BACHMANN

RPT 115

SERVICE MANUAL

Schematic Diagrams

CODE : 270208

Index & Warnings

GENERALMUSIC S.p.A. Sales Division: 47842 S.Giovanni in Marignano (RN) ITALY - Via delle Rose, 12 - tel. 0541/959511 - fax 0541/957404 - http://www.generalmusic.com

Notice

Service must be carried out by qualified personnel only. Any tampering carried out by unqualified personnel during the guarantee period will forfeit the right to guarantee.
For a correct operation of the instrument, after having switched off, be careful to wait at least 3 seconds before switching on again.
To improve the device's specifications, the schematic diagrams may be subject to change without prior notice.

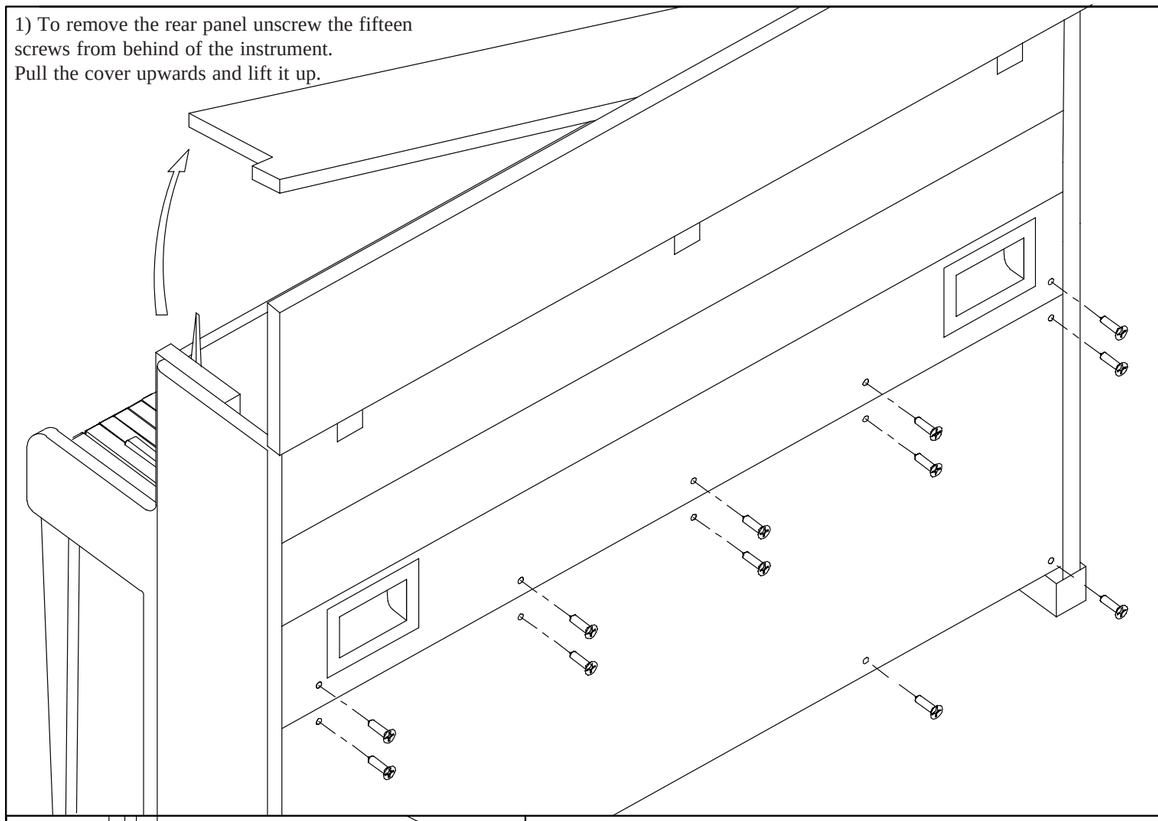
Schematic Notes

⚠ All components marked by this symbol have special safety characteristics, when replacing any of these components use only manufacturer's specified parts.
The (µ) micro symbol of capacitance value is substituted by U. The (Ω) omega symbol of resistance value is substituted by E.
The electrolytic capacitors are 25Vdc rated voltage unless otherwise specified. All resistors are 1/4W unless otherwise specified.
All switches shown in the "OFF" position. All DC voltages measured to ground with a voltmeter 20KOhm/V.

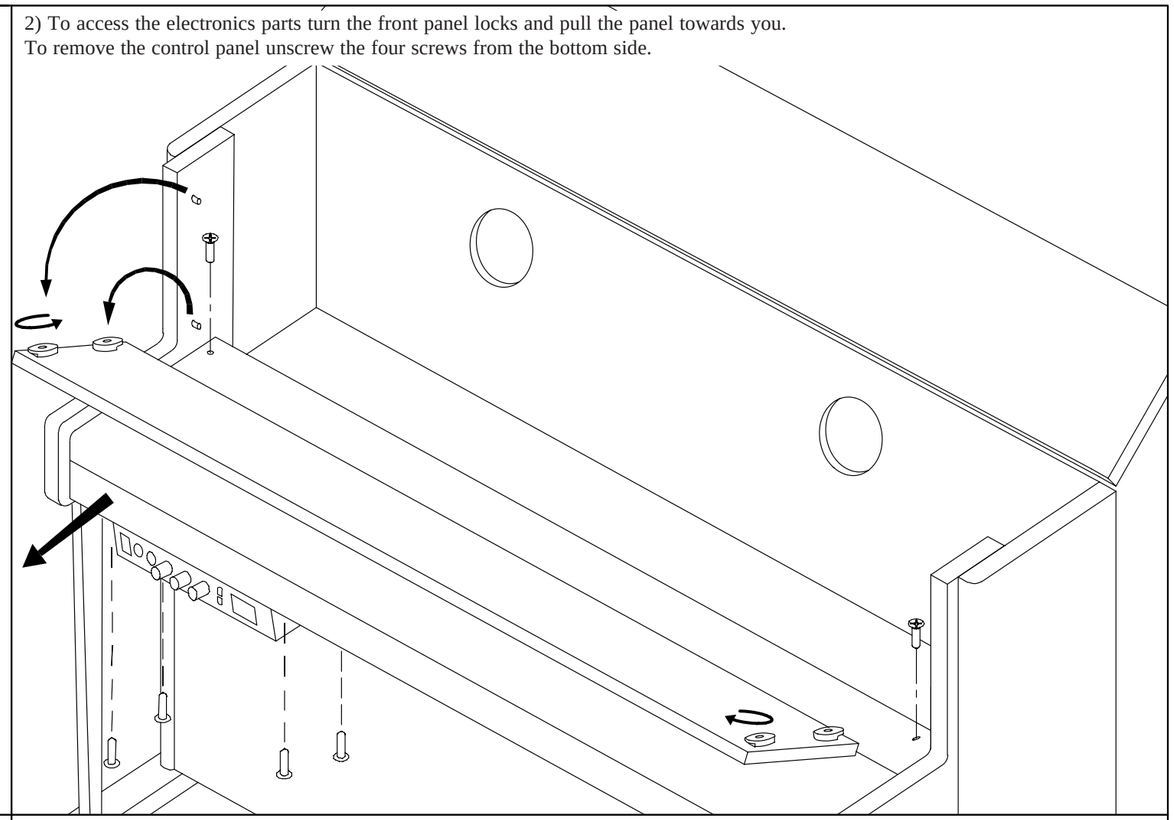
- Soldering point.
- Male connector.
- Female connector.
- M/F faston connector.
- Test point.
- Supply voltage.
- Logic supply ground.
- Analog supply ground.
- Signal ground.
- Chassis ground.
- Flag joined with one or more flags with the same signal name inscribed.

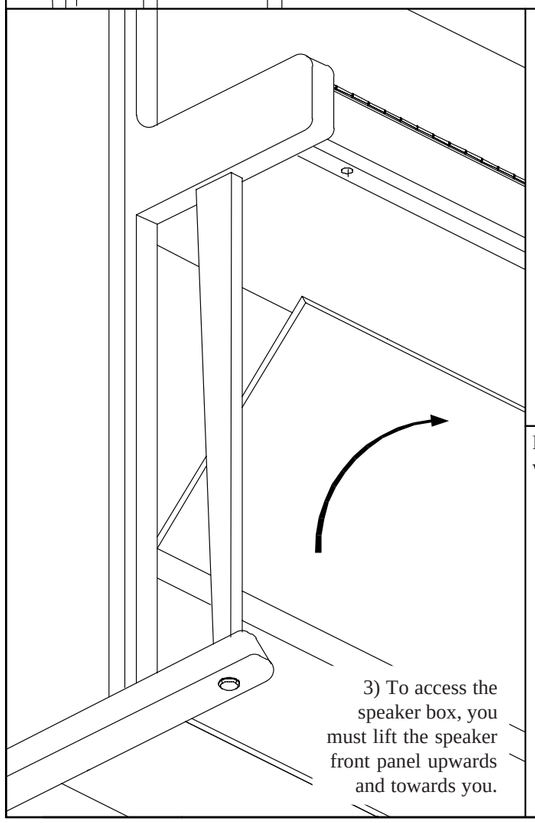
ATTENTION
Observe precautions when handling
electrostatic sensitive devices

1) To remove the rear panel unscrew the fifteen screws from behind of the instrument.
Pull the cover upwards and lift it up.

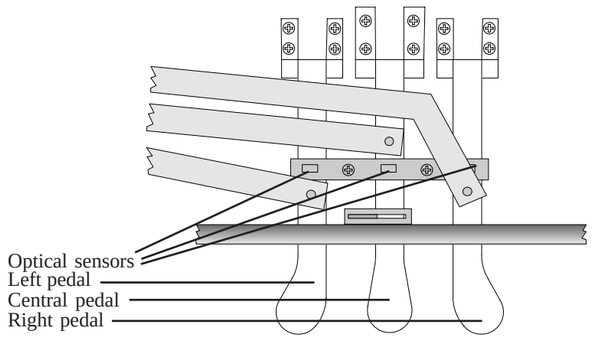


2) To access the electronics parts turn the front panel locks and pull the panel towards you.
To remove the control panel unscrew the four screws from the bottom side.



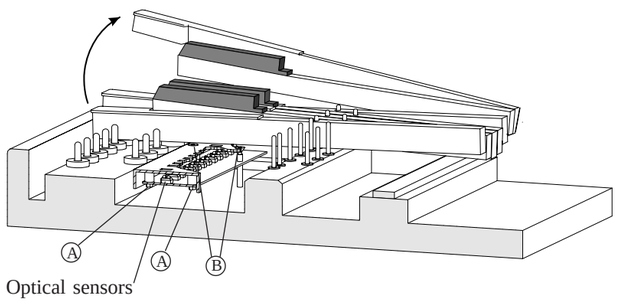


3) To access the speaker box, you must lift the speaker front panel upwards and towards you.



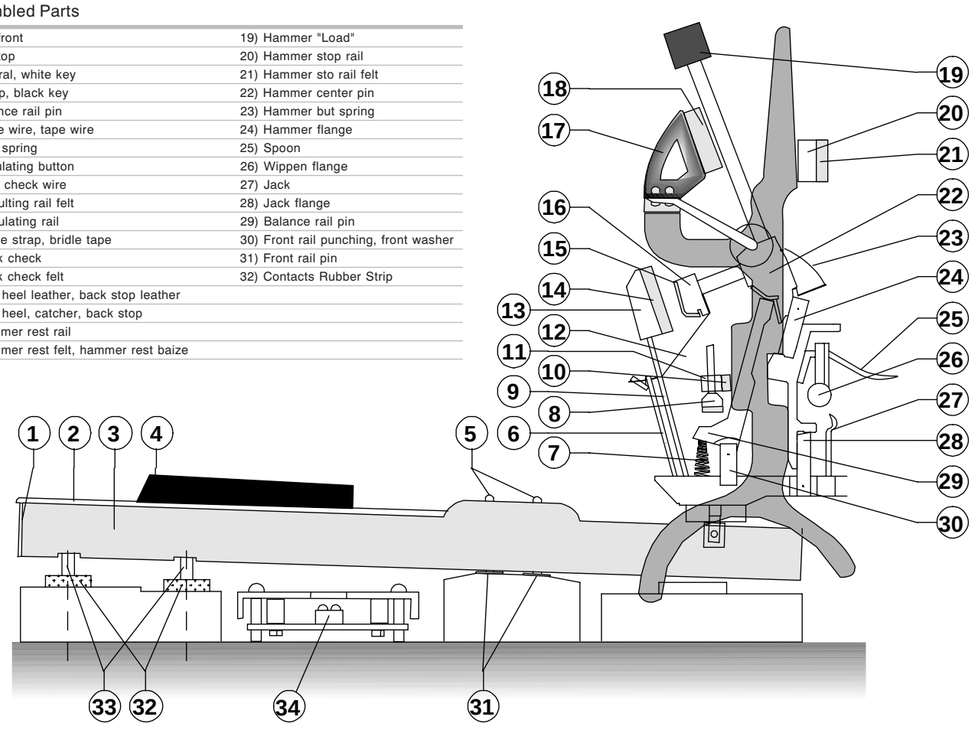
To access the optical sensor on the pedals board unscrew the two screws and turn it up.

Remove all sharp and natural keys to access to the optical sensors, we recommend to dispose the keys in order



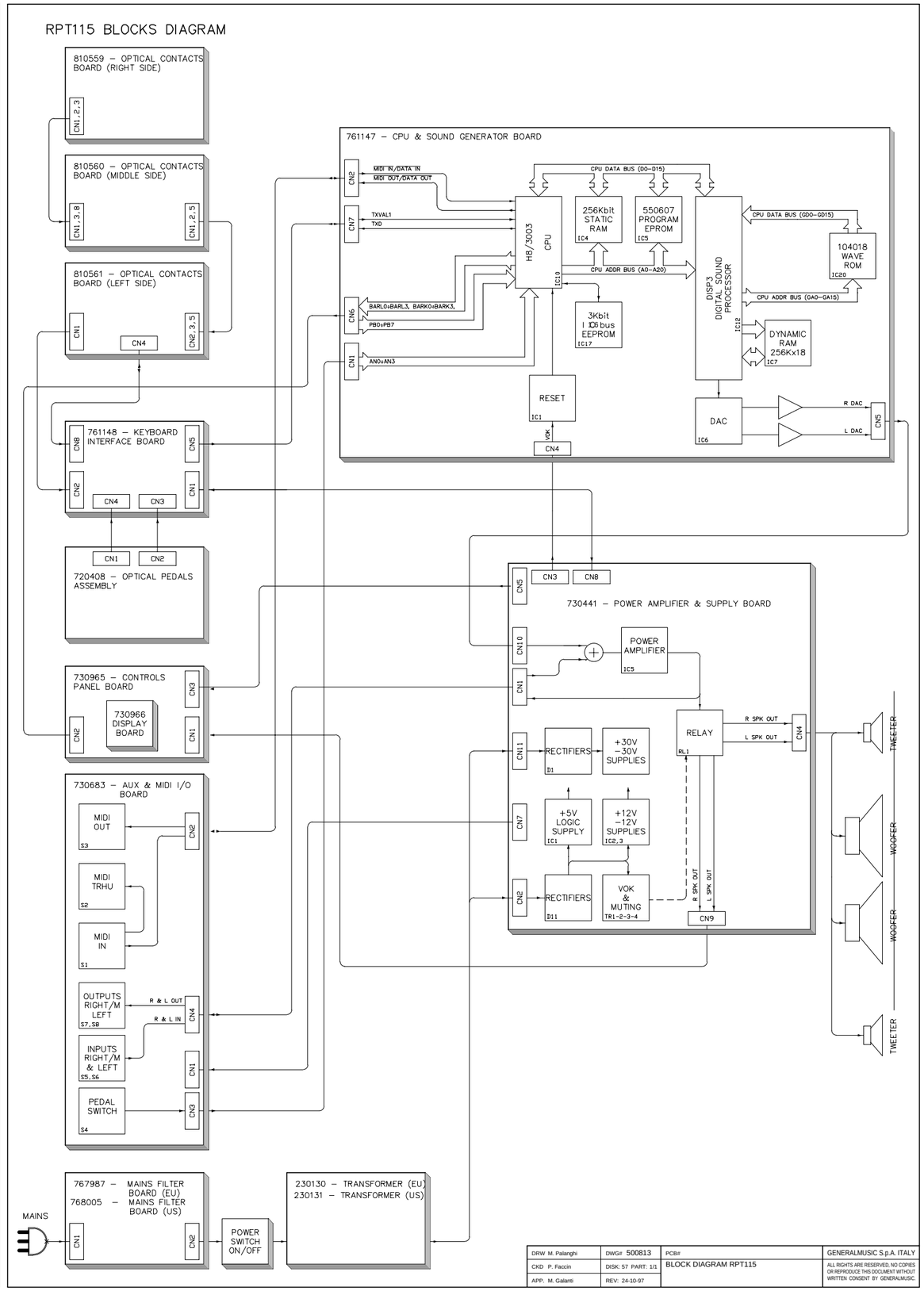
Assembled Parts

1) Key front	19) Hammer "Load"
2) Key top	20) Hammer stop rail
3) Natural, white key	21) Hammer sto rail felt
4) Sharp, black key	22) Hammer center pin
5) Balance rail pin	23) Hammer but spring
6) Bridle wire, tape wire	24) Hammer flange
7) Jack spring	25) Spoon
8) Regulating button	26) Wippen flange
9) Back check wire	27) Jack
10) Regulting rail felt	28) Jack flange
11) Regulating rail	29) Balance rail pin
12) Bridle strap, bridle tape	30) Front rail punching, front washer
13) Back check	31) Front rail pin
14) Back check felt	32) Contacts Rubber Strip
15) Butt heel leather, back stop leather	
16) Butt heel, catcher, back stop	
17) Hammer rest rail	
18) Hammer rest felt, hammer rest baize	



DRW M.PALANGH	DWG# 500812		GENERALMUSIC S.p.A. ITALY
CKD R.GIORGI	DISK: 57 PART:1/1	RPT115 OPENING INSTRUCTIONS	ALL RIGHTS ARE RESERVED, NO COPIES OR REPRODUCE THIS DOCUMENT WITHOUT WRITTEN CONSENT BY GENERALMUSIC.
APP. M.GALANTI	REV: 23/10/97		

RPT115 AUTOTEST CHART			
PROCEDURE	**OPERATIONS**	**EVENT DESCRIPTIONS**	**DISPLAY**
Start	Turn the instrument on while holding down the two data buttons.	A display message appears:	
Selectors	Press the " ▲ " button and rotate the SOUND and EDIT knobs.	The display will show the message 'rot' and then two numbers separated by a hyphen -: rotating the selectors; the two displayed numbers should change from 0 to 5 according to their position.	
	Press the " ▲ " button again and move the volume potentiometer.	The display shows at first the message "Pot" followed by the numbers from 0 to 127 corresponding to the trimmer position of the control; rotate the volume control to verify the correct operation on display	
Pedals	Press the " ▲ " button again to test the pedals.	The display shows at first the message 'PEd' followed by three digits associated to the pedals : move the pedals and the three displayed digits should change accordingly: 0 corresponds to pedal release, F to pedal completely pressed. The Damper pedal should display intermediate values (1,2,3...C,D,E).	
Sinus Test	Press the " ▲ " button again to test the output levels by means of the sinusoidal signal.	The signal is emitted to verify the audio output levels on speaker and auxiliars outputs.	
MIDI IN & MIDI OUT	Press the " ▲ " button again to test the MIDI interface.	The display shows at first the message 'Mid'. Connect the MIDI OUT and MIDI IN ports via a MIDI cable to create a MIDI LOOP. If a loop is present, the display will show 'LLL', if not,'---'.	
Autotest Stop	Press the " ▲ " button.	The display shows the message "StP":	
ATTENTION ***The following operations serves to callibrate the keyboard sensors.*** ***If this is not required, turn off the instrument at this point, otherwise continue as described below.***			
Note: *During the adjustement phase, the instrument does not respond to the keyboard.*			
Optical sensors autocalibration	Press the " ▲ " button again	The display shows the message "AdJ":	
	Press all sharp and natural keys one a time with the descripted precautions:	• Play the keys with ppp (pianissimo) action. • Release the keys slowly to avoid any oscillation. • Be sure that the keys is fully pressed untill the end stroke, but don't apply any extra pressure. • Perform previous operations as uniform as possible for all keys. • During calibration avoid any vibration to the keyboard.	
End of Calibrations and Check	Press the " ▲ " button again.	Autotest escape.	
		Wait for a few seconds while the instrument momorises permanentely the newly calibration of the keyboard.	
		Could happen that keys and/or pedals aren't calibrated because: 1) optical sensors are dirty (look at the previous page how to access), 2) optical sensors aren't in the right tollerance range, 3) keys and pedals aren't calibrated in the right way.	
		If at least one of previous three events come true, you can hear a sequence of tones (having a gap of 0.5sec). The heard tone belongs to the key not well calibrated. 1 tone -> The upper threshold value is too high. 2 tones -> The lower threshold value is less. 3 tones -> Insufficient threshold span.	
		If pedals aren't well calibrated yet, you can hear other three possibles kind of sequence of tones (having a gap of 200msec) with the following means: 2 adiacent tones -> The upper threshold value is too high. 3 adiacent tones -> The lower threshold value is less. 4 adiacent tones -> Insufficient threshold span. The heard tones refer to the pedals not well calibrated: • C2, C2#, (D2), (D2#) -> Left pedal • C4, C4#, (D4), (D4#) -> Central pedal • C6, C6#, (D6), (D6#) -> Right pedal	
End	Press the " ▲ " button again.	Re-start the instrument.	



730441 - POWER AMPLIFIER & SUPPLY BOARD

730683 - AUX & MIDI I/O BOARD

730965 - CONTROLS & PHONES BOARD

730966 - DISPLAY BOARD

MAINS (EU. VER.)
230VAC +/-15%
50Hz

767987 - MAINS FILTER BOARD

TRANSFORMER ASSEMBLY

730453 - 150W RPT115 MODEL (EUROPE VERSION)
730478 - 150W RPT115 MODEL (US VERSION)

NOTE: THE VOLTAGES ON THE TRANSFORMER SECONDARIES ARE MEASURED WITHOUT LOAD.

+/-12V REGULATORS

+5V REGULATOR

VOK GENERATOR

INPUT MIXER & FILTERS

AMPLIFIER

ROTARY ENCODER

PCB# 315016/2

PCB#310551

PCB#310504

PCB#310503

PCB# 310510

DRW M.PALANGHI	DWG# 500808	PCB# 310551 - 310504 - 310503 - 310510	GENERALMUSIC S.p.A. ITALY
CKD R.GIORGI	DSK# S4 PART: 1/1	SCHEMATIC DIAGRAM RPT115 CONTROLS PANEL, PWR AMP & SUPPLY, AUX & MIDI I/O BOARD, DISPLAY B.	ALL RIGHTS ARE RESERVED. NO COPIES OR REPRODUCE THIS DOCUMENT WITHOUT WRITTEN CONSENT BY GENERALMUSIC.
APP. M.GALANTI	REV: 20/09/95		

761098 - CPU & SOUND GENERATOR BOARD

CN2 — MIDI/CONTA I/O FROM AUX & MIDI I/O BOARD CN2
1 MIDI IN/DATA IN
2 MIDI OUT/DATA OUT
3 LGND

CN7 — DYNAMIC KEYBOARD FROM KEYBOARD CN5
1 TXVAL1
2 NTVAL1
3 GTVAL1
4 RS
5 TXD
6 LGND

IC18 H83003 — H8/3003 - CPU
IC4 HM62256 — STATIC RAM
IC5 27C4001D — PROGRAM EPROM
IC12 DISP3 — DIGITAL SOUND PROCESSOR DISP3 - DIGITAL SOUND PROCESSOR
IC20 23C32000G — DSP DATA BUS
IC7 HM514200 — 256K X 18 DINAMIC RAM
IC17 ST24W02C — EEPROM
IC13 74AC377 — OCTAL D-TYPE FLIP-FLOP
IC15 74HC245 — TRANSCEIVER OCTAL BUS
IC16 74HC245 — TRANSCEIVER OCTAL BUS
IC14 74HC74 — D FF
IC8 AD1865R — PCM D/A CONVERTER
IC3 MC33078
IC9 74HC02
IC1 74HC14
IC2 74HC04
IC19 74HC04
IC10 74HC02
IC11 74HC02
IC18 74HC04

ADDRESS BUS
DATA BUS
DSP ADDRESS BUS
DSP DATA BUS
DRAM DATA BUS

UNUSED GATES

CN1 — CONTROLS FROM AUX & MIDI I/O BOARD CN3
1 LGND
2 DAMPER
3 DAMPER
4 SOFT

CN4 — SUPPLY FROM POWER AMP & SUPPLY BOARD CN18
1 AGND
2 VGK
3 AGND
4 +12V
5 -12V
6 +5V
7
8 LGND
9

CN5 — TO POWER, L & R DAC OUTS BOARD CN18
R DAC 1
AGND 2
L DAC 3
4

PCB#315093/1

DRW PIER FACCIN	DWG# 580811	PCB# 315093/1	GENERALMUSIC S.p.A. ITALY
CKD PIER FACCIN	DSK# 57 PART. 1/1	SCHEMATIC DIAGRAM RPT115	ALL RIGHTS ARE RESERVED, NO COPIES OR REPRODUCE THIS DOCUMENT WITHOUT WRITTEN CONSENT BY GENERALMUSIC.
APP. M.GALANTI	REV: 22-10-97	CPU & SOUND GENERATOR BOARD	

761148 - KEYBOARD
INTERFACE BOARD

810563 - PEDALS OPTICAL CONTACTS BOARD

PCB# 310585

PCB# 310577

KEYBOARD SIGNALS
FROM/TO OPTICAL
CONTACTS BOARD CN4

KEYBOARD SIGNALS
FROM/TO KEYBOARD
INTERFACE BOARD CN5

810561 - OPTICAL
CONTACTS BOARD
(LEFT SIDE)

POWER SUPPLY
TO OPTICAL CONTACTS
BOARD (MIDDLE SIDE) CN1

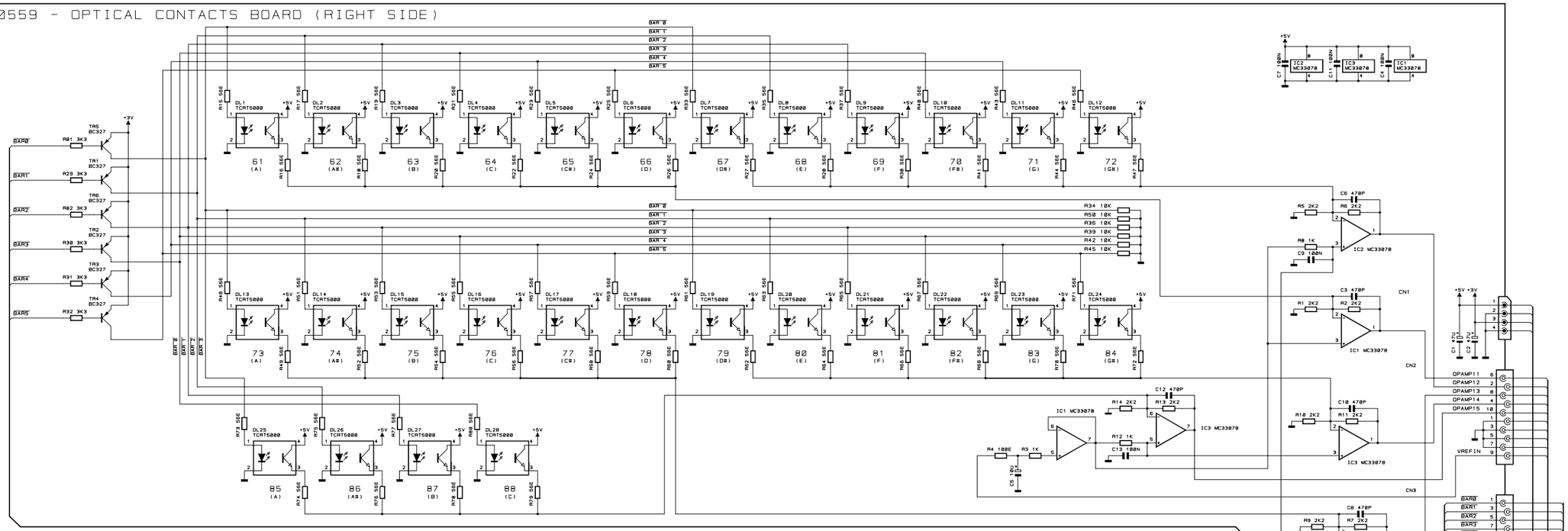
KEYBOARD SIGNAL
TO OPTICAL CONTACTS
BOARD (MIDDLE SIDE) CN2

KEYBOARD SIGNAL
TO OPTICAL CONTACTS
BOARD (MIDDLE SIDE) CN5

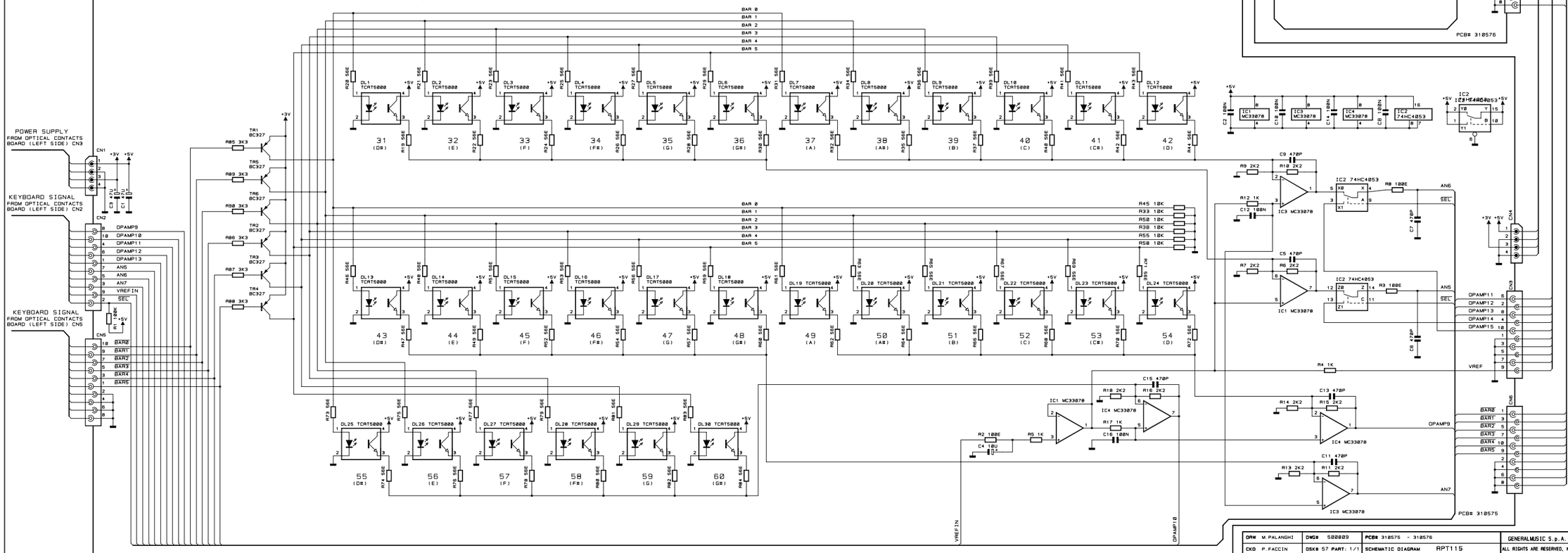
PCB# 310574

DRW M.PALANGHI	DWG# 500810	PCB# 310577 - 310574	GENERALMUSIC S.p.A. ITALY
CKD R.GIORGI	DSK# 57 PART: 1/1	SCHEMATIC DIAGRAM RPT115 OPTICAL CONTACTS BOARD (LEFT SIDE) KEYBOARD INTERFACE BOARD	ALL RIGHTS ARE RESERVED. NO COPIES OR REPRODUCE THIS DOCUMENT WITHOUT WRITTEN CONSENT BY GENERALMUSIC.
APP. G.GALANTI	REV: 22-10-97		

810559 - OPTICAL CONTACTS BOARD (RIGHT SIDE)



810560 - OPTICAL CONTACTS BOARD (CENTRAL SIDE)



DRW M.PALANGHI	DWG# 500889	PCB# 310575 - 310576	GENERALMUSIC S.p.A. ITALY
CKD P.FACCIN	DSK# 57 PART: 1/1	SCHEMATIC DIAGRAM RPT115 OPTICAL CONTACTS BOARDS (MID & RIGHT SIDE)	ALL RIGHTS ARE RESERVED, NO COPIES OR REPRODUCE THIS DOCUMENT WITHOUT WRITTEN CONSENT BY GENERALMUSIC
APP. M.GALANTI	REV: 22-10-97		

Spare Parts List (RPT115)

Wooden Parts

710447		**Wooden Parts (Black)**
261685	*	Front Panel
261633	*	Music Stand
261630	*	Rear Bar
261629	*	Leg
261628	*	Revolving Cover
261627	*	Right Foot
261626	*	Left Foot
261625	*	Pedals Support
261624	*	Right Lower Column
261623	*	Left Lower Column
261622	*	Keyboard Bar
261621	*	Keyboard Cover
261619	*	Front Panel Upper Side
261618	*	Cover
261615	*	Right Side
261614	*	Left Side
261471	*	Keyboard Support Panel
261405	*	Rear Closer Panel
261403	*	Rear Speaker Panel
261401	*	Cross Bar
710434		**Wooden Parts (Black hi-gloss)**
261564	*	Music Stand
261471	*	Keyboard Support Panel
261405	*	Rear Closer Panel
261403	*	Rear Speaker Panel
261401	*	Cross Bar
261400	*	Rear Cross Bar
261399	*	Wooden Leg
261397	*	Sliding Cover
261396	*	Right Food
261395	*	Left Food
261394	*	Pedals Box
261393	*	Front Panel
261392	*	Right Lower Colomn
261391	*	Left Lower Colomn
261390	*	Keyboard Bar
261389	*	Keyboard Cover
261387	*	Front Panel Upper Side
261386	*	Cover
261383	*	Right Side
261382	*	Left Side
710448		**Wooden Part (Walnut)**
261686	*	Front Panel
261654	*	Music Stand
261653	*	Shutter Rear Panel
261652	*	Speakers Rear Panel
261651	*	Rear Cross Bar
261650	*	Leg
261648	*	Slider Cover
261647	*	Right Food
261646	*	Left Food
261645	*	Pedal Box
261644	*	Lower Right Colomn
261643	*	Lower Left Colomn
261642	*	Keyboard Bar
261641	*	Keyboard Cover
261639	*	Front Panel Upper Side
261638	*	Cover
261635	*	Right Side
261634	*	Left Side
261471	*	Keyboard Support Panel
261401	*	Cross Bar

Various

340159	3M Dual Lock Fastening (Specify mt)
340042	Plastic Handle
324414	Hinge (666 item)
324407	Double Hinge (659 item)
324405	Hinge (661 item)
324400	Hinge (29200 item)
323069	Transparent Beating Rubber
323029	Holding Cover Pole
323005	Beating Rubber
210074	Black Acoustic Cloth
210016	1x10mm Adhesive Black Felt (specify mt)
170585	Metal Foot
657241	Black tube
660405	Heat Sink Protection Grid

220114	8E Woofer
220093	8e 40w Woofer Speaker
220087	8ohm Tweeter Speaker
171352	Tweeter Support
271193	User's Manual (RPT115)
020493	100n 250Vac MKP EMI Capacitor "Siemens"
652855	Sockets Box
652238	2 Keys <+ -> Rubber Pad
347360	Gray Knob
340120	Plexiglass Display Screen
150474	Black Hole Top
110285	Power Switch

Brassed Pedals Assembly

720408		Brassed Pedals Assembly
810168	*	**Reed Switch Board (PCB#310272)**
770717	*	Connection Cable
500063	*	Mechanical Parts
340105	**	Chassis Support
171261	**	Chassis Support
170880	**	Screen Panel
170875	**	Right Pedal
170874	**	Left Pedal
170873	**	Centre Pedal
170777	**	Pedal Return Spring
340500	*	3 Pedals Comand Lever
340499	*	3 Pedals Carring-out Lever
340274	*	Pedal Rubber
210016	*	1x10mm Adhesive Black Felt (specify mt)
190181	*	Pedals Clog
190178	*	Permanent Magnet
190015	*	Adhesive Rubber Foot
171263	*	Pedals Spring
070556	*	20K Lin (90deg. Stroke) Potentiometer

Mains Filter Board

767987		**Mains Filter Board (PCB#315016/2)**
230565	*	2.5mH 250V 3A AC Line Filter
140010	*	3 Contacts P=10 Vert Terminal Block
110113	*	Fuse Clip 5x20mm 6A max
020493	*	100n 250Vac MKP EMI Capacitor "Siemens"
010545	*	4n7 250Vac
150021	*	Cord Lock
130294	*	Mains Cord (EU)

Transformer Assembly

730453		Transformer Assembly
340329	*	Dc-Socket Bush
230130	*	150W 230V Transformer
190133	*	Lateroid Insulator For Screw Block
140036	*	Screw Block (specify contacts)

CPU & Sound Generator Baord

761147		**CPU & Sound Generator Borad (PCB#315093)**
141018	*	20 Contacts Vert Female Connector
141011	*	6 Contacts Vert Female Connector
141010	*	4 Contacts Vert Female Connector
140889	*	Dual In Line Vert Male Strip (specify cont.)
140874	*	Single In Line Vert Male Strip (specify cont.)
140352	*	9 Contacts Hor Male Connector
106001	*	MC33078P Smd Dual LN J-Fet Operat.Amp.
105006	*	HD6413003F16 Cpu Smd F=16MHz
104022	*	CMOS 32MBIT MASK ROM PRO-WAVE2
104021	*	CMOS SERIAL ACCESS 32KBIT (4096X8)
104020	*	HM62256AFP-7T SOP Sram 256K Ta=70nS
104012	*	23C32000G SOP Rom 32Mbit Wave1
104010	*	HM514280AJ SOJ Dram 4M5bit Ta=70nS
103010	*	74HC04D SOIC Hex Inverter
103009	*	74HC02D SOIC Quad 2-In Nor Gate
103007	*	74HC74D SOIC Dual Flip-Flop
103004	*	AD1865R SOP 18bit D/A Converter
103002	*	74HC245DW Soic Octal Bus Transceiver
103000	*	74HC14D Soic Hex Inverter Schmitt Trigger
101501	*	74AC377DW SOIC Octal Dtype Flip Flop
090194	*	BC560 TO92 LN Pnp Transistor
090183	*	Bc550 To92 Ln Npn Transistor
081000	*	PMLL4148 Smd 100mA 75V Signal Diode
080241	*	5V6 1W 5% Zener Diode
010727	*	45.1584MHz Quartz Resonator
010704	*	16MHz Quartz Resonator
010662	*	220p 10% 50V X8 Cap Array
550638		Prog EPROM
140877		Jumper For Contacts Strip (p=2.54mm)

Power Supply Board

730441		**Power Supply Board (PCB#310518)**
230527	*	BL02RN2-R62 EMI Coil For Signal
230524	*	100uH Switching Coil
171342	*	Left Holding Board
171341	*	Right Holding Board
141010	*	4 Contacts Vert Female Connector
140917	*	2 Contacts Vert Male Connector
140352	*	9 Contacts Hor Male Connector
140351	*	6 Contacts Hor Male Connector
140323	*	6 Contacts Vert Male Connector
140010	*	3 Contacts P=10 Vert Terminal Block
110304	*	Relay 12V / 2 Switch 5A 250V
110119	*	Fuse Clip 10A max (EU) (US)
100919	*	MC33078 Dual LN J-Fet Operat. Amplifier
100900	*	L4960 5-40V 2.5A Switching Regulator
100045	*	7812 +12V 1A Voltage Regulator
100043	*	7912 -12V 1A Voltage Regulator
100039	*	STK4151V 2x40W Hybrid Amplifier
090856	*	J176 TO92 P-Channel J-Fet Transistor
090183	*	Bc550 To92 Ln Npn Transistor
080605	*	KBL02 4A 200V Bridge Rectifier Diode
080171	*	Fe6b 6a 100V Fast Recovery Diode
080156	*	1N4002 1A 100V Rectifier Diode
080103	*	1N4148 100mA 75V Signal Diode
030950	*	470u 16v 20% Low Esr Vert Electrolytic Cap.
030880	*	10000uF 25V Snap-In Electrolytic Capacitor
030721	*	1000u 25V 20% Vert Electrolytic Capacitor
030555	*	4700u 50V 20% Snap-In Electrolytic Cap.
030486	*	100u 50V 20% Vert Electrolytic Capacitor
340075	*	Nylon Board Spacer
110011	*	T1A Fuse 5x20mm
110010	*	T2A Fuse 5x20mm
110003	*	T3.15A Fuse 5x20mm

Keyboard Interface Board

761148		**Keyboard Interface Board (PCB#310577)**
141018	*	20 Contacts Vert Female Connector
141011	*	6 Contacts Vert Female Connector
140918	*	2 Contacts Hor Male Connector
140874	*	Single In Line Vert Male Strip (specify cont.)
140872	*	4 Contatcs Hor Male Connector
104019	*	ST24W02 Smd 2Kbit Serial Access EEprom
100626	*	74HC4053 3x2ch Analog Multiplexer
100619	*	74HC32 Quad 2-Input Or Gate
100610	*	74HC245 Octal Bus Transceiver
100066	*	LM317 1.2-37V 1.5A Adjustable Regulator
010726	*	19.2MHz Ceramic Resonator With Cap.
010662	*	220p 10% 50V X8 Cap Array
550645		IC MICRO H8/329 PROG.<VALIS-O RPT 115>
140877		Jumper For Contacts Strip (p=2.54mm)

Controls & Outputs Assembly

730965		**Controls & Phones Board (PCB#310584)**
730966	*	**Display Boad (PCB#310583)**
140890	**	4 Contacts Hor Male Single-Strip
140529	**	Microswitch 12V 50mA 0.25mm
080717	**	HDN1105 7 Segments Display
080103	**	1N4148 100mA 75V Signal Diode
230569	*	FL5R200PNT EMI Coil For Signal
141018	*	20 Contacts Vert Female Connector
140917	*	2 Contacts Vert Male Connector
140877	*	Jumper For Contacts Strip (p=2.54mm)
140874	*	Single In Line Vert Male Strip (specify contacts)
140873	*	4 Contacts Vert Male Connector
140217	*	Horizontal Jack Stereo Slim Socket
140207	*	Horizontal Female Jack Socket
110321	*	2ways 6contacts Rotary Switch
090194	*	BC560 TO92 LN Pnp Transistor
080103	*	1N4148 100mA 75V Signal Diode
074699	*	50Kb C.C. 11mm Horr. Rotary Po

AUX & MIDI I\O Board

730683		**AUX & MIDI I\O Board (PCB#310551)**
230569	*	FL5R200PNT EMI Coil For Signal
230527	*	BL02RN2-R62 EMI Coil For Signal
141010	*	4 Contacts Vert Female Connector
140917	*	2 Contacts Vert Male Connector
140351	*	6 Contacts Hor Male Connector
140217	*	Horizontal Jack Stereo Slim Socket
140216	*	Horizontal Female 6 Poles Din Socket
140212	*	Horizontal Female 5 Poles Din Socket
100602	*	74HC04 Hex Inverter
100035	*	6N138 Optocoupler
090194	*	BC560 TO92 LN Pnp Transistor
080103	*	1N4148 100mA 75V Signal Diode

Optical Contacts Assembly

720525		Optical Contacts Assembly
810561	*	**Optical Contacts B. (Left Side) (PCB#310574)**
141018	**	20 Contacts Vert Female Connector
141013	**	Con V F 10c P=1.27 Mmatch Amp
140872	**	4 Contatcs Hor Male Connector
100919	**	MC33078 Dual LN J-Fet Operational Amp.
100626	**	74HC4053 3x2ch Analog Multiplexer
090153	**	BC327 TO92 Pnp Transistor
080900	**	OPTOELECT. REFLEX SENSOR TCRT5000
810560	*	**Optical Contacts B. (Middle Side) (PCB#310575)**
141013	**	Con V F 10c P=1.27 Mmatch Amp
140872	**	4 Contatcs Hor Male Connector
100919	**	MC33078 Dual LN J-Fet Operational Amp.
100626	**	74HC4053 3x2ch Analog Multiplexer
090153	**	BC327 TO92 Pnp Transistor
080900	**	OPTOELECT. REFLEX SENSOR TCRT5000
810559	*	**Optical Contacts B. (Right Side) (PCB#310576)**
141013	**	Con V F 10c P=1.27 Mmatch Amp
140872	**	4 Contatcs Hor Male Connector
100919	**	MC33078 Dual LN J-Fet Operational Amp.
090153	**	BC327 TO92 Pnp Transistor
080900	**	OPTOELECT. REFLEX SENSOR TCRT5000
660579	*	Optical Contacts Board Support

Note:

Each spare part is single quantity unless otherwise specified.
Asterisk prefix explanation:
Omitted = First level spare part.
One asterisk = Second level, part of previous listed first level part.
Two asterisk = Third level, part of previous listed second level part.
Three asterisk = ...
Any request for not above mentioned part must encompass specific description including:
1) Model name,
2) Section name,
3) Module code,
4) Reference name,
5) Quantity number.