

Some notes on making a keyboard for the HP120  
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These diagrams contain the following :

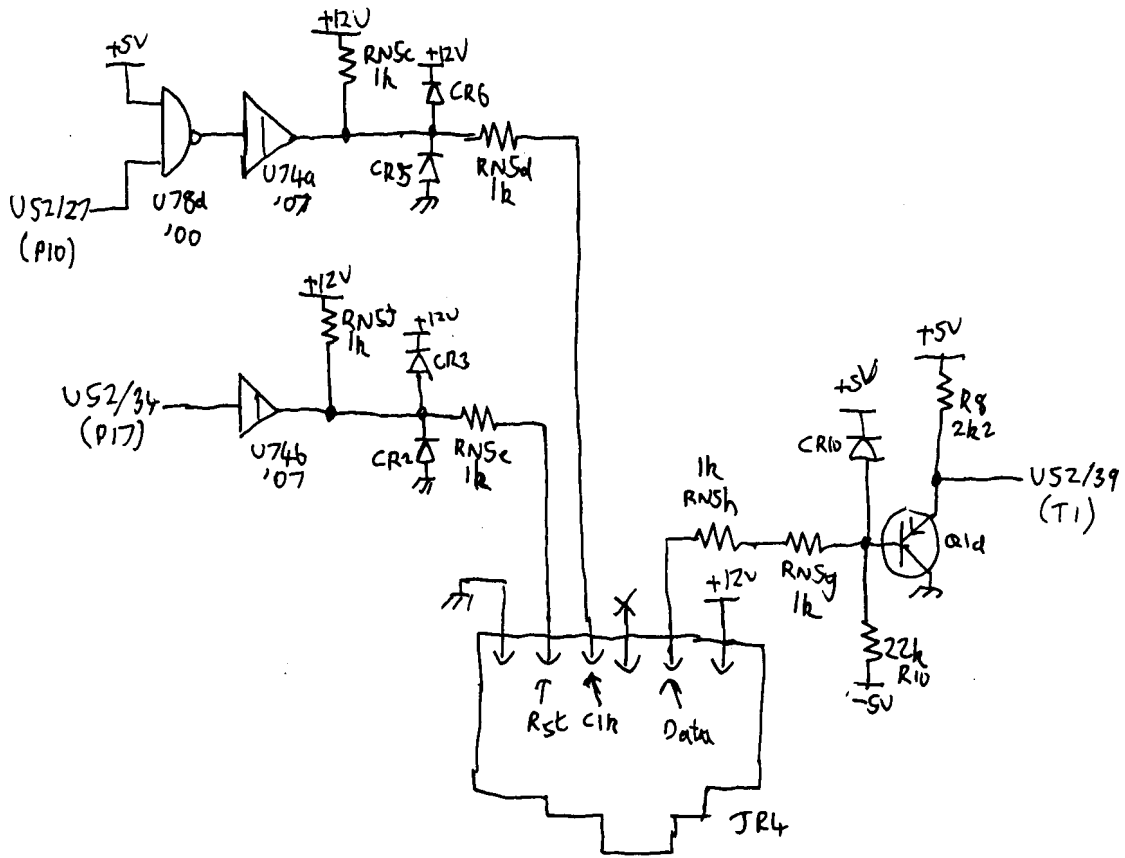
\* Schematic and key layout for the HP2623 terminal keyboard. This is the same keyboard (electrically) as used on the HP125

\* Schematic and key layout for the HP150 keyboard. This has the same interface as the HP120 keyboard

\* Schematic for my (ARD's) interface from an HP120 to an HP2623 keyboard. This connects between the RJ11 socket on the HP120 and the DA15 plug on an (unmodified) HP2623 keyboard

\* Schematic, key mapping, and ROM dump for my (ARD's) modification board for the HP150 keyboard. This connects in place of the 4024 counter chip (M2) on the HP150 keyboard and remaps the keys to work with either the HP120 or HP150. Note that the ID diode (D7) must be fitted on the HP150 keyboard PCB, if you have the US layout, fit this diode (1N4148 or similar) and change the byte at location fc of the EPROM from 7c to 78.

# HP120 Keyboard Interface

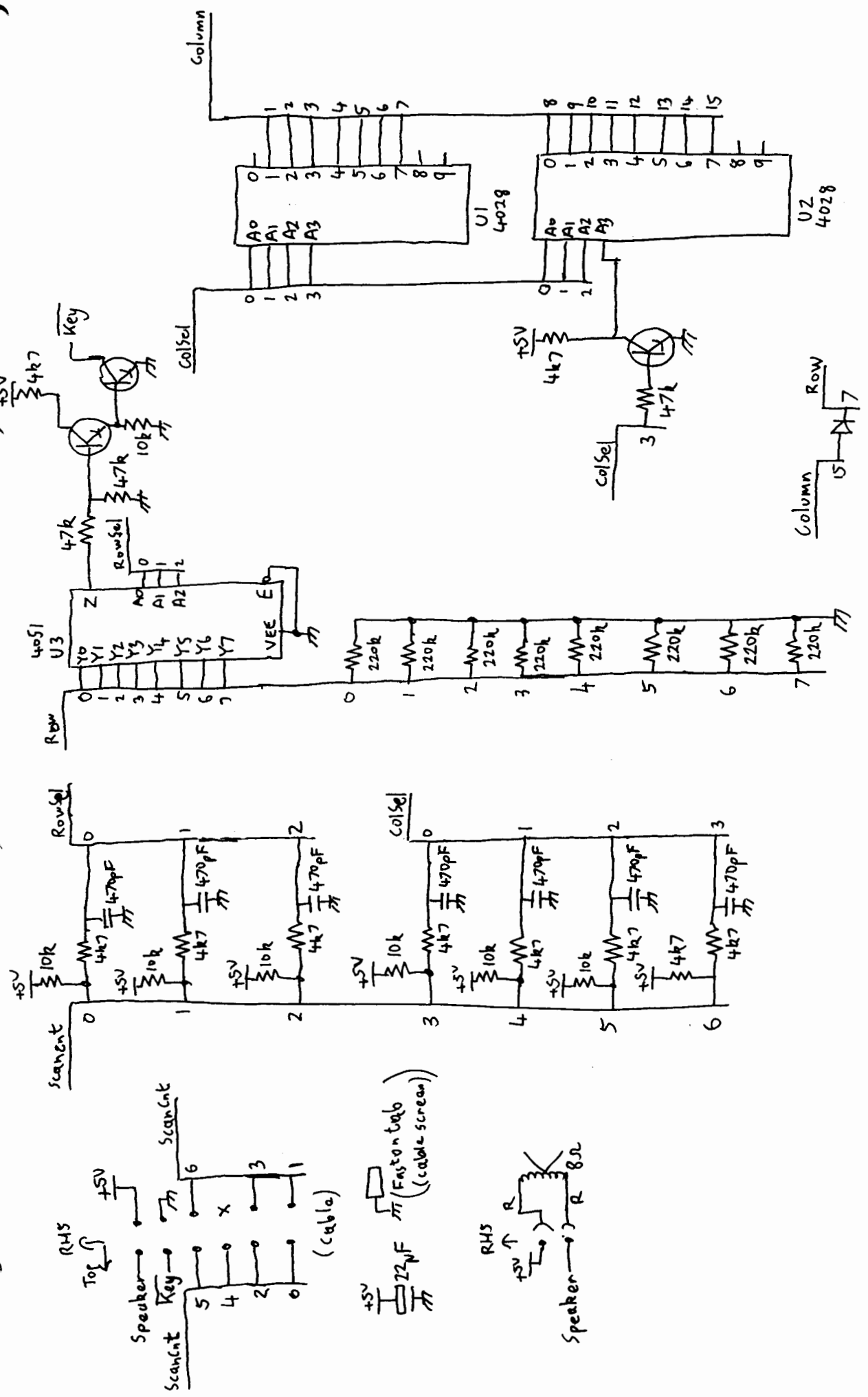


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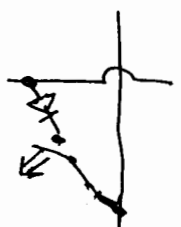


O2620-60108

sheet (1)

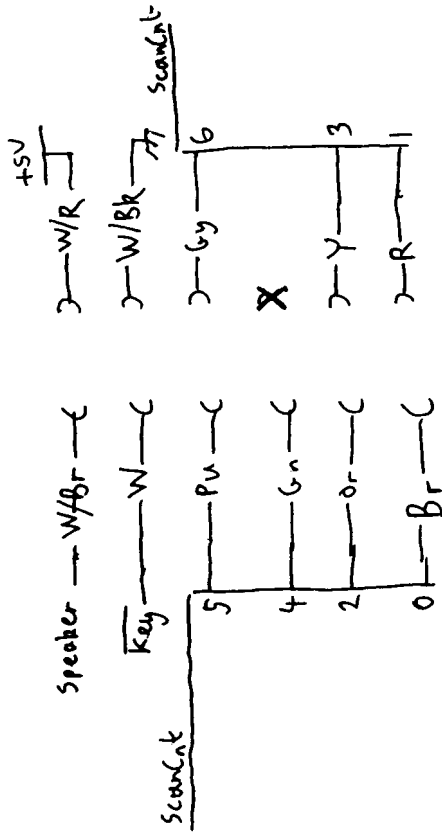
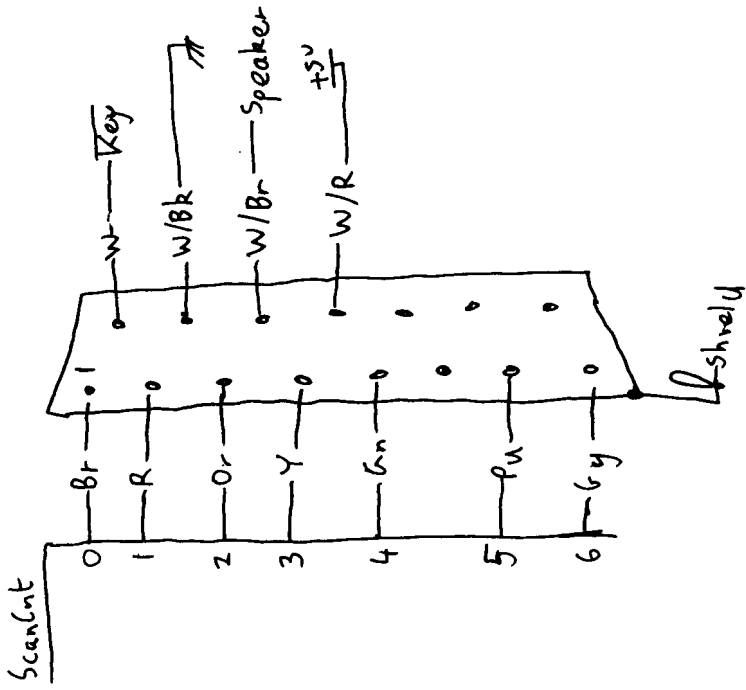
HP2623 Keyboard

Row	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	C / B /	! /   /	;	=	N	Lspace	N0	N1	N2	N3	N4	N5	N6	N7	N8
	X / V /	Z / Enter	Space	:	M	Lshift	N0	N1	N2	N3	N4	N5	N6	N7	N8
	D / G /	A / Return	) / ' /		J	Rshift	N1	N2	N3	N4	N5	N6	N7	N8	N9
	S / F /	BACK SPACE	H	@ * /	K	CTRL	N2	N3	N4	N5	N6	N7	N8	N9	N10
	E / T /	} / ] /	Y	{ / [ /	L	ESC	N3	N4	N5	N6	N7	N8	N9	N10	N11
	W / R /	> / < /	( / ) /	P	U	DEL	N4	N5	N6	N7	N8	N9	N10	N11	N12
	£ / 3 /	/ / . /	^ / ~ /	? / + /	I	N7	N5	N6	N7	N8	N9	N10	N11	N12	N13
	" / 2 /	~ / ` /	& / 6 /	= / 0 /	O	N8	N6	N7	N8	N9	N10	N11	N12	N13	N14



4 =

HP2623 Keyboard Sheet (2)



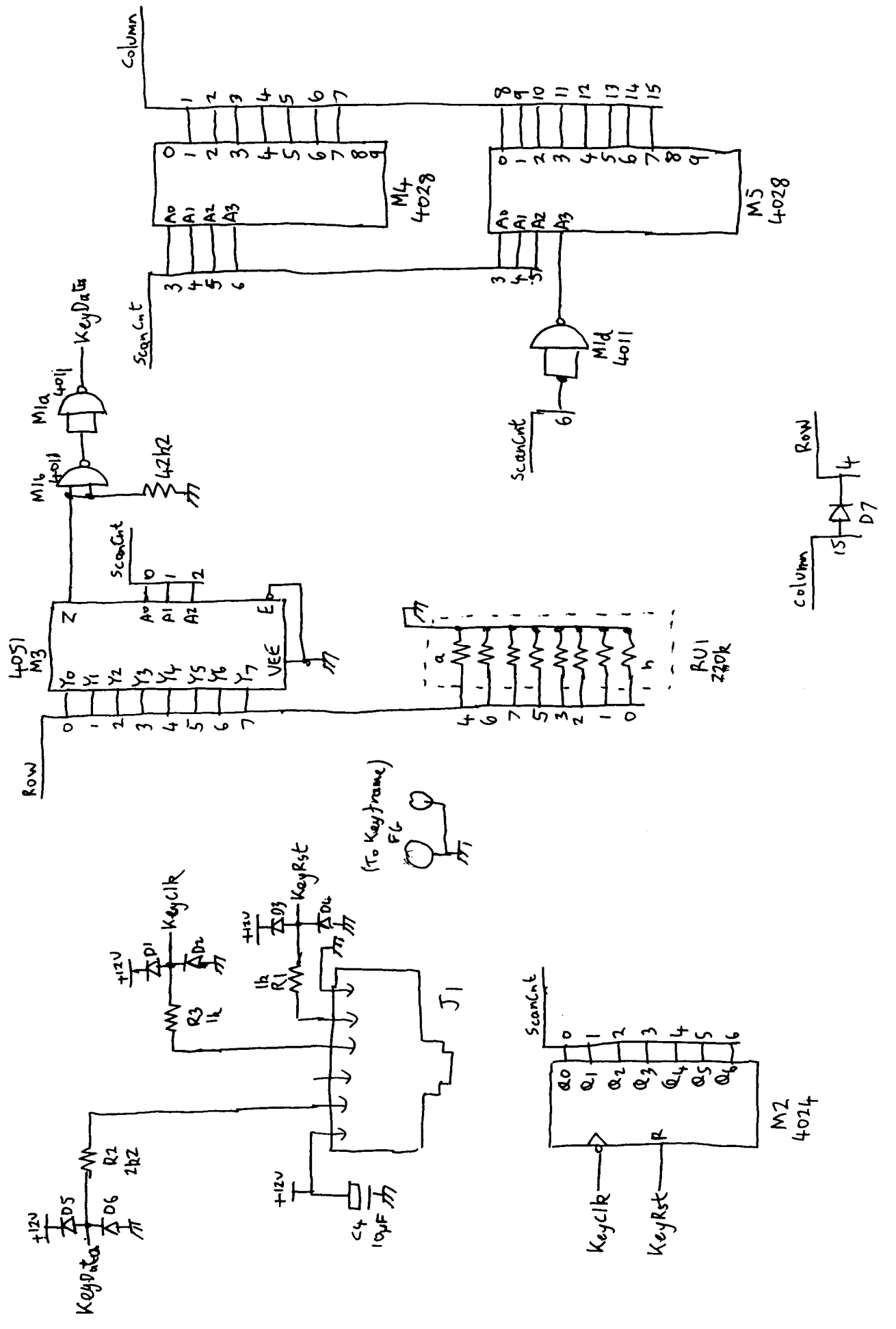
Shield  
(Faston Tab)

f1	f2	f3	f4	f5	f6	f7	f8	INS LINE	DEL LINE	BREAK	ROBT
AIDS	NUMS	USER NEXT KEYS PAGE	PREV PAGE	^	<	>	RDLL UP	INS CHAR	DEL CHAR	CLEM LINE	CLEA OSPLY
ESC	1	2	3	4	5	6	7	8	9	0	NUM —
TAB	Q	W	E	R	T	Y	U	I	O	P	DEL
CAPS	CTRL	A	S	D	F	G	H	J	K	L	RETURN
SHIFT	Z	X	C	V	B	N	M	:	;	—	SHIFT/ENTER
											Space Bar

Graph Display	Graph Copy	NUM
Graph Display 7	Graph Copy 4	—
Graph Display 4	Graph Copy 5	TAB
Graph Copy 1	Graph Copy 2	TAB
Cursor-Page 0	Cursor-Page 1	

HP 2623 Keypads (UK)



Row

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A07	B09	C09	D09	E09		A06	B08	C08	D08	E20			E08	
A14	B16	C16	D16	E16	F09	D07	E02	C01	B03	C20		A18	E01	
A13	B15	C15	D15	E15	F08	A02	E13	C02	F02	D19		F11	F01	
A12	B14	C14	D14	E14	F07	D02	D01	C03	D03	C19		A17	E03	
A11	B13	C13	D13	B02	F06	B01	B04	C04	D04	D18			E04	
A10	B12	C12	D12	E12	F05	A03	B05	C05	D05	C18		A16	E05	
A09	B11	C11	D11	E11	F03	A04	B06	C06	D06	D17		F10	E06	
A08	B10	C10	D10	E10	F04	A05	B07	C07	A01	C17		A15	E07	

Column



Upisn Kartan Sheet 2



A01	A02	A03	A04	A05	A06	A07	A08	A09	A10	A11	A12	A13	A14	A15	A16	A17	A18			
B01	B02	B03	B04	B05	B06	B07	B08	B09	B10	B11	B12	B13	B14	B15	B16	B17	B18	B19	B20	
C01	C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20	
D01	D02	D03	D04	D05	D06	D07	D08	D09	D10	D11	D12	D13	D14	D15	D16	D17	D18	D19	D20	
E01	E02	E03	E04	E05	E06	E07	E08	E09	E10	E11	E12	E13	E14	E15	E16	E17	E18	E19	E20	
F01	F02	F03	F04											F05	F06	F07	F08	F09	F10	F11

15

20

20

20

20

.11

HP150 Keyswitch Layout

Reset Stop Break	F1	F2	F3	F4	Menu	F5	F6	F7	F8	Clear Line	Clear Display
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~	'	8	7	6	5	4	3	2	1	0	Del Line
,	;	4	5	6	7	8	9	0	1	2	Del Line
Tab →	Q	W	E	R	T	Y	U	I	O	P	Del char
Caps Ctrl	A	S	D	F	G	H	J	K	L	*	Pr-6V
Del Esc	Shift	Z	X	C	V	B	N	M	;	'	Next
Print Enter	Ext char	Space	bar	Ext char	Ext char	Ext char	Ext char	Ext char	Ext char	Ext char	Ext char

HP150 Keypcaps (UK)

Addr	Key	HPISO Location	Col	Row	Byte
00	N/U	EOS			00
01					01
02					02
03					03
04					04
05					05
06					06
07					07
08	C	E05	14	5	75
09	X	E04	14	4	74
0A	D	D05	10	5	55
0B	S	D04	10	4	54
0C	E	C04	9	4	4C
0D	W	C03	9	3	4B
0E	3	B04	8	4	44
0F	2	B03	10	1	51
10	B	E07	14	7	77
11	V	E06	14	6	76
12	G	D07	7	1	39
13	F	D06	10	6	56
14	T	C06	9	6	4E
15	R	C05	9	5	4D
16	5	B06	8	6	46
17	4	B05	8	5	45
18	1	B02	5	4	2C
19	Z	E03	14	3	73
1A	A	D03	10	3	53
1B	Spare				78
1C	Q	C02	9	2	4A
1D	TAB	C01	9	1	49
1E	Spare				78
1F	CAPS	D01	8	3	43

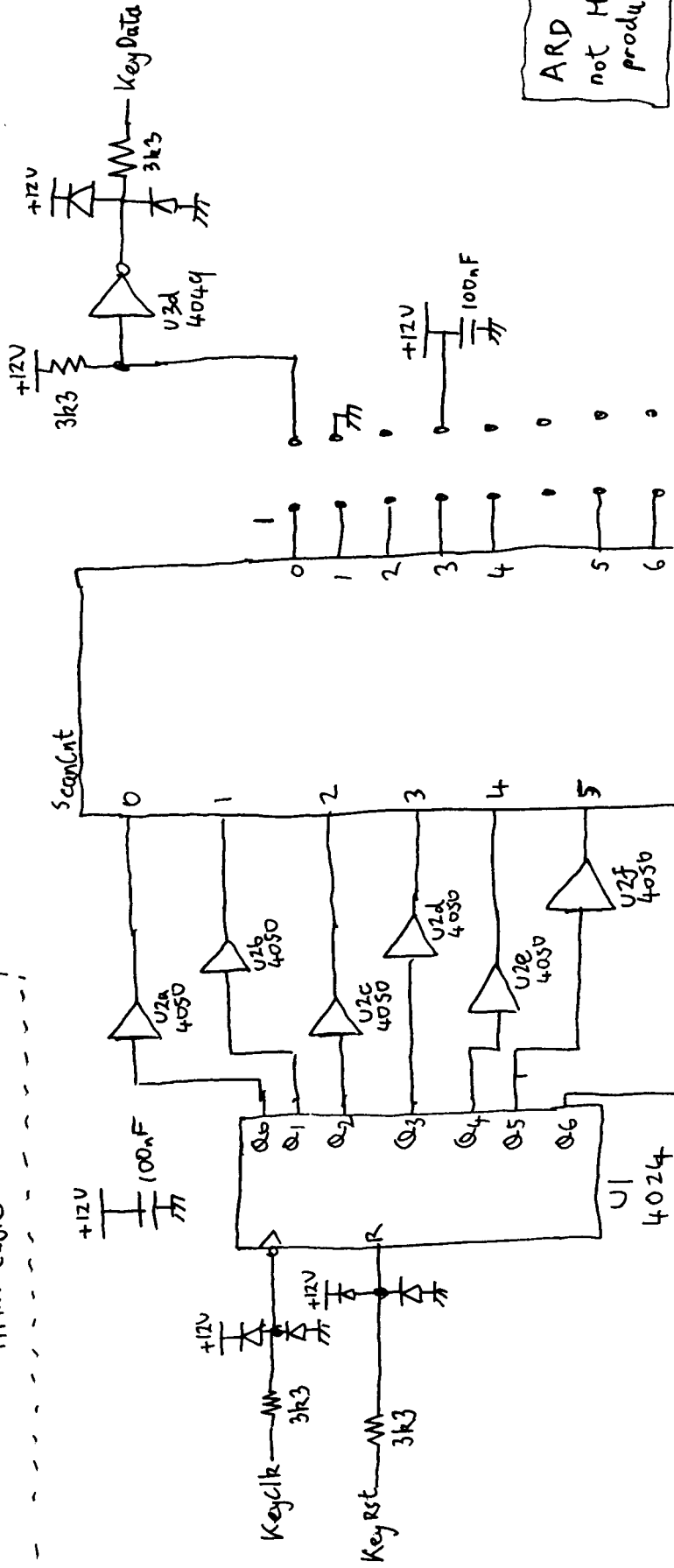
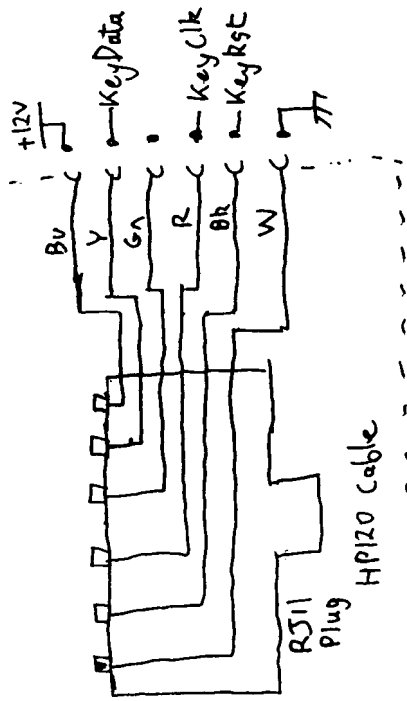
Addr	Key	HP150 Location	col	Row	Byte
20	space				78
21	Enter	F01	14	2	72
22	Return	D14	4	3	23
23	BackSpace	B14	2	3	13
24	]	C13	<del>14</del> 3	<del>3</del> 4	1C
25	<	C14	3	3	1B
26	'	B13	2	4	14
27	'	B01	7	4	3C
28	,	E10	5	7	2F
29	space	F04	6	7	37
2A	9	B10	2	7	17
2B	H	D08	10	0	50
2C	Y	C07	9	7	4F
2D	8	B09	2	0	10
2E	7	B08	8	0	40
2F	6	B07	8	7	47
30	-	E12	5	5	2D
31	.	E11	5	6	2E
32	\	D13	4	4	24
33	*	D12	4	5	25
34	[	C12	3	5	1D
35	P	C11	3	6	1E
36	+	B12	2	5	15
37	∅	<del>B11</del>	2	6	<del>16</del>
38	N	E08	14	0	70
39	M	E09	5	0	28
3A	J	D09	4	0	20
3B	K	D10	4	7	27
3C	L	D11	4	6	26
3D	U	C08	9	0	48
3E	I	C09	3	0	18
3F	O	C10	3	7	1F

Addr	Key	HP150 Location	col	Row	Byte
40	Lspace	F03	6	6	36
41	Lshift	E02	8	1	41
42	RShift	E13	8	2	42
43	Ctrl	D62	7	3	3B
44	Esc	E01	14	1	71
45	Del	A16	13	5	6D
46	N7	C17	11	7	5F
47	N8	C18	11	5	5D
48	N∅	F10	13	6	6E
49	N0	F11	13	2	6A
4A	N1	E17	12	6	66
4B	N2	E18	12	4	64
4C	N3	E19	12	2	62
4D	N4	D17	11	6	5E
4E	N5	D18	11	4	5C
4F	N6	D19	11	2	5A
50	N9	C19	11	3	5B
51	N-	B20	12	1	61
52	NTab→	<del>D20</del> E20	12	0	60
53	NTab←	D20	11	0	58
54	Break	A02	7	2	3A
55	Clear Dply	A14	1	1	09
56	Clear Line	A13	1	2	0A
57	Reset	A01	10	7	57
58	→	F09	6	1	31
59	↓	F08	6	2	32
5A	Roll Down	A17	13	3	6B
5B	Roll Up	A18	13	1	69
5C	Ins Char	C15	3	2	1A
5D	Del Char	C16	3	1	19
5E	Ins Line	B15	2	2	12
5F	Del Line	B16	2	1	11



Addr	Key	MPISO Location	Col	Row	Byte
60	Aids	A15	13	7	6F
61	Modes	A07	1	0	08
62	User Keys	A08	1	7	0F
63	↙	D15	4	2	22
64	Next Page	E16	5	1	29
65	Prev Page	D16	4	1	21
66	↑	E15	5	2	2A
67	←	F07	6	3	33
68	f1	A03	7	5	3D
69	f2	A04	7	6	3E
7A	f3	A05	7	7	3F
6B	f4	A06	7	0	38
6C	f5	A09	1	6	0E
6D	f6	A10	1	5	0D
6E	f7	A11	1	4	0C
6F	f8	A12	1	3	0B
70	Rspan	F05	6	5	35
71	N/U				78
72					78
73					78
74					78
75					78
76					78
77					78
78	N/U				78
79					78
7A					78
7B					78
7C					78
7D					78
7E					78
7F	10 Diode				7C

} ←

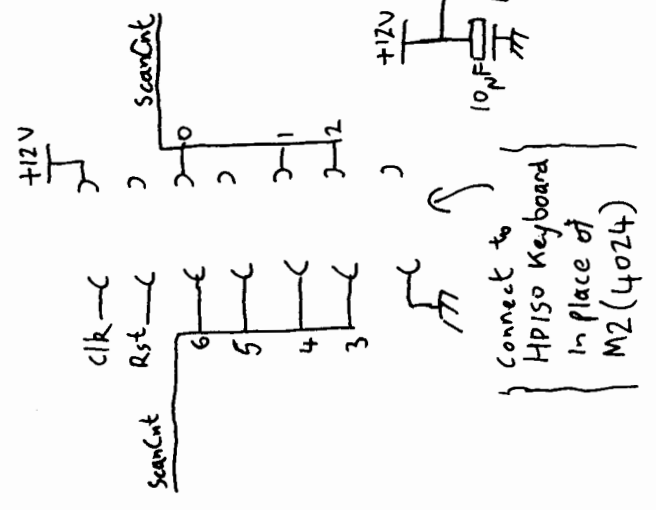
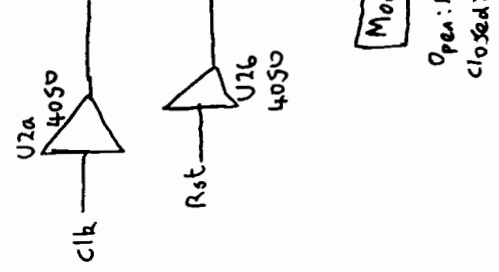
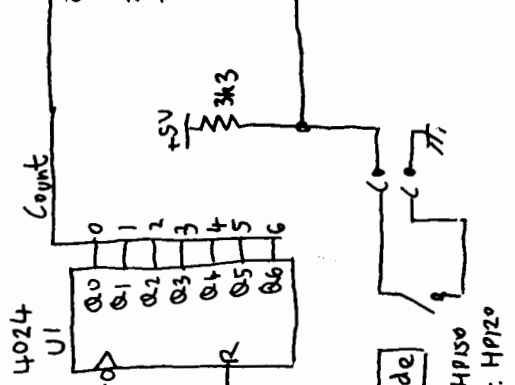
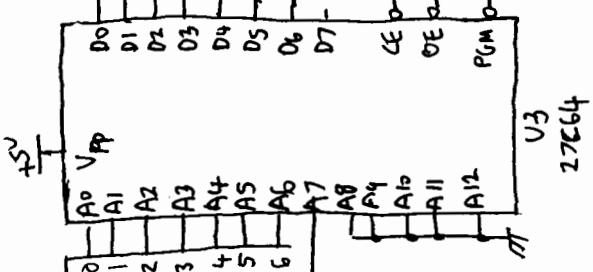
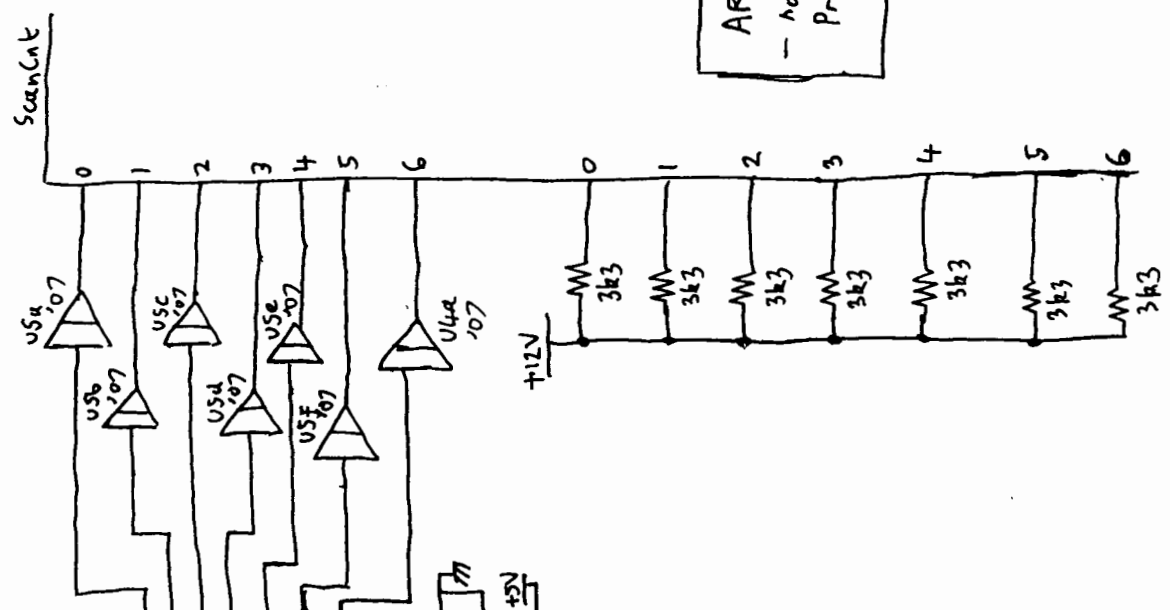


ARD Design  
not HP  
product

Header Plug -  
Link with IDC connectors  
to DA15 Socket (for  
2623 keyboard)

HP120 - HP2623 Keyboard Interface

ARD Design  
- not HP  
Product



Connect to  
HP150 Keyboard  
in place of  
M2 (4024)

HP120 Modification Board for HP150 Keyboard



Hex Dump of the EPROM (U3) for the HP150 keyboard modification board

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```
000000 00 01 02 03 04 05 06 07 75 74 55 54 4c 4b 44 51
000010 77 76 39 56 4e 4d 46 45 2c 73 53 78 4a 49 78 43
000020 78 72 23 13 1c 1b 14 3c 2f 37 17 50 4f 10 40 47
000030 2d 2e 24 25 1d 1e 15 16 70 28 20 27 26 48 18 1f
000040 36 41 42 3b 71 6d 5f 5d 6e 6a 66 64 62 5e 5c 5a
000050 5b 61 60 58 3a 09 0a 57 31 32 6b 69 1a 19 12 11
000060 6f 08 0f 22 29 21 2a 33 3d 3e 3f 38 0e 0d 0c 0b
000070 35 78 78 78 78 78 78 78 78 78 78 78 78 78 78 7c
000080 00 01 02 03 04 05 06 07 08 09 0a 0b 0c 0d 0e 0f
000090 10 11 12 13 14 15 16 17 18 19 1a 1b 1c 1d 1e 1f
0000a0 20 21 22 23 24 25 26 27 28 29 2a 2b 2c 2d 2e 2f
0000b0 30 31 32 33 34 35 36 37 38 39 3a 3b 3c 3d 3e 3f
0000c0 40 41 42 43 44 45 46 47 48 49 4a 4b 4c 4d 4e 4f
0000d0 50 51 52 53 54 55 56 57 58 59 5a 5b 5c 5d 5e 5f
0000e0 60 61 62 63 64 65 66 67 68 69 6a 6b 6c 6d 6e 6f
0000f0 70 71 72 73 74 75 76 77 78 79 7a 7b 7c 7d 7e 7f
```

All other locations : ff