

EM-50/EM-30
CREATIVE KEYBOARD

SERVICE NOTES
Issued by RES

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Specifications

Keyboard: 61 keys, velocity sensitive
Sound source: Newly developed (GM/GS Format)
Max Polyphony: 24 voices
Tones: 354 Tones + 12 Drum Kits
Wave Memory: 8Mbytes
Multitimbral parts: 16
Built-in Music Styles: 64 Styles on Rom+8 Custom on Flash
Style Progression (6 Levels)
Style Morphing (6 steps)
Recorder: 2 Tracks
Demo Songs: 16
User Programs: 64
One Touch settings: 512
Built-in Digital Effects: Reverb, Chorus
Display: Large backlit Custom LCD
Floppy Disk drive
(EM-50 only): Load/Save Song SMF Format 0 and 1,
User Programs, 8 Custom Styles
Jack and Connections: Double Stereo Phones, Output (R, L/Mono)
RCA Input (R,L), Sustain Pedal,
MIDI (In, Out), DC In
Controls: Master Volume (Rotative)
External Input Level (Rotative)
Tempo (Button)
Pitch Bender (Lever)
Modulation (Switch)
Beam Controller
Stereo Output Level: - 4 dBm Master Vol. : Max
Reverb : Off
Chorus : Off
Tone : Sine Wave
Play : C4 Key
Velocity : Max

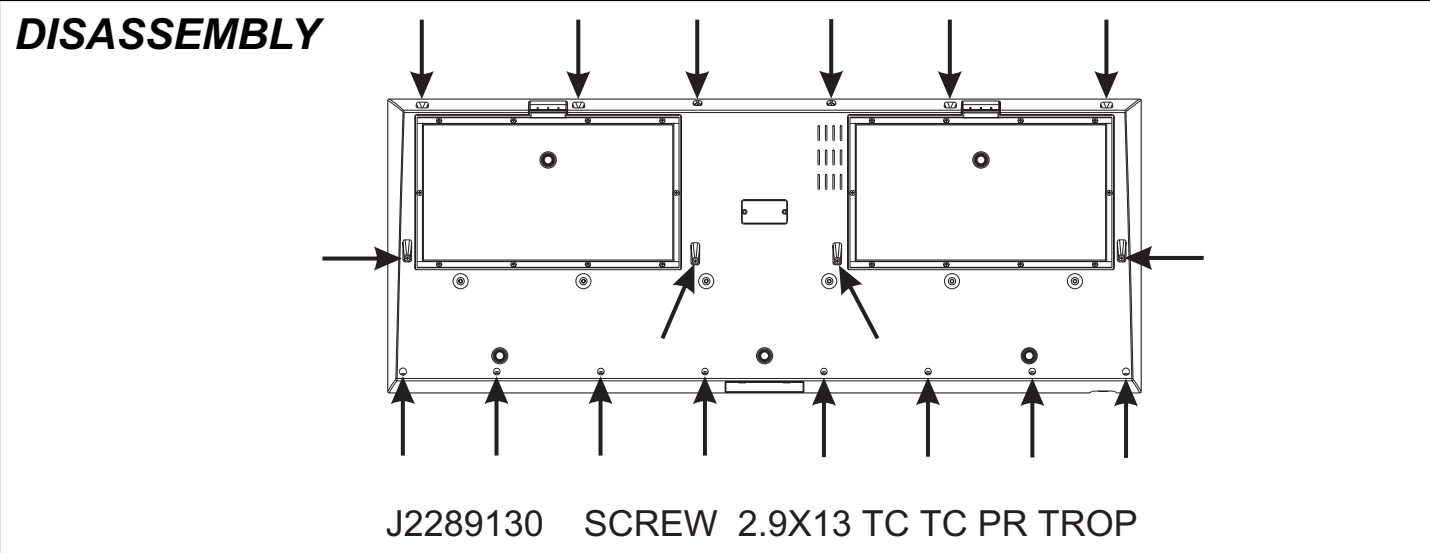
Stereo Output Impedance: 1.6 Kohm

Stereo Input Level : - 10 dBm (Power Amlifier at clipping)
Master Vol. : Max
Ext. Input Lev. : Max
1Khz Sine Wave on Ext. Input

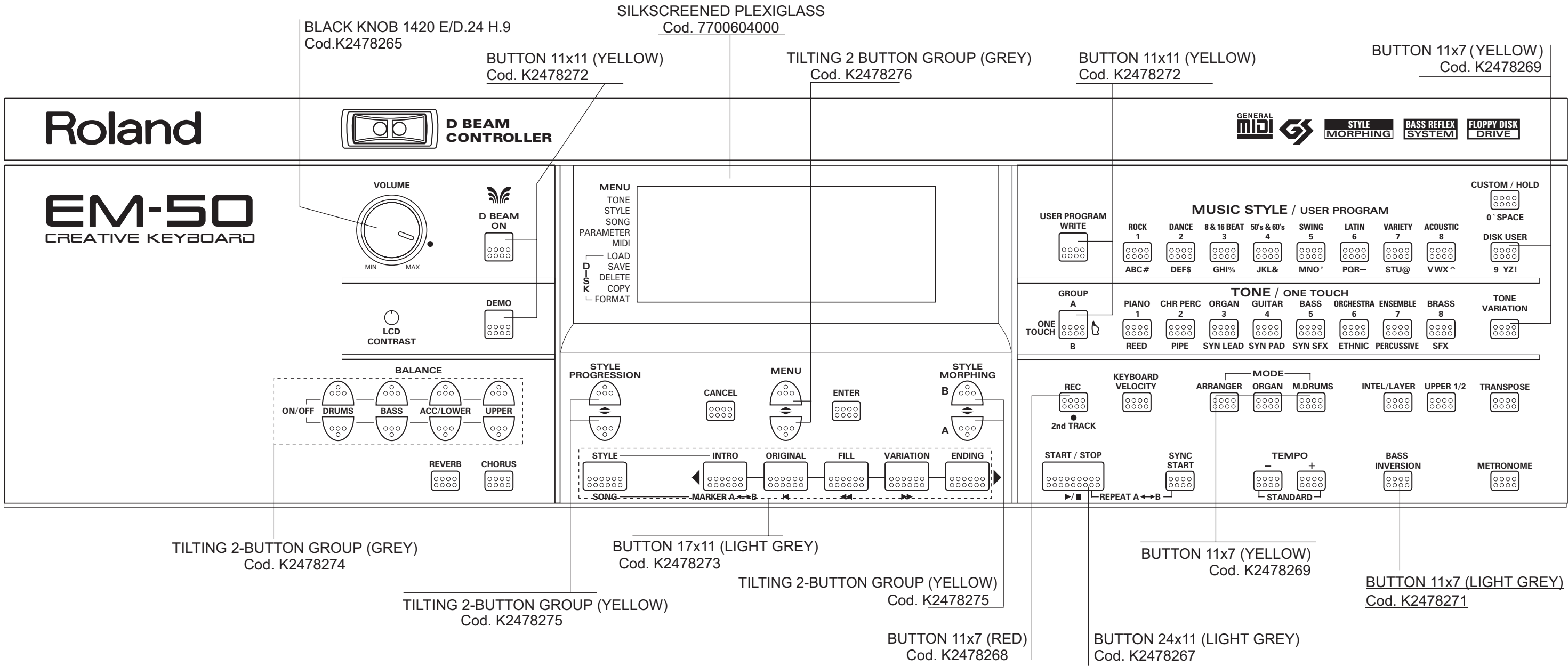
Stereo Input Impedance: 50 Kohm
Speakers : Bass Reflex System, 2 Full Range 12cm (5")
Amplifier : 10W + 10W (Musical Power)
Power Supply : 12V, 2A (ACJ Adaptor)
Dimensions : 1016(W) x 400(D) x 142(H) mm
40(W) x 15 3/4(D) x 8 5/8(H) inch
Weight : EM-50: 8.5kg (18.7 lbs)
EM-30: 8 kg (17.6 lbs)

Power supply :
ACJ adaptor (included) :
△ 2244861102 P. ADAPTOR. ACJ 230V 12V 2A SA
△ 2244861002 P. ADAPTOR. ACJ 230VE 12V 2A SA
△ 2244861401 P. ADAPTOR. ACJ 240VA 12V 2A SA
△ 2244861201 P. ADAPTOR. ACJ 120V 12V 1.75A SA

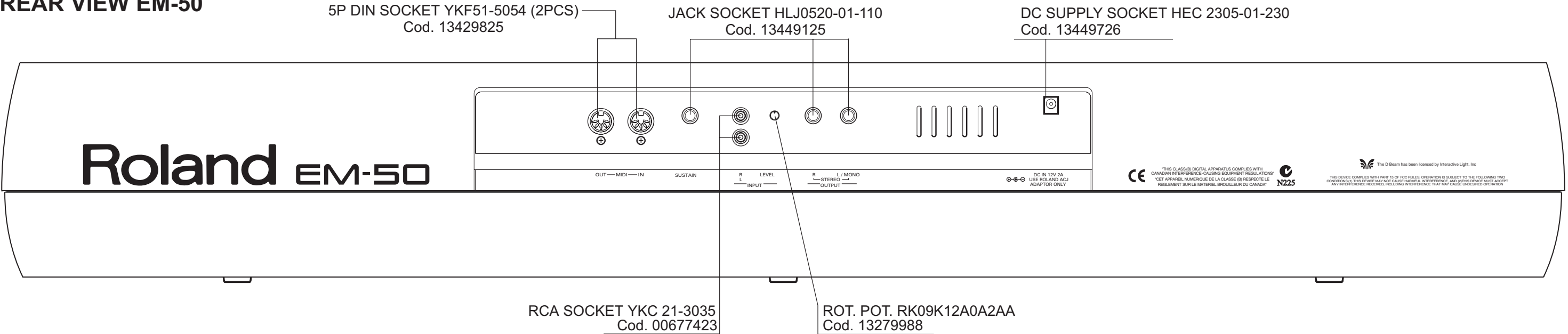
Supplied accessories:
Owner's Manual, ACJ adaptor,
MIDI/Joystick cable, multilingual CD-ROM (PC),
Music Rest
(see Parts List/Accessories on page 9)
Options: RH series headphones, DP-2, DP-6, or
BOSS FS-5U footswitch,
KS-12 keyboard stand



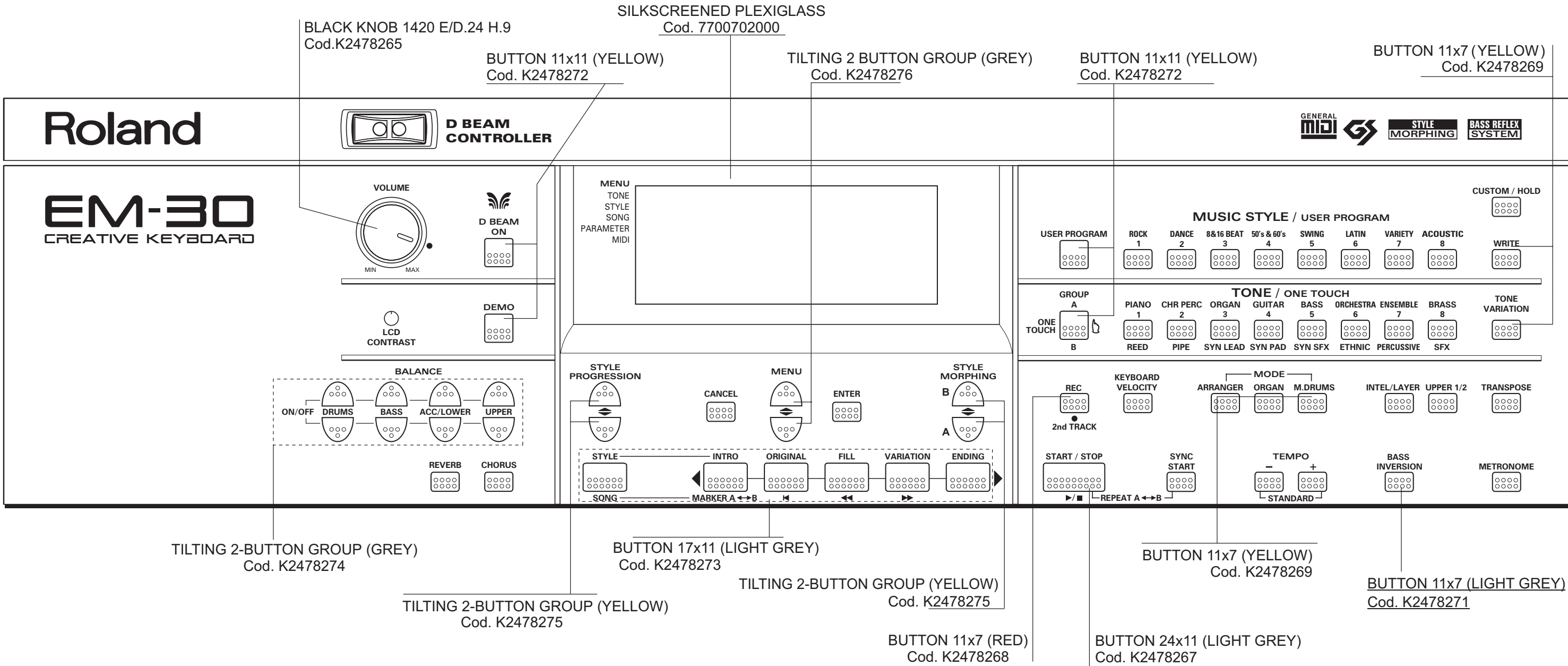
LOCATION OF CONTROLS EM-50



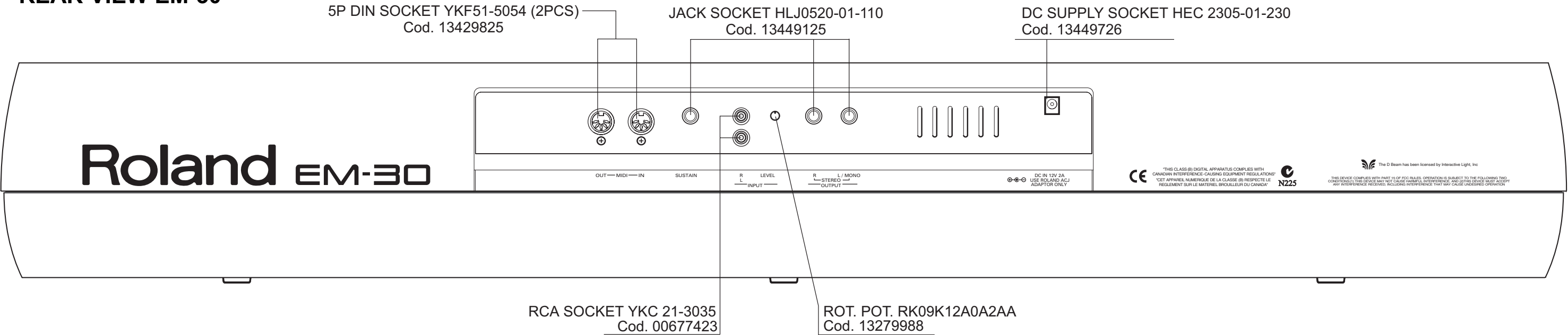
REAR VIEW EM-50



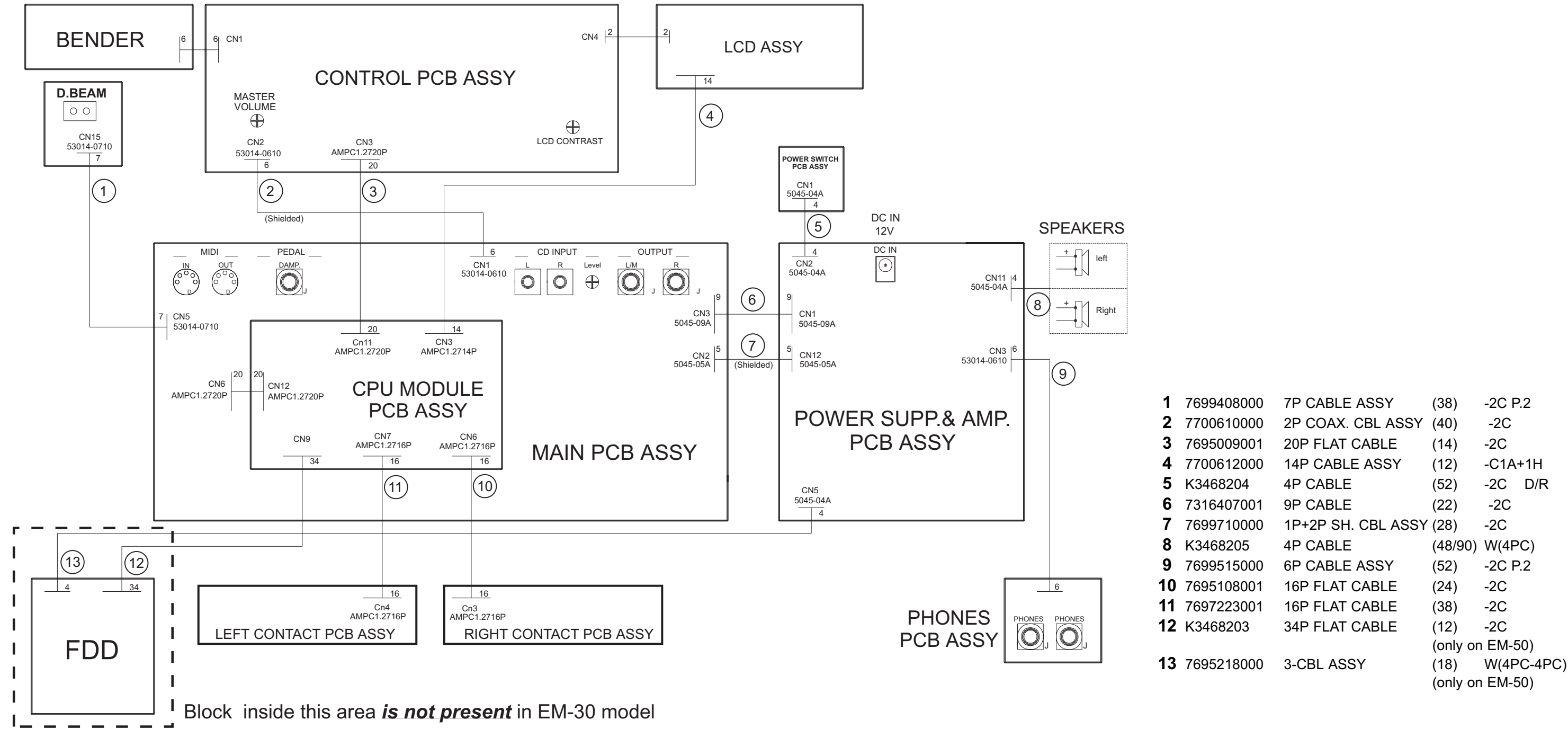
LOCATION OF CONTROLS EM-30



REAR VIEW EM-30

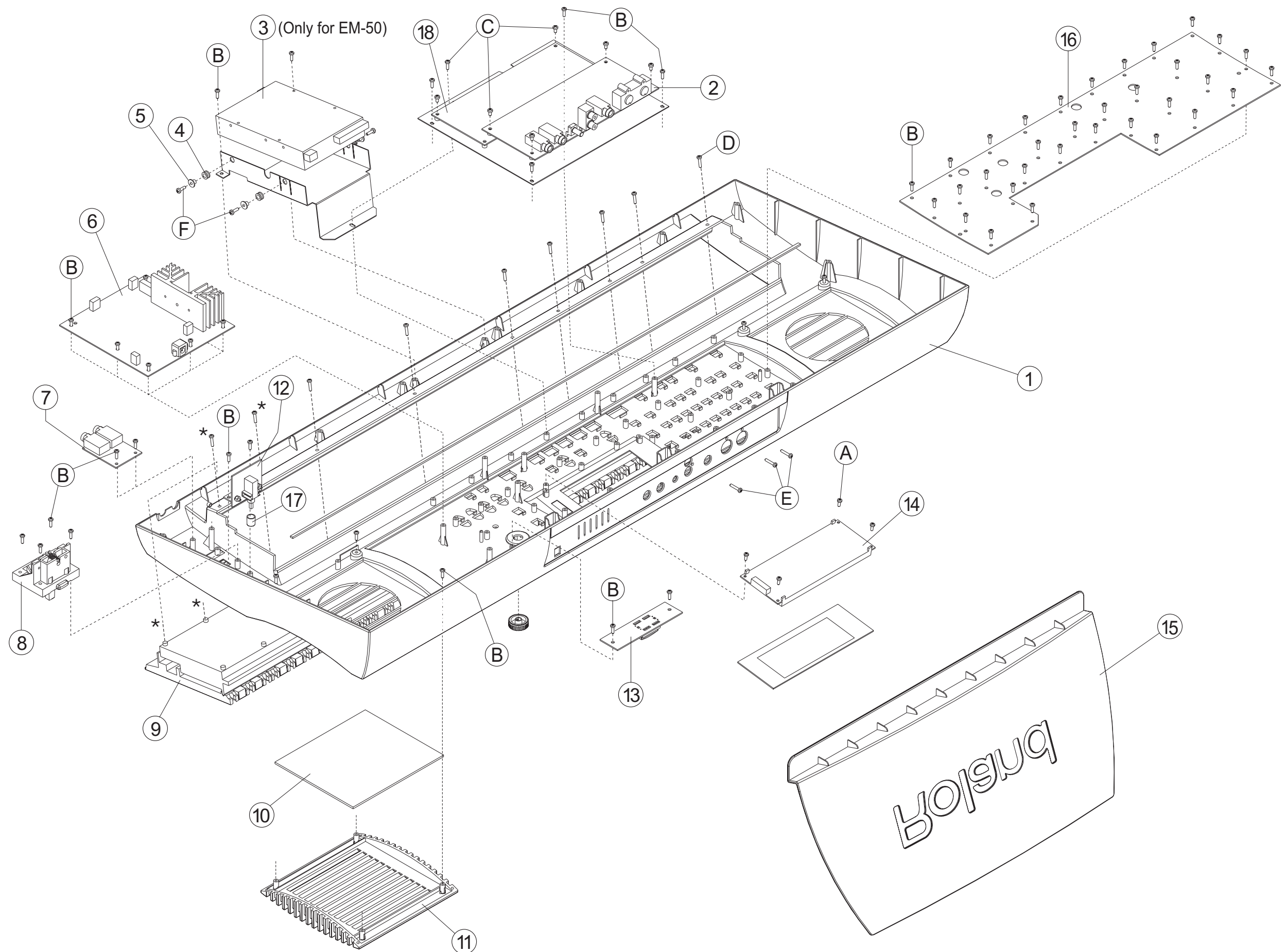


WIRING DIAGRAM

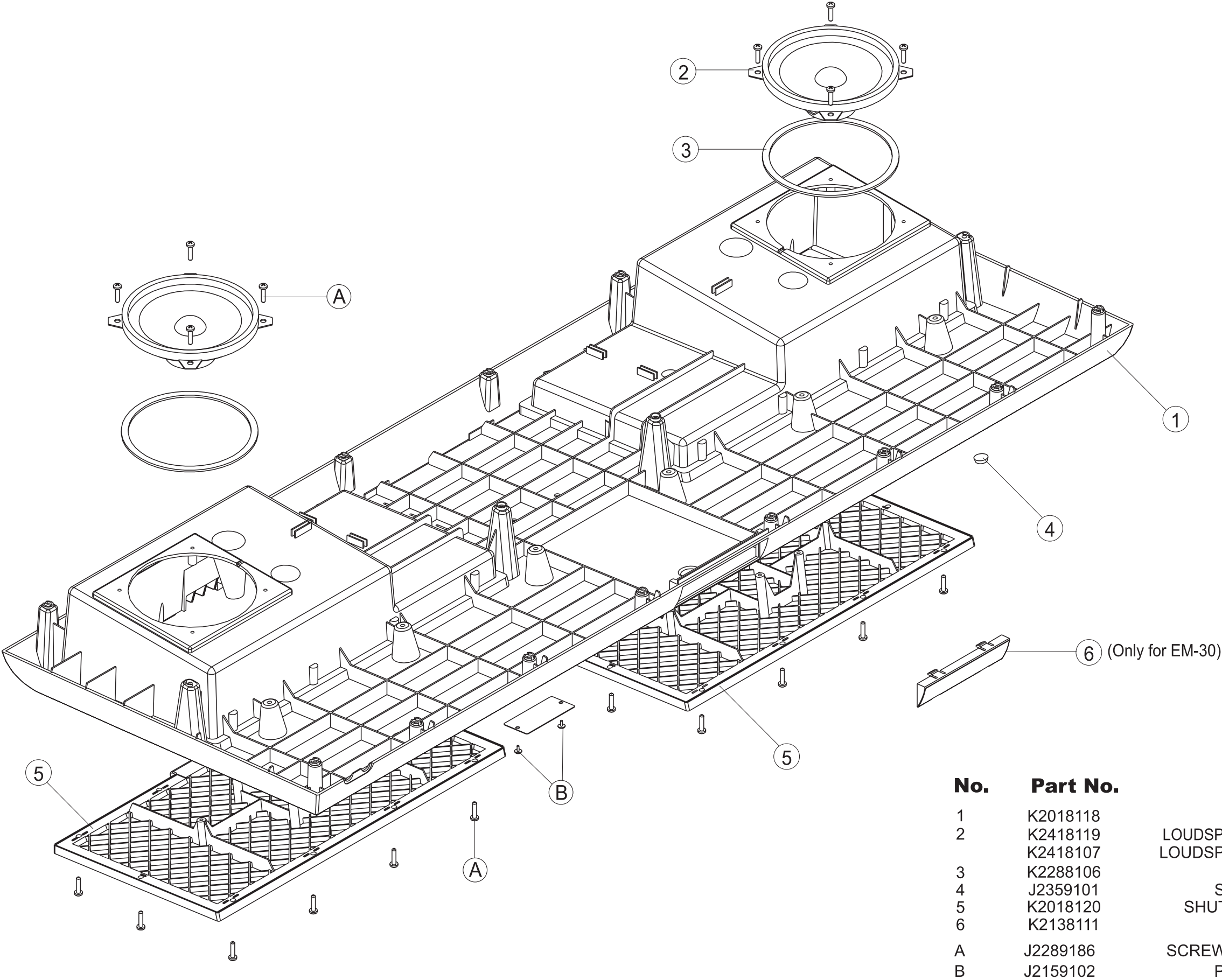


PART LIST OF EXPLODED VIEW (TOP) EM-50/EM-30

No.	Part No.	Description							
1	7700607000	VARN.+SILK. TOP CABINET	only for EM-50	10	K2248146	SPEAKER PROTECTION	A	J2289126	SELF TAP SCREW 2,9x8 TCTCPRBZ
	7700701000	VARN.+SILK. TOP CABINET	only for EM-30	11	K2248147	LOUDSPEAKER GRILL	B	J2289125	SCREW 2,9x10 TCTC PR TROP
2	7700601000	MAIN BOARD PCB ASSY		12	7699706000	POWER SWITCH ASSY	C	J2289193	SELF LOCK SCREW M3x6 TCTC H.6
3	J2409101	FLOPPY D. DRIVER JU-257 A166P	only for EM-50	13	7700609000	CONTROL PCB ASSY F/ D-BEAM	D	J2289130	SCREW 2,9x13 TCTCPR TROP
4	22265242	RUBBER GUIDE BUSHING	only for EM-50	14	7700605000	LCD + CONNECTIONS ASSY	E	J2289118	SCREW 2,9x16 TCTCPR BRUN
5	22165134	BRASS BUSHING	only for EM-50	15	K2198104	MUSIC REST	F	J2289108	SELF LOCK SCREW M3x10 TCTC H.6
6	7700606000	POWER SUPPLY ASSY		16	7700603000	CONTROLS PCB ASSY			
7	7700608000	HEADPHONES ASSY		17	K2478266	POWER SWITCH CAP (BLACK) 1420			
8	K3278101	PITCH BENDER W/SWITCH + CABLE		18	7700602000	CPU PCB ASSY			only for EM-50
9	7626921001	KEYBOARD ASSY 61 KEY TP/7BA 2°			7700703000	CPU PCB ASSY			only for EM-30

EXPLODED VIEW (TOP) EM-50/EM-30

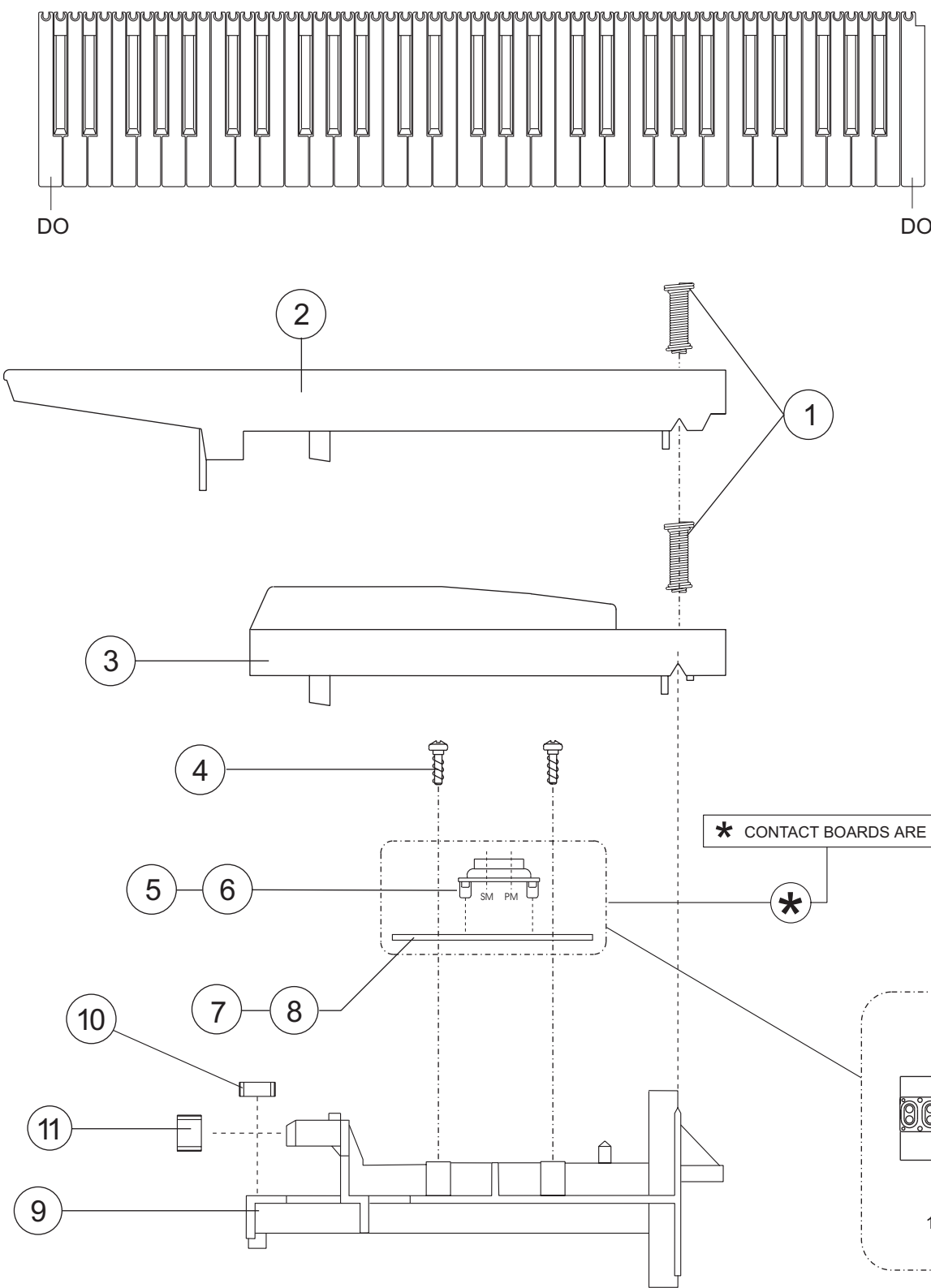
EXPLODED VIEW (BOTTOM) EM-50/EM-30



No.	Part No.	Description
1	K2018118	PLASTIC BOTTOM
2	K2418119	LOUDSPEAKER 6359/2 4 OHM for EM-50
	K2418107	LOUDSPEAKER CF120078-01 for EM-30
3	K2288106	SPEAKER GASKET
4	J2359101	SPACER 3M ART. SJ5012
5	K2018120	SHUTTER F/SPEAKER HOUSING
6	K2138111	CAP F/FDD HOUSING
A	J2289186	SCREW 3,5x16 TCPR TFR H.8 BRUN
B	J2159102	PLASTIC RIVET SR3055

KEYBOARD PARTS LIST

61-KEY KEYBOARD TP/7BA 2° code 7626921001



No.	PARTS NAME	CODE RJA	Num.
1	DOUBLE HEADED SPRING	22178226	61
2	NATURAL KEY C5 DO	J2579123	5
	NATURAL KEY D6 RE	J2579124	5
	NATURAL KEY E7 MI	J2579125	5
	NATURAL KEY F1 FA	J2579126	5
	NATURAL KEY G2 SOL	J2579127	5
	NATURAL KEY A3 LA	J2579128	5
	NATURAL KEY B4 SI	J2579129	5
	NATURAL KEY C8 DO (F)	J2579130	1
3	SHARP KEY	22578318	25
4	SCREW 2,9x10 TCTCPR TROP	J2289125	34
5	12P RUBBER CONTACT	2218523802	4
6	13P RUBBER CONTACT	2218523902	1
7	LEFT CONTACT PCB ASSY+RUBBER C. CH.	7624505001	1
8	RIGHT CONTACT PCB ASSY+RUBBER C. CH.	7624504001	1
9	KEYBOARD SUPPORT 61 KEYS	22818746	1
10	ADHESIVE RUBBER 8 x 2,5 x 848	22358151	1
11	RUBBER END STROKE	22158789	61

PARTS LIST EM-50/EM-30 (117V/230V/230VE/240VA)

SAFETY PRECAUTIONS :

The parts marked  have safety-related characteristics. Use only listed parts for replacement.

CONSIDERATION ON PARTS ORDERING

When ordering any parts listed in the parts list, please specify the following items in the order sheet.

Ex.	QTY	PART NUMBER	DESCRIPTION	MODEL NUMBER
10		22575241	Sharp Key	C-20/50
15		2247017300	Knob (orange)	DAC-15D

Failure to completely fill the above items with correct number and description will result in delayed or even undelivered replacement.

NOTE:

The parts marked " #" are new (Initial Parts).

 The parts marked  have Safety - Related characteristics. Use only listed parts for replacement.

<<EMI>> Component for EMC.

Note : Replacement should be made on a unit basis. No replacements available for individual parts. Replacement only be a unit.

CASING

#	K2198104	MUSIC REST	
#	K2248147	LOUDSPEAKER GRILL	
#	K2018120	SHUTTER F/SPEAKER HOUSING	EM50/30
#	K2018118	PLASTIC BOTTOM	EM-50/30
#	7700607000	VARN.+SILK. TOP CABINET	only for EM-50
#	7700604000	SILKSCREENED PLEXIGLASS	only for EM-50
#	7700701000	VARN.+SILK. TOP CABINET	only for EM-30
#	7700702000	SILKSCREENED PLEXIGLASS	only for EM-30
#	K2138111	CAP F/FDD HOUSING	only on EM-30

KNOB BUTTON

#	K2478265	BLACK KNOB 1420 E/D. 24 H.9	
#	K2478266	POWER SWITCH CAP (BLACK) 1420	
#	K2478267	BUTTON 24X11 (LIGHT GREY)	
#	K2478268	BUTTON 11X7 (RED)	
#	K2478269	BUTTON 11X7 (YELLOW)	
#	K2478271	BUTTON 11X7 (LIGHT GREY)	
#	K2478272	BUTTON 11X11 (YELLOW)	
#	K2478273	BUTTON 17X11 (LIGHT GREY)	
#	K2478274	TILTING 2-BUTTON GROUP (GREY)	
#	K2478275	TILTING 2-BUTTON GROUP (YELLOW)	
#	K2478276	TILTING 2-BUTTON GROUP (GREY)	

SWITCH

13129135	SWITCH SDDWA-1401A	
J3169105	SWITCH TP-1101A / EQV-PAE 05 R	SW1,2,4,5,6,9,10+64 CB
13159187	SLIDE SWITCH SSSS2-22-01	SW1 on CPU

JACK, SOCKET,

13449726	DC SUPPLY SOCKET HEC 2305-01-230	JK1 on PAB
13449252	JACK SOCKET YKB 21-5006	JK1, JK2 on PHB
13449125	JACK SOCKET HLJ0520-01-110	JK1, JK2, JK4 on MB
13429825	5P DIN SOCKET YKF51-5054 (2PCS)	JK5 on MB
00677423	RCA SOCKET YKC 21-3035	JK3 on MB

DISPLAY UNIT

Note # 7700605000 LCD+CONNECTIONS ASSY EM-50/30

BENDER UNIT

Note # K3278107 PITCH BENDER W/SWITCH +CABLE(44)

SPEAKER

K2418119	LOUDSPEAKER 6359/2 4 OHM	only for EM-50
K2418107	LOUDSPEAKER CF120078-01	only for EM-30

KEYBOARD ASSY

7626921001 61 KEY KEYBOARD TP/7BA 2ND
NOTE : For details, refer to KEYBOARD PARTS LIST (Page 7)

DISK DRIVE UNIT

Note J2409101 FLOPPY D.DRIVER JU-257 A166P only on EM-50

PCB ASSY

#	7700601000	MAIN BOARD PCB ASSY	EM-30/50
# 	7700602000	CPU PCB ASSY	only for EM-50
# 	7700703000	CPU PCB ASSY	only for EM-30
#	7700603000	CONTROLS PCB ASSY	EM-30/50

#	7700606000	POWER SUPPLY ASSY	EM-30/50
#	7700608000	HEADPHONES ASSY	EM-30/50
#	7700609000	CONTROL PCB ASSY F/ D-BEAM	EM-30/50
	7699706000	POWER SWITCH ASSY	E300/E480B EM-50/30
#	7624504001	RIGHT CONTACT PCB ASSY W/RUBBER C. CH.	
#	7624505001	LEFT CONTACT PCB ASSY W/RUBBER C. CH.	

IC

	15229718RI	I.C. 6N 137	PHOTO-COUPLER	IC3 on MB
#	K525814910	I.C. ROM K525814910	EM-50/30	IC11 on CPU
#	K525815010	I.C. ROM K525815010	EM-50/30	IC16 on CPU
	J5259109	I.C. HD6415108F10	FLAT CPU	IC5 on CPU
	J5159106	I.C. 74 HC238	CMOS	IC1 on CB
	15249111	I.C. TC7WU04 F	FLAT CMOS	IC2 on CPU
	15259701	I.C. 74 HC 00	FLAT CMOS	IC3 on CPU
	J5259001	I.C. 74 HC 04	FLAT CMOS	IC4 on MB
	J5259127	I.C. 74 HC 10	FLAT	IC15 on MB
	J5259102	I.C. 74 HC 273	FLAT CMOS	IC12 on CPU
	J5259113	I.C. 74 HC 390	FLAT CMOS	IC23 on CPU
	J5259128	I.C. 74 HC 393	FLAT	IC14 on MB
	00129278	I.C. SSC1080 FOB	(CUSTOM IC)	IC13 on CPU
	J5259107	I.C. HM628128ALFP-7	FLAT SRAM	IC14, IC15 on CPU
	J5259110	I.C. HM62256LFP-7T	FLAT SRAM	IC4 on CPU
	J5259129	I.C. E28F800B5B70	FLASH	IC17 on CPU
	15239229	I.C. TC6116-GP4	(CUSTOM IC)	IC1 on CPU
	15199780	I.C. HD63266FP-64A	FDC	IC19 on CPU
	15259884	I.C. TC7S08F MOS	CMOS	IC24, IC25 on CPU
	15259885	I.C. TC7S32F	CMOS	IC10 on CPU
	15259887	I.C. TC7SU04F	FLAT CMOS	IC27 on CPU / IC13 on MB
#	K5258151	I.C. FPGA-EPF8452ALC84-4		IC7 on CPU
	K5258146	I.C. TC74VHC139F	FLAT	IC18 on CPU
	J5259126	I.C. TC7SH32F	FLAT	IC26 on CPU
	15219183	I.C. M51953 AL	STANDING	IC7 on MB
	15289120	I.C. NJM 4565M-TE3	OP AMP	IC8 on MB
	15189210	I.C. BA 5218F	OP AMP	IC2, IC9, IC18 on MB
	15289710	I.C. UPD 63200GS	DAC	IC1 on MB
	15289105	I.C. UPC 4570G	OP AMP	IC11, IC12 on MB
	15189189	I.C. UPC 4570HA VERT.	OP.AMP.	IC10 DBB
	00458312	I.C. NJM 2360M	FLAT	IC6 on MB
	J5199109	I.C. 79L12 TO-92		IC5 on MB
	J5199110	I.C. L4940V5		IC1 on PAB
	15199550RI	I.C. TDA 1905	POWER AMP	IC2, IC3 on PAB

TRANSISTOR

15119155RI	TRANSISTOR	BC/560-B	Q3 on PAB
15119154RI	TRANSISTOR	BC/549-B	Q4 on PAB / Q1 on CB
15129114	TRANSISTOR	2SC-1815GR	Q17 on DBB
15129136	TRANSISTOR	2SC-2878-A/B	Q3, Q2 on MB
15319101	TRANSISTOR	2SC-2412	Q5, Q7, Q8, Q9 on MB
15319102	CHIP TRANSISTOR	2SC2882Y-TEL12	Q1 on MB
15309101	TRANSISTOR	2SA-1037KR	Q4, Q6, Q10, Q12 on MB
15129427	TRANSISTOR	2SC-2235Y	Q16 on DBB
15329104	TRANSISTOR	2SK-368GR FET CHIP	Q13 on MB

DIODE

15019159RI	DIODE	1N-4148	D1, 2, 4, 5, 6, 9 10 => 64 on CB / D4 on PAB
			D1 => D63 on LCB / D1 => D63 on RCB
15339105	DIODE	DAN-202K	D5, 6, 8, 9 MB
15339108	DIODE	DA-204K	D3, D10 MB / D1, 2, 3, 4 on CPU
15339142	DIODE	RB705D	CHIP D7 on MB
00893912	DIODE	SFPB-56	CHIP D2 on MB
15339109	DIODE	DAP 202K	CHIP D11, D12 on MB
01341623	DIODE	LED TLN 201	D216 on DBB
01342578	PHOTO DIODE	TPS 708	D215 on DBB
J5019106	ZENER DIODE	BZX79C 5.1V	D1, D13 on MB
	15091172RI	DIODE	BY 251 D1 on PAB
J5019105	DIODE	1N 4002	D2, D5 on PAB

RESISTOR

J3919104	RESISTOR ARRAY	EXB-A10E-103-J	RA1,2,3,4,6,7,10,11,13,16,17,18,19 on CPU
J3919108	RESISTOR ARRAY	EXB-V8V-103-JV	RA5, 8, 9, 12 on CPU
13819132RI	UNINFL.RES	100 OHM 0.6W 5%	R1, 2, 3, 4 on PHB
13819131RI	UNINFL.RES.	10 OHM 0.6W 5%	R82 on DBB / R4 on PAB
J3809127	UNINFL. RES.	22 OHM 1/4W	R37 on PAB
J3809152	OXIDE RESISTOR	0.22 OHM 1W 5%	R39 on MB
	J3809139	OXIDE RESISTOR	2.2 OHM 3W R1, R34 on PAB

POTENTIOMETER

13299226RI	TRIM POT.	4.7K P 2.5X5-HCERMET	P1, P2 on PAB (See CHANGE INFORMATION on Page 29)
00459901	ROT. POT.	10KB 14K 1230	VR1 on CB
J3219107	ROT. POTENTIOM.	EVUF2AH20B53	VR2 on CB
13279988	ROT.POT.	RK09K12A0A2AA	VR2 on MB
13299206	TRIMMER POT.	EVND 8AA03B24	VR1 on MB

CAPACITOR

13639154	ELECTRL.COND.-V	1000UF 16V	C48 on DBB
J3629122	ELECTRL.COND.-V	1000UF 25V	C46, C60 on MB
13639661RI	ELECTRL.COND.-V	2200UF 25V	C17, C18 on PAB
13649662RI	ELECTRL.COND.-V	3300UF 25V	C16 on PAB
J3629117	ELECTRL.COND.-V	4700UF 25V	C15 on PAB
J3629103	ELECTRL.COND.	100U 25V P5	C14 on PAB / C102, C61 on CPU / C4, 5, 49, 57, 58, 72 on MB
J3629133	ELECTROL.COND.	22U 25V P5	C24, C29 on PAB
J3629135	ELECTRL. COND.	470U 35V P5	C45 on MB
J3629104	ELECTRL.COND.	10U 50V P5	C19, 21, 32, 35 on PAB / C5, 10, 15, 18, 20, 31, 35 on CPU / C3, 25, 26, 82, 86 on MB
J3629105	ELECTRL.COND.	47U 50V P5	C20, 33 on PAB / C6, 56 on MB
J3629106	ELECTRL.COND.	4.7U 63V P5	C25, 28 on PAB / C108, 109 on MB
J3629107	ELECTRL.COND.	1UF 100V P5	C22, 23, 26, 27, 30, 31 on PAB
J3629143	ELECTR. COND.	10U 16V H.7	C5, 7 on CB / C44, 45 on DBB
J3629137	ELECTR. COND.	33U 16V H.7	C4 on CB
J3629142	ELECTR. COND.	1U 63V H.7	C43 on DBB
J3629149	ELECTR.COND.	100U 16V H.7	C6 on CB
13649103J0	UNPOL.COND.	10U 16 P5	C7, 10, 11, 12, 14, 16, 18, 21, 22, 59 on MB

INDUCTOR, COIL, FILTER

<<EMI>>	12449382RI	NOISE SUP.	PLT1-R53C	L4 on PAB
<<EMI>>	12449370	NOISE SUP.	SBT-0160W	L2, 3, 5 on MB
<<EMI>>	12449326	NOISE SUP.	SBT-0460	L4 on MB
<<EMI>>	J2399101	NOISE SUP.	BL03RN2-R62T2	L1=>L6 on PHB
<<EMI>>	J2399103	CHIP NOISE SUP.	ELKS471FA	FL1=>FL7 on CPU / FL1=>FL5 on MB
<<EMI>>	J2399104	CHIP NOISE SUP.	EXCCL4532U1	L1, 3, 5 on CPU / L1, L6=>L10, 12, 13 on MB
<<EMI>>	12449449	INDUCTOR	RCH-875-151K	L11 on MB

CRYSTAL, RESONATOR

00894023	QUARTZ	20.000 MHZ	MA-406	X1 on CPU	
00894034	QUARTZ	16.000 MHZ	MA-406	X2 on CPU	only on EM-50

RELAY

12439224RI	RELAY	DS2YS-12V	RL1 on PAB
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CONNECTOR

13419677RI	16P FEM. CONN.	AMP 1.27	CN6, 7 on CPU / CN3 on LCB / CN4 on RCB
13369689RI	20P FEM. CONN.	AMP 1.27	CN11, 12 on CPU / CN3 on CB
13369688RI	4P MALE CONN.	P 2.5 M	CN2, 5, 11 on PAB / CN1 on SWB
J3439106	9P MALE CONN.	P 2.5 M	CN3 on MB / CN1 on PAB
J3439109	5P MALE CONN.	P 2.5 M	CN12 on PAB / CN2 on MB
J3439121	6P MALE CONN.	P.2 M	CN1 on MB / CN1 on PHB / CN3 on PAB
J3439143	34P MALE CONN.	P. 1.27 M	CN9 on CPU only on EM-50
J3439123	6P MALE CONN.	P. 2 M 90°	CN2 on CB
J3439148	7P MALE CONN.	P.2 M	CN15 on DBB / CN5 on MB
J3439166	14P MALE CONN.	AMP 1.27	CN3 on CPU

WIRING, CABLE

#	K3468203	34P FLAT CABLE	(12)	-2C	From CN9 on CPU to FDD only on EM-50
	7695218000	3-CBL ASSY	(18)	W(4PC-4PC)	From CN5 on PAB to FDD only on EM-50
#	K3468204	4P CABLE	(52)	-2C D/R	From CN2 on PAB to CN1 SWB
#	K3468205	4P CABLE	(48/90)	W(4PC)	From CN2 on PAB to SPEAKERS
#	J3469157	AWG18-CBL	(38)+FASTON		On PHB
	7316407001	9P CABLE	(22)	-2C	From CN3 on MB to CN1 on PAB
	7695108001	16P FLAT CABLE	(24)	-2C	From CN6 on CPU to CN4 on RCB
	7697223001	16P FLAT CABLE	(38)	-2C	From CN7 on CPU to CN3 on LCB
	7695009001	20P FLAT CABLE	(14)	-2C	From CN11 on CPU to CN3 on CB
	7699710000	1P+2P SHLD CBL ASSY	(28)	-2C	From CN2 on MB to CN12 on PAB
	7699408000	7P CABLE ASSY	(38)	-2C P.2	From CN5 on MB to CN15 on DBB
	7699515000	6P CABLE ASSY	(52)	-2C P.2	From CN3 on PAB to CN1 on PHB
#	7700610000	2P COAX. CBL ASSY	(40)	-2C	From CN1 on MB to CN2 on CB
#	7700612000	14P CABLE ASSY	(12)	-C1A+1H	From CN3 on CPU to lcd ASSY

BATTERY

12569149RI	LITHIUM BATTERY CR2032
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SCREW

J2289122	SCREW 2.2X6 TC TC	BRUN
J2289126	SELF TAP.SCREW 2.9X 8 TCTCPRBZ	
J2289125	SCREW 2.9X10 TC TC PR TROP	
J2289130	SCREW 2.9X13 TC TC PR TROP	
J2289118	SCREW 2.9X16 TC TC PR	BRUN
J2289108	SELF LOCK.SCREW M3X10 TCTC	H.6
J2289147	SELF LOCK.SCREW M3X12 TCTC	H.6
J2289193	SELF LOCK.SCREW M3X6 TC TC	H.6
J2289149	SCREW 3X20 TC TFR	H.7
J2289186	SCREW 3.5X16 TCPR TFR	H.8 BRUN
J2289113	NUT 3MA	H.3
J2139102	TOOTHED WASHER	I/D 3

PACKING

#	K2638207	RIGHT POLYST. END-SIDE	EM-50/30
#	K2638208	LEFT POLYST. END-SIDE	EM-50/30
	K2678105	CARTENE ENVELOPE HD 140X57	
	K2678106	POLYETH.ENVELOPE 40X55	
#	K2618204	OUTER PACKING	only for EM-50
#	K2618208	OUTER PACKING	only for EM-30

MISCELLANEOUS

#	22165134	BRASS BUSHING	only on EM-50
#	22265242	RUBBER GUIDE BUSHING	only on EM-50
	00453223	LED SPACER H. 7 E.D. 5	
	J2359101	SPACER 3M ART. SJ5012	
	J2159102	PLASTIC RIVET SR3055	
#	K2248146	SPEAKER PROTECTION	EM-50/30
#	K2288106	SPEAKER GASKET 108/120 TH.2	
	1342982301	POWER SUPPLY SOCKET HOLDER N°2	
	01343089	D-BEAM CONTROLLER ESCT BLK	
	12569420	SOCKET FOR BATTERY CR2032	

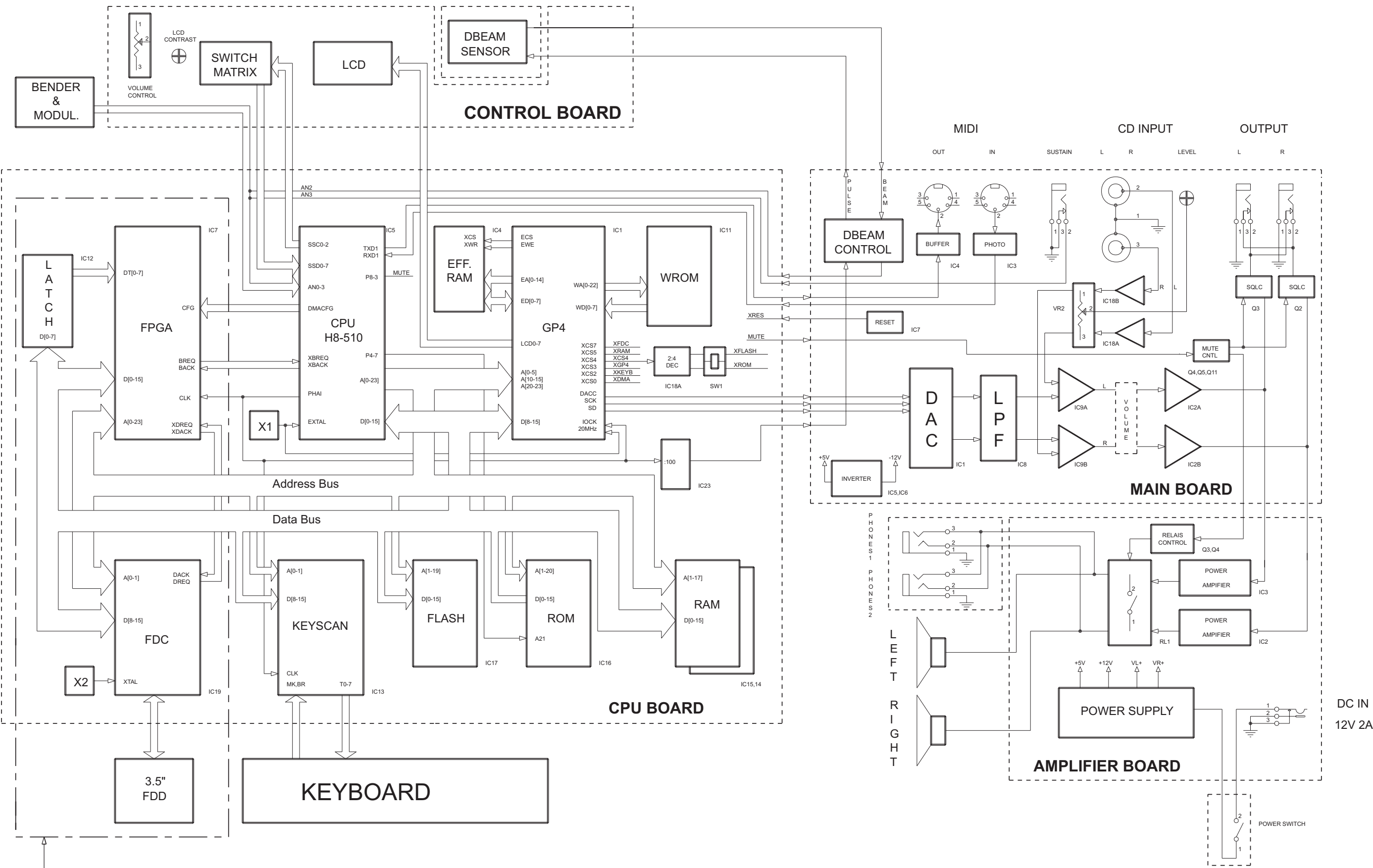
ACCESSORIES

	K6018109	MIDI GUIDE	
#	K6018332	OWNER'S MANUAL(E/D/F)	EM-30/50
#	K6018333	MIDI IMPLEMENT.MANUAL	EM-30/50
#	K2378112	INTERACTIVE CD-ROM	EM-30/50
⚠	2244861102	POWER ADAPTOR ACJ 230V 12V 2A SA	
⚠	2244861002	POWER ADAPTOR ACJ 230VE 12V 2A SA	
⚠	2244861401	POWER ADAPTOR ACJ 240VA 12V 2A SA	
⚠	2244861201	POWER ADAPTOR ACJ 120V 12V 1.75A SA	
#	K3418104	MIDI-PC CABLE M.5	

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BLOCK DIAGRAM



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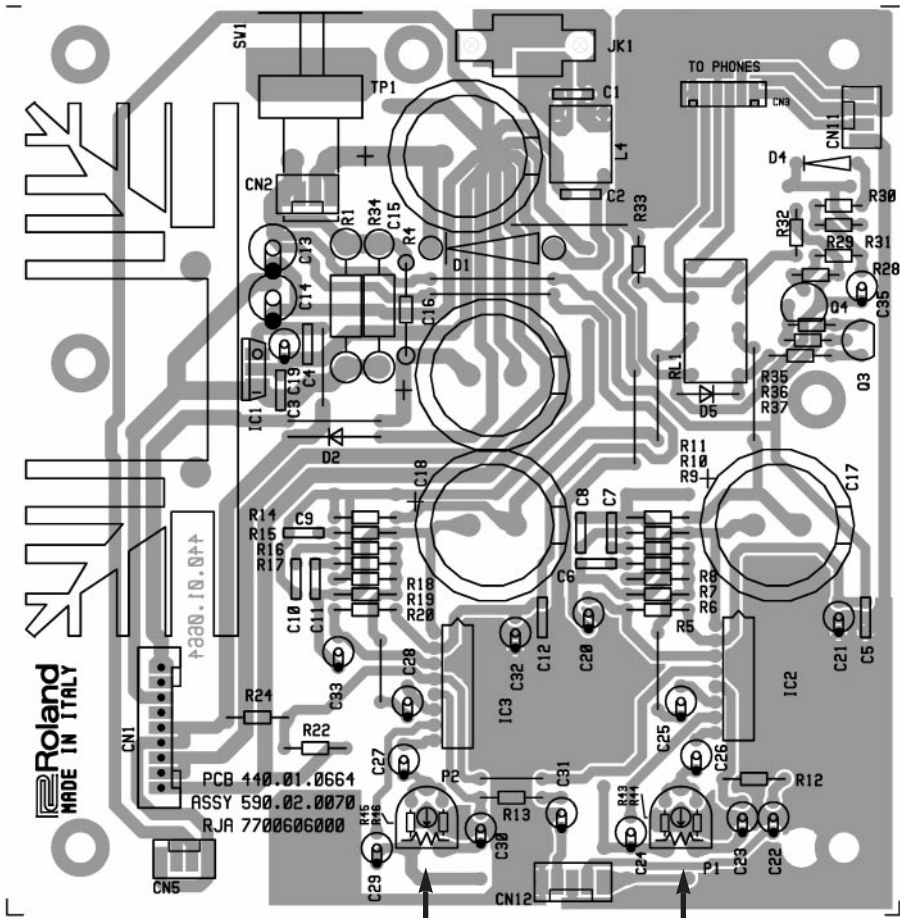
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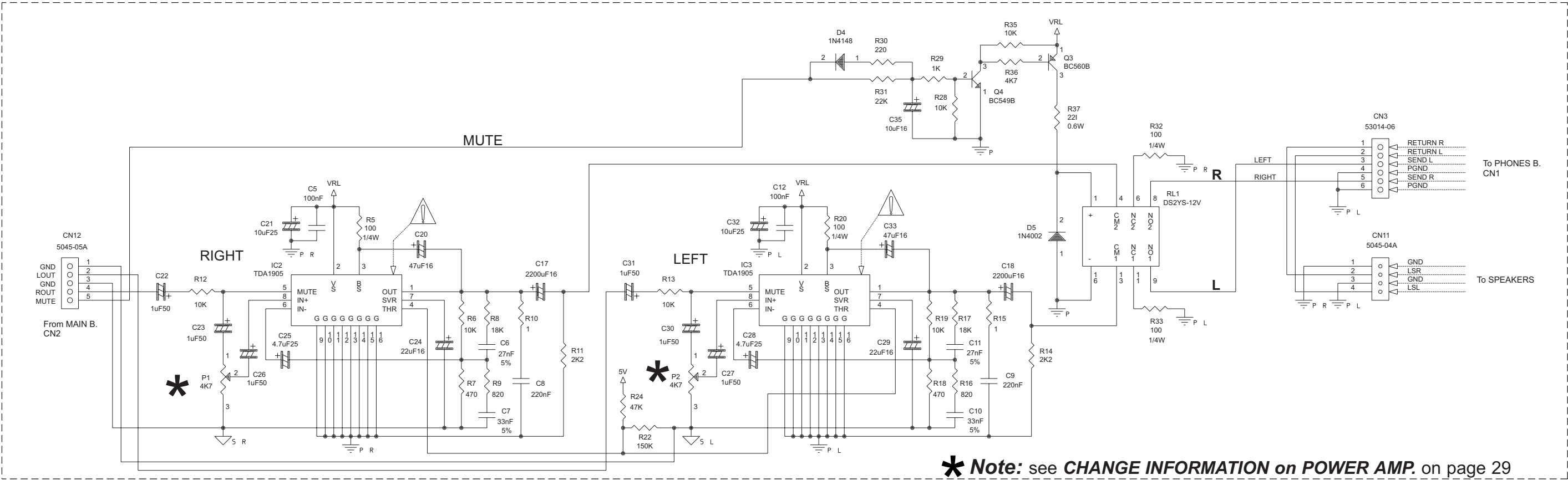
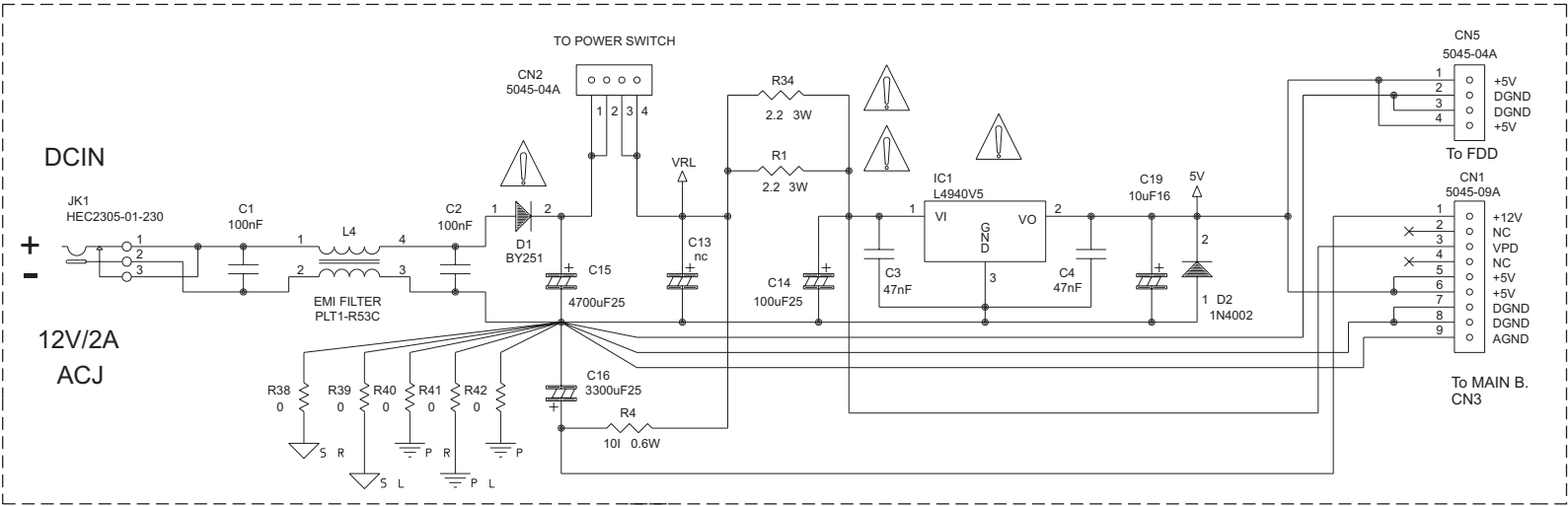
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POWER AMP. PCB ASSY & CIRCUIT DIAGRAM

ASSY 7700606000



View from component side

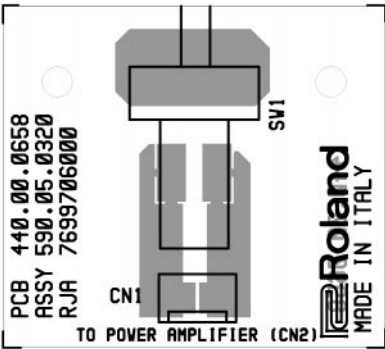


* Note: see **CHANGE INFORMATION** on **POWER AMP.** on page 29

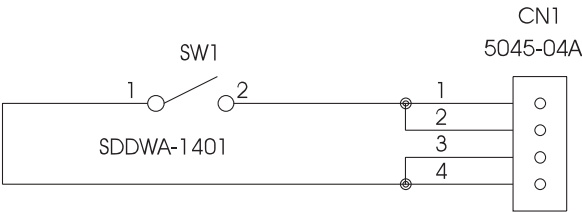
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A SWITCH PCB ASSY & CIRCUIT DIAGRAM ASSY 7699706000

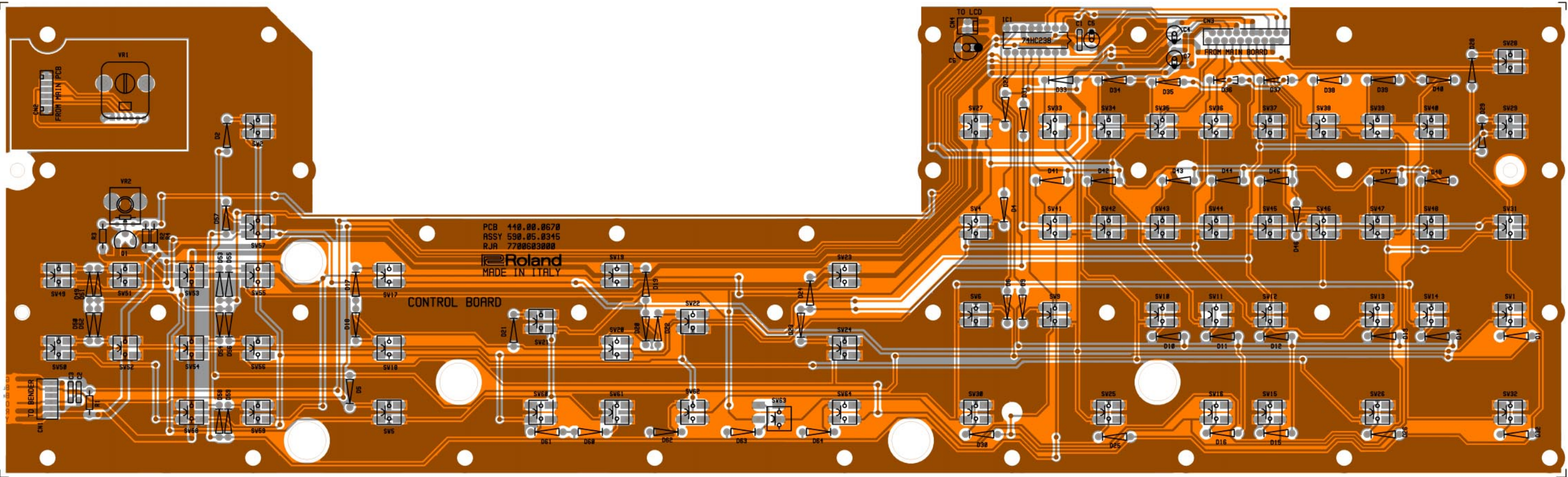
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View from component side



CONTROL PCB ASSY ASSY 7700603000



View from component side

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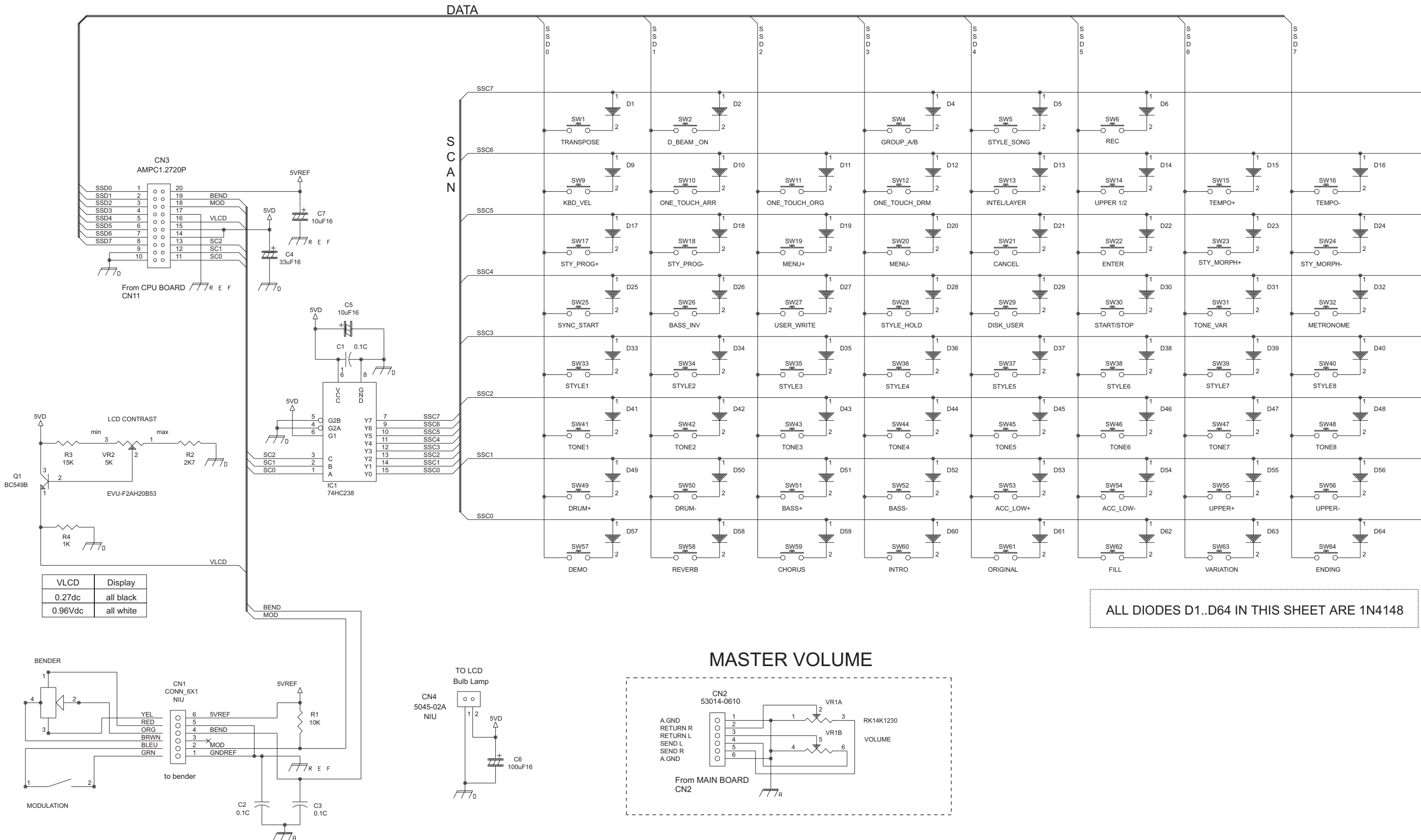
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CIRCUIT DIAGRAM (CONTROL PCB ASSY)



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A MAIN PCB ASSY ASSY 7700601000

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For Nordic Countries

Apparatus containing Lithium batteries

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

ADVARSEL!

Lithiumbatteri - Eksplosjonsfare.
Ved utskifting benyttes kun batteri som anbefalt av apparatfabrikanten.
Brukt batteri returneres apparatleverandøren.

VARNING!

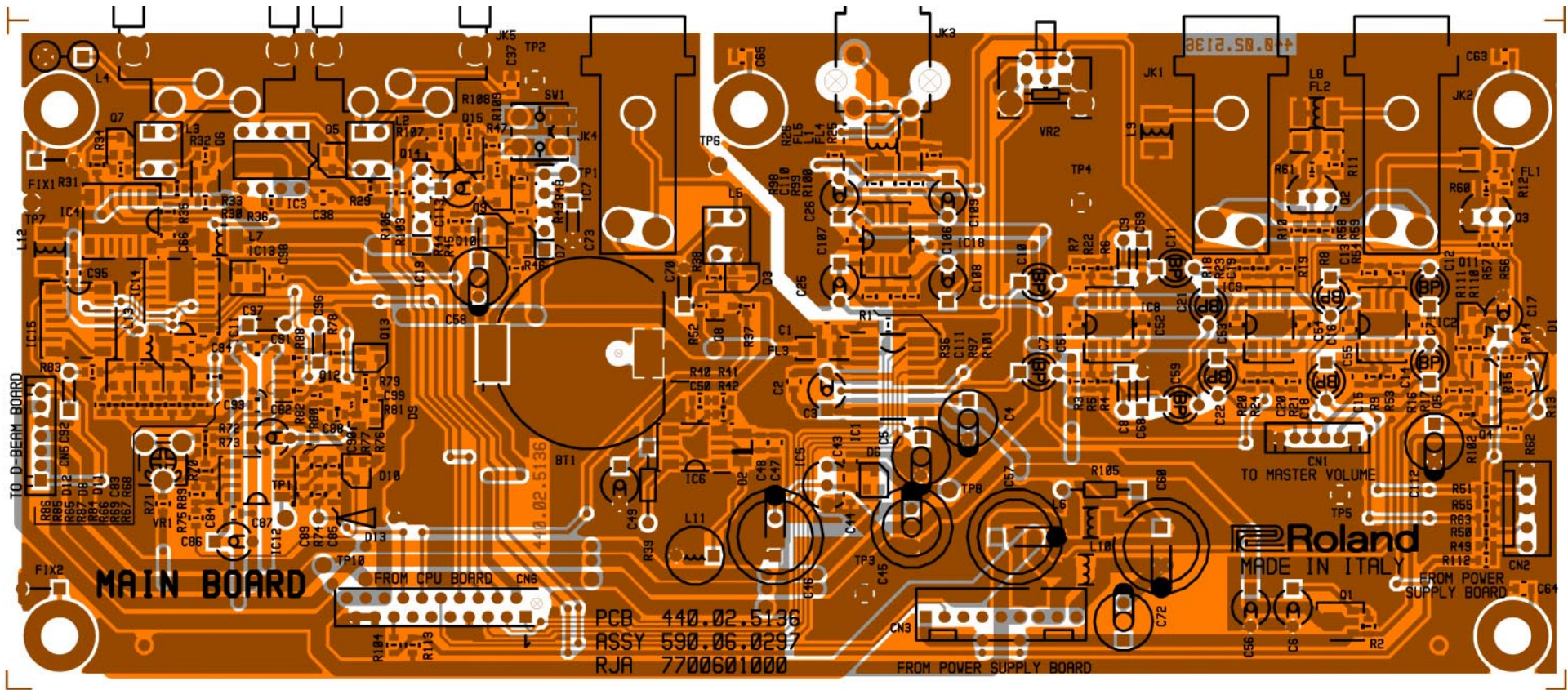
Eksplosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens instruktion.

VAROITUS!

Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.
Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

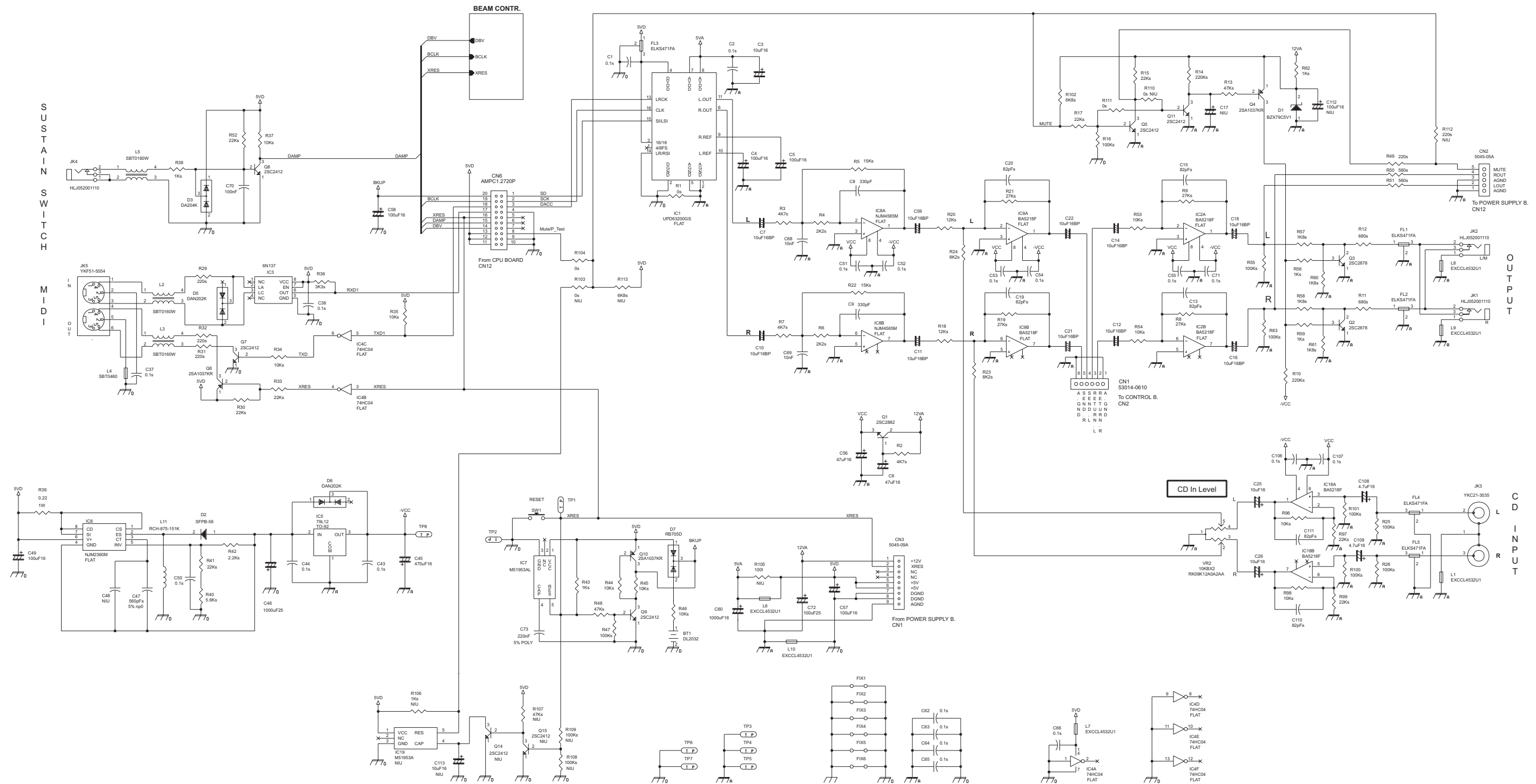
NOTE

When you replace the MAIN BOARD or Lithium battery,
You must reperform bender adjustment.
Refer to [Bender value setting] item in the test mode.



View from component side

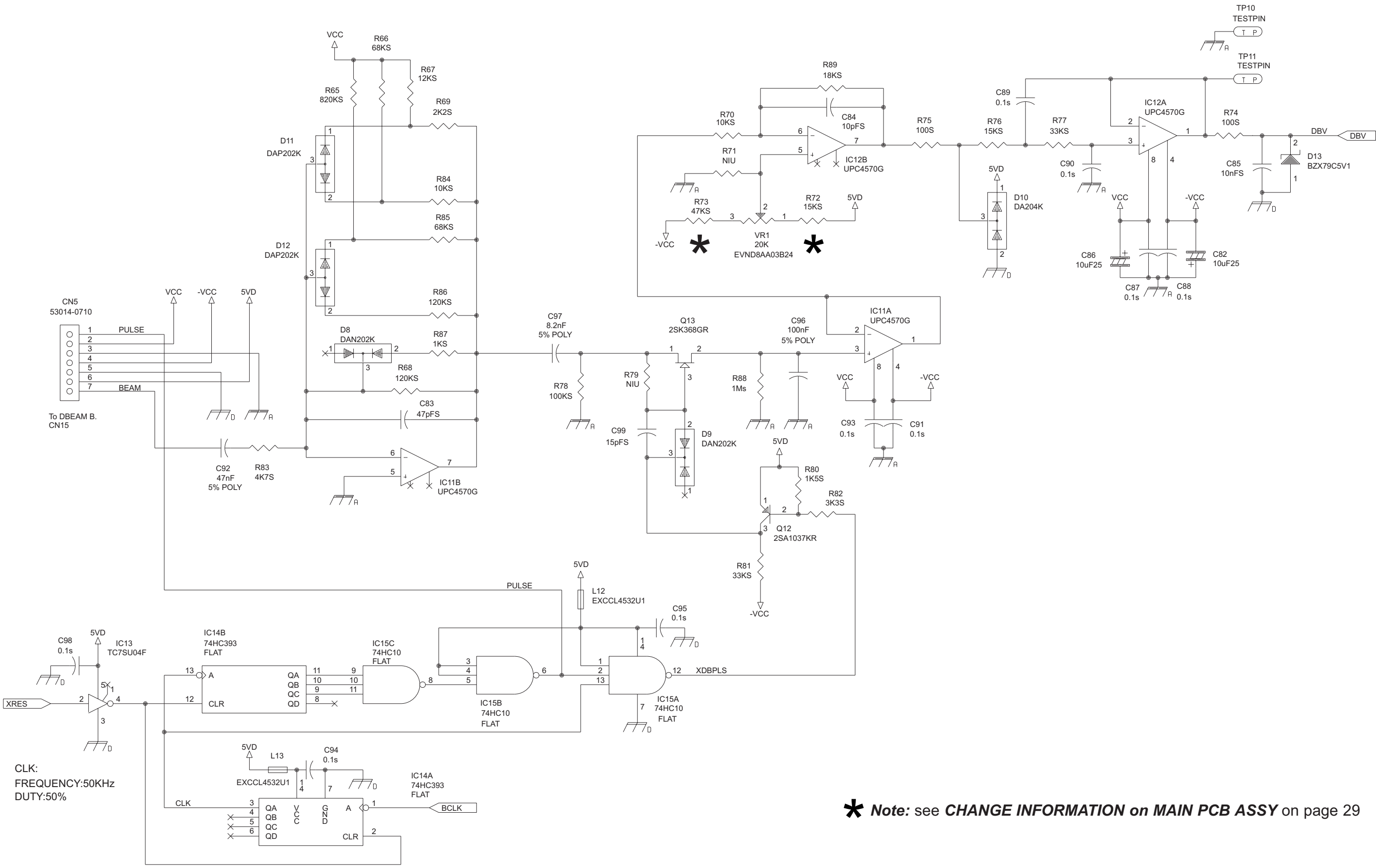
CIRCUIT DIAGRAM 1/2 (MAIN PCB ASSY)



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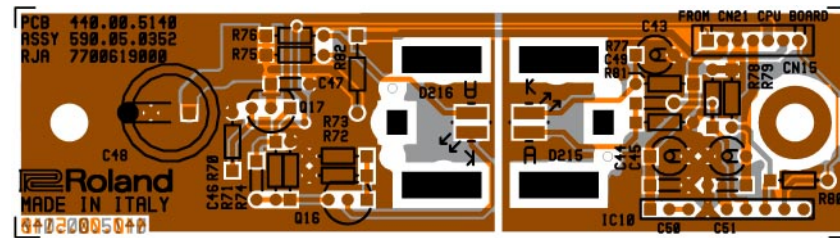
CIRCUIT DIAGRAM 2/2 (D-BEAM section/MAIN PCB ASSY)



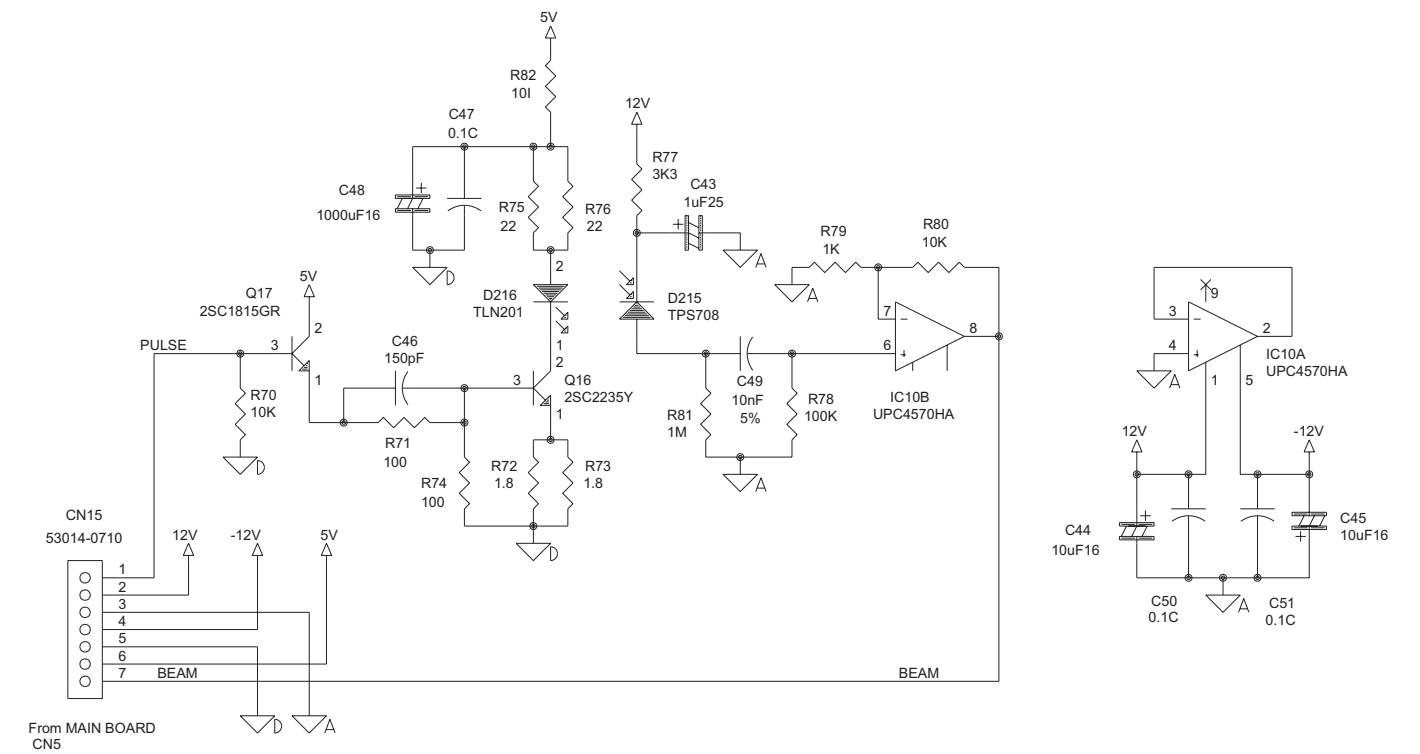
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D-BEAM PCB ASSY & CIRCUIT DIAGRAM

ASSY 7700609000

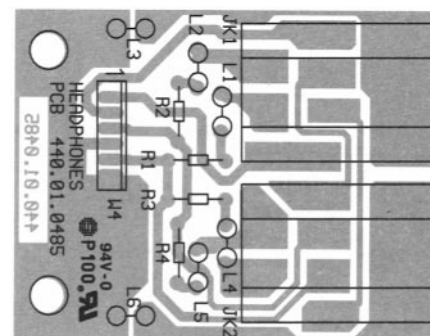


View from component side

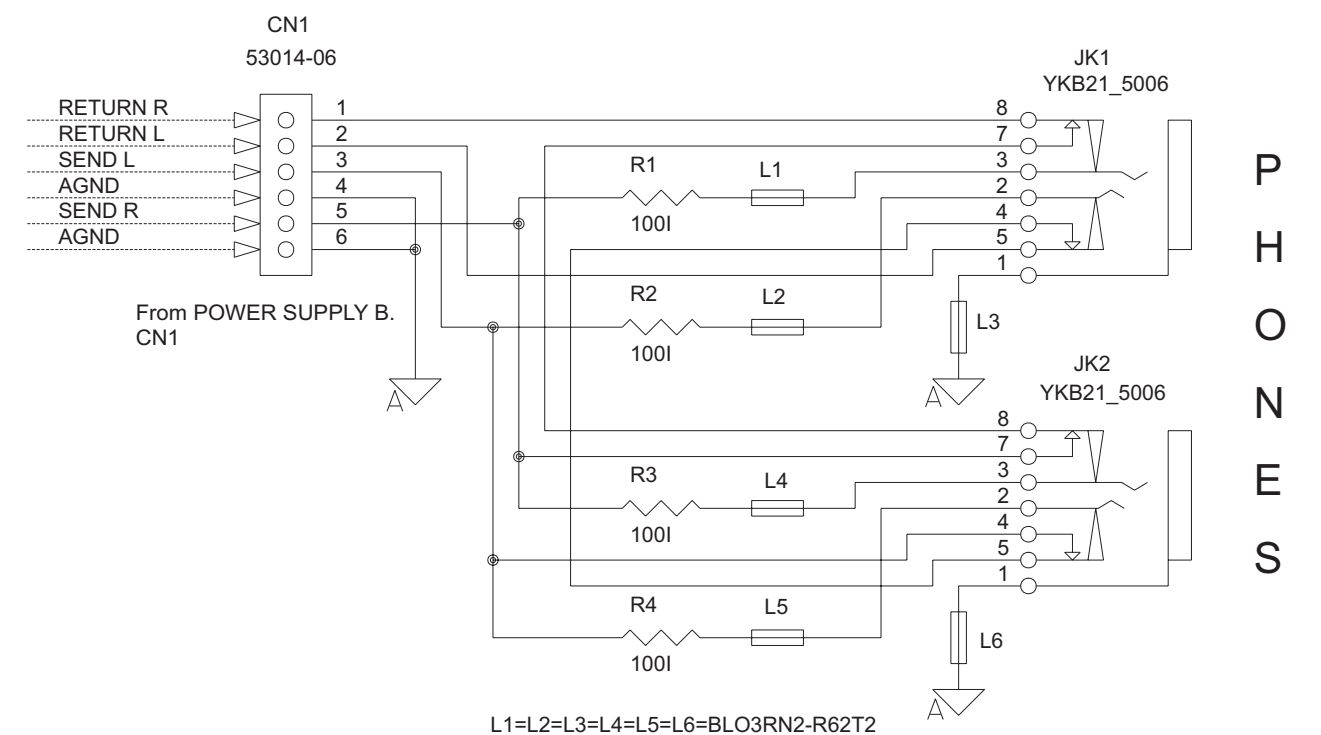


PHONES PCB ASSY & CIRCUIT DIAGRAM ASSY 7700608000

ASSY 7700608000

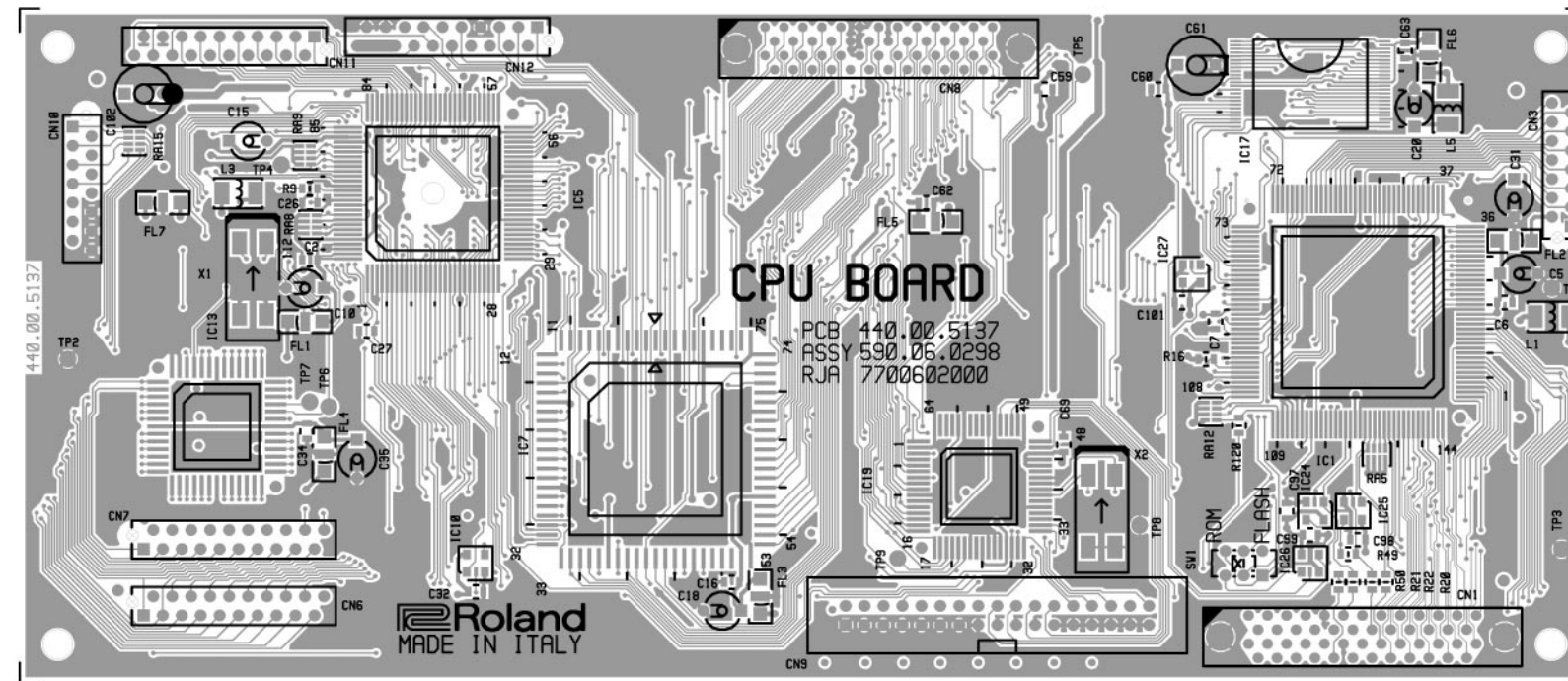


View from component side

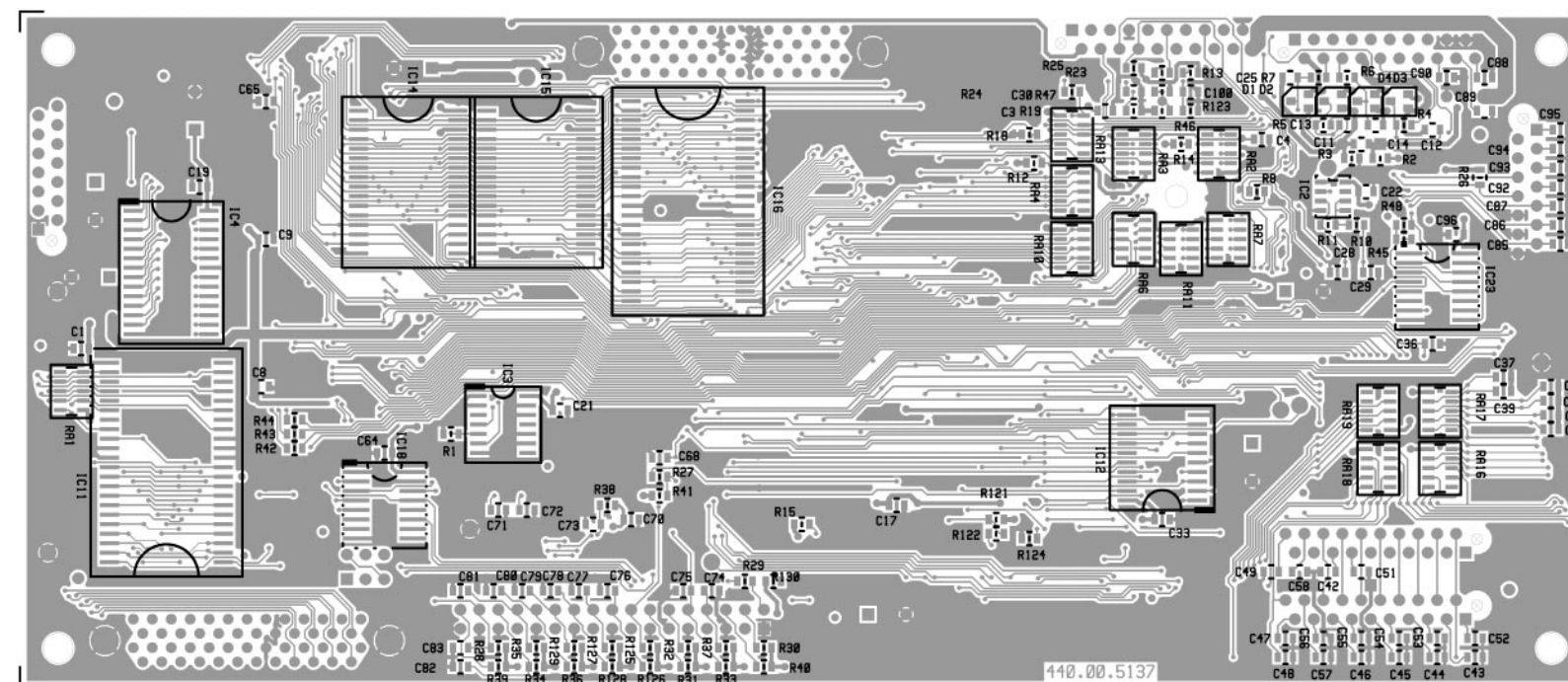


PHONES

ASSY 7700702000 for EM-50
ASSY 7700703000 for EM-30



View from component side



View from solder side

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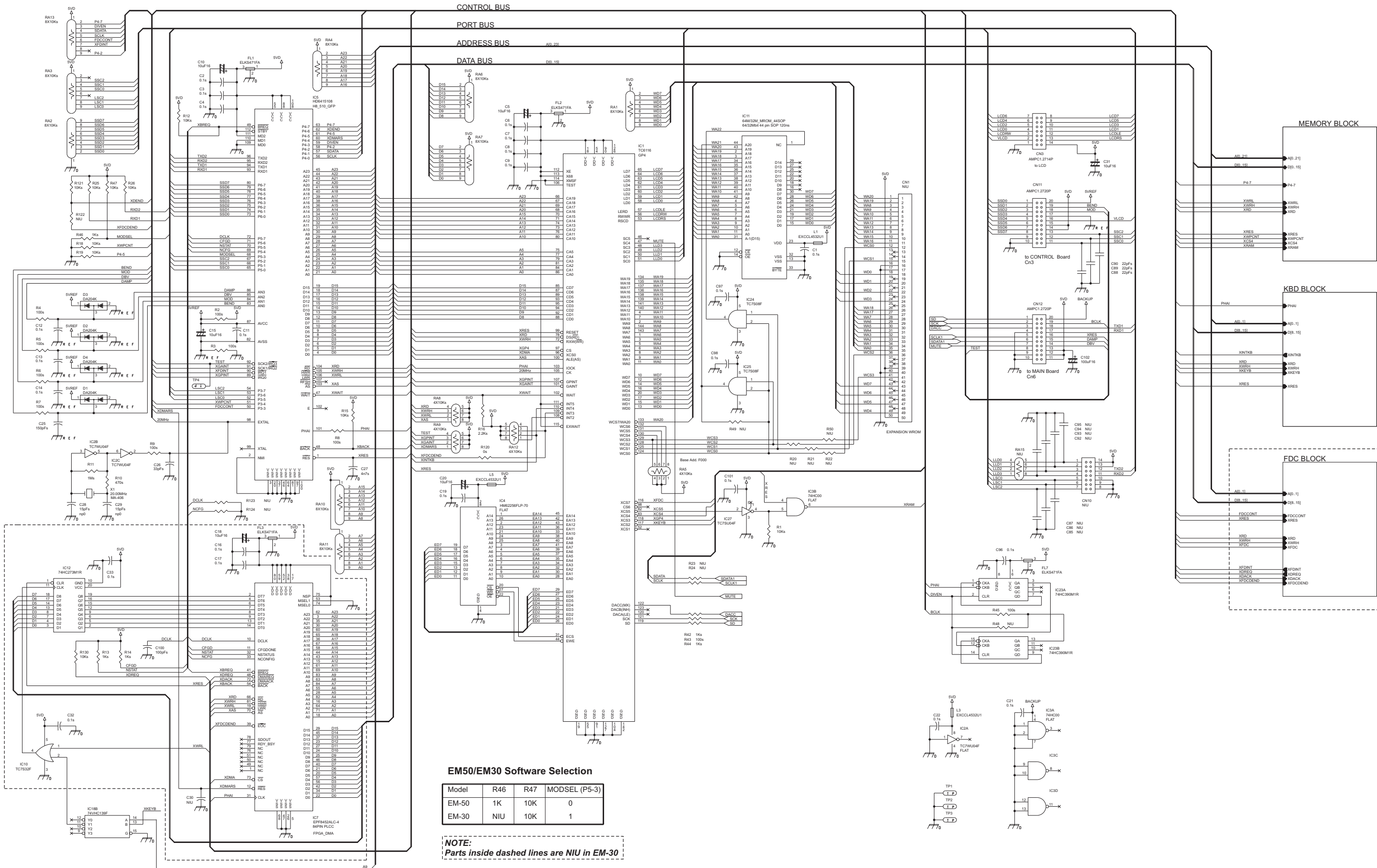
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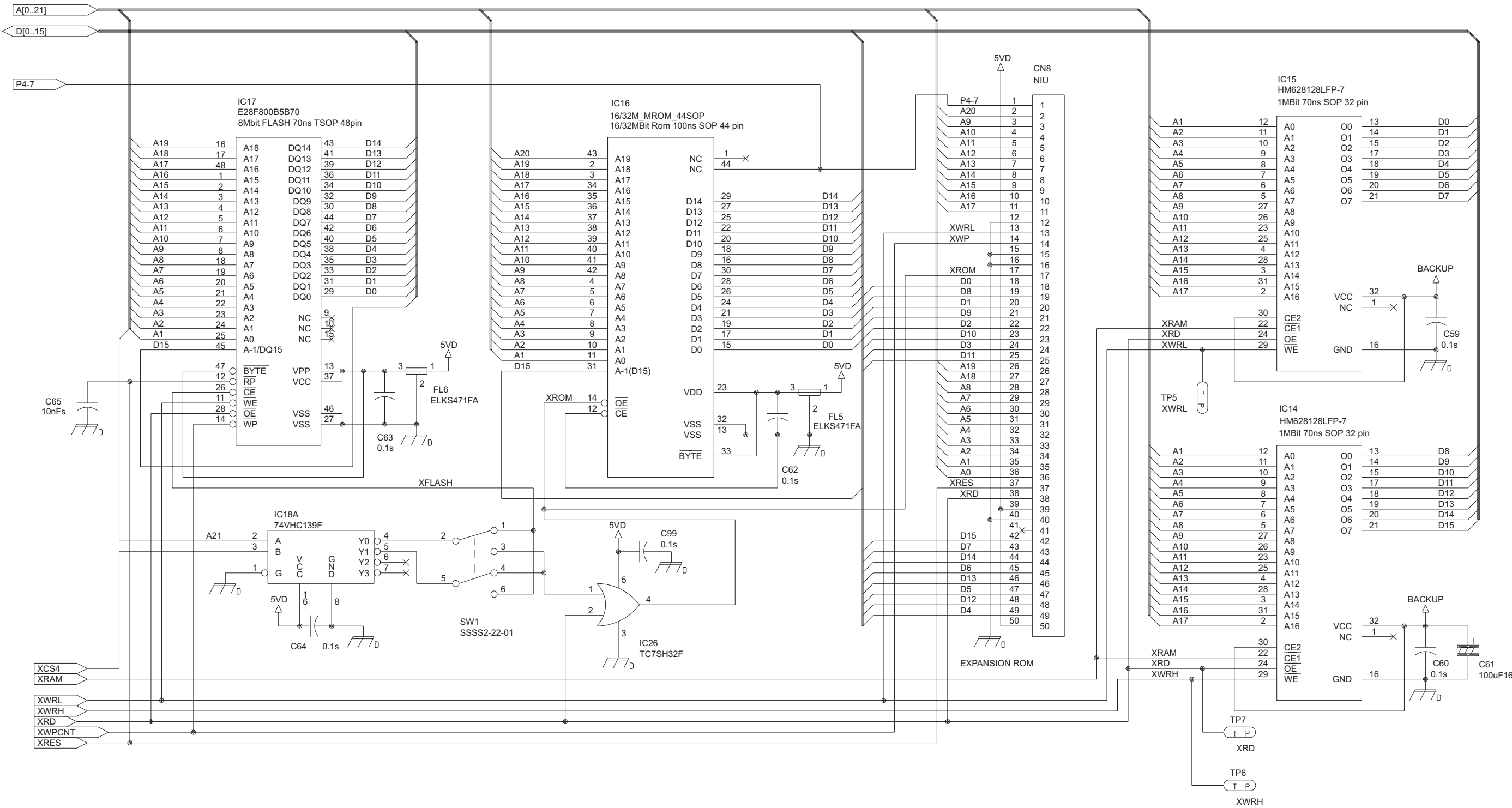
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CIRCUIT DIAGRAM 1/4 (CPU PCB ASSY)

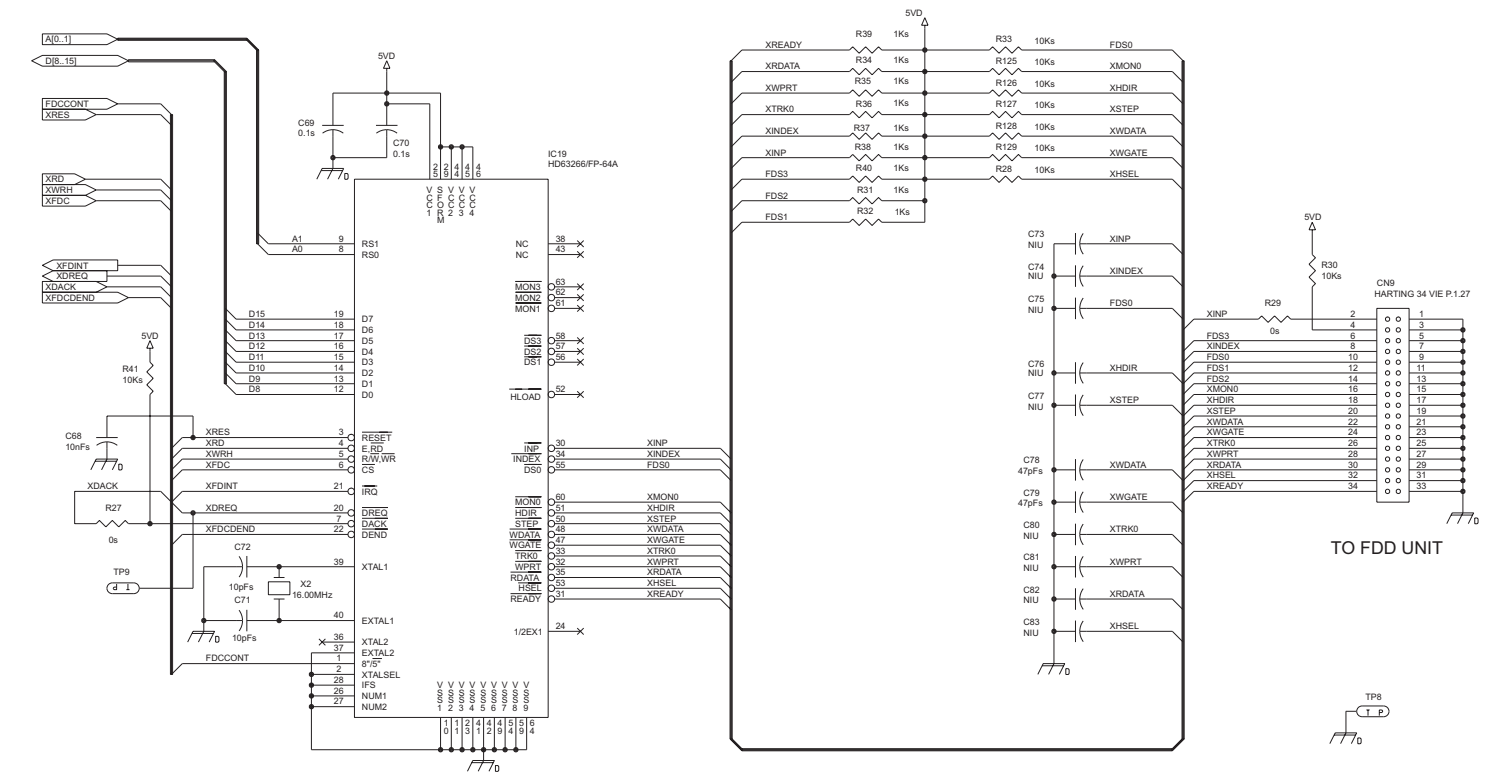


CIRCUIT DIAGRAM 2/4 (MEMORY section/CPU PCB ASSY)



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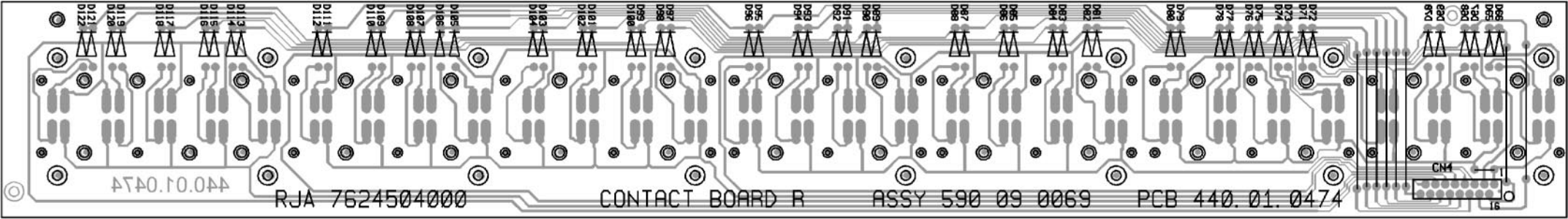
CIRCUIT DIAGRAM 4/4 (FDC section/CPU PCB ASSY, only for EM-50)



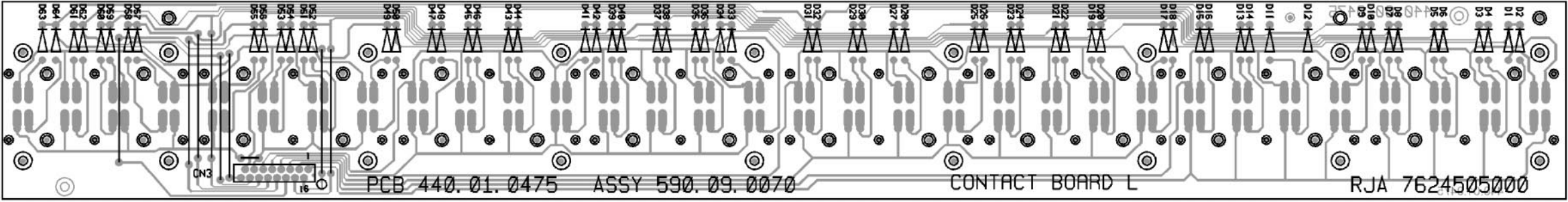
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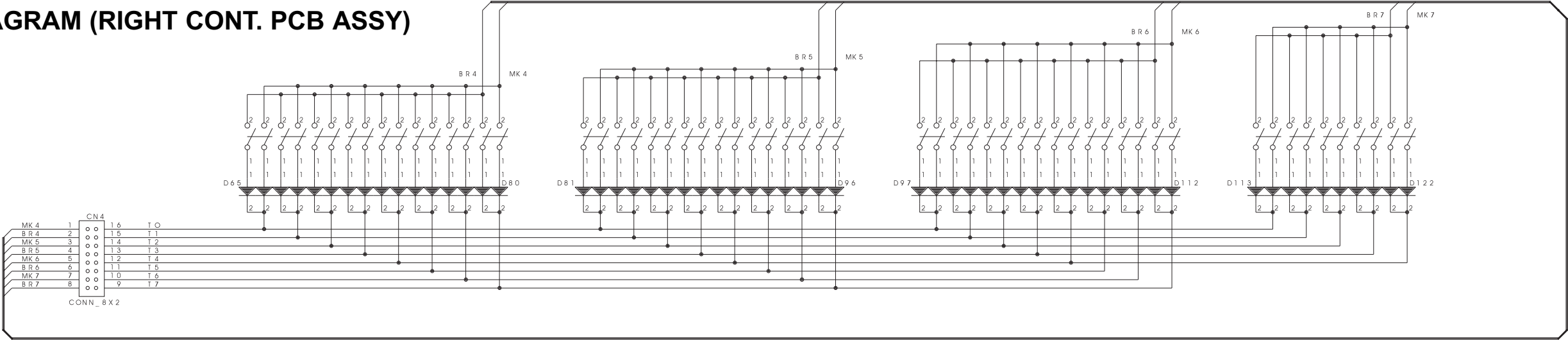
RIGHT CONTACT PCB ASSY w/RUBBER ASSY 7624504001



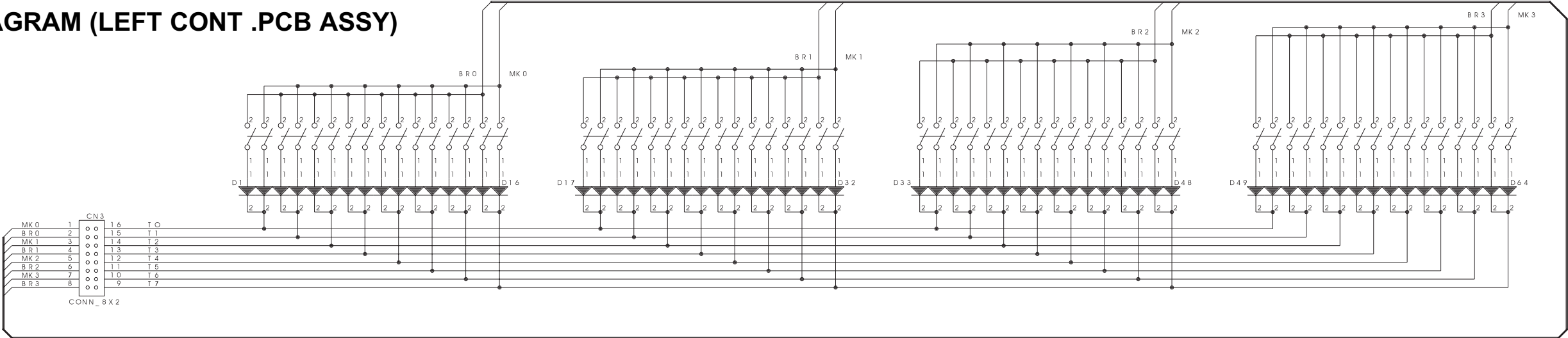
LEFT CONTACT PCB ASSY w/RUBBER ASSY 7624505001



CIRCUIT DIAGRAM (RIGHT CONT. PCB ASSY)



CIRCUIT DIAGRAM (LEFT CONT .PCB ASSY)



22

TEST MODE EM-50, EM-30

Introduction:

Warning !! the following measurements have to be carried out when the instrument is off :

- 1) **Voltage of the internal battery.**
Measure the voltage across the battery: it must not exceed 3.20 Vdc.
- 2) **Measure the consumption across the R46 resistor** on the Main Board: **it must not exceed 20 m.V.dc.**
The voltage at the **pin no. 32** of the RAM **must not be lower than 2.8 Vdc.**

Button description

Tn1 : Tone 1
Tn2 : Tone 2
Tn3 : Tone 3
Tn4 : Tone 4
Tn8 : Exit

Displaying messages

When a check implies messages to be visualized, they will be shown on the display in the following manner:

Display:	EM-50	XXX	XXXXXXXX
----------	-------	-----	----------

Test structure

The general test menu has a hierarchical structure. You can get back to each previous menu page up to the "Main Menu" page. The **Tone 8** button ("**Tn8 = Exit**") allows you to interrupt any test except for:

- Ro Test Rom
- Ra Test Ram
- Wr Test Wave Rom
- FD Disk Test (Only for EM-50)

How to enter the Test Mode

Turn the instrument on while keeping the button **tn1** pressed.

The Display shows:

Display :	Test
-----------	------

After a few seconds, it shows:

Display :	Ver	X.XX
-----------	-----	------

After a few seconds, it shows:

Display :	P K A M
-----------	---------

By pressing the following buttons, you'll start the corresponding following checks:

- ✧ **tn1** * **P** Control panel check
- ✧ **tn2** * **K** Keyboard Check
- ✧ **tn3** * **A** Audio check
- ✧ **tn4** * **M** Memory check

✧ ***tn1*** * ***P*** ***Control panel check***

By pressing the **tn1** button, the display shows the following test list:

Display :	P1	P2	FD
-----------	----	----	----

- P1 = tn1 Panel 1 Control Panel check (1st part)
- P2 = tn2 Panel 2 Control Panel check (2nd part)
- FD = tn3 Floppy D. (*) Floppy Disk check (* only for the mod. EM-50)

● **Control Panel check (1st part) [tn1]:**

By pressing the Tn1 button, the display shows the following possible check:

Display :	Sus	Midi
-----------	-----	------

- Sus = tn1 Sustain Footswitch test
- Midi = tn2 Midi Midi Test

● **Sus [tn1]**

By pressing the **tn1** button, the display shows:

Display :	Sus	OFF
-----------	-----	-----

Action: after inserting the connection pin into its socket, press and release the Sustain footswitch: the message "ON/OFF" will be shown on the display regardless of the whether the footswitch is being pressed or released.
To exit, press the tn8 Exit button. To get back to the Main Menu press tn8 Exit again.

● **Midi [tn2]**

By pressing the **tn2** button, you'll start the Midi test:
The display shows:

Display :	OUT < = > IN
-----------	--------------

Action: If the message "Out < = > In" is shown, the transmission and/or receipt of data has failed.
After connecting the MIDI cable (you have to shortcircuit the IN/OUT sockets), the display will show either OK or Er, if there is some error.
To exit, press the tn8 Exit button. To get back to the Main Menu press tn8 Exit again.

● **Control Panel check (2nd part) [tn2]:**

By pressing the tn2 button, you'll enter the 2nd check part:
The display shows:

Display :	Sw	Db	Ad	Lc
-----------	----	----	----	----

By pressing the following buttons, you'll start the corresponding following tests:

- Sw = tn1 Switch Test
- Db = tn2 D-Beam Test
- Ad = tn3 Ad Converter Test
- Lc = tn4 LCD Test

● **Sw [tn1]**

By pressing the **tn1** button, the display shows:

Display :	XX	ZZ
-----------	----	----

Display: **XX** = (number of buttons pressed)
 ZZ = (name of the next button to press)

Action : press the switches on the control panel. The display shows the number of the switch pressed and its name. When the switch is ON you'll hear a sound, no sound can be heard when it's off.
You may not exit the switch test, unless all switches have been pressed. Otherwise the switch test stops if some fault has been detected; in this event the last switch pressed is shown on the display.
To exit press the " Tone 8" and "Start/Stop" buttons. If some switches have not been pressed, their corresponding names will appear successively on the display.
To exit, press the tn8 Exit button. To get back to the Main Menu press tn8 Exit again.

● **Db [tn2]**

Press the **tn2** button and the Display will show:

Display :	Db	0/127
-----------	----	-------

Action: make sure that the value of the D-Beam controller ranges from 0 to 127 depending on the vertical distance of your hand from the infrared LEDs of the D-Beam.
When standing still, the value shown must be 0.
To exit, press the tn8 Exit button.

● **Ad [tn3]**

Press the **tn3** button and the Display will show:

Display :	Tst	Bd	Md
-----------	-----	----	----

Bd = **tn1 Bender Pitch bender test**
Md = **tn2 Modul Modulation Test**

● **Bd [tn1]**

Press the **tn1** button and the Display will show:

Display :	Bnd	-128	0	127
-----------	-----	------	---	-----

Action : Move the Bender lever towards the Right and Left end. The display will show the bender position and its corresponding value.
To exit, press the tn8 Exit button.

● **Md [tn2]**

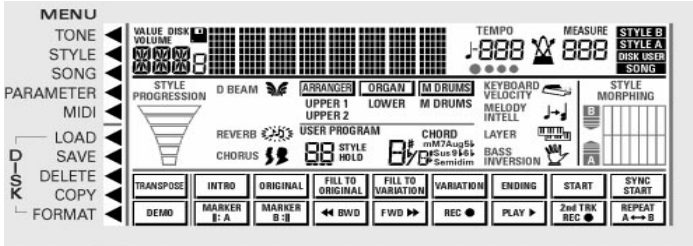
Press the **tn2** button and the Display will show:

Display :	Mod	OFF
-----------	-----	-----

Action : Move the Modulation lever from its rest position. Depending on the pressure applied, there will be a different evaluation and the resulting message will be either ON or OFF.
To exit, press the tn8 Exit button. To get back to the Main Menu press tn8 Exit again.

● **Lc [tn4]**

Press the **tn4** button and the Display will show:



Action : the display will show all the symbols and characters existing in it.
To exit, press the tn8 Exit button.

● **Disk check [tn3] only for EM-50 model** (the floppy disk has already been inserted Into the driver!):
Press the **tn3** button and the display will show:

Display :	Tst	25%	50%	75%
-----------	-----	-----	-----	-----

After a few seconds, it shows:

Display :	Tst	XXX
-----------	-----	-----

xxx = (Complete, Disk Error .Not Disk)

Action : The program will proceed to read and write the floppy disk, which has already been inserted into the driver. To interrupt the test and exit, wait until the test result appears on the display; the message shown may be:

"Complete" if it's successful,
"Disk Error" if some reading/writing errors have been detected,
"WRProt" if a protected disk has been inserted and
": NoDisk" if the disk has not been inserted.

Once you've pressed the tn3 button and have entered the "Fd TEST" (Disk Test), you may not exit this function until the test result has been shown.
To exit, press the tn8 Exit button. To get back to the Main Menu press tn8 Exit again.

✧ **tn2 * K Keyboard check**

Press the **tn2** button and the display will show:

Display :	YYYY	XXXX
-----------	------	------

Key yy Velocity zzz yy = {0, C# }
zzz = {Off,1,...,127}

Action : Press some keys of the keyboard, you'll hear a piano sound. The display will show the number of the pressed key, its name and velocity value.

✧ **tn3 * A Audio check**

Press the **tn2** button and the display will show:

Display :	Si	Ft	Ef
-----------	----	----	----

● **Si [tn1]:**

If you press the **tn1** button, you'll enter the Audio test.

Display :	Sin	Wave
-----------	-----	------

Before calibrating the audio output, make sure that the volume potentiometer is at its maximum position and that the AC/DC adaptor is the ACJx 12V 2A type.

Action : A sine wave sound having a 440 Hz frequency will be heard from the right speaker while a sine wave sound having a 1760 Hz frequency will be heard from the left speaker.
Calibrate the P1 trimmer so that the height of the signal relative to the right channel is 8.3 Vpp and calibrate the P2 trimmer so that the height of the signal relative to the left channel is 7.8 Vpp.
Of course, the calibration operation is not required, if on the POWER AMP. BOARD the P1 and P2 trimmers have been replaced by resistors (having fixed values).
Please refer to the CHANGE INFORMATION on page 29
To exit, press the tn8 Exit button.

NOTE The Audio test can be carried out individually, too; that is as a single check separated from the whole testing procedure. This procedure is described further on.(Page 25)

● **Ft [tn2]:**

Press the **tn2** button and the display will show:

Display :	W1	W2	W3
-----------	----	----	----

● **W1 [tn1]:**

Then press **tn1** "W1", and the display will show:

Display :	100Hz
-----------	-------

Action : A sine wave sound having a 100 Hz frequency will be heard from both, the right and the left speakers.
o exit, press the tn8 Exit button.

● **W2 [tn2]:**

Then press **tn2** "W2", and the display will show:

Display :	1000Hz
-----------	--------

Action : A sine wave sound having a 1000Hz frequency will be heard from both, the right and the left speakers.

● **W3 [tn3]:**
Then press **tn3** "W3", and the display will show:

Display :	10000Hz
-----------	---------

Action : A sine wave sound having a 10000Hz frequency will be heard from both, the right and the left speakers.
To exit, press the tn8 Exit button. To get back to the Main Menu press tn8 Exit again

● **Ef [tn3]:**
By pressing the tn3 button, the display will show:

Display :	Rev	Cho
-----------	-----	-----

Rev = tn1 REVERB Reverb Test
Cho = tn2 CHORUS Chorus Test

● **Rev [tn1]:**
By pressing the **tn1** button, the display will show:

Display :	Reverber
-----------	----------

Action : A drum sound with a marked reverb effect will be heard from both speakers. The quality level of the reverb effect has to be assessed by ear.

NOTE: Due to a multitasking problem, the first drum sound may result to have a less marked reverb effect than the following ones.
To exit, press the tn8 Exit button. To get back to the Main Menu press tn8 Exit again

● **Cho [tn2]:**
By pressing the **tn2** button, the display will show:

Display :	Chorus
-----------	--------

Action : A square wave sound enriched with the chorus effect will be heard from both speakers. The quality level of the chorus effect has to be assessed by ear.
To exit, press the tn8 Exit button. To get back to the Main Menu press tn8 Exit again

✧ **tn4 * M Memory check**

By pressing the **tn4** button, the display will show:

Display :	Ro	Ra	Wr
-----------	----	----	----

Memory checklist:

Ro = tn1 Rom Test
Ra = tn2 Ram Test
Wr = tn3 Wrom Test

● **Ro [tn1]:**
By pressing the tn1 button, the display will show:

Display :	Wait	XX
-----------	------	----

Action : By pressing the tn1 button, the ROM test result xx = {Ok,Er} will appear on the display
To exit, press the tn8 Exit button.

● **Ra [tn2]:**
By pressing the tn2 button, the display will show:

Display :	Wait	XX
-----------	------	----

Action : By pressing the tn3 button, the RAM test result xx = {Ok,Er} will appear on the display
To exit, press the tn8 Exit button.

● **Wr [tn3]:**
By pressing the tn3 button, the display will show:

Display :	Wait	XX
-----------	------	----

Action : By pressing the tn4 button, the Wave Rom test result xx = {Ok,Er} will appear on the display
To exit, press the tn8 Exit button. To get back to the Main Menu press tn8 Exit again

Identifying the software version.

To identify the current software version of the instrument, turn it on while keeping the Tn5 button pressed.
The display will show:

Display :	UUU	VER . XXX	ZZZ	YYY	VVVVVV
-----------	-----	-----------	-----	-----	--------

U = Name of the instrument
X = Software Version
Z = Day
Y = Month
V = Hour

Action : The display will show in sequence: the model name, the software version and the date.

*** Audio Test tn2 on "power on"**

Before calibrating the audio output, make sure that the volume potentiometer is at its maximum position and that the AC/DC adaptor is the ACJx 12V 2A type.

The display will show:

Display :	Wait
-----------	------

After a few seconds:

Display :	Audio Test
-----------	------------

Action : A sine wave sound having a 440 Hz frequency will be heard from the right speaker while a sine wave sound having a 1760 Hz frequency will be heard from the left speaker.
Calibrate the P1 trimmer so that the height of the signal relative to the right channel is 8.3 Vpp and calibrate the P2 trimmer so that the height of the signal relative to the left channel is 7.8 Vpp.
Of course, the calibration operation is not required, if on the POWER AMP. BOARD the P1 and P2 trimmers have been replaced by resistors (having fixed values).Please refer to the CHANGE INFORMATION on page 29
To exit, turn the instrument off.

Initialization of EM-50/30 ("Factory Setup") .

Warning!!!
When the "Factory Setup" is carried out, all the setting saved in the instrument by the user will be lost and replaced by the factory settings, except for the "Custom Styles".

PROCEDURE :
Turn the instrument on while keeping the "Write" button pressed.

In the middle of the display, the following message will be displayed:

Display :	FACTORY !
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NOTICE

Adjusting DBeam controller

When you replace Main PCB Assy, DBeam controller adjustment is necessary.

- 1-1 Remove the bottom cover.
- 1-2 Connect the test probe of the oscilloscope to the Tap Point of the Main PCB Assy.
TP 11: + TP 10: - (GND)
- 1-3 Adjust the voltage output from TP 11 to 0V by using VR1.

NOTE: When you adjust the voltage, be sure to keep EM-50/30 in a horizontal position, and keep any object and strong light (fluorescent lamp etc.) away from around the photoreceiver.

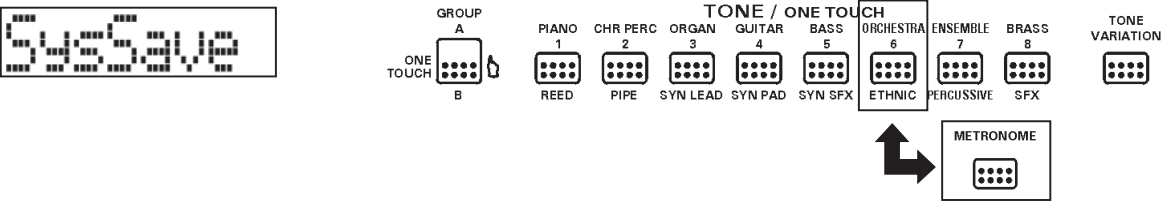
FLASH UPDATE

It is recommended to save content of the RAM/FLASH memory (User Style - User Program - Songs), before executing the Update procedure.

HOW TO SAVE THE SYSTEM PROGRAM ONTO A DISK (only for EM-50)

The RAM aread dedicated to the Songs is erased while saving the System Program onto a disk, therefore it is recommended to save the song before carrying out the "Save System Program" operation.

- (a) Turn the instrument on while keeping pressed the TONE/One Touch Number 6 button and the METRONOME button; the following message appears on the LCD: "SysSave". The instrument selects the "Save Program" function.



- (b) To carry on with this procedure, the instrument requires that an HD 3.5" 1.44 MB disk, that is DOS formatted, is inserted into drive. A flashing message, i.e. "InsrtDsk" (Insert Disk), will warn that the disk is missing in the drive.



- (c) During the "Save" operation, the message "Save" appears on the display, together with an increasing percentage number, indicating that the process (0% ~ 99%) is in progress.



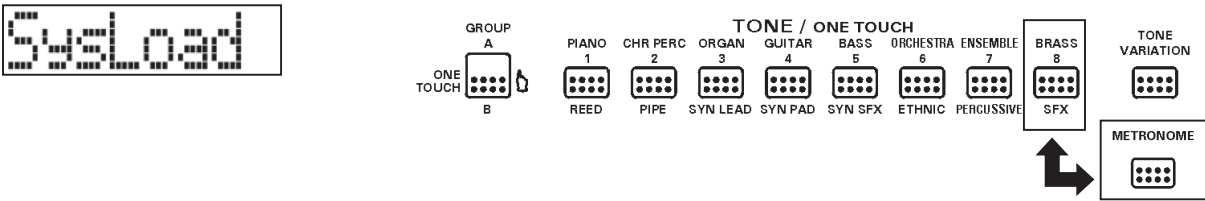
- (d) The "Save" operation is completed when the message "Complete" appears on the display.



NB: The created file will be called like the software version of the instrument: "EM50_xxx.SYS".

FLASH UPDATE FROM DISK (only for EM-50)

- (a) Turn the instrument on while keeping pressed the TONE/One Touch Number 8 and the METRONOME button; the following running message appears on the LCD: "System will be updated by Floppy Disk. Press CANCEL to abort or ENTER to continue. Sure?"
If you choose "ENTER", the "SysLoad" message appears on the display and the function 'Load Program from disk' is selected.



- (b) To carry on this procedure, the instrument requires that the Program Disk is inserted into the drive. A flashing message, i.e. "InsrtDsk" (Insert Disk), will warn that the disk is missing in the drive.



- (c) After inserting the disk, the LCD will show the file name (Software Version EM-50_xxx"), then the instrument checks the Checksum of the Program File. During this operation an increasing percentage number appears on the display (0% ~ 99%).



- (d) At the end of this check, the instrument starts writing the Flash memory. The display shows alternatively the messages: "Load" (reading from disk) and "Flsh" (writing in the Flash) together with an increasing percentage number, which indicates the operation being under progress.



- (e) The Update function is completed when the message "Complete" appears on the display.



- (f) Turn the instrument off and then on again while keeping the Write (Factory Setup) button pressed. The Factory Setup is required because during the Dump function the whole content of the RAM memory has been erased.

POSSIBLE ERROR MESSAGES WHILE LOADING/SAVING THE SYSTEM PROGRAM ONTO A DISK

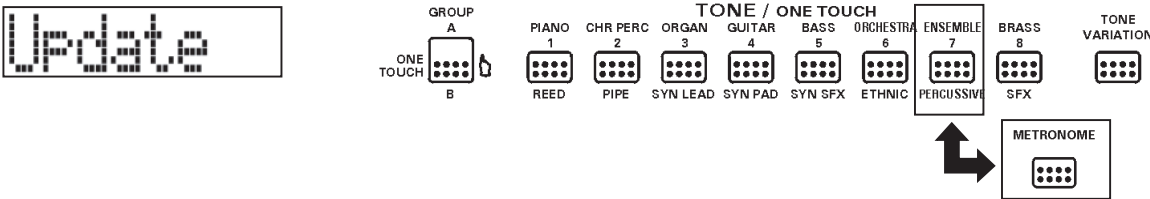
	Checksum error
	System error
	Disk or File under Writing protection
	Damaged or non-formatted disk
	Full disk
	Program File missing
	There's no disk in the drive or it has been ejected.

NOTICE: When the Load/Save System Program operations are interrupted duen to the above kind of messages, the operation must be started again.

FLASH UPDATE VIA MIDI (EM-50/30)

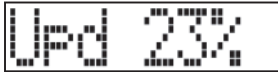
The RAM aread dedicated to the Songs is erased while saving the System Program onto a disk, therefore it is recommended to save the song before carrying out the "Save System Program" operation.

- (a) Turn the instrument on while keeping pressed the TONE/One Touch Number 7 and the METRONOME button; the follwoing running message appears on the LCD: "System will be updated by MIDI. Press CANCEL to abort or ENTER to continue. Sure?" If you choose "ENTER", the "Update" message appears on the display and the func tion 'Load Program via Midi' is selected.



- (b) Connect the MIDI OUT of a PC equipped with a musical software (e.g. Cubase, Audio Logic) with the MIDI IN of EM-50. After loading the MidiFile Program into the musical software of your PC, start Play on you PC.
(If you are using an SMF reader, like the Sound Brush, after connecting the MIDI cable and after inserting the MidiFile disk related to the Program, start Play in the Sound Brush).

- (c) The increasing percentage number (0% ~ 99%) appearing on the display indicates that the process is in progress.



- (d) The "Update" operation is completed when the message "Complete" appears on the display.



- (e) Turn the instrument on while keeping the Write (Factory Setup) button pressed. The Factory Setup is required because during the Dump function the whole content of the RAM memory has been erased.

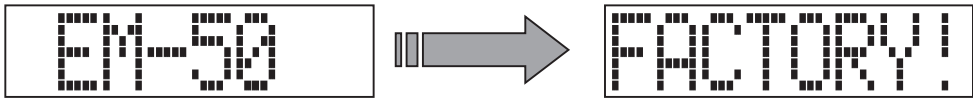
FACTORY SETUP

EM-50/30 is provided with a Factory Setup function, which retrieves all the original factory settings:

- USER PROGRAMS
- Resume PARAMETERS
- Resume MIDI
- DEMO Mode and ARRANGER On/Off in ON

Procedure

- a) Turn EM-50 off .
b) Turn EM-50 on again while holding down the USER PROGRAM WRITE button.
c) The following temporary message appears on the dislpay:



EMERGENCY UPDATE of the PROGRAM FLASH

Possible voltage drops and/or possible errors while updating the program are not supposed to cause the complete lost of the program; you should be able to update the program again anyway, simply by repeating the procedure described earlier on.
Should this be not possible, act as follows:

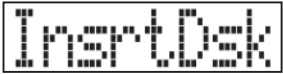
It is recommended to save content of the RAM/FLASH memory (User Style - User Program - Songs), before executing the Update procedure.

FLASH UPDATE FROM DISK (only for EM-50)

- (a) Turn the instrument off and disconnect the mains cable form the wall socket; then open the instrument and set the Flash/ROM switch to "ROM". (Such switch is placed on the CPU Board
- (b) Turn the instrument on, its display shows "SysLoad". The instrument selects the "Load Program from disk" automatically.



- (c) To carry on this procedure, the instrument needs that the Program Disk is inserted into the drive. A flashing message, i.e. "InsrtDsk" (Insert Disk), will warn that the disk is missing in the drive.



- (d) After inserting the disk, the LCD will show the file name (Software Version "EM50_xxx"), then the instrument checks the Checksum of the Program File. During this operation an increasing percentage number appears on the display (0% ~ 99%).



- (e) At the end of this check, the instrument starts writing the Flash memory. The display shows alternatively the messages: "Load" (reading from disk) and "Flsh" (writing in the Flash) together with an increasing percentage number, which indicates the operation being under progress.



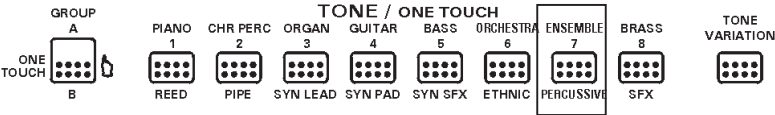
- (f) The Update function is completed when the message "Complete" appears on the display.



- (g) Turn the instrument off and set the Flash/ROM switch back to "Flash".
- (h) Turn the instrument on while keeping the Write (Factory Setup) button pressed. The Factory Setup is required because during the Dump function the whole content of the RAM memory has been erased.

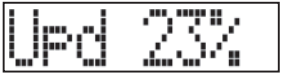
FLASH UPDATE via MIDI (EM-50/30)

- (a) Turn the instrument off and disconnect the mains cable form the wall socket; then open the instrument and set the Flash/ROM switch to "ROM". (Such switch is placed on the CPU Board.
- (b) Turn the instrument while keeping pressed the TONE/One Touch Number 7 button; the display will show: "Update".



- (c) Connect the MIDI OUT of a PC equipped with a musical software (e.g. Cubase, Audio Logic) with the MIDI IN of EM-50. After loading the MidiFile Program into the musical software of your PC, start Play on you PC.
(If you are using an SMF reader, like the Sound Brush, after connecting the MIDI cable and after inserting the MidiFile disk related to the Programma, start Play in the Sound Brush).

- (d) The LCD shows an increasing percentage number, which indicates how the func tion is proceeding.



- (e) The Update function is completed when the message "Complete" appears on the display.



- (f) Turn the instrument off and set the Flash/ROM switch back to "Flash".
- (g) Turn the instrument on again while keeping the "Write" button pressed (Factory Setup). The Factory Setup is required because during the Dump function the whole content of the RAM memory has been erased.

CHANGE INFORMATION on MAIN PCB ASSY

[REASON]

To improve the D-BEAM controller adjustment

[MEASURE]

MAIN PCB ASSY EM-50/EM-30 (7700601000)

Change value:

R72 from 15 Kohm (SMD) by 56 Kohm (SMD)

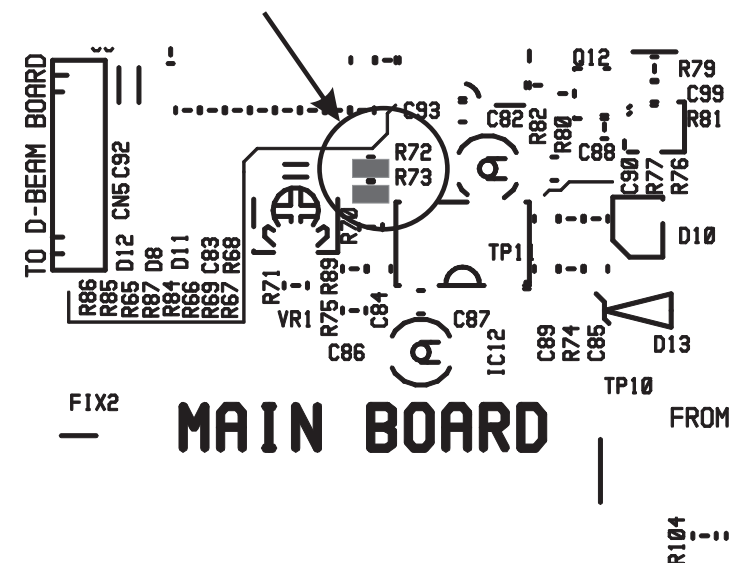
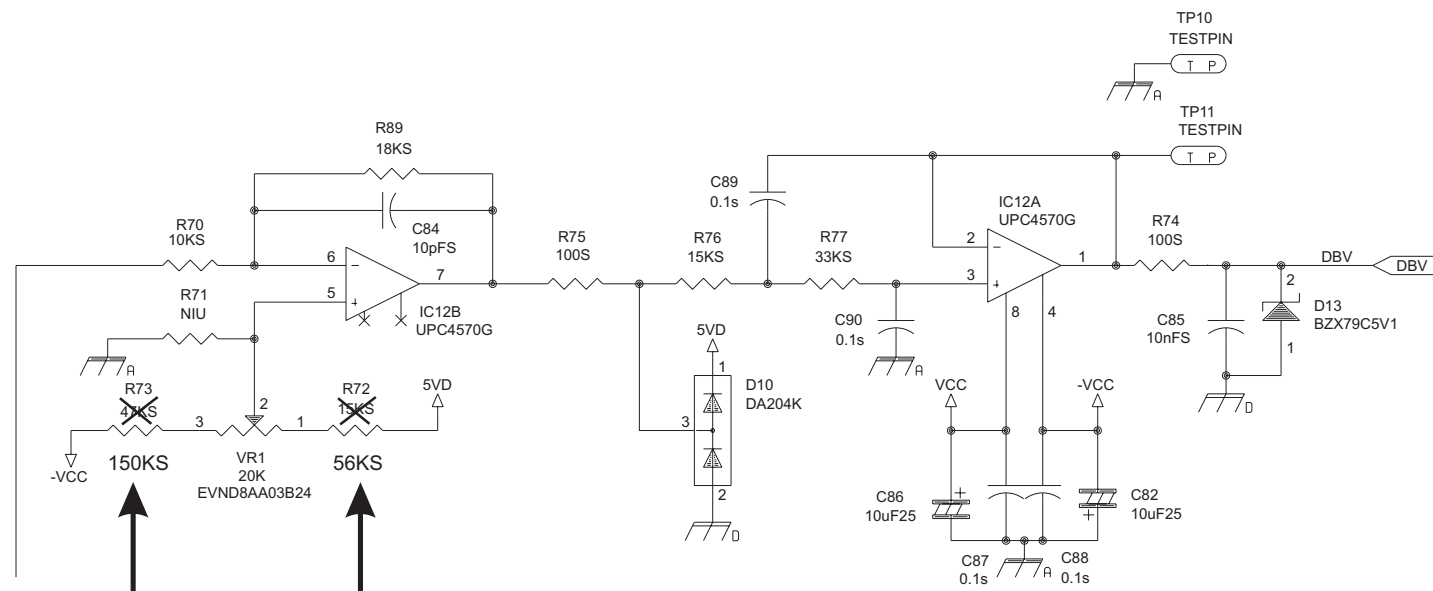
R73 from 47 Kohm (SMD) by 150 Kohm (SMD)

[EFFECTIVE]

Z M3 **** (From June 1999 Production)

[SERVICE RESPONSE]

When you meet a claim, please make the modifications explained in [MEASURE] above.



CHANGE INFORMATION on POWER & AMP. PCB ASSY

[REASON]

To eliminate the volume calibration by trimmer P1 and P2.

[MEASURE]

POWER & AMP. PCB ASSY EM-50/EM-30 (7700606000)

Remove:

P1, P2 :

add:

R44, R46 : 3K6 ohm

R43, R45 : 1K2 ohm

[EFFECTIVE]

Z M3 **** (From June 1999 Production)

