

CDP-M11/M12/M21/M41

SERVICE MANUAL

AEP Model
CDP-M11/M12/M21

UK Model
CDP-M41

E Model
Australian Model
CDP-M11/M21

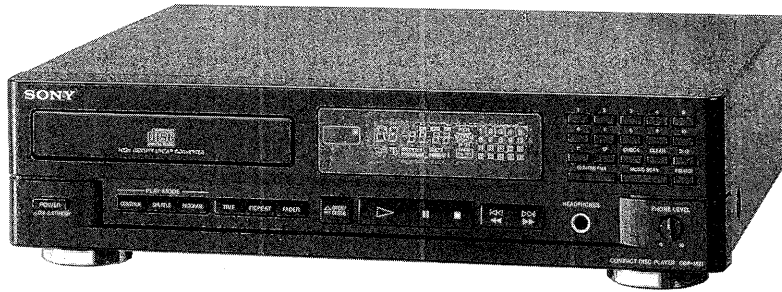


Photo : CDP-M21

SPECIFICATIONS

Compact disc player

Frequency response	2 Hz – 20 kHz \pm 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 (for CDP-195)	Output level max. 10 mW
HEADPHONES (for CDP-M11) (stereo phone jack)	Load impedance 32 ohms

General

Power requirements	Model for Continental Europe (CDP-M11, M12, M21) 220-230V AC, 50/60Hz Model for the United Kingdom (CDP-M21, M41) 240V AC, 50/60Hz
Power consumption	12W
Dimensions (approx. , including Projections)	355x95x305 mm (w/h/d) (14x33/4x121/8 inches)
Weight (approx.)	3.2kg (7 lbs 1 oz)

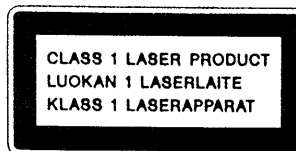
Model Name Using Similar Mechanism	CDP-291/391
CD Mechanism Type	CDM14-5BD1
Optical Pick-Up Block Type	BU-5BD1

Supplied accessories

Audio cord
(2 phono plugs – 2 phono plugs)

Design and specifications subject to change without notice.

For the United Kingdom and
European countries



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

COMPACT DISC PLAYER
SONY[®]



SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK Δ OR DOTTED LINE WITH MARK Δ 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.

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.

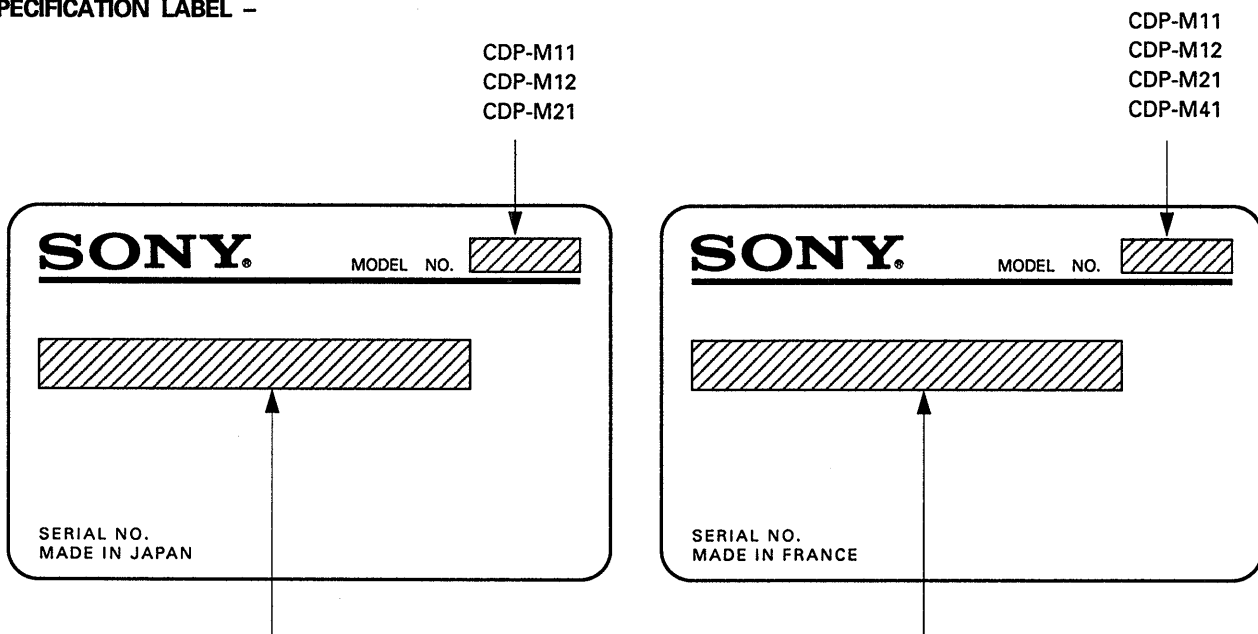
1. Laser Diode Properties
 - Material: GaAlAs
 - Wavelength: 780nm
 - Emission Duration: continuous
 - Laser Output: max.44.6 μ W*
 - * This output is the value measured at a distance of about 200mm from the objective lens surface on the Optical Pick-up Block.
2. During service, do not take the Optical 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 board).

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MODEL IDENTIFICATION

- SPECIFICATION LABEL -



CDP-M11
CDP-M12
CDP-M21

CDP-M11
CDP-M12
CDP-M21
CDP-M41

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)

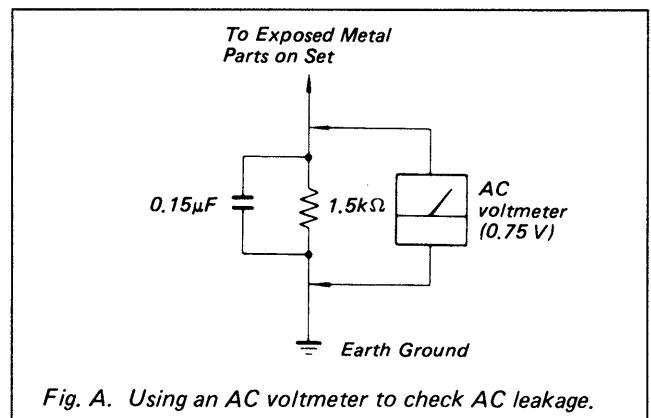
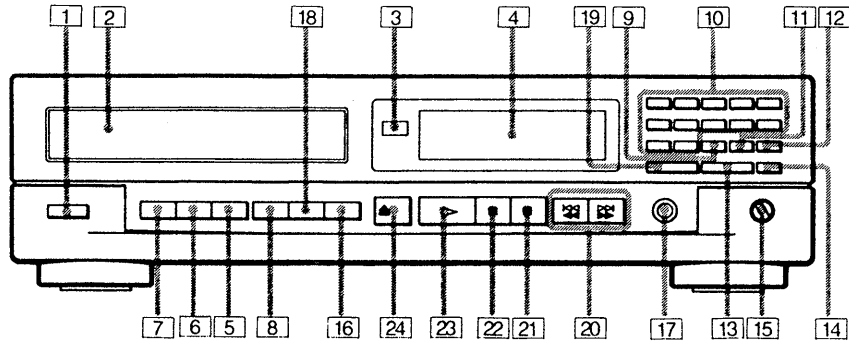


Fig. A. Using an AC voltmeter to check AC leakage.

SECTION 1
GENERAL

1-1. LOCATION OF CONTROLS

This section is extracted from instruction manual.



CDP-M11

- 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 P.SEARCH button
- 15 PHONE LEVEL control
- 16 FADER button
- 17 HEADPHONES jack (EXCEPT CDP-M12)
- 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

1-2. PIN FUNCTION OF IC101 AND IC401

● IC101 (CXA1372Q) PIN FUNCTION

Pin No.	Pin Name	I/O	Description
1	VC	—	GND when two (\pm) 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 connected 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 \pm 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 610k Ω 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 \pm 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 \pm 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-assymetry control input.
32	EFM	O	EFM comparator output.
33	FOK	O	Focus OK.
34	CC2	I	Defect-bottom-hold input (input by capacitive coupling).
35	CC1	O	Defect-bottom-hold output.
36	DVCC	—	Digital power supply. (+5V when \pm dual power supplies in use. +5V when a single power supply is in use.)
37	CB	I	The defect-bottom-hold capacitor is connected 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 \pm 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	DFDCT	I	The defect prevention hold capacitor is connected to this pin.

● 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	RST	I	Reset input.
33	+5V	—	+5V
34	VDD	—	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	Defect 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	INSW	I	Input for loading out switch.
64	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	LED	O	Output for motor volume LED lighting.
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	—	O	Not used (open).
78	—	O	Not used (open).
79	VDL DOWN	O	Output for motor volume down. (This set is not used).
80	VOL UP	O	Output for motor volume up. (This set is not used).

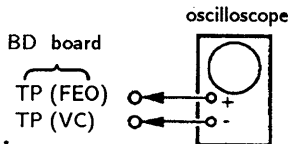
SECTION 2

ELECTRICAL BLOCK CHECKING

Note :

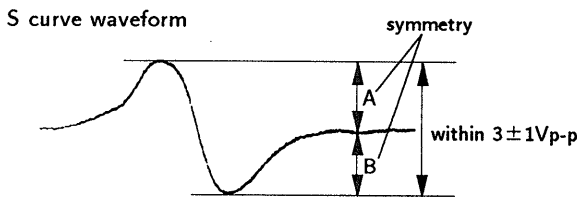
1. CD Block basically constructed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use the oscilloscope with more than 10MΩ impedance.
4. Clean an object lens by an applicator with neutral detergent when the signal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

S Curve Check



Procedure :

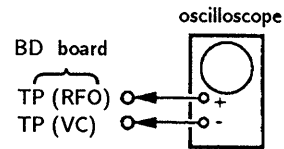
1. Connect oscilloscope to test point TP (FEO) on BD board.
2. Connect between test point TP (FES) and TP (VC) by lead wire.
3. Turned Power switch on and actuate the focus serch. (actuate the focus serch when disc table is moving in and out.)
4. Check the oscilloscope waveform (S curve) is symmetrical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



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

- Note :
- Try to measure 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

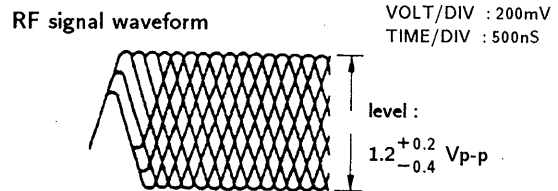


Procedure :

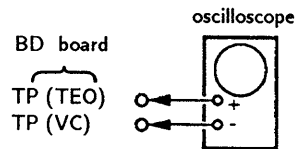
1. Connect oscilloscope to test point TP (RFO) on BD board.
2. Turn Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

Note :

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

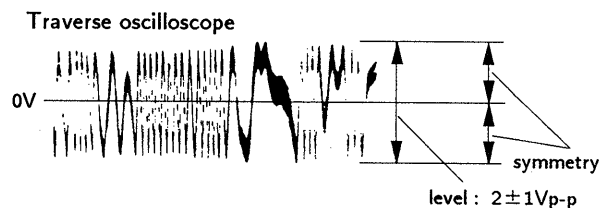


E-F Balance Check



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 oscilloscope waveform is symmetrical on the top and bottom in relation to 0V, and check this level.

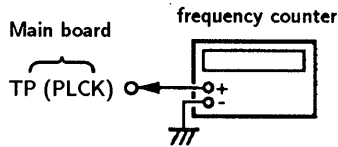


6. Remove the lead wire connected in step 1.

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

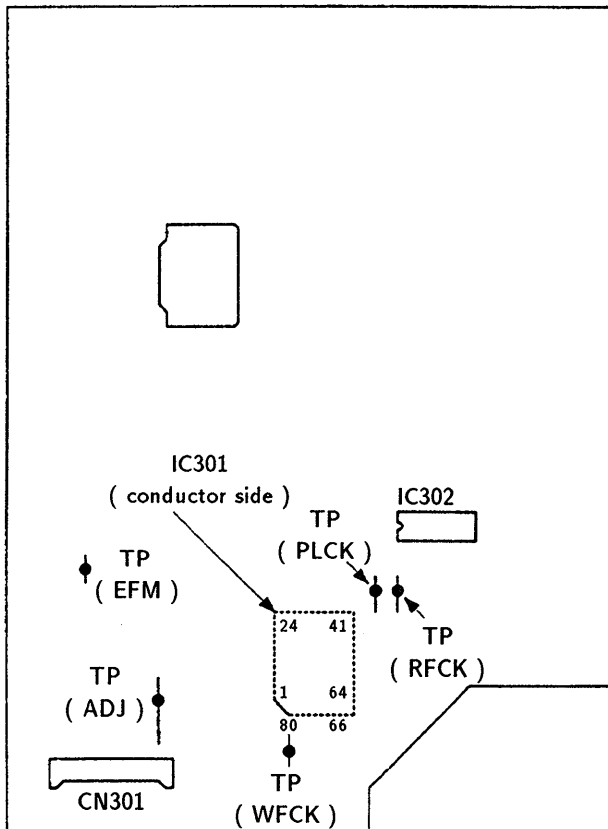
This gain has a margin, so even if it is slightly off. There is no problem.

Therefore, do not perform, this adjustment.

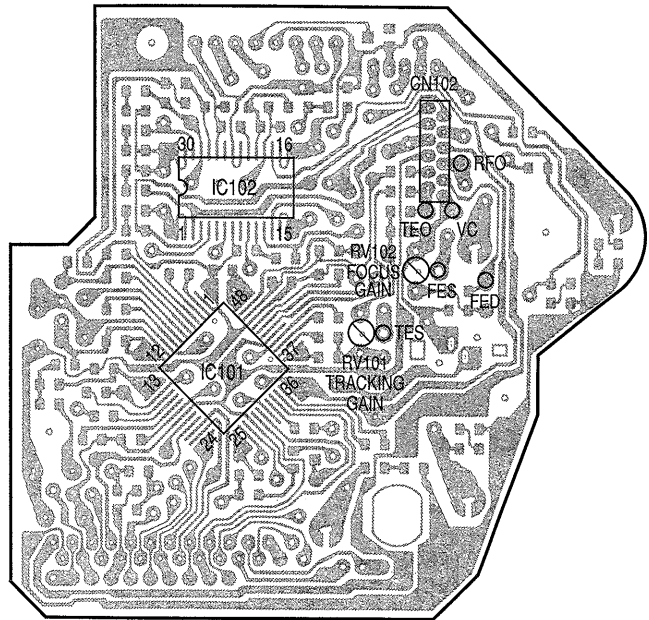
Please note that it should be fixed to mechanical center position when you moved and do not know original position.

Adjustment Location ;

[MAIN BOARD] – Component Side –



[BD BOARD] – Component Side –



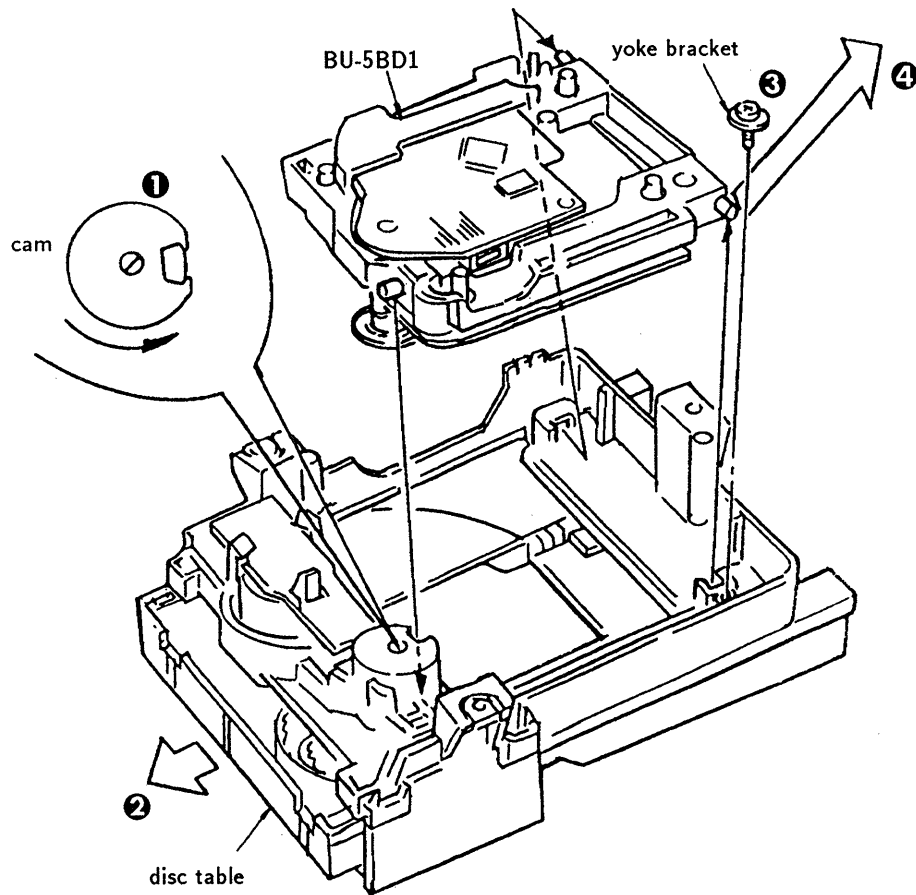
SECTION 3

DISASSEMBLY OF BASEUNIT

Note :

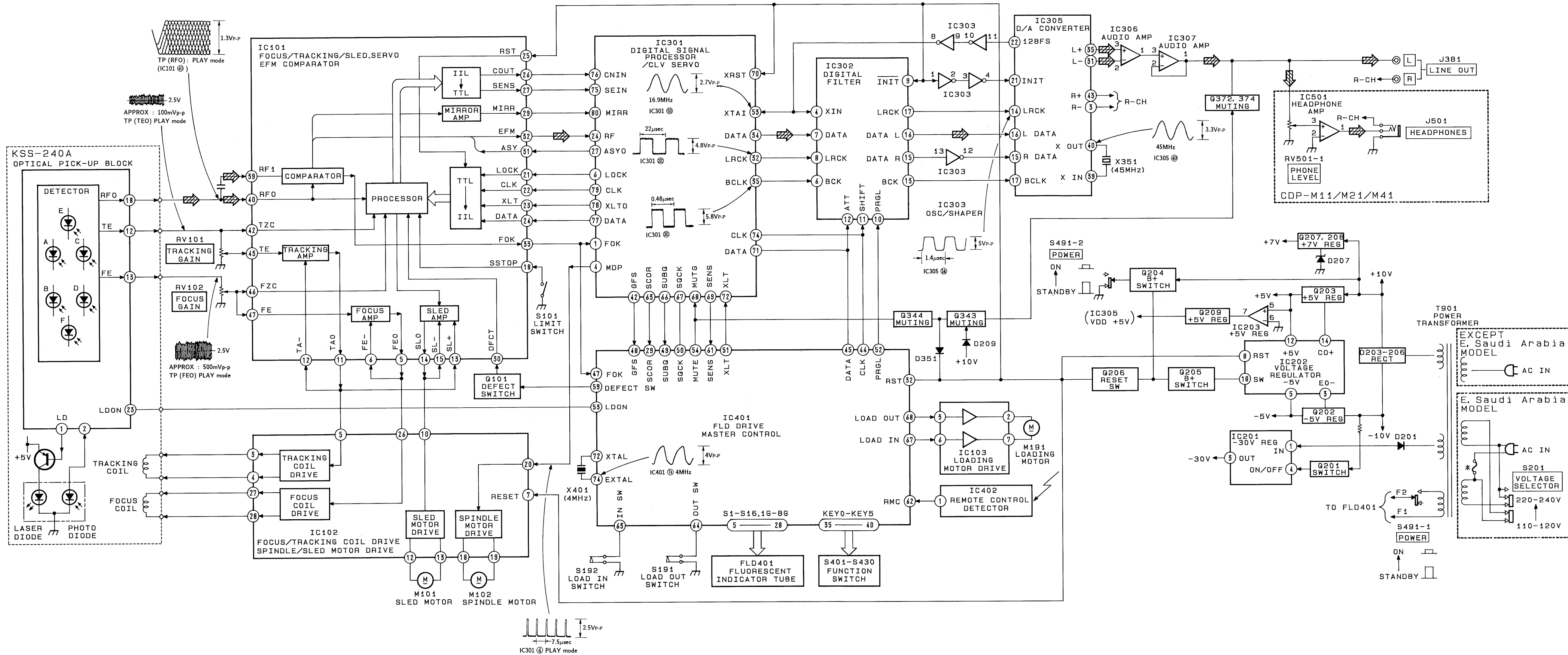
Follow the disassembly procedure in the numerical order given.

- 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.

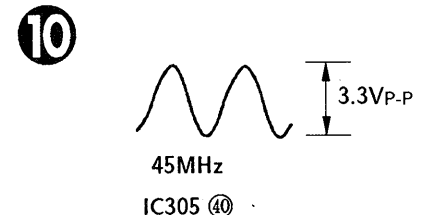
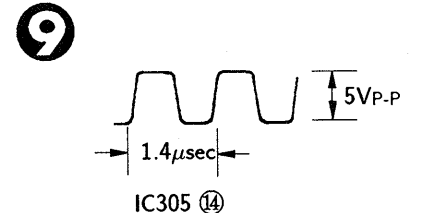
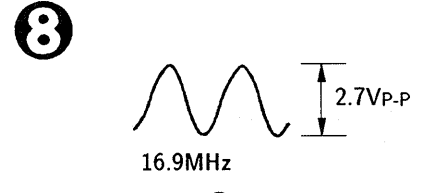
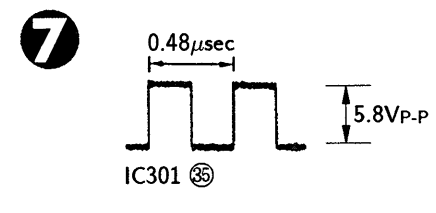
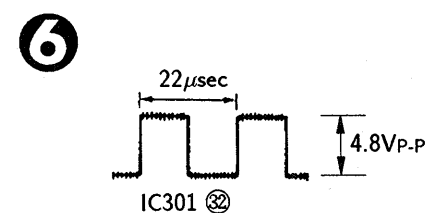
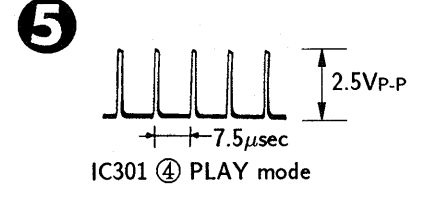
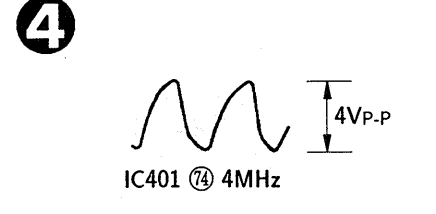
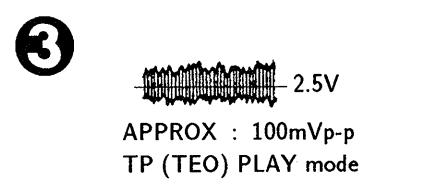
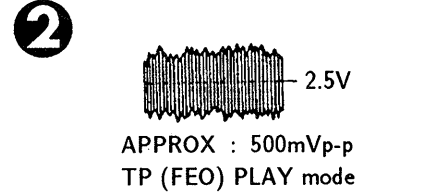
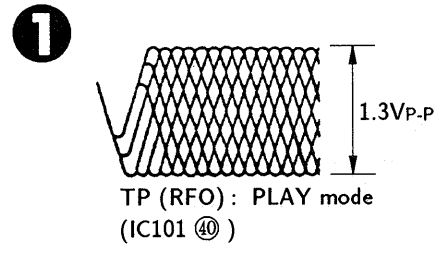


SECTION 4
DIAGRAMS

4-1. BLOCK DIAGRAM



4-2. WAVEFORMS



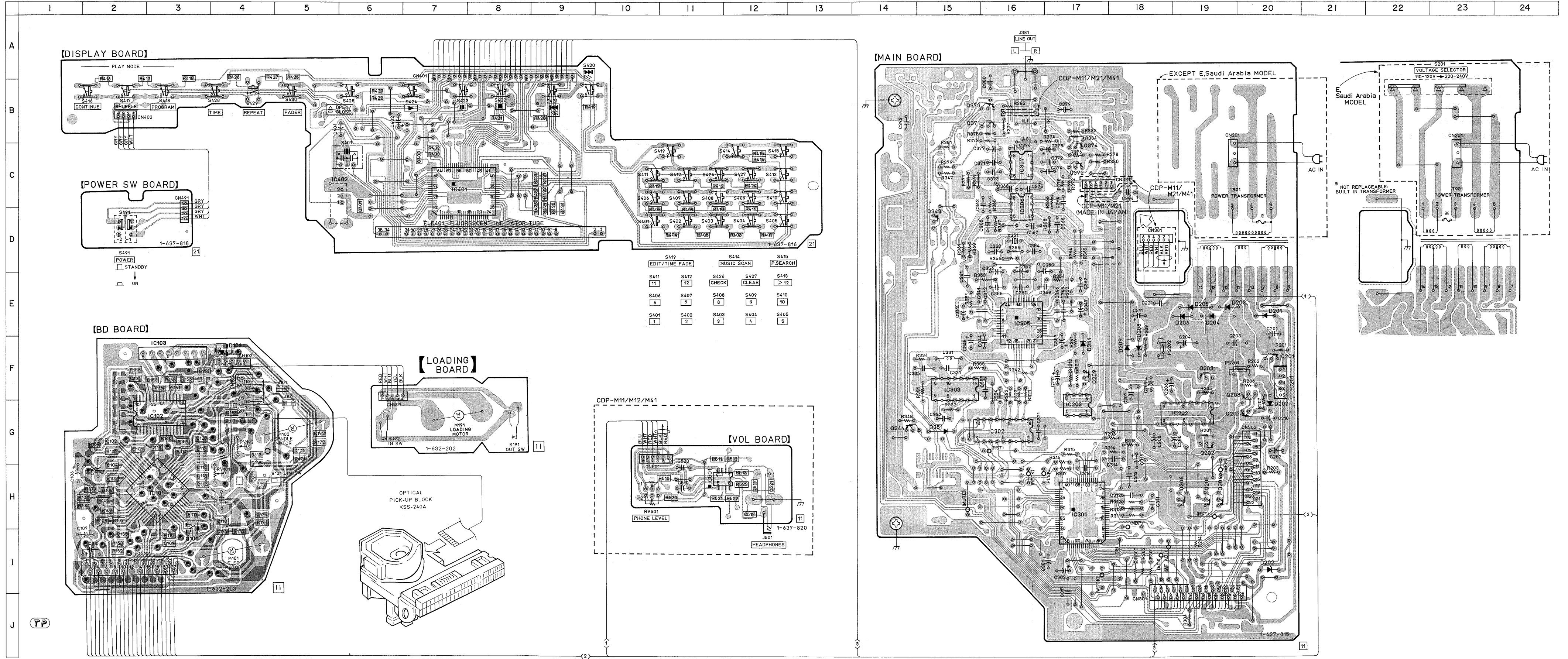
SEMICONDUCTOR LOCATION

Ref. No.	LOCATION No.	Ref. No.	LOCATION No.
D101	F-4	IC306	C-16
D201	E-20	IC307	C-16
D202	I-20	IC401	C-7
D203	E-19	IC402	C-6
D204	E-19	IC501	H-11
D205	E-19		
D206	E-19	Q101	I-3
D207	G-20	Q201	F-20
D208	F-18	Q202	G-19
D209	F-18	Q203	F-19
D341	F-17	Q204	H-19
D351	G-15	Q205	H-19
		Q206	H-19
IC101	H-3	Q207	G-20
IC102	G-3	Q208	F-20
IC103	F-3	Q209	F-17
IC201	F-20	Q343	D-15
IC202	G-19	Q344	G-14
IC203	G-17	Q371	B-16
IC301	H-17	Q372	C-17
IC302	G-16	Q373	B-16
IC303	F-15	Q374	C-17
IC305	F-16		

- Note:
- : indicated a lead wire mounted on the component side.
 - : indicated a lead wire mounted on the conductor side.
 - : Through hole.
 - : Pattern from the side which enables seeing.
 - : Pattern of the rear side.

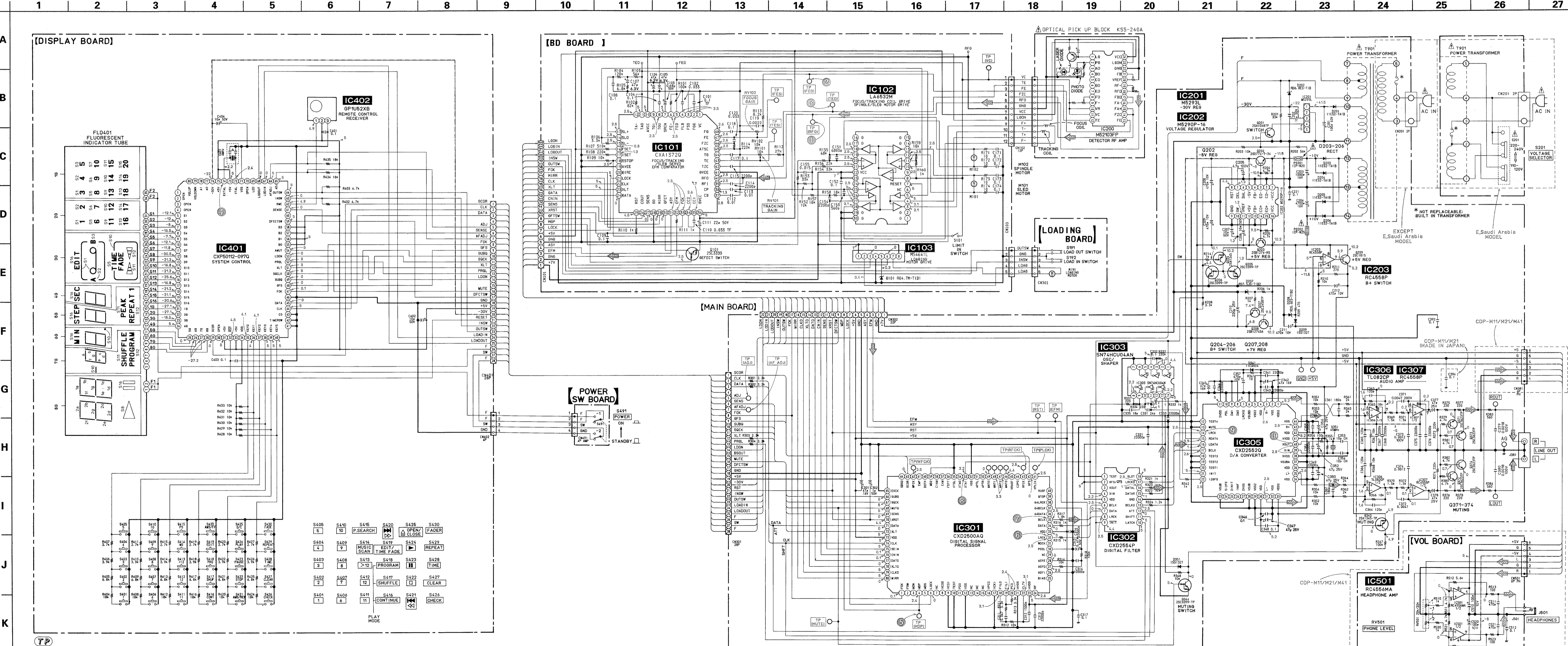
Semiconductor Lead Layouts is inserted on P21.

4-3. PRINTED WIRING BOARDS



S419	S414	S416
EDIT/TIME FADE	MUSIC SCAN	P-SEARCH
S411	S402	S424
11	12	CHECK
S406	S408	S409
6	8	9
S401	S403	S404
1	2	3
		4
		5

4.4. SCHEMATIC DIAGRAM



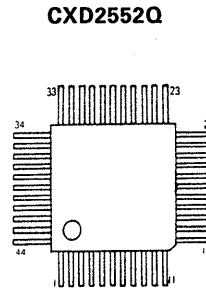
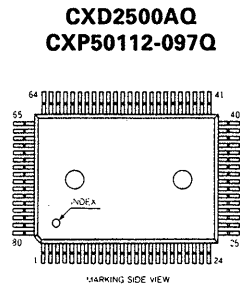
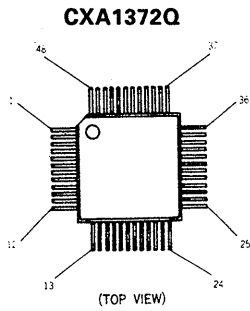
Note:

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

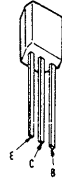
The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

- : B+ Line.
- : B- Line.
- : adjustment for repair.
- Voltagess are DC between measurement points and ground under no-signal (STOP) conditions.
- no mark: PB mode
- Voltagess are taken with a VOM (input impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path
- CD

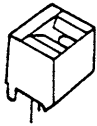
4-5. SEMICONDUCTOR LEAD LAYOUTS



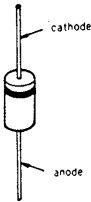
**DTA144ES
DTC144ES
2SC2458-YGR
2SC3623A-LK**



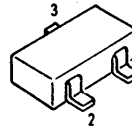
GP1U52XB



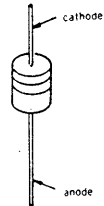
IN4148M



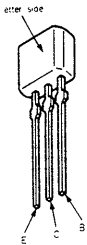
RD4.7M-B1



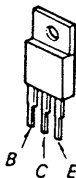
**RD5.6ES-B2
RD6.8ES-B1
RD7.5JS-B2
ISS202-1
11ES2
11EQS04**



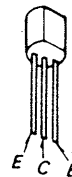
2SA1175-HFE



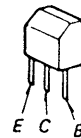
**2SB1094-L
2SB1274SA-RS**



2SC1815-Y

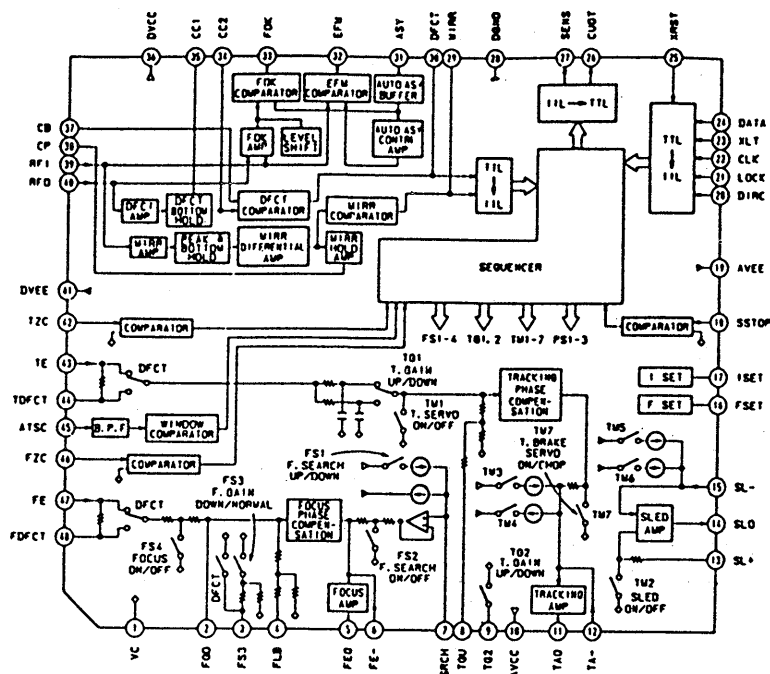


2SD774-34

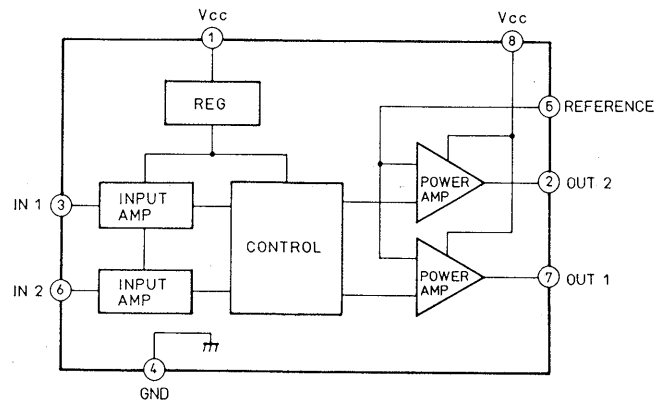


4-6. IC BLOCK DIAGRAMS

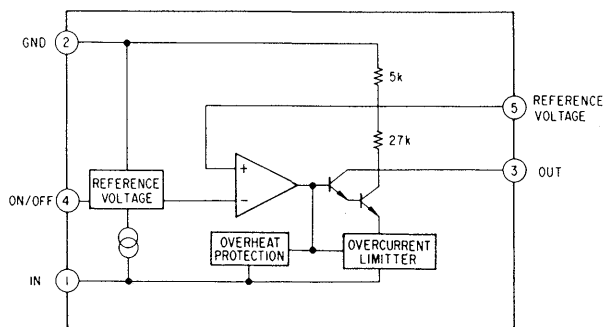
IC101 CXA1372Q



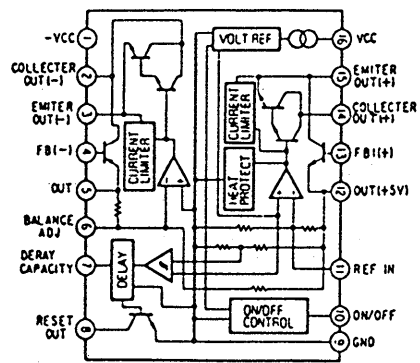
IC103 M54641L



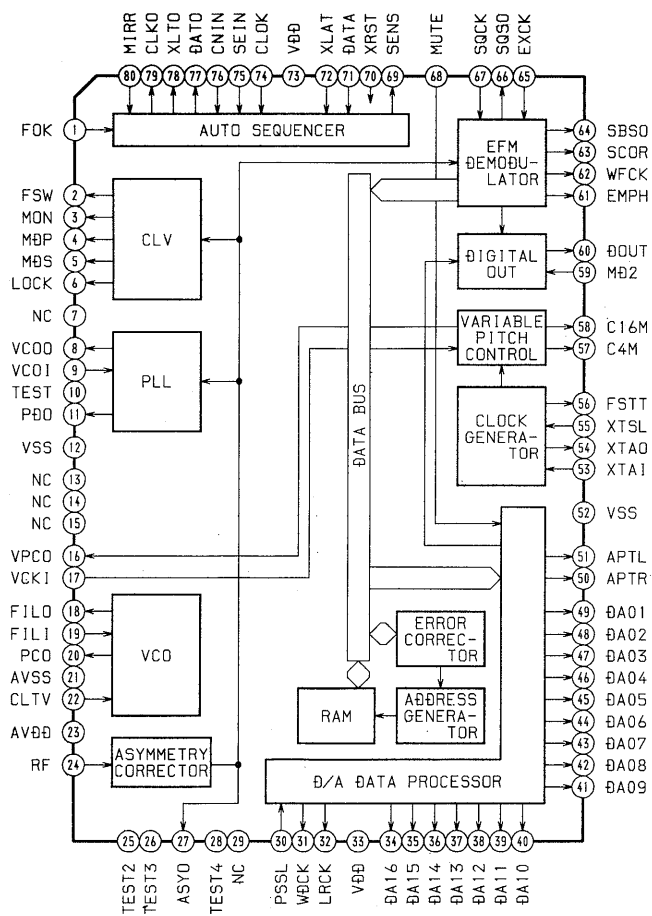
IC201 M5293L



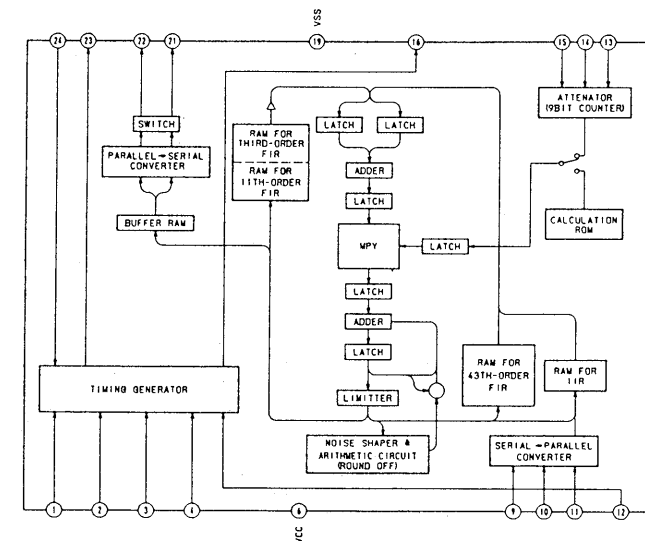
IC202 M5290P-16



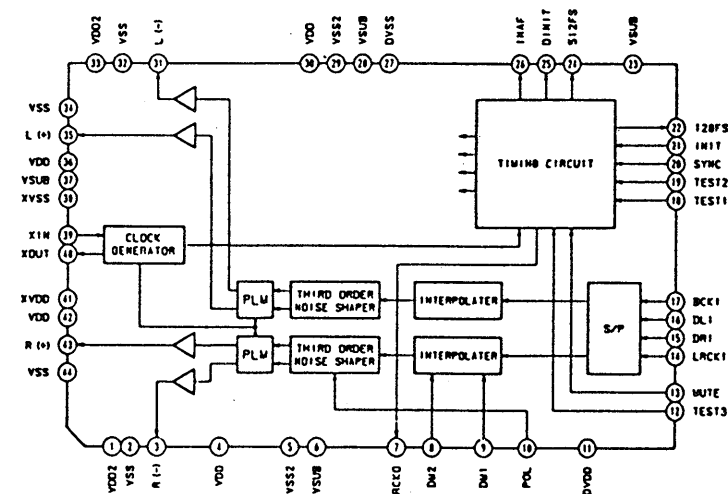
IC301 CXD2500AQ



IC302 CXD2554P

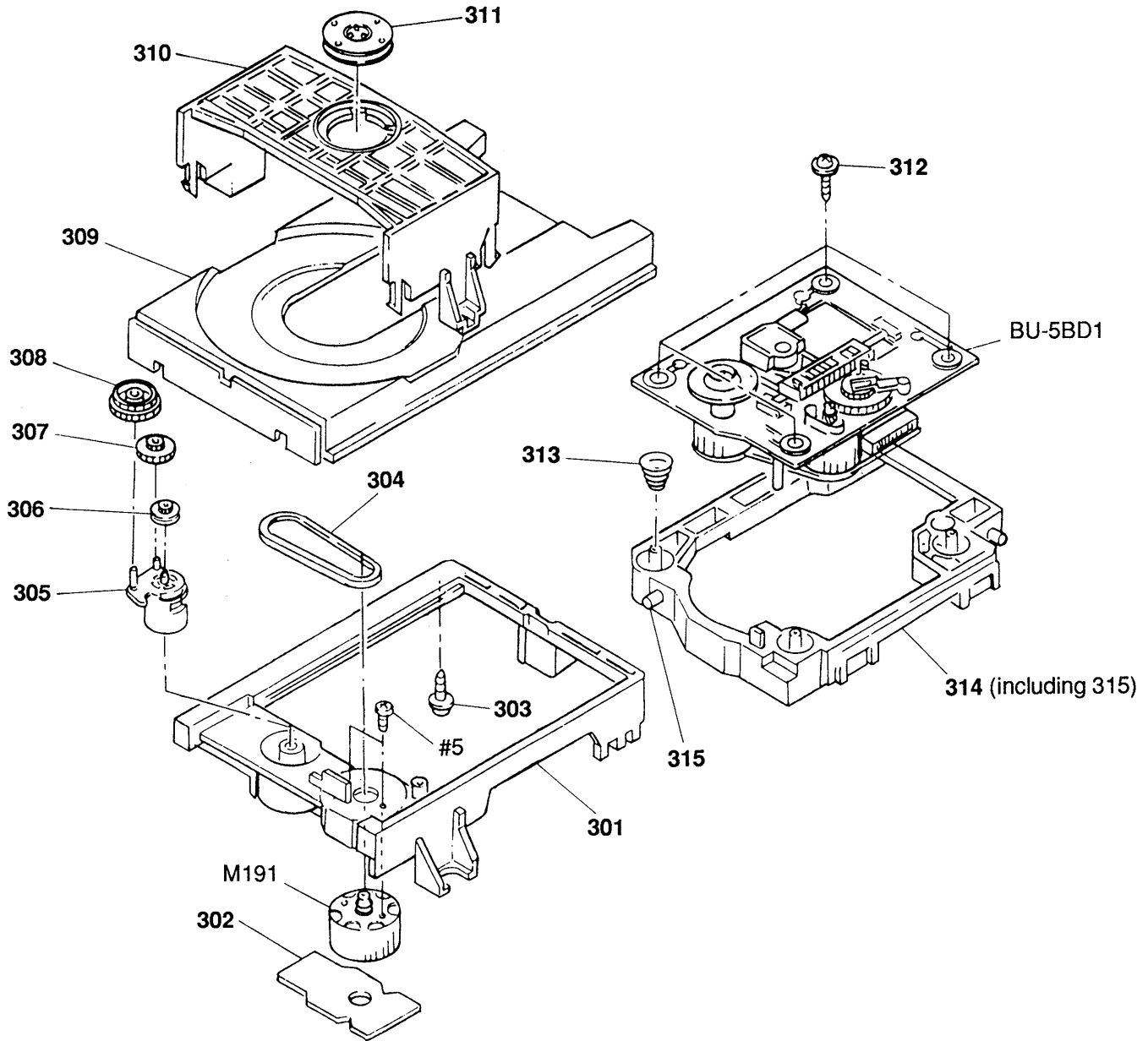


IC305 CXD2552AQ



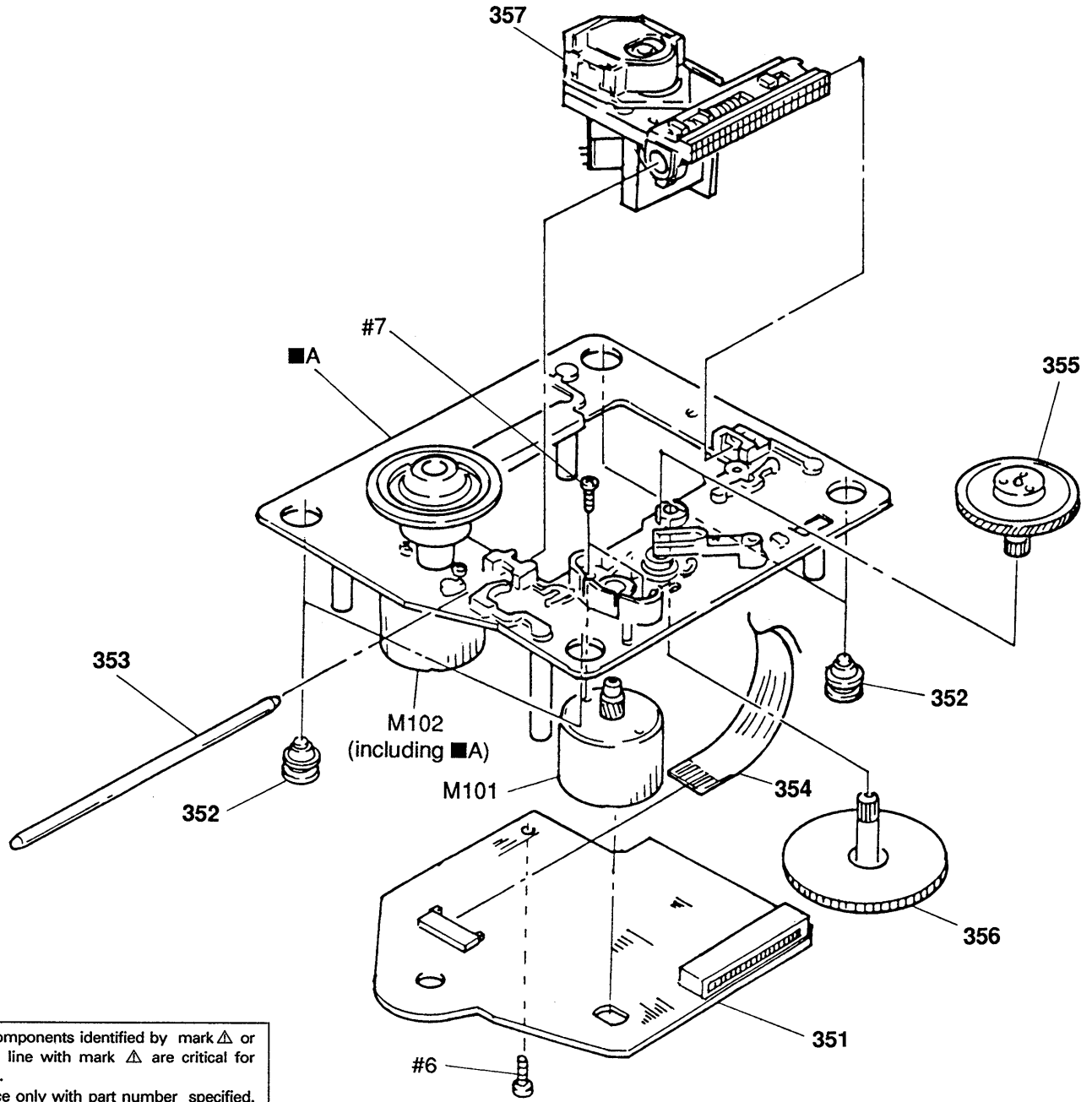
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	4-942-977-01	PLATE, INDICATION (M21:AEP/M41:UK)		16	* 4-941-467-11	PANEL, BACK (MADE IN FRANCE M12:UK)	
1	4-942-977-11	PLATE, INDICATION (M11:AEP/M12:AEP, UK)		16	* 4-941-467-21	PANEL (ALSACE), BACK (MADE IN FRANCE)	
1	4-942-983-01	PLATE, INDICATION (M21:E, Australian)		16	* 4-942-980-31	PANEL, BACK (MADE IN JAPAN M21:AEP)	
1	4-942-983-11	PLATE, INDICATION (M11:E, Australian, Saudi Arabia)		16	* 4-942-980-61	PANEL, BACK (M21:E)	
2	X-4941-318-1	PANEL ASSY, FRONT (M21:AEP)		16	* 4-942-981-01	PANEL, BACK (MADE IN JAPAN M11:AEP)	
2	X-4941-319-1	PANEL ASSY, FRONT (M11:AEP)		16	* 4-942-981-11	PANEL, BACK (M11:Australian)	
2	X-4941-320-1	PANEL ASSY, FRONT (M12:AEP, UK)		16	* 4-942-981-31	PANEL, BACK (M11:E, Saudi Arabia)	
2	X-4941-325-1	PANEL ASSY, FRONT (M21:E, Australian)		16	* 4-942-981-41	PANEL, BACK (M21:Australian)	
2	X-4941-327-1	PANEL ASSY, FRONT (M11:E, Australian, Saudi Arabia)		17	* A-4617-692-A	MAIN BOARD, COMPLETE (MADE IN FRANCE)	
2	X-4941-455-1	PANEL ASSY, FRONT (M41:UK)		17	* A-4617-706-A	MAIN BOARD, COMPLETE (MADE IN JAPAN M11/M21:AEP, Australian)	
2	X-4941-557-1	PANEL ASSY, FRONT (GRAY) (M11:AEP)		17	* A-4617-708-A	MAIN BOARD, COMPLETE (MADE IN JAPAN M11:E, Saudi Arabia/M21:E)	
3	4-928-635-01	SCREW, +8V (2.6X8) TAPPING		17	* A-4617-771-A	MAIN BOARD, COMPLETE (MADE IN JAPAN M12:AEP)	
4	4-922-531-01	KNOB (A TYPE), LOV (M11/M21/M41)		18	4-902-345-01	HEAT SINK	
5	4-927-341-01	BUTTON (POWER)		19	1-575-160-11	WIRE, FLAT TYPE (22 GORE)	
6	* 4-923-103-01	HOLDER, FL TUBE		21	* 4-924-098-31	HOLDER, PC BOARD (EXCEPT M12:AEP)	
8	4-942-979-11	PANEL, LOADING (M21:AEP/M41:UK)		21	* 4-924-098-41	HOLDER, PC BOARD (M12:AEP)	
8	4-942-979-21	PANEL, LOADING (M11:AEP)		22	* 3-349-025-41	HOLDER, PC BOARD	
8	4-942-979-31	PANEL, LOADING (GRAY) (M11:AEP/M12:AEP, UK)		23	4-933-601-01	FOOT	
8	4-942-979-51	PANEL, LOADING (M21:E, Australian)		24	* A-4617-690-A	DISP BOARD, COMPLETE (MADE IN FRANCE)	
8	4-942-979-61	PANEL, LOADING (M11:E, Australian, Saudi Arabia)		24	* A-4617-770-A'	DISP BOARD, COMPLETE (MADE IN JAPAN M12:AEP)	
9	3-704-366-01	SCREW (CASE) (M3X8)		24	* A-4617-777-A	DISP BOARD, COMPLETE (MADE IN JAPAN M11/M21)	
10	4-919-376-31	CASE (MADE IN JAPAN M11/M21)		25	* 1-637-818-11	POWER SW BOARD (MADE IN JAPAN)	
10	4-919-376-51	CASE (MADE IN FRANCE M11/M12:AEP/M41:UK)		25	* 1-637-818-21	POWER SW BOARD (MADE IN FRANCE)	
10	4-919-376-61	CASE (MADE IN FRANCE M12:AEP, UK)		26	* 1-637-820-11	VOL BOARD (MADE IN FRANCE EXCEPT M12)	
10	4-919-376-81	CASE (MADE IN JAPAN M12:AEP), M11: (AEP) GRAY		26	* 1-637-820-21	VOL BOARD (MADE IN LAPAN EXCEPT M12)	
11	⚠ 1-574-127-31	CORD, POWER (MADE IN FRANCE M11/M12/M21:AEP)		CN401	1-535-883-11	JUMPER, FILM (WITH TERMINAL)	
11	⚠ 1-574-358-31	CORD, POWER (WITH CONNECTOR) (M11/M21:Australian)		FLD401	1-519-611-11	INDICATOR TUBE, FLUORESCENT	
11	⚠ 1-574-390-31	CORD, POWER (M12/M41:UK)		T901	⚠ 1-449-922-11	TRANSFORMER, POWER (MADE IN JAPAN M11/M21:AEP, Australian/M12:AEP)	
11	⚠ 1-575-651-21	CORD, POWER (MADE IN JAPAN M11/M12/M21:AEP/M11:Saudi Arabia)		T901	⚠ 1-449-923-11	TRANSFORMER, POWER (MADE IN JAPAN M11:E, Saudi Arabia/M21:E)	
11	⚠ 1-575-653-21	CORD, POWER (M11/M21:E)		T901	⚠ 1-449-925-11	TRANSFORMER, POWER (MADE IN FRANCE AEP, UK)	
12	⚠ 1-569-007-11	ADAPTOR, CONVERSION 2P (M11/M21:E)					
12	⚠ 1-569-008-11	ADAPTOR, CONVERSION 2P (M11:Saudi Arabia)					
14	* 3-703-244-00	BUSHING (2104), CORD					
15	2-383-566-01	SCREW +PTTWH 3X8 S TIGHT (Saudi Arabia)					
15	4-886-821-11	SCREW, S TIGHT, +PTTWH 3X6 (EXCEPT Saudi Arabia)					

(2) MD SECTION (CDM14-5BD1)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
301	4-933-111-01	CHASSIS (MD)		309	4-933-112-01	TABLE, DISK	
302	* 1-632-202-11	LOADING BOARD		310	4-933-110-01	HOLDER (MG)	
303	* 4-917-583-21	BRACKET, YOKE		311	* 1-452-538-11	MAGNET	
304	4-927-649-01	BELT		312	4-933-134-01	SCREW (+PTPWH M2. 6X6)	
305	4-933-109-01	CAM		313	4-917-541-01	SPRING (B)	
306	4-927-651-01	PULLEY (S)		314	4-933-129-01	HOLDER (BU)	
307	4-927-628-01	GEAR (C)		315	4-933-108-01	SHAFT (CAM)	
308	4-933-107-01	GEAR (PL)		M191	A-4604-363-A	MOTOR (L) ASSY (LOADING)	

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



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

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	Δ 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 Δ or dotted line with mark Δ are critical for safety.
Replace only with part number specified.

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...: μ A..., uPA...: μ PA...,
uPB...: μ PB..., uPC...: μ PC...,
uPD...: μ PD...
- CAPACITORS
uF : μ F
- COILS
uH : μ H
- Hardware(# mark) list is given in the last of this parts list.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
	A-4617-161-A	BD BOARD, COMPLETE *****				< CONNECTOR >	
		< CAPACITOR >					
C101	1-163-038-00	CERAMIC CHIP	0.1uF 25V	CN101	1-568-796-11	SOCKET, CONNECTOR 22P	
C102	1-163-989-11	CERAMIC CHIP	0.033uF 10% 25V	CN102	1-568-795-11	SOCKET, CONNECTOR 12P	
C103	1-126-163-11	ELECT	0.68uF 20% 50V	CN103	* 1-564-721-11	PIN, CONNECTOR (SMALL TYPE) 5P	
C104	1-163-038-00	CERAMIC CHIP	0.1uF 25V			< DIODE >	
C105	1-126-154-11	ELECT	47uF 20% 6.3V	D101	8-719-105-72	DIODE RD4.7M-B1	
C106	1-126-154-11	ELECT	47uF 20% 6.3V			< IC >	
C107	1-126-154-11	ELECT	47uF 20% 6.3V	IC101	8-752-050-82	IC SC CXA1372Q	
C108	1-163-038-00	CERAMIC CHIP	0.1uF 25V	IC102	8-759-822-36	IC LA6532M	
C109	1-163-038-00	CERAMIC CHIP	0.1uF 25V	IC103	8-759-633-65	IC M54641L	
C110	1-163-989-11	CERAMIC CHIP	0.033uF 10% 25V			< JACK >	
C111	1-131-367-00	TANTALUM	22uF 10% 20V	J101	1-216-295-00	METAL CHIP 0 5% 1/10W	
C112	1-164-232-11	CERAMIC CHIP	0.01uF 50V	J102	1-216-295-00	METAL CHIP 0 5% 1/10W	
C113	1-164-232-11	CERAMIC CHIP	0.01uF 50V			< TRANSISTOR >	
C114	1-164-161-11	CERAMIC CHIP	0.0022uF 10% 100V	Q101	8-729-901-01	TRANSISTOR DTC144EK	
C115	1-164-161-11	CERAMIC CHIP	0.0022uF 10% 100V			< RESISTOR >	
C117	1-163-038-00	CERAMIC CHIP	0.1uF 25V	R101	1-216-097-00	METAL CHIP 100K 5% 1/10W	
C118	1-163-038-00	CERAMIC CHIP	0.1uF 25V	R102	1-216-095-00	METAL CHIP 82K 5% 1/10W	
C119	1-164-161-11	CERAMIC CHIP	0.0022uF 10% 100V	R103	1-216-091-00	METAL CHIP 56K 5% 1/10W	
C120	1-163-989-11	CERAMIC CHIP	0.033uF 10% 25V	R104	1-216-099-00	METAL CHIP 120K 5% 1/10W	
C151	1-163-019-00	CERAMIC CHIP	0.0068uF 10% 50V	R105	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
C152	1-163-038-00	CERAMIC CHIP	0.1uF 25V	R106	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
C153	1-163-006-11	CERAMIC CHIP	560PF 10% 50V	R107	1-216-114-00	METAL GLAZE 510K 5% 1/10W	
C154	1-164-161-11	CERAMIC CHIP	0.0022uF 10% 100V	R108	1-216-105-00	METAL CHIP 220K 5% 1/10W	
C155	1-163-023-00	CERAMIC CHIP	0.015uF 5% 50V	R109	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
C171	1-163-038-00	CERAMIC CHIP	0.1uF 25V	R110	1-216-049-00	METAL CHIP 1K 5% 1/10W	
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				

BD DISP

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R111	1-216-049-00	METAL CHIP	1K 5% 1/10W			< IC >	
R112	1-216-083-00	METAL CHIP	27K 5% 1/10W	IC401	8-752-817-41	IC CXP50112-097Q	
R113	1-216-071-00	METAL CHIP	8. 2K 5% 1/10W	IC402	8-749-920-83	IC GP1U52XB	
R114	1-216-105-00	METAL CHIP	220K 5% 1/10W			< RESISTOR >	
R152	1-216-073-00	METAL CHIP	10K 5% 1/10W				
R153	1-216-085-00	METAL CHIP	33K 5% 1/10W	R402	1-216-065-00	METAL CHIP	4. 7K 5% 1/10W
R154	1-216-085-00	METAL CHIP	33K 5% 1/10W	R403	1-216-065-00	METAL CHIP	4. 7K 5% 1/10W
R155	1-216-093-00	METAL CHIP	68K 5% 1/10W	R404	1-216-079-00	METAL CHIP	18K 5% 1/10W
R156	1-216-081-00	METAL CHIP	22K 5% 1/10W	R405	1-216-069-00	METAL CHIP	6. 8K 5% 1/10W
R157	1-216-079-00	METAL CHIP	18K 5% 1/10W	R406	1-216-063-00	METAL CHIP	3. 9K 5% 1/10W
R158	1-216-079-00	METAL CHIP	18K 5% 1/10W	R407	1-216-059-00	METAL CHIP	2. 7K 5% 1/10W
R159	1-216-079-00	METAL CHIP	18K 5% 1/10W	R408	1-216-079-00	METAL CHIP	18K 5% 1/10W
R160	1-216-049-00	METAL CHIP	1K 5% 1/10W	R409	1-216-069-00	METAL CHIP	6. 8K 5% 1/10W
R171	1-216-001-00	METAL CHIP	10 5% 1/10W	R410	1-216-063-00	METAL CHIP	3. 9K 5% 1/10W
R172	1-216-001-00	METAL CHIP	10 5% 1/10W	R411	1-216-059-00	METAL CHIP	2. 7K 5% 1/10W
R173	1-216-001-00	METAL CHIP	10 5% 1/10W	R412	1-216-079-00	METAL CHIP	18K 5% 1/10W
R174	1-216-001-00	METAL CHIP	10 5% 1/10W	R413	1-216-069-00	METAL CHIP	6. 8K 5% 1/10W
		< VARIABLE RESISTOR >		R414	1-216-063-00	METAL CHIP	3. 9K 5% 1/10W
RV101	1-238-016-11	RES. ADJ. CARBON 10K (TRACKING GAIN)		R415	1-216-059-00	METAL CHIP	2. 7K 5% 1/10W
RV102	1-238-016-11	RES. ADJ. CARBON 10K (FOCUS GAIN)		R416	1-216-079-00	METAL CHIP	18K 5% 1/10W
		< SWITCH >		R417	1-216-069-00	METAL CHIP	6. 8K 5% 1/10W
S101	1-572-085-11	SWITCH, LEAF (LIMIT IN)		R418	1-216-063-00	METAL CHIP	3. 9K 5% 1/10W
		*****		R419	1-216-059-00	METAL CHIP	2. 7K 5% 1/10W
		* A-4617-690-A DISP BOARD, COMPLETE (MADE IN FRANCE)		R420	1-216-079-00	METAL CHIP	18K 5% 1/10W
		* A-4617-770-A DISP BOARD, COMPLETE (MADE IN JAPAN M12:AEP)		R421	1-216-069-00	METAL CHIP	6. 8K 5% 1/10W
		* A-4617-777-A DISP BOARD, COMPLETE (MADE IN JAPAN M11/M21)		R422	1-216-063-00	METAL CHIP	3. 9K 5% 1/10W
		*****		R423	1-216-059-00	METAL CHIP	2. 7K 5% 1/10W
		* 4-923-103-01 HOLDER, FL TUBE		R424	1-216-079-00	METAL CHIP	18K 5% 1/10W
		< CAPACITOR >		R425	1-216-069-00	METAL CHIP	6. 8K 5% 1/10W
C401	1-163-038-00	CERAMIC CHIP	0. 1uF 25V	R426	1-216-063-00	METAL CHIP	3. 9K 5% 1/10W
C402	1-124-261-00	ELECT	10uF 20% 50V	R427	1-216-059-00	METAL CHIP	2. 7K 5% 1/10W
C403	1-163-038-00	CERAMIC CHIP	0. 1uF 25V	R428	1-216-073-00	METAL CHIP	10K 5% 1/10W
C404	1-124-261-00	ELECT	10uF 20% 50V	R429	1-216-073-00	METAL CHIP	10K 5% 1/10W
		< CONNECTOR >		R430	1-216-073-00	METAL CHIP	10K 5% 1/10W
CN401	1-535-883-11	JUMPER, FILM (WITH TERMINAL)		R431	1-216-073-00	METAL CHIP	10K 5% 1/10W
		< FLUORESCENT INDICATOR TUBE >		R432	1-216-073-00	METAL CHIP	10K 5% 1/10W
FLD401	1-519-611-11	INDICATOR TUBE, FLUORESCENT		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	1-554-303-52	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)	

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

DISP

LOADING

MAIN

Ref. No.	Part No.	Description	Remark
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 (P. SEARCH)	
S416	1-554-303-52	SWITCH, KEY BOARD (CONTINUE)	
S417	1-554-303-52	SWITCH, KEY BOARD (SHUFFLE)	
S418	1-554-303-52	SWITCH, KEY BOARD (PROGRAM)	
S419	1-554-303-52	SWITCH, KEY BOARD (EDIT/TIME FADE)	
S420	1-554-303-52	SWITCH, KEY BOARD (▶▶▶I.▶▶▶)	
S421	1-554-303-52	SWITCH, KEY BOARD (◀◀◀I.◀◀◀)	
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 (TIME)	
S429	1-554-303-52	SWITCH, KEY BOARD (REPEAT)	
S430	1-554-303-52	SWITCH, KEY BOARD (FADER)	
< SWITCH > (MADE IN FRANCE)			
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)	
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 (P. SEARCH)	
S416	1-554-303-81	SWITCH, KEY BOARD (CONTINUE)	
S417	1-554-303-81	SWITCH, KEY BOARD (SHUFFLE)	
S418	1-554-303-81	SWITCH, KEY BOARD (PROGRAM)	
S419	1-554-303-81	SWITCH, KEY BOARD (EDIT/TIME FADE)	
S420	1-554-303-81	SWITCH, KEY BOARD (▶▶▶I.▶▶▶)	

Ref. No.	Part No.	Description	Remark
S421	1-554-303-81	SWITCH, KEY BOARD (◀◀◀I.◀◀◀)	
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 (TIME)	
S429	1-554-303-81	SWITCH, KEY BOARD (REPEAT)	
S430	1-554-303-81	SWITCH, KEY BOARD (FADER)	
< CERAMIC >			
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 (OUT SW)	
S192	1-572-086-11	SWITCH, LEAF (IN SW)	

* A-4617-692-A MAIN BOARD, COMPLETE (MADE IN FRANCE)			
* A-4617-706-A MAIN BOARD, COMPLETE			
(MADE IN JAPAN M11/M21:AEP, Australian)			
* A-4617-708-A MAIN BOARD, COMPLETE			
(MADE IN JAPAN M11:E, Saudi Arabia)			
* A-4617-771-A MAIN BOARD, COMPLETE			
(MADE IN JAPAN M12:AEP)			

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	Ref. No.	Part No.	Description	Remark
C211	1-124-472-11	ELECT	470uF 20% 10V	C377	1-124-477-11	ELECT	47uF 20% 25V
C212	1-124-472-11	ELECT	470uF 20% 10V	C378	1-124-477-11	ELECT	47uF 20% 25V
C221	1-164-159-11	CERAMIC	0.1uF 50V	C379	1-106-349-00	MYLAR	0.0018uF 5% 100V
C301	1-124-477-11	ELECT	47uF 20% 25V	C380	1-106-349-00	MYLAR	0.0018uF 5% 100V
C302	1-124-791-11	ELECT	1.0uF 20% 100V	C392	1-164-159-11	CERAMIC	0.1uF 50V
C311	1-106-383-00	MYLAR	0.047uF 5% 200V	C394	1-164-159-11	CERAMIC	0.1uF 50V
C312	1-161-374-11	CERAMIC	0.0015uF 20% 50V			(MADE IN JAPAN M11/M21)	
C313	1-161-494-00	CERAMIC	0.022uF 25V			< CONNECTOR >	
C314	1-162-306-11	CERAMIC	0.01uF 20% 16V	CN201	*1-580-230-11	PIN, CONNECTOR (PC BOARD)	3P
C315	1-124-902-00	ELECT	0.47uF 20% 50V	CN301	*1-568-843-11	SOCKET, CONNECTOR	28P
C316	1-161-494-00	CERAMIC	0.022uF 25V	CN302	*1-568-822-11	SOCKET, CONNECTOR	22P
C317	1-164-159-11	CERAMIC	0.1uF 50V	CN381	*1-564-708-11	PIN, CONNECTOR (SMALL TYPE)	6P
C321	1-161-494-00	CERAMIC	0.022uF 25V			(EXCEPT M12)	
C331	1-162-208-31	CERAMIC	24PF 5% 50V			< DIODE >	
C332	1-106-220-00	MYLAR	0.1uF 5% 100V	D201	8-719-200-82	DIODE 11ES2	
C333	1-161-494-00	CERAMIC	0.022uF 25V	D202	8-719-109-96	DIODE RD6.8ES-B1	
C335	1-162-205-31	CERAMIC	18PF 5% 50V	D203	8-719-200-82	DIODE 11ES2	
C341	1-161-494-00	CERAMIC	0.022uF 25V	D204	8-719-200-82	DIODE 11ES2	
C342	1-124-477-11	ELECT	47uF 20% 25V	D205	8-719-200-82	DIODE 11ES2	
C343	1-161-494-00	CERAMIC	0.022uF 25V	D206	8-719-200-82	DIODE 11ES2	
C344	1-161-494-00	CERAMIC	0.022uF 25V	D207	8-719-114-49	DIODE RD7.5JS-B2	
C345	1-124-477-11	ELECT	47uF 20% 25V	D208	8-719-109-89	DIODE RD5.6ES-B2	
C346	1-164-159-11	CERAMIC	0.1uF 50V	D209	8-719-107-94	DIODE 1SS202-1 (MADE IN JAPAN M12:	
C347	1-124-477-11	ELECT	47uF 20% 25V			Saudi Arabia/M12:AEP)	
C348	1-164-159-11	CERAMIC	0.1uF 50V	D209	8-719-987-63	DIODE 1N4148M (MADE IN JAPAN M11:	
C349	1-161-494-00	CERAMIC	0.022uF 25V			Saudi Arabia/M12:AEP)	
C350	1-124-477-11	ELECT	47uF 20% 25V	D341	8-719-210-21	DIODE 11EQS04-TA1B	
C351	1-161-494-00	CERAMIC	0.022uF 25V	D351	8-719-107-94	DIODE 1SS202-1 (MADE IN JAPAN	
C352	1-124-477-11	ELECT	47uF 20% 25V			EXCEPT M11: Saudi Arabia/M12:AEP)	
C353	1-162-199-31	CERAMIC	10PF 5% 50V	D351	8-719-987-63	DIODE 1N4148M (MADE IN JAPAN M11:	
C354	1-162-199-31	CERAMIC	10PF 5% 50V			Saudi Arabia/M12:AEP)	
C355	1-161-494-00	CERAMIC	0.022uF 25V			< IC >	
C356	1-124-477-11	ELECT	47uF 20% 25V	IC201	8-759-633-42	IC M5293L	
C357	1-124-472-11	ELECT	470uF 20% 10V	IC202	8-759-630-21	IC M5290P-16	
C361	1-162-285-31	CERAMIC	180PF 10% 50V	IC203	8-759-945-58	IC RC4558P	
C362	1-162-285-31	CERAMIC	180PF 10% 50V	IC301	8-752-337-26	IC CXD2500AQ	
C363	1-162-283-31	CERAMIC	120PF 10% 50V	IC302	8-752-337-09	IC CXD2554P	
C364	1-162-283-31	CERAMIC	120PF 10% 50V	IC303	8-759-917-18	IC SN74HCU04AN	
C365	1-162-283-31	CERAMIC	120PF 10% 50V	IC305	8-752-334-87	IC CXD2552Q	
C366	1-162-283-31	CERAMIC	120PF 10% 50V	IC306	8-759-990-82	IC TL082CP	
C367	1-161-494-00	CERAMIC	0.022uF 25V	IC307	8-759-945-58	IC RC4558P	
C368	1-161-494-00	CERAMIC	0.022uF 25V			< JACK >	
C371	1-106-359-00	MYLAR	4700PF 5% 200V	J381	1-569-442-11	JACK, PIN 2P (LINE OUT)	
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				

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

MAIN

Ref. No.	Part No.	Description	Remark
		< COIL >	
L331	1-408-403-00	INDUCTOR 3.3uH	
		< IC LINK >	
PS201	△ 1-532-685-00	LINK, IC	
PS202	△ 1-532-637-00	LINK, IC 1.0A	
		< 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 2SC2458TP-YGR	
Q208	8-729-111-67	TRANSISTOR 2SB1094-L	
Q208	8-729-821-73	TRANSISTOR 2SB1274SA-RS (MADE IN JAPAN M12:AEP)	
Q209	8-729-281-52	TRANSISTOR 2SC1815-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	

Ref. No.	Part No.	Description	Remark
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	

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

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

MAIN

POWER SW

VOL

Ref. No.	Part No.	Description	Remark
		< SWITCH >	
S201	△ 1-571-722-11	SWITCH, VOLTAGE SELECTION (E, Saudi Arabia)	
		< CRYSTAL >	
X351	1-579-161-11	VIBRATOR, CRYSTAL (45MHz)	

	* 1-637-818-11	POWER SW BOARD (MADE IN JAPAN)	
	* 1-637-818-21	POWER SW BOARD (MADE IN FRANCE)	

		< CONNECTOR >	
CN491	* 1-568-953-11	PIN, CONNECTOR 4P	
		< SWITCH >	
S491	1-554-118-00	SWITCH, PUSH (1 KEY) (POWER)	

	* 1-637-820-11	VOL BOARD (MADE IN JAPAN EXCEPT M12)	
	* 1-637-820-21	VOL BOARD (MADE IN FRANCE EXCEPT M12)	

		< CAPACITOR >	
C510	1-124-584-00	ELECT 100uF 20% 10V	
C511	1-163-133-00	CERAMIC CHIP 470PF 5% 50V	
C512	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C520	1-124-584-00	ELECT 100uF 20% 10V	
C521	1-163-133-00	CERAMIC CHIP 470PF 5% 50V	
		< CONNECTOR >	
CN501	* 1-564-708-11	PIN, CONNECTOR (SMALL TYPE) 6P	
		< IC >	
IC501	8-759-981-86	IC RC4556MA	
		< JACK >	
J501	1-568-519-41	JACK, LARGE TYPE (HEADPHONES)	
		< 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	

Ref. No.	Part No.	Description	Remark
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 (PHONE LEVEL)	
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MISCELLANEOUS

11	△ 1-574-127-31	CORD, POWER (MADE IN FRANCE M11/M12/M21:AEP)	
11	△ 1-574-358-31	CORD, POWER (WITH CONNECTOR) (M11/M21:Australian)	
11	△ 1-574-390-31	CORD, POWER (M12/M41:UK)	
11	△ 1-575-651-21	CORD, POWER (MADE IN JAPAN M11/M12/M21:AEP/M11:Saudi Arabia)	
11	△ 1-575-653-21	CORD, POWER (M11/M21:E)	
12	△ 1-569-007-11	ADAPTOR, CONVERSION 2P (M11/M21:E)	
12	△ 1-569-008-11	ADAPTOR, CONVERSION 2P (M11:Saudi Arabia)	
19	1-575-160-11	WIRE, FLAT TYPE (22 CORE)	
25	* 1-637-818-11	POWER SW BOARD (MADE IN JAPAN)	
25	* 1-637-818-21	POWER SW BOARD (MADE IN FRANCE)	
26	* 1-637-820-11	VOL BOARD (MADE IN FRANCE EXCEPT M12)	
26	* 1-637-820-21	VOL BOARD (MADE IN LAPAN EXCEPT M12)	
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, FLUORESCENT	
T901	△ 1-449-922-11	TRANSFORMER, POWER (MADE IN JAPAN M11/M21:AEP, Australian/M12:AEP)	
T901	△ 1-449-923-11	TRANSFORMER, POWER (MADE IN JAPAN M11:E, Saudi Arabia/M21:E)	
T901	△ 1-449-925-11	TRANSFORMER, POWER (MADE IN FRANCE AEP, UK)	

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

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

Ref. No.	Part No.	Description	Remark
ACCESSORY & PACKING MATERIAL			
1-465-635-11		REMOTE, COMMANDER RM-D295 (MADE IN JAPAN M12)	
1-465-635-21		REMOTE, COMMANDER RM-D295 (MADE IN FRANCE M12)	
1-558-271-11		CORD, CONNECTION	
3-752-961-11		MANUAL, INSTRUCTION (MADE IN JAPAN M21)	
3-752-961-41		MANUAL, INSTRUCTION (MADE IN JAPAN M21:AEP)	
3-752-961-51		MANUAL, INSTRUCTION (E, F, SP, P) (MADE IN FRANCE M21:AEP/M41:UK)	
3-752-961-61		MANUAL, INSTRUCTION (G, D, SW, I) (MADE IN FRANCE M21:AEP)	
3-752-962-11		MANUAL, INSTRUCTION (MADE IN JAPAN M11)	
3-752-962-41		MANUAL, INSTRUCTION (G, D, SW, I) (MADE IN JAPAN M11:AEP)	
3-752-962-51		MANUAL, INSTRUCTION (E, F, SP, P) (MADE IN FRANCE M11:AEP)	
3-752-962-61		MANUAL, INSTRUCTION (G, D, SW, I) (MADE IN FRANCE M11:AEP)	
* 3-795-629-15		INSTRUCTION (MADE IN JAPAN M11/M12/ M21:AEP)	
* 3-795-629-45		INSTRUCTION (MADE IN FRANCE M12:AEP)	
* 4-922-998-03		CUSHION (MADE IN JAPAN M11/M12/M21)	
* 4-927-355-02		CUSHION (MADE IN FRANCE:AEP, UK)	
* 4-941-548-01		LABEL, CLASS 1	
* 4-942-898-21		INDIVIDUAL CARTON (MADE IN FRANCE M11:AEP)	
* 4-942-898-31		INDIVIDUAL CARTON (MADE IN FRANCE M12:AEP, UK)	
* 4-944-042-01		INDIVIDUAL CARTON (MADE IN JAPAN M11)	
* 4-944-042-11		INDIVIDUAL CARTON (MADE IN JAPAN M12)	
* 4-944-042-21		INDIVIDUAL CARTON (MADE IN JAPAN M21)	
* 4-942-898-11		INDIVIDUAL CARTON (MADE IN FRANCE M12)	

HARDWARE LIST

#1	7-682-548-09	SCREW +BVTT 3X8 (S)
#2	7-682-547-04	SCREW +BVTT 3X6 (S)
#3	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S
#4	7-682-547-09	SCREW +B 3X6
#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: DUTCH
 E: ENGLISH
 F: FRENCH
 G: GERMAN
 I: ITALIAN
 P: PORTUGUESE
 SP: SPANISH
 SW: SWEDISH

CDP-M11/M12/M21/M41

SONY[®] SERVICE MANUAL

AEP Model
CDP-M/11M/12/M21

UK Model
CDP-M41

E Model
CDP-M/11/M21

Australian Model
CDP-M11/M21

SUPPLEMENT-2

File this supplement with the service manual.

Subject: Display Board Circuit Modification

This supplement updates the service manual to include production changes. Refer to this supplement when the set has 64 pins IC401 on the display board. (When IC401 has 80 pins, please refer to the service manual previously issued.)

SECTION 1 DIAGRAMS

1-1. IC PIN FUNCTION

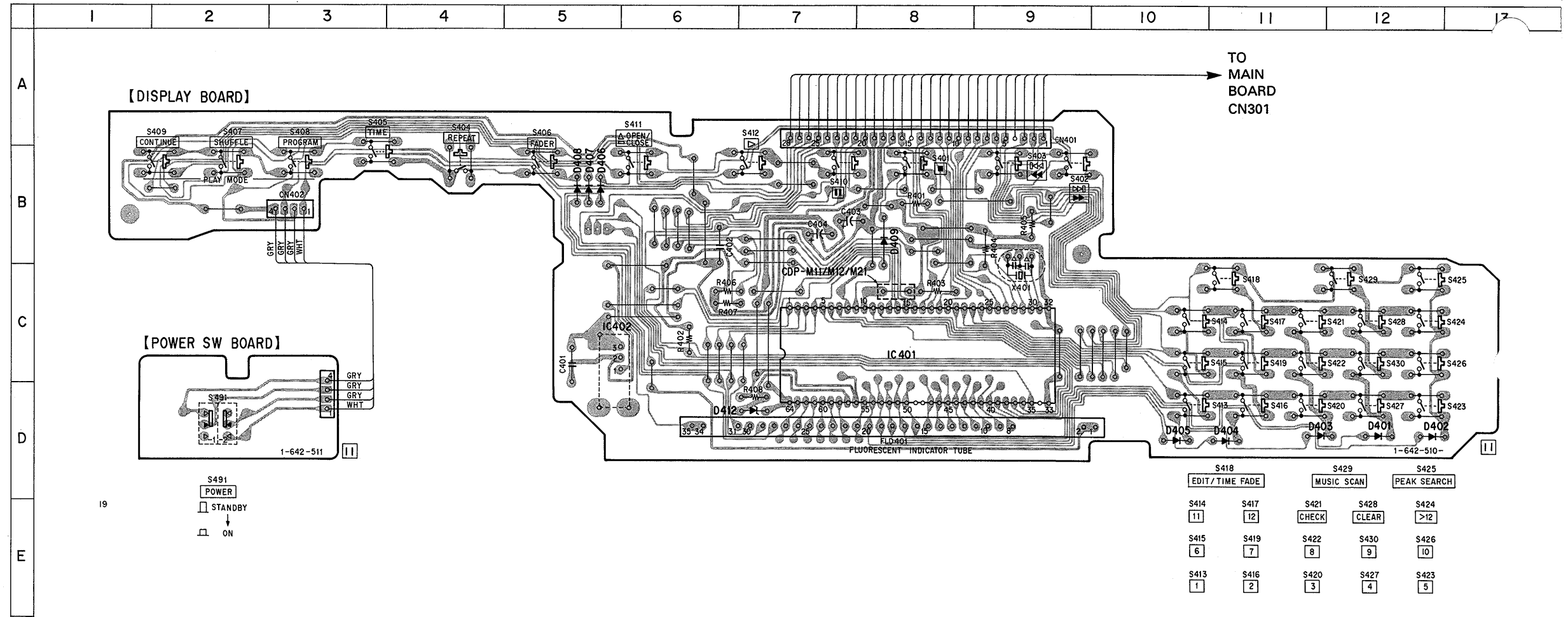
• IC401 (μ PD75212ACW-A23) pin function

Pin No.	Pin Name	I/O	Description
1-4	D-A	O	Segment output to FL tube and key scan output.
5	SCOR	I	Subcode sync signal SO+S1 detection input from IC301 (CXD2500AQ).
6	CLK	O	Serial data transfer clock output to IC301 (CXD2500AQ).
7	DATA	O	Serial data output to IC301 (CXD2500AQ).
8	TIMER	I	Timer play input terminal ("L": Timer play) Not in used. The equipment is fixed at "L".
9	SIRCS/BSIN	I	Remote control signal input.
10	18BIT/45BIT	I	Selected 18bit and 45bit. 18bit : "L", 45bit : "H". The equipment is fixed at "L".
11	ADJ	I	Test mode input, GFS check will not activate by "L".
12	SENSE	I	SENS signal input from IC301 (CXD2500AQ).
13	LOADOUT	O	Output for turn the loading motor to un-loading.
14	LOADIN	I	Output for turn the loading motor to loading.
15	OUTSW	I	Output for loading in switch.
16	INSW	I	Input for loading out switch.
17	DFCTSW	O	Defect circuit ON/OFF select output to IC101 (CXA1372Q).
18	PRGL	O	Attenuate data latch clock output to IC302 (CXD2554P).
19	XLT	O	Serial data latch output.
20	SQCK	O	Subcode (Q data) readout clock output to IC301 (CXD2500AQ).
21-24	K0-K3	I	Key return signal input.
25	SUB Q	I	Subcode (Q data) serial input from IC301 (CXD2500AQ).
26	GFS	I	Frame sync signal clock status input from IC301 (CXD2500AQ).
27	FOK	I	Focus OK signal input from IC101 (CXA1372Q).
28	AFADJ	I	Test mode input. All test operation will be activate by "L" mode when power on.
29	LDON	O	Laser diode ON/OFF select output of optical pick-up.
30	X1	I	Clock input. (4MHz)
31	X2	O	Clock Output.
32	VSS	-	Ground terminal.
33	XT1	I	Clock input. Not in used. (Open)
34	XT2	O	Clock output. Not in used. (The equipment is fixed at "L")
35	VLUP	O	Output for motor volume up. Not in used. (Open)
36	VLDOWN	O	Output for motor volume down. Not in used. (Open)
37	LED	O	Muting output of sircs remote commander. Not in used. (Open)
38	AMUTE	O	Muting output for IC301 (CXD2500AQ) and Q344 (2SC3399). Muting on by "H", Muting off by "L".
39	RESET	I	Reset signal input.
40-47	8G-1G	O	Grid output to FL tube.
48, 49	-	-	No connection.
50-54	P-L	O	Segment output to FL tube and key scan output.
55	K	O	Segment output to FL tube.
56	VLOD	I	Power voltage -30V for built in FL tube controller.
57	VPRE	I	Power supply for the FL tube predriver.
58-63	J-E	O	Segment output to FL tube.
64	VDD	-	Power supply (+5V)

1-2. PRINTED WIRING BOARDS

● SEMICONDUCTOR LOCATION

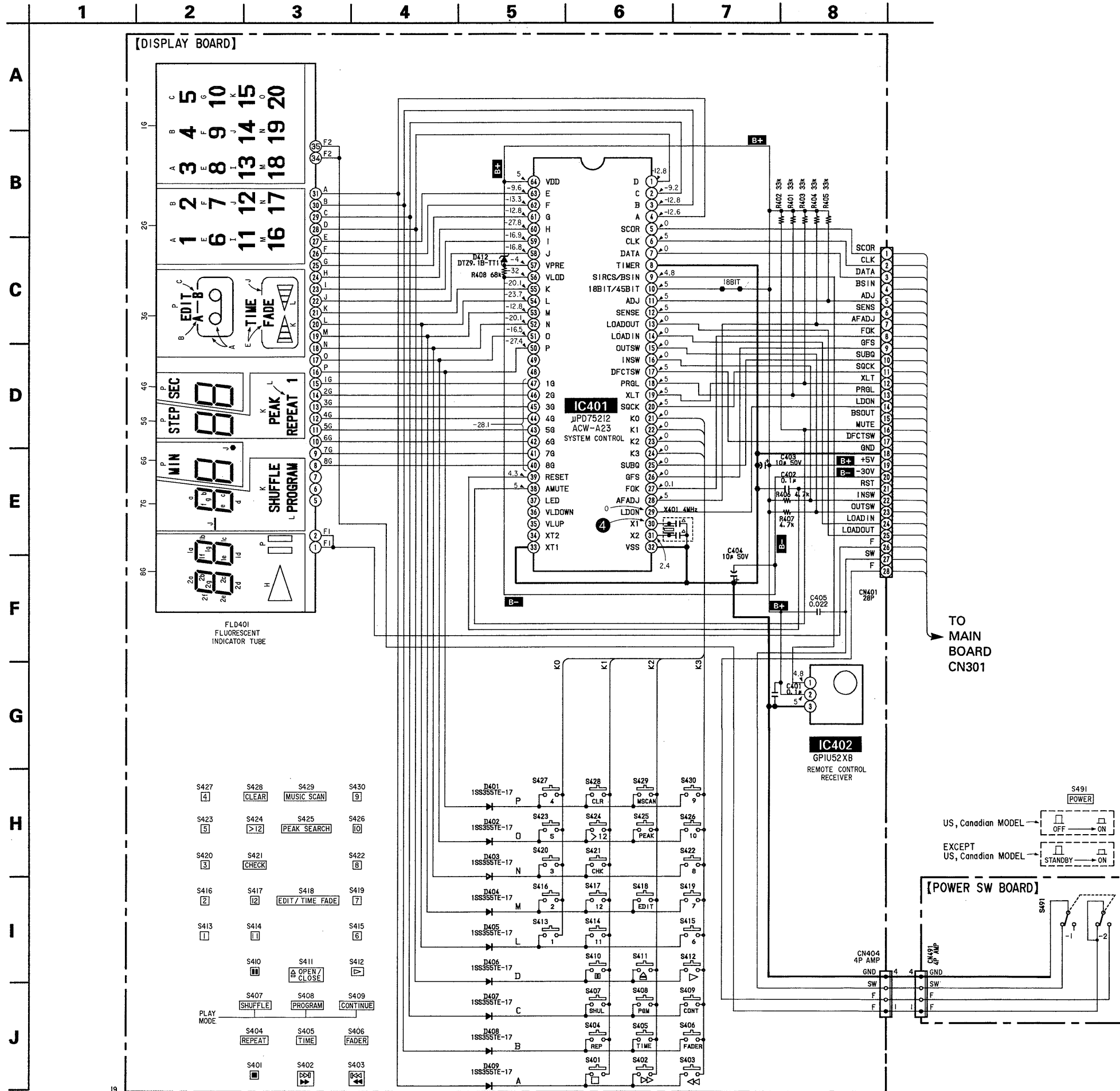
Ref. No.	Location
D401	D-12
D402	D-12
D403	D-11
D404	D-11
D405	D-10
D406	B-5
D407	B-5
D408	B-5
D409	B-8
D412	D-7
IC401	C-8
IC402	C-5



Notes on printed wiring boards:

- : Indicated a lead wire mounted on the component side
- : Pattern from the side which enables seeing

1-3. SCHEMATIC DIAGRAMS • See page 6 for note.



Notes on schematic diagram:

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

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

- **B+** : B+ Line
- **B-** : B- Line
- \square : Adjustment for repair
- Voltage are DC between measurement points and ground under no-signal (STOP) conditions.
- no mark : PB mode
- Voltages are taken with a VOM (input impedance 10M Ω). 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 \Rightarrow : CD

SECTION 2

ELECTRICAL PARTS LIST

DISPLAY

NOTE:

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

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...: μ A..., uPA...: μ PA...,
uPB...: μ PB..., uPC...: μ PC...,
uPD...: μ PD...
- CAPACITORS
uF : μ F
- COILS
uH : μ H

Ref.No.	Part No.	Description	Remarks	Ref.No.	Part No.	Description	Remarks
*	1-642-510-11	DISPLAY BOARD *****				< IC >	
*	4-923-103-01	HOLDER, FL TUBE		IC401	8-759-058-72	IC UPD75212ACW-A23	
		< CAPACITOR >		IC402	8-749-920-83	IC GPIU52XB	
C401	1-164-159-11	CERAMIC	0.1uF 50V			< RESISTOR >	
C402	1-164-159-11	CERAMIC	0.1uF 50V	R401	1-249-435-11	CARBON 33K 5% 1/4W	
C403	1-124-261-00	ELECT	10uF 20% 50V	R402	1-249-435-11	CARBON 33K 5% 1/4W	
C404	1-124-261-00	ELECT	10uF 20% 50V	R403	1-249-435-11	CARBON 33K 5% 1/4W	
		< CONNECTOR >		R404	1-249-435-11	CARBON 33K 5% 1/4W	
CN401	1-535-883-11	JUMPER, FILM (WITH TERMINAL) 28P		R405	1-249-435-11	CARBON 33K 5% 1/4W	
		< DIODE >		R406	1-249-425-11	CARBON 4.7K 5% 1/4W	
D401	8-719-987-63	DIODE 1N4148M (MADE IN JAPAN)		R407	1-249-425-11	CARBON 4.7K 5% 1/4W	
D401	8-719-987-06	DIODE WG713A (MADE IN FRANCE)		R408	1-249-439-11	CARBON 68K 5% 1/4W	
D402	8-719-987-63	DIODE 1N4148M (MADE IN JAPAN)				< SWITCH >	
D402	8-719-987-06	DIODE WG713A (MADE IN FRANCE)		S401	1-554-303-21	SWITCH, TACTILE (■)	
D403	8-719-987-63	DIODE 1N4148M (MADE IN JAPAN)		S402	1-554-303-21	SWITCH, TACTILE (▷▷ ▷▶▶▶)	
D403	8-719-987-06	DIODE WG713A (MADE IN FRANCE)		S403	1-554-303-21	SWITCH, TACTILE (◁◁◁ ◀◀◀)	
D404	8-719-987-06	DIODE 1N4148M (MADE IN JAPAN)		S404	1-554-303-21	SWITCH, TACTILE (REPEAT)	
D404	8-719-987-63	DIODE WG713A (MADE IN FRANCE)		S405	1-554-303-21	SWITCH, TACTILE (TIME)	
D405	8-719-987-63	DIODE 1N4148M (MADE IN JAPAN)		S406	1-554-303-21	SWITCH, TACTILE (FADER)	
D405	8-719-987-06	DIODE WG713A (MADE IN FRANCE)		S407	1-554-303-21	SWITCH, TACTILE (SHUFFLE)	
D406	8-719-987-63	DIODE 1N4148M (MADE IN JAPAN)		S408	1-554-303-21	SWITCH, TACTILE (PROGRAM)	
D406	8-719-987-06	DIODE WG713A (MADE IN FRANCE)		S409	1-554-303-21	SWITCH, TACTILE (CONTINUE)	
D407	8-719-987-63	DIODE 1N4148M (MADE IN JAPAN)		S410	1-554-303-21	SWITCH, TACTILE (■■)	
D407	8-719-987-06	DIODE WG713A (MADE IN FRANCE)		S411	1-554-303-21	SWITCH, TACTILE (△ OPEN/CLOSE)	
D408	8-719-987-63	DIODE 1N4148M (MADE IN JAPAN)		S412	1-554-303-21	SWITCH, TACTILE (▷)	
D408	8-719-987-06	DIODE WG713A (MADE IN FRANCE)		S413	1-554-303-21	SWITCH, TACTILE (1)	
D409	8-719-987-63	DIODE 1N4148M (MADE IN JAPAN)		S414	1-554-303-21	SWITCH, TACTILE (11)	
D409	8-719-987-06	DIODE WG713A (MADE IN FRANCE)		S415	1-554-303-21	SWITCH, TACTILE (6)	
D412	8-719-121-24	DIODE RD9.1ES-L (MADE IN JAPAN)		S416	1-554-303-21	SWITCH, TACTILE (2)	
D412	8-719-921-69	DIODE MTZJ-9.1 (MADE IN FRANCE)		S417	1-554-303-21	SWITCH, TACTILE (12)	
		< FLUORESCENT INDICATOR >		S418	1-554-303-21	SWITCH, TACTILE (EDIT/TIME FADE)	
FLD401	1-519-611-11	INDICATOR TUBE, FLUORESCENT		S419	1-554-303-21	SWITCH, TACTILE (7)	
				S420	1-554-303-21	SWITCH, TACTILE (3)	
				S421	1-554-303-21	SWITCH, TACTILE (CHECK)	
				S422	1-554-303-21	SWITCH, TACTILE (8)	

