

HP59313 Commands

(Sent to Listen Address)

xx11ddd - Load Channel Select Register
/ | \ ch1 (Selected channels are added)
ch4 ch3 ch2

In particular:

xx110001 ('1') : select channel 1
xx110010 ('2') : " " 2
xx110100 ('4') : " " 3
xx111000 ('8') : " " 4

xx000ddd - Load sample Rate

ddd
000 - Disable ('0')
001 - Single Conversion ('A')
010 - 200Hz ('B')
011 - 100Hz ('C')
100 - 50Hz ('D')
101 - 20Hz ('E')
110 - 10Hz ('F')
111 - 5Hz ('6')

xx001ddd - Aux Command

ddd
000 - Reset ('H')
001 - stop } conversion ('I')
010 - start } ('J')
011 - Enable ExtStart (cleared by Reset) ('K')
100 - Enable SRR ('L')
101 - Disable SRR ('M')
110 - Reverse Channel On ('N')
111 - Reverse Channel Off ('O')

HP1B Controller Commands (sent with ATN asserted)

x01aaaa Listen } aaaaa = Address set by
x10aaaa Talk } links on control logic PCB
x0111111 UnListen
x1066666 Untalk (66666 ≠ device address)
x0010100 Device Clear
x0011000 Serial Poll Enable
x0011001 Serial Poll Disable

Data output

11 bit 2's Complement, sign extended to 16 bits, sent MSB first

HP 59313 Analyze Section

$$V_{Ref} = -9.50V$$

$$V_{Z+} = 1.044V$$

$$V_{Z-} = -1.044V$$

Gain fully anticlockwise \rightarrow minimum gain

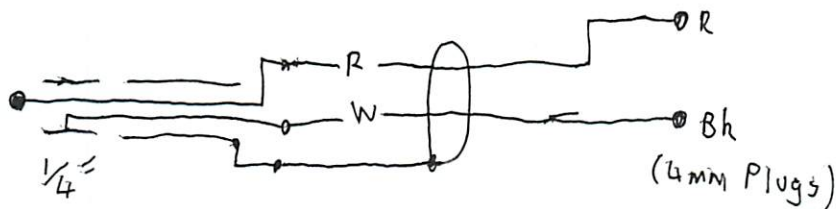
| | Ch(n) | V _{sum} | A0Ch _n |
|-----|--------|------------------|-------------------|
| -FS | -11.2V | 9.52V | 1.78V |
| 0 | 0 | 0.02V | 5.94V |
| +FS | 11.2V | -9.48V | 10.96V |

Input Amplifiers

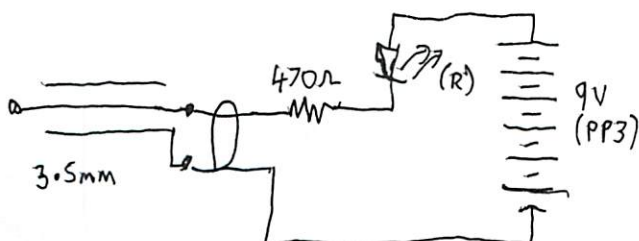
4 gain setting + gain preset

| | | | |
|---------------------------|---------|-------------|-------|
| No jumper | : x1 | 6.8 - 11.2V | Range |
| CH _n - M \pm | : x1.4 | 4.8 - 7.9V | Range |
| CH _n - ME | : x2.8 | 2.4 - 4.0V | Range |
| CH _n - LO | : x7.25 | 0.93 - 1.5V | Range |

Input Cable (NOT MP Product)



Reverse Channel Test Cable (NOT MP Product)



HP71 test programs for the HP59313 ADC

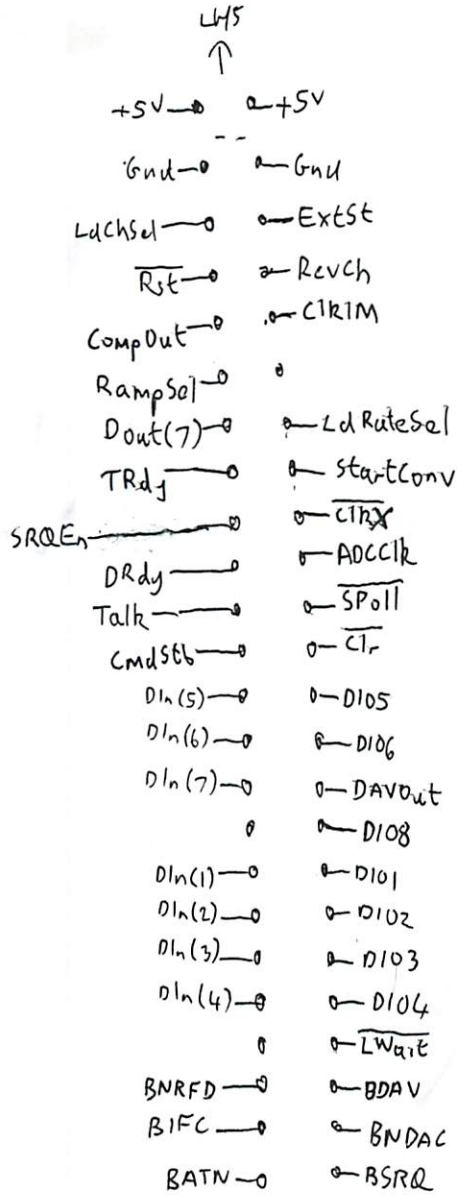
Repeatedly read analogue channel 1 and display the value in signed decimal

```
0010 INPUT "DEVICE ADDRESS ";D
0020 OUTPUT :D ;"H1A"
0030 'LOOP': OUTPUT :D ;"IJ"
0040 ENTER :D USING "#,B,B";H,L
0050 V=H*256+L @ IF V>32767 THEN V=V-65536
0070 DISP V
0080 GOTO 'LOOP'
```

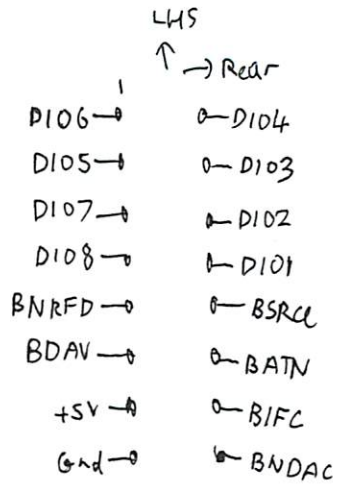
Turn the reverse channel on and off 10 times at 1Hz

```
0010 INPUT "DEVICE ADDRESS ";D
0020 OUTPUT :D ;"H"
0030 FOR N=1 TO 10
0040 OUTPUT :D ;"N"
0050 WAIT .5
0060 OUTPUT :D ;"O"
0070 WAIT .5
0080 NEXT N
0090 END
```

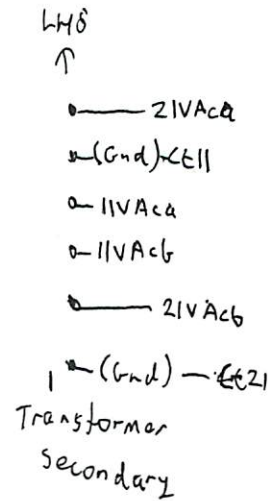
WPS9313



Inter-PCB
connectors



HP1B Connector
PCB



Analogue PCB

Rear
↑

- 1 - SPCmd
- CmdTest
- SPollTalk
- SR@RDy
- SPCStb
- 0 N/C
- 0 N/C
- 0 N/C
- 0 N/C
- 0 N/C

J2

RHS

↑

- 1 - N/C
- X
- 0 N/C
- 0 - Gnd

J5

Rear
↑

- 1 - Stg Ramp
- RefRamp
- ChSel(1)
- ChSel(2)
- ChSel(3)
- ChSel(4)
- 0 N/C
- 0 N/C
- IntegOut
- ADCIn

J3

RHS
↑

- 1 - N/C
- 0 N/C
- 0 N/C
- 0 N/C
- 0 N/C
- 0 N/C
- +15VU
- -15VU
- +5VT
- +5VU

J7

RHS

↑

- 1 - Ch(1)
- Ch(2)
- Ch(3)
- Ch(4)
- VSum
- VRef
- VZ+
- VZ-
- -15VT
- +15VT

J4

PSU Test Signals

xVU : Unregulated Input
-> xVolts.

xVT ; output of regulator,
before test jumper.

Control Logic PCB

Rear
↑

- 1 - AuxCmd
- ClkR0
- X
- DExtSt

J3

Rear
↑

- 1 - ExtStETP
- ClkR9
- ExtStEdge
- RateSel(2)
- RateSel(1)
- ADCClkEn
- mclk
- RstSampleClk
- Clk10K
- RateSel(0)

J4

Rear
↑

- 1 - POR
- LE_n
- ListenMode
- LHold
- Unlisten
- UNL
- MLA
- VT
- MyAddr
- TalkAV

J5

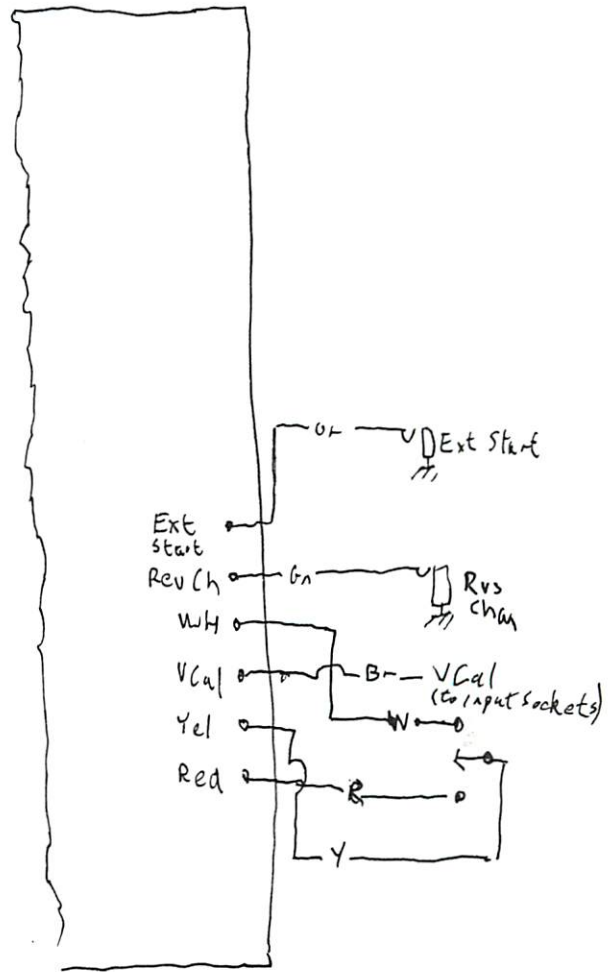
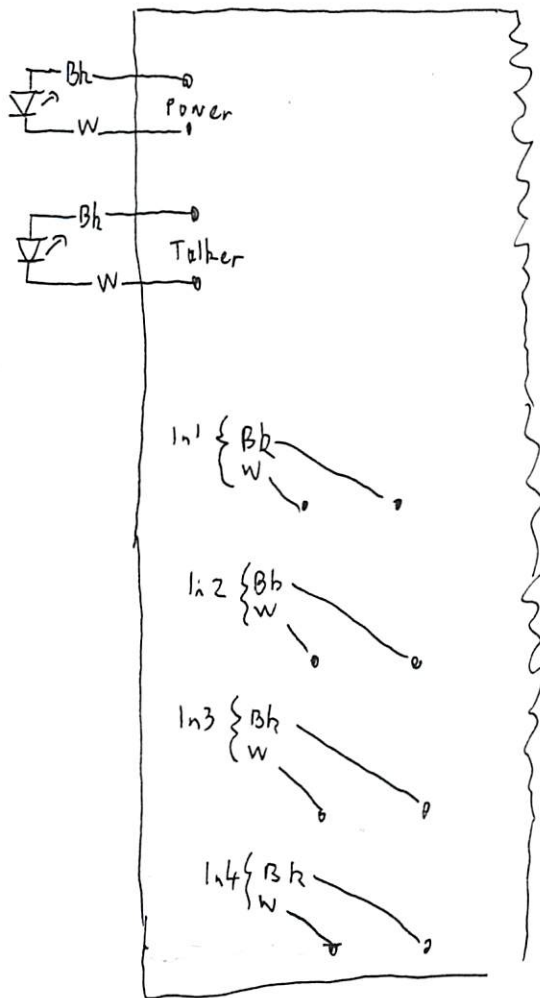
Data PCB

Rear
↑

- 1 - LatchDis
- LatchData
- 0 N/C
- ByteZ
- EoConv
- DoutEn
- Start
- ByteSel
- 0 N/C
- 0 N/C

J2

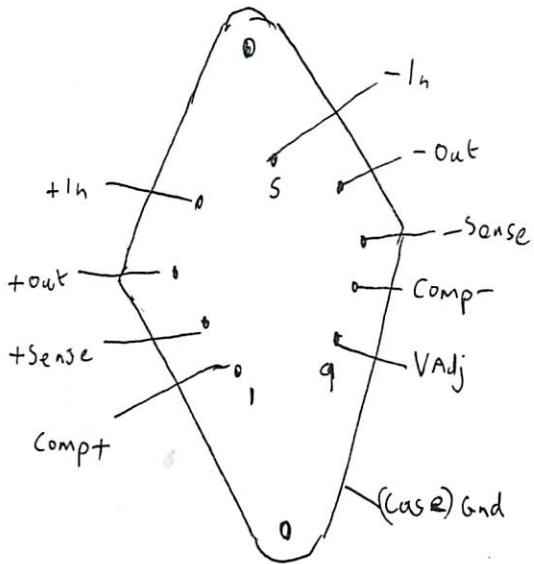
HP59313



Analogue PCB

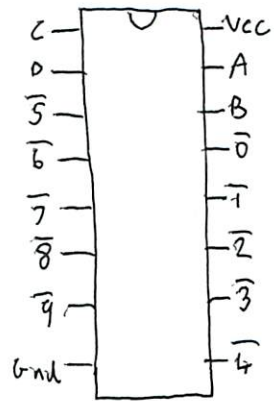
47310-60110

HPS9313



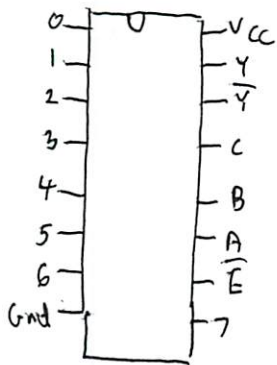
MC1468R

+/-15V Tracking
Regulator
(Underside View)



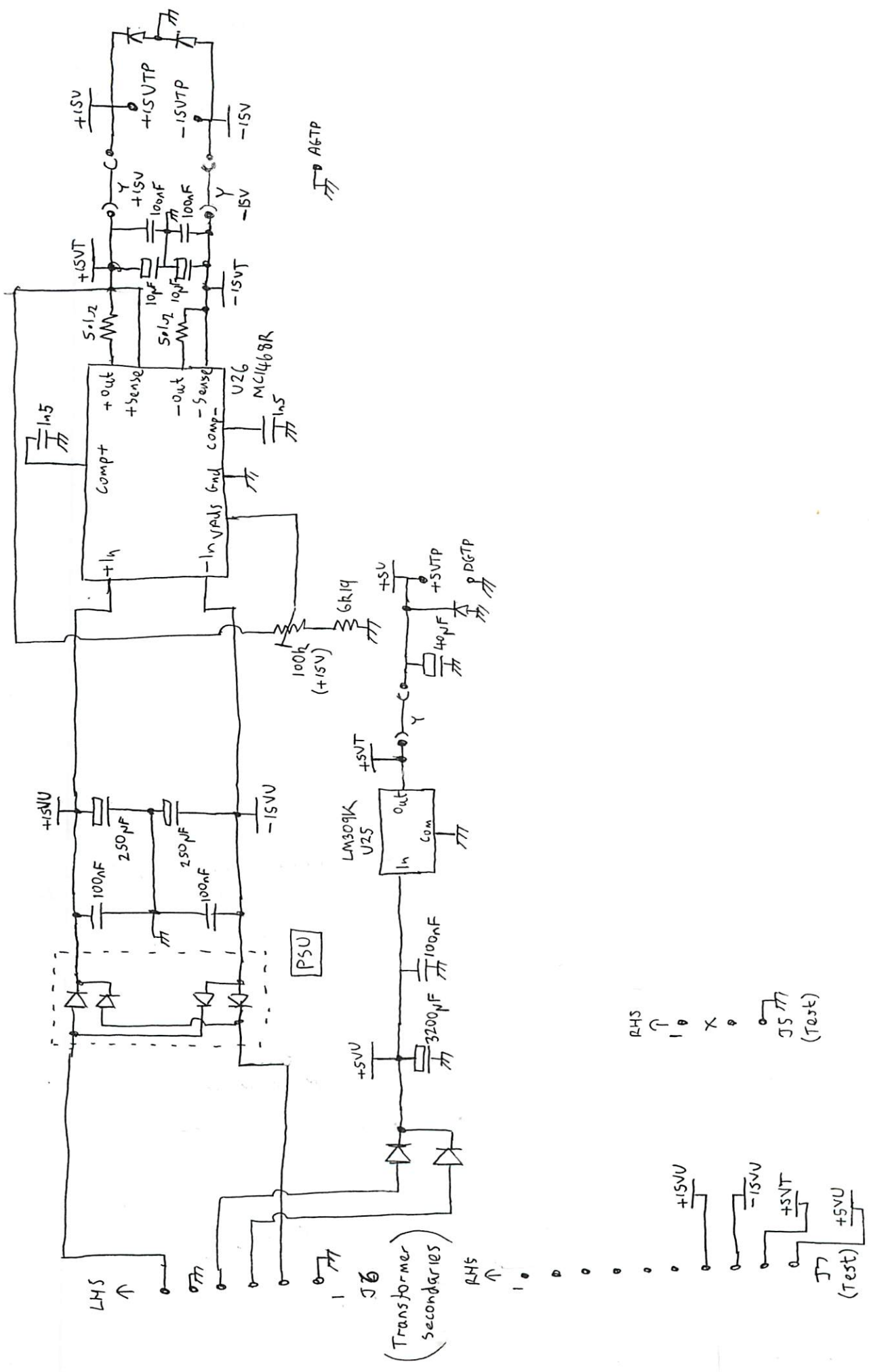
93L01

1-of-10 Decoder



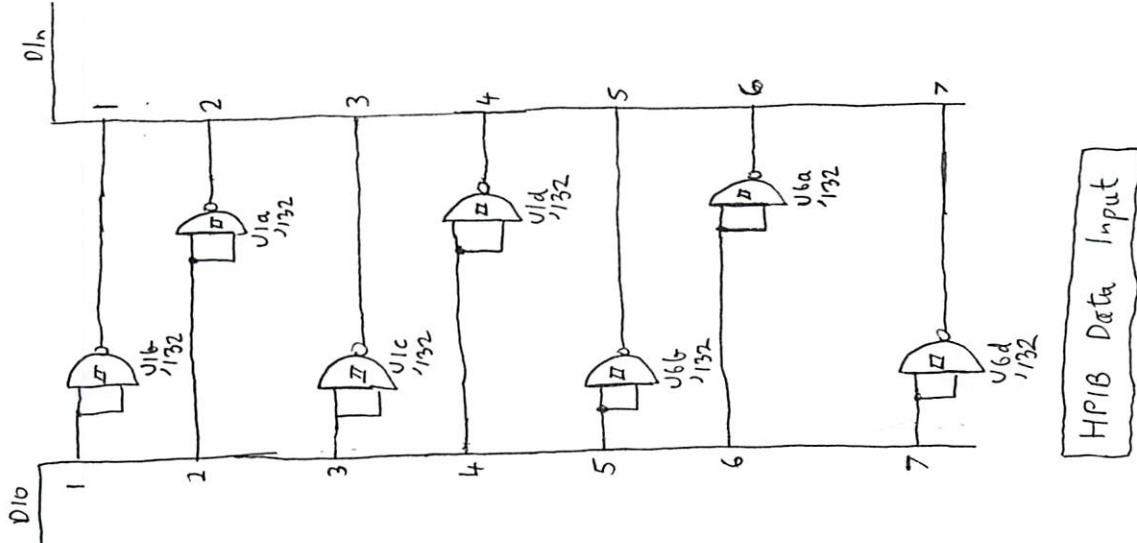
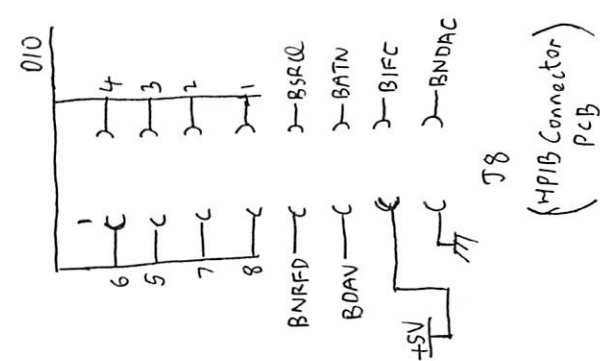
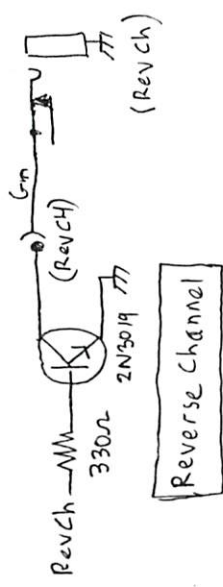
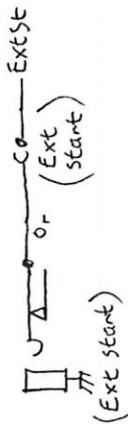
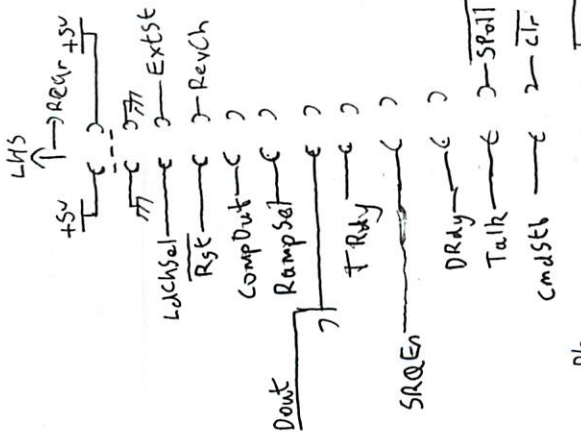
93L12

8 Input Multiplexer

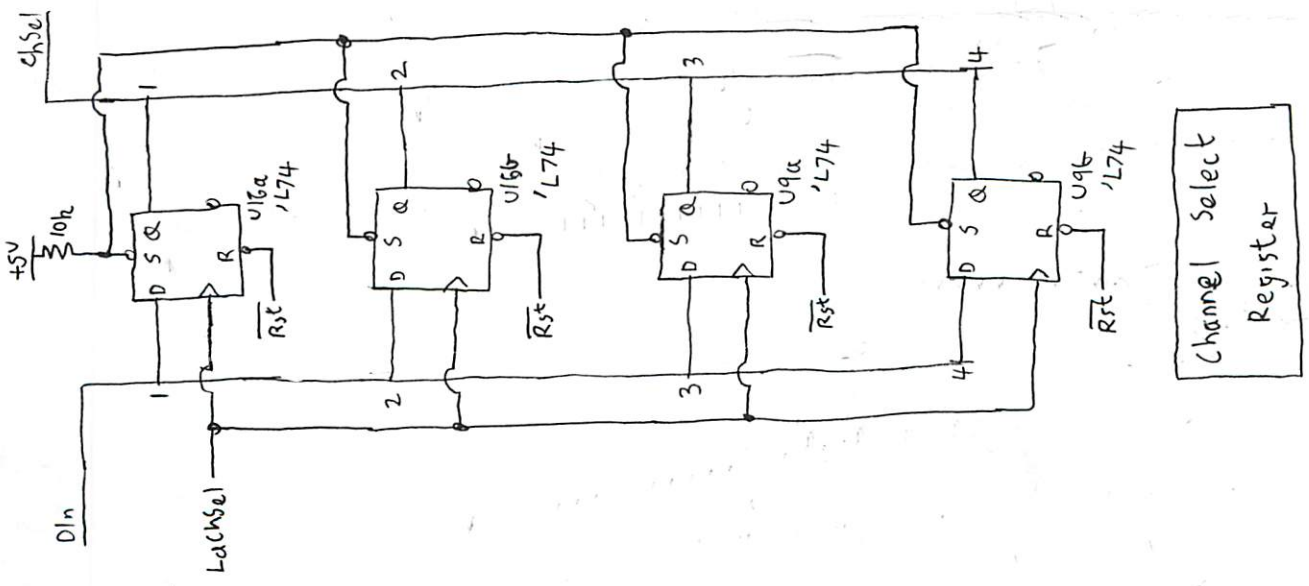


47310-60110

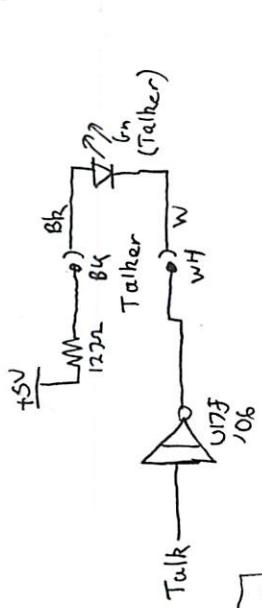
HP 59313 Analogue PCB Sheet 1



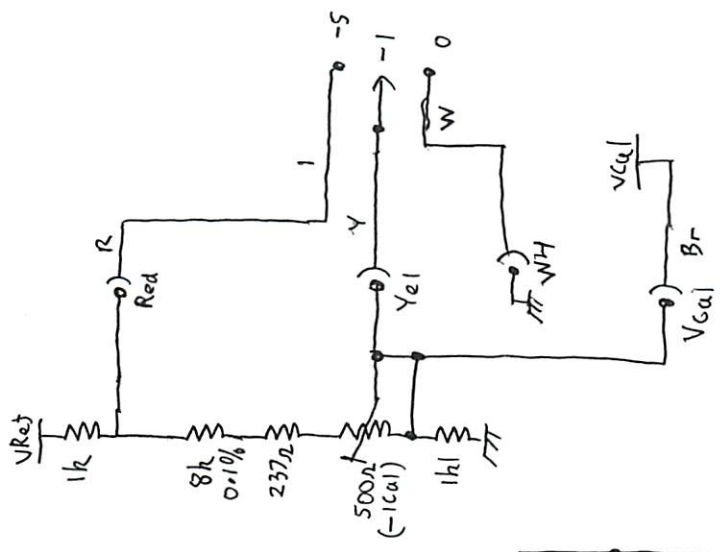
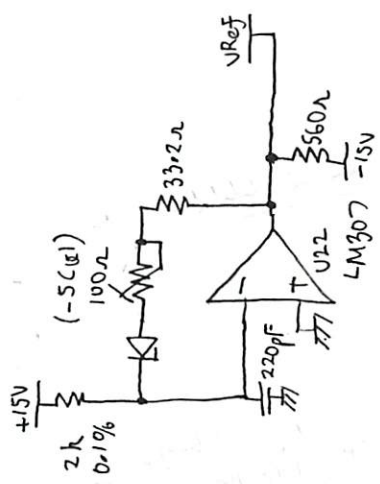
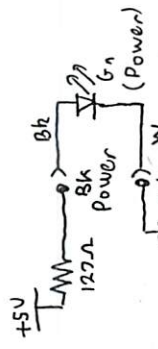
J1
 (Backplane)



Channel Select Register

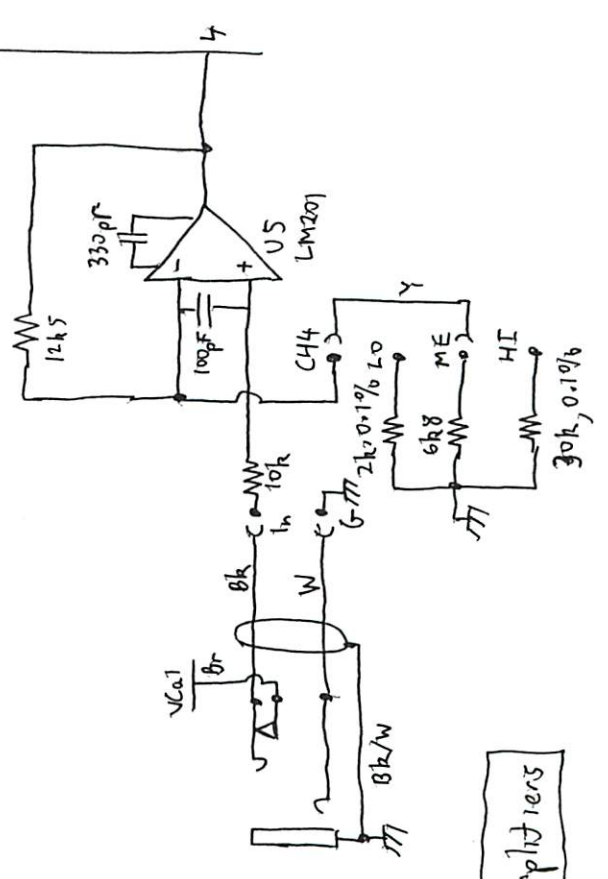
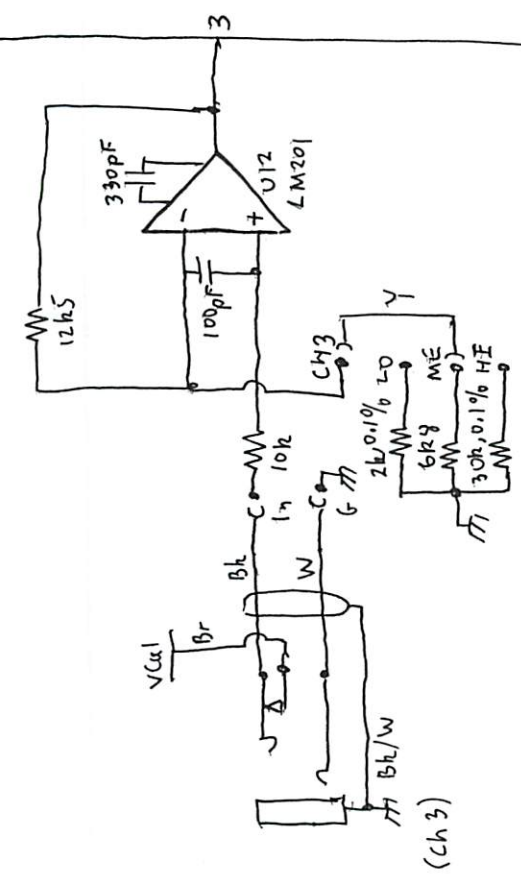
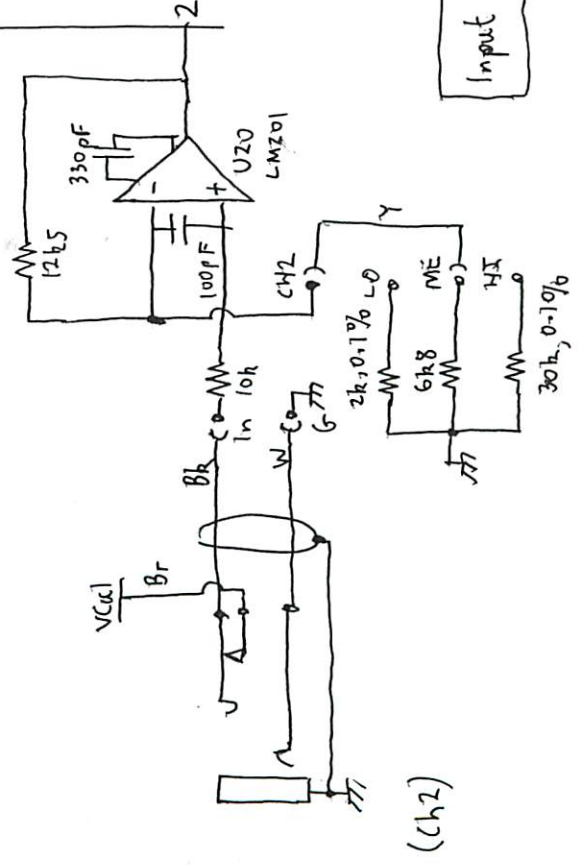
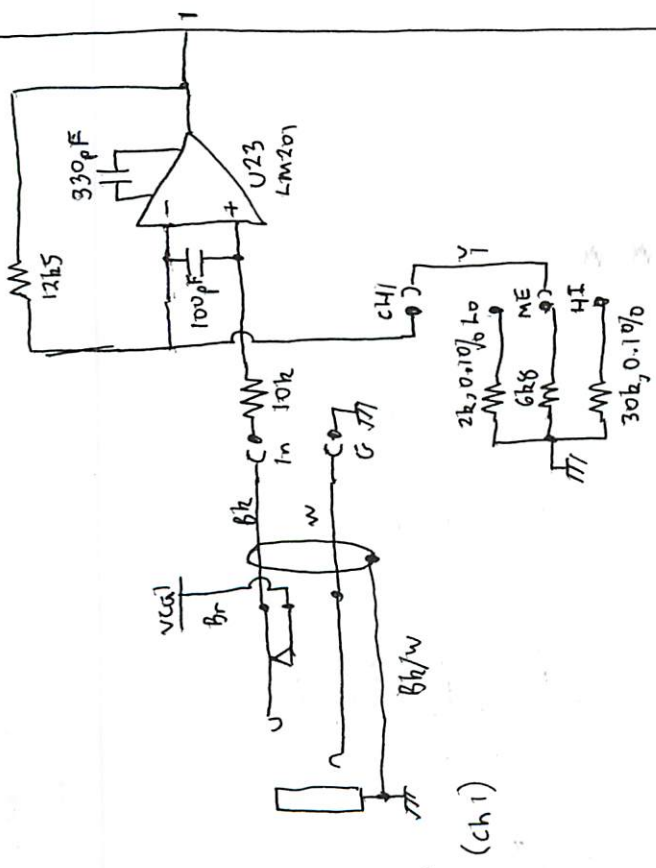


Indicators

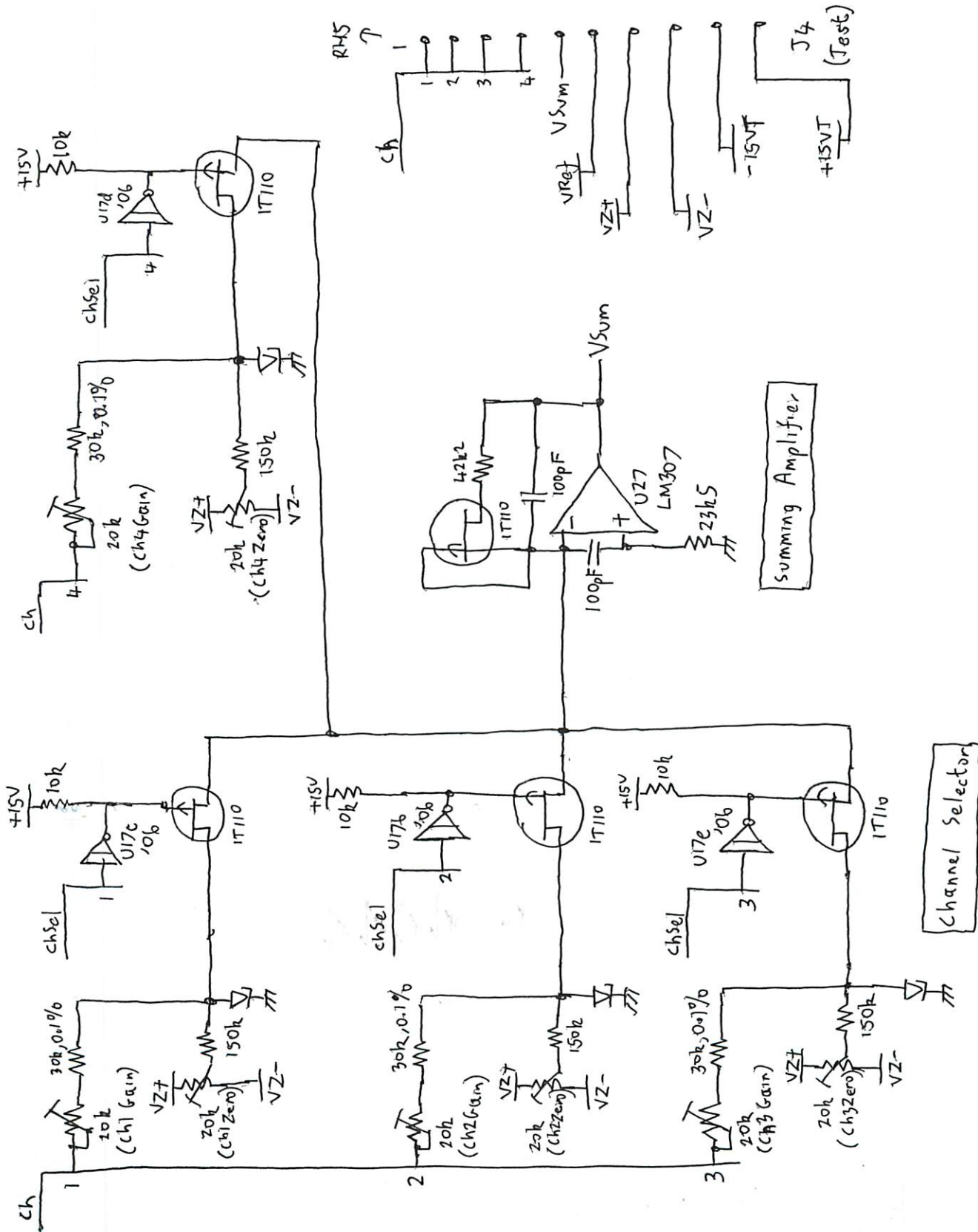


Reference Voltages

ch



Input Amplifiers



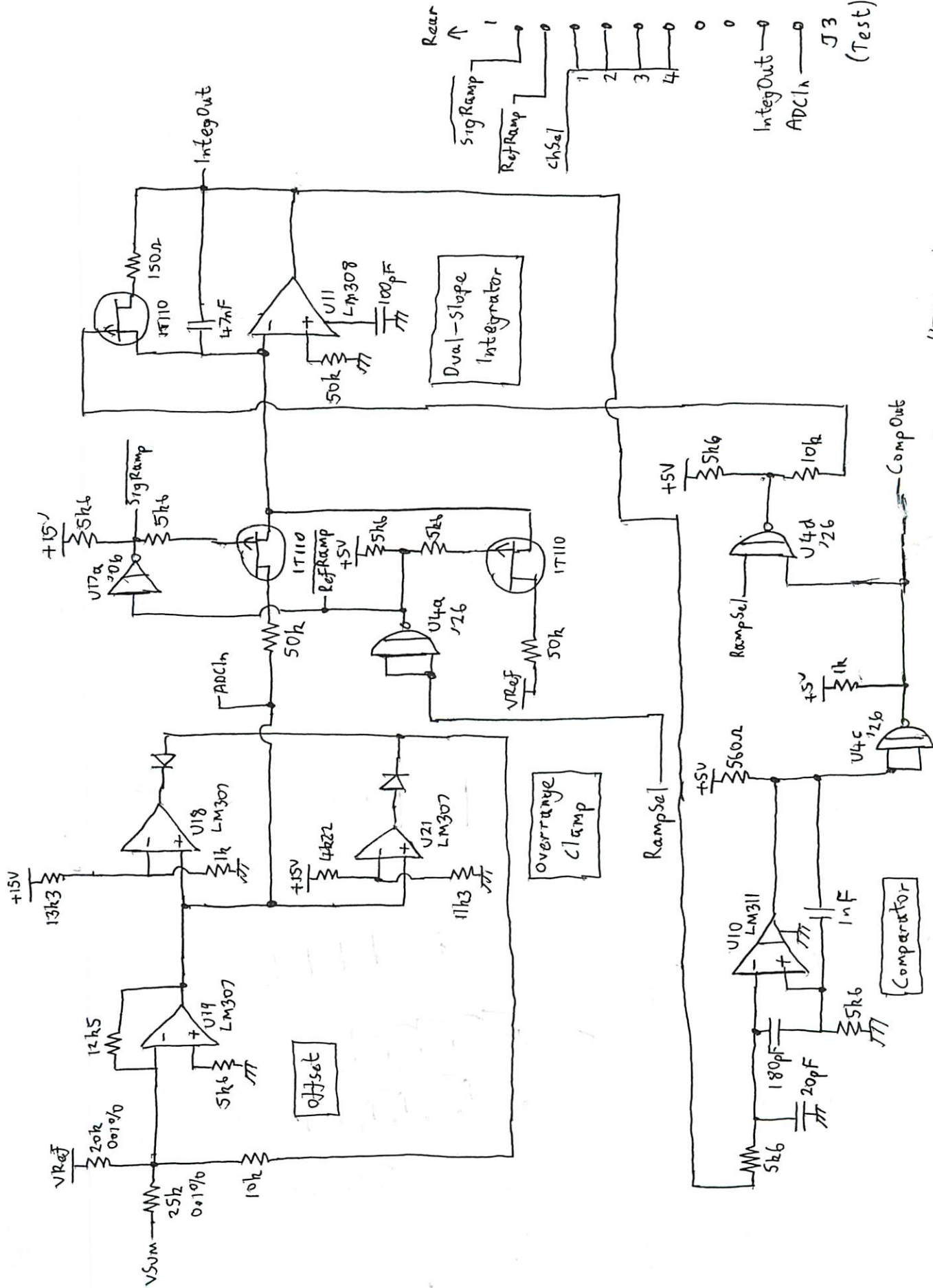
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Analogue PCB Sheet (5)

HP59313

Channel Selector

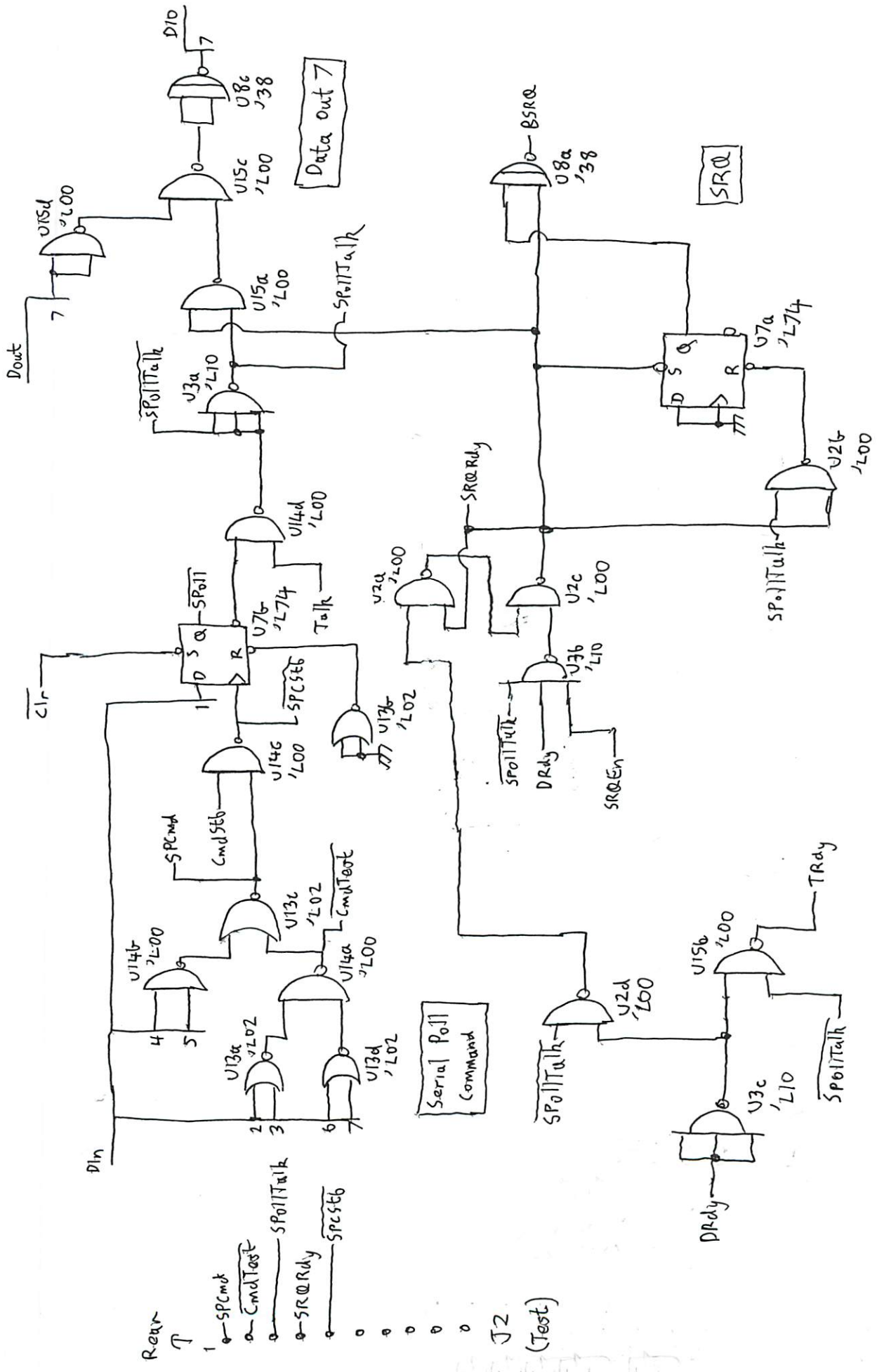
Summing Amplifier



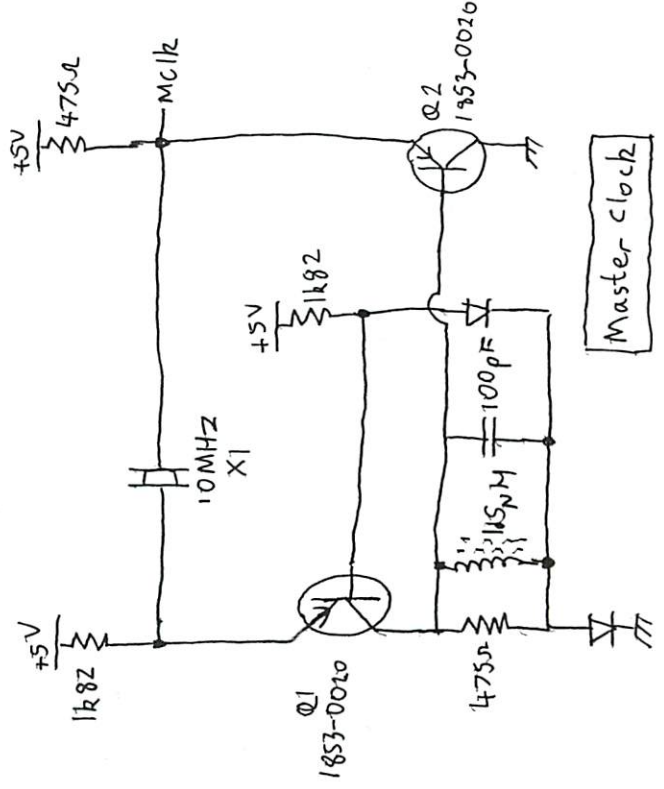
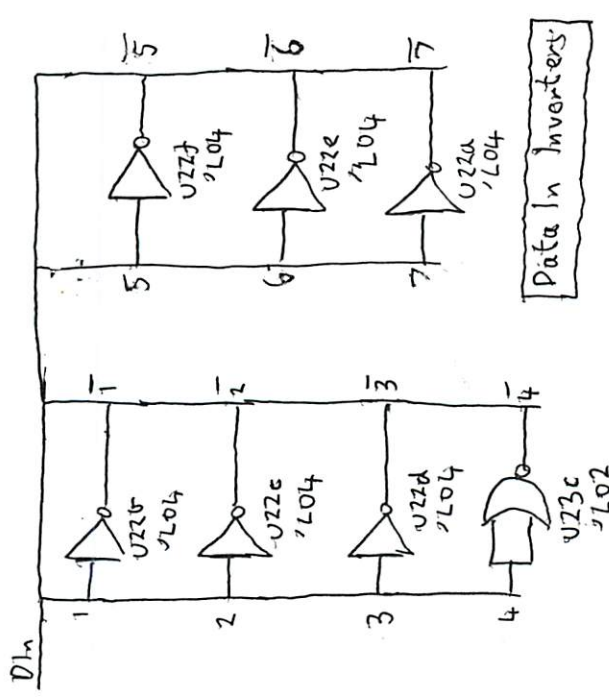
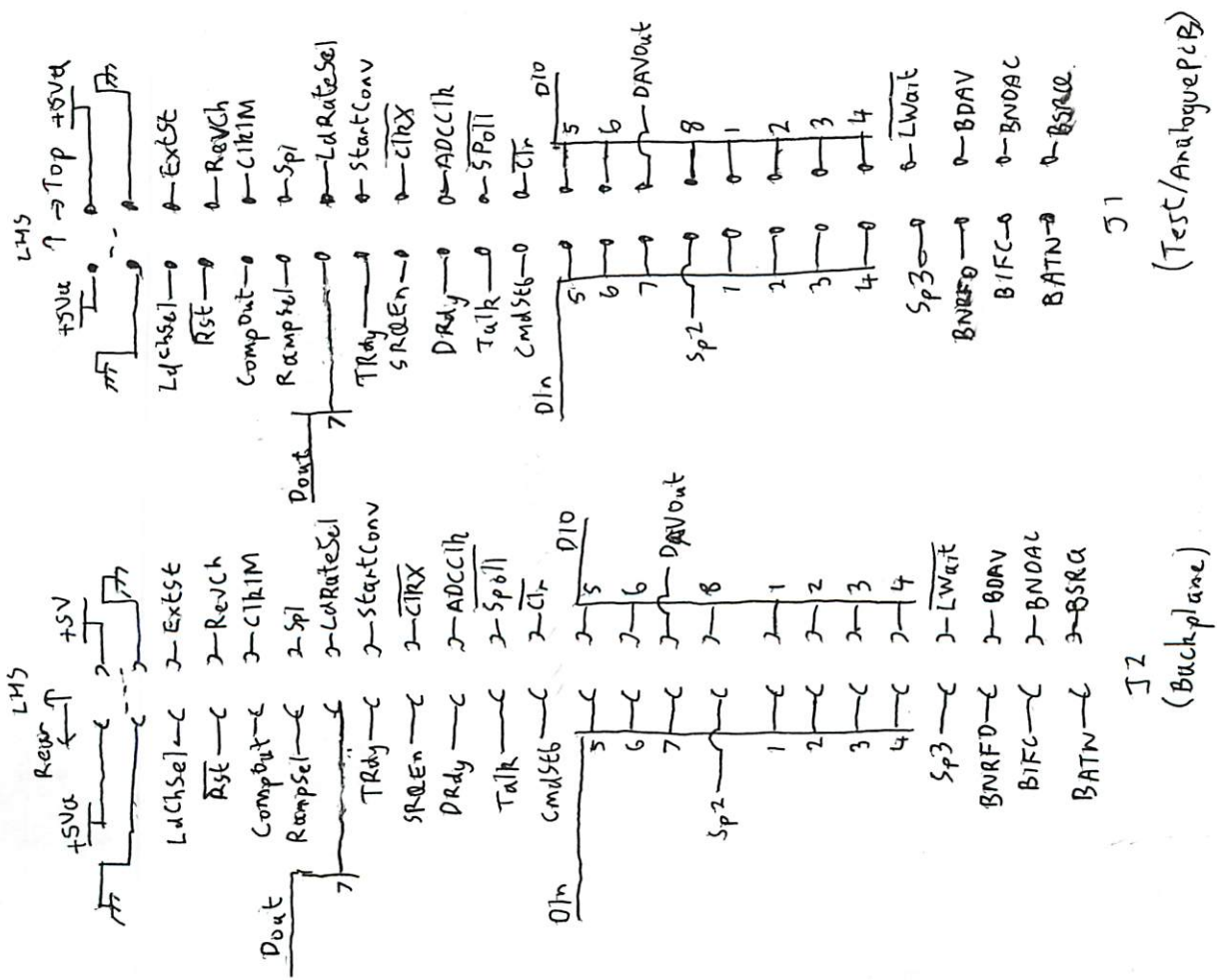
47310-60110

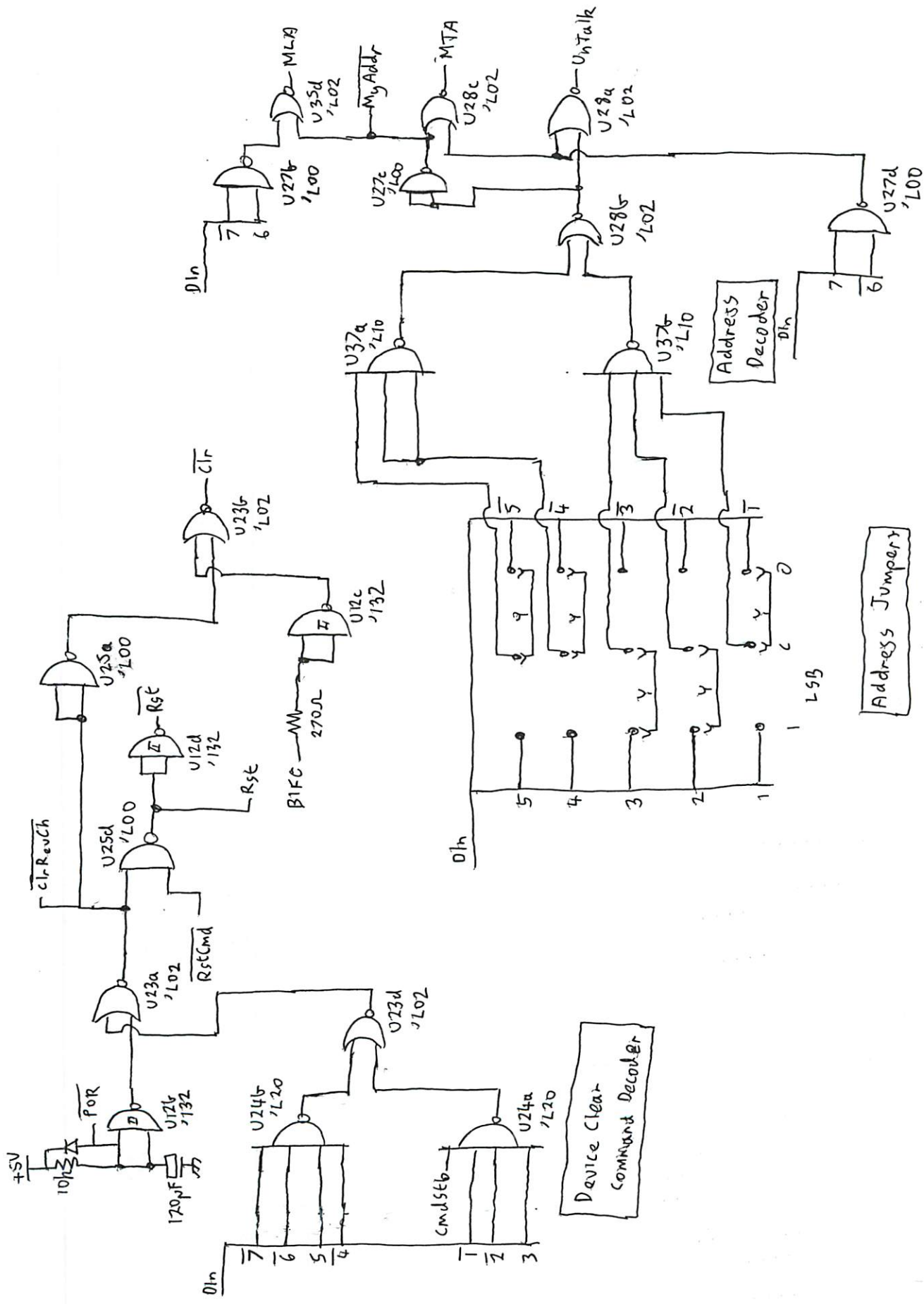
HP59313 Analogue PCB Sheet 6

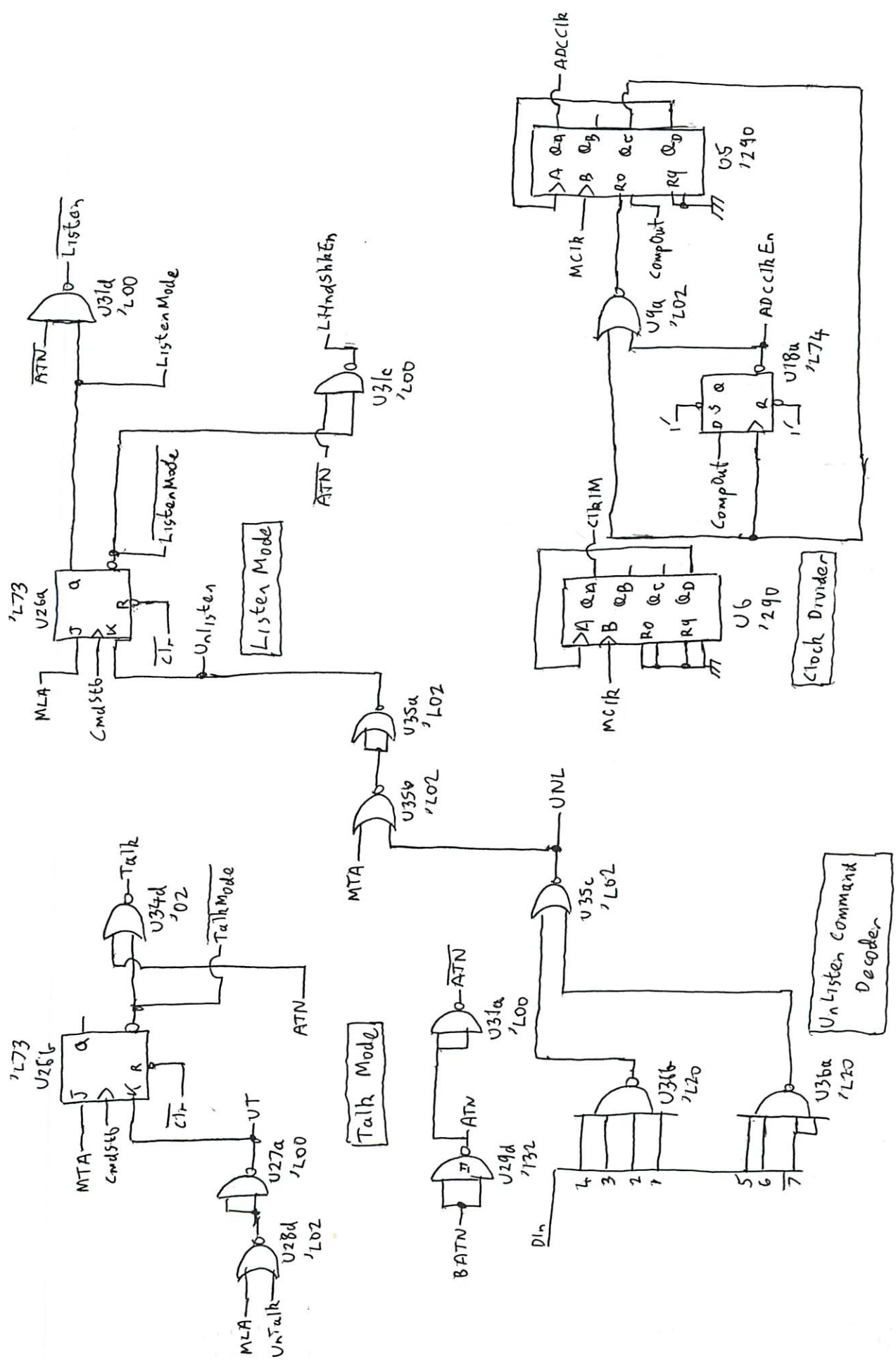
J3
(Test)

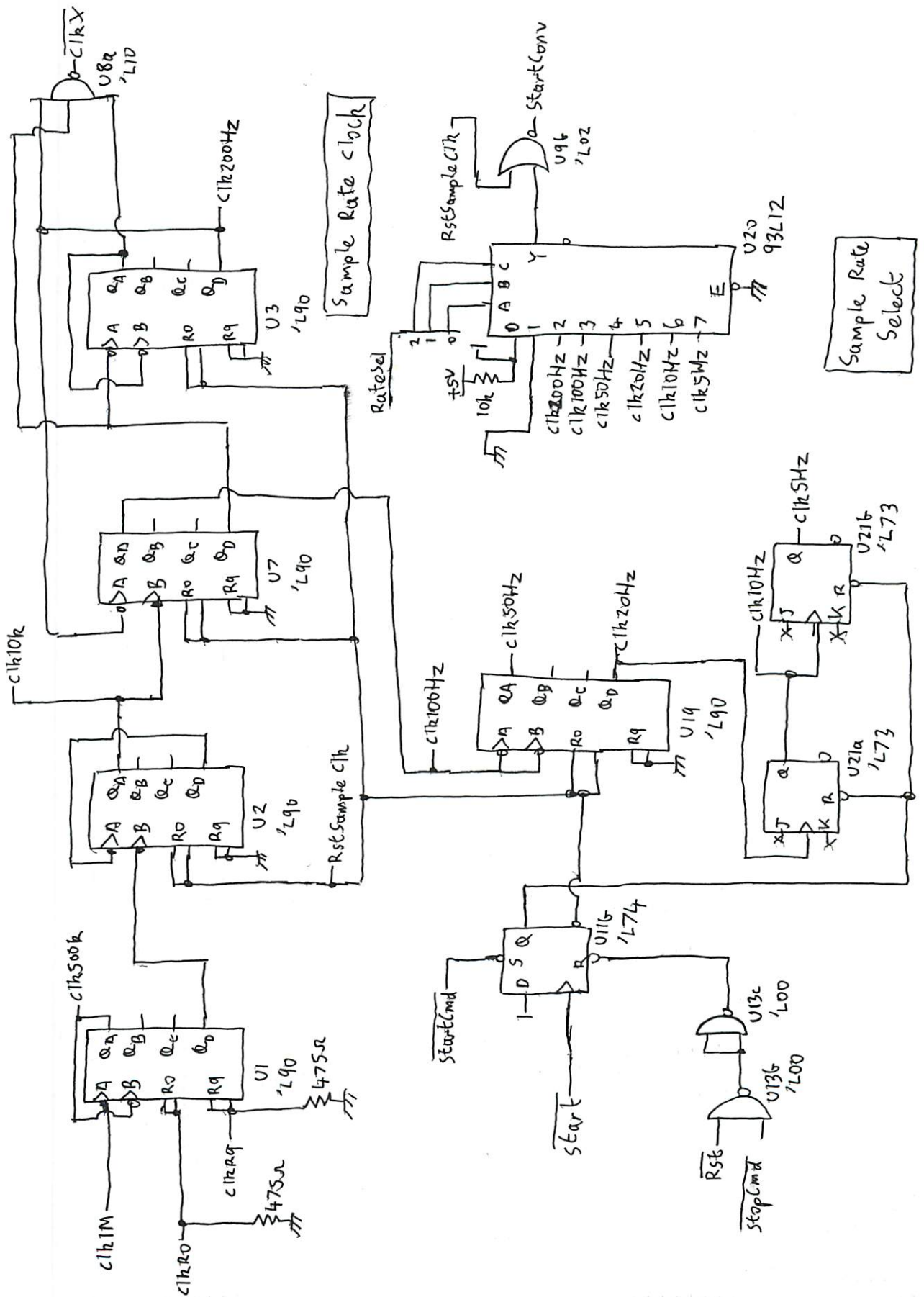


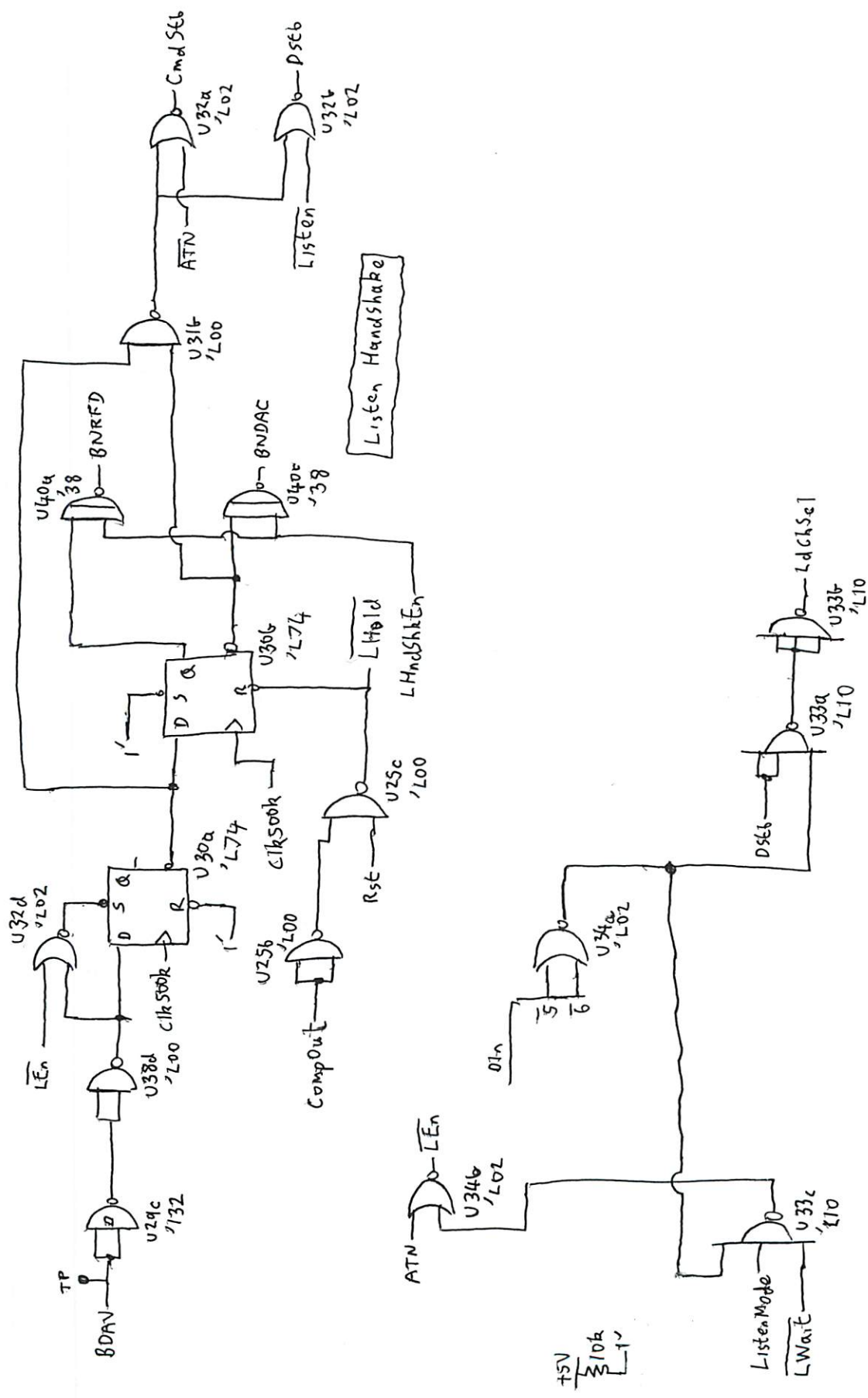
Rear
 T
 1 - SPCmd
 a - CmdStb
 - SPollTalk
 - SRQrdy
 - SPCStb
 -
 -
 -
 -
 J2
 (Test)

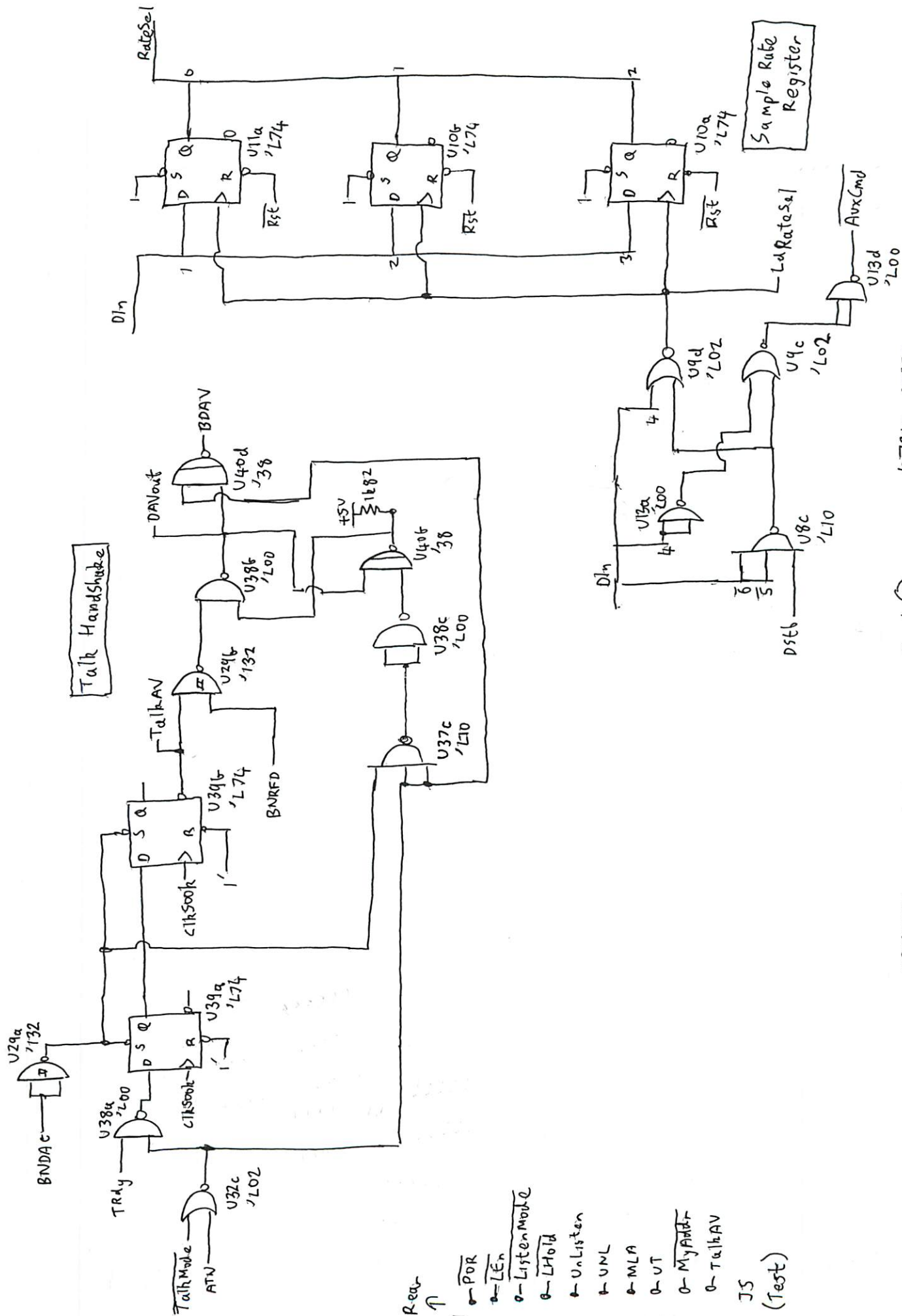






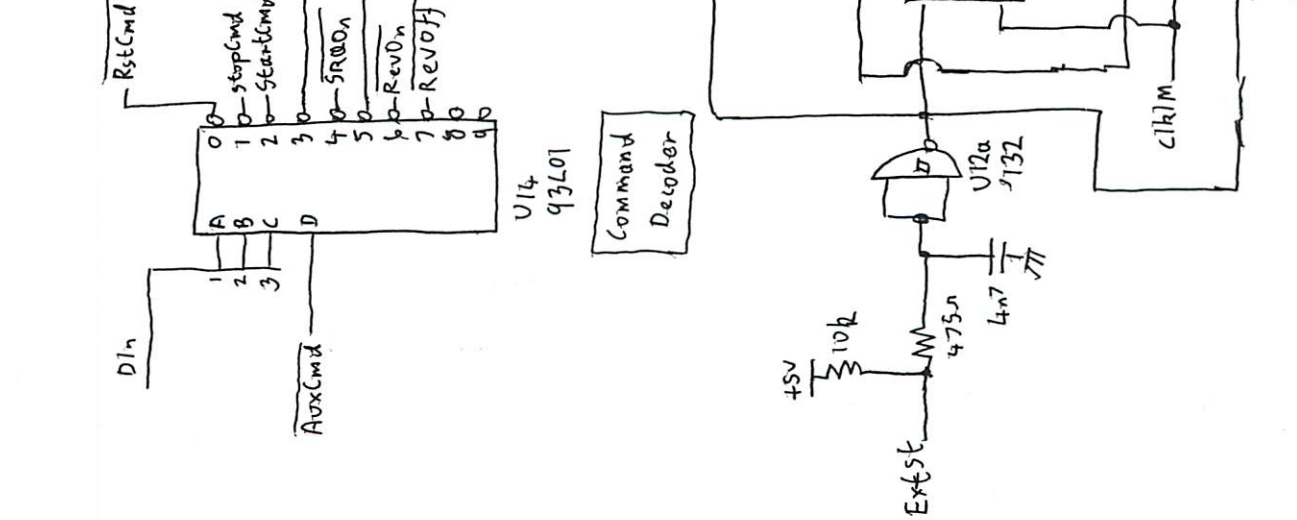
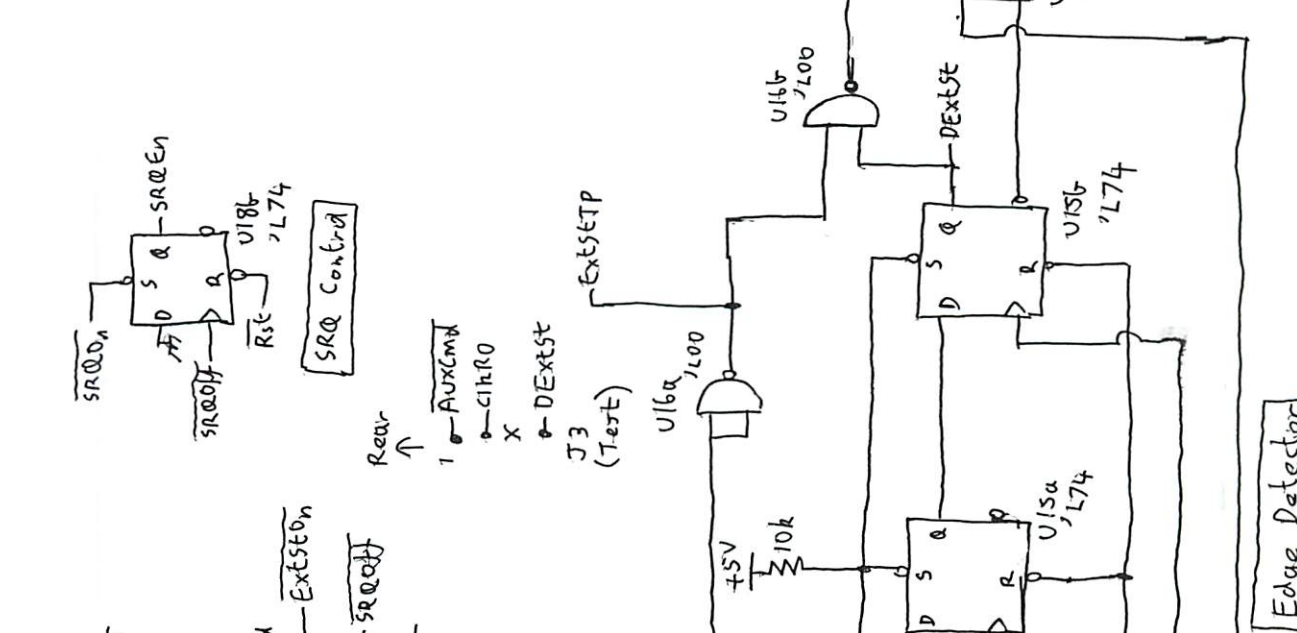
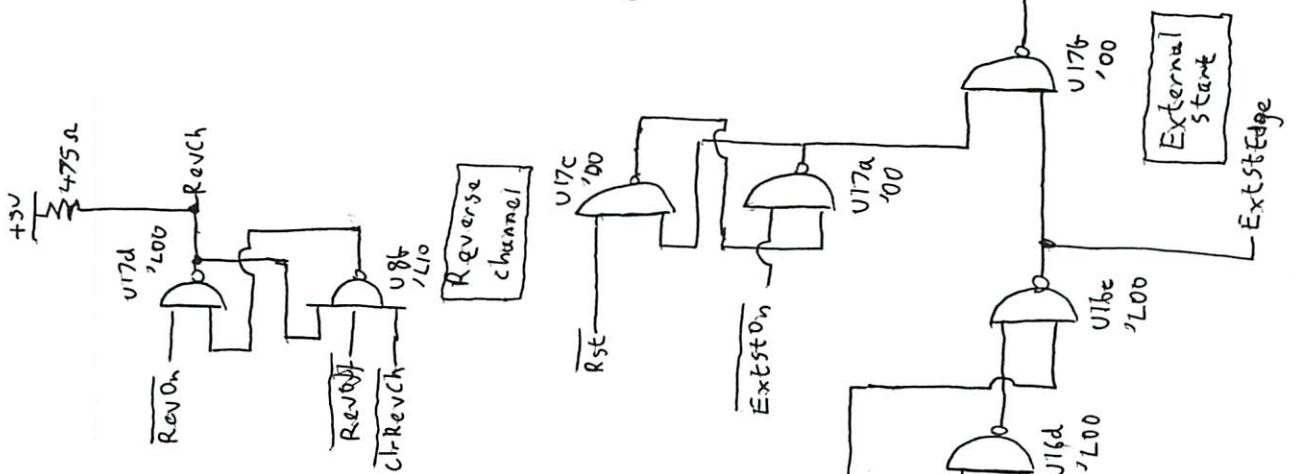
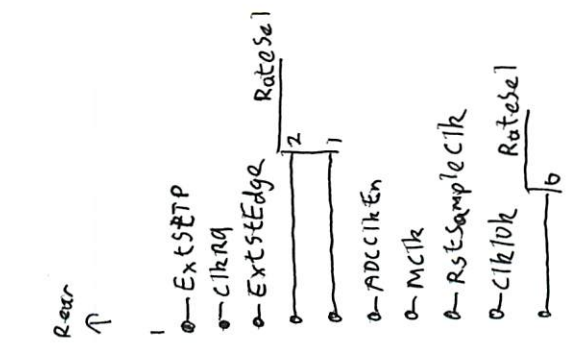


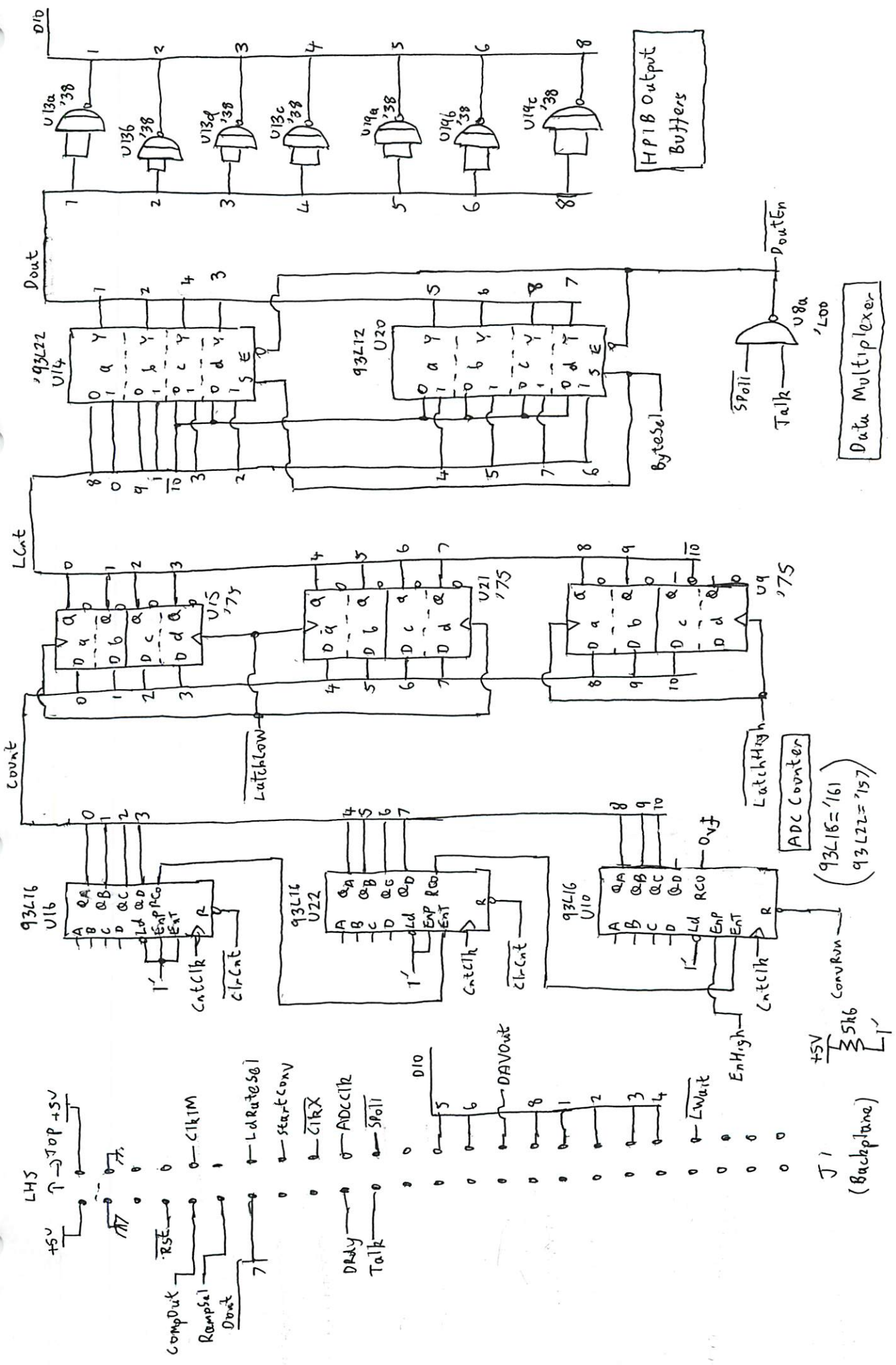




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HP59313 Control Logic PCB sheet 6





47310-60130

Data PCB sheet (1)

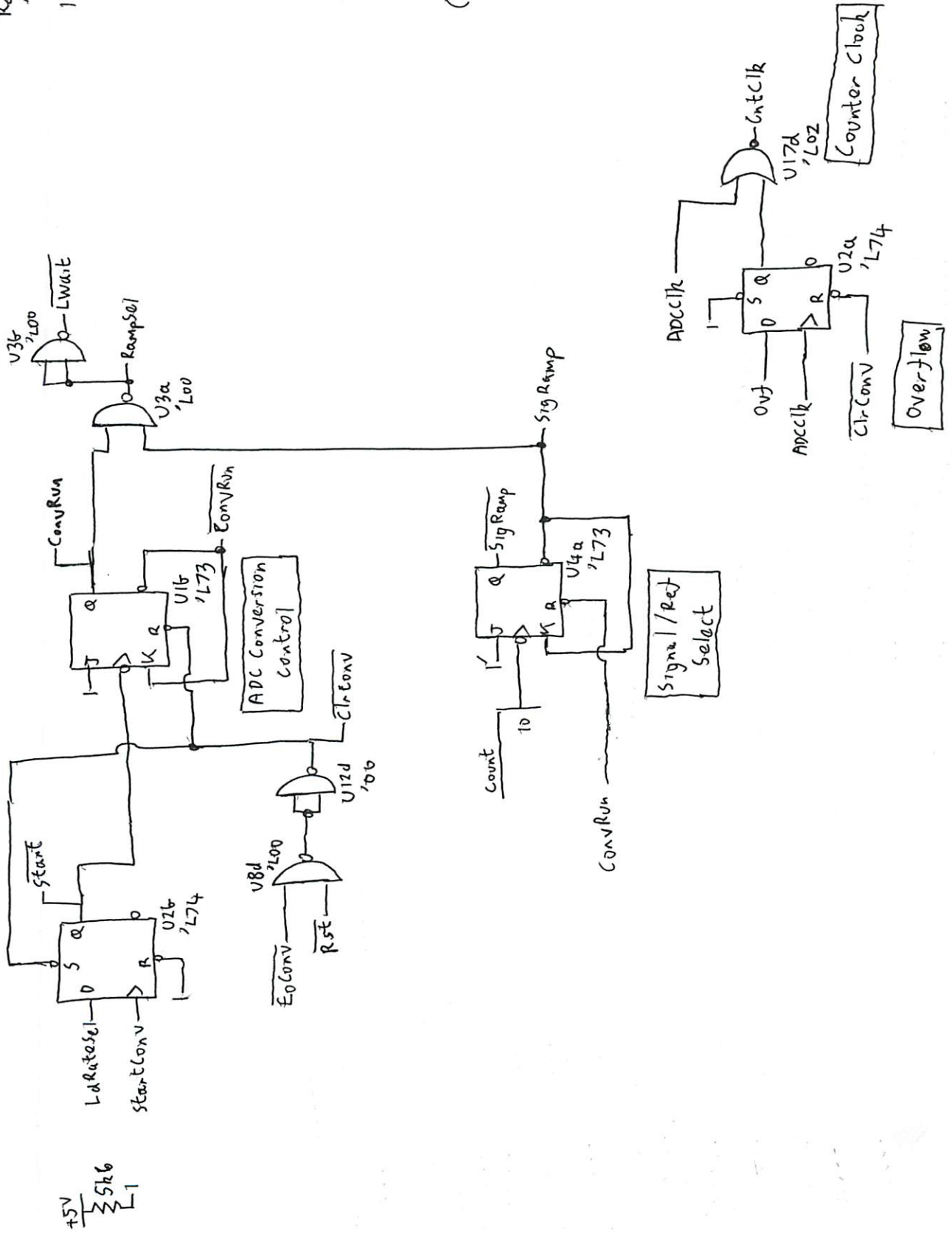
HPS9313

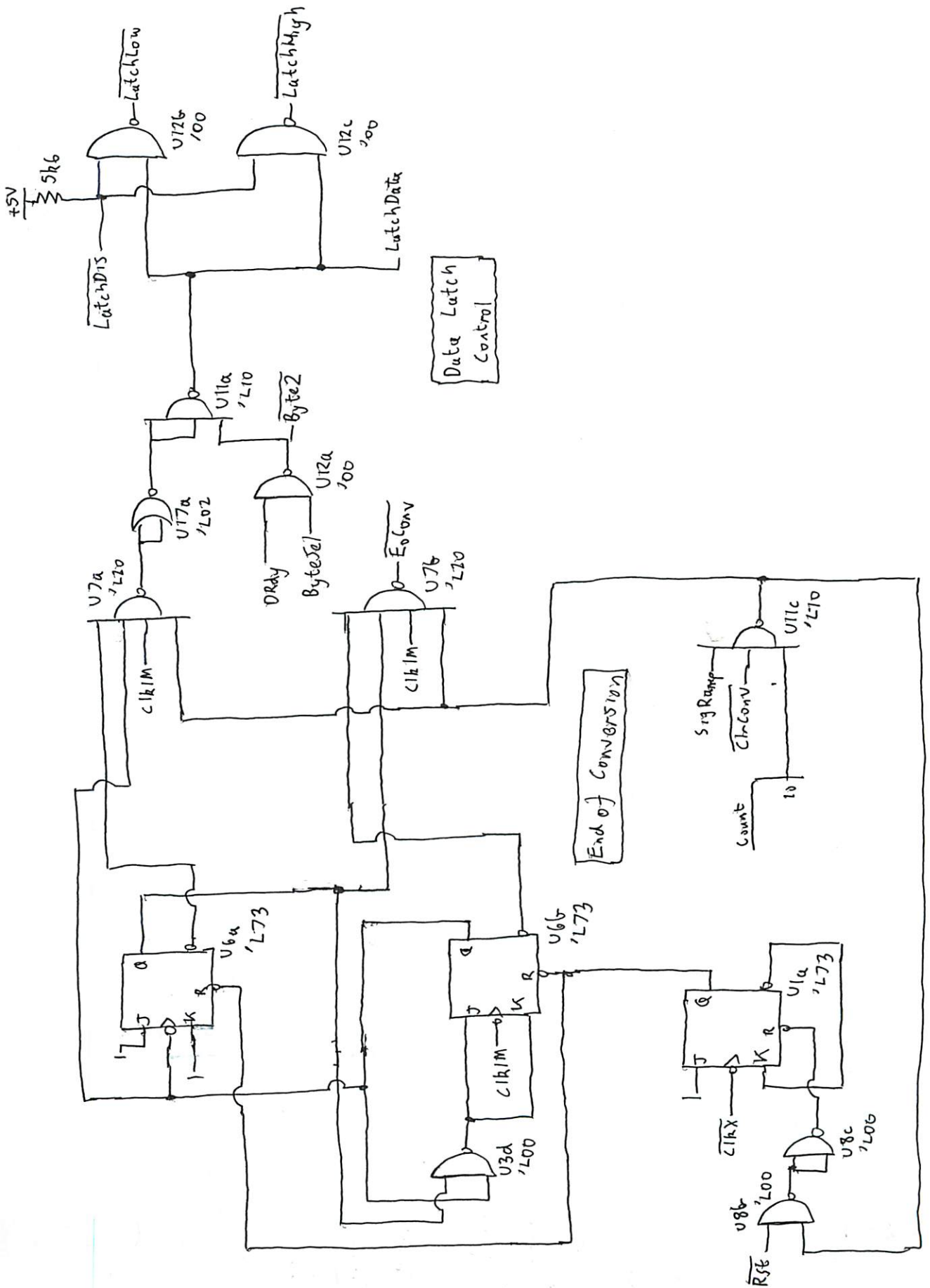
ADC Counter
 (93L16=161)
 (93L22=157)

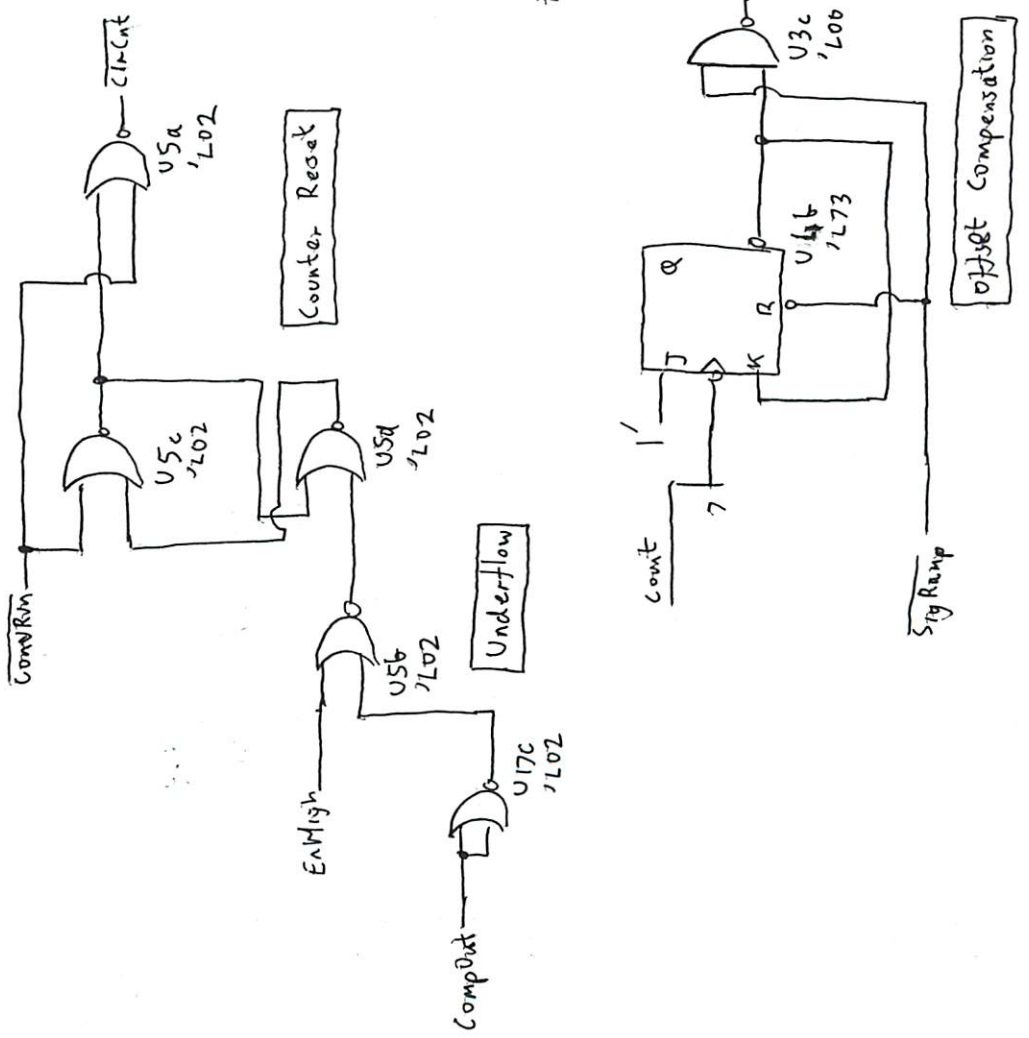
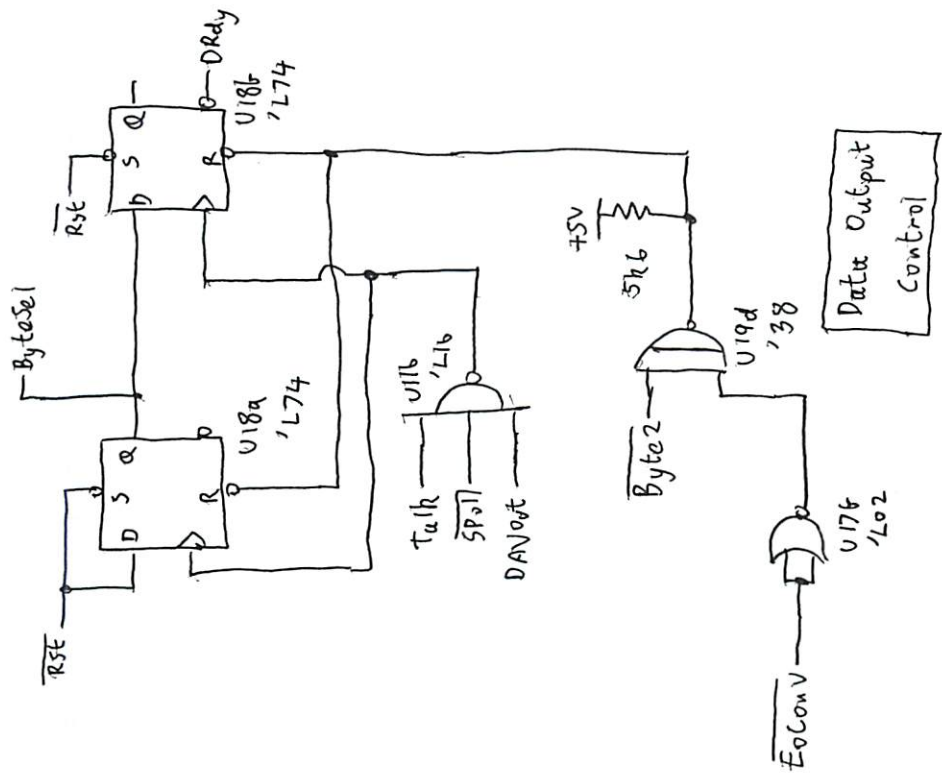
+5V
 5k6
 L1

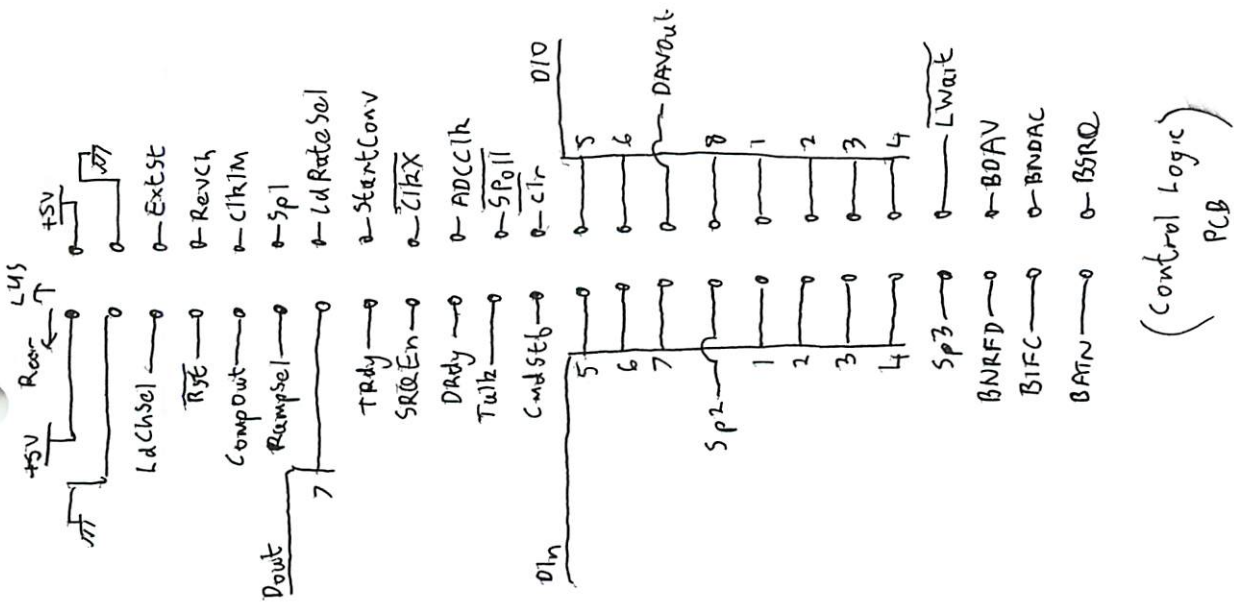
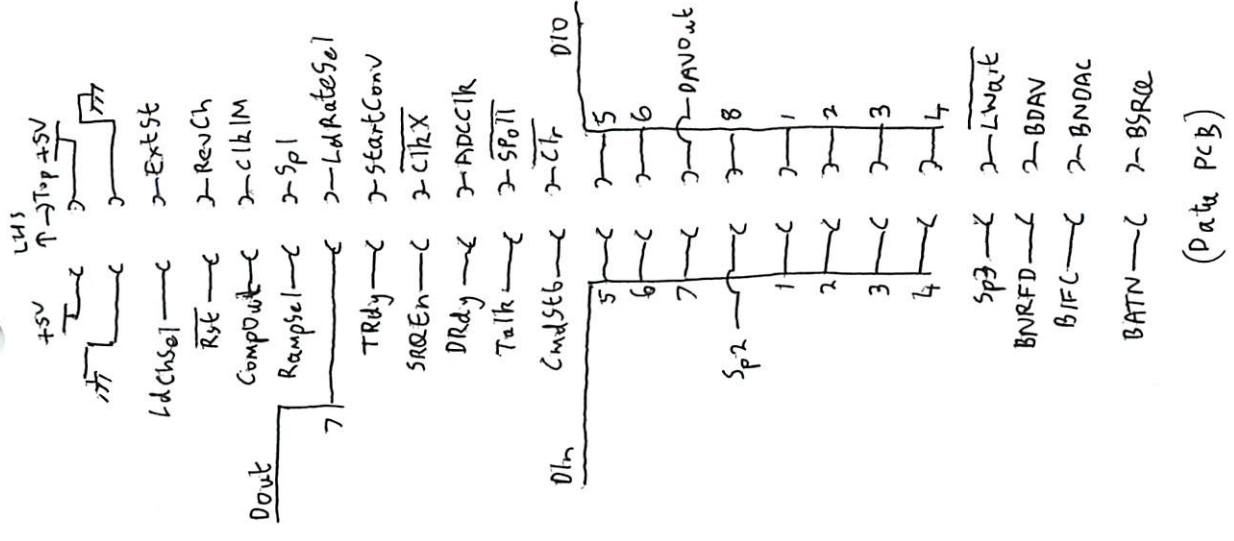
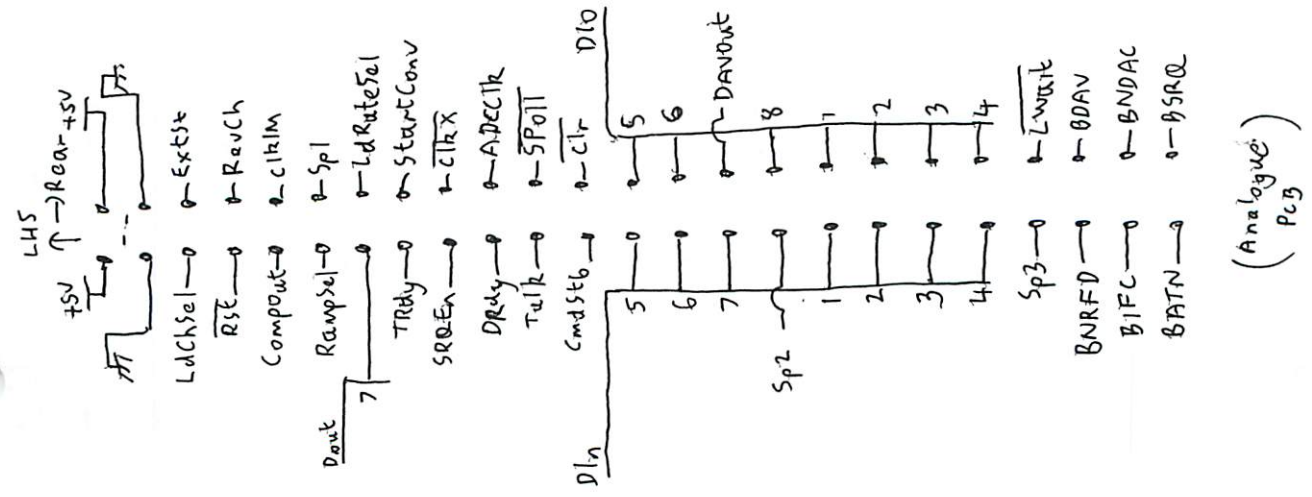
J1
 (Backplane)

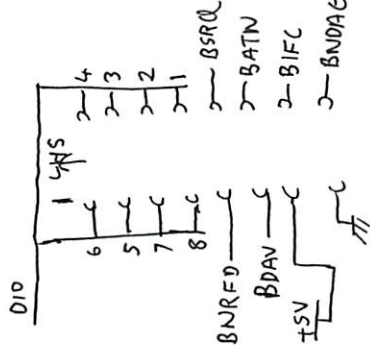
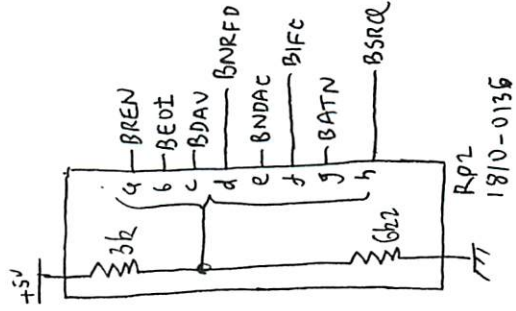
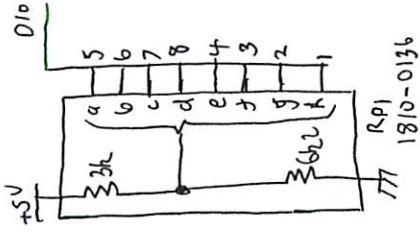
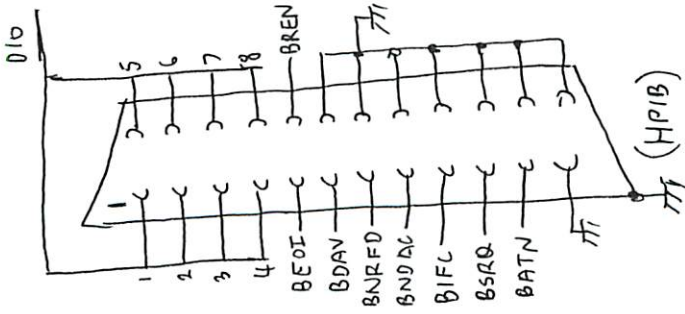
Rear ↑
 1 - Latch D15
 0 - Latch Data
 0
 0 - Byte 2
 0 - EoConv
 0 - OutEn
 0 - Start
 0 - Bytesel
 0
 0
 52
 (Test)



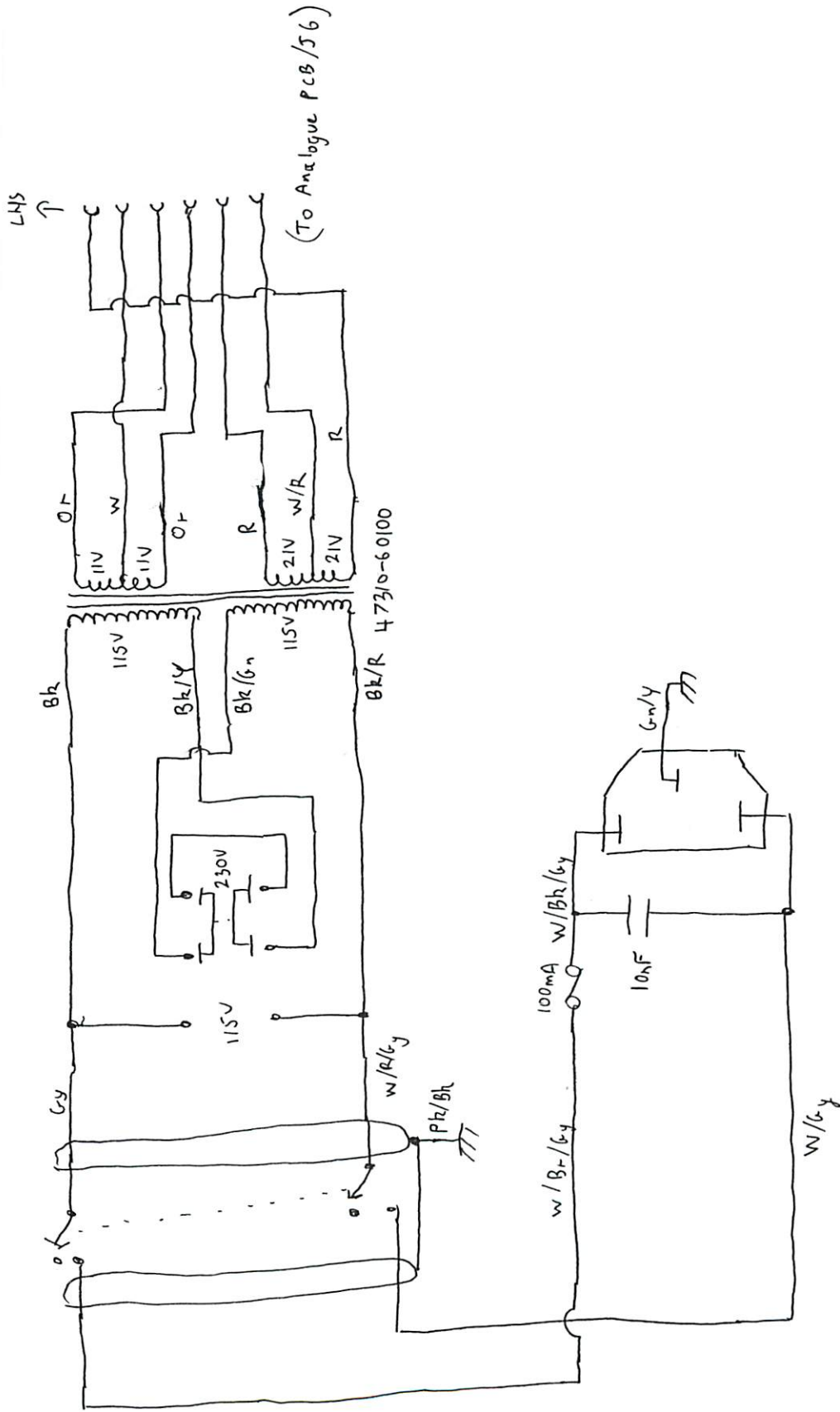








(To Analog PCB/J8)



HPS9313 Transformer Wiring