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IDENTIFICATION

PRODUCT CODE: AC-E700C-MC
PRODUCT NAME: CXPCCC0 PC11 MODULE
PRODUCT DATE: SEPTEMBER 1978
MAINTAINER: DEC/X11 SUPPORT GROUP

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1. ABSTACT:

PCC EXERCISES THE PC11 BY READING AN INCREMENTAL PATTERN
AND/OR BY PUNCHING AN INCREMENTAL PATTERN AND CHECKING
FOR ERRORS.

2. REQUIREMENTS:

HARDWARE: ANY PDP11 WITH A PC11
STORAGE:: PCC REQUIRES:
1. DECIMAL WORDS: 287
2. OCTAL WORDS: 0437
3. OCTAL BYTES: 1076

3. PASS DEFINITION:

ONE PASS CONSISTS OF READING AND/OR PUNCHING 6000 CHARACTERS.

4. EXECUTION TIME:

RUNNING ALONE THE PUNCH OR READER ONE PASS TAKES ABOUT
ONE MINUTE. RUNNING BOTH TAKES ABOUT TWO MINUTES.

5. CONFIGURATION REQUIREMENTS:

THE FOLLOWING STATE OF SR1 INDICATES THE OPERATION TO BE PERFORMED.

BITS	1	0	
	0	0	READER ONLY
	0	1	PUNCH ONLY
	1	0	READER AND PUNCH

6. DEVICE/OPTION SETUP:

MUST BUILD AN INCREMENTAL TEST PATTERN ON THE PUNCH TO
LOAD IN THE READER.

7. MODULE OPERATION:

INITIALIZES A PUNCH AND GENERATES AN INCREMENTAL
TEST PATTERN, AND/OR READS AN INCREMENTAL TEST PATTERN.

8. OPERATION OPTIONS:

NONE

9. NON-STANDARD PRINTOUTS:

ALL PRINTOUTS CONFORM TO DEC/X11 SPECIFICATIONS.

```
000000' TOMOD <PCCC >177550,70,4,,6000,20
000000' MODULE 140000,PCCC,177550,70,4,,6000,20
; .TITLE PCCC DEC/X11 SYSTEM EXERCISER MODULE
DDXCDM VERSION 6 23-MAY-78
;*****.LIST BIN*****
000000' BEGIN:
000000' 041520 041503 040 MODNAM: .ASCII /PCCC / ;MODULE NAME.
000005' 000 XFLAG: .BYTE OPEN ;USED TO KEEP TRACK OF WBUFF USAGE
000006' 177550 ADDR: 177550+0 ;1ST DEVICE ADDR.
000010' 000070 VECTOR: 70+0 ;1ST DEVICE VECTOR.
000012' 200 BR1: .BYTE PRTV4+0 ;1ST BR LEVEL.
000013' 000 BR2: .BYTE PRTV+0 ;2ND BR LEVEL.
000014' 000001 DVID1: +1 ;DEVICE INDICATOR 1.
000016' 000000 SR1: OPEN ;SWITCH REGISTER 1
000020' 000000 SR2: OPEN ;SWITCH REGISTER 2
000022' 000000 SR3: OPEN ;SWITCH REGISTER 3
000024' 000000 SR4: OPEN ;SWITCH REGISTER 4
;*****
000026' 140000 STAT: 140000 ;STATUS WORD.
000030' 000224 INIT: 0 ;MODULE START ADDR.
000032' 000224 SPOINT: MODSP ;MODULE STACK POINTER.
000034' 000000 PASCNT: 0 ;PASS COUNTER.
000036' 006000 ICOUNT: 6000 ;# OF ITERATIONS PER PASS=6000
000040' 000000 ICOUNT: 0 ;LOC TO COUNT ITERATIONS
000042' 000000 SOFCNT: 0 ;LOC TO SAVE TOTAL SOFT ERRORS
000044' 000000 HRDCNT: 0 ;LOC TO SAVE TOTAL HARD ERRORS
000046' 000000 SDFPAS: 0 ;LOC TO SAVE SOFT ERRORS PER PASS
000050' 000000 HRDPAS: 0 ;LOC TO SAVE HARD ERRORS PER PASS
000052' 000000 SVSCNT: 0 ;# OF SYS ERRORS ACCUMULATED
000054' 000000 RANNUM: 0 ;HOLDS RANDOM # WHEN RAND MACRO IS CALLED
000056' CONFIG:
000056' 000000 RES1: 0 ;RESERVED FOR MONITOR USE
000060' 000000 RES2: 0 ;RESERVED FOR MONITOR USE
000062' 000000 SVR0: 0 ;LOC TO SAVE R0.
000064' 000000 SVR1: OPEN ;LOC TO SAVE R1.
000066' 000000 SVR2: OPEN ;LOC TO SAVE R2.
000070' 000000 SVR3: OPEN ;LOC TO SAVE R3.
000072' 000000 SVR4: OPEN ;LOC TO SAVE R4.
000074' 000000 SVR5: OPEN ;LOC TO SAVE R5.
000076' 000000 SVR6: OPEN ;LOC TO SAVE R6.
000100' 000000 CSRA: OPEN ;ADDR OF CURRENT CSR.
000102' SRADR: ;ADDR OF GOOD DATA, OR
000102' 000000 ACSR: OPEN ;CONTENTS OF CSR.
000104' WASADR: ;ADDR OF BAD DATA, OR
000104' 000000 ASTAT: OPEN ;STATUS REG CONTENTS.
000106' ERRTP: ;TYPE OF ERROR
000106' 000000 ASB: OPEN ;EXPECTED DATA.
000110' 000000 AWAS: OPEN ;ACTUAL DATA.
000112' 000304 RSTRT: RSTRT ;RESTART ADDRESS AFTER END OF PASS
```

000114 000000
000116 000000
000120 000000
000122 000020
000040

WDTO: OPEN ; WORDS TO MEMORY PER ITERATION
WDFR: OPEN ; WORDS FROM MEMORY PER ITERATION
INTR: OPEN ; # OF INTERRUPTS PER ITERATION
IDNUM: 20 ; MODULE IDENTIFICATION NUMBER=20
; MODULE STACK STARTS HERE.
.REPT SPSIZ
.NLIST
.WORD 0
.LIST
.ENDR

000224

MODSP: ;*****

```
165  
166 000224 012767 000001 177666 START: MOV #1,INTR ; AT LEAST ONE INT/ITER.  
167 000232 012767 000001 177654 MOV #1,WDTO ; ONE WORD TO MEM/ITER  
168 000240 012767 000001 177650 MOV #1,WDFR ; ONE WORD FROM MEM/ITER.  
169 000246 032767 000002 177542 BIT #R11,SR1 ; ARE BOTH SELECTED ?  
170 000254 001403 BFC 1S ; NO-FIND OUT WHO - PUN OR READER  
171 000256 005267 177636 INC INTR ; 2 INTERRUPTS PER ITERATION  
172 000262 000410 BR RESTRT  
173 000264 005767 177526 1S: TST SR1 ; READER ONLY ?  
174 000270 001503 BNE 2S ; NO - PUN ONLY  
175 000272 005067 177620 CLR WDFR ; YES NO WORDS FROM MEM  
176 000276 000402 BR RESTRT  
177 000300 005067 177610 2S: CLR WDTO ; PUN ONLY-NO WORD TO MEM  
178 000304 016767 177506 RESTRT: MOV SR1,SWR  
179 000312 005067 000546 START1: CLR CHAR  
180 000316 005067 000544 CLR SCH  
181 000320 005067 000542 CLR WTCT  
182 000326 016701 177456 MOV VECTOR,R1 ; SET VECTOR  
183 000332 012721 000540 MOV #RDVEC,(R1)+ ; SET VECTOR  
184 000336 116711 177450 MOVB BR1,(R1) ; SET BR LEVEL  
185 000342 005767 000526 TST SWR ; TEST FOR READER OR PUNCH  
186 000346 001442 BEQ READ  
187  
188  
189  
190 ;PUNCH ROUTINE  
191 000350 016702 177432 PUNCH: MOV ADDR,R2 ; GET BASE ADDRESS  
192 000354 022222 CMP (R2)+,(R2)+ ; SET PUNCH ADDRESS  
193 000356 005721 TST (R1)+ ; SET PUNCH VECTOR  
194 000360 012721 000412 MOV #PCHVCT,(R1)+ ; SET VECTOR  
195 000364 116711 177422 MOVB BR1,(R1) ; SET BR LEVEL  
196  
197  
198  
199 000370 004567 000312 G0PU: JSR R5,WT ; CHECK FOR READY  
200 000374 016762 000464 MOV CHAR,2(R2) ; SET CHARACTER  
201 000402 052712 000100 BIS #100,(R2) ; SET PUNCH INTERRUPT  
202 000406 104400 000000 EXITS,BEGIN ; EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.  
203  
204  
205 ;PUNCH SERVICE ROUTINE  
206  
207 000412 PCHVCT: ;  
208  
209 000412 000004 000000 000420 PIRQS,BEGIN,1S ; QUEUE UP TO CONTINUE AT 1S AND RTI
```

```

219
220 000420 042712 000100 1S: BIC #100,(R2) ;CLEAR INT ENABLE
221 000422 105712 ;TEST FOR ERROR
222 000424 032767 ;TEST FOR ERROR
223 000430 032767 000001 000436 BIT #1,SWR ;TEST IF PUNCH ONLY
224 000436 001001 BNE INC ;YES
225 000439 004405 BR READ ;GO READ
226 000446 104413 000416 INCB READ ;SIGNAL END OF ITERATION.
227 000446 104413 000000- ENDS,BEGIN ;MONITOR SHALL TEST END OF PASS
228 000452 000746 BR GOPU
229
230 ;READ ROUTINE
231
232 000454 016700 177326 READ: MOV ADDR,R0 ;SET READER ADDRESS
233 000460 004567 000044 JSR R5,GORD ;READ
234 000464 016767 000402 000374 MOV CHAR1,SCH ;SAVE CHARACTER
235
236 RDS: JSR R5,GORD ;READ
237 000472 004567 000032 INCB SCH ;INCB
238 000476 105267 000364 000362 CMQB CHAR1 ;NEW CHAR=INCREMENTED ONE?
239 000510 001084 BNE DTR ;NO
240 000512 032767 000002 000354 BIT #2,SWR ;TEST FOR READ ONLY
241 000520 001350 BNE INC ;BR IF BOTH
242 000522 104413 000000- ENDS,BEGIN ;SIGNAL END OF ITERATION.
243 ;MONITOR SHALL TEST END OF PASS
244
245 000526 000761 BR RDS
246
247 000530 052710 000101 GORD: BIS #101,(R0) ;SET READ AND INT ENABLE
248 000534 104400 000000- EXITS,BEGIN ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.
249
250 ;READ SERVICE ROUTINE
251
252 000540 RDVEC:
253 000540 000004 000000 000546- ;TROS,BEGIN,1S ; QUEUE UP TO CONTINUE AT 1S AND RTI
254
255 1S: BIC #100,(R0) ;CLEAR INT ENABLE
256 000546 042710 ;TEST FOR ERROR
257 000548 104427 BMT RDER ;ERROR
258 000556 016067 000002 000306 MOV 2(R0),CHAR1 ;SAVE CHAR
259 000564 005767 000276 TST SCH ;ANY CHARS READ?
260 000572 010004 BNE ZS ;YES
261 000576 001001 BNEB CHAR1 ;CHECK FOR ZERO
262 000600 000753 BR GORD
263 000602 000205 RTS R5 ;RETURN

```

```

266
267 ;PUNCH ERROR
268
269 000604- PCHER:
270 000604 104403 000000 000746- MSGNS,BEGIN,MES1 ;ASCII MESSAGE CALL WITH COMMON HEADER
271 000612 032767 000001 000254 BIT #1,SWR ;DROP PUNCH
272 000620 001050 BNE DROP
273 000626 042767 000002 000244 BIC #2,SWR ;KEEP READING
274 000630 000167 177456 JMP START1
275
276 ;READ ERROR
277
278 000634- RDER:
279 000634 104403 000000 000752- MSGNS,BEGIN,MES2 ;ASCII MESSAGE CALL WITH COMMON HEADER
280 000642 005767 000226 TST SWR ;DROP READER
281 000648 001435 BEQ DROP
282 000650 112767 000001 000216 MOVB #1,SWR
283 000656 000167 177430 JMP START1
284
285 ;DATA ERROR
286
287 000662 116767 000200 177216 DTER: MOVB SCH,ASR ;EXPECTED DATA
288 000670 116767 000176 177212 MOVB CHAR1,AWAS ;ACTUAL DATA
289 *****
290 DATERS,BEGIN ;DATA ERROR!!!
291 *****
292 000702 000167 177404 JMP START1
293
294 ;WAIT LOOP
295
296 000706 105712 WT: TSTB (R2) ;TEST FOR READY
297 000710 100001 BPL 1 ;READY
298 000712 000205 RTS R5 ;READY
299 000714 005267 000150 1S: INC WTCT ;TIME OUT
300 000720 001003 BNE ZS ;RESTORE STACK
301 000724 000167 177654 TST (R6)+
302 000730 000730 JMP PCHER
303 000734 104407 000000- 2S: BREAKS,BEGIN ;TEMPORARY RETURN TO MONITOR...
304 000734 104407 000000- BREAKS,BEGIN ;THEN CONTINUE AT NEXT INSTRUCTION.
305 000740 000762 BR WT
306
307 000742 104410 000000- DROP: ENDS,BEGIN ;
308
309
310
311
312

```

```
322 ;VALUES OF "K"  
323  
324  
325 000746* 000756* MES1: PCH  
326 000750* 177777 177777  
327  
328 000752* 001021* MES2: RD  
329 000754* 177777 177777  
330  
331  
332 000756* 020045 052520 041516 PCH: .ASCIZ '* PUNCH ERROR, DROPPED THE PUNCH *'  
333 000764* 020110 051105 047522  
334 000772* 026122 042040 047522  
335 001008* 050120 042105 047522  
336 001008* 039510 044040 047522  
337 001014* 044103 022440 000  
338  
339 001021* 045 051040 049505 RD: .ASCIZ '* READ ERROR, DROPPED THE READER *'  
340 001034* 020103 042040 047522  
341 001042* 050120 042105 052040  
342 001058* 042504 050120 030505  
343  
344  
345 001064* 000000 CHAR: 0  
346 001068* 000000 SCR: 0  
347 001070* 000000 WCTI: 0  
348 001072* 000000 CHAR1: 0 ;TIME OUT COUNT  
349 001074* 000000 SWR: 0 ;READ CHARACTER  
;SAVE SWITCH REC  
350  
351  
352  
353  
354  
355  
356 000001 .END
```

```
ACSR = 000102R 147#  
ADDR = 001006R 113#  
ADDR22 = 001006R 165# 191 226  
ASB = 000106R 151# 290*  
ASTAT = 000104R 149#  
AWAS = 000110R 110# 291*  
BEGRN = 000000R 202# 209 218 237 247 254 271 281 293 310 311 317  
BIT0 = 000001 168#  
BIT1 = 000002 169#  
BIT10 = 004000 165#  
BIT11 = 004000 165#  
BIT12 = 010000 165#  
BIT13 = 020000 165#  
BIT14 = 040000 165#  
BIT15 = 100000 165#  
BIT16 = 000004 168#  
BIT17 = 000010 168#  
BIT18 = 000020 168#  
BIT19 = 000040 165#  
BIT20 = 000100 165#  
BIT21 = 000200 165#  
BIT22 = 000400 165#  
BIT23 = 001000 165#  
BREAKS = 104407 310 311  
BR1 = 000012R 184 195  
BR2 = 000012R 118#  
BTODS = 104421 165#  
CDATA = 104412 168#  
CHAR1 = 001063R 200 217* 346#  
CHAR2 = 001070R 233 259* 262 291 349#  
CONFIG = 000056R 135#  
CSRA = 000100R 145#  
DATCS = 104411 165#  
DATER = 104408 293 316#  
DPR = 000742R 283  
DTER = 000652R 234 290#  
DVID1 = 000014R 117#  
ENDTS = 104413 165#  
ENDT = 104410 317  
ERRVTP = 000106R 150#  
EXITS = 104400 165# 202 247  
GCPAS = 104415 165#  
GORD = 000370R 109#  
GORD = 000530R 228 231 246# 264  
GMBUF = 104414 165#  
HRDCH = 000044R 138#  
HRDPA = 104405 165#  
HRDPAS = 000050R 139#  
ICONT = 000036R 127#  
ICOUNT = 000040R 154#  
IDNUM = 000122R 154#  
INC = 000442R 215# 217# 236  
INT = 000030R 124#  
INT2 = 00120R 156#  
MAP22S = 004419R 205#  
VESI = 000746R 271 325#
```

MES2	= 000752R	281#	328#															
MODNAM	= 000000R	111#																
MODSP	= 000224R	125#	153#															
MSGS	= 104403	165#	271#	281														
MSGS	= 104403	165#																
MSGS	= 104401	165#																
NULL	= 000000	165#																
OPEN	= 000000	147#																
OTDAS	= 104420	165#																
PASCNT	= 000334R	125#																
PCH	= 000756R	125#																
PCHER	= 000604R	213#	331#															
PCHVCT	= 000412R	194#	270#	308														
DIRGS	= 000004	165#	207#															
POPS	= 05726	165#	209#	254														
POPS2	= 022626	165#																
PRTY	= 000000	116#																
PRTY0	= 000000	165#																
PRTY1	= 000040	165#																
PRTY2	= 000100	165#																
PRTY3	= 000140	165#																
PRTY4	= 000200	112#																
PRTY5	= 000200	165#																
PRTY6	= 000300	165#																
PRTY7	= 000340	165#																
PS	= 177776	165#																
PSW	= 000350R	191#																
PUNCH	= 000350R	165#																
PUSH	= 095746	165#																
PUSH2	= 024646	165#																
RANDS	= 104417	165#																
RANNUM	= 00054R	134#																
RD	= 01021R	328#																
RDER	= 000544R	258#	338#															
RDS	= 00043R	239#	480#															
RDVEC	= 000540R	183#	282#															
READ	= 000454R	186#	216#															
RESSTRT	= 000304R	172#	176#	226#	178#													
RES2	= 000060R	137#																
RSTRT	= 000112R	153#																
SBADR	= 000102R	146#																
SCH	= 01056R	180#																
SDFCNT	= 000042R	129#	229*	232*	233	260	290	347#										
SDFPERS	= 104406	165#																
SDFPAS	= 000046R	131#																
SPOINT	= 000022R	125#																
SPSIZ	= 000040	158#																
SRI	= 000016R	118#	169	173	17R													
SR2	= 000020R	119#																
SR3	= 000020R	120#																
SR4	= 000024R	120#																
START	= 000224R	124#	166#															
START1	= 000312R	179#	275	285	295													
STAT	= 000026R	123#																

SVR0	= 000062R	138#																
SVR1	= 000064R	139#																
SVR2	= 000066R	140#																
SVR3	= 000070R	141#																
SVR4	= 000072R	142#																
SVR5	= 000074R	143#																
SVR6	= 000076R	144#																
SWR	= 01074R	178#																
SYSCNT	= 000052R	133#	185	214	235	272	274*	282	284*	350#								
TRPDFD	= 000022	165#																
VECTOR	= 000010R	114#	182															
WASADR	= 000104R	148#																
WDRP	= 000116R	155#	168*	175*														
WDT0	= 000114R	154#	167*	177*														
WT	= 000706R	199#	302#	312														
WTC	= 01070R	191#	305*	348#														
XFLAG	= 000005R	112#																

. ABS. 000000 000
 001076 001

ERRORS DETECTED: 0
 DEFAULT GLOBALS GENERATED: 0
 XPCCO,XPCCO/SOL/CRF:SYM=DDXCOM,XPCCO
 RUN-TIME: 1 1 2 SECONDS
 RUN-TIME RATIO: 1972=6.8
 CORE USED: 7K (13 PAGES)