

.REM 1

IDENTIFICATION

PRODUCT CODE: AC-E845I-MC
PRODUCT NAME: CXDMBIO DM11-BB 16-LNE MO
PRODUCT DATE: SEPTEMBER 1978
MAINTAINER: DEC/X11 SUPPORT GROUP

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1. ABSTRACT

DMB IS AN I/O MODULE THAT EXERCISES UP TO 4 DM11-BB'S.
IT UTILIZES MAINTENANCE MODE AND SCAN ENABLE TO FULLY TEST THE SCAN LOGIC.

2. REQUIREMENTS

HARDWARE: ONE TO FOUR DM11-BB'S

STORAGE:: DMB REQUIRES:

1. DECIMAL WORDS: 324
2. OCTAL WORDS: 0504
3. OCTAL BYTES: 1211

NOTE : ALL NECESSARY CABLES AND TURN-AROUND
CONNECTORS MUST BE INSTALLED.

3. PASS DEFINITION

ONE PASS IS COMPLETED WHEN THE TEST SEQUENCE HAS BEEN RUN ON
16 LINES IN EACH OF THE DM11-BB'S 1000(10) TIMES.

4. EXECUTION TIME

RUNNING ALONE WITH ONLY ONE DM11-BB ON A PDP 11/05 TAKES APPROXIMATELY
ONE-HALF MINUTE PER PASS.

5. CONFIGURATION REQUIREMENTS

A. DEFAULT PARAMETERS:

DEVADR: 1, VCT: 1, BR1: 4, DVID1: 1

B. REQUIRED PARAMETERS:

DEVADR: ADDRESS OF THE FIRST DM11-BB FOR THIS MODULE

VECTOR: THE VECTOR ADDRESS OF THE FIRST DM11-BB IN THIS MODULE.

(NOTE: A MAX. OF 4 DM11-BB CAN BE FITTED INTO ONE
MODULE. IF YOU HAVE, FOR EXAMPLE, 8 DM11-BB'S,
YOU HAVE TO RUN 2 MODULES. THE VECTOR FOR
THE SECOND MODULE IS THE VECTOR ADDRESS OF THE
5TH DM11-BB.)

DVID1: IF MORE THAN 1 DM11-BB IS TO BE RUN, DVID1 MUST BE
SET UP ACCORDINGLY.

DMBI DEC/X11 SYSTEM EXERCISER MODULE
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SR1: = 0 DISPLACEMENT BETWEEN ADJACENT VECTORS IS TWO WORDS.
= 1 DISPLACEMENT BETWEEN ADJACENT VECTORS IS EIGHT WORDS. (2040 FRONT END)
= 2 DISPLACEMENT BETWEEN ADJACENT DEVICE ADDRESSES IS 16. WORDS. (DV11 SYSTEM)

6. DEVICE/OPTION SETUP

MAKE SURE ALL CABLES AND TURN-AROUND CONNECTORS ARE INSTALLED.

7. MODULE OPERATION

- A. TEST FOR THE NUMBER OF DM11-BB'S REQUIRED TO BE TESTED.
- B. SET UP INTERRUPT SERVICE VECTORS.
- C. ENABLE ALL LINES ON ONE DM11-BB.
- D. SET INTERRUPT ENABLE AND MAINTENANCE MODE.
- E. ENABLE SCANNER TO SCAN ALL 16 LINES.
- F. AN INTERRUPT WILL OCCUR FOR THE FIRST LINE. CHECK THE
THE CONTENTS OF THE CSR. IF OK, ENABLE SCANNER TO CAUSE
THE NEXT LINE TO INTERRUPT. REPEAT FOR ALL 16 LINES.
- G. REPEAT STEPS C THRU F FOR THE OTHER DM11-BB'S.
- H. REPEAT THE SEQUENCE C THRU G 1000(10) TIMES, THEN
DO AN ENDPAS CALL.

8. OPERATOR OPTIONS

NONE

9. NON-STANDARD PRINTOUTS

NONE


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205 ;DEFINITIONS
206 CLRMUX=002000 ;CLEAR MULTIPLEXER
207 CLRSCN=004000 ;CLEAR SCAN CIRCUIT
208 STEP=000400 ;STEP COMMAND FOR SCANNER
209 BUSY=20 ;BUSY FLAG FOR DM11-BB
210 INTENA=001000 ;INTERRUPT ENABLE
211 SCNA=40 ;ENABLE SCANNER
212 DONE=200 ;DONE FLAG
213
214
215 000224 012767 000020 177666 START: MOV #16,,INTR ;16 INTERRUPTS PER ITERATION
216 000233 016700 177556 MOV DVID1,R0 ;SAVE DVC
217 000236 001002 BNF IS ;BR IF ANY DEVS SELECTED
218 000240 104410 ENDS,BEGIN
219 000244 005260 1S: ASR R0 ;GET RID OF FIRST DEV
220 000246 103376 BCC IS ;LOOP TILL DONE
221 000250 006200 ASR R0 ;START SEARCH FOR NEXT DEV
222 000253 103003 BCC 3S ;NCT HERE- CHECK FOR MORE
223 000257 005700 ADD #16,,INTR ;DOUBLE INTR
224 000262 005700 TST R0 ;ANY MORE DEVS
225 000264 001371 BNE 2S ;BR IF YES
226 000266 016767 177522 RESTRT: MOV DVID1,SW-DMBR ;SAVE DVID1
227 000274 016700 177514 MOV DVID1,#0 ;SEE HOW MANY UNITS NEEDED TO BE TESTED
228 000300 012707 177074 1S: MOV #4,R1 ;SET UP MAX COUNT FOR GMLIB
229 000304 012707 001056 MOV #SRTAB,R2 ;R2 HAS THE LINK TABLE ADDRESS
230 000310 032767 000002 BIT #BIT,SRI ;16 MOPD DEV ADP DISPLACEMENT?
231 000316 001402 BEQ 2S ;BR IF NCT
232 000320 012702 001106 MOV #SRTRB,R2 ;R2 GETS NEW LINK TABLE ADDR
233 000324 016700 177460 MOV VECTOR,R3 ;R3 HAS THE 1ST VECTOR
234 000330 011203 177450 MOV #2,(R3)+ ;SET UP VECTOR LINKAGE
235 000332 062702 000006 ADD #2 ;UPDATE LINK TABLE ADDRESS
236 000336 116723 177450 MOV#B BR1,(R3)+ ;SET UP BR LEVEL
237 000342 105723 000001 TSTB (R3) ;UPDATE THE POINTFR
238 000344 032712 BIT #BIT,SP1 ;EIGHT WORDS BETWEEN VECTORS?
239 000352 001402 BCC 4S ;BR IF NCT
240 000354 062703 000014 ADD #14,R3 ;UPDATE VECTOR POINTER
241 000360 006000 ROR #0 ;SELECTING NEXT DEVICE?
242 000362 001404 BEQ LOOP ;NO- GO TO TEST SEQUENCE
243 000364 005201 INC #2 ;HAVE WE SET UP MORE THAN 4?
244 000366 100760 BMT 1S ;BR IF NCT
245 000370 104410 000000 ENDS,REGIN ;DVID1 INCORRECT
246
247 000374 016702 177406 LOOP: MOV ADDR,R2 ;R2 HAS THE ADDRESS OF THE 1ST CSR
248 000400 036767 000001 MOV #1,MARK ;MARK INDICATES UNIT UNDER TEST
249 000406 036767 000524 DMBTOP: BIT MARK,SW-DMBR ;THIS DM11-BB SELECTED?
250 000414 001573 BEQ DMBBOT ;BR IF NO
251 000416 012712 006000 MOV #CLPMUX+CLRSCN,(R2) ;CLEAR MULTIPLEXER AND SCAN LOGIC
252 000422 005004 CLR R4
253 000424 001417 1S: BIT #BUSY,(R2) ;CLEAR ALL MULTIPLEXER FLIP FLOPS?
254 000430 001417 BEQ 1S ;YES- CONTINUE
255 000432 104407 000000 BREAKS,REGIN ;TEMPORARY RETURN TO MONITOR....
256 000436 104407 000000 BREAKS,BEGIN ;THEN CONTINUE AT NEXT INSTRUCTION.
257 000442 005304 DEC P4 ;COUNT TO TIMEOUT IF HUNG
258 000444 004767 BNE JSR ;LOOP
259 000446 004767 JSR PC,ERR ;NO INTERRUPT OCCURRED
260 000452 012767 000016 MOV #16,ERRTYP ;BUSY WILL NOT CLEAR
    
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261 ;*****
262 000460 104405 000000 000000 HDRS,BEGIN,NULL ;BUSY NEVER CLEARED
263 ;*****
264 000466 000526 000020 2S: BR DROP
265 000470 012700 000020 MOV #16,,R0 ;R0 HAS THE MAX # OF LINES
266 000474 005012 CLR R0 ;CLEAR CSR
267
268 ;ENABLE ALL LINES
269 000476 012762 000001 000002 SCNTIA: MOV #12,(R2) ;SET LINE ENABLE FLIP FLOP
270 000510 005300 DEC #STEP,(R2) ;GO TO NEXT LINE
271 000512 001371 BNE SCNTIA ;DEC LINE COUNTER
272 000514 012767 171340 000330 MOV #171340,PATTN ;LAST LINE? BRANCH BACK IF NOT
273 000516 012767 000020 000324 MOV #16,,LINE ;SET UP EXPECTED CSR COUNTS
274 000518 052712 000040 MOV #MAINT+INTENA+17,(R2) ;SETUP #0 TO HAVE MAX. #OF LINES
275 000520 005067 000040 SCNTIB: BLS #RMA,(R2) ;SET INTERRUPT ENABLF AND MAINTENANCE WORD
276 000524 005067 CLR BRKCNT ;SETUP WATCHDOG TIMER
277
278 1S:
279 000544 104407 000000 BREAKS,REGIN ;TEMPORARY RETURN TO MONITOR....
280 000550 104407 000000 BREAKS,BEGIN ;THEN CONTINUE AT NEXT INSTRUCTION.
281 000554 005767 000366 TST INTFLG ;INT OCCURRED?
282 000560 001023 BNE DMSEV ;YES- GO SERVICE
283 000562 005367 000356 DEC BRKCNT ;NO- TIMEOUT?
284 000566 001366 BNE 1S ;NO- CONTINUE TIMING
285 000570 004767 JSR PC,ERR ;SETUP FOR BRKCR PRINTOUT
286 000574 012767 000003 177304 MOV #,ERRTYP ;NO INTERRUPT OCCURRED
287 ;*****
288 000602 104405 000000 000000 HDRS,BEGIN,NULL ;NO INTERRUPT OCCURRED
289 ;*****
290 000610 000455 BR DROP
291
292 ;ENTER HERE ON DM11-BB INTERRUPT
293 000612 011567 000322 DMINT: MOV (R5),UNIT ;STORE UNIT OFFSET
294 000616 012609 MOV (SP),R5 ;RESTORE R5
295 000620 012767 177777 000320 MOV #1,INTFLG ;INDICATE INTERRUPT OCCURRED
296 000626 000002 RTI
297
298 ;DM11-BB DEFERRED SERVICING
299 000630 005067 000312 000276 DMSEV: CLR INTFLG
300 000634 066767 177146 ADD ADDR,UNIT ;SETUP DM11BP CSR ADDRESS
301 000642 020267 000272 CMP R5,UNIT
302 000646 001411 BEQ 1S
303 000650 004767 000274 JSR PC,ERR
304 000654 012767 000015 177224 MOV #15,ERRTYP ;WRONG VECTOR ADDRESS
305 ;*****
306 000662 104405 000000 000000 HDRS,BEGIN,NULL ;DM11-BB INTERRUPTED TO WRONG ADDRESS
307 ;*****
308 1S: BR DROP
309 000674 105712 000246 TSTB (R2) ;IS DONE BIT SET?
310 000676 004767 000246 BNE JSR ;YES- BRANCH
311 000678 004767 000011 177176 JSR PC,ERR ;INTERUPT WITH DDMF NCT SET
312 000702 012767 000011 177176 MOV #1,ERRTYP ;ILLEGAL INTERRUPT
313 ;*****
314 000710 104405 000000 000000 HDRS,BEGIN,NULL ;INTERRUPT WITH DONE NOT SET
315 ;*****
316 000716 000412 BR DROP
    
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317 000720* 021267 000126 2S: CMP (R2),PATTEN ;CSR HAS THE EXPECTED CONTENTS?
318 000724* 001420 BEQ SCN16
319 000726* 004767 000216 JSR R7,ERR ;SETUP FOR ERROR REPORT
320 000732* 005067 177150 CLR ERR,TYP ;UNKNOWN ERROR
321 000736* 104405 000000* 000000 HDRERS,BEGIN,MULL ;CSR CONTENTS INCORRECT
322 000744* 000000* 000000* DROP: MSGMS,BEGIN,DROPH ;ASCII MESSAGE CALL WITH COMMON HEADER
323 000748* 104403 000000* 001170* BIC MARK,SW.DMBB ;DROP THIS DEVICE
324 000752* 045767 000160 000162 BNE DMBBOT ;GO TO INITIATE ANOTHER DM11-BP
325 000760* 001011 000000* ENDS,BEGIN ;ALL UNITS HAVE BEEN DROPPED
326 000762* 104410 000000*
327 000766* 042712 000240 SCN1D: BIC %SCNENA+DONE,(R2) ;CLEAR SCAN ENABLE AND DONE
328 000772* 005267 000054 INC PATTEN ;UPDATE EXPECTED RESULT- THE LAST
329 000776* 005367 000052 DEC LINE ;FOUR BITS OF THE CSR CONTAIN THE LINE #
330 001002* 001011 000010 DMBBOT: BNE SCNT1C ;COUNT 16 LINES
331 001004* 062702 000010 ADD #10,R2 ;FORM NEW CSR ADDRESS
332 001010* 032767 000002 177000 BIT #11,SR1 ;16 WORDS BETWEEN DMP'S ?
333 001016* 001402 BEQ #5 ;NO, CONTINUE
334 001020* 062702 000030 ADD #30,R2 ;YES, FORM THE PROPR ADDRESS
335 001024* 006367 000106 1S: ASL MARK ;LAST DM11-BB ?
336 001030* 103006 BCC SCNT1D ;BB IF NOT
337 001032* 104413 000000* ENDTIS,BEGIN ;SIGNAL END OF ITERATION.
338 001036* 000167 177332 2S: JMP LOOP ;PCNITD SHALL TEST END OF PASS
339
340 001042* 000167 177466 SCNT1C: JMP SCNT1B
341 001046* 000167 177334 SCNT1D: JMP DMBTOP
342
343 001052* 000000 PATTEN: 0
344 001054* 000000 LINE: 0
345
346 ;JSR LINKAGE TABLE TO LINK DEVICE INTRTS TO REGISTER OFFSETS
347 JSRTAB: JSR R5,DMBINTP ;1ST DM11-BB ISR ROUTINE
348 0 ;
349 JSR R5,DMBINTR ;2ND DM11-BB ISR ROUTINE
350 10 ;
351 JSR R5,DMBINTR ;3RD DM11-BB ISR ROUTINE
352 20 ;
353 JSR R5,DMBINTR ;4TH DM11-BB ISR ROUTINE
354 30 ;
355 ;THIS TABLE USED WHEN ADDR DISPLACEMENT IS 16. WORDS
356 JSRTBA: JSR R5,DMBINTP ;1ST DM11-BB ISR ROUTINE
357 0 ;
358 JSR R5,DMBINTR ;2ND DM11-BB ISR ROUTINE
359 40 ;
360 JSR R5,DMBINTR ;3RD DM11-BB ISR ROUTINE
361 50 ;
362 JSR R5,DMBINTR ;4TH DM11-BB ISR ROUTINE
363 140 ;
364
365 001106* 004567 177530
366 001062* 000000
367 001064* 004567 177522
368 001070* 000010
369 001072* 004567 177514
370 001076* 000020
371 001100* 004567 177506
372 001104* 000030
373
374 001106* 004567 177500
375 001112* 000000
376 001114* 004567 177472
377 001120* 000040
378 001122* 004567 177464
379 001126* 000100
380 001130* 004567 177456
381 001134* 000140
382

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373 ;VARIABLES
374 MARK: 0
375 001140* 000000 UNIT: 0 ;STORES OFFSFT OF UNIT THAT INTERRUPTED
376 001142* 000000 SW.DMBB: 0 ;WATCHDOG TIMER COUNTER
377 001144* 000000 BRKWT: 0 ;INDICATES INTERRUPT OCCURRED
378 001146* 000000 INTFLG: 0
379
380 ;ERROR REPORTING ROUTINE
381 ERR: MOV R2,CSRA
382 001154* 011267 176724 MOV R2,ACSR ;SET UP CONTENTS OF CSR TO BE PRINTED
383 001160* 016267 000002 176716 MOV (R2),ASTAT ;STATUS OF LINE REGISTER
384 001166* 000207 RTS PC
385
386 001170* 001174* 177777 DROPH: -WORD DROPHS,-1
387 001174* 047125 052111 042040 DROPHS: -ASCIZ /UNIT DROPPED/
388 001202* 047522 050120 042105
389 001210* 000
390 000001 .END

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SOPPAS	000046R	171#			
SPDINT	000032R	165#			
SPSIZ =	000040	1#	198		
SR1	000016R	158#	230	238	336
SR2	000020R	159#			
SR3	000022R	160#			
SR4	000024R	161#			
START	000224R	164	215#		
STAT	000026R	163#			
STEP =	000400	208#	270		
SVR0	000062R	178#			
SVR1	000064R	179#			
SVR2	000066R	180#			
SVR3	000070R	181#			
SVR4	000072R	182#			
SVR5	000074R	183#			
SVR6	000076R	184#			
SW.DMB	001142R	226#	249	326*	376#
SYSCNT	000052R	173#			
TRPDPD=	000027	205#			
UNIT	001140R	293#	300*	301	375#
VECTOR	000010R	154#	233		
WASADR	000104R	188#			
WDFR	000116R	195#			
WDTO	000114R	194#			
XFLAG	000005R	152#			

. ABS. 000000 000
001211 001

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0
XDMBIO,XDMBIO/SOL/CRF:SYM=DDXCOM,XDMBIO
RUN-TIME: 1 1 .3 SECONDS
RUN-TIME RATIO: 10/3=3.1
CORE USED: 7K (13 PAGES)