

Micro Fiche Scan

Name of device(s) tested:

DL11

Test description:

DL11 MODULE

MAINDEC Number or Package Identifier (after SEP 1977):

CXDLAL0

Fiche Document Part Number:

AH-E711L-MC

Fiche preparation date unknown, using copyright year:

1984

Image resolution:

8-bit gray levels, max. quality for archiving

COPYRIGHT (C) 1973-84 by d|i|g|i|t|a|l

.REM

IDENTIFICATION

PRODUCT CODE: AC-E709L-MC
PRODUCT NAME: CXDLALO DL11 MODULE
PRODUCT DATE: NOVEMBER 1984
MAINTAINER: DEC/X11 SUPPORT GROUP

THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL EQUIPMENT CORPORATION. DIGITAL EQUIPMENT CORPORATION ASSUMES NO RESPONSIBILITY FOR ANY ERRORS THAT MAY APPEAR IN THIS MANUAL.

THE SOFTWARE DESCRIBED IN THIS DOCUMENT IS FURNISHED TO THE PURCHASER UNDER A LICENSE FOR USE ON A SINGLE COMPUTER SYSTEM AND CAN BE COPIED (WITH INCLUSION OF DIGITALS COPYRIGHT NOTICE) ONLY FOR USE IN SUCH SYSTEM, EXCEPT AS MAY OTHERWISE BE PROVIDED IN WRITING BY DIGITAL.

DIGITAL EQUIPMENT CORPORATION ASSUMES NO RESPONSIBILITY FOR THE USE OR RELIABILITY OF ITS SOFTWARE ON EQUIPMENT THAT IS NOT SUPPLIED BY DIGITAL.

COPYRIGHT (C) 1973,1983,1984 DIGITAL EQUIPMENT CORPORATION

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

1. ABSTRACT:

DLA IS AN IOMOD THAT EXERCISES UP TO SIXTEEN DL11 ASYNCHRONOUS INTERFACES. IT IS CAPABLE OF EXERCISING ALL DL11 MODELS. IT USES MAINTENANCE MODE TO TRANSMIT AND RECEIVE A BINARY COUNT PATTERN OUTPUT AND RECEIVED IN 64. CHARACTER BURSTS. THE MAJOR PORTION OF THE ERROR CHECKING IS DEFERRED TO PRIORITY LEVEL 0. ALL LINES SELECTED FOR TEST (UP TO 16 DL11'S WITH CONTIGUOUS ADDRESSES AND VECTORS) ARE ACTIVATED AND RUN CONCURRENTLY. ALL TRANSMIT AND RECEIVE ERRORS ARE REPORTED ON THE CONSOLE TTY.

NOTE:

THIS MODULE IS NOT DESIGNED TO EXERCISE ANY TYPE OF TERMINAL DEVICE. IT IS DESIGNED ONLY TO EXERCISE THE DL. ANY INFORMATION DISPLAYED OR PRINTED IS INCIDENTAL AND SHOULD BE IGNORED. IN MOST CASES THE TERMINAL DEVICE SHOULD BE PLACED IN THE OFF-LINE MODE.

2. REQUIREMENTS:

HARDWARE:

AT LEAST ONE DL11 INTERFACE
NOTE: FOR THE DLV11, THE TEST CONNECTOR
MUST BE INSTALLED !

STORAGE:: DLA REQUIRES:

- 1. DECIMAL WORDS: 959
- 2. OCTAL WORDS: 1677
- 3. OCTAL BYTES: 3576

:RG002
:RG002
:RG002

3. PASS DEFINITION:

ONE PASS OF THE DLA MODULE CONSISTS OF TRANSMITTING AND RECEIVING SOME CHARACTERS. THE EXACT NUMBER DEPENDS ON THE BAUD RATE

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

4. EXECUTION TIME:

VARIABLES WITH BAUD RATE BUT SHOULD TAKE ABOUT ONE
MINUTE TO COMPLETE ONE PASS WHEN RUNNING ALONE.
SR1 MUST BE SET TO MATCH THE BAUD RATE OR THE
PASS TIMES WILL BE OFF. SR2 CAN BE SET TO THE
ITERATION CONSTANT (ICONT) DESIRED REGARDLESS OF
THE BAUD RATE IF DESIRED. (RS001)

5. CONFIGURATION PARAMETERS:

DEFAULT PARAMETERS:

DVA: 176500, VCT: 1, BR1: 4, BR2: 0, DVC: 1

REQUIRED PARAMETERS:

AT CONFIGURATION TIME THE USER MUST SPECIFY:

VCT: VECTOR ADDRESS OF FIRST DL11
DVC: NO OF DL11'S IF GREATER THAN 1

6. DEVICE OPTION SETUP:

NONE REQUIRED

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

7. MODULE OPERATION:

7.1 TEST SEQUENCE:

- A. START: USING THE DEVICE SELECTION PARAMETER "DVID1" THIS SECTION OF CODE SETS UP THE VECTORS OF ALL SELECTED LINES TO POINT TO THE APPROPRIATE JSR INSTRUCTION IN THE JSR LINKING TABLE.
- B. SETCSR: THIS PIECE OF CODE INSERTS THE PROPER CSR ADDRESS OF EACH ACTIVE LINE INTO THE THIRD WORD OF EACH JSR TABLE ENTRY.
- C. STUP: THIS ROUTINE INITIALIZES ALL TABLES, BUFFERS, FLAGS AND COUNTERS, THEN PROCEEDS TO TURN ON THE INTERRUPTS FOR ALL ACTIVE LINES. IT USES THE CONTENTS OF THE ACTIVE DEVICE TABLE TO FIND OUT WHICH LINES TO KICK OFF. AFTER INITIALIZING ALL LINES IT WAITS FOR COMPLETION OF 64 TRANSMITTER AND RECEIVER INTERRUPTS VIA A BREAK LOOP. IF THE 64 INTERRUPTS HAVE OCCURRED ON BOTH TRANSMITTER AND RECEIVER, OR IF THE BREAK LOOP TIMES OUT, CONTROL PASSES TO ERRCHK.
- D. TINT: THE TRANSMITTER SERVICE ROUTINE SIMPLY QUEUES UP THE REQUEST FOR SERVICE IN A FIFO QUEUE, UPDATES THE POINTER, AND RETURNS CONTROL BACK TO THE MONITOR WITH A PIRQ. THE ELEMENT THAT GETS STORED IN THE QUEUE IS A POINTER TO THE INTERRUPTING CSR ADDRESS. THE ACTUAL SERVICING IS DONE LATER WHERE THE SERVICE CODE IS EXECUTED AT PRIORITY LEVEL 0.
- E. TSERV: THIS CODE RETRIEVES A POINTER FROM THE FIFO QUEUE AND BUILDS THE CSR ADDRESS. THE FOLLOWING SEQUENCE IS EXECUTED:
1. TEST FOR END OF 64. CHAR BURST - IF END EXIT - IF NOT GO TO 2
 2. TEST READY FLAG - IF NOT ASSERTED GO REPORT FALSE INTERRUPT - IF ASSERTED PROCEED TO STEP 3
 3. COUNT THE INTERRUPT FOR INDIVIDUAL LINE
 4. GENERATE AND OUTPUT NEXT CHARACTER, KEEP TRACK OF THE NUMBER OF CHARACTERS

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

OUTPUT ON THE LINE, AND THEN EXIT BACK TO THE MONITOR.

- F. RINT: THE RECEIVER SERVICE ROUTINE STORES DATA AND STATUS INFORMATION IN A RECEIVER STARTUP TABLE, TESTS FOR THE END OF A 64. CHAR XFR SEQUENCE AND THEN EXECUTES AN "RTI". IT ALSO COUNTS RECEIVE INTERRUPTS IN A SEPARATE COUNTER FOR EACH LINE. SEPARATE COUNTER.
- G. ERRCHK: THE BULK OF THE ERROR CHECKING AND REPORTING IS DONE HERE AT THE END OF EACH 64. CHAR. BURST. THE FOLLOWING SEQUENCE IS EXECUTED:
1. TURN OFF RCVR AND XMTR INTR. ENABLES FOR ALL ACTIVE LINES
 2. SCAN THROUGH THE RECEIVER STATUS TABLE (64 ENTRIES OF TWO WORDS EACH) TO CHECK FOR AND REPORT:
 - A.) PARITY, FRAMING AND OVER-RUN ERRORS.
 - B.) RCVR FALSE INTERRUPTS
 - C.) DATA COMPARE ERRORS. ONLY IF A AND B DID NOT OCCUR.
 3. CHECK RECEIVER AND TRANSMITTER INTERRUPT COUNTS FOR EACH LINE TO BE SURE THAT NO LINES WERE DROPPED OR HAD TOO MANY INTERRUPTS.
 4. GO TO THE ENPS ROUTINE AFTER CHECKING ALL 64 ENTRIES.
- H. ENPS: COUNT THE 64. CHAR BURST AND TEST FOR 128. BURSTS (8192 CHARS). IF NOT END OF PASS GO TO I. IF END REPORT END OF PASS AND GO TO C.
- I. RESYNC: RESYNC THE DATA BUFFERS AND THEN RESTART AT STEP C.

7.2 DESCRIPTION OF TABLES, QUEUES, AND BUFFERS

- A. RSTAB: THIS IS A 128. WORD STATUS TABLE CONSISTING OF 64. TWO WORD ENTRIES. IT GETS LOADED DURING RECEIVER INTERRUPT SERVICE AND CHECKED AT THE END OF EACH 64. CHAR BURST. EACH ENTRY HAS THE FOLLOWING FORMAT:

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

1ST WORD: CONTENTS OF RCSR

2ND WORD: LO BYTE = RCVD DATA BYTE
HI BYTE = LINE NUMBER

- B. RCNT: 16 BYTE TABLE CONTAINING AN 8 BIT INTERRUPT COUNTER FOR EACH RCVR. THE APPROPRIATE BYTE GETS INCREMENTED DURING RCVR INTR SERVICE AND CHECKED FOR EQUIVALENCE TO THE NUMBER OF CHARACTERS TRANSMITTED.
- C. TCNT: 16 BYTE TABLE CONTAINING AN 8-BIT INTERRUPT COUNTER FOR EACH TRANSMITTER. THE APPROPRIATE BYTE GETS INCREMENTED DURING DEFERRED INTR. SERVICE AND CHECKED FOR EQUIVALENCE TO THE NUMBER OF CHARACTERS TRANSMITTED.
- D. DLNT: 16 BYTE TABLE CONTAINING AN 8-BIT DATA COUNTER FOR EACH LINE. THE APPROPRIATE BYTE GETS INCREMENTED EACH TIME A CHARACTER IS TRANSMITTED ON THE LINE, AND CLEARED BEFORE THE BEGINNING OF EACH 64. WORD BURST.
- E. TQ: 16 WORD FIFO QUEUE FOR TRANSMITTER SERVICE. LOADED DURING XMTR INTERRUPT SERVICE WITH A POINTER TO THE CSR ADDRESS AND UNLOADED DURING DEFERRED XMTR SERVICE.
- F. XBUF: 16 BYTE XMTR DATA BUFFERS - ONE BYTE/XMTR
- G. RBUF: 16 BYTE RCVR DATA BUFFERS - ONE BYTE/RCVR.
- H. JSRTAB: A 128 WORD TABLE THAT CONTAINS 64 JSR INSTRUCTIONS WITH TWO TRAILING ARGUMENTS. EACH RECEIVER AND EACH XMTR HAS AN ASSIGNED JSR IN THE TABLE OF THE FOLLOWING FORMAT:

```

JSR    RS,RINT(TINT)
  O
  N

```

WHERE THE O GETS OVERLAYED WITH THE ADDRESS OF THE CSR FOR LINE N AND N IS THE LINE NO. IN OCTAL (00-17)

8. OPERATOR OPTIONS:

-
- A. THE USER CAN USE THE "MOD" COMMAND TO DUMP THE TABLES BUFFERS DESCRIBED IN 7.2 TO OBTAIN MORE DETAILED ERROR INFORMATION.

DEC/X11 SYSTEM EXERCISER MACRO DEFINITION MODULE

- B. THE USER CAN MODIFY (DLA 14) "DVID1" TO SELECT OR DESELECT INDIVIDUAL DL11'S.
- C. SR1 IS USED TO SPECIFY THE BAUD RATE AND CHARACTER SIZE WITH WHICH THE DLA MODULE IS TO WORK. THE DEFAULT IS 9600 BAUD WITH AN 8-BIT CHARACTER SIZE.

1. CHAR. SIZE:

SR1	BIT1	BIT0	CHAR SIZE
	0	0	8-BIT
	0	1	7-BIT
	1	0	6-BIT
	1	1	5-BIT

- 2. BAUD RATE:
BITS 2-14 ARE USED. ONE AT MOST SHOULD BE SET; IF MORE THAN ONE BIT IS SET, THE RIGHT-MOST WILL BE USED.

BAUD	BIT SET
9600	NONE
7200	2
4800	3
2400	4
1800	5
1200	6
600	7
300	8
200	9
150	10
134.5	11
110	12
75	13
50	14

3. EXAMPLES:

SR1=5 MEANS 7-BIT CHARACTER AT 7200 BAUD
 SR1=12 MEANS 6-BIT CHARACTER AT 4800 BAUD
 SR1=1000 MEANS 8-BIT CHARACTER AT 200 BAUD
 SR1=0 (DEFAULT) MEANS 8-BIT CHARACTER AT 9600 BAUD

4. CHANGE ITERATION CONSTANT (ICONT) USING SR2: ;RS001

BIT15 = 1 SET ITERATION CONSTANT (ICONT) WITH VALUE LOADED INTO BITS 14:0.

BIT15 = 0 ICONT SET FROM CNTTBL ACCORDING TO THE BAUD RATE SELECTED BY SR1.

*NOTE : CHARACTER SIZE UNAFFECTED BY SR2.

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

9. NON-STANDARD PRINTOUTS:

THERE ARE TWO ERROR PRINTOUTS WHICH SUPPLY SPECIAL INFORMATION
IN THE CSRC AND STATC VALUES (CONSULT LISTING).

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

```

383 ;DL11 A-D DEC/X11 EXERCISER MODULE
384
385 000000 IOMOD <DLAL >,176500,1,4,,,0,26
      000000 MODULE 140000,DLAL ,176500,1,4,,,0,26,,,,
      .TITLE DLAL DEC/X11 SYSTEM EXERCISER MODULE
;      DDXCOM VERSION 6.4 28-JAN-82
      .LIST BIN
;*****
0000C0 BEGIN:
000000 104 114 101 MODNAM: .ASCII /DLAL / ;MODULE NAME.
000003 114 040
000005 000 XFLAG: .BYTE OPEN ;USED TO KEEP TRACK OF WBUFF USAGE
000006 176500 ADDR: 176500+0 ;1ST DEVICE ADDR.
000010 000001 VECTOR: 1+0 ;1ST DEVICE VECTOR.
000012 200 BR1: .BYTE PRTY4+0 ;1ST BR LEVEL.
000013 000 BR2: .BYTE PRTY+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 000226' INIT: START ;MODULE START ADDR.
000032 000224' SPOINT: MODSP ;MODULE STACK POINTER.
000034 000000 PASCNT: 0 ;PASS COUNTER.
000036 000000 ICONI: 0 ;# OF ITERATIONS PER PASS=0
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 000000 CONFIG: ;RESERVED FOR MONITOR USE
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
000106 000000 ASB: OPEN ;EXPECTED DATA.
000110 000000 AWAS: OPEN ;ACTUAL DATA.
000112 000552' RSTRT: RESTRT ;RESTART ADDRESS AFTER END OF PASS
000114 000000 WDTO: OPEN ;WORDS TO MEMORY PER ITERATION
000116 000000 WDFR: OPEN ;WORDS FROM MEMORY PER ITERATION
000120 000000 INTR: OPEN ;# OF INTERRUPTS PER ITERATION
000122 000026 IDNUM: 26 ;MODULE IDENTIFICATION NUMBER=26

```

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

000040

.REPT SPSIZ
.NLIST
.WORD 0
.LIST
.ENDR

;MODULE STACK STARTS HERE.

000224

MODSP:

386
387
388
389
390
391
392
393
394
395

;*
; THE NEXT LOCATION CONTAINS A NUMBER THAT CAN BE EXAMINED IN CORE TO BE
; SURE THAT THE LISTING AND ACTUAL CODE ARE THE SAME. THIS LOCATION IS TO
; BE INCREMENTED EACH TIME THE SOURCE CODE IS UPDATED. LOCATION 'MODREV'
; IS NOT USED BY THE PROGRAM.

MODREV: 1+1+1+1+1+1+1+1+1+1+1+0

000224 000014

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

```

397 ;THIS ROUTINE SETS UP THE VECTORS FOR ALL SELECTED LINES TO POINT
398 ;TO THE APPROPRIATE JSR IN THE JSR LINK TABLE AND SETS
399 ;THE ITERATION COUNT TO MATCH BAUD RATE SPEC. IN SR1
400 000226 005000 START: CLR R0 ;GET RID OF JUNK (REV.J0)
401 000230 012767 000100 177656 MOV #64.,WDTO ;64 (10) WORDS PER ITERATION TO MEM
402 000236 012767 000100 177652 MOV #64.,WDFR ;64 (10) WORDS FROM MEM PER ITERATION
403 000244 012767 000200 177646 MOV #128.,INTR ;64 INTERRUPTS PER ITERATION
404 000252 016701 177540 MOV SR1,R1 ;GET SR1 VALUE
405 000256 042701 177774 BIC #177774,R1 ;MASK OUT SIZE PART
406 000262 001406 BEQ 8$ ;DEFAULT SETTING
407 000264 112700 000200 MOVB #200,R0 ;SET UP MASK FOR 7-BIT
408 000270 005301 7$: DEC R1 ;COUNT BITS MASKED
409 000272 001402 BEQ 8$ ;EXIT WHEN DONE
410 000274 006200 ASR R0 ;SHIFT AND REPLICATE HIGH BIT
411 000276 000774 BR 7$ ;AGAIN?
412 000300 010067 002524 8$: MOV R0,SIZE ;SET SIZE MASK
413 000304 005000 CLR R0 ;INIT POINTER
414 000306 016701 177504 MOV SR1,R1 ;GET SR1
415 000312 006201 ASR R1 ;SHIFT SR1 TO
416 000314 006201 ASR R1 ;GET BAUD RATE
417 000316 001405 BEQ 19$ ;9600 BAUD SET
418 000320 062700 000002 18$: ADD #2,R0 ;ELSE BUMP POINTER
419 000324 006001 ROR R1 ;LOOK FOR SR1 BIT
420 000326 103401 BCS 19$ ;LEAVE IF WE FOUND IT
421 000330 000773 BR 18$ ;ELSE DO IT AGAIN
422 000332 005767 177462 19$: TST SR2 ;IF BIT15 SET, LOAD ITERATION CONSTANT IN SR2 ;RS001
423 000336 001407 BEQ 20$ ;ELSE LOAD FROM CNTTBL. ;RS001
424 000340 016704 177454 MOV SR2,R4 ;SAVE SR2 IN WORK AREA ;RS001
425 000344 042704 100000 BIC #100000,R4 ;MASK BIT15 ;RS001
426 000350 010467 177462 MOV R4,ICONT ;LOAD SELECTED ITERATION CONSTANT ;RS001
427 000354 000403 BR 17$ ;BYPASS CNTTBL ICONT VALUES ;RS001
428 000356 016067 001650' 177452 20$: MOV CNTTBL(R0),ICONT ;RS001
429 ;SET UP ITER COUNT
430 000364 016700 177420 17$: MOV VECTOR,R0 ;SET R0 TO POINT TO THE 1ST VECTOR
431 000370 016701 177420 MOV DVID1,R1 ;LOAD R1 WITH DEVICE SELECTION PARAMETER
432 000374 010167 002574 MOV R1,DVICE ;INITIALIZE TO RECORD ANY LINES DROPPED
433 000400 012702 003176' MOV #JSRTAB,R2 ;SET UP R2 TO POINT TO JSR TABLE
434 000404 006201 1$: ASR R1 ;SHIFT SELECT BIT INTO "C"
435 000406 103020 BCC 3$ ;BR IF NOT SELECTED
436 000410 010220 MOV R2,(R0)+ ;SET UP RCVR INTR POINTER
437 000412 116720 177374 MOVB BR1,(R0)+ ;SET UP RCVR PRIORITY LEVEL
438 000416 105720 TSTB (R0)+ ;MOVE POINTER
439 000420 062702 000010 ADD #10,R2 ;POINT R2 TO XMTR ENTRY IN JSR TABLE
440 000424 010220 MOV R2,(R0)+ ;SET UP XMTR INTR POINTER
441 000426 116720 177360 MOVB BR1,(R0)+ ;SET UP XMTR PRIORITY LEVEL
442 000432 105720 TSTB (R0)+ ;MOVE POINTER
443 000434 062702 000010 ADD #10,R2 ;POINT R2 TO RCVR ENTRY FOR NEXT LINE
444 000440 022702 003576' 2$: CMP #JSRTAB+400,R2 ;IS THE POINTER AT THE END OF THE TABLE?
445 000444 001357 BNE 1$ ;BR IF NOT
446 000446 000405 BR SETCSR ;GO SET UP CSR ADDRESSES
447 000450 062700 000010 3$: ADD #10,R0 ;UPDATE VECTOR POINTER
448 000454 062702 000020 ADD #20,R2 ;UPDATE JSR TABLE POINTER
449 000460 000767 BR 2$ ;GO CHECK FOR END OF TABLE
450
451 ;THIS ROUTINE SETS UP THE JSR TABLE SUCH THAT THE APPROPRIATE
452 ;CSR ADDRESS IS INCLUDED AS THE 3RD WORD OF EACH ENTRY
453

```

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

```

454 000462 016700 177320      SETCSR: MOV      ADDR,R0      ;GET THE FIRST CSR ADDRESS INTO R0
455 000466 016701 177322      MOV      DVID1,R1      ;LOAD R1 WITH THE DEVICE SELECTION PARAMETER
456 000472 001002              BNE      1$            ;BR IF DVC OK
457 000474 104410 000000'     END$,BEGIN            ;
458 000500 012702 003202'     1$:  MOV      #JSRTAB+4,R2  ;POINT R2 TO CSR ADDRESS ENTRY
459 000504 006201              2$:  ASR      R1            ;SHIFT SELECT BIT INTO "C"
460 000506 103014              BCC     4$            ;BR IF LINE NOT SELECTED
461 000510 010012              MOV     RO,(R2)       ;PUT RCVR CSR ADDRESS IN TABLE
462 000512 022020              CMP     (RO)+,(RO)+   ;GENERATE XMTR CSR ADDRESS IN RO
463 000514 062702 000010      ADD     #10,R2        ;POINT TO XMTR SLOT IN JSR TABLE
464 000520 010012              MOV     RO,(R2)       ;PUT XMTR CSR ADDRESS IN THE TABLE
465 000522 022020              CMP     (RO)+,(RO)+   ;GENERATE NEXT RCVR CSR ADDRESS IN RO
466 000524 062702 000010      ADD     #10,R2        ;POINT TO RCVR SLOT IN JSR TABLE
467 000530 022702 003602'     3$:  CMP     #JSRTAB+404,R2 ;IS POINTER BEYOND END OF TABLE?
468 000534 001363              BNE     2$            ;BR IF NOT
469 000536 000411              BR      REST          ;GO SET UP ACTIVE DEVICE TABLE.
470 000540 062700 000010      4$:  ADD     #10,R0       ;UPDATE CSR ADDRESS
471 000544 062702 000020      ADD     #20,R2        ;UPDATE JSR TABLE POINTER
472 000550 000767              BR      3$           ;GO TEST FOR END OF TABLE
473
474                          ;THIS ROUTINE CLEARS BUFFERS AND TABLES, INITIALIZES FLAGS, AND STARTS
475                          ;UP ALL SELECTED LINES.
476
477 000552 005000              RESTRT: CLR     R0      ;GET RID OF JUNK (REV.JO)
478 000554 005767 177254      TST     PASCNT        ;HAVE WE BEEN THRU START?
479 000560 001622              BEQ     START        ;BR THERE IF WE HAVEN'T
480 000562 004767 002262      REST:  JSR     PC,CLRBUF ;GO CLEAR XMTR. AND RCVR. BUFFERS
481 000566 004767 002312      STUP1: JSR     PC,DTAB  ;SET UP THE ACTIVE DEVICE TABLE.
482 000572 004767 002270      JSR     PC,CLRTAB    ;GO CLEAR TABLES AND QUEUES
483 000576 005067 002232      CLR     TXCNT        ;CLEAR TX TOTAL INTERRUPT COUNTER.
484 000602 005067 002230      CLR     RXCNT        ;CLEAR RX TOTAL INTERRUPT COUNTER.
485 000606 012767 002250' 002226  MOV     #RSTAB,SVPTR  ;INITIALIZE RCVR. STATUS TABLE POINTER
486 000614 012767 002730' 002222  MOV     #TQ,OPTR1     ;SET UP XMTR FIFO QUEUE POINTERS
487 000622 012767 002730' 002216  MOV     #TQ,OPTR2
488 000630 016700 002336      MOV     ACTDEV,R0    ;GET COUNT OF ACTIVE DEVICES
489 000634 116002 003152'     1$:  MOV     DEVTAB(R0),R2 ;GET AN ACTIVE LINE NO.
490 000640 004767 001244      JSR     PC,GETADR    ;GO BUILD CSR ADDRESS IN R3
491 000644 005763 000002      TST     2(R3)        ;READ RCV DBR TO FLUSH DONE BIT
492 000650 052713 000100      BIS     #100,(R3)    ;ENABLE RECEIVER INTERRUPTS
493 000654 052763 000004 000004  BIS     #4,4(R3)     ;ENABLE MAINT. MODE
494 000662 105262 002770'     INCB   XBUF(R2)      ;
495 000666 116263 002770' 000006  MOV     XBUF(R2),6(R3) ;OUTPUT CHAR ONTO TX.
496 000674 105267 002134      INCB   TXCNT        ;UP COUNT OF CHARS OUTPUT.
497 000700 105262 002710'     INCB   DCNT(R2)     ;COUNT CHARACTERS OUTPUT ON THIS LINE
498 000704 052763 000100 000004  BIS     #100,4(R3)   ;ENABLE TX INTERRUPTS.
499 000712 005300              DEC     R0           ;COUNT ONE KICKED OFF
500 000714 100347              BPL     1$          ;GO TEST FOR NEXT ONE
501 000716 012767 000006 002114  MOV     #6,CNTR      ;INITIALIZE COUNTER TO WAIT AT LEAST
502                          ;30 SECONDS BEFORE TIMING OUT
503 000724 005004              10$:  CLR     R4
504 000726              2$:
505 000726 104407 000000'     BREAK$,BEGIN        ;TEMPORARY RETURN TO MONITOR....
506 000732 104407 000000'     BREAK$,BEGIN        ;THEN CONTINUE AT NEXT INSTRUCTION.
507 000736 122767 000100 002071  CMP     #64.,TXCNT+1 ;64 TRANSMITTER INTERRUPTS?
508 000744 003004              BGT     3$          ;NO- BRANCH TO WAIT
509 000746 022767 000100 002062  CMP     #64.,RXCNT   ;YES- 64 RECEIVER INTERRUPTS?
510 000754 003405              BLE     4$          ;YES- GO CHECK FOR ERRORS

```

DEC/X11 SYSTEM EXERCISER MACRO DEFINITION MODULE

```

509 000756 005304          34:  DEC    R4          ;TIMEOUT?
510 000760 001362          BNE    24          ;NO- WAIT SOME MORE
511 000762 005367 002052  DEC    CNTR        ;EACH PASS OF THE SMALL LOOP TAKES
512                                ;AT LEAST 5 SECONDS
513 000766 001356          BNE    104         ;BRANCH IF NOT DONE WITH 6 PASSES OF
514                                ;THE SMALL COUNTER
515 000770 000167 000306  44:  JMP  ERRCHK
516
517 ;TRANSMITTER INTERRUPT SERVICE - ENTERED VIA APPROPRIATE JSR TABLE
518 ;ENTRY WITH R5 POINTING TO THE CSR ADDRESS. - CONTENTS OF R5
519 ;GETS QUEUED UP IN FIFO QUEUE AND ROUTINE RETURNS CONTROL BACK TO
520 ;THE MONITOR VIA A PIRQ TO DEFER SERVICING XMITTER AT LEVEL 0
521
522 000774 010577 002044  TINT:  MOV    R5,BQPTR1  ;STORE CONTENTS OF R5 IN THE QUEUE
523 001000 062767 000002 002036  ADD    #2,QPTR1    ;UPDATE THE QUEUE POINTER
524 001006 022767 002770' 002030  CMP    #TQ-40,QPTR1 ;POINTER AT END OF QUEUE?
525 001014 001003          BNE    14          ;BR IF NOT
526 001016 012767 002730' 002020  MOV    #TQ,QPTR1   ;RESET THE POINTER
527 001024 012605          14:  MOV    (R6)+,R5    ;RESTORE THE OTHER GUY'S R5
528
    001026 000004 000000' 001034'  ;-----
    PIRQ4,BEGIN,TSERV          ; QUEUE UP TO CONTINUE AT TSERV AND RTI
    ;-----
529
530 ;DEFERRED XMTR SERVICE - THIS ROUTINE RETRIEVES POINTER TO CSR ADDRESS
531 ;FROM THE FIFO QUEUE AND SERVICES THE LINE AT LEVEL 0
532
533 001034 017700 002006  TSERV:  MOV    BQPTR2,R0    ;GET POINTER FROM THE QUEUE
534 001040 062767 000002 002000  ADD    #2,QPTR2    ;UPDATE THE QUEUE POINTER
535 001046 022767 002770' 001772  CMP    #TQ-40,QPTR2 ;POINTER AT HIGH LIMIT
536 001054 001003          BNE    14          ;BR IF NOT
537 001056 012767 002730' 001762  MOV    #TQ,QPTR2   ;RESET THE POINTER
538 001064 012001          14:  MOV    (R0)+,R1    ;MOV CSR ADDRESS INTO R1
539 001066 011000          MOV    (R0),R0     ;MOV LINE # INTO R0
540 001070 105267 001741  INCB   TXCNT+1     ;COUNT TOTAL TX INTERRUPTS.
541 001074 105260 002670'  INCB   TCNT(R0)    ;COUNT THE INTERRUPT
542 001100 105711          TSTB   (R1)        ;XMTR READY FLAG ASSERTED?
543 001102 100017          BPL    44         ;BR IF NOT
544 001104 122767 000100 001722  CMPB   #64,,TXCNT  ;64 CHARACTERS TRANSMITTED?
545 001112 001427          BEQ    54         ;YES- BRANCH TO EXIT
546 001114 105260 002770'  INCB   XBUF(R0)    ;GENERATE NEXT DATA BYTE
547 001120 116061 002770' 000002  MOVB   XBUF(R0),2(R1) ;LOAD THE XMTR BUFFER
548 001126 105267 001702  INCB   TXCNT       ;UP TOTAL COUNT OF CHARS OUTPUT.
549 001132 105260 002710'  INCB   DCNT(R0)    ;COUNT CHARACTERS OUTPUT ON THIS LINE
550 001136 104400 000000'  EXIT4,BEGIN        ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.
551 001142 010167 176732  44:  MOV    R1,CSRA     ;SAVE CSR ADDRESS
552 001146 011167 176730  MOV    (R1),ACSR   ;SAVE CONTENTS OF THE CSR
553 001152 142711 000100  BICB   #100,(R1)  ;DISABLE XMTR INTERRUPT
554 001156 012767 000011 176722  MOV    #11,ERRTYP ;ILLEGAL INTERRUPT
555
    001164 104405 000000' 000000  ;*****
    MRDR4,BEGIN,NULL        ;XMTR FALSE INTERRUPT
    ;*****
556 001172          54:  EXIT4,BEGIN        ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.
    001172 104400 000000'
557
558 ;RECEIVER INTERRUPT SERVICE-ENTERED VIA APPROPRIATE JSR TABLE ENTRY
559 ;STORES PERTINENT INFORMATION IN THE RECEIVER STATUS TABLE THAT WILL
560 ;BE CHECKED IF 64. CHARACTERS HAVE BEEN RECEIVED

```

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

```

561
562 001176 010046          RINT:  MOV    R0,-(R6)      ;SAVE R0 AND R1 ON THE STACK
563 001200 010146          MOV    R1,-(R6)
564 001202 022767 000100 001626  CMP    #64.,RXCNT      ;64 CHAR'S RECEIVED?
565 001210 003422          BLE    1#              ;YES- BRANCH
566 001212 016700 001624  MOV    SVPTR,R0        ;NO- GET RCVR STATUS TABLE POINTER
567 001216 011501          MOV    (R5),R1        ;GET RCVR CSR ADDRESS
568 001220 011120          MOV    (R1),(R0).     ;SAVE THE RCSR CONTENTS
569 001222 106260 177777  ASRB   -1(R0)         ;SHIFT ERROR WORD
570 001226 156160 000003 177777  BISB  3(R1),-1(R0)    ;GET MORE ERROR STATUS
571 001234 116120 000002  MOVB  2(R), (R0).     ;SAVE THE RCVD DATA
572 001240 156160 000002 177775  BISB  2(R1),-3(R0)   ;REREAD CSR IN CASE ERROR SET BETWEEN THE
573                                     ;LAST TWO INSTRUCTIONS
574 001246 116520 000002  MOVB  2(R5),(R0).     ;SAVE THE LINE NUMBER
575 001252 010067 001564  MOV    R0,SVPTR       ;SAVE THE UPDATED STATUS TABLE POINTER
576 001256 016505 000002  1#:   MOV    2(R5),R5    ;GET LINE NO. INTO R5
577 001262 105255 002650' INCB  RCNT(R5)        ;COUNT THE INTERRUPT FROM THIS LINE
578 001266 005267 001544  INC   RXCNT           ;INCREMENT RX INTERRUPT TOTAL COUNT.
579 001272 012601 2#:   MOV    (R6)+,R1      ;RESTORE THE OTHER GUY'S REGISTER
580 001274 012600          MOV    (R6)+,R0
581 001276 012605          MOV    (R6)+,R5
582 001300 000002          RTI                    ;RETURN CONTROL BACK TO OTHER GUY
583
584                                     ;RECEIVER ERROR CHECKING AND CLEANUP ROUTINES
585
586                                     ;THIS ROUTINE DISABLES INTERRUPTS FROM ALL ACTIVE LINES
587
588 001302 016700 001664  ERRCHK: MOV  ACTDEV,R0 ;GET COUNT OF ACTIVE DEVICES
589 001306 116002 003152' 1#:   MOVB  DEVTAB(R0),R2 ;GET ACTIVE LINE NO.
590 001312 004767 000572  JSR   PC,GETADR      ;GO BUILD ADDRESS IN R3
591 001316 042713 000100  BIC   #100,(R3)     ;TURN OFF RECEIVER.
592 001322 042763 000100 000004  BIC   #100,4(R3)    ;TURN OFF TRANSMITTER.
593 001330 005300          DEC   R0             ;COUNT ONE GUY OFF
594 001332 100365          BPL   1#            ;BR TIL ALL OFF
595
596                                     ;THIS ROUTINE SCANS THROUGH THE 64 ENTRY RECEIVER STATUS TABLE
597                                     ;CHECKING FOR AND REPORTING ANY ERRORS
598
599 001334 026727 001476 000100  CHK1:  CMP    RXCNT,#64. ;MAKE SURE COUNT IS NO LARGER THAN TABLE
600 001342 003403          BLE    1#
601 001344 012767 000100 001464  MOV    #64.,RXCNT
602 001352 012701 002250' 1#:   MOV    #RSTAB,R1    ;GET STATUS TABLE POINTER
603 001356 005000          2#:   CLR    R0         ;INDICATE NO HARDWARE FAILURES YET.
604 001360 116102 000003  MOVB  3(R1),R2       ;GET LINE NO. INTO R2
605 001364 005711          TST   (R1)          ;ERROR SET?
606 001366 100047          BPL   5#            ;BRANCH IF NOT
607 001370 011104          MOV    (R1),R4      ;GET THE DEVICE STATUS INFORMATION
608 001372 004767 000602  JSR   PC,RCVERR     ;GO SETUP TO REPORT ERROR
609 001376 005067 176504  CLR   ERRTP
610 001402 006104          ROL   R4            ;PLACE THE OVERRUN BIT...
611 001404 006104          ROL   R4            ;...IN THE CARRY BIT
612 001406 103011          BCC   3#            ;IF NO ERROR, GO CHECK THE NEXT BIT
613 001410 012767 000021 176470  MOV    #21,ERRTP    ;OVERRUN ERROR
614                                     ;*****
614 001416 104406 000000' 000000  SOFER#,BEGIN,NULL ;OVERRUN ERROR
615 001424 104403 000000' 001706' MSGN#,BEGIN,OVERUN ;ASCII MESSAGE CALL WITH COMMON HEADER

```


DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

```

616 001432 006104          3$:  ROL    R4          ;PLACE THE FRAME BIT IN THE CARRY BIT      ;RG002
617 001434 103011          BCC    4$          ;IF NO ERROR, GO CHECK THE NEXT BIT      ;RG002
618 001436 012767 000022 176442  MOV    #22,ERRTYP ;FRAMING ERROR                          ;RG002
619          001444 104406 000000' 000000  ;*****
;SOFER$,BEGIN,NULL          ;FRAMING ERROR
;*****
620 001452 104403 000000' 001732'  MSGN$,BEGIN,FRAME ;ASCII MESSAGE CALL WITH COMMON HEADER
621 001460 006104          4$:  ROL    R4          ;CHECK FOR A PARITY ERROR                ;RG002
622 001462 103011          BCC    5$          ;IF NO ERROR, GO RESTORE THE REGISTERS  ;RG002
623 001464 012767 000023 176414  MOV    #23,ERRTYP ;PARITY ERROR                            ;RG002
624          001472 104406 000000' 000000  ;*****
;SOFER$,BEGIN,NULL          ;PARITY ERROR
;*****
625 001500 104403 000000' 001756'  MSGN$,BEGIN,PARITY ;ASCII MESSAGE CALL WITH COMMON HEADER
626 001506 105711          5$:  TSTB   (R1)        ;POINT TO LO BYTE OF CSR                ;RG002
627 001510 100410          BMI    6$          ;BR IF DONE WAS SET                    ;RG002
628 001512 004767 000462          JSR    PC,RCVERR   ;SETUP FOR ERROR REPORT
629 001516 012767 000011 176362  MOV    #11,ERRTYP ;ILLEGAL INTERRUPT
630          001524 104405 000000' 000000  ;*****
;HRDR$,BEGIN,NULL          ;RECEIVER FALSE INTERRUPT
;*****
631 001532 105262 003010'          6$:  INCB   RBUF(R2)    ;BUMP EXPECTED DATA                    ;RG002
632 001536 005700          TST    R0          ;HARDWARE ERRORS?
633 001540 001014          BNE    7$          ;DO NOT REPORT DATA ERRORS THEN.      ;RG002
634 001542 146762 001262 003010'  BICB   SIZE,RBUF(R2) ;MASK OFF BITS <7:5> TO CHECK ONLY
635 001550 146761 001254 000002  BICB   SIZE,2(R1)  ; SPECIFIED SIZE.
636 001556 126261 003010' 000002  CMPB   RBUF(R2),2(R1) ;DID RCVD DATA CHECK OK?
637 001564 001402          BEQ    7$          ;BR IF YES                              ;RG002
638 001566 004767 000334          JSR    PC,DATBAD   ;GO REPORT DATA ERROR
639 001572 022121          7$:  CMP    (R1)+,(R1)+ ;POINT R1 TO NEXT TABLE ENTRY        ;RG002
640 001574 005367 001236          DEC    RXCNT       ;ALL CHARS RECEIVED CHECKED?
641 001600 001266          BNE    2$          ;NO- GO CHECK NEXT ENTRY
642
643          ;THIS ROUTINE REPORTS ANY LINE RECEIVING AN INCORRECT NUMBER OF INTERRUPTS
644
645 001602 016701 001364          CKLINS: MOV    ACTDEV,R1 ;GET ACTIVE DEVICE COUNT
646 001606 116102 003152'          3$:  MOVB   DEVTAB(R1),R2 ;GET ACTIVE DEVICE LINE NO.
647 001612 126262 002650' 002710'  CMPB   RCNT(R2),DCNT(R2)
648          ;CORRECT NUMBER OF RECVR INTERRUPTS?
649 001620 001402          BEQ    4$          ;BR IF YES
650 001622 004767 000154          JSR    PC,BADR     ;GO REPORT BAD RCVR
651 001626 126262 002670' 002710'  4$:  CMPB   TCNT(R2),DCNT(R2)
652          ;CORRECT NUMBER OF XMTR INTERRUPTS?
653 001634 001402          BEQ    5$          ;BR IF YES
654 001636 004767 000202          JSR    PC,BADT     ;GO REPORT BAD XMTR
655 001642 005301          5$:  DEC    R1          ;COUNT ONE GUY CHECKED
656 001644 100360          BPL    3$          ;BR TIL ALL CHECKED
657 001646 000564          BR     ENPS        ;GO CHECK FOR END OF PASS
658
659          ;TABLE USED FOR DIFFERENT BAUD RATES
660
661 001650 001450          CNTTBL: 1450
662 001652 001140          1140
663 001654 000621          621
664 001656 000310          310
665 001660 000230          230
666 001662 000141          141

```

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

```

667 001664 000065          65
668 001666 000030          30
669 001670 000020          20
670 001672 000014          14
671 001674 000013          13
672 001676 000011          11
673 001700 000006          6
674 001702 000004          4
675 001704 000004          4 ;NOT A LEGAL SR1 SETTING
676
677 001706 001712'        OVERUN: M.OVER          ;RG002
678 001710 177777        -1                      ;RG002
679
680 001712 045 117 126 M.OVER: .ASCIZ /%OVERRUN ERROR%/ ;RG002
    001715 105 122 122
    001720 125 116 040
    001723 105 122 122
    001726 117 122 045
    001731 000
681
    .EVEN
682
683 001732 001736'        FRAME: M.FRAME          ;RG002
684 001734 177777        -1                      ;RG002
685
686 001736 045 106 122 M.FRAME: .ASCIZ /%FRAMING ERROR%/ ;RG002
    001741 101 115 111
    001744 116 107 040
    001747 105 122 122
    001752 117 122 045
    001755 000
687
    .EVEN
688
689 001756 001762'        PARITY: M.PAR          ;RG002
690 001760 177777        -1                      ;RG002
691
692 001762 045 120 101 M.PAR: .ASCIZ /%PARITY ERROR%/ ;RG002
    001765 122 111 124
    001770 131 040 105
    001773 122 122 117
    001776 122 045 000
693
    .EVEN
694
695
    ;ROUTINE TO REPORT BAD LINES (TOO MANY OR TOO FEW INTERRUPTS)
696
697 002002 004767 000102  BADR: JSR PC.GETADR ;GO BUILD CSR ADDRESS
698 002006 010367 176066  MOV R3,CSRA ;SAVE CSR ADDRESS
699 002012 116267 002710' 176062 MOVB DCNT(R2),ACSR ;CHARACTERS XMTD
700 002020 116267 002650' 176056 MOVB RCNT(R2),ASTAT ;# OF RCVR INTERRUPTS
701
702 002026 012767 000014 176052 MOV #14,ERRTYP ;WRONG # OF INTERRUPTS
703
    002034 104405 000000' 000000 ;*****
    ;HDRER#,BEGIN,NULL ;INCORRECT NUMBER OF RCVR INTERRUPTS
    ;*****
704
    ;NOTE THAT CSRC VALUE IS # OF CHARACTERS
705
    ;TRANSMITTED, AND STATC VALUE IS # OF
706
    ;RECEIVER INTERRUPTS
707

```

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

```

708 002042 000207          RTS      PC          ;RETURN TO CALLER
709
710 002044 004767 000040    BADT:   JSR      PC,GETADR    ;GO BUILD CSR ADDRESS
711 002050 022323          CMP      (R3)+,(R3)+    ;MAKE IT A XMTR CSR ADDRESS
712 002052 010367 176022    MOV      R3,CSRA        ;SAVE CSR ADDRESS
713 002056 116267 002710' 176016  MOVVB   DCNT(R2),ACSR    ;CHARACTERS XMITTED
714 002064 116267 002670' 176012  MOVVB   TCNT(R2),ASTAT  ;# OF XMTR INTERRUPTS
715
716 002072 012767 000014 176006  MOV      #14,ERRTYP     ;WRONG # OF INTERRUPTS
717          002100 104405 000000' 000000  HRDR$,BEGIN,NULL      ;INCORRECT NUMBER OF XMTR INTERRUPTS
;*****
;NOTE THAT CSRC VALUE IS # OF CHARACTERS
;TRANSMITTED, AND STATC VALUE IS # OF
;TRANSMITTER INTERRUPTS
718
719
720
721
722 002106 000207          RTS      PC          ;RETURN TO CALLER
723
724 002110 010203          GETADR: MOV      R2,R3        ;GET LINE NO.
725 002112 006303          ASL      R3            ;BUILD CSR ADDRESS
726 002114 006303          ASL      R3
727 002116 006303          ASL      R3
728 002120 066703 175662    ADD      ADDR,R3
729 002124 000207          RTS      PC          ;RETURN TO CALLER
730
731          ;ROUTINE TO REPORT RCVR DATA COMPARE ERRORS
732
733 002126 004767 177756    DATBAD: JSR      PC,GETADR    ;GO BUILD CSR ADDRESS
734 002132 010367 175742    MOV      R3,CSRA        ;SAVE CSR ADDRESS
735 002136 116167 000002 175744  MOVVB   2(R1),AMAS      ;SAVE BAD DATA
736 002144 005721          TST      (R1)+          ;GENERATE RCVR DATA ADDRESS
737 002146 010167 175732    MOV      R1,WASADR      ;SAVE ADDRESS OF BAD DATA
738 002152 005741          TST      -(R1)          ;RESET R1
739 002154 012705 003010'    MOV      #RBUF,R5       ;GENERATE ADDRESS OF GOOD DATA
740 002160 060205          ADD      R2,R5
741 002162 111567 175720    MOVVB   (R5),ASB        ;SAVE GOOD DATA
742 002166 010567 175710    MOV      R5,SBADR       ;SAVE ADDRESS OF GOOD DATA
743          ;*****
          DATER$,BEGIN      ;DATA ERROR!!!
;*****
744 002176 000207          RTS      PC          ;RETURN TO CALLER
745
746          ;ROUTINE TO SETUP FOR RECEIVER ERROR PRINTOUTS
747
748 002200 005200          RCVERR: INC      R0          ;INDICATE HARDWARE ERROR.
749 002202 004767 177702    JSR      PC,GETADR      ;GO BUILD CSR ADDRESS
750 002206 010367 175666    MOV      R3,CSRA        ;STUFF IT IN CSRA
751 002212 011167 175664    MOV      (R1),ACSR      ;GET CONTENTS IN ACSR
752 002216 000207          RTS      PC          ;RETURN TO CALLER
753
754          ;THIS ROUTINE CHECKS FOR AND REPORTS END OF PASS
755 002220          ENPS:  ENDIT$,BEGIN      ;SIGNAL END OF ITERATION.
          002220 104413 000000'    ;MONITOR SHALL TEST END OF PASS
756
757          ;THIS ROUTINE RESTARTS EACH 64 CHAR XFR SEQUENCE
758

```

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

```

759 002224 012700 003010' RESYNC: MOV @RBUF,R0 ;RESYNC DATA FOR NEXT PASS
760 002230 012701 002770' MOV @XBUF,R1
761 002234 112021 1$: MOV (R0)+,(R1)+
762 002236 022700 003030' CMP @RBUF+20,R0 ;DONE 16 BYTES?
763 002242 001374 BNE 1$ ;BR IF NOT
764 002244 000167 176316 JMP STUP1 ;RESUME.
765
766 ;TABLES AND BUFFERS
767
768 002250 RSTAB: .BLKW 128. ;128 WORD(64 ENTRIES)RCVR STATUS TABLE
769 002650 RCNT: .BLKW 8. ;RCVR INTERRUPT COUNTERS
770 002670 TCNT: .BLKW 8. ;XMTR INTERRUPT COUNTERS
771 002710 DCNT: .BLKW 8. ;CHARACTER COUNTERS
772
773 002730 TQ: .BLKW 16. ;16 WORD XMTR FIFO QUEUE
774
775 002770 XBUF: .BLKW 8. ;16 BYTE XMTR DATA BUFFERS
776 003010 RBUF: .BLKW 8. ;16 BYTE RCVR DATA BUFFERS
777
778 ;POINTERS, CONSTANTS, AND VARIABLES
779
780 003030 000000 SIZE: OPEN ;LOW BYTE IS MASK FOR VARIABLE 5-8 BIT COMPARE
781 003032 000000 COUNT: OPEN ;END OF PASS COUNTER
782 003034 000000 TXCNT: OPEN ;TX TOTAL INTERRUPTS COUNTER (HIGH BYTE).
783 ;TOTAL CHARACTERS TRANSMITTED (LOW BYTE)
784 003036 000000 RXCNT: OPEN ;RX TOTAL INTERRUPTS COUNTER.
785 003040 000000 CNTR: OPEN ;BREAK LOOP COUNTER
786 003042 000000 SVPTR: OPEN ;TEMP STORAGE FOR RSTAB POINTER
787 003044 000000 QPTR1: OPEN ;XMTR FIFO QUEUE POINTER - LOAD
788 003046 000000 QPTR2: OPEN ;XMTR FIFO QUEUE POINTER - UNLOAD
789
790
791 ;SUBROUTINE TO CLEAR DATA BUFFERS AT BEGINING OF EACH NEW PASS
792
793 003050 012700 002770' CLRBUF: MOV @XBUF,R0 ;SET UP R0 TO POINT TO BEGINING
794 003054 005020 1$: CLR (R0)+ ;CLEAR A WORD
795 003056 022700 003030' CMP @RBUF+20,R0 ;END OF RCVR BUFFER?
796 003062 001374 BNE 1$ ;BR TIL ALL CLEAR
797 003064 000207 RTS PC ;RETURN TO CALLER
798
799 ;SUBROUTINE TO CLEAR TABLES AND QUEUES
800
801 003066 012700 002250' CLRRTAB: MOV @RSTAB,R0 ;SET UP R0 TO POINT TO BEGINING
802 003072 005020 1$: CLR (R0)+ ;CLEAR A WORD
803 003074 022700 002770' CMP @TQ+40,R0 ;END?
804 003100 001374 BNE 1$ ;BR IF NOT
805 003102 000207 RTS PC ;RETURN TO CALLER
806
807 ;THIS ROUTINE SETS UP AN ACTIVE DEVICE TABLE TO REMEMBER HOW MANY
808 ;AND WHICH LINES WERE ACTIVE DURING TEST - IT IS USED DURING THE
809 ;ERROR CHECKING ROUTINES FOR VARIOUS PURPOSES
810
811 003104 005000 DTAB: CLR R0 ;SET UP R0 AS TOTAL LINE COUNTER
812 003106 005100 COM R0 ;INITIALLY SET TO MINUS ONE
813 003110 005001 CLR R1 ;SET UP R1 AS ACTIVE LINE COUNTER
814 003112 005101 COM R1 ;INITIALLY SET TO MINUS ONE
815 003114 016702 000054 MOV DVICE,R2 ;GET DEVICE SELECTION PARAMETER

```

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

```

816 003120 005200          1$:  INC      R0          ;COUNT ONE DEVICE
817 003122 022700 00002C    CMP      #20,R0       ;16 LINES CHECKED?
818 003126 001003          BNE      2$          ;BR IF NOT
819 003130 010167 000036    MOV      R1,ACTDEV    ;SAVE THE COUNT OF ACTIVE LINES
820 003134 000207          RTS      PC          ;RETURN TO CALLER
821 003136 006202          2$:  ASR      R2          ;SHIFT SELECT BIT INTO "C"
822 003140 103367          BCC      1$          ;BR IF NOT SELECTED
823 003142 005201          INC      R1          ;COUNT ACTIVE LINE
824 003144 110061 003152'  MOVB    R0,DEVTAB(R1) ;STORE ACTIVE LINE NO. IN THE TABLE
825 003150 000763          BR       1$          ;GO TEST NEXT LINE
826
827 003152          DEVTAB: .BLKW 8.      ;16 BYTE ACTIVE DEVICE TABLE
828 003172 000000          ACTDEV: OPEN        ;STORES COUNT OF NO. OF ACTIVE LINES MINUS ONE
829 003174 000000          DVICE: OPEN        ;DEVICE SELECTION INDICATOR
830
831          ;JSR LINK TABLE CONSISTING OF 32 JSR'S (16 RCVR AND 16 XMTR) THAT
832          ;LINK THE INTERRUPTS TO THE COMMON SERVICE ROUTINES
833
834 003176 004567 175774    JSRTAB: JSR      R5,RINT ;RECEIVER LINK FOR LINE 0
835 003202 000000          0              ;SET UP WITH RCVR CSR ADDRESS
836 003204 000000          0              ;LINE NUMBER
837 003206 004567 175562    JSR      R5,TINT      ;XMTR LINK FOR LINE 0
838 003212 000000          0              ;SET UP WITH XMTR CSR ADDRESS
839 003214 000000          0              ;LINE NUMBER
840 003216 004567 175754    JSR      R5,RINT      ;LINK FOR LINE 1
841 003222 000000          0
842 003224 000001          1
843 003226 004567 175542    JSR      R5,TINT      ;LINK FOR LINE 2
844 003232 000000          0
845 003234 000001          1
846 003236 004567 175734    JSR      R5,RINT      ;LINK FOR LINE 2
847 003242 000000          0
848 003244 000002          2
849 003246 004567 175522    JSR      R5,TINT      ;LINK FOR LINE 3
850 003252 000000          0
851 003254 000002          2
852 003256 004567 175714    JSR      R5,RINT      ;LINK FOR LINE 3
853 003262 000000          0
854 003264 000003          3
855 003266 004567 175502    JSR      R5,TINT      ;LINK FOR LINE 4
856 003272 000000          0
857 003274 000003          3
858 003276 004567 175674    JSR      R5,RINT      ;LINK FOR LINE 4
859 003302 000000          0
860 003304 000004          4
861 003306 004567 175462    JSR      R5,TINT      ;LINK FOR LINE 5
862 003312 000000          0
863 003314 000004          4
864 003316 004567 175654    JSR      R5,RINT      ;LINK FOR LINE 5
865 003322 000000          0
866 003324 000005          5
867 003326 004567 175442    JSR      R5,TINT      ;LINK FOR LINE 6
868 003332 000000          0
869 003334 000005          5
870 003336 004567 175634    JSR      R5,RINT      ;LINK FOR LINE 6
871 003342 000000          0
872 003344 000006          6

```

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

873	003346	004567	175422	JSR	R5,TINT	
874	003352	000000		0		
875	003354	000006		6		
876	003356	004567	175614	JSR	R5,RINT	;LINK FOR LINE 7
877	003362	000000		0		
878	003364	000007		7		
879	003366	004567	175402	JSR	R5,TINT	
880	003372	000000		0		
881	003374	000007		7		
882	003376	004567	175574	JSR	R5,RINT	;LINK FOR LINE 10
883	003402	000000		0		
884	003404	000010		10		
885	003406	004567	175362	JSR	R5,TINT	
886	003412	000000		0		
887	003414	000010		10		
888	003416	004567	175554	JSR	R5,RINT	;LINK FOR LINE 11
889	003422	000000		0		
890	003424	000011		11		
891	003426	004567	175342	JSR	R5,TINT	
892	003432	000000		0		
893	003434	000011		11		
894	003436	004567	175534	JSR	R5,RINT	;LINK FOR LINE 12
895	003442	000000		0		
896	003444	000012		12		
897	003446	004567	175322	JSR	R5,TINT	
898	003452	000000		0		
899	003454	000012		12		
900	003456	004567	175514	JSR	R5,RINT	;LINK FOR LINE 13
901	003462	000000		0		
902	003464	000013		13		
903	003466	004567	175302	JSR	R5,TINT	
904	003472	000000		0		
905	003474	000013		13		
906	003476	004567	175474	JSR	R5,RINT	;LINK FOR LINE 14
907	003502	000000		0		
908	003504	000014		14		
909	003506	004567	175262	JSR	R5,TINT	
910	003512	000000		0		
911	003514	000014		14		
912	003516	004567	175454	JSR	R5,RINT	;LINK FOR LINE 15
913	003522	000000		0		
914	003524	000015		15		
915	003526	004567	175242	JSR	R5,TINT	
916	003532	000000		0		
917	003534	000015		15		
918	003536	004567	175434	JSR	R5,RINT	;LINK FOR LINE 16
919	003542	000000		0		
920	003544	000016		16		
921	003546	004567	175222	JSR	R5,TINT	
922	003552	000000		0		
923	003554	000016		16		
924	003556	004567	175414	JSR	R5,RINT	;LINK FOR LINE 17
925	003562	000000		0		
926	003564	000017		17		
927	003566	004567	175202	JSR	R5,TINT	
928	003572	000000		0		
929	003574	000017		17		

J2

DEC/X11 SYSTEM EXERSIZER MACRO DEFINITION MODULE

930
931

000001

.END

SYMBOL TABLE

ACSR	000102R	CKLINS	001602R	INDPAR=	000040	PRTY0 =	000000	SIZE	003030R
ACTDEV	003172R	CLKPRE=	000001	INIT	000030R	PRTY1 =	000040	SOFCNT	000042R
ADDR	000006R	CLKSP\$=	104422	INTR	000120R	PRTY2 =	000100	SOFER\$=	104406
ADDR22=	001000	CLRBUF	003050R	JSRTAB	003176R	PRTY3 =	000140	SOFPAS	000046R
APTPRE=	000200	CLRTAB	003066R	KTPRES=	000400	PRTY4 =	000200	SPOINT	000032R
ASB	000106R	CNTR	003040R	KTXTND=	040000	PRTY5 =	000240	SPSIZ =	000040
ASTAT	000104R	CNTTBL	001650R	MAP22\$=	104416	PRTY6 =	000300	SR1	000016R
AUTO =	000010	CONFIG	000056R	MODNAM	000000R	PRTY7 =	000340	SR2	000020R
AWAS	000110R	COUNT	003032R	MODREV	000224R	PS =	177776	SR3	000022R
BADR	002002R	CSRA	000100R	MODSP	000224R	PSW =	177776	SR4	000024R
BADT	002044R	DATBAD	002126R	MSGN\$ =	104403	PUSH =	005746	START	000226R
BEGIN	000000R	DATCK\$=	104411	MSG\$ =	104402	PUSH2 =	024646	STAT	000026R
BIT0 =	000001	DATER\$=	104404	MSG\$ =	104401	PWRFLG=	000002	STUP1	000566R
BIT1 =	000002	DCNT	002710R	M.FRAME	001736R	QMON22=	000010	SVPTR	003042R
BIT10 =	002000	DEVTAB	003152R	M.OVER	001712R	QPTR1	003044R	SVR0	000062R
BIT11 =	004000	DTAB	003104R	M.PAR	001762R	QPTR2	003046R	SVR1	000064R
BIT12 =	010000	DVICE	003174R	NCPUOP=	000020	RAND\$ =	104417	SVR2	000066R
BIT13 =	020000	DVID1	000014R	NOPTY=	000002	RANNUM	000054R	SVR3	000070R
BIT14 =	040000	ECCMEM=	000100	NULL =	000000	RBUF	003010R	SVR4	000072R
BIT15 =	100000	ENDIT\$=	104413	OPEN =	000000	RCNT	002650R	SVR5	000074R
BIT2 =	000004	END\$ =	104410	OTOA\$ =	104420	RCVERR	002200R	SVR6	000076R
BIT3 =	000010	ENPS	002220R	OVERUN	001706R	REST	000562R	SYSCNT	000052R
BIT4 =	000020	ERRCHK	001302R	PARITY	001756R	RESTRT	000552R	TCNT	002670R
BIT5 =	000040	ERRTYP	000106R	PARPRE=	002000	RESYNC	002224R	TINT	000774R
BIT6 =	000100	EXIT\$ =	104400	PASCNT	000034R	RES1	000056R	TQ	002730R
BIT7 =	000200	FRAME	001732R	PDPF11=	000002	RES2	000060R	TRPDFD=	000023
BIT8 =	000400	GETADR	002110R	PDPLSI=	020000	RH70 =	001000	TSERV	001034R
BIT9 =	001000	GETPA\$=	104415	PDP44 =	100000	RINT	001176R	TXCNT	003034R
BREAK\$=	104407	GMBUF\$=	104414	PDP60 =	004000	RSTAB	002250R	USTACK=	000001
BR1	000012R	HRDCNT	000044R	PDP70 =	010000	RSTRT	000112R	VECTOR	000010R
BR2	000013R	HRDR\$=	104405	PIRQ\$ =	000004	RXCNT	003036R	WASADR	000104R
BTOD\$ =	104421	HRDPAS	000050R	POPSP =	005726	R6 =	0000006	WDFR	000116R
CAPRES=	000004	ICONT	000036R	POPSP2=	022626	R7 =	0000007	WDT0	000114R
CDATA\$=	104412	ICOUNT	000040R	PRHMS\$=	000002	SBADR	000102R	XBUF	002770R
CHK1	001334R	IDNUM	000122R	PRTY =	000000	SETCSR	000462R	XFLAG	000005R
CKHNG\$=	000001								

. ABS. 000000 000
003576 001
ERRORS DETECTED: 0

VIRTUAL MEMORY USED: 13133 WORDS (52 PAGES)
DYNAMIC MEMORY: 19748 WORDS (75 PAGES)
ELAPSED TIME: 00:00:56
DLA,DLA/CR/-SP=DDXCOM,DLA

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
ACSR	000102 R	#8-385 *9-552 *9-699 *9-713 *9-751
ACTDEV	003172 R	9-488 9-588 9-645 *9-819 #9-828
ADDR	000006 R	#8-385 9-454 9-728
ADDR22	= 001000	#8-385
APTPRE	= 000200	#8-385
ASB	000106 R	#8-385 *9-741
ASTAT	000104 R	#8-385 *9-700 *9-714
AUTO	= 000010	#8-385
AWAS	000110 R	#8-385 *9-735
BADR	002002 R	9-650 #9-697
BADT	002044 R	9-654 #9-710
BEGIN	000000 R	#8-385 9-457 9-504 9-504 9-528 9-550 9-555 9-556 9-614 9-615 9-619 9-620 9-624 9-625 9-630 9-703 9-717 9-743 9-755
BIT0	= 000001	#8-385
BIT1	= 000002	#8-385
BIT10	= 002000	#8-385
BIT11	= 004000	#8-385
BIT12	= 010000	#8-385
BIT13	= 020000	#8-385
BIT14	= 040000	#8-385
BIT15	= 100000	#8-385
BIT2	= 000004	#8-385
BIT3	= 000010	#8-385
BIT4	= 000020	#8-385
BIT5	= 000040	#8-385
BIT6	= 000100	#8-385
BIT7	= 000200	#8-385
BIT8	= 000400	#8-385
BIT9	= 001000	#8-385
BREAK#	= 104407	#8-385 9-504 9-504
BR1	000012 R	#8-385 9-437 9-441
BR2	000013 R	#8-385
BTOD#	= 104421	#8-385
CAPRES	= 000004	#8-385
CDATA#	= 104412	#8-385
CHK1	001334 R	#9-599
CKHNG#	= 000001	#8-385
CKLINS	001602 R	#9-645
CLKPRE	= 000001	#8-385
CLKSP#	= 104422	#8-385
CLRBUF	003050 R	9-480 #9-793
CLRTAB	003066 R	9-482 #9-801
CNTR	003040 R	*9-501 *9-511 #9-785
CNTTBL	001650 R	9-428 #9-661
CONFIG	000056 R	#8-385
COUNT	003032 R	#9-781
CSRA	000100 R	#8-385 *9-551 *9-698 *9-712 *9-734 *9-750
DATBAD	002126 R	9-638 #9-733
DATCK#	= 104411	#8-385
DATER#	= 104404	#8-385 9-743
DCNT	002710 R	*9-497 *9-549 9-647 9-651 9-699 9-713 #9-771

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
DEVTAB	003152 R	9-489 9-589 9-646 *9-824 #9-827
DTAB	003104 R	9-481 #9-811
DVICE	003174 R	*9-432 9-815 #9-829
DVID1	000014 R	#8-385 9-431 9-455
ECCMEM	= 000100	#8-385
ENDIT\$	= 104413	#8-385 9-755
END\$	= 104410	#8-385 9-457
ENPS	002220 R	9-657 #9-755
ERRCHK	001302 R	9-515 #9-588
ERRTYP	000106 R	#8-385 *9-554 *9-609 *9-613 *9-618 *9-623 *9-629 *9-702 *9-716
EXIT\$	= 104400	#8-385 9-550 9-556
FRAME	001732 R	9-620 #9-683
GETADR	002110 R	9-490 9-590 9-697 9-710 #9-724 9-733 9-749
GETPA\$	= 104415	#8-385
GWBUF\$	= 104414	#8-385
HRDCNT	000044 R	#8-385
HRDER\$	= 104405	#8-385 9-555 9-630 9-703 9-717
HRDPAS	000050 R	#8-385
ICONT	000036 R	#8-385 *9-426 *9-428
ICOUNT	000040 R	#8-385
IDNUM	000122 R	#8-385
INDPAR	= 000040	#8-385
INIT	000030 R	#8-385
INTR	000120 R	#8-385 *9-403
JSRTAB	003176 R	9-433 9-444 9-458 9-467 #9-834
KTPRES	= 000400	#8-385
KTXTND	= 040000	#8-385
MAP22\$	= 104416	#8-385
MODNAM	000000 R	#8-385
MODREV	000224 R	#8-394
MODSP	000224 R	8-385 #8-385
MSGN\$	= 104403	#8-385 9-615 9-620 9-625
MSG\$	= 104402	#8-385
MSG\$	= 104401	#8-385
M.FRAM	001736 R	9-683 #9-686
M.OVER	001712 R	9-677 #9-680
M.PAR	001762 R	9-689 #9-692
NCPUOP	= 000020	#8-385
NOPTY	= 000002	#8-385
NULL	= 000000	#8-385 9-555 9-614 9-619 9-624 9-630 9-703 9-717
OPEN	= 000000	8-385 8-385 8-385 8-385 8-385 8-385 8-385 8-385 8-385 8-385
		8-385 8-385 8-385 8-385 8-385 8-385 8-385 8-385 8-385 8-385
		8-385 8-385 #8-385 9-780 9-781 9-782 9-784 9-785 8-385
		9-787 9-788 9-828 9-829
OTOA\$	= 104420	#8-385
OVERUN	001706 R	9-615 #9-677
PARITY	001756 R	9-625 #9-689
PARPRE	= 002000	#8-385
PASCNT	000034 R	#8-385 9-478
PDPF11	= 000002	#8-385
PDPLSI	= 020000	#8-385
PDP44	= 100000	#8-385

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
PDP60	= 004000	#8-385
PDP70	= 010000	#8-385
PIRQ\$	= 000004	#8-385 9-528
POPSP	= 005726	#8-385
POPSP2	= 022626	#8-385
PRHMS\$	= 000002	#8-385
PRTY	= 000000	8-385 #8-385
PRTY0	= 000000	#8-385
PRTY1	= 000040	#8-385
PRTY2	= 000100	#8-385
PRTY3	= 000140	#8-385
PRTY4	= 000200	8-385 #8-385
PRTY5	= 000240	#8-385
PRTY6	= 000300	#8-385
PRTY7	= 000340	#8-385
PS	= 177776	#8-385
PSW	= 177776	#8-385
PUSH	= 005746	#8-385
PUSH2	= 024646	#8-385
PWRFLG	= 000002	#8-385
QMON22	= 000010	#8-385
QPTR1	003044 R	*9-486 9-522 *9-523 9-524 *9-526 #9-787
QPTR2	003046 R	*9-487 9-533 *9-534 9-535 *9-537 #9-788
RAND\$	= 104417	#8-385
RANNUM	000054 R	#8-385
RBUF	003010 R	*9-631 *9-634 9-636 9-739 9-759 9-762 #9-776 9-795
RCNT	002650 R	*9-577 9-647 9-700 #9-769
RCVERR	002200 R	9-608 9-628 #9-748
REST	000562 R	9-469 #9-480
RESTR	000552 R	8-385 #9-477
RESYNC	002224 R	#9-759
RES1	000056 R	#8-385
RES2	000060 R	#8-385
RH70	= 001000	#8-385
RINT	001176 R	#9-562 9-834 9-840 9-846 9-852 9-858 9-864 9-870 9-876
RSTAB	002250 R	9-882 9-888 9-894 9-900 9-906 9-912 9-918 9-924
RSTR	000112 R	9-485 9-602 #9-768 9-801
RXCNT	003036 R	#8-385 9-507 9-564 *9-578 9-599 *9-601 *9-640 #9-784
R6	=#000006	#8-385 *9-527 *9-562 *9-563 *9-579 *9-580 *9-581
R7	=#000007	#8-385
SBADR	000102 R	#8-385 *9-742
SETCSR	000462 R	9-446 #9-454
SIZE	003030 R	*9-412 9-634 9-635 #9-780
SOFcnt	000042 R	#8-385
SOFER\$	= 104406	#8-385 9-614 9-619 9-624
SFPAS	000046 R	#8-385
SPOINT	000032 R	#8-385
SPSIZ	= 000040	#1-29 8-385
SR1	000016 R	#8-385 9-404 9-414
SR2	000020 R	#8-385 9-422 9-424
SR3	000022 R	#8-385

SYMBOL CROSS REFERENCE

CREF V02

SYMBOL	VALUE	REFERENCES
SR4	000024 R	#8-385
STAF T	000226 R	8-385 #9-400 9-479
STAI	000026 R	#8-385
STUP1	000566 R	#9-481 9-764
SVPTR	003042 R	*9-485 9-566 *9-575 #9-786
SVRO	000062 R	#8-385
SVR1	000064 R	#8-385
SVR2	000066 R	#8-385
SVR3	000070 R	#8-385
SVR4	000072 R	#8-385
SVR5	000074 R	#8-385
SVR6	000076 R	#8-385
SYSCNT	000052 R	#8-385
TCNT	002670 R	*9-541 9-651 9-714 #9-770
TINT	000774 R	#9-522 9-837 9-843 9-849 9-855 9-861 9-867 9-873 9-879
TQ	002730 R	9-885 9-891 9-897 9-903 9-909 9-915 9-921 9-927
TRPDFD	* 000023	9-486 9-487 9-524 9-526 9-535 9-537 #9-773 9-803
		#8-385 8-385 8-385 #8-385 8-385 8-385 #8-385 8-385 8-385
		#8-385 8-385 8-385 #8-385 8-385 8-385 #8-385 8-385 8-385
		#8-385 8-385 8-385 #8-385 8-385 8-385 #8-385 8-385 8-385
		#8-385 8-385 8-385 #8-385 8-385 8-385 #8-385 8-385 8-385
		#8-385 8-385 8-385 #8-385 8-385 8-385 #8-385 8-385 8-385
		#8-385 8-385 8-385 #8-385 8-385 8-385 #8-385 8-385 8-385
		#8-385 8-385 8-385 #8-385 8-385 8-385 #8-385 8-385 8-385
		#8-385 8-385 8-385 #8-385 8-385 8-385 #8-385 8-385 8-385
		#8-385 8-385 8-385 #8-385 8-385 8-385 #8-385 8-385 8-385
		#8-385 8-385 8-385 #8-385 8-385 8-385 #8-385 8-385 8-385
		#8-385 8-385 8-385 #8-385 8-385 8-385 #8-385 8-385 8-385
		#8-385 8-385 8-385 #8-385 8-385 8-385 #8-385 8-385 8-385
TSERV	001034 R	9-528 #9-533
TXCNT	003034 R	*9-483 *9-496 9-505 *9-540 9-544 *9-548 #9-782
USTACK	* 000001	#8-385
VECTOR	000010 R	#8-385 9-430
WASADR	000104 R	#8-385 *9-737
WDFR	000116 R	#8-385 *9-402
WDTO	000114 R	#8-385 *9-401
XBUF	002770 R	*9-494 9-495 *9-546 9-547 9-760 #9-775 9-793
XFLAG	000005 R	#8-385

MACRO CROSS REFERENCE

CREF V02

MACRO NAME	REFERENCES									
BKMOD	01-125									
BREAK	01-223	9-504								
BTOD	01-247									
CKDATA	01-283									
CLKSP	01-150									
DATAACK	01-292									
DATERR	01-176	9-743								
DFSEVN	01-315	8-385	8-385	8-385	8-385	8-385	8-385	8-385	8-385	8-385
	8-385	8-385	8-385							
DSEVNT	01-325	8-385	8-385	8-385	8-385	8-385	8-385	8-385		
END	01-213	9-457								
ENDIT	01-204	9-755								
ENDMOD	01-209									
EQUATS	01-331	8-385								
EXIT	01-158	9-550	9-556							
GETPA	01-274									
GMBUFF	01-262									
HLFBRK	01-228									
HRDR	01-166	9-555	9-630	9-703	9-717					
IOMOD	01-121	8-385								
IOMODP	01-145									
IOMODR	01-141									
IOMODX	01-137									
MAP22	01-278									
MODULE	01-30	8-385								
MSG	01-192									
MSGN	01-196	9-615	9-620	9-625						
MSGS	01-200									
NBKMOD	01-133									
OTOA	01-233									
PIRQ	01-217	9-528								
RAND	01-162									
SBKMOD	01-129									
SOFER	01-182	9-614	9-619	9-624						