LEM
PROFESSIONAL SOUND

SERVICE MANUAL DX24

GENERALMUSIC

code 270252

Index

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.

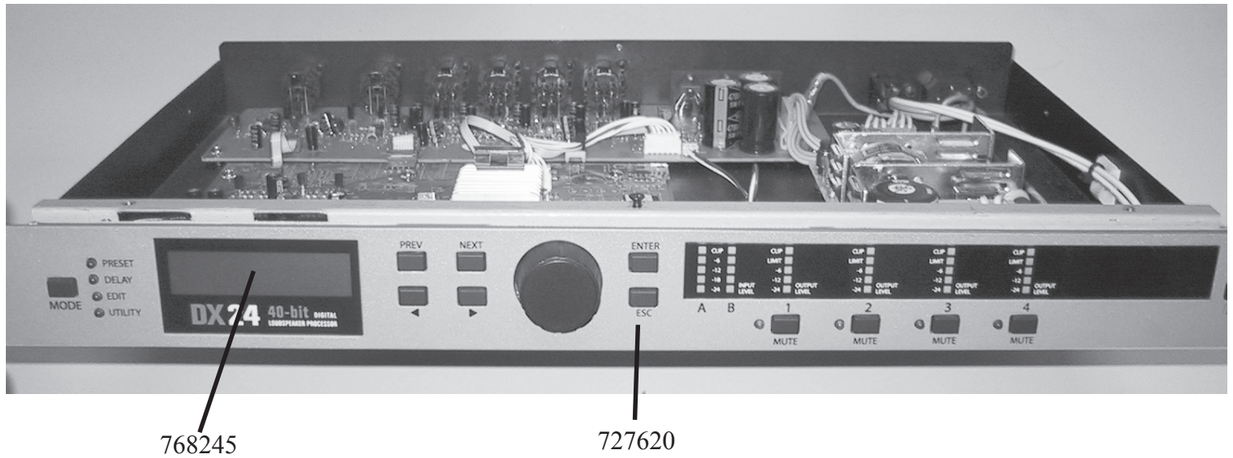
- Soldering point.
- Male connector.
- Female connector.
- M/F faston connector.
- Supply voltage.
- Test point.
- Flag joined with one or more flags with the same signal name inscribed.
- Logic supply ground.
- Analog supply ground.
- Chassis ground.
- Earth ground.

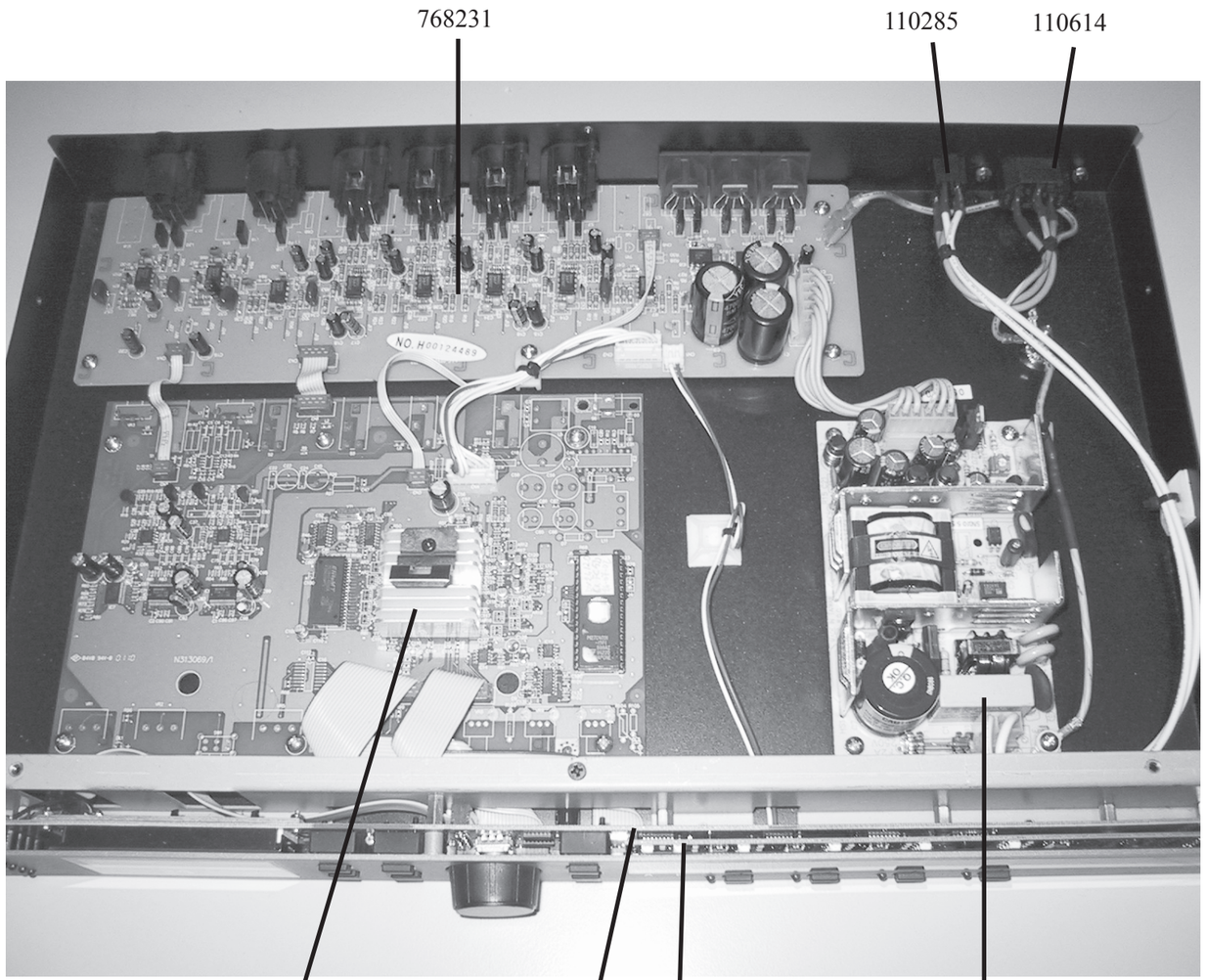
ATTENTION Observe precautions when handling electrostatic sensitive devices.

GENERALMUSIC S.p.A. Sales Division: 47842 S.Giovanni in Marignano (RN) ITALY - Via delle Rose, 12
Phone +39(0)541/959511 - Fax +39(0)541/957404 - Internet: www.generalmusic.com

DX 24 • TECHNICAL SPECIFICATIONS

INPUT section	
Connectors	2 x XLR-F
Nominal input sensitivity	0dBu (0.775V_{RMS})
Input Impedance	30kOhm, electronically balanced
Maximum Input Level	+14dBu
Input Gain	-30 / +6 dB variable in 0.5 dB steps
Output Section	
Connectors	4 x XLR-M
Output Impedance	600 Ohms, electronically balanced
Nominal Output Level	0 dBu
Maximum Output Level	+14 dBu
Output Gain	-30 / +6 dB variable in 0.5 dB steps
Minimum Total Delay Time	1.224mS
DSP Section	
A/D converters	20 bit
D/A converters	24 bit
Internal dynamics	40 bit
Sampling frequency	48 kHz
Features	
Configuration	2-WAY STEREO, 2,3,4-WAY MONO
Crossover Filters Type	Bessel, Butterworth or Linkwitz-Riley
Crossover Filters Slope	6, 12, 18, 24, or 48dB per octave
Delay Step	21 microseconds minimum
Max Delay time	582 ms (inputs), 189 ms (outputs)
EQ filters	Up to 30 maximum (depending on the crossover slope)
EQ Type	Peak, 6dB Lo-Shelf, 12dB Lo-Shelf, 6dB Hi-Shelf, 12dB Lo-Shelf, Notch
EQ Gain	+/15dB, variable in 0.5dB steps
EQ Bandwidth	0.05 to 3.00 octaves, variable in 0.05 steps
EQ freq	15.6 Hz to 16 kHz
Dynamics	Digital limiter on all the outputs
Memories	17 FACTORY PRESETS + 64 USER PRESETS
MIDI	MIDI IN/THRU/OUT
General Performance (with filters out)	
Frequency Response	20Hz - 20kHz, ±0.25dB
Dynamic range	>102dB 20Hz to 20kHz
Channel Separation	>100dB 20Hz to 20kHz
Distortion (THD)	0.06%, 20Hz to 20kHz
Input Metering	-24dB, -18dB, -12dB, -6dB, CLIP relative to Clip point (+14dBu)
Output Metering	-24dB, -12dB, -6dB, LIMIT relative to limiter threshold setting, CLIP
General	
Dimensions	483x44x300 mm
Weight	4.0 Kg
Power supply	see label on the unit





Testing procedure

Instruments required

1) Sinusoidal signal generator
2) Dual trace scope
3) Digital multimeter

Visual check

Check the internal cables and sockets for possible interruptions or shorts, also check the DC output voltages of the Switching Supply Unit disconnecting its output connector, if appears a damage don't try to repair it but replace the unit with a new one.

Setup

Switch off the unit.
Connect the signal generator to the IN A XLR socket, and set it at **1KHz, 0.775V_{RMS} (0dBu)**
Connect the digital multimeter to the OUT 1 XLR socket, and set in dBu scale.
Connect the scope CH1 probe tip to the pin 2 - OUT 1 socket and the CH2 probe tip to the pin 2 - OUT 3 socket, a single gnd clip must be connected to a socket ground (pin1).
Note: If you use a balanced signal generator you have to check a balanced output signal level, or if you use an unbalanced signal generator you have to check an unbalanced output signal level, in this last case you have to check always the negative signal circuitry in either pin 3 of XLR input and output sockets, refer to schematics.

Control Panel Test

Press and hold the **MUTE 3** and **MUTE 4** buttons while switch on the unit, a semi-automatic test starts and goes on with the following steps:
1- Leds must switch on sequentially.
2- Press the MODE button, the display shows KEY 1.
3- Press the PREV button, the display shows KEY 2.
4- Press the LEFT button, the display shows KEY 3.
5- Press the NEXT button, the display shows KEY 4.
6- Press the RIGHT button, the display shows KEY 5.
7- Press the ENTER button, the display shows KEY 6.
8- Press the ESC button, the display shows KEY 7.
9- Press the MUTE 1 button, the display shows KEY 8.
10- Press the MUTE 2 button, the display shows KEY 9.
11- Press the MUTE 3 button, the display shows KEY 10.
12- Press the MUTE 4 button, the display shows KEY 11.
13- Turning the DIAL encoder clockwise the numbers at the right of DIAL text on the display increase, turning counterclockwise decrease.

MIDI test

Establish a loop connecting a MIDI cable between MIDI IN and MIDI OUT sockets, the display shows the number 85 at the right of MIDI text.

IN A test

Check the OUT 1 level: it must be within 0±0.5dBu (775±50mV_{RMS}).
Check the OUT 3 level: it must be within 0±0.5dBu (775±50mV_{RMS}).
Sweeping the generator frequency from 20 to 20KHz no level changes must be detectable.

IN B test

Move the instruments connections to IN B and OUT 2 and 4 respectively.
Check the OUT 2 level: it must be within 0±0.5dBu (775±50mV_{RMS}).
Check the OUT 4 level: it must be within 0±0.5dBu (775±50mV_{RMS}).
Sweeping the generator frequency from 20 to 20KHz no level changes must be detectable.

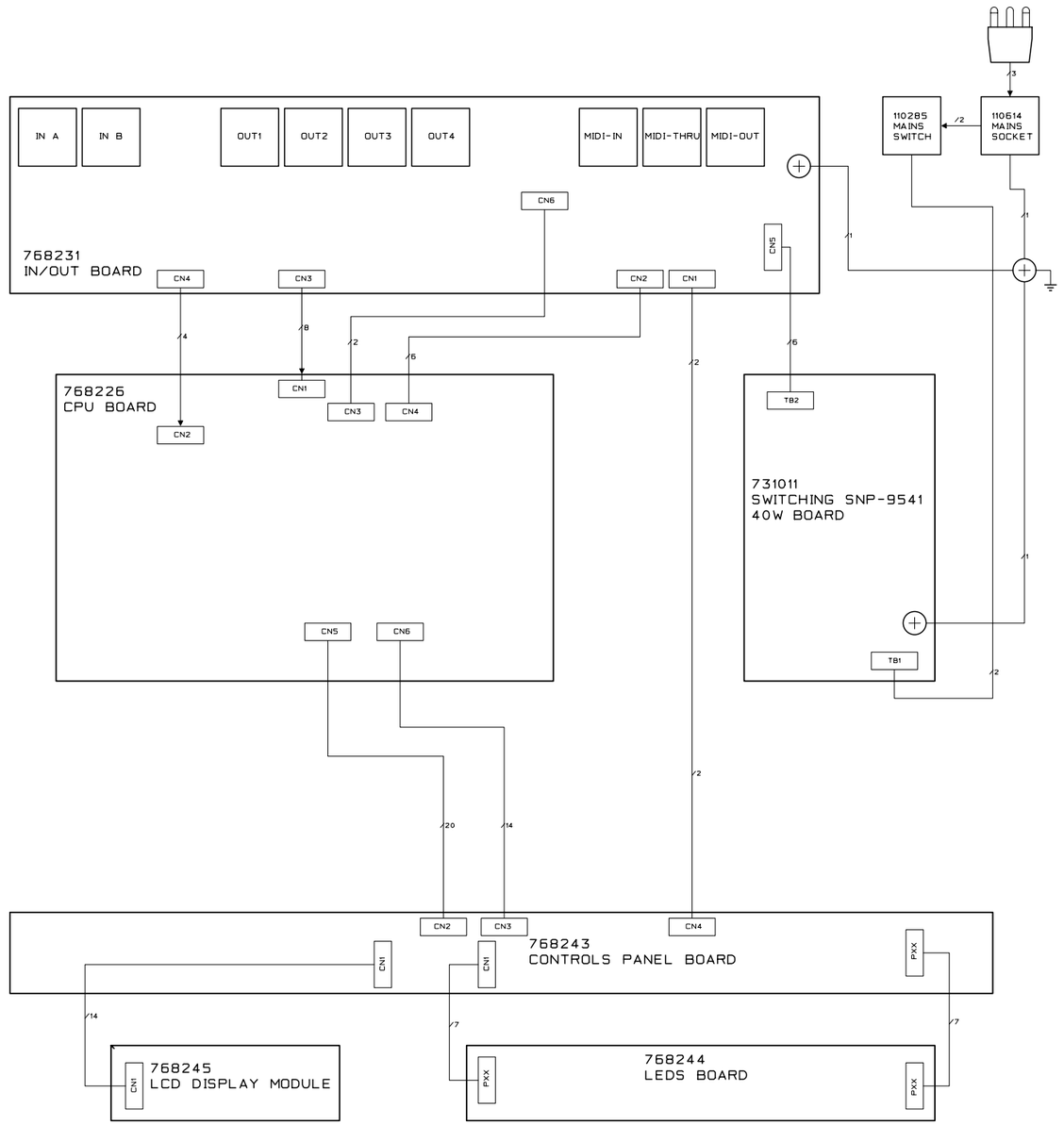
RESET MEMORY

Switch off the unit.
Press and hold the PREV and LEFT buttons while switch on the unit, the display shows INITIALIZING ALL MEMORY.

O.S. Release & DX-editor

The DX-editor program permits to edit the DX24 loudspeaker processor parameters remotely using a notebook PC-Windows based computer, via a MIDI interface; let up to 32 DX24 processors must be controlled remotely.
DX-editor can be downloaded free from LEM website (http://www.lemaudio.com).
To use the DX-editor, your DX24 unit must have an O.S. Release at least 2.0 or upper.
The O.S. Release appears on display while you turn on the unit.
If you want to upgrade your unit you have to replace the "550686 - Firmware" eprom in IC13 position with a new one with the lastest contents, this eprom may be ordered from Generalmusic.

DX24 WIRING/BLOCK DIAGRAM



DRW G.BOCCATO	DWG# 550721	PCB#	GENERALMUSIC S.p.A. ITALY
CKD G.RICCI	DATE 25-02-01	SCHEMATIC DIAGRAM DX24	
APP. F.GAZZILLI	REV: A	WIRING/BLOCK DIAGRAM	

768245
16x2 CHARACTERS
LCD MODULE

FROM CONTROLS PANEL

+5V	2	1	GND
CNTR	4	3	RS
R/W	6	5	ENABLE
D0	8	7	D1
D2	10	9	D3
D4	12	11	D5
D6	14	13	D7

BACKLIGHT

P80 R4 4E7 1/2W +5V

P90

768244
LED & METERS BOARD

-24dB B DL16A R10A 1K2
-12dB A DL4A R13A 1K2
-18dB A DL7A R14A 1K2
-24dB A DL11A R15A 1K2
-18dB B DL12A R7A 1K2
-12dB B DL8A R6A 1K2
-6dB B DL5A R4A 1K2
CLIP B DL3A R3A 1K2

IC1A 74HC4094

-6dB OUT1 DL13A R11A 1K2
-12dB OUT1 DL17A R16A 1K2
-24dB OUT1 DL21A R21A 1K2
CLIP OUT2 DL10A R9A 1K2
LIMIT OUT1 DL9A R8A 1K2
CLIP OUT1 DL6A R5A 1K2
-6dB A DL2A R2A 1K2
CLIP A DL1A R1A 1K2

IC2A 74HC4094

-24dB OUT3 DL31A R30A 1K2
-12dB OUT3 DL27A R27A 1K2
-6dB OUT3 DL23A R23A 1K2
LIMIT OUT3 DL19A R19A 1K2
-24dB OUT2 DL26A R26A 1K2
-12dB OUT2 DL22A R22A 1K2
-6dB OUT2 DL18A R17A 1K2
LIMIT OUT2 DL14A R12A 1K2

IC3A 74HC4094

-24dB OUT4 DL35A R34A 1K2
-12dB OUT4 DL32A R31A 1K2
-6dB OUT4 DL28A R28A 1K2
LIMIT OUT4 DL24A R24A 1K2
CLIP OUT4 DL20A R20A 1K2
CLIP OUT3 DL15A R18A 1K2

IC4A 74HC4094

R41A 10E P70A

STBLED P60A
CLOCK 1 P40A
LED-EN P30A
CLOCK P50A

P20A P10A

IC4A 74HC4094 IC3A 74HC4094 IC2A 74HC4094 IC1A 74HC4094

(PCB#313074)

768243
CONTROLS
PANEL BOARD

SW7 DIAL +5V
R1 5K6 C1 10N R2 5K6 C2 10N
R5 5K6 R3 5K6
IC1 74HC14

TO LCD DISPLAY CN1

+5V	2	1	GND
CNTR	4	3	RS
R/W	6	5	ENABLE
D0	8	7	D1
D2	10	9	D3
D4	12	11	D5
D6	14	13	D7

C4 10U C14 100N +5V

TO CPU CN2

P01	1	2	P02
P19	3	4	P04
P05	5	6	P06
P07	7	8	P08 /D0
D1/ P09	9	10	P10 /D2
D3/ P11	11	12	P12 /D4
D5/ P13	13	14	P14 /D6
D7/ P15	15	16	P16 /DE
DCS2/ P17	17	18	P18 /DRST
DIAL0	19	20	DIAL1

R13 3K9 R8 1K C15 220U

CN3

	1	2	
	3	4	
	5	6	?????
SD-SWT	7	8	SD-LED
CLOCK	9	10	STBSWT
	11	12	STBLED
	13	14	

AR4 4K7 X4 AR1 4K7 X4 IC6 74HC165 R31 10K

MUTE3 SW11 SW12
MUTE4
MUTE2 SW10 SW9
MUTE1 SW3
ENTER SW8
ESC

AR3 4K7 X4 AR2 4K7 X4 IC2 74HC165 R7 10K

MODE SW4
PAGE UP SW2
CRSR DW SW6
PAGE DW SW1
CRSR UP SW5

R6 10K C9 47P

IC4 74HC04 R24 10K C8 47P

IC1 74HC14

R19 10K C16 47P

DELAY DL2 R20 1K2
UTILITY DL4 R22 1K2
PRESET DL1 R18 1K2
EDIT DL3 R21 1K2

MUTE1 DL5 R25 1K2
MUTE2 DL6 R26 1K2
MUTE3 DL7 R28 1K2
MUTE4 DL8 R27 1K2

IC3 74HC4094 IC5 74HC4094

C7 47P

R14 10K D1 4148 R23 100K

C17 10U C10 47P

P7 SD-LED`
P6 STBLED
P4 CLOCK 1
P3 LED-EN
P5 CLOCK
P2
P1

C4A 100N C3A 100N C2A 100N C1A 100N
C11 100N C6 100N C12 100N C13 100N C5 100N C3 100N
C18 10U

IC4 74HC04 IC3 74HC4094 IC5 74HC4094 IC6 74HC165 IC2 74HC165 IC1 74HC14

CN4
+5V 1
GND 2

FROM IN/OUT BOARD CNx
PANEL SUPPLY

(PCB#313073)

DRW G.BOCCATO	DWG# 550720	PCB# 313073-313074	GENERALMUSIC S.p.A. ITALY
CKD RICCI/TOSI	DATE 10/01/03	SCHEMATIC DIAGRAM DX 24	
APP. F. GAZZILLI	REV: A	CONTROL PANEL ASSEMBLY	

768226
CPU/DSP & AD/DA BOARD

RED - ARM SECTION (PART 2/3)

IC12 REDLG

IC13 27C4001D

IC14 AT24C64

RED - DSP SECTION (PART 1/3)

IC12 REDLG

IC10 HMS14260

RED - PERIPHERALS SECTION (PART 3/3)

IC12 REDLG

IC9 PCM1716E

IC8 PCM1716E

IC7 PCM1800E

IC5 74HC74

IC6 74HC04

IC15 MAX709

IC17 74HC14

IC12 REDLG

24/96 D-SIGMA DA CONVERTER

IC8 PCM1716E

IC9 PCM1716E

IC3 MC33078 OR EQUIVALENT

IC4 MC33078 OR EQUIVALENT

A/D CONVERTER DUAL 20BIT

IC7 PCM1800E

IC5 74HC74

IC12 REDLG

IC10 HMS14260

IC4 MC33078

IC3 MC33078

IC6 74HC04

IC17 74HC14

IC13 27C4001D

IC14 AT24C32

IC12 REDLG

IC12 REDLG

IC12 REDLG

ADC SUPPLY

LOGIC SUPPLY ADC-PLL

PLL SUPPLY

PCB#313069/1

768231 - IN/OUT BOARD

IC7A 74HC04

IC8 6N138

IC5 MC33078

IC6 MC33078

IC4 MC33078

IC3 MC33078

IC2 MC33078

IC1 MC33078

IC10 MC33078

IC9 MC33078

MIDI OUT

MIDI THRU

MIDI IN

OUT1

OUT2

OUT3

OUT4

IN A

IN B

PCB#313069/1

731011 - SNP9541M
40W SWITCHING SUPPLY UNIT

⚠ MAINS 98÷265VAC 50/60Hz - (EU/US)

⚠ INLET

⚠ POWER SWITCH

VAC

PANEL SUPPLY TO FRONT PANEL

IC1A MC33078

IC2A MC33078

IC3A MC33078

IC4A MC33078

IC8A MC33078

IC1A MC33078

IC5A MC33078

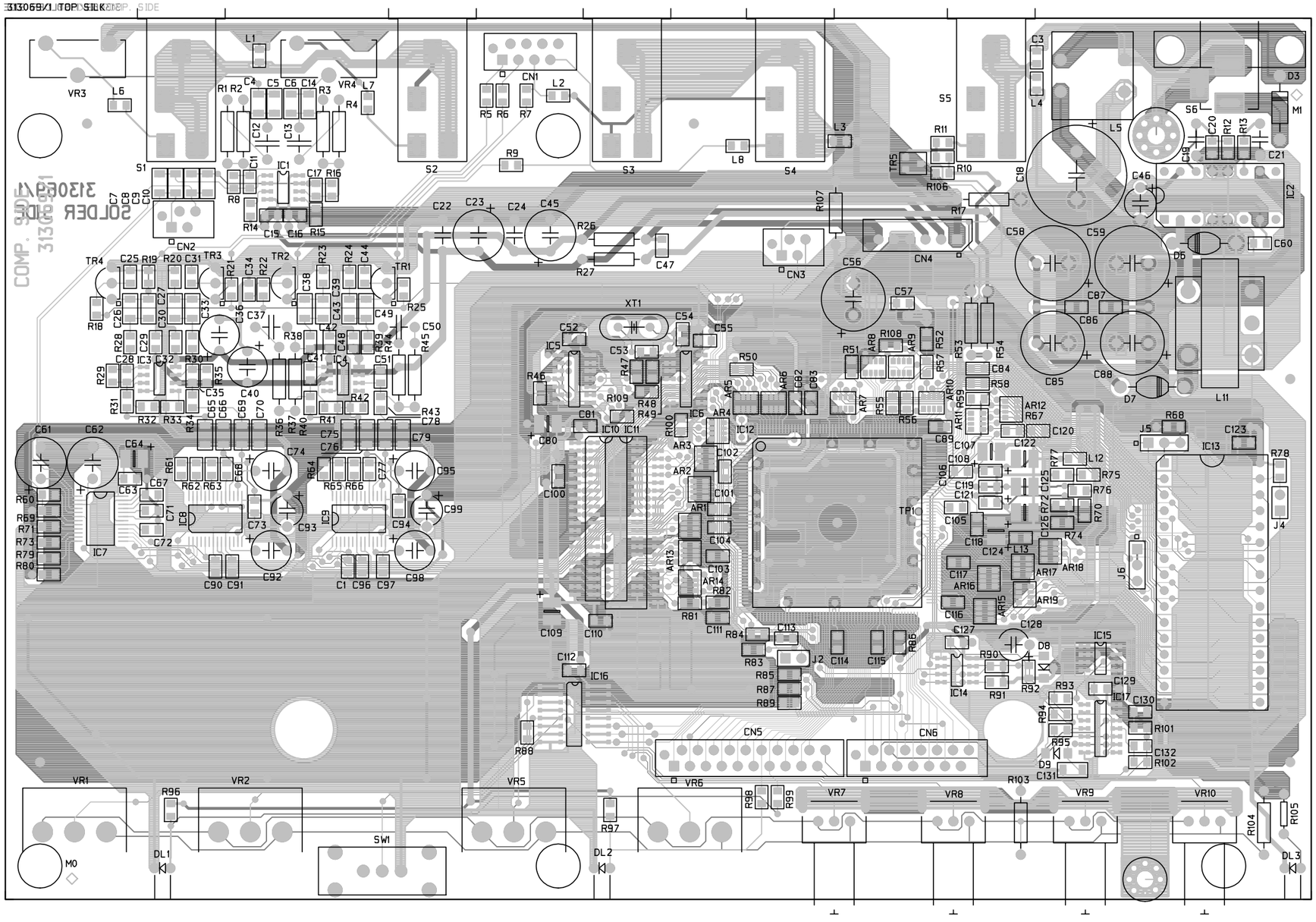
IC9A MC33078

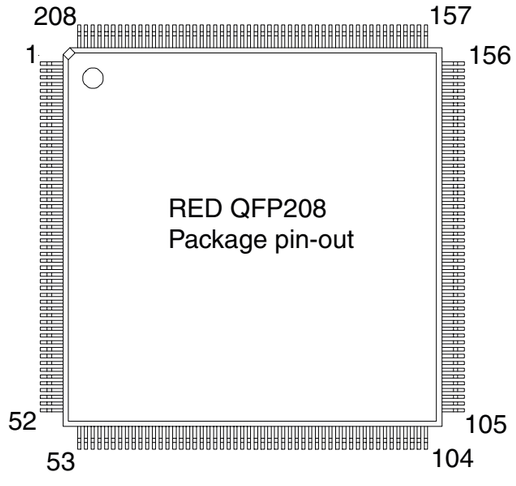
IC10A MC33078

DRW G. BOCCATO	DWG# 550719	PCB# 313069, 313070	GENERALMUSIC S.p.A. ITALY
CKD RICCI/GIBIN	DATE 07/03/01	SCHEMATIC DIAGRAM CPU/DSP & AD/DA, IN/OUT BOARD	ALL RIGHTS ARE RESERVED. NO COPIES OR REPRODUCE THIS DOCUMENT WITHOUT WRITTEN CONSENT BY GENERALMUSIC
APP. F. GAZZILLI	REV: C		

313069/1 TOP SIDE

313069/1 COMP. SIDE SOLDER SIDE





DRW G.BOCCATO	DWG# 550722	PCB# 313069/1	GENERALMUSIC S.p.A. ITALY
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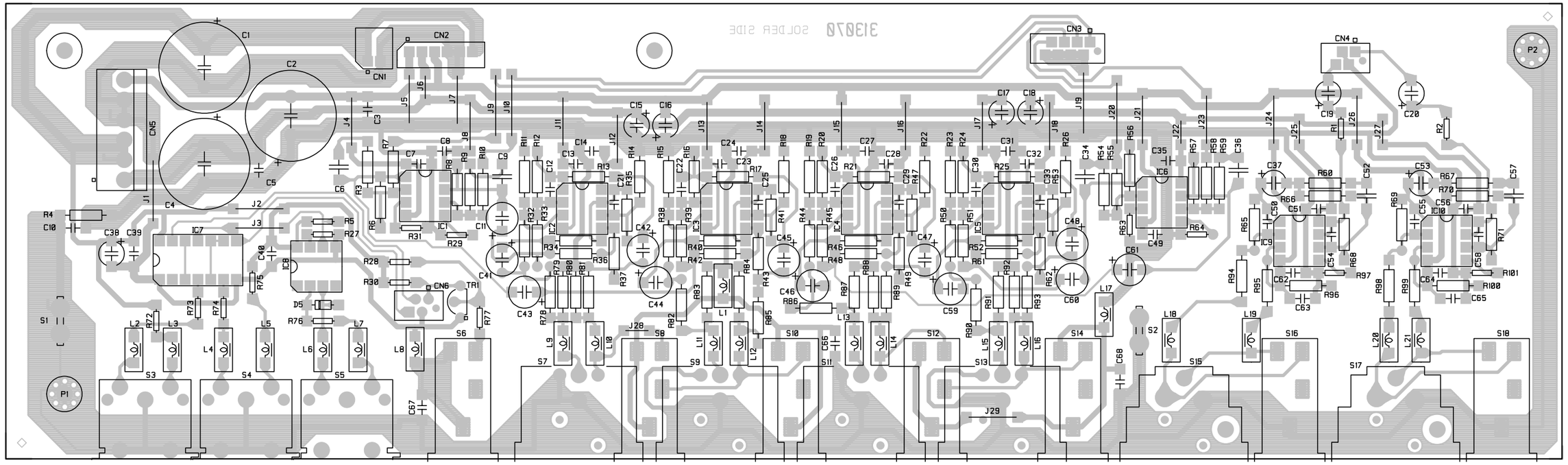
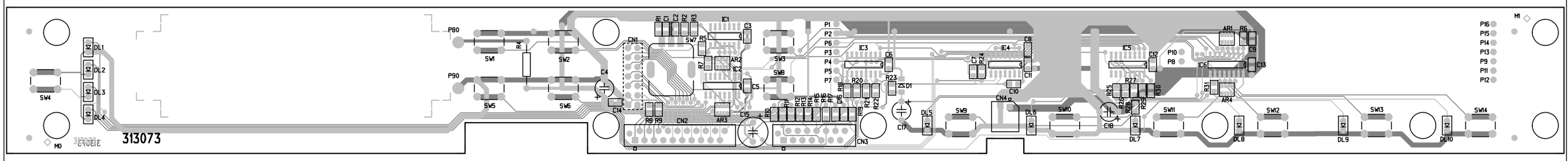
APP. F.GAZZILLI	REV: A	CPU & AD/DA PCB LAYOUT	

313070 TOP SILK



313073 TOP SILK



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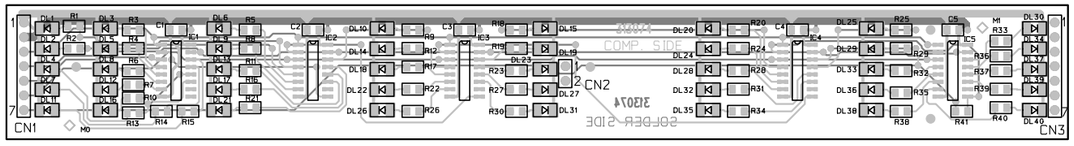

DRW G.BOCCATO	DWG# 550723	PCB# 313070/313073/313074	GENERALMUSIC S.p.A. ITALY
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APP. F.GAZZILLI	REV: A	I/O & CONTROLS PCB LAYOUT	

Spare Part List

Legend

EU = Europe Version 230Vac
US = United States Version 115Vac

Code		Description

Accessories

277349		Owner's Manual (Italian-English)
130297		Mains Cable (EU)
130283		Mains Cable (US)

Assembly

667731		Cover
667729		Chassis
667728		Front Panel
657279		Display Screen
657277		Meters Screen
347060		Nylon Cable Tie with 3mm Eye
340961		Encoder Knob
340186		Adhesive Cable Fixing
340078		TO220 Insulated Bush
210215		Adhesive Rubber Foam 10x1.9mm (Specify mt)
190234		100X130X0.4mm Lateroid Insulator
150298		100x2.5mm Nylon Cable Tie
120827		10mm Threaded Spacer
120582		M3 Black Nut
120481		3mm Black Shakeproof Washer
120467		4.2x10x0.5 Nylon Washer
120276		B2.9x6.5mm Screw
120029		M3x6tc Black Screw
120025		M3x10tsp Black Screw
120005		M3x10tc Screw

Mains Supply

110614		Mains Socket
110285		4A 250Vac Bipolar Power Switch
731011		**SNP9541M 40W Switching Supply Unit**

Controls Panel Assembly

768245		**2x16 Characters Lcd Module**
140860	*	14 Contacts Vert Male Dual In Line Strip
080757	*	WM-C1602N-2GLYC Wintek 2x16 Characters Lcd Display
768244		**Led & Meters Board (Pcb#313074)**
140874	*	Single In Line Vert Male Strip (specify contacts)
103028	*	74HC4094M1R SOIC 8bit Shift/Latch Register
081702	*	Led Smd Yellow
081701	*	Led Smd Green
081700	*	Led Smd Red
054037	*	1K2 1/10w 5% Smd Resistor 0805
054012	*	10E 1/10w 5% Smd Resistor 0805
011060	*	100n 50V 10% Cer. Cap. Smd CL2 Y5V 0805
768243		**Controls Panel Board (Pcb#313073)**
841268	*	14 Wires 15cm Latch/Transition Flat Cable
340856	*	6,4mm Led Spacer
141018	*	20 Contacts Vert Female Connector
141015	*	14 Contacts Vert Female Connector
140918	*	2 Contacts Hor Male Connector
140529	*	Microswitch 12V 50mA 0.25mm
110261	*	Dial Encoder with 30 Snap H=15mm Alps
103032	*	74HC165D SOIC 8bit P To S Shift Register
103028	*	74HC4094M1R SOIC 8bit Shift/Latch Register
103010	*	74HC04D SOIC Hex Inverter
103000	*	74HC14D Soic Hex Inverter Schmitt Trigger
081000	*	PMLL4148 Smd 100mA 75V Signal Diode
080705	*	3mm 60deg Diffused Red Led
055101	*	4K7 X4 1/16w 5% Smd Resistor Array
054060	*	100K 1/10w 5% Smd Resistor 0805
054048	*	10K 1/10w 5% Smd Resistor 0805
054045	*	5K6 1/10w 5% Smd Resistor 0805
054043	*	3K9 1/10w 5% Smd Resistor 0805
054037	*	1K2 1/10w 5% Smd Resistor 0805
054036	*	1K 1/10w 5% Smd Resistor 0805
040091	*	4E7 1/2W 5% Resistor
030565	*	220u 25V 20% Vert Electrolytic Capacitor
030246	*	10u 25V 20% Low Prof Vert Electrolytic Capacitor
011060	*	100n 50V 10% Cer. Cap. Smd CL2 Y5V 0805
011048	*	10n 50V 10% Cer. Cap. Smd CL2 X7R 0805
011020	*	47p 50V 10% Cer. Cap. Smd CL2 X7R 0805
347394		Rubber Switch Actuator
120579		M2 Nut
120021		M2x6tc Screw

Cpu/Dsp & AD/DA Board

768226		**Cpu/Dsp & AD/DA Board (Pcb#313069)**
550686	*	27C4001D Eprom 4mbit "DX24 Firmware"
250524	*	25x25mm Thermoconductor Adhesive
231000	*	BLM21A102STP Smd EMI Coil For Signal
177690	*	Heatsink
171039	*	Ground Leaf
141018	*	20 Contacts Vert Female Connector
141015	*	14 Contacts Vert Female Connector
141012	*	8 Contacts Vert Female Connector
141010	*	4 Contacts Vert Female Connector
140908	*	6 Contacts Vert Male Small Connector
140606	*	DIL32 Socket
130175	*	AWG18 Green Cable
120276	*	B2.9x6.5mm Screw
106003	*	MAX709 Power Monitor With Reset
106001	*	MC33078P SOIC Dual Low Noise Op. Amp.
105008	*	RED208 Risc Cpu and Dsp
104052	*	AT24C64 64Kbit Serial Access EEProm
104003	*	HM514260JP SOJ 4Mbit Dynamic Ram Ta=70ns
103043	*	PCM1716 24 Bit Stereo Dac
103042	*	PCM1800 20 Bit Stereo Adc
103010	*	74HC04D SOIC Hex Inverter
103007	*	74HC74D SOIC Dual Flip-Flop
103000	*	74HC14D Soic Hex Inverter Schmitt Trigger
090856	*	J176 TO92 P-Channel J-Fet Transistor
081000	*	PMLL4148 Smd 100mA 75V Signal Diode
055103	*	470E 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
054064	*	220K 1/10w 5% Smd Resistor 0805
054056	*	47K 1/10w 5% Smd Resistor 0805
054054	*	33K 1/10w 5% Smd Resistor 0805
054048	*	10K 1/10w 5% Smd Resistor 0805
054044	*	4K7 1/10w 5% Smd Resistor 0805
054039	*	1K8 1/10w 5% Smd Resistor 0805
054038	*	1K5 1/10w 5% Smd Resistor 0805
054035	*	820E 1/10w 5% Smd Resistor 0805
054033	*	560E 1/10w 5% Smd Resistor 0805
054032	*	470E 1/10w 5% Smd Resistor 0805
054028	*	220E 1/10w 5% Smd Resistor 0805
054024	*	100E 1/10w 5% Smd Resistor 0805
054020	*	47E 1/10w 5% Smd Resistor 0805
054012	*	10E 1/10w 5% Smd Resistor 0805
042605	*	10K0 1/4W 1% Metalized Film Resistor
042260	*	0E 1/4W Resistor
031007	*	10u 16V 20% Smd Electrolytic Tantalium Capacitor
030715	*	1000u 6v3 20% Vert Electrolytic Capacitor
030485	*	100u 25V 20% Vert Electrolytic Capacitor
011103	*	1u 16V 10% Cer. Cap. Smd CL2 XTR 1206
011060	*	100n 50V 10% Cer. Cap. Smd CL2 Y5V 0805
011032	*	470p 50V 10% Cer. Cap. Smd CL2 X7R 0805
011020	*	47p 50V 10% Cer. Cap. Smd CL2 X7R 0805
011014	*	15p 50V 10% Cer. Cap. Smd CL2 X7R 0805
010722	*	24.576MHz Quartz Resonator

In/Out Board

768231		**In/Out Board (Pcb#313070)**
230569	*	FL5R200PNT EMI Coil For Signal
141187	*	Hor Female XLR Socket (NC3FAH Neutrik)
141186	*	Hor Male XLR Socket (NC3MAH Neutrik)
141102	*	6 Contacts Vert Male Connector
141012	*	8 Contacts Vert Female Connector
141010	*	4 Contacts Vert Female Connector
140918	*	2 Contacts Hor Male Connector
140908	*	6 Contacts Vert Male Small Connector
140212	*	5 Poles Din Horizontal Female Socket
120857	*	6.3mm Vertical Male Faston for Pcb
100919	*	MC33078 Dual LN Operational Amplifier
100602	*	74HC04 Hex Inverter
100035	*	6N138 Optocoupler
080103	*	1N4148 100mA 75V Signal Diode
052048	*	10K 1/8w 5% Resistor
052044	*	4K7 1/8w 5% Resistor
052028	*	220E 1/8w 5% Resistor
052022	*	68E 1/8w 5% Resistor
042672	*	39K2 1/4W 1% Metalized Film Resistor
042632	*	18K2 1/4W 1% Metalized Film Resistor
042625	*	15K0 1/4W 1% Metalized Film Resistor
042611	*	11K5 1/4W 1% Metalized Film Resistor
042605	*	10K0 1/4W 1% Metalized Film Resistor
042524	*	2K43 1/4W 1% Metalized Film Resistor
042425	*	332E 1/4W 1% Metalized Film Resistor
042345	*	75E0 1/4W 1% Metalized Film Resistor
030858	*	4700uF 25V 20% Vert Electrolytic Capacitor
030403	*	47u 25V 20% Vert Electrolytic Capacitor
022002	*	1n5 2.5% 100V MKP Polypropylene Capacitor
010595	*	100n 50V -20+80% Ceramic Cap. Multilayer
010304	*	47p 50V 10% CL2 Ceramic Capacitor
010271	*	22p 50V 10% CL2 Ceramic Capacitor

Wiring Connections

841271	27.5cm Yel/Grn Eye/Faston/Faston Wire with 10E Res
841270	Single 12.5cm AWG18 White Faston/Faston Wire
841269	2 Wires 40cm Faston/Crimp Terminal Cable
841264	6 AWG18 Wires 10cm Crimp Terminal Cable
841263	8 Wires 3cm Flat Cable
841252	6 Wires 12.5cm Crimp Terminal Cable
841206	4 Wires 20cm Flat Cable
841005	7.5cm Yel/Grn Faston/Faston AWG18 Wire
840838	20 Wires 15cm Flat Cable
840826	14 Wires 15cm Flat Cable
840799	4 Wires 7.5cm Flat Cable
840776	2 Wires 25cm Crimp Terminal Cable

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.