

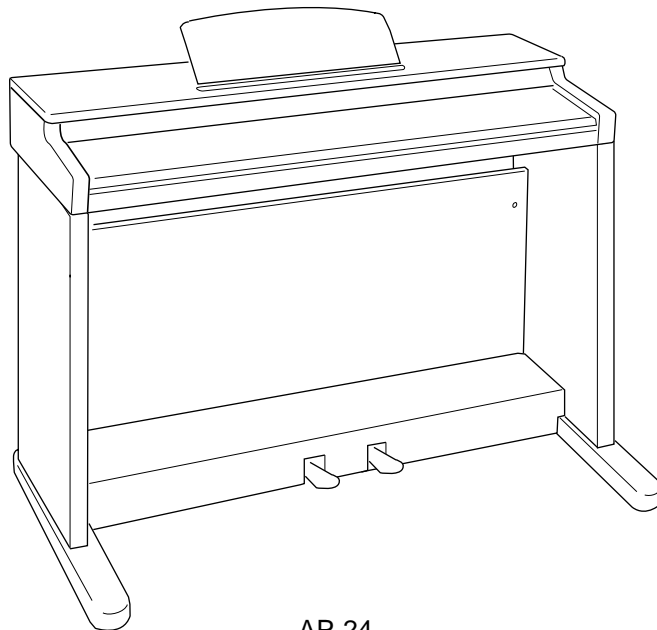
CASIO®

Service Manual

(without price)

AP-24

JUN. 2004



AP-24

ELECTRONIC KEYBOARD

CONTENTS

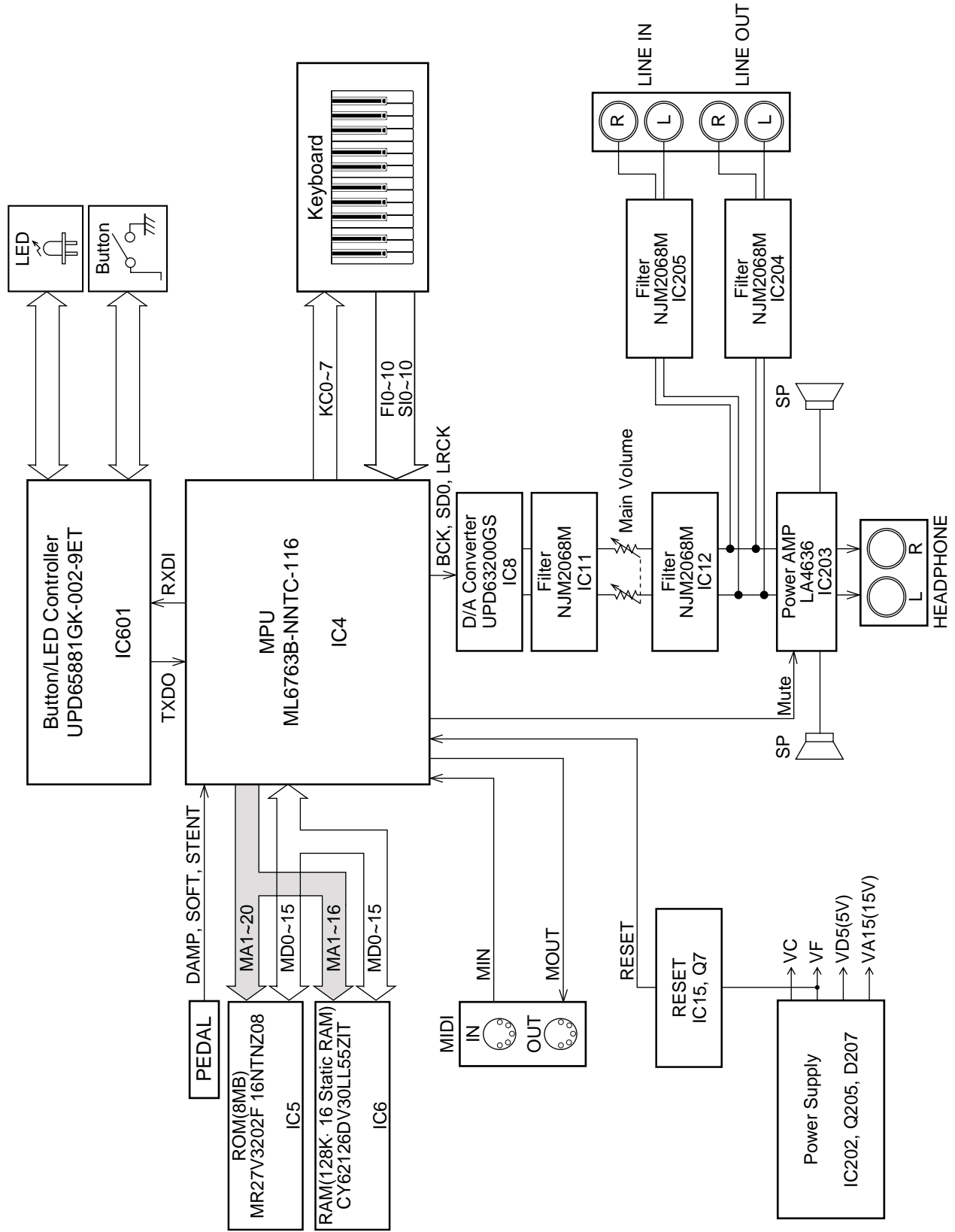
Specifications	1
Block Diagram	2
Circuit Description	3
Printed Circuit Board	4
Disassembly	6
Diagnostic Program	15
Schematic Diagrams	17
Exploded View	26
Parts List	28

SPECIFICATIONS

GENERAL

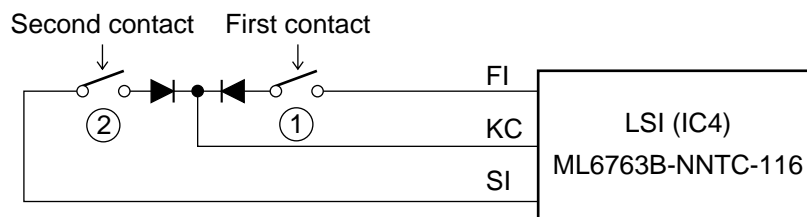
Keyboard:	88 piano keys (with touch response)
Polyphony:	32 notes, maximum
Tones:	10 tones (including two low-range tones for split), with layer and split
Digital Effects:	Reverb (4 types), Chorus (4 types)
Demo Tunes:	<ul style="list-style-type: none">• Number of Tunes: 8• Playback: Repeat (all tunes)
User Songs:	<ul style="list-style-type: none">• Number of Songs: Up to 10 download songs• Capacity: Approximately 7600 notes (45 kilobytes)
Memory:	<ul style="list-style-type: none">• Operations: Real-time recording, playback• Capacity: Approximately 5,200 notes (2 tracks)• Memory Backup: Built-in lithium battery (Battery Life: 5 years)
Pedals:	Damper, Soft/Sostenuto (Selectable)
Other Functions:	<ul style="list-style-type: none">• Metronome: Beat (6 types), Tempo (♩ = 30 to 255)• Touch Select: 3 types, off• Transpose: 1 octave (F# to C to F)• Tuning: A4 = 440Hz \pm50 cents (adjustable)
MIDI:	16 multi-timbre receive
Input/Output:	<ul style="list-style-type: none">• Headphones: Stereo standard jacks \times 2• MIDI (OUT) (IN)
Speakers:	\varnothing 12cm \times 2 (Output: 20 W + 20 W)
Power Supply:	AP-24: 120V AP-24V: 220-240V
Power Consumption:	AP-24: 55W AP-24V: 58W
Dimensions:	<ul style="list-style-type: none">• Digital Piano (without stand): 137.2 u 42.3 u 20.5 cm (54 $\frac{1}{16}$ \times 16 $\frac{11}{16}$ \times 8 $\frac{1}{16}$ inch)• Digital Piano: 138.5 \times 43.2 \times 81.0 cm (54 $\frac{9}{16}$ \times 17 \times 31 $\frac{15}{16}$ inch)
Weight:	<ul style="list-style-type: none">• Digital Piano (without stand): approximately 34.0 kg (75.0 lbs)• Digital Piano: Approximately 44.0 kg (97.0 lbs)

BLOCK DIAGRAM



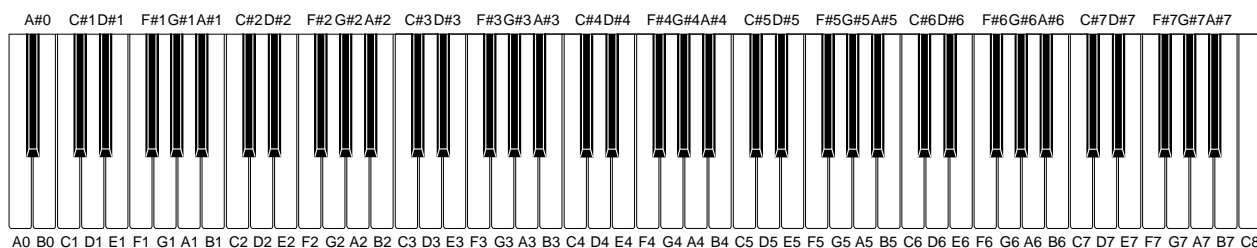
CIRCUIT DESCRIPTION

KEY MATRIX



	KC0	KC1	KC2	KC3	KC4	KC5	KC6	KC7
FI0	A0①	A0#①	B0①	C1①	C1#①	D1①	D1#①	E1①
SI0	A0②	A0#②	B0②	C1②	C1#②	D1②	D1#②	E1②
FI1	F1①	F1#①	G1①	G1#①	A1①	A1#①	B1①	C2①
SI1	F1②	F1#②	G1②	G1#②	A1②	A1#②	B1②	C2②
FI2	C2#①	D2①	D2#①	E2①	F2①	F2#①	G2①	G2#①
SI2	C2#②	D2②	D2#②	E2②	F2②	F2#②	G2②	G2#②
FI3	A2①	A2#①	B2①	C3①	C3#①	D3①	D3#①	E3①
SI3	A2②	A2#②	B2②	C3②	C3#②	D3②	D3#②	E3②
FI4	F3①	F3#①	G3①	G3#①	A3①	A3#①	B3①	C4①
SI4	F3②	F3#②	G3②	G3#②	A3②	A3#②	B3②	C4②
FI5	C4#①	D4①	D4#①	E4①	F4①	F4#①	G4①	G4#①
SI5	C4#②	D4②	D4#②	E4②	F4②	F4#②	G4②	G4#②
FI6	A4①	A4#①	B4①	C5①	C5#①	D5①	D5#①	E5①
SI6	A4②	A4#②	B4②	C5②	C5#②	D5②	D5#②	E5②
FI7	F5①	F5#①	G5①	G5#①	A5①	A5#①	B5①	C6①
SI7	F5②	F5#②	G5②	G5#②	A5②	A5#②	B5②	C6②
FI8	C6#①	D6①	D6#①	E6①	F6①	F6#①	G6①	G6#①
SI8	C6#②	D6②	D6#②	E6②	F6②	F6#②	G6②	G6#②
FI9	A6①	A6#①	B6①	C7①	C7#①	D7①	D7#①	E7①
SI9	A6②	A6#②	B6②	C7②	C7#②	D7②	D7#②	E7②
FI10	F7①	F7#①	G7①	G7#①	A7①	A7#①	B7①	C8①
SI10	F7②	F7#②	G7②	G7#②	A7②	A7#②	B7②	C8②

NOMENCLATURE OF KEYS

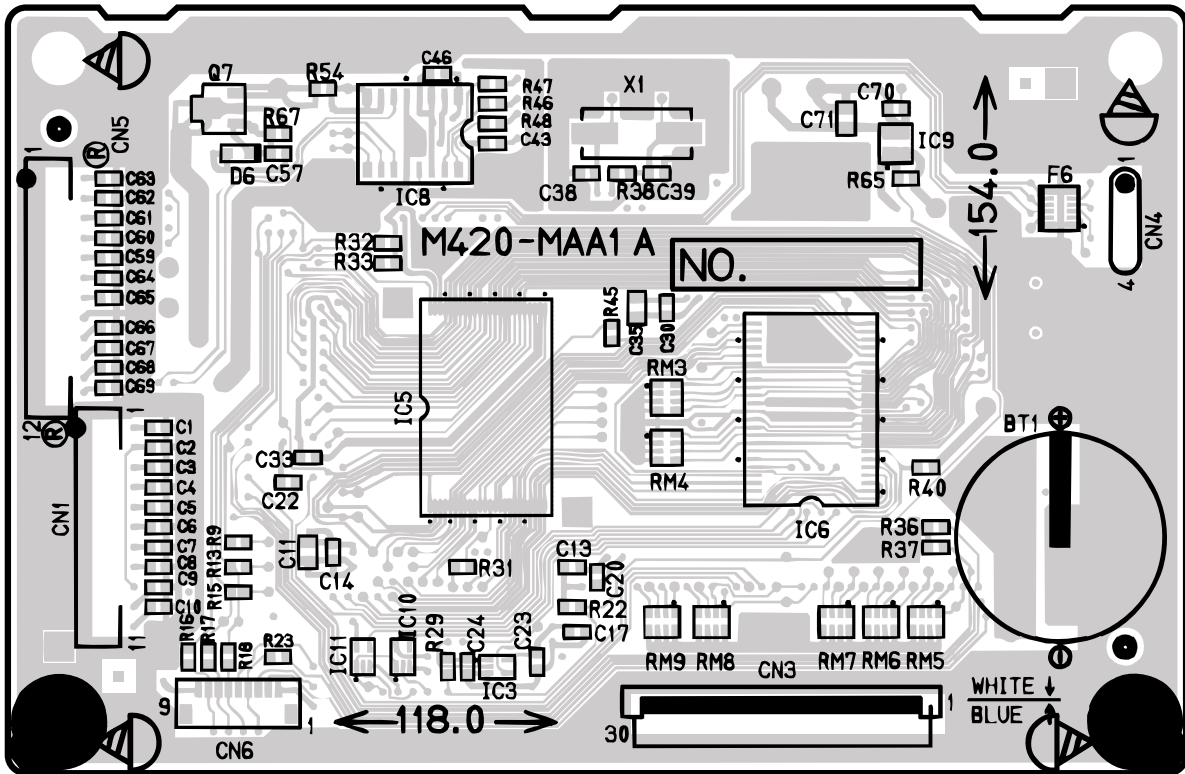


BUTTON MATRIX

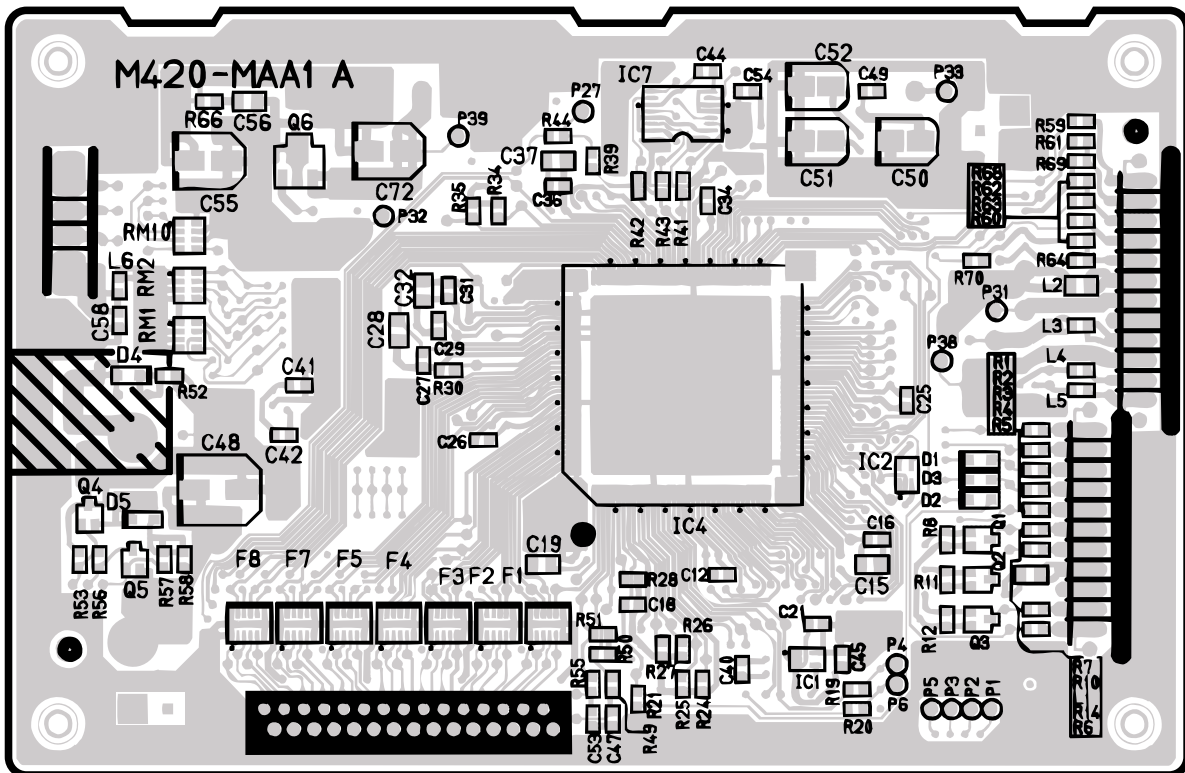
	KI0	KI1
KC0	CONTROL	—
KC1	SPLIT	METRONOME
KC2	START/STOP	RECORD

PRINTED CIRCUIT BOARD

MAIN PCB M420-MAA1

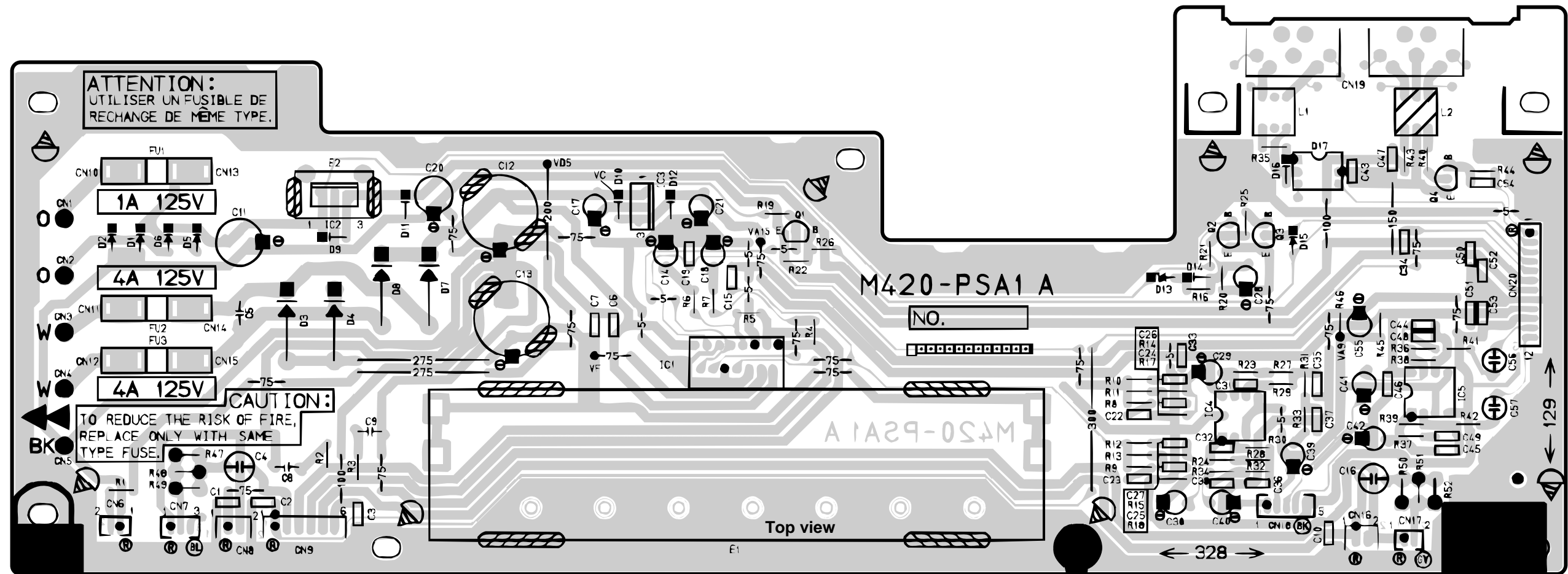


Top view

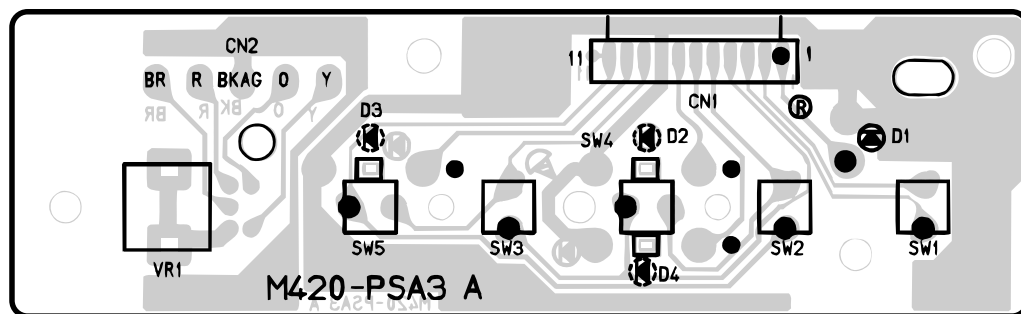


Bottom view

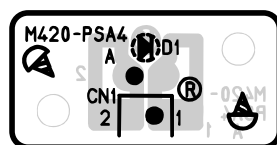
SUB PCB M420-PSA1



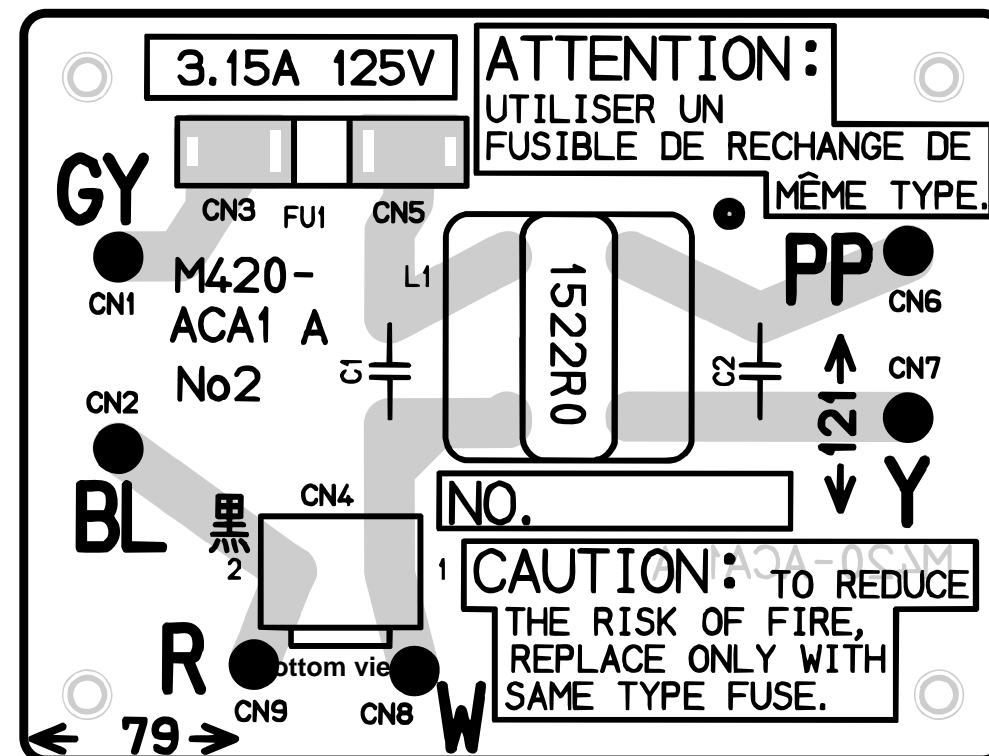
CONSOLE PCB M420-PSA3



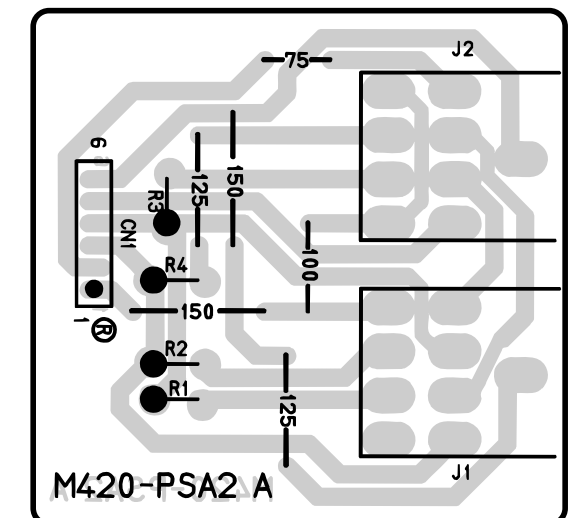
LED PCB M420-PSA4



POWER SUPPLY PCB M420-ACA1



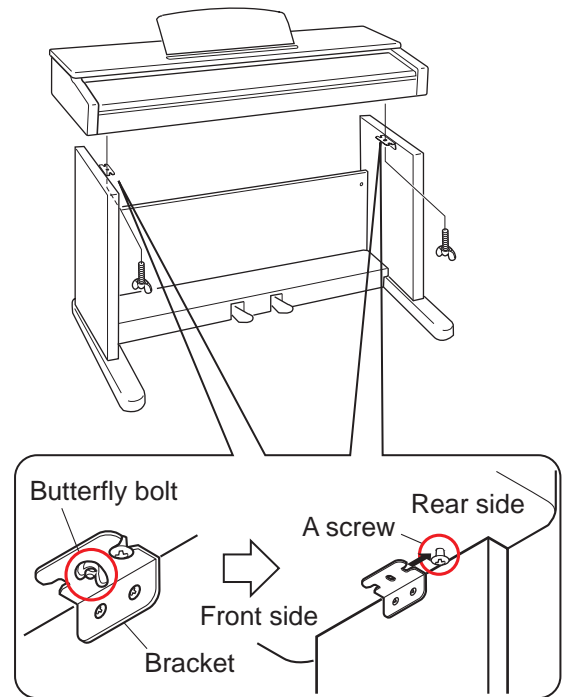
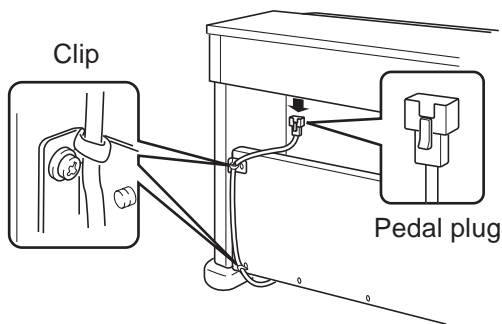
JACK PCB M420-PSA2



DISASSEMBLY

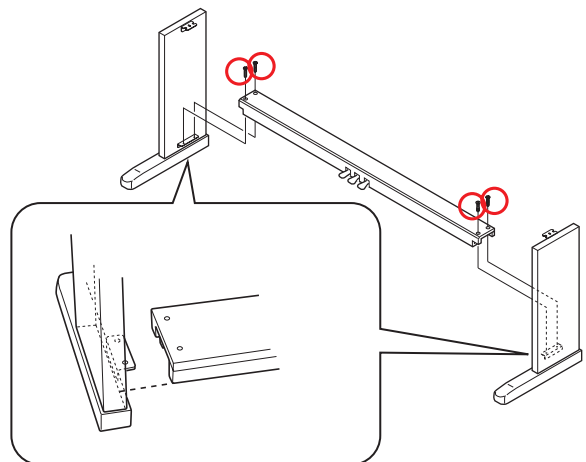
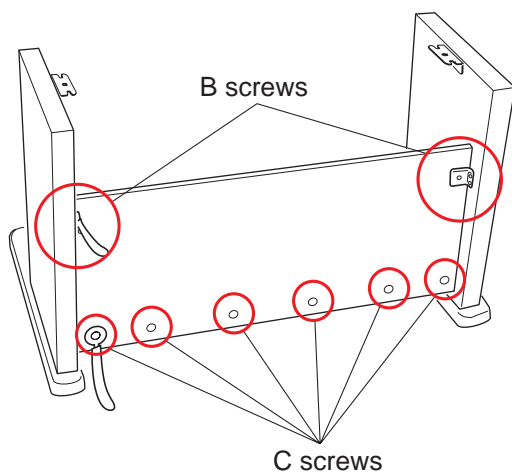
■ To remove the piano from the stand

1. Remove the pedal plug from the pedal connector on the bottom of the piano, and then remove the pedal cord from the clip.
2. Remove two butterfly bolts. Slide the piano toward the rear side, and then remove it from the brackets.



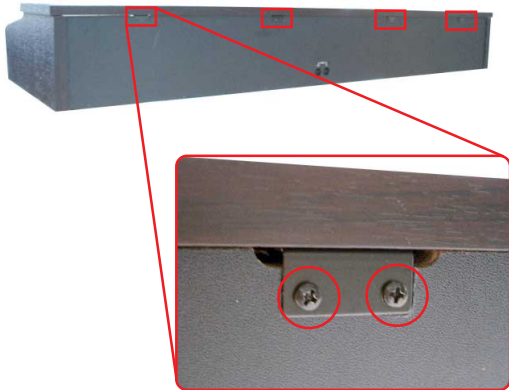
■ To remove the pedal from the stand

1. Remove the two B screws and six C screws.
2. Remove four screws.

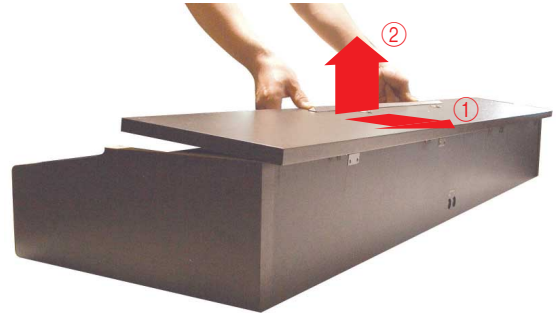


■ To remove the top board

1. Remove eight screws.

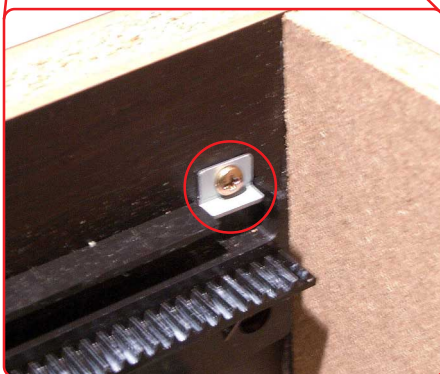
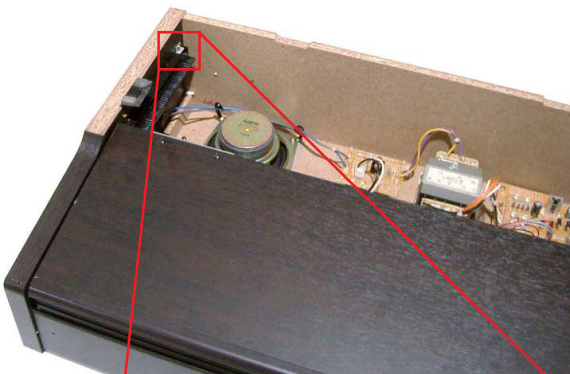


2. Slide the top board toward the front side. Next, lift the top board and remove it from the piano.

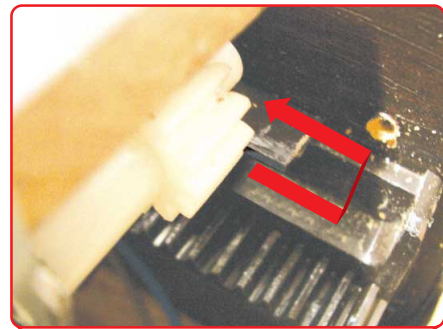


■ To remove the keyboard cover

1. Close the keyboard cover.
2. Remove one screw and the bracket.



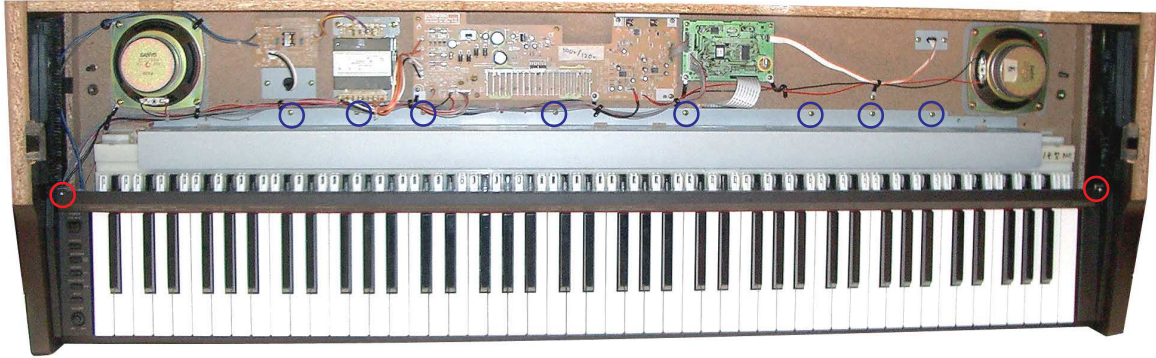
3. Lift the gear part upward (①), and then slide the keyboard cover toward the rear side (②) to remove it.



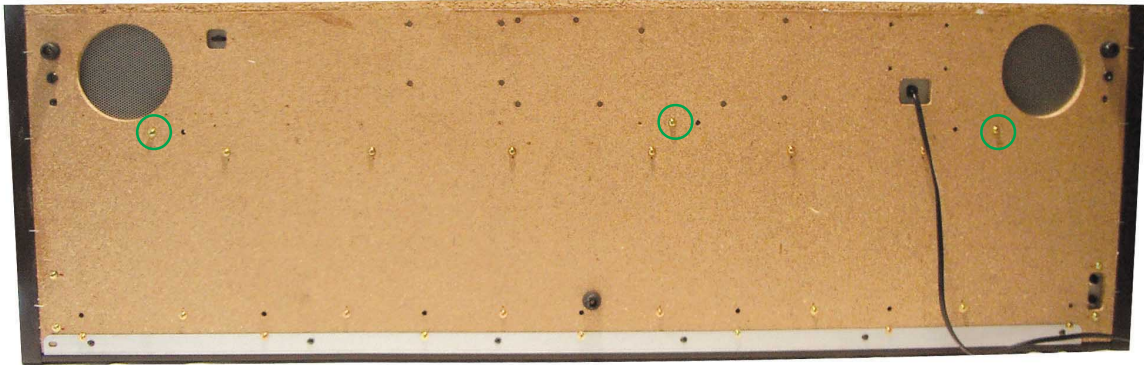
■ To remove the keyboard

1. Remove the two A screws on the front side and the panel.
2. Remove the three C screws on the back side. Next, remove the eight B screws on the front side and remove the bracket.

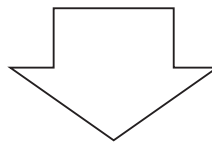
Front side



Back side

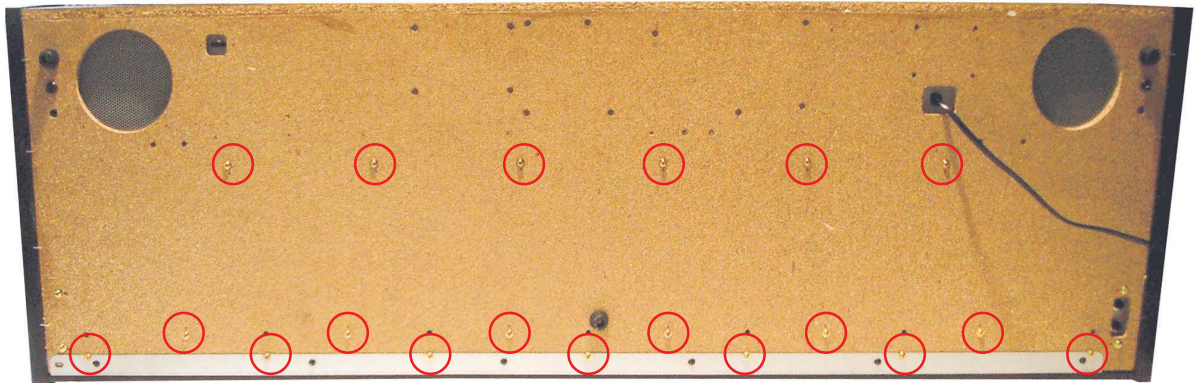


○ A screw ○ B screws ○ C screws

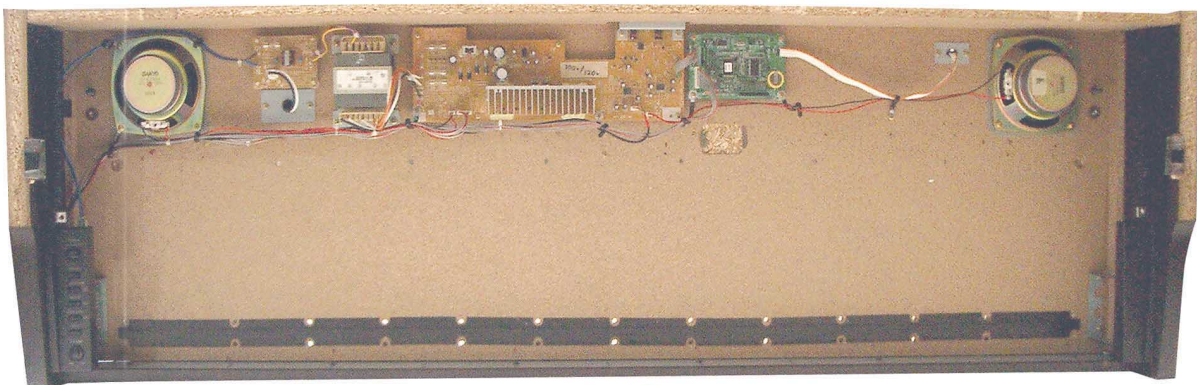
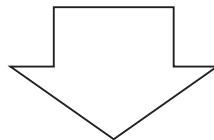
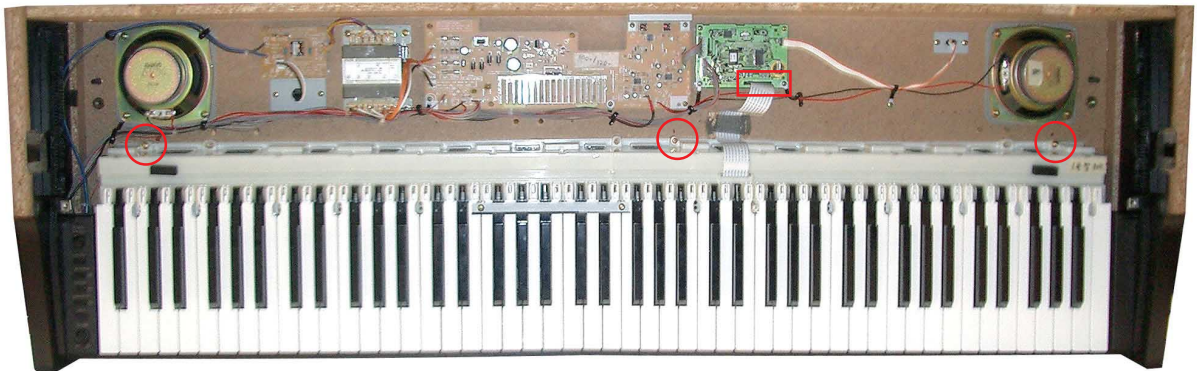


3. Remove 19 screws on the back side. Next, remove three screws and one FPC on the front side, and then remove the key ASSY.

Back side

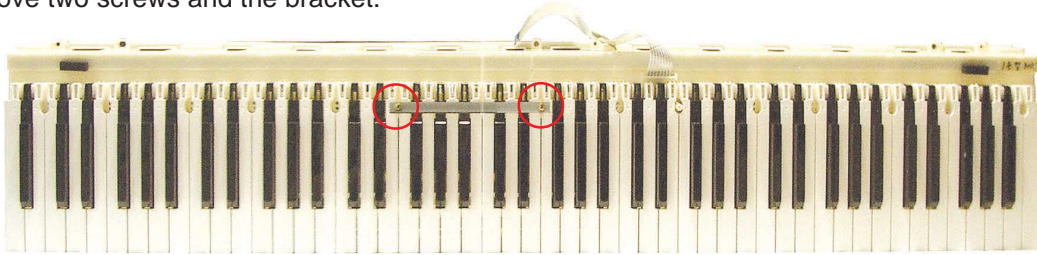


Front side

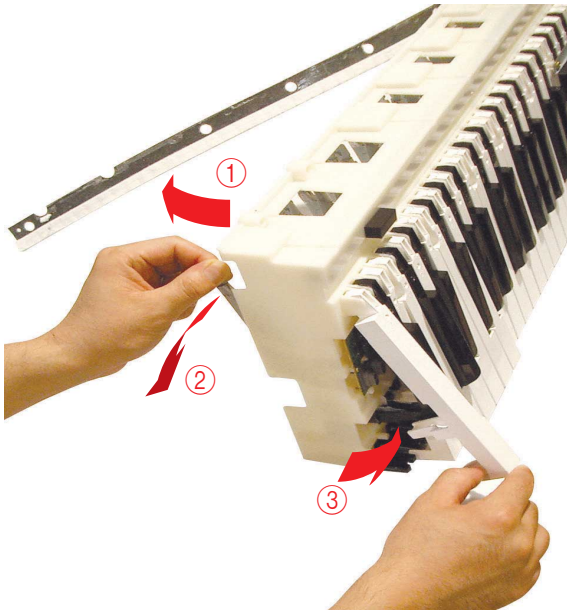


■ To remove the key PCB

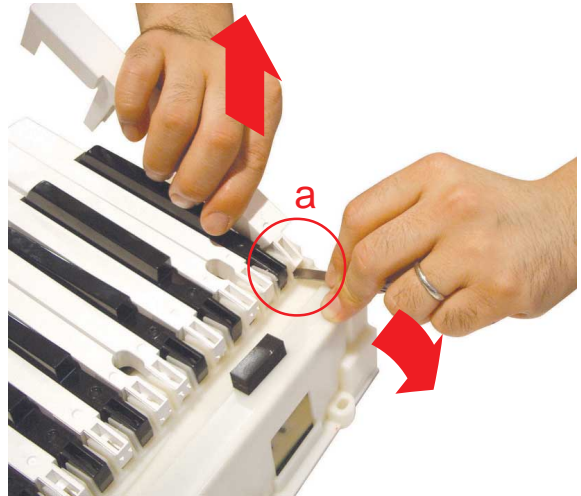
1. Remove two screws and the bracket.



2. Remove the cushion (①), pull the hammer (②), and then remove the key from the hammer (③).



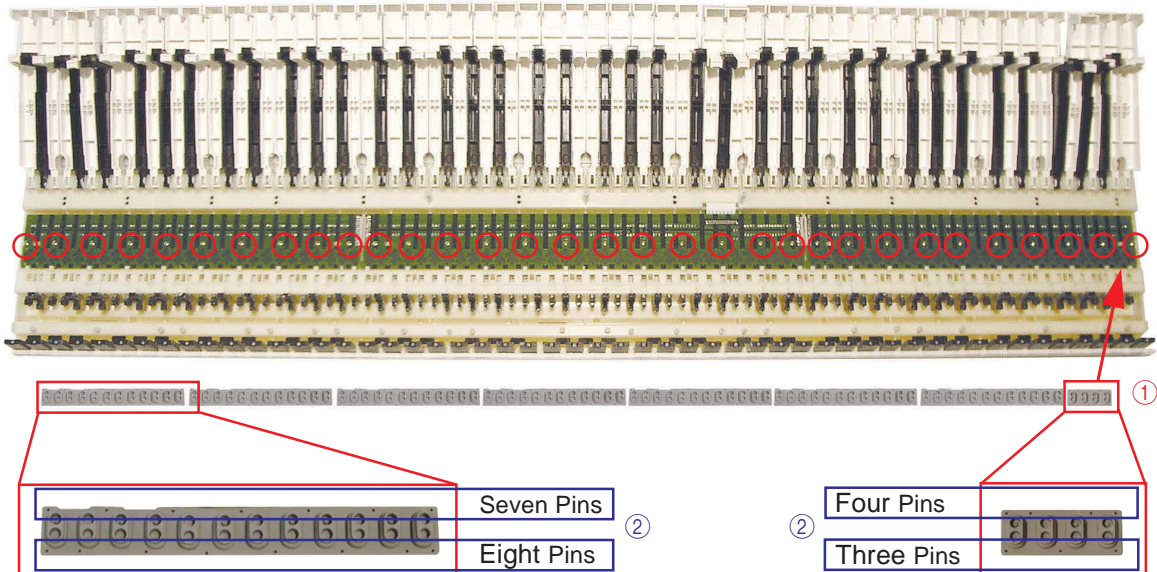
3. Insert the edge of the tweezers as shown in part a of the below figure to remove the key.



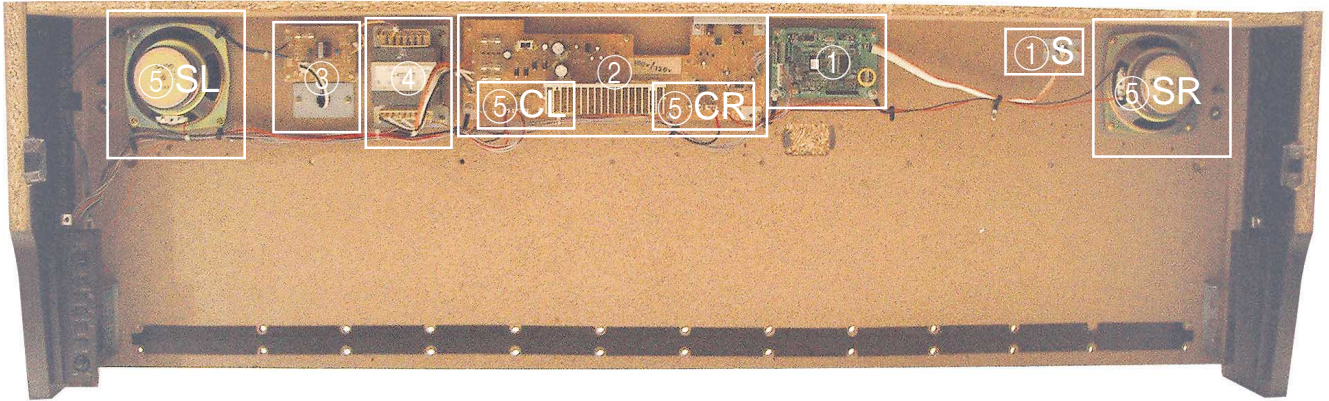
4. Remove eight rubber keys.
5. Remove 32 screws and the key PCB.

*Precautions when assembling the rubber keys

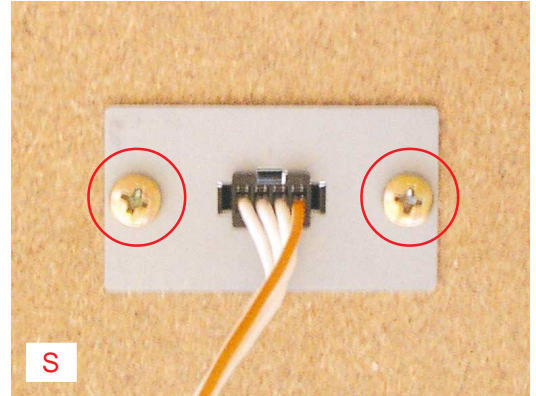
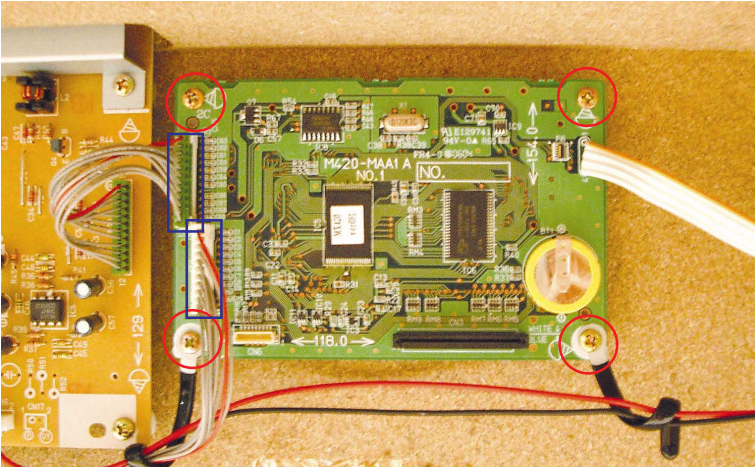
- ① The length of this only one rubber key is different.
- ② The numbers of pins on the upper and lower sides are different.
- ③ Insert the pins and fix them tightly.



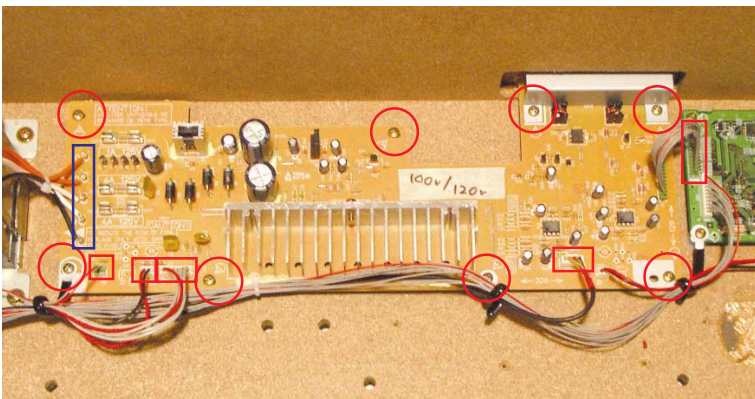
■ To remove the PCB



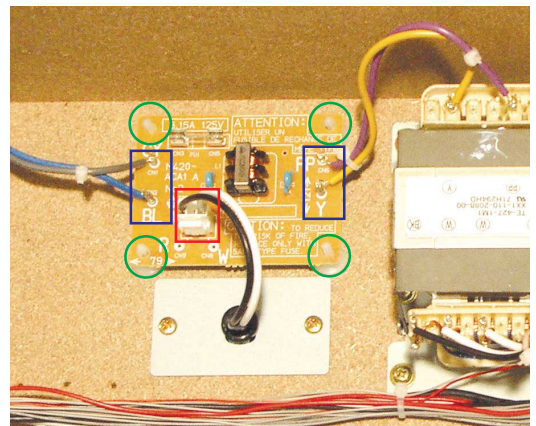
- ①. To remove the M420-MAA1 PCB
Remove six screws and two connectors.



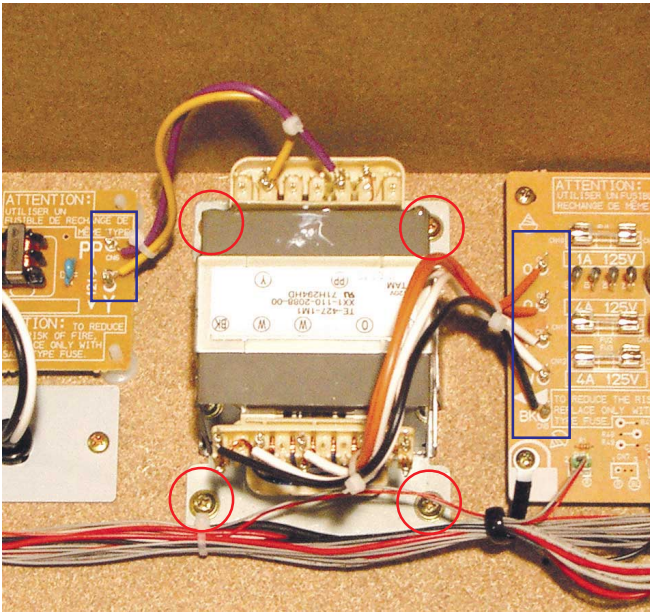
- ②. To remove the M420-PSA1 PCB
Remove eight screws, five connectors, and five lead wires.



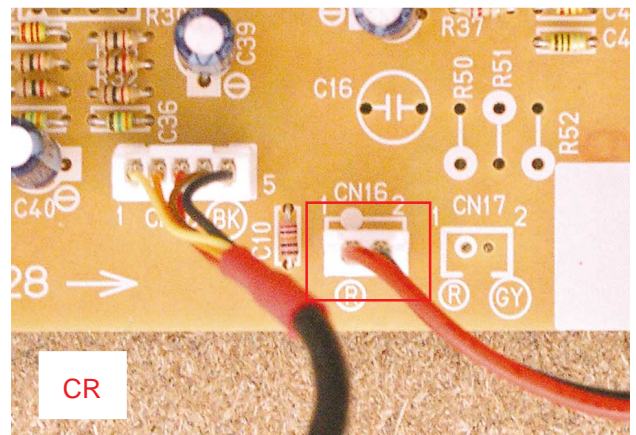
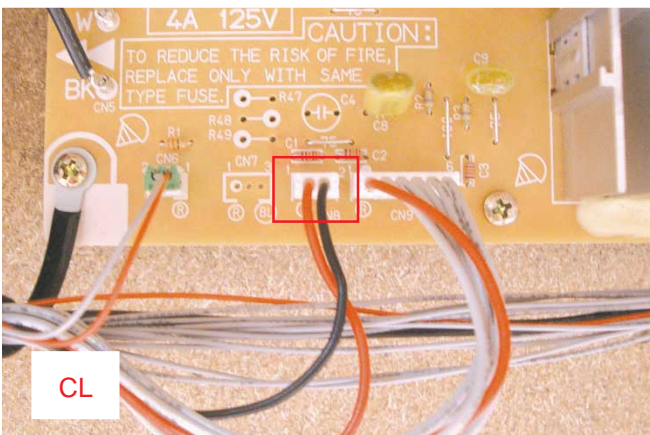
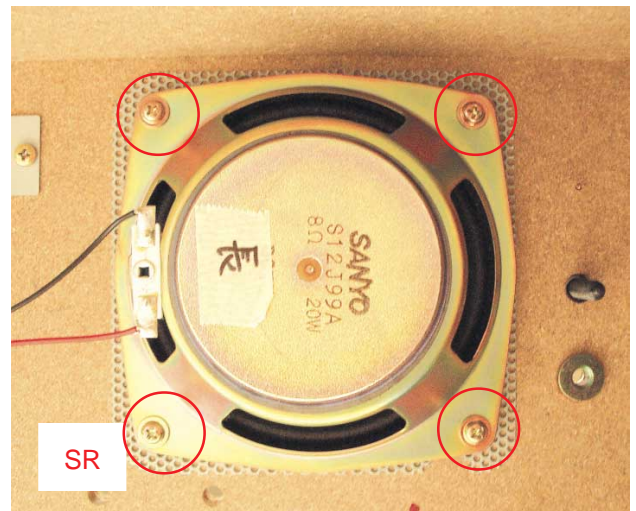
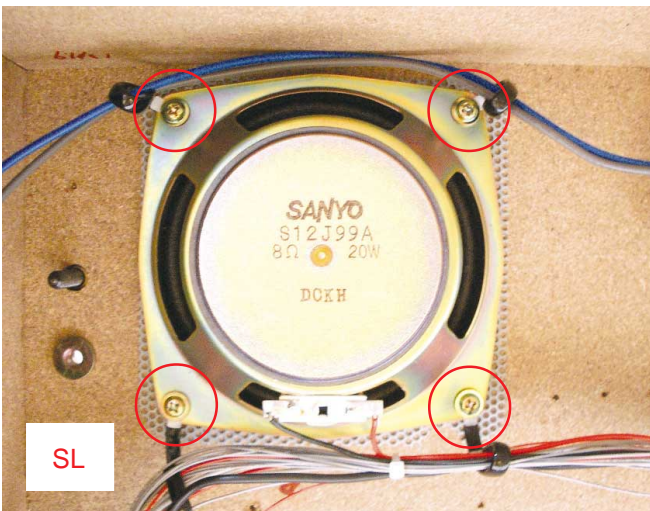
- ③. To remove the M420-ACA1U PCB
Remove four lead wires, one connector, and four clips.



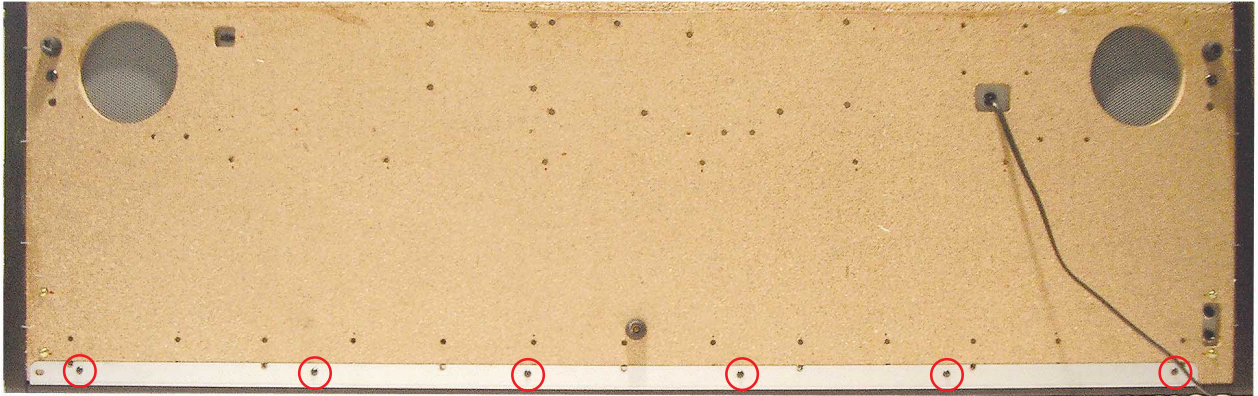
- ④. To remove the transformer
Remove four screws and seven lead wires.



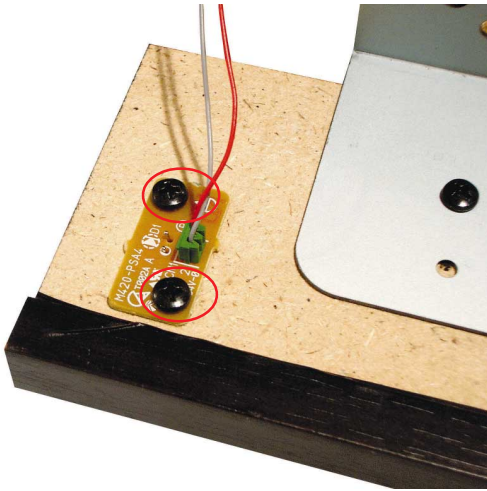
- ⑤. To remove the speaker
Remove eight screws and two connectors.



- To remove the M420-PSA4 PCB
 1. Remove six screws and the front board.



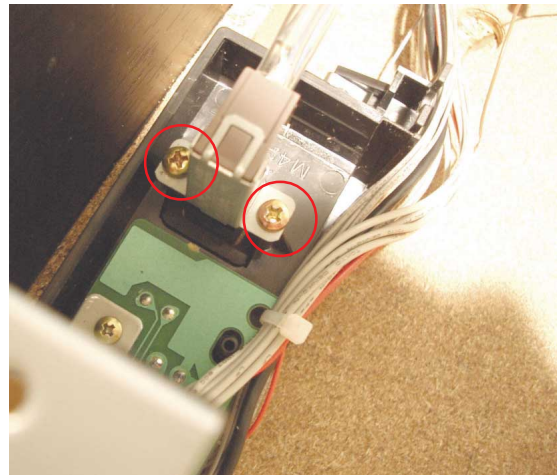
2. Remove two screws and the PSA4 PCB.



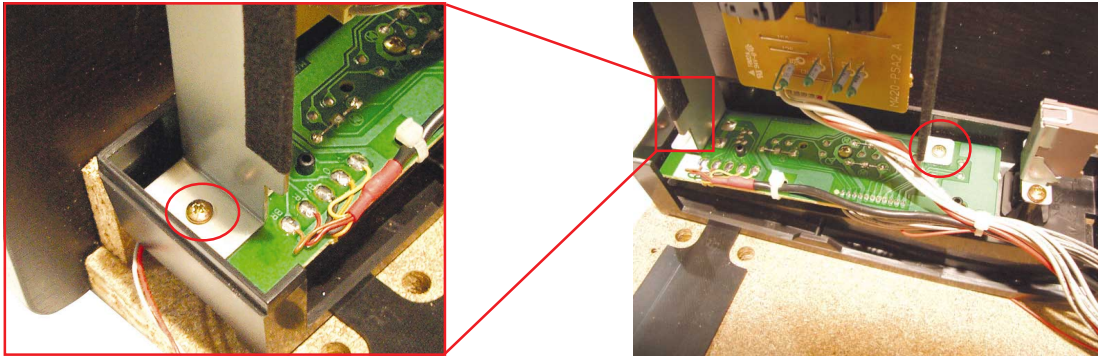
- To remove the M420-PSA2 PCB and the M420-PSA3 PCB
 1. Remove three screws.



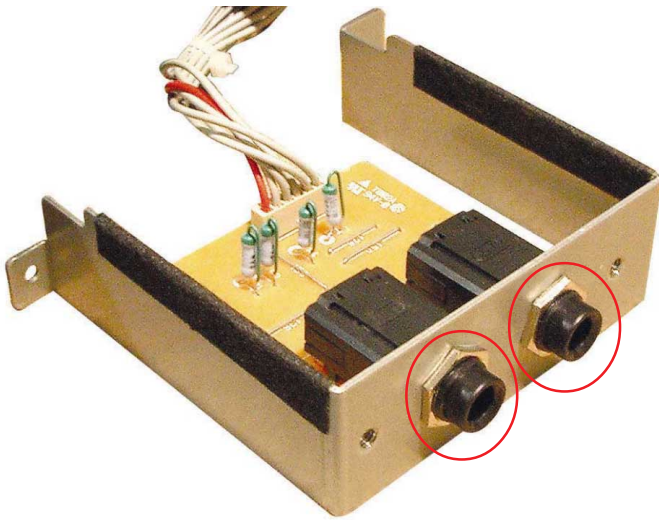
2. Remove two screws and the switch.



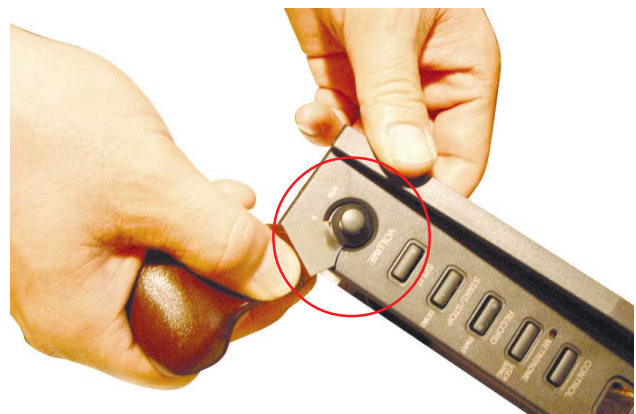
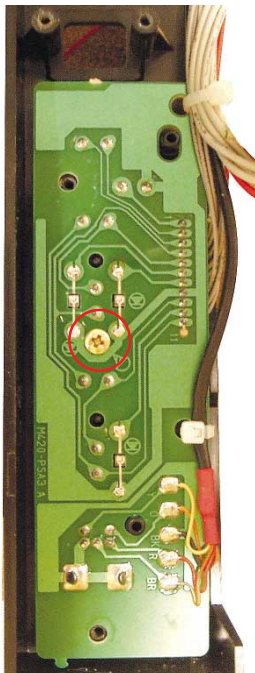
3. Remove two screws and the bracket.



4. Remove two nuts and the M420-PSA2 PCB.



5. Remove one screw and one volume knob, and then remove the M420-PSA3 PCB.



DIAGNOSTIC PROGRAM

■ Initial Setup

1. Connect an AC adaptor.
2. Connect a Pedal.
3. "Main" volume: MAX.

NOTE: If there is no pedal cable, pedal check can be skipped.

■ How to start diagnostic program

1. Press the "POWER" button while pressing the "METRONOME" buttons.
2. Release the "POWER" button first while still pressing the "METRONOME" buttons.
All the LEDs light and the test mode boots.

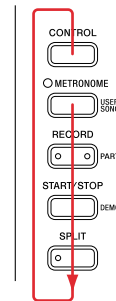
■ Diagnostic program

1. Automatic Test

- ① RAM CHECK
 - * When an error is found in RAM, "USER_SONG" LED lights.
- ② ROM CHECK
 - * When an error is found in ROM, "SPLIT" LED lights.
 - * The confirmation chord of C4, E4 and G4 sounds.
- ③ LED CHECK
 - The LED continues to light in the order of USER_SONG → PART(L) → PART(R) → SPLIT.

2. BUTTON check

- ① Press "CONTROL" button.
 - * The confirmation chord of C4, E4 and G4 sounds.
- ② Press the buttons in the following order.
 - (1) "METRONOME" Button
 - * The confirmation tone of C6 sounds.
 - (2) "RECORD" Button
 - * The confirmation tone of C6 sounds.
 - (3) "START/STOP" Button
 - * The confirmation tone of C6 sounds.
 - (4) "SPLIT" Button
 - * The confirmation tone of C6 sounds.
 - (5) "CONTROL" Button
 - * The confirmation chord of C4, E4 and G4 sounds.



3. Pedal check (If there is no Pedal, this check can be skipped)

- ① Press "CONTROL" button.
 - *The confirmation chord of C4, E4 and G4 sounds.
- ② Press the "DAMPER" pedal.
 - * The confirmation tone of C4 sounds and "PART(R)" LED lights.
- ③ Press the "SOFT" pedal.
 - * The confirmation tone of C4 sounds and "PART(L)" LED lights.

4. Headphone check

- ① Press "CONTROL" button.
* The confirmation chord of C4, E4 and G4 sounds.
- ② Connect the headphone to the jack.
* "PART(R)" LED lights.
- ③ Remove the headphone from the jack.
* "PART(L)" LED lights.
- ④ Connect the tuning meter to the jack.
* "PART(R)" LED lights.
- ⑤ Press A4 key.
* Make sure that the tuning meter is set at 440 ± 2 cents.
- ⑥ Remove the tuning meter from the jack.
* "PART(L)" LED lights.

5. MIDI IN/OUT check (If there is no MIDI cable, this check can be skipped)

- ① Connect MIDI IN and MIDI OUT terminals with a MIDI cable.
- ② Press "CONTROL" button.
* The confirmation chord of C4, E4 and G4 sounds.
* "PART(L)" LED lights.
- ③ Press "A4 KEY" button.
* The confirmation chord of C4, E4 and G4 sounds.

6. ROM version check

Version: 1.20

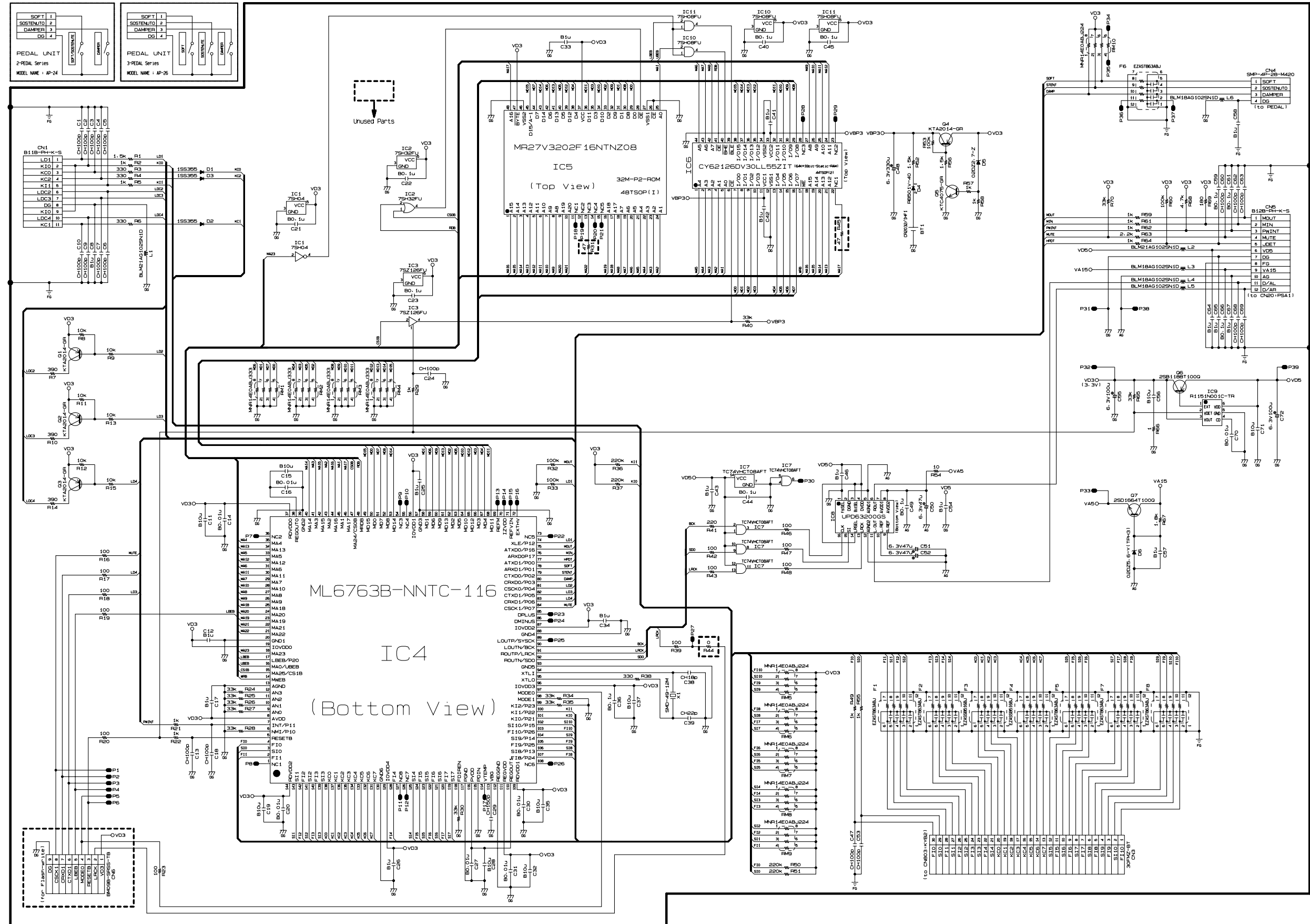
* LED should be in the following state.

USER_SONG LED:	Turn on
PART(L) LED:	Turn off
PART(R) LED:	Turn off
SPLIT LED:	Turn off

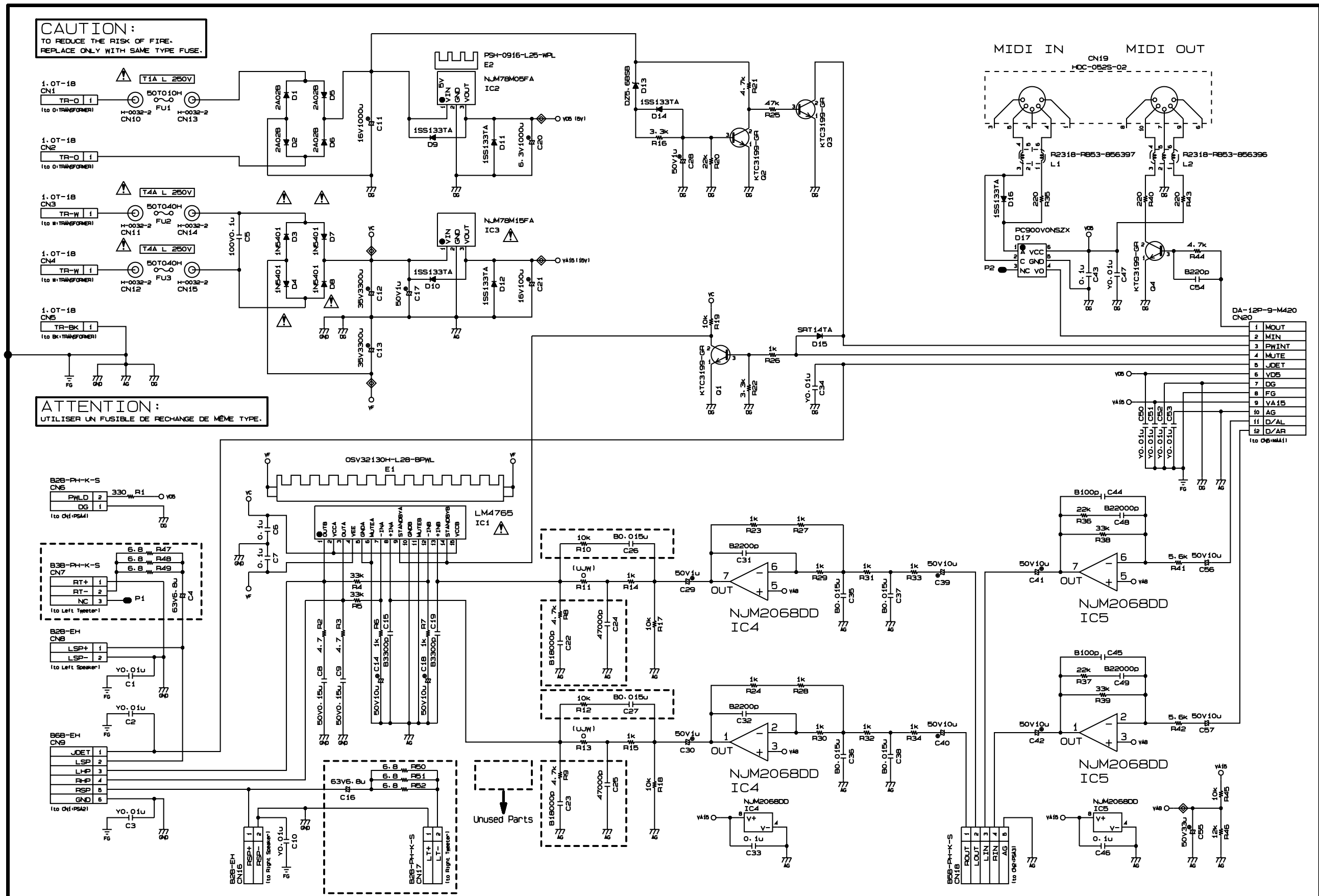
7. The diagnostic program ends.

SCHEMATIC DIAGRAMS

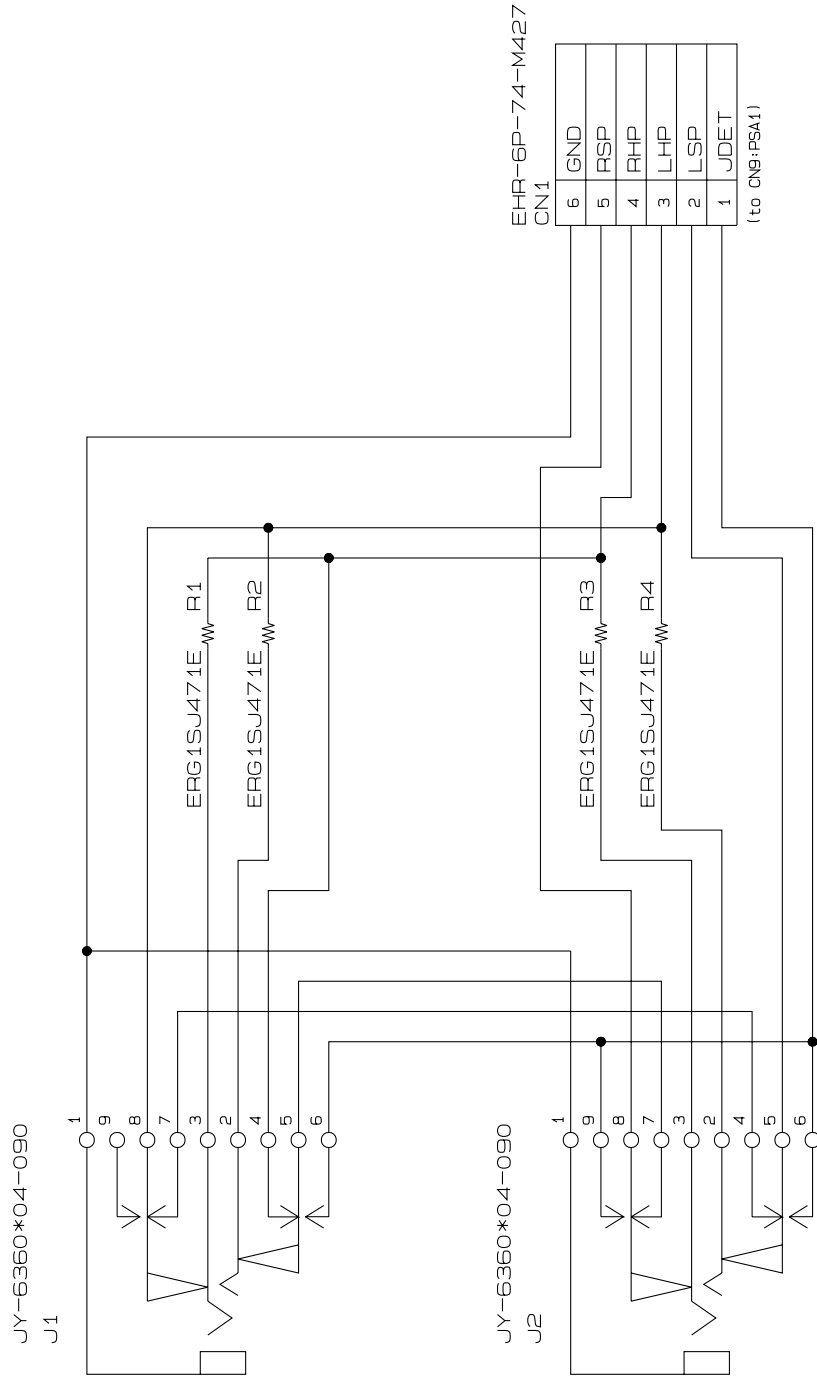
MAIN PCB M420-MAA1



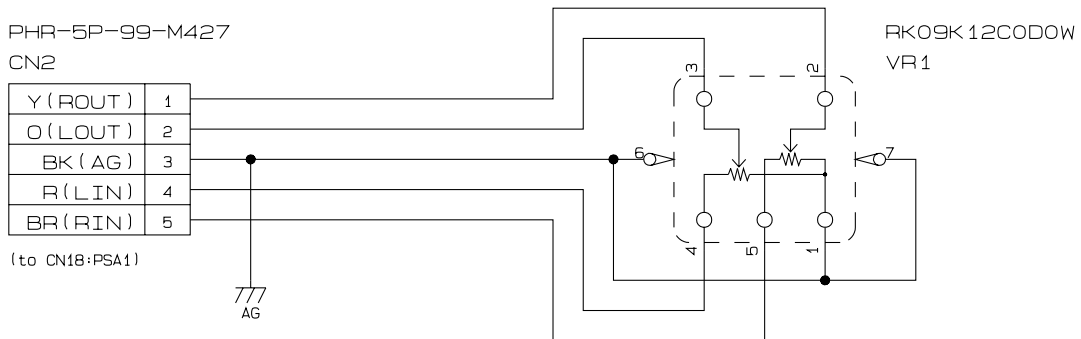
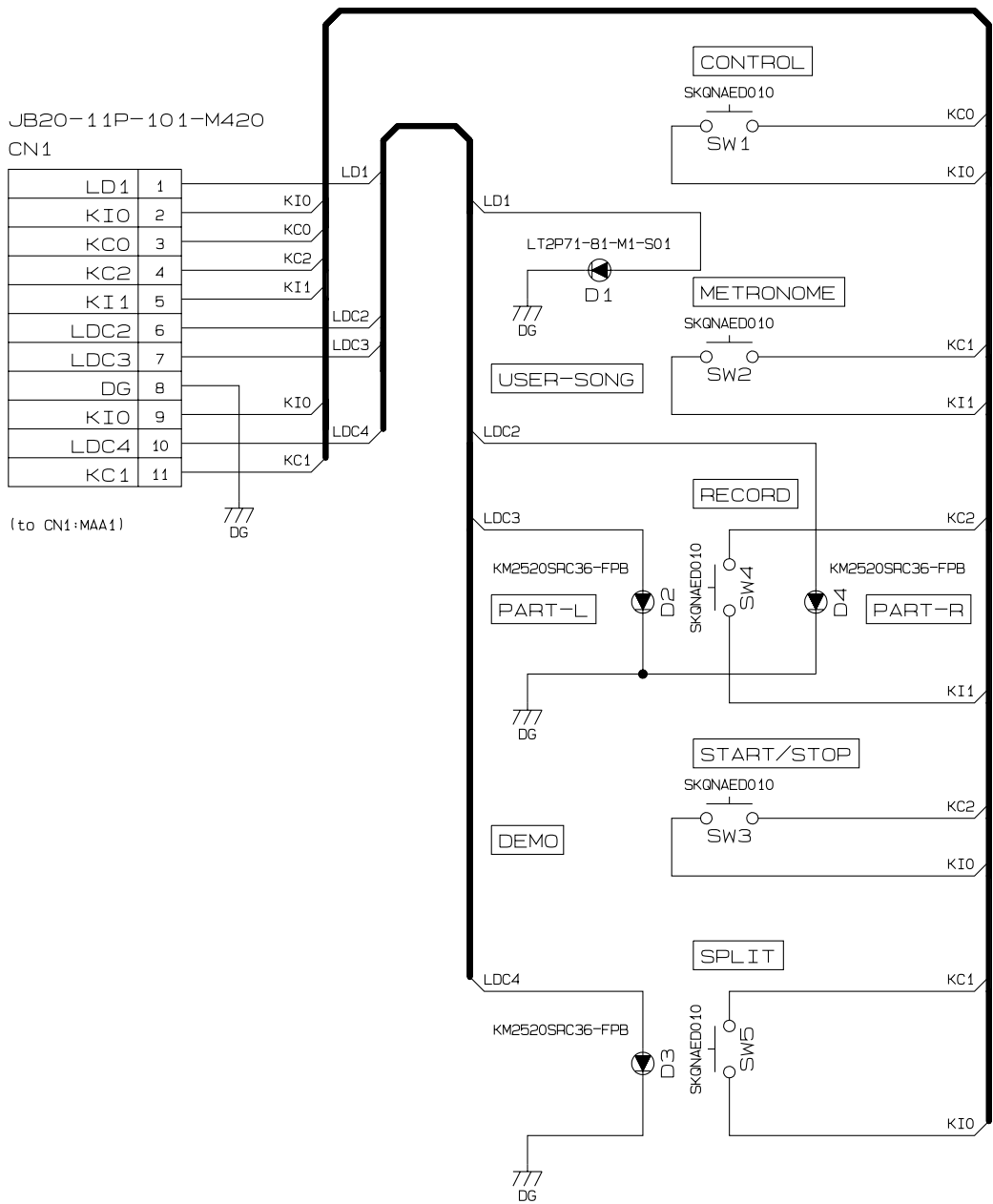
SUB PCB M420-PSA1



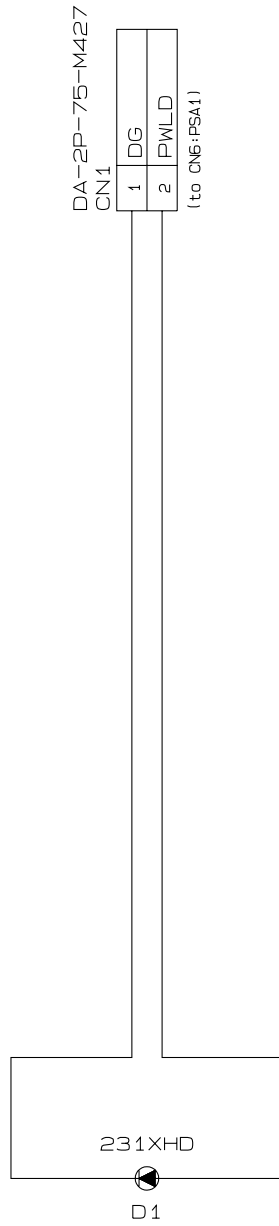
JACK PCB M420-PSA2



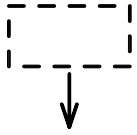
CONSOLE PCB M420-PSA3



LED PCB M420-PSA4

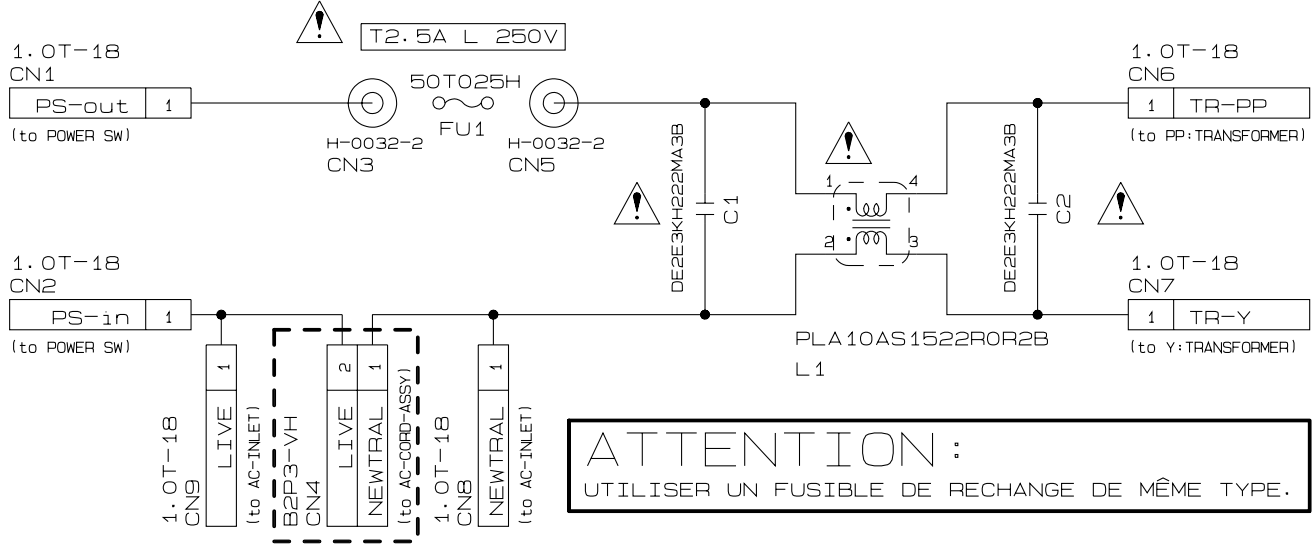


POWER SUPPLY PCB M420-ACA1

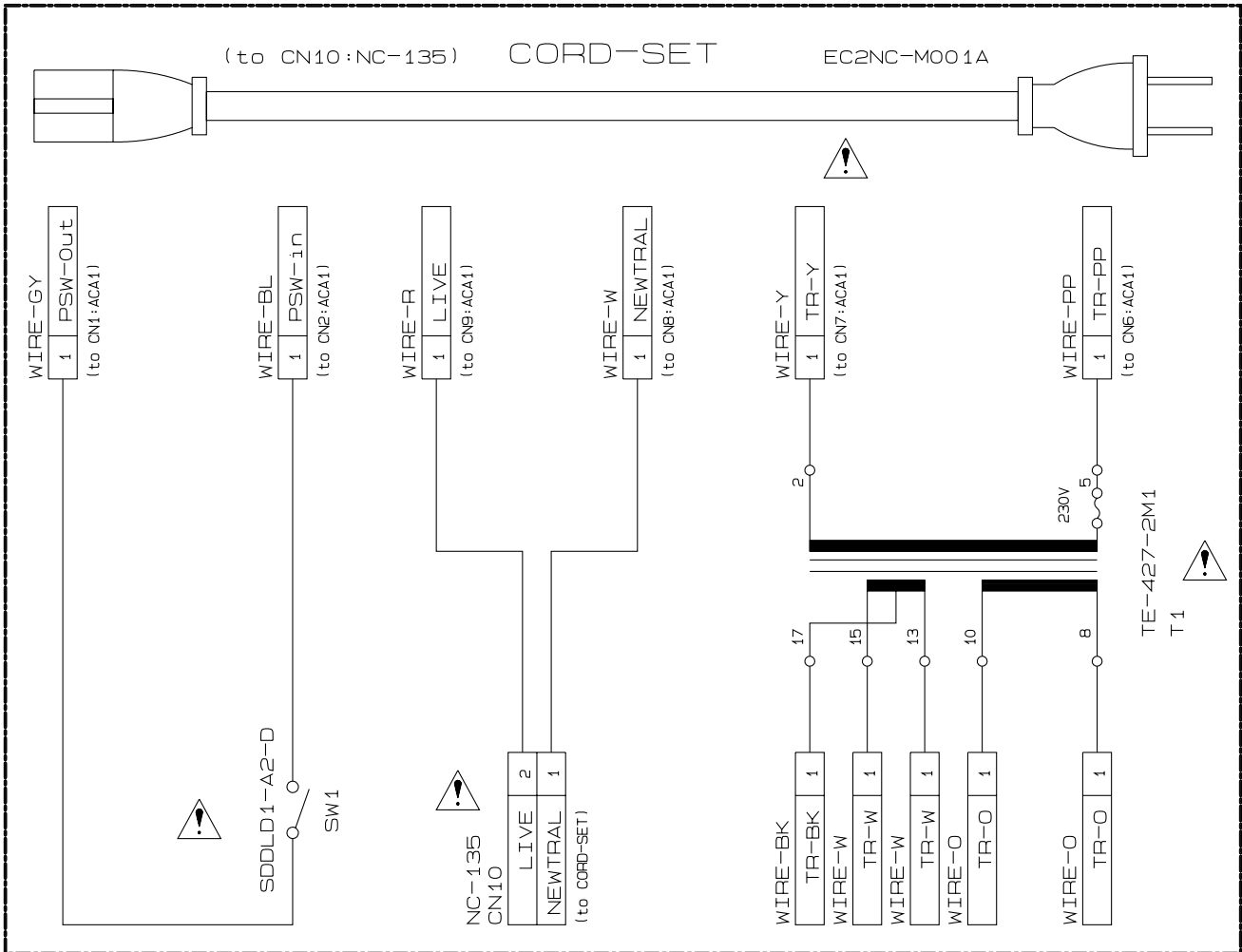


Unused Parts

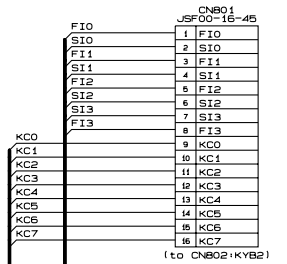
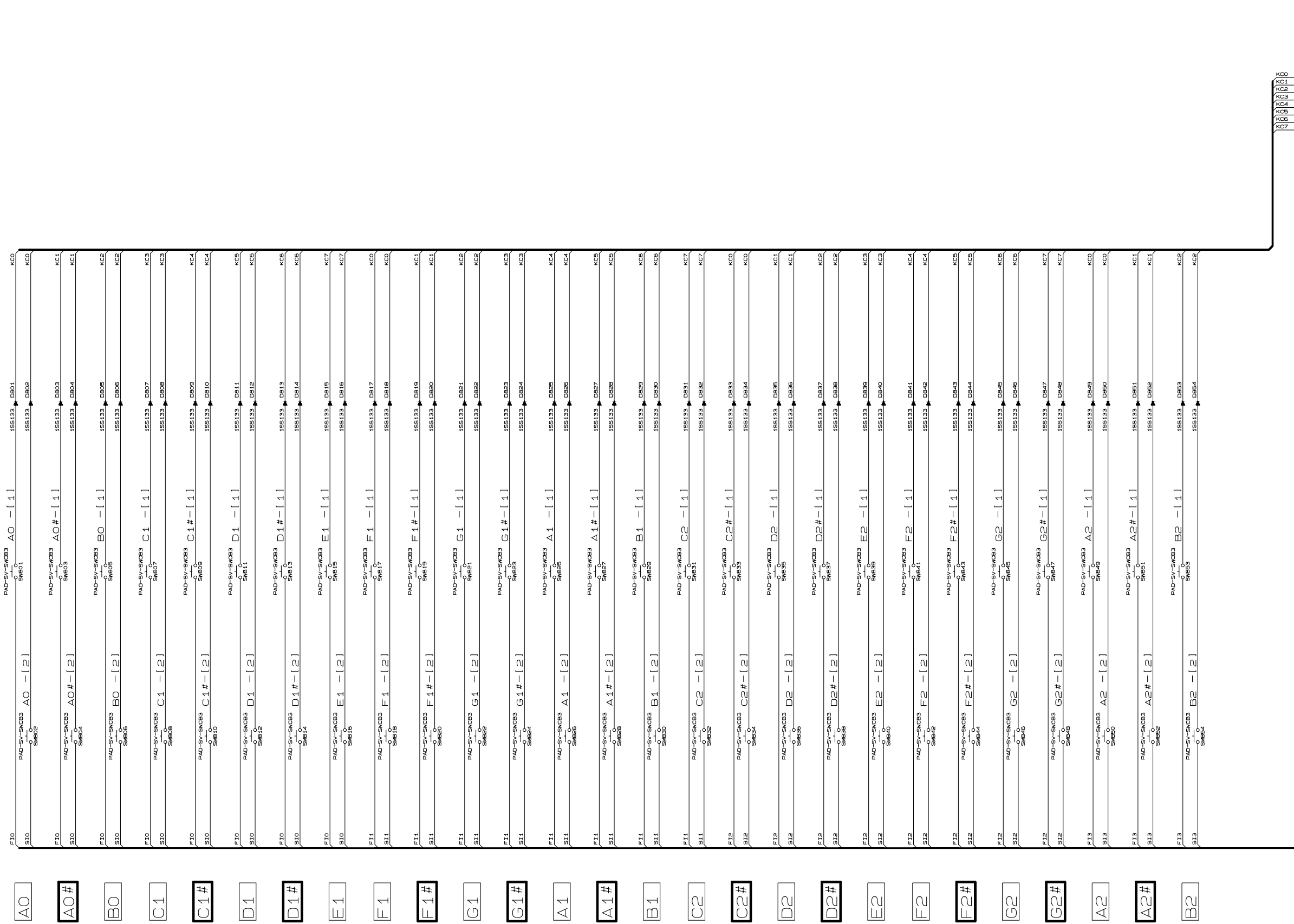
CAUTION :
TO REDUCE THE RISK OF FIRE.
REPLACE ONLY WITH SAME TYPE FUSE.



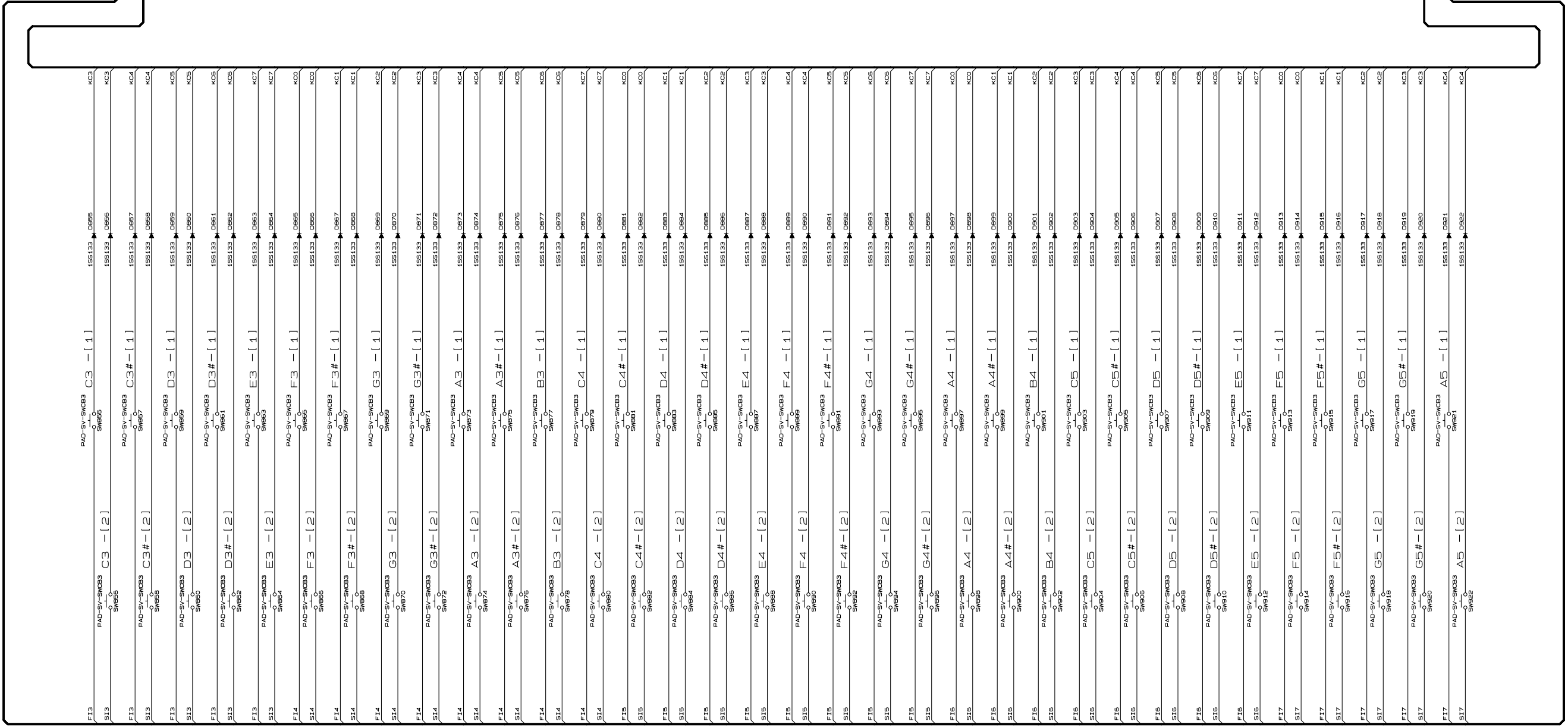
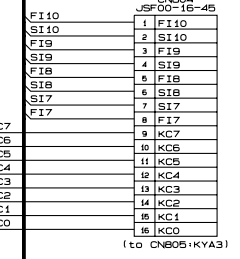
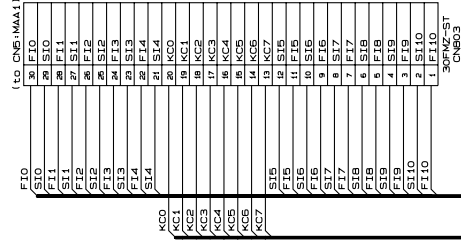
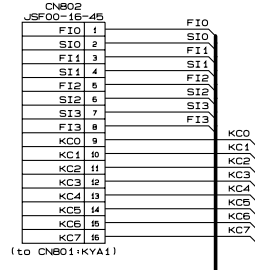
ATTENTION :
UTILISER UN FUSIBLE DE RECHANGE DE MÊME TYPE.



Keyboard PCB MPCK-KYA1

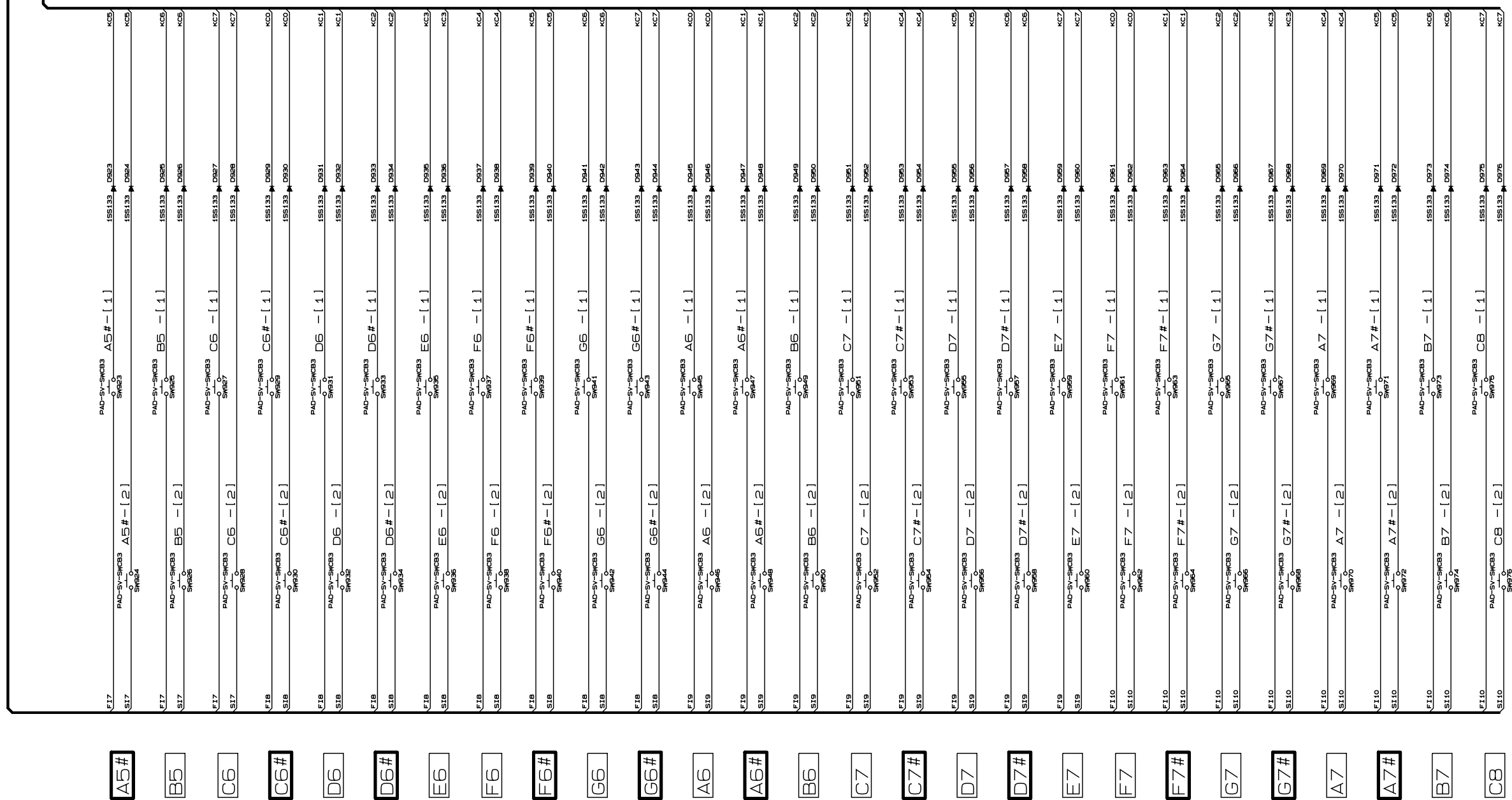
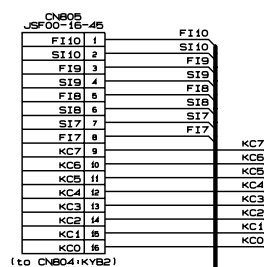


Keyboard PCB MPCK-KYB2

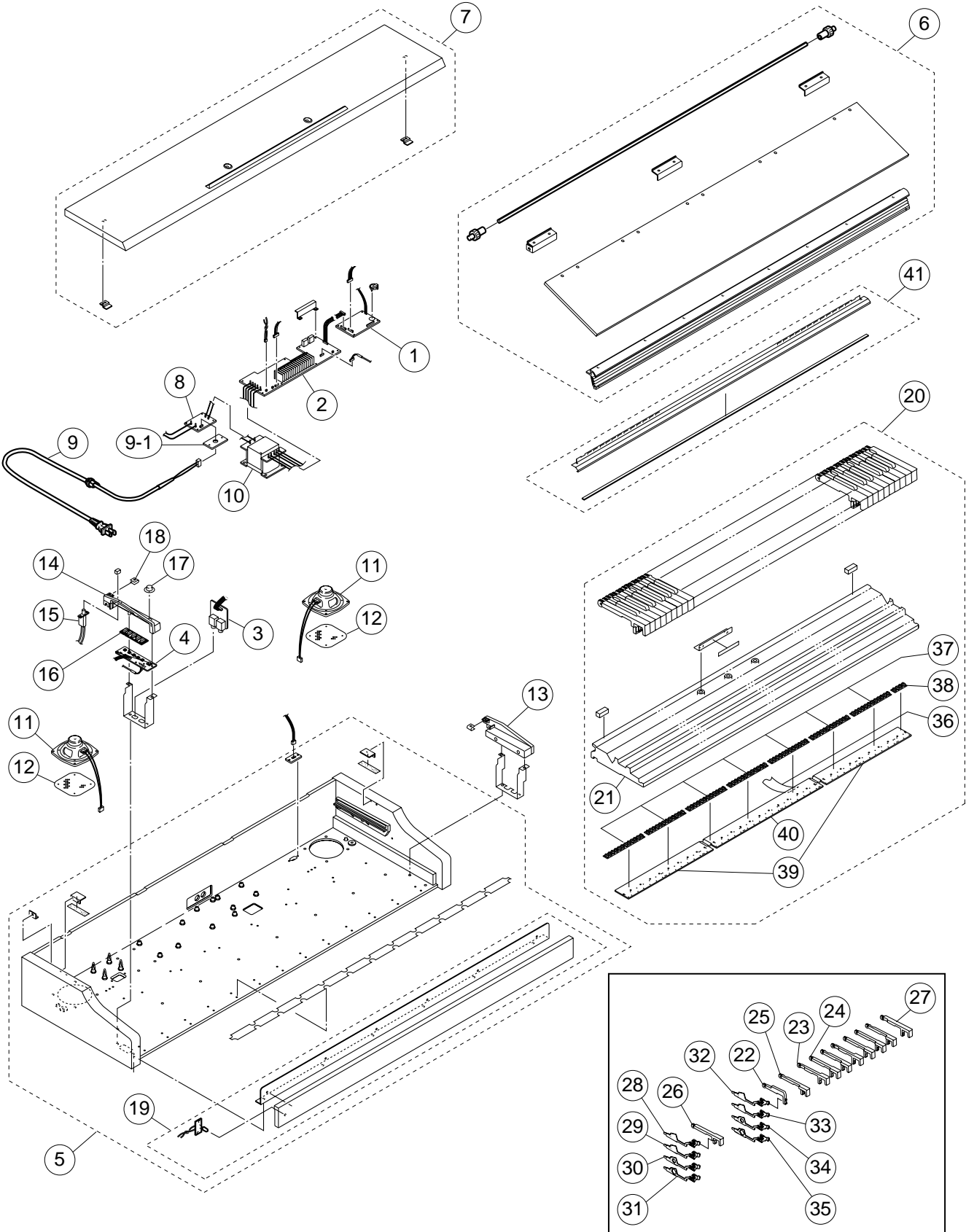


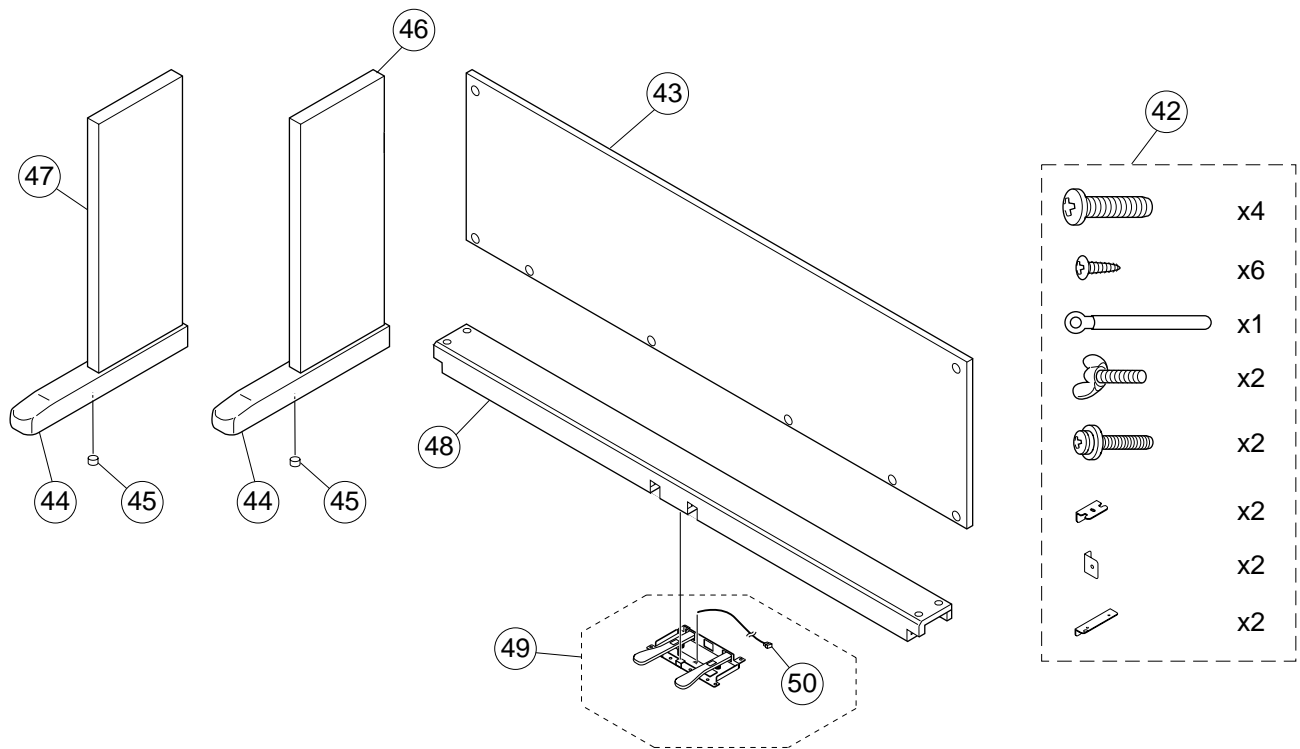
- C3
- C3#
- D3
- D3#
- E3
- F3
- F3#
- G3
- G3#
- A3
- A3#
- B3
- C4
- C4#
- D4
- D4#
- E4
- F4
- F4#
- G4
- G4#
- A4
- A4#
- B4
- C5
- C5#
- D5
- D5#
- E5
- F5
- F5#
- G5
- G5#
- A5

Keyboard PCB MPCK-KYA3

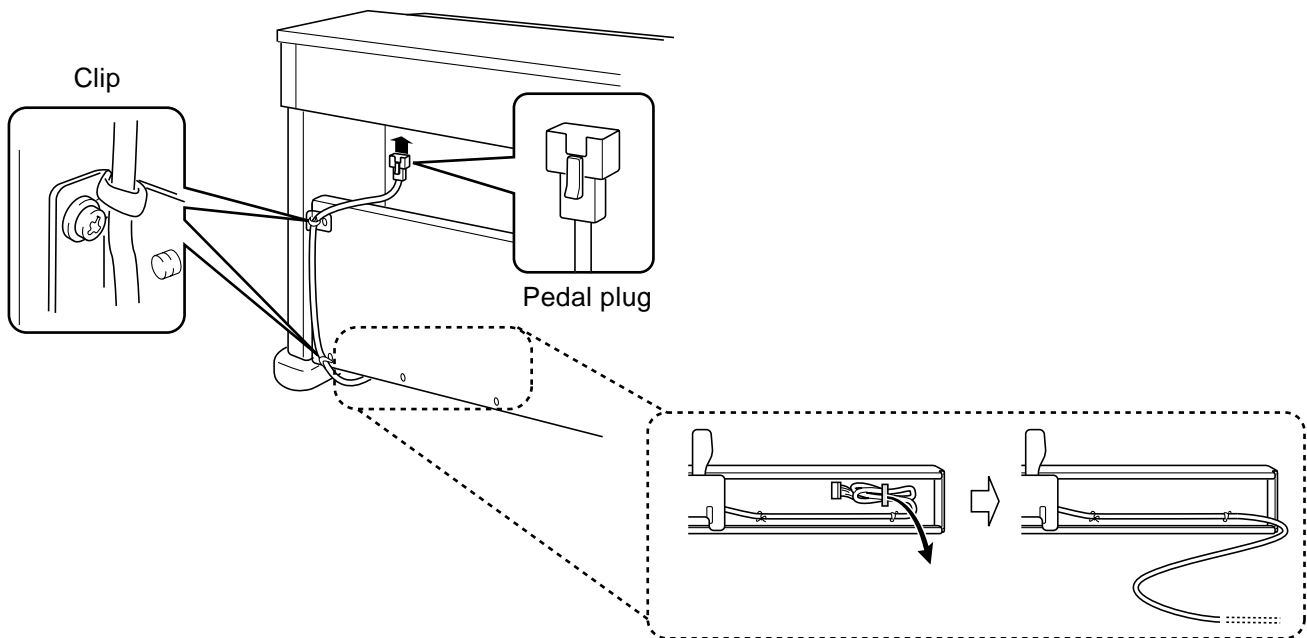


EXPLODED VIEW





Connecting the Pedal



PARTS LIST

AP-24

Notes: This parts list does not include the cosmetic parts, which parts are marked with item No. "R-X" in the exploded view.

Contact our spare parts department if you need these parts for refurbish.

1. Prices and specifications are subject to change without prior notice.
2. As for spare parts order and supply, refer to the "GUIDEBOOK for Spare parts Supply", published separately.
3. The numbers in item column correspond to the same numbers in drawing.

N	Item	Parts code	Parts name	Specification	QTY	Price Code	R	Remarks
MAIN PCB								
N	1	1016 4281	PCB ASSY/MAIN	TK-RJM503852*001	1	DW	A	
	BT1	1005 2229	BATTERY	CR2032/1HF1	1	AG	C	
	CN3	3501 7259	CONNECTOR	30FMZ-BT	1	AF	C	
	CN1	3501 3465	CONNECTOR	B11B-PH-K-S	1	AC	C	
	CN5	3500 5847	CONNECTOR	B12B-PH-K-S	1	AB	C	
	IC9	6932 0063	IC	R1151N001C-TR	1	AN	C	
	IC7	1012 3003	IC	TC74VHCT08AFT(EL)	1	AC	C	
	IC1	1004 0865	IC	TC7SH04FU(TE85L)	1	AA	C	
	IC10,11	1004 0647	IC	TC7SH08FU(TE85L)	2	AA	C	
	IC2	6930 9994	IC	TC7SH32FU(TE85L)	1	AB	C	
	IC3	1011 6307	IC	TC7SZ126FU(TE85L)	1	AB	C	
	IC8	2105 6665	IC	UPD63200GS-E1	1	AX	C	
N	IC6	1015 8046	MEMORY	CY62126DV30LL55ZIT	1	AV	C	
N	IC5	1016 4081	MEMORY	MR27V3202F16NTNZ08	1	BF	C	
	Q6	2259 2764	TRANSISTOR	2SB1188T100Q	1	AB	C	
	Q7	2253 0715	TRANSISTOR	2SD1664T100Q	1	AA	C	
	Q5	1011 6461	TRANSISTOR	KTC4075GR-RTK	1	AA	C	
PSA1 PCB								
N	2	1016 4287	PCB ASSY/PSA1J	TK-RJM503835*001	1	DB	B	120V
N	2	1016 4288	PCB ASSY/PSA1E	TK-RJM503886*001	1	DB	B	230V
	Q1,2,3,4	1007 9927	TRANSISTOR	KTC3199GR-AT	4	AA	C	
	CN9	3501 7371	CONNECTOR	B6B-EH	1	AA	C	
	CN19	1008 1222	CONNECTOR	HDC-052S-02	1	AF	C	
	FU1	1005 2231	FUSE	51MS010L	1	AC	A	120V
	FU1	1005 4029	FUSE	50T010H	1	AC	A	230V
	FU2,3	1005 2230	FUSE	51MS040L	2	AC	A	120V
	FU2,3	1005 4030	FUSE	50T040H	2	AC	A	230V
	IC1	1004 3418	IC	LM4765T	1	BC	C	
	IC4,5	2121 0072	IC	NJM2068DD	2	AD	C	
	IC2	2114 5796	IC	NJM78M05FA	1	AE	C	
	IC3	2114 5794	IC	NJM78M15FA	1	AE	C	
PS2A,3A PCB								
N	3	1016 4306	PCB ASSY/PSA2	TK-RJM503837*001	1	CE	C	
N	4	1016 4308	PCB ASSY/PSA3	TK-RJM503839*001	1	BV	B	
N	D2,3,4	1016 4051	LED	KM2520SRC36-FPB	3	AB	X	
	VR1	6930 8726	VARIABLE R	RK09K12C0D0W	1	AI	X	
	D1	1013 5479	LED	LT2P71-81-M1-S01	1	AA	X	
	SW1,2,3,4,5	1004 7536	SWITCH	SKQNAED010	5	AA	X	
MAIN CASE UNIT								
N	5	1016 4276	CASE ASSY/MAIN	TK-RJM503766*001	1	EC	C	
N	6	1016 4274	COVER ASSY/KEY	TK-RJM503765*001	1	CZ	C	
N	7	1016 4275	BOARD ASSY/TOP	TK-RJM503763*001	1	CX	C	
N	8	1016 4284	PCB ASSY/ACA1U	TK-RJM503880*001	1	BA	B	120V
	FU1	1004 7399	FUSE	51MS032L	1	AC	A	120V
N	8	1016 4286	PCB ASSY/ACA1E	TK-RJM503882*001	1	AZ	B	230V
	FU1	1004 7508	FUSE	50T025H	1	AC	A	230V
N	9	1016 4278	CORD ASSY/AC	TK-RJM503864*002	1	AM	C	120V
	9	1004 5707	CORD SET	BC2NC-M001A	1	BD	C	For UK
	9	1010 0792	CORD SET	INQ.1258(1)	1	AP	C	For Korea
	9	1004 5706	CORD SET	EC2NC-M001A	1	AM	C	For Euro
N	9-1	1016 4279	INLET ASSY/AC	TK-RJM503865*001	1	AH	C	230V
	10	1005 4031	TRANSFORMER	TE-427-1M1	1	CW	C	120V
	10	1005 4032	TRANSFORMER	TE-427-2M1	1	CW	C	230V
	11	1005 2227	SPEAKER	S12J99A	2	CD	C	

N	Item	Parts code	Parts name	Specification	QTY	Price Code	R	Remarks
	12	1005 2226	SPEAKER NET	M441205-001	2	AC	X	
	13	1005 2365	SIDE BLOCK/R	M141157-001	1	AD	X	
N	14	1016 3747	SIDE BLOCK/L	M141156-002V01	1	AD	X	
N	15	1016 4307	SW ASSY/POWER	TK-RJM503866*001	1	AR	C	
N	16	1016 4451	RUBBER/KEY	RJM503784-001V01	1	AF	C	
	17	1005 2232	KNOB/RTR	M341402-001	1	AE	C	
	18	6924 5260	BUTTON/POWER	M340318-001	1	AA	C	
N	19	1016 4303	BOARD ASSY/FRONT	TK-RJM503767*001	1	CI	C	
Keyboard UNIT								
N	20	1016 4291	KEY ASSY	TK-RJM504178*001	1	EH	A	
N	21	1016 4305	CHASSIS ASSY	TK-RJM504180*001	1	DK	C	
	22	1013 5317	BLACK KEY	RJM502797-001V01	36	AC	C	
	23	1013 5426	WHITE KEY/CEGB	RJM502862-001V01	7	AT	C	4pcs-1set
	24	1013 5427	WHITE KEY/DFA	RJM502863-001V01	7	AQ	C	3pcs-1set
	25	1013 5428	WHITE KEY/B	RJM502794-001V01	1	AG	C	
	26	1013 5429	WHITE KEY/SA	RJM502795-001V01	1	AJ	C	
	27	1013 5430	WHITE KEY/SC	RJM502796-001V01	1	AJ	C	
	28	1013 5435	HAMMER ASSY/W1	TK-RJM503155*001	13	AL	C	
	29	1013 5436	HAMMER ASSY/W2	TK-RJM503216*001	13	AL	C	
	30	1013 5437	HAMMER ASSY/W3	TK-RJM503217*001	13	AL	C	
	31	1013 5438	HAMMER ASSY/W4	TK-RJM503218*001	13	AL	C	
	32	1013 5439	HAMMER ASSY/B1	TK-RJM503219*001	9	AK	C	
	33	1013 5440	HAMMER ASSY/B2	TK-RJM503220*001	9	AK	C	
	34	1013 5442	HAMMER ASSY/B3	TK-RJM503221*001	9	AK	C	
	35	1013 5443	HAMMER ASSY/B4	TK-RJM503222*001	9	AK	C	
	36	3719 5442	CABLE	N30315B1B05-UL2896	1	AO	C	
	37	1013 3656	KEY RUBBER	RJM502920-001V01	7	AK	C	
	38	1013 3635	KEY RUBBER	RJM502921-001V01	1	AG	C	
	39	1013 3488	PCB ASSY/KYA	TK-RJM503365*001	1	BI	C	2pcs-1set
	40	1013 3482	PCB ASSY/KYB	TK-RJM503366*001	1	BC	C	
PANEL ASSY								
N	41	1016 4289	PANEL ASSY	TK-RJM503770*001	1	BV	C	
STAND								
N	42	1016 4309	SCREW SET	TK-RJM503810*001	1	AN	B	
N	43	1016 0961	STAND BOARD/BACK	RJM503742-001V01	1	BN	C	
N	44	1016 4310	FOOT ASSY	TK-RJM503823*001	2	BA	C	
N	45	1016 0973	FOOT /B	RJM503826-001V01	2	AA	C	
N	46	1016 0963	STAND BOARD/R	RJM503744-001V01	1	BS	C	
N	47	1016 0962	STAND BOARD/L	RJM503743-001V01	1	BS	C	
N	48	1016 4311	BOARD ASSY/PEDAL	TK-RJM503776*001	1	CH	C	
N	49	1016 4313	PEDAL ASSY	TK-RJM503901*001	1	BV	C	
N	50	1016 4048	CABLE	SMR-3P-155-M420	1	AI	B	
ACCESSORY								
	-	1005 4066	STAND ASSY/MUSIC	TK-M241576*2(M427)	1	CV	C	For US
	-	1005 2234	STAND ASSY/MUSIC	TK-M241576*1(M427)	1	CH	C	Except US

Notes: N- New parts

Q-Quantity used per unit

CASIO TECHNO CO.,LTD.
Overseas Service Division

6-2, Hon-machi 1-Chome
Shibuya-ku, Tokyo 151-8543, Japan