



SERVICE MANUAL

wk2000 hd



code 270280

Index

- 2 Opening Instructions & Keyboard Disassembling.
- 3 Internal Assembly.
- 4 Block Diagram.
- 5 Power Amplifier & Supply Board, HD Interface Board, Midi & Controls I/O Board.
- 6 Keyboard Contacts Board, Controls Panel Board, Trackball Board.
- 7 Cpu & Sound Generator Board (part 1/2).
- 8 Cpu & Sound Generator Board (part 2/2), Vocal Processor Interface.
- 9 Test Procedure, Spare Part List.



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.

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 1/8W unless otherwise specified.

All switches shown in the "OFF" position. All DC voltages measured to ground with a voltmeter 20KOhm/V.

← Soldering point.

↑ Supply voltage.

⏏ Logic supply ground.

• Male connector.

□ Test point.

⏏ Analog supply ground.

⏏ Female connector.

⏏ Flag joined with one or more flags with the same signal name inscribed.

⏏ Chassis ground.

⏏ M/F faston connector.

⏏ Earth ground.



ATTENTION

Observe precautions when handling electrostatic sensitive devices.



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Opening Instructions

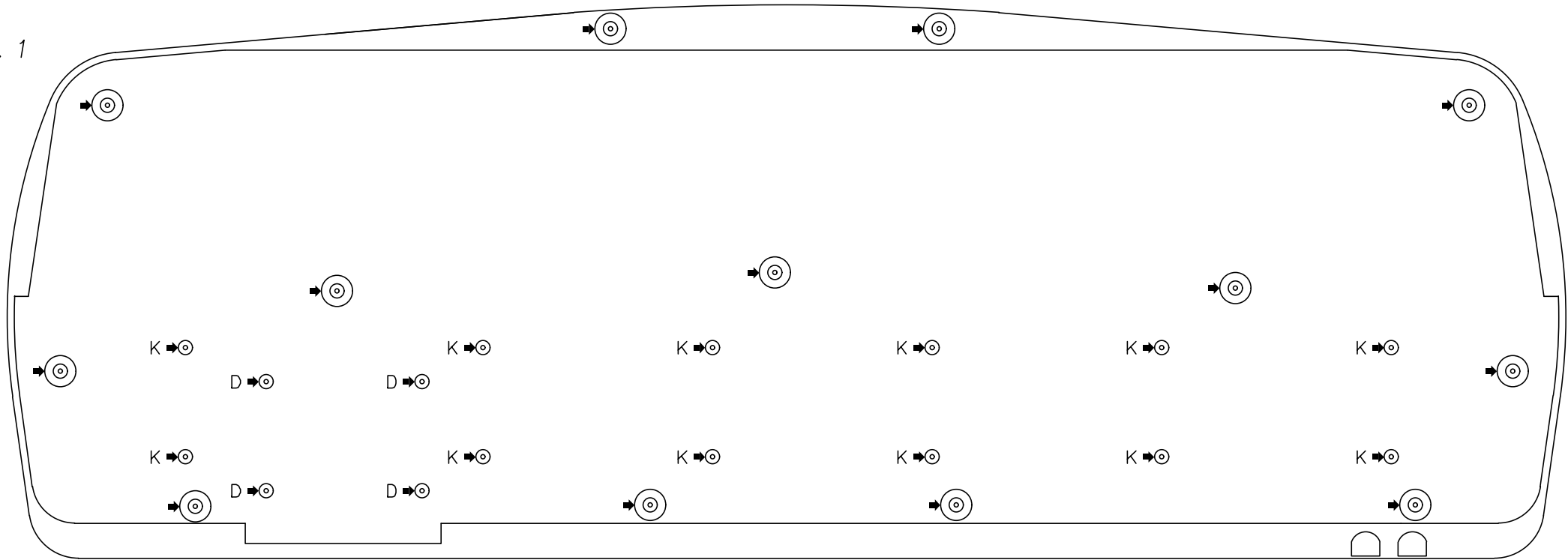
refer to fig. 1

To open the instrument remove the screws marked by ➡

To separate the keyboard from chassis remove the screws marked by K ➡ (open the instrument before proceed)

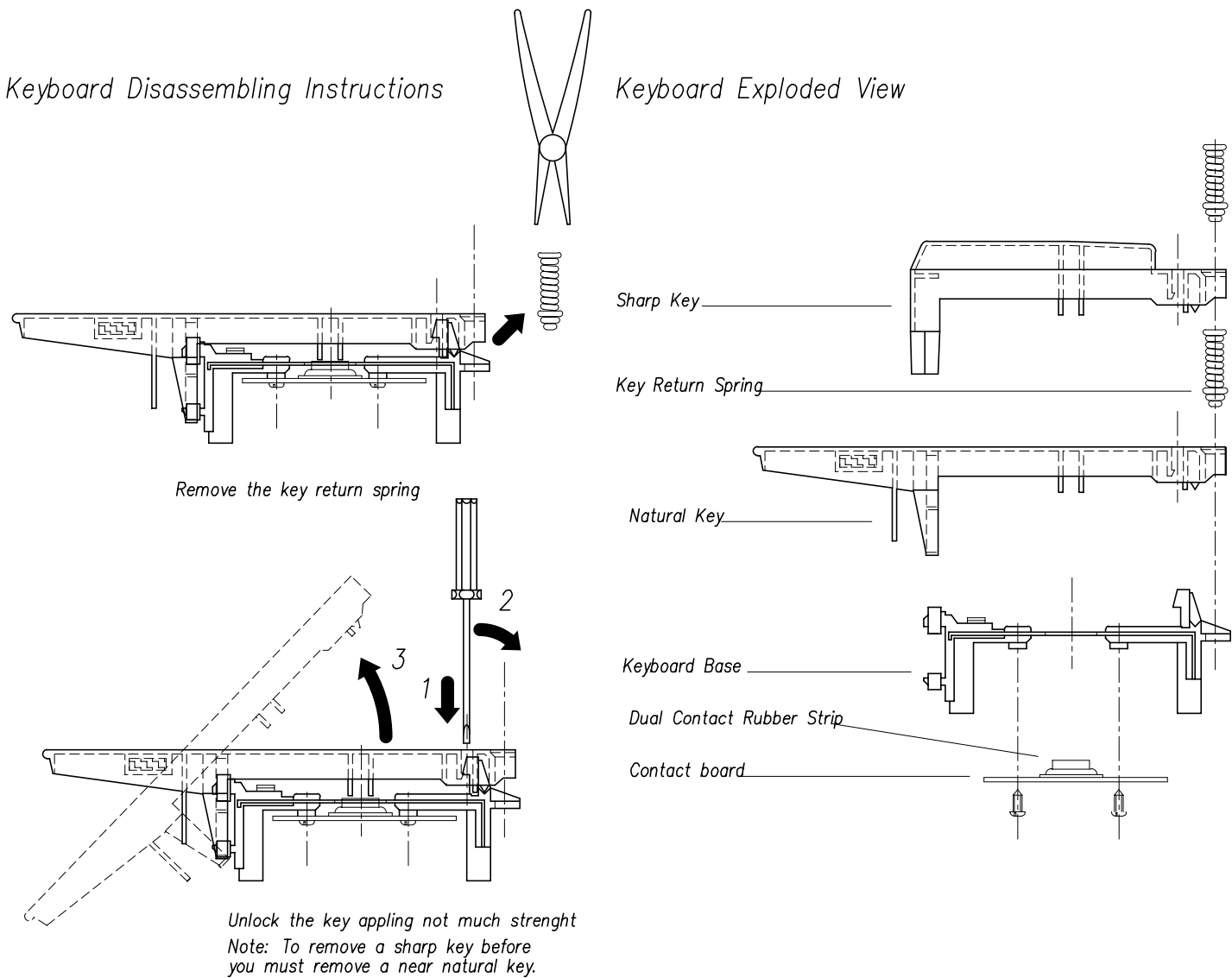
To access to the Disk Drive remove the screws marked by D ➡

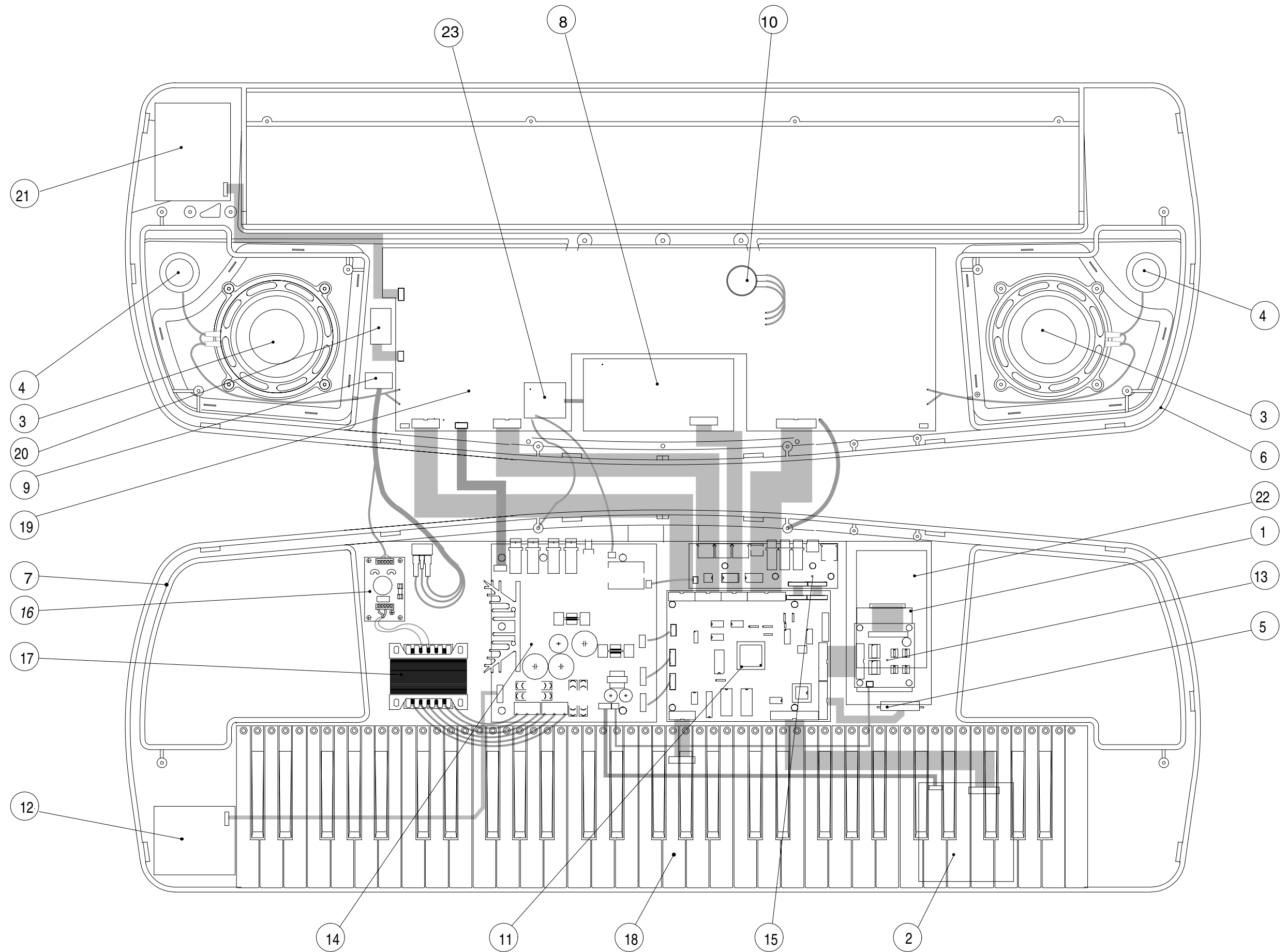
Fig. 1

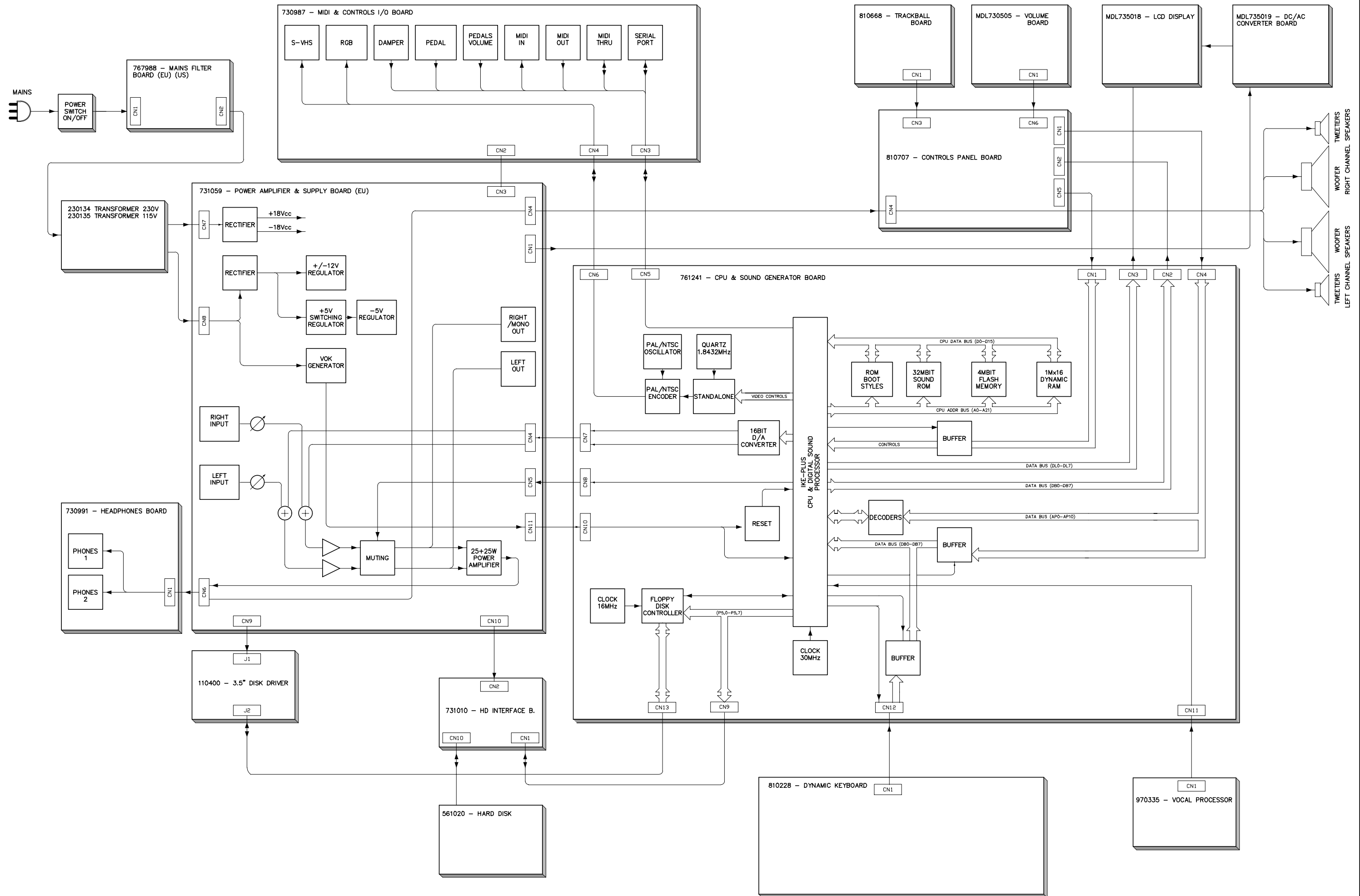


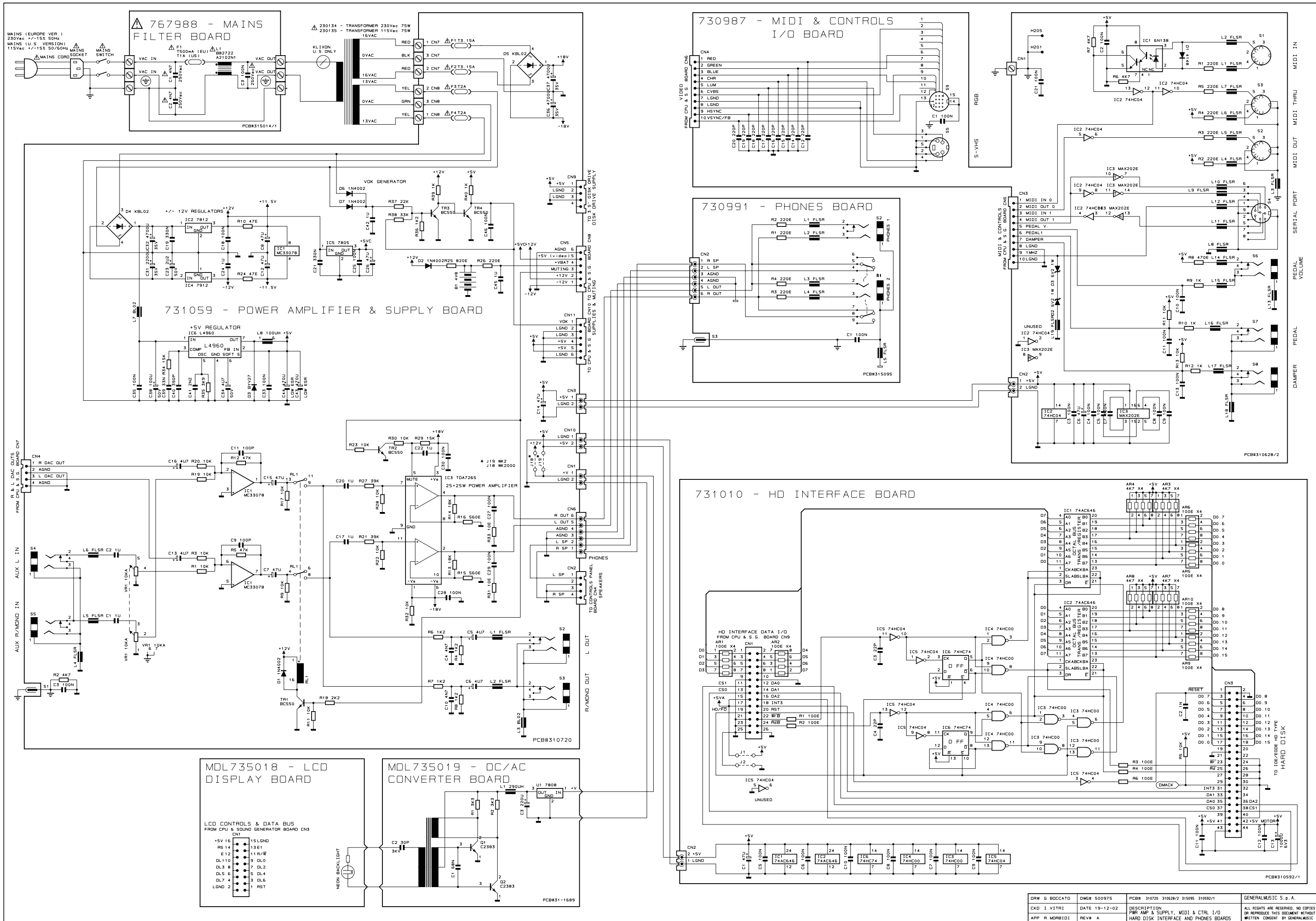
Keyboard Disassembling Instructions

Keyboard Exploded View

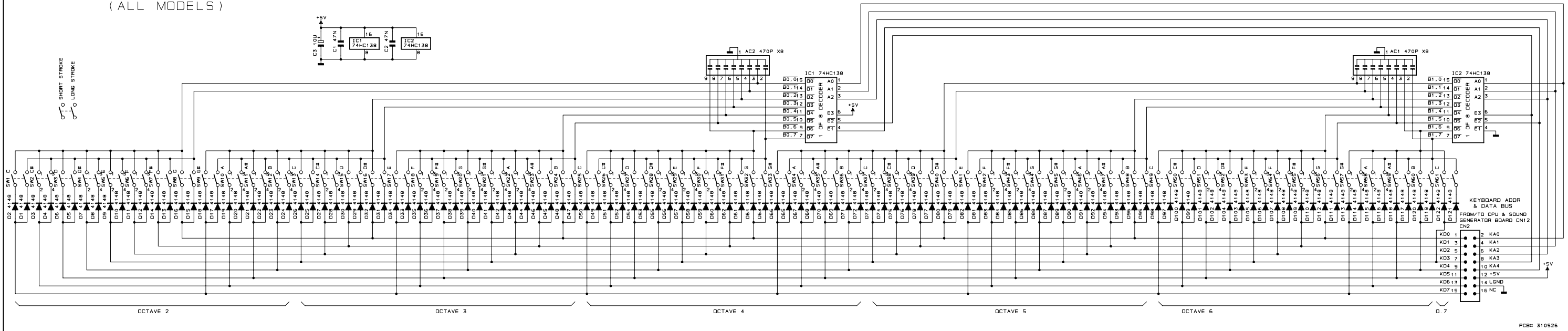




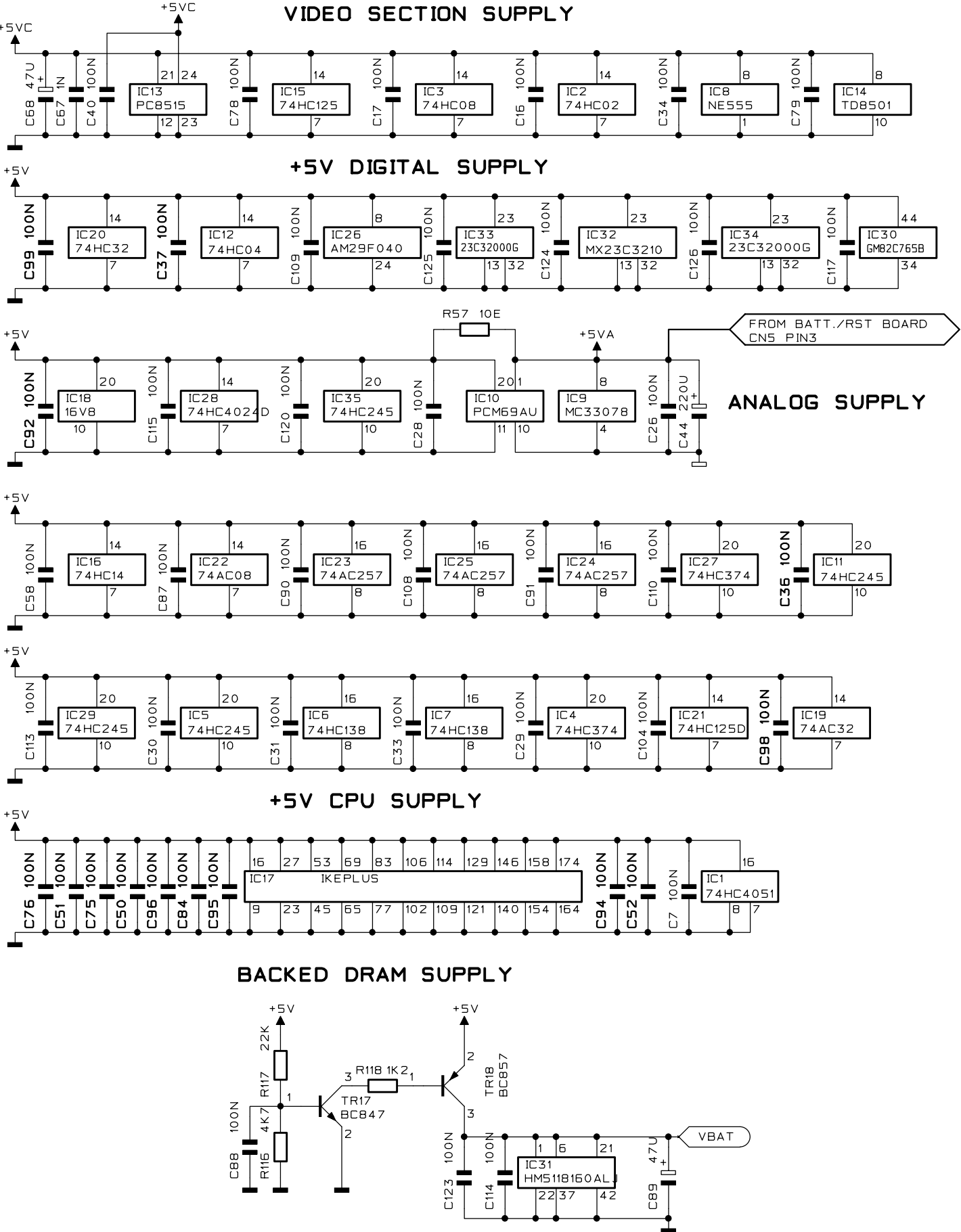




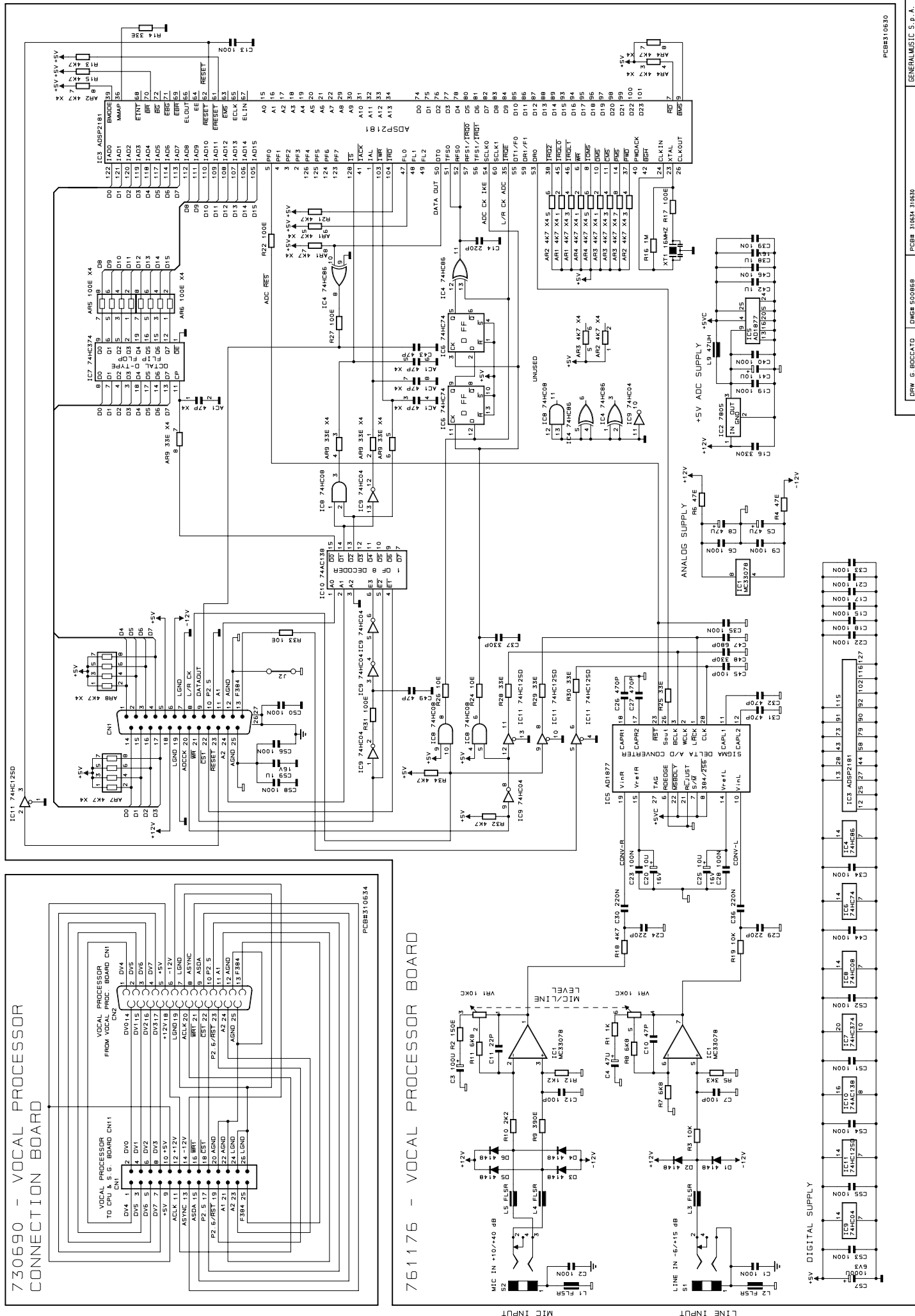
810288 - CONTACT BOARD (DYNAMIC KEYBOARD 61 NOTES)
(ALL MODELS)



CPU & SOUND GENERATOR BOARD (PART 2 OF 2)



DRW	VITRI	DWG#	500973B	PCB#	310718	GENERALMUSIC S.p.A. ITALY
CKD	BOCCATO	DATE	09/12/02	SCHEMATIC DIAGRAM WK2000		ALL RIGHTS ARE RESERVED. NO COPIES OR REPRODUCE THIS DOCUMENT WITHOUT WRITTEN CONSENT BY GENERALMUSIC.
APP.	GALANTI	REV:	A	CPU & SOUND GENERATOR BOARD		



DRW	G. BOCCATO	DWG#	500973B	PCB#	310718	GENERALMUSIC S.p.A. ITALY
CKD	I. VITRI	DATE	23-07-99	DESCRIPTION		ALL RIGHTS ARE RESERVED. NO COPIES OR REPRODUCE THIS DOCUMENT WITHOUT WRITTEN CONSENT BY GENERALMUSIC.
APP.	R. MORFOTI	REV#	A	VOCAL PROCESSOR BOARD		

TEST PROCEDURE

This procedure are not intended to repair a fault but only to check the proper instrument operations after a repairing execution. The procedures that follow must be executed in the order specified.

Instrument and Tools

- 1) Dual trace oscilloscope.
- 2) Midi cable.
- 3) Television with RGB and S-VHS input sockets compatible with PAL and NTSC standards.
- 4) S-VHS cable.
- 5) DIN/SCART cable.
- 6) DIN/RCA cable.
- 7) Volume pedal.
- 8) Latest version of the appropriate Operating System Disk.
- 9) Dynamic microphone to check WK2000 with Vocal Processor installed.
- 10) N.1 stereo jack plug.
- 11) N.2 mono jack plug.

Setup

- Connect the television by RGB and S-VHS sockets.
- Connect the dynamic microphone to the Vocal Processor MIC socket if present.
- Connect the stereo jack to the PHONES 2 output.
- Connect the mono jack to the LEFT and RIGHT OUTPUTS.

Operating System Check

- Turn on the instrument.
- The instrument starts with the video output set on PAL mode by default. Set TV input on RGB mode, on the TV screen must appear the welcome message:

GEM WK2000 Keyboard

- Press the "MIDI/GENERAL" button, press cursor PAGE NEXT button until the release date of the operating system loaded is displayed, it must correspond to the latest release date.
- If an update is required put the Operating System disk into the disk drive and turn on again the keyboard, the display shows "LOAD O.S." then press ENTER to confirm.
- NOTE: After any servicing operation an operating system re-loading is recommended.

Reset Procedure

- Press UPPER 1, PADS 2 3 and 4 buttons simultaneously to reset the instrument.

Right & Left Outputs Check

- Check the level from the output sockets as follow:
 - Connect the dual trace oscilloscope to the tip and sleeve contacts of the stereo jack plugged into PHONES 2, set it at 2ms/div. 2V/div.
 - Press "MIDI/GENERAL" button.
 - Press PAGE NEXT button until the display shows: "Tuning:00 Dynamic: Norm".
 - Press cursor DOWN button until "Norm" text flashes.
 - Rotate the DIAL counterclockwise until the display shows "OFF".
 - Press ESCAPE.
 - Press 68 on SOUNDS numeric keypad, the display will show "68:OBOE".
 - Disable REVERB and CHORUS by pressing its correspondent button.
 - Set MASTER VOLUME potentiometer to its maximum.
 - Play the note key C6 (61 note keyboards normally starts from C2) and verify with the oscilloscope the output levels: their must be 7.5±0.5Vpp.
- Move the oscilloscope probes to the two mono jacks plugged into R & L OUTPUTS, the scope shows two traces with 1.0Vpp ±5% each.

Pedals Check

- Plug in the PEDAL VOLUME to its socket, it vary the level from 0 (no sound) to the level set by MASTER VOLUME potentiometer.
- Plug in the switch pedal (NC) to the DAMPER jack socket, press down the pedal and then press a note key: the instrument plays the note, release the note key and the sound holds on, release the pedal and the sound shuts off.
- Plug in the switch pedal (NC) to the PEDAL jack socket, press down the pedal and a rhythm starts, press again the pedal and the rhythm stops.

Midi In/Out Check

- Set on UPPER 1 section only.
- Set UPPER 1 to local off following the procedure explained below:
 - Press "MIDI/GENERAL" button.
 - Press PAGE NEXT until display shows "Midi Local Track 01-08".
 - Press F8, the correspondent text "On" flashes.
 - Rotate the DIAL counterclockwise until display shows "--".
- Insert the Midi loop (by a suitable cable) between MIDI IN and OUT sockets, now each keyboard event will be send thru the external Midi loop and played by the internal generation.

Computer Socket Check

- Set the keyboard on COMPUTER MODE pressing the following buttons:
 - Turn back pressing PAGE BACK until display shows "Serial Computer:Off".
 - Press cursor DOWN two times.
 - Rotate the DIAL until display shows "MAC: Serial"
- Insert the Computer loop cable (pin 1-2 and 3-5 shorted) in COMPUTER socket, now each keyboard event will be send thru the COMPUTER and looped back into the internal generation.
- Connect the CH1 probe of the oscilloscope at PIN 1 of the COMPUTER socket and its ground clip at PIN 4, set it at 200uS/div. 2V/div.: the trace must show a 1MHz signal with 5V of amplitude centred on 0V (±2.5V).
- Connect the CH2 probe of the oscilloscope at PIN 6 of the COMPUTER socket and its ground clip at PIN 4, set it at 500uS/div. 10V/div.: playing some notes on the keyboard, the CH2 oscilloscope trace must show a sequence of pulses with 24V of amplitude centred on 0V.
- Rotate the DIAL to restore "Serial Computer:Off".
- Restore the Track on by pressing 4 times PAGE NEXT 4 times, F8, rotate DIAL.
- Press ESCAPE.

Outputs Video Check

- **NTSC mode, RGB Selection**
 - Select NTSC mode on the instrument as follow:
 - Select "GENERAL" with UP and DOWN cursor keys at the left of the display.
 - Press PAGE> cursor until display shows "TV=PAL"
 - Rotate the DIAL until display shows "TV=NTSC", on TV screen must appear the following message:

GEM WK2000 Keyboard

- wrote larger than in the previous PAL setting.
- Disconnect or deselect the RGB input and select the S-VHS input (YC3) on TV.
- **NTSC mode, S-VHS Selection**
 - Adjust if necessary the colours and the flicker on TV rotating the C19 capacitor trimmer.
- **PAL mode, S-VHS Selection**
 - Select PAL mode rotating the DIAL until display shows "TV=PAL".
 - Adjust if necessary the colours and flickers on TV rotating the C20 capacitor trimmer.
 - Press ESCAPE button.
 - Reconnect or reselect the RGB input to the TV.

Hard Disk Check

- Verify Hard Disk "Direct load" operation as follow :
 - Eject any 3.5" diskette from its drive if present.
 - Press HARD DISK key, display shows the first partition name.
 - Press ENTER and the display will show the name of a song.
 - Press START/STOP and the song will start to play in "Direct" mode (reading data direct from HD), hear the song for few seconds ad press START/STOP key again.

Vocal Processor Check (if present)

- Press VOCAL P and the correspondent led lighths on.
- Press EQUAL/MIC button, display shows "MIC OFF" .
- Rotate the DIAL to activate the microphone, the display message change to "MIC ON" and speak some words into the microphone.
- Rotate the DIAL to de-activate the microphone.

Ram Back Up Check

- Press TRANSPOSE " #" and display shows below TRANSPOSE "1".
- Switch off the instrument and wait at least 20 sec. When you switch on the instrument be sure display shows the same "TRANSPOSE" number. NOTE: the instrument have an internal re-chargeable NiCd battery that insures the data backup for a maximum of 30 days, therefore it is recommended to hold switched on the instrument for at least 8-10 hours after a long time of inactivity.

Reliability Check

Before reassembling the instrument and before deliver it to the user, it is a goal verify its reliability:
To do that switch it off, or leaving it switched on but operating with greatest caution, carefully shake the boards and connections inside it using an insulated tool (for example the handle of the screwdriver) to find wrong contacts and so on.
Turn on the instrument and verify that it operates correctly.
Finally leave it switched on for a long time verifying its functionality occasionally.

Spare Part List

Legend

EU = Europe Version

US = U.S. Version

For Ref position see drawing at page 3.

Ref	code	Description
Optional Accessories		
970110	X-Metal	Stand
970116	Single Foot	Switch
970080	Triple Foot	Switch
970134	Piano Single Foot	Switch
970013	Volume	Pedal
970107	PRO Volume	Pedal
130301	2mt Midi	Cable
130429	3mt RS232	Cable (MiniDin 8 To D-Sub 9)
990927	AS-1 Arabic	Scale Converter
970949	Carrying	Bag
951283	LM 20	Dynamic Mic with XLR Cable

Accessories

MDL345019	Music	Stand
970412	Owner's	Manual (Italian Language)
970413	Owner's	Manual (English Language)
955883	Operating	System Disk
271351	HD	Contents List
130317	DIN/SCART	Video Cable (Pal)(EU)
130428	DIN/RCA	Video Cable (Ntsc)(US)
130297	Mains	Cable (EU)
130283	Mains	Cable (US)

Cabinet Assembly

23	MDL735019	DC/AC Converter Board (Pcb#31-1689-4)
20	MDL735018	Lcd Display (Pcb#31-1691-1)
	MDL115003	* Neon Lamp For LCD Display
3	MDL735006	Volume Board
	MDL345020	Black Power Switch Actuator
	MDL345018	Diak Knob
	MDL345017	Volume Knob
	MDL120000	D-Sub Connector Fixing Screw
	660752	Vocal Processor Slot Closer
	660283	Right Speaker Grid
	660282	Left Speaker Grid
	660281	Tweeter Grid
7	653586	Bottom Chassis
6	653579	Top Chassis
	653578	Display Screen
1	561020	Hard Disk
	341026	Tweeter Rear Closer
	341005	Hard Disk Suspension Rubbber
	340542	H=2mm Spacer
	340501	Right Speaker Box Gasket
	340498	Left Speaker Box Gasket
	340186	Adhesive Cable Fixing
	340115	Adhesive Flat Cable Fixing
	340093	Board Spacer for DC/AC Conv. Board
	340078	TO220 Insulated Bush
3	220110	5" 4ohm Woofer Speaker
4	220109	1/2" 4ohm Dome Tweeter Speaker
	210254	Speaker Filler
	210250	5" Speaker Gasket
	210217	Black Sealer (specify mt)
	190015	Adhesive Rubber Foot
	171639	HD and HD Interface Board Support
	171534	Support for Vocal Processor Cover
	171378	Support for Vocal Processor Connector
	130061	AWG24 Black Cable
	120960	Dial Steel Sphere
	120683	M6 Socket
	120581	M3 Black Self-Locking Nut
	120521	3mm Black Spring Washer
	120451	3.2x7x0.5 Black Washer
	120410	3x6tc Black Screw
	120374	WL4x15tt Black Screw
	120364	WL3.5x12tt Black Screw
	120346	WL4x20tc Black Screw
	120319	B3.5x19tc Black Screw
	120288	WL3x20tc Black Screw
	120276	B2.9x6.5mm Screw
	120272	WL3x10tc Black Screw
	120029	M3x6tc Black Screw
	120011	M3x20tc Black Screw

	120003	M3x8tc Black Screw
2	110400	3,5 Floppy Disk Drive
10	110263	Dial Encoder with 24 Snap H=20mm Panasonic

Mains Assembly

	770832	Mains Cables Assembly
	171635	* Mains Switch Support
9	110320	* Power Switch
	730513	Mains Filter & Transformer Assembly (EU)
	730522	Mains Filter & Transformer Assembly (US)
16	767988	* Mains Filter Board (Pcb#315014) (EU)(US)
	230568	** 10mH 250Vac 1A AC Line EMI Coil "Siemens"
	140010	** 3 Contacts P=10 Vert Terminal Block
	110119	** Fuse Clip 10A max (EU) (US)
	020493	** 100n 250Vac MKP EMI Capacitor "Siemens"
	010545	** 4n7 250V Ceramic Capacitor (Iec-UI-Csa)
17	230134	* Transformer 230Vac 75W (EU)
17	230135	* Transformer 115Vac 75W (US)
	110614	* Mains Socket
	110017	* T500mA Fuse 5x20mm (EU)
	110082	* T1A Fuse 6.3x32mm (US)

Power Amplifier Board

	110010	T2A Fuse 5x20mm (EU)
	110003	T3.15A Fuse 5x20mm (EU)
	110083	T2A Fuse 6.3x32mm (US)
	110061	T3.15A Fuse 6.3x32mm (US)
14	731059	Power Amplifier Board (Pcb#310720)
	MDL145036	* 6 Contacts Vert Male Connector
	MDL145034	* 4 Contacts Vert Male Connector
	MDL145032	* 2 Contacts Vert Male Connector
	340079	* TO220 Mica Washer
	340078	* TO220 Insulated Bush
	230569	* FL5R200PNT EMI Coil For Signal
	230527	* BL02RN2-R62 EMI Coil For Signal
	230524	* 100uH Switching Coil
	170742	* Heatsink
	170716	* TO220 h=38mm Heatsink
	160178	* Copper Jumper
	150249	* 140x3.2mm Nylon Cable Tie
	140217	* Jack Stereo Slim Horizontal Socket
	140010	* 3 Contacts P=10 Vert Terminal Block
	120849	* Hor Pc Male Faston 2.8
	120582	* M3 Black Nut
	120521	* 3mm Black Spring Washer
	120301	* B3.5x13tc Black Screw
	120257	* B2.9x9.5tc Black Screw
	120005	* M3x10tc Screw
	110305	* Relay 12V / 2 Switch 1A 250Vac
	110300	* 4.8V 280mAh Nicd Battery
	110119	* Fuse Clip 10A max (EU) (US)
	100958	* TDA7265 Dual 25W Power Amplifier
	100919	* MC33078 Dual LN Operational Amplifier
	100900	* L4960 5-40V 2.5A Switching Regulator
	100059	* 7805 +5V 1A Voltage Regulator
	100045	* 7812 +12V 1A Voltage Regulator
	100043	* 7912 -12V 1A Voltage Regulator
	090183	* BC550C TO92 LN Npn Transistor
	080605	* KBL02 4A 200V Rectifier Diode Bridge
	080170	* BYV27 2A 100V Fast Recovery Diode
	080156	* 1N4002 1A 100V Rectifier Diode
	070611	* 2x10K Log Rotary Potentiometer
	052056	* 47K 1/8w 5% Resistor
	052055	* 39K 1/8w 5% Resistor
	052054	* 33K 1/8w 5% Resistor
	052052	* 22K 1/8w 5% Resistor
	052051	* 18K 1/8w 5% Resistor
	052050	* 15K 1/8w 5% Resistor
	052048	* 10K 1/8w 5% Resistor
	052044	* 4K7 1/8w 5% Resistor
	052043	* 3K9 1/8w 5% Resistor
	052040	* 2K2 1/8w 5% Resistor
	052037	* 1K2 1/8w 5% Resistor
	052036	* 1K 1/8w 5% Resistor
	052035	* 820E 1/8w 5% Resistor
	052033	* 560E 1/8w 5% Resistor
	052028	* 220E 1/8w 5% Resistor
	050491	* 10K 1/4W 5% Resistor
	050211	* 47E 1/4W 5% Resistor
	050131	* 10E 1/4W 5% Resistor
	030950	* 470u 16V 20% Low Esr Vert Electrolytic Capacitor
	030554	* 4700u 35v 20% Snap-In Electrolytic Capacitor
	030526	* 2200u 35v 20% Snap-In Electrolytic Capacitor

030486	*	100u 50V 20% Vert Electrolytic Capacitor
030403	*	47u 25V 20% Vert Electrolytic Capacitor
030170	*	4u7 50V 20% Vert Electrolytic Capacitor
030082	*	2u2 50V 20% Vert Electrolytic Capacitor
021030	*	330n 63V 10% MKT Polyester Capacitor
021024	*	100n 63V 10% MKT Polyester Capacitor
021018	*	33n 63V 10% MKT Polyester Capacitor
021004	*	2n2 63V 10% MKT Polyester Capacitor
010599	*	1u 50V -20+80% Ceramic Cap. Multilayer
010595	*	100n 50V -20+80% Ceramic Cap. Multilayer
010543	*	4n7 50V 10% CL2 Ceramic Capacitor
010413	*	390p 50V 10% CL2 Ceramic Capacitor
010345	*	100p 50V 10% CL2 Ceramic Capacitor

Midi & Controls I/O Board

15	730987	Midi & Controls I/O Board (PCB#310628)
230569	*	FL5R200PNT EMI Coil For Signal
140248	*	4 Poles Mini Din Female Socket
140247	*	8 Poles Mini Din Female Socket
140219	*	13 Poles Din Horizontal Female Socket
140217	*	Jack Stereo Slim Horizontal Socket
140212	*	5 Poles Din Horizontal Female Socket
100734	*	MAX202E RS232 Drivers/Receiver
100602	*	74HC04 Hex Inverter
100035	*	6N138 Optocoupler
080242	*	6V2 1W 5% Zener Diode
080103	*	1N4148 100mA 75V Signal Diode

Phones Board

12	730991	Phones Board (PCB#315095)
315095	*	Unavailable
230569	*	FL5R200PNT EMI Coil For Signal
140231	*	Jack Stereo Horizontal Socket (with dual switch)
140217	*	Jack Stereo Slim Horizontal Socket
010595	*	100n 50V -20+80% Ceramic Cap. Multilayer

Controls Panel Board

19	810707	Controls Panel Board (Pcb#310719)
MDL145034	*	4 Contacts Vert Male Connector
MDL145033	*	3 Contacts Vert Male Connector
653590	*	<Track-Voc-Mute> Rubber Key Pad
653589	*	<Display> Rubber Key Pad
653588	*	<Sound-Sty/Song> Rubber Key Pad
653587	*	<Sequ-Utility> Rubber Key Pad
341017	*	<Sampling> Rubber Key Pad
341016	*	<Transpose> Rubber Key Pad
341015	*	<Arrange/Var.> Rubber Key Pad
341014	*	<Enter/Escape> Rubber Key Pad
341013	*	<Start/Stop> Rubber Key Pad
340896	*	<Style & Sound> Rubber Key Pad
160178	*	Copper Jumper
140882	*	26 Contacts Vert Male Connector Din41651
140854	*	16 Contacts Vert Male Connector Din41651
080752	*	3mm Wide Diffused Red Led
010595	*	100n 50V -20+80% Ceramic Cap. Multilayer

Trackball Board

21	810668	Trackball Board (PCB#310635)
340237	*	Pitch & Modulation Hemispherical Knob
310635	*	Unavailable
070700	*	10K+10K Linear Joystik Potentiometer
010595	*	100n 50V -20+80% Ceramic Cap. Multilayer

Keyboard Assembly

18	720552	Keyboard Assembly
810288	*	61N Contacts Board (Pcb#310526)
340212	**	13 Dual Contact Rubber Strip
340211	**	12 Dual Contact Rubber Strip
140854	**	16 Contacts Vert Male Connector Din41651
100606	**	74HC138 1 Of 8 Decoder
080103	**	1N4148 100mA 75V Signal Diode
010660	**	470p 10% 50V X8 Cap Array
500073	*	TP9 Mechanical Keyboard Assembly
160215	**	Key Return Spring (61N)
151213	**	Last C Key (TP9) (61N)
151212	**	Sharp Key (TP9) (61N)
151211	**	B Key (TP9) (61N)
151210	**	A Key (TP9) (61N)
151209	**	G Key (TP9) (61N)
151208	**	F Key (TP9) (61N)

151207	**	E Key (TP9) (61N)
151206	**	D Key (TP9) (61N)
151205	**	C Key (TP9) (61N)

Cpu & Sound Generator Board

11	761241	Cpu & Sound Generator Board (Pcb#310718)
MDL145055	*	10 Contacts Vert Male Connector p=2mm
MDL145036	*	6 Contacts Vert Male Connector
MDL145034	*	4 Contacts Vert Male Connector
560018	*	GAL16V8 Gate Array Logic (Programmed)
230582	*	LC Delay Line 400ns 0.5MHz
160122	*	Jump Length 2.5mm
140882	*	26 Contacts Vert Male Connector Din41651
140866	*	34 Contacts Vert Male Connector Din41651
140854	*	16 Contacts Vert Male Connector Din41651
106002	*	NE555 SOIC Timer
106001	*	MC33078P SOIC Dual Low Noise Op. Amp.
106000	*	TDA8501 PAL/NTSC Encoder
105011	*	IKE plus - Cpu & Dsp
104061	*	K3N6C1000E-12 32Mbit Rom (WK1)
104032	*	MX23C3210MC-12 32Mbit Rom "GM-GMX Sounds"
104026	*	AM29F040-75EC TSOP 4Mbit Flash Memory Ta=70nS
104009	*	HMS118160ALJ 16Mbit Dram Ta=70nS
103030	*	74HC32D SOIC Quad 2-In Or Gate
103029	*	74HC4024D SOIC 7-Stage Binary Counter
103019	*	PCA8515 SOIC Standalone OSD
103017	*	74HC4051DW SOIC 8ch Analog Multiplexer
103013	*	74HC138D SOIC 1 Of 8 Decoder
103012	*	74HC125D SOIC Quad Tri-State Buffer
103010	*	74HC04D SOIC Hex Inverter
103009	*	74HC02D SOIC Quad 2-In Nor Gate
103008	*	PCM69AU SOIC 2ch 1bit Dac
103003	*	74HC374DW SOIC Octal D-Type Flip-Flop
103002	*	74HC245DW SOIC Octal Bus Transceiver
103001	*	74HC08D SOIC Quad 2-Input And Gate
103000	*	74HC14D Soic Hex Inverter Schmitt Trigger
101508	*	74AC32 SOIC Quad 2-input Or Gate
101505	*	74AC08 SOIC Quad 2-input And Gate
101504	*	74AC257 SOIC Quad 2-input Multiplexer
100591	*	GM82C765B Floppy Disk Controller
091002	*	PMBT2369 TO236 Smd Npn Transistor (1J)
091001	*	BC857B/C TO236 Smd Pnp Transistor (9BB/C-3F/G)
091000	*	BC847B/C TO236 Smd Npn Transistor (8BB/C-1F/G)
081000	*	PMLL4148 Smd 100mA 75V Signal Diode
055104	*	2K2 X4 1/16w 5% Smd Resistor Array
055102	*	33E X4 1/16w 5% Smd Resistor Array
055101	*	4K7 X4 1/16w 5% Smd Resistor Array
055100	*	100E X4 1/16w 5% Smd Resistor Array
054072	*	1M 1/10w 5% Smd Resistor 0805
054068	*	470K 1/10w 5% Smd Resistor 0805
054063	*	180K 1/10w 5% Smd Resistor 0805
054060	*	100K 1/10w 5% Smd Resistor 0805
054055	*	39K 1/10w 5% Smd Resistor 0805
054052	*	22K 1/10w 5% Smd Resistor 0805
054050	*	15K 1/10w 5% Smd Resistor 0805
054049	*	12K 1/10w 5% Smd Resistor 0805
054048	*	10K 1/10w 5% Smd Resistor 0805
054046	*	6K8 1/10w 5% Smd Resistor 0805
054045	*	5K6 1/10w 5% Smd Resistor 0805
054044	*	4K7 1/10w 5% Smd Resistor 0805
054043	*	3K9 1/10w 5% Smd Resistor 0805
054042	*	3K3 1/10w 5% Smd Resistor 0805
054039	*	1K8 1/10w 5% Smd Resistor 0805
054038	*	1K5 1/10w 5% Smd Resistor 0805
054037	*	1K2 1/10w 5% Smd Resistor 0805
054036	*	1K 1/10w 5% Smd Resistor 0805
054033	*	560E 1/10w 5% Smd Resistor 0805
054032	*	470E 1/10w 5% Smd Resistor 0805
054030	*	330E 1/10w 5% Smd Resistor 0805
054028	*	220E 1/10w 5% Smd Resistor 0805
054026	*	150E 1/10w 5% Smd Resistor 0805
054025	*	120E 1/10w 5% Smd Resistor 0805
054024	*	100E 1/10w 5% Smd Resistor 0805
054023	*	82E 1/10w 5% Smd Resistor 0805
054022	*	68E 1/10w 5% Smd Resistor 0805
054018	*	33E 1/10w 5% Smd Resistor 0805
050131	*	10E 1/4W 5% Resistor
030931	*	10u 35V 20% Electrolytic Tantalium Capacitor
030565	*	220u 25V 20% Vert Electrolytic Capacitor
030485	*	100u 25V 20% Vert Electrolytic Capacitor
030403	*	47u 25V 20% Vert Electrolytic Capacitor
030245	*	10u 50V 20% Vert Electrolytic Capacitor
011502	*	470pFx4 10% 100V Cer. Array Cap. NP0 Smd
011501	*	220pFx4 10% 100V Cer. Array Cap. NP0 Smd

011500	*	47pFx4 10% 100V Cer. Array Cap. NP0 Smd
011103	*	1u 16V 10% Cer. Cap. Smd CL2 XTR 1206
011064	*	220n 50V 10% Cer. Cap. Smd CL2 X7R 1206
011060	*	100n 50V 10% Cer. Cap. Smd CL2 Y5V 0805
011048	*	10n 50V 10% Cer. Cap. Smd CL2 X7R 0805
011047	*	8n2 50V 10% Cer. Cap. Smd CL2 X7R 0805
011036	*	1n 50V 10% Cer. Cap. Smd CL2 X7R 0805
011032	*	470p 50V 10% Cer. Cap. Smd CL2 X7R 0805
011028	*	220p 50V 10% Cer. Cap. Smd CL2 X7R 0805
011024	*	100p 50V 10% Cer. Cap. Smd CL2 X7R 0805
011020	*	47p 50V 10% Cer. Cap. Smd CL2 X7R 0805
011018	*	33p 50V 10% Cer. Cap. Smd CL2 X7R 0805
011016	*	22p 50V 10% Cer. Cap. Smd CL2 X7R 0805
011012	*	10p 50V 10% Cer. Cap. Smd CL2 X7R 0805
010730	*	4.433619MHz Quartz Resonator
010729	*	3.579545MHz Quartz Resonator
010721	*	1.8432MHz Quartz Resonator
010714	*	30MHz Quartz Resonator
010704	*	16MHz Quartz Resonator
010602	*	5p2-30pF N750 Ceramic Capacitor Trimmer

HD Interface Board

13	731010	HD Interface Board (Pcb#310592)
841190	*	26 Wires 10cm Latch/Transition Flat Cable
140915	*	44 Contacts P=2mm Vert Male Strip
103031	*	74HC00D SOIC Quad 2-In Nand Gate
103010	*	74HC04D SOIC Hex Inverter
103007	*	74HC74D SOIC Dual Flip-Flop
101507	*	74AC646 SOIC Octal Transceiver Register
055101	*	4K7 X4 1/16w 5% Smd Resistor Array
055100	*	100E X4 1/16w 5% Smd Resistor Array
030715	*	1000u 6v3 20% Vert Electrolytic Capacitor

Wiring Connectoins

841170	26 Wires 17.5cm Flat Cable
841169	4 Wires 30cm Crimp Terminal Cable
841168	2 Wires 50cm Crimp Terminal Cable
841167	4 Wires 50cm Crimp Terminal Cable
841166	15cm Yel/Grn Eye/Faston Wire
841165	44 Wires 5cm Flat Cable
841149	44 Wires 7.5cm Flat Cable (HD Connection)
841148	26 Wires 10cm Flat Cable
841147	30cm Yel/Grn Eye/Faston Wire
841146	12.5cm Yel/Grn Eye/Solder Wire
841127	2 Wires 35cm Faston/Solder Red/Black Cable
841005	7.5cm Yel/Grn Faston/Faston AWG18 Wire
840983	10 Wires 5cm Crimp Terminal Cable
840982	6 Wires 45cm Crimp Terminal Cable
840981	3 (of 4) Wires 55cm Flat Cable
840979	4 Wires 17.5cm Crimp Terminal Cable
840978	2 Wires 10cm Crimp Terminal Cable
840977	2 Wires 40cm Flat Cable
840976	6 Wires 7.5cm Crimp Terminal Cable
840975	4 Wires 35cm Flat Cable
840974	4 Wires 7.5cm Crimp Terminal Cable
840837	15cm Yel/Grn Eye/Faston Wire
840835	5cm Yel/Grn Faston/Faston Wire
840655	26 Wires 20cm Latch Flat Cable
840595	16 Wires 12cm Latch Flat Cable
840586	34 Wires 30cm Latch Flat Cable
840556	16 Wires 17.5cm Latch Flat Cable
840554	16 Wires 40cm Latch Flat Cable
840532	16Wires 45cm Latch Flat Cable
840529	16 Wires 20cm Latch Flat Cable
5	730690 Vocal Processor Flat Cable

Vocal Processor Interface (Optional)

22	970335	Vocal Processor Interface Kit
271256		Vocal Processor Owner's Manual Addendum
271273		Owner's Manual Addendum (All Languages)
180777		<Prog/Style> Adhesive Plate
981141		Vocal Processor Assembly
653441	*	Voc.Proc. Adhesive Plate
652881	*	Voc.Proc. Bottom Box
652880	*	Voc.Proc. Top Box
340503	*	Outward Knob
340502	*	Inner Knob
761176	*	Vocal Processor Board (Pcb#310630)
140861	**	25 Contacts Hor Male Connector Din41652
140217	**	Jack Stereo Slim Horizontal Socket
106001	**	MC33078P SOIC Dual Low Noise Op. Amp.
105010	**	ADSP2181 Dsp Microcomputer

103041	**	74HC86 SOIC Quad 2-Input Ex-Or Gate
103013	**	74HC138D SOIC 1 Of 8 Decoder
103012	**	74HC125D SOIC Quad Tri-State Buffer
103011	**	AD1877 SOIC Dual Channel 1bit ADC
103010	**	74HC04D SOIC Hex Inverter
103007	**	74HC74D SOIC Dual Flip-Flop
103001	**	74HC08D SOIC Quad 2-Input And Gate
103003	**	74HC374DW SOIC Octal D-Type Flip-Flop
101500	**	74AC138D SOIC 1 Of 8 Decoder
100059	**	7805 +5V 1A Voltage Regulator
081000	**	PMLL4148 Smd 100mA 75V Signal Diode
071011	**	2x10K Alog Rotary Pot
055102	**	33E X4 1/16w 5% Smd Resistor Array
055101	**	4K7 X4 1/16w 5% Smd Resistor Array
055100	**	100E X4 1/16w 5% Smd Resistor Array
010724	**	16MHz Ceramic Resonator With Capacitors

Note:

- All dimensions are in mm unless otherwise specified.
- The screw description is defined as follows:

type of screw + diameter + X + length + type of head

where type of screw is one of these:

M = Metric thread

B = Self-tapping screw for metal

WL = Self-tapping screw for wood

and type of head is one of these:

tc = cylinder Phillips head

ts = flared Phillips head

tt = rounded Phillips head

te = hexagonal nut head

tsp = flat flared Phillips head

tce = cylinder Allen hexagonal head

tspe = flat flared Allen hexagonal head
- The washer description is defined as follow:

hole diameter + X + external diameter + X + thick
- 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.