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DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

SEQ 0001

.REM \$

IDENTIFICATION

PRODUCT CODE: AC-S0398-MC
PRODUCT NAME: CXDPV80 DPV-11 MODULE
PRODUCT DATE: SEPTEMBER 1983
MAINTAINER: DEC/X11 SUPPORT GROUP

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1. ABSTRACT

DPV IS AN IOMOD THAT EXERCISES UP TO SIX CONSECUTIVELY
ADDRESSED SYNCHRONOUS LINE INTERFACES (DPV11) BY TRANSMITTING A
STANDARD BINARY COUNT PATTERN IN EITHER INTERNAL OR EXTERNAL
LOOPBACK. THE USER MAY ALSO SELECT EITHER BIT ORIENTED PROTOCOL
(BOP) OR BYTE ORIENTED PROTOCOL (BCP). THE RECEIVED DATA IS
COMPARED WITH THE TRANSMITTED DATA AND ANY ERRORS
ARE REPORTED VIA THE CONSOLE TTY. ALL AVAILABLE INTERFACES
(UP TO 6) ARE ACTIVATED AND RUNNING SIMULTANEOUSLY.

(NOTE: THIS MODULE IS A MODIFICATION OF CXDPBB WHICH IS THE
DEC/X11 MODULE FOR THE DUP11).

2. REQUIREMENTS

HARDWARE: DPV11 SYNCHRONOUS INTERFACE
STORAGE:: THE DPV REQUIRES:
1. DECIMAL WORDS: 604
2. OCTAL WORDS: 1134
3. OCTAL BYTES: 2270

3. PASS DEFINITION

ONE PASS OF THE DPV MODULE CONSISTS OF TRANSMITTING AND RECEIVING
14,400 8-BIT CHARACTERS (TOTAL) PER ACTIVE DEVICE.

4. EXECUTION TIME

ONE DPV RUNNING ALONE ON A LSI 11/23 PROCESSOR TAKES APPROXIMATELY
1 MINUTE TO COMPLETE ONE PASS. THIS TIME INCREASES SLIGHTLY
AS MORE DEVICES ARE ADDED.

5. CONFIGURATION PARAMETERS

DEFAULT PARAMETERS:

DEVADR: 000001, VECTOR: 001, BR1: 5, BR2: 5, DEVCNT: 1
THE DEVICE IS TESTED IN SDLC MODE AS A SECONDARY STATION,
WITH A HARDWARE BCC CHECK USING THE CRC/CCITT POLYNOMIAL.

REQUIRED PARAMETERS: THE CSR AND VECTOR MUST BE SET UP BY THE USER.

6. DEVICE/OPTION SETUP

SR1

BIT 0 = 0 BIT ORIENTED PROTOCOL
BIT 0 = 1 BYTE ORIENTED PROTOCOL

D1

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BIT 1 = 0 INTERNAL LOOPBACK (MAINTENANCE MODE)
BIT 1 = 1 EXTERNAL LOOPBACK (ONBOARD CONNECTOR - H3260 RS423)

7. MODULE OPERATION

TEST SEQUENCE:

- A. TEST UP TO 6 POSSIBLE DEVICES FOR SELECTION
- B. STORE THE NO. OF DEVICES TO BE TESTED AND SET UP THE VECTORS AND PRIORITIES FOR THESE DEVICES
- C. LOAD ALL REGISTERS--SET UP IN USER DEFINED MODE, TURN RECEIVER AND TRANSMITTER ON, AND INTERRUPT ENABLES FOR ALL ACTIVE DEVICES, ENABLE SELECTED DEVICES.
- D. TRANSMITTER INTERRUPT SERVICE:
 - 1.) TEST FOR FALSE INTERRUPT (READY (0)); REPORT ERRORS
 - 2.) OUTPUT NEXT CHARACTER TO THE DEVICE
 - 3.) RETURN TO MONITOR TO WAIT FOR RECEIVER INTERRUPT.
- E. RECEIVER INTERRUPT SERVICE:
 - 1.) TEST FOR FALSE INTERRUPT (DONE (0)); REPORT ERRORS
 - 2.) CHECK FOR DATA ERROR, REPORT ERRORS
 - 3.) IF LAST CHARACTER, CHECK FOR BCC ERROR.
 - 4.) RETURN TO MONITOR TO WAIT FOR TRANSMITTER INTERRUPT
- F. REPEAT D AND E UNTIL ALL DEVICES HAVE BEEN PROCESSED.
- G. TURN OFF ALL ACTIVE DEVICES AND DECREMENT ITERATION COUNT, IF NOT 0, RESTART AT B.
- H. SIGNAL END PASS.

8. OPERATION OPTIONS

- A. LOCATION DVID1 (DPV 14) MAY BE CHANGED TO SELECT ANY COMBINATION OF DEVICES BIT0-DEV0, BIT1-DEV1BIT5-DEV5.

NOTE: IF DVID1 IS INITIALLY 0 DPV WILL BE DROPPED FROM TEST.

9. NON STANDARD PRINTOUTS

NONE: ALL PRINTOUTS HAVE STANDARD FORMATS AS DESCRIBED IN THE DEC/X11 DOCUMENT.

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159      ;
160      ; EDIT      BY      DATE      REASON
161      ;
162      ; 001      R. SOLER    12-SEP-83    PART OF THE IDNUM UPDATE
163      ;                                PROGRAM. THIS MODULES IDNUM
164      ;                                WAS 14 BUT SHOULD BE 151.
165      ;
166      ;--
167 000000      IOMOD    <DPVB > .1,1,5,5,0,151,70      ;RS001
      000000      MODULE 140000,DPVB .1,1,5,5,0,151,70.....
      ;          .TITLE DPVB DEC/X11 SYSTEM EXERCISER MODULE
      ;          .DDXCOM VERSION 6.4    28-JAN-82
      ;          .LIST  BIN
      ;*****
      000000      REGIN:
      000000      104      120      126 MODNAM: .ASCII /DPVB / ;MODULE NAME.
      000003      102      040
      000005      000
      000006 000001      XFLAG: .BYTE OPEN      ;USED TO KEEP TRACK OF WBUF USAGE
      000010 000001      ADDR: 1+0      ;1ST DEVICE ADDR.
      000012      240      VECTOR: 1+0      ;1ST DEVICE VECTOR.
      000013      240      BR1: .BYTE PRTY5+0      ;1ST BR LEVEL.
      000014 000001      BR2: .BYTE PRTY5+0      ;2ND BR LEVEL.
      000016 000000      DVID1: 0+1      ;DEVICE INDICATOR 1.
      000020 000000      SR1: OPEN      ;SWITCH REGISTER 1
      000022 000000      SR2: OPEN      ;SWITCH REGISTER 2
      000024 000000      SR3: OPEN      ;SWITCH REGISTER 3
      ;          SR4: OPEN      ;SWITCH REGISTER 4
      ;*****
      000026 140000      STAT: 140000      ;STATUS WORD.
      000030 000244      INIT: START      ;MODULE START ADDR.
      000032 000224      SPOINT: MODSP      ;MODULE STACK POINTER.
      000034 000000      PASCNT: 0      ;PASS COUNTER.
      000036 000151      ICONT: 151      ;# OF ITERATIONS PER PASS=151
      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      SOFPAS: 0      ;LOC TO SAVE SOFT ERRORS PER PASS
      000050 000000      HRDPAS: 0      ;LOC TO SAVE HARD ERRORS PER PASS
      000052 000000      SYSCNT: 0      ;# OF SYS ERRORS ACCUMULATED
      000054 000000      RANUM: 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: OPEN      ;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      SBADR:      ;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

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000106	000000	ASB:	OPEN	; EXPECTED DATA.
000110	000000	AWAS:	OPEN	; ACTUAL DATA.
000112	000330	RSTRT:	RESTR	; RESTART ADDRESS AFTER END OF PASS
000114	000000	WDT0:	OPEN	; WORDS TO MEMORY PER ITERATION
000116	000000	WDFR:	OPEN	; WORDS FROM MEMORY PER ITERATION
000120	000000	INTR:	OPEN	; # OF INTERRUPTS PER ITERATION
000122	000070	IDNUM:	70	; MODULE IDENTIFICATION NUMBER=70
	000040		.REPT SPSIZ	; MODULE STACK STARTS HERE.
			.MLIST	
			.WORD 0	
			.LIST	
			.ENDR	
000224		MODSP:		
			;*****G*****	

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169
170
171      100000      ;BIT DEFINITIONS
172      040000      BIT15= 100000
173      020000      BIT14= 40000
174      010000      BIT13= 20000
175      004000      BIT12= 10000
176      002000      BIT11= 4000
177      001000      BIT10= 2000
178      000400      BIT9= 1000
179      000200      BIT8= 400
180      000100      BIT7= 200
181      000040      BIT6= 100
182      000020      BIT5= 40
183      000010      BIT4= 20
184      000004      BIT3= 10
185      000002      BIT2= 4
186      000001      BIT1= 2
187                      BIT0= 1
188
189      ;CONTROL AND STATUS REGISTER DEFINITIONS
190      ;-----
191                      ;RXCSR = RECEIVER CONTROL AND STATUS (16XXX0)
192                      ;RDSR = RECEIVER DATA AND STATUS (16XXX2) READ ONLY
193                      ;PCSAR = PARAMETER CONTROL SYNC/ADDRESS (16XXX2) WRITE ONLY
194                      ;TXCSR = TRANSMITTER CONTROL AND STATUS (16XXX4)
195                      ;TDSR = TRANSMITTER DATA AND STATUS (16XXX6)
196      000000      RXCSR= 0      ;RECEIVER CONTROL AND STATUS REG
197      000002      RDSR= 2      ;RECEIVER DATA BUFFER REGISTER
198      000002      PCSAR= 2      ;PARAMETER CONTROL SYNC/ADDRESS
199      000004      TXCSR= 4      ;TRANSMITTER CONTROL AND STATUS REGISTER
200      000006      TDSR= 6      ;TRANSMITTER DATA BUFFER REGISTER
201
202
203      ;RXCSR BIT DEFINITIONS
204      004000      RXACT= BIT11      ;RECEIVER ACTIVE
205      002000      RXSTAT= BIT10      ;RECEIVER STATUS AVAILABLE
206      000100      RXIE= BIT6      ;RECEIVE INTERRUPT ENABLE
207      000020      RXEN= BIT4      ;RECEIVER ENABLE
208      000004      RTS= BIT2      ;REQUEST TO SEND
209
210      ;RDSR BIT DEFINITIONS
211      100000      ERR= BIT15      ;RECEIVER ERROR
212      004000      ROVER= BIT11      ;RECEIVER OVERRUN
213      002000      RABORT= BIT10      ;RECEIVER ABORT
214      001000      REOM= BIT9      ;RECEIVE END OF MESSAGE
215      000400      RSON= BIT8      ;RECEIVE START OF MESSAGE
216
217      ;PCSAR BIT DEFINITIONS
218      040000      BCP= BIT14      ;PROTOCOL SELECTION, SET = BCP, CLEAR = BOP,
219      010000      SECAOR= BIT12      ;SECONDARY ADDRESS,
220      001400      CRC16= BIT8:BIT9      ;CRC16
221
222      ;TXCSR BIT DEFINITIONS
223      000100      TXIE= BIT6      ;TRANSMITTER INTERRUPT ENABLE
224      000020      TXEN= BIT4      ;TRANSMITTER ENABLE
225      000010      MAINT= BIT3      ;MAINTENANCE MODE

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226      000004      TBE = BIT2      ;TRANSMIT BUFFER EMPTY
227      000002      TXACT = BIT1     ;TRANSMITTER ACTIVE
228      000001      RESET = BIT0     ;DPV RESET
229
230      ;TDSR BIT DEFINITIONS
231      100000      TERR = BIT15      ;TRANSMIT DATA LATE ERROR
232      002000      TABORT = BIT10    ;TRANSMIT ABORT
233      001000      TEOM = BIT9       ;TRANSMIT END OF MESSAGE
234      000400      TSOM = BIT8       ;TRANSMIT START OF MESSAGE
235
236      ;MISCELLANEOUS STORAGE
237 000224 000000      N.DPVS: OPEN     ;SOFTWARE MEMORY
238 000226 000000      TOTAL: OPEN     ;STORAGE FOR DATA CHECK
239 000230 000000      COUNT: OPEN     ;ITERATION COUNT
240 000232 000000      RXBF: OPEN      ;REC BUFFER ADRS STORAGE
241 000234 000000      SAVBF: OPEN     ;REC ISR TEMPORARY STORAGE
242 000236 000000      SELECT: OPEN    ;SOFTWARE POINTER TO ACTIVE DEVICES
243
244 000240 000000      MODE: .WORD 0    ;PROTOCOL MODE (0 = BOP, 1 = BCP)
245 000242 000000      LOOP: .WORD 0   ;LOOPBACK FLAG (0 = MAINTENANCE, 1 = EXTERNAL)
246
247
248      .MACRO $PUSH      $A,$B,$C,$D,$E,$F
249      .IIF NB <$A>, MOV $A,-(SP)      ;SAVE '$A' ON THE STACK
250      .IIF NB <$B>, MOV $B,-(SP)      ;SAVE '$B' ON THE STACK
251      .IIF NB <$C>, MOV $C,-(SP)      ;SAVE '$C' ON THE STACK
252      .IIF NB <$D>, MOV $D,-(SP)      ;SAVE '$D' ON THE STACK
253      .IIF NB <$E>, MOV $E,-(SP)      ;SAVE '$E' ON THE STACK
254      .IIF NB <$F>, MOV $F,-(SP)      ;SAVE '$F' ON THE STACK
255      .ENDM $PUSH
256      .MACRO $POP      $A,$B,$C,$D,$E,$F
257      .IIF NB <$A>, MOV (SP)+,$A      ;POP STACK TO '$A'
258      .IIF NB <$B>, MOV (SP)+,$B      ;POP STACK TO '$B'
259      .IIF NB <$C>, MOV (SP)+,$C      ;POP STACK TO '$C'
260      .IIF NB <$D>, MOV (SP)+,$D      ;POP STACK TO '$D'
261      .IIF NB <$E>, MOV (SP)+,$E      ;POP STACK TO '$E'
262      .IIF NB <$F>, MOV (SP)+,$F      ;POP STACK TO '$F'
263      .ENDM $POP

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SEQ 0009

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265
266
267
268 000244          ;BEGIN TESTING FOR THE DPV-11
269 000244 032767 000001 177544 START:
270 000252 001003          BIT      @BIT0,SR1      ;WHAT PROTOCOL?
271 000254 005067 177760          BNE      1$      ;IF SET, BCP
272 000260 000403          CLR      MODE          ;FLAG THAT BOP MODE REQUESTED.
273 000262          BR      2$
274 000262 012767 000001 177750 1$:      MOV      @1,MODE      ;FLAG THAT BCP MODE REQUESTED.
275 000270          2$:
276 000270 032767 000002 177520          BIT      @BIT1,SR1      ;WHAT LOOPBACK
277 000276 001003          BNE      3$      ;IF SET, EXTERNAL LOOPBACK.
278 000300 005067 177736          CLR      LOOP      ;FLAG THAT MAINTENANCE MODE (INTERNAL
279          BR      4$      ;LOOPBACK) REQUESTED.
280 000304 000403          3$:
281 000306 012767 000001 177726          MOV      @1,LOOP      ;FLAG THAT EXTERNAL LOOPBACK REQUESTED.
282 000312          4$:
283 000314 016767 177474 177714          MOV      DVID1,SELECT      ;GET ACTIVE DEVICES
284 000322 001002          BNE      RESTR1      ;BR IF ANY ARE SELECTED
285 000324          DROP:
286 000324 104410 000000'          END$,BEGIN      ;INCORRECT NUMBER OF DPV11'S
287
288
289          ;SETUP VECTORS FOR ACTIVE DEVICES
290 000330          RESTR1:
291 000330 032767 177700 177700          BIT      @C<77>,SELECT      ;MAKE SURE NO MORE THAN 6 SELECTED.
292 000336 001372          BNE      DROP          ;INVALID-NO MORE THAN 6 DEVICES!!
293 000340 016701 177672          MOV      SELECT,R1      ;GET IMAGE OF RUNNING DEVICES
294 000344 001767          BEQ      DROP          ;BR IF ALL DPV'S DROPPED
295 000346 005067 177652          CLR      N.DPV5      ;CLEAR THE # OF DPV'S (SOFTWARE)
296 000352 016702 177432          MOV      VECTOR,R2      ;GET INITIAL VECTOR
297 000356 016700 177424          MOV      ADDR,R0      ;GET INITIAL ADDRESS
298 000362 012703 001752'          MOV      @LNKTAB,R3      ;SET ISR POINTER
299 000366 012767 002172' 177636          MOV      @RXBFO,RXBFB      ;SET UP BUFFER POINTERS
300 000374          1$:
301 000374 006201          ASR      R1      ;ACTIVE?
302 000376 103410          BCS      3$      ;BR IF YES
303 000400 001437          BEQ      SETUP1      ;BR IF DONE
304 000402 062703 000024          ADD      @24,R3      ;POP ISR POINTER
305 000406          2$:
306 000406 062702 000010          ADD      @10,R2      ;NEXT DEVICE VECTOR
307 000412 062700 000010          ADD      @10,R0      ;NEXT DEVICE CSR
308 000416 000766          BR      1$      ;CONTINUE
309 000420          3$:
310 000420 005267 177600          INC      N.DPV5      ;UPDATE THE # TO RUN
311 000424 010312          MOV      R3,(R2)      ;LOAD ISR POINTER (RECEIVER)
312 000426 116762 177360 000002          MOV8     BR1,2(R2)      ;LOAD PRIORITY
313 000434 010063 000004          MOV      R0,4(R3)      ;LOAD CSR POINTER
314 000440 005063 000010          CLR      10(R3)      ;CLR REC BYTE COUNT
315 000444 062703 000012          ADD      @12,R3      ;UPDATE POINTER
316 000450 010362 000004          MOV      R3,4(R2)      ;LOAD TRANSMITTER ISR
317 000454 116762 177333 000006          MOV8     BR2,6(R2)      ;LOAD PRIORITY
318 000462 010063 000004          MOV      R0,4(R3)      ;LOAD CSR POINTER
319 000466 005063 000010          CLR      10(R3)      ;CLEAR TX BYTE COUNT
320 000472 062703 000012          ADD      @12,R3      ;NEXT ISR POINTER
321 000476 000743          BR      2$      ;CONTINUE

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322
323
324 000500
325 000500 016767 177520 177412
326 000506 016767 177512 177400
327 000514 016767 177504 177374
328 000522 006367 177372
329 000526 012700 000006
330 000532 012703 002156
331 000536
332 000536 012723 000135
333 000542 005300
334 000544 001374
335 000546 012700 000006
336 000552 012703 002172
337 000556
338 000556 012723 000135
339 000562 005300
340 000564 001374
341
342
343 000566
344 000566 016700 177214
345 000572 016701 177440
346 000576
347 000576 006201
348 000600 103404
349 000602 001410
350 000604 062700 000010
351 000610 000772
352 000612
353 000612 004767 001024
354 000616 062700 000010
355 000622 000765
356 000624
357 000624 016701 177406
358 000630 016767 177370 177370
359 000636 016700 177144
360 000642
361 000642 006201
362 000644 103404
363 000646 001406
364 000650
365 000650 062700 000010
366 000654 000772
367 000656
368 000656 004767 001052
369 000662 000772
370
371
372 000664
373 000664 012705 020000
374
375
376 000670
377 000670
378 000670 104407 000000

;SET UP BUFFERS
SETUP1:
MOV N.DPVS,INTR ;SET # OF INTERRUPTS
MOV N.DPVS,WDT0 ;SET # OF WORDS TO MEM
MOV N.DPVS,WDFR ;SET # OF WORDS FROM MEM
ASL INTR ;DOUBLE INTERRUPTS
MOV #6,R0 ;LOAD BUFFER SIZE
MOV #TXBF0,R3 ;LOAD BUFFER START
1$:
MOV #135,(R3)+ ;FIRST CHARACTER TO TRANSMIT.
DEC R0 ;LOAD UNTIL DONE.
BNE 1$ ;BR IF MORE TO GO
MOV #6,R0 ;LOAD BUFFER SIZE
MOV #RXBF0,R3 ;LOAD START ADDRESS
2$:
MOV #135,(R3)+ ;FIRST CHARACTER TO RECEIVE.
DEC R0 ;LOAD BUFFER UNTIL DONE.
BNE 2$ ;BR IF MORE TO GO

;PRELIMINARY DEVICE SETUP
SETUP2:
MOV ADDP,R0 ;LOAD FIRST CSR
MOV SELECT,R1 ;SET UP TO GET ACTIVE DEVICES
1$:
ASR R1 ;GET AN ACTIVE
BCS 2$ ;ONE
BEQ ACTIV ;BR IF DONE
ADD #10,R0 ;UPDATE FOR THE NEXT ONE
BR 1$ ;CONTINUE
2$:
JSR PC,PRELIM ;GO DO THE DEVICE SETUP
ADD #10,R0 ;UPDATE FOR THE NEXT ONE
BR 1$ ;CONTINUE
ACTIV:
MOV SELECT,R1 ;GET THE ACTIVE DPV'S
MOV N.DPVS,TOTAL ;SET UP FOR DATA CHECK
MOV ADDR,R0 ;GET FIRST CSR
1$:
ASR R1 ;GET AN ACTIVE ONE
BCS 3$ ;BR IF ACTIVE
BEQ WAIT ;BR IF DONE
2$:
ADD #10,R0 ;UPDATE CSR
BR 1$ ;CONTINUE
3$:
JSR PC,READY ;TURN ON DEVICE
BR 2$ ;CONTINUE

;DELAY AND SCAN FOR FINISH ROUTINE
WAIT:
MOV #20000,R5 ;SET UP FOR A LONG DELAY
;APPROX 30 SECONDS ON A LSI 11/23
;APPROX 60 SECONDS ON A LSI 11/2

SCAN:
1$:
BREAK$,BEGIN ;TEMPORARY RETURN TO MONITOR....

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      000674 104407 000000'
379 000700 005767 177322
380 000704 001004
381
382
383 000706 104413 000000'
      000712
384 000712 000167 177412      2$:
385 000716
386 000716      3$:
387 000716 005305
388 000720 001363
389 000722 104403 000000' 000734'
390 000730 104410 000000'
391 000734
392 000734 002222'
393 000736 177777

      HUNG:
      MHUNG
      -1

BREAK$,BEGIN
1ST TOTAL
BNE 3$
; THEN CONTINUE AT NEXT INSTRUCTION.
; GET THE # OF ACTIVE DPVS
; BR IF MORE TO GO
; -----
; -----
ENDIT$,BEGIN
; SIGNAL END OF ITERATION.
; MONITOR SHALL TEST END OF PASS
JMP RESTRT
; RESTART PROGRAM
DEC R5
BNE 1$
MSGN$,BEGIN,HUNG
END$,BEGIN
; STALL FOR ALL DPV'S TO FINISH
; BR IF DELAY NOT ZERO
; ASCII MESSAGE CALL WITH COMMON HEADER
; DROP THE MODULE
; POINTER TO ASCII MESSAGE
; TERMINATOR
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395                                     ;TRANSMITTER INTERRUPT SERVICE ROUTINE
396 000740 TXISR:
397 000740 0.0046 MOV R0,-(SP) ;SAVE R0 ON THE STACK
000742 010146 MOV R1,-(SP) ;SAVE R1 ON THE STACK
398 000744 012500 MOV (R5)+,R0 ;GET DEVICE CSR AND POP OFFSET TO R5
399 000746 012501 MOV (R5)+,R1 ;GET DATA ADDRESS AND LEAVE R5=COUNT ADDRESS
400 000750 032760 100000 000006 PIY #TERR,TDSR(R0) ;DATA LATE ERROR?
401 000756 001430 BCU 2$ ;BR IF NO
402 000760 010067 177114 MOV R0,CSRA ;ADDRESS OF RXCSR FOR TYPEOUT
403 000764 011067 177112 MOV (R0),ACSR ;CONTENTS OF RXCSR FOR TYPEOUT
404 000770 016067 000006 177106 MOV TDSR(R0),ASTAT ;CONTENTS OF TDSR FOR TYPEOUT
405 000776 012760 000001 000004 MOV #RESET, TXCSR(R0) ;TURN OFF THE DEVICE
406 001004 012601 MOV (SP)+,R1 ;POP STACK TO R1
001006 012600 MOV (SP)+,R0 ;POP STACK TO R0
001010 012605 MOV (SP)+,R5 ;POP STACK TO R5
407 -----
001012 000004 000000' 001020' PIRQ$,BEGIN,1$ ; QUEUE UP TO CONTINUE AT 1$ AND RTI
-----
408 001020 1$:
409 001020 012767 000041 177060 MOV #41,ERRTYP ;XMITTER DATA LATE
410 001026 104406 000000' 000000 SOFER$,BEGIN,NULL ;TRANSMIT DATA LATE ERROR
;*****
411 001034 000167 177630 JMP SCAN ;CONTINUE SCANNING FOR END
412 001040 2$:
413 001040 005215 INC (R5) ;UPDATE THE COUNTER
414 001042 022715 000001 CMP #1,(R5) ;IS THIS THE FIRST ONE?
415 001046 001004 BNE 3$ ;IF NOT, SEND DATA
416 001050 052760 000400 000006 BIS #TSOM,TDSR(R0) ;IF YES, DON'T TRANSMIT DATA
417 ;SEND OUT A SECOND FLAG (OR SYNCH)
418 ;NOTE: IN BOP MODE ONLY 1 FLAG IS
419 ;NECESSARY. IN BCP MODE, 2 SYNCHS
420 ;ARE NEEDED. IN BOTH CASE WE SEND OUT
421 ;2 JUST FOR EASE OF CODING.
422 001056 000414 BR 4$
423 001060 3$:
424 001060 011160 000006 MOV (R1),TDSR(R0) ;PUSH OUT DATA.
425 001064 105211 INCB (R1) ;CHANGE DATA FOR NEXT CHARACTER.
426 001066 022715 002261 CMP #1201,,(R5) ;CHECK FOR FINISH. (THE TRANSMIT COUNTER IS
427 ;1201. BECAUSE WE COMPENSATE FOR THE EXTRA
428 ;FLAG OR SYNCH).
429 001072 001006 BNE 4$ ;BR IF MORE TO GO
430 001074 052760 001000 000006 BIS #TEOM,TDSR(R0) ;END OF MESSAGE.
431 001102 042760 000100 000004 BIC #TXIE, TXCSR(R0) ;TURN OFF INTERRUPTS
432 001110 4$:
433 001110 012601 MOV (SP)+,R1 ;POP STACK TO R1
001112 012600 MOV (SP)+,R0 ;POP STACK TO R0
001114 012605 MOV (SP)+,R5 ;POP STACK TO R5
434 001116 000002 RTI ;RETURN FROM INTERRUPT

```

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

```

436                                     ;RECEIVER INTERRUPT SERVICE ROUTINE
437 001120                               RXISR:
438 001120 010046                       MOV     R0,-(SP)           ;SAVE R0 ON THE STACK
439 001122 010146                       MOV     R1,-(SP)           ;SAVE R1 ON THE STACK
440 001124 012500                       MOV     (R5)+,R0           ;GET CSR
441 001126 012501                       MOV     (R5)+,R1           ;GET BUFFER ADDR AND LEAVE R5=F . COUNT
442 001130 105710                       TSTB    (R0)              ;IS RECEIVER DATA AVAILABLE? (( 7 OF RXCSR)
443 001132 100430                       BMI     2$                ;OK IF SET - BR
444 001134 010067 176740                 MOV     R0,CSRA           ;ADDRESS OF RXCSR FOR HARD ERROR MESSAGE.
445 001136 011067 176736                 MOV     (R0),ACSR         ;CONTENTS OF RXCSR FOR HARD ERROR MESSAGE.
446 001144 016067 000002 176732         MOV     RDSR(R0),ASTAT ;CONTENTS OF RDSR FOR HARD ERROR MESSAGE.
447 001152 012760 000001 000004         MOV     @RESET,TXCSR(R0) ;TURN OFF THE DEVICE
448
449 001160 012601                       MOV     (SP)+,R1           ;POP STACK TO R1
450 001162 012600                       MOV     (SP)+,R0           ;POP STACK TO R0
451 001164 012605                       MOV     (SP)+,R5           ;POP STACK TO R5
452 001166 000004 000000' 001174'       ;-----
453                                     PIRQ$,BEGIN,1$           ; QUEUE UP TO CONTINUE AT 1$ AND RTI
454                                     ;-----
455 001174                               1$:
456 001174 012767 000011 176704         MOV     @11,ERRTYP        ;ILLEGAL INTERRUPT
457 001202 104195 000000' 000000       ;*****
458                                     HRDR$,BEGIN,NULL        ;FALSE INTERRUPT
459                                     ;*****
460 001210 000157 177454                 JMP      SCAN            ;CONTINUE SCANNING FOR END
461 001214 016067 000002 177012         MOV     RDSR(R0),SAVBF      ;SAVE THE CHARACTER IN THE BUFFER
462 001222 032767 006000 177004         BIT     @ROVER!RABORT,SAVBF ;WAS THERE AN OVERRUN OR ABORT?
463 001230 001012                       BNE     5$                ;BRANCH TO ERROR IF AN OVERRUN OR ABORT REC.
464 001232 005215                       INC     (R5)              ;UPDATE THE CHARACTER COUNT.
465 001234 022715 002260                 CMP     @1200.,(R5)        ;DONE?
466 001240 001467                       BEQ     13$              ;BR IF DATA DONE
467 001242 121167 176766                 CMPB    (R1),SAVBF        ;IS THE DATA OK?
468 001246 001033                       BNE     10$              ;IF NOT, PROCEED.
469 001250 105211                       INCB    (R1)              ;UPDATE DATA
470 001252 000167 000354                 JMP     20$
471 001256                               5$:
472 001256 010067 176616                 MOV     R0,CSRA           ;ADDRESS OF RXCSR FOR HARD ERROR MESSAGE.
473 001262 011067 176614                 MOV     (R0),ACSR         ;CONTENTS OF RXCSR FOR HARD ERROR MESSAGE.
474 001266 016067 000002 176610         MOV     RDSR(R0),ASTAT ;CONTENTS OF RDSR FOR HARD ERROR MESSAGE.
475 001274 012760 000001 000004         MOV     @RESET,TXCSR(R0) ;TURN OFF THE DEVICE
476
477 001302 012601                       MOV     (SP)+,R1           ;POP STACK TO R1
478 001304 012600                       MOV     (SP)+,R0           ;POP STACK TO R0
479 001306 012605                       MOV     (SP)+,R5           ;POP STACK TO R5
480 001310 000004 000000' 001316'       ;-----
481                                     PIRQ$,BEGIN,6$           ; QUEUE UP TO CONTINUE AT 6$ AND RTI
482                                     ;-----
483 001316                               6$:
484 001316 012767 000017 176562         MOV     @17,ERRTYP        ;OVERRUN OR ABORT.
485 001324 104405 000000' 000000       ;*****
486                                     HRDR$,BEGIN,NULL        ;HARDWARE DATA ERROR
487                                     ;*****
488 001332 000167 177332                 JMP     SCAN            ;CONTINUE SCANNING FOR END

```

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

```

480
481
482 001336                                10$:
483 001336 010167 176540                MOV    R1,SBADR      ;LOAD GOOD DATA ADRS
484 001342 010067 176532                MOV    R0,CSRA      ;LOAD CSR
485 001346 012767 000234' 176530        MOV    #SAVBF,WASADR  ;LOAD BAD DATA ADRS
486 001354 111167 176526                MOV    (R1),ASB     ;LOAD GOOD DATA
487 001360 116767 176650 176522        MOV    SAVBF,AWAS    ;LOAD BAD DATA
488 001366 012760 000001 000004        MOV    #RESET, TXCSR(R0) ;TURN OFF THE DEVICE
489 001374 012601                        MOV    (SP)+,R1     ;POP STACK TO R1
      001376 012600                        MOV    (SP)+,R0     ;POP STACK TO R0
      001400 012605                        MOV    (SP)+,R5     ;POP STACK TO R5
490
      001402 000004 000000' 001410'    PIRQ$,BEGIN,11$      ; QUEUE UP TO CONTINUE AT 11$ AND RTI
      ;-----
491 001410                                11$:
492
      001410 104404 000000'            ;*****
      DATER$,BEGIN                     ;DATA ERROR!!!
      ;*****
493 001414 000167 177250                JMP     SCAN      ;CONTINUE SCANNING FOR END
494
495
496 001420                                13$:
497 001420 005767 176614                TST     MODE      ;PROTOCOL?
498 001424 001405                        BEQ     14$        ;BR IF BOP MODE
499 001426 032767 100000 176600        BIT     #ERR,SAVBF  ;CHECK FOR CRC ERROR
500 001434 001071                        BNE     19$        ;BR IF NO ERROR
501 001436 000440                        BR      17$        ;CRC ERROR
502 001440                                14$:
503 001440 032767 100000 176566        BIT     #ERR,SAVBF  ;CHECK FOR CRC ERROR
504 001446 001034                        BNE     17$        ;BR IF ERROR
505 001450 032767 001000 176556        BIT     #REOM,SAVBF ;WAS RECEIVE END OF MESSAGE RECEIVED?
506 001456 001060                        BNE     19$        ;IF YES, OK.
507
508 001460 010067 176414                MOV    R0,CSRA      ;ADDRESS OF RXCSR FOR HARD ERROR MESSAGE.
509 001464 011067 176412                MOV    (R0),ACSR    ;CONTENTS OF RXCSR FOR HARD ERROR MESSAGE.
510 001470 016767 176540 176406        MOV    SAVBF,ASTAT  ;CONTENTS OF RDSR FOR HARD ERROR MESSAGE.
511 001476 012760 000001 000004        MOV    #RESET, TXCSR(R0) ;TURN OFF THE DEVICE
512
513 001504 012601                        MOV    (SP)+,R1     ;POP STACK TO R1
      001506 012600                        MOV    (SP)+,R0     ;POP STACK TO R0
      001510 012605                        MOV    (SP)+,R5     ;POP STACK TO R5
514
      001512 000004 000000' 001520'    PIRQ$,BEGIN,16$      ; QUEUE UP TO CONTINUE AT 16$ AND RTI
      ;-----
515 001520                                16$:
516 001520 012767 000017 176360        MOV     #17,ERRTYP   ;RECEIVE END OF MESSAGE NOT RECEIVED
517
      001526 104405 000000' 000000    ;*****
      HADER$,BEGIN,NULL               ;RECEIVER ERROR
      ;*****
518 001534 000167 177130                JMP     SCAN      ;CONTINUE SCANNING FOR END
519
520 001540                                17$:
521
522 001540 010067 176334                MOV    R0,CSRA      ;ADDRESS OF RXCSR FOR HARD ERROR MESSAGE.
523 001544 011067 176332                MOV    (R0),ACSR    ;CONTENTS OF RXCSR FOR HARD ERROR MESSAGE.
524 001550 016067 000002 176326        MOV    RDSR(R0),ASTAT ;CONTENTS OF RDSR FOR HARD ERROR MESSAGE.

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DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

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525 001556 012760 000001 000004      MOV    #RESET, TXCSR(R0) ;TURN OFF THE DEVICE
526
527 001564 012601      MOV    (SP)+, R1      ;POP STACK TO R1
      001566 012600      MOV    (SP)+, R0      ;POP STACK TO R0
      001570 012605      MOV    (SP)+, R5      ;POP STACK TO R5
528
      001572 000004 000000' 001600'
      PIRQ$, BEGIN, 18$      ; QUEUE UP TO CONTINUE AT 18$ AND RTI
      .....
529 001600      18$:
530 001600 012767 000043 176300      MOV    #43, ERR_TYP      ;CRC ERROR
531      001606 104405 000000' 000000
      .....
      HARDER$, BEGIN, NULL      ;HARDWARE DETECTED CRC ERROR
      .....
532 001614 000167 177050      JMP    SCAN      ;CONTINUE SCANNING FOR END
533 001620
534 001620 012760 000001 000004      MOV    #RESET, TXCSR(R0) ;TURN OFF THE DEVICE
535 001626 005367 176374      DEC    TOTAL      ;DECREMENT DEVICE COUNTER
536 001632
537 001632 012601      MOV    (SP)+, R1      ;POP STACK TO R1
      001634 012600      MOV    (SP)+, R0      ;POP STACK TO R0
      001636 012605      MOV    (SP)+, R5      ;POP STACK TO R5
538 001640 000002      RTI      ;RETURN FROM INTERRUPT
      20$:

```

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

```

540
541
542
543
544
545 001642
546 001642 052760 000001 000004
547 001650 005767 176364
548 001654 001004
549
550
551 001656 012760 010135 000002
552 001664 000403
553 001666
554
555 001666 012760 041626 000002
556 001674
557 001674 005767 176342
558 001700 001004
559 001702 052760 000010 000004
560 001710 000403
561 001712
562 001712 052760 000004 000000
563 001720
564 001720 052710 000120
565 001724 052760 000020 000004
566 001732 000207
567
568
569
570 001734
571 001734 052760 000400 000006
572 001742 052760 000100 000004
573 001750 000207
574
575

```

; SUBROUTINES
 ; PRELIM SUBROUTINE SETS UP THE DPV
 ; RO = CSR ADDRESS
 PRELIM:
 BIS #RESET, TXCSR(RO); RESET THE DPV11
 TST MODE; WHAT PROTOCOL?
 BNE 1; ; BRANCH IF BCP.
 ; BOP MODE - CRC-CCITT AND SECONDARY ADDRESS
 MOV #SECADR:135, PCSAR(RO)
 BR 2;
 1;
 ; BCP MODE - CRC16 AND SYNCH CHARACTER
 MOV #BCP:CRC16:226, PCSAR(RO)
 2;
 TST LOOP; WHAT LOOPBACK?
 BNE 3; ; BRANCH IF EXTERNAL LOOPBACK.
 BIS #MAINT, TXCSR(RO); TURN ON MAINTENANCE MODE (INTERNAL LOOP)
 BR 4;
 3;
 BIS #RTS, RXCSR(RO); SET RTS IN ORDER TO USE TURNAROUND.
 4;
 BIS #RXEN!RXIE, (RO); TURN ON RECEIVER AND INT. ENABLE
 BIS #TXEN, TXCSR(RO); ENABLE THE TRANSMITTER
 RTS PC; RETURN
 ; READY SUBROUTINE TURNS ON THE TRANSMITTER
 ; RO = CSR ADDRESS
 READY:
 BIS #TSCH, (RO); TURN ON TRANSMITTER
 BIS #TXIE, TXCSR(RO); TURN ON TRANSMITTER INT. ENABLE
 RTS PC; RETURN

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

```

577                                     ;SERVICE CODE FOR LINKING A PARTICULAR DEVICE
578                                     ;TO A COMMON TRANSMIT OR RECEIVE INTERRUPT SERVICE ROUTINE.
579
580 001752                               LNKTAB:
581                                     ,MACRO  $JS,$Q
582                                     JSR      R5,RXISR      ;ANSWER FOR DEVICE '$Q REC ISR
583                                     0                ;CSR FOR DEVICE '$Q REC ISR
584                                     RXBF'$Q          ;BUFFER LOC FOR DEVICE '$Q
585                                     BCNT'$Q          ;BYTE COUNT ADDRESS FOR RXBF'$Q
586
587                                     JSR      R5,TXISR      ;ANSWER FOR DEVICE '$Q TX ISR
588                                     0                ;CSR FOR DEVICE '$Q TX ISR
589                                     TXBF'$Q          ;DATA ADDRESS FOR DEVICE '$Q
590                                     OFFSET'$Q        ;BYTE COUNT ADDRESS FOR DEVICE '$Q
591
592                                     .ENDM  $JS
593
594                                     $JS      $Q
595                                     .ENDM
596
001752 004567 177142                   JSR      R5,RXISR      ;ANSWER FOR DEVICE 0 REC ISR
001756 000000                           0                ;CSR FOR DEVICE 0 REC ISR
001760 002172'                          RXBF0          ;BUFFER LOC FOR DEVICE 0
001762 002206'                          BCNT0          ;BYTE COUNT ADDRESS FOR RXBF0

001764 004567 176750                   JSR      R5,TXISR      ;ANSWER FOR DEVICE 0 TX ISR
001770 000000                           0                ;CSR FOR DEVICE 0 TX ISR
001772 002156'                          TXBF0          ;DATA ADDRESS FOR DEVICE 0
001774 002142'                          OFFSET0        ;BYTE COUNT ADDRESS FOR DEVICE 0

001776 004567 177116                   JSR      R5,RXISR      ;ANSWER FOR DEVICE 1 REC ISR
002002 000000                           0                ;CSR FOR DEVICE 1 REC ISR
002004 002174'                          RXBF1          ;BUFFER LOC FOR DEVICE 1
002006 002210'                          BCNT1          ;BYTE COUNT ADDRESS FOR RXBF1

002010 004567 176724                   JSR      R5,TXISR      ;ANSWER FOR DEVICE 1 TX ISR
002014 000000                           0                ;CSR FOR DEVICE 1 TX ISR
002016 002160'                          TXBF1          ;DATA ADDRESS FOR DEVICE 1
002020 002144'                          OFFSET1        ;BYTE COUNT ADDRESS FOR DEVICE 1

002022 004567 177072                   JSR      R5,RXISR      ;ANSWER FOR DEVICE 2 REC ISR
002026 000000                           0                ;CSR FOR DEVICE 2 REC ISR
002030 002176'                          RXBF2          ;BUFFER LOC FOR DEVICE 2
002032 002212'                          BCNT2          ;BYTE COUNT ADDRESS FOR RXBF2

002034 004567 176700                   JSR      R5,TXISR      ;ANSWER FOR DEVICE 2 TX ISR
002040 000000                           0                ;CSR FOR DEVICE 2 TX ISR
002042 002162'                          TXBF2          ;DATA ADDRESS FOR DEVICE 2
002044 002146'                          OFFSET2        ;BYTE COUNT ADDRESS FOR DEVICE 2

002046 004567 177046                   JSR      R5,RXISR      ;ANSWER FOR DEVICE 3 REC ISR
002052 000000                           0                ;CSR FOR DEVICE 3 REC ISR
002054 002200'                          RXBF3          ;BUFFER LOC FOR DEVICE 3
002056 002214'                          BCNT3          ;BYTE COUNT ADDRESS FOR RXBF3

002060 004567 176654                   JSR      R5,TXISR      ;ANSWER FOR DEVICE 3 TX ISR
002064 000000                           0                ;CSR FOR DEVICE 3 TX ISR
002066 002164'                          TXBF3          ;DATA ADDRESS FOR DEVICE 3

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DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

002070	002150'		OFSET3		;BYTE COUNT ADDRESS FOR DEVICE 3
002072	004567	177022	JSR	R5,RXISR	;ANSWER FOR DEVICE 4 REC ISR
002076	000000		0		;CSR FOR DEVICE 4 REC ISR
002100	002202'		RXBF4		;BUFFER LOC FOR DEVICE 4
002102	002216'		BCNT4		;BYTE COUNT ADDRESS FOR RXBF4
002104	004567	176630	JSR	R5,TXISR	;ANSWER FOR DEVICE 4 TX ISR
002110	000000		0		;CSR FOR DEVICE 4 TX ISR
002112	002166'		TXBF4		;DATA ADDRESS FOR DEVICE 4
002114	002152'		OFSET4		;BYTE COUNT ADDRESS FOR DEVICE 4
002116	004567	176776	JSR	R5,RXISR	;ANSWER FOR DEVICE 5 REC ISR
002122	000000		0		;CSR FOR DEVICE 5 REC ISR
002124	002204'		RXBF5		;BUFFER LOC FOR DEVICE 5
002126	002220'		BCNT5		;BYTE COUNT ADDRESS FOR RXBF5
002130	004567	176604	JSR	R5,TXISR	;ANSWER FOR DEVICE 5 TX ISR
002134	000000		0		;CSR FOR DEVICE 5 TX ISR
002136	002170'		TXBF5		;DATA ADDRESS FOR DEVICE 5
002140	002154'		OFSET5		;BYTE COUNT ADDRESS FOR DEVICE 5

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

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598                                     ;BUFFER AREAS
599
600                                     .MACRO  $OF,$Q
601   OFFSET' $Q:                      .WORD  0      ;TRANSMITTER BYTE COUNT POINTER FOR DEVICE '$Q'
602   .ENDM
604   $OF      $Q
605   .ENDM
002142 000000   OFFSET0: .WORD  0      ;TRANSMITTER BYTE COUNT POINTER FOR DEVICE 0
002144 000000   OFFSET1: .WORD  0      ;TRANSMITTER BYTE COUNT POINTER FOR DEVICE 1
002146 000000   OFFSET2: .WORD  0      ;TRANSMITTER BYTE COUNT POINTER FOR DEVICE 2
002150 000000   OFFSET3: .WORD  0      ;TRANSMITTER BYTE COUNT POINTER FOR DEVICE 3
002152 000000   OFFSET4: .WORD  0      ;TRANSMITTER BYTE COUNT POINTER FOR DEVICE 4
002154 000000   OFFSET5: .WORD  0      ;TRANSMITTER BYTE COUNT POINTER FOR DEVICE 5
606
607
608                                     .MACRO  $TB,$Q
609   TXBF' $Q:                        .WORD  0      ;TRANSMITTER BUFFER FOR DEVICE '$Q'
610   .ENDM
612   $TB      $Q
613   .ENDM
002156 000000   TXBF0:  .WORD  0      ;TRANSMITTER BUFFER FOR DEVICE 0
002160 000000   TXBF1:  .WORD  0      ;TRANSMITTER BUFFER FOR DEVICE 1
002162 000000   TXBF2:  .WORD  0      ;TRANSMITTER BUFFER FOR DEVICE 2
002164 000000   TXBF3:  .WORD  0      ;TRANSMITTER BUFFER FOR DEVICE 3
002166 000000   TXBF4:  .WORD  0      ;TRANSMITTER BUFFER FOR DEVICE 4
002170 000000   TXBF5:  .WORD  0      ;TRANSMITTER BUFFER FOR DEVICE 5
614
615
616                                     .MACRO  $RB,$Q
617   RXBF' $Q:                        .WORD  0      ;RECEIVER BUFFER FOR DEVICE '$Q'
618   .ENDM
620   $RB      $Q
621   .ENDM
002172 000000   RXBF0:  .WORD  0      ;RECEIVER BUFFER FOR DEVICE #0
002174 000000   RXBF1:  .WORD  0      ;RECEIVER BUFFER FOR DEVICE #1
002176 000000   RXBF2:  .WORD  0      ;RECEIVER BUFFER FOR DEVICE #2
002200 000000   RXBF3:  .WORD  0      ;RECEIVER BUFFER FOR DEVICE #3
002202 000000   RXBF4:  .WORD  0      ;RECEIVER BUFFER FOR DEVICE #4
002204 000000   RXBF5:  .WORD  0      ;RECEIVER BUFFER FOR DEVICE #5
622
623
624                                     .MACRO  $BC,$Q
625   BCNT' $Q:                        .WORD  0      ;RECEIVER BYTE COUNT POINTER FOR DEVICE '$Q'
626   .ENDM
628   $BC      $Q
629   .ENDM
002206 000000   BCNT0:  .WORD  0      ;RECEIVER BYTE COUNT POINTER FOR DEVICE 0
002210 000000   BCNT1:  .WORD  0      ;RECEIVER BYTE COUNT POINTER FOR DEVICE 1
002212 000000   BCNT2:  .WORD  0      ;RECEIVER BYTE COUNT POINTER FOR DEVICE 2
002214 000000   BCNT3:  .WORD  0      ;RECEIVER BYTE COUNT POINTER FOR DEVICE 3
002216 000000   BCNT4:  .WORD  0      ;RECEIVER BYTE COUNT POINTER FOR DEVICE 4
002220 000000   BCNT5:  .WORD  0      ;RECEIVER BYTE COUNT POINTER FOR DEVICE 5
630
631
632
633                                     ;ASCII MESSAGES
637 002222      045      104      120  MHUNG:  ;ASCIIZ  'DPV11 MODULE IS HUNG - SEE LISTING'

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H2

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DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

SEQ 0020

641		.EVEN
642	00C001	.END

SYMBOL TABLE

ACSR	000102R	CLKSP#	104422	NOPTY#	000002	RANNUM	000054R	SR1	000016R
ACTIV	000624R	CONFIG	000056R	NULL	000000	RDSR	000002	SR2	000020R
ADDR	000006R	COUNT	000230R	N.DPVS	000224R	READY	001734R	SR3	000022R
ADDR22#	001000	CRC16	001400	OFSET0	002142R	REOM	001000	SR4	000024R
APTPRE#	000200	CSRA	000100R	OFSET1	002144R	RESET	000001	START	000244R
ASB	000106R	DATCK#	104411	OFSET2	002146R	RESTR	000330R	STAT	000026R
ASTAT	000104R	DATER#	104404	OFSET3	002150R	RES1	000056R	SVR0	000062R
AUTO	000010	DROP	000324R	OFSET4	002152R	RES2	000060R	SVR1	000064R
AWAS	000110R	DVID1	000014R	OFSET5	002154R	RH70	001000	SVR2	000066R
BCNT0	002206R	ECCMEM	000100	OPEN	000000	ROVER	004000	SVR3	000070R
BCNT1	002210R	ENDIT#	104413	OTOA#	104420	RSOM	000400	SVR4	000072R
BCNT2	002212R	END#	104410	PARPRE	002000	RSTR	000112R	SVR5	000074R
BCNT3	002214R	ERR	100000	PASCNT	000034R	RTS	000004	SVR6	000076R
BCNT4	002216R	ERRTYP	000106R	PCSAR	000002	RXACT	004000	SYSCNT	000052R
BCNT5	002220R	EXIT#	104400	PDPF11	000002	RXBF	000232R	TABORT#	002000
BCP	040000	GETPA#	104415	PDPLS1	020000	RXBF0	002172R	TRE	000004
BEGIN	000000R	GMBUF#	104414	PDP44	100000	RXBF1	002174R	TDSR	000006
BIT0	000001	HRDCNT	000044R	PDP60	004000	RXBF2	002176R	TEOM	001000
BIT1	000002	HRDER#	104405	PDP70	010000	RXBF3	002200R	TERR	100000
BIT10	002000	HRDPAS	000050R	PIRQ#	000004	RXBF4	002202R	TOTAL	000226R
BIT11	004000	HUNG	000734R	POPSP	005726	RXBF5	002204R	TRPDFD#	000023
BIT12	010000	ICONT	000036R	POPSP2	022626	RXCSR	000000	TSOM	000400
BIT13	020000	ICOUNT	000040R	PRELIM	001642R	RXEN	000020	TXACT	000002
BIT14	040000	IDNUM	000122R	PRHMS#	000002	RXIE	000100	TXBF0	002156R
BIT15	100000	INDPAR#	000040	PRTY	000000	RXISR	001120R	TXBF1	002160R
BIT2	000004	INIT	000030R	PRTY0	000000	RXSTAT	002000	TXBF2	002162R
BIT3	000010	INTR	000120R	PRTY1	000040	R6	000006	TXBF3	002164R
BIT4	000020	KTPRES#	000400	PRTY2	000100	R7	000007	TXBF4	002166R
BIT5	000040	KTXEND	040000	PRTY3	000140	SAVBF	000234R	TXBF5	002170R
BIT6	000100	LNKTAB	001752R	PRTY4	000200	SBADR	000102R	TXCSR	000004
BIT7	000200	LOOP	000242R	PRTY5	000240	SCAN	000670R	TXEN	000020
BIT8	000400	MAINT	000010	PRTY6	000300	SECADR	010000	TXIE	000100
BIT9	001000	MAP22#	104416	PRTY7	000340	SELECT	000236R	TXISR	000740R
BREAK#	104407	MHUNG	002222R	PS	177776	SETUP1	000500R	USTACK#	000001
BR1	000012R	MODE	000240R	PSW	177776	SETUP2	000566R	VECTOR	000010R
BR2	000013R	MODNAM	000000R	PUSH	005746	SOFCNT	000042R	WAIT	000664R
BTOD#	104421	MODSP	000224R	PUSH2	024646	SOFER#	104406	WASADR	000104R
CAPRES#	000004	MSGN#	104403	PWRFLG	000002	SOFPAS	000046R	WDFR	000116R
CDATA#	104412	MSG#	104402	QMON22	000010	SPOINT	000032R	WOTO	000114R
CKHNG#	000001	MSG#	104401	RABORT	002000	SPSIZ	000040	XFLAG	000005R
CLKPRE#	000001	NCFUOP	000020	RAND#	104417				

. ABS. 000000 000
002270 001
ERRORS DETECTED: 0

VIRTUAL MEMORY USED: 13897 WORDS (55 PAGES)
DYNAMIC MEMORY: 19748 WORDS (75 PAGES)
ELAPSED TIME: 00:00:37
XDPVB0,XDPVB0/CR/-SP=DDXCOM,XDPVB0

J2

SEQ 0022

SYMBOL CROSS REFERENCE

CREF VO1

SYMBOL	VALUE	REFERENCES
ACSR	000102 R	05-167 *8-403 *9-445 *9-470 *9-509 *9-523
ACTIV	000624 R	7-349 07-356
ADDR	000006 R	05-157 7-297 7-344 7-359
ADDR22	* 001000	05-167
APTPRE	* 000200	05-167
ASB	000106 R	05-167 *9-486
ASTAT	000104 R	05-167 *8-404 *9-446 *9-471 *9-510 *9-524
AUTO	* 000010	05-167
AWAS	000110 R	05-167 *9-487
BCNT0	002206 R	11-596 012-629
BCNT1	002210 R	11-596 012-629
BCNT2	002212 R	11-596 012-629
BCNT3	002214 R	11-596 012-629
BCNT4	002216 R	11-596 012-629
BCNT5	002220 R	11-596 012-629
BCP	* 040000	06-218 10-555
BEGIN	000000 R	05-167 7-287 7-378 7-378 7-383 7-389 7-390 8-407 8-410 9-450 9-453 9-475 9-478 9-490 9-492 9-514 9-517 9-528 9-531
BIT0	* 000001	05-167 06-186 6-228 7-269
BIT1	* 000002	05-167 06-185 6-227 7-276
BIT10	* 002000	05-167 06-176 6-205 6-213 6-232
BIT11	* 004000	05-167 06-175 6-204 6-212
BIT12	* 010000	05-167 06-174 6-219
BIT13	* 020000	05-167 06-173
BIT14	* 040000	05-167 06-172 6-218
BIT15	* 100000	05-167 06-171 6-211 6-231
BIT2	* 000004	05-167 06-184 6-208 6-226
BIT3	* 000010	05-167 06-183 6-225
BIT4	* 000020	05-167 06-182 6-207 6-224
BIT5	* 000040	05-167 06-181
BIT6	* 000100	05-167 06-180 6-206 6-223
BIT7	* 000200	05-167 06-179
BIT8	* 000400	05-167 06-178 6-215 6-220 6-234
BIT9	* 001000	05-167 06-177 6-214 6-220 6-233
BREAK\$	* 104407	05-167 7-378 7-378
BR1	000012 R	05-167 7-312
BR2	000013 R	05-167 7-317
BTOD\$	* 104421	05-167
CAPRES	* 000004	05-167
CDATA\$	* 104412	05-167
CKHNG\$	* 000001	05-167
CLKPRE	* 000001	05-167
CLKSP\$	* 104422	05-167
CONFIG	000056 R	05-167
COUNT	000230 R	06-239
CRC16	* 001400	06-220 10-555
CSRA	000100 R	05-167 *8-402 *9-444 *9-469 *9-484 *9-508 *9-522
DATCK\$	* 104411	05-167
DATER\$	* 104404	05-167 9-492
DROP	000324 R	07-286 7-292 7-294
DVID1	000014 R	05-167 7-284

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SYMBOL CROSS REFERENCE

CREF V01

SEQ 0023

SYMBOL	VALUE	REFERENCES
ECCMEM	= 000100	05-167
ENDIT\$	= 104413	05-167 7-383
END\$	= 104410	05-167 7-287 7-390
ERR	= 100000	06-211 9-499 9-503
ERRTYP	000106 R	05-167 *8-409 *9-452 *9-477 *9-516 *9-530
EXIT\$	= 104400	05-167
GETPA\$	= 104415	05-167
GWBUF\$	= 104414	05-167
HRDCNT	000040 R	05-167
HRDER\$	= 104405	05-167 9-453 9-478 9-517 9-531
HRDPAS	000050 R	05-167
HUNG	000734 R	7-389 07-391
ICONT	000036 R	05-167
ICOUNT	000040 R	05-167
IDNUM	000122 R	05-167
INOPAR	= 000040	05-167
INIT	000030 R	05-167
INTR	000120 R	05-167 *7-325 *7-328
KTPRES	= 000400	05-167
KTXTND	= 040000	05-167
LNKTAB	001752 R	7-298 011-580
LOOP	000242 R	06-245 *7-278 *7-282 10-557
MAINT	= 000010	06-225 10-559
MAP22\$	= 104416	05-167
MMHUNG	002222 R	7-392 012-637
MODE	000240 R	06-244 *7-271 *7-274 9-497 10-547
MODNAM	000000 R	05-167
MODSP	000224 R	5-167 05-167
MSGN\$	= 104403	05-167 7-389
MSG\$	= 104402	05-167
MSG\$	= 104401	05-167
NCPUOP	= 000020	05-167
NOAPTY	= 000002	05-167
NULL	= 000000	05-167 8-410 9-453 9-478 9-517 9-531 7-358
N.DPVS	000224 R	06-237 *7-295 *7-310 7-325 7-326 7-327
OFSET0	002142 R	11-596 012-605
OFSET1	002144 R	11-596 012-605
OFSET2	002140 R	11-596 012-605
OFSET3	002150 R	11-596 012-605
OFSET4	002152 R	11-596 012-605
OFSET5	002154 R	11-596 012-605
OPEN	= 000000	5-167 5-167 5-167 5-167 5-167 5-167 5-167 5-167 5-167 5-167
OTOA\$	= 104420	05-167
PARPRE	= 002000	05-167
PASCNT	000034 R	05-167
PCSAR	= 000002	06-198 *10-551 *10-555
PDPF11	= 000002	05-167
PDPLSI	= 020000	05-167
PDP44	= 100000	05-167
PDP60	= 004000	05-167

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SEQ 0024

SYMBOL CROSS REFERENCE

CREF V01

SYMBOL	VALUE	REFERENCES
PDP70	010000	05-167
PIRQ\$	000004	05-167 8-407 9-450 9-475 9-490 9-514 9-528
POPSP	005726	05-167
POPSP2	022626	05-167
PRELIM	001642 R	7-353 010-545
PRHMS\$	000002	05-167
PRTY	000000	05-167
PRTY0	000000	05-167
PRTY1	000040	05-167
PRTY2	000100	05-167
PRTY3	000140	05-167
PRTY4	000200	05-167
PRTY5	000240	5-167 05-167
PRTY6	000300	05-167
PRTY7	000340	05-167
PS	177776	05-167
PSW	177776	05-167
PUSH	005746	05-167
PUSH2	024646	05-167
PWRFLG	000002	05-167
QMON22	000010	05-167
RABORT	002000	06-213 9-458
RAND\$	104417	05-167
RANUM	000054 R	05-167
RDSR	000002	06-197 9-446 9-456 9-471 9-524
READY	001734 R	7-368 010-570
REOM	001000	06-214 9-505
RESET	000001	06-228 8-405 9-447 9-472 9-488 9-511 9-525 9-534 10-546
RESTR	000330 R	5-167 7-285 07-290 7-385
RES1	000056 R	05-167
RES2	000060 R	05-167
RH70	001000	05-167
ROVER	004000	06-212 9-458
RSM	000400	06-215
RSTR	000112 R	05-167
RTS	000004	06-208 10-562
RXACT	004000	06-204
RXBF	000232 R	06-240 07-299
RXBFO	002172 R	7-299 7-336 11-596 012-621
RXBF1	002174 R	11-596 012-621
RXBF2	002176 R	11-596 012-621
RXBF3	002200 R	11-596 012-621
RXBF4	002202 R	11-596 012-621
RXBF5	002204 R	11-596 012-621
RXCSR	000000	06-196 010-562
RXEN	000020	06-207 10-564
RXIE	000100	06-206 10-564
RXISR	001120 R	09-437 11-596 11-596 11-596 11-596 11-596
RXSTAT	002000	06-205
R6	000006	05-167
R7	000007	05-167
SAVBF	000234 R	06-241 09-456 9-458 9-463 9-485 9-487 9-499 9-503 9-505

SYMBOL CROSS REFERENCE

CREF V01

SEQ 0026

SYMBOL	VALUE	REFERENCES
USTACK	* 000001	05-167
VECTOR	000010 R	05-167 7-296
WAIT	000664 R	7-363 07-372
WASADR	000104 R	05-167 09-485
WDFR	000116 R	05-167 07-327
WOTO	000114 R	05-167 07-326
XFLAG	000005 R	05-167

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XDPVBO CREATED BY MACRO ON 1-DEC-83 AT 09:48 PAGE 6

SEQ 0027

MACRO CROSS REFERENCE

CREF V01

MACRO NAME	REFERENCES									
BKMOD	#1-125									
BREAK	#1-223	7-378								
BT00	#1-247									
CKDATA	#1-283									
CLKSP	#1-150									
DATAK	#1-292									
DATERR	#1-176	9-492								
DFSEVN	#1-315	5-167	5-167	5-167	5-167	5-167	5-167	5-167	5-167	5-167
	5-167	5-167	5-167							
DSEVNT	#1-325	5-167	5-167	5-167	5-167	5-167	5-167	5-167		
END	#1-213	7-287	7-390							
ENDIT	#1-204	7-383								
ENDMOD	#1-209									
EQUATS	#1-331	5-167								
EXIT	#1-158									
GETPA	#1-274									
GMBUFF	#1-262									
HLFBRK	#1-228									
HRDER	#1-166	9-453	9-478	9-517	9-531					
IOMOD	#1-121	5-167								
IOMODP	#1-145									
IOMODR	#1-141									
IOMODX	#1-137									
MAP22	#1-278									
MODULE	#1-30	5-167								
MSG	#1-192									
MSGN	- 196	7-389								
MSGS	200									
NBKMOD	- 33									
OTOA	#1-233									
PIRQ	#1-217	8-407	9-450	9-475	9-490	9-514	9-528			
RAND	#1-162									
SBKMOD	#1-129									
SOFER	#1-182	8-410								
\$EC	#12-624	12-629	12-629	12-629	12-629	12-629	12-629			
\$JS	#11-581	11-596	11-596	11-596	11-596	11-596	11-596			
\$OF	#12-600	12-605	12-605	12-605	12-605	12-605	12-605			
\$POP	#6-256	8-406	8-433	9-449	9-474	9-489	9-513	9-527	9-537	
\$PUSH	#6-248	8-397	9-438							
\$RB	#12-616	12-621	12-621	12-621	12-621	12-621	12-621			
\$TB	#12-608	12-613	12-613	12-613	12-613	12-613	12-613			

DPV8 DEC/X11 SYSTEMB1
.....C1
.....D1
.....E1
.....F1
.....G1
.....H1
.....I1
.....J1
.....K1
.....L1
.....M1
.....N1

.....B2
.....C2
.....D2
.....E2
.....F2
.....G2
.....H2
.....I2
.....J2
.....K2
.....L2
.....M2
.....N2

.....B3