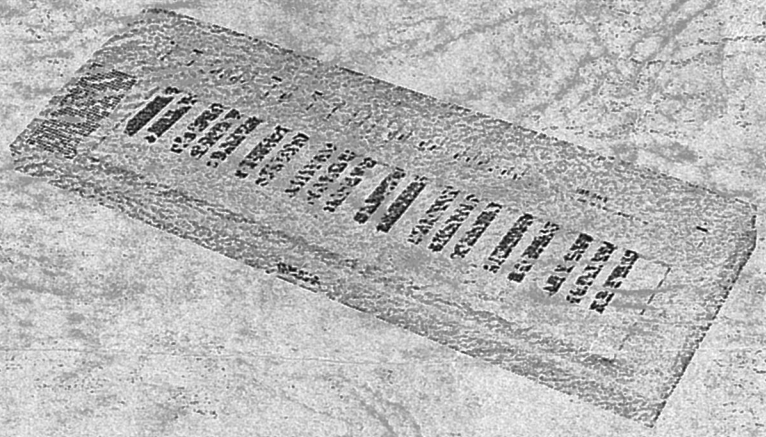
YAMAHA

PORTABLE KEYBOARD

PS-20



SERVICE MANUAL

'80.9 1.7K K·S ⊖ Printed in Japan

CONTENTS

SPECIFICATIONS

KEYBOARD
49 keys ($C_1 \sim C_5$)

ORCHESTRA TONES

Tone	Tone
ORGAN 1	ORGAN 2
TRUMPET	STRING
CLARINET	OBOE
PIANO	HARPSICHORD
ACCORDION	VIBRAPHONE

EFFECT
SUSTAIN

AUTO RHYTHM SECTION

RHYTHM SELECTOR

Rhythm	Rhythm
MARCH	DISCO
WALTZ	ROCK
TANGO	SWING
RHUMBA	SAMBA

RHYTHM CONTROLS
Rhythm START, Rhythm SYNCHRO START,
TEMPO, VOLUME, 8 BAR VARIATION

AUTO BASS CHORD SECTION
NORMAL
SINGLE FINGER CHORD
FINGERED CHORD
MEMORY
MULTI BASS
VOLUME

AUTO ARPEGGIO SECTION
VARIATION
VOLUME

OTHER CONTROLS AND INDICATORS
POWER Switch
Pilot Light
MASTER VOLUME

AUXILIARY TERMINALS
HEADPHONES
AUX-OUT (600Ω)
AUX-IN (30kΩ)
EXP. PEDAL
DC 9V IN

MAIN AMPLIFIER
5W (R.M.S.)

SPEAKER
12 cm (5") x 8 cm (3") (4Ω)

RATED VOLTAGE
DC 9V: Batteries (SUM-1, "D" size, R20 or EQU)
AC power adaptor
Car battery adaptor (option)

POWER CONSUMPTION
14W (with AC power adaptor)

EXTERIOR
Main unit: ABC resin
Finish: Polyurethane coating

DIMENSIONS
Width : 84 cm (35")
Depth : 29 cm (12") – 33 cm [14"] –
Height : 9 cm (3-3/4") – 25 cm [10-1/2"] –
* – [ ] – indicates the dimensions when the music rest is attached.

WEIGHT
5.8 kg (12 lbs. 12 oz.)
* This weight does not include the weight of the dry-cell batteries.

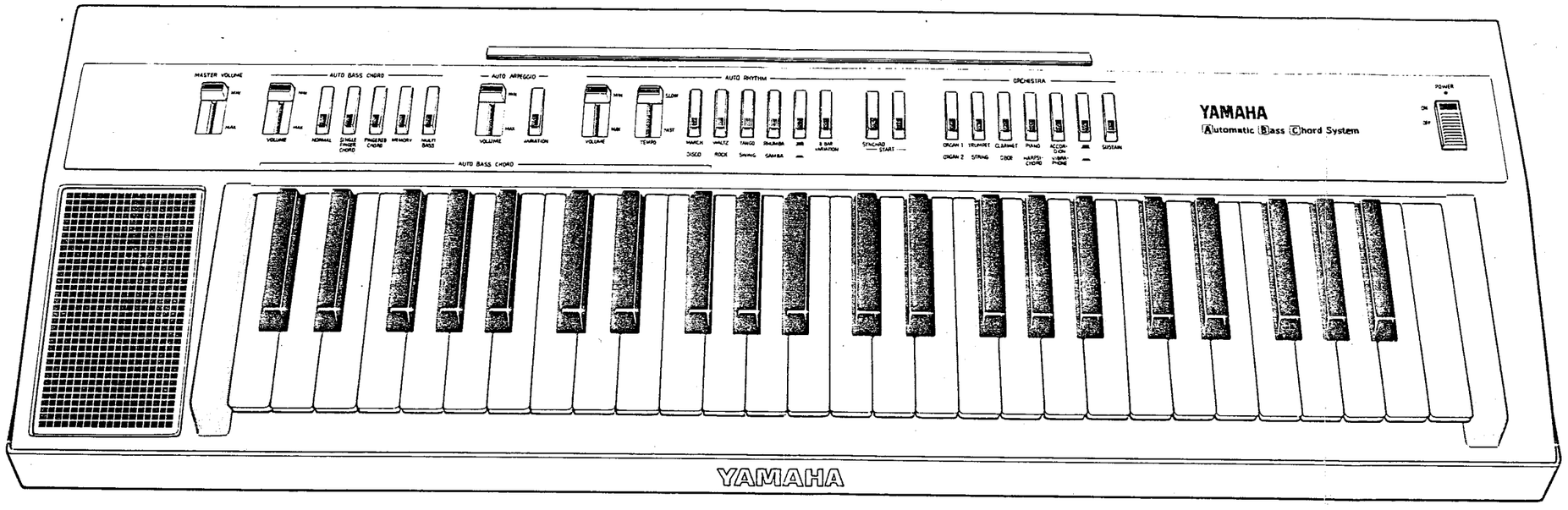
Specifications subject to change without notice..

ACCESSORIES

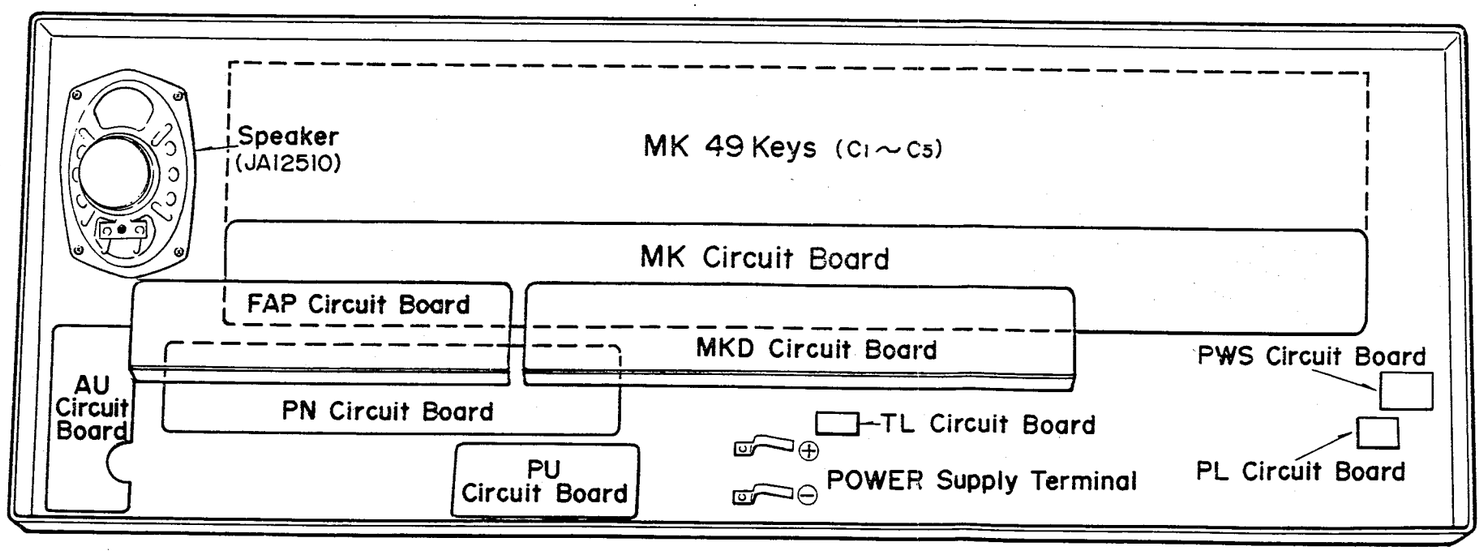
DUST COVER	BATTERY PACK
MUSIC REST	AC POWER ADAPTOR

The maximum number of notes which can be simultaneously sounded on this instrument is shown below.
* Normally . . . . . 10 notes (Melody)
* During ABC playing
  Bass note 1
  Melody notes 4
  Chord notes 4
  Arpeggio note 1

PANEL LAYOUT



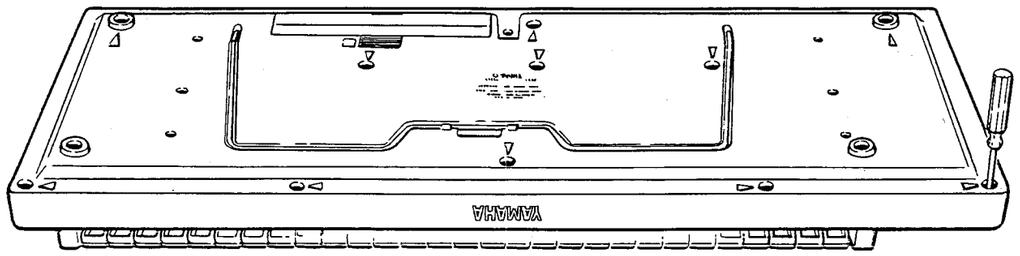
UNIT LAYOUT (Bottom View)



Sub Circuit Board	TO3 : On MKD Circuit Board	⇨ Applied YM1001 (KAR)	
	DC : On FAP Circuit Board	⇨ Applied S/# 1002 ~ 2290	
	IMR : On PA Circuit Board		

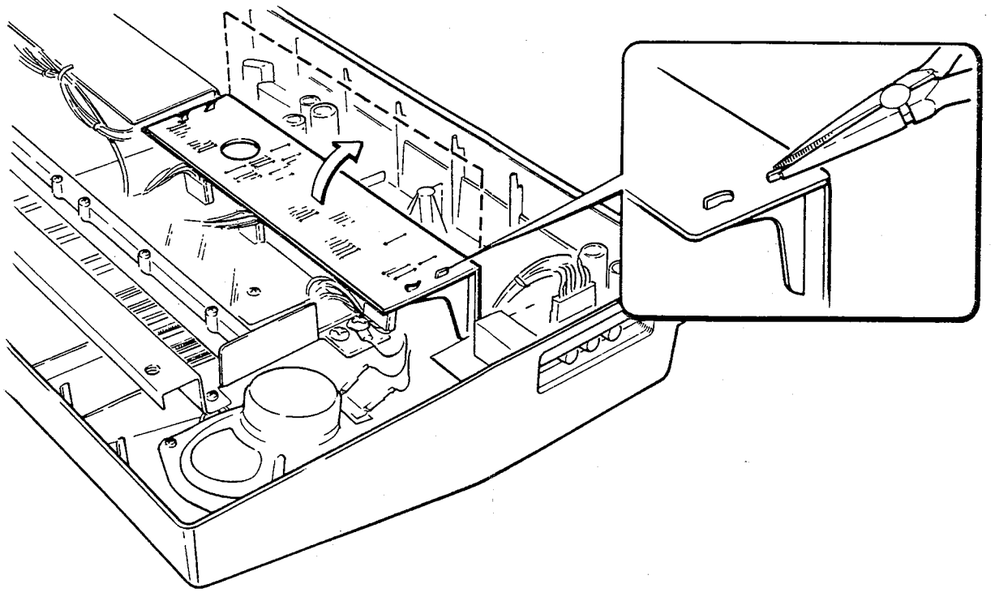
1. Removal of bottom case

Turn over the unit, unscrew the fixing screws (11 in all) in the holes marked with ▽ and remove the bottom case by pulling its four sides gradually.



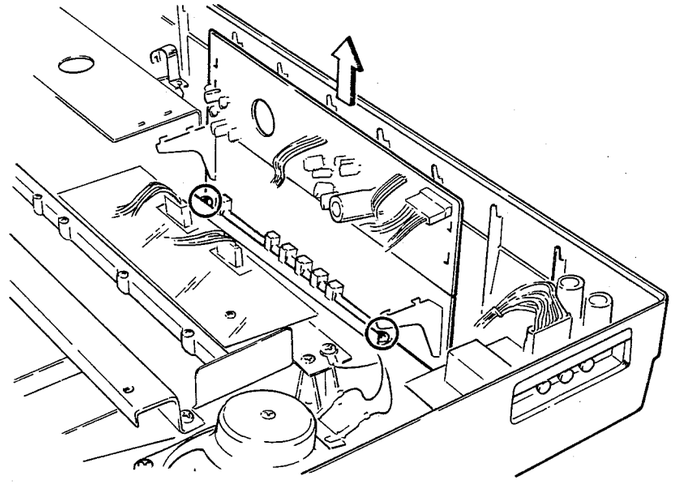
2. Removal of FAP circuit board

1) Straighten four fastening plates fixing the circuit board with a Longnose pliers and raise the circuit board gently.



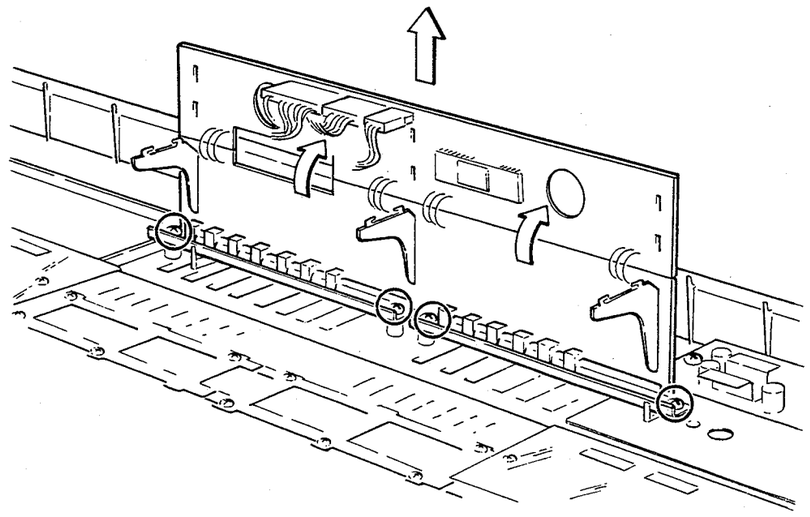
DISASSEMBLY PROCEDURE

2) Remove four screws shown in the figure, connectors connected to the circuit board and Ribbon Wire. Then FAP circuit board can be removed.



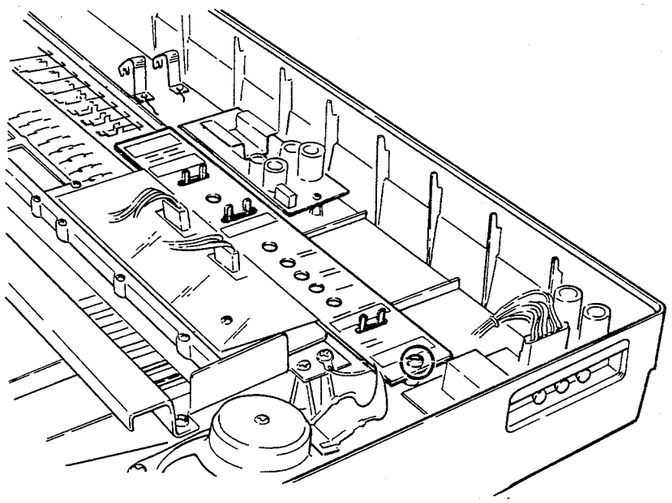
3. Removal of MKD circuit board

1) Follow step 1) of **2** to raise MKD circuit board.
2) Remove two screws shown in the figure and connectors connected to the circuit board, and the circuit board can be removed.



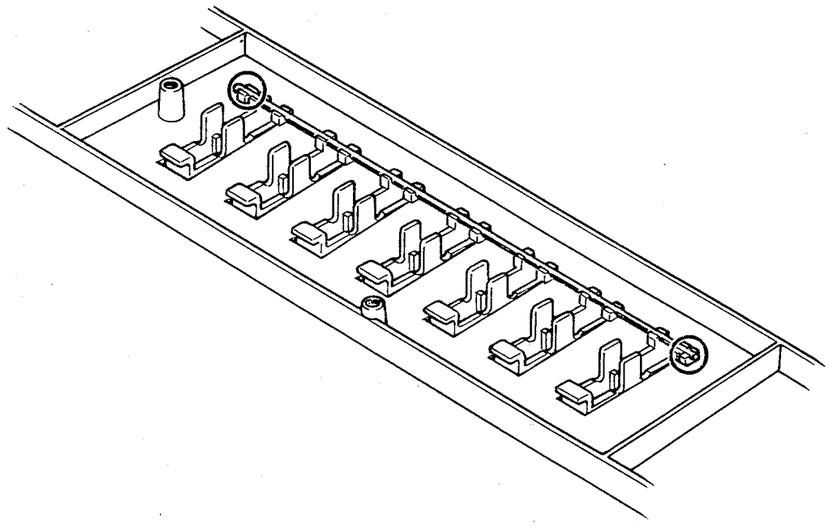
4. Removal of PN circuit board

1) Remove slide volume knobs on the panel.
2) Remove FAP circuit board, referring to 2.
3) Remove PN circuit board by unscrewing one fixing screw.



5. Removal of switches

1) Remove each circuit board referring to the removal instruction for each circuit board.
2) Push the shaft of switches with fingers from the front panel side, and the shaft will come off the bearings.
3) Each switch can be removed from the shaft easily.
4) When reinstalling them, fit the switches onto the shaft from the back side of the panel, place the shaft on the bearings and push its both ends until locked.

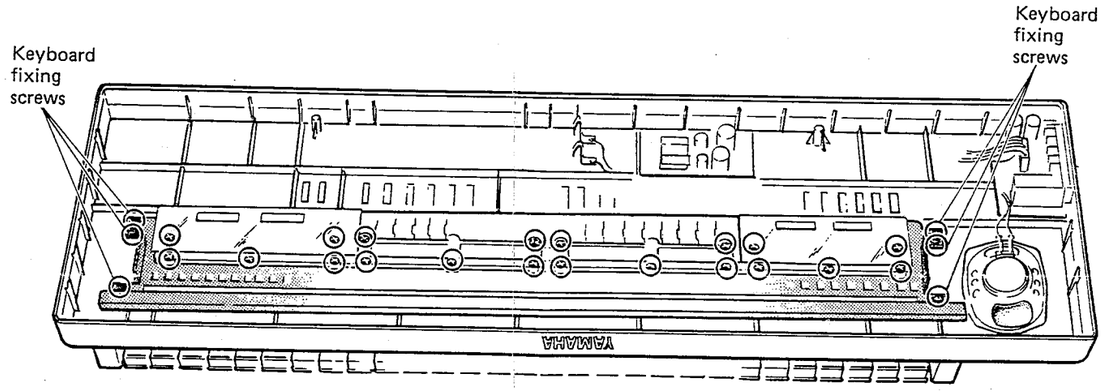


6. Removal of MK circuit board

1) Follow step 1) of 2 to raise each circuit board.
2) Remove the fixing screws (20 in all) and connectors connected to MK circuit board, and MK circuit board can be removed.

7. Removal of keyboard

1) Remove the entire keyboard by unscrewing six fixing screws.



8. Removing Keyboard

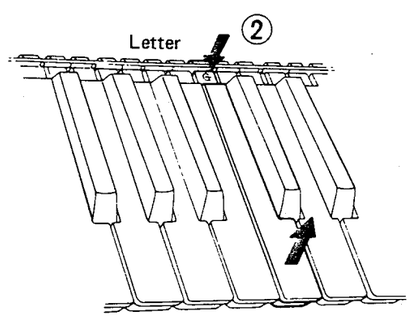
1) Remove bottom case.
2) Remove MK fastening screws securing keyboard.
3) Raise the keyboard, and remove connectors.
4) Remove keyboard up.

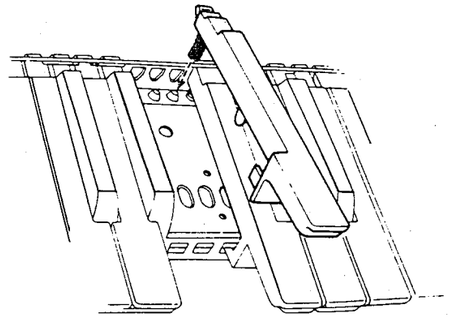
9. Removing Keys

1) Remove white keys first, then black keys, making sure to mark their order.
2) Push the key down in the direction of arrow at the point marked with the letter as shown in the figure to release the key hook from its fulcrum.
3) Remove your finger from the key and then withdraw the key making sure not to lose the spring.

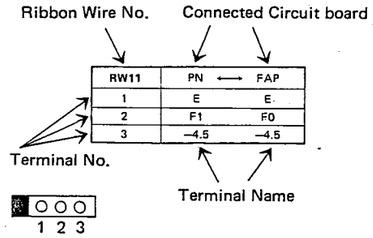
Installation Precautions

Insert the spring over the round peg as shown in the figure and push the key down so that the hook falls over the fulcrum. Install black keys before installing white keys.





• How to Read Wiring Table



• Wiring Table of Ribbon Wire

RW1	MKD ⟷ MKD	
1	VIB	VIB
2	DV	DV

RW2	PWS ⟷ PL	
1	E	E
2	PL	PL

RW3	PN ⟷ AU	
1	EXO	EXO
2	P9	P9

RW4	PN ⟷ MKD	
1	−9	−9
2	TCL	TCL

RW5	PA ⟷ AU	
1	AUI	AUI
2	P9	P9

RW6	MKD ⟷ FAP	
1	DV	DV
2	VI	VO

RW7	PN ⟷ PA	
1	MO	MI
2	–	E

RW8	MKD ⟷ TL	
1	−9	−9
2	TL	TL

RW9	MKD ⟷ MKD	
1	ENS	ENS
2	−9	−9
3	$\overline{IC}$	$\overline{IC}$

RW10	MKD ⟷ MKD	
1	R4	R4
2	R3	R3
3	R2	R2

RW11	PN ⟷ FAP	
1	E	E
2	FI	F0
3	−4.5	−4.5

RW12	PN ⟷ MKD	
1	ABC	ABC
2	ARP	ARP
3	RHY	RHY

RW13	PA ⟷ AU	
1	P9	P9
2	SPA	SPA
3	SPB	SPB

RW14	MKD ⟷ MKD	
1	$\overline{SY}$	$\overline{SY}$
2	ϕM	ϕM
3	$\overline{Si}$	$\overline{SO}$
4	VI	VI

RW15	FAP ⟷ MKD	
1	−9	−9
2	−9	−9
3	E	E
4	E	E

RW16	FAP ⟷ MKD	
1	−4.5	−4.5
2	16′	16′
3	8′	8′
4	4′	4′
5	2′	2′

RW17	FAP ⟷ MKD	
1	AV	AV
2	MB	MB
3	ME	ME
4	FC	FC
5	SF	SF

RW18	FAP ⟷ MKD	
1	OR1	OR1
2	TP	TP
3	CL	CL
4	PF	PF
5	ACC	ACC

RW19	FAP ⟷ MKD	
1	OR2	OR2
2	ST	ST
3	OB	OB
4	MC	MC
5	VIB	VIB

• Connector Table

C1 [MKD]

Pin No.	Pin Name	Wire Color	Destination
1	N1	BR	MK-N1 (C1-1)
2	N2	RE	MK-N2 (C1-2)
3	N3	OR	MK-N3 (C1-3)
4	N4	YE	MK-N4 (C1-4)
5	N5	GR	MK-N5 (C1-5)
6	N6	BE	MK-N6 (C1-6)
7	N7	VI	MK-N7 (C1-7)

C2 [MKD]

Pin No.	Pin Name	Wire Color	Destination
1	$\overline{B11}$	BR	MK-$\overline{B11}$ (C2-1)
2	$\overline{B12}$	RE	MK-$\overline{B12}$ (C2-2)
3	$\overline{B21}$	OR	MK-$\overline{B21}$ (C2-3)
4	$\overline{B22}$	YE	MK-$\overline{B22}$ (C2-4)
5	$\overline{B31}$	GR	MK-$\overline{B31}$ (C2-5)
6	$\overline{B32}$	BE	MK-$\overline{B32}$ (C2-6)
7	$\overline{B41}$	VI	MK-$\overline{B41}$ (C2-7)
8	$\overline{B42}$	GY	MK-$\overline{B42}$ (C2-8)

C3 [MKD]

Pin No.	Pin Name	Wire Color	Destination
1	$\overline{KC1}$	–	Non Connect
2	$\overline{KC2}$	–	
3	$\overline{KC3}$	–	
4	$\overline{KC4}$	–	
5	ϕM	–	
6	$\overline{SY}$	–	
7	$\overline{IC}$	–	
8	E	–	
9	−9	–	
10	ENS	–	

C4 [FAP]

Pin No.	Pin Name	Wire Color	Destination
1	E	–	Non Connect
2	E	–	
3	E	–	
4	−9	–	
5	−9	–	

C5 [FAP]

Pin No.	Pin Name	Wire Color	Destination
1	SLI	–	
2	PL	PK	PWS-PL (C8-7)
3	PSE	SB	PWS-PSE (C8-1)
4	DC9	BE	AU-DC9 (C7-1)
5	DC9	BE	AU-DC9 (C7-2)
6	E	RE	Power Supply Terminal +
7	E	RE	Power Supply Terminal +

C6 [PA]

Pin No.	Pin Name	Wire Color	Destination
1	P9	BE	MK-Shield cover
2	P9	BE	AU-DC9 (C7-3)
3	P9	BE	AU-DC9 (C7-4)
4	PE	OR	PWS-PE (C8-3)
5	PE	OR	PWS-PE (C8-4)

C7 [AU]

Pin No.	Pin Name	Wire Color	Destination
1	DC9	BE	FAP-DC9 (C5-4)
2	DC9	BE	FAP-DC9 (C5-5)
3	DC9	BE	PA-P9 (C6-2)
4	DC9	BE	PA-P9 (C6-3)
5	BP9	BE	Power Supply Terminal −
6	BP9	BE	Power Supply Terminal −
7	E	RE	Power Supply Terminal +
8	E	RE	Power Supply Terminal +
9	SP1	YE	Speaker +
10	SP2	VI	Speaker −

C8 [PWS]

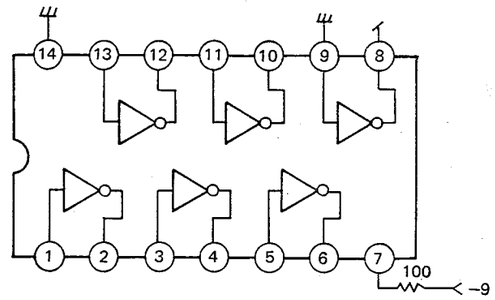
Pin No.	Pin Name	Wire Color	Destination
1	PL	PK	FAP-PL (C5-2)
2	BPE	RE	Power Supply Terminal +
3	BPE	RE	Power Supply Terminal +
4	PE	OR	PA-PE (C6-5)
5	PE	OR	PA-PE (C6-4)
6	BPE	RE	Power Supply Terminal +
7	PSE	SB	FAP-PSE (C5-3)

Wiring Table & Notes

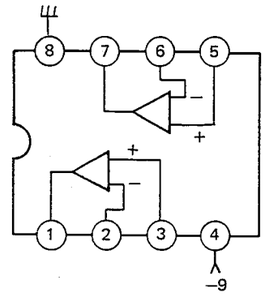
Notes)

1. Integrated Circuit
   - IC1 : YM1001 or YM1011 (KAR)
   - IC2 : YM1101 (DOM)
   - IC3, 4 : YM1002 (PSC II)
   - IC5 : TC4069 (INV.)
   - IC6 ~ 12 : μPC4558 (OP. Amp)
   - IC13 : iG2602 (VCA)
   - IC14 : LA4125 (P. Amp)
2. Transistor
   - Tr1 : 2SC752
   - Tr2 ~ 7, 9 : 2SC1815
   - Tr8 : 2SA733
   - Tr12, 13 : 2SA937
   - Tr10 : 2SC509
   - Tr11 : 2SA509
   - Tr14 : 2SC2021
3. Field Effect Transistor
   - FET1 : 2SK105
   - FET2 ~ 15 : 2SK246
4. Diode
   - ZD1 : WZ061
   - ZD2 : WZ056
   - D50 ~ 66 : 1S1555
   - D67 : 10E-1
5. LED 1, 2 : SLC-2ZUR
6. Piezoelectric Ceramic Vibrator
   - CL1 : QU00090 (470 kHz)

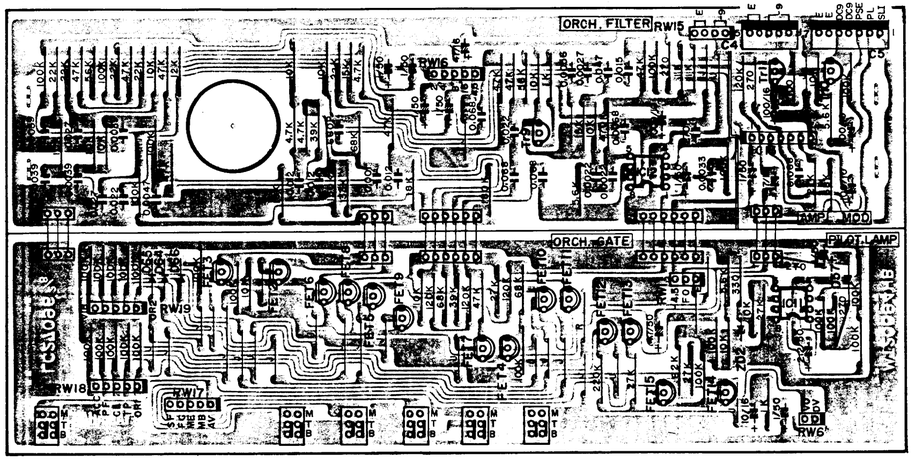
TC4069 (Inverter) : IC5



μPC4558 (OP. Amp) : IC6 ~ 12

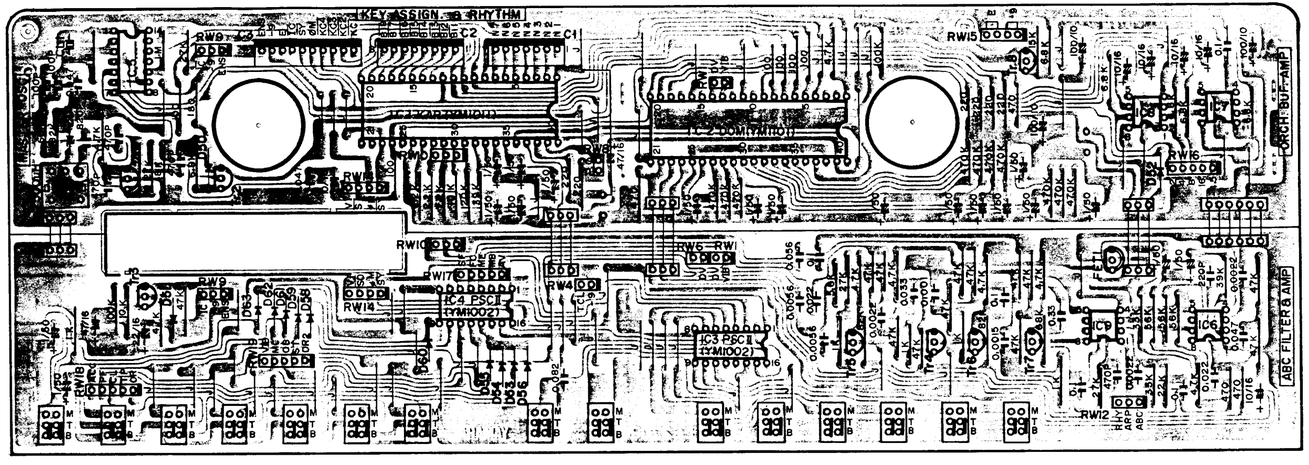


FAP



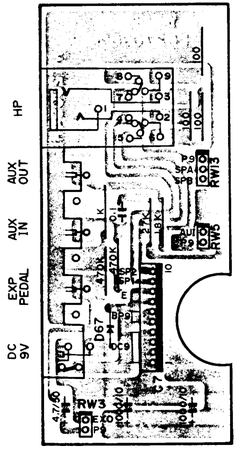
PS6 ARPEGGIO VARIATION | PS5 MULTI BASS | PS4 MEMORY | PS3 F·C | PS2 S·FC | PS1 NORMAL

MKD



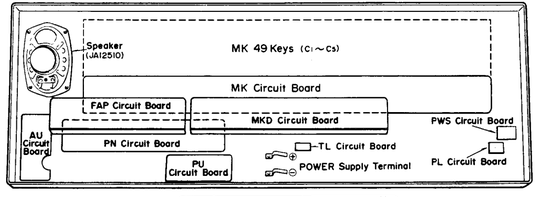
PS21 SUS | PS20 ♯/♭ | PS19 AC/VIB | PS18 PF/HC | PS17 CL/OB | PS16 TP/ST | PS15 ORI/OR2 | PS14 ST | PS13 S.ST | PS12 8 BAR | PS11 ♯/♭ | PS10 RHU/SAM | PS9 TAN/SWI | PS8 WAL/ROK | PS7 MAR/DIS

AU



TL

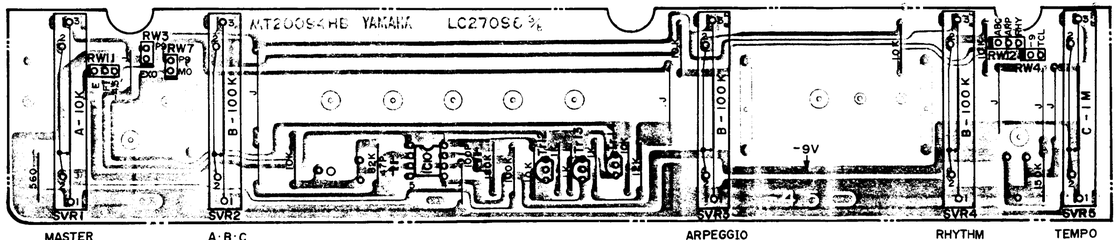
View from the printed pattern side



Sub Circuit Board — TO3 : On MKD Circuit Board ⇨ Applied YM1001(KAR)
DC : On FAP Circuit Board ⇨ Applied S/# 1002~2290
IMR : On PA Circuit Board ⇨ Applied S/# 1002~2290

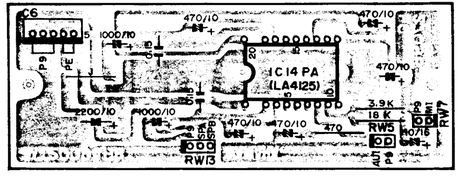
PN

View from the printed pattern side

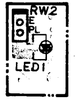


MASTER VOLUME | A·B·C VOLUME | ARPEGGIO VOLUME | RHYTHM VOLUME | TEMPO VOLUME

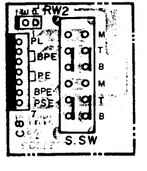
PA



PL



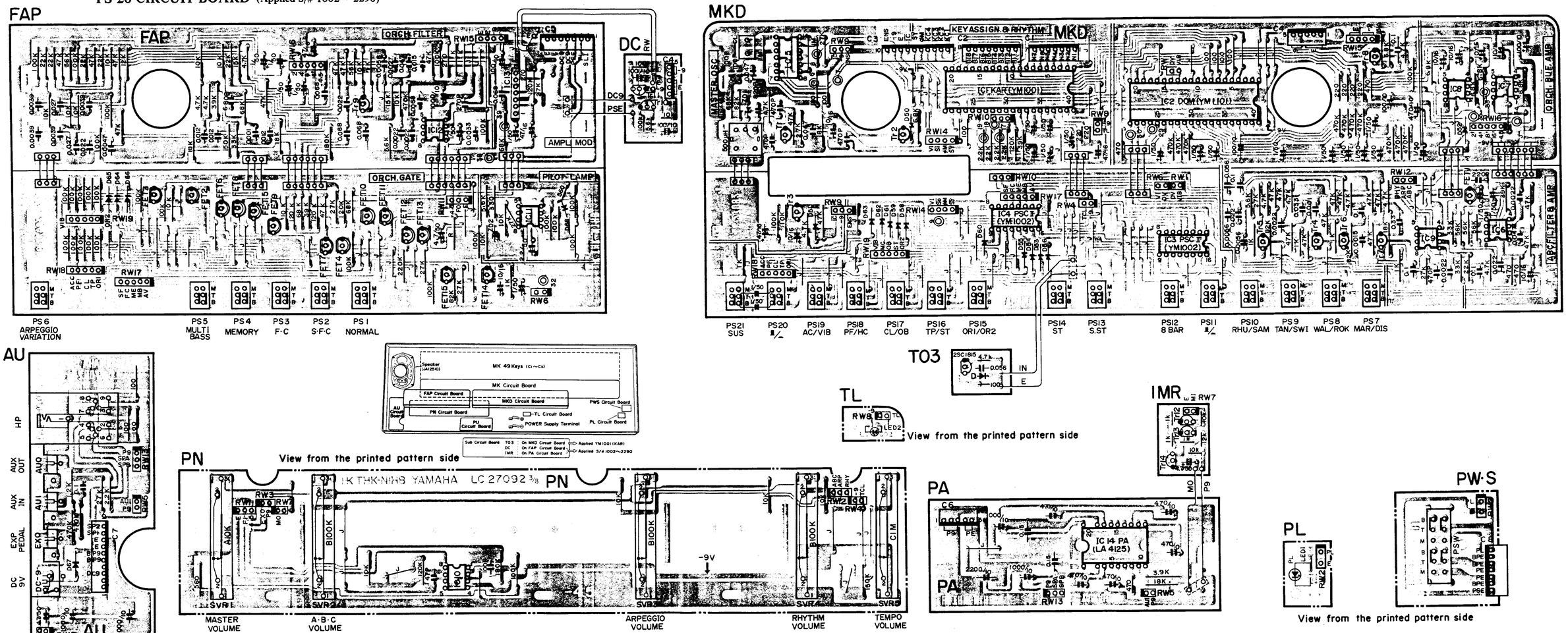
PW·S



View from the printed pattern side

PS-20

PS-20 CIRCUIT BOARD (Applied S/# 1002 ~ 2290)



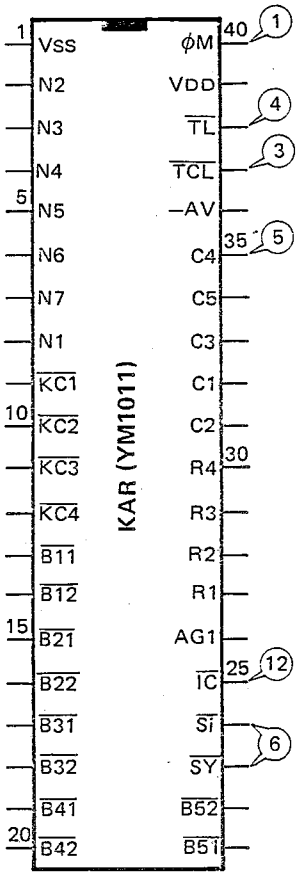
KEP-NA10448-05 A

LSI DATA TABLE

Part Name	YM1011 (YM1001)	Function Name	KAR (Key Assigner & Rhythm)

Pin No.	Pin Name	Description
1	VSS	Ground (0V)
2	N2	Note Block (⇐MK)
3	N3	
4	N4	
5	N5	
6	N6	
7	N7	
8	N1	
9	$\overline{KC1}$	Key Code Data OUT (⇒DOM)
10	$\overline{KC2}$	
11	$\overline{KC3}$	
12	$\overline{KC4}$	
13	$\overline{B11}$	Octave Block (⇐MK)
14	$\overline{B12}$	
15	$\overline{B21}$	
16	$\overline{B22}$	
17	$\overline{B31}$	
18	$\overline{B32}$	
19	$\overline{B41}$	
20	$\overline{B42}$	

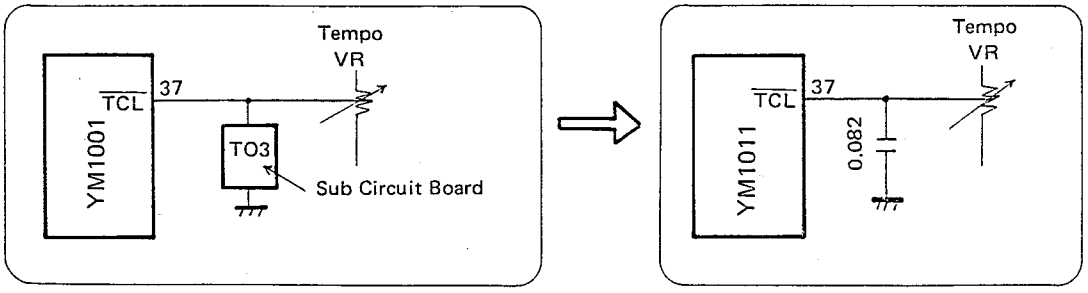
Pin No.	Pin Name	Description
40	ϕM	Master Clock IN (470kHz)
39	VDD	DC Supply (−9V)
38	$\overline{TL}$	Tempo lamp Drive OUT
37	$\overline{TCL}$	C.R for tempo clock oscillation
36	−AV	DC supply for Rhythm sound source (−2V)
35	C4	HC
34	C5	HB
33	C3	LC (C.R for Rhythm envelope setting)
32	C1	SDN
31	C2	HH
30	R4	BDP
29	R3	DP
28	R2	HB/HLC (Rhythm sound source OUT)
27	R1	HH/SDN
26	AG1	Analog GND
25	$\overline{IC}$	Initial clear IN
24	$\overline{Si}$	Serial data IN (⇐PSC II)
23	$\overline{SY}$	Synchro data IN (⇐KAR)
22	$\overline{B52}$	Octave block
21	$\overline{B51}$	



NOTE) ⌒ Marks ... Refer to MAIN WAVE FORMS (P19 ~ 22)

SERVICE PART FOR YM1001 (KAR)

YM1011 should be used as a service part for YM1001. At the same time, be sure to replace TO3 circuit board connected to 37 pin with a capacitor of 0.082μF.

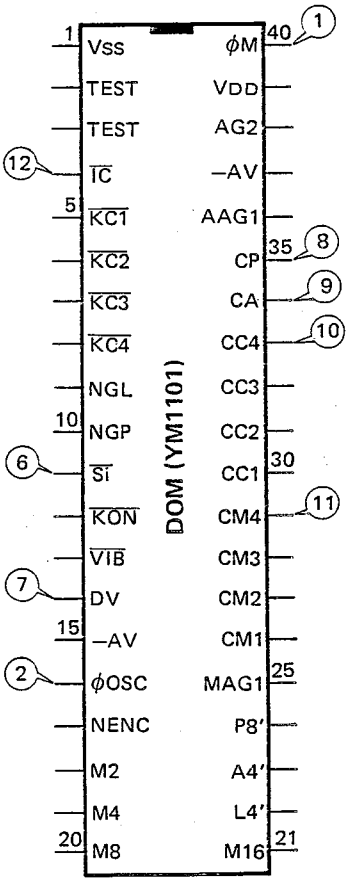


YM1001 + TO3 (Sub Circuit Board) YM1011 + Capacitor 0.082

Part Name	YM1101	Function Name	DOM (Digital Tone Generator)

Pin No.	Pin Name	Description
1	VSS	Ground (0V)
2	TEST	Test Pin
3	TEST	– do. –
4	$\overline{IC}$	Initial clear IN
5	$\overline{KC1}$	Key code data IN (⇐KAR)
6	$\overline{KC2}$	
7	$\overline{KC3}$	
8	$\overline{KC4}$	
9	NGL	Normal gate data OUT
10	NGP	NC
11	$\overline{SI}$	Serial data IN (⇐PSC II)
12	$\overline{KON}$	KEY ON signal OUT
13	$\overline{VIB}$	Vibraphone-ON data OUT
14	DV	Deray vibrato data OUT
15	–AV	DC supply for sound source (–2V)
16	ϕOSC	Clock for sound source IN (588kHz)
17	NENC	NC
18	M2′	2′
19	M4′	4′ Sound source OUT
20	M8′	8′

Pin No.	Pin Name	Description
40	ϕM	Master clock IN (470kHz)
39	VDD	DC Supply (–9V)
38	AG2	Analog GND
37	–AV	DC Supply for Sound source (–2V)
36	AAG1	GND (Auto Bass Sound source)
35	CP	C.R for Auto Bass/Manual Key Sound source envelope setting
34	CA	C.R for Auto Arpeggio/Manual Key Sound source envelope setting
33	CC4	C.R for Auto Code/Manual Key Sound source envelope setting
32	CC3	
31	CC2	
30	CC1	
29	CM4	C.R for Manual Key Sound source envelope setting
28	CM3	
27	CM2	
26	CM1	
25	MAG1	GND (Manual Key sournd source)
24	P8′	Auto Bass sound source OUT
23	A4′	Auto Arpeggio sound source OUT
22	L4′	Auto Code sound source OUT
21	M16′	16′ sound source OUT

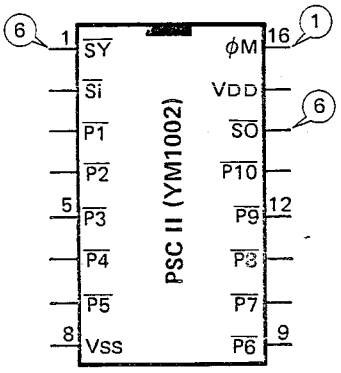


NOTE) ◯ Marks ... Refer to MAIN WAVE FORMS (P19 ~ 22)

Part Name	YM1002	Function Name	PSC II (Parallel – Serial Converter)

Pin No.	Pin Name	Description
1	$\overline{SY}$	Synchro data IN (⇐KAR)
2	$\overline{Si}$	Serial data IN (⇐PSC II)
3	$\overline{P1}$	Parallel data IN 1 (⇐SW)
4	$\overline{P2}$	– do. – 2 (⇐SW)
5	$\overline{P3}$	– do. – 3 (⇐SW)
6	$\overline{P4}$	– do. – 4 (⇐SW)
7	$\overline{P5}$	– do. – 5 (⇐SW)
8	VSS	Ground (0V)

Pin No.	Pin Name	Description
16	ϕM	Master clock IN (470kHz)
15	VDD	DC Supply (–9V)
14	$\overline{SO}$	Serial data OUT (⇒KAR, DOM)
13	$\overline{P10}$	Parallel data IN 10 (⇐SW)
12	$\overline{P9}$	– do. – 9 (⇐SW)
11	$\overline{P8}$	– do. – 8 (⇐SW)
10	$\overline{P7}$	– do. – 7 (⇐SW)
9	$\overline{P6}$	– do. – 6 (⇐SW)



NOTE) ◯ Marks ... Refer to MAIN WAVE FORMS (P19～22)

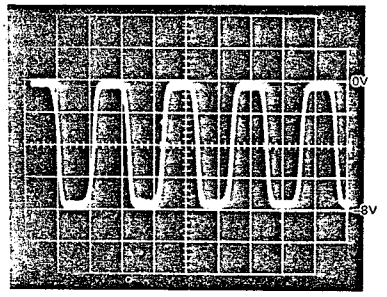
MAIN WAVE FORMS

Wave Shape Figures

1 Master Clock (φM)

- CHECK POINT (MKD)
  4th Pin of IC5
- CONDITION
  Power SW. – ON

f ≒ 470kHz

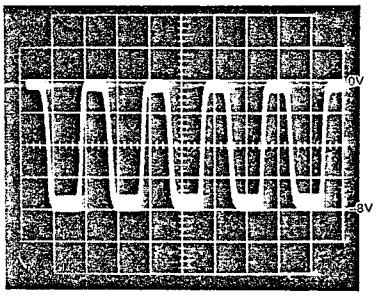


CH. 1	CH. 2
2 /DIV	/DIV
1μ /DIV	
AC (DC)	AC·DC
φM	

2 Sound Source Clock (φOSC)

- CHECK POINT (MKD)
  6th Pin of IC5
  [16th Pin of IC2 (DOM)]
- CONDITION
  ORGAN 1 – ON
  * Frequency varies with Vibrato in case of ORGAN2, TRUMPET, OBOE and STRING.

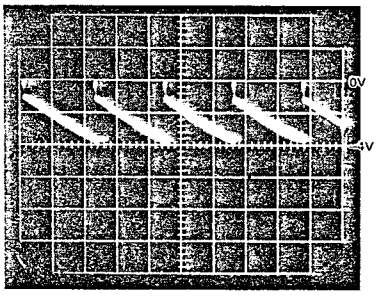
f ≒ 588kHz



CH. 1	CH. 2
2 /DIV	/DIV
1μ /DIV	
AC (DC)	AC·DC
φOSC	

3 Tempo Clock ($\overline{TCL}$)

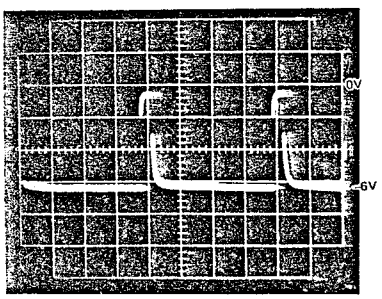
- CHECK POINT (MKD)
  37th Pin of IC1 (KAR)
- CONDITION
  RHYTHM START
  Tempo Volume MAX.



CH. 1	CH. 2
2 /DIV	/DIV
2mS /DIV	
AC (DC)	AC·DC
$\overline{TCL}$	

4 Tempo Lamp Drive Pulse ($\overline{TL}$)

- CHECK POINT (MKD)
  38th Pin of IC1 (KAR)
- CONDITION
  RHYTHM START
  Tempo Volume MAX.

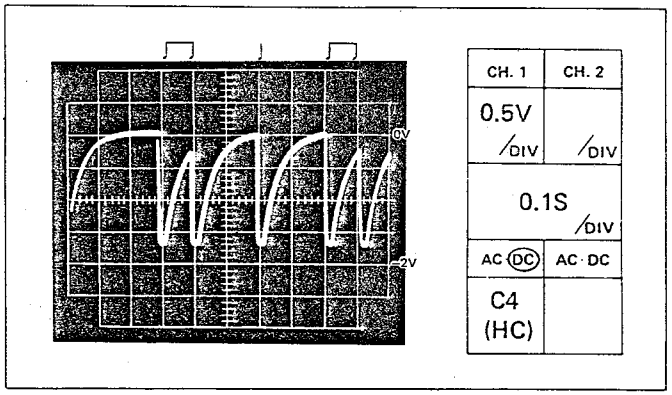


CH. 1	CH. 2
2 /DIV	/DIV
0.2S /DIV	
AC (DC)	AC·DC
$\overline{TL}$	

5 Rhythm Envelope (HC)

●CHECK POINT (MKD)
35th Pin of IC1 (KAR)
Envelope of High Conga

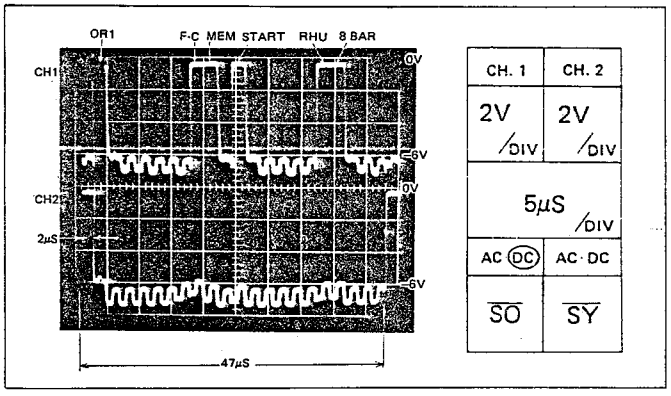
●CONDITION
RHYTHM START (RHUMBA)
Tempo Volume MAX.
*The wave form varies with the rhythm.

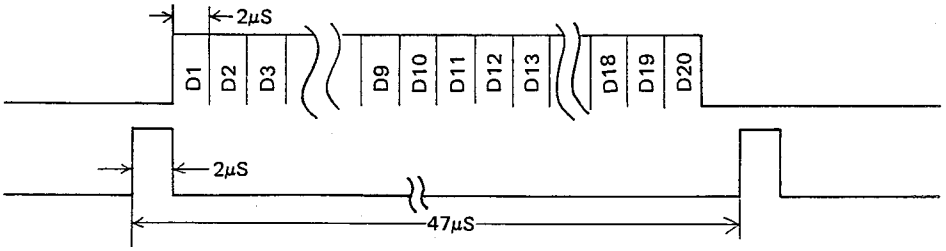


6 Serial Function Data (SO)

●CHECK POINT (MKD)
CH1 .... 14th Pin of IC4
CH2 .... 1st Pin of IC4

●CONDITION
ORGAN 1 – ON
RHYTHM START (RHUMBA)
8 BAR – ON
FINGERED CHORD MEMORY – ON



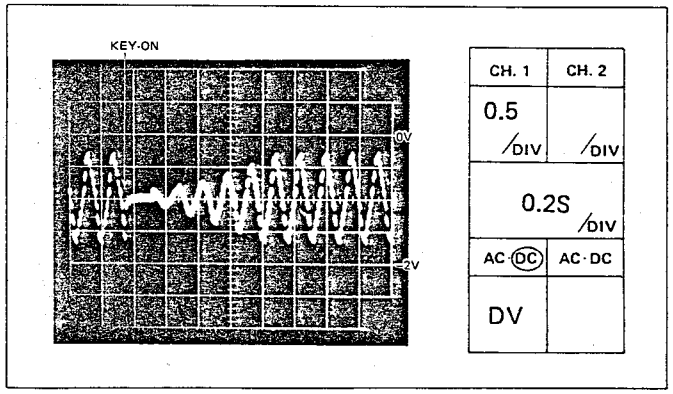


Parallel Data		Serial Data
PSC II (IC4)	$\overline{P10}$	D1 ..... ORGAN 1, TRUMPET, CLARINET, OBOE
	$\overline{P9}$	D2 ..... ORGAN 2
	$\overline{P8}$	D3 ..... HARPSICHORD
	$\overline{P7}$	D4 ..... VIBRAPHONE, PIANO
	$\overline{P6}$	D5 ..... STRING, ACCORDION
	$\overline{P5}$	D6 ..... VIBRAPHONE, SUSTAIN
	$\overline{P4}$	D7 ..... SINGLE FINGER CHORD
	$\overline{P3}$	D8 ..... FINGERED CHORD
	$\overline{P2}$	D9 ..... MEMORY
	$\overline{P1}$	D10 ..... –
PSC II (IC3)	$\overline{P10}$	D11 ..... RHYTHM START
	$\overline{P9}$	D12 ..... SYNCHRO START
	$\overline{P8}$	D13 ..... RHYTHM SELECT
	$\overline{P7}$	D14 ..... MARCH (DISCO)
	$\overline{P6}$	D15 ..... WALTS (ROCK)
	$\overline{P5}$	D16 ..... TANGO (SWING)
	$\overline{P4}$	D17 ..... RHUMBA (SAMBA)
	$\overline{P3}$	D18 ..... 8 BAR VARIATION
	$\overline{P2}$	D19 ..... ARPEGGIO VARIATION
	$\overline{P1}$	D20 ..... MULTI BASS

7-a Modulation Signal for Vibrato (DV)

●CHECK POINT (MKD)
14th Pin of IC2 (DOM)

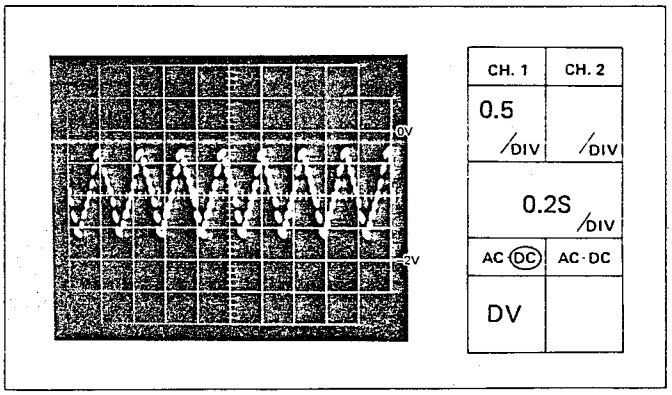
●CONDITION
TRUMPET – ON
KEY – ON
*The same wave form is obtained for ORGAN2, STRING and OBOE.



7-b Modulation Signal for V.C.A. (DV)

●CHECK POINT (MKD)
14th Pin of IC2 (DOM)

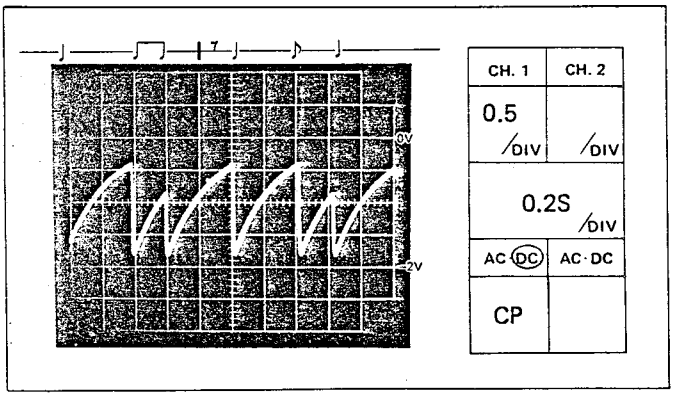
●CONDITION
Vibraphone – ON



8 Auto Bass Envelope (CP)

●CHECK POINT (MKD)
35th Pin of IC2 (DOM)

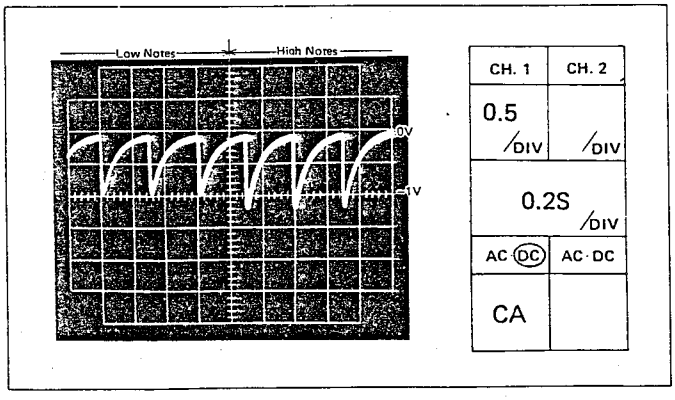
●CONDITION
RHYTHM START (ROCK)
BASS VARIATION – ON
A·B·C KEY – ON
*The pattern varies with the rhythm.



9-a Auto Arpeggio Envelope (CA)

●CHECK POINT (MKD)
34th Pin of IC2 (DOM)

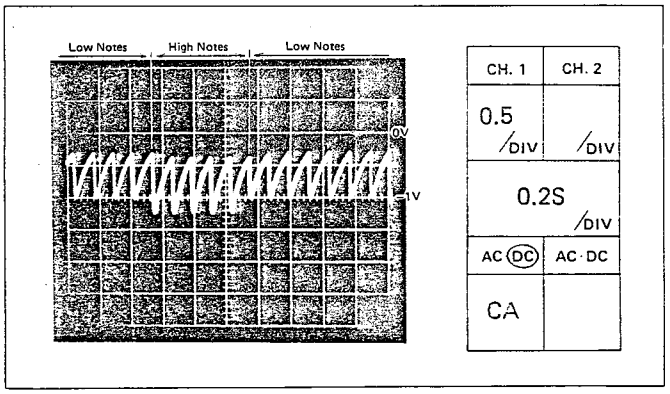
●CONDITION
ARPEGGIO START



9-b Auto Arpeggio Envelope (CA)

●CHECK POINT (MKD)
34th Pin of IC2 (DOM)

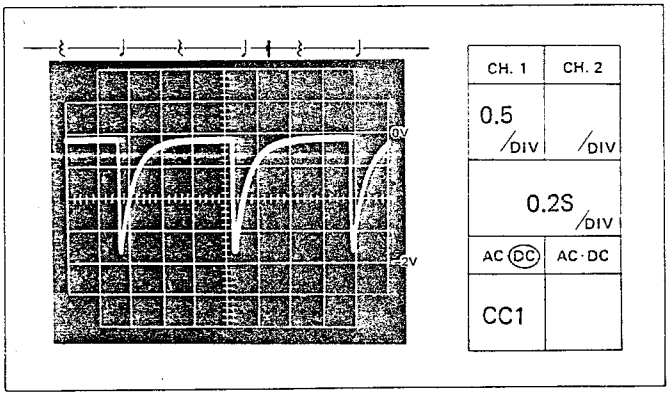
CONDITION
ARPEGGIO START
*When Up Tempo campared with 9-a.



10 Auto Chord Envelope (CC1~4)

●CHECK POINT (MKD)
From 30th to 33th Pin of IC2 (DOM)

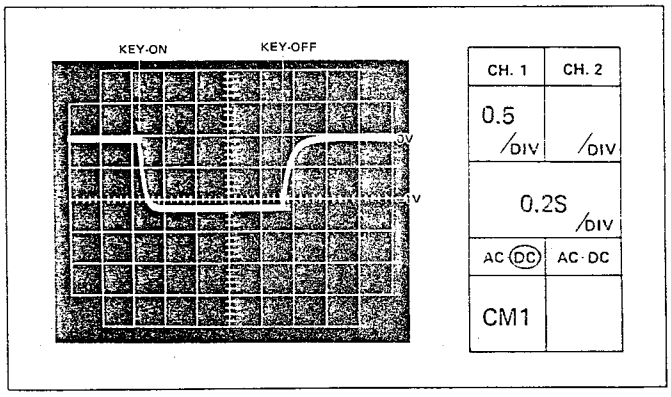
CONDITION
A·B·C – ON
KEY – ON



11 Manual Key Envelope (CM1~4)

●CHECK POINT (MKD)
From 26th to 29th of IC2 (DOM)

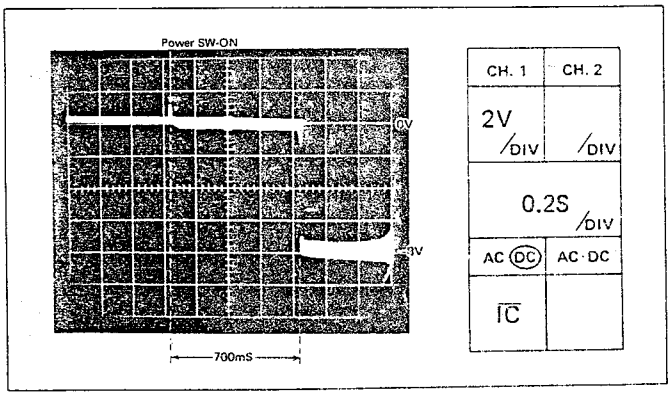
●CONDITION
OBOE – ON
KEY-ON – OFF



12 Initial Clear ($\overline{IC}$)

●CHECK POINT (MKD)
10th Pin of IC5

●CONDITION
Power SW. OFF → ON



YAMAHA

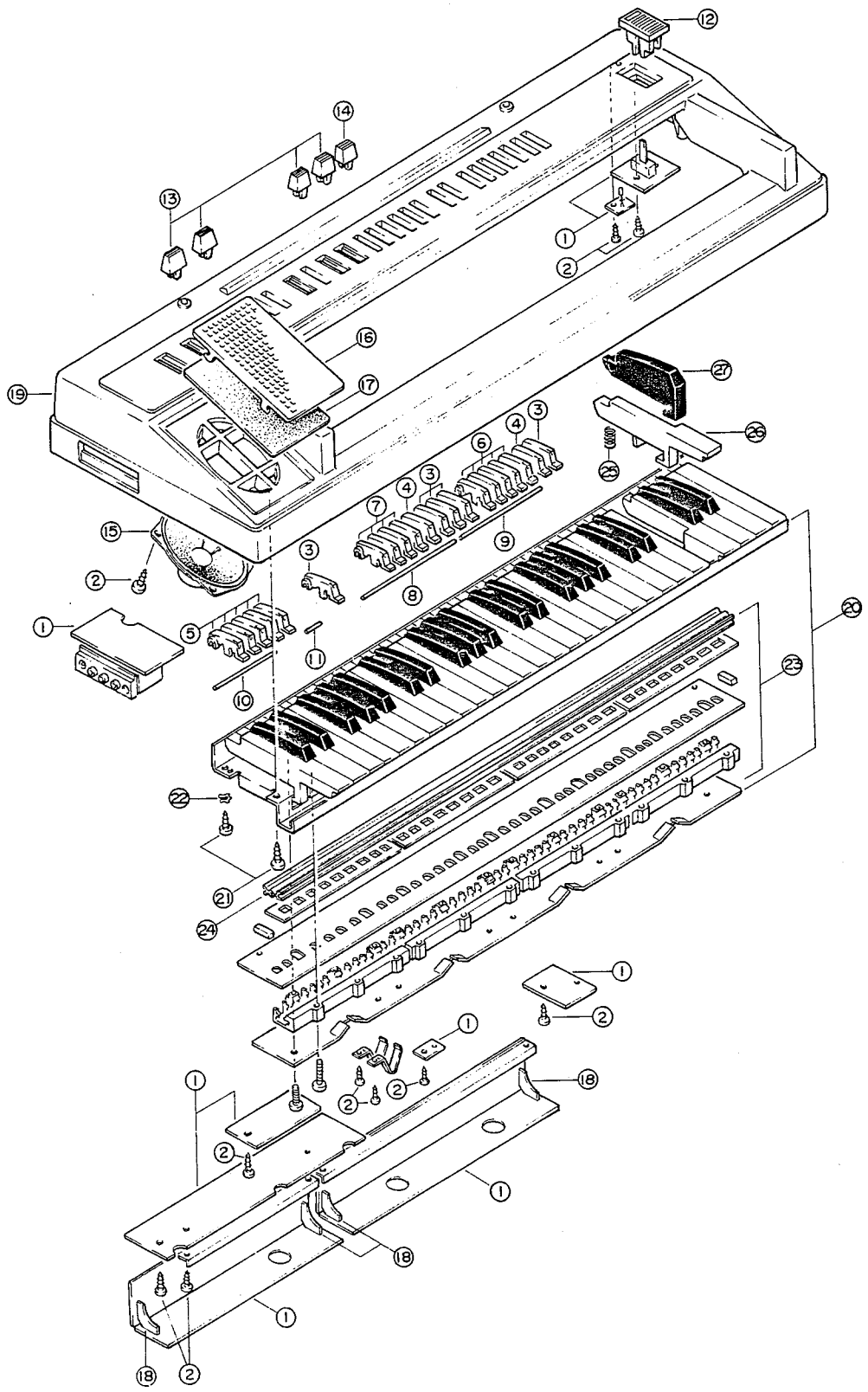
PORTABLE KEYBOARD

PS-20

PARTS LIST

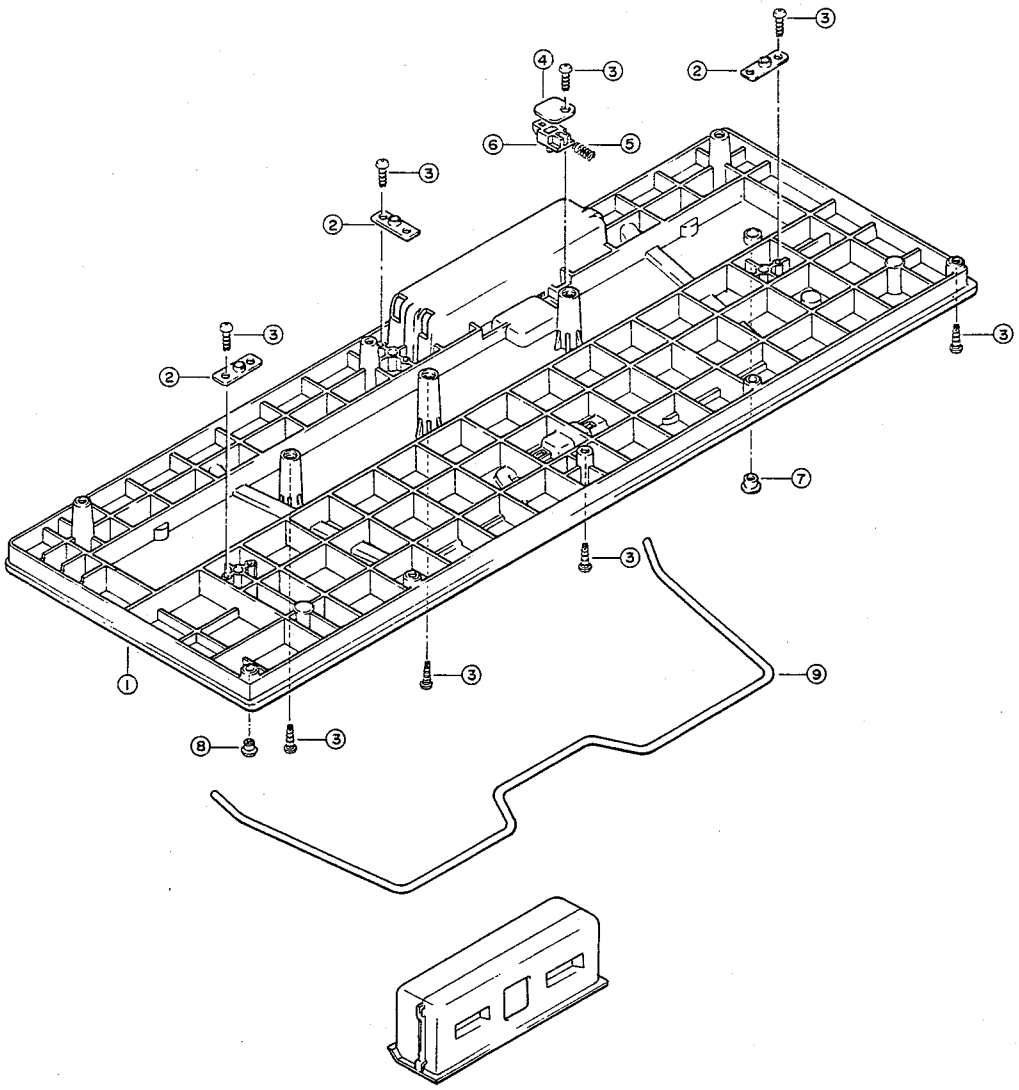
CONTENTS

A. Upper Case Assembly & Keyboard Assembly (上ケース，鍵盤)



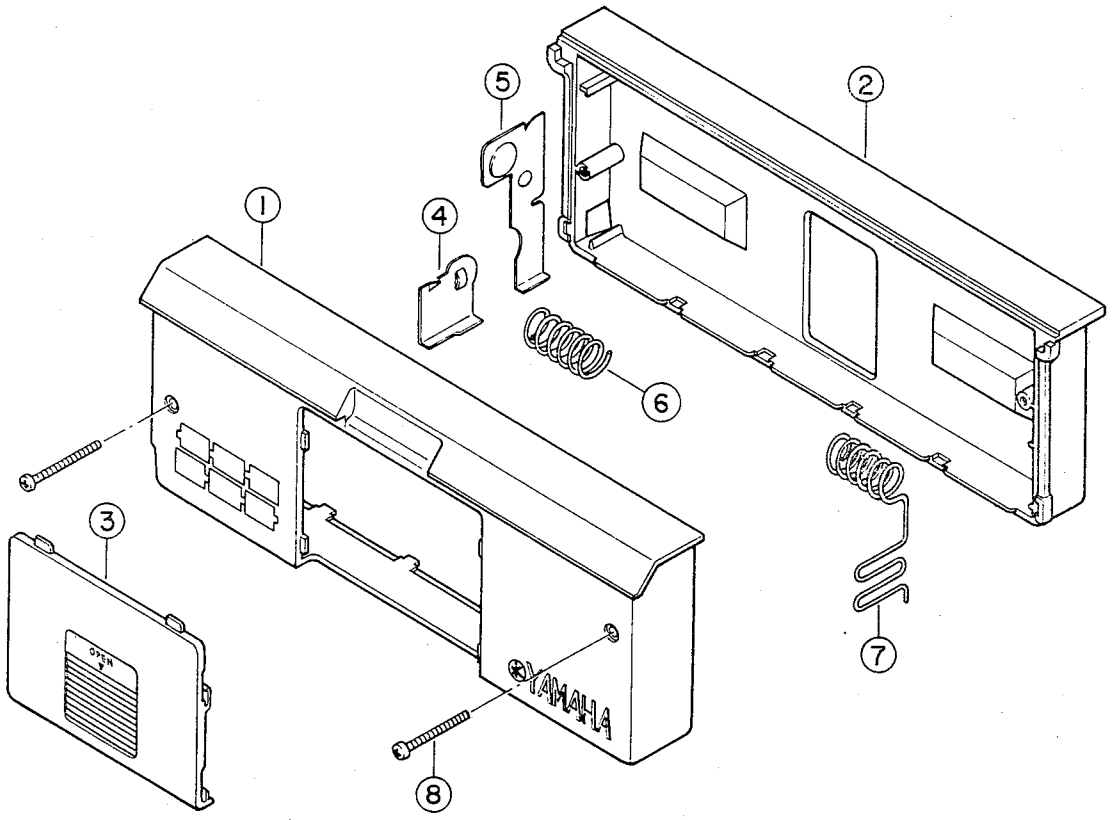
	Ref. No.	Part No.	Description		(部 品 名)	Remarks	Common model	Markets
			Upper Case Assembly					
※	1	30 10 06 NB 10 07 10	MO1 Circuit Board Assembly		M O 1 シート Ass'y			
	2	40 10 00 EJ 03 00 80	Pan Head Tapping Screw	3 x 8	ナベタッピングネジ	Yellow		
※	3	30 10 00 CB 03 68 70	Knob, Push	DARK BROWN	ツ マ ミ	Variation, Sustain		
※	4	30 10 00 CB 03 68 80	– do. –	RED	〃	Function 1/2		
※	5	30 10 00 CB 03 68 90	– do. –	BLUE	〃	A·B·C		
※	6	30 10 00 CB 03 69 00	– do. –	GREEN	〃	Orchestra		
※	7	30 10 00 CB 03 69 10	– do. –	YELLOW	〃	Rhythm		
※	8	30 10 00 AA 04 89 90	Shaft	ℓ = 140	シ ャ フ ト			
※	9	30 10 00 AA 04 90 00	– do. –	ℓ = 115	〃			
※	10	30 10 00 AA 04 90 20	– do. –	ℓ = 87	〃			
※	11	30 10 00 AA 04 90 50	– do. –	ℓ = 25	〃			
※	12	30 10 00 CB 03 83 50	Slide Switch Knob		スライドスイッチツマミ	Power SW		
※	13	30 10 00 CB 03 69 30	Knob, Slide	DARK BROWN	ツ マ ミ	Volume		
※	14	30 10 00 CB 03 69 40	– do. –	YELLOW	〃	Tempo		
※	15	40 10 00 JA 12 51 00	Speaker		ス ピ ー カ			
※	16	30 10 00 AA 04 90 60	Speaker Grille		スピーカグリル			
※	17	40 10 00 CA 01 22 10	Cloth		不 織 布			
		40 10 00 CB 06 92 50	Binding Tie		インシュロックタイ			
※	18	30 10 00 AA 04 91 00	Stay		ス テ ー			
※	19	30 10 05 NK 04 55 50	Upper Case		上 ケ ー ス			
			Keyboard Assembly					
※	20	30 10 00 NB 10 06 60	Keyboard Assembly		鍵 盤 Ass'y			
	21	40 10 00 EJ 04 01 00	Pan Head Tapping Screw	4 x 10	ナベタッピングネジ	Yellow		
	22	40 10 00 EV 42 00 40	Toothed Lock Washer	B4S	歯 付 座 金	Yellow		
	23	30 10 00 NB 10 06 80	Switch Unit		スイッチユニット			
	24	40 10 00 CB 03 39 80	Rubber Contact		可 動 導 電 ゴ ム			
	25	30 10 00 AA 04 37 20	Coil Spring		コイルスプリング			
	26	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	〃			
	27	30 10 00 CB 03 22 70	Black Key		黒 鍵			
		40 10 00 CC 02 17 50	Felt		フ ェ ル ト			
		40 10 00 LB 60 24 90	Bass Post, Top Type	8P	トップ型ベースポスト			
		40 10 00 LB 60 24 60	– do. –	7P	〃			

B. Bottom Case Assembly (下ケース)



Ref. No.	Part No.	Description	(部 品 名)	Remarks	Common model	Markets
1	30 10 00 CB 03 70 10	Bottom Case Assembly	下 ケ ー ス Ass'y			
2	30 10 00 AA 04 90 70	Stand Holder	脚 取 付 金 具			
3	40 10 00 EJ 04 01 00	Pan Head Tapping Screw 4 x 10	ナベタッピングネジ			
※ 4	30 10 00 AA 04 90 80	Hook Stopper	ツ メ 押 え 板			
※ 5	30 10 00 AA 04 90 90	Spring	バ ネ			
※ 6	30 10 00 CB 03 70 30	Hook	ツ メ			
3	40 10 00 EJ 04 01 00	Pan Head Tapping Screw 4 x 10	ナベタッピングネジ			
7	30 10 00 CB 02 68 40	Button	ゴ ム ボ タ ン	White		
※ 8	30 10 00 CB 03 80 00	Leg	ゴ ム 脚			
※ 9	30 10 00 AA 04 89 80	Music Rest	譜 面 ワ イ ヤ ー			

C. Battery Case Assembly (電池ケース)

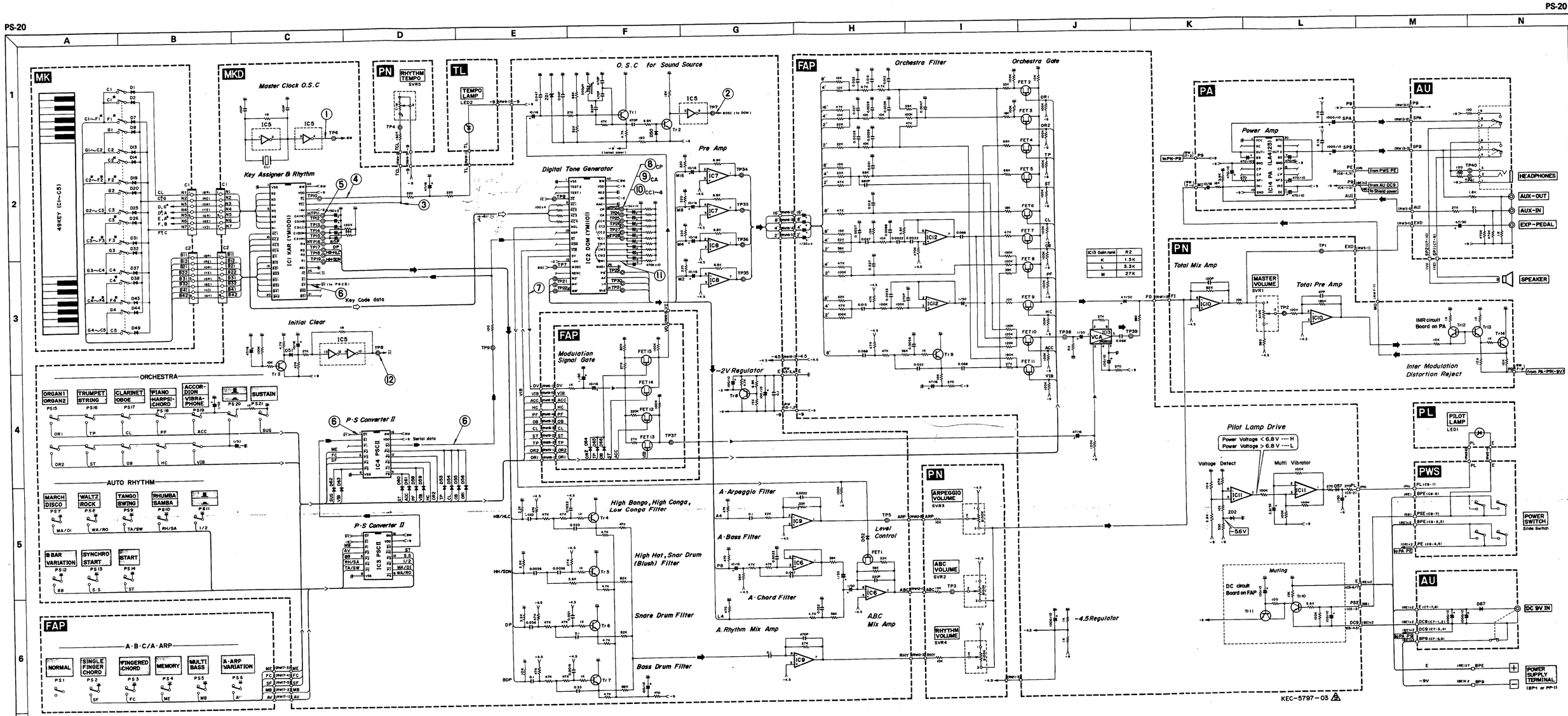


Ref. No.	Part No.	Description		(部 品 名)	Remarks	Common model	Markets
1	30 10 00 CB 03 70 80	Battery Case A	#03078	電 池 ケ ー ス A			
2	30 10 00 CB 03 70 90	Battery Case B	#03079	〃 B			
3	30 10 00 CB 03 71 00	Battery Case Lid	#03710	電池ケース蓋(クッション付)			
4	30 10 00 BB 00 49 10	Battery Terminal A	#00491	電 池 端 子 A			
5	30 10 00 BB 00 49 20	Battery Terminal B	#00492	〃 B			
6	30 10 00 AA 04 92 30	Spring Terminal A		接 点 バ ネ A			
7	30 10 00 AA 04 92 40	Spring Terminal B		〃 B			
8	40 10 00 EJ 03 03 00	Pan Head Tapping Screw	3 x 30	ナベタッピンネジ 2種	Yellow		

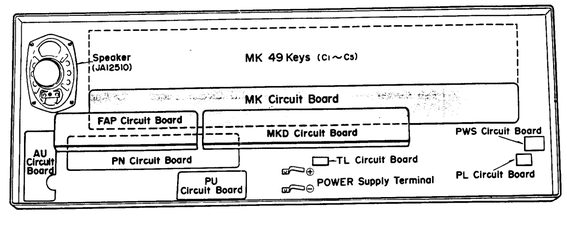
D. Electronic Components (電気部品)

Ref. No.	Part No.	Description		(部 品 名)	Remarks	Common model	Markets
	30 10 06 NB 10 07 10	MO1 Circuit Board Ass'y		MO1シートAss'y			
	30 10 00 iT 10 01 00	IC	YM1001	I C	KAR		
	30 10 00 iT 10 02 00	– do. –	YM1002	〃	PSCII		
	30 10 00 iT 11 01 00	– do. –	YM1101	〃	DOM		
	40 10 00 iG 00 17 20	– do. –	TC4069	〃	INVERTER		
	40 10 00 iG 02 60 00	– do. –	iG02602	〃	VCA		
	40 10 00 iG 02 83 00	– do. –	μPC4558	〃	OP. Amp		
	40 10 00 iG 04 23 00	– do. –	LA4125	〃	Power Amp		
	40 10 00 iA 07 33 40	Transistor	2SA733	トランジスタ			
	40 10 00 iA 05 09 10	– do. –	2SA509	〃			
	40 10 00 iC 05 09 20	– do. –	2SC509	〃			
	40 10 00 iC 07 52 30	– do. –	2SC752	〃			
	40 10 00 iC 18 15 30	– do. –	2SC1815	〃			
	40 10 00 iE 10 12 20	FET	2SK105	FET			
*	40 10 00 iE 10 26 10	– do. –	2SK246	〃			
	40 10 00 iF 00 00 40	Diode	1S1555	ダイオード			
	40 10 00 iH 00 05 90	– do. –	10E-1	〃			
	40 10 00 iF 00 03 20	Zener Diode	WZ061	ツェナーダイオード			
	40 10 00 iF 00 08 60	– do. –	WZ056	〃			
	40 10 00 iF 00 20 00	LED	SLC22UR	LED			
	40 10 00 GE 90 01 90	O·S·C Coil	500μH	OSCコイル			
*	40 10 00 QU 00 09 00	Ceramic Armature	470 kHz	セラミック振動子			
	40 10 00 FD 65 24 70	Polystyrene Capacitor	470P	スチロールコンデンサ			
	40 10 00 FD 65 28 20	– do. –	820P	〃			
*	40 10 00 HQ 60 02 10	Slide Variable Resistor	A10K	スライドボリウム			
*	40 10 00 HQ 60 02 20	– do. –	B100K	〃			
	40 10 00 HQ 60 02 40	– do. –	C1M	〃			
	40 10 00 KA 40 08 50	Slide Switch		スライドスイッチ	Power Switch		
*	30 10 00 BA 01 43 80	Heat Sink		放熱板			
	40 10 00 LB 60 24 60	Bass Post, Top Type	7P	トップ型ベースポスト			
	40 10 00 LB 60 24 90	– do. –	8P	〃			
	40 10 00 LB 60 24 70	– do. –	10P	〃			
	40 10 00 LB 50 02 50	– do. –	5P	〃			
	40 10 00 LB 60 30 00	Bass Post, Bottom Type	7P	ボトム型ベースポスト			
	40 10 00 KA 80 20 30	Push Switch	5	プッシュスイッチ	A·B·C Switch		
	40 10 00 KA 80 20 40	– do. –	6	〃	Orchestra Switch		
	40 10 00 KA 80 20 50	– do. –	9	〃	Rhythm Switch		
	40 10 00 LB 10 05 90	Terminal Plate		ジャック板			

PS-20 OVERALL CIRCUIT DIAGRAM 002655



UNIT LAYOUT (Bottom View)



• Wiring Table of Ribbon Wire

RW1	MKD ⟷ MKD
1	VIB — VIB
2	DV — DV

RW2	PWS ⟷ PL
1	E — E
2	PL — FL

RW3	PN ⟷ AU
1	EXO — EXO
2	P9 — P9

RW4	PN ⟷ MKD
1	−9 — −9
2	TCL — TCL

RW5	PA ⟷ AU
1	AUE — AUE
2	P9 — P9

RW6	MKD ⟷ FAP
1	DV — DV
2	VI — VO

RW7	PN ⟷ PA
1	MO — MI
2	– — E

RW8	MKD ⟷ TL
1	−9 — −9
2	TL — TL

RW9	MKD ⟷ MKD
1	ENS — ENS
2	−9 — −9
3	IC — IC

RW10	MKD ⟷ MKD
1	R4 — R4
2	R3 — R3
3	R2 — R2

RW11	PN ⟷ FAP
1	E — E
2	F1 — F0
3	−4.5 — −4.5

RW12	PN ⟷ MKD
1	ABC — ABC
2	ARP — ARP
3	RHY — RHY

RW13	PA ⟷ AU
1	P9 — P9
2	SPA — SPA
3	SPB — SPB

RW14	MKD ⟷ MKD
1	SV — SV
2	9M — 9M
3	9I — 9O
4	VI — VI

RW15	FAP ⟷ MKD
1	−9 — −9
2	−9 — −9
3	E — E
4	E — E

RW16	FAP ⟷ MKD
1	−4.5 — −4.5
2	16' — 16'
3	8' — 8'
4	4' — 4'
5	2' — 2'

RW17	FAP ⟷ MKD
1	AV — AV
2	MB — MB
3	ME — ME
4	FC — FC
5	SF — SF

RW18	FAP ⟷ MKD
1	OR1 — OR1
2	TP — TP
3	CL — CL
4	PF — PF
5	ACC — ACC

RW19	FAP ⟷ MKD
1	OR2 — OR2
2	ST — ST
3	OB — OB
4	HC — HC
5	VIB — VIB

• Connector Table

C1 [MKD]

Pin No.	Pin Name	Wire Color	Destination
1	N1	BP	MK-N1 (C1-1)
2	N2	RE	MK-N2 (C1-2)
3	N3	OR	MK-N3 (C1-3)
4	N4	YE	MK-N4 (C1-4)
5	N5	GR	MK-N5 (C1-5)
6	N6	BE	MK-N6 (C1-6)
7	N7	VI	MK-N7 (C1-7)

C2 [MKD]

Pin No.	Pin Name	Wire Color	Destination
1	B11	BR	MK-B11 (C2-1)
2	B12	RE	MK-B12 (C2-2)
3	B21	OR	MK-B21 (C2-3)
4	B22	YE	MK-B22 (C2-4)
5	B31	GR	MK-B31 (C2-5)
6	B32	BE	MK-B32 (C2-6)
7	B41	VI	MK-B41 (C2-7)
8	B42	GY	MK-B42 (C2-8)

C3 [MKD]

Pin No.	Pin Name	Wire Color	Destination
1	KC1	–	Non Connect
2	KC2	–	
3	KC3	–	
4	KC4	–	
5	9M	–	
6	5V	–	
7	VC	–	
8	E	–	
9	−9	–	
10	ENS	–	

C4 [FAP]

Pin No.	Pin Name	Wire Color	Destination
1	E	–	Non Connect
2	E	–	
3	E	–	
4	−9	–	
5	−9	–	

C5 [FAP]

Pin No.	Pin Name	Wire Color	Destination
1	SLE	–	
2	PL	PK	PWS-PL (C8-7)
3	PSE	SB	PWS-PSE (C8-1)
4	DC9	BE	AU-DC9 (C7-1)
5	DC9	BE	AU-DC9 (C7-2)
6	E	RE	Power Supply Terminal +
7	E	RE	Power Supply Terminal +

C6 [PA]

Pin No.	Pin Name	Wire Color	Destination
1	P9	BE	MK-Shield cover
2	P9	BE	AU-DC9 (C7-3)
3	P9	BE	AU-DC9 (C7-4)
4	PE	OR	PWS-PE (C8-3)
5	PE	OR	PWS-PE (C8-4)

C7 [AU]

Pin No.	Pin Name	Wire Color	Destination
1	DC9	BE	FAP-DC9 (C5-4)
2	DC9	BE	FAP-DC9 (C5-5)
3	DC9	BE	PA-P9 (C6-2)
4	DC9	BE	PA-P9 (C6-3)
5	BP9	BE	Power Supply Terminal –
6	BP9	BE	Power Supply Terminal –
7	E	RE	Power Supply Terminal +
8	E	RE	Power Supply Terminal +
9	SP1	YE	Speaker +
10	SP2	VI	Speaker –

C8 [PWS]

Pin No.	Pin Name	Wire Color	Destination
1	PL	PK	FAP-PL (C5-2)
2	BPE	RE	Power Supply Terminal +
3	BPE	RE	Power Supply Terminal +
4	PE	OR	PA-PE (C6-5)
5	PE	OR	PA-PE (C6-6)
6	BPE	RE	Power Supply Terminal +
7	PSE	SB	FAP-PSE (C5-3)

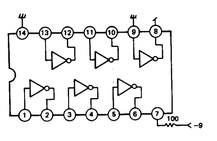
IC13 Gain rank	R2
K	1.5K
L	3.3K
M	27K

Wiring Table & Notes

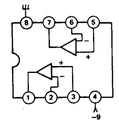
Notes)

1. Integrated Circuit
   - IC1 : YM1011 (KAR)
   - IC2 : YM1101 (DOM)
   - IC3, 4 : YM1002 (PSC II)
   - IC5 : TC4069 (INV.)
   - IC6 ~ 12 : μPC4558 (OP. Amp)
   - IC13 : iG2602 (VCA)
   - IC14 : LA4125 (P. Amp)
2. Transistor
   - Tr1 : 2SC752
   - Tr2 ~ 7, 9 : 2SC1815
   - Tr8 : 2SA733
   - Tr12, 13 : 2SA937
   - Tr10 : 2SC509
   - Tr11 : 2SA509
   - Tr14 : 2SC2021
3. Field Effect Transistor
   - FET1 : 2SK105
   - FET2 ~ 15 : 2SK246
4. Diode
   - ZD1 : WZ061
   - ZD2 : WZ056
   - D50 ~ 66 : 1S1555
   - D67 : 10E-1
5. LED 1, 2 : SLC-2ZUR
6. Piezoelectric Ceramic Vibrator
   - CL1 : QU00090 (470 kHz)

TC4069 (Inverter) : IC5



μPC4558 (OP. Amp) : IC6 ~ 12



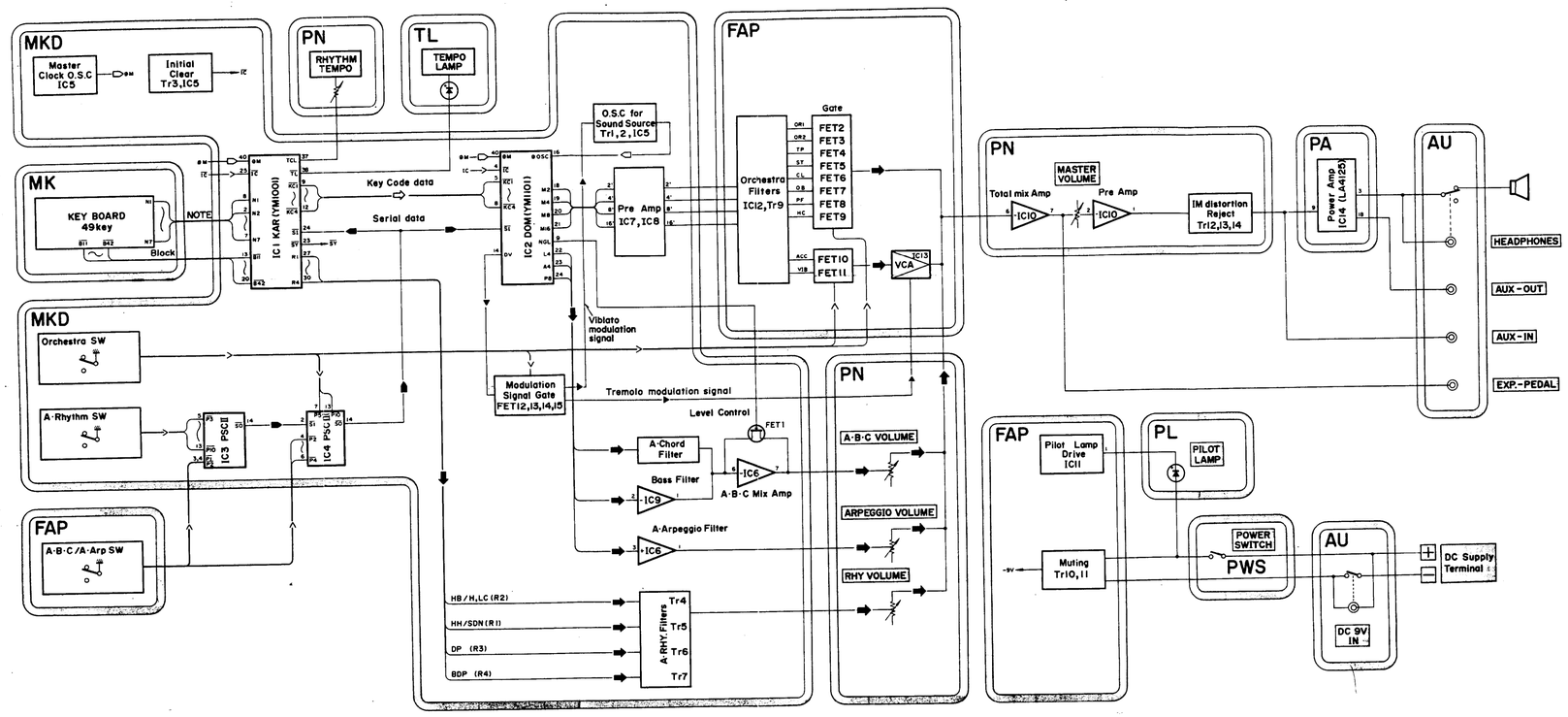
- Key code data (possible to measure with an osilloscope)
- Clock pulse (– do. –)
- Pulse form signal (– do. –)
- Trigger pulse (– do. –)
- Audio signal (possible to measure with signal tracer)
- Low frequency modulation signal (possible to measure with VOM)
- DC control signal (possible to measure with VOM)

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

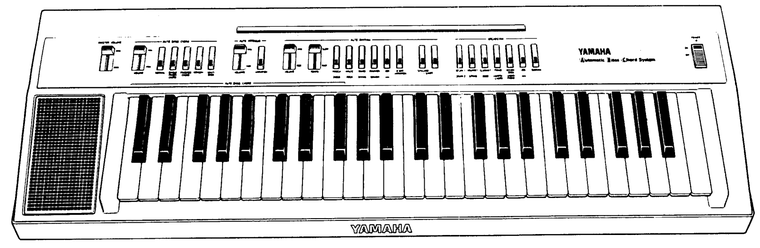
BL	BLACK	RE	RED
YE	YELLOW	BE	BLUE
GY	GRAY	GG	GRASS GREEN
PK	PINK	OR	ORANGE
BR	BROWN	VI	VIOLET
GR	GREEN	SB	SKY BLUE
WH	WHITE	TP	TIN PLATED WIRE
TR	TRANSPARENT		
SOR	Shielding orange wire		
SGRS	Earthing conductor of shielding green wire		

PS-20 BLOCK DIAGRAM

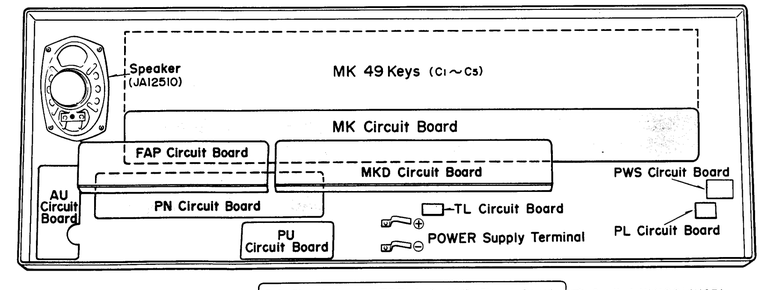


- Key code data (possible to measure with an osilloscope)
- Clock pulse (– do. –)
- Pulse form signal (– do. –)
- Trigger pulse (– do. –)
- Audio signal (possible to measure with signal tracer)
- Low frequency modulation signal (possible to measure with VOM)
- DC control signal (possible to measure with VOM)

PANEL LAYOUT



UNIT LAYOUT (Bottom View)



Sub Circuit Board TO3 : On MKD Circuit Board → Applied YM1001(KAR)
DC : On FAP Circuit Board
IMR : On PA Circuit Board → Applied S/# 1002~2290