

# Altair 8800b Computer Schematic

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## Altair 8800b Computer

Section: Title & Contents

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## NOTES

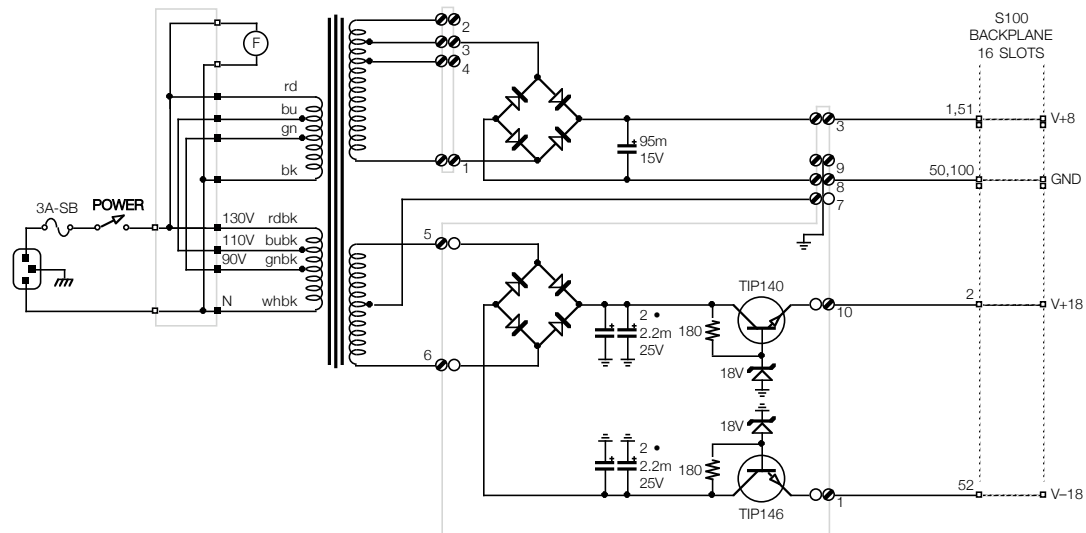
- IC locations are identified by a label of the form:  
U<board><alpha>  
  
<board> = two characters  
FP = Front Panel  
FN = Front Panel Interface
- The symbol  represents a connector pin. The solid black end is the male side, the white-filled end is the female side.  
Connector pins are identified by a label of the form:  
N <connector> . <pin>
- A small black marker on the upper half of a gate symbol indicates an open-collector output.
- Based on the MITS schematic.
- 2021 Jun: This drawing / bhilpert.

### Altair 8800b Computer

Section: Notes

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Measured Voltages / No Load

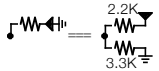
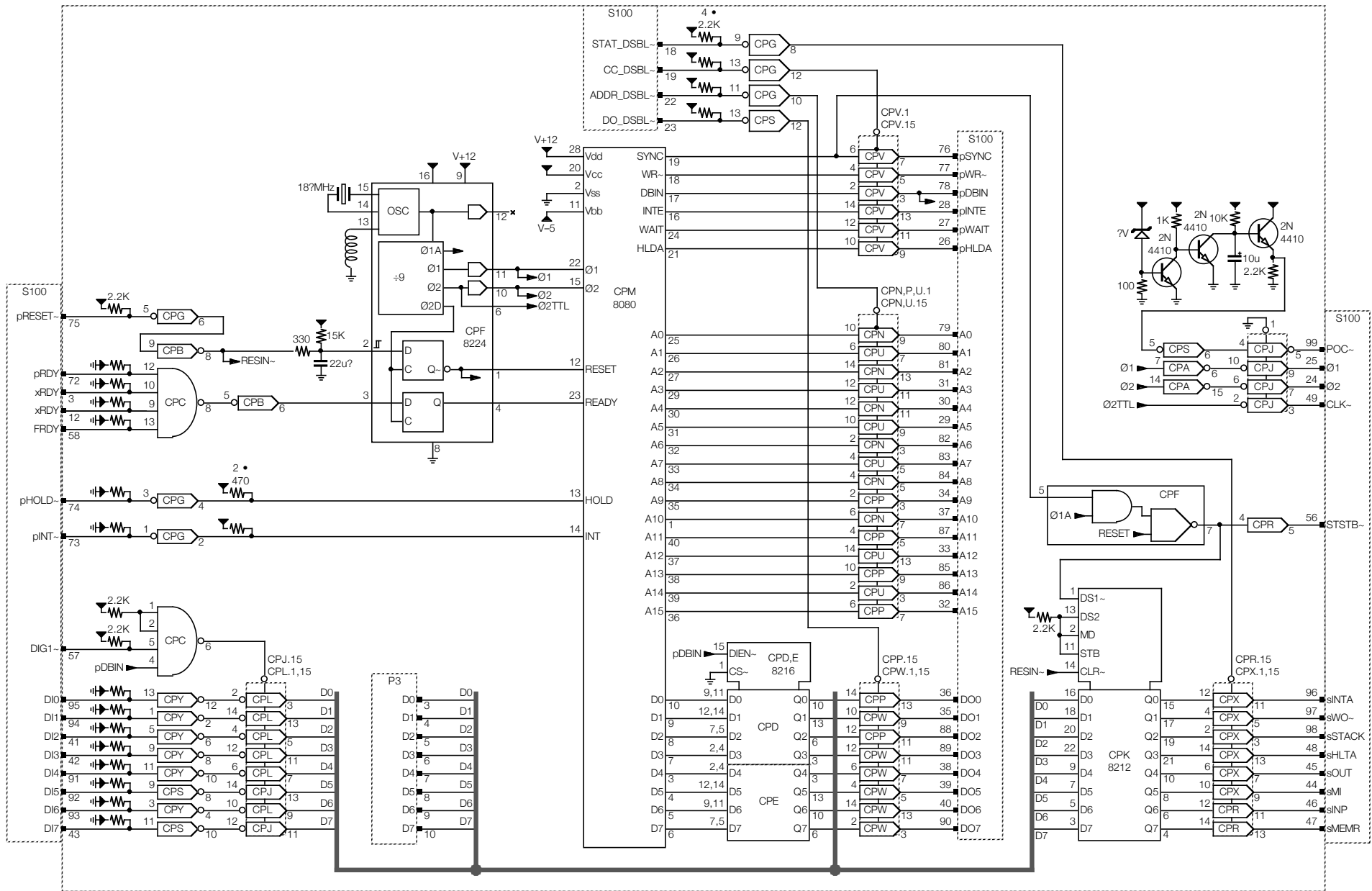
Line In	Primary	V+8	V+8	V+8	V±18	V±18unr	V-18	V+18
VAC	Tap	Tap	VAC	VDC	VAC	VDC	VDC	VDC
121	130	4	6.5	8.6				
"	"	3	7.2	9.0				
"	"	2	7.8	-	17.5	±23.6	-18.6	19.2
121	110	4	7.5	9.5				
"	"	3	8.3	-				
"	"	2	9.0	-	20.1	±27.5	-19.2	20.0

## Altair 8800b Computer

Section: Power Supply

Page: PS1

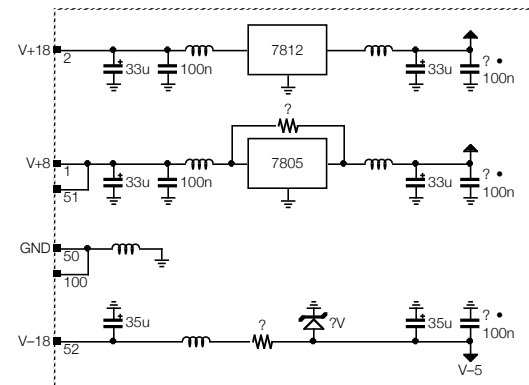
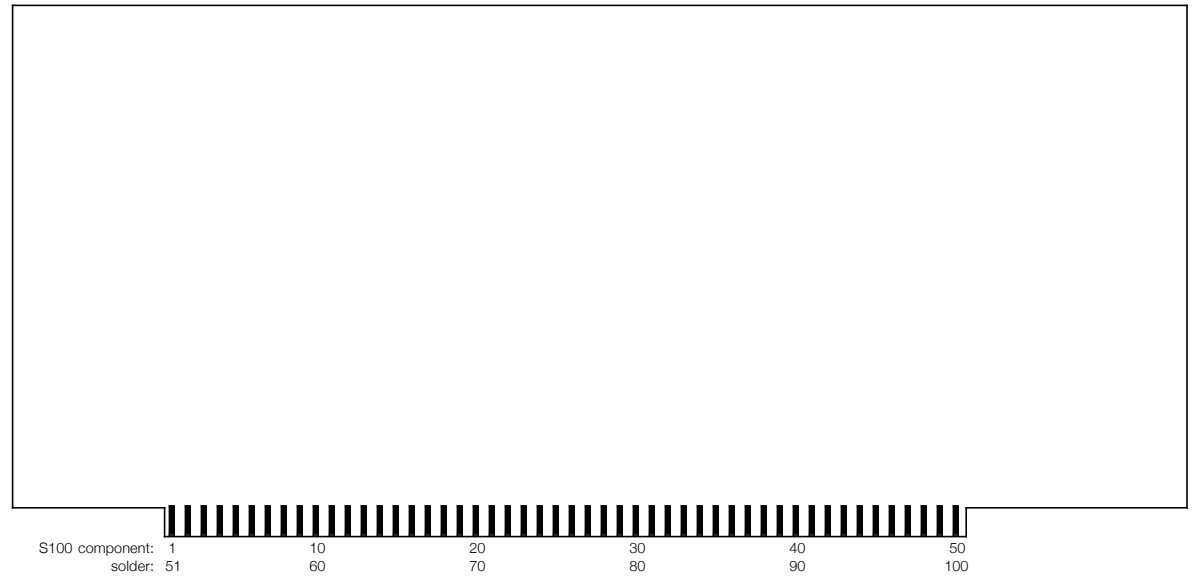
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UCPx	Type	a	b	c	d	e	f
A	4009	u	u	√	u	u	√
B	74LS04	u	u	√	√	u	u
C	74LS13/LS20	√	√				
D	8216	√	√	√	√		
E	8216	√	√	√	√		
F	8224	√					
G	74LS04	√	√	√	√	√	√
H	-						
J	74368/8T98	√	√	√	√	√	√
K	8212	√					
L	74368/8T98	√	√	√	√	√	√
M	8080A	√					
N	74367	√	√	√	√	√	√
P	74367	√	√	√	√	√	√
R	74367	u	u	√	u	√	√
S	74LS14	u	u	√	√	√	√
T	-						
U	74367	√	√	√	√	√	√
V	74367	√	√	√	√	√	√
W	74367	√	√	√	√	√	√
X	74367	√	√	√	√	√	√
Y	74LS14	√	√	√	√	√	√

Total ICs: 20

Type	Qty	Pins	V+5	GND
74LS04	2	14	14	7
74LS14	2	14	14	7
74LS13/20	1	14	14	7
74367	7	16	16	8
74368	2	16	16	8
4009	1	16	*	*
8080	1	40	*	*
8212	1	24	24	12
8216	2	16	16	8
8224	1	16	16	8
Total:		20		

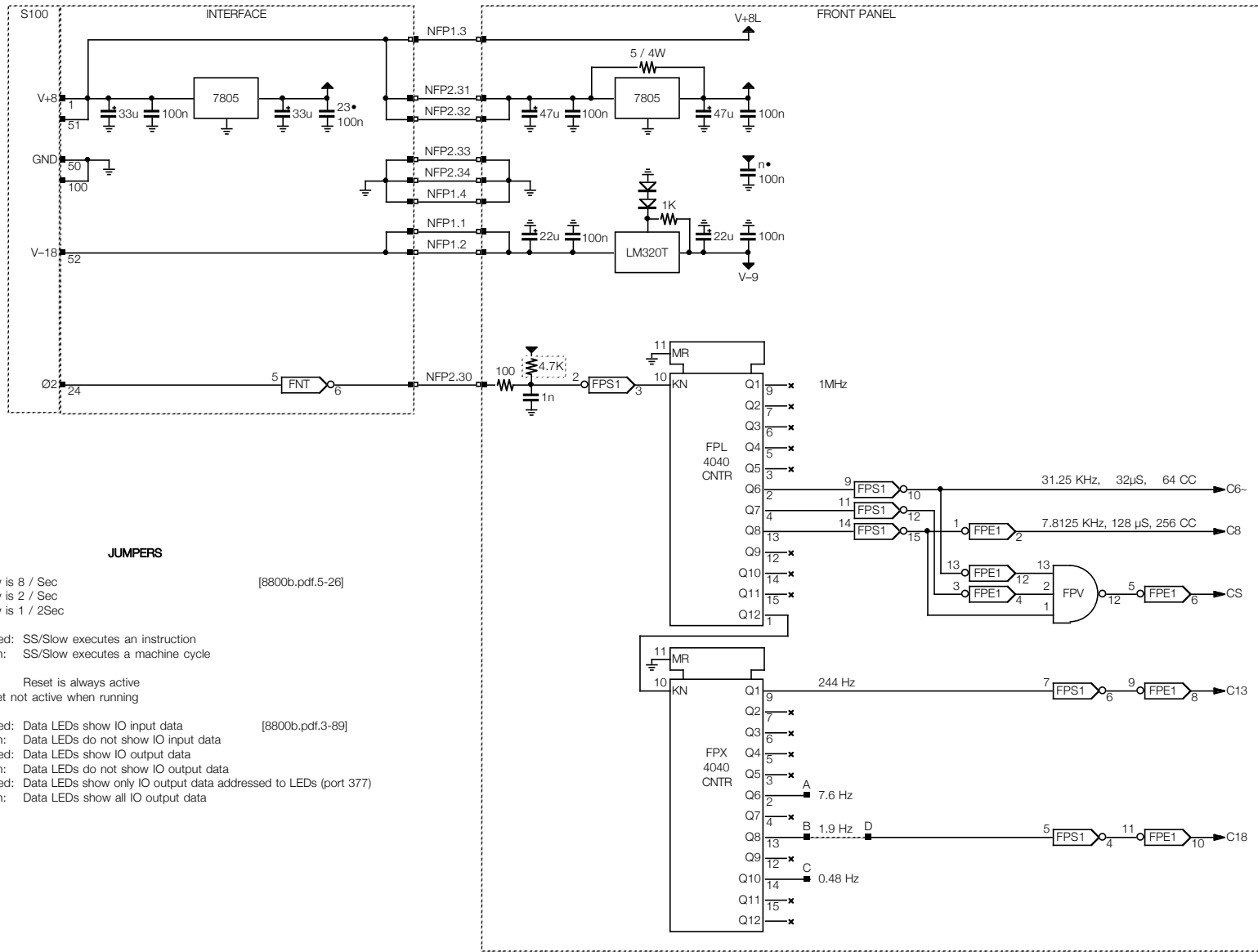


### Altair 8800b Computer

Section: CPU BOARD

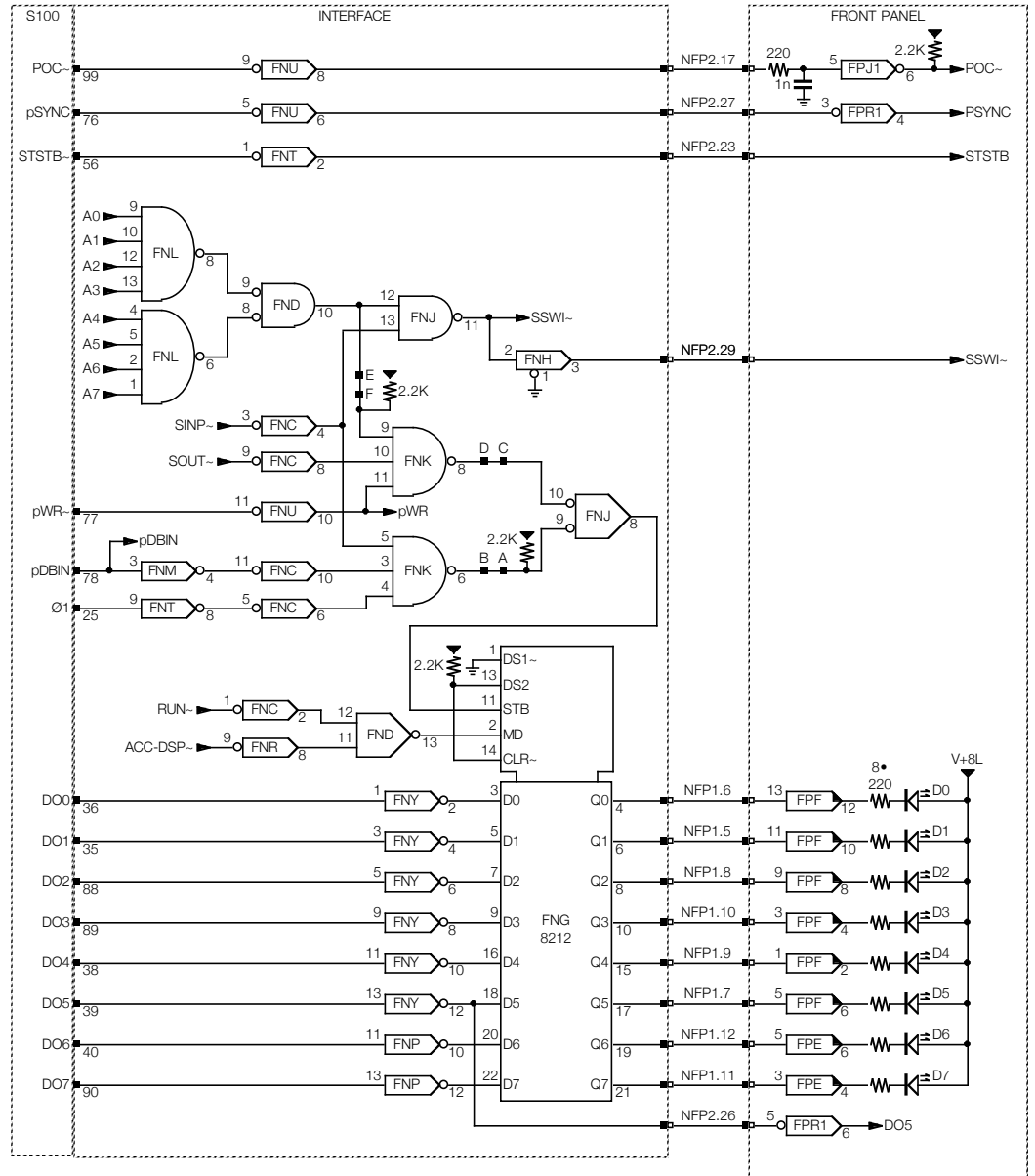
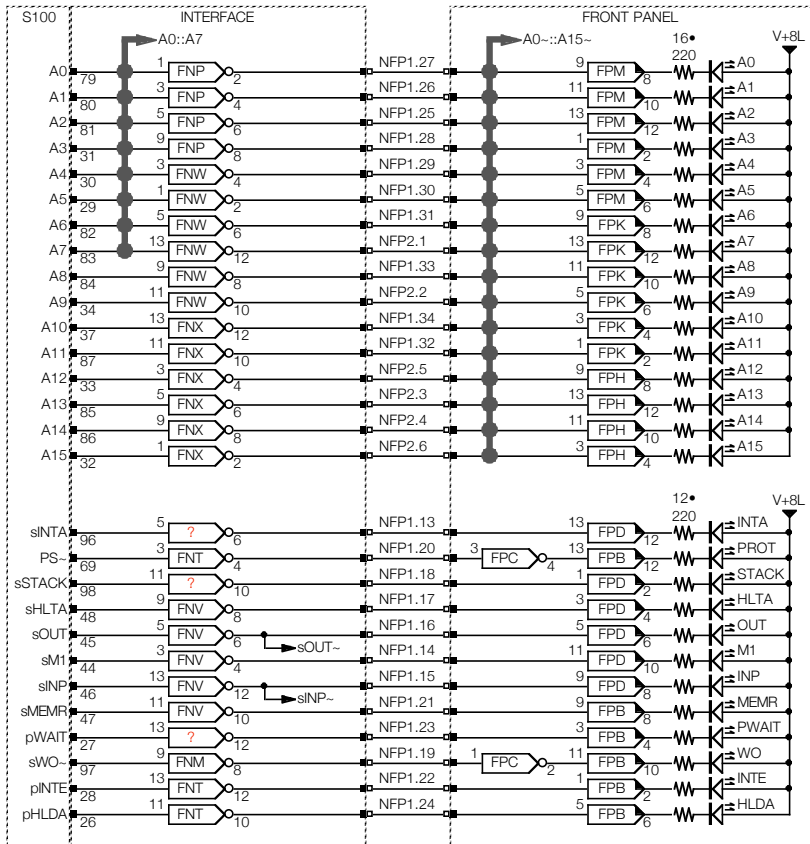
Page: CP2

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**JUMPERS**

- FP.A-D: Slow is 8 / Sec [8800b.pdf.5-26]
- FP.B-D: Slow is 2 / Sec
- FP.C-D: Slow is 1 / 2Sec
- FP.E-F: closed: SS/Slow executes an instruction  
open: SS/Slow executes a machine cycle
- FP.G-H: Reset is always active
- FP.G-J: Reset not active when running
- FN.A-B: closed: Data LEDs show IO input data [8800b.pdf.3-89]  
open: Data LEDs do not show IO input data
- FN.C-D: closed: Data LEDs show IO output data  
open: Data LEDs do not show IO output data
- FN.E-F: closed: Data LEDs show only IO output data addressed to LEDs (port 377)  
open: Data LEDs show all IO output data

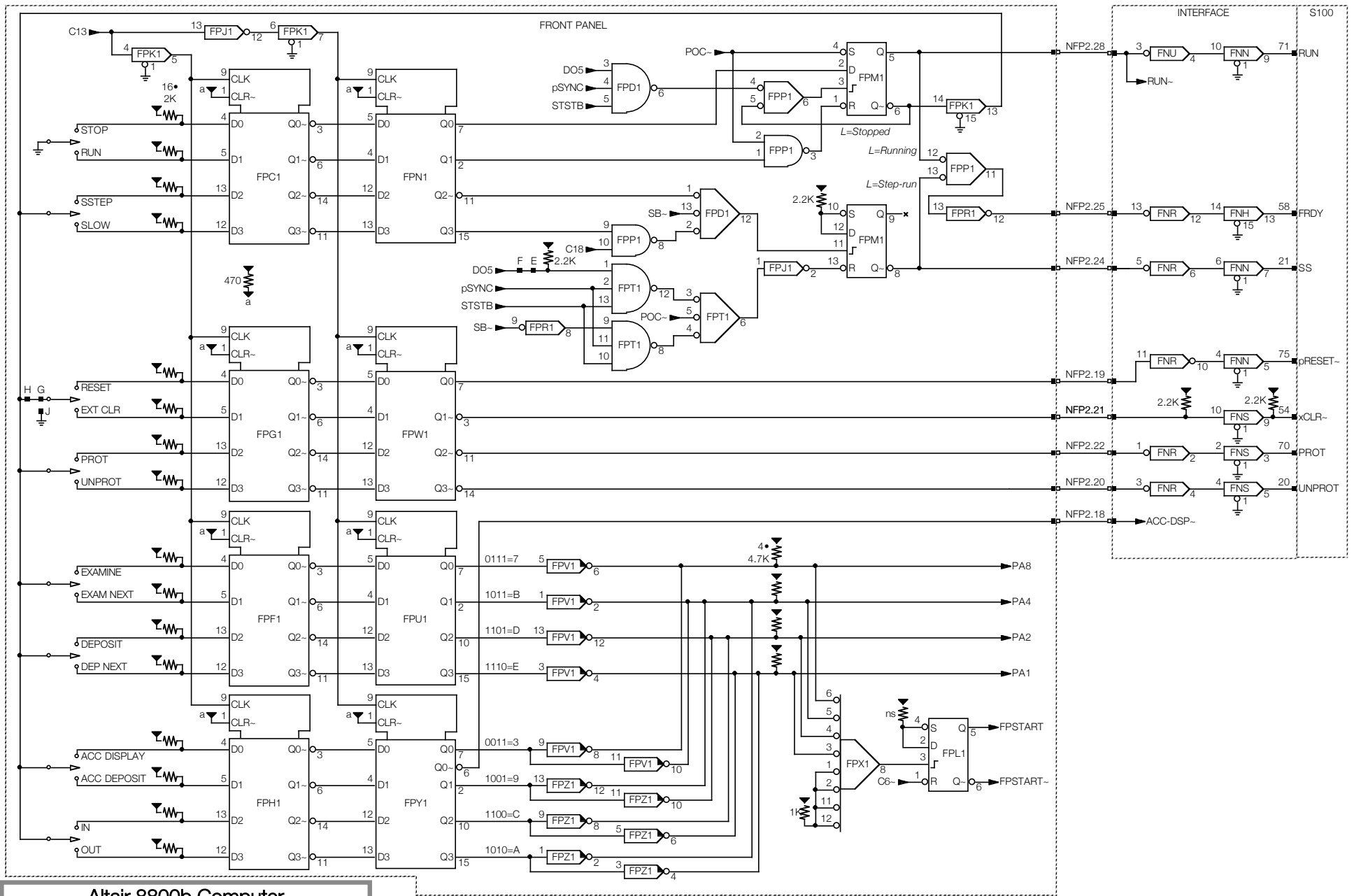


## Altair 8800b Computer

Section: Front Panel - Display LEDs

Page: FP2

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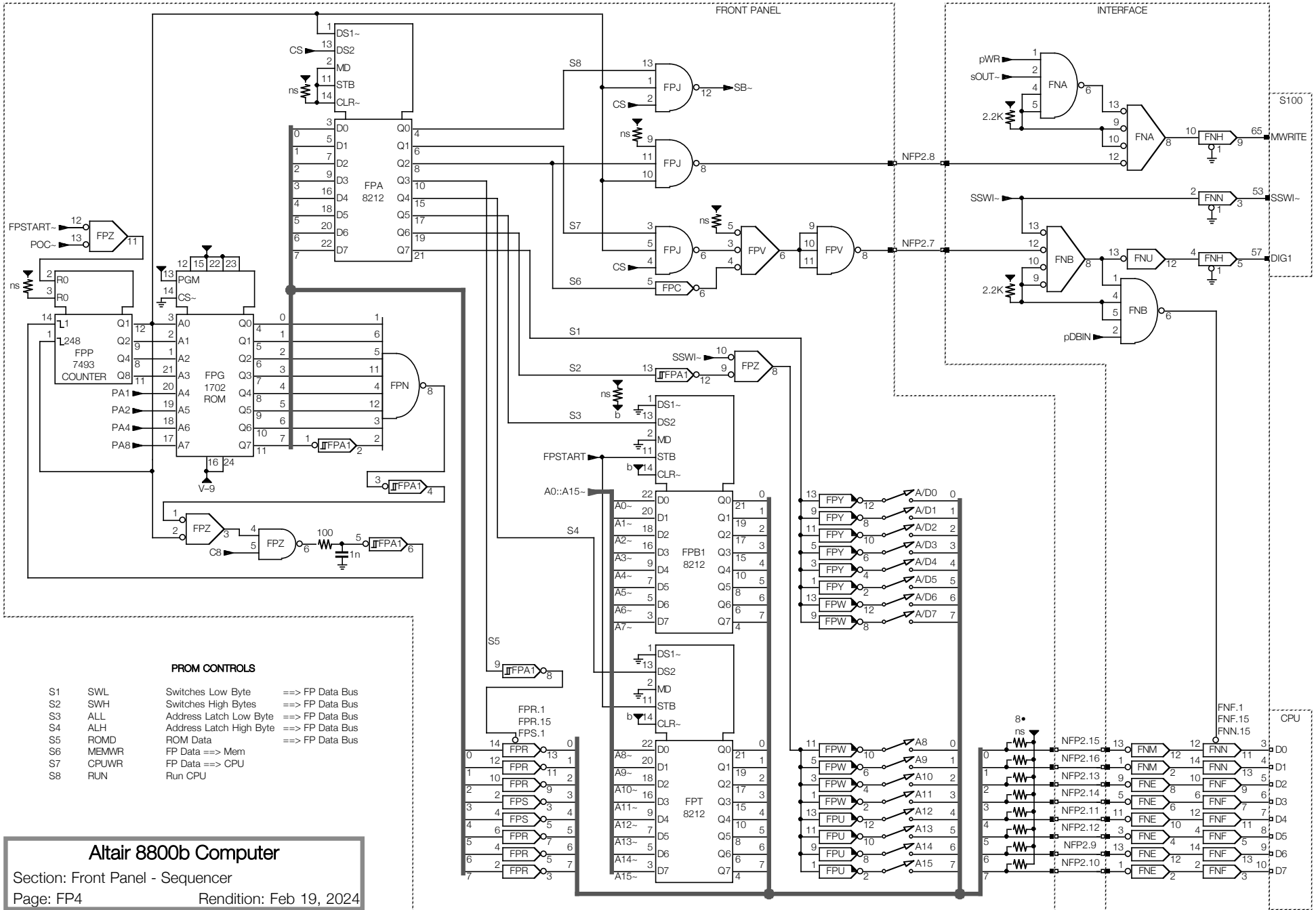
### Altair 8800b Computer

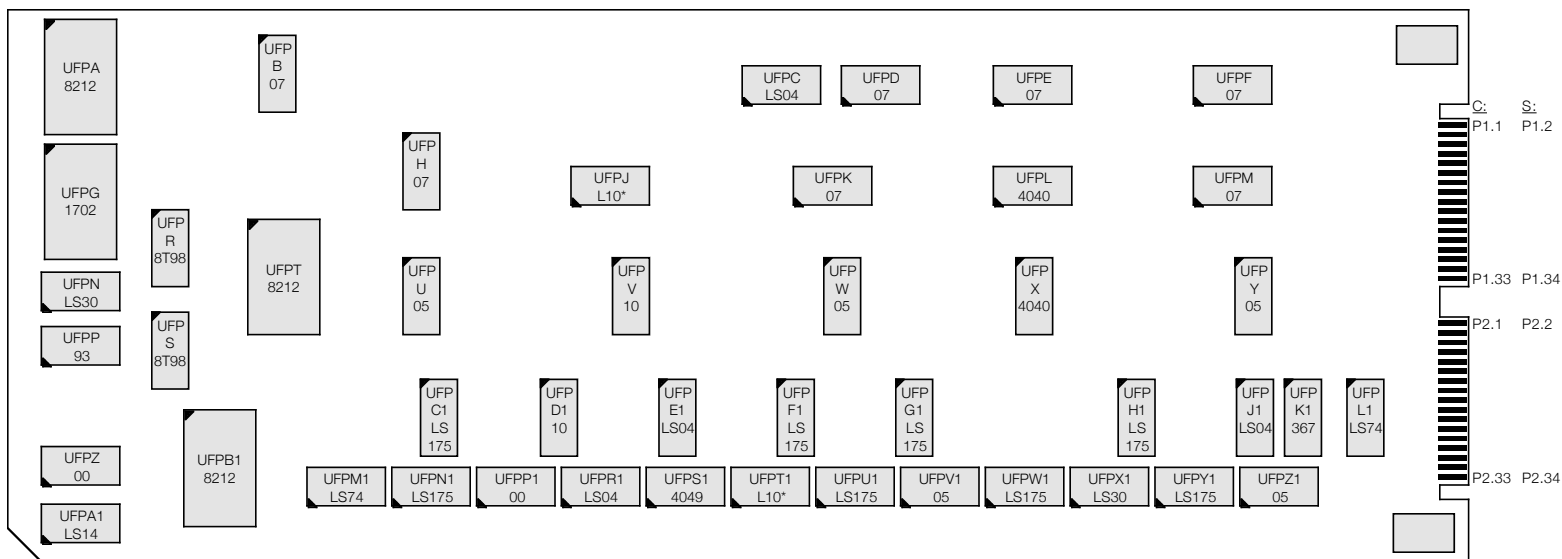
Section: Front Panel - Fct. Switches & Run Control

Page: FP3

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Front Panel Display/Control Board

UFPx	Type	a	b	c	d	e	f	UFPx	Type	a	b	c	d	e	f	Type	Count	Pins	V+5	GND
A	8212	√	-	-	-	-	-	A1	74LS14	√	√	√	√	u	√	7400/LS00	2	14	14	7
B	7407	√	√	√	√	√	√	B1	8212	√	-	-	-	-	-	74LS04	4	14	14	7
C	74LS04	√	√	√	u	u	u	C1	74LS175	√	-	-	-	-	-	7405	5	14	14	7
D	7407	√	√	√	√	√	√	D1	7410/LS10	√	√	u	-	-	-	7407	7	14	14	7
E	7407	u	√	√	u	u	u	E1	74LS04	√	√	√	√	√	√	7410/LS10	4	14	14	7
F	7407	√	√	√	√	√	√	F1	74LS175	√	-	-	-	-	-	74LS14	1	14	14	7
G	1702A	√	-	-	-	-	-	G1	74LS175	√	-	-	-	-	-	7430/L30/L	2	14	14	7
H	7407	u	√	u	√	√	√	H1	74LS175	√	-	-	-	-	-	74LS74	2	14	14	7
J	7410/LS10	√	√	√	-	-	-	J1	74LS04	√	u	√	u	u	√	7493	1	14	5	10
K	7407	√	√	√	√	√	√	K1	74367	u	√	√	u	u	√	74LS175	8	16	16	8
L	4040	√	-	-	-	-	-	L1	74LS74	√	u	-	-	-	-	74367	1	16	16	8
M	7407	√	√	√	√	√	√	M1	74LS74	√	√	-	-	-	-	8T98	2	16	16	8
N	74L30/LS30	√	-	-	-	-	-	N1	74LS175	√	-	-	-	-	-	8212	3	24	24	12
P	7493	√	-	-	-	-	-	P1	7400/LS00	√	√	√	√	-	-	4009/4049	1	16	1,16	8
R	8T98	√	√	√	√	√	√	R1	74LS04	u	√	√	√	u	√	4040	2	16	16	8
S	8T98	√	√	-	-	-	-	S1	4009/4049	√	√	√	√	√	√	1702A	1	24	*	*
T	8212	√	-	-	-	-	-	T1	7410/LS10	√	√	√	-	-	-	Total:	46			
U	7405	√	u	u	√	√	√	U1	74LS175	√	-	-	-	-	-					
V	7410/LS10	√	√	√	-	-	-	V1	7405	√	√	√	√	√	√					
W	7405	√	√	√	√	√	√	W1	74LS175	√	-	-	-	-	-					
X	4040	√	-	-	-	-	-	X1	7430/L/LS	√	-	-	-	-	-					
Y	7405	√	√	√	√	√	√	Y1	74LS175	√	-	-	-	-	-					
Z	7400/LS00	√	√	√	√	-	-	Z1	7405	√	√	√	√	√	√					

Total ICs: 23

Total ICs: 23

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Section: Front Panel - FP Board Layout & ICs

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**P1**

V-18	1	2	V-18
V+8L	3	4	GND
LD1~	5	6	LD0~
LD5~	7	8	LD2~
LD4~	9	10	LD3~
LD7~	11	12	LD6~
sINTA~	13	14	sMI~
sINP~	15	16	sOUT~
sHLTA~	17	18	sSTACK~
sWO	19	20	PS
MEMR~	21	22	pINTE~
pWAIT~	23	24	pHLDA~
A2~	25	26	A1~
A0~	27	28	A3~
A4~	29	30	A5~
A6~	31	32	A9~
A8~	33	34	A10~

**P2**

A7~	1	2	A11~
A13~	3	4	A14~
A12~	5	6	A15~
FDIG2~	7	8	DEP~
FDI6~	9	10	FDI7~
FDI4~	11	12	FDI5~
FDI2~	13	14	FDI3~
FDI0~	15	16	FDI1~
POC	17	18	ACC-DSP~
pRESET	19	20	UNPROTECT~
xCLR~	21	22	PROTECT~
STSTB	23	24	SS~
FRDY~	25	26	DO5~
pSYNC~	27	28	RUN~
SSW1~	29	30	Ø2~
V+8	31	32	V+8
GND	33	34	GND



S100 component: 1 solder: 51  
 10 20 30 40 50  
 60 70 80 90 100

UFNx	Type	Original						UFNx	Type						
		a	b	c	d	e	f			a	b	c	d	e	f
A	7420	√	√					N	74LS367	√	√	√	√	√	√
B	7420	√	√					O	-						
C	74LS04	√	√	√	√	√	u	P	74LS04	√	√	√	√	√	√
D	7402	u	u	√	√			Q	-						
E	74LS04	√	√	√	√	√	√	R	74LS04	√	√	√	√	√	√
F	74LS367	√	√	√	√	√	√	S	74LS367	√	√	√	u	u	u
G	8212	√						T	74LS04	√	√	√	√	√	√
H	74LS367	√	√	u	√	u	√	U	74LS04	u	√	√	√	√	√
I	-							V	74LS04	√	√	√	√	√	√
J	7400	u	u	√	√			W	74LS04	√	√	√	√	√	√
K	7410	u	√	√				X	74LS04	√	√	√	√	√	√
L	7420	√	√					Y	74LS04	√	√	√	√	√	√
M	74LS04	√	√	√	√	√	√								

Total ICs 22

**Altair 8800b Computer**

Section: Front Panel - Interface Layout & ICs

Page: FP6

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