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.REM _
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IDENTIFICATION

PRODUCT CODE: AC-E851H-MC

PRODUCT NAME: CXDRBH0 DR11-B MODULE

PRODUCT DATE: SEPTEMBER 1978

MAINTAINER: DEC/X11 SUPPORT GROUP

1. ABSTRACT

DRB IS A IOMOD THAT EXERCISES ONE DR11-B. THE DEVICE IS EXERCISED USING THE MAINTENANCE MODE TO TRANSER A 16 WORD BUFFER.

2. REQUIREMENTS

HARDWARE: ONE DR11-B INTERFACE A M968 MAINTENANCE MODULE
STORAGE:: DRB REQUIRES:
1. DECIMAL WORDS: 205
2. OCTAL WORDS: 0315
3. OCTAL BYTES: 632

3. PASS DEFINITION

ONE PASS OF DRB CONSISTS OF TRANSFERRING ONE 16 WORD BLOCK OF DATA 77000(8) TIMES

4. EXECUTION TIME

ONE PASS OF DRB RUNNING ALONE ON A PDP11/05 PROCESSOR TAKES APPROXIMATELY TEN SECONDS.

5. CONFIGURATION REQUIREMENTS

DEFAULT PARAMETERS:

DEVADR: 172410, VECTOR: 124, BR1: 5, DEVCNT: 1

REQUIRED PARAMETERS:

NONE

6. DEVICE/OPTION SET-UP

INSTALL THE M-968 MAINTENANCE MODULE

7. MODULE OPERATION

TEST SEQUENCE:

A. SET UP VECTOR AND DEVICE REGISTERS
B. TRANSFER 16 WORDS IN MAINT. MODE
C. COMPARE DATA IN:OUT - REPORT ERRORS
D. REPEAT 77000 TIMES
E. SIGNAL END OF PASS, RESTART AT A.

SEQ 0003

IF DEVICE FAILS TO INTERRUPT NO END OF PASS PRINTOUT WILL
OCCUR.

8. OPERATION OPTIONS

NONE

9. NON STANDARD PRINTOUTS

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

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                        ;DR11-B DEC/X11 EXERCISER MODULE
000000'                 IOMOD   <DRBH >,172410,124,5,,,77000,56
000000'                 MODULE  140000,DRBH ,172410,124,5,,,77000,56
                        .TITLE  DRBH DEC/X11 SYSTEM EXERCISER MODULE
                ;       DDXCOM  VERSION  6      23-MAY-78
                                .LIST   BIN
                                ;*************************************************************************
000000'                         BEGIN:
000000' 051104  044102      040 MODNAM: .ASCII  /DRBH / ;MODULE NAME.
000005'     000                 XFLAG:  .BYTE   OPEN            ;USED TO KEEP TRACK OF WBUFF USAGE
000006' 172410                  ADDR:   172410+0                ;1ST DEVICE ADDR.
000010' 000124                  VECTOR: 124+0                   ;1ST DEVICE VECTOR.
000012'     240                 BR1:    .BYTE   PRTY5+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' 000224'                 INIT:   START                   ;MODULE START ADDR.
000032' 000224'                 SPOINT: MODSP                   ;MODULE STACK POINTER.
000034' 000000                  PASCNT: 0                       ;PASS COUNTER.
000036' 077000                  ICONT:  77000                   ;# OF ITERATIONS PER PASS=77000
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                  RANNUM: 0                       ;HOLDS RANDOM # WHEN RAND MACRO IS CALLED
000056'                         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'                         ERRTYP:                         ;TYPE OF ERROR
000106' 000000                  ASB:    OPEN                    ;EXPECTED DATA.
000110' 000000                  AWAS:   OPEN                    ;ACTUAL DATA.
000112' 000240'                 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' 000056                  IDNUM:  56                      ;MODULE IDENTIFICATION NUMBER=56
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                000040                  .REPT   SPSIZ           ;MODULE STACK STARTS HERE.
                                        .NLIST
                                        .WORD   0
                                        .LIST
                                        .ENDR
000224'                         MODSP:
                                ;*************************************************************************
                                ;THIS MODULE TESTS THE DR-11B DIRECT MEMORY ACCESS INTERFACE
                                ;MAINTENANCE MODULE M-968 TO BE USED WITH THIS TEST

                                ;INITIALIZATION FOR (DMA) DR-11B


000224' 012767  000001  177666  START:  MOV     #1,INTR         ;1 INTERRUPT PER ITERATION
000232' 012767  000016  177654          MOV     #16,WDTO        ;16 WORDS TO MEM PER ITERATION

000240'                         RESTRT:
000240' 104407  000000'                 BREAK$,BEGIN            ;TEMPORARY RETURN TO MONITOR....
000244' 104407  000000'                 BREAK$,BEGIN            ;THEN CONTINUE AT NEXT INSTRUCTION.
000250' 016705  177532                  MOV     ADDR,R5                 ;GET DEVICE ADDRESS
000254' 012725  177760                  MOV     #-20,(R5)+              ;SIXTEEN WORD TRANSFER
000260' 016700  177524                  MOV     VECTOR,R0               ;LOAD DEVICE VECTOR
000264' 012720  000420'                 MOV     #DRIR,(R0)+             ;SET VECTOR TO SERVICE ROUTINE
000270' 116720  177516                  MOVB    BR1,(R0)+               ;SET PRIORITY
000274' 012767  000572' 000256          MOV     #DR60F,VA               ;SETUP BUS ADDRESS
000302' 104415  000000' 000560'         GETPA$,BEGIN,VA                 ;GET PHYSICAL ADDRESS FROM 16-BIT VA
000310' 016725  000246                  MOV     PA,(R5)+                ;SET UP REAL ADDR.
000314' 005025                          CLR     (R5)+                   ;CLEAR THE CSR
000316' 012715  177777                  MOV     #-1,(R5)                ;SET UP DATA
000322' 056745  000236                  BIS     EA,-(R5)                ;SET EXTENDED MEM. BITS
000326' 005067  000234                  CLR     DONFLG                  ;CLEAR THE DEVICE COMPLETION FLAG
000332' 052715  010101                  BIS     #010101,(R5)            ;SETUP MAINTENANCE MODE
                                                                        ;ENABLE INTERRUPT AND GO
000336' 012767  000010  000224          MOV     #10,TMRCNT              ;SET UP TIMING LOOP
000344' 005004                  TIME:   CLR     R4                      ;SETUP TIMER COUNTER
000346'                         TIMER:
000346' 104407  000000'                 BREAK$,BEGIN            ;TEMPORARY RETURN TO MONITOR....
000352' 104407  000000'                 BREAK$,BEGIN            ;THEN CONTINUE AT NEXT INSTRUCTION.
000356' 005767  000204                  TST     DONFLG                  ;DID THE INTERRUPT OCCUR?
000362' 001012                          BNE     DONE                    ;IF YES CALL FOR END OF PASS
000364' 005304                          DEC     R4                      ;IF NO, COUNT SOME TIME. HAVE WE TIMED OUT?
000366' 001367                          BNE     TIMER                   ;IF NO, GO BREAK AGAIN
000370' 005367  000174                  DEC     TMRCNT                  ;DECREASE THE OVERALL COUNT
000374' 100364                          BPL     TIMER                   ;GO AGAIN IF MORE TIME
000376' 104403  000000' 000520'         MSGN$,BEGIN,HUNG        ;ASCII MESSAGE CALL WITH COMMON HEADER
000404' 104410  000000'                 END$,BEGIN              ;
000410'                         DONE:
000410' 104413  000000'                 ENDIT$,BEGIN            ;SIGNAL END OF ITERATION.
                                                                ;MONITOR SHALL TEST END OF PASS
000414' 000167  177620                  JMP     RESTRT                  ;ELSE DO IT AGAIN
                                        ;CHECK DATA TRANSFER


000420'                         DRIR:
                                ;-------------------------------------------------------------------
000420' 000004  000000' 000426'         PIRQ$,BEGIN,CHECK               ; QUEUE UP TO CONTINUE AT CHECK AND RTI
                                        ;-------------------------------------------------------------------
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                                ;
000426' 012701  000572'         CHECK:  MOV     #DRBUF,R1       ; GET THE BUFFER ADDRESS
000432' 012702  000010                  MOV     #8.,R2          ; LOAD THE COUNTER
000436' 022121                  1$:     CMP     (R1)+,(R1)+     ; ARE THE TWO SEQUENTIAL WORDS EQUAL ?
000440' 001003                          BNE     2$              ; NO, REPORT AN ERROR
000442' 005302                          DEC     R2              ; DONE THE WHOLE BUFFER ?
000444' 003374                          BGT     1$              ; NO, KEEP CHECKING
000446' 000416                          BR      GOOD            ; YES, CONTINUE
000450' 012767  000572' 177424  2$:     MOV     #DRBUF, SBADR           ;GOOD DATA ADDRESS
000456' 010567  177416                  MOV     R5,CSRA                 ;MOVE STATUS REG ADDRESS
000462' 012767  177777  177416          MOV     #-1,ASB                 ;"SHOULD BE"
000470' 014167  177414                  MOV     -(R1),AWAS              ;WAS
000474' 010167  177404                  MOV     R1,WASADR               ;BAD DATA ADDRESS
                                ;*****************************************************************
000500' 104404  000000'                 DATER$,BEGIN            ;DATA ERROR!!!
                                ;*****************************************************************
000504' 042715  000100          GOOD:   BIC     #100,   (R5)            ;CLEAR INTERRUPT ENABLE
000510' 005267  000052                  INC     DONFLG          ;SET THE COMPLETION FLAG
000514' 104400  000000'                 EXIT$,BEGIN                     ;EXIT TO MONITOR. MODULE WAIT FOR INTERRUPT.


000520' 000524'                 HUNG:   FAIL
000522' 177777                          177777
000524' 042504  044526  042503  FAIL:   .ASCIZ  "DEVICE FAILED TO INTERRUPT"
000532' 043040  044501  042514
000540' 020104  047524  044440
000546' 052116  051105  052522
000554' 052120     000
                000560'                 .EVEN

000560' 000000                  VA:     OPEN                            ;MODULE REF. TAG
000562' 000000                  PA:     OPEN                            ;REAL ADDRESS
000564' 000000                  EA:     OPEN                            ;EX. MEM. ADDR.
000566' 000000                  DONFLG: OPEN                            ;DEVICE COMPLETION FLAG
000570' 000000                  TMRCNT: OPEN
000572' 000020                  DRBUF:  .BLKW 20
                000001                  .END
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ACSR    000102R          163#
ADDR    000006R          129#    193
ADDR22= 001000           181#
ASB     000106R          167#    240*
ASTAT   000104R          165#
AWAS    000110R          168#    241*
BEGIN   000000R          126#    191     192     199     210     211     218     219     221     228     244     248
BIT0  = 000001           181#
BIT1  = 000002           181#
BIT10 = 002000           181#
BIT11 = 004000           181#
BIT12 = 010000           181#
BIT13 = 020000           181#
BIT14 = 040000           181#
BIT15 = 100000           181#
BIT2  = 000004           181#
BIT3  = 000010           181#
BIT4  = 000020           181#
BIT5  = 000040           181#
BIT6  = 000100           181#
BIT7  = 000200           181#
BIT8  = 000400           181#
BIT9  = 001000           181#
BREAK$= 104407           181#    191     192     210     211
BR1     000012R          131#    197
BR2     000013R          132#
BTOD$ = 104421           181#
CDATA$= 104412           181#
CHECK   000426R          228     231#
CONFIG  000056R          151#
CSRA    000100R          161#    239*
DATCK$= 104411           181#
DATER$= 104404           181#    244
DONE    000410R          213     220#
DONFLG  000566R          204*    212     247*    264#
DRBUF   000572R          198     231     238     266#
DRIR    000420R          196     226#
DVID1   000014R          133#
EA      000564R          203     263#
ENDIT$= 104413           181#    221
END$  = 104410           181#    219
ERRTYP  000106R          166#
EXIT$ = 104400           181#    248
FAIL    000524R          252     254#
GETPA$= 104415           181#    199
GOOD    000504R          237     246#
GWBUF$= 104414           181#
HRDCNT  000044R          146#
HRDER$= 104405           181#
HRDPAS  000050R          148#
HUNG    000520R          218     252#
ICONT   000036R          143#
ICOUNT  000040R          144#
IDNUM   000122R          173#
INIT    000030R          140#
INTR    000120R          172#    187*
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```
MAP22$=  104416                 181#
MODNAM   000000R                127#
MODSP    000224R                141#    179#
MSGN$  = 104403                 181#    218
MSGS$  = 104402                 181#
MSG$   = 104401                 181#
NULL   = 000000                 181#
OPEN   = 000000                 128#    134     135     136     137     154     155     156     157     158     159     160     161
                                163     165     167     168     170     171     172     181#    261     262     263     264     265
OTOA$  = 104420                 181#
PA       000562R                200     262#
PASCNT   000034R                142#
PIRQ$  = 000004                 181#    228
POPSP  = 005726                 181#
POPSP2=  022626                 181#
PRTY   = 000000                 132     181#
PRTY0  = 000000                 181#
PRTY1  = 000040                 181#
PRTY2  = 000100                 181#
PRTY3  = 000140                 181#
PRTY4  = 000200                 181#
PRTY5  = 000240                 131     181#
PRTY6  = 000300                 181#
PRTY7  = 000340                 181#
PS     = 177776                 181#
PSW    = 177776                 181#
PUSH   = 005746                 181#
PUSH2  = 024646                 181#
RAND$  = 104417                 181#
RANNUM   000054R                150#
RESTRT   000240R                169#    190#    223
RES1     000056R                152#
RES2     000060R                153#
RSTRT    000112R                169#
SBADR    000102R                162#    238*
SOFCNT   000042R                145#
SOFERS=  104406                 181#
SOFPAS   000046R                147#
SPOINT   000032R                141#
SPSIZ  = 000040                   1#    174
SR1      000016R                134#
SR2      000020R                135#
SR3      000022R                136#
SR4      000024R                137#
START    000224R                140     187#
STAT     000026R                139#
SVR0     000062R                154#
SVR1     000064R                155#
SVR2     000066R                156#
SVR3     000070R                157#
SVR4     000072R                158#
SVR5     000074R                159#
SVR6     000076R                160#
SYSCNT   000052R                149#
TIME     000344R                208#
TIMER    000346R                209#    215     217
```



```
TMRCNT   000570R                207*    216*    265#
TRPDFD=  000022                 181#
VA       000560R                198*    199     261#
VECTOR   000010R                130#    195
WASADR   000104R                164#    242*
WDFR     000116R                171#
WDTO     000114R                170#    188*
XFLAG    000005R                128#
.      = 000632R                259#    266#

. ABS.  000000      000
        000632      001

 ERROPS DETECTED:  0
 DEFAULT GLOBALS GENERATED:  0

 XDRBH0,XDRBH0/SOL/CRF:SYM=DDXCOM,XDRBH0
 RUN-TIME:  1  1  .2 SECONDS
 RUN-TIME RATIO: 9/2=3.3
 CORE USED:  7K  (13 PAGES)
```