

DPAE DEC/X11 SYSTEM EXERCISER MODULE
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SEQ 0001

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IDENTIFICATION

PRODUCT CODE: AC-E712E-MC
PRODUCT NAME: CXDPAE0 DEC/X11 DP11 MODULE
DATE: SEPTEMBER 1978
MAINTAINER: DEC/X11 SUPPORT GROUP

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1. ABSTRACT

DPA IS AN IOMOD THAT EXERCISES UP TO EIGHT 8-BIT SYNCHRONOUS LINE INTERFACES (DL11) BY TRANSMITTING A STANDARD BINARY COUNT PATTERN USING THE MAINTENANCE MODE FEATURE. THE RECEIVED DATA IS COMPARED WITH THE TRANSMITTED DATA AND ANY ERRORS ARE REPORTED VIA THE CONSOLE TTY. ALL AVAILABLE INTERFACES (UP TO 8) ARE ACTIVATED AND RUNNING SIMULTANEOUSLY.

2. REQUIREMENTS

HARDWARE: DP11 SYNCHRONOUS INTERFACE

STORAGE:: DPA REQUIRES:

- 1. DECIMAL WORDS: 728
- 2. OCTAL WORDS: 1330
- 3. OCTAL BYTES: 2660

3. PASS DEFINITION

ONE PASS OF THE DPA MODULE CONSISTS OF TRANSMITTING AND RECEIVING 12808 8-BIT CHARACTERS (TOTAL)

4. EXECUTION TIME

DPA RUNNING ALONE ON A PDP11/05 PROCESSOR TAKES APPROXIMATELY --- MINUTES TO COMPLETE ONE PASS.

5. CONFIGURATION PARAMETERS

DEFAULT PARAMETERS:

DEVADR: 174770, VECTOR: 440, BR1: 5, BR2: 5, DEVCNT: 1

REQUIRED PARAMETERS: NONE

6. DEVICE/OPTION SETUP

NONE: NO DEVICE IS REQUIRED IN MAINTENANCE MODE

7. MODULE OPERATION

TEST SEQUENCE:

- A. TEST UP TO 8 POSSIBLE DEVICES FOR SELECTION
- B. STORE THE DEVICE NO. OF DEVICES TO BE TESTED AND SET UP THE VECTORS FOR THESE DEVICES
- C. TURN ON RECEIVER INTERRUPT ENABLE, TRANSMITTER INTERRUPT ENABLE AND MAINTENANCE MODE FOR ALL ACTIVE DEVICES.
- D. INITIAL TRANSMITTER INTERRUPT SERVICE:
 - 1.) TEST FOR FALSE INTERRUPT (READY (0)); REPORT ERRORS
 - 2.) OUTPUT NEXT CHARACTER TO EACH ACTIVE DEVICE
 - 3.) RETURN TO MONITOR TO WAIT FOR RECEIVER INTERRUPT.
- E. RECEIVER INTERRUPT SERVICE:
 - 1.) TEST FOR FALSE INTERRUPT (DONE (0)); REPORT ERRORS
 - 2.) COMPARE INPUT/OUTPUT DATA; REPORT ERRORS
 - 3.) RETURN TO MONITOR TO WAIT FOR TRANSMITTER INTERRUPT
- F. REPEAT D AND E UNTIL 12800.(TOTAL) CHARACTERS HAVE BEEN PROCESSED
- G. AT END OF PASS TURN OFF ALL ACTIVE DEVICES AND RESTART AT B

8. -----
OPERATION OPTIONS

A. LOCATION DVID1 (DPA 14) MAY BE CHANGED TO SELECT ANY COM-
BINATION OF DEVICES BIT0=DEV0, BIT1=DEV1, BIT7=DEV7
IF DVID1 IS INITIALLY 0 DPA WILL BE DROPPED FROM TEST.

9. -----
NON STANDARD PRINTOUTS

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

```
138 ;LIST SEQ,BIN
139 ;SET UP VECTOR (RETURN ADDRESS(PC)) PC = INTR SERV. AREA.
140
141 IOMOD <DPAE> 174770,440,5,2000,30
142 MODLE 140000,DPAE,174770,440,5,2000,30
143 TITLE DPAE DEC/X11 SYSTEM EXERCISER MODULE
144 ; DDXCOM VERSION 6 23-MAY-78
145 ;LIST
146 *****
147 BEGIN: .ASCII /DPAE / ;MODULE NAME
148 MODNAM: .ASCII /DPAE / ;MODULE NAME
149 XFLAG: .BYTE OPEN ;USED TO KEEP TRACK OF WBUFF USAGE
150 ADDR: 174770+0 ;1ST DEVICE ADDR.
151 VECTOR: 440+0 ;1ST DEVICE VECTOR.
152 BR1: .BYTE PRTY5+0 ;1ST BR LEVEL.
153 BR2: .BYTE PRTY+0 ;2ND BR LEVEL.
154 DVID1: .+ ;DEVICE INDICATOR 1.
155 SR1: OPEN ;SWITCH REGISTER 1.
156 SR2: OPEN ;SWITCH REGISTER 2.
157 SR3: OPEN ;SWITCH REGISTER 3.
158 SR4: OPEN ;SWITCH REGISTER 4.
159 *****
160 STAT: 140000 ;STATUS WORD.
161 INIT: START ;MODULE START ADDR.
162 SPOINT: MODSP ;MODULE STACK POINTER.
163 PASCNT: 0 ;PASS COUNTER.
164 ICONT: 2000 ;# OF ITERATIONS PER PASS=2000
165 ILOC: 0 ;LOC TO COUNT ITERATIONS
166 SDFCNT: 0 ;LOC TO SAVE TOTAL SOFT ERRORS
167 HRDCNT: 0 ;LOC TO SAVE TOTAL HARD ERRORS
168 SDPPAS: 0 ;LOC TO SAVE SOFT ERRORS PER PASS
169 HRDPAS: 0 ;LOC TO SAVE HARD ERRORS PER PASS
170 SYSCNT: 0 ;# OF SVS ERRORS ACCUMULATED
171 RANNUM: 0 ;HOLDS RANDOM # WHEN RAND MACRO IS CALLED
172 CONFIG: 0 ;RESERVED FOR MONITOR USE
173 RES1: 0 ;RESERVED FOR MONITOR USE
174 RES2: 0 ;RESERVED FOR MONITOR USE
175 SVRO: OPEN ;LOC TO SAVE R0.
176 SVR1: OPEN ;LOC TO SAVE R1.
177 SVR2: OPEN ;LOC TO SAVE R2.
178 SVR3: OPEN ;LOC TO SAVE R3.
179 SVR4: OPEN ;LOC TO SAVE R4.
180 SVR5: OPEN ;LOC TO SAVE R5.
181 SVR6: OPEN ;LOC TO SAVE R6.
182 CSRA: OPEN ;ADDR OF CURRENT CSR.
183 SRADR: ;ADDR OF CURR DATA, OR
184 ACSR: OPEN ;CONTENTS OF CSR.
185 WASADR: OPEN ;ADDR OF BAD DATA OR
186 ASSTAT: ;STATUS REG CONTENTS.
187 ERRRTYP: ;TYPE OF ERROR.
188 ASB: OPEN ;EXPECTED DATA.
189 AWAS: OPEN ;ACTUAL DATA.
190 RSTRT: ;START ADDRESS AFTER END OF PASS
191 WDT0: OPEN ;WORDS TO MEMORY PER ITERATION
192 WDFR: OPEN ;WORDS FROM MEMORY PER ITERATION
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193 INTR: OPEN ;# OF INTERRUPTS PER ITERATION
194 IDNUM: 30 ;MODULE IDENTIFICATION NUMBER=30
195 ;REPT SPSIZ ;MODULE STACK STARTS HERE.
196 ;NLIST
197 ;WORD 0
198 ;LIST
199 ;ENDR
200 MODSP: *****
201 *****
202 000224 012767 000016 177662 START: MOV #16,WDT0 ;16 WORDS TO MEM
203 000232 012767 000016 177656 MOV #16,WDFR ;16 WORDS FROM
204 000240 012767 000016 177652 MOV #16,INTR ;16 INTERRUPTS
205 *****
206 000246 005767 177542 RESTPT: TST DVID1 ;CHECK ANY DPN'S ON LINE
207 000252 001002 BNE 1$ ;YES
208 000254 104410 ENDS,BEGIN ;INITIALIZE RECEIVE COUNT
209 000260 005067 002364 1$: CLR TRCNT ;INITIALIZE TRANSMIT COUNT
210 000264 005067 002362 CLR RCCNT ;INITIALIZE RECEIVE COUNT
211 000270 005067 002360 CLR DPN ;NO. DPN'S THAT ARE DONE
212 000274 005067 002356 CLR NO_DP ;NO. DPN'S SELECTED
213 000300 016767 174510 MOV DVID1,DVIDA ;SET UP BINARY COUNT OF DEVICE(S) SELECTED
214 000306 016701 174776 MOV VECTOR,R1 ;R1 = VECTOR ADDRESS
215 000312 012702 002470 MOV #LINKR,R2 ;R2 = LINK: JSR TABLE WITH OFFSET
216 000316 012767 000901 MOV #1,PNTN ;SET UP PNTN TO TEST DEVICE ON LINE
217 000324 036767 002304 2$: BIT PNTN,DVID1 ;TEST IS THIS DPN ON LINE
218 000332 001422 BEQ 3$ ;NO GO CHANGE DP ADDR & TRY AGAIN
219 000334 005267 002316 INC NO_DP ;COUNT NO. DPN'S SELECTED
220 000340 010221 MOV R2,(R1)+ ;SET UP VECTOR RETURN ADDRESS(RCV)
221 000342 016721 177444 MOV R1,(R1)+ ;SET UP VECTOR PRIORITY (RCV)
222 000346 005721 TSTB ;INCR. POINTER
223 000350 062702 000006 ADD #6,R2 ;UPDATE NEW LINK ADDRESS
224 000354 010221 MOV R2,(R1)+ ;SET UP VECTOR RETURN ADDRESS (XMT)
225 000356 016721 177430 MOV R1,(R1)+ ;SET UP VECTOR PRIORITY (XMT)
226 000362 005721 TSTB ;INCR. POINTER
227 000364 062702 000006 ADD #6,R2 ;UPDATE NEW LINK ADDRESS
228 000370 108367 002234 4$: ASLB PNTN ;SET UP FOR NEW DEVICE COMPARE
229 000374 103406 BCS START1 ;HAVE WE TESTED FOR ALL ON LINE
230 *****
231 000376 000752 BR 2$ ;NOT DONE GO DO MORE
232 000400 062701 000010 3$: ADD #10,R1 ;UPDATE TO NEW VECTOR ADDRESS
233 000404 062701 000014 ADD #14,R2 ;UPDATE TO NEW LINK ADDRESS
234 000410 000767 BR 4$ ;GO TEST FOR NEXT DEVICE ON LINE
235 *****
236 *****
237 ; THIS CODE WILL CLEAR ALL OF THE WRITE BUFFER AREA
238 *****
239 000412 012767 000157 002214 START1: MOV #111,CNT80 ;COUNT REQUIRED TO GO THRU
240 000420 012703 002130 MOV #DPLIN,R3 ;ALL 89 DATA STORAGE BUFFER
241 *****
242 000424 005023 1$: CLR (R3)+ ;STARTING ADDRESS OF
243 000426 005367 002202 DEC CNT80 ;DATA BUFFER LOCATIONS.
244 000432 001374 BNE 1$ ;CLEAR DATA BUFF REG
245 ;ARE THERE MORE TO CLEAR?
246 ;NO GO BACK & DO THE REST
247 *****
248 ; THIS CODE WILL SELECT WHICH LINES (<1:8>) HAVE
; BEEN SELECTED FOR TEST & TRANSMIT SYNC TO START
```

249 ; TESTING ALL LINES.
250
251 000434 012767 000010 002200 INT: MOV #10,COUNT ;SET COUNT VALUE TO NUMBER OF POSSIBLE DEVICES
252 000442 016701 177340 MOV ADDR,R1 ;R1=174770
253 000446 012702 002150 MOV #DVA01,R2 ;R2=DVA01 ADDR.
254 000456 012703 002150 MOV #DPL01,R3 ;LINE BUFFER POINTER
255 000456 012704 002250 MOV #DPL01,R4 ;START OF LINE BUFF
256 000462 010122 1S: MOV R1,(R2)+ ;DVA0X=DEVICE ADDR. CODE
257 000464 010423 MOV R4,(R3)+ ;BUFF POINTER HAS START OF LINE
258
259 000466 062701 177770 ADD #-10,R1 ;UPDATE STORAGE
260 000472 062704 000020 ADD #20,R4 ;UPDATE
261 000476 005367 002140 DEC COUNT ;CNT DOWN
262 000502 001367 BNE 1S ;NOT DONE GO BACK FOR MORE
263
264
265 000504 005067 002130 START2: CLR NODVTS ;CLEAR NO. OF LINE TESTED
266
267 000510 016701 177772 MOV ADDR,R1 ;REG. DEVICE ADDRESS
268 000514 016702 177266 MOV ADDR,R2 ;XMT CSR ADDRESS IN R2
269 000520 062702 000004 ADD #4,R2 ;R2=XMT CSR REGISTER 174XX4
270 000524 012700 002171 MOV #LNSYN1+1,R0 ;SET UP R0 TO POINT TO LNSYN LCC.
271 000530 012703 002110 MOV #LNSYN1,R3
272 000534 012767 000001 002066 MOV #1,PNTN ;SET PNTN REG POINTER TO
273 ;1ST DEVICE ON LINE
274 000542 036767 002062 177244 DS: BIT PNTN,DVID1 ;TEST IS THIS DEVICE ON LINE
275 000550 001472 BEQ CCC ;NO GO UPDATE ADDRESS
276 000552 112710 000004 MOV #4,(R0) ;PLACE SYNC COUNT INTO HIGH
277 ;BYTE LNSYN X
278 000556 012713 010020 MOV #10020,(R3) ;COUNT 16 HIGH BYTE FOR XMT
279 ;LOW BYTE FOR RCV
280 000562 062700 000002 CS: ADD #2,R0 ;UPDATE LNSYN X POINTER
281 000566 005253 TST (R3)+ ;UPDATE LNCNT X POINTER
282 000570 000257 CCB ;CLEAR CARRY BIT (CLR FOR TEST)
283 000572 106367 002032 PNTN ASLB ;CLEAR CARRY BIT (CLR FOR TEST)
284 000576 103361 DS BCC ;NO GO BACK SET UP NEXT DP
285 000600 012767 000001 002022 KCKOFF: MOV #1,PNTN ;NEW POINTER
286 000606 012700 002016 177200 UPDAT BIT PNTN,DVID1 ;IS THIS LINE ON
287 000614 001411 BIS #105,(R1) ;GET UPDATE ADDRESS
288 000616 052711 000105 BIS #105,(R1) ;SET INTR ENABLE,MAINT. MODE,
289 ;& STRIP SYNC
290 000622 116761 002004 000003 MOV #3,(R1) ;LOAD SYNC BUFFER WITH SYNC CHAR.
291 000630 052712 000312 BIS #312,(R2) ;INITIALIZE XMT STATUS
292 ;=DON'T
293 ;=IDLE SYNC
294 ;=INTR ENABLE
295 ;=XMT SYNC ON INTR
296 ;=IDLE SYNC
297 000634 105062 000003 UPDAT: CLRB 3(R2) ;CLEAR SYNC EXT
298 000640 062701 177770 ADD #-10,R1 ;UPDATE RCV CSR DEVICE ADDRESS
299 000644 062702 177770 ADD #-10,R2 ;UPDATE XMT CSR DEVICE ADDRESS
300 000650 000257 CCB ;CLEAR CONDITION CODES
301 000652 106367 001752 ASLB PNTN ;MOVE POINTER FOR NEXT TEST
302 000656 103361 BCC KCKOFF ;GO ENABLE NEXT LINE
303 000664 005000 WNDOW: MOV #6,R1 ;SET UP COUNT FOR NO OF WAIT LOOPS
304 000666 1S: CLR R0 ;CLEAR WAIT LOOP COUNTER

305 000666 104407 000000 BREAKS,BEGIN ;TEMPORARY RETURN TO MONITOR.
306 000672 104407 000000 BREAKS,BEGIN ;CONTINUE AT NEXT INSTRUCTION.
307 000676 022767 000016 001744 CMP #16,TRCNT ;?
308 000700 022767 000016 001736 BGT 3S ;YES BRANCH TO WAIT FOR NEXT INTR. SEQUENCE
309 000706 022767 000016 001736 CME #16,RCCNT ;?
310 000714 003406 DEC RO ;NO, START WAIT LOOP
311 000716 005300 3S: DEC RO
312 000720 005302 BNE 2S
313 000722 005302 DEC 1S
314 000724 001357 BNE 1S
315 000726 000167 000606 JMP INTR ;REPORT DEVICE FAILED TO INTERRUPT
316 000732 104400 000000 4S: EXITS,BEGIN ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.
317 000736 005113 BS: COM (R3) ;SET LNCNT X FLAG (THIS DP NOT SELECTED)
318 000740 003267 INC NODVTS ;SET UP DEVICE COUNT
319 000744 000706 BR CS ;GO BACK & UPDATE REG.
320
321 ;THIS CODE WILL ANSWER THE XMT INTERRUPT REQUEST
322 ; FOR SERVICE
323
324
325
326
327
328
329 000746 010046 DPXMT: MOV R0,-(SP) ;SAVE REG. 0 ON STACK
330 000750 010146 MOV R1,-(SP) ;SAVE REG. 1 ON STACK
331 000754 016001 002150 MOV #5,R0 ;R0 HAS LINE NO. OFFSET
332 000760 105763 000004 MOV DVA01,(R0),R1 ;R1 = NO WITH OFFSET VALUE
333 000764 105763 000004 TSTB 4(R1) ;TEST IF DONE BIT SET
334 000766 112760 000200 002451 DPXMT1: SWI #20,ERSTT+1(R0) ;DONE IS SET CONT. PROGRAM
335 000774 000167 JMP XRUB ;
336
337
338 001000 032761 000010 000004 DPXMT1: BIT #10,4(R1) ;TEST FOR RESYNC
339 001006 001023 BNE DPXMT2 ;BRANCH IF IN SYNC
340 001010 005267 001634 INC LNSYN1(R0),6(R1) ;NUMBER OF CHAR XMTED
341 001014 116661 002170 000006 MOV LNSYN1(R0) ;SEND DATA TO ACTIVE DP LINE NO BUFF
342 001022 105260 002170 000006 CMPB #26,LNSYN1(R0) ;INCREMENT NEXT DATA WORD
343 001026 122760 000026 002170 000006 CMB #26,LNSYN1(R0) ;CHECK IS THIS = TO SYNC CHAR.
344 001034 001002 BNE DPXMT3 ;OK CONT.
345 001036 105260 002170 000006 INCB LNSYN1(R0) ;INC SYNC COUNT CHAR.(THIS IS DCNE
346 ;SO THAT STRIP SYNC CHAR. WILL
347 ;NOT MAKE AN ERROR)
348 001042 105360 002211 000006 DPXMT3: DECB LNCNT1+1(R0) ;CHECK HAVE XMTED
349 ;ALL 16 CHAR. THIS LINE
350 001046 001017 BNE XNTRN ;NO RETURN TO MONITOR
351 001050 052711 BIS #10,(R1) ;SET RE-SYNC BIT
352 001054 000414 BR XNTRN ;RETURN TO MONITOR.
353 001058 116151 000003 000006 DPXMT2: MOV #3,(R1),6(R1) ;XMT SYNC CHAR. (TSVNC)
354 001064 105360 002171 000006 MOV #3,(R1),6(R1) ;XMT SYNC CHAR. (TSVNC)
355 001070 001006 BNE LNSYN1+1(R0) ;DEC SYNC COUNTER
356 001072 122760 000004 002171 000004 MOV #4,LNSYN1+1(R0) ;EXIT IF SYNC COUNT NOT ZERO
357 001076 042761 000010 000004 BIT #10,4(R1) ;EXIT INITIALIZE SYNC COUNTER
358 001106 000167 000774 XNTRN: JMP XRUB ;CLEAR SYNC FLAG
359
360 ; THIS CODE WILL ANSWER THE RCV INTERRUPT

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361 ; REQUEST FOR SERVICE
362
363 001112* 010246 DPCV: MOV R2,-(SP) ;SAVE REG. 2 ON STACK
364 001114* 010346 MOV R3,-(SP) ;SAVE REG. 3 ON STACK
365 001116* 010446 MOV R4,-(SP) ;SAVE REG. 4 ON STACK
366 001118* 010546 MOV R5,-(SP) ;SAVE REG. 5 ON STACK
367 001122* 016304 002150* MOV DADR1(R3),R4 ;GET OFFSET
368 001126* 010574 TSTB (R4) ;R3 = R4 DEVICE CODE OFFSET VALUE
369 001130* 100405 BMI DPCV1 ;IS DONE SET
370 001132* 112763 DPCV1 ;IS DONE SET
371 001140* 000167 000752 MOVB #200,ERRST(R3) ;IS DONE SET
372 JMP RRUD ;
373
374 001144* 032764 040000 000004 DPCV1: BIT #40000,4(R4) ;IS OVERRUN BIT SET
375 001152* 001421 BEQ READ ;NO OVERRUN GO READ DATA
376 001154* 105363 002170* DECB LMSYNI(R3) ;UPDATE XMT DATA
377 001160* 105263 002211* INCB LNCNT1+(R3) ;" " ACTIVE COUNT
378 001164* 042764 160000 000004 BIC #160000,4(R4) ;CLEAR OVERRUN ERROR BITS
379 001200* 032763 000010 000004 BIS #10,4(R3) ;SET RESYNC FLAG
380 001204* 112763 000100 002450* MOVB #400,ERRST(R3) ;CLEAR RECEIVE ACTIVE
381 001212* 000167 000700 JMP RRUD ;
382
383
384 001216* 032714 004000 READ: BIT #4000,(R4) ;IS DEVICE ACTIVE
385 001224* 001441 RCVRTN ;GET OUT DEVICE NOT READY
386 001226* 066302 CLR R2 ;CLEAR BYTE PTRER
387 001232* 066302 002230* ADD VRFGL1(R3),R2 ;GET BYTE OFFSET
388 001236* 116412 000002 DPLN(R3),R2 ;ADR=DATA BUFF ADDR
389 001242* 001427 000026 MOVB 2(R4),(R2) ;DATA TO DATA BUFF
390 001246* 001427 CMPB #26,(R2) ;SKP IF SYNC BIT
391 001250* 005267 001376 BNC RCVRTN ;
392 001254* 105263 002230* INCB VRFGL1(R3) ;NO. OF RCV'ED. CHAR.
393 001260* 105363 002210* DECB LNCNT1(R3) ;CHECK HAVE WE TRANSFERRED ALL
394 ; DATA WORDS.
395 BNE RCVRTN ;HAVE WE DONE DONE RECEIVING
396 ; ALL DATA TRANSFERS
397 CLR R4 ;CLEAR RCV. CSR REG.
398 001270* 005064 000004 CLG R4 ;CLEAR XMT. CSR REG.
399 001274* 005267 001354 001346 INC DDDN ;COMPARE TO CHCK COUNT
400 001300* 026767 001352 001346 CMP NO.DP,DPDN ;BRANCH AND CONTINUE TEST OF OTHER DP'S
401 001306* 001907 000002 BNE RCVRTN ;
402 001310* 012604 (SP)+,R4 ;UPDATE STACK POINTER
403 001312* 012603 (SP)+,R4 ;
404 001314* 012602 (SP)+,R2 ;
405 001316* 012605 (SP)+,R5 ;
406 ;
407 ;
408 001320* 000004 000000* 001420* PIRQS,BEGIN,CHCK1 ;
409 ;-----;
410 ;
411
412 001326* 000167 000564 RCVRTN: JMP RRUD ;
413
414
415
416

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417 001332* 005003 CHCK: CLR R3 ;SET UP OFFSET FOR DEVICE ADDRESS
418 001334* 012700 002450* MOV ERRST,R0 ;GET STARTING ADDRESS OF ERROR STATUS PUFFIR
419 001340* 012701 000014* MOV #8,R1 ;GET NUMBER OF DEVICES SELECTED
420 001344* 012702 000010 1S: MOV #8,R2 ;GET MAX. DEVICE COUNT
421 001350* 105720 TSTB (R0)+ ;TEST STATUS WORD ERROR INDICATED
422 001354* 004767 000276 BREQ #8,RCERR ;BRANCH IF THIS REV STATUS HAS NO ERRPJP
423 001360* 105720 2S: TSTB (R0)+ ;TEST STATUS WORD ERROR INDICATED
424 001364* 001407 000352 BEQ #8,RCERR ;BRANCH IF THIS XMTR STATUS HAS NO ERROR
425 001368* 005721 3S: JSR PC,XTERR ;UPDATE OFFSET POINTER
426 001372* 005723 TST (R3)+ ;UPDATE DEVICE ADDRESS OFFSET POINTER
427 001376* 005302 DEC R2 ;DECREMENT COUNT
428 001380* 005767 001232 BNE #8,IDA ;BRANCH IF NOT DONE
429 001400* 001402 4S: TST #8,IDA ;HAVE ALL LINES COMPLETE THEIR XFER'S????????????????
430 001404* 001402 000000* BREQ #8,IDA ;BRANCH TO CHECK DATA ROUTINE
431 001408* 104400 EXITS,BEGIN ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.
432 001412* 005003 CLR R1 ;
433 001414* 005002 CLR R2 ;
434 001416* 005000 CLR R0 ;
435 ;
436 ;
437 001420* 012767 000020 001214 CHCK1: MOV #20,COUNT ;CLEAR R0:NO WILL BE
438 ; USED AS OFFSET
439 ; FOR COUNTING NO OF
440 001426* 005002 002210* CLR R2 ;CHAR. READ
441 001430* 105721 1S: MOV #LNCNT1,R1 ;CLR BUFF POINTER
442 001434* 001402 TSTB (R1) ;
443 001436* 001402 2S: BEQ (R1)+,(R2)+ ;
444 001440* 022122 BR ;
445 001442* 000774 CHCK2: MOV R2,R0 ;R0 WILL HOLD LINE NO./?
446 001444* 010200 MOV DPLN(R2),R2 ;R2=START ADDR. THIS LINE BUFF
447 001446* 016202 002130* MOV (R2),CHECKR ;GET FIRST CHAR.
448 001452* 111267 001170 001164 MOV R2,CHECKR ;CHECK DATA & INCR. POINTER
449 001456* 126722 001164 001154 CUNTNU: CMPB CHECKR,(R2)+ ;THIS WORD GOOD GO CHECK MORE
450 001462* 001410 1S: BREQ #26,CHECKR ;WAS IT STRIP CHAR.
451 001464* 127767 000026 001146 TST ERRT ;NO GO REPORT ERROR
452 001472* 001144 BNE CHECKR ;YES UPDATE CHECKR
453 001474* 005267 INC R2 ;UPDATE DPLN PUFFIR POINTER
454 001500* 000765 001136 1S: CONTNU BR ;GO BACK & CHECK REAL DATA
455 001504* 005267 001126 CONTNU INCB CHECKR ;SET UP FOR NEXT BYTE TEST
456 001510* 005367 001116 DEC COUNT ;ONE MORE BYTE HAS BEEN TESTED
457 001514* 001360 BNE CUNTNU ;NOT DONE YET GO CHECK MORE
458 001516* 005267 001104 INC NODVTS ;THIS LINE DONE ADD 1 TO
459 ; NO. OF DEVICES TESTED
460 ;
461 001522* 012711 100777 MOV #100777,(R1) ;
462 001526* 027677 000010 001104 CMP #10,NODVTS ;HAVE ALL LINES BEEN TESTED
463 001534* 001260 BEQ PASS ;GO TO END PASS CODING
464 001536* 000730 BR CHCK1 ;
465 ;
466 ;
467 ;
468 ;
469 001540* 012767 000023 176340 INTER: MOV #23,ERRTYP ;DEV FAILED TO INTERRUPT
470 001546* 104405 000000* 000000 HDRS,BEGIN,NULL ;DEVICE FAILED TO INTERRUPT
471 ;*****
472 ;*****

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473 001554 104403 000000 001574 MSGNS,BEGIN,16 ;ASCII MESSAGE CALL WITH COMMON HEADER
474 001562 042767 040000 176236 BIC #40000,STAT ;ABORTING SELECTION OF THIS MODULE
475 001570 104400 000000 EXITS,BEGIN ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.
476 001574 001600 1S: TEXT ;MESSAGE POINTER
477 001576 177777 ; TERMINATOR
478 001800 020040 042504 044526 TEXT: .ASCIZ ' DEVICE FAILED TO INTERRUPT DROPPING MODULE '
479 001606 042503 043040 044501
480 001614 042514 020104 047524
481 001622 044440 052116 051105
482 001630 052522 052120 042040
483 001636 047522 050120 047111
484 001644 020107 047515 052504
485 001652 042514 000040
486
487
488 001656 105740 RCERR: TSTB -(R0) ;UPDATE OFFSET POINTER
489 001660 122700 CNPB #100,R0 ;TEST FOR DATA OVER RUN ERROR
490 001664 001006 BNE #5 ;BRANCH IF NOT OVER ?? RUN
491 001666 012767 000021 176212 MOV #21,ERRTYP ;DATA OVERRUN
492 *****
493 001674 104406 000000 000000 SOPS,BEGIN,NULL ;DATE OVER RUN
494 *****
495 001702 122700 000200 1S: CNPB #200,R0 ;TEST FOR FALSE INTERRUPT
496 001706 001010 BNE #5 ;BRANCH IF NOT FALSE INTERRUPT ERROR
497 001710 010107 176164 MOV R1,CSRA ;GET DEVICE ADDRESS
498 001714 012767 000011 176164 MOV #11,ERRTYP ;ILLEGAL INTERRUPT
499 *****
500 001722 104405 000000 000000 HDRS,BEGIN,NULL ;FALSE RECEIVE INTERRUPT
501 *****
502 001730 105720 2S: TSTB (R0)+ ;UPDATE OFFSET POINTER
503 001732 112763 000377 002210 MOVB #37,LNCNT1(R3) ;ABORT THIS DEVICE
504 001740 000207 RTS #C ;RETURN TO CALL ROUTINE
505
506
507 001742 105740 XTERR: TSTB -(R0) ;UPDATE OFFSET POINTER
508 001744 122700 CNPB #200,R0 ;TEST FOR ERROR
509 001748 001010 BNE #5 ;BRANCH IF THIS IS NOT ERROR
510 001752 010107 176122 MOV R1,CSRA ;GET DEVICE
511 001756 012767 000011 176122 MOV #11,ERRTYP ;ILLEGAL INTERRUPT
512 *****
513 001764 104405 000000 000000 HDRS,BEGIN,NULL ;FALSE TRANSMIT INTERRUPT
514 *****
515 001772 105720 1S: TSTB (R0)+ ;UPDATE OFFSET
516 001774 112763 000377 002211 MOVB #37,LNCNT1+1(R3) ;ABORT FURTHER TEST OF THIS DEVICE
517 002002 000207 RTS #C ;RETURN TO CALL ROUTINE
518
519
520
521
522 002004 016067 002150 176066 ERRRT: MOV DVAD1(R0),CSRA ;CSRA=LINE ADDR.
523 002012 005302 R2 ;UPDATE POINTER TO DATA BUFF
524 002014 112267 176070 MOVB (R2),AWAS ;BAD DATA BYTE
525 002016 005302 INC R2 ;UPDATE POINTER TO DATA BUFF
526 002022 118767 000620 176056 MOVB CHECKR,ASB ;GOOD DATA BYTE
527 002030 005267 000612 INC CHECKR ;UPDATE FOR NEXT TEST
528 002034 005367 DEC COUNT ;ONE MORE BYTE HAS BEEN TESTED

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529 *****
530 002040 104404 000000 DTERS,BEGIN ;DATA ERROR !!!
531 *****
532
533 002044 005767 000572 RESTOR: TST COUNT ;ARE WE DONE CHECKING DATA ON
534 ;ON THIS LINE
535 002050 001202 BNE CONTNU ;NO GO DO THE REST OF THIS LINE
536 002052 005267 000562 INC NODVTS ;YES THIS LINE DONE ADD 1 TO
537 ;NODVTS>NO. OF LINES TESTED
538
539 002056 012711 100777 MOV #100777,(R1) ;HAVE ALL LINES BEEN TESTED
540 002062 023767 000010 CMP #10,NODVTS ;GO TO END PASS CODE
541 002064 001402 BEQ PASS ;RETURN TO MONITOR
542 002072 000167 177322 JMP CHECK1
543
544
545 002076 104413 000000 PASS: ENDTLS,BEGIN ;SIGNAL END OF ITERATION.
546 002078 000167 176116 JMP START ;MONITOR SHALL TEST END OF PASS
547 ;NO GO DO ONE MORE
548
549
550
551
552
553
554
555
556 002106 012601 XRUD: MOV (SP)+,R1 ;XMIT, REGISTER UPDATE
557 002110 012600 MOV (SP)+,R0 ;
558 002112 012605 MOV (SP)+,R5 ;
559 002114 000002 RTI ;
560
561
562 002116 012604 RRUD: MOV (SP)+,R4 ;RCV. REGISTER UPDATE
563 002120 012603 MOV (SP)+,R3 ;
564 002122 012602 MOV (SP)+,R2 ;
565 002124 000002 MOV (SP)+,R5 ;
566 002126 000002 RTI ;
567
568
569
570
571 ; SYNC WORD STORAGE LOCATIONS (LINE SYNC <1:8>)
572
573 002130 000010 DPLIN: .BLKW 8. ;CONTAINS OFFSET POINTER TO DATER STORAGE BUFF
574 002150 000010 DVADI: .BLKW 8. ;DEVICE ADDRESS < 174770:174700 >
575 002170 000010 LNSYNI: .BLKW 8. ;HIGH BYTE=SYNC COUNT NO.
576 ;LOW BYTE= BINARY WORD PATTERN
577 002210 000010 LNCNT1: .BLKW 8. ;HIGH BYTE=NO. XMTED INTERRUPTS
578 ;LOW BYTE = NO. RCV. INTERRUPTS
579 VRFLG1: .BLKW 8. ;BYTE OFFSET VALUE FOR READ
580
581 ;RECEIVE DATA 16 BYTES PER.BUFFER
582
583 002250 000010 DPLIN1: .BLKW 8. ;DPL1 LINE #1 RECEIVE
584 ;DATA BUFFER

```


585
586
587 002270 000010
588 002310 000010
589 002330 000010
590 002350 000010
591 002370 000010
592 002410 000010
593 002430 000010
594
595
596
597 002450 000010
598
599
600
601
602
603 002470 004567 176416
604 002474 000000
605 002476 004567 176244
606 002502 000000
607 002504 004567 176402
608 002512 000000
609 002512 004567 176230
610 002516 000002
611 002520 004567 176366
612 002524 000000
613 002526 004567 176214
614 002532 000004
615 002534 004567 176352
616 002540 000006
617 002542 004567 176200
618 002546 000006
619 002550 004567 176336
620 002554 000010
621 002556 004567 176164
622 002562 000010
623 002564 004567 176322
624 002570 000012
625 002572 004567 176150
626 002576 000012
627 002600 004567 176306
628 002604 000014
629 002606 004567 176134
630 002612 000014
631 002614 004567 176272
632 002620 000016
633 002622 004567 176120
634 002626 000016
635
636
637 002630 000000
638 002632 013426
639 002634 000000
640 002636 000000

DPLIN2: .BLKW 8.
DPLIN3: .BLKW 8.
DPLIN4: .BLKW 8.
DPLIN5: .BLKW 8.
DPLIN6: .BLKW 8.
DPLIN7: .BLKW 8.
DPLIN8: .BLKW 8.

;LOW BYTE HAS 1ST CHAR.
;HIGH BYTE HAS 2ND CHAR. ETC.
;DP11 LINE #2 RECEIVE
;DP11 LINE #3 RECEIVE
;DP11 LINE #4 RECEIVE
;DP11 LINE #5 RECEIVE
;DP11 LINE #6 RECEIVE
;DP11 LINE #7 RECEIVE
;DP11 LINE #8 RECEIVE

ERSTT: .BLKW 8. ;STORAGE OF STATUS TYPE OF ERROR

; SERVICE CODE FOR LINKING A PARTICULAR DEVICE
; TO A COMMON XMT OR RCV SERVICE ROUTINE.

LINKER: JSR R5,DPRCV ;ANSWER LINE 1 RCV INTR
0 ;OFFSET FOR LINE 1
JSR R5,DPXMT ;ANSWER LINE 1 XMT INTR
0 ;OFFSET FOR LINE 1
JSR R5,DPRCV ;ANSWER LINE 2 RCV INTR
2 ;OFFSET FOR LINE 2
JSR R5,DPXMT ;ANSWER LINE 2 XMT INTR
2 ;OFFSET FOR LINE 2
JSR R5,DPRCV ;ANSWER LINE 3 RCV INTR
4 ;OFFSET FOR LINE 3
JSR R5,DPXMT ;ANSWER LINE 3 XMT INTR
4 ;OFFSET FOR LINE 3
JSR R5,DPRCV ;ANSWER LINE 4 RCV INTR
6 ;OFFSET FOR LINE 4
JSR R5,DPXMT ;ANSWER LINE 4 XMT INTR
6 ;OFFSET FOR LINE 4
JSR R5,DPRCV ;ANSWER LINE 5 RCV INTR
8 ;OFFSET FOR LINE 5
JSR R5,DPXMT ;ANSWER LINE 5 XMT INTR
10 ;OFFSET FOR LINE 5
JSR R5,DPRCV ;ANSWER LINE 6 RCV INTR
12 ;OFFSET FOR LINE 6
JSR R5,DPXMT ;ANSWER LINE 6 XMT INTR
12 ;OFFSET FOR LINE 6
JSR R5,DPRCV ;ANSWER LINE 7 RCV INTR
14 ;OFFSET FOR LINE 7
JSR R5,DPXMT ;ANSWER LINE 7 XMT INTR
14 ;OFFSET FOR LINE 7
JSR R5,DPRCV ;ANSWER LINE 8 RCV INTR
16 ;OFFSET FOR LINE 8
JSR R5,DPXMT ;ANSWER LINE 8 XMT INTR
16 ;OFFSET FOR LINE 8

PNTR: OPEN ;PNTR REG TO TEST DEVICE ON LINE
TSVNC: 13426 ;SVNC CODE
CNT80: OPEN ;USED FOR COUNTER OF 64.
DVIDA: OPEN ;POINTER FLAG WHICH WILL BRANCH TO
;TEST STATUS OF ALL LINES AFTER

641
642 002640 000000
643 002642 000000
644
645 002644 000000
646 002646 000000
647 002650 000000
648 002652 000000
649 002654 000000
650 002656 000000
651 000001

NODVTS: OPEN
COUNT: OPEN
RCV DAT: 0
CHECKR: 0
TRCNT: 0
RCCNT: 0
DPDN: OPEN
NO.DP: OPEN
-END

;COMPLETING ONE LINE DATA TRANSFER
;WHEN #8 ALL LINES HAVE BEEN TESTED
;COUNTS DOWN FROM 16 WHEN CHECKING
;DATA BUFFER REG
;WORD USED TO INCREMENT XMTED DATA
;STORES WORD BEING CHECKED
;XMT COUNT
;RECEIVE COUNT
;DP'S DONE COUNTER
;NO. DP'S SELECTED

PS	=	177776	202#																		
PSW	=	177776	202#																		
PUSH	=	005746	202#																		
PUSH2	=	024646	202#																		
RANDS	=	104417	202#																		
RANNUM	=	000054R	197#																		
RCENT	=	002652R	210#	309	392*	648#															
RCERR	=	001656R	423#	488#																	
RCVDT	=	002644R	64#		396	402	413#														
RCVTRN	=	001326R	38#																		
READ	=	001216R	374#	384#																	
RESTOR	=	002044R	534#																		
RESTR	=	000246R	190#	206#																	
RES1	=	000056R	173#																		
RES2	=	000060R	174#																		
RRUD	=	002116R	371#	381	413	562#															
RSTR	=	000112R	190#																		
SBADR	=	000102R	183#																		
SOPCNT	=	000042R	166#																		
SOPERS	=	104406	202#	493																	
SOPAS	=	000046R	169#																		
SPOINT	=	000032R	169#																		
SPSIZ	=	000040	1	195																	
SR1	=	000016R	155#																		
SR2	=	000022R	155#																		
SR3	=	000022R	155#																		
SR4	=	000024R	156#																		
START	=	000224R	161#	202#	548																
START1	=	000412R	295#	239#																	
START2	=	000504R	265#																		
STAT	=	000026R	160#	474*																	
SVR0	=	000062R	175#																		
SVR1	=	000062R	176#																		
SVR2	=	000066R	176#																		
SVR3	=	000070R	178#																		
SVR4	=	000072R	179#																		
SVR5	=	000074R	180#																		
SVR6	=	000076R	181#																		
SYSCNT	=	000052R	170#																		
TEXT	=	001600R	476#	478#																	
TRCNT	=	002650R	209#	307	340*	647#															
TRPDEF	=	000022	202#																		
TSVNC	=	002632R	290#	637#																	
UPDAT	=	000640R	287#	297#																	
VECTR	=	000010R	151#	214																	
VRELGL	=	002230R	387#	393*	579#																
WASADR	=	000104R	185#																		
WDFR	=	000116R	192#	203*																	
WDT0	=	000114R	191#	202*																	
WNDOW	=	000660R	302#																		
XPLAG	=	000005R	149#																		
XNTRN	=	001106R	350#	352	355	358#															
XRUD	=	002106R	356#	556#																	
XTERR	=	001742R	476#	577#	579#	583#	587#	588#	589#	590#	591#	592#	593#								
.	=	002660R	597#																		

. ABS. 000000 000
 002660 001

ERRORS DETECTED: 0
 DEFAULT GLOBALS GENERATED: 0
 XDPAEO, XDPAEO/SOL/CRF:SYM=DDXCOM, XDPAEO
 RUN-TIME: 1 2 3 SECONDS
 RUN-TIME RATIO: 15/4=3.6
 CORE USED: 7K (13 PAGES)