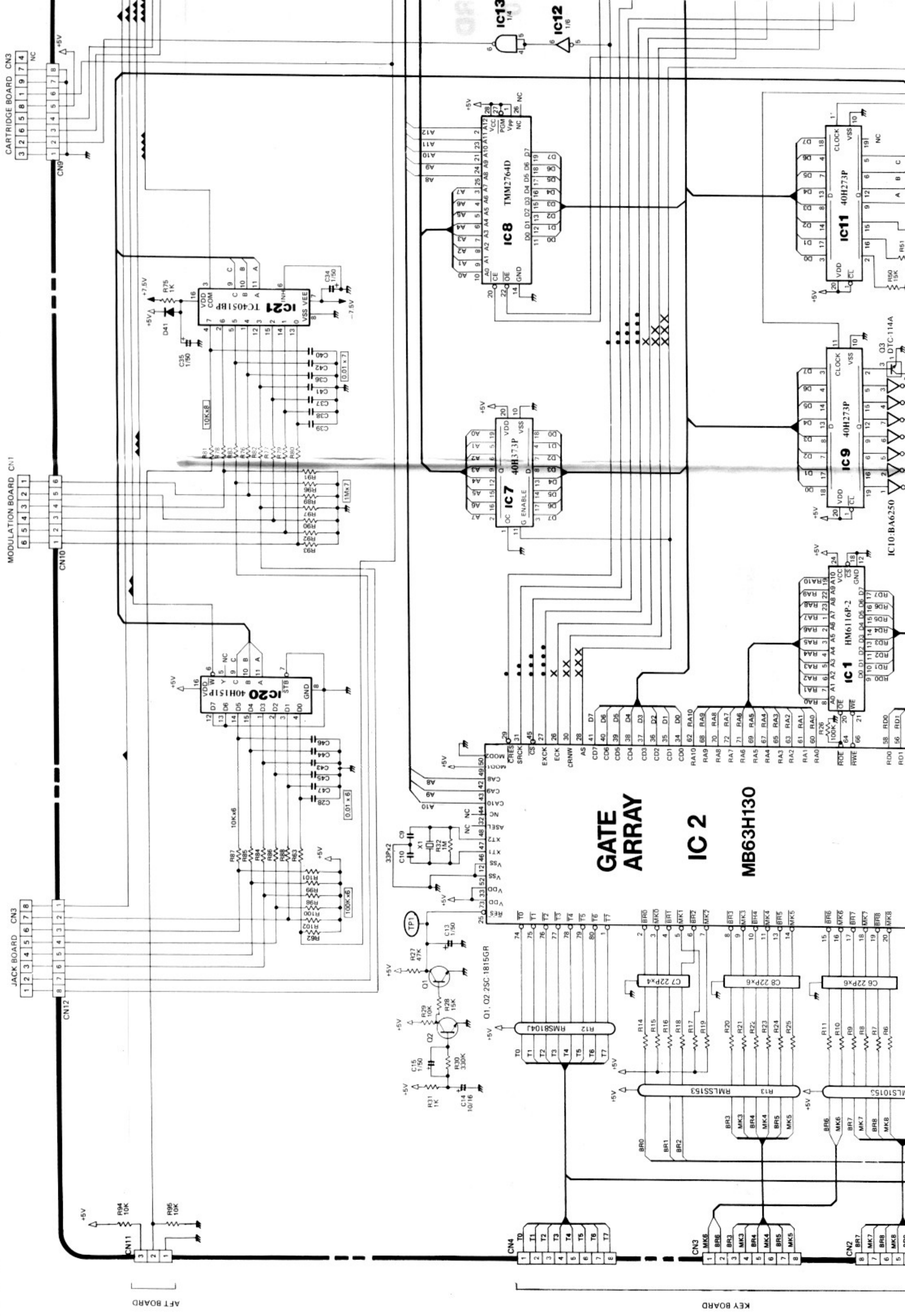


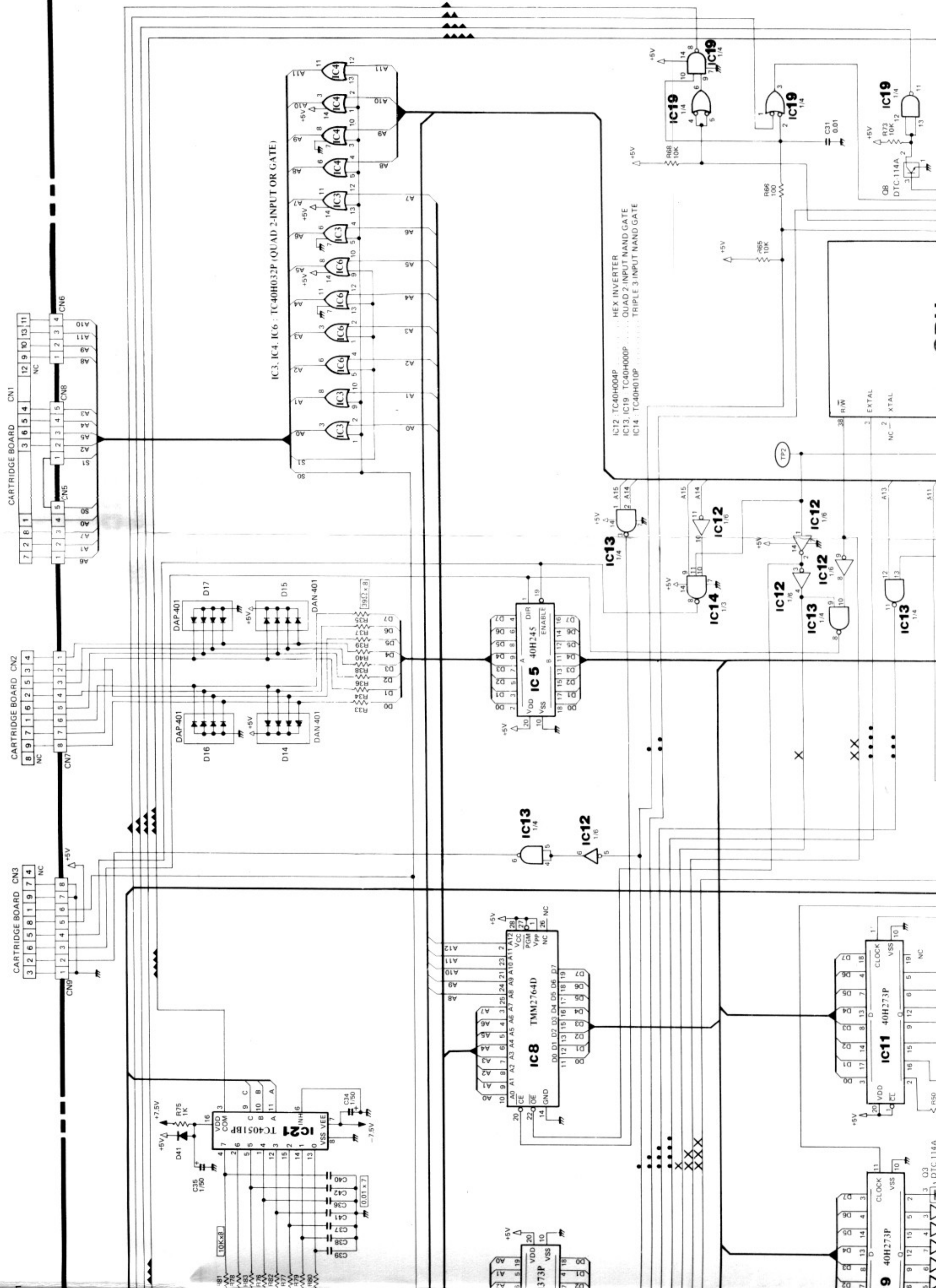
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

CIRCUIT DIAGRAM



A B C D E F G H I J K L M N O

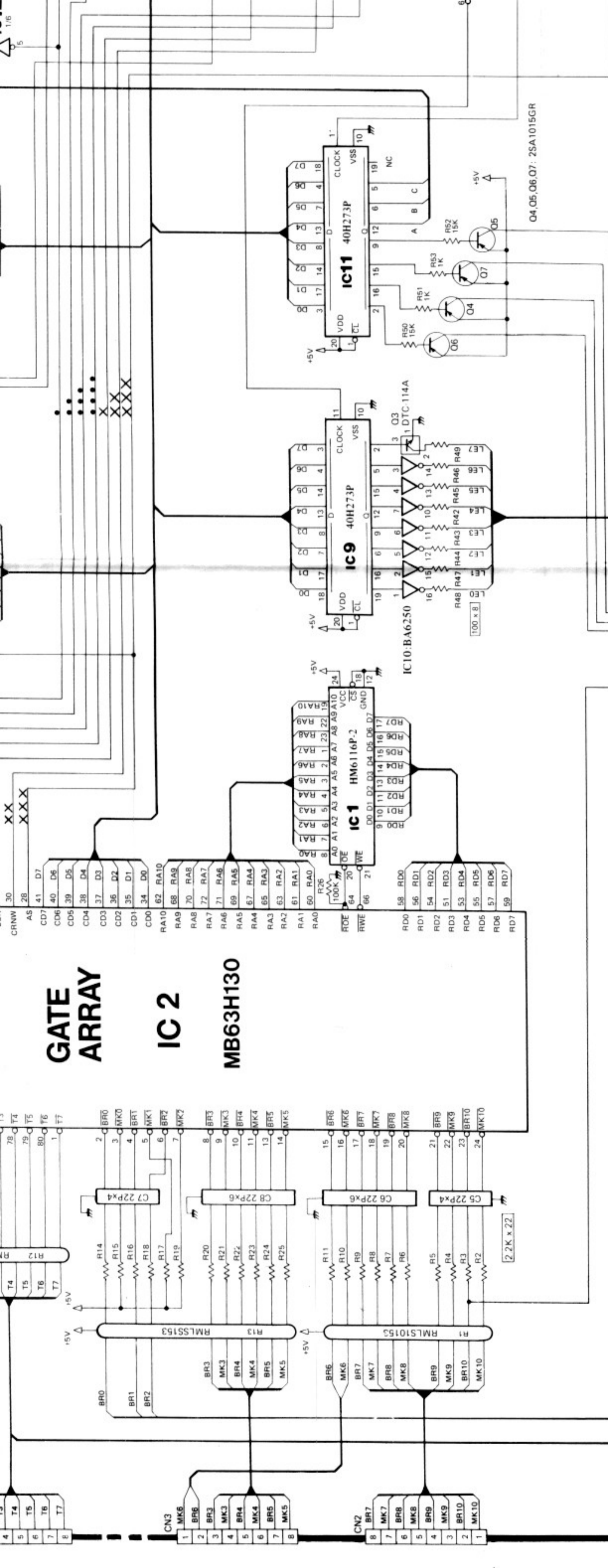
19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47



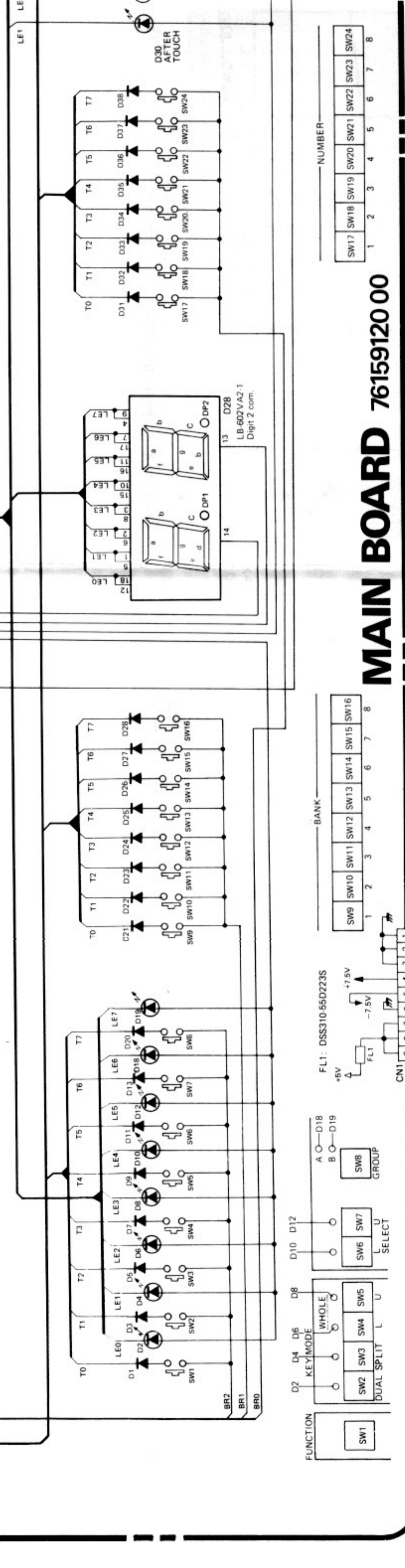
GATE ARRAY

IC 2

MB63H130

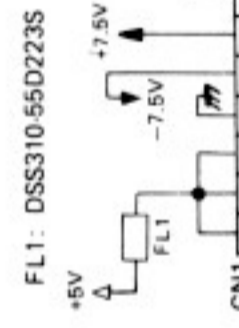
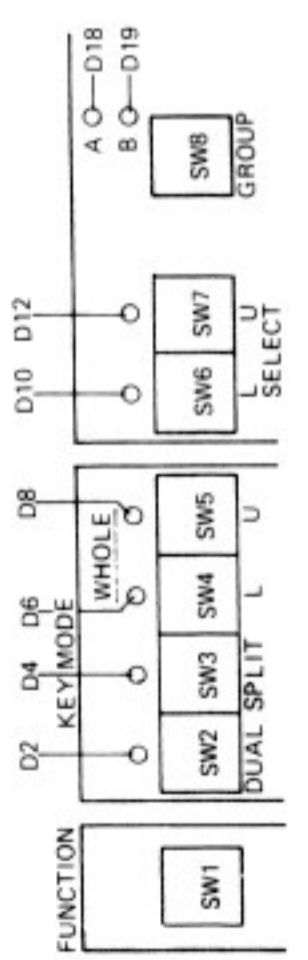


KEY BOARD

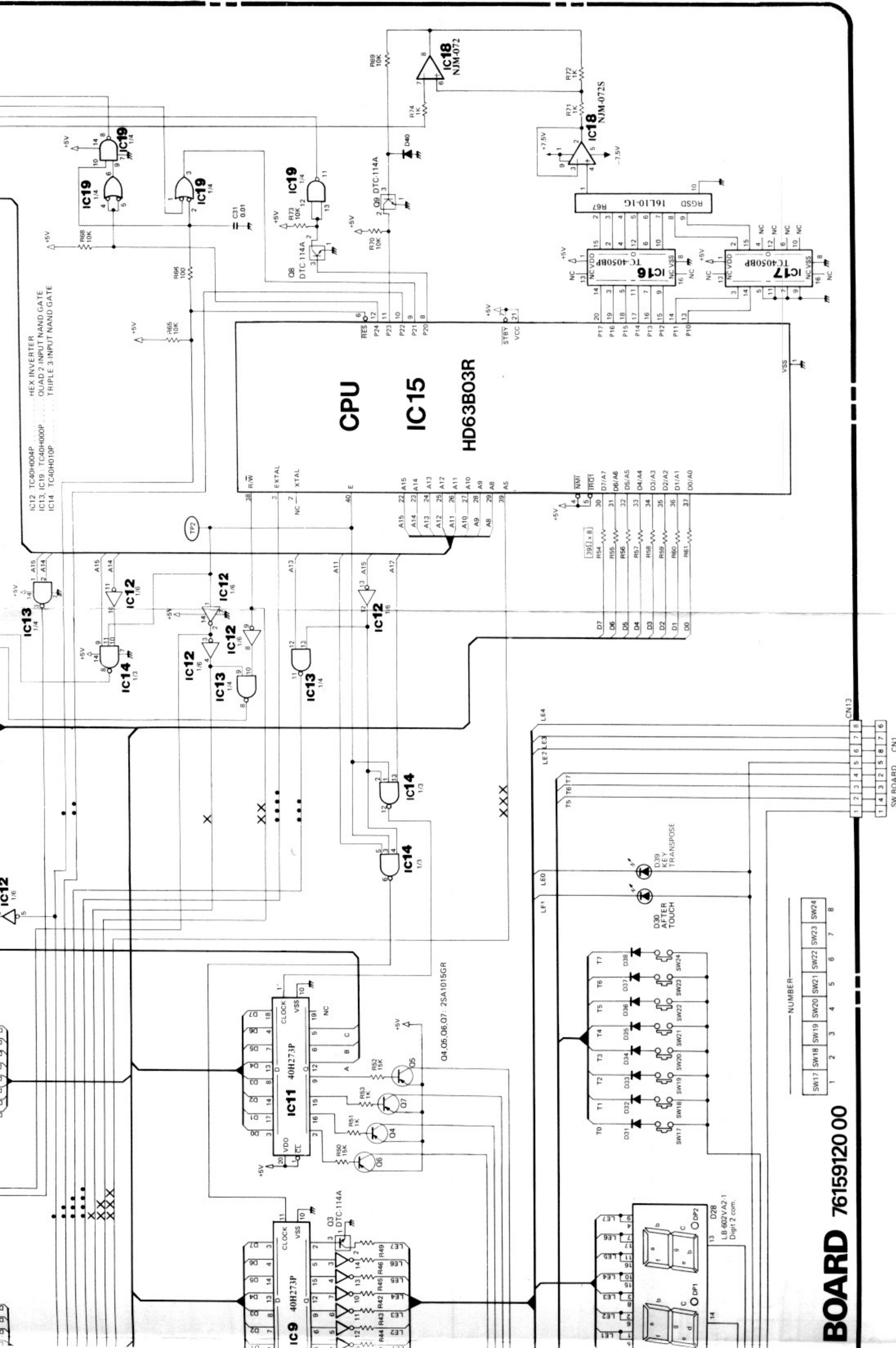


MAIN BOARD 76159120 00

FL1: DSS310-55D223S



J K L M N O P Q R S T U V W X Y Z

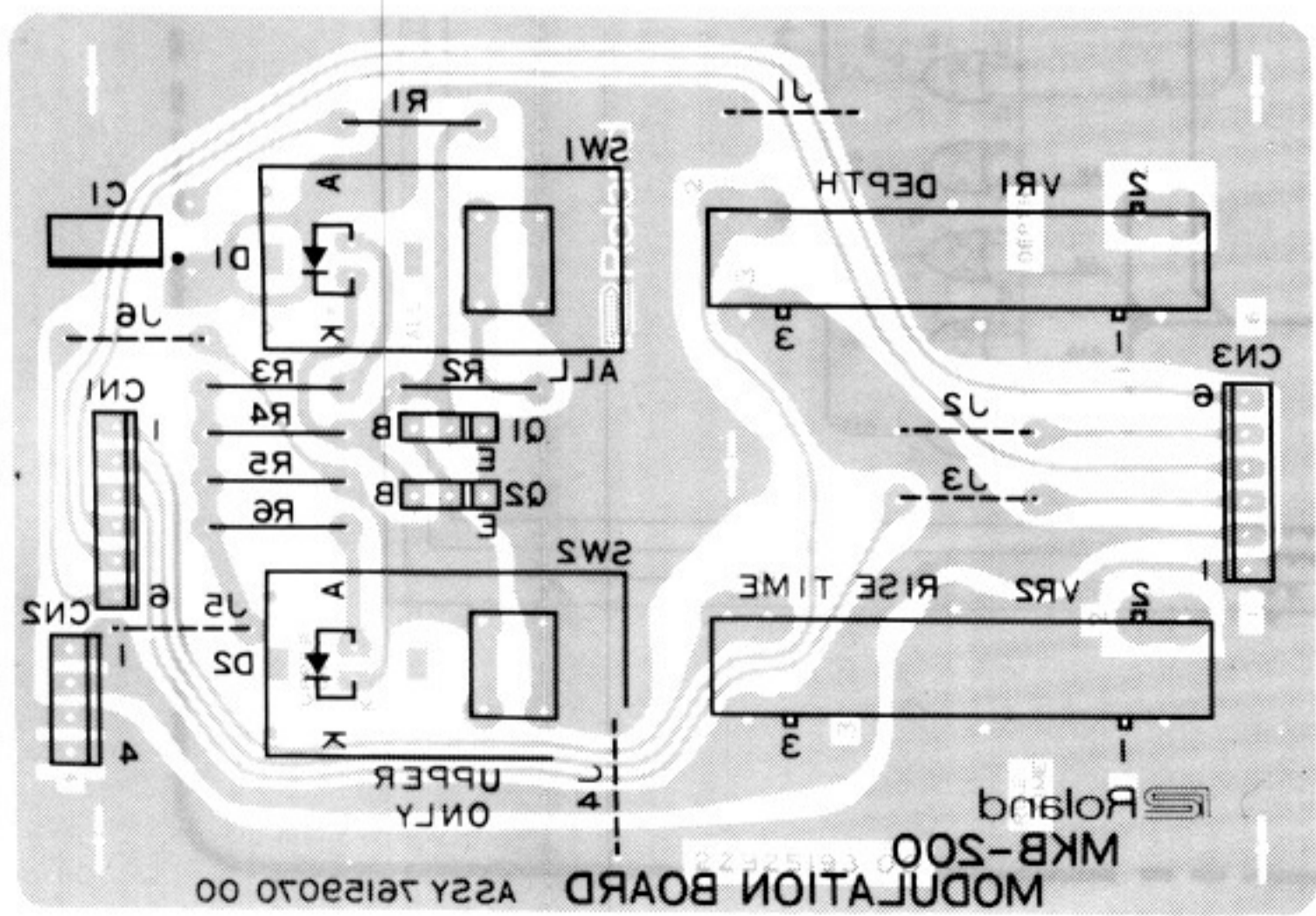


BOARD 76159120 00

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 2

A B C D E F G H I J K L M N O P

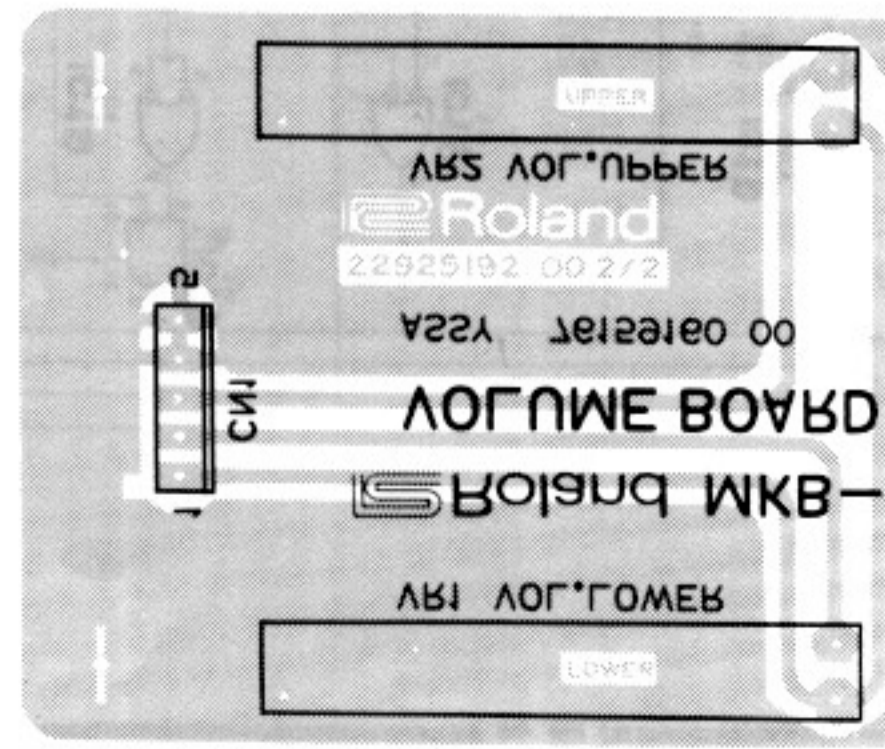
SOLDER SIDE



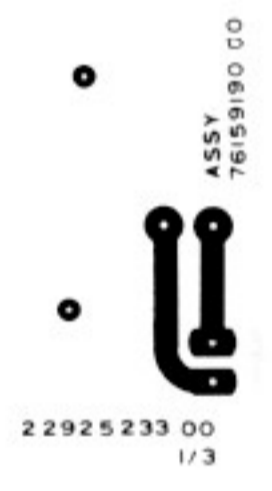
MODULATION BOARD

7615907000 (pcb 22925193 00)

SOLDER SIDE



SOLDER SIDE



AFT BOARD

7615919000 (pcb 22925233 00)

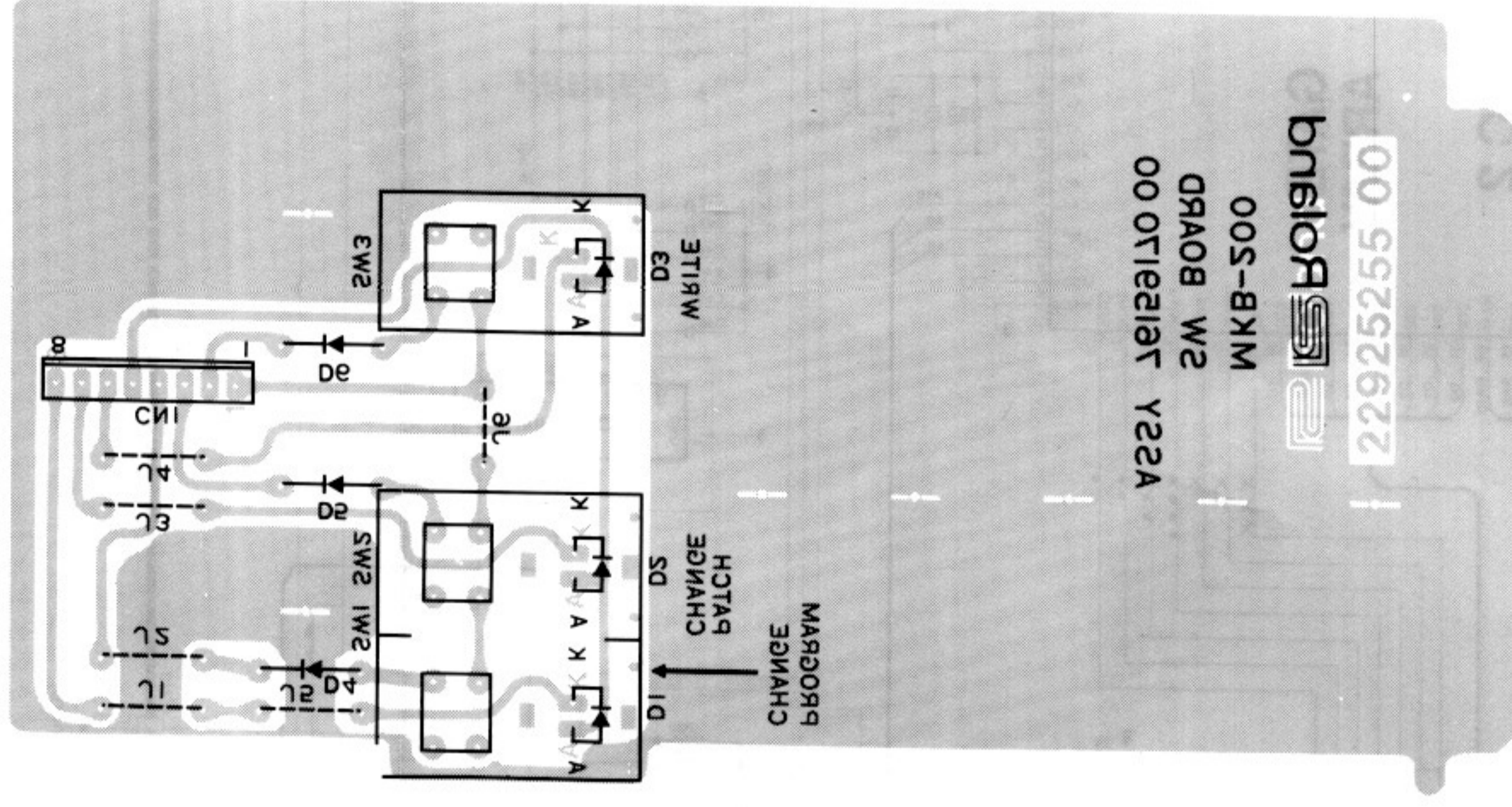
MAIN BOARD

76159 12000

See P 8

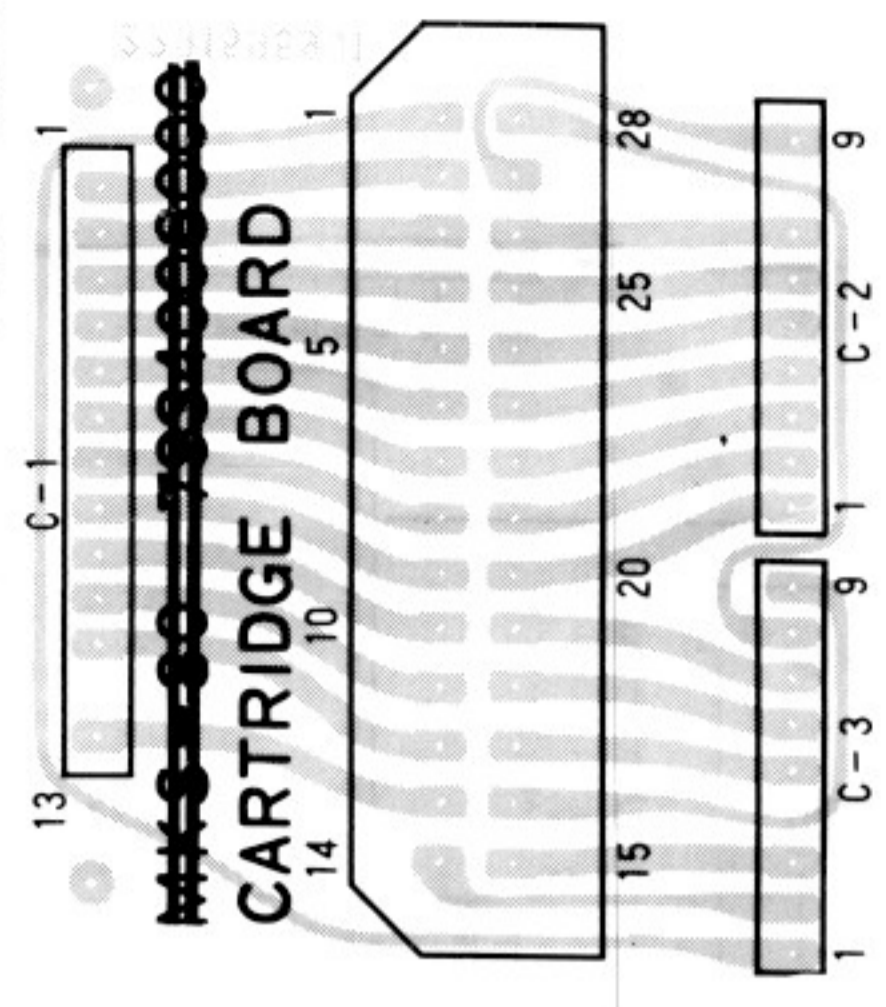
9 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48

SOLDER SIDE



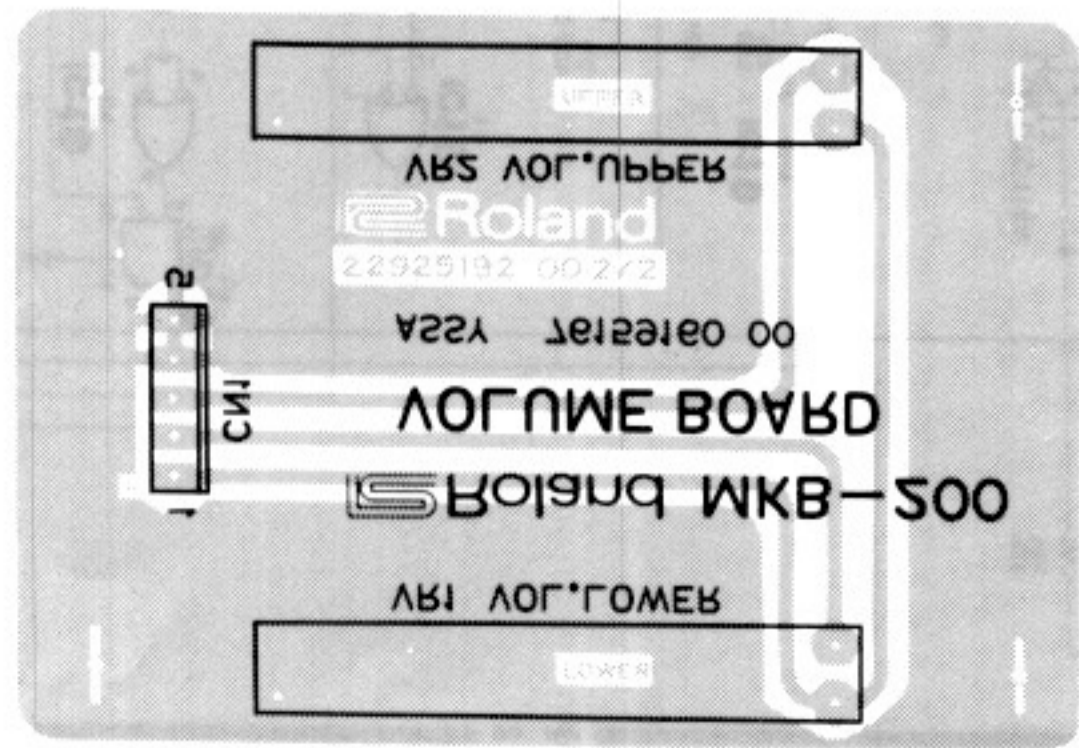
SW BOARD
 7615917000 (pcb 22925255 00)

PART SIDE



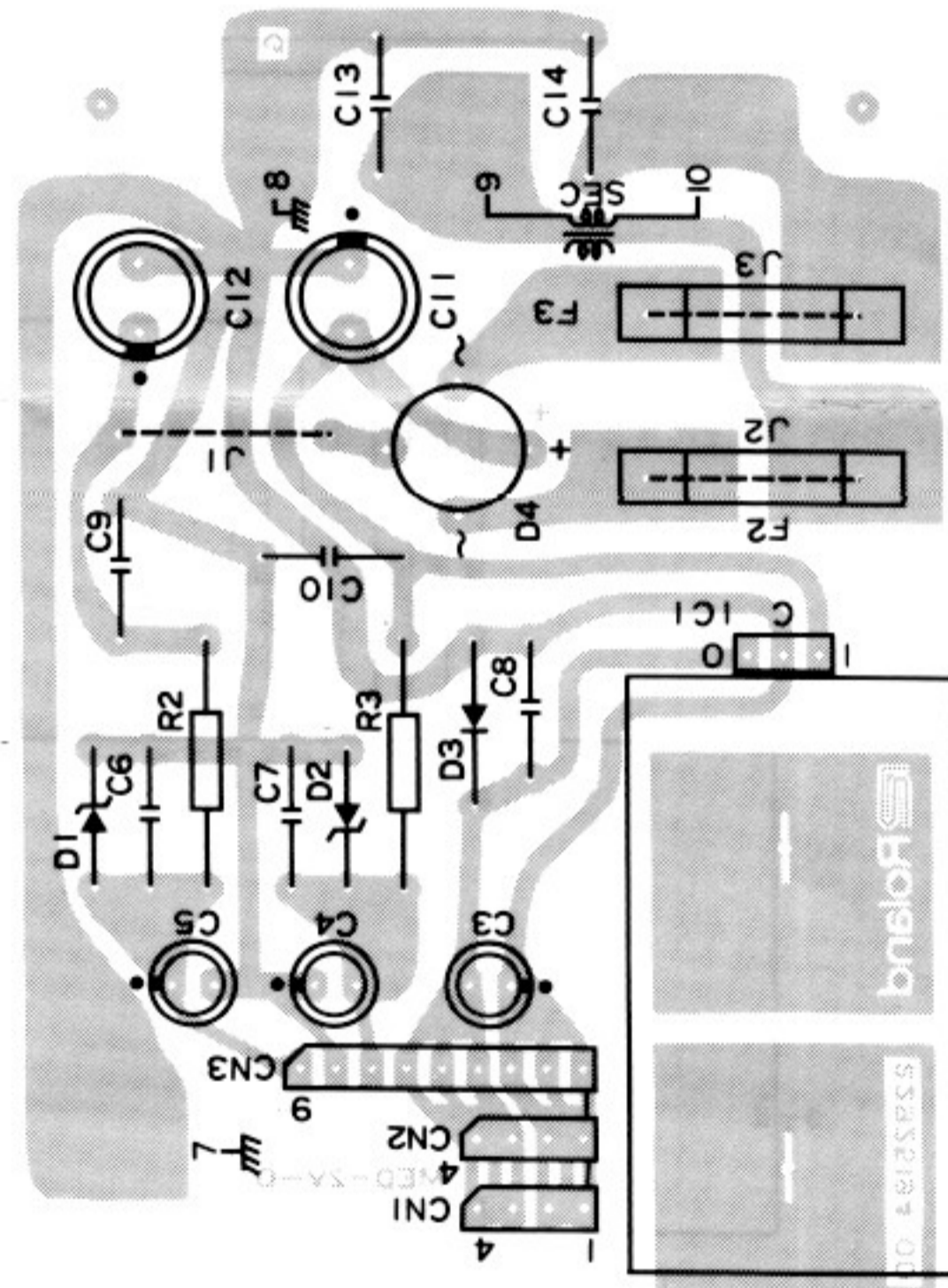
CARTRIDGE BOARD
 7615918000 (pcb 22925191 01)

SOLDER SIDE



VOLUME BOARD

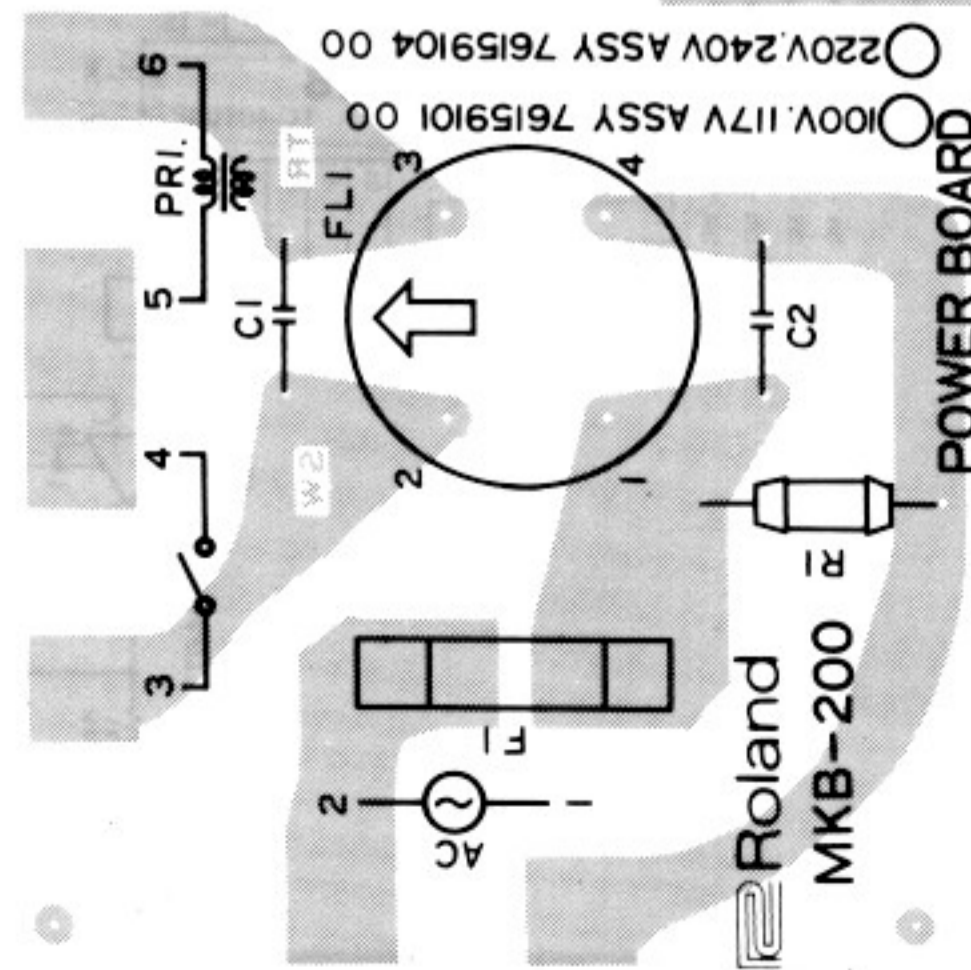
7615916000 (pcb 22925192 00)



PART SIDE

JACK BOARD

7615915000 (pcb 229251920 00)

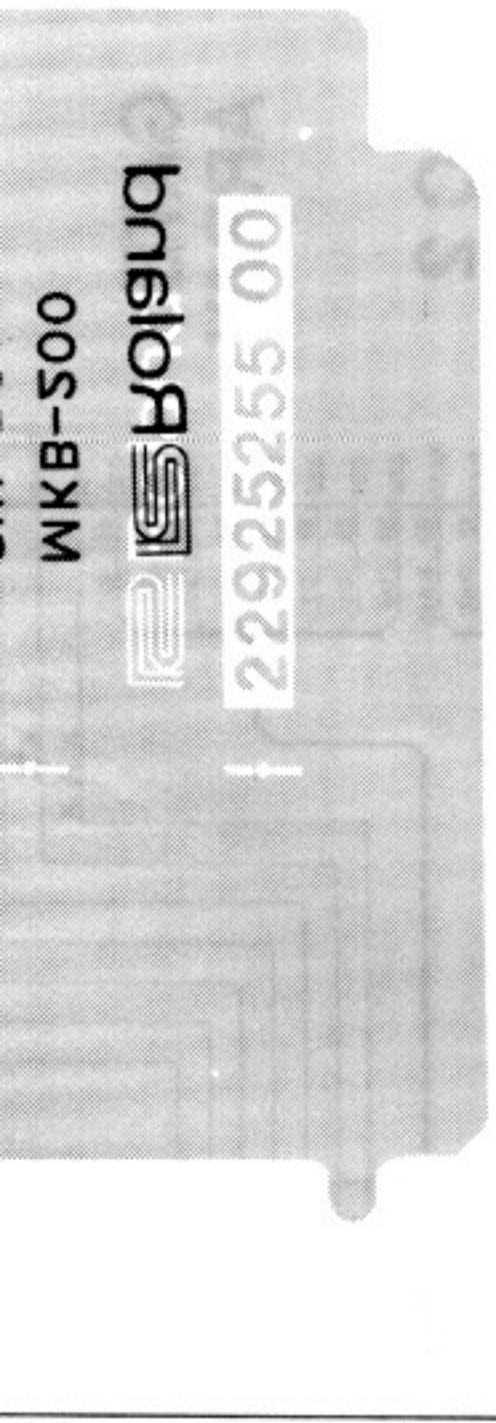


POWER BOARD

7615910100 100, 117V (pcb 22925194 00)

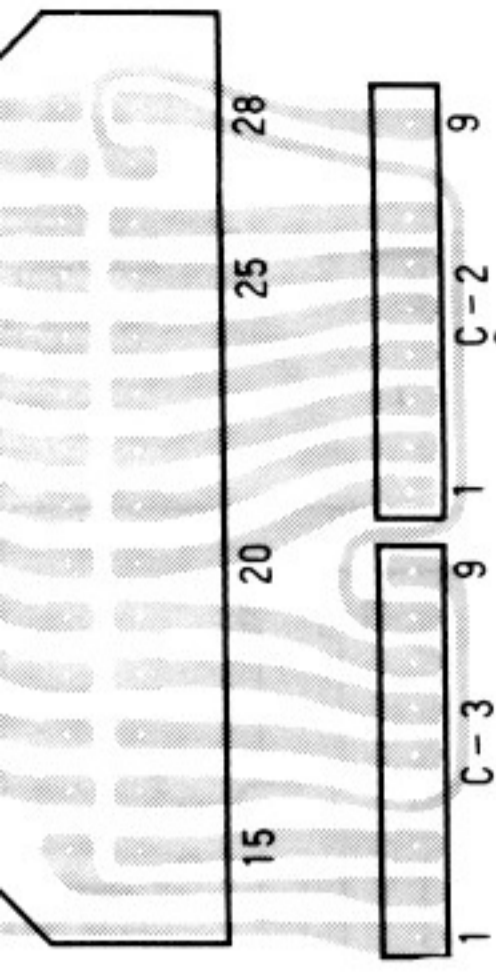
7615910400 220, 240V (pcb 22925194 00)

K L M N O P Q R S T U V W X Y Z



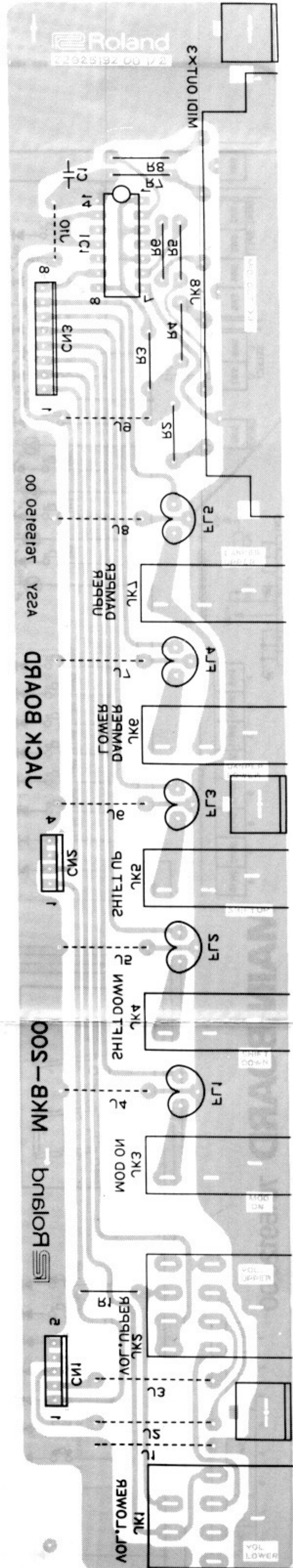
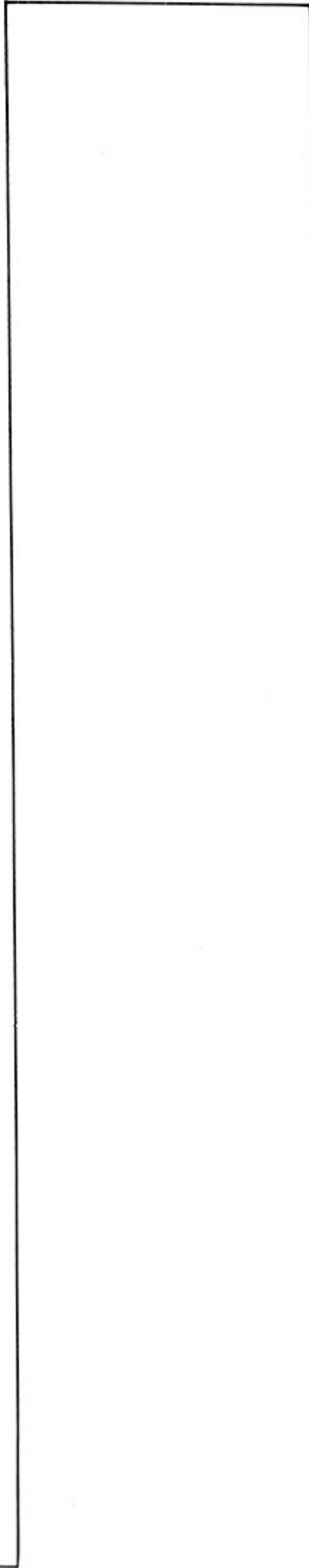
SW BOARD

7615917000 (pcb 22925255 00)



CARTRIDGE BOARD

7615918000 (pcb 22925191 01)



JACK BOARD
7615915000 (pcb 229251920 00)

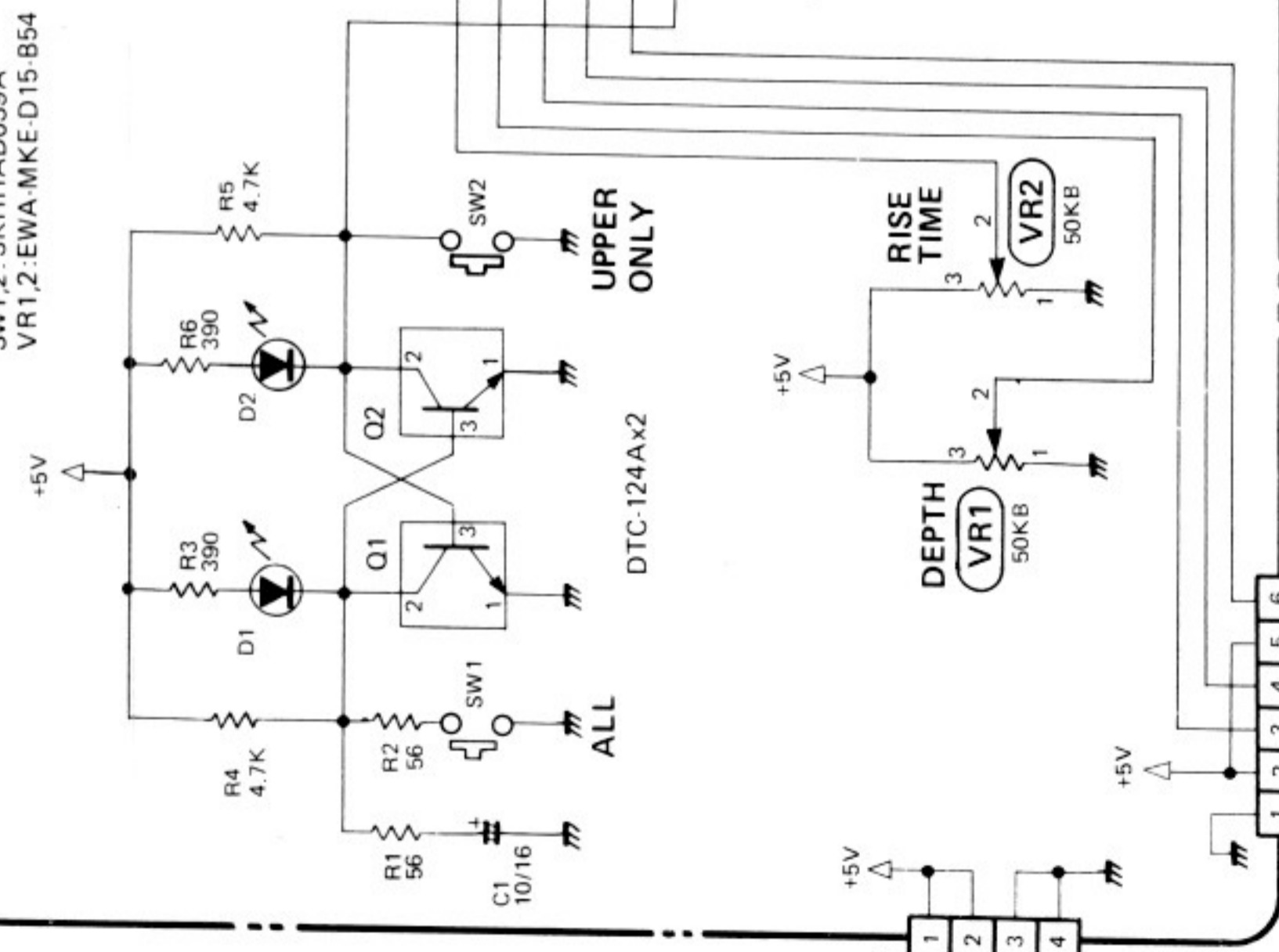
SOLDER SIDE

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

CIRCUIT DIAGRAM

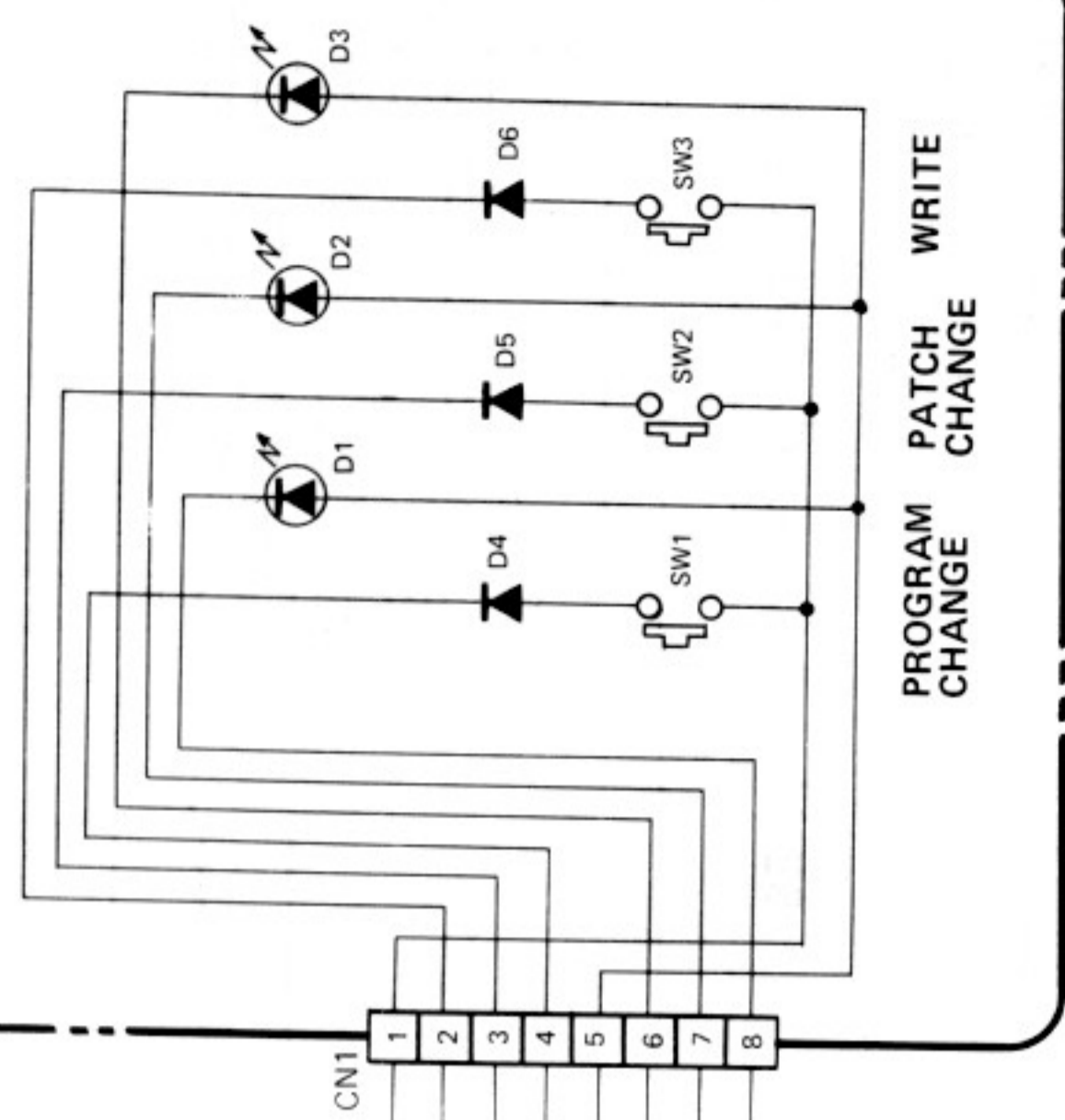
MODULATION BOARD 7615307000

D1,2: SLR-34VR-3
SW1,2: SKHHAD039A
VR1,2: EWA-MKE-D15-B54



SW BOARD 7615917000

SW1,2,3 : SKHHAD039A
D1,2,3 : SLR-34VR3
D4,5,6 : 1S-2473

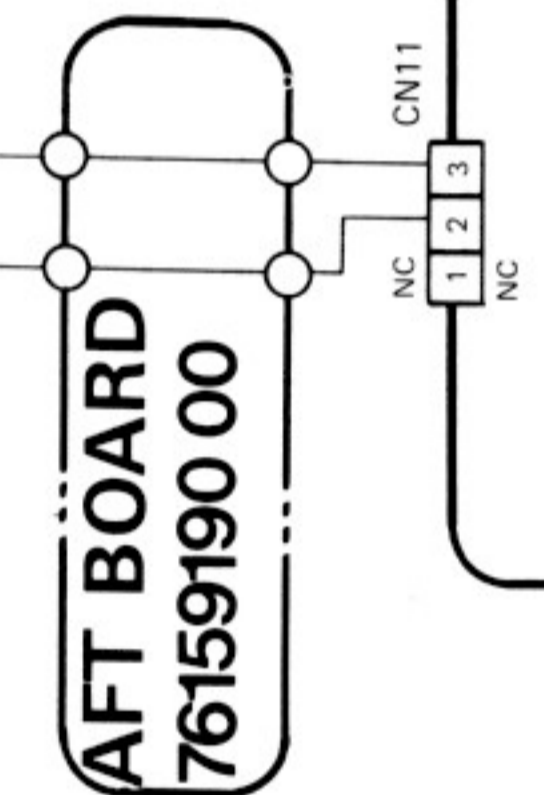


MAIN BOARD 7615912000

AFT BOARD 7615919000

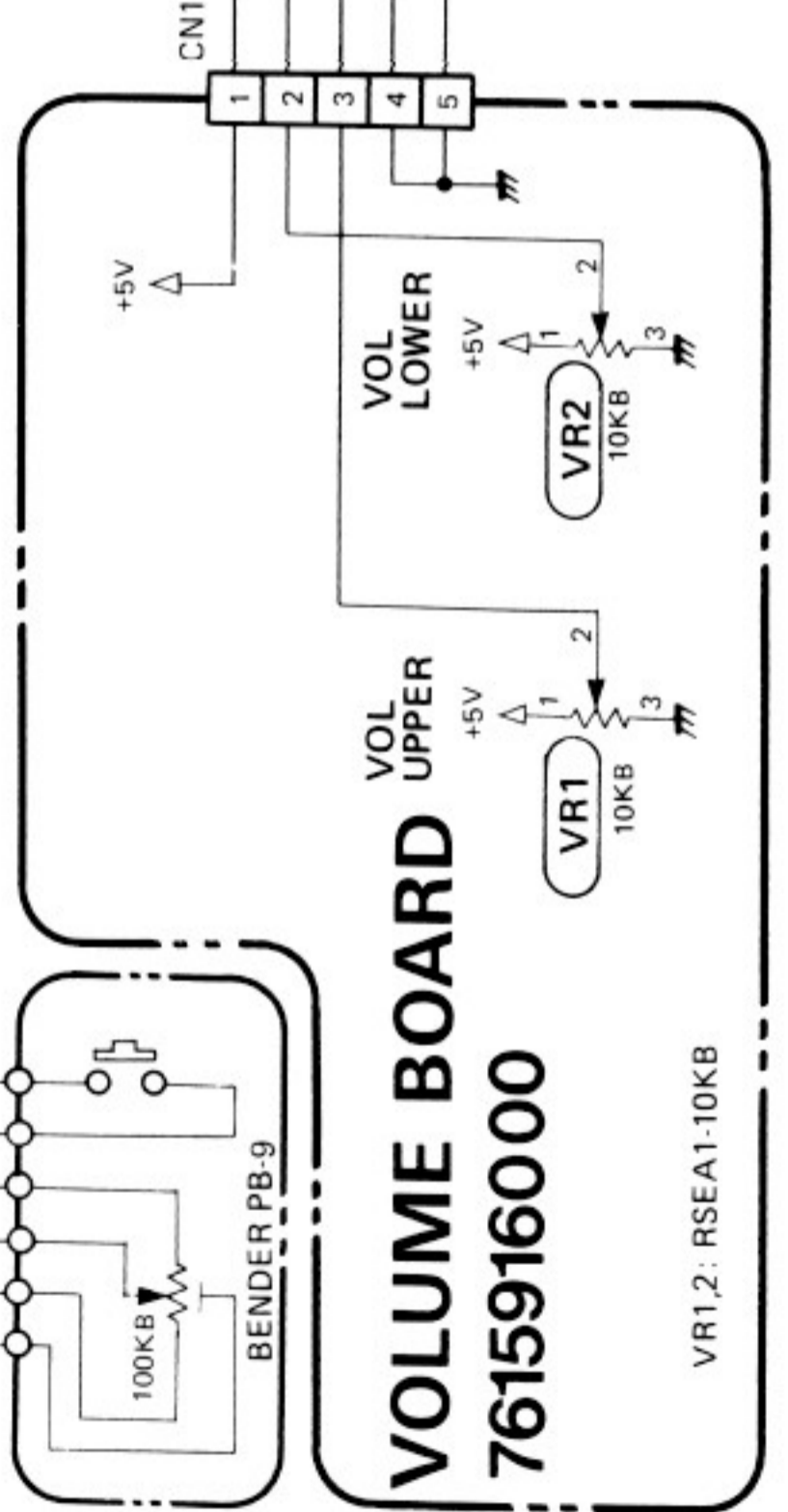
KBD

CN: 520314-2
AFTER TOUCH

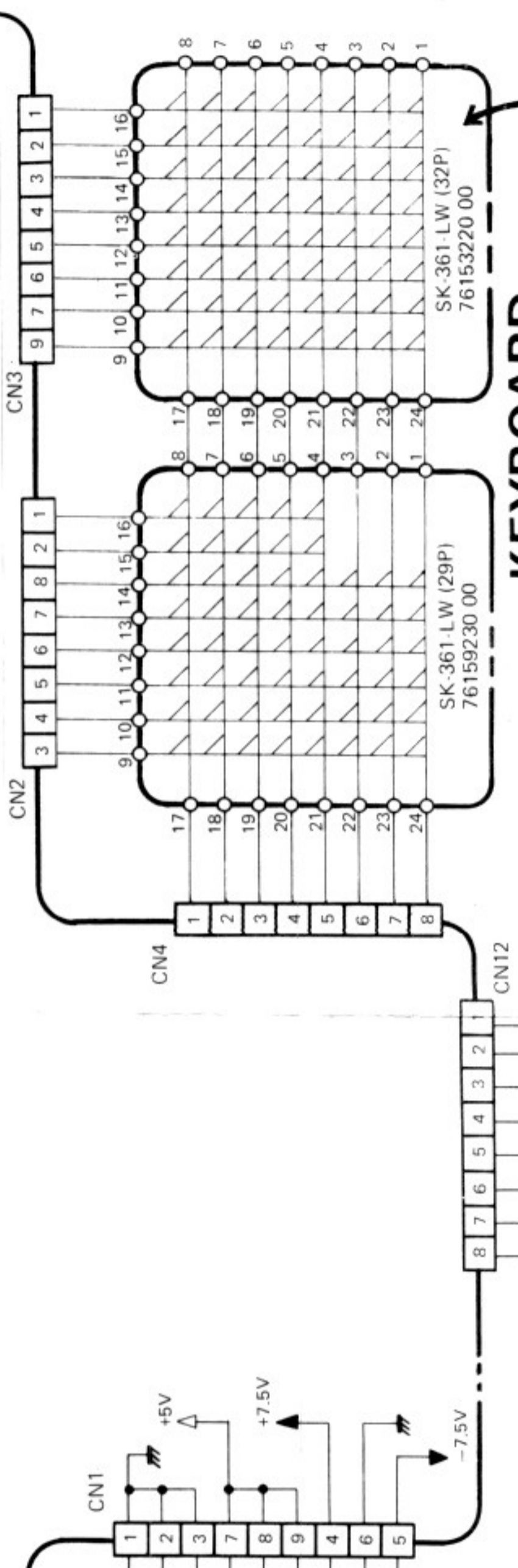
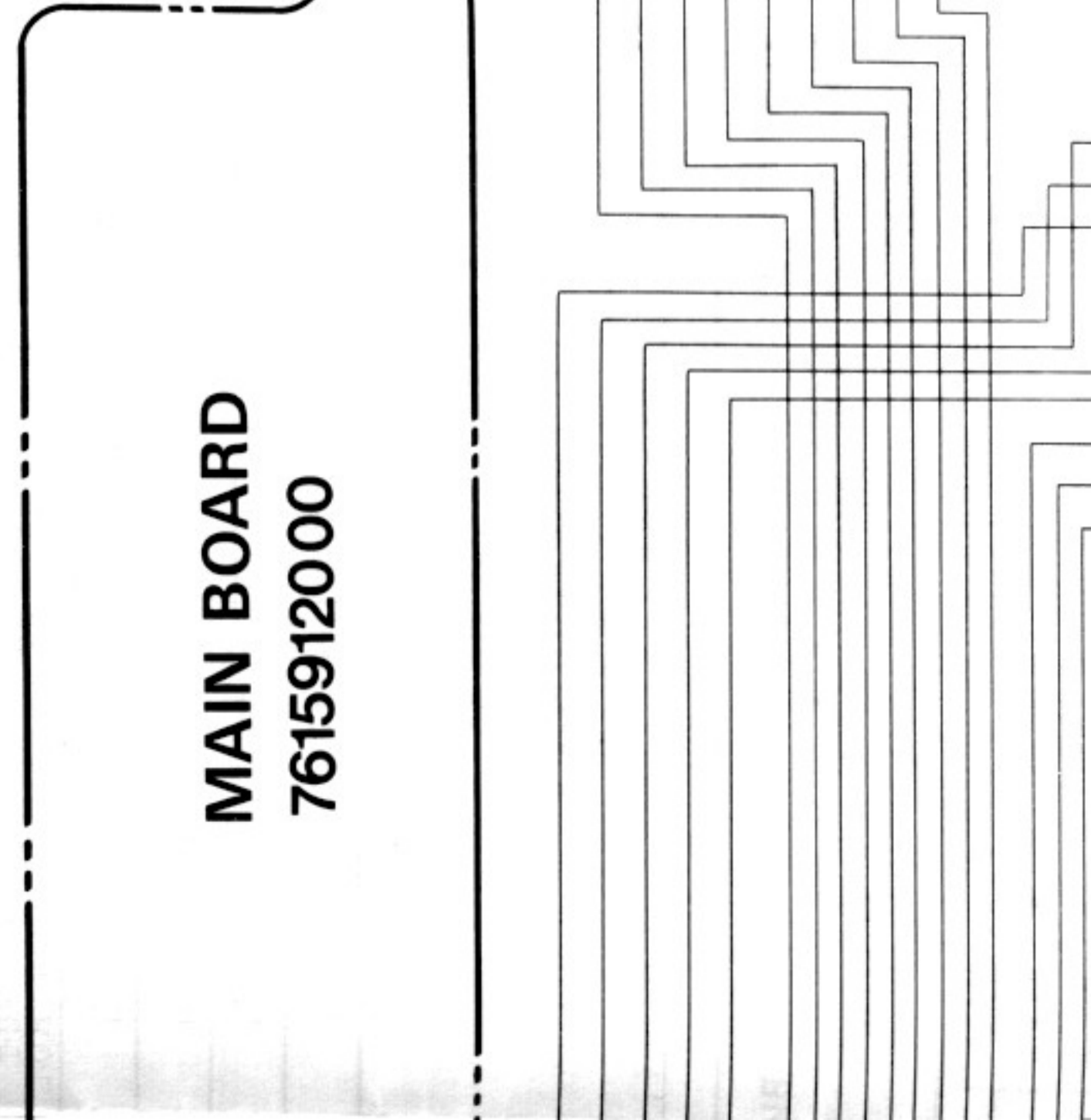
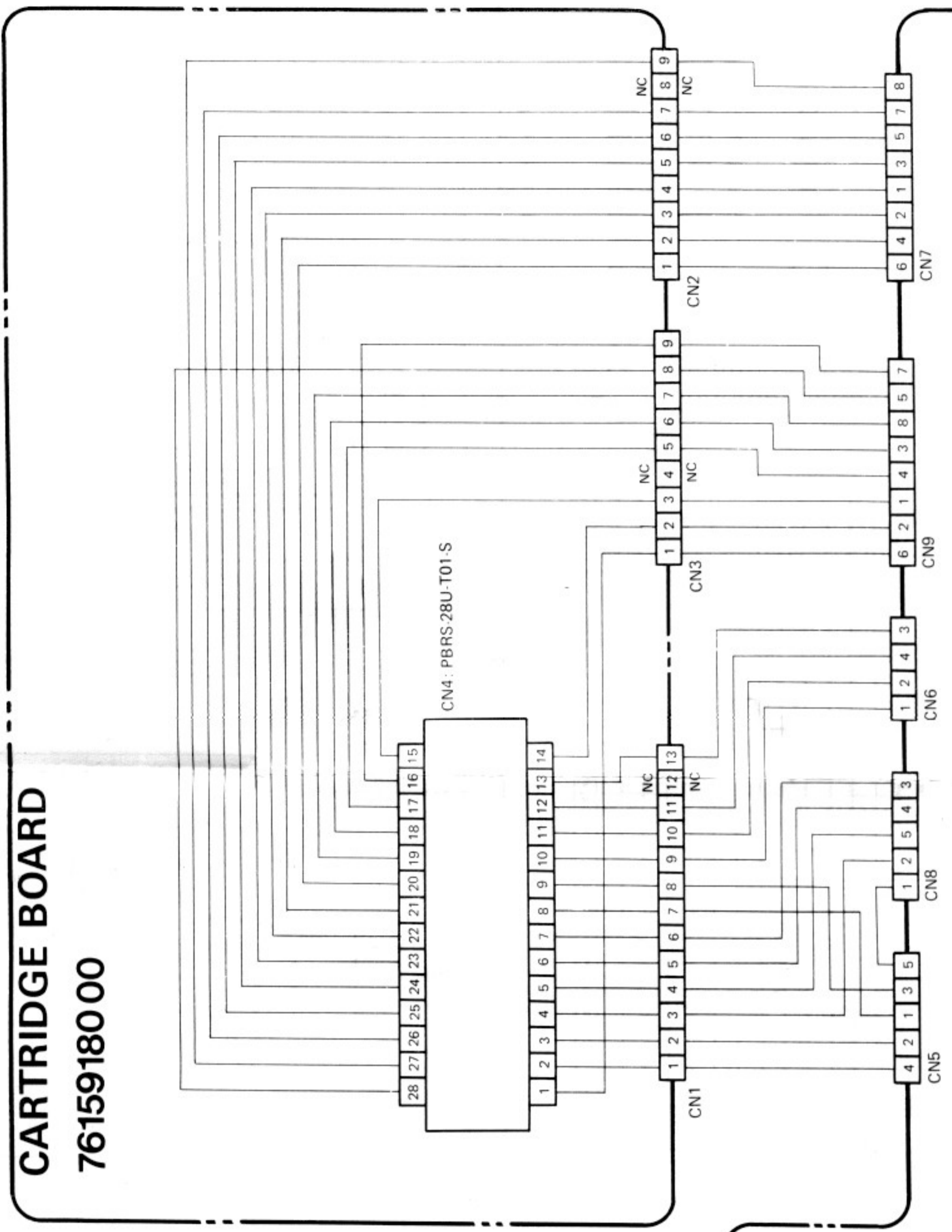
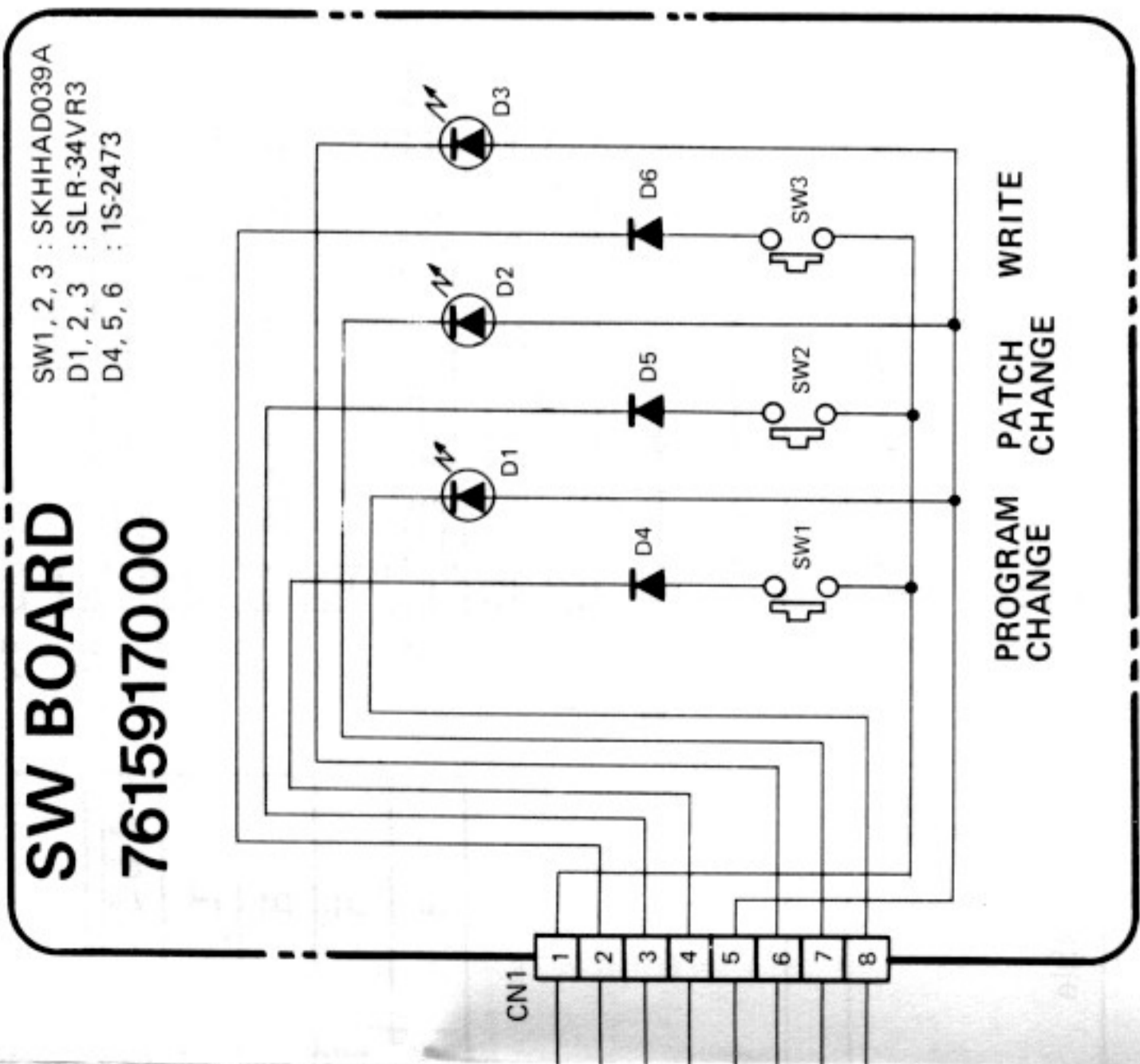


VOLUME BOARD 7615916000

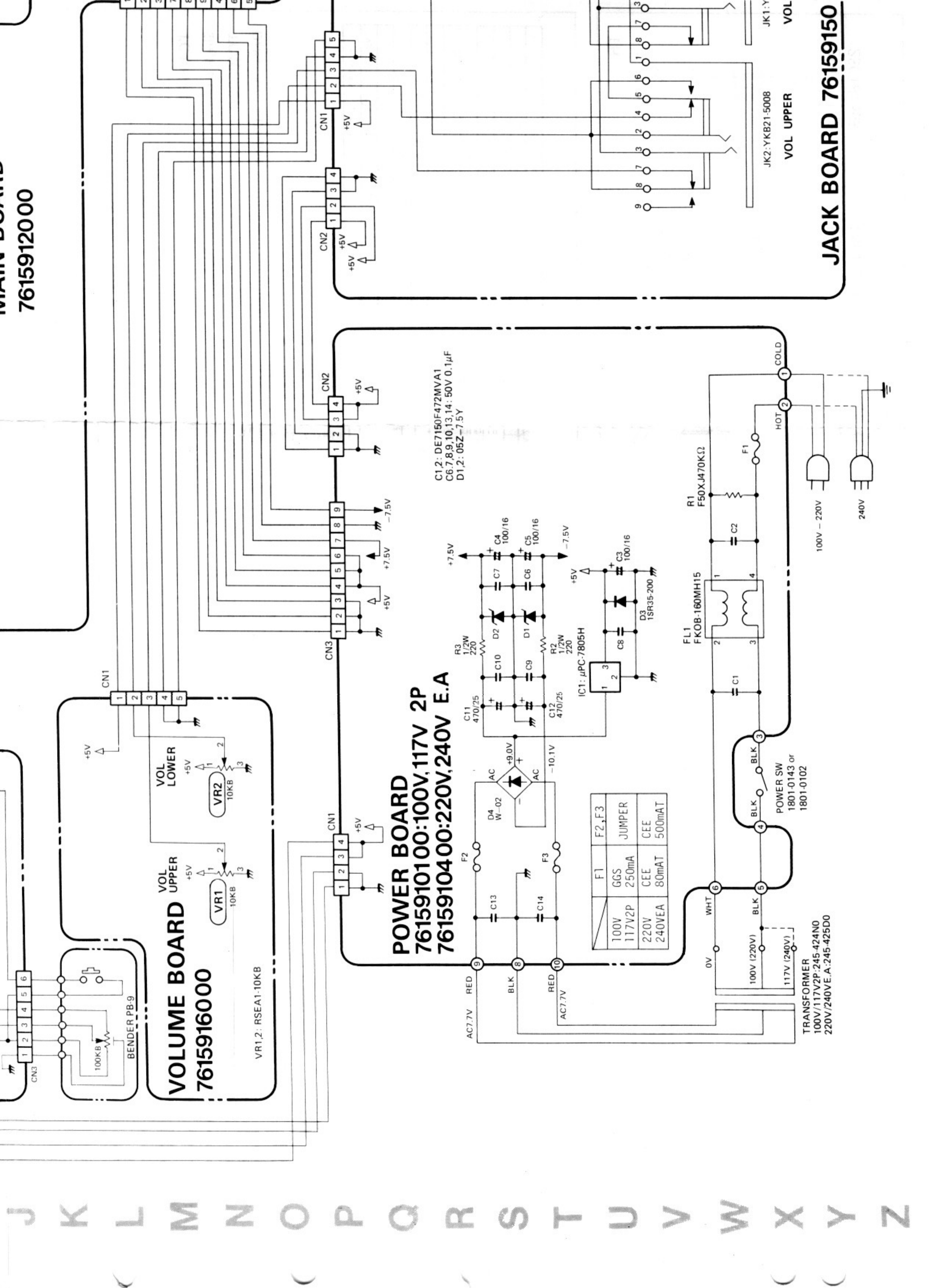
VR1,2: RSEA1-10KB



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 47



MAIN BOARD
7615912000



**VOLUME BOARD
7615916000**

VOL UPPER

VOL LOWER

VR1,2: RSEA1-10KB

**POWER BOARD
7615910100:100V,117V 2P
7615910400:220V,240V E.A**

C1,2: DE7150F472MVA1
C6,7,8,9,10,13,14: 50V 0.1μF
D1,2: 05Z-7.5Y

F1	GGS	250mA
F2, F3	JUMPER	
100V	CEE	500mAT
117V2P	CEE	80mAT
220V	CEE	500mAT
240VEA	CEE	500mAT

TRANSFORMER
100V/117V2P:245-424N0
220V/240VE.A:245-425D0

POWER SW
1801-0143 or
1801-0102

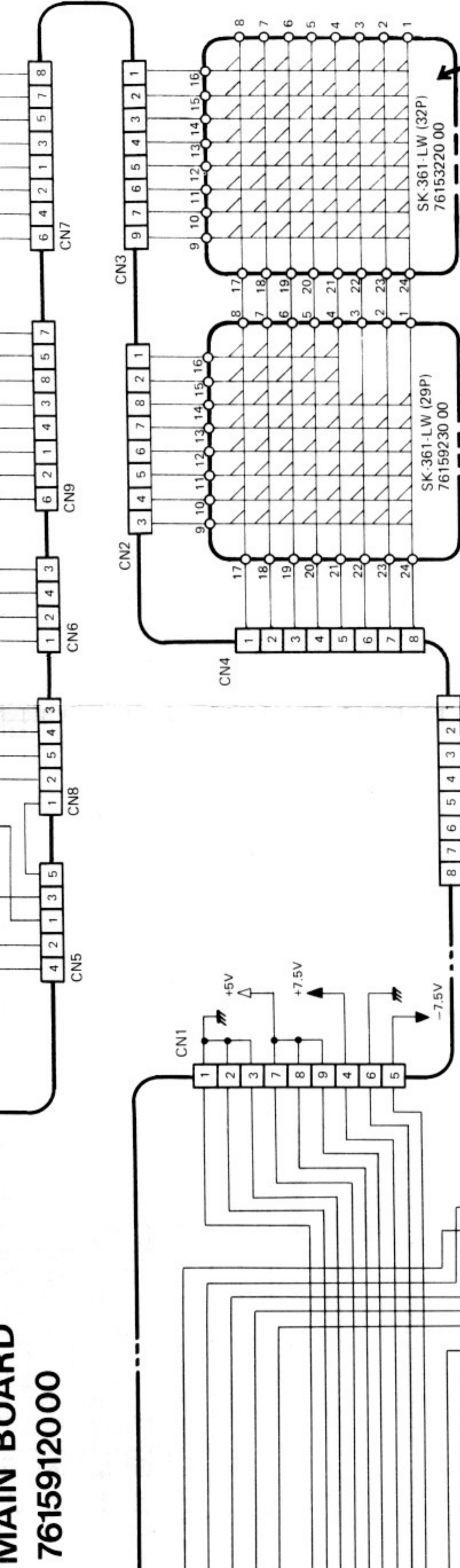
JACK BOARD 76159150

JK1:Y VOL
JK2:YKB21-5008 VOL UPPER

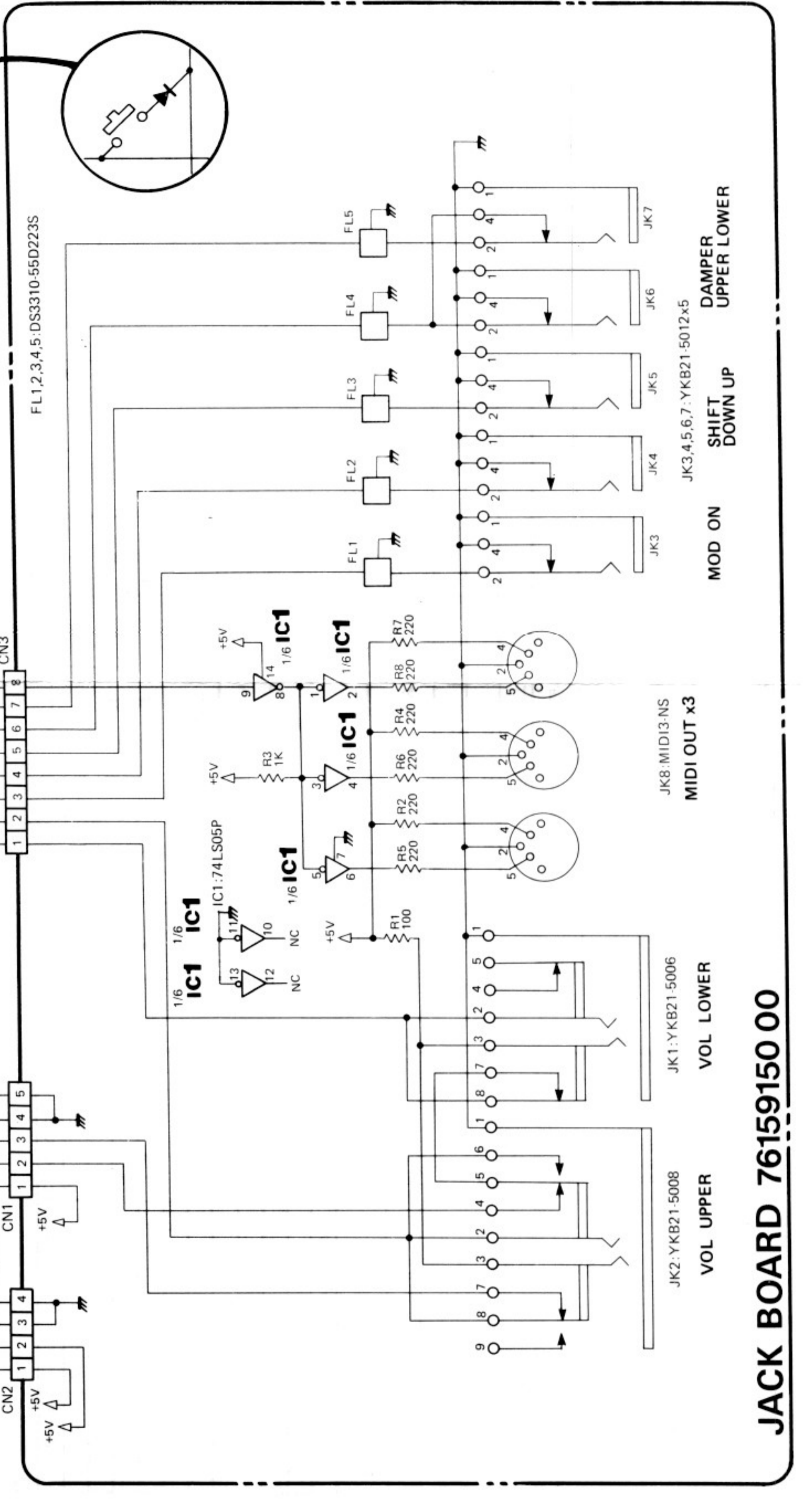
100V - 220V
240V

J K L M N O P Q R S T U V W X Y Z

**MAIN BOARD
7615912000**



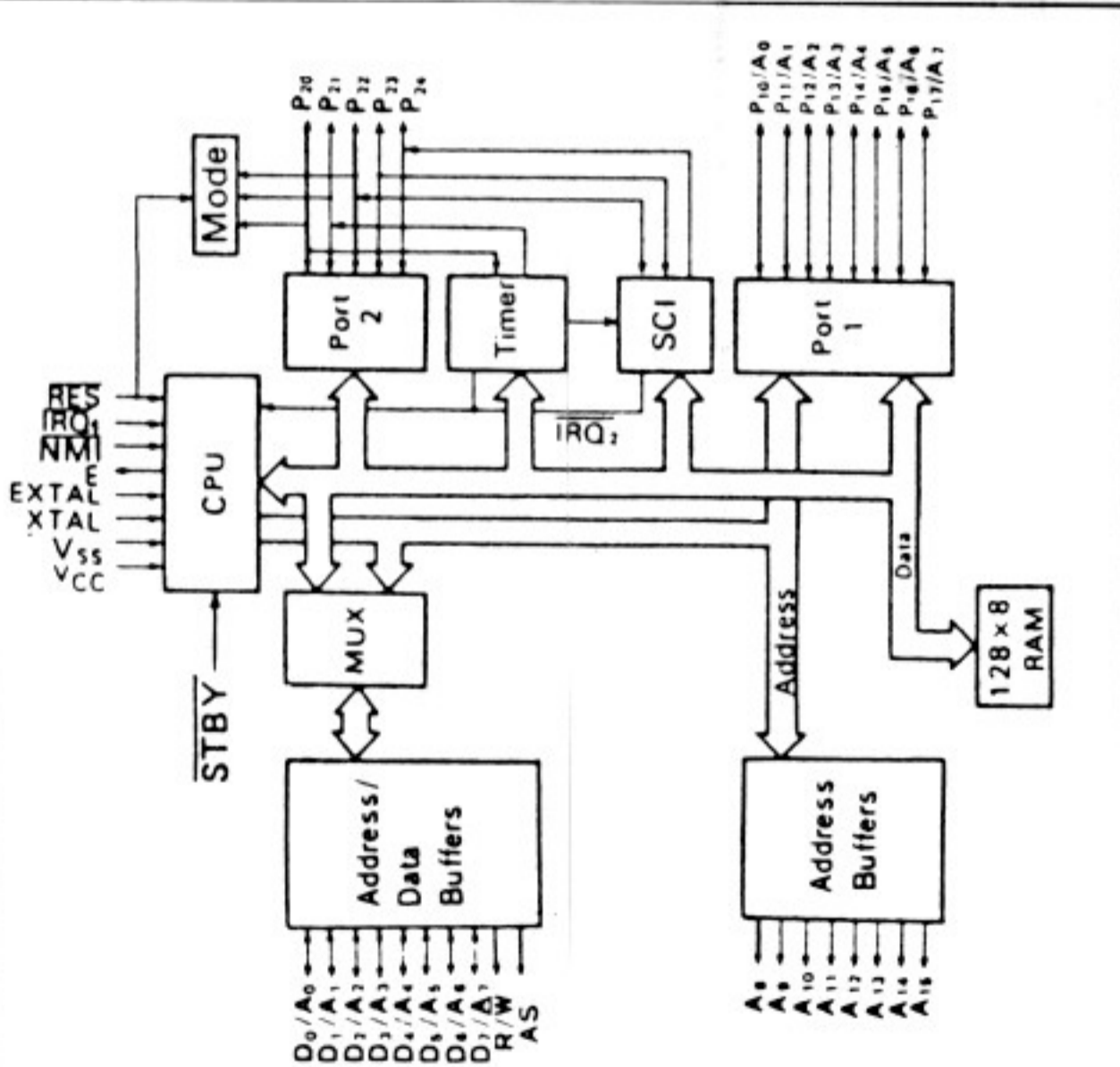
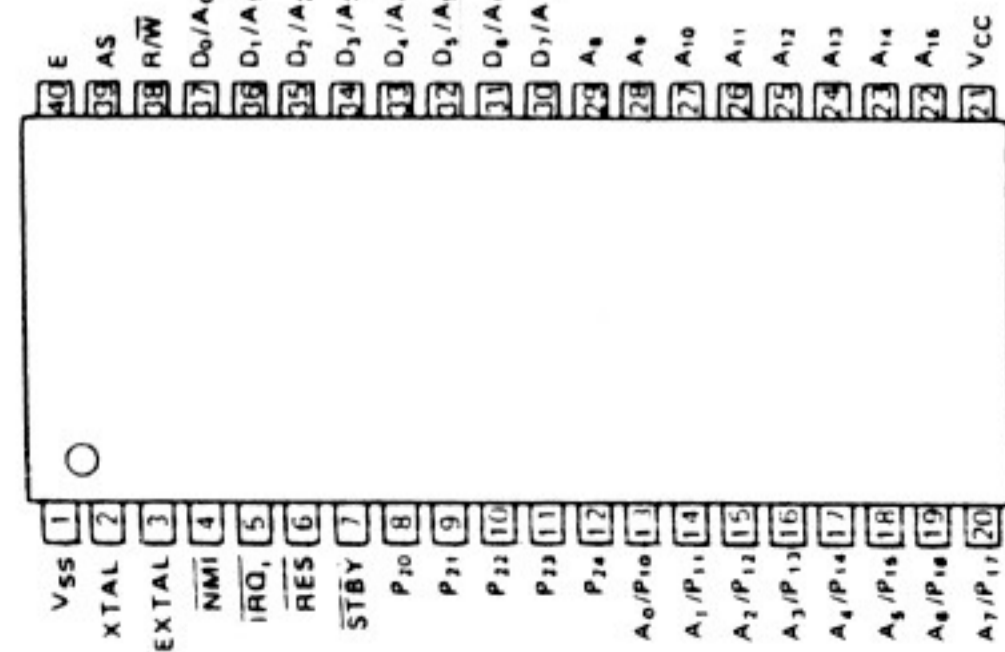
KEYBOARD



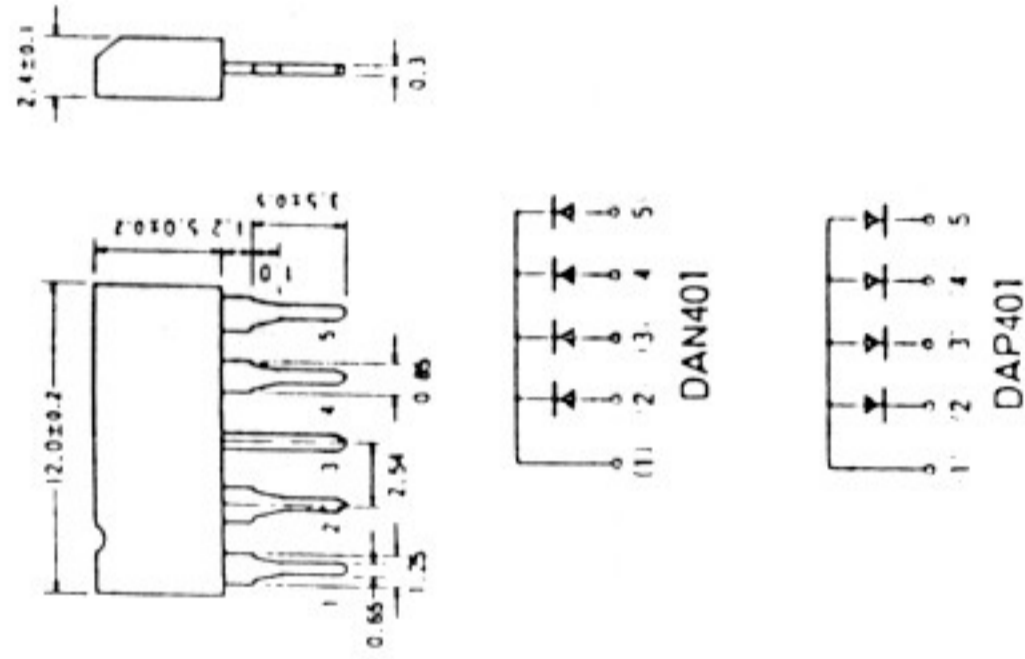
JACK BOARD 76159150 00

IC DATA

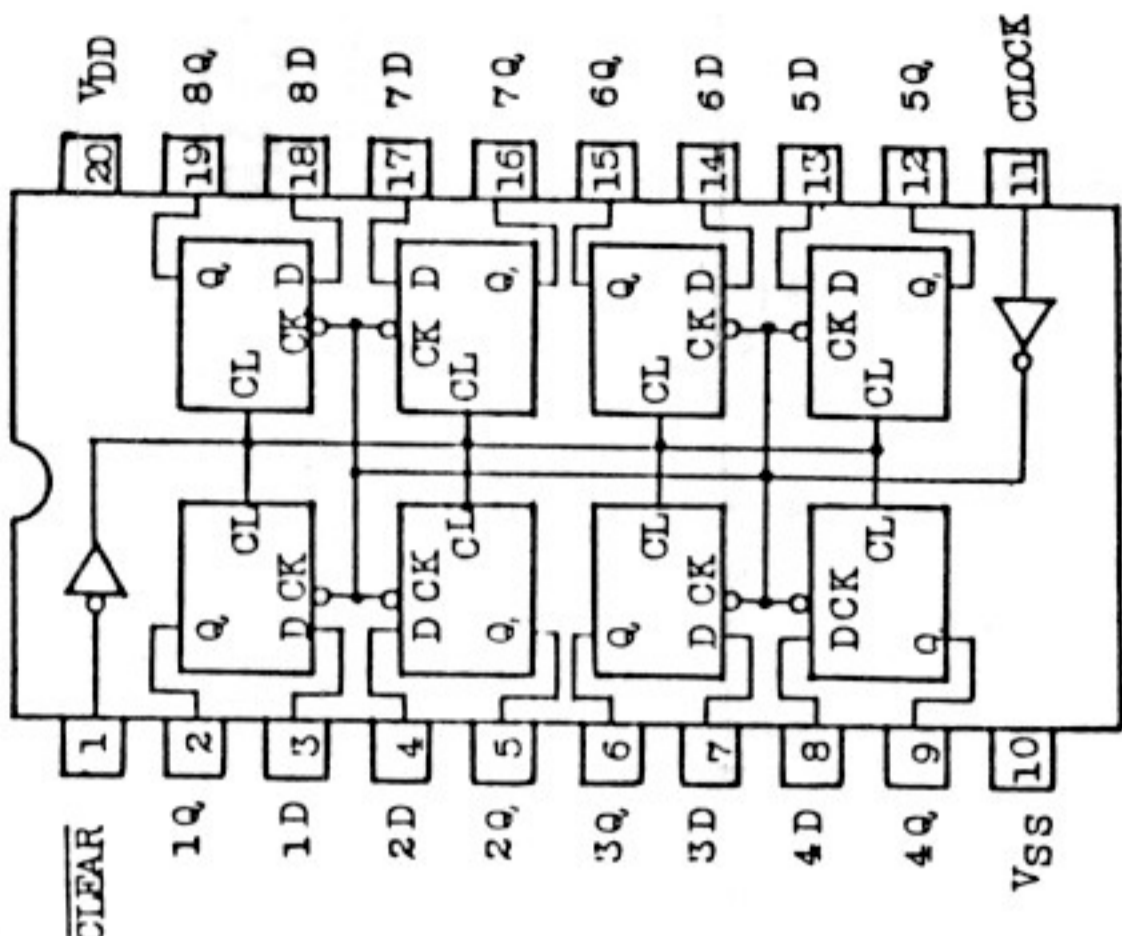
HD63B03R



DIODE ARRAY DAN401 DAP401



TC40H273P OCTAL "D" TYPE FLIP-FLOPS

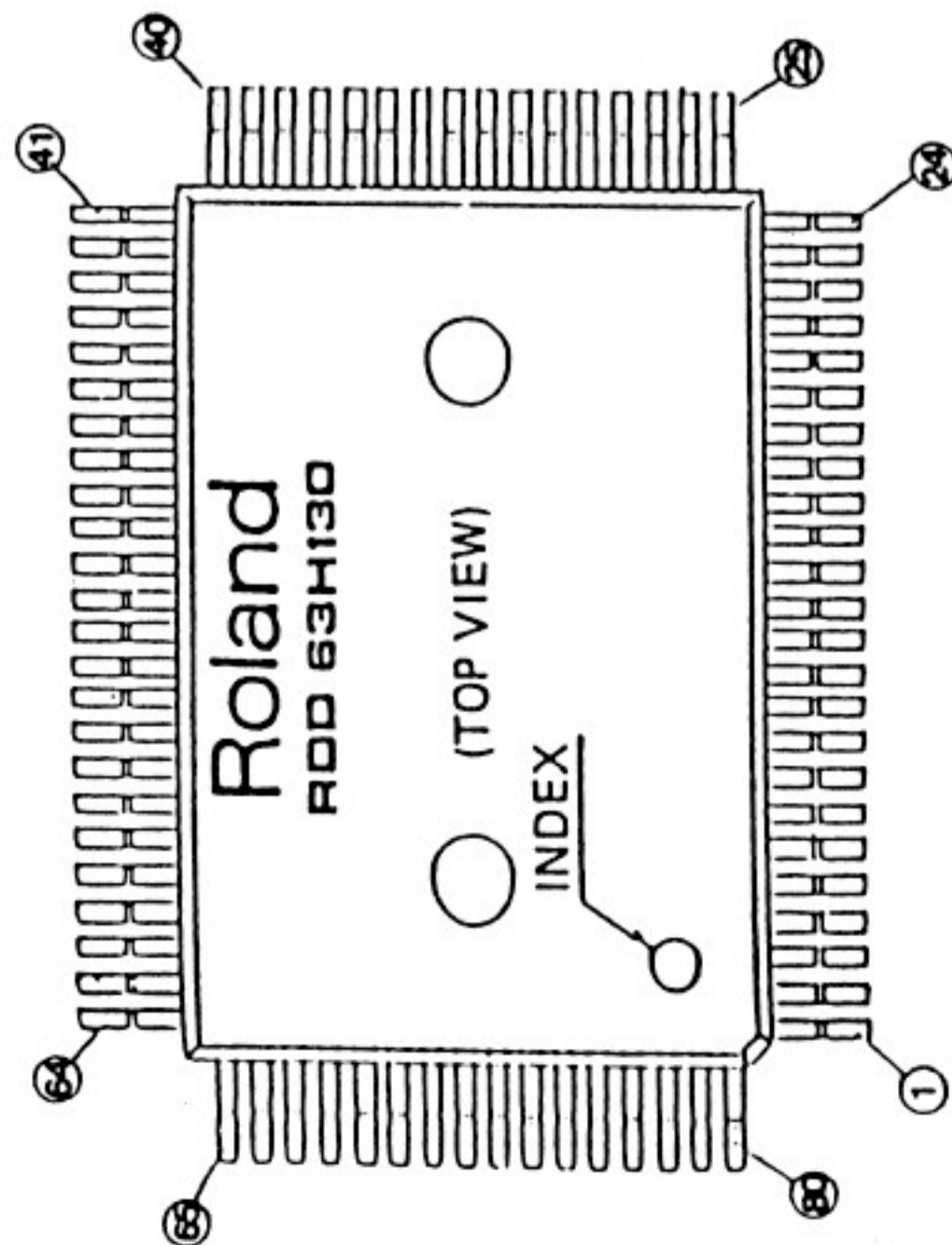


Truth Table

CLEAR	1
L	H
H	H
H	H

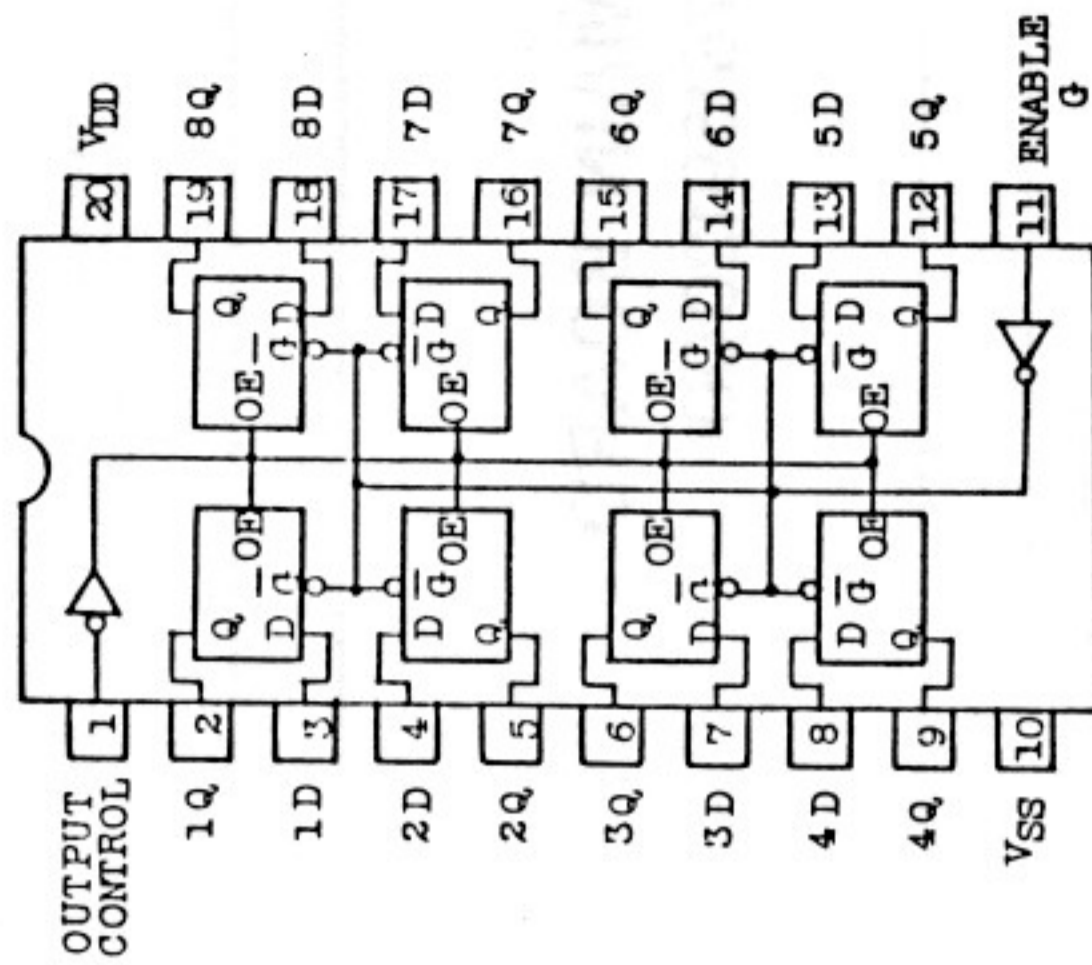
MB63H130

Pin Assignment



Pin no.	I/O	Pin name	Pin no.	I/O	Pin name	Pin no.	I/O	Pin name
1	I	T7	41	I	BR9	61	0	RA1
2	I	BR0	42	I	MK9	62	0	RA10
3	I	MK0	43	I	BR10	63	0	RA2
4	I	BR1	44	I	MK10	64	I/O	ROE
5	I	MK1	45	I	RES	65	0	RA3
6	I	BR2	46	I	E	66	0	RWE
7	I	MK2	47	0	EXCK	67	0	RA4
8	I	BR3	48	I	AS	68	0	RA9
9	I	MK3	49	I	CRES	69	0	RA5
10	I	BR4	50	I	CRNW	70	0	RA8
11	I	MK4	51	I/O	SRCK	71	0	RA6
12	-	VSS	52	-	NC	72	0	RA7
13	I	BR5	53	I/O	VDD	73	-	VDD
14	I	MK5	54	I/O	CD0	74	0	T0
15	I	BR6	55	I/O	CD1	75	0	T1
16	I	MK6	56	I/O	CD2	76	0	T2
17	I	BR7	57	I/O	CD3	77	0	T3
18	I	MK7	58	I/O	CD4	78	0	T4
19	I	BR8	59	I/O	CD5	79	0	T5
20	I	MK8	60	I/O	CD6	80	0	T6

TC40H373P OCTAL "D" TYPE LATCHES



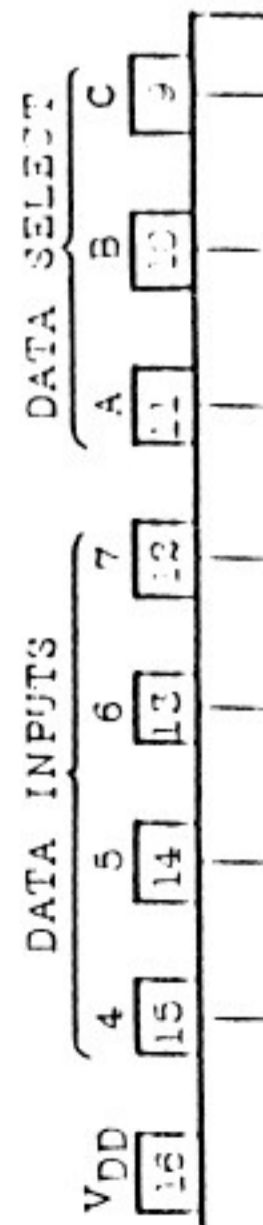
Truth Table

OUTPUT CONTROL	L
L	L
L	L
H	H

TC40H151P 1-OF-8 DATA SELECTOR/MULTIPLEXER

Truth Table

INPUTS			OUTPUTS	
SELECT		STROBE	W	Y
A	B	S	H	L
X	X	X	H	L



TC4051BP

Single 8-Channel Multiplexer/Demultiplexer

TC4052BP

Differential 4-Channel Multiplexer/Demultiplexer

Bl...
TC4051BP
A B C
1 2 3 4 5 6 7 8 9 10 11

MIDI IMPLEMENTATION

MKB-200 MIDI IMPLEMENTATION Ver 1.0 Nov. 15, 1985

*** MKB-200 MIDI IMPLEMENTATION ***
Version 1.0
Nov. 15, 1985

1. TRANSMITTED DATA

Status	Second	Third	Description
1001 nnnn	0kkk kkkk	0000 0000	Note OFF #1
1001 nnnn	0kkk kkkk	0vvv vvvv	Note ON vvvvvv = 1 thru 127
1011 nnnn	0000 0001	0vvv vvvv	Modulation vvvvvv = 0 thru 127
1011 nnnn	0100 0000	0000 0000	Hold OFF
1011 nnnn	0100 0000	0111 1111	Hold ON
1011 nnnn	0ccc cccc	0vvv vvvv	Control Change #2
1100 nnnn	0ppp pppp		Program Change #3
1101 nnnn	0vvv vvvv		Channel Pressure
1110 nnnn	0bbb bbbb	0mmm mmmm	Pitch Bender #4
1011 nnnn	0111 1011	0000 0000	ALL NOTES OFF #5
1011 nnnn	0111 1100	0000 0000	OMNI OFF
1011 nnnn	0111 1101	0000 0000	OMNI ON
1011 nnnn	0111 1110	0000 0000	MONO ON
1011 nnnn	0111 1111	0000 0001	POLY ON
1011 nnnn	0111 1111	0000 0000	Exclusive
1111 0000			End Of Exclusive
1111 0111			Tune Request
1111 0110			Active Sensing #7
1111 1110			

notes : #1 kkkkkk = 24 thru 108.
With KEY TRANSPOSE set at "0", kkkkkk = 36 thru 96.

#2 cccccc = 0 thru 63 are continuous controllers.
vvvvvv = 0 (minimum) to 127 (maximum)

cccccc = 64 thru 121 are switches.
vvvvvv = 0 (off) or 127 (on)

#3 pppppp = 0 thru 127

#4 0bbbbbbb = LSB, 0mmmmmmm = MSB

#5 When all notes are turned OFF on the MKB-200 keyboard,
ALL NOTES OFF message is sent.

#6 Refer to section 2. TRANSMITTED EXCLUSIVE MESSAGE.

#7 When the "WRITE" button is pressed in "PROGRAM CHANGE" mode,
or when the button is pressed in "PATCH CHANGE" mode with
the memory cartridge write protected.

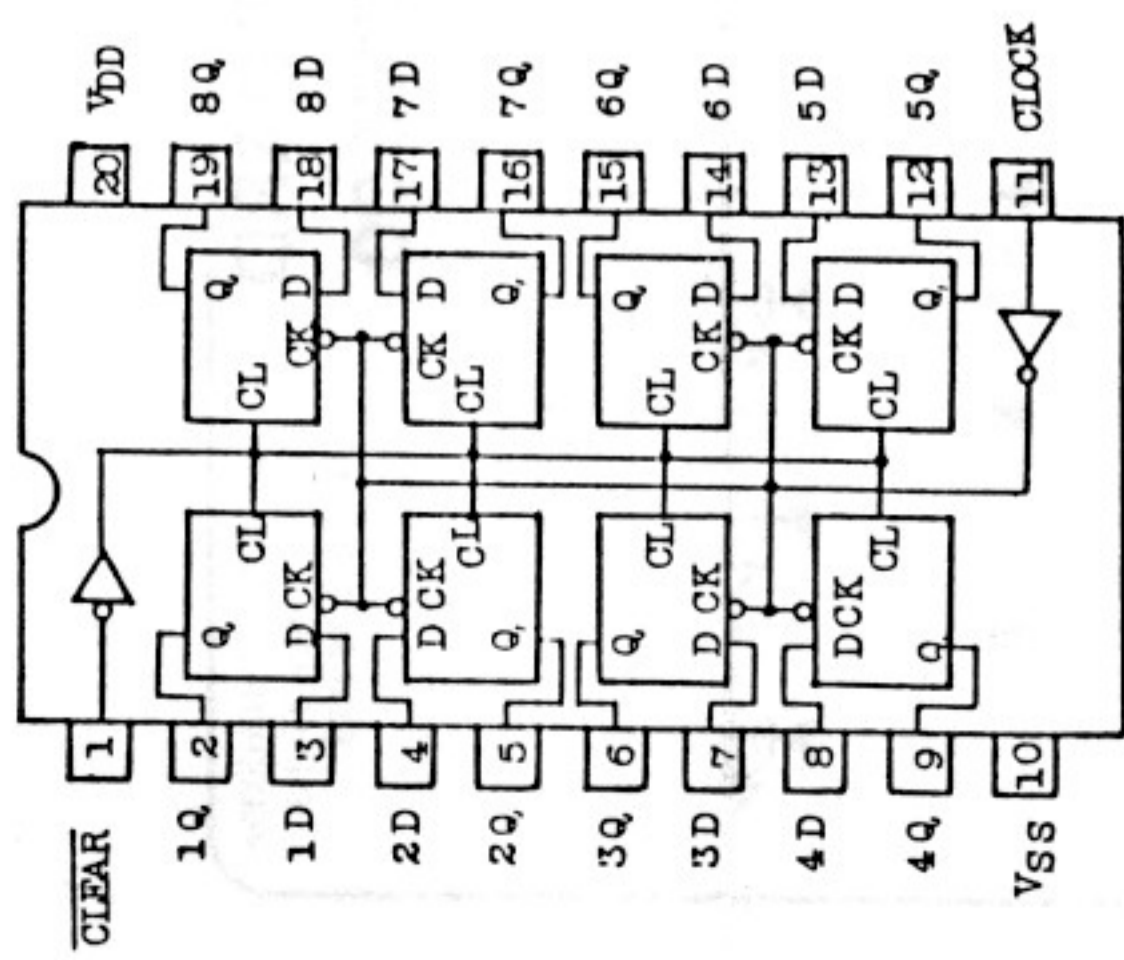
** When power is first applied, the following messages are transmitted.

- a. OMNI OFF message over all channels.
- b. Cartridge data (Program Change and Volume value), if Memory Cartridge is inserted.
- c. Program Change (C0 00, C1 00) and Volume value (B0 07 VV, B1 07 WW), if Memory Cartridge is not inserted.

** When the "KEY MODE" is changed, the following messages are transmitted.

- a. Note OFFs for the keys that have been held down on the MKB-200 keyboard.
- b. Damper OFF on the old channel(s) and damper ON on the new channel(s), if damper pedal is on.
- c. If the present Modulation value is not "00", 00 on the old channel(s) and the present value on the new channel(s).
- d. If the present Pitch Bender value is not "Center", center value on the old channel(s) and the present value on the new channel(s).
- e. If the present Channel pressure value is not "00", 00 on the old channel(s) and the present value on the new channel(s).

TC40H273P OCTAL "D" TYPE FLIP-FLOPS

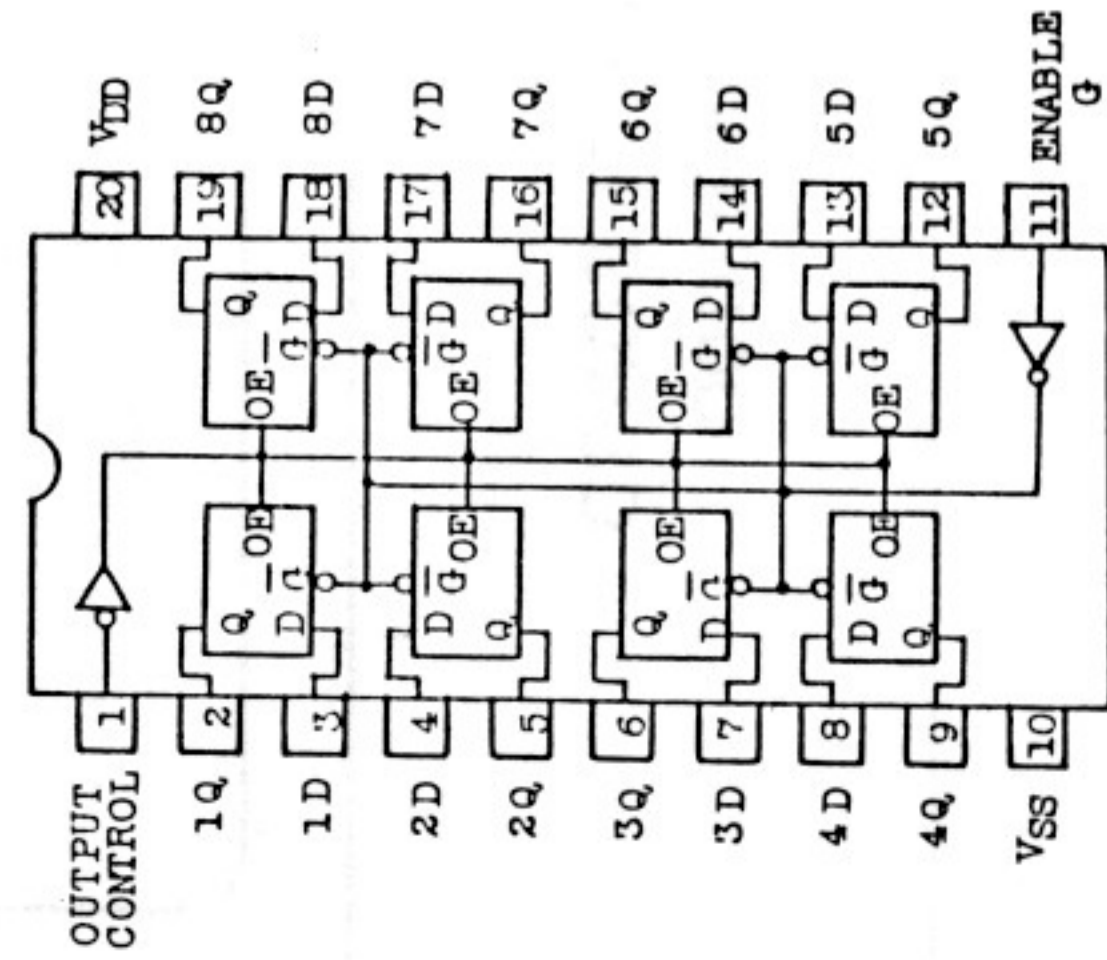


Truth Table

INPUTS		DATA		OUTPUT
CLEAR	CLOCK			Q
L	*	*	*	L
H	↑	H	H	H
H	↑	L	L	L
H	L	*	*	Q ₀

* = Don't Care

TC40H373P OCTAL "D" TYPE LATCHES



Truth Table

INPUTS		DATA		OUTPUT
OUTPUT CONTROL	ENABLE G			Q
L	H	H	H	H
L	H	L	L	L
L	L	*	*	Q ₀
H	*	*	*	High Impedance

* = Don't care

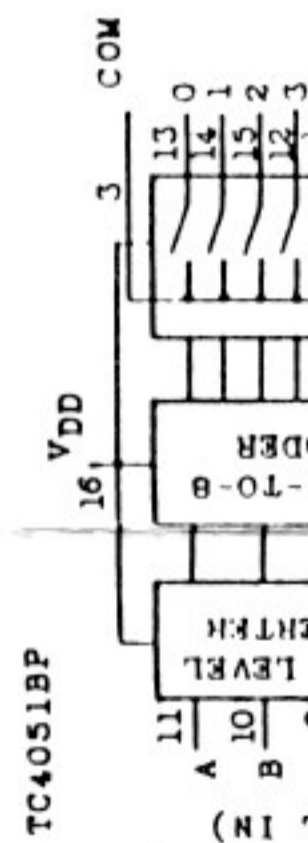
TC4051BP

Single 8-Channel Multiplexer/Demultiplexer

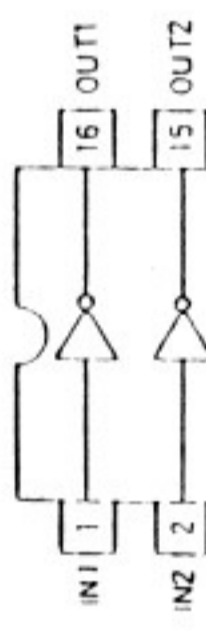
TC4052BP

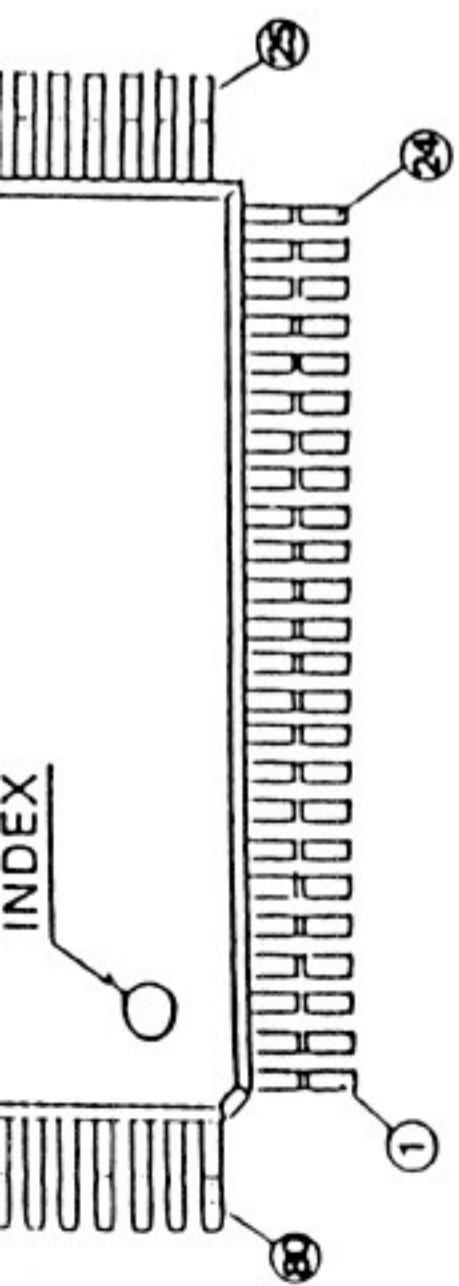
Differential 4-Channel Multiplexer/Demultiplexer

Block Diagram



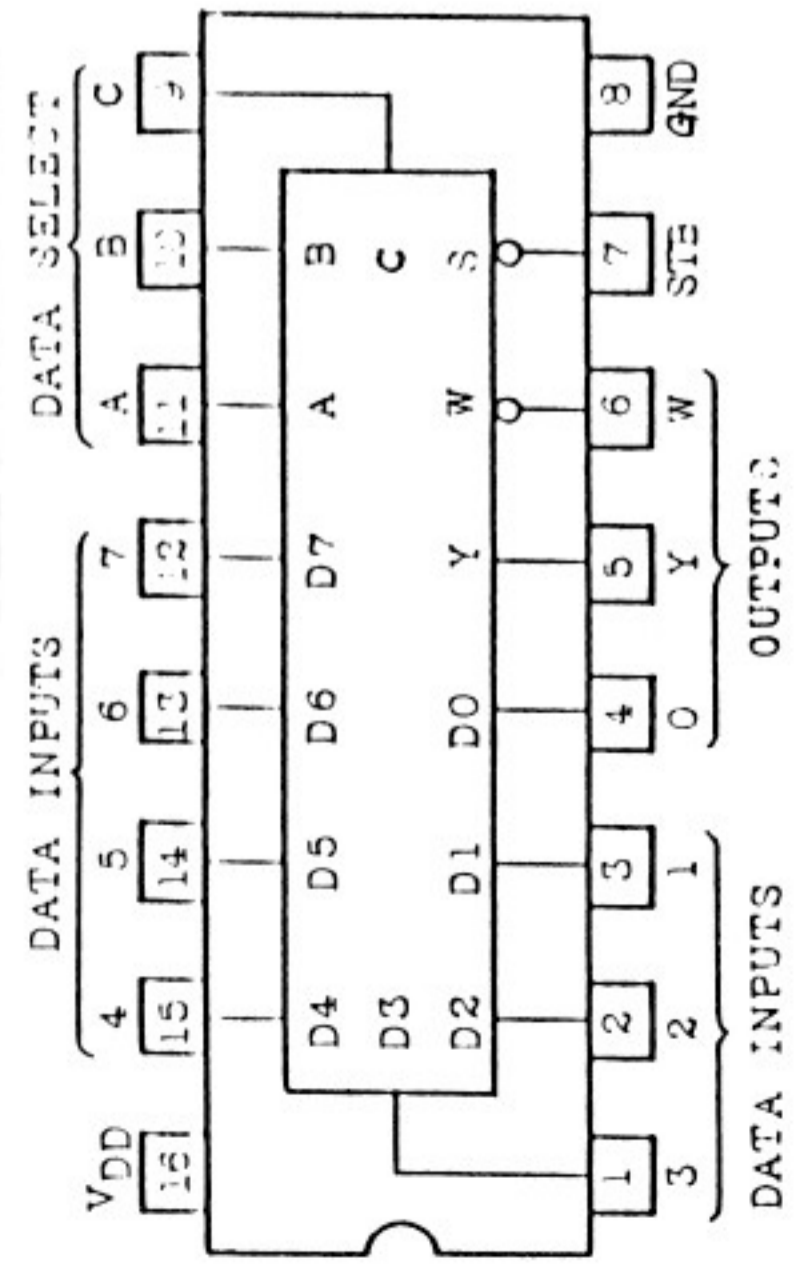
DA6250 BA6250F





12	-	VSS	32	-	NC	52	-	VSS	72	0	RA7
13	I	BR5	33	-	VDD	53	I/O	RD4	73	-	VDD
14	I	MK5	34	I/O	CD0	54	I/O	RD2	74	0	T0
15	I	BR6	35	I/O	CD1	55	I/O	RD5	75	0	T1
16	I	MK6	36	I/O	CD2	56	I/O	RD1	76	0	T2
17	I	BR7	37	I/O	CD3	57	I/O	RD6	77	0	T3
18	I	MK7	38	I/O	CD4	58	I/O	RD0	78	0	T4
19	I	BR8	39	I/O	CD5	59	I/O	RD7	79	0	T5
20	I	MK8	40	I/O	CD6	60	0	RA0	80	0	T6

TC40H151P 1-OF-8 DATA SELECTOR/MULTIPLEXER



Truth Table

A	SELECT		STROBE	INPUTS		OUTPUTS	
	B	C		W	Y		
X	X	X	S	X	H	L	D0
L	L	L	L	L	D0	D1	D1
H	L	L	L	L	D2	D3	D2
L	H	L	L	L	D4	D5	D3
H	H	L	L	L	D6	D7	D4
L	L	H	L	L	D5	D6	D5
H	L	H	L	L	D7	D6	D6
L	H	H	L	L	D6	D7	D7
H	H	H	L	L	D7	D7	D7

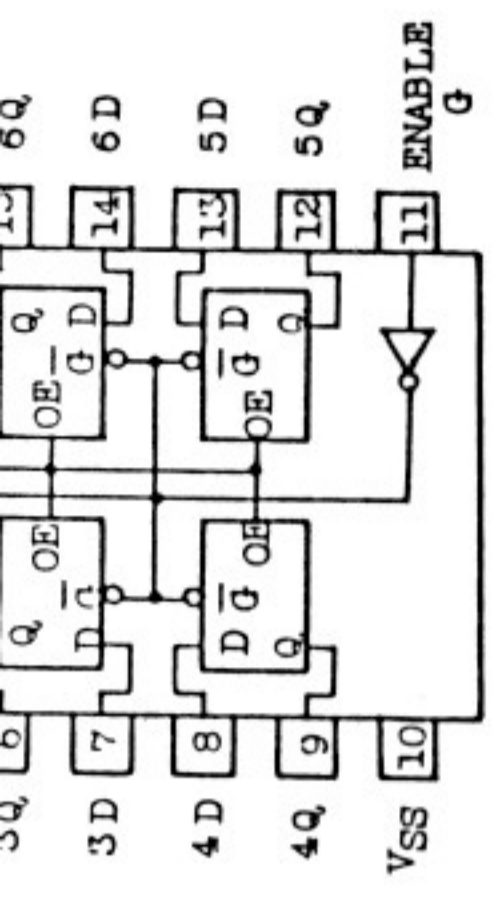
X = Don't care

TC4051BP

Single 8-Channel Multiplexer/Demultiplexer

TC4052BP

Differential 4-Channel Multiplexer/Demultiplexer



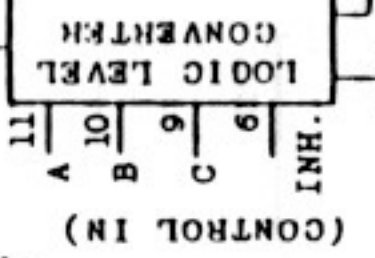
Truth Table

CONTROL INPUTS		'ON' CHANNEL		
INHIBIT	C	A	TC4051BP	TC4052BP
L	L	L	0	0X, 0Y
L	L	L	1	1X, 1Y
L	L	L	2	2X, 2Y
L	L	L	3	3X, 3Y
L	L	L	4	-
L	L	L	5	-
L	L	L	6	-
L	L	L	7	-
H	*	*	NONE	NONE

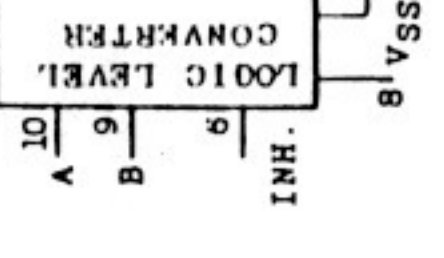
* Don't Care. Δ Except TC4052BP

Bic

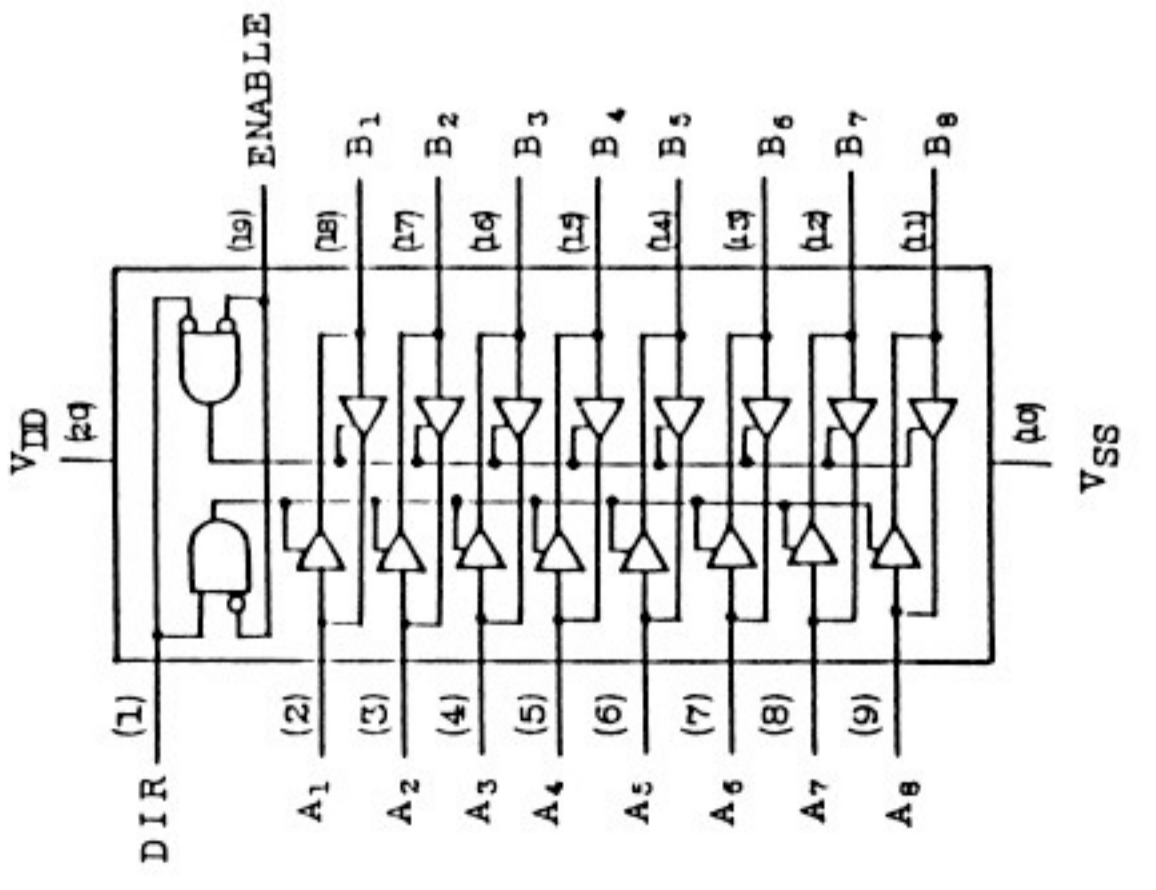
TC4051BP



TC4052BP



TC40H245P OCTAL BUS TRANSCEIVERS NONINVERTED 3-STATE OUTPUTS

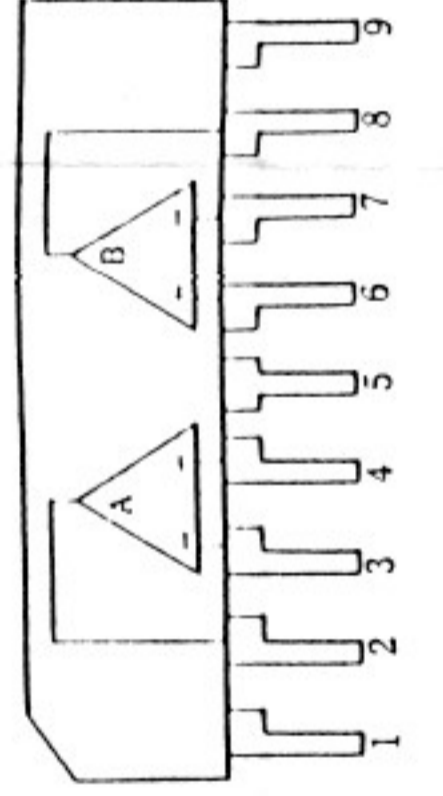


Truth Table

CONTROL INPUTS		DATA PORT STATUS	
ENABLE	DIR	A	B
L	L	B data to A bus	A data to B bus
L	H	A data to B bus	High Impedance
H	X	High Impedance	High Impedance

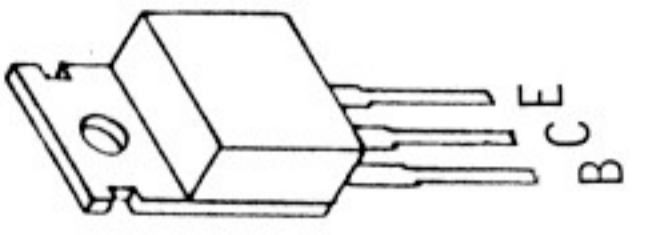
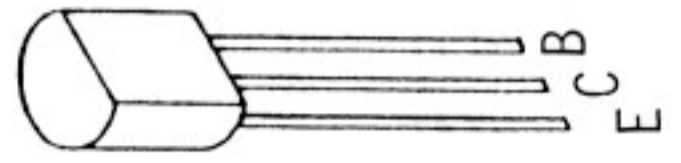
X = Don't care

NJM072S



1. V-
2. A OUTPUT
3. A (-) INPUT
4. A (+) INPUT
5. V+
6. B (+) INPUT
7. B (-) INPUT
8. B OUTPUT
9. V-

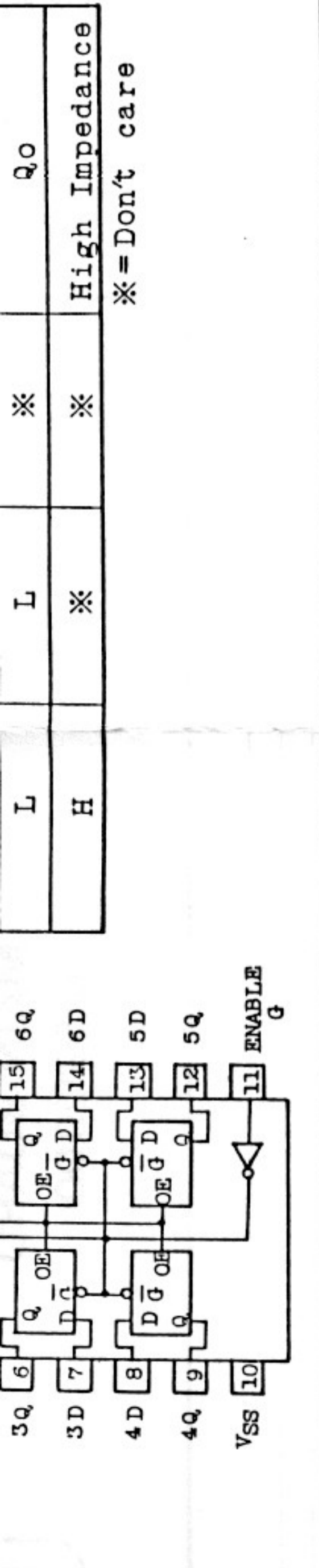
TR



2SA1015GR
2SC1815GR

2SA815Y
2SC1625Y

DTA14
DTC14
DTC11



L	L	*	Q0
H	*	*	High Impedance

* = Don't care

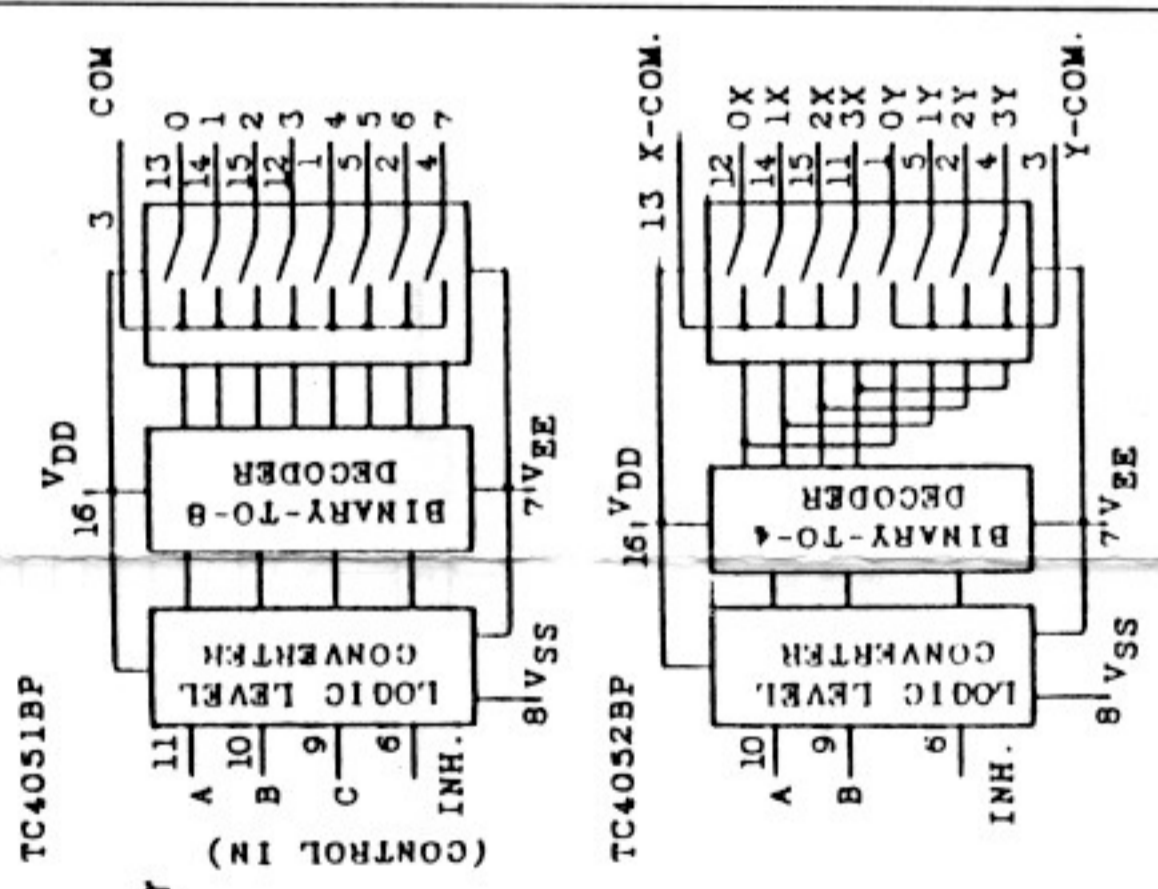
TC4051BP

Single 8-Channel Multiplexer/Demultiplexer

TC4052BP

Differential 4-Channel Multiplexer/Demultiplexer

Block Diagram

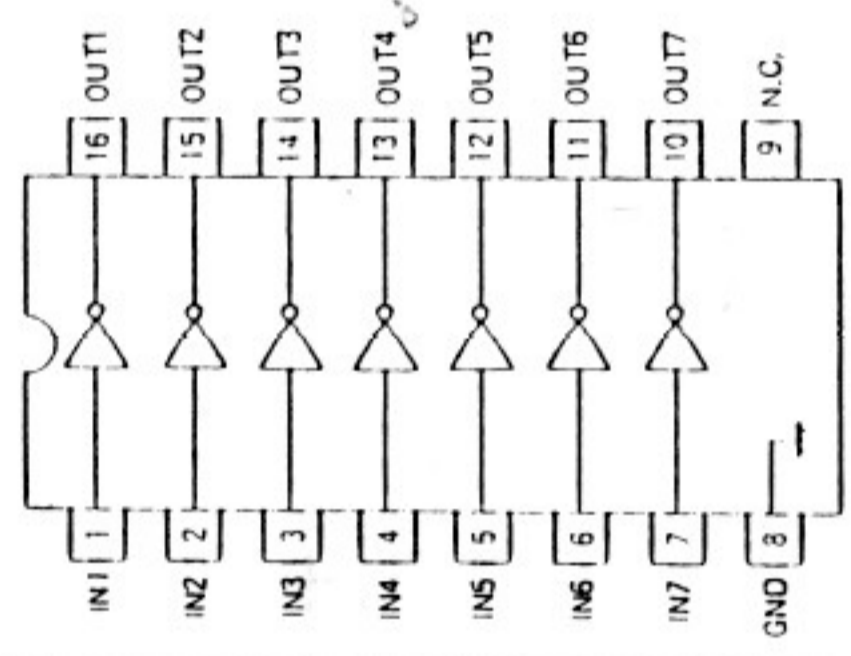


Truth Table

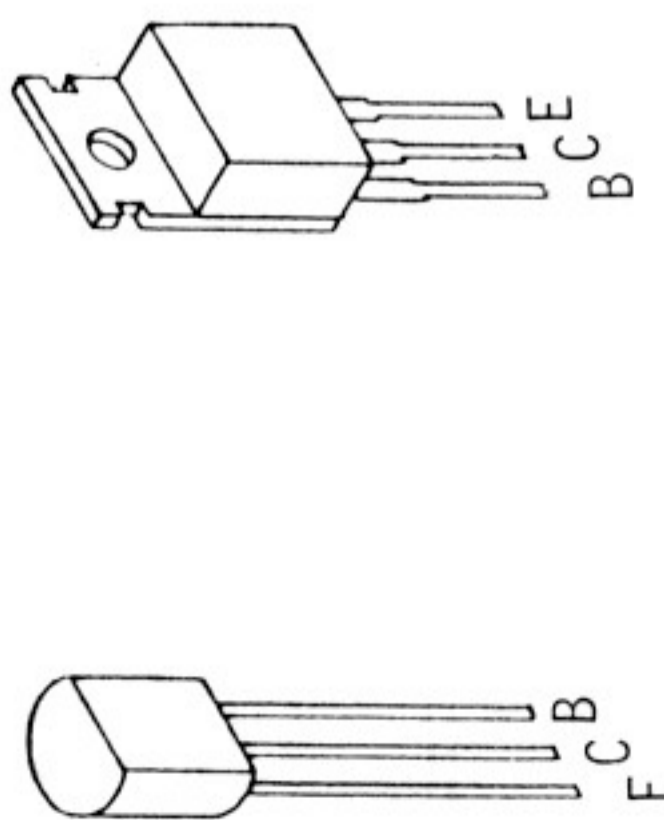
CONTROL INPUTS	'ON' CHANNEL
INHIBIT C	TC4051BP TC4052BP
L L L L L L L L	0 0X, 0Y
L L L L L L L L	1 1X, 1Y
L L L L L L L L	2 2X, 2Y
L L L L L L L L	3 3X, 3Y
L L L L L L L L	4 -
L L L L L L L L	5 -
L L L L L L L L	6 -
L L L L L L L L	7 -
H * * * * *	NONE
H * * * * *	NONE

* Don't Care. Δ Except TC4052BP

DA6250 BA6250F



TR



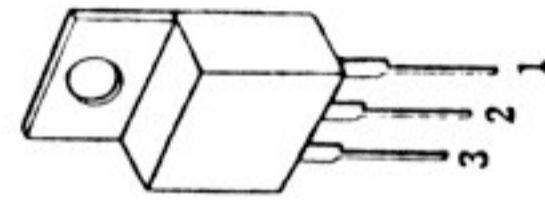
2SA1015GR
2SC1815GR
2SA815Y
2SC1625Y



DTA144ES
DTC144ES
DTC114EF

REGULATOR

μPC7805H



1. OUTPUT
2. GND
3. INPUT

** When power is first applied, the following messages are transmitted.

- OMNI OFF message over all channels.
- Cartridge data (Program Change and Volume value), if Memory Cartridge is inserted.
- Program Change (CO 00, Cl 00) and Volume value (BO 07 VV, Bl 07 WW), if Memory Cartridge is not inserted.

** When the "KEY MODE" is changed, the following messages are transmitted.

- Note OFFs for the keys that have been held down on the MKB-200 keyboard.
- Damper OFF on the old channel(s) and damper ON on the new channel(s), if damper pedal is on.
- If the present Modulation value is not "00", 00 on the old channel(s) and the present value on the new channel(s).
- If the present Pitch Bender value is not "Center", center value on the old channel(s) and the present value on the new channel(s).
- If the present Channel pressure value is not "00", 00 on the old channel(s) and the present value on the new channel(s).

** When the "Patch Number" is changed, the following messages are transmitted.

- OMNI OFF message over all channels.
- Program Change (only on the active channel).
- Volume data (only on the active channel).
- Note OFFs for the keys that have been held down on the MKB-200 keyboard.
- Damper OFF on the old channel(s) and damper ON on the new channel(s), if damper pedal is on.
- If the present Modulation value is not "00", 00 on the old channel(s) and the present value on the new channel(s).
- If the present Pitch Bender value is not "Center", center value on the old channel(s) and the present value on the new channel(s).
- If the present Channel pressure value is not "00", 00 on the old channel(s) and the present value on the new channel(s).

TRANSMITTED EXCLUSIVE MESSAGE

The following message will be sent only after power is turned ON while holding down "FUNC" button. The message is sent with a value (0zzzz zzzz) whenever a change of VOLUME knob is detected. The message will be interpreted as a tone parameter change by MKS-7, JUNO-106, JUNO-106S and HS-60.

For the function, refer to MIDI Implementation of these instruments, respectively.

Byte	Description
1111 0000	Exclusive status
0100 0001	Roland ID #
0011 0010	Operation code = Tone parameter change
0000 nann	Unit # = MIDI basic channel. nnnn = 0 thru 15 where nnnn + 1 = channel #
0000 yyyy	Parameter number yyyy = 0 thru 15
0zzzz zzzz	Value zzzzzz = 0 thru 127
1111 0111	End of Exclusive

*** Example ***
a b c d e f g
F0 41 32 00 03 40 F7

*1. yyyy is set when "BANK" or "NUMBER" button is pressed while holding down "FUNC" button.