JVC

SERVICE MANUAL

COMPACT DISC AUTOMATIC CHANGER

CH-X400 / CH-X450

COMPACT disc DIGITAL AUDIO

Area Suffix

CH-X400
J ----- Northern America
E --- Continental Europe

CH-X450
U ---------- Other areas

Contents

Safety precaution ---------- 1-2
Important for laser products ---------- 1-3
Location of main parts ---------- 1-4
Removal of main parts ---------- 1-5
JC 12 Forced eject procedures ------- 1-19
Troubleshooting ---------- 1-20
Wiring connections ---------- 1-26
Pickup replacement procedure ------- 1-27
Description of major ICs ---------- 1-29

This service manual is printed on 100% recycled paper.

COPYRIGHT © 2000 VICTOR COMPANY OF JAPAN, LTD.

No.49585
Dec. 2000

Safety precaution

⚠ ***CAUTION*** **Burrs formed during molding may be left over on some parts of the chassis. Therefore, pay attention to such burrs in the case of preforming repair of this system.**

⚠ ***CAUTION*** **Please use enough caution not to see the beam directly or touch it in case of an adjustment or operation check.**

Important for laser products

1.CLASS 1 LASER PRODUCT

2.DANGER : Invisible laser radiation when open and inter lock failed or defeated. Avoid direct exposure to beam.

3.CAUTION : There are no serviceable parts inside the Laser Unit. Do not disassemble the Laser Unit. Replace the complete Laser Unit if it malfunctions.

4.CAUTION : The compact disc player uses invisible laserradiation and is equipped with safety switches whichprevent emission of radiation when the drawer is open and the safety interlocks have failed or are de feated. It is dangerous to defeat the safety switches.

5.CAUTION : If safety switches malfunction, the laser is able to function.

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

⚠ ***CAUTION*** **Please use enough caution not to see the beam directly or touch it in case of an adjustment or operation check.**

VARNING : Osynlig laserstrålning är denna del är öppnad och spårren är urkopplad. Betrakta ej strålen.

VARO : Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle.Älä katso säteeseen.

ADVARSEL : Usynlig laserstråling ved åbning , når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

ADVARSEL : Usynlig laserstråling ved åpning,når sikkerhetsbryteren er avslott. unngå utsettelse for stråling.

REPRODUCTION AND POSITION OF LABELS

WARNING LABEL

DANGER : Invisibie laser radiation when open and interlock or defeated.
AVOID DIRECT EXPOSURE TO BEAM (e)

ADVARSEL :Usynlig laserstråling ved åbning , når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling. (f)

VARNING : Osynlig laserstrålning är denna del är öppnad och spårren är urkopplad. Betrakta ej strålen. (s)

VARO : Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle.Älä katso säteeseen. (d)

CLASS 1
LASER PRODUCT

Caution.
This production contains laser component of higher laser class than Class 1.

Top panel of the unit
Geräteoberseite
Panneau supérieur de l"appereil

Position And Reproduction Of Labels

Rear panel of the unit

Name/Rating Plate

Location of main parts

■ Bottom view

■ Top side view

■ Remove the main board view

Removal of main parts

Disassembling procedures

Perform operations according to the items to be disassembled.

Replacement of the Pickup

1. After removing the exterior (top and bottom)...
2. Proceed to the "Pickup Replacement" section.
3. When applying grease, refer to the Exploded View.
   Use new grease.

Mechanism section

1. Remove the exterior (required section only).
2. The mechanism section is designed so that each unit can be removed separately.
3. When reassembling, refer to the assembling precautions.
   (Use new grease when applying grease.)

Fig. 1

■ Exterior section

Removing the bottom cover and front panel assembly

1. Remove the screw (1-a) to unlock the mounting direction knob located on the side of the main unit.
2. Turn the mounting direction knob in the direction of the arrow using a coin, etc. to remove it. (The knob can be removed only when it is set to this position.)
3. Remove the four top cover fixing screws (1) at the triangle (A) marks on the side of the main unit. (Perform the same operation on both sides.)
4. Turn the unit upside down so the bottom surface is facing upward.
5. Lift the rear edge of the bottom cover slightly and lift the side by grasping the DIN jack section on the side panel, then turn it toward the front (raise upward) to remove the bottom cover.
6. Unhook the four catches located on both sides of the front panel, and turn the front panel toward the top cover (lower down) to remove the front panel.

Fig. 2

Fig. 3

Fig. 4

Removing the top cover

1. Pull out the dampers, being careful not to damage.
   When reattaching a damper, insert your finger to push out the center of the damper to mount it on the damper shaft, as shown in Fig. 6-1.
2. Turn the damper spring bracket toward the top at a right angle as shown in Fig. 7, then push down the lower side of the damper spring bracket to lift it off.
3. Remove the three fixing screws (3) and (4) on the DIN jack PCB assembly.
4. Lift the changer unit upward.
5. Remove the damper springs from the mechanism chassis if required. To reassemble, refer to the diagram below.

Fig. 5

Fig. 6-1

Fig 6

Fig. 8

Fig. 7

How to attach the damper springs

Fig. 8-1

Fig. 9

Removing the fittings

1. Remove the fixing screw (5).
2. Unhook the two catches (a) on the top edge of the fitting, then unhook the catches (b) at the left/right bottom edges.

Fig. 10

Removing the main PCB assembly

1. Remove the power IC fixing screw (6).
2. Remove the four screws (7) securing the main PCB assembly.
3. Disconnect position motor wire connector CN504 from the main PCB assembly.
4. Disconnect sensor PCB assembly wire connector CN601 from the main PCB assembly.
5. Remove the flexible ribbon wire from CN502 on the traverse mechanism PCB assembly.
   When reinstalling the PC boards, refer to the reassembling procedures for protecting switches, etc.

Fig. 11

■ Changer mechanism section

Sensor assembly unit

1. Remove the two screws (1) securing the sensor assembly unit.
2. Unhook the springs on the back of the sensor assembly unit from the holes on the chassis.

Fig. 12

Magazine lock arm

1. Remove the magazine lock spring from the front side of the chassis.
2. Remove the poly-washer (b) securing the magazine lock arm.
3. Turn the magazine lock arm in the direction of the arrow until the notch is at the "C" position to remove it from the chassis.

Fig. 13

Positioning motor assembly

1. Remove the two screws (2) securing the positioning motor.
2. Slightly lift the positioning motor assembly to remove it from the two burrs on the chassis.

Fig. 14

Rear slider

1. Position the unit with the front section facing down. Rotate the third gear located on the back of the main unit in the direction of the arrow (clockwise).
2. Shift the rear slider in the direction of the arrow and remove it at the rear slider mounting position (at the widest hole).

Fig. 15

Front slider

1. Position the unit with the rear section facing down. Rotate the third gear located on the bottom of the unit in the direction of the arrow (clockwise) until the front slider is shifted to the outermost position.
2. Remove the E-washer securing the front slider to remove the front slider from the chassis.

Fig. 16

Top plate

1. Remove the nine screws (3) securing the top plate.
2. Disconnect the section (e) attached to the rear of the unit, then lift the top plate slightly.
3. Slide the top plate toward the rear of the unit to remove the upper rod from the top plate.

Fig. 17

Fig. 18

Lifter unit

1. Unhook the elevator spring located on the front side of the unit.
   (Be sure to first unhook the spring from the lifter side as shown in the upper part of the diagram.)
2. Lift the lifter unit upward, then remove the lower rod to remove the lifter unit from the chassis.

Fig. 19

Lifter bracket

1. Remove the two lifter bracket fixing screws (4) located on the back of the lifter unit.
2. Remove the lower rod.

Fig. 20

Side bracket and traverse mechanism

1. Remove the two side bracket unit fixing screws (5) to disconnect the side bracket unit from the lifter unit.
2. Remove the three shafts on the traverse mechanism assembly from the lifter unit.

For reassembling, refer to the reassembling procedures.

Fig. 21

Fig. 22

Pickup assembly

1. Remove the three mechanism PCB fixing screws (6) located on the back of the traverse mechanism.
2. Disconnect the two feed motor wires (blue and white), two spindle motor wires (red and black) and two tray motor wires (brown and black) that are soldered to the mechanism PCB assembly.
3. Short-circuit the grounding point on the mechanism PCB assembly, and lift it with the flexible PCB attached to connector CN501.
   Next, short-circuit the grounding point on the pickup unit and disconnect CN501.
4. Remove the screw (7) to remove the feed motor assembly.
5. Remove the screw (8) to remove the shaft holder retaining the feed slide shaft assembly and the middle gear.
6. Remove the middle gear.
7. Move the pickup assembly upward from the gear section and remove it from the traverse chassis assembly.
8. Remove the two screws (9) to remove the rack arm.
9. Pull out the feed slide shaft assembly.
10. Remove the screw (10) to remove the spring.

Note: Before replacing the pickup, be sure to short-circuit the grounding points. First short-circuit the PCB section and then immediately short-circuit the pickup section.

Fig. 23

Fig. 24

Fig. 25

Tray motor

1. Remove the two screws (11) securing the tray motor.
2. Remove the two screws (12) to remove the tray motor assembly from the tray motor holder.

Separation of the chassis L assembly and ahassis R assembly

1. Remove the two screws (13) retaining the chassis "L" and "R" assemblies.
2. Slide the chassis L assembly toward the front and detach it, then remove the chassis "L" upward.

Fig. 26

Fig. 27

Fig. 28

Precautions on reassembling

When reassembling, also refer to the disassembling procedures.

Mounting the traverse mechanism

1. When mounting the pickup assembly, attach the feed slide shaft assembly to the traverse chassis.
   Apply E-JC-525 grease to the shaft.
2. Mount the middle gear and the feed slide shaft to the traverse chassis and secure them with the screw (14) through the shaft holder.
3. Before mounting the mechanism PCB assembly, move the pickup to the outer edge position, then secure the PCB assembly using the screw (15).
   At this time, check that the rest switch is correctly placed.
4. To mount the rack arm, first move the pickup to the middle position and secure it with the screws (16).

Fig. 29

Fig. 30

Mechanism PCB assembly

Fig. 31

Fig. 32

Mounting the lifter unit

1. Insert the shafts (B) of the traverse mechanism assembly into the slide grooves (F) on the lifter unit.
2. Shift the hook of the lifter unit to the edge, and shift the sliding lever inside the side bracket unit to the edge as well.
3. With each hole and lever shifted to the edge, mount the lifter unit and side bracket unit from the side.
   (Check each attached section, and check that the two shafts (C) of the lifter unit are correctly inserted into the holes (g) of the side bracket unit. After mounting, check that the levers move together.)
4. Turn the lifter unit upside down.
   As shown in Fig. 35, slide the lever 30 mm away from the edge, then mount the lifter bracket L assembly.

Fig. 33

Fig. 34

Fig. 35

Expanded view

Connection of the chassis "L" assembly and chassis "R" assembly

1. Attach the lower rod to the chassis "R" assembly. While shifting the rod toward the front side, mount the rod on the lifter unit.
   With the rod mounted, place the lifter unit on the chassis "R" assembly.
2. Combine the chassis "L" and "R" assemblies so that the hook section (h) of the chassis "L" assembly is inserted into the notch of the chassis "R" assembly by sliding it from the front side.
3. After engaging, secure with the two screws (18).
4. Attach the tension spring between the lifter unit and the chassis.

Fig. 36

Fig. 37

Fig. 38

Mounting the top plate

1. Mount the upper rod on the lifter side (j) and set it on the rear of the top plate, then mount the other end of the upper rod to (k).
2. Check that the five points (l, m, n, o and p) are correctly positioned.
   When mounting section (q), set it so that section (D) of the lifter unit is pinched by the bending section of the top plate.
3. Secure the top plate with six fixing screws (19).

Fig. 39

Fig. 40

Expanded view of mounting "q"

Fig. 41

Fig. 42

Mounting the front slider and rear slider

1. Position the unit with the rear side facing down, then rotate the third gear in the direction of the arrow (clockwise) until the lift arm comes to the position at which the holes are exposed, as shown in Fig. 43-1.
2. Mount the front slider from the top.
   Rotate the third gear counterclockwise until the hole of the slider is lined up with the right hole of the stud, as shown in Fig. 43-2.
3. Mount the E-washer on the shaft.
4. Position the unit with the front side facing down, then mount the rear slider. Check that the (r), (s) and (t) positions are correctly mounted as shown in Fig. 44.
5. Rotate the third gear in the direction of the arrow (counterclockwise) until the lifter unit is at the top position.

Fig. 44

Mounting the sensor PCB assembly

1. Attach the longer spring to the white resin, and attach the shorter spring temporarily to the sensor assembly bracket.
2. Mount the sensor assembly so that the shaft of the lift arm is inserted into the longer hole on the white resin located on the back of the sensor PCB assembly.
3. Attach the shorter spring to the hook of the lift arm.

Fig. 45

Mounting the main PC board assembly

1. Rotate the third gear clockwise until section (E) of the front slider and the third hole from the right are lined up.
   (Be sure to set properly. If incorrectly set, the switches on the PCB assembly may be damaged.)
2. After they are correctly positioned, mount the main PCB assembly.

Fig. 46

JC12 Forced eject procedures

Troubleshooting

■ Servicing procedures for CH-X400 & CH-X450 error displays

Error display	Servicing procedure
E1: Eject error	The magazine cannot be ejected until S601 (magazine switch) turns off. Can the magazine be ejected? YES→1, NO→2 1 The magazine switch (S601) does not turn off even though the magazine is completely ejected. 2 Check that the magazine is not engaged with the mechanism assembly.
E2: Position motor error	The lifter does not move up and down when exchanging or ejecting discs. After resetting, check whether or not the lifter moves.YES→3, NO→4 3If the lifter exceeds the required disc position, check the lift position input. (IC601 pin 76) If the lifter does not reach the required disc position, check the mechanism (mainly the lifter elevation mechanism) 4Check that voltage is present at the motor terminal. If voltage is present, check the lifter elevation mechanism. If voltage is not present, separate the motor from the circuit and check again whether or not voltage is present. If voltage is present, next check that the armature resistance of the position motor (resistance between motor terminals) is approx. 12 Ω. If the resistance is excessively low (1 - 2 Ω), the motor is defective.
E3: Tray motor error	Trays cannot be opened or closed when exchanging or ejecting discs. Does the tray move when changing or ejecting discs? YES→5, NO→ 6 5Check that TRAY OUT SW (S602) and TRAY IN SW (S603) function correctly.

	S602 & IC601 pin (46)	S603 & IC601 pin (45)
When opening	H	L
When closing	L	H

6Check that the drive voltage is applied to the motor terminal.
If the voltage is present, check the tray mechanism.
If the voltage is not present, separate the motor from the circuit and check again whether or not the voltage is present.

E4: Pick returning error	Does the feed (pickup unit) return to the inner area of the disc when ejecting? YES→7, NO→8, 9 7 Check the rest switch. 8If the feed gear is rotated, check the feed transfer mechanism 9If the feed gear is not rotated, check the motor driver and the pattern.

Other errors occurring in the receiver or controller.

E8: Connection error	When selecting the CD Changer mode using function keys, etc., the unit does not enter the CD changer mode, or the E8 error display appears. This signifies trouble relating to communications. aCheck the connection cables between the CD changer and the receiver (CD changer controller). bCheck the CD changer power cord and the fuse (including F901 on the PC board). cCheck IC651 and its peripheral circuits.

★ The E1～E8 error displays described above may appear as E-1～E-8, 1E1～1E8, R-1～R-8, or RST1～RST8, depending on the product.

CH-X400 & CX-H450 Error code

The following error codes can be displayed and stored in up to 3 memories when the KD-MX3000 is used with the controller. Refer to the KD-MX3000 service manual regarding error code indication.
The error code indication when using the earlier controller is the same as the CH-X99,KD-MK88 and other 12CD changer models.

CH-1 error code table

Generating condition		Description	Error code
Tray extension error	Tray-in switch time out (Tray-in switch Low, Tray-out switch High)	Tray stops part way	E1 03 00 11
	Tray-out switch time out (Tray-in switch High, Tray-out switch High)	Tray stops part way	E1 03 00 12
	Tray-in switch time out (Tray-in switch Low, Tray-out switch Low)	Tray-in switch faulty or other defect	E1 03 00 13
	MAG-in switch Low to High	Magazine removed when tray partly extende	E1 03 00 14
Tray retraction error	Tray-in switch time out (Tray-in switch Low, Tray-out switch Low)	Tray motor inoperative	E1 03 00 16
	Tray-out switch time out (Tray-in switch High, Tray-out switch High)	Tray retraction stops part way	E1 03 00 17
	Tray-in switch time out (Tray-in switch Low, Tray-out switch Low)	Tray-in switch faulty or other defect	E1 03 00 18
	MAG-in switch Low to High	Magazine removed when tray partly r etracted	E1 03 00 19
Lifter raise error	Wait position time out	Position motor inoperative	E1 02 00 21
	Wait position time out	Position not stable in fine adjust mode	E1 02 00 22
	Wait position time out	Other fault	E1 02 00 23
Lifter lower error	Wait position time out	Position motor inoperative	E1 02 00 26
	Wait position time out	Position not stable in fine adjust mode	E1 02 00 27
	Wait position time out	Other fault	E1 02 00 28
Chuck error	Play position time out	Position motor inoperative	E1 02 00 31
	Play position time out	Position not stable in fine adjust mode	E1 02 00 32
	Play position time out	Other fault	E1 02 00 33
Unchuck error	Wait position time out	Position motor inoperative	E1 02 00 36
	Wait position time out	Position not stable in fine adjust mode	E1 02 00 37
	Wait position time out	Other fault	E1 02 00 38
Eject error	Eject position time out	Position motor inoperative	E1 02 00 41
	Eject position time out	Eject position not attained	E1 02 00 42
	MAG in switch time out	Magazine not ejected	E1 02 00 43
Initialize error	Mechanism switch time out	Both Tray-in and Tray-out Low	E1 03 00 46
	Absolute position time out	Not stable at absolute position	E1 03 00 47

Note: The 1st error code is indicated by E1, while the 2nd and 3rd error codes are respectively indicated by E2 and E3.

■ Flow chart for reading TOC (Table of contents)

■General section

■Feed section

■Focus section

■Spindle section

■Tracking section

■ Signal processing section

Wiring connections

Wiring of mechanism board section

Pickup replacement procedure

1. Remove the bottom cover, front panel and top cover from the exterior section.
2. Unplug the flexible ribbon wire from connector CN502 on the traverse mechanism PC board assembly.
3. Turn the rear slider and third gear in the lifter section counterclockwise until the traverse mechanism assembly is in the lowermost (bottom) position.
4. Unsolder the two wires (black and brown) connected to the tray motor.
5. Remove the two screws (1) from the round holes on the chassis R assembly to remove the lifter bracket (L).
6. Remove the lower rod.
7. Short-circuit the grounding point on the traverse mechanism PCB assembly of the lifter unit. Unsolder the wires connected to the spindle motor (red, black) and to the feed motor (blue, white) to lift the PCB assembly.
   Next, short-circuit the grounding point on the pickup main unit and unplug the pickup flexible PCB from CN501.
8. Remove the three fixing screws (2) from the round holes on the chassis R assembly to remove the traverse mechanism PCB assembly.
9. Remove the pickup shaft holder fixing screw (3) to remove the pickup assembly.

Fig. 49

Fig. 50

Note: When replacing the pickup, be sure to apply countermeasures against static electricity (grounding the operation table, wrist band and soldering iron). To remove it, first short-circuit the grounding point on the mechanism PCB, then lift the mechanism PCB assembly with CN501 connected. Next, short-circuit the grounding point on the pickup main unit, then unplug the pickup flexible PCB from connector CN501.

When reassembling, perform in the reverse order.

Fig. 51

10. Remove the two rack arm fixing screws (4).
    Pull out the feed slide shaft.
    Remove the shaft holder fixing screw (5).
11. When mounting the lifter bracket after replacing the pickup, shift the lifter unit lever approx. 30 mm towards the inside, then mount the lifter bracket.

Fig. 52

Fig. 53

Fig. 54

Descriprion of major ICs

■ BA5926S(IC581):CD/POSITION/TRAY DRIVER

1.Terminal layout & Block diagram

T.S.D: Thermal shut down circuit
D: Driver buffer
Unit of resistor:[Ω]

2.Pin function

No.	Symbol	Function	No.	Symbol	Function
1	OUT1-	Driver CH1 negative output	17	OUT4-	Driver CH4 negative output
2	OUT+	Driver CH1 positive output	18	OUT4+	Driver CH4 positive output
3	OUT2-	Driver CH2 negative output	19	OUT5-	Driver CH5 negative output
4	OUT2+	Driver CH2 positive output	20	OUT5+	Driver CH5 positive output
5	IN 2	Driver CH2 input	21	IN 5	Driver CH5 input
6	IN 1	Driver CH1 input	22	IN 4	Driver CH4 input
7	VCC	Power supply	23	VCC	Power supply
8	VCC	Power supply	24	BIAS IN	Bias input
9	REG-B	Connect to external TR.BASE	25	GND	Substrate ground
10	REG OUT	Constant voltage output(5V)(*3)	26	GND	Substrate ground
11	VCC	Power supply	27	VCC	Power supply
12	IN3-R	driver CH3 reverse input	28	IN6-R	Driver CH6 reverse input
13	IN3-F	Driver CH3 forward input	29	IN6-F	Driver CH6 forward input
14	OUT3+	Driver CH3 positive output	30	OUT6+	Driver CH6 positive output
15	OUT3-	Driver CH3 negative output	31	OUT6-	Driver CH6 negative output
16	GND	ground	32	GND	ground

Note 1) Positive output and negative output of phasing with input.

Note 2) Loading positive output and loading negative output of phasing with mode.

*3 Connect to external PNP transistor collector.

■ UPD780058GC-067(IC601):CPU

1.Terminal layout

2.Block diagram

3.Pin function

UPD780058GC-067

Pin No.	PORT Name	I/O	Function	Active	Pin No.	PORT Name	I/O	Function	Active
1	LCDDA	O	LCD driver data output		41	NC	O	Unused output port	
2	LCDSCK	O	LCD driver clock output		42	NC	O	Unused output port	
3	LCDCE	O	LCD driver chip enable output		43	NC	O	Unused output port	
4	AVSS	-	Connect to ground		44	MAG IN	-	Magazine switch Lo:magazine inserted	L
5	ADCOUT	O	Power on Hi output. Low in stop mode.	H	45	TRAY IN	O	Tray retract switch Lo:retraction complete	L
6	NC	O	Unused output port		46	TRAY OUT	O	Tray extend switch Lo:extension complete	L
7	AVREF1	-	Connect to 5V		47	REST	I	Resr switch	L
8	NC	O	Unused output port		48	NC	O	Unused output port	
9	NC	O	Unused output port		49	EMPH	O	Emphasis select output Hi:on	H
10	CDCHECK	I	CD check mode input. Reset only.		50	NC	O	Unused output port	
11	EPROMDI	I/O	EEPROM data input		51	BUFF CONT	O	Buffer control output	L
12	EOROMDO	O	EEPROM data output. Hi durring input.		52	TEST RUN	I	Test running input	L
13	EPROMCK	I/O	EEPROM clock input/output		53	NC	O	Unused output port	
14	LED	O	Lifter LED output	H	54	NC	O	Unused output port	
15	BUS I/O	O	JVC bus input/output control(Lo:input)		55	NC	O	Unused output port	
16	BUS SI	I	JVC bus data input		56	MUTE	O	Mute output. When reverse of earlier audio mute. Mute power OR output	H
17	BUS SO	O	JVC bus data output						
18	BUS SCK	I/O	JVC bus clock input/output		57	STAGE	I	LCD,AD key,remote inhibit selector Low:inhidit	L
19	NC	O	Unused output port		58	NC	O	Unused output port	
20	NC	O	Unused output port		59	EPROM CLF	I	EEPROM clear input Functional only dunng reset	L
21	NC	O	Unused output port		60	RESET	I	Reset input (includes flash write in function)	L
22	NC	O	Unused output port		61	REMOCON	I	Remote controller signal input	
23	NC	O	Unused output port		62	PWR DET	I	Memory power detect input	
24	NC	O	Unused output port		63	PWR SW	I	CRTL+B detect input	
25	BUSOUT	O	JVC bus output	H	64	BUS INT	I	JVC bus com start interrupt input	
26	CD ON	O	CD power control Hi:on	H	65	EJECT	I	Eject key input	
27	PWR CONT	O	Power supply control output Hi:on	H	66	NC	I	Unused output port	L
28	POSMO+	O	Position motor control output		67	VSS0	-	Connect to ground	
29	POSMO-	O	Position motor control output		68	VDD1	-	Connect to 5V	
30	TRAYMO+	O	Tray motor control output		69	X2	O	Oscillater (4.19430 MHz)	
31	TRAYMO-	O	Tray motor control output		70	X1	I	Oscillater (4.19430 MHz)	
32	BUCK	O	CD LSI data clock		71	IC	-	Connect to ground	
33	VSS1	-	Connect to ground		72	XT2	O	Open	
34	LSI RESET	O	CD LSI reset	L	73	XT1	I	Connect to VDD	
35	CCE	O	CD LSI chip enable		74	VDD	-	Connect to 5V	
36	BUS0	I/O	CD LSI data 0(open drain)		75	AVREF0	-	Connect to ADCONT	
37	BUS1	I/O	CD LSI data 1 (open drain)		76	L SENSOR	I	Linear sensor input(8 bit A/D input)	
38	BUS2	I/O	CD LSI data 2 (open drain)		77	KEY1	I	Key input 1 (8 bit A/D input)	
39	BUS3	I/O	CD LSI data 3 (open drain)		78	KEY2	I	Key input 2 (8 bit A/D input)	
40	NC	O	Unused output port		79	KEY3	I	Key input 3 (8 bit A/D input)	
					80	KEY0	I	Key input 0 (8 bit A.D input)	

■ TC9462F(IC521): DSP&DAC

1.Pin layout & Block Diagram

2.Pin function

PIN No.	SYMBOL	I/O	FUNCTIONAL DESCRIPTION	REMARKS
1	TEST0	I	Test mode terminal.Normally, Keep at open.	With pull-up resistor.
2	$\overline{HSO}$	O	Playback speed mode fllag output terminal. $\overline{UHSO}$ / $\overline{HSO}$ / PLAYBACK SPEED H / H / Nomal H / L / 2 times L / H / 4 times L / L / --	--
3	$\overline{UHSO}$	O		
4	EMPH	O	Subcode Q data emphasis flag output terminal.Emphasis ON at "H" level and OFF at "L" level.The output polarity can invert by command.	--
5	LRCK	O	Channel clock output terminal.(44.1khz)L-ch at "L" level and R-ch at "H" level. the output polarity can invert by command.	--
6	V_{SS}	--	Digital GND terminal.	--
7	BCK	O	Bit clock output terminal.(1.4122MHz)	--
8	AOUT	O	Audio data output terminal.	--
9	DOUT	O	Digital data output terminal.	--
10	MBOV	O	Buffer memory over signal output terminal. Over at "H" level.	--
11	IPF	O	Correction flag output terminal. At "H" level,AOUT output is made to correction impossibility by C_2 correction processing.	--
12	SBOK	O	Subcode Q data CRCC check adjusting result output terminal. The adjusting result is OK at "H" level.	--
13	CLCK	I/O	Subcode P~W data reabout clock input/output terminal. This terminal can select by command bit.	--
14	V_{DD}	--	Digital power supply voltage terminal.	--
15	V_{SS}	--	Digital GND terminal.	--
16	DATA	O	Subcode P~W data output terminal.	--
17	SFSY	O	Play-back frame sync signal output terminal.	--
18	SBSY	O	Subcode block sync signal output terminal.	--
19	SPCK	O	Processor status signal reabout clock output terminal.	--
20	SADA	O	Processor status signal output terminal.	--
21	COFS	O	Correction frame clock output terminal. (7.35kHz)	--
22	MONIT	O	Internal signal (DSP internal flag and PLL clock) output terminal.Selected by command. This terminal output the text data with serial by command.	--
23	V_{DD}	--	Digital power supply voltage terminal.	--
24	TESIO0	I	Test input/output terminal.Normally,keep at "L" level. The terminal that inputted the clock for read of text data by command.	--
25	$P2V_{REF}$	--	PLL double reference voltage supply terminal.	--

2.Pin Function

TC9462F(2/2)

Pin No.	Symbol	I/O	Function
40	RFCT	I	RFRP signal center level input terminal
41	RFZI	I	RFRP zero cross input terminal
42	RFRP	I	RF ripple signal input terminal
43	FEI	I	Focus error signal input terminal
44	SBAD	I	Sub-beam adder signal input terminal
45	TSIN	I	Test input terminal Normally, keep at "vref" level
46	TEI	I	Tracking error signal input terminal. Take in at tracking servo ON.
47	TEZI	I	Tracking error zero cross input terminal
48	FOO	O	Focus servo equalizer output terminal
49	TRO	O	Tracking servo equalizer output terminal
50	VREF	-	Analog reference voltage supply terminal
51	RFGC	O	RF amplitude adjustment control signal output terminal
52	TEBC	O	Tracking balance control signal output terminal
53	FMO	O	Feed equalizer output terminal
54	FVO	O	Speed error signal or feed search equalizer output terminal
55	DMO	O	Disk equalizer output terminal (PWM carrier=88.2kHz for DSP, Synchronize to PXO)
56	2VREF	-	Analog double reference voltage supply terminal
57	SEL	O	APC circuit ON/OFF indication signal output terminal
58~61	FLGA~D	O	External flag output terminal for internal signal
62	VDD	-	Digital power supply voltage terminal
63	VSS	-	Digital GND terminal
64~67	IO0~3	I/O	General I/O terminal
68	DMOUT	I	This terminal control IO0~IO3 terminal
69	CKSE	I	Normally, keep at open
70	DACT	I	DAC test mode terminal. Normally, keep at open
71	TESIN	I	Test input terminal, Normally, keep at "L" level
72	TESIO1	I	Test input/output terminal. Normally, keep at "L" level
73	VSS	-	Digital GND terminal
74	PXI	I	Crystal oscillator connecting input terminal for DSP
75	PXO	O	Crystal oscillator connecting output terminal for DSP
76	VDD	-	Digital power supply voltage terminal
77	XVSS	-	Oscillator GND terminal for system clock
78	XI	I	Crystal oscillator connecting input terminal for system clock
79	XO	O	Crystal oscillator connecting output terminal for system clock
80	XVDD	-	Oscillator power supply voltage terminal for system clock
81	DVSR	-	Analog GND terminal for DA converter (Rch)
82	RO	O	R channel data forward output terminal
83	DVDD	-	Analog supply voltage terminal for DA converter
84	DVR	-	Reference voltage terminal for DA converter
85	LO	O	L channel data forward output terminal
86	DVSL	-	Analog GND terminal for DA converter (Lch)
87~89	TEST1~3	I	Test mode terminal . Normal keep at open
90~93	BUS0~3	I/O	Micon interface data input/output terminal
94	VDD	-	Digital power supply voltage terminal
95	VSS	-	Digital GND terminal
96	BUCK	I	Micon interface clock input terminal
97	CCE	I	Command and data sending/receiving chip enable signal input terminal
98	TEST4	I	Test mode terminal. Normal, keep at open
99	TSMOD	I	Local test mode selection terminal
100	RST	I	Reset signal input terminal. Reset at "L" level

■ TA2109F-X (IC501) : RF amp.

1. Pin layout

2. Block diagram

3. Pin function

Pin No.	Symbol	I/O	Pin function	Pin No.	Symbol	I/O	Pin function
1	Vcc	-	Power supply input terminal	13	SBAD	O	Sub beam adder signal output terminal
2	FNI	I	Main beam I-V amp input terminal	14	FEO	O	Focus error signal output terminal
3	FPI	I	Main beam I-V amp input terminal	15	FEN	I	FE amp negative input terminal
4	TPI	I	Sub beam I-v input terminal	16	VRO	O	Reference voltage (VREF) output terminal
5	TNI	I	Sub beam I-V input terminal	17	RFRP	O	Track count signal output terminal
6	MDI	I	Monitor photo diode amp input terminal	18	RFIS	I	RFRP detect circuit input terminal
7	LDO	O	Laser diode amp output terminal	19	RFGO	O	RF gain signal output terminal
8	SEL	I	Laser diode control signal input terminal	20	RFGC	I	RF amplitude adj. control signal input terminal
9	TEB	I	T. error balance adj. signal input terminal	21	AGCI	I	RF signal amplitude adj. amp input terminal
10	2VRO	O	Reference voltage output terminal	22	RFO	O	RF signal output terminal
11	TEN	I	TE amp negative input terminal	23	GND	-	Ground terminal
12	TEO	O	TE error signal output terminal	24	RFN	I	RF amp negative input terminal

■BA15218F-XE (IC101) : CD LPF

1. Pin layout

2. Block diagram

■ BR24CO1AF(IC604):EP ROM

1.Terminal Layout

2.Block Diagrram

3.Pin Function

Symbol	I/O	Function
VCC	-	Puwer Supply
GND	-	Ground(OV)
A1･A2･A3	I	Slaves Address Set(Pin)
SCL	I	Serial Clock Input
SDA	I/O	Slaves and Word Address,Serial Data Input, Serial Data Output(*)
TEST	I	Ground

(*)An open drain output requires a pull-up resistor.

■ HD74HC126FP-X (IC651) : Buffer

1.Terminal layout

3.Pin function

Input		Outout
C	A	Y
L	X	Z
H	L	H
H	H	L

2.Block diagram

■ IC-PST600M/G/-W1197(IC602):Reset

1.Terminal layout

2.Block diagram

VICTOR COMPANY OF JAPAN, LIMITED
MOBILE ELECTRONICS DIVISION
PERSONAL & MOBILE NETWORK BUSINESS UNIT. 10-1,1Chome,Ohwatari-machi,Maebashi-city,Japan

(No.49585)

Printed in Japan
200012(V)

Brock Diagram

< MEMO >

Standard schematic diagram

NOTES
1. VOLTAGES ARE DC-MEASURED WITH A DIGITAL VOLT METER WITHOUT INPUT SIGNAL CONDITION---CD MODE.
2. UNLESS OTHERWISE SPECIFIED.
   ALL RESISTORS ARE 1/10W OR 1/4W ±5% METAL GLAZE RESISTOR.
   ALL CAPACITORS ARE 50V OR 25V CERAMIC CAPACITOR.
   ALL RESISTANCE VALUES ARE IN OHM.
   ALL CAPACITANCE VALUES ARE IN uF(P=pF)
   ALL E.CAPACITORS ARE SHOWN IN THE FORM OF CAPACITANCE(uF)/RATED VOLTAGE(V)

Note:399001.002
CH-X400J/E CH-X450U VDH3990-001CV

CH-X400/CH-X450

DTA114EKA		10K
DTC114EKA		10K

NOTES

1. VOLTAGES ARE DC-MEASURED WITH A DIGITAL VOLT METER WITHOUT INPUT SIGNAL CONDITION---CD MODE.
2. UNLESS OTHERWISE SPECIFIED.
   ALL RESISTORS ARE 1/10W OR 1/4W ±5% METAL GLAZE RESISTOR.
   ALL CAPACITORS ARE 50V OR 25V CERAMIC CAPACITOR.
   ALL RESISTANCE VALUES ARE IN OHM.
   ALL CAPACITANCE VALUES ARE IN uF(P=pF)
   ALL E.CAPACITORS ARE SHOWN IN THE FORM OF CAPACITANCE(uF)/RATED VOLTAGE(V)

⇨ CD signal

Note:C39901.001
CH-400J/E CH-X450U VDH3990-001AV

Printed circuit board

■ Volume board

■ Mechanism board

■ 8Pin connector board

■ Main board

Note:CH-X400/CH-X450
/d2/c/vmw5777/002ch/5777

PARTS LIST

[CH-X400]
[CH-X450]

* All printed circuit boards and its assemblies are not available as service parts.

Areas suffix

CH-X400

E ---------- Continental Europe
J ---------- Northern America

Areas suffix

CH-X450

U ---------- Other Areas

- Contents -

Exploded view of general assembly and parts list ---------- 2- 2
CD changer mechanism assembly and parts list ---------- 2- 4
Electrical parts list ---------- 2- 7
Packing materials and accessories parts list ---------- 2- 9

Exploded view of general assembly and parts list

Block No. M 1 M M

■ Parts list (General assembly)

Block No. M1MM

⚠	Item	Parts number	Parts name	Q'ty	Description	Area
	1	----------	CD CHANGER MECHA	1		
	2	LV41843-001A	LASER CAUTION	1	CH-X400E,X450U	
	3	LV20065-002B-SK	FITTING	1		
	4	LV40706-003A	CAUTION LABEL	1		
	5	QYSDST2004Z	SCREW	1		
	6	LV10407-004A	TOP COVER	1	CH-X450U	
		LV10407-006A	TOP COVER	1	CH-X400E/J	
	7	VYSH101-031	SPACER	1		
	8	QYSSST2005M	SCREW	2		
	9	LV10408-004A	BOTTOM COVER	1	CH-X450U	
		LV10408-006A	BOTTOM COVER	1	CH-X400E/J	
	10	LV30632-001A	INSULATOR	1		
	11	LV40530-001A	BRACKET	2		
	12	LV30360-004A-SL	DIRECTION KNOB	2		
	13	LV30451-002A	DAMPER	4		
	14	LV40345-003A	DAMPER SP(R)	1		
	15	LV40346-003A	DAMPER SP(L)	1		
	16	QYSDST2604M	SCREW	4	TOP+BOTTOM	
	17	QYSSST2605M	SCREW	6		
	18	QYSDST2005Z	SCREW	2	PWB+TOP	
	19	QYSDST2606Z	SCREW	1	8P+TOP	
	20	LV20923-004B	F.PANEL ASS'Y	1	CH-X400E	
		LV20923-001B	F.PANEL ASS'Y	1	CH-X400J	
		LV20923-002B	F.PANEL ASS'Y	1	CH-X450U	
	21	LV30786-003A-SL	HOLD BRACKET	1		
	22	QYSDSF2005Z	SCREW	2	DOOR-3+HOLD BKT	
	23	LV32473-002A	NAME PLATE	1	CH-X400E	
		LV32474-003A	NAME PLATE	1	CH-X400J	
		LV32475-003A	NAME PLATE	1	CH-X450U	
	24	VYSS2R2-028	SPACER	1		
	25	LV40762-001A	CAUTION LABEL	1		
	26	LV40487-003A	CAUTION LABEL	1		
	27	LV40528-005A	LABEL	1	CH-X400E/J	
		LV40528-006A	LABEL	1	CH-X450U	
	28	E70891-001	CLASS 1 LABEL	1		
	29	LV40847-001A	SPACER(H)	1		
	30	VYSA1R4-056	SPACER	1		

CD changer mechanism assembly and parts list

Block No. M 2 M M

■ Parts list (CD changer mechanism)

Block No. M2MM

⚠	Item	Parts number	Parts name	Q'ty	Description	Area
	A	LV30928-201A	TRA MECHA UNIT	1		
	1	LV30096-002A	CHASSIS(L) ASSY	1		
	2	LV30097-001A	CHASSIS(R) ASSY	1		
	2-1	QYSDST2004Z	SCREW	1		
	3	QYSDST2004Z	SCREW	27		
	4	LV40129-003A	MOTOR BKT ASS'Y	1		
	5	PPN13KA10C-SA5	MOTOR ASS'Y	2		
	6	WJM0017-001A	E-SI C WIRE C-F	1		
	7	QYSPSPT2025M	MINI SCREW	2		
	9	LV40131-001A	WORM WHEEL(P)	1		
	11	LV40132-003A	THIRD GEAR	1		
	12	LV40133-005A	LIFTER GEAR	1		
	13	LV30100-002A	APLOCK ARM	1		
	14	LV40134-003A	M.LOCK SPRING	1		
	15	QYWDL163525-6	SLIT WASHER	4		
	16	LV40142-003A	LIFTER SPRING	1		
	17	LV40478-002A	EJECT DAMPER	1		
	18	LV10027-002A	TOP COVER	1		
	19	LV30101-004A	MAGAZINE SPRING	3		
	20	LV30448-001A	FRONT SLIDER AS	1		
	21	LV30449-001A	REAR SLIDER ASS	1		
	22	REE1500X	E.RING	1		
	23	LV40135-003A	ROD(U)	1		
	24	LV40136-002A	ROD(L)	1		
	25	LV30104-002A	SENSOR BRACKET	1		
	26	LV30105-001A	SENSOR HOLDER	1		
	27	QVY0002-B14	S V RESISTOR	1		
	28	WJM0017-002A	E-SI C WIRE C-F	1		
	29	LV40137-001A	SENSOR SPRING	1		
	30	LV20067-002A	LIFTER UNIT	1		
	30-1	LV30110-001A	HOOK	1		
	30-2	VKR3203-001	CLAMPER	1		
	30-3	VKL7938-001	CLAMPER GUIDE	1		
	30-4	VKS5587-002	DETECT ROLLER	2		
	30-5	VKZ4563-005	O RING	4		
	31	LV30148-004A	SIDE BKT UNIT	1		
	31-1	LV40148-003A	TRAY GEAR	1		
	31-2	QYWDL163525-6	SLIT WASHER	1		
	31-3	LV40190-002A	RETURN SP.(R)	1		
	32	LV40149-003A	L.BKT(L) ASSY	1		
	33	LV30119-002A	SWITCH LEVER	1		
	34	LV40151-002A	SWITCH SPRING	1		
	35	LV40152-001A	WORM WHEEL(T)	1		
	36	REE1500X	E.RING	1		
	37	LV30120-001A	T.MOTOR HOLDER	1		
	39	QUB540-10A2A2	WIRE(T.MOTOR)	1		
	40	QUB541-11A2A2	WIRE(T.MOTOR)	1		
	42	QYSPSPL2004Z	SCREW	3		

■ Parts list (CD changer mechanism)

Block No. M2MM

⚠	Item	Parts number	Parts name	Q'ty	Description	Area
	43	LV40474-002A	ELEVATOR SPRING	1		
	45	OPTIMA-720L1	C.D PICK (CAR)	1		
	46	FF050SK11170SA2	DC MOTOR	1		
	47	QUB456-04A2A2	WIRE(F.MOTOR)	1		
	48	QUB459-05A2A2	WIRE(F.MOTOR)	1		
	50	LV40155-001A	MIDDLE GEAR	1		
	51	LV40156-001A	S.S. GEAR	1		
	52	LV40157-001A	SCREW SHAFT	1		
	53	LV30122-001A	SHAFT HOLDER	1		
	54	VKZ4248-204	MINI TAP SCREW	1		
	55	LV30123-001A	RACK ARM	1		
	56	QYSPSPT1722M	MINI SCREW	2		
	57	LV30124-001A	P.S. SPRING	1		
	58	QYSPSPU1414M	SCREW	1		
	63	LV30450-003A	PICK FPC	1		
	64	QYSDST2006Z	SCREW	3		
	65	QUQ710-2614BJ	CARD WIRE	1		
	66	QYSDSP2606Z	SCREW	1		
	67	QYSDSR2006Z	SCREW	1		
	68	VKL7059-002SS	TR.BRACKET	1		
	69	VYSA1R4-088	SPACER	1		
	70	QUQ110-1013BJ	CARD WIRE	1		
	71	VYSH102-102	SPACER	1		
	72	LV40123-004A	LIFT ARM ASSY	1		
	73	LV30098-003A	EJECT SLIDER	1		
	74	LV40126-003A	EJECT SPRING	2		
	77	VYSA1R4-056	SPACER	1		

■ **Electrical parts list (Main board)** **Block No. 01**

⚠	Item	Parts number	Parts name	Remarks	Area
	C 101	QERF1CM-106Z	E CAPACITOR	10MF 20% 16V	
	C 102	NCB31HK-821X	C CAPACITOR		
	C 103	NCS31HJ-121X	C CAPACITOR		
	C 104	QERF0JM-476Z	E CAPACITOR	47MF 20% 6.3V	
	C 105	NBE21AM-106X	E CAPACITOR		
	C 106	NCS31HJ-101X	C CAPACITOR		
	C 111	NCS31HJ-101X	C CAPACITOR		
	C 112	NCB31HK-103X	C CAPACITOR		
	C 201	QERF1CM-106Z	E CAPACITOR	10MF 20% 16V	
	C 202	NCB31HK-821X	C CAPACITOR		
	C 203	NCS31HJ-121X	C CAPACITOR		
	C 204	QERF0JM-476Z	E CAPACITOR	47MF 20% 6.3V	
	C 205	NBE21AM-106X	E CAPACITOR		
	C 206	NCS31HJ-101X	C CAPACITOR		
	C 501	QERF0JM-107Z	E CAPACITOR	100MF 20% 6.3V	
	C 502	NCB31HK-103X	C CAPACITOR		
	C 503	QERF0JM-107Z	E CAPACITOR	100MF 20% 6.3V	
	C 504	NCB31HK-103X	C CAPACITOR		
	C 505	NCB31HK-103X	C CAPACITOR		
	C 506	QERF0JM-107Z	E CAPACITOR	100MF 20% 6.3V	
	C 507	NCB31HK-103X	C CAPACITOR		
	C 508	NCB31CK-104X	C CAPACITOR		
	C 509	NCB31CK-104X	C CAPACITOR		
	C 510	NDC31HJ-680X	C CAPACITOR		
	C 512	QERF0JM-107Z	E CAPACITOR	100MF 20% 6.3V	
	C 513	NCB31HK-103X	C CAPACITOR		
	C 514	NCS31HJ-101X	C CAPACITOR		
	C 522	NCB31HK-103X	C CAPACITOR		
	C 523	NBE21CM-105X	C CAPACITOR		
	C 524	QERF0JM-107Z	E CAPACITOR	100MF 20% 6.3V	
	C 525	NCB31HK-103X	C CAPACITOR		
	C 526	QERF0JM-107Z	E CAPACITOR	100MF 20% 6.3V	
	C 533	NCS31HJ-470X	C CAPACITOR		
	C 534	NCB31HK-153X	C CAPACITOR		
	C 536	NCB31HK-103X	C CAPACITOR		
	C 537	NCB31HK-272X	C CAPACITOR		
	C 538	NCB31HK-103X	C CAPACITOR		
	C 539	NCB31EK-333X	C CAPACITOR		
	C 542	NCB31HK-182X	C CAPACITOR		
	C 543	NCS31HJ-271X	C CAPACITOR		
	C 544	QERF0JM-476Z	E CAPACITOR	47MF 20% 6.3V	
	C 545	NCB31EK-473X	C CAPACITOR		
	C 546	NCB31EK-473X	C CAPACITOR		
	C 547	NCB31EK-473X	C CAPACITOR		
	C 549	NCB31EK-473X	C CAPACITOR		
	C 551	QERF0JM-476Z	E CAPACITOR	47MF 20% 6.3V	
	C 552	NCB31HK-103X	C CAPACITOR		
	C 553	NCB31HK-103X	C CAPACITOR		
	C 554	QERF0JM-107Z	E CAPACITOR	100MF 20% 6.3V	
	C 555	NCB31HK-103X	C CAPACITOR		
	C 556	NDC31HG-100X	C CAPACITOR		
	C 557	NDC31HG-100X	C CAPACITOR		
	C 558	NCS31HJ-101X	C CAPACITOR		
	C 571	QERF0JM-107Z	E CAPACITOR	100MF 20% 6.3V	
	C 573	QERF0JM-107Z	E CAPACITOR	100MF 20% 6.3V	
	C 574	NCB31HK-103X	C CAPACITOR		
	C 581	QERF1AM-227Z	E CAPACITOR	220MF 20% 10V	
	C 582	NCB31HK-103X	C CAPACITOR		
	C 583	QERF1CM-226Z	E CAPACITOR	22MF 20% 16V	
	C 601	QERF0JM-107Z	E CAPACITOR	100MF 20% 6.3V	
	C 602	NCB31HK-103X	C CAPACITOR		
	C 603	NCS31HJ-220X	C CAPACITOR		
	C 604	NCS31HJ-220X	C CAPACITOR		

⚠	Item	Parts number	Parts name	Remarks	Area
	C 605	QERF0JM-476Z	E CAPACITOR	47MF 20% 6.3V	
	C 606	NCB31HK-103X	C CAPACITOR		
	C 609	QERF0JM-107Z	E CAPACITOR	100MF 20% 6.3V	
	C 610	NCB31CK-104X	C CAPACITOR		
	C 611	NCB31CK-104X	C CAPACITOR		
	C 612	NCB31CK-104X	C CAPACITOR		
	C 651	NCB31HK-103X	C CAPACITOR		
	C 901	QEZ0338-228	E CAPACITOR	2200MF	
	C 902	NCB31HK-103X	C CAPACITOR		
	C 906	NCS31HJ-101X	C CAPACITOR		
	C 907	NCS31HJ-101X	C CAPACITOR		
	C 912	QERF1CM-107Z	E CAPACITOR	100MF 20% 16V	
	C 913	QERF1AM-107Z	E CAPACITOR	100MF 20% 10V	
	C 914	NCB31HK-103X	C CAPACITOR		
	C 915	NCB31HK-103X	C CAPACITOR		
	C 941	QERF1AM-107Z	E CAPACITOR	100MF 20% 10V	
	C 942	NCB31HK-103X	C CAPACITOR		
	C 943	QERF1CM-476Z	E CAPACITOR	47MF 20% 16V	
	C 944	NCB31HK-103X	C CAPACITOR		
	C 945	NCB31HK-103X	C CAPACITOR		
	C 946	QERF1CM-106Z	E CAPACITOR	10MF 20% 16V	
	C 951	NCB31HK-103X	C CAPACITOR		
	C 982	NCB31HK-103X	C CAPACITOR		
	C 983	QERF1CM-476Z	E CAPACITOR	47MF 20% 16V	
	CN501	QGF1014F1-15	FPC CONNECTOR		
	CN502	QGF1029F1-26	CONNECTOR		
	CN503	QGF1009F2-26	FFC/FPC CONECTOR		
	CN504	QGA2501F1-02	CONNECTOR		
	CN601	QGA2501F1-03	CONNECTOR		
	CN902	QNZ0095-001	CONNECTOR		
	CN903	QGF1004F4-10	CONNECTOR		
	CN904	QGF1009F2-10	CONNECTOR		
	D 101	HSM2836C-W	DIODE		
	D 583	DSK10C-T1	DIODE		
	D 584	DSK10C-T1	DIODE		
	D 585	DSK10C-T1	DIODE		
	D 911	DSK10C-T1	DIODE		
	D 912	MA3062/H/-X	ZENER DIODE		
	D 913	HSM2836C-W	DIODE		
	D 921	HSM2838C-W	DIODE		
	D 941	MA3100/L/-X	ZENER DIODE		
	D 951	MA3051/M/-X	ZENER DIODE		
	D 981	MA3091/M/-X	ZENER DIODE		
	F 901	ICP-N70	IC PROTECTER		
	IC101	BA15218F-XE	IC		
	IC501	TA2109F-X	IC		
	IC521	TC9462F	IC		
	IC581	BA5926S	IC		
	IC601	UPD780058GC-067	IC		
	IC602	IC-PST600M/G/-W	IC		
	IC604	BR24C01AF-X	IC		
	IC651	HD74HC126FP-X	IC		
	L 521	QQL231K-4R7Y	INDUCTOR		
	L 551	QQL231K-4R7Y	INDUCTOR		
	L 601	QQL231K-4R7Y	INDUCTOR		
	O 101	2SD1048/6-7/-X	TRANSISTOR		
	O 201	2SD1048/6-7/-X	TRANSISTOR		
	O 501	2SB1322/RS/-T	TRANSISTOR		
	O 581	2SB1322/RS/-T	TRANSISTOR		
	O 602	2SC2412K/R/-X	TRANSISTOR		
	O 901	2SA1037AK/R/-X	TRANSISTOR		
	O 902	DTC114EKA-X	TRANSISTOR		
	O 911	2SD1994A/RS/-T	TRANSISTOR		

■ **Electrical parts list (Main board)** **Block No. 01**

⚠	Item	Parts number	Parts name	Remarks	Area
	O 921	2SC2412K/R/-X	TRANSISTOR		
	O 922	2SA1037AK/R/-X	TRANSISTOR		
	O 941	2SB941A/QP/	TRANSISTOR		
	O 942	2SD1994A/RS/-T	TRANSISTOR		
	Q 943	DTA114EKA-X	TRANSISTOR		
	O 944	DTC114EKA-X	TRANSISTOR		
	O 971	2SA1037AK/R/-X	TRANSISTOR		
	O 972	2SC2412K/R/-X	TRANSISTOR		
	O 981	2SD1994A/RS/-T	TRANSISTOR		
	R 101	NRSA63J-273X	MG RESISTOR		
	R 102	NRSA63J-123X	MG RESISTOR		
	R 103	NRSA63J-333X	MG RESISTOR		
	R 104	NRSA63J-223X	MG RESISTOR		
	R 105	NRSA63J-223X	MG RESISTOR		
	R 106	NRSA63J-103X	MG RESISTOR		
	R 107	NRSA63J-471X	MG RESISTOR		
	R 108	NRSA63J-682X	MG RESISTOR		
	R 112	NRSA63J-470X	MG RESISTOR		
	R 201	NRS181J-273X	MG RESISTOR		
	R 202	NRSA63J-123X	MG RESISTOR		
	R 203	NRSA63J-333X	MG RESISTOR		
	R 204	NRSA63J-223X	MG RESISTOR		
	R 205	NRSA63J-223X	MG RESISTOR		
	R 206	NRSA63J-103X	MG RESISTOR		
	R 207	NRSA63J-471X	MG RESISTOR		
	R 208	NRSA63J-682X	MG RESISTOR		
	R 501	NRSA63J-473X	MG RESISTOR		
	R 502	NRSA63J-473X	MG RESISTOR		
	R 503	NRS181J-104X	MG RESISTOR		
	R 504	NRSA63J-473X	MG RESISTOR		
	R 505	NRSA63J-473X	MG RESISTOR		
	R 506	NRSA63J-104X	MG RESISTOR		
	R 507	NRSA63J-220X	MG RESISTOR		
	R 508	NRSA63J-220X	MG RESISTOR		
	R 509	NRSA63J-273X	MG RESISTOR		
	R 510	NRSA63J-393X	MG RESISTOR		
	R 511	NRSA63J-222X	MG RESISTOR		
	R 512	NRSA63J-153X	MG RESISTOR		
	R 513	NRSA63J-682X	MG RESISTOR		
	R 514	NRSA63J-473X	MG RESISTOR		
	R 521	NRSA63J-472X	MG RESISTOR		
	R 522	NRSA63J-472X	MG RESISTOR		
	R 523	NRSA63J-472X	MG RESISTOR		
	R 524	NRSA63J-472X	MG RESISTOR		
	R 525	NRSA63J-103X	MG RESISTOR		
	R 531	NRSA63J-103X	MG RESISTOR		
	R 532	NRSA63J-473X	MG RESISTOR		
	R 533	NRSA63J-683X	MG RESISTOR		
	R 534	NRSA63J-474X	MG RESISTOR		
	R 536	NRSA63J-333X	MG RESISTOR		
	R 537	NRSA63J-103X	MG RESISTOR		
	R 541	NRSA63J-122X	MG RESISTOR		
	R 542	NRSA63J-103X	MG RESISTOR		
	R 543	NRSA63J-332X	MG RESISTOR		
	R 544	NRSA63J-332X	MG RESISTOR		
	R 545	NRSA63J-332X	MG RESISTOR		
	R 547	NRSA63J-332X	MG RESISTOR		
	R 571	NRSA63J-101X	MG RESISTOR		
	R 581	NRS181J-332X	MG RESISTOR		
	R 582	NRSA63J-123X	MG RESISTOR		
	R 583	NRSA63J-102X	MG RESISTOR		
	R 584	NRS181J-102X	MG RESISTOR		
	R 601	NRSA63J-472X	MG RESISTOR		

⚠	Item	Parts number	Parts name	Remarks	Area
	R 602	NRS181J-103X	MG RESISTOR		
	R 603	NRSA63J-472X	MG RESISTOR		
	R 604	NRSA63J-472X	MG RESISTOR		
	R 605	NRSA63J-472X	MG RESISTOR		
	R 606	NRSA63J-103X	MG RESISTOR		
	R 607	NRSA63J-103X	MG RESISTOR		
	R 609	NRSA63J-473X	MG RESISTOR		
	R 610	NRSA63J-473X	MG RESISTOR		
	R 611	NRSA63J-473X	MG RESISTOR		
	R 612	NRSA63J-473X	MG RESISTOR		
	R 614	NRSA63J-473X	MG RESISTOR		
	R 617	NRSA63J-473X	MG RESISTOR		
	R 618	NRSA63J-102X	MG RESISTOR		
	R 619	NRSA63J-103X	MG RESISTOR		
	R 620	NRSA63J-104X	MG RESISTOR		
	R 621	NRSA63J-473X	MG RESISTOR		
	R 622	NRSA63J-103X	MG RESISTOR		
	R 625	NRSA63J-472X	MG RESISTOR		
	R 626	NRSA63J-473X	MG RESISTOR		
	R 651	NRSA63J-223X	MG RESISTOR		
	R 652	NRSA63J-101X	MG RESISTOR		
	R 653	NRSA63J-223X	MG RESISTOR		
	R 654	NRSA63J-334X	MG RESISTOR		
	R 655	NRSA63J-101X	MG RESISTOR		
	R 656	NRSA63J-223X	MG RESISTOR		
	R 657	NRSA63J-334X	MG RESISTOR		
	R 658	NRSA63J-331X	MG RESISTOR		
	R 659	NRSA63J-104X	MG RESISTOR		
	R 660	NRSA63J-103X	MG RESISTOR		
	R 661	NRSA63J-104X	MG RESISTOR		
	R 901	NRSA63J-103X	MG RESISTOR		
	R 902	NRSA63J-392X	MG RESISTOR		
	R 903	NRSA02J-222X	MG RESISTOR		
	R 911	QRE141J-472Y	C RESISTOR	4.7K 5% 1/4W	
	R 912	QRE141J-2R2Y	C RESISTOR	2.2 5% 1/4W	
	R 921	NRSA63J-273X	MG RESISTOR		
	R 923	NRSA63J-184X	MG RESISTOR		
	R 924	NRSA63J-682X	MG RESISTOR		
	R 925	QRE141J-223Y	C RESISTOR	22K 5% 1/4W	
	R 926	NRSA63J-223X	MG RESISTOR		
	R 941	NRS181J-100X	MG RESISTOR		
	R 942	NRSA63J-471X	MG RESISTOR		
	R 943	NRSA63J-332X	MG RESISTOR		
	R 951	NRSA63J-122X	MG RESISTOR		
	R 954	NRSA63J-272X	MG RESISTOR		
	R 971	NRSA63J-223X	MG RESISTOR		
	R 972	NRSA63J-222X	MG RESISTOR		
	R 973	NRSA63J-104X	MG RESISTOR		
	R 981	NRSA63J-221X	MG RESISTOR		
	R 982	NRSA63J-221X	MG RESISTOR		
	S 601	VSH1173-001	SWITCH		
	S 602	VSH1173-001	SWITCH		
	S 603	VSH1173-001	SWITCH		
	S 604	VSH1173-001	SWITCH		
	S 606	QSW0643-001Z	TACT SWITCH		
	X 521	QAX0413-001Z	CRYSTAL		
	X 601	QAX0414-001Z	CRYSTAL		

Packing materials and accessories parts list

Block No. M 3 M M
Block No. M 4 M M

■ Parts list (Packing)

Block No. M3MM

⚠	Item	Parts number	Parts name	Q'ty	Description	Area
	P 1	QPA01703505P	POLY BAG	1	INSTRUCTIONS	
	P 2	QPA00801205	POLY BAG	1	SCREW KIT	
	P 3	QPC03005120P	POLY BAG	1	SET	
	P 4	LV32482-001A	CARTON	1	CH-X450U	
		LV32480-001A	CARTON	1	CH-X400E/J	
	P 5	LV10504-001A	CUSHION	1		
	P 6	LV30453-003A	ACCESSARY BOX	1		
	P 7	LV30575-002A	SEPALATOR	1		
	P 8	LV30576-002A	SPACER	1	FOR MAGAZINE	

■ Parts list (Accessories)

Block No. M4MM

⚠	Item	Parts number	Parts name	Q'ty	Description	Area
	A 1	LVT0580-002A	INSTRUCTIONS	1	ENG,GER,FRE	CH-X400E
		LVT0580-003A	INSTRUCTIONS	1	DUT,SPA,ITA	CH-X400E
		LVT0580-004A	INSTRUCTIONS	1	SWE,FIN	CH-X400E
		LVT0580-001A	INSTRUCTIONS	1	ENG,SPA,FRE	CH-X400J
		LVT0580-005A	INSTRUCTIONS	1	ENG,CHI,ARA	CH-X450U
		LVT0580-006A	INSTRUCTIONS	1	ENG,CHI,ARA	CH-X450U
	A 2	BT-54013-1	WARRANTY CARD	1	CH-X400E	
		BT-51018-2	WARRANTY CARD	1	CH-X400J	
	A 3	BT-51020-2	J=REGIST CARD	1	CH-X400J	
	A 4	BT-52004-1	WARRANTY CARD	1	CH-X400J	
	A 5	BT-20071B	SVC CENTER LIST	1	CH-X400J	
	A 6	LV41155-001A	INFO.SHEET	1	CH-X400J	
	A 7	LVT0327-001B	TROUBLE SHOOTIN	1	CH-X400J	
	A 8	LV20738-002A-SK	MOUNT HOLDER	1		
	A 9	LV20737-002A-SK	MOUNT HOLDER(R)	1		
	A 10	QAM0080-001	8P BUS-BUS CORD	1		
	A 11	QYSDSP4008Z	SCREW	4		
	A 12	VKZ4029-003	SCREW	4	M5X20	
	A 13	LV40507-001A	INST SHEET	1		
	A 14	LV30682-205A-CL	MAGAZINE ASS'Y	1		
	KIT	CHX99J-SCREW1	SCREW PARTS KIT	1	A11,A12	