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1          ;***COPYRIGHT 1969, DIGITAL EQUIPMENT CORP., MAYNARD, MASS.***
2
3
4          ;THIS SUB-PROGRAM ASSEMBLED WITH SYSTEM PARAMETER FILE - S,MAC(V414)
5          XLIST
6          LIST
7          TITLE  DPDINT - DATA PRODUCTS DISK INTERRUPT SERVICE
8          SUBTTL A. BLACKINGTON/CMF TS 12 JAN 69 V401
9          XP      VDPDIT,401*
10
11         000204 DCB=204          ;DATA-CONTROL-B
12         000270 DF=270         ;DISK-FILE
13         000270 DSK=DF
14
15         ;THIS NEXT CONSTANT MUST BE SET TO MATCH CAPACITY OF THE PARTICULAR DISK FILE---
16         INTERNAL LBHIGH ;HIGHEST LEGAL LOGICAL BLOCK NUMBER
17 000000 000000 127777 LBHIGH: 130000-1
18
19         ;START A WRITE ON DISK FILE
20
21         ;AT ENTRY,          C(TAC 18-35)= LOGICAL BLOCK NUMBER
22         ;                   C(TAC1)      = IOWD
23
24         INTERNAL DFWRT,DFRED
25         EXTERNAL DSKX8,DCBBIT,DSKBIT,DSKCHN,DCBCHN,ERRPNT,DSKX9
26         ENTRY LODINT
27         LODINT:
28
29         DFWRT:
30 000001 202100 000201' DFWRT1: MOVEM TAC1,IOWRD
31 000002 200100 000204'        MOVE TAC1,[BLKO DCB,IOWRD]
32 000003 264000 000120'        JSR DFRW          ;SET UP DISK ADDRESS
33
34
35 000004 661040 000200          TLO TAC,WLE          ;ENABLE WRITE LOCK ERROR
36 000005 541040 000000          HRRI TAC,DSKCHN ;TURN ON DISK
37 000006 435040 002310          IORI TAC,WRT+CLE+EIS+ENE
38                                STARTDV DSK+EXTERNAL PIOFF,PION
39                                CONO PI,PIOFF
40 000010 727201 000000          CONO DSK,(TAC)
41 000011 546040 000200'        HLRM TAC,DSKCON
42 000012 700600 000000          CONO PI,PION
43 000013 551040 000000          HRRZI TAC,DCBCHN
44 000014 720601 003750          CONO DCB,OUT+DAR+BR+P18+DFNUM(TAC) ;TURN ON DATA-CONTROL-B
45 000015 263140 000000          POPJ PDP,
46
47         ;SIMILAR ROUTINE FOR READ
48
49         DFRED:
50 000016 202100 000201' DFRED1: MOVEM TAC1,IOWRD
51 000017 200100 000205'        MOVE TAC1,[BLKI DCB,IOWRD]
52 000020 264000 000120'        JSR DFRW
53
54 000021 541040 000005'        HRRI TAC,DSKCHN
55 000022 435040 001310          IORI TAC,RED+CLE+EIS+ENE ;TURN ON DISK
56 000023 700600 000007'        STARTDV DSK+EXTERNAL PIOFF,PION
57                                CONO PI,PIOFF

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DPDINT - DATA PRODUCTS DISK INTERRUPT SERVICE MACRO.V36 19:04 4-JUN-69 PAGE 13-1  
A. BLACKINGTON/CMF TS 12 JAN 69 V401

62 000031 263140 000000 POPJ PDP,

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63                ;SERVICE INTERRUPT ON DATA-CONTROL-B
64
65                INTERNAL FTCHECK,FTMONP
66                IFE FTCHECK+FTMONP,<
67                INTERNAL DCBINT
68
69 000032 000000 000000 DCBINT: Z
70                >
71 000033 202040 000203' DCBIN1: MOVE4 TAC,ACSAV
72 000034 551040 000000                HRRZ1 TAC,DCBBIT
73 000035 700601 001000                CONO PI,1000(TAC)                ;TURN OFF DCB CHANNEL
74 000036 720640 000202'                CONI DCB,DCBERR                ;SAVE STATUS OF DATA CONTROL
75 000037 551040 000021'                HRRZ1 TAC,DSKCHN
76 000040 720740 000400                CONSO DCB,OUT                ;SKIP IF WRITING
77 000041 727201 010010                CONO DF,END+EIS(TAC)
78 000042 200040 000203'                MOVE TAC,ACSAV
79 000043 254520 000032'                JEN @DCBINT
80 000044 264000 000032' JSRDCB: JSR DCBINT                ;JSR STORED IN INTERRUPT CELL
81
82
83                ;DISK & DCB FLAGS
84
85                000100 ADE=1029                ;ADDRESS ERROR
86                100000 ADT=1020                ;ADDRESS TERMINATED
87                000040 ALM=1030                ;ALARM
88                000400 CME=1027                ;COMMAND ERROR
89                001000 DCE=1026                ;DATA CLOCK ERROR
90                010000 MISS=1023                ;DATA MISSED FLAG
91                000020 DRLATE=1031                ;DATA REQUEST LATE
92                000010 RCE=1032                ;READ COMPARE ERROR
93                000004 PAR=1033                ;PARITY ERROR
94                400000 IDS=1010                ;IDLE STATE (1 IF IDLE)
95                000001 NOPR=1035                ;OPERABLE (1 IF NOT)
96                000200 WLE=1020                ;WRITE-LOCK ERROR
97                000400 OUT=1027                ;OUTPUT INDICATION
98                000200 CLE=1020                ;CLEAR ERROR FLAGS
99                000002 FER=1034                ;FILE ERROR
100                001577 DVERAS=DRLATE+RCE+PAR+ADE+CME+DCE+ALM+NOPR+FER
101                001000 BR=1026                ;BUFFER REQUEST FLAG FOR DCB
102                002000 DAR=1025                ;DATA ACCUMULATOR REQUEST
103                000050 DFNUM=5032                ;DISK NUMBER FOR DATA CONTROL
104                010000 END=1023                ;END-SECTOR
105                000010 EIS=1032                ;ENABLE IDLE STATE
106                004000 XMOVE=1024                ;BUFFER ACCUMULATOR MOVE FLAG
107                000300 P10=3029                ;PACK 2 10-BIT BYTES
108                001000 REQ=1026                ;READ INDICATION
109                002000 WRT=2026                ;WRITE INDICATION
110                000100 ENE=1029                ;ENABLE ERROR INTERRUPT

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111          ;INTERRUPT ROUTINE TO HANDLE SECTOR-END FLAG.
112          ;CHECK FOR ERRORS. IF THE JOB IS COMPLETED (SIOWD = 0), GO TO
113          ;DEVICE INDEPENDENT PACKAGE, ELSE CONTINUE THE JOB.
114
115          INTERN DSKINT
116          EXTERNAL DFINT,DSKSAV
117
118 000045 727360 000200' DSKINT: CONSO DF,@DSKCON
119 000046 254000 000045' JRST DSKINT          ;ALTERED BY INITIALIZATION
120 000047 264000 000000' JSR DSKSAV
121 000050 551040 000034' HRRZI TAC,DCBBIT
122 000051 700601 001000' CONO PI,1000(TAC)      ;MAKE SURE DCB IS OFF
123 000052 513000 000200' HLLZS DSKCON
124 000053 201000 000000' MOVEI IOS,0
125 000054 332000 000176' SKIPE DSKIOS          ;ERROR WAIT?
126 000055 254000 000115' JRST DSKIN3          ;YES
127 000056 201100 001577' MOVEI TAC1,DVERAS
128 000057 720700 000400' CONSZ DCB,OUT
129 000060 660100 000200' TRO TAC1,WLE

130 000061 727302 000000' CONSZ DF,(TAC1)
131 000062 402000 000175' SETZM SIOWD          ;ERROR?
132 000063 200040 000202' MOVE TAC,DCBERR      ;YES, DO NOT DO MORE NOW
133 000064 606040 017000' TRNN TAC,MISS       ;PICK UP DATA-CONTROL STATUS
134 000065 727300 001573' CONSZ DF,DVERAS-PAR ;DATA-MISSED FLAG ON?
135 000066 435000 200000' ORI IOS,IODERR      ;NO, DISK ERRORS?
136 000067 727300 000004' CONSZ DF,PAR        ;YES, SET DEVICE ERROR FLAG.
137 000070 435000 100000' IORI IOS,IODTER     ;PARITY ERROR?
138 000071 620100 001577' TRZ TAC1,DVERAS     ;YES
139 000072 727302 000000' CONSZ DF,(TAC1)
140 000073 435000 400000' ORI IOS,IOIMPM
141 000074 727200 000200' CONO DF,CLE
142 000075 326000 000107' JUMPN IOS,DSKIN2
143 000076 336000 000175' SKIPN SIOWD
144 000077 254000 000000' JRST DFINT          ;JOB DONE?
145
146
147 000100 200040 000174' MOVE TAC,SREC       ;YES, RETURN TO DEV. INDEP. ROUT.
148 000101 271040 000001' ADDI TAC,1          ;WITH ERROR FLAGS
149 000102 221040 000054' IMULI TAC,*D44
150 000103 200100 000175' MOVE TAC1,SIOWD
151 000104 720740 000400' CONSO DCB,OUT
152 000105 254000 000016' JRST DFRED1
153 000106 254000 000001' JRST DFWRT1
; AND BLOCK NUMBER

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```
154 000107          DSKIN2:
155 000107 551040 000037' HRRZI TAC,DSKCHN
156 000110 727201 010010 CONO DF,END+EIS(TAC) ;SEND END AND ENABLE FOR IDLE
157                                     ;FOLLOWING ERROR
158 000111 202000 000176' MOVEM IOS,DSKIOS ;SAVE ERROR FLAGS
159 000112 201000 401577 MOVEI IOS,IDS+DVER&S
160 000113 542000 000200' HRRM IOS,DSKCON
161 000114 263140 000000 POPJ PDP,0 ;DISMISS
162
163 000115 200000 000176' DSKIN3: MOVE IOS,DSKIOS ;PICK
164 000116 727200 000000 CONO DF,0
165 000117 254000 000077' JRST DFINT
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```

166                                     ;SET UP FOR READ AND WRITE
167
168                                     ;IFE FTCHK+FTMNP,<
169 000120 000000 000000 DFRW:  Z
170                                     >
171 000121 202100 000000 DFRW1: MOVEM TAC1,DSKX8           ;SET UP INTERRUPT LOC
172
173                                     ;CONVERT FROM LOGICAL TO PHYSICAL SECTOR NUMBER.
174                                     ;ENTER WITH LOGICAL NUMBER IN TAC
175
176 000122 202040 000177' CNVBK1: MOVEM TAC,SLBLK
177 000123 553000 000001' CNVBK2: HRRZS TAC
178                                     ;FN FTCHK,<
179 000124 313040 000000' CAMEL TAC,LBHIGH           ;LOGICAL BLOCK NUMBER IN RANGE
180                                     ;(COMPARE WITH HIGHEST LEGAL)?
181 000125 254200 000161' HALT CNVERR                 ;NO, HALT - IF CONTINUE PUSHED,
182                                     ;THEN FLAG AS DEVICE ERROR
183                                     >
184 000126 231040 000054 IDIVI TAC,*D44
185
186 000127 202040 000174' MOVEM TAC,SRECN           ;SAVE THE BLOCK NUMBER
187 000130 402000 000175' SETZM SLOWD             ;CLEAR SAVED IOWD
188 000131 242040 000006 LSH TAC,6
189 000132 270040 000002 ADD TAC,TAC1
190 000133 720600 000000 CONO DCB,0           ;INSURANCE
191 000134 727140 000001 DATAO DF,TAC           ;SEND OUT ADDRESS
192 000135 554040 000201' HLRZ TAC,IOWRD         ;WILL THIS I/O CAUSE A CHANGE
193 000136 301040 777600 CAIL TAC,-200        ; IN POSITION ARM DURING READ OR
194 000137 254000 000152' JRST CNVRK1             ; WRITE?
195 000140 275100 000054 SUBI TAC1,*D44         ;MAYBE.
196 000141 242100 000007 LSH TAC1,7
197 000142 301042 000000 CAIL TAC,(TAC1)
198 000143 254000 000152' JRST CNVBK1             ;NO, GO AHEAD AS IS.
199
200 000144 200040 000201' MOVE TAC,IOWRD          ;PUT SMALLER SIZE IN IOWD.
201 000145 506100 000201' HRLM TAC1,IOWRD
202 000146 217000 000002 MOVMS TAC1
203 000147 507000 000002 HRLS TAC1
204 000150 270040 000002 ADD TAC,TAC1
205 000151 202040 000175' MOVEM TAC,SLOWD
206
207 000152 727340 100000 CNVBK1: CONSO DF,ADT     ;ADDRESS GO OK?
208 000153 254000 000152' JRST .-1               ;WAIT FOR IT
209 000154 551040 000050' HRRZ TAC,DCBBIT
210 000155 700601 002000 CONO PI,2000(TAC)     ;TURN ON DCB CHANNEL
211 000156 205040 401577 MOVST TAC,IDS+DVERAS
212 000157 402000 000176' SETZM DSKIOS
213 000160 254020 000120' JRST @DFRW
214
215 000161 201000 200000 IFN FTCHK,<
216 000162 254000 000117' CNVERR: MOVEI IOS,IODERR ;HERE ONLY IF OPERATOR PUSHES CONTINUE AFTER HALT
                                     ;FLAG AS DEVICE ERROR
                                     >

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```

; WAIT FOR DISK TO BE TURNED ON
217
218
219 INTERNAL DISKUP
220
221 000163 402000 000121' DISKUP: SETZM DSKX8 ;ZERO THE BLKI/BLKO WORD
222 000164 200040 000044' MOVE TAC,JSRDCB ;STORE JSR EXECUTED ON BLKI/BLKO COMPLETION
223 000165 202040 000000 MOVEM TAC,DSKX9
224 000166 727300 000001 CUNSZ DF,NOPR
225 000167 254000 000166' JRST .-1
226 000170 551040 000000 HRRZI TAC,DSKBIT
227 000171 435040 000154' IORI TAC,DCBBIT
228 000172 700601 002200 CONO PI,2200(TAC)
229 000173 263140 000000 POPJ PDP,
230
231 IFN FTCHECK+FTMONP,<
232 EXTERNAL SRECN,SLOWD,DSKIOS,SLBLK,DFRW,ACSAV,DCBERR,DCBINT,IOWRD,DSKCON
233 INTERNAL DCBIN1,DFRW1
234 >
235 IFE FTCHECK+FTMONP,<
236 INTERNAL DSKCON
237 000174 000000 000000 SRECN: Z ;SAVE OF BLOCK NUMBER
238 000175 000000 000000 SLOWD: Z ;NEXT IOWD TO USE
239 000176 000000 000000 DSKIOS: Z ; ERROR FLAGS
240 000177 000000 000000 SLBLK: Z ;LOGICAL BLOCK NUMBER LAST SELECTED
241 ;CLEARED ON EACH CALL TO DFWRD OR DFRED
242
243 000200 000000 000000 DSKCON: 0
244 000201 000000 000000 IOWRD: 0
245 000202 000000 000000 DCBERR: 0
246 000203 000000 000000 ACSAV: 0
247 >
248 OPDENDU: FND
249 000204 720500 000201'
250 000205 720400 000201'

```

NO ERRORS DETECTED

PROGRAM BREAK IS 000206

OPDINT - DATA PRODUCTS DISK INTERRUPT SERVICE MACRO.V36 19:04 4-JUN-69 PAGE 19  
 SYMBOL TABLE

ACSAV	000203'	ADE	000100	ADT	100000
ALM	000040	RR	001000	CLE	000200
CME	000400	CNVBK1	000152'	CNVBK2	000123'
CNVBLK	000122'	CNVERR	000161'	DAR	002000
DCB	000204	DCBBIT	000171' EXT	DCBCHN	000027' EXT
DCBERR	000202'	DCRIN1	000033'	DCBINT	000032' INT
DCE	001000	DF	000270	DFINT	000162' EXT
DFNUM	000050	DFRED	000016' INT	DFRED1	000016'
DFRW	000120'	DFRW1	000121'	DFWRT	000001' INT
DFWRT1	000001'	DISKUP	000163' INT	DPDEND	000204'
DRLATE	000020	DSK	000270	DSKBIT	000170' EXT
DSKCHN	000107' EXT	DSKCON	000200' INT	DSKIN2	000107'
DSKIN3	000115'	DSKINT	000045' INT	DSKIOS	000176'
DSKSAV	000047' EXT	DSKX8	000163' EXT	DSKX9	000165' EXT
DVERAS	001577	EIS	000010	END	010000
ENE	000100	ERRPNT	000000 EXT	FER	000002
FTCHEC	000000 INT	FTMONP	000000 INT	FTRCHK	777777
IDS	400000	IODERR	200000 INT	IODTER	100000 INT
IOIMPM	400000 INT	IOS	000000 INT	IOWRD	000201'
JSRDCB	000044'	LBHIGH	000000' INT	LDDINT	000001' INT
MISS	010000	NOPR	000001	OUT	000400
PI8	000300	PAR	000004	PDP	000003 INT
PIOFF	000023' EXT	PION	000026' EXT	RCE	000010
RED	001000	SLOWD	000175'	SLBLK	000177'
SRECN	000174'	TAC	000001 INT	TAC1	000002 INT
VDPDIT	000401 INT	WLE	000200	WRT	002000
XMOVE	004000				







DVIN	6#	6				
DVLNG	6#	6				
DVLPT	6#	6				
DVMTA	6#	6				
DVOUT	6#	6				
DVPTP	6#	6				
DVPTR	6#	6				
DVTTY	6#	6				
EIS	37	54	77	105#	156	
END	77	174#	156			
ENE	37	54	110#			
ENTRB	6#	6				
ERRPNT	24					
F8MERR	6#	6				
FER	99#	170				
FNERR	6#	6				
FRGSEG	6#	6				
FT2REL	6#					
FTATTA	6#					
FTCHEC	6#	65	66	168	231	235
FTEXAM	6#					
FTFINI	6#					
FTGETT	6#					
FTHALT	6#					
FTKCT	6#					
FTMONP	6#	65	66	168	231	235
FTRPV	6#					
FTRA10	6#					
FTRCHK	6#	178	213			
FTREAS	6#					
FTSLEE	6#					
FTTALK	6#					
FTTIME	6#					
FTTRAC	6#					
FTTRPS	6#					
FTTTY5	6#					
HSAMSK	6#	6				
HSAPQS	6#	6				
HSASIZ	6#	6				
HUNGCT	6#	6				
HUNGST	6#	6				
I	6#	6				
IB	6#	6				
IBUFR	6#	6				
ICLOSB	6#	6				
IDS	94#	159	210			
ILM	6#					
ILUERR	6#	6				
INRFR	6#	6				
INITR	6#	6				
INPB	6#	6				
IO	6#	6				
IOACT	6#	6				





WLE	35	96#	129
WRT	37	129#	
WTMASH	6#	6	
XMOVE	61	106#	

CODES	6#		
DISARL	6#		
ENABLE	6#		
NOSCHE	6#		
NOSHUF	6#		
QUEUES	6#		
SCHEDU	6#		
SHUFFL	6#		
STARTD	6#	38	55
XP	6#	6	9