

YAMAHA

SYMPHONIC ENSEMBLE

SK50D



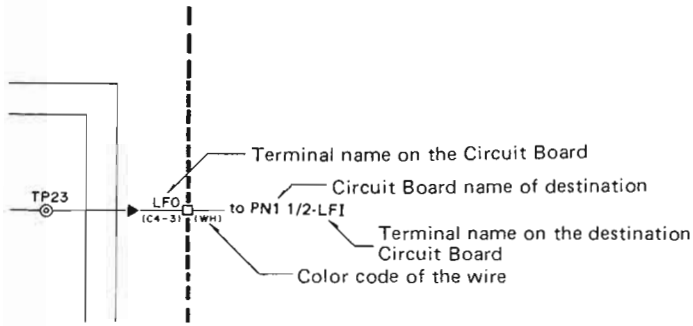
SERVICE MANUAL

CONTENTS(目次)

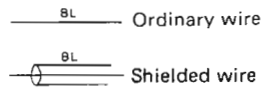
	CODING GUIDE(活用の手引).....	1
	DISASSEMBLY PROCEDURE(分解手順).....	2
	SPECIFICATIONS (総合仕様).....	4
	PANEL LAYOUT, UNIT LAYOUT.....	5
CPA	Circuit Diagram.....	10
CPA	Circuit Board & Wiring.....	13
CPB	Circuit Diagram.....	16
CPB	Circuit Board & Wiring.....	19
CPC	Circuit Diagram.....	22
CPC	Circuit Board & Wiring.....	25
PG	Circuit Diagram.....	28
PG	Circuit Board & Wiring.....	31
OG1	Circuit Diagram.....	34
OG1	Circuit Board & Wiring.....	37
OG2	Circuit Diagram.....	40
OG2	Circuit Board & Wiring.....	42
KC	Circuit Diagram.....	44
KC	Circuit Board & Wiring.....	46
TE	Circuit Diagram.....	48
TE	Circuit Board & Wiring.....	50
JK	Circuit Diagram.....	54
JK	Circuit Board & Wiring.....	54
PN1, PN2	Circuit Diagram, Circuit Board & Wiring.....	56
TC, SW	Circuit Diagram, Circuit Board & Wiring.....	58
DC, AC	Circuit Diagram.....	59
DC, AC	Circuit Board & Wiring.....	61
MK, PC	Circuit Diagram・PC Circuit Board & Wiring.....	64
	PANEL SETTING.....	67
	CHECKS AND ADJUSTMENTS(検査調整基準).....	70
	PARTS LIST	

CODING GUIDE(活用の手引)

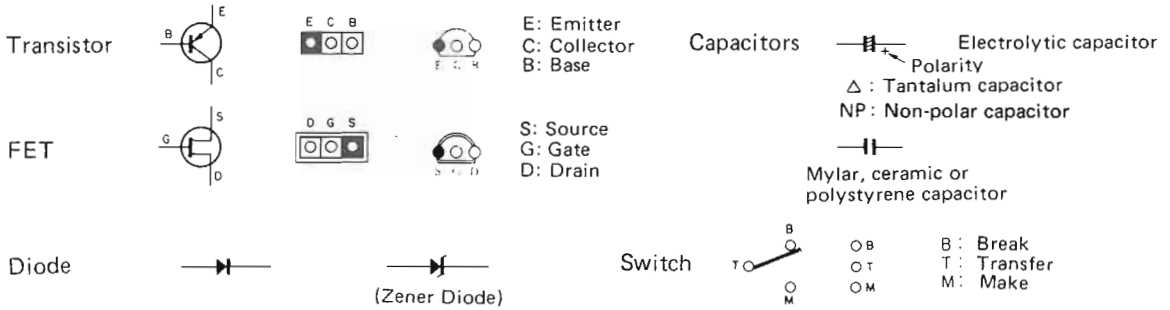
1 Wiring Notation



Note: Types of wire



2 Symbol Description



3 Abbreviations of Wire Color Codes

BLACK (クロ).....BL	BROWN (チャ).....BR	RED (アカ).....RE
ORANGE (タイ).....OR	YELLOW (キイ).....YE	GREEN (ミト).....GR
BLUE (アオ).....BE	VIOLET (ムラ).....VI	GRAY (ハイ).....GY
WHITE (シロ).....WH	GRASS GREEN (クサ).....GG	SKY BLUE (ソラ).....SB
PINK (モモ).....PK	TRANSPARENT (トウメイ).....TR	

4 Relation of Color Coding and Notes

C	C≠	D	D≠	E	F	F≠	G	G≠	A	A≠	B
BR	RE	OR	YE	GR	BE	VI	GY	WH	GG	SB	PK
(チャ)	(アカ)	(タイ)	(キイ)	(ミト)	(アオ)	(ムラ)	(ハイ)	(シロ)	(クサ)	(ソラ)	(モモ)

5 Logic Symbols

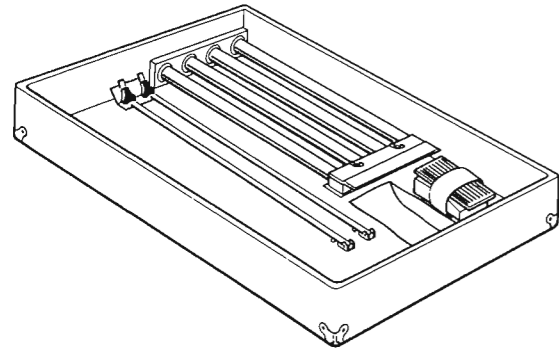
<table border="1"> <tr><td></td><td>MIL</td><td>YAMAHA</td></tr> <tr><td>NOT (INVERTOR)</td><td></td><td></td></tr> <tr><td>NOR</td><td></td><td></td></tr> <tr><td>NAND</td><td></td><td></td></tr> </table>		MIL	YAMAHA	NOT (INVERTOR)			NOR			NAND			<p>Exclusive OR (排他的論理和)</p> <p>Truth Table</p> <table border="1"> <tr><th>A</th><th>B</th><th>Y</th></tr> <tr><td>L</td><td>L</td><td>L</td></tr> <tr><td>H</td><td>L</td><td>H</td></tr> <tr><td>L</td><td>H</td><td>H</td></tr> <tr><td>H</td><td>H</td><td>L</td></tr> </table>	A	B	Y	L	L	L	H	L	H	L	H	H	H	H	L	<p>NOT (Inverter)</p> <p>Truth Table</p> <table border="1"> <tr><th>A</th><th>Y</th></tr> <tr><td>L</td><td>H</td></tr> <tr><td>H</td><td>L</td></tr> </table>	A	Y	L	H	H	L																												
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DISASSEMBLY PROCEDURE (分解手順)

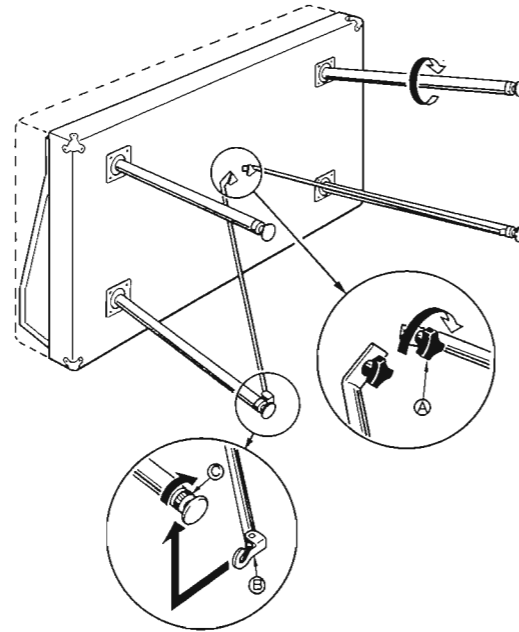
STAND ASSEMBLY (組み立て)

Four legs and two braces are stored in the upper section of the SK50D case. These are attached to the instrument in the following manner.

1. Remove the legs and braces from the upper section of the SK50D case, then securely close the case while assembling the stand.
2. Stand the instrument on the rear panel of the case and screw the legs into their sockets as shown in the illustration below.

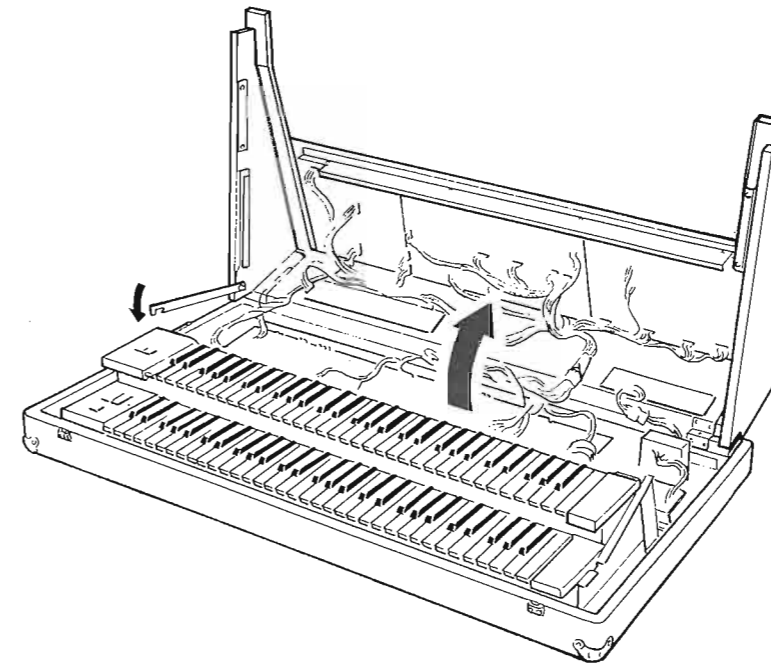


3. Attach the braces to the rear legs as shown below.
 - Loosely attach the braces to the underside of the SK50D with the screws (A).
 - Loosen the lock rings (B) on the rear legs and insert the brace hooks (C) between the legs and lock rings. Tighten the lock rings securely.
 - Finally, securely tighten the screws (A).

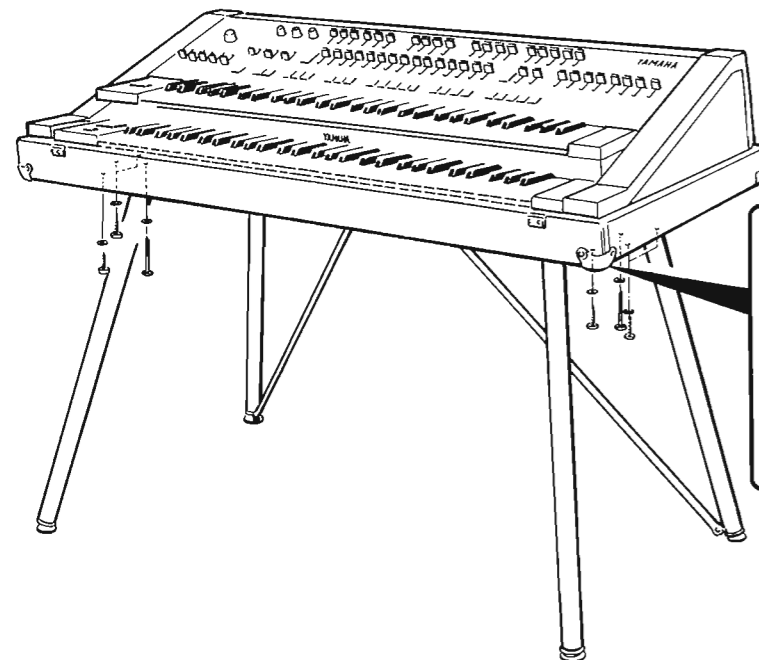


LIST

- Leg (4)
- Foot controller (FC-3A)
- Brace (2)
- Power cord



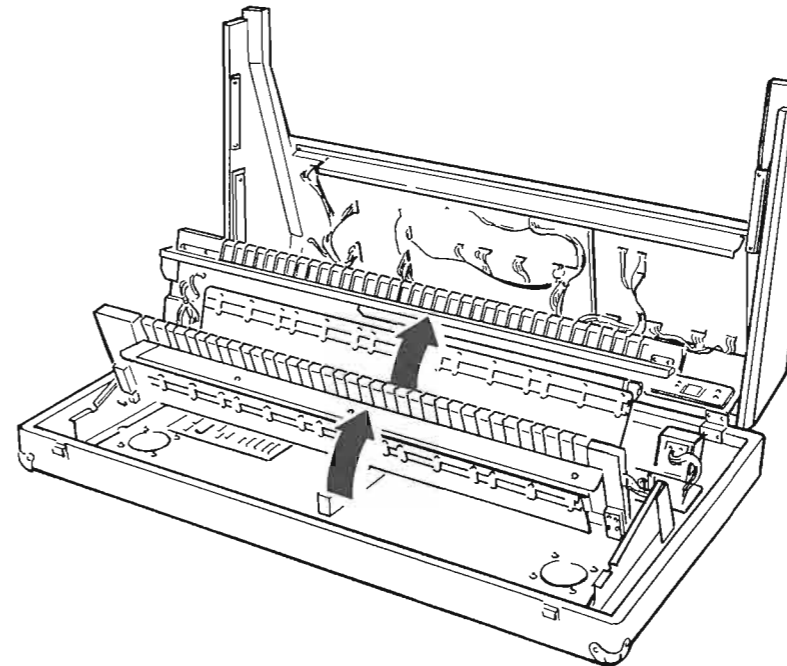
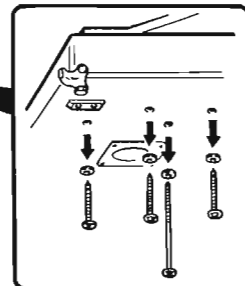
- Lift the panel as shown in the figure until it is fully opened.
- パネル部を図のように持ち上げ回転させて開きます。



Opening the Console Panel and Keyboard.

パネル及び鍵盤部の開閉

- Remove 8 screws from the bottom cover.
- 図のようにケース底側のネジ合計8本をはずします。



- The keyboard can now be lifted as shown in the figure.
- パネルを上げた状態で鍵盤部を図のように回転させることができます。

SPECIFICATIONS (総合仕様)

KEYBOARD

UPPER KEYBOARD . . . 61 keys C₁ ~ C₆ 5 octaves
 LOWER KEYBOARD . . . 61 keys C₁ ~ C₆ 5 octaves

OUTPUT section

LINE OUT ON, OFF; MIXED
 EXT TONECABINET output OFF
 Volume MASTER VOLUME
 SPLIT volume:
 SOLO/UPPER ORGAN/LOWER
 ORGAN/STRING/POLY-SYNTH

PITCH section TUNE: 438 ~ 450Hz
 POLY-SYNTH DETUNE: -20 to $+27$ cents
 SOLO TUNE: -500 ~ $+700$ cents

SOLO SYNTHESIZER section (Single-note, High-note priority)

MODE NORMAL, BASS
 (to lower keyboard C₁ ~ F₂#
 by MANUAL BASS)
 LFO SPEED: 0.1 ~ 100Hz
 PORTAMENTO 3 sec max. (C₃ ~ C₆)
 GLIDE 70msec. max.
 VCO block
 FEET 4', 5-1/3', 8', 16', 32', 64'
 WAVE \curvearrowright → \curvearrowleft , mixable
 PW 50 ~ 85%,
 LFO, MANUAL, EG selectable

VCF block
 CUT OFF FREQ Variable range: 10 octaves
 RESONANCE Q : 0.5 ~ 10
 MODULATION 3 octaves/max.
 EG DEPTH 0 ~ 10 octaves
 VCA block HOLD, GATE, EG selectable
 EG (ENVELOPE GENERATOR)
 ATTACK TIME 0.003 ~ 3 sec.
 DECAY TIME 0.03 ~ 30 sec.
 SUSTAIN LEVEL 0 ~ 10
 RELEASE TIME 0.03 ~ 30 sec.

TOUCH

VIBRATO ± 120 cents/8', A₃
 BRILLIANCE +5 octaves/max.
 MODULATION 6 octaves/max.

BASS section

MANUAL BASS OFF: Playable by BASS PEDAL
 ON: Playable lower keyboard
 C₁ ~ F₂# and by BASS
 PEDAL
 SUSTAIN 2 sec. max.
 BRILLIANCE ± 5 dB/500Hz (Sine wave)
 Tone Lever 16', 8', ATTACK 8'

VIBRATO section (POLY-SYNTH & STRING)

DELAY 0 ~ 3.2 sec.
 SPEED 5 ~ 7Hz
 DEPTH ± 30 cents

UPPER ORGAN section

ORGAN selector CANCEL, ORGAN 1, ORGAN 2
 ORGAN 3, MANUAL
 DECAY OFF, ON → } SUSTAIN
 0.03 ~ 1.6 sec. lever
 SUSTAIN OFF, ON → } S ~ L
 0.03 ~ 1.6 sec.
 BRILLIANCE ± 7 dB/5kHz (Sine wave)
 PERCUSSIVE 2nd, 3rd, 5th lever
 DECAY TIME 0.8 sec./max.
 Tone Lever 16', 8', 5-1/3', 4', 2-2/3', 2', 1-3/5',
 1-1/3', 1'

LOWER ORGAN section

ORGAN selector CANCEL, ORGAN 1, ORGAN 2

POLY-SYNTH section

STRINGS selector CANCEL, STRING 1, STRING 2
 STRING 3
 POLY-SYNTH selector CANCEL, POLY-SYNTH 1, POLY-
 SYNTH 2, POLY-SYNTH 3,
 MANUAL
 SLOW ATTACK OFF: 3msec. ON: 80msec.
 SUSTAIN SUSTAIN switch: ON, OFF
 SUSTAIN lever: 0.03 ~ 1.6 sec.
 BRILLIANCE ± 12 dB/5kHz (Sine wave)
 MODE I: one tone generator
 II: both tone generators
 FEET 4' \curvearrowleft , 8' \curvearrowleft , BP8' \curvearrowleft , 8' \curvearrowright , 16' \curvearrowleft , 16' \curvearrowright
 CUT OFF FREQ 10 octaves
 RESONANCE Q : 0.5 ~ 10
 EG DEPTH 10 octaves
 ATTACK TIME 0.003 ~ 3 sec.
 DECAY TIME 0.03 ~ 30 sec.
 SUSTAIN LEVEL 0 ~ 10
 RELEASE TIME 0.03 ~ 30 sec.

TREMOLO/ENSEMBLE section (ENSEMBLE priority)

TREMOLO UPPER ORGAN, LOWER ORGAN
 POLY-SYNTH switch
 SPEED OFF: 0.64Hz, ON: 6.4Hz
 ENSEMBLE UPPER ORGAN, LOWER ORGAN
 POLY-SYNTH switch

REAR PANEL

OUTPUT MIXED: 600 Ω , -10 dBm
 ORGAN, POLY-SYNTH, SOLO,
 BASS
 FOOT CONT Foot controller connection
 MIXED VOLUME, STRING
 VOLUME, POLY-SYNTH
 BRILLIANCE
 FOOT SW Foot switch connection
 SUSTAIN (ORGAN, POLY-
 SYNTH) PORTAMENTO (SOLO
 SYNTHESIZER)
 CONTROL VOLT IN: 0.25 ~ 2V
 OUT: 0.19 ~ 3V
 TRIGGER IN: 15 ~ 5V OFF, 0 ~ -15 V ON
 OUT: OFF (14 ~ 10V), ON (1 ~ 0V)
 KEY CODE TTL level, key code data output
 PEDALS Bass Pedal connection
 EXT TONECABINET 11 pins connector, ON/OFF switch
 connectable the Leslie models 415,
 715, 815 or equivalent (2ch-11 pin
 type)

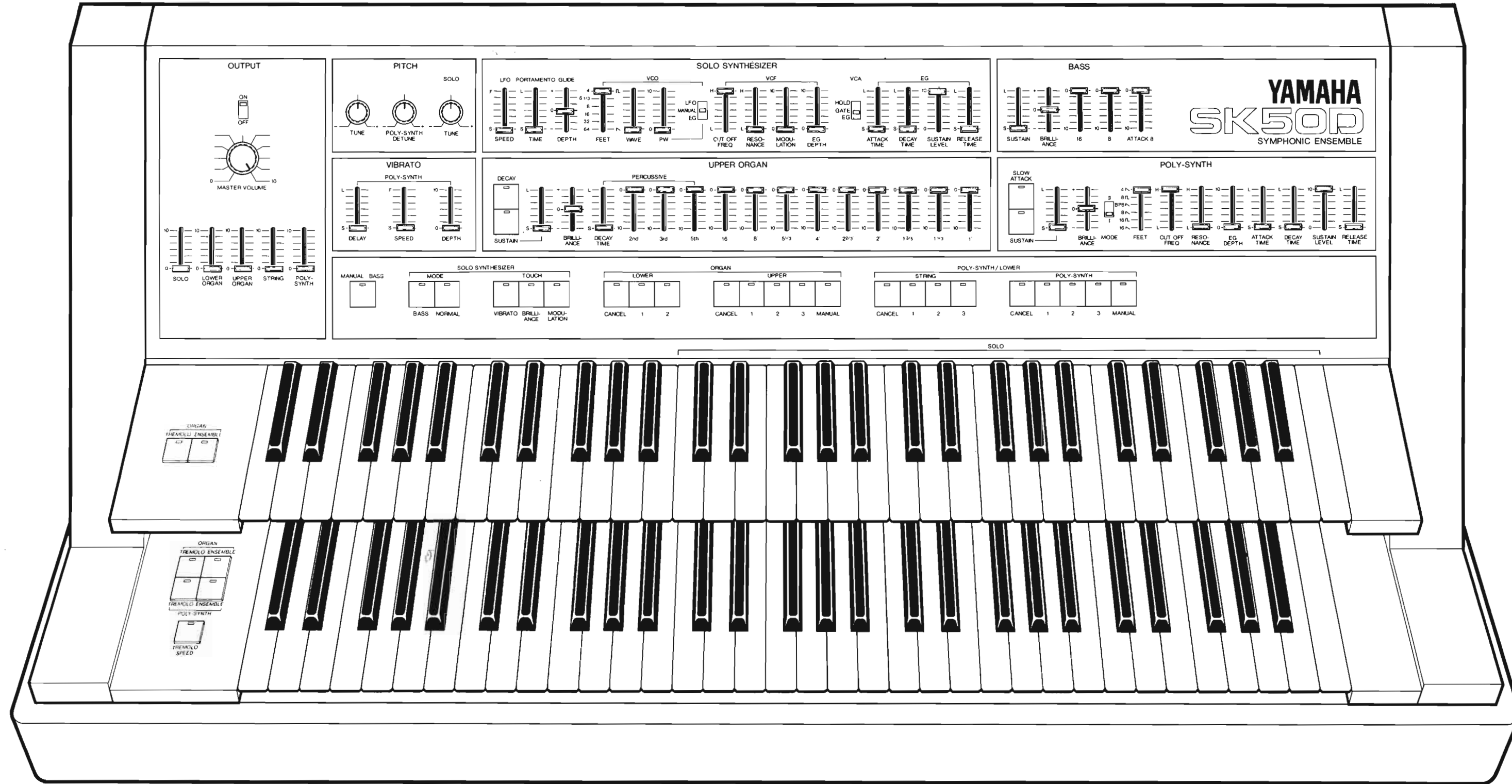
USABLE TONES (depending on MODE of SOLO SYNTHESIZER section)

UPPER KEYBOARD NORMAL: OFF 7 notes
 NORMAL: ON 7 notes +1 note
 LOWER KEYBOARD BASS: OFF 7 notes
 BASS: ON 7 notes +1 note

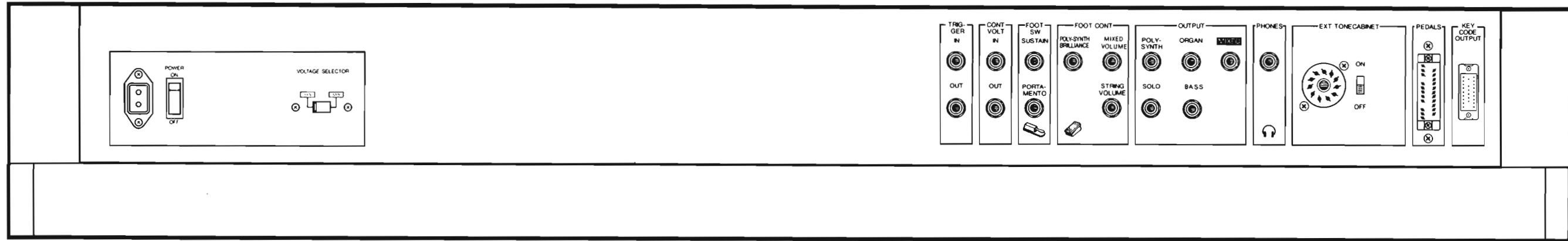
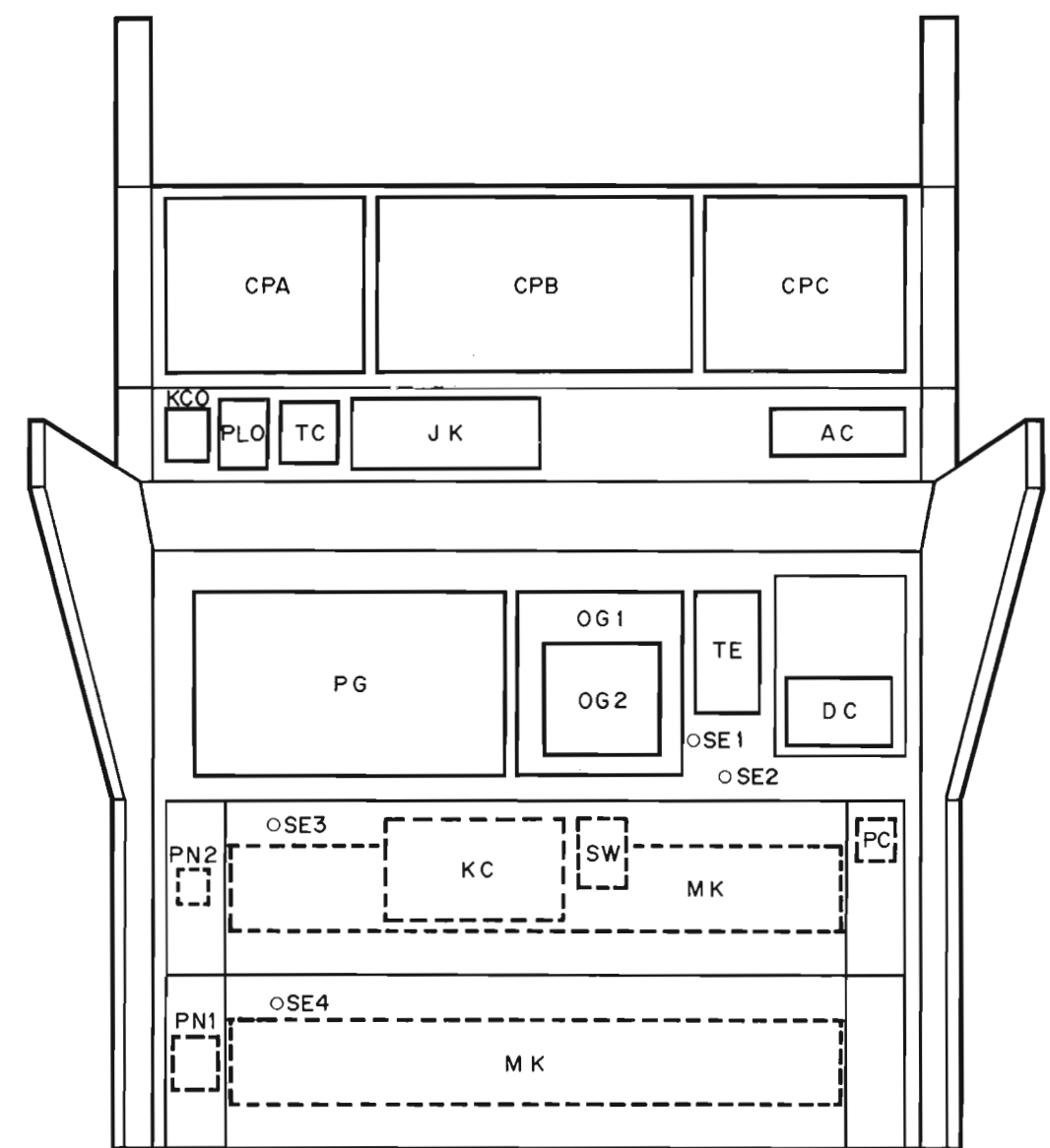
OTHERS

Power source US and Canadian models
 100V, 120V selectable 60Hz
 General model
 100, 120, 220 or 240V
 selectable, 50/60Hz
 Power consumption US model 60W
 Canadian Model 60W
 General model 60W
 Dimensions (WxHxD) 1128x237x642mm (without legs)
 (44-3/8' x 9-3/8' x 25-1/4')
 Finish Rosewoodgrain cabinet
 Accessory FC-3A Foot controller
 Optional Accessories FC-4 Foot switch pedal
 BP2 Bass pedal

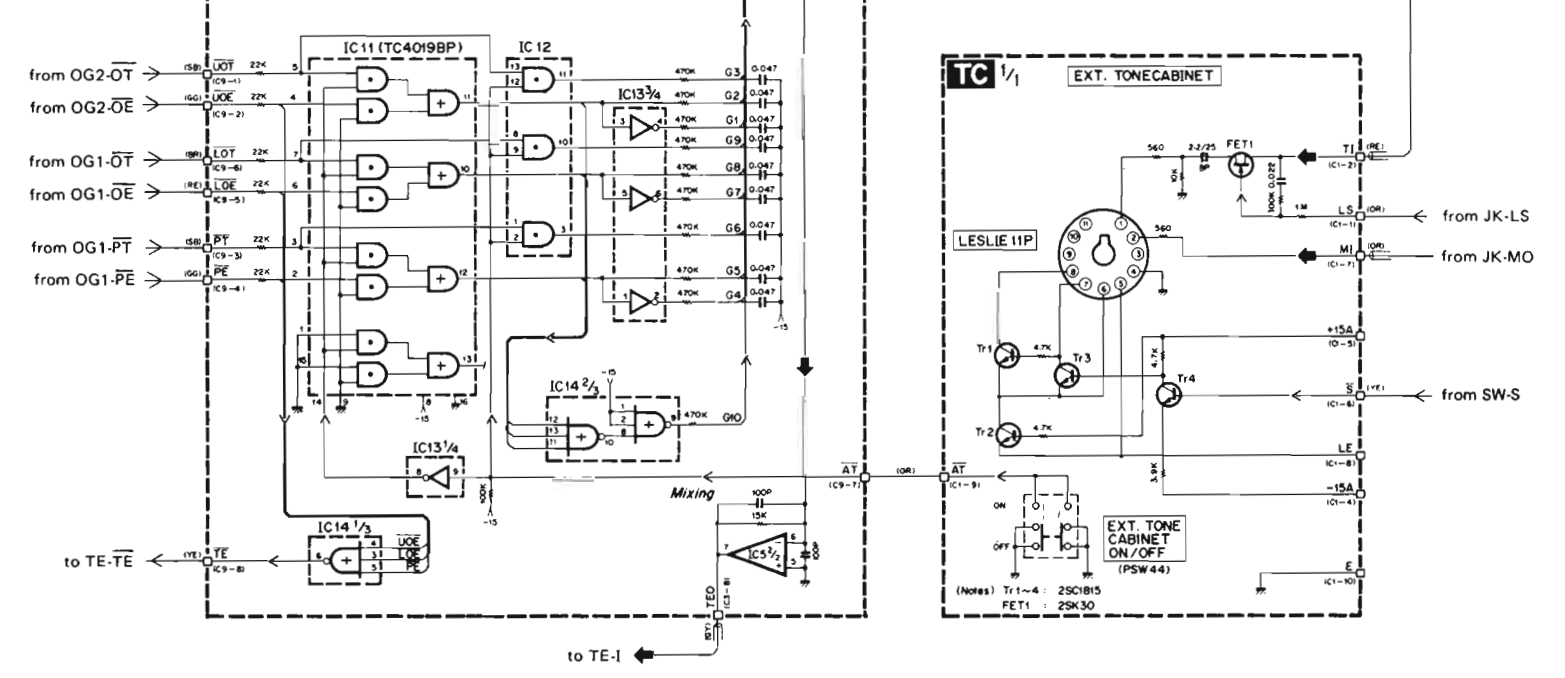
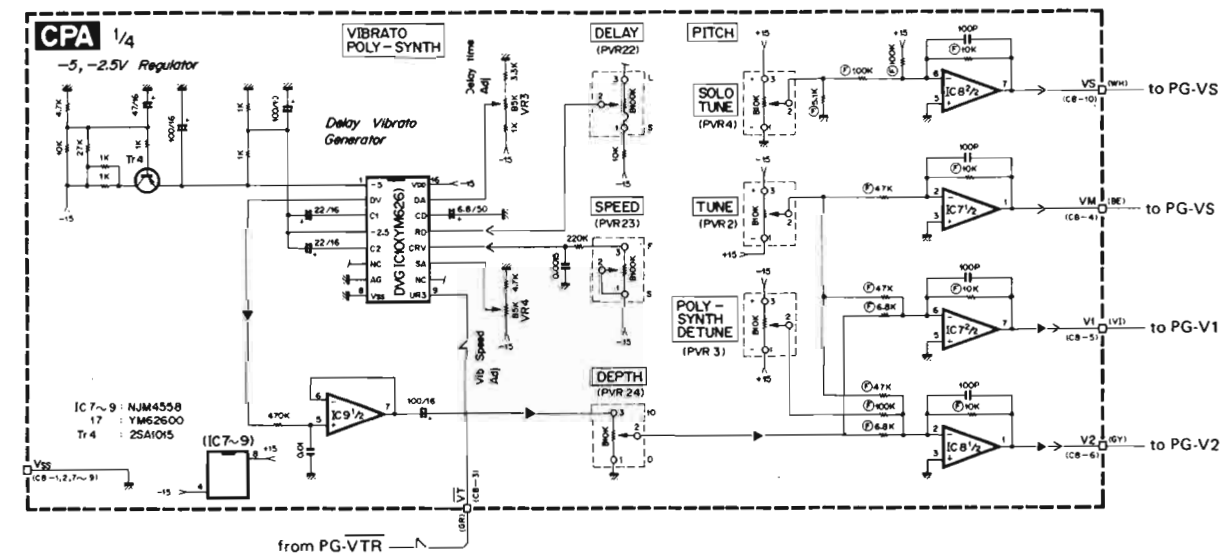
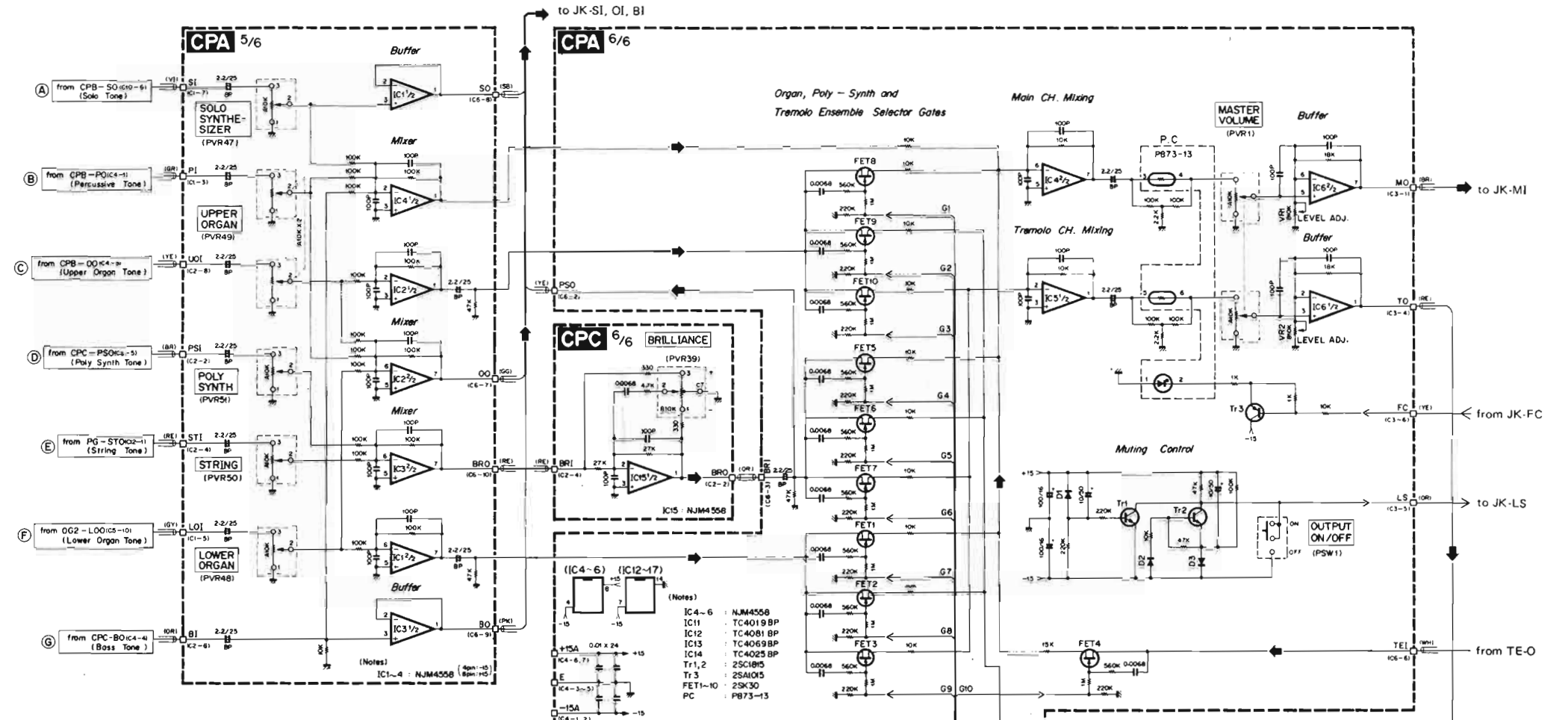
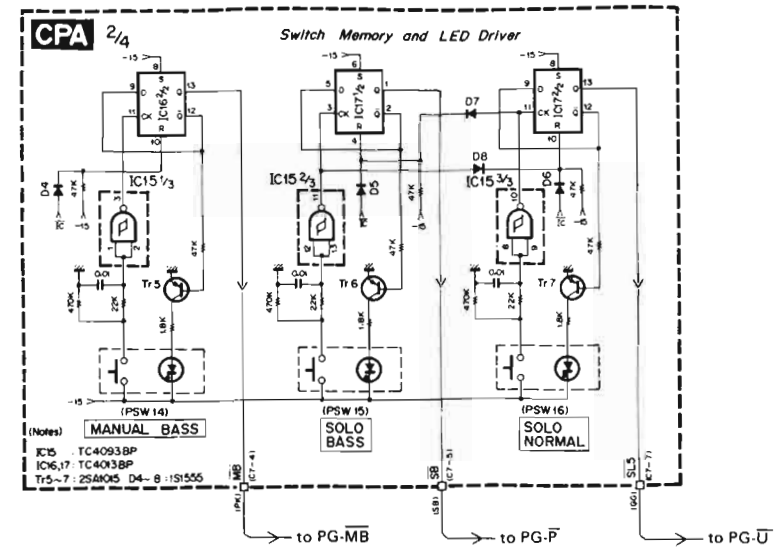
* Specifications subject to change without notice.



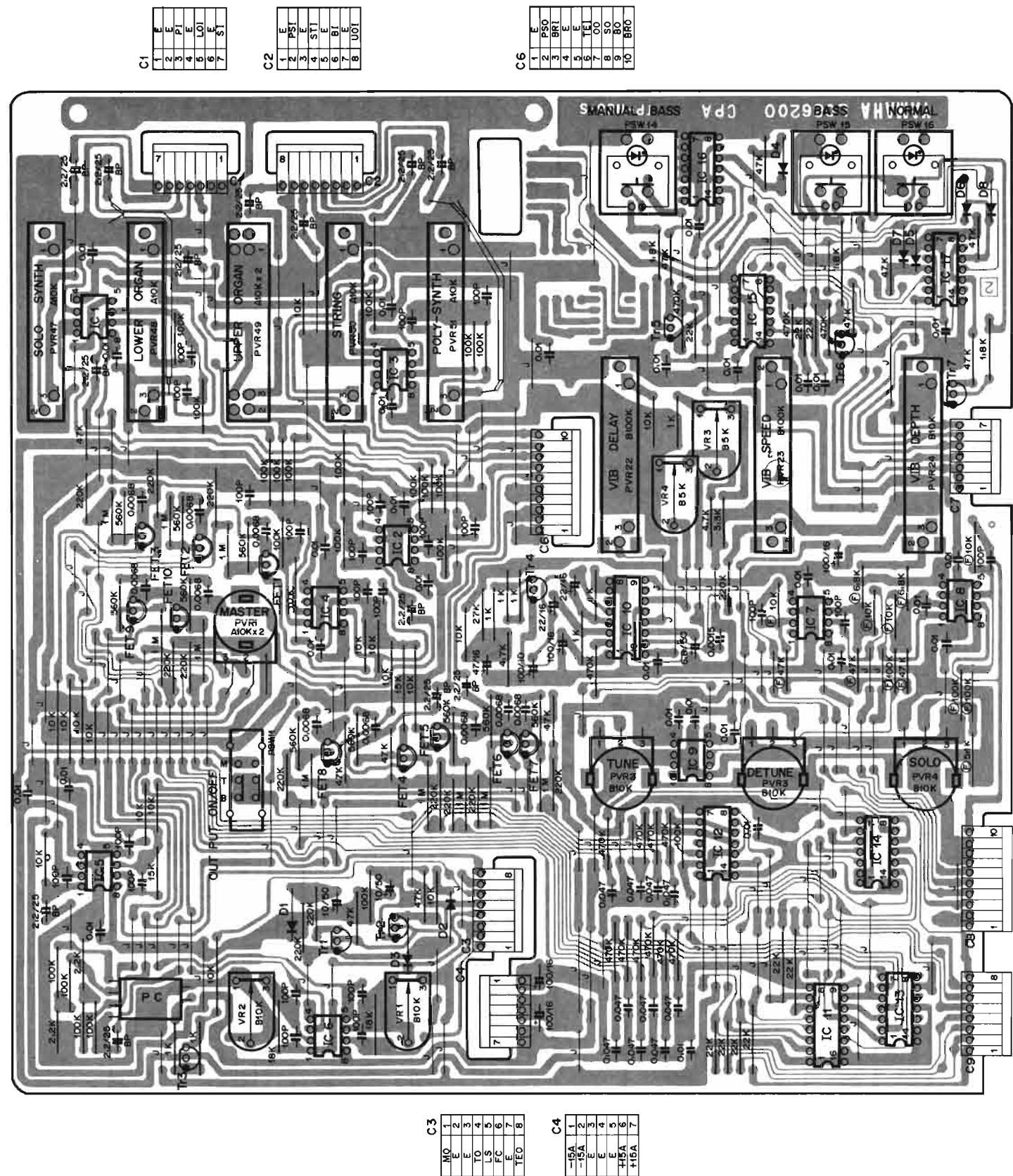
PANEL LAYOUT, UNIT LAYOUT



CPA Circuit Diagram



CPA Circuit Board & Wiring



C1

1	E	BL	JK-E (IC1-8)
2	E	S GR	S
3	PI	S GR	CPC-PO (IC4-1)
4	E	S GY	S
5	LOI	S GY	OG2-LOO (IC5-10)
6	E	S VI	S
7	SI	S VI	CPC-SO (IC10-8)

C2

1	E	S BR	S
2	PSI	S BR	CPC-PSO (IC3-5)
3	E	S RE	S
4	STI	S RE	PG-STO (IC12-1)
5	E	S OR	S
6	BI	S OR	CPC-BO (IC4-4)
7	E	S YE	S
8	UOI	S YE	CPC-OO (IC4-3)

C6

1	E	BL	JK-E (IC1-8)
2	E	S GR	S
3	PI	S GR	CPC-PO (IC4-1)
4	E	S GY	S
5	LOI	S GY	OG2-LOO (IC5-10)
6	E	S VI	S
7	SI	S VI	CPC-SO (IC10-8)
8	UOI	S YE	CPC-OO (IC4-3)

C7

7	SL5	GG	PG-L (IC4-3)
6	NC	-	-
5	SB	SB	PG-P (IC4-5)
4	MB	PK	PG-MB (IC8-10)
3	IC	GG	OG1-IC (IC1-10)
2	IC	GG	OG1-IC (IC1-1)
1	IC	GG	OG1-IC (IC1-1)

C8

10	V5	-	-
9	V5s	-	-
8	V5S	-	-
7	V5S	-	-
6	V2	GY	PG-V2 (IC6-4)
5	V1	VI	PG-V1 (IC6-5)
4	VM	GR	PG-VM (IC3-6)
3	VT	GR	PG-VTR (IC3-6)
2	VSS	-	-
1	VSS	-	-

C9

8	T/E	YE	TE-T/E (IC3-2)
7	AT	DR	TC-AT (IC1-9)
6	LOT	SB	OG1-OT (IC15-7)
5	LOE	GG	OG1-OE (IC15-6)
4	PE	RE	OG1-PE (IC15-8)
3	PT	BR	OG1-PT (IC15-5)
2	UOE	GG	OG2-OE (C7-1)
1	UOT	SB	OG2-OT (C7-3)

C3

1	MO	S BR	JK-MI (IC1-3)
2	E	S BR	S
3	E	S RE	S
4	TO	S RE	TC-TI (IC1-2)
5	LS	OR	JK-LS (IC1-1)
6	FC	YE	JK-FC (IC3-3)
7	E	S GY	S
8	TEO	S GY	TE-I (IC2-8)

C4

1	-15A	VE	DC-15A (IC2-2)
2	-15A	YE	CPC-15A (IC9-7)
3	E	BL	DC-E (IC2-3)
4	E	BL	CPC-E (IC9-3)
5	E	BL	TC-L (IC1-8)
6	+15A	BR	DC+15A (IC2-1)
7	+15A	BR	CPC+15A (IC9-1)

C1

1	E	BL	JK-E (IC1-8)
2	E	S GR	S
3	PI	S GR	CPC-PO (IC4-1)
4	E	S GY	S
5	LOI	S GY	OG2-LOO (IC5-10)
6	E	S VI	S
7	SI	S VI	CPC-SO (IC10-8)

C2

1	E	S BR	S
2	PSI	S BR	CPC-PSO (IC3-5)
3	E	S RE	S
4	STI	S RE	PG-STO (IC12-1)
5	E	S OR	S
6	BI	S OR	CPC-BO (IC4-4)
7	E	S YE	S
8	UOI	S YE	CPC-OO (IC4-3)

C3

1	MO	S BR	JK-MI (IC1-3)
2	E	S BR	S
3	E	S RE	S
4	TO	S RE	TC-TI (IC1-2)
5	LS	OR	JK-LS (IC1-1)
6	FC	YE	JK-FC (IC3-3)
7	E	S GY	S
8	TEO	S GY	TE-I (IC2-8)

C4

1	-15A	VE	DC-15A (IC2-2)
2	-15A	YE	CPC-15A (IC9-7)
3	E	BL	DC-E (IC2-3)
4	E	BL	CPC-E (IC9-3)
5	E	BL	TC-L (IC1-8)
6	+15A	BR	DC+15A (IC2-1)
7	+15A	BR	CPC+15A (IC9-1)

C6

1	E	-	-
2	PSO	S YE	JK-PSI (IC2-1)
3	BRI	S OR	CPC-BRO (IC2-2)
4	E	S OR	S
5	E	S WH	S
6	TEI	S WH	TE-O (IC3-3)
7	DO	GG	JK-OI (IC2-7)
8	SO	S SB	JK-SI (IC2-3)
9	BO	S PK	JK-BI (IC2-5)
10	BRO	S RE	CPC-BRI (IC2-4)

C7

1	IC	GG	OG1-IC (IC12-10)
2	IC	GG	CPC-IC (IC1-1)
3	IC	GG	CPC-IC (IC2-1)
4	M8	PK	PG-MB (IC8-10)
5	SB	SB	PG-P (IC4-5)
6	NC	-	-
7	SL5	GG	PG-L (IC4-3)

C8

1	V5s	VI	DC-E (IC3-3)
2	V5	-	-
3	VT	GR	PG-VTR (IC3-6)
4	VM	BE	OG1-VM (IC2-5)
5	V1	VI	PG-V1 (IC6-5)
6	V2	GY	PG-V2 (IC6-4)
7	V5s	-	-
8	V5s	-	-
9	V5s	-	-
10	V5	WH	PG-VS (IC9-1)

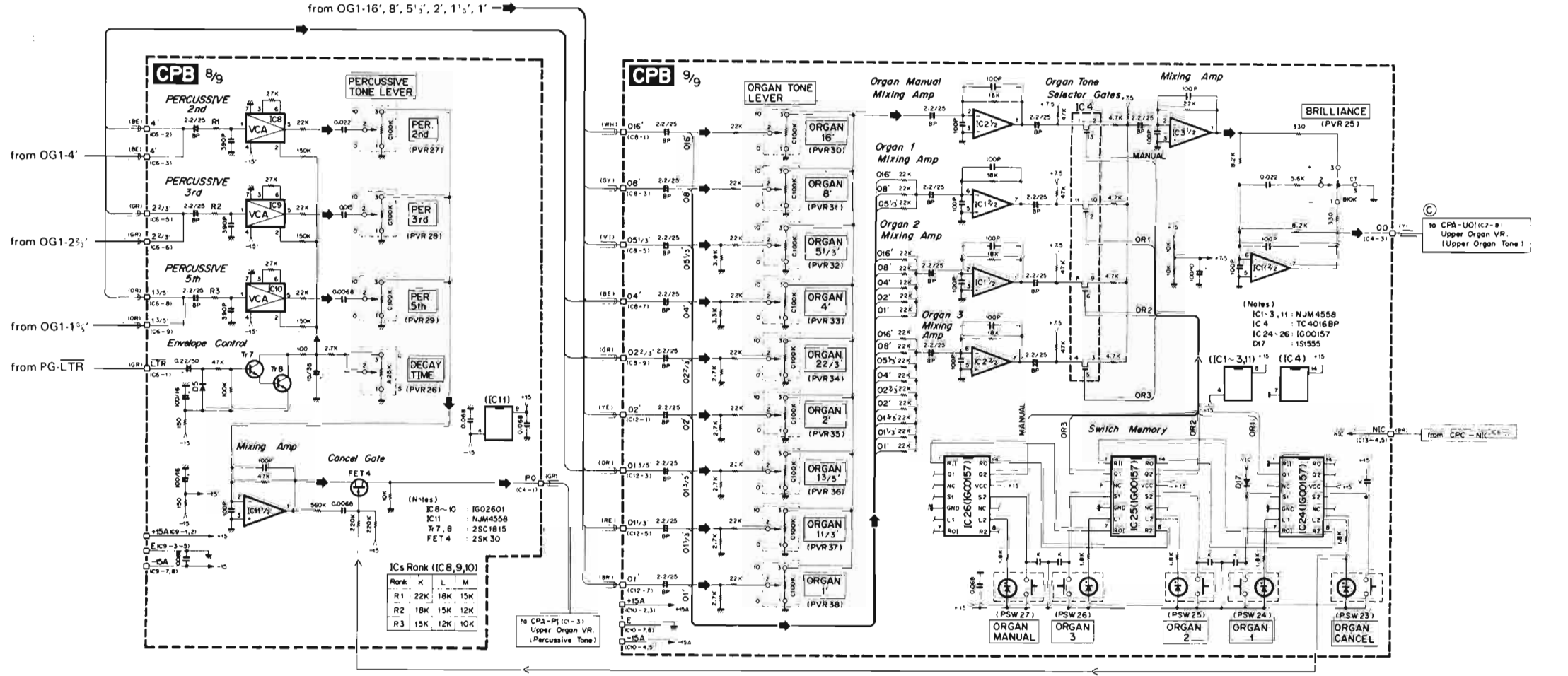
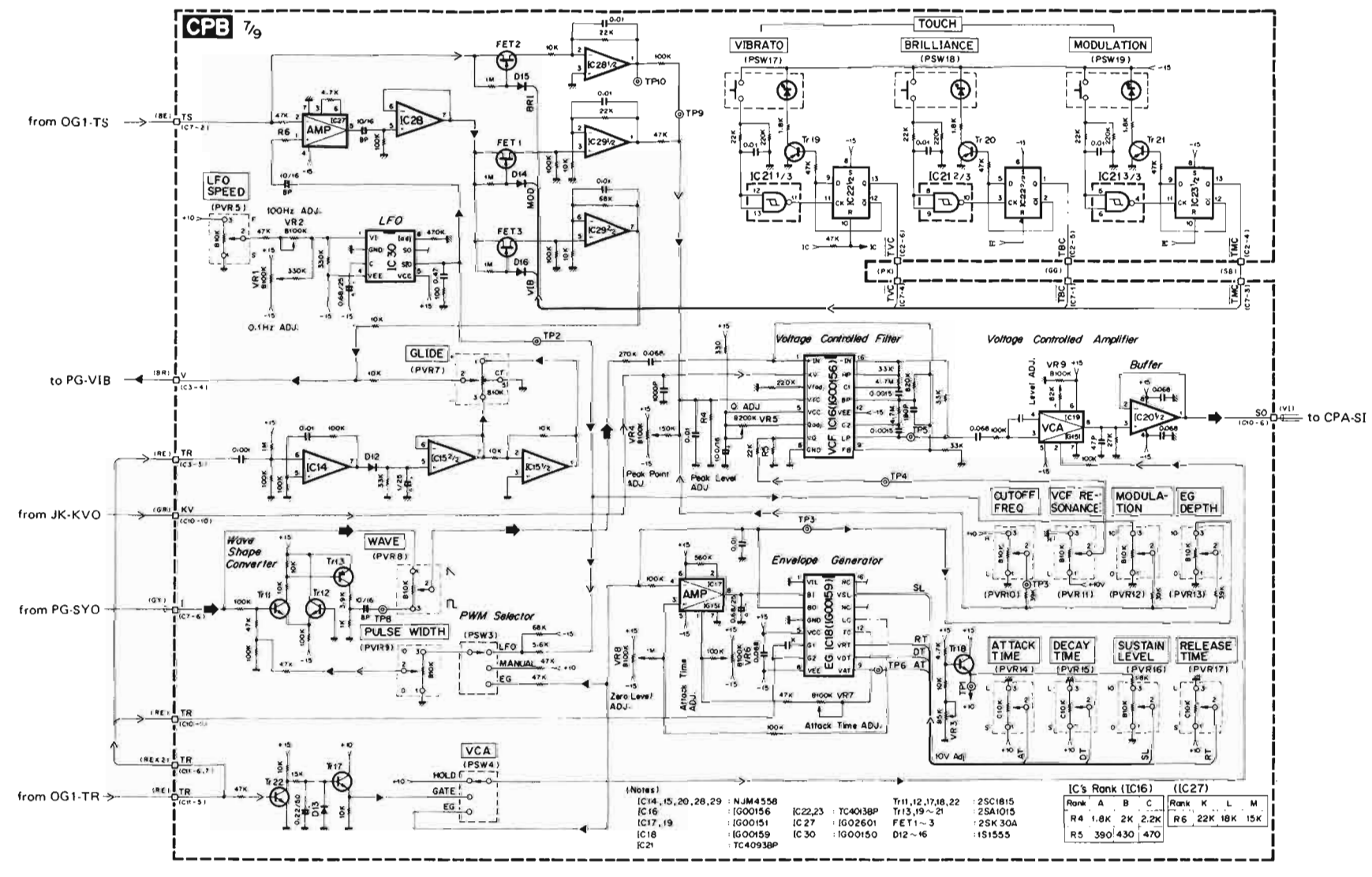
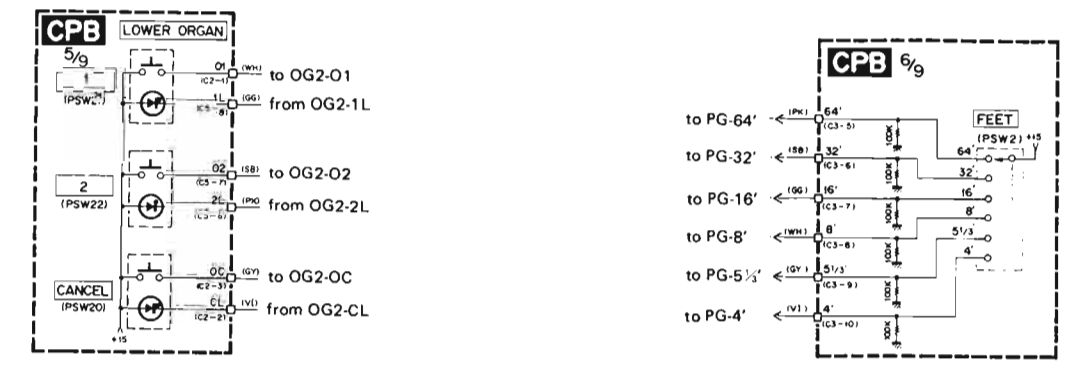
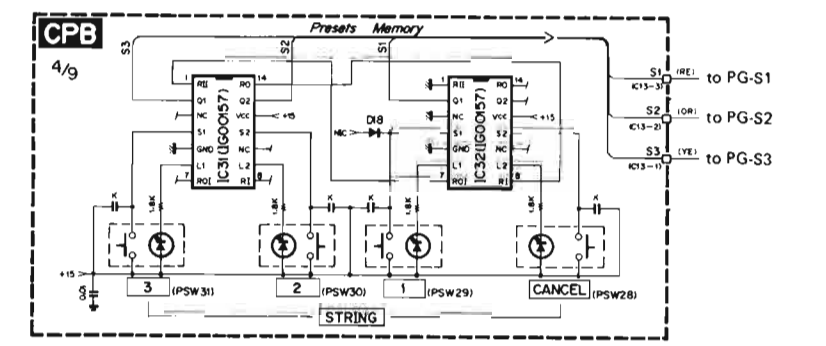
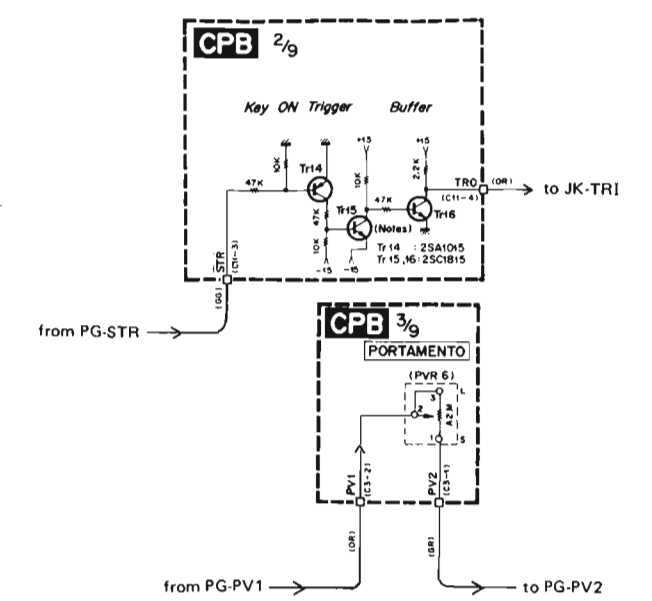
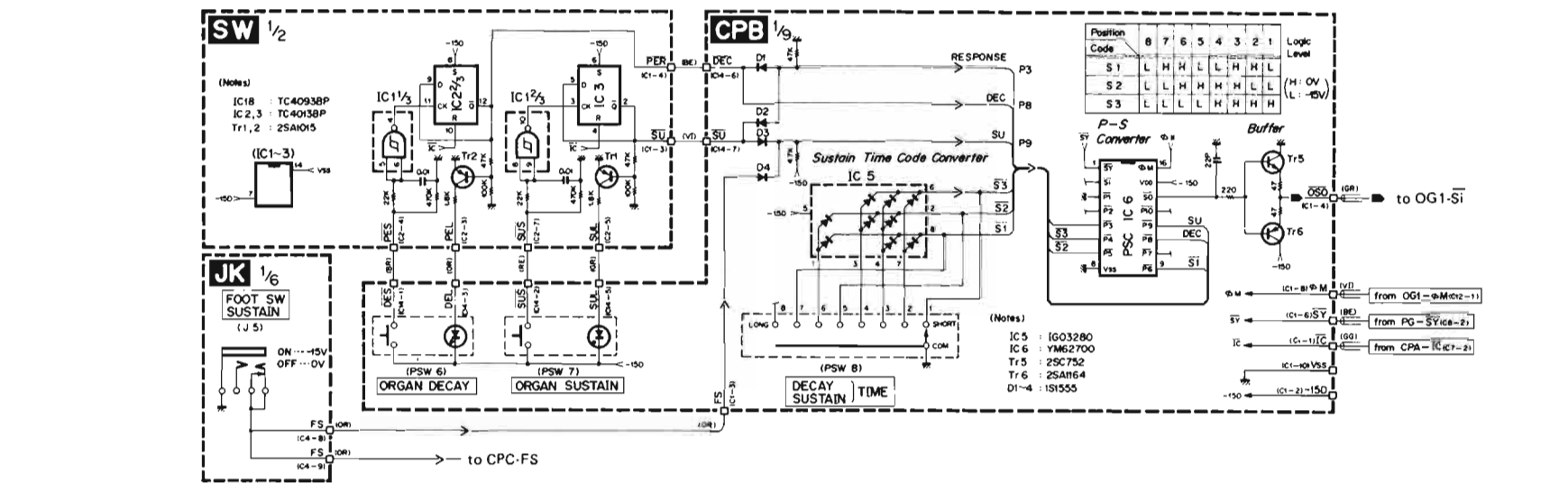
C9

1	UOT	SB	OG2-OT (C7-3)
2	UOE	GG	OG2-OE (C7-1)
3	PT	BR	OG1-PT (IC15-5)
4	PE	RE	OG1-PE (IC15-8)
5	LOE	GG	OG1-OE (IC15-6)
6	LOT	SB	OG1-OT (IC15-7)
7	AT	DR	TC-AT (IC1-9)
8	T/E	YE	TE-T/E (IC3-2)

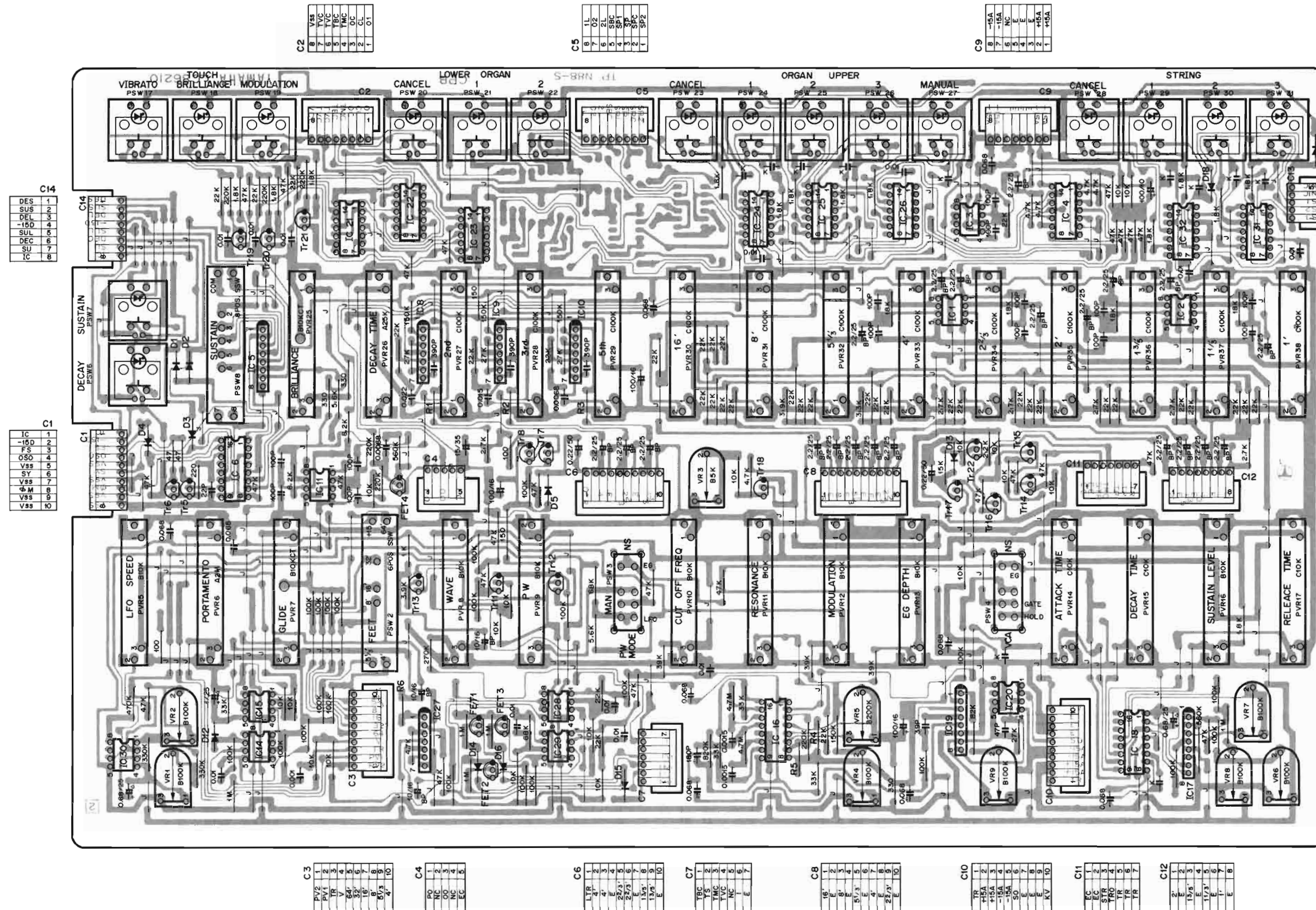
- Notes)
- Circuit Board : LC86200 (3)
 - IC, LSI
 - IC1 ~ 9 : NJM4558D (OP-Amp)
 - IC10 : YM62600 (DVG)
 - IC11 : TC4019BP (AND-OR Select)
 - IC12 : TC4081BP (AND)
 - IC13 : TC4069BP (Inverter)
 - IC14 : TC4025BP (3 Input NOR)
 - IC15 : TC4093BP (Schmitt Trigger NAND)
 - IC16, 17 : TC4013BP ("D" Flip-Flop)
 - Transistors
 - Tr1, 2 : 2SC1815 (O, Y)
 - Tr3 ~ 7 : 2SA1015 (O, Y)
 - Field Effect Transistors
 - FET1 ~ 10 : 2SK30A (Y)
 - Diodes
 - D1 ~ D8 : 1S1555
 - (F) marked Resistor :
 - 1% 100PPM Metal Film Resistor
 - Photo Coupler
 - PC : P873-13
 - Capacitor
 - (K) marked: Ceramic Capacitor
 - Rotary Variable Resistor
 - PVR1 : A10K x 2 HS31099
 - PVR2, 3, 4 : B10K HS31057
 - Slide Variable Resistor
 - PVR22 : B100K with Open HQ23005
 - PVR23 : B100K HQ23004
 - PVR24 : B10K HQ23006
 - PVR47, 48, 50, 51 : A10K HQ23002
 - PVR49 : A10K x 2 HQ23001
 - Slide Switch
 - PSW1 : 2 way, 2 contact KA40060
 - Push Switch with LED
 - PSW14 : Gray KA90170
 - PSW15, 16 : White KA90171

View from the printed pattern side of the circuit board

CPB Circuit Diagram



CPB Circuit Board & Wiring



Pin No.	Pin Name	Wire Color	Destination
1	IC	GG	CPA-IC (IC2-2)
2	-15D	YE	DC-15D (IC2-5)
3	FS	OR	JK-FS (IC4-8)
4	OSO	S GR	OG1-S (IC5-1)
5	Vs	S GR S	-
6	SY	S BE	PG-SY (IC8-2)
7	Vs	S BE S	-
8	GM	S VI	OG1-GM (IC12-1)
9	S VI S	-	-
10	Vs	VI	DC-Vs (IC2-4)

Pin No.	Pin Name	Wire Color	Destination
1	WH	OG2-O1	(IC6-3)
2	CL	VI	OG2-CL (IC6-3)
3	OC	GY	OG2-OC (IC6-2)
4	TMC	SB	CPB-TMC (IC7-3)
5	TBC	GG	CPB-TBC (IC7-1)
6	TVC	PK	CPB-TVC (IC7-4)
7	TVC	-	-
8	Vs	VI	CPC-Vs1 (IC1-7)

Pin No.	Pin Name	Wire Color	Destination
1	PV2	GR	PG-PV2 (IC9-5)
2	PV1	OR	PG-PV1 (IC9-4)
3	TR	RE	CPB-TR (IC11-7)
4	V	BR	PG-VIB (IC11-4)
5	64	PK	PG-64 (IC11-5)
6	32	SB	PG-32 (IC11-6)
7	16	GG	PG-16 (IC11-7)
8	8	WH	PG-8 (IC11-8)
9	5 1/3	GY	PG-5 1/3 (IC11-9)
10	4	VI	PG-4 (IC11-10)

Pin No.	Pin Name	Wire Color	Destination
1	PO	S GR	CPA-PI (IC1-3)
2	NC	-	-
3	DO	S YE	CPA-DO (IC2-8)
4	NC	BL	CPB-EC (IC11-2)

Pin No.	Pin Name	Wire Color	Destination
1	SP2	-	-
2	SP	-	-
3	SP	-	-
4	SP1	-	-
5	SBC	-	-
6	2L	PK	OG2-2L (IC6-5)
7	O2	SB	OG2-O2 (IC6-5)
8	1L	GG	OG2-1L (IC6-4)

Pin No.	Pin Name	Wire Color	Destination
1	LTR	GR	PG-LTR (IC3-1)
2	4	S BE	CPB-4 (IC8-7)
3	4	S BE	OG1-4 (IC10-3)
4	E	S BE S	-
5	2 2/3	S GR	CPB-2 2/3 (IC8-9)
6	2 2/3	S GR	OG1-2 2/3 (IC10-1)
7	E	S GR S	-
8	1 3/5	S OR	CPB-1 3/5 (IC12-3)
9	1 3/5	S OR	OG1-1 3/5 (IC11-5)
10	E	S OR S	-

Pin No.	Pin Name	Wire Color	Destination
1	DES	BR	SW-PES (IC2-4)
2	SUS	RE	SW-SUS (IC2-7)
3	DEL	OR	SW-DEL (IC2-3)
4	-15D	YE	SW-15D (IC1-8)
5	SUL	GR	SW-SUL (IC2-5)
6	DEC	BE	SW-PER (IC1-4)
7	SU	VI	SW-SU (IC1-3)
8	IC	GY	SW-IC (IC1-1)

Pin No.	Pin Name	Wire Color	Destination
1	EC	BL	DC-Vs (IC4-4)
2	EC	BL	CPB-EC (IC4-5)
3	STR	GG	PG-STR (IC9-2)
4	TRD	OR	JK-TR (IC4-1)
5	TR	RE	OG1-TR (IC13-2)
6	TR	RE	CPB-TR (IC10-1)
7	TR	RE	CPB-TR (IC3-3)

Pin No.	Pin Name	Wire Color	Destination
1	2	S YE	OG1-2 (IC11-7)
2	E	S YE S	-
3	1 3/5	S OR	CPB-1 3/5 (IC6-8)
4	E	S OR S	-
5	1 1/3	S RE	OG1-1 1/3 (IC11-3)
6	E	S RE S	-
7	1	S BR	OG1-1 (IC11-1)
8	E	S BR S	-

Pin No.	Pin Name	Wire Color	Destination
1	TR	RE	CPB-TR (IC11-6)
2	+15A	BR	CPA-15A (IC4-7)
3	+15A	BR	CPB-15A (IC10-2)
4	E	BL	CPA-E (IC4-4)
5	E	BL	CPB-E (IC10-7)
6	NC	-	-
7	-15A	YE	CPA-15A (IC4-2)
8	-15A	YE	CPB-15A (IC10-4)

Pin No.	Pin Name	Wire Color	Destination
1	EC	BL	DC-Vs (IC4-4)
2	EC	BL	CPB-EC (IC4-5)
3	STR	GG	PG-STR (IC9-2)
4	TRD	OR	JK-TR (IC4-1)
5	TR	RE	OG1-TR (IC13-2)
6	TR	RE	CPB-TR (IC10-1)
7	TR	RE	CPB-TR (IC3-3)

Pin No.	Pin Name	Wire Color	Destination
1	DES	BR	SW-PES (IC2-4)
2	SUS	RE	SW-SUS (IC2-7)
3	DEL	OR	SW-DEL (IC2-3)
4	-15D	YE	SW-15D (IC1-8)
5	SUL	GR	SW-SUL (IC2-5)
6	DEC	BE	SW-PER (IC1-4)
7	SU	VI	SW-SU (IC1-3)
8	IC	GY	SW-IC (IC1-1)

- Notes
- Circuit Board : LC86210
 - IC, LSI
 - IC1 ~ 3, 11, 14, 15, 20, 28, 29 : NJM4558DV (OP-Amp)
 - IC4 : TC4016BP (Analog SW)
 - IC5 : iG03280 (Diode Matrix)
 - IC6 : YM62700 (PSC)
 - IC8 ~ 10, 27 : iG02601 (VCA)
 - IC16 : iG00156 (+VCF)
 - IC17, 19 : iG00151 (VCA)
 - IC18 : iG00159 (EG-VCA)
 - IC21 : TC4093BP (NAND Schmitt Trigger)
 - IC22, 23 : TC4013BP ("D" Flip-Flop)
 - IC24 ~ 26, 31, 32 : iG00157 (SW Memory)
 - IC30 : iG00150 (VCOII)
 - Transistors
 - Tr5 : 2SC752 (Y)
 - Tr6 : 2SA1164 (GR)
 - Tr7, 8, 11, 12, 15 ~ 18, 22 : 2SC1815 (O, Y)
 - Tr13, 14, 19 ~ 21 : 2SA1015 (O, Y)
 - Field Effect Transistors
 - FET1 ~ 4 : 2SK30A (Y)
 - Diodes
 - D1 ~ 5, 12 ~ 18 : 1S1555
 - Capacitor
 - (K) marked : Ceramic Capacitor 100P
 - (A) marked : Solid Aluminum Capacitor
 - Set "R1 ~ R6" in accordance with the following table. See illust for VCA (IC8 ~ 10, 27) rank.

IC number	rank	K L M		
		R1	R2	R3
IC8	R1	22K	18K	15K
IC9	R2	18K	15K	12K
IC10	R3	15K	12K	10K
IC27	R6	22K	18K	15K

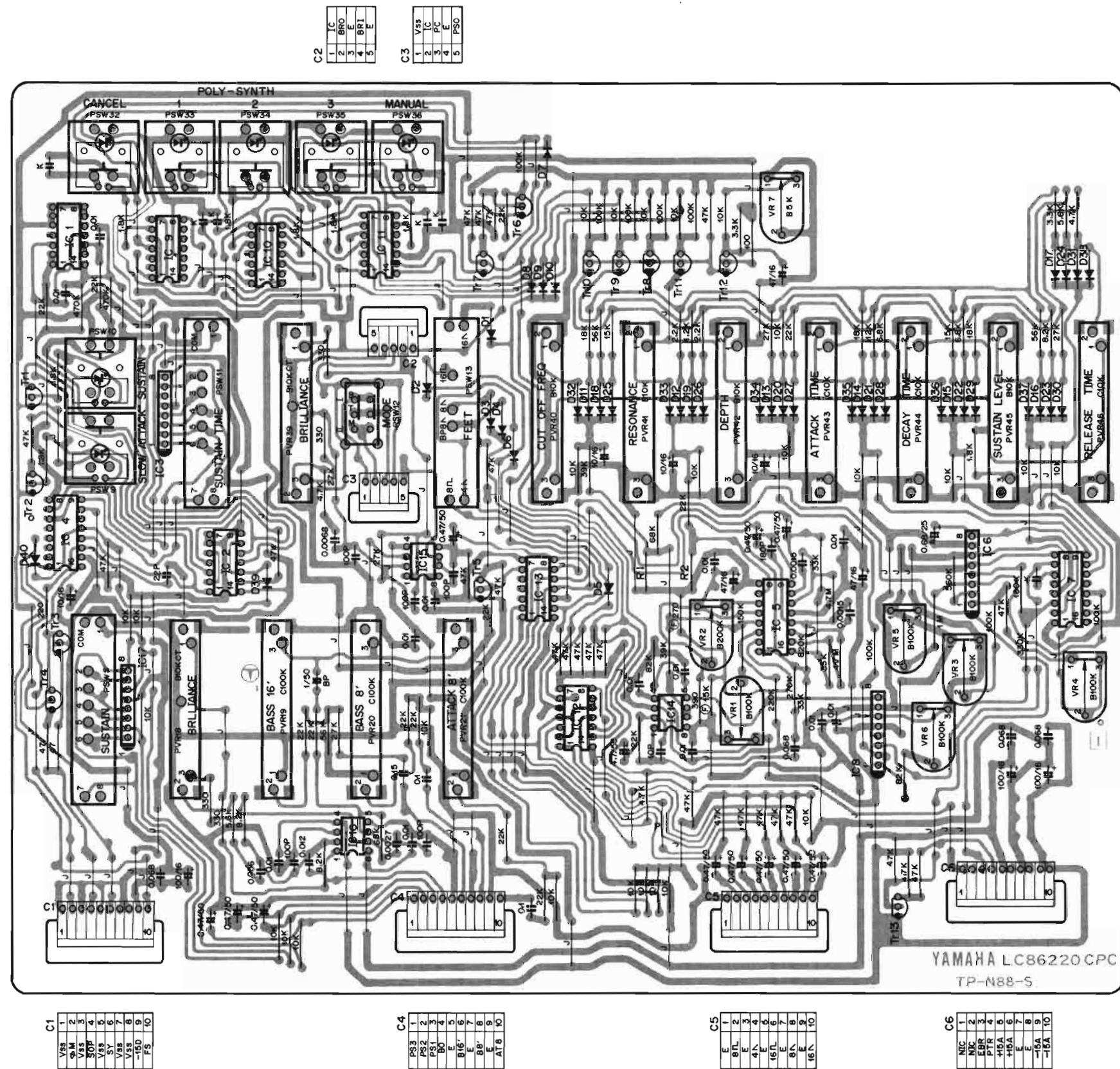
- Set "R4, R5" in accordance with the following table. See illust for VCF (IC16) rank.

R	rank		
	A	B	C
R4	1.8K	2K	2.2K
R5	390	430	470

- Semi-Variable Resistor
 - VR1 ~ 9 : V10K type
- Slide Variable Resistor
 - PVR5, 8 ~ 13, 16 : B10K HQ23006
 - PVR6 : A2M HQ23011
 - PVR7, 25 : B10KCT HQ23007
 - PVR14, 15, 17 : C10K HQ23009
 - PVR26 : A25K HQ23003
 - PVR27 ~ 38 : C100K HQ23008
- Slide Switch
 - PSW2 : 6 contact with click KA40080
 - PSW3, 4 : 2 way, 3 contact (Non shorting) KA40059
 - PSW8 : 8 contact (Non click) KA40079
- Push Switch with LED
 - PSW6, 7, 17 ~ 20 : Gray KA90170
 - PSW21, 22, 24 ~ 27, 29 ~ 31 : White KA90171

View from the printed pattern side of the circuit board

CPC Circuit Board & Wiring



C2

1	Vrs	IC
2	BRO	S OR
3	BR	S
4	BR	S
5	PSO	S BR

C3

1	Vrs	VI
2	BRO	S OR
3	PC	SB
4	BR	S BR
5	PSO	S BR

C1

1	Vrs	IC
2	BR	S
3	BR	S
4	BR	S
5	BR	S
6	BR	S
7	BR	S
8	BR	S
9	BR	S
10	BR	S

C4

1	PS3	OR
2	PS2	RE
3	PS1	BR
4	BO	S OR
5	E	S YE S
6	B16'	S YE
7	E	S GR S
8	B8'	S GR
9	E	S BE S
10	AT8	S BE

C5

1	E	S SB S
2	B1	S SB
3	E	S PK S
4	4N	S PK
5	E	S WH S
6	16L	S WH
7	E	S GG S
8	B1N	S GG
9	E	S GY S
10	16N	S GY

C6

1	NIC	BR
2	NK	BR
3	EBR	OR
4	HDA	BR
5	HDA	BR
6	HDA	BR
7	E	BL
8	E	BL
9	-15A	YE
10	-15A	YE

C1

Pin No.	Pin Name	Wire Color	Destination
1	Vrs	S VI	S
2	BR	S VI	KC-6M (IC5-10)
3	Vrs	S GY	S
4	SOP	S GY	PG-SI (IC8-7)
5	Vrs	S BE	S
6	SY	S BE	PG-SY (IC8-4)
7	Vrs	VI	CPB-Vrs (IC2-8)
8	Vrs	VI	DC-Vrs (IC3-4)
9	-15D	YE	DC-15D (IC3-6)
10	FS	OR	JK-FS (IC4-8)

C2

Pin No.	Pin Name	Wire Color	Destination
1	IC	GG	CPA-IC (IC7-3)
2	BRO	S OR	CPA-BRI (IC6-3)
3	E	S OR	S
4	BR1	S RE	CPA-BRO (IC6-10)
5	E	S RE	S

C3

Pin No.	Pin Name	Wire Color	Destination
1	Vrs	VI	PG-Vrs (IC7-7)
2	IC	GG	OG1-IC (IC12-8)
3	PC	SB	PG-PC (IC9-7)
4	E	S BR	S
5	PSO	S BR	CPA-PSI (IC2-2)

C4

Pin No.	Pin Name	Wire Color	Destination
1	PS3	OR	OG2-PS3 (IC5-1)
2	PS2	RE	OG2-PS2 (IC5-2)
3	PS1	BR	OG2-PS1 (IC5-3)
4	BO	S OR	CPA-B1 (IC2-6)
5	E	S YE S	S
6	B16'	S YE	OG2-B16' (IC5-4)
7	E	S GR S	S
8	B8'	S GR	OG2-B8' (IC5-6)
9	E	S BE S	S
10	AT8	S BE	OG2-AT8 (IC5-8)

C5

Pin No.	Pin Name	Wire Color	Destination
1	E	S SB S	S
2	B1	S SB	PG-B1 (IC13-2)
3	E	S PK S	S
4	4N	S PK	PG-4N (IC13-1)
5	E	S WH S	S
6	16L	S WH	PG-16L (IC13-3)
7	E	S GG S	S
8	B1N	S GG	PG-B1N (IC13-5)
9	E	S GY S	S
10	16N	S GY	PG-16N (IC13-4)

C6

Pin No.	Pin Name	Wire Color	Destination
1	NIC	BR	OPB-NIC (IC13-5)
2	NIC	BR	OG2-NIC (IC6-7)
3	EBR	OR	JK-EBR (IC3-2)
4	PTR	RE	PG-PTR (IC3-7)
5	+15A	BR	CPB-+15A (IC10-3)
6	+15A	BR	JK-+15A (IC3-1)
7	E	BL	CPB-E (IC10-8)
8	E	BL	JK-E (IC4-10)
9	-15A	YE	CPB-15A (IC10-5)
10	-15A	YE	JK-15A (IC3-5)

Notes

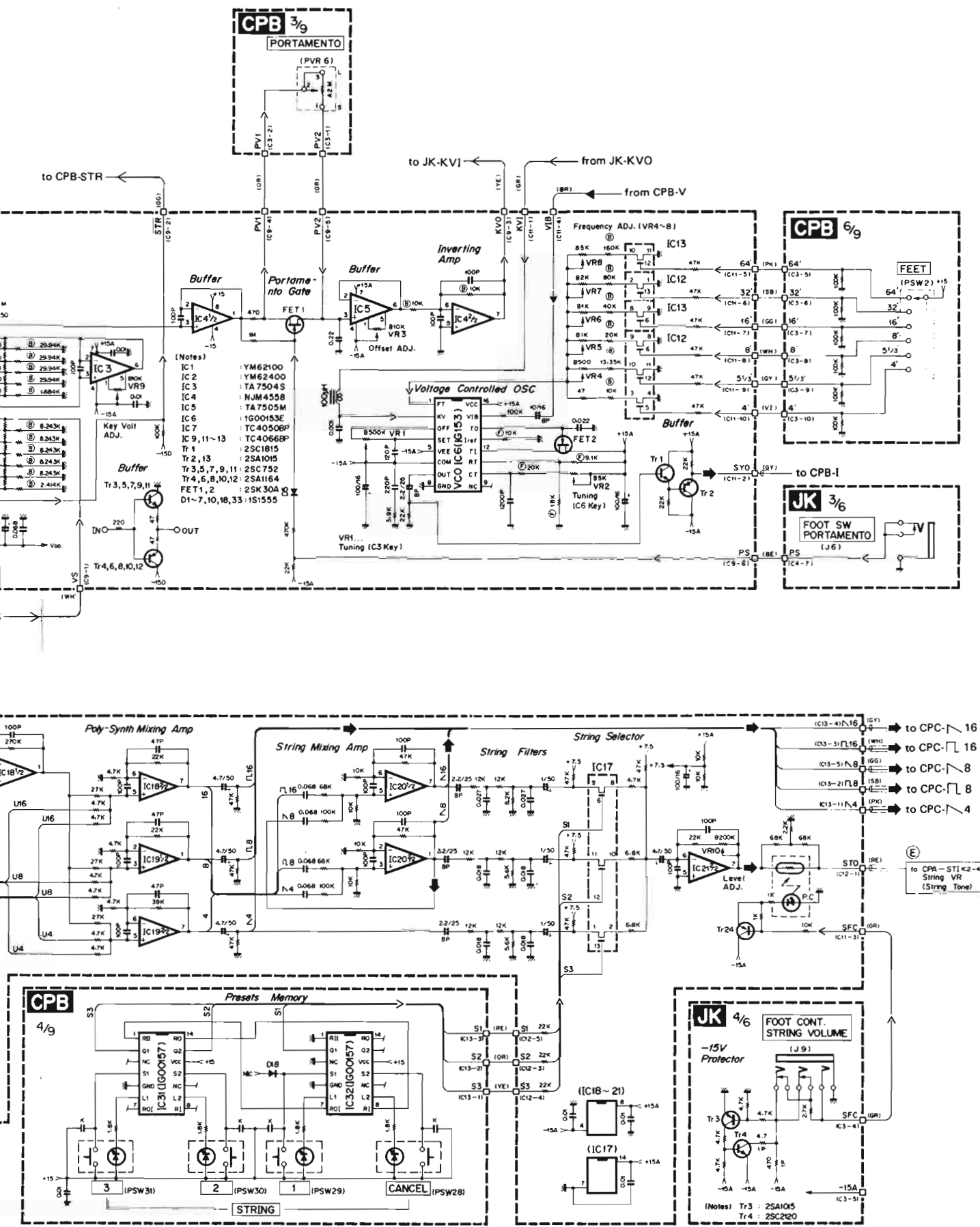
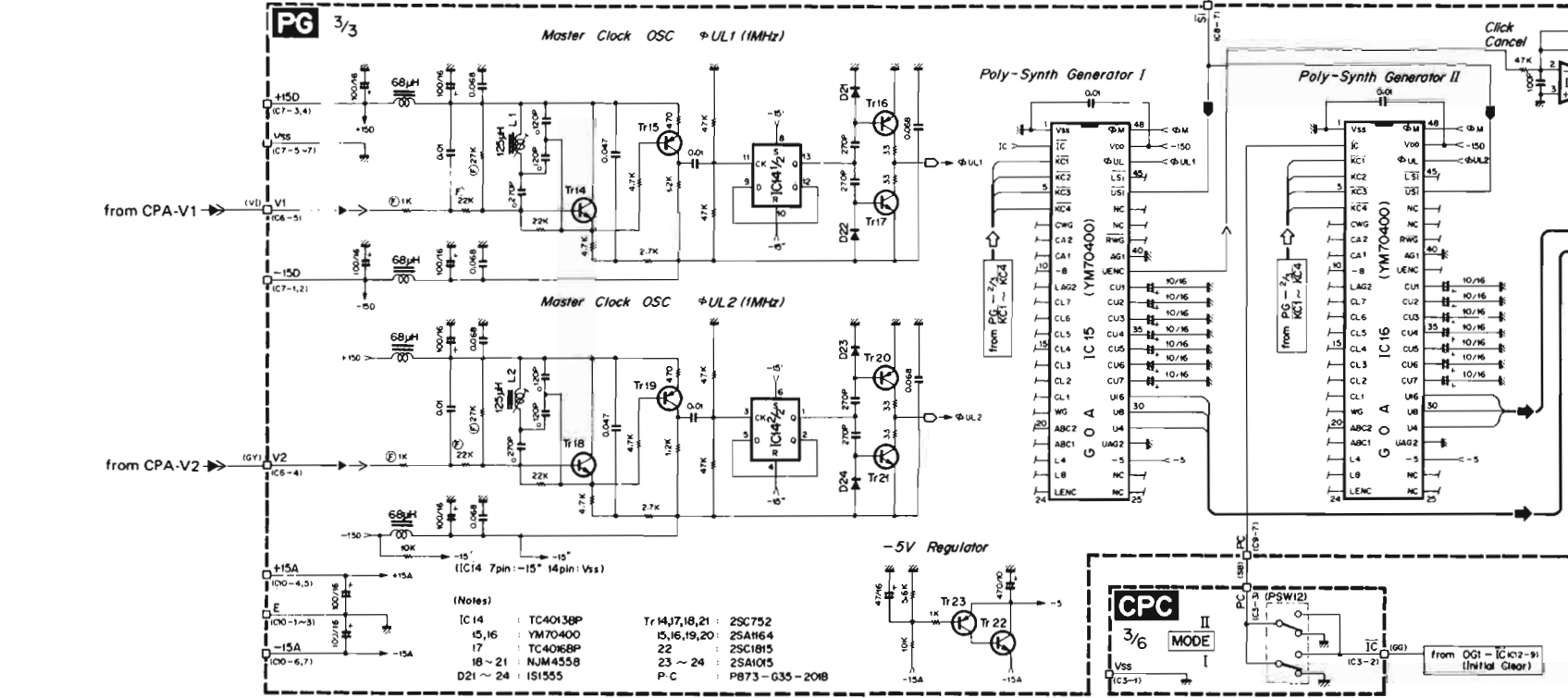
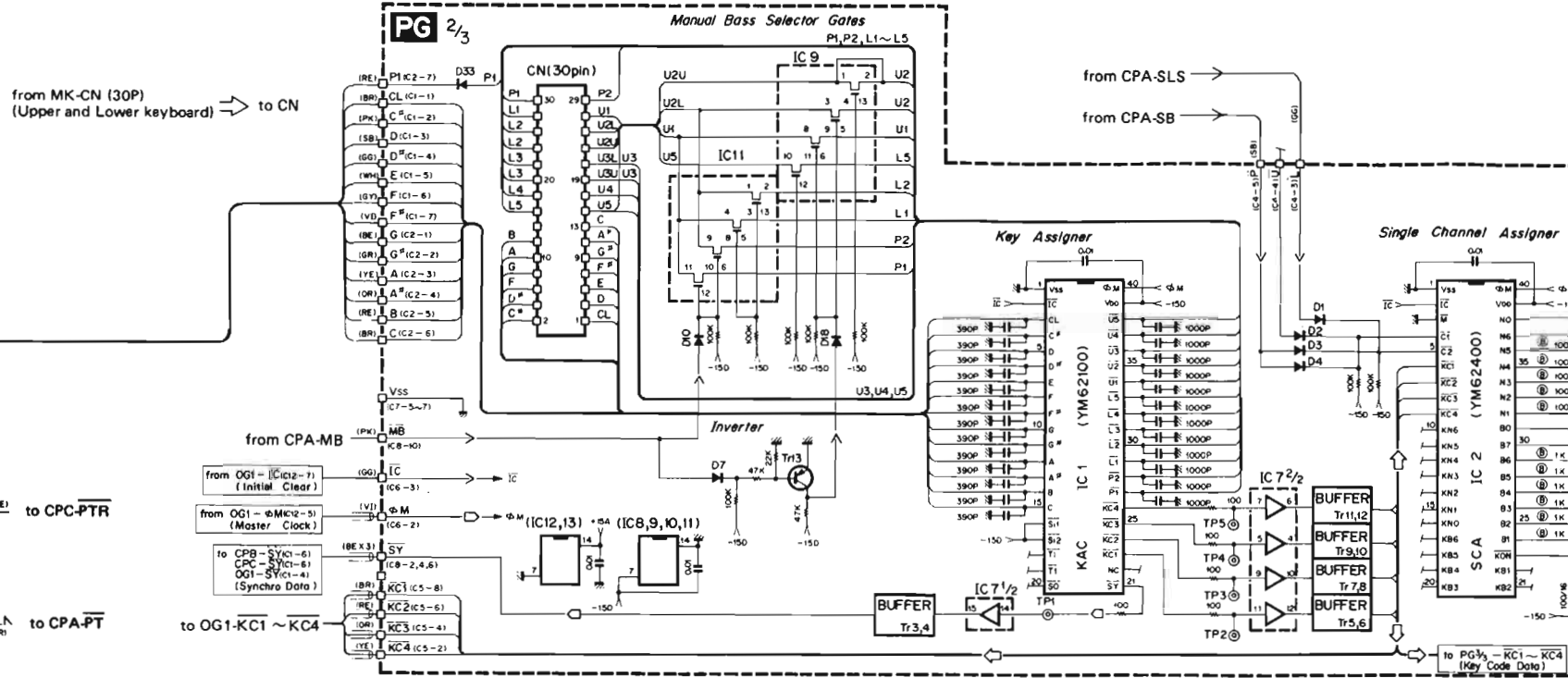
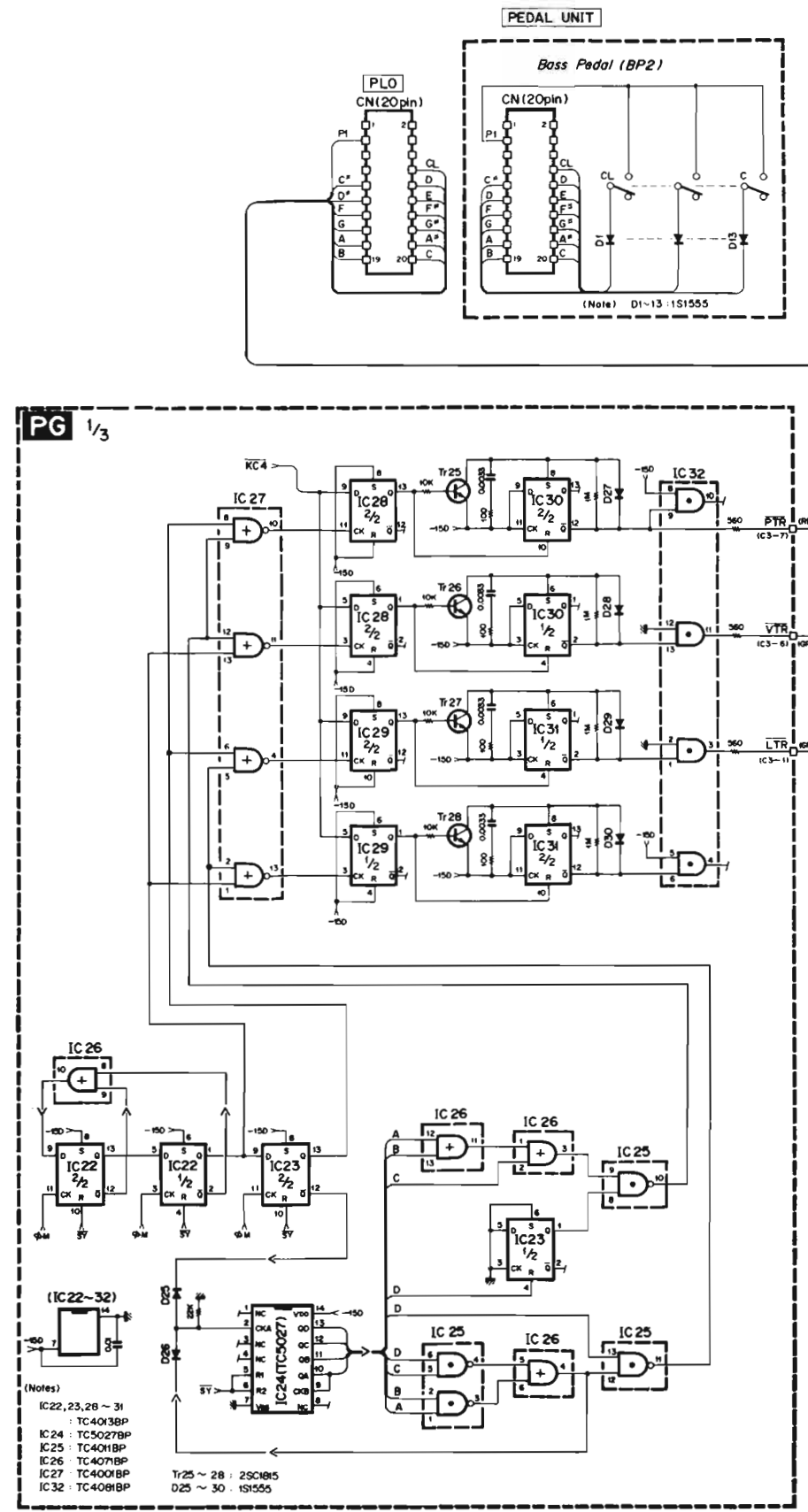
- Circuit Board : LC86220 □
- IC, LSI
 IC1 : TC4093BP (NAND, Schmitt Trigger)
 IC2 : TC4013BP ("D" Flip-Flop)
 IC3, 17 : iG03280 (Diode Matrix)
 IC4 : YM62700 (PSC)
 IC5 : iG00156 (+VCF)
 IC6, 8 : iG00151 (VCA)
 IC7 : iG00159 (EG-VCA)
 IC9, 10, 11 : iG00157 (SW Memory)
 IC12, 13 : TC4016BP (Analog SW)
 IC14, 15, 16 : NJM4558DV (OP-Amp)
- Transistors
 Tr1, 2, 5, 6 : 2SC1815 (O, Y)
 8 ~ 13 : 2SC752 (Y)
 Tr3 : 2SA1164 (GR)
 Tr7 : 2SA1015 (O, Y)
- Diodes
 D1 ~ 40 : 1S1555
- Capacitor
 (K) marked : Ceramic Capacitor 1000P
 ▲ marked : Solid Aluminum Capacitor
- Set "R1, R2" in accordance with the following table.
 See illust for VCF (IC16) rank.

R	rank	A	B	C
	R1	1.8K	2K	2.2K
	R2	390	430	470

- ⊕ marked : Metal Film Resistor (1%)
- Semi-Variable Resistor
 VR1 ~ 7 : V10K type

View from the printed pattern side of the circuit board

PG Circuit Diagram



PG Circuit Board & Wiring

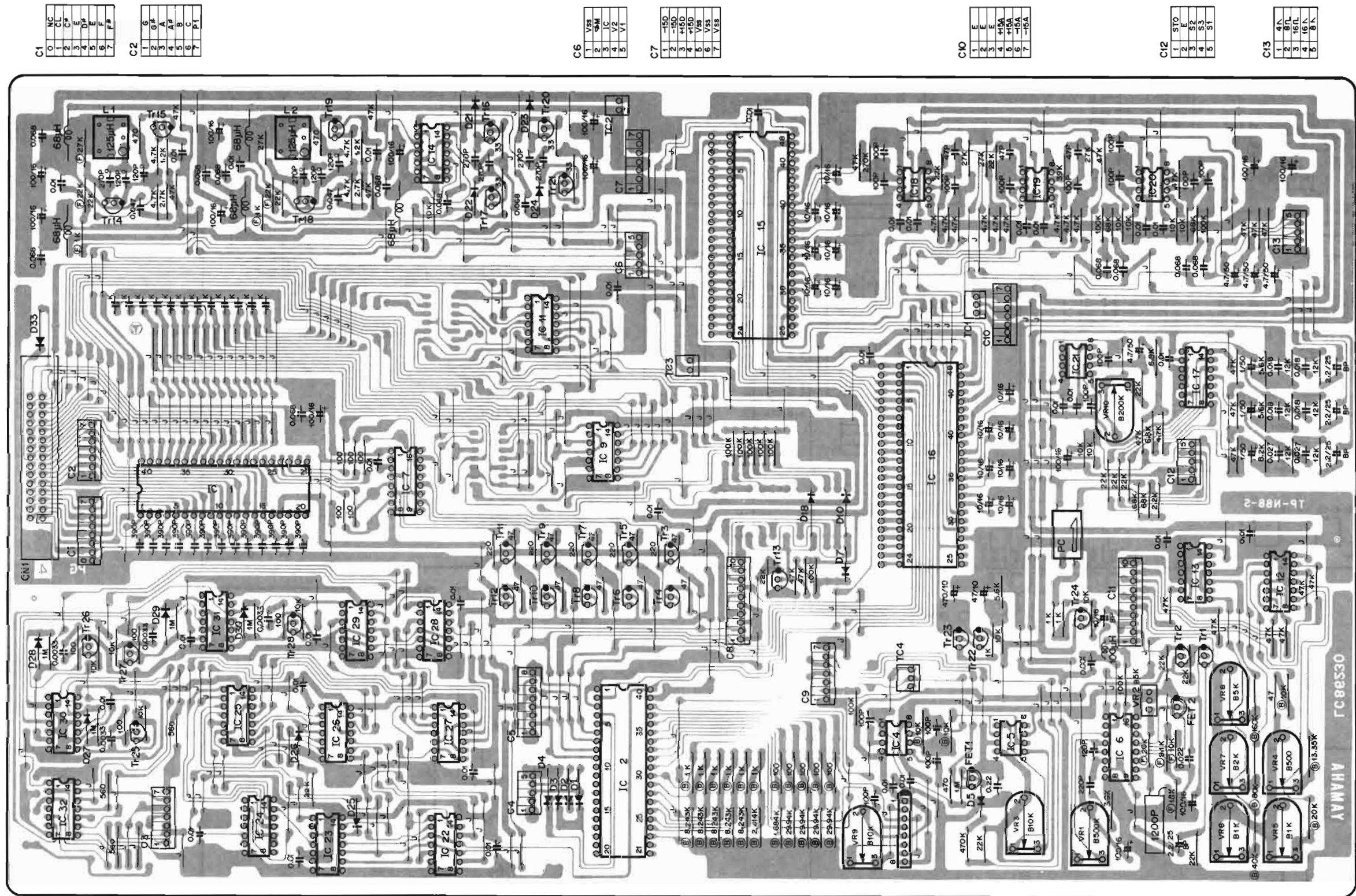


Table C1: Pin connections for connector C1.

Table C2: Pin connections for connector C2.

Table C6: Pin connections for connector C6.

Table C7: Pin connections for connector C7.

Table C10: Pin connections for connector C10.

Table C12: Pin connections for connector C12.

Table C13: Pin connections for connector C13.

Table C1: Pin connections for connector C1.

Table C8: Pin connections for connector C8.

Table C2: Pin connections for connector C2.

Table C9: Pin connections for connector C9.

Table C3: Pin connections for connector C3.

Table C10: Pin connections for connector C10.

Table C4: Pin connections for connector C4.

Table C11: Pin connections for connector C11.

Table C5: Pin connections for connector C5.

Table C12: Pin connections for connector C12.

Table C6: Pin connections for connector C6.

Table C13: Pin connections for connector C13.

Table C7: Pin connections for connector C7.

- Notes: 1. Circuit Board : LC86230, 2. IC, LSI: IC1 : YM62100 (KAC), IC2 : YM62400 (SCA), IC3 : TA7504S (OP-Amp), IC4, 18 ~ 21 : NJM4558DV (OP-Amp), IC5 : TA7505M (OP-Amp), IC6 : iG00153 (E) (VCOIII), IC7 : TC4050BP (Buffer), IC9, 11 ~ 13 : TC4066BP (Analog SW), IC14, 22, 23, 28 ~ 31 : TC4013BP ("D" Flip-Flop), IC15, 16 : YM70400 (GOA), IC17 : TC4016BP (Analog SW), IC24 : TC5027BP (Counter), IC25 : TC4011BP (2 IN NAND), IC26 : TC4071BP (2 IN OR), IC27 : TC4001BP (2 IC NOR), IC32 : TC4081BP (2 IN AND)

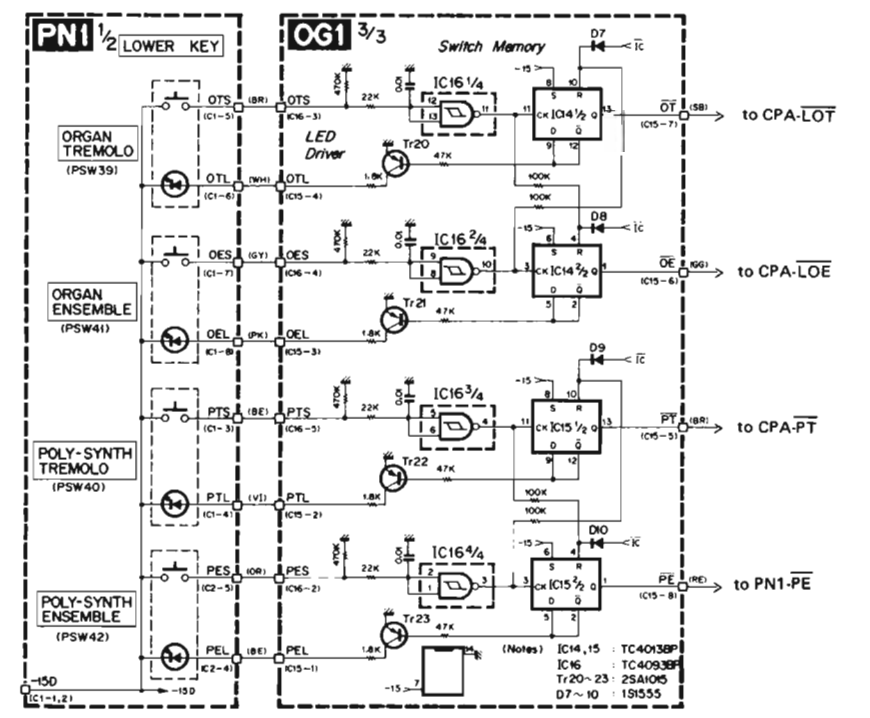
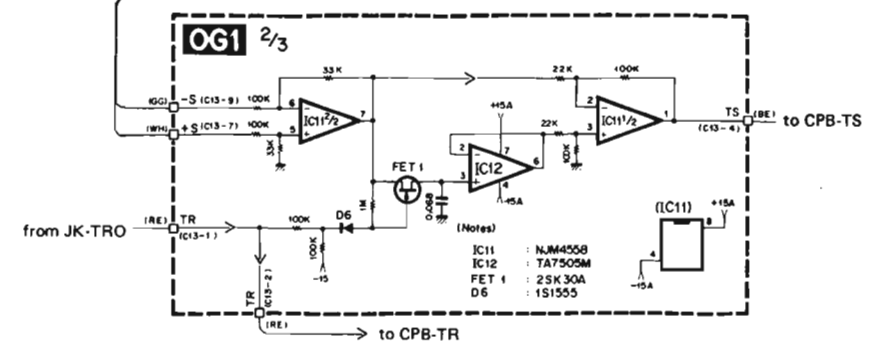
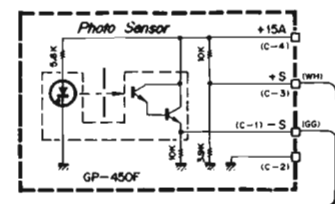
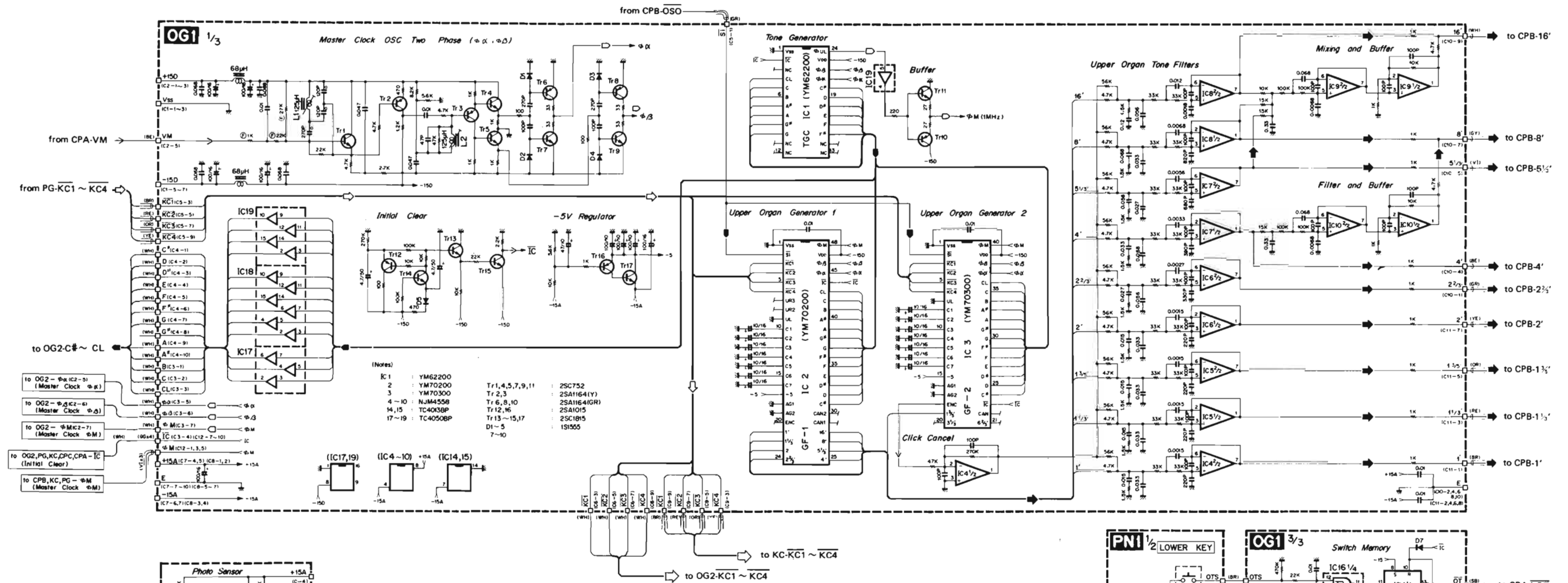
- 3. Transistors: Tr1, 22, 25 ~ 28 : 2SC1815 (O, Y), Tr2, 13, 23, 24 : 2SA1015 (O, Y), Tr3, 5, 7, 9, 11, 14, 17, 18, 21 : 2SC752 (Y), Tr4, 6, 8, 10, 12, 16, 20 : 2SA1164 (GR), Tr15, 19 : 2SA1164 (Y)

- 4. Field Effect Transistors: FET1, 2 : 2SK30A (Y)
- 5. Diodes: D1 ~ 5, 7, 10, 18, 21 ~ 30, 33 : 1S1555
- 6. Capacitor: (K) marked : Ceramic Capacitor 1000P, (O) marked : Polystyrene Capacitor
- 7. Coil: 125µH : OSC Coil
- 8. Resistor: (B) marked : Metal Oxide Film Resistor (±0.1%), (F) marked : Metal Oxide Film Resistor (±1%)
- 9. Semi-Variable Resistor: VR2 : RJ9W
- 10. Photo Coupler: PC : P873-G35-201B

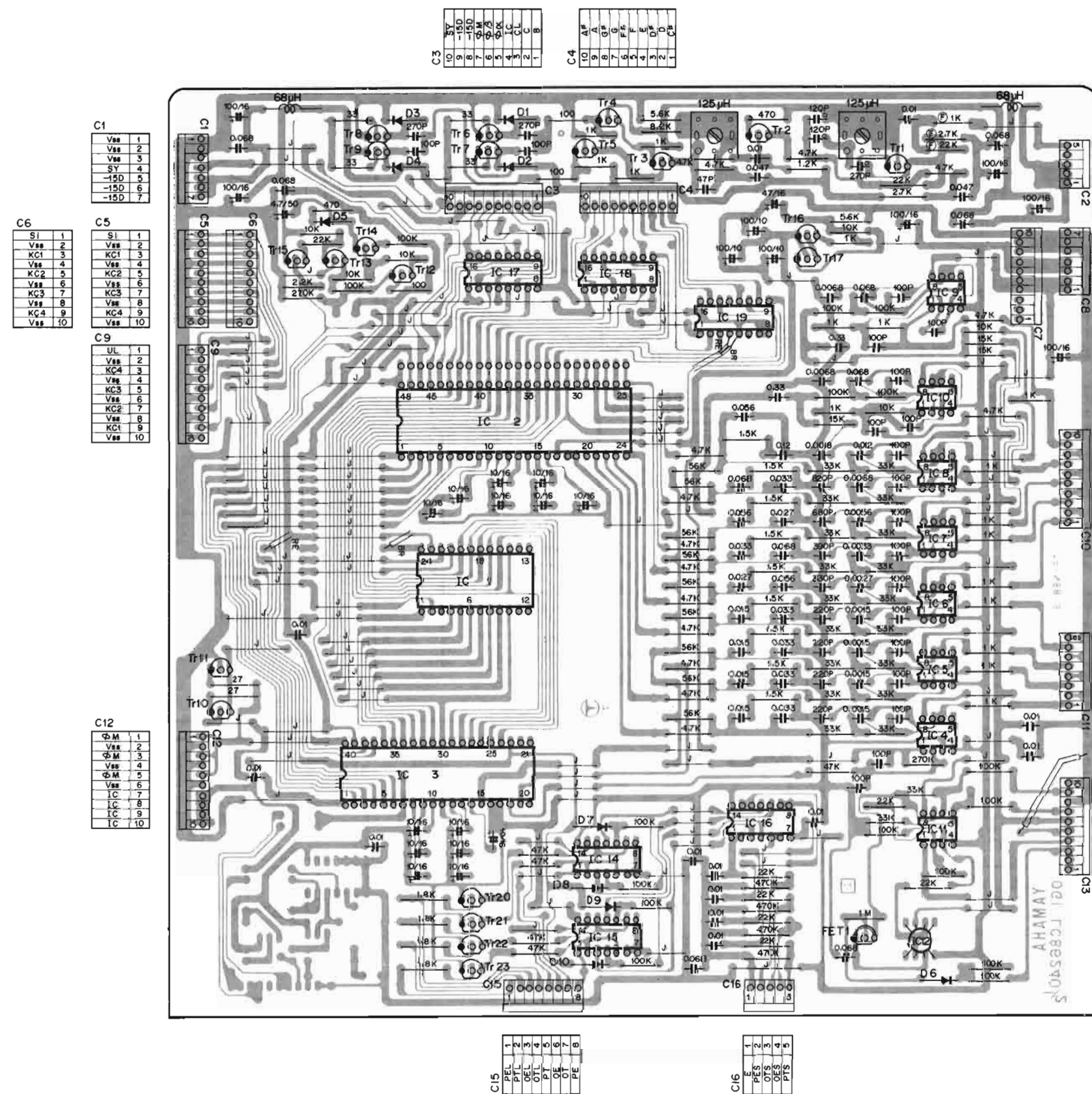
PLO: Pin connections for PLO connector.

View from the component side of the circuit board

OG1 Circuit Diagram



OG1 Circuit Board & Wiring



C1

Vss	1
Vss	2
Vss	3
SY	4
-15D	5
-15D	6
-15D	7

C2

VM	5
NC	4
+15D	3
+15D	2
+15D	1

C3

UL	1
Vss	2
KC4	3
Vss	4
KC3	5
Vss	6
KC2	7
Vss	8
KC1	9
Vss	10

C4

UL	1
Vss	2
KC4	3
Vss	4
KC3	5
Vss	6
KC2	7
Vss	8
KC1	9
Vss	10

C5

UL	1
Vss	2
KC4	3
Vss	4
KC3	5
Vss	6
KC2	7
Vss	8
KC1	9
Vss	10

C6

VM	1
Vss	2
KC1	3
Vss	4
KC2	5
Vss	6
KC3	7
Vss	8
KC4	9
Vss	10

C7

UL	1
Vss	2
KC4	3
Vss	4
KC3	5
Vss	6
KC2	7
Vss	8
KC1	9
Vss	10

C8

UL	1
Vss	2
KC4	3
Vss	4
KC3	5
Vss	6
KC2	7
Vss	8
KC1	9
Vss	10

C9

UL	1
Vss	2
KC4	3
Vss	4
KC3	5
Vss	6
KC2	7
Vss	8
KC1	9
Vss	10

C10

UL	1
Vss	2
KC4	3
Vss	4
KC3	5
Vss	6
KC2	7
Vss	8
KC1	9
Vss	10

C11

UL	1
Vss	2
KC4	3
Vss	4
KC3	5
Vss	6
KC2	7
Vss	8
KC1	9
Vss	10

C12

UL	1
Vss	2
KC4	3
Vss	4
KC3	5
Vss	6
KC2	7
Vss	8
KC1	9
Vss	10

C13

UL	1
Vss	2
KC4	3
Vss	4
KC3	5
Vss	6
KC2	7
Vss	8
KC1	9
Vss	10

C14

UL	1
Vss	2
KC4	3
Vss	4
KC3	5
Vss	6
KC2	7
Vss	8
KC1	9
Vss	10

C15

UL	1
Vss	2
KC4	3
Vss	4
KC3	5
Vss	6
KC2	7
Vss	8
KC1	9
Vss	10

C16

UL	1
Vss	2
KC4	3
Vss	4
KC3	5
Vss	6
KC2	7
Vss	8
KC1	9
Vss	10

C1

Pin No.	Pin Name	Wire Color	Destination
1	Vss	VI	DC-Vss (C1-4)
2	Vss	VI	PG-Vss (C7-6)
3	Vss	S BE S	
4	SV	S BE S	PG-SV (C8-6)
5	-15D	VE	PG--15D (C7-1)
6	-15D	VE	KC--15D (C4-2)
7	-15D	VE	DC--15D (C1-6)

C2

Pin No.	Pin Name	Wire Color	Destination
1	+15D	BR	DC:+15D (C1-6)
2	+15D	BR	KG:+15D (C4-7)
3	+15D	BR	PG:+15D (C7-3)
4	NC	-	
5	VM	BE	CPA-VM (C8-4)

C3

Pin No.	Pin Name	Wire Color	Destination
1	B	WH	OG2-B (C3-1)
2	C	WH	OG2-C (C2-2)
3	CL	WH	OG2-CL (C2-3)
4	IC	WH	OG2-IC (C2-4)
5	φM	WH	OG2-φM (C2-6)
6	φM	WH	OG2-φM (C2-6)
7	φM	WH	OG2-φM (C2-7)
8	-15D	WH	OG2--15D (C2-8)
9	-15D	WH	OG2--15D (C2-9)
10	SV	WH	OG2-SV (C2-10)

C4

Pin No.	Pin Name	Wire Color	Destination
1	C#	WH	OG2-C# (C3-1)
2	D	WH	OG2-D (C3-2)
3	D#	WH	OG2-D# (C3-3)
4	E	WH	OG2-E (C3-4)
5	F	WH	OG2-F (C3-5)
6	F#	WH	OG2-F# (C3-6)
7	G	WH	OG2-G (C3-7)
8	G#	WH	OG2-G# (C3-8)
9	A	WH	OG2-A (C3-9)
10	A#	WH	OG2-A# (C3-10)

C5

Pin No.	Pin Name	Wire Color	Destination
1	S1	S GR	CPB-SO1 (C1-4)
2	Vss	S GR	
3	KC1	S GR	PG-KC1 (C5-8)
4	Vss	S GR	
5	KC2	S GR	PG-KC2 (C5-5)
6	Vss	S GR	
7	KC3	S GR	PG-KC3 (C5-4)
8	Vss	S GR	
9	KC4	S GR	PG-KC4 (C5-2)
10	Vss	S GR	

C6

Pin No.	Pin Name	Wire Color	Destination
1	S1	WH	OG2-Vss (C1-2)
2	Vss	WH	OG2-KC1 (C1-3)
3	KC1	WH	OG2-Vss (C1-4)
4	Vss	WH	OG2-Vss (C1-5)
5	Vss	WH	OG2-Vss (C1-6)
6	KC2	WH	OG2-KC3 (C1-7)
7	KC3	WH	OG2-KC3 (C1-7)
8	Vss	WH	OG2-Vss (C1-8)
9	KC4	WH	OG2-KC4 (C1-9)
10	Vss	WH	OG2-Vss (C1-10)

C7

Pin No.	Pin Name	Wire Color	Destination
1	NC	WH	
2	NC	WH	
3	NC	WH	
4	+15A	WH	OG2:+15A (C4-4)
5	+15A	WH	OG2:+15A (C4-5)
6	-15A	WH	OG2--15A (C4-6)
7	-15A	WH	OG2--15A (C4-7)
8	E	WH	OG2-E (C4-8)
9	E	WH	OG2-E (C4-9)
10	E	WH	OG2-E (C4-10)

C8

Pin No.	Pin Name	Wire Color	Destination
1	+15A	BR	DC:+15A (C1-1)
2	+15A	BR	PG:+15A (C10-4)
3	-15A	VE	DC--15A (C1-2)
4	-15A	VE	PG--15A (C10-7)
5	E	-	
6	E	BL	PG-E (C10-1)
7	E	BL	DC-E (C4-3)

C9

Pin No.	Pin Name	Wire Color	Destination
1	UL	-	
2	Vss	-	
3	KC4	S YE	KC-KC4 (C5-8)
4	Vss	S YE S	
5	KC3	S OR	KC-KC3 (C5-6)
6	Vss	S OR S	
7	KC2	S RE	KC-KC2 (C5-2)
8	Vss	S RE S	
9	KC1	S BR	KC-KC1 (C5-4)
10	Vss	S BR S	

C10

Pin No.	Pin Name	Wire Color	Destination
1	2/2/3	S GR	CPB-2/2/3 (C6-6)
2	E	S GR S	
3	4	S BE	CPB-4 (C6-3)
4	E	S BE S	
5	5/1/3	S GR	CPB-5/1/3 (C6-5)
6	E	S V1 S	
7	8	S GR	CPB-8 (C6-3)
8	E	S GR S	
9	16	S WH	CPB-16 (C6-1)
10	E	S WH S	

C11

Pin No.	Pin Name	Wire Color	Destination
1	T	S BR	CPB-T (C12-7)
2	C	S BR S	
3	1/3	S RE	CPB-1/3 (C12-5)
4	E	S RE S	
5	1/3/5	S OR	CPB-1/3/5 (C6-9)
6	E	S OR S	
7	2	S YE	CPB-2 (C12-1)
8	E	S YE S	

C12

Pin No.	Pin Name	Wire Color	Destination
1	φM	S VI	CPB-φM (C1-8)
2	Vss	S VI S	
3	φM	S VT	KC-φM (C5-10)
4	Vss	S VT S	
5	φM	S VI	PG-φM (C6-2)
6	Vss	S VI S	
7	IC	CG	PG-IC (C6-3)
8	IC	GG	KC-IC (C6-1)
9	IC	GG	CPA-IC (C3-2)
10	IC	GG	CPA-IC (C7-1)

C13

Pin No.	Pin Name	Wire Color	Destination
1	TR	RE	JK-TRG (C4-2)
2	TR	RE	CPB-TR (C11-5)
3	TR	-	
4	TS	BE	CPB-TS (C7-2)
5	E	BL	PG-E (C2)
6	+15A	BR	PG:+15A (C4-4)
7	-15A	BR	PG--15A (C4-6)
8	E	S WH	PG+S (C-3)
9	-S	GG	PG--S (C-1)
10	E	S GG S	

C14

Pin No.	Pin Name	Wire Color	Destination
1	PEL	BE	PN1-PEL (C2-4)
2	PTL	VI	PN1-PTL (C1-4)
3	OEL	PK	PN1-OEL (C1-8)
4	OTL	WH	PN1-OTL (C1-6)
5	PT	BR	CPA-PT (C9-3)
6	OE	GG	CPA-LOE (C9-5)
7	DT	SB	CPA-LOT (C9-6)
8	PE	RE	CPA-PE (C9-4)

C15

Pin No.	Pin Name	Wire Color	Destination
1	E	NL	PN2-E (C1-3)
2	PES	OR	PN1-PES (C2-5)
3	OTS	BR	PN1-OTS (C1-5)
4	OES	GY	PN1-OES (C1-7)
5	PTS	BE	PN1-PTS (C1-3)

C16

Pin No.	Pin Name	Wire Color	Destination
1	E	NL	PN2-E (C1-3)
2	PES	OR	PN1-PES (C2-5)
3	OTS	BR	PN1-OTS (C1-5)
4	OES	GY	PN1-OES (C1-7)
5	PTS	BE	PN1-PTS (C1-3)

C7

Pin No.	Pin Name	Wire Color	Destination
10	E	-	
9	E	-	
8	E	-	
7	-15A	-	
6	-15A	-	
5	+15A	-	
4	+15A	-	
3	NC	-	
2	NC	-	
1	NC	-	

C8

Pin No.	Pin Name	Wire Color	Destination
7	E	-	
6	E	-	
5	E	-	
4	-15A	-	
3	-15A	-	
2	+15A	-	
1	+15A	-	

C9

Pin No.	Pin Name	Wire Color	Destination
10	E	-	
9	16	-	
8	E	-	
7	8	-	
6	E	-	
5	5/1/3	-	
4	E	-	
3	4	-	
2	E	-	
1	2/2/3	-	

C10

Pin No.	Pin Name	Wire Color	Destination
10	E	-	
9	-S	-	
8	E	-	
7	2	-	
6	E	-	
5	1/3/5	-	
4	E	-	
3	1/3/5	-	
2	E	-	
1	1	-	

C11

Pin No.	Pin Name	Wire Color	Destination
10	E	-	
9	-S	-	
8	E	-	
7	4	-	
6	E	-	
5	+15A	-	
4	TS	-	
3	TR	-	
2	TR	-	
1	TR	-	

C12

Pin No.	Pin Name	Wire Color	Destination
10	E	-	
9	-S	-	
8	E	-	
7	4	-	
6	E	-	
5	+15A	-	
4	TS	-	
3	TR	-	
2	TR	-	
1	TR	-	

C13

Pin No.	Pin Name	Wire Color	Destination
10	E	-	
9	-S	-	
8	E	-	
7	4	-	
6	E	-	
5	+15A	-	
4	TS	-	
3	TR	-	
2	TR	-	
1	TR	-	

C10

Pin No.	Pin Name	Wire Color	Destination
10	E	-	
9	16	-	
8	E	-	
7	8	-	
6	E	-	
5	5/1/3	-	
4	E	-	
3	4	-	
2	E	-	
1	2/2/3	-	

C11

Pin No.	Pin Name	Wire Color	Destination
10	E	-	
9	-S	-	
8	E	-	
7	2	-	
6	E	-	
5	1/3/5	-	
4	E	-	
3	1/3/5	-	
2	E	-	
1	1	-	

C12

Pin No.	Pin Name	Wire Color	Destination
10	E	-	
9	-S	-	
8	E	-	
7	4	-	
6	E	-	
5	+15A	-	
4	TS	-	
3	TR	-	
2	TR	-	
1	TR	-	

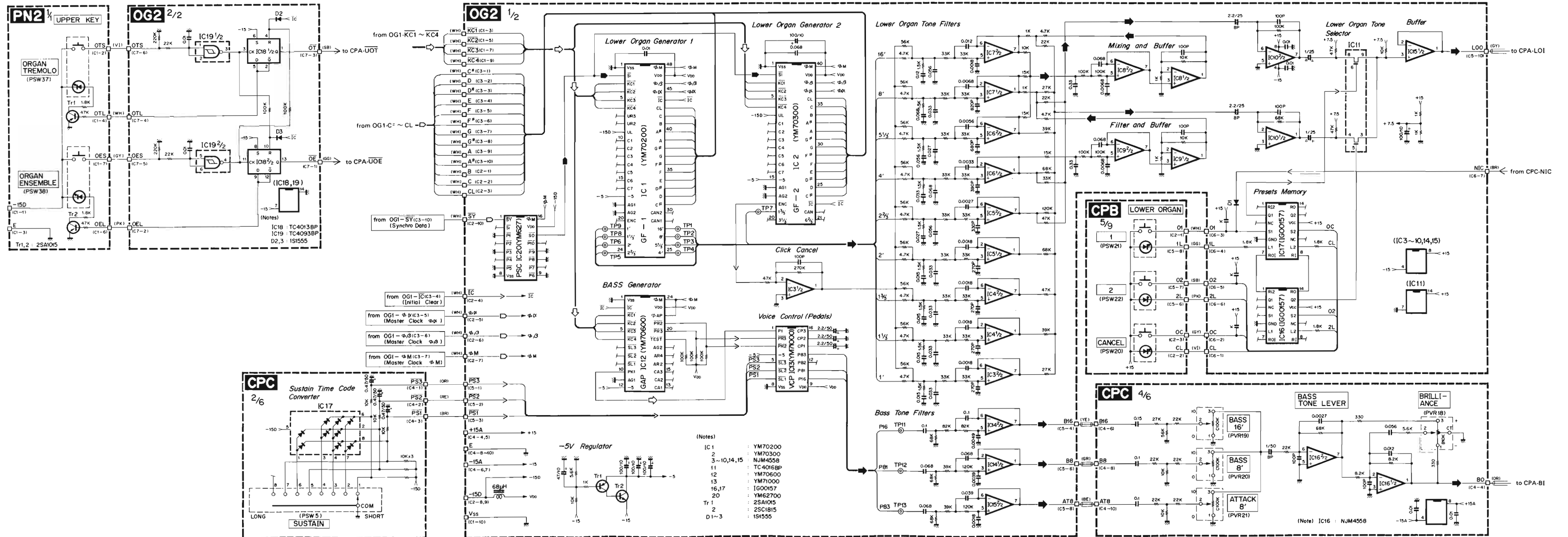
C13

Pin No.	Pin Name	Wire Color	Destination
10	E	-	
9	-S	-	
8	E	-	
7	4	-	
6	E	-	
5	+15A	-	
4	TS	-	
3	TR	-	
2	TR	-	
1	TR	-	

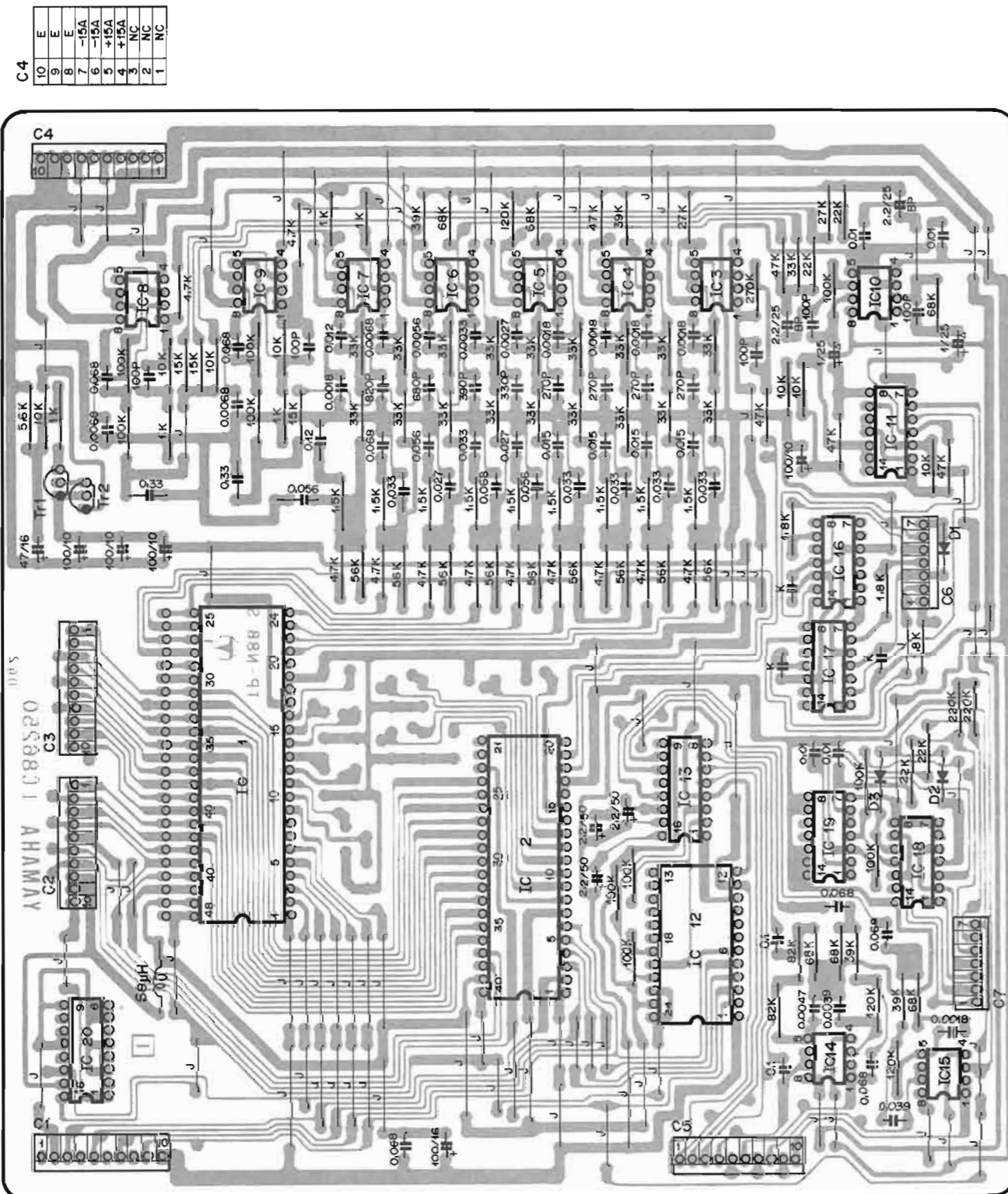
C10

Pin No.

OG2 Circuit Diagram



OG2 Circuit Board & Wiring



C4

10	E	NC
9	E	NC
8	E	NC
7	-15A	NC
6	+15A	NC
5	+15A	NC
4	+15A	NC
3	NC	NC
2	NC	NC
1	NC	NC

C3

C#	1
D	2
D#	3
E	4
F	5
F#	6
G	7
G#	8
A	9
A#	10

C2

B	4
C	2
CL	3
IC	4
φA	5
φB	6
φM	7
-15D	8
-15D	9
SY	10

C1

NC	1
Vss	2
KC1	3
Vss	4
KC2	5
Vss	6
KC3	7
Vss	8
KC4	9
Vss	10

C5

PS3	1
PS2	2
PS1	3
B16'	4
E	5
B8'	6
E	7
AT8'	8
E	9
LOO	10

C1

Pin No.	Pin Name	Wire Color	Destination
1	NC	WH	
2	Vss	WH	OG1-Vss (C6-2)
3	KC1	WH	OG1-KC1 (C6-3)
4	Vss	WH	OG1-Vss (C6-4)
5	KC2	WH	OG1-KC2 (C6-5)
6	Vss	WH	OG1-Vss (C6-6)
7	KC3	WH	OG1-KC3 (C6-7)
8	Vss	WH	OG1-Vss (C6-8)
9	KC4	WH	OG1-KC4 (C6-9)
10	Vss	WH	OG1-Vss (C6-10)

C7

Pin No.	Pin Name	Wire Color	Destination
1	OE	GG	CpA-UOE (C9-2)
2	OEL	PK	PN2-OEL (C1-6)
3	OT	SB	CPA-UOT (C9-1)
4	OTL	WH	PN2-OTL (C1-4)
5	OES	GY	PN2-OES (C1-7)
6	OTS	VI	PN2-OTS (C1-2)
7	IC	-	-

C2

Pin No.	Pin Name	Wire Color	Destination
1	B	WH	OG1-B (C3-1)
2	C	WH	OG1-C (C3-2)
3	CL	WH	OG1-CL (C3-3)
4	IC	WH	OG1-IC (C3-4)
5	φA	WH	OG1-φA (C3-5)
6	φB	WH	OG1-φB (C3-6)
7	φM	WH	OG1-φM (C3-7)
8	-15D	WH	OG1-15D (C3-8)
9	-15D	WH	OG1-15D (C3-9)
10	SY	WH	OG1-SY (C3-10)

C3

Pin No.	Pin Name	Wire Color	Destination
1	C#	WH	OG1-C# (C4-1)
2	D	WH	OG1-D (C4-2)
3	D#	WH	OG1-D# (C4-3)
4	E	WH	OG1-E (C4-4)
5	E	WH	OG1-E (C4-5)
6	F#	WH	OG1-F# (C4-6)
7	G	WH	OG1-G (C4-7)
8	G#	WH	OG1-G# (C4-8)
9	A	WH	OG1-A (C4-9)
10	A#	WH	OG1-A# (C4-10)

C6

7	NIC
6	2L
5	O2
4	1L
3	O1
2	OC
1	CL

C4

Pin No.	Pin Name	Wire Color	Destination
1	NC	WH	
2	NC	WH	
3	NC	WH	
4	+15A	WH	OG1-15A (C7-4)
5	+15A	WH	OG1-15A (C7-5)
6	-15A	WH	OG1-15A (C7-6)
7	-15A	WH	OG1-15A (C7-7)
8	E	WH	OG1-E (C7-8)
9	E	WH	OG1-E (C7-9)
10	E	WH	OG1-E (C7-10)

C5

Pin No.	Pin Name	Wire Color	Destination
1	PS3	OR	CPC-PS3 (C4-1)
2	PS2	RE	CPC-PS2 (C4-2)
3	PS1	BR	CPC-PS1 (C4-3)
4	B16'	SYE	CPC-B16' (C4-6)
5	E	SYE S	
6	S GR	S GR S	CPC-B8' (C4-8)
7	E	S GR S	
8	AT8'	S BE	CPC-AT8' (C4-10)
9	E	S BE S	
10	LOO	S GY	CPA-LOI (C1-5)

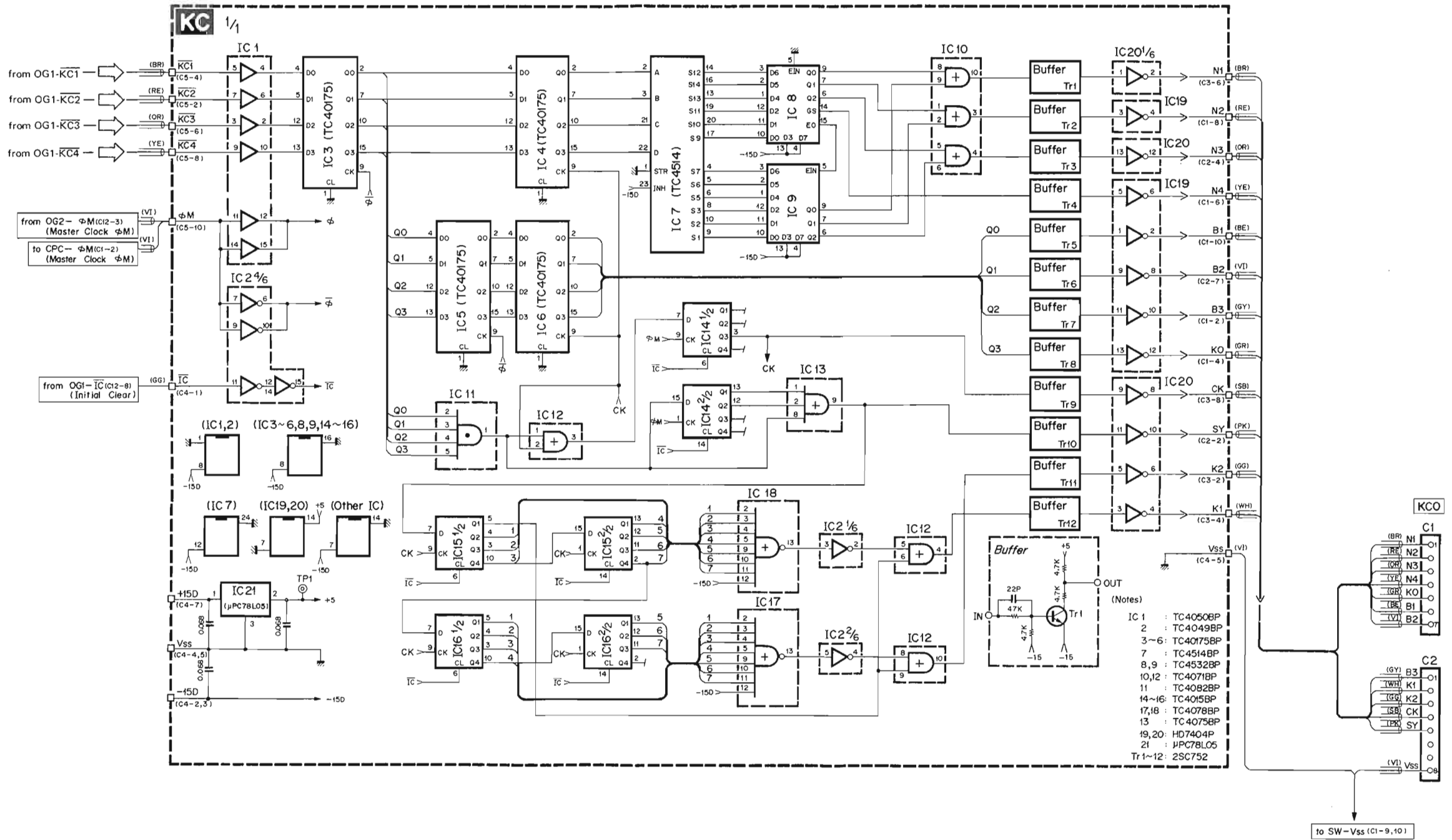
C6

Pin No.	Pin Name	Wire Color	Destination
1	CL	VI	CPB-CL (C2-2)
2	OC	PK	CPB-OC (C2-3)
3	O1	WH	CPB-O1 (C2-1)
4	1L	GG	CPB-1L (C5-8)
5	O2	SB	CPB-O2 (C5-7)
6	2L	PK	CPB-2L (C5-6)
7	NIC	BR	CPC-NIC (C6-2)

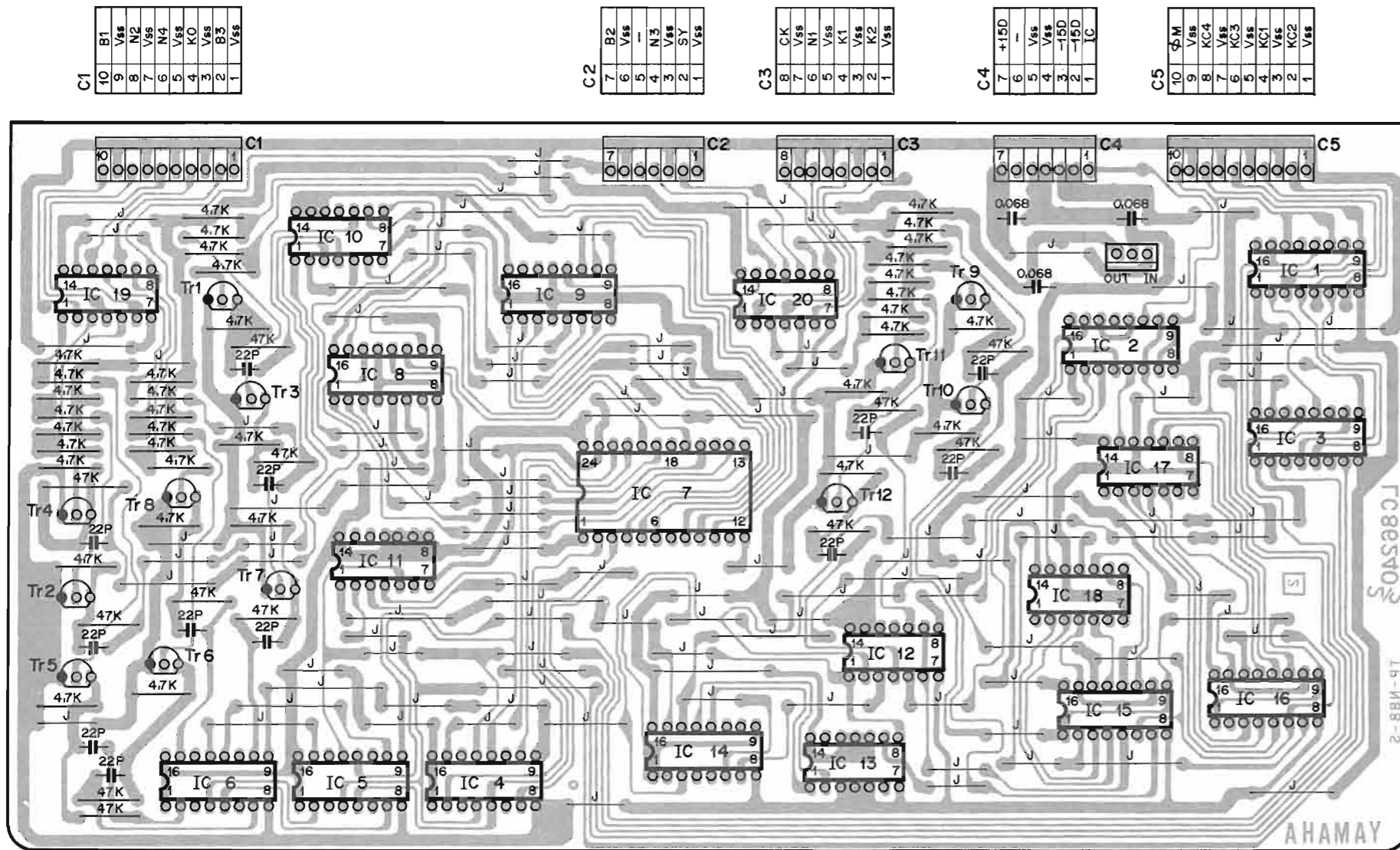
- (Notes)
- Circuit Board : LC86250□
 - IC, LSI
 - IC1 : YM70200 (GF-1)
 - IC2 : YM70300 (GF-2)
 - IC3 ~ 10, 14, 15 : NJM4558DV (OP-Amp)
 - IC11 : TC4016BP (Analog SW)
 - IC12 : YM70600 (GAP)
 - IC13 : YM71000 (VCP)
 - IC16, 17 : iG00157 (SW Memory)
 - IC18 : TC4013BP ("D" Flip-Flop)
 - IC19 : TC4093BP (2 IN NAND Schmitt Trigger)
 - IC20 : YM62700 (PSC)
 - Transistors
 - Tr1 : 2SA1015 (O, Y)
 - Tr2 : 2SC1815 (O, Y)
 - Diodes
 - D1 ~ D3 : 1S1555
 - Capacitor (K) marked : Ceramic Capacitor 1000P

View from the component side of the circuit board

KC Circuit Diagram



KC Circuit Board & Wiring



(Key Code Section)

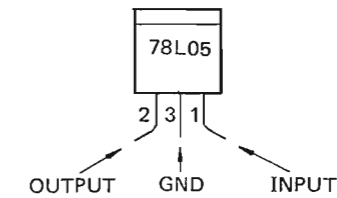
1. Integrated Circuits

- IC1 : TC4050BP (Buffer)
- IC2 : TC4049BP (Invertor)
- IC3 ~ 6 : TC40175BP ("D" Flip-Flop)
- IC7 : TC4514BP (Decoder)
- IC8, 9 : TC4532BP (Encoder)
- IC10, 12 : TC4071BP (2 IN OR)
- IC11 : TC4082BP (4 IN AND)
- IC13 : TC4075BP (3 IN OR)
- IC14 ~ 16 : TC4015BP (Shift Register)
- IC17, 18 : TC4078BP (8 IN NOR)
- IC19, 20 : HD7404P (Inverter-TTL)
- IC21* : μ PC78L05 (+5V Regulator)

2. Transistors

- Tr1 ~ 12 : 2SC752 (Y)

* μ PC78L05



View from the component side of the circuit board

Pin No.	Pin Name	Wire Color	Destination
1	Vss	S GY S	
2	B3	S GY	KCO-B3 (C2-1)
3	Vss	S GP S	
4	KO	S GR	KCO-KO (C1-5)
5	Vss	S YE S	
6	N4	S YE	KCO-N4 (C1-4)
7	Vss	S RE S	
8	N2	S RE	KCO-N2 (C1-2)
9	Vss	S BE S	
10	B1	S BE	KCO-B1 (C1-6)

Pin No.	Pin Name	Wire Color	Destination
1	Vss	S GG S	
2	K2	S GG	KCO-K2 (C2-3)
3	Vss	S WH S	
4	K1	S WH	KCO-K1 (C2-2)
5	Vss	S BR S	
6	N1	S BR	KCO-N1 (C1-1)
7	Vss	S SB S	
8	CK	S SB	KCO-CK (C2-4)

Pin No.	Pin Name	Wire Color	Destination
1	Vss	S RE S	
2	KC2	S RE	OG1-KC2 (C9-7)
3	Vss	S BR S	
4	KC1	S BR	OG1-KC1 (C9-9)
5	Vss	S OR S	
6	KC3	S OR	OG1-KC3 (C9-5)
7	Vss	S YE S	
8	KC4	S YE	OG1-KC4 (C9-3)
9	Vss	S VI S	
10	ϕ M	S VI	OG1- ϕ M (C12-3) CPC- ϕ M (C1-3)

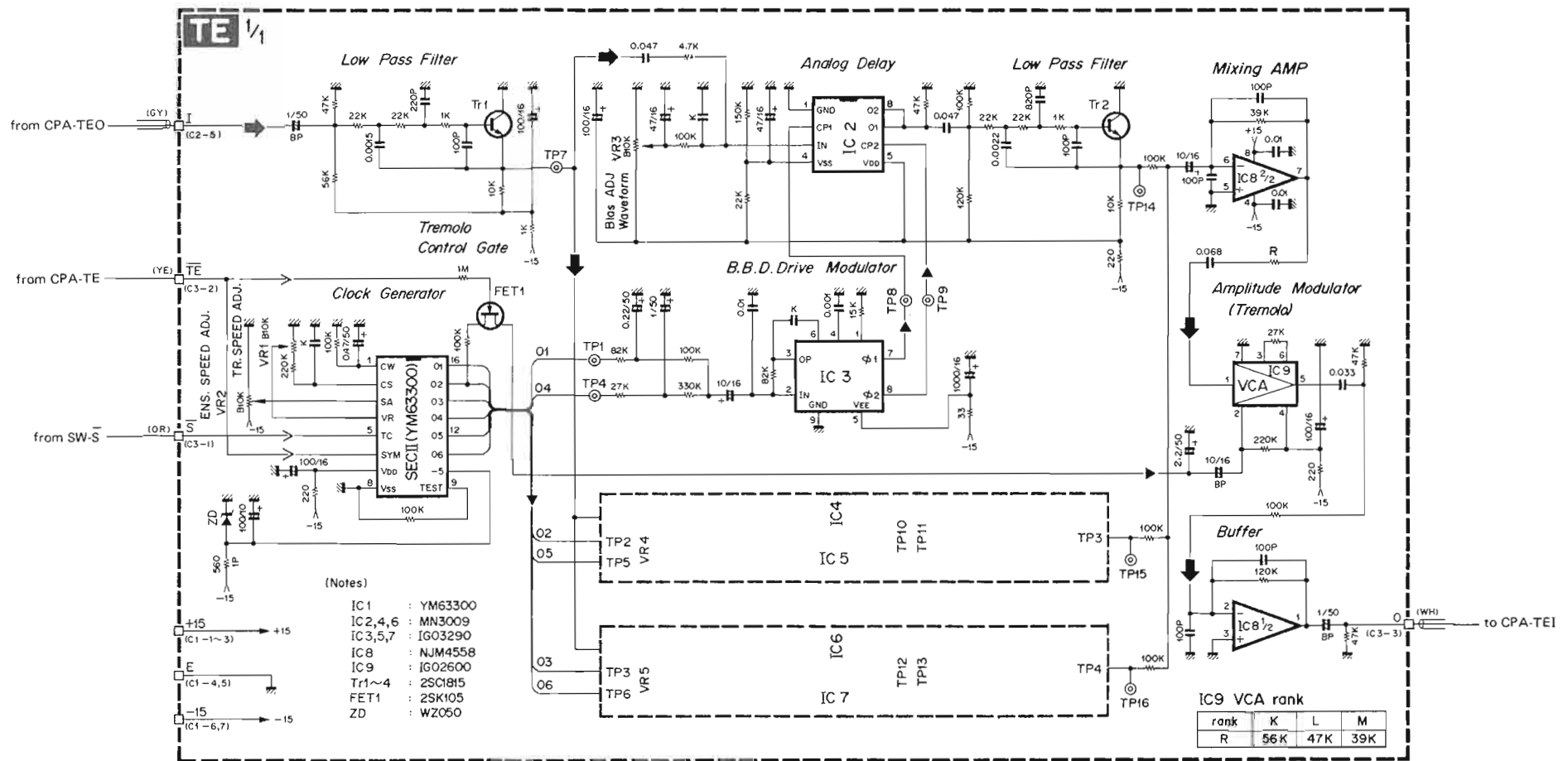
Pin No.	Pin Name	Wire Color	Destination
1	N1	S BR	KC-N1 (C3-6)
2	N2	S RE	KC-N2 (C1-8)
3	N3	S OR	KC-N3 (C2-4)
4	N4	S YE	KC-N4 (C1-6)
5	KO	S GR	KC-KO (C1-4)
6	B1	S BE	KC-B1 (C1-10)
7	B2	S VI	KC-B2 (C2-7)

Pin No.	Pin Name	Wire Color	Destination
1	Vss	S PK S	
2	SY	S PK	KCO-SY (C2-5)
3	Vss	S OR S	
4	N3	S OR	KCO-N3 (C1-4)
5	-	-	-
6	Vss	S VI S	
7	B2	S VI	KCO-B2 (C1-7)

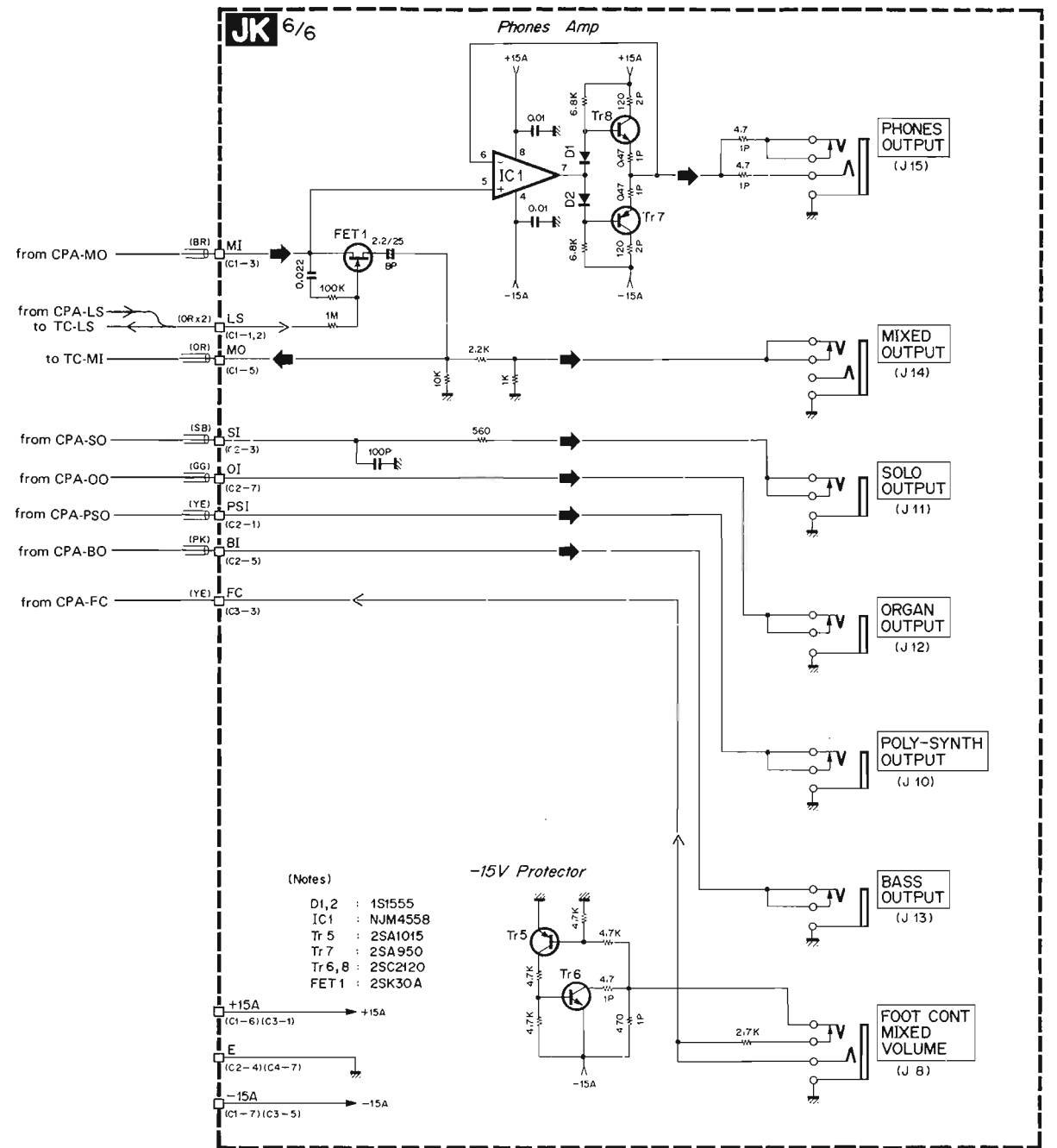
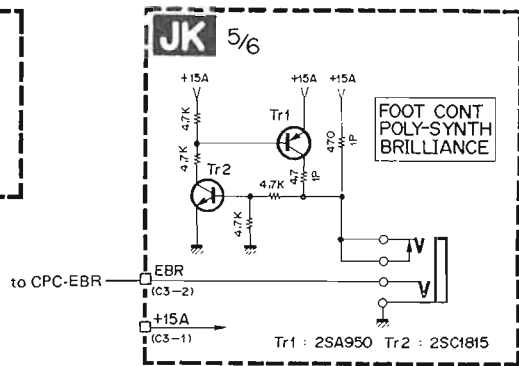
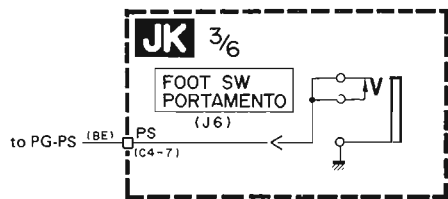
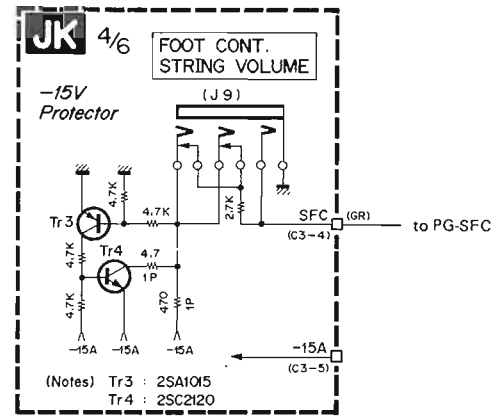
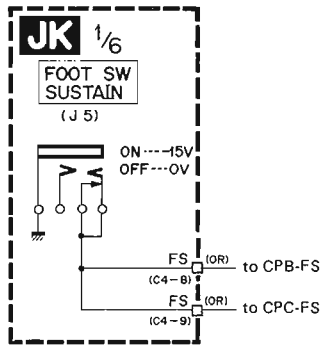
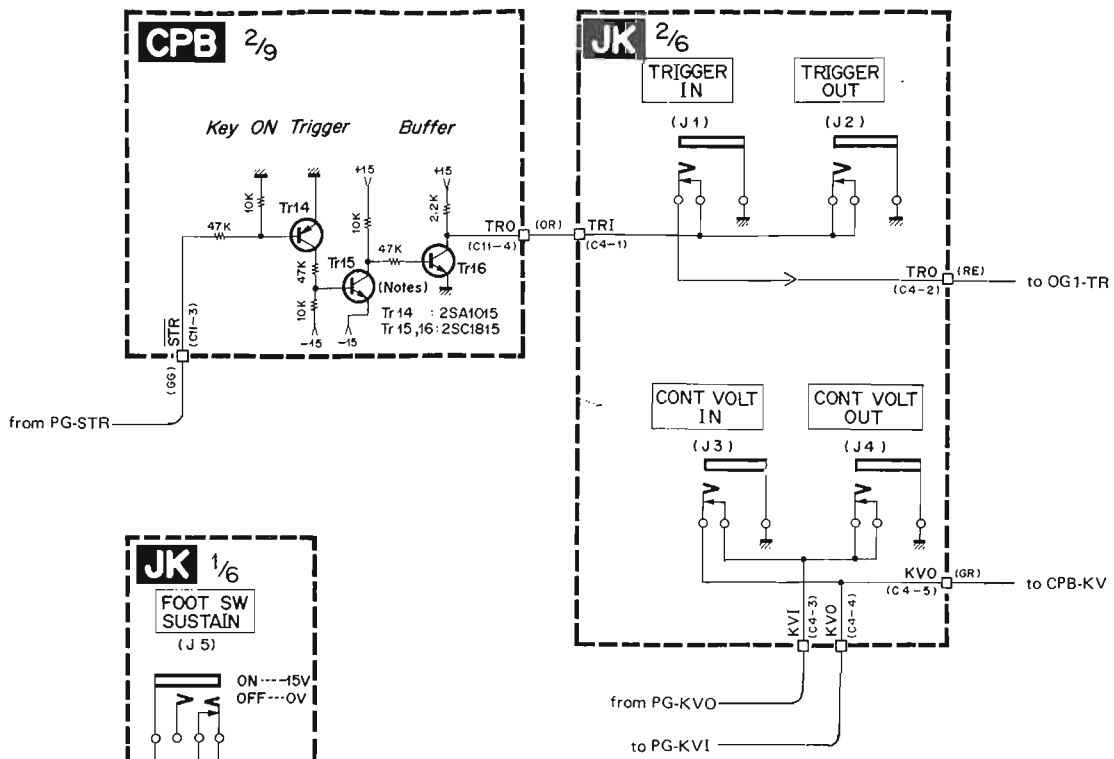
Pin No.	Pin Name	Wire Color	Destination
1	IC	GG	OG1-IC (C12-8)
2	-15D	YE	OG1-15D (C1-6)
3	-15D	-	-
4	Vss	VI	PG-Vss (C7-5)
5	Vss	VI	SW-Vss (C1-10)
6	-	-	-
7	+15D	BR	OG1+15D (C2-2)

Pin No.	Pin Name	Wire Color	Destination
1	B3	S GY	KC-B3 (C1-2)
2	K1	S WH	KC-K1 (C3-4)
3	K2	S GG	KC-K2 (C3-2)
4	CK	S SB	KC-CK (C3-8)
5	SY	S PK	KC-SY (C2-2)
6	-	-	-
7	-	-	-
8	Vss	VI	SW-Vss (C1-9)

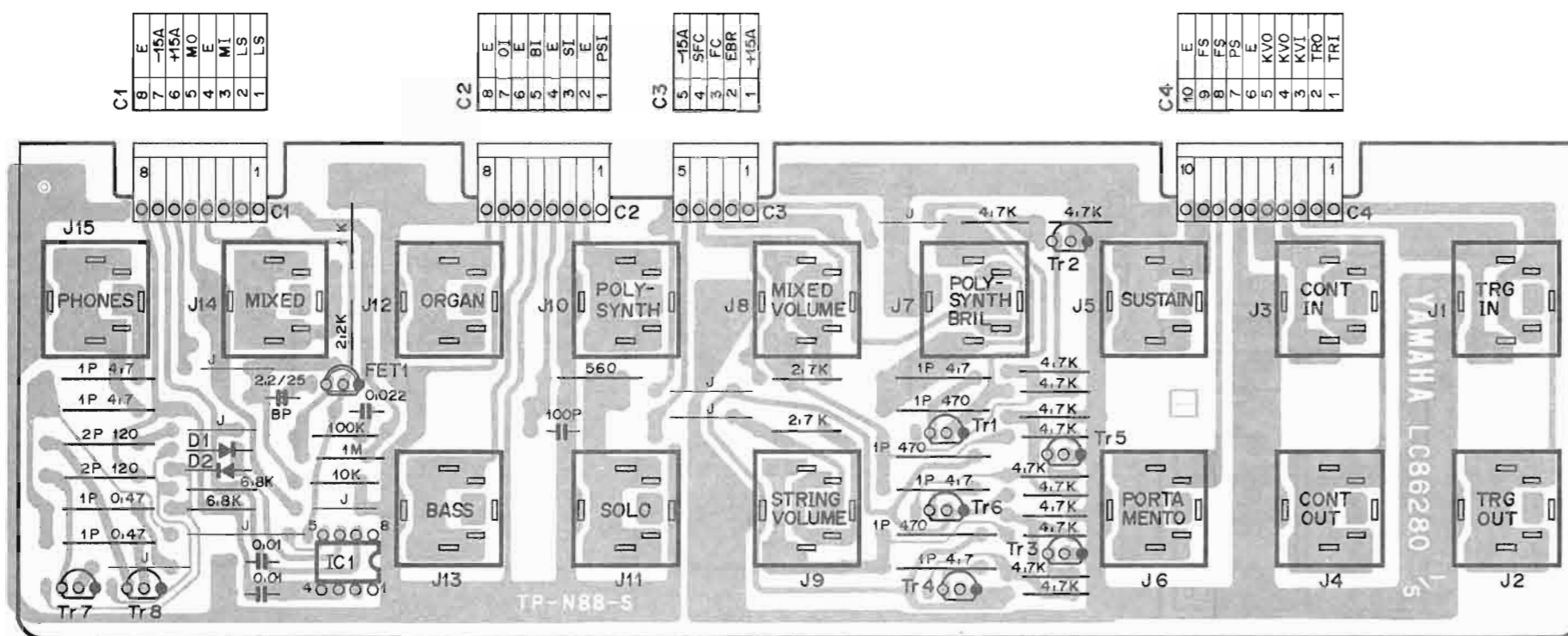
TE Circuit Diagram



JK Circuit Diagram



JK Circuit Board & Wiring



View from the printed pattern side of the circuit board

C1

Pin No.	Pin Name	Wire Color	Destination
1	LS	OR	CPA-LS (C3-5)
2	LS	OR	TC-LS (C1-1)
3	MI	S BR	CPA-MO (C3-1)
4	E	S OR S	
5	MO	S OR	TC-MI (C1-7)
6	+15A	BR	DC-+15A (C3-11)
7	-15A	YE	DC--15A (C3-2)
8	E	BL	CPA-E (C1-1)

C4

Pin No.	Pin Name	Wire Color	Destination
1	TR1	OR	CPB-TR0 (C11-4)
2	TR0	RE	OG1-TR (C13-1)
3	KV1	YE	PG-KV1 (C9-3)
4	KV0	GR	PG-KV1 (C11-1)
5	KV0	GR	CPB-KV (C10-10)
6	E	-	-
7	PS	BE	PG-PS (C9-6)
8	FS	OR	CPB-FS (C1-3)
9	FS	OR	CPC-FS (C1-10)
10	E	BL	CPC-E (C6-8)

C2

Pin No.	Pin Name	Wire Color	Destination
1	PS1	S YE	CPA-PS0 (C6-2)
2	E	S YE S	
3	SI	S SB	CPA-SO (C6-8)
4	E	S SB S	
5	BI	S PK	CPA-BO (C6-9)
6	E	S PK S	
7	O1	S GG	CPA-O0 (C6-7)
8	E	S GG S	

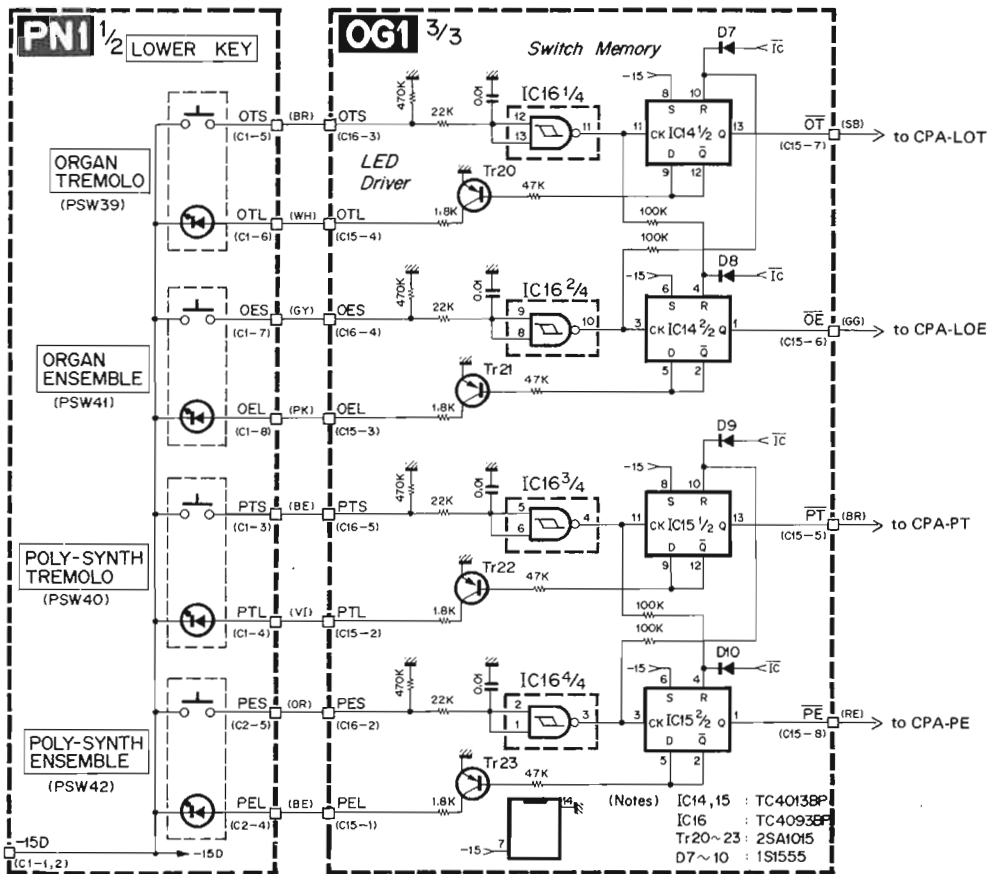
C3

Pin No.	Pin Name	Wire Color	Destination
1	+15A	BR	CPC-+15A (C6-6)
2	EBR	DR	CPC-EBR (C6-3)
3	FC	YE	CPA-FC (C3-6)
4	SFC	GR	PG-SFC (C11-3)
5	-15A	YE	CPC--15A (C6-10)

(Notes)

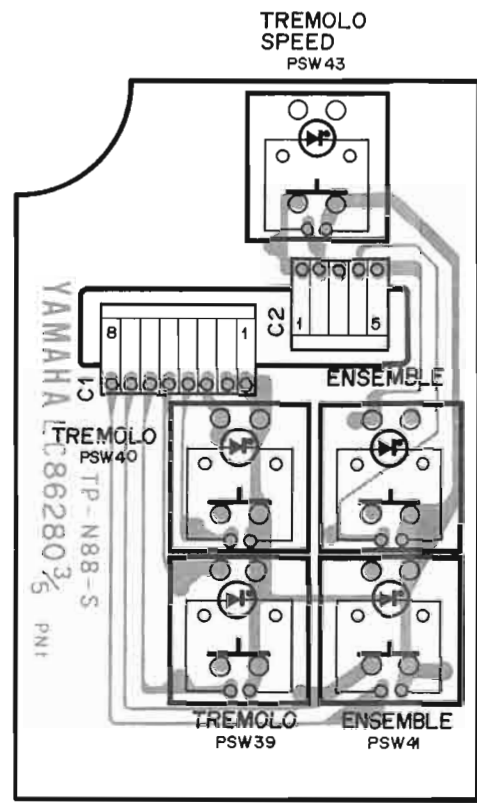
- Circuit Board : LC86280 1/5
- IC
IC1 : NJM4558DV (OP-Amp)
- Transistor
Tr1, 7 : 2SA950 (Y)
Tr2 : 2SC1815 (O, Y)
Tr3, 5 : 2SA1015 (O, Y)
Tr4, 6, 8 : 2SC2120 (Y)
- Field Effect Transistor
FET : 2SK30A (Y)
- Diodes
D1, 2 : 1S1555
- Jack
J1 ~ 15 : JL2B
- Resistor
(*) marked : Metal Oxide Film Resistor

PN1, PN2 Circuit Diagram · Circuit Board & Wiring



C1

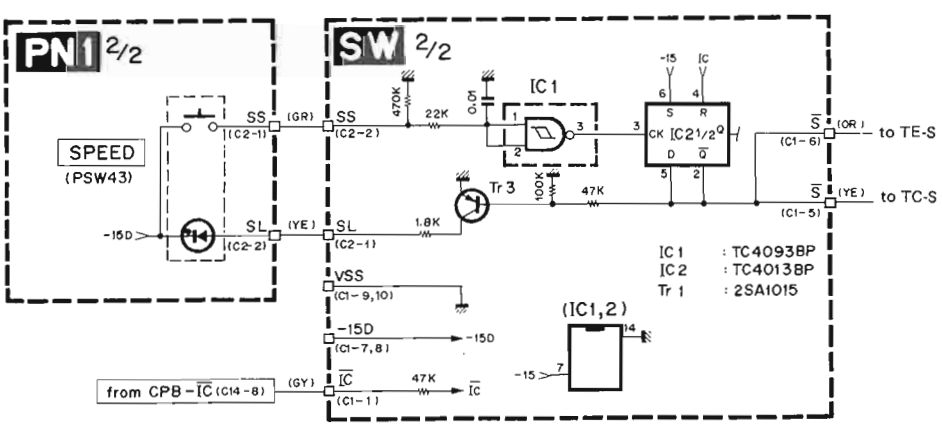
-15A	1
-15A	2
PTS	3
PTL	4
OTS	5
OTL	6
OES	7
OEL	8



C2

1	SS
2	SL
3	NC
4	PEL
5	PES

View from the printed pattern side of the circuit board



C1

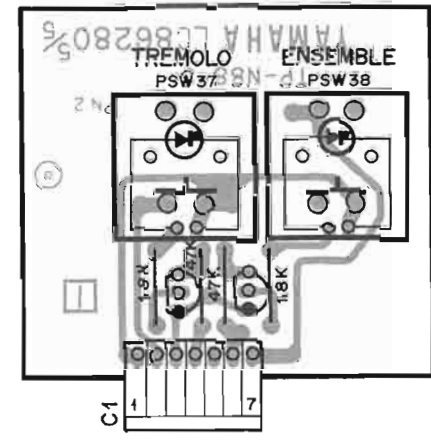
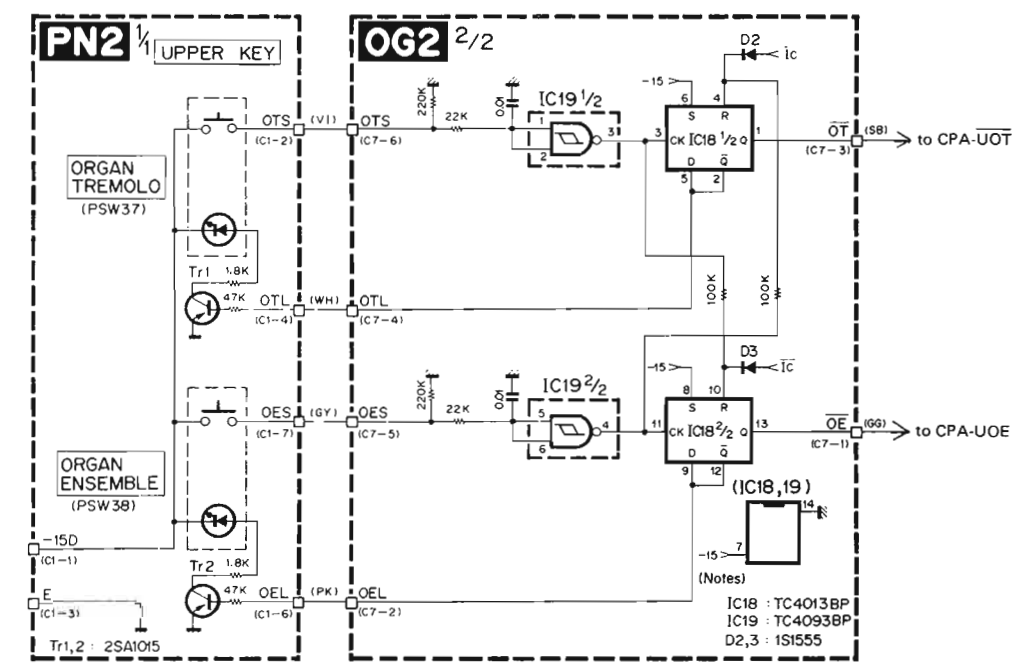
Pin No.	Pin Name	Wire Color	Destination
1	-15A	YE	SW-15D (C1-7)
2	-15A	YE	PN2-15A (C1-1)
3	PTS	BE	OG1-PTS (C16-5)
4	PTL	VI	OG1-PTL (C15-2)
5	OTS	BR	OG1-OTS (C16-3)
6	OTL	WH	OG1-OTL (C15-4)
7	OES	GY	OG1-OES (C16-4)
8	OEL	PK	OG1-OEL (C15-3)

- (Notes)
 1. Circuit Board : LC86280 □-3/5
 2. Push SW with LED
 PSW39 ~ 43 : Gray

C2

Pin No.	Pin Name	Wire Color	Destination
1	SS	GR	SW-SS (C2-2)
2	SL	YE	SW-SL (C2-1)
3	NC	-	-
4	PEL	BE	OG1-PEL (C15-1)
5	PES	OR	OG1-PES (C16-2)

KEP-NA80726 3/5-09



C1

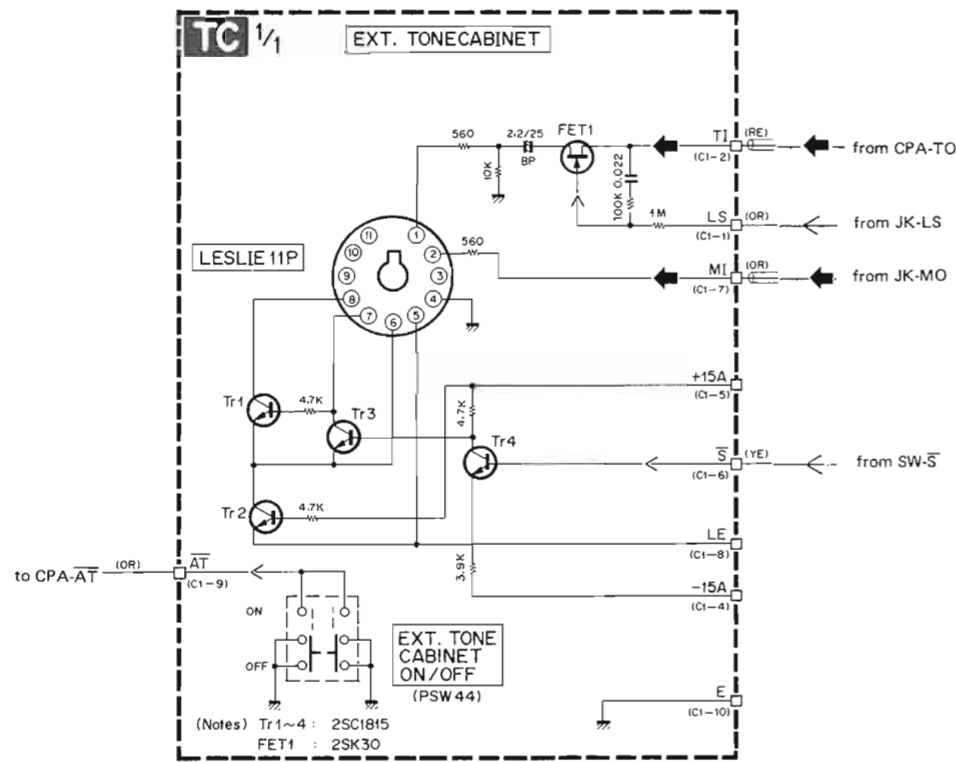
Pin No.	Pin Name	Wire Color	Destination
1	-15A	YE	PN1-15A (C1-2)
2	OTS	VI	OG2-OTS (C7-6)
3	E	BL	OG1-E (C16-1)
4	OTL	WH	OG2-OTL (C7-4)
5	NC	-	-
6	OEL	PK	OG2-OEL (C7-2)
7	OES	GY	OG2-OES (C7-5)

- (Notes)
 1. Circuit Board : LC86280 □-5/5
 2. Transistor
 Tr1, 2 : 2SA1015 (O, Y)
 3. Push SW with LED
 PSW37, 38 : Gray

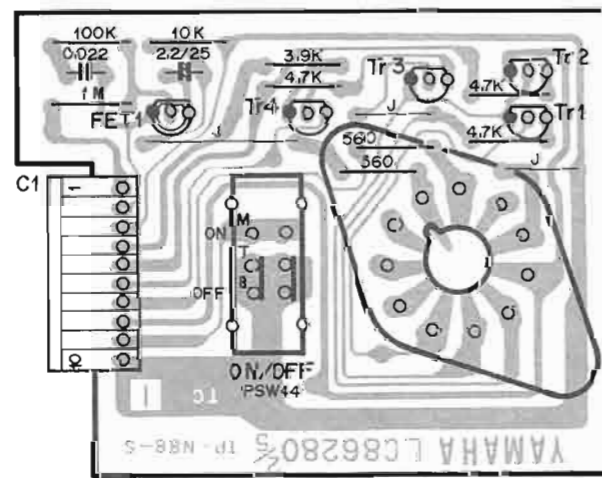
View from the printed pattern side of the circuit board

KEP-NA80726 5/5-09

TC, SW Circuit Diagram · Circuit Board & Wiring



KEC-90471-06 Δ



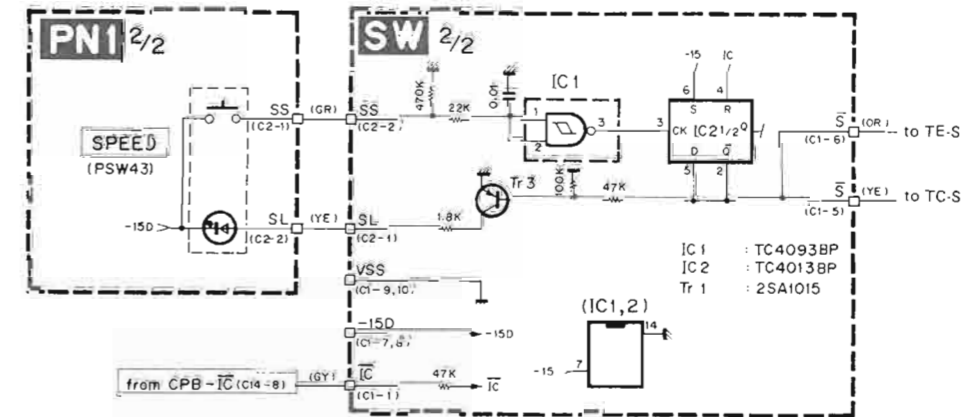
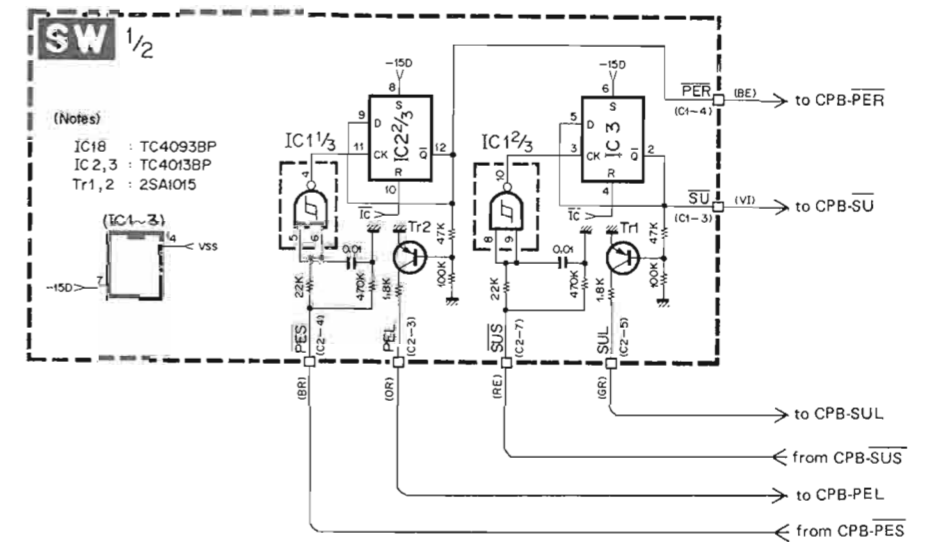
View from the printed pattern side of the circuit board

KEP-NA80726 2/5-09 Δ

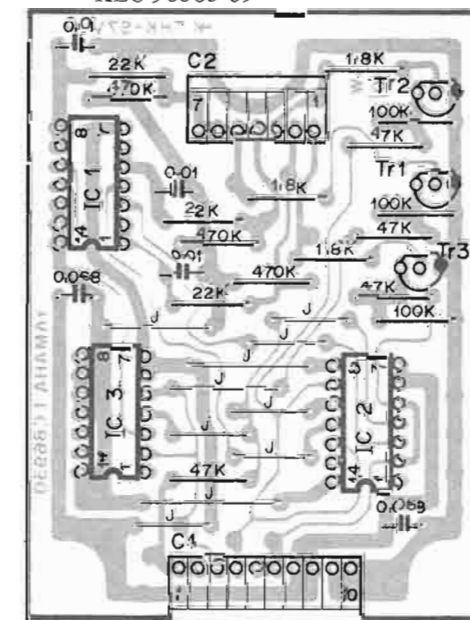
Pin No.	Pin Name	Wire Color	Destination
1	LS	OR	4K-LS (C1-2)
2	TL	S RR	CPA-TO (C3-4)
3	E	S RE S	-
4	-15A	YE	TE-15A (C1-7)
5	+15A	B R	TE+15A (C4-1)
6	S	YE	SW-S (C1-5)
7	MJ	S OR	JK-MO (C1-5)
8	LE	BL	CPA-E (C4-5)
9	AT	OR	CPA-AT (C9-7)
10	E	BL	TE-E (C3-5)

(Notes)

1. Circuit Board : LC86280 □-2/5
2. Transistor
Tr1 ~ 4 : 2SC1815 (O, Y)
3. Field Effect Transistor
FET1 : 2SK30A (Y)
4. Slide Switch
PSW44 : 2 way, 2 contact KA40084



KEC-90503-09



View from the component side of the circuit board

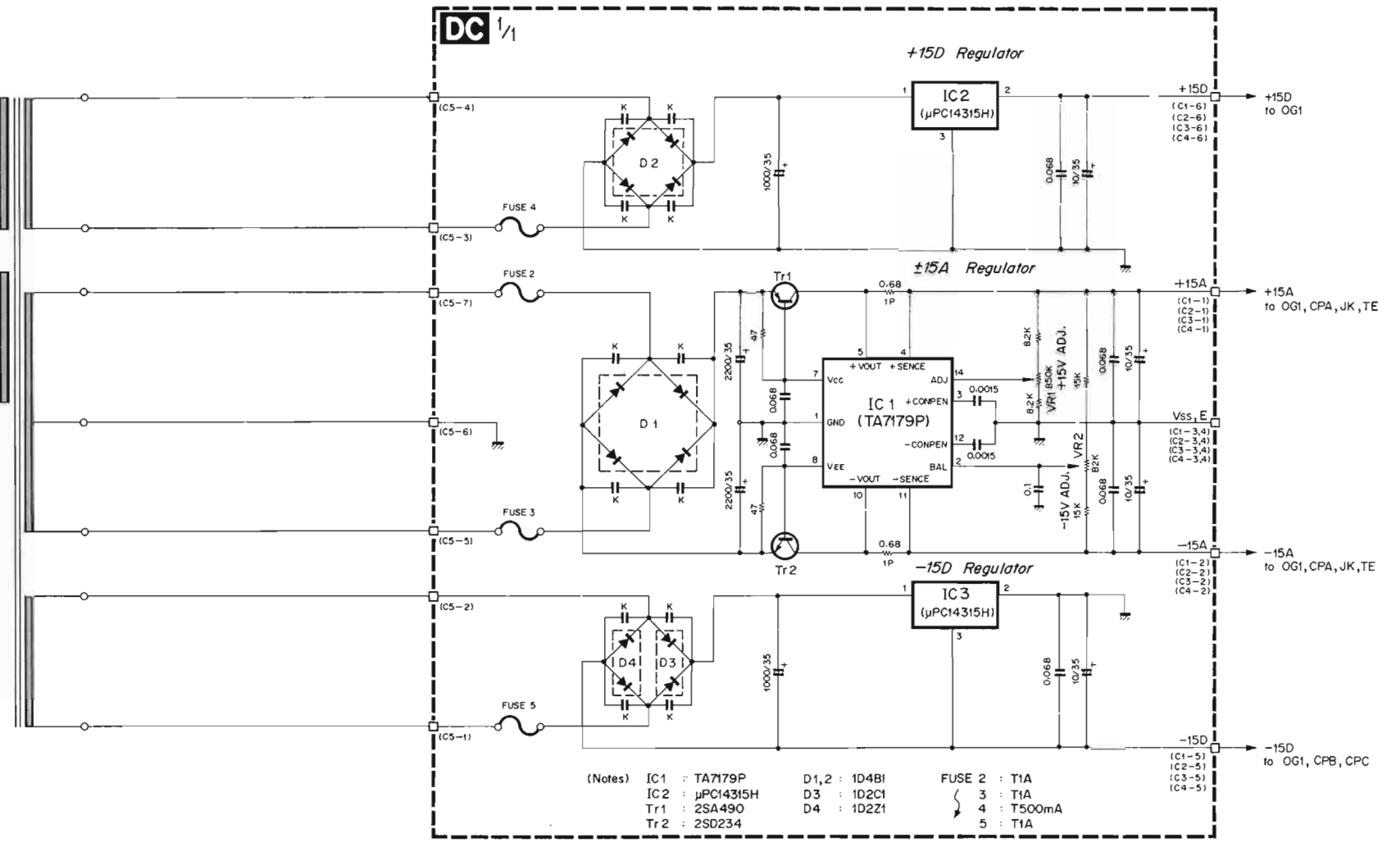
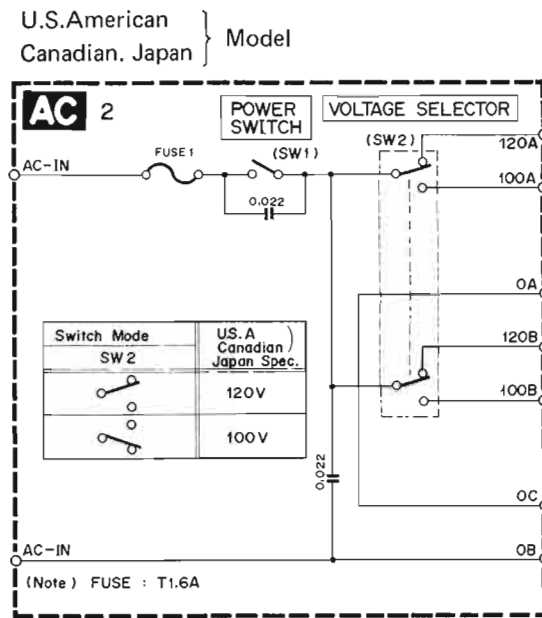
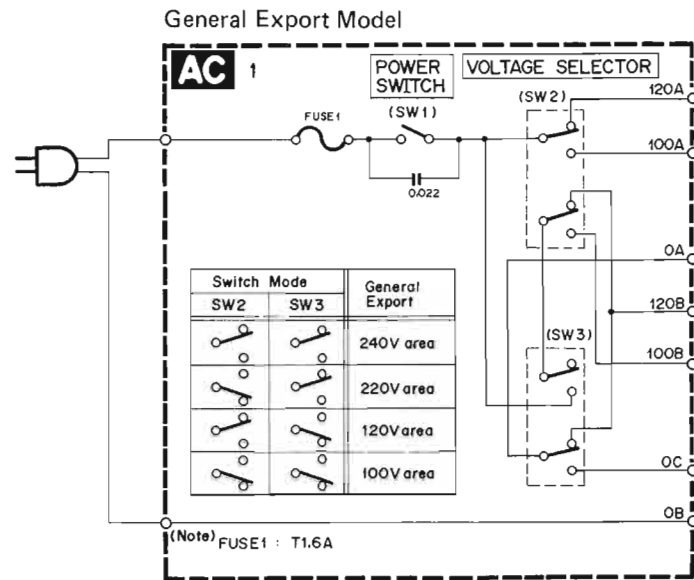
KEP-NA80763-09 Δ

Pin No.	Pin Name	Wire Color	Destination
1	IC	GY	CPB-IC (C14-8)
2	SS	GR	PN1-SS (C2-1)
3	PER	BE	CPB-DEC (C14-6)
4	S	YE	TC-S (C1-6)
5	SUL	GR	CPB-SUL (C14-5)
6	SUS	RE	CPB-SUS (C14-2)
7	SUS	RE	CPB-SUS (C14-2)

(Notes)

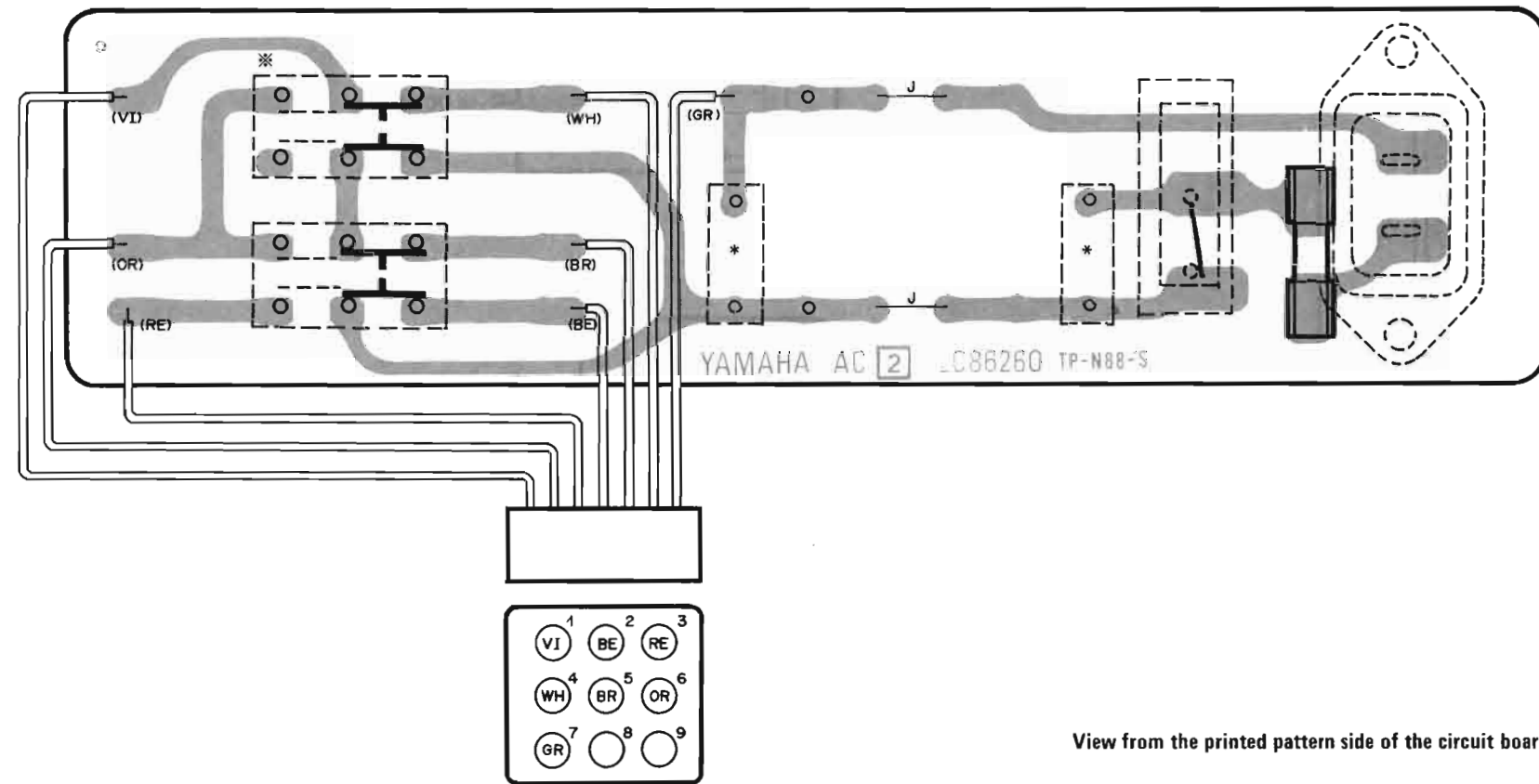
1. Circuit Board : LC86930
2. IC
IC1 : TC4093BP (2 IN NAND Schmitt Trigger)
IC2, 3 : TC4013BP ("D" Flip-Flop)
3. Transistors
Tr1 ~ 3 : 2SA1015 (O, Y)

DC, AC Circuit Diagram



DC, AC Circuit Board & Wiring

AC (General Export Model)



View from the printed pattern side of the circuit board

KEP-NA80733-07
KEP-NA80734-07
KEP-NA80735-07

(Notes)

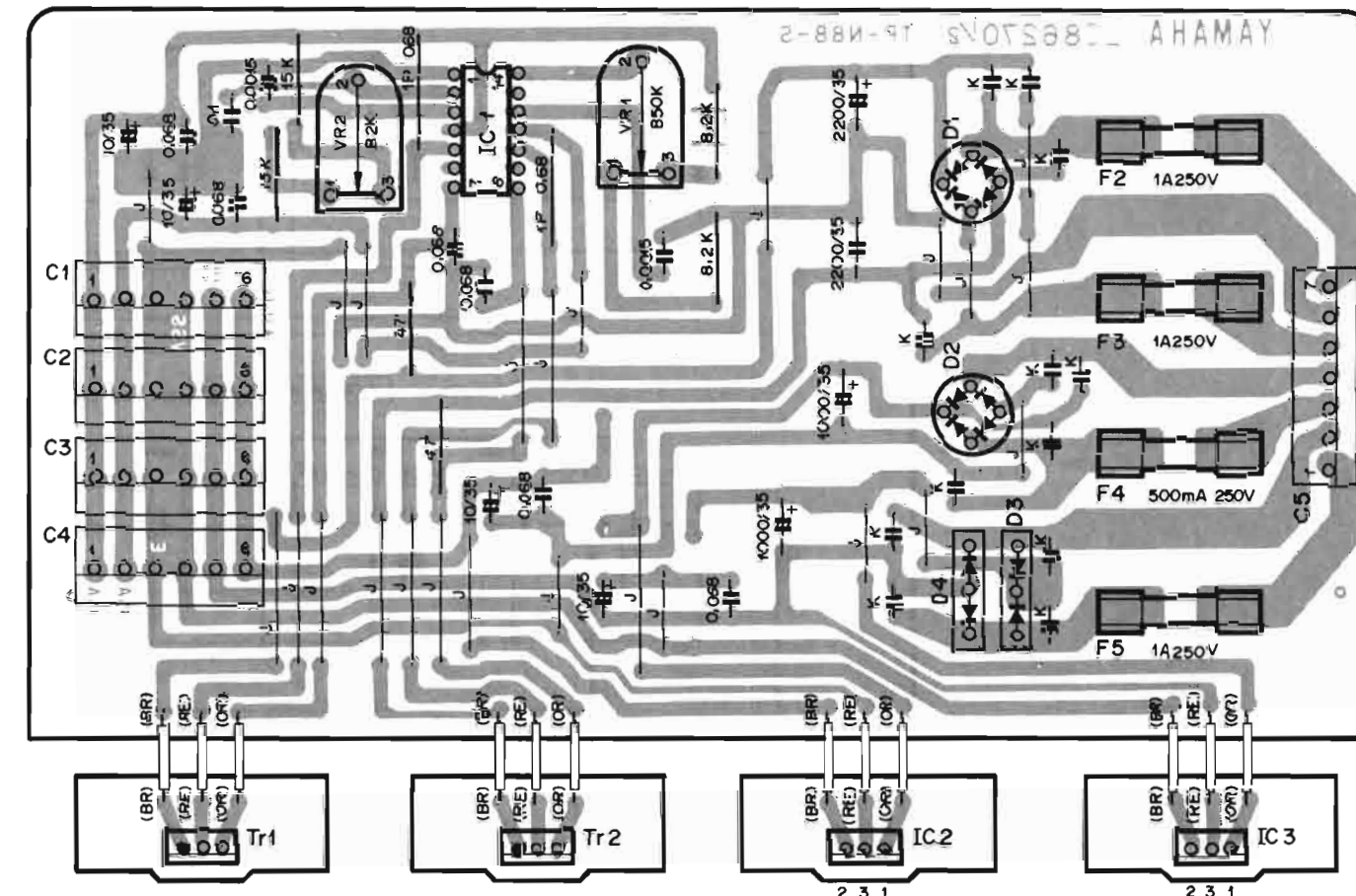
1. Circuit Board : LC86260
2. Capacitor
(*) marked : Spark Killer Capacitor 250V/0.022μF
3. Fuse

Common Model	NA No.	Fuse
General Export	NA80734	Ⓢ T1.6A 250V
US, American Canadian	NA80733	Ⓢ 1.6A 125V
Japan	NA80735	Ⓢ 1.6A 250V

* U.S. American Canadian Model



DC



View from the component side of the circuit board

(Notes)

1. Circuit Board : LC86270
2. IC
IC1 : TA7179P
IC2, 3 * : μPC14315H
3. Transistor
Tr1 : 2SA490 (Y)
Tr2 : 2SD234 (Y)
4. Diodes
D1, 2 : 1D4B1
D3 : 1D2C1
D4 : 1D2Z1
5. Capacitor
(K) marked : Ceramic Capacitor 1000P
6. Resistor
1P 0.68 : Metal Oxide Film Resistor
7. Variable Resistor
Vr1, 2 : V10K

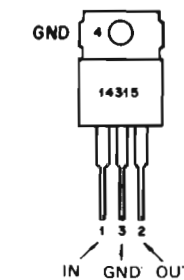
8. Fuse

Common Model	NA No.	F2, F3	F4	F5
US, American Canadian Japan	NA80730	Ⓢ 1A 250V	Ⓢ 500mA 250V	Ⓢ 1A 250V
General Export	NA80731	Ⓢ T 1A 250V	Ⓢ T500mA 250V	Ⓢ T1A 250V

9. Connector

- C1 ~ 4 : 5277-06A LB60397
- C5 : 5277-07A LB60398

*μPC14315 Connection Diagram



C1			
Pin No.	Pin Name	Wire Color	Destination
1	+15A	BR	OG1-+15A (C8-1)
2	-15A	YE	OG1-15A (C8-3)
3	E	BL	OG1-E (C8-7)
4	V _{SS}	VI	OG1-V _{SS} (C1-1)
5	-15D	VE	OG1-15D (C1-7)
6	+15D	BR	OG1-15D (C2-1)

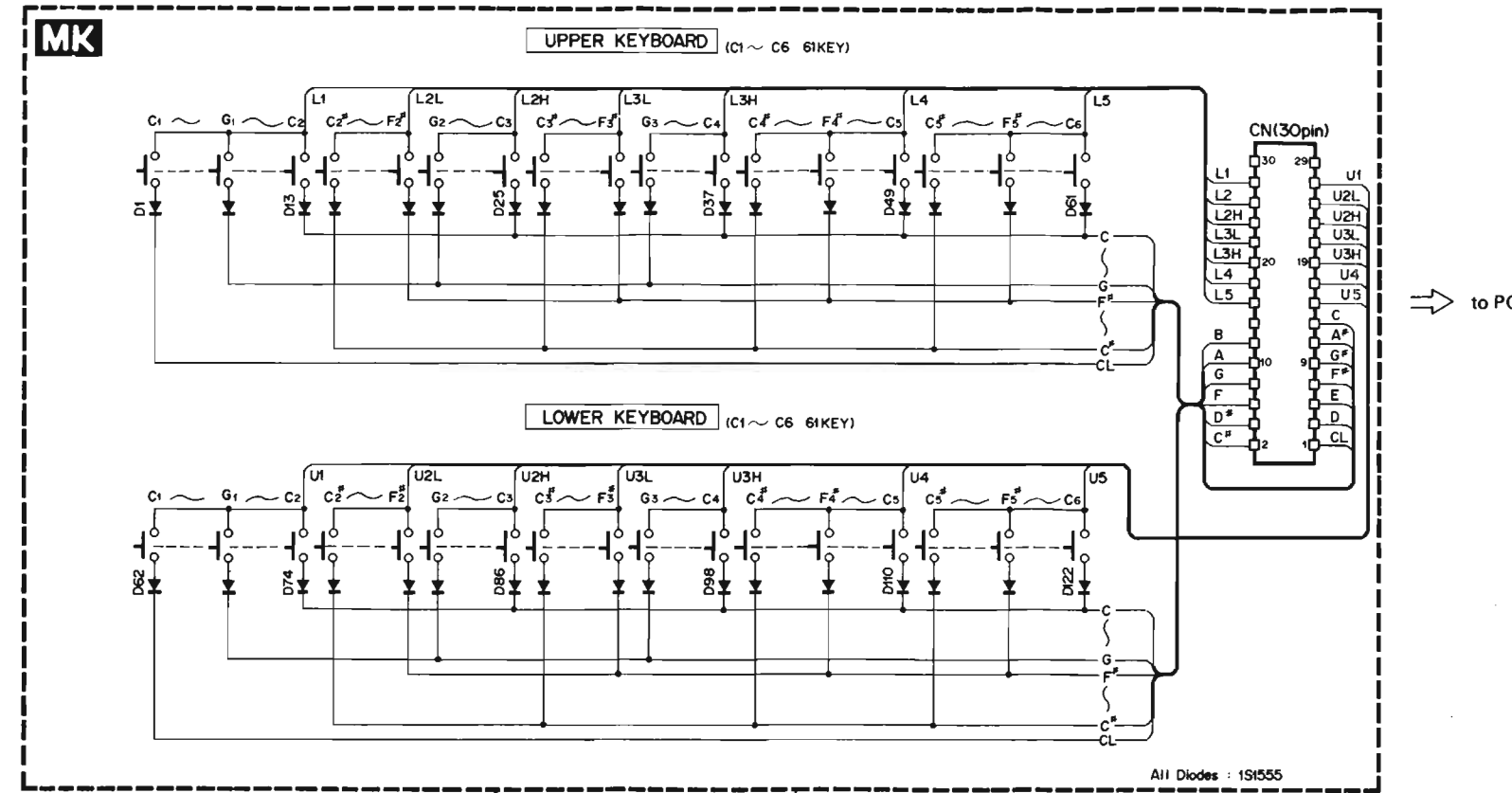
C2			
Pin No.	Pin Name	Wire Color	Destination
1	+15A	DR	CPA-+15A (C4-6)
2	-15A	YE	CPA-15A (C4-1)
3	E	BL	CPA-E (C4-3)
4	V _{SS}	VI	CPB-V _{SS} (C1-10)
5	-15D	YE	CPB-15D (C1-2)
6	+15D	-	-

C3			
Pin No.	Pin Name	Wire Color	Destination
1	+15A	BR	JK-+15A (C1-6)
2	-15A	YE	JK-15A (C1-7)
3	E	VI	CPA-V _{SS} (C8-1)
4	V _{SS}	VI	CPC-V _{SS} (C1-8)
5	-15D	YE	CPC-15D (C1-9)
6	+15D	-	-

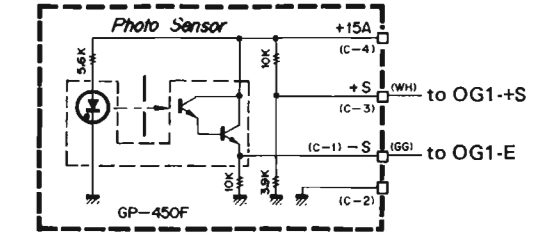
C4			
Pin No.	Pin Name	Wire Color	Destination
1	+15A	BR	TE-+15A (C1-2)
2	-15A	YE	TE-15A (C1-6)
3	E	BL	TE-E (C1-4)
4	V _{SS}	BL	CPB-EC (C11-1)
5	-15D	-	-
6	+15D	-	-

KEP-NA80730-09
KEP-NA80731-09

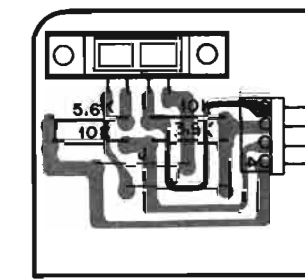
MK, PC Circuit Diagram · PC Circuit Board



KEC-90474-06



KEC-90505-09 Δ



Note)
Photo Sensor : GP-450F

C1

Pin No.	Pin Name	Wire Color	Destination
1	-S	SGG	OG1-S (C13-9)
2	E	BL	OG1-E (C13-5)
3	+S	SWH	OG1+S (C13-7)
4	+15A	BR	OG1+15A (C13-6)

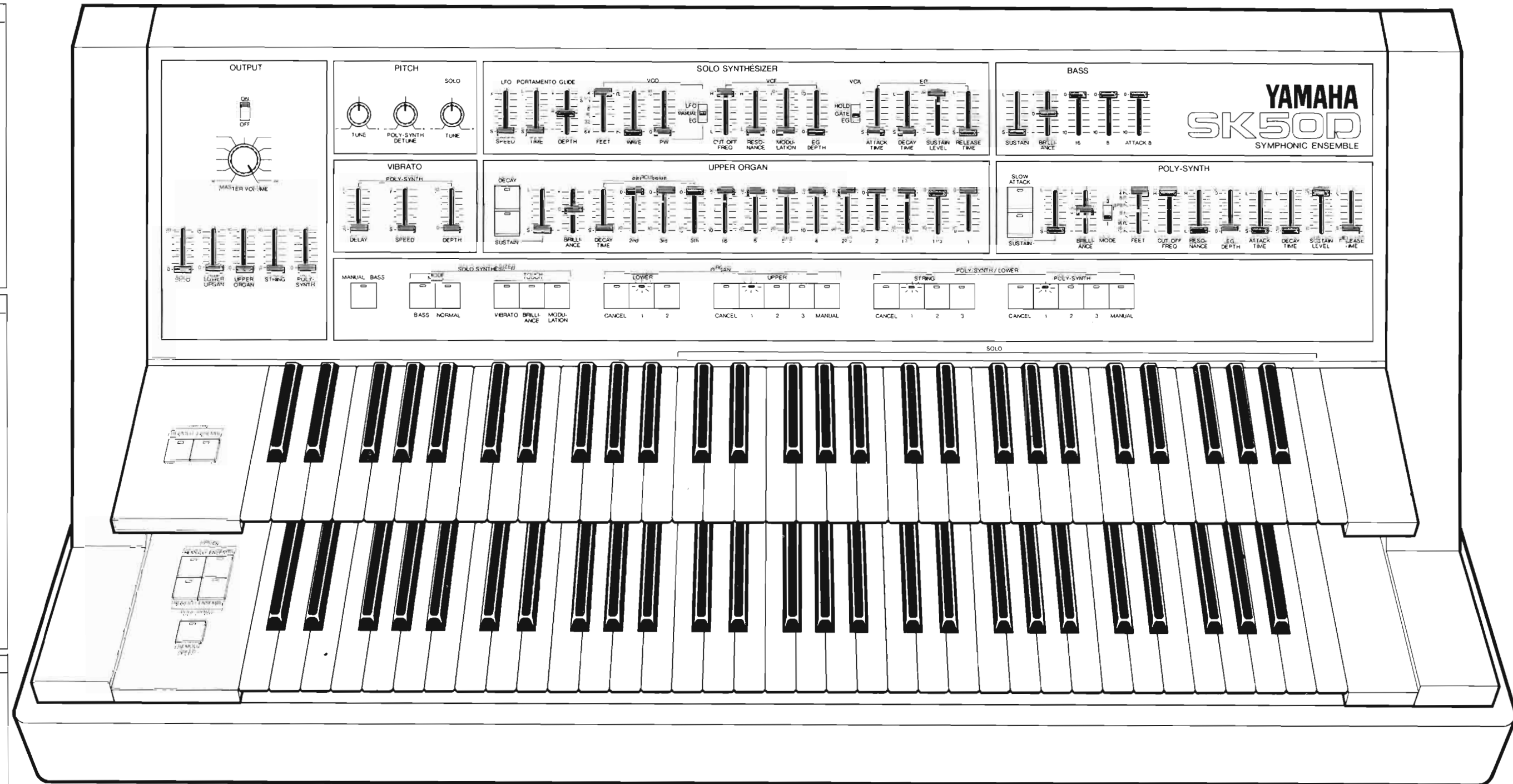
KEP-NA80743-09 Δ

PANEL SETTING

BLOCK	CONTROL	SETTING	BLOCK	CONTROL	SETTING
OUTPUT	OUTPUT ON/OFF	ON	SOLO SYNTHESIZER	LFO SPEED	S
	MASTER VOLUME	10 (Max.)		PORTAMENTO TIME	S
	SPLIT VOLUME	0 (Min.)		GLIDE DEPTH	0 (CENTER)
	SOLO LOWER ORGAN	↓		VCO FEET	4'
	UPPER ORGAN	↓		WAVE	∩
PITCH	TUNE	CENTER	VCF	0	
	POLY-SYNTH DETUNE	↓	LFO/MANUAL/EG	MANUAL	
	SOLO TUNE	↓	VCF CUT OFF FREQ.	H	
VIBRATO (POLY-SYNTH)	DELAY	S	RESONANCE	L	
	SPEED	S	MODULATION	0	
	DEPTH	0	EG DEPTH	0	

BLOCK	CONTROL	SETTING	BLOCK	CONTROL	SETTING
UPPER ORGAN	DECAY Switch	OFF (LED OFF)	POLY-SYNTH	SLOW ATTACK	OFF (LED OFF)
	SUSTAIN Switch	OFF (LED OFF)		SUSTAIN Switch	OFF (LED OFF)
	DECAY SUSTAIN } Lever	S		SUSTAIN Lever	S
	BRILLIANCE	0		BRILLIANCE	0 (CENTER)
	PERCUSSIVE	↓		MODE I/II	I
	DECAY TIME	S		FEET	4'∩
	2nd	0		CUTOFF FREQ.	H
	3rd	0		RESONANCE	L
	5th	0		EG DEPTH	0
	TONE LEVERS	↓		ATTACK TIME	S
	16'	↓		DECAY TIME	S
	8'	↓		SUSTAIN LEVEL	10
	5 1/2'	↓		RELEASE TIME	S
	4'	↓			
	2 3/4'	↓			
2'	↓				
1 3/4'	↓				
1 1/2'	↓				
1'	↓				
BASS	SUSTAIN	S			
	BRILLIANCE	0 (CENTER)			
	16' 8' ATTACK 8'	↓			

BLOCK	CONTROL	SETTING	BLOCK	CONTROL	SETTING
Switch Block SOLO & BASS	MANUAL BASS	OFF	Switch Block POLY-SYNTH	STRING CANCEL	ON (LED ON)
	SOLO SYNTHESIZER MODE NORMAL	OFF		1	ON (LED ON)
	BASS	OFF		2	ON (LED ON)
	TOUCH VIBRATO	OFF	3	ON (LED ON)	
	BRILLIANCE	OFF	MANUAL	MANUAL	(All OFF)
Switch Block ORGAN	LOWER CANCEL	ON (LED ON)	Switch Block TREMOLO/ENSEMBLE	UPPER ORGAN TREMOLO	(All OFF)
	1	ON (LED ON)		ENSEMBLE	(All OFF)
	2	ON (LED ON)		LOWER ORGAN TREMOLO	(All OFF)
	UPPER CANCEL	ON (LED ON)	ENSEMBLE	(All OFF)	
	1	ON (LED ON)	POLY-SYNTH TREMOLO	(All OFF)	
2	ON (LED ON)	ENSEMBLE	(All OFF)		
3	ON (LED ON)	TREMOLO SPEED	(All OFF)		
MANUAL	ON (LED ON)				



CHECKS AND ADJUSTMENTS

Before checking or making an adjustment, you must first set-up the panel as shown on page 67, then change panel setting as required to make each adjustment.

Equipment Required

Oscilloscope
AC Voltmeter
Frequency counter
Digital voltmeter

CIRCUIT BOARDS AND FUNCTIONS

Circuit boards	Functions	Circuit boards	Functions
CPA	Mixing Circuit LINE OUT Control Circuit SOLO SYNTHESIZER & BASS Control Circuit PITCH Circuit DELAY VIBRATO Circuit	CPC	POLY-SYNTH MODE Switch Circuit PRESET MEMORY Circuit BASS Mixing Circuit BRILLIANCE Circuit SUSTAIN Circuit
CPB	SOLO SYNTHESIZER KEY ON TRIGGER Circuit FEET Switch Circuit LFO Circuit GLIDE Circuit VCF Circuit VCA Circuit EG Circuit TOUCH CONTROL Switch Circuit UPPER ORGAN Mixing Circuit PERCUSSIVE Circuit DECAY/SUSTAIN Circuit BRILLIANCE Circuit PRESET MEMORY & Tone Selector Circuit LOWER ORGAN PRESET MEMORY Circuit STRING PRESET MEMORY Circuit	PG	KEY ASSIGNER & SPLIT Circuit SOLO SYNTHESIZER KEY VOLTAGE Generator VCO Circuit POLY-SYNTH MASTER CLOCK Circuit Tone Generator Circuit Mixing Circuit STRING Filter & Selector Circuit TRIGGER Detector
CPC	POLY-SYNTH VCF Circuit EG VCF Circuit BRILLIANCE Circuit SLOW ATTACK/SUSTAIN Circuit	OG1	INITIAL CLEAR Circuit ORGAN (UPPER, LOWER) MASTER CLOCK Circuit UPPER ORGAN Tone Generator Circuit Filter & Mixing Circuit TOUCH SENSE Circuit TREMOLO/ENSEMBLE SW MEMORY Circuit
		OG2	LOWER ORGAN Tone Generator Circuit Filter Circuit Mixing Circuit Tone Selector Circuit

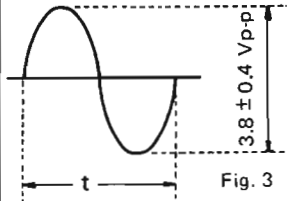
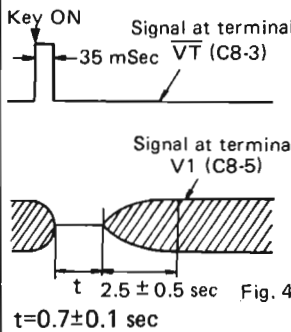
Tuning

Circuit boards	Functions	Circuit boards	Functions
OG2	BASS Tone Generator Circuit Filter Circuit TREMOLO/ENSEMBLE SW MEMORY Circuit		
KC	KEY CODE DATA Converter		
TE	TREMOLO/ENSEMBLE Circuit		
DC	+ 15D Regulator - 15D Regulator ± 15A Regulator		
JK	PHONES Amp + 15V Protector Circuit Two - 15V Protector Circuits		
TC	EXT. TONECABINET Control Circuit		

Item	Setting	Adjustment & reading	Where to adjustment	Remark
		Note: Before tuning make sure that the DEPTH control in the VIBRATO block is set to "0" and the TUNE , POLY-SYNTH DETUNE and SOLO TUNE controls are all center. If the results are not satisfactory after performing the preceding steps, verify the voltages found in the pitch circuit checks on page 76 of the CPA circuit board adjustment. Also verify the key voltage reference, the key voltage adjustment, and the offset adjustment as found on page 89 of the PG circuit board adjustment.		
UPPER ORGAN (LOWER ORGAN)	UPPER ORGAN block 8' 10	Depressing the A3 Key, adjust L1 on the OG1 board to tune A3 to pitch 440Hz ± 1 cent.	L1 (OG 1)	*1
POLY-SYNTH I	POLY-SYNTH block MODE I FEET 8'	Depressing the A3 key, adjust L1 on the PG board to tune A3 to pitch 440Hz ± 1 cent.	L1 (PG)	
POLY-SYNTH II	POLY-SYNTH block MODE II	Depressing the A3 key, adjust L2 on the PG board to tune A3 to pitch 440Hz ± 1 cent.	L2 (PG)	

*1 Connect a tuning device to the MIXING OUTPUT jack.
Tuning can be done by ear using two previously tuned voice (Upper/Lower Organ) as a reference and eliminate the beating with the voice being tune.

Item	Setting	Adjustment & reading	Where to adjustment	Remark
SOLO SYNTHESIZER				
1. PITCH adjustment	SOLO SYNTHESIZER block FEET 4' UPPER ORGAN block 4' 10	a) Adjust VR2 on the PG board to tune C6 to ORGAN pitch. b) Adjust VR1 on the PG board to tune C3 to ORGAN pitch. c) Repeat a) and b) to eliminate the beating perfectly.	PG board VR2 VR1	
2. FEET adjustment	FEET 5 1/3' UPPER ORGAN block 5 1/3' 10 FEET 8' UPPER ORGAN block 8' 10 FEET 16' UPPER ORGAN block 10 10 FEET 32' UPPER ORGAN block 16 10 FEET 64' UPPER ORGAN block 16 10	d) Depressing the C6 Key, adjust VR4 on the PG board to tune C6 to ORGAN pitch. e) Depressing the C6 Key, adjust VR5 on the PG board to tune C6 to ORGAN pitch. f) Depressing the C6 Key, adjust VR6 on the PG board to tune C6 to ORGAN pitch. g) Depressing the C6 Key, adjust VR7 on the PG board to tune C6 to ORGAN pitch. h) Depressing the C6 Key, adjust VR8 on the PG board to tune C6 to ORGAN pitch.	VR4 VR5 VR6 VR7 VR8	

Item	Setting	Test point	Adjustment & reading	Where to adjustment	Remark
DELAY VIBRATO circuit (POLY-SYNTH) 1. Vibrato speed adjustment	VIBRATO block DEPTH10	V1 (C8-5)	 Fig. 3 $t = 0.2 \text{ sec (} f = 5 \pm 0.1 \text{ Hz)}$ $(f = 7 \pm 0.3 \text{ Hz)}$	VR4	Adjustment
	SPEEDSF		When depressing any key, the waveform as shown below should appear at the V1 terminal.		Check
2. Delay Time adjustment	DELAYL		 Fig. 4 $t = 0.7 \pm 0.1 \text{ sec}$	VR3	Adjustment

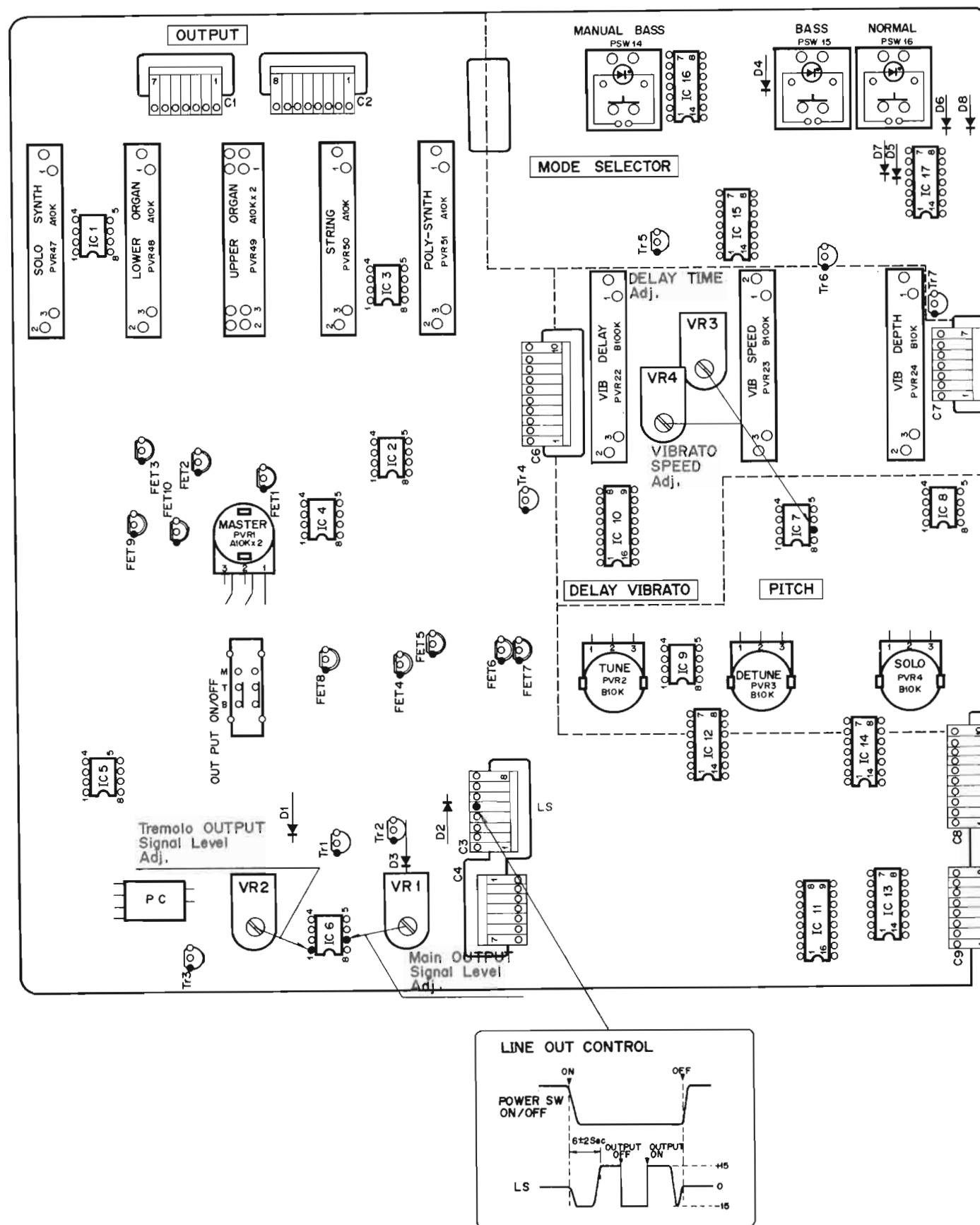
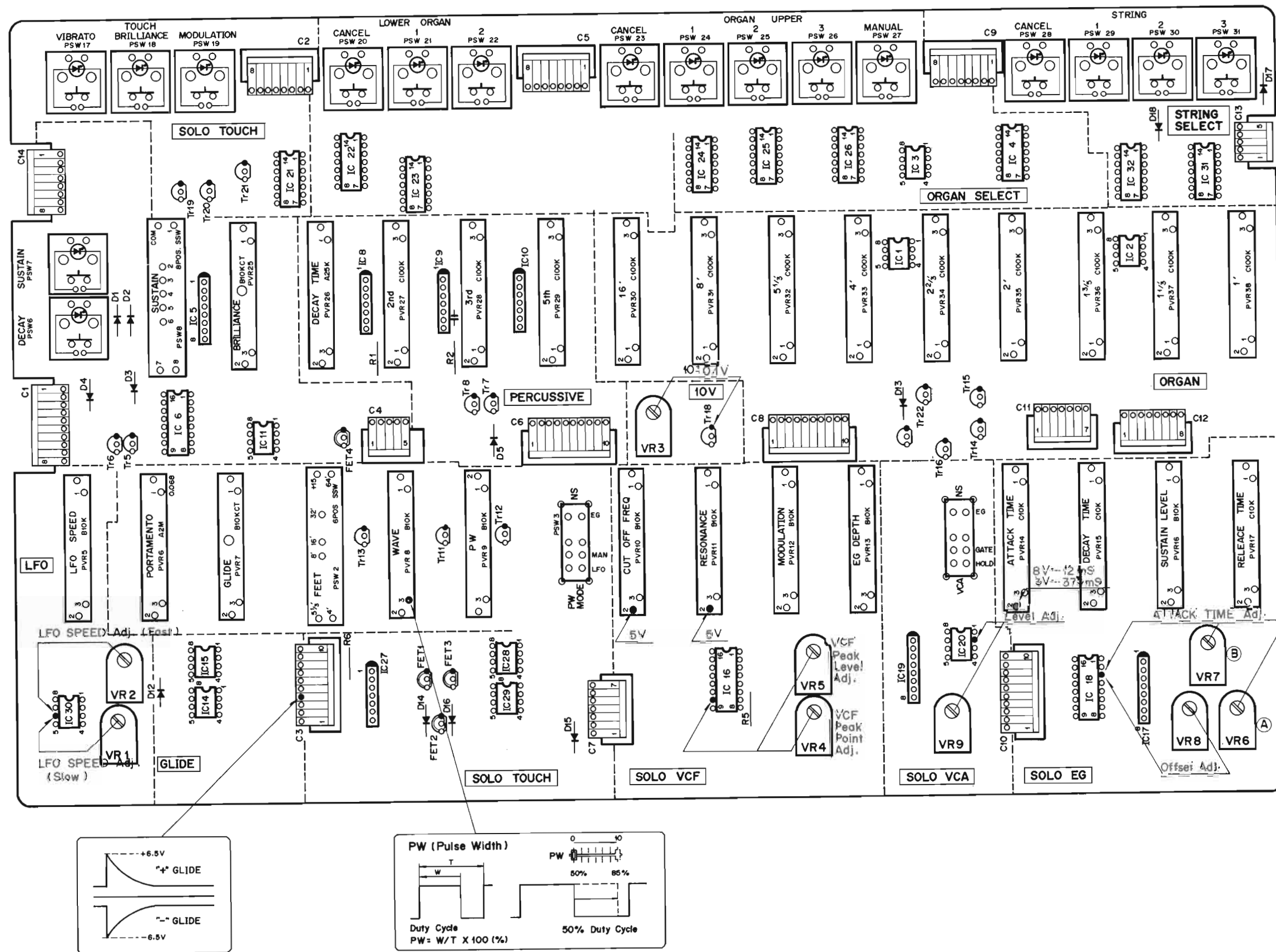


Table 1.

The note ranges of each keyboard corresponding to the settings of the SOLO SYNTHESIZER MODE (NORMAL, BASS) switch and MANUAL BASS switch.

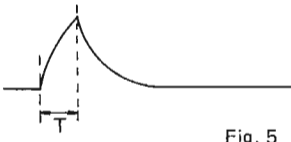
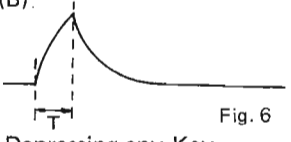
SWITCH SETTINGS	SOLO SYNTHESIZER	UPPER ORGAN	LOWER ORGAN	POLY-SYNTH (STRING)	BASS
1 MODE SW } MANUAL BASS } OFF	No sound is generated.				
2 NORMAL ON	UPPER KEYBOARD C ₃ ~ C ₆	UPPER KEYBOARD C ₁ ~ C ₆	LOWER KEYBOARD C ₁ ~ C ₆	LOWER KEYBOARD C ₁ ~ C ₆	Sound is generated by connecting BASS PEADL BP2.
3 BASS ON	Sound is generated by BP2 (Corresponding to C ₃ ~ C ₄ of UPPER KEYBOARD.)				
4 MANUAL BASS ON	No sound is generated.				Sound is generated by both BP2 and LOWER KEYBOARD (C ₁ ~ F ₂ #).
5 NORMAL } MANUAL BASS } ON	UPPER KEYBOARD C ₃ ~ C ₆	LOWER KEYBOARD G ₂ ~ C ₆	LOWER KEYBOARD G ₂ ~ C ₆	LOWER KEYBOARD G ₂ ~ C ₆	High Note Priority.
6 BASS } MANUAL BASS } ON	BP2 + LK (C ₁ ~ F ₂ #)				

The volume of the SOLO SYNTHESIZER, UPPER ORGAN, LOWER ORGAN, POLY-SYNTH and BASS can be adjusted.

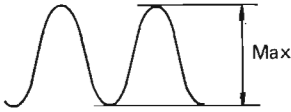
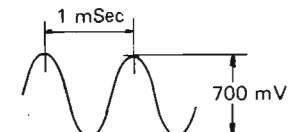
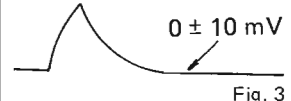




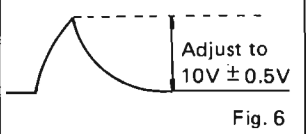
CPB Circuit Board

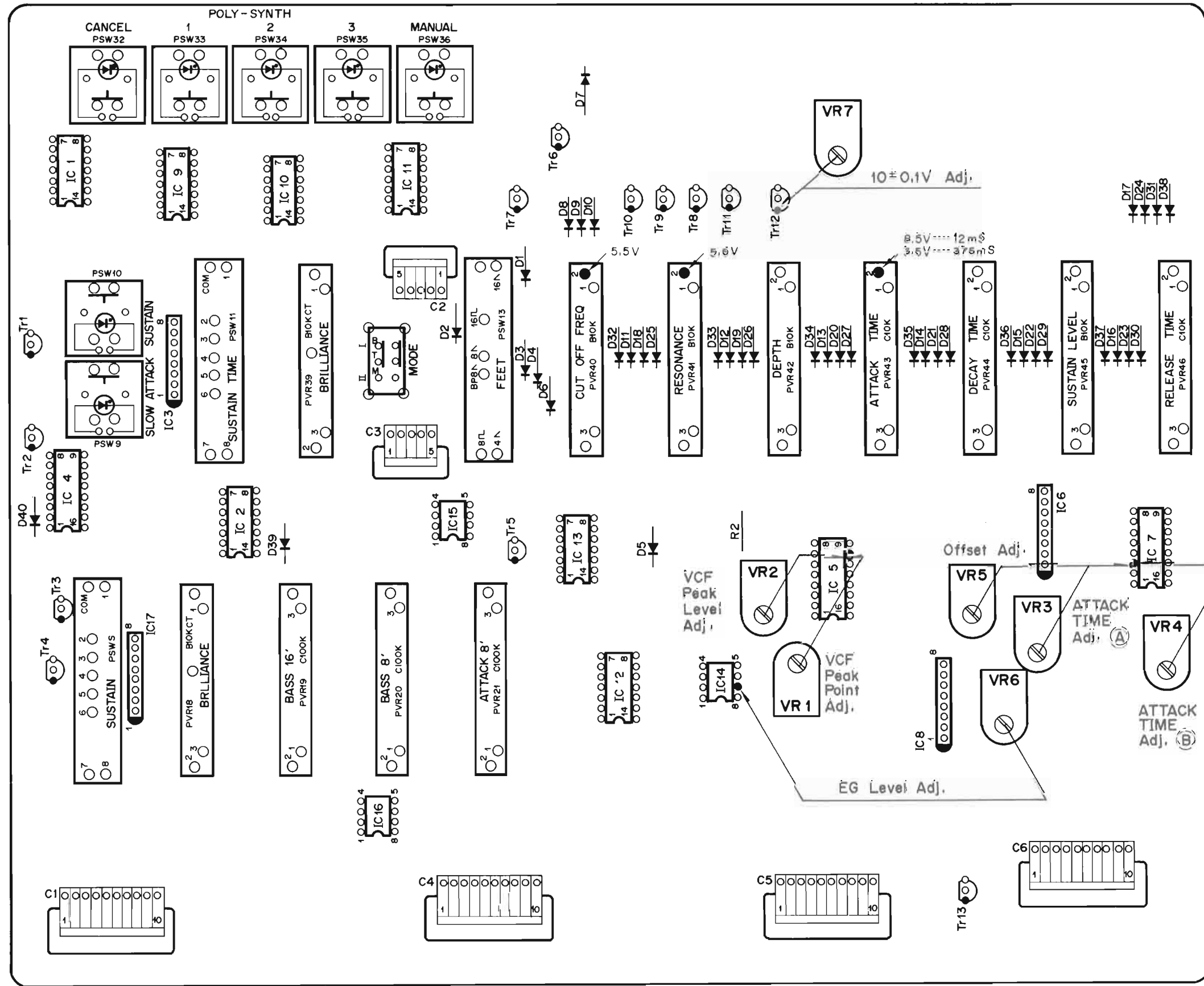
Item	Setting	Test point	Adjustment & reading	Where to adjustment	Remark
Reference voltage (10V) generator		Tr 18-E	Adjust VR3 to obtain a 10V ± 0.1V reading.	VR3 (B5K)	Adjustment
LFO SPEED adjustment	SOLO SYNTHESIZER block LFO SPEED F LEO SPEED S	IC30-pin6	Adjust to 0.1Hz (10s) ± 0.01Hz with VR1. Adjustment to 100Hz (10ms) ± 10Hz with VR2.	VR1 (B100K) VR2 (B100K)	Adjustment
VCF Peak/peak level adjustment (Tone quality adjustment)	WAVE N EG DEPTH 0 Adjust CUTOFF FREQ lever (PVR10) to achieve a +5V reading at the second terminal of PVR10. Adjust RESONANCE lever (PVR11) to achieve a +5V reading at the second terminal of PVR11. FEET 8'	IC16-pin 10 (LP)	Depress the C4 Key. [Peak adjustment] Adjust to achieve maximum amplitude. [Peak level adjustment]	VR4 (B100K) VR5 (B200K)	Fig. 1 Fig. 2
VCA Level adjustment	VCA HOLD	IC20-pin 1	Adjust to 450 mV.	VR9 (B100K)	Fig. 3
EG Offset voltage adjustment	Adjust ATTACK TIME lever (PVR14) to achieve a 8V ± 0.1V reading at the second terminal of PVR14. DECAY TIME S SUSTAIN LEVEL 0 RELEASE TIME S	IC18-pin 3 (BO)	Depressing any Key, adjust to 0V ± 100 mV.	VR8 (B100K)	Fig. 4

Item	Setting	Test point	Adjustment & reading	Where to adjustment	Remark
EG ATTACK TIME adjustment	Adjust ATTACK TIME lever (PVR14) to achieve a $8V \pm 0.1V$ reading the second terminal of PVR14. DECAY TIME . . . S SUSTAIN LEVEL . . . 0 RELEASE TIME . . . S	IC18-pin 3	(A)  Fig. 5 Depressing any Key, adjust T to 12 mSec.	VR6 (B100K)	Adjust- ment
	Adjust ATTACK TIME lever (PVR14) to achieve a $3V \pm 0.05V$ reading at the second terminal of PVR14.	IC18-pin 3	(B)  Fig. 6 Depressing any Key, adjust T to 375 mSec. Note: Both VR6 and VR7 affect ATTACK TIME adjustment each other. If the attack time is longer than 375 mSec, adjust VR7 so that the attack time is slightly longer. If shorter, adjust VR7 so that the attack time is slightly shorter. Repeat steps (A) and (B).	VR7 (B100K)	Adjust- ment

CPC Circuit Board

Item	Setting	Test point	Adjustment & reading	Where to adjustment	Remark
Reference voltage (10V) generator		Tr 12-E	Adjust to 10.5V	VR7	
VCF Peak/peak level adjustment (Tone quality adjustment)	Switch block POLY-SYNTH MANUAL ON POLY-SYNTH block FEET 16' Adjust CUTOFF FREQ lever (RVR40) to achieve a 5.5V reading at the second terminal of PVR 40. Adjust RESONANCE lever (PVR41) to achieve a 5.5V reading at the second terminal of PVR 41. EG DEPTH 0	IC5 Pin 10 (LP) of VCF (iG00156)	Depress the C6 Key. [Peak]  Fig. 1 Adjust to achieve maximum amplitude. [Peak level]  Fig. 2 Adjust to 700 mV.	VR1 VR2	
EG Offset adjustment	Adjust ATTACK TIME lever (PVR43) to achieve a 8.5V reading at the second terminal of PVR43.	IC7 Pin 3 (BO) of EG (iG00159)	 Fig. 3 Depressing any Key, adjust to 0V ± 10mV.	VR5	
ATTACK TIME adjustment	DECAY TIME . . . S SUSTAIN LEVEL 0 RELEASE TIME S		(A)  Fig. 4 Depressing any Key, adjust T to 12 mSec.	VR3	
	Adjust ATTACK TIME level (PVR43) to achieve a 3.5V reading at the second terminal of PVR43.		(B)  Fig. 5 Depressing any Key, adjust T to 375 mSec.	VR4	

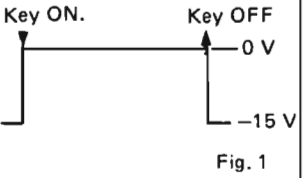
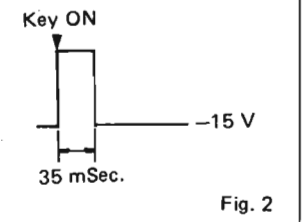
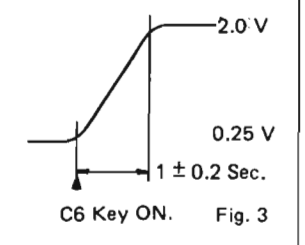

Item	Setting	Test point	Adjustment & reading	Where to adjustment	Remark
EG level adjustment			Note: Both VR3 and VR4 affect ATTACK TIME adjustment each other. If the attack time is longer than 375 mSec adjust VR4 so that the attack time is slightly longer. If shorter, adjust VR4 so that the attack time is slightly shorter. Repeat steps (A) and (B).	VR3 VR4	
	EG DEPTH 10	IC14-pin 7		VR6	



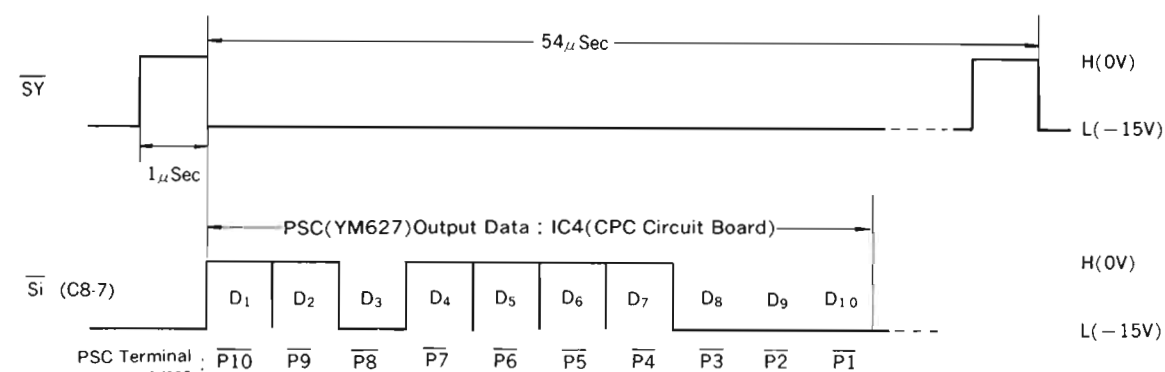
PG Circuit Board

Item	Setting	Test point	Adjustment & reading	Where to adjustment	Remark
Key voltage Reference Generator	SOLO SYNTHESIZER block PORTAMENTO . . S PITCH block Adjust SOLO TUNE control (PVR 4) to achieve a $-2V \pm 0.002V$ at VS terminal.				
Key voltage adjustment		PV1 (C9-4)	$-0.25V \pm 0.001V$	VR9	Adjustment
Offset adjustment		KVO (C9-3)	$+0.25V \pm 0.001V$	VR3	Adjustment
SOLO SYNTHESIZER TUNING			Refer to tuning procedure on page 73.		
Master clock osc adjustment (POLY-SYNTH PITCH tuning)			Refer to tuning procedure on page 72.		
STRING level adjustment	POLY-SYNTH block MODE I Switch block STRING 2 ON Depress the C3 Key.	STO (C12-1)	Adjust VR10 to achieve $0.26 V_{p-p}$ reading at STO terminal.	VR10	Adjustment

PG Circuit Board

Item	Setting	Test point	Adjustment & reading	Where to adjustment	Remark
TRIGGER Detector	Depress the A3 Key on the upper keyboard. Depress the A3 Key on the lower keyboard.	LTR (C3-1) PTR (C3-7)			Check
	Depress the A3 Key on the upper keyboard.	VTR (C3-6)			Check
PORTAMENTO	PORTAMENTO . . . L	KVO (C9-3)	Depress the C3 Key → C6 Key.		Check
					
VCO OUT	Depress the C6 Key.	SYO (C11-2)			Check

● Serial Data Timing Chart for GOA (POLY-SYNTH Generator)

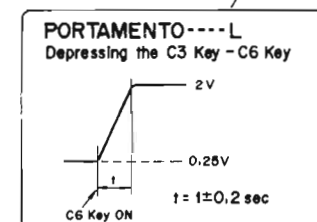
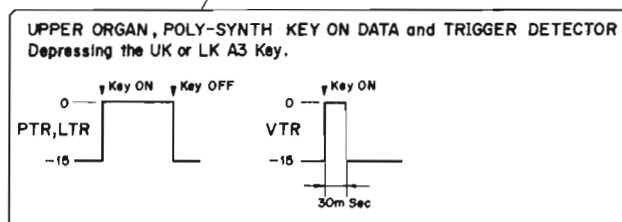
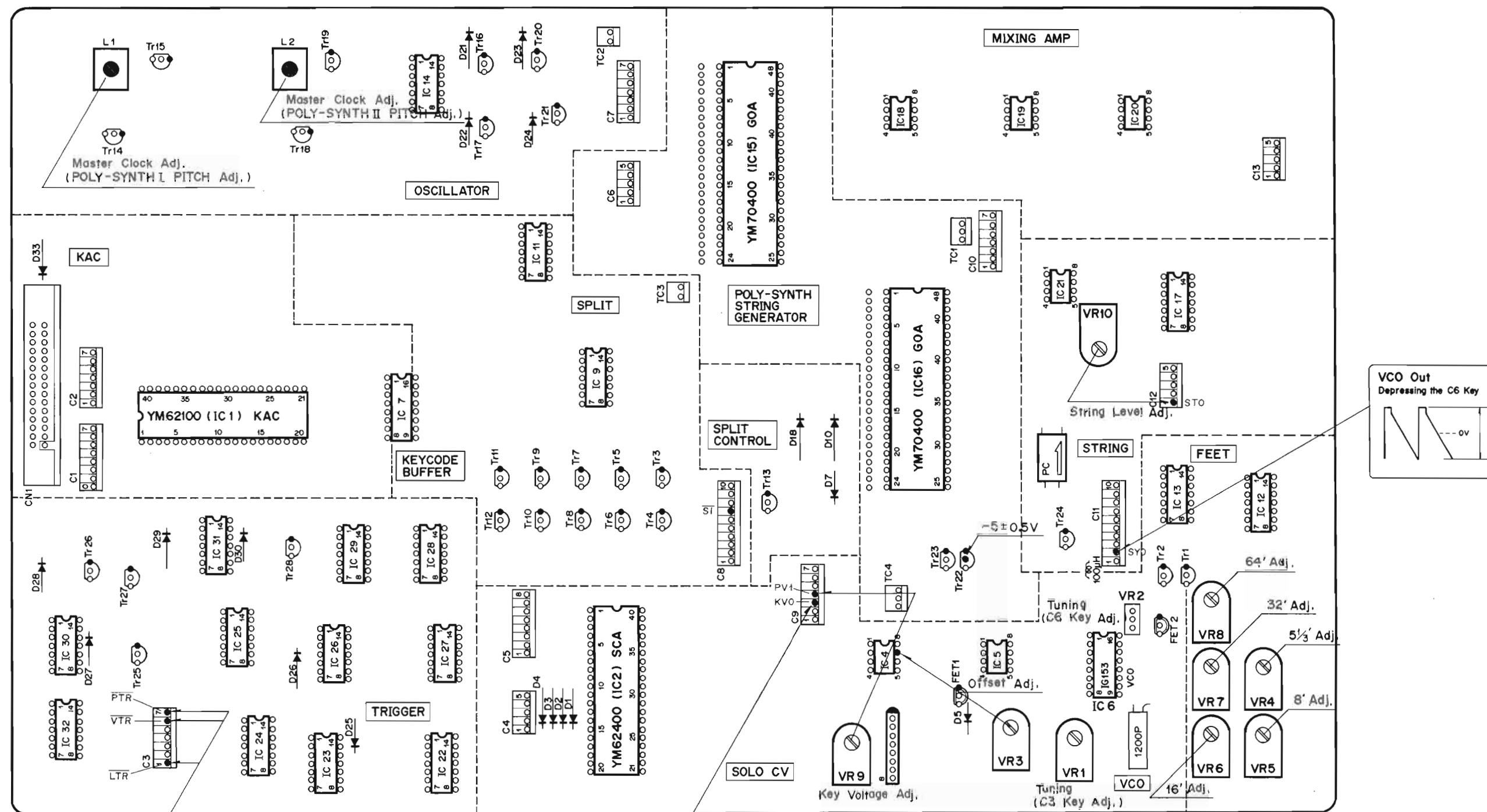


Note)
 D₁ : H or L → SLOW ATTACK / FAST
 D₂ : H or L → DAMP / SUSTAIN
 D₃ : L (Fixed)
 D₄ : H (Fixed)
 D₅ : H or L → S₁
 D₆ : H or L → S₂
 D₇ : H or L → S₃
 D₈ : L (Fixed)
 D₉ : L (Fixed)
 D₁₀ : L (Fixed)

Condition	PSC terminal levels		Sound volume envelope of sound source
	P10	P9	
SLOW ATTACK OFF	L	H	
SUSTAIN	L	H	
SLOW ATTACK ON	H	H	
SUSTAIN ON	L	L	
SLOW ATTACK ON	H	L	
SUSTAIN	H	L	

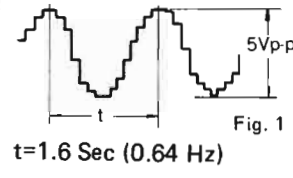
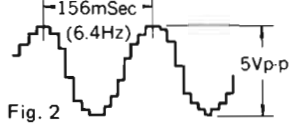
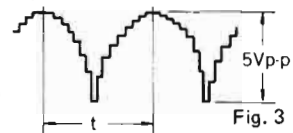
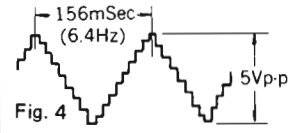
● SUSTAIN TIME Data.

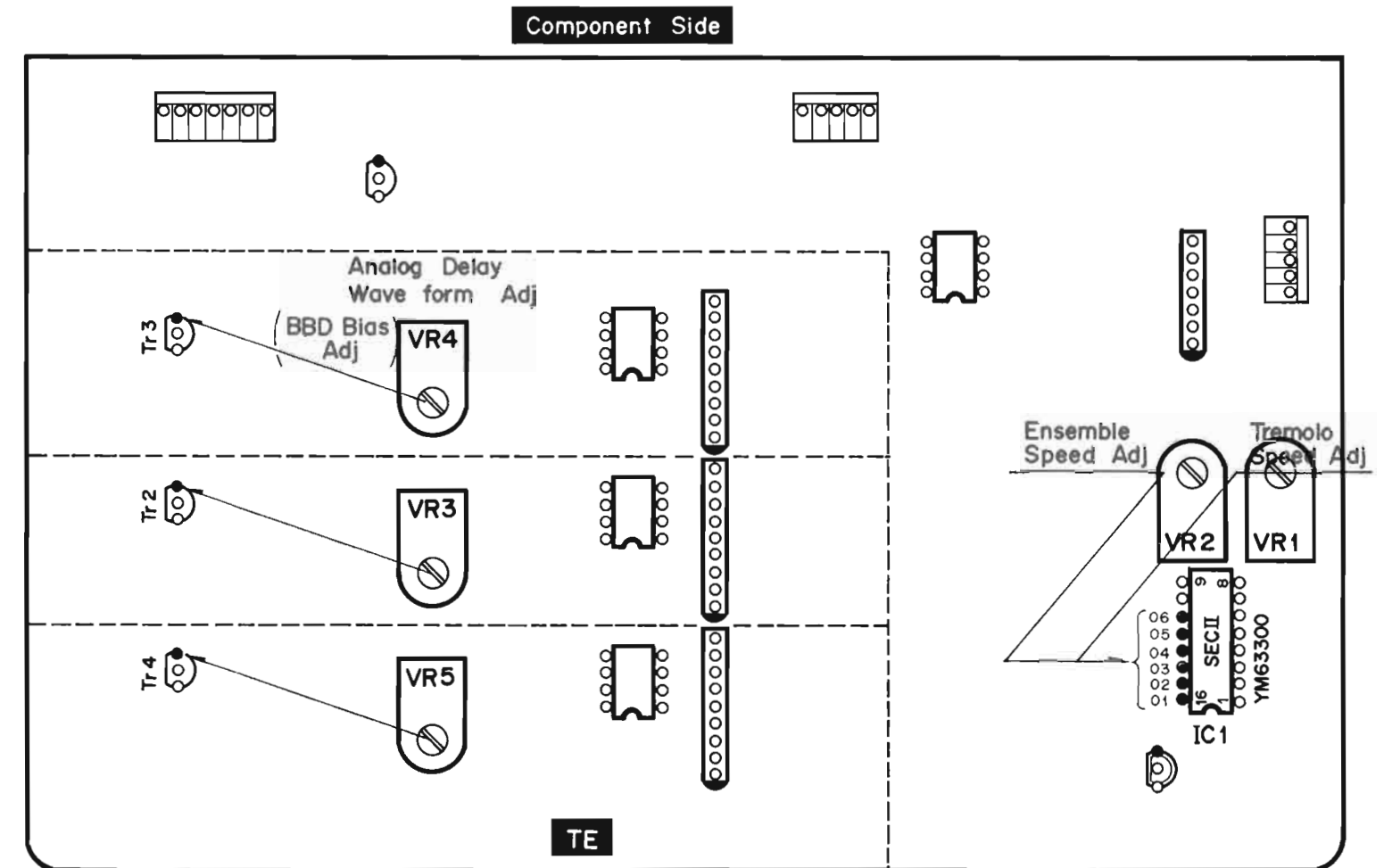
SUSTAIN Lever (PSW11)	Sustain data			Sustain time(msec)
	D ₅ (S ₁)	D ₆ (S ₂)	D ₇ (S ₃)	
LONG	8	L	L	1600
	7	H	L	1100
	6	H	H	750
	5	L	H	450
	4	L	H	250
	3	H	H	150
	2	H	L	90
SHORT	1	L	H	30

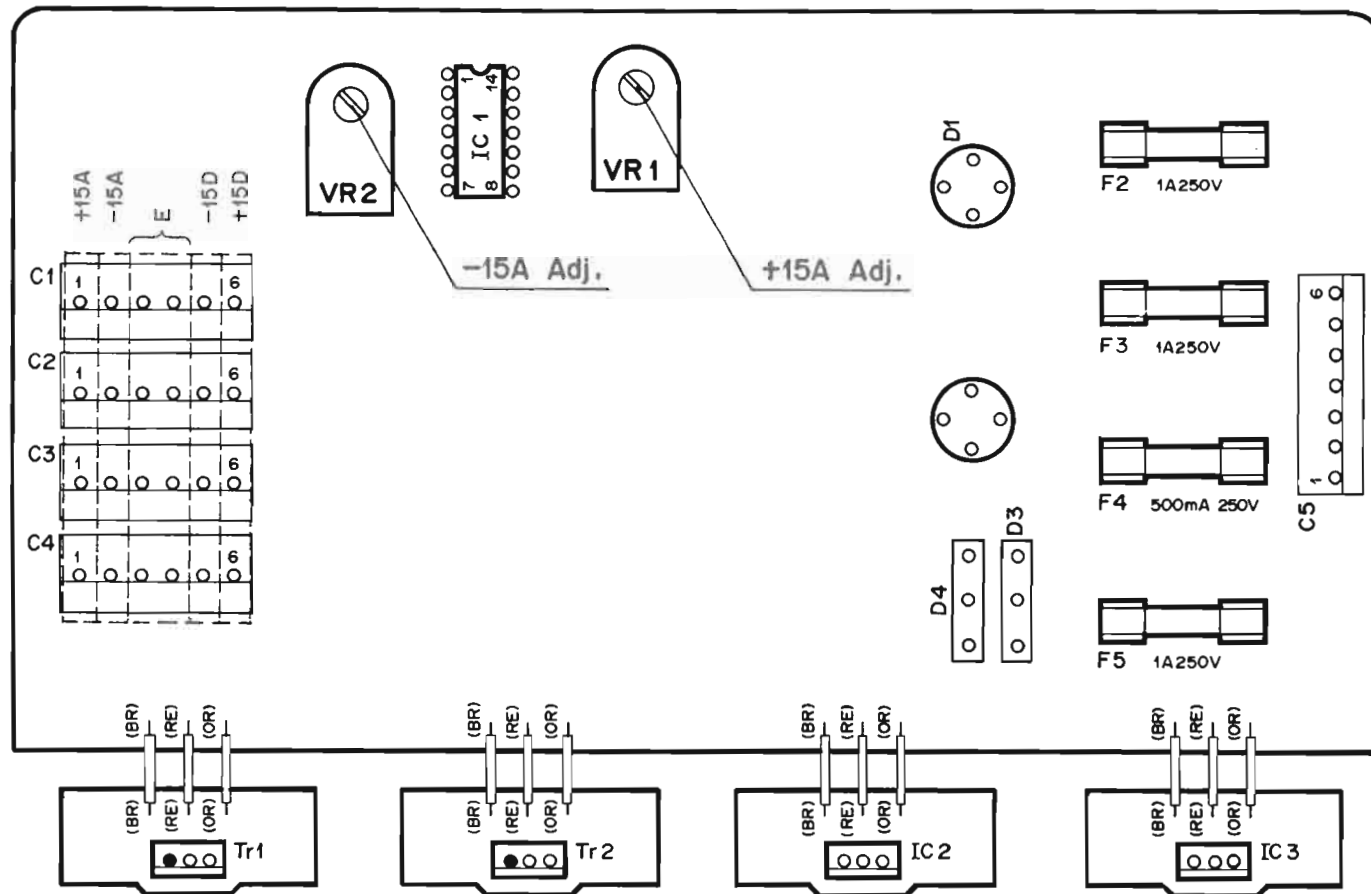


Key	Key Voltage	Key	Key Voltage	Key	Key Voltage
C3	0.250	C4	0.500	C5	1.000
D#3	0.265	D#4	0.530	D#5	1.050
D3	0.281	D4	0.561	D5	1.122
D#3	0.297	D#4	0.595	D#5	1.189
E3	0.315	E4	0.630	E5	1.250
F3	0.334	F4	0.667	F5	1.335
F#3	0.354	F#4	0.707	F#5	1.414
G3	0.376	G4	0.749	G5	1.498
G#3	0.394	G#4	0.794	G#5	1.587
A3	0.420	A4	0.841	A5	1.682
A#3	0.445	A#4	0.891	A#5	1.782
B3	0.472	B4	0.944	B5	1.886
				C6	2.000

TE Circuit Board

Item	Setting	Test point	Adjustment & reading	Where to adjustment	Remark
T/E Clock Generator Circuit Ensemble Speed adjustment	UPPER or LOWER Keyboard Endblock TREMOLO/ENSEMBLE ENSEMBLE . . . ON	O1 (IC1 - pin 16) O2 (IC1 - pin 15) O3 (IC1 - pin 14) O4 (IC1 - pin 13) O5 (IC1 - pin 12) O6 (IC1 - pin 11)	The waveforms shown in Fig 1 and 2 should appear at O1, O2, O3, and O4, O5, O6 (IC1) terminal.  t=1.6 Sec (0.64 Hz) 	VR2	
Tremolo Speed adjustment	ENSEMBLE . . . OFF TREMOLO ON	O1 (IC1 - pin 16) O2 (IC1 - pin 15) O3 (IC1 - pin 14) O4 (IC1 - pin 13) O5 (IC1 - pin 12) O6 (IC1 - pin 11)	The waveforms shown in Fig 3 should appear at O1. At this time adjust VR1 so that the frequency is 6.4Hz ± 0.1Hz.  t=156 mSec (6.4 Hz) The waveforms shown in Fig 4 should appear at O2, O3.  Check for a DC voltage of -2.5V.	VR1	
BBD Circuit	Connect pin 9 (TEST-Terminal) of IC1 to -15V. UPPER Keyboard Endblock TREMOLO/ENSEMBLE TREMOLO . . . ON OUTPUT block UPPER ORGAN .10 UPPER ORGAN block 810	Tr2-E Tr3-E Tr4-E	Adjust VR3, VR4, and VR5 for the best achievable sine wave.	VR3 VR4 VR5	





DC Circuit Board

Item	Setting	Test point	Adjustment & reading	Where to adjustment	Remark
Power supply voltage adjustment					
1) +15A		(C1-1) (C2-1) (C3-1) (C4-1)	+15V ± 0.015V	VR1 (B-50K)	Adjustment
2) -15A		(C1-2) (C2-2) (C3-2) (C4-2)	-15V ± 0.015V	VR2 (B-2K)	Adjustment
1) +15D		(C1-6) (C2-6) (C3-6) (C4-4)	+15V ± 0.7V		Check
2) -15D		(C1-5) (C2-5) (C3-5) (C4-5)	-15V ± 0.7V		Check

PC Circuit Board

Item	Setting	Test point	Adjustment & reading	Where to adjustment	Remark
TOUCH CONTROL	No Keys depressed	+S (C-3)	4.2V ± 0.2V		Check
		-S (C-1)	4.0V		Check
	Apply pressure while depressing a Key. (C ₃ ~ C ₆)	-S (C-1)	3.0V		Check

JK Circuit Board

Item	Setting	Test point	Adjustment & reading	Where to adjustment	Remark
+15V Protector circuit		EBR (C3-2)	+15V ^{+0V} / _{-2V}		Check
-15V Protector circuit		SFC (C3-4)	-15V ^{+2V} / _{-0V}		Check
-15V Protector circuit		FC (C3-3)	-15V ^{+2V} / _{-0V}		Check
LINE OUT Control Circuit					
MO output signal	OUTPUT block <input type="checkbox"/> ON/OFF ON	MI (C1-3) MO (C1-5)	Signal level should be equal to the signal input at terminal MI.		Check
MIXED OUTPUT		MIXED OUTPUT	Check for an output signal from the MIXED OUTPUT		Check
PHONES Amp		PHONES OUTPUT	Check for an output signal from a set of stereo headphones.		Check
	<input type="checkbox"/> ON/OFF OFF	MO (C1-5) MIXED OUTPUT PHONES OUTPUT	Check for no output Check for an output signal from a set of stereo headphones.		Check

YAMAHA

SYMPHONIC ENSEMBLE

SK50D

PARTS LIST

CONTENTS

A. Electronic Components	1
B. Top Cover & Bottom Frame	6
C. Control Panel	9
D. Upper & Lower Keyboard	12
E. Bass Pedal BP2	15
F. Foot Controller FC-3A	17

A. Electronic Components

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model
	30:12:91:NA:80:68:60	Circuit Board, TE	T E シ ー ト		SK20
※	30:12:00:NA:80:71:80	- do. -, KC	K C "		
※	30:12:93:NA:80:72:00	- do. -, CPA	C P A "		
※	30:12:93:NA:80:72:10	- do. -, CPB	C P B "		
※	30:12:93:NA:80:72:20	- do. -, CPC	C P C "		
※	30:12:93:NA:80:72:30	- do. -, PG	P G "		
※	30:12:93:NA:80:72:40	- do. -, OG1	O G 1 "		
※	30:12:93:NA:80:72:50	- do. -, OG2	O G 2 "		
※	30:12:00:NX:80:00:70	- do. -, PN1	P N 1 "		
※	30:12:00:NX:80:00:80	- do. -, PN2	P N 2 "		
※	30:12:00:NX:80:00:50	- do. -, JK	J K "		
※	30:12:00:NX:80:00:60	- do. -, TC	T C "		
※	30:12:00:NA:80:73:00	- do. -, DC	D C "	J.U.C.	
※	30:12:00:NA:80:73:10	- do. -, - do. -	" "	G	
※	30:12:00:NA:80:73:30	- do. -, AC	A C "	U.C	
※	30:12:00:NA:80:73:40	- do. -, - do. -	" "	G	
※	30:12:00:NA:80:73:50	- do. -, - do. -	" "	J	
※	30:12:00:NA:80:74:30	- do. -, PC	P C "		
※	30:12:92:NA:80:76:30	- do. -, SW	S W "		SK30
※	40:10:00:LC:86:27:00	Printed Circuit Board	プ リ ン ト 基 板	PC Sensor	
※	40:10:00:LC:86:42:00	- do. -	" "	Bass Pedal	
	40:10:00:iG:00:11:70	IC TC4001BP	I C	NOR	
	40:10:00:iG:00:11:80	- do. - TC4013BP	" "	D-F/F x 2	
	40:10:00:iG:00:11:90	- do. - TC4015BP	" "	Shift Register x 2	
	40:10:00:iG:00:12:40	- do. - TC4011BP	" "	NAND	
	40:10:00:iG:00:12:60	- do. - TC4049BP	" "	Inverter	
	40:10:00:iG:00:12:70	- do. - TC4066BP	" "	Analog SW	
	40:10:00:iG:00:13:90	- do. - NJM4558DV	" "	OP Amp x 2	
	40:10:00:iG:00:15:00	- do. - iG00150	" "	VCO II	
	40:10:00:iG:00:15:10	- do. - iG00151	" "	VCA	
	40:10:00:iG:00:15:30	- do. - iG00153	" "	VCO III	
	40:10:00:iG:00:15:60	- do. - iG00156	" "	(+) VCF	
	40:10:00:iG:00:15:70	- do. - iG00157	" "	SW-MEMORY	
	40:10:00:iG:00:15:90	- do. - iG00159	" "	EG-VCA	
	40:10:00:iG:00:14:40	- do. - TC4071BP	" "	OR	
	40:10:00:iG:00:16:90	- do. - TC4016BP	" "	Analog SW	
	40:10:00:iG:00:17:00	- do. - TC4019BP	" "	AND-OR Select	
	40:10:00:iG:00:17:20	- do. - TC4069UBP	" "	Inverter	
	40:10:00:iG:00:17:40	- do. - TC4050BP	" "	Buffer	
	40:10:00:iG:00:17:60	- do. - TC4081BP	" "	AND	
	40:10:00:iG:02:55:00	- do. - TA7504S	" "	OP Amp	
	40:10:00:iG:02:56:00	- do. - TA7505M	" "	- do. -	
	40:10:00:iG:02:60:00	- do. - iG02600	" "	VCA	
※	40:10:00:iG:02:60:10	- do. - iG02601	" "	- do. -	
	42:00:00:iG:02:70:00	- do. - HD7404P	" "	Inverter (TTL)	
	40:10:00:iG:02:87:00	- do. - μPC14315H	" "	+15V Regulator	
※	42:00:00:iG:03:16:00	- do. - μPC78L05	" "	+5V Regulator	
	40:10:00:iG:03:20:10	- do. - TA7179P	" "	±15V Regulator	
	40:10:00:iG:03:28:00	- do. - iG03280	" "	Di Matrix	
	40:10:00:iG:03:29:00	- do. - iG03290	" "	BBD Driver	
	40:10:00:iG:03:56:00	- do. - TC4532BP	" "	8 bit Encoder	
	40:10:00:iG:03:57:00	- do. - TC4075BP	" "	3 input OR	

※ New Parts (新規部品) (J: Japan, U: US.American, C: Canadian, G: General)

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model
	40:10:00 iG:03:58:00	IC TC40175BP	I C	D-F/F	
	40:10:00 iG:04:33:00	- do. - TC4093BP	"	NAND (Schmitt Trigger)	SK20
※	40:10:00 iG:04:34:00	- do. - TC5027BP	"	Counter	
	40:10:00 iG:04:61:00	- do. - MN3009	"	BBD	
※	40:10:00 iG:04:73:00	- do. - TC4025BP	"	3 input NOR	
※	40:10:00 iG:04:75:00	- do. - TC4078BP	"	8 input NOR	
※	40:10:00 iG:04:76:00	- do. - TC4082BP	"	4 input AND	
※	40:10:00 iG:04:77:00	- do. - TC4514BP	"	4 bit to 16 bit DECODER	
	30:10:00 iT:62:10:00	- do. - YM62100	"	KAC	SK20
	30:10:00 iT:62:20:00	- do. - YM62200	"	TGC	SK20
※	30:10:00 iT:62:40:00	- do. - YM62400	"	SCA	SK30
	30:10:00 iT:62:60:00	- do. - YM62600	"	DVG	SK20
	30:10:00 iT:62:70:00	- do. - YM62700	"	PSC	SK20
	30:10:00 iT:63:30:00	- do. - YM63300	"	SEC II	SK20
	30:10:00 iT:70:20:00	- do. - YM70200	"	GF1	SK20
※	30:10:00 iT:70:30:00	- do. - YM70300	"	GF2	SK30
	30:10:00 iT:70:40:00	- do. - YM70400	"	GOA	SK20
※	30:10:00 iT:70:60:00	- do. - YM70600	"	GAP	
※	30:10:00 iT:71:00:00	- do. - YM71000	"	VCP	
	40:10:00 iA:04:90:10	Transistor 2SA490(Y)	ト ラ ン ジ ス タ		
	40:10:00 iA:09:50:00	- do. - 2SA950(Y)	"		
	40:10:00 iA:10:15:70	- do. - 2SA1015(O,Y)	"		
	40:10:00 iA:11:64:00	- do. - 2SA1164(Y)	"		
	40:10:00 iA:11:64:10	- do. - (GR)	"		
	40:10:00 iC:07:52:20	- do. - 2SC752(Y)	"		
	40:10:00 iC:18:15:70	- do. - 2SC1815(O,Y)	"		
	40:10:00 iC:21:20:00	- do. - 2SC2120(Y)	"		
	42:00:00 iD:02:34:20	- do. - 2SD234(Y)	"		
	40:10:00 iE:00:00:10	FET 2SK30(Y)	F E T		
	40:10:00 iE:10:12:30	- do. - 2SK105	"		
	40:10:00 iF:00:00:40	Diode 1S1555	ダ イ オ ード		
	40:10:00 iF:00:08:80	- do. - WZ050	"		
	40:10:00 iH:00:02:80	- do. - 1D2C1	"		
	40:10:00 iH:00:02:90	- do. - 1D2Z1	"		
	40:10:00 iH:00:04:70	- do. - 1D4B1	"		
	40:10:00 HQ:23:00:10	Slide Variable Resistor A-10K Ω x 2	ス ラ イ ド ボ リ ュ ーム		
	40:10:00 HQ:23:00:20	- do. - A-10K Ω	"		
	40:10:00 HQ:23:00:30	- do. - A-25K Ω	"		
	40:10:00 HQ:23:00:40	- do. - B-100K Ω	"		
	40:10:00 HQ:23:00:50	- do. - (with open) - do. -	"		
	40:10:00 HQ:23:00:60	- do. - B-10K Ω	"		
	40:10:00 HQ:23:00:70	- do. - - do. -	"	Center Click	
	40:10:00 HQ:23:00:80	- do. - C-100K Ω	"		
	40:10:00 HQ:23:00:90	- do. - C-10K Ω	"		
※	40:10:00 HQ:23:01:10	- do. - A-2M Ω	"		
	40:10:00 HS:31:05:70	Rotary Variable Resistor B-10K Ω	ロ ー タ リ ー ボ リ ュ ーム		
	40:10:00 HS:31:09:90	- do. - A-10K Ω x 2	"		
	40:10:00 HT:19:00:10	Semi Variable Resistor B-500 Ω	半 固 定 抵 抗		

※ New Parts (新規部品)

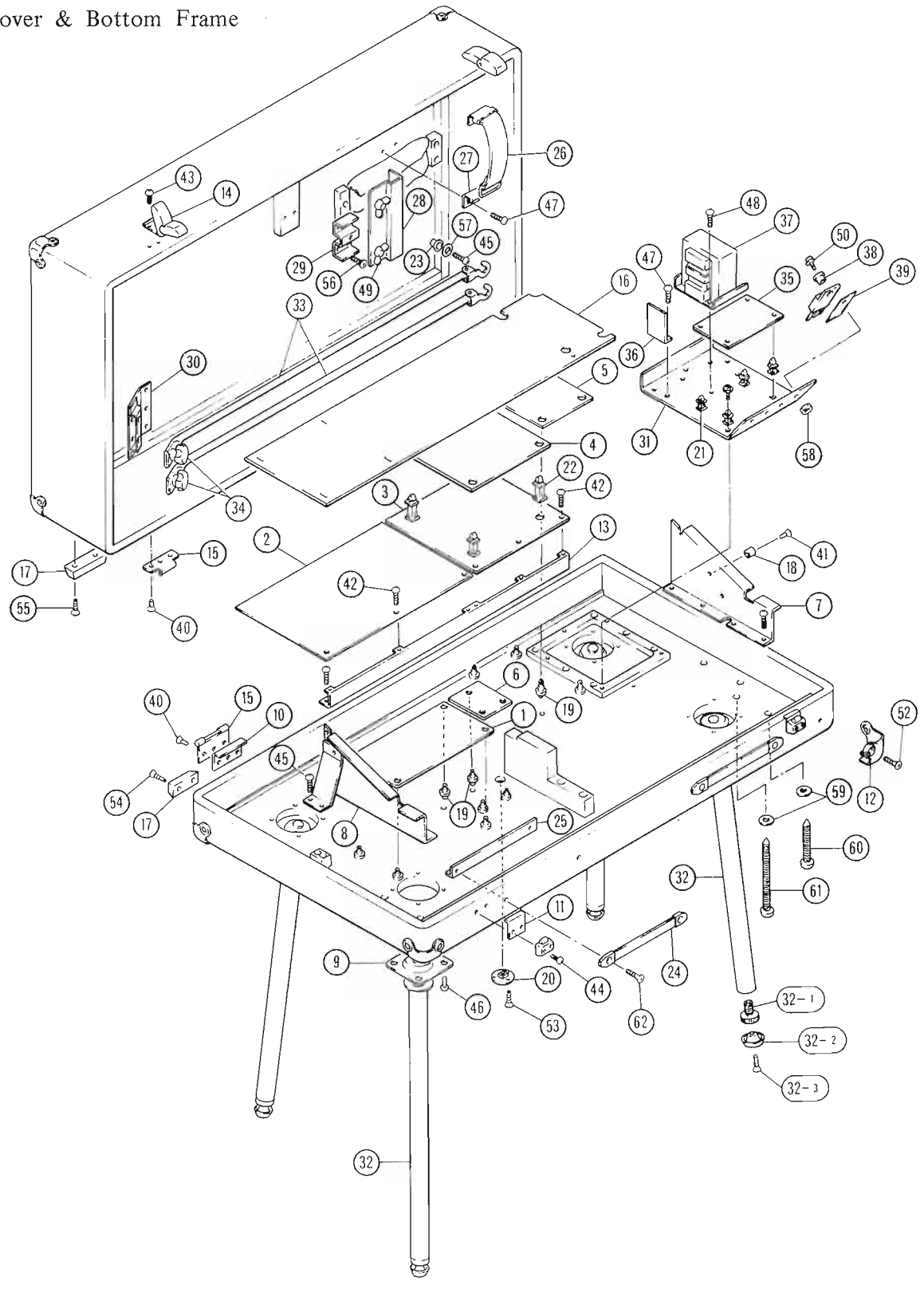
Ref. No.	Part No.		Description	部 品 名	Remarks	Common Model		
	40:10:00	HT:19:00:20	Semi Variable Resistor B-1K Ω	半 固 定 抵 抗	V10K			
	40:10:00	HT:19:00:40	- do. - B-5K Ω	〃	V10K8-4-2			
	40:10:00	HT:19:00:50	- do. - B-10K Ω	〃	- do. -			
	40:10:00	HT:19:00:70	- do. - B-50K Ω	〃	- do. -			
	40:10:00	HT:19:00:80	- do. - B-100K Ω	〃	- do. -			
	40:10:00	HT:19:00:90	- do. - B-200K Ω	〃	- do. -			
	40:10:00	HT:19:01:00	- do. - B-500K Ω	〃	- do. -			
	40:10:00	HT:19:01:30	- do. - B-2K Ω	〃	V10K			
	40:10:00	HT:69:00:10	- do. - B-5K Ω	〃	RJ 9W			
	40:10:00	HL:32:51:20	Metal Oxide Film Resistor 120 Ω	酸 金 抵 抗				
	40:10:00	HL:31:24:70	- do. - 0.47 Ω	〃				
	40:10:00	HL:31:26:80	- do. - 0.68 Ω	〃				
	40:10:00	HL:31:34:70	- do. - 4.7 Ω	〃				
	40:10:00	HL:31:54:70	- do. - 470 Ω	〃				
	40:10:00	HU:57:52:70	Metal Film Resistor $\pm 1\%$ 270 Ω	金 属 皮 膜 抵 抗				
	40:10:00	HU:57:61:00	- do. - -do.- 1K Ω	〃				
	40:10:00	HU:57:65:10	- do. - -do.- 5.1K Ω	〃				
	40:10:00	HU:57:66:80	- do. - -do.- 6.8K Ω	〃				
	40:10:00	HU:57:69:10	- do. - -do.- 9.1K Ω	〃				
	40:10:00	HU:57:71:00	- do. - -do.- 10K Ω	〃				
	40:10:00	HU:57:71:50	- do. - -do.- 15K Ω	〃				
	40:10:00	HU:57:71:80	- do. - -do.- 18K Ω	〃				
	40:10:00	HU:57:72:00	- do. - -do.- 20K Ω	〃				
	40:10:00	HU:57:72:20	- do.- -do.- 22K Ω	〃				
	40:10:00	HU:57:72:70	- do. - -do.- 27K Ω	〃				
	40:10:00	HU:57:74:70	- do. - -do.- 47K Ω	〃				
	40:10:00	HU:57:81:00	- do. - -do.- 100K Ω	〃				
	40:10:00	HU:59:51:00	- do. - $\pm 0.1\%$ 100 Ω	〃				
	40:10:00	HU:59:61:00	- do. - -do.- 1K Ω	〃				
	40:10:00	HU:59:71:00	- do. - -do.- 10K Ω	〃				
※	40:10:00	HU:59:72:00	- do. - -do.- 20K Ω	〃				
	40:10:00	HU:59:74:00	- do. - -do.- 40K Ω	〃				
	40:10:00	HU:59:78:00	- do. - -do.- 80K Ω	〃				
	40:10:00	HU:59:81:60	- do. - -do.- 160K Ω	〃				
※	40:10:00	HZ:00:18:30	- do. - -do.- 1.684K Ω	〃				
※	40:10:00	HZ:00:18:40	- do. - -do.- 2.414K Ω	〃				
※	40:10:00	HZ:00:18:50	- do. - -do.- 8.243K Ω	〃				
※	40:10:00	HZ:00:18:60	- do. - -do.- 13.35K Ω	〃				
※	40:10:00	HZ:00:18:70	- do. - -do.- 29.94K Ω	〃				
	40:10:00	FD:65:21:20	Polystyrene Capacitor 120pF	スチロールコンデンサ				
	40:10:00	FD:65:22:70	- do. - 270pF	〃				
	40:10:00	FF:04:31:20	Polystyrene Capacitor 1200pF	防 湿 型 ス チ コ ン				
	40:10:00	FL:63:71:00	Bipolar Capacitor 16V 10 μ F	バイポーラコンデンサ				
	40:10:00	FL:64:62:20	- do. - 25V 2.2 μ F	〃				
	40:10:00	FL:66:61:00	- do. - 50V 1 μ F	〃				
	40:10:00	FN:14:61:00	Solid Aluminium Capacitor 25V 1 μ F	固体アルミコンデンサ				
	40:10:00	FN:24:56:80	- do. - -do.- 0.68 μ F	〃				
	40:10:00	FN:24:61:00	- do. - -do.- 1 μ F	〃				

※ New Parts (新規部品)

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model		
	40:10:00 FZ:00:22:50	Spark Killer Capacitor 0.022 μ F	スパークキラーコンデンサ				
	40:10:00 UJ:12:84:70	Electrolytic Capacitor 10V 470 μ F	電 解 コ ン デ ン サ				
※	40:10:00 UJ:13:91:00	- do. - 16V 1000 μ F	"				
※	40:10:00 UJ:15:91:00	- do. - 35V 1000 μ F	"				
	40:10:00 KA:40:05:90	Slide Switch 2way, 3contact (NS)	ス ラ イ ド ス イ ッ チ	2回路3接点(NS)			
	40:10:00 KA:40:06:00	- do. - 2way, 2contact (NS)	"	2回路2接点(NS)			
	40:10:00 KA:40:07:90	- do. - 8contact (non click)	"	8接点(クリック無し)			
※	40:10:00 KA:40:08:00	- do. - 6contact (with click)	"	6接点(クリック有り)			
※	40:10:00 KA:40:08:40	- do. - 2way, 2contact (S)	"	2回路2接点(S)			
	40:10:00 KA:90:17:00	Push Switch with L.E.D Gray	プッシュスイッチ				
	40:10:00 KA:90:17:10	- do. - White	"				
	40:10:00 KA:10:08:10	Power Switch	パ ワ ー ス イ ッ チ				
	40:10:00 iK:00:02:60	Photo Cuppler P873-G35-201B	フ ォ ト カ プ ラ ー				
	40:10:00 iK:00:02:90	- do. - P873-13	"				
	40:10:00 iK:00:00:30	Photo Cell	フ ォ ト セ ル	EXP Pedal			
※	40:10:00 iK:00:03:20	Photo Sensor	フ ォ ト セ ン サ ー	Touch Control			
	40:10:00 GE:30:01:20	Choke Coil 100 μ H	チ ョ ー ク コ イ ル				
	40:10:00 GE:30:03:50	- do. - 68 μ H	"				
	40:10:00 GE:90:01:70	OSC Coil 125 μ H	発 振 コ イ ル				
	40:10:00 LB:20:15:40	Jack JL2B	ジ ャ ッ ク				
	40:10:00 LB:60:33:70	Socket 11P	ソ ケ ッ ト				
	40:10:00 JB:00:01:70	Lamp 24V 5W	電 球	EXP Pedal			
	40:10:00 KB:00:07:10	Fuse 250V T500mA	ミニチュアヒューズ	Circuit Board, DC G			
	40:10:00 KB:00:07:30	- do. - -do.- T1A	"	- do. - G			
	40:10:00 KB:00:24:40	- do. - -do.- 500mA	"	- do. - J.U.C			
	40:10:00 KB:00:24:70	- do. - -do.- 1A	"	- do. - J.U.C			
	42:00:00 KB:00:07:40	Fuse 250V T2A	ミニチュアヒューズ	Circuit Board, AC G			
※	42:00:00 KB:00:23:50	- do. - -do.- 12A	"	- do. - J			
※	42:00:00 KB:00:25:00	- do. - 125V -do.-	"	- do. - U.C			
	40:10:00 KA:40:08:30	Voltage Selector	電 圧 切 換 器				
※	30:12:00 NB:81:68:60	Power Transformer Unit	電源トランスユニット				
※	40:10:00 MG:00:10:30	AC Cord	電 源 コ ー ド	J			
※	40:10:00 MG:00:10:40	- do. -	"	U			
※	40:10:00 MG:00:10:50	- do. -	"	G			
※	40:10:00 MG:00:11:20	- do. -	"	C			
	40:10:00 LB:20:05:70	Fuse Holder Pin	ヒューズホルダーピン	(AC)			
	40:10:00 LB:20:15:30	- do. -	"	(DC)			
	40:10:00 LB:60:30:00	Connector NH 7P	N H コ ン ネ ク タ ー	Bottom Entry			

※ New Parts (新規部品) (J: Japan, U: US.American, C: Canadian, G: General)

B. Top Cover & Bottom Frame



Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model
※	30:12:93 00:00:00:10	Case Assembly	ケ ー ス Ass'y		
※	1 30:12:00 NA:80:71:80	Circuit Board, KC	K C シ ー ト		
※	2 30:12:93 NA:80:72:30	- do. - , PG	P G "		

※ New Parts (新規部品)

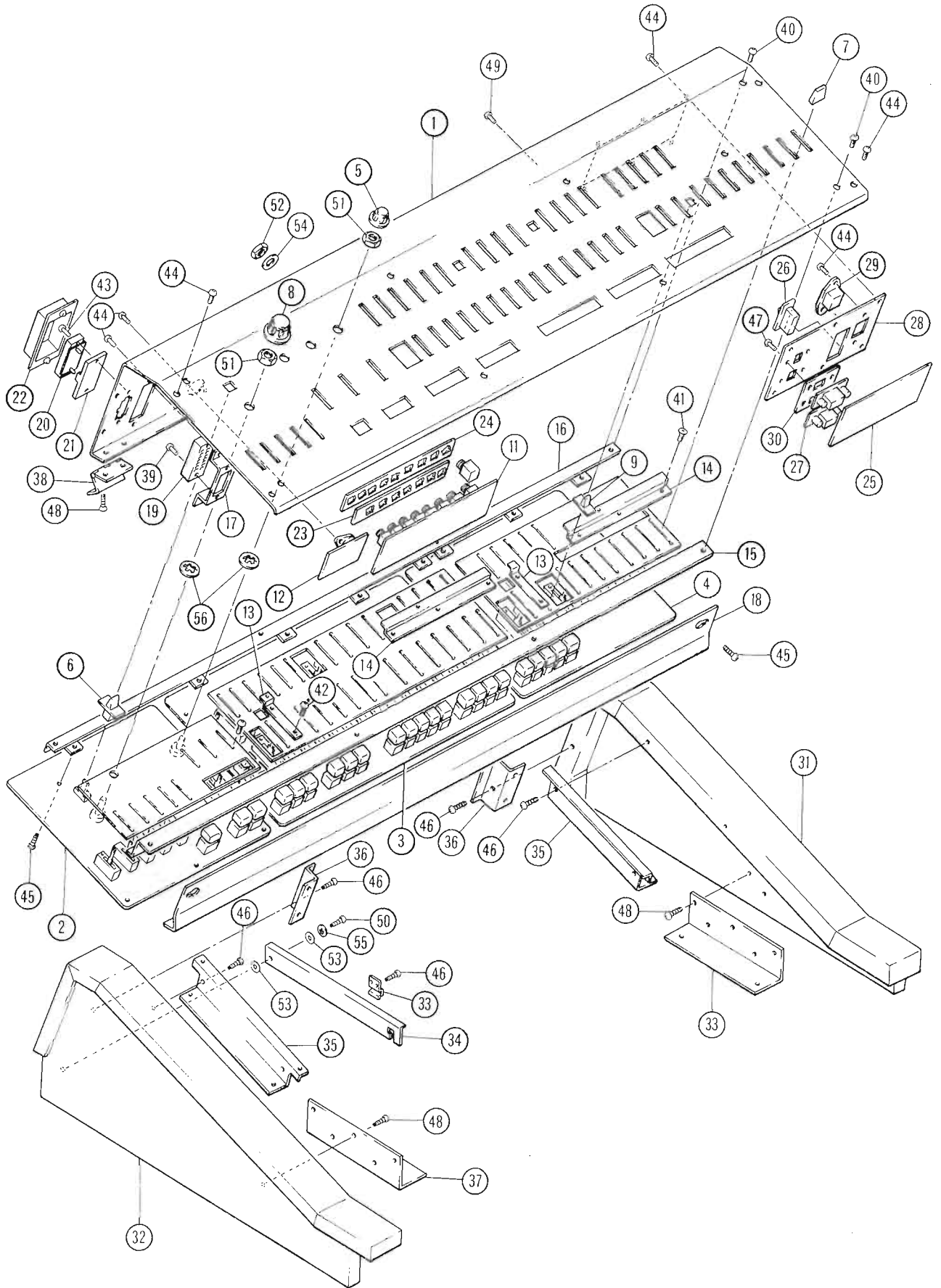
Ref. No.	Part No.			Description	部 品 名	Remarks	Common Model		
※ 3	30	12	93	NA:80:72:40	Circuit Board, OG1	OG1 シート			
※ 4	30	12	93	NA:80:72:50	- do. -, OG2	OG2 "			
※ 5	30	12	91	NA:80:68:60	- do. -, TE	TE "	SK 20		
※ 6	30	12	92	NA:80:76:30	- do. -, SW	SW "	SK 30		
※ 7	30	10	00	AA:81:58:10	Keyboard Holder (Right)	鍵盤取付金具(右)			
※ 8	30	10	00	AA:81:58:00	- do. - (Left)	" (左)			
9	30	10	00	AA:81:54:30	Flange, Leg	脚 フ ラ ン ジ			
10	30	10	00	AA:01:46:90	Corner Angle	コーナアングル			
※ 11	30	10	00	AA:80:58:10	- do. -	"			
※ 12	30	10	00	AA:81:47:70	Corner Fitting	コーナ金具			
※ 13	30	10	00	AA:81:55:00	Angle	シート取付アングル			
※ 14	40	10	00	EX:00:00:30	Lock	バ ッ チ ン 錠			
※ 15	31	10	00	AA:81:65:10	Hanging Hinge	引 掛 蝶 番			
※ 16	40	10	00	CA:80:25:80	Shield Paper	シールド紙	SK 30		
17	30	10	00	CB:01:03:10	Leg, Plastic	脚			
18	30	10	00	CB:03:30:70	Stopper	回 転 止 め			
19	30	56	00	CB:08:70:00	Holder, Circuit Board	シートホルダー			
20	30	10	00	AA:80:42:70	Nut for Leg	脚 用 ナ ッ ト			
※ 21	30	10	00	CB:81:78:10	PC Support	P C サ ポ ー ト			
※ 22	40	10	00	CB:81:85:80	- do. -	"			
23	30	10	00	CB:00:18:10	Bearing	L E 軸 受 け	FC-3A		
24	30	54	00	NB:80:15:50	Handle Assembly	把 手 Ass'y			
25	30	10	00	AA:80:42:80	Handle Holder	把手取付金具			
※ 26	30	10	00	NB:81:67:50	Pedal Stopper Band	ペダル止めバンド			
27	30	10	00	AA:80:43:20	Holder, Pedal Stopper Band	引 掛 金 具			
※ 28	30	10	00	AA:81:54:40	Leg Holder	脚 保 持 金 具			
※ 29	30	10	00	AA:81:54:60	- do. -	脚 受 金 具			
※ 30	30	10	00	AA:81:54:70	Stay Holder	ステイ取付金具			
※ 31	30	10	00	BA:80:51:10	Chassis, Power Supply	電 源 シ ャ ー シ			
※ 32	30	10	00	NB:81:67:30	Leg Assembly	パイプ脚 Ass'y			
※ 32-1	30	10	00	AA:81:54:10	Leg Adjustment	調 整 ナ ッ ト			
※ 32-2	30	10	00	AA:81:54:20	Leg Glide	調 整 座			
※ 32-3	40	10	00	EB:35:02:00	Flat Head Screw M5 x 20	サ ラ 小 ネ ジ	Black		

※ New Parts (新規部品)

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model		
※ 33	30:10:00 NB:81:67:40	Stay Assembly	脚 ス テ イ Ass'y				
34	30:10:00 CB:80:83:30	Knob Screw	ノ ブ ネ ジ		CP-70		
※	30:12:00 NB:81:67:10	Power Supply Unit Assembly	電 源 Ass'y	J.U.C			
※	30:12:00 NB:81:68:10	- do. -	"	G			
※ 35	30:12:00 NA:80:73:00	Circuit Board, DC	D C シ ー ト	J.U.C			
※	30:12:00 NA:80:73:10	- do. -	"	G			
※ 36	30:10:00 AA:81:63:00	Holder Connector	コネクタホルダー				
	40:10:00 KB:00:07:10	Fuse 250V T500mA	ヒ ュ ー ズ	G			
	40:10:00 KB:00:07:30	- do. - -- do. - T1A	"	- do. -			
※	40:10:00 KB:00:24:40	- do. - -- do. - 500mA	"	J.U.C			
※	40:10:00 KB:00:24:70	- do. - -- do. - 1A	"	- do. -			
	40:10:00 LB:20:15:30	Fuse Holder Pin	ヒューズホルダーピン				
※	40:10:00 LB:60:39:70	Connector, Socket Housing 6P	コ ネ ク タ ー				
※	40:10:00 LB:60:39:80	- do. - 7P	"				
※ 37	30:12:00 NB:81:68:60	Power Transformer Unit	電源トランスユニット				
	38 30:54:00 CB:07:28:80	Isolation Bush	絶 縁 ブ ッ シ ュ				
	39 40:10:00 iL:00:02:70	Isolation Base	マイカベース				
	40 40:10:00 EB:23:01:20	Flat Head Screw M3 x 12	皿 小 ネ ジ	Chromium			
	41 40:10:00 EB:34:01:60	- do. - M4 x 16	"	Black			
	42 40:10:00 ED:33:00:60	Bind Head Screw M3 x 6	バ イ ン ド 小 ネ ジ	Chromium			
	43 40:20:00 ED:23:01:20	- do. - M3 x 12	"	- do. -			
	44 40:10:00 ED:23:01:60	- do. - M3 x 16	"	- do. -			
	45 40:10:00 ED:34:01:20	- do. - M4 x 12	"	Black			
	46 40:10:00 ED:35:01:60	- do. - M5 x 16	"	- do. -			
	47 40:10:00 Ei:33:01:00	Bind Head Tapping Screw 3 x 10	バ イ ン ド タ ッ ピ ン ネ ジ 1 種	- do. -			
	48 40:10:00 Ei:34:01:00	- do. - 4 x 10	"	- do. -			
	49 40:10:00 EU:06:00:20	Wing Screw M6 x 20	蝶 ネ ジ				
	50 40:10:00 EL:02:60:80	- do. - M2.6 x 8	セ ム ス 小 ネ ジ	Yellow			
	51 40:10:00 EL:04:01:40	- do. - M4 x 14	"	- do. -			
	52 40:10:00 EM:23:51:20	Oval Head Tapping Screw 3.5 x 12	丸 皿 タ ッ ピ ン ネ ジ 1 種	Chromium			
	53 40:10:00 EO:03:01:60	Flat Head Tapping Screw 3 x 16	皿 タ ッ ピ ン ネ ジ 1 種	Black			
	54 40:10:00 EO:23:51:60	- do. - 3.5 x 16	"	- do. -			
	55 40:10:00 EO:33:52:00	- do. - 3.5 x 20	"	Chromium			
	56 40:10:00 EO:34:01:60	- do. - 4 x 16	"	Black			
	57 40:10:00 EV:20:30:40	Flat Washer M4	平 座 金	- do. -			
	58 40:10:00 EV:10:02:60	Hexagonal Nut M2.6	六 角 ナ ッ ト	Yellow			
	59 40:10:00 EV:20:30:50	Flat Washer M5	平 座 金	Black			
	60 40:10:00 ED:35:03:50	Bind Head Screw M5 x 35	尖 先 バ イ ン ド 小 ネ ジ	- do. -			
	61 40:10:00 ED:35:09:50	- do. - M5 x 95	"	- do. -			
	62 40:10:00 EF:20:54:00	Oval Head Screw M5 x 40	丸 皿 小 ネ ジ	Chromium			

※ New Parts (新規部品) (J: Japan, U: US.American, C: Canadian, G: General)

C. Control Panel



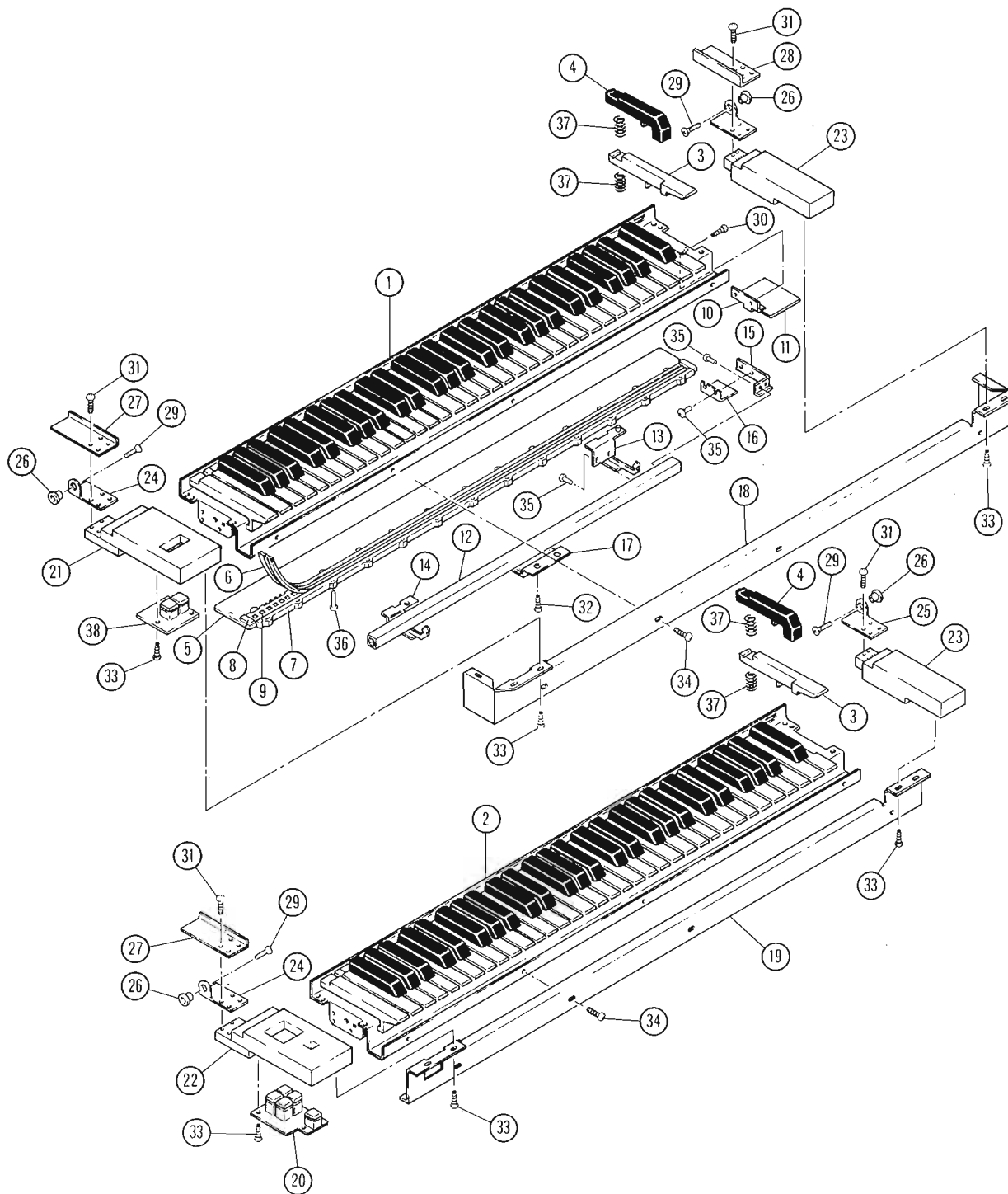
Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model
※ 1	30:10:00 AA:81:58:20	Control Panel	コントロールパネル		
2	30:12:93 NA:80:72:00	Circuit Board, CPA	C P A シ ー ト		
3	30:12:93 NA:80:72:10	- do. -, CPB	C P B "		
4	30:12:93 NA:80:72:20	- do. -, CPC	C P C "		
5	30:56:00 CB:81:21:40	Knob (Ivory)	ツ マ ミ		
6	30:10:00 CB:81:46:90	- do. - (- do. -)	"		
7	30:10:00 CB:81:69:60	- do. - (Yellow)	"		
	30:10:00 CB:81:69:70	- do. - (Gray)	"		
	30:10:00 CB:81:69:80	- do. - (White)	"		
※ 8	30:10:00 CB:81:78:30	- do. -	"		
※ 9	30:10:00 CB:81:79:00	- do. -	"		
※ 10	40:10:00 CA:80:26:60	Dust-Proof Cloth	防 塵 ク ロ ス		
	40:10:00 CA:80:28:80	- do. -	"		
	40:10:00 CA:80:28:90	- do. -	"		
11	30:12:00 NX:80:00:50	Circuit Board, JK	J K シ ー ト		
12	30:12:00 NX:80:00:60	- do. -, TC	T C "		
13	30:10:00 AA:81:47:90	Braket	取 付 板		
※ 14	30:10:00 AA:81:57:40	Slide VR Angle	補 強 ア ン グ ル		
※ 15	30:10:00 AA:81:57:80	Circuit Board Angle	シ ー ト 取 付 ア ン グ ル		
※ 16	30:10:00 AA:81:57:90	- do. -	"		
※ 17	30:10:00 AA:81:58:30	PK Connector Holder	コ ン ネ ク タ 取 付 金 具		
※ 18	30:10:00 AA:81:58:60	Panel Holder	パ ン ネ ル 受 け 金 具		
19	30:12:00 MZ:80:88:20	PK Cord Assembly	P K 束 線 Ass'y		
	40:10:00 BB:00:44:30	Contact Pin 2.5P	2.5P コ ン タ ク ト ピ ン		
	40:10:00 LB:60:01:30	20P Connector	コ ン ネ ク タ ー 20P		
	40:10:00 LB:60:24:40	Housing 7P	ハ ウ ジ ン グ 7 P		
	40:10:00 LB:60:24:80	- do. - 8P	" 8 P		
20	30:12:00 MZ:80:88:40	KC Cord Assembly	K C 束 線 Ass'y		
	40:10:00 BB:00:46:90	Contact Pin 2.5P	コ ン ネ ク ト ピ ン		
	40:10:00 LB:60:37:60	Housing 7P	ハ ウ ジ ン グ 7 P		
	40:10:00 LB:60:37:70	- do. - 8P	" 8 P		
	40:10:00 LB:60:39:40	Connector Socket 24P	コ ン ネ ク タ 24P		
21	40:10:00 AA:81:65:00	Bracket	ブ ラ ケ ッ ト		
22	30:10:00 CB:81:79:10	Cover	カ バ ー		
23	30:10:00 AA:81:36:10	Spacer Jack	ジャックスペーサー		
※ 24	30:10:00 AA:81:57:20	- do. -	"		
※	30:12:00 NB:81:66:70	AC Panel Assembly	A C パ ン ネ ル Ass'y	U.C	
※	30:12:00 NB:81:68:70	- do. -	"	G	
※	30:12:00 NB:81:68:80	- do. -	"	J	
※ 25	30:12:00 NA:80:73:30	Circuit Board, AC	A C シ ー ト	U.C	
※	30:12:00 NA:80:73:40	- do. -	"	G	

※ New Parts (新規部品) (J: Japan, U: US.American, C: Canadian, G: General)

Ref. No.	Part No.		Description	部 品 名	Remarks	Common Model		
※	30:12:00	NA:80:73:50	Circuit Board, AC	A C シ ー ト	J			
26	40:10:00	KA:10:10:60	Power Switch	パ ワ ー ス イ ッ チ				
27	40:10:00	KA:40:08:30	Voltage Selector	電 圧 切 換 器				
※	28	30:10:00	AA:81:55:10	AC Panel	A C パ ネ ル	G		
※		30:10:00	AA:81:64:50	- do. -	"	J.U.C		
29	40:10:00	LB:20:18:20	AC Inlet	A C イ ン レ ッ ト	J.U.C			
		40:10:00	LB:20:18:60	- do. -	"	G		
		40:10:00	MG:00:10:30	AC Cord	電 源 コ ー ド	J		
		40:10:00	MG:00:10:40	- do. -	"	C		
		40:10:00	MG:00:10:50	- do. -	"	G		
		40:10:00	MG:00:11:20	- do. -	"	U		
30	40:10:00	CB:81:78:90	Spacer	ス ペ ー サ ー				
31	30:12:93	DA:80:58:00	Side Board, Panel (Right)	パ ネ ル 側 板 (右)				
32	30:12:93	DA:80:58:10	- do. - (Left)	" (左)				
33	30:54:00	AA:80:25:40	Holder, Stay	ス テ ー 押 え 金 具				
34	30:54:00	AA:80:25:30	Stay (Left)	ス テ ー (左)				
35	30:10:00	AA:81:11:50	Panel Bracket (Large)	パ ネ ル 取 付 ア ン グ ル				
36	30:10:00	AA:81:11:60	- do. - (Small)	"				
37	30:10:00	AA:81:58:40	- do. -	パ ネ ル 固 定 金 具				
38	30:10:00	AA:81:12:40	Hinge	蝶 番				
39	42:00:00	EA:33:00:80	Pan Head Screw M3 x 8	ナ ベ 小 ネ ジ	Black			
40	40:10:00	EC:33:00:50	Truss Head Screw M3 x 5	ト ラ ス 小 ネ ジ	- do. -			
41	40:10:00	ED:32:00:40	Bind Head Screw M2 x 4	バ イ ン ド 小 ネ ジ	- do. -			
42	40:10:00	ED:32:60:40	- do. - M2.6 x 4	"	- do. -			
43	40:10:00	ED:32:60:80	- do. - M2.6 x 8	"	- do. -			
44	42:00:00	ED:33:00:60	- do. - M3 x 6	"	- do. -			
45	42:00:00	Ei:33:00:60	Bind Tapping Screw 3 x 6	バ イ ン ド タ ッ ピ ン ネ ジ 2 種	- do. -			
46	40:10:00	Ei:03:01:00	- do. - 3 x 10	"	Yellow			
47	40:10:00	Ei:33:01:00	- do. - - do. -	"	Black			
48	40:10:00	Ei:04:01:00	- do. - 4 x 10	"	Yellow			
49	40:10:00	Ei:34:01:00	- do. - - do. -	"	Black			
50	40:10:00	Ei:34:01:60	- do. - 4 x 16	"	- do. -			
51	40:10:00	EZ:30:70:10	Hexagonal Nut M7	六 角 ナ ッ ト	Yellow			
52	40:10:00	LX:20:00:60	- do. - M9	"	Black			
53	40:10:00	EV:20:00:40	Plain Washer M4	平 座 金	Yellow			
54	40:10:00	LX:20:00:10	- do. - M9	"	Black			
55	40:10:00	EV:41:00:40	Toothed Lock Washer A4M	歯 付 座 金	Yellow			
56	40:10:00	EV:41:00:70	- do. - A7M	"	- do. -			

※ New Parts (新規部品) (J: Japan, U: US.American, C: Canadian, G: General)

E. Upper & Lower Keyboard



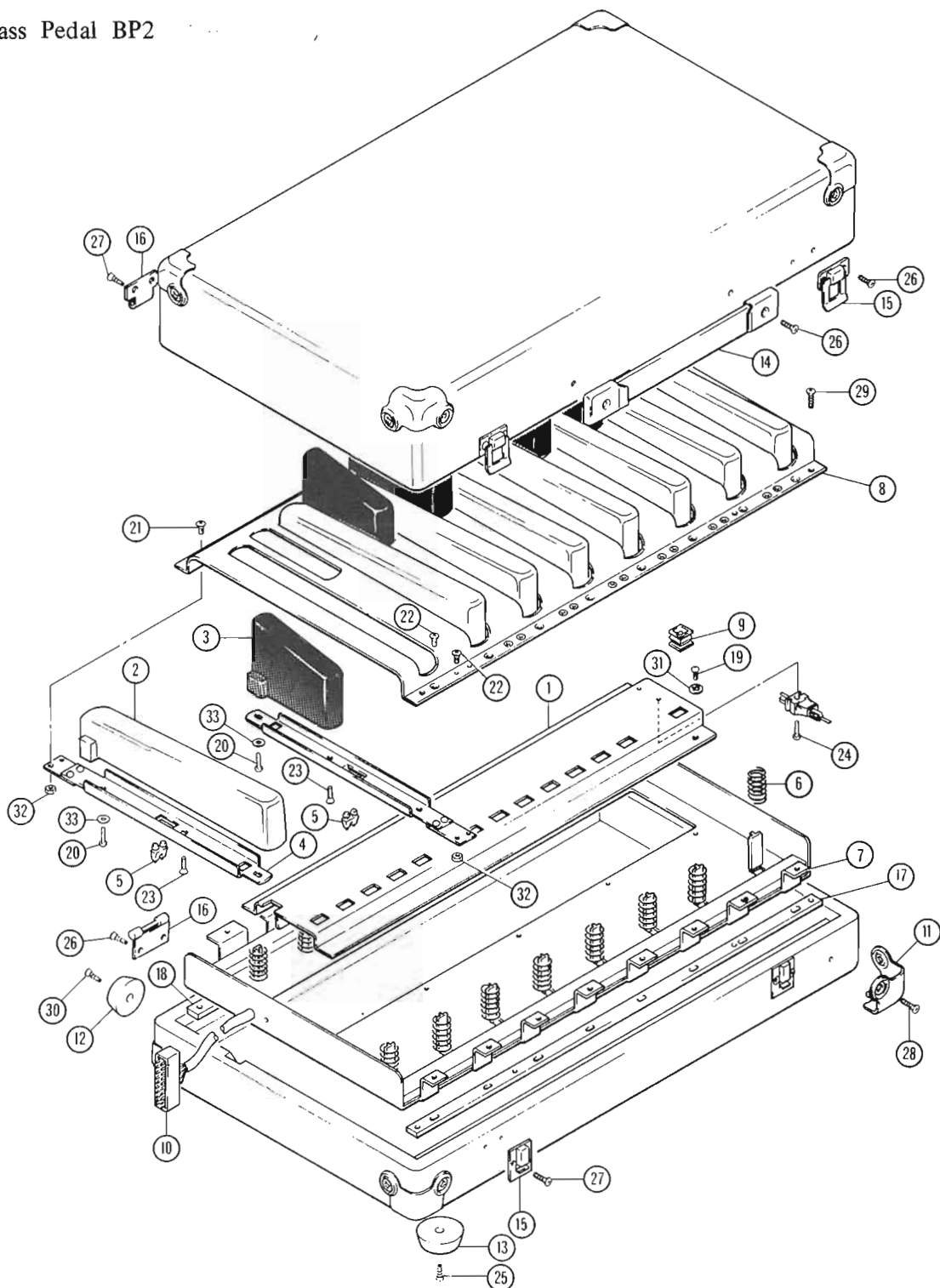
Ref. No.	Part No.	Description	部品名	Remarks	Common Model
※ 1	30:10:00 NB:81:72:50	Keyboard Assembly (U)	鍵盤 Ass'y (UK)		
2	30:10:00 NB:81:74:30	- do. - (L)	" (LK)		
3	30:10:00 CB:03:22:10	White Key C, F	白 鍵		
	30:10:00 CB:03:22:20	- do. - D	"		

※ New Parts (新規部品)

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model
	30:10:00 CB:03:22:30	White Key	B, E 白 鍵		
	30:10:00 CB:03:22:40	- do. -	G "		
	30:10:00 CB:03:22:50	- do. -	A "		
	30:10:00 CB:03:22:60	- do. -	C# "		
※	4 30:10:00 CB:81:83:40	Black Key	黒 鍵		
	30:10:00 NB:81:68:20	Switch Unit	(UK) スイッチユニット		
	30:10:00 NB:81:55:30	- do. -	(LK) "		
※	5 30:10:00 NA:80:73:20	Circuit Board, MK	(UK) M K シ ー ト		
	30:10:00 NA:80:65:20	- do. -	(LK) "		SK 20
	6 40:10:00 CB:03:23:30	Rubber Contact	可 動 導 電 ゴ ム		
	7 30:10:00 CB:03:24:00	Holder	12Keys 基板ホルダー (Q)		
	30:10:00 CB:03:24:10	- do. -	13Keys " (K)		
	8 40:10:00 CB:03:35:40	End Plate	エ ン ド プ レ ー ト		
	9 30:10:00 CB:03:35:70	Isolation Spacer	12Keys 絶縁スペーサー (Q)		
	30:10:00 CB:03:35:80	- do. -	13Keys " (K)		
※	10 30:10:00 AA:81:63:70	Intrapta Angle	イ ン タ ラ プ タ ア ン グ ル		
※	11 30:12:00 NA:80:74:30	Circuit Board, PC	P C シ ー ト		
※	12 30:10:00 BA:80:51:80	PC Bar	P C バ ー		
※	13 30:10:00 AA:81:63:30	PC Angle A	P C ア ン グ ル A		
※	14 30:10:00 AA:81:65:60	- do. - B	" B		
※	15 30:10:00 BA:80:52:70	Angle, Reflector	リフレクターアングル		
※	16 30:10:00 BA:80:52:80	PC Reflector	P C リ フ レ ク タ ー		
※	17 30:10:00 AA:81:63:80	Stopper, PC Bar	P C バ ー ス ト ッ パ ー		
※	18 30:10:00 AA:81:57:50	Keyboard Spacer	(U) ロ 金 (U)		
※	19 30:10:00 AA:81:57:60	- do. -	(L) " (L)		
※	20 30:12:00 NX:80:00:70	Circuit Board PN1	P N 1 シ ー ト		
	38 30:12:00 NX:80:00:80	- do. - PN2	P N 2 "		
※	21 30:12:00 DA:80:58:40	Upper Endblock	(Left) 上 鍵 盤 拍 子 木 (左)		
※	22 30:12:00 DA:80:58:30	Lower Endblock	(Left) 下 鍵 盤 拍 子 木 (左)		
※	23 30:12:00 DA:80:58:20	Endblock	(Right) " (右)		
	24 30:10:00 AA:03:28:60	Hinge, MK	(Left) M K 回 転 金 具 (左)		
	25 30:10:00 AA:03:28:70	- do. -	(Right) " (右)		
	26 30:10:00 CB:01:18:30	Bush	ブ ッ シ ュ		
※	27 30:10:00 AA:81:66:20	Spacer	(Left) 回 転 止 め 金 具 (左)		
※	28 30:10:00 AA:81:57:30	- do. -	(Right) " (右)		
	40:10:00 KA:90:17:00	Push Switch With L.E.D.	LED付プッシュスイッチ		
29	40:10:00 EB:05:01:60	Flat Head Screw	M5 x 16 サ ラ 小 ネ ジ	Yellow	

※ New Parts (新規部品)

D. Bass Pedal BP2



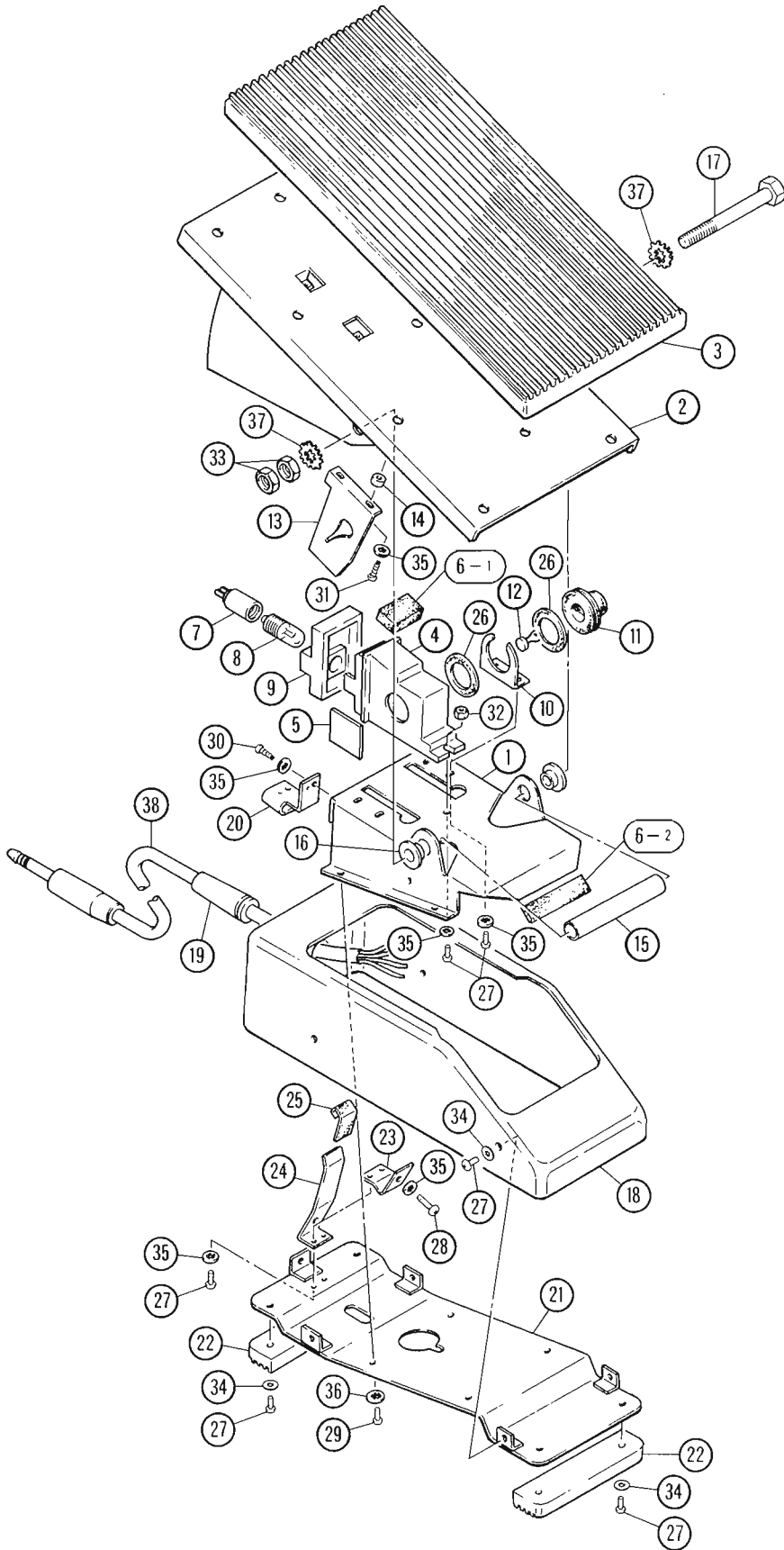
Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model		
※	30:12:00 NB:81:68:90	Bass Pedal Assembly	ベースペダル Ass'y				
※	1 30:12:00 NB:81:69:00	Switch Base Assembly	スイッチベース Ass'y				
	30:10:00 AA:02:31:40	Switch Base	スイッチベース				
	30:10:00 NB:03:70:40	Switch Assembly	スイッチ Ass'y				
※	40:10:00 LC:86:42:00	Printed Circuit Board	プリント基板				

※ New Parts (新規部品)

Ref. No.	Part No.				Description	部 品 名	Remarks	Common Model		
	30	10:00	NB:01:88:20	White Key Assembly		白 鍵 Ass'y				
	30	10:00	NB:01:88:30	Black Key Assembly		黒 鍵 Ass'y				
2	30	10:00	CB:01:70:70	White Key Head		白 鍵 ヘ ッ ド				
3	30	10:00	CB:01:70:80	Black Key Head		黒 鍵 ヘ ッ ド				
4	30	10:00	AA:02:13:90	Key Arm		キ ー ア ー ム				
	30	0:00	AA:02:14:00	Key Arm Spring		板 バ ネ				
5	30	10:00	CB:01:69:30	Actuator		ア ク チ ェ ー タ ー				
6	30	10:00	AA:02:14:10	Key Spring		キ ー ス プ リ ン グ				
7	30	10:00	AA:02:14:20	Switch Frame		ス イ ッ チ フ レ ー ム				
※	8	30	10:00	AA:81:59:10	Key Frame		キ ー フ レ ー ム			
	9	30	10:00	CB:01:83:70	Rubber, Dust Cover		防 塵 ゴ ム			
		40	10:00	CD:01:02:10	Key Guide Cloth		キ ー ガ イ ド ク ロ ス			
		40	10:00	CD:01:02:20	- do. -		//			
※	10	30	12:00	MZ:80:89:30	B.P. Cable Assembly		B P 線 材 Ass'y			
		30	10:00	CB:00:45:30	Cord Bush		コ ー ド ブ ッ シ ュ			
		40	10:00	LB:60:01:40	Plug 20P		プ ラ グ 20P			
		40	10:00	LB:00:01:50	Connector Cover		コ ネ ク タ カ バ ー			
		40	10:00	MD:00:01:00	Cable		ケ ー ブ ル			
		40	10:00	LB:60:24:40	Connector Housing 2.5P		コ ネ ク タ ハ ウ ジ ン グ			
		40	10:00	CB:00:07:10	Cord Holder		コ ー ド 押 え			
		30	12:00	00:00:00:01	B.P. Case Assembly		B P ケ ー ス 本 体 Ass'y	蓋 含 む		
		30	12:94	DA:80:59:40	B.P. Case Cover Assembly		B P ケ ー ス 蓋 Ass'y			
	11	30	10:00	AA:80:90:50	Corner Fitting		コ ー ナ ー 金 具			
	12	30	10:00	CB:02:32:00	Slip Fitt		ス ベ リ 座			
	13	30	54:00	CB:80:12:70	Leg, Rubber		ゴ ム 脚			
	14	30	54:00	NB:81:12:70	Handle Assembly		把 手 Ass'y			
	15	40	10:00	EX:00:00:40	Lock		パ ッ チ ン 錠			
	16	40	10:00	EX:00:00:50	Hanging Hinge		引 掛 蝶 番			
	17	30	10:00	CB:01:84:00	Cushion		ク ッ シ ョ ン			
	18	30	10:00	CB:01:84:10	- do. -		//			
	19	40	10:00	EA:03:00:50	Pan Head Screw M3 x 5		ナ ベ 小 ネ ジ	Yellow		
	20	40	10:00	EA:04:02:00	- do. - M4 x 20		//	- do. -		
	21	40	10:00	EB:03:00:50	Flat Head Screw M3 x 5		皿 小 ネ ジ	- do. -		
	22	40	10:00	EB:03:00:60	- do. - M3 x 6		//	- do. -		
	23	40	10:00	EB:04:02:00	- do. - M4 x 20		//	- do. -		
	24	40	10:00	ED:03:01:20	Bind Head Screw M3 x 12		バ イ ン ド 小 ネ ジ	- do. -		
	25	40	10:00	Ei:34:01:20	Bind Head Tapping s 4 x 12		バ イ ン ド タ ッ ピ ン ネ ジ 1 種	Black		
	26	40	10:00	EM:23:01:00	Oval Head Tapping Screw 3 x 10		丸 皿 タ ッ ピ ン ネ ジ 1 種	Choromium		
	27	40	10:00	EM:23:51:00	- do. - 3.5 x 10		//	- do. -		
	28	40	10:00	EO:24:02:00	Flat Head Tapping Screw 4 x 20		皿 タ ッ ピ ン ネ ジ 1 種	- do. -		
	29	40	10:00	EP:03:11:00	Flat Head Screw 3.1 x 10		サ ラ 木 ネ ジ	Yellow		
	30	40	10:00	ER:22:71:30	Oval Head Wood Screw 2.7 x 13		丸 皿 木 ネ ジ	Choromium		
	31	40	10:00	EV:41:00:30	Toothed Lock Washer A3M		歯 付 座 金	Yellow		
	32	40	10:00	EV:10:00:30	Hexagonal Nut M3		六 角 ナ ッ ト	- do. -		
	33	40	10:00	EV:20:00:40	Flat Washer M4		平 座 金	- do. -		

※ New Parts (新規部品)

F. Foot Controller FC-3A



Ref. No.	Part No.			Description	部 品 名	Remarks	Common Model							
※	30	12	00	NB	81	64	90	EXP Pedal Assembly	E X P Ass'y					
※	1	30	10	00	AA	81	53	30	EXP Frame	E X P フ レ ー ム				
	2	30	10	00	AA	01	38	00	EXP Pedal Plate	踏 板				
	3	30	10	00	CB	00	36	80	EXP Mat	E X P マ ッ ト				
	4	30	10	00	CB	00	76	20	Lamp Cover	ラ ン プ カ バ ー				
	5	40	10	00	CG	00	00	10	Glass	ス リ ガ ラ ス				
※	6	30	10	00	CB	81	77	80	Stopper Rubber	ス ト ッ パ ー ゴ ム				
※		30	10	00	CB	81	85	90	- do. -	〃				
	7	30	10	00	CB	00	76	40	Lamp Holder	ラ ン プ ホ ル ダ ー				
	8	40	10	00	JB	00	01	70	Lamp 24V 5W	電 球				
	9	40	10	00	LB	20	01	20	Bracket	ブ ラ ケ ッ ト				
	10	30	10	00	AA	01	08	00	Holder Plate	ホ ル ダ ー 支 持 板				
	11	30	10	00	CB	00	76	30	Holder, Photo Cell	フ ォ ト セ ル ホ ル ダ ー				
	12	40	10	00	i K	00	00	30	Photo Cell	フ ォ ト セ ル				
※	13	30	10	00	AA	81	53	40	Shutter Plate	シャ ッ タ ー 板				
	14	30	10	00	CB	00	76	50	Spacer	ス ペ ー サ ー				
	15	30	10	00	AA	01	48	00	- do. -	〃				
※	16	30	10	00	CB	00	18	10	Bearing	L E 軸 受				
	17	30	10	00	AA	01	08	20	Shaft	シャ フ ト				
※	18	30	10	00	CB	81	86	00	EXP Case	E X P ケ ー ス				
	19	30	56	00	CB	00	45	30	Cord Bush	コ ー ド ブ ッ シ ュ				
※	20	30	10	00	AA	01	37	80	Cord Clamper	コ ー ド 支 え				
※	21	30	10	00	AA	01	37	90	EXP Base	E X P ベ ー ス				
※	22	30	10	00	CB	03	00	40	Stopper	滑 り 止 め ゴ ム				
※	23	30	10	00	AA	81	53	50	Pedal Spring Angle	バ ネ 押 え ア ン グ ル				
※	24	30	10	00	AA	81	53	60	Pedal Spring	板 バ ネ				
※	25	40	10	00	CA	80	25	90	Pedal Slide Skin	摺 動 皮 革				
	26	30	10	00	CC	02	03	70	Felt $\phi 25 \times \phi 25 \times 2t$	フ ェ ル ト				
	38	40	10	00	M i	01	35	70	Cord Assembly	束 線				
※	27	40	10	00	ED	33	01	00	Bind Head Screw M3 x 10	バ イ ン ド 小 ネ ジ	Black			
	28	42	00	00	ED	03	02	50	- do. - M3 x 25	〃	Yellow			
	29	40	10	00	ED	34	01	00	- do. - M4 x 10	〃	Black			
	30	40	10	00	E i	03	00	80	Bind Head Tapping Screw 3 x 8	バ イ ン ド タ ッ ピ ン ネ ジ 2 種	Yellow			
	31	40	10	00	E i	03	01	00	- do. - 3 x 10	〃 3 種	- do. -			
	32	40	10	00	EV	10	00	30	Hexagonal Nut M3	六 角 ナ ッ ト				
	33	40	10	00	EV	10	00	68	- do. - M6	〃				
※	34	40	10	00	EV	20	30	30	Flat Washer M3	平 座 金	Black			
	35	40	10	00	EV	41	00	30	Toothed Lock Washer A3M	歯 付 座 金	Yellow			
※	36	40	10	00	EV	40	30	40	- do. - A4M	〃	Black			
	37	40	10	00	EV	43	00	60	- do. - AB6M	〃	- do. -			

※ New Parts (新規部品)

SK50D SERVICE MANUAL

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電音サービス課

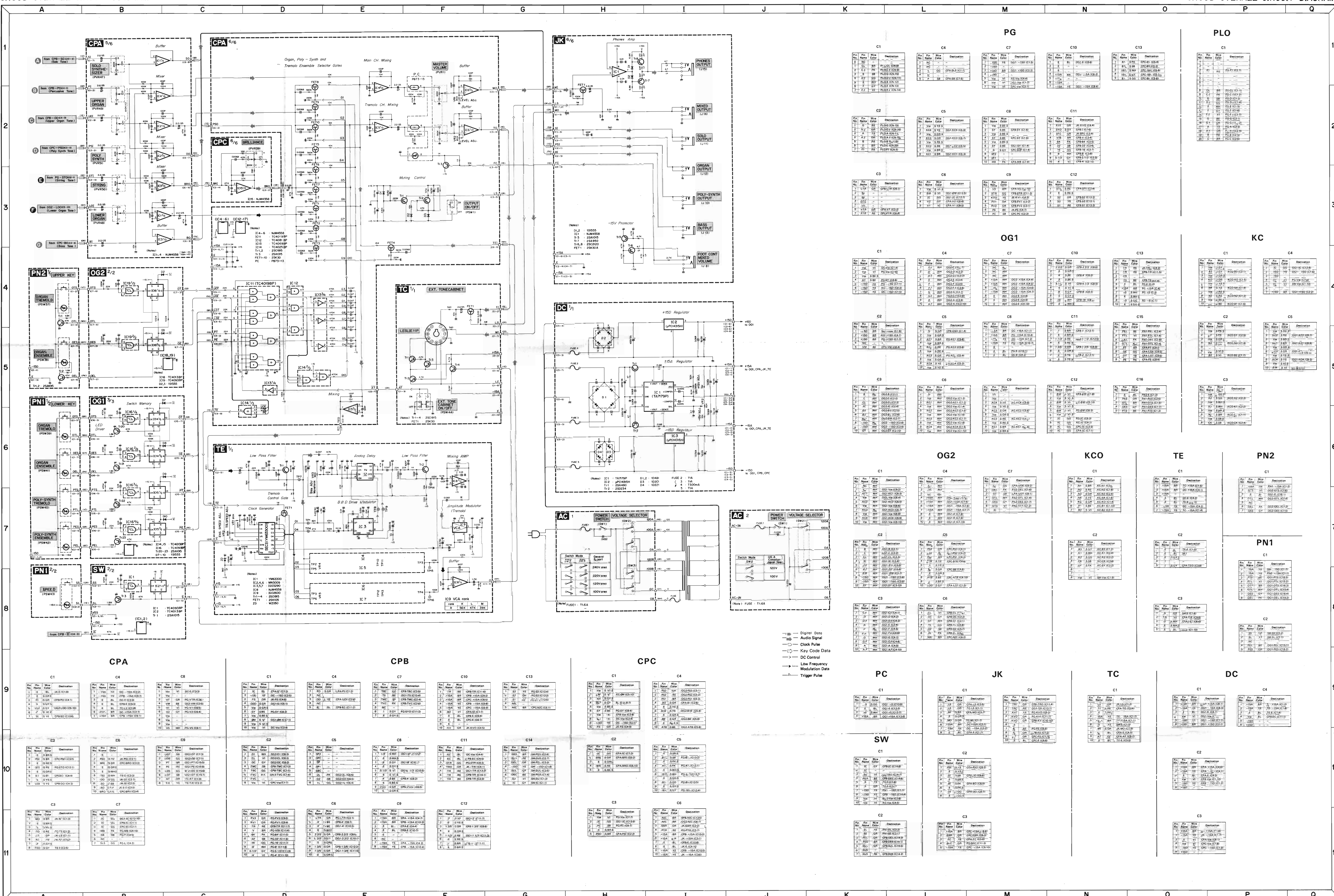
パーツリスト：(株)豊立設計事務所

版 下 ・ 印 刷：東海電子印刷株式会社

SK50D OVERALL CIRCUIT DIAGRAM 1/2 006886

SK50D OVERALL CIRCUIT DIAGRAM

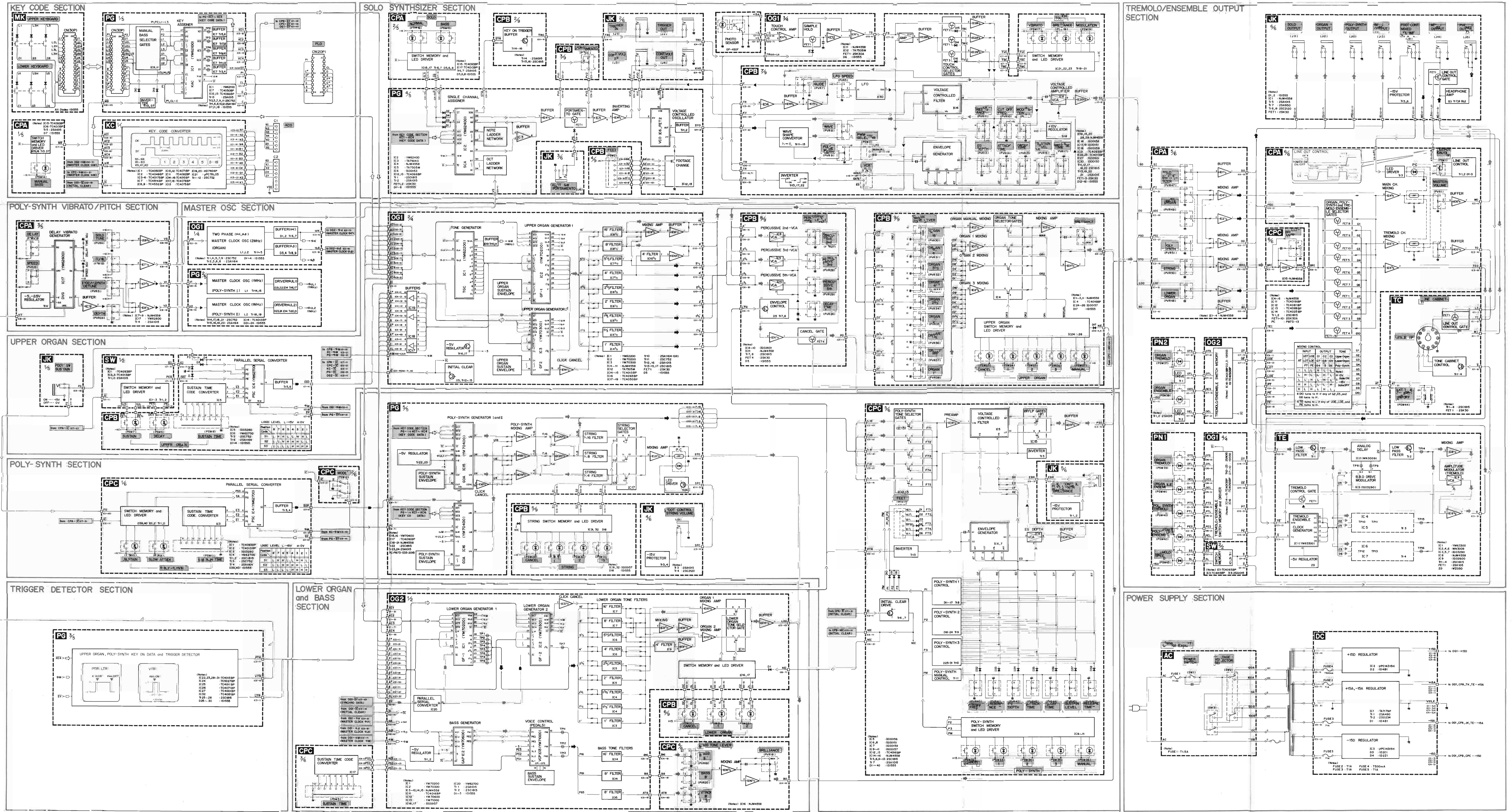
SK50D OVERALL CIRCUIT DIAGRAM



SK50D OVERALL CIRCUIT DIAGRAM

SK50D OVERALL CIRCUIT DIAGRAM

Section	Part No.	Part Name	Value	Destination
C1	1	IC1	74LS00	CPA-101
	2	IC2	74LS00	CPA-102
	3	IC3	74LS00	CPA-103
	4	IC4	74LS00	CPA-104
	5	IC5	74LS00	CPA-105
	6	IC6	74LS00	CPA-106
	7	IC7	74LS00	CPA-107
	8	IC8	74LS00	CPA-108
	9	IC9	74LS00	CPA-109
	10	IC10	74LS00	CPA-110
	11	IC11	74LS00	CPA-111
	12	IC12	74LS00	CPA-112
C2	1	IC1	74LS00	CPB-101
	2	IC2	74LS00	CPB-102
	3	IC3	74LS00	CPB-103
	4	IC4	74LS00	CPB-104
	5	IC5	74LS00	CPB-105
	6	IC6	74LS00	CPB-106
	7	IC7	74LS00	CPB-107
	8	IC8	74LS00	CPB-108
	9	IC9	74LS00	CPB-109
	10	IC10	74LS00	CPB-110
	11	IC11	74LS00	CPB-111
	12	IC12	74LS00	CPB-112
C3	1	IC1	74LS00	CPC-101
	2	IC2	74LS00	CPC-102
	3	IC3	74LS00	CPC-103
	4	IC4	74LS00	CPC-104
	5	IC5	74LS00	CPC-105
	6	IC6	74LS00	CPC-106
	7	IC7	74LS00	CPC-107
	8	IC8	74LS00	CPC-108
	9	IC9	74LS00	CPC-109
	10	IC10	74LS00	CPC-110
	11	IC11	74LS00	CPC-111
	12	IC12	74LS00	CPC-112
C4	1	IC1	74LS00	OG1-101
	2	IC2	74LS00	OG1-102
	3	IC3	74LS00	OG1-103
	4	IC4	74LS00	OG1-104
	5	IC5	74LS00	OG1-105
	6	IC6	74LS00	OG1-106
	7	IC7	74LS00	OG1-107
	8	IC8	74LS00	OG1-108
	9	IC9	74LS00	OG1-109
	10	IC10	74LS00	OG1-110
	11	IC11	74LS00	OG1-111
	12	IC12	74LS00	OG1-112
C5	1	IC1	74LS00	OG2-101
	2	IC2	74LS00	OG2-102
	3	IC3	74LS00	OG2-103
	4	IC4	74LS00	OG2-104
	5	IC5	74LS00	OG2-105
	6	IC6	74LS00	OG2-106
	7	IC7	74LS00	OG2-107
	8	IC8	74LS00	OG2-108
	9	IC9	74LS00	OG2-109
	10	IC10	74LS00	OG2-110
	11	IC11	74LS00	OG2-111
	12	IC12	74LS00	OG2-112
C6	1	IC1	74LS00	JK-101
	2	IC2	74LS00	JK-102
	3	IC3	74LS00	JK-103
	4	IC4	74LS00	JK-104
	5	IC5	74LS00	JK-105
	6	IC6	74LS00	JK-106
	7	IC7	74LS00	JK-107
	8	IC8	74LS00	JK-108
	9	IC9	74LS00	JK-109
	10	IC10	74LS00	JK-110
	11	IC11	74LS00	JK-111
	12	IC12	74LS00	JK-112
C7	1	IC1	74LS00	DC-101
	2	IC2	74LS00	DC-102
	3	IC3	74LS00	DC-103
	4	IC4	74LS00	DC-104
	5	IC5	74LS00	DC-105
	6	IC6	74LS00	DC-106
	7	IC7	74LS00	DC-107
	8	IC8	74LS00	DC-108
	9	IC9	74LS00	DC-109
	10	IC10	74LS00	DC-110
	11	IC11	74LS00	DC-111
	12	IC12	74LS00	DC-112
C8	1	IC1	74LS00	AC-101
	2	IC2	74LS00	AC-102
	3	IC3	74LS00	AC-103
	4	IC4	74LS00	AC-104
	5	IC5	74LS00	AC-105
	6	IC6	74LS00	AC-106
	7	IC7	74LS00	AC-107
	8	IC8	74LS00	AC-108
	9	IC9	74LS00	AC-109
	10	IC10	74LS00	AC-110
	11	IC11	74LS00	AC-111
	12	IC12	74LS00	AC-112
C9	1	IC1	74LS00	PLO-101
	2	IC2	74LS00	PLO-102
	3	IC3	74LS00	PLO-103
	4	IC4	74LS00	PLO-104
	5	IC5	74LS00	PLO-105
	6	IC6	74LS00	PLO-106
	7	IC7	74LS00	PLO-107
	8	IC8	74LS00	PLO-108
	9	IC9	74LS00	PLO-109
	10	IC10	74LS00	PLO-110
	11	IC11	74LS00	PLO-111
	12	IC12	74LS00	PLO-112
C10	1	IC1	74LS00	CPA-201
	2	IC2	74LS00	CPA-202
	3	IC3	74LS00	CPA-203
	4	IC4	74LS00	CPA-204
	5	IC5	74LS00	CPA-205
	6	IC6	74LS00	CPA-206
	7	IC7	74LS00	CPA-207
	8	IC8	74LS00	CPA-208
	9	IC9	74LS00	CPA-209
	10	IC10	74LS00	CPA-210
	11	IC11	74LS00	CPA-211
	12	IC12	74LS00	CPA-212
C11	1	IC1	74LS00	CPB-201
	2	IC2	74LS00	CPB-202
	3	IC3	74LS00	CPB-203
	4	IC4	74LS00	CPB-204
	5	IC5	74LS00	CPB-205
	6	IC6	74LS00	CPB-206
	7	IC7	74LS00	CPB-207
	8	IC8	74LS00	CPB-208
	9	IC9	74LS00	CPB-209
	10	IC10	74LS00	CPB-210
	11	IC11	74LS00	CPB-211
	12	IC12	74LS00	CPB-212
C12	1	IC1	74LS00	CPC-201
	2	IC2	74LS00	CPC-202
	3	IC3	74LS00	CPC-203
	4	IC4	74LS00	CPC-204
	5	IC5	74LS00	CPC-205
	6	IC6	74LS00	CPC-206
	7	IC7	74LS00	CPC-207
	8	IC8	74LS00	CPC-208
	9	IC9	74LS00	CPC-209
	10	IC10	74LS00	CPC-210
	11	IC11	74LS00	CPC-211
	12	IC12	74LS00	CPC-212
C13	1	IC1	74LS00	OG1-201
	2	IC2	74LS00	OG1-202
	3	IC3	74LS00	OG1-203
	4	IC4	74LS00	OG1-204
	5	IC5	74LS00	OG1-205
	6	IC6	74LS00	OG1-206
	7	IC7	74LS00	OG1-207
	8	IC8	74LS00	OG1-208
	9	IC9	74LS00	OG1-209
	10	IC10	74LS00	OG1-210
	11	IC11	74LS00	OG1-211
	12	IC12	74LS00	OG1-212
C14	1	IC1	74LS00	OG2-201
	2	IC2	74LS00	OG2-202
	3	IC3	74LS00	OG2-203
	4	IC4	74LS00	OG2-204
	5	IC5	74LS00	OG2-205
	6	IC6	74LS00	OG2-206
	7	IC7	74LS00	OG2-207
	8	IC8	74LS00	OG2-208
	9	IC9	74LS00	OG2-209
	10	IC10	74LS00	OG2-210
	11	IC11	74LS00	OG2-211
	12	IC12	74LS00	OG2-212
C15	1	IC1	74LS00	JK-201
	2	IC2	74LS00	JK-202
	3	IC3	74LS00	JK-203
	4	IC4	74LS00	JK-204
	5	IC5	74LS00	JK-205
	6	IC6	74LS00	JK-206
	7	IC7	74LS00	JK-207
	8	IC8	74LS00	JK-208
	9	IC9	74LS00	JK-209
	10	IC10	74LS00	JK-210
	11	IC11	74LS00	JK-211
	12	IC12	74LS00	JK-212
C16	1	IC1	74LS00	DC-201
	2	IC2	74LS00	DC-202
	3	IC3	74LS00	DC-203
	4	IC4	74LS00	DC-204
	5	IC5	74LS00	DC-205
	6	IC6	74LS00	DC-206
	7	IC7	74LS00	DC-207
	8	IC8	74LS00	DC-208
	9	IC9	74LS00	DC-209
	10	IC10	74LS00	DC-210
	11	IC11	74LS00	DC-211
	12	IC12	74LS00	DC-212
C17	1	IC1	74LS00	AC-201
	2	IC2	74LS00	AC-202
	3	IC3	74LS00	AC-203
	4	IC4	74LS00	AC-204
	5	IC5	74LS00	AC-205
	6	IC6	74LS00	AC-206
	7	IC7	74LS00	AC-207
	8	IC8	74LS00	AC-208
	9	IC9	74LS00	AC-209
	10	IC10	74LS00	AC-210
	11	IC11	74LS00	AC-211
	12	IC12	74LS00	AC-212
C18	1	IC1	74LS00	PLO-201
	2	IC2	74LS00	PLO-202
	3	IC3	74LS00	PLO-203
	4	IC4	74LS00	PLO-204
	5	IC5	74LS00	PLO-205
	6	IC6	74LS00	PLO-206
	7	IC7	74LS00	PLO-207
	8	IC8	74LS00	PLO-208
	9	IC9	74LS00	PLO-209
	10	IC10	74LS00	PLO-210
	11	IC11	74LS00	PLO-211
	12	IC12	74LS00	PLO-212
C19	1	IC1	74LS00	CPA-301
	2	IC2	74LS00	CPA-302
	3	IC3	74LS00	CPA-303
	4	IC4	74LS00	CPA-304
	5	IC5	74LS00	CPA-305
	6	IC6	74LS00	CPA-306
	7	IC7	74LS00	CPA-307
	8	IC8	74LS00	CPA-308
	9	IC9	74LS00	CPA-309
	10	IC10	74LS00	CPA-310
	11	IC11	74LS00	CPA-311
	12	IC12	74LS00	CPA-312
C20	1	IC1	74LS00	CPB-301
	2	IC2	74LS00	CPB-302
	3	IC3	74LS00	CPB-303
	4	IC4	74LS00	CPB-304
	5	IC5	74LS00	CPB-305
	6	IC6	74LS00	CPB-306
	7	IC7	74LS00	CPB-307
	8	IC8	74LS00	CPB-308
	9	IC9	74LS00	CPB-309
	10	IC10	74LS00	CPB-310
	11	IC11	74LS00	CPB-311
	12	IC12	74LS00	CPB-312
C21	1	IC1	74LS00	CPC-301
	2	IC2	74LS00	CPC-302
	3	IC3	74LS00	CPC-303
	4	IC4	74LS00	CPC-304
	5	IC5	74LS00	CPC-305
	6	IC6	74LS00	CPC-306
	7	IC7	74LS00	CPC-307
	8	IC8	74LS00	CPC-308
	9	IC9	74LS00	CPC-309
	10	IC10	74LS00	CPC-310
	11	IC11	74LS00	CPC-311
	12	IC12	74LS00	CPC-312
C22	1	IC1	74LS00	OG1-301
	2	IC2	74LS00	OG1-302
	3	IC3	74LS00	OG1-303
	4	IC4	74LS00	OG1-304
	5	IC5	74LS00	OG1-305
	6	IC6	74LS00	OG1-306
	7	IC7	74LS00	OG1-307
	8	IC8	74LS00	OG1-308
	9	IC9	74LS00	OG1-309
	10	IC10	74LS00	OG1-310
	11	IC11	74LS00	OG1-311
	12	IC12	74LS00	OG1-312
C23	1	IC1	74LS00	OG2-301
	2	IC2	74LS00	OG2-302
	3	IC3	74LS00	OG2-303
	4	IC4	74LS00	OG2-304
	5	IC5	74LS00	OG2-305
	6	IC6	74LS00	OG2-306
	7	IC7	74LS00	OG2-307
	8	IC8	74LS00	OG2-308
	9	IC9	74LS00	OG2-309
	10	IC10	74LS00	OG2-310
	11	IC11	74LS00	OG2-311
	12	IC12	74LS00	OG2-312
C24	1	IC1	74LS00	JK-301
	2	IC2	74LS00	JK-302
	3	IC3	74LS00	JK-303
	4	IC4	74LS00	JK-304
	5	IC5	74LS00	JK-305
	6	IC6	74LS00	JK-306
	7	IC7	74LS00	JK-307
	8	IC8	74LS00	JK-308
	9	IC9	74LS00	JK-309
	10	IC10	74LS00	JK-310
	11	IC11	74LS00	JK-311
	12	IC12	74LS00	JK-312
C25	1	IC1	74LS00	DC-301
	2	IC2	74LS00	DC-302
	3	IC3	74LS00	DC-303
	4	IC4	74LS00	DC-304
	5	IC5	74LS00	DC-305
	6	IC6	74LS00	DC-306
	7	IC7	74LS00	DC-307
	8	IC8	74LS00	DC-308
	9	IC9	74LS00	DC-309
	10	IC10	74LS00	DC-310
	11	IC11	74LS00	DC-311</



- Digital Data
- Audio Signal
- Clock Pulse
- Key Code Data
- DC Control
- Low Frequency Modulation Data
- Trigger Pulse

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- Audio Signal
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