

CASIO®

Service Manual

(without price)

AP-40

AUG. 2000



AP-40

DIGITAL PIANO

Ver.1 Oct. / 2000

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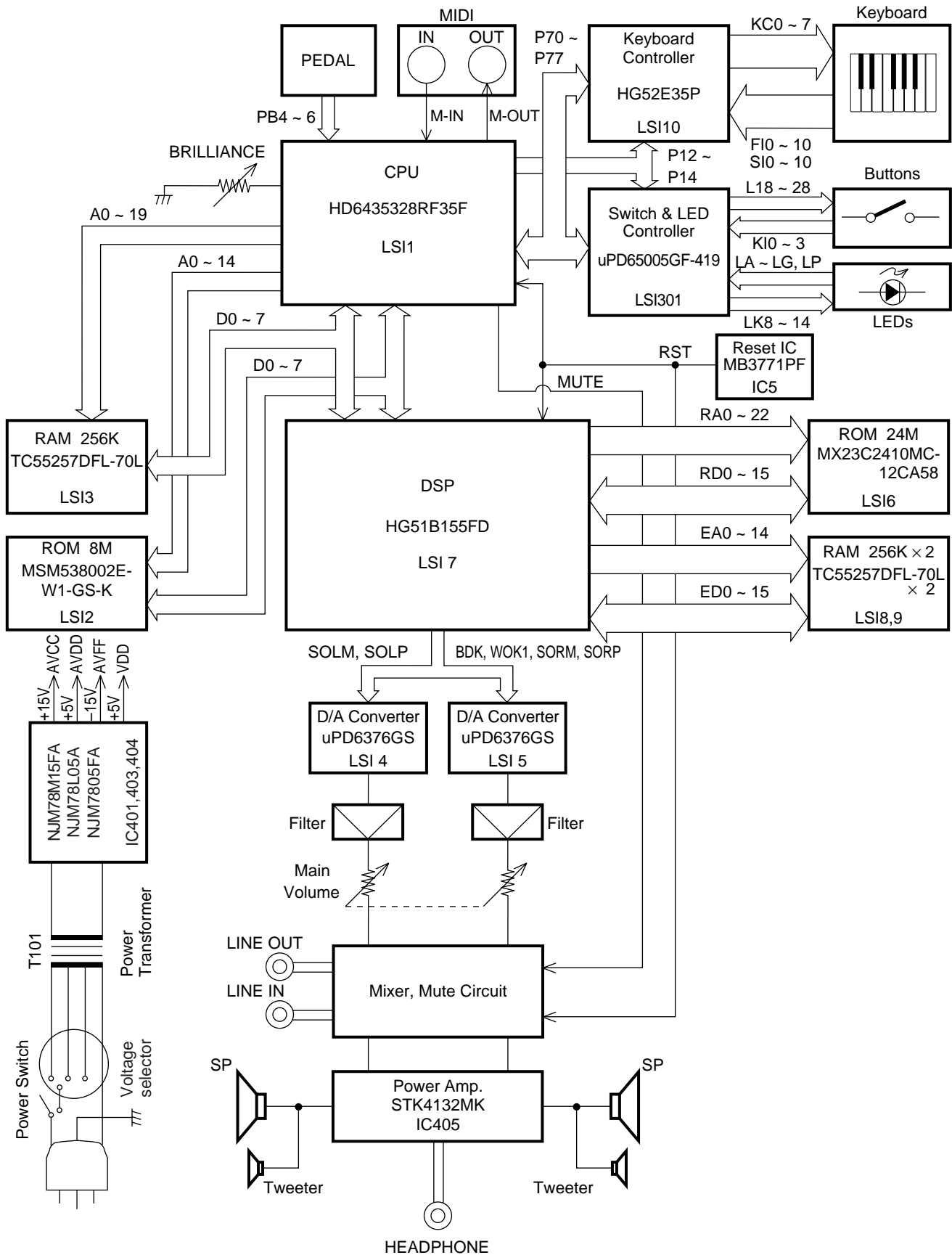
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SPECIFICATIONS

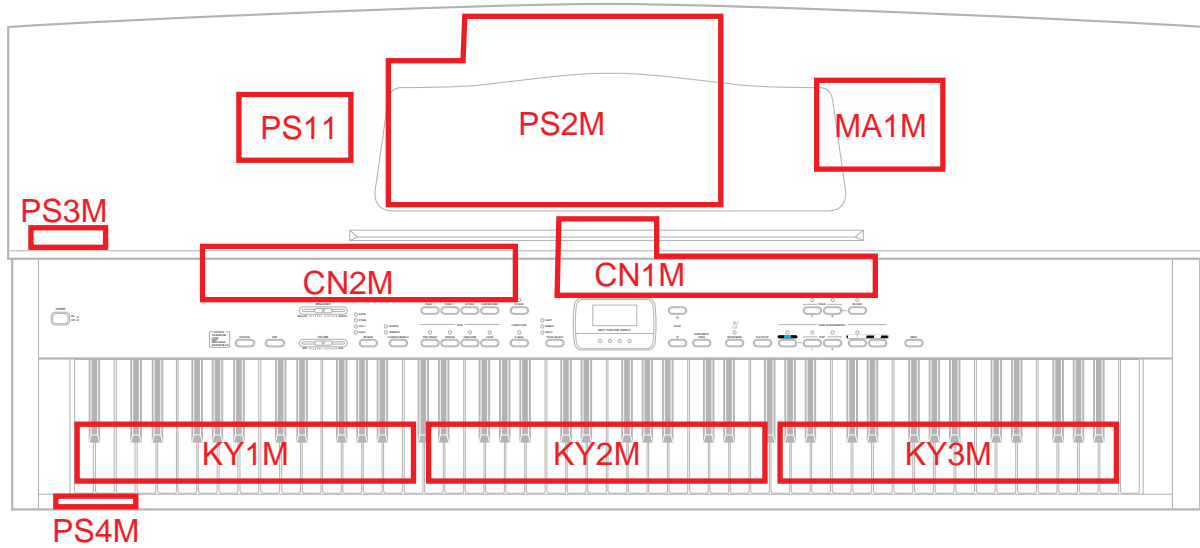
GENERAL

Keyboard:	88 piano keys (with touch response)
Polyphonic:	32 notes, maximum
Tones:	<ul style="list-style-type: none">• 10 (including two bass tones)• Tuning Curves: 3 (preset for each tone)• Layer: Adjustable volume• Split: Split point, adjustable volume
Digital Effects:	Reverb (4 types), Chorus, Tremolo, Brilliance
Demo Tunes:	<ul style="list-style-type: none">• Number of Tunes: 8• Playback: Repeat (all tunes, one tune)
Memory:	<ul style="list-style-type: none">• Operations: Real-time recording, playback• Number of Tracks: 2 (Track A, Track B)• Capacity: Approximately 5,000 notes (total of 2 tracks)• Memory Backup: Built-in lithium battery (Battery Life: 5 years)
Song Lesson:	<ul style="list-style-type: none">• Number of Tunes: 80• Playback: All song repeat, specific song• Part Off: L, R• Phrase Repeat
Pedals:	Damper, Soft, Sostenuto
Other Functions:	<ul style="list-style-type: none">• Metronome: Beat (6 types), Tempo (\downarrow = 30 to 300)• Touch Select: 3 types• Transpose: 1 octave (F# to C to F)• Tuning: A4 = 440Hz \pm13Hz (adjustable)• Temperament: 7 types• Baroque pitch
MIDI:	16 multi-timbre receive
Input/Output:	<ul style="list-style-type: none">• Headphones: Stereo standard jacks \times 2• LINE OUT (R)(L): Monaural standard jacks \times 2 Output impedance: 22KΩ Output voltage: 2.0V (RMS) MAX• LINE IN (R)(L): Monaural standard jacks \times 2 Input impedance: 30KΩ Input voltage: 200mV• MIDI (OUT) (IN)
Speakers:	\varnothing 16cm \times 2, \varnothing 5cm \times 2 (Output: 30W + 30W)
Power Supply:	120V (for U.S.A.), 120V, 220V, 230V and 240V (for other countries) AC household current via AC power cord supplied with piano.
Power consumption:	70W (with 120V AC), 90W (with 220V, 230V and 240V AC)
Dimensions:	<ul style="list-style-type: none">• CELVIANO Only: 139.0 \times 54.0 \times 24.9 cm (54 $\frac{3}{4}$ \times 21 $\frac{1}{4}$ \times 9 $\frac{13}{16}$ inch)• CELVIANO and Stand: 139.0 \times 54.0 \times 88.4 cm (54 $\frac{3}{4}$ \times 21 $\frac{1}{4}$ \times 34 $\frac{13}{16}$ inch)
Weight:	<ul style="list-style-type: none">• CELVIANO Only: approximately 48.5kg (107.1 lbs)• CELVIANO and Stand: approximately 63.6kg (140.4 lbs)

BLOCK DIAGRAM



PCB LAYOUT

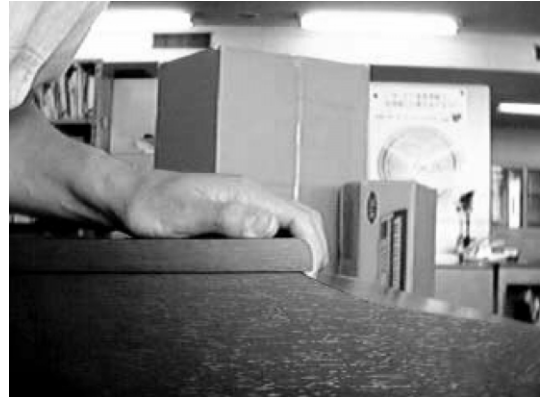


PCB	JCM434-	Components
Main PCB	MA1M	CPU, DSP, Sound Source ROM Working storage RAM, Effect RAM Reset IC, DAC, Filter, Key con-troller, Power amp, Power supply circuit
Jack PCBs	PS2M	LINE IN/OUT jack, MIDI jacks
	PS3M	Phone jacks
	PS4M	Power indicator
Console PCBs	CN1M	Gate array (Button controller/LED driver), LEDs, Buttons
	CN2M	Main Volume, Brilliance volume, LEDS, Buttons
Power PCB	PS11	Fuse, Noise filter

DISASSEMBLY INSTRUCTIONS

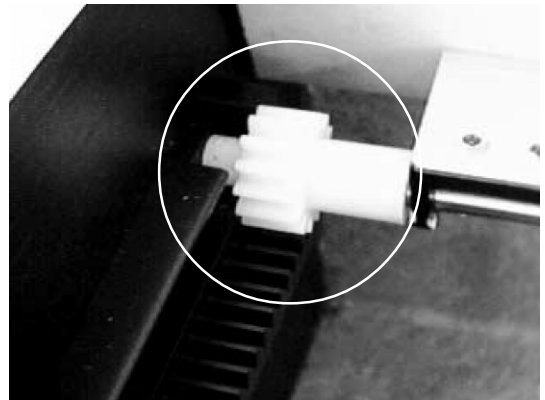
1. Disassembling top board

- 1-1. Remove 8 screws on the rear.
- 1-2. Slide the top board towards the rear.
The top board will be free from catches on the case.
- 1-3. Lift the top board.



2. Disassembling keyboard cover

- 2-1. Slide the keyboard cover to open fully.
- 2-2. Passing the gear into the opening on each rack, lift the keyboard cover.



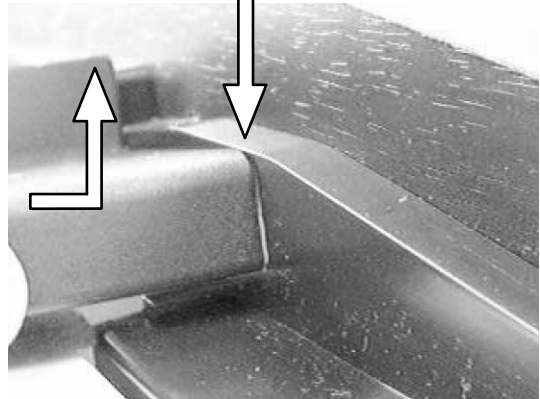
3. Disassembling console panel

Note: To avoid scratch on the side board, put paper between the console panel and the side board at both ends.

Insert paper here.



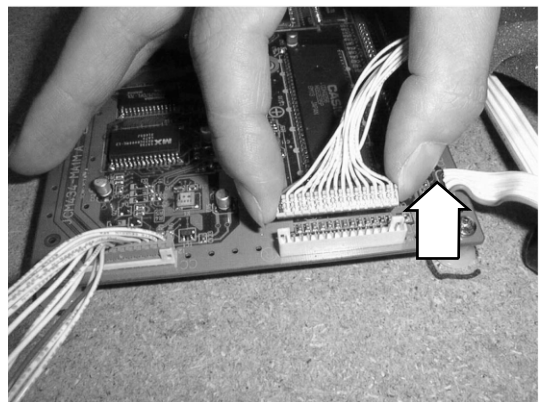
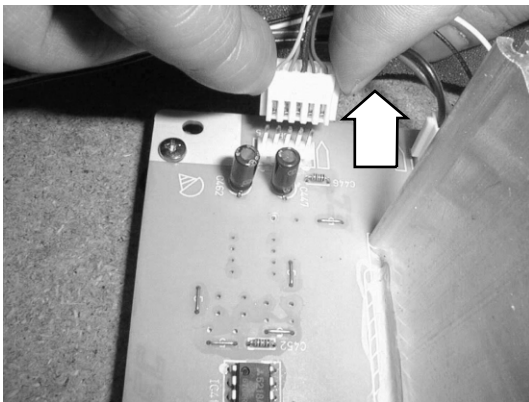
Insert paper here.



3-1. Remove three screws afixing the console panel.

3-2. Remove the screw fixing a grounding wire at the transformer.

3-3. Disconnect two connectors CF on PCB JCM434-PS2M and CD on PCB JCM434-MA1M



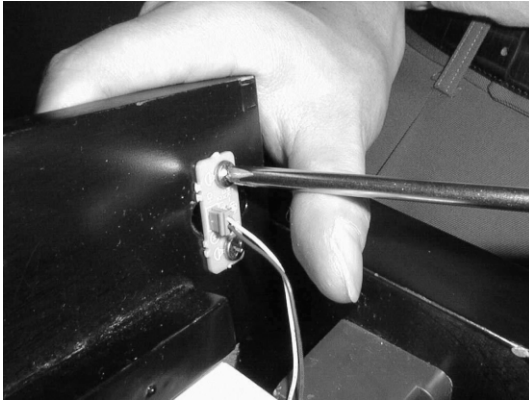
3-4. Slide the console panel towards the front to free from catches.

3-5. Turn round the console panel.

3-6. Remove the 2 screws fixing the power switch.

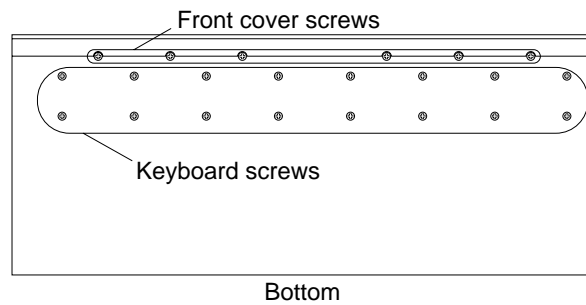
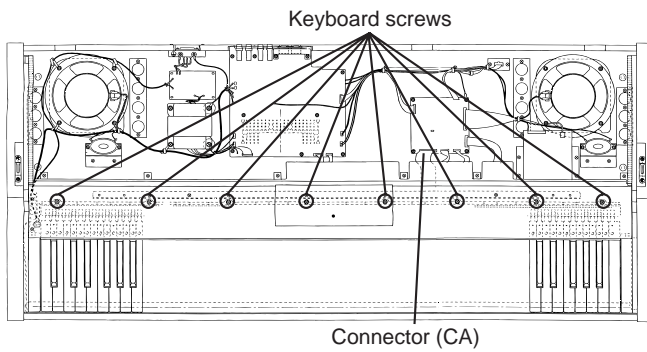
4. Disassembling front cover

- 4-1. Remove 9 screws at the front edge on the bottom.
- 4-2. Unscrew 2 screws and remove JCM434-PS4M



5. Removal of keyboard unit

- 5-1. Disconnect connector CA on the PCB MA1M.
- 5-2. Remove 24 screws that affix the keyboard unit (16 on the bottom of the case and 8 on the keyboard unit).
- 5-3. Lift and remove the keyboard unit.



6. Removal of keys

6-1. While prying the side partition plastics with tweezers, push the edge of the key toward front.

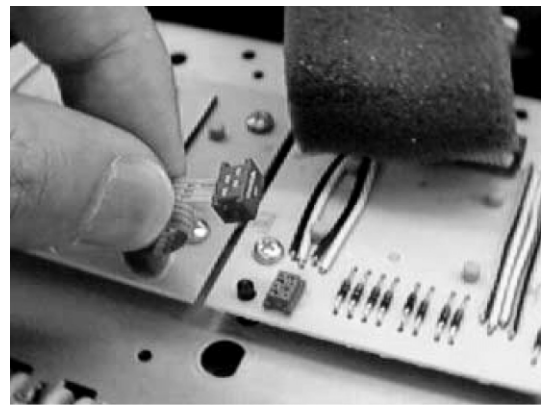


7. Disassembling keyboard PCBs

7-1. Turn round the keyboard unit to face the PCB up.

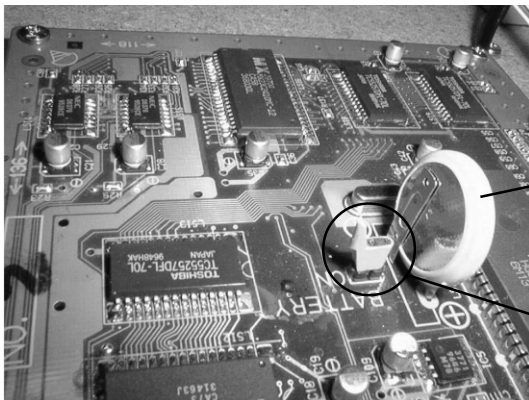
7-2. Disconnect the connector at the middle of keyboard.

7-3. Remove screws on the keyboard PCBs.



8. Replacing the main PCB

Note: The main PCB contains a lithium battery for memory back-up. Please remove the jumper before replacing the PCB. And make sure that the jumper is reset on new main PCB after replacing the PCB. Because no jumper is set on a spare part of the main PCB.

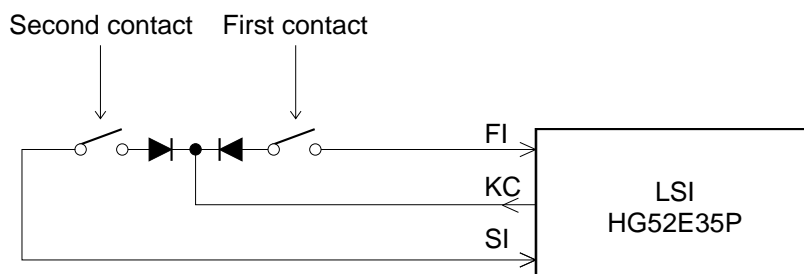


Lithium battery

Jumper

CIRCUIT DESCRIPTION

KEYMATRIX



	KC0	KC1	KC2	KC3	KC4	KC5	KC6	KC7
FI0	A0 ①	A0 # ①	B0 ①	C1 ①	C1 # ①	D1 ①	D1 # ①	E1 ①
SI0	A0 ②	A0 # ②	B0 ②	C1 ②	C1 # ②	D1 ②	D1 # ②	E1 ②
EI1	F1 ①	F1 # ①	G1 ①	G1 # ①	A1 ①	A1 # ①	B1 ①	C2 ①
SI1	F1 ②	F1 # ②	G1 ②	G1 # ②	A1 ②	A1 # ②	B1 ②	C2 ②
FI2	C2 # ①	D2 ①	D2 # ①	E2 ①	F2 ①	F2 # ①	G2 ①	G2 # ①
SI2	C2 # ②	D2 ②	D2 # ②	E2 ②	F2 ②	F2 # ②	G2 ②	G2 # ②
FI3	A2 ①	A2 # ①	B2 ①	C3 ①	C3 # ①	D3 ①	D3 # ①	E3 ①
SI3	A2 ②	A2 # ②	B2 ②	C3 ②	C3 # ②	D3 ②	D3 # ②	E3 ②
FI4	F3 ①	F3 # ①	G3 ①	G3 # ①	A3 ①	A3 # ①	B3 ①	C4 ①
SI4	F3 ②	F3 # ②	G3 ②	G3 # ②	A3 ②	A3 # ②	B3 ②	C4 ②
FI5	C4 # ①	D4 ①	D4 # ①	E4 ①	F4 ①	F4 # ①	G4 ①	G4 # ①
SI5	C4 # ②	D4 ②	D4 # ②	E4 ②	F4 ②	F4 # ②	G4 ②	G4 # ②
FI6	A4 ①	A4 # ①	B4 ①	C5 ①	C5 # ①	D5 ①	D5 # ①	E5 ①
SI6	A4 ②	A4 # ②	B4 ②	C5 ②	C5 # ②	D5 ②	D5 # ②	E5 ②
FI7	F5 ①	F5 # ①	G5 ①	G5 # ①	A5 ①	A5 # ①	B5 ①	C6 ①
SI7	F5 ②	F5 # ②	G5 ②	G5 # ②	A5 ②	A5 # ②	B5 ②	C6 ②
FI8	C6 # ①	D6 ①	D6 # ①	E6 ①	F6 ①	F6 # ①	G6 ①	G6 # ①
SI8	C6 # ②	D6 ②	D6 # ②	E6 ②	F6 ②	F6 # ②	G6 ②	G6 # ②
FI9	A6 ①	A6 # ①	B6 ①	C7 ①	C7 # ①	D7 ①	D7 # ①	E7 ①
SI9	A6 ②	A6 # ②	B6 ②	C7 ②	C7 # ②	D7 ②	D7 # ②	E7 ②
FI10	F7 ①	F7 # ①	G7 ①	G7 # ①	A7 ①	A7 # ①	B7 ①	C8 ①
SI10	F7 ②	F7 # ②	G7 ②	G7 # ②	A7 ②	A7 # ②	B7 ②	C8 ②

BUTTON MATRIX

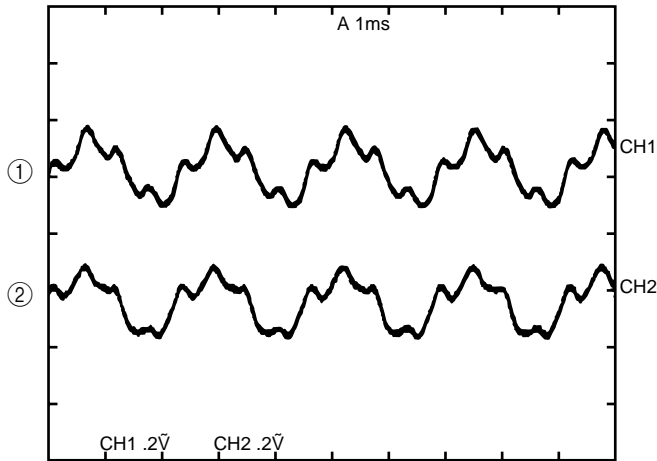
	KI0	KI1	KI2	KI3
L18	STEP BY STEP	PART L	PART R	NEXT
L19	TOUCH SELECT	TRACK A	TRACK B	PLAY/STOP
L20	TEMPO/BEAT/FIXED	METRONOME		
L24	PIANO 2	E. PIANO	HARPSICHORD	W.BASS
L25	PIANO 1	STRINGS	CHOIR	E.BASS
L26	VIBRAPHONE	PIPEORGAN	CHORUS/TREMOLO	REVERB
L27	SONG SELECT		RECORD	
L28		VALUE DOWN	VALUE UP	DEMO

POWER SUPPLY CIRCUIT

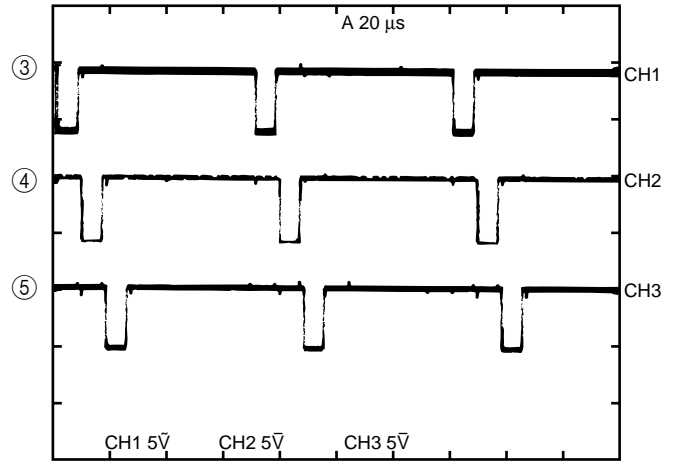
The power supply circuit generates four voltages as shown in the following table.

Name	Voltage	For operation of
VDD	+5 V	CPU, Reset IC, Working storage RAM, DSP, Key touch LSI, Sound source ROM, Effect RAM, Gate array
AVDD	+5 V	DAC
AVCC	+15 V	Filter, Mixer
AVFF	-15 V	Filter, Mixer

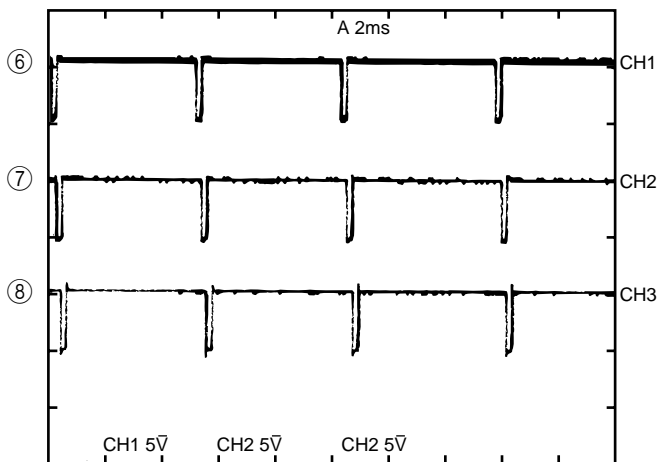
MAJOR WAVEFORMS



- ① Filter output L-ch CF connector pin 4
- ② Filter output R-ch CF connector pin 5
- Tone : Piano 1
- Key : A4



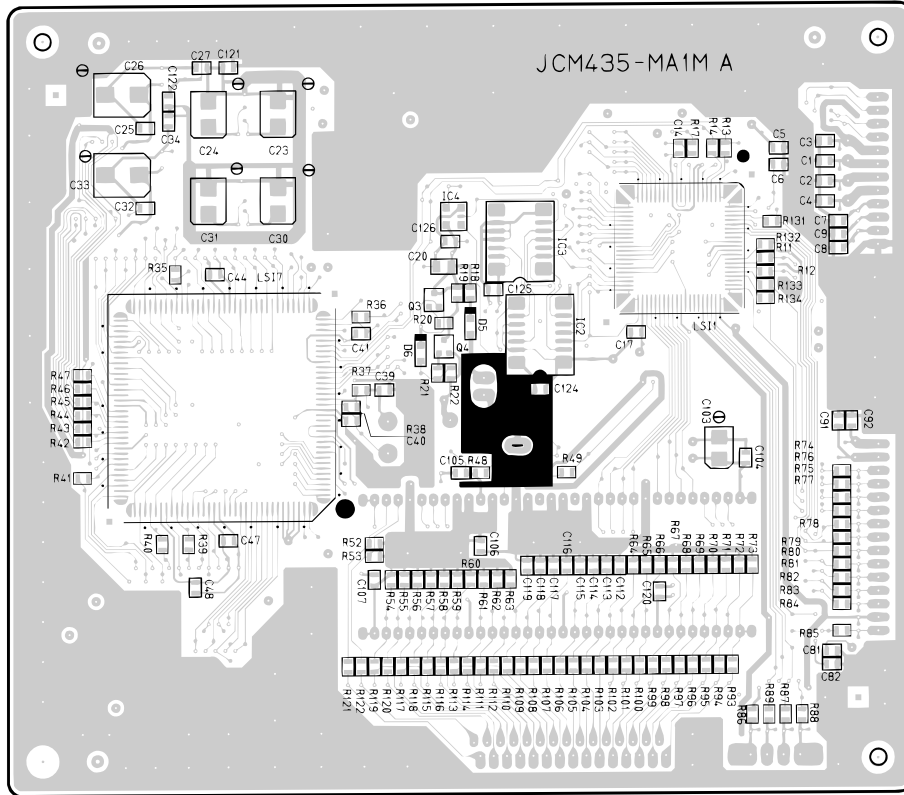
- ③ Key scan signal KC0 CA connector pin 20
- ④ Key scan signal KC1 CA connector pin 19
- ⑤ Key scan signal KC2 CA connector pin 18



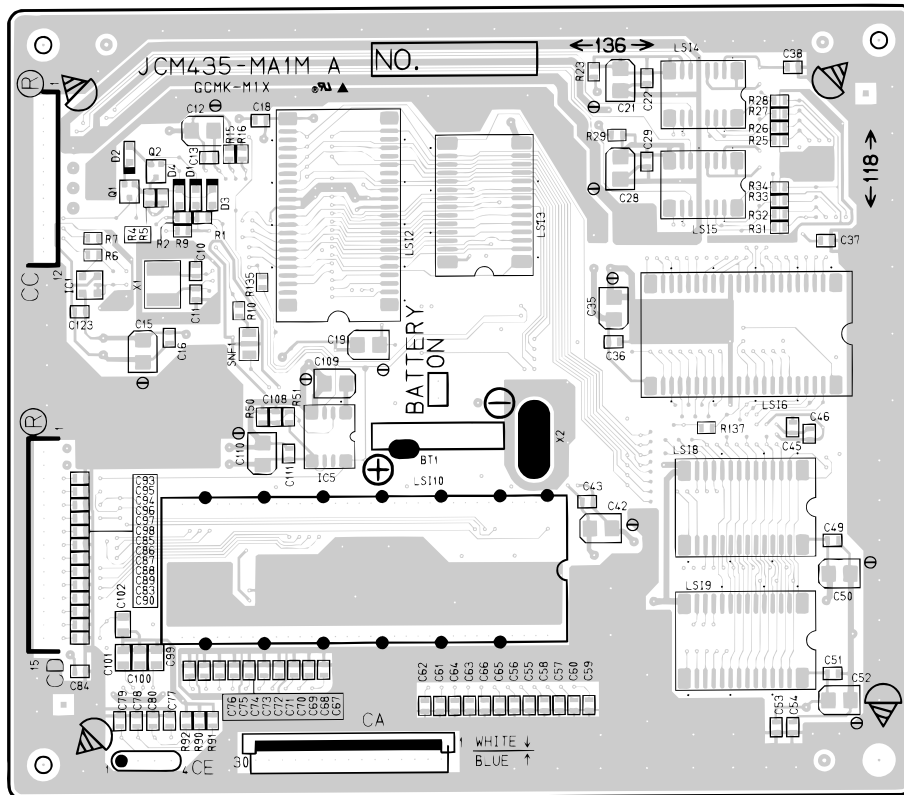
- ⑥ Button scan signal L24 UPD65005GF-419 pin 53
- ⑦ Button scan signal L25 UPD65005GF-419 pin 54
- ⑧ Button scan signal L26 UPD65005GF-419 pin 55

PRINTED CIRCUIT BOARD

JCM435-MAIN



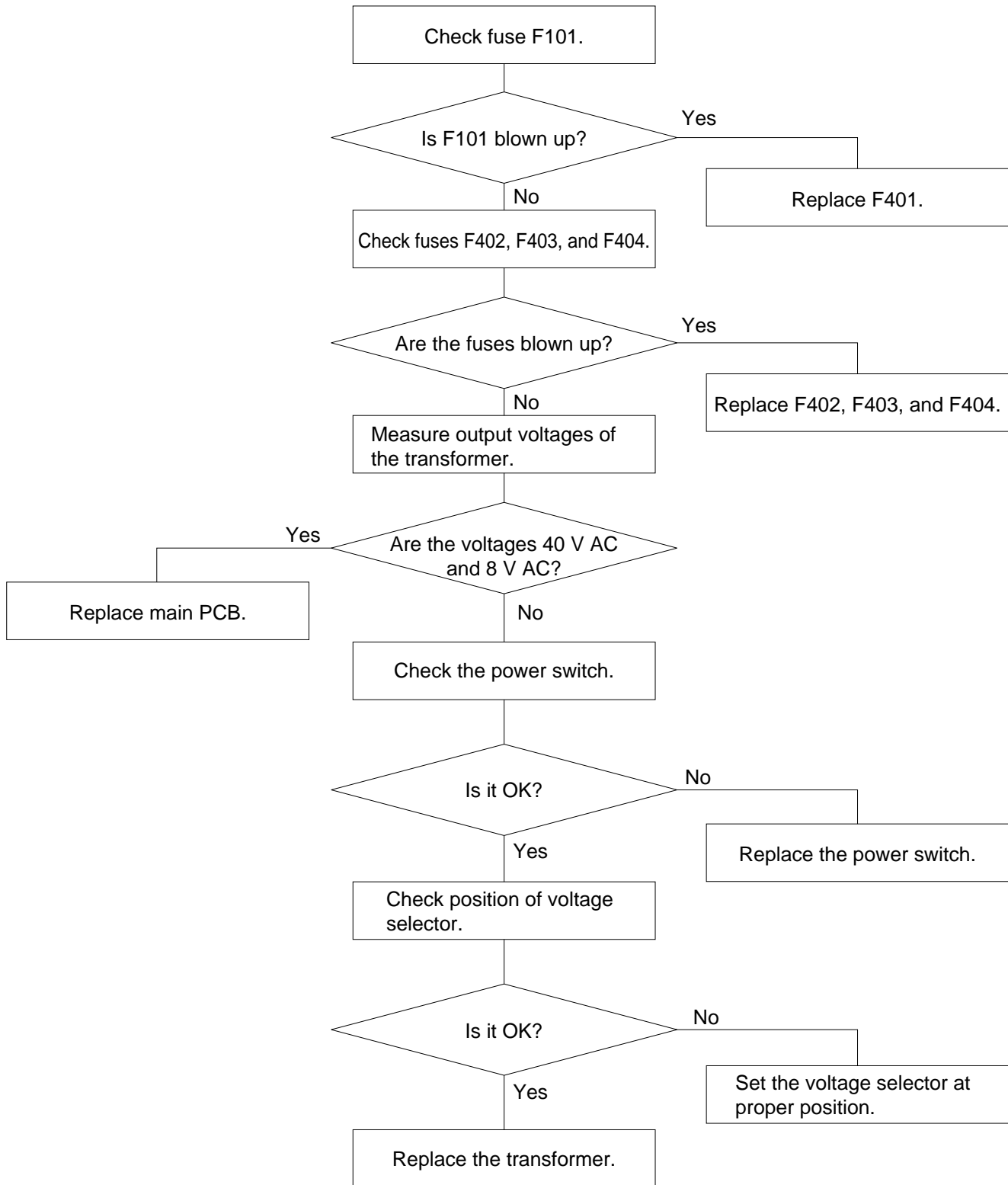
Top View



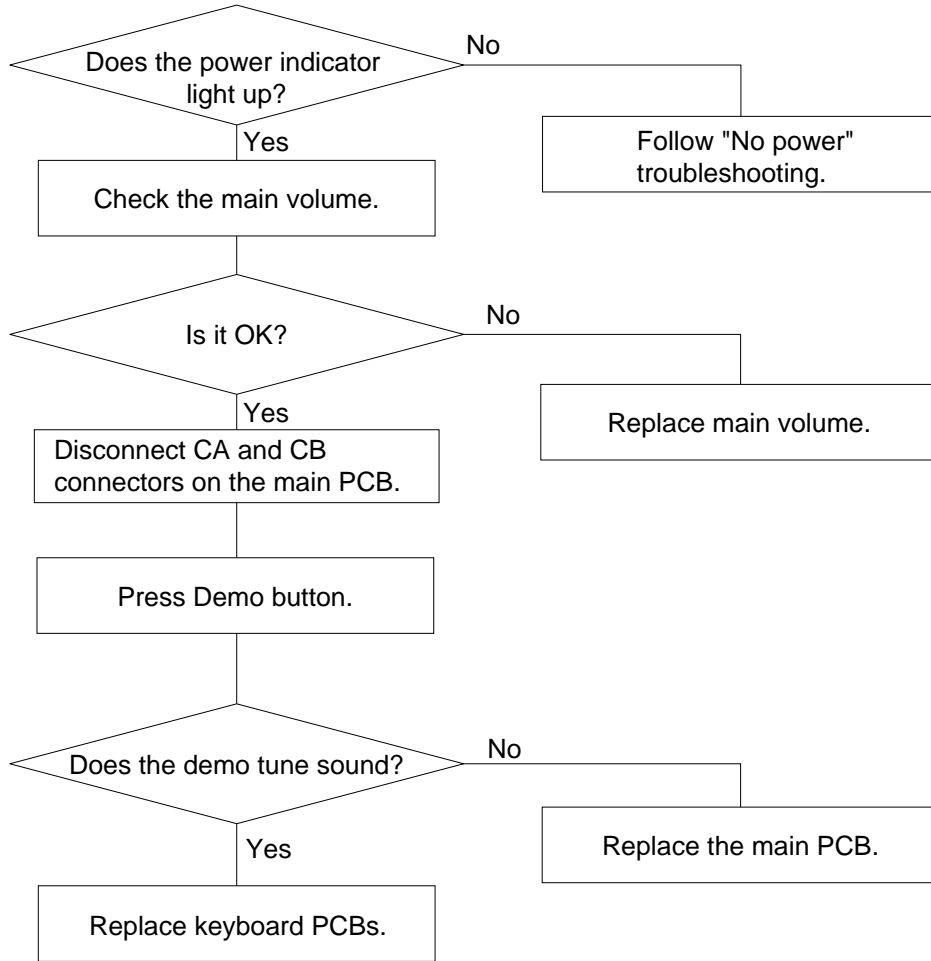
Bottom View

TROUBLESHOOTING

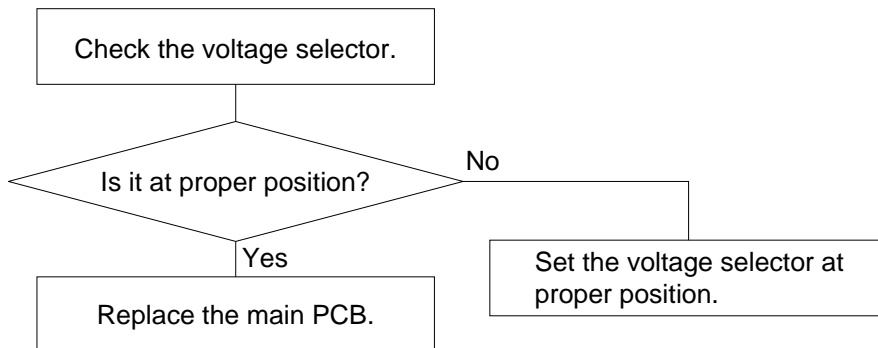
1. No power



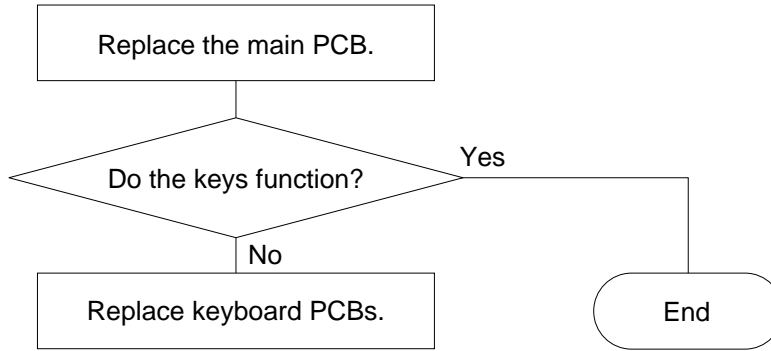
2. No sound



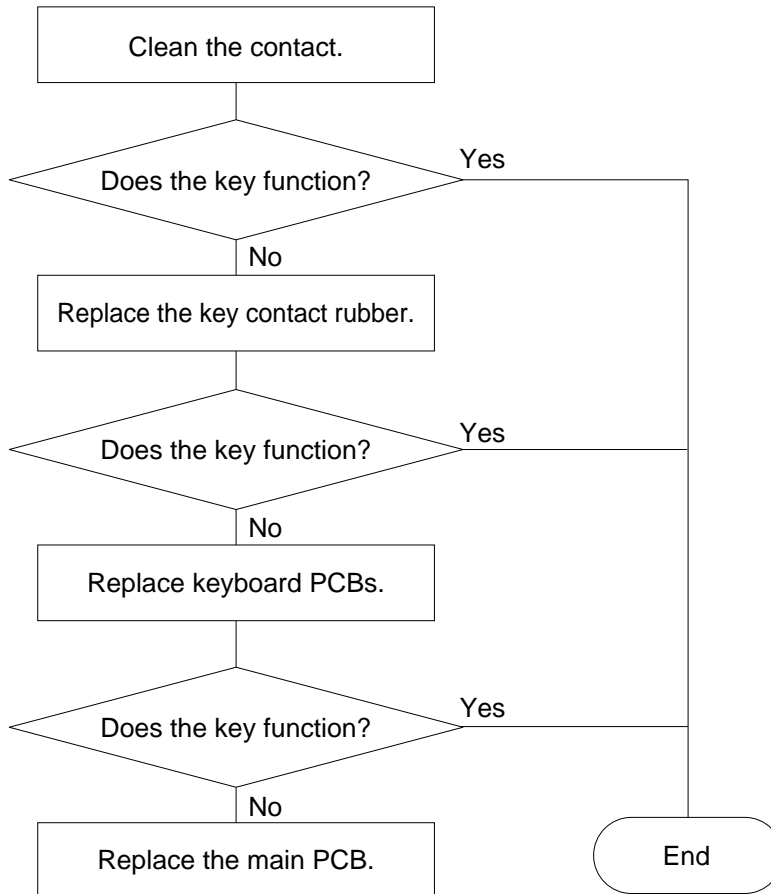
3. Distorted sound



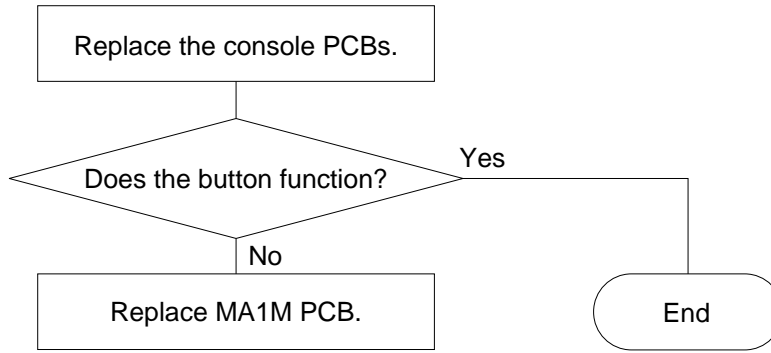
4. Certain keys do not function



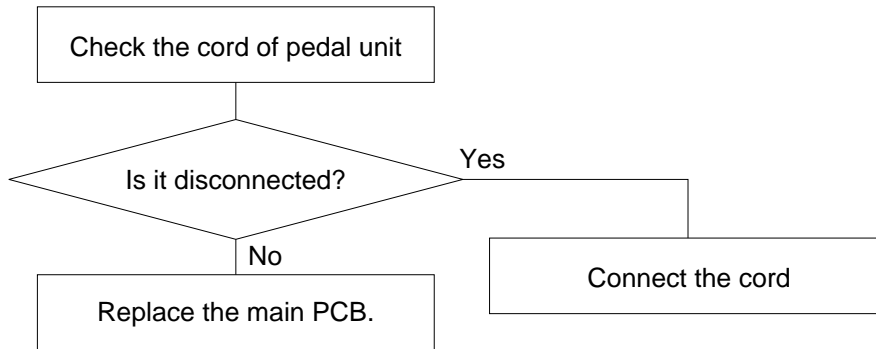
5. A certain key does not function



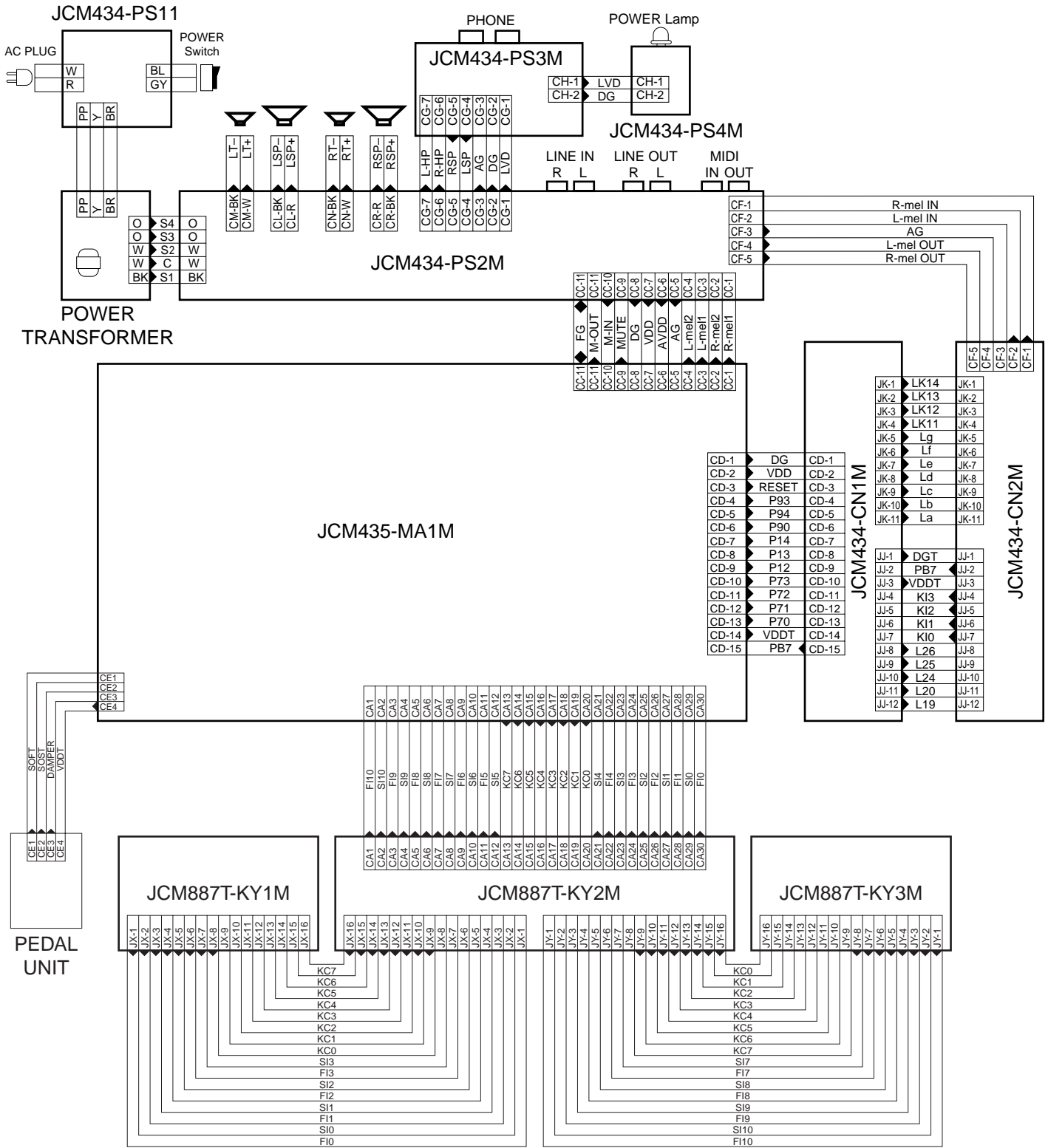
6. A certain button does not function



7. A certain tone is strange when record/playback

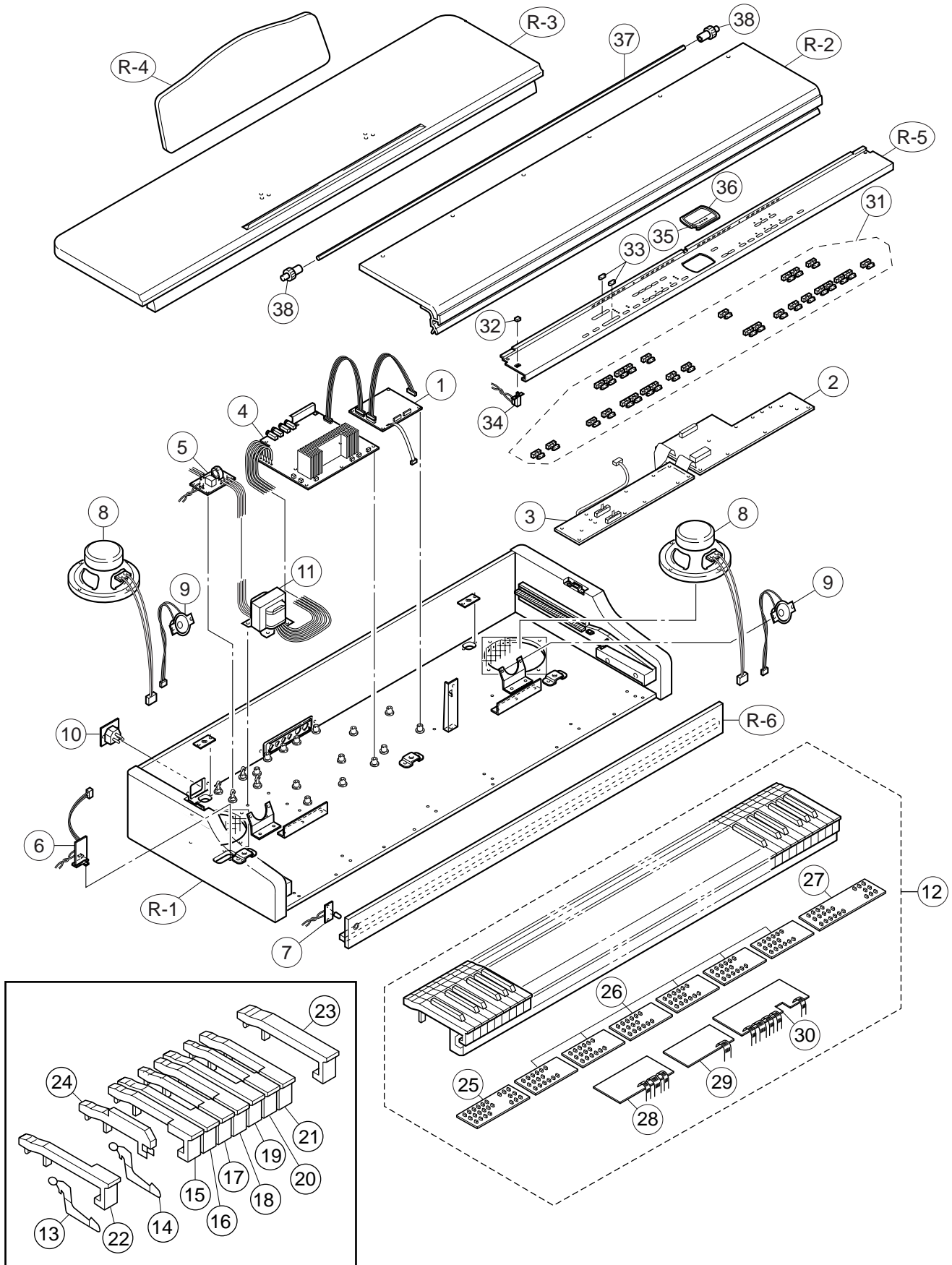


WIRING DIAGRAM

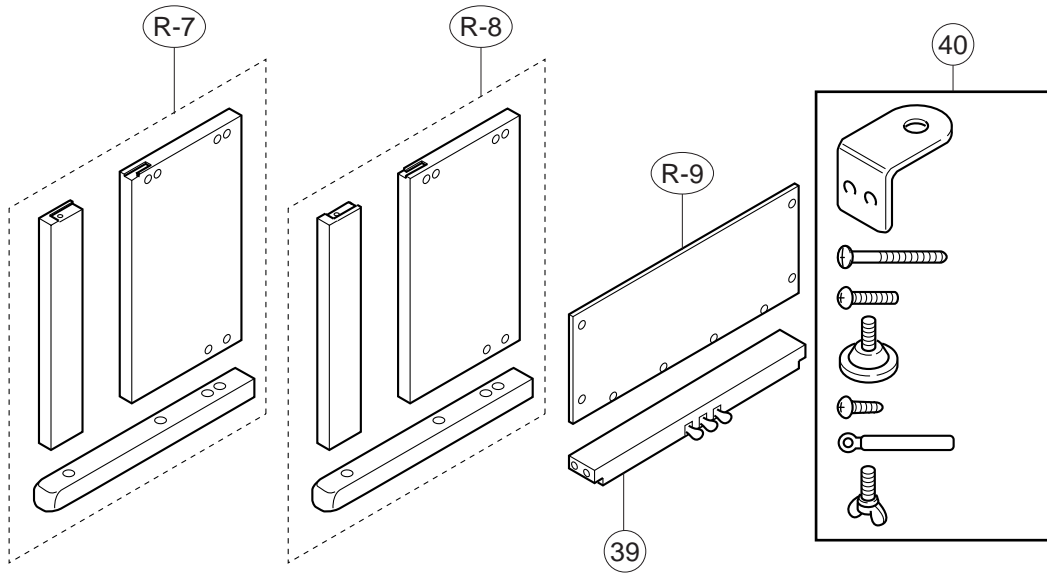


EXPLODED VIEW

CABINET



STAND



PARTS LIST

AP-40

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.

PARTS PRICE LIST
AP-40

N	Item	Code No.	PART NAME	Specification	Q		Price Code	R
					BK	BN		
Main PCB								
N	1	1003 2486	PCB ASSY/MA1M	M241412*1 TK(M435)	1	1	DT	A
	BT1	3815 0794	BATTERY / LITHIUM	CR2032/1VC1	1	1	AI	X
	D1-D4	2390 2555	DIODE / SHOTTKY	RB500V-40TE-17	4	4	AB	C
	D5	2390 2555	DIODE / SHOTTKY	RB500V-40TE-17	1	1	AB	C
	D6	2360 3057	DIODE / ZENER	UDZTE-173.3B	1	1	AA	C
	IC1	2105 1120	IC / MOS	TC7S08F-TE85R	1	1	AB	C
	IC2	2105 6354	IC / MOS	TC74HC27AF(TP1)	1	1	AC	C
	IC3	2105 6353	IC / MOS	TC74HC11AF(TP1)	1	1	AC	C
	IC4	2105 6355	IC / MOS	TC7S00F(TE85R)	1	1	AC	C
	IC5	2114 4060	IC	MB3771PF-EF	1	1	AK	C
	LSI1	2012 5844	LSI	HD6435328RF35F	1	1	BZ	B
	LSI10	2011 5194	LSI	HG52E35P	1	1	BJ	B
N	LSI2	1002 5582	LSI	MSM538002E-W1-GS-K	1	1	AV	B
	LSI3,LSI8,LSI9	2012 5572	LSI	TC55257DFL-70L(EL)	3	3	AS	B
	LSI4,LSI5	2114 4221	LSI	UPD6376GS-E1	2	2	AS	B
	LSI6	2012 5707	LSI	MX23C2410MC-12CA58	1	1	BO	B
	LSI7	2012 1316	LSI	HG51B155FD-1	1	1	BU	B
	Q1,12	2250 1162	TRANSISTOR	2SA1576A-T106R	2	2	AA	C
	Q3	2250 1162	TRANSISTOR	2SA1576A-T106R	1	1	AA	C
	Q4	2252 0637	TRANSISTOR	2SC4081-T106R	1	1	AA	C
	X1	2590 2100	OSCILLATOR / CERAMIC	CSACS20.00MX040-TC	1	1	AG	C
	X2	2590 2709	OSCILLATOR / CERAMIC	HC-49US16384	1	1	AL	C
Console PCB								
	LED306 - LED332	2370 0630	LED	LN282RPX-(TX3)	27	27	AB	C
	LED302	2370 1386	LED	LN282RPX(V)-(TX2)	1	1	AB	C
	LED303 - LED305	2370 0679	LED	LN382GPX-(TX2)	3	3	AB	C
	LED301	2370 0497	LED	LB-603VP	1	1	AT	C
	IC301	2114 3318	IC	BA612	1	1	AI	C
	LSI301	2011 0812	LSI	UPD65005GF-419	1	1	AT	B
	Q309 - Q312	2220 1409	TRANSISTOR	2SC1740SR-TP-T	4	4	AA	C
	Q301 - Q308	2259 1883	TRANSISTOR	DTA114TS-TP-T	8	8	AA	C
	SW301 - SW329	3412 0903	SWITCH / TACT	EVQ-21405R	29	29	AA	C
	VR301	2765 0280	POTENTIOMETER	EWA-NAXCH1B14	1	1	AI	C
	VR302	2765 2187	POTENTIOMETER	EWA-NFECH1B54	1	1	AG	C
	2	6926 2060	PCB ASSY/CN1M	M140658*1	1	1	CS	B
	3	6926 2070	PCB ASSY/CN2M	M140659*1	1	1	CN	B
Power supply PCB								
	D405 - D408	2390 3022	DIODE	3BZ41(LC6-15)	4	4	AD	C
	D416	2390 1323	DIODE	RB100A-T32-T	1	1	AC	C
	D422/423	2360 1729	DIODE	MTZJ5.1AT-77-T	2	2	AA	C
	F402	3632 0273	FUSE / TIME-LAG (For 110 - 127V AREA)	UL-TSC-1.6A-N1	1	1	AF	B
	F402	3631 1045	FUSE / TIME-LAG (For 220 - 240V AREA)	(S)T-1.6A	1	1	AF	B
	F403 / 406	3632 0420	FUSE / TIME-LAG (For 110 - 127V AREA)	UL-TSC-6.3A-N1	2	2	AF	B
	F403 / 406	3632 0427	FUSE / TIME-LAG (For 220 - 240V AREA)	(S)T-6.3A	2	2	AF	B
	IC401	2114 5794	IC	NJM78M15FA	1	1	AE	C
	IC402	2114 5795	IC	NJM79M15FA	1	1	AG	C
	IC403	2114 5797	IC	NJM78L05A(T3)	1	1	AE	C
	IC404	2114 3444	IC	NJM7805FA	1	1	AE	C
	IC405	2114 2149	IC	STK4152MK2	1	1	BP	C
	IC406/408/410/411	2114 1799	IC	M5218APR	4	4	AC	C
	IC409	2252 1248	IC / PHOTO COUPLER	HCPL-261A	1	1	AL	C
	J401/402	3612 0584	JACK	YKB21-5012	2	2	AD	C
	J403/404	3612 0789	JACK	YKB21-5010	2	2	AC	C
	J405	3501 4816	JACK / DIN	YKF51-5051	1	1	AH	C
	Q401 - Q404	2254 0551	FET	2SK365-BL(TPE4)	4	4	AC	C
	4	6926 5800	PCB ASSY/PS2M (For 110 - 127V AREA)	M140654*2	1	1	DH	B
N	4	1003 2464	PCB ASSY/PS2M (For 220 - 240V AREA)	M140654*3 TK(M435)	1	1	DI	B

N	Item	Code No.	PART NAME	Specification	Q		Price Code	R
					BK	BN		
PS11,PS3,PS4 PCBs								
	J406	3613 1533	JACK	HLJ4336-01-3040	1	1	AP	C
	F401	3632 0720	FUSE / TIME-LAG (For 110 - 127V AREA)	MT4-3.15A-N1	1	1	AG	B
	F401	3631 1045	FUSE / TIME-LAG (For 220 - 240V AREA)	(S)T-1.6A	1	1	AF	B
	L401	3013 2577	COIL / CHOKE	PLAC1522R0R01B1	1	1	AM	C
	LED401	2320 9748	LED	LN28RPH	1	1	AB	C
	SW402	3613 1740	VOLTAGE SELECTOR	HXW1219-01-110	1	1	AK	C
	5	6926 2160	PCB ASSY/PS11 (For 110 - 127V AREA)	M340695*1	1	1	BR	B
N	5	10032465	PCB ASSY/PS11 (For 220 - 240V AREA)	M340695*2 TK(M435)	1	1	BW	B
	6	6926 2030	PCB ASS'Y/PS3M	M340697*1	1	1	BV	B
N	7	1003 2488	PCB ASS'Y/PS4M	M340698*1 TK(M435)	1	1	BH	B
Other electrical parts								
	8	3831 1077	SPEAKER	SG16G51BFA	2	2	BS	B
	9	3831 1075	SPEAKER / TWEETER	S05JH37A	2	2	AR	B
	10	3613 0217	RECEPTACLE	NC-174-10-C	1	1	AJ	B
	11	3012 1593	TRANSFORMER	TE-434-1M1	1	1	CL	B
Keyboard unit								
	12	6927 3230	UNIT/KEYBOARD	M140830*1	1	1	EO	B
	13	6927 3250	HAMMER/WHITE KEY	M340962*1	52	52	BF	C
	14	6927 3260	HAMMER/BLACK KEY	M340963*1	36	36	BF	C
	15	6927 4040	WHITE KEY/C	M140783-1	7	7	AH	B
	16	6927 4050	WHITE KEY/D	M140785-1	7	7	AI	B
	17	6927 4060	WHITE KEY/E	M140786-1	7	7	AH	B
	18	6927 4070	WHITE KEY/F	M140787-1	7	7	AI	B
	19	6927 4080	WHITE KEY/G	M140788-1	7	7	AH	B
	20	6927 4090	WHITE KEY/A	M140789-1	7	7	AH	B
	21	6927 4100	WHITE KEY/B	M140790-1	8	8	AI	B
	22	6927 4110	WHITE KEY/SA	M140792-1	1	1	AM	B
	23	6927 4120	WHITE KEY/SC	M140791-1	1	1	AN	B
	24	6927 4030	BLACK KEY	M140784-1	36	36	AG	B
	25	6928 4470	RUBBER/CONTACT AB	M240957-2	1	1	AE	B
	26	6928 4480	RUBBER/CONTACT CB	M240958-2	6	6	AH	B
	27	6928 4490	RUBBER/CONTACT CS	M240959-2	1	1	AH	B
N	28	1000 9529	PCB ASSY/KY1M	M240951A*1	1	1	BO	B
N	29	1000 9530	PCB ASSY/KY2M	M240952A*1	1	1	BT	B
N	30	1000 9531	PCB ASSY/KY3M	M241019A*1	1	1	BM,	B
Mechanical parts								
N	31	6926 2420	BUTTON SET 434	M240744*1	1	1	AU	B
	32	6924 5260	BUTTON / POWER	M340318-1	1	1	AA	B
	33	6919 3241	KNOB / SLIDE	M311405A-1	2	2	AB	A
	34	6924 4710	SWITCH ASS'Y / POWER	M340337*1	1	1	BK	B
	35	6926 2440	PANEL / DISPLAY	M240668-1	1	1	AE	C
	36	6926 2450	PLATE / DISPLAY	M340658-1	1	1	AE	C
	37	6924 5121	SHAFT	M440300A-1	1	1	BA	C
	38	6924 5140	GEAR	4247002100	2	2	AC	C
Stand								
N	39	1003 2481	PEDAL BOX	M241399*2 TK(M435)	1	0	DM	B
N	39	1003 2480	PEDAL BOX	M241399*1 TK(M435)	0	1	DO	B
N	40	1002 7739	SCREW SET	CA024/021	1	1	BE	B
AC cord								
		3701 0196	AC CORD (For 110 - 127V AREA)	UC-964-J01	1	1	BN	C
		3701 0595	AC CORD (For 220 - 240V, EUROPE)	EC-654-E06	1	1	BP	C
		3701 1008	AC CORD (For 230V, UK)	SP22-17022A	1	1	CD	C

Notes:N-New parts

Q-Quantity used per unit

R-Rank

R- A:Essential

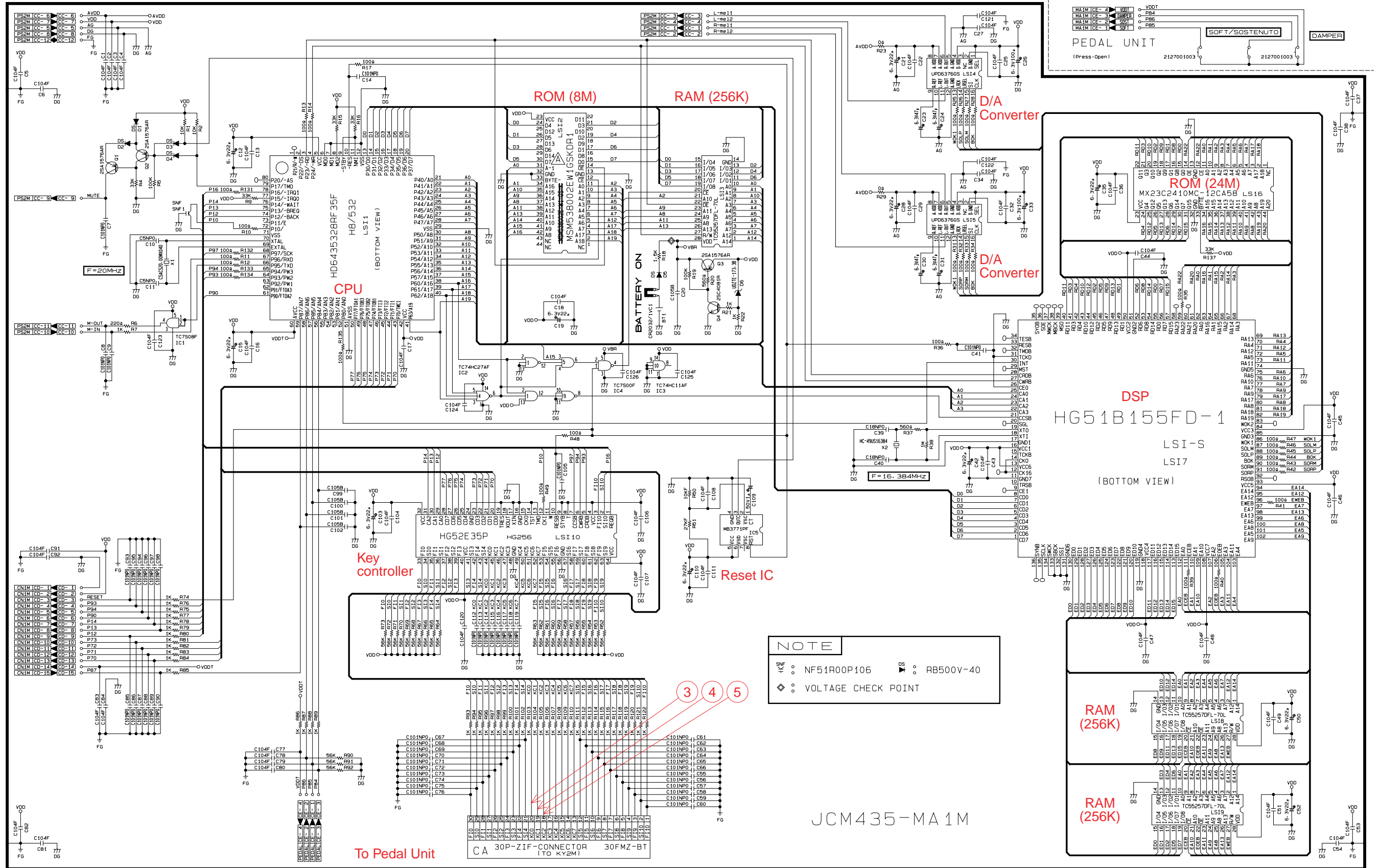
B:Stock recommended

C:Others

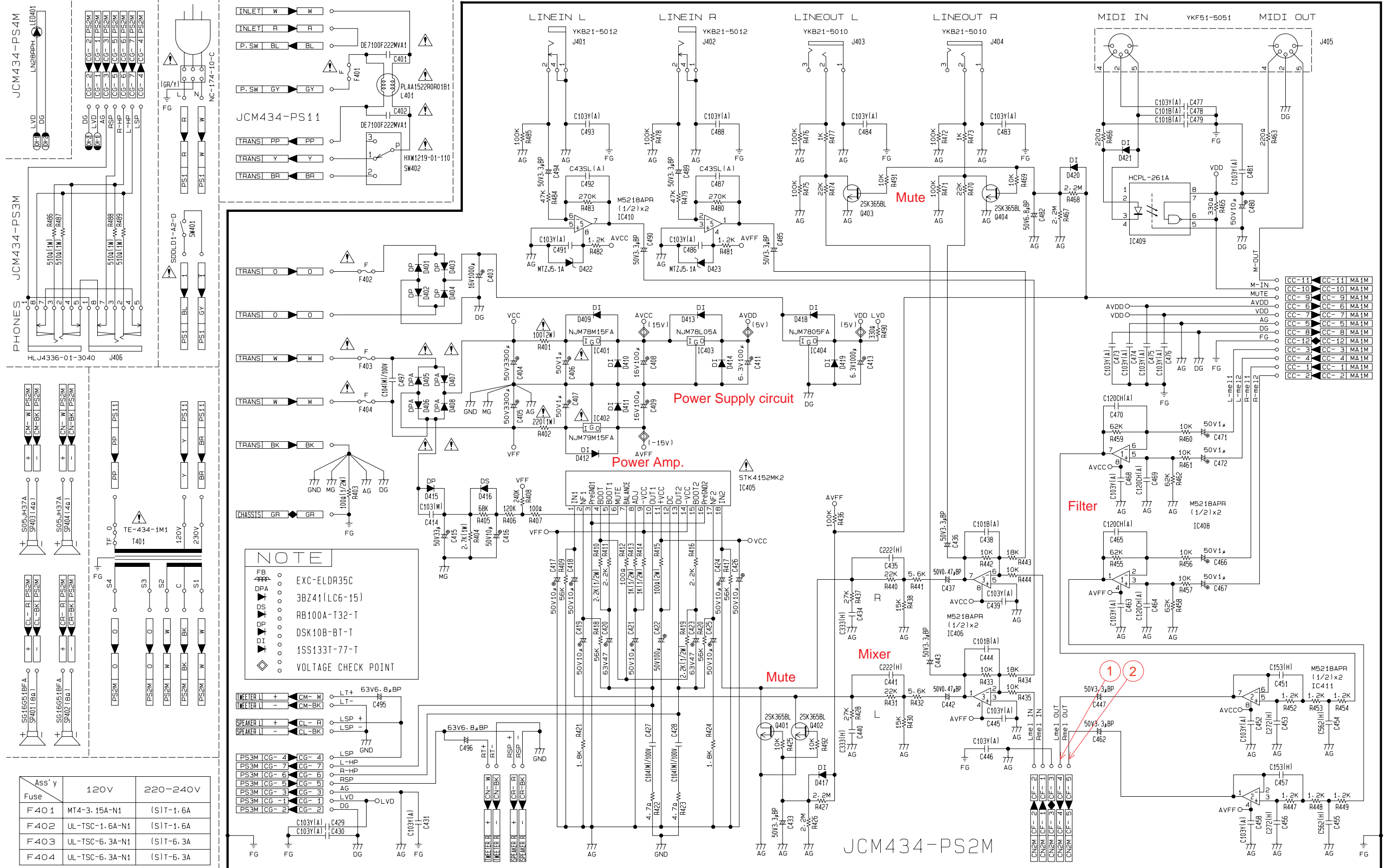
X:No stock recommended

SCHEMATIC DIAGRAMS

Main PCB JCM435-MA1M



I/O PCBs JCM434-PS2M, Phone Jack PCBs JCM434-PS3M, LED PCBs JCM 434-PS4M, Power PCBs JCM 434-PS11



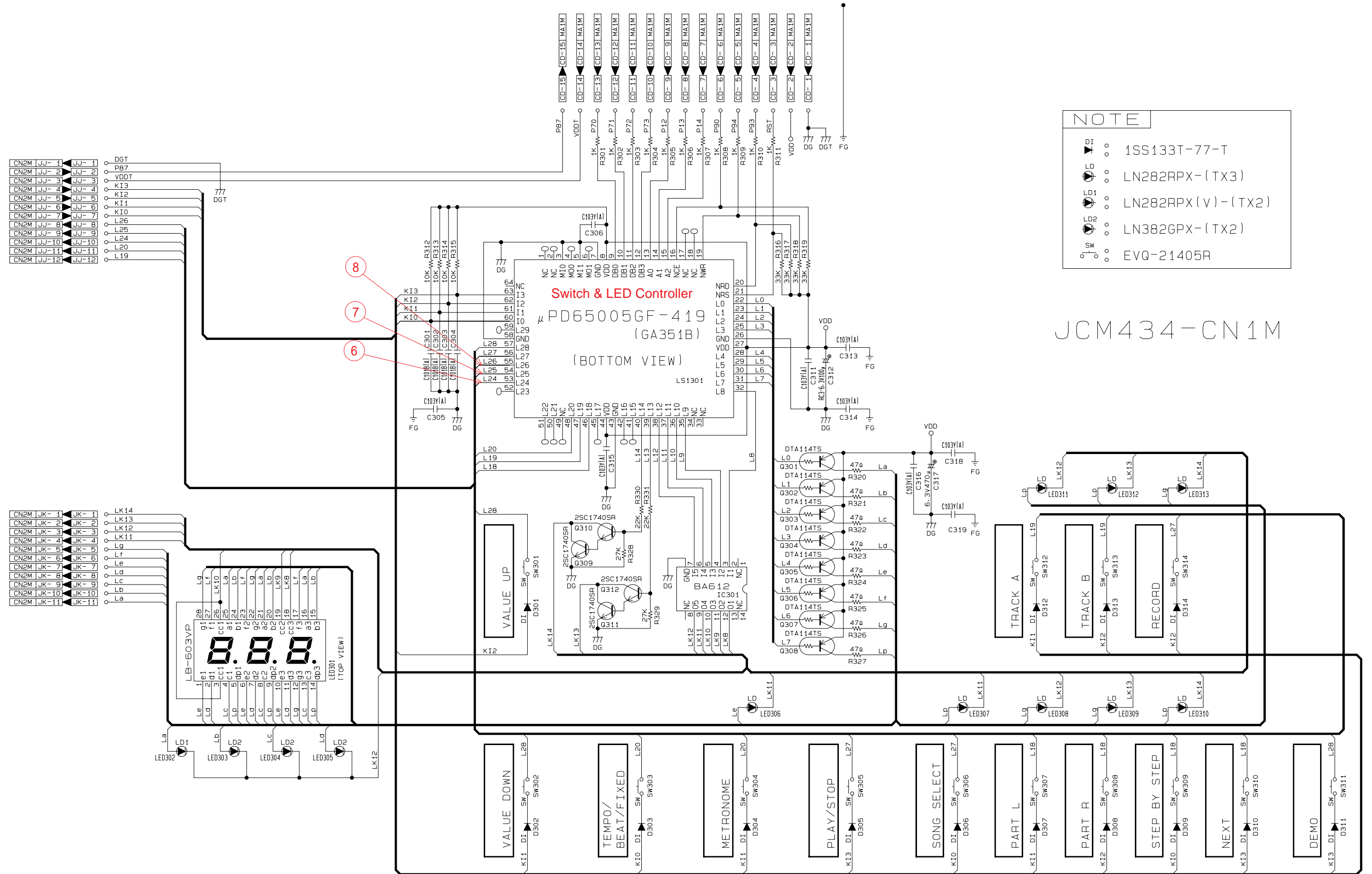
Ass'y	120V	220-240V
Fuse		
F401	MT4-3.15A-N1	(S)T-1.6A
F402	UL-TSC-1.6A-N1	(S)T-1.6A
F403	UL-TSC-6.3A-N1	(S)T-6.3A
F404	UL-TSC-6.3A-N1	(S)T-6.3A

NOTE

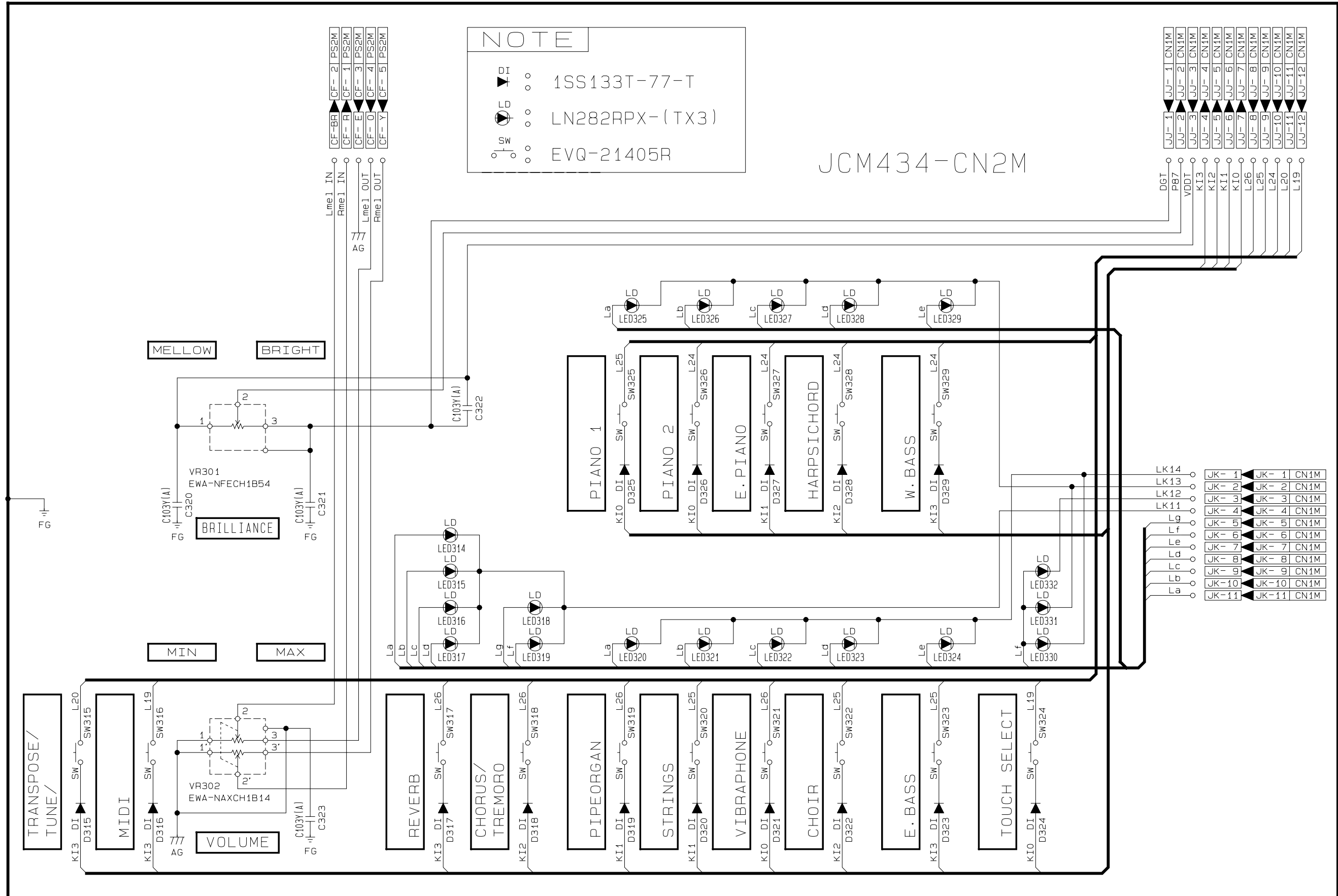
- EXC-ELDR35C
- 3BZ41(LC6-15)
- RB100A-T32-T
- DSK10B-BT-T
- 1SS133T-77-T
- ◇ VOLTAGE CHECK POINT

JCM434-PS2M

Console PCBs JCM434-CN1M



Console PCBs JCM434-CN2M



NOTE

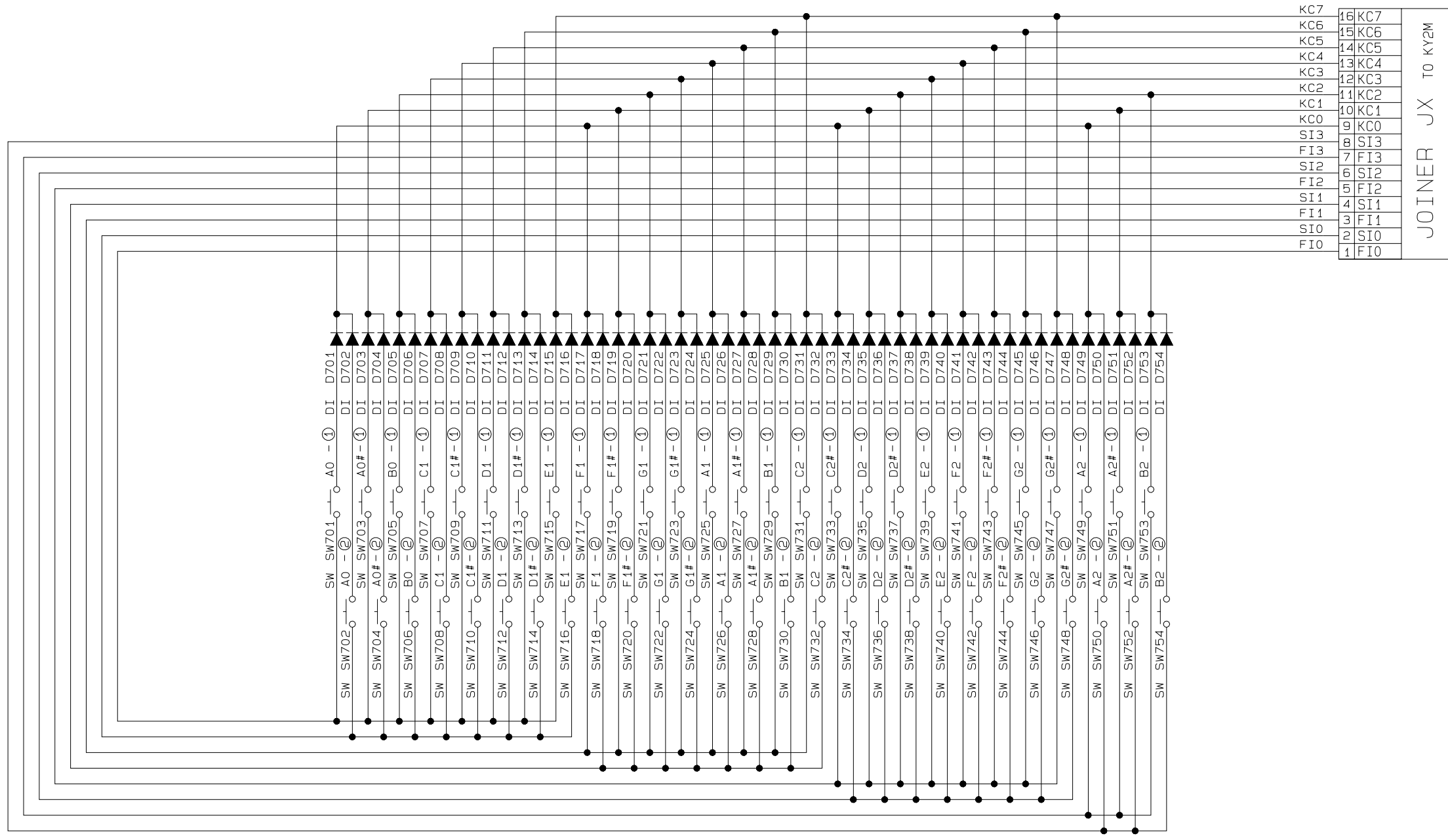
- ▶ DI 1SS133T-77-T
- ⦿ LN282RPX-(TX3)
- ⦿ EVQ-21405R

JCM434-CN2M

Keyboard PCB JCM887T-KY1M

JCM887T-KY1M

NOTE
 : 1S2076TE



Keyboard PCB JCM887T-KY2M

NOTE

DI \blacktriangleright \circ : 1S2076TE

JCM887T-KY2M

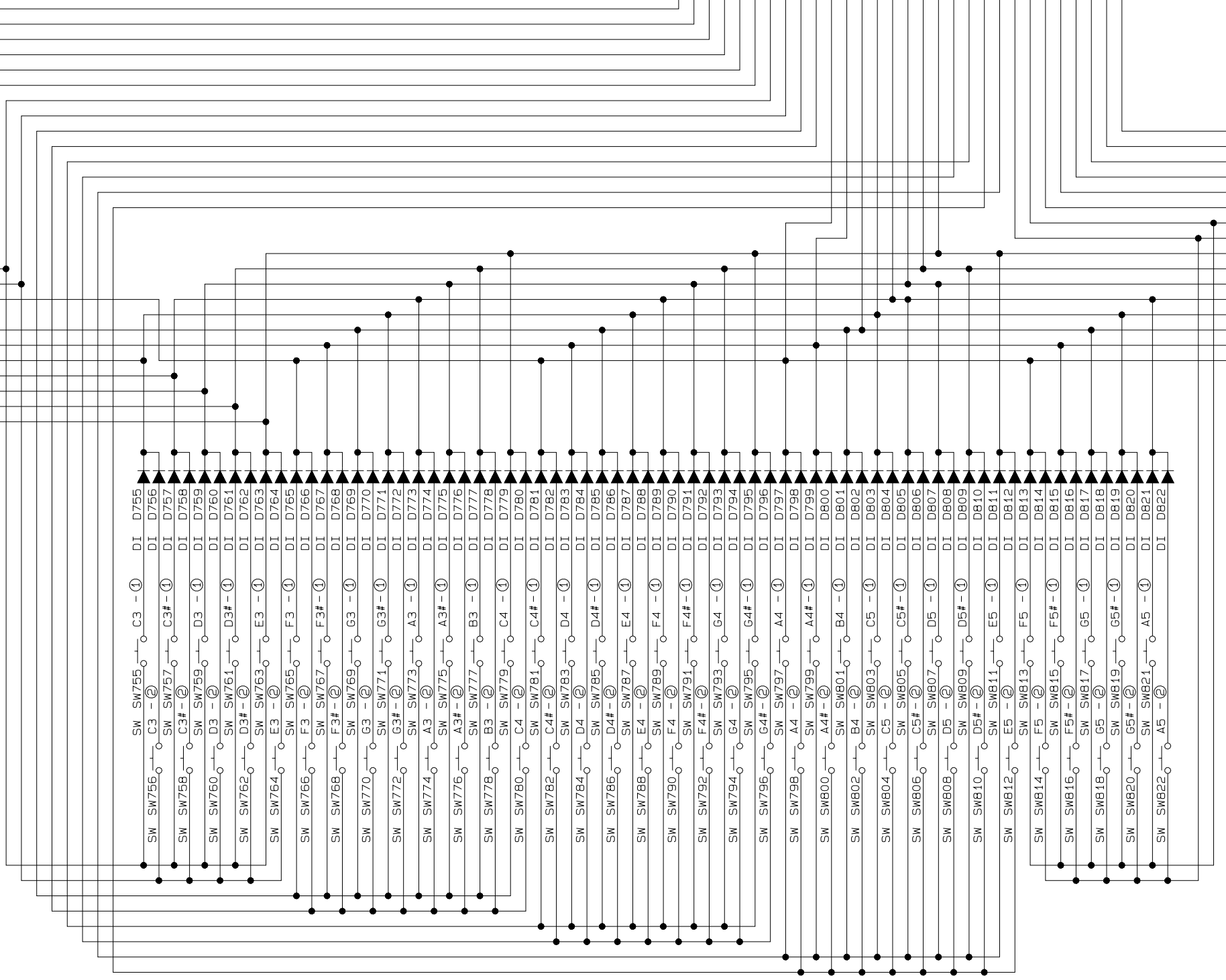
CONNECTOR CA701 TO MA1M

JOINER JX TO KY1M	
F10	1
SI0	2
FI1	3
SI1	4
FI2	5
SI2	6
FI3	7
SI3	8
KC0	9
KC1	10
KC2	11
KC3	12
KC4	13
KC5	14
KC6	15
KC7	16

30	FI0
29	SI0
28	FI1
27	SI1
26	FI2
25	SI2
24	FI3
23	SI3
22	FI4
21	SI4
20	KC0
19	KC1
18	KC2
17	KC3
16	KC4
15	KC5
14	KC6
13	KC7
12	SI5
11	FI5
10	SI6
9	FI6
8	SI7
7	FI7
6	SI8
5	FI8
4	SI9
3	FI9
2	SI10
1	FI10

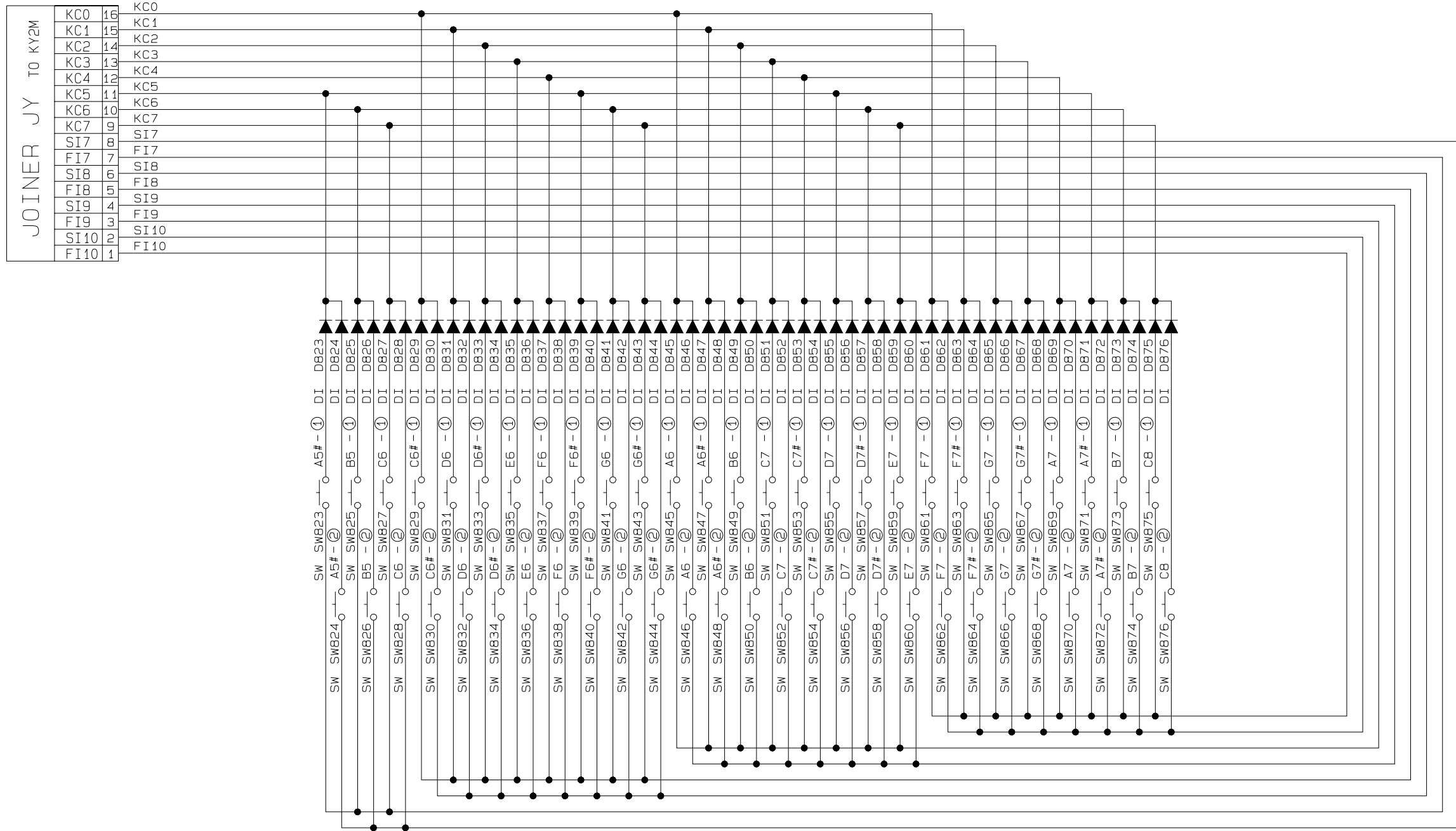
1	FI10
2	SI10
3	FI9
4	SI9
5	FI8
6	SI8
7	FI7
8	SI7
9	KC7
10	KC6
11	KC5
12	KC4
13	KC3
14	KC2
15	KC1
16	KC0

JOINER JY TO KY3M



JCM887T-KY3M

NOTE
 : 1S2076TE



Ver.1 : Correction of page 21, due to parts code misprinted.

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