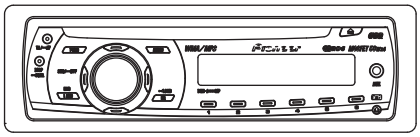
Pioneer sound.vision.soul

Service Manual



DEH-2000MPB/XN/EW5

ORDER NO.
CRT4043

CD RDS RECEIVER

DEH-2000MPB/XN/EW5
DEH-2000MP/XN/EW5
DEH-2020MP/XN/EW5

This service manual should be used together with the following manual(s):

Model No.	Order No.	Mech.Module	Remarks
CX-3195	CRT3815	S10.5COMP2	CD Mech. Module : Circuit Descriptions, Mech. Descriptions, Disassembly

For details, refer to "Important Check Points for Good Servicing".

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PIONEER EUROPE NV Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
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K-ZZU. OCT. 2007 Printed in Japan

SAFETY INFORMATION

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.

● **Safety Precautions for those who Service this Unit.**

- **When checking or adjusting the emitting power of the laser diode exercise caution in order to get safe, reliable results.**

Caution:

1. **During repair or tests, minimum distance of 13 cm from the focus lens must be kept.**
2. **During repair or tests, do not view laser beam for 10 seconds or longer.**

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

CAUTION
This product contains a laser diode of higher class than 1. To ensure continued safety, do not remove any covers or attempt to gain access to the inside of the product.
Refer all servicing to qualified personnel.

The following caution label appears on your unit.

Location: on the bottom of the unit

WARNING!

The AEL (accessible emission level)of the laser power output is less than CLASS 1 but the laser component is capable of emitting radiation exceeding the limit for CLASS 1.
A specially instructed person should do servicing operation of the apparatus.

Laser diode characteristics
Wave length : 785 nm to 814 nm
Maximum output : 1 190 μW(Emitting period : unlimited)

Additional Laser Caution

Transistors Q101 in PCB drive the laser diodes.
When Q101 is shorted between their terminals, the laser diodes will radiate beam.
If the top cover is removed with no disc loaded while such short-circuit is continued, the naked eyes may be exposed to the laser beam.

[Important Check Points for Good Servicing]

In this manual, procedures that must be performed during repairs are marked with the below symbol.
Please be sure to confirm and follow these procedures.

1. Product safety

Please conform to product regulations (such as safety and radiation regulations), and maintain a safe servicing environment by following the safety instructions described in this manual.

① Use specified parts for repair.

Use genuine parts. Be sure to use important parts for safety.

② Do not perform modifications without proper instructions.

Please follow the specified safety methods when modification(addition/change of parts) is required due to interferences such as radio/TV interference and foreign noise.

③ Make sure the soldering of repaired locations is properly performed.

When you solder while repairing, please be sure that there are no cold solder and other debris.
Soldering should be finished with the proper quantity. (Refer to the example)

④ Make sure the screws are tightly fastened.

Please be sure that all screws are fastened, and that there are no loose screws.

⑤ Make sure each connectors are correctly inserted.

Please be sure that all connectors are inserted, and that there are no imperfect insertion.

⑥ Make sure the wiring cables are set to their original state.

Please replace the wiring and cables to the original state after repairs.
In addition, be sure that there are no pinched wires, etc.

⑦ Make sure screws and soldering scraps do not remain inside the product.

Please check that neither solder debris nor screws remain inside the product.

⑧ There should be no semi-broken wires, scratches, melting, etc. on the coating of the power cord.

Damaged power cords may lead to fire accidents, so please be sure that there are no damages.
If you find a damaged power cord, please exchange it with a suitable one.

⑨ There should be no spark traces or similar marks on the power plug.

When spark traces or similar marks are found on the power supply plug, please check the connection and advise on secure connections and suitable usage. Please exchange the power cord if necessary.

⑩ Safe environment should be secured during servicing.

When you perform repairs, please pay attention to static electricity, furniture, household articles, etc. in order to prevent injuries.
Please pay attention to your surroundings and repair safely.

2. Adjustments

To keep the original performance of the products, optimum adjustments and confirmation of characteristics within specification.
Adjustments should be performed in accordance with the procedures/instructions described in this manual.

3. Lubricants, Glues, and Replacement parts

Use grease and adhesives that are equal to the specified substance.
Make sure the proper amount is applied.

4. Cleaning

For parts that require cleaning, such as optical pickups, tape deck heads, lenses and mirrors used in projection monitors, proper cleaning should be performed to restore their performances.

5. Shipping mode and Shipping screws

To protect products from damages or failures during transit, the shipping mode should be set or the shipping screws should be installed before shipment. Please be sure to follow this method especially if it is specified in this manual.

CONTENTS

1. SERVICE PRECAUTIONS

1.1 SERVICE PRECAUTIONS

● Service Precaution

1. You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.
2. Before disassembling the unit, be sure to turn off the power. Unplugging and plugging the connectors during power-on mode may damage the ICs inside the unit.
3. To protect the pickup unit from electrostatic discharge during servicing, take an appropriate treatment (shorting-solder) by referring to "the DISASSEMBLY".
4. After replacing the pickup unit, be sure to check the grating.
5. Be careful in handling ICs. Some ICs such as MOS type are so fragile that they can be damaged by electrostatic induction.

1.2 NOTES ON SOLDERING

- For environmental protection, lead-free solder is used on the printed circuit boards mounted in this unit.
  Be sure to use lead-free solder and a soldering iron that can meet specifications for use with lead-free solders for repairs accompanied by reworking of soldering.

- Compared with conventional eutectic solders, lead-free solders have higher melting points, by approximately 40° C.
  Therefore, for lead-free soldering, the tip temperature of a soldering iron must be set to around 373° C in general, although the temperature depends on the heat capacity of the PC board on which reworking is required and the weight of the tip of the soldering iron.

Compared with eutectic solders, lead-free solders have higher bond strengths but slower wetting times and higher melting temperatures (hard to melt/easy to harden).

The following lead-free solders are available as service parts:

- Parts numbers of lead-free solder:
  GYP1006 1.0 in dia.
  GYP1007 0.6 in dia.
  GYP1008 0.3 in dia.

2. SPECIFICATIONS

2.1 SPECIFICATIONS

General

Power source ..... 14.4 V DC (10.8 V to 15.1 V allowable)
Grounding system ..... Negative type
Max. current consumption ..... 10.0 A
Backup current ..... 2 mA or less

Dimensions (W × H × D):
- DIN
  - Chassis ..... 178 × 50 × 162 mm
  - Nose ..... 188 × 58 × 15 mm
- D
  - Chassis ..... 178 × 50 × 162 mm
  - Nose ..... 170 × 48 × 15 mm

Weight ..... 1.3 kg

Audio

Maximum power output ..... 50 W × 4
Continuous power output ... 22 W × 4 (50 Hz to 15 000 Hz, 5% THD, 4 Ω load, both channels driven)
Load impedance ..... 4 Ω (4 Ω to 8 Ω allowable)
Tone controls:
- Bass
  - Frequency ..... 100 Hz
  - Gain ..... ±13dB
- Mid
  - Frequency ..... 1 kHz
  - Gain ..... ±12 dB
- Treble
  - Frequency ..... 10 kHz
  - Gain ..... ±12 dB

CD player

System ..... Compact disc audio system
Usable discs ..... Compact disc
Signal-to-noise ratio ..... 94 dB (1 kHz) (IEC-A network)
Number of channels ..... 2 (stereo)
WMA decoding format ..... Ver. 7, 7.1, 8, 9, 10, 11 (2ch audio) (Windows Media Player)
MP3 decoding format ..... MPEG-1 & 2 Audio Layer 3
WAV signal format ..... Linear PCM & MS ADPCM

FM tuner

Frequency range ..... 87.5 MHz to 108.0 MHz
Usable sensitivity ..... 8 dBf (0.7 μV/75 Ω, mono, S/N: 30 dB)
Signal-to-noise ratio ..... 75 dB (IEC-A network)

MW tuner

Frequency range ..... 531 kHz to 1 602 kHz (9 kHz)
Usable sensitivity ..... 18 μV (S/N: 20 dB)
Signal-to-noise ratio ..... 65 dB (IEC-A network)

LW tuner

Frequency range ..... 153 kHz to 281 kHz
Usable sensitivity ..... 30 μV (S/N: 20 dB)
Signal-to-noise ratio ..... 65 dB (IEC-A network)

Note

Specifications and the design are subject to modifications without notice due to improvements. ■

2.2 DISC/CONTENT FORMAT

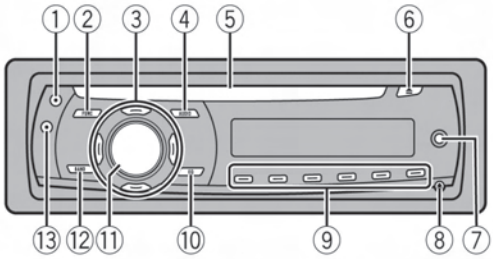
COMPACT disc DIGITAL AUDIO

COMPACT disc DIGITAL AUDIO TEXT

Plays Windows Media™

2.3 PANEL FACILITIES

Head unit



① **TA button**
Press to turn TA function on or off. Press and hold to turn AF function on or off.

② **FUNCTION button**
Press to recall the function menu when operating a source.

③ **▲/▼/◄/► buttons**
Press to perform manual seek tuning, fast forward, reverse and track search controls. Also used for controlling functions.

④ **AUDIO button**
Press to select various sound quality controls.

⑤ **Disc loading slot**
Insert a disc to play.

⑥ **EJECT button**
Press to eject a CD from your built-in CD player.

⑦ **AUX input jack (3.5 mm stereo jack)**
Use to connect an auxiliary equipment.

⑧ **DETACH button**
Press to remove the front panel from the head unit.

⑨ **1 to 6 buttons**
Press for preset tuning.

⑩ **EQ button**
Press to select various equalizer curves.
Press and hold to turn loudness on or off.

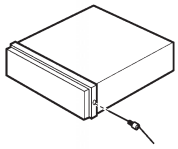
⑪ **SOURCE button, VOLUME**
This unit is turned on by selecting a source.
Press to cycle through all the available sources.
Press and hold to recall the initial setting menu when the sources are off.
Rotate it to increase or decrease the volume.

⑫ **BAND button**
Press to select among MW/LW and two FM bands and cancel the control mode of functions.

⑬ **DISPLAY button**
Press to select different displays.

Fastening the front panel

If you do not plan to detach the front panel, the front panel can be fastened with supplied screw.

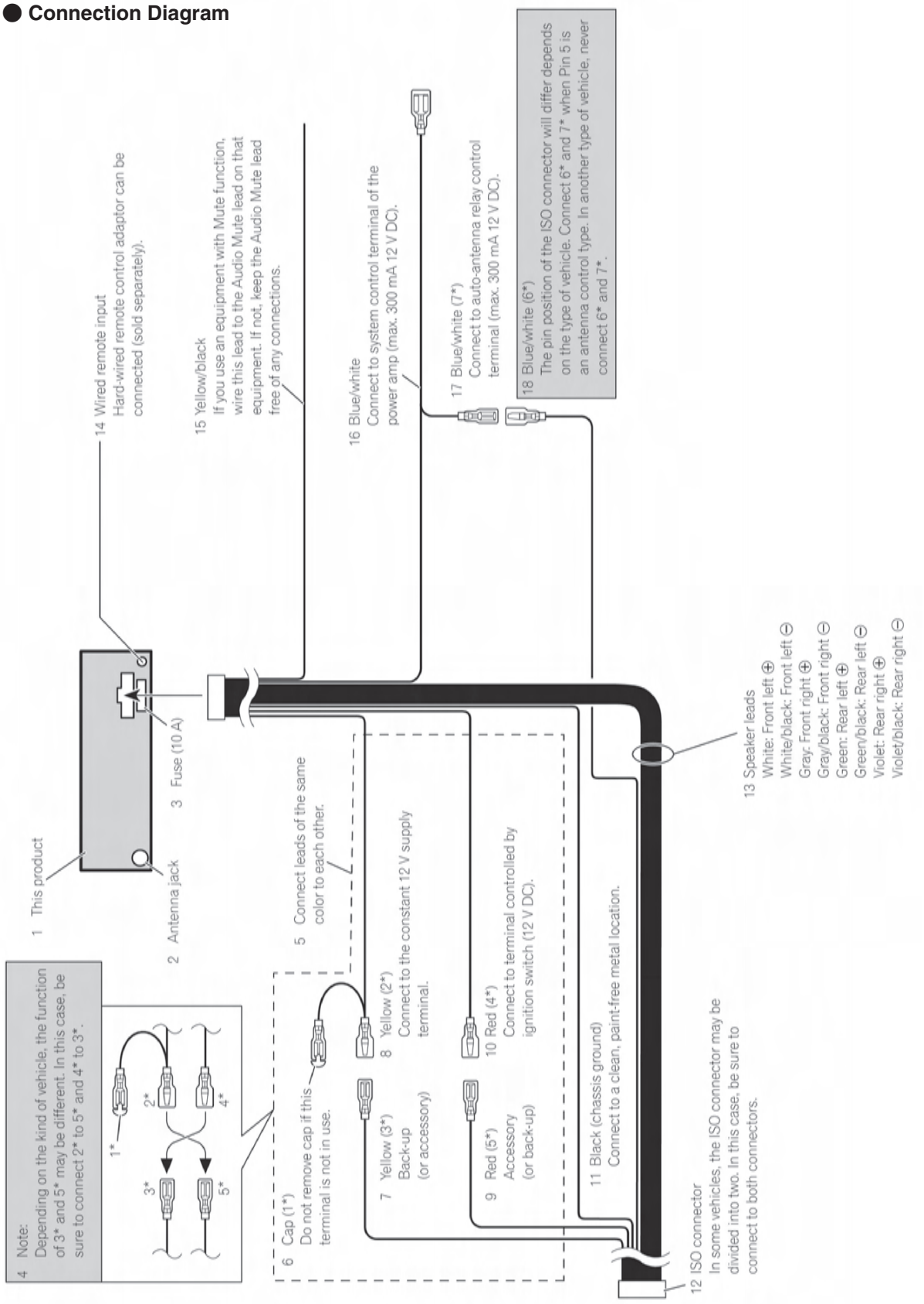


Screw
(BPZ20P060FTC)

5 6 7 8

2.4 CONNECTION DIAGRAM

● Connection Diagram



3. BASIC ITEMS FOR SERVICE

3.1 CHECK POINTS AFTER SERVICING

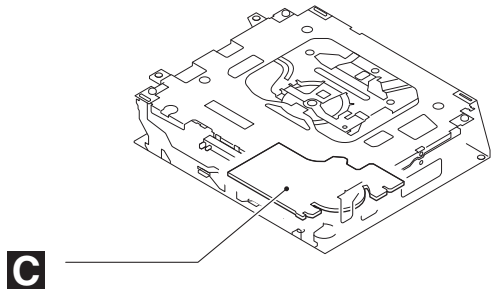
To keep the product quality after servicing, please confirm following check points.

No.		Procedures	Item to be confirmed
1		Confirm whether the customer complain has been solved. If the customer complain occurs with the specific media, use it for the operation check.	The customer complain must not be reappeared. Display, audio and operations must be normal.
2	CD	Play back a CD. (Track search)	No malfunction on display, audio and operation. Display, audio and operations must be normal.
3	FM/AM tuner	Check FM/AM tuner action. (Seek, Preset) Switch band to check both FM and AM.	Display, audio and operations must be normal.
4		Check whether no disc is inside the product.	The media used for the operating check must be ejected.
5		Appearance check	No scratches or dirt on its appearance after receiving it for service.

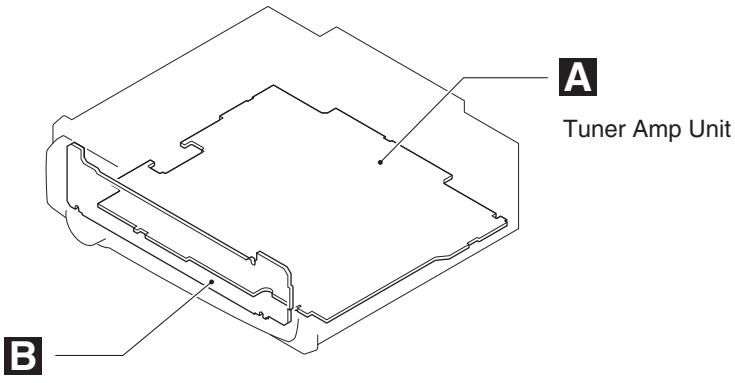
See the table below for the items to be checked regarding video and audio:

Item to be checked regarding audio
Distortion
Noise
Volume too low
Volume too high
Volume fluctuating
Sound interrupted

3.2 PCB LOCATIONS



CD Core Unit(S10.5COMP2)



Tuner Amp Unit

Keyboard Unit

Unit Number	:	YWM5228
Unit Name	:	Tuner Amp Unit
Unit Number	:	(2000MP)
Unit Number	:	(2000MPB)
Unit Name	:	Keyboard Unit
Unit Number	:	(2020MP)
Unit Name	:	Keyboard Unit
Unit Number	:	CWX3514
Unit Name	:	CD Core Unit(S10.5COMP2)

3.3 JIGS LIST

● Jigs List

Name	Jig No.	Remarks
Test Disc	TCD-782	Checking the grating
L.P.F.		Checking the grating (Two pieces)

● Grease List

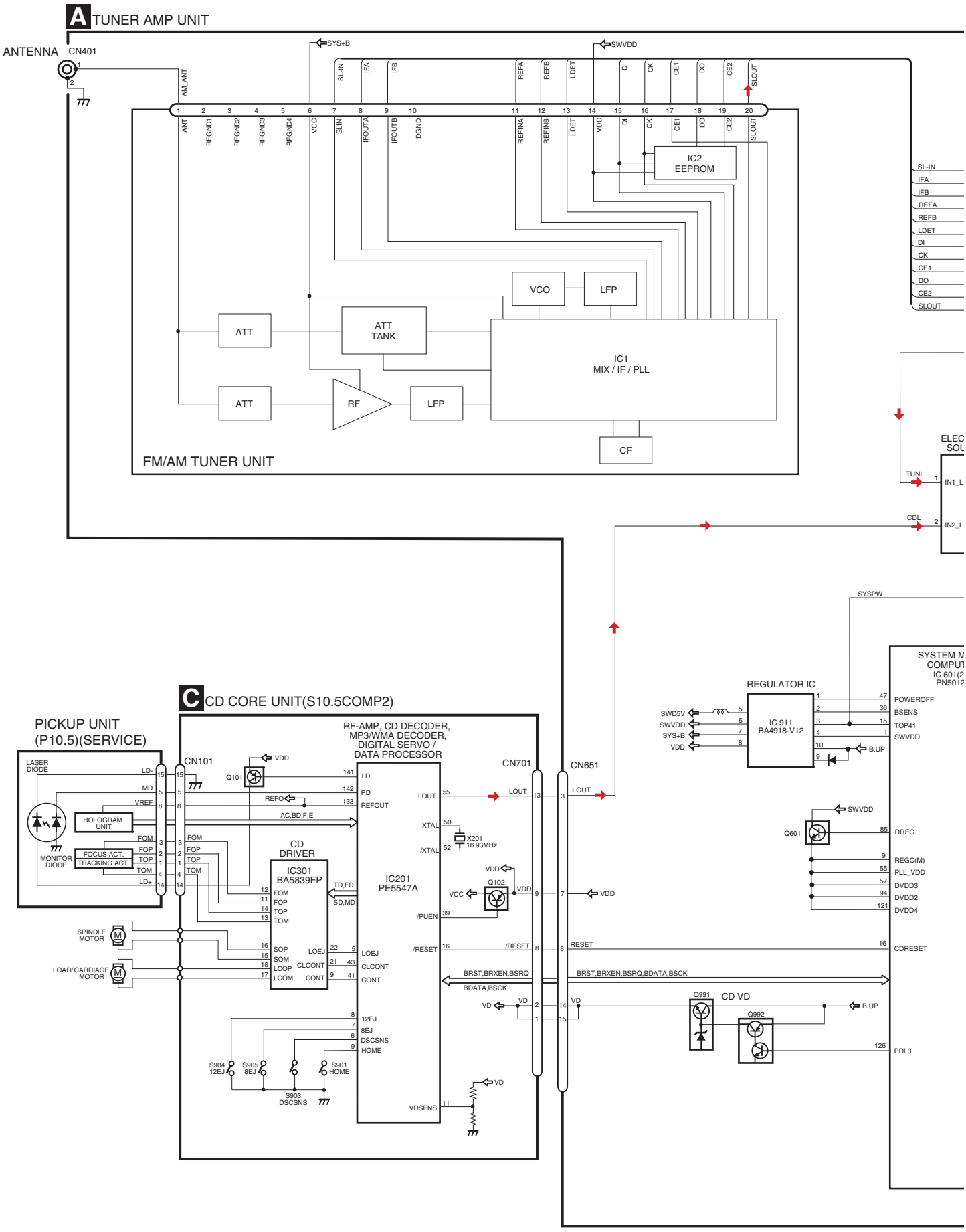
Name	Grease No.	Remarks
Grease	GEM1024	CD Mechanism Module
Grease	GEM1045	CD Mechanism Module

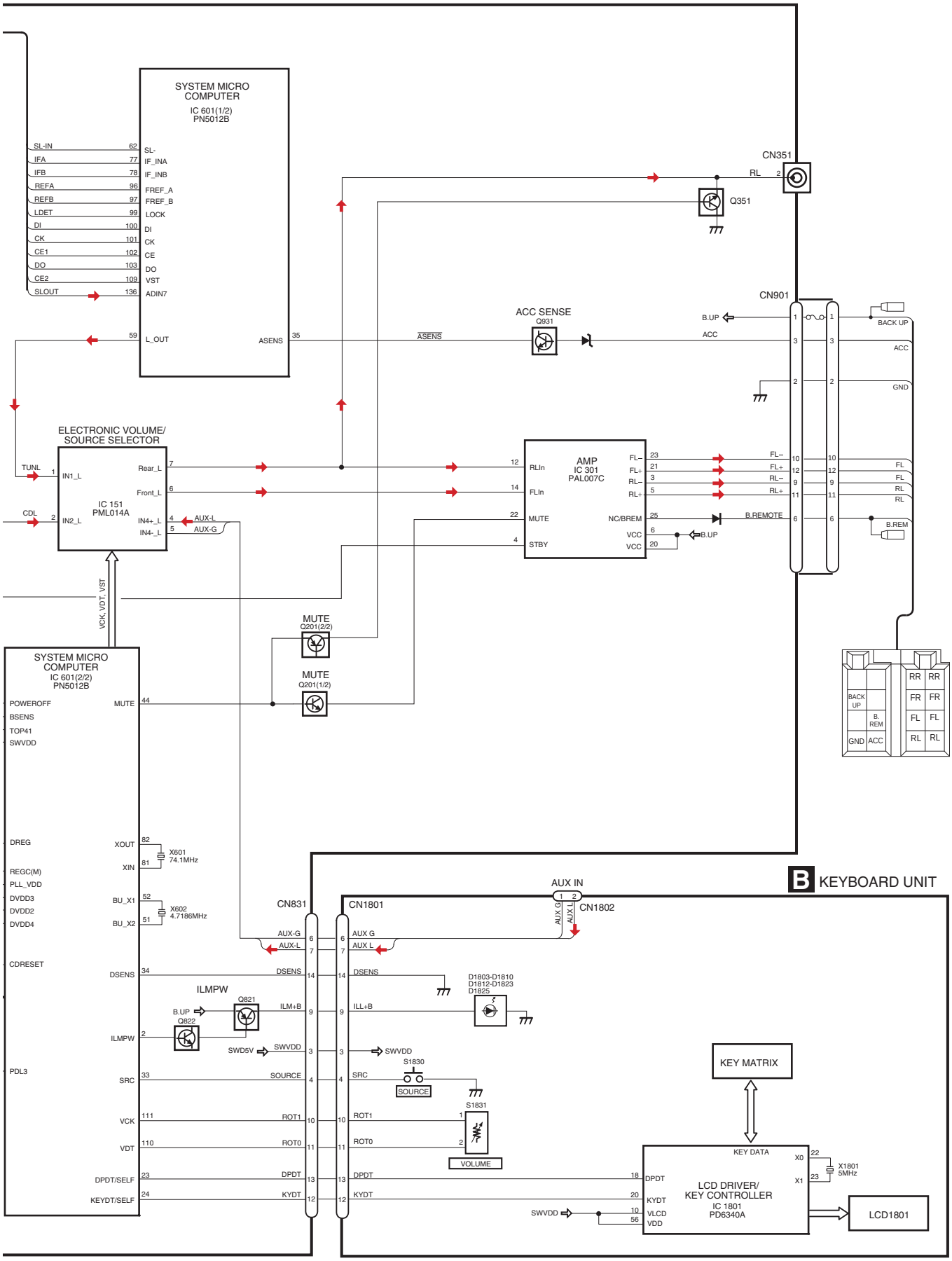
Before shipping out the product, be sure to clean the following portions by using the prescribed cleaning tools:

Portions to be cleaned	Cleaning tools
CD pickup lenses	Cleaning liquid : GEM1004 Cleaning paper : GED-008

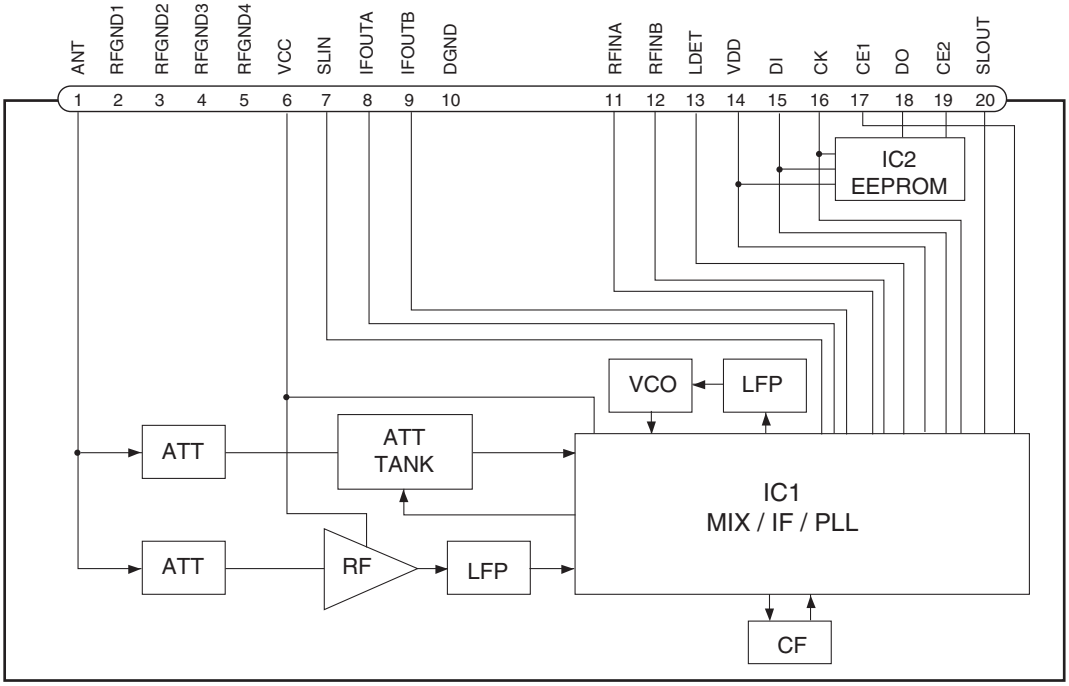
4. BLOCK DIAGRAM

4.1 BLOCK DIAGRAM



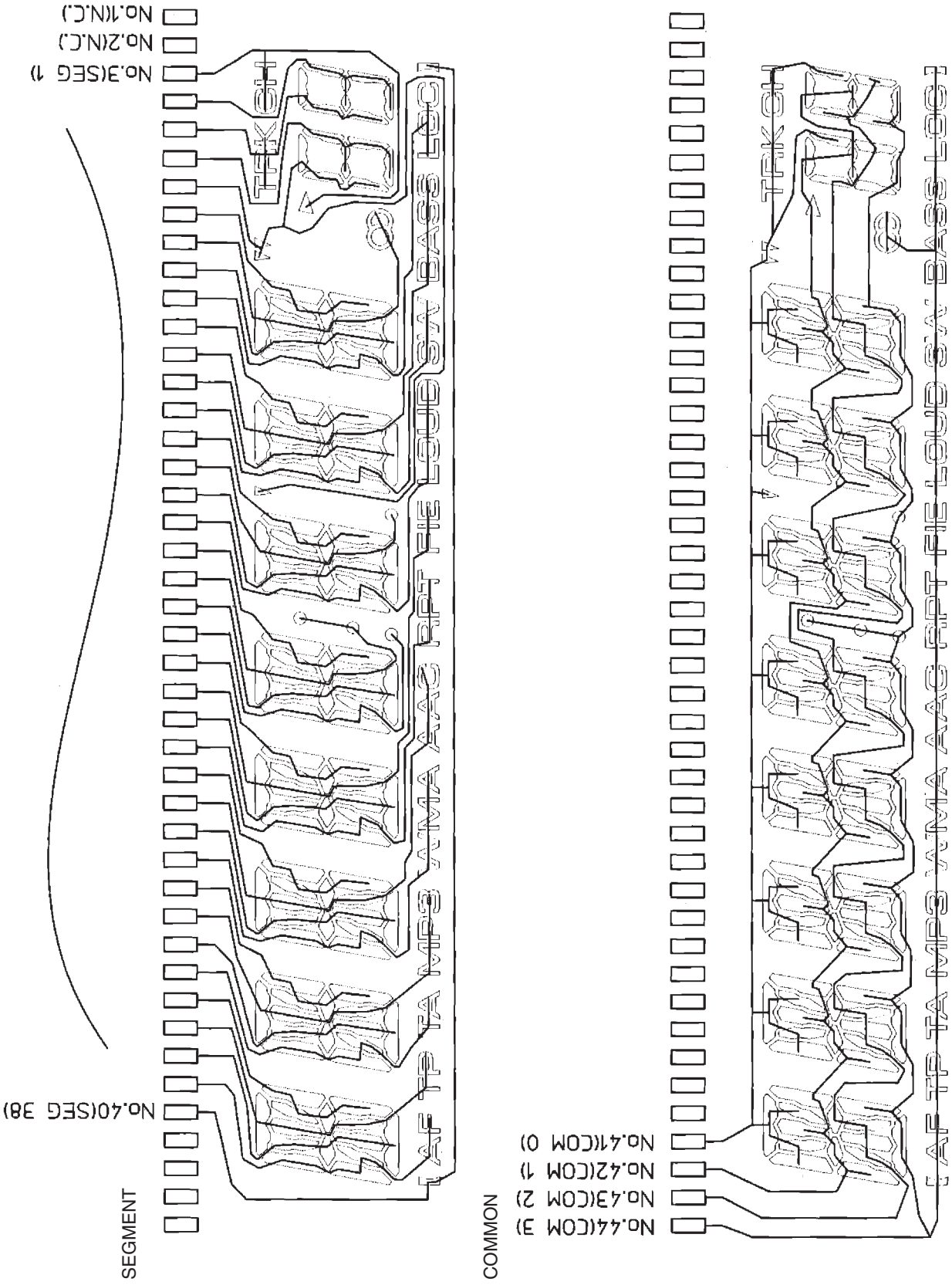

SYSTEM MICRO COMPUTER
IC 601(1/2)
PN5012B
SL-IN 62
IFA 77
IFB 78
REFA 96
REFB 97
LDET 99
DI 100
CK 101
CE1 102
DO 103
CE2 109
SLOUT 136
SL-
IF_INA
IF_INB
FREF_A
FREF_B
LOCK
DI
CK
CE
DO
VST
ADIN7
59 L_OUT
ASENS 35
CN351
RL 2
Q351
CN901
ACC SENSE
Q931
B.UP
ACC
BACK UP
GND
ELECTRONIC VOLUME/
SOURCE SELECTOR
IC 151
PML014A
TUNL 1
CDL 2
IN1_L
IN2_L
Rear_L 7
Front_L 6
IN4+_L 4
IN4-_L 5
AUX-L
AUX-G
AMP
IC 301
PAL007C
RLIn 12
FLIn 14
MUTE 22
STBY 4
FL– 23
FL+ 21
RL– 3
RL+ 5
NC/BREM 25
VCC 6
VCC 20
B.REMOTE
B.REM
FL
RL
VCK, VDT, VST
MUTE
Q201(2/2)
MUTE
Q201(1/2)
SYSTEM MICRO COMPUTER
IC 601(2/2)
PN5012B
POWEROFF
BSENS
TOP41
SWVDD
MUTE 44
DREG
REGC(M)
PLL_VDD
DVDD3
DVDD2
DVDD4
CDRESET
PDL3
XOUT 82
XIN 81
X601
74.1MHz
BU_X1 52
BU_X2 51
X602
4.7186MHz
DSENS 34
ILMPW 2
SRC 33
VCK 111
VDT 110
DPDT/SELF 23
KEYDT/SELF 24
ILMPW
Q821
Q822
B.UP
SWD5V
SWVDD
SOURCE
ROT1
ROT0
DPDT
KYDT
CN831
CN1801
CN1802
AUX IN
AUX G
AUX L
DSENS
ILM+B
SWVDD
SRC
SOURCE
S1830
S1831
VOLUME
D1803-D1810
D1812-D1823
D1825
ILL+B
KEY MATRIX
KEY DATA
LCD DRIVER/
KEY CONTROLLER
IC 1801
PD6340A
DPDT
KYDT
VLCD
VDD
X0
X1
X1801
5MHz
LCD1801
B KEYBOARD UNIT

● FM/AM Tuner Unit

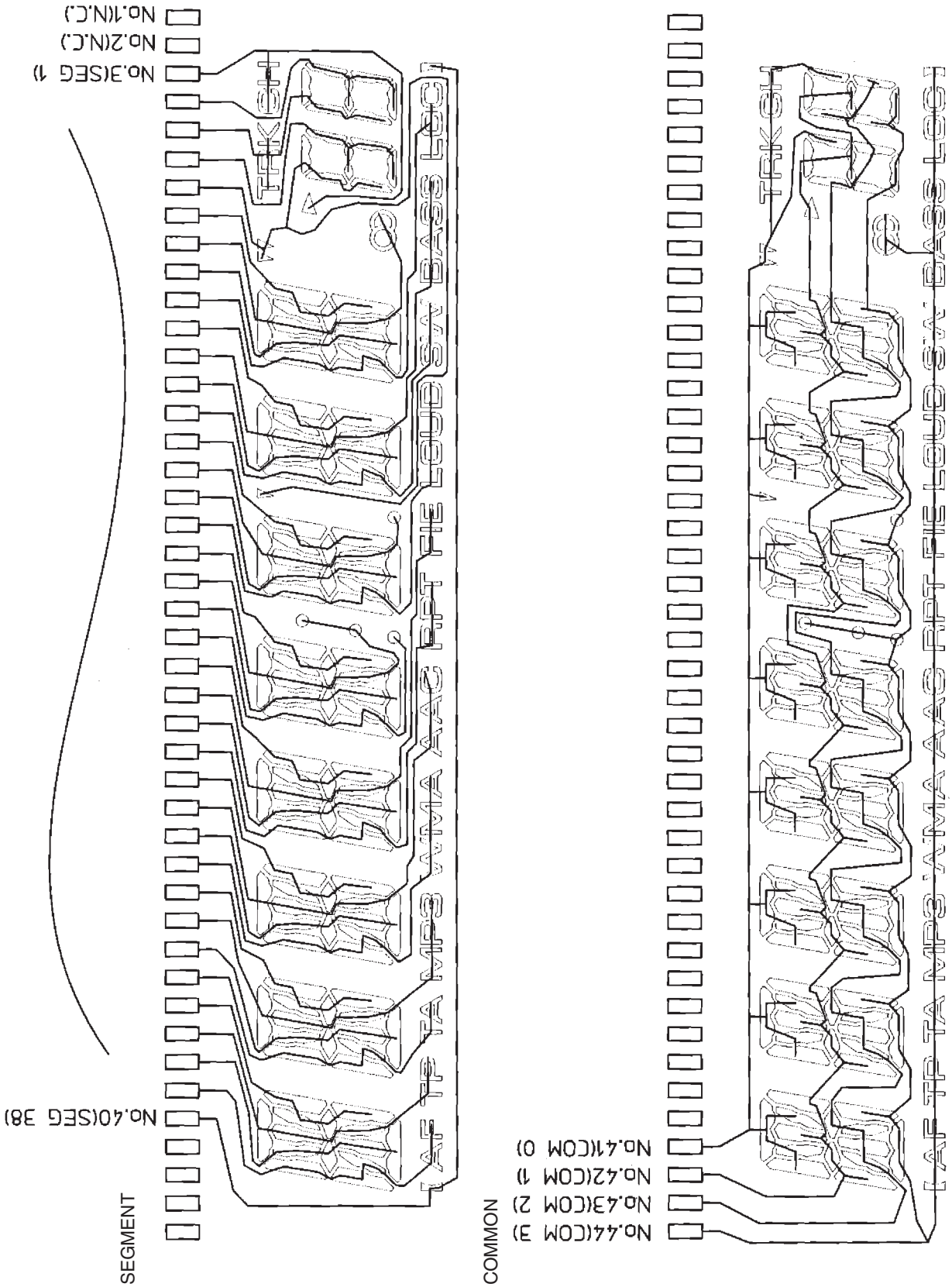


No.	Symbol	I/O	Explain	
1	ANT	I	Antenna Input	Antenna input. 75 ohm. Surge absorber is necessary. Series circuit including an inductor and a resistor is connected with RF ground for the countermeasure against the ham of power transmission line.
2	RFGND1		RF Ground	Ground of R.F. block
3	RFGND2		RF Ground	Ground of R.F. block
4	RFGND3		RF Ground	Ground of R.F. block
5	RFGND4		RF Ground	Ground of R.F. block
6	VCC		Power Supply	Power supply for Analog block. D.C 8.4 V ± 0.3 V (performance isn't guaranteed besides 8.4 V)
7	SLIN	I	Signal Level Input	Input signa level from BE_IC
8	IFOUTA	O	IF Output	IF signal output (F.E.output)
9	IFOUTB	O	IF Output	IF signal output (F.E.output)
10	DGND		Digital Ground	Ground of Digital. block
11	REFINA	I	Reference Signal	Input reference signal for PLL part with FE_IC
12	REFINB	I	Reference Signal	Input reference signal for PLL part with FE_IC
13	LDET	O	Lock Detector	PLL lock detecter output "High" active
14	VDD		Power Supply	Power supply for Digital block. D.C 3.3 V ± 0.2 V
15	DI	I	Data In	Data input (not sending data in tuner reception operating in noise being output)
16	CK	I	CK	Clock data input(not sending data in tuner reception operating in noise being output)
17	CE1	I	Chip Enable-1	Chip enable for FE_IC "High" active
18	DO	O	Data Out	Data output
19	CE2	O	Chip Enable-2	Chip enable for EEPROM "Low" active. in power ON/OFF, please turn CE2 into "High" (= VDD).
20	SLOUT	O	Signal Level Output	Output of FM/AM signals level (D.C.)

● **LCD(CAW1930)**

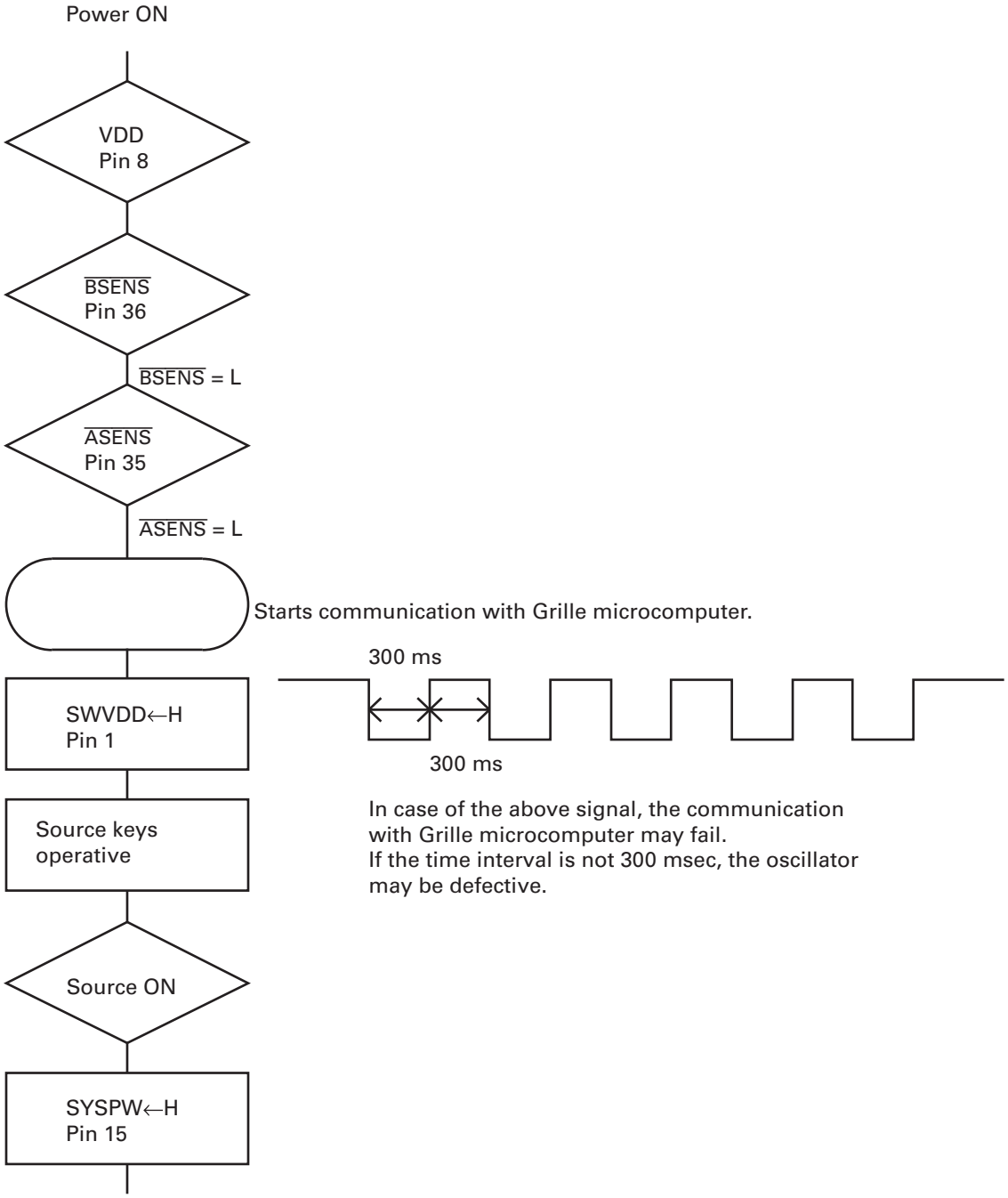

No.1(N.C.)
No.2(N.C.)
No.3(SEG 1)
No.40(SEG 38)
SEGMENT
No.41(COM 0)
No.42(COM 1)
No.43(COM 2)
No.44(COM 3)
COMMON

● LCD(CAW1932)


No.1(N.C.)
No.2(N.C.)
No.3(SEG 1)
No.40(SEG 38)
SEGMENT
No.41(COM 0)
No.42(COM 1)
No.43(COM 2)
No.44(COM 3)
COMMON

5. DIAGNOSIS

5.1 OPERATIONAL FLOW CHART



Completes power-on operation.(After that, proceed to each source operation.)

5.2 ERROR CODE LIST

● Error Messages

If a CD is not operative or stopped during operation due to an error, the error mode is turned on and cause(s) of the error is indicated with a corresponding number. This arrangement is intended at reducing nonsense calls from the users and also for facilitating trouble analysis and repair work in servicing.

(1) Basic Indication Method

1) When SERRORM is selected for the CSMOD (CD mode area for the system), error codes are written to DMIN (minutes display area) and DSEC (seconds display area). The same data is written to DMIN and DSEC. DTNO remains in blank as before.

2) Head unit display examples

Depending on display capability of LCD used, display will vary as shown below. xx contains the error number.

8-digit display	6-digit display	4-digit display
ERROR-xx	ERR-xx	E-xx

(2) Error Code List

Code	Class	Displayed error code	Description of the code and potential cause(s)
10	Electricity	Carriage Home NG SERVO LSI Communication Error	CRG can't be moved to inner diameter. CRG can't be moved from inner diameter. → Failure on home switch or CRG move mechanism. Communication error between microcomputer and SERVO LSI.
11	Electricity	Focus Servo NG	Focusing not available. → Stains on rear side of disc or excessive vibrations on REWRITABLE.
12	Electricity	Spindle Lock NG Subcode NG	Spindle not locked. Sub-code is strange (not readable). → Failure on spindle, stains or damages on disc, or excessive vibrations. A disc not containing CD-R data is found. Turned over disc are found, though rarely. CD signal error.
17	Electricity	Setup NG	AGC protection doesn't work. Focus can be easily lost. → Damages or stains on disc, or excessive vibrations on REWRITABLE.
30	Electricity	Search Time Out	Failed to reach target address. → CRG tracking error or damages on disc.
44	Electricity	ALL Skip	Skip setting for all track. (CD-R/RW)
50	Mechanism	CD On Mech Error	Mechanical error during CD ON. → Defective loading motor, mechanical lock and mechanical sensor.
A0	System	Power Supply NG	Power (VD) is ground faulted. → Failure on SW transistor or power supply (failure on connector).

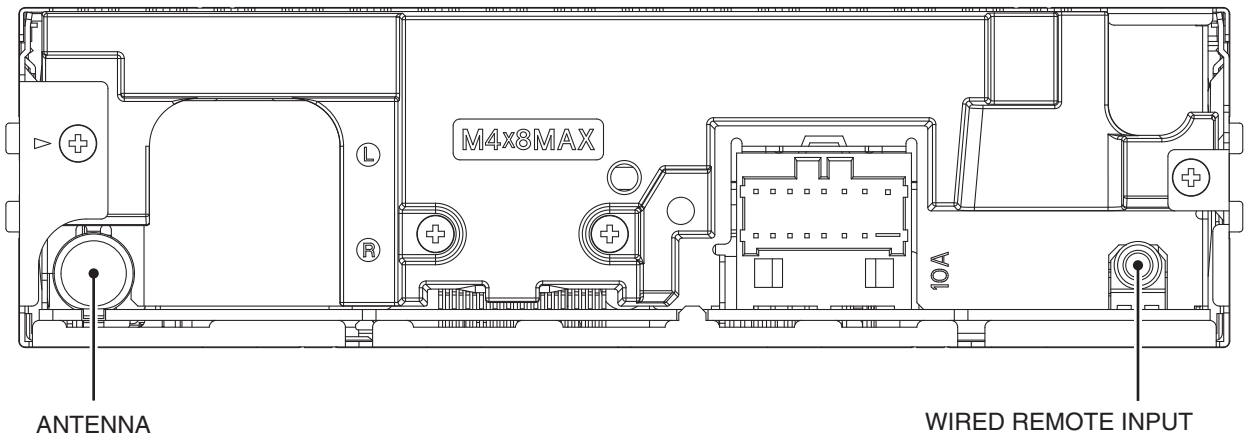
Remarks: Mechanical errors are not displayed (because a CD is turned off in these errors).

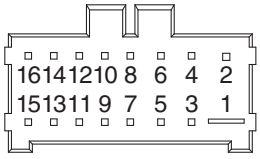
Unreadable TOC does not constitute an error. An intended operation continues in this case.

Upper digits of an error code are subdivided as shown below:

1x: Setup relevant errors, 3x: Search relevant errors, Ax: Other errors.

5.3 CONNECTOR FUNCTION DESCRIPTION





Pin No.		Pin No.	
1	B. UP	9	RL-
2	GND	10	FL-
3	ACC	11	RL+
4	NC	12	FL+
5	NC	13	RR-
6	B.REM	14	FR-
7	NC	15	RR+
8	TEL	16	FR+

6. SERVICE MODE
6.1 CD TEST MODE

1) Cautions on adjustments
• In this product the single voltage (3.3 V) is used for the regulator. The reference voltage is the REFO1 (1.65 V) instead of the GND.
If you should mistakenly short the REFO1 with the GND during adjustment, accurate voltage will not be obtained, and the servo's misoperation will apply excessive shock to the pickup. To avoid such problems:
a. Do not mix up the REFO1 with the GND when connecting the (-) probe of measuring instruments. Especially on an oscilloscope, avoid connecting the (-) probe for CH1 to the GND.
b. In many cases, measuring instruments have the same potential as that for the (-) probe. Be sure to set the measuring instruments to the floating state.
c. If you have mistakenly connected the REFO1 to the GND, turn off the regulator or the power immediately.

• Before mounting and removing filters or leads for adjustment, be sure to turn off the regulator.

• For stable circuit operation, keep the mechanism operating for about one minute or more after the regulator is turned on.

• In the test mode, any software protections will not work. Avoid applying any mechanical or electrical shock to the mechanism during adjustment.

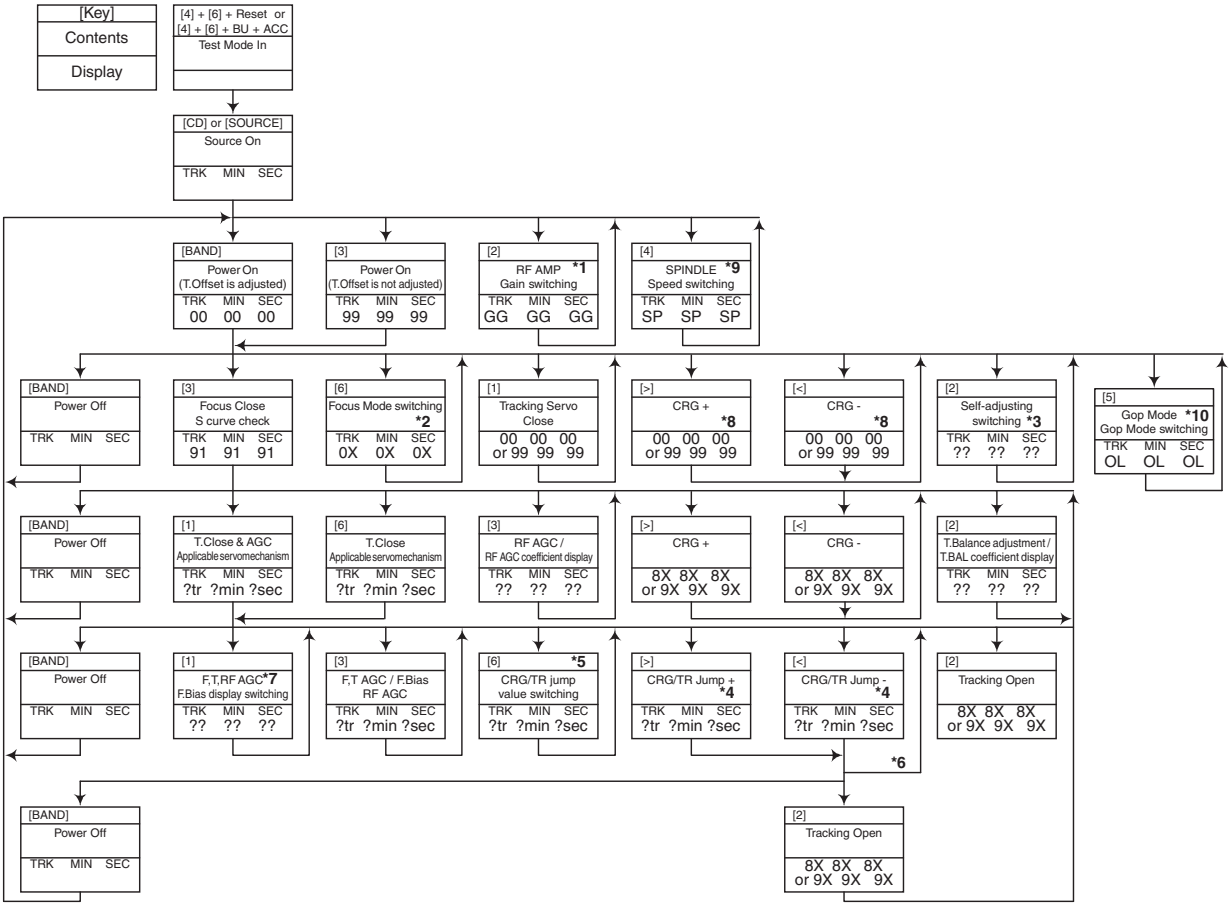
•The RFI and RFO signals with a wide frequency range are easy to oscillate. When observing the signals, insert a resistor of 1k ohms in series.

•The load and eject operation is not guarantied with the mechanism upside down. If the mechanism is blocked due to mistaken eject operation, reset the product or turn off and on the ACC to restore it.

2) Test mode
This mode is used to adjust the CD mechanism module.
•To enter the test mode.
While pressing the 4 and 6 keys at the same time, reset.
•To exit from the test mode.
Turn off the ACC and back up.

Notes:
a. During ejection, do not press any other keys than the EJECT key until the loaded disc is ejected.
b. If you have pressed the (→) key or (←) key during focus search, turn off the power immediately to protect the actuator from damage caused by the lens stuck.
c. For the TR jump modes except 100TR, the track jump operation will continue even if the key is released.
d. For the CRG move and 100TR jump modes, the tracking loop will be closed at the same time when the key is released.
e. When the power is turned off and on, the jump mode is reset to the single TR (91), the RF amp gain is set to 0 dB, and the auto-adjustment values are reset to the default settings.

● Flow Chart



*1) TYP (TRK MIN SEC) → + 6 dB ($^{TRK}06^{MIN}06^{SEC}06$) → + 12 dB ($^{TRK}12^{MIN}12^{SEC}12$)

*2) Focus Close → S Curve check setting → F EQ measurement setting
$^{TRK}00^{MIN}00^{SEC}00$ $^{TRK}01^{MIN}01^{SEC}01$ $^{TRK}02^{MIN}02^{SEC}02$
($^{TRK}99^{MIN}99^{SEC}99$)

*3) F.Offset Display → RF.Offset → T.Offset Display → Switch to the order of the original display

*4) 1TR/4TR/10TR/32TR/100TR

*5) Single → 4TR → 10TR → 32TR → 100TR → CRG Move
9x(8x):91(81) 92(82) 93(83) 94(84) 95(85) 96(86)

*6) Only at the time of CRG move, 100TR jump

*7) TRK/MIN/SEC → F.AGC → T.AGC Gain → F.Bias → RF AGC

*8) CRG motor voltage = 2 [V]

*9) TYP (1X) (TRK MIN SEC) → 2X ($^{TRK}22^{MIN}22^{SEC}22$) → 1X ($^{TRK}11^{MIN}11^{SEC}11$)

*10) OFF(TYP) (TRK MIN SEC) → FORCUS ($^{TRK}70^{MIN}70^{SEC}70$) → TRACKING ($^{TRK}71^{MIN}71^{SEC}71$)

[Key]	Operation Test Mode
[BAND]	Power On/Off
[>]	CRG + / TR Jump + (Direction of the external surface)
[<]	CRG - / TR Jump - (Direction of the internal surface)
[1]	T. CLS & AGC & Applicable servomechanism / AGC,AGC display setting
[2]	RF Gain switching / Offset adjustment display / T.Balance adjustment / T. Open
[3]	F. Close,S Curve / Rough Servo and RF AGC / F,T,RF AGC
[4]	SPDL 1X/2X switching As for the double speed(2x), audio output cannot be supported.
[5]	Error Rate measurement ON : ERR 30Counts Start BER display data[%]
[6]	F. Mode switching / Tracking Close / CRG•TR Jump Switching

- As for the double speed (2x), audio output cannot be supported

*) • After the [Eject] key is pressed keys other than the [Eject] key should not be pressed, until disc ejection is complete.
- When the key [2] or [3] is pressed during the Focus Search, the power supply should be immediately turned off (otherwise the lens sticks to Wall, causing the actuator to be damaged).
- In the case of TR jump other than to 100TR, the function shall continue to be processed even if the TR jump key is released. As for the CRG Move and 100TR Jump, the mechanism shall be set to the Tracking Close mode when the key is released.
- When the power is turned on/off the jump mode is reset to the Single TR (91) while the gain of the RFAMP is reset to 0 dB. At the same time all the self-adjusting values shall return to the default setting.

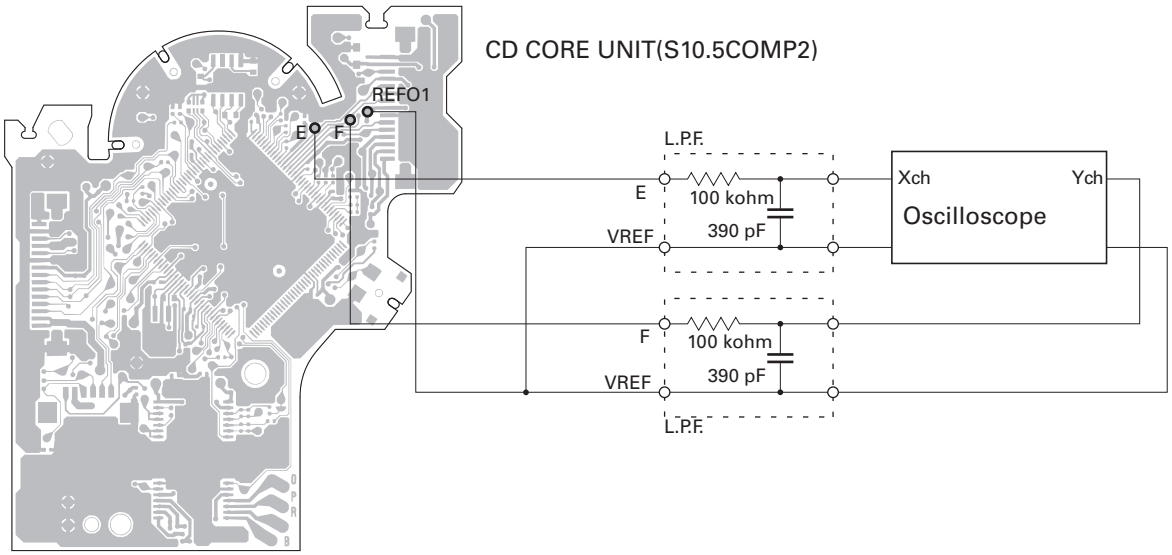
6.2 CHECKING THE GRATING AFTER CHANGING THE PICKUP UNIT

- **Note :**
  The grating angle of the PU unit cannot be adjusted after the PU unit is changed. The PU unit in the CD mechanism module is adjusted on the production line to match the CD mechanism module and is thus the best adjusted PU unit for the CD mechanism module. Changing the PU unit is thus best considered as a last resort. However, if the PU unit must be changed, the grating should be checked using the procedure below.

- **Purpose :**
  To check that the grating is within an acceptable range when the PU unit is changed.

- **Symptoms of Mal-adjustment :**
  If the grating is off by a large amount symptoms such as being unable to close tracking, being unable to perform track search operations, or taking a long time for track searching.

- **Method :**
- Measuring Equipment • Oscilloscope, Two L.P.F.
- Measuring Points • E, F, REFO1
- Disc • TCD-782
- Mode • TEST MODE



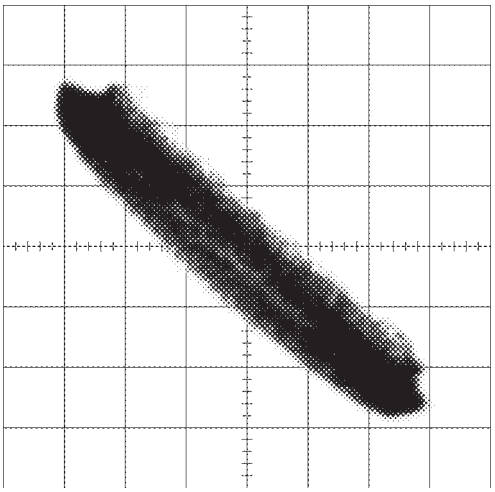
- **Checking Procedure**
1. In test mode, load the disc and switch the 3 V regulator on.
2. Using the → and ← buttons, move the PU unit to the innermost track.
3. Press key 3 to close focus, the display should read "91". Press key 2 to implement the tracking balance adjustment the display should now read "81". Press key 3. The display will change, returning to "81" on the fourth press.
4. As shown in the diagram above, monitor the LPF outputs using the oscilloscope and check that the phase difference is within 75 degrees. Refer to the photographs supplied to determine the phase angle.
5. If the phase difference is determined to be greater than 75 degrees try changing the PU unit to see if there is any improvement. If, after trying this a number of times, the grating angle does not become less than 75 degrees then the mechanism should be judged to be at fault.

- **Note**
  Because of eccentricity in the disc and a slight misalignment of the clamping center the grating waveform may be seen to "wobble" (the phase difference changes as the disc rotates). The angle specified above indicates the average angle.
- **Hint**
  Reloading the disc changes the clamp position and may decrease the "wobble".

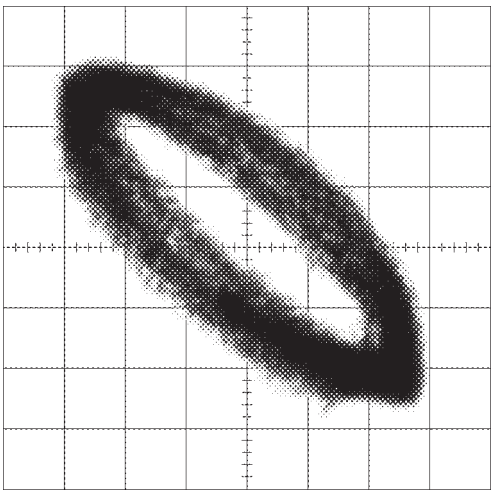
Grating waveform

Ech → Xch 20 mV/div, AC
Fch → Ych 20 mV/div, AC

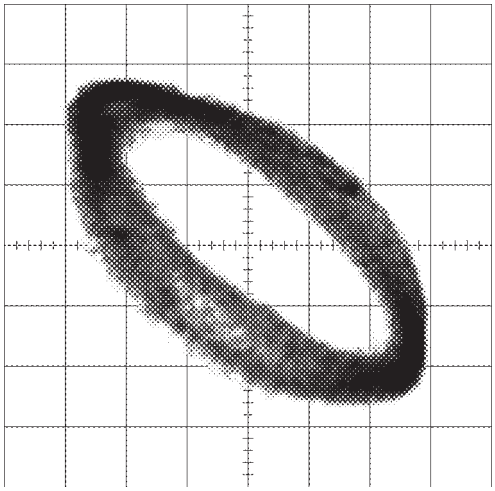
0 degrees



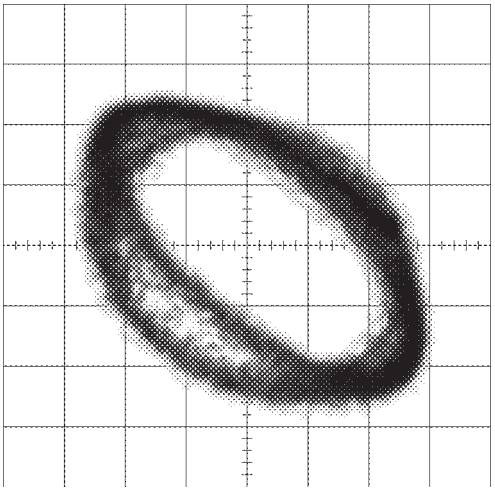
30 degrees



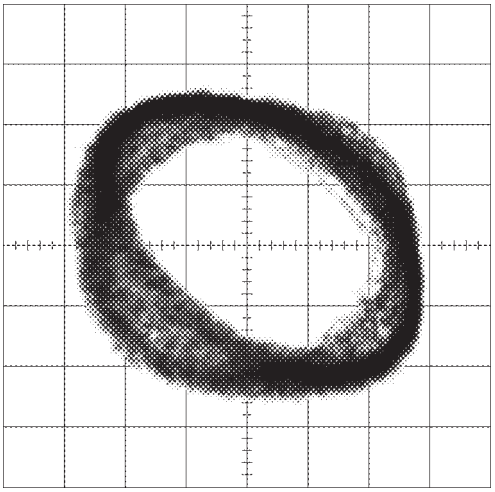
45 degrees



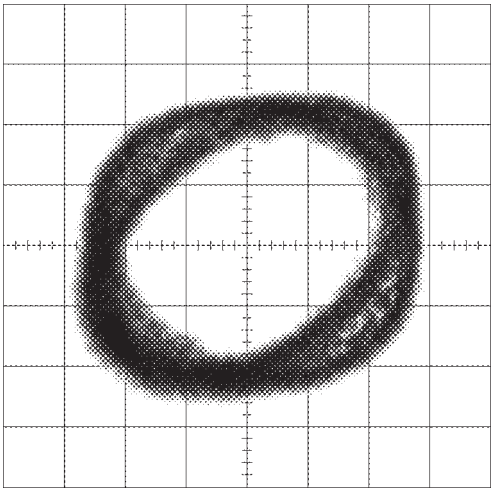
60 degrees



75 degrees



90 degrees



7. DISASSEMBLY

While the photograph shown is slightly different from this model in shape, the disassembly procedure is the same.

● Removing the Case (not shown)

1. Remove the Case.

● Removing the CD Mechanism Module (Fig.1)

1 Remove the four screws.

Disconnect the connector and then remove the CD Mechanism Module.

● Removing the Grille Assy (Fig.1)

2 Release the two latchs and then remove the Grille Assy.

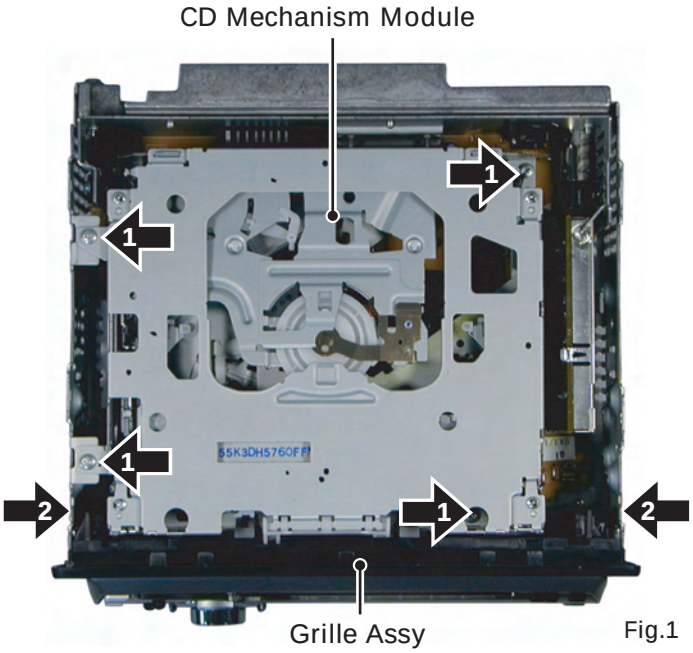


Fig.1

● Removing the Tuner Amp Unit (Fig.2)

1 Remove the two screws.

2 Remove the two screws.

3 Straighten the tabs at two locations indicated.

4 Remove the two screws and then remove the Tuner Amp Unit.

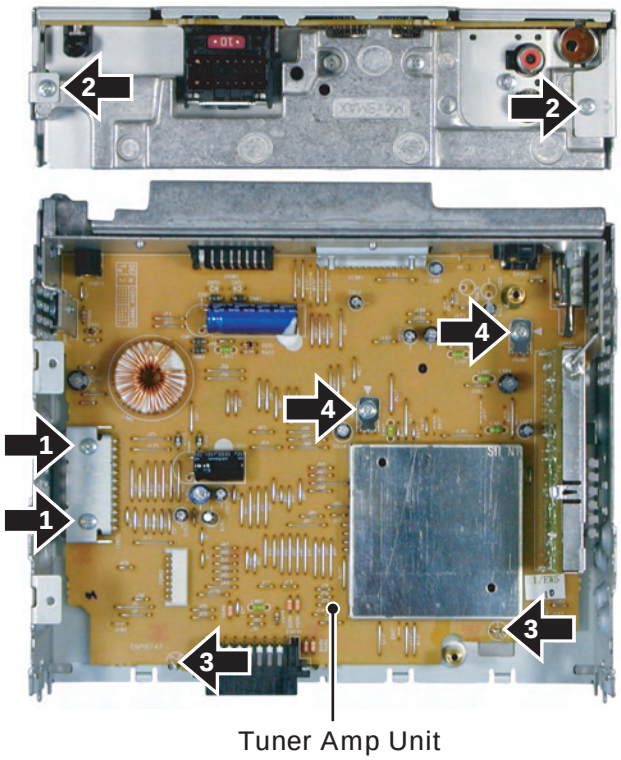
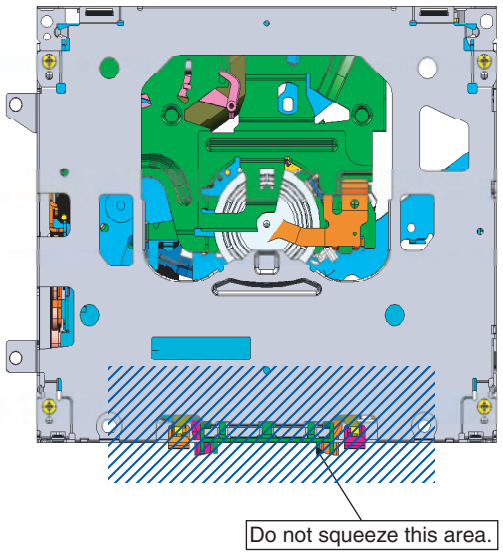


Fig.2

● How to hold the Mechanism Unit

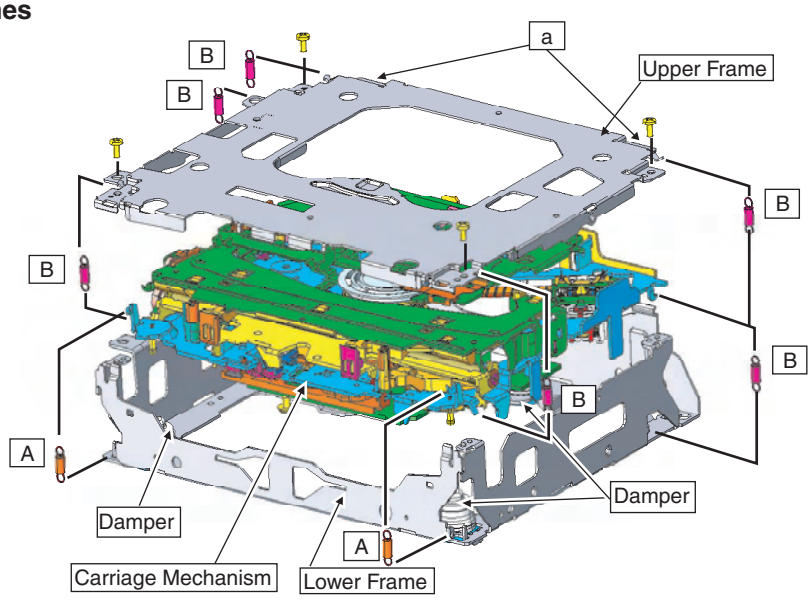
1. Hold the Upper and Lower Frames.
2. Do not hold the front portion of the Upper Frame, because it is not very solid.



● Removing the Upper and Lower Frames

1. With a disc inserted and clamped in the mechanism, remove the two Springs (A), the six Springs (B), and the four Screws.
2. Turn the Upper Frame using the part "a" as a pivot, and remove the Upper Frame.
3. While lifting the Carriage Mechanism, remove it from the three Dampers.

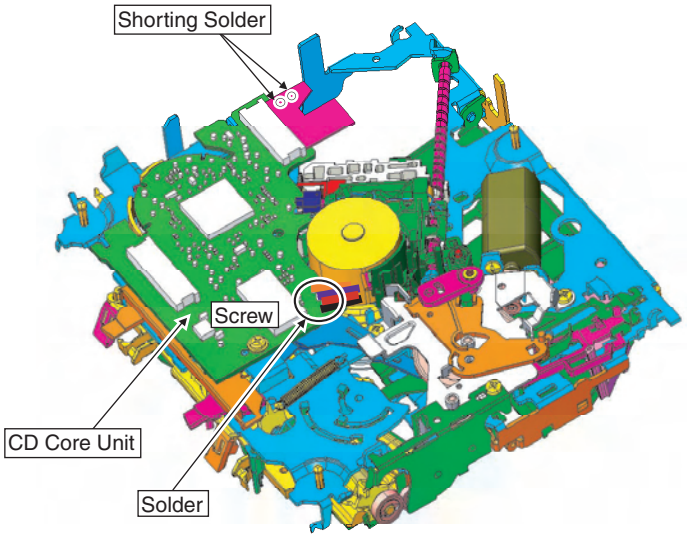
Caution: When assembling, be sure to apply some alcohol to the Dampers and assemble the mechanism in a clamped state.



● How to remove the CD Core Unit

1. Apply Shorting Solder to the flexible cable of the Pickup, and disconnect it from the connector.
2. Unsolder the four leads, and loosen the Screw.
3. Remove the CD Core Unit.

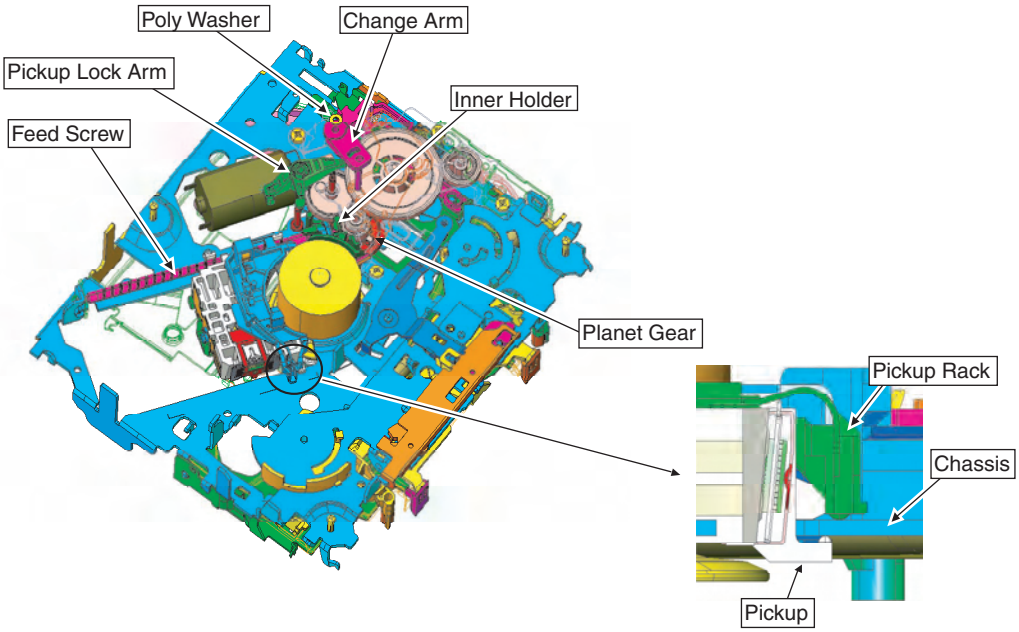
Caution: When assembling the CD Core Unit, assemble it with the SW in a clamped state so as not to damage it.



● How to remove the Pickup Unit

1. Make the system in the carriage mechanism mode, and have it clamped.
2. Remove the CD Core Unit and remove the leads from the Inner Holder.
3. Remove the Poly Washer, Change Arm, and Pickup Lock Arm.
4. While releasing from the hook of the Inner Holder, lift the end of the Feed Screw.

Caution: When assembling, move the Planet Gear to the load/eject position before setting the Feed Screw in the Inner Holder.
Assemble the sub unit side of the Pickup, taking the plate (Chassis) in-between. When treating the leads of the Load Carriage Motor Assy, do not make them loose over the Feed Screw.



8. EACH SETTING AND ADJUSTMENT

8.1 PCL OUTPUT CONFIRMATION

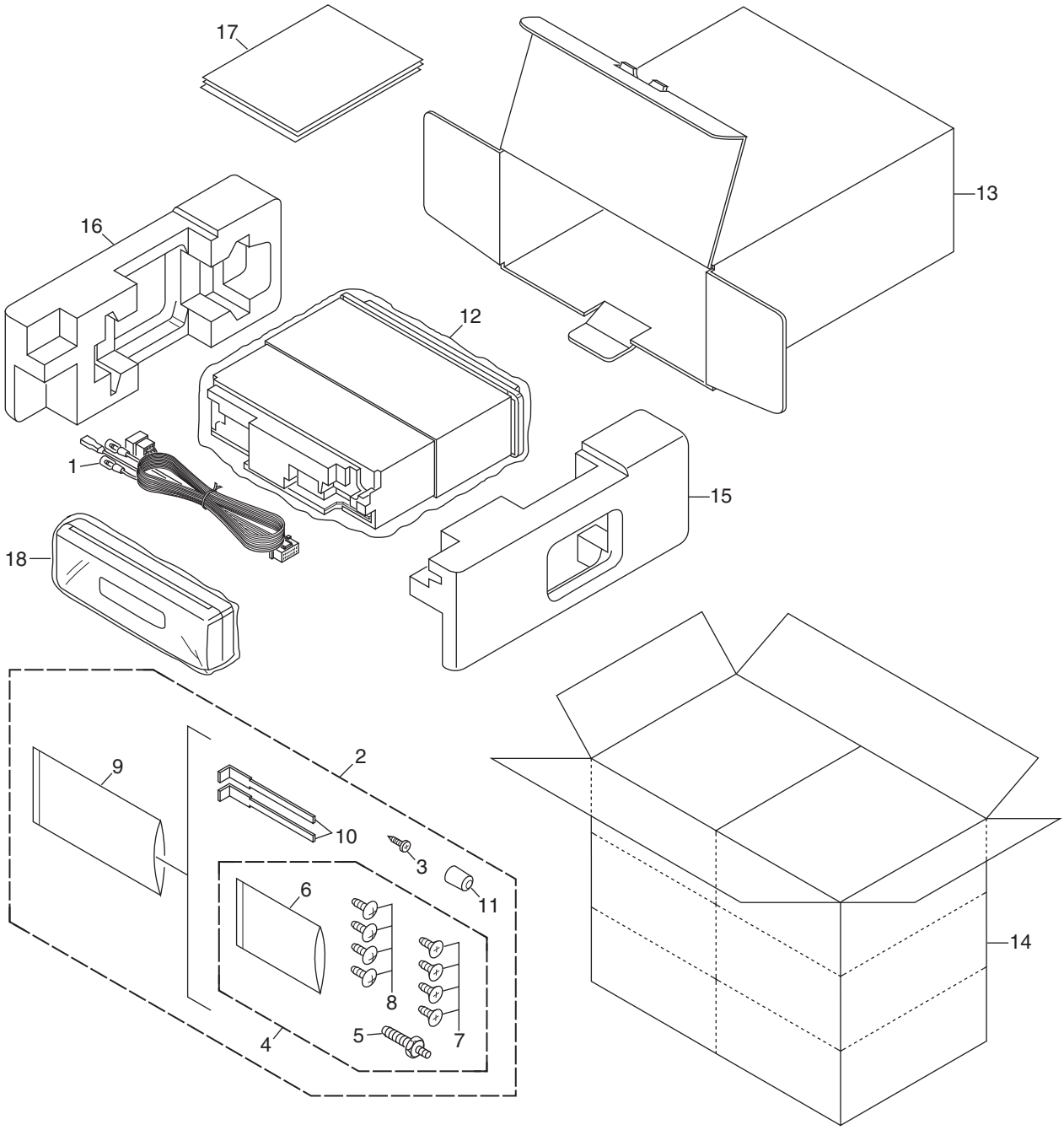
● PCL Output

In the normal operation mode (with the detachable panel installed, the ACC switched ON, the standby mode cancelled), shift the TESTIN IC601(Pin 112) terminal to H. The clock signal is output from the SCET IC601(Pin 43) terminal.
The frequency of the clock signal is 1 Hz. The clock signal should be 1 Hz ± 0.000 04 Hz.
If the clock signal is out of the range, the X'tal (X601) should be replaced with new one.

9. EXPLODED VIEWS AND PARTS LIST

NOTES : • *Parts marked by " * " are generally unavailable because they are not in our Master Spare Parts List.*
• *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
• *Screw adjacent to▽ mark on the product are used for disassembly.*
• *For the applying amount of lubricants or glue, follow the instructions in this manual. (In the case of no amount instructions,apply as you think it appropriate.)*

9.1 PACKING



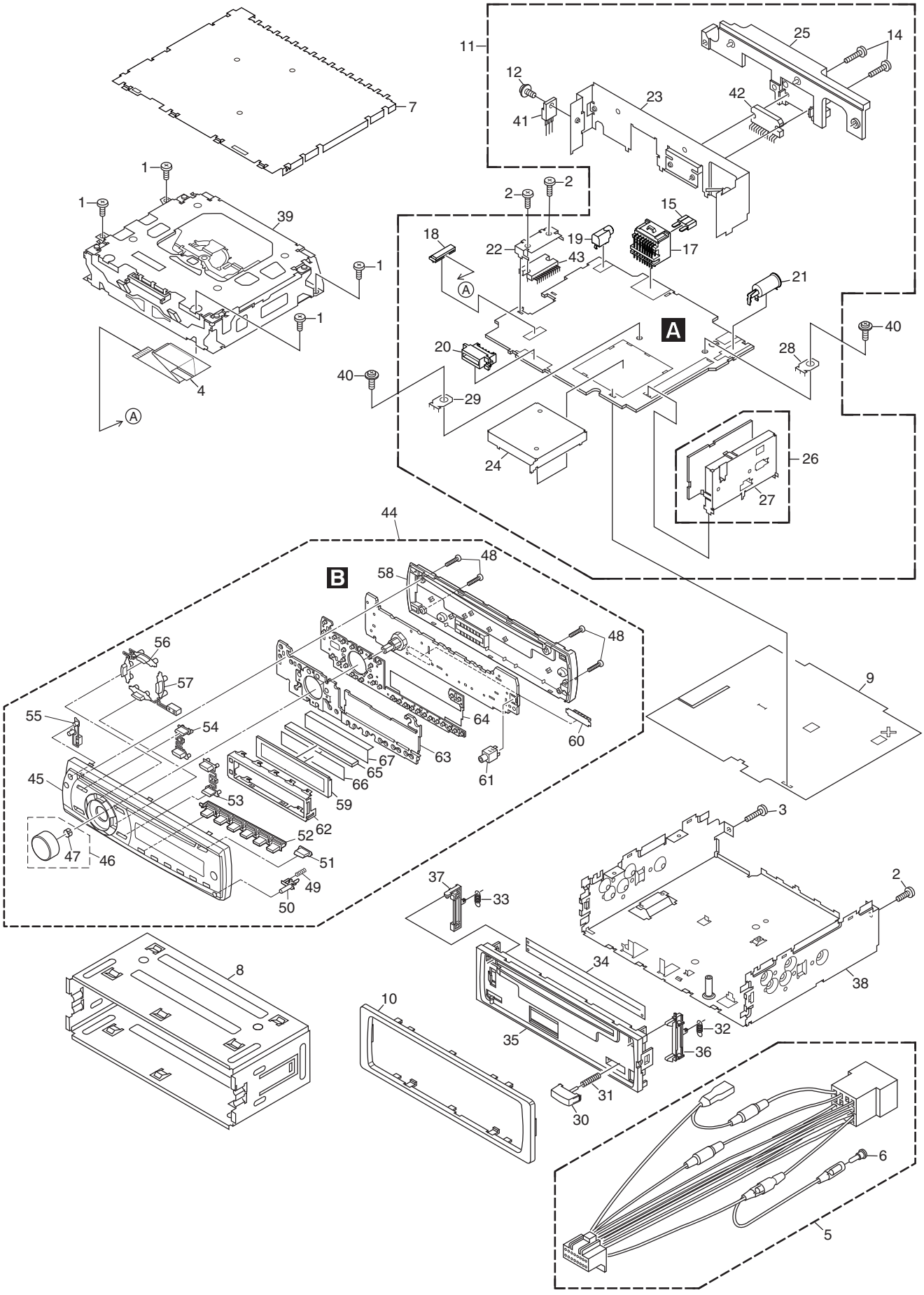
PACKING SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	Cord Assy	CDP1015
*	2	Accessory Assy	YEA5029
	3	Screw	BPZ20P060FTC
	4	Screw Assy	CEA3849
	5	Screw	CBA1650
*	6	Polyethylene Bag	CEG-127
	7	Screw	CRZ50P090FTC
	8	Screw	TRZ50P080FTC
	9	Polyethylene Bag	CEG1160
	10	Handle	CND3707
	11	Bush	CNV3930
	12	Polyethylene Bag	CEG1373
	13	Unit Box(2000MPB)	YHG5327
		Unit Box(2000MP)	YHG5312
		Carton(2020MP)	YHG5329
	14	Contain Box(2000MPB)	YHL5327
		Contain Box(2000MP)	YHL5312
		Contain Box(2020MP)	YHL5329
	15	Protector	YHP5309
	16	Protector	YHP5040
	17-1	Installation Manual	YRD5142
	17-2	Owner's Manual	YRD5140
	17-3	Owner's Manual	YRD5141
*	17-4	Warranty Card	CRY1265
	18	Case Assy	YXB5009

Owner's Manual,Installation Manual

Part No.	Language
YRD5140	English, Spanish, German, French
YRD5141	Italian, Dutch, Russian
YRD5142	English, Spanish, German, French, Italian, Dutch, Russian

9.2 EXTERIOR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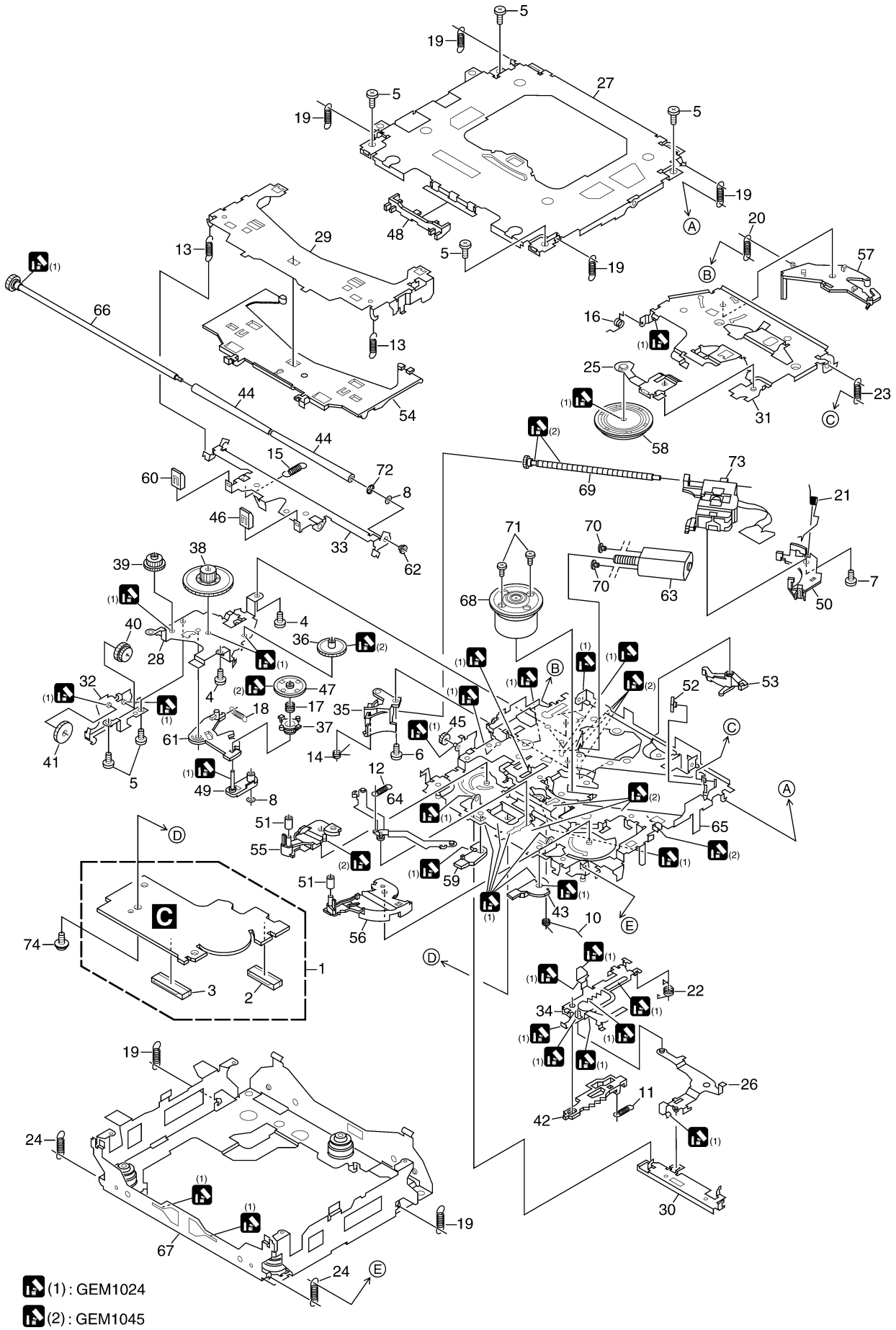
EXTERIOR SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	Screw	BSZ26P060FTC
	2	Screw	BSZ26P100FTC
	3	Screw	BSZ26P180FTC
	4	Cable	CDE8337
	5	Cord Assy	CDP1015
	6	Pin	CKX-003
	7	Case	CNB2793
	8	Holder	CND3598
	9	Insulator	CNN2325
	10	Panel	YNS5276
	11	Tuner Amp Unit	YWM5228
	12	Screw	BSZ26P060FTC
	13	•••••	
	14	Screw	BSZ26P160FTC
⚠	15	Fuse(10 A)	YEK5001
	16	•••••	
	17	Plug(CN901)	CKM1376
	18	Connector(CN651)	CKS3829
	19	Connector(CN871)	CKS4124
	20	Connector(CN831)	CKS5664
	21	Antenna Jack(CN401)	CKX1056
	22	Holder	CND3545
	23	Holder	YND5013
	24	Holder	CND3706
	25	Heat Sink	CNR1668
	26	FM/AM Tuner Unit	CWE2106
	27	Holder	CND3466
	28	Terminal(CN402)	VNF1084
	29	Terminal(CN601)	VNF1084
	30	Button(DETACH)	CAC4836
	31	Spring	CBH2367
	32	Spring	CBH2961
	33	Spring	CBH2962
	34	Cover	CNN1665
	35	Panel	CNS9206
	36	Arm	CNV9311
	37	Arm	CNV9312
	38	Chassis Unit(2000MPB)	YXA5399
		Chassis Unit(2000MP)	YXA5361
		Chassis Unit(2020MP)	YXA5398
	39	CD Mechanism Module(S10.5)	CXK5763
	40	Screw	ISS26P055FTC
	41	Transistor(Q991)	2SD2396
	42	IC(IC301)	PAL007C
	43	IC(IC911)	BA4918-V12
	44	Grille Assy(2000MPB)	YXA5371
		Detachable Assy(2000MP)	YXA5316
		Grille Assy(2020MP)	YXA5370
	45	Grille Unit(2000MPB)	YXA5309
		Grille Unit(2000MP)	YXA5337
		Grille Assy(2020MP)	YXA5380
	46	Knob Unit(2000MPB,2020MP)	YXC5074
		Konb Unit(2000MP)	YXC5072
	47	Spring	YBL5010
	48	Screw	BPZ20P100FTC
	49	Spring	CBH2210
	50	Button(Detach)	YAC5217
	51	Button(EJECT)	YAC5218
	52	Button(1 - 6)	YAC5219
	53	Button(AUDIO,EQ)	YAC5220
	54	Button(FUNC,BAND)	YAC5221
	55	Button(DISP,TA)	YAC5222
	56	Button(UP,<)	YAC5236
	57	Button(DOWN,>)	YAC5237
	58	Cover	YNS5248
	59	LCD(LCD1801)(2000MPB)	CAW1932
		LCD(LCD1801)(2000MP,2020MP)	CAW1930
	60	Connector(CN1801)	CKS5663
	61	Jack(CN1802)	YKN5001
	62	Holder	YNC5045
	63	Lighting Conductor	YNV5108
	64	Rubber Contact	YNV5109
	65	Connector	YNV5166
	66	Sheet(2000MPB)	CNN1381
	67	Sheet(2000MPB)	CNN1382

9.3 CD MECHANISM MODULE



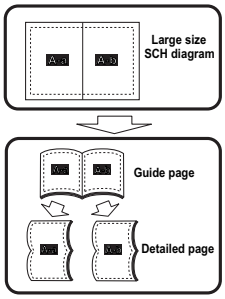
CD MECHANISM MODULE SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	CD Core Unit(S10.5COMP2)	CWX3514
	2	Connector(CN101)	CKS4182
	3	Connector(CN701)	CKS4808
	4	Screw	BMZ20P025FTC
	5	Screw	BSZ20P040FTC
	6	Screw(M2 x 3)	CBA1511
	7	Screw(M2 x 4)	CBA1835
	8	Washer	CBF1038
	9	•••••	
	10	Spring	CBH2609
	11	Spring	CBH2612
	12	Spring	CBH2614
	13	Spring	CBH2616
	14	Spring	CBH2617
	15	Spring	CBH2620
	16	Spring	CBH2855
	17	Spring	CBH2937
	18	Spring	CBH2735
	19	Spring	CBH2854
	20	Spring	CBH2642
	21	Spring	CBH2856
	22	Spring	CBH2857
	23	Spring	CBH2860
	24	Spring	CBH2861
	25	Spring	CBL1686
	26	Arm	CND1909
	27	Frame	CND2582
	28	Bracket	CND2583
	29	Arm	CND2584
	30	Lever	CND2585
	31	Arm	CND2586
	32	Bracket	CND2587
	33	Arm	CND2588
	34	Lever	CND2589
	35	Holder	CNV7201
	36	Gear	CNV7207
	37	Gear	CNV7208
	38	Gear	CNV7209
	39	Gear	CNV7210
	40	Gear	CNV7211
	41	Gear	CNV7212
	42	Rack	CNV7214
	43	Arm	CNV7216
	44	Roller	CNV7218
	45	Gear	CNV7219
	46	Guide	CNV7361
	47	Gear	CNV7595
	48	Guide	CNV7799
	49	Arm	CNV7805
	50	Rack	CNV8342
	51	Roller	CNV8343
	52	Holder	CNV8344
	53	Arm	CNV8345
	54	Guide	CNV8347
	55	Arm	CNV8348
	56	Arm	CNV8349
	57	Arm	CNV8350
	58	Clamper	CNV8365
	59	Arm	CNV8386
	60	Guide	CNV8396
	61	Arm	CNV8413
	62	Collar	CNV8938
	63	Motor Unit(M2)	CXC4026
	64	Arm Unit	CXC4027
	65	Chassis Unit	CXC4028
	66	Gear Unit	CXC4029
	67	Frame Unit	CXC4031
	68	Motor Unit(M1)	CXC7134
	69	Screw Unit	CXC6359
	70	Screw	JFZ20P020FTC
	71	Screw	JGZ17P022FTC
	72	Washer	YE20FTC
	73	Pickup Unit(P10.5)(Service)	CXX1942
	74	Screw	IMS26P030FTC

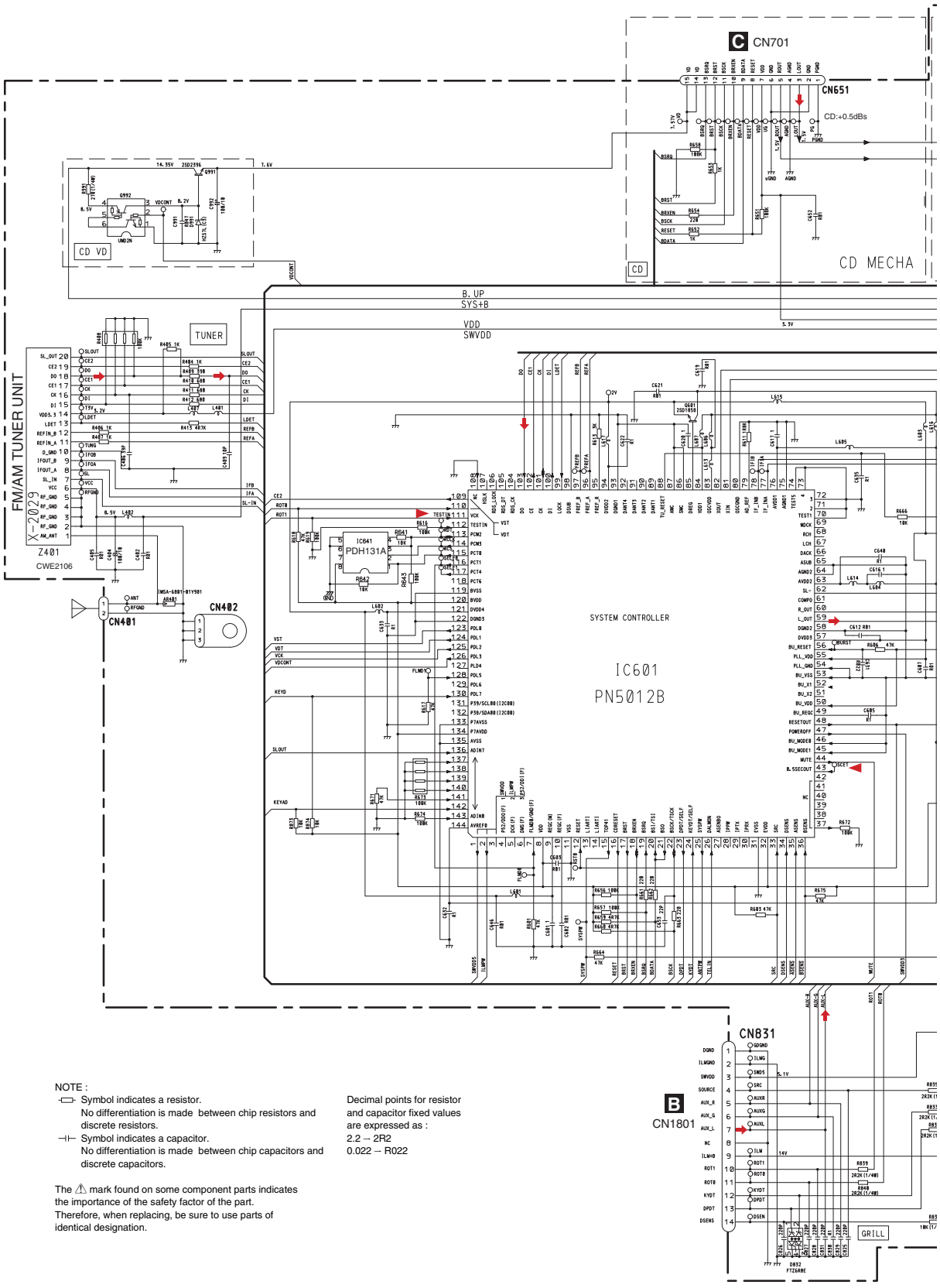
10. SCHEMATIC DIAGRAM

10.1 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)

Note: When ordering service parts, be sure to refer to " EXPLODED VIEWS AND PARTS LIST" or "ELECTRICAL PARTS LIST".



A-a



NOTE :

- Symbol indicates a resistor. No differentiation is made between chip resistors and discrete resistors.
- Symbol indicates a capacitor. No differentiation is made between chip capacitors and discrete capacitors.

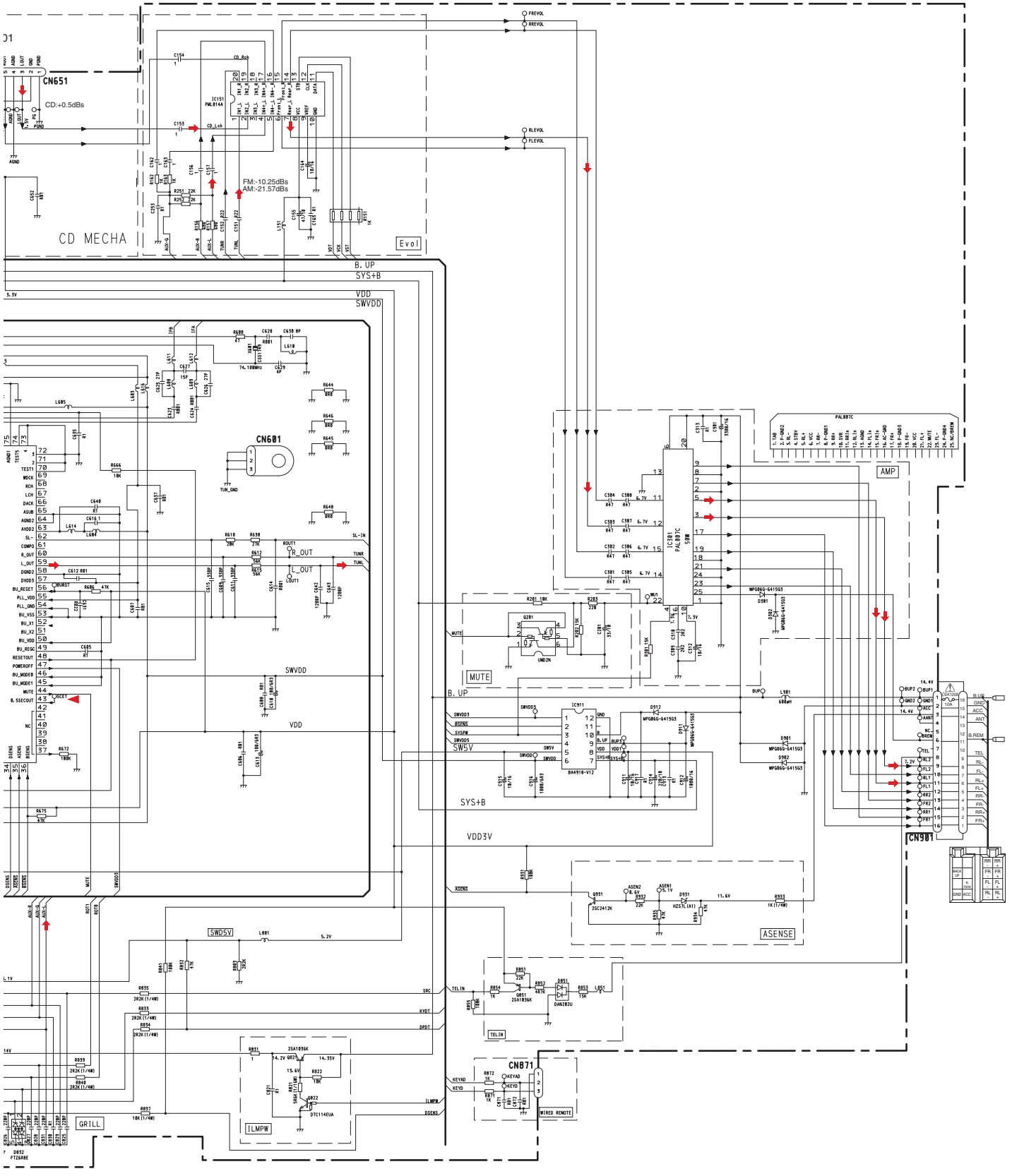
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

Decimal points for resistor and capacitor fixed values are expressed as :
2.2 → 2R2
0.022 → R022

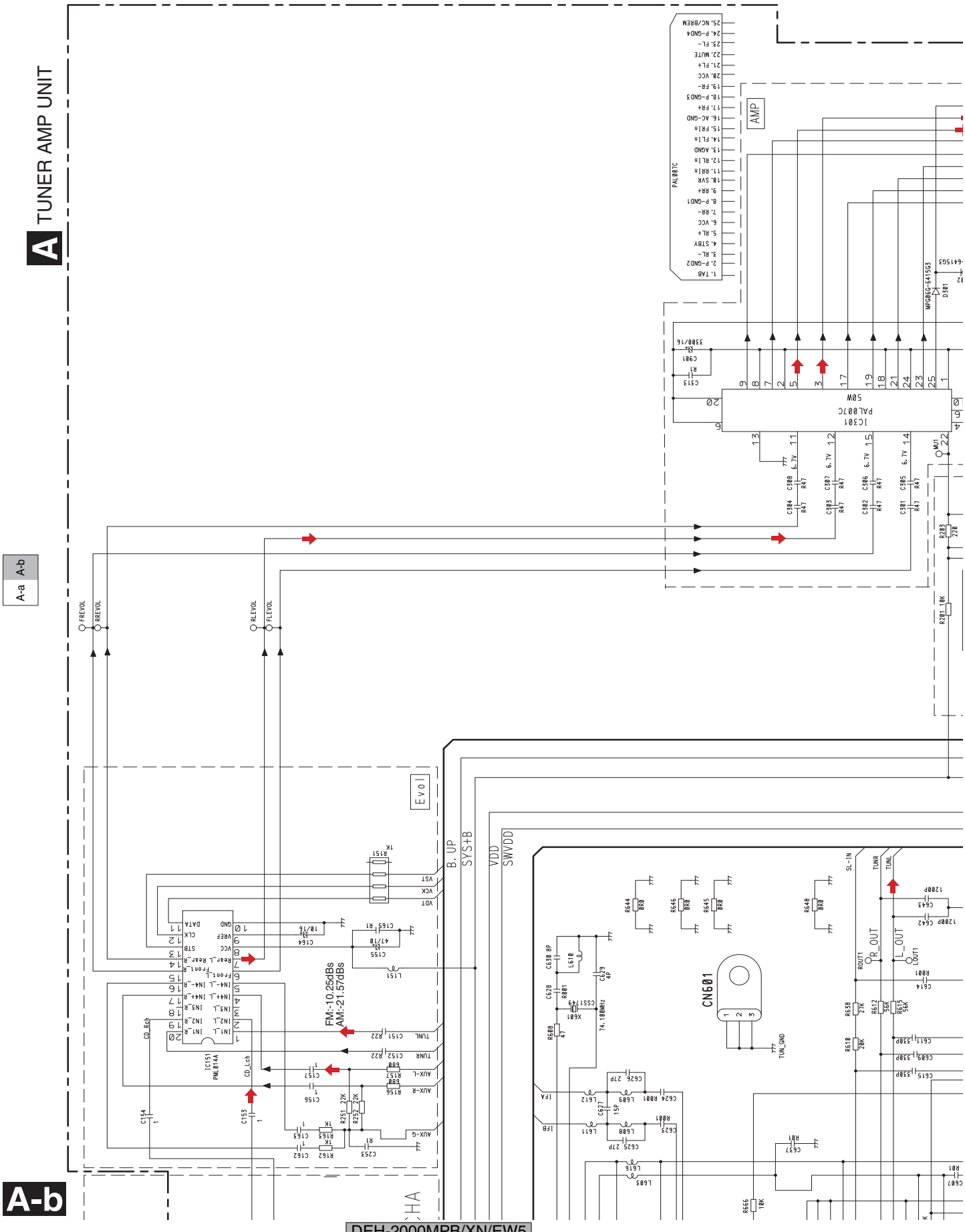
A

A-b

A TUNER AMP UNIT

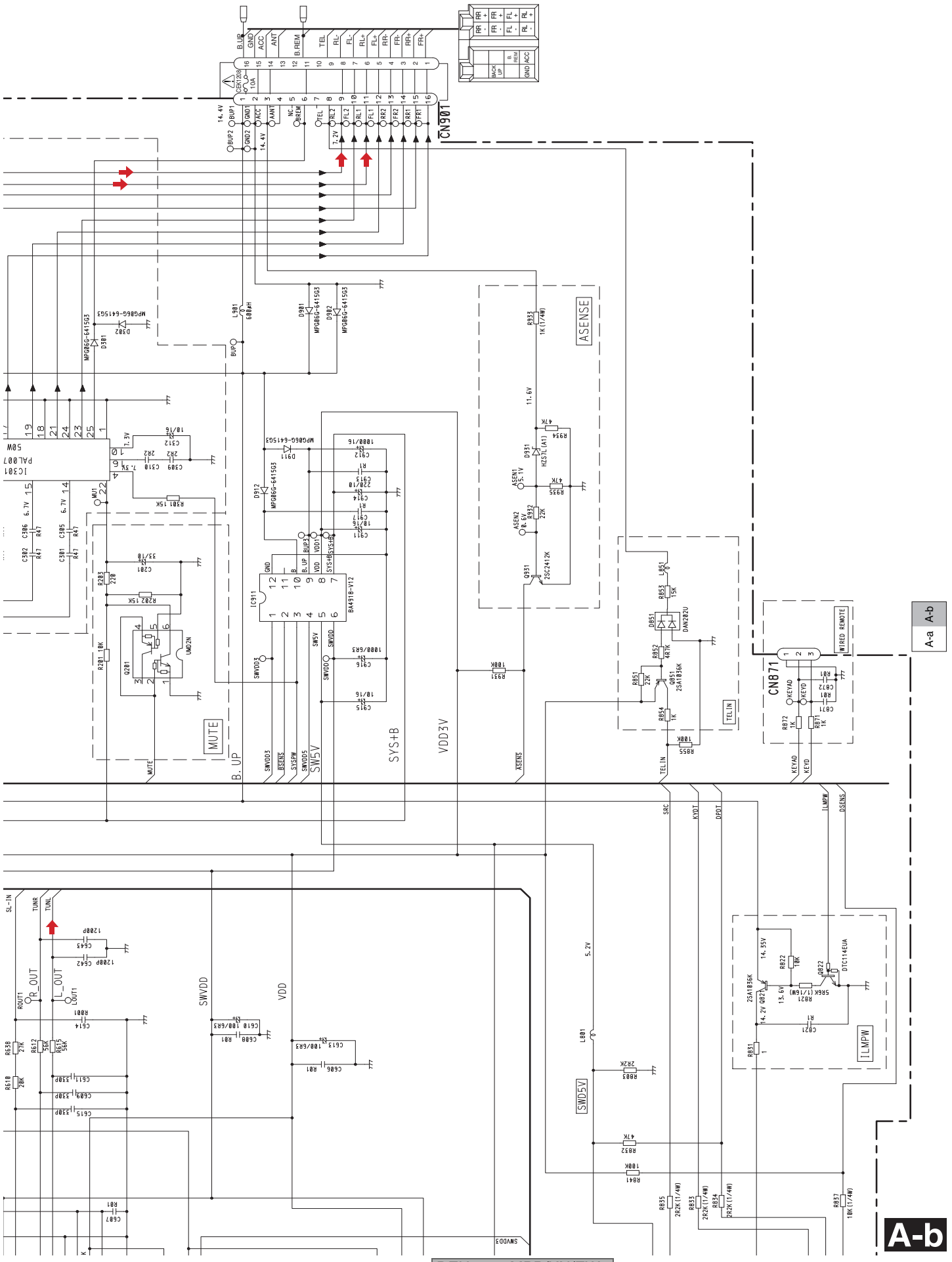


A TUNER AMP UNIT

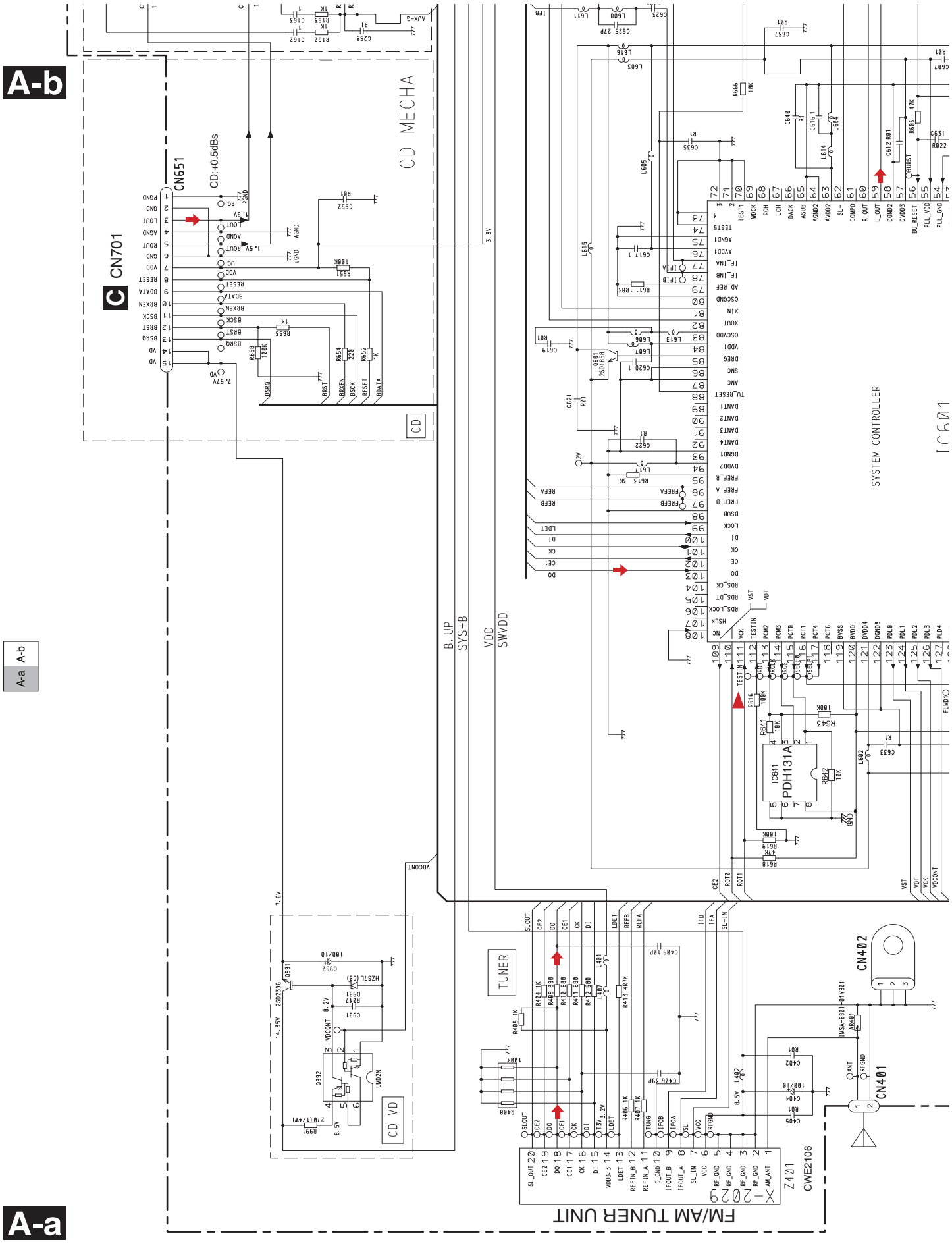


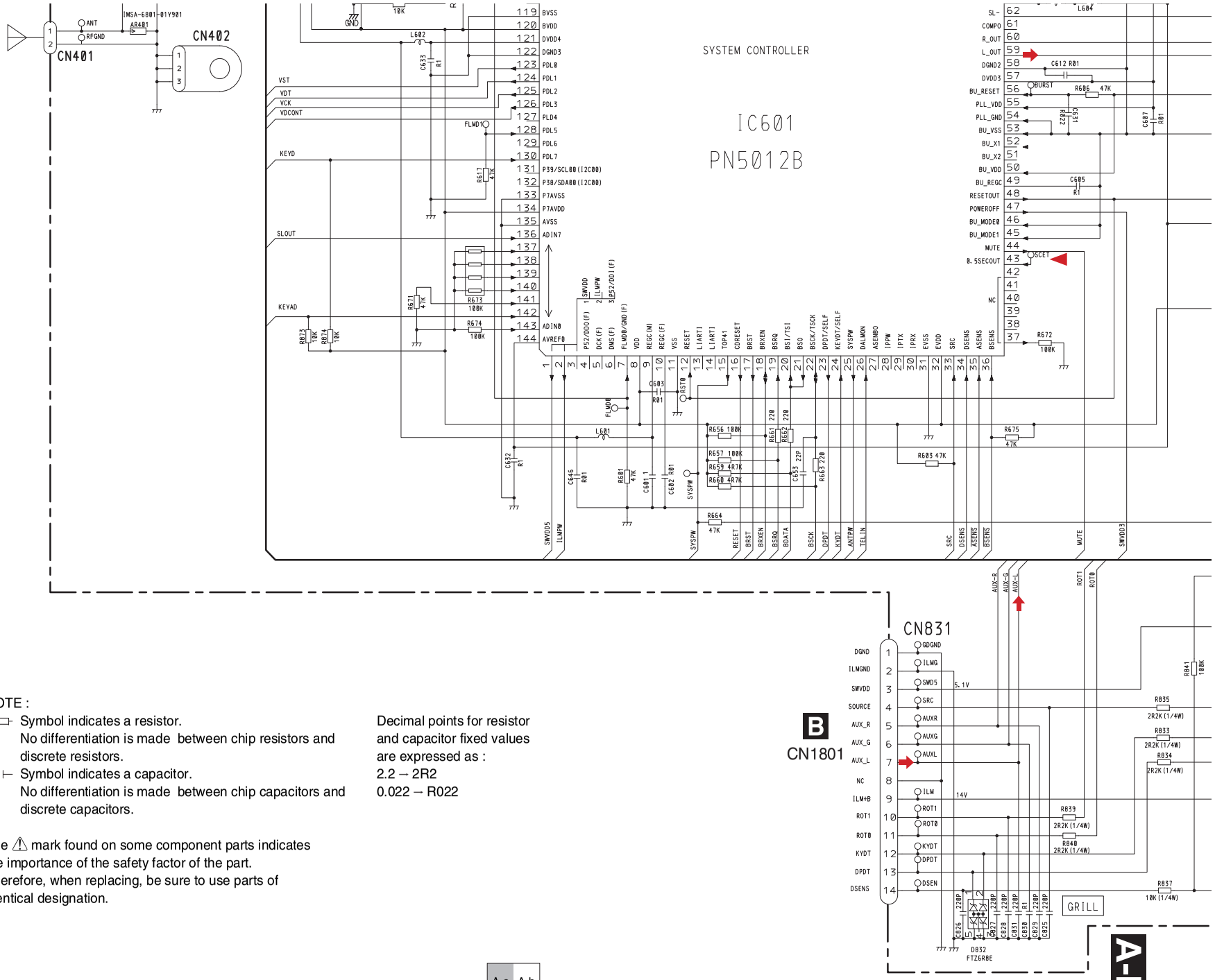
A-a A-b

A-b


CN901
B.UP
GND
ACC
ANT
B.REM
TEL
RL-
FL
RL+
FL+
RR-
FR-
RR+
FR+
BUP1
GND1
ACC
AANT
NC
BREM
TEL
RL2
FL2
RL1
FL1
RR2
FR2
RR1
FR1
BUP2
GND2
14.4V
7.2V
ASENSE
MUTE
B.UP
SYS+B
VDD3V
SW5V
SWVDD
VDD
SW5V
CN871
KEYAD
KEYD
WIRED REMOTE
TEL.IN
ILMPW
DSENS
SRC
KYDT
DPDT
SL-IN
TUNR
TUNL
R_OUT
L_OUT
ROUT1
LOUT1
A-a
A-b

A-b


A-b
A-a
CD MECHA
CN651
CD:+0.5dBs
CN701
CD
SYSTEM CONTROLLER
IC601
B_UP
SYS+B
VDD
SW/DD
VDCONT
TUNER
IC641
PDH131A
CD VD
FM/AM TUNER UNIT
X-2029
Z401
CWE2106
CN402
CN401



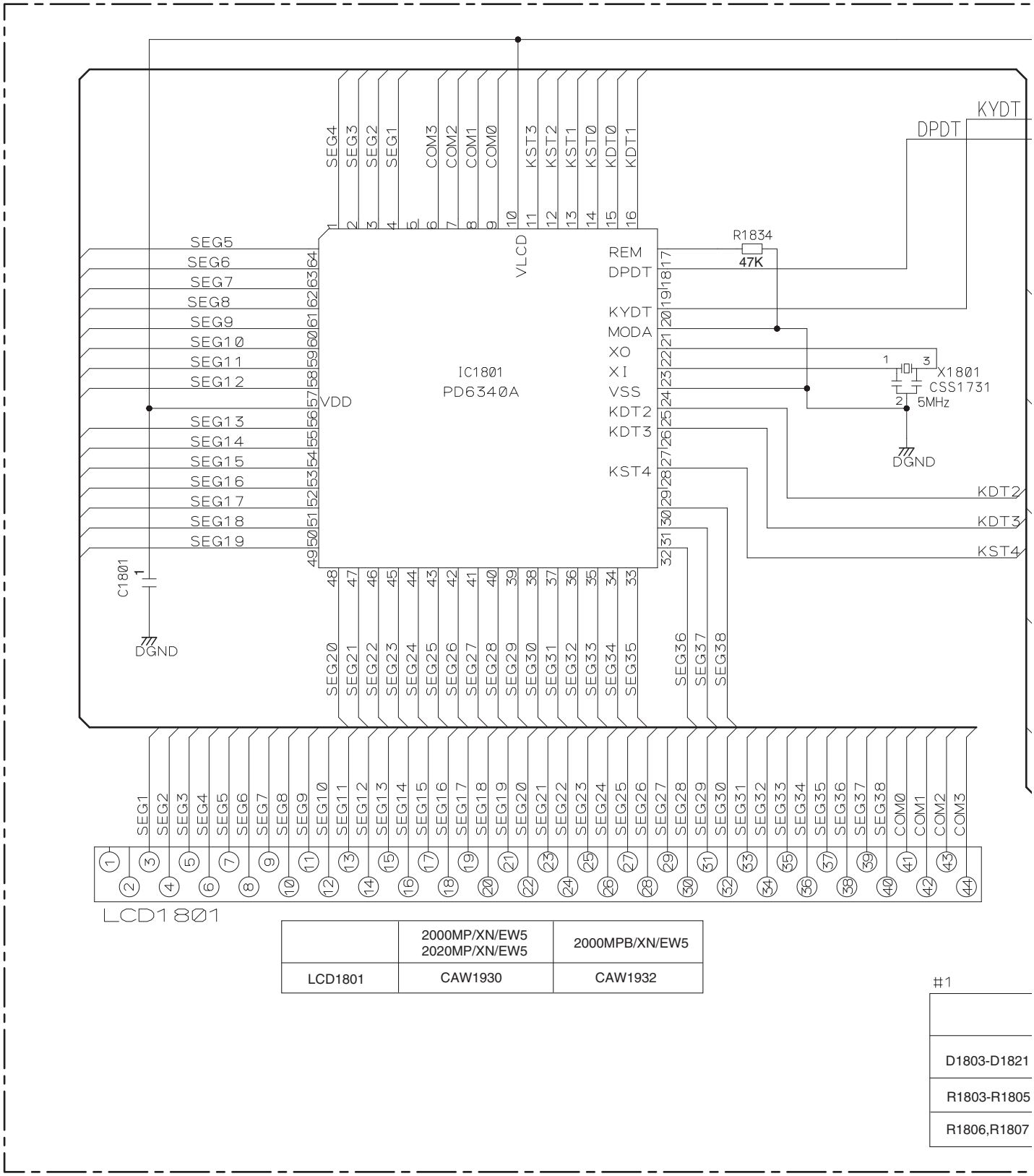
NOTE :

- Symbol indicates a resistor. No differentiation is made between chip resistors and discrete resistors.
- Symbol indicates a capacitor. No differentiation is made between chip capacitors and discrete capacitors.

The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

Decimal points for resistor and capacitor fixed values are expressed as :
2.2 → 2R2
0.022 → R022

10.2 KEYBOARD UNIT

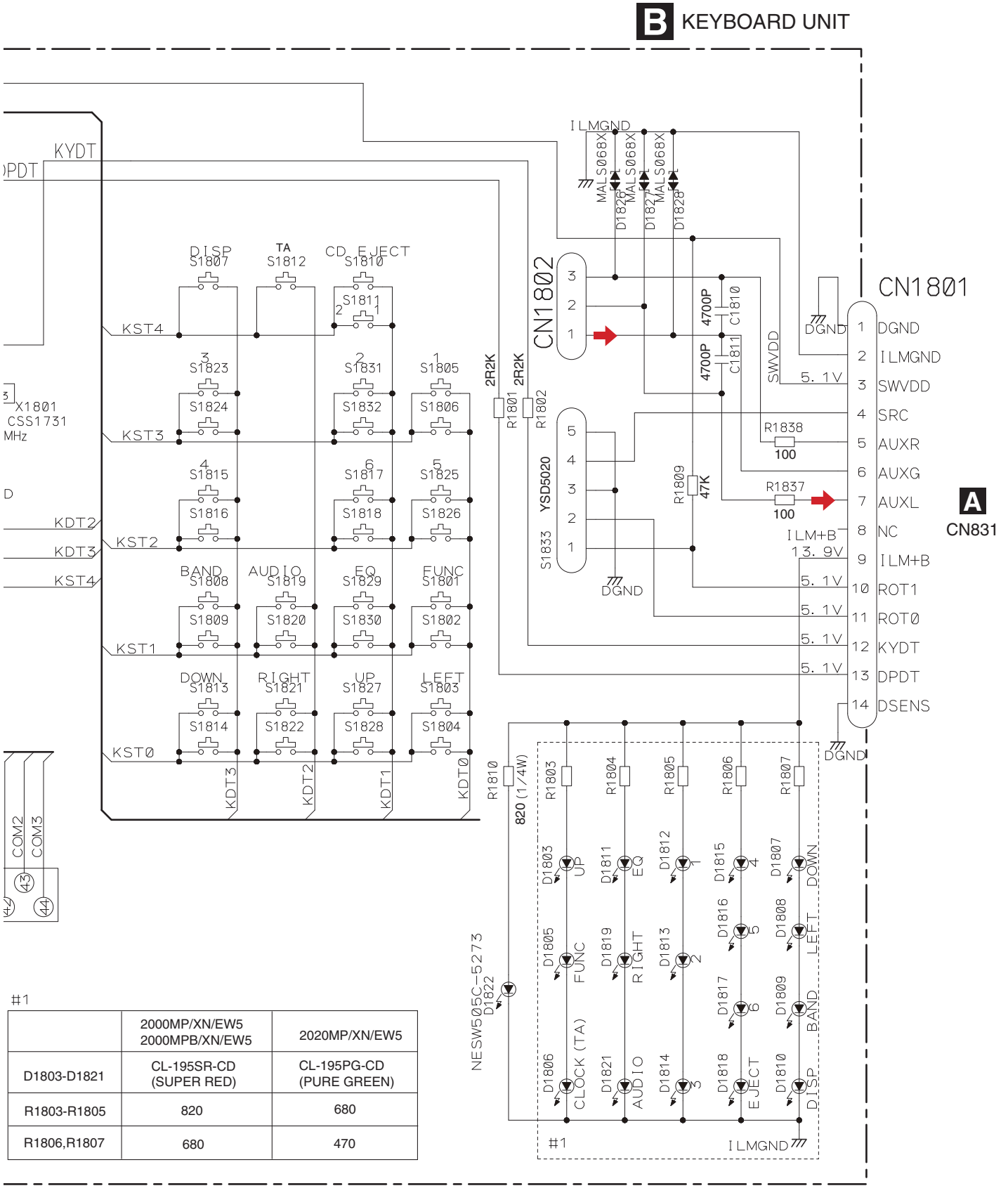


	2000MP/XN/EW5 2020MP/XN/EW5	2000MPB/XN/EW5
LCD1801	CAW1930	CAW1932

#1

D1803-D1821
R1803-R1805
R1806,R1807

B KEYBOARD UNIT

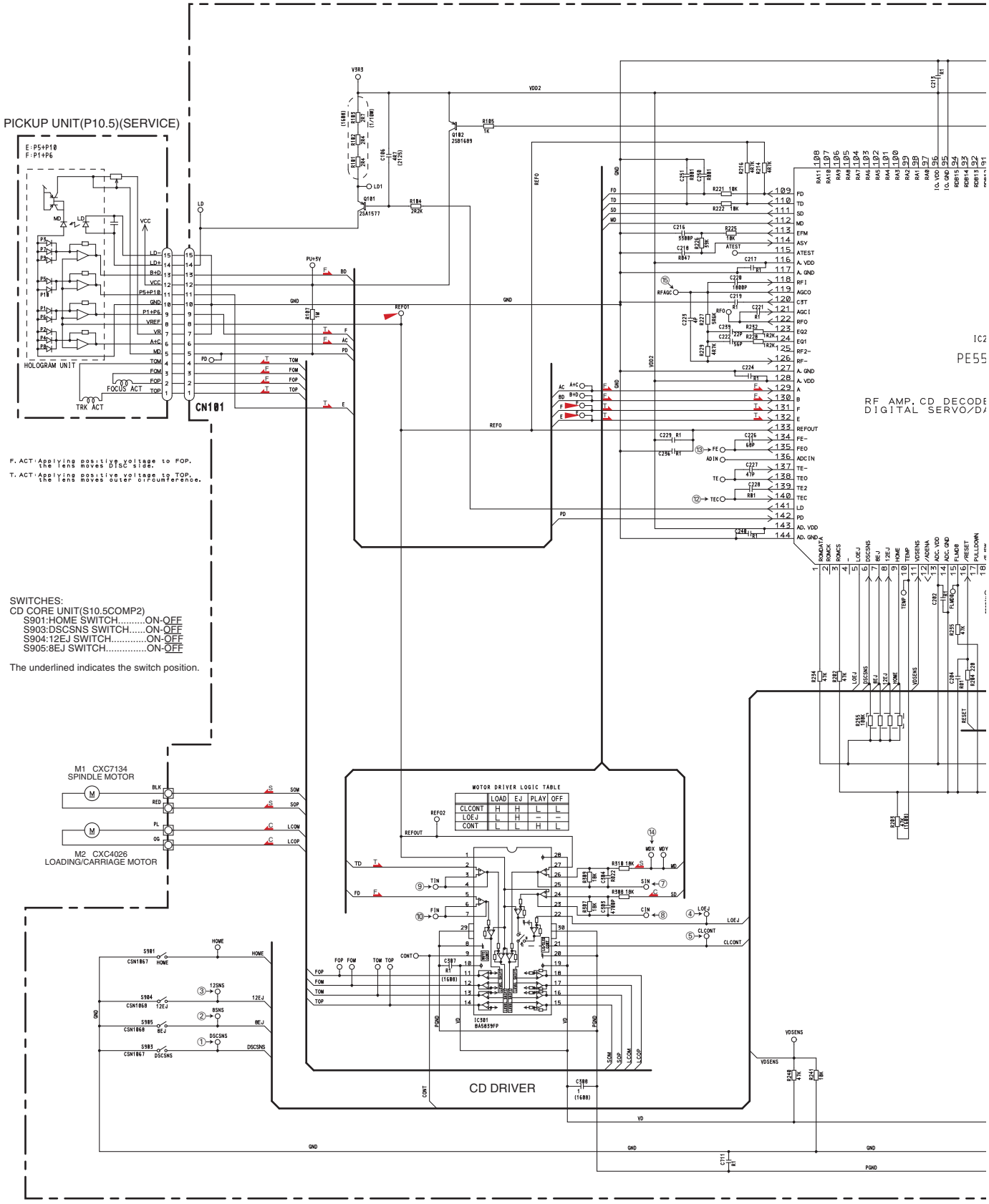


#1

	2000MP/XN/EW5 2000MPB/XN/EW5	2020MP/XN/EW5
D1803-D1821	CL-195SR-CD (SUPER RED)	CL-195PG-CD (PURE GREEN)
R1803-R1805	820	680
R1806,R1807	680	470

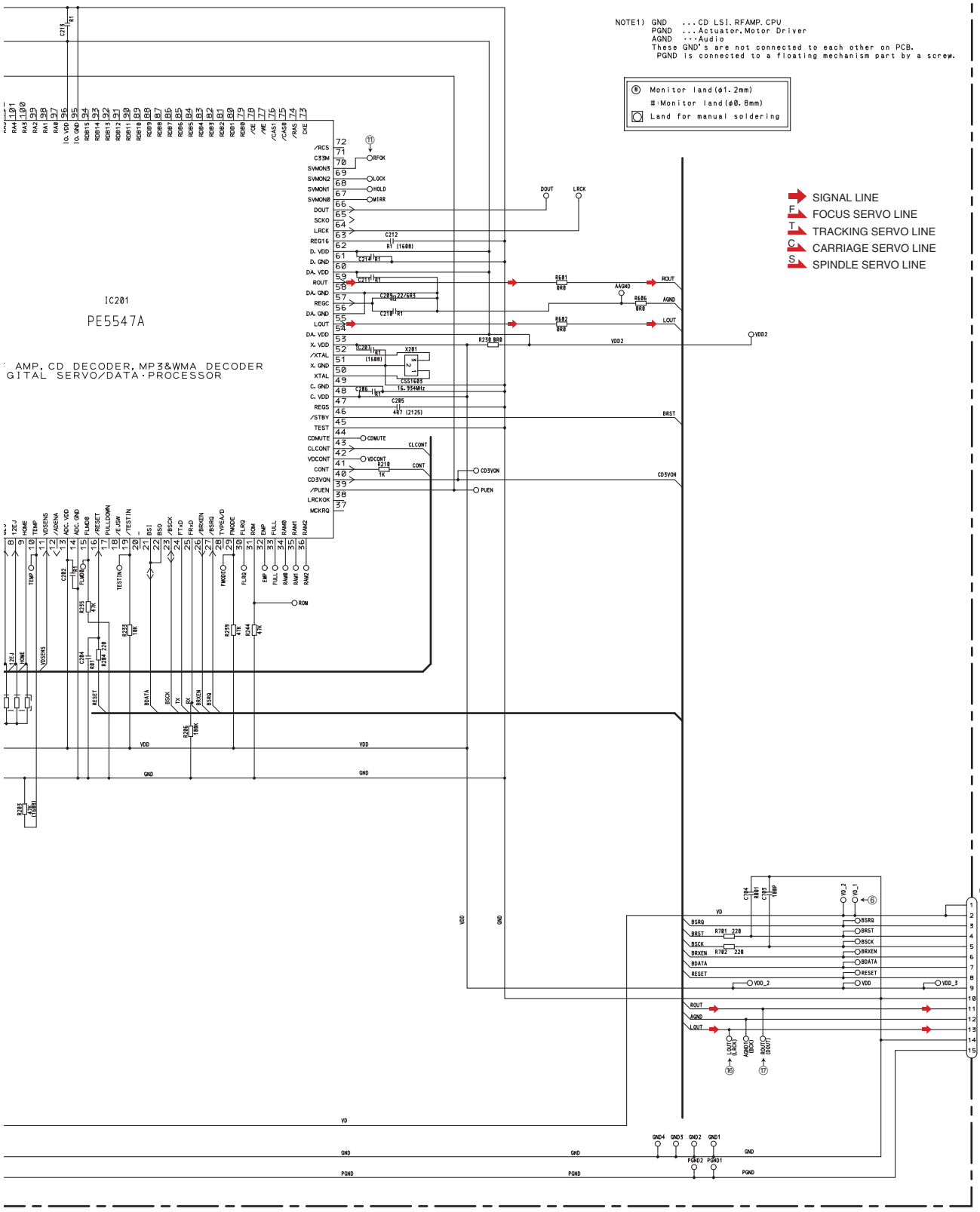
10.3 CD MECHANISM MODULE(GUIDE PAGE)

C-a



C

C CD CORE UNIT(S10.5COMP2)



C CD CORE UNIT(S10.5COMP2)

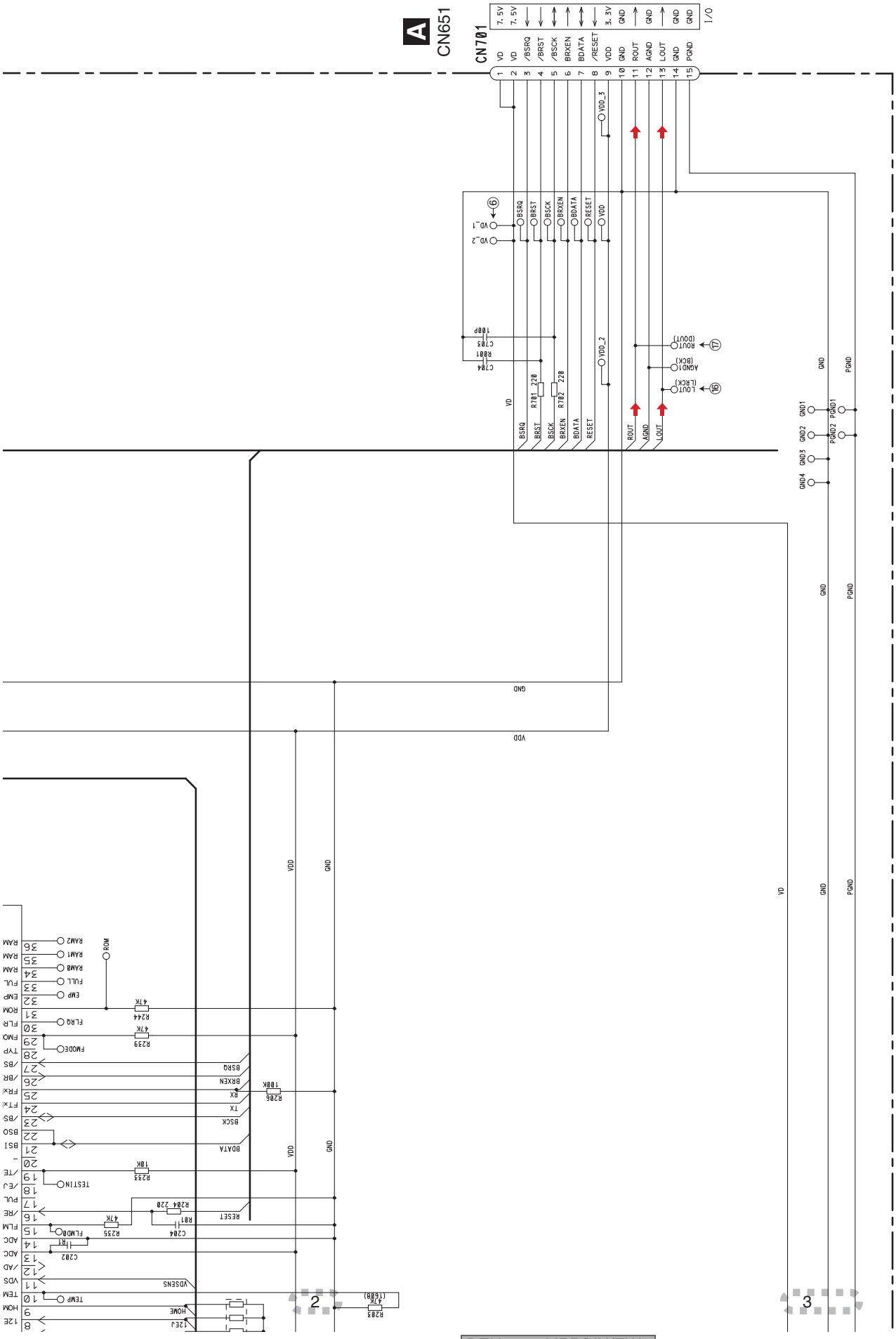
NOTE1) GND ...CD LSI, RFAMP, CPU
PGND ...Actuator, Motor Driver
AGND ...Audio
These GND's are not connected to each other on PCB.
PGND is connected to a floating mechanism part by a screw.

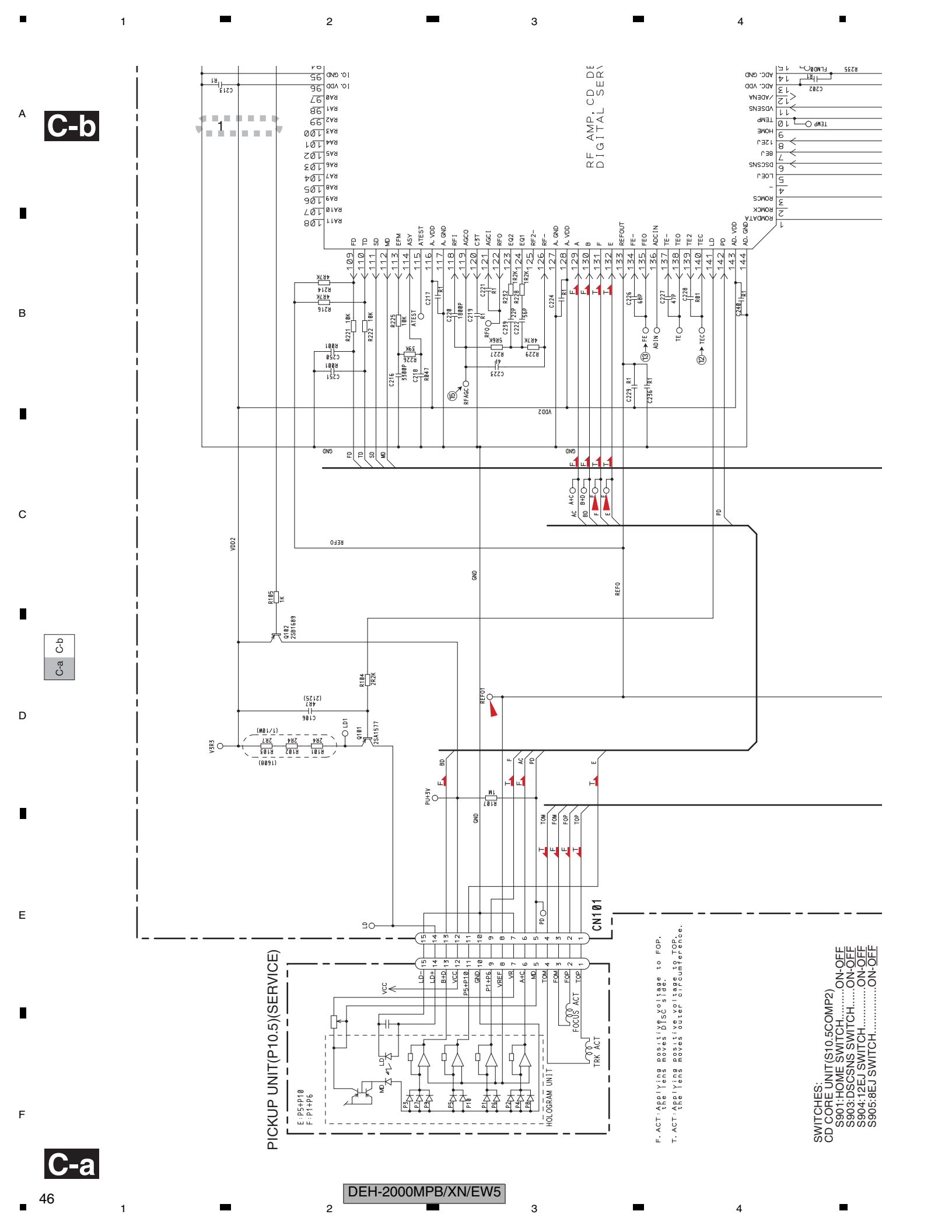
Ⓑ Monitor land(φ1.2mm)
#:Monitor land(φ0.8mm)
Land for manual soldering

SIGNAL LINE
FOCUS SERVO LINE
TRACKING SERVO LINE
CARRIAGE SERVO LINE
SPINDLE SERVO LINE

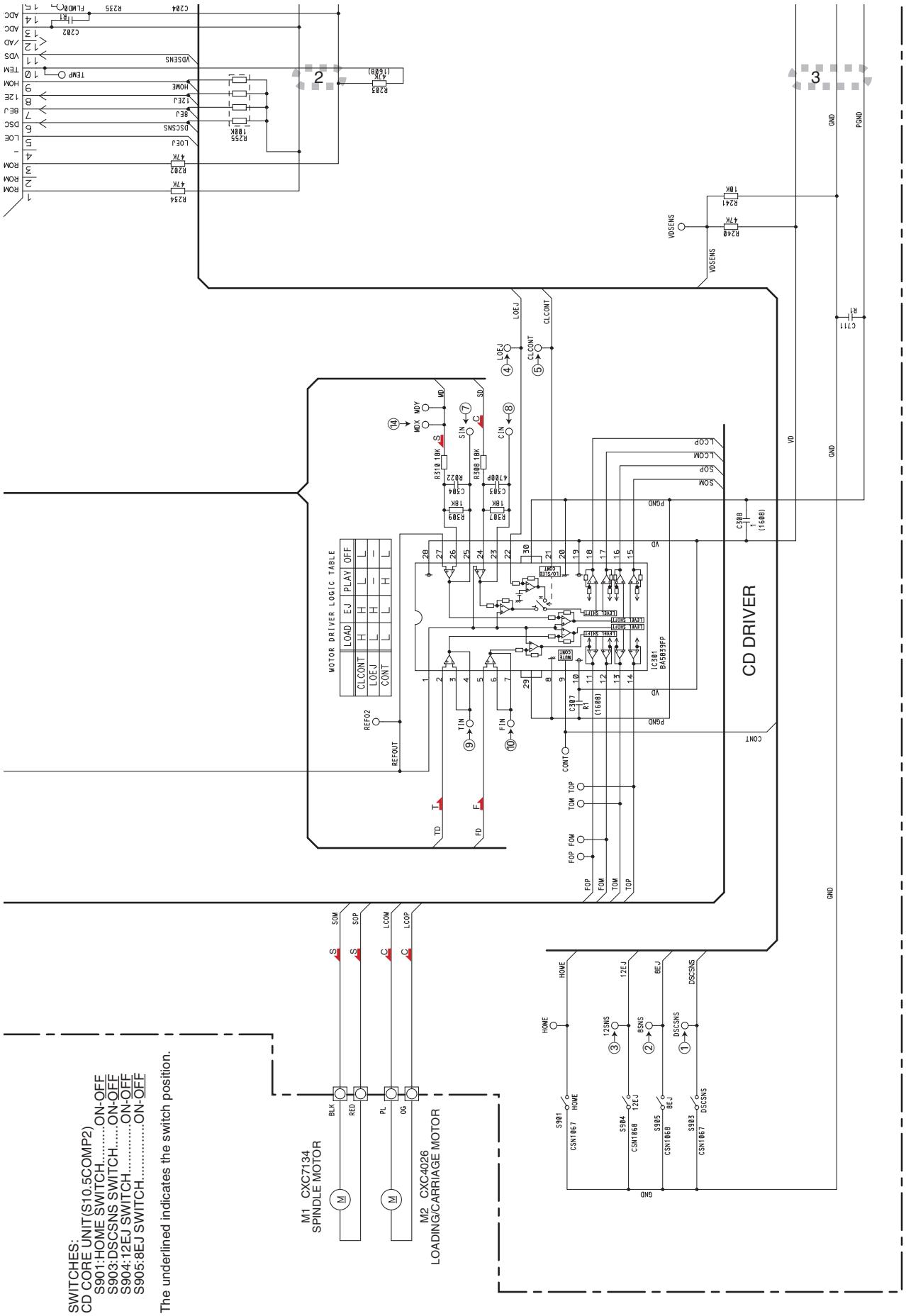
IC201
PE5547A

AMP, CD DECODER, MP3&WMA DECODER
GITAL SERVO/DATA·PROCESSOR


A
CN651
CN701
7.5V
7.5V
VD
VD
/BSRQ
/BRST
/BSCK
BRXEN
BDATA
/RESET
3.3V
GND
ROUT
AGND
LOUT
GND
GND
I/O
PGND
VD_1
VD_2
BSRQ
BRST
BSCK
BRXEN
BDATA
RESET
VDD
VDD_3
VDD_2
ROUT
AGND
LOUT
(DOUT)
(BCK)
(LRCK)
R701 220
R702 220
C703 100P
C704 R001
GND1
GND2
GND3
GND4
PGND1
PGND2
GND
PGND
VDD
GND
VD
2
3
ROM
RAM2
RAM1
RAM0
FULL
EMP
FLR0
FMODE
TESTIN
TEMP
HOME
12CL
VDSENS
FLMDB
RESET
BSRQ
BRXEN
RX
TX
BSCK
BDATA
R239 47K
R244 47K
R233 10K
R235 47K
R204 220
R001
C204
C202
R206 100K
R283 47K
C-a
C-b
C-b
DEH-2000MPB/XN/EW5
45


C-b
C-a
RF AMP, CD DE
DIGITAL SER\
CN101
PICKUP UNIT(P10.5)(SERVICE)
HOLOGRAM UNIT
FOCUS ACT
TRK ACT
SWITCHES:
CD CORE UNIT(S10.5COMP2)
S901:HOME SWITCH.....ON-OFF
S903:DSCSNS SWITCH.....ON-OFF
S904:12EJ SWITCH.....ON-OFF
S905:8EJ SWITCH.....ON-OFF

C-b


CD DRIVER
IC301 BA5839FP
MOTOR DRIVER LOGIC TABLE
LOAD EJ PLAY OFF
CLCONT H L L
LOEJ L H L
CONT L L H
M1 CXC7134
SPINDLE MOTOR
M2 CXC4026
LOADING/CARRIAGE MOTOR
S901 CSN1067 HOME
S904 CSN1068 12EJ
S905 CSN1068 8EJ
S903 CSN1067 DSCSNS
SWITCHES:
CD CORE UNIT(S10.5COMP2)
S901:HOME SWITCH.....ON-OFF
S903:DSCSNS SWITCH.....ON-OFF
S904:12EJ SWITCH.....ON-OFF
S905:8EJ SWITCH.....ON-OFF
The underlined indicates the switch position.

C-a c-b

C-a

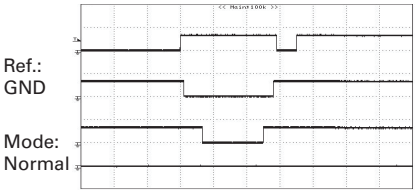
10.4 WAVEFORMS

● CD Core Unit

Note : 1. The encircled numbers denote measuring points in the circuit diagram.
2. Reference voltage REFO1(1.65 V)

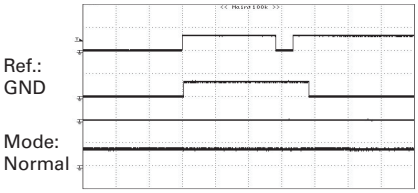
①DSCSNS	5 V/div	500 ms/div
②8SNS	5 V/div	
③12SNS	5 V/div	
④LOEJ	5 V/div	

12 cm CD Loading operation



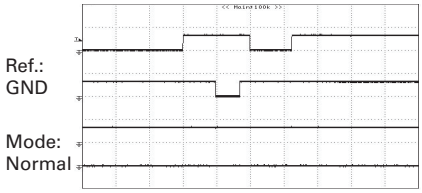
①DSCSNS	5 V/div	500 ms/div
⑤CLCONT	5 V/div	
④LOEJ	5 V/div	
⑥VD	10 V/div	

12 cm CD Loading operation



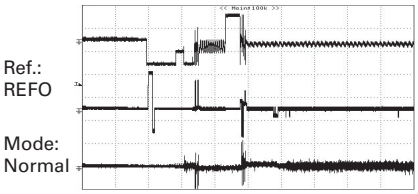
①DSCSNS	5 V/div	500 ms/div
②8SNS	5 V/div	
③12SNS	5 V/div	
④LOEJ	5 V/div	

8 cm CD Loading operation



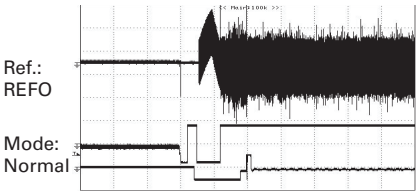
⑦SIN	1 V/div	1 s/div
⑧CIN	500 mV/div	
⑨TIN	1 V/div	

12 cm CD-DA setup operation after loading



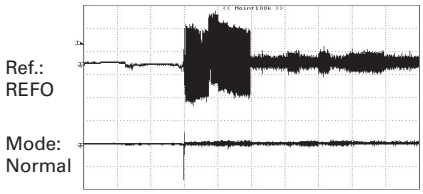
⑩FIN	200 mV/div	500 ms/div
⑪RFOK(MONI_2)	2 V/div	
⑦SIN	2 V/div	

12 cm CD-DA Source On setup operation



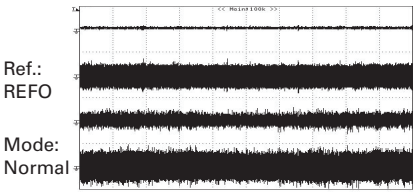
⑫TE	500 mV/div	200 ms/div
⑬FE	500 mV/div	

Source On setup operation



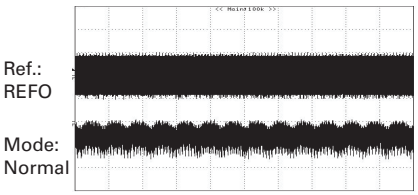
⑬FE	500 mV/div	20 ms/div
⑩FIN	500 mV/div	
⑫TE	500 mV/div	
⑨TIN	500 mV/div	

CD-DA Play operation



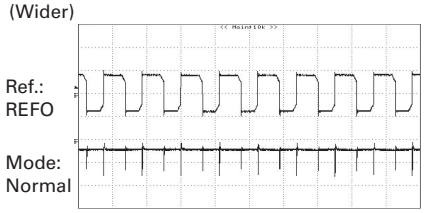
⑭MDX	2 V/div	200 ms/div
⑦SIN	500 mV/div	

Spindle waveform during play operation



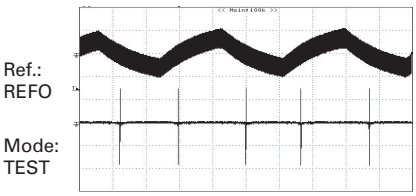
⑭MDX	2 V/div	5 µs/div
⑦SIN	500 mV/div	

Spindle waveform during play operation (Wider)



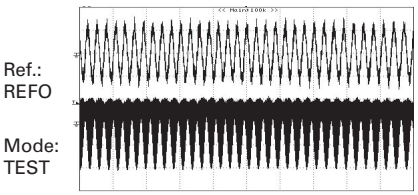
⑩FIN	500 mV/div	200 ms/div
⑬FE	500 mV/div	

Focus Search waveform



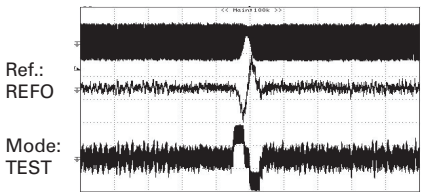
⑫TE	500 mV/div	2 ms/div
⑮RFAGC	500 mV/div	

Track Open waveform



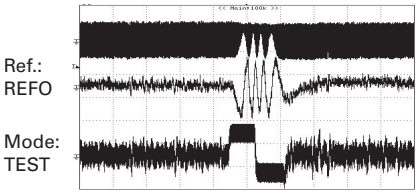
⑮RFAGC	1 V/div	500 µs/div
⑫TE	500 mV/div	
⑨TIN	500 mV/div	

1 Track Jump waveform



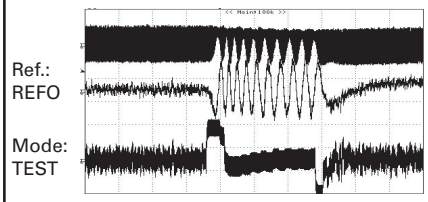
⑮RFAGC	1 V/div	500 µs/div
⑫TE	500 mV/div	
⑨TIN	500 mV/div	

4 Tracks Jump waveform



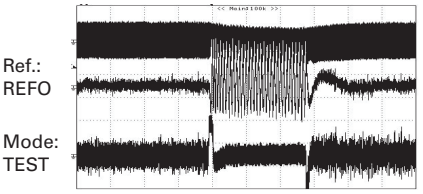
⑮RFAGC	1 V/div	500 µs/div
⑫TE	500 mV/div	
⑨TIN	500 mV/div	

10 Tracks Jump waveform



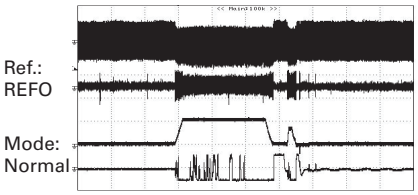
⑮RFAGC	1 V/div	2 ms/div
⑫TE	500 mV/div	
⑨TIN	500 mV/div	

32 Tracks Jump waveform



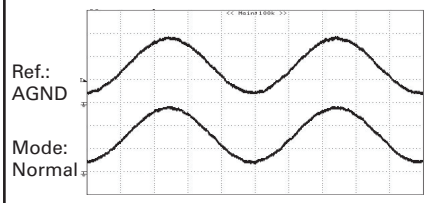
⑮RFAGC	1 V/div	200 ms/div
⑫TE	1 V/div	
⑧CIN	1 V/div	
⑦SIN	2 V/div	

Search operation(Outter to Inner)



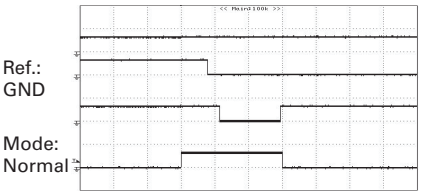
⑯LOUT	1 V/div	200 µs/div
⑰ROUT	1 V/div	

Analog audio waveform



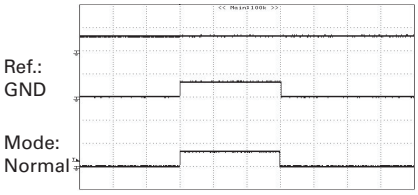
①DSCSNS	5 V/div	500 ms/div
②8SNS	5 V/div	
③12SNS	5 V/div	
④LOEJ	5 V/div	

12 cm CD Eject operation



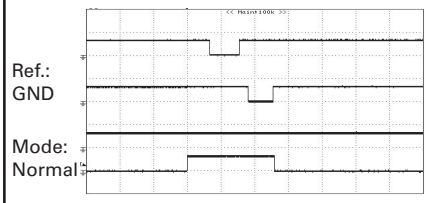
①DSCSNS	5 V/div	500 ms/div
⑤CLCONT	5 V/div	
④LOEJ	5 V/div	

12 cm CD Eject operation



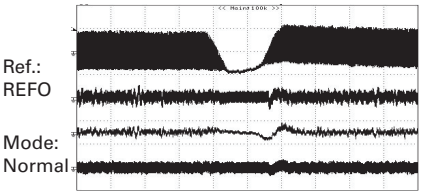
①DSCSNS	5 V/div	500 ms/div
②8SNS	5 V/div	
③12SNS	5 V/div	
④LOEJ	5 V/div	

8 cm CD Eject operation



⑮RFAGC	1 V/div	500 µs/div
⑨TIN	1 V/div	
⑫TE	1 V/div	
⑩FIN	1 V/div	

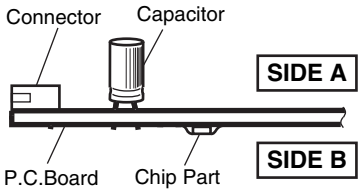
Black dot(800 µm) during play



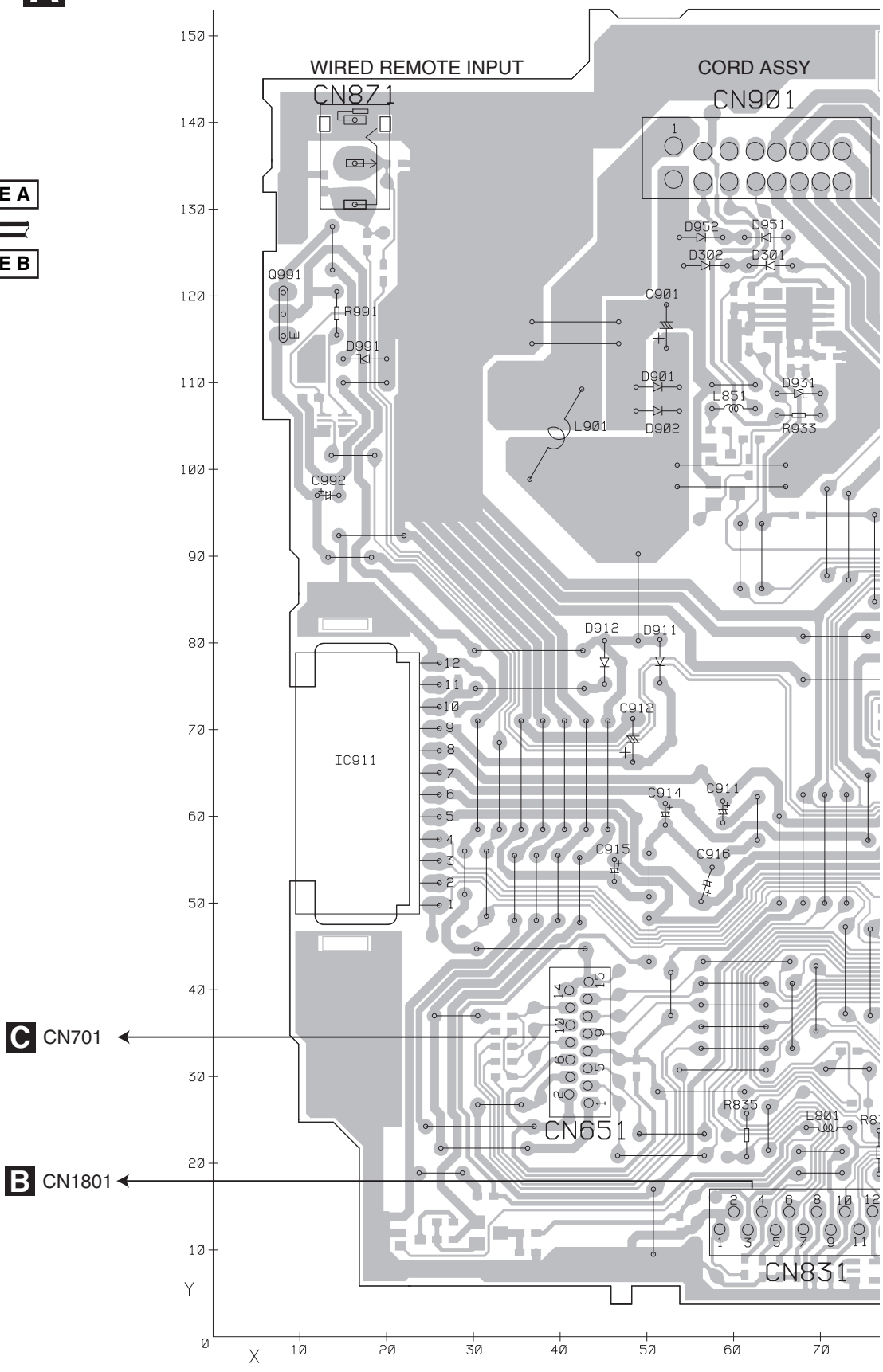
11. PCB CONNECTION DIAGRAM
11.1 TUNER AMP UNIT

NOTE FOR PCB DIAGRAMS

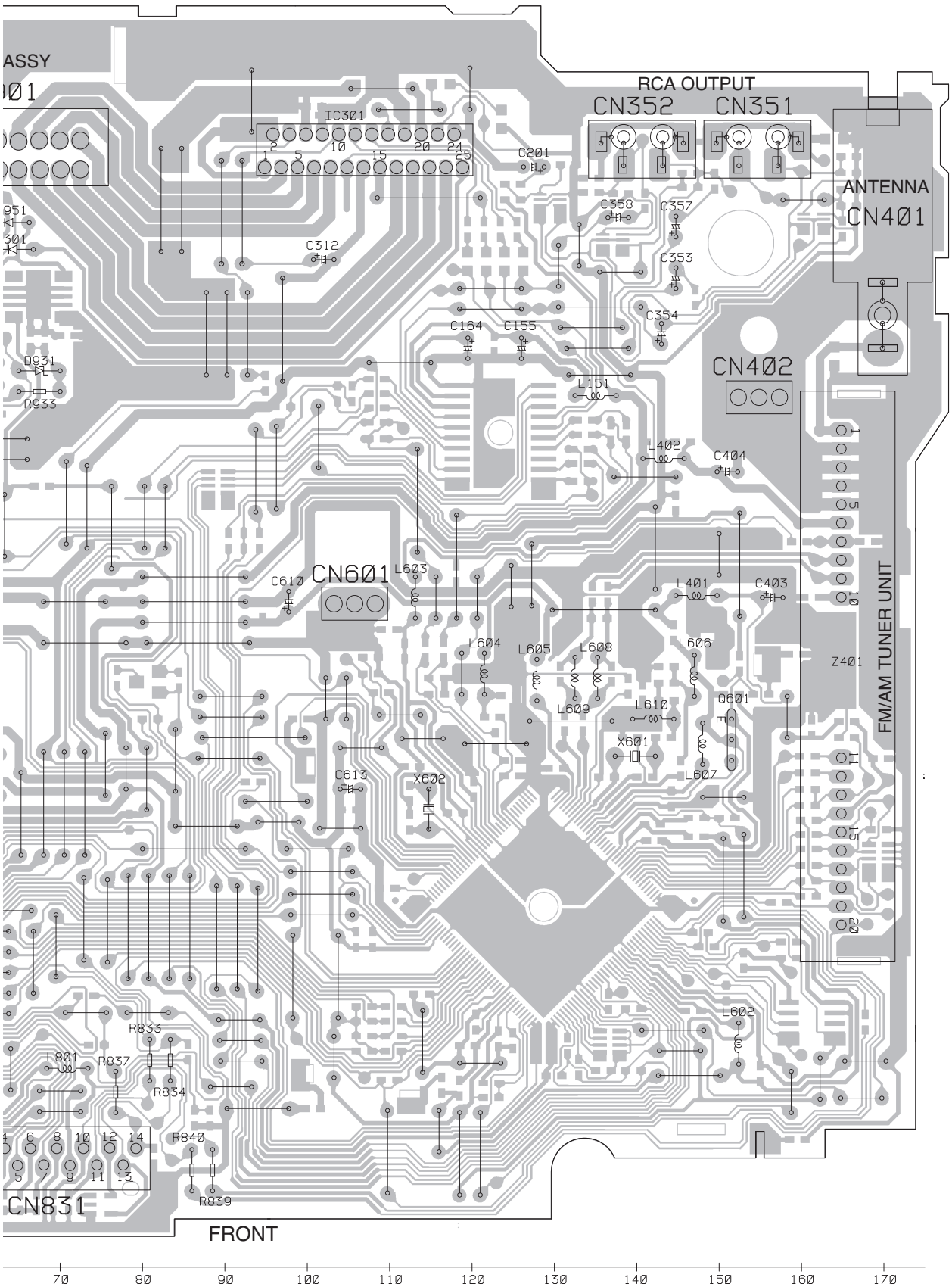
1. The parts mounted on this PCB include all necessary parts for several destination. For further information for respective destinations, be sure to check with the schematic diagram.
2. Viewpoint of PCB diagrams



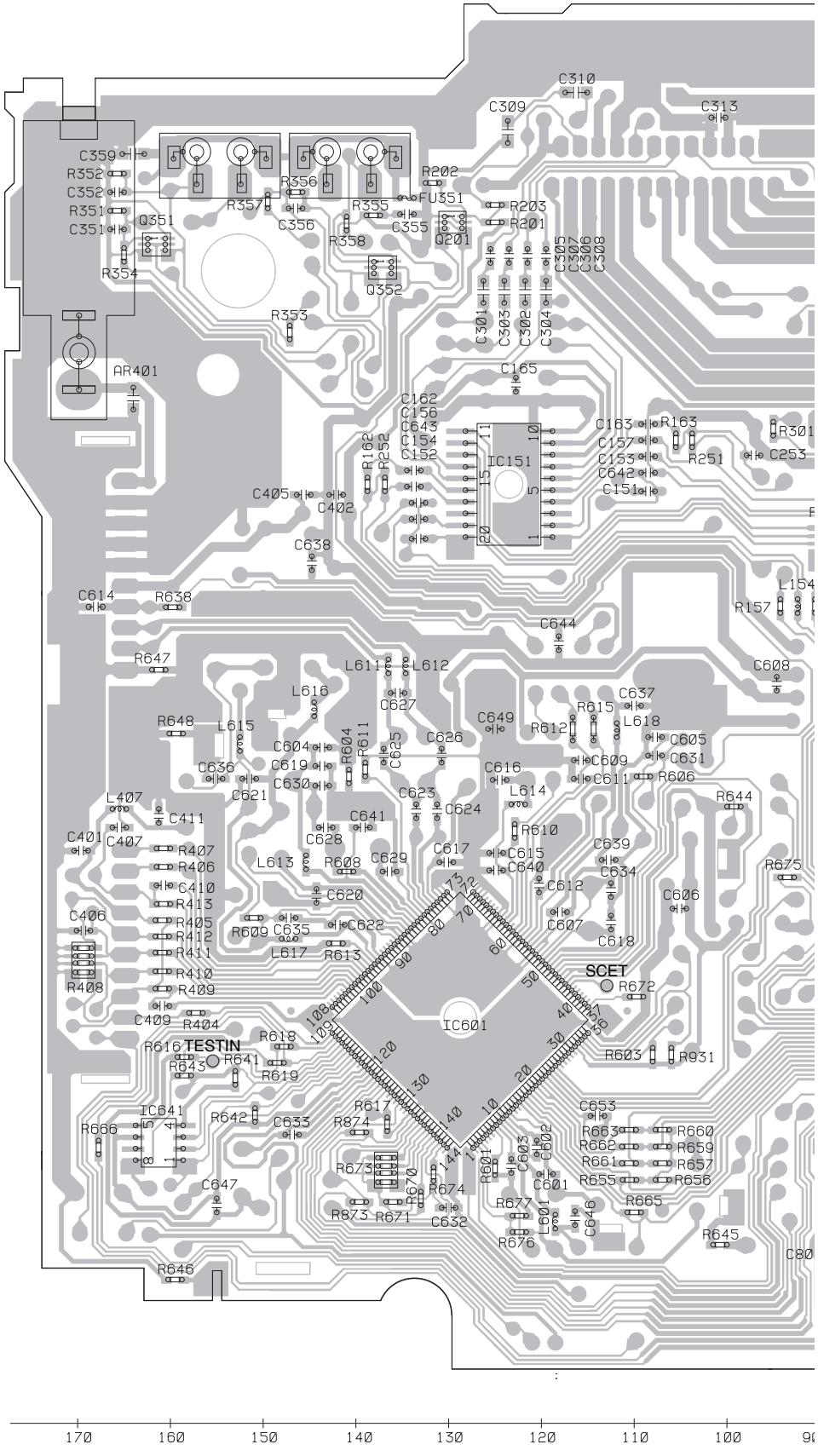
A TUNER AMP UNIT



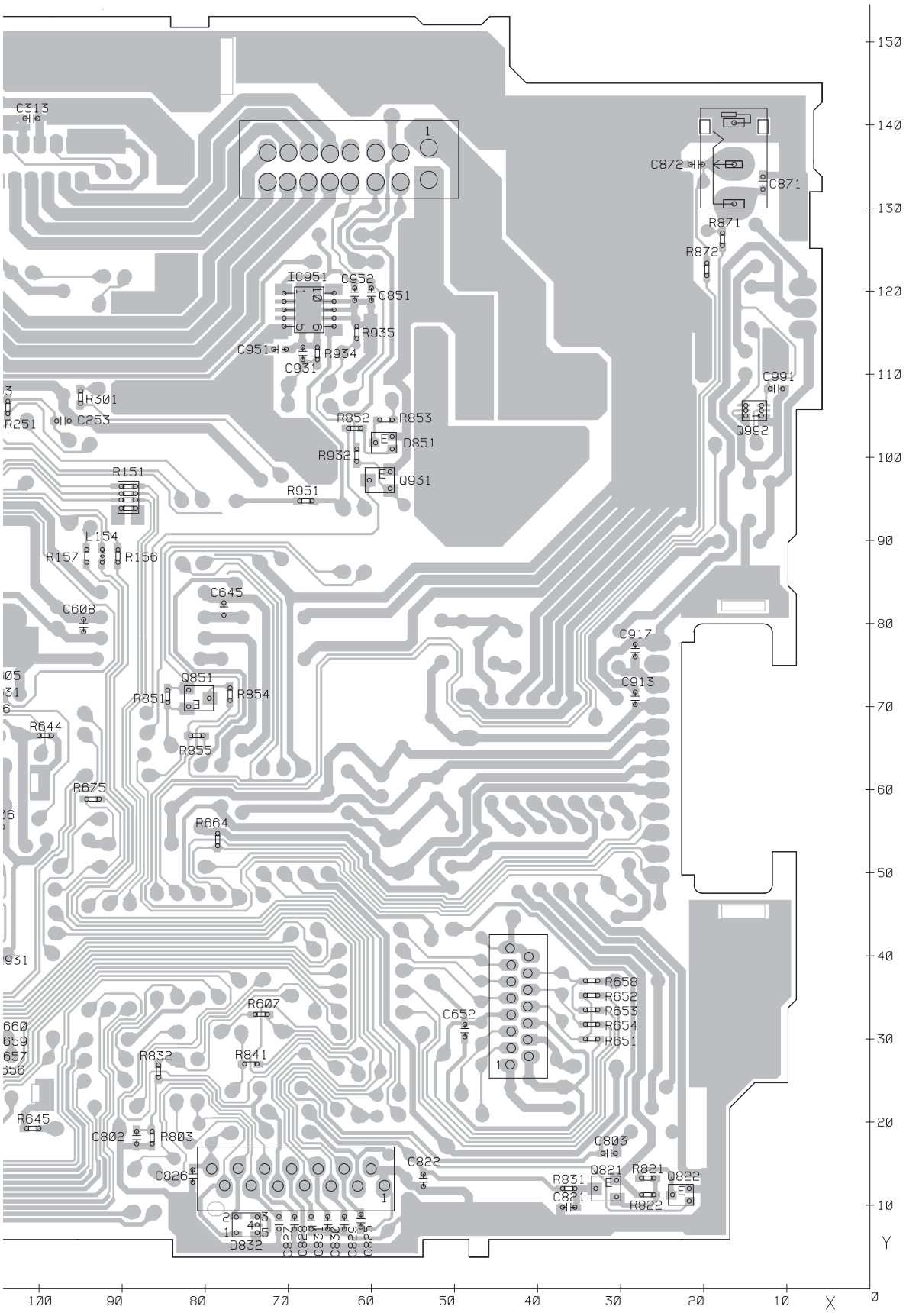
SIDE A


ASSY
RCA OUTPUT
CN352
CN351
ANTENNA
CN401
IC301
C201
C358
C357
C353
C354
C312
C164
C155
D931
R933
L151
CN402
L402
C404
CN601
C610
L603
L401
C403
L604
L605
L608
L606
Z401
FM/AM TUNER UNIT
L609
L610
Q601
X601
L607
C613
X602
L602
R833
L801
R837
R834
R840
R839
CN831
FRONT
70 80 90 100 110 120 130 140 150 160 170

A TUNER AMP UNIT



SIDE B

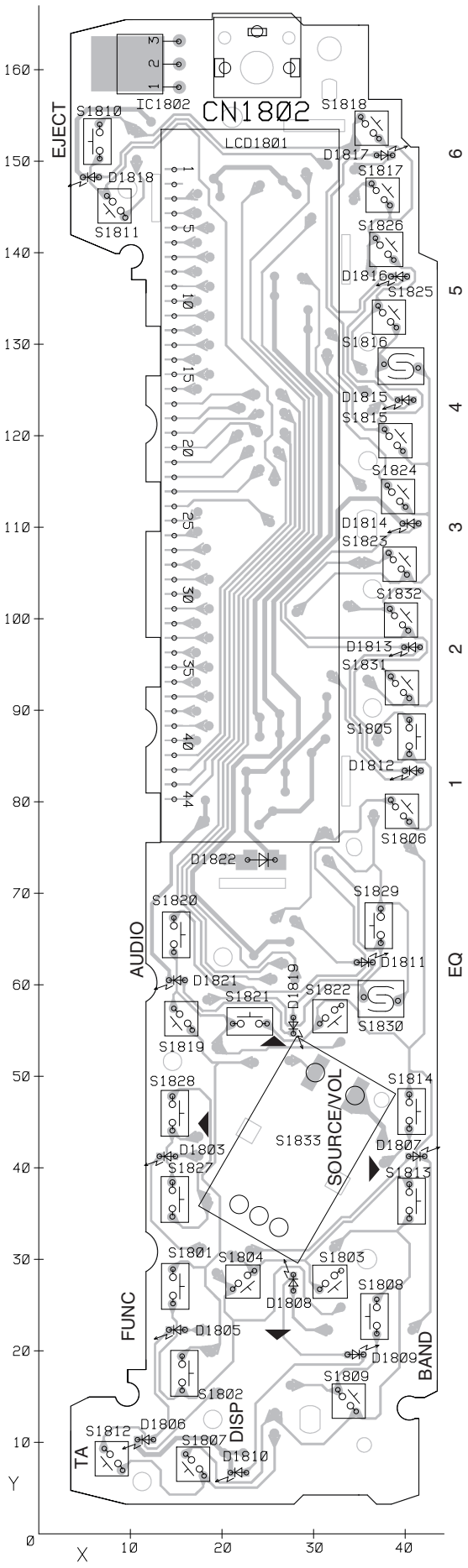


DEH-2000MPB/XN/EW5

11.2 KEYBOARD UNIT

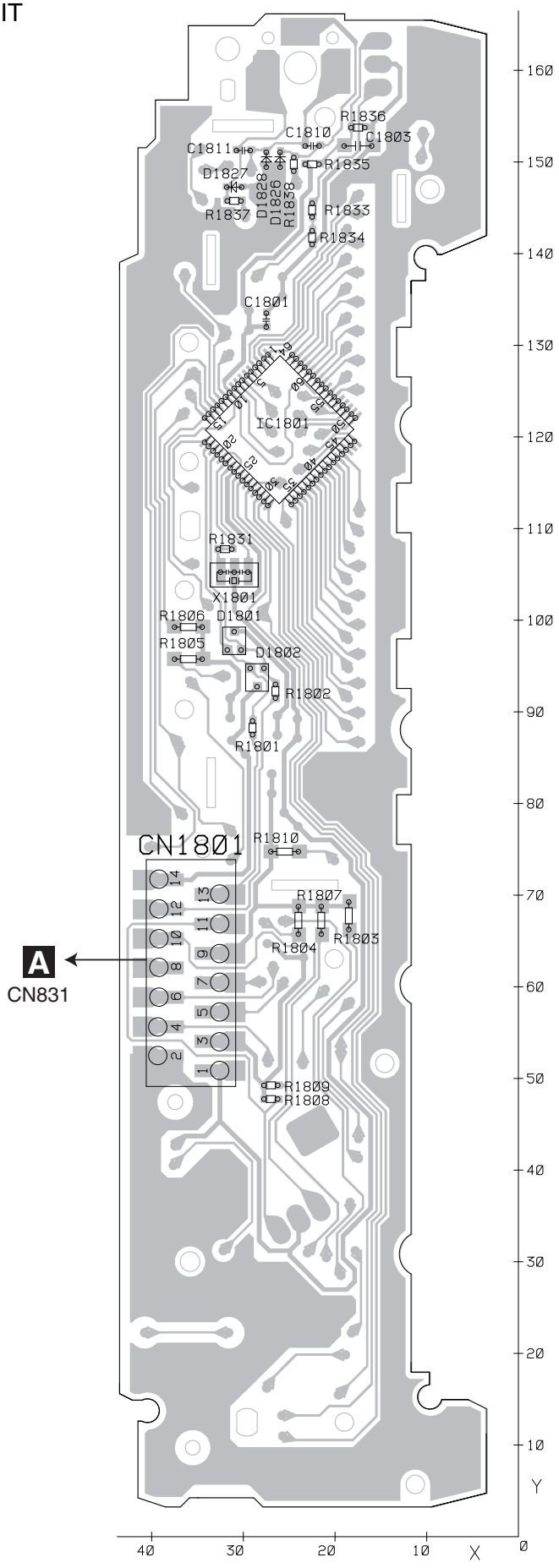
B KEYBOARD UNIT

SIDE A



B KEYBOARD UNIT

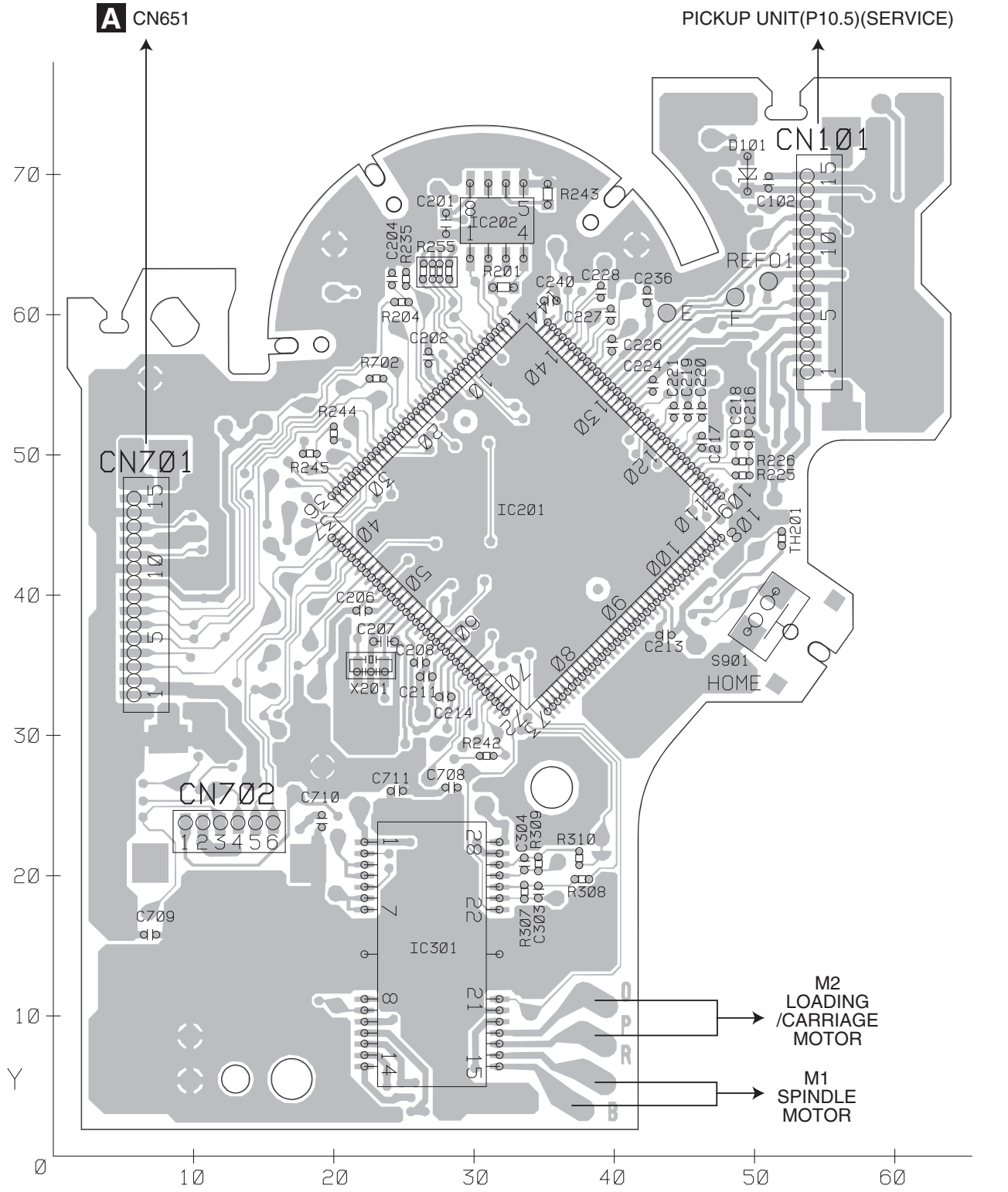
SIDE B



11.3 CD CORE UNIT(S10.5COMP2)

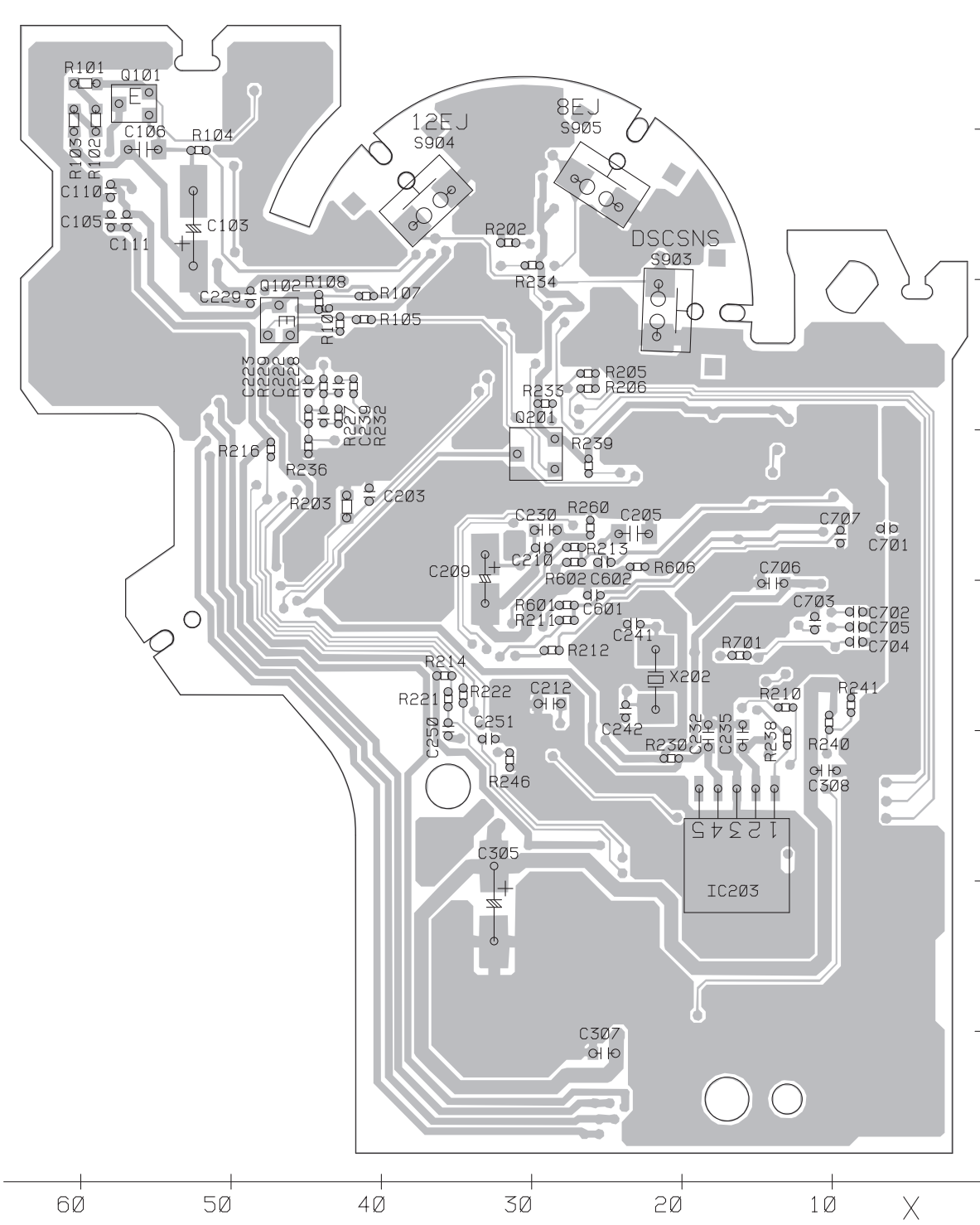
C CD CORE UNIT(S10.5COMP2)

SIDE A



C CD CORE UNIT(S10.5COMP2)

SIDE B



12. ELECTRICAL PARTS LIST

NOTE:

- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The part numbers shown below indicate chip components.*

  Chip Resistor

  RS1/◯S◯◯◯J,RS1/◯◯S◯◯◯J

  Chip Capacitor (except for CQS.....)

  CKS....., CCS....., CSZS.....
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Meaning of the figures and others in the parentheses in the parts list.*

Example) IC 301 is on the point (face A, 91 of x-axis, and 111 of y-axis) of the corresponding PC board.

IC 301 (A, 91, 111) IC NJM2068V

Circuit Symbol and No. **Part No.**

Unit Number : YWM5228
Unit Name : Tuner Amp Unit
Unit Number : (2000MP)
Unit Number : (2000MPB)
Unit Name : Keyboard Unit
Unit Number : (2020MP)
Unit Name : Keyboard Unit
Unit Number : CWX3514
Unit Name : CD Core Unit(S10.5COMP2)

A

Unit Number : YWM5228
Unit Name : Tuner Amp Unit

MISCELLANEOUS

IC 151	(B,124,101) IC	PML014A
IC 301	(A,95,133) IC	PAL007C
IC 601	(B,129,44) IC	PN5012B
IC 641	(B,161,30) IC	PDH131A
IC 911	(A,17,68) IC	BA4918-V12
Q 201	(B,130,130) Transistor	UMD2N
Q 601	(A,152,67) Transistor	2SD1858
Q 821	(B,32,12) Transistor	2SA1036K
Q 822	(B,23,11) Chip Transistor	DTC114EUA
Q 851	(B,81,71) Transistor	2SA1036K
Q 931	(B,59,97) Transistor	2SC2412K
Q 991	(A,8,115) Transistor	2SD2396
Q 992	(B,14,106) Transistor	UMD2N
D 301	(A,67,124) Diode	MPG06G-6415G3
D 302	(A,54,124) Diode	MPG06G-6415G3
D 832	(B,75,8) Diode	FTZ6R8E
D 851	(B,59,102) Diode	DAN202U
D 901	(A,49,110) Diode	MPG06G-6415G3
D 902	(A,49,107) Diode	MPG06G-6415G3
D 911	(A,52,80) Diode	MPG06G-6415G3
D 912	(A,45,80) Diode	MPG06G-6415G3
D 931	(A,65,109) Diode	HZS7L(A1)
D 991	(A,20,113) Diode	HZS7L(C3)
L 151	(A,138,106) Inductor	LAU2R2K
L 401	(A,150,82) Inductor	LAU2R2K
L 402	(A,146,98) Inductor	LAU2R2K
L 407	(B,166,66) Inductor	CTF1473
L 601	(B,119,22) Inductor	CTF1389
L 602	(A,152,25) Inductor	LAUR47K
L 603	(A,113,79) Inductor	LAU2R2K
L 604	(A,122,70) Inductor	LAUR47K
L 605	(A,128,69) Inductor	LAUR47K
L 606	(A,147,69) Inductor	LAU1R0K
L 607	(A,148,61) Inductor	LAU1R0K
L 608	(A,135,69) Inductor	LAU1R5K
L 609	(A,133,69) Inductor	LAU1R5K
L 610	(A,140,67) Inductor	LAU1R2J
L 611	(B,137,82) Inductor	CTF1379
L 612	(B,135,82) Inductor	CTF1379
L 613	(B,145,61) Inductor	CTF1379
L 614	(B,123,67) Inductor	CTF1379
L 615	(B,153,73) Inductor	CTF1379
L 616	(B,145,77) Inductor	CTF1379
L 617	(B,147,52) Inductor	CTF1389
L 801	(A,73,24) Inductor	LAU2R2K
L 851	(A,58,107) Inductor	LAU2R2K
L 901	(A,36,98) Choke Coil 600 µH	CTH1280
X 601	(A,142,62) Oscillator 74.100 MHz	CSS1749
AR401	(B,164,111) Surge Protector	IMSA-6801-01Y901
	(A,165,75) FM/AM Tuner Unit	CWE2106

RESISTORS

R 151	(B,89,95)	RAB4C102J
R 156	(B,91,88)	RS1/16S681J
R 157	(B,94,88)	RS1/16S681J
R 162	(B,139,101)	RS1/16S102J
R 163	(B,106,106)	RS1/16S102J
R 201	(B,125,130)	RS1/16S103J
R 202	(B,132,134)	RS1/16S153J

Circuit Symbol and No.		Part No.
R 203	(B,125,131)	RS1/16S221J
R 251	(B,104,106)	RS1/16S223J
R 252	(B,137,101)	RS1/16S223J
R 301	(B,95,107)	RS1/16S153J
R 404	(B,157,44)	RS1/16S102J
R 405	(B,161,54)	RS1/16S102J
R 406	(B,161,60)	RS1/16S102J
R 407	(B,161,62)	RS1/16S102J
R 408	(B,169,50)	RAB4C104J
R 409	(B,161,47)	RS1/16S391J
R 410	(B,161,49)	RS1/16S681J
R 411	(B,161,51)	RS1/16S681J
R 412	(B,161,53)	RS1/16S681J
R 413	(B,161,56)	RS1/16S472J
R 601	(B,125,28)	RS1/16S473J
R 603	(B,108,40)	RS1/16S473J
R 606	(B,109,70)	RS1/16S473J
R 608	(B,141,60)	RS1/16S470J
R 610	(B,123,64)	RS1/16S203J
R 611	(B,139,71)	RS1/16S182J
R 612	(B,117,75)	RS1/16S563J
R 613	(B,142,52)	RS1/16S302J
R 615	(B,114,75)	RS1/16S563J
R 616	(B,159,40)	RS1/16S104J
R 617	(B,137,32)	RS1/16S473J
R 618	(B,148,41)	RS1/16S473J
R 619	(B,149,39)	RS1/16S104J
R 638	(B,160,88)	RS1/16S273J
R 641	(B,151,33)	RS1/16S103J
R 642	(B,151,33)	RS1/16S103J
R 643	(B,159,38)	RS1/16S104J
R 644	(B,99,67)	RS1/16S0R0J
R 645	(B,101,19)	RS1/16S0R0J
R 646	(B,160,16)	RS1/16S0R0J
R 648	(B,159,74)	RS1/16S0R0J
R 651	(B,34,30)	RS1/16S104J
R 652	(B,34,35)	RS1/16S102J
R 653	(B,34,34)	RS1/16S102J
R 654	(B,34,32)	RS1/16S221J
R 656	(B,107,26)	RS1/16S104J
R 657	(B,107,28)	RS1/16S104J
R 658	(B,34,37)	RS1/16S104J
R 659	(B,107,30)	RS1/16S472J
R 660	(B,107,32)	RS1/16S472J
R 661	(B,111,28)	RS1/16S221J
R 662	(B,111,30)	RS1/16S221J
R 663	(B,111,32)	RS1/16S221J
R 664	(B,79,54)	RS1/16S473J
R 666	(B,168,30)	RS1/16S103J
R 671	(B,136,24)	RS1/16S473J
R 672	(B,110,46)	RS1/16S104J
R 673	(B,137,27)	RAB4C104J
R 674	(B,132,27)	RS1/16S104J
R 675	(B,94,59)	RS1/16S473J
R 803	(B,86,18)	RS1/16S222J
R 821	(B,27,13)	RS1/16S562J
R 822	(B,27,11)	RS1/16S103J
R 831	(B,36,12)	RS1/16S1R0J
R 832	(B,86,26)	RS1/16S473J
R 833	(A,81,23)	RD1/4PU222J
R 834	(A,83,23)	RD1/4PU222J
R 835	(A,62,21)	RD1/4PU222J
R 837	(A,77,19)	RD1/4PU103J
R 839	(A,89,14)	RD1/4PU222J
R 840	(A,86,14)	RD1/4PU222J
R 841	(B,75,27)	RS1/16S104J
R 851	(B,85,71)	RS1/16S223J
R 852	(B,62,104)	RS1/16S472J
R 853	(B,58,105)	RS1/16S153J
R 854	(B,77,72)	RS1/16S102J
R 855	(B,81,67)	RS1/16S104J
R 871	(B,18,126)	RS1/16S102J
R 872	(B,20,123)	RS1/16S102J
R 873	(B,140,24)	RS1/16S103J
R 874	(B,140,31)	RS1/16S103J
R 931	(B,106,40)	RS1/16S104J
R 932	(B,62,100)	RS1/16S223J
R 933	(A,70,106)	RD1/4PU102J
R 934	(B,67,113)	RS1/16S473J
R 935	(B,62,115)	RS1/16S473J
R 991	(A,14,116)	RD1/4PU271J

CAPACITORS

C 151	(B,109,101)	CKSRYB224K10
C 152	(B,133,95)	CKSRYB224K10
C 153	(B,109,104)	CKSRYB105K10
C 154	(B,133,98)	CKSRYB105K10
C 155	(A,126,113)	CEJQ470M10
C 156	(B,134,101)	CKSRYB105K10
C 157	(B,109,106)	CKSRYB105K10
C 162	(B,134,103)	CKSRYB105K10
C 163	(B,109,108)	CKSRYB105K10
C 164	(A,120,113)	CEJQ100M16
C 165	(B,123,112)	CKSRYB104K16
C 201	(A,129,134)	CEJQ330M10
C 253	(B,97,104)	CKSRYB104K16
C 301	(B,126,122)	CKSQYB474K16
C 302	(B,122,122)	CKSQYB474K16
C 303	(B,124,122)	CKSQYB474K16
C 304	(B,120,122)	CKSQYB474K16
C 305	(B,126,126)	CKSRYB474K10
C 306	(B,122,126)	CKSRYB474K10
C 307	(B,124,126)	CKSRYB474K10
C 308	(B,120,126)	CKSRYB474K10
C 309	(B,124,139)	CKSQYB225K10
C 310	(B,116,144)	CKSQYB225K10
C 312	(A,101,122)	CEJQ100M16
C 313	(B,101,141)	CKSRYB104K16
C 402	(B,142,100)	CKSRYB103K50
C 404	(A,150,97)	CEJQ101M10
C 405	(B,146,100)	CKSRYB103K50
C 406	(B,169,53)	CCSRCH390J50
C 409	(B,161,45)	CCSRCH100D50
C 601	(B,120,27)	CKSRYB105K10
C 602	(B,121,30)	CKSRYB103K50
C 603	(B,123,28)	CKSRYB103K50
C 605	(B,108,74)	CKSRYB104K16
C 606	(B,105,56)	CKSRYB103K50
C 607	(B,118,55)	CKSRYB103K50

Circuit Symbol and No.			Part No.
C 608	(B,95,80)		CKSRYB103K50
C 609	(B,116,72)		CKSRYB331K50
C 610	(A,98,80)		CEJQ101M6R3
C 611	(B,116,70)		CKSRYB331K50
C 612	(B,120,58)		CKSRYB103K50
C 613	(A,104,58)		CEAL101M6R3
C 614	(B,168,88)		CKSRYB102K50
C 615	(B,125,62)		CKSRYB331K50
C 616	(B,125,69)		CKSRYB105K10
C 617	(B,130,61)		CKSRYB105K10
C 619	(B,144,71)		CKSRYB103K50
C 620	(B,144,57)		CKSRYB105K10
C 621	(B,152,70)		CKSRYB103K50
C 622	(B,142,54)		CKSRYB104K16
C 623	(B,134,66)		CKSRYB102K50
C 624	(B,131,66)		CKSRYB102K50
C 625	(B,137,72)		CCSRCH270J50
C 626	(B,131,72)		CCSRCH270J50
C 627	(B,136,79)		CCSRCH150J50
C 628	(B,143,64)		CKSRYB102K50
C 629	(B,136,60)		CCSRCH4R0C50
C 630	(B,144,69)		CCSRCH8R0D50
C 631	(B,108,72)		CKSRYB223K50
C 632	(B,130,23)		CKSRYB104K16
C 633	(B,147,31)		CKSRYB104K16
C 635	(B,147,55)		CKSRYB104K16
C 637	(B,110,77)		CKSRYB103K50
C 640	(B,125,60)		CKSRYB104K16
C 642	(B,109,103)		CKSRYB122K50
C 643	(B,133,99)		CKSRYB122K50
C 646	(B,116,22)		CKSRYB103K50
C 652	(B,49,31)		CKSRYB103K50
C 653	(B,114,33)		CCSRCH220J50
C 821	(B,36,10)		CKSRYB104K16
C 825	(B,61,8)		CCSRCH221J50
C 826	(B,82,14)		CCSRCH221J50
C 827	(B,71,8)		CCSRCH221J50
C 828	(B,69,8)		CCSRCH221J50
C 829	(B,63,8)		CCSRCH221J50
C 830	(B,65,8)		CKSRYB104K16
C 831	(B,67,8)		CCSRCH221J50
C 871	(B,13,133)		CKSRYB103K50
C 872	(B,21,135)		CKSRYB103K50
C 901	(A,52,114)	3 300 µF/16 V	CCH1732
C 911	(A,59,62)		CEJQ100M16
C 912	(A,48,66)		CEAT102M16
C 913	(B,28,71)		CKSRYB104K16
C 914	(A,52,62)		CEAT221M10
C 915	(A,46,55)		CEJQ100M16
C 916	(A,58,55)	1 000 µF/6.3 V	CCH1751(P35)
C 917	(B,28,77)		CKSRYB104K16
C 991	(B,11,108)		CKSRYB473K25
C 992	(A,12,97)		CEJQ101M10

B

Unit Number : (2000MP)
Unit Number : (2000MPB)
Unit Name : Keyboard Unit

Circuit Symbol and No.			Part No.
MISCELLANEOUS			
IC 1801	(B,26,121)	IC	PD6340A
D 1803	(A,14,42)	LED	CL-195SR-CD
D 1805	(A,15,23)	LED	CL-195SR-CD
D 1806	(A,12,11)	LED	CL-195SR-CD
D 1807	(A,41,42)	LED	CL-195SR-CD
D 1808	(A,28,28)	LED	CL-195SR-CD
D 1809	(A,35,20)	LED	CL-195SR-CD
D 1810	(A,22,7)	LED	CL-195SR-CD
D 1811	(A,36,63)	LED	CL-195SR-CD
D 1812	(A,41,84)	LED	CL-195SR-CD
D 1813	(A,41,97)	LED	CL-195SR-CD
D 1814	(A,41,111)	LED	CL-195SR-CD
D 1815	(A,40,124)	LED	CL-195SR-CD
D 1816	(A,39,138)	LED	CL-195SR-CD
D 1817	(A,38,151)	LED	CL-195SR-CD
D 1818	(A,6,149)	LED	CL-195SR-CD
D 1819	(A,28,55)	LED	CL-195SR-CD
D 1821	(A,15,61)	LED	CL-195SR-CD
D 1822	(A,24,74)	White LED	NESW505C-5273
D 1826	(B,26,151)	Diode	MALS068X
D 1827	(B,31,148)	Diode	MALS068X
D 1828	(B,28,151)	Diode	MALS068X
X 1801	(B,31,106)	Ceramic Resonator 5.00 MHz	CSS1731
S 1833	(A,28,42)	Rotary Switch	YSD5020
LCD1801	(A,15,149)	LCD(2000MP)	CAW1930
	(A,15,149)	LCD(2000MPB)	CAW1932
RESISTORS			
R 1801	(B,29,89)		RS1/16S222J
R 1802	(B,27,93)		RS1/16S222J
R 1803	(B,19,68)		RS1/4SA821J
R 1804	(B,24,68)		RS1/4SA821J
R 1805	(B,36,96)		RS1/4SA821J
R 1806	(B,36,100)		RS1/4SA681J
R 1807	(B,22,68)		RS1/4SA681J
R 1809	(B,27,50)		RS1/16S473J
R 1810	(B,26,75)		RS1/4SA821J
R 1834	(B,23,142)		RS1/16S473J
R 1837	(B,31,146)		RS1/16S101J
R 1838	(B,25,150)		RS1/16S101J
CAPACITORS			
C 1801	(B,28,133)		CKSRYB105K10
C 1810	(B,23,152)		CKSRYB472K50
C 1811	(B,30,152)		CKSRYB472K50

B

Unit Number : (2020MP)
Unit Name : Keyboard Unit

Circuit Symbol and No.			Part No.
MISCELLANEOUS			
IC 1801	(B,26,121)	IC	PD6340A
D 1803	(A,14,42)	LED	CL-195PG-CD
D 1805	(A,15,23)	LED	CL-195PG-CD
D 1806	(A,12,11)	LED	CL-195PG-CD
D 1807	(A,41,42)	LED	CL-195PG-CD
D 1808	(A,28,28)	LED	CL-195PG-CD

Circuit Symbol and No.		Part No.
D 1809	(A,35,20) LED	CL-195PG-CD
D 1810	(A,22,7) LED	CL-195PG-CD
D 1811	(A,36,63) LED	CL-195PG-CD
D 1812	(A,41,84) LED	CL-195PG-CD
D 1813	(A,41,97) LED	CL-195PG-CD
D 1814	(A,41,111) LED	CL-195PG-CD
D 1815	(A,40,124) LED	CL-195PG-CD
D 1816	(A,39,138) LED	CL-195PG-CD
D 1817	(A,38,151) LED	CL-195PG-CD
D 1818	(A,6,149) LED	CL-195PG-CD
D 1819	(A,28,55) LED	CL-195PG-CD
D 1821	(A,15,61) LED	CL-195PG-CD
D 1822	(A,24,74) White LED	NESW505C-5273
D 1826	(B,26,151) Diode	MALS068X
D 1827	(B,31,148) Diode	MALS068X
D 1828	(B,28,151) Diode	MALS068X
X 1801	(B,31,106) Ceramic Resonator 5.00 MHz	CSS1731
S 1833	(A,28,42) Rotary Switch	YSD5020
LCD1801	(A,15,149) LCD	CAW1930

RESISTORS

R 1801	(B,29,89)	RS1/16S222J
R 1802	(B,27,93)	RS1/16S222J
R 1803	(B,19,68)	RS1/4SA681J
R 1804	(B,24,68)	RS1/4SA681J
R 1805	(B,36,96)	RS1/4SA681J
R 1806	(B,36,100)	RS1/4SA471J
R 1807	(B,22,68)	RS1/4SA471J
R 1809	(B,27,50)	RS1/16S473J
R 1810	(B,26,75)	RS1/4SA821J
R 1834	(B,23,142)	RS1/16S473J
R 1837	(B,31,146)	RS1/16S101J
R 1838	(B,25,150)	RS1/16S101J

CAPACITORS

C 1801	(B,28,133)	CKSRYB105K10
C 1810	(B,23,152)	CKSRYB472K50
C 1811	(B,30,152)	CKSRYB472K50

C

Unit Number : CWX3514
Unit Name : CD Core
Unit(S10.5COMP2)

MISCELLANEOUS

IC 201	(A,34,46)	IC	PE5547A
IC 301	(A,27,14)	IC	BA5839FP
Q 101	(B,56,72)	Transistor	2SA1577
Q 102	(B,47,57)	Chip Transistor	2SB1689
X 201	(A,23,35)	Ceramic Resonator 16.934 MHz	CSS1603
S 901	(A,53,37)	Switch(HOME)	CSN1067
S 903	(B,19,58)	Switch(DSCSNS)	CSN1067
S 904	(B,38,67)	Switch(12EJ)	CSN1068
S 905	(B,24,68)	Switch(8EJ)	CSN1068

RESISTORS

R 101	(B,60,73)	RS1/10SR2R4J
R 102	(B,59,71)	RS1/10SR2R4J
R 103	(B,60,71)	RS1/10SR2R7J
R 104	(B,52,69)	RS1/16SS222J
R 105	(B,41,57)	RS1/16SS102J
R 107	(B,41,59)	RS1/16SS105J
R 202	(B,32,62)	RS1/16SS473J
R 203	(B,42,45)	RS1/16S473J
R 204	(A,25,61)	RS1/16SS221J
R 206	(B,26,53)	RS1/16SS104J
R 210	(B,13,32)	RS1/16SS102J
R 214	(B,36,34)	RS1/16SS472J
R 216	(B,47,49)	RS1/16SS472J
R 221	(B,36,32)	RS1/16SS103J
R 222	(B,35,32)	RS1/16SS103J
R 225	(A,49,49)	RS1/16SS103J
R 226	(A,49,50)	RS1/16SS393J
R 227	(B,45,51)	RS1/16SS562J
R 228	(B,42,53)	RS1/16SS122J
R 229	(B,44,53)	RS1/16SS472J
R 230	(B,21,28)	RS1/16SS0R0J
R 232	(B,43,51)	RS1/16SS122J
R 233	(B,29,52)	RS1/16SS103J
R 234	(B,30,61)	RS1/16SS473J
R 235	(A,25,63)	RS1/16SS473J
R 239	(B,26,48)	RS1/16SS473J
R 240	(B,10,31)	RS1/16SS473J
R 241	(B,9,32)	RS1/16SS103J
R 244	(A,20,52)	RS1/16SS473J
R 255	(A,27,63)	RAB4CQ104J
R 307	(A,34,19)	RS1/16SS183J
R 308	(A,38,20)	RS1/16SS183J
R 309	(A,35,21)	RS1/16SS183J
R 310	(A,38,21)	RS1/16SS183J
R 601	(B,28,38)	RS1/16SS0R0J
R 602	(B,27,41)	RS1/16SS0R0J
R 606	(B,23,41)	RS1/16SS0R0J
R 701	(B,16,35)	RS1/16SS221J
R 702	(A,23,55)	RS1/16SS221J

CAPACITORS

C 106	(B,56,69)	CKSQYB475K6R3
C 202	(A,27,57)	CKSSYB104K10
C 204	(A,24,63)	CKSSYB103K16
C 205	(B,23,43)	CKSQYB475K6R3
C 206	(A,22,39)	CKSSYB104K10
C 207	(A,24,37)	CKSRYB104K16
C 209	(B,33,40)	CEVW220M6R3
C 210	(B,29,42)	CKSSYB104K10
C 211	(A,27,34)	CKSSYB104K10
C 212	(B,29,32)	CKSRYB104K16
C 213	(A,44,37)	CKSSYB104K10
C 214	(A,28,33)	CKSSYB104K10
C 216	(A,50,51)	CKSSYB332K50
C 217	(A,46,51)	CKSSYB104K10
C 218	(A,49,51)	CKSSYB473K10
C 219	(A,45,53)	CKSSYB104K10
C 220	(A,46,53)	CKSSYB182K50
C 221	(A,44,53)	CKSSYB104K10
C 222	(B,43,53)	CCSSCH560J50

Circuit Symbol and No.		Part No.
C 223	(B,45,53)	CCSSCH4R0C50
C 224	(A,43,55)	CKSSYB104K10
C 226	(A,40,58)	CCSSCH680J50
C 227	(A,40,60)	CCSSCH470J50
C 228	(A,39,62)	CKSSYB103K16
C 229	(B,49,59)	CKSSYB104K10
C 236	(A,42,61)	CKSSYB104K10
C 239	(B,44,51)	CCSSCH220J50
C 240	(A,35,61)	CKSSYB104K10
C 250	(B,36,30)	CKSSYB102K50
C 251	(B,33,29)	CKSSYB102K50
C 303	(A,35,19)	CKSSYB472K25
C 304	(A,34,21)	CKSSYB223K16
C 307	(B,25,9)	CKSRYB104K16
C 308	(B,10,27)	CKSRYB105K10
C 703	(B,11,37)	CCSSCH101J50
C 704	(B,8,36)	CKSSYB102K50
C 711	(A,25,26)	CKSSYB104K10

Miscellaneous Parts List

	Pickup Unit(P10.5)(Service)	CXX1942
M 1	Motor Unit(SPINDLE)	CXC7134
M 2	Motor Unit(LOADING/CARRIAGE)	CXC4026