

# Service Manual

PCM Digital Piano

## SX-PX20

(M), (MC), (EN), (EI), (EH), (EB), (EF), (EZ), (EW),  
(EL), (EP), (EK), (XT), (XL), (XR), (XS), (XD), (X)



### AREAS

(M): U.S.A.	(EP): Spain
(MC): Canada	(EK): the United Kingdom
(EN): Norway, Sweden, Denmark, Finland	(XT): Taiwan
(EI): Italy	(XL): New Zealand
(EH): Holland	(XR): Australia
(EB): Belgium	(XS): Malaysia, Singapore, South Africa
(EF): France, Austria	(XD): Saudi Arabia
(EZ): Germany	(X): the Middle East, Indonesia, Hong Kong, the Philippines,
(EW): Switzerland	Thailand
(EL): Finland	

### Specifications

KEYBOARD	88 KEYS (16 NOTES POLYPHONIC)
TONE	PIANO 1, PIANO 2, E PIANO 1, E PIANO 2, HARPSICHORD, GUITAR, HARP, SYNTH 1/CLAVI, SYNTH 2/VIBETONE
BRILLIANCE	MELLOW, BRIGHT, NORMAL
EFFECT	CHORUS
TRANPOSE	UP (+C#, +D, +D#, +E, +F, +F#) DOWN (-B, -A#, -A, -G#, -G)
MIDI	MIDI PROGRAM CHANGE
MODE SET	MIDI.....OMNI ON, PROGRAM CHANGE, CHORUS, PEDAL OTHERS.....SOSTENUTO, MIN RANGE, PIANO TUNING
TERMINALS	MIDI.....IN, OUT, THRU AUX IN.....input level 500mV 100KΩ L, R/R+L LINE OUT.....output level 2V 600Ω L, R/R+L OTHERS.....PEDAL IN, HEADPHONE JACK, AC CORD
OTHERS	POWER SW, MAIN VOLUME, TUNE, INITIAL KEY
OUTPUT	20W × 2
SPEAKERS	16cm (6-5/16") × 1, 12cm (4-23/32") × 1, HORN TWEETER × 1
POWER REQUIREMENT	90W AC 120/220/240V 50/60Hz, AC 120V 60Hz (NORTH AMERICA)
DIMENSIONS (W × H × D)	137.8cm × 80.2cm × 46.0cm (54-1/4" × 31-9/16" × 18-1/8")
NET WEIGHT	50.4Kg (111.1lbs.)
ACCESSORIES	STAND, AC CORD

\*Specifications are subject to change without notice for further improvement.

# Technics

Matsushita Electric Industrial Co., Ltd.  
Central P.O. Box 288, Osaka 530-91, Japan

Matsushita Services Company  
50 Meadowland Parkway,  
Secaucus, New Jersey 07094

Panasonic Hawaii, Inc.  
99-859 Iwaiwa Street  
P.O. Box 774  
Honolulu, Hawaii 96808-0774

Panasonic Sales Company,  
Division of Matsushita Electric  
of Puerto Rico, Inc.  
Ave. 65 De Infanteria, KM 9.7  
Victoria Industrial Park  
Carolina, Puerto Rico 00630

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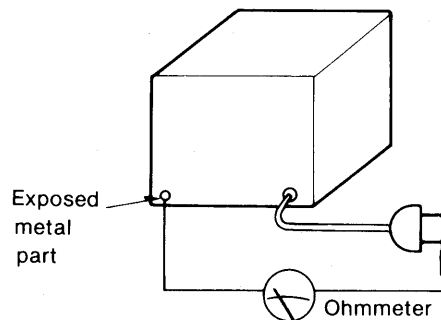
# SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

### • Safety Precaution

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

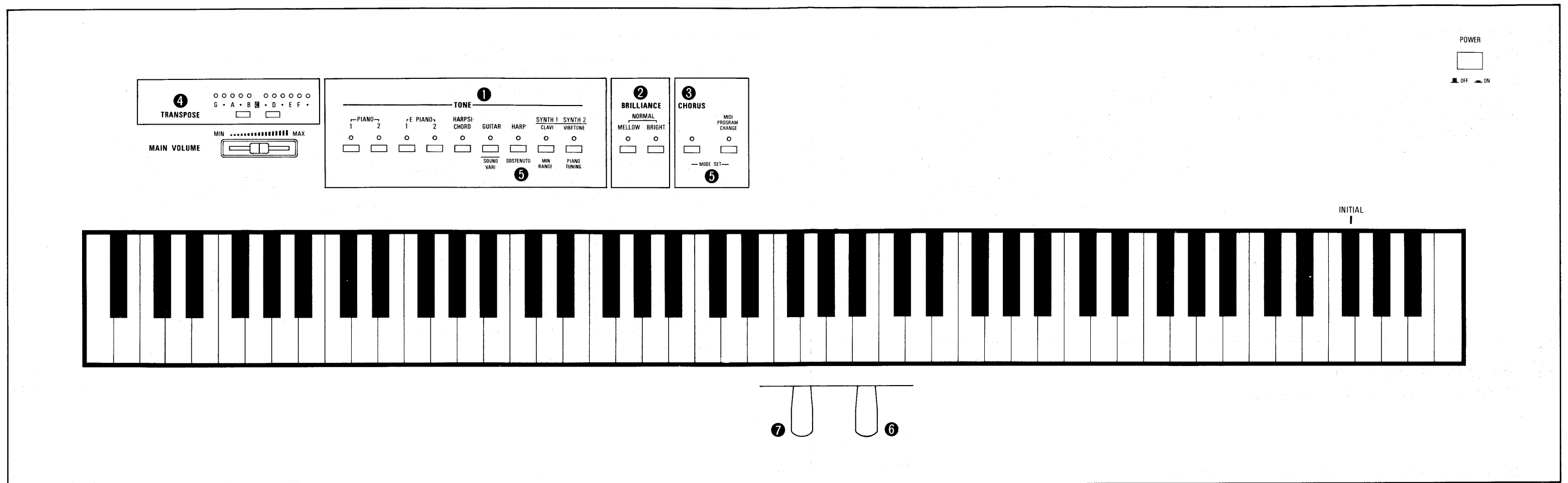
### • Insulation Resistance Test

1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screw heads, connectors, control shafts, handle brackets, etc..  
Measurements should range from 3MΩ to infinity to all exposed parts.



Resistance=3MΩ to ∞

# ARRANGEMENT OF CONTROL PANEL



## BASIC FUNCTION

### 1 TONE

Eleven different tones produced by a PCM digital sound source can be selected. Each voice features Touch Response, which increases the volume and changes the timbre as the velocity-sensitive keyboard is played harder.

### 2 BRILLIANCE

The brilliance of the tone is increased by pressing the **BRIGHT** button. The tone is softened by pressing the **MELLOW** button. If both buttons are simultaneously pressed to turn them on, the brilliance returns to normal.

### 3 CHORUS

The **CHORUS** effect expands the sound of one instrument to the sound of many instruments playing in unison. Pressing this button alternately turns the **CHORUS** effect on and off.

### 4 TRANSPOSE

C is the standard setting, and the key may be raised or lowered with the two **TRANSPOSE** buttons. The key can be reset to C instantly by pressing both **TRANSPOSE** buttons simultaneously.

- When **TRANSPOSE** is used, depending on the selected tones, the sound produced by some keys in the outer ranges may be raised or lowered by one octave.

### 5 MODE SET

When the **MODE SET** buttons (**CHORUS** and **MIDI PROGRAM CHANGE**) are on, the following four modes can be set.

#### 1. SOUND VARI

When the **SOUND VARI** button is off, the two far right buttons in the **TONE** section provide **SYNTH 1** and **SYNTH 2** tones. When it is on, the **CLAVI** and **VIBETONE** tones are active for these buttons.

### 2. SOSTENUTO

When this button is turned on, the soft pedal works as a **SOSTENUTO** pedal.

### 3. MIN RANGE

Pressing this button on broadens the range at low volumes. If a key is pressed very slowly, it may not produce any sound.

### 4. PIANO TUNING

When this button is on, the sound is a little lower for low notes and a little higher for high notes as on a regular piano. When it is off, the tuning is even.

- On the PX20, modes set using these procedures will return to the standard settings when the power is turned off.

### 6 SUSTAIN PEDAL

When a key is released while this pedal is depressed, the sound is sustained so that it lingers and slowly fades out.

- The tones of the far right keys are automatically sustained just like in an acoustic.

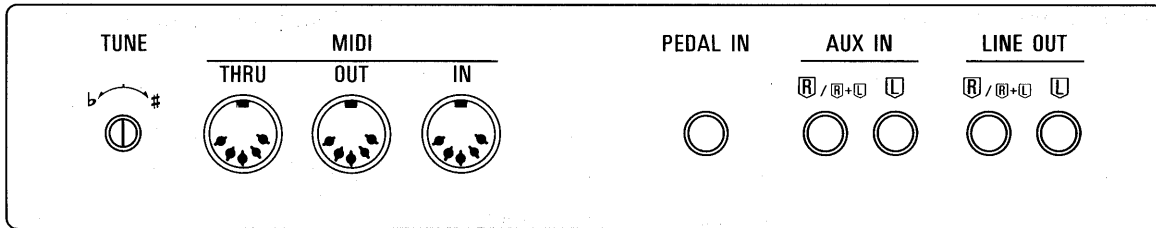
### 7 SOFT PEDAL

When the pedal is depressed, the sound is softer and the volume is lower.

- The soft pedal can also be used as a **SOSTENUTO** pedal.

# CONNECTION TERMINALS

(On the rear panel)



## ■ TUNE

During an ensemble performance with other instruments, fine adjustments of pitch can be made using this knob.

## ■ PEDAL IN

Connect the cord from the included stand to this terminal.

## ■ AUX IN (input level 500mV, 1 K $\Omega$ )

Other instruments such as a rhythm machine or sound module can be connected to the piano so that the sound is output from the piano.

To receive monaural sound, connect instruments to the R/R+L terminal.

## ■ LINE OUT (output level 2V 600 $\Omega$ )

By plugging into a Technics Tone Cabinet or a high-power amplifier, the sound can be reproduced at high volume. (Use the R/R+L terminal when outputting monaural sound.)

## ■ PHONES

For silent practice headphones may be used. When plugged in, the speaker system is automatically switched off, and sound is heard only through the headphones.

## ■ MIDI (Musical Instrument Digital Interface)

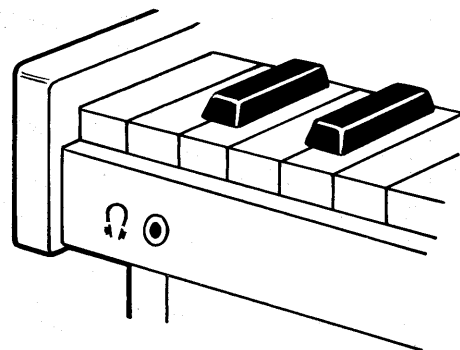
MIDI is standard specification that enables connection to equipment such as synthesizers and personal computers. Data transmission and reception are possible between the Technics Digital Piano instruments provided with MIDI terminals.

**IN:** The terminal that receives data from external equipment.

**OUT:** The terminal that transmits data from the piano to external equipment.

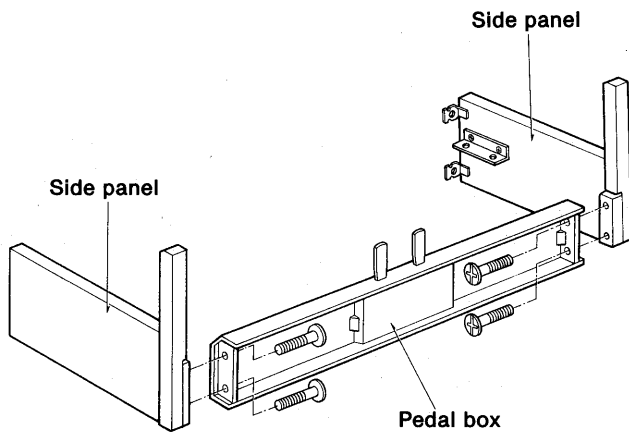
**THRU:** The terminal that transfers data from the IN terminal directly to other equipment.

• Use a 5-pin DIN cord (less than 15m long) for these connections.



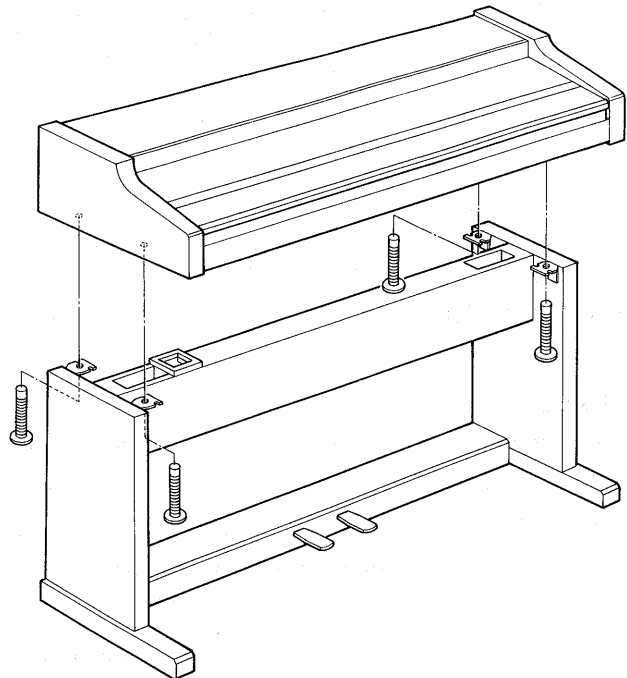
# HOW TO ASSEMBLE THE PIANO

- 1** Attach the side panels to the pedal box using the four black bolts.



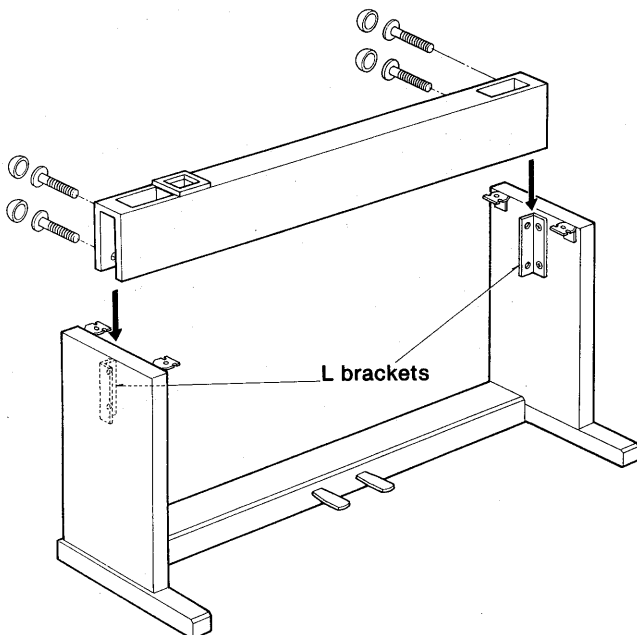
[Fig. 1]

- 3** Set the piano on the stand, and secure it to the stand with the four brown bolts.



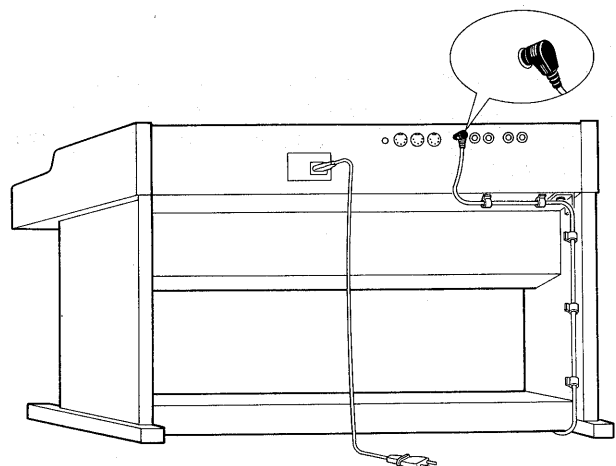
[Fig. 3]

- 2** Place the stand upright, and fit the crossboard onto the L brackets from above. Secure it with the four black bolts, and cover the boltheads with the caps.



[Fig. 2]

- 4** Attach the cord from the pedal box.

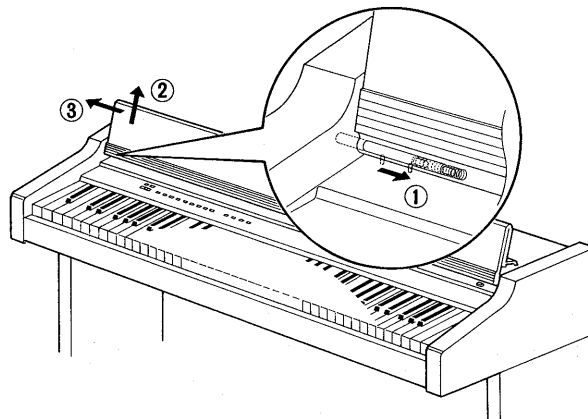


[Fig. 4]

# DISASSEMBLY PROCEDURE

## 1 How to remove the keyboard cover

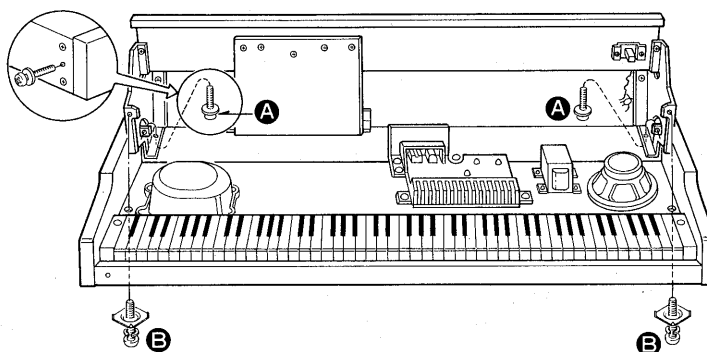
- ① Left shaft slide to inside with tool as shown Fig. 5-①.
- ② Lift upward left side of keyboard cover as shown as Fig. 5-②.
- ③ Remove the keyboard cover slide it leftward as shown Fig. 5-③.



[Fig. 5]

## 2 How to remove the top cover

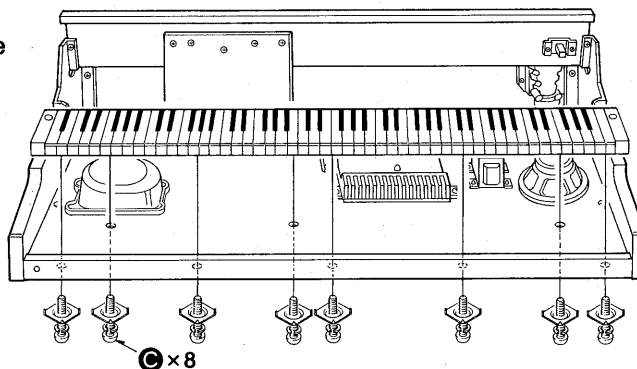
- Remove the keyboard cover according to procedure 1.
- ① Remove the 2 screws A and 2 screws B which fasten the top cover located under the shelf board.
  - ② The top cover can be opened by lifting.



[Fig. 6]

## 3 How to remove the keyboard

- Open the top cover according to procedure 2.
- ① Remove the 8 screws C which fasten the keyboard.



[Fig. 7]

#### 4 How to remove the keys

• Remove the keyboard according to procedure 3.

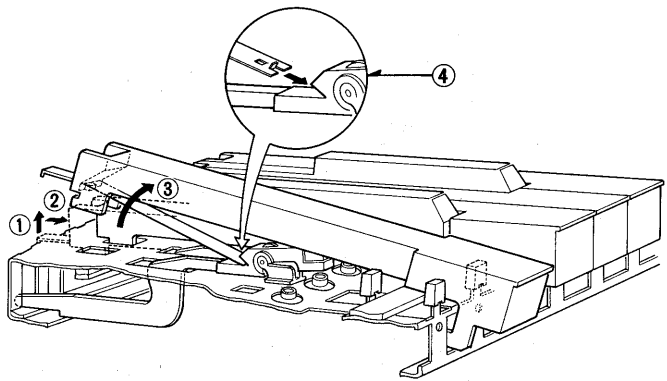
- ① Lift up the claw as shown Fig. 8-①.
- ② The key push to forward as shown Fig. 8-②.  
Key can be removed from chassis.
- ③ Lift up the key and take it out from chassis.

#### Note:

• In the case of disassembly black key remove the right and left white key at first and after that black key can be removed.

#### Reassembly method

- ① Insert the spring in to the hammer notch with the tang pointing-up as shown in Fig. 8-④.
- ② While holding the spring against the hammer, place the rear edge of the spring in the notch inside the rear edge of the key.
- ③ Slowly push the key down into the slots in the chassis.



[Fig. 8]

#### 5 How to remove the printed circuit boards

##### MAIN Main P.C.B. (Fig. 10)

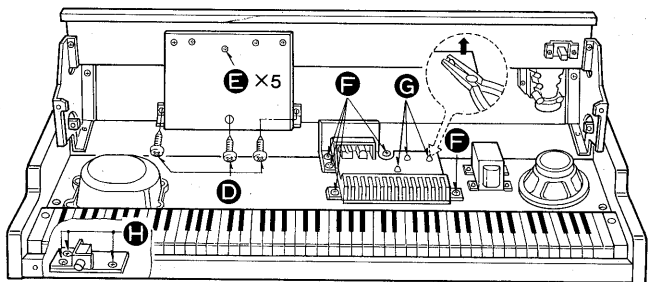
• Remove the 3 screws ① and 5 screws ② on the Main P.C.B.

##### AS Amp & Power Supply P.C.B.

• Remove the 5 screws ③ which fasten the amp unit.  
• Release the 3 claws ④ of P.C.B. holder to remove the Amp & power supply P.C.B.

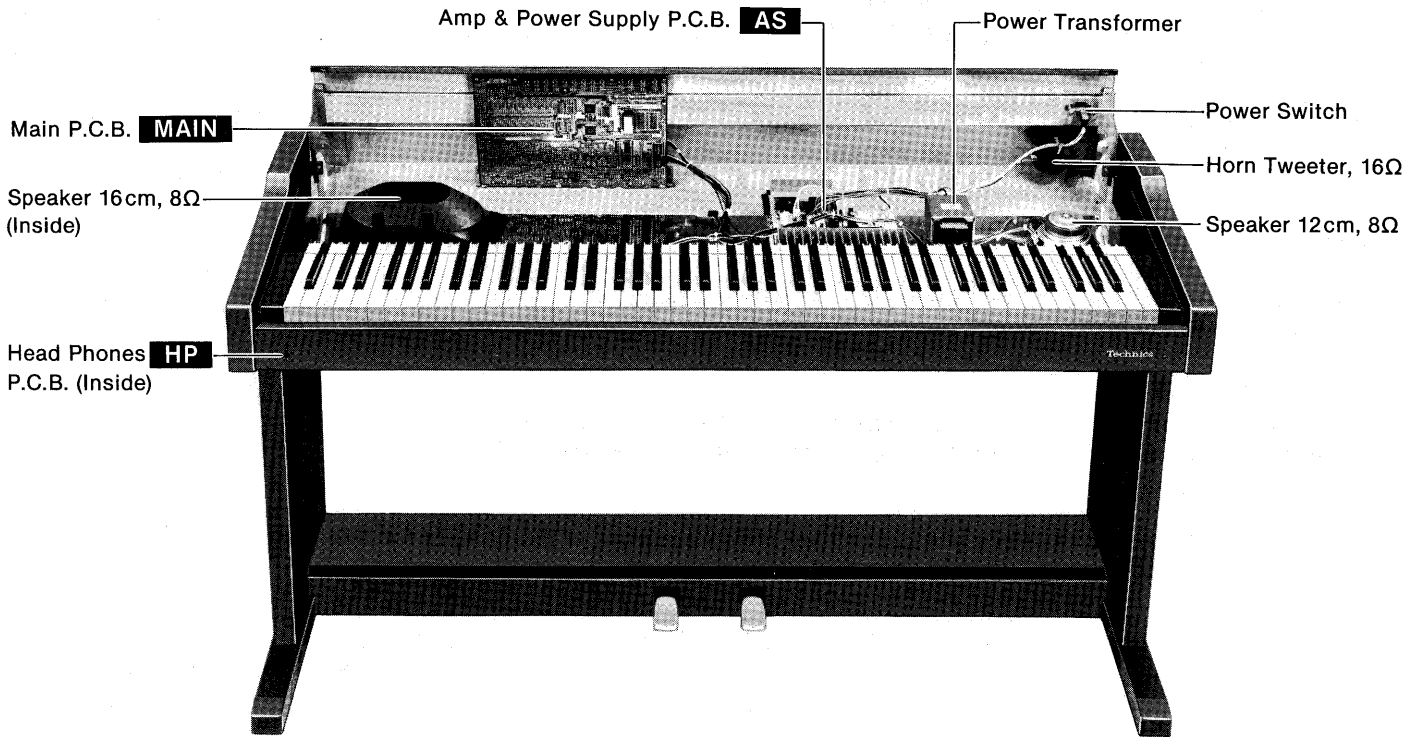
##### HP Headphones P.C.B.

• Remove the keyboard according to procedure 3.  
• Remove the 3 screws ⑤ on the headphones P.C.B.



[Fig. 9]

# PARTS LOCATION



[Photo-1]

# KEYBOARD RANGES

8 va bassa

Middle C

8 va

A#2 D#7 G#12 C#17 F#22 A#26 D#31 G#36 C#41 F#46 A#50 D#55 G#60 C#65 F#70 A#74 D#79 G#84

C#5 F#10 A#14 D#19 G#24 C#29 F#34 A#38 D#43 G#48 C#53 F#58 A#62 D#67 G#72 C#77 F#82 A#86

A1 C4 E8 G11 B15 D18 F21 A25 C28 E32 G35 B39 D42 F45 A49 C52 E56 G59 B63 D66 F69 A73 C76 E80 G83 B87

B3 D6 F9 A13 C16 E20 G23 B27 D30 F33 A37 C40 E44 G47 B51 D54 F57 A61 C64 E68 G71 B75 D78 F81 A85 C88



# PRECAUTIONS BEFORE SERVICING

## ■ Precautions for measuring of the output waveforms.

1. Please set the INITIAL mode before measurement.
  - INITIAL mode: While holding down both MODE SET buttons (CHORUS and MIDI PROGRAM CHANGE), press the INITIAL key.
2. After INITIAL mode, set the measurement conditions as each check points.
3. The waveform was measured by "National Digital Storage Oscilloscope VP-5730A". Therefore the waveforms of musical tone signals shown may somewhat change due to variation of timing of measure.
4. The voltage shown in the photo is 1/10 of the actual value. However, the actual voltage is 10 times of as shown in this photo.
5. The tone signal output varies with the level of key pressing force.
 

In this measurement, the waveform obtained with maximum key pressing force is shown. However, the output level and waveform may vary, depending on the timing and measuring instrument and other conditions in the measurement.

## ■ Important safety notice:

Components identified by  $\triangle$  mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

## ■ Symbolic Marks

The symbolic marks for resistors and capacitors, which are used in the circuits for this Piano, are as shown in TABLE-1 and TABLE-2.

### 1. RESISTORS

- Resistors without symbolic mark are FIXED CARBON FILM RESISTORS (ERD-type).
- All resistors are 1/4WATT,  $\pm 5\%$  TOLERANCE unless otherwise designated in the schematic diagrams.

(TABLE-1)

SYMBOL	SPECIFICATION	SYMBOL	SPECIFICATION
ⓕ	Fixed Carbon Film Resistors "FLAME-PROOF" (ERD—F—type)	ⓕ	Fixed Metal Film Resistors "FLAME-PROOF" (ERX—type)
ⓕ	Fixed Wire Wound Resistors "FLAME-PROOF" (ERF—type)	ⓕ	Fuse Type Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERQ—type)
ⓕ	Fixed Metal Oxide Film Resistors "FLAME-PROOF" (ERG—type)	ⓕ	Fuse Type Fixed Carbon Film Resistors "FLAME-PROOF" (ERD2FC—type)
	Fixed Metal Film Resistors (Precision and High Stability) (ERO—type)		

### 2. CAPACITORS

- Capacitors without symbolic mark are POLYESTER CAPACITORS. (ECQM-type, ECQG-type,  $\pm 10\%$  Tolerance)
- Polarized capacitors without symbolic mark are Aluminum Electrolytic Capacitors. (ECEA—type,  $\pm 20\%$  Tolerance)

(TABLE-2)

SYMBOL	SPECIFICATION	TYPE
Ⓝ	Non-Polarised Electrolytic Capacitors	ECEA—N—type
Ⓨ	Non-Polarised Electrolytic (for Network System)	ECEA—Y—type
Ⓚ	Aluminum Electrolytic Capacitors (Miniature type)	ECEA—K—type ECEA—X—type
Ⓜ	Aluminum Electrolytic Capacitors (Low leakage current type)	ECEA—M—type
Ⓩ	Aluminum Electrolytic Capacitors (Low impedance type)	ECEA—Z—type
Ⓣ	Metalized Plastic Film Capacitors (TF Series)	ECQV—type
Ⓣ	Polyester Film Capacitors	ECQB—type
○	Temperature Compensating Ceramic Capacitors	ECC—type
○	High-Dielectric Constant Ceramic Capacitors	ECK—type
	Metalized Polyester Film Capacitors for Across the Line	ECQ—EW—type
	Aluminum Electrolytic Capacitors for smooting Circuit	ECES—type

## ■ Symptoms which appear to be signs of trouble

The following changes in performance may occur in the Technics digital piano but do not indicate trouble.

Phenomenon	Remedy
No sound	<ul style="list-style-type: none"> <li>• No sound is made when main volume is at minimum. Properly adjust the sound volume.</li> <li>• No sound is produced if a key is pressed while holding down the <b>PROGRAM CHANGE</b> button.</li> </ul>
Only 16 tones are made when 17 more keys are pressed.	16 tones on the PX30 can be produced at one time.
The sustain effect is improper.	The tones of the far right keys are automatically sustained just like in an acoustic piano.

## MEASUREMENTS AND ADJUSTMENTS

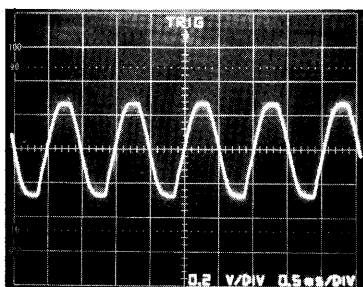
### ■ Measuring Equipment

- Oscilloscope 20 MHz, 10 : 1 probe
- Oscillator, 1 kHz sine wave, 0~10Vp-p, 600Ω
- Capacitor, 50V 1μF (ECEA1HN010S)

ADJUSTMENT	MEASURING CONDITIONS	EQUIPMENT	ADJUSTMENT P.C.B.	ADJ. POINT	CONNECT METER TO	METER READING
BBD bias (CHORUS)	any position	Oscilloscope and oscillator	<b>MAIN</b> P.C.B.	VR1	IC46-①	Photo-A
<ol style="list-style-type: none"> <li>1. Connect the oscilloscope to IC46-① pin of <b>MAIN</b> circuit board.</li> <li>2. Input 1 kHz sine wave to IC45-③ pin by oscillator through capacitor of less than 50V 1μF. Then, adjust the output level of oscillator until the sinewave on the oscilloscope is clipped.</li> <li>3. Adjust VR1 so that the output waveforms on the oscilloscope are evenly clipped at top and bottom.</li> </ol>						

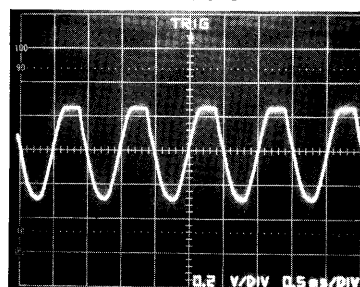
### BBD bias adjustment

○ : Good



[Photo-A]

× : Fault



[Photo-B]

[digital piano]

# MIDI Implementation Chart

[ SX-PX20/SX-PX30 ]

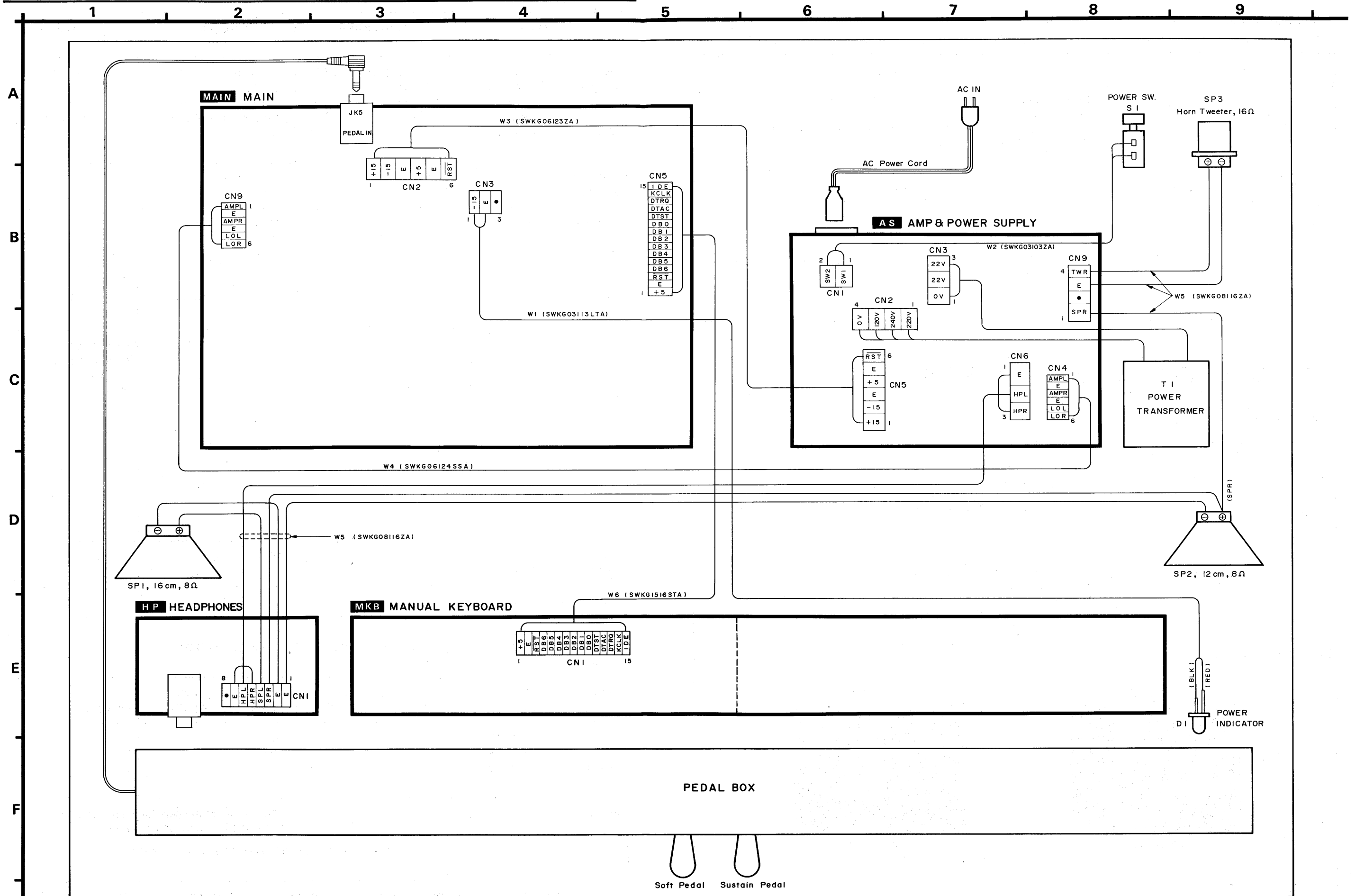
Function...		Transmitted	Recognized	Remarks
<b>Basic Channel</b>	Default Changed	1 (PX20), 1~16 (PX30) 1 ~ 16	1 (PX20), 1~16 (PX30) 1 ~ 16	(PX30: memorized)
<b>Mode</b>	Default Messages Altered	3 × _____	1 (PX20); 1, 3 (PX30) × _____	(PX30: memorized)
<b>Note Number</b>	True voice	21 ~ 108 _____	**21 ~ 126 21 ~ 119	
<b>Velocity</b>	Note ON Note OFF	○ × (9nH: V=0)	○ ×	
<b>After Touch</b>	Key's Ch's	× ×	× ×	
<b>Pitch Bender</b>		×	×	
<b>Control Change</b>	64 66 67 93	*○× *○× *○× *○×	*○× *○× *○× *○×	sustain pedal sostenuto pedal soft pedal chorus
<b>Prog Change</b>	True #	*○ (0 ~ 127) ×	*○ (0 ~ 8) × 0 ~ 8	
<b>System Exclusive</b>		×	×	
<b>System Common</b>	Song Pos Song Sel Tune	× × (PX20), ○ (PX30) ×	× × (PX20), ○ (PX30) ×	
<b>System Real Time</b>	Clock Commands	× (PX20), ○ (PX30) × (PX20), *○× (PX30)	× (PX20), ○ (PX30) × (PX20), *○× (PX30)	start/stop
<b>Aux Messages</b>	Local ON/OFF All Notes OFF Active Sense Reset	× ○ ○ ×	× ○ ○ ×	
<b>Notes</b>	<p>*○×..... Whether or not the data for each of these items is transmitted or received can be set.</p> <p>** Changes depending on the position of the transpose.</p>			

**Mode 1:** OMNI ON, POLY  
**Mode 3:** OMNI OFF, POLY

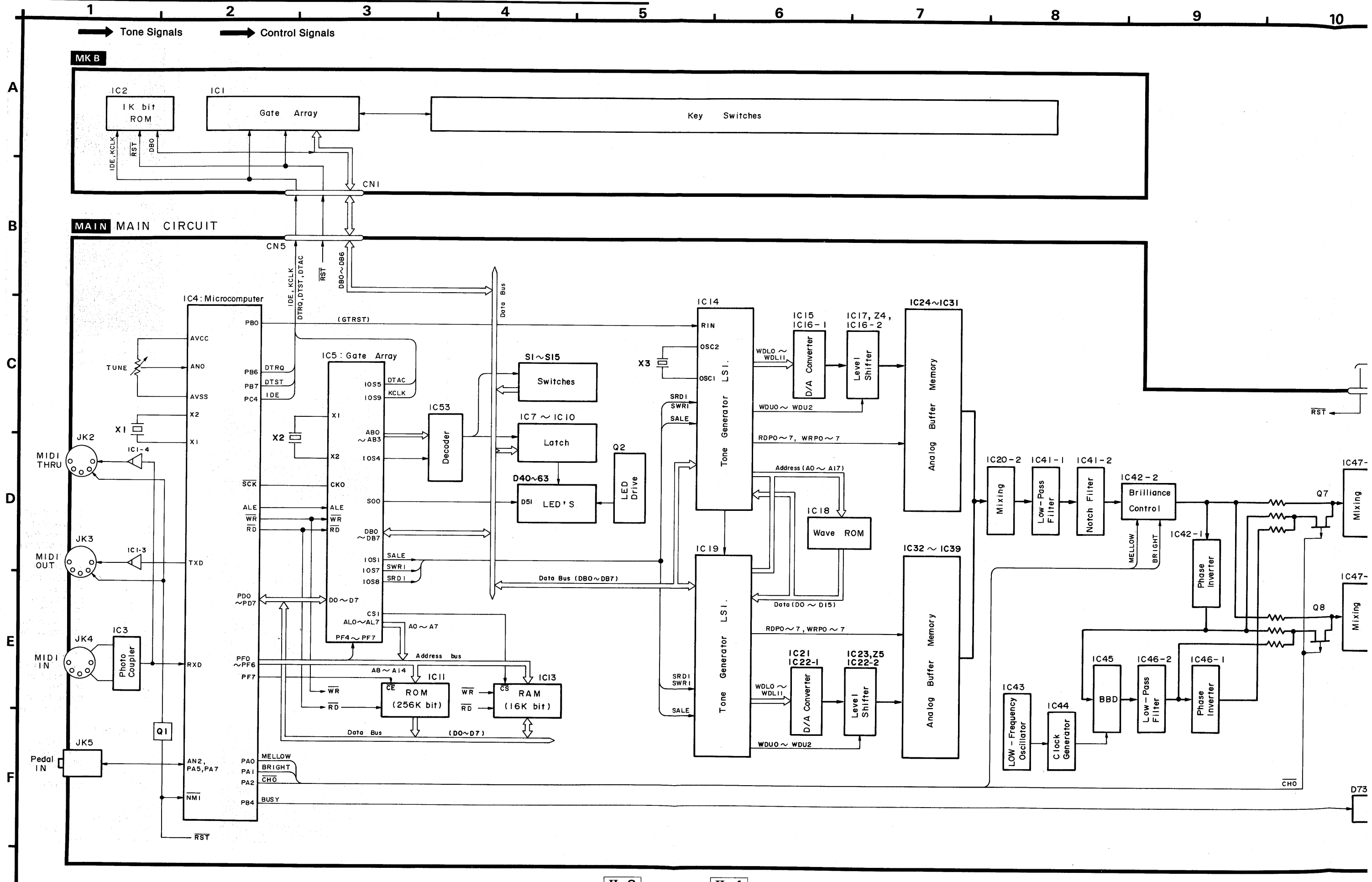
**Mode 2:** OMNI ON, MONO  
**Mode 4:** OMNI OFF, MONO

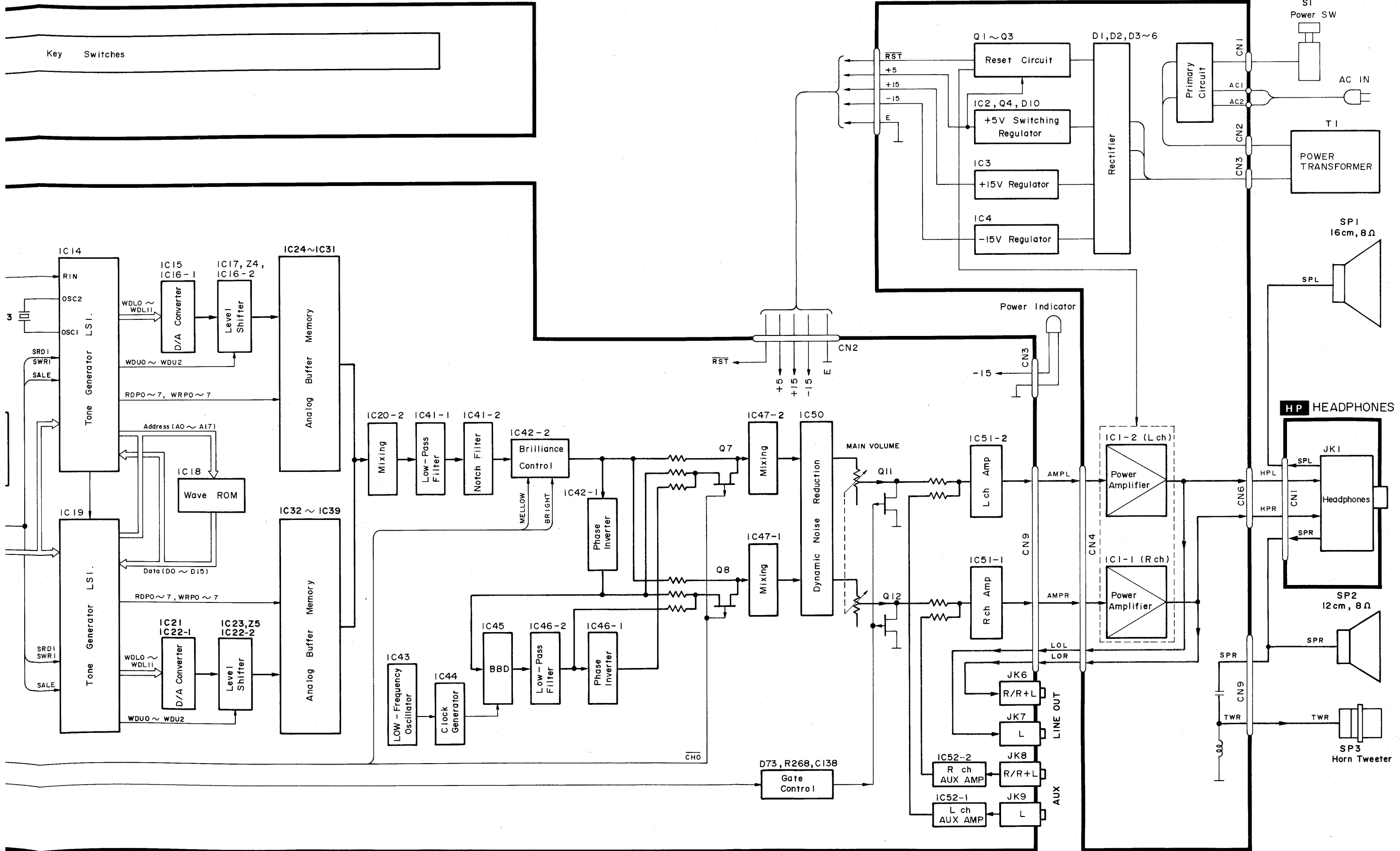
○ : Yes  
× : NO

# WIRING CONNECTION DIAGRAM



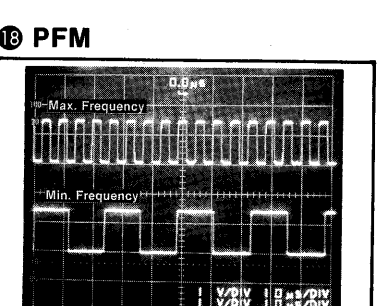
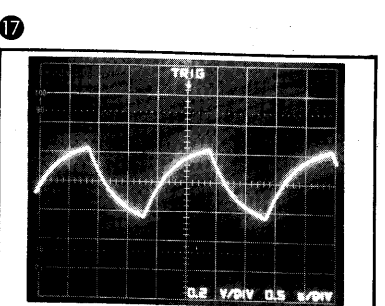
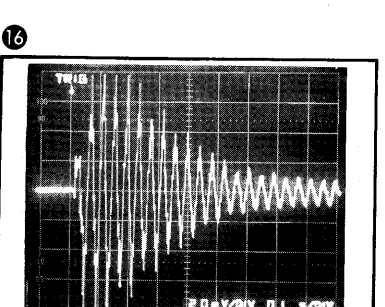
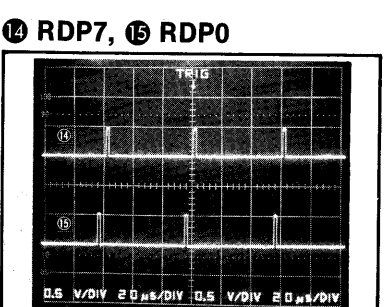
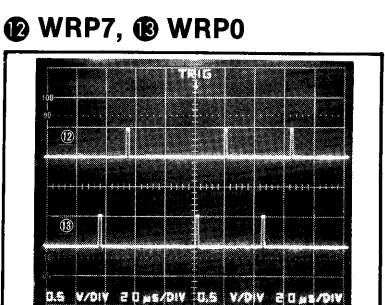
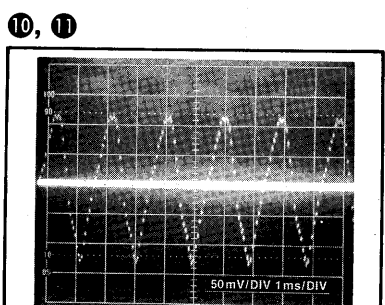
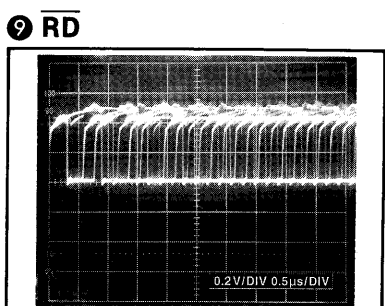
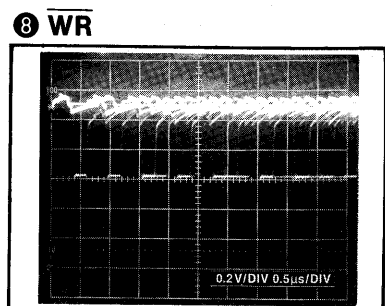
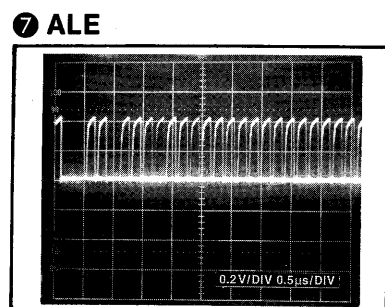
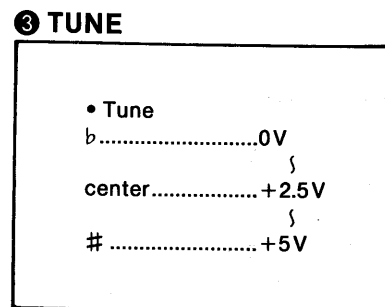
# BLOCK DIAGRAM



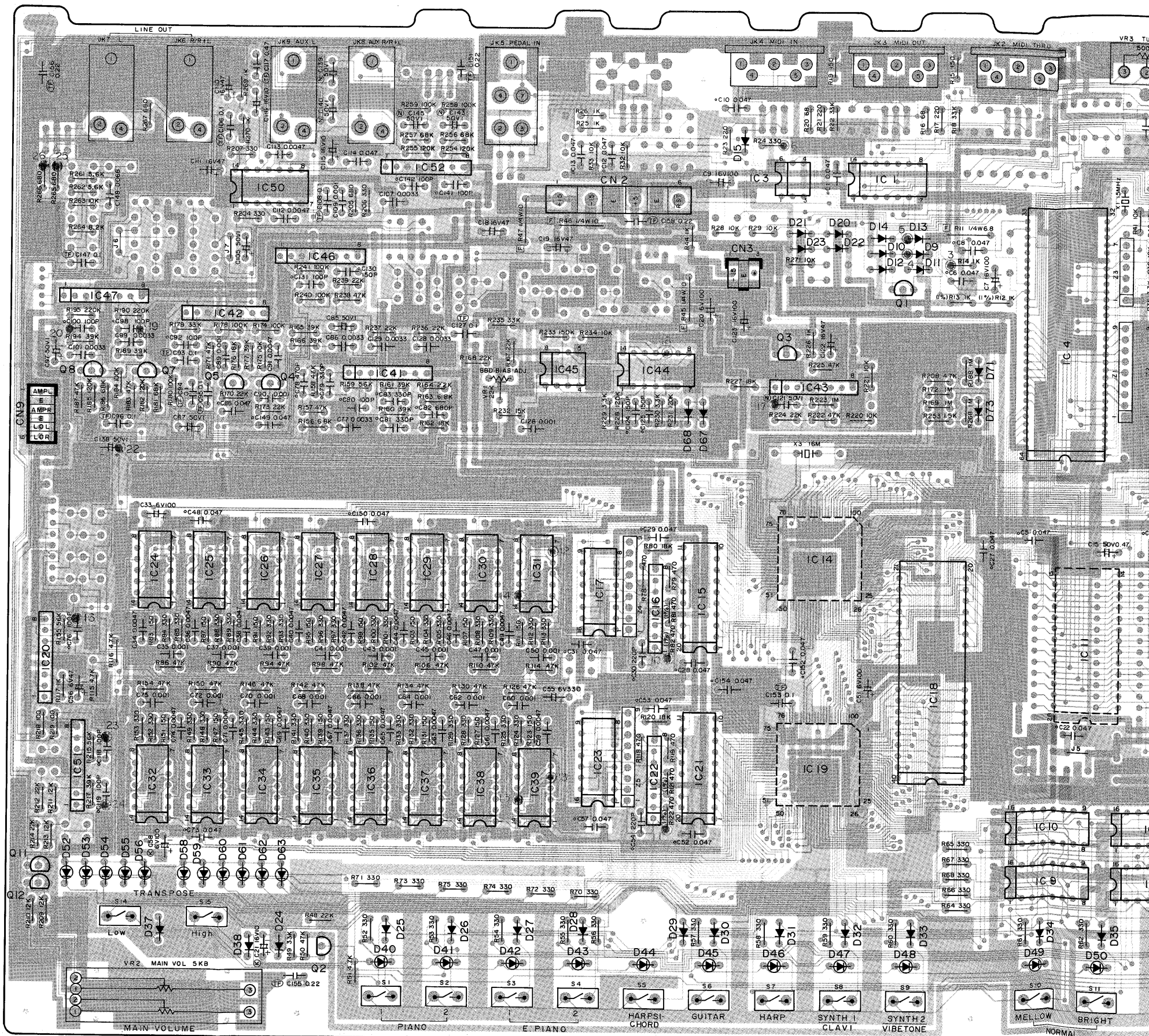


1 2 3 4 5 6 7 8 9 10

A  
B  
C  
D  
E  
F

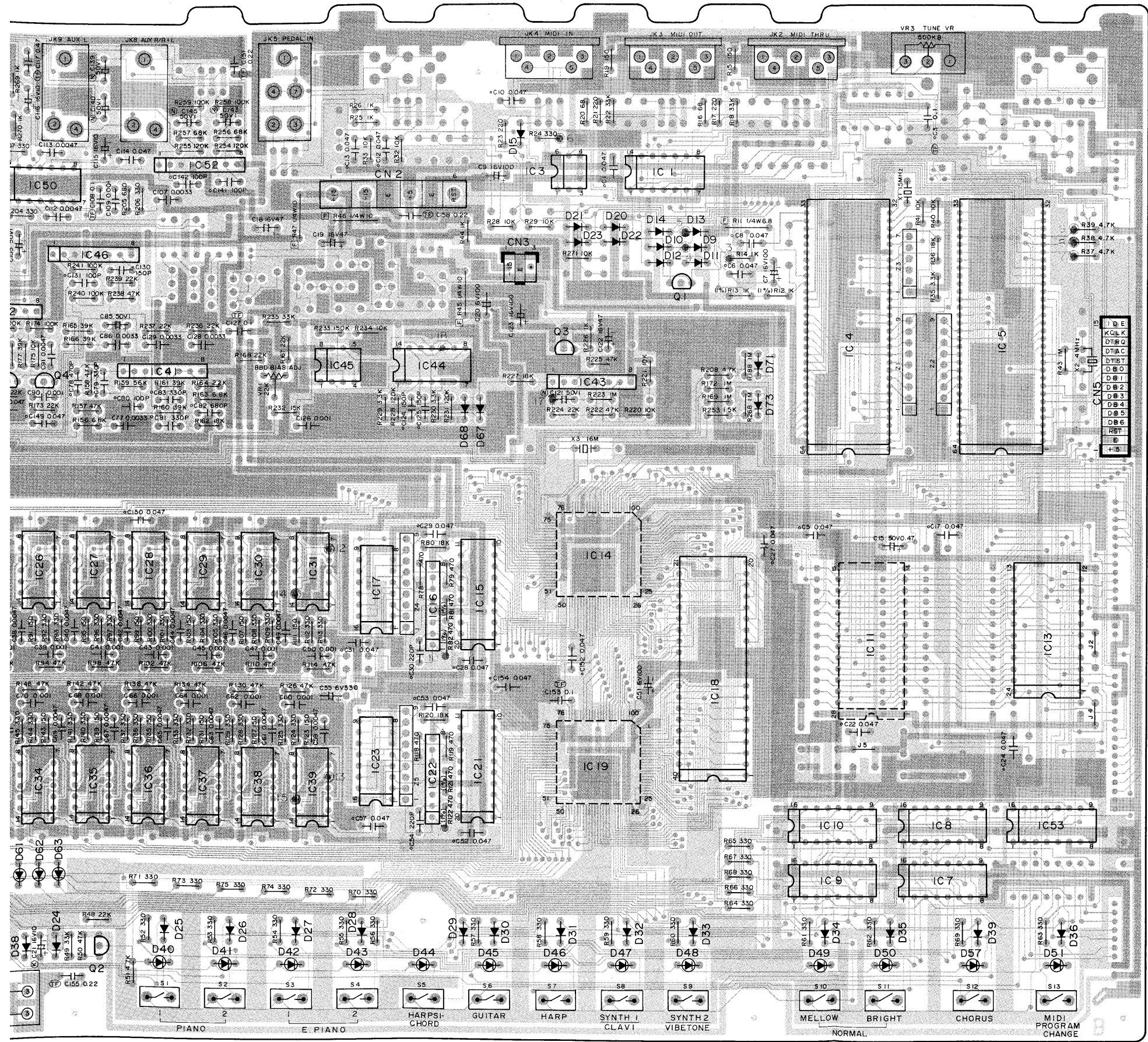


Circuit view on top of P.C.B.

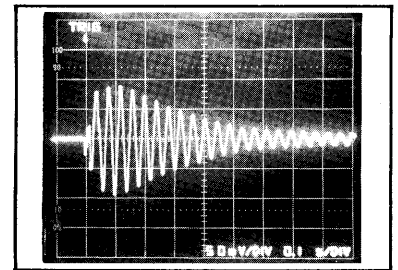


f P.C.B.

SXPG141421

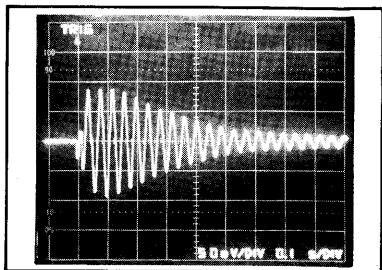


19 Lch



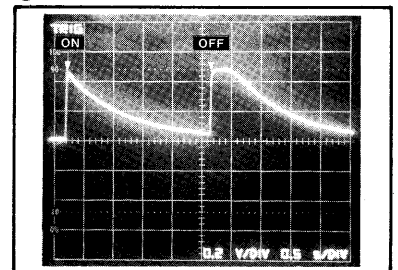
- Tone.....Piano I
- Brilliance.....Mellow
- Chorus...OFF • Key...C<sub>52</sub>

20 Rch



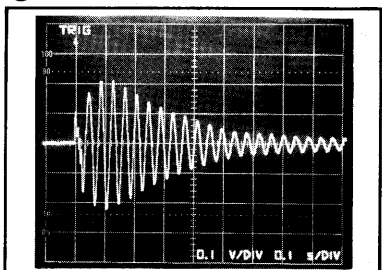
- Tone.....Piano I
- Brilliance.....Mellow
- Chorus...OFF • Key...C<sub>52</sub>

22



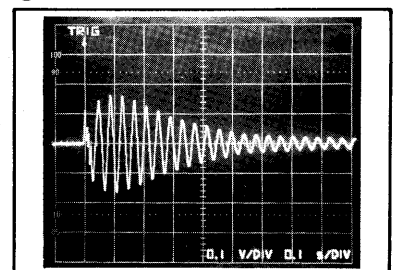
- Power SW.....ON-OFF

23 Lch



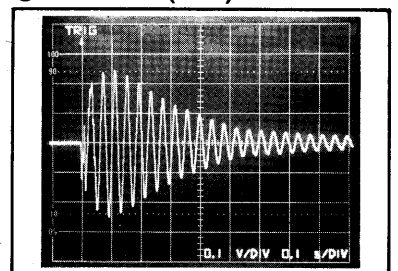
- Tone...Piano I • Main Vol. ...Max.
- Brilliance.....Mellow
- Chorus...OFF • Key...C<sub>52</sub>

24 Rch



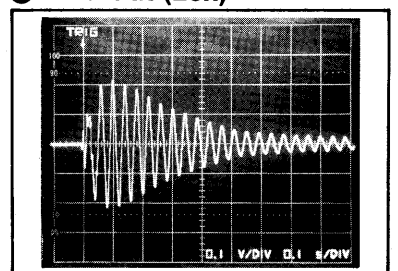
- Tone...Piano I • Main Vol. ...Max.
- Brilliance.....Mellow
- Chorus...OFF • Key...C<sub>52</sub>

25 Line Out (Rch)



- Tone...Piano I • Main Vol. ...Max.
- Brilliance.....Mellow
- Chorus...OFF • Key...C<sub>52</sub>

26 Line Out (Lch)



- Tone...Piano I • Main Vol. ...Max.
- Brilliance.....Mellow
- Chorus...OFF • Key...C<sub>52</sub>

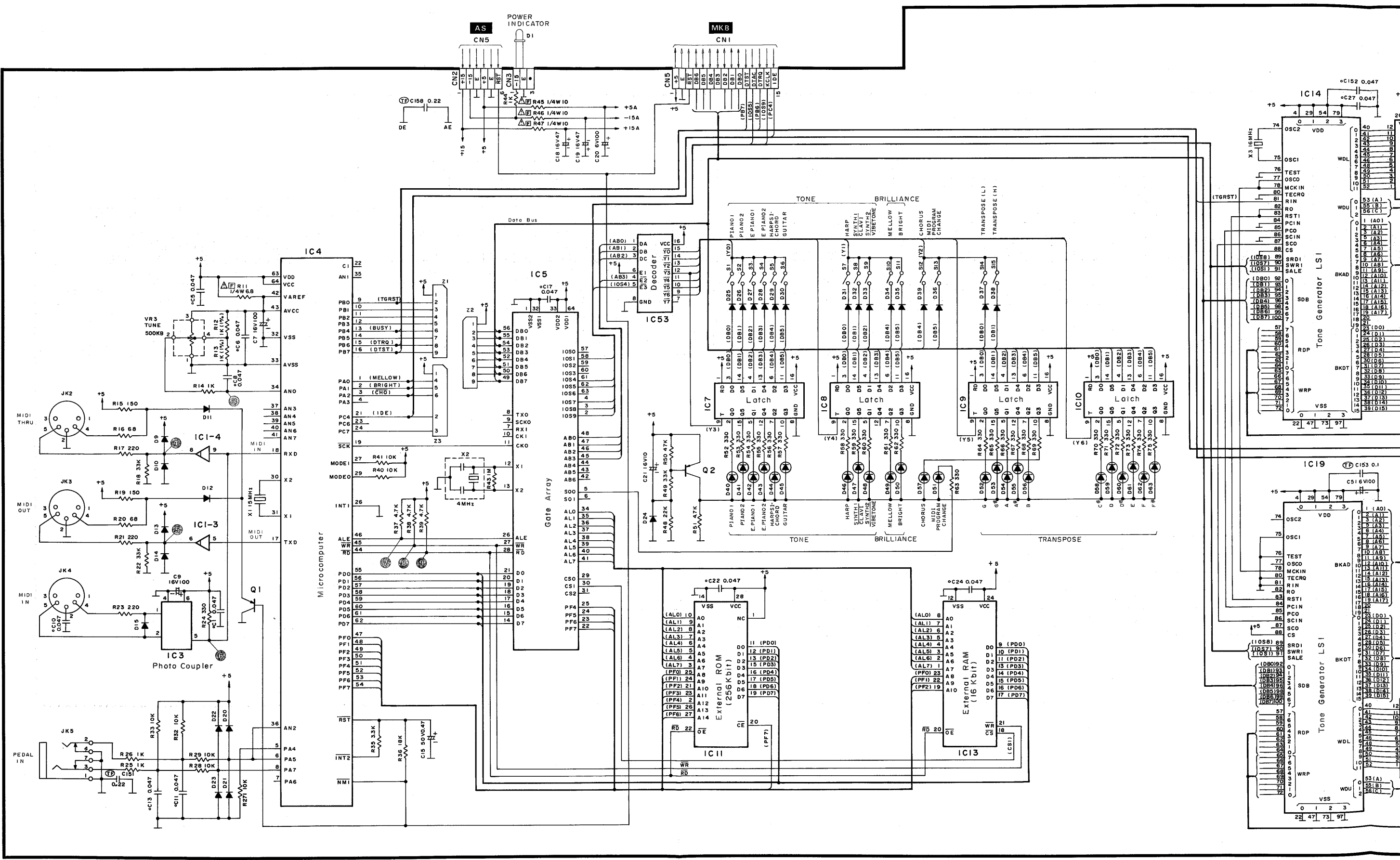
NOTES:

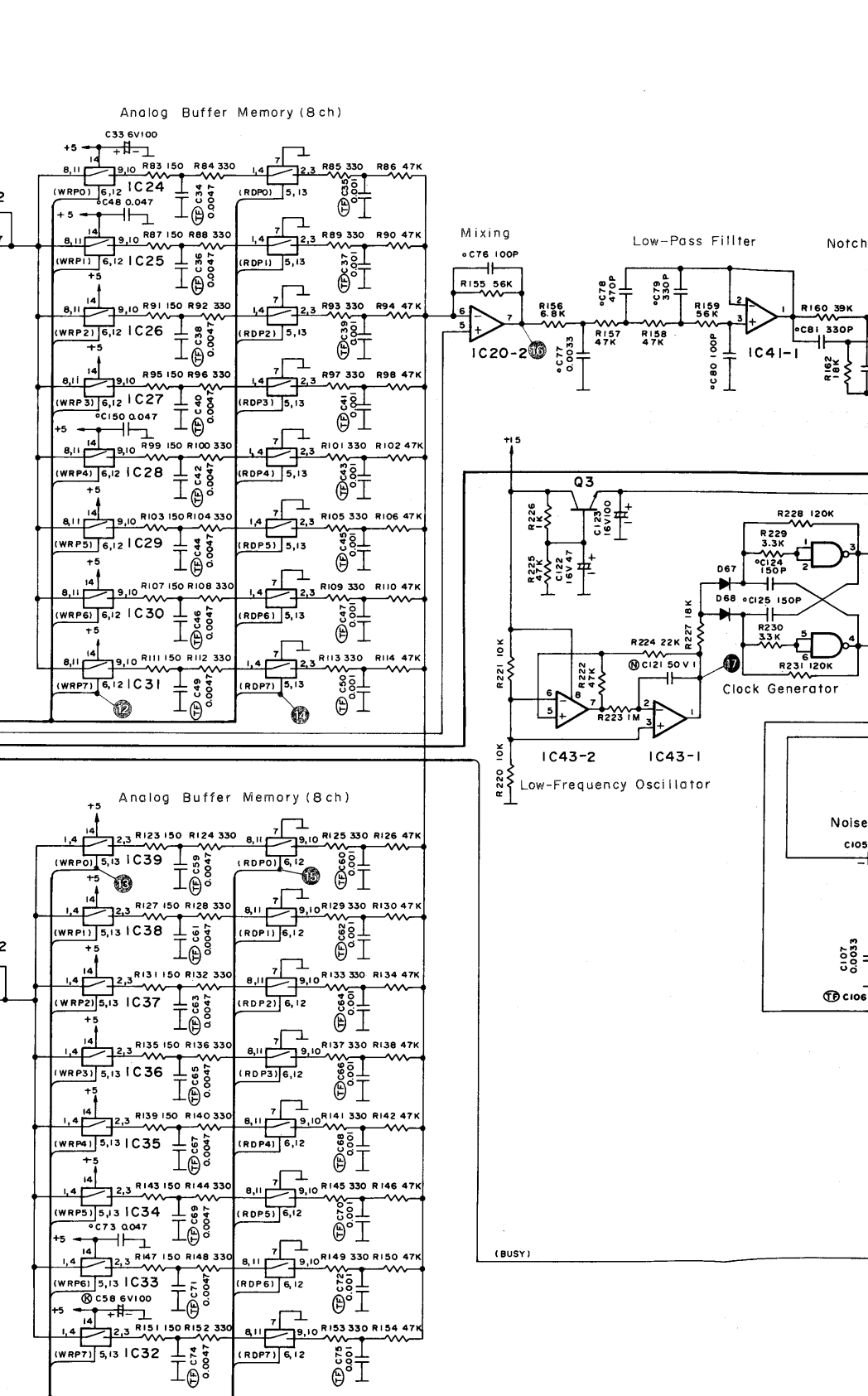
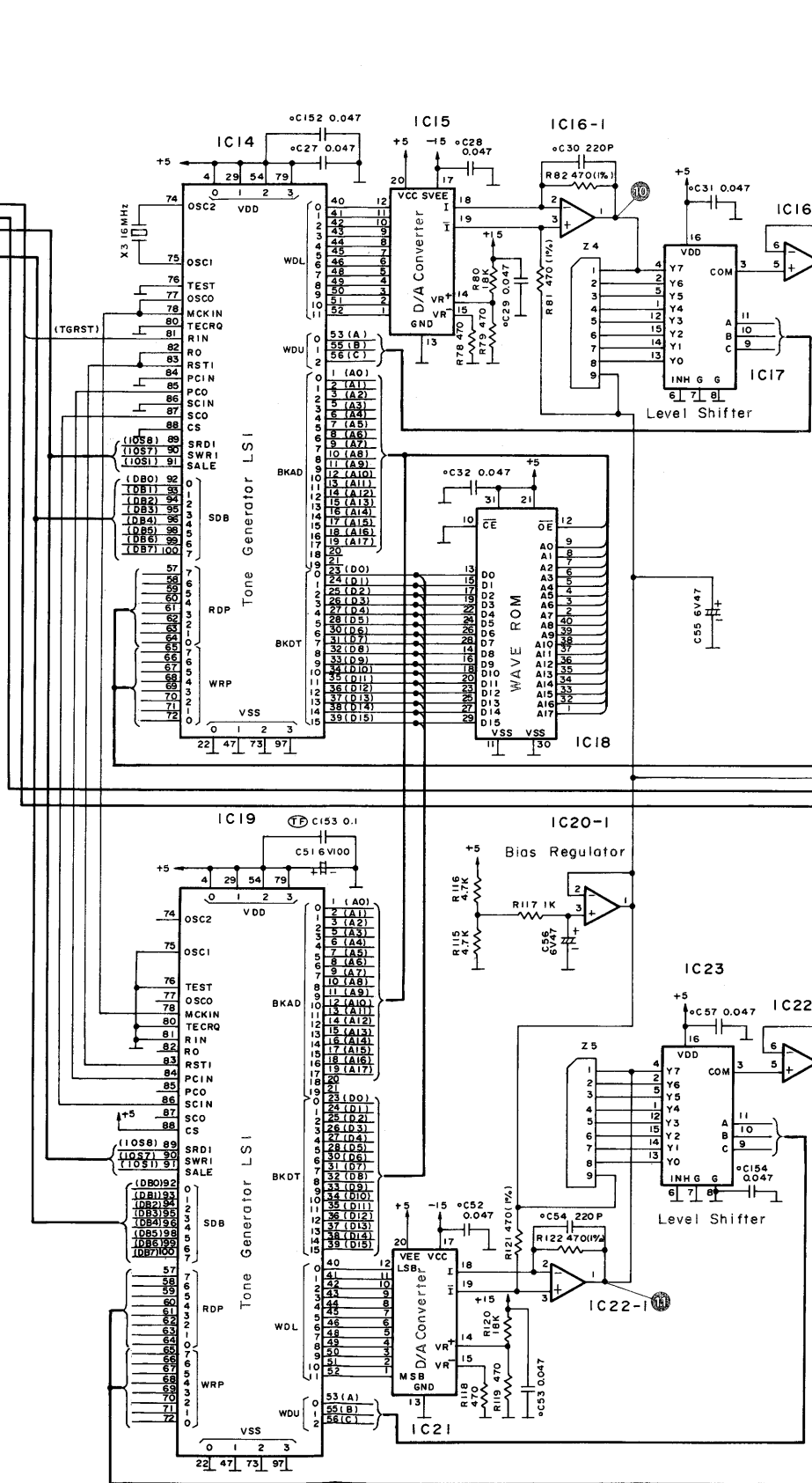
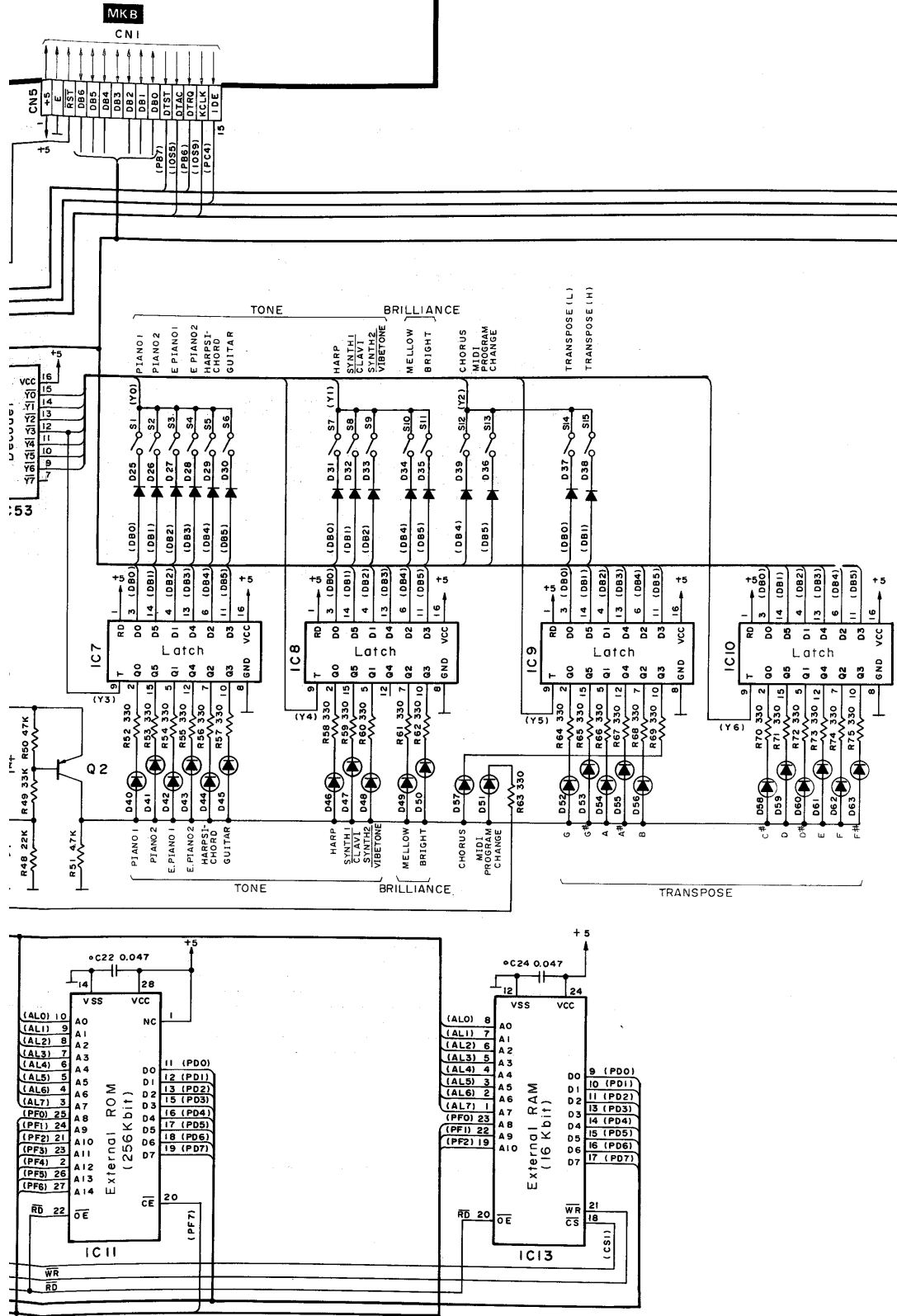
- IC'S
  - IC1: SVIGM74LS07
  - IC3: SVIGTLP513
  - IC4: SVIG7810HCW
  - IC5: SVIGM603A114
  - IC7~10: SVIGM74LS174
  - IC11: SVIG2PX30AX1
  - IC13: SVIGD446C25
  - IC14, 19: MN6635
  - IC15, 21: SVIGBA9221
  - IC16, 22: SVIGM5238L
  - IC17, 23: SVIGT74H4051
  - IC18: SVIGU3C04165
  - IC20, 41~43, 46, 47, 51, 52: SVIGM5218L
  - IC24~39: SVIGM74H4066
  - IC44: SVIGMSM4011
  - IC45: MN3009
  - IC50: SVIGLM1894N
  - IC53: SVIGM74LS138
- TRANSISTORS
  - Q1: 2SA1015-GR
  - Q2: 2SA830SB
  - Q3: 2SC2320LFG
  - Q4, 5, 7, 8, 11, 12: 2SJ105GR
- DIODES
  - D9~15, 20~39, 67, 68, 71, 73: MA165TA5
  - D40~63: LN282R

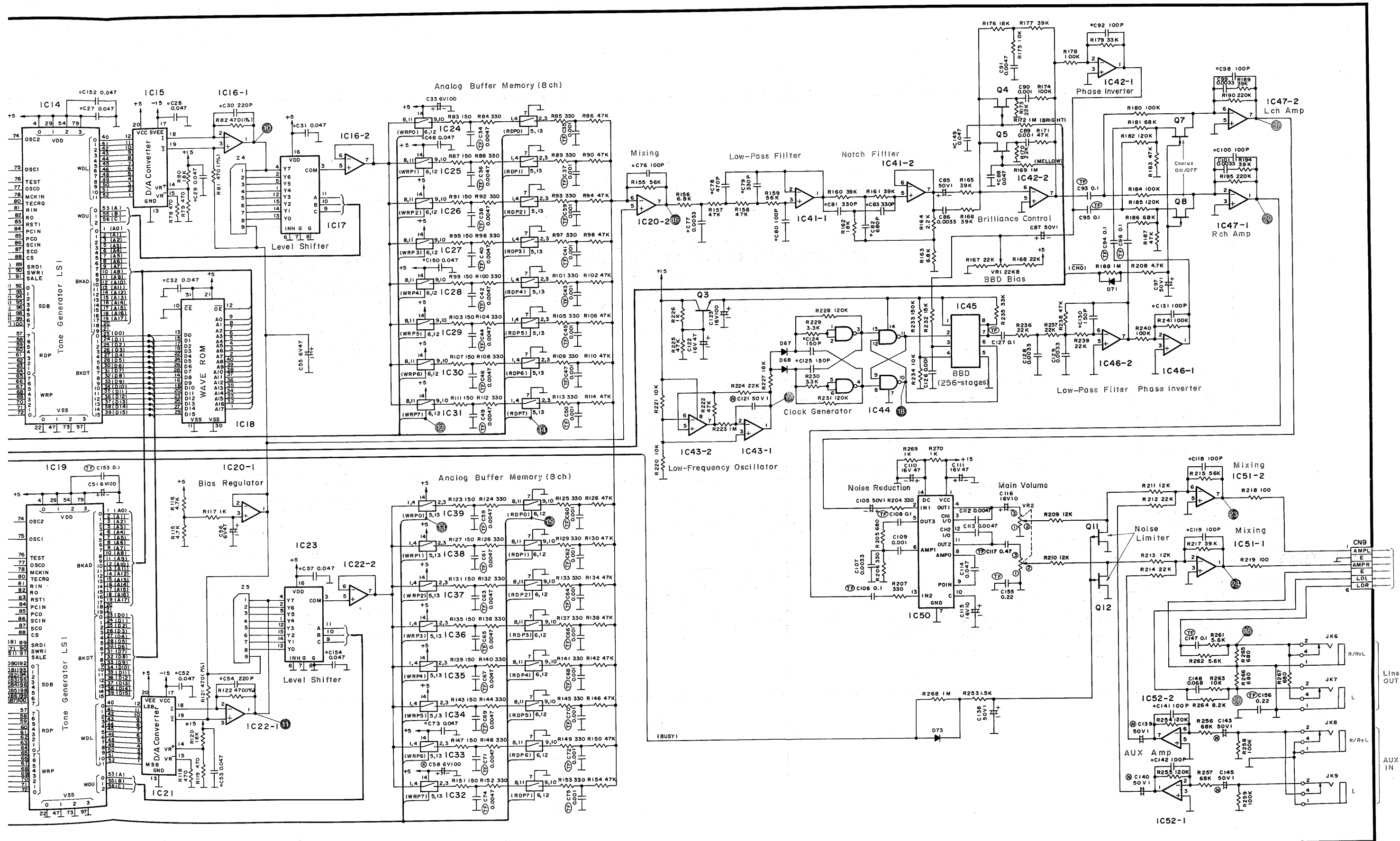


1 2 3 4 5 6 7 8 9 10

A  
B  
C  
D  
E  
F



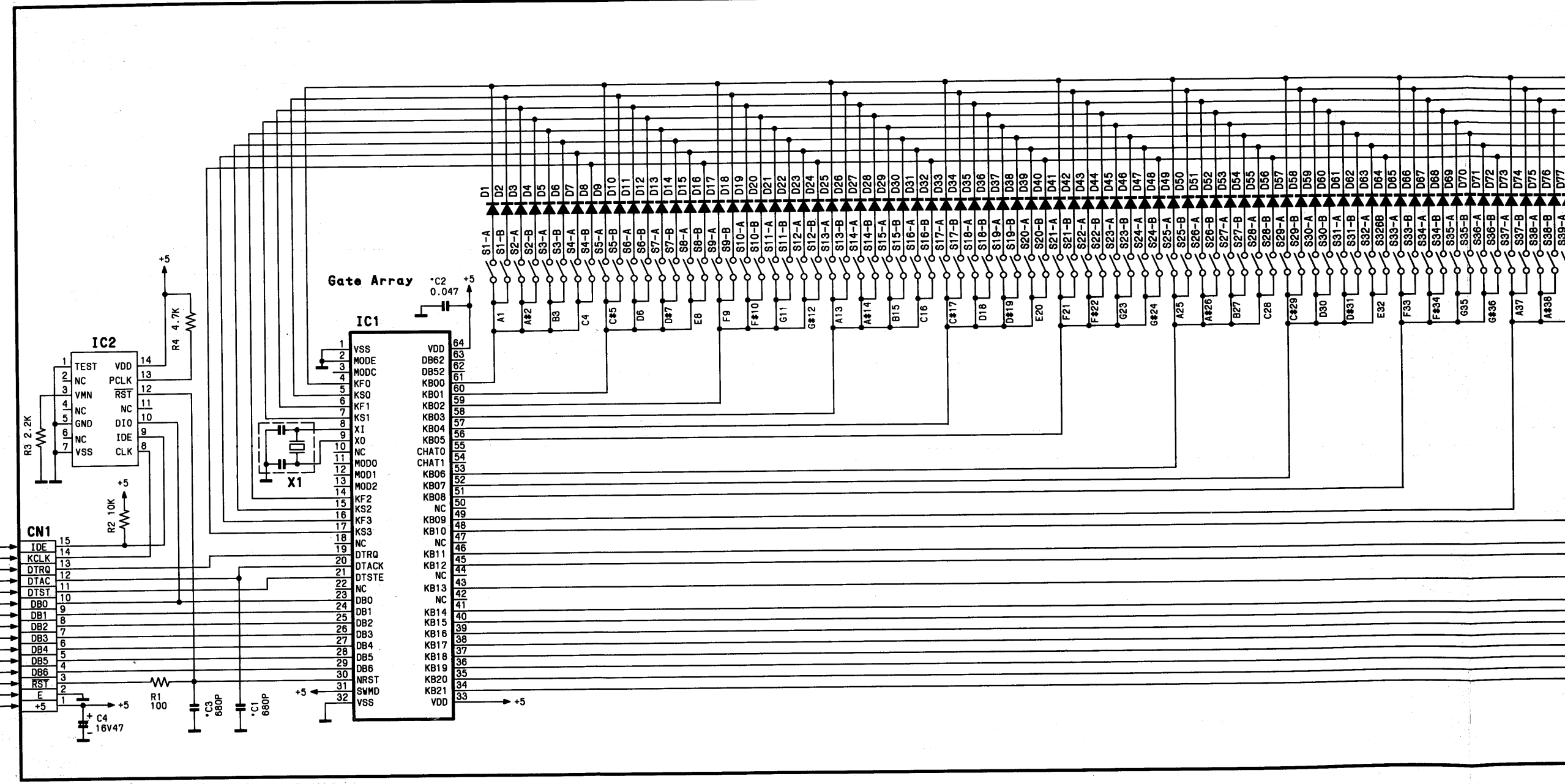




1 2 3 4 5 6 7 8 9 10

A  
B  
C  
D  
E  
F

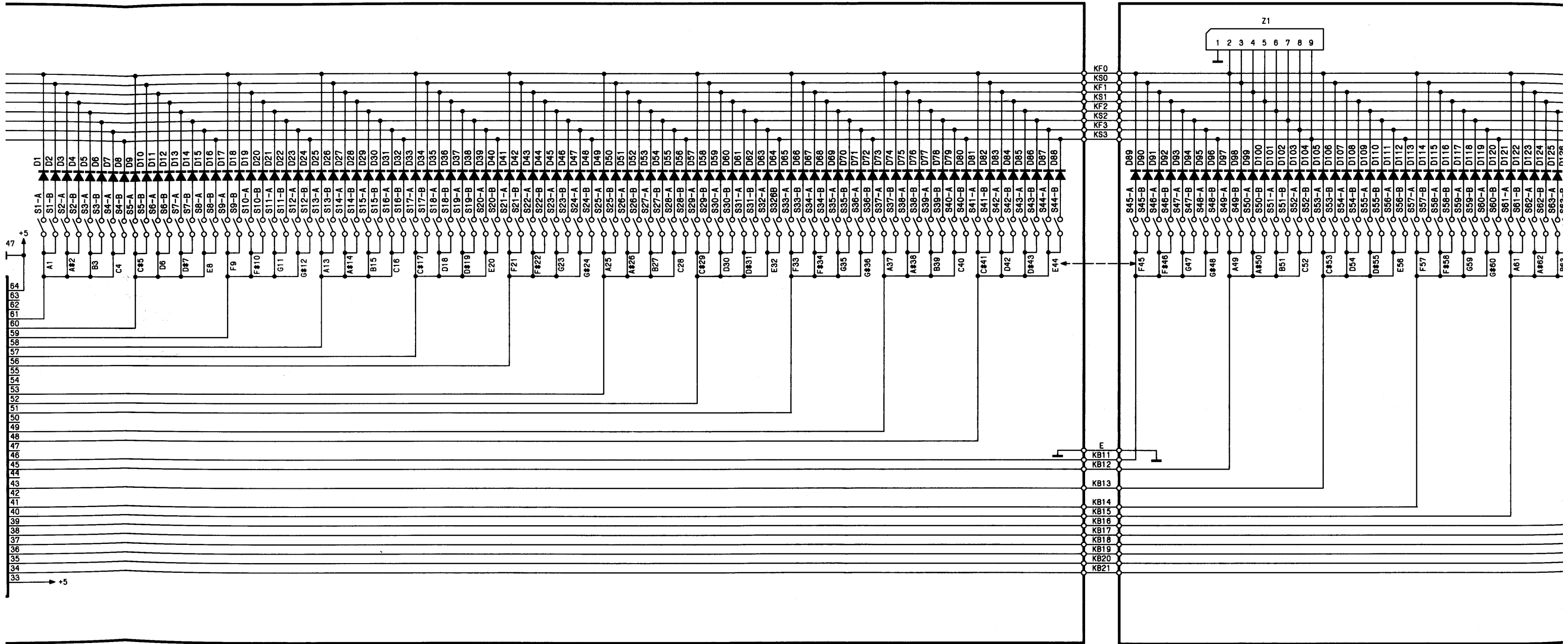
MAIN  
CN5



- NOTES:**
- IC'S: MN50020PGV
  - IC1: not supplied
  - IC2: not supplied
  - DIODES: MA162A
  - D1~176: MA162A

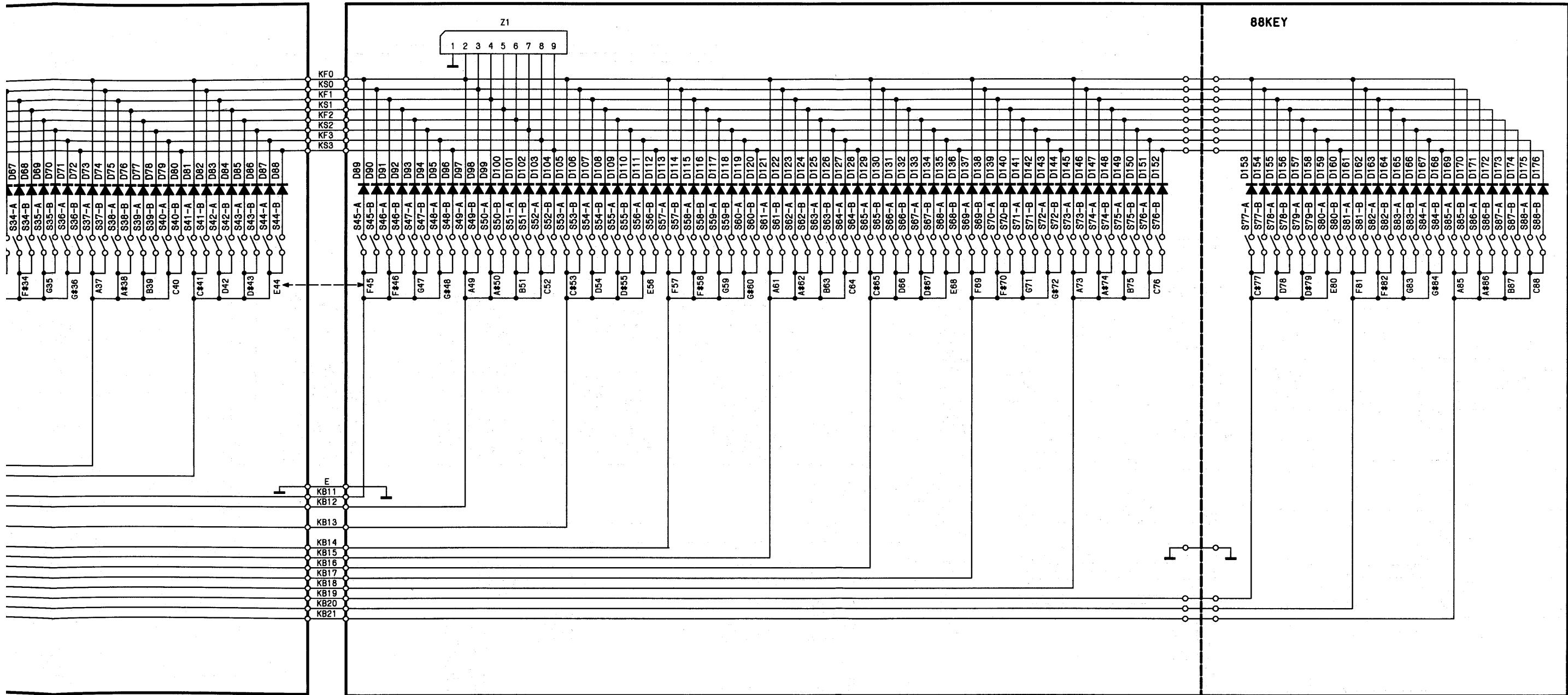
# RAM

5 6 7 8 9 10 11 12 13 14



**NOTES:**

- IC'S
- IC1: MN50020PGV
- IC2: not supplied
- DIODES
- D1~176: MA162A





■ The repair of the keyboard PCB and key switches.

The keyboards on the SX-PX30 employ an operating system which is unique to each unit. This system insures touch response accuracy.

To maintain that accuracy, please note the following points when repairing the keyboard:

1. When repairing the Rubber Contact Switches:

SSPG6003A (6 continuous)

SSPG7003A (7 continuous)

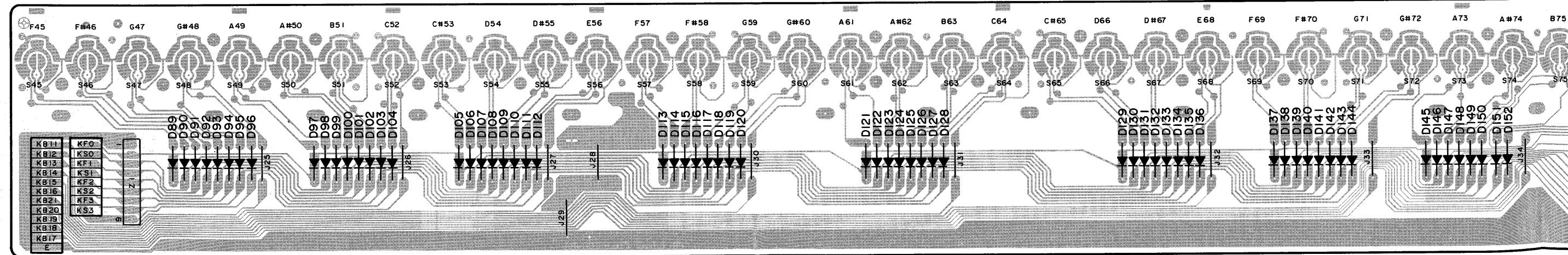
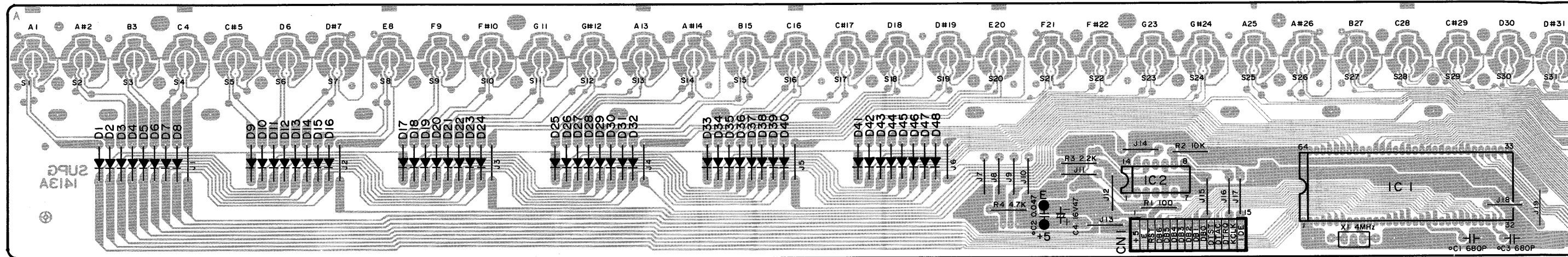
A. It is necessary to replace all of these switches if one of them becomes defective. (The replacement parts are selected for accuracy of touch response.)

B. Cut Jumper 15 on the Manual Keyboard P.C.B. to disconnect the Data ROM. (It is not necessary with the higher tolerance switches.)

2. If the Manual Keyboard P.C.B. needs to be replaced, due to physical damage, it is necessary to replace both keyboard P.C.B.'s at the same time.

3. The Data ROM (IC2) is matched to Rubber Contact Switches/P.C.B. combination and is not available separately. If this part should become defective cut jumper 15 or remove the part. To insure touch response accuracy it may be necessary to replace the Rubber Contact Switches. (See Step 1)

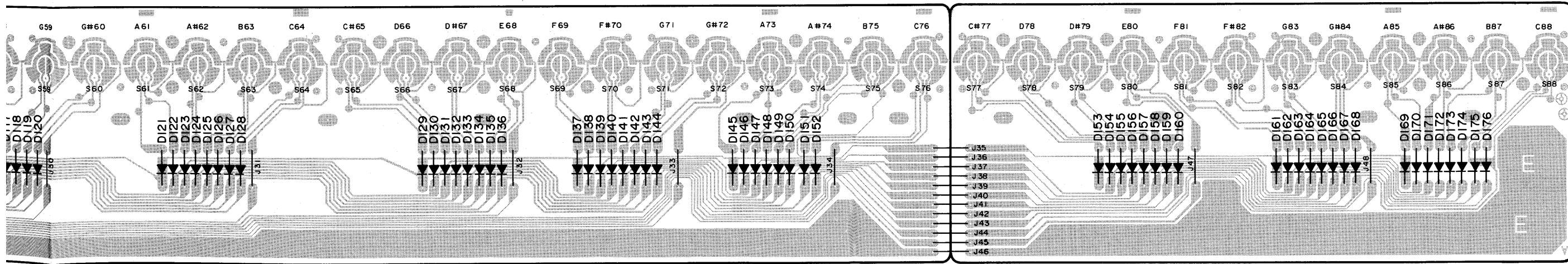
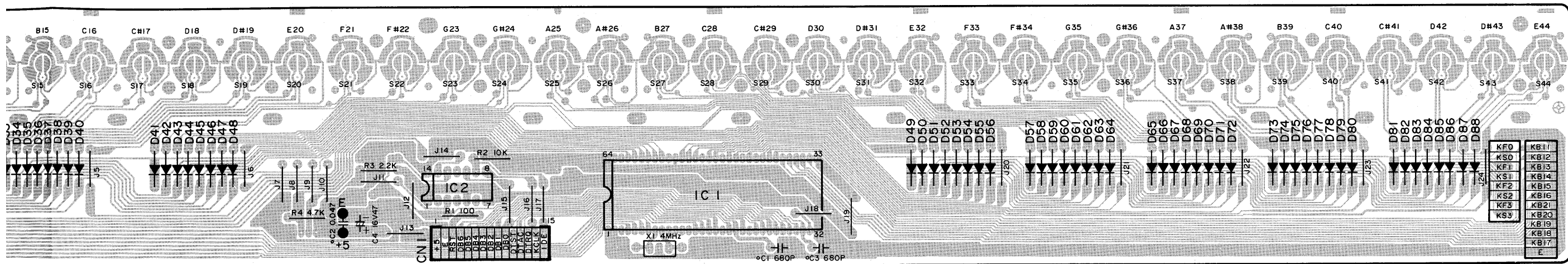
4. If the Manual Keyboard microprocessor (IC1) is defective, it can be replaced with a unit from parts. No special considerations are necessary.



- NOTES:
- IC'S MN50020PGV
  - IC1: not supplied
  - IC2:
  - DIODES MA162A
  - D1~176:

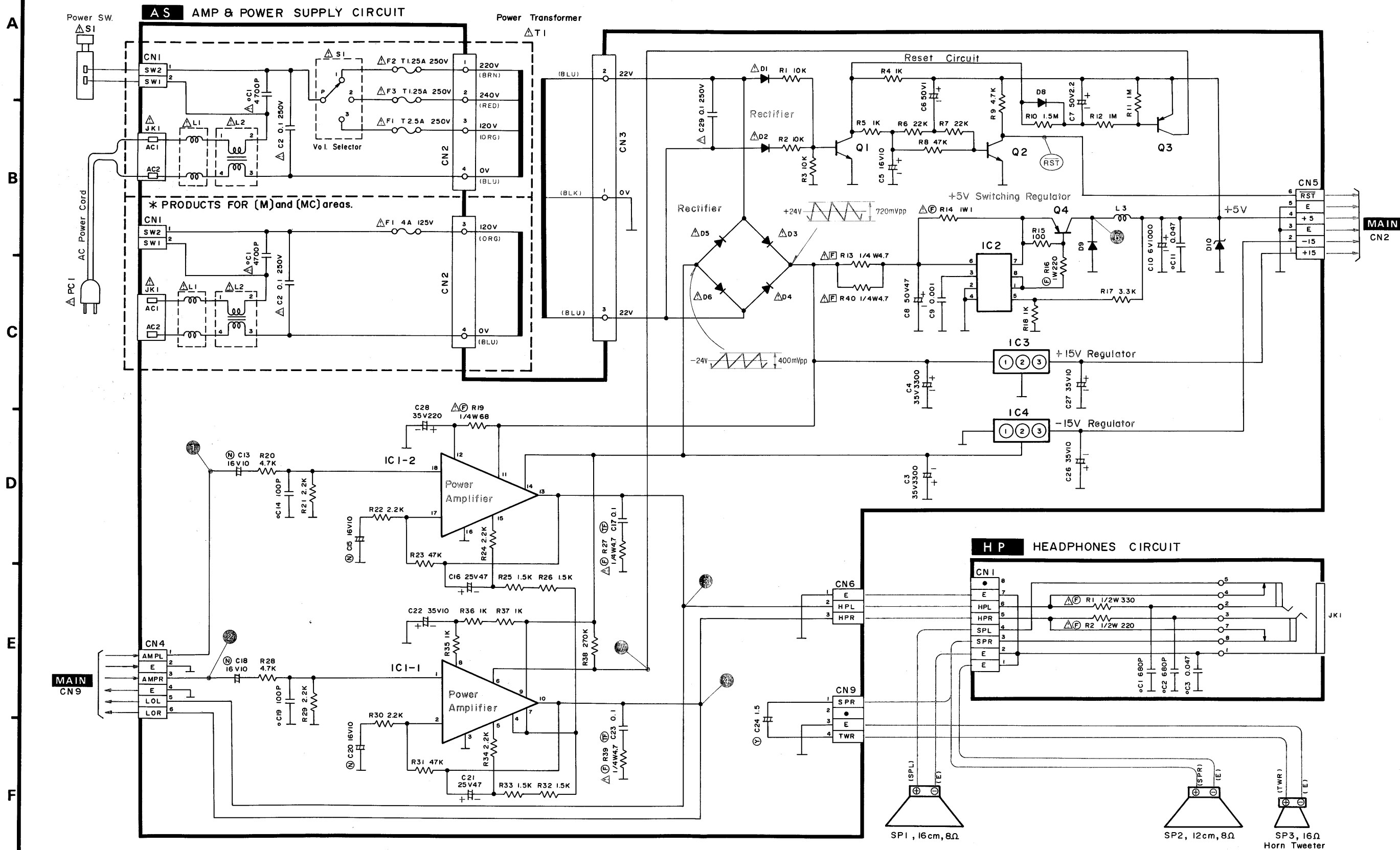
2. If the Manual Keyboard P.C.B. needs to be replaced, due to physical damage, it is necessary to replace both keyboard P.C.B.'s at the same time.
3. The Data ROM (IC2) is matched to Rubber Contact Switches/P.C.B. combination and is not available separately. If this part should become defective cut jumper 15 or remove the part. To insure touch response accuracy it may be necessary to replace the Rubber Contact Switches. (See Step 1)
4. If the Manual Keyboard microprocessor (IC1) is defective, it can be replaced with a unit from parts. No special considerations are necessary.

SXPG141311

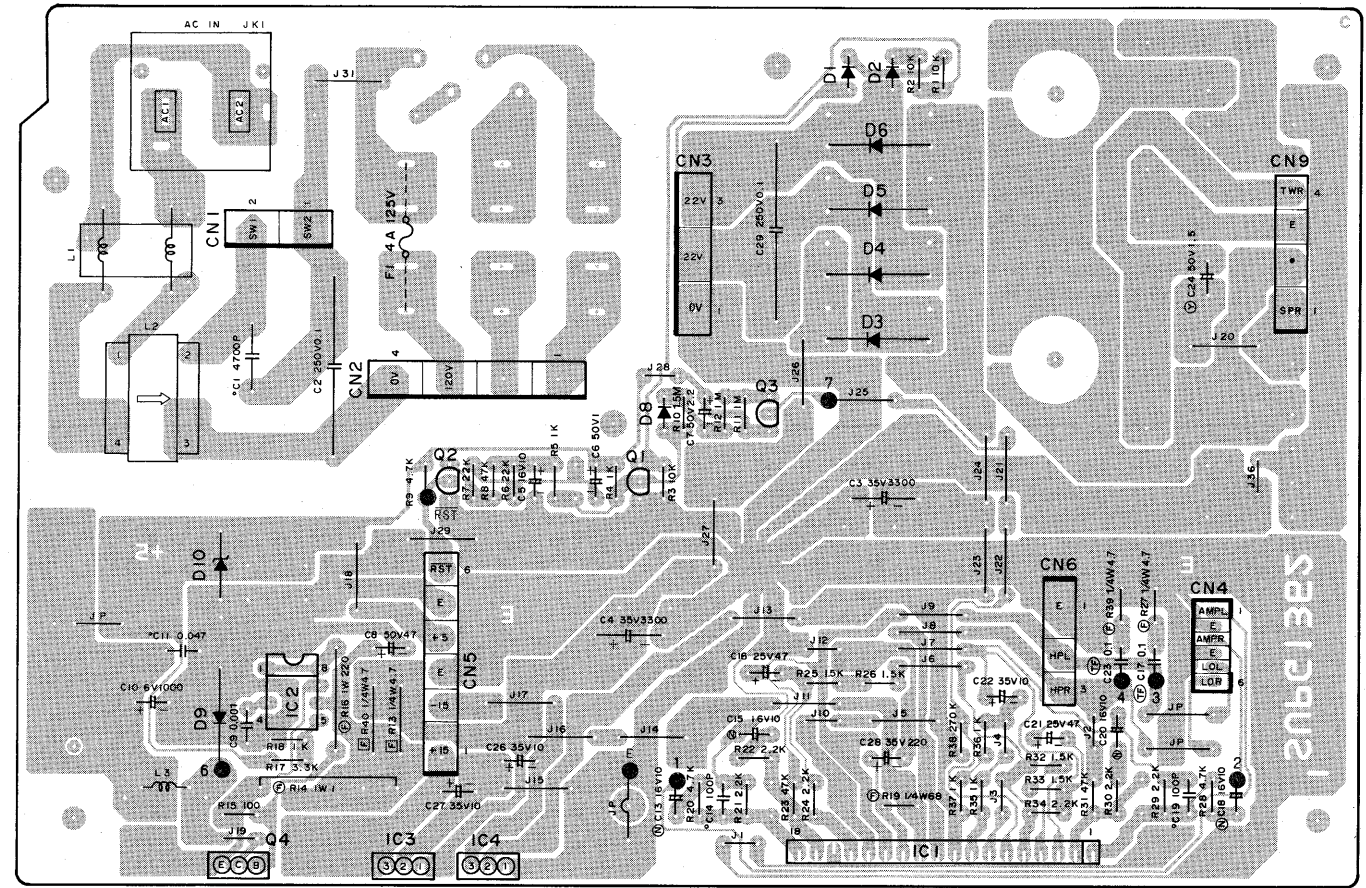
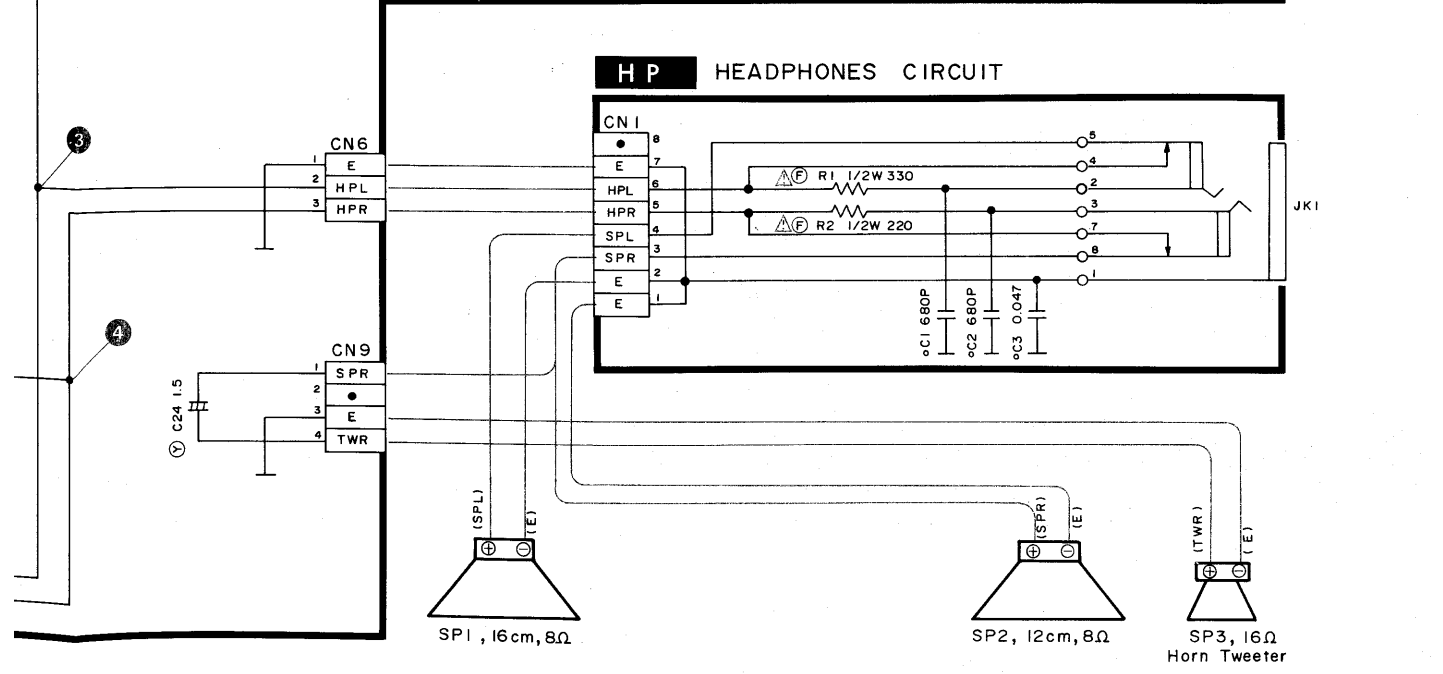
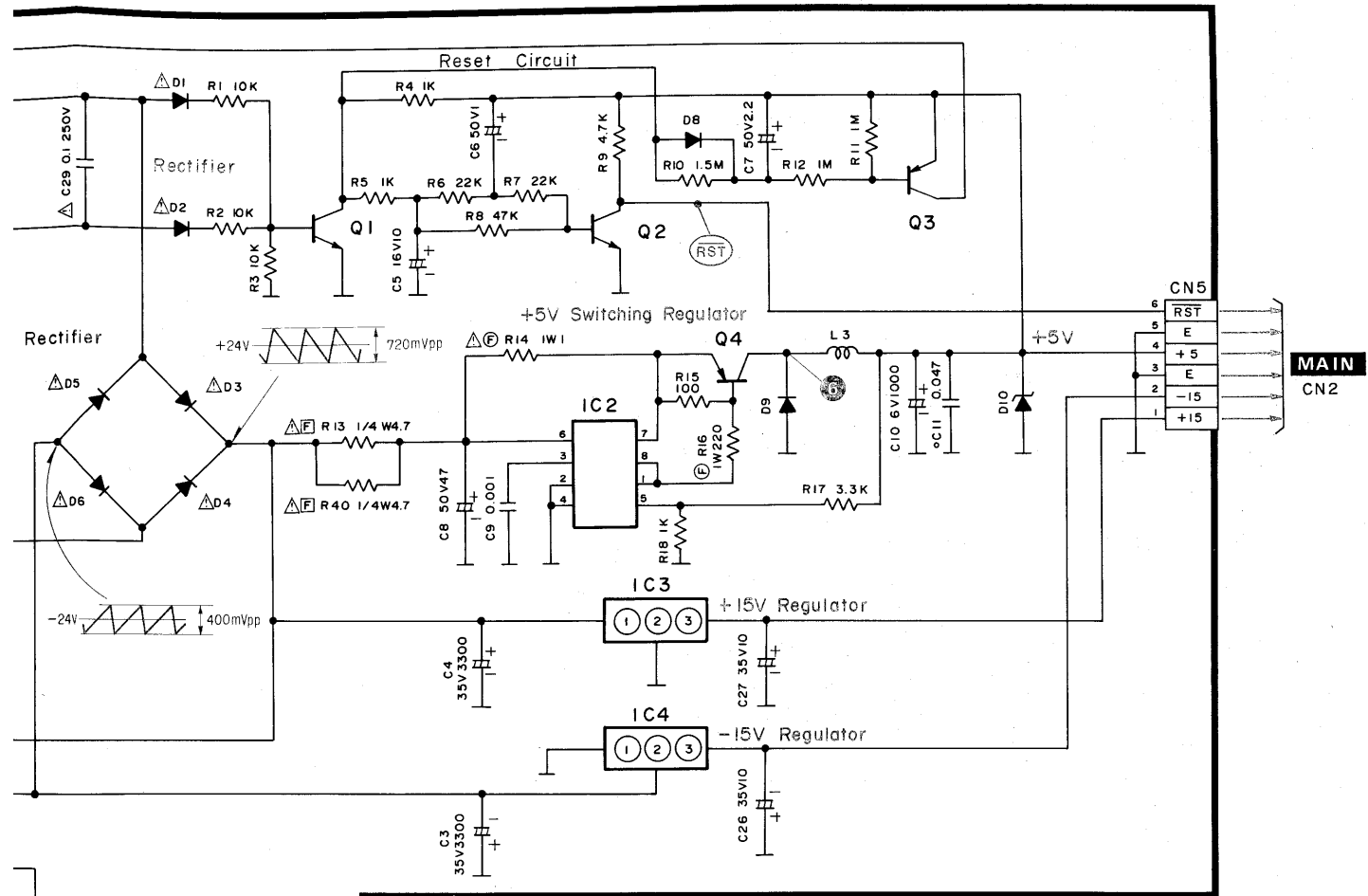


- NOTES:**
- IC'S
    - IC1: MN50020PGV
    - IC2: not supplied
  - DIODES
    - D1~176: MA162A





• Products for (M) and (MC) areas. SXP1362141



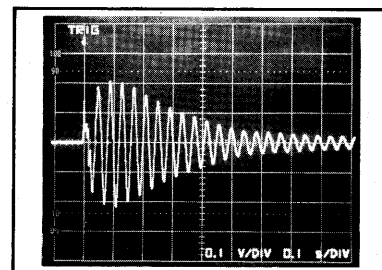
Measuring Conditions

- Tone.....Piano I
- Chorus.....OFF
- Keyboard.....C<sub>52</sub>
- Main Volume.....Max.
- Brilliance.....Mellow

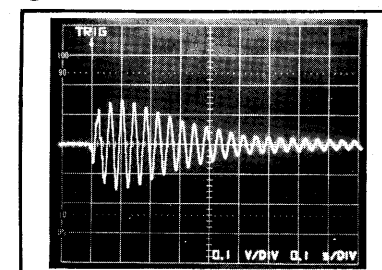
NOTES:

- IC'S
  - IC1: SVIGS4132M2M
  - IC2: SVIGM5291P
  - IC3: SVIGM5F7815
  - IC4: SVIGM5F7915
- TRANSISTORS
  - Q1, 2: 2SC2320LFG
  - Q3: 2SA1015-GR
  - Q4: 2SB953AQP
- DIODES
  - D1, 2: SVDGERA1502Y
  - D3~6: SVDS3V20
  - D7, 8: MA165TA5
  - D9: SVDGRK14
  - D10: MA2062LF
- FUSES
  - F1: XBA1C40NU100

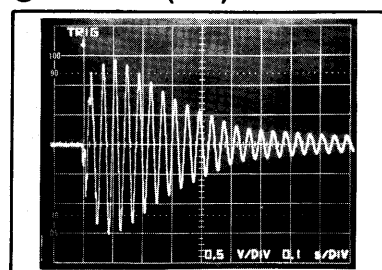
1 Lch



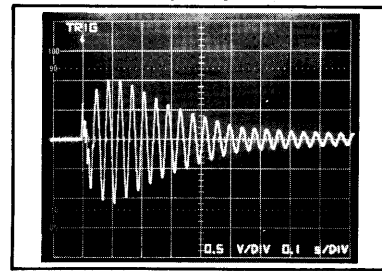
2 Rch



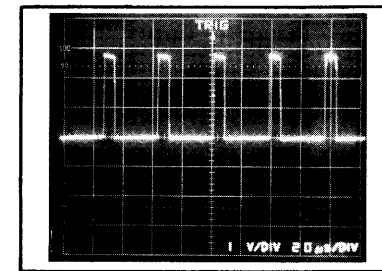
3 Line Out (Lch)



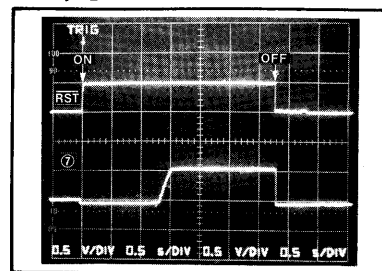
4 Line Out (Rch)



6



RST, 7



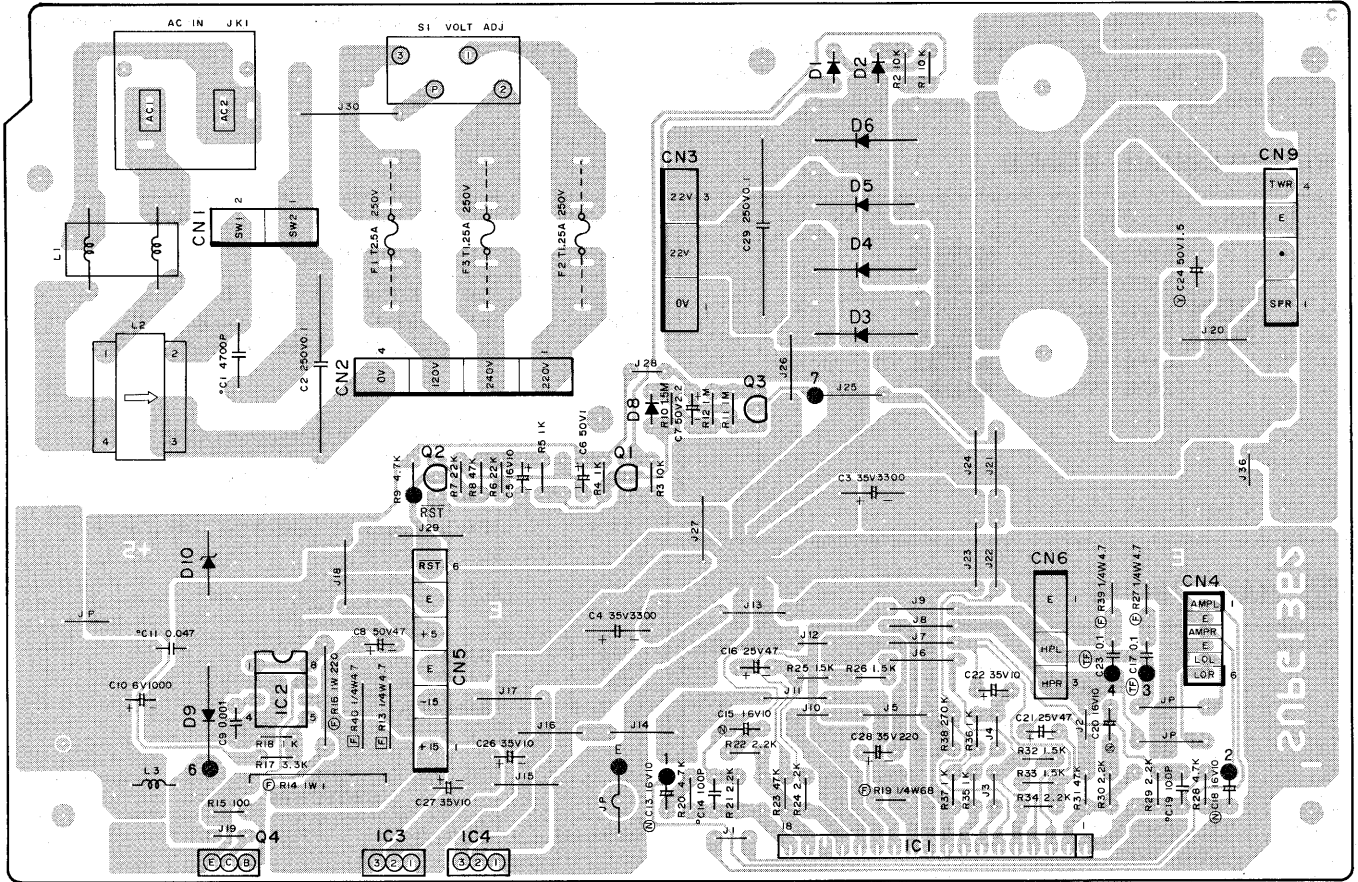
• Power SW.....ON - OFF

• Products for (XL) and (XR) areas

**SXPG1362131**

• Except for (XL) (XR) (M) (MC) areas

**SXPG1362121**

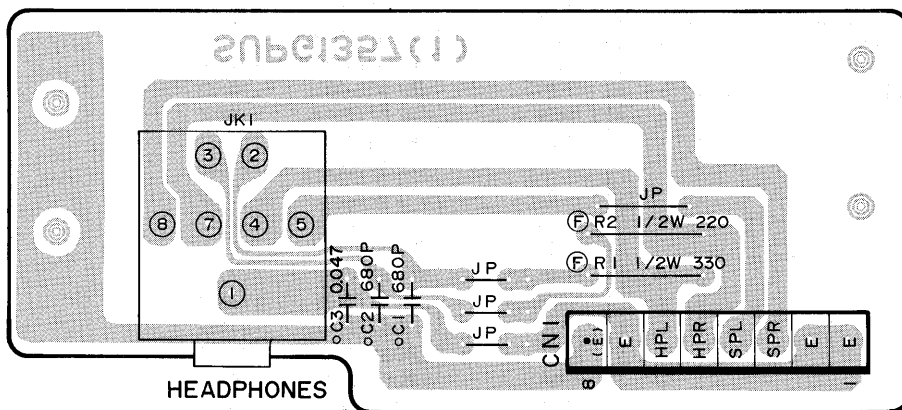


**NOTES:**

- IC'S
  - IC1: SVIGS4132M2M
  - IC2: SVIGM5291P
  - IC3: SVIGM5F7815
  - IC4: SVIGM5F7915
- TRANSISTORS
  - Q1, 2: 2SC2320LFG
  - Q3: 2SA1015-GR
  - Q4: 2SB953AQP
- DIODES
  - D1, 2: SVDGERA1502Y
  - D3~6: SVDS3V20
  - D7, 8: MA165TA5
  - D9: SVGGRK14
  - D10: MA2062LF
- FUSES
  - F1: XBA2C25TB0
  - F2, 3: XBA2C12TB0

**HP**

**HEADPHONES CIRCUIT BOARD**



**SXPG135721**

# REPLACEMENT PARTS LIST ..... P.C.B. and Wiring Parts

## Notes:

1. Printed circuit board assembly with mark (NLA) is not longer available after production discontinuation of the complete set.
2. Important safety notice  
Components identified by  $\Delta$  mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
3. The "S" mark is service standard parts and may differ from production parts.
4.  $\bigcirc$  mark are new parts.
5. For part No. with area mark, check the area when placing an order.

## PRINTED CIRCUIT BOARD

	NLA	Area	Part No.	Description	Per/Set
$\bigcirc$	NLA		SXPG141421	<b>MAIN</b>	1
$\bigcirc$	NLA		SXPG141311	<b>MKB</b>	1
$\bigcirc$	NLA	<b>M MC</b>	SXPG1362141	<b>AS</b>	1
$\bigcirc$	NLA	<b>XL XR</b>	SXPG1362131	<b>AS</b>	1
$\bigcirc$	NLA		SXPG1362121	<b>AS</b> Other areas	1
$\bigcirc$	NLA		SXPG135721	<b>HP</b>	1

## MAIN MAIN CIRCUIT

	Ref. No.	Part No.	Description	Per/Set
<b>INTEGRATED CIRCUITS</b>				
$\bigcirc$	IC1	SVIGM74LS07	Hex Buffers (O.C.)	1
	IC3	SVIGTLP513	Photo Coupler	1
	IC4	SVIG7810HCW	1 chip 8 bit Microcomputer	1
	IC5	SVIGM603A114	Gate Array	1
	IC7~10	SVIGM74LS174	Hex D-type Flip-Flops	4
$\bigcirc$	IC11	SVIG2PX30AX1	256K bit EP ROM	1
	IC13	SVIGD446C25	16K bit SRAM	1
	IC14, 19	MN6635	Digital Sound Processor	2
	IC15, 21	SVIGBA9221	12 bit D-A Converter	2
	IC16, 22	SVIGM5238L	Operational Amplifier	2
	IC17, 23	SVIGT74H4051	8-channel Multiplexer	2
$\bigcirc$	IC18	SVIGU3C04165	4M bit Mask ROM	1
	IC20, 41~43, 46, 47, 51, 52	SVIGM5218L	Operational Amplifier	8
	IC24~39	SVIGM74H4066	Quad Bilateral Switches	16
	IC44	SVIGMSM4011	2-input NAND Gate	1
	IC45	MN3009	BBD (256 stages)	1
	IC50	SVIGLM1894N	Dynamic Noise Reduction	1
	IC53	SVIGM74LS138	Decoder	1
<b>TRANSISTORS</b>				
S	Q1	2SA1015-GR	2SA933STRS	1
	Q2	2SA830SB		1
S	Q3	2SC2320LFG	2SC1310FG	1
	Q4, 5, 7, 8, 11, 12	2SJ105GR		6
<b>DIODES</b>				
	D9~15, 20~39, 67, 68, 71, 73	MA165TA5		31
$\bigcirc$	D40~63	LN282R	LED (Red)	24

	Ref. No.	Part No.	Description	Per/Set
<b>OSCILLATORS</b>				
	X1	SVQG49S1500T	15 MHz, Quartz Oscillator	1
	X2	EF0FC4004A3	4 MHz, Ceramic Oscillator	1
	X3	SVQG49S1600T	16 MHz, Quartz Oscillator	1
<b>COMPONENT COMBINATIONS</b>				
	Z1, 2	EXBP88472JM	4.7 K $\Omega$ $\times$ 8	2
	Z3	EXBP86472JM	4.7 K $\Omega$ $\times$ 6	1
	Z4, 5	EXKS14Z2073	1 K $\Omega$ /2 K $\Omega$ , Ladder Network	2
<b>JACKS</b>				
	JK2~4	SJSG1370A	Jack	3
	JK5	SJJG390A	Jack	1
	JK6~9	SJJG400A	Jack	4
<b>SWITCHES</b>				
	SW1~15	SSHG1046A	Push switch	15
<b>VARIABLE RESISTORS</b>				
$\bigcirc$	VR2	EWD06910B53G	5 K $\Omega$ B, Main Volume	1
	VR3	EVA06215B55G	500 K $\Omega$ B, TUNING VOLUME	1
<b>SEMI-FIXED RESISTOR</b>				
	VR1	EVSG0E1B223A	22 K $\Omega$ B	1
<b>RESISTORS</b>				
	R11	$\Delta$ ERD2FCJ6R8	6.8 $\Omega$ , 1/4W, Fuse Type	1
	R12, 13	ER0S2TKF1001	1 K $\Omega$ , $\pm$ 1%	2
	R14	ERDS2TJ102	1 K $\Omega$	1
	R15	ERDS2TJ151	150 $\Omega$	1
	R16	ERDS2TJ680	68 $\Omega$	1
	R17	ERDS2TJ221	220 $\Omega$	1
	R18	ERDS2TJ333	33 K $\Omega$	1
	R19	ERDS2TJ151	150 $\Omega$	1
	R20	ERDS2TJ680	68 $\Omega$	1
	R21	ERDS2TJ221	220 $\Omega$	1
	R22	ERDS2TJ333	33 K $\Omega$	1
	R23	ERDS2TJ221	220 $\Omega$	1
	R24	ERDS2TJ331	330 $\Omega$	1
	R25, 26	ERDS2TJ102	1 K $\Omega$	2
	R28, 29	ERDS2TJ103	10 K $\Omega$	2
	R32, 33	ERDS2TJ103	10 K $\Omega$	2
	R35	ERDS2TJ332	3.3 K $\Omega$	1
	R36	ERDS2TJ183	18 K $\Omega$	1
	R37~39	ERDS2TJ472	4.7 K $\Omega$	3
	R40, 41	ERDS2TJ103	10 K $\Omega$	2

Ref. No.	Part No.	Description	Per/Set	Ref. No.	Part No.	Description	Per/Set
R43	ERDS2TJ105	1MΩ	1	R160, 161	ERDS2TJ393	39KΩ	2
R44	ERDS2TJ102	1KΩ	1	R162	ERDS2TJ183	18KΩ	1
R45~47	△ ERD2FCG100	10Ω, 1/4W, Fuse Type	3	R163	ERDS2TJ682	6.8KΩ	1
R48	ERDS2TJ223	22KΩ	1	R164	ERDS2TJ222	2.2KΩ	1
R49	ERDS2TJ333	33KΩ	1	R165, 166	ERDS2TJ393	39KΩ	2
R50	ERDS2TJ473	47KΩ	1	R167, 168	ERDS2TJ223	22KΩ	2
R51	ERDS2TJ472	4.7KΩ	1	R169	ERDS2TJ105	1MΩ	1
R52~75	ERDS2TJ331	330Ω	24	R170	ERDS2TJ223	22KΩ	1
R78, 79	ERDS2TJ471	470Ω	2	R171	ERDS2TJ473	47KΩ	1
R80	ERDS2TJ183	18KΩ	1	R172	ERDS2TJ105	1MΩ	1
R81, 82	ER0S2TKF4700	470Ω, ±1%	2	R173	ERDS2TJ223	22KΩ	1
R83	ERDS2TJ151	150Ω	1	R174	ERDS2TJ104	100KΩ	1
R84, 85	ERDS2TJ331	330Ω	2	R175	ERDS2TJ103	10KΩ	1
R86	ERDS2TJ473	47KΩ	1	R176	ERDS2TJ183	18KΩ	1
R87	ERDS2TJ151	150Ω	1	R177	ERDS2TJ393	39KΩ	1
R88, 89	ERDS2TJ331	330Ω	2	R178	ERDS2TJ104	100KΩ	1
R90	ERDS2TJ473	47KΩ	1	R179	ERDS2TJ333	33KΩ	1
R91	ERDS2TJ151	150Ω	1	R180	ERDS2TJ104	100KΩ	1
R92, 93	ERDS2TJ331	330Ω	2	R181	ERDS2TJ683	68KΩ	1
R94	ERDS2TJ473	47KΩ	1	R182	ERDS2TJ124	120KΩ	1
R95	ERDS2TJ151	150Ω	1	R183	ERDS2TJ473	47KΩ	1
R96, 97	ERDS2TJ331	330Ω	2	R184	ERDS2TJ104	100KΩ	1
R98	ERDS2TJ473	47KΩ	1	R185	ERDS2TJ124	120KΩ	1
R99	ERDS2TJ151	150Ω	1	R186	ERDS2TJ683	68KΩ	1
R100, 101	ERDS2TJ331	330Ω	2	R187	ERDS2TJ473	47KΩ	1
R102	ERDS2TJ473	47KΩ	1	R188	ERDS2TJ105	1MΩ	1
R103	ERDS2TJ151	150Ω	1	R189	ERDS2TJ393	39KΩ	1
R104, 105	ERDS2TJ331	330Ω	2	R190	ERDS2TJ224	220KΩ	1
R106	ERDS2TJ473	47KΩ	1	R194	ERDS2TJ393	39KΩ	1
R107	ERDS2TJ151	150Ω	1	R195	ERDS2TJ224	220KΩ	1
R108, 109	ERDS2TJ331	330Ω	2	R204	ERDS2TJ331	330Ω	1
R110	ERDS2TJ473	47KΩ	1	R205	ERDS2TJ681	680Ω	1
R111	ERDS2TJ151	150Ω	1	R206, 207	ERDS2TJ331	330Ω	2
R112, 113	ERDS2TJ331	330Ω	2	R208	ERDS2TJ472	4.7KΩ	1
R114	ERDS2TJ473	47KΩ	1	R209~211	ERDS2TJ123	12KΩ	3
R115, 116	ERDS2TJ472	4.7KΩ	2	R212	ERDS2TJ223	22KΩ	1
R117	ERDS2TJ102	1KΩ	1	R213	ERDS2TJ123	12KΩ	1
R118, 119	ERDS2TJ471	470Ω	2	R214	ERDS2TJ223	22KΩ	1
R120	ERDS2TJ183	18KΩ	1	R215	ERDS2TJ563	56KΩ	1
R121, 122	ER0S2TKF4700	470Ω, ±1%	2	R217	ERDS2TJ393	39KΩ	1
R123	ERDS2TJ151	150Ω	1	R218, 219	ERDS2TJ101	100Ω	2
R124, 125	ERDS2TJ331	330Ω	2	R220, 221	ERDS2TJ103	10KΩ	2
R126	ERDS2TJ473	47KΩ	1	R222	ERDS2TJ473	47KΩ	1
R127	ERDS2TJ151	150Ω	1	R223	ERDS2TJ105	1MΩ	1
R128, 129	ERDS2TJ331	330Ω	2	R224	ERDS2TJ223	22KΩ	1
R130	ERDS2TJ473	47KΩ	1	R225	ERDS2TJ473	47KΩ	1
R131	ERDS2TJ151	150Ω	1	R226	ERDS2TJ102	1KΩ	1
R132, 133	ERDS2TJ331	330Ω	2	R227	ERDS2TJ183	18KΩ	1
R134	ERDS2TJ473	47KΩ	1	R228	ERDS2TJ124	120KΩ	1
R135	ERDS2TJ151	150Ω	1	R229, 230	ERDS2TJ332	3.3KΩ	2
R136, 137	ERDS2TJ331	330Ω	2	R231	ERDS2TJ124	120KΩ	1
R138	ERDS2TJ473	47KΩ	1	R232	ERDS2TJ153	15KΩ	1
R139	ERDS2TJ151	150Ω	1	R233	ERDS2TJ154	150KΩ	1
R140, 141	ERDS2TJ331	330Ω	2	R234	ERDS2TJ103	10KΩ	1
R142	ERDS2TJ473	47KΩ	1	R235	ERDS2TJ333	33KΩ	1
R143	ERDS2TJ151	150Ω	1	R236, 237	ERDS2TJ223	22KΩ	2
R144, 145	ERDS2TJ331	330Ω	2	R238	ERDS2TJ473	47KΩ	1
R146	ERDS2TJ473	47KΩ	1	R239	ERDS2TJ223	22KΩ	1
R147	ERDS2TJ151	150Ω	1	R240, 241	ERDS2TJ104	100KΩ	2
R148, 149	ERDS2TJ331	330Ω	2	R253	ERDS2TJ152	1.5KΩ	1
R150	ERDS2TJ473	47KΩ	1	R254, 255	ERDS2TJ124	120KΩ	2
R151	ERDS2TJ151	150Ω	1	R256, 257	ERDS2TJ683	68KΩ	2
R152, 153	ERDS2TJ331	330Ω	2	R258, 259	ERDS2TJ104	100KΩ	2
R154	ERDS2TJ473	47KΩ	1	R261, 262	ERDS2TJ562	5.6KΩ	2
R155	ERDS2TJ563	56KΩ	1	R263	ERDS2TJ103	10KΩ	1
R156	ERDS2TJ682	6.8KΩ	1	R264	ERDS2TJ822	8.2KΩ	1
R157, 158	ERDS2TJ473	47KΩ	2	R265~267	ERDS2TJ681	680Ω	3
R159	ERDS2TJ563	56KΩ	1	R268	ERDS2TJ105	1MΩ	1

Ref. No.	Part No.	Description	Per/Set	Ref. No.	Part No.	Description	Per/Set
R269, 270	ERDS2TJ102	1K $\Omega$	2	C79	ECCR1H331J	330pF	1
R271	ERDS2TJ103	10K $\Omega$	1	C80	ECCR1H101J	100pF	1
<b>CAPACITORS</b>							
C1	ECKR1E473ZV	0.047 $\mu$ F	1	C81	ECCR1H331J	330pF	1
C3	ECQV1H104JZ	0.1 $\mu$ F	1	C82	ECCR1H681J	680pF	1
C5, 6	ECKR1E473ZV	0.047 $\mu$ F	2	C83	ECCR1H331J	330pF	1
C7	ECEA1CU101	100 $\mu$ F, 16V	1	C85	ECEA1HU010	1 $\mu$ F, 50V	1
C8	ECKR1E473ZV	0.047 $\mu$ F	1	C86	ECQG1H332KZ	0.0033 $\mu$ F	1
C9	ECEA1CU101	100 $\mu$ F, 16V	1	C87	ECEA1HU010	1 $\mu$ F, 50V	1
C10	ECKR1E473ZV	0.047 $\mu$ F	1	C88	ECKR1E473ZV	0.047 $\mu$ F	1
C12, 13	ECKR1E473ZV	0.047 $\mu$ F	2	C89, 90	ECQG1H102KZ	0.001 $\mu$ F	2
C15	ECEA1HUR47	0.47 $\mu$ F, 50V	1	C91	ECQG1H472KZ	0.0047 $\mu$ F	1
C17	ECKR1E473ZV	0.047 $\mu$ F	1	C92	ECCR1H101J	100pF	1
C18, 19	ECEA1CU470	47 $\mu$ F, 16V	2	C93~96	ECQV1H104JZ	0.1 $\mu$ F	4
C20	ECEA0JU101	100 $\mu$ F, 6.3V	1	C97	ECEA1HU010	1 $\mu$ F, 50V	1
C21	ECEA1CK100		1	C98	ECCR1H101J	100pF	1
C22, 24	ECKR1E473ZV	0.047 $\mu$ F	2	C99	ECQG1H332KZ	0.0033 $\mu$ F	1
C27~29	ECKR1E473ZV	0.047 $\mu$ F	3	C100	ECCR1H101J	100pF	1
C30	ECCR1H221J	220pF	1	C101	ECQG1H332KZ	0.0033 $\mu$ F	1
C31, 32	ECKR1E473ZV	0.047 $\mu$ F	2	C105	ECEA1HU010	1 $\mu$ F, 50V	1
C33	ECEA0JU101	100 $\mu$ F, 6.3V	1	C106	ECQV1H104JZ	0.1 $\mu$ F	1
C34	ECQG1H472KZ	0.0047 $\mu$ F	1	C107	ECQG1H332KZ	0.0033 $\mu$ F	1
C35	ECQG1H102KZ	0.001 $\mu$ F	1	C108	ECQV1H104JZ	0.1 $\mu$ F	1
C36	ECQG1H472KZ	0.0047 $\mu$ F	1	C109	ECQG1H102KZ	0.001 $\mu$ F	1
C37	ECQG1H102KZ	0.001 $\mu$ F	1	C110, 111	ECEA1CU470	47 $\mu$ F, 16V	2
C38	ECQG1H472KZ	0.0047 $\mu$ F	1	C112, 113	ECQG1H472KZ	0.0047 $\mu$ F	2
C39	ECQG1H102KZ	0.001 $\mu$ F	1	C114	ECQM1H473KV	0.047 $\mu$ F	1
C40	ECQG1H472KZ	0.0047 $\mu$ F	1	C115, 116	ECEA1CU100	10 $\mu$ F, 16V	2
C41	ECQG1H102KZ	0.001 $\mu$ F	1	C117	ECQV1H474JZ	0.47 $\mu$ F	1
C42	ECQG1H472KZ	0.0047 $\mu$ F	1	C118, 119	ECCR1H101J	100pF	2
C43	ECQG1H102KZ	0.001 $\mu$ F	1	C121	ECEA1HN010S	1 $\mu$ F, 50V	1
C44	ECQG1H472KZ	0.0047 $\mu$ F	1	C122	ECEA1CU470	47 $\mu$ F, 16V	1
C45	ECQG1H102KZ	0.001 $\mu$ F	1	C123	ECEA1CU101	100 $\mu$ F, 16V	1
C46	ECQG1H472KZ	0.0047 $\mu$ F	1	C124, 125	ECCR1H151J	150pF	2
C47	ECQG1H102KZ	0.001 $\mu$ F	1	C126	ECQG1H102KZ	0.001 $\mu$ F	1
C48	ECKR1E473ZV	0.047 $\mu$ F	1	C127	ECQV1H104JZ	0.1 $\mu$ F	1
C49	ECQG1H472KZ	0.0047 $\mu$ F	1	C128, 129	ECQG1H332KZ	0.0033 $\mu$ F	2
C50	ECQG1H102KZ	0.001 $\mu$ F	1	C130	ECCR1H151J	150pF	1
C51	ECEA0JU101	100 $\mu$ F, 6.3V	1	C131	ECCR1H101J	100pF	1
C52, 53	ECKR1E473ZV	0.047 $\mu$ F	2	C138	ECEA1HU010	1 $\mu$ F, 50V	1
C54	ECCR1H221J	220pF	1	C139, 140	ECEA1HN010S	1 $\mu$ F, 50V	2
C55	ECEA0JU331	330 $\mu$ F, 6.3V	1	C141, 142	ECCR1H101J	100pF	2
C56	ECEA0JU470	47 $\mu$ F, 6.3V	1	C143	ECEA1HN010S	1 $\mu$ F, 50V	1
C57	ECKR1E473ZV	0.047 $\mu$ F	1	C145	ECEA1HN010S	1 $\mu$ F, 50V	1
C58	ECEA0JK101	100 $\mu$ F, 6.3V	1	C147	ECQV1H104JZ	0.1 $\mu$ F	1
C59	ECQG1H472KZ	0.0047 $\mu$ F	1	C148	ECQM1H683KV	0.068 $\mu$ F	1
C60	ECQG1H102KZ	0.001 $\mu$ F	1	C149, 150	ECKR1E473ZV	0.047 $\mu$ F	2
C61	ECQG1H472KZ	0.0047 $\mu$ F	1	C151	ECQV1H224JZ	0.22 $\mu$ F	1
C62	ECQG1H102KZ	0.001 $\mu$ F	1	C152	ECKR1E473ZV	0.047 $\mu$ F	1
C63	ECQG1H472KZ	0.0047 $\mu$ F	1	C153	ECQV1H104JZ	0.1 $\mu$ F	1
C64	ECQG1H102KZ	0.001 $\mu$ F	1	C154	ECKR1E473ZV	0.047 $\mu$ F	1
C65	ECQG1H472KZ	0.0047 $\mu$ F	1	C155, 156	ECQV1H224JZ	0.22 $\mu$ F	2
C66	ECQG1H102KZ	0.001 $\mu$ F	1	C157	ECKR1E473ZV	0.047 $\mu$ F	1
C67	ECQG1H472KZ	0.0047 $\mu$ F	1	C158	ECQV1H224JZ	0.22 $\mu$ F	1
C68	ECQG1H102KZ	0.001 $\mu$ F	1				
C69	ECQG1H472KZ	0.0047 $\mu$ F	1				
C70	ECQG1H102KZ	0.001 $\mu$ F	1				
C71	ECQG1H472KZ	0.0047 $\mu$ F	1				
C72	ECQG1H102KZ	0.001 $\mu$ F	1				
C73	ECKR1E473ZV	0.047 $\mu$ F	1				
C74	ECQG1H472KZ	0.0047 $\mu$ F	1				
C75	ECQG1H102KZ	0.001 $\mu$ F	1				
C76	ECCR1H101J	100pF	1				
C77	ECQG1H332KZ	0.0033 $\mu$ F	1				
C78	ECCR1H471J	470pF	1				

**MKB MANUAL KEYBOARD CIRCUIT**

Ref. No.	Part No.	Description	Per/Set
<b>INTEGRATED CIRCUIT</b>			
IC1	MN50020PGV	Gate Array	1
<b>DIODES</b>			
S D1~176	MA162A	MA150IR	176
<b>OSCILLATOR</b>			
X1	EF0FC4004A3	4MHZ, Ceramic Oscillator	1
<b>COMPONENT COMBINATION</b>			
Z1	EXBP88332JM	3.3K $\Omega$ × 8	1
<b>SWITCHES</b>			
○ S1~14, 45~58	SSPG6003A	Rubber Switch (6 continuous)	28
○ S15~49, 59~88	SSPG7003A	Rubber Switch (7 continuous)	65
<b>RESISTORS</b>			
R1	ERDS2TJ101	100 $\Omega$	1
R2	ERDS2TJ103	10K $\Omega$	1
R3	ERDS2TJ222	2.2K $\Omega$	1
R4	ERDS2TJ472	4.7K $\Omega$	1
<b>CAPACITORS</b>			
C1	ECCR1H681J	680pF	1
C2	ECKR1E473ZV	0.047 $\mu$ F	1
C3	ECCR1H681J	680pF	1
C4	ECEA1CU470	47 $\mu$ F, 16V	1

**AS AMP & POWER SUPPLY CIRCUIT**

Ref. No.	Part No.	Description	Per/Set
<b>INTEGRATED CIRCUITS</b>			
IC1	SVIGS4132M2M	Power Amplifier	1
IC2	SVIGM5291P	Switching Regulator	1
IC3	SVIGM5F7815	Voltage Regulator	1
IC4	SVIGM5F7915	Voltage Regulator	1
<b>TRANSISTORS</b>			
S Q1, 2	2SC2320LFG	2SC1310FG	2
S Q3	2SA1015-GR	2SA933STRS	1
Q4	2SB953AQP		1
<b>DIODES</b>			
D1, 2	△ SVDGERA1502Y	Rectifier	2
D3~6	△ SVDS3V20	Rectifier	4
D8	MA165TA5		1
D9	SVDGRK14		1
D10	MA2062LF	Zener	1

Ref. No.	Part No.	Description	Per/Set
<b>COILS &amp; LINE FILTER</b>			
L1	△ SLOG10W2D1	Coil	1
L2	△ SLTGLF3	Line Filter	1
L3	SLOG2A121TZ	Coil	1
<b>JACK</b>			
JK1	△ SJVD0203B	AC Inlet	1
<b>SWITCH</b>			
○ S1	△ SSRG100A	Voltage Selector Except for [M], [MC] areas	1
<b>FUSES</b>			
○ F1	M MC △ XBA1C40NU100	4A, 125V, [M] [MC] areas	1
○ F1	△ XBA2C25TB0	T2.5A, 250V Except for [M], [MC] areas	1
○ F2, 3	△ XBA2C12TB0	T1.25A, 250V	2
<b>RESISTORS</b>			
R1~3	ERDS2TJ103	10K $\Omega$	3
R4, 5	ERDS2TJ102	1K $\Omega$	2
R6, 7	ERDS2TJ223	22K $\Omega$	2
R8	ERDS2TJ473	47K $\Omega$	1
R9	ERDS2TJ472	4.7K $\Omega$	1
R10	ERDS2TJ155	1.5M $\Omega$	1
R11, 12	ERDS2TJ105	1M $\Omega$	2
R13	△ ERD2FCJ4R7	4.7 $\Omega$ , 1/4W, Fuse Type	1
R14	△ ERX1ANJP1R0S	1 $\Omega$ , 1W, Flame-Proof	1
R15	ERDS2TJ101	100 $\Omega$	1
R16	△ ERG1ANJP221S	220 $\Omega$ , 1W, Flame-Proof	1
R17	ERDS2TJ332	3.3K $\Omega$	1
R18	ERDS2TJ102	1K $\Omega$	1
R19	△ ERD25FVJ680	68 $\Omega$ , 1/4W, Flame-Proof	1
R20	ERDS2TJ472	4.7K $\Omega$	1
R21, 22	ERDS2TJ222	2.2K $\Omega$	2
R23	ERDS2TJ473	47K $\Omega$	1
R24	ERDS2TJ222	2.2K $\Omega$	1
R25, 26	ERDS2TJ152	1.5K $\Omega$	2
R27	△ ERD25FVJ4R7	4.7 $\Omega$ , 1/4W, Flame-Proof	1
R28	ERDS2TJ472	4.7K $\Omega$	1
R29, 30	ERDS2TJ222	2.2K $\Omega$	2
R31	ERDS2TJ473	47K $\Omega$	1
R32, 33	ERDS2TJ152	1.5K $\Omega$	2
R34	ERDS2TJ222	2.2K $\Omega$	1
R35~37	ERDS2TJ102	1K $\Omega$	3
R38	ERDS2TJ274	270K $\Omega$	1
R39	△ ERD25FVJ4R7	4.7 $\Omega$ , 1/4W, Flame-Proof	1
R40	△ ERD2FCJ4R7	4.7 $\Omega$ , 1/4W, Fuse Type	1
<b>CAPACITORS</b>			
C1	△ ECKCVA1472MF	4700pF, Line-Capacitor	1
C2	△ ECQU2A104MN	0.1 $\mu$ F, 250V, Across-the Line Capacitor	1
C3, 4	ECEA1VU332	3300 $\mu$ F, 35V	2
C5	ECEA1CU100	10 $\mu$ F, 16V	1
C6	ECEA1HU010	1 $\mu$ F, 50V	1
C7	ECEA1HU2R2	2.2 $\mu$ F, 50V	1
C8	ECEA1HU470	47 $\mu$ F, 50V	1
C9	ECQG1H102KZ	0.001 $\mu$ F	1
C10	ECEA0JU102	1000 $\mu$ F, 6.3V	1
C11	ECKR1E473ZV	0.047 $\mu$ F	1
C13	ECEA1CN100S	10 $\mu$ F, 16V	1
C14	ECCR1H101J	100pF	1

Ref. No.	Part No.	Description	Per/Set
C15	ECEA1CN100S	10 $\mu$ F, 16V	1
C16	ECEA1EU470	47 $\mu$ F, 25V	1
C17	ECQV1H104JZ	0.1 $\mu$ F	1
C18	ECEA1CN100S	10 $\mu$ F, 16V	1
C19	ECCR1H101J	100pF	1
C20	ECEA1CN100S	10 $\mu$ F, 16V	1
C21	ECEA1EU470	47 $\mu$ F, 25V	1
C22	ECEA1VU100	10 $\mu$ F, 35V	1
C23	ECQV1H104JZ	0.1 $\mu$ F	1
○ C24	ECEA50Y1R5	1.5 $\mu$ F, 50V	1
C26, 27	ECEA1VU100	10 $\mu$ F, 35V	2
C28	ECEA1VU221	220 $\mu$ F, 35V	1
C29	△ ECQE2A104MW	0.1 $\mu$ F, 250V	1

### HP HEADPHONES CIRCUIT

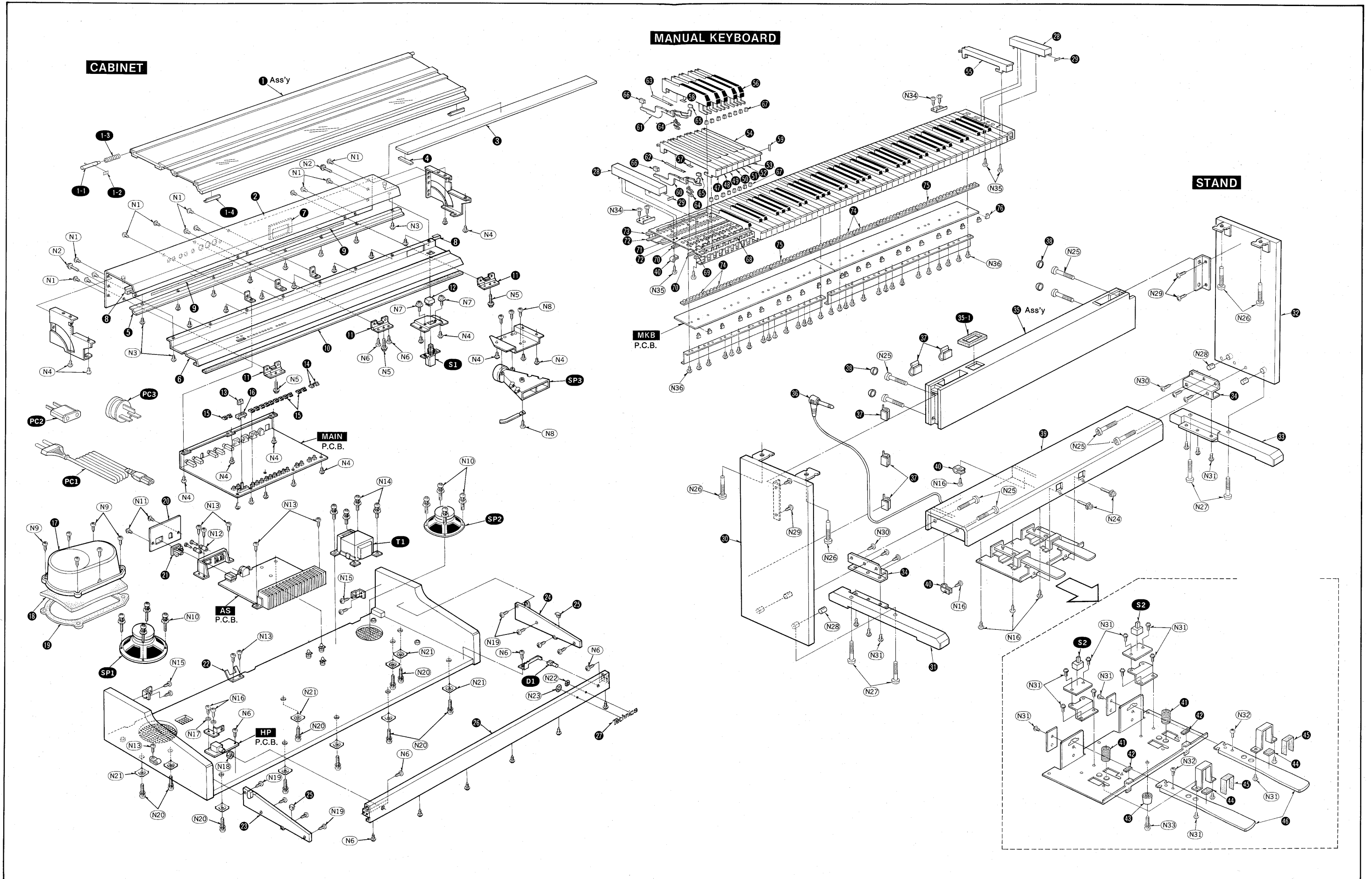
Ref. No.	Part No.	Description	Per/Set
<b>JACK</b>			
JK1	SJYG100A	Jack	1
<b>RESISTORS</b>			
R1	△ ERD50FJ331	330 $\Omega$ , 1/2W, Flame-Proof	1
R2	△ ERD50FJ221	220 $\Omega$ , 1/2W, Flame-Proof	1
<b>CAPACITORS</b>			
C1, 2	ECCR1H681J	680pF	2
C3	ECKR1E473ZV	0.047 $\mu$ F	1

### WIRING PARTS

Ref. No.	Part No.	Description	Per/Set
○ W1	SWKG03113LTA		1
W2	SWKG03103ZA		1
○ W3	SWKG06123ZA		1
○ W4	SWKG06124SSA		1
○ W5	SWKG08116ZA		1
○ W6	SWKG1516STA		1



# EXPLODED VIEWS OF CABINET



# REPLACEMENT PARTS LIST ..... Cabinet and Chassis Parts

- Notes:**
1. Important safety notice  
Components identified by  $\Delta$  mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
  2.  $\circ$  mark are new parts.
  3. For part No. with area mark, check the area when placing an order.

## ■ CABINET & CHASSIS PARTS

Ref. No.	Part No.	Description	Per/Set	Ref. No.	Part No.	Description	Per/Set
<b>SWITCHES</b>							
S1	$\Delta$ ESB8213V	Power Switch	1	$\circ$ 17	SHRG8371A	Speaker Cover	1
S2	SSHG1034A	Push Switch (Pedal)	2	18	SHSG9160A	Sound Absorbing Material	1
<b>SPEAKERS</b>							
SP1	EAS16PL403A	16cm, 8 $\Omega$	1	$\circ$ 19	SHRG7172A	Gasket	1
SP2	EAS12P241C	12cm, 8 $\Omega$	1	20	$\text{M MC}$ SMKG3051A	AC Panel	1
SP3	EAS8HH62A	Horn Tweeter, 16 $\Omega$	1	20	SMKG3050A	AC Panel, Other areas	1
<b>TRANSFORMER</b>							
$\circ$ T1	$\text{M MC}$ $\Delta$ SLTG5M31	Power Transformer	1	21	$\text{XL XR}$ SJS9334A	AC Inlet Cover	1
$\circ$ T1	$\Delta$ SLTG5M30	Power Transformer, Other areas	1	21	SJS9231A	AC Inlet Cover, Other areas	1
<b>POWER INDICATOR</b>							
D1	LN29RP	Power Indicator	1	$\circ$ 22	SUSG560A	Spring	1
<b>POWER CORD &amp; PLUG</b>							
PC1	$\Delta$ SJAG62	Power Cord	1	$\circ$ 23	SKEG7680A	Left Guide	1
$\text{M MC XT}$ PC1	$\Delta$ SJAG61	Power Cord	1	$\circ$ 24	SKEG7690A	Right Guide	1
$\text{XL XR}$ PC1	$\Delta$ SJAG39	Power Cord	1	$\circ$ 25	SHGG8490A	Rubber	2
$\text{EK XS XD}$ PC1	$\Delta$ SJAG41	Power Cord, Other areas	1	$\circ$ 26	SGXG2871A	Ornament	1
PC1	$\Delta$ SJAG41	Power Cord, Other areas	1	27	SGBG160A	Technics Badge	1
PC2	$\Delta$ SJP5213-1	Attachment Plug	1	$\circ$ 28	SGWG2210B	End Cover Panel	2
PC3	$\text{X XT}$ $\Delta$ SJPG1350A	Power Plug	1	$\circ$ 29	SHSG3690A	Felt (End Cover Panel)	2
<b>CABINET PARTS</b>				<b>STAND</b>			
$\circ$ 1	SKZG8460A	Keyboard Cover Ass'y	1	$\circ$ 30	SKSG2410A	Left Plank	1
$\circ$ 1-1	SNEG2310B	Shaft	1	31	SKLG250A	Left Leg	1
$\circ$ 1-2	SHSG5930A	Felt	1	$\circ$ 32	SKSG2420A	Right Plank	1
$\circ$ 1-3	SUSG550A	Spring	1	33	SKLG260A	Right Leg	1
$\circ$ 1-4	SHGG8500A	Rubber Pad	2	34	SUWG3060A	Metal Fittings	2
$\circ$ 2	SGWG1990A	Top Cover	1	$\circ$ 35	SKZG7790A	Horn Loaded Cabinet Ass'y	1
$\circ$ 3	SKZGE020A	Plank	1	$\circ$ 35-1	[ SHRGA7180A	Gasket	1
$\circ$ 4	SHSG6000A	Felt	1	$\circ$ 36	SWPG140A	Pedal Cord	1
$\circ$ 5	SGXG2930A	Ornament	1	37	SHRG9620A	Cord Clamper	5
$\circ$ 6	SGWG1920A	Control Panel	1	38	SNEG1760A	Cap	4
$\circ$ 7	SHSG3700A	Felt	1	$\circ$ 39	SKZGD840A	Pedal Box	1
$\circ$ 8	SHSG3670A	Felt	2	40	SHRG1070A	Cord Clamper	3
$\circ$ 9	SHSG3650A	Felt	2	41	SUSG440A	Spring	2
10	SHSG3430A	Felt (Red)	1	42	SHSG2790A	Felt	2
11	SBHG180A	Hinge	3	43	SKLG160A	Foot	1
12	SBCG110B	Power Switch Button	1	44	SHSG2770A	Felt	2
13	SBNG7050A	Knob (Slide Volume)	1	45	SHSG2750A	Felt	2
14	SBCG250B	Push Button (Gray)	2	46	STBG3100A	Pedal	2
15	SBCG250C	Push Button (Black)	13	<b>MANUAL KEYBOARD</b>			
16	SGEG260A	Ornament (Slide Volume)	2	$\circ$ 47	STBGA1050A	White Key (AA Key)	1
				$\circ$ 48	STBGA1060A	White Key (B Key)	8
				$\circ$ 49	STBGA1070A	White Key (C Key)	7
				$\circ$ 50	STBGA1080A	White Key (D Key)	7
				$\circ$ 51	STBGA1090A	White Key (E Key)	7
				$\circ$ 52	STBGA1100A	White Key (F Key)	7
				$\circ$ 53	STBGA1110A	White Key (G Key)	7
				$\circ$ 54	STBGA1120A	White Key (A Key)	7
				$\circ$ 55	STBGA1130A	White Key (CC Key)	1
				$\circ$ 56	STBG2920A	Black Key	36
				$\circ$ 57	SHSG3620A	Felt (White Key)	52
				$\circ$ 58	SHSG3630A	Felt (Black Key)	36
				$\circ$ 59	SHSG5910A	Felt (White Key)	52
				$\circ$ 60	STBG9261A	Hammer (White Key)	52
				$\circ$ 61	STBG9270A	Hammer (Black Key)	36
				$\circ$ 62	SUSG520A	Spring (White Key)	52
				$\circ$ 63	SUSG531A	Spring (Black Key)	36
				$\circ$ 64	STBG9280A	Fulcrum (Hammer)	88

■ PACKING PARTS

Ref. No.	Part No.	Description	Per/Set	Ref. No.	Part No.	Description	Per/Set
○ 65	SHGG9120A	Rubber Cap (Hammer)	88	○ 1	SPNG1990A	Upper Cover	1
○ 66	SHSG5760A	Felt (Hammer)	88	○ 2	SPNG5753A	Upper Pad (Left)	1
○ 67	SHRG9900A	Key Guide Rubber	88	○ 3	SPNG5754A	Upper Pad (Right)	1
○ 68	SHSG3451A	Felt	2	○ 4	SPNG5716A	Lower Pad (Left)	1
○ 69	SHSG3552A	Felt	2	○ 5	SPNG5717A	Lower Pad (Right)	1
○ 70	SHSG2670A	Felt	2	○ 6	SPNG2010A	Carton Box	1
○ 71	SHSG3530A	Felt	2	○ 7	SPHG2000A	Protection Sheet	1
○ 72	SHSG3461A	Felt	2	○ 8	SPHG1320A	Protection Sheet	1
○ 73	SHSG9312A	Felt	2	○ 9	SPHG1110A	Polyethylene Bag	1
○ 74	SSPG7003A	Rubber Switch (7 Continuous)	4	○ 10	SPNG5714A	Left Side Pad	1
○ 75	SSPG6003A	Rubber Switch (6 Continuous)	10	○ 11	SPNG5715A	Right Side Pad	1
○ 76	SHRG9751A	P.C.B. Spacer	24	○ 12	SPNG5752A	Pad	2
<b>SCREWS &amp; WASHERS</b>				○ 13	SPNG1998B	Carton	1
N1	XTW3+8LFZ	Screw	13	○ 14	SPNG2002A	Pad	1
N2	SNEG1880A	Screw with Washer	2	○ 15	SPHG2100A	Protection Sheet	2
N3	XTW3+8L	Screw	16	○ 16	SPHG1570A	Polyethylene Bag	2
N4	XTV3+8B	Screw	17	○ 17	SPHG1580A	Protection Sheet	2
N5	XYN3+F14FZ	Screw with Washer	3	○ 18	SPHG2010A	Protection Sheet	2
N6	XTB35+12AFZ	Screw	14	○ 19	SPHG2050A	Polyethylene Bag	2
N7	XYN3+F10FZ	Screw with Washer	2	○ 20	SPSG40A	Band	4
N8	XTB4+8A	Screw	4	<b>INSTRUCTION BOOK</b>			
N9	XTN5+12A	Screw	6	○ 21	EN EL SQFGA990	Instruction Book	1
N10	XYN3+F20	Screw with Washer	8	○ 21	M SQFGA980	Instruction Book	1
N11	XTW3+8JFZ	Screw	2	○ 21	SQFGA1010	Instruction Book, Other areas	1
N12	SNEG1700A	Nylon Latch, Except for [M] & [MC] areas	2	○ 22	SQFGA21450	Instruction Book (Stand)	1
N13	XTB35+12A	Screw	8				
N14	XYN4+F14	Screw with Washer	4				
N15	XTB35+16A	Screw	4				
N16	XTB35+14A	Screw	7				
N17	XWA4B	Washer	2				
N18	XNS12FZ	Nut	1				
N19	XTB3+16AFZ	Screw	8				
N20	XYN5+C25FZ	Screw with Washer	10				
N21	SNEG150B	Washer	10				
N22	SNEG1770A	Reating Ring	1				
N23	SNEG1780A	Reating Ring	1				
N24	XYN4+F16FZS	Screw with Washer	2				
N25	SNEG2280A	Bolt (Black)	8				
N26	SNEG2330A	Bolt (Brown)	4				
○ N27	SNEG2380A	Bolt (Yellow)	4				
N28	SNEG1710A	Nut	4				
N29	XTT4+25AFZ	Screw	4				
N30	XTT4+16AFZ	Screw	6				
N31	XTW3+8C	Screw	20				
N32	XSN3+10	Screw	2				
N33	XYN4+C25	Screw with Washer	1				
N34	XTT4+12A	Screw	4				
N35	XTT4+14A	Screw	4				
N36	XTW3+10TFZ	Screw	30				

# PACKING

