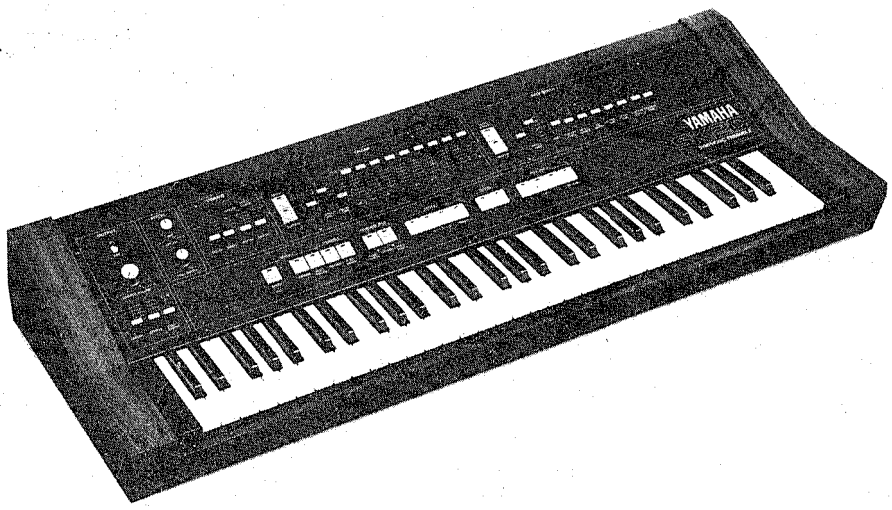
YAMAHA

SYMPHONIC ENSEMBLE

SK20



SERVICE MANUAL

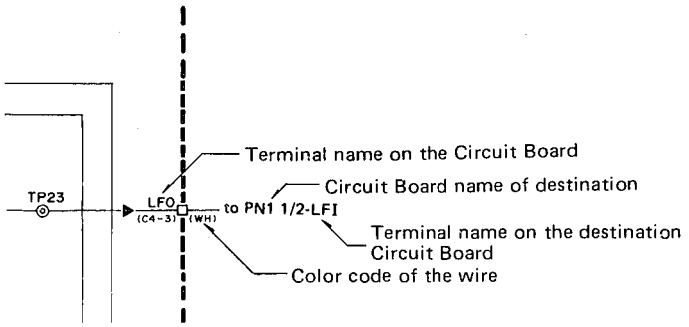
006440

'80.9 2.5K Ⓚ Printed in Japan

CONTENTS (目次)

CODING GUIDE (活用の手引)

1 Wiring Notation



Note: Types of wire

BL — Ordinary wire

BL — Shielded wire

2 Symbol Description

Transistor

E: Emitter
C: Collector
B: Base

FET

S: Source
G: Gate
D: Drain

Diode

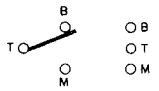
(Zener Diode)

Capacitors

Electrolytic capacitor
Polarity
△ : Tantalum capacitor
NP : Non-polar capacitor

Mylar, ceramic or polystyrene capacitor

Switch



B : Break
T : Transfer
M : Make

3 Abbreviations of Wire Color Codes

BLACK (クロ) ..... BL	BROWN (チャ) ..... BR	RED (アカ) ..... RE
ORANGE (ダイ) ..... OR	YELLOW (キイ) ..... YE	GREEN (ミドリ) ..... GR
BLUE (アオ) ..... BE	VIOLET (ムラサキ) VI	GRAY (ハイイロ) ..... 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 (チャ)	RE (アカ)	OR (ダイ)	YE (キイ)	GR (ミドリ)	BE (アオ)	VI (ムラサキ)	GY (ハイイロ)	WH (シロ)	GG (クサ)	SB (ソラ)	PK (モモ)

5 Logic Symbols

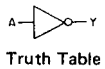
	MIL	YAMAHA
NOT (INVERTOR)		
NOR		
NAND		

Exclusive OR (排他的論理和)

Truth Table

A	B	Y
L	L	L
H	L	H
L	H	H
H	H	L

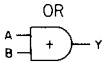
NOT (Inverter)



Truth Table

A	Y
L	H
H	L

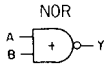
OR



Truth Table

A	B	Y
L	L	L
H	L	H
L	H	H
H	H	H

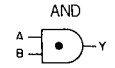
NOR



Truth Table

A	B	Y
L	L	H
H	L	L
L	H	L
H	H	L

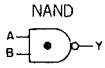
AND



Truth Table

A	B	Y
L	L	L
H	L	L
L	H	L
H	H	H

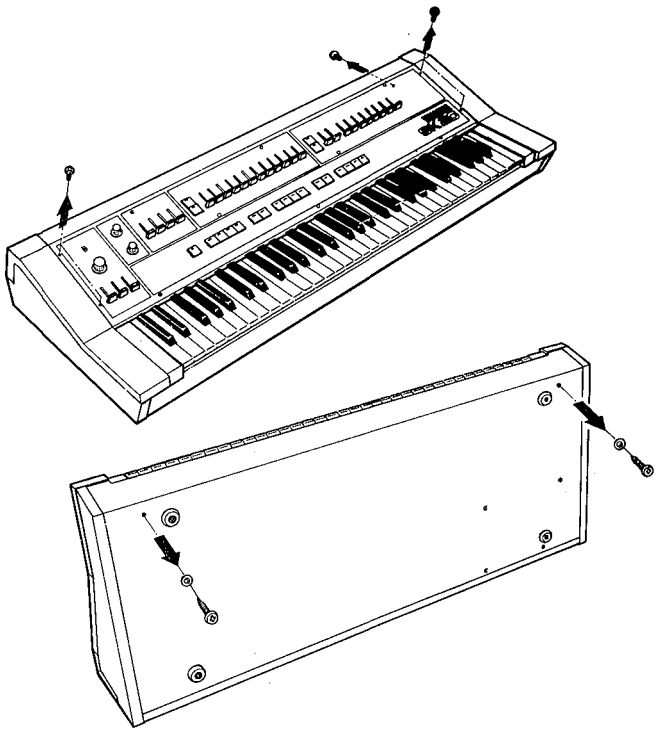
NAND



Truth Table

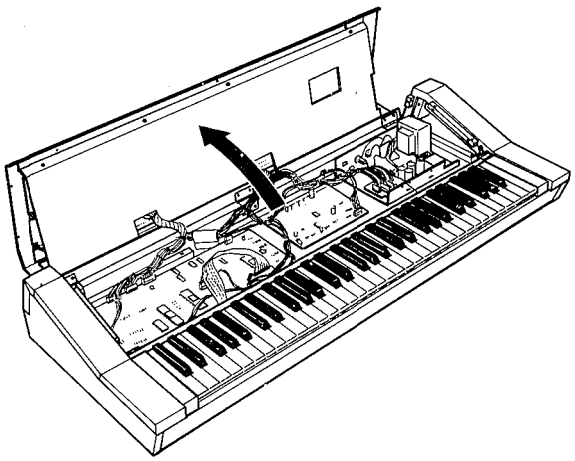
A	B	Y
L	L	H
H	L	H
L	H	H
H	H	L

DISASSEMBLY PROCEDURE (分解手順)

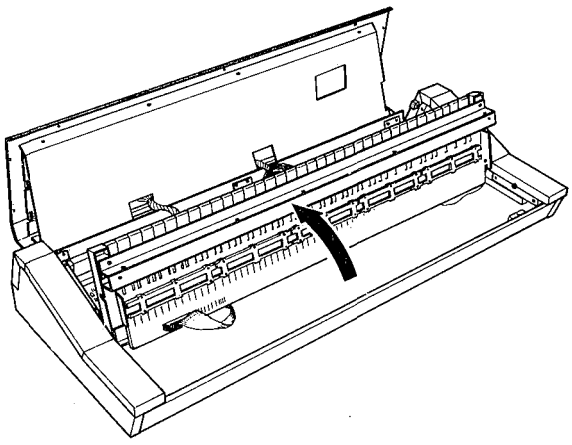


Opening the Console Panel and Keyboard:
パネル及び、鍵盤部の開閉

- Remove 7 screws from the console panel and bottom cover.
- 図の様にパネル面及び底板部のネジ合計7本を外します。



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



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

SPECIFICATIONS (総合仕様)

KEYBOARD . . . . . 61 keys, C1 ~ C6, 5 octaves

ORGAN block

Tone lever . . . . . 16', 8', 5-1⅓', 4', 2-⅔', 2', 1'
PERCUSSIVE. . . . . 2 nd, 3rd, DECAY TIME lever
DECAY TIME : 0.1 ~ 0.75 sec
BRILLIANCE. . . . . BRILLIANCE lever
SUSTAIN . . . . . SUSTAIN lever ; 30msec ~ 1.6 sec, SUSTAIN switch ; ON/OFF
DECAY. . . . . DECAY switch ; ON/OFF, DECAY lever (commonly use SUSTAIN lever)
Select switch . . . . . ORGAN1/ORGAN2/ORGAN3 MANUAL

POLY-SYNTH block

FEET . . . . . 4'⟍/8'⊓/BP8'⟍/8'⟍/16'⊓/16'⟍
VCF . . . . . Filter : BP ; ± 6dB/oct.
LP ; −12dB/oct.
OUTOFF FREQ : Variable range ; 10 oct.
RESONANCE : Q ; 0.5 ~ 10
EG DEPTH : Variable range ; 10 oct
Envelopw generator . . . ATTACK TIME : 3 msec ~ 3sec
DECAY TIME ; 30msec ~ 30 sec
SUSTAIN LEVEL ; 0 ~ 10
RELEASE TIME ; 30msec ~ 30sec
BRILLIANCE. . . . . BRILLIANCE lever
SLOW ATTACK . . . . . SLOW ATTACK 8msec/80msec
SUSTAIN . . . . . SUSTAIN lever ; 30msec ~ 1.6sec SUSTAIN ; ON/OFF
Selecto switch. . . . . POLY-SYNTH1/POLY-SYNTH2/POLY - SYNTH 3/MANUAL STRING 1/STRING2

OUTPUT block

ORGAN/STRING/
POLY-SYNTH . . . . . Mixing control
MASTER VOLUME. . . Control MIXED output
ON/OFF . . . . . Line switch

PITCH block

ORGAN . . . . . 435Hz ~ 450Hz
POLY-SYNTH . . . . . 435Hz ~ 450Hz

Specifications and design are subject to change without notice for improvement.

VIBRATO block

DELAY. . . . . 0 ~ 3.2 sec.
SPEED . . . . . 5 ~ 7 Hz
DEPTH . . . . . ORGAN ; ± 40 cents
POLY-SYNTH ; ± 40 cents

ENSEMBLE/TREMOLO block (Ensemble tremolo)

ENSEMBLE. . . . . ORGAN ; ON/OFF
POLY-SYNTH ; ON/OFF
TREMOLO . . . . . ORGAN ; ON/OFF
POLY-SYNTH ; ON/OFF
SPEED ; FAST/SLOW

KEYBOARD SPLIT function

POLY-SYNTH▼ORGAN; ON/OFF
ORGAN▼POLY-SYNTH; ON/OFF
Split between F♯ and G marked ▼

REAR PANEL

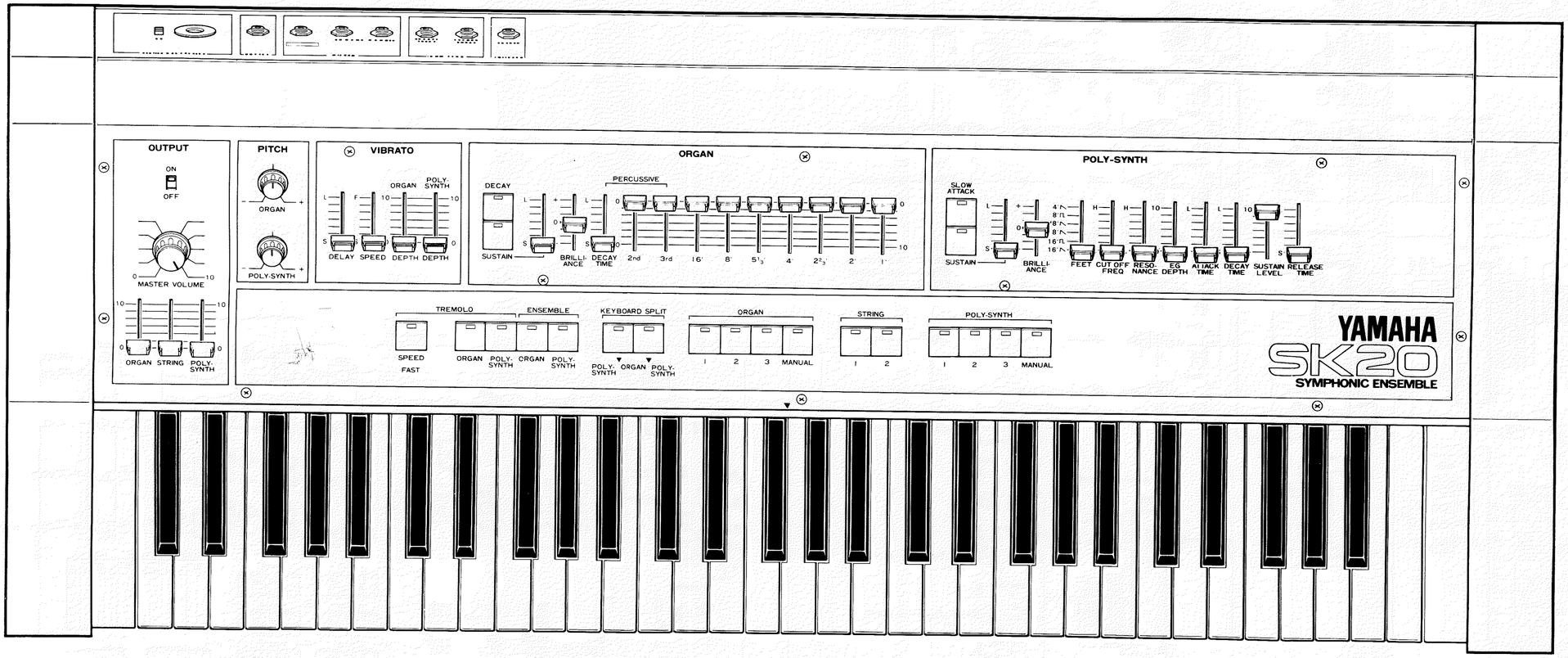
OUTPUT. . . . . MIXED ; (−10dBm)
ORGAN POLY-SYNTH
PHONES
EXT TONE CABINET 11 pins connecter, ON/OFF switch
Connectable the Leslie models 415, 715, 815 or equivalent (2-ch, 11 pin type)
FOOT CONT . . . . . MIXED VOLUME
STRING VOLUME
FOOT SW . . . . . SUSTAIN

Usable tones. . . . . Seven notes at nomal
Seven plus seven notes at KEY-BOARD SPLIT switch to ON

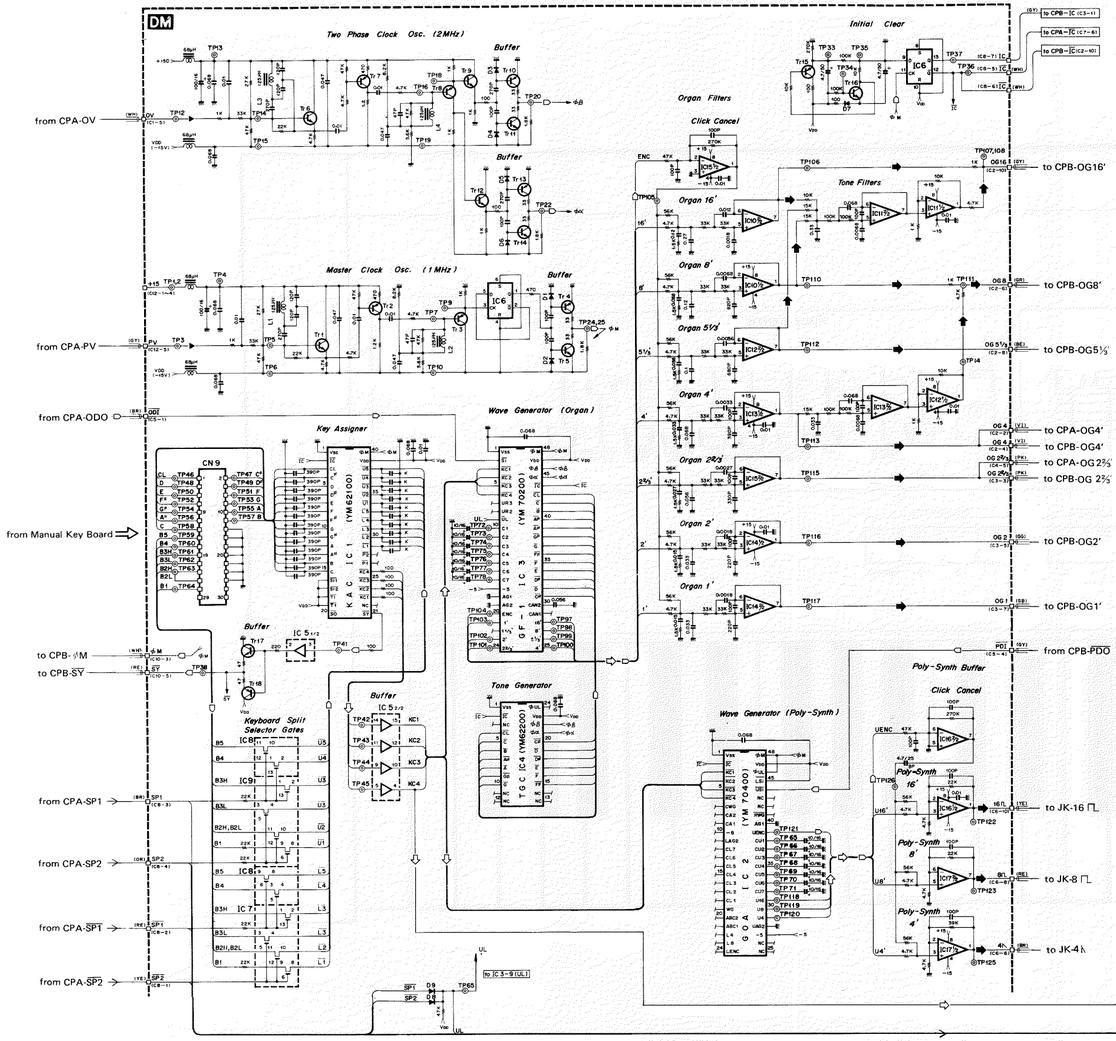
OTHERS

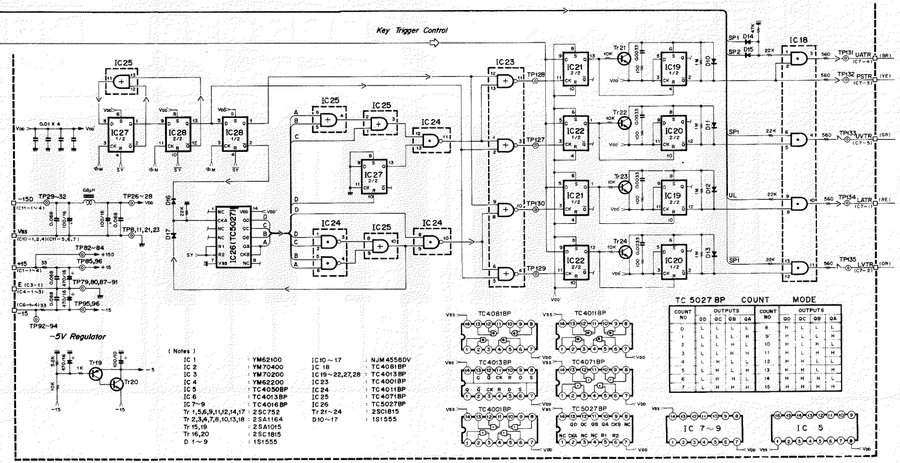
Power source USA and canadian model ; 120 V 50Hz/60Hz
General model ; 110V ~ 130V or 220V ~ 240V selectable ; 50/60Hz
Power consumption . . . USA model ; 30W
Canadian model ; 35VA
General model ; 35W
Demensions . . . . . 1 000(W) x 158(H) x 406(D) mm
39.3/8(W) x 6-1/4(H) x 16(D) inch
Weight. . . . . 15 kg, 33 lbs
Finish . . . . . Semi-gloss black panels, rese-wood grain cabinet

PANEL LAYOUT



DM Circuit Diagram

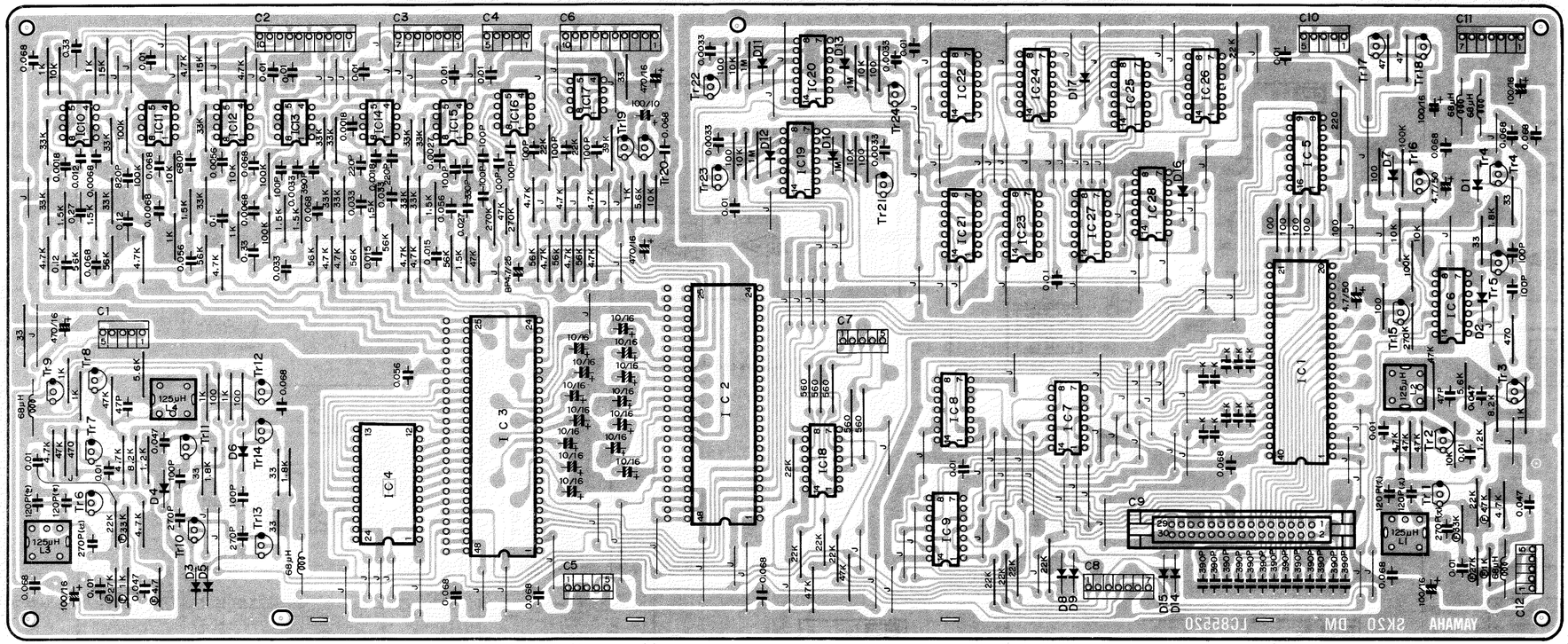




(Notes)

IC 1	YM62100	IC 10 ~ 17	NJM4558DV
IC 2	YM70400	IC 18	TC4081BP
IC 3	YM70200	IC 19 ~ 22, 27, 28	TC4013BP
IC 4	YM62200	IC 23	TC4001BP
IC 5	TC4050BP	IC 24	TC4011BP
IC 6	TC4013BP	IC 25	TC4071BP
IC 7 ~ 9	TC4016BP	IC 26	TC5027BP
Tr 1,5,8,9,11,12,14,17	2SC752	Tr 21 ~ 24	2SC1815
Tr 2,3,4,7,8,10,13,18	2SA1164	D 10 ~ 17	1S1555
Tr 15,19	2SA1015		
Tr 16,20	2SC1815		
D 1 ~ 9	1S1555		

DM Circuit Board & Wiring



Note)

1. Circuit Board : LC85520
2. Transistor
   - Tr1, 5, 6, 9, 11, 12, 14, 17 : 2SC752
   - Tr2, 3, 4, 7, 8, 10, 13, 18 : 2SA1164
   - Tr16, 20 ～ 24 : 2SC1815
   - Tr15, 19 : 2SA1015
3. IC
   - IC1 : YM62100 (KAC) **LSI PIN FUNCTIONS*
   - IC2 : YM70400 (GOA) **LSI PIN FUNCTIONS*
   - IC3 : YM70200 (GF-1) **LSI PIN FUNCTIONS*
   - IC4 : YM62200 (TGC) **LSI PIN FUNCTIONS*
   - IC5 : TC4050BP
   - IC6, 19 ～ 22, 27, 28 : TC4013BP
   - IC7 ～ 9 : TC4016BP
   - IC10 ～ 17 : NJM4558DV
   - IC18 : TC4081BP
   - IC23 : TC4001BP
   - IC24 : TC4011BP
   - IC25 : TC4071BP
   - IC26 : TC5027BP
4. Diode
   - 1S1555
5. Capacitor
   - (K) : 1000P

C1

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	DC−15 (C1-9)
2	+15	BR	DC−15 (C1-10)
3	+15	BR	DM−15 (C12-1)
4	+15	BR	DM−15 (C12-2)
5	V	S WH	CPA-0V (C5-6)

C2

Pin No.	Pin Name	Wire Color	Destination
1	E	S VI S	
2	OG4	S VI	CPA-OG4 (C10-3)
3	E	S VI S	
4	OG4	S VI	CPB-OG4 (C1-4)
5	E	S GR S	
6	OG8	S GR	CPB-OG8 (C1-2)
7	E	S BE S	
8	OG5 1/3	S BE	CPB-OG5 1/3 (C1-3)
9	E	S GY S	
10	OG16	S GY	CPB-OG16 (C1-1)

C3

Pin No.	Pin Name	Wire Color	Destination
1	E	BL	CPA-E (C2-3)
2	E	S PK S	
3	OG2 1/3	S PK	CPB-OG2 1/3 (C1-5)
4	E	S GG	
5	OG2	S GG S	CPB-OG2 (C1-6)
6	E	S SB S	
7	OG1	S SB	CPB-OG1 (C1-7)

C4

Pin No.	Pin Name	Wire Color	Destination
1	E	BL	CPA-E (C2-4)
2	E	BL	DC-E (C2-7)
3	E	BL	DC-E (C2-8)
4	E	S PK S	
5	2	S PK	CPA-OG2 1/3 (C10-1)

C5

Pin No.	Pin Name	Wire Color	Destination
1	ODi	S BR	CPA-ODO (C8-5)
2	Vss	S BR S	
3	Vss		—
4	PDi	S GY	CPB-PDO (C2-7)
5	Vss	S GY S	

C6

Pin No.	Pin Name	Wire Color	Destination
1	−15	YE	DC−15 (C2-1)
2	−15	YE	DC−15 (C2-2)
3	−15	YE	CPA−15 (C2-5)
4	−15	YE	CPA−15 (C2-6)
5	E	S BR S	
6	4	S BR	JK-4 (C4-3)
7	E	S RE S	
8	8	S RE	JK-8 (C5-1)
9	E	S YE S	
10	16	S YE	JK-16 (C4-4)

C7

Pin No.	Pin Name	Wire Color	Destination
1	LATR	RE	CPA-LATR (C10-5)
2	LVTR	OR	CPA-LVTR (C5-8)
3	PSTR	YE	CPB-PSTR (C3-3)
4	UATR	BR	CPA-UATR (C10-4)
5	UVTR	GR	CPA-UVTR (C5-7)

C8

Pin No.	Pin Name	Wire Color	Destination
1	SP2	YE	CPA-SP2 (C11-4)
2	SP1	RE	CPA-SP1 (C11-1)
3	SP1	BR	CPA-SP1 (C11-2)
4	SP2	OR	CPA-SP2 (C11-3)
5	IC	WH	CPA-IC (C7-6)
6	IC	WH	CPB-IC (C2-10)
7	IC	GY	CPB-IC (C3-1)

C10

Pin No.	Pin Name	Wire Color	Destination
1	Vss	—	—
2	Vss	S WH S	
3	φM	S WH	CPB-φM (C4-1)
4	Vss	S RE S	
5	SY	S RE	CPB-SY (C4-5)

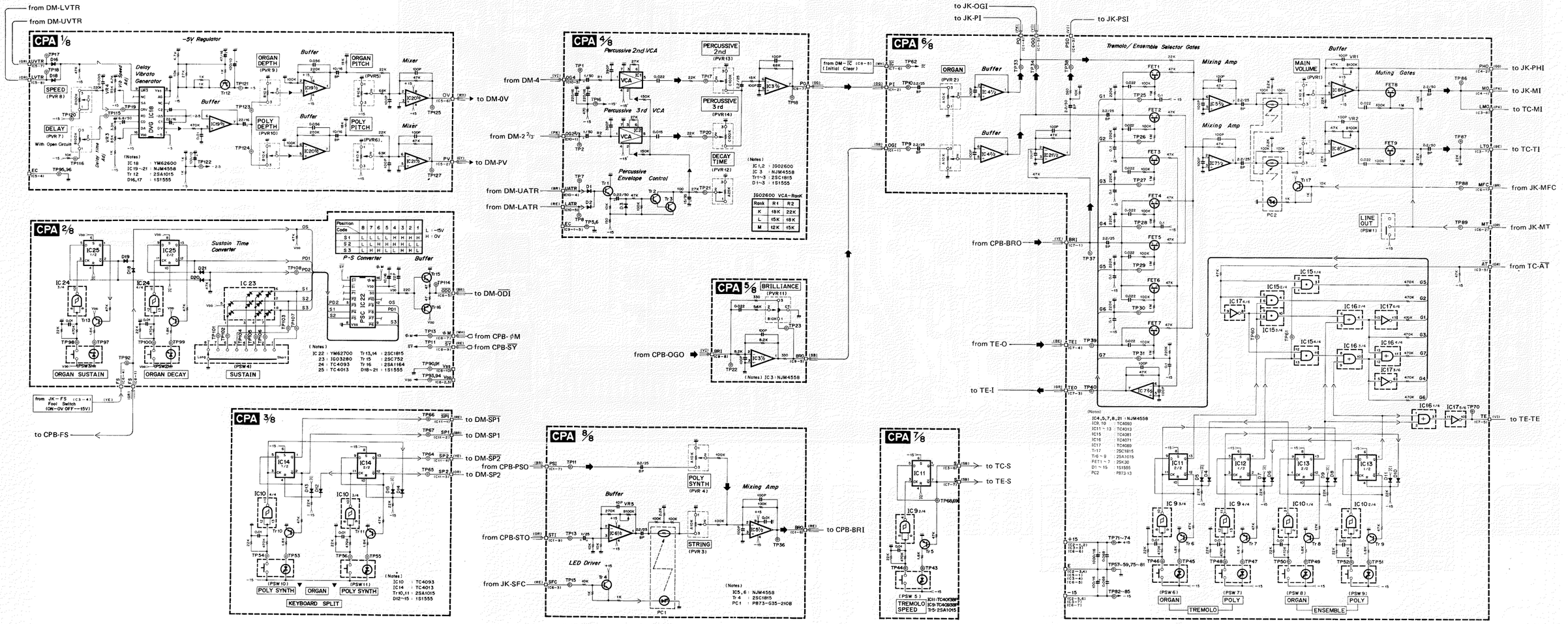
C11

Pin No.	Pin Name	Wire Color	Destination
1	−15D	YE	DC−15D (C3-5)
2	−15D	YE	DC−15D (C3-6)
3	−15D	YE	CPA-V∞ (C8-2)
4	−15D	YE	CPA-V∞ (C8-3)
5	Vss	BL	DC-Vss (C3-1)
6	Vss	BL	DC-Vss (C3-2)
7	Vss	BL	CPA-Vss (C8-10)

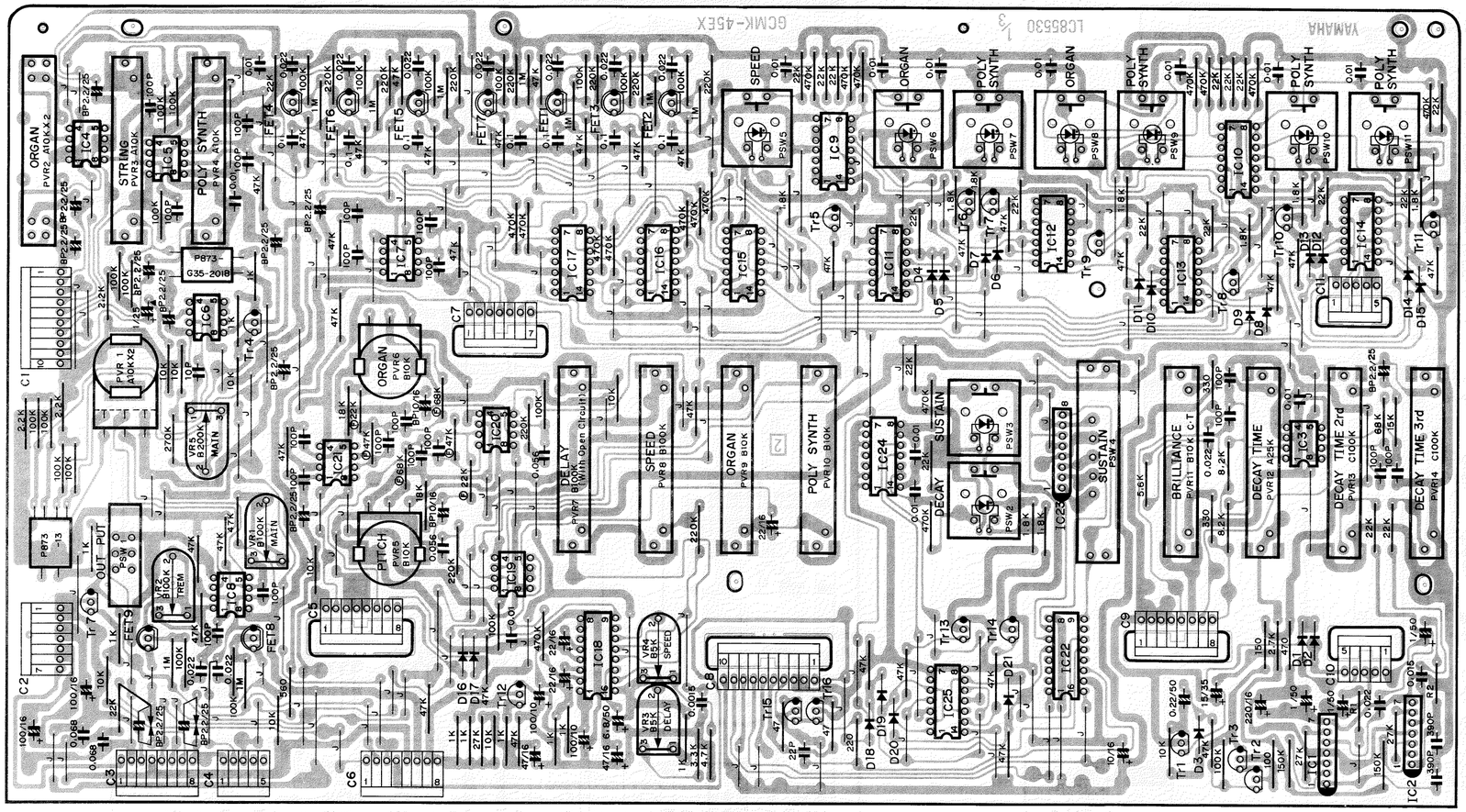
C12

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	DM−15 (C1-3)
2	+15	BR	DM−15 (C1-4)
3	+15	BR	CPA−15 (C2-1)
4	+15	BR	CPA−15 (C2-2)
5	PV	GY	CPA-PV (C5-2)

CPA Circuit Diagram



CPA Circuit Board & Wiring



● View from the printed pattern side of the circuit board.

C1

Pin No.	Pin Name	Wire Color	Destination
1	OGI	S SB	CPA-BRO (C9-5)
2	PI	S GG	CPA-PO (C9-7)
3	E	S PK S	
4	PO	S PK	JK-PI (C2-4)
5	OGO	S VI	JK-OGI (C2-5)
6	BRO	S RE	CPB-BRI (C5-1)
7	PSI	S BR	CPB-PSO (C3-2)
8	E	S BR S	
9	STI	S OR	CPB-STO (C3-4)
10	E	S OR S	

C2

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	DM–+15 (C12-3)
2	+15	BR	DM–+15 (C12-4)
3	E	BL	DM-E (C3-1)
4	E	BL	DM-E (C4-1)
5	–15	YE	DM––15 (C6-3)
6	–15	YE	DM––15 (C6-4)
7	LE	BL	DC-E (C2-9)

C3

Pin No.	Pin Name	Wire Color	Destination
1	LE	BL	TC-LE (C1-8)
2	–15	YE	TC––15 (C1-7)
3	+15	BR	TC–+15 (C1-6)
4	E	BL	TC-E (C1-5)
5	AT	GR	TC-AT (C1-4)
6	S	SB	TC-S (C1-3)
7	LTO	BE	TC-TI (C1-1)
8	LMO	PK	TC-MI (C1-2)

C4

Pin No.	Pin Name	Wire Color	Destination
1	MO	PK	JK-MI (C1-4)
2	PHO	GG	JK-PHI (C1-3)
3	PSO	VI	JK-PSI (C1-2)
4	–	–	–
5	–	–	–

C5

Pin No.	Pin Name	Wire Color	Destination
1	E	–	–
2	PV	S GY	DM-PV (C12-5)
3	EC	S GY S	
4	EC	BL	DC-E (C2-10)
5	EC	S WH S	
6	OV	S WH	DM-0V (C1-8)
7	UVTR	GR	DM-UVTR (C7-5)
8	LVTR	OR	DM-LVTR (C7-2)

C6

Pin No.	Pin Name	Wire Color	Destination
1	MFC	BR	JK-MFC (C3-6)
2	MT	OR	JK-MT (C3-5)
3	SFC	RE	JK-SFC (C3-7)
4	FS	YE	JK-FS (C3-4)
5	E	BL	JK-E (C3-3)
6	+15	BR	JK–+15 (C3-2)
7	–15	YE	JK––15 (C3-1)

C8

Pin No.	Pin Name	Wire Color	Destination
1	FS	S GR	CPB-FS (C2-9)
2	V∞	YE	DM––15D (C11-3)
3	V∞	YE	DM––15D (C11-4)
4	Vss	S BR S	
5	ODD	S BR	DM-ODI (C5-1)
6	Vss	S WH S	
7	ØM	S WH	CPB-ØM (C4-3)
8	Vss	S RE S	
9	SY	S RE	CPB-SY (C4-7)
10	Vss	BL	DM-Vss (C11-7)

C7

Pin No.	Pin Name	Wire Color	Destination
1	BRI	S YE	CPB-BRO (C5-3)
2	E	BL	CPB-E (C5-5)
3	TEO	S GR	TE-I (C2-4)
4	TEI	S BE	TE-O (C3-3)
5	TE	VI	TE-TE (C3-2)
6	IC	WH	DM-IC (C8-5)
7	S	SB	TE-S (C3-1)

C9

Pin No.	Pin Name	Wire Color	Destination
1	EC	–	–
2	EC	–	–
3	EC	BL	DC-E (C2-11)
4	EC	S SB S	
5	BRO	S SB	CPA-OGI (C1-1)
6	E	S GG S	
7	PO	S GG	CPA-PI (C1-2)
8	BRI	S VI	CPB-OGO (C2-2)

C10

Pin No.	Pin Name	Wire Color	Destination
1	OG2½	S PK	DM-OG2 ½ (C4-6)
2	4	–	–
3	OG4	S VI	DM-OG4 (C2-2)
4	UATR	BR	DM-UATR (C7-4)
5	LATR	RE	DM-LATR (C7-1)

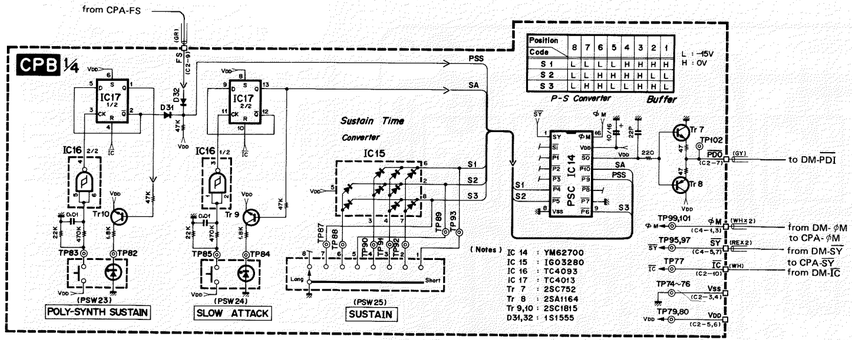
C11

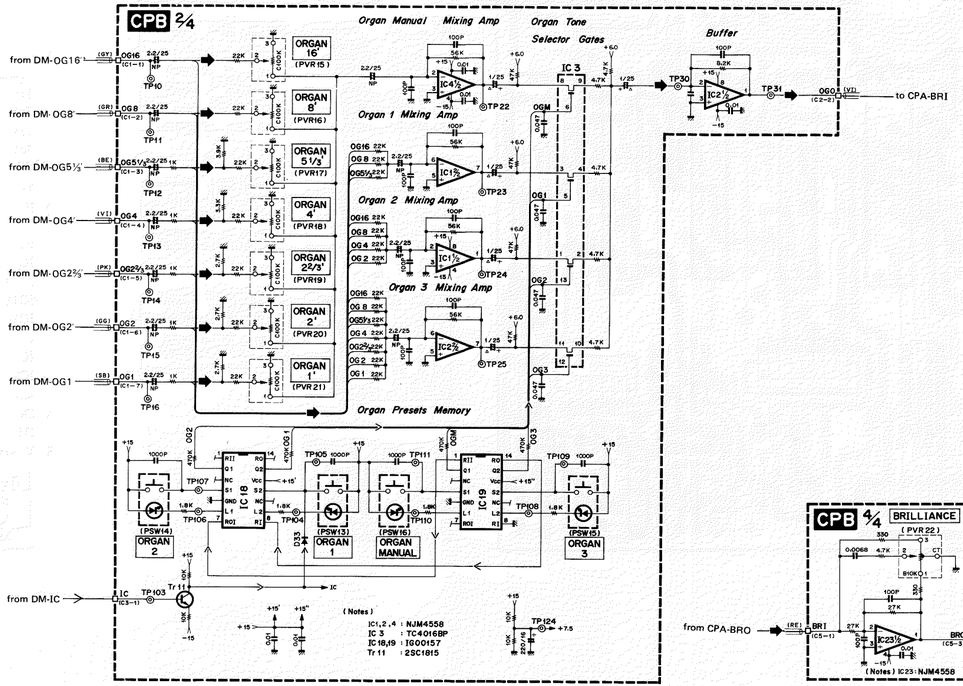
Pin No.	Pin Name	Wire Color	Destination
1	SP1	RE	DM-SP1 (C8-2)
2	SP1	BR	DM-SP1 (C8-3)
3	SP2	OR	DM-SP2 (C8-4)
4	SP2	YE	DM-SP2 (C8-1)
5	SP2	–	–

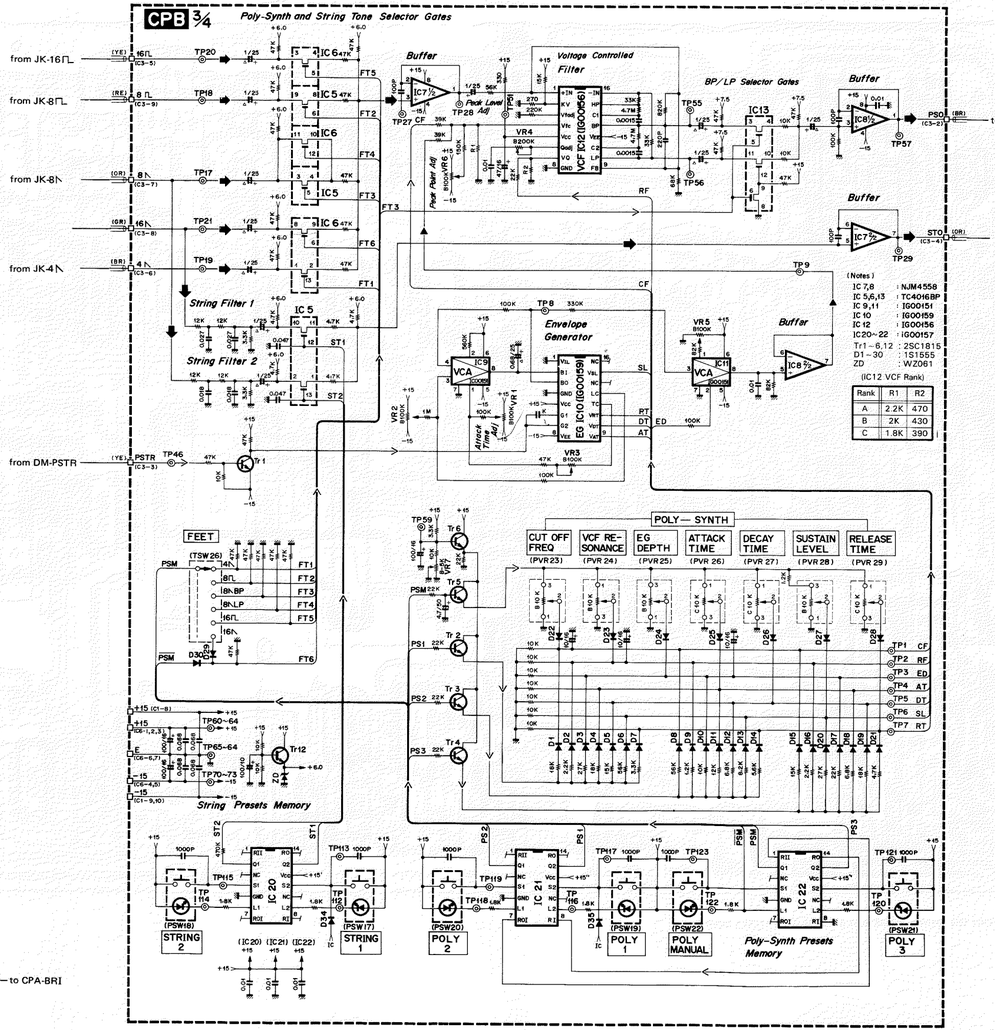
Note)
1. Circuit Board : LC85530
2. Transistor
   Tr1 ~ 4, 13, 14, 17 : 2SC1815
   Tr5 ~ 12 : 2SA1015
   Tr15 : 2SC753
   Tr16 : 2SA1164
3. FET
   FET1 ~ 9 : 2SK30 (Y)
4. IC
   IC1, 2 : iG02600
   IC3 ~ 8, 19 ~ 21 : NJM4558DV
   IC9, 10, 24 : TC4093BP
   IC11 ~ 14, 25 : TC4013BP
   IC15 : TC4081BP
   IC16 : TC4071BP
   IC17 : TC4069BP
   IC18 : YM62600
   IC22 : YM62700
   IC23 : iG03280
5. Diode
   D1 ~ 21 : 1S1555
6. IC Gain Rank : iG02600

Rank	R1	R2
K	18K	22K
L	15K	18K
M	12K	15K

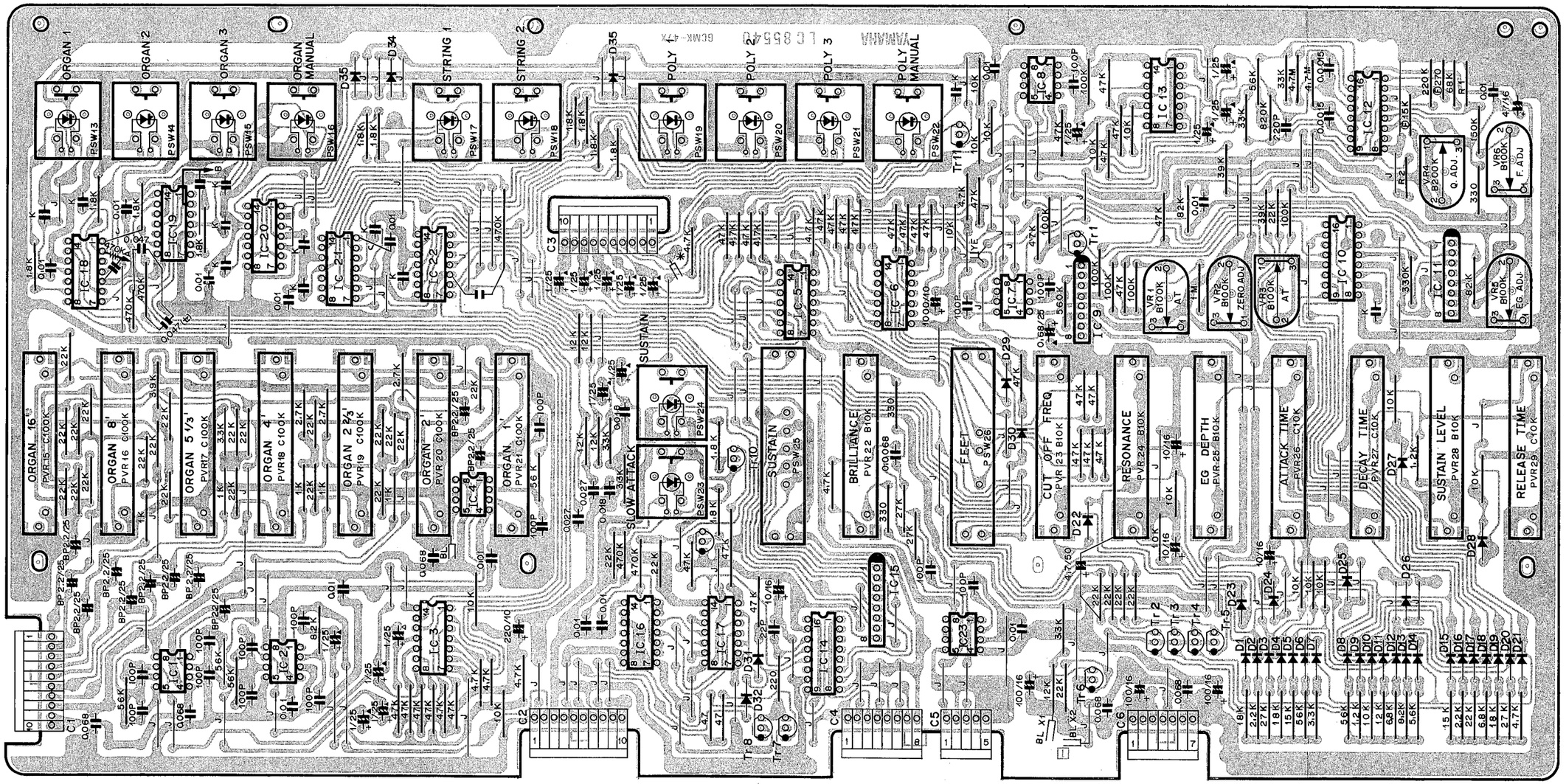
CPB Circuit Diagram







CPB Circuit Board & Wiring



- View from the printed pattern side of the circuit board.

Note)

1. Circuit Board : LC85540
2. Transistor
   - Tr1 ~ 6, 9 ~ 11, 12 : 2SC1815
   - Tr7 : 2SC752
   - Tr8 : 2SA1164
3. IC1, 2, 4, 7, 8, 23 : NJM4558DV
   - IC3, 5, 6, 13 : TC4016BP
   - IC9, 11 : iG00151
   - IC10 : iG00159
   - IC12 : iG00156
   - IC14 : YM62700 (PSC) **LSI PIN FUNCTIONS*
   - IC15 : iG3280
   - IC16 : TC4093BP
   - IC17 : TC4013BP
   - IC18 ~ 22 : iG00157
4. Diode
   - D1 ~ 35 : 1S1555
   - ZD : WZ061
5. Capacitor
   - K mark : Ceramic capacitor 1000P
   - ▲ mark : Tantalum Capacitor
6. IC Gain Rank

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

C1

Pin No.	Pin Name	Wire Color	Destination
1	OG16	S GY	DM-OG16 (C2-10)
2	OG8	S GR	DM-OG8 (C2-6)
3	OG5 1/3	S BE	DM-OG5 1/3 (C2-8)
4	OG4	S VI	DM-OG4 (C2-4)
5	OG2 2/3	S PK	DM-OG2 2/3 (C3-3)
6	OG2	S GG	DM-OG2 (C3-5)
7	OG1	S SB	DM-OG1 (C3-7)
8	+15	BR	CPB-+15 (C6-1)
9	–15	YE	DC-–15 (C1-3)
10	–15	YE	CPB-–15 (C6-4)

C2

Pin No.	Pin Name	Wire Color	Destination
1	E	S VI S	
2	OGO	S VI	CPA-BRI (C9-8)
3	Vss	BL	DC-Vss (C3-3)
4	Vss	BL	DC-Vss (C3-4)
5	Voo	YE	DC-–15D (C3-7)
6	Voo	YE	DC-–15D (C3-8)
7	PDO	S GY	DM-PDI (C5-4)
8	Vss	S GR S	
9	FS	S GR	CPA-FS (C8-1)
10	IC	WH	DM-IC (C8-6)

C3

Pin No.	Pin Name	Wire Color	Destination
1	IC	GY	DM-IC (C8-7)
2	PSO	S BR	CPA-PSI (C1-7)
3	PSTR	YE	DM-PSTR (C7-3)
4	STO	S OR	CPA-STI (C1-9)
5	16 ⊓	S YE	JK-16⊓ (C4-5)
6	4 ⅄	S BR	JK-4 ⅄ (C4-2)
7	8 ⅄	S OR	JK-8 ⅄ (C4-8)
8	16 ⅄	S GR	JK-16 ⅄ (C5-5)
9	8⊓	S RE	JK-8⊓ (C5-2)
10	8⊓	–	–

C4

Pin No.	Pin Name	Wire Color	Destination
1	ϕM	S WH	DM-ϕM (C10-3)
2	Vss	S WH S	
3	ϕM	S WH	CPA-ϕM (C8-7)
4	Vss	S WH S	
5	SY	S RE	DM-SY (C10-5)
6	Vss	S RE S	
7	SY	S RE	CPA-SY (C8-9)
8	Vss	S RE S	

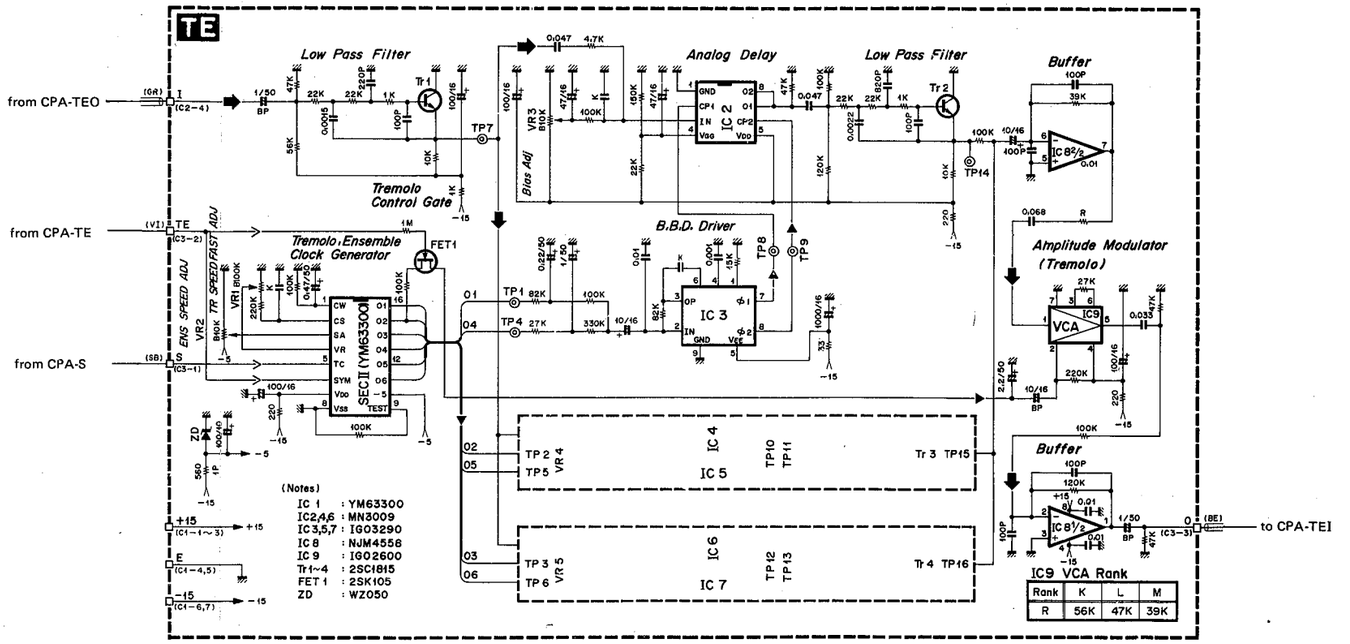
C5

Pin No.	Pin Name	Wire Color	Destination
1	BRI	S RE	CPA-BRO (C1-6)
2	E	S RE S	
3	BRO	S YE	CPA-BRI (C7-1)
4	E	S YE S	
5	E	BL	CPA-E (C7-2)

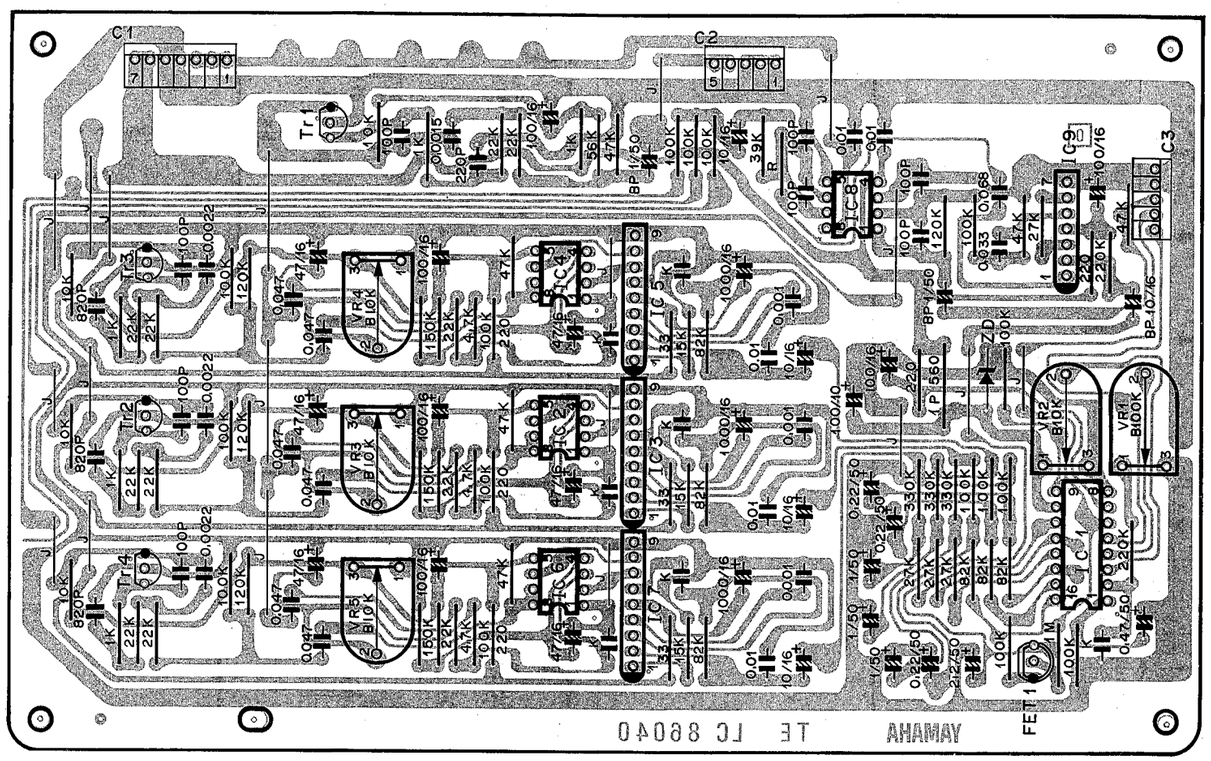
C6

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	CPB-+15 (C1-8)
2	+15	BR	DC-+15 (C1-7)
3	+15	BR	DC-+15 (C1-8)
4	–15	YE	CPB-–15 (C1-10)
5	–15	YE	DC-–15 (C1-4)
6	E	BL	DC-E (C2-5)
7	E	BL	DC-E (C2-6)

TE Circuit Diagram



TE Circuit Board & Wiring



Note)
1. Circuit Board : LC86040
2. Transistor
   Tr1 ~ 4 : 2SC1815 (O, Y)
3. FET
   FET1 : 2SK105F
4. IC
   IC1 : YM63300 (SECII)
   IC2, 4, 6 : MN3009
   IC3, 5, 7 : iG03290
   IC8 : NJM4558DV
   IC9 : iG02600
   iG02590
5. Diode
   ZD : WZ050
6. Capacitor
   K mark : 1000P
7. IC9 (iG02660, iG02590)

Rank	K	L	M
R	56K	47K	39K

C1

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	DC-+15 (C1-5)
2	+15	BR	DC-+15 (C1-6)
3	+15	–	–
4	E	–	–
5	E	–	–
6	–15	YE	DC-–15 (C1-1)
7	–15	YE	DC-–15 (C1-2)

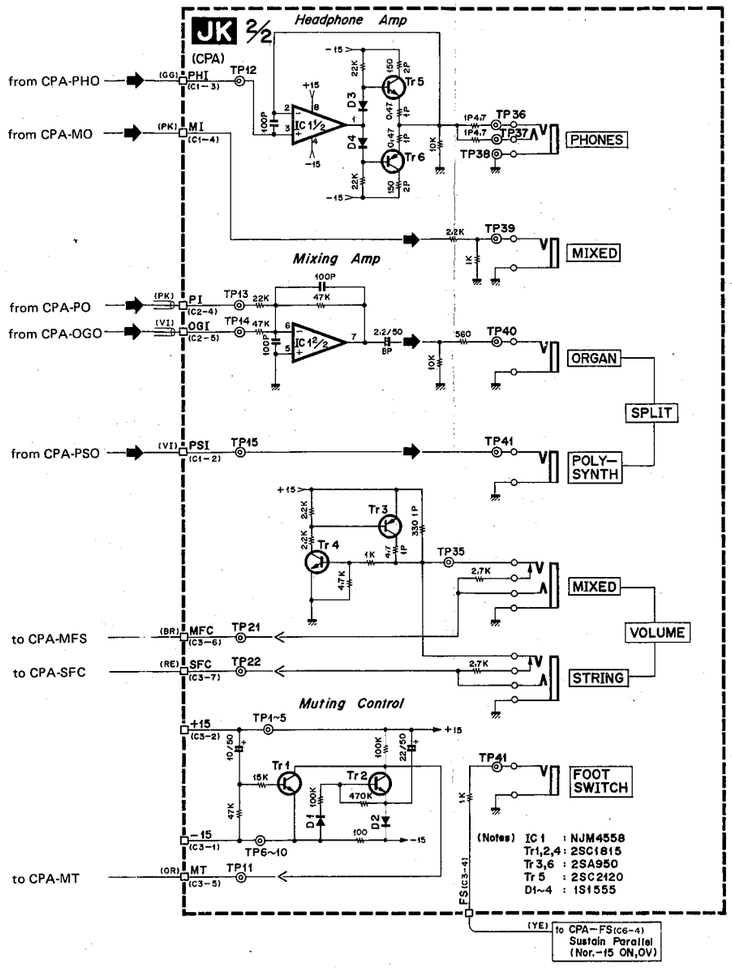
C2

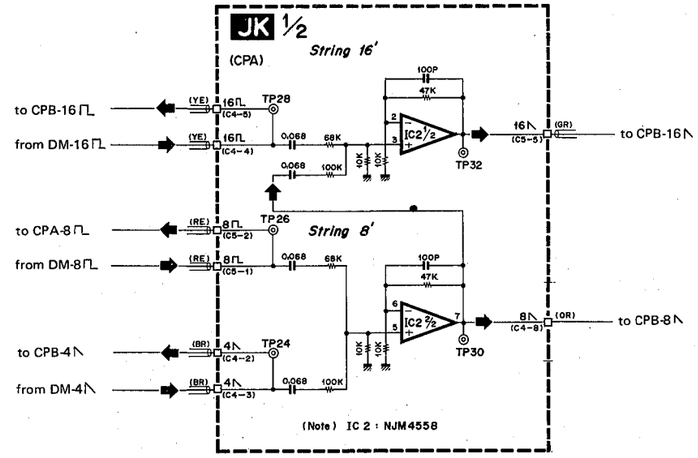
Pin No.	Pin Name	Wire Color	Destination
1	E	BL	DC-E (C2-3)
2	E	BL	DC-E (C2-4)
3	E	S GR S	
4	I	S GR	CPA-TEO (C7-3)
5	I	–	–

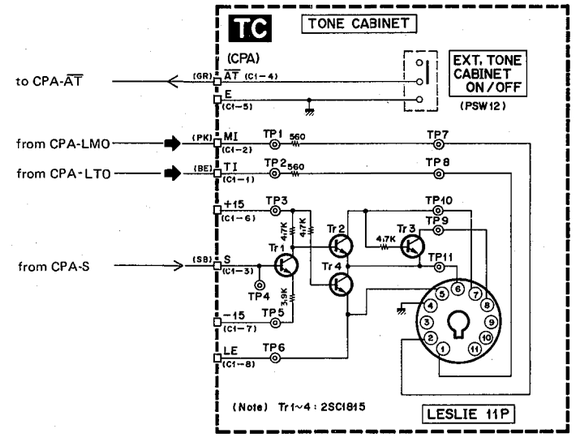
C3

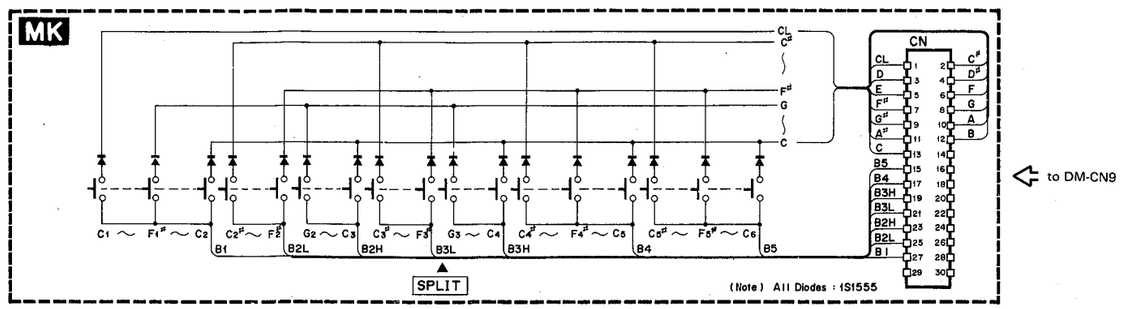
Pin No.	Pin Name	Wire Color	Destination
1	S	SB	CPA-S (C7-7)
2	TE	VI	CPA-TE (C7-5)
3	O	S BE	CPA-TEI (C7-4)
4	E	S BE S	
5	E	–	–

JK · TC · MK Circuit Diagram



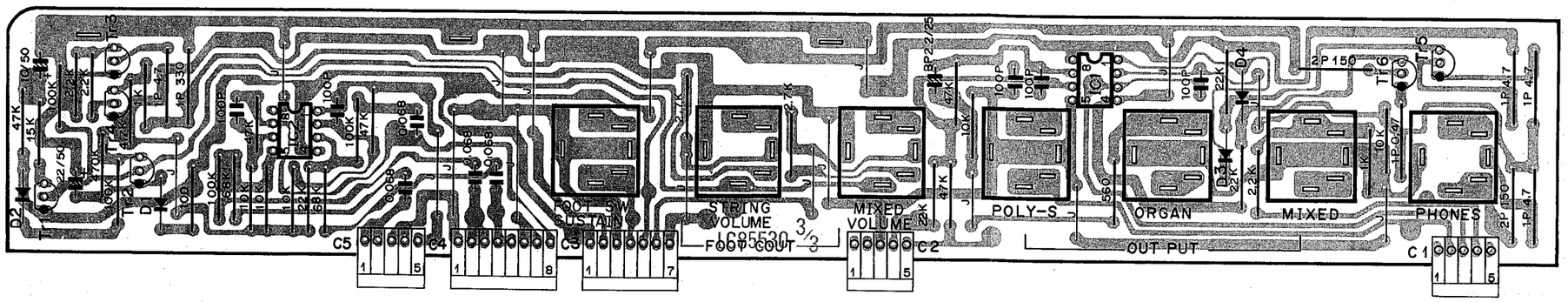






MK KEC-90408-03
JK KEC-90409-06 ⚠
TC KEC-90410-06 ⚠

JK · TC Circuit Board & Wiring



C1

Pin No.	Pin Name	Wire Color	Destination
1	–	–	–
2	PSI	VI	CPA-PSO (C4-3)
3	PHI	GG	CPA-PHO (C4-2)
4	MI	PK	CPA-MO (C4-1)
5	–	–	–

C2

Pin No.	Pin Name	Wire Color	Destination
1	–	–	–
2	–	–	–
3	E	S VI S	
4	PI	S PK	CPA-PO (C1-4)
5	OGI	S VI	CPA-OGO (C1-5)

C3

Pin No.	Pin Name	Wire Color	Destination
1	–15	YE	CPA-–15 (C6-7)
2	+15	BR	CPA-+15 (C6-6)
3	E	BL	CPA-E (C6-5)
4	FS	YE	CPA-FS (C6-4)
5	MT	OR	CPA-MT (C6-2)
6	MFS	BR	CPA-MFS (C6-1)
7	SFC	RE	CPA-SFC (C6-3)

C4

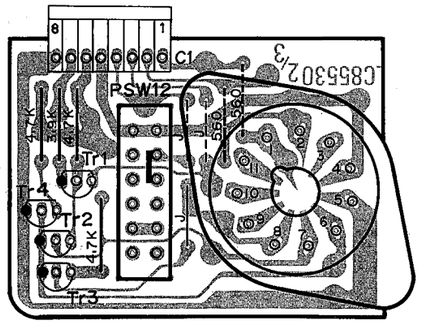
Pin No.	Pin Name	Wire Color	Destination
1	E	S BR S	
2	4 ⎍	S BR	CPB-4⎍ (C3-6)
3	4 ⎍	S BR	DM-4 ⎍ (C6-6)
4	16⎍	S YE	DM-16⎍(C6-10)
5	16⎍	S YE	CPB-16⎍(C3-5)
6	E	S YE S	
7	E	S OR S	
8	8 ⎍	S OR	CPB-8 ⎍ (C3-7)

C5

Pin No.	Pin Name	Wire Color	Destination
1	8⎍	S RE	DM-8⎍(C6-8)
2	8⎍	S RE	CPB-8⎍(C3-9)
3	E	S RE S	
4	E	S GR S	
5	16 ⎍	S GR	CPB-16⎍ (C3-8)

JK Circuit Board

Note)
1. Circuit Board : LC85530 (CPA)
2. Transistor
   Tr1, 2, 4 : 2SC1815
   Tr5 : 2SC2120
   Tr3, 6 : 2SA950
3. IC
   IC1, 2 : NJM4558DV
4. Diode
   D1 ~ 4 : 1S1555



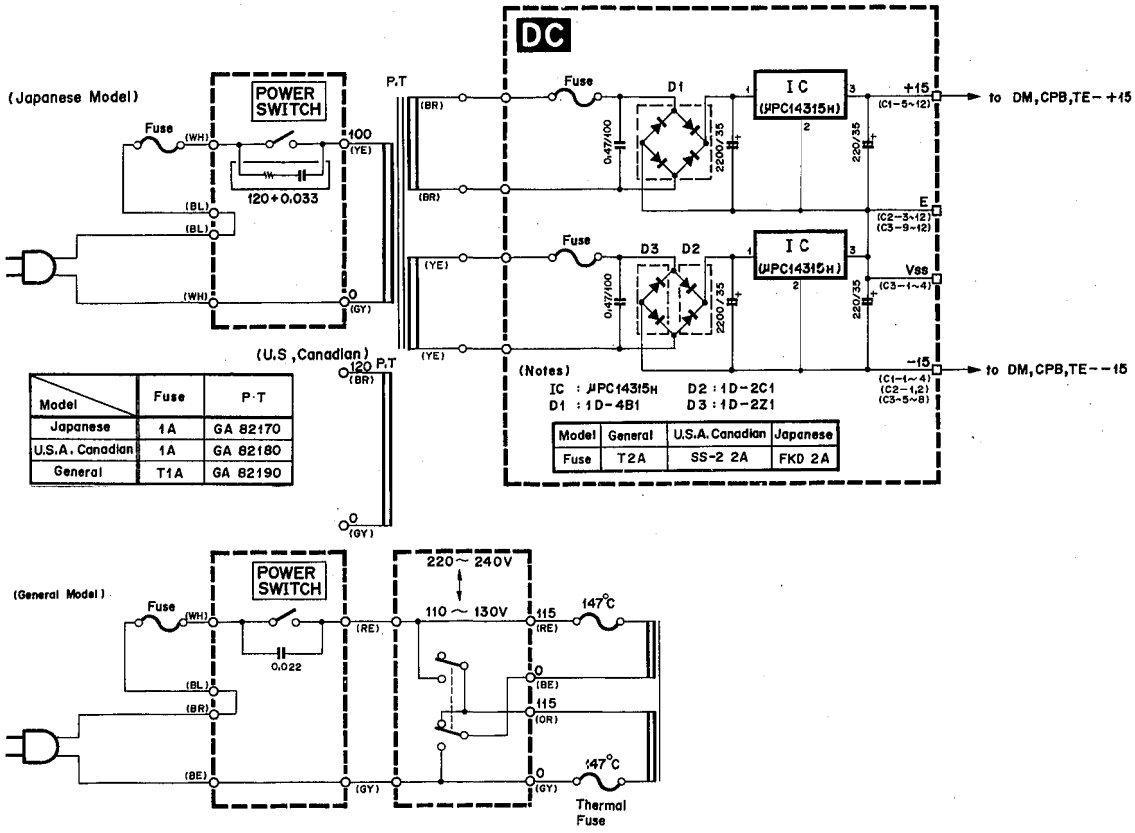
C1

Pin No.	Pin Name	Wire Color	Destination
1	TI	BE	CPA-LTO (C3-7)
2	MI	PK	CPA-LMO (C3-8)
3	S	SB	CPA-S (C3-6)
4	AT	GR	CPA-AT (C3-5)
5	E	BL	CPA-E (C3-4)
6	+15	BR	CPA-+15 (C3-3)
7	–15	YE	CPA-–15 (C3-2)
8	LE	BL	CPA-LE (C3-1)

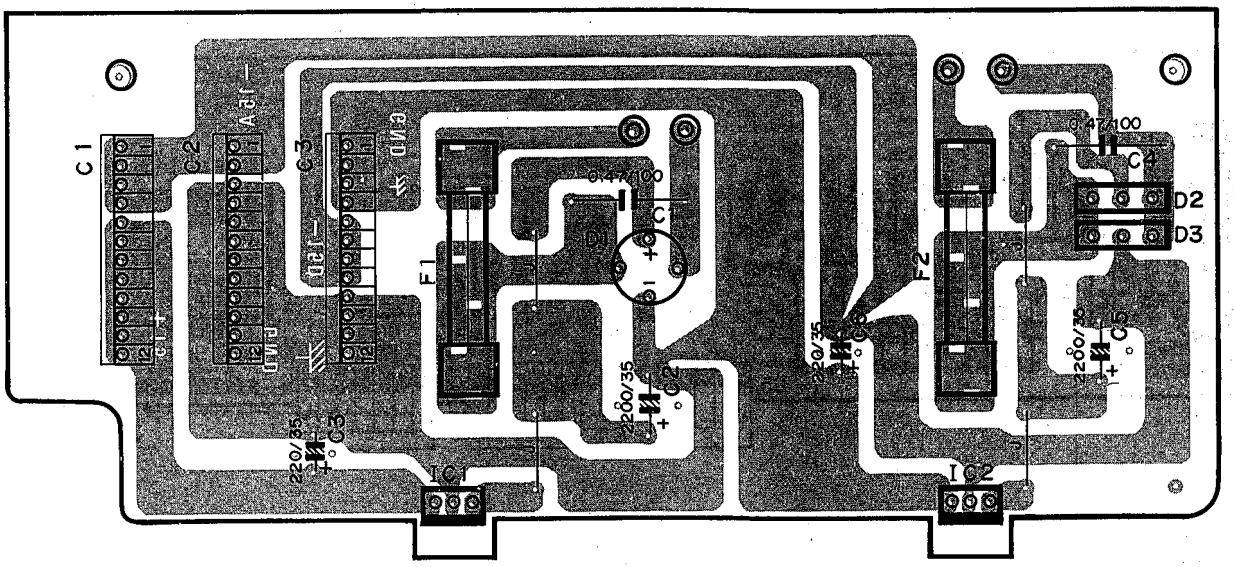
TC Circuit Board

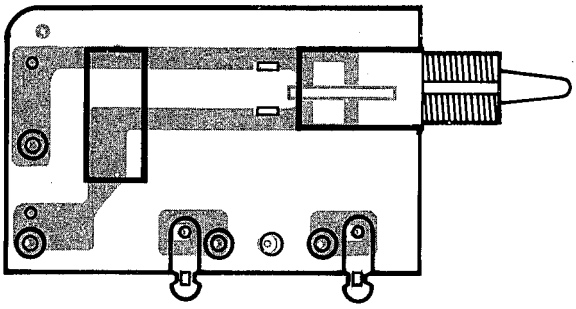
Note)
1. Circuit Board : LC85530 (CPA)
2. Transistor
   Tr1 ~ 4 : 2SC1815

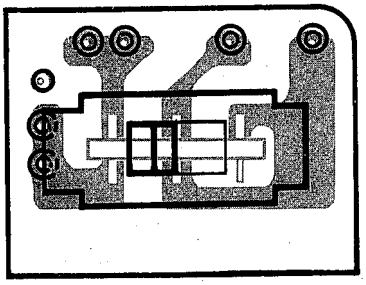
DC Circuit Diagram



DC Circuit Board & Wiring







C1

Pin No.	Pin Name	Wire Color	Destination
1	−15	YE	TE-−15 (C1-6)
2	−15	YE	TE-−15 (C1-7)
3	−15	YE	CPB-−15 (C1-9)
4	−15	YE	CPB-−15 (C6-5)
5	+15	BR	TE-+15 (C1-1)
6	+15	BR	TE-+15 (C1-2)
7	+15	BR	CPB-+15 (C6-2)
8	+15	BR	CPB-+15 (C6-3)
9	+15	BR	DM-+15 (C1-1)
10	+15	BR	DM-+15 (C1-2)
11	+15	–	–
12	+15	–	–

C2

Pin No.	Pin Name	Wire Color	Destination
1	−15	YE	DM-−15 (C6-1)
2	−15	YE	DM-−15 (C6-2)
3	E	BL	TE-E (C2-1)
4	E	BL	TE-E (C2-2)
5	E	BL	CPB-E (C6-6)
6	E	BL	CPB-E (C6-7)
7	E	BL	DM-E (C4-2)
8	E	BL	DM-E (C4-3)
9	E	BL	CPA-LE (C2-7)
10	E	BL	CPA-EC (C5-4)
11	E	BL	CPA-EC (C9-3)
12	E	BL	Chassis

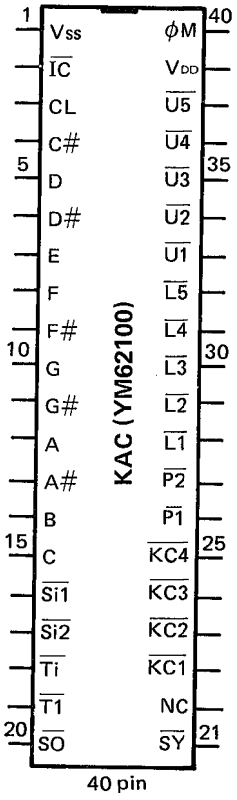
C3

Pin No.	Pin Name	Wire Color	Destination
1	Vss	BL	DM-Vss (C11-5)
2	Vss	BL	DM-Vss (C11-6)
3	Vss	BL	CPB-Vss (C2-3)
4	Vss	BL	CPB-Vss (C2-4)
5	−15D	YE	DM-−15D (C11-1)
6	−15D	YE	DM-−15D (C11-2)
7	−15D	YE	CPB-V_{DD} (C2-5)
8	−15D	YE	CPB-V_{DD} (C2-6)
9	E	BL	MK Earth
10	E	BL	Panel Earth
11	E	BL	Bottom Shield
12	E	–	–

Note)
1. Circuit Board : LC85551
2. IC1, 2 : μPC14315H
3. Diode
   D1 : 1D4B1
   D2 : 1D2C1
   D3 : 1D2Z1

LSI PIN FUNCTIONS

Part Name	YM62100	Function Name	KAC (Key Assigner)

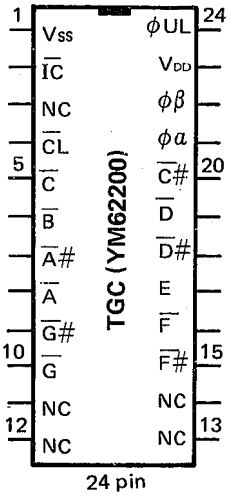


40 pin

Pin No.	Name	Description
1	Vss	Ground (0V)
2	$\overline{IC}$	Initial clear
3	CL	Note block
4	C#	–do.–
5	D	–do.–
6	D#	–do.–
7	E	–do.–
8	F	–do.–
9	F#	–do.–
10	G	–do.–
11	G#	–do.–
12	A	–do.–
13	A#	–do.–
14	B	–do.–
15	C	–do.–
16	$\overline{Si1}$	VDD
17	$\overline{Si2}$	– do. –
18	$\overline{Ti}$	Test pin (–15V)
19	$\overline{T1}$	Test pin (–15V)
20	$\overline{SO}$	VDD

Pin No.	Name	Description
40	ϕM	Master clock in (1MHz)
39	VDD	DC supply (–15V)
38	$\overline{U5}$	UK octave block (C5# ~ C6)
37	$\overline{U4}$	–do.– (C4# ~ C5)
36	$\overline{U3}$	–do.– (C3# ~ C4)
35	$\overline{U2}$	–do.– (C2# ~ C3)
34	$\overline{U1}$	–do.– (C1 ~ C2)
33	$\overline{L5}$	LK octave block (C5# ~ C6)
32	$\overline{L4}$	–do.– (C4# ~ C5)
31	$\overline{L3}$	–do.– (C3# ~ C4)
30	$\overline{L2}$	–do.– (C2# ~ C3)
29	$\overline{L1}$	–do.– (C1 ~ C2)
28	$\overline{P2}$	NC
27	$\overline{P1}$	–do.–
26	$\overline{KC4}$	Key code data out (⇨ GF-1, GOA)
25	$\overline{KC3}$	–do.– (–do.–)
24	$\overline{KC2}$	–do.– (–do.–)
23	$\overline{KC1}$	–do.– (–do.–)
22	NC	–
21	$\overline{SY}$	Synchro data out

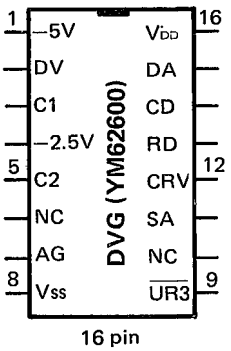
Part Name	YM62200	Function Name	TGC (Tone Generator)



24 pin

Pin No.	Name	Description	Pin No.	Name	Description
1	Vss	Ground (0V)	24	φUL	Master Clock out (1MHz) NC
2	IC	Initial clear	23	VDD	DC supply (−15V)
3	NC	−	22	φβ	Master clock in (2MHz,opposite phase to φα)
4	CL	Tone signal data out (serial data)	21	φa	Master clock in (2MHz)
5	C	−do.−	20	C#	Tone signal data out (serial data)
6	B	−do.−	19	D	−do.−
7	A#	−do.−	18	D#	−do.−
8	A	−do.−	17	E	−do.−
9	G#	−do.−	16	F	−do.−
10	G	−do.−	15	F#	−do.−
11	NC	−	14	NC	−
12	NC	−	13	NC	−

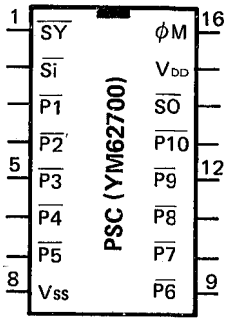
Part Name	YM62600	Function Name	DVG (Delay Vibrato Generator)



16 pin

Pin No.	Name	Description	Pin No.	Name	Description
1	−5V	DC supply for vibrato generator	16	VDD	DC power supply (−15V)
2	DV	Delay vibrato signal out	15	DA	Delay time adjusting
3	C1	Capacitor for delay rise (positive side)	14	CD	Capacitor for delay time setting
4	−2.5	Vibrato signal mid-point potential	13	RD	Resistor for delay time setting
5	C2	Capacitor for delay rise (negative side)	12	CRV	C·R for vibrato oscillation
6	NC	−	11	SA	Vibrato speed adjusting
7	AG	Vibrato signal GND	10	NC	−
8	Vss	Ground (0V)	9	UR3	Key ON signal in ⎍‾30mSec

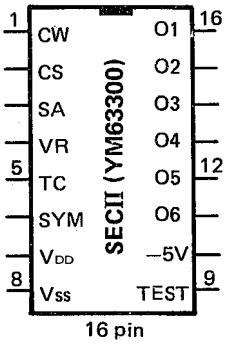
Part Name	YM62700	Function Name	PSC (Parallel-Serial Convertor)



16 pin

Pin No.	Name	Description	Pin No.	Name	Description
1	$\overline{SY}$	Synchro-pulse input (⇐ KAC)	16	φM	Master clock input
2	$\overline{Si}$	Serial data input NC	15	V_{DD}	DC power supply (−15V)
3	$\overline{P1}$	Parallel data input 1	14	$\overline{SO}$	Serial data output (⇦ GF-1, GOA)
4	$\overline{P2}$	−do.− 2	13	$\overline{P10}$	Parallel data input 10
5	$\overline{P3}$	−do.− 3	12	$\overline{P9}$	−do.− 9
6	$\overline{P4}$	−do.− 4	11	$\overline{P8}$	−do.− 8
7	$\overline{P5}$	−do.− 5	10	$\overline{P7}$	−do.− 7
8	Vss	DC power supply (0V)	9	$\overline{P6}$	−do.− 6

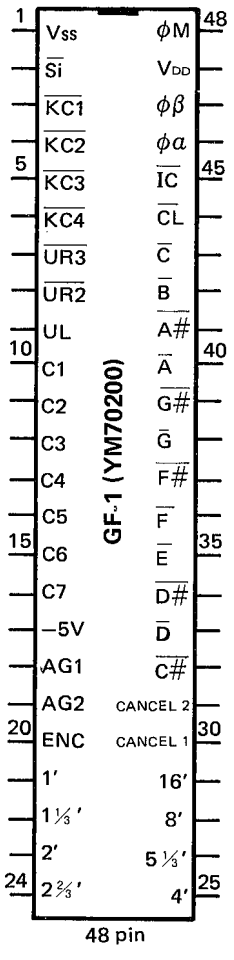
Part Name	YM63300	Function Name	SEC II (Symphonic Ensemble Clock Generator II)



16 pin

Pin No.	Name	Description	Pin No.	Name	Description
1	CW	CR for slow⇄fast time	16	O1	Tremolo Ensemble clock OUT
2	CS	Speed set at fast	15	O2	−do.−
3	SA	Speed set at slow	14	O3	−do.−
4	VR	Tremolo speed set	13	O4	Ensemble clock OUT
5	TC	Slow/Fast change data IN	12	O5	−do.−
6	SYM	Tremolo/Ensemble change data IN	11	O6	−do.−
7	V_{DD}	Power supply (−15V)	10	−5V	Power supply for clock (−5V)
8	Vss	Ground (0V)	9	TEST	Test pin

Part Name	YM70200	Function Name	GF-1 (Generator of Flute – 1)

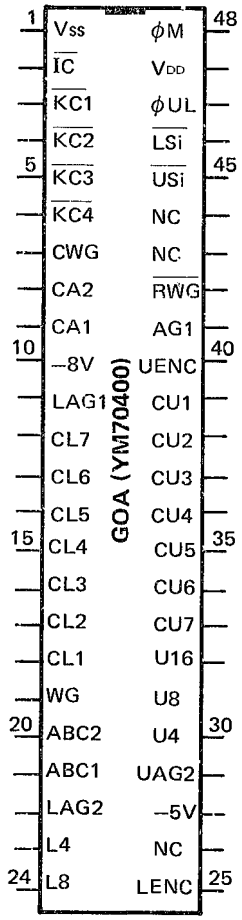


48 pin

Pin No.	Name	Description
1	Vss	Ground (0V)
2	$\overline{Si}$	Serial data in (sustain) (⇦ PSC)
3	$\overline{KC1}$	Key code data in (⇦ KAC)
4	$\overline{KC2}$	–do.–
5	$\overline{KC3}$	–do.–
6	$\overline{KC4}$	–do.–
7	$\overline{UR3}$	Key ON data out NC
8	$\overline{UR2}$	–do.–
9	UL	UK/LK control data in (Vss: LK VDD : UK)
10	C1	Capacitor for ORGAN signal envelope setting
11	C2	–do.–
12	C3	–do.–
13	C4	–do.–
14	C5	–do.–
15	C6	–do.–
16	C7	–do.–
17	–5V	
18	AG1	Envelope GND
19	AG2	Signal GND
20	ENC	Click cancel signal out
21	1'	Signal out (sine wave)
22	1⅓'	–do.–
23	2'	–do.–
24	2⅔'	–do.–

Pin No.	Name	Description
48	ϕM	Master clock in (1MHz)
47	VDD	DC supply (–15V)
46	$\phi\beta$	Master clock in (2MHz,opposite phase to $\phi\alpha$)
45	$\phi\alpha$	Master clock in (2MHz)
44	$\overline{IC}$	Initial clear in
43	$\overline{CL}$	Tone signal data in (serial data ⇦TGC)
42	$\overline{C}$	–do.–
41	$\overline{B}$	–do.–
40	$\overline{A\#}$	–do.–
39	$\overline{A}$	–do.–
38	$\overline{G\#}$	–do.–
37	$\overline{G}$	–do.–
36	$\overline{F\#}$	–do.–
35	$\overline{F}$	–do.–
34	$\overline{E}$	–do.–
33	$\overline{D\#}$	–do.–
32	$\overline{D}$	–do.–
31	$\overline{C\#}$	–do.–
30	CANCEL 2	
29	CANCEL 1	NC
28	16'	Signal out (sine wave)
27	8'	–do.–
26	5⅓'	–do.–
25	4'	–do.–

Part Name	YM70400	Function Name	GOA (Generator of Orchestra & ABC)



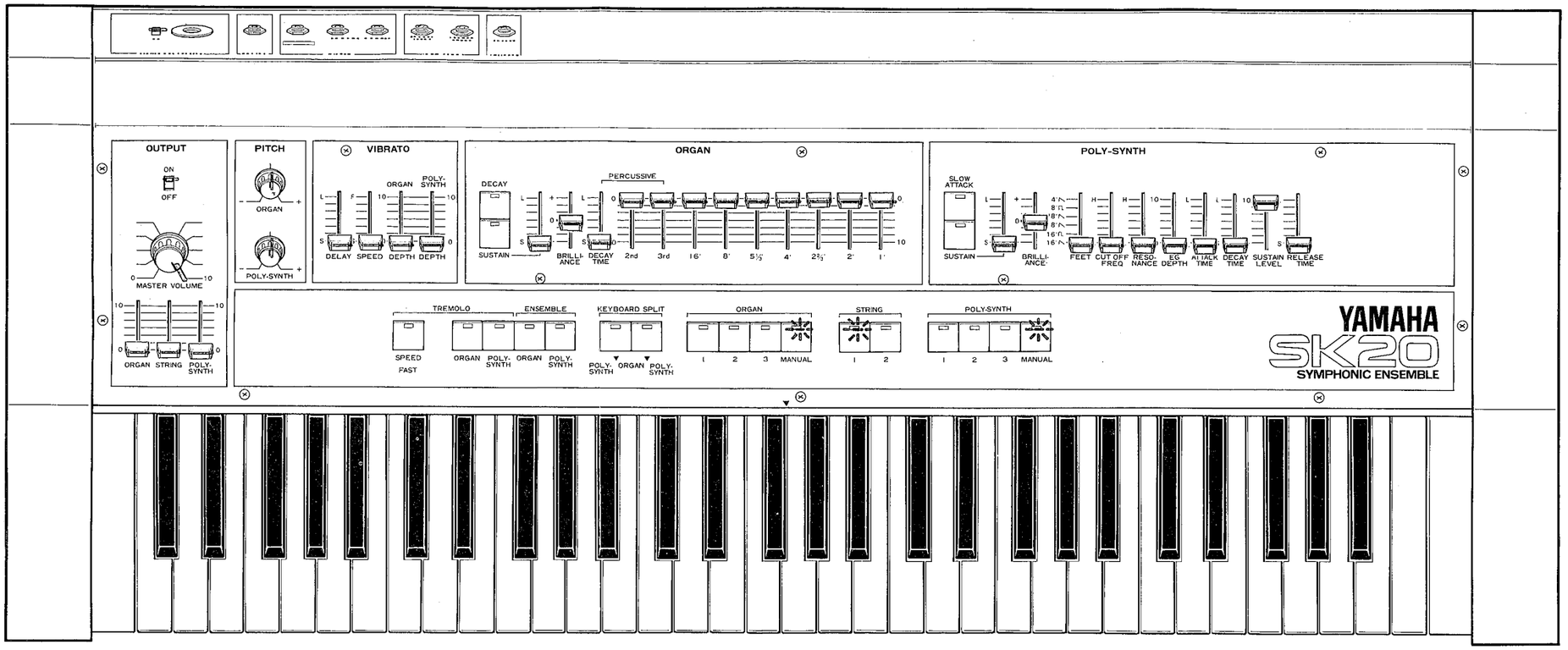
48 pin

Pin No.	Name	Description
1	Vss	Ground (0V)
2	$\overline{IC}$	Initial clear
3	$\overline{KC1}$	Key code data in
4	$\overline{KC2}$	—do.—
5	$\overline{KC3}$	—do.—
6	$\overline{KC4}$	—do.—
7	CWG	NC
8	CA2	—do.—
9	CA1	—do.—
10	−8V	—do.—
11	LAG1	—do.—
12	CL7	—do.—
13	CL6	—do.—
14	CL5	—do.—
15	CL4	—do.—
16	CL3	—do.—
17	CL2	—do.—
18	CL1	—do.—
19	WG	—do.—
20	ABC2	—do.—
21	ABC1	—do.—
22	LAG2	—do.—
23	L4	—do.—
24	L8	—do.—

Pin No.	Name	Description
48	ϕM	Master clock in
47	VDD	DC power supply (−15V)
46	ϕUL	Master clock in (tone generator)
45	$\overline{LSi}$	NC
44	$\overline{USi}$	Serial data in (sustain, slow AT) (⇦PSC)
43	NC	NC
42	NC	—do.—
41	$\overline{RWG}$	—do.—
40	AG1	Ground envelope
39	UENC	Click cancel signal OUT
38	CU1	Capacitor of POLY-SYNTH signal envelope setting
37	CU2	—do.—
36	CU3	—do.—
35	CU4	—do.—
34	CU5	—do.—
33	CU6	—do.—
32	CU7	—do.—
31	U16	Signal OUT 16′ ⊓⊔ 1 : 1
30	U8	—do.— 8′ ⊓⊔ 1 : 1
29	U4	—do.— 4′ ⩘
28	UAG2	Ground (tone generator)
27	−5V	DC supply (−5V, tone generator)
26	NC	NC
25	LENC	—do.—

MEMO

PANEL SETTING



BLOCK	CONTROL	SETTING
OUTPUT	LINE OUTION/OFF	ON
	MASTER VOLUME	MAX (10)
	ORGAN VOLUME	MIN (O)
	STRING VOLUME	MIN (O)
	POLY-SYNTH VOLUME	MIN (O)

BLOCK	CONTROL	SETTING
VIBRATO	DELAY	SHORT (S)
	SPEED	SLOW (S)
	DEPTH	
	ORGAN	0
	POLY-SYNTH	0

BLOCK	CONTROL	SETTING
PITCH	ORGAN	CENTER
	POLY-SYNTH	CENTER

BLOCK	CONTROL	SETTING
ORGAN	DECAY SW	OFF (LED OFF)
	SUSTAIN SW	OFF (LED OFF)
	SUSTAIN レバー	SHORT (S)
	BRILLIANCE	CENTOR (O)
	PERCUSSIVE	
	DECAY TIME	SHORT (S)
	2nd	0
	3rd	0
	16′	0
	8′	0
	5⅓′	0
	4′	0
	2⅔′	0
	2′	0
	1′	0

BLOCK	CONTROL	SETTING
PANEL SWITCH	TREMOLO	
	SPEED	OFF
	ORGAN	OFF
	POLY-SYNTH	OFF
	ENSEMBLE	
	ORGAN	OFF
	POLY-SYNTH	OFF
	KEYBOARD	
	SPLIT 1	OFF
	2	OFF
	ORGAN 1	OFF
	2	OFF
	3	OFF
	MANUAL	ON (LED ON)
	STRING 1	ON (LED ON)
	2	OFF
	POLY-SYNTH	
	1	OFF
	2	OFF
	3	OFF
	MANUAL	ON (LED ON)

BLOCK	CONTROL	SETTING
POLY-SYNTH	SLOW ATTACK SW	OFF (LED OFF)
	SUSTAIN SW	OFF (LED OFF)
	SUSTAIN レバー	SHORT (S)
	BRILLIANCE	CENTER (O)
	FEET SW	16′
	CUT OFF FREQUENCY	LOW (L)
	RESONANCE	LOW (L)
	EG DEPTH	0
	ATTACK TIME	SHORT (S)
	DECAY TIME	SHORT (S)
	SUSTAIN LEVEL	MAX (10)
	RELEASE TIME	0

BLOCK	CONTROL	SETTING
REAR PANEL	EXT TONE CABINET ON/OFF	OFF

CHECKS AND ADJUSTMENTS

Before checking or making any adjustment, you must first set-up the panel as shown on page 39, then change panel setting as required to make each adjustment.

Equipment Required

Oscilloscope
AC Voltmeter
Frequency counter
Digital voltmeter

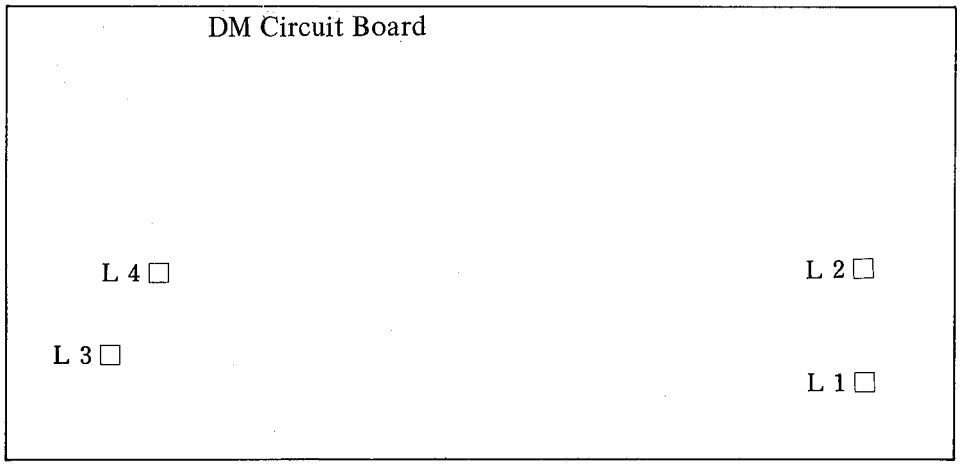
Circuit Locations

Circuit Board	Circuit
DM	Initial clear circuit Master clock generator 2-phase clock generator −5V power supply Trigger detector Wave generator Sound source filter Click canceller
CPA	Switch memory (TREMOLO/ENSEMBLE / KEYBOARD SPLIT) Serial data generator −5V power supply Pitch & vibrato circuit Percussive circuit Brilliance circuit ORGAN Volume Circuit POLY-SYNTH Volume Circuit STRING Volume Circuit OUTPUT amplifier and EXP circuit Headphone amplifier Organ buffer Sawtooth wave generator +15V protection circuit Muting circuit Leslie speaker control circuit

Circuit Board	Circuit
CPB	Switch memory Serial data generator Organ mixer String filter VCF circuit Envelope generator POLY-SYNTH-preset circuit POLY-SYNTH manual control circuit Brilliance circuit
TE	Input LPF circuit Modulating LFO generator BBD clock oscillator BBD circuit Output LPF circuit Amplitude modulator

1. Tuning

Item	Setting	Test point	Adjustment & reading
STRING/POLY-SYNTH	Set the STRING volume control in the OUTPUT Section to MAXIMUM. Set the String 2 Preset by pushing the appropriate STRING Preset button	Connect a tuning device to MIXED OUTPUT.	Depressing A3 Key, adjust L1 on DM board to tune A3 to pitch (440Hz) ± 1 cent
ORGAN	Set the ORGAN Volume control in the OUTPUT Section to MAXIMUM. Set the ORGAN 2 Preset by pushing the appropriate ORGAN Preset button.	Connect a tuning device to MIXED OUTPUT.	Depressing A3 Key, adjust L3 on DM board to tune A3 to pitch (440Hz) ± 1 cent



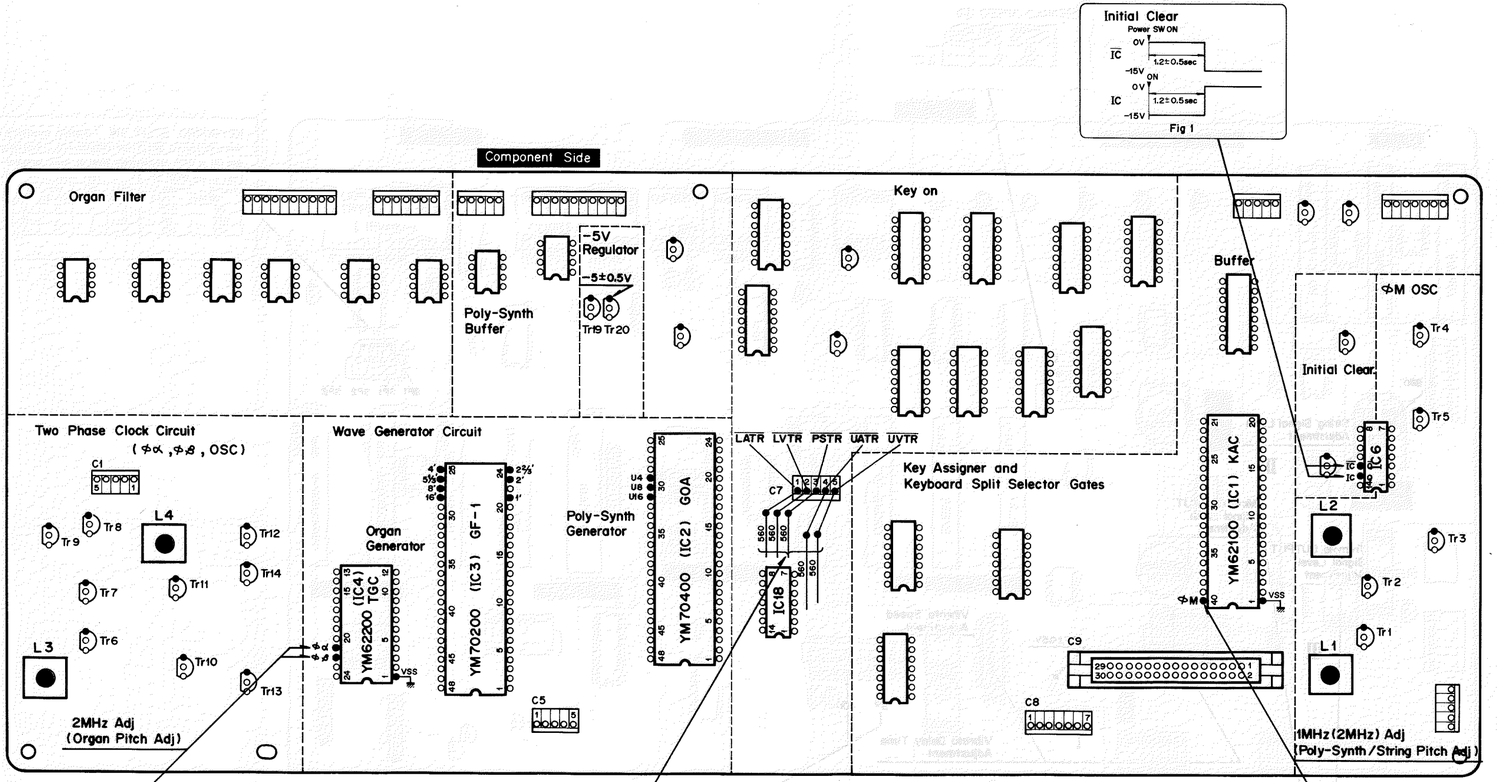
Keyboard side

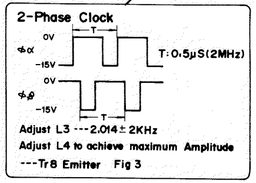
2. Adjustment of Circuit Boards

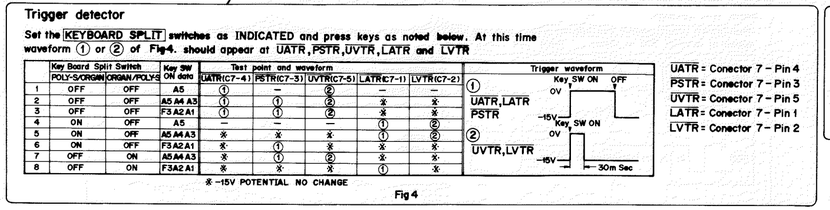
DM Circuit Board

Item	Setting	Test point	Adjustment & reading	Remark
Checking KEY-BOARD SPLIT	KEYBOARD SPLIT SWITCH Set POLY-SYNTH/ORGAN and ORGAN/POLY-SYNTH switches OFF.	IC3-pin 27	Output should correspond to a key of C1 to C6.	
		IC2-pin 30	Output should correspond to a key of C1 to C6.	
	Set POLY-SYNTH/ORGAN switches ON.	IC3-pin 27	Output should correspond to a key of G3 to C6.	
		IC2-pin 30	Output should correspond to a key of C1 to F3#.	
	Set ORGAN/POLY-SYNTH switches ON.	IC3-pin 27	Output should correspond to a key of C1 to F3#.	
		IC2-pin 30	Output should correspond to a key of G3 to C6.	
Wave Generator Circuit Board	ORGAN: Set DECAY and SUSTAIN switches OFF. POLY-SYNTH: Set SLOW ATTACK and SUSTAIN switches OFF. KEYBOARD: Set SPLIT switches OFF. Depress A3 key.	Each output pin of IC3 (GF-1) Each output pin of IC2 (GOA)	When A3 key is depressed the wave form and level of each output signal of IC3 and IC2 should be as noted below.	

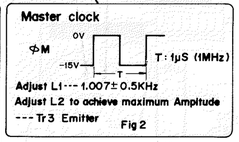
Test point	Level	Signals	Frequency
1′ (IC3-pin 21)	120 ± 30mVp-p	Sine wave	3744 ± 6
2′ (IC3-pin 23)			1772 ± 3
2 (IC3-pin 24)			1328 ± 3
4′ (IC3-pin 25)			886 ± 2
5 (IC3-pin 26)			664 ± 2
8′ (IC3-pin 27)			443 ± 2
16′ (IC3-pin 28)			221.5 ± 1
U 4′ (IC2-pin 29)	120 ± 30mVp-p	Sawtooth wave	886 ± 2
U 8′ (IC2-pin 30)		Square wave	443 ± 1
U16′ (IC2-pin 31)		(1 : 1)	221.5 ± 1

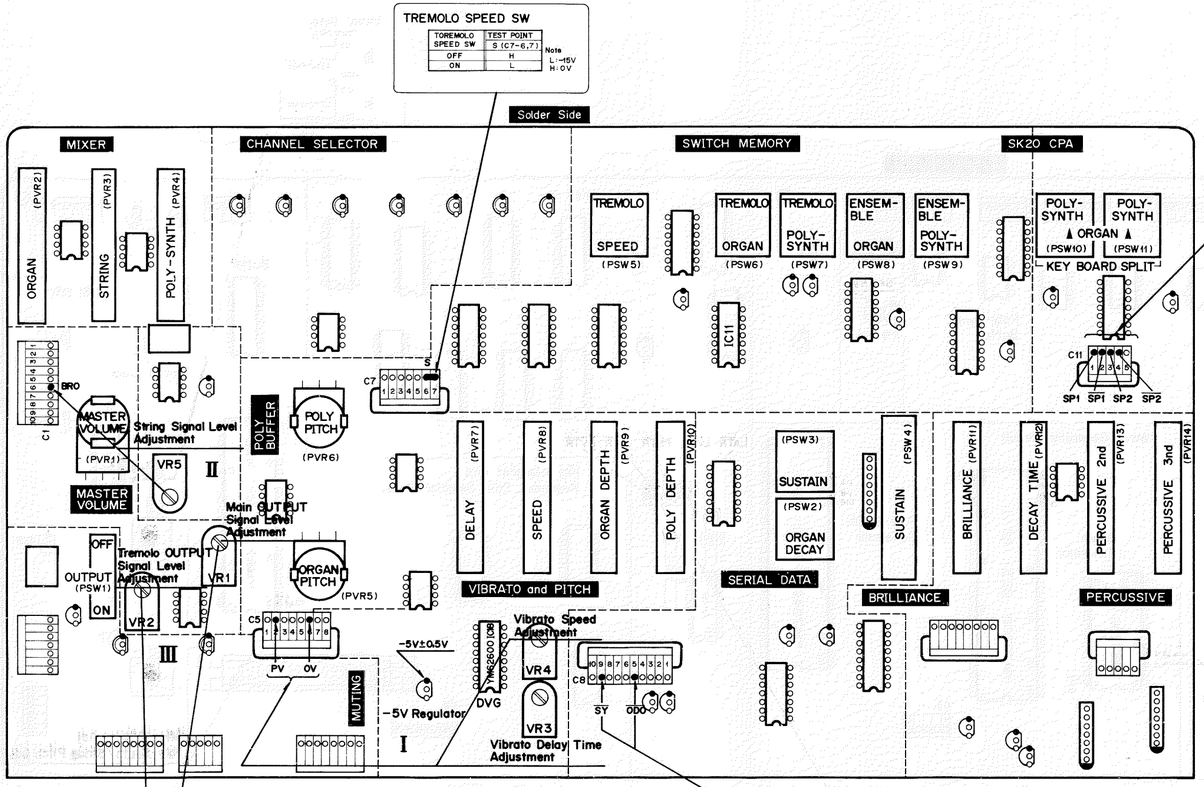




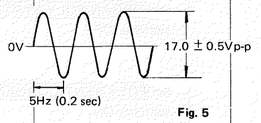
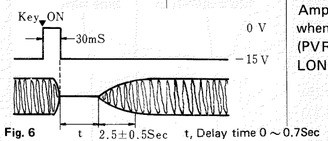


	Key Board Split Switch		Key SW ON data	Test point and waveform				
	POLY-S/ORGAN	ORGAN/POLYS		UATR(C7-4)	PSTR(C7-3)	UVTR(C7-5)	LATR(C7-1)	LVTR(C7-2)
1	OFF	OFF	A5	①	–	②	–	–
2	OFF	OFF	A5 A4 A3	①	①	②	*	*
3	OFF	OFF	F3 A2 A1	①	①	②	*	*
4	ON	OFF	A5	–	–	–	①	②
5	ON	OFF	A5 A4 A3	*	*	*	①	②
6	ON	OFF	F3 A2 A1	*	①	*	*	*
7	OFF	ON	A5 A4 A3	*	①	②	*	*
8	OFF	ON	F3 A2 A1	*	*	*	①	*



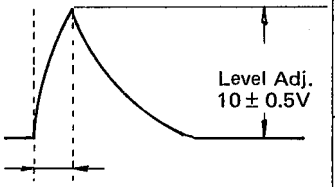


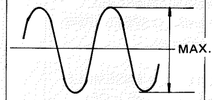
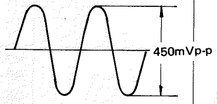
CPA Circuit Board

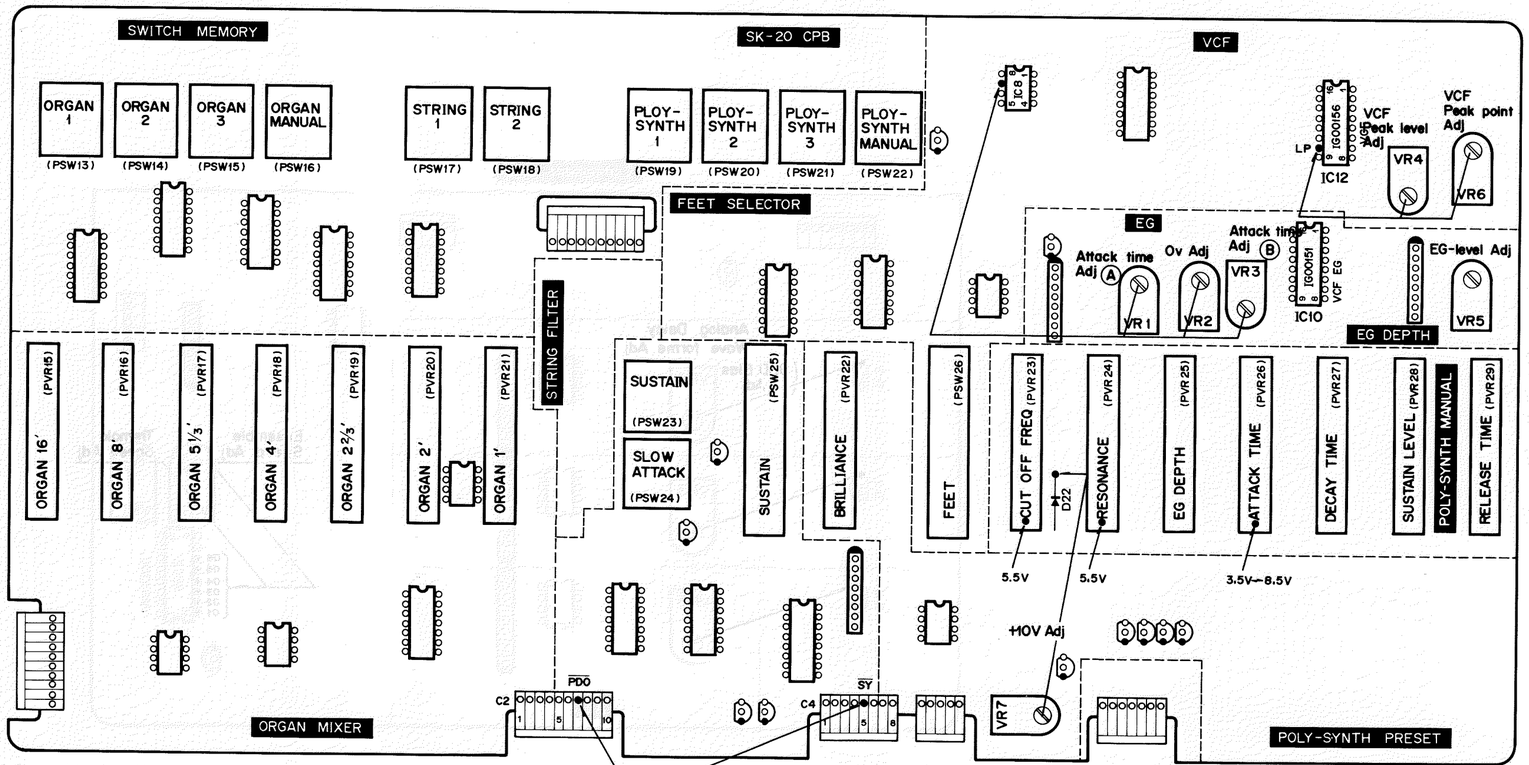
	Item	Setting	Test point	Adjustment & reading	Where to adjust
I	**Vibrato Speed Adjustment**	Turn ORGAN PITCH (PVR5) fully counterclockwise. Turn POLY-SYNTH PITCH (PVR6) fully counterclockwise. Set VIBRATO DELAY (PVR7) to SHORT. Set VIBRATO SPEED (PVR8) to SLOW. Set ORGAN DEPTH (PVR9) to 10. Set POLY DEPTH (PVR10) to 10.	OV terminal (PV) OV terminal (C5-6) PV terminal (C5-2)	 Fig. 5 17.0 ± 0.5Vp-p Adjust frequency with VR4 to obtain a sine wave of 5Hz. When VIBRATO SPEED (PVR8) is set to the FAST position frequency should be equal to 7.0 ± 0.5Hz.	VR4
	Vibrato Delay Time Adjustment	Set VIBRATO DELAY (PVR7) to LONG. Reset VIBRATO DELAY (PVR7) to SHORT.		When a key is depressed the envelope shown in Fig. 6 should be obtained. As VIBRATO DELAY (PVR7) is turned toward the SHORT position the delay time "t" should become shorter simultaneously. Amplitude should be fixed when VIBRATO DELAY (PVR7) is varied from LONG to SHORT.  Fig. 6	VR3
	Organ and Poly-Synth Pitch Checks	Set ORGAN DEPTH (PVR9) to 0. Set POLY DEPTH (PVR10) to 0. Turn ORGAN PITCH (PVR5) fully clockwise. Turn POLY PITCH (PVR6) fully clockwise.	OV terminal (C5-6) PV terminal (C5-2) OV terminal PV terminal	Terminals PV and OV should be at 0 ± 0.2V. 10.4 ± 0.2V 10.4 ± 0.2V	

	Item	Setting	Test point	Adjustment & reading	Where to adjust	Remark
II	**String Volume Circuit**	Set STRING 1 (PSW17) switch ON. Set STRING VOLUME (PVR3) to 10 Depress A3 Key.	BRO terminal (C1-6)	Adjust VR5 to obtain an output of 400mVp-p.	VR5	
III	**OUTPUT Amplifier**	Set ORGAN VOLUME (PVR2) to 10. Set ORGAN TONE levers 16', 8', 5 1/3', 4', 2 2/3', 2', and 1' to 10 (maximum). In this setting, turn on EXT TONE CABINET (PSW12) and TREMOLO ORGAN switches.	EXT TONE CABI Connector Pin 2 EXT Connector Pin 1	Simultaneously depress Keys C3, D3, E3, F3, G3, A3 and B3 then adjust VR1 to obtain a 0dB ± 1dB reading. Adjust VR2 to obtain a 0dB ± 1dB reading At this time, the output Level at the MIXED OUT jack should be at −10dB ± 3dB.	VR1 VR2	

CPB Circuit Board

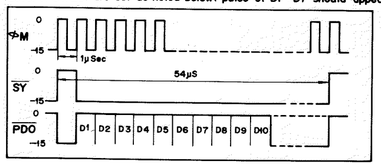
Item	Setting	Test point	Adjustment & reading	Where to adjust	Remark
POLY-SYNTH VCF-EG Circuit	Turn on [POLY-SYNTH MANUAL] (PSW22) Switch. [EG DEPTH] ..... "10" [DECAY TIME] ..... "S" [SUSTAIN LEVEL] "0" [RELEASE TIME] ... "S"				
Offset Adj.	Connect a voltmeter from terminal 2 of [ATTACK TIME] control to ground. Set [ATTACK TIME] control (PVR26) for a voltage of +8.5 V at terminal 2 of the control.	IC8-pin7	Adjust VR2 so that voltage is 0V.	VR2	
Level Adj.	Depress any one of the keys.	IC8-pin7	Adjust VR5 so that level is 10V as shown below.  	VR5	
ATTACK TIME Adj. Ⓐ	Connect a voltmeter from terminal 2 of [ATTACK TIME] control to ground. Set [ATTACK TIME] control (PVR26) for a voltage of +8.5V at terminal 2 of the control. Depress any one of the keys.	IC8-pin7	Ⓐ ATTACK TIME Adj.: 12msec. Ⓑ ATTACK TIME Adj.: 375msec. Adjust VR1 so that the attack time is 12msec. as shown.	VR1	
ATTACK TIME Adj. Ⓑ	Connect a voltmenter from terminal 2 of [ATTACK TIME] control to ground. Set [ATTACK TIME] control (PVR26) for a voltage of +3.5 V at terminal 2 of the control. Depress any one of the keys.	IC8-pin7	Adjust VR3 so that the attack time is 375msec. as shown. Make adjustments Ⓐ and Ⓑ repeatedly until the specified attack time is met. Note: Both VR1 and VR3 affects [ATTACK TIME] adjustment. If the attack time is longer than 375msec., adjust VR3 so that the attack time is slightly longer. If shorter, adjust VR3 so that the attack time is slightly shorter.	VR3	

Item	Setting	Test point	Adjustment & reading	Where to adjust	Remark
VCF Circuit	Turn on POLY-SYNTH MANUAL (PSW22) switch. Select 8'\ FEET switch (PSW26). EG DEPTH ..... "0" Connet a voltmeter from terminal 2 of CUTOFF FREQUENCY control to ground. Set CUTOFF FREQUENCY control (PVR23) for a voltage of +5.5V at terminal 2 of the control. Connect a voltmeter from terminal 2 of RESONANCE control to ground. Set RESONANCE control (PVR24) for a voltage of +5.5V at terminal 2 of the control.		Peak Point Adj. 		
Peak Point Adj.	Depress C5 key.	IC12 ..... Pin10 (LP terminal)	Adjust VR6 so that maximum amplitude is obtained.	VR6	
Peak Level Adj.	Depress C5 key.	IC12 ..... Pin10 (LP terminal)	Peak Level Adj.  Adjust VR4 so that amplitude is 450mVp-p.	VR4	



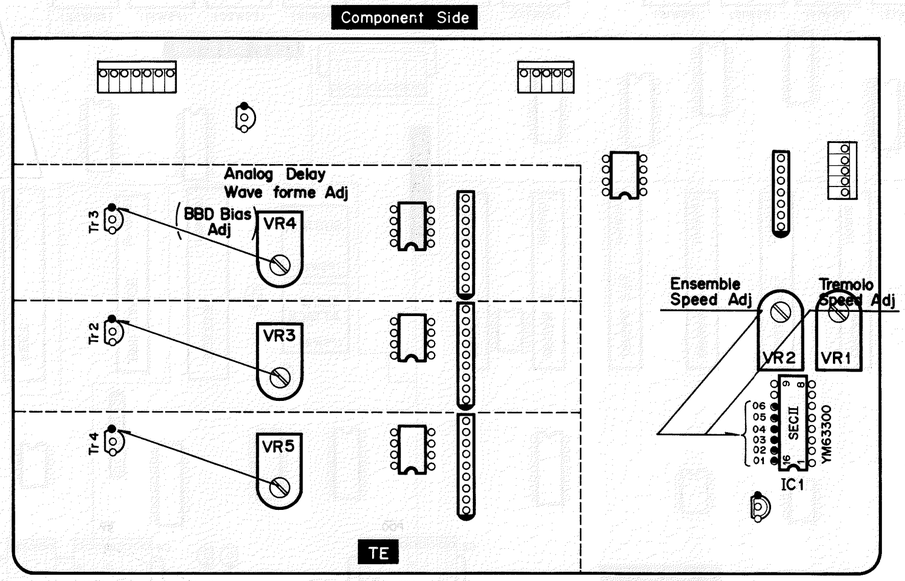
Serial data generator

When SLOW ATTACK (PSW24), POLY-SYNTH SUSTAIN (PSW23) and POLY-SYNTH SUSTAIN Lever (PSW25) are set as noted below, pulse of D1~D7 should appear at PDO terminal.



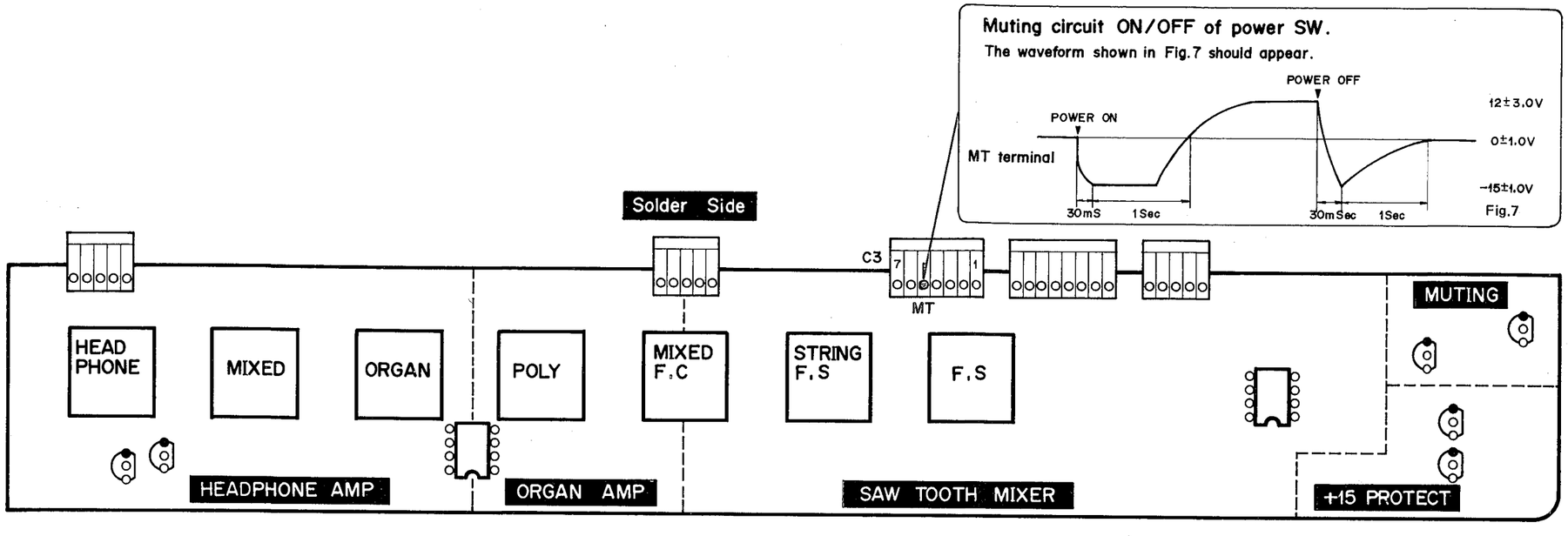
SWITCH	POSITION	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	5354
POLY-SYNTH SUSTAIN (PSW23)	LED ON	–	L	–	H	–	–	–	–	–	–	
	LED OFF	–	H	–	H	–	–	–	–	–	–	
SLOW ATTACK (PSW24)	LED ON	H	–	–	H	–	–	–	–	–	–	
	LED OFF	L	–	–	H	–	–	–	–	–	–	
POLY-SYNTH SUSTAIN LEVER (PSW25)	SHORT	–	–	–	H	L	L	H	–	–	–	
		–	–	–	H	H	L	H	–	–	–	
		–	–	–	H	L	H	H	–	–	–	
		–	–	–	H	H	H	H	–	–	–	
		–	–	–	H	L	H	L	–	–	–	
		–	–	–	H	H	L	L	–	–	–	
	LONG	–	–	–	H	L	L	L	–	–	–	

Note = L: –15V H: 0V



TE Circuit Board

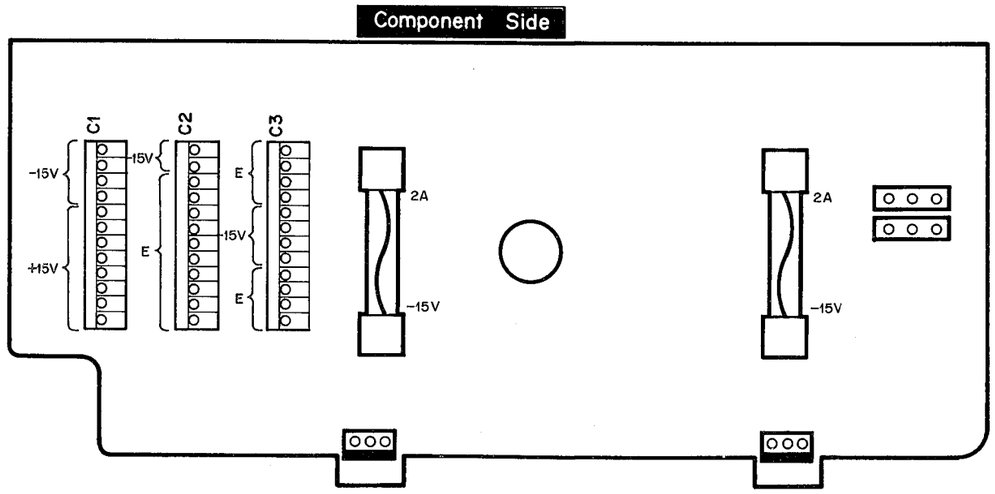
Item	Setting	Test point	Adjustment & reading	Where to adjust	Remark
Ensemble Speed Adjustment	Turn on ENSEMBLE ORGAN switch (PSW8).	O1 (IC1- pin 16) O2 (IC1- pin 15) O3 (IC1- pin 14)	The waveforms shown in Fig. 11 should appear at O1, O2, O3 (IC1) Terminal. Fig. 11	VR2	
		O4 (IC1-pin 13) O5 (IC1- pin 12) O6 (IC1- pin 11)			
Tremolo Speed Adjustment	Turn on TREMOLO ORGAN (PSW6) and TREMOLO SPEED (PSW 5) switches. NOTE: The ENSEMBLE ORGAN switch is OFF.	O1 (IC1- pin 16)	The waveform shown in Fig. 10 should appear at O1, O2, O3. At this time adjust VR1 so that the frequency is 6.4 ± 0.1Hz. Fig. 10	VR1	
		O2 (IC1- pin 15) O3 (IC1- pin 14)			
		O4 (IC1- pin 13) O5 (IC1- pin 12) O6 (IC1- pin 11)	Check for a DC voltage of −2.5V.		
BBD Circuit	Connect pin 9 (TEST-Terminal) of IC1 to −15V. Set ORGAN VOLUME (PVR2) to 10. Set ORGAN TONE levers 8' to 10 (Maximum).	Tr2-E Tr3-E Tr4-E	Adjust VR3, VR4,and VR5 for the best achievable sine wave.	VR3 VR4 VR5	



Muting circuit ON/OFF of power SW.

The waveform shown in Fig.7 should appear.

Fig.7



3. Timbre and envelope waveforms of ORGAN

All ORGAN TONE VOLUME 16′ ~ 1′ : max (10)
ORGAN VOLUME : max. (10)
A3 Key DEPRESSED
Test point : MIXED OUT jack

1. SUSTAIN switch ON

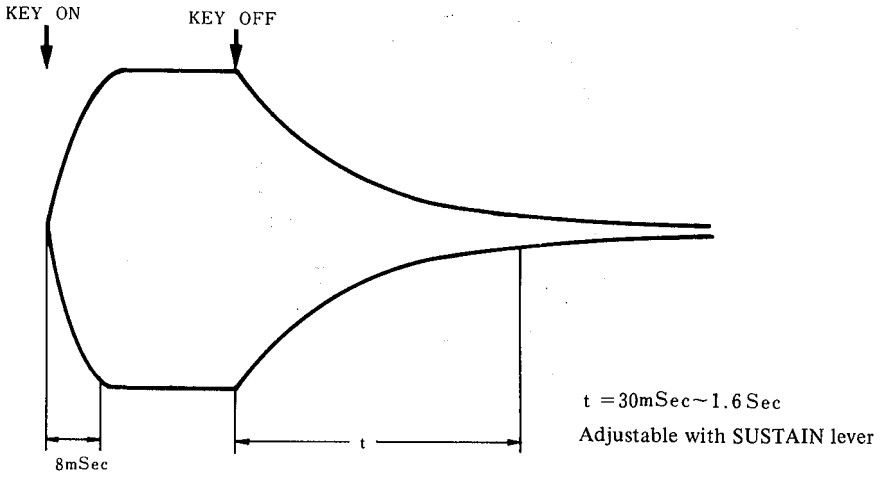


Fig. 12

2–1. ORGAN DECAY switch ON (When key is hold down)

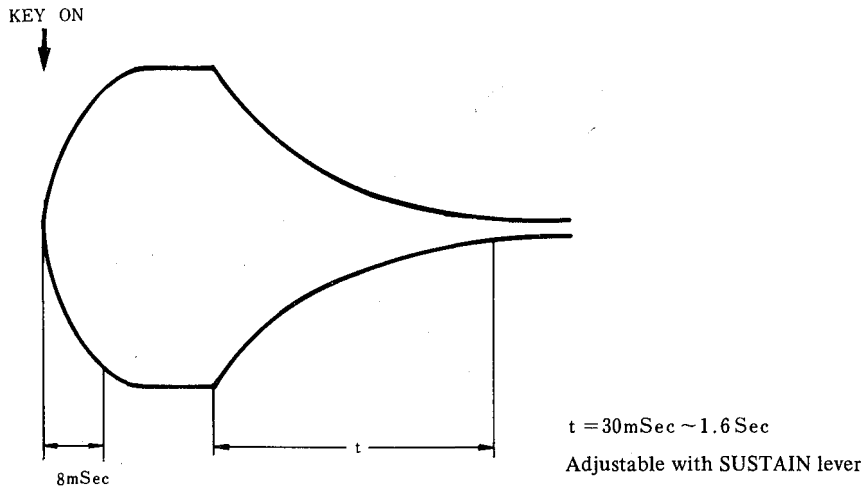


Fig. 13

2–2. ORGAN DECAY switch ON (When a key is released)

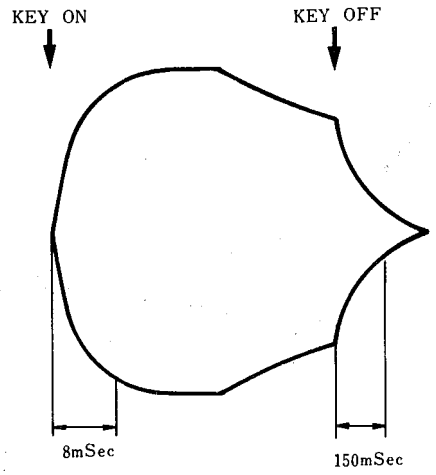
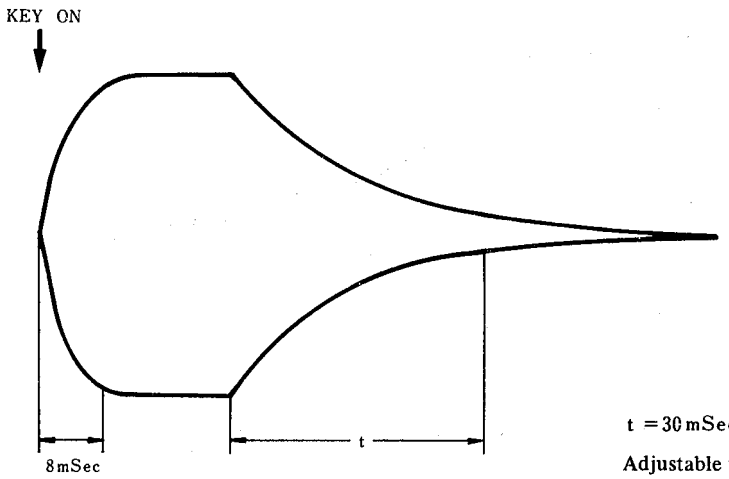


Fig. 14

3. Both SUSTAIN and ORGAN DECAY switches ON (When key is hold down)



t = 30 mSec ~ 1.6 Sec
Adjustable with SUSTAIN lever

Fig. 15

4–1. DECAY TIME SHORT with PERCUSSIVE 2nd and 3rd levers set at maximum

Fig. 16

4–2. DECAY time long with PERCUSSIVE 2nd and 3rd levers set at maximum

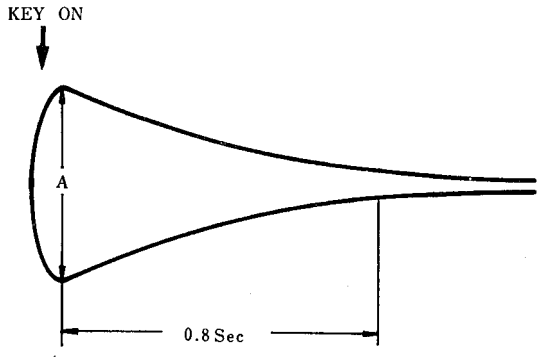


Fig. 17

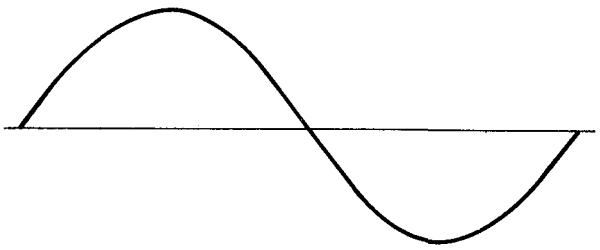
* The timbre and note should be 4′ at 2nd and 2 2/3′ at 3rd.

Timbre waveforms and levels of ORGAN

* Each timbre wave form is generated when depressing the A3 key.
ORGAN VOLUME and each of timbre lever are set at 10 (maximum).

Level difference : ± 3dB Test point : MIXED OUT jack

ORGAN 16′

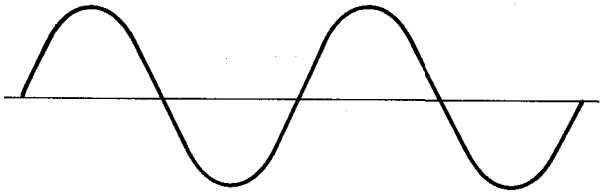


KEY	C_1	C_2	C_3	C_4	C_5	C_6
LEVEL	−23	−23	−29	−30	−33	−38

[dB]

Fig. 18

ORGAN 8′

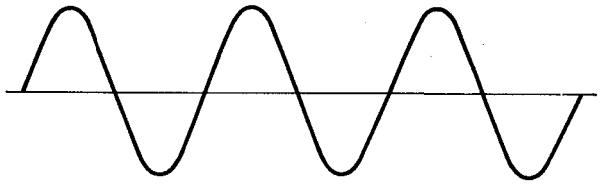


KEY	C_1	C_2	C_3	C_4	C_5	C_6
LEVEL	−26	−24	−25	−29	−32	−36

[dB]

Fig. 19

ORGAN 5⅓′

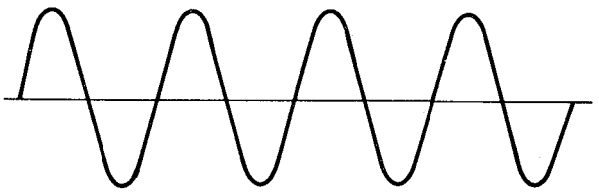


KEY	C_1	C_2	C_3	C_4	C_5	C_6
LEVEL	−24	−23	−26	−30	−33	−40

[dB]

Fig. 20

ORGAN 4′

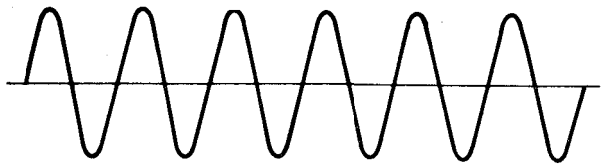


KEY	C_1	C_2	C_3	C_4	C_5	C_6
LEVEL	−23	−23	−25	−30	−34	−37

[dB]

Fig. 21

ORGAN 2⅔′

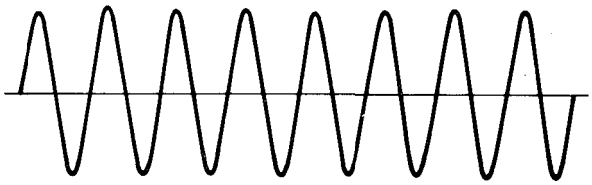


KEY	C1	C2	C3	C4	C5	C6
LEVEL	−22	−23	−27	−31	−35	−43

[dB]

Fig. 22

ORGAN 2′

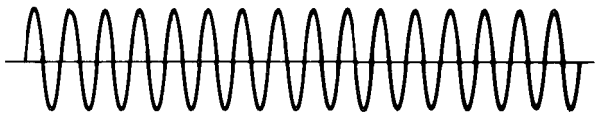


KEY	C1	C2	C3	C4	C5	C6
LEVEL	−21	−22	−25	−29	−34	−41

[dB]

Fig. 23

ORGAN 1′



KEY	C1	C2	C3	C4	C5	C6
LEVEL	−22	−25	−30	−34	−41	−41

[dB]

Fig. 24

Preset sounds of ORGAN

Each PRESET Sound must have the same sound as compared to the ORGAN MANUAL, when the footage controls are set as shown below.

Presets SW	Footage Control (maximum)
ORGAN 1	16′ 8′ 5 1/3′
ORGAN 2	16′ 8′ 4′ 2′
ORGAN 3	16′ 8′ 5 1/3′ 4′ 2 2/3′ 2′ 1′

Timbre and envelope waveforms of POLY-SYNTH

Envelope waveforms of POLY-SYNTH Test point : MIXED OUT jack

POLY-SYNTH VOLUME: maximum (10)

CUTOFF FREQUENCY: maximum (10)

1. SLOW ATTACK switch ON

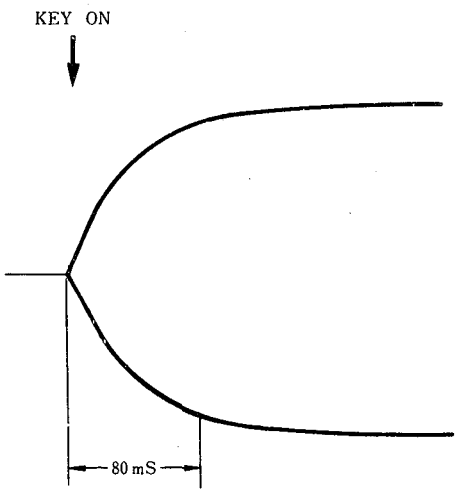
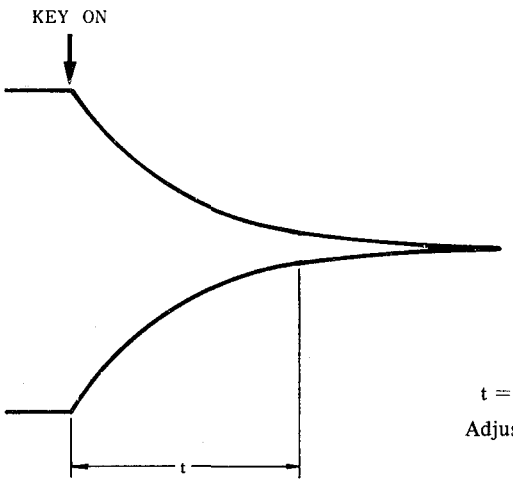


Fig. 25

2. SUSTAIN switch ON (When key is released)



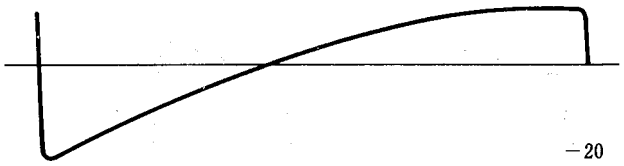
t = 30 mS ~ 1.6 Sec
Adjustable with SUSTAIN lever

Fig. 26

Waveforms of the Feet Selector

* POLY-SYNTH VOLUME: maximum (10)
CUTOFF FREQUENCY: maximum (10)
For the correct waveform as shown check below while depressing the A3 key.
Level difference is ± 3dB.

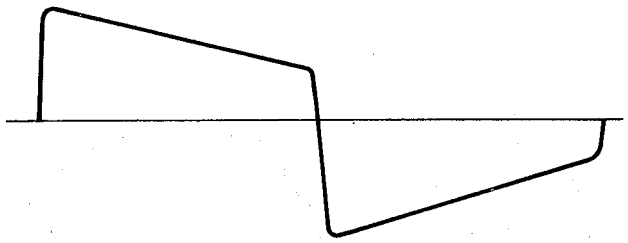
16'



−20 dB

Fig. 27

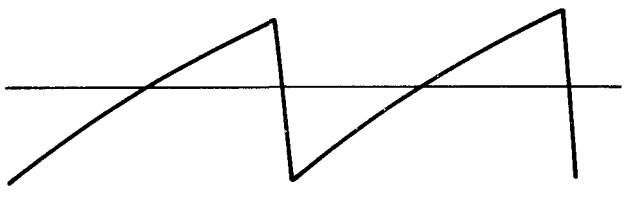
16



−18 dB

Fig. 28

LP 8'

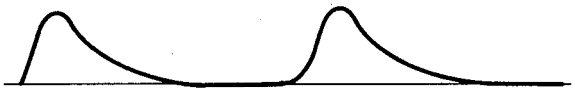


−21 dB

Fig. 29

BP 8′

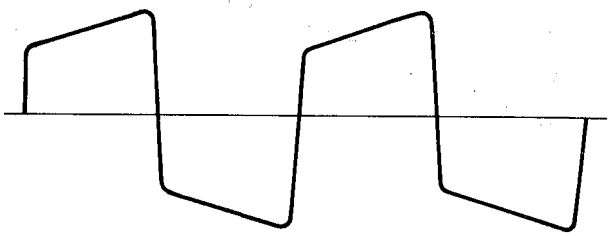
For this check, adjust the cut off Frequency Control until you achieve maximum Amplitude.



−27 dB

Fig. 30

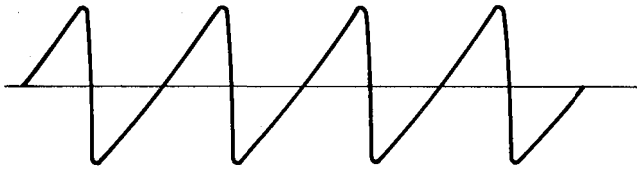
8′



−18 dB

Fig. 31

4′



−20 dB

Fig. 32

Output and envelope waveforms of POLY-SYNTH preset sounds

* Set SUSTAIN ON and SUSTAIN lever to "long".

It is assumed that the A3 key is on and level differrence are with in ± 3dB

POLY-SYNTH 1

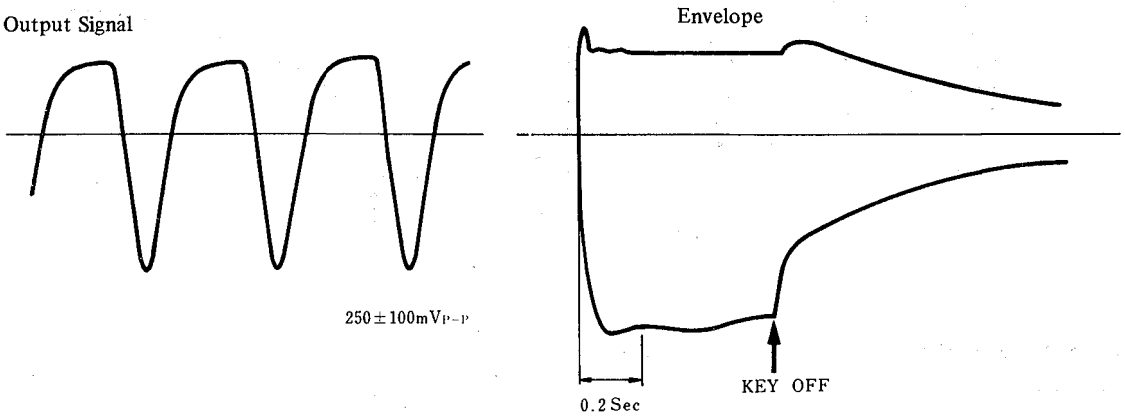


Fig. 33

POLY-SYNTH 2

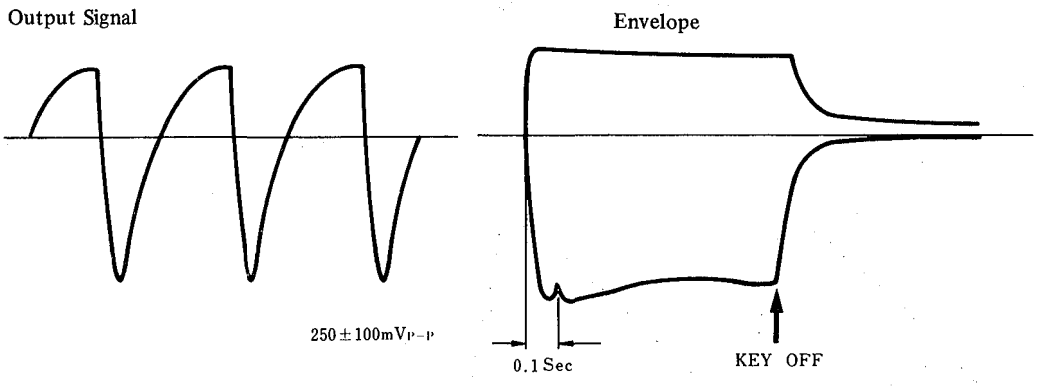


Fig. 34

POLY-SYNTH 3

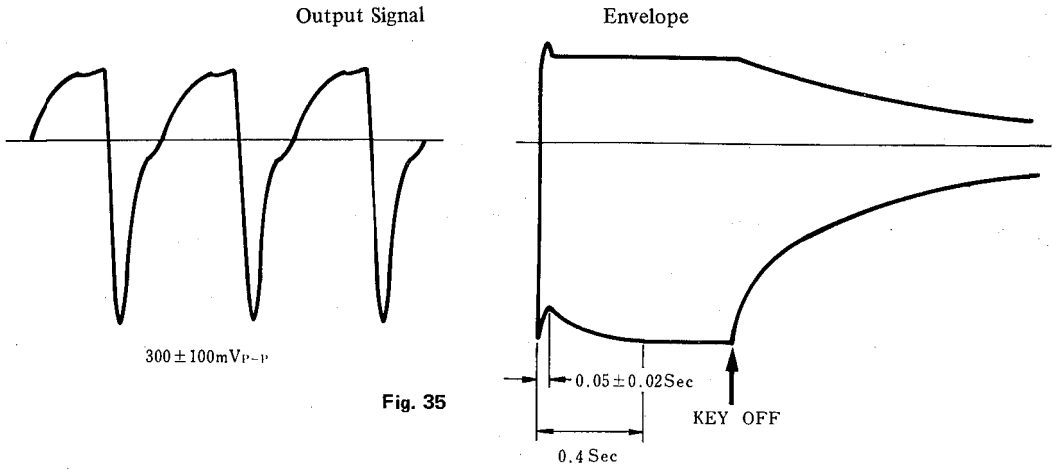


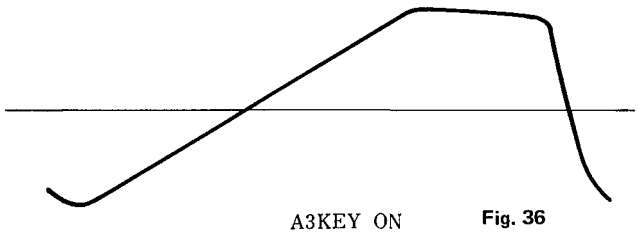
Fig. 35

Preset sounds of STRING *Difference: 3dB

STRING 1

KEY	C1	C2	C3	C4	C5	C6
LEVEL	−21	−18	−16	−16	−17	−20

[dB]

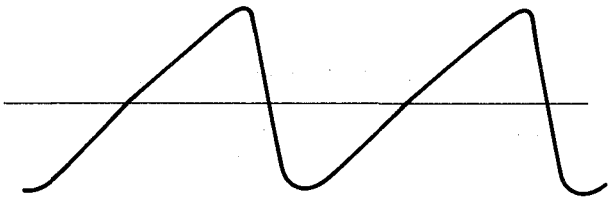


A3KEY ON Fig. 36

STRING 2

KEY	C1	C2	C3	C4	C5	C6
LEVEL	−20	−17	−17	−17	−20	−23

[dB]



A3KEY ON

Fig. 37

YAMAHA

SYMPHONIC ENSEMBLE

SK 20

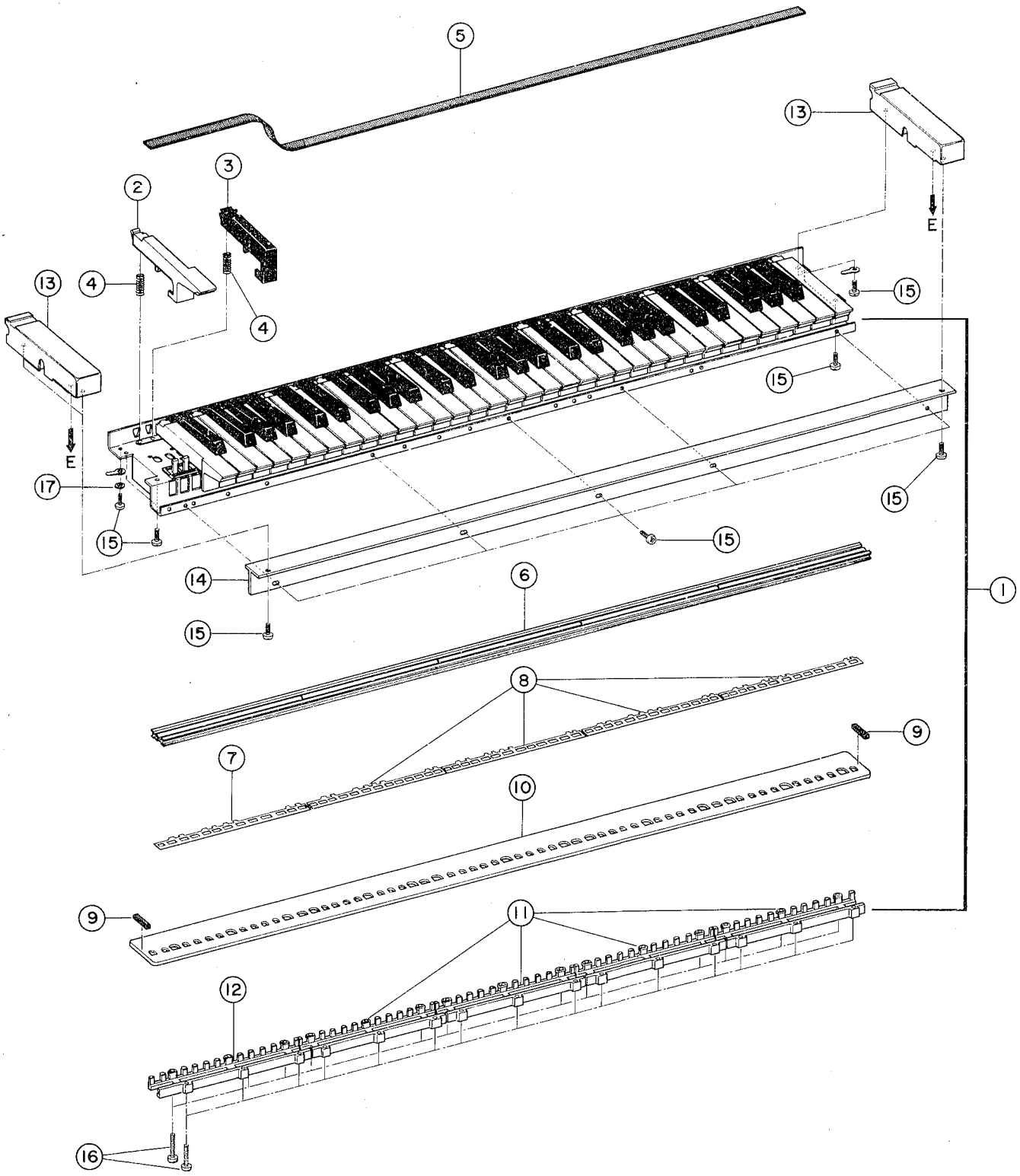
PARTS LIST

CONTENTS

007309

'80.9 0.5K ㊎ Printed in Japan

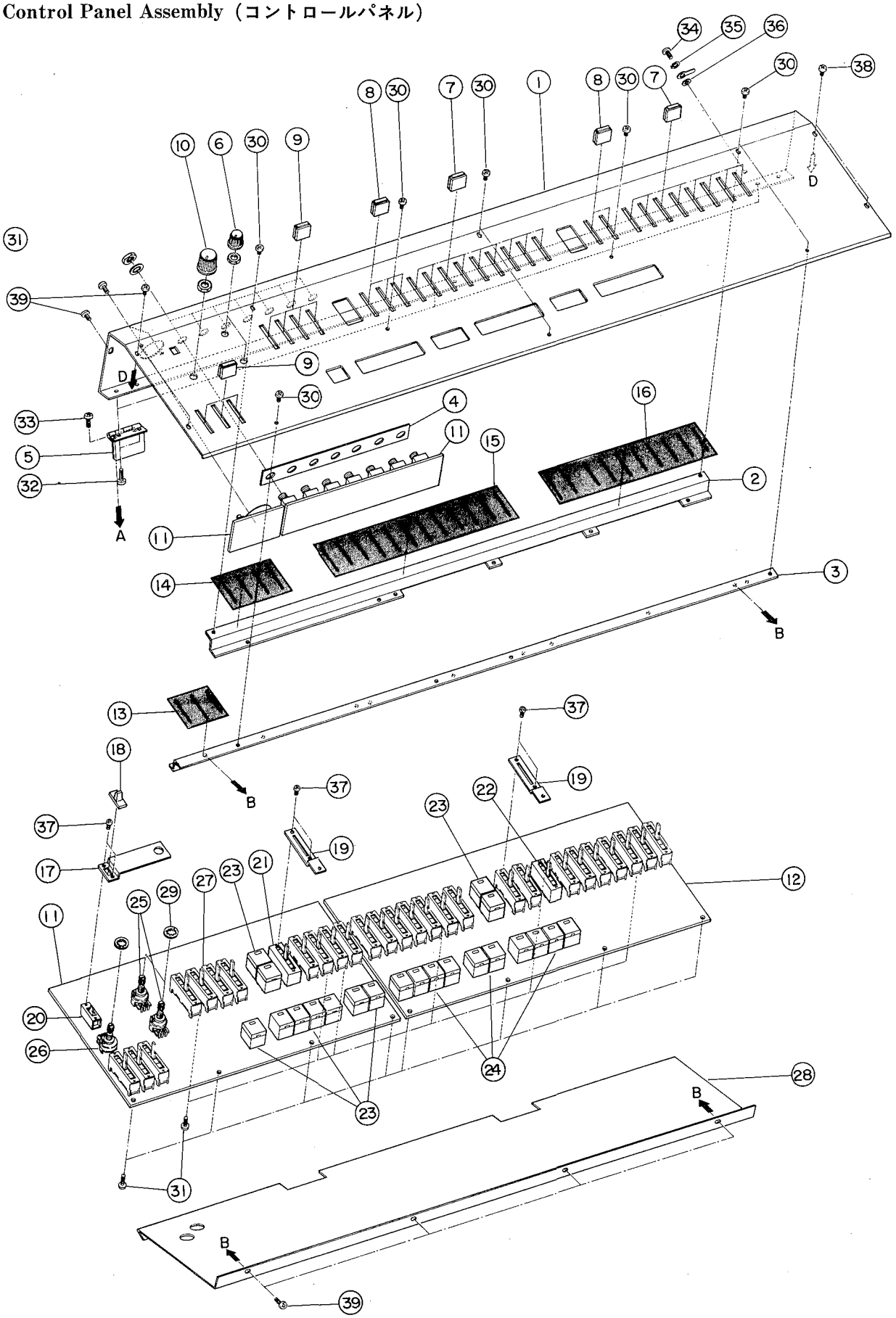
A. Keyboard Assembly (鍵盤)



	Ref. No.	Part No.	Description		部品名	Remarks	Common Model		
			KEYBOARD ASSEMBLY						
※	1	30 10 00 NB 81 55 20	Keyboard Assembly	C-61 Keys	鍵盤 Ass'y	C-61 Keys'			
	2	30 10 00 CB 03 22 10	White Key	C. F	白鍵				
		30 10 00 CB 03 22 20	— do —	D	〃				
		30 10 00 CB 03 22 30	— do —	B.E	〃				
		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=	〃				
	3	30 10 00 CB 03 22 70	Black Key		黒鍵				
	4	30 10 00 AA 04 37 20	Coil Spring		コイルスプリング				
	5	40 10 00 CC 01 47 50	Felt		フェルト	CP-10			
	6	40 10 00 CB 03 23 30	Rubber Contact		可動電動ゴム	CP-10			
	7	30 10 00 CB 03 35 70	Spacer Q		絶縁スペーサQ	12 Key			
	8	30 10 00 CB 03 35 80	— do — K		〃 K	13 key			
	9	40 10 00 CB 03 35 40	End Plate		エンドプレート				
※	10	30 10 00 NA 80 65 20	MK Circuit Board		MKシート				
	11	30 10 00 CB 03 24 00	Holder, MK Circuit Board	Q	基板ホルダー	12 Key			
	12	30 10 00 CB 03 24 10	— do —	K	〃	13 Key			
	13	30 10 00 CB 81 50 10	End Block		拍子木				
	14	30 10 00 CB 81 67 90	Keyboard Spacer		口棒レール				
	15	40 10 00 Ei 34 01 00	Bind Head Tapping Screw	M4 x 10	バインドタッピングネジ	Black			
	16	40 10 00 EZ 33 01 40	Screw	M3 x 14	エバータイトバインドネジ				
	17	40 10 00 EV 42 30 40	Toothed Lock Screw	B4S	歯付座金				

※ New Parts (新規部品)

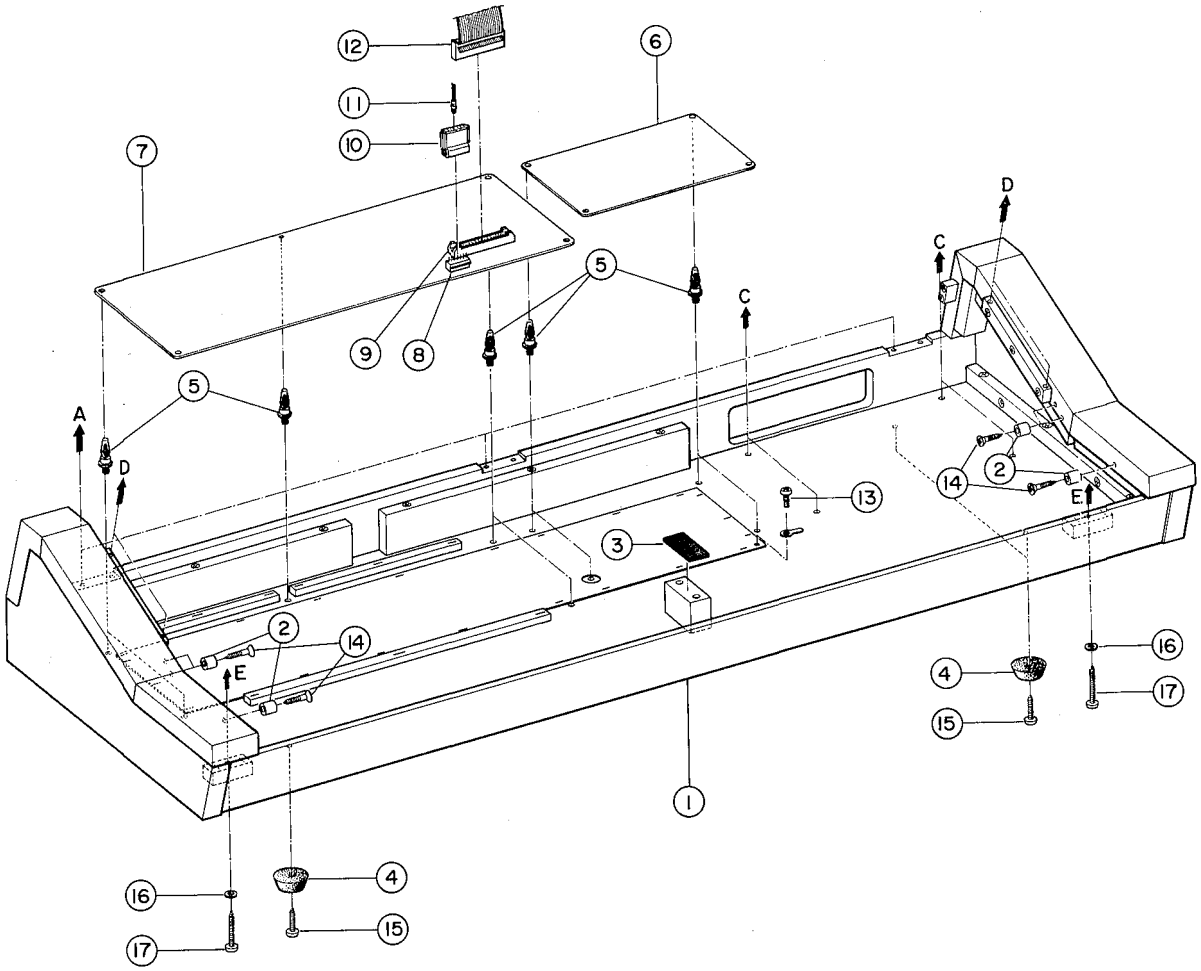
B. Control Panel Assembly（コントロールパネル）



	Ref. No.	Part No.	Description		部品名	Remarks	Common Model		
			PANEL ASSEMBLY						
※	1	30 10 00 AA 81 39 70	Control Panel		コントロールパネル				
※	2	30 10 00 AA 81 39 80	Circuit Board Angle/Bracket		シート取付アングル				
※	3	30 10 00 AA 81 39 90	– do –		〃				
※	4	30 10 00 AA 81 36 10	Jack Spacer		ジャックスペーサー				
	5	30 10 00 AA 81 14 20	Hinge		蝶番				
	6	30 56 00 CB 81 21 40	Knob (IVORY)	for Rotary VR	ツマミ				
※	7	30 10 00 CB 81 69 60	Knob (YELLOW)	for Slide VR	〃				
※	8	30 10 00 CB 81 69 70	Knob (GREY)	for Slide VR	〃				
※	9	30 10 00 CB 81 69 80	Knob (WHITE)	for Slide VR	〃				
※	10	30 10 00 CB 81 78 30	Knob		〃	Master Vol			
※	11	30 12 91 NA 80 68 30	Circuit Board	CPA	CPAシート				
※	12	30 12 91 NA 80 68 40	Circuit Board	CPB	CPBシート				
	13	40 10 00 CA 80 22 90	Dust Proof Cover		防塵クロス				
	14	40 10 00 CA 80 23 00	– do –		〃				
	15	40 10 00 CA 80 23 20	– do –		〃				
	16	40 10 00 CA 80 23 30	– do –		〃				
※	17	30 10 00 AA 81 40 00	Switch Bracket		スイッチ取付金具				
	18	30 10 00 CB 81 46 90	Knob (IVORY)		ツマミ				
※	19	30 10 00 AA 81 47 90	Shield Board		取付板				
	20	40 10 00 KA 40 06 00	Slide Switch		スライドSW(2回路2接点)	OUT PUT			
※	21	40 10 00 KA 40 07 90	– do –		〃 (8接点)	SUSTAIN			
	22	40 10 00 KA 40 08 20	– do –		〃 (6接点)	FEET			
※	23	40 10 00 KA 90 17 00	– do –	(GREY)	LED付プッシュSW(灰)				
※	24	40 10 00 KA 90 17 10	– do –	(WHITE)	〃 (白)				
	25	40 10 00 HS 31 05 70	Rotaly Variable Resistor	B10K	ロータリーVR				
	26	40 10 00 HS 31 09 90	– do –	A10K x 2	〃				
※	27	40 10 00 HQ 23 00 10	Slide Variable Resistor	A10K x 2	スライドVR				
※		40 10 00 HQ 23 00 20	– do –	A10K	〃				
※		40 10 00 HQ 23 00 30	– do –	A25K	〃				
※		40 10 00 HQ 23 00 40	– do –	B100K	〃				
※		40 10 00 HQ 23 00 50	– do –	B100K OPEN	〃				
※		40 10 00 HQ 23 00 60	– do –	B10K	〃				
※		40 10 00 HQ 23 00 70	– do –	B10K (C. T)	〃				
※		40 10 00 HQ 23 00 80	– do –	C100K	〃				
※		40 10 00 HQ 23 00 90	– do –	C10K	〃				
※	28	40 10 00 CA 80 23 50	Shield Cover		シールドカバー				
	29	40 10 00 EV 41 00 70	Toothed Lock Washer	7S	歯付座金	Yellow			
	30	40 10 00 EC 33 00 50	Truss Head Screw	M3 x 5	トラス小ネジ	Black			
	31	42 00 00 ED 33 00 60	Bind Head Tapping Screw	M3 x 6	バインド小ネジ	Black			
	32	40 10 00 EM 13 00 60	Oval Head Tapping Screw	M3 x 6	丸皿タッピングネジ	FNM 3-3g			
	33	40 10 00 Ei 33 01 20	Bind Head Tapping Screw	M3 x 12	バインドタッピングネジ1種	Black			
	34	40 10 00 Ei 34 01 00	Bind Head Tapping Screw	M4 x 10	バインドタッピングネジ	Black			
	35	40 10 00 EV 30 00 40	Spring Lock Washer	4S	バネ座金	Yellow			
	36	40 10 00 EV 42 30 40	Toothed Lock Washer	B4S	歯付座金	Yellow			
	37	40 10 00 ED 32 60 40	Bind Head Screw	M2.6 x 4	バインド小ネジ	Black			
	38	40 10 00 Ei 33 51 00	Bind Head Tapping Screw	M3.5 x 10	バインドタッピングネジ	Black			
	39	40 10 00 ED 33 00 80	Bind Head Screw	M3 x 8	バインド小ネジ	Black			

※ **New Parts** (新規部品)

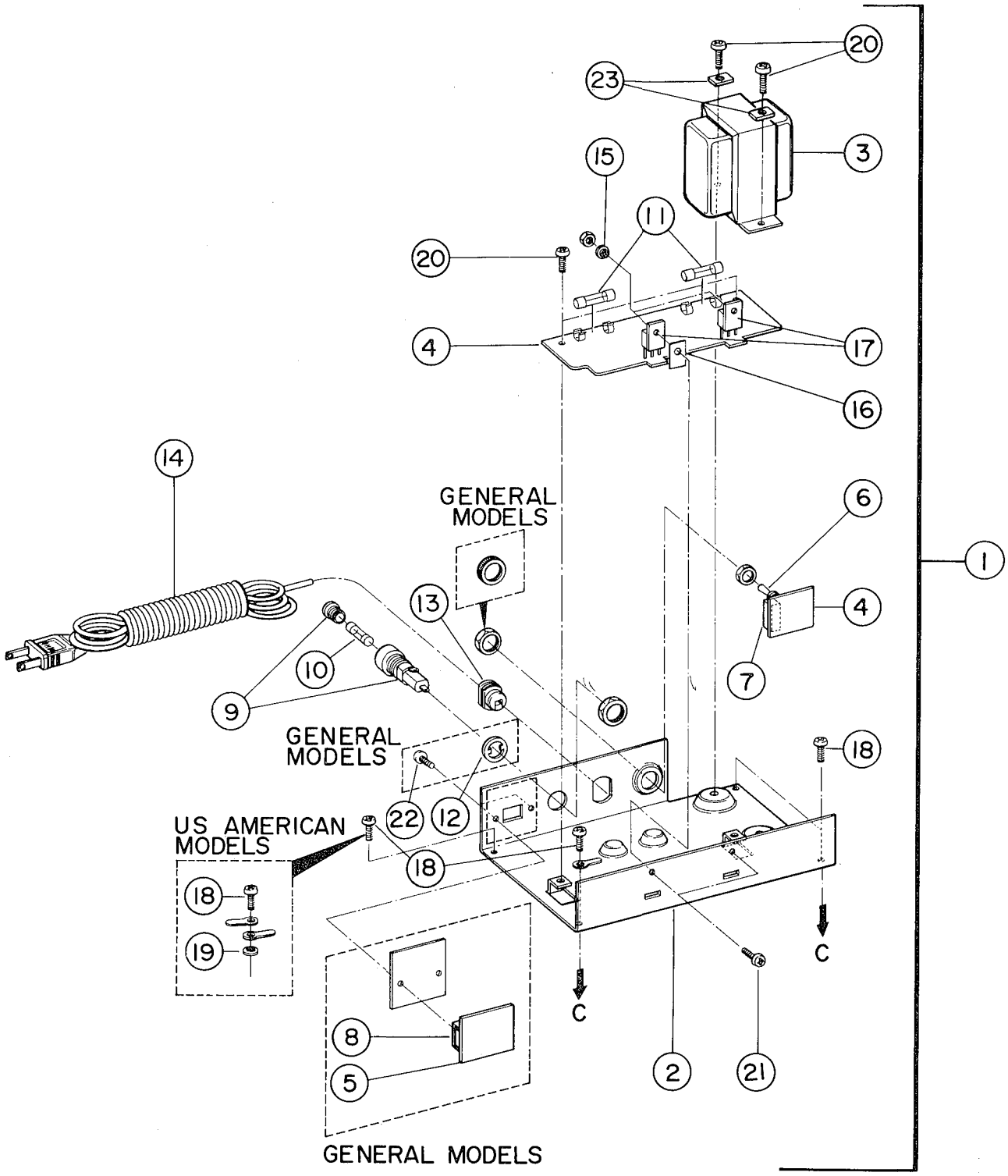
C. Cabinet Assembly（外装）



	Ref. No.	Part No.	Description		部品名	Remarks	Common Model		
			BOTTOM CASE ASSEMBLY						
※	1	30 12 91 00 00 00 10	Bottom Case Assembly		外装集成				
	2	30 10 00 CB 03 30 70	Spacer		回転止メ				
※	3	40 10 00 CA 80 26 00	Shield Cover	#80260	シールド紙				
	4	30 54 00 CB 80 12 70	Leg		ゴム脚				
	5	30 56 00 CB 08 70 00	Holder Circuit Board		シートホルダー				
※	6	30 12 91 NA 80 68 60	Circuit Board	TE	TEシート				
※	7	30 12 91 NA 80 68 20	Circuit Board	DM	DMシート				
	8	40 10 00 LB 50 02 50	Connector NH	5P	コネクターソケット	Top Entry			
		40 10 00 LB 50 02 70	— do —	5P	〃	Side Entry			
		40 10 00 LB 50 03 70	— do — NH	5P	〃	Bottom Entry			
		40 10 00 LB 60 24 60	— do —	7P	〃	Top Entry			
		40 10 00 LB 60 24 70	— do —	10P	〃	Top Entry			
		40 10 00 LB 60 25 00	— do —	7P	〃	Side Entry			
		40 10 00 LB 60 30 00	— do —	7P	〃	Bottom Entry			
		40 10 00 LB 60 30 10	— do —	8P	〃	Bottom Entry			
		40 10 00 LB 60 30 20	— do —	8P	〃	Side Entry			
		40 10 00 LB 60 30 70	— do —	10P	〃	Bottom Entry			
		40 10 00 LB 60 31 30	— do —	12P	〃	Top Entry			
		40 10 00 LB 60 31 50	— do —	10P	〃	Bottom Entry			
※	9	40 10 00 LB 60 24 30	Connector Flat Cable	30P	フラットケーブルコネクター	Header			
	10	40 10 00 LB 50 02 40	Connector Housing	5P	コネクターハウジング				
		40 10 00 LB 60 24 40	— do —	7P	〃				
		40 10 00 LB 60 24 50	— do —	10P	〃				
		40 10 00 LB 60 24 80	— do —	8P	〃				
		40 10 00 LB 60 29 20	— do —	12P	〃				
	11	40 10 00 BB 00 44 30	Contact Pin		コンタクトピン				
	12	30 12 00 MZ 80 84 00	Flat Cable Assembly	30P	フラットケーブルAss'y	MK→←DM			
	13	40 10 00 Ei 33 01 20	Bind Head Tapping Screw	M3 x 12	バインドタッピングネジ1種	Black			
	14	40 10 00 EO 04 01 60	Flat Head Tapping Screw	M4 x 16	サラタッピングネジ	Yellow			
	15	40 10 00 Ei 04 01 60	Bind Head Tapping Screw	M4 x 16	バインドタッピングネジ	Yellow			
	16	40 10 00 EV 20 30 50	Flat Washer	5S	平座金	Black			
	17	40 10 00 Ei 95 03 50	Bind Head Screw	M5 x 35	尖先バインド小ネジ	Black			

※ New Parts (新規部品)

D. Power Supply Unit (電源ユニット)



	Ref. No.	Part No.	Description	部品名	Remarks	Common Model		
			POWER SUPPLY					
※	1	30 12 00 NB 81 55 40	Power Supply Unit	電源ユニット	Japan			
※		30 12 00 NB 81 55 50	– do –	〃	U.S American			
※		30 12 00 NB 81 55 60	– do –	〃	Canadian			
※		30 12 00 NB 81 55 70	– do –	〃	General			
	2	30 10 00 BA 80 41 80	Chassis, Power Supply Unit	電源シャーシ	Japan			
		30 10 00 BA 80 41 90	– do –	〃	U.S American Canadian			
		30 10 00 BA 80 42 00	– do –	〃	General			
※	3	40 10 00 GA 82 17 00	Power Transformer	電源トランス	Japan			
※		40 10 00 GA 82 18 00	– do –	〃	U.S American Canadian			
※		40 10 00 GA 82 19 00	– do –	〃	General			
※	4	30 12 00 NA 80 68 50	Circuit Board DC	DCシート	Japan			
※		30 12 00 NA 80 68 90	– do –	〃	U.S American			
※		30 12 00 NA 80 69 00	– do –	〃	General			
※		30 12 00 NA 80 69 10	– do –	〃	Canadian			
※	5	40 10 00 LC 85 55 20	Circuit Board DC	プリント基板	General			
	6	40 10 00 KA 30 04 30	Power Switch	電源スイッチ	Japan			
		40 10 00 KA 30 04 70	– do –	〃	General			
		40 10 00 KA 30 05 00	– do –	〃	Canadian			
		40 10 00 KA 30 05 80	– do –	〃	U.S American			
	7	40 10 00 FR 16 42 20	Spark Suppressor Capacitor 0.022μF	スパークキラーコンデンサー	PME 265 RIFA	General		
		40 10 00 FZ 00 01 10	– do – 0.033 + 120 Ω	〃	NSK 135	Japan U.S American		
		40 10 00 FZ 00 09 50	– do – 0.033 + 120 Ω	〃	2CA	Canadian		
※	8	40 10 00 KA 40 08 20	Slide Switch	スライドスイッチ	General			
	9	40 10 00 LB 20 04 90	Fuse Holder	ヒューズホルダー	Japan, Canadian U.S American			
		40 10 00 LB 20 05 90	– do –	〃	General			
	10	40 10 00 KB 00 03 30	Fuse 1A	ヒューズ	Japan			
		40 10 00 KB 00 10 60	– do – 1A ST–4	〃	U.S American Canadian			
		40 10 00 KB 00 07 30	– do – T1A	〃	General			
	11	40 10 00 KB 00 03 50	– do – FKD2A	〃	Japan			
		40 10 00 KB 00 10 30	– do – SS–2 2A	〃	U.S American Canadian			
		40 10 00 KB 00 07 50	– do – T2A	〃	General			
	12	40 10 00 AA 03 15 80	Fuse Holder Washer	ヒューズホルダーワッシャー	General			
	13	40 10 00 CB 06 86 30	Cord Bushing SR–3P–4	コードブッシュ	Japan			
		40 10 00 CB 80 68 50	– do – SR–6N3–4	〃	U.S American Canadian			
		40 10 00 CB 07 27 50	– do – SR–4N–4	〃	General			
	14	40 10 00 MG 00 06 00	A,C Cord	電源コード	Japam			
		40 10 00 MG 00 07 10	– do –	〃	U.S American Canadian			
		40 10 00 MG 00 08 60	– do –	〃	General			

※ New Parts (新規部品)

Ref. No.	Part No.	Description	部品名	Remarks	Common Model		
15	30 54 00 CB 07 28 80	Bush	絶縁ブッシュ				
16	40 10 00 iL 00 02 70	Isolation Base	マイカーベース				
17	40 10 00 iG 02 87 00	IC μPC 14315H	IC				
18	40 10 00 EL 34 01 40	Sems Screw M4 x 14	セムス小ネジ	Black			
19	40 10 00 EV 42 30 40	Toothed Lock Washer	歯付座金	Black			
20	40 10 00 Ei 33 00 80	Bind Head Topping Screw M3 x 8	バインドタッピングネジ	Black			
21	40 10 00 EL 02 60 80	Sems Screw M2.6 x 8	セムス小ネジ	Yellow			
22	40 10 00 ED 33 00 60	Bind Head Screw M3 x 6	バインド小ネジ	Black (General)			
23	30 54 00 AA 80 44 90	Flat Washer	平座金				

※ New Parts (新規部品)

E. Electronic Components（電気部品）

	Ref. No.	Part No.	Description		部品名	Remarks	Common Model		
			CIRCUIT BOARD						
※		30 12 91 NA 80 68 20	Circuit Board	DM	D M シート				
※		30 12 91 NA 80 68 30	– do –	CPA	C P A シート				
※		30 12 91 NA 80 68 40	– do –	CPB	C P B シート				
※		30 12 91 NA 80 68 60	– do –	TE	T E シート				
※		30 10 00 NA 80 65 20	– do –	MKC–61	M K シート				
※		30 12 00 NA 80 68 50	– do –	DC	D C シート	Japan			
※		30 12 00 NA 80 68 90	– do –	DC	〃	US American			
※		30 12 00 NA 80 69 00	– do –	DC	〃	General			
※		30 12 00 NA 80 69 10	– do –	DC	〃	Canadian			
			I.C						
		40 10 00 iG 00 11 70	I.C	TC4001BP	I C	NOR			
		40 10 00 iG 00 11 80	– do –	TC4013BP	〃	D-F/F			
		40 10 00 iG 00 12 40	– do –	TC4011BP	〃	NAND			
		40 10 00 iG 00 13 90	– do –	NJM4558DV	〃	OP Amp			
		40 10 00 iG 00 14 40	– do –	TC4071BP	〃	OR			
		40 10 00 iG 00 15 10	– do –	# 151	〃	VCA			
		40 10 00 iG 00 15 60	– do –	# 156	〃	+ VCF			
		40 10 00 iG 00 15 70	– do –	# 157	〃	Switch Memory (x2)			
		40 10 00 iG 00 15 90	– do –	# 159	〃	EG-VCA			
		40 10 00 iG 00 16 90	– do –	TC4016BP	〃	Bi lateral sw			
		40 10 00 iG 00 17 20	– do –	TC4069BP	〃	Inverter			
		40 10 00 iG 00 17 40	– do –	TC4050BP	〃	Converter			
		40 10 00 iG 00 17 60	– do –	TC4081BP	〃	AND			
		40 10 00 iG 02 60 00	– do –	# 02600	〃	VCA			
		40 10 00 iG 02 87 00	– do –	μPC 14315H	〃	+15V Regulater			
		40 10 00 iG 03 28 00	– do –	# 03280	〃	D–Matorix			
		40 10 00 iG 03 29 00	– do –	# 03290	〃	BBD Driver			
		40 10 00 iG 04 33 00	– do –	TC4093BP	〃	SCHMITT TRIGGER			
		40 10 00 iG 04 34 00	– do –	TC5027BP	〃	4 BIT COUNTER			
		30 10 00 iG 04 61 00	– do –	MN3009	〃	B.B.D			
		30 10 00 iT 62 10 00	– do –	YM62100	〃	KAC			
※		30 10 00 iT 62 20 00	– do –	YM62200	〃	TGC			
		30 10 00 iT 62 60 00	– do –	YM626	〃	DVG			
		30 10 00 iT 62 70 00	– do –	YM627	〃	PSC			
		30 10 00 iT 63 30 00	– do –	YM63300	〃	SEC II			
※		30 10 00 iT 70 20 00	– do –	YM70200	〃	GF-1			
※		30 10 00 iT 70 40 00	– do –	YM70400	〃	GOA			
			TRANSISTOR						
		40 10 00 iA 09 50 00	Transistor	2SA950 (Y)	トランジスター				
		40 10 00 iA 10 15 70	– do –	2SA1015 (OY)	〃				
		40 10 00 iA 11 64 10	– do –	2SA1164 (GR)	〃				
		40 10 00 iC 07 52 20	– do –	2SC752 (Y)	〃				
		40 10 00 iC 18 15 80	– do –	2SC1815 (Y, GR)	〃				
		40 10 00 iC 21 20 00	– do –	2SC2120 (Y)	〃				
		40 10 00 iE 00 00 10	FET	2SK30 (Y)	F E T				
		40 10 00 iE 10 12 30	– do –	2SK105 (F)	〃				
			DIODE						
		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 –	1D–2C1	〃				
		40 10 00 iH 00 02 90	– do –	1D–2Z1	〃				
		40 10 00 iH 00 04 70	– do –	1D–4B1	〃				

※ New Parts (新規部品)

	Ref. No.	Part No.	Description		部品名	Remarks	Common Model		
		40 10 00 iK 00 02 60	Photo Coupler	P873–G35–201B	フォトカプラー				
		40 10 00 iK 00 02 90	– do –	P873–13	〃				
			COIL						
		40 10 00 GE 30 03 50	Choke Coil	68μH	チョークコイル				
		40 10 00 GE 90 01 70	O.S.C Coil	125μH	OSCコイル				
			RESISTOR						
※		40 10 00 HQ 23 00 10	Slide Variable Resistor	A10K x 2	スライドVR				
※		40 10 00 HQ 23 00 20	– do –	A10K	〃				
※		40 10 00 HQ 23 00 30	– do –	A25K	〃				
※		40 10 00 HQ 23 00 40	– do –	B100K	〃				
※		40 10 00 HQ 23 00 50	– do –	B100K OPEN	〃				
※		40 10 00 HQ 23 00 60	– do –	B10K	〃				
※		40 10 00 HQ 23 00 70	– do –	B10K (C, T)	〃				
※		40 10 00 HQ 23 00 80	– do –	C100K	〃				
※		40 10 00 HQ 23 00 90	– do –	C10K	〃				
		40 10 00 HS 31 05 70	Rotary Variable Resistor	B10K	ロータリーVR				
		40 10 00 HS 31 09 90	– do –	A10K x 2	〃				
		40 10 00 HT 19 00 40	Semi Variable Resistor	B5K	半固定VR				
		40 10 00 HT 19 00 50	– do –	B10K	〃				
		40 10 00 HT 19 00 80	– do –	B100K	〃				
		40 10 00 HT 19 00 90	– do –	B200K	〃				
		40 10 00 HL 31 24 70	Metal Oxide Film Resistor	1P 0.47 Ω	酸化金属被膜抵抗				
		40 10 00 HL 31 34 70	– do –	1P 4.7 Ω	〃				
		40 10 00 HL 31 53 30	– do –	1P 330 Ω	〃				
		40 10 00 HL 31 55 60	– do –	1P 560 Ω	〃				
		40 10 00 HL 32 51 50	– do –	2P 150 Ω	〃				
		40 10 00 HU 57 52 70	Metal Film Resistor	270 Ω	金属被膜抵抗				
		40 10 00 HU 57 61 00	– do –	1KΩ	〃				
		40 10 00 HU 57 62 70	– do –	27KΩ	〃				
		40 10 10 HU 57 63 30	– do –	33KΩ	〃				
		40 10 00 HU 57 64 70	– do –	47KΩ	〃				
		40 10 00 HU 57 71 50	– do –	15KΩ	〃				
		40 10 00 HU 57 72 20	– do –	22KΩ	〃				
		40 10 00 HU 57 74 70	– do –	47KΩ	〃				
		40 10 00 HU 57 76 80	– do –	68KΩ	〃				
			CAPACITOR						
		40 10 00 FC 18 54 70	Metalized Mylar Capacitor	0.47/100μF	メタライズドマイラーコンデンサー				
		40 10 00 FD 65 21 20	Polytyrene Capacitor	120pF (J)	スチロールコンデンサー				
		40 10 00 FD 65 22 70	– do –	270pF (J)	〃				
		40 10 00 FL 63 71 00	Non-Polar Capacitor	10/16	ノンポーラコンデンサー				
		40 10 00 FL 64 64 70	– do –	4.7/25	〃				
		40 10 00 FM 09 61 00	– do –	1/16	〃				
		42 00 00 FM 11 61 00	– do –	1/50	〃				
		40 10 00 FN 14 61 00	Solid Aluminium Capacitor	1/25	固体アルミコンデンサー				
		40 10 00 FN 24 56 80	– do –	0.68/25	〃				

※ New Parts (新規部品)

	Ref. No.	Part No.	Description		部品名	Remarks	Common Model		
			FUSE						
		40 10 00 KB 00 03 30	Fuse	1A	ヒューズ	Japan			
		40 10 00 KB 00 03 50	– do –	FKD2A	〃	Japan			
		40 10 00 KB 00 06 10	– do –	T 1A	〃	General			
		40 10 00 KB 00 07 50	– do –	T 2A	〃	General			
		40 10 00 KB 00 10 30	– do –	SS-2, 2A		U.S American Canadian			
		40 10 00 KB 00 10 60	– do –	ST-4, 1A	〃	U.S American Canadian			
			TRANSFORMER		〃				
※		40 10 00 GA 82 17 00	Power Transformer		電源トランス	Japan			
※		40 10 00 GA 82 18 00	– do –		〃	U.S American Canadian			
※		40 10 00 GA 82 19 00	– do –		〃	General			
			SWITCH						
		40 10 00 KA 30 04 30	Power Switch		電源スイッチ	Japan			
		40 10 00 KA 30 04 70	– do –		〃	General			
		40 10 00 KA 30 05 00	– do –		〃	Canadian			
		40 10 00 KA 30 05 80	– do –		〃	U.S American			
		40 10 00 KA 40 06 00	Slide Switch		スライドSW(2回路2接点)	OUT PUT			
		40 10 00 KA 40 07 90	– do –		〃 (8接点)	SUSTAIN			
※		40 10 00 KA 40 08 00	– do –		〃 (6接点)	FEET			
※		40 10 00 KA 40 08 10	– do –		〃 (4回路2接点)	TONE CABINET			
※		40 10 00 KA 40 08 20	– do –		〃	General			
※		40 10 00 KA 90 17 00	Push Switch With LED	(GREY)	LED付プッシュSW				
		40 10 00 KA 90 17 10	– do –	(WHITE)	〃				
		40 10 00 LB 20 15 40	Jack		JL2B形ジャック				
		40 10 00 LB 60 33 70	Socket	11P	ソケット				
		40 10 00 LB 20 15 30	Fuse Holder Pin		ヒューズホルダーピン				
			CONNECTOR						
		40 10 00 LB 50 02 50	Connector NH	5P	コネクターソケット	Top Entry			
		40 10 00 LB 50 02 70	– do –	5P	〃	Side Entry			
		40 10 00 LB 50 03 70	– do –	5P	〃	Bottom Entry			
		40 10 00 LB 60 24 60	– do –	7P	〃	Top Entry			
		40 10 00 LB 60 24 70	– do –	10P	〃	– do –			
		40 10 00 LB 60 25 00	– do –	7P	〃	Side Entry			
		40 10 00 LB 60 30 00	– do –	7P	〃	Bottom Entry			
		40 10 00 LB 60 30 10	– do –	8P	〃	– do –			
		40 10 00 LB 60 30 20	– do –	8P	〃	Side Entry			
		40 10 00 LB 60 30 70	– do –	10P	〃	Bottom Entry			
		40 10 00 LB 60 31 30	– do –		〃	Top Entry			
		40 10 00 LB 60 31 50	– do –	10P	〃	Bottom Entry			
		40 10 00 LB 60 24 30	Connector, Flat Cable	30P	フラットケーブルコネクター	DM			
		40 10 00 LB 50 02 40	Connector, Housing	5P	コネクターハウジング				
		40 10 00 LB 60 24 40	– do –	7P	〃				
		40 10 00 LB 60 24 50	– do –	10P	〃				
		40 10 00 LB 60 24 80	– do –	8P	〃				
		40 10 00 LB 60 29 20	– do –	12P	〃				
		40 10 00 BB 00 44 30	Contact Pin		コンタクトピン				
※		30 12 00 MZ 80 84 00	Flat Cable Assembly	30P	フラットケーブルAss'y	MK ⟷ DM			

※ **New Parts** (新規部品)

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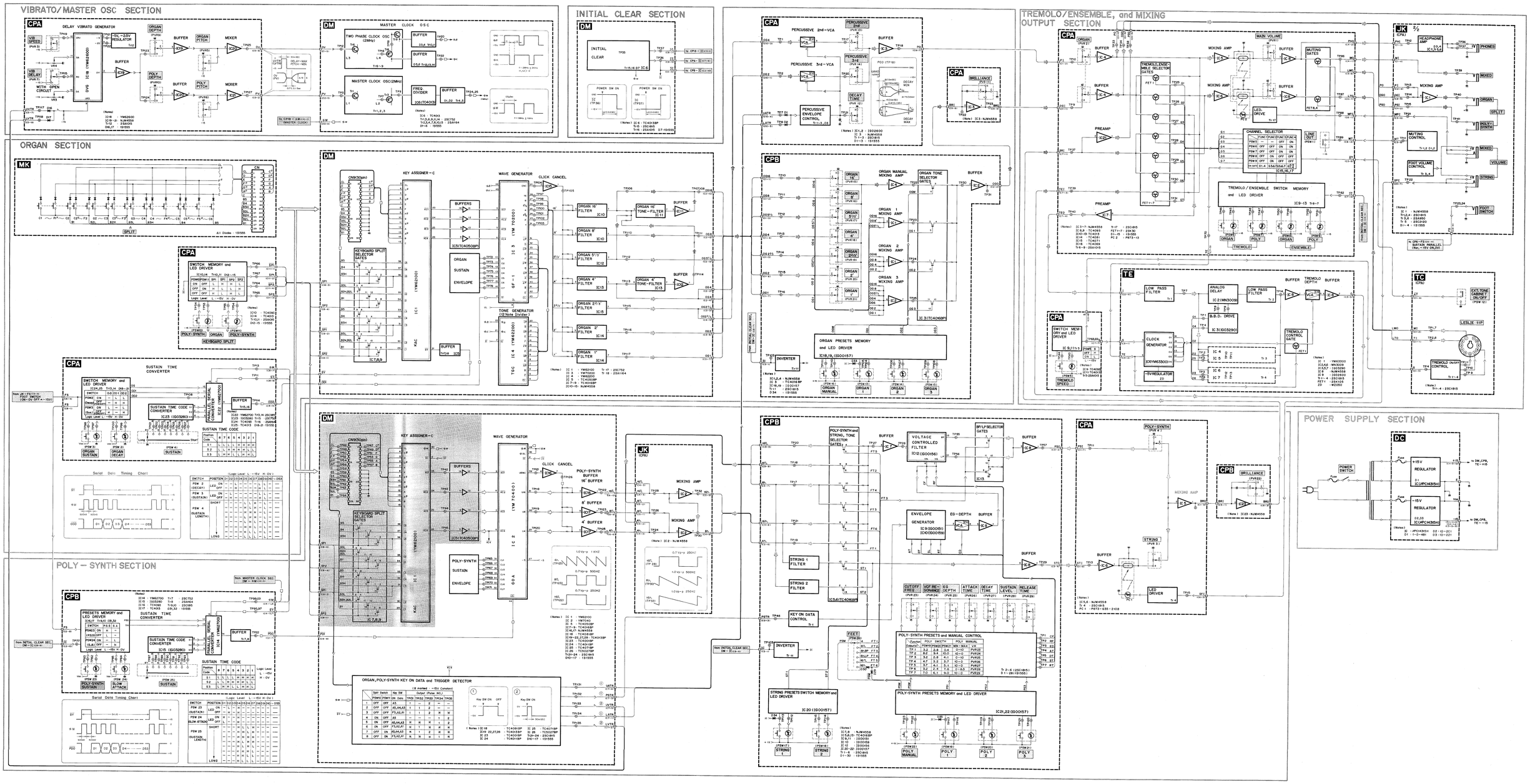
SINCE 1887 YAMAHA

NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN

SK20 BLOCK DIAGRAM 006884

SK20 BLOCK DIAGRAM



SK20 BLOCK DIAGRAM

6440

SK20 OVERALL CIRCUIT DIAGRAM 006884

SK20 OVERALL CIRCUIT DIAGRAM

DM

C1

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	DC-+15 (C1-9)
2	+15	BR	DC-+15 (C1-10)
3	+15	BR	DM-+15 (C12-1)
4	+15	BR	DM-+15 (C12-2)
5	0V	SWH	CPA-0V (C5-6)

C2

Pin No.	Pin Name	Wire Color	Destination
1	E	SVIS	
2	OG4	SVI	CPA-OG4 (C10-3)
3	E	SVIS	
4	OG4	SVI	CPB-OG4 (C1-4)
5	E	SGRS	
6	OG8	SGR	CPB-OG8 (C1-2)
7	E	SBES	
8	OG5⅓	SBE	CPB-OG5⅓ (C1-3)
9	E	SGYS	
10	OG16	SGY	CPB-OG16 (C1-1)

C3

Pin No.	Pin Name	Wire Color	Destination
1	E	BL	CPA-E (C2-3)
2	E	SPKS	
3	OG2⅔	SPK	CPB-OG2⅔ (C1-5)
4	E	SGG	
5	OG2	SGGS	CPB-OG2 (C1-6)
6	E	SSBS	
7	OG1	SSB	CPB-OG1 (C1-7)

C4

Pin No.	Pin Name	Wire Color	Destination
1	E	BL	CPA-E (C2-4)
2	E	BL	DC-E (C2-7)
3	E	BL	DC-E (C2-8)
4	E	SPKS	
5	OG2⅔	SPK	CPA-OG2⅔ (C10-1)

C5

Pin No.	Pin Name	Wire Color	Destination
1	$\overline{ODI}$	SBR	CPA-ODO (C8-5)
2	Vss	SBRS	
3	Vss	–	–
4	$\overline{PDI}$	SGY	CPB-PDO (C2-7)
5	Vss	SGYS	

C6

Pin No.	Pin Name	Wire Color	Destination
1	−15	YE	DC-−15 (C2-1)
2	−15	YE	DC-−15 (C2-2)
3	−15	YE	CPA-−15 (C2-5)
4	−15	YE	CPA-−15 (C2-6)
5	E	SBRS	
6	4⋀	SBR	JK-4⋀ (C4-3)
7	E	SRES	
8	8⊓	SRE	JK-8⊓ (C5-1)
9	E	SYES	
10	16⊓	SYE	JK-16⊓ (C4-4)

C7

Pin No.	Pin Name	Wire Color	Destination
1	LATR	RE	CPA-LATR (C10-5)
2	LVTR	OR	CPA-LVTR (C5-8)
3	PSTR	YE	CPB-PSTR (C3-3)
4	UATR	BR	CPA-UATR (C10-4)
5	UVTR	GR	CPA-UVTR (C5-7)

C8

Pin No.	Pin Name	Wire Color	Destination
1	$\overline{SP2}$	YE	CPA-$\overline{SP2}$ (C11-4)
2	$\overline{SP1}$	RE	CPA-$\overline{SP1}$ (C11-1)
3	SP1	BR	CPA-SP1 (C11-2)
4	SP2	OR	CPA-SP2 (C11-3)
5	$\overline{IC}$	WH	CPA-$\overline{IC}$ (C7-6)
6	$\overline{IC}$	WH	CPB-$\overline{IC}$ (C2-10)
7	IC	GY	CPB-IC (C3-1)

C10

Pin No.	Pin Name	Wire Color	Destination
1	Vss	–	–
2	Vss	SWHS	
3	ϕM	SWH	CPB-ϕM (C4-1)
4	Vss	SRES	
5	$\overline{SY}$	SRE	CPB-$\overline{SY}$ (C4-5)

C11

Pin No.	Pin Name	Wire Color	Destination
1	−15D	YE	DC-−15D (C3-5)
2	−15D	YE	DC-−15D (C3-6)
3	−15D	YE	CPA-VDD (C8-2)
4	−15D	YE	CPA-VDD (C8-3)
5	Vss	BL	DC-Vss (C3-1)
6	Vss	BL	DC-Vss (C3-2)
7	Vss	BL	CPA-Vss (C8-10)

C12

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	DM-+15 (C1-3)
2	+15	BR	DM-+15 (C1-4)
3	+15	BR	CPA-+15 (C2-1)
4	+15	BR	CPA-+15 (C2-2)
5	PV	GY	CPA-PV (C5-2)

CPA

C1

Pin No.	Pin Name	Wire Color	Destination
1	OGI	SSB	CPA-BRO (C9-5)
2	PI	SGG	CPA-PO (C9-7)
3	E	SPKS	
4	PO	SPK	JK-PI (C2-4)
5	OGO	SVI	JK-OGI (C2-5)
6	BRO	SRE	CPB-BRI (C5-1)
7	PSI	SBR	CPB-PSO (C3-2)
8	E	SBRS	
9	STI	SOR	CPB-STO (C3-4)
10	E	SORS	

C2

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	DM-+15 (C12-3)
2	+15	BR	DM-+15 (C12-4)
3	E	BL	DM-E (C3-1)
4	E	BL	DM-E (C4-1)
5	−15	YE	DM-−15 (C6-3)
6	−15	YE	DM-−15 (C6-4)
7	LE	BL	DC-E (C2-9)

C3

Pin No.	Pin Name	Wire Color	Destination
1	LE	BL	TC-LE (C1-8)
2	−15	YE	TC-−15 (C1-7)
3	+15	BR	TC-+15 (C1-6)
4	E	BL	TC-E (C1-5)
5	$\overline{AT}$	GR	TC-$\overline{AT}$ (C1-4)
6	S	SB	TC-S (C1-3)
7	LTO	BE	TC-TI (C1-1)
8	LMO	PK	TC-MI (C1-2)

C4

Pin No.	Pin Name	Wire Color	Destination
1	MO	PK	JK-MI (C1-4)
2	PHO	GG	JK-PHI (C1-3)
3	PSO	VI	JK-PSI (C1-2)
4	–	–	–
5	–	–	–

C5

Pin No.	Pin Name	Wire Color	Destination
1	E	–	–
2	PV	SGY	DM-PV (C12-5)
3	EC	SGYS	
4	EC	BL	DC-E (C2-10)
5	EC	SWHS	
6	0V	SWH	DM-0V (C1-5)
7	UVTR	GR	DM-UVTR (C7-5)
8	LVTR	OR	DM-LVTR (C7-2)

C6

Pin No.	Pin Name	Wire Color	Destination
1	MFC	BR	JK-MFC (C3-6)
2	MT	OR	JK-MT (C3-5)
3	SFC	RE	JK-SFC (C3-7)
4	FS	YE	JK-FS (C3-4)
5	E	BL	JK-E (C3-3)
6	+15	BR	JK-+15 (C3-2)
7	−15	YE	JK-−15 (C3-1)

C7

Pin No.	Pin Name	Wire Color	Destination
1	BRI	SYE	CPB-BRO (C5-3)
2	E	BL	CPB-E (C5-5)
3	TEO	SGR	TE-I (C2-4)
4	TEI	SBE	TE-O (C3-3)
5	TE	VI	TE-TE (C3-2)
6	$\overline{IC}$	WH	DM-$\overline{IC}$ (C8-5)
7	S	SB	TE-S (C3-1)

C8

Pin No.	Pin Name	Wire Color	Destination
1	FS	SGR	CPB-FS (C2-9)
2	VDD	YE	DM-−15D (C11-3)
3	VDD	YE	DM-−15D (C11-4)
4	Vss	SBRS	
5	$\overline{ODO}$	SBR	DM-$\overline{ODI}$ (C5-1)
6	Vss	SWHS	
7	ϕM	SWH	CPB-ϕM (C4-3)
8	Vss	SRES	
9	$\overline{SY}$	SRE	CPB-$\overline{SY}$ (C4-7)
10	Vss	BL	DM-Vss (C11-7)

C9

Pin No.	Pin Name	Wire Color	Destination
1	EC	–	–
2	EC	–	–
3	EC	BL	DC-E (C2-11)
4	EC	SSBS	
5	BRO	SSB	CPA-OGI (C1-1)
6	E	SGGS	
7	PO	SGG	CPA-PI (C1-2)
8	BRI	SVI	CPB-OGO (C2-2)

C10

Pin No.	Pin Name	Wire Color	Destination
1	OG2⅔	SPK	DM-OG2⅔ (C4-5)
2	4	–	–
3	OG4	SVI	DM-OG4 (C2-2)
4	UATR	BR	DM-UATR (C7-4)
5	LATR	RE	DM-LATR (C7-1)

C11

Pin No.	Pin Name	Wire Color	Destination
1	$\overline{SP1}$	RE	DM-$\overline{SP1}$ (C8-2)
2	SP1	BR	DM-SP1 (C8-3)
3	SP2	OR	DM-SP2 (C8-4)
4	$\overline{SP2}$	YE	DM-$\overline{SP2}$ (C8-1)
5	SP2	–	–

CPB

C1

Pin No.	Pin Name	Wire Color	Destination
1	OG16	SGY	DM-OG16 (C2-10)
2	OG8	SGR	DM-OG8 (C2-6)
3	OG5⅓	SBE	DM-OG5⅓ (C2-8)
4	OG4	SVI	DM-OG4 (C2-4)
5	OG2⅔	SPK	DM-OG2⅔ (C3-3)
6	OG2	SGG	DM-OG2 (C3-5)
7	OG1	SSB	DM-OG1 (C3-7)
8	+15	BR	CPB-+15 (C6-1)
9	−15	YE	DC-−15 (C1-3)
10	−15	YE	CPB-−15 (C6-4)

C2

Pin No.	Pin Name	Wire Color	Destination
1	E	SVIS	
2	OGO	SVI	CPA-BRI (C9-8)
3	Vss	BL	DC-Vss (C3-3)
4	Vss	BL	DC-Vss (C3-4)
5	VDD	YE	DC-−15D (C3-7)
6	VDD	YE	DC-−15D (C3-8)
7	$\overline{PDO}$	SGY	DM-$\overline{PDI}$ (C5-4)
8	Vss	SGRS	
9	FS	SGR	CPA-FS (C8-1)
10	$\overline{IC}$	WH	DM-$\overline{IC}$ (C8-6)

C3

Pin No.	Pin Name	Wire Color	Destination
1	IC	GY	DM-IC (C8-7)
2	PSO	SBR	CPA-PSI (C1-7)
3	PSTR	YE	DM-PSTR (C7-3)
4	STO	SOR	CPA-STI (C1-9)
5	16⊓	SYE	JK-16⊓ (C4-5)
6	4⋀	SBR	JK-4⋀ (C4-2)
7	8⋀	SBR	JK-8⋀ (C4-8)
8	16⋀	SYE	JK-16⋀ (C5-5)
9	8⊓	SRE	JK-8⊓ (C5-2)
10	8⊓	–	–

C4

Pin No.	Pin Name	Wire Color	Destination
1	ϕM	SWH	DM-ϕM (C10-3)
2	Vss	SWHS	
3	ϕM	SWH	CPA-ϕM (C8-7)
4	Vss	SWHS	
5	$\overline{SY}$	SWH	DM-$\overline{SY}$ (C10-5)
6	Vss	SRES	
7	$\overline{SY}$	SRE	CPA-$\overline{SY}$ (C8-9)
8	Vss	SRES	

C5

Pin No.	Pin Name	Wire Color	Destination
1	BRI	SRE	CPA-BRO (C1-6)
2	E	SRES	
3	BRO	SYE	CPA-BRI (C7-1)
4	E	SYES	
5	E	BL	CPA-E (C7-2)

C6

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	CPB-+15 (C1-8)
2	+15	BR	DC-+15 (C1-7)
3	+15	BR	DC-+15 (C1-8)
4	−15	YE	CPB-−15 (C1-10)
5	−15	YE	DC-−15 (C1-4)
6	E	BL	DC-E (C2-5)
7	E	BL	DC-E (C2-6)

C1

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	DC-+15 (C1-5)
2	+15	BR	DC-+15 (C1-6)
3	+15	–	–
4	E	–	–
5	E	–	–
6	−15	YE	DC-−15 (C1-1)
7	−15	YE	DC-−15 (C1-2)

C2

Pin No.	Pin Name	Wire Color	Destination
1	E	BL	DC-E (C2-3)
2	E	BL	DC-E (C2-4)
3	E	SGRS	
4	I	SGR	CPA-TEO (C7-3)
5	I	–	–

C3

Pin No.	Pin Name	Wire Color	Destination
1	S	SB	CPA-S (C7-7)
2	TE	VI	CPA-TE (C7-5)
3	O	SBE	CPA-TEI (C7-4)
4	E	SBES	
5	E	–	–

TE

C1

Pin No.	Pin Name	Wire Color	Destination
1	+15	BR	DC-+15 (C1-5)
2	+15	BR	DC-+15 (C1-6)
3	+15	–	–
4	E	–	–
5	E	–	–
6	−15	YE	DC-−15 (C1-1)
7	−15	YE	DC-−15 (C1-2)

C2

Pin No.	Pin Name	Wire Color	Destination
1	E	BL	DC-E (C2-3)
2	E	BL	DC-E (C2-4)
3	E	SGRS	
4	I	SGR	CPA-TEO (C7-3)
5	I	–	–

C3

Pin No.	Pin Name	Wire Color	Destination
1	S	SB	CPA-S (C7-7)
2	TE	VI	CPA-TE (C7-5)
3	O	SBE	CPA-TEI (C7-4)
4	E	SBES	
5	E	–	–

JK

C1

Pin No.	Pin Name	Wire Color	Destination
1	–	–	–
2	PSI	VI	CPA-PSO (C4-3)
3	PHI	GG	CPA-PHO (C4-2)
4	MI	PK	CPA-MO (C4-1)
5	–	–	–

C2

Pin No.	Pin Name	Wire Color	Destination
1	–	–	–
2	–	–	–
3	E	SVIS	
4	PI	SPK	CPA-PO (C1-4)
5	OGI	SVI	CPA-OGO (C1-5)

C3

Pin No.	Pin Name	Wire Color	Destination
1	−15	YE	CPA-−15 (C6-7)
2	+15	BR	CPA-+15 (C6-6)
3	E	BL	CPA-E (C6-5)
4	FS	YE	CPA-FS (C6-4)
5	MT	OR	CPA-MT (C6-2)
6	MFS	BR	CPA-MFS (C6-1)
7	SFC	RE	CPA-SFC (C6-3)

C4

Pin No.	Pin Name	Wire Color	Destination
1	E	SBRS	
2	4⋀	SBR	CPB-4⋀ (C3-6)
3	4⋀	SBR	DM-4⋀ (C6-6)
4	16⊓	SYE	DM-16⊓ (C6-10)
5	16⊓	SYE	CPB-16⊓ (C3-5)
6	E	SYES	
7	E	SORS	
8	8⋀	SOR	CPB-8⋀ (C3-7)

C5

Pin No.	Pin Name	Wire Color	Destination
1	8⊓	SRE	DM-8⊓ (C6-8)
2	8⊓	SRE	CPB-8⊓ (C3-9)
3	E	SRES	
4	E	SGRS	
5	16⋀	SGR	CPB-16⋀ (C3-8)

TC

C1

Pin No.	Pin Name	Wire Color	Destination
1	TI	BE	CPA-LTO (C3-7)
2	MI	PK	CPA-LMO (C3-8)
3	S	SB	CPA-S (C3-6)
4	$\overline{AT}$	GR	CPA-$\overline{AT}$ (C3-5)
5	E	BL	CPA-E (C3-4)
6	+15	BR	CPA-+15 (C3-3)
7	−15	YE	CPA-−15 (C3-2)
8	LE	BL	CPA-LE (C3-1)

DC

C1

Pin No.	Pin Name	Wire Color	Destination
1	−15	YE	TE-−15 (C1-6)
2	−15	YE	TE-−15 (C1-7)
3	−15	YE	CPB-−15 (C1-9)
4	−15	YE	CPB-−15 (C6-5)
5	+15	BR	TE-+15 (C1-1)
6	+15	BR	TE-+15 (C1-2)
7	+15	BR	CPB-+15 (C6-2)
8	+15	BR	CPB-+15 (C6-3)
9	+15	BR	DM-+15 (C1-1)
10	+15	BR	DM-+15 (C1-2)
11	+15	–	–
12	+15	–	–

C2

Pin No.	Pin Name	Wire Color	Destination
1	−15	YE	DM-−15 (C6-1)
2	−15	YE	DM-−15 (C6-2)
3	E	BL	TE-E (C2-1)
4	E	BL	TE-E (C2-2)
5	E	BL	CPB-E (C6-6)
6	E	BL	CPB-E (C6-7)
7	E	BL	DM-E (C4-2)
8	E	BL	DM-E (C4-3)
9	E	BL	CPA-LE (C2-7)
10	E	BL	CPA-EC (C5-4)
11	E	BL	CPA-EC (C9-3)
12	E	BL	Chassis

C3

Pin No.	Pin Name	Wire Color	Destination
1	Vss	BL	DM-Vss (C11-5)
2	Vss	BL	DM-Vss (C11-6)
3	Vss	BL	CPB-Vss (C2-3)
4	Vss	BL	CPB-Vss (C2-4)
5	−15D	YE	DM-−15D (C11-1)
6	−15D	YE	DM-−15D (C11-2)
7	−15D	YE	CPB-VDD (C2-5)
8	−15D	YE	CPB-VDD (C2-6)
9	E	BL	MK Earth
10	E	BL	Panel Earth
11	E	BL	Bottom Shield
12	E	–	–

NOTES:

1. All Resistors are 1/4 watt unless otherwise specified.
2. All Capacitors are in microfarads unless otherwise specified.
3. All Keyswitches, Tabswitches and Pushbutton Switches shown in "off" position.
4. Capacitors
   - △ mark : Tantalum Capacitor
   - ○ mark : Polystyrene Capacitor
   - K mark : Ceramic Capacitor 1000pF
5. ABBREVIATIONS OF WIRE COLOR IN ELECTONE
   - BL .... BLACK
   - YE .... YELLOW
   - GY .... GRAY
   - PK .... PINK
   - BR .... BROWN
   - GR .... GREEN
   - WH .... WHITE
   - TR .... TRANSPARENT
   - RE .... RED
   - BE .... BLUE
   - GG .... GRASS GREEN
   - OR .... ORANGE
   - VI .... VIOLET
   - SB .... SKY BLUE
   - TP .... TIN PLATED WIRE
   - SOR ...... Shielded orange wire
   - SGRS ..... Shield portion of shielded green wire

SK20 OVERALL CIRCUIT DIAGRAM