

-REM -

IDENTIFICATION

PRODUCT CODE: AC-F053B-MC
PRODUCT NAME: CX8MERO BM873-YF MODULE
PRODUCT DATE: SEPTEMBER 1978
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) 1976,1978 DIGITAL EQUIPMENT CORPORATION

1.0 ABSTRACT

BME IS A BACKGROUND MODULE THAT EXERCISES A SINGLE BM873-YF BOOTSTRAP ROM OPTION. IT COMPARES THE CONTENTS OF EACH OF THE 256(10) LOCATIONS STORED IN THE ROM WITH THE CONTENTS OF A 256(10) WORD CORE MEMORY BUFFER TO VERIFY THAT EACH LOCATION IN THE ROM CAN BE UNIQUELY ADDRESSED AND CONTAINS THE CORRECT DATA. ALL ERRORS ARE REPORTED VIA THE CONSOLE DEVICE.

2.0 REQUIREMENTS

HARDWARE: A PDP11 COMPUTER WITH A BM873-YF OPTION
STORAGE:: BME REQUIRES:
1. DECIMAL WORDS: 368
2. OCTAL WORDS: 0560
3. OCTAL BYTES: 1340

3.0 PASS DEFINITION

THE INITIAL PASS CONSISTS OF EXECUTING THE BASIC TEST SEQUENCE ONE TIME BEFORE REPORTING END OF PASS. SUBSEQUENT PASSES OF THE BM873-YF MODULE CONSISTS OF 100(8) ITERATIONS OF THE BASIC TEST SEQUENCE DESCRIBED IN PARA. 7 BELOW.

4.0 EXECUTION TIME

PASS TIME VARIES DEPENDENT UPON CPU TYPE AND THE CONFIGURATION BEING EXERCISED. WHEN RUNNING ALONE ON A PDP11/40 THE FIRST PASS SHOULD TAKE LESS THAN 10 SECONDS AND SUBSEQUENT PASSES LESS THAN ONE MINUTE.

5.0 CONFIGURATION OPTIONS

DEFAULT PARAMETERS:
DVA: 173000
REQUIRED PARAMETERS:
NONE

6.0 DEVICE OPTION SETUP

NONE REQUIRED

7.0 MODULE OPERATION

TEST SEQUENCE:

1. R1 IS SET UP TO POINT TO THE FIRST WORD IN THE ROM
2. R2 IS SET UP TO POINT TO THE CORRESPONDING WORD IN THE CORE MEMORY BUFFER.

THE ADDRESS IN R1 IS CHECKED FOR EQUALITY TO EITHER 173024 OR 173224 AND IF FOUND EQUAL GOES TO STEP (5) - IF NOT IT PROCEEDS WITH STEP (3). THESE TWO ADDRESSES ARE NOT CHECKED BECAUSE THEIR CONTENTS AS READ ON THE BUS WILL VARY DEPENDENT UPON WHICH PARTICULAR "LOAD" BUTTON HAD BEEN INITIALLY DEPRESSED TO LOAD THE PROGRAM.

3. R1 AND R2 ARE USED TO COMPARE A ROM WORD WITH ITS CORE IMAGE COUNTERPART. IF THE WORDS DON'T COMPARE A SUB-ROUTINE IS CALLED TO SET UP THE ERROR INFORMATION AND REPORT IT VIA A "DATER" CALL TO THE MONITOR.
4. STEP (3) IS REPEATED.
5. R1 AND R2 ARE UPDATED TO POINT TO THE NEXT WORD AND A TEST MADE ON R2 TO SEE IF 256(10) WORDS HAVE BEEN CHECKED. IF YES, GO TO STEP (6) IF NOT REPEAT (3) THRU (5).
6. A PASS COUNTER IS DECREMENTED AND TESTED TO SEE IF 100(8) ITERATIONS OF STEPS (1) THRU (5) HAVE OCCURRED - IF YES GO TO STEP (7) IF NOT REPEAT (1) THRU (5).
7. REPORT END OF PASS AND REPEAT (1) THRU (6).

8.0 OPERATOR OPTIONS

(NONE)

9.0 NON-STANDARD PRINTOUTS

(NONE)

```

000000  BKMOD <BMBE > 173000,0,0,0,0,100,154
000000  MODULE 40020,BMBE,173000,0,0,0,0,100,154
,      TITLE BMBE DEC/X11 SYSTEM EXERCISER MODULE
      DDACON VERSION 6 23-MAY-78
      .LIST BYN
*****
000000  BEGIN:
000000  046502 041105 040 MODNAM: .ASCII /BMBE / ;MODULE NAME.
000005  000 XFLAG: .BYTE OPEN ;USED TO KEEP TRACK OF WBOFF USAGE
000006  173000 ADDR: 173000+0 ;1ST DEVICE ADDR.
000010  000000 VECTOR: 0+0 ;1ST DEVICE VECTOR.
000013  000 BR1: .BYTE PRTV0+0 ;1ST BR LEVEL.
000014  000 BR2: .BYTE PRTV0+0 ;2ND BR LEVEL.
000016  000001 DVID1: 0+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  040020 STAT: 40020 ;STATUS WORD
000030  000224 INIT: START ;MODULE START ADDR.
000032  000224 SPOINT: MODSP ;MODULE STACK POINTER.
000033  000000 PASCNT: 0 ;PASS COUNTER
000034  000000 ICONF: 100 ;# OF ITERATIONS PER PASS=100
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 SVSCNT: 0 ;# OF SYS ERRORS ACCUMULATED
000054  000000 RANUM: 0 ;HOLDS RANDOM # WHEN RAND MACRO IS CALLED
000056  000000 COMPTG: 0 ;RESERVED FOR MONITOR USE
000058  000000 RES2: 0 ;RESERVED FOR MONITOR USE
000060  000000 SVR0: OPEN ;LOC TO SAVE R0.
000062  000000 SVR1: OPEN ;LOC TO SAVE R1.
000064  000000 SVR2: OPEN ;LOC TO SAVE R2.
000066  000000 SVR3: OPEN ;LOC TO SAVE R3.
000068  000000 SVR4: OPEN ;LOC TO SAVE R4.
000070  000000 SVR5: OPEN ;LOC TO SAVE R5.
000072  000000 SVR6: OPEN ;LOC TO SAVE R6.
000074  000000 CSRA: OPEN ;ADDR OF CURRENT CSR.
000076  000000 SBADR: ;ADDR OF GOOD DATA, OR
000078  000000 ACSR: OPEN ;CONTENTS OF CSR.
000080  000000 WASADR: ;ADDR OF BAD DATA, OR
000082  000000 ASTAT: OPEN ;STATUS REG CONTENTS.
000084  000000 ERRRTYP: ;TYPE OF ERROR
000086  000000 ASB: OPEN ;EXPECTED DATA.
000088  000000 AWAS: OPEN ;ACTUAL DATA.
000090  000230 RSTRT: RSTRT ;RESTART ADDRESS AFTER END OF PASS
000092  000000 WMDT: OPEN ;WORDS TO MEMORY PER ITERATION
000094  000000 WMDP: OPEN ;WORDS FROM MEMORY PER ITERATION
000096  000000 INTR: OPEN ;# OF INTERRUPTS PER ITERATION
000100  000154 IDNUM: 154 ;MODULE IDENTIFICATION NUMBER=154
000102  000040 .REPT SPSIZ ;MODULE STACK STARTS HERE.
000104  000040 .NLIST

```

```

      .WORD 0
      .LIST
      .ENDR
000224
*****

```

```

203
204 000224* 016705 177556
205
206 000230*
207 000230* 010501
208 000232* 012702 000336*
209 000236* 022701 173024
210 000242* 022703
211 000242* 022703 173224
212 000250* 001410
213 000252* 021112
214 000254* 011402
215 000256* 004767 000026
216 000262* 021112
217 000264* 001402
218 000266* 004767 000016
219 000272* 022122
220 000274* 022702 001336*
221 000300* 001356
222 000302*
223 000302* 104413 000000*
224
225 000306* 000750
226
227
228
229
230 000310* 010267 177566
231 000314* 010167 177564
232 000320* 011167 177564
233 000324* 011267 177556
234
235 000330* 104404 000000*
236
237 000334* 000207
238
239
240
241
242 000336* 010037
243 000336* 000040
244 000342* 013700
245 000344* 177570
246 000346* 032700
247 000346* 000001
248 000352* 001007
249 000354* 000557
250 000356* 005000
251 000356* 000404
252 000362* 173000
253 000364* 000340
254 000366* 002700
255 000372* 010005
256 000374* 106300
257 000376* 122700
258

```

```

START: MOV ADDR,R5 ;GET FIRST ROM ADDRFS INTO R5
RESTART:
AGAIN: MOV R5,R1 ;R1 POINTS TO ROM WORD
MOV #BMTAB,R2 ;R2 POINTS TO ROM IMAGE IN CORE
1S: CMP #173024,R1 ;ROM ADDRESS = 173024 ??
BEQ 3S ;BR IF YES
MOV #173224,R1 ;ROM ADDRESS = 173224 ??
BEQ 3S ;BR IF YES
CMP (R1),(R2) ;CHECK ONE LOCATION
BFP 2S ;BR IF CROMJ = [CORE]
JSR PC,BMERR ;GO SETUP AND REPORT ERROR
CMP (R1),(R2) ;CHECK IT AGAIN
BEQ 3S ;BR IF CROMJ = [CORE]
JSR PC,BMERR ;GO SETUP AND REPORT ERROR
3S: CMP (R1)*(R2)+ ;ADD *2 TO BOTH POINTERS
TABEND,R2 ;DONE LAST WORD ??
BNE 1S ;BR IF NOT
4S: ENDTAB,BEGIN ;SIGNAL END OF ITERATION.
BR AGAIN ;MONITOR SHALL TEST END OF PASS

```

```

;THIS ROUTINE SETS UP AND REPORTS ALL DATA COMPARE ERRORS
BMERR: MOV R2,SBADR ;SAVE THE ADDR. OF GOOD DATA
MOV R1,WASADR ;SAVE ADDR. OF THE BAD DATA
MOV (R1),AWAS ;GET WAS DATA
MOV (R2),ASB ;GET THE S/B DATA
;*****
DATERS,BEGIN ;DATA ERROR!!!
;*****
RTS PC ;CONTINUE CHECKING

```

```

;256(10) WORD TABLE THAT STORES A CORE IMAGE OF THE CONTENTS OF THE ROM
BMTAB: 010037 ;CONTENTS OF LOCATION 173000
000040 ;CONTENTS OF LOCATION 173002
013700 ;ETC.
177570
032700
000001
001007
000557
005000
000404
173000
000340
002700
010005
106300
122700

```

```

259 000400* 000340 000340
260 000402* 101404 101404
261 000404* 122700 122700
262 000406* 000080 000080
263 000410* 011001 011001
264 000412* 005000 005000
265 000414* 000300 000300
266 000416* 044700 044700
267 000420* 000404 000404
268 000422* 105705 105705
269 000424* 100550 100550
270 000426* 012703 012703
271 000430* 000401 000401
272 000432* 005700 005700
273 000434* 001402 001402
274 000436* 013700 013700
275 000440* 000020 000020
276 000442* 052700 052700
277 000444* 000007 000007
278 000446* 012706 012706
279 000450* 000012 000012
280 000452* 012701 012701
281 000454* 177170 177170
282 000456* 005705 005705
283 000460* 100402 100402
284 000462* 005306 005306
285 000464* 002475 002475
286 000466* 000005 000005
287 000470* 005004 005004
288 000472* 010302 010302
289 000474* 032711 032711
290 000476* 000040 000040
291 000500* 001775 001775
292 000502* 005700 005700
293 000504* 100454 100454
294 000506* 110011 110011
295 000510* 105711 105711
296 000512* 100376 100376
297 000514* 110261 110261
298 000516* 000002 000002
299 000520* 105711 105711
300 000522* 100376 100376
301 000524* 000302 000302
302 000526* 102661 102661
303 000530* 000002 000002
304 000532* 000302 000302
305 000534* 032711 032711
306 000536* 100040 100040
307 000540* 001775 001775
308 000542* 100745 100745
309 000544* 005700 005700
310 000546* 100421 100421
311 000550* 012711 012711
312 000552* 000003 000003
313 000554* 132711 132711
314 000556* 000240 000240

```

315	000560	000402	000402
316	000562	173000	173000
317	000564	000340	000340
318	000566	001377	001377
319	000570	100003	100003
320	000572	116124	116124
321	000574	000002	000002
322	000576	000666	000666
323	000600	122222	122222
324	000602	022704	022704
325	000604	001000	001000
326	000606	101377	101377
327	000610	005007	005007
328	000612	005202	005202
329	000614	122702	122702
330	000616	000332	000332
331	000620	103003	103003
332	000622	105002	105002
333	000624	062702	062702
334	000626	000401	000401
335	000630	022704	022704
336	000632	160000	160000
337	000634	101516	101516
338	000636	001775	001775
339	000640	000001	000001
340	000642	132711	132711
341	000644	000240	000240
342	000646	001375	001375
343	000650	100316	100316
344	000652	112461	112461
345	000654	000002	000002
346	000656	000771	000771
347	000660	012711	012711
348	000662	000017	000017
349	000664	032711	032711
350	000666	000000	000000
351	000670	001775	001775
352	000672	016100	016100
353	000674	000002	000002
354	000676	000476	000476
355	000700	012703	012703
356	000702	035401	035401
357	000704	012700	012700
358	000706	100005	100005
359	000710	005005	005005
360	000712	000655	000655
361	000714	010032	010032
362	000716	000566	000566
363	000720	012700	012700
364	000722	000056	000056
365	000724	010640	010640
366	000726	010540	010540
367	000730	010440	010440
368	000732	010340	010340
369	000734	010240	010240
370	000736	010140	010140

371	000740	014000	014000
372	000742	000177	000177
373	000744	004446	004446
374	000746	005002	005002
375	000750	005003	005003
376	000752	052700	052700
377	000754	034400	034400
378	000756	012704	012704
379	000760	177400	177400
380	000762	012706	012706
381	000764	000017	000017
382	000766	012701	012701
383	000770	176700	176700
384	000772	005705	005705
385	000774	100402	100402
386	000776	005306	005306
387	001000	002437	002437
388	001002	000005	000005
389	001004	110061	110061
390	001006	000010	000010
391	001010	032711	032711
392	001012	004000	004000
393	001014	001766	001766
394	001016	012711	012711
395	001020	000021	000021
396	001022	010261	010261
397	001024	000634	000634
398	001026	010361	010361
399	001030	000006	000006
400	001032	010461	010461
401	001034	000002	000002
402	001036	000300	000300
403	001040	110001	110001
404	001042	000300	000300
405	001044	105711	105711
406	001046	010371	010371
407	001050	032711	032711
408	001052	060000	060000
409	001054	001346	001346
410	001056	032761	032761
411	001060	140000	140000
412	001062	000012	000012
413	001064	001342	001342
414	001066	005700	005700
415	001070	100470	100470
416	001072	005000	005000
417	001074	000000	000000
418	001076	000776	000776
419	001100	016100	016100
420	001102	000012	000012
421	001104	000773	000773
422	001106	012702	012702
423	001110	000631	000631
424	001112	012703	012703
425	001114	006410	006410
426	001116	012700	012700

427	001120	130400	130400
428	001122	012704	012704
429	001124	110000	110000
430	001126	005005	005005
431	001130	000714	000714
432	001132	010037	010037
433	001134	000040	000040
434	001136	012700	012700
435	001138	000664	000664
436	001140	000664	000664
437	001144	005005	005005
438	001146	012500	012500
439	001150	012501	012501
440	001152	012502	012502
441	001154	012725	012725
442	001156	173634	173634
443	001158	011503	011503
444	001160	012715	012715
445	001164	000340	000340
446	001166	012704	012704
447	001168	174346	174346
448	001170	012706	012706
449	001174	000004	000004
450	001176	062704	062704
451	001200	000448	000448
452	001204	105704	105704
453	001204	100770	100770
454	001206	032764	032764
455	001210	004000	004000
456	001214	000094	000094
457	001214	001770	001770
458	001216	026417	026417
459	001218	000448	000448
460	001220	001365	001365
461	001224	010315	010315
462	001226	010745	010745
463	001230	010745	010745
464	001234	010045	010045
465	001234	012700	012700
466	001236	000130	000130
467	001240	012700	012700
468	001244	000156	000156
470	001246	103374	103374
471	001248	000448	000448
472	001250	010401	010401
473	001254	012700	012700
474	001256	000100	000100
475	001260	010021	010021
476	001262	005061	005061
477	001264	177744	177744
478	001266	005061	005061
479	001270	177764	177764
480	001270	032711	032711
481	001274	004000	004000
482	001276	001775	001775

483	001300	010014	010014
484	001302	005061	005061
485	001304	177766	177766
486	001306	012761	012761
487	001310	107400	107400
488	001312	170021	170021
489	001314	032711	032711
490	001316	004000	004000
491	001320	001775	001775
492	001320	010014	010014
493	001324	012705	012705
494	001326	100000	100000
495	001330	005007	005007
496	001332	000000	000000
497	001334	000000	000000
498	001336	177777	177777
499		000001	

TABEND: 177777
-END

. ABS. 000000 000
001340 001

ERRORS DETECTED: 0
DEFAULT GLOBALS GENERATED: 0

XBMEBO, XBMEBO/SOL/CRF: SYM=DDXCON, XBMEBO
RUN-TIME: 11.2 SECONDS
RUN-TIME RATIO: 18/3=5.8
CORE USED: 7K (13 PAGES)