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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 ERRCON - MONITOR DETECTED ERROR HANDLING ROUTINES - V404
8      SUBTTL T, HASTINGS/TH/RCC TS 01 JUN 69
9      XP VERRCN,404+
10
11      ;THIS MACRO PUTS VERSION NO. IN STORAGE MAP AND GLOB
12      ENTRY ERRCON ;ALWAYS LOAD ERRCON(IF LIB SEARCH)
13      000000      ERRCON:
14
15      ;THESE ERROR ROUTINE PRINT "ERROR IN JOB N"
16      ;FOLLOWED BY AN APPROPRIATE ERROR MESSAGE
17      ;THEN THE JOB IS STOPPED AND CONSOLE IS RETURNED TO
18      ;MONITOR COMMAND MODE
19
20      ;APR DETECTED ERRORS
21      ;PUSHDOWN OVERFLOW,ILLEGAL MEMORY, NONEXISTENT MEMORY
22      ;FOR WHICH THE USER IS NOT ENABLED.
23      ;SEE APRSER TO SEE HOW APR INTERRUPTS ARE HANDLED
24      ;CALL: SKIPE TAC,APRERR ;RESULT OF CONI APR,APRPR
25      ;      PUSHJ PDP,APRILM ;FROM CLK SERVICE ROUT.(LOWEST PRIOTITY P1)
26      ;      RETURN TO RESCHEDULE NEW USER
27
28      INTERNAL APRILM
29      EXTERNAL USRREL,APRPC
30      EXTERNAL APRERR,CONMES,HOLD,INLMES,JOBN,PJOB,PRQM
31      EXTERNAL STOP1,TTYFWR,USRXIT,UUO0,WSCHED
32
33      000000 402000 000000 APRILM: SETZM APRERR ;CLEAR FLAG IMMEDIATELY,IN CASE OTHER ERRORS OCCUR
34      000001 606040 020000 TRNN TAC,ILM ;ILLEGAL MEMORY?
35      000002 254000 000022 JRST APRNXM ;NO
36      000003 550040 000000 WRRZ TAC,APRPC ;YES, PC STORED BY APR INTERRUPT
37
38      IFE FT2REL,<
39      CAMG TAC,USRREL ;IS PC IN BOUNDS/
40      >
41      IFN FT2REL,<
42      EXTERN SEGILM
43      CAMLE TAC,USRREL ;IS PC IN BOUNDS(LOG SEG)?
44      PUSHJ PDP,SEGILM ;NO, IS PC IN LEGAL MEMORY IN HIGH SEG?
45      >
46      JRST APRILR ;YES, GO PRINT ILL MEM REF
47      JSP TAC,ERRPTU ;NO, PRINT PC EXCEEDS MEM BOUND
48      ASCII7 /PC OUT OF BOUNDS/
49
50      000015 265040 000211 APRILR: JSP TAC,ERRPTU
51      000016 446311 420232 ASCII7 /ILL MEM RFF/
52      000017 426324 051212
53      000020 430000 000000

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52 000021 254000 000036'

JRST APRSCD

PRINT LOC, THEN STOP JOB

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53					
54	000022	606040	010000	APRNXM: TRNN TAC,NXM	NON-EX MEM?
55	000023	254000	000031	JRST APRPDL	NO
56	000024	265040	000211	JSP TAC,ERRPTU	YES
57	000025	472371	620212	ASCII /NON EX MEM/	
	000026	541011	542632		
	000027	000000	000000		
58	000030	254000	000036	JRST APRSCD	PRINT LOC, THEN STOP JOB
59					
60	000031	606040	200000	APRPDL: TRNN TAC,POV	PUSHDOWN OVERFLOW?
61	000032	265240	000052	JSP DAT,UEERROR	NO, MUST BE HARDWARE PROBLEM
62	000033	265040	000211	JSP TAC,ERRPTU	YES
63	000034	502111	420236	ASCII /PDL OV/	
	000035	530000	000000		
64	000036	200100	000003	APRSCD: MOVE TAC1,APRPDL	PRINT APR PC
65	000037	254000	000236	JRST PCPNT	IAS:
66					1)"AT USER LOC XXX" OR
67					2)"AT EXEC LOC XXX; EXEC CALLED FROM
68					EXEC/USER LOC YYY

```

69
70      ;ADDRESS CHECK ERROR AT ANY LEVEL
71      ;DEV DAT MUST BE SET UP TO POINT TO OFFENDING DEVICE
72
73      INTERNAL ADRERR
74
75      000040 265040 000212' ADRERR: JSP TAC,ERRDEV      ;GET JOB NO, FROM DEVICE DATA BLOCK
76      000041 406110 451212      ASCII7 /ADDRESS CHECK FOR /
77      000042 516464 041620
78      000043 426071 320214
79      000044 476444 000000
80      000045 254000 000167'      JRST DEVEXC      ;PRINT "DEVICE XXX; EXEC CALLED FROM
81                                          ; EXEC/USER LOC YYY"
82                                          ; THEN STOP JOB
83
84      ;UNEXPLAINABLE MONITOR ERROR
85      ;CALL: JSP DAT,UERROR      ;AT UUD LEVEL(PDP SET UP)
86      ;      JSP DAT,ERROR      ;AT INTERRUPT LEVEL(PDP NOT SET UP)
87      ;      JSP DAT,CERROR      ;AT INTERRUPT OR UUD LEVEL (PDP SET UP) -MESSAGE TO
88      ;      JSP DAT,CERROR      ;BLAME JOB 0(PRIENT ON OPERATORS TTY)
89      ;      JSP DAT,CERROR      ;BLAME JOB=C(ITEM), PDP SETUP
90
91      INTERNAL ERROR,UERROR,CERROR,OERROR
92      EXTERNAL JOB,ERRPDL,NULADR
93      NLAADR: EXP NULADR
94      ERROR: MOVEI PDP,ERRPDL      ;USE LOWER CORE FOR PD LIST
95      OERROR: PUSH PDP,NLAADR      ;PUSH ADR, OF NULJOB ON PD LIST IN CASE
96                                          ; THIS ERROR IS AT PI LEVEL 7 OR HIGHER
97                                          ; SO NULL JOB WILL BE STARTED WHEN LAST
98                                          ; POPJ IS DONE(STOP2 IN RUNCSS)
99                                          ;BLAME JOB 0(PRIENT ON OPERATORS TTY)
100                                          ;PRINT FOR CURRENT JOB
101                                          ;PRINT ACCORDING TO C(ITEM)
102
103      000051 634200 000004      TDZA ITEM,ITEM
104      000052 200200 000000      UERROR: MOVE ITEM,JOB
105      000053      CERROR:
106      IFN ETHALT,<
107          HALT      ,+1
108          ;PUT ADR OF JSP DAT, IN PC AND STOP SO A
109          ; DUMP CAN BE TAKEN,CONTINUE WILL PRINT ERROR MESSAGE
110
111      >
112
113      000053 265040 000213'      JSP TAC,ERRPNT      ;ITEM ALREADY SETUP
114      000054 426452 247644      ASCII7 /ERROR IN MONITOR/
115      000055 202231 620232
116      000056 476351 152236
117      000057 510000 000000
118      000060 200103 777777      MOVE TAC1,-1(PDP)
119      000061 254000 000236'      JRST PCPNT      ;GET LOC OF JSP DAT,ERROR
120                                          ;PRINT "AT EXEC LOC XXX;
121                                          ; EXEC CALLED FROM EXEC/USER YYY"
122                                          ; THEN STOP JOB
123
124      ;INPUT UUD FOR OUTPUT DEVICE
125      ;CALLED AT UUD LEVEL ONLY
126
127      INTERNAL ILLINP
128
129      000062 265040 000211' ILLINP: JSP TAC,ERRPTU

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116	000063	476532	450252	ASCII /OUTPUT /	
	000064	521070	000070		
117	000065	260140	000310	PUSHJ PDP,ERNAM	PRINT "DEVICE XXX"
118	000066	265040	000233	JSP TAC,UUOMES	PRINT MESSAGE,UUOPC,STOP JOB
119	000067	200070	147234	ASCII / CANNOT DO INPUT/	
	000070	476504	042236		
	000071	202231	650252		
	000072	520000	000000		

```

120
121
122          ;OUTPUT UUD FOR INPUT DEVICE
123          ;CALLED AT UUD LEVEL ONLY
124
125          INTERNAL ILLOUT
126          000073 265040 000211' ILLOUT: JSP TAC,ERRPTU
127          000074 446352 052650          ASCII? /INPUT /
128          000075 200020 000000
129          000076 260140 000310'          PUSHJ PDP,ERNAM          ;PRINT "DEVICE XXX"
130          000077 265040 000233'          JSP TAC,UUOMES          ;PRINT MESSAGE,UUOPC,STOP JOB
131          000100 202070 147234          ASCII? / CANNOT DO OUTPUT/
132          000101 476504 042236
133          000102 202372 552240
134          000103 526500 000000
135
136          ;ILLEGAL DEVICE DATA MODE (INIT, OPEN, OR SETSTS UUOS)
137          ;CALLED AT UUD LEVEL ONLY
138
139          INTERNAL ILLMOD
140          000104 265040 000211' ILLMOD: JSP TAC,ERRPTU
141          000105 446311 442616          ASCII? /ILLEGAL DATA MODE FOR /
142          000106 406374 042202
143          000107 522024 046636
144          000110 422124 043236
145          000111 511000 000000
146          000112 254000 000167'          JRST DEVEXC          ;PRINT "DEVICE XXX",UUD PC
147
148          ;IO UUD TO USER CHANNEL WITH NO PREVIOUS INIT OR OPEN
149          ;CALLED AT UUD LEVEL ONLY
150
151          INTERNAL IOIERR
152          000113 265040 000211' IOIERR: JSP TAC,ERRPTU
153          000114 446364 052236          ASCII? /IO TO UNASSIGNED CHANNEL/
154          000115 202531 640646
155          000116 516230 747212
156          000117 421010 344202
157          000120 472350 546000
158          000121 254000 000234'          JRST UUOPCP          ;PRINT UUD PC

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149
150      ;ILLEGAL UUD
151      ;CALLED AT UUD LEVEL ONLY
152
153      INTERNAL UUDERR
154
155      000122 265040 000211' UUDERR: JSP TAC,ERRPTU
156      000123 446311 442616      ASCII? /ILLEGAL UUD/
157      000124 406304 052652
158      000125 474000 000000
159      000126 200100 000000      MOVE TAC1,UUD0      ;GET LAST UUD PC
160      IFN FTHALT,<
161      TLNN TAC1,USRM0D      ;UUD FROM EXEC?
162      HALT ,+1      ;YES,HALT SO DUMP CAN BE TAKEN
163      >      ; CONTINUE WILL PRINT MESSAGE
164
165      000127 364100 000236'      SOJA TAC1,PCPNT      ;AND PRINT, PRINT USER UUD PC IF DIFF,
166      ;ILLEGAL INSTRUCTION
167
168      ;HALT INSTRUCTION IS A SPECIAL CASE WHICH STOPS JOB BUT
169      ;THE USER MAY CONTINUE FROM IT(EFFECTIVE ADR.)
170      ;CALLED AT UUD LEVEL WITH A JRST
171
172      INTERNAL ILLINS
173      EXTERNAL JOBPD1,TTYSTC
174
175      000130 554040 000014 ILLINS: HLRZ TAC,UUD      ;ILLEGAL OPCODE
176      000131 306040 254207      CAIN TAC,254200+PROG      ;IS IT A HALT?
177      000132 254000 000137'      JRST HALTI      ;YES, PRINT DIFFERENT MESSAGE
178      000133 265040 000211'      JSP TAC,ERRPTU
179      000134 446311 420222      ASCII? /ILL INST,/
180      000135 472472 427000
181      000136 254000 000234'      JRST UUDOPCP      ;PRINT UUD PC AND STOP JOB
182
183      000137 265040 000211' HALTI: JSP TAC,ERRPTU
184      000140 442031 452000      ASCII? /HALT/
185      000141 370107 000000      SOS TAC1,JOBPD1(JDAT)      ;UUDOPC=LOC OF HALT+1
186      000142 260140 000256'      PUSHJ PDP,PCP      ;PRINT "USER LOC XXX"
187      000143 260140 000000      PUSHJ PDP,INLMES      ;PRINT MONITOR MODE RESPONSE
188      000144 064253 641432 *C      ASCII? /
189
190      000145 050321 227000 ,/
191      000146 542607 000141'      HRRM UUD,JOBPD1(JDAT)      ;SAVE EFFECTIVE ADDRESS OF HALT
192      000147 260140 000000      PUSHJ PDP,TTYSTC      ;START TTY TYPING
193      000150 260140 000000      PUSHJ PDP,STOP1      ;STOP JOB
194
195      000151 261147 000146'      PUSH PDP,JOBPD1(JDAT)      ; RETURN ONLY IF HE TYPES CONT
196      000152 254000 000000      JRST USRXIT      ;PUT USER RETURN ON END OF PD LIST
197      ;RETURN TO USER IN CASE HE TYPES CONT COMMAND

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195 ;ROUTINE FOR HUNG IO DEVICE
196 ;CALL MOVE DEVDAT,ADDRESS OF DEVICE DATA BLOCK
197 ; PUSHJ PDP,DEVHNG
198
199 INTERNAL DEVHNG
200
201 000153 201040 010000 DEVHNG: MOVEI TAC,IOACT ;TURN OFF IO DEVICE ACTIVE BIT IN
202 000154 412046 000002 ANDCAM TAC,DEVIOS(DEVDAT);MEMORY AND IOS
203 000155 620000 010000 TRZ IOS,IOACT
204 000156 265040 000212 JSP TAC,ERRDEV
205 000157 442531 643500 ASCII /HUNG /
206 000160 000000 000000
207 000161 254000 000167 JRST DEVEXC
208
209 ;BAD DECTAPE DIRECTORY
210 ;CALLED AT INTERRUPT AND UDO LEVELS WITH DEVDAT AND ITEM SETUP
211
212 INTERNAL BADDIR
213 000162 265040 000213 BADDIR: JSP TAC,ERRPNT
214 000163 412030 420210 ASCII /BAD DIRECTORY FOR /
215 000164 446450 541650
216 000165 476453 120214
217 000166 476444 000000
218
219 ;ROUTINE TO PRINT "DEVICE XXX: EXEC CALLED FOR EXEC/USER YYY"
220 ;THEN STOP JOB
221 ;TO BE USED BY DEVICE DEPENDENT ERROR MESSAGES AFTER JSP TAC,DEVERR
222
223 INTERNAL DEVEXC
224 000167 260140 000310 DEVEXC: PUSHJ PDP,ERNAM ;PRINT "DEVICE XXX"
225 000170 254000 000241 JRST EXCALP ;PRINT "EXEC CALLED FROM EXEC/USER LOC YYY"
226

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```

225
226 ;ROUTINE TO HALT A JOB WHEN A DEVICE IS NOT READY FOR I/O
227 ;CALLED FROM XXXSER AT UUO LEVEL
228 ;CALL MOVE DEVDAT,ADDR, OF DEV, DDB
229 ; PUSHJ PDP,HNGSTP
230
231 INTERNAL HNGSTP
232
233 000171 261140 000004 HNGSTP: PUSH PDP,ITEM
234 000172 261140 000000 PUSH PDP,IOS
235 000173 261140 000006 PUSH PDP,DEV DAT
236 000174 260140 000000 PUSHJ PDP,TTYFILL
237 000175 260140 000000 PUSHJ PDP,PRGM
238 000176 260140 000310' PUSHJ PDP,ERNAM
239 000177 260140 000143' PUSHJ PDP,INLMES
240 000200 202371 337432 ASCII / OK?
241 *C
242 000201 052750 306424
243 000202 064245 600000 ./

244 000203 260140 000147' PUSHJ PDP,TTYSTC
245 000204 262140 000006 POP PDP,DEV DAT
246 000205 262140 000000 POP PDP,IOS
247 000206 260140 000150' PUSHJ PDP,STOP1
248 000207 262140 000004 POP PDP,ITEM
249 000210 254000 000000 JRST WSCHED

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```

;SAVE DEV'S IOS WORD & DDB
;FIND JOB'S TTY & WAIT UNTIL I/O IS FINISHED
;PRINT QUESTION MARK FOR BATCH
;PRINT "DEVICE XXX"
;AND MSG.

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```

;START UP TTY IN COMMAND MODE
;BRING BACK DEV DDB & IOS WORD

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```

;STOP JOB &
;RESCHEDULE

```

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250
251      ;COMMON ERROR MESSAGE SETUP ROUTINES
252      ;CALL: JSP TAC,ERRPTU, ERRDEV, OR ERRPNT
253      ;      ASCII? /MESSAGE/
254      ;      RETURNS HERE WITH DEVDAT SAVED @PDP)
255      ;      C(DEV DAT)=TTYDOB, DAT TO TTY OUTPUT BUFFER POINTER
256      ;      ITEM=JOB NUMBER
257
258      ;USE ERRPTU IF AT UUD LEVEL FOR SURE
259      ;ERRDEV IF ERROR FOR AN ASSIGNED DEVICE AT ANY LEVEL
260      ;ERRPNT WITH ITEM ALREADY SET TO OFFENDING JOB NUMBER
261      ;THE JSP CALL IS USED IN CASE PUSHDOWN SPACE BECOMES CRITICAL
262      ;AGAIN AND ERRPNT HAS TO WIPF EXISTING LIST OUT
263
264      INTERNAL ERRPTU
265      INTERNAL ERRDEV,ERRPNT
266      EXTERNAL PJORN,JOB,JRTADR,JBTDAT,TTYFND,NULERR
267      IFN FTTYSER,<EXTERNAL TTYERP>
268
269      000211 334200 000052' ERRPTU: SKIPA ITEM,JOB      ;BLAME CURRENT JOB IF NOT 0,
270      000212 135200 000000' ERRDEV: LDB ITEM,PJORN    ;JOB NO. FROM DEVICE DATA BLOCK
271      000213 336000 000004' ERRPNT: SKIPN ITEM      ;ERROR IN NULL JOB?
272      000214 476000 000000      SETOM NULERR          ;YES, SET FLAG FOR ERROR IN NULL JOB
273                                          ;SO STATE OF NULL JOB WILL RE REESTABLISHED
274                                          ;WHEN IS IT RUN AGAIN(SEE CLOCK1)
275
276      000215 261140 000005      PUSH PDP,DAT          ;SAVE CALL TO ERROR(JSP DAT,ERROR)
277      IFN FTRCHK,<
278      000216 301200 000000      CAIL      ITEM,JOBN    ;JOB NUMBER
279      000217 254200 000217'    HALT      ,             ;OUT OF RANGE?
280      >
281      000220 261140 000006      PUSH PDP,DEV DAT      ;SAVE ADR. OF DEV. DATA BLOCK
282      000221 261140 000001      PUSH PDP,TAC          ;SAVE RETURN FROM ERRPNT
283      000222 200344 000000      MOVE JDAT,JBTDAT(ITEM) ;EVEN NULL JOB HAS JOB DATA AREA
284
285      IFN JDAT=PROG,<
286      000223 260140 000000      MOVE PROG,JBTADR(ITEM) ;JOB RELOCATION
287      >
288      IF FTTYSER,< PUSHJ PDP,TTYFND      ;FIND TTY FOR THIS JOB(ITEM)>
289      IFN FTTYSER,< PUSHJ PDP,TTYERP    ;FIND THIS TTY AND
290      >                                ;SET MERTPO IN DOB
291      000224 260140 000177'      PUSHJ PDP,INLMES
292      000225 374321 242644      ASCII? /?
293      000226 512372 220222      ERROR IN JOB /
294      000227 471011 247604
295      000230 200000 000000
296      000231 260140 000000      PUSHJ PDP,PJOB
297      000232 254000 000224'      JRST INLMES
298
299      ;PRINT JOB NO.
300      ;PRINT MESSAGE SPECIFIED BY CALLER
301      ;AND RETRUN TO LOC. AFTER MESSAGE

```

```

297
298
299
300
301
302
303
304
305 000233 260140 000000 UUOMES: PUSHJ PDP,CONMES      ;PRINT MESSAGE POINTED TO BY TAC
306 000234 200107 000151' UUOPCP: MOVE TAC1,JOBPD1(JDAT) ;UUO PC STORED IN JOB DATA AREA
307
308 000235 364100 000236'          SOJA TAC1,PCPNT      ; FIRST LOC ON PD LIST
309
310
311
312
313
314
315
316
317
318
319
320
321
322 000236 260140 000256' PCPNT:  PUSHJ PDP,PCP      ;PRINT " AT EXEC XXX" OR " AT USER "
323 000237 603100 010000          TLNE TAC1,USRMOD      ;WAS PC IN USER MODE?
324 000240 254000 000247'          JRST PCSTOP          ;YES, ENOUGH INFO,
325
326
327
328
329
330
331
332
333
334
335 000241 260140 000232' EXCALP: PUSHJ PDP,INLMES
336 000242 355012 552636          ASCII /; UUO/
337 000243 000000 000000          MOVE TAC1,JOBPD1(JDAT) ;UUO PC IN JOB DATA AREA
338 000244 200107 000234'          SUBI TAC1,1          ;BACK IT UP TO POINT TO UUO
339 000245 275100 000001          PUSHJ PDP,PCP          ;PRINT "EXEC LOC " OF USER LOC
340 000246 260140 000256'          PCSTOP: PUSHJ PDP,HOLD ;STOP JOB, START TTY AND SET JOB ERROR BIT
341 000247 262140 000006          POP PDP,DEV DAT      ;RETURN ONLY IF AT INTERRUPT LEVEL
342 000251 254000 000000          JRST TPOPJ          ;REMOVE ERROR CALL AND RETURN

```

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343
344
345      ;ROUTINE TO PRINT PC AS:
346      ;1) "EXEC LOC XXX" OR "USER LOC XXX"
347      ;CALL: MOVE TAC1,PC TO PRINT(LH=PC FLAGS)
348      ;      PUSHJ PDP,PCP
349
350 000252 202032 420212 XMODE:  ASCIZ / AT EXEC /
000253 542130 320000
351 000254 202032 420252 UMODE:  ASCIZ / AT USER /
000255 516132 220000
352
353 000256 201040 000252' PCP:   MOVEI TAC,XMODE      ;ASSUME PC IN EXEC MODE
354 000257 603100 010000      TLNE TAC1,USRM0D      ;IS IT?
355 000260 201040 000254'      MOVEI TAC,UMODE      ;NO, USER MODE
356 000261 260140 000233'      PUSHJ PDP,CONMES      ;PRINT ONE OR OTHER
357 000262 550040 000002      HRRZ TAC,TAC1        ;PRINT RIGHT HALF IN OCTAL
358                                     ; FALL INTO OCTPNT
359
360
361      INTERN OCTPNT
362
363      ;ROUTINE TO PRINT 6 DIGIT OCTAL NUMBER
364      ;CALL: MOVE DAT,TTY OUTPUT BYTE POINTER
365      ;      HRRZ TAC, OCTAL NUMBER
366      ;      PUSHJ PDP,OCTPNT
367      ;      RETURN TAC1,PRESERVED,TAC DESTROYED
368
369 000263 514040 000001 OCTPNT:  HRLZ TAC,TAC          ;MOVE TO LH FOR ROTATING
370 000264 660040 700000      TRO TAC,700000      ;SETUP AN END FLAG
371
372 000265 241040 000003 OCTP1:  ROT TAC,3          ;GET NEXT OCTAL DIGIT
373 000266 607040 777777      TLNN TAC,777777      ;WAS THAT FLAG?
374 000267 263140 000000      POPJ PDP,          ;YES, DO NOT PRINT IT
375 000270 260140 000305'      PUSHJ PDP,PRNUM      ;NO, PRINT OCTAL DIGIT
376 000271 541040 000000      HRRZ TAC,0          ;CLEAR RH
377 000272 254070 000265'      JRST OCTP1          ;GET NEXT OCTAL DIGIT
378
379      ;ROUTINE TO ADD 1 TO TAC AND PRINT DECIMAL
380      ;SAME CALL AS OCTPNT
381
382      INTERN DECP1
383
384 000273 344040 000274' DECP1:  AOJA TAC,RADX10      ;ADD 1 AND GO PRINT
385
386      ;ROUTINE TO PRINT DECIMAL
387      ;CALL: SAME AS OCTPNT
388      ;TAC1: PRESERVED
389
390      INTERN RADX10
391
392 000274 261140 000002 RADX10:  PUSH PDP,TAC1        ;SAVE TAC1
393 000275 260140 000300'      PUSHJ PDP,PRDIG      ;PRINT DECIMAL DIGITS

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394 000276 262140 000002      POP PDP,TAC1      ;RESTORE TAC1
395 000277 263140 000000      POPJ PDP,          ;AND RETURN
396
397      ;RECURSIVE DECIMAL PRINT ROUTINE
398      ;CALL: MOVE TAC,DECIMAL NO.
399      ;      PUSHJ PDP,PRTDIG
400
401 000300 231040 000012      PRTDIG: IDIVI TAC,12      ;DIVIDE BY 10
402 000301 506123 000000      WRLM TAC1,(PDP)      ;RT ON PD LIST
403 000302 322040 000304      JUMPE TAC,#+2      ;FINISHED?
404 000303 260140 000300      PUSHJ PDP,PRTDIG      ;NO, CALL S OR F
405 000304 554043 000000      WLRZ TAC,(PDP)      ;YES, GET LAST NUMBER
406 000305 271040 000060      PRTNUM: ADDJ TAC,"0"      ;CONVERT TO ASCII
407      IFN FTTYSER,<
408      EXTERN OUTCHS
409 000306 200400 000001      MOVE     TEM,TAC      ;PUT CHAR IN CHAR AC
410 000307 254000 000000      JRST     OUTCHS      ;AND OUTPUT IN SCNSRF
411      >
412      IFE FTTYSER,<
413      IDPB     TAC,BAT      ;ADD CHAR TO HALGF DUPLEX OUTPUT STREAM
414      POPJ PDP,
415      >

```

```

416
417          ;ROUTINE TO PRINT "DEVICE XXX"
418          ;CALL  MOVE DAT,ASCII OUTPUT BYTE POINTER
419          ;      PUSH PDP,DEV DAT
420          ;      PUSHJ PDP,ERNAM
421
422          INTERNAL ERNAM
423
424          000310 260140 000241' ERNAM:  PUSHJ PDP,INLMES
425          000311 422132 644606          ASCII /DEVICE /
426          000312 425000 000000
427          000313 332103 777777          SKIPE TAC1,-1(PDP)      ;IS DEV DAT = 0?
428          000314 200102 000000          MOVE TAC1,DEVNAM(TAC1)  ;NO, GET DEVICE NAME
429
430          ;ROUTINE TO PRINT SIXBIT NAME
431          ;CALL  MOVE DAT,ASCII OUTPUT BYTE POINTER
432          ;      MOVE TAC1,NAME
433          ;      PUSHJ PDP,PRNAME
434
435          INTERNAL PRNAME
436          EXTERNAL CPOPJ
437
438          000315 201040 000000 PRNAME:  MOVEI TAC,0
439          000316 246040 000006          LSHC TAC,6
440          000317 322040 000000          JUMPF TAC,CPOPJ
441          000320 201401 000040          MOVEI TEM,40(TAC)
442          IFN FITYSER,<
443          EXTERN OUTCHS
444          000321 260140 000307'          PUSHJ PDP,OUTCHS
445          >
446          IFE FITYSER,<
447          IDPB TEM,DAT
448          >
449          000322 254000 000315'          JRST PRNAME
450
451
452          000323          ERREND: END

```

NO ERRORS DETECTED

PROGRAM BREAK IS 000323

ADRERR	000040' INT	APRERR	000070' EXT	APRILM	000000' INT
APRILR	000015' INT	APRNXM	000022' INT	APRPC	000036' FXT
APPPDL	000031' INT	APRSCD	000036' INT	BADDIR	000162' INT
CERROR	000053' INT	CONMES	000241' EXT	CPOPJ	000317' FXT
DAT	000005' INT	DECP1	000273' INT	DEV DAT	000006' INT
DEVEXC	000167' INT	DEVHNG	000153' INT	DEVIOS	000002' INT
DEVNAM	000000' INT	ERNAM	000310' INT	ERRCON	000000' INT
ERRDEV	000212' INT	ERREND	000323' INT	ERROR	000047' INT
ERRPDL	000047' EXT	ERRPNT	000213' INT	ERRPTU	000211' INT
EXCALP	000241' INT	FTPREL	777777 777777	FTHALT	000000
FTCHK	777777 777777	FTTYS	777777 777777	HALTI	000137' INT
HNGSTP	000171' INT	HOLD	000247' EXT	ILLINP	000062' INT
ILLINS	000130' INT	ILLMOD	000174' INT	ILLOUT	000073' INT
ILM	020000	INLMES	000310' EXT	IOACT	010000 INT
IOIERR	000113' INT	IOS	000000 INT	ITEM	000004 INT
JBTADR	000000 EXT	JBT DAT	000222' EXT	J DAT	000007 INT
JOB	000211' EXT	JORN	000216' EXT	JOBPD1	000244' FXT
NLADR	000046' INT	NULADR	000046' EXT	NULERR	000214' FXT
NXM	010000	OCTP1	000265' INT	OCTPNT	000263' INT
OERROR	000050' INT	OUTCHS	000321' EXT	PCP	000256' INT
PCPNT	000236' INT	PCSTOP	000247' INT	PDP	000003 INT
PJOB	000231' EXT	PJOBNT	000212' EXT	POV	200000
PRNAME	000315' INT	PROG	000007 INT	PRGM	000175' EXT
PRTDIG	000300' INT	PRTNUM	000305' INT	RADX10	000274' INT
SEGILM	000005' EXT	STOP1	000206' EXT	TAC	000001 INT
TAC1	000002 INT	TEM	000010 INT	TPOPJ	000251' FXT
TTYERP	000223' EXT	TTYFND	000000 EXT	TTYFUW	000174' FXT
TTYSTC	000203' EXT	UERROR	000052' INT	UMODE	000254' INT
USRMOD	010000 INT	USRREL	000004' EXT	USRXIT	000152' FXT
UUD	000014 INT	UUD	000126' EXT	UUDERR	000122' INT
UUDMES	000233' INT	UUDPCP	000234' INT	VERRCN	000404 INT
WSCHED	000210' EXT	XMODE	000252' INT		

A	6#	6					
AC1	6#	6					
AC2	6#	6					
AC3	6#	6					
ADRERR	73	75#					
AEFERR	6#	6					
AL	6#	6					
APRERR	30	33					
APRILM	28	33#					
APRILR	45	50#					
APRNXM	35	54#					
APRPC	29	36	64				
APRPOL	55	60#					
APRSCD	48	52	58	64#			
ASSCON	6#	6					
ASSPRG	6#	6					
R	6#	6					
RADDIR	211	213#					
RUFFMT	6#	6					
BUFWRD	6#	6					
CERROR	88	98#					
CLKR	6#	6					
CLSIN	6#	6					
CLSOUT	6#	6					
CMWB	6#	6					
CONMES	30	305	356				
CORCNT	6#	6					
CPOPJ	436	440					
D	6#	6					
DAT	6#	6	61	276			
DCL	6#	6					
DCLI	6#	6					
DCLD	6#	6					
DCLR	6#	6					
DDI	6#	6					
DDO	6#	6					
DECP1	382	384#					
DEN	6#	6					
DEVADR	6#	6					
DEVBIF	6#	6					
DEVCHR	6#	6					
DEVCTR	6#	6					
DEVDAT	6#	6	202	235	245	281	341
DEVEXC	77	139	206	220	222#		
DEVEXT	6#	6					
DEVFIL	6#	6					
DEVHMG	199	201#					
DEVIDD	6#	6					
DEVLOS	6#	6	202				
DEVLNG	6#	6					
DEVMOD	6#	6					
DEVNAM	6#	6	427				
DEVOAD	6#	6					

DEVPPN	6#	6
DEVPTR	6#	6
DEVSER	6#	6
DGF	6#	6
DHNG	6#	6
DIN	6#	6
DINI	6#	6
DLK	6#	6
DMT	6#	6
DNAERR	6#	6
DOU	6#	6
DR	6#	6
DRL	6#	6
DRN	6#	6
DSEB	6#	6
DSI	6#	6
DSKRLB	6#	6
DSO	6#	6
DVAVAL	6#	6
DVCDR	6#	6
DVDIR	6#	6
DVDJRI	6#	6
DVDIS	6#	6
DVDSK	6#	6
DVDTA	6#	6
DVIN	6#	6
DVLNC	6#	6
DVLPT	6#	6
DVMTA	6#	6
DVOUT	6#	6
DVPTP	6#	6
DVPTR	6#	6
DVTTY	6#	6
ENTRB	6#	6
ERNAM	117	128 222 238 422 424#
ERRCON	12	13#
ERRDEV	75	244 265 270#
ERREND	492#	
ERROR	88	91#
ERRPOL	89	91
ERRPNT	103	213 265 271#
ERRPTU	46	50 56 115 126 137 146 155 176 180 264 269#
EXCALP	223	333 335#
FBIERR	6#	6
FNFEPR	6#	6
FRGSEG	6#	6
FT2REFL	6#	37 40
FTAATTA	6#	
FTCHEC	6#	
FTFXAM	6#	
FTFINI	6#	
FTGETT	6#	
FTHALT	6#	99 158

FTKCT	6#							
FTVONP	6#							
FTPRV	6#							
FTPA10	6#							
FTRCHK	6#	277						
FTREAS	6#							
FTSLE	6#							
FTTAK	6#							
FTTIME	6#							
FTTRAC	6#							
FTTRPS	6#							
FTTYS	6#	267	287	288	407	412	442	446
WALTI	175	180#						
HNGSTP	231	233#						
HOLD	30	340						
HSAMSK	6#	6						
HSAPDS	6#	6						
HSASIZ	6#	6						
HUNGCT	6#	6						
HUNGST	6#	6						
I	6#	6						
IB	6#	6						
IBUF3	6#	6						
ICLOS8	6#	6						
ILLIMP	113	115#						
ILLINS	170	173#						
ILLMOD	135	137#						
ILLOUT	124	126#						
ILM	6#	34						
ILUERR	6#	6						
INPER	6#	6						
INITR	6#	6						
INLMES	30	184	239	291	295	335	424	
INPB	6#	6						
IO	6#	6						
IOACT	6#	6	201	203				
IOREG	6#	6						
IOBKTL	6#	6						
IOROT	6#	6						
IOCON	6#	6						
IOEND	6#	6						
IODERR	6#	6						
IOINTER	6#	6						
IOEND	6#	6						
IOFST	6#	6						
IOIERR	144	146#						
IOIMPM	6#	6						
IONRCK	6#	6						
IONPAR	6#	6						
IOS	6#	6	203	234	246			
IOEND	6#	6						
IOUSE	6#	6						
IOW	6#	6						

[illegible]

[illegible]

UU02	31	157		
UUNERR	153	155#		
UUNMES	118	129	302	305#
UUNPCP	148	178	302	306#
UWP	6#	6		
UWPOFF	6#	6		
VERRCN	10#	10		
WSCHFD	31	249		
WTMASK	6#	6		
XMODE	350#	353		

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