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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         ;THIS MACRO PUTS VERSION NO. IN STORAGE MAP AND GLOB
11
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
21         ;APR DETECTED ERRORS
22         ;PUSHDOWN OVERFLOW,ILLEGAL MEMORY, NONEXISTENT MEMORY
23         ;FOR WHICH THE USER IS NOT ENABLED.
24         ;SEE APRSER TO SEE HOW APR INTERRUPTS ARE HANDLED
25         ;CALL: SKIPE TAC,APRERR ;RESULT OF CONI APR,APRPR
26         ; PUSHJ PDP,APRILM ;FROM CLK SERVICE ROUT.(LOWEST PRIORITY P1)
27         ; RETURN TO RESCHEDULE NEW USER
28
29         INTERNAL APRILM
30         EXTERNAL USRREL,APRPC
31         EXTERNAL APRERR,CONMES,HOLD,INLMES,JOBN,PJOB,PRQM
32         EXTERNAL STOP1,TTYFUW,USRXIT,UUO0,WSCHED
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 000004 313040 000000 FXTERN SEGILM ;IS PC IN BOUNDS(LOG SEG)?
43 000005 260140 000000 CAMLE TAC,USRREL ;NO, IS PC IN LEGAL MEMORY IN HIGH SEG?
44         >
45 000006 254000 000015' JRST APRILR ;YES, GO PRINT ILL MEM REF
46 000007 265040 000211' JSP TAC,ERRPTU ;NO, PRINT PC EXCEEDS MEM BOUND
47 000010 502064 047652 ASCII? /PC OUT OF BOUNDS/
48 000011 521011 743100
49 000012 412372 547210
50 000013 514000 000000
51 000014 254000 000036' JRST APRSCD ;PRINT LOC, THEN STOP JOB
52
53
54
55 000015 265040 000211' APRILR: JSP TAC,ERRPTU
56 000016 446311 420232 ASCII? /ILL MEM RFF/
57 000017 426324 051212
58 000020 430000 000000

```

52 000021 254000 000036'

JRST APRSCD

PRINT LOC, THEN STOP JOB

```
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,UERROR  ;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,APRPO
65 000037 254000 000236'   JRST PCPNT
66
67
68
```

```

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 ASCII /ADDRESS CHECK FOR /
    000042 516464 041620
    000043 426071 320214
    000044 476444 000000
77 000045 254000 000167' JRST DEVEXC ;PRINT "DEVICE XXX; EXEC CALLED FROM
78 ; EXEC/USER LOC YYY"
79 ; THEN STOP JOB
80
81 ;UNEXPLAINABLE MONITOR ERROR
82 ;CALL: JSP DAT,UERROR ;AT UO LEVEL(PDP SET UP)
83 ; JSP DAT,ERROR ;AT INTERRUPT LEVEL(PDP NOT SET UP)
84 ; JSP DAT,CERROR ;AT INTERRUPT OR UO LEVEL (PDP SET UP) -MESSAGE TO
85 ; ; OPERATOR'S CONSOLE RATHER THAN SPECIAL JOB
86 ; JSP DAT,CERROR ;BLAME JOB=C(ITEM), PDP SETUP
87
88 INTERNAL ERROR,UERROR,CERROR,OERROR
89 EXTERNAL JOB,ERRPDL,NULADR
90 000046 000000 000000 NLAADR: EXP NULADR
91 000047 201140 000000 ERROR: MOVE! PDP,ERRPDL ;USE LOWER CORE FOR PD LIST
92 000050 261140 000046' OERROR: PUSH PDP,NLAADR ;PUSH ADR, OF NULJOB ON PD LIST IN CASE
93 ; THIS ERROR IS AT PI LEVEL 7 OR HIGHER
94 ; SO NULL JOB WILL BE STARTED WHEN LAST
95 ; POPJ IS DONE(STOP2 IN RUNCSS)
96 000051 634200 000004 ;BLAME JOB 0(PRINT ON OPERATORS TTY)
97 000052 200200 000000 UERROR: MOVE ITEM,ITEM ;PRINT FOR CURRENT JOB
98 000053 CERROR: ;PRINT ACCORDING TO C(ITEM)
99 ;FN FTHALT,<
100 HALT ,+1 ;PUT ADR OF JSP DAT, IN PC AND STOP SO A
101 ; DUMP CAN BE TAKEN,CONTINUE WILL PRINT ERROR MESSAGE
102
103 >
104 000053 265040 000213' JSP TAC,ERRPNT ;ITEM ALREADY SETUP
    000054 426452 247644 ASCII /ERROR IN MONITOR/
    000055 202231 620232
    000056 476351 152236
    000057 510000 000000
105 000060 200103 777777 MOVE TAC1,-1(PDP) ;GET LOC OF JSP DAT,ERROR
106 000061 254000 000236' JRST PCPNT ;PRINT "AT EXEC LOC XXX;
107 ; EXEC CALLED FROM EXEC/USER YYY"
108 ; THEN STOP JOB
109
110 ;INPUT UO FOR OUTPUT DEVICE
111 ;CALLED AT UO LEVEL ONLY
112
113 INTERNAL ILLINP
114
115 000062 265040 000211' ILLINP: JSP TAC,ERRPTU
    
```

ERRCON - MONITOR DETECTED ERROR HANDLING ROUTINES - V404  
T. HASTINGS/TH/RCC TS 01 JUN 69

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

```

149
150          ;ILLEGAL UO
151          ;CALLED AT UO LEVEL ONLY
152
153          INTERNAL UOERR
154
155 000122 265040 000211' UOERR: JSP TAC,ERRPTU
156 000123 446311 442616      ASCII? /ILLEGAL UO/
      000124 406304 052652
      000125 474000 000000
157 000126 200100 000000      MOVE TAC1,UO00          ;GET LAST UO PC
158          IFN FTHALT,<
159          TLNN TAC1,USRMOD          ;UO FROM EXEC?
160          HALT      ,+1              ;YES,HALT SO DUMP CAN BE TAKEN
161          ; CONTINUE WILL PRINT MESSAGE
162
163 000127 364100 000236' >          SOJA TAC1,PCPNT          ;AND PRINT, PRINT USER UO PC IF DIFF,
164
165          ;ILLEGAL INSTRUCTION
166
167          ;HALT INSTRUCTION IS A SPECIAL CASE WHICH STOPS JOB BUT
168          ;THE USER MAY CONTINUE FROM IT(EFFECTIVE ADR.)
169          ;CALLED AT UO LEVEL WITH A JRST
170
171          INTERNAL ILLINS
172          EXTERNAL JOBPD1,TTYSTC
173 000130 554040 000014 ILLINS: HLRZ TAC,UO          ;ILLEGAL OPCODE
174 000131 306040 254207      CAIN TAC,254200+PROG      ;IS IT A HALT?
175 000132 254000 000137'      JRST HALTI              ;YES, PRINT DIFFERENT MESSAGE
176 000133 265040 000211'      JSP TAC,ERRPTU
177 000134 446311 420222      ASCII? /ILL INST,/
      000135 472472 427000
178 000136 254000 000234'      JRST UOOPCP          ;PRINT UO PC AND STOP JOB
179
180 000137 265040 000211' HALTI: JSP TAC,ERRPTU
181 000140 442031 452000      ASCII? /HALT/
182 000141 370107 000000      SOS TAC1,JOBPD1(JDAT) ;UOOPC=LOC OF HALT+1
183 000142 260140 000256'      PUSHJ PDP,PCP          ;PRINT "USER LOC XXX"
184 000143 260140 000000      PUSHJ PDP,INLMES      ;PRINT MONITOR MODE RESPONSE
185          ASCII? /
186 000144 064253 641432 *C
187
188 000145 050321 227000 ,/
189 000146 542607 000141'      HRRM UO,JOBPD1(JDAT) ;SAVE EFFECTIVE ADDRESS OF HALT
190 000147 260140 000000      PUSHJ PDP,TTYSTC      ;START TTY TYPING
191 000150 260140 000000      PUSHJ PDP,STOP1      ;STOP JOB
192          ; RETURN ONLY IF HE TYPES CONT
193 000151 261147 000146'      PUSH PDP,JOBPD1(JDAT) ;PUT USER RETURN ON END OF PD LIST
194 000152 254000 000000      JRST USRXIT          ;RETURN TO USER IN CASE HE TYPES CONT COMMAND
    
```

```

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 /
000160 000000 000000
206 000161 254000 000167 JRST DEVEXC
207
208 ;BAD DECTAPE DIRECTORY
209 ;CALLED AT INTERRUPT AND UUD LEVELS WITH DEVDAT AND ITEM SETUP
210
211 INTERNAL BADDIR
212
213 000162 265040 000213 BADDIR: JSP TAC,ERRPNT
214 000163 412030 420210 ASCII /BAD DIRECTORY FOR /
000164 446450 541650
000165 476453 120214
000166 476444 000000
215
216 ;ROUTINE TO PRINT "DEVICE XXX: EXEC CALLED FOR EXEC/USER YYY"
217 ;THEN STOP JOB
218 ;TO BE USED BY DEVICE DEPENDENT ERROR MESSAGES AFTER JSP TAC,DEVERR
219
220 INTERNAL DEVEXC
221
222 000167 260140 000310 DEVEXC: PUSHJ PDP,ERNAM ;PRINT "DEVICE XXX"
223 000170 254000 000241 JRST EXCALP ;PRINT "EXEC CALLED FROM EXEC/USER LOC YYY"
224
    
```

```
225
226 ;ROUTINE TO HALT A JOB WHEN A DEVICE IS NOT READY FOR I/O
227 ;CALLED FROM XXXSER AT UOQ 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,DEVDAT ;SAVE DEV'S IOS WORD & DDB
236 000174 260140 000000 PUSHJ PDP,TTYFINW ;FIND JOB'S TTY & WAIT UNTIL I/O IS FINISHED
237 000175 260140 000000 PUSHJ PDP,PRDM ;PRINT QUESTION MARK FOR BATCH
238 000176 260140 000310' PUSHJ PDP,ERNAM ;PRINT "DEVICE XXX"
239 000177 260140 000143' PUSHJ PDP,INLMES ;AND MSG.
240 000200 202371 337432 ASCII? / OK?
241 *C
242 000201 052750 306424
243 000202 064245 600000 ,/

244 000203 260140 000147' PUSHJ PDP,TTYSTC ;START UP TTY IN COMMAND MODE
245 000204 262140 000006 POP PDP,DEVDAT ;BRING BACK DEV DDB & IOS WORD
246 000205 262140 000000 POP PDP,IOS
247 000206 260140 000150' PUSHJ PDP,STOP1 ;STOP JOB &
248 000207 262140 000004 POP PDP,ITEM ;RESCHEDULE
249 000210 254000 000000 JRST WSCHED
```

```

250
251
252 ;COMMON ERROR MESSAGE SETUP ROUTINES
253 ;CALL: JSP TAC,ERRPTU, ERRDEV, OR ERRPNT
254 ; ASCII? /MESSAGE/
255 ; RETURNS HERE WITH DEVDAT SAVED @ (PDP)
256 ; C(DEVDAT)=TTYDOB, DAT TO TTY OUTPUT BUFFER POINTER
257 ; ITEM=JOB NUMBER
258
259 ;USE ERRPTU IF AT UO0 LEVEL FOR SURE
260 ;ERRDEV IF ERROR FOR AN ASSIGNED DEVICE AT ANY LEVEL
261 ;ERRPNT WITH ITEM ALREADY SET TO OFFENDING JOB NUMBER
262 ;THE JSP CALL IS USED IN CASE PUSHDOWN SPACE BECOMES CRITICAL
263 ;AGAIN AND ERRPNT HAS TO WIPF EXISTING LIST OUT
264
265 INTERNAL ERRPTU
266 INTERNAL ERRDEV,ERRPNT
267 EXTERNAL PJORN,JOB,JRTADR,JBTDAT,TTYFND,NULERR
268 IFN FTTYSER,<EXTERNAL TTYERP>
269 000211 334200 000052' ERRPTU: SKIPA ITEM,JOB ;BLAME CURRENT JOB IF NOT @,
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 IFN JDAT=PROG,<
285 ;MOVE PROG,JBTAOR(ITEM) ;JOB RELOCATION
286 >
287 ;IFE FTTYSER,< PUSHJ PDP,TTYFND ;FIND TTY FOR THIS JOB(ITEM)>
288 000223 260140 000000 IFN FTTYSER,< PUSHJ PDP,TTYERP ;FIND THIS TTY AND
289 ;SET MERTPO IN DOB
290 >
291 000224 260140 000177' ;PUSHJ PDP,INLMES
292 ;ASCII? /?
293 000225 374321 242644 ERROR IN JOB /
294 000226 512372 220222
295 000227 471011 247604
296 000230 200000 000000
297 000231 260140 000000 ;PUSHJ PDP,PJOB ;PRINT JOB NO.
298 000232 254000 000224' ;JRST INLMES ;PRINT MESSAGE SPECIFIED BY CALLER
; AND RETRUN TO LOC. AFTER MESSAGE

```

```

297
298 ;ROUTINE TO PRINT UOO PC AND STOP JOB
299 ;IF IN USER MODE PC WILL PRINT AS "AT USER LOC XXX"
300 ;IF IN EXEC MODE "AT EXEC LOC XXX; EXEC CALLED FORM EXEC/USER/ LOC YYY"
301
302 INTERNAL UOOPCP,UUOMES
303 EXTERNAL JOBPD1
304
305 000233 260140 000000 UUOMES: PUSHJ PDP,CONMES ;PRINT MESSAGE POINTED TO BY TAC
306 000234 200107 000151' UOOPCP: MOVE TAC1,JOBPD1(JDAT) ;UOO PC STORED IN JOB DATA AREA
307 ; FIRST LOC ON PD LIST
308 000235 364100 000236' SOJA TAC1,PCPNT ;DECREMENT TO POINT TO UOO IN USER AREA
309
310 ;ROUTINE TO PRINT ONE OF THREE MESSAGES AND STOP JOB
311 ;1) "AT EXEC LOC XXX; EXEC CALLED FROM EXEC LOC YYY"
312 ;2) "AT EXEC LOC XXX; EXEC CALLED FORM USER LOC YYY"
313 ;3) "AT USER LOC YYY"
314
315 ;CALL: MOVE TAC1, XXX ;WITH PC FLAGS IN LH
;
; PUSHJ PDP,PCPNT
; NEVER RETURN IF AT UOO LEVEL
;
316
317
318
319 INTERNAL PCPNT
320 EXTERNAL TPOPJ
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 ;ROUTINE TO PRINT EITHER:
327 ;1) "; EXEC CALLED FROM EXEC LOC YYY"
328 ;2) "; EXEC CALLED FROM USER LOC YYY"
329 ;AND STOP JOB
330 ;CALL: PUSHJ PDP,EXCALP
331 ; NEVER RETURNS IF AT UOO LEVEL
332
333 INTERNAL EXCALP,PCSTOP
334
335 000241 260140 000232' EXCALP: PUSHJ PDP,INLMES
336 000242 355012 552636 ASCIZ /; UOO/
000243 000000 000000
337 000244 200107 000234' MOVE TAC1,JOBPD1(JDAT) ;UOO PC IN JOB DATA AREA
338 000245 275100 000001 SUBI TAC1,1 ;BACK IT UP TO POINT TO UOO
339 000246 260140 000256' PUSHJ PDP,PCP ;PRINT "EXEC LOC " OF USER LOC
340 000247 260140 000000 PCSTOP: PUSHJ PDP,HOLD ;STOP JOB, START TTY AND SET JOB ERROR BIT
341 000250 262140 000006 POP PDP,DEV DAT ;RETURN ONLY IF AT INTERRUPT LEVEL
342 000251 254000 000000 JRST TPOPJ ;REMOVE ERROR CALL AND RETURN
    
```

```

343
344          ;ROUTINE TO PRINT PC AS:
345          ;1) "EXEC LOC XXX" OR "USER LOC XXX"
346          ;CALL: MOVE TAC1,PC TO PRINT(LH=PC FLAGS)
347          ;      PUSHJ PDP,PCP
348
349
350 000252 202032 420212 XMODE:  ASCI? / AT EXEC /
000253 542130 320000
351 000254 202032 420252 UMODE:  ASCI? / 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          ;      HRR 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     HRRI 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      HRLM 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      PRNUM: 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 ;SHIFT IN NEXT CHAR.
440 000317 322040 000000 JUMPF TAC,CPOPJ
441 000320 201401 000040 MOVEI TEM,40(TAC) ;ASCII VERSION INTO CHREC FOR OUTCHS
442 IFN FTTYSER,<
443 EXTERN OUTCHS
444 000321 260140 000307' PUSHJ PDP,OUTCHS
445 >
446 IFE FTTYSER,<
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
FRRPDL	000047' EXT	ERRPNT	000213' INT	ERRPTU	000211' INT
EXCALP	000241' INT	FTPREL	777777 777777	FTHALT	000000
FTRCHK	777777 777777	FTTTYS	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	JBTDAT	000222' EXT	JDAT	000007 INT
JOB	000211' EXT	JORN	000216' EXT	JOBPD1	000244' FXT
NLADDR	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	PJOBN	000212' EXT	POV	200000
PRNAME	000315' INT	PRG	000007 INT	PRQM	000175' EXT
PRTDIG	000300' INT	PRTNUM	000305' INT	RADX10	000274' INT
SEGILM	000005' EXT	STCP1	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	UUD00	000126' EXT	UUDERR	000122' INT
UUDMFS	000233' INT	UUDPCP	000234' INT	VERRCN	000404 INT
WSCHED	000210' EXT	XMODF	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#					
RUFPMT	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					
DCLO	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#					
DEVID	6#	6					
DEVIDS	6#	6	202				
DEVLOG	6#	6					
DEVMOD	6#	6					
DEVNAM	6#	6	427				
DEVOID	6#	6					



FTKCT	6#							
FTVONP	6#							
FTPRV	6#							
FTPA10	6#							
FTRCHK	6#	277						
FTREAS	6#							
FTSLE	6#							
FTTAK	6#							
FTTME	6#							
FTTRAC	6#							
FTTRPS	6#							
FTTYS	6#	267	287	288	407	412	442	446
HALTI	175	180#						
HNGSTP	231	233#						
HOLD	30	340						
HS4MSK	6#	6						
HSAP0S	6#	6						
HSASIZ	6#	6						
HUNGCT	6#	6						
HUNGST	6#	6						
I	6#	6						
IB	6#	6						
IBUF3	6#	6						
ICLOS	6#	6						
ILLIMP	113	115#						
ILLINS	170	173#						
ILLMOD	135	137#						
ILLOUT	124	126#						
ILM	6#	34						
ILUERR	6#	6						
INPER	6#	6						
INTR	6#	6						
INLMES	30	184	239	291	295	335	424	
INPB	6#	6						
IO	6#	6						
IOACT	6#	6	201	203				
IOREG	6#	6						
IOPKTL	6#	6						
IOROT	6#	6						
IOCON	6#	6						
IOEND	6#	6						
IODERR	6#	6						
IOINTER	6#	6						
IOFND	6#	6						
IOFST	6#	6						
IOIERR	144	146#						
IOIMPM	6#	6						
IONRCK	6#	6						
IOPAR	6#	6						
IOS	6#	6	203	234	246			
IOEND	6#	6						
IOUSE	6#	6						
IOW	6#	6						





UU02	31	157		
UU0ERR	153	155#		
UU0MES	118	129	302	305#
UU0PCP	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#		
SCHEPU	6#		
SHUFFL	6#		
STARTD	6#		
XP	6#	6	9