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.REM -

IDENTIFICATION

PRODUCT CODE: AC-F060E-MC
PRODUCT NAME: CXBMD00 RDV11/KDF11-B MOD
PRODUCT DATE: JULY 1981
MAINTAINER: DIAGNOSTIC ENGINEERING

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1. ABSTRACT:

BMD IS A BKM0D THAT VERIFIES CHECKSUMS FOR EACH ROM/EPR0M ON THE RDV11 BOOTSTRAP MODULE OR THE DIAGNOSTIC BOOTSTRAP ROMS ON THE KDF11-B.

2. REQUIREMENTS:

HARDWARE:: LSI-11 PROCESSOR:
11/03(LSI-11/02), 11/23(KDF11-A), 11/23H(KDF11-B)
STORAGE:: BMD REQUIRES:
1. DECIMAL WORDS: 278
2. OCTAL WORDS: 426
3. OCTAL BYTES: 1055

NOTE: TO TEST WITH KDF11-B (11/23B) SET
SR1 BIT0 TO 1 (SEE SEC. 8)

3. PASS DEFINITION:

A SINGLE PASS CONSISTS OF THE CHECKSUM VERIFICATION OF ALL ROMS 30 (R) TIMES.

4. EXECUTION TIME:

THE BMD RUNNING ALONE ON THE LSI-11 REQUIRES APPROXIMATELY SECS. TO RUN.

5. CONFIGURATION REQUIREMENTS:

DEFAULT PARAMETERS:
ROM ADDRESS: 173000

6. DEVICE/OPTION SETUP:

NONE

7. MODULE OPERATION:

A. SET UP THE PAGE CONTROL REGISTER
B. TEST FOR EXISTENT MEMORY
C. COMPUTE A CHECKSUM FOR AN EXISTENT PAGE OF ROM
D. ADD CHECKSUM TO THE VALUE STORED IN THE ROM
E. IF THE RESULT IS 0, REPEAT STEPS B-D FOR EACH PAGE

8. OPERATION OPTIONS:

SR1 BIT0 SET(1):
DEVICE UNDER TEST IS KDF11-B WITH 2K ROM
SR1 BIT0 CLEAR(0):
DEVICE UNDER TEST IS RDV11

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9. NON-STANDARD PRINTOUTS:

NONE

.NLIST
.NLIST SEQ,LD,BIN
.LIST

```
*****
*
*      EDIT:   BY:      DATE:      REASON:
*
*      003     D GAUDIN    06-JAN-81    UPDATE INTERNAL REVISION
*
*      004     T CHAPSKY   28-JUL-81    UPDATE FOR KDF11-B
*
*****
-
BKMOD  <BMDE >177520,,,,,30,143                ;RG03
MODULE 40020,BMDE ,177520,,,,,30,143
.TITLE BMDE DEC/X11 SYSTEM EXERCISER MODULE
;      DDSCOM VERSION 6      23-MAY-78
.LIST   BIN
;*****
BEGIN:
MODNAM: .ASCII /BMDE / ;MODULE NAME.
XFLAG:  .BYTE OPEN      ;USED TO KEEP TRACK OF WBUF USAGE
ADDR:   177520+0        ;1ST DEVICE ADDR.
VECTOR: +0              ;1ST DEVICE VECTOR.
BR1:    .BYTE PRTY+0    ;1ST BR LEVEL.
BR2:    .BYTE PRTY+0    ;2ND BR LEVEL.
DVID1:  +1              ;DEVICE INDICATOR 1.
SR1:    OPEN            ;SWITCH REGISTER 1
SR2:    OPEN            ;SWITCH REGISTER 2
SR3:    OPEN            ;SWITCH REGISTER 3
SR4:    OPEN            ;SWITCH REGISTER 4
;*****
STAT:   40020           ;STATUS WORD.
INIT:   START          ;MODULE START ADDR.
SPOINT: MODSP          ;MODULE STACK POINTER.
PASCNT: 0               ;PASS COUNTER.
ICOUNT: 30              ;# OF ITERATIONS PER PASS=30
LCOUNT: 0               ;LOC TO COUNT ITERATIONS
SOFCNT: 0               ;LOC TO SAVE TOTAL SOFT ERRORS
HRDCNT: 0               ;LOC TO SAVE TOTAL HARD ERRORS
SOFPAS: 0               ;LOC TO SAVE SOFT ERRORS PER PASS
HRDPAS: 0               ;LOC TO SAVE HARD ERRORS PER PASS
SYSCNT: 0               ;# OF SYS ERRORS ACCUMULATED
RANUM: 0                ;HOLDS RANDOM # WHEN RAND MACRO IS CALLED
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CONFIG:
RES1: 0 ;RESERVED FOR MONITOR USE
RES2: 0 ;RESERVED FOR MONITOR USE
SVR0: OPEN ;LOC TO SAVE R0.
SVR1: OPEN ;LOC TO SAVE R1.
SVR2: OPEN ;LOC TO SAVE R2.
SVR3: OPEN ;LOC TO SAVE R3.
SVR4: OPEN ;LOC TO SAVE R4.
SVR5: OPEN ;LOC TO SAVE R5.
SVR6: OPEN ;LOC TO SAVE R6.
CSRA: OPEN ;ADDR OF CURRENT CSR.
SBADR: ;ADDR OF GOOD DATA, OR
ACSR: OPEN ;CONTENTS OF CSR.
WASADR: ;ADDR OF BAD DATA, OR
ASTAT: OPEN ;STATUS REG CONTENTS.
ERRTYP: ;TYPE OF ERROR
ASB: OPEN ;EXPECTED DATA.
AWAS: OPEN ;ACTUAL DATA.
RSTRT: RESTRT ;RESTART ADDRESS AFTER END OF PASS
WDR: OPEN ;WORDS TO MEMORY PER ITERATION
WDRF: OPEN ;WORDS FROM MEMORY PER ITERATION
INTR: OPEN ;# OF INTERRUPTS PER ITERATION
IDNUM: 143 ;MODULE IDENTIFICATION NUMBER=143
.REPT SPSIZ ;MODULE STACK STARTS HERE.
.NLIST
.WORD 0
.LIST
.ENDR
MODSP:
;*****
;+
; THE NEXT LOCATION CONTAINS A NUMBER THAT CAN BE EXAMINED IN COME 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+0
;*****
PCR=177520
SUML: 0
SUMH: 0
TMPL: 0
TMPL: 0
TPCR: 0 ;TC001
START:
RESTR:
ST: MOV #400,PCR ;LOAD STARTING PAGE INTO PCR
BIT #1,SR1 ;KDF11-B ? ;TC001
BEQ 106 ;IF NO, BRANCH ;TC001
MOV #400,TPCR ;IF YES,LOAD TEMPORARY PCR ;TC001
106: MOV #177520,CSRA ;STORE CONTROL REGISTER ADDRESS
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225 000272' 005067 177732 ST1: CLR SUMH
226 000276' 005067 177724 CLR SUML
227 000302' 032767 000001 177506 BIT #1,SR1 ;KDF11-B ? ;TC001
228 000310' 001404 BEQ 20S ;IF NO, BRANCH ;TC001
229 000312' 016767 177720 177562 MOV TPCR,ACSR ;STORE TEMPORARY PCR ;TC001
230 000320' 000424 BP 1S ;BRANCH AROUND ;TC001
231 000322' 016767 177520 177552 20S: MOV PCR,ACSR ;STORE CONTENTS OF CONTROL REGISTER
232 000330' 022737 177777 173774 30S: CMP #1,#173774 ;MEMORY EXIST?
233 000336' 001015 HNE 1S ;BR IF YES
234 000340' 032767 000360 177520 40S: BIT #360,PCR ;DIAGNOSTIC ROM?
235 000346' 001055 50S: BNE 5S ;BR IF NO
236 000350' 012767 000006 177530 MOV #6,ERRTYP
237 ;*****
238 000356' 104405 000000' 000000 HRDERS,BEGIN,NULL ;NON-EXISTENT DIAGNOSTIC ROM
239 ;*****
240 000364' 104403 000000' 000676' MSGNS,BEGIN,MSG1 ;ASCII MESSAGE CALL WITH COMMON HEADER
241
242 000372' 012700 173000 1S: MOV #173000,R0 ;STARTING LOCATION IN ROM
243 000376' 020027 173776 2S: CMP R0,#173776 ;LAST LOCATION IN ROM?
244 000402' 001413 BEQ 3S ;BR IF YES
245 000404' 112067 177622 MOVB (R0)+,TMPL ;GET LOW BYTE OF DATA
246 000410' 112067 177620 MOVB (R0)+,TMPL ;GET HIGH BYTE OF DATA
247 000414' 066767 177612 ADD TMPL,SUML ;SUM LOW BYTES
248 000422' 066767 177606 ADD TMPL,SUMH ;SUM HIGH BYTES
249 000430' 000762 BH 2S ;CONTINUE UNTIL END OF PAGE
250 000432' 112067 177574 3S: MOVB (R0)+,TMPL ;GET CHECKBYTE
251 000436' 066767 177570 ADD TMPL,SUML ;ADD TO SUM
252 000444' 105767 177556 TSTB SUML ;IS RESULT 0 ?
253 000450' 001402 BEQ 4S ;BR IF YES
254 000452' 004767 000124 JSR PC,DCERR ;REPORT TYPE OF ERROR
255 000456' 112067 177552 MOVB (R0)+,TMPL ;GET CHECKBYTE
256 000462' 066767 177546 4S: ADD TMPL,SUMH ;ADD TO SUM
257 000470' 105767 177534 TSTB SUMH ;IS RESULT 0 ?
258 000474' 001402 BEQ 5S ;BR IF YES
259 000476' 004767 000100 JSR PC,DCERR ;REPORT TYPE OF ERROR
260 000502' 032767 000001 177306 5S: BIT #1,SR1 ;KDF11-B ? ;TC001
261 000510' 001413 BEQ 60S ;BRANCH, IF NO ;TC001
262 000512' 062767 001002 177516 70S: ADD #1002,TPCR ;ADJUST TEMP. PCR ;TC001
263 000520' 016767 177512 MOV TPCR,PCR ;INCR PCR ;TC001
264 000526' 022767 007416 177502 CMP #7416,TPCR ;FINISH TEST OF ALL PAGES? ;TC001
265 000534' 001256 BNE ST1 ;BR IF NOT ;TC001
266 000536' 000416 BR 80S ;DONE ;TC001
267 000540' 062767 001002 177520 60S: ADD #1002,PCR ;INCREMENT PCR
268 000546' 122767 000060 177520 CMPL #60,PCR ;EXCEEDED LOW RANGE?
269 000554' 001003 BNE 6S ;BR IF NOT YET
270 000556' 012767 100600 177520 MOV #100600,PCR ;ADJUST PCR
271 000564' 022767 001000 177520 6S: CMP #1000,PCR ;FINISHED TEST OF ALL PAGES?
272 000572' 001237 BNE ST1 ;BR IF NOT YET
273 000574' 80S:
274 000574' 104413 000000' ENDTIS,BEGIN ;SIGNAL END OF ITERATION.
275 ;MONITOR SHALL TEST END OF PASS
276 000600' 000617 BR SI ;BR IF NO
277
278 000602' 032767 000001 177206 DCERR: BIT #1,SR1 ;KDF11-B ? ;TC001
279 000610' 001404 BEQ 90S ;BR IF NO ;TC001
280 000612' 022767 007416 177416 CMP #7416,TPCR ;DIAGNOSTIC ROM? ;TC001

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281 000620' 000403 BH 95S ;BRANCH ;TC001
282 000622' 022767 007416 177520 90S: CMP #7416,PCR ;DIAGNOSTIC ROM?
283 000630' 002411 95S: BLT 7S ;BR IF NO
284 000632' 005067 177250 CLR ERRTYP
285 ;*****
286 000636' 104405 000000' 000000 HRDERS,BEGIN,NULL ;DIAGNOSTIC ROM CHECKSUM ORDER
287 ;*****
288 000644' 104403 000000' 000702' MSGNS,BEGIN,MSG2 ;ASCII MESSAGE CALL WITH COMMON HEADER
289 000652' 000207 RTS PC ;RETURN
290 000654' 005067 177226 7S: CLR ERRTYP
291 ;*****
292 000660' 104405 000000' 000000 HRDERS,BEGIN,NULL ;CHECKSUM ERROR--NON-DIAGNOSTIC ROM
293 ;*****
294 000666' 104403 000000' 000706' MSGNS,BEGIN,MSG3 ;ASCII MESSAGE CALL WITH COMMON HEADER
295 000674' 000207 RTS PC ;RETURN
296
297 000676' 000712' MSG1: NONXT
298 000700' 177777 177777
299 000702' 000753' MSG2: DIAG
300 000704' 177777 177777
301 000706' 001013' MSG3: NDIAG
302 000710' 177777 177777
303
304 000712' 042045 040511 047107 NONXT: .ASCIZ '%DIAGNOSTIC ROM IS NON-EXISTENT%'
305 000720' 051517 044524 020103
306 000726' 047522 020115 051511
307 000734' 047040 047117 042455
308 000742' 044530 052123 047105
309 000750' 022524 000
310 000753' 045 044504 043501 DIAG: .ASCIZ '%DIAGNOSTIC ROM CHECKSUM ERROR%'
311 000760' 047516 052123 041511
312 000766' 051040 046517 041440
313 000774' 042510 045503 052523
314 001002' 020115 051105 047522
315 001010' 022522 000
316 001013' 045 047516 026516 NDIAG: .ASCIZ '%NON-DIAGNOSTIC ROM CHECKSUM ERROR%'
317 001020' 044504 043501 047516
318 001026' 052123 041511 051040
319 001034' 046517 041440 042510
320 001042' 045503 052523 020115
321 001050' 051105 047522 022522
322 001056' 000
323
324 000001 .END

```

BMDE DEC/X11 SYSTEM EXERCISER MODULE MACY11 30(1046) 28-SEP-81 13:21 PAGE 10
XBMDX0.P11 28-SEP-81 11:42 CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0008

[illegible]

SYSCNT	000052R	167#						
TMPI	000234R	216#	246*	248	255*	256		
TMPL	000232R	215#	245*	247	250*	251		
TPCR	000236R	217#	223*	229	262*	263	264	280
TRPDFD=	000022	199#						
VECTOR	000010P	148#						
WASADR	000104R	182#						
WDFR	000116R	189#						
WDTO	000114R	188#						
XFLAG	000005R	146#						

BKMOD	1#	138		
BREAK	1#			
BTOD	1#			
CKDATA	1#			
DATAACK	1#			
DATERR	1#			
DPSEVN	1#	199		
DSEVNT	1#	199		
END	1#			
ENDIT	1#	273		
ENDMOD	1#			
EQUATS	1#	199		
EXIT	1#			
GETPA	1#			
GWBUFF	1#			
HRDR	1#	237	285	291
IOMOD	1#			
IOMODP	1#			
IOMODR	1#			
IOMODX	1#			
MAP22	1#			
MODULE	1#	139		
MSG	1#			
MSGN	1#	240	288	294
MSGS	1#			
NBKMOD	1#			
OTOA	1#			
PIRG	1#			
RAND	1#			
SBKMOD	1#			
SOFER	1#			

. ABS. 000000 000
 001057 001

ERRORS DETECTED: 0
 DEFAULT GLOBALS GENERATED: 0

XBMDE0,XBMDE0/SOL/CHF=DDXCOM,P11,XBMDE0.P11
 RUN-TIME: 1 1 .3 SECONDS
 RUN-TIME RATIO: 37/3=12.3
 CORE USED: 9K (18 PAGES)