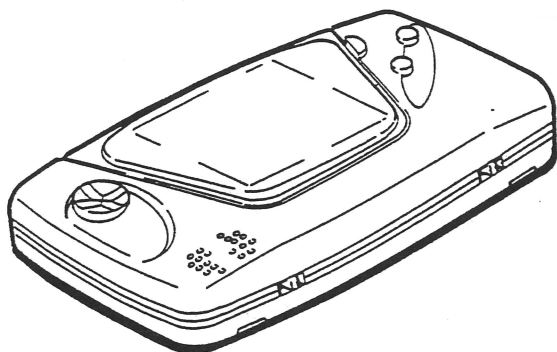


SEGATM SERVICE MANUAL

GAME GEAR VA1



NO.	004
ISSUED	DECEMBER, 1993

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Sega Enterprises, Ltd.

BEFORE USING THIS SERVICE MANUAL

This service manual covers the one-chip custom LSI (CPU+VDP+SCA).

The First Serial No. of 1 Chip Version Unit.

■ AC 120V area

- 020176537~(For USA)
- 020168498~(For CANADA)
- B20135204~
- K20117921~
- P31000001~

■ AC 230V/240V area

- 020019501~
- B30000001~
- K37000001~
- P31020001~

● COMPARISON WITH ANOTHER MODEL

Electrical Components

COMPONENT	GAME GEAR VA0	GAME GEAR VA1
CPU	IC Z80A	IC CUSTOM CHIP GG
VIDEO PROCESSOR IC	IC CUSTOM CHIP VDP GG	
I/O, LCD CONTROL IC	IC CUSTOM CHIP SCA GG	
MEMORY FOR CPU'S PROGRAM	IC UPD4364G-15L	Same as on left
MEMORY FOR VIDEO PROCESSOR IC	IC HM65256BLFP-12	Same as on left
OP AMP	IC UPC358G2	Same as on left
DUAL SWITCHING REGULATOR	IC MB3775	Same as on left
DUAL LOW-VOLTAGE POWER AMP	IC TDA2822M	Same as on left

1. SPECIFICATIONS

Ratings

#

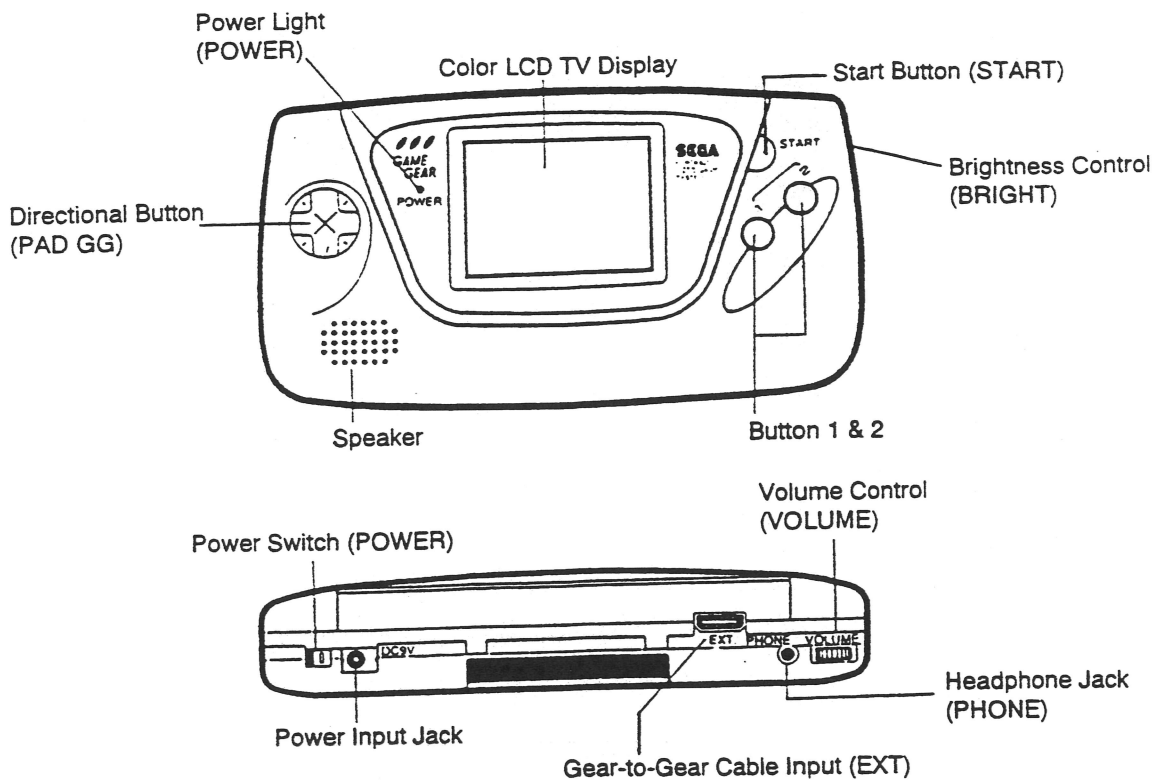
Specifications

CPU		Z80A (3.58MHz)
Memories	RAM	64kbit
	V-RAM	128kbit
Audio		3 types of sound + 1 noise.
Display capability	VDP	SEGA custom LSI (1 chip= CPU+VDP+SCA)
	Scrolling Screens	160 × 146 dot matrix 32 on-screen colors displayed from a palette of 4096 colors.
	Sprite Screens	64 sprites on-screen with dimensions of 8 × 8 dot or 16 × 16 dot displayed from a palette of 4096 colors.
	Character Patterns	Maximum of 448 defined types possible.
	Scrolling Directions	Horizontal, vertical, diagonal.
	Display	3.2" Color LCD with Back-Light.
	Screen Dimensions	65.27 mm wide × 48.90mm high
	Screen Composition	160 dot wide × 146 dot high
Headphone terminal		Plug in any set of normal headphones for private play.
Extension terminal		To play multi-player games using more than one Game Gear system.
Slots		For cartridge or TV Tuner Adaptor

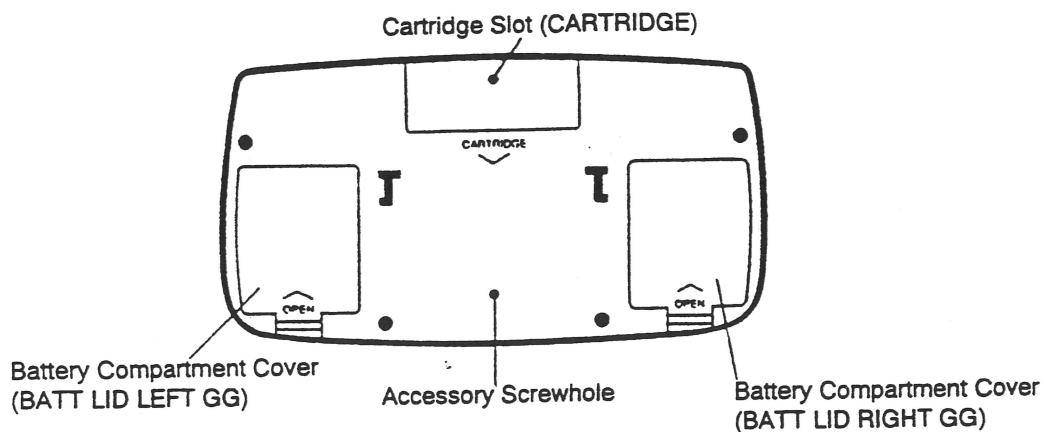
* Design and specifications are subject to change without notice.

2. IDENTIFYING PARTS

2-1. Front & Top Views of Console

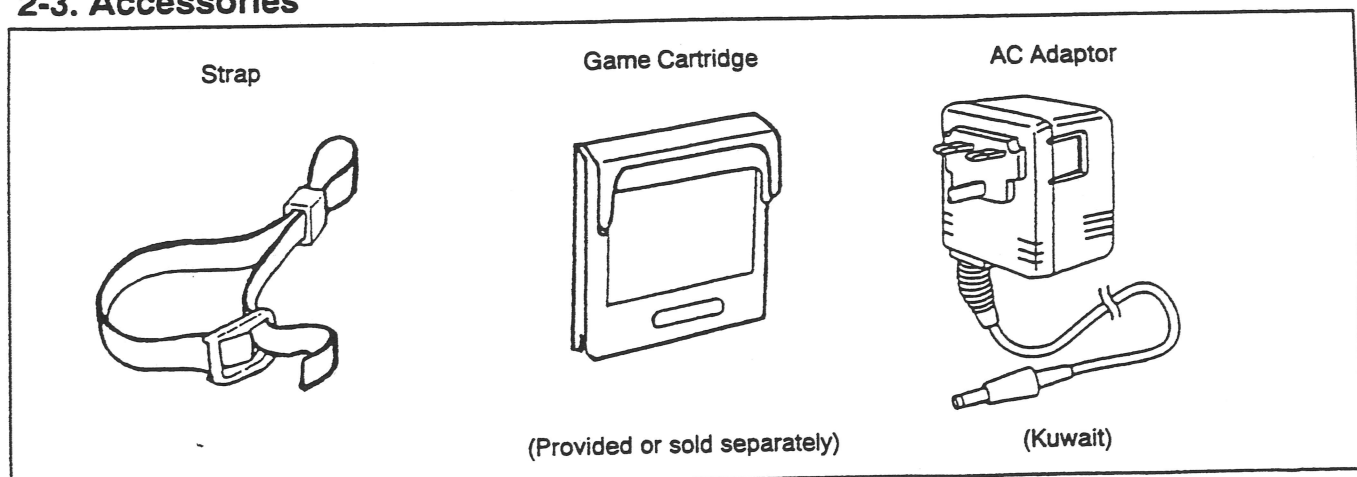


2-2. Bottom View of Console



Note: Names of parts in brackets () are used in the parts list.

2-3. Accessories



3. DISASSEMBLY

3-1. Dismantling Procedure

Removal of bottom screws and bottom case
(See Fig.1).

- 1) Turn the power button off.
- 2) Turn over the unit.
- 3) Remove both battery compartment lids (8 & 9).
- 4) Remove screw (204).
- 5) Remove six screws (201).

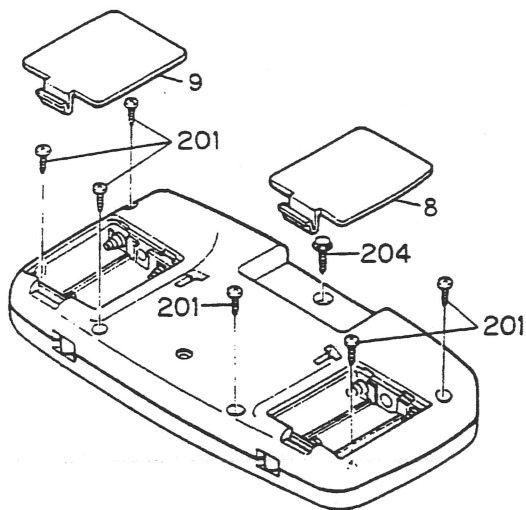


Fig-1

- 6) Remove the bottom case (See Fig.2).
Lift bottom case in the direction of arrow (A)
and make the open condition.
Remove the connector of DC-DC converter
board fixed on the bottom case.
Disconnect two connectors of sound board.

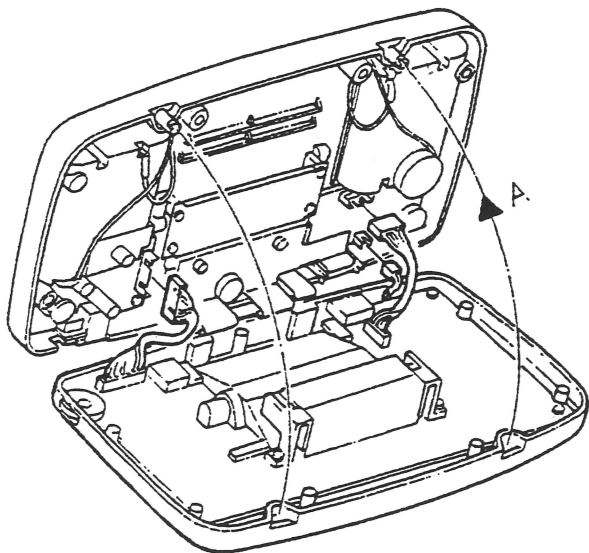


Fig-2

Main board removal (See Fig.3).

- 1) Remove two screws (202).
- 2) Remove six screws (203).
- 3) Remove the main board from the top case.

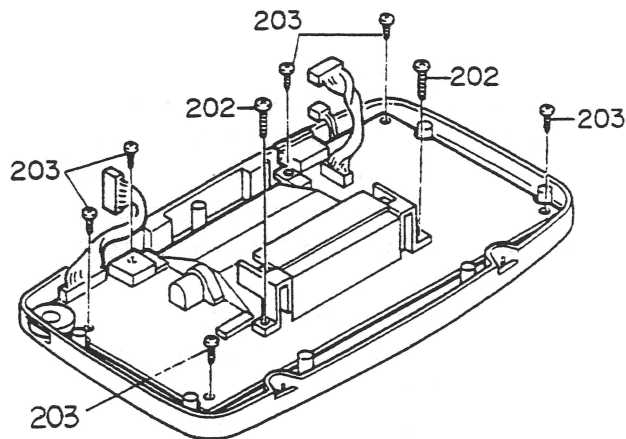


Fig-3

Sound board and DC-DC converter board
removal (See Fig.4).

- 1) Remove four screws (203).
- 2) Remove the support plate from the bottom case.
- 3) Remove two screws (203).
- 4) Remove the sound board from the bottom case.
- 5) Remove the battery blade cover.
- 6) Remove two screws (203).
- 7) Remove the DC-DC converter board.

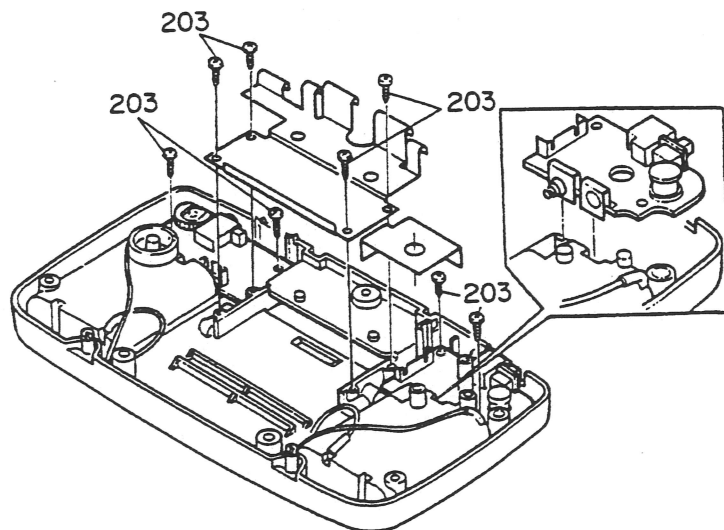


Fig-4

3-2. Reinstalling procedure

Sound board and DC-DC converter board reinstallation.

- 1) Attach the power knob to the DC-DC converter board.
- 2) Attach the DC-DC converter board to the bottom case.
- 3) Tighten two screws (203).
- 4) Attach the battery blade cover.
- 5) Attach the sound board.
- 6) Tighten two screws (203).
- 7) Attach the support plate.
- 8) Tighten four screws (203).

Main board reinstallation.

- 1) Spray surface of inside clear plate with static proof liquid.
- 2) Carefully check and remove dust inside clear plate and top case using air gun in a clean place.
Attach each button and rubber contact in its normal position.
- 3) Attach the LCD cushion along to the bosses in the top case.
- 4) Lead the speaker cable outside the bosses of the top case.
- 5) Attach the main board.

Case 1 After exchange of LCD.

Take off protective film of LCD.

Case 2 Others

Clean surface of LCD using an air gun.

- 6) Attach the main board inside and along to the bosses of top case.

Note: When setting the main board, it is important to attach it as quickly as possible to prevent the adhesion of dust on the surface of the LCD and clear plate.

- 7) Tighten six screws (203).
- 8) Tighten two screws (202).

Bottom case reinstallation.

- 1) Connect 2 connectors from the main board to the sound board and 1 connector from the main board to the DC-DC converter board.
- 2) Firmly set the bottom case to the top case taking care not to pinch the cables by the edge of the cases.

Tightening the screws on the bottom case.

- 1) Turn over the unit.
- 2) Tighten six screws (201).
- 3) Tighten the screw (204).
- 4) Attach both battery lids (8 & 9).

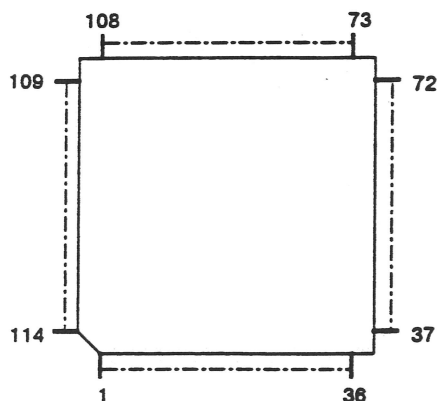
7. PARTS SPECIFICATIONS

7-1. Main Circuit Board

IC1 Custom Chip

GG QFP 144P

■ Top View



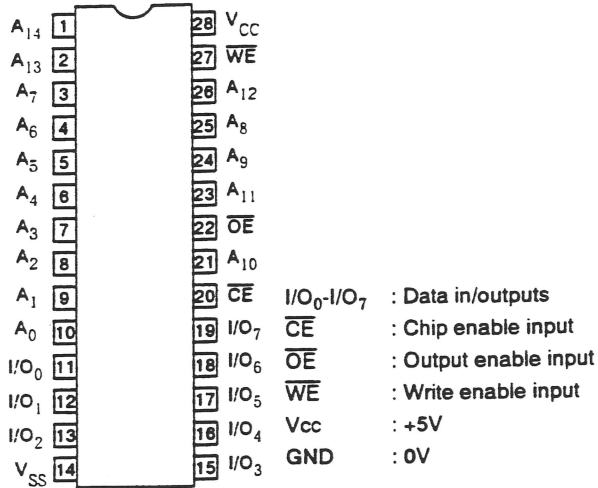
■ Description

No.	Pin Name	No.	Pin Name	No.	Pin Name	No.	Pin Name
1	V _{DD}	37	GND	73	V _{DD}	109	GND
2	A0	38	NGG	74	AD10	110	CSYN
3	A1	39	NTV	75	AD11	111	NUP
4	A2	40	NLCD	76	AD12	112	NDW
5	A3	41	A	77	AD13	113	NLE
6	A4	42	TPR2	78	AD14	114	NRI
7	A5	43	TPR1	79	NWE	115	TST2
8	A6	44	CLA3	80	NOE	116	TST1
9	A7	45	CB3	81	NCE	117	TST0
10	A8	46	CA2	82	GND (A)	118	NTSC
11	A9	47	CB2	83	VONF	119	SEC
12	A10	48	CA1	84	VRES	120	PC6
13	A11	49	CB1	85	VREF	121	PC5
14	A12	50	DW	86	SNDR	122	PC4
15	A13	51	D03	87	SNDL	123	PC3
16	A14	52	D01	88	SND1	124	PC2
17	A15	53	D04	89	SND2	125	PC1
18	GND	54	D02	90	SND3	126	PC0
19	D0	55	CL2	91	SNDN	127	CRAM
20	D1	56	P1	92	V _{DD} (A)	128	IRQ
21	D2	57	P4	93	GND (A)	129	NWR
22	D3	58	P2	94	SD10	130	NRD
23	D4	59	P3	95	SD20	131	RST
24	D5	60	DB	96	SD30	132	488
25	D6	61	AD0	97	SD40	133	HBK
26	D7	62	AD1	98	V _{DD} (A)	134	VBK
27	MRQ	63	AD2	99	SAMP	135	CP0
28	EXM1	64	AD3	100	SPON	136	V _{DD}
29	EXM2	65	AD4	101	HSYN	137	XTL2
30	VCK	66	AD5	102	VSYN	138	XTL1
31	CCK	67	AD6	103	INT	139	GND
32	NPS	68	AD7	104	NM1	140	NLED
33	NTR	69	AD8	105	WAIT	141	RSH
34	NTL	70	AD9	106	NBRQ	142	NJAP
35	NMI	71	GND	107	NBAK	143	GND
36	V _{DD}	72	GND	108	V _{DD}	144	GND

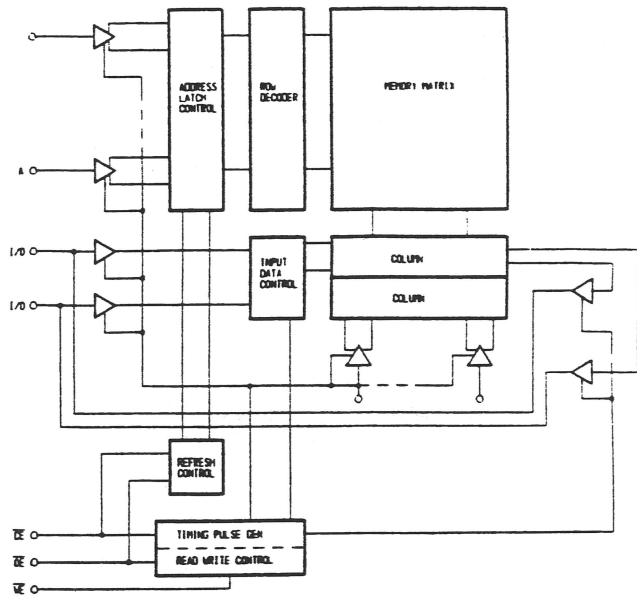
IC2

IC HM65256BLFP-12

■ Top View & Pin Layout



■ Block Diagram



■ Operation Mode

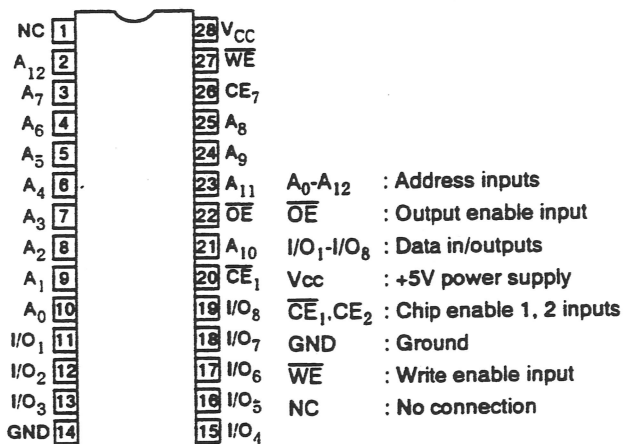
$\overline{CE}$	$\overline{OE}$	$\overline{WE}$	I/O	Mode
L	L	H	Low Z	Read
L	X	L	High Z	Write
L	H	H	High Z	—
H	L	X	High Z	Refresh
H	H	X	High Z	Standby

IC3

IC μ PD4364G-15L

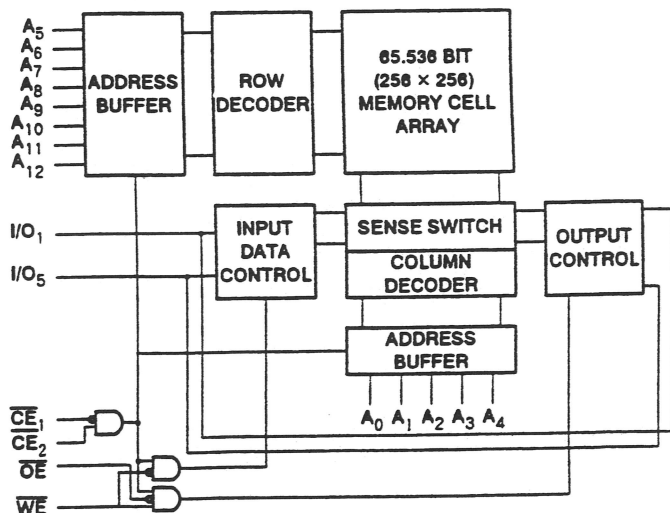
IC MB8464A-10LL

■ Top View & Pin Layout



IC FCB61C65L-70T

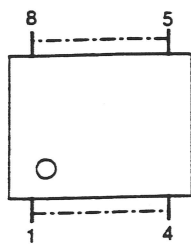
■ Block Diagram



IC4 Dual Operational Amplifier

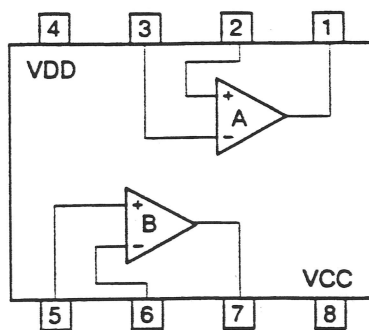
IC μ PC358G2

■ Top View



IC NJM2904-01

■ Pin Layout

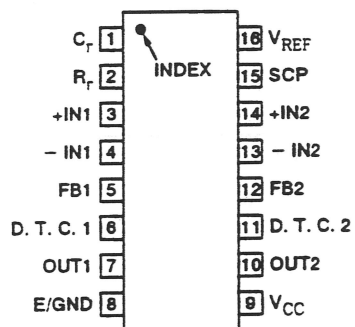


7-2 DC-DC Converter Circuit Board

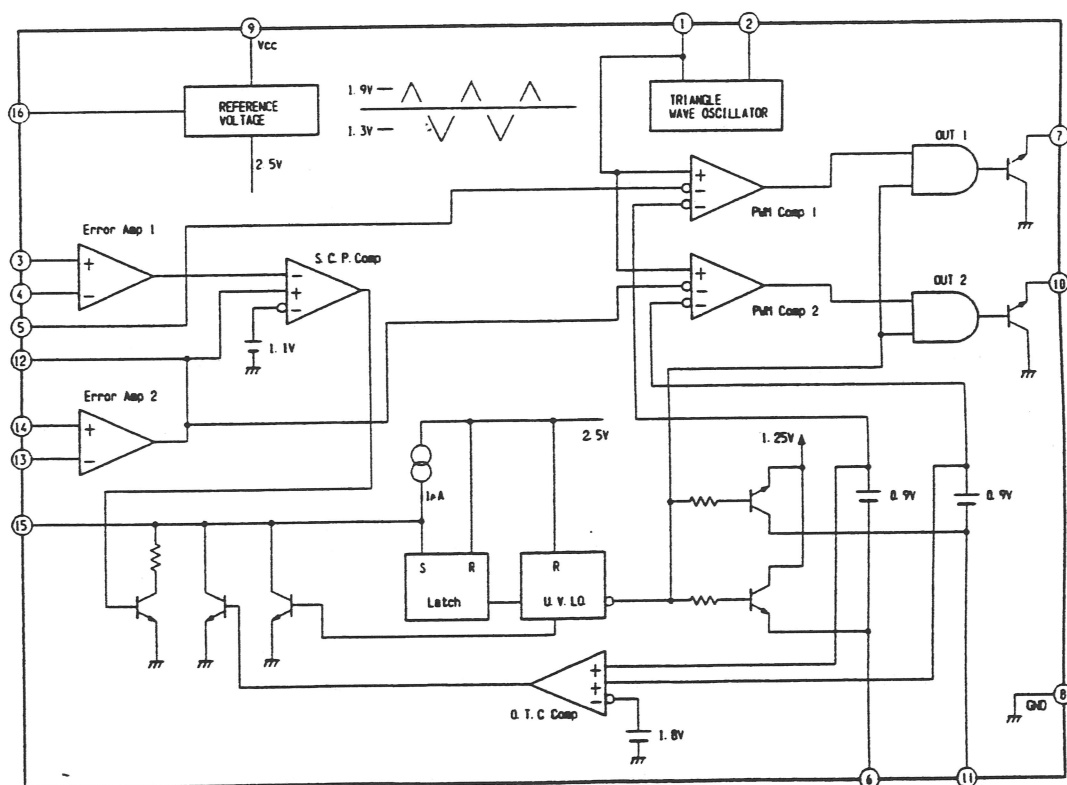
IC1

IC MB3775PF-G-BND

■ Top View & Pin Layout



■ Block Diagram

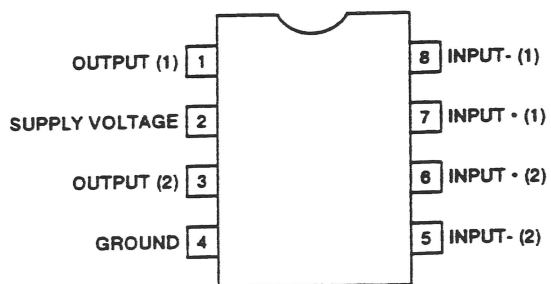


7-3 Sound Circuit Board

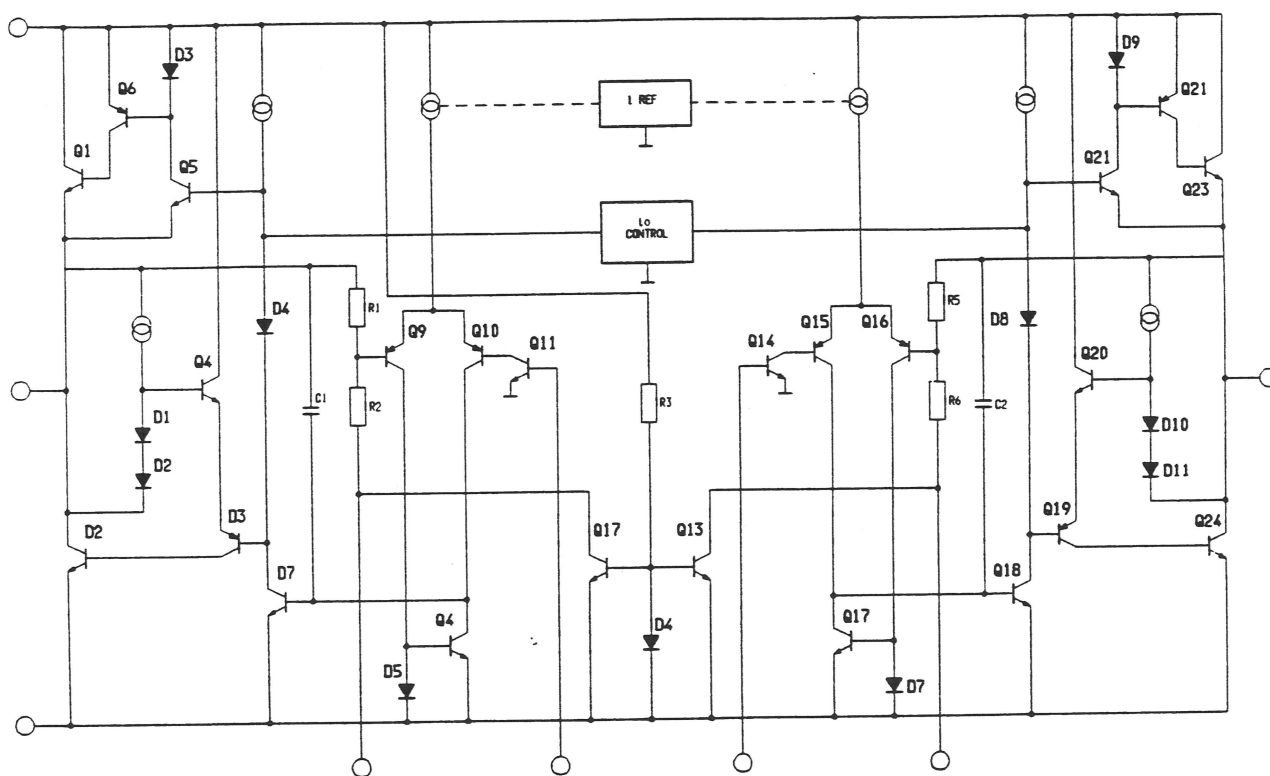
IC1

IC TDA2822M

■ Top View & Pin Layout



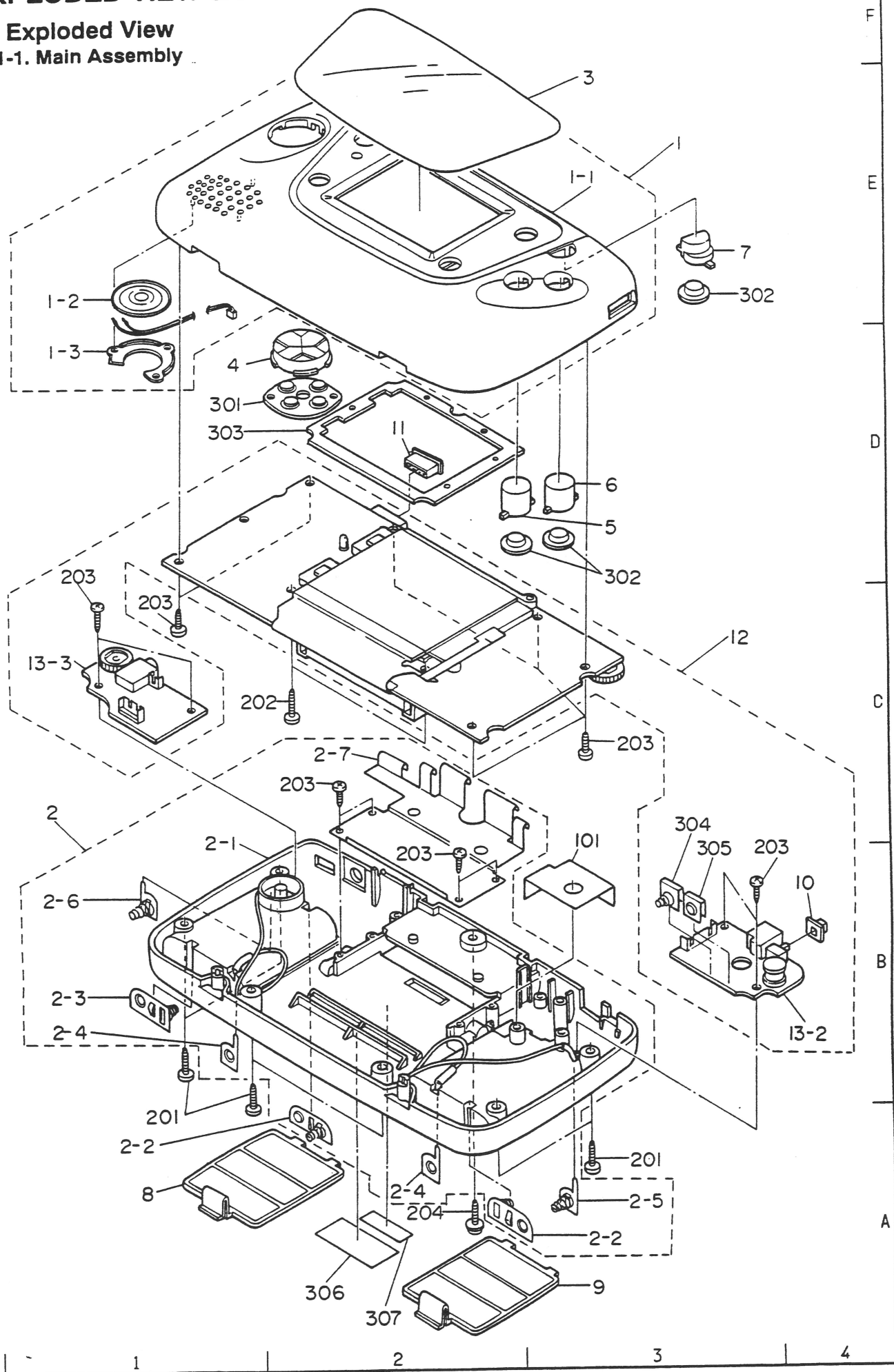
■ Block Diagram



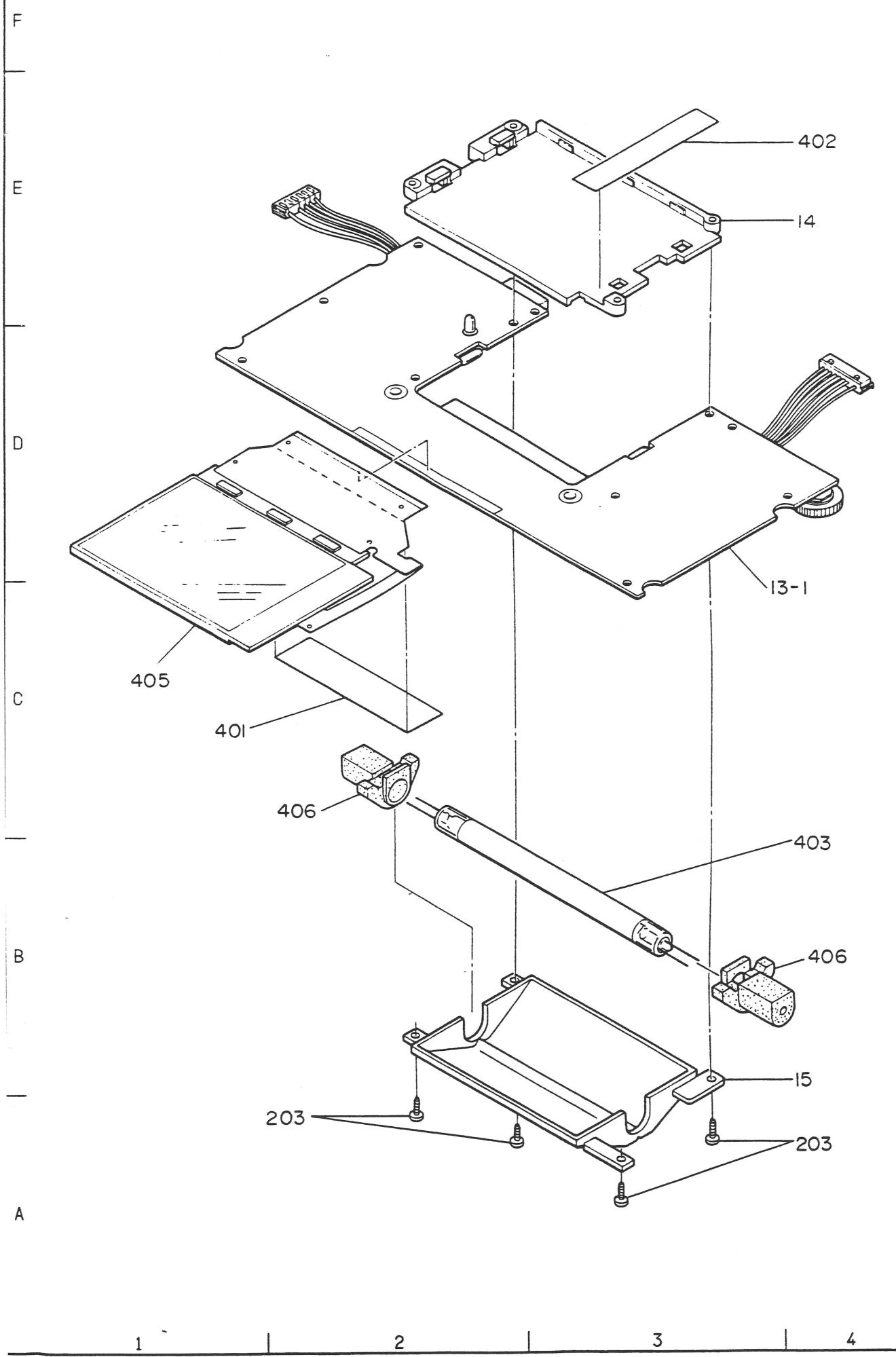
8. EXPLODED VIEW & PARTS LIST

8-1. Exploded View

8-1-1. Main Assembly



8-1-2. Sub Assembly



8-2. Mechanical Parts List

8-2-1. Main Assembly

Ref No.	Parts No.	Description	Circuit No.	Parts No.	Description
1	610-5403	ASSY TOP CASE GG USA ALL [A. C]	13-1	837-9024	IC BD GG MAIN USA VA1 (CBA) [1XX]
1	610-5403-01	ASSY TOP CASE GG USA ALL 01 [C. S. C]	13-1	837-9024-01P	IC BD GG MAIN USA VA1 W/SEQ(CBA) [1XX]
1-1	253-6420-91	TOP CASE GG EXPORT ALL [A. C]	13-1	837-9130-01P	IC BD GG MAIN EUR VA1 W/SEQ(CBA) [2XX]
1-1	253-6420-01-91	TOP CASE GG EXPORT 01 ALL [C. S. C]	13-2	837-9025	IC BD GG DC-DC CONV. USA VA1 (CBA) [1XX]
1-2	130-5052	SPKR 8 OHM 0.15W 28CS028003-01	13-2	837-9025-01P	IC BD GG DC-DC USA VA1 W/SEQ(CBA) [1XX]
1-3	253-6367	SPEAKER HOLDER GG	13-2	837-9131-01P	IC BD GG DC-DC CONV. EUROPE VA1 (CBA) [2XX]
2	610-5213	ASSY BOTTOM CASE GG USA [A. C]	13-3	837-9026	IC BD GG SOUND USA VA1 (CBA) [1XX]
2	610-5213-01	ASSY BOTTOM CASE GG USA 01 [C. S. C]	13-3	837-9026-01P	IC BD GG SOUND USA VA1 W/SEQ(CBA) [1XX]
2-1	253-6421	BOTTOM CASE GG EXPORT [A. C]	13-3	837-9132-01P	IC BD GG SOUND EUROPE VA1 (CBA) [2XX]
2-1	253-6421-01	BOTTOM CASE GG EXPORT 01 [C. S. C]	101	253-6422	BATT. BLADE COVER GG
2-2	250-5208	BATT. BLADE 2P A	201	012-P02610-0B	TAP SCR PH BLK 2.6×10
2-3	250-5209	BATT. BLADE 2P B	202	012-P00312	TAP SCR PH 3×12
2-4	250-5210	BATT. BLADE 1P C	203	012-P00206	TAP SCR PH 2×6
2-5	250-5211	BATT. BLADE 1P D	204	029-000003-0B	TAP SCR LH-3 2.6×10 BLK
2-6	250-5214	BATT. BLADE 1P E	301	509-5334	RUBBER CONTACT GG 4P [2XX]
2-7	250-5243	SUPPORT PLATE GG 01	301	509-5435	RUBBER CONTACT GG 4P BALL TYPE [1XX]
3	253-6434	CLEAR PLATE GG INMOLD	302	509-5335	RUBBER CONTACT GG 1P
4	253-6363-03	PAD GG 03 (CONTACT TYPE) [2XX]	303	601-6428	LCD CUSHION GG
4	253-6486	PAD GG BALL TYPE [1XX]	304	250-5202	BATT. BLADE 1P B
5	253-6364	BUTTON 1 GG	305	250-5203	BATT. BLADE 1P A
6	253-6365	BUTTON 2 GG	306	670-2704	LABEL INDICATION GG USA SMITH [1XX]
7	253-6366	START BUTTON GG	306	670-2707	LABEL INDICATION GG MUL SMITH [2XX]
8	253-6368	BATT LID LEFT GG	307	670-2705	LABEL SER. NO. GG
9	253-6369	BATT LID RIGHT GG	【NOTE】 1. The insides of the top and bottom cases are coated with aluminum or given a conductive surface treatment. Combine the top and bottom cases with the same coating. A top case coated with aluminum and a bottom case with a conductive surface treatment or vice versa cannot be used in combination. 2. [1XX]→ AC120V area. [2XX]→ AC230V/240V area. 3. The MAIN, DC-DC conv. and SOUND boards cannot be ordered individually.		
10	253-6378	POWER KNOB GG			
11	253-6401	10P CONN COVER GG			
12	837-7841-01P	ASSY IC BD GG USA W/SEQ [1XX]			
12	837-7994	ASSY IC BD GG EUROPE W/SEQ [2XX]			
13	837-9023	IC BD GG USA VA1 W/SEQ(CBA) [1XX]			
13	837-9023-01P	IC BD GG USA VA1 W/SEQ(CBA) [1XX]			
13	837-9129-01P	IC BD GG EUR VA1 W/SEQ(CBA) [2XX]			

8-2-2. Sub Assembly

Ref No.	Parts No.	Description	Circuit No.	Parts No.	Description
14	253-6370	SPREAD PLATE GG			
15	253-6380	REFLECT COVER GG			
203	012-P00206	TAP SCR PH 2×6			
401	090-0050	POLY FILM 633S			
402	090-0048	TAPE GG			
403	390-5309	FL LIGHT GG (BACK LIGHT) ELEBAM			
405	390-5311	ASSY LCD 3.2" COLOR GG CITIZEN			
406	601-6541	FL LIGHT PROTECTOR GG			
【NOTE】 Please place order of POLY FILM in units of rolls. One roll of POLY FILM can be used for approx. 300 Game Gear units.					

al Parts List

Circuit Board

No.	Description	Circuit No.	Parts No.	Description
7-A	IC CUSTOM CHIP GG OFF 144P IC HM65256BLFP-12 SOP 28P	EM8 EM8	271-0007-02 271-0007-04	EMI FILTER DSS306-93E222Z100 MURATA EMI FILTER ED31-B222M TOKIN
6-A	IC UPD4364G-15L SOP 28P	L1	271-0017	BEADS INDUCTOR FBA04VA900AB-00 TAIYO
5-A	IC KM6264BLG-12 SOP 28P	L1	271-0017-02	BEADS INDUCTOR HF708TL3.5x9R TDK
1-A	IC FCB61C65L-70T SOP 28P	L2	180-5077	CHOKO COIL 105UH KI-1589 KIJIMA
35-A	IC MB8464A-10LL SOP	L2	180-5092	CHOKO COIL 105UH TOKYO TRANS
53-10A	IC LC3564PM-10L SOP	L2	180-5114	CHOKO COIL 105UH CA-C-D007-001 FUJI
53-12A	IC LC3564PM-12L SOP	L3	180-5073	P.COIL CHIP 100UH LEM4532T101K TAIYO
66-10A	IC LC3664BML-10H SOP	L3	180-5073-02	P.COIL CHIP 100UH NL453232T-101K TDK
66-85A	IC LC3664BML-85H SOP	T1	560-5172	INVERTER XFMR KI-1588 KIJIMA
330-10A	IC MB8464H-10LL SOP 28P	T1	560-5201	INVERTER XFMR TT911217-1 TOKYO TRANS
331-15A	IC GM76C88ALFW-15 SOP 28P	T1	560-5251	INVERTER XFMR CA-T-1618-001 FUJI
134-A	IC UPC358G2 SOP 8P	VR1	220-5339	VOL CONT 20K B RK09J11T0 ALPS
134-01-A	IC NJM2904-01 SOP 8P	VR1	220-5339-01	VOL CONT 20K B-TYPE HOKURIKU
5127	XSTR 2SD1614 CHIP	R1	476-1472-J-16	RES CHIP 4.7K OHM 1/16W 5%
5127	XSTR 2SD1614 CHIP	R2	476-1472-J-16	RES CHIP 4.7K OHM 1/16W 5%
5126	XSTR 2SC1623 L5..7 CHIP	R3	476-1472-J-16	RES CHIP 4.7K OHM 1/16W 5%
5126	XSTR 2SC1623 L5..7 CHIP	R4	476-1472-J-16	RES CHIP 4.7K OHM 1/16W 5%
5126	XSTR 2SA812 M5..7 CHIP	R5	476-1474-J-16	RES CHIP 470K OHM 1/16W 5%
5126	XSTR 2SC1623 L5..7 CHIP	R6	476-1474-J-16	RES CHIP 470K OHM 1/16W 5%
5126	XSTR 2SA812 M5..7 CHIP	R7	476-1474-J-16	RES CHIP 470K OHM 1/16W 5%
5125	XSTR 2SC1623 L5..7 CHIP	R8	476-1474-J-16	RES CHIP 470K OHM 1/16W 5%
5125	XSTR 2SC1623 L5..7 CHIP	R9	476-2471-J-10	RES CHIP 470 OHM 1/10W 5%
USED	NOT USED	R10	476-2472-J-10	RES CHIP 4.7K OHM 1/10W 5%
0-5308	LED SLR 34-VT3F	R11	476-2472-J-10	RES CHIP 4.7K OHM 1/10W 5%
31-5072	DIODE 1SS184 CHIP	R12	476-1122-J-16	RES CHIP 1.2K OHM 1/16W 5%
81-5072	DIODE 1SS184 CHIP	R13	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%
81-5072	DIODE 1SS184 CHIP	R14	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%
81-5072	DIODE 1SS184 CHIP	R15	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%
230-5066	XTAL OSC 32.215905M 100PPM	R16	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%
209-5037-01A	CONN 45P FOR GG 3HOLES	R17	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%
209-5037-02A	CONN 45P FOR GG 3HOLES	R18	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%
209-5038	CONN 10P FOR GG HDC-0492	R19	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%
600-5910	WIRE HARN 6P FOR GG 60MM	R20	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%
600-5911	WIRE HARN 9P FOR GG 60MM	R21	476-1221-J-16	RES CHIP 220 OHM 1/16W 5%
514-5040	FUSE THERMAL SMO95B0	R22	476-2472-J-10	RES CHIP 4.7K OHM 1/10W 5%
514-5040	FUSE THERMAL SMO95B0	R23	476-2182-J-10	RES CHIP 1.8K OHM 1/10W 5%
079-000003	EYLET 3.5x7	R24	476-2510-J-10	RES CHIP 51 OHM 1/10W 5%
079-000003	EYLET 3.5x7	R25	476-2103-J-10	RES CHIP 10K OHM 1/10W 5%
271-0007	EMI FILTER STX222MB	R26	476-2103-J-10	RES CHIP 10K OHM 1/10W 5%
271-0007-02	EMI FILTER DSS306-93E222Z100 MURATA	R27	476-2103-J-10	RES CHIP 9.1K OHM 1/10W 1%
271-0007-04	EMI FILTER ED31-B222M TOKIN	R28	476-2912-F-10	RES CHIP 1.1K OHM 1/10W 1%
271-0007	EMI FILTER STX222MB	R29	476-2112-F-10	RES CHIP 3K OHM 1/10W 1%
271-0007-02	EMI FILTER DSS306-93E222Z100 MURATA	R30	476-2302-F-10	RES CHIP 100K OHM 1/10W 5%
271-0007-04	EMI FILTER ED31-B222M TOKIN	R31	476-2104-J-10	RES CHIP 100K OHM 1/10W 5%
271-0007	EMI FILTER STX222MB	R32	476-2104-J-10	RES CHIP 30K OHM 1/10W 5%
271-0007-02	EMI FILTER DSS306-93E222Z100 MURATA	R33	476-2303-J-10	RES CHIP 20K OHM 1/10W 5%
271-0007-04	EMI FILTER ED31-B222M TOKIN	R34	476-2203-J-10	RES CHIP 51 OHM 1/10W 5%
271-0007	EMI FILTER STX222MB	R35	476-2510-J-10	RES CHIP 56K OHM 1/10W 1%
271-0007-02	EMI FILTER DSS306-93E222Z100 MURATA	R36	476-2563-F-10	RES CHIP 30K OHM 1/10W 1%
271-0007-04	EMI FILTER ED31-B222M TOKIN	R37	476-2303-F-10	RES CHIP 30K OHM 1/10W 5%
271-0007	EMI FILTER STX222MB	R38	476-2510-J-10	RES CHIP 51 OHM 1/10W 5%
271-0007-02	EMI FILTER DSS306-93E222Z100 MURATA	R39	476-2471-F-10	RES CHIP 470 OHM 1/10W 1%
271-0007-04	EMI FILTER ED31-B222M TOKIN	R40	476-2222-J-10	RES CHIP 2.2K OHM 1/10W 5%
271-0007	EMI FILTER STX222MB	R41	476-2244-J-10	RES CHIP 240K OHM 1/10W 5%
271-0007-02	EMI FILTER DSS306-93E222Z100 MURATA	R42	476-2223-J-10	RES CHIP 22K OHM 1/10W 5%
271-0007-04	EMI FILTER ED31-B222M TOKIN	R43	476-2223-J-10	RES CHIP 22K OHM 1/10W 5%
271-0007	EMI FILTER STX222MB	R44	476-2105-J-10	RES CHIP 1M OHM 1/10W 5%
271-0007-02	EMI FILTER DSS306-93E222Z100 MURATA	R45	476-2223-J-10	RES CHIP 22K OHM 1/10W 5%
271-0007-04	EMI FILTER ED31-B222M TOKIN	R46	476-2223-J-10	RES CHIP 22K OHM 1/10W 5%
271-0007	EMI FILTER STX222MB	R47	476-2103-J-10	RES CHIP 10K OHM 1/10W 5%
271-0007-02	EMI FILTER DSS306-93E222Z100 MURATA	R48	476-2103-J-10	RES CHIP 10K OHM 1/10W 5%
271-0007-04	EMI FILTER ED31-B222M TOKIN	R49	476-2103-J-10	RES CHIP 10K OHM 1/10W 5%
271-0007	EMI FILTER STX222MB	R50	476-2473-J-10	RES CHIP 47K OHM 1/10W 5%
271-0007-02	EMI FILTER DSS306-93E222Z100 MURATA	R51	476-2473-J-10	RES CHIP 47K OHM 1/10W 5%
271-0007-04	EMI FILTER ED31-B222M TOKIN	R52	476-2102-J-10	RES CHIP 1K OHM 1/10W 5%
271-0007	EMI FILTER STX222MB	R53	476-2102-J-10	RES CHIP 1K OHM 1/10W 5%
271-0007-02	EMI FILTER DSS306-93E222Z100 MURATA	R54	476-2102-J-10	RES CHIP 1K OHM 1/10W 5%
271-0007-04	EMI FILTER ED31-B222M TOKIN	R55	476-2102-J-10	RES CHIP 1K OHM 1/10W 5%
271-0007	EMI FILTER STX222MB			RES CHIP 1K OHM 1/10W 5%

Circuit No.	Parts No.	Description	Circuit No.	Parts No.	Description
R56	476-2182-J-10	RES CHIP 1.8K OHM 1/10W 5%	C59	151-0265	CAP CER CP 0.1UF 25V ZF 2125
R57	476-2182-J-10	RES CHIP 1.8K OHM 1/10W 5%	C60	151-0286	CAP CER CHIP 0.47UF 16V Z F GSR40
R58	476-2102-J-10	RES CHIP 1K OHM 1/10W 5%	C61	153-0085-01	CAP TANT CHIP 1UF 16V 20% F931C
J1	NOT USED	NOT USED (W/SEQ)	C61	153-0086	CAP TANT CHIP 1UF 16V SVA1C105M1-8R
C1	150-0311	CAP E CHIP 33UF 6.3V MF6.3FC33D8	C61	153-0090	CAP TANT CHIP 1UF 10V SVA1A105M1
C2	NOT USED	NOT USED	C62	153-0085-01	CAP TANT CHIP 1UF 16V 20% F931C
C3	NOT USED	NOT USED	C62	153-0086	CAP TANT CHIP 1UF 16V SVA1C105M1-8R
C4	150-0308	CAP E CHIP 10UF 6.3V MF6.3FC10B6	C62	153-0090	CAP TANT CHIP 1UF 10V SVA1A105M1
C4	150-0420	CAP E CHIP 10UF 16V 20% UUS1A100MC22GH	C63	151-0265	CAP CER CP 0.1UF 25V ZF 2125
C5	NOT USED	NOT USED	C64	153-0085-01	CAP TANT CHIP 1UF 16V 20% F931C
C6	151-0320	CAP CER CP 68PF 50V J CH 2125	C64	153-0086	CAP TANT CHIP 1UF 16V SVA1C105M1-8R
C7	151-0358	CAP CER CP 0.33UF 16V ZF 2125	C64	153-0090	CAP TANT CHIP 1UF 10V SVA1A105M1
C8	151-0358	CAP CER CP 0.33UF 16V ZF 2125	C65	151-0264	CAP CER CP 8200PF 50V KB 2125
C9	151-0358	CAP CER CP 0.33UF 16V ZF 2125	C66	151-0264	CAP CER CP 8200PF 50V KB 2125
C10	151-0358	CAP CER CP 0.33UF 16V ZF 2125	C67	153-0085-01	CAP TANT CHIP 1UF 16V 20% F931C
C11	150-0308	CAP E CHIP 10UF 6.3V MF6.3FC10B6	C67	153-0086	CAP TANT CHIP 1UF 16V SVA1C105M1-8R
C11	150-0420	CAP E CHIP 10UF 16V 20% UUS1A100MC22GH	C67	153-0090	CAP TANT CHIP 1UF 10V SVA1A105M1
C12	151-0307	CAP CER CP 0.022UF 50V ZF 2125	C68	150-0313	CAP E CHIP 100UF 6.3V MF6.3FC100D13
C13	151-0265	CAP CER CP 0.1UF 25V ZF 2125	C69	152-0177	CAP MP 0.1UF 10QV 10%
C14	150-0308	CAP E CHIP 10UF 6.3V MF6.3FC10B6	C70	151-0272	CAP CER 270PF 2KV SL MURATA
C14	150-0420	CAP E CHIP 10UF 16V 20% UUS1A100MC22GH	C70	151-0272-01	CAP CER 270PF 2KV SL MURAYAMA
C15	151-0265	CAP CER CP 0.1UF 25V ZF 2125	C71	151-0307	CAP CER CP 0.022UF 50V ZF 2125
C16	151-0265	CAP CER CP 0.1UF 25V ZF 2125	C72	151-0307	CAP CER CP 0.022UF 50V ZF 2125
C17	151-0357	CAP CER CP 1200PF 50V K B 1608	C73	151-0307	CAP CER CP 0.022UF 50V ZF 2125
C18	151-0291	CAP CER CP 39PF 50V K SL 1608			
C19	151-0291	CAP CER CP 39PF 50V K SL 1608			
C20	151-0291	CAP CER CP 39PF 50V K SL 1608			
C21	151-0291	CAP CER CP 39PF 50V K SL 1608			
C22	151-0291	CAP CER CP 39PF 50V K SL 1608			
C23	151-0291	CAP CER CP 39PF 50V K SL 1608			
C24	151-0291	CAP CER CP 39PF 50V K SL 1608			
C25	151-0291	CAP CER CP 39PF 50V K SL 1608			
C26	151-0291	CAP CER CP 39PF 50V K SL 1608			
C27	151-0291	CAP CER CP 39PF 50V K SL 1608			
C28	151-0291	CAP CER CP 39PF 50V K SL 1608			
C29	151-0291	CAP CER CP 39PF 50V K SL 1608			
C30	151-0291	CAP CER CP 39PF 50V K SL 1608			
C31	151-0291	CAP CER CP 39PF 50V K SL 1608			
C32	151-0263	CAP CER CP 2200PF 50V KB 2125			
C33	151-0263	CAP CER CP 2200PF 50V KB 2125			
C34	151-0263	CAP CER CP 2200PF 50V KB 2125			
C35	151-0263	CAP CER CP 2200PF 50V KB 2125			
C36	151-0263	CAP CER CP 2200PF 50V KB 2125			
C37	151-0263	CAP CER CP 2200PF 50V KB 2125			
C38	151-0263	CAP CER CP 2200PF 50V KB 2125			
C39	151-0328	CAP CER CHIP 22PF 50V CH 2125			
C40	151-0328	CAP CER CHIP 22PF 50V CH 2125			
C41	151-0265	CAP CER CP 0.1UF 25V ZF 2125			
C42	150-0308	CAP E CHIP 10UF 6.3V MF6.3FC10B6			
C42	150-0420	CAP E CHIP 10UF 16V 20% UUS1A100MC22GH			
C43	151-0309	CAP E CHIP 22UF 6.3V MF6.3FC22D6			
C44	151-0265	CAP CER CP 0.1UF 25V ZF 2125			
C45	150-0307	CAP E CHIP 4.7UF 35V MF35FC4.7D6			
C46	151-0265	CAP CER CP 0.1UF 25V ZF 2125			
C47	150-0318	CAP E CHIP 68UF 6.3V MF6.3FC68D10			
C48	151-0265	CAP CER CP 0.1UF 25V ZF 2125			
C49	150-0319	CAP E CHIP 100UF 4V MF4FC100D10			
C50	151-0265	CAP CER CP 0.1UF 25V ZF 2125			
C51	151-0265	CAP CER CP 0.1UF 25V ZF 2125			
C52	151-0271	CAP CER CP 0.01UF 50V ZF 2125			
C53	151-0271	CAP CER CP 0.01UF 50V ZF 2125			
C54	150-0317	CAP E CHIP 0.47UF 50V MF50VFC0.47A6			
C55	150-0317	CAP E CHIP 0.47UF 50V MF50VFC0.47A6			
C56	151-0270	CAP CER CP 47PF 50V KSL 2125			
C57	151-0270	CAP CER CP 47PF 50V KSL 2125			
C58	151-0286	CAP CER CHIP 0.47UF 16V ZF GSR 40			

8-3-2. DC-DC Converter Circuit Board

IC1	313-5140-A	IC MB3775PF-G-BND SOP FUJITSU
Q1	482-5125	XSTR 2SA812 M5..7 CHIP NEC
Q2	482-5126	XSTR 2SC1623 L5..7 CHIP NEC
Q3	482-5130	XSTR CHIP 2SB1301 ZQ OR ZP NEC
D1	481-5111	DIODE CHIP U1BC44 TOSHIBA
D2	481-5071	DIODE CHIP HRF 22 HITACHI
D3	481-5071	DIODE CHIP HRF 22 HITACHI
D6	NOT USED	NOT USED
J1	210-5078	CONN DC JACK EIAJ W/SW HOSHIDEN[1XX]
J1	210-5062	CONN DC JACK W/SW LGP4013-0300 [2XX]
CN1	212-5355	CONN 9P FOR GG 178094-9 AMP
SW1	510-5028	SLIDE SW HSW1805-010010 HOSHIDEN
L1	180-5071	CHOKE COIL 1.2MH FL7H122J TAIYO
L2	180-5072	CHOKE COIL 68UH TSL1110680K1R TDK
L2	180-5083	CHOKE COIL 68UH A90-870-0 SEIBU
JV	271-0041	BEADS INDUCTOR FBA04VA450AB-00 TAIYO
JV	271-0041-01	BEADS INDUCTOR B-01C-AT
JG	271-0041	BEADS INDUCTOR FBA04VA450AB-00 TAIYO
JG	271-0041-01	BEADS INDUCTOR B-01C-AT
R1	476-2333-J-10	RES CHIP 33K OHM 1/10W 5%
R2	476-2273-J-10	RES CHIP 27K OHM 1/10W 5%
R3	476-2102-J-10	RES CHIP 1K OHM 1/10W 5%
R4	476-2392-J-10	RES CHIP 3.9K OHM 1/10W 5%
R5	476-2222-J-10	RES CHIP 2.2K OHM 1/10W 5%
R6	476-2102-J-10	RES CHIP 1K OHM 1/10W 5%
R7	476-2114-F-10	RES CHIP 110K OHM 1/10W 1%
R8	476-2432-F-10	RES CHIP 4.3K OHM 1/10W 1%
R9	476-2473-J-10	RES CHIP 47K OHM 1/10W 5%
R10	476-2333-J-10	RES CHIP 33K OHM 1/10W 5%
R11	476-2123-J-10	RES CHIP 12K OHM 1/10W 5%
R12	476-0361-J-04	RES CHIP 360 OHM 1/4W 5%
R13	476-2221-J-10	RES CHIP 220 OHM 1/10W 5%

【NOTE】 1. [1XX]→ AC120V area. [2XX]→ AC230V/240V area.

Circuit No.	Parts No.	Description	Circuit No.	Parts No.	Description
R14	476-2203-F-10	RES CHIP 20K OHM 1/10W 1%			
R15	476-2682-F-10	RES CHIP 6.8K OHM 1/10W 1%			
C1	153-0088	CAP TANT CP 0.68UF 16V 3216			
C1	153-0096	CAP TANT CHIP 0.68UF 20V 20% F9			
C2	151-0265	CAP CER CP 0.1UF 25V ZF 2125			
C3	151-0269	CAP CER CP 0.1UF 25V K 2125			
C4	151-0265	CAP CER CP 0.1UF 25V ZF 2125			
C5	150-0314-A	CAP E 22UF 35V M 35SP(X)22			
C5	150-0314-01A	CAP E 22UF 35V 35YXB22MY0511			
C6	151-0265	CAP CER CP 0.1UF 25V ZF 2125			
C7	151-0268	CAP CER CHIP 680PF K B 2125			
C8	151-0269	CAP CER CP 0.1UF 25V K 2125			
C10	151-0265	CAP CER CP 0.1UF 25V ZF 2125			
C11	150-0315-A	CAP E 100UF 25V M 25SP(X)100			
C11	150-0315-01A	CAP E 100UF 25V 25YXB100MY0611			
C12	151-0265	CAP CER CP 0.1UF 25V ZF 2125			
C13	150-0316-A	CAP E 820UF 6.3V M 6.3SP(X)820			
C13	150-0316-01A	CAP E 820UF 6.3V 6.3YXB820Y			
C14	151-0265	CAP CER CP 0.1UF 25V ZF 2125			
8-3-3. Sound Circuit Board					
IC1	313-5141	IC TDA2822M			SGS
IC1	313-5141-01	IC KA2209 8P DIP			SAMSUNG
J1	210-5061	CONN MINI JACK HSJ0873-01-440			HOSHIDEN
CN1	212-5354	CONN 6P FOR GG 188094-6			AMP
CN2	212-5356-02	CONN M MT AMP CT 2P 173981-2			AMP
VR1	220-5343	SW VOL CONT 10K OHM K102J0225			ALPS
VR1	220-5343-01	VOL CONT 10K OHM A-TYPE			HOKURIKU
R1	476-2563-J-10	RES CHIP 56K OHM 1/10W 5%			
R2	476-2563-J-10	RES CHIP 56K OHM 1/10W 5%			
R3	476-24R7-J-10	RES CHIP 4.7 OHM 1/10W 5%			
R4	476-24R7-J-10	RES CHIP 4.7 OHM 1/10W 5%			
R5	476-2101-J-10	RES CHIP 100 OHM 1/10W 5%			
R6	476-2101-J-10	RES CHIP 100 OHM 1/10W 5%			
C1	150-0313-01	CAP E CP 100UF 6.3V MV6.3VC100			
C1	150-0313-03	CAP E CHIP 100UF 6.3V 20% UWXO			
C2	150-0313-01	CAP E CP 100UF 6.3V MV6.3VC100			
C2	150-0313-03	CAP E CHIP 100UF 6.3V 20% UWXO			
C3	150-0313-01	CAP E CP 100UF 6.3V MV6.3VC100			
C3	150-0313-03	CAP E CHIP 100UF 6.3V 20% UWXO			
C4	151-0265	CAP CER CP 0.1UF 25V ZF 2125			
C5	150-0312-01	CAP E CP 47UF 4V MV4VC47			
C5	150-0312-02	CAP E CHIP 47UF 4V UWXOG470MCR			
C6	151-0265	CAP CER CP 0.1UF 25V ZF 2125			
C7	150-0312-01	CAP E CP 47UF 4V MV4VC47			
C7	150-0312-02	CAP E CHIP 47UF 4V UWXOG470MCR			
C8	151-0265	CAP CER CP 0.1UF 25V ZF 2125			
LF1	270-5044-02	LINE FILTER SDP-103C1			TOKIN
LF1	270-5057	LINE FILTER CMO4RC02T			TAIYO

【NOTE】 1. [1XX]→ AC120V area. [2XX]→ AC230V/240V area.

8-4. Accessories/Package List

No.	Parts No.	Description	No.	Parts No.	Description
1	400-5050	AC ADAPTOR AC240V/DC9V 1A AS(AUSTRALIA)	16	671-1362	INR CTN GG MULTI(2180)
1	400-5109A	AC ADAP. AC240V/DC9V 0.85A BS (U. K. KUWAIT)	16	671-3857	(MK-2180(Except USA & CANADA)) INR CTN GG MULTI 2100 PM
1	400-5204	AC ADAPTOR AC220V/DC 10V 0.85A (EXCEPT U. K. KUWAIT, USA&CANADA)			(MK-2100(Except USA & CANADA))
2	601-6499	STRAP GG	16	671-3862	INR-CTN GG MULTI 2184 PM
3	610-5343	PACKING GG PLUS TRAY & LID(MK-2182 (AUSTRALIA, KUWAIT, SAUDIARABIA & SPAIN))	16	671-3941	(MK-2184(Except USA & CANADA)) INR-CTN GG MULTI 2180 PM
3	610-5365	PACKING TRAY GG EXPORT SET (MK-2180(SPAIN))			(MK-2180(Except USA & CANADA))
4	670-0332-01	SEAL G. PREZIOSI ITALY 01 (MK-2100/2182/2184(ITALY))	17	671-2370E	MA CTN GG USA 2122 E(MK-2122(USA))
5	670-0364-27	BAR CODE SEAL MULTI(2180) (MK-2180(SPAIN))	17	671-3760	MA CTN GG USA 2100 PM(MK-2100(USA))
6	670-0863-02	MEMBERSHIP CARD SWEDEN 02(SWEDEN)	17	671-3766	MA CTN GG USA 2121 PM (MK-2121(USA))
7	670-1440	STICKER GG USA (MK-2100(USA))	17	671-3778	MA CTN GG USA 2131 PM(MK-2131(USA))
7	670-2582	STICKER INCL. COLUMNS GG ITALY (MK-2100(ITALY))	17	671-2370-02	MA CTN GG CAN 2122-22 (MK-2122(CANADA))
8	670-1523	INFOR SHEET GG CANADA(MK-2100(CANADA))	17	671-3788	MA CTN GG CAN 2100 PM (MK-2100(CANADA))
9	670-1564-04	BUSINESS REPLY MAIL GG USA 04(USA)	17	671-3800	MA CTN GG CAN 2131 PM(MK-2131(CANADA))
9	670-4106	BUSINESS REPLY CARD SOC(MK-2122/2131 (CANADA))	17	671-1363	MA CTN GG MULTI (2180)
10	670-1513	WARRANTY CARD GG CANADA (MK-2100(CANADA))	17	671-1893	(MK-2180(Except USA & CANADA)) MA CTN GG PLUS MULTI (2182)
10	670-1629-01	WARRANTY CARD GG ITA 01(ITALY)	17	671-3858	MK-2182(Except USA & CANADA))
10	670-2401	GUARANTEE CARD SOE GG ESP(SPAIN)	17	671-3858	MA CTN GG MULTI 2100 PM
10	670-2757-02	GUARANTEE CARD GG SOE 02(SEGA OF EUROPE)	17	671-3863	(MK-2100(Except USA & CANADA))
10	670-3327	WARRANTY CARD OZISOFT AUS(AUSTRALIA)	17	671-3942	MA CTN GG MULTI 2184 PM
11	670-2778	EPILEPSY WARNING SHEET USA(USA)	17	671-3942	(MK-2184(Except USA & CANADA))
11	670-2779	EPILEPSY WARNING SHEET MULTI (MK-2100(CANADA))			MA CTN GG MULTI 2180 PM
12	670-2116-**	GAME CATALOG GG USA (MK-2122/2131(CANADA))	18	671-1917	(MK-2180(Except USA & CANADA))
13	670-4206	PERIPHERAL CATALOG GG USA (MK-2122/2131(USA & CANADA))	18	671-1918	PACKING CASE GG MULTI (MK-2180(SPAIN))
14	671-1270-02	BOX GG MULTI CE SMITH 02 (MK-2180(SPAIN))			PACKING BOARD GG MULTI (MK-2180(SPAIN))
14	671-1892-02	BOX GG W/AC MULTI CE SMITH 02 (MK-2182(KUWAIT/SAUDIARABIA/SPAIN))	19	672-0422-02	INSTR MANUAL GG USA 02(USA)
15	671-3757	BOX & PACK SET GG 2100 PM(MK-2100(USA))	19	672-0422-22E	INSTR MANUAL GG CANADA E(CANADA)
15	671-3763	BOX & PACK SET GG 2121 PM(MK-2121(USA))	19	672-0422-22F	INSTR MANUAL GG CANADA F(CANADA)
15	671-3775	BOX & PACK SET GG 2131 PM(MK-2131(USA))	19	672-0422-51	INSTR MANUAL GG MUL EPILESY
15	671-4664	BOX & PACK SET GG 2122 PM(MK-2122(USA))	19	672-1041	(Except USA / CANADA & SAUDIARABIA)
15	671-3785	BOX & PACK SET GG CAN 2100 PM (MK-2100(CANADA))			INSTR MANUAL GG KSA(SAUDIARABIA)
15	671-3790	BOX & PACK SET GG CAN 2122 PP (MK-2122(CANADA))	20	672-0423	PLAY INSTR GG USA COLUMNS (USA)
15	671-3797	BOX & PACK SET GG CAN 2131 PM (MK-2131(CANADA))	20	672-0646	PLAY INSTR GG USA SONIC H-H (USA)
15	671-3856	BOX & PACK SET GG MUL 2100 PM (MK-2100(Except USA & CANADA))	20	672-0972	PLAY INSTR GG USA SONIC2 (USA)
15	671-3861	BOX & PACK SET GG MUL 2184 PM (MK-2184(Except USA & CANADA))	20	672-0972-22	PLAY INSTR GG SONIC2 CAN(CANADA)
15	671-3919	BOX & PACK SET GG MUL 2182 PP (MK-2182(Except USA, CANADA, AUSTRALIA, KUWAIT, SPAIN & SAUDIARABIA))	20	672-0423-50	PLAY INSTR GG COLUMNS MULTI(Except USA)
15	671-3940	BOX & PACK SET GG MUL 2180 P (MK-2180(Except USA & CANADA))	20	672-0646-50	PLAY INSTR GG SONIC H-H MUL
16	671-2369E	INR-CTN GG USA 2122 E(MK-2122(USA))	20	672-1063-50	(Except USA & CANADA)
16	671-3759	INR-CTN GG USA 2100 PM(MK-2100(USA))			PLAY INSTR GG 4 IN 1 MUL
16	671-3765	INR-CTN GG USA 2121 PM(MK-2121(USA))			(Except USA & CANADA)
16	671-3777	INR-CTN GG USA 2131 PM(MK-2131(USA))			
16	671-2369-02	INR-CTN GG CAN 2122-22(MK-2122(CANADA))			
16	671-3787	INR-CTN GG CAN 2100 PM(MK-2100(CANADA))			
16	671-3799	INR-CTN GG CAN 2131 PM(MK-2131(CANADA))			

【NOTE】

ACCESSORY PROVIDED

MODEL NO.	MK-2100	MK-2121	MK-2122	MK-2131
SONIC CARTRIDGE	NO	YES	NO	NO
SONIC2 CARTRIDGE	NO	NO	NO	YES
COLUMNS CARTRIDGE	YES	NO	NO	NO
4 IN 1 CARTRIDGE	NO	NO	NO	NO
AC ADAPTOR	NO	NO	NO	NO

MK-2180	MK-2182	MK-2184
NO	YES	NO
NO	NO	NO
NO	NO	NO
NO	NO	YES
NO	YES	NO

