AMCOMP SUNNYVALE, CALIFORNIA	TITLE Specification, Jumper Options MODEL 8020	DOC NO 1550050	
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PRE-PRODUCTION

APR 22 1977

8020-12	jdb	4/20/77	A	A	A	A	A	A	A	A	A	A	A	A	A							
EO	APPD	DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

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SIGNATURES		DATE			
DWN			ENG		
CHK			ENG	jdb	4/14/77
			APPD		

ENGINEERING
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This document will explain the jumpering required for all the wiring options available in the 8020 controller.

1.0 Controller/CPU Interface

1.1 Interrupt vector address.(1040063)

Interrupt vector of $210/_8$ is recommended and generally used in the Dec system for this disc subsystem. The table will indicate how the controller is jumpered to provide the address of $210/_8$ or any other address. The total possible address range is from $000/_8$ to $377/_8$.

From / To	E7	E5	E6	E8	E4	E3	E2	E1
Ground E10		X	X	X		X	X	X
Gate address E9	X				X			
Desired address	2			1		0		

Step 1 - Write interrupt vector in the location made for the desired address in octal notation.

Step 2 - Check E10 ground for any 'zero' weight in the octal notation.

Step 3 - Check E9 gate address for any 'one' weight in the octal notation.

Step 4 - Jumper E10 to all checked E points, jumper E9 to all checked E points.

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1.2 Priority. (1040063)

Any priority may be selected, however, this is a system sensitive feature and the operation of the system may be affected by the priority selected. Level 5 is recommended with level 7 being highest in priority and level 4 being lowest.

Priority	Block	Grant	Interrupt	Propagate 7	6	5	4
level 7	E24-E26	E27-E25	E17-E31		E23-E22	E21-E20	E19-E18
level 6	E24-E23	E27-E22	E17-E30	E26-E25		E21-E20	E19-E18
level 5*	E24-E21	E27-E20	E17-E29	E26-E25	E23-E22		E19-E18
level 4	E24-E19	E27-E18	E17-E28	E26-E25	E23-E22	E21-E20	

Step 1 - Choose the desired level.

Step 2 - Jumper each pair as described adjacent to the desired level.

1.3 Number of Memory Cycles per NPR Cycle. (1040063)

The normal operation of the unibus allows a single transfer with each grant of the bus. This prohibits any unit from holding the bus for a long burst of data transfer. It is recommended that the jumpering is 1. If any other jumpering is made it may cause system problems and must be coordinated with the user.

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It should be noted that if any other number is used that the system is required to always transfer a number of data words that is a multiple of the number chosen because the controller will not free up the bus until the transfer is complete.

No. of Memory Cycles		From	To
Recommended	1	E11	E13
	2	E11	E14
	4	E11	E15
	8	E11	E16
	16	E11	E12

Step 1 - Choose no. of memory cycles desired. One (1) is recommended.

Step 2 - Jumper E11 to the point adjacent to it.

2.0 Interlace/Memory size/Address allocation

2.1 Interlace. (1040062)

Interlace factor allows logical sectors to be separated on the track a distance equal to the ratio used. This allows the buffer to accept data at the physical rate of the disc and send the data to the CPU at a slower rate. This feature is system sensitive and must be specified by the user.

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2.1 (Cont'd.)

From	To			
	1:1	2:1	4:1	8:1
E19	E40	E37	E32	E31
E20	E39	E40	E37	E32
E17	E34	E39	E40	E37
E18	E33	E34	E39	E40
E23	E30	E33	E34	E39
E24	E29	E30	E33	E34
E21	E31	E29	E30	E33
E22	E32	E31	E29	E30
E27	E37	E32	E31	E29

Step 1 - Choose desired interlace factor.

Step 2 - Jumper each point in the "from" column to the adjacent point in the "to" column.

2.2 Memory Size

2.2.1 Illegal Unit Jumper. (1040062)

The illegal unit jumper will provide a method of detecting a selection to a unit that is not provided in the subsystem. The unit selected for this jumpering should be the last unit specified in the subsystem. Zero (0) being the lowest going to 3 as the highest.

Highest Unit	Illegal Jumper			
	From	To		
0	E3	E7	E6	E5
1	E3	E7	E6	
2	E3	E7		
3	E3	None		

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2.2.1 (Cont'd.)

Step 1 - Choose the highest unit defined in the subsystem.

Step 2 - Jumper from E3 to each point to the right of it.

2.2.2 Unit Select Jumper. (1040062)

The unit select jumper is used to select the partially populated disc and is used in conjunction with maximum size jumpering, 2.2.3, To determine when the system tries to address a track that is not provided on a disc which is specified.

Unit No.	Unit Select	
	From	To
0	E2	E8
1	E2	E5
2	E2	E6
3	E2	E7

Step 1 - Choose unit which has partial tracks if any. It must be the highest addressed unit.

Step 2 - Jumper unit select from E2 to the point adjacent to it on the table.

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2.2.3 Maximum Size Jumper. (1040062)

The maximum size jumper defines the maximum number of tracks in a partial disc. It is used in conjunction with the unit select jumpering to detect addressing to unavailable tracks on a defined disc unit. Only one disc in the subsystem may be a partial disc. A mix of 8500 & 8400 disc units is not allowed on one controller.

Disc Size	Maximum Size Jumper								
	From	To							
0 Tracks	E1	E9	E10	E11	E12	E13	E14	E15	E16
16	E1	E9	E10	E11	E12	E13	E14	E15	
32	E1	E9	E10	E11	E12	E13	E14		
48	E1	E9	E10	E11	E12	E13			
64	E1	E9	E10	E11	E12				
80	E1	E9	E10	E11					
96	E1	E9	E10						
112	E1	E9							

Step 1 - Choose the number of tracks in the partial disc.

Step 2 - Jumper from E1 to each point to the right of it on the table.

No jumpering is available for Partial 8500's above 112 tracks.

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2.3 Address Allocation. (1040062)

The jumpering for address allocation provides the use of two registers RCDA and RCEX to define the address space of the disc memory subsystem. The use of RCEX as an address register is not normally defined in DEC system and should be coordinated with system software and diagnostic programming.

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2.3 Address Allocation

TABLE 4-1. RCDA AND RCEX REGISTER STRAPPING

Function (8400/8500 Disc Memory Units)	Strapping
1. Single 8400 Disc Memory Unit	
RCDA bits 8-14 = Track address bits 0 - 6 RCEX is not used	E41-E47, E69-E81, E58-E65, E67-E68, E70-E71, E56-E72, E57-E73, E75-E74-E76-E77-E78-E79-E80.
2. Multiple 8400 Disc Memory Units with extended unit bits (2 bits) RCDA bits 8 - 14 = Track address bits 0 - 6 RCEX bits 0 and 1 = Disc unit select	E41-E47, E42-E52, E43-E53 E54-E51-E50-E49, E66-E67, E64-E65, E70-E71, E56-E72, E57-E73, E75-E74-E78-E79-E80, E62-E76, E63-E77.
3. Multiple 8400 Disc Memory Units with extended track address and unit bits (4 bits) RCDA bits 8 - 12 = Track address bits 0 - 4 RCEX bits 0 - 1 - Track address bits 5 and 6 RCEX bits 2 and 3 = Disc unit select	E42-E49, E43-E50, E44-E52, E45-E53, E56-E55, E64-E65, E66-E67, E70-E71, E59-E72-E76-E75-E74-E80, E60-E73-E77, E62-E78, E63-E79.
4. Multiple 8500 Disc Memory Units with extended track bits and unit bits (5 bits) RCDA bits 8 - 14 = Track address bits 0 - 6 RCEX bits 1 and 2 = Disc unit select RCEX bits 0 = Track address Bit 7	E44-E53, E64-E65, E66-E67 E41-E47, E42-E49, E43-E52, E69-E48, E58-E55, E56-E72, E57-E73, E59-E70-E74-E76, E62-E77, E63-E78, E75-E79-E80
5. Multiple 8500 Disc Memory Units with extended track bits and unit bits (5 bits) RCDA bits 8 - 12 = Track address bits 0 - 4 RCEX bits 0, 1, and 2 = Track address bits 5, 6, and 7 RCEX bits 3 and 4 = Disc unit select	E42-E49, E43-E50, E44-E51, E45-E52, E46-E53, E47-E48, E36-E55, E64-E65, E66-E67, E59-E72-E76, E60-E73-E77, E61-E70-E74-E78, E62-E79, E63-E80.

STEP 1 Choose the memory configuration desired.

STEP 2 Make all jumpering specified in the Table to the right of the configuration selected.

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APPENDIX A

LOCATION OF E POINTS ON 1940062

Point	Zone	Definition	
E1	8C	highest track on last disk	
E2	8C	last disk	
3	8C	highest unit assigned	
4	8C	highest unit assigned	
5	13B	U sel 1	
6	13B	U sel 2	
7	13B	U sel 3	
8	13B	U sel 0	
9	14D	Max number of tracks on disk	112
10			96
11			80
12			64
13			48
14			32
15			16
16	14D		0
17	16B	LCCC	Sector counter physical
18		D	
19		A	least significant
20	16B	B	
21	16A	G	
22		H	
23		E	
24		F	
25		L	
26		M	most significant
27		J	
28	16A	K	Sector counter physical
29	15A	LCC	Sector target logical
30		4	
31		6	
32		7	
33		3	
34		2	
35		11	most significant
36		10	
37		8	
38		9	
39		1	
40		0	Sector target logical — Least significant

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E POINTS FOR 1940062

41	D13	Track address RCDA
42	D16	Track address RCEX 0
43	D16	1
44	D16	2
45	D16	3
46	D16	Track address RCEX 4
47	13B	Track address
48	13C	pull up
49	15C	RCEX Register input
50	15C	
51	15C	
52	13C	Unit select register input
53	13C	
54	13C	
55	15C	Clock to RCEX register
56	13C	Track address register
57	13C	Track address register
58	13C	Unit address register
59	15C	Output RCEX register
60	15C	
61	15C	
62	13C	Output of unit sel register
63	13C	
64	13C	
65	8B	exceeded subsystem, addressing
66	14C	wrap total system addressing
67	14C	
68	14C	
69	13C	track address register
70	14B	unit change
71	14B	pull up
72	13C	track address 5
73	13C	6
74	13C	7
75	5B	Ground
76	5B	EXO
77	5B	1
78	5B	2
79	5B	3
80	5B	4
81	13C	Ground
82	13C	Track address T8

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LOCATION OF E POINTS ON 1040063

APPENDIX B

Point	Zone	Definition
E1	22D	Vector address 1
2	22C	2
3	22B	4
4	22A	8
5	19B	64
6	19C	32
7	19A	128
8	19D	Vector address 16
9	3D	Enable address vector
10	3D	ground
11	43D	memory cycle/NPR
12		16
13		1
14		2
15		4
16	43D	memory cycles/NPR 8
17	7A	priority selection
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31	7A	priority selection