

YAMAHA

ELECTRONIC PIANO

CP25



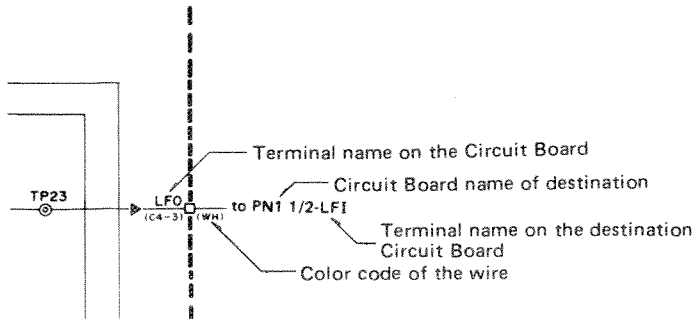
SERVICE MANUAL

CONTENTS

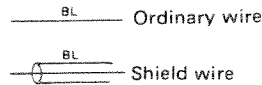
	CORDING GUIDE	1
	SPECIFICATIONS	2
	ASSEMBLY PROCEDURE	3
	DISASSEMBLY PROCEDURE	4
	PANEL LAYOUT	6
	PART NAMES AND FUNCTIONS	7
	BLOCK DIAGRAM	9
	TECHNICAL EXPLANATION	10
	ADJUSTING THE MECHANISM	14
	BASIC ADJUSTMENT PROCEDURE (ELECTRICAL)	15
	IC DATA CHART	16
DM	Circuit Board & Wiring	17
DM	Circuit Diagram	18
EFT	Circuit Board & Wiring	19
EFT	Circuit Diagram	20
PN1, PN2	Circuit Board & Wiring	21
PN1, PN2	Circuit Diagram	22
MK1, MK4	Circuit Board & Wiring, Circuit Diagram	23
JK1, JK2, AC	Circuit Board & Wiring, Circuit Diagram	24
DC	Circuit Board & Wiring, Circuit Diagram	25
	Parts List	

CODING GUIDE

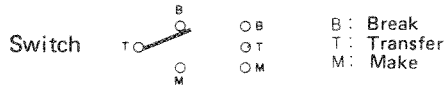
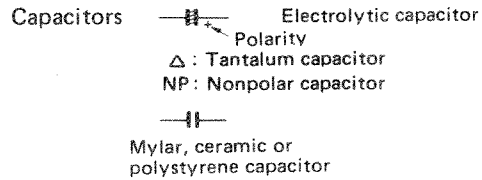
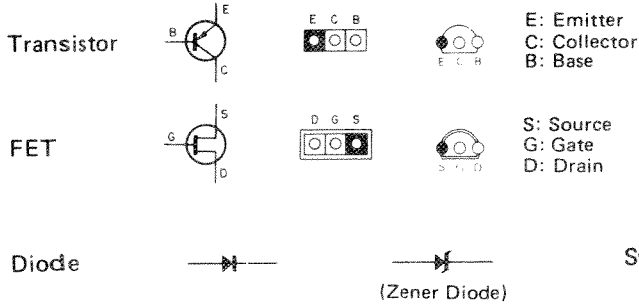
1 Wiring Notation



Note: Types of wire



2 Symbol Description



3 Abbreviations of Wire Color Codes

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

4 Relation of Color Coding and Notes

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

5 Logic Symbols

	MIL	YAMAHA
NOT		
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

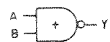
OR



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

SPECIFICATIONS

KEYBOARD 61 keys (E₀ ~ E₅)
 Velocity-sensitive touch response

SINGLE mode 16 note simultaneous output,
 max.

DUAL mode 8 note simultaneous output,
 max.

CONTROLS

MODE DUAL/SINGLE selector

PITCH I

PITCH II

DECAY I 8 position switch

DECAY II 8 position switch

TREMOLO SPEED

TREMOLO DEPTH

TREMOLO ON/OFF

FLANGER ON/OFF

WAVE 4 position switch (A,B,C,D)

FILTER 4 independent selectors
 (1,2,3,4)

5TH, 8TH Independent 5th and 8th
 transpose selectors

BALANCE 1, 2 ↔ 3, 4

EQUALIZER Continuously variable bass and
 treble controls

VOLUME

SIDE PANEL

FOOT SW TREMOLO

FOOT SW SUSTAIN

OUTPUT 1, 2 1/4" phone jacks

PHONES 8 ohms or high impedance
 headphones

LINE ON/OFF

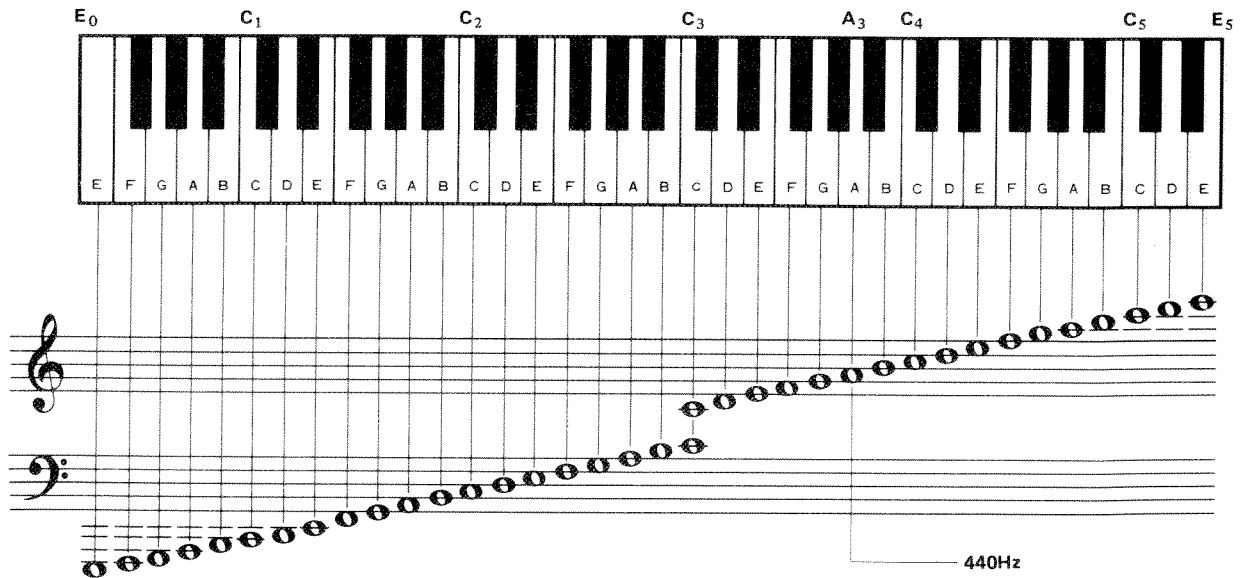
POWER REQUIREMENTS U.S. & Canadian models
 120V 50/60Hz 22 Watts
 General model
 Selectable (100, 120, 220 or
 240V) 22 Watts

DIMENSIONS 41-7/8" x 7-1/2" x 23-1/2"
 (W x H x D)
 (1,063 x 189 x 596 mm)

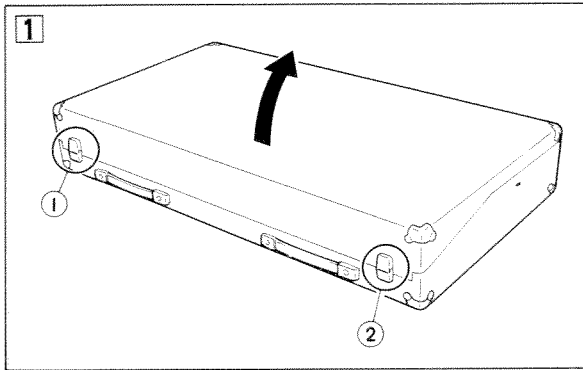
WEIGHT 90.4 lbs (41 kg)

STANDARD ACCESSORY FC-4 footswitch

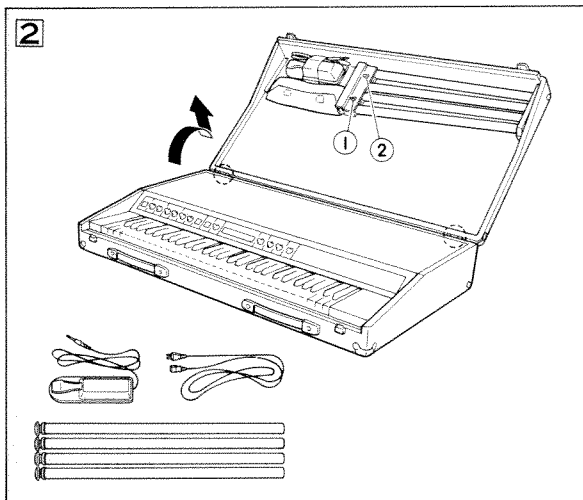
** Specifications are subject to change without notice.*



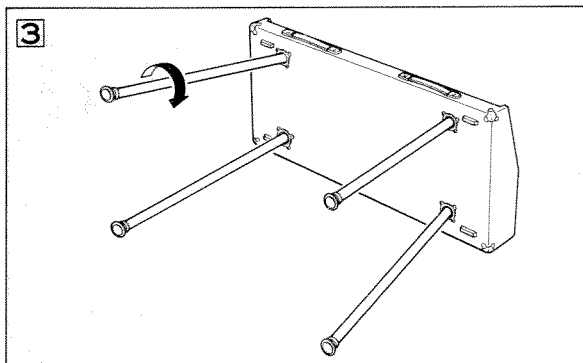
ASSEMBLY PROCEDURE



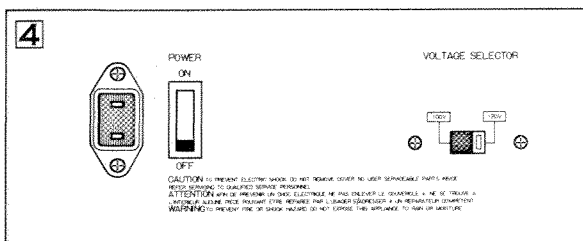
- Lay the CP25 on the floor as shown and open the lid fully by unlatching the two catches ① and ② .



- Remove the lid from the body by lifting it so as to slip it off its rear hinges.
Provided inside of the lid are the AC cord, four legs and the sustain pedal.
- Unscrew the fly nuts ① and ② , and remove the legs.



- Place the main body of the CP25 on its back edge and install each leg by screwing it into its hole in the body.
NOTE: When fitting the leg in the hole, make sure that the thread and groove are in a perfect engagement.
- Set the CP25 upright and connect the output cord to the amplifier and the sustain pedal.



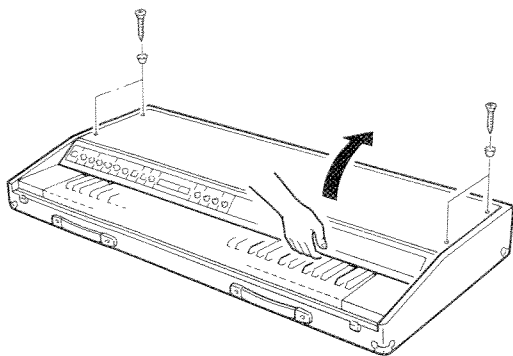
(U.S. & CANADIAN MODELS)

- Connect both the output cord to the amplifier and the sustain pedal. Set the voltage selector to the proper line voltage of that area where CP25 is used and set the switches and controls. And then connect the AC cable to the AC INLET jack on the CP25 firmly.
(→ SEE PAGE 6 & 7)

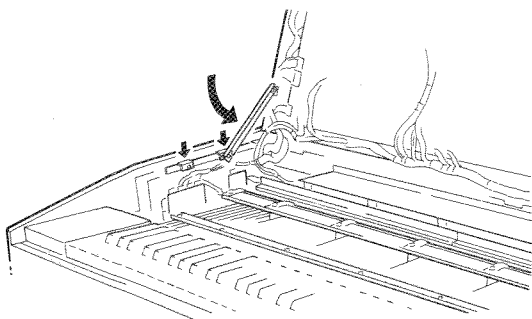
DISASSEMBLY PROCEDURE

1. Opening the lid

Remove the 4 screws holding the lid.
Grasp the panel just above the keyboard and lift up.

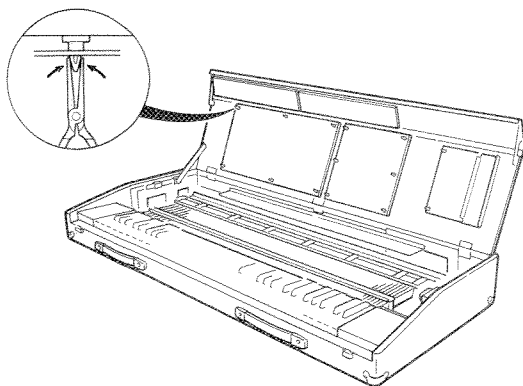


Use the stay provided to hold the lid. The stay provides two different lid angles.



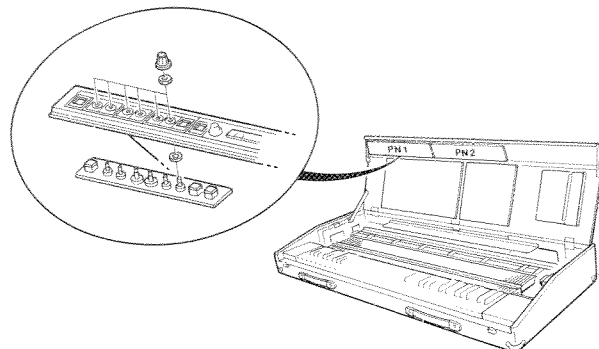
2. Removing circuit boards

Compress the board holders with pliers to release the boards.



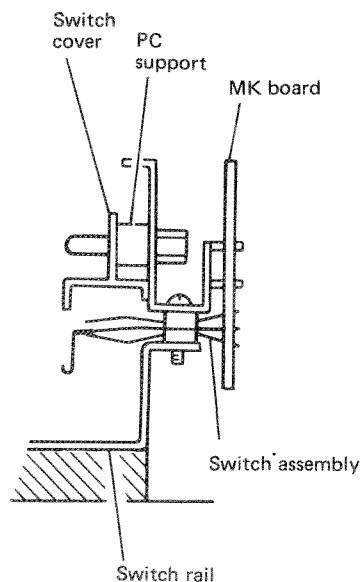
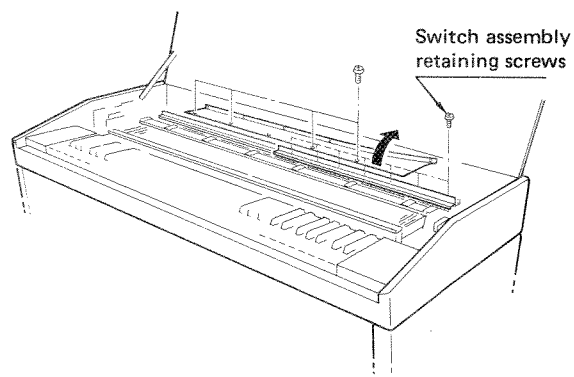
3. Removing panel boards

1) Remove all front panel knobs, hex nuts and washers.
(PN1, PN4 boards)



4. Removing the switch assembly (MK board)

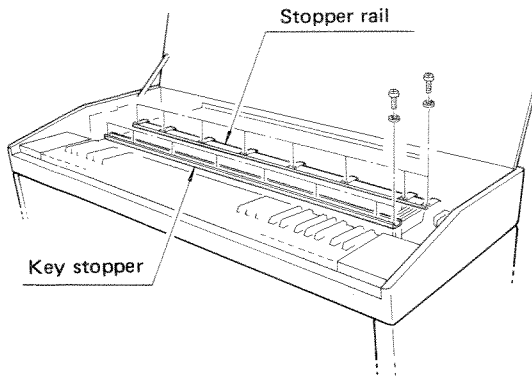
Remove the shield paper.
The switch assembly is divided into 3 separate parts. Remove the screws of the desired section or sections to be removed.



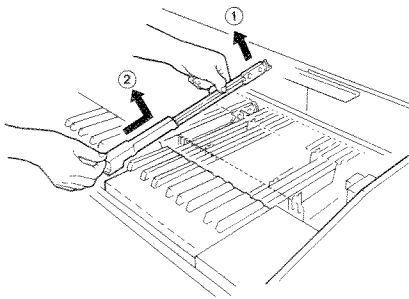
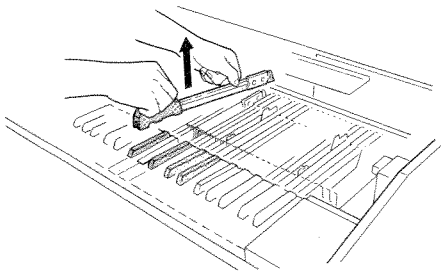
5. Removing the keys

Before removing any keys be sure to remove the switch assembly, being careful not to damage the switch contacts.

Remove the stopper rails and the key stopper screws. Reinforcing hardware is attached to the stopper rail.



Be sure to remove the black keys before removing the white keys.



TECHNICAL EXPLANATION

External specifications

The CP25 is an electronic piano with touch response, preset memories, and built-in filters. When the MODE switch is set to SINGLE, output is from a single tone generator with 16-note polyphonic capability. When the MODE switch is set to DUAL, output is from two tone generators with 8-note polyphonic capability.

Keyboard

There is a single keyboard with one make/break transfer switch for each key.

The touch-response effect is generated by counting the time between the make and break of the key switch and generating the level of the note according to the time difference (velocity sensitive).

Key assigner & channel processor

LSI YM636 (CPA) detects the pressed keys and assigns their keycode data in chronological order to the 16 note memories.

The 16 locations each contain touch response, sustain pedal, and other data. Also, because the successive notes are distributed among 16 locations, the IC calculates appropriate envelope times.

Tone generator

LSI YM722 (CPB) generates the music signal using the keycode data from YM636 (CPA) and touch response data.

The YM722 can only handle 8 notes, so two of them are used for each channel to handle 16 (in the SINGLE mode).

Two YM722s can also be used in parallel to form a dual tone generator (as in the DUAL mode).

16 notes are output in parallel from YM633, with 1-8 going to one YM722 (CPB) LSI and 9-16 going to another.

Applying VDD (-15V) to the CS terminal of the YM722s (pin 10) selects 1-8, while VSS (0V) selects 9-16.

In the CP35, IC16 and IC18 apply to channels 1 through 8 while IC15 and IC17 apply to channels 9 through 16.

SINGLE MODE: 16 output channels of YM636 correspond to 16 pressed keys.

DUAL MODE: Channels 1-8 and 9-16 carry the same data forming dual 8-channel tone generators.

The octave blocks have two outputs with completely different envelopes for attack and sustain.

MEMO

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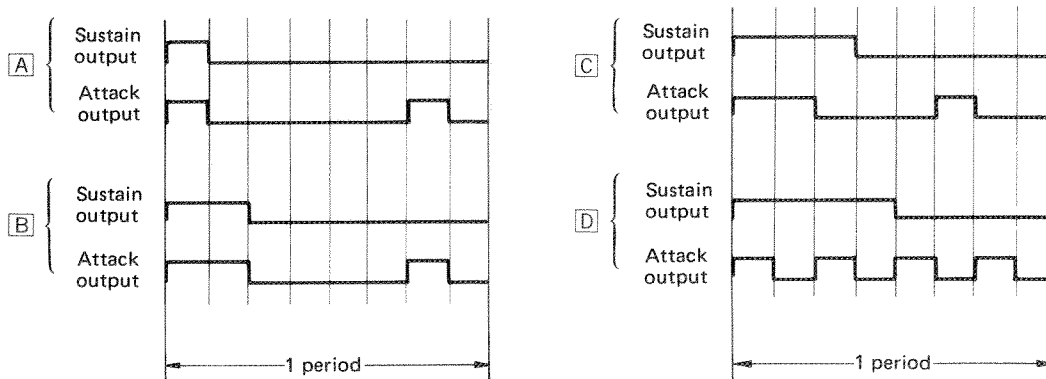
The table below gives the correspondence between output terminals, the notes output, and the output envelopes.

Terminal	Output note	Output envelope
	HS2 43 E ₀ ~ C ₁ C ₁ [#] ~ C ₂	Sustain envelope
	HS3 42 C ₂ [#] ~ C ₃	
	HS4 41 C ₃ [#] ~ C ₄	Approx. 100mV
	HS5 40 C ₄ [#] ~ C ₅	
	HS6 39 C ₅ [#] ~ E ₆	Attack envelope
	HA2 37 E ₀ ~ C ₁ C ₁ [#] ~ C ₂	
	HA3 36 C ₂ [#] ~ C ₃	Approx. 50mV
	HA4 35 C ₃ [#] ~ C ₄	
	HA5 34 C ₄ [#] ~ C ₅	0V
	HA6 33 C ₅ [#] ~ E ₆	

- So that the charge/discharge times of the capacitors which determine the envelopes of the 8 intervals of C1—C16 will not have any effect on the note envelopes, two capacitors are used for each note and are switched alternately in and out.
- The basic waveform that will be used to produce all music signals is selected by the A, B, C and D positions of the **WAVE** (PSW10) switch as shown in the diagram (in the DUAL mode).

WAVE 1 II

Output waveform



- By using the CH-II 5th and 8th (PSW19, 20) panel switches, the second channel can be shifted up a fifth an octave, or a twelfth from the first channel (in the DUAL mode).

	SET CONDITION	OUTPUT NOTE RANGE
Channel I		E ₀ ~ A ₃ ~ E ₆
Channel II	• 5th On	B ₀ ~ E ₄ ~ B ₆ (up a 5th)
	• 8th On	E ₁ ~ A ₄ ~ E ₇ (up an octave)
	• 5th, 8th On	B ₁ ~ E ₅ ~ B ₇ (up a twelfth)

Filters

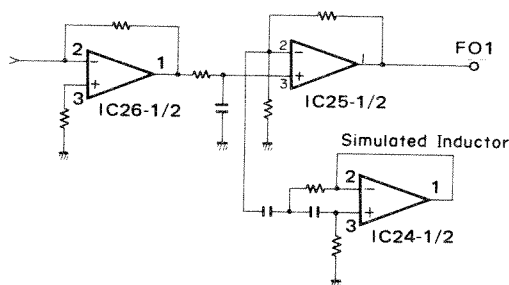
The filter circuits are constructed entirely of capacitors, resistors, and Op amps, in both filter and mixer configurations. They combine the attack outputs HA2–HA6 and the sustain outputs HS2–HS6 and send them to the filter select circuit.

Filter select circuit

The select circuit is a Schmidt trigger combining an "On" switch, a HAND and an inverter, plus a flip flop, an indicator LED, and an LED driver with an Op amp multivibrator (low-frequency oscillator) for LED flashing. FET gates (FET1–4, one for each voice) are turned on (0V) or off (–15V) to select the voice.

Mixing

Overall timbre of the signal from the output of the filter select and preset select circuits is adjusted by equalization circuitry on the DM board. A simulated semiconductor inductor is formed by IC19 2/2 which, combined with IC20 1/2, forms a peaking type equalizer. This equalizer creates a +10 dB frequency boost at 560 Hz.

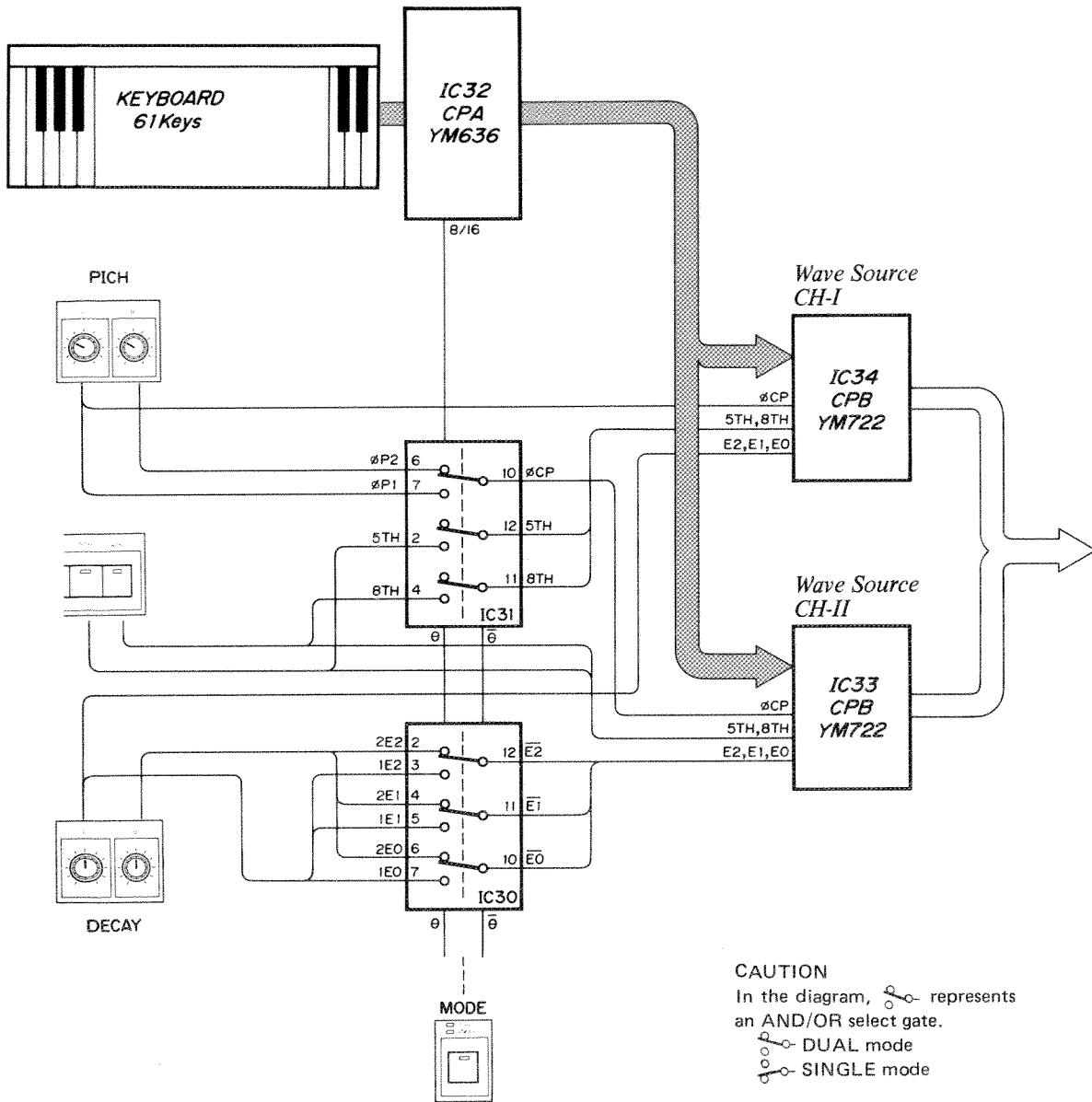





Mode switching

Function changes resulting from mode switching.

Turning the MODE switch on or off results in the following function changes:

Mode Switching		DUAL	SINGLE
MODE SW		LED lights.	LED extinguishes.
Maximum number of notes		8 notes.	16 notes.
Operational tone generators		2 channels.	1 channel.
Knob Functions	PITCH I	Functions only in channel I.	Functions in both channels I & II.
	PITCH II	Functions only in channel II.	Has no effect on pitch.
	DECAY I	Functions only in channel I.	Functions in both channels I & II.
	DECAY II	Functions only in channel II.	Has no effect on decay time.
	5th, 8th	Functions only in channel II.	Functions in both channels I & II.



CAUTION
 In the diagram,  represents an AND/OR select gate.
 DUAL mode
 SINGLE mode

MODE SWITCHING OPERATION

Key coder channel processor (YM636)

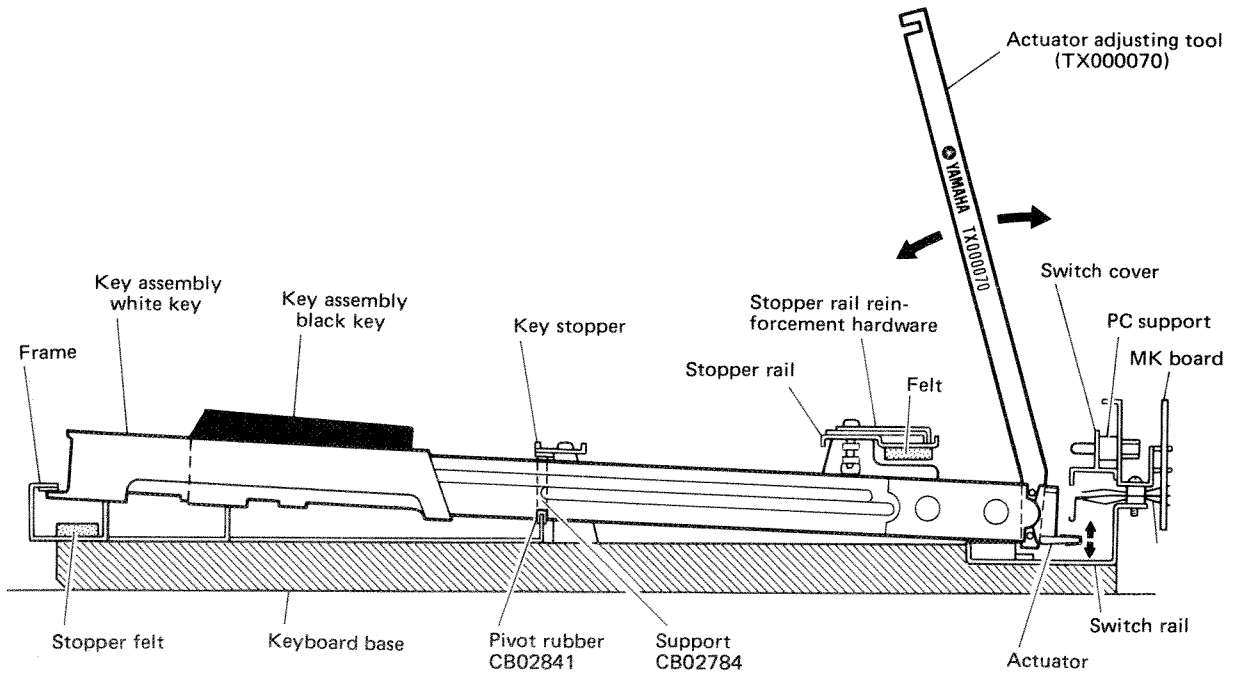
DUAL MODE	SINGLE MODE
<p>When power is switched on, the LED lights and the PN1 board MODE terminal (C3-1) goes to VSS (0V) while the $\overline{\text{MODE}}$ terminal (C3-2) goes to VDD (-15V).</p> <p>The VSS level from the MODE terminal drives pin 22 of IC32 (YM636.CPA) 8/16 to VSS. In this state, the key coder/channel processor IC (YM636.CPA) assigns 8-channel operation to the key coder function, and informs the CPB IC (YM722) of note initiation.</p>	<p>When the MODE switch is pressed, the LED is extinguished and the PN1 board MODE terminal (C3-2) goes to VSS (0V) while the $\overline{\text{MODE}}$ terminal (C3-1) goes to VDD (-15V).</p> <p>The VDD level from the MODE terminal drives pin 22 of IC32 (YM636.CPA) 8/16 to VDD. In this state the key code/channel processor IC (YM636.CPA) assigns 16-channel operation to the key coder function, and informs the CPB IC (YM722) of note initiation.</p>

Wave Source (YM722)

DUAL MODE	SINGLE MODE
<p>The YM722 CPB IC generates a tone generator waveform based on the key code data. Since the YM722 IC has 8-note tone generation capability, two CPB ICs must be used when in the DUAL mode: IC34 for channel I and IC33 for channel II. Channel I and channel II both use the same key code data.</p>	<p>Since the YM722 IC has 8-note tone generation capability, its function in the SINGLE mode is different from that in the DUAL mode. Two CPB ICs are still used, but one (IC34) handles the first 8 channels (1 through 8) and the second (IC33) handles the last 8 channels (9 through 16) in response to the 16 channel key code data from the YM636 IC. This results in 16-note simultaneous capability. Timing between the first and last 8 channels is accomplished by switching levels at pin 10 (CS) of the YM722: VDD for the first 8 channels and VSS for the last 8 channels.</p>

● Adjusting the velocity keying actuator

*NOTE: Actuator adjustment is preset at the factory, so no adjustment is required unless the key assembly is replaced.



Use the actuator adjusting tool to adjust the level of each key to be the same as the adjacent keys.

- * If the level of a note is too low, lower the actuator by moving the adjustment tool forward. Lowering the actuator results in higher velocity thereby increasing level.
- * If the level of a note is high, raise the actuator by moving the adjustment tool back. Raising the actuator results in lower velocity thereby decreasing level.

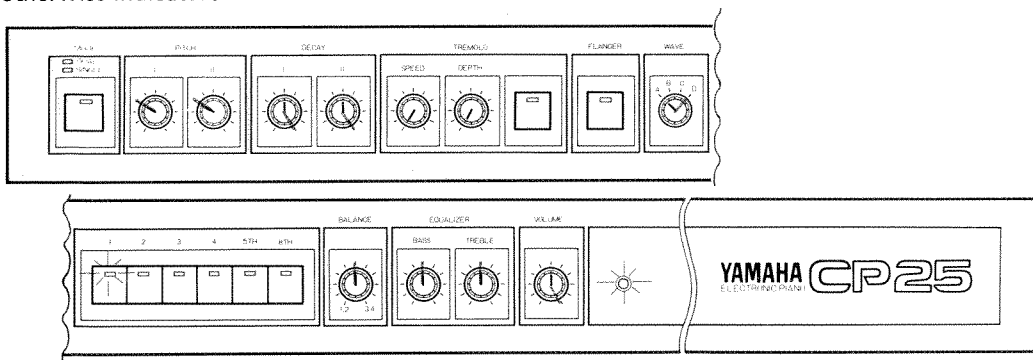
BASIC ADJUSTMENT PROCEDURE(ELECTRICAL)

1. Basic panel settings

Initial setting: When power is first turned on the following condition is obtained:

● Power indicator	LED	Lights
● Mode switch(PSW1)	LED	Lights (DUAL mode indicated)
● Filter 1 (PSW11)	LED	Lights
● Filter 3 (PSW13)	LED	Lights

When performing adjustments, all controls should be set as shown in the illustration and chart below except as otherwise indicated.

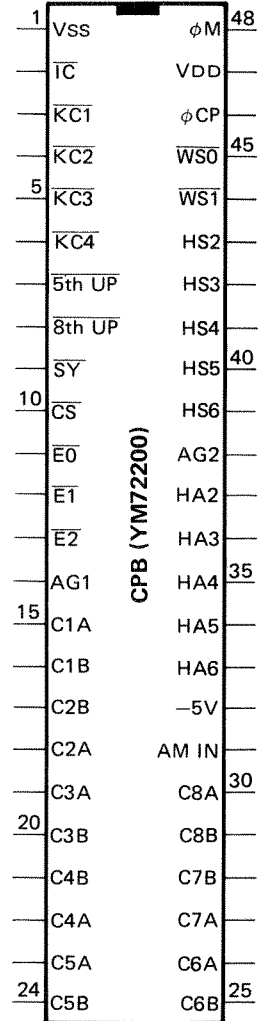


MODE (PSW 1)	OFF
PITCH I (PVR 2)	10 o'clock position
PITCH II (PVR 3)	10 o'clock position
DECAY I	fully clockwise (DECAY MAX)
DECAY II	fully clockwise (DECAY MAX)
TREMOLO SPEED (PVR 6)	MINIMUM
TREMOLO DEPTH (PVR 7)	MINIMUM
TREMOLO (PSW 8)	OFF
FLANGER (PSW 9)	OFF
WAVE (PSW 10)	fully clockwise (D position)
FILTER 1 (PSW 11)	ON
FILTER 2 (PSW 12)	OFF
FILTER 3 (PSW 13)	OFF
FILTER 4 (PSW 14)	OFF
5TH (PSW 15)	OFF
8TH (PSW 16)	OFF

BALANCE (PVR 17)	Centered
BASS (PVR 18)	Centered
TREBLE (PVR 19)	Centered
VOLUME (PVR 20)	MAXIMUM
TURN THE I/O PANEL LINE SW	ON

Part Name	YM722000	Function Name	CPB (Combo Piano-B) Tone Generator
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Terminal			Description	Terminal			Description
Pin No.	Name	I/O		Pin No.	Name	I/O	
1	VSS	I	Ground (0V)	48	ϕ M	I	Master Clock (1MHz)
2	\overline{IC}	I	Initial Clear	47	VDD	I	DC Supply (-15V)
3	$\overline{KC1}$	I	Key Code Data	46	ϕ CP	I	Pitch Clock
4	$\overline{KC2}$	I	- do. -	45	$\overline{WS0}$	I	Wave Select Data
5	$\overline{KC3}$	I	- do. -	44	$\overline{WS1}$	I	- do. -
6	$\overline{KC4}$	I	- do. -	43	HS2	O	Sound Source Waveform (Sustain) Block 0, 1,
7	5th UP	I	Transposition Data	42	HS3	O	- do. - 2
8	8th UP	I	- do. -	41	HS4	O	- do. - 3
9	SY	I	Synchro Data	40	HS5	O	- do. - 4
10	\overline{CS}	I	Chip Select ^{1~8ch, 9~16ch} Synchro Select.	39	HS6	O	- do. - 5, 6
11	$\overline{E0}$	I	Envelope Data	38	AG2	I	Analog Ground
12	$\overline{E1}$	I	- do. -	37	HA2	O	Sound Source Waveform (Attack) Block 0, 1,
13	$\overline{E2}$	I	- do. -	36	HA3	O	- do. - 2
14	AG1	I	Analog Ground	35	HA4	O	- do. - 3
15	C1A	I	Envelope Setting Capacitor	34	HA5	O	- do. - 4
16	C1B	I	- do. -	33	HA6	O	- do. - 5, 6
17	C2B	I	- do. -	32	-5V	I	DC Supply (\approx -10V)
18	C2A	I	- do. -	31	AMIN	I	Minimum Level Setting
19	C3A	I	- do. -	30	C8A	I	Envelope Setting Capacitor
20	C3B	I	- do. -	29	C8B	I	- do. -
21	C4B	I	- do. -	28	C7B	I	- do. -
22	C4A	I	- do. -	27	C7A	I	- do. -
23	C5A	I	- do. -	26	C6A	I	- do. -
24	C5B	I	- do. -	25	C6B	I	- do. -



MEMO

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DM Circuit Board & Wiring

Connector

C1

Pin No.	Pin Name	Wire Color	Destination
1	C#	BR	MK1-C# (C1-7)
2	D	RE	MK1-D (C1-6)
3	D#	OR	MK1-D# (C1-5)
4	E	YE	MK1-E (C1-4)
5	F	GR	MK1-F (C1-3)

C2

Pin No.	Pin Name	Wire Color	Destination
1	MODE	BE	PN1-MODE (C3-2)
2	MODE	BL	PN1-MODE (C3-1)
3	2Q2	YE	PN1-2Q2 (C1-6)
4	1Q2	BR	PN1-1Q2 (C1-3)
5	2Q1	OR	PN1-2Q1 (C1-5)
6	1Q1	PK	PN1-1Q1 (C1-2)
7	200	RE	PN1-200 (C1-4)
8	1Q0	SB	PN1-1Q0 (C1-1)
9	5TH	WH	PN2-5TH (C5-3)
10	6TH	GR	PN2-6TH (C5-4)

C3

Pin No.	Pin Name	Wire Color	Destination
1	PV1	GR	PN1-PV1 (C1-7)
2	VSS	-	-
3	VSS	VI	PN1-VSS (C1-9)
4	VDD	GG	PN1-VDD (C1-10)
5	PV2	BE	PN1-PV2 (C1-8)

C4

Pin No.	Pin Name	Wire Color	Destination
1	BR0	-	-
2	-	-	-
3	BR1	BR	MK1-BR1 (C3-6)
4	MK1	RE	MK1-MK1 (C3-7)
5	BR2	OR	MK1-BR2 (C3-5)
6	MK2	YE	MK1-MK2 (C3-4)
7	BR3	GR	MK1-BR3 (C3-3)
8	MK3	BE	MK1-MK3 (C3-2)
9	BR4	VI	MK4-BR4 (C3-6)
10	MK4	GY	MK4-MK4 (C3-7)

C5

Pin No.	Pin Name	Wire Color	Destination
1	BR5	WH	MK4-BR5 (C3-5)
2	MK5	GG	MK4-MK5 (C3-4)
3	BR6	SB	MK4-BR6 (C3-3)
4	MK6	PK	MK4-MK6 (C3-2)
5	BR7	-	-
6	MK7	-	-

C6

Pin No.	Pin Name	Wire Color	Destination
1	SUST.	SB	JK-SUST. (C1-5)
2	CK	PK	PN1-CK (C3-3)
3	-	-	-
4	WAVE1	BR	PN2-WAVE1 (C4-5)
5	WAVE0	YE	PN2-WAVE0 (C4-4)

C7

Pin No.	Pin Name	Wire Color	Destination
1	F#	BE	MK1-F# (C1-2)
2	G	VI	MK1-G (C1-1)
3	G#	GY	MK1-G# (C2-5)
4	A	WH	MK1-A (C2-4)
5	A#	GG	MK1-A# (C2-3)
6	B	SB	MK1-B (C2-2)
7	C	PK	MK1-C (C2-1)
8	-	-	-
9	-	-	-
10	-	-	-

C8

Pin No.	Pin Name	Wire Color	Destination
1	VSS	GY	DC-VSS (C1-1)
2	VSS	GY	DC-VSS (C1-3)
3	VDD	RE	DC-VDD (C2-4)
4	VDD	RE	DC-VDD (C2-5)
5	GND	-	-
6	GND	BL	DC-GND (C4-6)
7	+15V	-	-
8	+15V	BR	DC+15V (C4-3)
9	-15V	-	-
10	-15V	YE	DC-15V (C3-3)

C9

Pin No.	Pin Name	Wire Color	Destination
1	FO2	S BE	PN2-FO2 (C6-8)
2	FO1	S VI	PN2-FO1 (C6-6)
3	-	-	-
4	SW3	BR	PN2-SW3 (C5-1)
5	SW4	RE	PN2-SW4 (C5-2)
6	SW1	OR	PN2-SW1 (C4-2)
7	SW2	GR	PN2-SW2 (C4-3)

Notes

- YM63600: IC32 (See Page 16)
- YM72200: IC33, 34 (See Page 16)
- TC4019BP: IC30, 31
Quadruple AND/OR Select Gate

Logic Diagram

2SA1015(O,Y): Tr5
2SC752(Y): Tr1, 3

- TC4081BP: IC29
Quadruple 2-Input AND Gate

Block Diagram

2SK105(E): FET1 ~ 4

- NJM4558DV: IC1 ~ 28
Dual Operational Amplifier

Logic Diagram

1S1555: D1 ~ 40

YAMAHA

ELECTRONIC PIANO

CP 25

PARTS LIST

CONTENTS

A. Electronic Components	1
B. Cabinet Assembly	4
C. Top Board Assembly	7
D. Keyboard Assembly	9
E. Sustainer Pedal	11

A. Electronic Components

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets
*	NA:10:70:30	Circuit Board, AC	#2891	A C シ ー ト		J
*	NA:10:70:40	- do. - , - do. -	- do. -	"		U
*	NA:10:70:50	- do. - , - do. -	- do. -	"		G
*	NA:10:74:10	- do. - , - do. -	- do. -	"		C
*	NA:10:70:60	- do. - , PN	#2892	P N シ ー ト		
*	NA:10:70:70	- do. - , DM	#2893	D M シ ー ト		
*	NA:10:70:80	- do. - , EFT	#2884	E F T シ ー ト		
*	NA:10:70:90	- do. - , JK	#2887	J K シ ー ト		
*	NA:10:71:10	- do. - , DC	#2888	D C シ ー ト		J
*	NA:10:71:20	- do. - , - do. -	- do. -	"		U.C
*	NA:10:71:30	- do. - , - do. -	- do. -	"		G
*	NB:10:35:20	Power Transformer Assembly	#3851	電 源 ト ラ ン ス A s s ' y		G
*	NB:10:35:30	- do. -	#3940	"		J,U
*	NB:10:35:40	- do. -	- do. -	"		C
*	NB:81:76:90	Switch Assembly	33 Key	ス イ ッ チ A s s ' y		
*	NB:81:77:10	- do. -	28 Key	"		
	NB:80:76:00	Switch Unit	6 Key	ス イ ッ チ ユ ニ ッ ト		
	NB:80:76:10	- do. -	3 Key	"		
	NB:81:75:70	- do. -	4 Key	"		
	iG:00:11:80	IC	TC4013BP	I C	2-input NOR	
	iG:00:13:90	- do. -	NJM4558DV	"	OP. Amp	
	iG:00:17:00	- do. -	TC4019BP	"	AND-OR Select Gate	
	iG:00:17:40	- do. -	TC4050BP	"	Hex Buffer/ Converter	
	iG:00:17:60	- do. -	TC4081BP	"	2-input AND	
	iG:02:74:00	- do. -	TA7220P	"	Amp	
	iG:02:87:00	- do. -	μPC14315H	"	+15V Regulator	
	iG:03:13:00	- do. -	NE570N	"	Compander	
	iG:03:29:00	- do. -	#3290	"	BBD Driver	
	iG:04:61:00	- do. -	MN3009	"	256 Stage BBD	
	iT:63:60:00	- do. -	YM63600	"	CP-A (Keycoder Channel Processor)	
	iT:72:20:00	- do. -	YM72200	"	CP-B (Tone Generator)	
	iA:05:09:10	Transistor	2SA509(Y)	ト ラ ン ジ ス タ		
	iA:10:15:70	- do. -	2SA1015(O,Y)	"		
	iC:05:09:20	- do. -	2SC509(Y)	"		
	iC:07:52:20	- do. -	2SC752(Y)	"		
	iC:18:15:70	- do. -	2SC1815(O,Y)	"		
	iE:10:12:00	FET	2SK105(F)	F E T		
	iF:00:00:40	Diode	1S1555	ダ イ オ ー ド		
	iF:00:02:90	LED		L E D	Power Indicator	
	iH:00:04:70	Diode	1D4B1	ダ イ オ ー ド		
	iK:00:03:40	Photo Coupler	P1501	フ ォ ト カ プ ラ ー		
	iL:00:05:80	Mica Base		マイ カ ベ ー ス		
	CB:07:28:80	Insulation Busing		絶 縁 ブ ッ シ ュ		
	HS:31:04:40	Variable Resistor	B50KΩ	ロータリーボリューム	TREBLE, BASS	
	HS:31:05:50	- do. -	A10KΩ	"	MASTER VOL.	

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

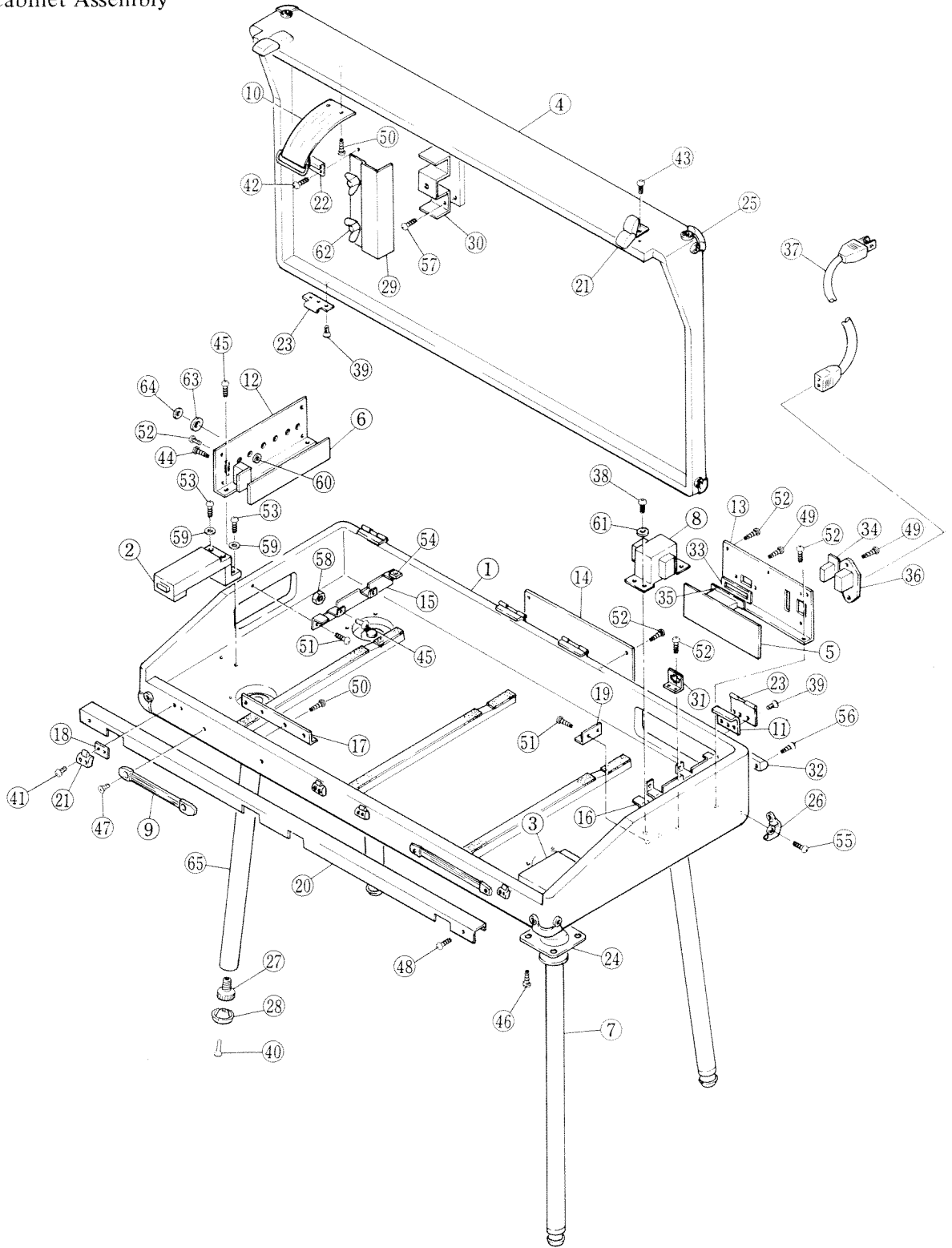
Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets
	HS 31 05 70	Variable Resistor	B10K Ω	ロータリーボリューム	PITCH TREMOLO DEPTH	
	HS 31 13 30	- do. -	C100K Ω	"	TREMOLO SPEED	
	HS 31 14 20	- do. -	BH10K Ω x2	"	BALANCE	
	HT 37 00 20	Semi Variable Resistor	B10K Ω	半 固 定 抵 抗		
	HT 37 01 00	- do. -	B50K Ω	"		
	HV 35 43 30	Flame-Proof Carbon Resistor	33 Ω	不燃化カーボン抵抗		
	HV 35 52 20	- do. -	220 Ω	"		
	HZ 00 24 10	Solid Resistor	22M Ω	ソリッド抵抗		
	ED 65 22 70	Polystyrene Capacitor	270PF	スチロールコンデンサ		
	ED 65 26 80	- do. -	680PF	"		
	FL 63 64 70	B.P. Electrolytic Cap.	4.7 μ F/16V	B. P. ケ ミ コ ン		
	FL 63 71 00	- do. -	10 μ F/16V	"		
	FL 63 72 20	- do. -	22 μ F/16V	"		
	FL 66 64 70	- do. -	4.7 μ F/50V	"		
	FM 80 92 20	Electrolytic Capacitor	2200 μ F/35V	ケ ミ コ ン		
	UJ 15 91 00	- do. -	1000 μ F/35V	"		
	FZ 00 29 40	- do. -	6.8 μ F/25V	"	Low Leak	
	FZ 00 22 50	Spark Suppressor Cap.	0.022 μ F	スパークキラーコンデンサ		
	FZ 00 28 50	- do. -	0.0022 μ F	"		U
	KA 10 10 60	Power Switch		パ ワ ー ス イ ッ チ		
	KA 40 08 10	Slide Switch	4-2	ス ラ イ ド ス イ ッ チ	LINE SW	
	KA 40 08 30	Voltage Selector		電 圧 切 替 器		
	KA 50 17 20	Rotary Switch	1-8	ロ ー タ リ ー ス イ ッ チ	DECAY I,II	
	KA 50 17 00	- do. -	3-4	"	WAVE	
	KA 90 17 01	Push Switch W/LED	Gray	プ ッ シ ュ ス イ ッ チ	MODE, TREMOLO, FLANGER 5TH, 8TH UP	
	KA 90 17 11	- do. -	White	"	PRESET	
	KB 00 03 30	Fuse	1A 250V	ヒ ュ ー ズ		J
	KB 00 03 40	- do. -	1.5A 250V	"		J
	KB 00 07 10	- do. - (Miniature)	T500mA 250V	"		G
	KB 00 07 30	- do. - - do. -	T1A 250V	"		G
	KB 00 10 60	- do. -	1A 150V	"		U.C
	KB 00 15 90	- do. -	1.5A 250V	"		U.C
	KC 00 13 00	Relay	RZ-12	リ レ ー		
	GE 30 03 50	Choke Coil	68 μ H	チ ョ ー ク コ イ ル		
	GE 90 03 40	OSC Coil	200 μ H	OSC コ イ ル		
	GE 90 05 00	Coil	CK4	コ イ ル		
	GE 90 05 30	- do. -	CK6	"		
	MG 00 10 30	AC Cord		電 源 コ ー ド		J
	MG 00 10 40	- do. -		"		U
	MG 00 10 50	- do. -		"		G
	MG 00 12 80	- do. -		"		C

* New Parts (新規部品)

Ref. No.	Part No.	Description		部 品 名	Remarks	Common Model	Markets
	LB:20:15:40	Phone Jack	JL2B	ジ ャ ッ ク			
	LB:20:18:20	AC Inlet	2P	A C イ ン レ ッ ト			J.U.C
	LB:20:18:60	- do. -	2P	"			G
	LB:20:05:70	Fuse Holder Pin		ヒ ュ ー ズ ホ ル ダ ー ピ ン			
	LB:20:15:30	- do. -		"			
	LB:50:02:50	Connector Base Pin	5P	2.5ピッチベースピン	Top Entry		
	LB:60:24:60	- do. -	7P	"	- do. -		
	LB:60:24:90	- do. -	8P	"	- do. -		
	LB:60:24:70	- do. -	10P	"	- do. -		
	LB:50:02:70	- do. -	5P	"	Side Entry		
	LB:60:28:20	- do. -	6P	"	- do. -		
	LB:50:03:70	- do. -	5P	"	Bottom Entry		
	LB:60:30:00	- do. -	7P	"	- do. -		
	LB:60:30:70	- do. -	10P	"	- do. -		
	LB:50:02:40	Connector Housing	5P	2.5ピッチハウジング			
	LB:60:28:10	- do. -	6P	"			
	LB:60:24:40	- do. -	7P	"			
	LB:60:24:80	- do. -	8P	"			
	LB:60:24:50	- do. -	10P	"			
	LB:60:15:40	Connector Plug	9P	9 P プ ラ グ			
	LB:60:15:50	Connector Cap	9P	9 P キ ャ ッ プ			
	LB:60:40:40	Connector Housing	8P	ハ ウ ジ ン グ			
	LB:60:39:90	Connector	8P	コ ネ ク タ ー			
	BB:00:44:30	Pin Contact		ピ ン コ ン タ ク ト			
	BB:00:49:90	- do. -		"			
	LB:60:16:70	- do. -		"			

* New Parts (新規部品)

B. Cabinet Assembly



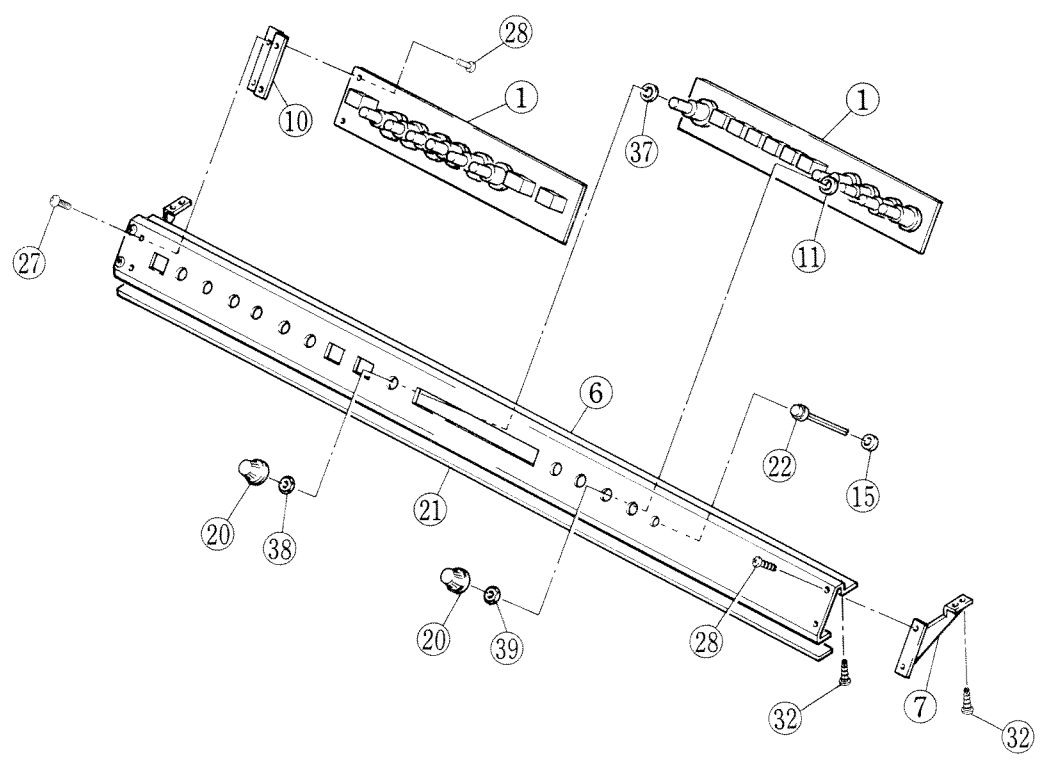
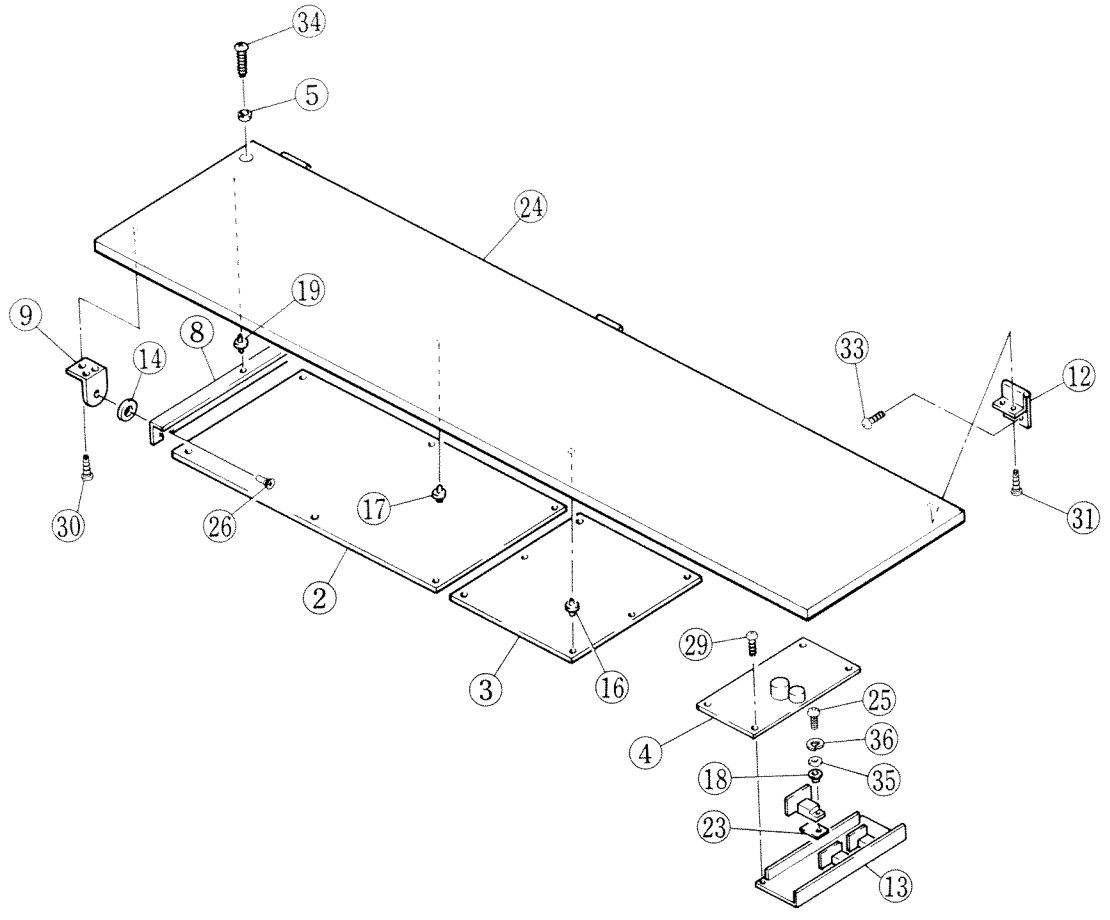
Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets
※ 1	DA.02.46.80	Bottom Case Assembly	底 枠 集 成			
※ 2	DA.02.47.00	End Block Assembly (L)	拍 子 木 集 成 (左)			
※ 3	DA.02.45.80	- do. - (R)	" (右)			
※ 4	DA.02.47.20	Cover Assembly	蓋 集 成			

※ New Parts (新規部品)

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets
* 5	NA 10 70 30	Circuit Board, AC	#2891 AC シ ー ト			J
* *	NA 10 70 40	- do. - , - do. -	- do. - "			U
* *	NA 10 70 50	- do. - , - do. -	- do. - "			G
* *	NA 10 74 10	- do. - , - do. -	- do. - "			C
* 6	NA 10 70 90	- do. - , JK	#2887 JK シ ー ト			
* 7	NB 10 34 90	Leg Assembly	脚 パ イ プ Ass'y			
* 8	NB 10 35 20	Power Transformer Assembly	電 源 ト ラ ン ス Ass'y			G
* *	NB 10 35 30	- do. -	"			J.U
* *	NB 10 35 40	- do. -	"			C
9	NB 80 59 50	Handle Assembly	取 手 Ass'y			
10	NB 80 59 60	Pedal Stopper Band	ペダル止めバンド Ass'y			
11	AA 01 46 90	Corner Angle	コ ー ナ ー ア ン グ ル			
* 12	AA 05 25 50	I/O Panel	I/O パ ネ ル			
13	AA 05 25 60	AC Panel	電 源 パ ネ ル			J.U.C
	AA 05 25 70	- do. -	"			G
14	AA 05 26 20	Name Plate	ネ ー ム プ レ ー ト			
15	AA 05 26 30	Top Board Holder (L)	屋 根 受 金 具 (左)			
16	AA 05 26 40	- do. - (R)	" (右)			
17	AA 05 32 00	Handle Plate	取 手 取 付 金 具			
18	AA 05 32 40	Lock Plate	バ ッ チ ン 錠 プ レ ー ト			
19	AA 05 32 80	Transformer Holder	ト ラ ン ス 受 け			
* 20	AA 05 34 60	Front Rail	ロ 金			
21	AA 80 24 50	Lock	バ ッ チ ン 錠			
22	AA 80 43 20	Holder, Pedal Stopper Band	引 掛 金 具			
23	AA 80 64 20	Latch Hinge	引 掛 蝶 番			
24	AA 80 72 00	Leg Flange	脚 フ ラ ン ジ			
25	AA 80 90 50	Corner Metal	コ ー ナ ー 金 具			
26	AA 81 47 70	- do. -	"			
27	AA 81 54 10	Leg Adjust Nut	調 整 ナ ッ ト			
28	AA 81 54 20	Leg Glide	調 整 座			
* 29	AA 05 26 80	Leg Holder	脚 保 持 金 具			
* 29	AA 05 44 70	Leg Holder	脚 受 金 具			
30	AA 81 54 60	- do. -	脚 受 金 具			
31	AA 81 63 00	Connector Holder	コ ネ ク タ ホ ル ダ ー			
32	CB 01 03 10	Case Leg	脚			
33	CB 81 78 90	Spacer	ス ペ ー サ ー			
34	KA 10 10 60	Power Switch	パ ワ ー ス イ ッ チ			
35	KA 40 08 30	Voltage Selector	電 圧 切 替 器			
36	LB 20 18 20	AC Inlet	2 P イ ン レ ッ ト			J.U.C
	LB 20 18 60	- do. -	"			G
37	MG 00 10 30	AC Cord	電 源 コ ー ド			J
	MG 00 10 40	- do. -	"			U
	MG 00 10 50	- do. -	"			G
	MG 00 12 80	- do. -	"			C
38	EA 34 01 50	Pan Head Screw	M4x15 BL ナ ベ 小 ネ ジ			
39	EB 23 01 40	Flat Head Screw	M3x14 Cr 皿 小 ネ ジ			
40	EB 35 02 00	- do. -	M5x20 BL "			
41	EC 23 01 60	Truss Screw	M3x16 Cr ト ラ ス 小 ネ ジ			
42	EC 33 01 20	- do. -	M3x12 BL "			
43	ED 23 01 40	Bind Screw	M3x14 Cr バ イ ン ド 小 ネ ジ			
44	ED 32 60 40	- do. -	M2.6x4 BL "			
45	ED 34 00 80	- do. -	M4x8 BL "			
46	ED 34 01 60	- do. -	M4x16 BL "			

* New Parts (新規部品)

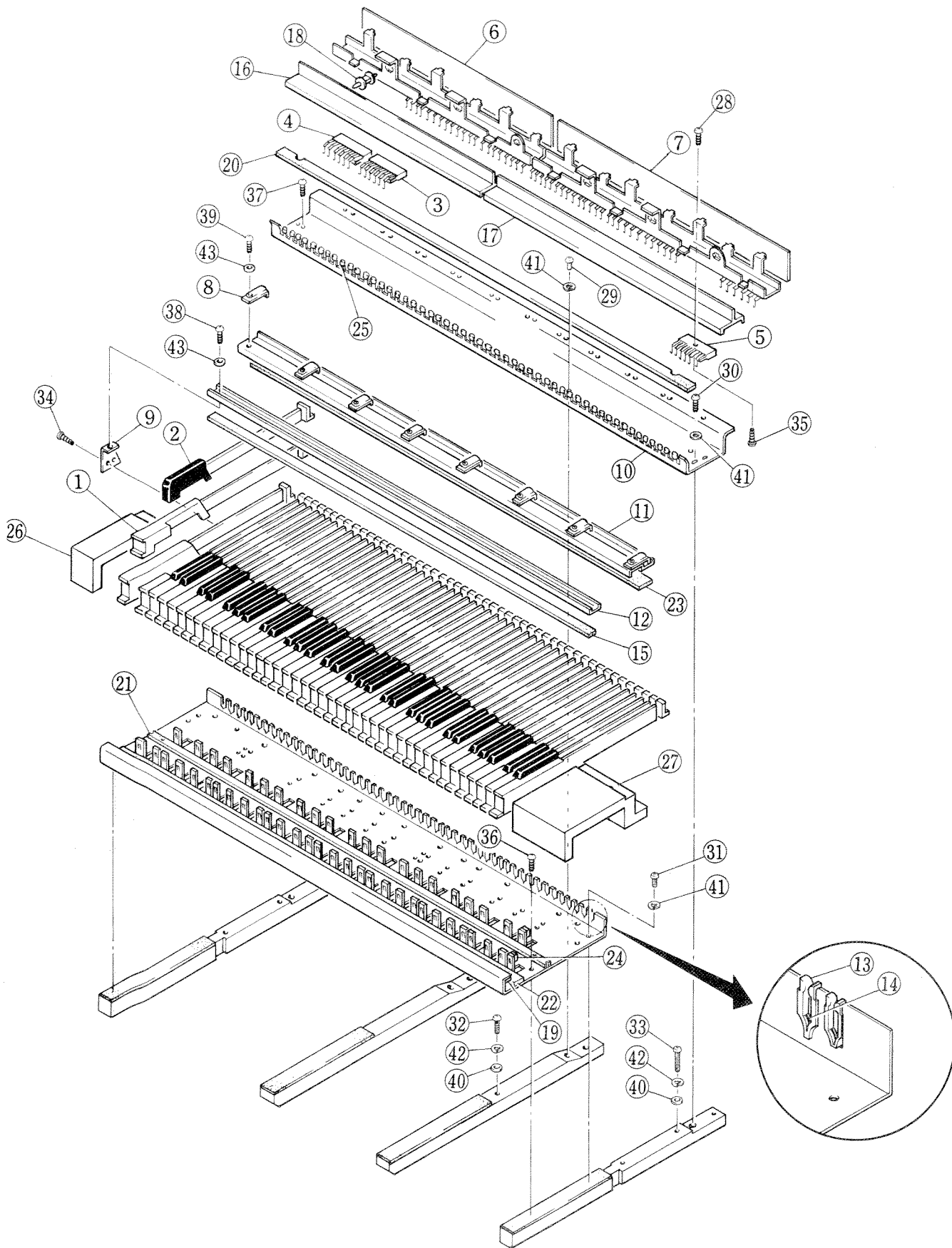
C. Top Board Assembly



Ref. No.	Part No.	Description	部 品 名		Remarks	Common Model	Markets
* 1	NA:10:70:60	Circuit Board, PN	#2892	PN	シ ー ト		
* 2	NA:10:70:70	- do. - , DM	#2893	DM	シ ー ト		
* 3	NA:10:70:80	- do. - , EFT	#2884	EFT	シ ー ト		
* 4	NA:10:71:10	- do. - , DC	#2888	DC	シ ー ト		J
* 5	NA:10:71:20	- do. - , - do. -	- do. -		"		U.C
* 6	NA:10:71:30	- do. - , - do. -	- do. -		"		C
5	AA:02:90:40	Washer			皿 ワ ッ シ ャ ー		
* 6	AA:05:24:70	Panel			パ ネ ル		
7	AA:05:24:80	Panel Stay			パ ネ ル ス テ ー		
8	AA:05:26:00	Stay			ス テ ー		
9	AA:05:26:10	Stay Holder			ス テ ー 固 定 金 具		
* 10	AA:05:28:70	Switch Holder (B)			S W 固 定 金 具 B		
11	AA:80:58:20	Spacer			ス ペ ー サ ー		
12	AA:81:73:80	Hinge			蝶 番		
13	BA:01:50:70	Heat Sink			ヒ ー ト シ ン ク		
14	CB:01:18:30	Busing			ブ ッ シ ュ		
15	CB:02:99:30	LED Socket			LED ソ ケ ッ ト		
16	CB:03:97:50	C.B. Holder			シ ー ト ホ ル ダ ー		
17	CB:04:00:80	- do. -			"		
18	CB:07:28:80	Insulation Busing			絶 縁 ブ ッ シ ュ		
19	CB:08:70:00	C.B. Holder			シ ー ト ホ ル ダ ー		
20	CB:81:01:20	Knob			ツ マ ミ		
* 21	CC:01:53:40	Panel Felt			パ ネ ル 貼 フェ ル ト		
22	iF:00:02:90	LED			L E D		
23	iL:00:05:80	Mica Base			マ イ カ ベ ー ス		
24	DA:02:47:10	Top Board Assembly			屋 根 集 成		
25	EA:32:60:80	Pan Head Screw	M2.6x8	BL	ナ ベ 小 ネ ジ		
26	EB:34:01:20	Flat Head Screw	M4x12	BL	皿 小 ネ ジ		
27	EC:33:00:60	Truss Screw	M3x6	BL	ト ラ ス 小 ネ ジ		
28	ED:33:00:60	Bind Screw	M3x6	BL	バ イ ン ド 小 ネ ジ		
29	Ei:33:00:80	Bind Tapping Screw	3x8	BL	バ イ ン ド タ ッ ピ ン グ ネ ジ		
30	Ei:33:01:00	- do. -	3x10	BL	"		
31	Ei:33:01:20	- do. -	3x12	BL	"		
32	Ei:33:51:20	- do. -	3.5x12	BL	"		
33	Ei:33:51:60	- do. -	3.5x16	BL	"		
34	EM:45:03:00	Oval Head Tapping Screw	5x30	BL	丸 皿 タ ッ ピ ン グ ネ ジ		
35	EV:20:30:30	Flat Washer	3S	BL	平 座 金		
36	EV:30:30:30	Spring Lock Washer	3S	BL	バ ネ 座 金		
37	EV:41:00:70	Toothed Lock Washer	A7S	Ye	歯 付 座 金		
38	EZ:30:70:10	Hexagonal Nut	M7	Ye	特 殊 六 角 ナ ッ ト		
39	EZ:30:90:10	- do. -	M9	Ye	"		

* New Parts (新規部品)

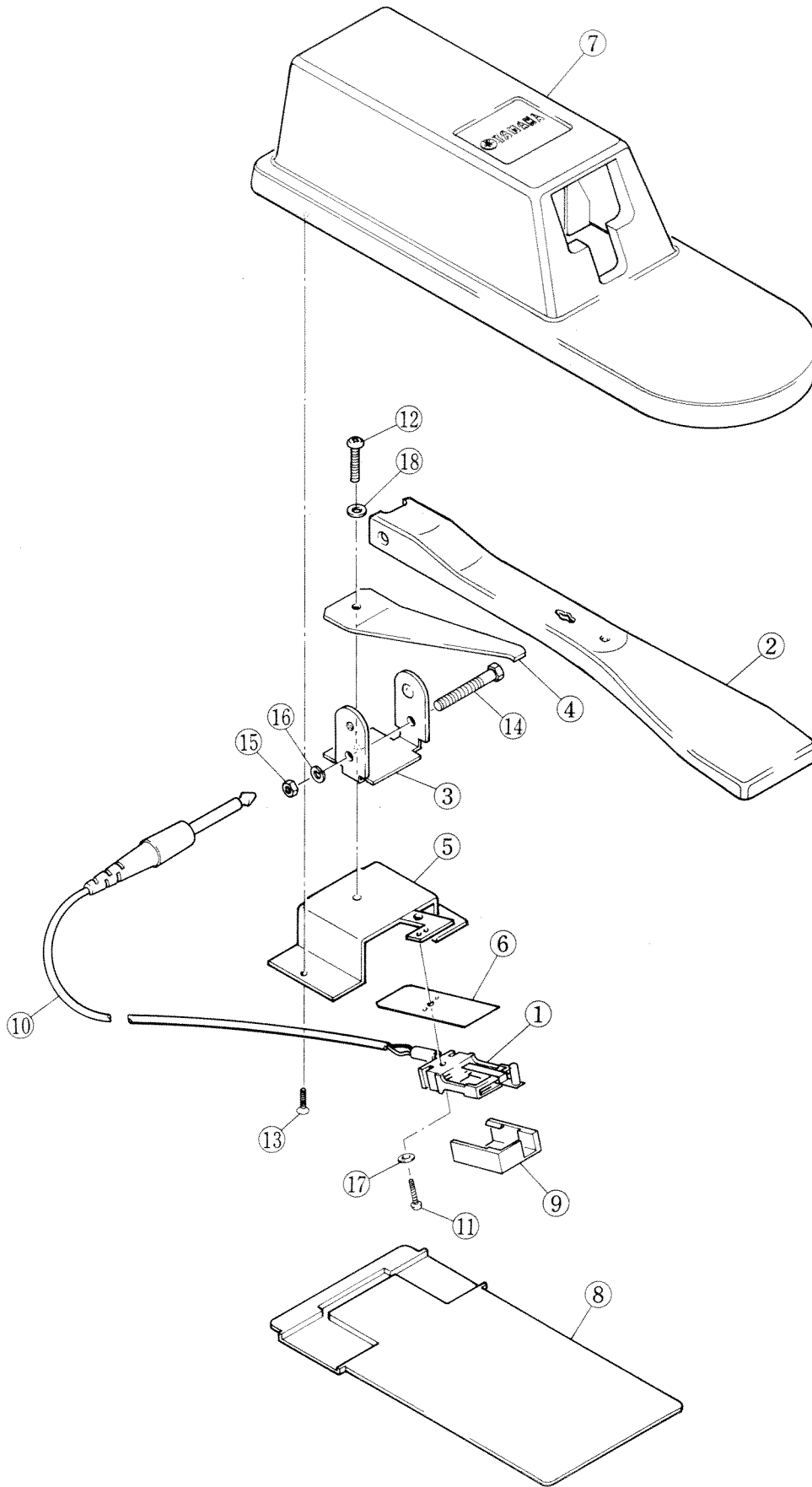
D. Keyboard Assembly



Ref. No.	Part No.	Description			部 品 名	Remarks	Common Model	Markets
1	NB:04:51:00	White Key Assembly	E'		白 鍵 Ass'y			
	NB:04:34:30	- do. -	C,F		"			
	NB:04:34:40	- do. -	D		"			
	NB:04:34:50	- do. -	E,B		"			
	NB:04:34:60	- do. -	G		"			
	NB:04:34:70	- do. -	A		"			
2	NB:04:35:10	Black Key Assembly			黒 鍵 Ass'y			
3	NB:80:76:00	Switch Unit	6 Key		スイッチユニット			
4	NB:80:76:10	- do. -	3 Key		"			
5	NB:81:75:70	- do. -	4 Key		"			
6	NB:81:76:90	Switch Assembly	33 Key		スイッチ Ass'y			
※	7	NB:81:77:10	- do. -	28 Key	"			
8	AA:80:46:40	Guard, Stopper Rail			ストッパーレール補強金具			
9	AA:80:46:50	Stay (B)			ステ - (B)			
※	10	AA:81:67:90	Switch Rail		スイッチレール			
※	11	AA:81:68:10	Stopper Rail		ストッパーレール			
※	12	AA:81:68:50	Key Stopper		キーストッパー			
13	CB:02:78:40	Support			サポ - ト			
14	CB:02:84:10	Pivot Rubber			ピボットゴム			
15	CB:03:07:70	Key Stopper Rubber			キーストッパーゴム			
16	CB:03:97:80	Switch Cover			スイッチカバー			
※	17	CB:04:00:60	- do. -		"			
18	CB:81:78:10	PC Support			PC サポ - ト			
19	CC:02:15:30	Stopper Felt			ストッパーフェルト			
※	20	CC:07:04:50	- do. -		"			
※	21	CC:07:04:70	- do. -		"			
※	22	CC:07:04:90	- do. -		"			
※	23	CC:07:05:10	- do. -		"			
24	CD:01:00:50	Key Guide Cloth			キーガイドクロス			
25	CH:00:02:90	Tube		Between White & White Key	ヒシチューブ			
	CH:00:03:00	- do. -		Between White & Black Key	"			
※	26	DA:02:47:00	End Block Assembly (L)		拍子木集成 (左)			
27	DA:02:45:80	- do. - (R)			" (右)			
28	EA:03:01:20	Pan Head Screw	M3x12	Ye	ナベ小ネジ			
29	EA:04:01:60	- do. -	M4x16	Ye	"			
30	EA:05:01:60	- do. -	M5x16	Ye	"			
31	EA:05:02:00	- do. -	M5x20	Ye	"			
32	EA:35:03:00	- do. -	M5x30	BL	"			
33	EA:35:03:50	- do. -	M5x35	BL	"			
34	EJ:03:00:60	Pan Head Tapping Screw	3x6	Ye	ナベタッピングネジ			
35	EJ:03:01:20	- do. -	3x12	Ye	"			
36	EQ:03:51:30	Round Head Wood Screw	3.5x13	Ye	丸木ネジ			
37	ES:04:01:20	Tap Tight Screw	4x12	Ye				
38	ES:04:01:50	- do. -	4x15	Ye	"			
39	ES:04:02:00	- do. -	4x20	Ye	"			
40	EV:20:30:50	Flat Washer	5S	BL	平座金			
41	EV:30:00:50	Spring Lock Washer	5S	Ye	バネ座金			
42	EV:30:30:50	- do. -	5S	Bl	"			
43	EV:42:00:40	Toothed Lock Washer	B4S	Ye	歯付座金			

※ New Parts (新規部品)

E. Sustainer Pedal



CP25 SERVICE MANUAL

1981年12月 初版

発行所 日本楽器製造株式会社
電音サービス課

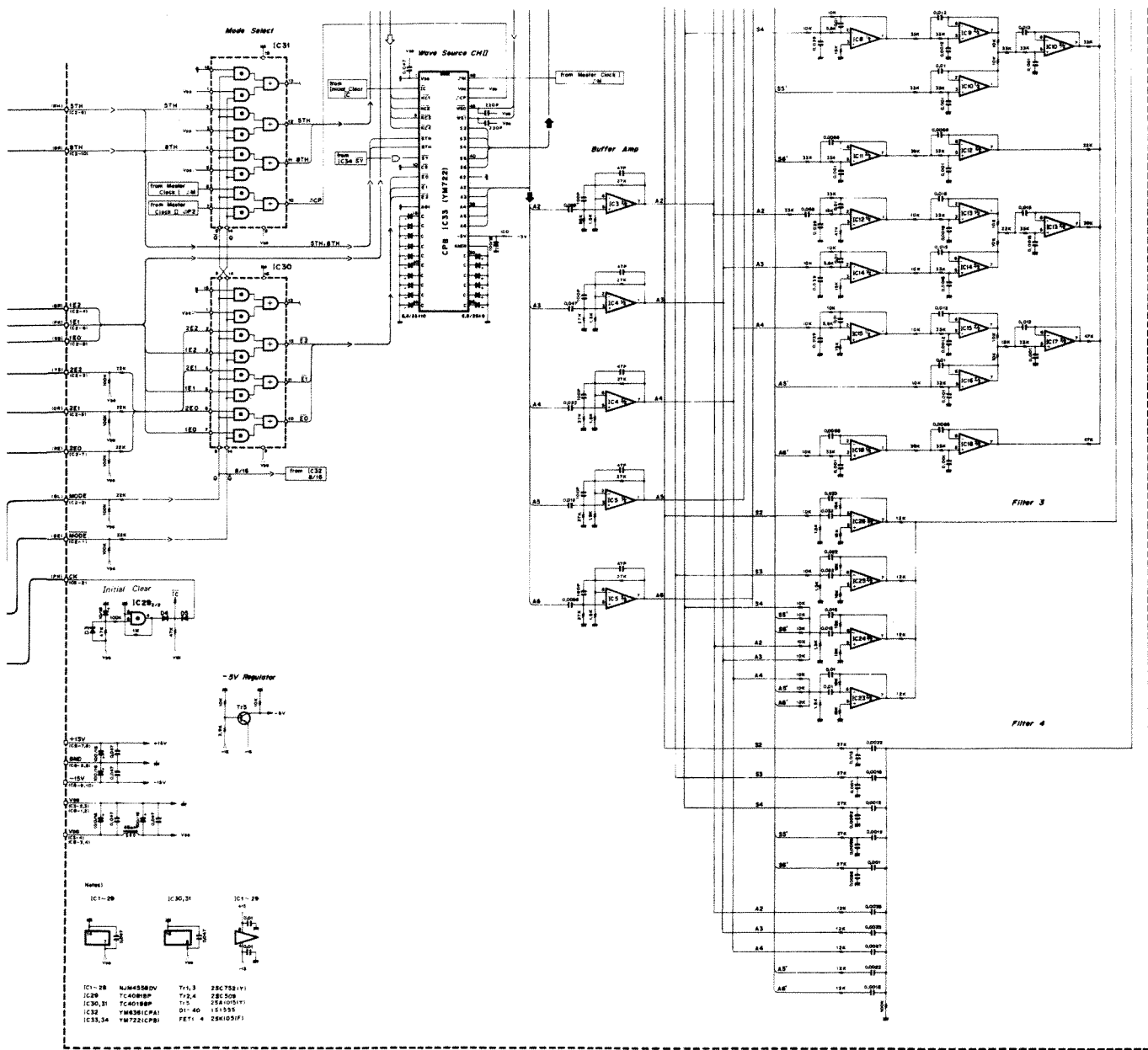
本文・総回路図
版 下 中部電子印刷(株)

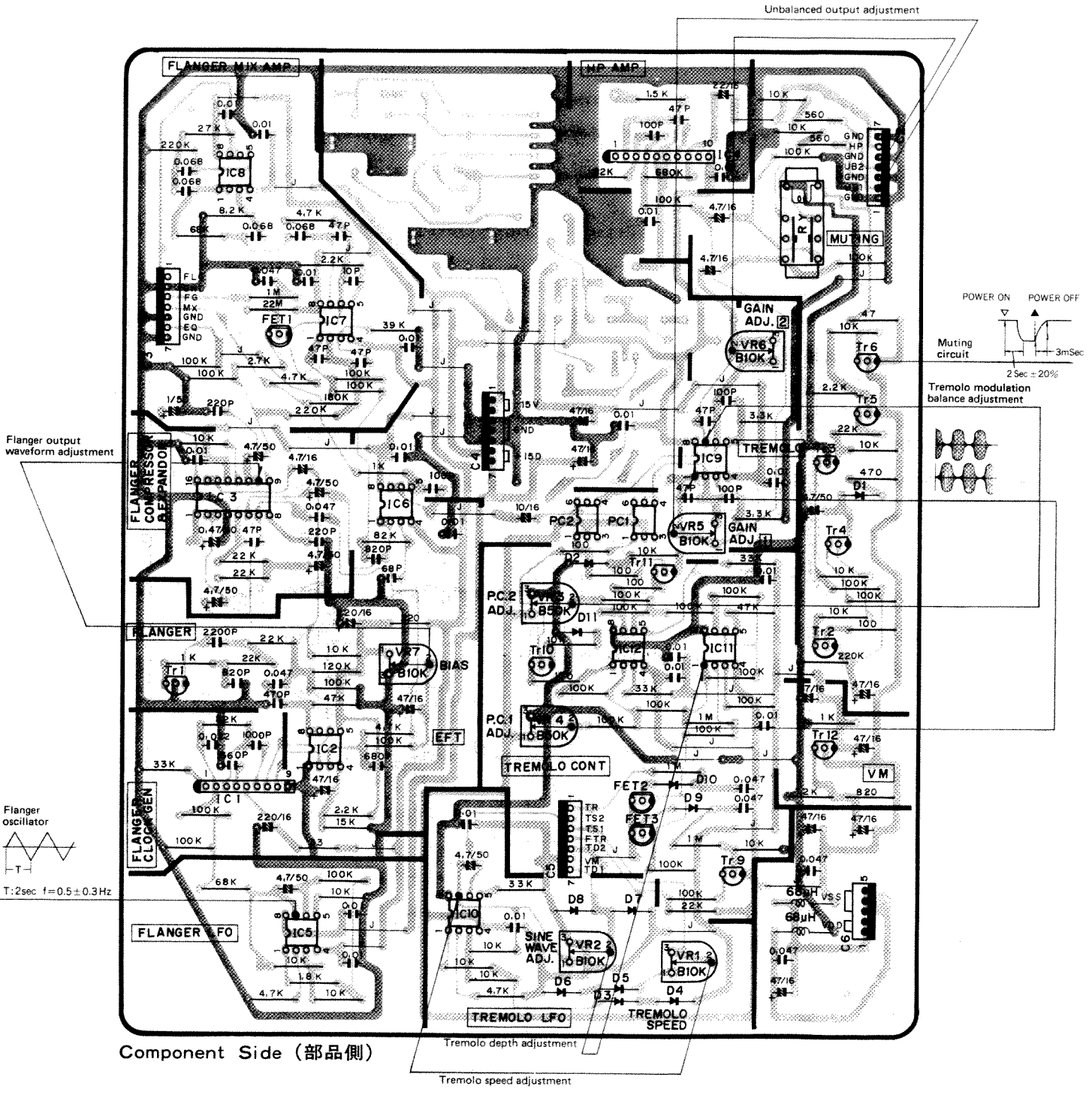
パーツリスト 豊立設計事務所

本文印刷 株式会社ブレーン企画

総回路図印刷 中部電子印刷(株)

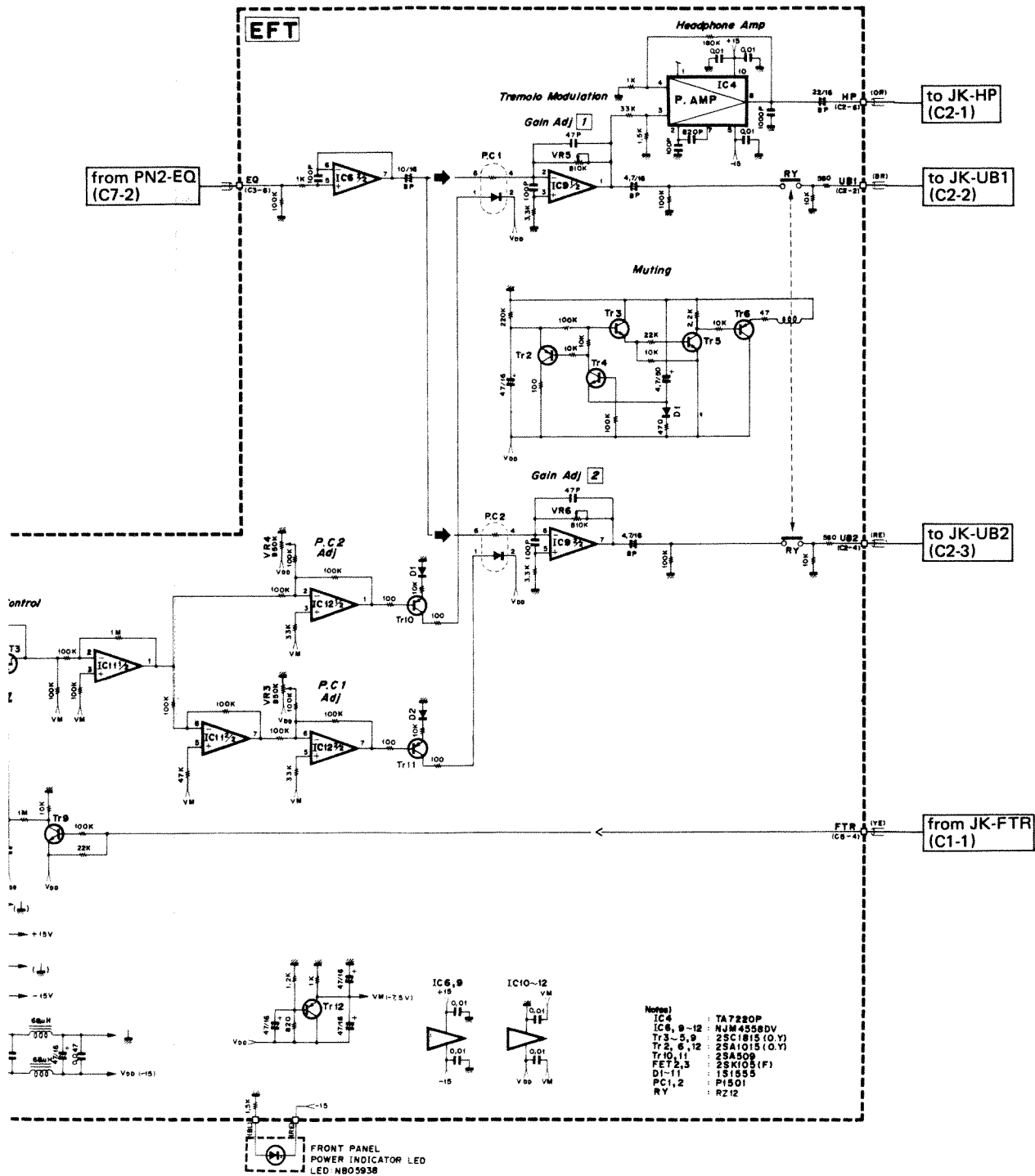
DM Circuit Diagram





Component Side (部品側)

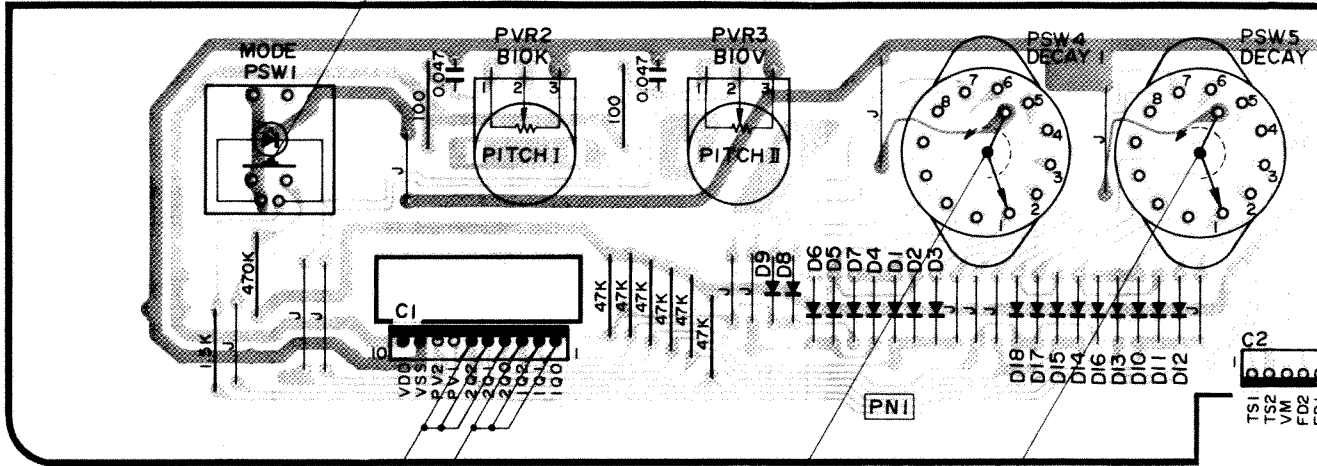
EFT Circuit Diagram



MODE SW. DATA

MODE SW. (PSW1)	"ON" (DUAL)	"OFF" (SINGLE)
MODE (C3-1)	0 V	-15V
MODE (C3-2)	-15V	0 V

PN 1 Board



Pattern Side(パターン側)

DECAY SW. DATA

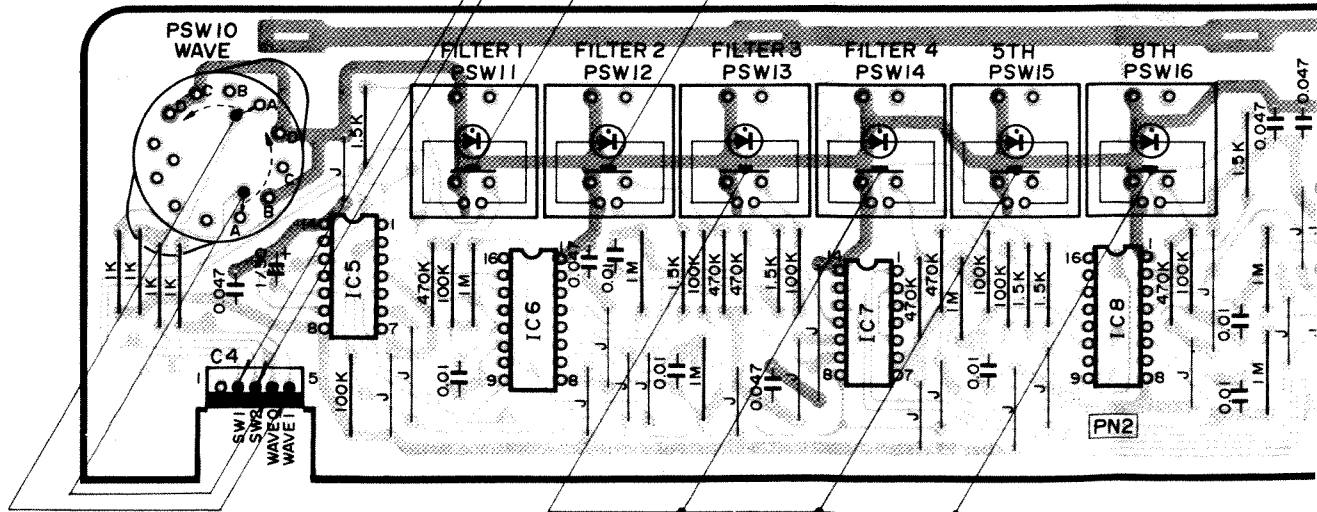
Switching the DECAY SW. from 1 to 8 produces the following.

point	POSITION	1st	2nd	3rd	4th	5th	6th	7th	8th
102 C1-3 202(C1-6)		H	H	H	H	L	L	L	L
101 C1-2 201(C1-5)		H	H	L	L	H	H	L	L
100 C1-1 200(C1-4)		H	L	H	L	H	L	H	L

"H" = 0 V, "L" = -15V

PN2 Board

Pattern Side(パターン側)



WAVE SELECT DATA

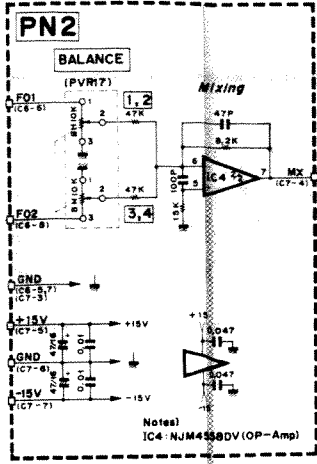
point	POSITION	A	B	C	D
WAVE1 (C4-5)		L	L	H	H
WAVE0 (C4-4)		L	H	L	H

FILTER, 5TH, 8TH, SW. DATA

Turinin these switches on/off produces the following conditions.

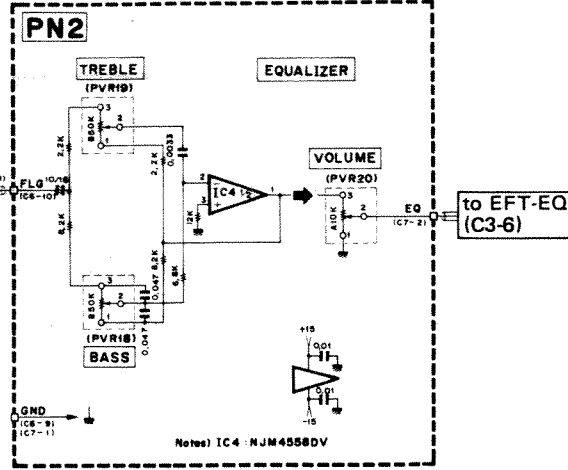
	FILTER1 (C4-2)	FILTER2 (C4-3)	FILTER3 (C5-1)	FILTER4 (C5-2)	5TH (C5-3)	8TH (C5-4)
"ON"	0 V	0 V	0 V	0 V	0 V	0 V
"OFF"	-15V	-15V	-15V	-15V	-15V	-15V

PN2 Circuit Diagram



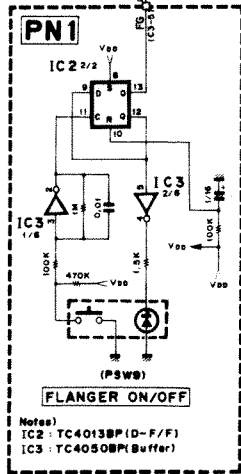
to EFT-MX (C3-4)

from EFT-FLG (C3-1)



to EFT-EQ (C3-6)

to EFT-FG (C3-3)

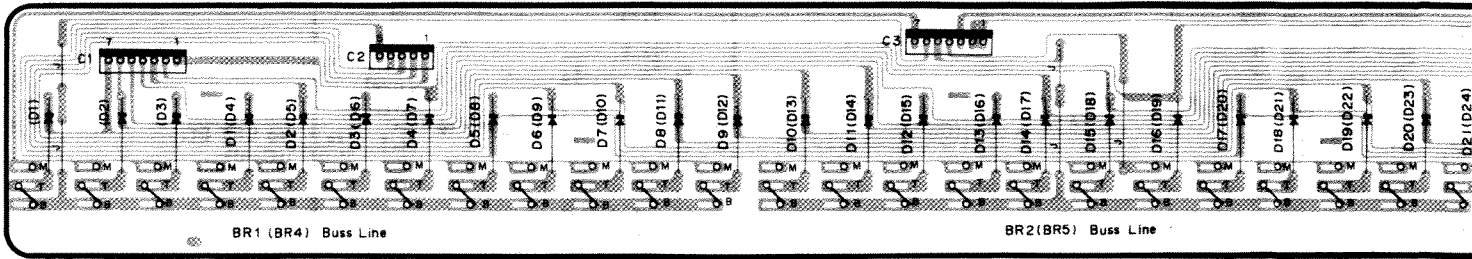


MK1 Circuit Board & Wiring, Circuit Diagram

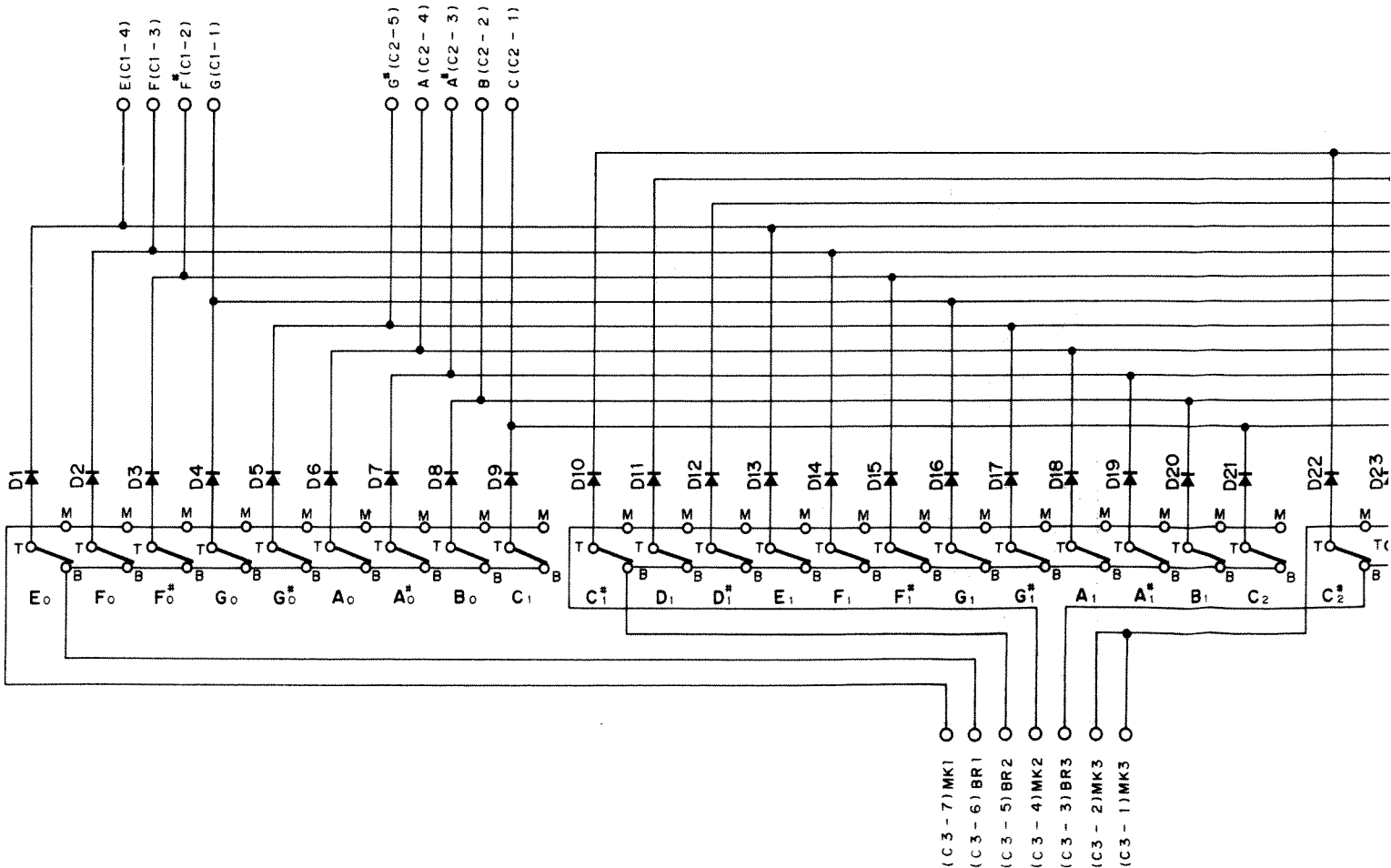
Pin	7	6	5	4	3	2	1
MK1	-	-	-	E	F	F [#]	G

Pin	5	4	3	2	1
MK1	G [#]	A	A [#]	B	C

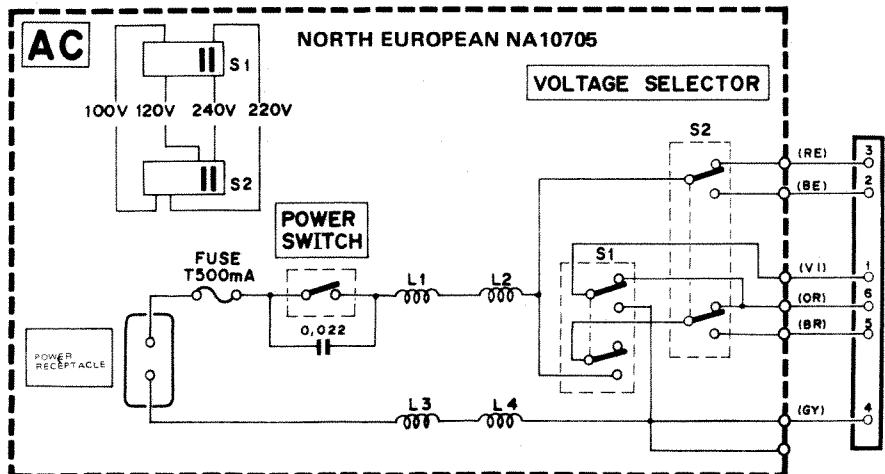
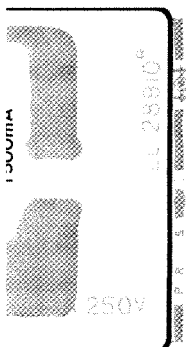
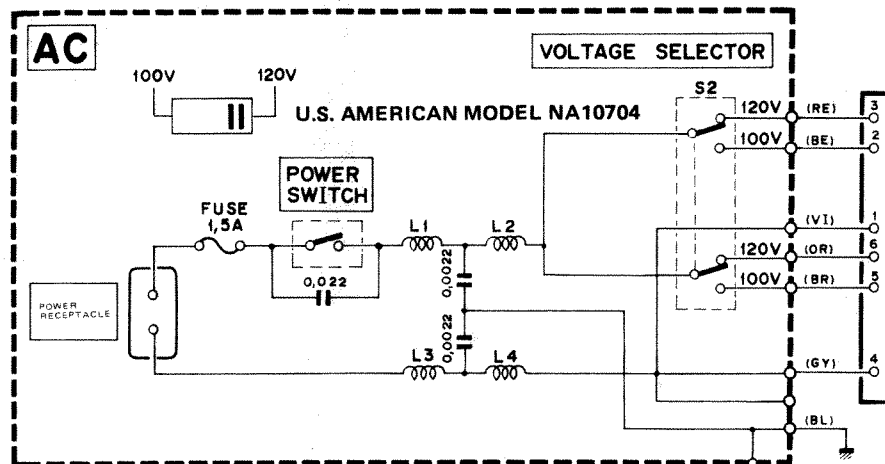
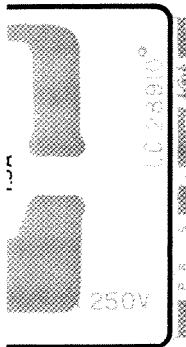
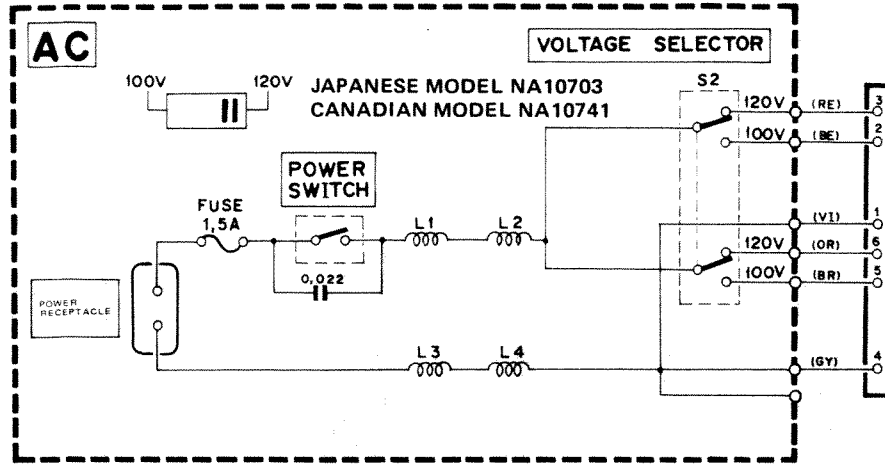
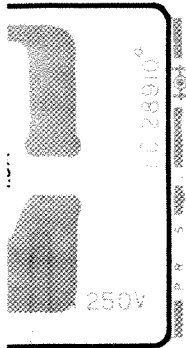
Pin	7	6	5	4	3	2	1
MK1	MK1	BR1	BR2	MK2	BR3	MK3	MK3



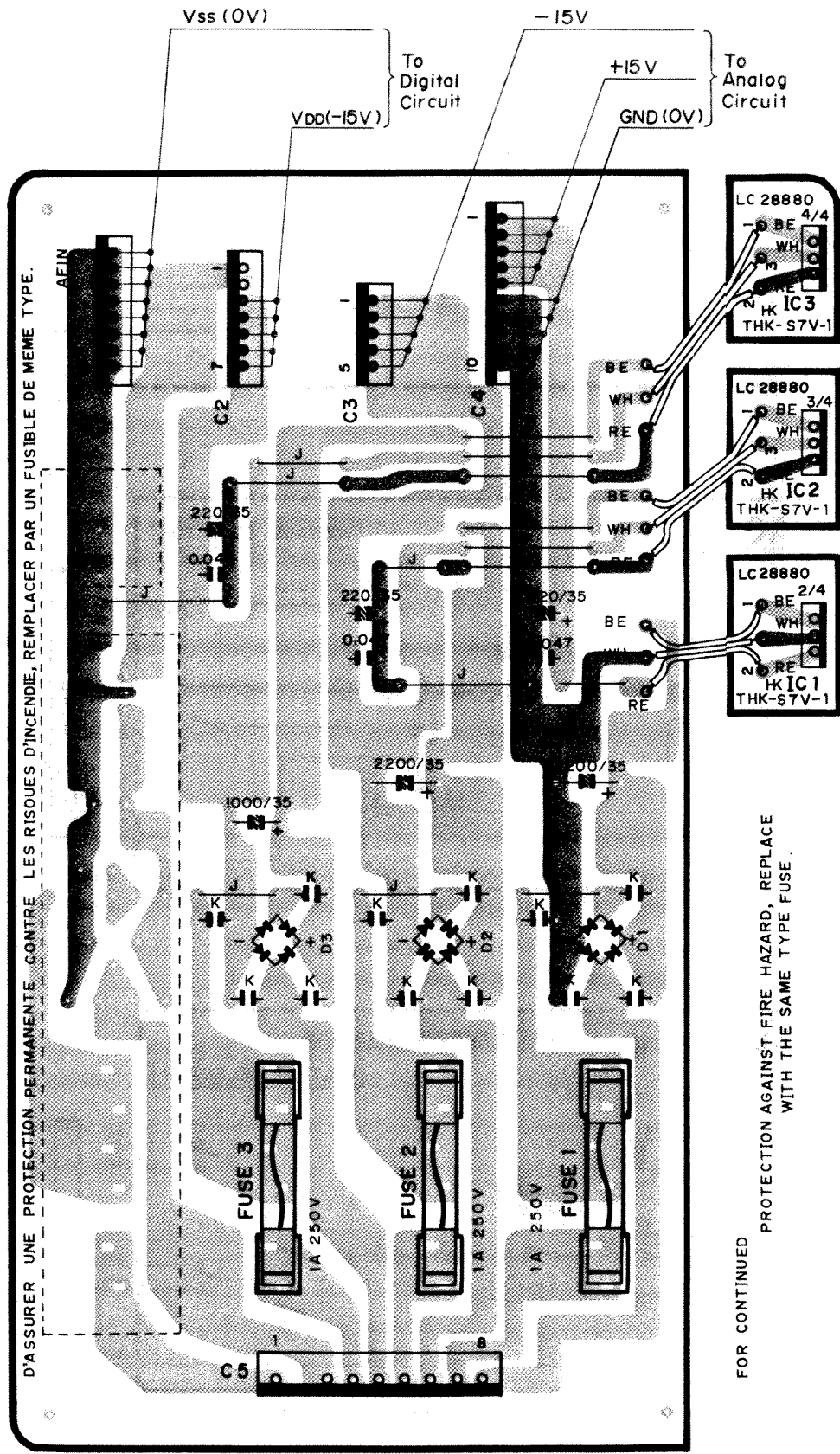
MK1 Board
 E₀ F₀ F₀[#] G₀ G₀[#] A₀ A₀[#] B₀ C₁ C₁[#] D₁ D₁[#] E₁ F₁ F₁[#] G₁ G₁[#] A₁ A₁[#] B₁



AC Circuit Board

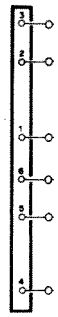


DC Circuit Board & Wiring



Component Side (部品側)

FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE WITH THE SAME TYPE FUSE.



C1

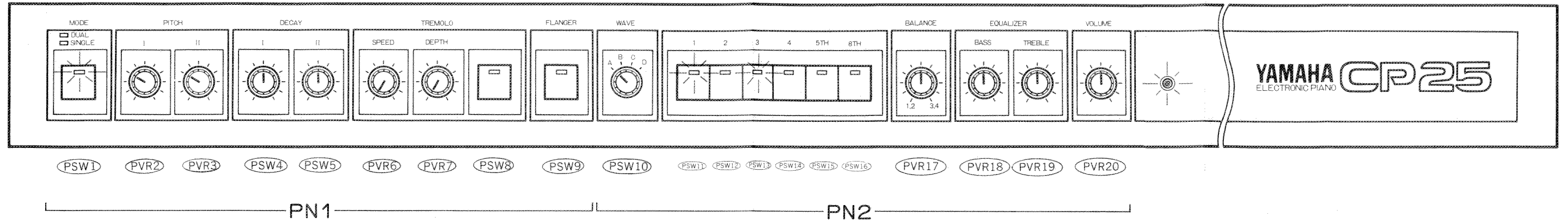
Pin No.	Pin Name	Wire Color	DM
1	Vss	GY	DM
2	Vss		
3	Vss	GY	DM
4	Vss		
5	Vss	GY	EFT
6	Vss		
7	Vss	GY	PN2
8	Vss		

C2

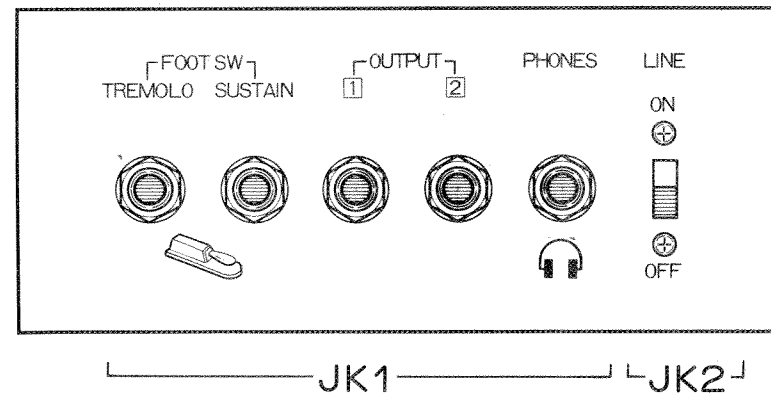
Pin No.	Pin Name	Wire Color	DM
1	-	-	
2	-	-	
3	VDD		
4	VDD	RE	DM
5	VDD	RE	DM
6	VDD	RE	EFT
7	VDD	RE	PN2

PANEL LAYOUT

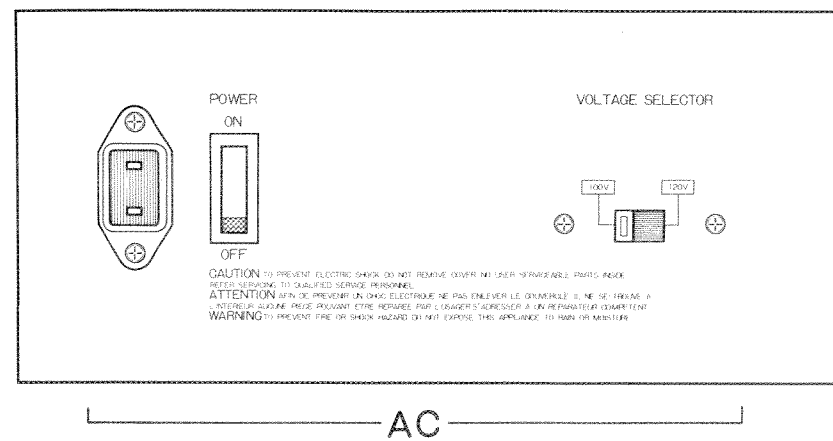
FRONT PANEL



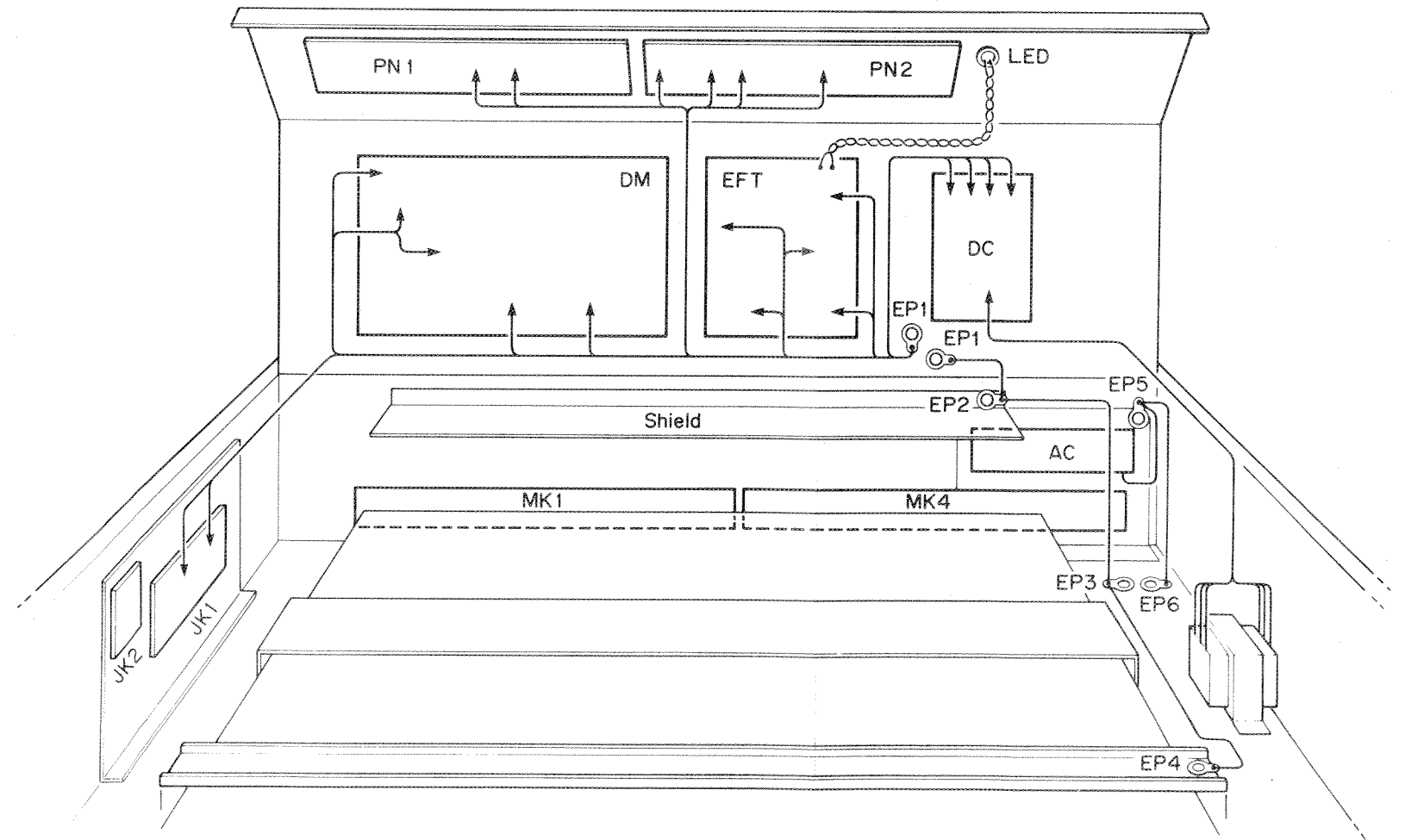
LEFT SIDE PANEL



REAR PANEL

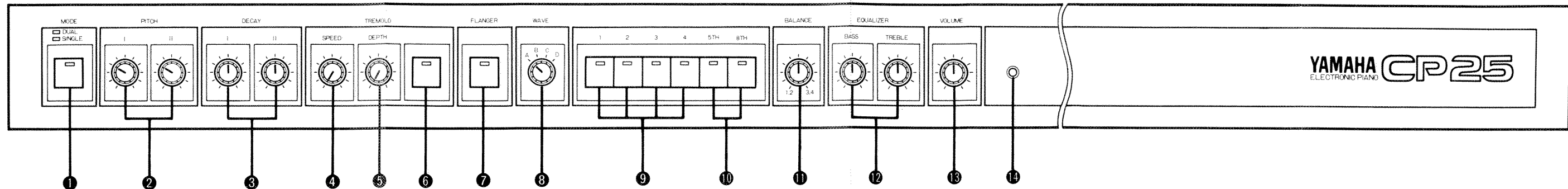


UNIT LAYOUT



PART NAMES AND FUNCTIONS

CONTROL PANEL (FRONT PANEL)

**1 MODE**

The MODE switch (DUAL/SINGLE) determines the maximum number of simultaneous output notes and the number of sound channels used.

DUAL: In the DUAL mode, 2 sound channels are operative with a maximum of 8 simultaneous output notes.

SINGLE: In the SINGLE mode, 1 sound channel is operative with a maximum of 16 simultaneous output notes.

When the MODE switch indicator LED is lit, the DUAL mode is active, and when extinguished, the SINGLE mode is active. MODE alternates between DUAL and SINGLE each time the MODE switch is pressed.

When power to the instrument is initially turned on, the DUAL mode is automatically activated.

2 PITCH I, II

The PITCH I and PITCH II controls independently adjust the pitch of the CP25's sound channels I and II, respectively. Turning either of these controls to the right (clockwise) raises the pitch of the respective channel, while turning to the left (counterclockwise) lowers pitch.

Setting channel I and channel II to different pitches produces a "detune" effect creating a fatter, honky-tonk piano type sound.

Pitch control range is approximately from 436Hz to 453Hz. Setting the PITCH controls to approximately 10 o'clock provides 440Hz (A₃) tuning.

* When the SINGLE mode is active, the PITCH II control has no effect.

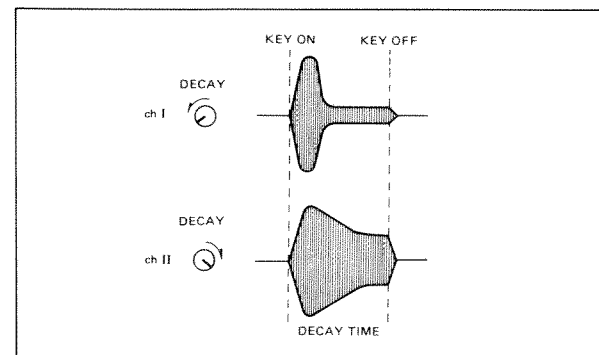
3 DECAY I, II

The DECAY I and DECAY II controls independently adjust the decay time of sound channels I and II, respectively.

Turning either of these controls to the right (clockwise) lengthens the decay time of the respective channel, while turning to the left (counterclockwise) shortens decay time.

The DECAY controls can each be set to eight different positions. Once the pitch, tone and balance of the two sound channels have been set, the DECAY I and II controls can be used to create a broad variety of decay time combinations providing extra sound control flexibility.

By setting exceptionally long decay times it is possible to create sustained, organ-like tones.



* When the SINGLE mode is active, the DECAY II control has no effect.

4 TREMOLO SPEED

The tremolo effect produces periodic variations in the volume of the sound. Turning the TREMOLO SPEED control to the right (clockwise) increases the speed of the volume variation, while turning it to the left (counterclockwise) creates a slower tremolo sound.

If the CP25's independent OUT 1 and OUT 2 outputs are connected to separate amplifier and speaker systems, the sound will seem to sweep back and forth between the two speakers at a rate determined by the TREMOLO SPEED control.

5 TREMOLO DEPTH

This control determines by how much the volume of the sound is varied by the tremolo effect. Turning the TREMOLO DEPTH control to the right (clockwise) produces a larger variation in volume, while turning it to the left (counterclockwise) produces a smaller (shallower) volume variation.

TREMOLO SPEED	TREMOLO DEPTH	TREMOLO OUTPUT
SPEED Slow	DEPTH Smaller	OUT 1
SPEED Fast	DEPTH Larger	OUT 2

6 TREMOLO SWITCH

This switch turns the tremolo effect on or off. Pressing this switch causes its LED indicator to light showing that the tremolo effect is on. Pressing it a second time turns the tremolo effect off (LED "off").

* Tremolo output from OUT 1 and 2 is reverse phase. If both of the tremolo outputs from OUT 1 and OUT 2 are mixed with the monaural signal by using a mixer, the tremolo effect is not produced.

7 FLANGER SWITCH

The flanger effect produces a pleasant "swooshing" or "swirling" effect with long tones, and adds interesting tonal variation to staccato passages.

Pressing the FLANGER switch causes its LED indicator to light showing that the flanger effect is on. Pressing it a second time turns the flanger effect off (LED "off").

8 WAVE

The WAVE selector selects the waveform shape of the channel I and channel II tone generators but not each independently. Four basic waveforms (A, B, C and D) can be selected, providing a broad range of subtle tonal variations.

9 FILTER SELECTORS

These selectors permit application of four types of filtration to the waveform determined by the WAVE selector (1, 2, 3 or 4).

1. FILTER SELECTOR 1 activates a low-pass filter thereby producing a round, warm sound.
2. FILTER SELECTOR 2 activates a low-pass filter with a higher cutoff frequency than that of FILTER SELECTOR 1, thereby producing a somewhat harder sound.
3. FILTER SELECTOR 3 activates a bandpass filter which produces a clear, well-defined sound.
4. FILTER SELECTOR 4 activates a high-pass filter thereby producing a hard, bright sound.

* The tonal quality of sound can be changed not only by combining filter selectors 1 through 4 of channels I and II but also by adjusting the DECAY controls and selecting A, B, C or D on the WAVE control.

The DECAY controls adjusted at the dual mode can cause an overall change to the sound and therefore they are helpful in creating sounds.

10 5TH, 8TH SELECTORS

These selectors raise the pitch of channel II by the designated interval with respect to channel I.

Pressing the 5th selector causes the pitch of channel II to be an interval of perfect fifth higher than channel I.

Pressing the 8th selector causes the pitch of channel II to be one octave higher than channel I.

Pressing both the 5th and 8th selectors causes the pitch of channel II to be an interval of perfect 12th (an octave and a fifth) higher than channel I. (DUAL MODE)

* When the SINGLE mode is active, the above transpositions affect the overall sound.

11 BALANCE

Balances or "mixes" the sound of filters 1 and 2 in relation to filters 3 and 4. Turning this control to the right increases the level of the FILTER 3 and 4 sound in relation to the FILTER 1 and 2 sound, while turning to the left increases the level of the FILTER 1 and 2 sound in relation to the FILTER 3 and 4 sound.

* If the BALANCE control is rotated towards a side where no filter is active, no sound will be produced. i.e. FILTER 1 only engaged and the BALANCE control rotated fully to the right (3.4 side).

12 EQUALIZER

BASS: Turning the BASS control to the right (clockwise) emphasizes the low-frequency range thereby producing a fat, heavy sound. Turning this control to the left (counterclockwise) de-emphasizes the low-frequency range, while, set to its center position response is virtually flat.

TREBLE: Turning the TREBLE control to the right (clockwise) emphasizes the high-frequency range thereby producing a light, bright sound. Turning this control to the left (counterclockwise) de-emphasizes the high-frequency range, while, at its center position response is virtually flat.

13 VOLUME

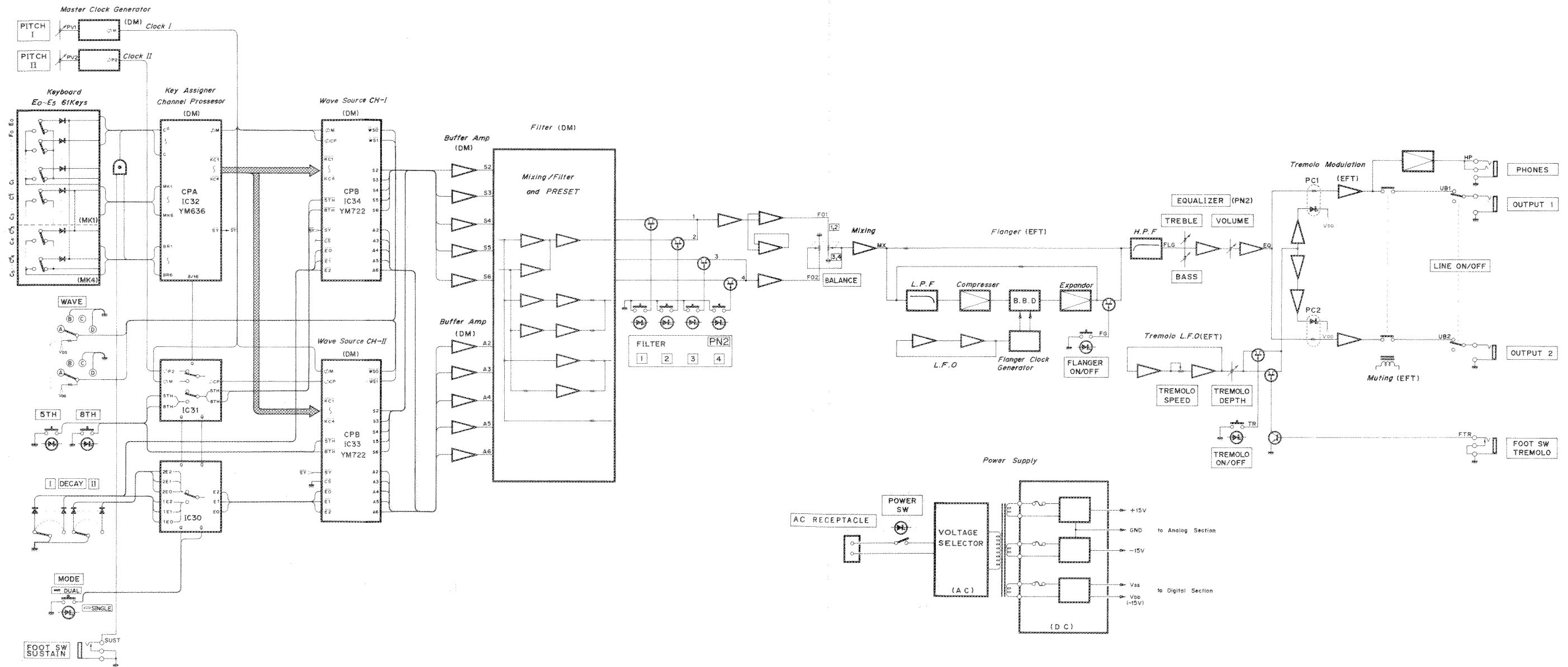
Controls the overall volume level of the CP25 sound.

Turning the VOLUME control to the right (clockwise) increases overall volume, while turning it to the left (counterclockwise) decreases overall volume.

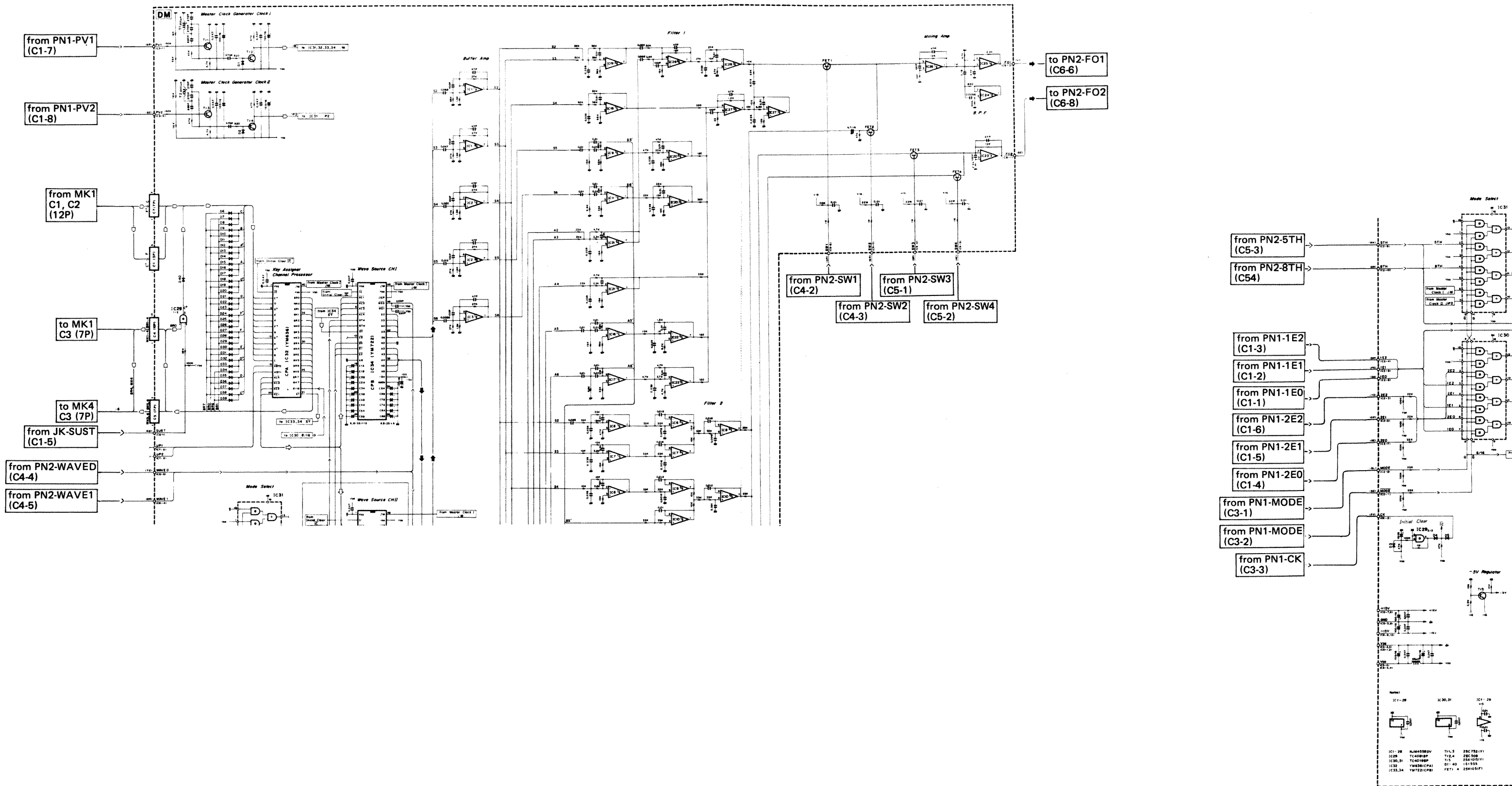
14 POWER INDICATOR

This indicator lights to show that the rear-panel power switch is turned on.

BLOCK DIAGRAM



DM Circuit Diagram



EFT Circuit Board & Wining

• Connector

C2			
Pin No.	Pin Name	Wire Color	Destination
1	GND	S BR	JK-GND (C2-4)
2	UB1	S BR	JK-UB1 (C2-3)
3	GND	S RE	JK-GND (C2-6)
4	UB2	S RE	JK-UB2 (C2-5)
5	GND	S OR	JK-GND (C2-2)
6	H.P	S OR	JK-HP (C2-1)
7	GND	-	-

C4			
Pin No.	Pin Name	Wire Color	Destination
1	-15V	YE	DC-15V (C3-4)
2	-15V	-	-
3	GND	-	-
4	GND	BL	DC-GND (C4-7)
5	GND	-	-
6	+15V	-	-
7	+15V	BR	DC+15V (C4-4)

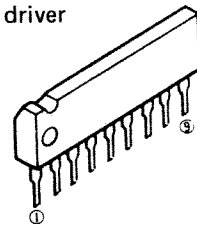
C6			
Pin No.	Pin Name	Wire Color	Destination
1	VDD	RE	DC-VDD (C2-6)
2	VDD	-	-
3	VSS	-	-
4	VSS	GY	DC-VSS (C1-7)
5	VSS	-	-

C3			
Pin No.	Pin Name	Wire Color	Destination
1	FLG	S WH	PN2-FLG (C6-10)
2	GND	S WH	PN2-GND (C6-9)
3	FG	VI	PN1-FG (C3-5)
4	MX	S GY	PN2-MX (C7-4)
5	GND	S GY	PN2-GND (C7-3)
6	EQ	S GG	PN2-EQ (C7-2)
7	GND	S GG	PN2-GND (C7-1)

C5			
Pin No.	Pin Name	Wire Color	Destination
1	TR	OR	PN1-TR (C3-4)
2	TS2	VI	PN1-TS2 (C2-2)
3	TS1	BE	PN1-TS1 (C2-1)
4	FTR	YE	JK-FTR (C1-1)
5	TD2	WH	PN1-TD2 (C2-4)
6	VM	SB	PN1-VM (C2-3)
7	TD1	GG	PN1-TD1 (C2-5)

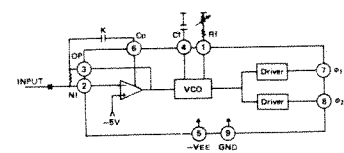
Notes

• iG03290: IC1
BBD driver

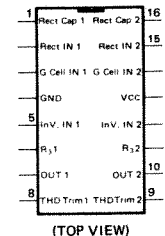


①	②	③	④	⑤	⑥	⑦	⑧	⑨
Rf	-IN	OP	Cf	VEE	Cp	φ1	φ2	GND

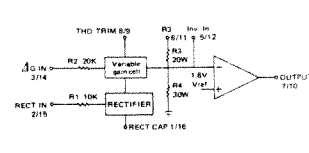
Block & Schematic Diagram



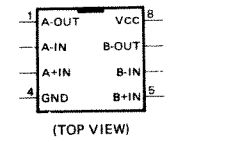
• NE570: IC3
COMPANDER



Block & Schematic Diagram



• NJM4558DV: IC5 ~ 12
Dual Operational Amplifier



Logic Diagram

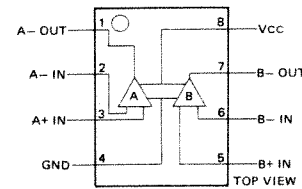
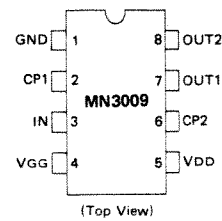
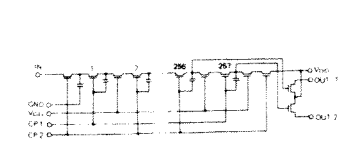


Photo Cappler
• P1501: PC1, 2
• RZ12: RY

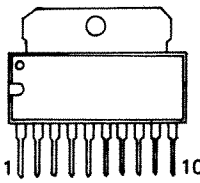
• MN3009: IC2
256 stage BBD



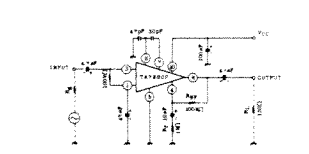
Block & Schematic Diagram



• TA7220P: IC4
LOW POWER AMP.
P SIP 10 PIN (with Tab)



Block & Schematic Diagram



• 2SA1015(O,Y): Tr2, 6, 12
• 2SC1815(O,Y): Tr1, 3, 4, 5, 9
• 2SA509(O,Y): Tr10, 11

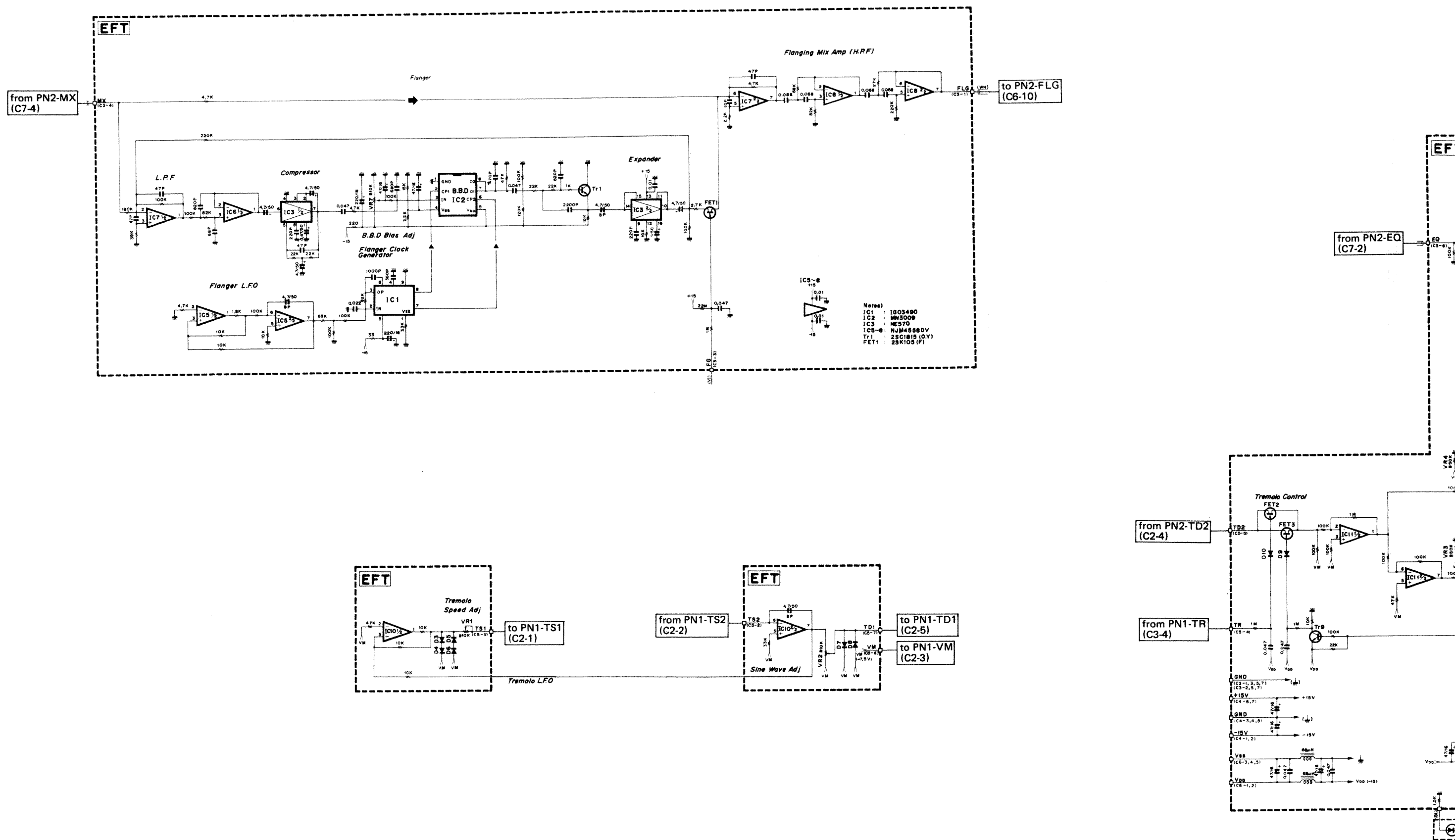
• 2SK105(F): FET1, 2, 3

• 1S1555: D1 ~ 11

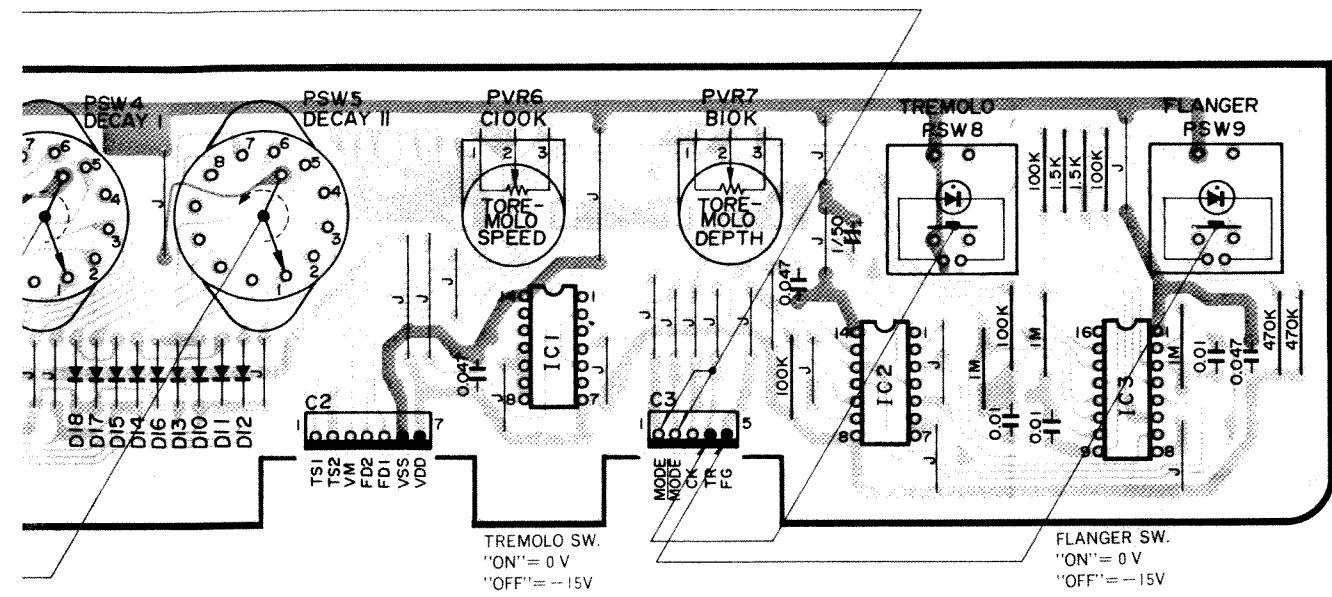
EFT Circuit Board & Wining

Item	Setting	Test Point	Adjustment	Adj. Point	Rem.
FLANGER OSC		IC5 pin 7			Check
		IC1 pin 7 pin 8	 f = 120kHz ~ 25kHz Make sure that FM mod. is applied in above freq. range.		Check
FLANGER WAVEFORM	FILTER I - 1 only on. Press C ₅ key.	IC3 pin 10	 Adj. for perfect symmetry.	VR7	Adj.
TREMOLO OSC	TREMOLO SPEED -MAX	IC10 pin 7	 f = 15 ± 0.5Hz	VR1	Adj.
Speed	TREMOLO SPEED -MIN	IC10 pin 7	 f = 0.5 ± 0.4Hz		Check
Depth	TREMOLO DEPTH -MAX	IC11 pin 1 IC11 pin 1	 Adjust for sine-wave.	VR2	Adj.
	TREMOLO SW -ON				
MODULATION BALANCE					
OUT 1		IC9 pin 1		VR3	Adj.
OUT 2		IC9 pin 7	 Adjust for 95% mod. Check that IC9 pin 1 is 180 degrees out of phase.	VR4	Adj.
UNBALANCED output circuit	FILTER I - 1 -ON	EQ (C3-6)	Adjust so 0.8 times the EQ terminal input signal appears at UB1, UB2.		
OUT 1		UB1 (C2-2)		VR5	Adj.
OUT 2	C ₅ Key -ON	UB2 (C2-4)		VR6	Adj.
MUTING	Power	Tr6 Emitter	 2 sec ± 20% 3msec		Check

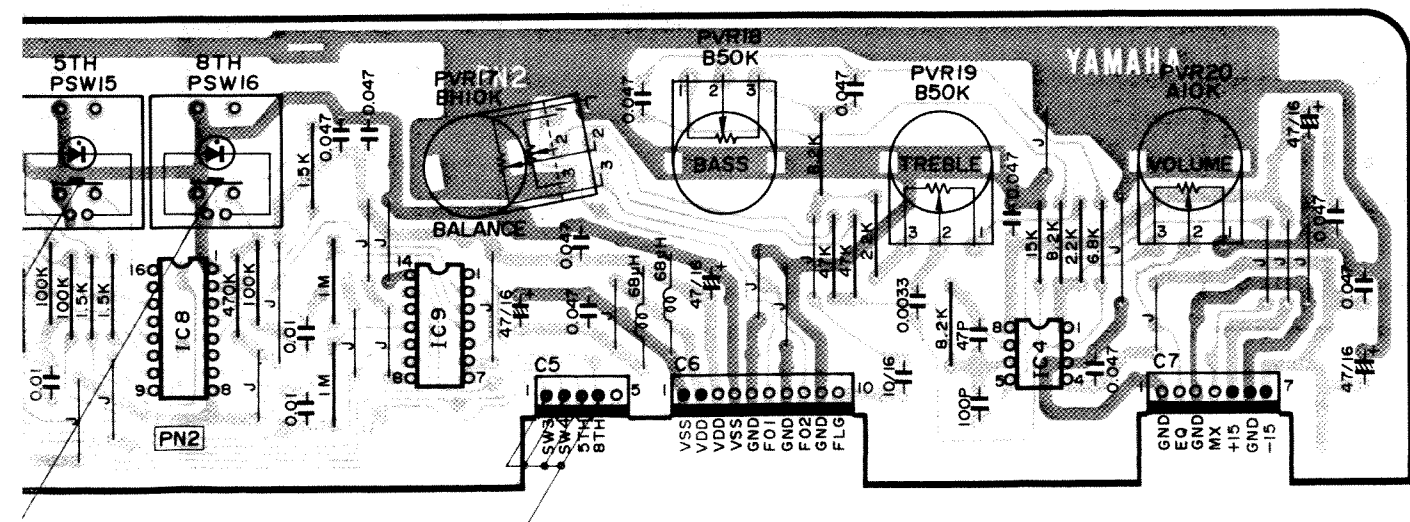
EFT Circuit Diagram



PN1, 2 Circuit Board & Wining



ide(パターン側)



PN1, 2 Circuit Board & Wining

• Connector

C1

Pin No.	Pin Name	Wire Color	Destination
1	1Q0	SB	DM-1Q0 (C2-8)
2	1Q1	PK	DM-1Q1 (C2-6)
3	1Q2	BR	DM-1Q2 (C2-4)
4	2Q0	RE	DM-2Q0 (C2-7)
5	2Q1	OR	DM-2Q1 (C2-5)
6	2Q2	YE	DM-2Q2 (C2-3)
7	PV1	GR	DM-PV1 (C3-1)
8	PV2	BE	DM-PV2 (C3-5)
9	VSS	VI	DM-VSS (C3-3)
10	VDD	GG	DM-VDD (C3-4)

C2

Pin No.	Pin Name	Wire Color	Destination
1	TS1	BE	EFT-TS1 (C5-3)
2	TS2	VI	EFT-TS2 (C5-2)
3	VM	SB	EFT-VM (C5-6)
4	TD1	WH	EFT-TD1 (C5-5)
5	TD1	GG	EFT-TD1 (C5-7)
6	VSS	GR	PN2-VSS (C6-4)
7	VDD	OR	PN2-VDD (C6-3)

C3

Pin No.	Pin Name	Wire Color	Destination
1	MODE	BL	DM-MODE (C2-2)
2	MODE	BE	DM-MODE (C2-1)
3	CK	PK	DM-CK (C6-2)
4	TR	OR	EFT-TR (C5-1)
5	FG	VI	EFT-FG (C3-3)

C4

Pin No.	Pin Name	Wire Color	Destination
1			
2	SW1	OR	DM-SW1 (C9-6)
3	SW2	GR	DM-SW2 (C9-7)
4	WAVED	YE	DM-WAVED (C6-5)
5	WAVE1	BR	DM-WAVE1 (C6-4)

C5

Pin No.	Pin Name	Wire Color	Destination
1	SW3	BR	DM-SW3 (C9-4)
2	SW4	RE	DM-SW4 (C9-5)
3	5TH	WH	DM-5TH (C2-9)
4	8TH	GR	DM-8TH (C2-10)

C6

Pin No.	Pin Name	Wire Color	Destination
1	VSS	GY	DC-VSS (C1-7)
2	VDD	RE	DC-VDD (C2-7)
3	VDD	OR	PN1-VDD (C2-7)
4	VSS	GR	PN1-VSS (C2-6)
5	GND	S VI S	
6	FO1	S VI	DM-FO1 (C9-2)
7	GND	S BE S	
8	FO2	S BE	DM-FO2 (C9-1)
9	GND	S WH S	EFT-GND (C3-2)
10	FLG	S WH	EFT-FLG (C3-1)

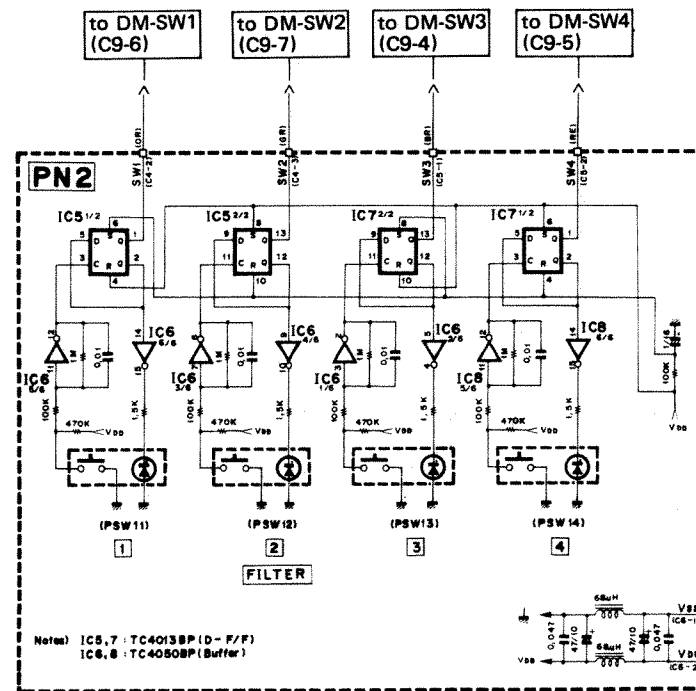
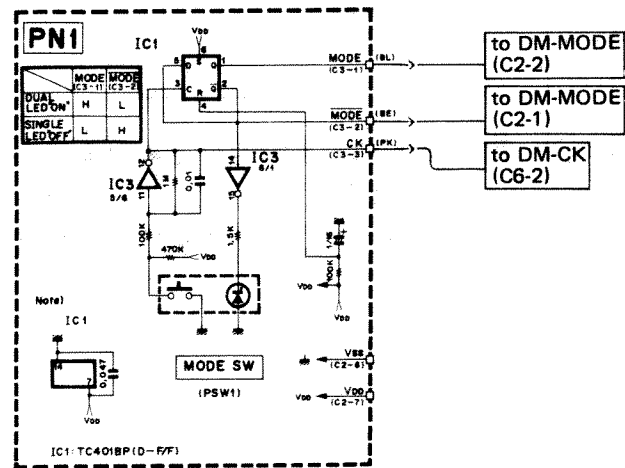
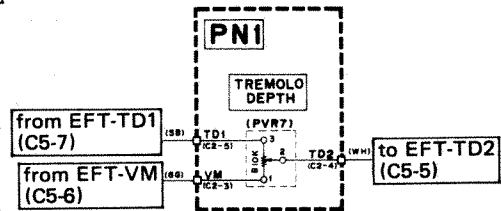
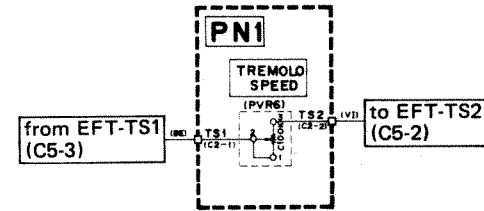
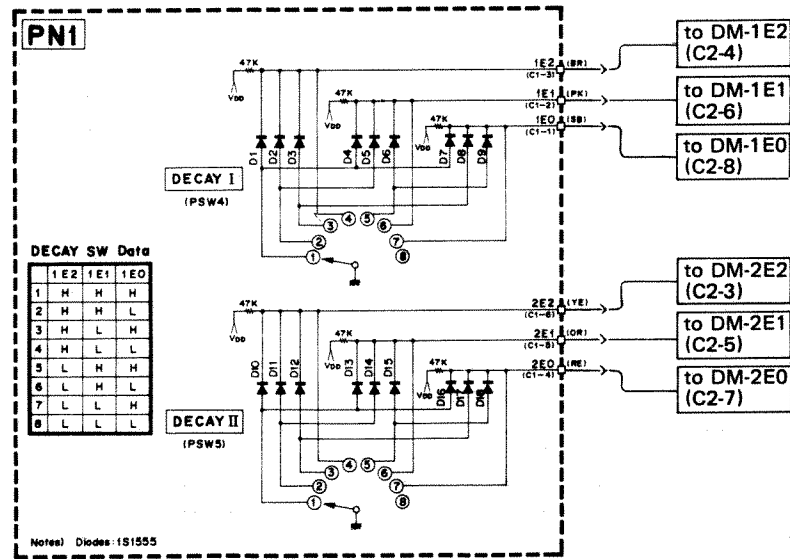
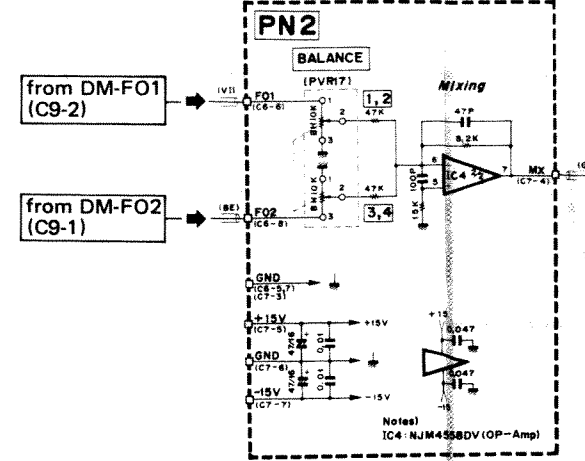
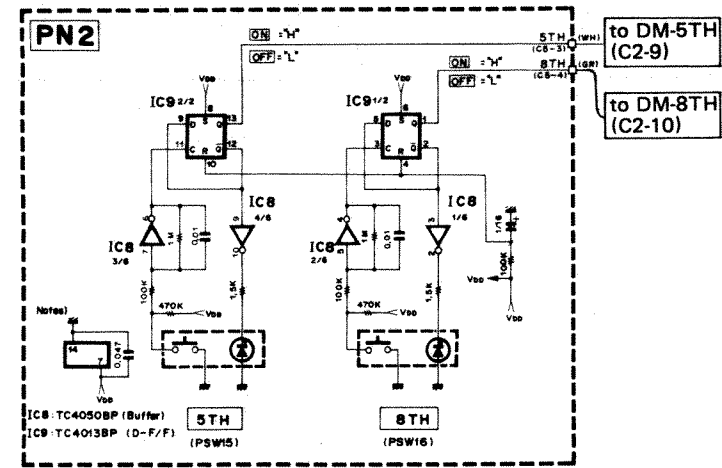
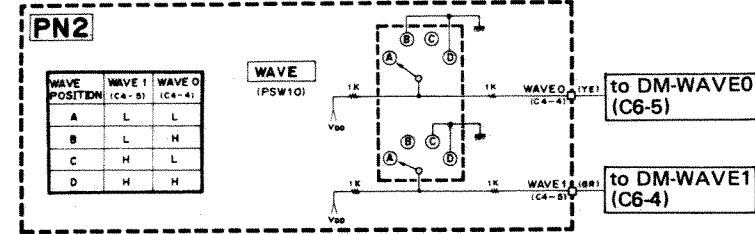
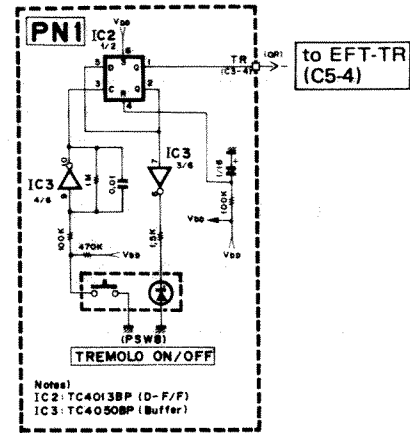
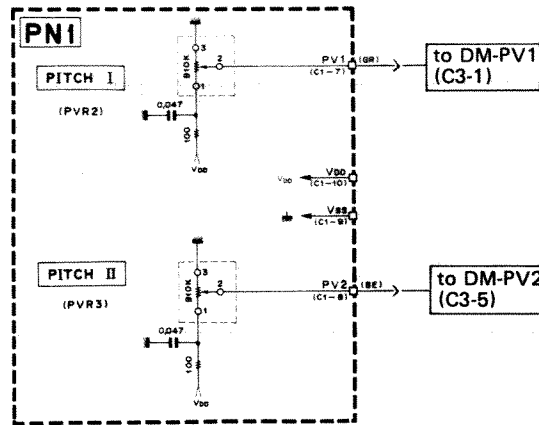
C7

Pin No.	Pin Name	Wire Color	Destination
1	GND	S GG S	EFT-GND (C3-7)
2	EQ	S GG	EFT-EQ (C3-6)
3	GND	S GY S	EFT-GND (C3-5)
4	MX	S GY	EFT-MX (C3-4)
5	+15V	BR	DC+15V (C4-5)
6	GND	BL	DC-GND (C4-8)
7	-15V	YE	DC-15V (C3-5)

Notes)

<p>•TC4013BP: IC1, 2, 5, 7, 9 Dual "D" Flip Flop with Set/Reset Capability</p> <p>Block Diagram</p> <p>(TOP VIEW)</p> <p>Truth Table</p> <table border="1"> <thead> <tr> <th colspan="2">INPUTS</th> <th colspan="2">OUTPUTS</th> </tr> <tr> <th>CLOCK</th> <th>DATA</th> <th>Q</th> <th>Q'</th> </tr> </thead> <tbody> <tr><td>0</td><td>0</td><td>0</td><td>1</td></tr> <tr><td>0</td><td>1</td><td>0</td><td>1</td></tr> <tr><td>1</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>1</td><td>1</td><td>1</td><td>0</td></tr> </tbody> </table> <p>*: Data Change *: Data Change</p>	INPUTS		OUTPUTS		CLOCK	DATA	Q	Q'	0	0	0	1	0	1	0	1	1	0	0	0	1	1	1	0	<p>•TC4050BP: IC3, 6, 8 Hex Buffer/Converter (Non Inverting)</p> <p>Logic Diagram</p> <p>(TOP VIEW)</p>	<p>•NJM4558DV: IC4 Dual Operational Amplifier</p> <p>Logic Diagram</p> <p>(TOP VIEW)</p>
INPUTS		OUTPUTS																								
CLOCK	DATA	Q	Q'																							
0	0	0	1																							
0	1	0	1																							
1	0	0	0																							
1	1	1	0																							
<p>•Push SW.(Knob:grey)</p> <p>PSW1 : MODE PSW8 : TREMOLO PSW9 : FLANGER PSW15 : 5TH PSW16 : 8TH</p>	<p>•Push SW. (Knob:white)</p> <p>PSW11 : FILTER 1 PSW12 : FILTER 2 PSW13 : FILTER 3 PSW14 : FILTER 4</p>	<p>Anode</p> <p>Cathode</p> <p>1S1555 : D1 ~ 18</p>																								
<p>•Rotary SW. Single Circuit, 8 positions.</p> <p>PSW4 : DECAY I PSW5 : DECAY II</p>	<p>•Rotary SW. Three-Circuit, 4 positions.</p> <p>PSW10 : WAVE</p>																									

PN1 Circuit Diagram

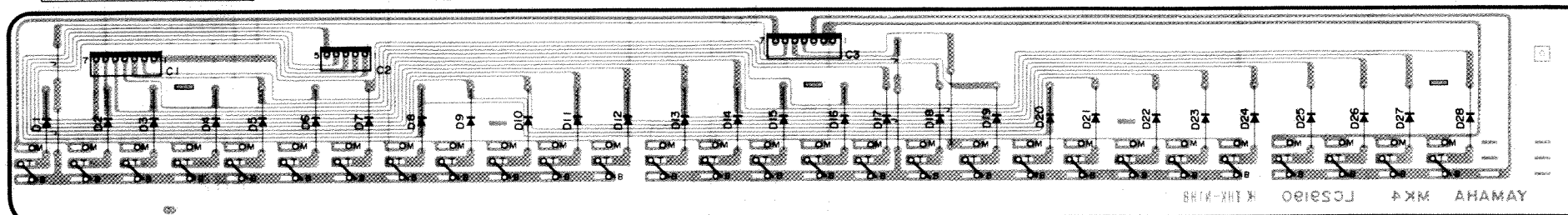
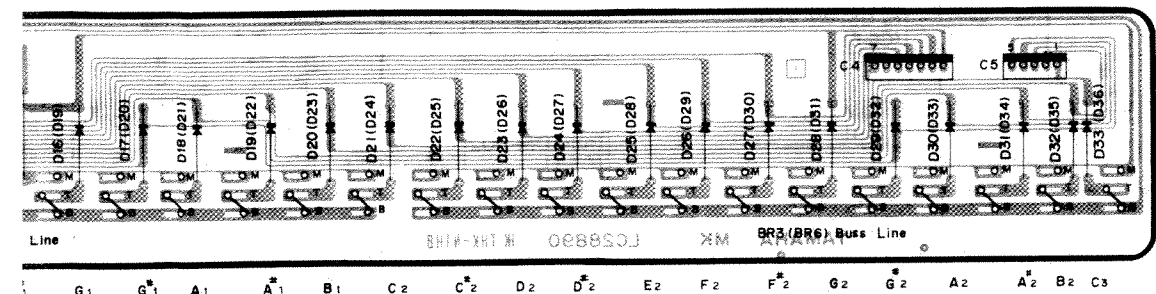


MK4 Circuit Board & Wining, Circuit Diagram

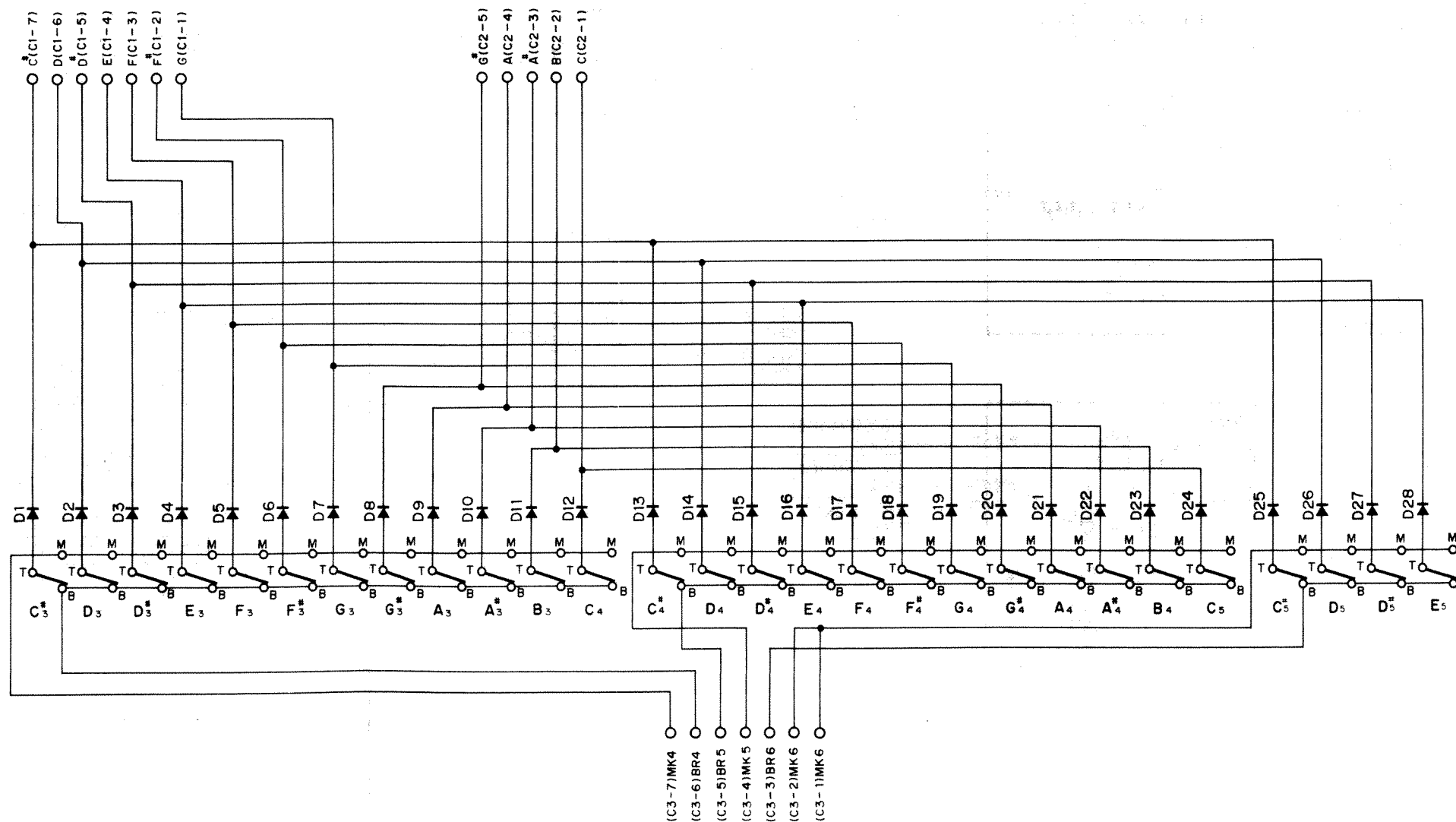
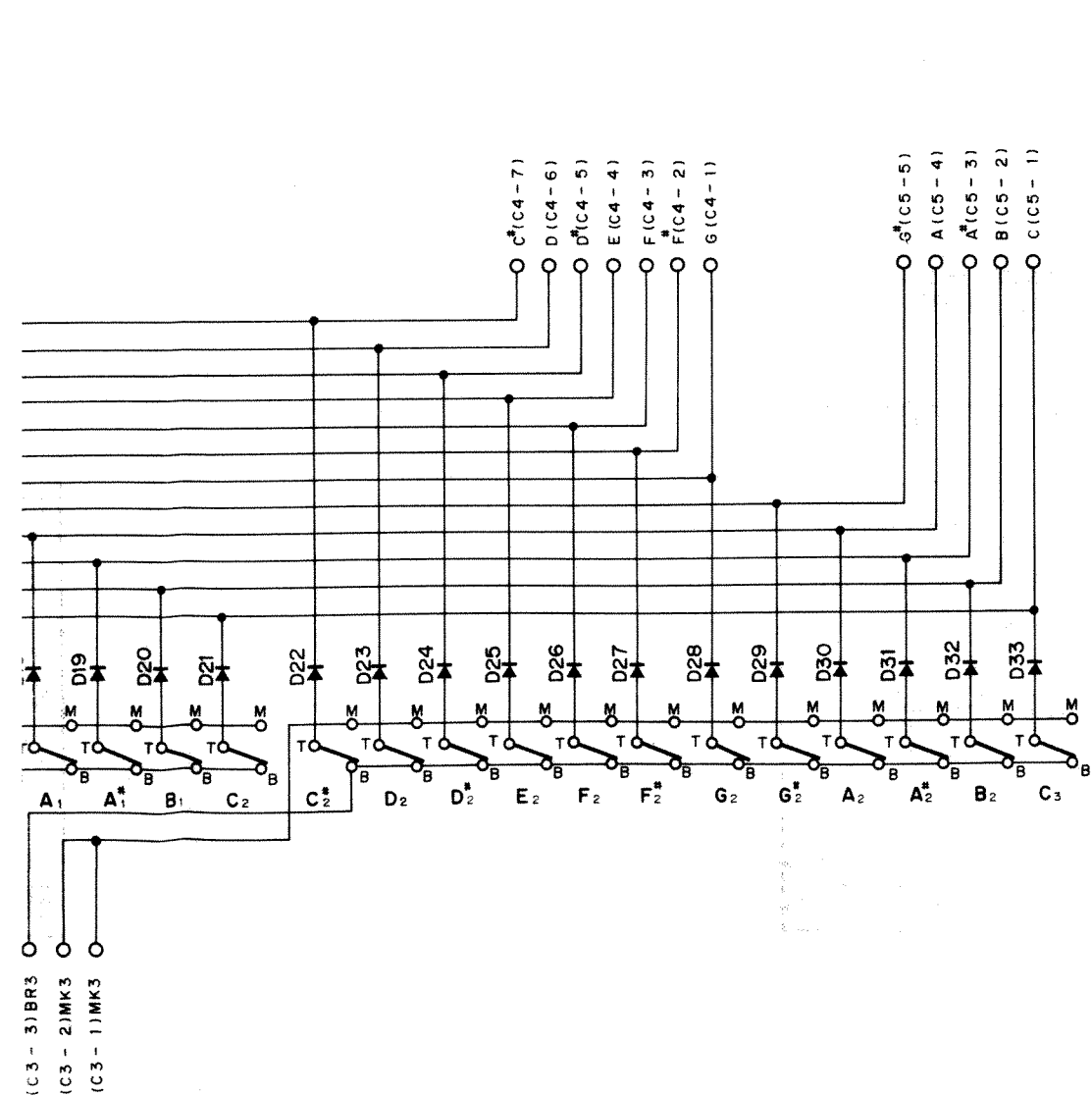
am

C4							C5						
Pin	7	6	5	4	3	2	1	Pin	5	4	3	2	1
MK1	C [#]	D [#]	D [#]	E	F	F [#]	G	MK1	G [#]	A	A [#]	B	C

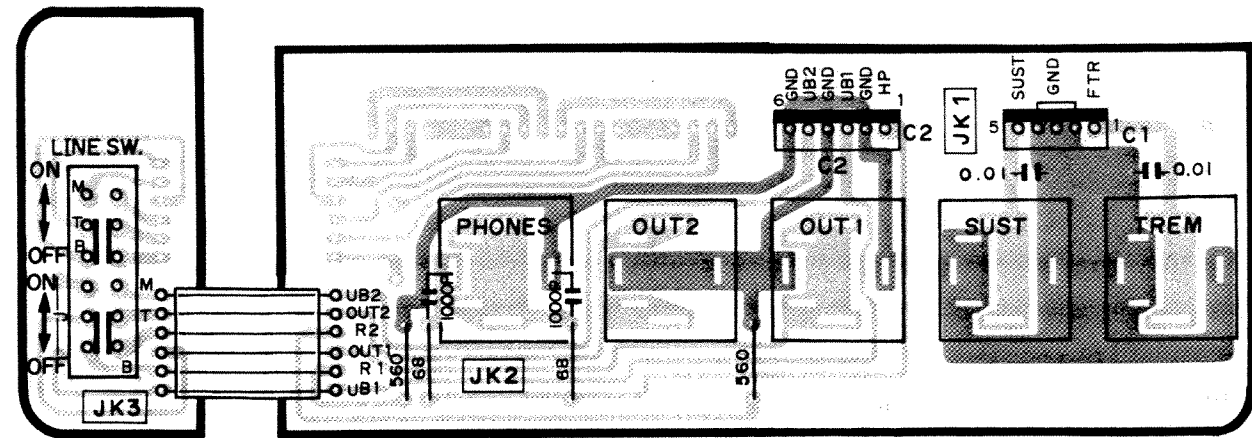
C1							C2				C3										
Pin	7	6	5	4	3	2	1	Pin	5	4	3	2	1	Pin	7	6	5	4	3	2	1
MK4	C [#]	D [#]	D [#]	E	F	F [#]	G	MK4	C [#]	A	A [#]	B	C	MK4	MK4	BR4	BR5	MK5	BR6	MK6	MK6



Component Side(部品側)



JK1, 2 Circuit Board & Wiring, Circuit Diagram



Pattern Side (パターン側)

KEP-NA10709-14 △

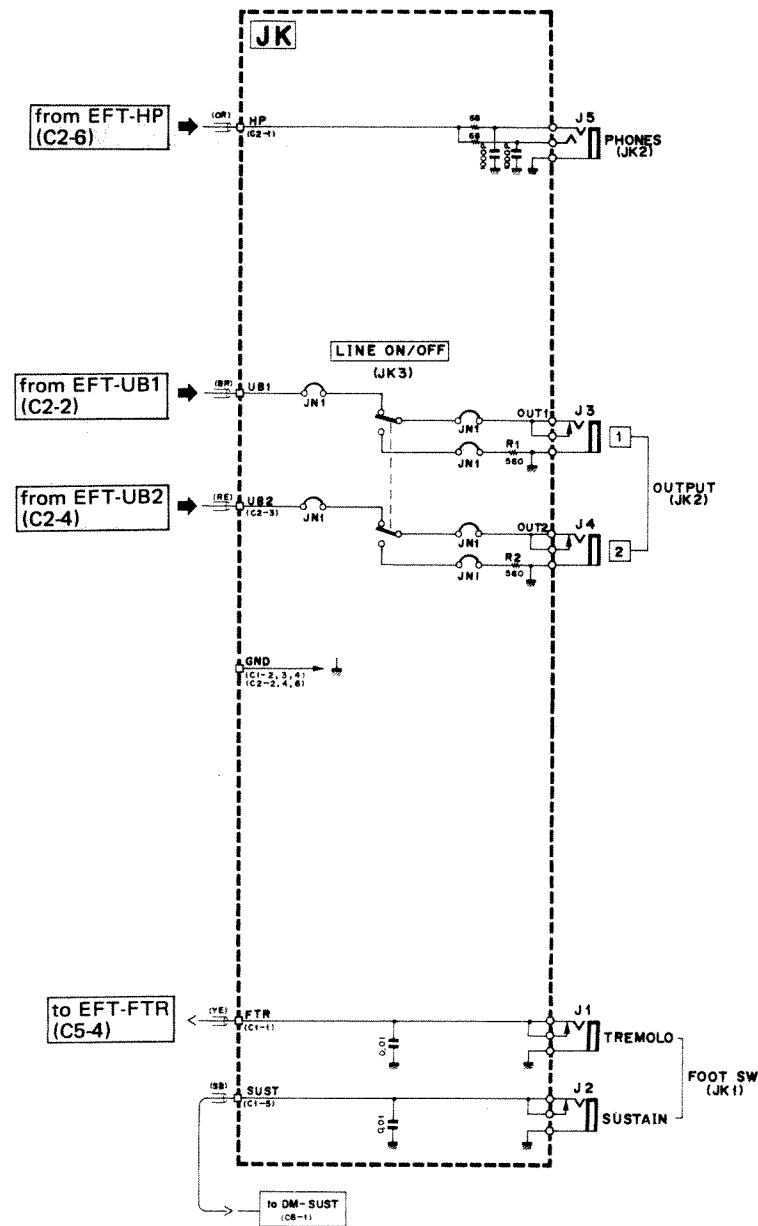
● Connector

C1

Pin No.	Pin Name	Wire Color	Destination
1	FTR	YE	EFT-FTR (C5-4)
2	GND		
3	GND	BL	DC-GND (C4-9)
4	GND		
5	SUST.	SB	DM-SUST. (C8-1)

C2

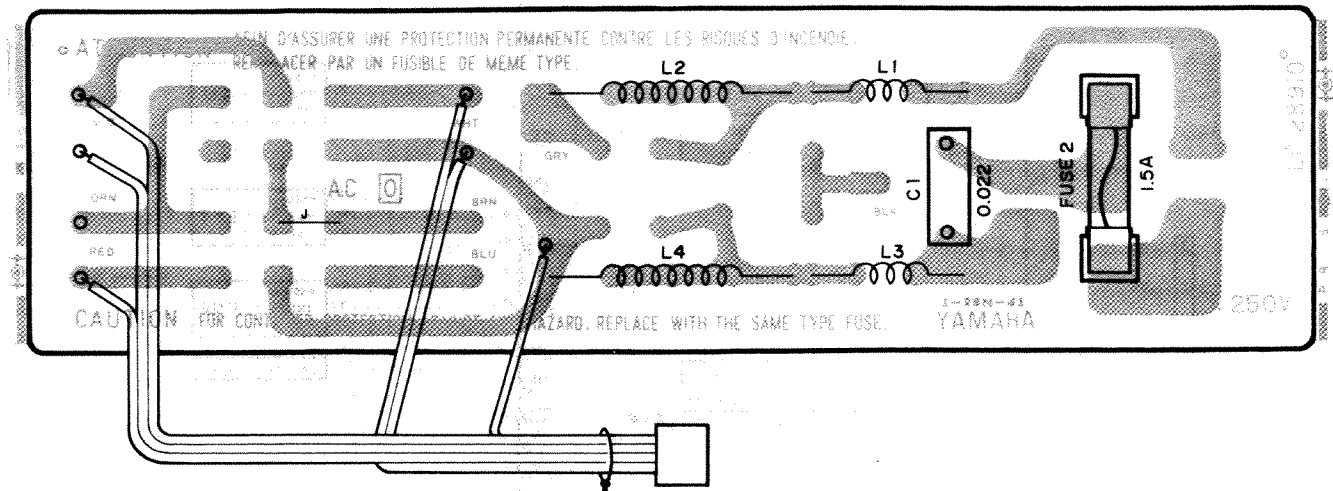
Pin No.	Pin Name	Wire Color	Destination
1	HP	S OR	EFT-HP (C2-6)
2	GND	S OR S	EFT-GND (C2-6)
3	UB1	S BR	EFT-UB1 (C2-2)
4	GND	S BR S	EFT-GND (C2-1)
5	UB2	S RE	EFT-UB2 (C2-4)
6	GND	S RE S	EFT-GND (C2-3)



KEC-10183-14 △

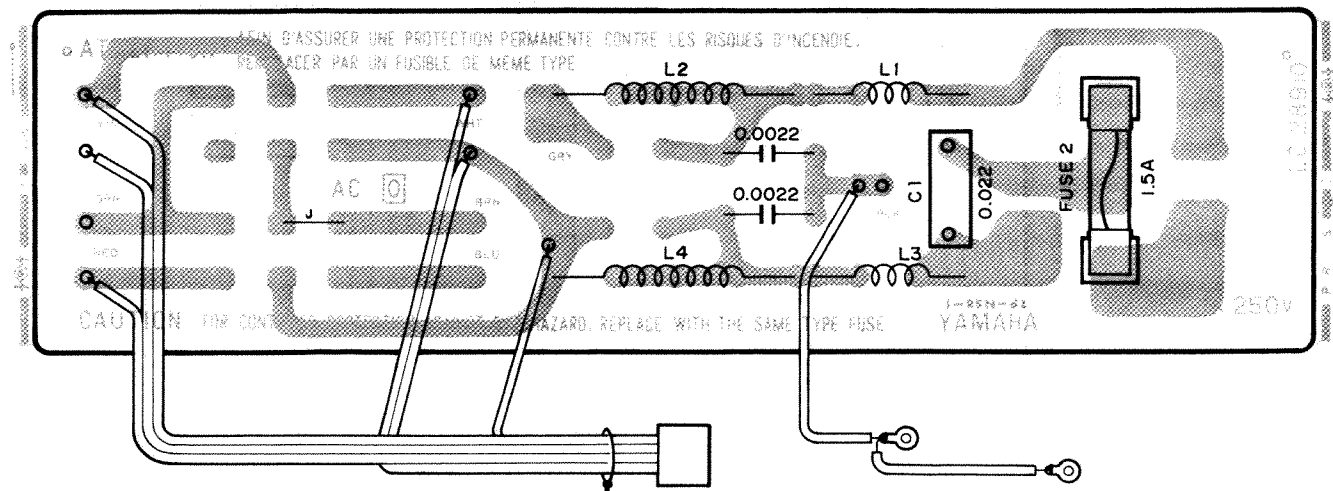
AC Circuit Board & Wiring

● Japanese, Canadian Model



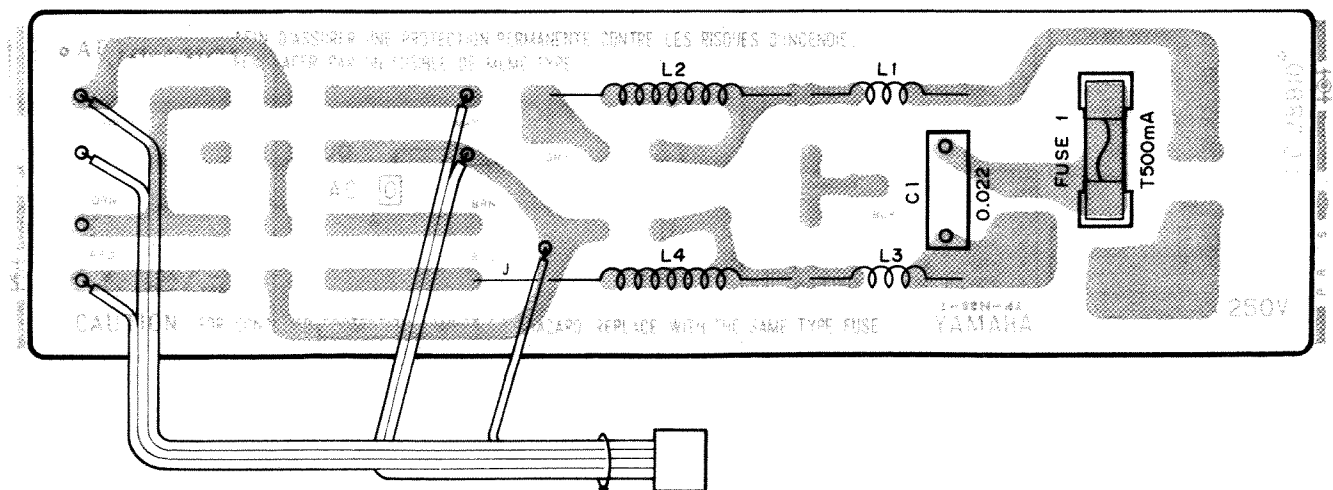
Pattern Side (パターン側)

● U.S. American Model



Pattern Side (パターン側)

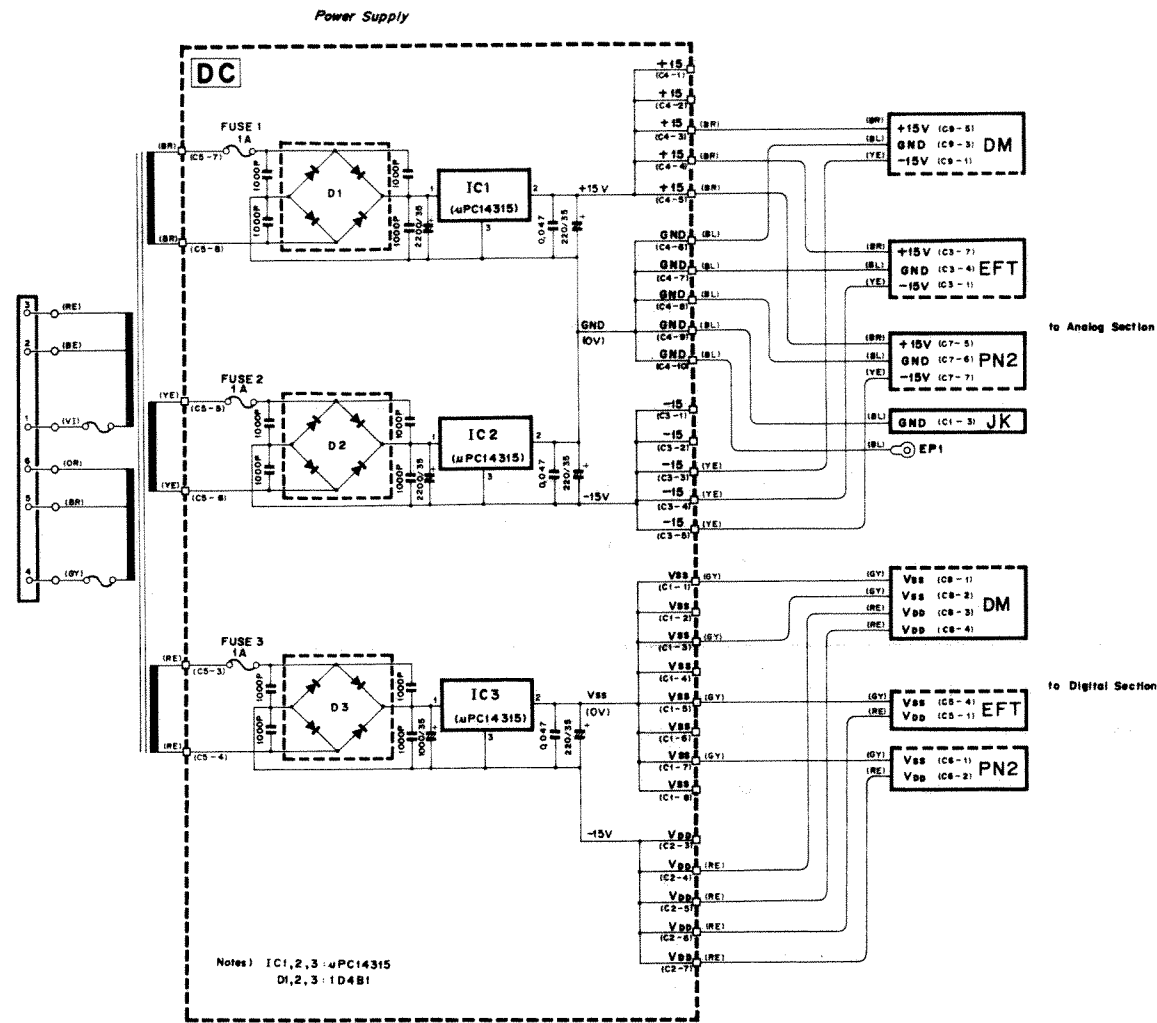
● North European Model



Pattern Side (パターン側)

KEP-NA10703-14 △

DC Circuit Diagram



CP25 SERVICE MANUAL

1981年12月 初版

発行所 日本楽器製造株式会社
電音サービス課

本文・総回路図 中部電子印刷(株)
版 下

パーツリスト 豊立設計事務所

本文印刷 株式会社ブレーン企画

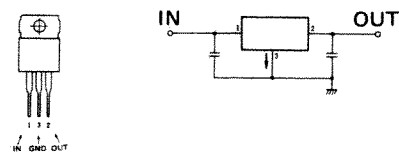
総回路図印刷 中部電子印刷(株)

C1				C3			
Pin No.	Pin Name	Wire Color	Destination	Pin No.	Pin Name	Wire Color	Destination
1	VSS	GY	DM-VSS (C8-1)	1	-15V	-	-
2	VSS	-	-	2	-15V	-	-
3	VSS	GY	DM-VSS (C8-2)	3	-15V	YE	DM-15V (C8-10)
4	VSS	-	-	4	-15V	YE	EFT-15V (C4-1)
5	VSS	GY	EFT-VSS (C6-4)	5	-15V	YE	PN2-15V (C7-7)
6	VSS	-	-				
7	VSS	GY	PN2-VSS (C6-1)				
8	VSS	-	-				

C2				C4			
Pin No.	Pin Name	Wire Color	Destination	Pin No.	Pin Name	Wire Color	Destination
1	-	-	-	1	+15V	-	-
2	-	-	-	2	+15V	-	-
3	VDD	-	-	3	+15V	BR	DM+15V (C9-5)
4	VDD	RE	DM-VDD(C8-1)	4	+15V	BR	EFT+15V (C4-7)
5	VDD	RE	DM-VDD(C8-2)	5	+15V	BR	PN2+15V (C7-5)
6	VDD	RE	EFT-VDD(C8-1)	6	GND	BL	DM-GND (C9-3)
7	VDD	RE	PN2-VDD (C8-2)	7	GND	BL	EFT-GND (C4-4)
				8	GND	BL	PN2-GND (C7-6)
				9	GND	BL	JK-GND (C1-3)
				10	GND	BL	EP1

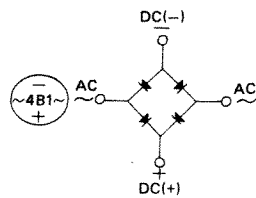
Notes

● μ PC14315: IC1, 2, 3
P3PIN



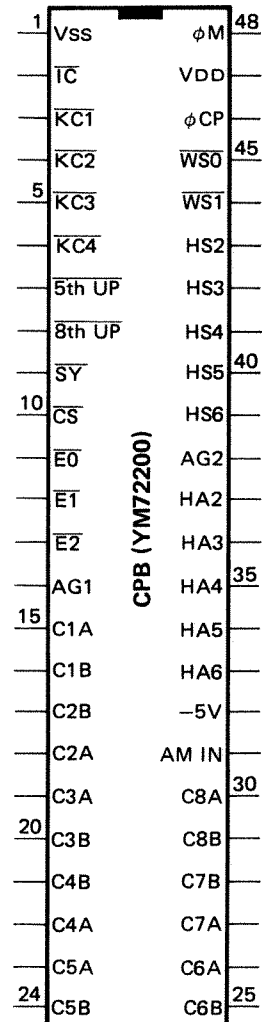
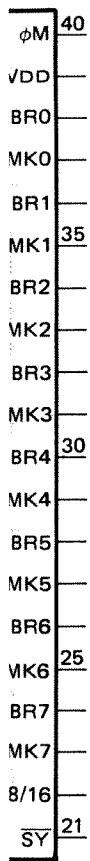
Pin No.	①	③	②
Pin Name	IN	GND	OUT
μ PC14315H	23V		15V

●Diode
1D4B1: D1, 2, 3, 4



Part Name	YM722000	Function Name	CPB (Combo Piano-B) Tone Generator
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Terminal		I/O	Description	Terminal		I/O	Description
Pin No.	Name			Pin No.	Name		
1	VSS	I	Ground (0V)	48	φM	I	Master Clock (1MHz)
2	IC	I	Initial Clear	47	VDD	I	DC Supply (-15V)
3	KC1	I	Key Code Data	46	φCP	I	Pitch Clock
4	KC2	I	- do. -	45	WS0	I	Wave Select Data
5	KC3	I	- do. -	44	WS1	I	- do. -
6	KC4	I	- do. -	43	HS2	O	Sound Source Waveform (Sustain) Block 0, 1,
7	5th UP	I	Transposition Data	42	HS3	O	- do. - 2
8	8th UP	I	- do. -	41	HS4	O	- do. - 3
9	SY	I	Synchro Data	40	HS5	O	- do. - 4
10	CS	I	Chip Select ^{1~8ch, 9~16ch} Synchro Select.	39	HS6	O	- do. - 5, 6
11	E0	I	Envelope Data	38	AG2	I	Analog Ground
12	E1	I	- do. -	37	HA2	O	Sound Source Waveform (Attack) Block 0, 1,
13	E2	I	- do. -	36	HA3	O	- do. - 2
14	AG1	I	Analog Ground	35	HA4	O	- do. - 3
15	C1A	I	Envelope Setting Capacitor	34	HA5	O	- do. - 4
16	C1B	I	- do. -	33	HA6	O	- do. - 5, 6
17	C2B	I	- do. -	32	-5V	I	DC Supply (≒ -10V)
18	C2A	I	- do. -	31	AMIN	I	Minimum Level Setting
19	C3A	I	- do. -	30	C8A	I	Envelope Setting Capacitor
20	C3B	I	- do. -	29	C8B	I	- do. -
21	C4B	I	- do. -	28	C7B	I	- do. -
22	C4A	I	- do. -	27	C7A	I	- do. -
23	C5A	I	- do. -	26	C6A	I	- do. -
24	C5B	I	- do. -	25	C6B	I	- do. -



CPB (YM722000)

MEMO

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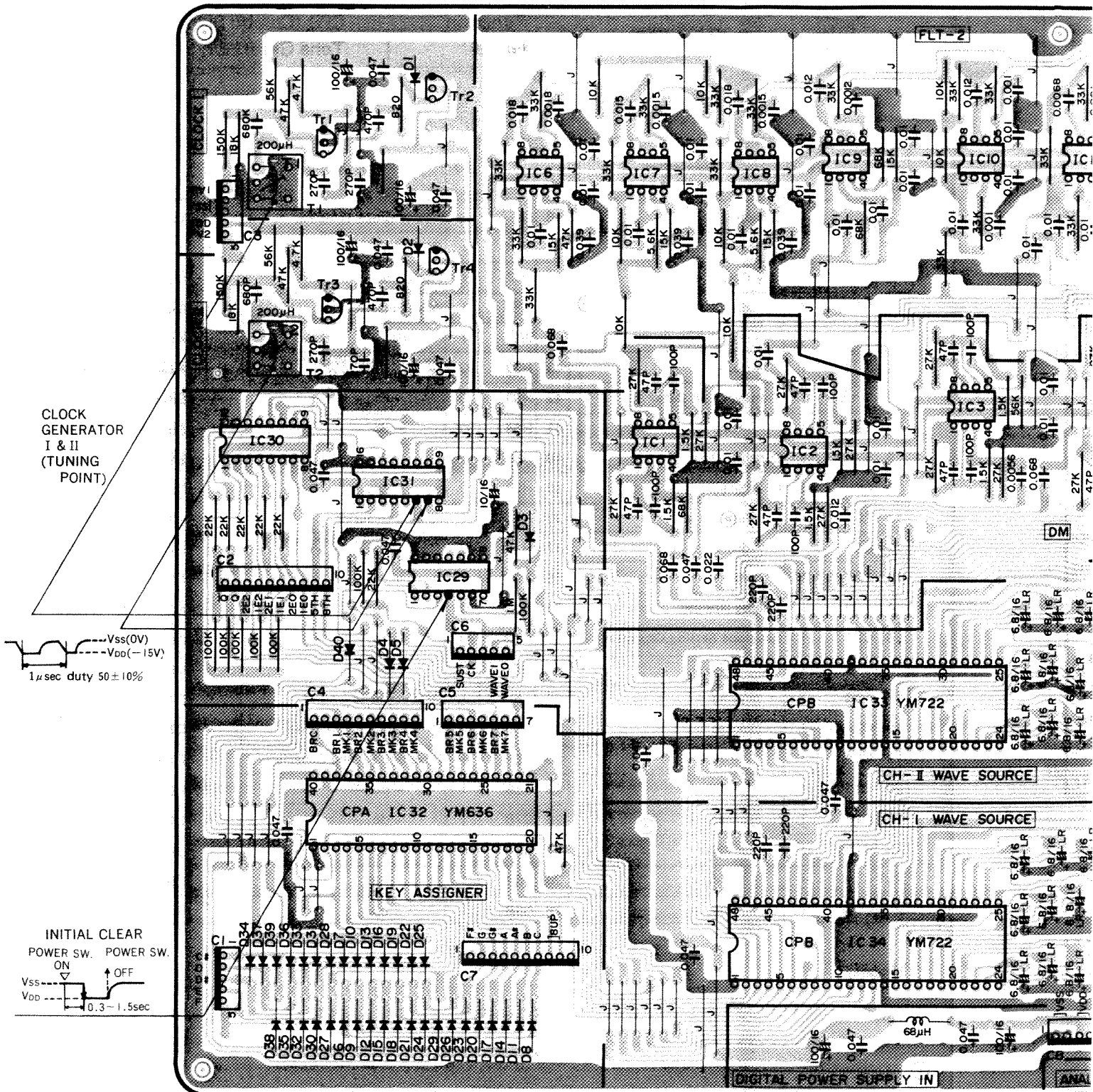
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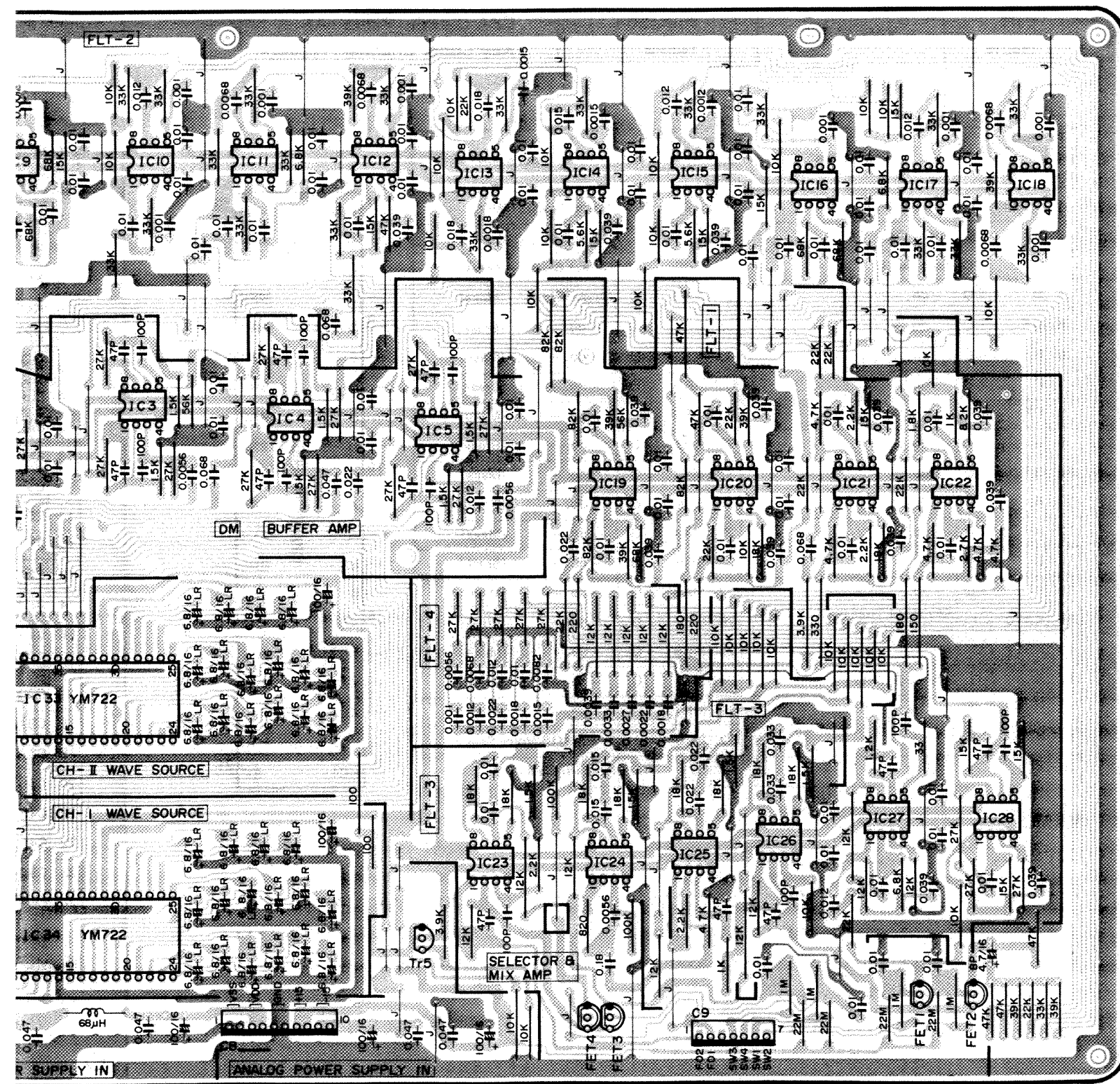
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Component Side(部品側)

DM Circuit Board & Wining

DM Circuit Board & Wining



• Connector

C1				C4				C7				C9			
Pin No.	Pin Name	Wire Color	Destination	Pin No.	Pin Name	Wire Color	Destination	Pin No.	Pin Name	Wire Color	Destination	Pin No.	Pin Name	Wire Color	Destination
1	C*	BR	MK1-C* (C1-7)	1	BR0	-	-	1	F*	BE	MK1-F* (C1-2)	1	F02	S BE	PN2-F02 (C6-8)
2	D	RE	MK1-D (C1-6)	2	-	-	-	2	G	VI	MK1-G (C1-1)	2	F01	S VI	PN2-F01 (C6-6)
3	D*	OR	MK1-D* (C1-5)	3	BR1	BR	MK1-BR1 (C3-6)	3	G*	GY	MK1-G* (C2-5)	3	-	-	-
4	E	YE	MK1-E (C1-4)	4	MK1	RE	MK1-MK1 (C3-7)	4	A	WH	MK1-A (C2-4)	4	SW3	BR	PN2-SW3 (C5-1)
5	F	GR	MK1-F (C1-3)	5	BR2	OR	MK1-BR2 (C3-5)	5	A*	GG	MK1-A* (C2-3)	5	SW4	RE	PN2-SW4 (C5-2)
				6	MK2	YE	MK1-MK2 (C3-4)	6	B	SB	MK1-B (C2-2)	6	SW1	OR	PN2-SW1 (C4-2)
				7	BR3	GR	MK1-BR3 (C3-3)	7	C	PK	MK1-C (C2-1)	7	SW2	GR	PN2-SW2 (C4-3)
				8	MK3	BE	MK1-MK3 (C3-2)	8	-	-	-	8	-	-	-
				9	BR4	VI	MK4-BR4 (C3-6)	9	-	-	-	9	-	-	-
				10	MK4	GY	MK4-MK4 (C3-7)	10	-	-	-	10	-	-	-

C2				C5				C8							
Pin No.	Pin Name	Wire Color	Destination	Pin No.	Pin Name	Wire Color	Destination	Pin No.	Pin Name	Wire Color	Destination	Pin No.	Pin Name	Wire Color	Destination
1	MODE	BE	PN1-MODE (C3-2)	1	BR5	WH	MK4-BR5 (C3-5)	1	VSS	GY	DC-VSS (C1-1)	1	SUST	SB	JK-SUST (C1-5)
2	MODE	BL	PN1-MODE (C3-1)	2	MK5	GG	MK4-MK5 (C3-4)	2	VSS	GY	DC-VSS (C1-3)	2	CK	PK	PN1-CK (C3-3)
3	202	YE	PN1-202 (C1-6)	3	BR6	SB	MK4-BR6 (C3-3)	3	VDD	RE	DC-VDD (C2-4)	3	-	-	-
4	1Q2	BR	PN1-1Q2 (C1-3)	4	MK6	PK	MK4-MK6 (C3-2)	4	VDD	RE	DC-VDD (C2-5)	4	GND	-	-
5	2Q1	OR	PN1-2Q1 (C1-5)	5	BR7	-	-	5	GND	BL	DC-GND (C4-6)	5	+15V	-	-
6	1Q1	PK	PN1-1Q1 (C1-2)	6	MK7	-	-	6	GND	BR	DC-GND (C4-3)	6	+15V	BR	DC+15V (C4-3)
7	200	RE	PN1-200 (C1-4)					7	-15V	-	-	7	-15V	-	-
8	1Q0	SB	PN1-1Q0 (C1-1)					8	-15V	YE	DC-15V (C3-3)	8	-15V	YE	DC-15V (C3-3)
9	5TH	WH	PN2-5TH (C5-3)												
10	8TH	GR	PN2-8TH (C5-4)												

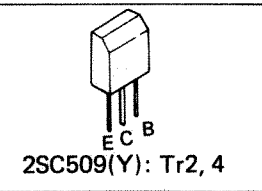
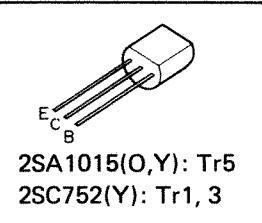
C3				C6			
Pin No.	Pin Name	Wire Color	Destination	Pin No.	Pin Name	Wire Color	Destination
1	PV1	GR	PN1-PV1 (C1-7)	1	SUST	SB	JK-SUST (C1-5)
2	VSS	-	-	2	CK	PK	PN1-CK (C3-3)
3	VSS	VI	PN1-VSS (C1-9)	3	-	-	-
4	VDD	GG	PN1-VDD (C1-10)	4	WAVE1	BR	PN2-WAVE1 (C4-5)
5	PV2	BE	PN1-PV2 (C1-8)	5	WAVE0	YE	PN2-WAVE0 (C4-4)

Notes

- YM63600: IC32 (See Page 16)
- YM72200: IC33, 34 (See Page 16)

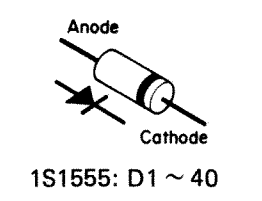
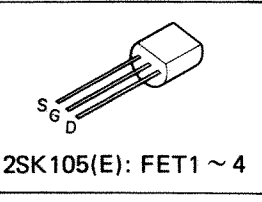
•TC4019BP: IC30, 31
Quadruple AND/OR Select Gate

(TOP VIEW)



•TC4081BP: IC29
Quadruple 2-Input AND Gate

(TOP VIEW)



•NJM4558DV: IC1 ~ 28
Dual Operational Amplifier

(TOP VIEW)