	BIAS	O	Connect a bias resistor. RBIAS = 4.7kΩ	52	PH0	O	Peak-level output of RRF signal
13	AGND1	O	Decoupling pin for internal reference voltage	53	TESTEQRFN	O	Test pin
14	VREF	I/O	Decoupling pin for internal reference voltage / Reference voltage input	54	TESTEQRFP	O	Test pin
15	NC (VSS)	-	Connect to VSS	55	SLLPFP	I	LPF input (+) for auto slice
16	XLAT	I	Latch input for register setting	56	SLLPFN	I	LPF input (-) for auto slice
17	SDATA	I	Data input for register setting	57	OSTCC	O	Capacitor connection pin for fc setting of equalizer output offset-canceller
18	SCLK	I	Clock input for register setting	58	WRF	O	Write RF signal output
19	MCLK	I	Main clock input (34.5744MHz)	59	NC (VSS)	-	Connect to VSS
20	DVSS	I	Digital ground pin	60	AVSS1	O	Analog ground pin
21	DVDD	I	Digital positive power supply pin	61	AVDD1	I	Analog positive power supply pin
22	ATFG	O	ATIP FG output (Wobble signal after the binary data conversion)	62	RECDIN	I	RF input for recording block detection
23	XTOR	O	Tracking amplitude detection output	63	RRF	O	Read RF signal output
24	XTAND	O	Tracking error detection output	64	MPXOUT	O	Multiplexer output for signal monitor
25	TZC	O	Tracking zero-cross detection signal output	65	AUX1	I	Auxiliary input (1) for signal monitor
26	RECD2	O	Recording block detection signal 2 "H": Recording block, "L": Unrecording block	66	AUX2	I	Auxiliary input (2) for signal monitor
27	RECD1	O	Recording block detection signal 1 "H": Recording block, "L": Unrecording block	67	AUX3	I	Auxiliary input (3) for signal monitor
28	RZC	O	RF zero-cross detection signal output	68	GIN	I	Side beam signal (G) input
29	DECEFM	O	EFM output after sliced (inversion)	69	HIN	I	Side beam signal (H) input
30	XDECEFM	O	EFM output after sliced (positive-phase)	70	EIN	I	Side beam signal (E) input
31	GAINUP3	I	0 and + 18 dB switching control input "H": + 18 dB, "L": Hold	71	FIN	I	Side beam signal (F) input
32	GAINUP2	I					
33	GAINUP1	I					
34	SLHOLD	I	Slice level hold signal input "H": Hold	74	CIN	I	Main beam signal (C) input
35	MPDSH	I	Sample pulse input for main-beam "H": Sample, "L": Hold	75	BIN	I	Main beam signal (B) input
36	SPDSH	I	Sample pulse input for side-beam "H": Sample, "L": Hold	76	AIN	I	Main beam signal (A) input
37	WBLSH	I	Sample pulse input for Wobble signal "H": Sample, "L": Hold	77	RREF	I	Power setting voltage input for Read APC
38	RFPDSH	I	Sample pulse input for Read APC "H": Sample, "L": Hold	78	VRDCN	I	Laser driver control amp. (-) for Read
39	WFPDSH	I	Sample pulse input for Write APC "H": Sample, "L": Hold	79	VRDC	O	Laser driver control output for Read
40	AVSS2	I	Analog ground pin	80	AVSS3	I	Analog ground pin

■ BA7082F (SERVO DIGITAL PCB ASSY: IC302, VCO IC)

• Block Diagram

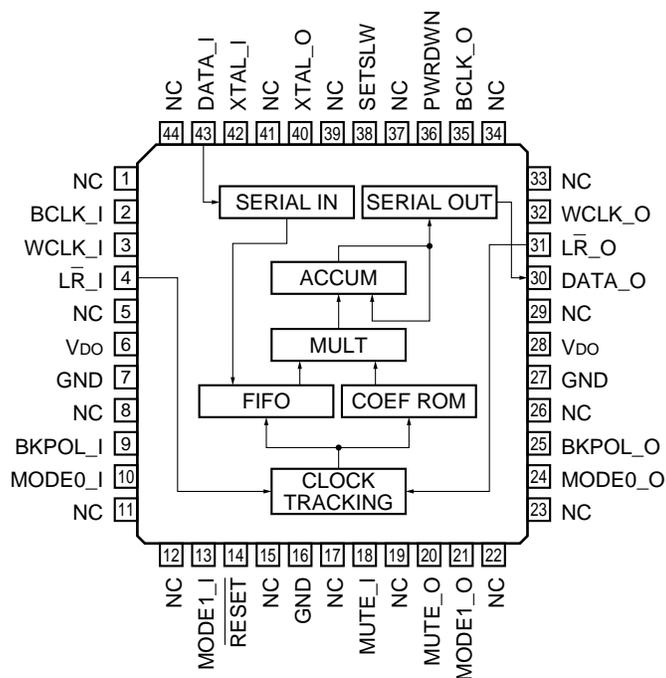


• Pin Function

No.	Pin Name	I/O	Function	No.	Pin Name	I/O	Function
1	SW1	O	Collector open output	9	FADJ	-	f0 Adjust pin
2	SW2		Logic block output for control sensitivity adjustment	10	VCC	-	VCC pin
3	SW3				11	CT2	-
4	BW	I	Logic block input for control sensitivity adjustment	12	CT1		
5	BWB					13	VCTL
6	1/2FB	I	Logic block input for control sensitivity adjustment and 1/2 frequency demultiplier switch H: through, L: 1/2 frequency demultiplier output	14	VO	O	Amp. output for sensitivity adjustment
7	FOUT	O	VCO output pin	15	IN2	I	Amp. input for sensitivity adjustment IN1: positive-phase input IN2: Inverting input
8	GND	-	GND pin	16	IN1		

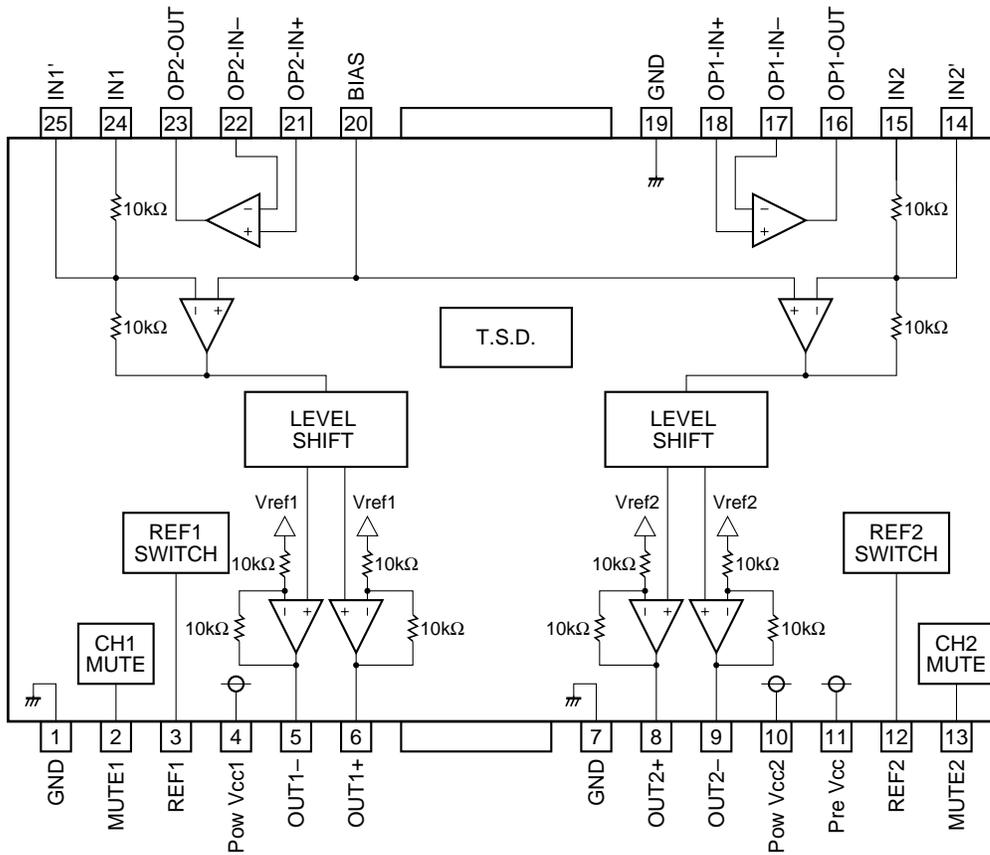
■ AD1893JST (SERVO DIGITAL PCB ASSY: IC311, Sample Rate Converter IC)

• Block Diagram



■ BA5912AFP-Y (SERVO DIGITAL PCB ASSY: IC351, Driver IC)

• Block Diagram

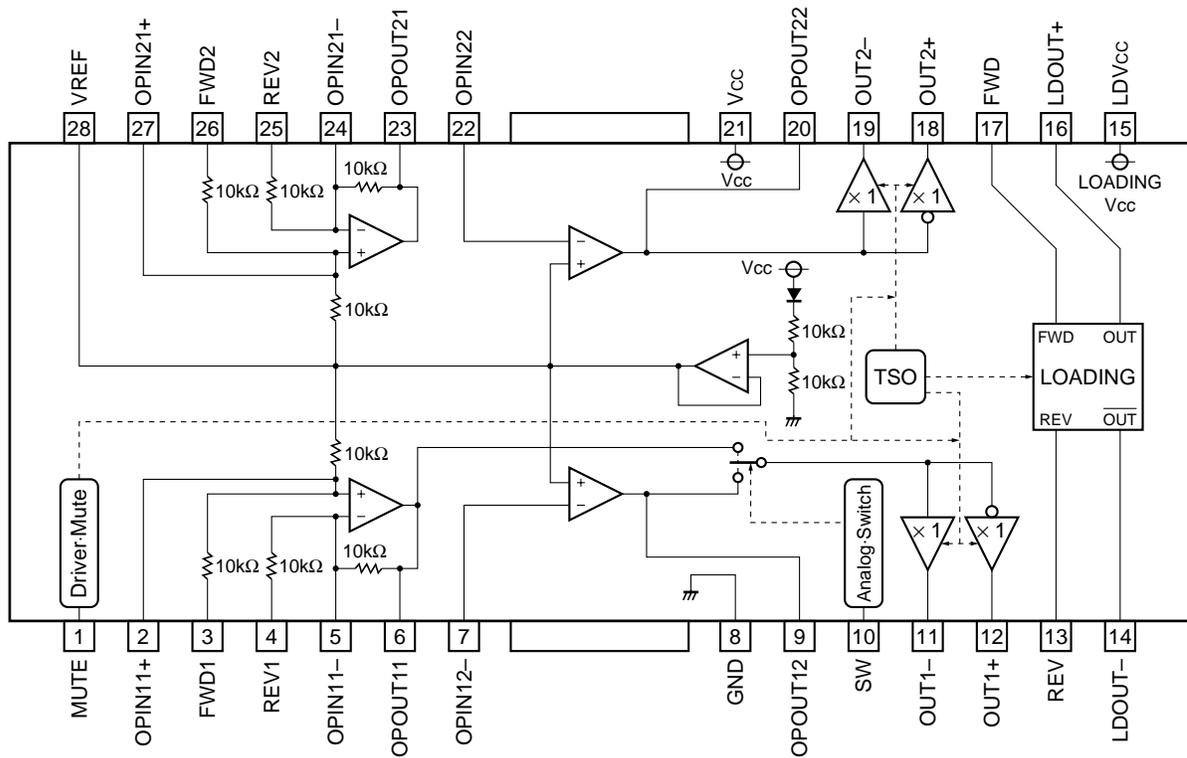


• Pin Function

No.	Pin Name	Function	No.	Pin Name	Function
1	GND	Sub-straight GND	14	IN2'	CH2 input pin for gain adjustment
2	MUTE1	CH1 mute pin	15	IN2	CH2 gain fixed input
3	REF1	CH1 Vref switching pin	16	OP1 -OUT	OP amp. 1 output
4	Pow Vcc1	Pow Vcc (CH1)	17	OP1 -IN -	OP amp. 1 - input
5	OUT1-	CH1 negative output	18	OP1 -IN +	OP amp. 1 + input
6	OUT1+	CH1 positive output	19	GND	Sub-straight GND
7	GND	Sub-straight GND	20	BIAS	Bias input
8	OUT2+	CH2 negative output	21	OP2 -IN+	OP amp. 2 + input
9	OUT2-	CH2 positive output	22	OP2 -IN-	OP amp. 2 - input
10	Pow Vcc2	Pow Vcc (CH2)	23	OP2 -OUT	OP amp. 2 output
11	Pre Vcc	Pre Vcc	24	IN1	CH1 gain fixed input
12	REF2	CH2 Vref switching pin	25	IN1'	CH1 input pin for gain adjustment
13	MUTE2	CH2 mute pin			

■ BA5932FP (SERVO DIGITAL PCB ASSY: IC352, Driver IC)

• Block Diagram

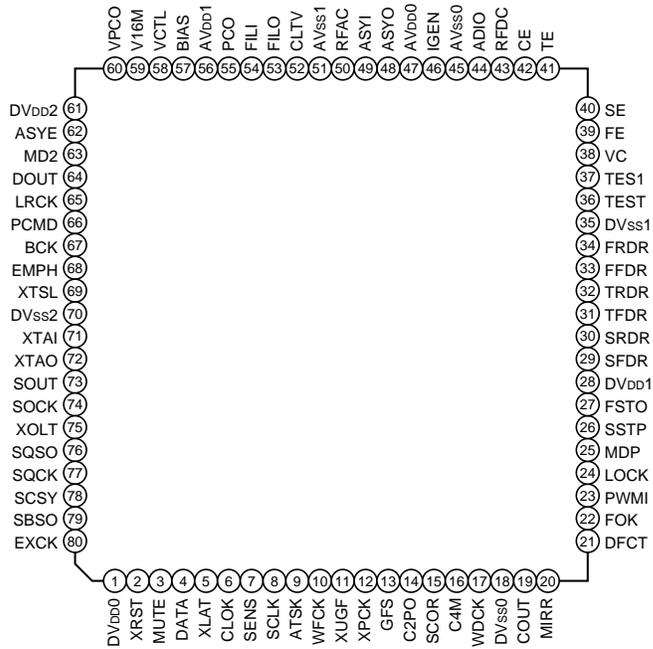


• Pin Function

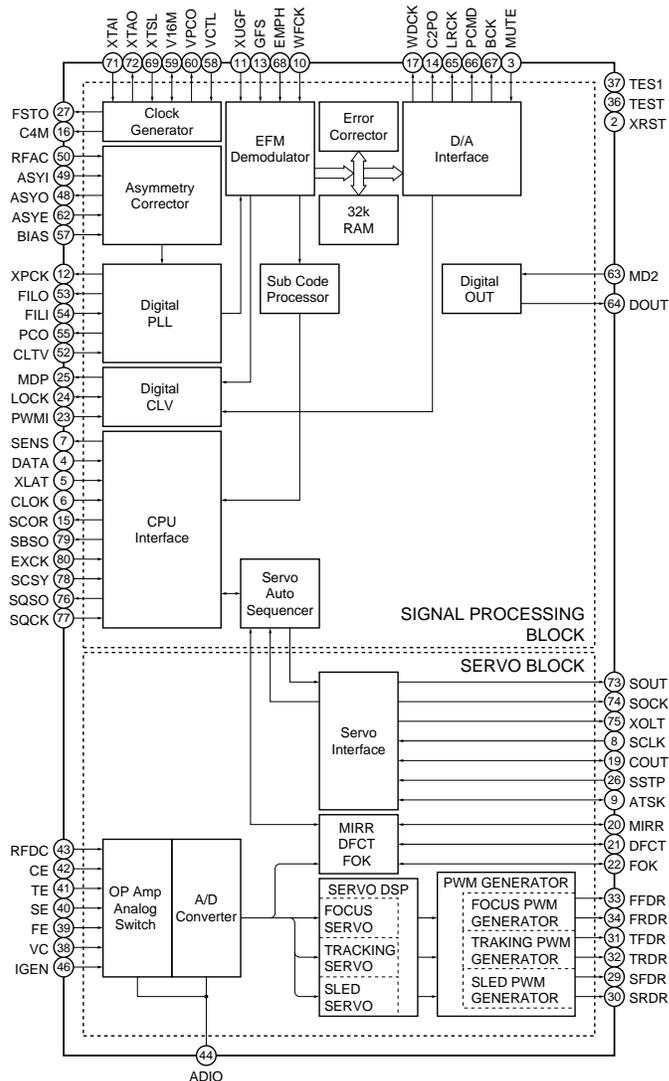
No.	Pin Name	Function	No.	Pin Name	Function
1	MUTE	Mute pin	15	LDVcc	Vcc for loading and output H bridge section
2	OPIN1 1+	OP amp. non-inverting input	16	LDOUT+	Loading positive output
3	FWD1	Forward input	17	FWD	Loading forward input
4	REV1	Reverse input	18	OUT2+	Driver output
5	OPIN1 1-	Op amp. inverting input	19	OUT2-	Driver output
6	OPOUT1 1	OP amp. output	20	OPOUT2 2	OP amp. output
7	OPIN1 2-	OP amp. inverting input	21	Vcc	Vcc for two axes driver and loading pre section
8	GND	Sub-straight GND	22	OPIN 2 2	OP amp. inverting input
9	OPOUT1 2	OP amp. output	23	OPOUT2 1	OP amp. output
10	SW	Analog switch input	24	OPIN2 1-	OP amp. inverting input
11	OUT1-	Driver output	25	REV2	Reverse input
12	OUT1+	Driver output	26	FWD2	Forward input
13	REV	Loading reverse input	27	OPIN2 1+	OP amp. non-inverting input
14	LDOUT-	Loading negative output	28	VREF	Reference voltage output

■ CXD2585Q (SERVO DIGITAL PCB ASSY: IC353, Digital Signal Processor IC)

• Pin Assignment



• Block Diagram



• Pin Function

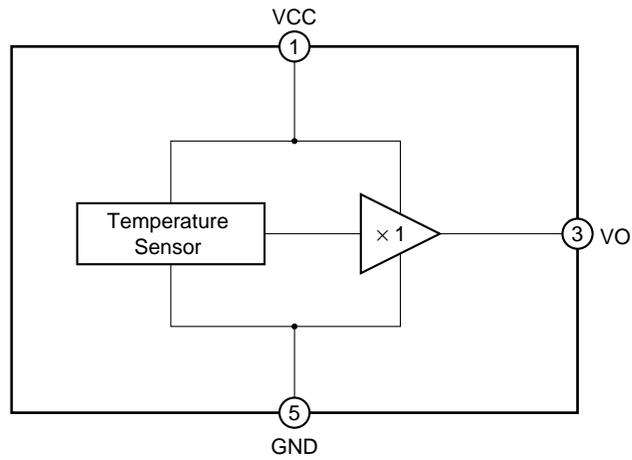
No.	Pin Name	I/O	Function	No.	Pin Name	I/O	Function
1	DVDD0	-	Digital power supply	41	TE	I	Tracking error input
2	XRST	I	System reset. Rest when "L"	42	CE	I	Center servo analog input
3	MUTE	I	Mute input. Mute when "H"	43	RFDC	I	RF signal input
4	DATA	I	Serial data input from CPU	44	ADIO	O	Test pin Non connection
5	XLAT	I	Latch input from CPU Serial data is latched at the falling edge.	45	AVSS0	-	Analog GND
6	CLOK	I	Serial data transfer clock input from CPU	46	IGEN	I	Constant current input for OP amplifier
7	SENS	O	SENS output to CPU	47	AVDD0	-	Analog power supply
8	SCLK	I	CLock input for SENS serial-data readout	48	ASYO	O	EFM full-swing output ("L"=VSS, "H"=VDD)
9	ATSK	I/O	Input and output for anti-shock	49	ASYI	I	Asymmetry comparate voltage input
10	WFCK	O	WFCK output	50	RFAC	I	EFM signal input
11	XUGF	O	XUGF output. MNT0 and RFCK output by switching the command.	51	AVSS1	-	Analog GND
12	XPCK	O	XPCK output. MNT1 output by switching the command.	52	CLTV	I	VCO 1 control voltage input for gradual increase
13	GFS	O	GFX output. MNT2 and XROF output by switching the command.	53	FIL0	O	Filter output for master PLL (Slave=digital PLL)
14	C2PO	O	C2PO output. MNT3 and GTOP output by switching the command.	54	FIL1	I	Filter input for master PLL
15	SCOR	O	Outputs "H" when either subcode sync. S0 or S1 is detected.	55	PCO	O	Charge pump output for master PLL
16	C4M	O	4.2336MHz output Outputs 1/4 frequency demultiply of V16M in the CAV-W mode and variable pitch.	56	AVDD1	-	Analog power supply
17	WDCK	O	Word clock output $f=2F_s$ Outputs GRSCOR by command switch	57	BIAS	I	Constant current input of asymmetry circuit
18	DVSS0	-	Digital GND	58	VCTL	I	VCO2 control voltage input for wide-band EFM PLL
19	COUT	I/O	Input and output of track-number count signal	59	V16M	I/O	VCO2 oscillation output for wide-band EFM PLL Clock input for wide-band EFM-PLL by command switch
20	MIRR	I/O	Mirror signal input and output	60	VPCO	O	Charge pump output for wide-band EFM PLL
21	DFCT	I/O	Defect signal input and output	61	DVDD2	-	Digital power supply
22	FOK	I/O	Focus OK signal input and output	62	ASYE	I	Asymmetry circuit ON/OFF control (L:OFF, H:ON)
23	PWMI	I	External control input of spindle motor	63	MD2	I	Digital out ON/OFF control (L:OFF, H:ON)
24	LOCK	I/O	GFS is asmpled at 460Hz; when GFS is "H", this pin outputs "H". If GFS is "L" eight consecutive samples, this pint outputs "L". Input when LKIN="1".	64	DOUT	O	Digital out output
25	MDP	O	Servo control output of spindle motor	65	LRCK	O	D/A interface LR clock output $f=F_s$
26	SSTP	I	Detection signal input of disc innermost	66	PCMD	O	D/A interface Serial data output (2's COMP, MSB first)
27	FSTO	O	Outputs 2/3 frequency demultiply of XTAL pin	67	BCK	O	D/A interface Bit clock output
28	DVDD1	-	Digital power supply	68	EMPH	O	Outputs "H" when the playback disc has emphasis, and "L" when there is no emphasis.
29	SFDR	O	Sled drive output	69	XTSL	I	X'tal selection input 16.9344MHz: L, 33.8688MHz: H
30	SRDR	O		70	DVSS2	-	Digital GND
31	TFDR	O	Tracking drive output	71	XTAI	I	Crystal oscillation circuit input Input the external master clock via this pin.
32	TRDR	O		72	XTAO	O	Crystal oscillation circuit output
33	FFDR	O		73	SOUT	O	Serial data output in the servo block
34	FRDR	O	Focus drive output	74	SOCK	O	Serial data readout clock output in the servo block
35	DVSS1	-	Digital GND	75	XOLT	O	Serial data latch output in the servo block
36	TEST	I	TEST pin : normally GND	76	SQSO	O	SubQ 80-bit, PCM peak and level data output CD TEXT data output
37	TES1	I		77	SQCK	I	Clock input for SQSO readout
38	VC	I	Center voltage input	78	SCSY	I	Input for resynchronous of GRSCOR
39	FE	I	Focus error signal input	79	SBSO	O	Serial output of Sub P to W
40	SE	I	Sled error signal input	80	EXCK	I	Clock input for SBSO readout

Notes) • PCMD is an MSB first, two's complement output.

- GTOP is used to monitor the frame sync protection status. (High: sync protection window released)
- XUGF is the negative pulse for the frame sync derived from the EFM signal. It is the signal before sync protection.
- XPCK is the inverse of the EFM PLL clock. The PLL is designed so that the falling edge of XPCK and the EFM signal transition point coincide.
- GFS goes high when the frame sync and the insertion protection timing match.
- RFCK is derived with the crystal accuracy. This signal has a cycle of 136 μ s.
- C2PO represents the data error status.
- XROF is generated when the 32K RAM exceeds the ± 28 Frame jitter match.

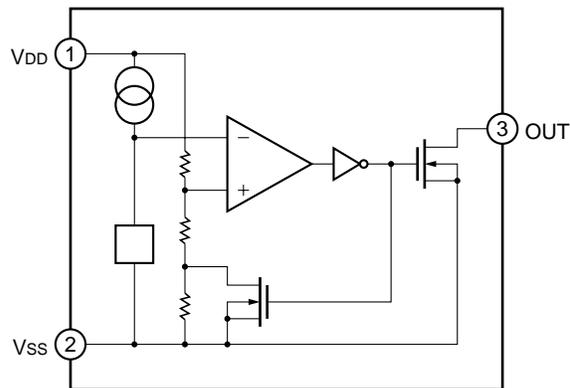
■ TK11041M-1 (SERVO DIGITAL PCB ASSY: IC355, Thermo Sensor IC)

• Block Diagram



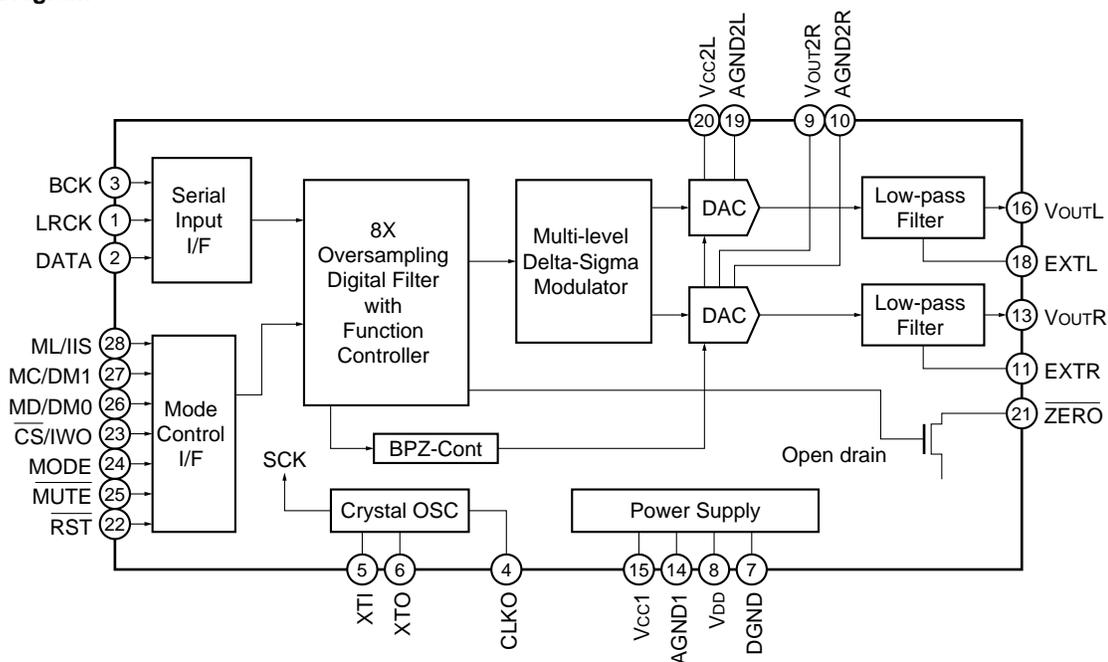
■ S-806E (FUNCTION A ASSY: IC702, Voltage Detector IC)

• Block Diagram



■ PE8001A (AUDIO PCB ASSY: IC401, D/A Converter IC)

• Block Diagram



• Pin Function

No.	Pin Name	I/O	Function	No.	Pin Name	I/O	Function
1	LRCK	I	LRCK clock input (fs) *1	15	VCC1	-	Analog power supply +5V
2	DATA	I	Data input *1	16	VOU TL	O	L ch analog voltage output
3	BCK	I	Bit clock input for data *1	17	NC	-	Non connection
4	CLKO	O	Buffer output of system clock	18	EXTL	O	L ch analog output amp. common
5	XTI	I	Crystal oscillation connection or external clock input	19	AGND2L	-	Analog GND
6	XTO	O	Crystal oscillation connection	20	VCC2L	-	Analog power supply +5V
7	DGND	-	Digital GND	21	ZERO	O	Zero data flag
8	VDD	-	Digital power supply +5V	22	RST	I	Reset *2
9	VCC2R	-	Analog power supply +5V	23	CS/IWO	I	Chip select / Input format select *3
10	AGND2R	-	Analog GND	24	MODE	I	Mode control select *2 (H: Software, L: Hardware)
11	EXTR	O	R ch analog output amp. common	25	MUTE	I	Mute control *2
12	NC	-	Non connection	26	MD/DM0	I	Mode control data / deemphasis select 1 *2
13	VOU TR	O	R ch analog voltage output	27	MC/DM1	I	Mode control BCK / deemphasis select 2 *2
14	AGND1	-	Analog GND	28	ML/IIS	I	Mode control latch / Input format select *2

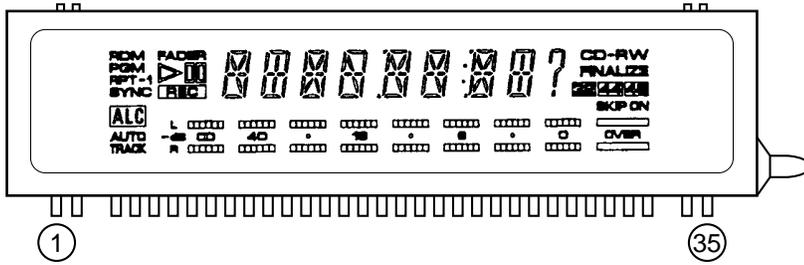
Note :

- *1 : Schmitt trigger input
- *2 : Schmitt trigger input with pull-up resistor
- *3 : Schmitt trigger input with pull-down resistor

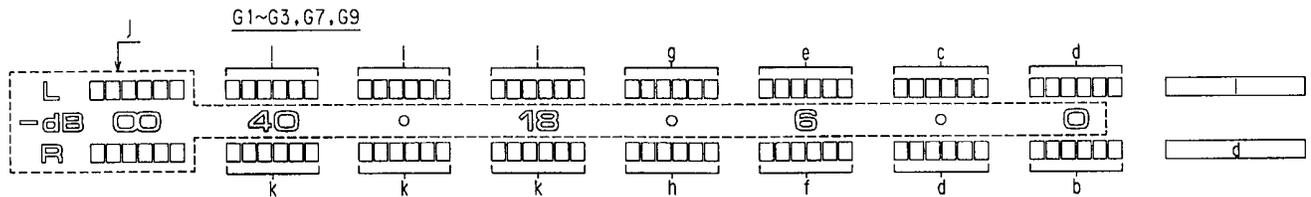
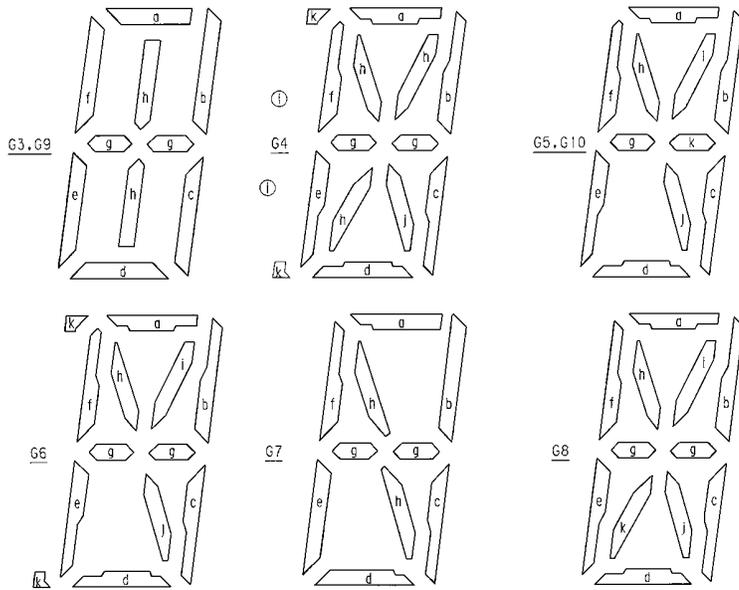
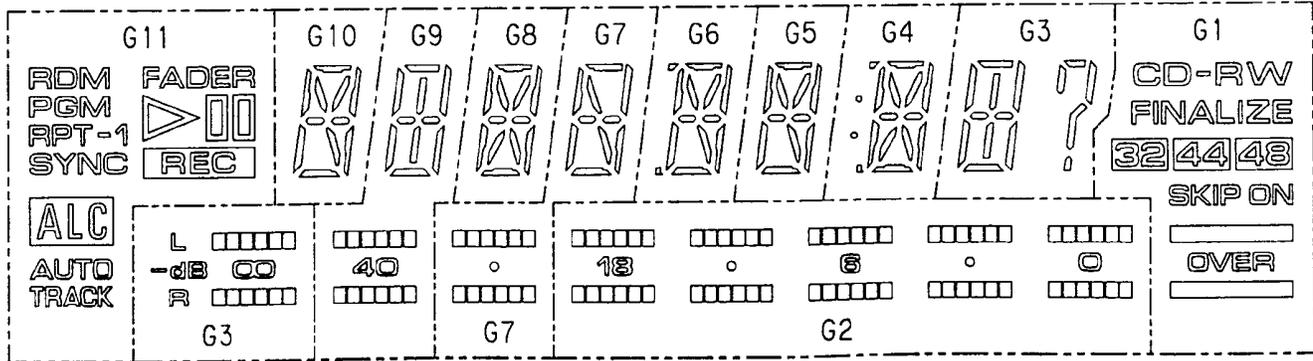
7-2. DISPLAY

■ PEL1097 (FUNCTION PCB ASSY: V701)

• FL TUBE



• Anode & Grid Assignment



	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11
S1	a	a	a	a	a	a	a	a	a	a	FADER
S2	OVER	b	b	b	b	b	b	b	b	b	
S3	(CD-R)W	c	c	c	c	c	c	c	c	c	
S4	32	d	d	d	d	d	d	d	d	d	REC
S5	44	e	e	e	e	e	e	e	e	e	RDM
S6	CD(-RW)	f	f	f	f	f	f	f	f	f	PGM
S7	(CD)-R(W)	g	g	g	g	g	g	g	g	g	RPT
S8	ON	h	h	h	h	h	h	h	h	h	-1
S9	i	i	?	i	i	i	i	i	i	i	SYNC
S10	48	j	j	j	j	j	j	j	j	j	ALC
S11	SKIP	k		k	k	k	k	k	k	k	AUTO TRACK
S12	FINALIZE										

• Pin Assignment

Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Assignment	F1	F1	NP	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	G11	G10	G9	G8

Pin No.	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Assignment	G7	G6	G5	G4	G3	G2	G1	S12	NL	NL	NL	NL	NL	NL	NP	F2	F2

F1,F2:Filament G1~G11:Grid S1~S12:Anode NP:No Pin NL:No Lead

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