CDP-195/295/491

SERVICE MANUAL

US Model
CDP-195/491

Canadian Model

AEP Model

E Model
CDP-195/295

UK Model
CDP-491

Australian Model
CDP-295

Photo : CDP-295

Model Name Using Similar Mechanism	CDP-291/391
CD Mechanism Type	CDM14-5BD1
Optical Pick-Up Block Type	BU-5BD1

SPECIFICATIONS

Compact disc player

Frequency response	2 Hz – 20 kHz ± 0.5 dB
Signal to noise ratio	More than 100 dB
Dynamic range	More than 97 dB
Harmonic distortion	Less than 0.005%
Channel separation	More than 95 dB

Outputs

LINE OUT (phono jacks)	Output level 2 V (at 50 kilohms) Load impedance over 10 kilohms
PHONES (stereo phone jack)	Output level max. 10 mW Load impedance 32 ohms

General

	CDP-195/295/491
Power requirements	Model for Continental Europe 220 – 230 V AC, 50/60 Hz Model for Canada 120 V AC, 60 Hz Model for Australia 240 V AC, 50 Hz Model for other countries 110, 120, 220 or 240 V AC, adjustable, 50/60 Hz
Power consumption	12 W
Dimensions (approx., including projections)	430 × 100 × 280 mm (w/h/d) (17 × 4 × 11 1/8 inches)
Weight (approx.)	3.5 kg (7 lbs 12 oz)

Supplied accessories

Audio cord		1 (2 phono plugs – 2 phono plugs)
Remote commander	(CDP-295/491)	1
R6(size AA) batteries	(CDP-295/491)	2
AC plug adaptor (for some areas)		1

Remote commander RM-D295 (CDP-295/491)

Remote control system	Infrared control
Power requirements	3 V DC with two R6 (size AA) batteries
Dimensions	Approx. 40 × 20 × 175 mm (w/h/d) (1 3/4 × 13/16 × 7 inches)
Weight	Approx. 95 g (4 oz) Including batteries

Design and specifications subject to change without notice.

CLASS 1 LASER PRODUCT
LUOKAN 1 LASERLAITE
KLASS 1 LASERAPPARAT

This Compact Disc player is classified as a CLASS 1 LASER product.
The CLASS 1 LASER PRODUCT label is located on the rear exterior.

MICROFILM

COMPACT DISC PLAYER

SONY®

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.
During repair, pay attention to electrostatic breakdown and also use the procedure in the printed matter which is included in the repair parts.
The flexible board is easily damaged and should be handled with care.

1. Laser Diode Properties
   - Material: GaAlAs
   - Wavelength: 780nm
   - Emission Duration: continuous
   - Laser Output: max.44.6μW*

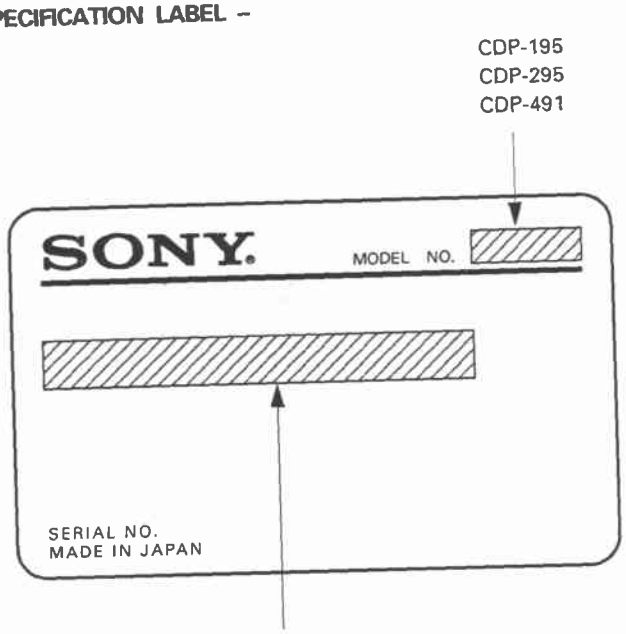
   * This output is the value measured at a distance of about 200mm from the objective lens surface on the Optical Pick-up Block.

2. During service, do not take the Optical Pick-up Block apart, and do not adjust the APC circuit. If there is a breakdown in the APC circuit (including laser diode), replace the entire Optical Pick-up Block (including APC borad).

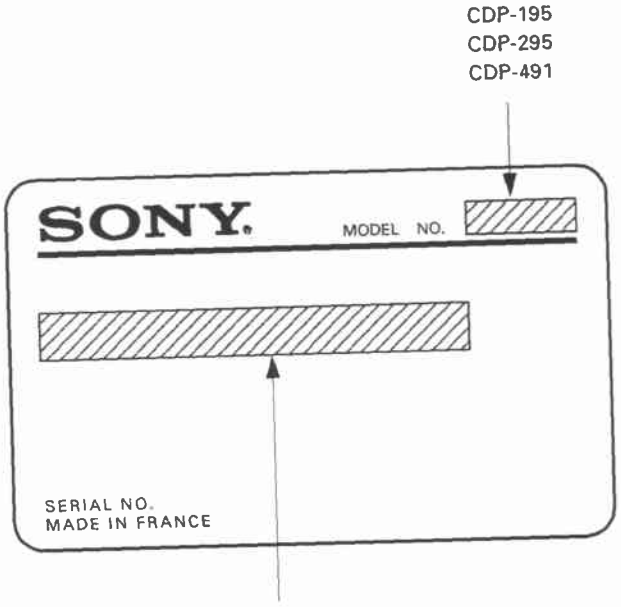
TABLE OF CONTENTS

MODEL IDENTIFICATION

– SPECIFICATION LABEL –



US, Canadian MODEL: AC120, 60Hz 12W
AEP MODEL: AC220-230V, 50/60Hz
Australian MODEL: AC240V, 50/60Hz
E, Saudi Arabian MODEL: AC110-120, 220-240V, 50/60Hz, 12W



AEP MODEL: AC220-230V, 50/60Hz
UK MODEL: AC240V, 50/60Hz

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer: Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig.A)

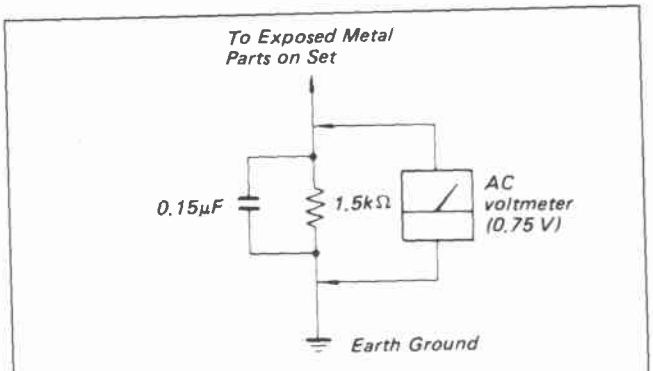
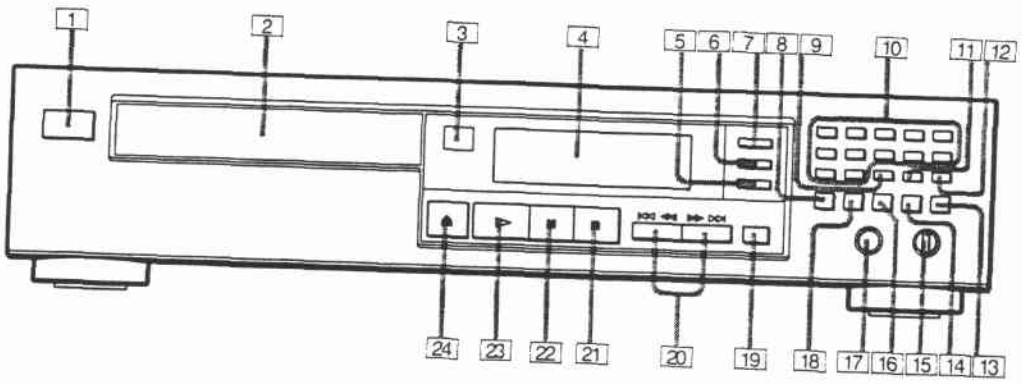


Fig. A. Using an AC voltmeter to check AC leakage.

SECTION 1
GENERAL

LOCATION OF CONTROLS

This section is extracted from instruction manual.



CDP-295

1 POWER switch
2 Disc tray
3 Remote sensor
4 Display window
5 PROGRAM button
6 SHUFFLE button
7 CONTINUE button
8 TIME button
9 CHECK (program check) button
10 Numeric buttons
11 CLEAR (program clear) button
12 >12 (over 12) button
13 MUSIC SCAN button
14 PEAK SEARCH button
15 PHONE LEVEL control
16 FADER button
17 PHONES jack
18 REPEAT button
19 EDIT/TIME FADE button
20 ⏮ ◀◀/▶▶ ⏭ (AMS*/RMS**/manual search) buttons
21 ■ (stop) button
22 ❚❚ (pause) button
23 ▶ (play) button
24 ⏏ (open/close) button

* AMS is the abbreviation of Automatic Music Sensor.
** RMS is the abbreviation of Random Music Sensor.

SECTION 3
DISASSEMBLY

Note :

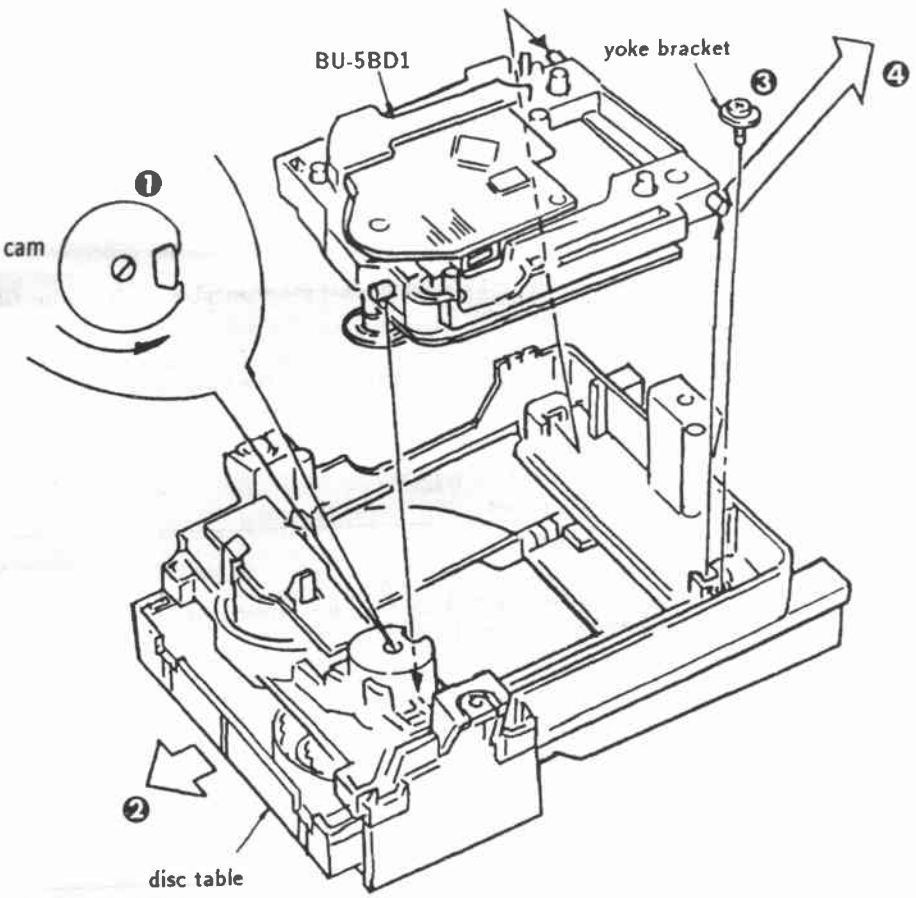
Follow the disassembly procedure in the nomerical order given.

❶ Turn the cam to the direction of arrow (Counter clock wise) by minus screw driver.

❷ Take off the disc table.

❸ Remove the yoke bracket.

❹ Remove the MD (BU-5BD1) to the direction of arrow.



SECTION 4
DIAGRAMS

4-1. PIN FUNCTION OF IC101 AND IC401

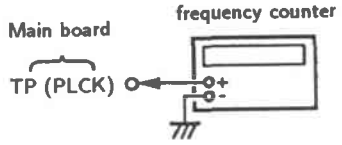
● IC101 (CXA1372Q) PIN FUNCTION

Pin No.	Pin Name	I /O	Description
1	VC	—	GND when two (±) dual power supplies are in use, or the center voltage (2.5V) when a single power supply is in use.
2	FGD	I	Time constants for gain switching in normal mode/down mode and for focus gain are conncted between the FGD and FS3 pins.
3	FS3	I	
4	FLB	I	The capacitor for low frequency boost in the focus servo loop is connected.
5	FEO	O	Focus drive output.
6	FE−	I	Inverted input to focus amplifier.
7	SRCH	I	Time constants to generate the focus search waveform are connected.
8	TGU	I	Time constants for gain switching in normal mode/up mode and for tracking gain are connected between TGU pin and TG2 pin.
9	TG2	I	
10	AVCC	—	Analog power supply (5V when ± dual power supplies are in use, 5V when a single power supply is in use.)
11	TAO	O	Tracking drive output.
12	TA−	I	Inverted input to tracking amplifier.
13	SL+	I	Non-inverted input to sled amplifier.
14	SLO	O	Sled drive output.
15	SL−	I	Non-inverted input to sled amplifier.
16	ESET	I	The 610kΩ phase compensator resistor is connected to this pin.
17	ISET	I	The current setting resistor is connected to this pin.
18	SSTOP	I	The limit switch is connected to this pin.
19	AVEE	—	Analog power supply (−5V when ± dual power supplies are in use, or GND when a single power supply is in use.)
20	DIRC	I	Direct control pin.
21	LOCK	I	Sled run-away prevention circuit operates when this signal is "L".
22	CLK	I	Serial data transfer clock input that is supplied from CPU (or DSP).
23	XLT	I	Latch input from CPU (or DSP).
24	DATA	I	Serial data input from CPU (or DSP).
25	XRST	I	System reset. "L" to reset.
26	C.OUT	O	Output to tracking counter.
27	SENS	O	SENS output.
28	DGND	—	Digital ground (GND). (GND when ± dual power supplies are in use. GND when a single power supply is in use.)
29	MIRR	O	Mirror output.
30	DFCT	O	Defect output. "H" when defective.
31	ASY	I	Auto-assymmetry control input.
32	EFM	O	EFM comparator output.
33	FOK	O	Focus OK.
34	CC2	I	Defect-bottom-hold input (inout by capacitive coupling).
35	CC1	O	Defect-bottom-hold output.
36	DVCC	—	Digital power supply. (+5V when ± dual power supplies in use. +5V when a single power supply is in use.)
37	CB	I	The defect-bottom-hold capacitor is connrcted to this pin.
38	CP	I	The mirror hold capacitor is connected to this pin.
39	RF1	I	RF signal input (input by capacitive coupling).
40	RF0	I	RF signal input (input by DC coupling).
41	DVEE	—	Digital power supply (−5V when ± dual power supplies are in use. GND when a single power supply is in use.)
42	TZC	I	Tracking zero-cross comparator input.
43	TE	I	Tracking error input.
44	TDFCT	I	The defect prevention hold capacitor is connected to this pin.
45	ATSC	I	Anti-shock input.
46	FZC	I	Focus zero-cross comparator input.
47	FE	I	Focus error input.
48	FDFCT	I	The defect prevention hold capactior is connected to this pin.

RF PLL Free-run Frequency Check

Procedure :

1. Connect frequency counter to test point (PLCK) with lead wire.



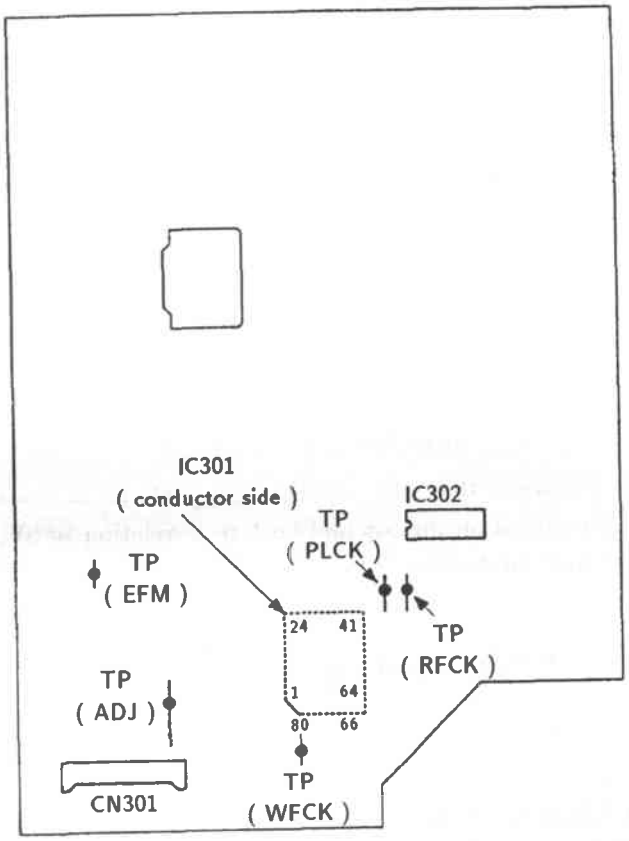
2. Turn Power switch on.
3. Confirm that reading on frequency counter is 4. 3218MHz.

Focus/Tracking Gain

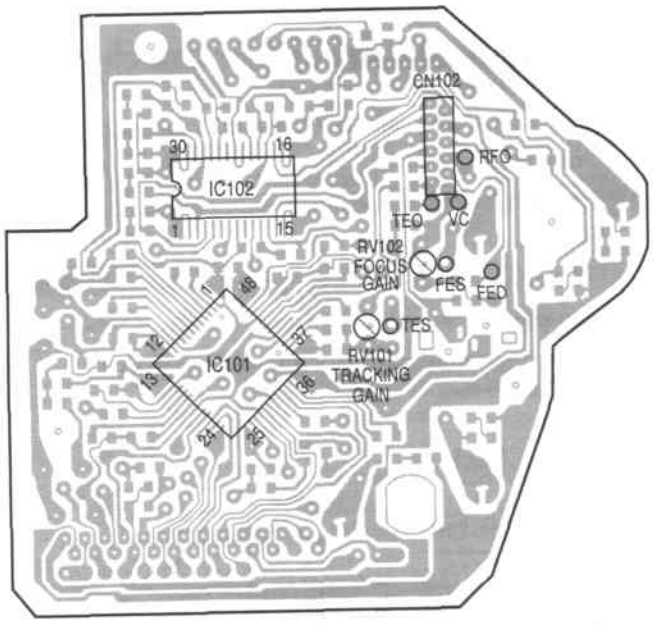
This gain has a margin, so even if it is slightly off. There is no problem.
Therefore, do not perform, this adjustment.
Please note that it should be fixed to mechanical center position when you moved and do not know original position.

Adjustment Location :

[MAIN BOARD] – Component Side –



[BD BOARD] – Component Side –

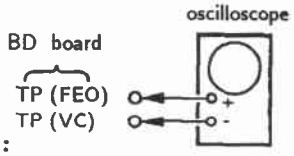


SECTION 2
ELECTRICAL BLOCK CHECKING

Note :

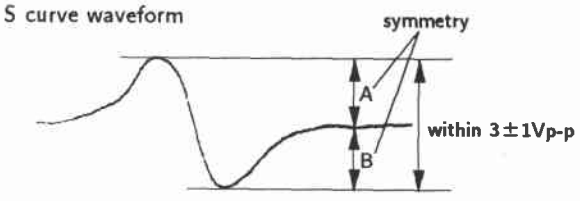
1. CD Block basically constructed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use the oscilloscope with more than 10MΩ impedance.
4. Clean an object lens by an applicator with neutral detergent when the signal level is low than specified value with the following checks.

S Curve Check



Procedure :

1. Connect oscilloscope to test point TP (FEO) on BD board.
2. Connect between test point TP (FES) and TP (VC) by lead wire.
3. Turned Power switch on and actuate the focus serch. (actuate the focus serch when disc table is moving in and out.)
4. Check the oscilloscope waveform (S curve) is symmetrical between A and B. And confirm peak to peak level within 3±1Vp-p.

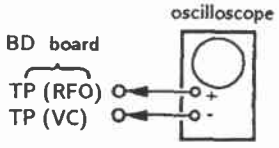


5. After check, remove the lead wire connected in step 2.

Note : • Try to mesure several times to make sure that the ratio of A : B or B : A is more than 10 : 7.

• Take sweep time as long as possible and light up the brightness to obtain best waveform.

RF Level Check

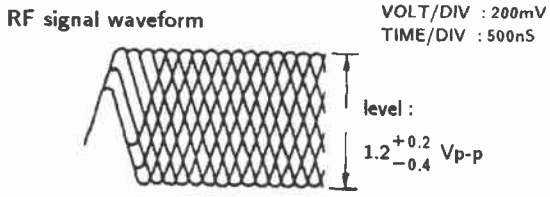


Procedure :

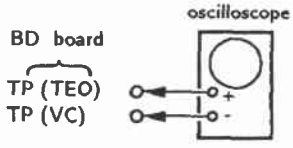
1. Connect oscilloscope to test point TP (RFO) on BD board.
2. Turn Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

Note :

Clear RF signal waveform means that the shape "◇" can be clearly distinguished at the center of the waveform.

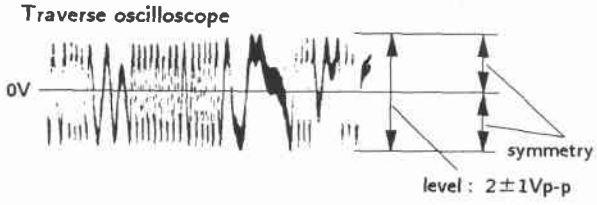


E-F Balance Check



Procedure :

1. Connect test point TP (ADJ) to ground and TP (TES) to TP (VC) with lead wire.
2. Connect oscilloscope to test point TP (TEO) on BD board.
3. Turn Power switch on.
4. Put disc (YEDS-18) in and playback.
5. Confirm that the osilloscope waveform is symmetrical on the top and bottom in relation to 0V, and check this level.

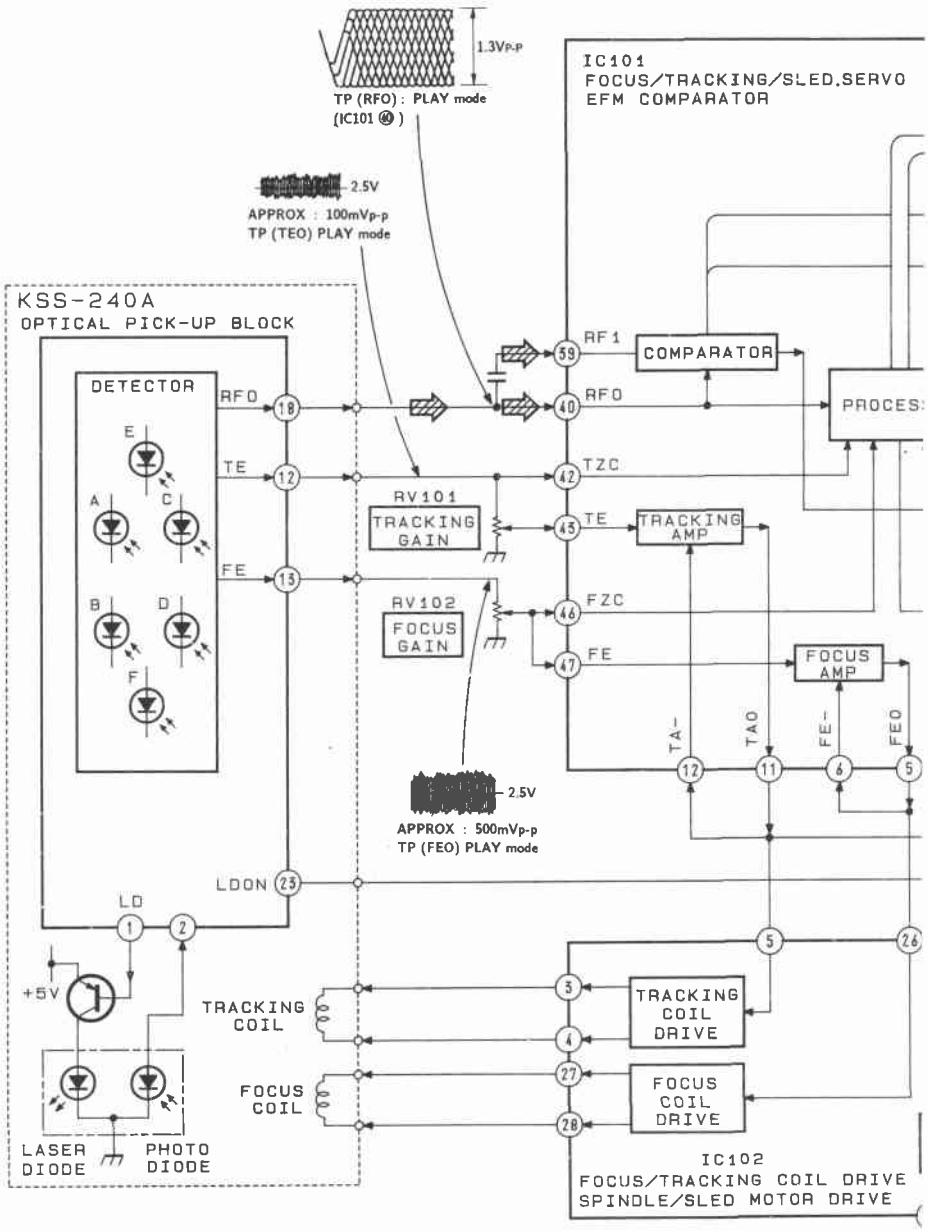


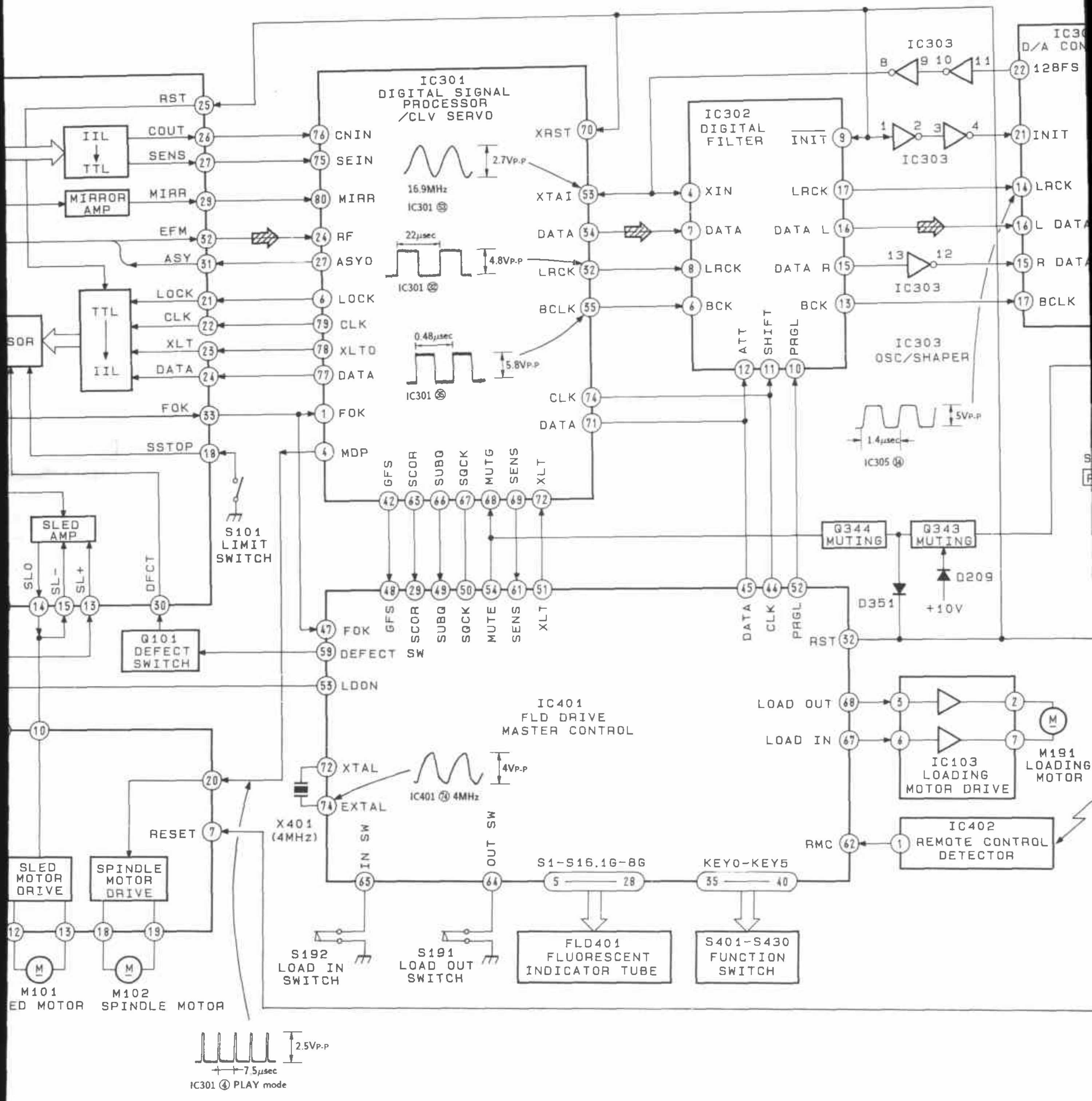
6. Remove the lead wire connected in step 1.

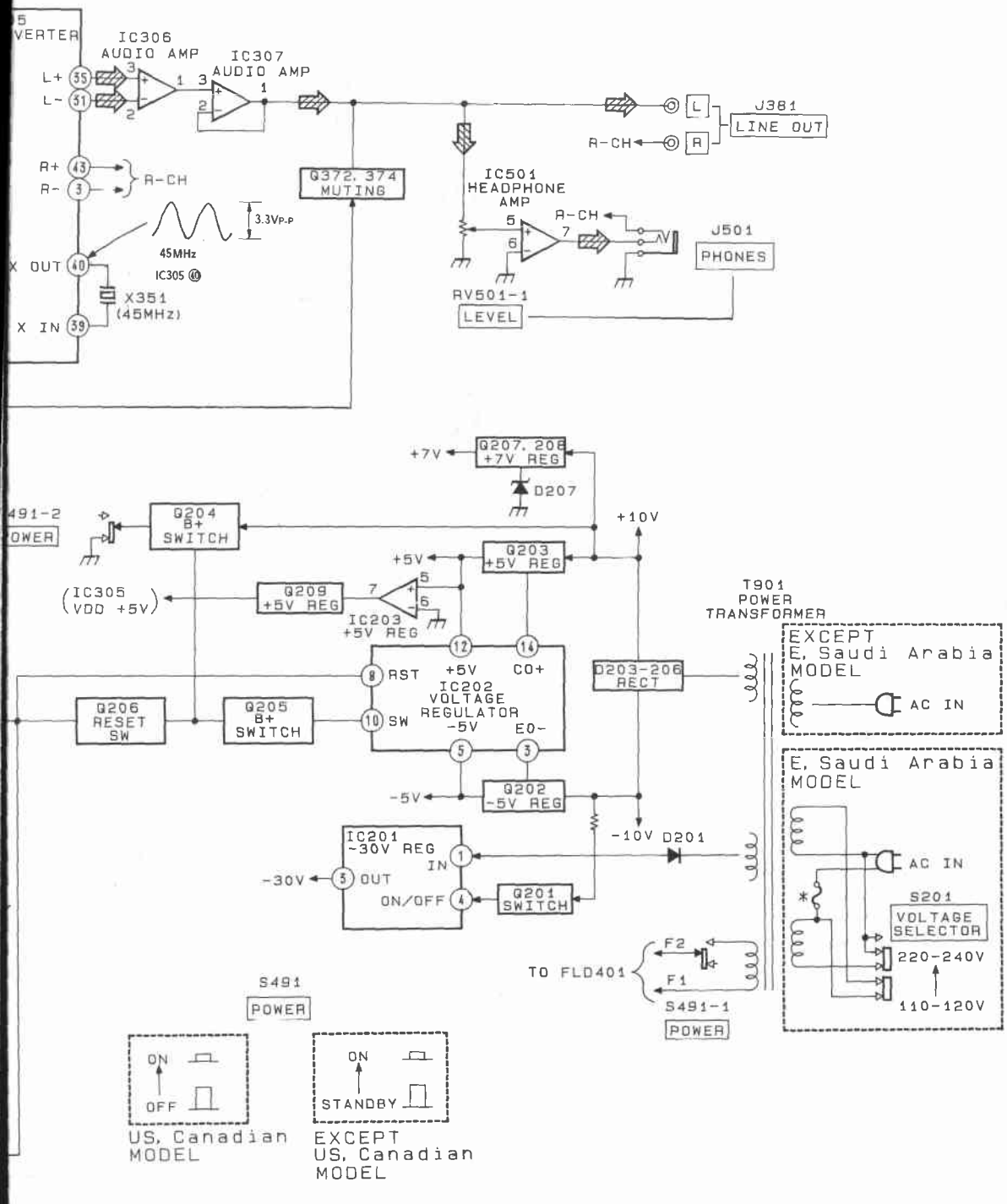
• IC401 (CXP50112-097Q) PIN FUNCTION

Pin No.	Pin Name	I /O	Description
1 - 4	—	—	Not used (open).
5 - 20	S1 -S16	O	Segment output to FL tube.
21 - 28	1G - 8G	O	Common output to FL tube.
29	SCOR	I	Subcode sync signal S0 + S1 detection input from IC301 (CXD2500AQ).
30	—	—	Not used (open).
31	+5V	—	+5V
32	$\overline{\text{RST}}$	I	Reset input.
33	+5V	—	+5V
34	V_{DD}	—	Power voltage terminal (+5V).
35 - 40	KEY0 - KEY5	I	Key A/D input.
41	—	—	Not used (Ground).
42	TIMER SW	I	Auto play select input (Auto play "L").
43	—	—	Not used (Ground).
44	CLK	O	Serial data transfer clock output to IC301 (CXD2500AQ).
45	DATA	O	Serial data output to IC301 (CXD2500AQ).
46	—	—	Not used (Ground).
47	FOK	I	Focus OK signal input from IC101 (CXA1372Q).
48	GFS	I	Frame sync signal clock status input from IC301 (CXD2500AQ).
49	SUBQ	I	Sub code (Q data) serial input from IC301 (CXD2500AQ).
50	SQCLK	O	Sub code (Q data) readout clock output to IC301 (CXD2500AQ).
51	XLT	O	Serial data latch output.
52	PRGL	O	Attenuate data latch clock output to IC302 (CXD2554P).
53	LDON	O	Laser diode ON/OFF select output of optical pick-up.
54	AMUT	O	Muting output for IC301 (CXD2500AQ) and Q344 (2SC3399). Muting on by "H", Muting off by "L".
55 - 58	B0 - B3	—	Not used (+5V)
59	DEFECT SW	O	Deffect circuit ON/OFF select output to IC101 (CXA1372Q).
60	—	—	Not used (open).
61	SENSE	I	SENS signal input from IC301 (CXD2500AQ).
62	RMC	I	Remote control signal input.
63	$\overline{\text{INSW}}$	I	Input for loading out switch.
64	$\overline{\text{OUTSW}}$	I	Output for loading in switch.
65	ADJ	I	Tset mode input. GFS check will not activate by "L".
66	AFADJ	I	Test mode input. All test operation will be activate by "L" mode when power on.
67	LODIN	O	Output for turn the loading motor to loading.
68	LODOUT	O	Output for turn the loading motor to un loading.
69	—	—	Not used (open).
70	—	—	Not used (open).
71	Vss	—	Ground.
72	XTAL	O	Clock output.
73	+5V	—	+5V
74	EXTAL	I	Clock input. (4MHz)
75	+5V	—	+5V
76	−30V	I	Power voltage −30V for built in FL tube controller.
77	—	—	Not used (open).
78	—	—	Not used (open).
79	—	—	Not used (open).
80	—	—	Not used (open).

4-2. BLOCK DIAGRAM

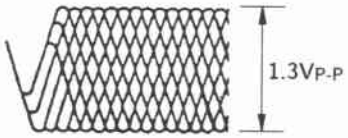



IC301
DIGITAL SIGNAL PROCESSOR /CLV SERVO
IC302
DIGITAL FILTER
IC303
IC303 OSC/SHAPER
D/A CON
IIL → TTL
MIRROR AMP
TTL → IIL
SLED AMP
S101 LIMIT SWITCH
Q101 DEFECT SWITCH
Q344 MUTING
Q343 MUTING
D209
D351
+10V
RST
COUT
SENS
MIRR
EFM
ASY
LOCK
CLK
XLT
DATA
FOK
SSTOP
CNIN
SEIN
RF
ASYO
XLTO
MDP
XRST
XTAI
LRCK
BCLK
XIN
INIT
DATA L
DATA R
BCK
128FS
L DATA
R DATA
ATT
SHIFT
PRGL
GFS
SCOR
SUBQ
SQCK
MUTG
MUTE
SLO
SL-
SL+
DFCT
16.9MHz
IC301 ㊺
2.7Vp-p
22μsec
4.8Vp-p
IC301 ㊷
0.48μsec
5.8Vp-p
IC301 ㊽
5Vp-p
1.4μsec
IC305 ⑭
IC401
FLD DRIVE
MASTER CONTROL
FOK
DEFECT SW
LDON
XTAL
EXTAL
X401 (4MHz)
4Vp-p
IC401 ㊹ 4MHz
RESET
IN SW
OUT SW
S1-S16,1G-8G
KEY0-KEY5
LOAD OUT
LOAD IN
RMC
IC103
LOADING MOTOR DRIVE
M191
LOADING MOTOR
IC402
REMOTE CONTROL DETECTOR
SLED MOTOR DRIVE
SPINDLE MOTOR DRIVE
M101
ED MOTOR
M102
SPINDLE MOTOR
S192
LOAD IN SWITCH
S191
LOAD OUT SWITCH
FLD401
FLUORESCENT INDICATOR TUBE
S401-S430
FUNCTION SWITCH
2.5Vp-p
7.5μsec
IC301 ④ PLAY mode


IC306
AUDIO AMP
IC307
AUDIO AMP
L+
L-
R+
R-
R-CH
3.3Vp-p
45MHz
IC305
X351
(45MHz)
X OUT
X IN
Q372, 374
MUTING
IC501
HEADPHONE
AMP
R-CH
J381
LINE OUT
J501
PHONES
RV501-1
LEVEL
+7V
Q207, 208
+7V REG
D207
+10V
Q204
B+
SWITCH
+5V
Q203
+5V REG
Q209
+5V REG
IC203
+5V REG
(IC305
VDD +5V)
T901
POWER
TRANSFORMER
EXCEPT
E, Saudi Arabia
MODEL
AC IN
D203-206
RECT
RST
+5V
CO+
IC202
VOLTAGE
REGULATOR
SW
-5V
EO-
Q206
RESET
SW
Q205
B+
SWITCH
-5V
Q202
-5V REG
IC201
-30V REG
IN
OUT
ON/OFF
-30V
-10V
D201
Q201
SWITCH
E, Saudi Arabia
MODEL
AC IN
S201
VOLTAGE
SELECTOR
220-240V
110-120V
F2
F1
TO FLD401
S491-1
POWER
S491
POWER
ON
OFF
US, Canadian
MODEL
ON
STANDBY
EXCEPT
US, Canadian
MODEL

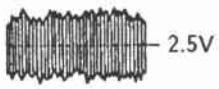
4-3. WAVEFORMS

❶



TP (RFO) : PLAY mode
(IC101 ㊵)

❷



APPROX : 500mVp-p
TP (FEO) PLAY mode

❸

APPROX : 100mVp-p
TP (TEO) PLAY mode

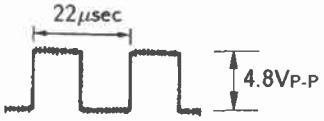
❹

IC401 ⑭ 4MHz

❺

IC301 ④ PLAY mode

❻



IC301 ㉜

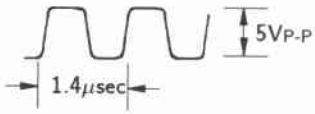
❼

IC301 ㉟

❽

16.9MHz
IC301 ㊸

❾



IC305 ⑭

❿

45MHz
IC305 ㊵

• SEMICONDUCTOR LOCATION

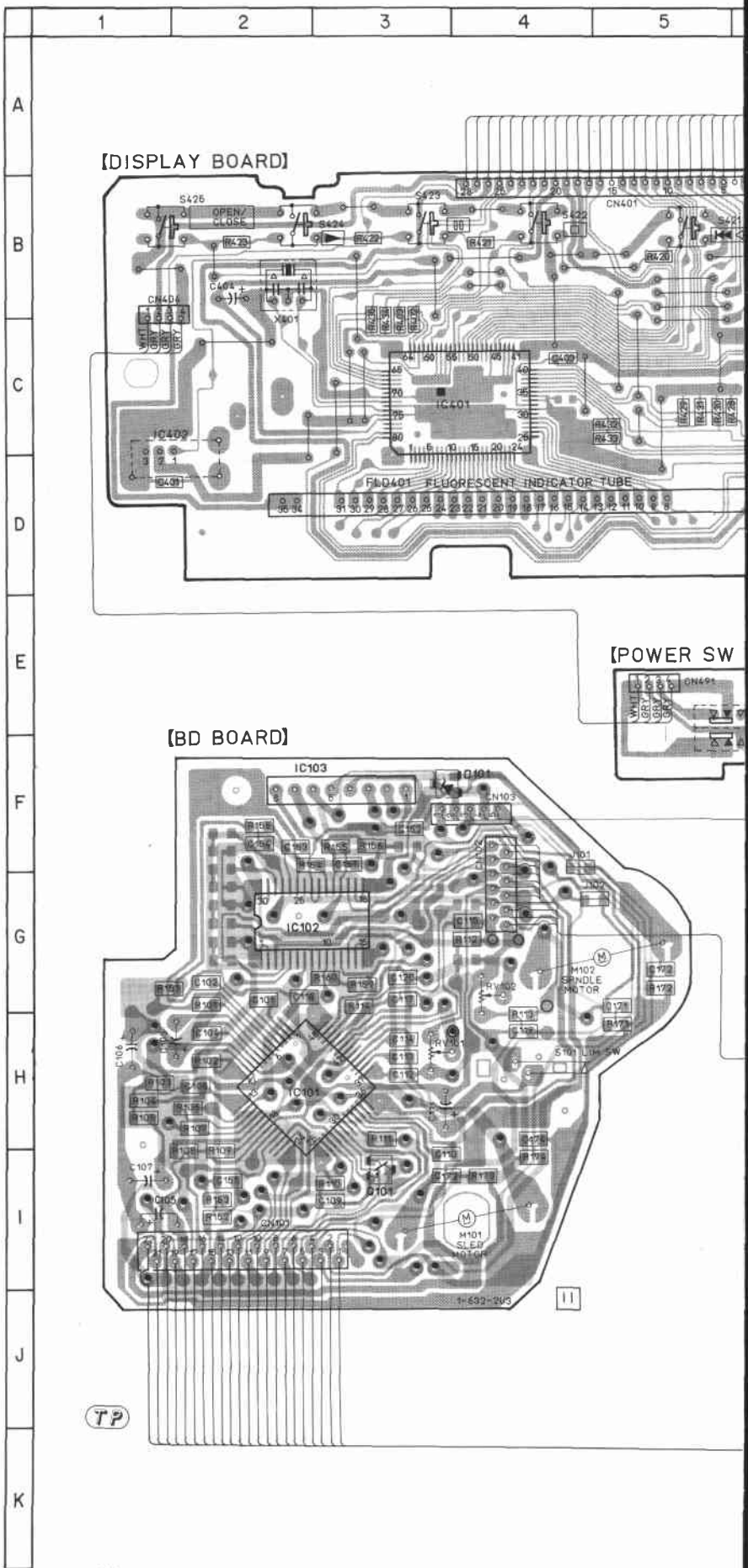
Ref. No.	LOCATION No.	Ref. No.	LOCATION No.
D101	F-3	IC306	D-14
D201	E-18	IC307	C-14
D202	I-18	IC401	C-4
D203	E-17	IC402	C-1
D204	E-17	IC501	G-10
D205	E-17		
D206	E-17	Q101	I-3
D207	G-18	Q201	F-18
D208	F-16	Q202	G-17
D209	F-16	Q203	F-17
D341	F-15	Q204	H-17
D351	G-13	Q205	H-17
		Q206	H-17
IC101	H-2	Q207	G-18
IC102	G-2	Q208	G-18
IC103	F-3	Q209	F-15
IC201	F-18	Q343	D-13
IC202	G-17	Q344	G-12
IC203	G-15	Q371	B-14
IC301	H-15	Q372	C-15
IC302	G-14	Q373	B-14
IC303	G-13	Q374	C-15
IC305	E-14		

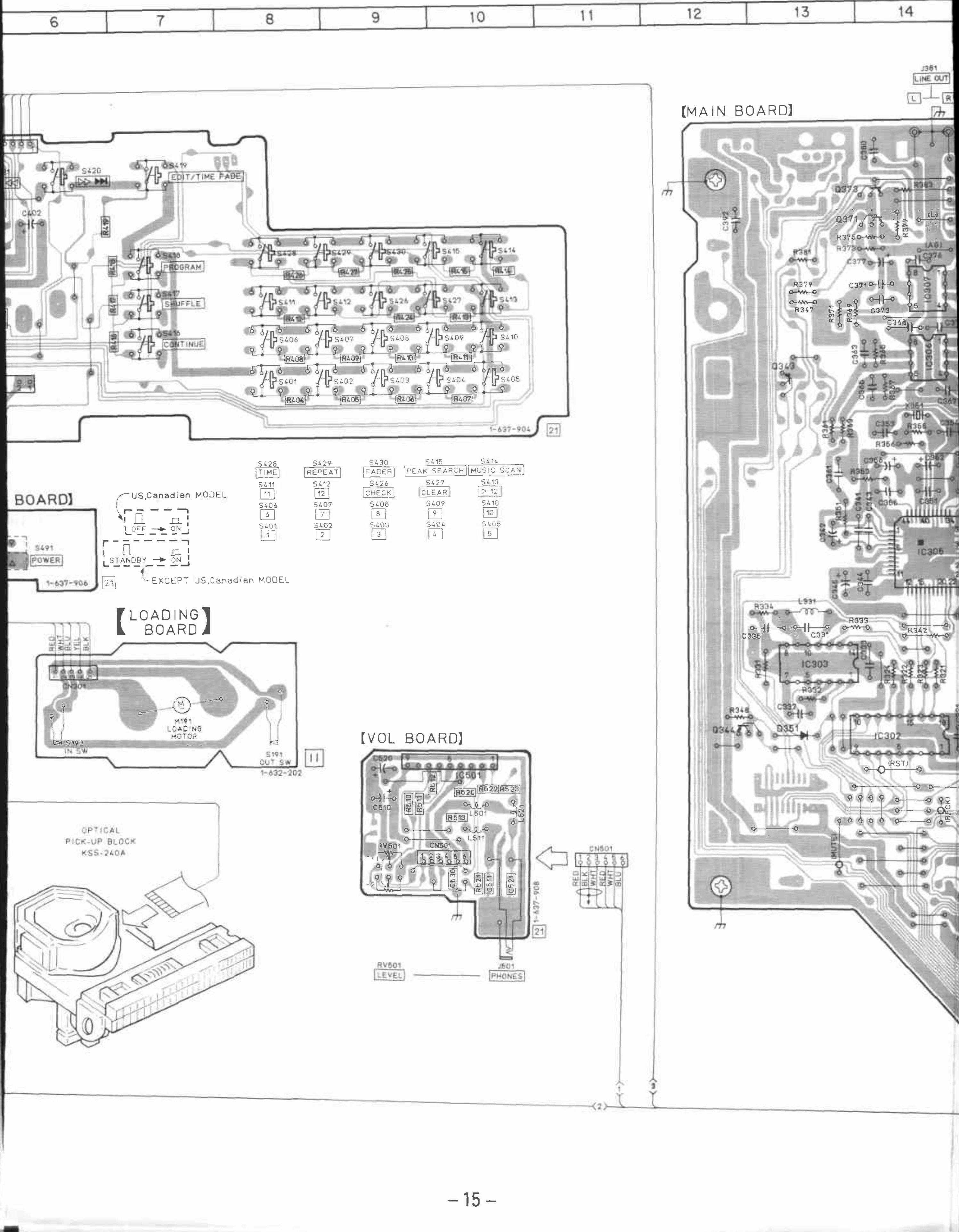
Note:

- ○—— : indicated a lead wire mounted on the component side.
- ■ : parts mounted on the conductor side.
- ● : Through hole.
- ▒▒ : Pattern from the side which enables seeing.
- ▒▒ : Pattern of the rear side.

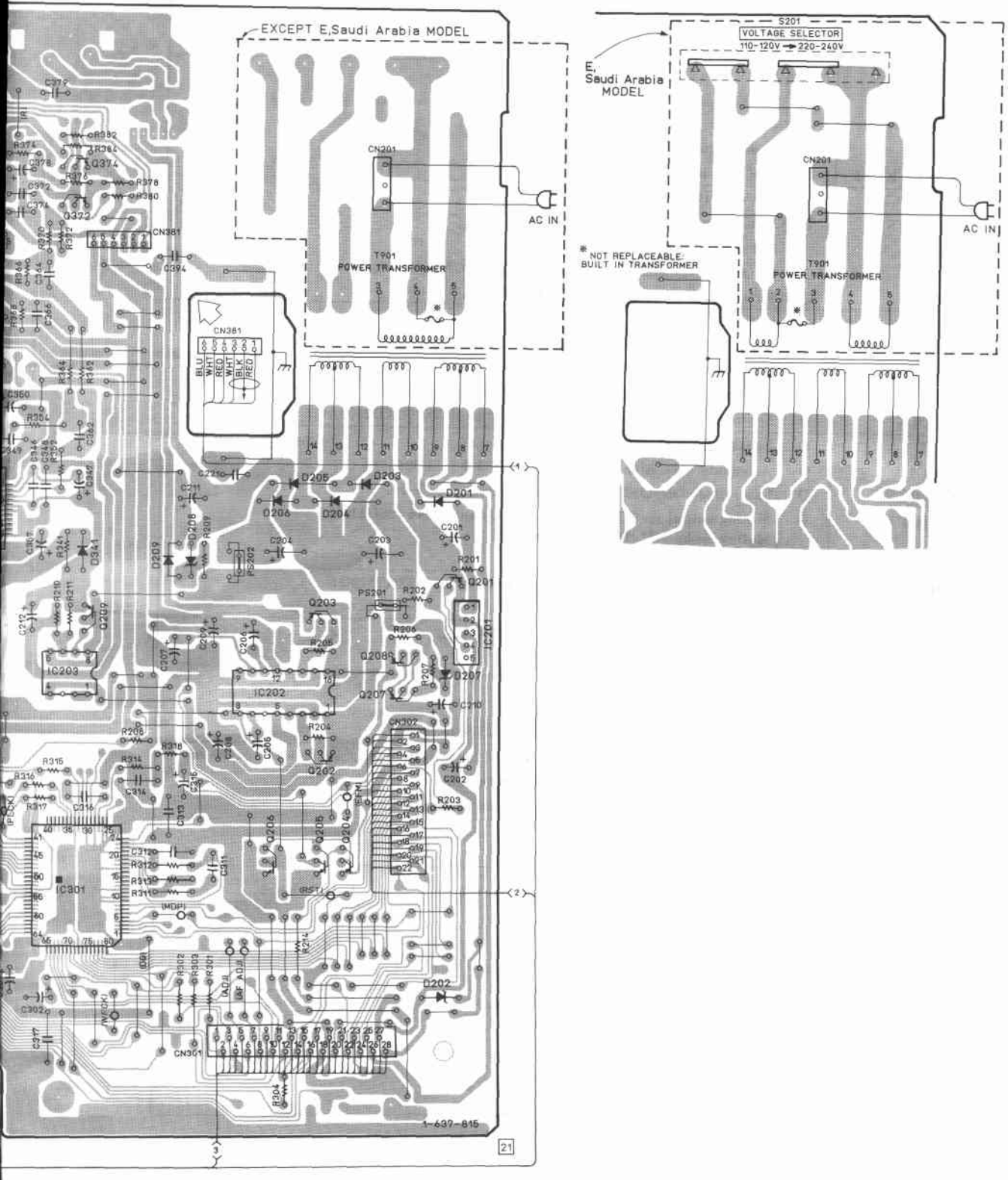
"Semiconductor Lead Layouts" is inserted on P21.

4-4. PRINTED WIRING BOARDS

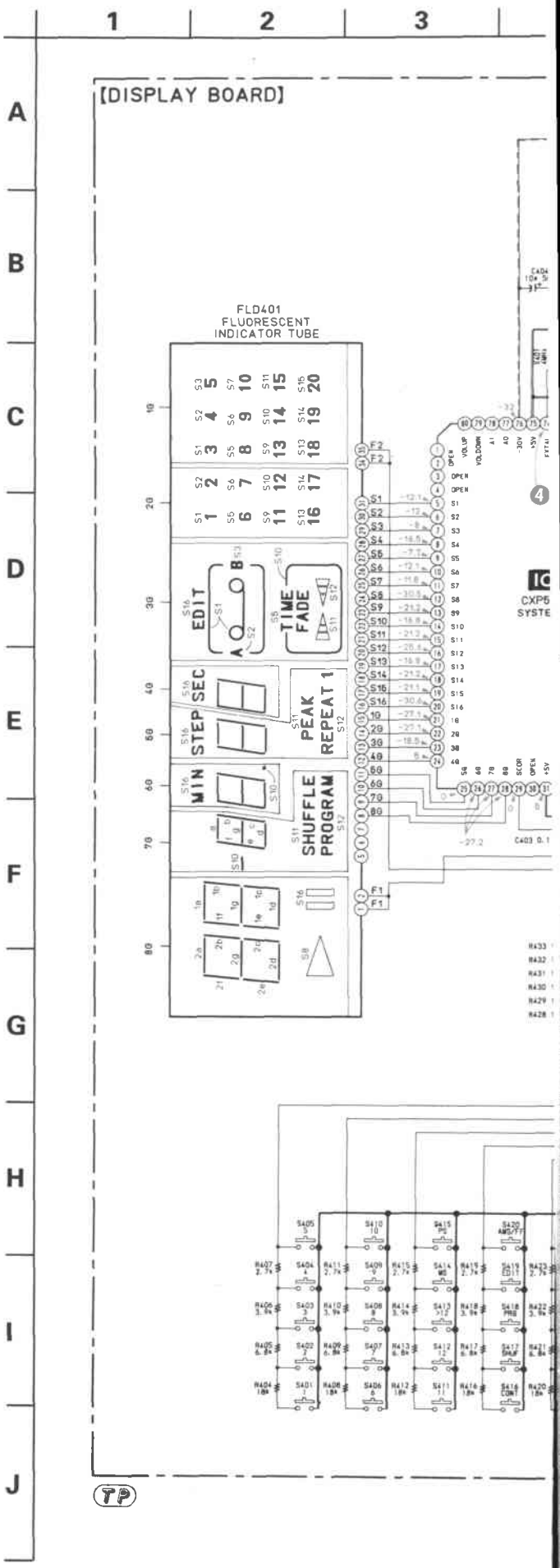



6
7
8
9
10
11
12
13
14
[MAIN BOARD]
J381
LINE OUT
S420
S419
EDIT/TIME FADE
S418
PROGRAM
S417
SHUFFLE
S416
CONTINUE
1-637-904
21
S428
TIME
S429
REPEAT
S430
FADER
S415
PEAK SEARCH
S414
MUSIC SCAN
S411
11
S412
12
S426
CHECK
S427
CLEAR
S413
> 12
S406
6
S407
7
S408
8
S409
9
S410
10
S401
1
S402
2
S403
3
S404
4
S405
5
BOARD]
US,Canadian MODEL
OFF
ON
STANDBY
ON
EXCEPT US,Canadian MODEL
S491
POWER
1-637-906
21
[LOADING BOARD]
RED
WHT
BLU
YEL
BLK
CN301
M191
LOADING
MOTOR
S192
IN SW
S191
OUT SW
1-632-202
11
OPTICAL
PICK-UP BLOCK
KSS-240A
[VOL BOARD]
C520
C501
R612
R620
R622
R523
C610
R610
R511
R513
L601
L621
L511
RV601
CN501
C630
R521
C511
C521
1-637-908
21
CN501
RED
BLK
WHT
RED
WHT
BLU
RV601
LEVEL
J501
PHONES
IC307
IC306
IC305
IC303
IC302
Q373
Q371
Q343
Q344
D351
(RST)
(MUTE)

15	16	17	18	19	20	21	22



4-5. SCHEMATIC DIAGRAM



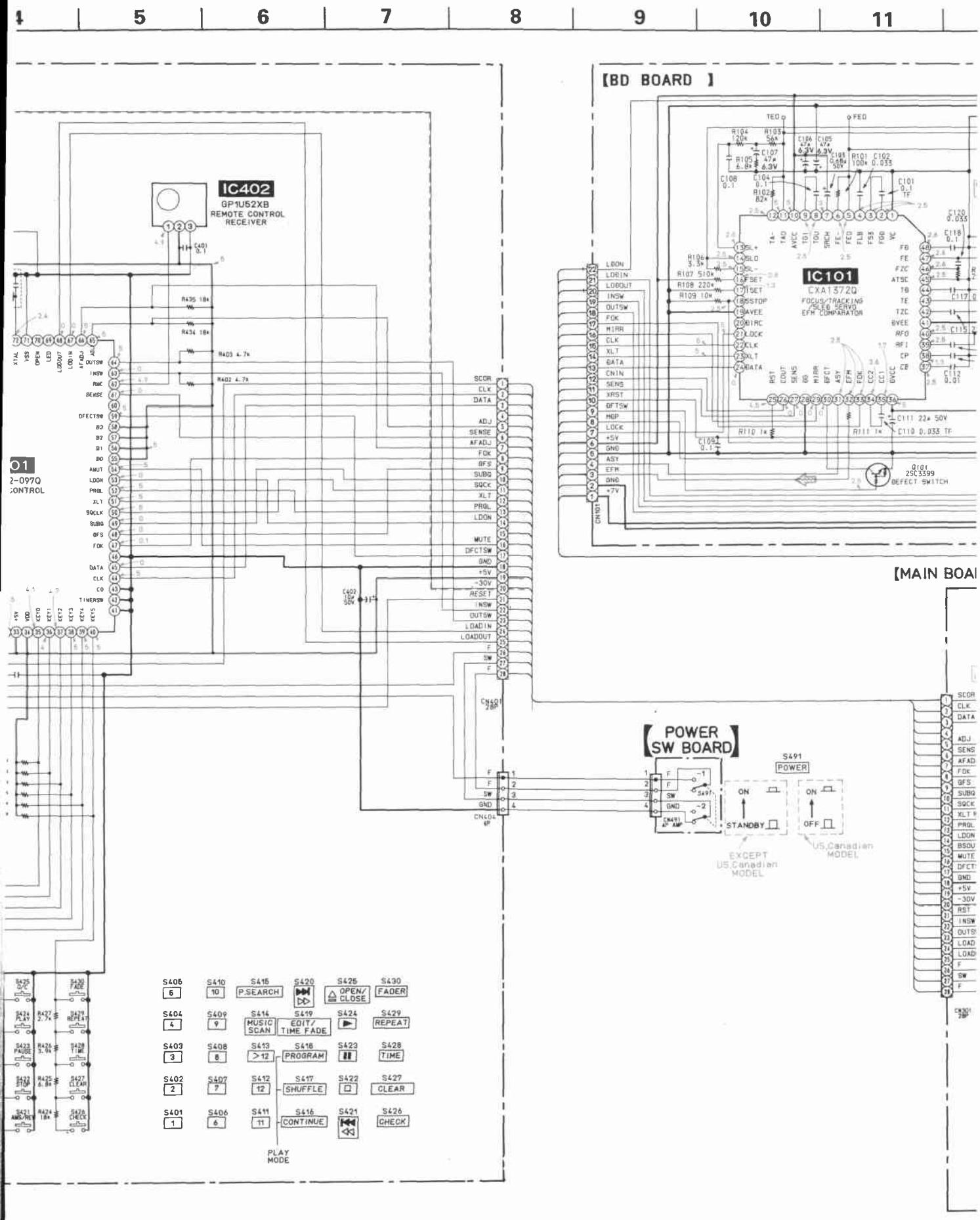
Note:

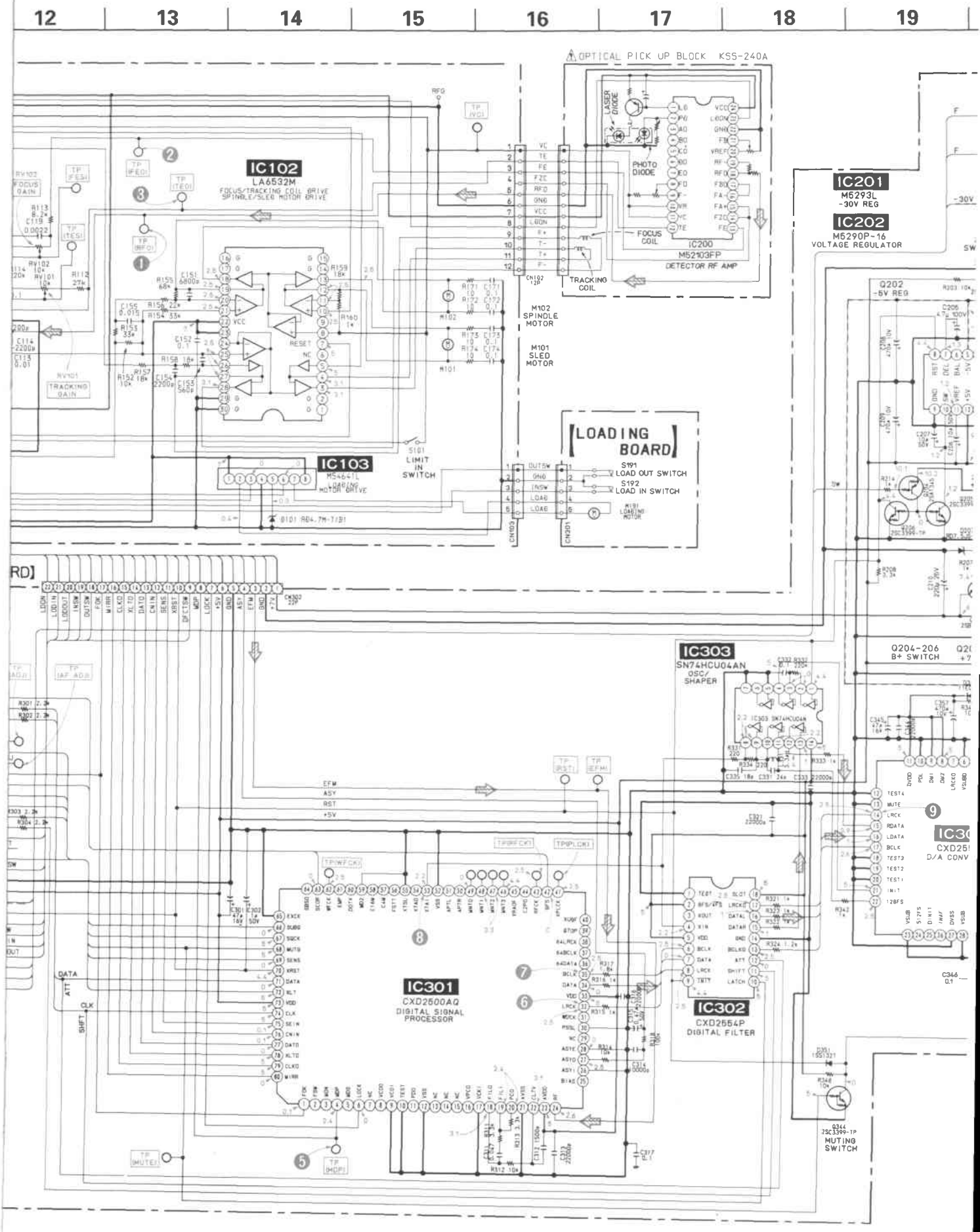
- All capacitors are in µF unless otherwise noted. pF: µµF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, 1/4W or less unless otherwise noted.
- △ : internal component.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

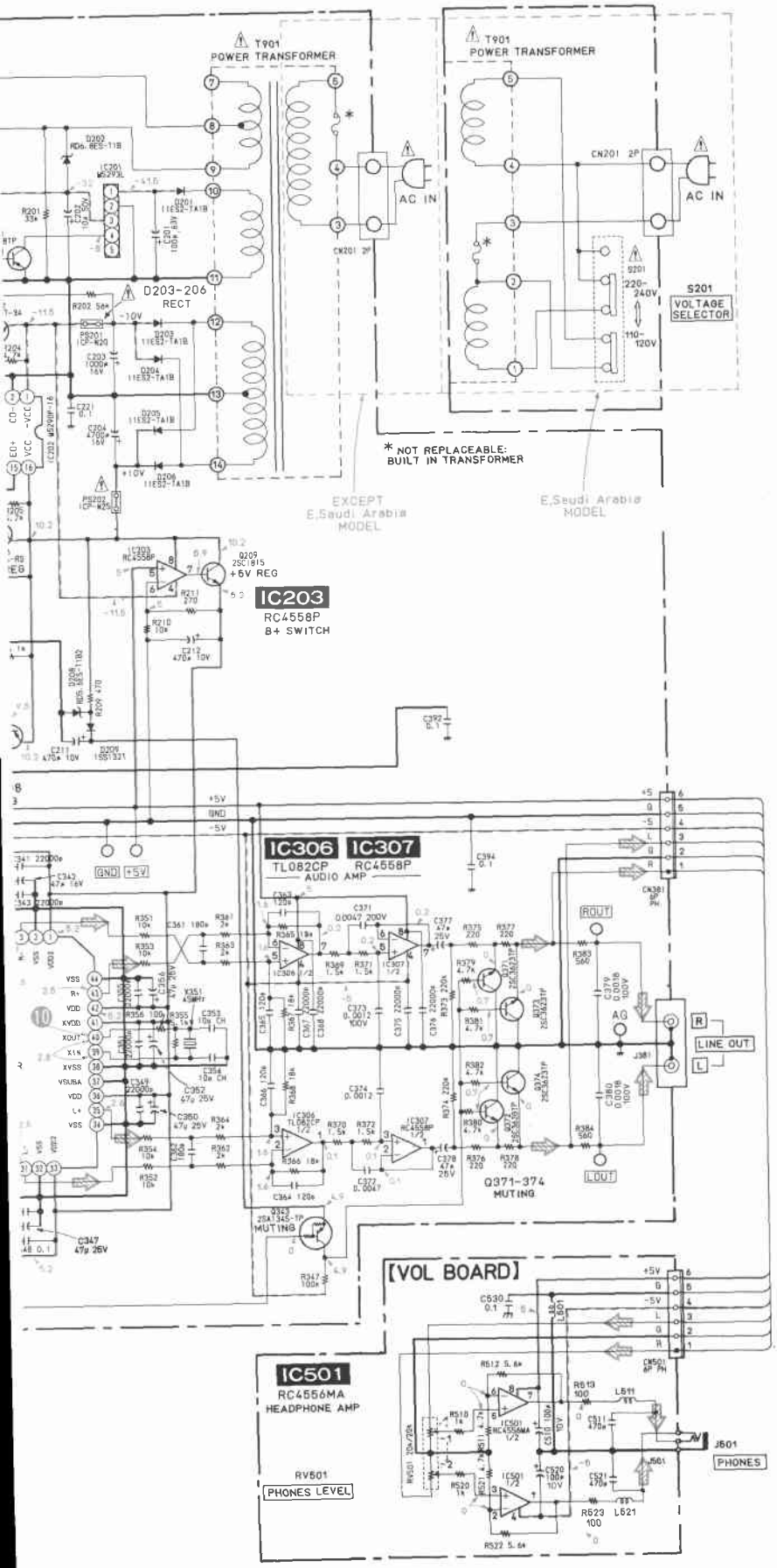
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

- ——— : B + Line.
- - - - : B – Line.
- [ ] : adjustment for repair.
- Voltages are DC between measurement points and ground under no-signal (STOP) conditions.
- no make : PB mode
- Voltages are taken with a VOM (input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path
  ⇨ : CD


4
5
6
7
8
9
10
11
IC402
GP1U52XB
REMOTE CONTROL
RECEIVER
【BD BOARD 】
IC101
CXA1372Q
FOCUS/TRACKING
/SLED SERVO
EFM COMPARATOR
Q101
2SC3399
DEFECT SWITCH
【MAIN BOAI
【POWER
SW BOARD】
S491
POWER
ON
STANDBY
ON
OFF
EXCEPT
US,Canadian
MODEL
US,Canadian
MODEL
S405
6
S410
10
S415
P.SEARCH
S420
S425
OPEN/
CLOSE
S430
FADER
S404
4
S409
9
S414
MUSIC
SCAN
S419
EDIT/
TIME FADE
S424
S429
REPEAT
S403
3
S408
8
S413
>12
S418
PROGRAM
S423
S428
TIME
S402
2
S407
7
S412
12
S417
SHUFFLE
S422
S427
CLEAR
S401
1
S406
6
S411
11
S416
CONTINUE
S421
S426
CHECK
PLAY
MODE

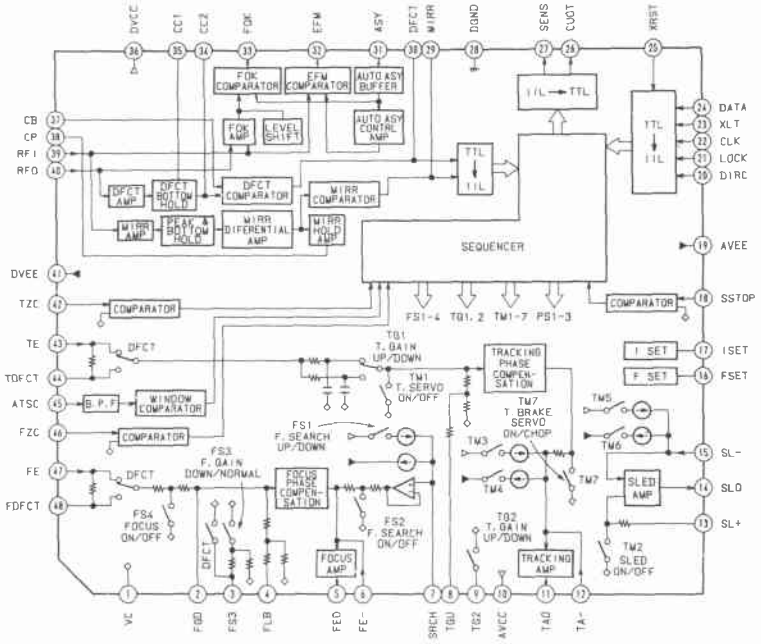

12
13
14
15
16
17
18
19
OPTICAL PICK UP BLOCK KSS-240A
IC102
LA6532M
FOCUS/TRACKING COIL DRIVE
SPINDLE/SLED MOTOR DRIVE
IC103
MS4641L
LOADING MOTOR DRIVE
IC201
M5293L
-30V REG
IC202
M5290P-16
VOLTAGE REGULATOR
IC200
M52103FP
DETECTOR RF AMP
PHOTO DIODE
LASER DIODE
FOCUS COIL
TRACKING COIL
M102
SPINDLE MOTOR
M101
SLED MOTOR
LOADING BOARD
S191
LOAD OUT SWITCH
S192
LOAD IN SWITCH
S101
LIMIT IN SWITCH
M191
LOADING MOTOR
IC303
SN74HCU04AN
OSC/ SHAPER
IC301
CXD2500AQ
DIGITAL SIGNAL PROCESSOR
IC302
CXD2554P
DIGITAL FILTER
IC
CXD25
D/A CONV
Q202
-5V REG
Q204-206
B+ SWITCH
Q344
2SC3399-TP
MUTING SWITCH
RFG
EFM
ASY
RST
+5V
DATA
ATT
CLK
SHFT

20 | 21 | 22 | 23 | 24 | 25

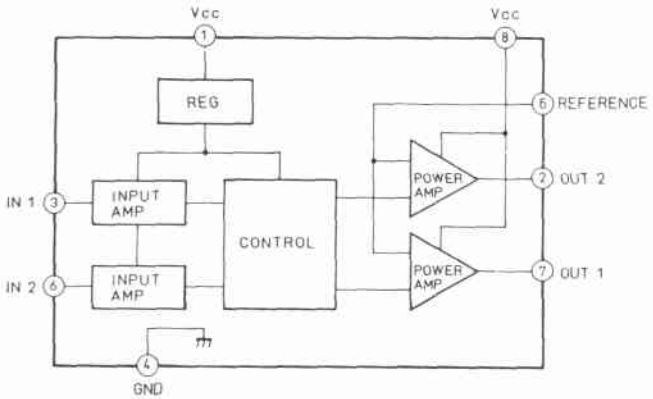


4-7. IC BLOCK DIAGRAMS

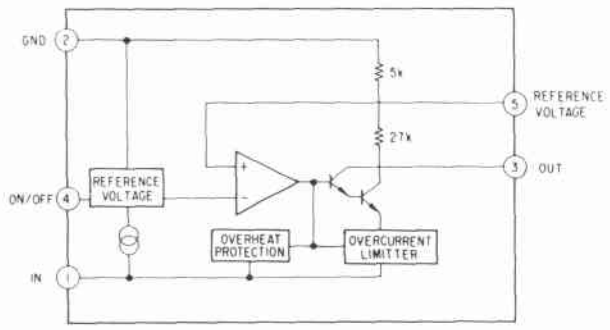
IC101 CXA1372Q



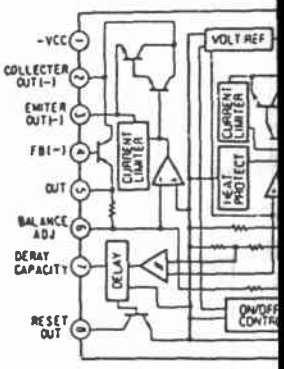
IC103 M54641L



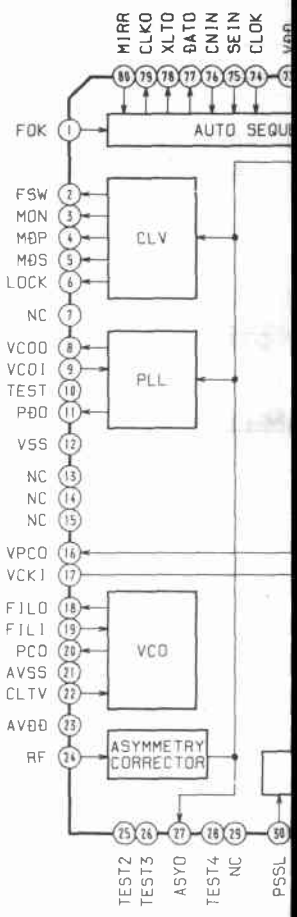
IC201 M5293L



IC202 M5290P-16

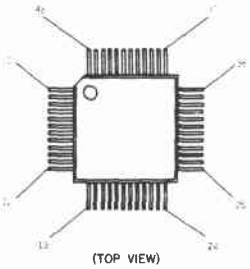


IC301 CXD2500AQ



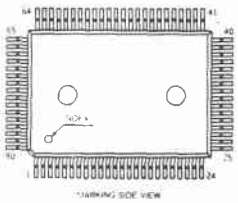
4-6. SEMICONDUCTOR LEAD LAYOUTS

CXA1372Q

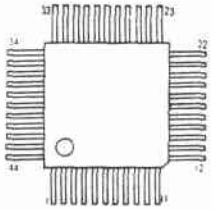


(TOP VIEW)

CXD2500AQ
CXP50112-097Q



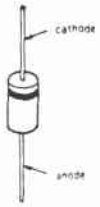
CXD2552Q



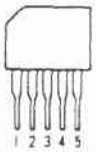
DTA144ES
DTC144ES
2SC2458-YGR
2SC3623A-LK

GP1U52XB

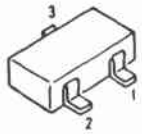
IN4148M



M5293L



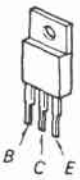
RD4.7M-B1



RD5.6ES-B2
RD6.8ES-B1
RD7.5JS-B2
ISS202-1
11ES2
11EQS04

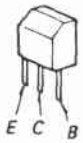
2SA1175-HFE

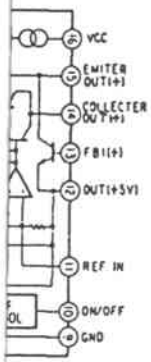
2SB1094-L
2SB1274SA-RS



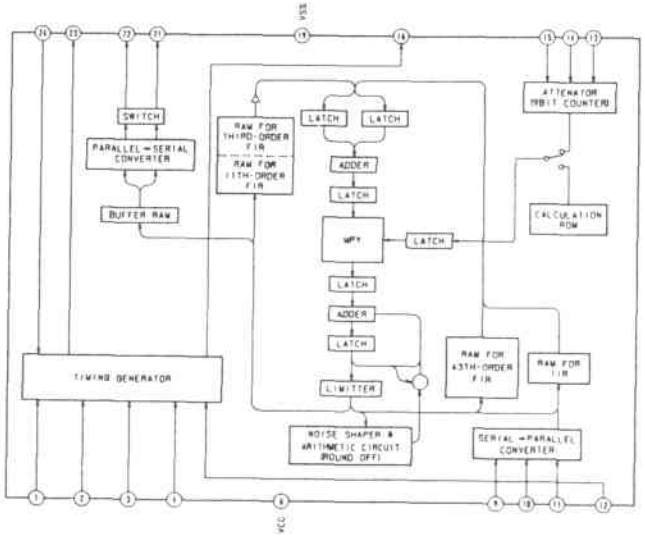
2SC1815-Y

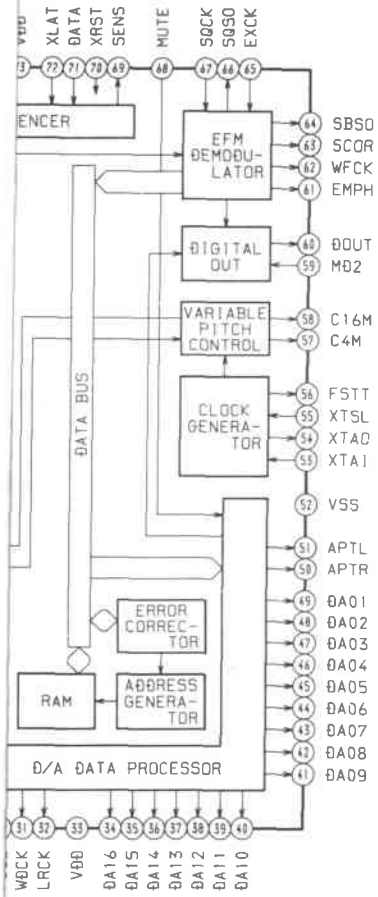
2SD774-34



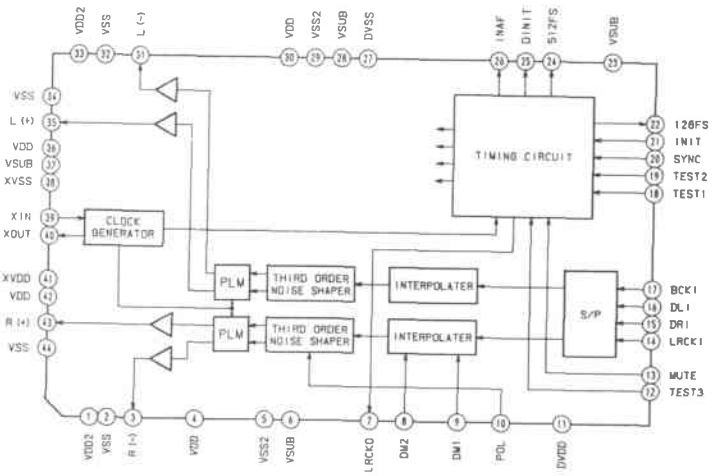


IC302 CXD2554P





IC305 CXD2552AQ



SECTION 5
EXPLODED VIEW

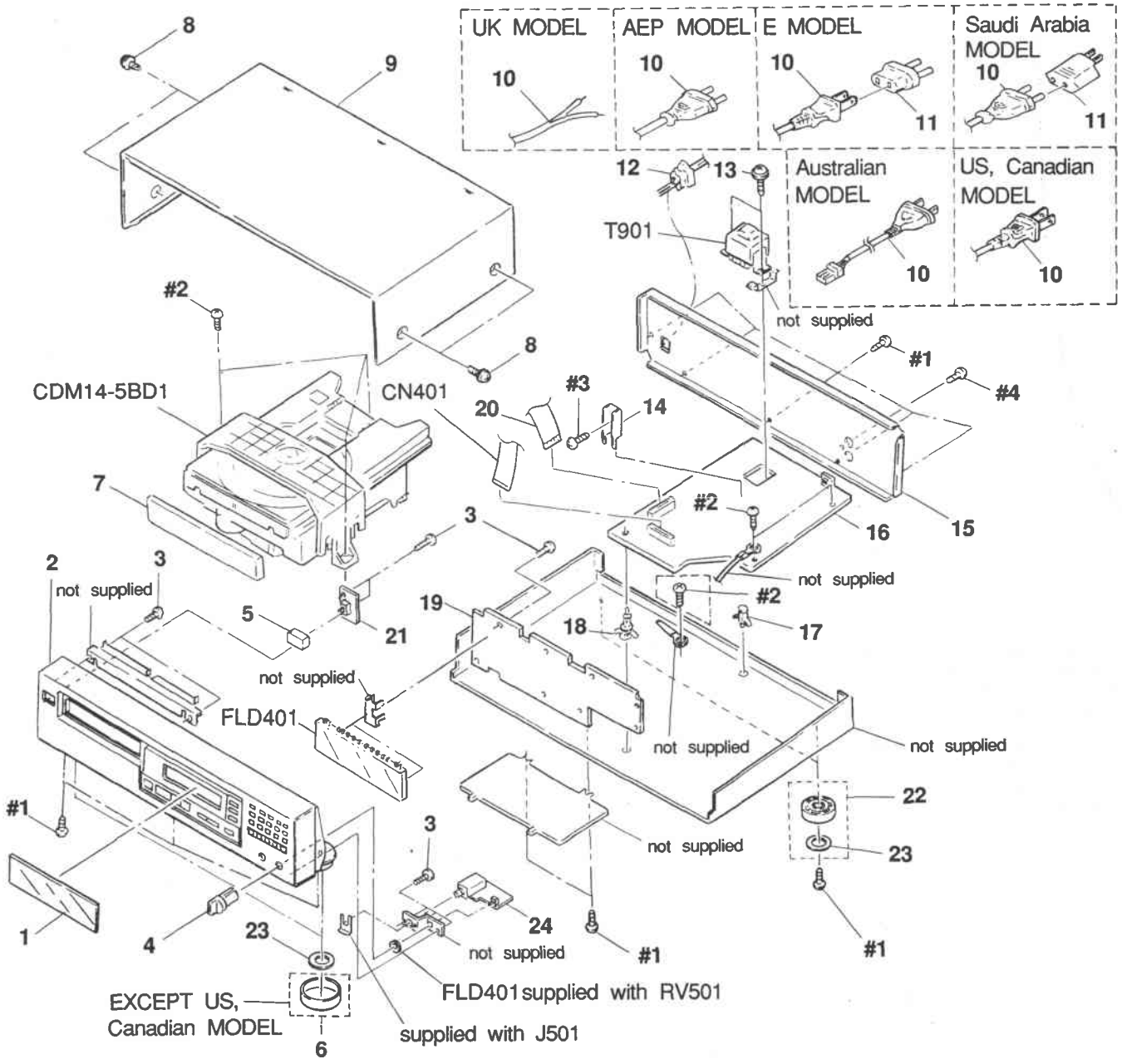
NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Color Indication of Appearance Parts
  Example:
  KNOB,BALANCE(WHITE)...(RED)
  ↑ ↑
  Parts color Cabinet's color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware(# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

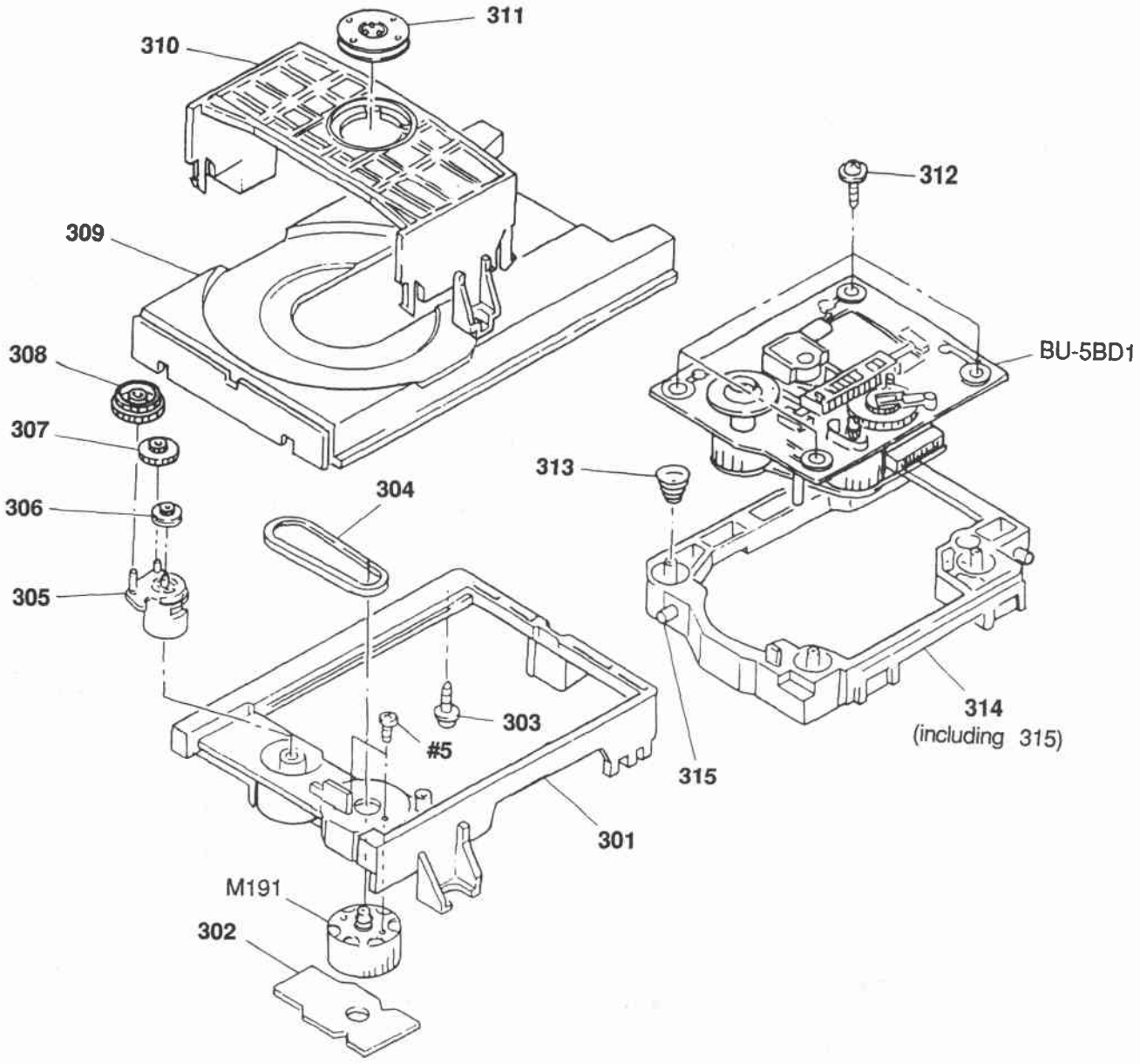
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

(1) CABINET SECTION



Ref. No.	Part No.	Description	Remark
1	4-942-767-11	PLATE, INDICATION (195)	
1	4-942-767-01	PLATE, INDICATION (295/491)	
2	X-4941-260-1	PANEL ASSY, FRONT (MADE IN FRANCE 295:AEP)	
2	X-4941-262-1	PANEL ASSY, FRONT (MADE IN JAPAN 195:AEP, E, Saudi Arabia, Aastralian)	
2	X-4941-261-1	PANEL ASSY, FRONT (MADE IN JAPAN 195:US, Canadian)	
2	X-4941-263-1	PANEL ASSY, FRONT (MADE IN FRANCE 195:AEP)	
2	X-4941-259-1	PANEL ASSY, FRONT (MADE IN JAPAN 295:AEP, E, Australian)	
2	X-4941-258-1	PANEL ASSY, FRONT (MADE IN JAPAN 295:Canadian)	
2	X-4941-430-1	PANEL ASSY, FRONT (MADE IN JAPAN 491:US)	
2	X-4941-456-1	PANEL ASSY, FRONT (MADE IN FRANCE 491:UK)	
3	4-928-635-01	SCREW, +BV (2.6X8) TAPPING	
4	4-922-531-01	KNOB (A TYPE), LOV	
5	4-922-921-01	BUTTON (POWER)	
6	4-933-135-01	RING (DIA.58A), ORNAMENTAL (EXCEPT US, Canadian)	
7	4-942-763-01	PAENL, LOADING (MADE IN JAPAN 295/491)	
7	4-942-763-11	PAENL, LOADING (MADE IN FRANCE 295:AEP/491:UK)	
7	4-942-763-21	PAENL, LOADING (MADE IN JAPAN 195)	
7	4-942-763-31	PAENL, LOADING (MADE IN FRANCE 195)	
8	3-704-366-01	SCREW (CASE) (M3X8)	
9	4-929-035-31	CASE (MADE IN JAPAN 195/295/491)	
9	4-929-035-41	CASE (MADE IN FRANCE 195/295/491)	
10 ⚠	1-574-390-31	CORD, POWER (491:UK)	
10 ⚠	1-574-653-21	CORD, POWER (E)	
10 ⚠	1-558-945-21	CORD, POWER (POLAR, SPT-1) (US, Canadian)	
10 ⚠	1-574-127-31	CORD, POWER (MADE IN FRANCE 195/295:AEP)	
10 ⚠	1-574-358-31	CORD, POWER (WITH CONNECTOR) (195/295:Australian)	
10 ⚠	1-575-651-21	CORD, POWER (MADE IN JAPAN AEP, Saudi Arabia)	
11 ⚠	1-569-007-11	ADAPTOR, CONVERSION 2P (195/295:E)	
11 ⚠	1-569-008-11	ADAPTOR, CONVERSION 2P (195:Saudi Arabia)	
12	* 3-703-244-00	BUSHING (2104), CORD (EXCEPT E, US, Canadian)	
12	* 3-703-571-12	BUSHING (S) (4516), CORD (E, US, Canadian)	
13	4-886-821-11	SCREW, S TIGHT, +PTTWH 3X6	
14	4-902-345-01	HEAT SINK	
15	* 4-942-769-21	PANEL, BACK (MADE IN JAPAN 295:AEP)	
15	* 4-942-770-21	PANEL, BACK (MADE IN JAPAN 195:AEP)	
15	* 4-942-770-41	PANEL, BACK (195:Australian)	
15	* 4-942-769-41	PANEL, BACK (295:Australian)	
15	* 4-942-770-31	PANEL, BACK (195:E, Saudi Arabia)	
15	* 4-942-769-11	PANEL, BACK (295:Canadian)	
15	* 4-942-770-11	PANEL, BACK (195:Canadian)	
15	* 4-942-769-02	PANEL, BACK (491:US)	
15	* 4-942-770-01	PANEL, BACK (195:US)	
15	* 4-942-769-31	PANEL, BACK (295:E)	
15	* 4-942-769-51	PANEL, BACK (MADE IN FRANCE 195, 295:AEP/491:UK)	
16	* A-4617-692-A	MAIN BOARD, COMPLETE (MADE IN FRANCE)	
16	* A-4617-706-A	MAIN BOARD, COMPLETE (MADE IN JAPAN AEP, US, Canadian, Australian)	
16	* A-4617-708-A	MAIN BOARD, COMPLETE (MADE IN JAPAN E, Saudi Arabia)	
17	* 3-349-025-41	HOLDER, PC BOARD	
18	* 4-924-098-01	HOLDER, PC BOARD	
19	* A-4617-713-A	DISPLAY BOARD, COMPLETE (MADE IN FRANCE)	
19	* A-4617-705-A	DISPLAY BOARD, COMPLETE (MADE IN JAPAN 195/295/491)	
20	1-575-002-11	WIRE, FLAT TYPE (22 CORE)	
21	* 1-637-906-11	POWER SW BOARD (MADE IN JAPAN)	
21	* 1-637-906-21	POWER SW BOARD (MADE IN FRANCE)	
22	X-3304-938-2	FOOT ASSY (EXCEPT US, Canadian)	
22	X-4885-950-2	FOOT ASSY (US, Canadian)	
23	4-923-836-11	CUSHION	
24	* 1-637-908-11	VOL BOARD (MADE IN JAPAN)	
24	* 1-637-908-21	VOL BOARD (MADE IN FRANCE)	
CN401	1-535-883-11	JUMPER, FILM (WITH TERMINAL)	
FLD401	1-519-611-11	INDICATOR TUBE, FLUORESCENT	
T901 ⚠	1-449-923-11	TRANSFORMER, POWER (E, Saudi Arabia)	
T901 ⚠	1-449-921-11	TRANSFORMER, POWER (US, Canadian)	
T901 ⚠	1-449-925-11	TRANSFORMER, POWER (MADE IN FRANCE AEP, UK)	
T901 ⚠	1-449-922-11	TRANSFORMER, POWER (MADE IN JAPAN AEP, Australian)	

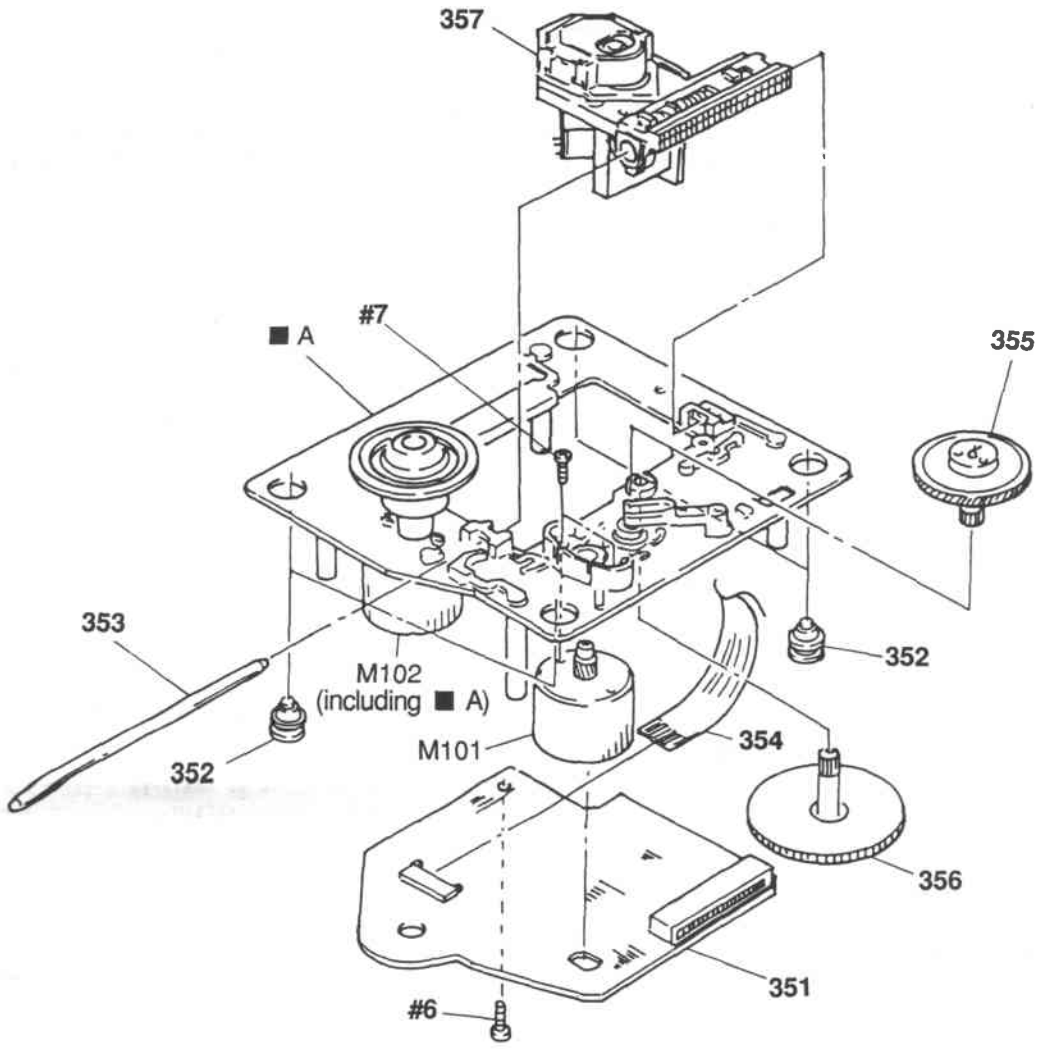
(2) MD SECTION (CDM14-5BD1)



Ref. No.		Part No.	Description	Remark
301		4-933-111-01	CHASSIS (MD)	
302	*	1-632-202-11	LOADING BOARD	
303	*	4-917-583-21	BRACKET, YOKE	
304		4-927-649-01	BELT	
305		4-933-109-01	CAM	
306		4-927-651-01	PULLEY (S)	
307		4-927-628-01	GEAR (C)	
308		4-933-107-01	GEAR (PL)	

Ref. No.		Part No.	Description	Remark
309		4-933-112-01	TABLE, DISK	
310		4-933-110-01	HOLDER (MG)	
311	*	1-452-538-11	MAGNET	
312		4-933-134-01	SCREW (+PTPWH M2.6X6)	
313		4-917-541-01	SPRING (B)	
314		4-933-129-01	HOLDER (BU) (INCLUDING 315)	
315		4-933-108-01	SHAFT (CAM)	
M191		A-4604-363-A	MOTOR (L) ASSY (LOADING)	

(3) PICK-UP BLOCK (BU-5BD1)



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
351	A-4617-161-A	BD BOARD, COMPLETE	
352	4-933-126-01	INSULATOR (A)	
353	4-917-565-01	SHAFT, SLED	
354	1-575-001-11	WIRE, FLAT TYPE (12 CORE)	
355	4-917-567-01	GEAR (M)	
356	4-917-564-01	GEAR (P), FLATNESS	
357 ⚠	8-848-144-11	DEVICE, OPTICAL KSS-240A	
M101	X-4917-504-1	MOTOR ASSY (SLED)	
M102	X-4917-523-3	MOTOR ASSY (SPINDLE)	

SECTION 6
ELECTRICAL PARTS LIST

BD

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL : Metal-film resistor
  METAL OXIDE : Metal Oxide-film resistor
  F : nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : μ, for example :
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH
- Hardware(# mark) list is given in the last of this parts list.

Ref. No.	Part No.	Description			Remark
	A-4617-161-A	BD BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C102	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C103	1-126-163-11	ELECT	4.7uF	20%	50V
C104	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C105	1-126-154-11	ELECT	47uF	20%	6.3V
C106	1-126-154-11	ELECT	47uF	20%	6.3V
C107	1-126-154-11	ELECT	47uF	20%	6.3V
C108	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C109	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C110	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C111	1-131-367-00	TANTALUM	22uF	10%	20V
C112	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C113	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C114	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C115	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C117	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C118	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C119	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C120	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C151	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C152	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C153	1-163-006-11	CERAMIC CHIP	560PF	10%	50V
C154	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C155	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V
C171	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C172	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C173	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C174	1-163-038-00	CERAMIC CHIP	0.1uF		25V

Ref. No.	Part No.	Description			Remark
		< CONNECTOR >			
CN101	1-568-796-11	SOCKET, CONNECTOR 22P			
CN102	1-568-795-11	SOCKET, CONNECTOR 12P			
CN103 *	1-564-721-11	PIN, CONNECTOR (SMALL TYPE) 5P			
		< DIODE >			
D101	8-719-105-72	DIODE RD4.7M-B1			
		< IC >			
IC101	8-752-050-82	IC SC CXA1372Q			
IC102	8-759-822-36	IC LA6532M			
IC103	8-759-633-65	IC M54641L			
		< JUMPER >			
J101	1-216-295-00	METAL CHIP	0	5%	1/10W
J102	1-216-295-00	METAL CHIP	0	5%	1/10W
		< TRANSISTOR >			
Q101	8-729-901-01	TRANSISTOR DTC144EK			
		< RESISTOR >			
R101	1-216-097-00	METAL CHIP	100K	5%	1/10W
R102	1-216-095-00	METAL CHIP	82K	5%	1/10W
R103	1-216-091-00	METAL CHIP	56K	5%	1/10W
R104	1-216-099-00	METAL CHIP	120K	5%	1/10W
R105	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R106	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R107	1-216-114-00	METAL GLAZE	510K	5%	1/10W
R108	1-216-105-00	METAL CHIP	220K	5%	1/10W
R109	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R110	1-216-049-00	METAL CHIP	1K	5%	1/10W

BD DISP

Ref. No.	Part No.	Description			Remark
R111	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R112	1-216-083-00	METAL CHIP	27K	5% 1/10W	
R113	1-216-071-00	METAL CHIP	8.2K	5% 1/10W	
R114	1-216-105-00	METAL CHIP	220K	5% 1/10W	
R152	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R153	1-216-085-00	METAL CHIP	33K	5% 1/10W	
R154	1-216-085-00	METAL CHIP	33K	5% 1/10W	
R155	1-216-093-00	METAL CHIP	68K	5% 1/10W	
R156	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R157	1-216-079-00	METAL CHIP	18K	5% 1/10W	
R158	1-216-079-00	METAL CHIP	18K	5% 1/10W	
R159	1-216-079-00	METAL CHIP	18K	5% 1/10W	
R160	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R171	1-216-001-00	METAL CHIP	10	5% 1/10W	
R172	1-216-001-00	METAL CHIP	10	5% 1/10W	
R173	1-216-001-00	METAL CHIP	10	5% 1/10W	
R174	1-216-001-00	METAL CHIP	10	5% 1/10W	
		< VARIABLE RESISTOR >			
RV101	1-238-016-11	RES, ADJ, CARBON 10K (TRACKING GAIN)			
RV102	1-238-016-11	RES, ADJ, CARBON 10K (FOCUS GAIN)			
		< SWITCH >			
S101	1-572-085-11	SWITCH, LEAF (LIMIT IN)			
		**********			
	* A-4617-705-A	DISPLAY BOARD, COMPLETE (MADE IN JAPAN)			
	* A-4617-713-A	DISPLAY BOARD, COMPLETE (MADE IN FRANCE)			
		**********			
	4-944-482-11	SPACER (75X7)			
		< CAPACITOR >			
C401	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C402	1-124-261-00	ELECT	10uF	20% 50V	
C403	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C404	1-124-261-00	ELECT	10uF	20% 50V	
		< CONNECTOR >			
CN401	1-535-883-11	JUMPER, FILM (WITH TERMINAL)			
		< INDICATOR FLUORESCENT >			
FLD401	1-519-611-11	INDICATOR TUBE, FLUORESCENT			

Ref. No.	Part No.	Description			Remark
		< IC >			
IC401	8-752-817-41	IC CXP50112-097Q			
IC402	8-749-920-83	IC GP1U52XB			
		< RESISTOR >			
R402	1-216-065-00	METAL CHIP	4.7K	5% 1/10W	
R403	1-216-065-00	METAL CHIP	4.7K	5% 1/10W	
R404	1-216-079-00	METAL CHIP	18K	5% 1/10W	
R405	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R406	1-216-063-00	METAL CHIP	3.9K	5% 1/10W	
R407	1-216-059-00	METAL CHIP	2.7K	5% 1/10W	
R408	1-216-079-00	METAL CHIP	18K	5% 1/10W	
R409	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R410	1-216-063-00	METAL CHIP	3.9K	5% 1/10W	
R411	1-216-059-00	METAL CHIP	2.7K	5% 1/10W	
R412	1-216-079-00	METAL CHIP	18K	5% 1/10W	
R413	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R414	1-216-063-00	METAL CHIP	3.9K	5% 1/10W	
R415	1-216-059-00	METAL CHIP	2.7K	5% 1/10W	
R416	1-216-079-00	METAL CHIP	18K	5% 1/10W	
R417	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R418	1-216-063-00	METAL CHIP	3.9K	5% 1/10W	
R419	1-216-059-00	METAL CHIP	2.7K	5% 1/10W	
R420	1-216-079-00	METAL CHIP	18K	5% 1/10W	
R421	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R422	1-216-063-00	METAL CHIP	3.9K	5% 1/10W	
R423	1-216-059-00	METAL CHIP	2.7K	5% 1/10W	
R424	1-216-079-00	METAL CHIP	18K	5% 1/10W	
R425	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R426	1-216-063-00	METAL CHIP	3.9K	5% 1/10W	
R427	1-216-059-00	METAL CHIP	2.7K	5% 1/10W	
R428	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R429	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R430	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R431	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R432	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R433	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R434	1-216-079-00	METAL CHIP	18K	5% 1/10W	
R435	1-216-079-00	METAL CHIP	18K	5% 1/10W	
		< SWITCH > (MADE IN JAPAN)			
S401	1-554-303-81	SWITCH, KEY BOARD (1)			
S402	1-554-303-81	SWITCH, KEY BOARD (2)			
S403	1-554-303-81	SWITCH, KEY BOARD (3)			
S404	1-554-303-81	SWITCH, KEY BOARD (4)			
S405	1-554-303-81	SWITCH, KEY BOARD (5)			

When indicating parts by reference number, please include the board name.

DISP LOADING MAIN

Ref. No.	Part No.	Description	Remark
S406	1-554-303-81	SWITCH, KEY BOARD (6)	
S407	1-554-303-81	SWITCH, KEY BOARD (7)	
S408	1-554-303-81	SWITCH, KEY BOARD (8)	
S409	1-554-303-81	SWITCH, KEY BOARD (9)	
S410	1-554-303-81	SWITCH, KEY BOARD (10)	
S411	1-554-303-81	SWITCH, KEY BOARD (11)	
S412	1-554-303-81	SWITCH, KEY BOARD (12)	
S413	1-554-303-81	SWITCH, KEY BOARD (>12)	
S414	1-554-303-81	SWITCH, KEY BOARD (MUSIC SCAN)	
S415	1-554-303-81	SWITCH, KEY BOARD (PEAK SEARCH)	
S416	1-554-303-81	SWITCH, KEY BOARD (CONTINUE)	
S417	1-554-303-81	SWITCH, KEY BOARD (SHUFFLE)	
S419	1-554-303-81	SWITCH, KEY BOARD (EDIT/TIME FADE)	
S420	1-554-303-81	SWITCH, KEY BOARD (▶▶|, ▶▶)	
S421	1-554-303-81	SWITCH, KEY BOARD (|◀◀, ◀◀)	
S422	1-554-303-81	SWITCH, KEY BOARD (■)	
S423	1-554-303-81	SWITCH, KEY BOARD (▮▮)	
S424	1-554-303-81	SWITCH, KEY BOARD (▶)	
S425	1-554-303-81	SWITCH, KEY BOARD (OPEN/CLOSE⏏)	
S426	1-554-303-81	SWITCH, KEY BOARD (CHECK)	
S427	1-554-303-81	SWITCH, KEY BOARD (CLEAR)	
S428	1-554-303-81	SWITCH, KEY BOARD (TIMER)	
S429	1-554-303-81	SWITCH, KEY BOARD (REPEAT)	
S430	1-554-303-81	SWITCH, KEY BOARD (FADER)	
S718	1-554-303-81	SWITCH, KEY BOARD (PROGRAM)	
		< SWITCH > (MADE IN FRANCE)	
S401	1-554-303-52	SWITCH, KEY BOARD (1)	
S402	1-554-303-52	SWITCH, KEY BOARD (2)	
S403	1-554-303-52	SWITCH, KEY BOARD (3)	
S404	1-554-303-52	SWITCH, KEY BOARD (4)	
S405	1-554-303-52	SWITCH, KEY BOARD (5)	
S406	1-554-303-52	SWITCH, KEY BOARD (6)	
S407	1-554-303-52	SWITCH, KEY BOARD (7)	
S408	1-554-303-52	SWITCH, KEY BOARD (8)	
S409	1-554-303-52	SWITCH, KEY BOARD (9)	
S410	1-554-303-52	SWITCH, KEY BOARD (10)	
S411	1-554-303-52	SWITCH, KEY BOARD (11)	
S412	1-554-303-52	SWITCH, KEY BOARD (12)	
S413	1-554-303-52	SWITCH, KEY BOARD (>12)	
S414	1-554-303-52	SWITCH, KEY BOARD (MUSIC SCAN)	
S415	1-554-303-52	SWITCH, KEY BOARD (PEAK SEARCH)	
S416	1-554-303-52	SWITCH, KEY BOARD (CONTINUE)	
S417	1-554-303-52	SWITCH, KEY BOARD (SHUFFLE)	
S419	1-554-303-52	SWITCH, KEY BOARD (EDIT/TIME FADE)	
S420	1-554-303-52	SWITCH, KEY BOARD (▶▶|, ▶▶)	
S421	1-554-303-52	SWITCH, KEY BOARD (|◀◀, ◀◀)	
S422	1-554-303-52	SWITCH, KEY BOARD (■)	
S423	1-554-303-52	SWITCH, KEY BOARD (▮▮)	
S424	1-554-303-52	SWITCH, KEY BOARD (▶)	
S425	1-554-303-52	SWITCH, KEY BOARD (OPEN/CLOSE⏏)	
S426	1-554-303-52	SWITCH, KEY BOARD (CHECK)	
S427	1-554-303-52	SWITCH, KEY BOARD (CLEAR)	
S428	1-554-303-52	SWITCH, KEY BOARD (TIMER)	
S429	1-554-303-52	SWITCH, KEY BOARD (REPEAT)	
S430	1-554-303-52	SWITCH, KEY BOARD (FADER)	
S718	1-554-303-52	SWITCH, KEY BOARD (PROGRAM)	
		< CRYSTAL >	
X401	1-577-358-21	VIBRATOR, CERAMIC (4MHz)	
		**********	
*	1-632-202-11	LOADING BOARD	
		**********	
		< CONNECTOR >	
CN301	* 1-564-707-11	PIN, CONNECTOR (SMALL TYPE) 5P	
		< SWITCH >	
S191	1-572-086-11	SWITCH, LEAF (LOAD OUT)	
S192	1-572-086-11	SWITCH, LEAF (LOAD IN)	
		**********	
*	A-4617-692-A	MAIN BOARD, COMPLETE (MADE IN FRANCE AEP, UK)	
*	A-4617-706-A	MAIN BOARD, COMPLETE (MADE IN JAPAN: AEP, US, Canadian, Australian)	
*	A-4617-708-A	MAIN BOARD, COMPLETE (MADE IN JAPAN: E, Saudi Arabia)	
		**********	
	4-902-345-01	HEAT SINK	
	7-682-547-09	SCREW +B 3X6	
		< CAPACITOR >	
C201	1-124-572-11	ELECT 100uF 20% 63V	
C202	1-123-875-11	ELECT 10uF 20% 50V	
C203	1-124-360-00	ELECT 1000uF 20% 16V	
C204	1-124-898-11	ELECT 4700uF 20% 16V	
C205	1-124-927-11	ELECT 4.7uF 20% 100V	
C206	1-123-875-11	ELECT 10uF 20% 50V	
C207	1-123-875-11	ELECT 10uF 20% 50V	
C208	1-124-472-11	ELECT 470uF 20% 10V	
C209	1-124-472-11	ELECT 470uF 20% 10V	
C210	1-124-120-11	ELECT 220uF 20% 25V	

When indicating parts by reference number, please include the board name.

MAIN

Ref. No.	Part No.	Description			Remark
C211	1-124-472-11	ELECT	470uF	20%	10V
C212	1-124-472-11	ELECT	470uF	20%	10V
C221	1-164-159-11	CERAMIC	0.1uF		50V
C301	1-124-477-11	ELECT	47uF	20%	25V
C302	1-124-791-11	ELECT	1.0uF	20%	100V
C311	1-106-383-00	MYLAR	0.047uF	5%	200V
C312	1-161-374-11	CERAMIC	0.0015uF	20%	50V
C313	1-161-494-00	CERAMIC	0.022uF		25V
C314	1-162-306-11	CERAMIC	0.01uF	20%	16V
C315	1-124-902-00	ELECT	0.47uF	20%	50V
C316	1-161-494-00	CERAMIC	0.022uF		25V
C317	1-164-159-11	CERAMIC	0.1uF		50V
C321	1-161-494-00	CERAMIC	0.022uF		25V
C331	1-162-208-31	CERAMIC	24PF	5%	50V
C332	1-106-220-00	MYLAR	0.1uF	5%	100V
C333	1-161-494-00	CERAMIC	0.022uF		25V
C335	1-162-205-31	CERAMIC	18PF	5%	50V
C341	1-161-494-00	CERAMIC	0.022uF		25V
C342	1-124-477-11	ELECT	47uF	20%	25V
C343	1-161-494-00	CERAMIC	0.022uF		25V
C344	1-161-494-00	CERAMIC	0.022uF		25V
C345	1-124-477-11	ELECT	47uF	20%	25V
C346	1-164-159-11	CERAMIC	0.1uF		50V
C347	1-124-477-11	ELECT	47uF	20%	25V
C348	1-164-159-11	CERAMIC	0.1uF		50V
C349	1-161-494-00	CERAMIC	0.022uF		25V
C350	1-124-477-11	ELECT	47uF	20%	25V
C351	1-161-494-00	CERAMIC	0.022uF		25V
C352	1-124-477-11	ELECT	47uF	20%	25V
C353	1-162-199-31	CERAMIC	10PF	5%	50V
C354	1-162-199-31	CERAMIC	10PF	5%	50V
C355	1-161-494-00	CERAMIC	0.022uF		25V
C356	1-124-477-11	ELECT	47uF	20%	25V
C357	1-124-472-11	ELECT	470uF	20%	10V
C361	1-162-285-31	CERAMIC	180PF	10%	50V
C362	1-162-285-31	CERAMIC	180PF	10%	50V
C363	1-162-283-31	CERAMIC	120PF	10%	50V
C364	1-162-283-31	CERAMIC	120PF	10%	50V
C365	1-162-283-31	CERAMIC	120PF	10%	50V
C366	1-162-283-31	CERAMIC	120PF	10%	50V
C367	1-161-494-00	CERAMIC	0.022uF		25V
C368	1-161-494-00	CERAMIC	0.022uF		25V
C371	1-106-359-00	MYLAR	4700PF	5%	200V
C372	1-106-359-00	MYLAR	4700PF	5%	200V
C373	1-106-345-00	MYLAR	0.0012uF	5%	100V
C374	1-106-345-00	MYLAR	0.0012uF	5%	100V
C375	1-161-494-00	CERAMIC	0.022uF		25V
C376	1-161-494-00	CERAMIC	0.022uF		25V
C377	1-124-477-11	ELECT	47uF	20%	25V
C378	1-124-477-11	ELECT	47uF	20%	25V
C379	1-106-349-00	MYLAR	0.0018uF	5%	100V
C380	1-106-349-00	MYLAR	0.0018uF	5%	100V
C392	1-164-159-11	CERAMIC	0.1uF		50V
C394	1-164-159-11	CERAMIC	0.1uF		50V
		< CONNECTOR >			
CN201	* 1-580-230-11	PIN, CONNECTOR (PC BOARD) 3P			
CN301	* 1-568-843-11	SOCKET, CONNECTOR 28P			
CN302	* 1-568-822-11	SOCKET, CONNECTOR 22P			
CN381	* 1-564-708-11	PIN, CONNECTOR (SMALL TYPE) 6P			
		< DIODE >			
D201	8-719-200-82	DIODE 11ES2			
D202	8-719-109-96	DIODE RD6.8ES-T1B			
D203	8-719-200-82	DIODE 11ES2			
D204	8-719-200-82	DIODE 11ES2			
D205	8-719-200-82	DIODE 11ES2			
D206	8-719-200-82	DIODE 11ES2			
D207	8-719-114-49	DIODE RD7.5JS-T1B2			
D208	8-719-109-89	DIODE RD5.6ES-B2			
D209	8-719-107-94	DIODE 1SS202-1 (MADE IN FRANCE)			
D209	8-719-987-63	DIODE 1N4148M (MADE IN JAPAN)			
D341	8-719-210-21	DIODE 11EQS04			
D351	8-719-107-94	DIODE 1SS202-1 (MADE IN FRANCE)			
D351	8-719-987-63	DIODE 1N4148M (MADE IN JAPAN)			
		< IC >			
IC201	8-759-633-42	IC M5293L			
IC202	8-759-630-21	IC M5290P-16			
IC203	8-759-945-58	IC RC4558P			
IC301	8-752-337-26	IC CXD2500AQ			
IC302	8-752-337-09	IC CXD2554P			
IC303	8-759-917-18	IC SN74HCU04AN			
IC305	8-752-334-87	IC CXD2552Q			
IC306	8-759-990-82	IC TL082CP			
IC307	8-759-945-58	IC RC4558P			
		< JACK >			
J381	1-569-442-11	JACK, PIN 2P (LINE OUT)			
		< COIL >			
L331	1-408-403-00	INDUCTOR 3.3uH			
		< IC LINK >			
PS201⚠	1-532-685-00	LINK, IC (ICP-N20)			
PS202⚠	1-532-637-00	LINK, IC 1.0A (ICP-N25)			

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When indicating parts by reference number, please include the board name.

MAIN POWER SW

Ref. No.	Part No.	Description			Remark
		< TRANSISTOR >			
Q201	8-729-119-76	TRANSISTOR 2SA1175-HFE			
Q202	8-729-140-96	TRANSISTOR 2SD774-34			
Q203	8-729-111-67	TRANSISTOR 2SB1094-L			
Q204	8-729-900-65	TRANSISTOR DTA144ES			
Q205	8-729-900-89	TRANSISTOR DTC144ES			
Q206	8-729-900-89	TRANSISTOR DTC144ES			
Q207	8-729-230-45	TRANSISTOR 2SC2458-YGR			
Q208	8-729-821-73	TRANSISTOR 2SB1274SA-RS			
Q209	8-729-281-52	TRANSISTOR 2SC1815Y-Y			
Q343	8-729-900-65	TRANSISTOR DTA144ES			
Q344	8-729-900-89	TRANSISTOR DTC144ES			
Q371	8-729-141-30	TRANSISTOR 2SC3623A-LK			
Q372	8-729-141-30	TRANSISTOR 2SC3623A-LK			
Q373	8-729-141-30	TRANSISTOR 2SC3623A-LK			
Q374	8-729-141-30	TRANSISTOR 2SC3623A-LK			
		< RESISTOR >			
R201	1-249-435-11	CARBON	33K	5%	1/4W
R202	1-249-438-11	CARBON	56K	5%	1/4W
R203	1-249-429-11	CARBON	10K	5%	1/4W
R204	1-249-425-11	CARBON	4.7K	5%	1/4W
R205	1-249-425-11	CARBON	4.7K	5%	1/4W
R206	1-249-417-11	CARBON	1K	5%	1/4W
R207	1-249-417-11	CARBON	1K	5%	1/4W
R208	1-249-423-11	CARBON	3.3K	5%	1/4W
R209	1-249-413-11	CARBON	470	5%	1/4W
R210	1-249-429-11	CARBON	10K	5%	1/4W
R211	1-249-410-11	CARBON	270	5%	1/4W
R214	1-249-417-11	CARBON	1K	5%	1/4W
R301	1-249-421-11	CARBON	2.2K	5%	1/4W
R302	1-249-421-11	CARBON	2.2K	5%	1/4W
R303	1-249-421-11	CARBON	2.2K	5%	1/4W
R304	1-249-421-11	CARBON	2.2K	5%	1/4W
R311	1-249-423-11	CARBON	3.3K	5%	1/4W
R312	1-249-429-11	CARBON	10K	5%	1/4W
R313	1-249-423-11	CARBON	3.3K	5%	1/4W
R314	1-249-429-11	CARBON	10K	5%	1/4W
R315	1-249-417-11	CARBON	1K	5%	1/4W
R316	1-249-417-11	CARBON	1K	5%	1/4W
R317	1-249-420-11	CARBON	1.8K	5%	1/4W
R318	1-249-441-11	CARBON	100K	5%	1/4W
R321	1-249-417-11	CARBON	1K	5%	1/4W
R322	1-249-417-11	CARBON	1K	5%	1/4W
R323	1-249-417-11	CARBON	1K	5%	1/4W
R324	1-249-418-11	CARBON	1.2K	5%	1/4W
R331	1-249-409-11	CARBON	220	5%	1/4W
R332	1-247-887-00	CARBON	220K	5%	1/4W
R333	1-249-417-11	CARBON	1K	5%	1/4W
R334	1-249-409-11	CARBON	220	5%	1/4W
R341	1-249-393-11	CARBON	10	5%	1/4W
R342	1-249-417-11	CARBON	1K	5%	1/4W
R347	1-249-441-11	CARBON	100K	5%	1/4W
R348	1-249-429-11	CARBON	10K	5%	1/4W
R351	1-249-429-11	CARBON	10K	5%	1/4W
R352	1-249-429-11	CARBON	10K	5%	1/4W
R353	1-249-429-11	CARBON	10K	5%	1/4W
R354	1-249-429-11	CARBON	10K	5%	1/4W
R355	1-247-848-11	CARBON	5.1K	5%	1/4W
R356	1-249-405-11	CARBON	100	5%	1/4W
R361	1-247-838-00	CARBON	2K	5%	1/4W
R362	1-247-838-00	CARBON	2K	5%	1/4W
R363	1-247-838-00	CARBON	2K	5%	1/4W
R364	1-247-838-00	CARBON	2K	5%	1/4W
R365	1-249-432-11	CARBON	18K	5%	1/4W
R366	1-249-432-11	CARBON	18K	5%	1/4W
R367	1-249-432-11	CARBON	18K	5%	1/4W
R368	1-249-432-11	CARBON	18K	5%	1/4W
R369	1-249-419-11	CARBON	1.5K	5%	1/4W
R370	1-249-419-11	CARBON	1.5K	5%	1/4W
R371	1-249-419-11	CARBON	1.5K	5%	1/4W
R372	1-249-419-11	CARBON	1.5K	5%	1/4W
R373	1-247-887-00	CARBON	220K	5%	1/4W
R374	1-247-887-00	CARBON	220K	5%	1/4W
R375	1-249-409-11	CARBON	220	5%	1/4W
R376	1-249-409-11	CARBON	220	5%	1/4W
R377	1-249-409-11	CARBON	220	5%	1/4W
R378	1-249-409-11	CARBON	220	5%	1/4W
R379	1-249-425-11	CARBON	4.7K	5%	1/4W
R380	1-249-425-11	CARBON	4.7K	5%	1/4W
R381	1-249-425-11	CARBON	4.7K	5%	1/4W
R382	1-249-425-11	CARBON	4.7K	5%	1/4W
R383	1-249-414-11	CARBON	560	5%	1/4W
R384	1-249-414-11	CARBON	560	5%	1/4W
		< SWITCH >			
S201 ⚠	1-571-722-11	SWITCH, VOLTAGE SELECTION (E, Saudi Arabia)			
		< CRYSTAL >			
X351	1-579-161-11	VIBRATOR, CRYSTAL (45MHz)			

****

* 1-637-906-11 POWER SW BOARD (MADE IN JAPAN)
* 1-637-906-21 POWER SW BOARD (MADE IN FRANCE)

****

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Replace only with part number specified.

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When indicating parts by reference number, please include the board name.

POWER SW | VOL

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
CN491	* 1-568-953-11	PIN, CONNECTOR 4P	
		< SWITCH >	
S491	1-554-118-00	SWITCH, PUSH (1 KEY) (POWER)	
		**********	
	* 1-637-908-11	VOL BOARD (MADE IN JAPAN)	
	* 1-637-908-21	VOL BOARD (MADE IN FRANCE)	
		**********	
		< CAPACITOR >	
C510	1-124-584-00	ELECT 100uF 20% 10V	
C511	1-163-133-00	CERAMIC CHIP 470PF 5% 50V	
C520	1-124-584-00	ELECT 100uF 20% 10V	
C521	1-163-133-00	CERAMIC CHIP 470PF 5% 50V	
C530	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
		< CONNECTOR >	
CN501	* 1-564-708-11	PIN, CONNECTOR (SMALL TYPE) 6P	
		< IC >	
IC501	8-759-981-89	IC RC4556S	
		< JACK >	
J501	1-568-519-41	JACK, LARGE TYPE (PHONES)	
		< COIL >	
L501	1-424-090-11	COIL, LINE FILTER	
L511	1-424-090-11	COIL, LINE FILTER	
L521	1-424-090-11	COIL, LINE FILTER	
		< RESISTOR >	
R510	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R511	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R512	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R513	1-216-025-00	METAL CHIP 100 5% 1/10W	
R520	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R521	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R522	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R523	1-216-025-00	METAL CHIP 100 5% 1/10W	
		< VARIABLE RESISTOR >	
RV501	1-241-386-11	RES, VAR, CARBON 20K/20K (LEVEL)	

Ref. No.	Part No.	Description	Remark
		MISCELLANEOUS	
		**********	
10 ⚠	1-558-945-21	CORD, POWER (POLAR, SPT-1) (US, Canadian)	
10 ⚠	1-574-127-31	CORD, POWER (MADE IN FRANCE 195/295:AEP)	
10 ⚠	1-574-358-31	CORD, POWER (WITH CONNECTOR)	
10 ⚠	1-574-390-31	CORD, POWER (491:UK)	
10 ⚠	1-574-653-21	CORD, POWER (E)	
10 ⚠	1-575-651-21	CORD, POWER (MADE IN JAPAN	
11 ⚠	1-569-007-11	ADAPTOR, CONVERSION 2P (195/295:E)	
11 ⚠	1-569-008-11	ADAPTOR, CONVERSION 2P	
20	1-575-002-11	WIRE, FLAT TYPE (22 CORE)	
21 *	1-637-906-11	POWER SW BOARD (MADE IN JAPAN)	
21 *	1-637-906-21	POWER SW BOARD (MADE IN FRANCE)	
24 *	1-637-908-11	VOL BOARD (MADE IN JAPAN)	
24 *	1-637-908-21	VOL BOARD (MADE IN FRANCE)	
311 *	1-452-538-11	MAGNET	
354	1-575-001-11	WIRE, FLAT TYPE (12 CORE)	
357 ⚠	8-848-144-11	DEVICE, OPTICAL KSS-240A	
CN401	1-535-883-11	JUMPER, FILM (WITH TERMINAL)	
FLD401	1-519-611-11	INDICATOR TUBE, FLURESCENT	
M101	X-4917-504-1	MOTOR ASSY (SLED)	
M102	X-4917-523-3	MOTOR ASSY (SPINDLE)	
M191	A-4504-363-A	MOTOR (L) ASSY (LOADING)	
T901 ⚠	1-449-921-11	TRANSFORMER, POWER (US, Canadian)	
T901 ⚠	1-449-922-11	TRANSFORMER, POWER (MADE IN JAPAN AEP, Australian)	
T901 ⚠	1-449-923-11	TRANSFORMER, POWER (E, Saudi Arabia)	
T901 ⚠	1-449-925-11	TRANSFORMER, POWER (MADE IN FRANCE AEP, UK)	
		**********	

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When indicating parts by reference number, please include the board name.

Ref. No.	Part No.	Description	Remark
		ACCESSORY & PACKING MATERIAL	
	1-465-635-11	COMMANDER, REMOTE (RM-D295) (MADE IN JAPAN 295/491)	
	1-465-635-21	COMMANDER, REMOTE (RM-D295) (MADE IN FRANCE 295/491)	
	1-558-271-11	CORD, CONNECTION	
	2-181-754-01	COVER (MLY), BATTERY (295/491)	
*	3-750-090-01	INSTRUCTION (MADE IN JAPAN 195:AEP, Canadian/295:Canadian)	
*	3-795-629-15	INSTRUCTION (MADE IN JAPAN 295:AEP)	
	3-752-961-11	MANUAL, INSTRUCTION (ENGLISH, F, E, P) (MADE IN JAPAN 295)	
	3-752-961-21	MANUAL, INSTRUCTION (ENGLISH) (MADE IN JAPAN 491:US)	
	3-752-961-41	MANUAL, INSTRUCTION (D, NL, S, I) (MADE IN JAPAN 295:AEP)	
	3-752-961-51	MANUAL, INSTRUCTION (ENGLISH, F, E, P) (MADE IN FRANCE 295:AEP/491:UK)	
	3-752-961-61	MANUAL, INSTRUCTION (D, NL, S, I) (MADE IN FRANCE 295:AEP)	
	3-752-962-11	MANUAL, INSTRUCTION (ENGLISH, F, E, P) (MADE IN JAPAN 195:AEP, E, Canadian, Saudi Arabia)	
	3-752-962-21	MANUAL, INSTRUCTION (ENGLISH) (MADE IN JAPAN 195:US)	
	3-752-962-51	MANUAL, INSTRUCTION (ENGLISH, F, E, P) (MADE IN FRANCE 195:AEP)	
	3-752-962-41	MANUAL, INSTRUCTION (D, NL, S, I) (MADE IN JAPAN 195:AEP)	
	3-752-962-61	MANUAL, INSTRUCTION (D, NL, S, I) (MADE IN FRANCE 195:AEP)	
*	4-925-389-01	CUSHION (MADE IN JAPAN 195/295/491)	
*	4-929-506-02	CUSHION (MADE IN FRANCE 195/295/491)	
*	4-941-548-01	LABEL, CLASS 1 (EXCEPT US, Canadian)	
*	4-939-718-41	INDIVIDUAL CARTON (MADE IN JAPAN 295)	
*	4-939-718-51	INDIVIDUAL CARTON (MADE IN JAPAN 491)	
*	4-939-718-61	INDIVIDUAL CARTON (MADE IN JAPAN 195)	
*	4-942-897-11	INDIVIDUAL CARTON (MADE IN FRANCE 295:AEP)	
*	4-942-897-21	INDIVIDUAL CARTON (MADE IN FRANCE 195:AEP)	
*	4-942-897-31	INDIVIDUAL CARTON (MADE IN FRANCE 491:UK)	

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HARDWARE LIST

# 1	7-682-548-09	SCREW +BVTT 3X8 (S)
# 2	7-682-547-04	SCREW +BVTT 3X6 (S)
# 3	7-682-547-09	SCREW +B 3X6
# 4	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S
# 5	7-621-775-10	SCREW +B 2.6X4
# 6	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S
# 7	7-621-255-15	SCREW +P 2X3

D: GERMAN F: FRENCH NL: DUTCH S: SWEDISH
E: SPANISH I: ITALIAN P: PORTUGUESE

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