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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          LIST
6          LIST
7          TITLE MTASRX - MAGTAPE ROUTINES FOR PDP-10(TM-10) V420
8          SUBTTL T. WACHS/TH TS 20 MAY 69
9          XP      VMTASR,420      ;DEFINE VERSION NUMBER FOR LOADER STORAGE MAP
10
11
12          ENTRY MTASRX
13          MTASRX:
14
15          INTERNAL MTADSP
16
17          ;DISPATCH TABLE
18          000000 254000 000232' JRST MTAINI
19          000001 254000 000071' JRST HUNGTP ;HUNG DEVICE
20          000002 254000 000274' MTADSP: JRST MTAREL ;RELEASE
21          000003 254000 000047' JRST MTCLOS ;CLOSE
22          000004 254000 000330' JRST MTOUT
23          000005 254000 000355' JRST MTIN
24          000006 254000 000042' JRST SAVCHK ;ENTER
25          000007 254000 000042' JRST SAVCHK ;LOOKUP
26          000010 254000 000515' JRST MTDMPO
27          000011 254000 000516' JRST MTDMPI
28          000012 263140 000000' POPJ PDP, ;USET0
29          000013 263140 000000' POPJ PDP, ;USET1
30          000014 263140 000000' POPJ PDP, ;UGETF
31          000015 254000 000000' JRST CPOPJ1 ;RENAME
32          000016 263140 000000' POPJ PDP, ;CLOSE INPUT
33          000017 263140 000000' POPJ PDP, ;UTPCLR
34          000020 254000 000241' JRST MTAP0
35
36          000340 MTC=340
37          000344 MTS=344
38
39
40          ;MTACHN=FLAG CHANNEL
41          ;MTDCHN=DATA CHANNEL
42          ;MTFLAG=10*MTACHN + 400
43          ;MTBOTH=10*MTACHN+MTDCHN
44          ;MTALOC=40 + 2*MTDCHN
45          ;MTLOC1=MTALOC+1
46          INTERN MTAINI,MTADDS,MTADDB
47          EXTERN ADVBFE,ADVBFF,MTFLAG,MTBOTH,SETACT,CLRACT,WSYNC
48          EXTERN STDENS,SETION,MTREQ,MTAVAL,CLOCK,MTALOC,MTLOC1,OUT
49          EXTERN CPOPJ,CPOPJ1,PIOMOD,PUNIT,MWAIT,JIFSC2,COMCHK
50          EXTERN PIOFF,PION,MTASAV,ADRERR,PDVCNT,MTSIZ,STOIOS,IADRCK
51
52          010000 COMPAT=10000 ;IRM COMPATABLE 9-TRACK
53          200000 DMPMOD=200000 ;DUMP MODE FILE
54          400000 MTREW=400000 ;MAGTAPE IS REWINDING
55
56          000003 MTRY=3 ;NO. OF TIMES TO RETRY ON AN ERROR

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57

000073 QUANT=3

:NO. OF RECORDS TO READ UNINTERRUPTED

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58          000005  TP=DAT
59          ;DDB
60 000021 556441 200000 MTADDB: SIXBIT /MTA?/
61 000022 000036 000001 XWD +D30*HUNGST,MTS17+1
62 000023 000000 000000 ?
63 000024 000000 000002 MTADSP
64 000025 001023 154403 XWD 1023,154403
65 000026 000000 000000 ?
66 000027 000000 000000 ?
67 000030 000007 000000 XWD PROC,0
68 000031 000007 000000 XWD PROC,0
69          XP MTADDS,.-MTADDB I SIZE OF DDB (FOR BUILD)
70

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71 000032 476000 000662' ;INITIALIZE
72 000033 476000 000666' MTAINI: SETOM NMTREW ;RESET FLAGS
73 000034 402000 000670' SETOM UNIT
74 000035 402000 000573' SETZM ERRFLG
75 000036 734200 000000' SETZM REMNDR
76 000037 200040 000675' CONO MTC,0 ;TURN OFF MTC
77 000040 202040 000000' MOVE TAC,[JSR MTDEND] ;SET UP END-CONDITION
78 000041 263140 000000' MOVEM TAC,MTLOC1 ;FOR BLK1/BLK0
79 POPJ PDP,
80
81 000042 135040 000000' ;IF ENTER OR LOOKUP IN SAVE MODE - CHANGE TO MODE 16
82 000043 306040 000002' SAVCHK: LDB TAC,PIOMOD ;GET MODE
83 000044 660000 000016' CAIN TAC,2 ;SAVE MODE?
84 000045 202006 000002' TRO IOS,16 ;YES, CHANGE TO DUMP-MODE
85 000046 254000 000015' MOVEM IOS,DEVINS(DEVDAT)
86 JRST CPOPJ1 ;GIVE GOOD RETURN FROM LOOKUP/ENTER
87
88 000047 607300 004000' ;CLOSE
89 000050 263140 000000' MTCLOS: TLNN DEVDAT,OUTPB ;OUTPUT BEEN DONE?
90 POPJ PDP, ;NO, GO AWAY
91
92 000051 135040 000042' LDR TAC,PIOMOD
93 000052 305040 000016' CAIGE TAC,16 ;DUMP MODE?
94 000053 260140 000000' PUSHJ PDP,OUT ;NO, EMPTY LAST PARTIAL BUFFER
95 000054 260140 000000' PUSHJ PDP,WSYNC ;WAIT FOR IO TO STOP
96 000055 201600 000003' MOVEI UUO,3 ;WRITE 2 ENDS-OF FILE
97 000056 260140 000245' PUSHJ PDP,MTAP1
98 000057 602000 400000' TRNE IOS,IOIMPM ;WRITE LOCK?
99 000060 263140 000000' POPJ PDP, ;YES! RETURN
100 000061 260140 000000' PUSHJ PDP,SETACT
101 000062 260140 000054' PUSHJ PDP,WSYNC
102 000063 201600 000003' MOVEI UUO,3
103 000064 260140 000245' PUSHJ PDP,MTAP1
104 000065 260140 000061' PUSHJ PDP,SETACT
105 000066 260140 000062' PUSHJ PDP,WSYNC
106 000067 201600 000007' MOVEI UUO,7 ;AND BACKSPACE OVER ONE OF THEM
107 000070 254000 000245' JRST MTAP1
108
109 000071 627000 400000' HUNGTP: TLZN IOS,NMTREW ;TAPE REWINDING?
110 000072 254000 000416' JRST THRUTP ;NO, GIVE UP CONTROL
111 000073 370000 000662' SOS NMTREW ;YES, DECREASE COUNT OF TAPES IN REW
112 000074 350000 000000' AOS NMTREQ ;THRUTP WILL SOS THIS BACK
113 000075 254000 000416' JRST THRUTP ;TURN OFF TM10

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111 ;CONNECT CONTROL TO A TRANSPORT
112 000076 201040 440102 CONECT: MOVEI TAC,440102 ;SET UP INTERRUPT CONDITIONS
113 000077 542040 000365' HRRM TAC,MTAINT
114 000100 542300 000663' HRRM DEVDAT,USEWRD ;SAVE DEVDAT FOR INTERRUPT
115 000101 135240 000000 LDS TP,PUNIT ;GET UNIT
116 000102 316240 000666' CAMN TP,UNIT ;ALREADY CONNECTED TO IT?
117 000103 254000 000116' JRST CNECT3 ;YES
118 000104 242240 000017 LSH TP,17 ;NO. SET FOR CONO
119 000105 734700 000002 CONSZ MTS,2 ;CONTROL FREE?
120 000106 254000 000112' JRST CNECT2 ;YES. DO A NO-OP CONO
121 000107 660240 000000 TRO TP,MTFLAG ;NO. SET CONTROL FREE ENABLE
122 000110 607000 400000 TLNN IOS,MTREW ;CONNECTING TO A REWINDING TAPE?
123 000111 260140 000122' PUSHJ PDP,CNECT4 ;NO,CHANGE RETURN
124 000112 506240 000663' CNECT2: HRLM TP,USEWRD ;MIGHT NEED ON INTERRUPT LEVEL
125 000113 734205 000000 CONO MTC,(TP) ;CONO TO MTC
126 000114 242240 000003 LSH TP,3 ;SAVE UNIT
127 000115 556240 000666' HLRZM TP,UNIT
128 000116 325000 000666' CNECT3: JUMPGE IOS,WSYNC ;WAIT FOR DEV TO FREE IF NOT REWINDING
129 000117 606240 004000 TRNN TP,4000 ;REWINDING. CONTROL FREE ENABLE?
130 000120 350003 AOS (PDP) ;NO. SKIP RETURN
131 000121 263140 000000 POPJ PDP, ;YES. IMMEDIATE RETURN
132 000122 201040 000127' CNECT4: MOVEI TAC,TPREDY ;SET TO TRY CONTROL
133 000123 542043 777777 HRRM TAC,-1(PDP) ;AGAIN WHEN INACTIVE
134 000124 254000 000065' JRST SETACT ;SET DEVICE ACTIVE
135
136
137 ;DELAY TILL TAPE COMES OUT OF IO WAIT, THEN GET CONTROL
138 000125 476000 000000 DLYRDY: SETOM MTAVAL
139 000126 260140 000116' PUSHJ PDP,WSYNC ;WAIT FOR IO TO STOP
140
141
142 ;GET MTC, CONECT TAPE TO CONTROL
143 000127 352000 000074' TPREDY: AOSE MTREQ ;GET CONTROL
144 000130 260140 000000 PUSHJ PDP,MTWAIT ;WAIT FOR IT
145 000131 201040 000023 MOVEI TAC,QUANT ;SET QUANTUM TIME
146 000132 202040 000671' MOVEM TAC,QUANTM
147 000133 202340 000664' TPRDY2: MOVEM PROG,USEPRG
148 000134 260140 000076' PUSHJ PDP,CONECT ;CONECT CONTROL TO TAPE
149
150
151 ;SET TP FOR THIS TAPE
152 000135 135240 000676' TPSET: LDR TP,[POINT 2,IOS,28] ;PARITY
153 000136 336000 000005 TP SKIPN TP ;USE STANDARD IF 0
154 000137 201240 000000 MOVEI TP,STDENS ;NOT SPECIFIED, USE STANDARD FOR SYS.
155 000140 370000 000005 SOS TP ;SET TO USFR'S REQUEST
156 000141 242240 000006 LSH TP,6
157 000142 606000 001000 TRNN IOS,IOPAR ;PARITY
158 000143 660240 040000 TRO TP,4000 ;ODD
159 000144 200100 000666' MOVE TAC1,UNIT ;UNIT
160 000145 137100 000677' DPR TAC1,[POINT 3,TP,20] ;INTO COMMAND
161 000146 660240 000000 TRO TP,MTBOTH ;PI CHANNELS
162 000147 201040 000003 MOVEI TAC,MTTRY ;SET ERROR COUNT
163 000150 212040 000667' MOVNM TAC,ERCNT

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MTASRX - MAGTAPE ROUTINES FOR PDP-10(TM-10) V420
T. WACHS/TH TS 20 MAY 69

MACRO.V36 19108 4-JUN-69 PAGE 16-1

164	000151	734700	000004	CONSE	MTS,4	17 OR 9 TRACK?
165	000152	254200	000156	JRST	RDYCHK	17 TRACK
166	000153	607000	010000	TLNN	IOS,COMPAT	19 TRACK, CORE DUMP?
167	000154	664240	020000	TRCA	TP,20000	1YES
168	000155	660240	040300	TRC	TP,40300	INO. SET 600 BPI, ODD PARITY

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169                                     ;MAKE SURE TAPE IS READY
170 000156 734720 000240 RDYCHK: CONS? MTS,40          ;READY?
171 000157 263140 000200      POPJ PDP,                ;YES
172 000160 734740 200200      CONS0 MTS,200200         ;REWINDING?
173 000161 263140 000200      POPJ PDP,                ;NO. LET XPORT HUNG INTERRUPT HANDLE IT
174
175 000162 661000 400000      TLO IOS,MTRW             ;YES. MUST BE REWINDING
176 000163 260140 000124'    PUSHJ PDP,SETACT         ;DEVICE ACTIVE
177 000164 350000 000662'    AOS MTRW                 ;BUMP COUNT OF REWINDING DRIVES
178 000165 371000 000127'    SOSL MTRW                 ;LET SOMEONE ELSE USE TAPES
179 000166 254000 000125'    JRST DLYRDY              ;NOONE ELSE WANTS CONTROL
180 000167 260140 000231'    PUSHJ PDP,CLOCKRQ        ;PUT IN A TIME REQUEST
181 000170 254000 000126'    JRST DLYRDY+1             ;AND WAIT

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182 000171 000172' 000000' MTCLOCK: XWD      ,+1,JIFSC2
183 000172 402000 000665'      SETZM    CLKREQ      ;INDICATE NO CLOCK REQUEST IN NOW
184 000173 331000 000165'      SKIPL    MTREQ      ;CONTROL FREE?
185 000174 263140 000000'      POPJ      POP,        ;NO. COME BACK LATER
186 000175 476000 000662' MTCLOCK2: SETOM   NMTREW      ;COUNT NO. OF TAPES REWINDING
187 000176 202300 000240'      MOVEM    DEVDAT,SAVDEV
188 000177 201300 000021'      MOVEI    DEVDAT,MTADDR   ;START AT MTA0
189 000200 350000 000173'      AOS      MTREQ      ;MAKE SURE NO OTHER MTA REQUESTS ARE HONORED NOW
190 000201 200006 000002'      REWCHK: MOVE    IOS,DEVIOS(DEV DAT)
191 000202 325000 000220'      JUMPGE   IOS,REWCK2    ;TAPE NOT REWINDING
192 000203 260140 000076'      PUSHJ    PDP,CONNECT ;REWINDING - CONNECT TO IT
193 000204 263140 000000'      POPJ      POP,        ;CONTROL NOT FREE NOW - RETURN ON INTERRUPT LEVEL
194 000205 734740 000040'      REWCKA: CONSO   MTS,40      ;STILL REWINDING?
195 000206 254000 000214'      JRST     REWCK1      ;YES
196 000207 623000 000001'      TLZE     IOS,IOSW    ;NO. TAKE OUT OF IO WAIT
197 000210 260140 000000'      PUSHJ    PDP,SETIOD
198 000211 621000 400000'      TLZ      IOS,MTREW
199 000212 260140 000000'      PUSHJ    PDP,CLRACT   ;NO LONGER ACTIVE
200 000213 254000 000220'      JRST     REWCK2

201 000214 350000 000662'      REWCK1: AOS      NMTREW      ;COUNT REWINDING TAPE
202 000215 201040 000036'      MOVEI    TAC,36
203 000216 734700 200000'      CONSZ    MTS,200000 ;IF TAPE IS STILL REWINDING
204 000217 137040 000000'      DPR      TAC,PDCNT   ;MAKE SURE IT DOESN'T GET A HUNG DEVICE
205 000220 554306 000003'      REWCK2: HLRZ    DEVDAT,DEVSER(DEV DAT) ;NEXT DEVICE
206 000221 554046 000000'      HLRZ    TAC,DEVNAM(DEV DAT) ;A MAG TAPE?
207 000222 306040 556441'      CAIN     TAC,(SIXBIT ,MTA.)
208 000223 254000 000201'      JRST     REWCHK    ;YES. CHECK IT
209 000224 200300 000240'      MOVE     DEVDAT,SAVDEV ;PICK UP DEV DAT AGAIN
210 000225 371000 000200'      SOSL     MTREQ      ;FREE MTASER AGAIN
211 000226 476000 000125'      SETOM    MTAVAL     ;SOMEONE WAITING FOR CONTROL
212 000227 335000 000662'      SKIPGE   NMTREW      ;ANY TAPE REWINDING?
213 000230 254000 000436'      JRST     THRUT3    ;NO
214

215 000231 200040 000171'      CLOKRO: MOVE    TAC,MTCLOCK ;PUT A CLOCK REQUEST IN
216 000232 700600 000000'      CONO     PI,PIOFF   ;HAVE MONITOR WAKE UP
217 000233 331000 000665'      SKIPL    CLKREQ      ;IF NO CLOCK REQUEST IN ASK TO WAKE UP
218 000234 136040 000000'      IDPB     TAC,CLOCK   ;IN HALF A SECOND
219 000235 476000 000665'      SETOM    CLKREQ      ;NOW WE HAVE ONE
220 000236 700600 000000'      CONO     PI,PION
221 000237 254000 000436'      JRST     THRUT3
222 000240 000000 000000'      SAVDEV: ?      ;TEMPORARY STORAGE FOR DEV DAT

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223      ;MTAPE
224      000241 602600 000100 MTAP0: TRNE U00,100      ;SETTING 7 TRACK MODE?
225      000242 254000 000272' JRST SET9TK          ;YES
226
227      000243 620000 776000 MTAP: TRZ IOS,776000      ;TURN OFF ERROR BITS
228      000244 202006 000002 MOVEM IOS,DEVIOS(DEVDAT) ;SAVE IOS
229      000245 260140 000127' MTAP1: PUSHJ PDP,TPRENY    ;GET CONTROL FOR THIS TAPE
230      000246 620240 000007 MTAP3: TRZ TP,7           ;NO DATA TRANSFER
231      000247 405600 000017 ANDI U00,17             ;GET FUNCTION
232      000250 241600 777777 ROT U00,-1              ;TRANSLATE FROM TABLE
233      000251 331000 000014 SKIPL U00
234      000252 334054 000320' SKIPA TAC,MTPTBL(U00)
235      000253 554054 000320' HLRZ TAC,MTPTBL(U00)
236      000254 622040 000100 TRZE TAC,100             ;MOVE TAPE BACKWARD?
237      000255 734740 100000 CONSO MTS,100000         ;YES, TAPE AT LOAD POINT?
238      000256 606040 777777 TRNN TAC,-1              ;FOR NO-OP?
239      000257 254000 000413' JRST THRUTA              ;YES, GO CHECK FOR BOT
240      000260 622040 000200 TRZE TAC,200             ;SKIP TO LOGICAL EOT?
241      000261 254000 000276' JRST LEOT                ;YES
242      000262 626040 000400 TRZN TAC,400 ;TRY TO WRITE TAPE?
243      000263 254000 000266' JRST MTAG0              ;NO.
244      000264 734770 000010 CONSZ MTS,10             ;YES, WRITE LOCKED?
245      000265 254000 000611' JRST ILL0P              ;YES, LIGHT ERROR BIT
246      000266 137040 000700' MTAG0: DPB TAC,(POINT 4,TP,26) ;PUT FUNCTION INTO COMMAND
247      000267 506240 000663' HRLM TP,USEWRD          ;SAVE COMMAND
248      000270 734205 000000 CONO MTC,(TP)            ;START TAPE MOVING
249      000271 254000 000212' JRST CLRACT              ;AND RETURN
250
251
252      ;SET 9-TRACK TAPE
253      000272 602600 000001 SET9TK: TRNE U00,1
254      000273 665000 010000 TLOA IOS,COMPAT          ;SET IBM COMPAT.
255      000274 621000 010000 MTAREL: TLZ IOS,COMPAT     ;NOT IBM COMPAT
256      000275 254000 000000 JRST STOIOS
257      ;SKIP TO LOGICAL EOT
258      000276 734700 100000 LEOT: CONSZ MTS,100000     ;TAPE AT BOT?
259      000277 254000 000302' JRST LEOT2              ;YES, DONT BACKSPACE
260      000300 260140 000266' PUSHJ PDP,MTAG0          ;BACKSPACE RECORD
261      000301 260140 000315' PUSHJ PDP,EOTWT         ;WAIT FOR IT
262      000302 201600 000016 LEOT2: MOVEI U00,16       ;SKIP A FILE
263      000303 260140 000313' PUSHJ PDP,MTAP2
264      000304 201600 000006 MOVEI U00,6              ;SKIP A RECORD
265      000305 260140 000243' PUSHJ PDP,MTAP
266      000306 260140 000315' PUSHJ PDP,EOTWT         ;WAIT FOR IT
267      000307 200006 000002 MOVE IOS,DEVIOS(DEVDAT)
268      000310 606000 020000 TRNN IOS,I00END          ;END OF FILE SEEN?
269      000311 254000 000302' JRST LEOT2              ;NO. SKIP TO NEXT FILE
270      000312 201600 000007 MOVEI U00,7              ;YES, BACKSPACE RECORD
271
272      000313 260140 000133' MTAP2: PUSHJ PDP,TPRDY2
273      000314 254000 000246' JRST MTAP3
274      ;WAIT FOR TAPE TO FINISH, MTRQ WILL COUNT DOWN AT END OF OPERATION
275      000315 352000 000225' EOTWT: AOSE MTRQ

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MTASRX - MAGTAPE ROUTINES FOR PDP-10(TM-12) V420
T. WACHS/TH TS 27 MAY 69

MACRO.V36 19:08 4-JUN-69 PAGE 19-1

276	000316	260140	000130'	PUSHJ	PDP,MTWAIT	WAIT TILL MTREQ IS COUNTED DOWN
277	000317	260140	000000	PDPJ	PDP,	

278	000320	000111	000000	MTPTL: XWD	101,0	IREW,NOP
279	000321	000405	000000	XWD	405,0	IWRITE EOF,
280	000322	000000	000000	XWD	0,0	
281	000323	000117	000000	XWD	107,6	IBACKSPACE REC,SKIP REC
282	000324	000111	000000	XWD	111,207	IREW,UNLOAD,LOG EOT
283	000325	000415	000000	XWD	415,0	IWRITE BLANK TAPE,
284	000326	000000	000000	XWD	0,0	
285	000327	000117	000016	XWD	117,16	IBACK FILE,SKIP FILE

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286                                     ;OUTPUT UUD
287 000330 260140 000127' MTOUT: PUSHJ PDP,TPREDY ;GET CONTROL, SETUP TP
288 000331 734720 000010 CONSZ MTS,10 ;WRITE LOCK?
289 000332 254020 000611' JRST TLLOP ;YES, SET IOIMPM AND RETURN
290 000333 734720 004000 CONSZ MTS,4000 ;EOT?
291 000334 664000 042000 TROA IOS,IOTEND+IOBKT ;YES, LIGHT BIT
292 000335 665000 000020 TLQA IOS,IO ;NO, INDICATE OUTPUT
293 000336 254020 000454' JRST ADVOUT ;DONE IF EOT
294 000337 201066 000010 MTOUT1: MOVEI TAC,@DEVIAD(DEV DAT) ;ADDRESS OF BUFFER
295 000340 210101 000001 MOVN TAC1,1(TAC) ;WORD COUNT
296 000341 504040 000002 HRL TAC,TAC1 ;IN LH OF COMMAND
297 000342 347040 000454' AOJG TAC,ADVOUT ;SKIP IF 0 WORDS
298 000343 660240 004000 MTOUT2: TRO TP,4000 ;FUNCTION = WRITE
299 000344 205120 734100 MOVSI TAC1,(BLKI MTC,) ;SETUP BLKI
300 000345 202040 000673' MDTG0: MOVEM TAC,PNTR ;SAVE BLKI/BLKI POINTER
301 000346 202040 000674' MOVEM TAC,SVNTR
302 000347 541100 000673' HRRJ TAC1,PNTR ;BLKI/BLKI PNTR
303 000350 202100 000000 MOVEM TAC1,MTALOC ;INTO INTERRUPT LOC
304 000351 506240 000643' HKLM TP,USEWRD ;SAVE COMMAND

305 000352 734225 000000 CONO MTC,(TP) ;START TAPE MOVING
306 000353 660020 010000 TRO IOS,IOACT ;SETACT CLEARS IOW
307 000354 254020 000275' JRST STOIOS ;STORE IOS AND RETURN
308
309                                     ;INPUT UUD
310 000355 260140 000127' MTIN: PUSHJ PDP,TPREDY ;SETUP TP FOR THIS DRIVE
311 000356 621000 000020 TLZ IOS,IO ;INPUT
312 000357 460066 000007 MTIN1: SETCM TAC,@DEVIAD(DEV DAT) ;LARGEST POSSIBLE WRD CNT
313 000360 541066 000007 HRRJ TAC,@DEVIAD(DEV DAT) ;STARTING ADDRESS
314 000361 270040 000701' ADD TAC,FXWD 2,1 ;MAKE REAL IOWD
315 000362 660240 002000 MTIN2: TRO TP,2000 ;FUNCTION = READ
316 000363 205120 734000 MOVSI TAC1,(BLKI MTC,) ;SETUP BLKI
317 000364 254020 000345' JRST MDTG0 ;GO START TAPE
318

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319	000365	734740	440102	MTAINT: CONSO	MTS,440102	INTERRUPT FOR MAG TAPE?
320	000366	254000	000366	JRST	.	NO. GO AWAY
321	000367	734340	000400	CONSO	MTS,440100	WAS CONTROL FREE ENABLED?
322	000370	734700	440100	CONSO	MTS,440100	NO. CONTROL FREE ERRONEOUSLY ON?
323	000371	254000	000373	JRST	MTAINT+1	REAL MTA INTERRUPT
324	000372	254000	000366	JRST	MTASAV	THIS INTERRUPT NOT REALLY FOR MTA
325	000373	264000	000000	JSR	DEV DAT,USEWRD	YES. SAVE ACS
326	000374	590300	000663	HRRF	IOS,DEV IOS(DEV DAT)	RESET DEV DAT
327	000375	200006	000002	MOVE	IOS,REWCKA	AND IOS
328	000376	321000	000205	JUMPL	PROG,USEPRG	CONTROL FREE INTERRUPT ON A REW. TAPE
329	000377	200340	000664	MOVE	TAC,ERRFLG	BACKSPACE FROM ERROR?
330	000400	332040	000670	SKIPF	TRYAGN	YES. REISSUE COMMAND
331	000401	254000	000625	JRST	CONSO	ERROR?
332	000402	734700	440000	CONSO	MTS,440000	YES. ILLEGAL OP OR HUNG DEVICE
333	000403	254000	000602	JRST	ERROR	DATA OPERATION?
334	000404	734300	000007	CONSO	MTS,100000	YES
335	000405	254000	000446	JRST	TP,CPOINT 4,USEWRD,81	GET FUNCTION
336	000406	135240	000702	LDR	TP,6	SKIPPING A RECORD?
337	000407	306240	000006	CAIN	CONSO	YES. SEEN AN EOF?
338	000410	734740	010000	CONSO	MTS,100000	NO.
339	000411	334000	000000	SKIPF	TRO	YES. TURN ON EOF BIT
340	000412	660000	020000	TRO	MTS,300000	NO. BOT OR REWINDING?
341	000413	734700	300000	THRUTA: CONSO	TROA	YES. SET BOT RIT FOR USER TO SEE
342	000414	664000	004000	TROA	TRF	NO. TURN OFF BOT RIT
343	000415	620000	004000	TRF	MTS,4000	NO. EOT?
344	000416	734700	004000	THRUTP: CONSO	TRO	YES
345	000417	660000	002000	TRO	TLZE	JOB IN IO WAIT?
346	000420	620000	000001	TLZE	IOS,10W	YES. TAKE IT OUT
347	000421	260140	000210	PUSHJ	PDP,SET100	
348	000422	621000	000000	TLZ	IOS,DMPMOD	
349	000423	260140	000271	PUSHJ	PDP,CLRACT	
350						CONTROL FREE INTERRUPT?
351						YES. DONT COUNT DOWN MTRQ
352	000424	375000	000315	SOSGE	MTREQ	COUNT DOWN REQUEST COUNT
353	000425	254000	000434	JRST	THRUT2	NOONE ELSE WAITING
354	000426	331000	000662	SKIFL	NMTREW	IF THERE ARE TAPES REWINDING
355	000427	332000	000665	SKIPF	CLKREQ	WHICH HAVEN'T BEEN CHECKED IN
356	000430	334000	000000	SKIPF		MORE THAN 1/2 A SECOND
357	000431	254000	000175	JRST	MTCLK2	GO CHECK THEM NOW
358	000432	476000	000226	SETOM	MTAVAL	SOMEONE ELSE WANTS IT
359	000433	254000	000436	JRST	THRUT3	DISMISS INTERRUPT AND RETURN

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360                                     ;HERE WHEN CONTROL IS ALL DONE, CHECK ON REWINDING TAPES IF NEEDED
361 000434 331000 000662' THRUT2: SKIPL  NMTREW          ;ANY DRIVES REWINDING?
362 000435 254000 000175'          JRST  MCLK2          ;YES, CHECK IF ANY THROUGH
363 000436 554240 000663' THRUT3: HLRZ   TP,USEWRD      ;GET UNIT
364 000437 620240 017777          TRZ    TP,17777       ;MASK OUT FUNCTION
365 000440 734205 000000          CONO   MTC,(TP)       ;DISMISS INTERRUPT
366 000441 513000 000365'          HLLZS  MTAINT        ;DONT LOOK AT ANY MORE INTERRUPTS
367 000442 263140 000000          POPJ   PDP,           ;AND EXIT
368
369
370                                     ;HERE WHEN BLKI/BLKO COUNTS DOWN TO ZERO
371 000443 000000 000000  MTDEND: 0
372 000444 734600 000001          CONO   MTS,1          ;GIVE A FUNCTION STOP
373 000445 254520 000443'          JEN    @MTDEND        ;AND EXIT

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374 000446 734700 000600 DATEND: CONSZ MTS,20600 IRECORD OK?
375 000447 254000 000614 JRST RETRY IPARITY, DATA LATE OR BAD TAPE
376 000450 603000 000620 DATND2: TLNE IOS,OMPMOD IJUMP MODE?
377 000451 254000 000627 JRST CMPEND IYES
378 000452 607000 000620 TLNN IOS,IO IREADING?
379 000453 254000 000626 JRST INPTND IYES, FINISH INPUT
380 000454 260140 000620 ADVOUT: PUSHJ PDP,ADVBFEE IWRITING, ADVANCE BUFFERS
381 IEND OF TAPE?
382 000455 254000 000616 JRST THRUTP IYES, DONT WRITE ANY MORE
383 000456 623000 000621 NXTREC: TLNE IOS,IOX IIN IO WAIT?
384 000457 260140 000621 PUSHJ PDP,SETIOD IRESTART JOB
385 000460 377000 000671 SOSG QUANTM ICOUNT DOWN PROTECT TIME
386 000461 337000 000624 SKIPG NTREQ IANYONE ELSE WANT CONTROL?
387 000462 734700 000600 CONSZ MTS,4000 INO. KEEP GOING UNLESS EOT
388 000463 254000 000616 JRST THRUTP IYES, GIVE UP CONTROL
389 000464 211040 000603 MOVNI TAC,MTTRY IRESET ERROR COUNT
390 000465 202040 000667 MOVEM TAC,ERCNT
391 000466 554240 000663 HLRZ TP,USEWRD IPICK UP COMMAND
392 000467 603000 000620 TLNE IOS,IO IAND DO NEXT RECORD
393 000470 254000 000637 JRST MTOUT1
394 000471 554066 000607 HLRZ TAC,0DEVIAD(DEV DAT) IPICK MAX. SIZE OF BUFFER
395 000472 271066 000607 ADDI TAC,0DEVIAD(DEV DAT) IADD IN FIRST ADDRESS
396 000473 260140 000600 PUSHJ PDP,IADRCK ICHECK IT'S O.K.
397 000474 254000 000616 JRST THRUTP INO - RELEASE CONTROL
398 000475 254000 000635 JRST MTIN1 IO.K, DO NEXT INPUT,
399
400 IHERE WHEN THROUGH AN INPUT RECORD
401 000476 734700 001000 INPTND: CONSZ MTS,10000 IEOF?
402 000477 254000 000612 JRST DATEOF IYES
403 000500 201066 000607 MOVEI TAC,0DEVIAD(DEV DAT) ISTART OF RECORD
404 000501 550100 000673 HRRZ TAC1,PNTX IWHERE WE ARE NOW
405 000502 275101 000601 SUBI TAC1,1(TAC) ILAST LOC-FIRST LOC
406 000503 542101 000601 HRRM TAC1,1(TAC) I=WORD COUNT
407 000504 260140 000600 PUSHJ PDP,ADVBFEE IADVANCE BUFFERS
408 000505 254000 000616 JRST THRUTP INONE FREE
409 000506 254000 000656 JRST NXTREC ICONTINUE WITH NEXT RECORD
410
411
412 IHERE AT THE END OF A DUMP MODE RECORD
413 000507 554240 000663 DMPEND: HLRZ TP,USEWRD ISET UP COMMAND AGAIN
414 000510 734740 014000 CONSO MTS,14000 IEOF OR EOT?
415 000511 254000 000537 JRST DMPBLK INO,GET NEXT COMMAND
416 000512 734740 004000 CONSO MTS,4000 IEOF?
417 000513 660000 020000 TRO IOS,IOEND IYES,SET EOF BIT
418 000514 254000 000616 JRST THRUTP IAND RETURN TO USER

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419 000515 665000 000020 MTDMPI: TL0A IOS,IO IDUMP OUTPUT
420 000516 621000 000020 MTDMPI: TL7 IOS,IO IDUMP INPUT
421 000517 505600 000027 HRLI U00,PROG
422 000520 260140 000000 PUSHJ PDP,COMCHK ICHECK VALIDITY OF LIST
423 000521 254000 000000 JRST ADRERR INOT VALID
424 000522 261140 000000 PUSH PDP,IOS IWSYNC WILL Clobber IOS
425 000523 260140 000127' PUSHJ PDP,TPREBY IGET CONTROL, SETUP TP
426 000524 262140 000000 POP PDP,IOS
427 000525 603000 000000 TLNE IOS,IO ICHECK WRITE LOCK
428 000526 734740 000010 CONSO MTS,4010 IAND EOT IF WRITING
429 000527 254000 000034' JRST MTDMPI2
430 000530 734740 000000 CONSO MTS,4000 IERROR
431 000531 664000 400000 TR0A IOS,IOIMPM IWRITE LOCK
432 000532 660000 000000 TR0 IOS,IOTEND+IOBKTL IEOT
433 000533 254000 000016' JRST THRUTP IGIVE UP TAPE AND RETURN
434 000534 661000 200000 MTDMPI2: TL0 IOS,DMPMOD IINDICATE DUMP-MODE
435 000535 370000 000014 SOS U00 IWILL COUNT IT UP LATER
436 000536 202600 000672' MOVEM U00,LSTLOC ISAVE LOC OF LIST
437 000537 260140 000546' DMPBLK: PUSHJ PDP,NXTCOM IGET NEXT COMMAND

438 000540 271047 000000 ADDI TAC,(PROG) IADD RELOCATION FACTOR
439 000541 603000 000020 TLNE IOS,IO IWRITING?
440 000542 254000 000343' JRST MTOUT2 IYES, GO WRITE RECORD
441 000543 606000 000001 TRMN IOS,1
442 000544 660240 012000 TR0 TP,10000 IOR - READ ACROSS RECORD BOUNDARIES
443 000545 254000 000362' JRST MTIN2 IGO READ RECORD(S)
444
445 000546 332040 000573' NXTCOM: SKIPE TAC,REMNRD IPARTIAL IOWD LEFT TO DO?
446 000547 254000 000562' JRST NXTCM3 IYES, CONTINUE WITH IT
447 000550 354040 000672' ACSA TAC,LSTLOC IGET NEXT COMMAND LOC
448 000551 542040 000672' HRRM TAC,LSTLOC
449 000552 200060 000001 MOVE TAC,ATAC IPICK UP COMMAND
450 000553 321040 000557' JUMPL TAC,NXTCM2 IREAL COMMAND
451 000554 327040 000547' JUMPR TAC,NXTCOM+1 IGO-TO-WORD
452 000555 262140 000001 POP PDP,TAC I0 - THROUGH
453 000556 254000 000416' JRST THRUTP
454
455
456 000557 603000 000020 NXTCM2: TLNE IOS,IO IWRITING?
457 000560 602000 000001 TRNE IOS,1 IYES, MODE 16?
458 000561 263140 000000 POPJ PDP, INO, USE IOWD AS OBTAINED
459 000562 574100 000001 NXTCM3: HLRE TAC1,TAC IYES, GET WORDCOUNT
460 000563 402000 000573' SETZM REMNRD
461 000564 311100 000574' CAML TAC1,MTSZ IRECORD TOO LARGE?
462 000565 263140 000000 POPJ PDP, INO, GO WRITE
463 000566 270040 000703' ADD TAC,[XWD MTSZ,MTSZ] IYES,
464 000567 202040 000573' MOVEM TAC,REMNRD IOWD TO USE FOR NEXT RECORD
465 000570 275040 000000 SUBI TAC,MTSZ IADDRESS FOR THIS IOWD
466 000571 505040 000000 HRLI TAC,MTSZ IWRITE -MTSZ WORD RECORDS
467 000572 263140 000000 POPJ PDP, IRETURN THE IOWD
468 000573 200000 000000 REMNRD: 0
469 000574 777777 000571' MTSZ: YWD -1,MTSZ INEG. OF RECORD SIZE IN WORDS

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470 000575 260140 000436' MTHUNG: PUSHJ PDP,THRUT3 ;TURN OFF ERROR PI BIT
471 000576 260140 000163' PUSHJ PDP,SETACT ;TURN ON IOACT
472 000577 201040 000001' MOVEI TAC,1 ;SET HUNG-TIME TO 1 MORE TICK
473 000600 137040 000217' DPR TAC,P0VCNT ;SET HUNG TIME
474 000601 263140 000000' POPJ PDP, ;AND EXIT
475
476
477 000602 734700 400000' ERROR: CONSZ MTS,400000 ;HUNG DEVICE?
478 000603 254000 000575' JRST MTHUNG ;YES
479
480 ;ILLEGAL OP INTERRUPT
481 000604 606000 010000' TRNN IOS,IOACT ;DATA OPERATION?
482 000605 254000 000611' JRST ILLOP ;NO, LIGHT ERROR BIT, GIVE UP CONTROL
483 000606 660000 400000' TRN IOS,IOIMPM ;YES, LIGHT IOIMPM
484 000607 202000 000002' MOVEM IOS,DEVIO(DEV DAT) ;SINCE DEVICE IS STILL ACTIVE
485 000610 254000 000434' JRST THRUT2 ;COUNT DOWN MREQ ON HUNG CALL
486
487 000611 664000 400000' ILLOP: TROA IOS,IOIMPM
488 000612 661000 000040' DATEOF: TLO IOS,IOEND ;EOF - LIGHT BIT
489 000613 254000 000416' JRST THRUTP ;AND GIVE UP CONTROL
490
491 ;TRY AGAIN ON PARITY ERROR OR BAD TAPE
492 000614 606000 000100' RETRY: TRNN IOS,IONRCK ;WANT TO STOP ON ERROR?
493 000615 351040 000667' AOSL TAC,ERCNT ;OR TRIED ENOUGH?
494 000616 254000 000644' JRST PERMER ;YES, PERMANENT ERROR
495 000617 201040 000002' RETRY1: MOVEI TAC,2 ;SET RETRY SWITCH
496 000620 202040 000670' MOVEM TAC,ERRFLG
497 000621 554240 000663' RETRY2: HLRZ TP,USEWRD ;PICK UP COMMAND
498 000622 405240 760770' ANDI TP,760770 ;SET FOR BACKSPACE
499 000623 734205 007000' CONO MTC,7000(TP) ;BACKSPACE RECORD
500 000624 263140 000000' POPJ PDP, ;AND GO AWAY
501
502 ;COME HERE AFTER BACKSPACE IS THROUGH
503 000625 363040 000636' TRYAGN: SOJLE TAC,TRYSKP ;GO IF NOT 2ND BACKSPACE
504 000626 734740 100000' CONSO MTS,100000 ;BOT?
505 000627 254000 000620' JRST RETRY2-1 ;NO, BACKSPACE AGAIN
506 000630 ;TRYNXT: ;READ RECORD AGAIN
507 000630 200040 000674' MOVE TAC,SVPNTR ;RESET POINTER
508 000631 202040 000673' MOVEM TAC,PNTR
509 000632 554240 000663' HLRZ TP,USEWRD ;GET COMMAND
510 000633 734205 000000' CONO MTC,(TP) ;EXECUTE IT AGAIN
511 000634 402000 000670' SETZM ERRFLG
512 000635 263140 000000' POPJ PDP, ;AND GO AWAY
513
514 ;HERE AFTER 2ND BACKSPACE OR SKIP AFTER ERROR
515 000636 321040 000630' TRYSKP: JUMPL TAC,TRYNXT ;AFTER FORWARD SKIP IF NEGATIVE
516 000637 554240 000663' HLRZ TP,USEWRD ;AFTER 2ND BACKSPACE - SKIP A RECORD
517 000640 405240 760770' ANDI TP,760770
518 000641 734205 000000' CONO MTC,6000(TP) ;SKIP A RECORD
519 000642 476000 000670' SETOM ERRFLG ;INDICATE FORWARD SKIP
520 000643 263140 000000' POPJ PDP, ;AND GO AWAY

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521 000644 603000 000020 PERMR: TLAE IOS,IO ;READING?
522 000645 602000 000120 TRAE IOS,IONRCK ;NO RECOVERY WANTED?
523 000646 254000 000655 JRST SETIOS ;REALLY PERMANENT
524 000647 303040 000100 GAILF TAC,1000 ;TRIED TO REWRITE 100 TIMES
525 000650 254000 000655 JRST SETIOS ;YES, REALLY PERMANENT
526 000651 327040 000621 JUMPG TAC,RETRY2 ;TRY WRITING WITH 3 INCHES OF
527 000652 205040 010000 MOVSI TAC,10000 ;BLANK TAPE TO ERASE BAD SPOT
528 000653 436040 000663 ORM TAC,USEWRD ;SET COMMAND TO 14 (FROM 4)
529 000654 254000 000617 JRST RETRY1 ;AND TRY AGAIN
530
531 000655 734700 000400 SETIOS: CONSZ MTS,400 ;DATA MISSED OR BAD TAPE?
532 000656 660000 200000 TRO IOS,100ERR ;YES
533 000657 734700 020200 CONSZ MTS,20200 ;PARITY ERROR?
534 000660 660000 100000 TRO IOS,100TER ;YES
535 000661 254000 000450 JRST DATN02 ;SAVE ERROR WORD AND GO AWAY
536 000662 000000 000000 NMTREW: 0
537 000663 000000 000000 USEWRD: 0
538 000664 000000 000000 USEPRG: 0
539 000665 000000 000000 CLKREQ: 0

540 000666 000000 000020 UNIT: 0
541 000667 000000 000030 FRCNT: 0
542 000670 000000 000000 ERRFLG: 0
543 000671 000000 000000 QUANTM: 0
544 000672 000000 000000 LSTLOC: 0
545 000673 000000 000000 PNTR: 0
546 000674 000000 000000 SVPNTR: 0
547 000675 MTAEEND: END
548 000675 264000 000443
549 000676 270200 000000
550 000677 170300 000005
551 000700 110400 000005
552 000701 000002 000001
553 000702 330400 000663
554 000703 000000 000570

```

NO ERRORS DETECTED

PROGRAM BREAK IS 000704

ADRERR	000521' EXT	ADVBF	000454' EXT	ADVBF	000504' EXT
ADVOUT	000454'	CLKREQ	000665'	CLOCK	000234' EXT
CLOCKRQ	000231'	CLRACT	000423' EXT	CNECT2	000112'
CNECT3	000116'	CNECT4	000122'	COMCHK	000520' EXT
COMPAT	010000	CNECT	000076'	CPOPJ	000000' EXT
CPPOPJ1	000046' EXT	DAT	000005 INT	DATEND	000446'
DATEOF	000612'	DATND2	000450'	DEV DAT	000006 INT
DEVIAD	000007 INT	DEVIOS	000002 INT	DEVNAM	000000 INT
DEVOAD	000010 INT	DEVSEF	000003 INT	DLYRDY	000125'
DMPBLK	000537'	DMPEND	000507'	DMPMOD	200000
EOTWT	000315'	ERCNT	000667'	ERRFLG	000670'
ERROR	000602'	HUNGST	000001 INT	HUNGTP	000071'
IADRCX	000473' EXT	ILLOP	000611'	INPTND	000476'
IO	000000 INT	IOACT	010000 INT	IOBCTL	040000 INT
IOBOT	004000 INT	IODEND	020000 INT	IODERR	200000 INT
IODTER	100000 INT	IOEND	000040 INT	IOIMPM	400000 INT
IONRCK	000100 INT	IOPAR	001000 INT	IOS	000000 INT
IOTEND	000000 INT	IOW	000001 INT	JIFSC2	000171' EXT
LEOT	000276'	LEOT2	000322'	LSTLOC	000672'
HMTSIZ	000574' EXT	MTADDB	000021' INT	MTADDS	000011 INT
MTADSP	000002' INT	MTAEND	000675'	MTAGO	000266'
MTAINI	000032'	MTAJNT	000365' INT	MTALOC	000350' EXT
MTAP	000243'	MTAP0	000241'	MTAP1	000245'
MTAP2	000313'	MTAP3	000246'	MTAREL	000274'
MTASAV	000373' EXT	MTASRX	000000' INT	MTAVAL	000432' EXT
MTBOTH	000146' EXT	WTC	000340	MTCLK2	000175'
MTCLOK	000171'	WTCLOS	000047'	MTDEND	000443'
MTDMP2	000534'	MTDMP1	000516'	MTDMP0	000515'
MTDTGO	000345'	WTFLAG	000107' EXT	MTHUNG	000575'
MTIN	000355'	MTIN1	000357'	MTIN2	000362'
MTLOC1	000040' EXT	MTOUT	000330'	MTOUT1	000337'
MTOUT2	000343'	MTPTRL	000320'	MTREQ	000461' EXT
MTREW	400000	MTS	000344	MTSIZ	000703' EXT
MTSZ	000574'	MTTRY	000003	MTWAIT	000316' EXT
NMTREW	000662'	NXTCM2	000557'	NXTCM3	000562'
NXTCOM	000546'	NXTREC	000456'	OUT	000053' EXT
OUTPR	004000 INT	PDP	000003 INT	PDV CNT	000600' EXT
PERMER	000644'	PIOFF	000232' EXT	PIOMOD	000051' EXT
PION	000236' EXT	PNT	000673'	PROG	000007 INT
PUNIT	000101' EXT	QUANT	000003	QUANTM	000671'
RDYCHK	000156'	REMNR	000573'	RETRY	000614'
RETRY1	000617'	RETRY2	000621'	REWCHK	000201'
REWCK1	000214'	REWCK2	000220'	REWCKA	000205'
SAVCHK	000042'	SAVDEV	000240'	SET9TK	000272'
SETACT	000576' EXT	SETIAD	000457' EXT	SETIOS	000655'
STDENS	000137' EXT	STOIOS	000354' EXT	SVPNTR	000674'
TAC	000001 INT	TAC1	000002 INT	THRUT2	000434'
THRUT3	000436'	THRUTA	000413'	THRUTP	000416'
TP	000005	TPRDY2	000133'	TPREDY	000127'
TPSET	000135'	TRYAGN	000625'	TRYNXT	000630'
TRYSKP	000636'	UNIT	000666'	USEPRG	000664'
USEWRD	000663'	UUO	000014 INT	VMTASR	000420 INT
WSYNC	000126' EXT				

[illegible]

DEVIOS	6#	6	84	190	228	267	327	484
DEVLOG	6#	6						
DEVMOD	6#	6						
DEVNAM	6#	6	206					
DEVQAD	6#	6	294					
DEVPPN	6#	6						
DEVPTR	6#	6						
DEVSER	6#	6	205					
DGF	6#	6						
DHNG	6#	6						
DIN	6#	6						
DINI	6#	6						
DLK	6#	6						
DLYRDY	138#	179	181					
DMPBLK	415	437#						
DMPEND	377	413#						
DMPMOD	53#	348	376	434				
DMT	6#	6						
DNAERR	6#	6						
DOU	6#	6						
DR	6#	6						
DRL	6#	6						
DRN	6#	6						
DSER	6#	6						
DSI	6#	6						
DSKRLB	6#	6						
DSO	6#	6						
DVAVAL	6#	6						
DVCDR	6#	6						
DVDIR	6#	6						
DVDIRI	6#	6						
DVDIS	6#	6						
DVDSK	6#	6						
DVDTA	6#	6						
DVIN	6#	6						
DVLNG	6#	6						
DVLPT	6#	6						
DVMTA	6#	6						
DVOUT	6#	6						
DVPTP	6#	6						
DVPTR	6#	6						
DVTTY	6#	6						
ENTRP	6#	6						
FOTWT	261	266	275#					
ERCNT	163	300	493	541#				
ERRFLG	73	330	496	511	519	542#		
ERROR	333	477#						
FBMERR	6#	6						
FNERR	6#	6						
FRGSEF	6#	6						
FT2REL	6#							
FTATTA	6#							
FTCHEC	6#							

[illegible]

IOTEND	6#		291	345	432														
IOUSE	6#	6																	
IOW	6#	6				196	346	383											
IOWC	6#	6																	
IPERR	6#	6																	
ITEM	6#	6																	
JACCT	6#	6																	
JBFADR	6#	6																	
JBFCTR	6#	6																	
JBFPTR	6#	6																	
JBUF	6#	6																	
JDAT	6#	6																	
JERR	6#	6																	
JIFSC2	49	162																	
JLOG	6#	6																	
JNA	6#	6																	
JRQ	6#	6																	
JWPOS	6#	6																	
JWSIZ	6#	6																	
JXPN	6#	6																	
LEOT	241	258#																	
LEOT2	259	262#	269																
LISTSN	6																		
LOOKR	6#	6																	
LSTLOC	436	447	448	544#															
MEDDIE	6#	6																	
MMTSIZ	455	466	469																
MTADD8	46	60#	70	188															
MTADDS	46	70#	70																
MTADSP	15	20#	63																
MTAENO	547#																		
MTAGO	243	246#	260																
MTAINI	18	71#																	
MTAINT	46	113	319#	324	366														
MTALOC	48	303																	
MTAP	227#	265																	
MTAPP	34	224#																	
MTAP1	94	100	104	229#															
MTAP2	263	272#																	
MTAP3	230#	273																	
MTAREL	20	255#																	
MTASAV	50	325																	
MTASEFX	12	13#					</												

MTDTGO	300#	317															
MTFLAG	47	121															
MTHUNG	470#	478															
MTIN	23	310#															
MTIN1	312#	398															
MTIN2	315#	443															
MTLOC1	48	77															
MTOUT	22	287#															
MTOUT1	294#	393															
MTOUT2	298#	440															
MTPTRL	234	235	278#														
MTREQ	48	119	143	178	184	189	210	275	352	386							
MTREW	54#	116	122	175	198												
MTS	37#	119	164	170	172	194	203	237	244	258	288	290	319	322			
	332	338	341	344	372	374	307	401	414	416	428	430	477	504			
	531	533															
MTSIZ	50	51	463	455													
MTSZ	461	469#															
MTTRY	56#	162	399														
MTWAIT	49	144	276														
NECERR	6#	6															
NLEERR	6#	6															
NMTREW	71	118	177	186	201	212	354	361	536#								
NSDERR	6#	6															
NSFEPR	6#	6															
NSHF	6#	6															
NSRBIT	6#	6															
NSWP	6#	6															
NXM	6#																
NXTCM2	450	456#															
NXTCM3	446	459#															
NXTCM	437	445#	451														
NXTREC	383#	479															
OBUEP	6#	6															
OCLDSB	6#	6															
OUT	48	91															
OUTBER	6#	6															
OUTPR	6#	6	87														
PDP	6#	6	28	29	30	32	33	78	88	91	92	94	96	97			
	98	120	121	102	123	130	131	133	139	144	148	171	173	176			
	180	185	192	193	197	199	229	260	261	263	265	266	272	276			
	277	287	310	347	349	367	360	384	396	407	422	424	425	426			
	437	452	458	462	467	470											

[illegible]

[illegible]

CODES	6#			
DISABL	6#			
ENABLE	6#			
NOSCHE	6#			
NOSHIF	6#			
QUEUES	6#			
SCHERU	6#			
SHUFFL	6#			
STARTD	6#			
XP	6#	6	9	69