

# E-5

## INTELLIGENT SYNTHESIZER

# SERVICE NOTES

First Edition

ERRATA & SUPPLEMENT is attached at the end of the page.  
最終頁に正誤表&追加情報があります。

### SPECIFICATIONS

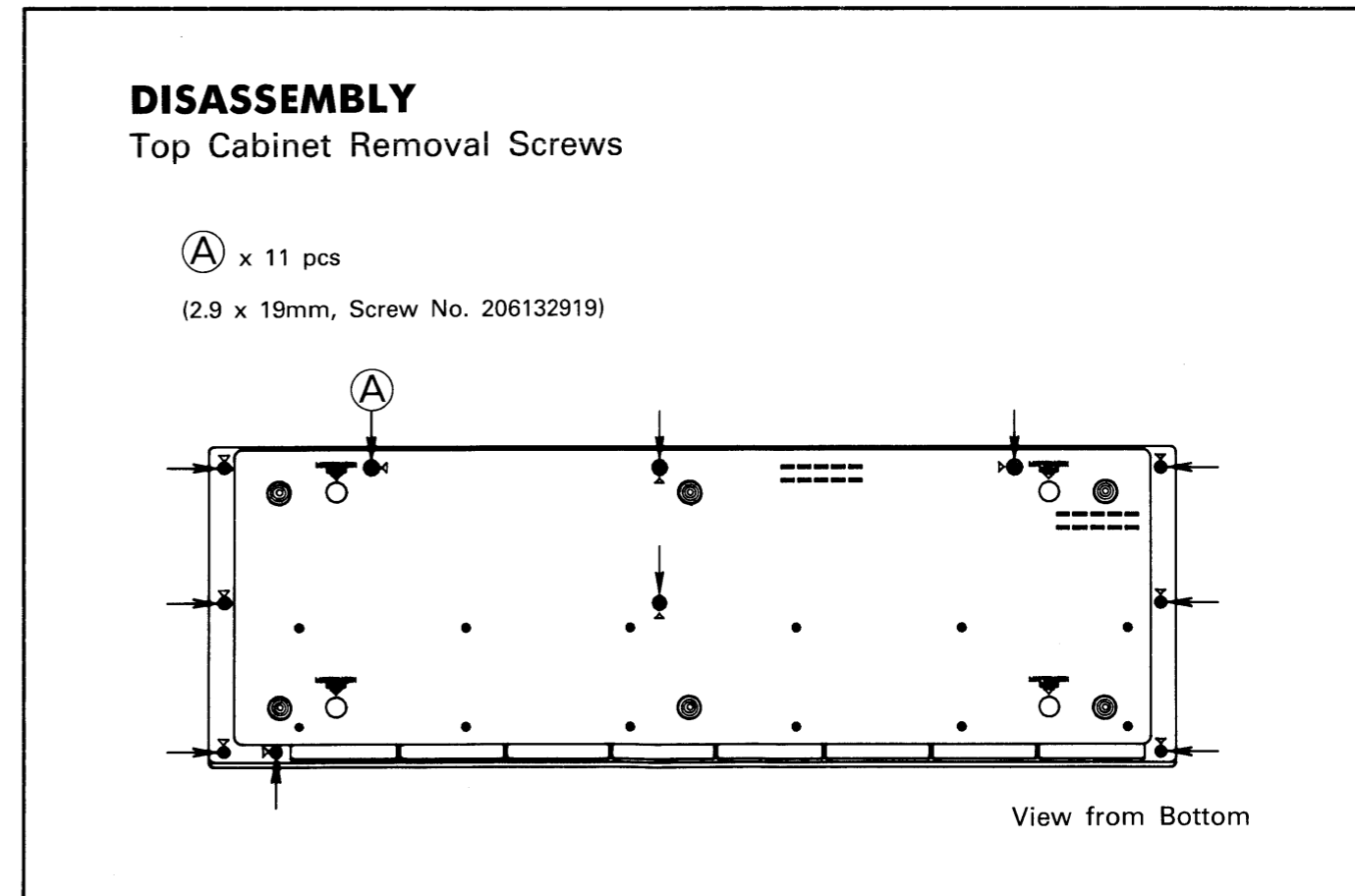
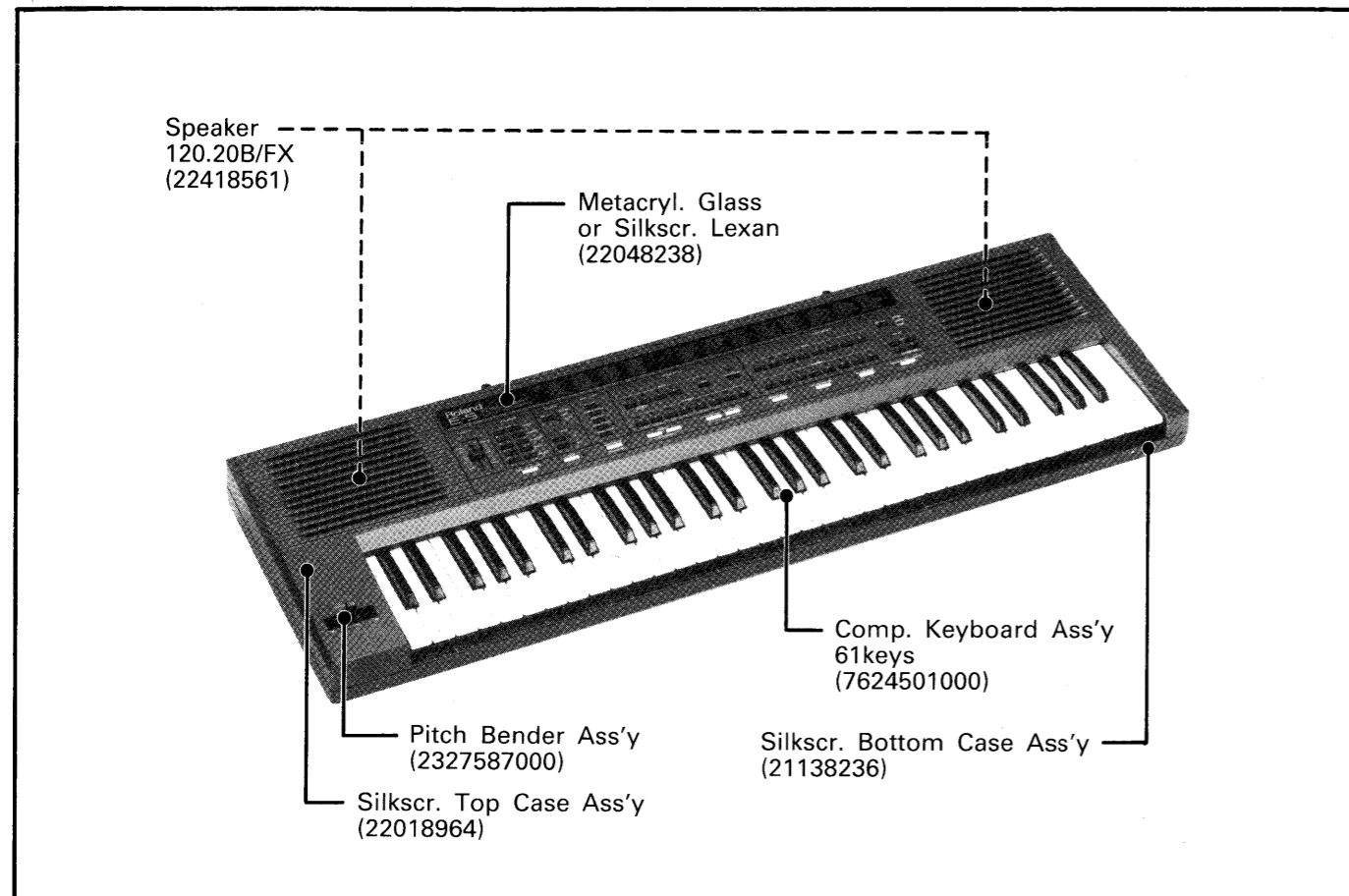
KEYBOARD	61 Keys Velocity Sensitive
SOUND SOURCE SYSTEM	LA Digital Synthesis
BUILT-IN EFFECTS	Digital Reverb(3types: Room, Hall, Delay)
<b>PANEL SWITCH/CONTROL</b>	
Pitch Bend/Modulation	
Volume	Master Volume Control
Balance	Upper, Lower, Accomp., Bass, Drum
Pitch	Transposer, Master Tune
Arranger	On/Off, Chord Intelligence, Memory, Sync Start, Sync Stop
Rhythm Section	Bank 1, 2, 3, 4, Demosong, Style-Card, Variation
Tone Select	Upper, Lower, Bass, Bank 1÷8, Number 1÷8
Reverb	Reverb Types (Room, Hall, Delay)
Real Time Switches	Manual Drum, Split, Fill-in to Variation, Fill-in to Original, Intro/Ending, Adv. Arranger, Start/Stop, Melody Intelligence, Break Mute, Tempo +/-
DISPLAY	48 LEDs Indicators
<b>REAR PANEL TERMINAL</b>	
AUX OUT (RIGHT/MONO, LEFT)	
MIDI OUT/THRU/IN	
HEADPHONE, DC 12V IN, POWER ON/OFF, Memory Style Card,	
PEDAL Footswitch Jack (for Sustain)	
BUILT-IN SPEAKERS	120mm x 2
POWER AMPLIFIER	5W x 2 (stereo)
WEIGHT	7kg + 1.4kg (AC/DC Adaptor)/16lbs 7oz + 3lbs 1oz (AC/DC Adaptor)
DIMENSIONS	963(W) x 320(D) x 95(H)mm/37-15/16(W) x 12-9/16(D) x 3-11/16 in.
POWER SUPPLY	External DC Power Supply 12V DC, 1.6A
<b>ACCESSORIES</b>	
	AC/DC Adaptor 12V DC, 2A
	ACJ100 (Part No. 22448613) 100V
	ACJ120 (Part No. 22448612) 117V
	ACJ220 (Part No. 22448611) 220V
	ACJ240E (Part No. 22448610) 240VE
	ACJ240A (Part No. 22448614) 240VA
	Music Rest N. 002 E-10/20 (Part No. 22198641)
	Owner's Manual English/Germ./French (Part No. 26038199)
	Japanese/Eng/Italian (Part No. 26038200)
<b>OPTIONS</b>	
	Stereo Expression Pedal FV-200
	Keyboard Stand KS-8
	Style Memory Card RXN E-series type
	Pedal Footswitch DP-2

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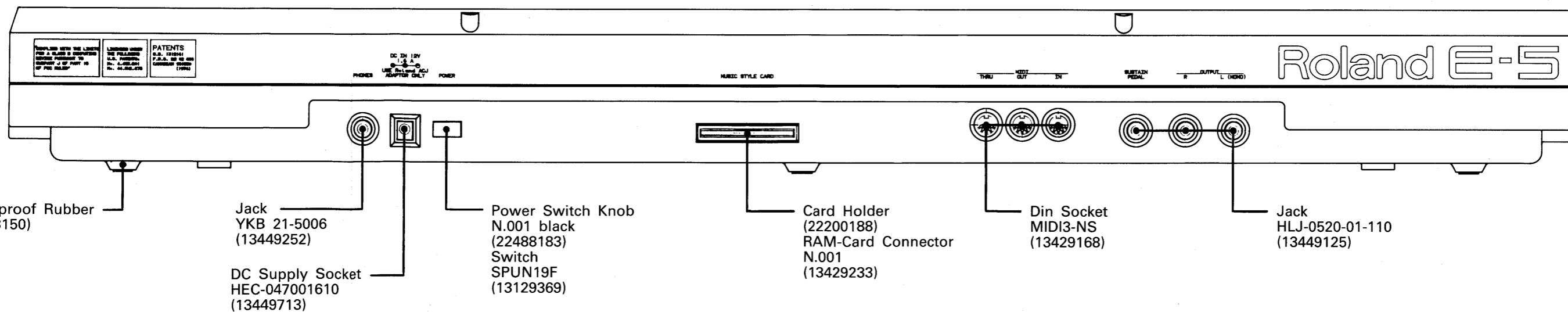
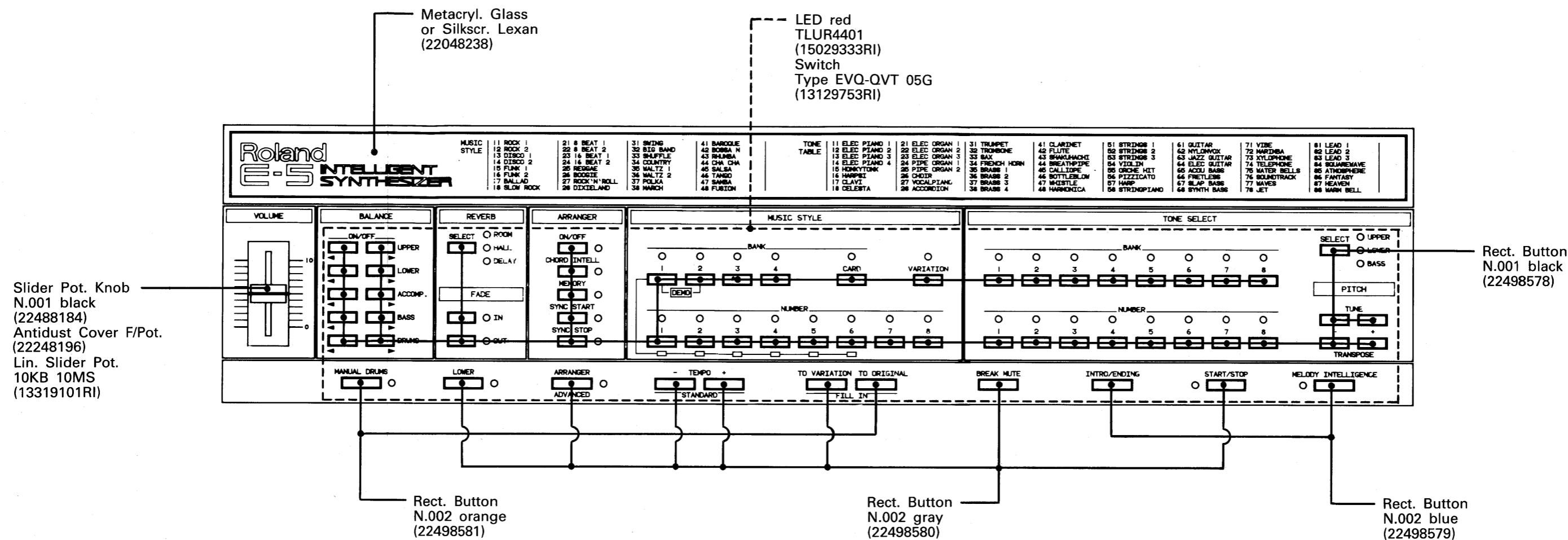
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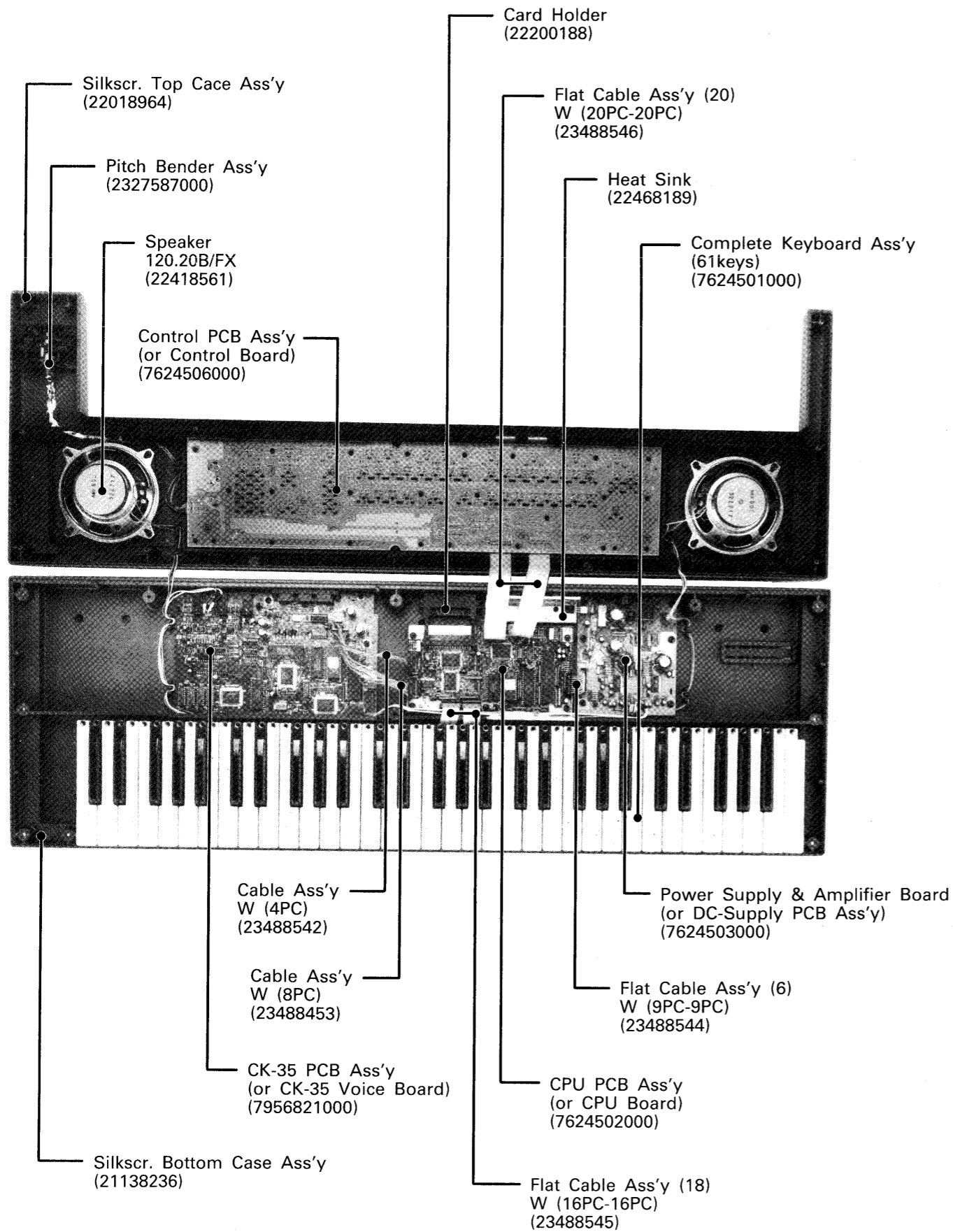


LOCATION OF CONTROLS/パネル配置図



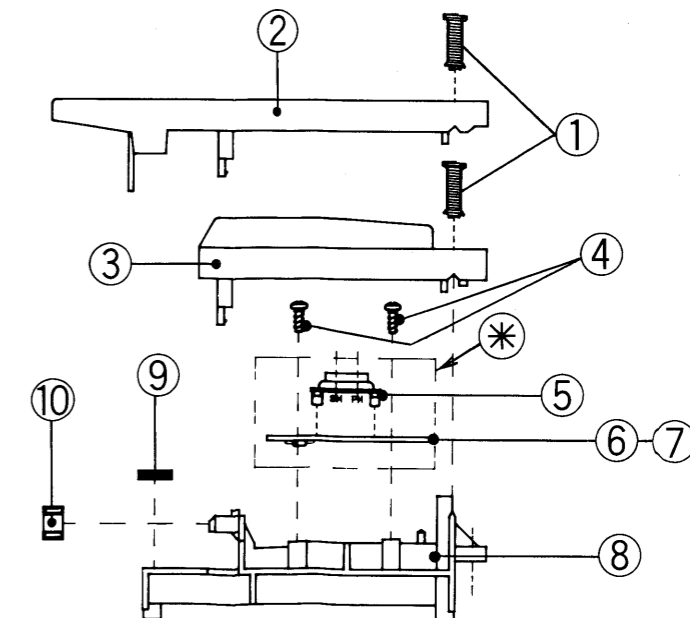
**EXPLODED VIEW/分解図**

**KEYBOARD/鍵盤**



**COMP. KEYBOARD ASS'Y (61 keys)**  
ASSY 7624501000

No.	PART No.	PART NAME	
1	22178226	Key Spring	キースプリング
2	22578312 22578314 22578315 22578316 22578317 22578310 22578311 22578313	Natural Key C5 (DO) Natural Key D6 (RE) Natural Key E7 (MI) Natural Key F1 (FA) Natural Key G2 (SOL) Natural Key A3 (LA) Natural Key B4 (SI) Natural Key C8 (DO*)	白鍵
3	22578318	Sharp Key	黒鍵
4	*****	Self Tap. Screw 2.9 x 8mm TC TC PR BZ (Screw No. 206132908)	タッピングビス
5	22185238 22185239 22188245 22188246	12P Rubber Contact 13P Rubber Contact 4P Rubber Contact 8P Rubber Contact	ゴム接片
6 (*)	7624504000	Contact PCB R Ass'y (w/Rubber Contact)	コンタクト PCB R 基板 (含ゴム接片)
7 (*)	7624505000	Contact PCB L Ass'y (w/Rubber Contact)	コンタクト PCB L 基板 (含ゴム接片)
8	22818746	Plastic Chassis N.001 (E-5)	プラスチックシャーシ
9	22358151	Adhesive Rubber 8 x 2.5mm 848mm	接着剤付ゴム
10	22158789	Guide Bushing (E-5)	ガイドブッシュ



## PARTS LIST

## SAFETY PRECAUTIONS:

The parts marked  $\Delta$  have safety-related characteristics. Use only listed parts for replacement.

## 安全上の注意:

$\Delta$ が付いている部品は、安全上特別な規格でつくられたものです。交換の際は、指定された部品番号以外の部品は使わないようにして下さい。

## CONSIDERATIONS ON PARTS ORDERING

When ordering any parts listed in the parts list, please specify the following items in the order sheet.

QTY	PART NUMBER	DESCRIPTION	MODEL NUMBER
Ex. 10	22575241	Sharp Key	C-20/50
15	2247017300	Knob (orange)	DAC-15D

Failure to completely fill the above items with correct number and description will result in delayed or even undelivered replacement.

## パーツ発注に関するお願い

オーダーシートには、必ず下記の4項目は正確に記入して下さい。(例外は除く)

必要数	パーツナンバー	品名	使用機種
例) 10	22575241	Sharp Key	C-20/50
15	2247017300	Knob (orange)	DAC-15D

もし記入漏れ、誤記等がある場合、必要部品が発送出来なかったり、大幅な遅れの原因になります。御協力をお願いします。

## CASING ケース

21138236	Silkscr. Bottom Case Assy	E-5
22018964	Silkscr. Top Case Assy	E-5
22048238	Silkscr. Lexan (or Metacryl. glass)	E-5

## HOLDER ホルダー

22208320	Music Score Holder
22200188	Card Holder

## KNOB, BUTTON ツマミ, ボタン

22488184	Slider Pot. Knob N.001 black	VOLUME
22488183	Power Switch Knob N.001 black	POWER
22498578	Rect. Button N.001 black	
22498580	Rect. Button N.002 gray	
22498581	Rect. Button N.002 orange	
22498579	Rect. Button N.002 blue	

## SWITCH スイッチ

$\Delta$ 13129369	Switch SPUN 19F	E-5	POWER
13129753RI	Switch Type EVQ-QVT 05G		

## SPEAKER スピーカー

22418561	Speaker 4 ohm 120.20B/FX
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## KEYBOARD 鍵盤

7624501000	Comp.Keyboard Assy	E-5
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Refer to "Keyboard Parts List" for details.  
詳細は"鍵盤パーツリスト"を参照のこと。

## BENDER UNIT ベンダーユニット

2327587000	Pitch Bender Ass'y	E-20
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## JACK, SOCKET ジャック, ソケット

13449713	DC Supply Socket HEC-047001610		
13449252	Jack Socket YKB 21-5006		
13429823RI	Power Socket Block		
13449125	Jack HLT-0520-01-110	CK35 JK1,2,5	OUTPUT L(MONO)/R, Foot Pedal
13429168	DIN Socket MID13-NS	CK35 JK3	MIDI IN/OUT/THRU

## TRANSISTOR トランジスター

15119154RI	Transistor BC/549-B	NPN	
15119113	2SA-1015GR		CK35 Q6, 9
15119419	2SA-935Q		CK35 Q4
15129114	2SC-1815GR		CK35 Q5, 7, 8
15129136	2SC-2878A		CK35 Q1,1A,2,2A
15129602	2SD-667C		CK35 Q3

## PCB ASSY 基板

$\Delta$ 7624502000	CPU PCB Ass'y ( or CPU Board )	E-5
$\Delta$ 7956821000	CK-35 PCB Ass'y (pcb 2292081500) ( or CK-35 Voice Board )	Made in Italy
7624506000	Control PCB Ass'y ( or Control Board )	E-5
7624503000	Power Supply & Amplifier Board ( or DC-Supply PCB Ass'y )	E-5
7624504000	Contact PCB R Ass'y ( or Right Contact PCB Ass'y + Rubber )	
7624505000	Contact PCB L Ass'y ( or Left Contact PCB Ass'y + Rubber )	

## IC

NOTE: See page of "CPU PCB ASS'Y" for details.

注) 詳しくは "CPU PCB ASS'Y" の頁を参照のこと。(page 10)

Prior to SN \*\*\*\*\*

15179983	I.C. Mask ROM TYPE A	LH53234L	CPU PCB IC5
15449220RI	I.C. E-PROM (IC6)	TMS27C512-25	E-5 CPU PCB IC6
15179798	I.C. Blank E-PROM 512K	TMS27C512-25	
SN ***** - UP			
15179998	I.C. Mask ROM TYPE B	LH53236S	CPU PCB IC5

15169514RI	I.C. 74HC04	hex. inverter	
15169547RI	I.C. 74HC08	quad 2-input AND gate	
15169539RI	I.C. 74HC139	dual 2-to-4 line decoder	
15238122	I.C. M60012-0148 FP	gate array	
15229830	I.C. MB63H149	gate array	
15239132	I.C. UPD65005GF-323	gate array	
15279517	I.C. HM6116 FP-2	SRAM	
15179291RI	I.C. MC68HC11 AOP	CPU	
15179211RI	I.C. 63B50P	asynchronous communication adaptor	
15219183	I.C. M51953	reset IC	
15199559RI	I.C. TD62506P	bus buffer	
15199560RI	I.C. TD62305AP	bus buffer	
$\Delta$ 15199197RI	I.C. UA7805 SCNC	+5V voltage regulator	
$\Delta$ 15199550RI	I.C. TDA1905	power amplifier	
15179286	P8098	16 bit CPU	CK35 IC34
15229896	LA32(MB87136A)	LA Chip	CK35 IC36
15239106	HG61H15B72F	Gate Array	CK35 IC35
15229863	HG61H20R36F	reverb chip	CK35 IC17
15449121	TC534000P-7476	4M bit Mask ROM	CK35 IC37
15179917	HN623257PZ21	256K bit Mask ROM(Reverb)	CK35 IC13
15179991	LH531484	512K bit Mask ROM	CK35 IC28
15179438	M5M5256BP-12L	256K bit SRAM	CK35 IC26
15179376	MB81416-10	4x16K bit DRAM	CK35 IC9-IC12
15219162	PCM-54HP	16 bit D/A Converter	CK35 IC8
15229706S0	PC910	Optoisolator	CK35 IC21
15169515	TC74HC00P	Quad 2-Input NAND	CK35 IC16
15169516	TC74HC02P	Quad 2-Input NOR	CK35 IC32
15169514	TC74HC04P	Hex Inverter	CK35 IC25
15169537	TC74HC27P	Triple 3-Input NOR	CK35 IC15
15169512	TC74HCU04P	Hex Inverter	CK35 IC24
15169334H0	HD74LS05P	Hex Inverter w/Open Collector	CK35 IC14, 22
15159113H0	HD14051BP	8-Input MUX/DMUX	CK35 IC6
15189171	M5218P	Dual Op Amp	CK35 IC1, 3, 4
15189147	NJM-072D	Dual Op Amp	CK35 IC2,18,19
15189188	M5238L	Dual Op Amp	CK35 IC7
15219181	M5207L01	Dual VCA	CK35 IC5

**CABLE ASSY** ケーブルアッセンブリ

23488542	FL. CBL ASSY W(4PC)
23488543	FL. CBL ASSY (9) W(4PC)
23488544	FL. CBL ASSY (6) W(9PC-9PC)
23488453	FL. CBL ASSY W(8PC)
23488545	FL. CBL ASSY (18) W(16PC-16PC)
23488546	FL. CBL ASSY (20) W(20PC-20PC)
23478279	Wiring Assy n.003

**CONNECTOR** コネクタ

13429233	RAM-Card Connector N.001	
13419677RI	16P FEM. CONN. AMP C/1.27	
13369689RI	20P FEM. CONN. AMP C/1.27	
13369543RI	9P MALE CONN. AMP	
13369542RI	6P MALE CONN.X PITCH BENDER	
13419676RI	8P MALE CONN. MOLEX	
13369688RI	4P MALE CONN. C25	
13439120	5045-04A 4P	CK35 CN8,10
13439124	5045-08A 6P	CK35 CN7

**CAPACITOR** コンデンサー

13519905RI	Ceram. Cond. 47000pF 10%	
13529147RI	Capac. Array 8 x 100pF	
13529179RI	Multilayer Cer. Cond. 100k 20%	
13649668RI	Electrl.Cond. -AX 47 $\mu$ F 25V	
13639179RI	Electrl.Cond. -V 100 $\mu$ F 25V	
13639661RI	Electrl.Cond. -V 2200 $\mu$ F 25V	
13639167RI	Electrl.Cond. -V 22 $\mu$ F 25V	
13649662RI	Electrl.Cond. -V 3300 $\mu$ F 25V	
13639169RI	Electrl.Cond. -V 47 $\mu$ F 25V	
13639206RI	Electrl.Cond. -V 10 $\mu$ F 50V	
13639223RI	Electrl.Cond. -V 4.7 $\mu$ F 63V	
13639255RI	Electro.Cond. -V 1 $\mu$ F 100V	
13639154S0	Electro. 1000 $\mu$ F/16V	CK35 C39,40,69,72
13639922J0	Bi-Poler 10 $\mu$ F/16V	CK35 C7,24

**RESISTOR** 抵抗

13910103RI	Resistor Array S.L.8x10K +C	(RGLD8X103J)	
13919142RI	Resistor Array S.L.8x100k +C	(RGLD8X104J)	
13919117RI	Resistor Array S.L.8x33K +C	(RGSD8X333J)	
13919222RI	Resistor Array SL4x680 OHM E/U	(RGSD4X681J)	
13819149	10 ohm 1/2W		CK35 R45
13919303	Resistor Array 33K x 8	(RML-S8-333J)	CK35 RA1, 2
12559733	1 ohm Fuse Resistor	(ERQ-16NK1RO-E)	CK35 R86

**DIODE, LED** ダイオード, LED

15019159RI	Diode 1N-414B		
15029333RI	LED Diode TLUR4401 red		
15019332RI	Zener Diode BZX55C 6.2V		
15019158RI	Diode 1N-4001		
△15019172RI	Diode BY 251		
15019125	Diode 1SS-133		CK35 D2, 4, 5
15019406	Zener Diode MTZ6.8B-T77	Zener 6.8V	CK35 D1, 3, 7

**INDUCTOR, COIL** インダクター, コイル

22448240	BLO2RN2-R62	Noise Sup.	
12449382RI	PLT1-R53C	Noise Sup.	
12449305	ECE-A 330 $\mu$ H	Coil	CK35 L1
12399501M1	BL02RN2-R62	EMI Filter	CK35 L3, 4
13529145	DSS306-55FZ103N	EMI Filter	CK35 FL2
13529105M1	DSS310-55D223S	EMI Filter	CK35 FL1

**RESONATOR, CRYSTAL** 発振子, クリスタル

15299115RI	Ceramic Resonator 16MHz	
12389717	Crystal 12.000MHz	CK35 X2
15299108	Crystal 16.384MHz	CK35 X1

**POTENTIOMETER** ポリユーム

13299227RI	Trim. Pot. 22k ohm 5x10H CERMET
13319101RI	Lin. Slider Pot. 10k $\Omega$ 10MS

**SCREW, NUT, WASHER and OTHER** ビス類

*****	Self Tap. Screw 2.2 x 6 TC TC	(Screw No.201132206)
*****	Self Tap. Screw 3.5 x 13 TC TC	(Screw No.201133513)
*****	Self Tap. Screw 2.9 x 6 MM.	(Screw No.206132906)
*****	Self Tap. Screw 2.9 x 8 TCTCPRBZ	(Screw No.206132908)
*****	Self Tap. Screw 2.9 x 13	(Screw No.206132913)
*****	Self Tap. Screw 2.9 x 19 TCTCPRBZ	(Screw No.206132919)
*****	Self Tap. Screw 2.9 x13 TCTSPPR	(Screw No.210132913)
*****	Screw 3MA x 10 TC TC	(Screw No.215133010)
*****	Special Screw 3.5 x 9.5 PR T.8	(Screw No.250990009)
*****	Nut 3MA H.3	(Screw No.260133003)
*****	Toothed Washer-IN I/D 3	(Screw No.273990001)
*****	Spacer H.11.5	(Screw No.279992005)

**MISCELLANEOUS** その他

13429550RI	I.C. Socket 28P
22358150	Shockproof Rubber ゴム足
22248196	Antidust Cover F/Pot. ダストカバー
22468189	Heat Sink ヒートシンク

**ACCESSORIES** 付属品

22198641	Music Rest N.002	E-10/20
△22448613	AC/DC Adaptor 12Vdc, 2A ACJ100	
△22448612	AC/DC Adaptor 12Vdc, 2A ACJ120	
△22448611	AC/DC Adaptor 12Vdc, 2A ACJ220	
△22448610	AC/DC Adaptor 12Vdc, 2A ACJ240E	
△22448614	AC/DC Adaptor 12Vdc, 2A ACJ240A	
26038199	Owner's Manual English/Germ/French	
26038200	Owner's Manual Japanese/Eng/Italian	

# CHECKING

## 1. ANALOG TO DIGITAL CONVERSION

\*The outputs controls, analog value, are fed to the CPU (IC1) pins 18, 19, 20 and converted to the corresponding digital value by the CPU's internal ADC.

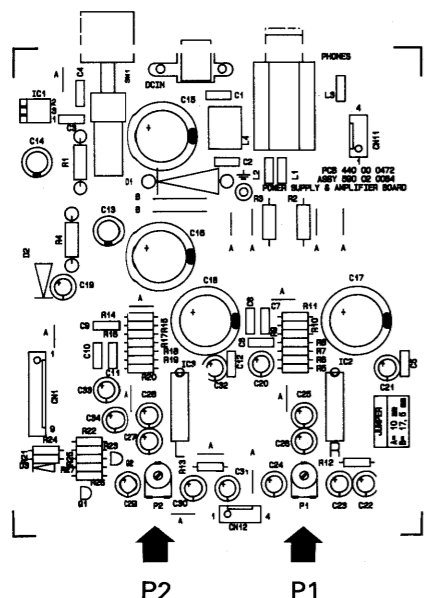
### ANALOG CONTROL VOLTAGE TEST

CONTROL ツマミ	TEST POINT テストポイント (CPU BOARD)	ANALOG READING (DC VOLTAGE) 電圧値 (DC)
MODULATION	pin18 of IC1	OFF (OFF 状態) -----> PRESSED (押された状態) 116mV DC                              4.97V DC
PITCH BENDER	pin20 of IC1	LEFT (左側) <-----> CENTER (中央) <----> RIGHT (右側) 840mV DC                      2.54V DC                      4.2V DC
VOLUME	pin19 of IC1	DOWN (最小) -----> UP (最大) 55mV DC    基準電圧 4.97V DC

# ADJUSTMENT

### ◎AUDIO LEVEL ADJ.

- Press "FADE IN" while switching ON the instrument.  
A 440 Hz sine wave will be output from right speaker and a 880 Hz sine wave will be output from left speaker.
- Connect the oscilloscope across right loudspeaker and adjust the signal output level at 9 Vpp by trimmer P1 located on the POWER AMP PCB.
- Repeat the same as above for adjusting the left channel by trimmer P2 located on the same PCB.
- For coming out from this situation, switch OFF the instrument.



# 確認

## 1. A/D 変換

\*各ツマミに対するアナログ電圧は CPU (IC1) の18, 19, 20番ピンに加えられ, CPU 内部の AD コンバータでデジタル値に,それぞれ変換される。

### 各ツマミに対する電圧

## 調整仕様

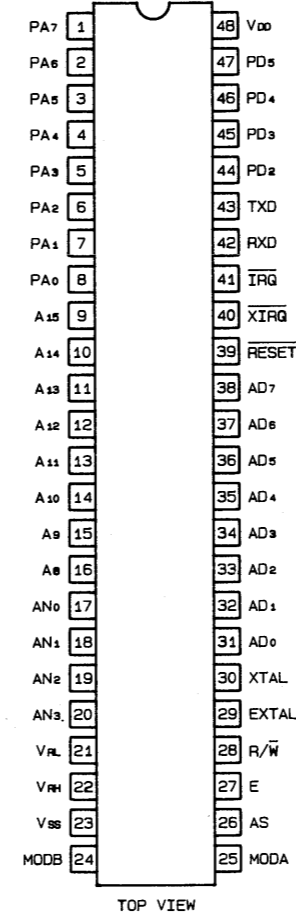
### ◎オーディオレベル調整

- "FADE IN" ボタンを押しながら, 電源を入れる。  
右側のスピーカからは440Hz のサイン波が, 左側のスピーカからは, 880Hz のサイン波が出力されます。
- 右側のスピーカにオシロスコープを接続し, 電源アンプ基板の半固定ボリューム P1 で出力信号レベルが 9 Vpp になるように調整する。
- 同様に, 左側のスピーカにオシロスコープを接続し, 電源アンプ基板の半固定ボリューム P2 で出力信号レベルが 9 Vpp になるように調整する。
- 通常状態に戻る為には, 一旦電源を切って入れ直します。

Power Supply & Amplifier Board  
(or POWER AMP PCB)

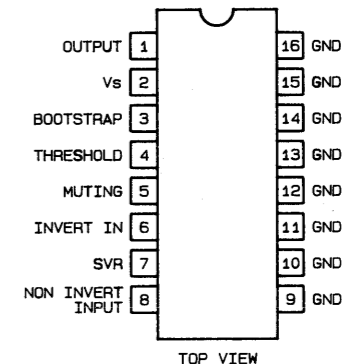
# IC DATA

## 68HC11AOP (CPU)



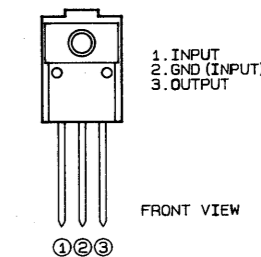
CPU PCB

## TDA1905 (Power Amplifier)



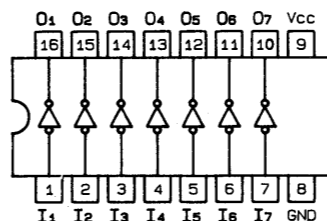
PA & AMP PCB

## L7805CV



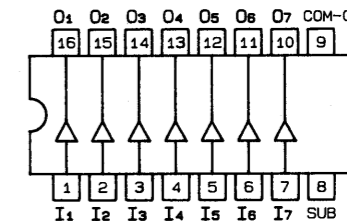
PA & AMP PCB

## BUS BUFFER TD62505P

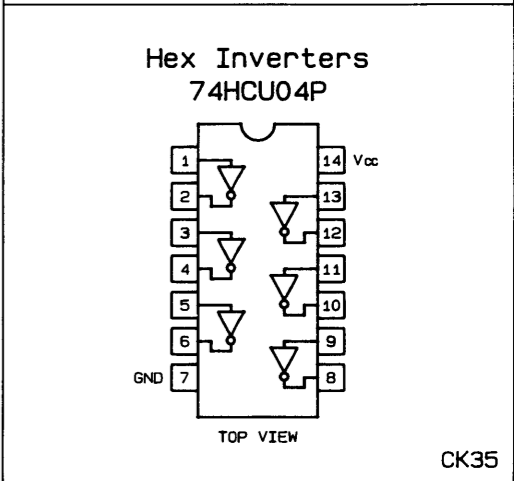
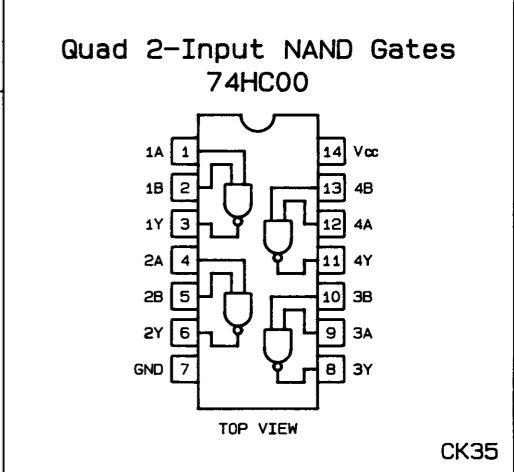
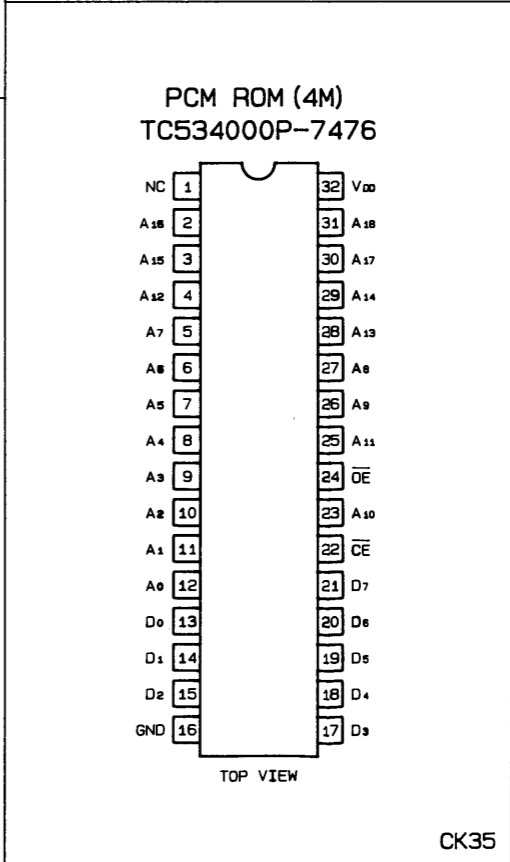
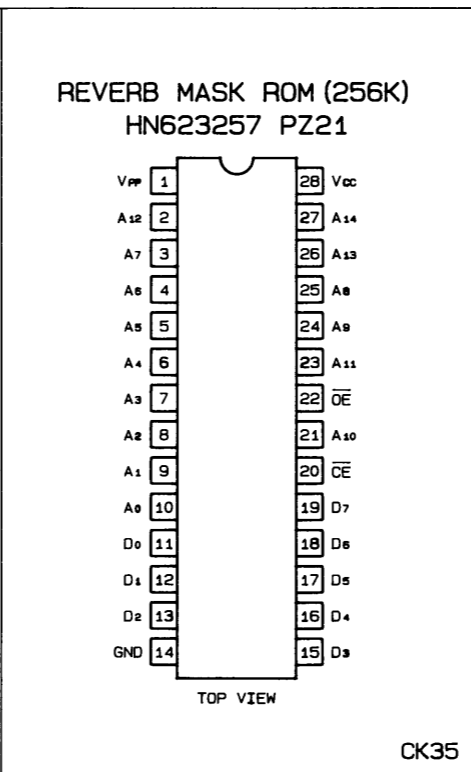
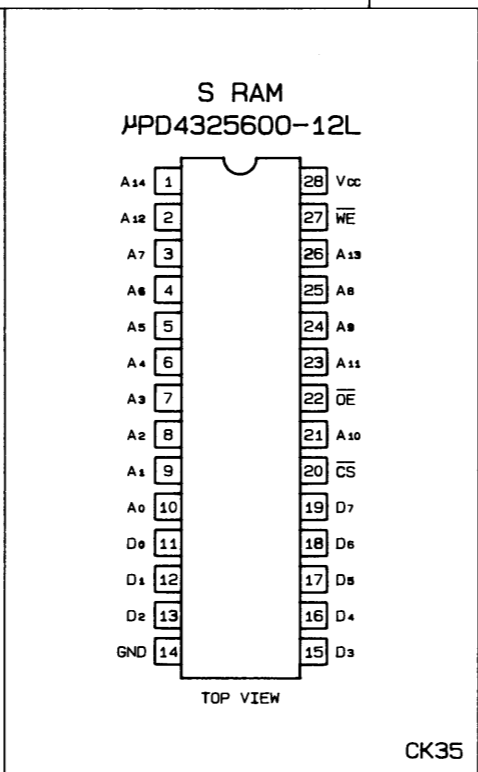
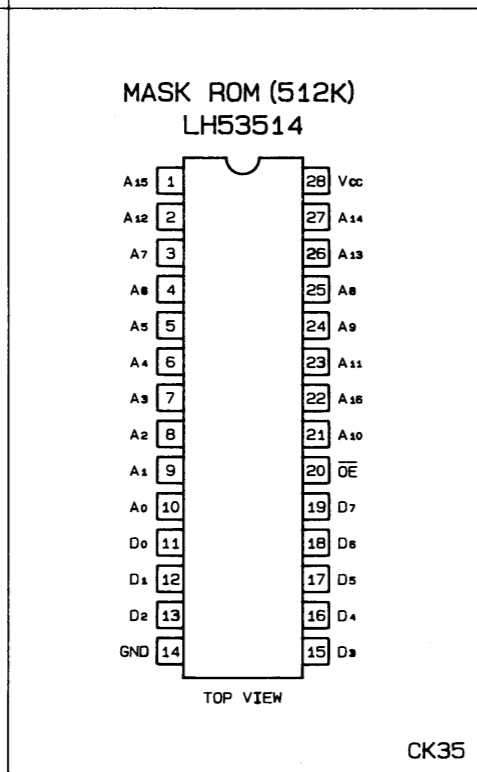
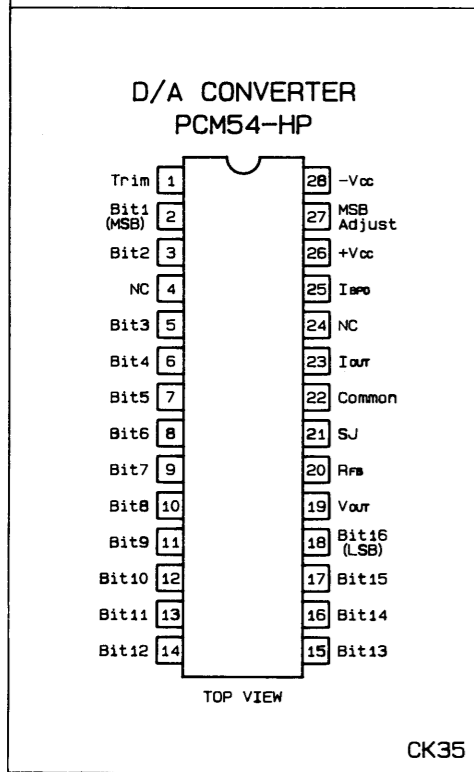
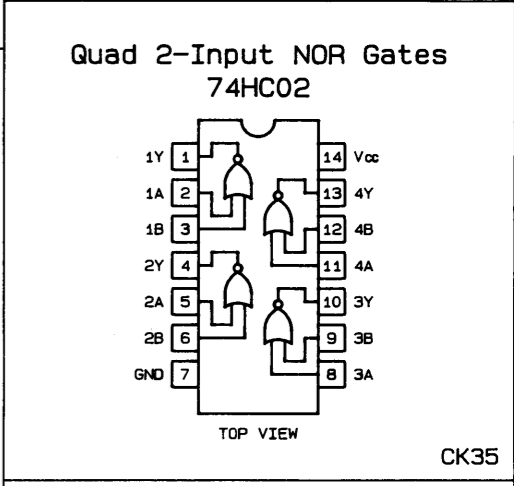
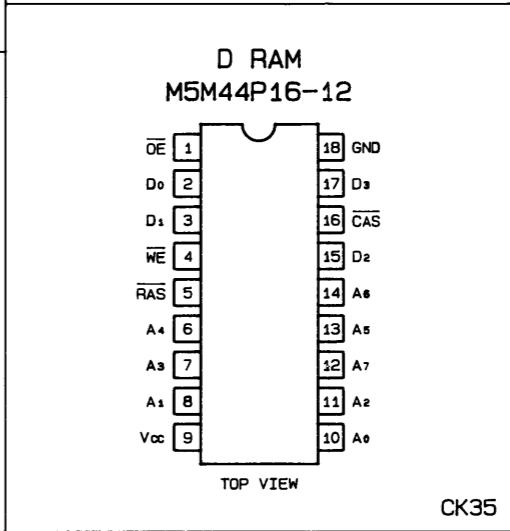
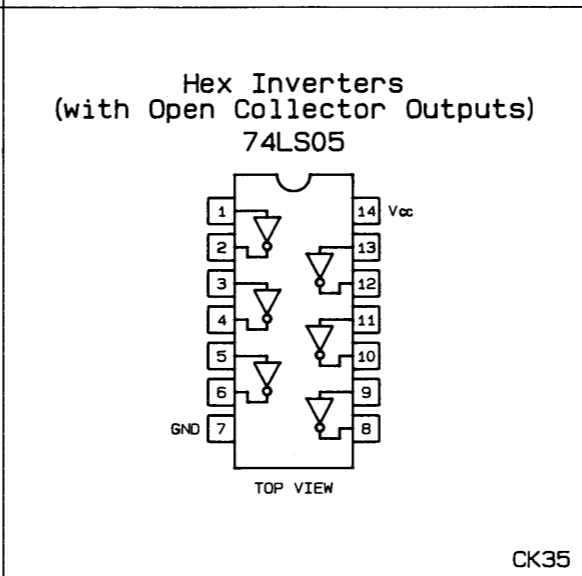
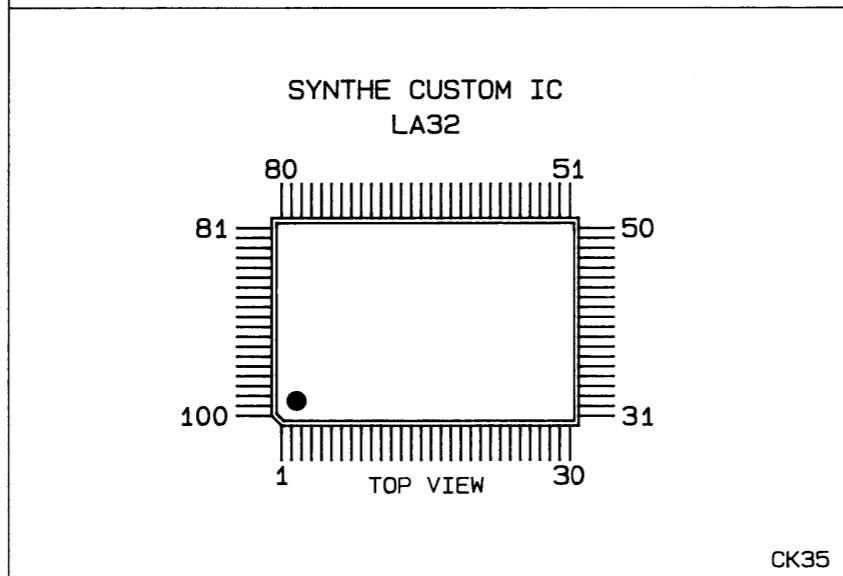
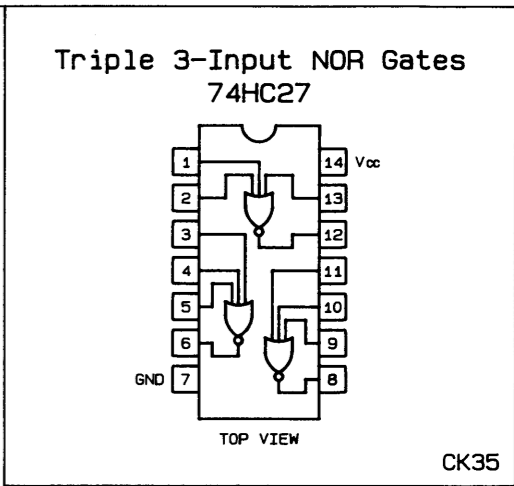
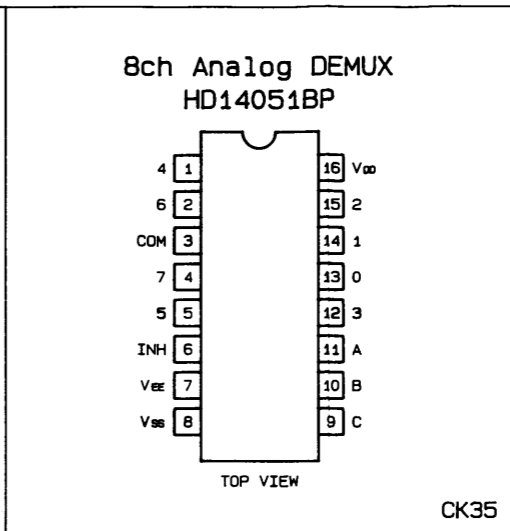
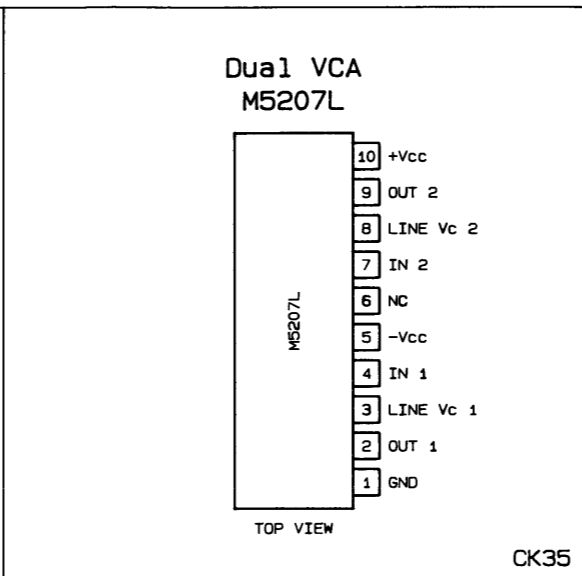
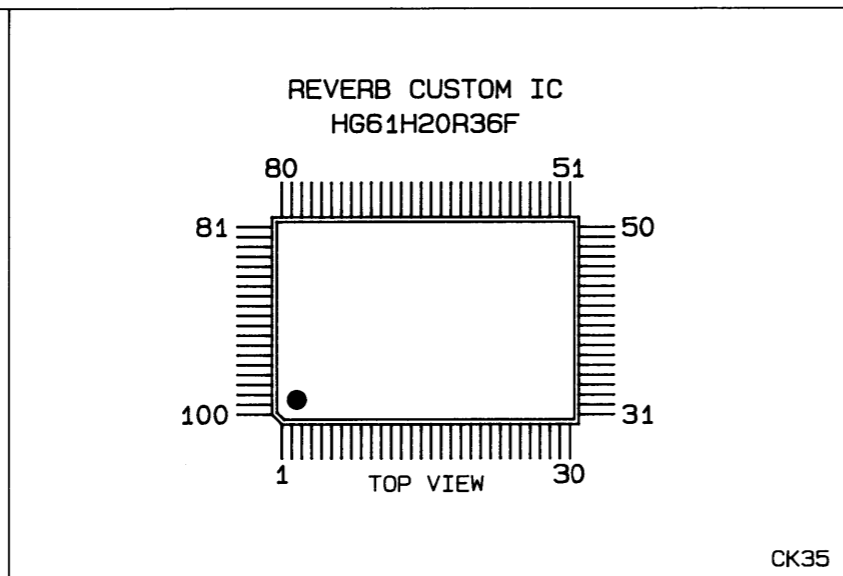
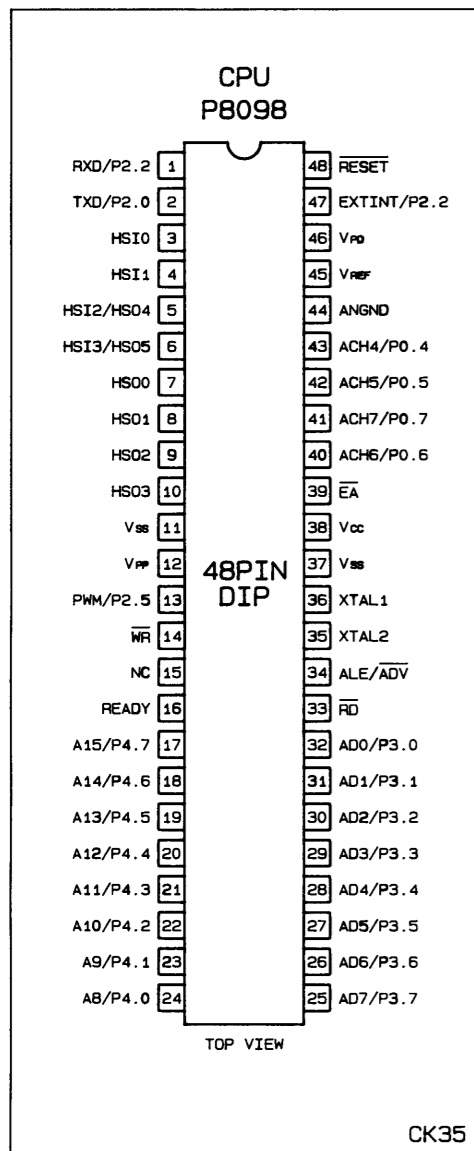


CONTROL PCB

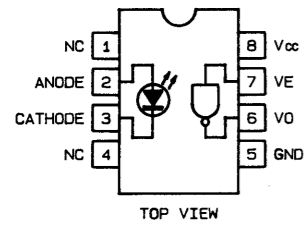
## BUS BUFFER TD62305AP



CONTROL PCB

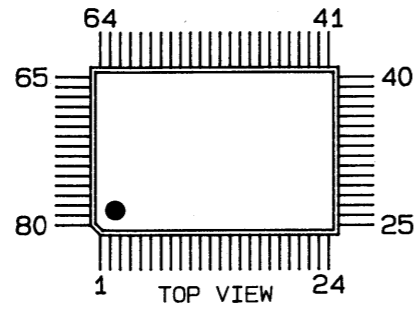


Opto-isolator  
PC910



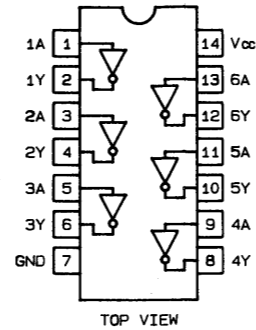
CK35

GATE ARRAY  
MB63H149



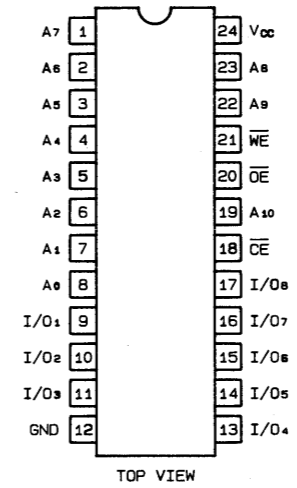
MAIN CPU

Hex Inverter  
74HC04



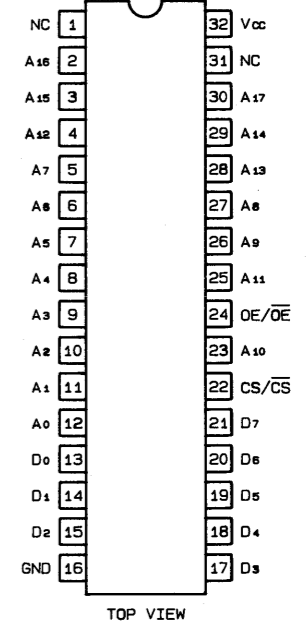
MAIN CPU

S RAM  
HM6116FP-3



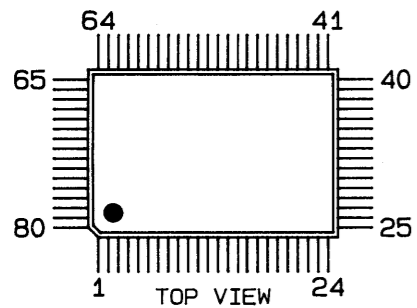
MAIN CPU

LH53234L  
LH53236S  
(2M MASK ROM)



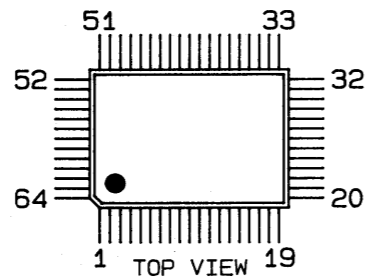
MAIN CPU

GATE ARRAY  
HG61H15B72F



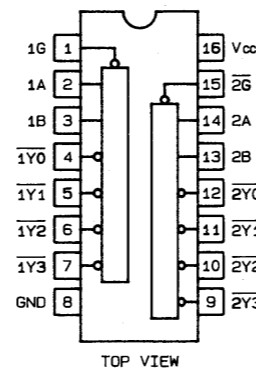
CK35

GATE ARRAY  
MPD65005GF-323



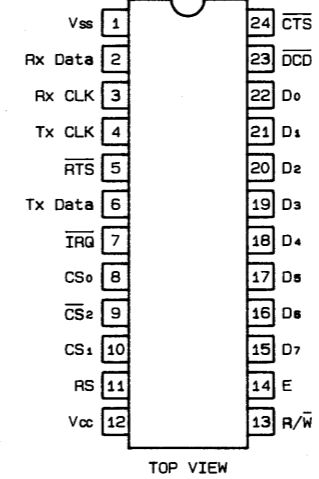
MAIN CPU

Dual 2-To-4 Line Decoder  
74HC139



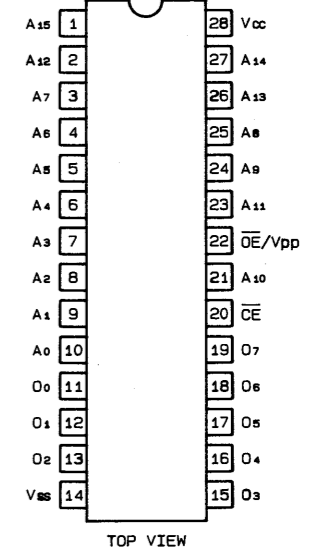
MAIN CPU

HD63B50  
(Asynchronous  
communication  
interface adapter)



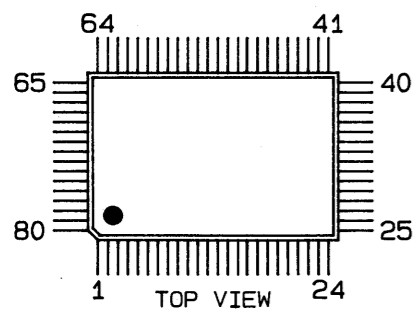
MAIN CPU

27C512-25  
(EP ROM)



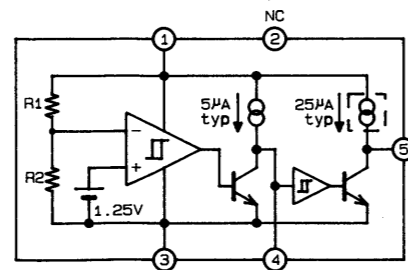
MAIN CPU

GATE ARRAY  
M60012-0148FP



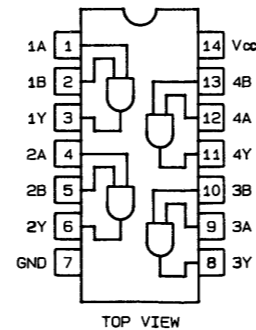
MAIN CPU

RESET IC  
M51953A



MAIN CPU

Quad 2-Input AND Gate  
74HC08



MAIN CPU

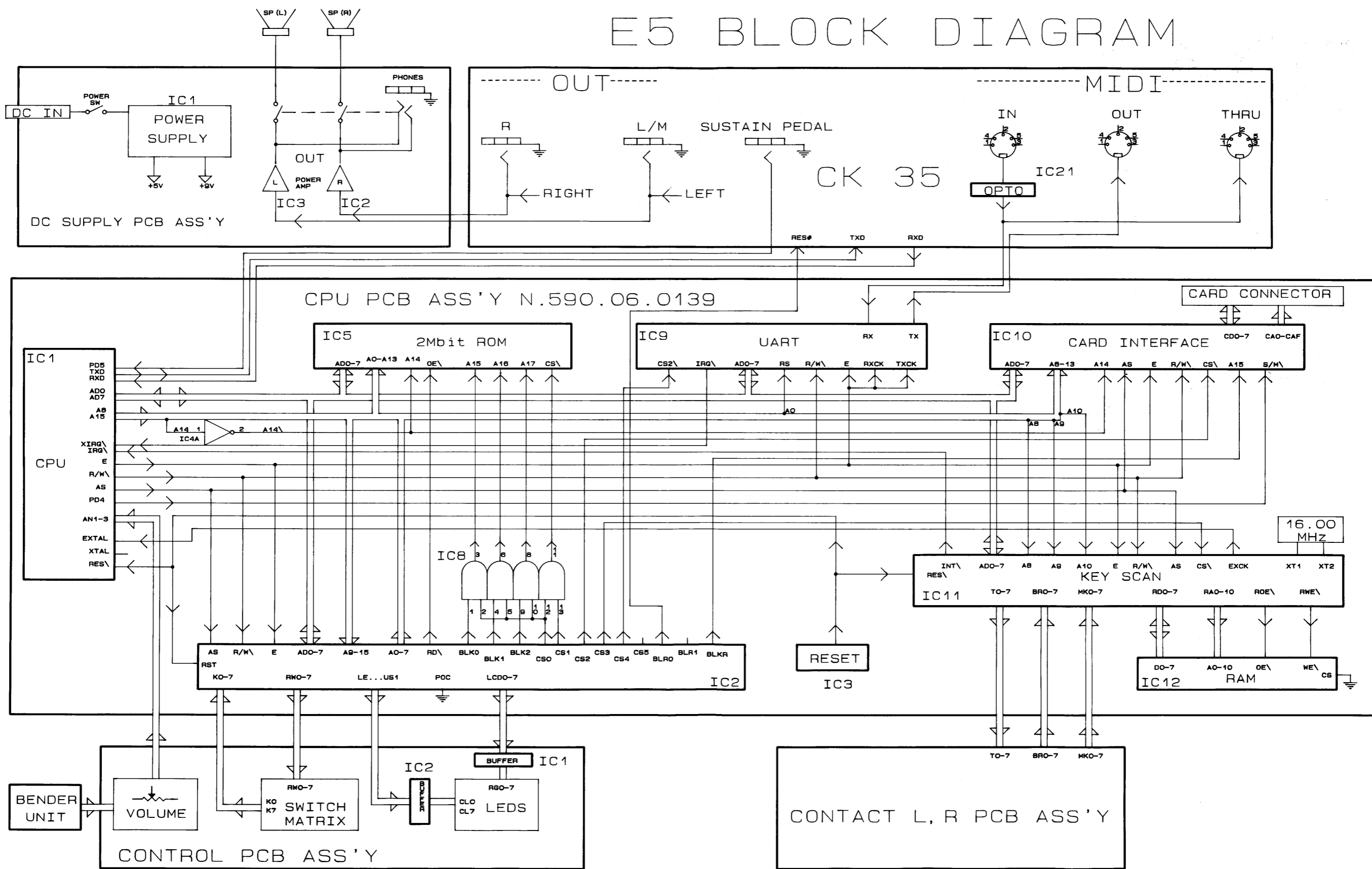


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

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BLOCK DIAGRAM

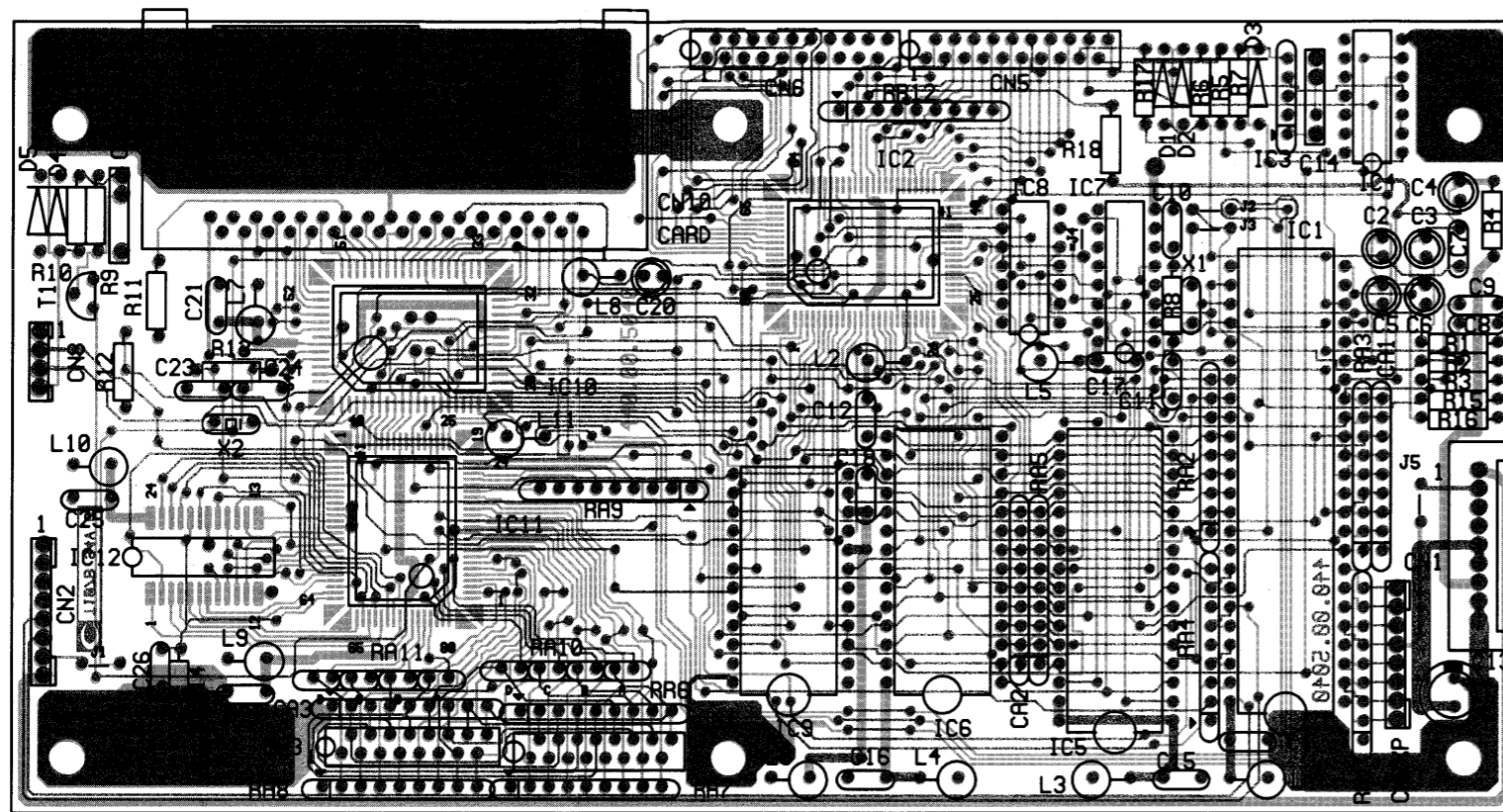
E5 BLOCK DIAGRAM



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

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**CPU PCB ASS'Y  
(CPU BOARD)**  
ASSY 7624502000



View from component side

**CPU PCB ASS'Y**

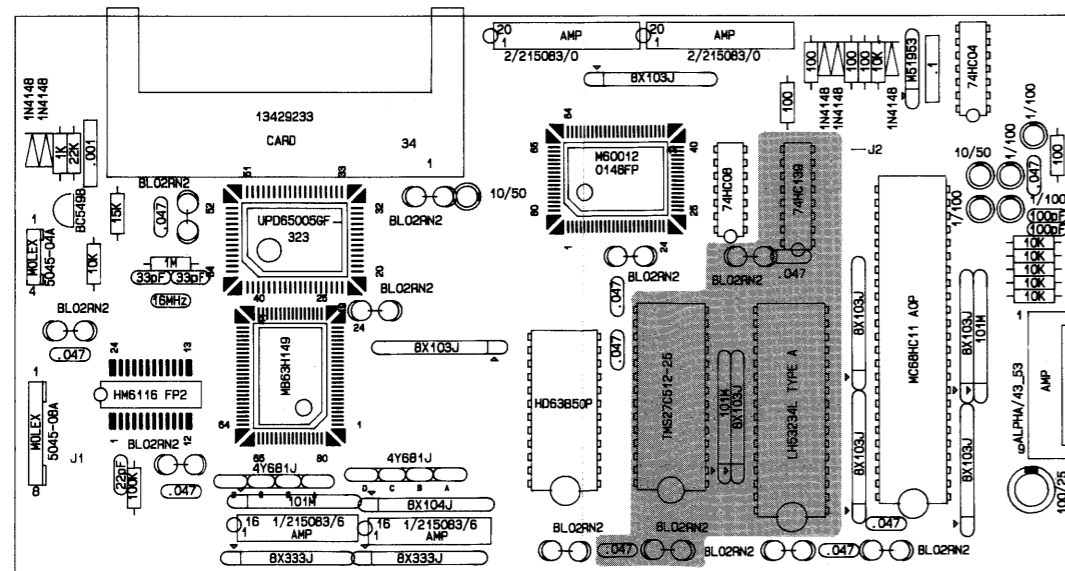
NOTE: Difference between type "A" and "B" is portion in the figure below. The two CPU PCB ASS'Ys are functionally identical.

- CPU PCB ASS'Y TYPE "A"  
.....with 0.5M EPROM (IC6) plus 2M ROM type "A" (IC5)
- CPU PCB ASS'Y TYPE "B"  
.....with only 2M ROM type "B" (IC5)

注：タイプ "A" と "B" の違いは下図の の部分のみです。2種類の CPU PCB ASS'Y は機能的には全く同じです。

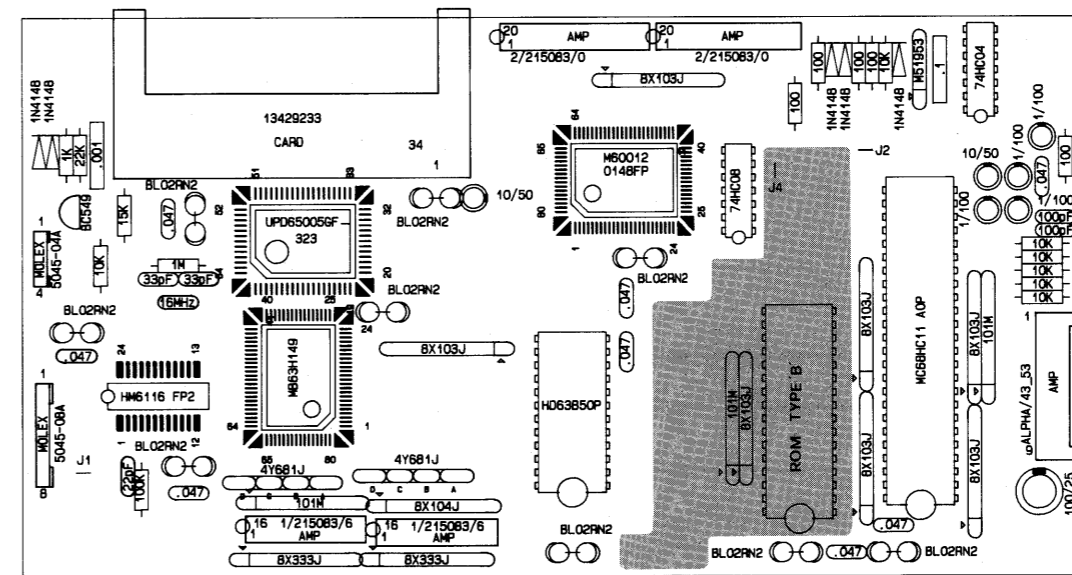
- CPU PCB ASS'Y タイプ "A"  
.....0.5M EPROM (IC6) と 2M ROM タイプ "A" (IC5)
- CPU PCB ASS'Y タイプ "B"  
.....2M ROM タイプ "B" (IC5) のみ

	TYPE "A" (EPROM Ver.)	TYPE "B" (MASK ROM Ver.)
IC6	EPROM (27C512)	N.C.
IC5	MASK ROM TYPE A (LH53234L)	MASK ROM TYPE B (LH53236S)
IC7	74HC139	N.C.
C16, C17	0.047 μF	N.C.
L4, L5	BL02RN2	N.C.
J4	N.C.	Jumper



**CPU PCB ASS'Y  
TYPE "A"**  
(Prior to SN\*\*\*\*\*)

EPROM VERSION  
(WITH TYPE 'A' ROM)



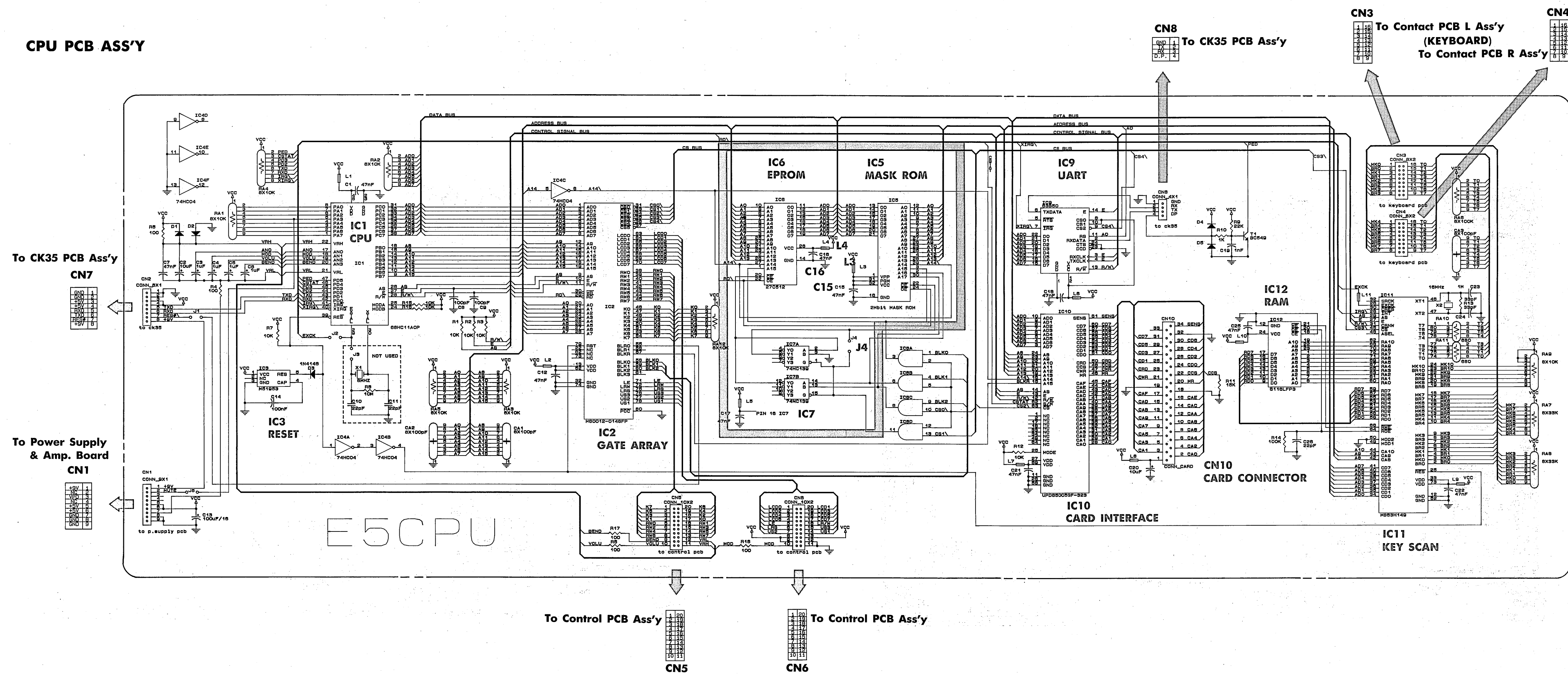
**CPU PCB ASS'Y  
TYPE "B"**  
(SN\*\*\*\*\*-UP)

MASKED ROM VERSION

- POLYPROPYLENE CAPACITOR
- CERAMIC CAPACITOR

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46

CPU PCB ASS'Y



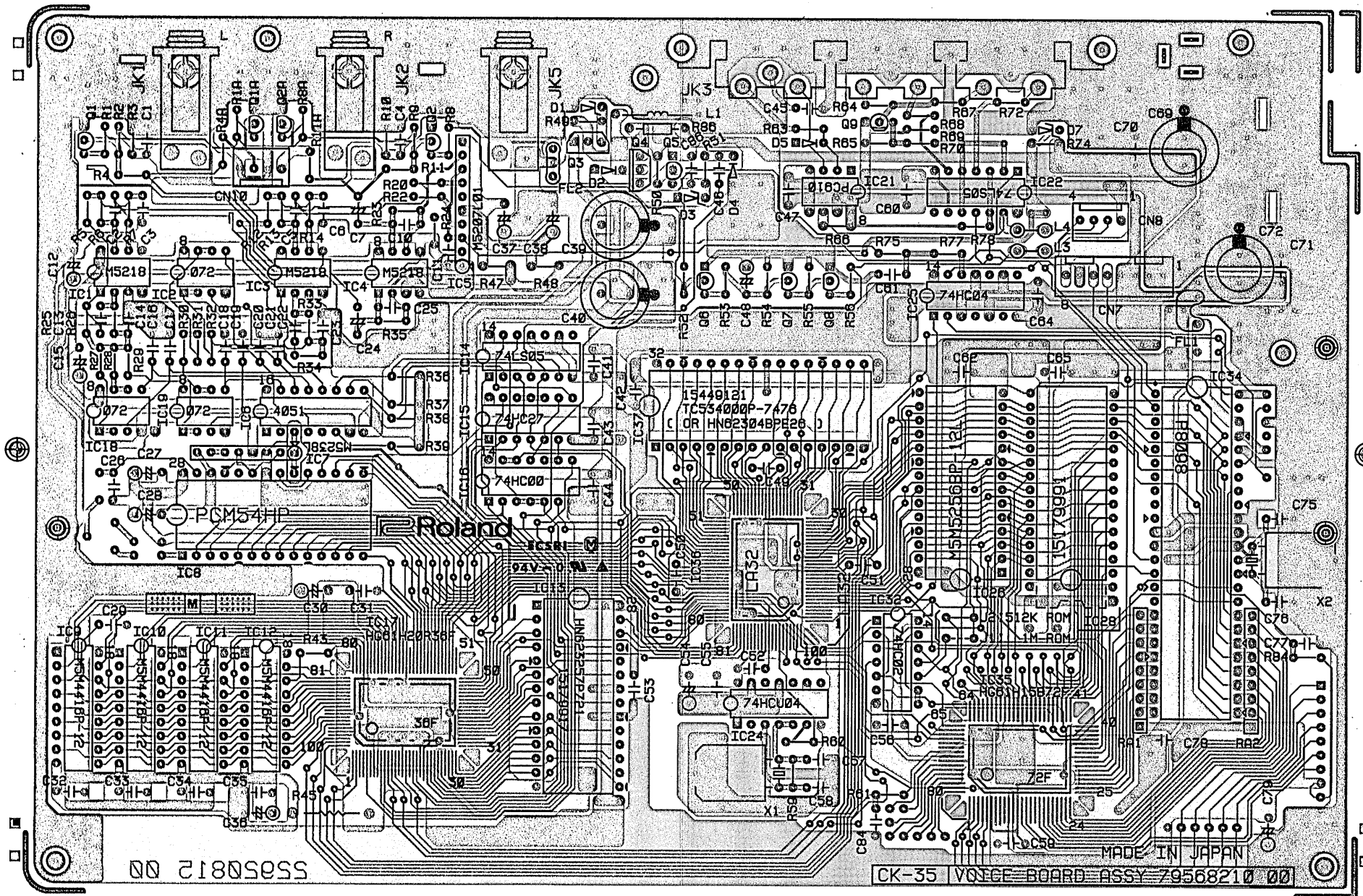
E5CPU

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**CK-35 PCB ASS'Y** .....(Made in Italy/Japan)  
**(CK-35 VOICE BOARD)**  
ASSY 7956821000  
(pcb 2292081500)

**CK-35 PCB ASS'Y**  
NOTE: There are some differences in PCB layout (Resistor and capacitor positions etc.) between CK-35 PCB Ass'y made in Italy and in Japan. But the two CK-35 PCB Ass'ys are functionally identical.  
Only CK-35 made in Italy can be supplied for replacement.  
注: イタリア製と日本製CK-35基板は、基板のレイアウト(抵抗、コンデンサの位置等)が多少違います。しかし回路的には全く同じです。  
補修用としてはイタリア製CK-35基板のみが供給されます。

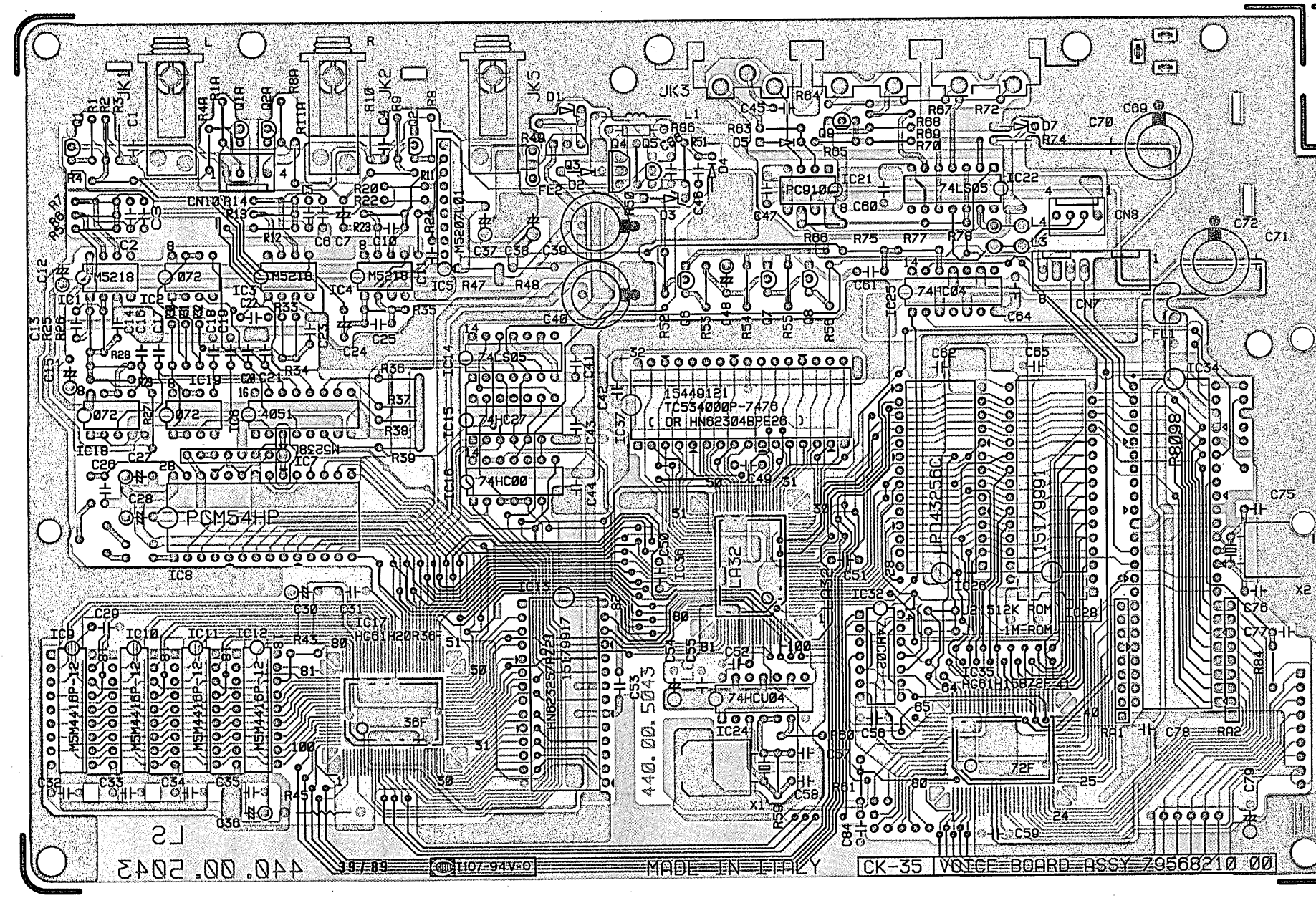
**MADE IN JAPAN**



View from component side

**MADE IN JAPAN**

**MADE IN ITALY**

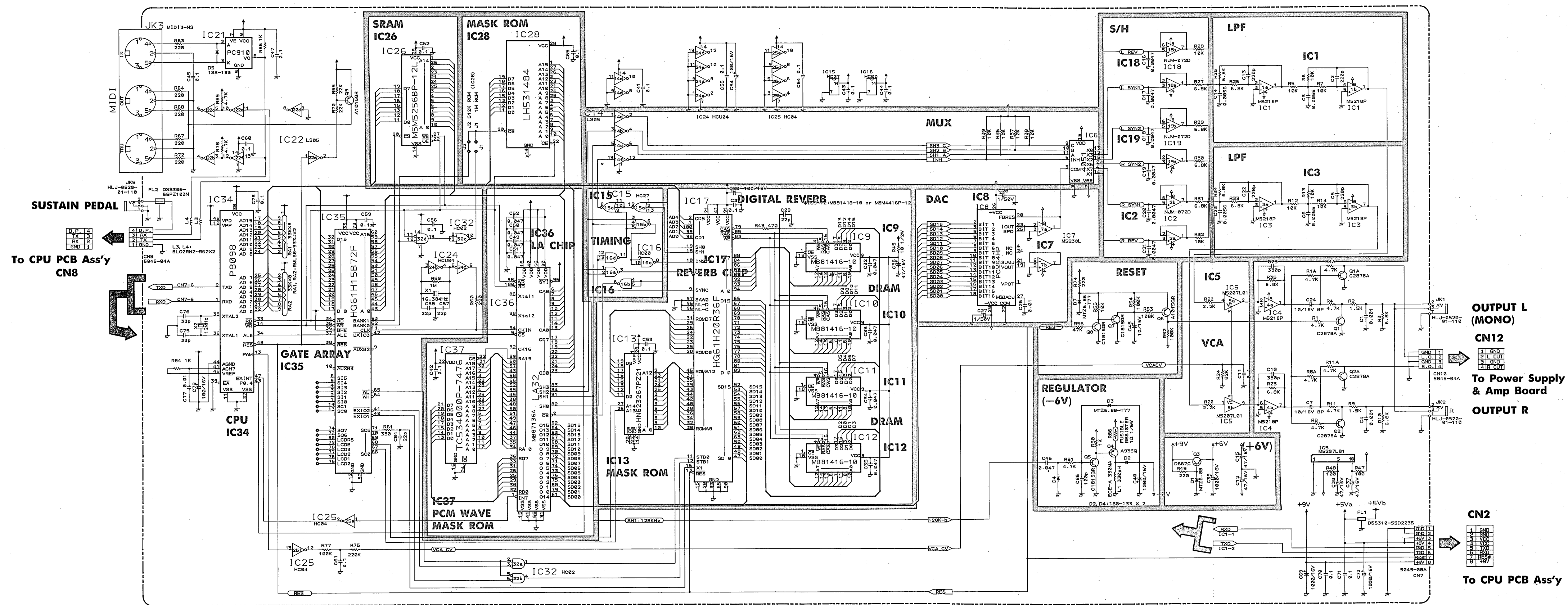


**MADE IN ITALY**

View from component side

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46

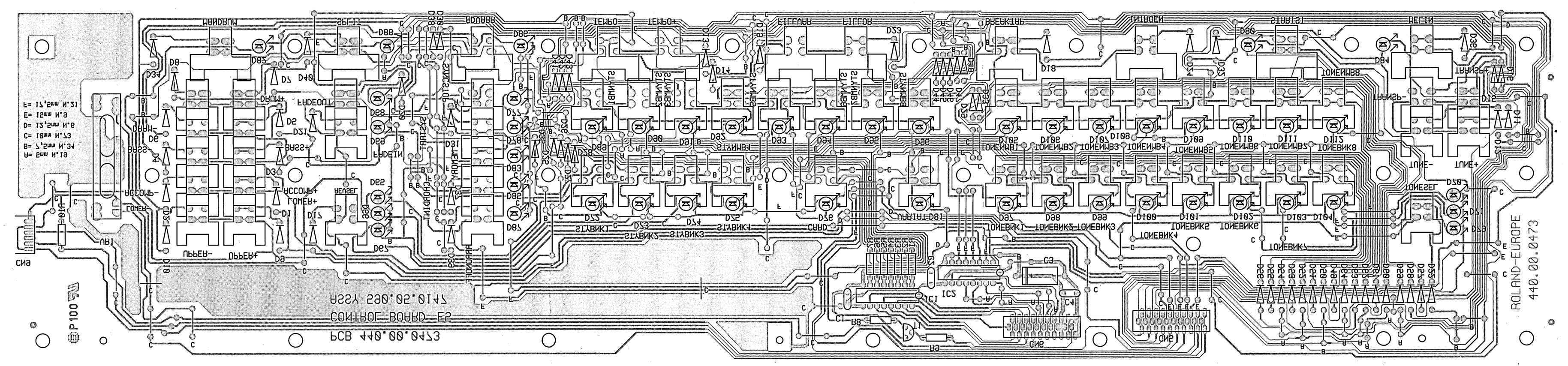
CK-35 PCB ASS'Y



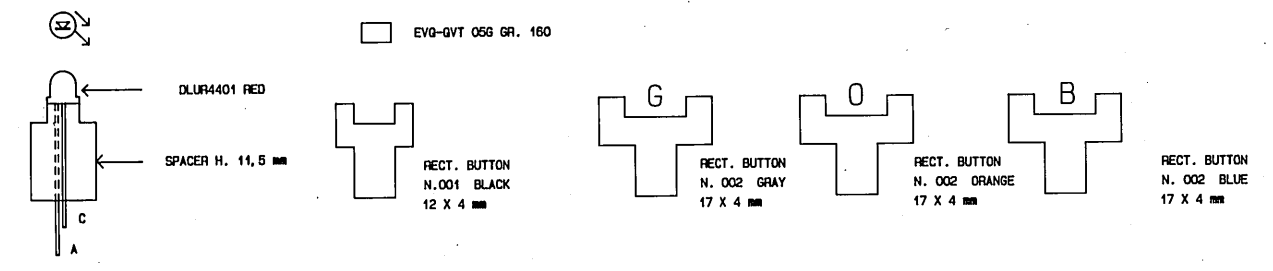
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46

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**CONTROL PCB ASS'Y  
(CONTROL BOARD)  
ASSY 7624506000**

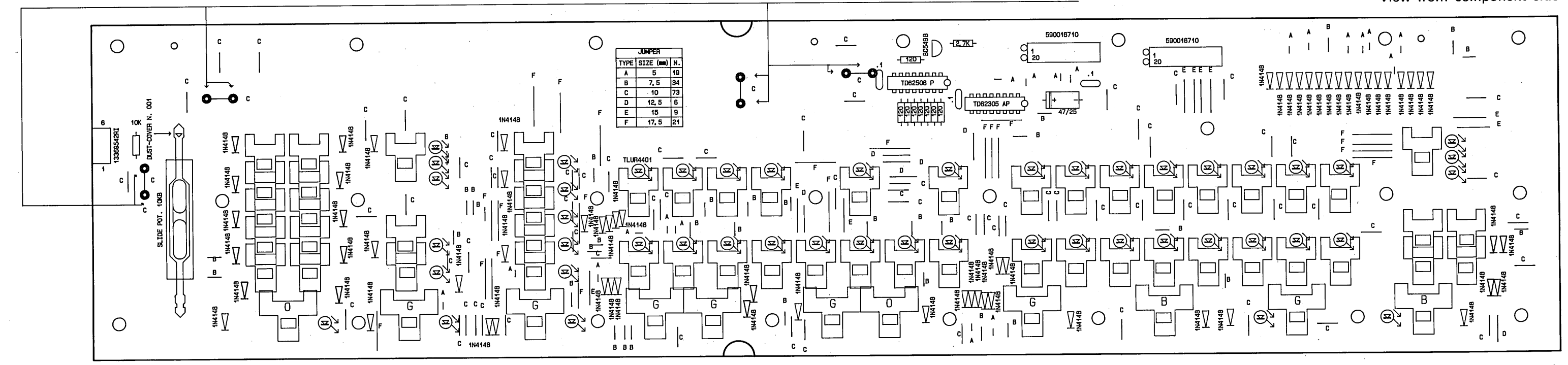


View from foil side



SOLDER IN THE INDICATED POINTS  
ON THE COMPONENT'S SIDE

View from component side

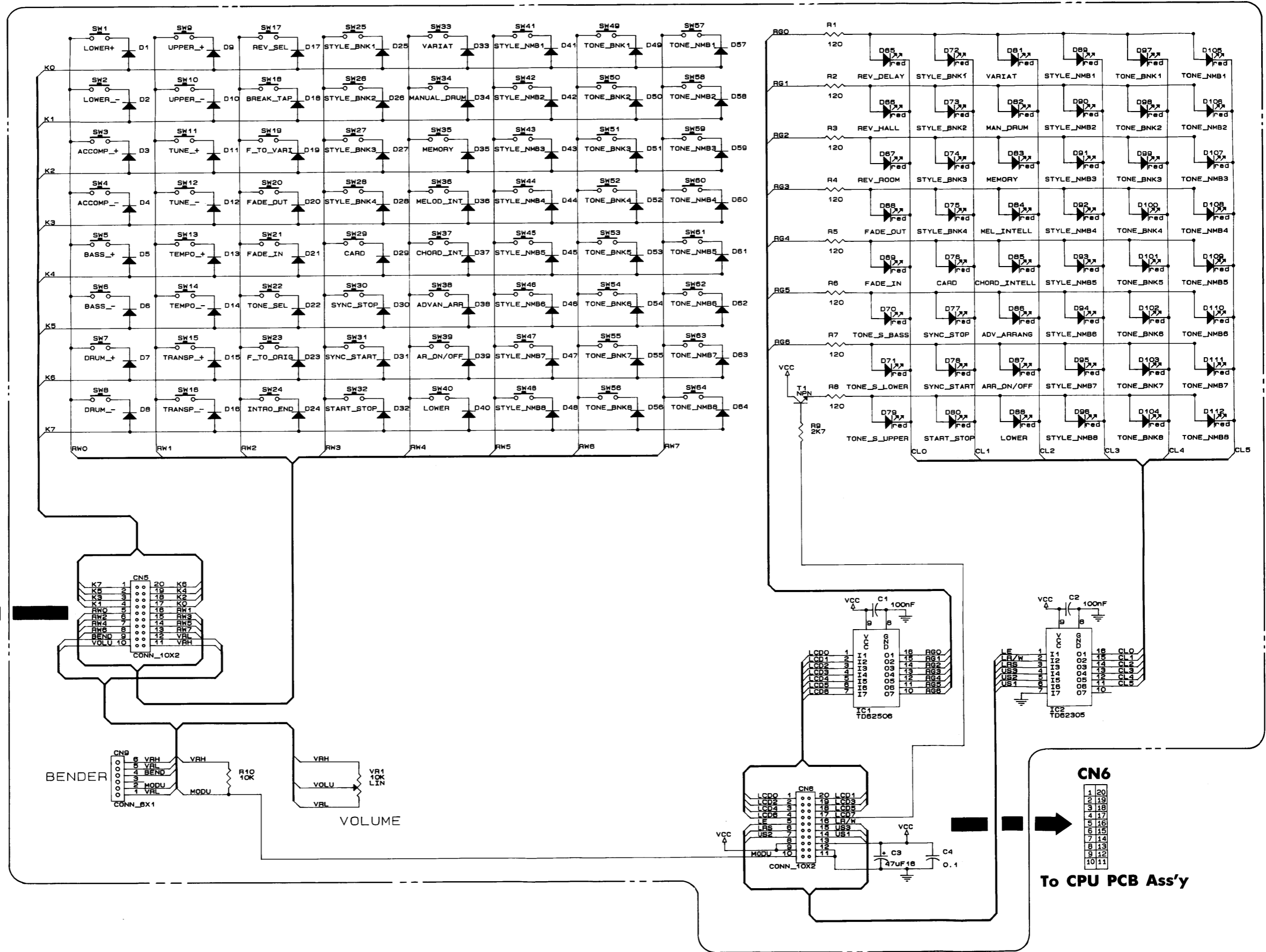


TYPE	SIZE (mm)	NO.
A	7.5 x 3.4	10
B	12.5 x 4.8	5
C	17.5 x 4.8	5
D	12.5 x 4.8	5
E	17.5 x 4.8	5

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

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### CONTROL PCB ASS'Y



CN5

1	20
2	19
3	18
4	17
5	16
6	15
7	14
8	13
9	12
10	11

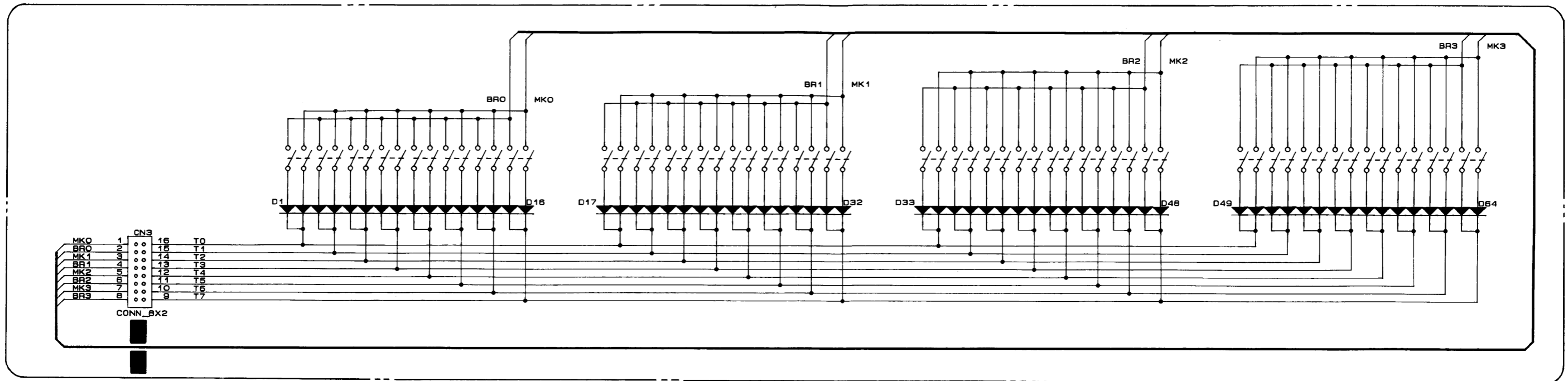
To CPU PCB Ass'y

CN6

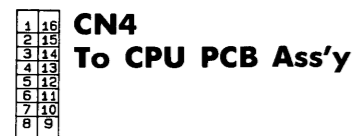
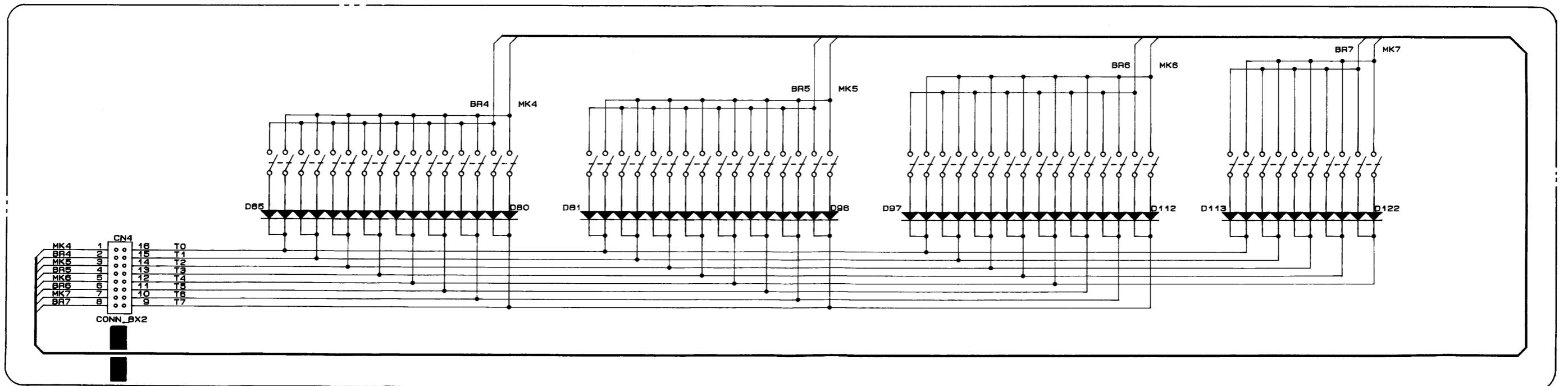
1	20
2	19
3	18
4	17
5	16
6	15
7	14
8	13
9	12
10	11

To CPU PCB Ass'y

### CONTACT PCB L ASS'Y



### CONTACT PCB R ASS'Y



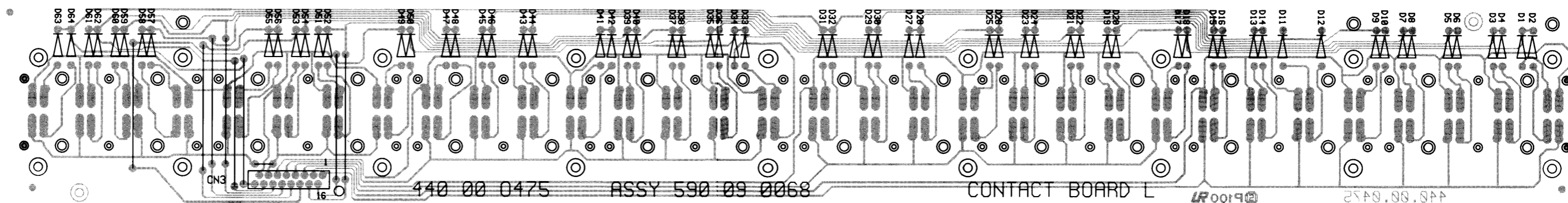


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

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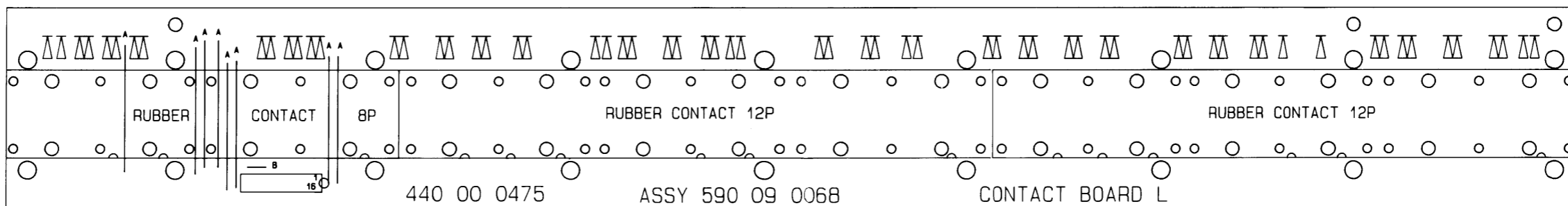
### CONTACT PCB L ASS'Y

ASSY 7624505000



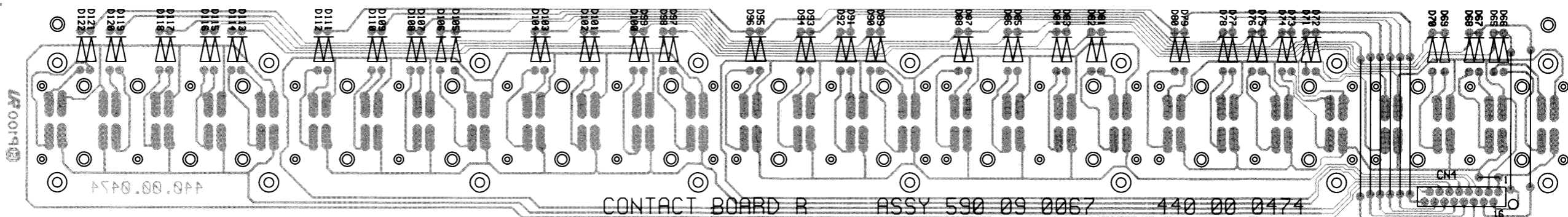
JUMPER	
A= 35mm	B= 5mm

Δ = 1N4148



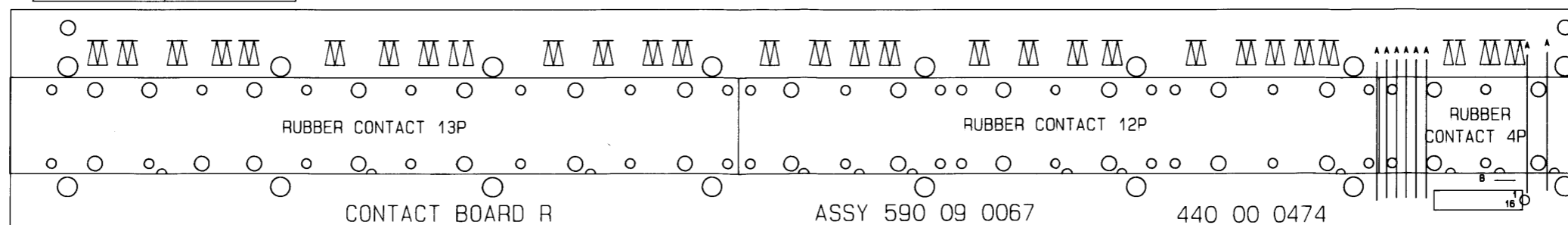
### CONTACT PCB R ASS'Y

ASSY 7624504000



JUMPER	
A= 35mm	B= 5mm

Δ = 1N4148



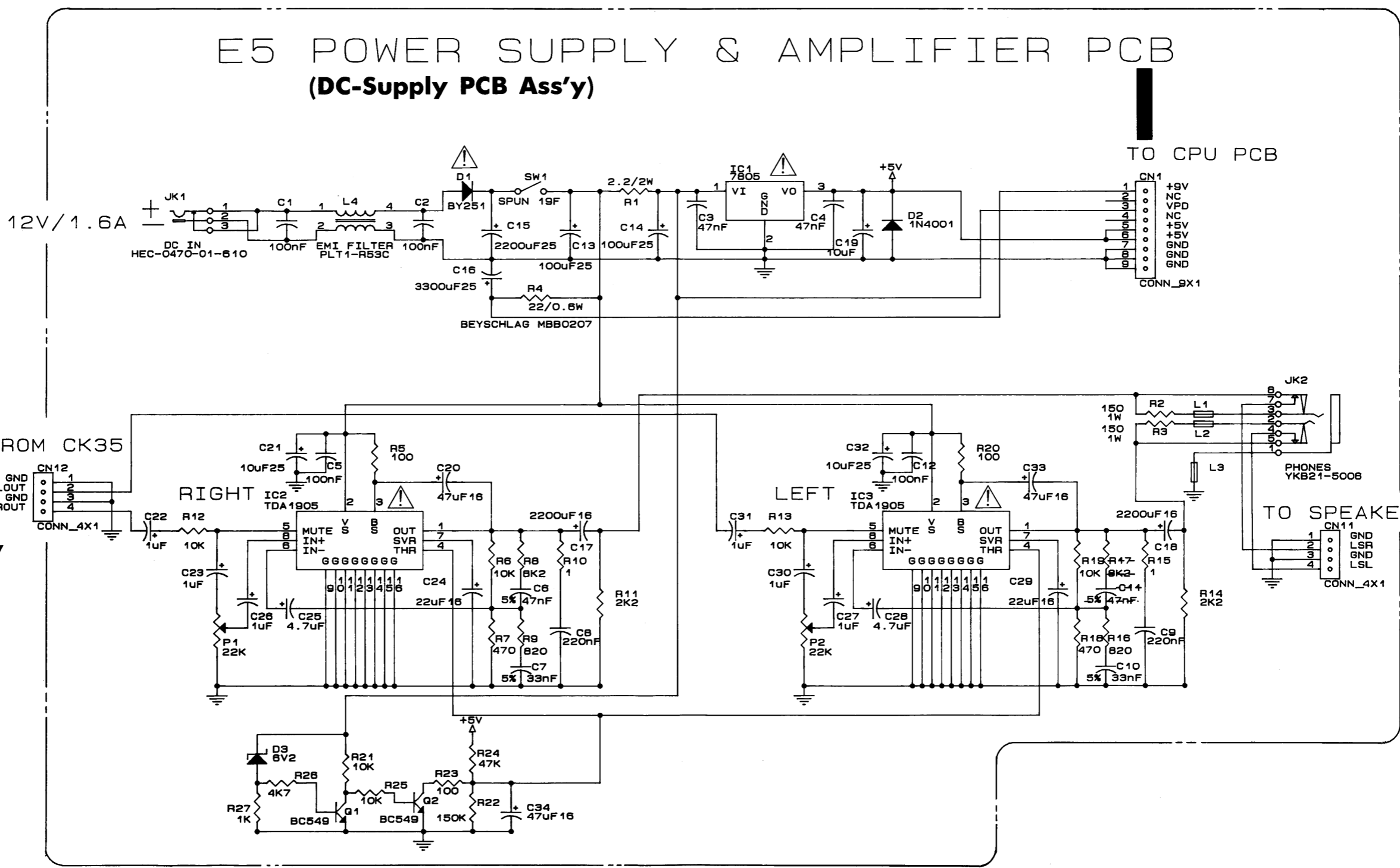
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

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### POWER SUPPLY & AMPLIFIER BOARD (DC-SUPPLY PCB ASS'Y)

1	+9V
2	MUTE
3	NC
4	NC
5	VCC
6	VCC
7	GND
8	GND
9	GND

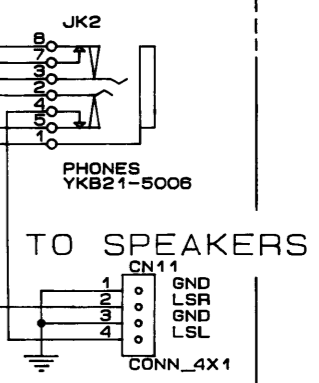
**CN1**  
To CPU PCB Ass'y



TO CPU PCB

GND	1
L.D.	2
GND	3
R.D.	4

**CN10**  
To CK-35 PCB Ass'y

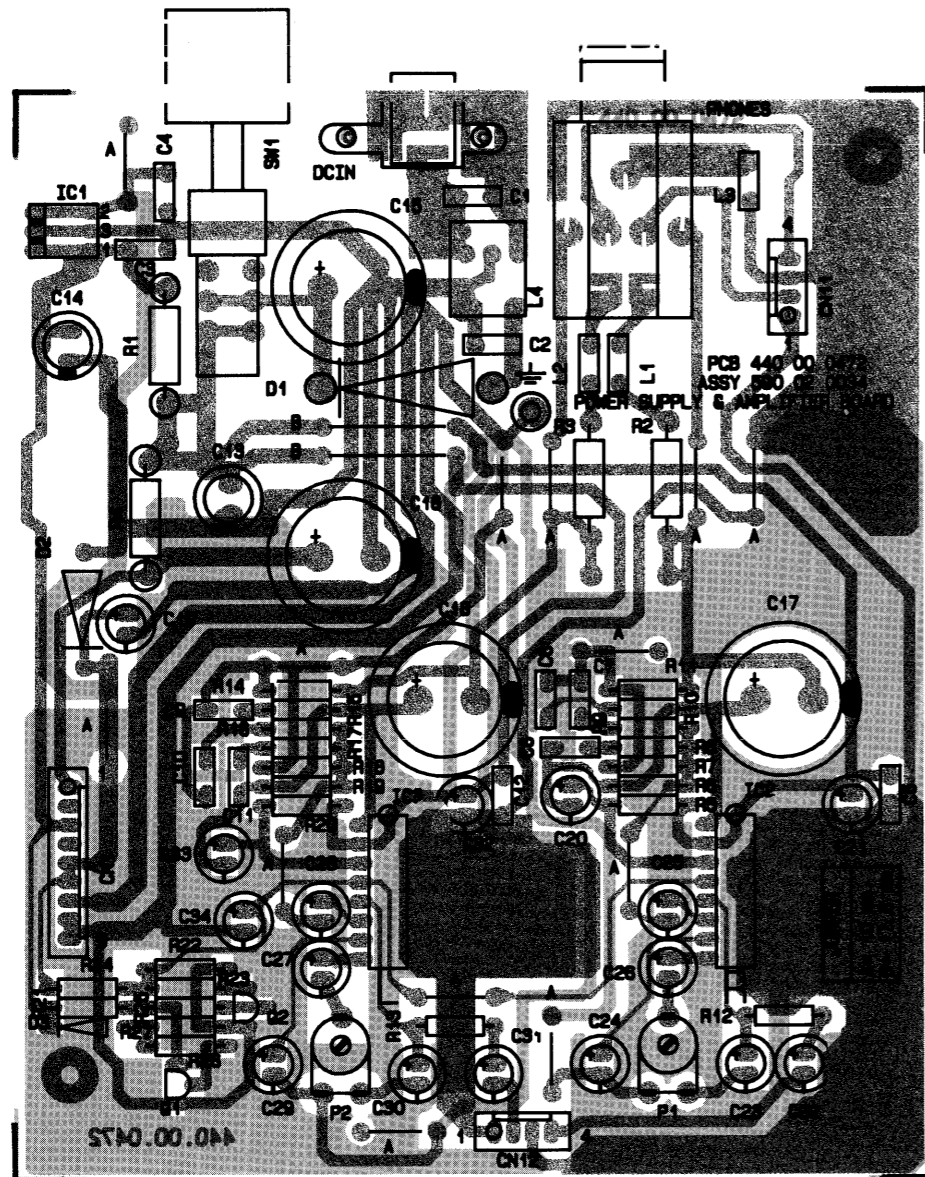


TO SPEAKERS

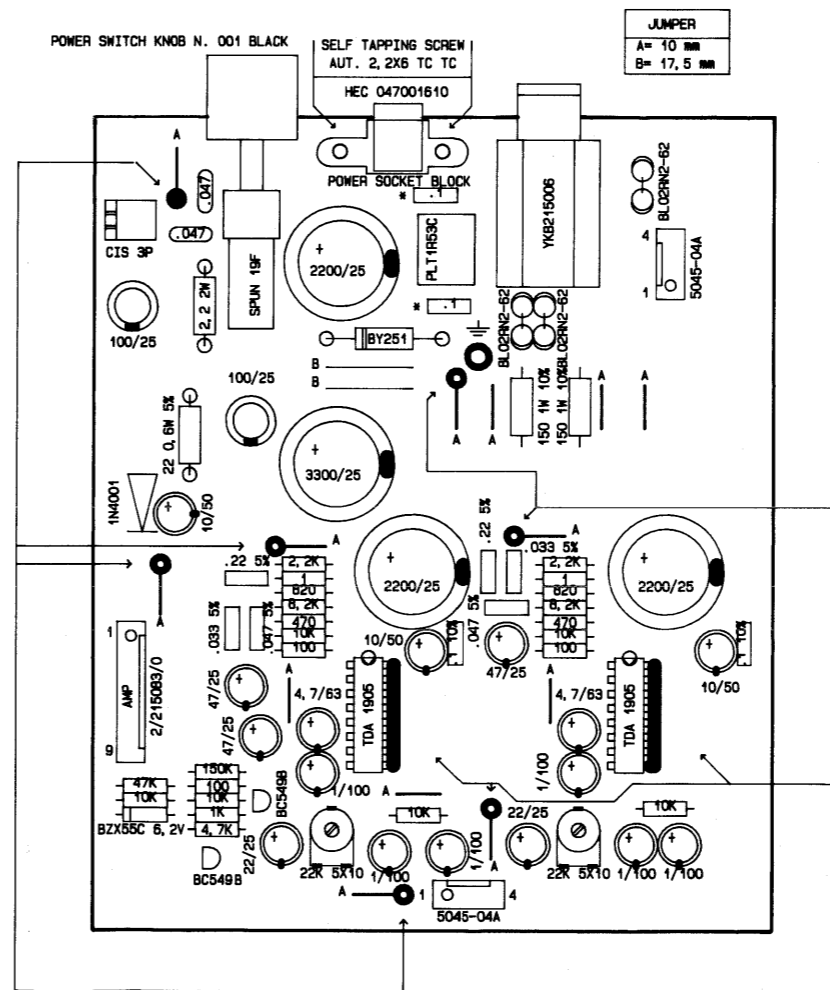
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

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### POWER SUPPLY & AMPLIFIER BOARD (DC-SUPPLY PCB ASS'Y) ASSY 7624503000



View from component side



SOLDER IN THE INDICATED POINTS ON THE COMPONENT'S SIDE

- CERAMIC CAPACITOR
- POLYPROPYLENE CAPACITOR
- MULTILAYER CAPACITOR
- SOLDERING TO ELEVATE THE COMPONENT

TO: SERVICE ENGINEERS  
サービス担当各位殿

E - 5

E-5 SERVICE NOTES CORRECTION AND SUPPLEMENT  
E-5 サービスノート訂正と補足


- \* There are some errors as shown below in the E-5 service notes. Please correct your service notes. Thank you.
- \* E-5 サービスノートについて下記のとおり誤記訂正、及び補足が有りますので修正をお願い致します。

PARTS LIST ( PAGE 4 - 5 )      パーツリスト      ( 4 ~ 5 頁 )

SUPPLEMENT 補足	HOLDER			
	22200188	Card Holder(or Guide for Cartridge)		
SUPPLEMENT 補足	IC			
	15179376	MB81416-10 4x16K bit DRAM	CK35	IC9-IC12
	or 15179345	M5M4416P-12		
	or 15179394	MN4264-12		
	15229706S0	PC910 Optoisolator	CK35	IC21
	or 15229718	6N137		
WRONG 誤	CONNECTOR			
	13439124	5045-08A <del>8P</del>	CK35	IC7
CORRECT 正	CONNECTOR			
	13439124	5045-08A 8P	CK35	IC7
SUPPLEMENT 補足	DIODE, LED			
	15019125	Diode 1SS-133	CK35	D2, 4, 5
	or 15019159RI	1N4148		
SUPPLEMENT 補足	IC			
	15179438	M5M5256BP-12L 256K bit SRAM	CK35	IC26
	or 15179374H0	HM62256LP-12		

ER00005

Page	旧 (PREVIOUS) →	新 (NEW)																										
3	E-5 (KEYBOARD PARTS LIST) 22178266 Key Spring 22578312 Natural Key C5(DO) 22578314 Natural Key D6(RE) 22578315 Natural Key E7(MI) 22578316 Natural Key F1(FA) 22578317 Natural Key G2(SOL) 22578310 Natural Key A3(LA) 22578311 Natural Key B4(SI) 22578313 Natural Key C8(DO*) 22578318 Sharp Key 22158789 Guide Bushing	SUPPLEMENTARY INFOMATION  * <u>Natural/Sharp keys, Key spring and Guide Bushing for E-5/PC-200 are totally equivalent</u> though the part codes for E-5/PC-200 are different. You can use both part codes for ordering.  追加情報																										
3	----- PC-200 (KEYBOARD PARTS LIST) 22178235 Key Spring 22578340 Natural Key C5(DO) 22578341 Natural Key D6(RE) 22578342 Natural Key E7(MI) 22578336 Natural Key F1(FA) 22578337 Natural Key G2(SOL) 22578338 Natural Key A3(LA) 22578339 Natural Key B4(SI) 22578343 Natural Key C8(DO*) 22578344 Sharp Key 22158794 Guide Bushing	* 白鍵 (Natural Key), 黒鍵 (Sharp Key), キースプリング (Key Spring), ガイドブッシング (Guide Bushing) の <u>ハンコード</u> はE-5, PC-200では違いますが, <u>全く同じ</u> ものです。 どちらのハンコードで注文しても問題ありません。  <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">E-5</th> <th style="text-align: center;">PC-200</th> </tr> <tr> <th colspan="2" style="text-align: center;">-----</th> </tr> </thead> <tbody> <tr><td style="text-align: center;"><u>22178266</u></td><td style="text-align: center;">= 22178235</td></tr> <tr><td style="text-align: center;"><u>22578312</u></td><td style="text-align: center;">= 22578340</td></tr> <tr><td style="text-align: center;"><u>22578314</u></td><td style="text-align: center;">= 22578341</td></tr> <tr><td style="text-align: center;"><u>22578315</u></td><td style="text-align: center;">= 22578342</td></tr> <tr><td style="text-align: center;"><u>22578316</u></td><td style="text-align: center;">= 22578336</td></tr> <tr><td style="text-align: center;"><u>22578317</u></td><td style="text-align: center;">= 22578337</td></tr> <tr><td style="text-align: center;"><u>22578310</u></td><td style="text-align: center;">= 22578338</td></tr> <tr><td style="text-align: center;"><u>22578311</u></td><td style="text-align: center;">= 22578339</td></tr> <tr><td style="text-align: center;"><u>22578313</u></td><td style="text-align: center;">= 22578343</td></tr> <tr><td style="text-align: center;"><u>22578318</u></td><td style="text-align: center;">= 22578344</td></tr> <tr><td style="text-align: center;"><u>22158789</u></td><td style="text-align: center;">= 22158794</td></tr> </tbody> </table>	E-5	PC-200	-----		<u>22178266</u>	= 22178235	<u>22578312</u>	= 22578340	<u>22578314</u>	= 22578341	<u>22578315</u>	= 22578342	<u>22578316</u>	= 22578336	<u>22578317</u>	= 22578337	<u>22578310</u>	= 22578338	<u>22578311</u>	= 22578339	<u>22578313</u>	= 22578343	<u>22578318</u>	= 22578344	<u>22158789</u>	= 22158794
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5	PART CODE ERROR / ハ°-ツゴト" 誤記 PARTS LIST / ハ°-ツリスト  23478279 Wiring Ass'y N.003 →	Please cancel it because it has not been used for E-5. 削除して下さい。 E-5では使用されていない為。																											
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<p style="text-align: right;">* Please amend all existing service notes as above.                      * 該当サービスノートを上記のように修正して下さい。</p>																													

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E-5 P.4	* 13449713 DC-SUPPLY SOCKET HEC-047001610	* 13449726 MAIN SOCKET HEC-2305-01-230
E-16 P.5	* 13429823RI POWER SOCKET BLOCK	* 1342982301 POWER SOCKET BLOCK
E-35 P.5		
E-56 P.5		