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SEQ 0001

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.REM \_

IDENTIFICATION

PRODUCT CODE: AC-F057N-MC  
PRODUCT NAME: CXBMCNO BOOTSTRAP ROM MOD  
PRODUCT DATE: SEPTEMBER 1978  
MAINTAINER: DEC/X11 SUPPORT GROUP

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1. ABSTRACT:

1 BMC IS A BMOD THAT DOES A READ CHECKSUM FOR EACH ROM SELECTED IN ONE OF TWO GROUPS. WITH BIT 15 = 0 IN SRI ANY COMBINATION OF ROMS IN THE A GROUP CAN BE TESTED BY SELECTIVE SETTING OF THE OTHER BITS IN SRI. WITH BIT15 = 1 IN SRI ANY COMBINATION OF ROMS IN THE B GROUP CAN BE TESTED BY SELECTIVE SETTING OF THE OTHER BITS IN SRI. IF YOUR SYSTEM HAS A ROM OR ROMS FROM EACH OF THE TWO GROUPS, THEN CONFIGURE 2 COPTES OF THE RMC MODULE AND USE ONE TO CHECK THE ROMS IN THE A GROUP AND THE OTHER FOR THE ROMS IN THE B GROUP.

2. REQUIREMENTS:

HARDWARE: ANY PDP-11 WITH A ROM.  
STORAGE:: BMC REQUIRES:

1. DECIMAL WORDS: 662
2. OCTAL WORDS: 1226
3. OCTAL BYTES: 2454

3. PASS DEFINITION:

ONE PASS CONSISTS OF DOING A CHECKSUM ON EACH ROM 3000(8) TIMES.

4. EXECUTION TIME:

BMC RUNNING ALONE TAKES APPROXIMATELY ONE MINUTE.

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5. CONFIGURATION REQUIREMENTS:

SET THE CORRESPONDING BITS IN SR1 TO A "1" FOR THE DESIRED ROM.  
GROUP A (BIT 15 MUST BE A ZERO)

BIT 0 =YA  
BIT 1 =YB  
BIT 2 =MR11  
BIT 3 =YC  
BIT 4 =YF  
BIT 5 =VH  
BIT 6 =BM873 YA  
BIT 7 =BM873 YB  
BIT 8 =BM873 VC  
BIT 9 =BM873 YD  
BIT 10 =M9301 YA  
BIT 11 =M9301 YB  
BIT 12 =M9301 VC  
BIT 13 =BM792 VL  
BIT 14 =M9400 (NOT A VH)

GROUP B (BIT 15 MUST ALSO BE SET TO A ONE)

BIT 0 =BM873 SF  
BIT 1 =BM873 SE  
BIT 2 =BM873 SC  
BIT 3 =M9301 SB  
BIT 4 =M9301 SA  
BIT 5 =M9301 YD  
BIT 6 =M9400 VH  
BIT 7 =M9301 YF  
BIT 8 =M9301 VH  
BIT 9 =M9301 YE  
BIT 10 =M9301 YJ  
BIT 11 = OPEN  
BIT 12 = OPEN  
BIT 13 = OPEN  
BIT 14 = OPEN

REMEMBER, FOR GROUP B ROMS, BIT 15 MUST BE SET ALONG WITH ANY OTHER BITS.

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**6. DEVICE/OPTION SETUP:**

M9301 ROMS MUST HAVE THE SWITCH SET WHICH ENABLES THE SECOND HALF OF THE ROM (165000 - 165777), OR ELSE LOCATIONS MUST BE PATCHED AS SHOWN:

LOCATION FIX? +2 MUST GO FROM A 177777 TO A 000001  
WHERE FIX? IS FIXA FOR M9301 YA, FIXB M9301YB, ETC.  
LOCATIONS M93?HI AND M93?LO WHERE ? IS THE Y? OPTION  
TO BE TESTED, MUST BE SET TO:

M93AHI: 26634  
M93ALO: 74  
M93BHI: 53546  
M93BL0: 100

M93CHI: 136712  
M93CLO: 113

**7. MODULE OPERATION:**

A READ CHECKSUM ON ALL SELECTED ROMS IN THE ORDER INDICATED  
IN STEP #5. THE YA HAS A POSSIBILITY OF TWO CHECKSUM VALUES DEPENDING  
ON THE ROM USED. AN APPROPRIATE CHECK IS MADE FOR THIS SITUATION.

**8. OPERATING OPTIONS:**

NONE

**9. NON-STANDARD PRINTOUTS:**

NONE

```

000000* 000000 000000 <BMCN> 300,13
000000* MODULF 40020,BMCN 300,13
000005* ;TITLE BMCN DEC/X11 SYSTEM EXERCISER MODULE
000006* DDXCOM VERSION 6 23-MAY-78
000007* LIST BYN
*****
000000* 000000 046502 047103 040 000000 :MODULE NAME.
000001* ;USED TO KEEP TRACK OF MBUFF USAGE
000002* ADDR: +0 :1ST DEVICE ADDR.
000003* VECTOR: +0 :1ST DEVICE VECTOR.
000004* BR1: .BYTE PRTY+0 :2ND BR LEVEL.
000005* BR2: .BYTE PRTY+0 :DEVICE INDICATOR 1.
000006* DVID1: +1 :SWITCH REGISTER 1.
000007* SR1: OPEN :SWITCH REGISTER 2.
000008* SR2: OPEN :SWITCH REGISTER 3.
000009* SR3: OPEN :SWITCH REGISTER 4.
000010* SR4: OPEN
*****
000026* 040020 STAT: 400020 :STATUS WORD.
000030* 000224* INIT: START :MODULES START ADDR.
000032* 000224* SPOINT: MODSP :MODULE STACK POINTER.
000033* 000000 PASCNT: 0 :PASS COUNTER.
000034* 000300 ICOUNT: 300 :# OF ITERATIONS PER PASS=300
000035* 000000 ICOUNT: 0 :LOC TO COUNT ITERATIONS.
000049* 000000 SWTCH: :LOC TO SAVE TOTAL SOFT ERRORS.
000044* 000000 HDPCT: :LOC TO SAVE TOTAL HARD ERRORS.
000045* 000000 HDPPAS: :LOC TO SAVE SOFT ERRORS PER PASS.
000050* 000000 HDHPAS: :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* 000000 CONFIG: :RESERVED FOR MONITOR USE.
000057* 000000 RES1: 0 :RESERVED FOR MONITOR USE.
000058* 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* 000000 SBADR: :ADDR OF GOOD DATA, OR.
000104* 000000 ACSR: OPEN :CONTENTS OF CSR.
000104* 000000 WASADR: :ADDR OF BAD DATA, OR.
000104* 000000 ASTAT: OPEN :STATUS REG CONTENTS.
000106* 000000 ERRTYP: :TYPE OF ERROR
*****

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000106* 000000 ASB: OPEN :EXPECTED DATA.
000110* 000000 AWAS: OPEN :ACTUAL DATA.
000112* 000224* RSTRT: RSTRT :RESTART ADDRESS AFTER END OF PASS
000114* 000000 VD0: OPEN :WORDS TO MEMORY PER ITERATION.
000116* 000000 VDFR: OPEN :WORDS FROM MEMORY PER ITERATION.
000120* 000000 INTR: OPEN :# OF INTERRUPTS PER ITERATION.
000122* 000013 IDNUM: 13 :MODULE IDENTIFICATION NUMBER=13.
000040 :REPT SPSIZ :MODULE STACK STARTS HERE.
      :LIST :WORD 0
      :ENDR
000224* MODSP: ****
*****
229
230
231 000224* 016767 177566 002152 START: :GET THE ROMS TO TEST INFO.
232 000232* 002001 002132 RSTRT: MOV SRI,HOLD1 :BR IF ROMS ARE FROM THE A GROUP.
233 000234* 012767 001356* 002132 BSQ 1$ :POINT TO NEW ROM INFO.
234 000242* 042767 100000 002134 MOV $100000,HOLD1 :GET RID OF "GROUP" BIT.
235 000250* 000403 BR STR :GO TEST.
236
237 000252* 012767 000606* 002114 1$: MOV #SETUP,TEST :POINT TO OLDER ROMS INFO.
238 000260* 016767 002120 002110 STR: MOV HOLD1,HOLD :TEST FOR ROMS.
239 000262* 005167 002104 TST HOLD :TEST FOR ROMS.
240 000265* 005167 002104 BEQ 1$ :TEST FOR ROMS.
241 000272* 001907 000000* ENDS-BEGIN :SET R0 POINT TO SETUP ROUTINES.
242 000304* 012767 000609 002074 1$: MOV TEST,RO :SET R0 POINT TO SETUP ROUTINES.
243 000312* 005067 002074 :1,PONT :SET DROP POINTER.
244
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246
247 ;CALCULATIONS TO DETERMINE A LEGAL ROM.
248
249
250 000312* 005067 002074 CAL: CLR HI :LOOK FOR ROM.
251 000316* 005067 002066 CLR LO :GO SETUP.
252 000322* 006267 002050 ASR HOLD :MOVE POINTER.
253 000326* 103405 BCS DO :MOVE DROP POINTER.
254 000330* 062700 000030 ADD $24,RO
255 000334* 006367 002046 ASL PONT :MOVE DROP POINTER.
256 000340* 000764 BR CAL
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258
259 ;CHECKSUM DRIVER
260
261
262 000342* 004510 DOI: JSR RS,(R0) :GO SETUP.
263 000344* 010167 002030 DOI: MOV RI,SAVE :SAVE ROM ADDRESS.
264 000345* 010167 002036 DOI: MOV RS,SAVE1 :SAVE LIMIT.
265 000354* 005167 002034 1$: TEST :IS IT A 8M873 OR M9301?
266 000360* 001410 BEQ 1$ :BRANCH IF NOT.
267 000362* 022701 173024 CMP $173024,R1 :ARE WE AT THE DIODE LOCATION?
268 000366* 001403 BNE 1$ :BRANCH IF SO.
269 000370* 022701 173224 CMP $173224,R1 :IS THIS THE OTHER DIODE LOCATION?
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271 000374* 001902      ;NOT REALLY TRUE FOR M9301 BUT EXCLUDED FOR SAKE OF COMMON CODE.
272 000376* 005721      BNE    R1      ;BRANCH IF NOT
273 000400* 005302      TST    R1      ;SKIP THAT LOCATION FOR BN873
274 000402* 002002      DFC    R2      ;CORRECT WORD COUNT
275 000406* 005567      ADD    (R1)+,LO  ;ADD CONTENTS OF ROM LOCATION
276 000412* 005302      ADC    R1      ;KEEP CARRY BIT
277 000414* 001357      DEC    R2      ;LIMIT MET?
278 000416* 005767      BNE    1$      ;NO
279 000424* 002010      TST    BMFLAG  ;WHAT KIND OF ROM?
280 000424* 012767      BGE    4$      ;BR IF NOT M9301 ON ITS FIRST TRIP THRU
281 000432* 012701      MOV    $1,BMFLAG  ;INDICATE 1ST PART OF M9301 WAS DONE
282 000432* 001620      MOV    M93ADR,R1  ;GET OTHER HALF'S ADDR
283 000432* 001556      MOV    BCDLN,R2  ;SET COUNT UP AGAIN
284 000444* 000240      BR    DOI      ;GO CHECK OTHER HALF
285 000446* 002367      NOP
286 000452* 001013      CMP    R2,LO  ;CHECK TOTAL
287 000454* 0020467     BNE    R2,R1  ;BLOCK ERROR
288 000454* 001732      CMP    R2,R1  ;CHECK CARRY
289 000460* 001010      ENDITS,BEGIN  ;SIGNAL END OF ITERATION
290 000462* 104413      000000*      ALT:   TST    HOLD  ;MONITOR SHALL TEST END OF PASS
291 000466* 005767      BEQ    STR    ;ANY MORE ROMS?
292 000472* 001672      ADD    $24.,R0  ;NO
293 000474* 002700      BR    CAL    ;YES MOVE POINTER
294 000500* 000704      ;GO DO OTHERS
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## ;PASS COUNTER

## ;ERROR CHECKING AND REPORTING

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307 000502* 026767 001672 001416  ERR:   CMP    SAVE,ADR  ;CHECK FOR YA ERROR
308 000510* 001010      BNE    BRR1      ;SAVE ROM ADDRESS
309 000512* 026767 001672 001416  CMP    LOWACK  ;CHECK ALTERNATE LOW SUM
310 000520* 001004      BNE    ERK1      ;CHECK ALTERNATE HIGH SUM
311 000522* 026767 001664 001410  CMP    HBACK1  ;OK
312 000530* 001756      BEQ    AL4      ;UNKOWN ERROR
313
314 000532* 016767 001642 177340  ERR1:  MOV    SAVE,CSRA  ;SAVE CHECKSUM
315 000540* 016767 001644 177344  MOV    LOACSR  ;SAVE CHECKSUM
316 000546* 016767 001630 177330  MOV    SAVEL,ASTAT  ;SAVE LIMIT
317 000554* 000567 177326  CLR    ERRTYP  ;UNKNOWN ERROR
318
319 000560* 104405 000000* 000000  HRDERS,BEGIN,NULL  ;CHECKSUM ERROR
320 000566* 104403 000000* 002416*  MSGNS,BEGIN,MES1  ;ASCII MESSAGE CALL WITH COMMON HEADER
321 000574* 006767 001606 001602  BTC    PONT,ROLD1  ;CLEAR OFFENDING ROM
322 000602* 000167 177452  JMP    STR    ;REGISTER SETUP ROUTINE
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## ;REGISTER SETUP ROUTINE

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327
328
329 000606* 016701 001314      SETUP:  MOV    AADR,R1  ;SET YA REGISTERS
330 000612* 016702 001312      MOV    ACH,R2
331 000616* 016703 001310      MOV    ACH,R3
332 000622* 016704 001306      MOV    ACH,R4
333 000626* 012767 000000 001560  MOV    $0,BMFLAG
334 000634* 000205          RTS    RS
335
336
337 000636* 016701 001306      MOV    BADR,R1  ;SET YB REGISTERS
338 000642* 016702 001304      MOV    BLK,R2
339 000645* 016703 001302      MOV    BCK,R3
340 000652* 016704 001300      MOV    BCK,R4
341 000656* 012767 000000 001530  MOV    $0,BMFLAG
342 000664* 000205          RTS    RS
343
344
345 000666* 016701 001256      MOV    BADR,R1  ;SET MR-11 REGISTERS
346 000672* 016702 001262      MOV    MLC,R2
347 000676* 016703 001260      MOV    MCK,R3
348 000702* 016704 001256      MOV    MCK,R4
349 000706* 012767 000000 001500  MOV    $0,BMFLAG
350 000714* 000205          RTS    RS
351
352
353 000716* 016701 001244      MOV    CADR,R1  ;SET YC REGISTERS
354 000722* 016702 001242      MOV    ACH,R2
355 000726* 016703 001246      MOV    CCK,R3
356 000732* 016704 001234      MOV    CCK,R4
357 000736* 012767 000000 001450  MOV    $0,BMFLAG
358 000744* 000205          RTS    RS
359
360
361 000746* 016701 001214      MOV    CADR,R1  ;SET YF REGISTERS
362 000752* 016702 001216      MOV    FLM,R2
363 000756* 016703 001214      MOV    FCK,R3
364 000762* 016704 001212      MOV    FCK,R4
365 000766* 012767 000000 001420  MOV    $0,BMFLAG
366 000774* 000205          RTS    RS
367
368
369 000776* 016701 001200      MOV    HADR,R1  ;SET YH REGISTERS
370 001002* 016702 001142      MOV    ACH,R2
371 001006* 016703 001142      MOV    RCK,R3
372 001012* 016704 001170      MOV    HCK,R4
373 001016* 012767 000000 001370  MOV    $0,BMFLAG
374 001024* 000205          RTS    RS
375
376
377 001026* 016701 001156      MOV    BMADR,R1  ;SET BN873 YA ADDRESS
378 001032* 016702 001154      MOV    BMILN,R2
379 001036* 016703 001152      MOV    BMCK,R3
380 001042* 016704 001150      MOV    BMCR1,R4
381 001046* 012767 000001 001340  MOV    $1,BMFLAG
382 001054* 000205          RTS    RS

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;INDICATE TO CHECKSUM ROUTINE

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383 001055- 016701 001126      MOV     BMADR,R1      ;SET BM873 YB ADDRESS
385 001062- 016702 001132      MOV     BCDLW,R2
387 001095- 016703 001138      MOV     SBMC1,R3
388 001076- 016767 000001 001310      MOV     SBMC1,R4
389 001104- 000205      RTS     #1,BMFLAG
390                                     ;INDICATE TO CHECKSUM ROUTINE
391 001105- 016701 001076      MOV     BMADR,R1      ;SET BM873 YC ADDRESS
392 001112- 016702 001102      MOV     BCDLW,R2
393 001116- 016703 001104      MOV     SBMC1,R3
394 001122- 016704 001102      MOV     SBMC1,R4
395 001126- 012767 000001 001260      MOV     #1,BMFLAG
396 001134- 000205      RTS     R5
397                                     ;INDICATE TO CHECKSUM ROUTINE
398 001135- 016701 001046      MOV     BMADR,R1      ;SET BM873 YD ADDRESS
399 001142- 016703 001052      MOV     BCDLW,R2
400 001146- 016703 001060      MOV     SBMC1,R3
401 001152- 016704 001056      MOV     SBMC1,R4
402 001164- 000205      RTS     #1,BMFLAG
403                                     ;INDICATE TO CHECKSUM ROUTINE
404
405 001166- 016701 001016      MOV     BMADR,R1      ;SET M9301 ADDRESS(FIRST HALF)
407 001173- 016702 001022      MOV     BCDLW,R2      ;SET COUNT FOR FIRST HALF
408 001176- 016703 001040      MOV     M93AH1,R3      ;SET HIGH SUM
409 001202- 016704 001036      MOV     M93AL0,R4      ;SET CARRY SUM
410 001206- 012767 177777 001200  FIXA:      MOV     #1,BMFLAG
411 001214- 000205      RTS     R5
412
413 001215- 016701 000766      MOV     BMADR,R1      ;SET M9301 ADDRESS(FIRST HALF)
414 001222- 016702 000772      MOV     BCDLW,R2      ;SET COUNT FOR FIRST HALF
415 001226- 016703 001014      MOV     M93AH1,R3      ;SET HIGH SUM
416 001232- 016704 001012      MOV     M93BL0,R4      ;SET CARRY SUM
417 001236- 012767 177777 001150  FIXB:      MOV     #1,BMFLAG
418 001244- 000205      RTS     R5
419
420
421 001245- 016701 000736      MOV     BMADR,R1      ;SET M9301 ADDRESS(FIRST HALF)
422 001252- 016702 000742      MOV     BCDLW,R2      ;SET COUNT FOR FIRST HALF
423 001256- 016703 000770      MOV     M93CH1,R3      ;SET HIGH SUM
424 001262- 016704 000766      MOV     M93CL0,R4      ;SET CARRY SUM
425 001274- 000205      RTS     #1,BMFLAG
426
427 001275- 016701 000640      JBM792 ROM SETUP
428 001302- 016702 000622      MOV     VLADR,R1
429 001306- 016703 000632      MOV     ACH,R2
430 001312- 016704 000630      MOV     VLHIGH,R3
431 001316- 012767 000000 001070      MOV     VLOW,R4
432 001324- 000205      RTS     #1,BMFLAG
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439 001326- 016701 000656      JM9400 ROM SETUP
440 001332- 016702 000662      MOV     BMADR,R1      ;SET M9400 ADDRESS(FIRST HALF)
441 001336- 016703 000716      MOV     BCDLW,R2      ;SET COUNT FOR FIRST HALF
442 001342- 016704 000714      MOV     M94H1,R3      ;SET HIGH SUM
443 001346- 012767 177777 001040  FIXD:      MOV     M94L0,R4      ;SET CARRY SUM
444 001354- 000205      RTS     #1,BMFLAG
445
446
447
448 001356-          START OF GROUP B SETUP ROUTINES
449 001356-          NEWROM:
450
451 001356- 016701 000626      JBM873 SF ROM SETUP
452 001362- 016702 000632      MOV     BMADR,R1      ;SET BM873 SF ADDRESS
453 001366- 016703 000644      MOV     BCDLW,R2      ;SET COUNT FOR 1ST HALF
454 001372- 016704 000642      MOV     SBMC1,R3      ;SET HI CKSUM
455 001376- 012767 000001 001010      MOV     SBMC1,R4      ;SET LOW CKSUM
456 001404- 000205      RTS     #1,BMFLAG
457
458 001406- 016701 000576      JBM873 SE ROM SETUP
459 001412- 016702 000602      MOV     BMADR,R1      ;SET BM873 SE ADDRESS
460 001416- 016703 000642      MOV     BCDLW,R2      ;SET COUNT FOR 1ST HALF
461 001422- 016704 000640      MOV     SEBMC1,R3      ;SET HI CKSUM
462 001426- 012767 000001 000760      MOV     SEBMC1,R4      ;SET LOW CKSUM
463 001434- 000205      RTS     #1,BMFLAG
464
465 001436- 016701 000546      JBM873 SC ROM SETUP
466 001442- 016702 000552      MOV     BMADR,R1      ;SET BM873 SC ADDRESS
467 001446- 016703 000616      MOV     BCDLW,R2      ;SET COUNT FOR 1ST HALF
468 001452- 016704 000614      MOV     SCBMC1,R3      ;SET HI CKSUM
469 001456- 012767 000001 000730      MOV     SCBMC1,R4      ;SET LOW CKSUM
470 001464- 000205      RTS     #1,BMFLAG
471
472 001466- 016701 000516      JM9301 SB SET UP
473 001472- 016702 000522      MOV     BMADR,R1      ;SET M9301 ADDRESS(FIRST HALF)
474 001478- 016703 000572      MOV     BCDLW,R2      ;SET COUNT FOR FIRST HALF
475 001502- 016704 000570      MOV     M93SH1,R3      ;SET HIGH SUM
476 001506- 012767 177777 000700      MOV     M93SL0,R4      ;SET CARRY SUM
477 001514- 000205      RTS     #1,BMFLAG
478
479 001516- 016701 000466      JM9301 SA SET UP
480 001522- 016702 000442      MOV     BMADR,R1      ;SET M9301 ADDRESS(FIRST HALF)
481 001526- 016703 000546      MOV     BCDLW,R2      ;SET COUNT FOR FIRST HALF
482 001532- 016704 000544      MOV     M93SAH1,R3      ;SET HIGH SUM
483 001538- 012767 177777 000650      MOV     M93SAL0,R4      ;SET CARRY SUM
484 001544- 000205      RTS     #1,BMFLAG
485
486 001546- 016701 000436      JM9301 YD SET UP
487 001552- 016702 000442      MOV     BMADR,R1      ;SET M9301 ADDRESS(FIRST HALF)
488 001556- 016703 000522      MOV     BCDLW,R2      ;SET COUNT FOR FIRST HALF
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SEQ 0011

495 001562\* 016704 000570 000620 MOV N93VDL,R4 ;SET CARRY SUM  
496 001562\* 016705 000412 MOV R5  
497 001574\* 000205 RTS  
  
500 001576\* 016701 000406 ;N9401 YH SET UP  
501 001602\* 016702 000412 MOV BMADR,R1 ;SET N9401 ADDRESS(FIRST HALF)  
502 001605\* 016703 000416 MOV BCDLN,R2 ;SET COUNT FOR FIRST HALF  
503 001612\* 016704 000474 MOV N93VHR,R3 ;SET HIGH SUM  
504 001616\* 012767 177777 000570 MOV N94VHL,R4 ;SET CARRY SUM  
505 001624\* 000205 RTS  
506  
508 001626\* 016701 000356 ;N9301 YF  
509 001632\* 016702 000362 MOV BMADR,R1 ;SET N9401 ADDRESS(FIRST HALF)  
510 001638\* 016703 000452 MOV BCDLN,R2 ;SET COUNT FOR FIRST HALF  
511 001642\* 016704 000450 MOV N93VFR,R3 ;SET HIGH SUM  
512 001646\* 012767 177777 000540 MOV N93VFL,R4 ;SET CARRY SUM  
513 001654\* 000205 RTS  
516 001656\* 016701 000326 ;N9301 YH SET UP  
517 001662\* 016702 000332 MOV BMADR,R1 ;SET N9301 ADDRESS (FIRST HALF)  
518 001666\* 016703 000426 MOV BCDLN,R2 ;SET COUNT FIRST HALF  
519 001672\* 016704 000424 MOV N93VHR,R3 ;SET HIGH SUM  
520 001676\* 012767 177777 000510 MOV N93VHL,R4 ;SET CARRY SUM  
521 001704\* 000205 RTS  
526 001706\* 016701 000276 ;N9301 YE SET UP  
527 001712\* 016702 000302 MOV BMADR,R1 ;SET N9301 ADDRESS (FIRST HALF)  
528 001716\* 016703 000402 MOV BCDLN,R2 ;SET COUNT FIRST HALF  
529 001722\* 016704 000400 MOV N93VHR,R3 ;SET HIGH SUM  
530 001726\* 012767 177777 000460 MOV N93VFL,R4 ;SET CARRY SUM  
531 001734\* 000205 RTS  
536 001736\* 016701 000246 ;N9301 YJ SET UP  
537 001742\* 016702 000352 MOV BMADR,R1 ;SET N9301 ADDRESS (FIRST HALF)  
538 001746\* 016703 000356 MOV BCDLN,R2 ;SET COUNT FIRST HALF  
539 001752\* 016704 000430 MOV N93VHR,R3 ;SET HIGH SUM  
540 001756\* 012767 177777 000430 MOV N93VHL,R4 ;SET CARRY SUM  
541 001764\* 000205 RTS  
545 001766\* 016701 000342 ;GROUP B BIT 11 SET UP  
546 001772\* 016702 000340 MOV GB11ADR,R1 ;SET ADDRESS  
547 001776\* 016703 000336 MOV GB11LIM,R2 ;SET COUNT  
548 002002\* 016704 000334 MOV GB11HI,R3 ;SET HIGH SUM  
549 002002\* 016705 000205 MOV GB11LO,R4 ;SET CARRY SUM  
550

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SEQ 0012

551 002006\* 012767 177777 000400 MOV #1,BMFLAG  
552 002014\* 000205 RTS  
553  
554 ;GROUP B BIT 12 SET UP  
555 002016\* 016701 000322 MOV GR12ADR,R1 ;SET ADDRESS  
556 002022\* 016702 000320 MOV GB12LIM,R2 ;SET COUNT  
557 002026\* 016703 000316 MOV GB12HI,R3 ;SET HIGH SUM  
558 002032\* 016704 000314 MOV GR12LO,R4 ;SET CARRY SUM  
559 002036\* 012767 177777 000350 MOV #1,BMFLAG  
560 002044\* 000205 RTS  
564 ;GROUP B BIT 13 SET UP  
565 002046\* 016701 000302 MOV GB13ADR,R1 ;SET ADDRESS  
566 002052\* 016702 000300 MOV GB13LIM,R2 ;SET COUNT  
567 002056\* 016703 000276 MOV GB13HI,R3 ;SET HIGH SUM  
568 002062\* 016704 000274 MOV GB13LO,R4 ;SET CARRY SUM  
569 002066\* 012767 177777 000320 MOV #1,BMFLAG  
570 002074\* 000205 RTS  
571 ;GROUP B BIT 14 SET UP  
572 002076\* 016701 000262 MOV GB14ADR,R1 ;SET ADDRESS  
573 002102\* 016702 000260 MOV GB14LIM,R2 ;SET COUNT  
574 002106\* 016703 000256 MOV GB14HI,R3 ;SET HIGH SUM  
575 002112\* 016704 000254 MOV GB14LO,R4 ;SET CARRY SUM  
576 002124\* 000205 RTS  
581 ;THINGS YOU CANNOT RUN WITHOUT, AT THIS POINT IN TIME.  
582  
583 002126\* 173000 ADDR: 173000 ;VA ADDRESS  
584 002130\* 000040 ACH: 32 ;VA LIMIT  
585 002132\* 172735 ACHR: 172735 ;VA CHECKSUM  
586 002134\* 000018 ACKI: 10 ;VA CARRY  
587 002136\* 067715 ACK: 67715 ;VA ALTERNATE LOW SUM  
588 002140\* 000010 ACKR: 10 ;VA ALTERNATE HIGH SUM  
589 002142\* 173400 VLAADR: 173400  
590 002144\* 066435 VLHIGH: 66435  
591 002146\* 000010 VLLOW: 10  
593  
594 002150\* 173100 BADR: 173100 ;VB & MR-11 ADDRESS  
595 002152\* 000032 BLH: 26 ;VB LIMIT  
596 002154\* 171632 BCKI: 171632 ;VB LOW SUM  
597 002156\* 000006 BCKL: 6 ;VB HI SUM  
598  
599 002160\* 000100 MLM: 64 ;MR-11 LIMIT  
600 002162\* 172021 MCK: 172021 ;MR-11 LOW SUM  
601 002164\* 000020 MCKI: 20 ;MR-11 HI SUM  
602  
603 002166\* 173200 CADR: 173200 ;VC ADDRESS  
604 002170\* 174164 CCCK: 174164 ;VC LOW SUM  
605 002172\* 000005 CCCKI: 5 ;VC HI SUM  
606

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SEQ 0013

607 002174-	000037	PFLN:	31	;VF LIMIT
608 002176-	111603	PCKI:	111603	;VF LOW SUM
609 002200-	000010	PCKI:	10	;VF HI SUM
611 002202-	173300	HADR:	173300	;VH ADDRESS
612 002204-	121506	HCKI:	121506	;VH LOW SUM
613 002206-	000010	HCKI:	10	;VH HI SUM
615 002210-	173000	BBMADR:	173000	
616 002212-	0000200	BBMLN:	200	
618 002214-	060754	BBMCK:	60754	;BM873 YA LIMIT
619 002216-	000035	BBMCKI:	35	;BM873 YA SUM
620 002220-	000400	BCDLH:	400	;BM873 YB,YC,VD LIMIT
622 002222-	143524	BBMCK:	143524	;BM873 YB HI SUM
624 002224-	000065	BBMCKI:	65	;BM873 YB LOW SUM
626 002226-	076101	CBMCK:	76101	;BM873 VC HI SUM
627 002230-	000064	CBMCKI:	64	;BM873 VC LOW SUM
628 002232-	132040	DBMCK:	132040	;BM873 VD HI SUM
630 002234-	000055	DBMCKI:	55	;BM873 VD LOW SUM
631 002236-	162074	SBMCK:	162074	;BM873 SF HI SUM
633 002240-	000054	SBMCKI:	54	;BM873 SF LO SUM
635 002242-	055367	M93AH:	55367	;M9301YA HI SUM
636 002244-	000170	M93AL:	170	;M9301YA CARRY SUM
637 002246-	055471	M93BH:	55471	;M9301YB HI SUM
638 002250-	000174	M93BL:	174	;M9301YB CARRY SUM
640 002252-	162214	M93CH:	162214	;M9301YC HIGH SUM
642 002254-	000206	M93CLO:	206	;M9301YC CARRY SUM
644 002256-	165000	M93ADR:	165000	;M9301 LOWER ADDRESS
645 002260-	022464	M94HI:	22464	;M9400 HIGH SUM
647 002262-	000203	M94LO:	203	;M9400 CARRY SUM
648 002264-	146474	SEBNC:	146474	;BN873 SE HI CHECKSUM
650 002266-	000063	SEBNCI:	63	;LOW
652 002270-	015456	SCBMC:	15456	;BM873 SC HI CHECKSUM
653 002272-	000117	SCBNCI:	117	;LOW
655 002274-	146054	M93SH:	146054	;M9301 SB HI CHECKSUM
656 002276-	000207	M93SL:	207	;LOW
658 002300-	025332	M93AH:	25332	;M9301 SA HI CHECKSUM
659 002302-	000175	M93AL:	175	
661 002304-	132311	M93YDH:	132311	
662 002306-	000171	M93YDL:	171	;M9301 YD HI CHECKSUM

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SEQ 0014

663 002310-	040774	M94YHR:	40774	;M9400 VH HI CHECKSUM
664 002312-	000174	M94YHL:	174	;M9400 VH LOW CHECKSUM
665 002314-	112445	M93YFR:	112445	;M9301 VF HIGH CHECKSUM
666 002316-	000215	M93YFL:	215	;M9301 VF LOW CHECKSUM
667 002320-	175261	M93YRH:	175261	;M9301 VH HIGH CHECKSUM
668 002322-	000174	M93YRL:	174	;M9301 VH LOW CHECKSUM
671 002324-	024457	M93YER:	24457	;M9301 VE HIGH CHECKSUM
674 002326-	000164	M93YEL:	164	;M9301 VE LOW CHECKSUM
675 002330-	162632	M93YJH:	162632	;M9301 VJ HIGH CHECKSUM
678 002332-	000153	M93YJL:	153	;M9301 VJ LOW CHECKSUM
679 002334-	000000	GB11ADR:	0	;BIT 11 ADDRESS
680 002336-	000000	GB11LTM:	00	;BIT 11 LIMIT
681 002340-	000000	GB11LIM:		;HIGH CHECKSUM
682 002342-	000000	GB11LO:	0	;CARRY CHECKSUM
684 002344-	000000	GB12ADR:	0	;BIT 12 ADDRESS
685 002346-	000000	GB12LTM:	00	;BIT 12 LIMIT
686 002350-	000000	GB12LIM:	0	;HIGH CHECKSUM
687 002352-	000000	GB12LO:	0	;CARRY CHECKSUM
689 002354-	000000	GB13ADR:	0	;BIT 13 ADDRESS
690 002356-	000000	GB13LTM:	00	;BIT 13 LIMIT
691 002360-	000000	GB13LIM:	0	;HIGH CHECKSUM
692 002362-	000000	GB13LO:	0	;CARRY CHECKSUM
694 002364-	000000	GB14ADR:	0	;BIT 14 ADDRESS
695 002366-	000000	GB14LTM:	00	;BIT 14 LIMIT
696 002370-	000000	GB14LIM:	0	;HIGH CHECKSUM
697 002372-	000000	GB14LO:	0	;CARRY CHECKSUM
698 002374-	000000	TEST:	0	;HOLDS START OF GROUP A OR B ROM SETUPS
700 002376-	000000	HOLD:	0	;SR1 SAVED
701 002400-	000000	SAVE:	0	;SAVE ADDRESS
702 002402-	000000	SAVER:	0	;SAVE LIMIT
703 002404-	000000	HOLD1:	0	
704				
705				
707 002406-	000000	PONT:	0	;DROP POINTER
708 002410-	000000	LO:	0	;LOW CHECKSUM
709 002412-	000000	HI:	0	;HIGH CHECKSUM
710 002414-	000000	BMFLAG:	0	;FLAG TO SKIP LOC 173024 FOR BM873 ROM
713 002416-	097777	MES1:	DROP	
714				
715				
717 002422-	020045	DROP:	.ASCIZ "DROPPED OFFENDING ROM "	
718 002430-	042520	051104	050117	

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SEQ 0015

719	002436	042506	047116	047111
720	002444	020107	047522	020115
721	002452	000045		
722				
723				
724				
725				
726				
727		000001		

000001

-END

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XRMCN.O.P11 12-OCT-78 11:47      CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0016

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0017

CDATAS=	104412	729*	
COM1C	000006R	406*	
CSR1	000100R	409*	314*
DATACKS=	104411	449*	
DATERS=	0022304	450*	
DBMCK=	002232R	450*	629*
DBMCK1	002234R	401	630*
DO	000342R	254	283*
DO1	000344R	264*	284*
DROP	002422R	713	717*
DVID1	000014R	181*	
ENDITS=	104413	229*	290
ENDS=	104410	229*	243
ERR	000502R	287	289
ERRTYP	000106R	214*	317*
ERR1	000532R	308*	310
EXITS=	104400	229*	314*
FCK	002176R	363	608*
FCK1	002200R	363	609*
FIXA	002206R	404*	
FIXR	001363R	418*	
FIXC	001366R	426*	
FIXD	001346R	444*	
PLW	002174R	362	607*
GB11AD	002334R	547	679*
GB11HI	002340R	549	681*
GB11LD	002342R	548	680*
GB12AD	002344R	556	684*
GB12HI	002350R	558	686*
GB12LI	002346R	557	685*
GB12LO	002352R	559	687*
GB13AD	002354R	565	689*
GB13HT	002360R	567	691*
GB13LI	002356R	566	690*
GB13LD	002362R	568	692*
GB14AD	002364R	574	694*
GB14HI	002370R	576	696*
GB14LI	002366R	575	695*
GBTPAS=	104412	213	697*
GWBUFS=	104414	249*	
HADR	002202R	269*	
HCK1	002504R	371	612*
HCK1	002506R	372	613*
HT	002412R	251*	246*
HOLD	002376R	240*	241
HOLD1	002404R	232*	235*
HRDCNT	000044R	194*	
HRDERS=	104405	229*	319
HRDPAS	000050R	196*	
ICONT	000036R	191*	
ICOUNT	000040R	192*	
IDNUM	000122R	221*	
INIT	000030R	188*	
INTR	000120R	220*	

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CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0018

LO	002410R	252*	275*	286	309	315	708*
MAP22S=	104416	229*					
MCK	002162R	347	600*				
MCK1	002164R	348	601*				
NES1	002416R	321	713*				
NLM	002160R	346	599*				
MODNAM	000000R	175*					
MODSP	000242R	169*	227*				
MSGNS=	104403	229*	321				
MSGSS=	104402	229*					
MSGS=	104401	229*					
M93ADP	002235R	240*					
M93AHF	002233R	240*					
M93ALO	002234R	409					
M93ARH	002234R	416					
M93BLD	002235R	417					
M93CHI	002235R	424					
M93CLO	002254R	425					
M93SAH	002300R	486					
M93SAL	002302R	487					
M93SBH	002274R	478					
M93SBL	002276R	479					
M93YDH	002304R	494					
M93YDL	002306R	495					
M93YEH	002324R	531					
M93YEL	002326R	532					
M93YFH	002314R	512					
M93YFL	002316R	514					
M93YHH	002320R	521					
M93YHL	002322R	520					
M93YJL	002332R	521					
M94HT	002260R	443					
M94LO	002326R	443					
M94VHH	002310R	503					
M94VHL	002312R	504					
NEWROM	001356R	224					
NULL =	000000	229*					
OPEN =	000000	176	182	183	184	185	202
PTOAS=	104420	229*	213	215	216	218	220
PASCNT	000034R	190*					
PIRQS=	000004	229*					
PONT	002406R	245*	256*	322	707*		
POPSP=	005726	229*					
POPSP2=	022626	229*					
PRTY	= 000000	171*					
PRTY0	= 000000	172*					
PRTY1	= 000040	173*					
PRTY2	= 000100	174*					
PRTY3	= 000140	175*					
PRTY4	= 000200	176*					
PRTY5	= 000240	177*					
PRTY6	= 000300	178*					
PRTY7	= 000340	179*					
PS	= 177776	229*					

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XBMCN0.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0019

PSW	= 177776	229*
PUSH	= 005746	329*
PUSH2	= 024645	329*
RANGE	= 104215	329*
RANNUM	000054R	156
RESTRT	000224R	217 232*
RESJ	000056R	200*
RESR	000060R	201*
RSRT	000112R	217*
SAVE	002400R	264*
SAVE1	002402R	265* 307 314 701*
SADR	000102R	210#
SBMK	002236R	454 632*
SBNC1	002240R	455 633*
SCBMC	002270R	470 652*
SCBNC1	002272R	471 653*
SEBMC	002264R	462 649*
SEBNC1	002266R	463 650*
SETUP	000060R	238
SIMINT	000000R	152*
SIMFRS	= 104406	222
SIMPAS	0000046R	105*
SPOINT	0000032R	105*
SPSTZ	= 000040	1 222
SR1	000016R	182 232
SR2	000020R	183*
SR3	000022R	184*
SR4	000024R	185*
START	000224R	186 231*
STAT	000026R	187*
STR	000260R	236 240# 293 323
SVR0	000062R	202#
SVR1	000064R	203#
SVR2	000066R	204#
SVR3	000070R	205*
SVR4	000072R	206*
SVR5	000074R	207*
SVR6	000076R	208*
SYSCNT	000052R	173*
TBUF	000737R	174*
TRDPDN	= 000022	238* 244 699*
VECTOR	000010R	175*
WASADR	000104R	215*
WDPR	000116R	216*
WDTO	000114R	216*
XFLG	000005R	176*
VLADR	002142R	431 590*
VHIGH	002144R	433 591*
YLOW	002146R	434 592*

\* ARS. 000000 000  
002454

ERRORS DETECTED: 0

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XBMCN0.P11 CROSS REFERENCE TABLE -- USER SYMBOLS

SEQ 0020

DEFAULT GLOBALS GENERATED: 0

XBMCN0,XBMCN0/SOL/CRF:SYM=DDXCON,XBMCN0

RUN-TIME: 12.4 SECONDS

RUN-TIME RATIO: 18/4=4.3

CORE USED: 7K (13 PAGES)