

HP9820 Diagrams

These Diagrams cover those sections that are different from the HP9810:

I/O Backplane 09820-66501 Memory Box

ROM1 09820-66521
ROM2 09820-66522
Memory Timing 09820-66523
Memory Address 09820-66524
Memory Data 09820-66525
RAM 09820-66526
Memory Backplane 09820-66527

Keyboard

Keyboard Cable
Keyboard Encoder 09820-66532 (and 09810-66531)
Keyboard 09820-66533

Display 09820-66541

For the following sections, please refer to the HP9810 Diagrams

Backplane 09810-66502
ROM Module Backplane 09810-66503

CPU

I/O Interface 09810-66511
Clock 09810-66512
CPU Control 09810-66513
Data Path 09810-66514

Printer

Printer Interface 11219-66551
Printer Driver 11219-66552

Card Reader

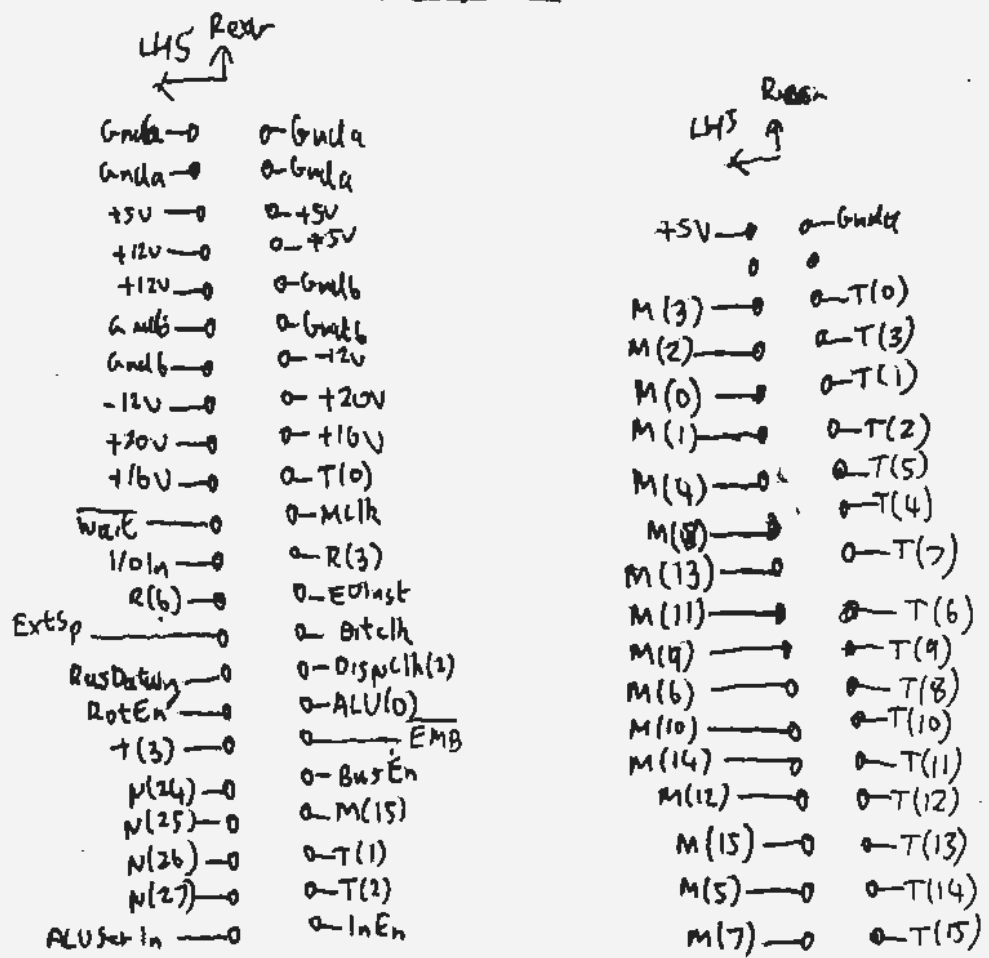
Card Reader Wiring
Card Reader Interface 09810-66562

PSU

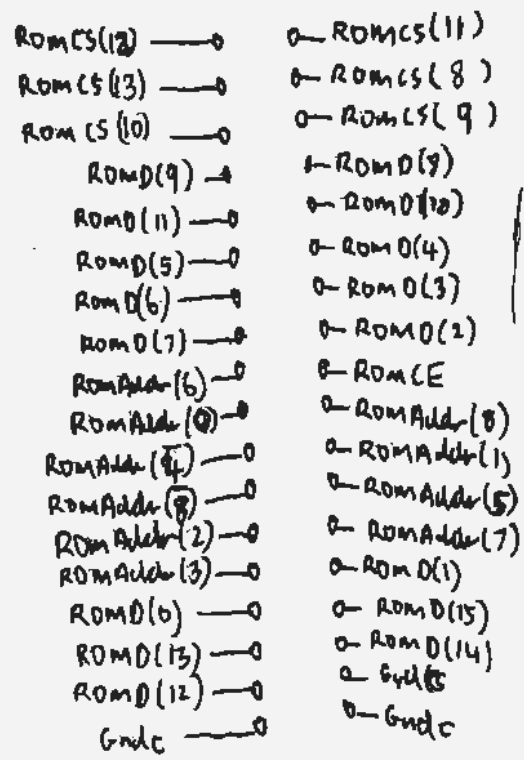
Transformer Wiring
+5V PSU 09810-66581
+16V/+20V/+24V PSU 09810-66582
+/-12V PSU 09810-66583

ROM Module

HP4870 Memory Box



Test connector



Rom Module chip Selects

	Left (1)	Middle (2)	Right (3)
CS A	ROMCS(8)	ROMCS(10)	ROMCS(12)
CS B	ROMCS(9)	ROMCS(11)	ROMCS(13)

Memory Box to
Main Backplane

HP 9820 Memory Box

Rear
 ↑
 → Top

○ Gnd 1a
 ○ +5V
 ○ +5V
 ○ Gnd b
 ○ Gnd b
 ○ -12V

○ Gnd a
 ○ +5V
 ○ +5V
 ○ Gnd b
 ○ Gnd b
 ○ -12V

N/C →	○ N/C	N/C →	○ N/C
ROMCS(3) →	○ ROMCS(2)	ROMCS(7) →	○ ROMCS(6)
ROMCS(1) →	○ ROMCS(6)	ROMCS(5) →	○ ROMCS(4)
ROMD(8) →	○ ROMD(4)	ROMD(8) →	○ ROMD(9)
ROMD(10) →	○ ROMD(11)	ROMD(10) →	○ ROMD(11)
ROMD(4) →	○ ROMD(5)	ROMD(4) →	○ ROMD(5)
ROMD(3) →	○ ROMD(6)	ROMD(3) →	○ ROMD(6)
ROMD(2) →	○ ROMD(7)	ROMD(2) →	○ ROMD(7)
ROMCE →	○ N/C	ROMCE →	○ N/C
ROMAddr(9) →	○ ROMAddr(6)	ROMAddr(8) →	○ ROMAddr(6)
ROMAddr(1) →	○ ROMAddr(10)	ROMAddr(1) →	○ ROMAddr(10)
ROMAddr(8) →	○ ROMAddr(4)	ROMAddr(8) →	○ ROMAddr(4)
ROMAddr(2) →	○ ROMAddr(5)	ROMAddr(2) →	○ ROMAddr(5)
ROMAddr(3) →	○ ROMAddr(7)	ROMAddr(3) →	○ ROMAddr(7)
ROMD(6) →	○ ROMD(1)	ROMD(0) →	○ ROMD(1)
ROMD(13) →	○ ROMD(15)	ROMD(13) →	○ ROMD(15)
ROMD(12) →	○ ROMD(14)	ROMD(12) →	○ ROMD(14)
Gndc →	○ Gndc	Gndc →	○ Gndc

09820-66521

ROM 1
 (R/B)

09820-66522

ROM 2
 (R/R)

HP9820 Memory Box

Rear
↑ → Top

GndA → 0	0-GndA
+5V → 0	0+5V
GndB → 0	0-GndB
+16V → 0	0-EXTRAMEXIST
statEn → 0	0-Precharge
Memcycle → 0	0-RAMWr
Wait → 0	0-Highmom
I/OIn → 0	0-R(b)
ExtSp → 0	0-RawRAMCS1
T(10) → 0	0-TLd
MClk → 0	0-RotEn
R(3) → 0	0-TMode
EDfast → 0	0-TRegSin
BitClk → 0	0-TClk
RAMCSEn → 0	0-Rjsh
ALU(0) → 0	0-RAMAddr(0)
RAMAddr(4) → 0	0-RAMAddr(1)
RAMAddr(2) → 0	0-RAMAddr(3)

GndC → 0	0-GndC
+5V → 0	0+5V
GndD → 0	0-GndD
+16V → 0	0+16V
+12V → 0	0-RAMCS(0)
statEn → 0	0-RAMCS(1)
Memcycle → 0	0-Highmem
R(b) → 0	0-RawRAMCS1
N(27) → 0	0-RAMAddr(8)
RAMEn → 0	0-RAMAddr(6)
RotEn → 0	0-RAMAddr(5)
R(3) → 0	0-RAMAddr(4)
BitClk → 0	0-RAMAddr(7)
RAMCSEn → 0	0-Rjsh
ALU(0) → 0	0-M(3)
M(2) → 0	0-M(4)
M(0) → 0	0-M(8)
M(1) → 0	0-M(13)

N(25) → 0	0-RotEn'
N(26) → 0	0-BusDataIn
EMB → 0	0-DispClk(2)
BusEn → 0	0-M(3)
ALUserIn → 0	0-M(2)
InEn → 0	0-M(0)
N(24) → 0	0-M(1)
N/C → 0	0-M(4)
RomCE → 0	0-ROMEn
GndE → 0	0-GndE

ROMCS(3) → 0	0-ROMCS(8)
ROMCS(9) → 0	0-ROMCS(13)
ROMCS(2) → 0	0-ROMCS(12)
ROMCS(7) → 0	0-ROMCS(11)
ROMCS(1) → 0	0-ROMCS(10)
ROMCS(5) → 0	0-M(11)
ROMCS(4) → 0	0-M(9)
ROMCS(0) → 0	0-M(6)
ROMCS(6) → 0	0-M(10)
ROMEn → 0	0-M(14)
ROMAddr(6) → 0	0-M(12)
ROMAddr(8) → 0	0-M(5)
M(15) → 0	0-M(7)
ROMAddr(0) → 0	0-ROMAddr(1)
ROMAddr(4) → 0	0-ROMAddr(2)
ROMAddr(8) → 0	0-ROMAddr(3)
ROMAddr(5) → 0	0-ROMAddr(7)
GndF → 0	0-GndF

09820-66523
Memory Timing
(R/or)

09820-66524
Memory Address
(R/Y)

HP 9820 Memory Box

Rear
↑ → Top

Gnd a →	o +5V
Gnd b →	o Gnd b
+16V →	o -12V
stxtEn →	o +12V
ExtRAMEn →	o RAMDn(15)
RAMDout(11) →	o RAMDout(8)
RAMDout(5) →	o RAMDn(1)
RAMDout(15) →	o RAMDn(12)
RAMEn →	o RAMDout(9)
TLd →	o RAMDn(7)
TMake →	o RAMDn(5)
TRegStk →	o RAMDout(12)
Tclk →	o RAMDn(11)
RAMDout(7) →	o RAMDout(1)
RAMDn(8) →	o RAMDn(9)
T(3) →	o T(0)
T(4) →	o T(5)
T(2) →	o T(1)

T(6) →	o T(7)
T(8) →	o T(4)
T(11) →	o T(10)
T(13) →	o T(12)
T(15) →	o T(15)
ROMD(9) →	o ROMD(8)
ROMD(11) →	o RAMDout(4)
ROMD(10) →	o RAMDout(6)
ROMD(6) →	o RAMDout(2)
ROMD(7) →	o RAMDout(10)
ROMD(3) →	o ROMD(14)
ROMD(2) →	o ROMD(5)
RAMDn(4) →	o RAMDn(3)
RAMDn(0) →	o RAMDn(2)
RAMDn(14) →	o RAMDout(13)
RAMDn(13) →	o RAMDout(3)
RAMDn(6) →	o RAMDout(14)
RAMDn(10) →	o RAMDout(0)
ROMD(1) →	o ROMD(15)
ROMD(12) →	o ROMD(12)
ROMD(0) →	o ROMD(14)
Gnd c →	o Gnd c

09820-66525
Memory Data
(R/GN)

HP 9820 Memory Box

Door
↑ → Top

- Gnd6 → 0 +20V
- +16V → 0
- RAMCS(0) → 0
- N/C → 0 Precharge
- RAMWr → 0 RAMDIn(13)
- RAMOut(11) → 0 RAMOut(8)
- RAMOut(5) → 0 RAMDIn(1)
- RAMOut(15) → 0 RAMDIn(12)
- RAMOut(9) → 0 RAMDIn(7)
- RAMOut(7) → 0 RAMDIn(5)
- RAMOut(12) → 0 RAMDIn(11)
- RAMOut(1) → 0 RAMDIn(8)
- RAMAdd(5) → 0 RAMDIn(9)
- RAMAdd(4) → 0 RAMAdd(8)
- RAMAdd(7) → 0 RAMAdd(6)
- RAMAdd(1) → 0 RAMAdd(0)
- RAMAdd(3) → 0 RAMAdd(4)
- N/C → 0 RAMAdd(2)

- Gnd6 → 0 +20V
- +16V → 0
- RAMCS(1) → 0
- N/C → 0
- RAMWr → 0
- RAMOut(11) → 0
- RAMOut(5) → 0
- RAMOut(15) → 0
- RAMOut(9) → 0
- RAMOut(7) → 0
- RAMOut(12) → 0
- RAMOut(1) → 0
- RAMAdd(5) → 0
- RAMAdd(9) → 0
- RAMAdd(7) → 0
- RAMAdd(1) → 0
- RAMAdd(3) → 0
- N/C → 0

- 0 +20V
- 0 Gnd6
- 0 Ext RAM Exist
- 0 Precharge
- 0 RAMDIn(15)
- 0 RAMOut(8)
- 0 RAMDIn(1)
- 0 RAMDIn(12)
- 0 RAMDIn(7)
- 0 RAMDIn(5)
- 0 RAMDIn(11)
- 0 RAMDIn(8)
- 0 RAMDIn(4)
- 0 RAMAdd(8)
- 0 RAMAdd(6)
- 0 RAMAdd(0)
- 0 RAMAdd(4)
- 0 RAMAdd(2)

- N/C → 0
- RAMOut(8) → 0
- RAMOut(10) → 0
- RAMDIn(2) → 0
- RAMDIn(14) → 0
- RAMDIn(4) → 0
- RAMDIn(13) → 0
- RAMDIn(6) → 0
- RAMDIn(10) → 0
- Gnd6 → 0

- 0 N/C
- 0 RAMOut(4)
- 0 RAMOut(2)
- 0 RAMDIn(3)
- 0 RAMDIn(0)
- 0 RAMOut(13)
- 0 RAMOut(3)
- 0 RAMOut(14)
- 0 RAMOut(6)
- 0 Gnd6

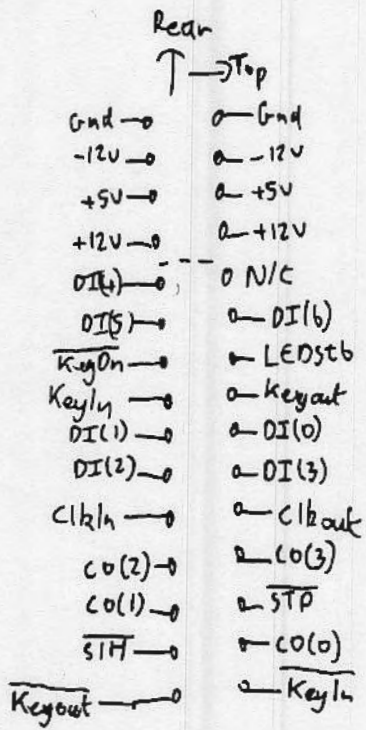
- N/C → 0
- RAMOut(6) → 0
- RAMOut(10) → 0
- RAMDIn(2) → 0
- RAMDIn(14) → 0
- RAMDIn(4) → 0
- RAMDIn(13) → 0
- RAMDIn(6) → 0
- RAMDIn(10) → 0
- Gnd6 → 0

- 0 N/C
- 0 RAMOut(4)
- 0 RAMOut(2)
- 0 RAMDIn(3)
- 0 RAMDIn(0)
- 0 RAMOut(13)
- 0 RAMOut(3)
- 0 RAMOut(14)
- 0 RAMOut(6)
- 0 Gnd6

09820-66526
Standard RAM
(R/Bu)

09820-66526
Option RAM
(R/Bu)

HP9820 Keyboard

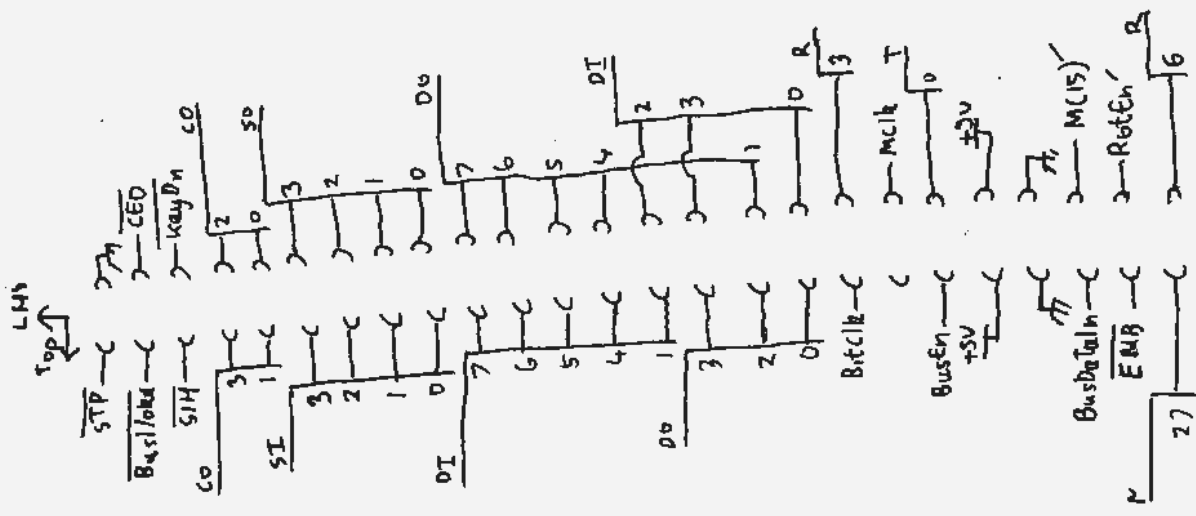


Encoder → Cable

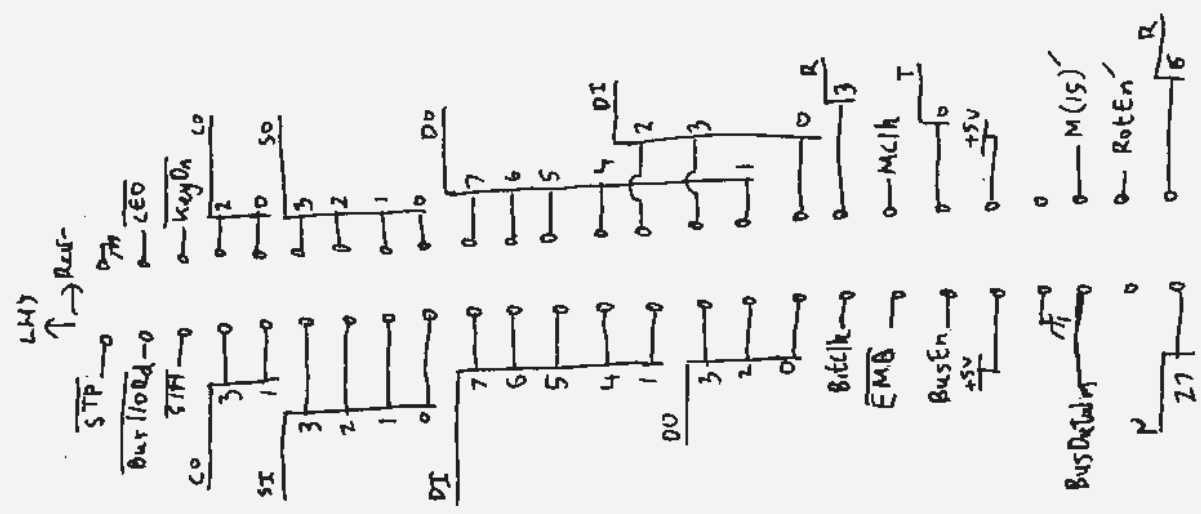
- R0
- R1
- R2
- R3
- C2
- C12
- C0
- C3
- C7
- C11
- C5
- C6
- C10
- C9
- C8
- C4
- C1
- N/C
- N/C
- N/C
- Sense B
- Sense A

Encoder clock frequency (at
 08f output) = 170 kHz

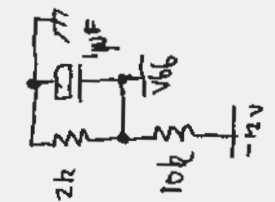
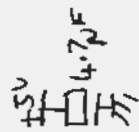
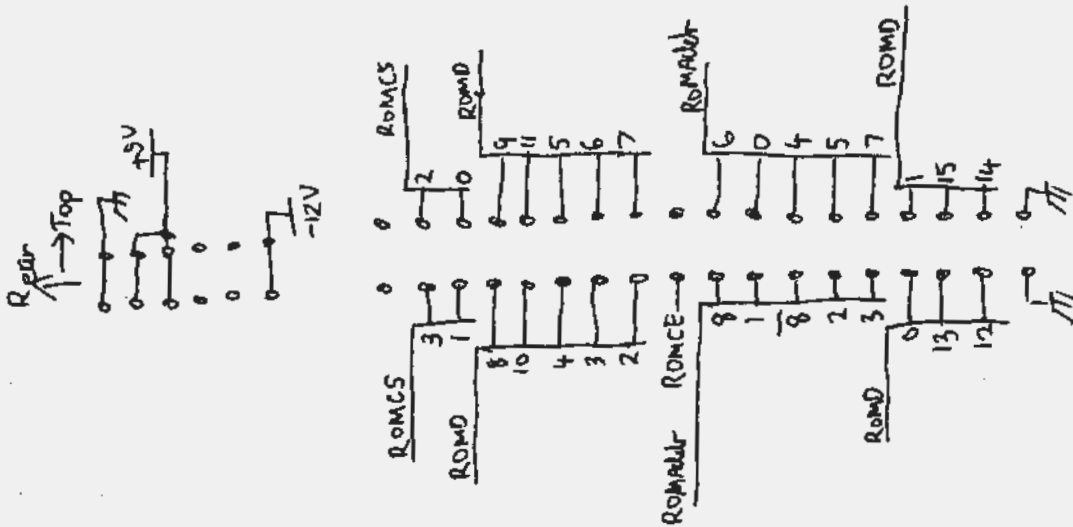
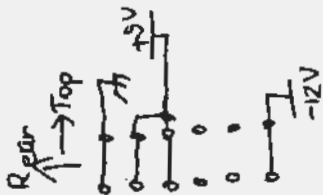
Encoder → Keyboard



(Typical of 4)
 I/O Connector

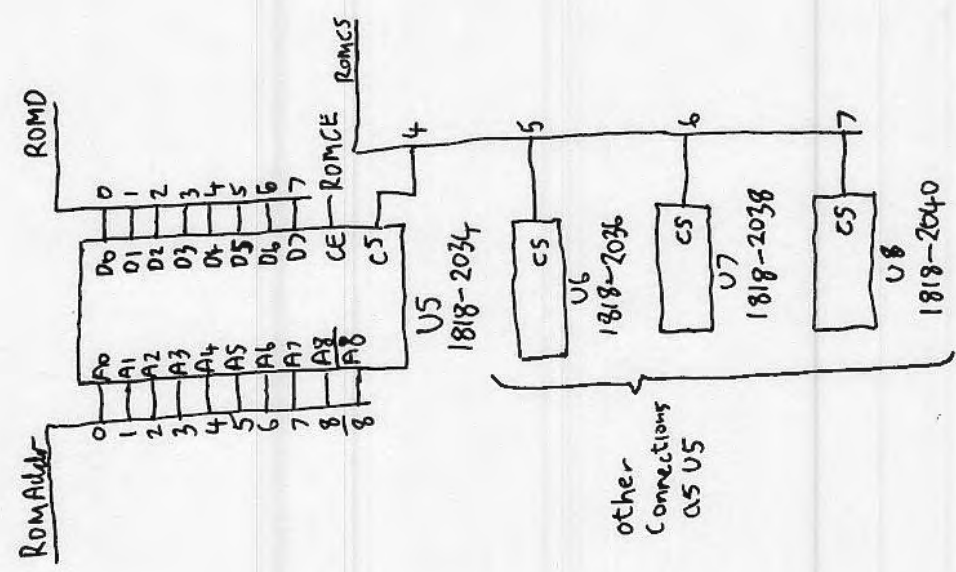
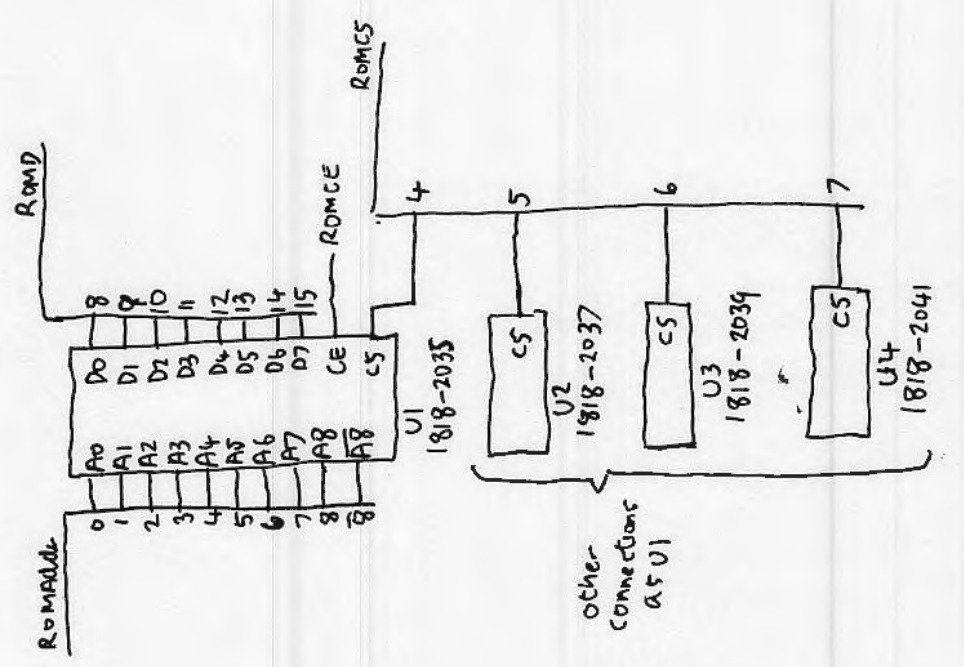
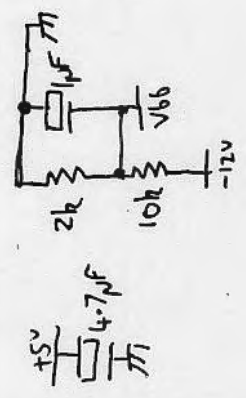
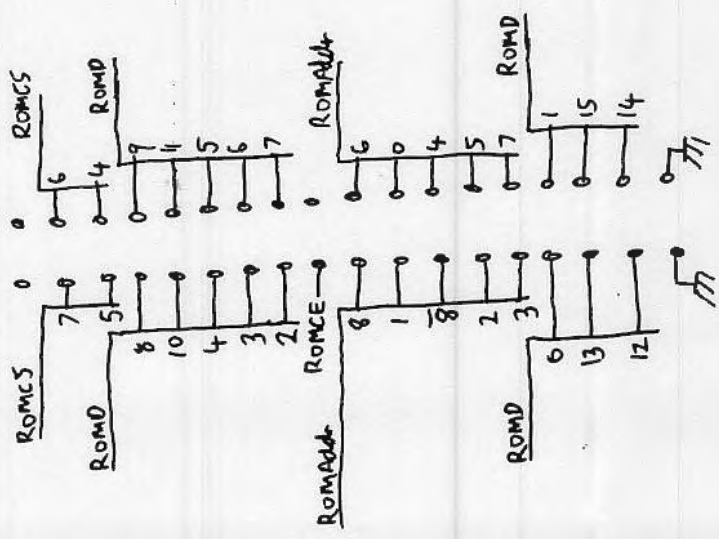


(Main Backplane)



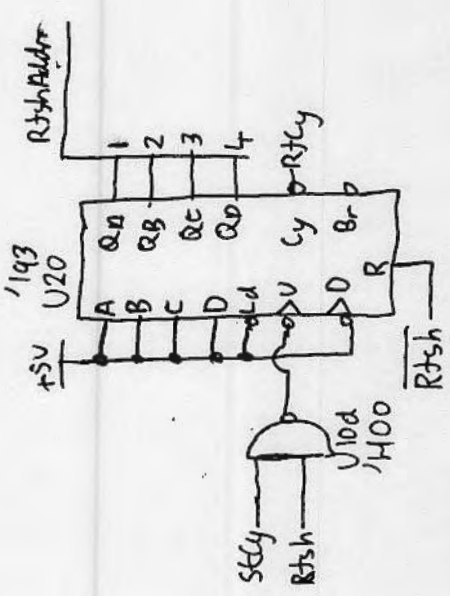
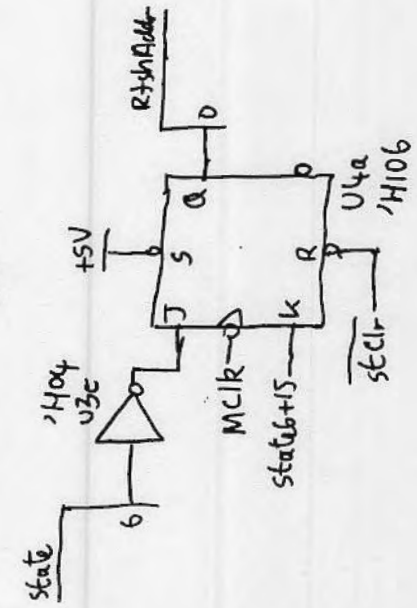
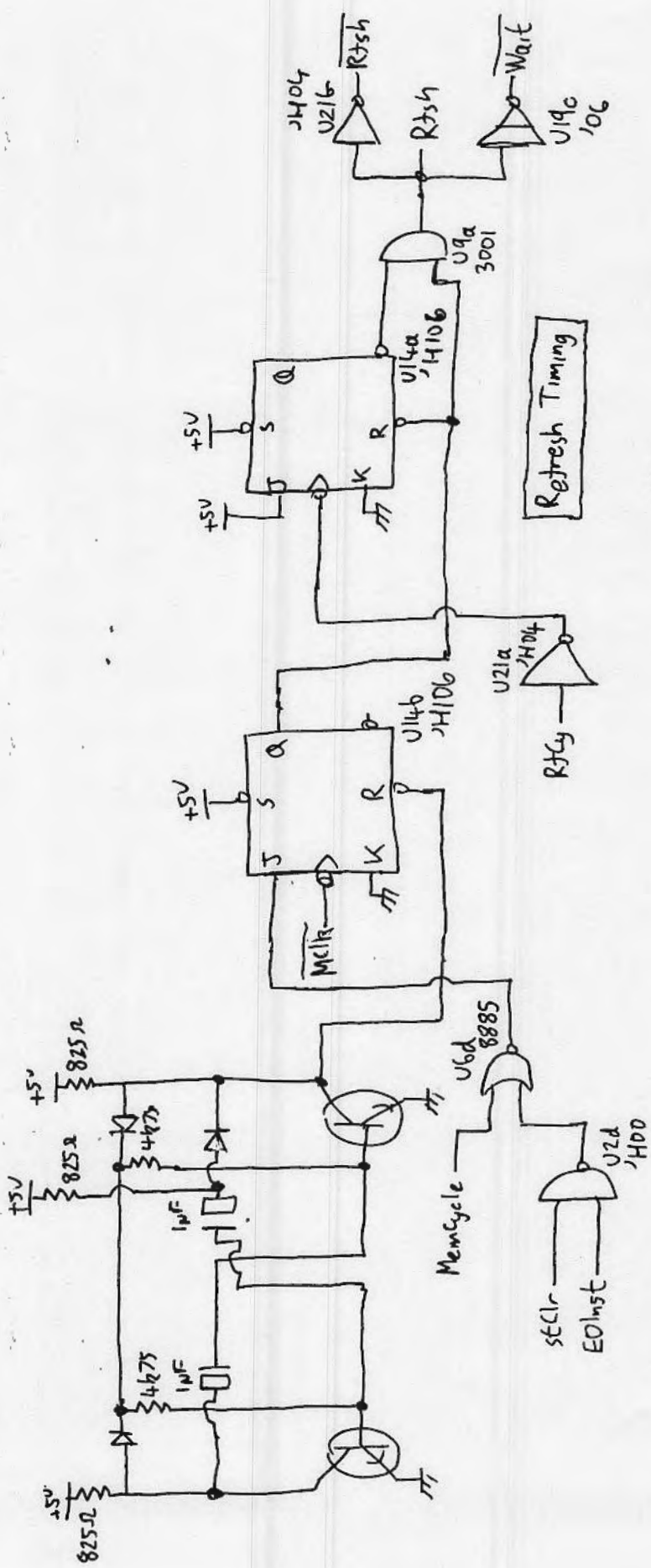
HP 9820 ROM I PCB (R/B~)

09820-66521

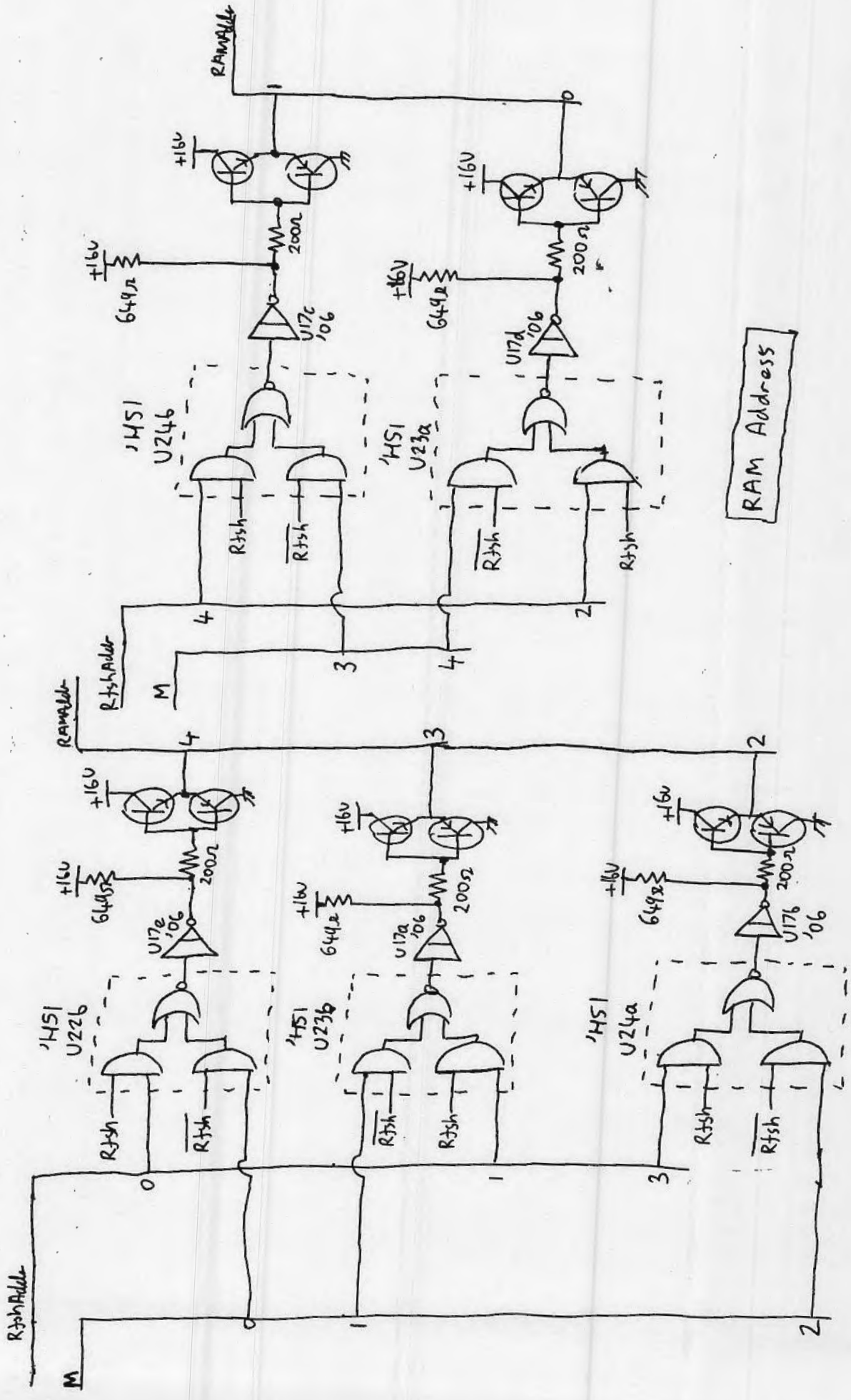


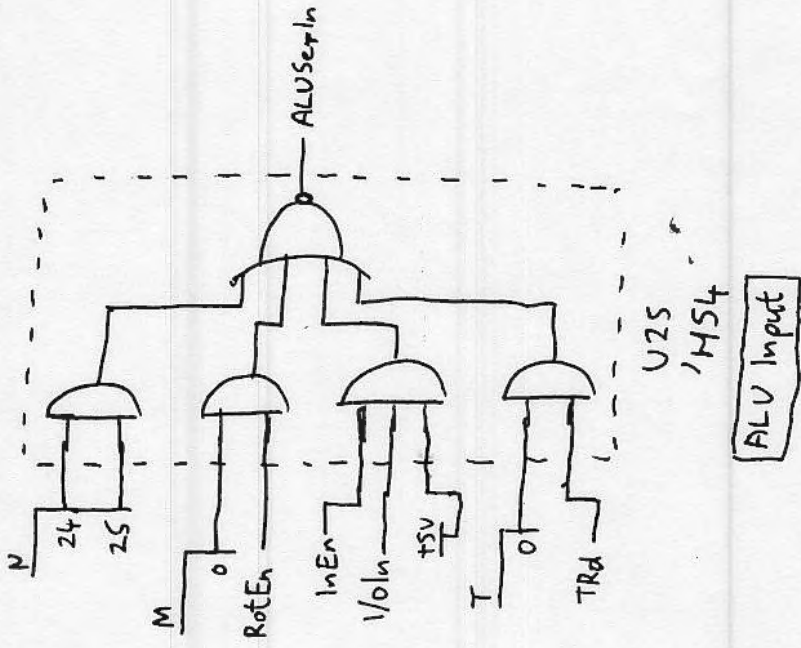
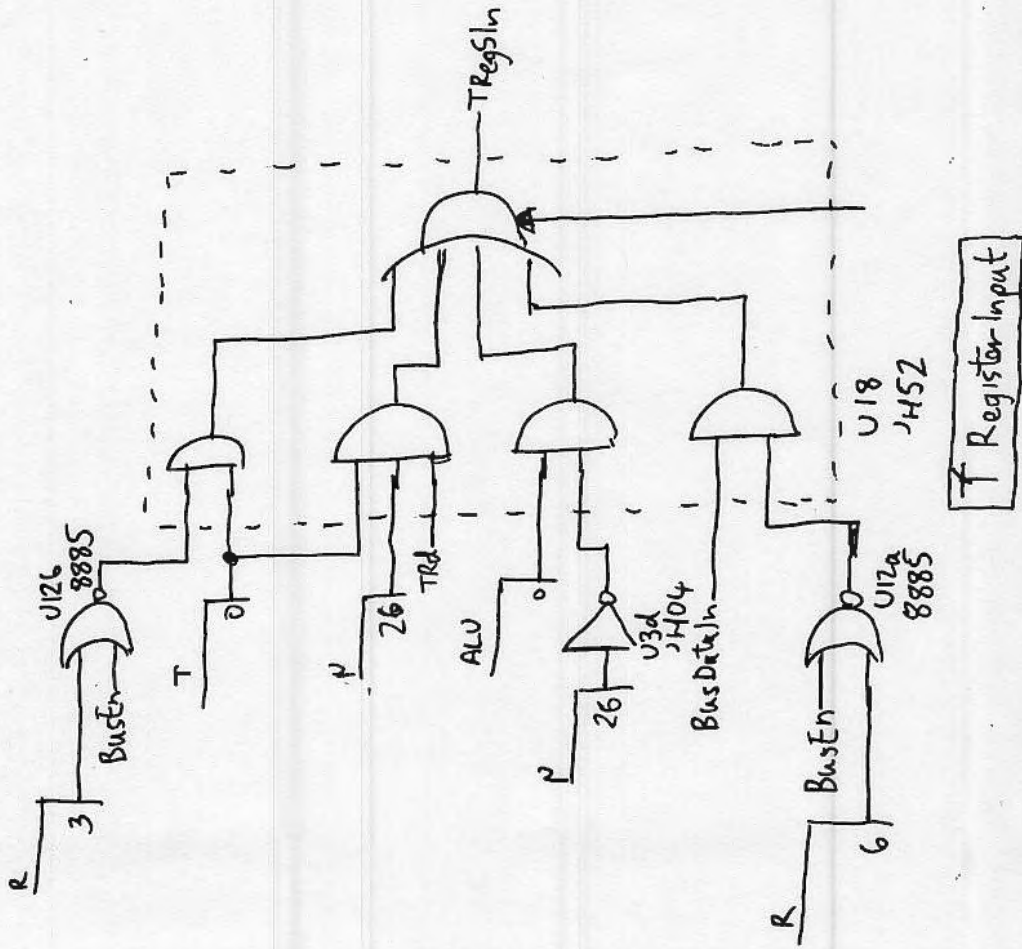
09820 - 66522

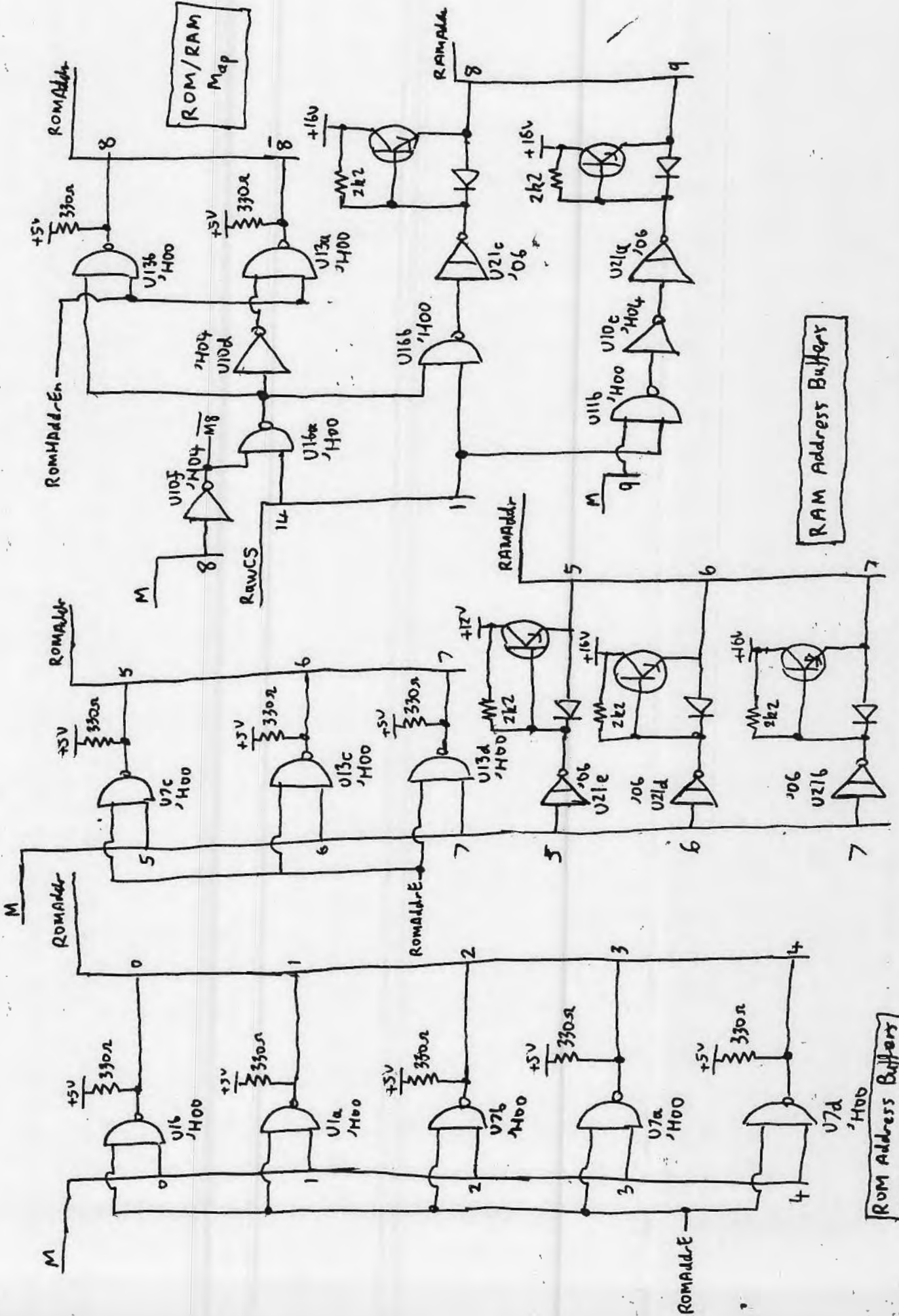
HP 9820 ROM2 PCB (R/R)

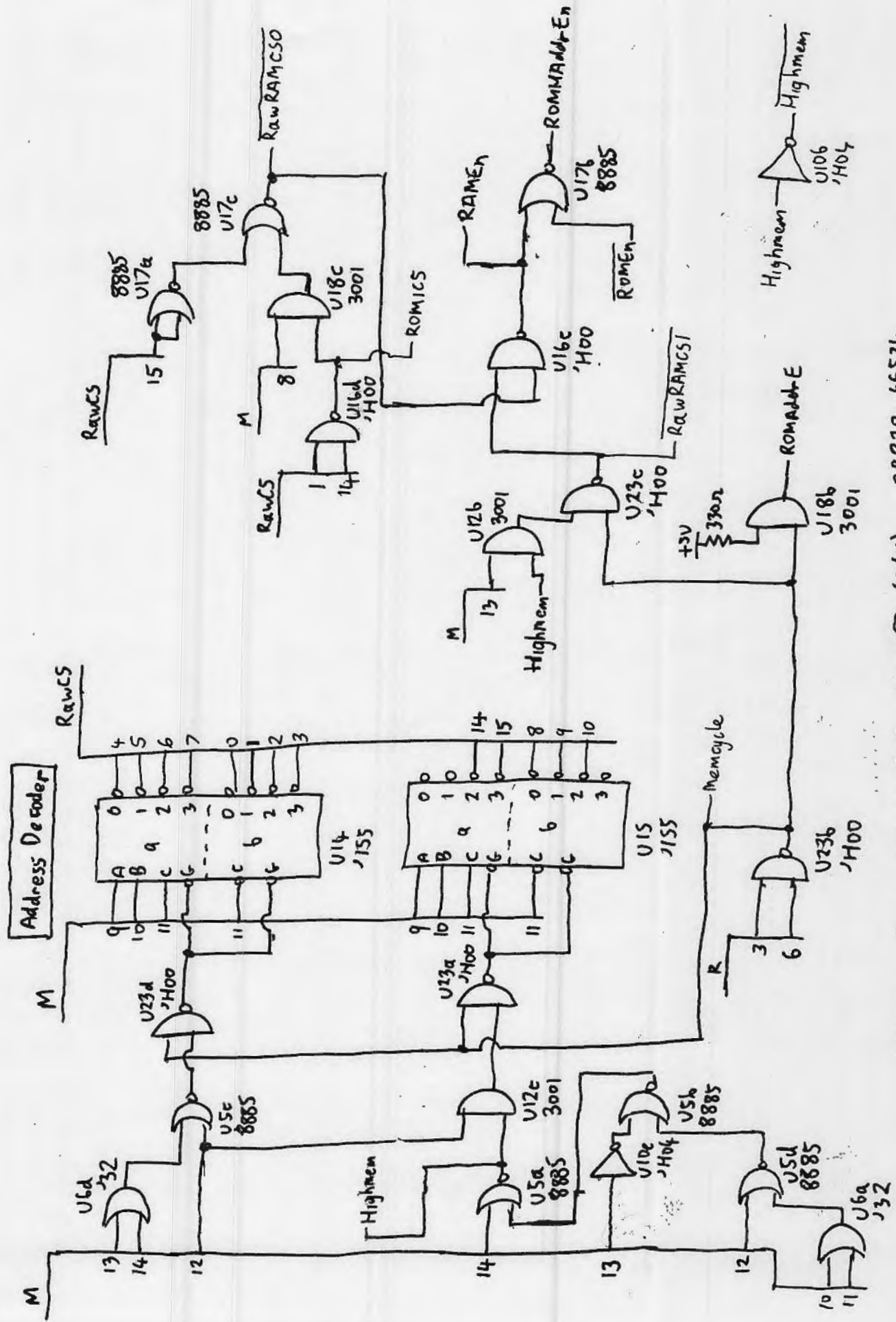


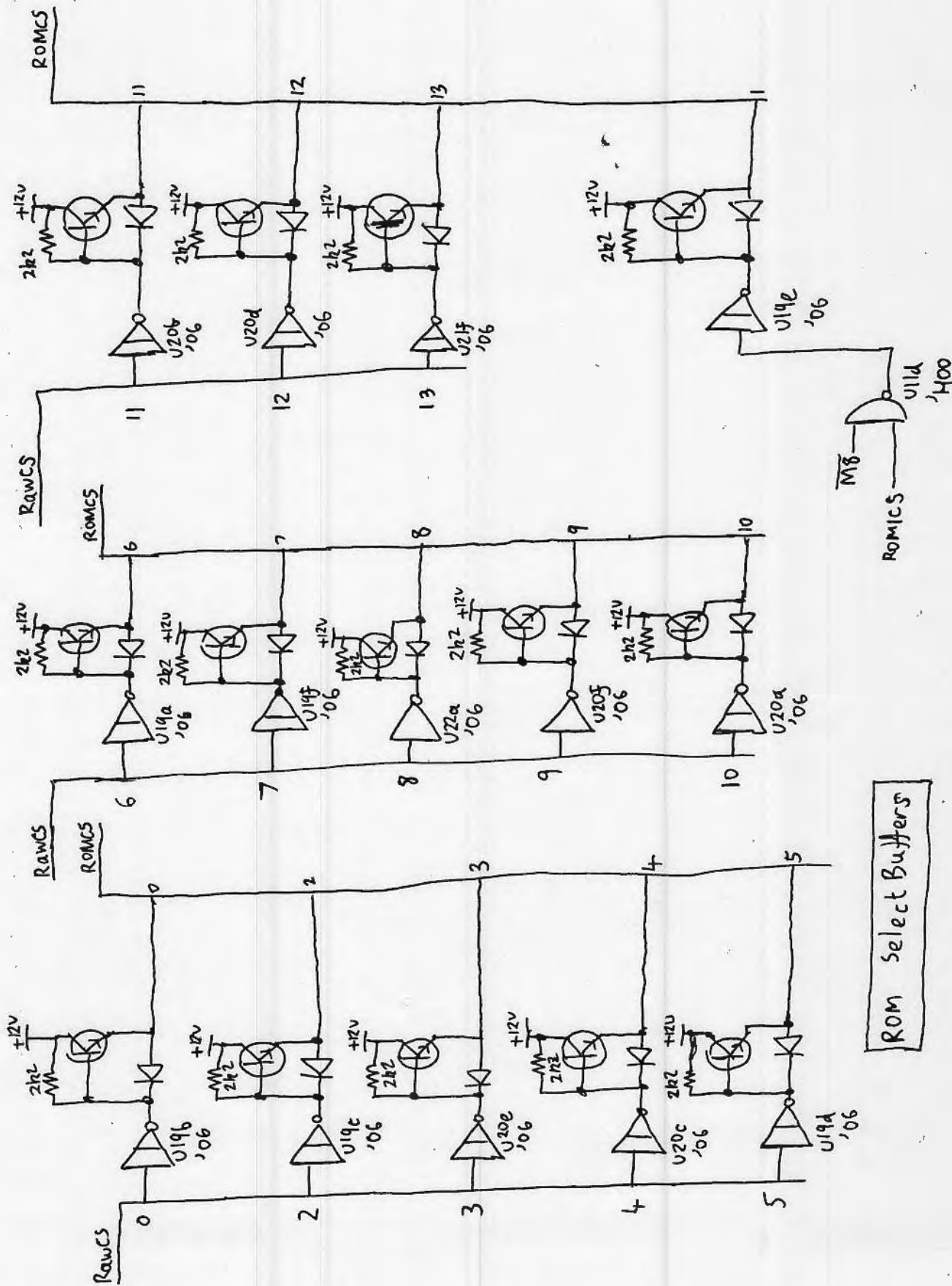
Refresh Address





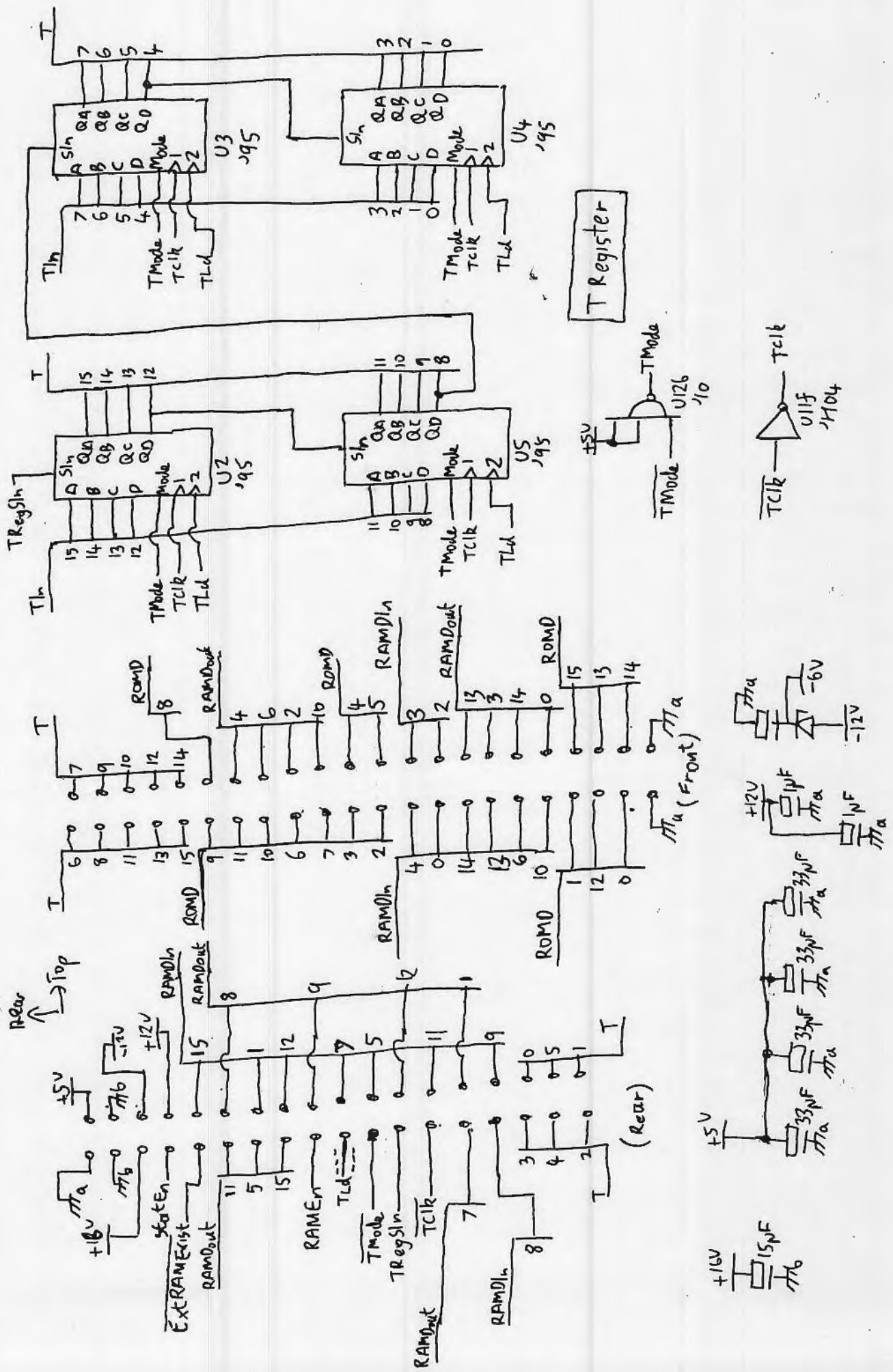






ROM Select Buffers

HP9820 Memory Address PCB sheet (4) (R/Y) 09820-66S24

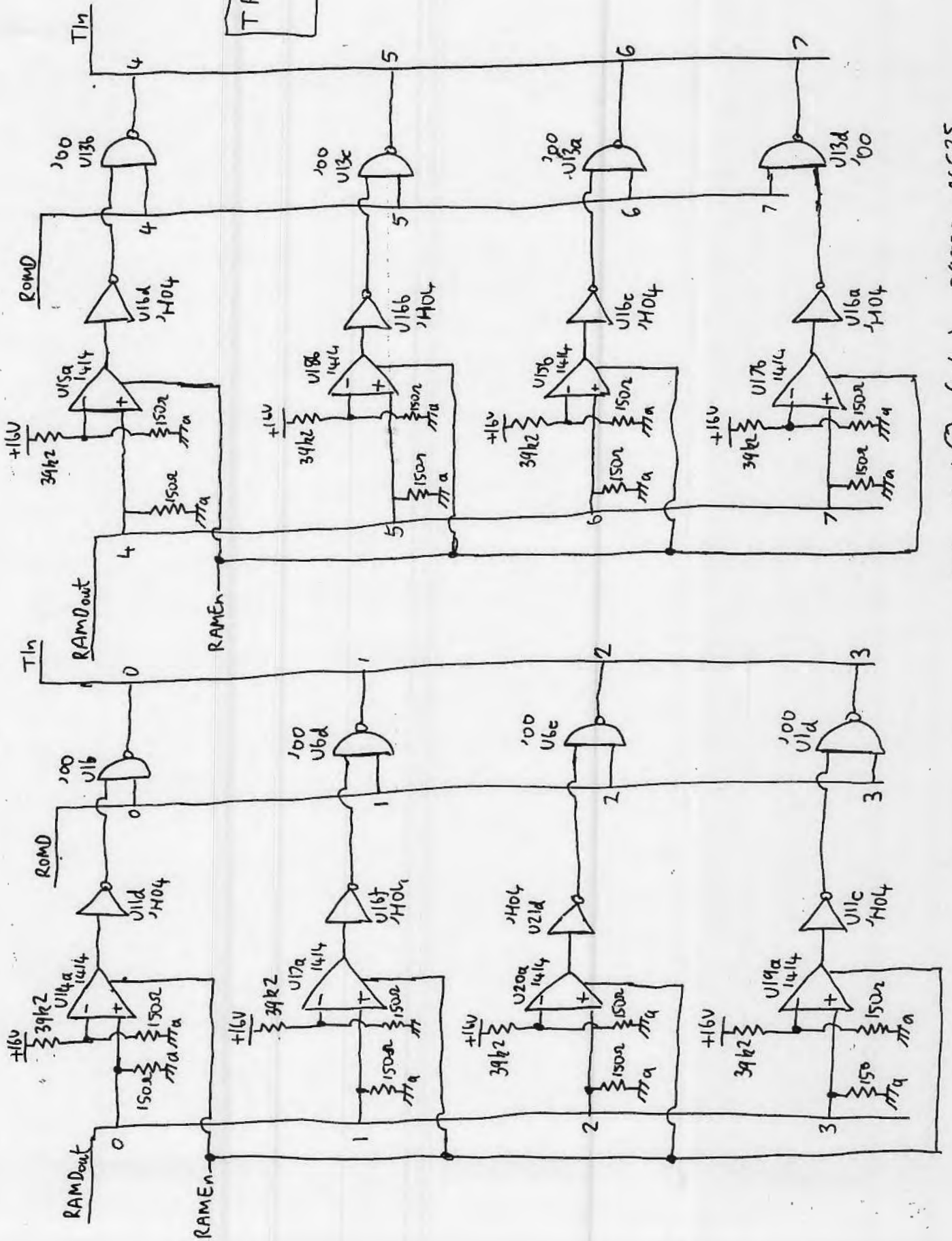


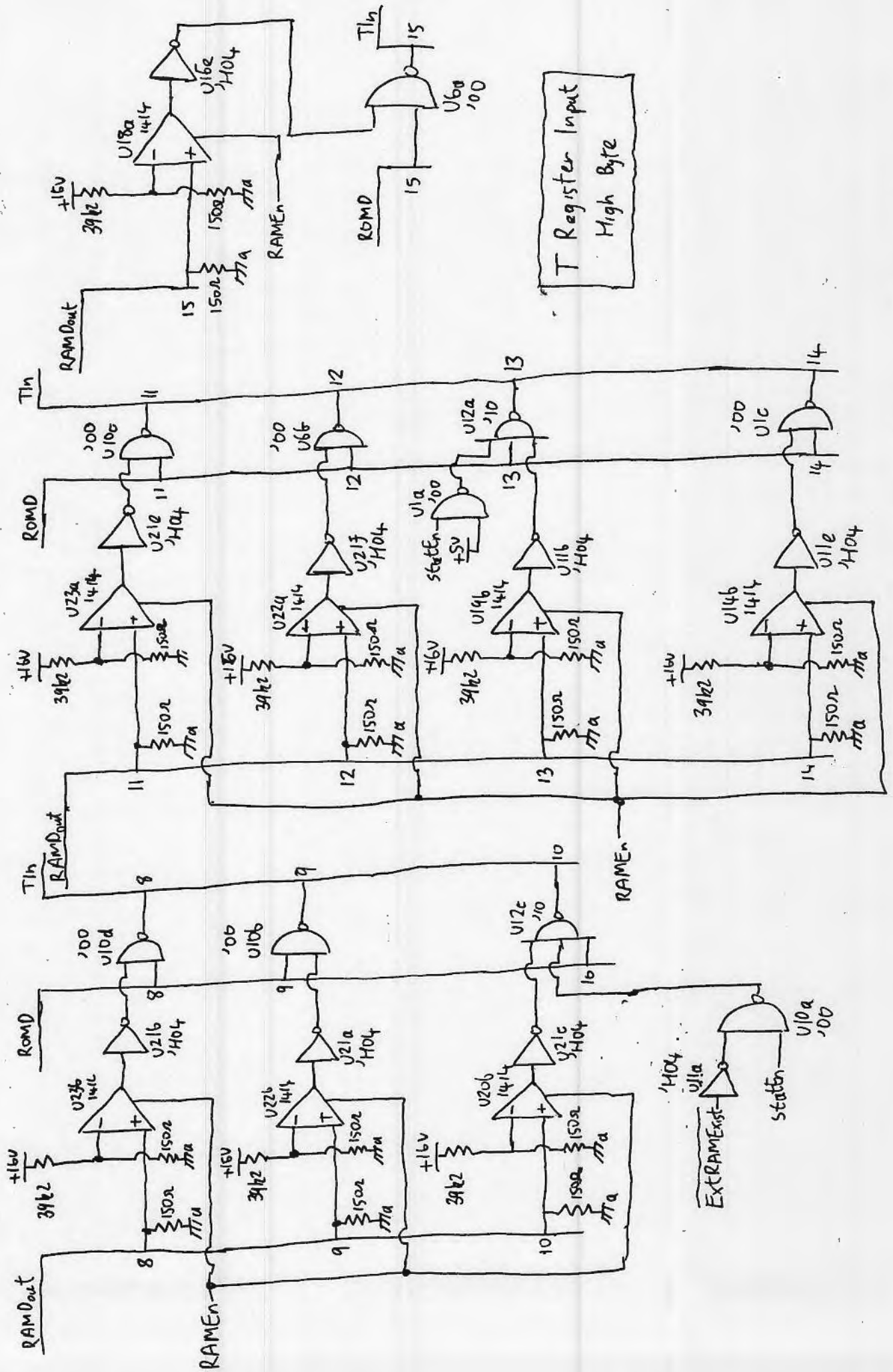
09820-66SZ5

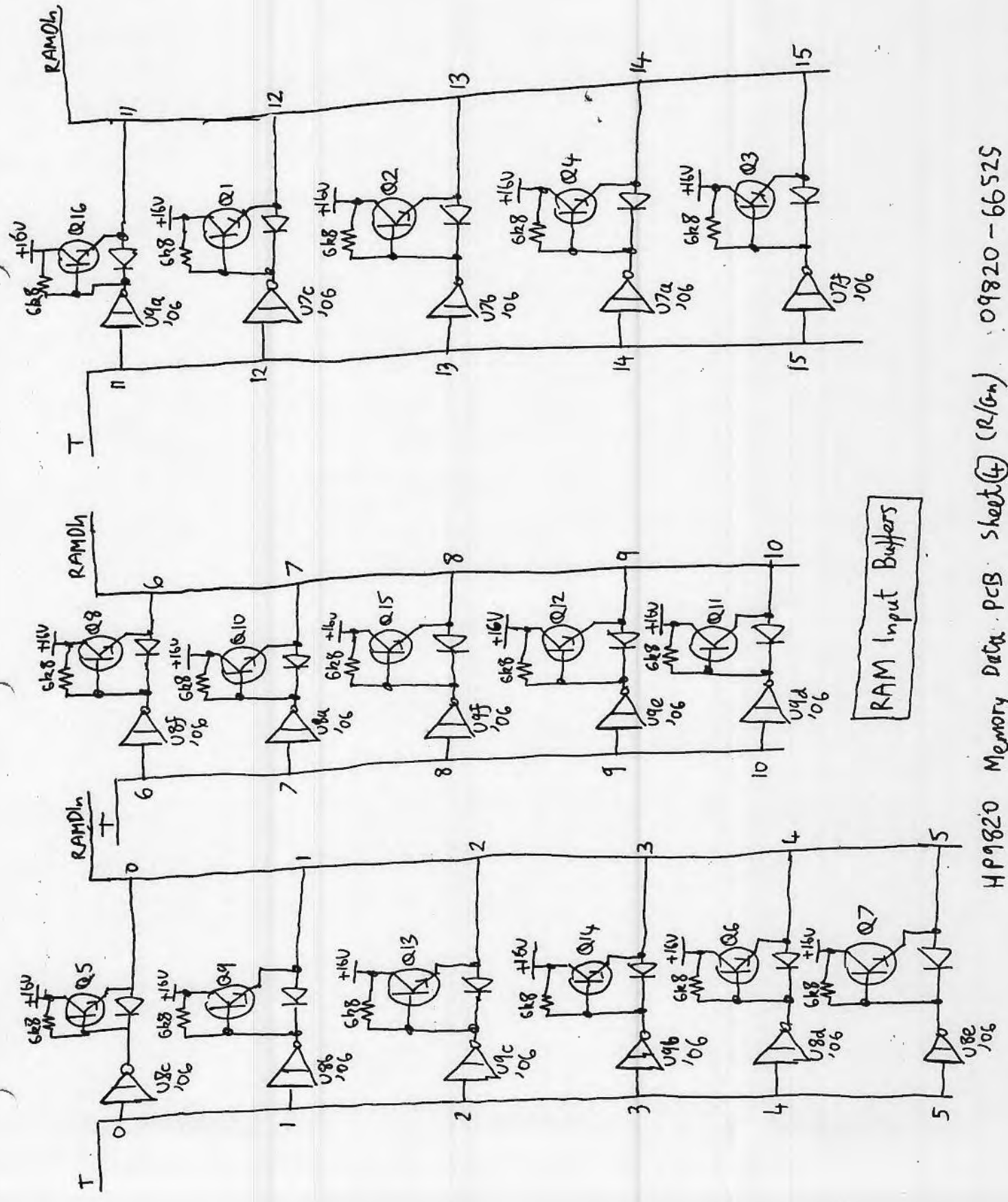
Sheet 1 (R/Gn)

HP9820 Memory Data PCB

T Register Input
Low Byte

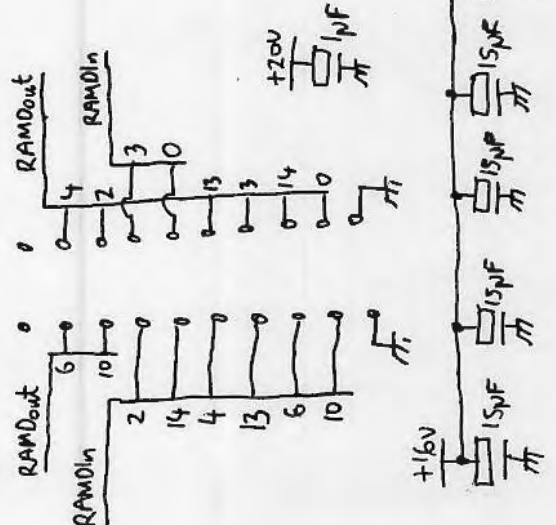
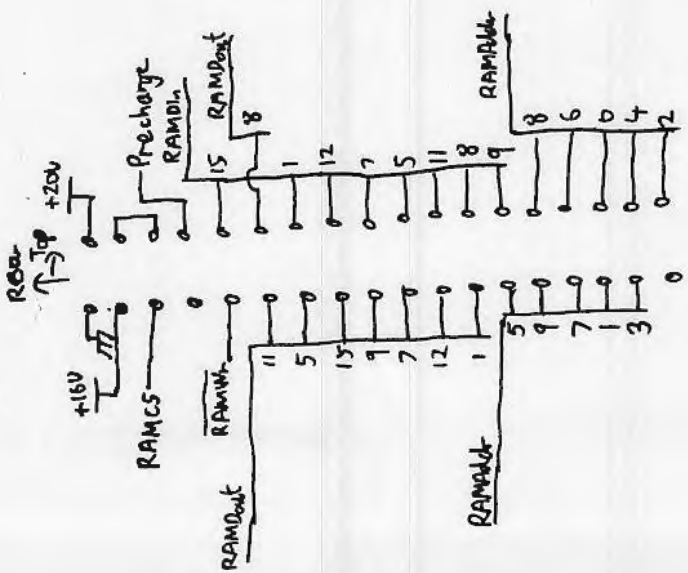
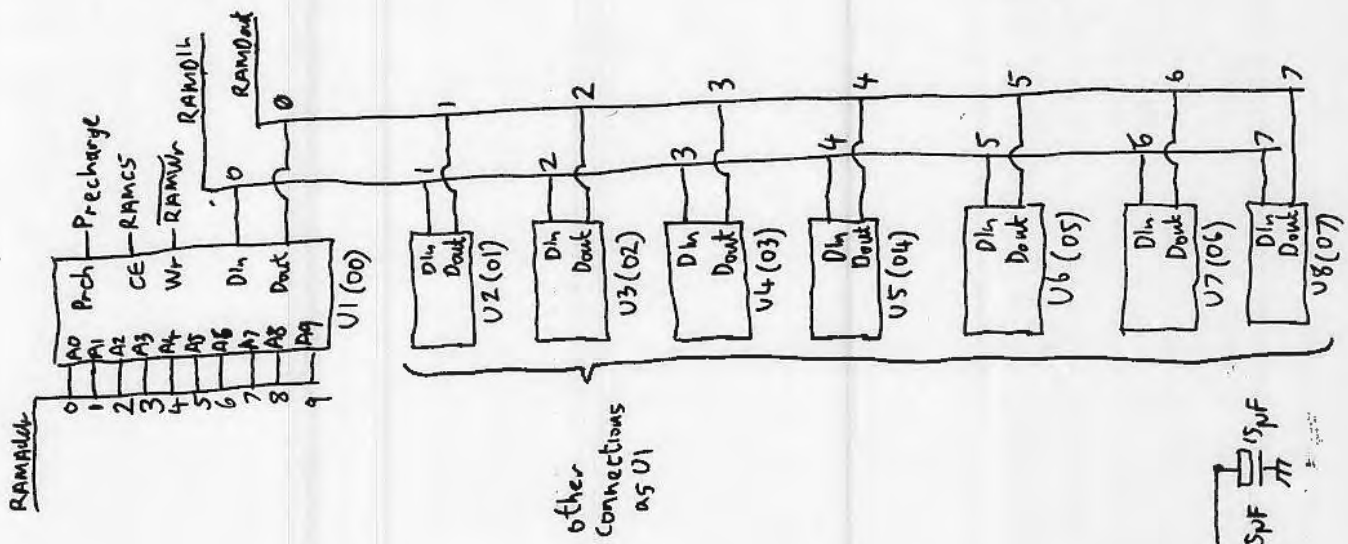
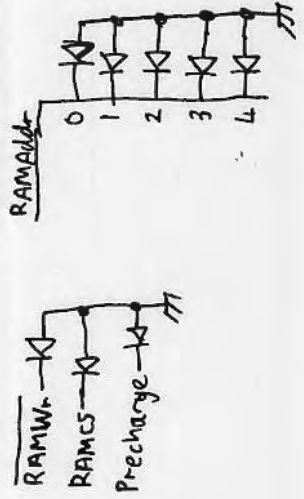
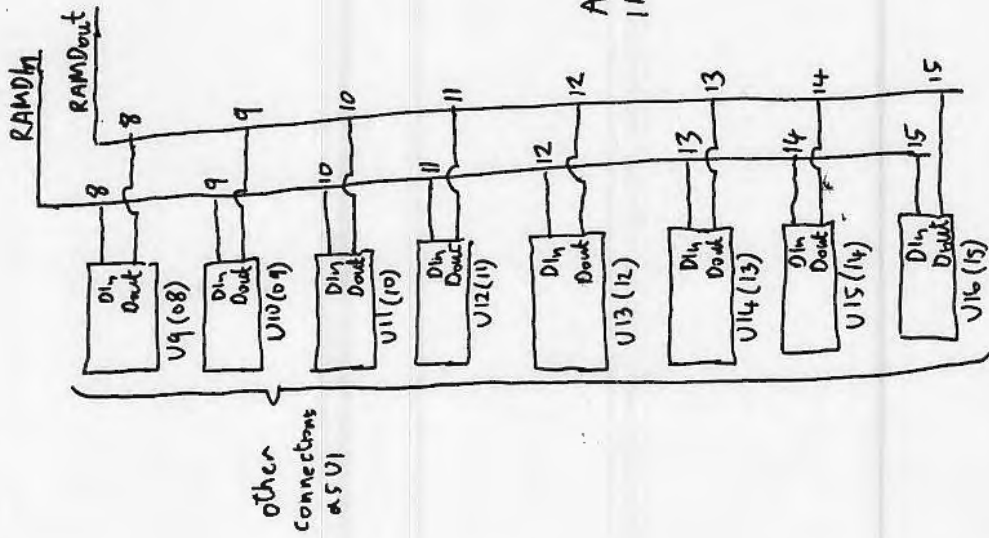






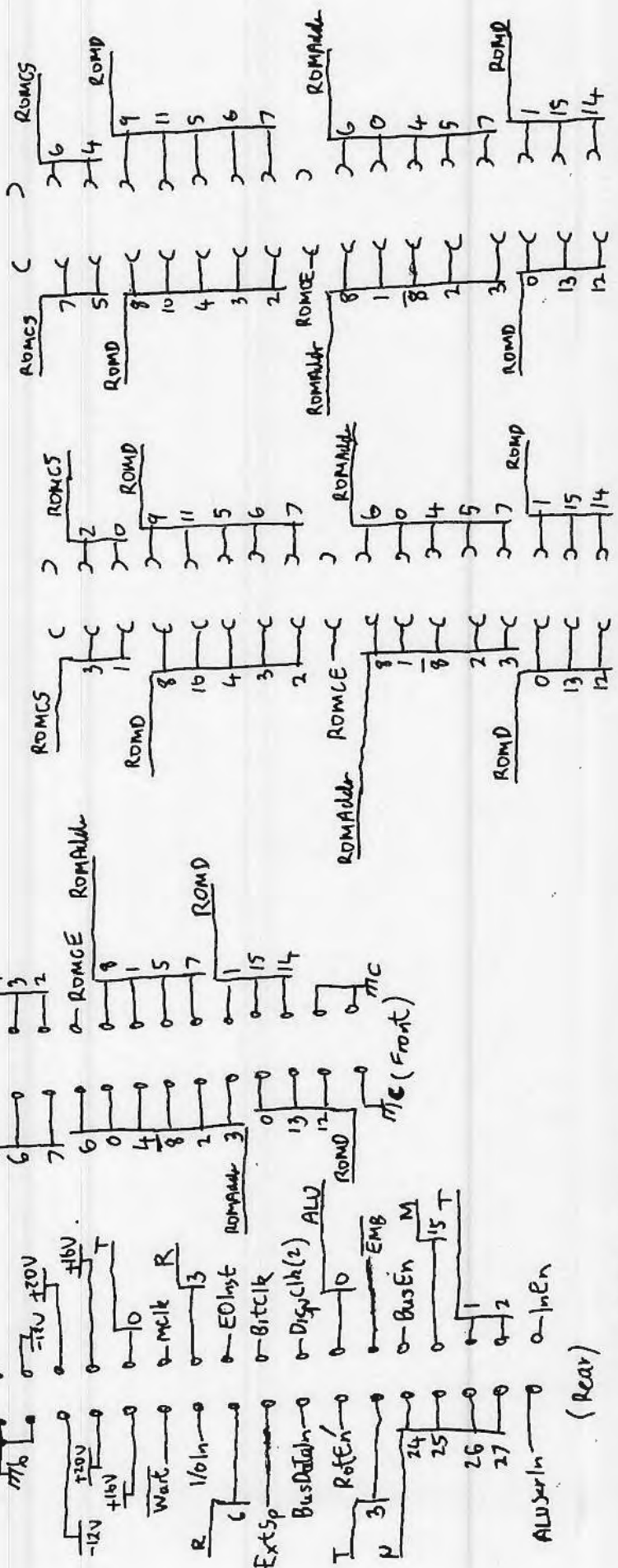
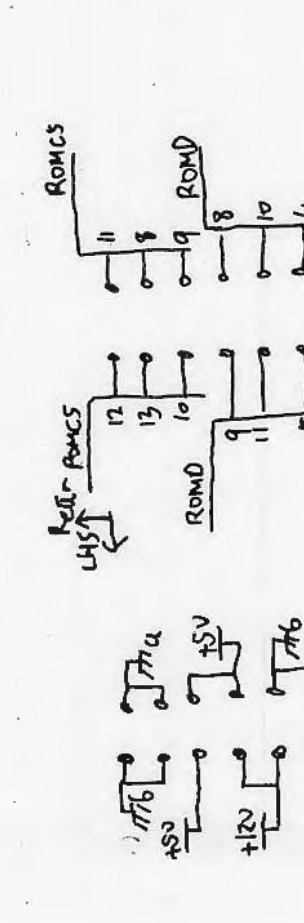
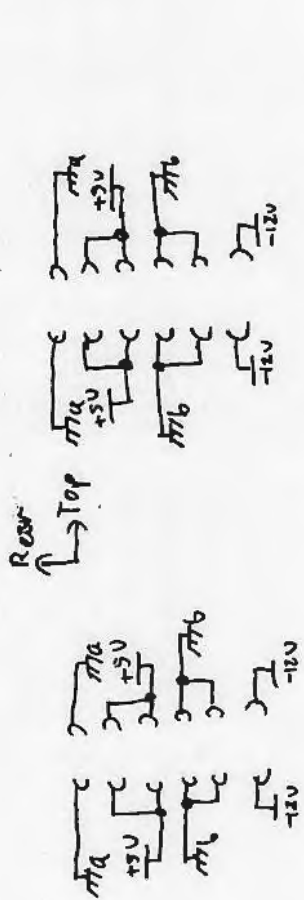
HP9820 Memory Data PCB sheet (4) (R/Gn) 09820-66525

All IC's
1103 1Kx1 DRAM



09820-66526

HP9820 RAM PCB (R/Bu)



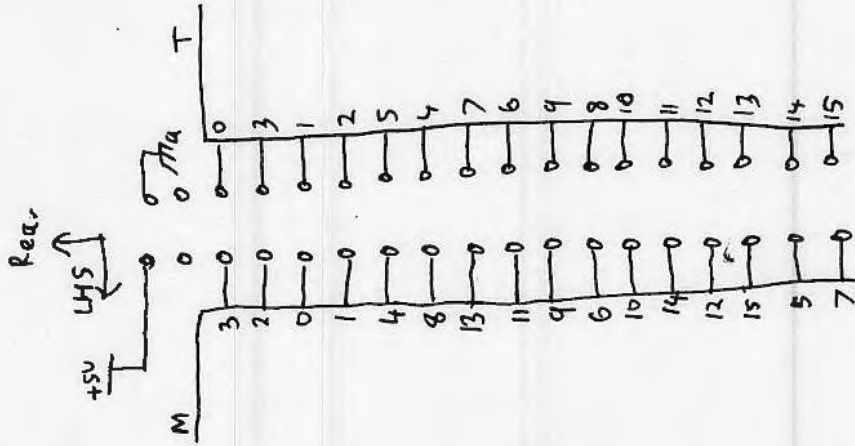
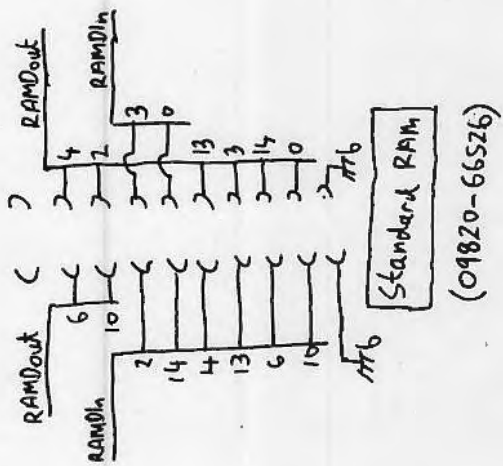
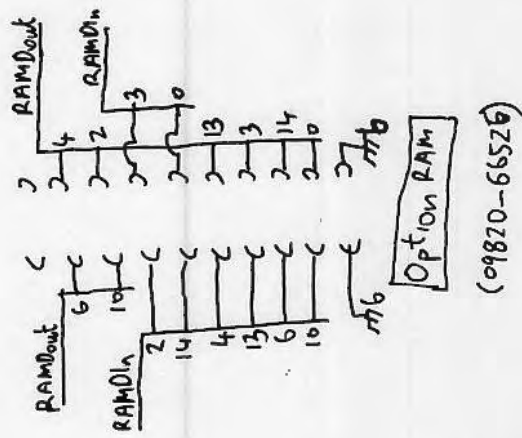
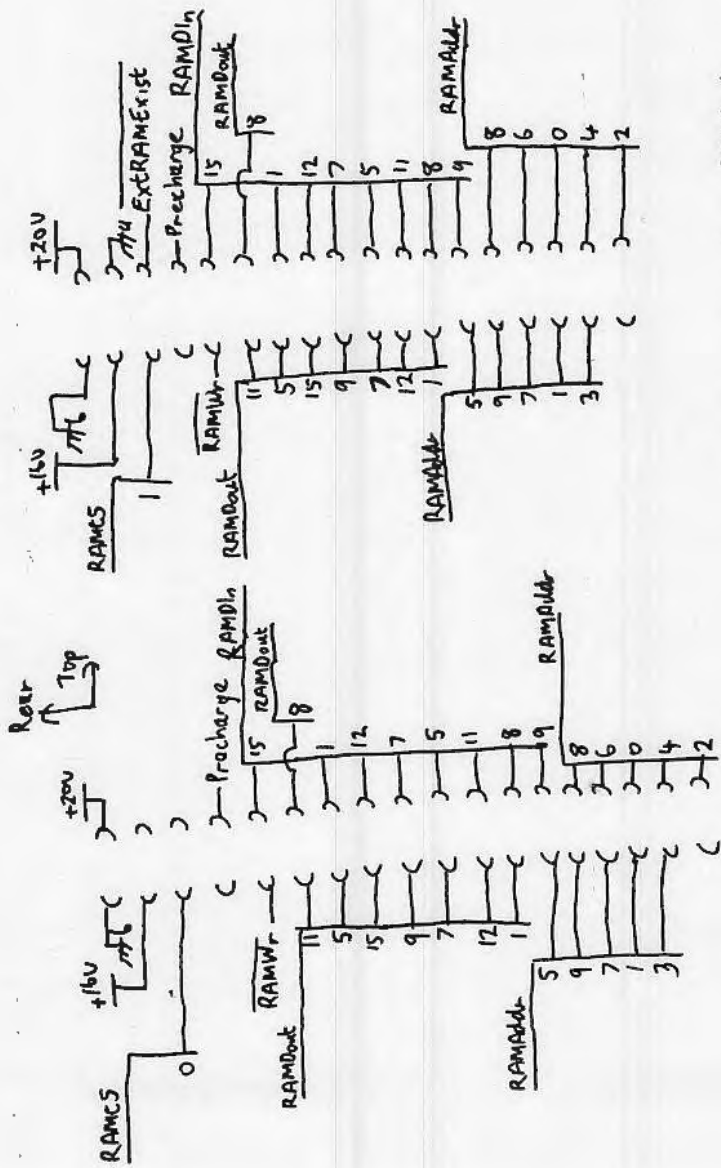
Main Backplane connector

ROM1

ROM2

(09820-66521)

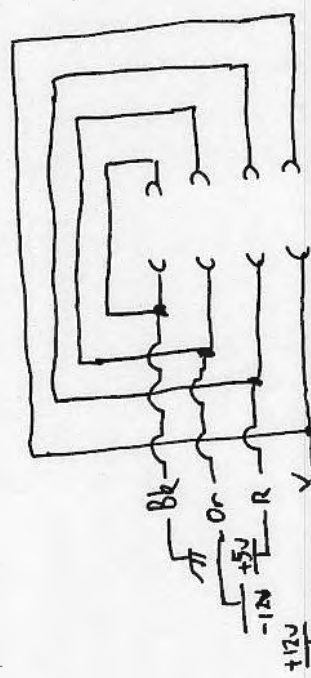
(09820-66522)



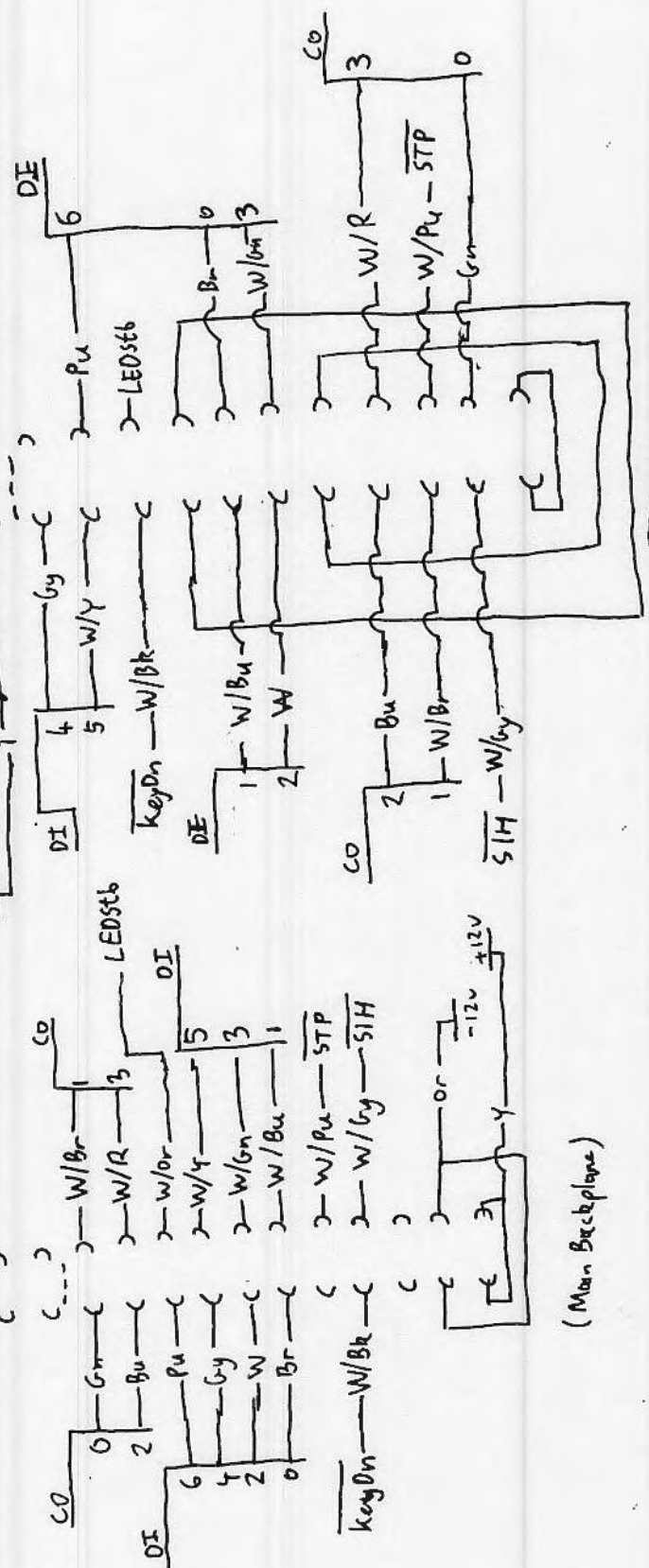
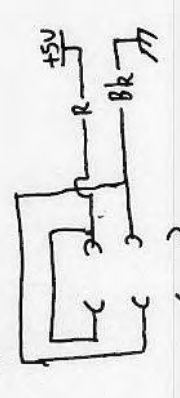
(09820-66526)

(09820-66526)

Rear
 ↑ Top

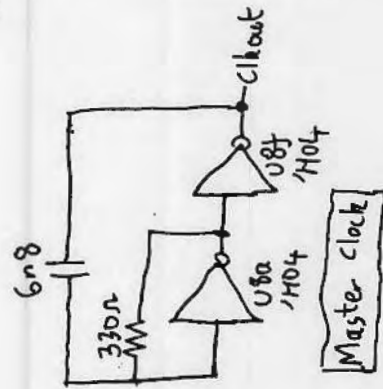
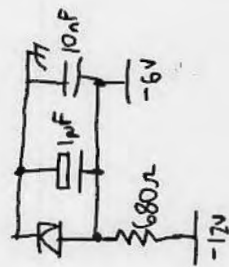
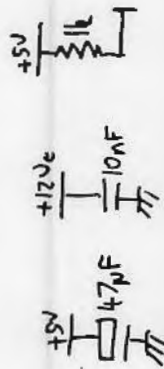
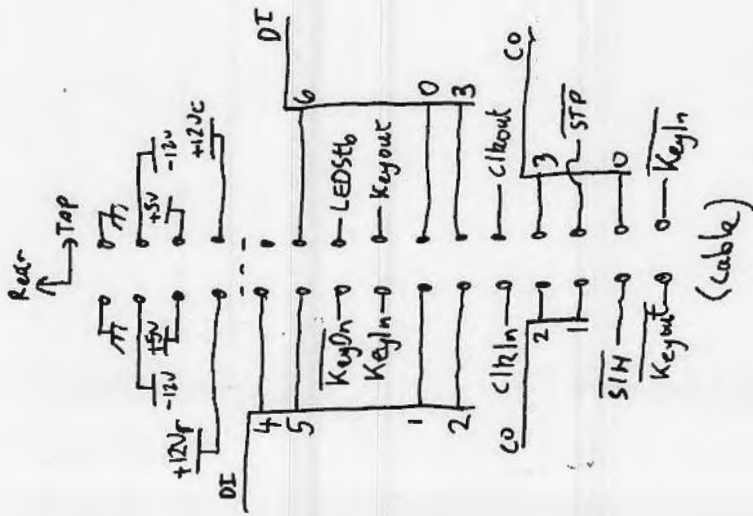


LMS
 ↑ Top

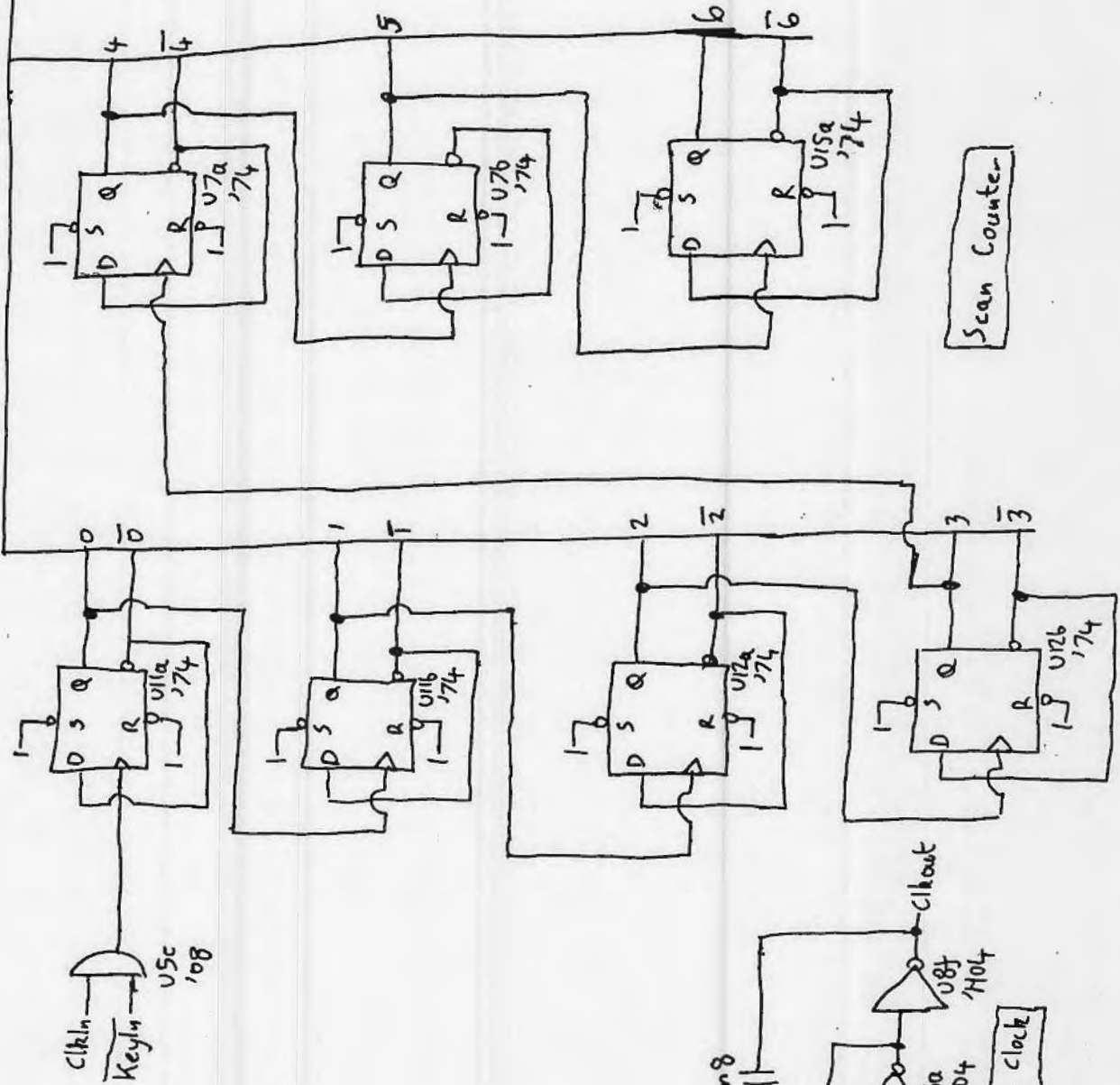


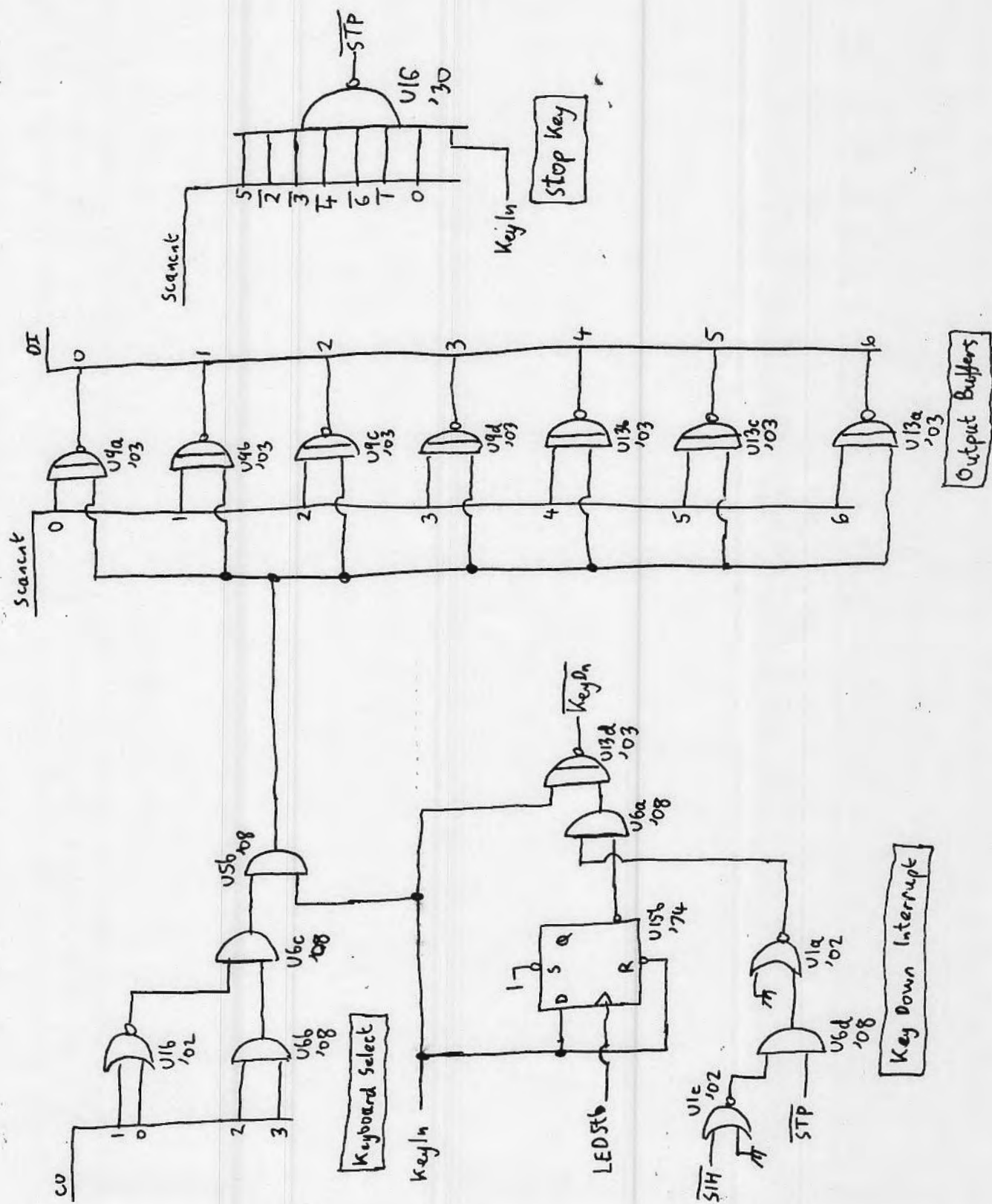
Keyboard Encoder
 (09820-66532)

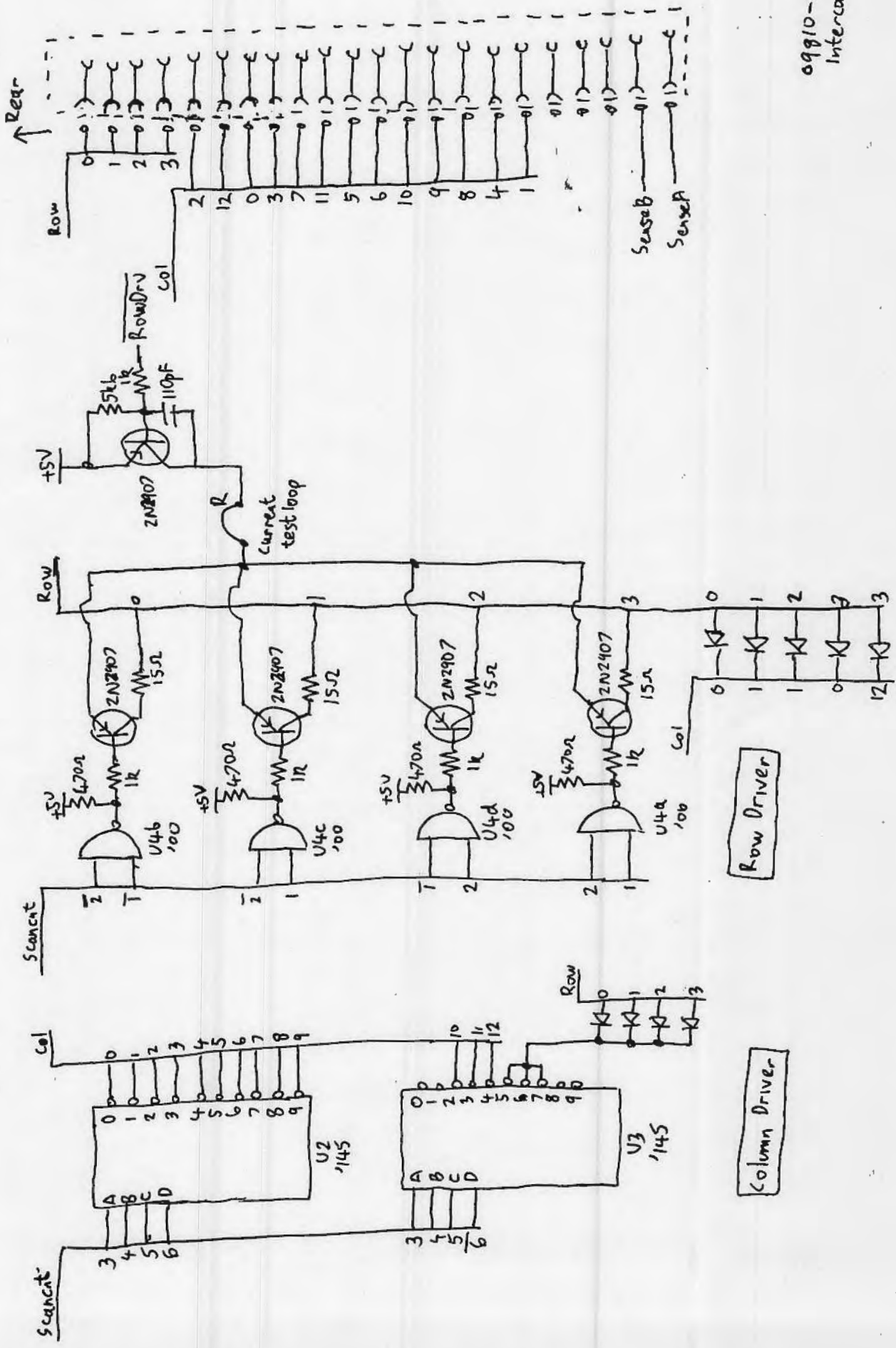
(Main Backplane)



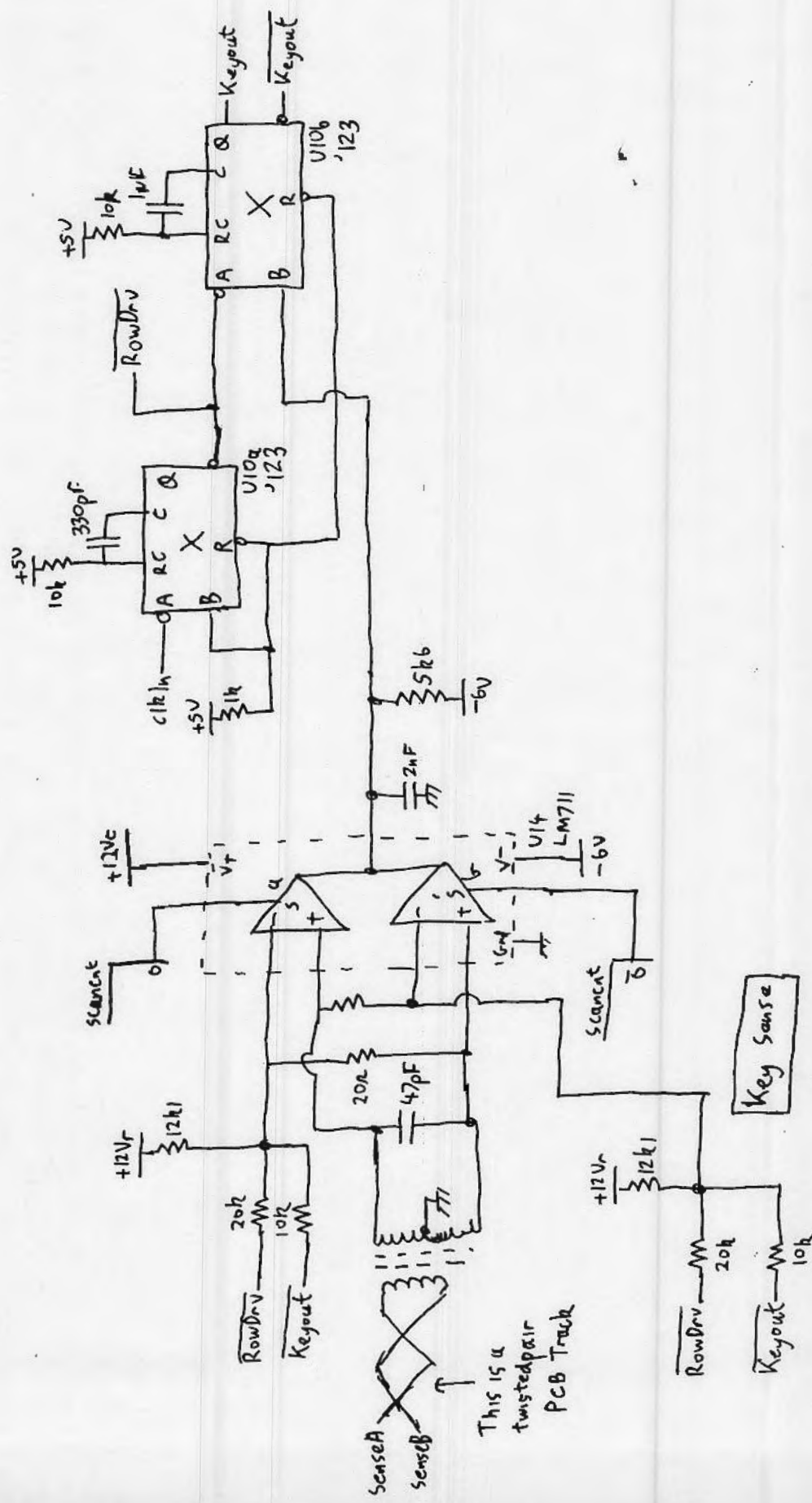
ScanCut







09810-66531
Interconnect PCB



ERASE	FIXEDN	FLOATH	DELETE	INSERT	RECALL	BACK	FORWARD	CLEAR	ENTER	DISPLAY	PRINT	SPACE	LIST	LOAD	RECORD	
. \$			O	I		N	S	/	ENTER EXP	()	A	X	>	JUMP	END
%			E	J	O	T	*	7	8	9	"	B	Y	≤	IF	GO TO SUB
&			F	K	P	U	-	4	5	6	,	C	Z	=	FLAG N	REMAIN
'			G	L	Q	V	+	1	2	3	;	→	R()	≠	SET CLEAR FLAG	GO TO
? SPACE			H	M	R	W	0	.			EXECUTE	RUN PROGRAM	STOP		STORE	

HP 9820 Keycaps

Notes: These 4 keys are denoted by 'blanks' (top) to 'blanks' (bottom) in the schematic diagram



R0 → C2 NORMAL, TRACE
 BLANK0, BLANK1 R0 → C1
 BLANK2, BLANK3 R3 → C1
 \$, % R2 → C4
 &, ' R3 → C4

R2 → C8 D, E
 R3 → C8 F, G

R0 → C12 DELETE, RECALL
 R1 → C12 INSERT, FORWARD
 R2 → C12 ERASE, BACK

R0 → C9 H, I
 R1 → C9 J, K
 R3 → C9 N, O
 R2 → C10 T, U
 R2 → C9 L, M
 R1 → C10 R, S
 R3 → C10 V, W
 R0 → C10 P, Q

R3 → C2 PRINT, SPACEN
 R2 → C2 ENTER, DISPLAY
 R1 → C2 FIXEDN, FLOATN

R2 → C6 4, 5
 R3 → C6 6, 7
 R1 → C5 +, *
 R0 → C6 0, 1
 R1 → C6 2, 3
 R2 → C5 -, /
 R3 → C5 ., /
 R0 → C5 (,)

Z, RUN PROGRAM R1 → C11
 X, Y R0 → C11

ENTER EXP, →
 R0 → C7 8, 9
 R3 → C11
 R1 → C7 R(,);
 R2 → C11 EXECUTE, √
 R3 → C7 >, ?
 R0 → C4 STOP, SPACE
 R1 → C4 ≠, ''
 R0 → C8 GOTO, A
 R1 → C8 B, C

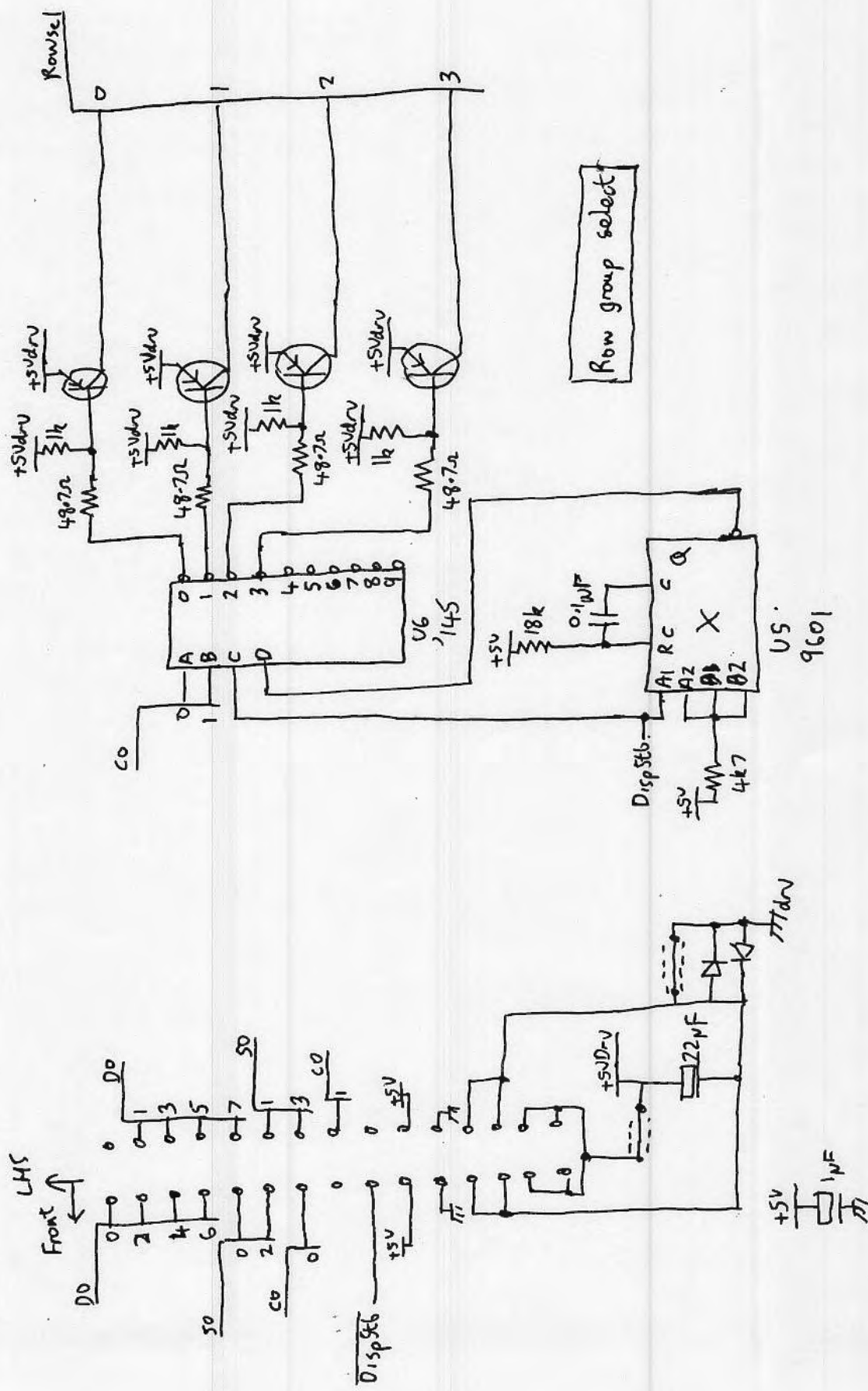
R1 → C0 CLEAR, STORE
 R2 → C0 LIST, LOAD

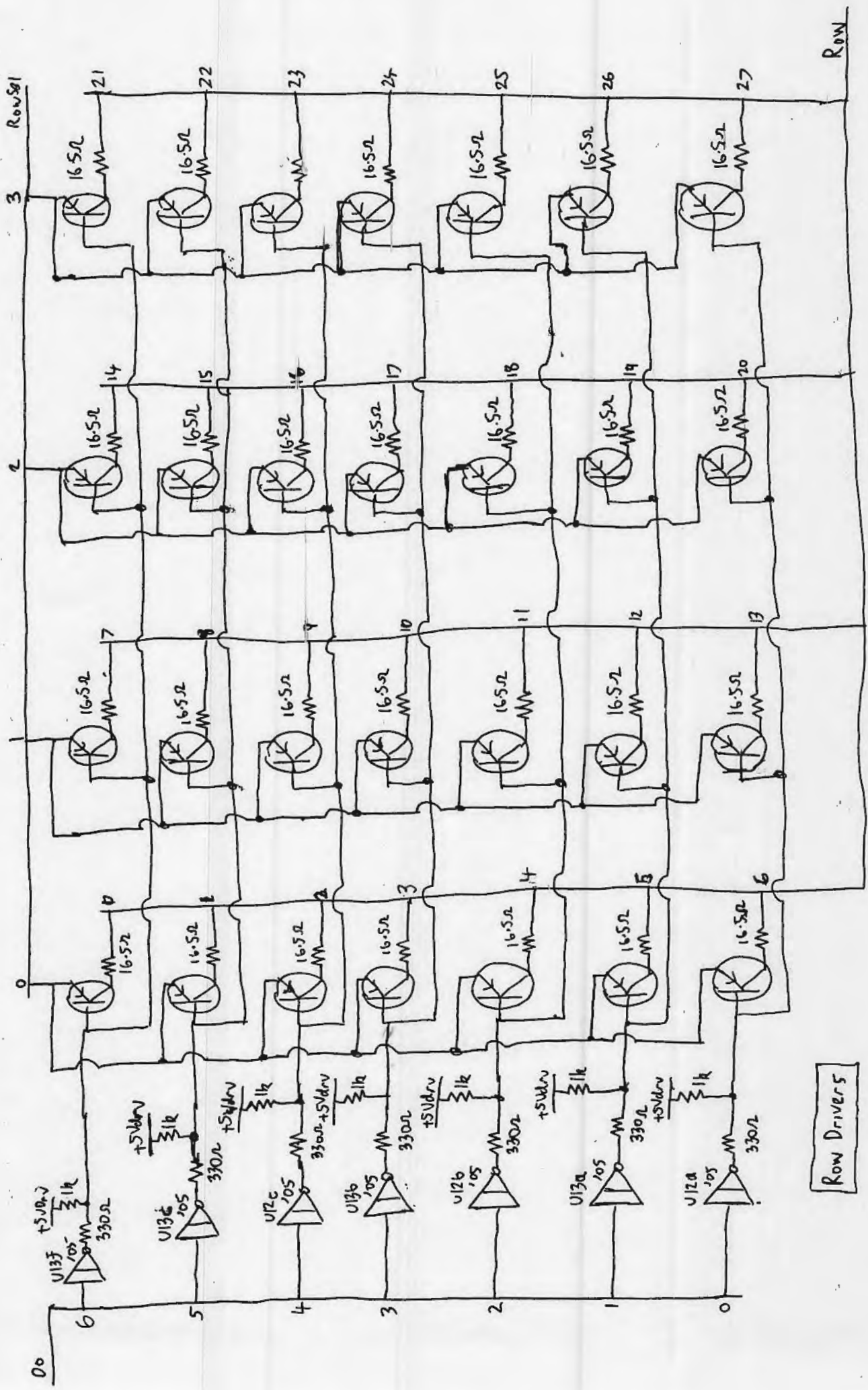
R2 → C7 ≤, =

R2 → C3 IF, GOTOSUB
 R3 → C3 FLAGN, SET/CLEAR FLAGN
 R1 → C3 END, RETURN

R0 → C3 RECORD, JUMP

HP9820 Keyboard Diode Layout
 (seen from underside)
 09820-66533 PCB





HP9820 Display PCB sheet 2 (Y/B)

09820-66541

