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IDENTIFICATION

PRODUCT CODE: AC-F057N-MC
PRODUCT NAME: CX8MCNO BOOTSTRAP ROM MOD
PRODUCT DATE: SEPTEMBER 1978
MAINTAINER: DEC/X11 SUPPORT GROUP

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1. ABSTRACT:

- 1 BMC IS A RKMOD THAT DOES A READ CHECKSUM FOR EACH ROM SELECTED IN ONE OF TWO GROUPS. WITH BIT 15 = 0 IN SR1 ANY COMBINATION OF ROMS IN THE A GROUP CAN BE TESTED BY SELECTIVE SETTING OF THE OTHER BITS IN SR1. WITH BIT15 = 1 IN SR1, ANY COMBINATION OF ROMS IN THE B GROUP CAN BE TESTED, BY SELECTIVE SETTING OF THE OTHER BITS IN SR1. IF YOUR SYSTEM HAS A ROM OR ROMS FROM EACH OF THE TWO GROUPS, THEN CONFIGURE 2 COPIES OF THE BMC MODULE AND USE ON 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.

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 =YH
BIT 6 =BM873 YA
BIT 7 =BM873 YB
BIT 8 =BM873 YC
BIT 9 =BM873 YD
BIT 10 =M9301YA
BIT 11 =M9301YB
BIT 12 =M9301YC
BIT 13 =BM792VL
BIT 14 =M9400 (NOT A YH)

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 SR
BIT 4 =M9301 SA
BIT 5 =M9301 YD
BIT 6 =M9400 YH
BIT 7 =M9301 YF
BIT 8 =M9301 YH
BIT 9 =M9301 YF
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.

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
M93BLO: 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

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000000*      BMCM <BMCM> 300,13
000000*      MODL 40020, BMCM 300,13
;      TITLE BMCM DEC/X11 SYSTEM EXERCISER MODULE
;      DOXCOM VERSION 6 23-MAY-78
;      LIST BIN
*****
000000*      BEGIN:
000000*      MODNAM: 046502 047103 040 /BMCM / ;MODULE NAME
000000*      XPLAG: 000000 /BYTE OPEN /USED TO KEEP TRACK OF WHUFF USAGE
000000*      ADDR: 000000 /+0 /1ST DEVICE ADDR
000000*      VECTOR: 000000 /+0 /1ST DEVICE VECTOR
000000*      BR1: 000000 /BYTE PRTY+0 /1ST RR LEVEL
000000*      BR2: 000000 /BYTE PRTY+0 /2ND RR LEVEL
000000*      DIV1: 000000 /+1 /DEVICE INDICATOR 1
000000*      SR1: 000000 /OPEN /SWITCH REGISTER 1
000000*      SR2: 000000 /OPEN /SWITCH REGISTER 2
000000*      SR3: 000000 /OPEN /SWITCH REGISTER 3
000000*      SR4: 000000 /OPEN /SWITCH REGISTER 4
*****
000026*      STAT: 40020 /STATUS WORD
000030*      INITS: 000224 /MODULE START ADDR
000033*      POINT: 000224 /MODULE STACK POINTER
000036*      PASCNT: 000000 /PASS COUNT
000036*      ICOUNT: 300 /# OF ITERATIONS PER PASS=300
000040*      ICOUNT: 0 /LOC TO COUNT ITERATIONS
000042*      SOPCNT: 0 /LOC TO SAVE TOTAL SOFT ERRORS
000044*      HRCNT: 0 /LOC TO SAVE TOTAL HARD ERRORS
000046*      SOPPAS: 0 /LOC TO SAVE SOFT ERRORS PER PASS
000050*      HRDPAS: 0 /LOC TO SAVE HARD ERRORS PER PASS
000052*      SVSCNT: 0 /# OF SVS ERRORS ACCUMULATED
000054*      RANUM: 000000 /WORDS RANDOM # WHEN RAND MACRO IS CALLED
000056*      CONFIG:
000056*      RFS1: 0 /RESERVED FOR MONITOR USE
000056*      RFS2: 0 /RESERVED FOR MONITOR USE
000056*      RFS3: 0 /RESERVED FOR MONITOR USE
000056*      RFS4: 0 /LOC TO SAVE R0
000056*      RFS5: 0 /LOC TO SAVE R1
000056*      RFS6: 0 /LOC TO SAVE R2
000056*      RFS7: 0 /LOC TO SAVE R3
000056*      RFS8: 0 /LOC TO SAVE R4
000056*      RFS9: 0 /LOC TO SAVE R5
000056*      RFS10: 0 /LOC TO SAVE R6
000056*      CSRA: 0 /ADDR OF CURRENT CSR
000056*      CSRADR: 0 /ADDR OF GOOD DATA, OR
000056*      ACSR: 0 /CONTENTS OF CSR
000056*      WASADP: 0 /ADDR OF BAD DATA, OR
000056*      ASTAT: 0 /STATUS REG CONTENTS
000056*      ERRTP: 0 /TYPE OF ERROR

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000106*      ASH: 000000 /EXPECTED DATA
000110*      AWAS: 000000 /ACTUAL DATA
000112*      RSTRT: 000224 /RESTART ADDRESS AFTER END OF PASS
000114*      WDTN: 000000 /WORDS TO MEMORY PER ITERATION
000116*      WDFR: 000000 /WORDS FROM MEMORY PER ITERATION
000120*      INTR: 000000 /# OF INTERRUPTS PER ITERATION
000122*      IDNUM: 000013 /MODULE IDENTIFICATION NUMBER=13
;      LIST SPSIZ
;      WORD 0
;      LIST
;      PMK
000224*      MODSP:
*****
229 000224*      START:
230 000224*      RSTRT: MOV SR1,HOLD1 /GET THE ROWS TO TEST INFO
231 000224*      3GE IS /FOR IF ROWS ARE FROM THE A GROUP
232 000232*      002007 177566 002152 /POINT TO NEW ROW INFO
233 000234*      012767 001356 002132 /GET RID OF "GROUP" BIT
234 000242*      042767 100000 002134 /GO TEST
235 000250*      000403
236
237 000252*      012767 000606 002114 IS: MOV #SETUP,TEST /POINT TO OLDFR ROWS INFO
238
239
240 000260*      016767 002120 002110 STR: MOV HOLD1,HOLD /TEST FOR ROWS
241 000266*      005767 002104 /TEST FOR ROWS
242 000272*      001002
243
244 000274*      104410 000000 002074 IS: ENDS,REGIN /
245 000300*      016700 002070 /LET R0 POINT TO SETUP ROUTINES
246 000304*      012767 000001 /SET DROP POINTER
247
248
249 ;CALCULATIONS TO DETERMINE A LEGAL ROW
250
251 000312*      005067 002074 CAL: CLR HI
252 000316*      005067 002066 CLR LO
253 000322*      006267 002050 ASR HOLD /LOOK FOR ROM
254 000326*      103405 000030 RDS /GO SETUP
255 000330*      067700 000030 ADD #24,R0 /MOVE POINTER
256 000334*      006367 002046 ASL POINT /MOVE DROP POINTER
257 000340*      000764 BR CAL
258
259 ;CHECKSUM DRIVER
260
261
262 000342*      004510 DN: JSR R5,(R0) ;GO SETUP
263 000344*      010167 002030 DN1: MOV R1,SAVE /SAVE ROW ADDRESS
264 000350*      010267 002026 MOV R2,SAVE1 /SAVE LIMIT
265 000352*      005767 002034 IS: TEST BFLAG /IS IT A BM873 OR M9301?
266 000360*      001410 BRQ 35 /BRANCH IF NOT
267 000362*      022701 173024 CWP #173024,R1 /ARE WE AT THE DIODE LOCATION?
268 000366*      001403 BRQ 25 /BRANCH IF SO
269 000370*      022701 173224 CMP #173224,R1 /IS THIS THE OTHER DIODE LOCATION
270

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271 ;NOT REALLY TRUE FOR W9301 BUT EXCLUDED FOR SAKE OF COMMON CODE.
272 BNE JS ;BRANCH IF NOT
273 TST (R1)+ ;SKIP THAT LOCATION FOR RM873
274 000400 015701 01620 ;CORRECT WORD COUNT
275 000402 062167 002002 3S: ADD (R1)+,L0 ;ADD CONTENTS OF ROM LOCATION
276 000406 005567 002000 ADC HI ;KEEP CARRY BIT
277 000412 005302 DEC R2 ;LIMIT MET?
278 000414 001357 BNE LS ;NO
279 000416 005767 001772 TST BMFLAG ;WHAT KIND OF ROM?
280 000422 002010 BGE 4S ;BR IF NOT W9301 ON ITS FIRST TRIP THRU
281 000424 012767 000001 001762 MOV R1,RMFLAG ;INDICATE 1ST PART OF W9301 WAS DONE
282 000432 015701 01620 MOV W9301,R1 ;GET OTHER HALF'S ADDR
283 000436 016701 001556 MOV BCDUM,R2 ;SET COUNT UP AGAIN
284 000442 000740 BR 001 ;GO CHECK OTHER HALF
285 000444 000240 4S: NOP ;CHECK TOTAL
286 000446 020367 CMP HI,L0 ;BR IF ERROR
287 000452 001013 BNE ERR ;CHECK CARRY
288 000454 020467 001732 CMP R4,HI
289 000460 001010 BNE ERR
290 000462 104413 000000- ENDITS,BEGIN ;SIGNAL END OF ITERATION.
291 ;MONITOR SHALL TEST END OF PASS
292 000466 005767 001704 ALT: TST HOLD ;ANY MORE ROMS?
293 000472 001672 3RQ STR ;NO
294 000474 020700 ADD R24,R0 ;YES MOVE POINTER
295 000500 000704 BR CAL ;GO DO OTHERS
296
297 ;PASS COUNTER
298
299
300
301
302
303
304
305
306
307
308 000502 026767 001672 001416 ERR: CMP SAVE,AADR ;CHECK FOR VA ERROR
309 000510 001010 BNE ERR1 ;CHECK ALTERNATE LOW SUM
310 000512 026767 001672 001416 CMP L0,ACK
311 000520 001004 BNE ERR1 ;CHECK ALTERNATE HIGH SUM
312 000522 026767 001664 001410 CMP HI,ACK1
313 000530 001756 BEQ ALT ;OK
314
315 000532 016767 001642 177340 ERR1: MOV SAVE,CSRA ;SAVE ROM ADDRESS
316 000540 015701 01620 MOV W9301,CSR ;SAVE CHECKSUM
317 000546 016767 001630 177330 MOV SAVE1,ASTAT ;SAVE LIMIT
318 000554 005067 177326 CLR ERR1 ;UNKNOWN ERROR
319 *****
320 *WDERS,PCIN, NULL ;CHECKSUM ERROR
321 *****
322 MSGNS,BPCIN,MES1 ;ASCII MESSAGE CALL WITH COMMON HEADER
323 000574 046767 001606 001602 BIC PONT,HOLD1 ;CLEAR OFFENDING ROM
324 000602 000167 177452 JAP STR
325
326 ;REGISTER SETUP ROUTINE

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327
328
329 000606 016701 001314 SETUP: MOV AADR,R1 ;SET VA REGISTERS
330 000612 016702 001312 MOV ACK,R2
331 000614 016703 001306 MOV ACK1,R3
332 000622 016704 001306 MOV ACK1,R4
333 000626 012767 000000 001560 MOV R0,RMFLAG
334 000634 000205 RTS R5
335
336
337 000636 016701 001306 MOV BADR,R1 ;SET VB REGISTERS
338 000642 016702 001304 MOV BLM,R2
339 000646 016703 001304 MOV BCK,R3
340 000652 016704 001306 MOV BCK1,R4
341 000656 012767 000000 001530 MOV R0,RMFLAG
342 000664 000205 RTS R5
343
344
345 000666 016701 001256 MOV BADR,R1 ;SET WR-11 REGISTERS
346 000672 016702 001262 MOV BLM,R2
347 000676 016703 001260 MOV BCK,R3
348 000682 016704 001256 MOV BCK1,R4
349 000686 012767 000000 001500 MOV R0,RMFLAG
350 000694 000205 RTS R5
351
352
353 000716 016701 001244 MOV CADR,R1 ;SET VC REGISTERS
354 000722 016702 001202 MOV ACK,R2
355 000726 016703 001236 MOV ACK1,R3
356 000732 016704 001234 MOV ACK1,R4
357 000736 012767 000000 001450 MOV R0,RMFLAG
358 000744 000205 RTS R5
359
360
361 000746 016701 001214 MOV CADR,R1 ;SET VF REGISTERS
362 000752 016702 001216 MOV FLM,R2
363 000756 016703 001214 MOV FCK,R3
364 000762 016704 001212 MOV FCK1,R4
365 000766 012767 000000 001420 MOV R0,RMFLAG
366 000774 000205 RTS R5
367
368
369 000776 016701 001200 MOV HADR,R1 ;SET VH REGISTERS
370 000782 016702 001172 MOV ACK,R2
371 000786 016703 001172 MOV HCK,R3
372 000792 016704 001170 MOV HCK1,R4
373 000796 012767 000000 001370 MOV R0,RMFLAG
374 000804 000205 RTS R5
375
376
377 001026 016701 001156 MOV BMADR,R1 ;SET RM873 VA ADDRESS
378 001032 016702 001154 MOV BLM,R2
379 001036 016703 001152 MOV BMCK,R3
380 001042 016704 001150 MOV BMCK1,R4
381 001046 012767 000001 001340 MOV R1,RMFLAG ;INDICATE TO CHECKSUM ROUTINE
382 001054 000205 RTS R5

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383 001056- 016701 001126      MOV      BMADR,R1      ;SET RM873 Y8 ADDRESS
384 001062- 016702 001132      MOV      BCDLM,R2
385 001066- 016703 001130      MOV      BRMCK,R3
386 001072- 016704 001126      MOV      BRMCK,R4
387 001076- 012767 000001 001310 RTS      #1,BMFLAG      ;INDICATE TO CHECKSUM ROUTINE
388 001104- 000205
389
390 001106- 016701 001076      MOV      BMADR,R1      ;SET RM873 VC ADDRESS
391 001112- 016702 001102      MOV      BCDLM,R2
392 001116- 016703 001130      MOV      BRMCK,R3
393 001122- 016704 001102      MOV      BRMCK,R4
394 001126- 012767 000001 001260 RTS      #1,BMFLAG      ;INDICATE TO CHECKSUM ROUTINE
395 001134- 000205
396
397 001136- 016701 001046      MOV      BMADR,R1      ;SET RM873 VD ADDRESS
398 001142- 016702 001052      MOV      BCDLM,R2
399 001146- 016703 001060      MOV      BRMCK,R3
400 001152- 012767 000001 001230 RTS      #1,BMFLAG      ;INDICATE TO CHECKSUM ROUTINE
401 001156- 000205
402
403 001166- 016701 001016      MOV      BMADR,R1      ;SET M9301 ADDRESS(FIRST HALF)
404 001172- 016702 001022      MOV      BCDLM,R2      ;SET COUNT FOR FIRST HALF
405 001176- 016703 001040      MOV      M93RH,R3      ;SET HIGH SUM
406 001182- 016704 001036      MOV      M93AL,R4      ;SET CARRY SUM
407 001186- 000205 177777 001200 FIXA: MOV      #1,BMFLAG
408
409 001216- 016701 000766      MOV      BMADR,R1      ;SET M9301 ADDRESS(FIRST HALF)
410 001222- 016702 000772      MOV      BCDLM,R2      ;SET COUNT FOR FIRST HALF
411 001226- 016703 001014      MOV      M93RH,R3      ;SET HIGH SUM
412 001232- 016704 001036      MOV      M93AL,R4      ;SET CARRY SUM
413 001236- 000205 177777 001150 FIXB: MOV      #1,BMFLAG
414
415 001246- 016701 000736      MOV      BMADR,R1      ;SET M9301 ADDRESS(FIRST HALF)
416 001252- 016702 000742      MOV      BCDLM,R2      ;SET COUNT FOR FIRST HALF
417 001256- 016703 000770      MOV      M93RH,R3      ;SET HIGH SUM
418 001262- 016704 000766      MOV      M93AL,R4      ;SET CARRY SUM
419 001266- 000205 177777 001120 FIXC: MOV      #1,BMFLAG
420
421 001276- 016701 000640      ;RM792 ROM SETUP
422 001282- 016702 000622      MOV      VLADR,R1
423 001286- 016703 000632      MOV      ACH,R2
424 001292- 012767 000000 001070 MOV      VILCH,R3
425 001296- 000205 177777      MOV      VILDR,R4
426
427 001302- 012767 000000      MOV      #0,BMFLAG
428 001306- 000205 177777      RTS
429
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439 001326- 016701 000656      ;M9400 ROM SETUP
440 001332- 016702 000662      MOV      BMADR,R1      ;SET M9400 ADDRESS(FIRST HALF)
441 001336- 016703 000716      MOV      BCDLM,R2      ;SET COUNT FOR FIRST HALF
442 001342- 012767 000000 001040 MOV      M94RH,R3      ;SET HIGH SUM
443 001346- 000205 177777      MOV      M94AL,R4      ;SET CARRY SUM
444
445
446
447
448
449 001356-
450
451
452
453 001356- 016701 000626      ;RM873 SF ROM SETUP
454 001362- 016702 000632      MOV      BMADR,R1      ;SET BM873 SF ADDRESS
455 001366- 016703 000644      MOV      BCDLM,R2      ;SET COUNT FOR 1ST HALF
456 001372- 016704 000642      MOV      SRMCK,R3      ;SET HI CKSUM
457 001376- 012767 000001 001010 MOV      SRMCK,R4      ;SET LOW CKSUM
458 001382- 000205 177777      MOV      #1,BMFLAG      ;INDICATE TO CKSUM ROUTINE
459
460
461 001406- 016701 000576      ;RM873 SE ROM SETUP
462 001412- 016702 000602      MOV      BMADR,R1      ;SET BM873 SE ADDRESS
463 001416- 016703 000642      MOV      BCDLM,R2      ;SET COUNT FOR 1ST HALF
464 001422- 016704 000640      MOV      SRBNC,R3      ;SET HI CKSUM
465 001426- 012767 000001 000760 MOV      SRBNC,R4      ;SET LOW CKSUM
466 001432- 000205 177777      MOV      #1,BMFLAG      ;INDICATE TO CKSUM ROUTINE
467
468
469 001436- 016701 000546      ;RM873 SC ROM SETUP
470 001442- 016702 000552      MOV      BMADR,R1      ;SET BM873 SC ADDRESS
471 001446- 016703 000616      MOV      BCDLM,R2      ;SET COUNT FOR 1ST HALF
472 001452- 016704 000614      MOV      SCBNC,R3      ;SET HI CKSUM
473 001456- 012767 000001 000730 MOV      SCBNC,R4      ;SET LOW CKSUM
474 001462- 000205 177777      MOV      #1,BMFLAG      ;INDICATE TO CKSUM ROUTINE
475
476
477 001466- 016701 000516      ;M9301 SB SET UP
478 001472- 016702 000522      MOV      BMADR,R1      ;SET M9301 ADDRESS(FIRST HALF)
479 001476- 016703 000572      MOV      BCDLM,R2      ;SET COUNT FOR FIRST HALF
480 001482- 016704 000570      MOV      M93RH,R3      ;SET HIGH SUM
481 001486- 012767 177777 000700 MOV      M93AL,R4      ;SET CARRY SUM
482 001492- 000205 177777      MOV      #1,BMFLAG
483
484 001516- 016701 000466      ;M9301 SA SET UP
485 001522- 016702 000472      MOV      BMADR,R1      ;SET M9301 ADDRESS(FIRST HALF)
486 001526- 016703 000546      MOV      BCDLM,R2      ;SET COUNT FOR FIRST HALF
487 001532- 016704 000544      MOV      M93RH,R3      ;SET HIGH SUM
488 001536- 012767 177777 000650 MOV      M93AL,R4      ;SET CARRY SUM
489 001542- 000205 177777      MOV      #1,BMFLAG
490
491
492 001546- 016701 000436      ;M9301 VD SET UP
493 001552- 016702 000442      MOV      BMADR,R1      ;SET M9301 ADDRESS(FIRST HALF)
494 001556- 016703 000522      MOV      BCDLM,R2      ;SET COUNT FOR FIRST HALF

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495 001562* 016704 000520      MOV      M93VFL,R4      ;SET CARRY SUM
496 001562* 012767 177777      MOV      #1,BMFLAG
497 001574* 000205                RTS      R5
498
499
500
501 001576* 016701 000406      ;M9401 VH SET UP
502 001602* 016703 000412      MOV      BMADR,R1      ;SET M9401 ADDRESS(FIRST HALF)
503 001605* 016703 000416      MOV      BCDLM,R2      ;SET COUNT FOR FIRST HALF
504 001612* 016703 000424      MOV      M93VFL,R4      ;SET HIGH SUM
505 001616* 012767 177777      MOV      #1,BMFLAG      ;SET CARRY SUM
506 001624* 000205                RTS      R5
507
508
509
510 001626* 016701 000356      ;M9301 VF
511 001632* 016703 000362      MOV      BMADR,R1      ;SET M9401 ADDRESS(FIRST HALF)
512 001636* 016703 000452      MOV      BCDLM,R2      ;SET COUNT FOR FIRST HALF
513 001642* 016704 000450      MOV      M93VFL,R4      ;SET HIGH SUM
514 001646* 012767 177777      MOV      #1,BMFLAG      ;SET CARRY SUM
515 001654* 000205                RTS      R5
516
517
518
519 001656* 016701 000326      ;M9301 VH SET UP
520 001662* 016703 000332      MOV      BMADR,R1      ;SET M9301 ADDRESS (FIRST HALF)
521 001666* 016703 000426      MOV      BCDLM,R2      ;SET COUNT FIRST HALF
522 001672* 016704 000424      MOV      M93VFL,R4      ;SET HIGH SUM
523 001676* 012767 177777      MOV      #1,BMFLAG      ;SET CARRY SUM
524 001704* 000205                RTS      R5
525
526
527
528 001706* 016701 000276      ;M9301 VE SET UP
529 001712* 016703 000302      MOV      BMADR,R1      ;SET M9301 ADDRESS (FIRST HALF)
530 001716* 016703 000402      MOV      BCDLM,R2      ;SET COUNT FIRST HALF
531 001722* 016704 000400      MOV      M93VFL,R4      ;SET HIGH SUM
532 001726* 012767 177777      MOV      #1,BMFLAG      ;SET CARRY SUM
533 001734* 000205                RTS      R5
534
535
536
537 001736* 016701 000246      ;M9301 VJ SET UP
538 001742* 016703 000252      MOV      BMADR,R1      ;SET M9301 ADDRESS (FIRST HALF)
539 001746* 016703 000356      MOV      BCDLM,R2      ;SET COUNT FIRST HALF
540 001752* 016704 000356      MOV      M93VFL,R4      ;SET HIGH SUM
541 001756* 012767 177777      MOV      #1,BMFLAG      ;SET CARRY SUM
542 001764* 000205                RTS      R5
543
544
545
546 001766* 016701 000342      ;GROUP R RIT 11 SET UP
547 001772* 016703 000340      MOV      GR11ADR,R1      ;SET ADDRESS
548 001776* 016704 000336      MOV      GR11LIM,R2      ;SET COUNT
549 002002* 016704 000334      MOV      GR11HI,R3      ;SET HIGH SUM
550                                MOV      GR11LO,R4      ;SET CARRY SUM

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551 002006* 012767 177777 000400      MOV      #1,BMFLAG
552 002014* 000205                RTS      R5
553
554
555
556 002016* 016701 000322      ;GROUP R RIT 12 SET UP
557 002022* 016703 000320      MOV      GR12ADR,R1      ;SET ADDRESS
558 002026* 016703 000316      MOV      GR12LIM,R2      ;SET COUNT
559 002032* 016704 000314      MOV      GR12HI,R3      ;SET HIGH SUM
560 002036* 012767 177777      MOV      GR12LO,R4      ;SET CARRY SUM
561 002044* 000205                RTS      R5
562
563
564
565 002046* 016701 000302      ;GROUP R RIT 13 SET UP
566 002052* 016703 000300      MOV      GR13ADR,R1      ;SET ADDRESS
567 002056* 016703 000276      MOV      GR13LIM,R2      ;SET COUNT
568 002062* 016704 000274      MOV      GR13HI,R3      ;SET HIGH SUM
569 002066* 012767 177777      MOV      GR13LO,R4      ;SET CARRY SUM
570 002074* 000205                RTS      R5
571
572
573
574 002076* 016701 000262      ;GROUP R RIT 14 SET UP
575 002102* 016703 000260      MOV      GR14ADR,R1      ;SET ADDRESS
576 002106* 016703 000256      MOV      GR14LIM,R2      ;SET COUNT
577 002112* 016704 000254      MOV      GR14HI,R3      ;SET HIGH SUM
578 002116* 012767 177777      MOV      GR14LO,R4      ;SET CARRY SUM
579 002124* 000205                RTS      R5
580
581
582
583
584 002126* 173000                ;THINGS YOU CANNOT RUN WITHOUT, AT THIS POINT IN TIME.
585 002130* 000400                ADDR: 173000      ;VA ADDRESS
586 002132* 172735                ACK: 32      ;VA LIMIT
587 002134* 000010                ACKH: 10      ;VA CHECKSUM
588 002136* 067715                ACKL: 67715   ;VA CARRY
589 002140* 000010                ACKI: 10      ;VA ALTERNATE LOW SUM
590 002142* 173400                VLAADR: 173400 ;VA ALTERNATE HIGH SUM
591 002144* 066435                VLLHIGH: 66435
592 002146* 000010                VLLLOW: 10
593
594
595
596 002150* 173100                RADR: 173100   ;VB & WP-11 ADDRESS
597 002152* 000032                RLM: 26      ;VB LIMIT
598 002154* 171632                RCK: 171632   ;VB LOW SUM
599 002156* 000006                RCKI: 6       ;VB HI SUM
600
601
602
603 002160* 000100                MLM: 64      ;MR-11 LIMIT
604 002162* 112021                WCK: 112021   ;MR-11 LOW SUM
605 002164* 000020                MCKI: 20     ;MR-11 HI SUM
606
607
608
609 002166* 173200                CADR: 173200   ;YC ADDRESS
610 002170* 124164                CCK: 124164   ;YC LOW SUM
611 002172* 000005                CCKI: 5       ;YC HI SUM

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607	002174	000037	FLM:	31	YF LIMIT
608	002176	111603	FCK:	111603	YF LOW SUM
609	002200	000010	FCK1:	10	YF HI SUM
610					
611	002202	173300	HADR:	173300	YH ADDRESS
612	002204	121506	HCK:	121506	YH LOW SUM
613	002206	000010	HCK1:	10	YH HI SUM
614					
615					
616	002210	173000	BMADR:	173000	BM873 YA LIMIT
617	002212	000200	BMLM:	200	YH SUM
618	002214	000754	BMCK:	00754	LOW SUM
619	002216	000035	BMCK1:	35	
620					
621	002220	000400	BCDLM:	400	BM873 YB,YC,YD LIMIT
622					
623	002222	143524	BRMCK:	143524	BM873 YR HI SUM
624	002224	000065	BRMCK1:	65	BM873 YB LOW SUM
625					
626	002226	076101	CRMCK:	76101	BM873 YC HI SUM
627	002230	000064	CRMCK1:	64	BM873 YC LOW SUM
628					
629	002232	132040	DBMCK:	132040	BM873 YD HI SUM
630	002234	000055	DBMCK1:	55	BM873 YD LOW SUM
631					
632	002236	162074	SRMCK:	162074	BM873 SF HI SUM
633	002240	000054	SRMCK1:	54	BM873 SF LO SUM
634					
635	002242	055367	M93AHI:	55367	M9301YA HI SUM
636	002244	000170	M93ALO:	170	M9301YA CARRY SUM
637					
638	002246	055471	M93RHI:	55471	M9301YB HI SUM
639	002250	000174	M93RLO:	174	M9301YB CARRY SUM
640					
641	002252	162214	M93CHI:	162214	M9301YC HIGH SUM
642	002254	000206	M93CLO:	206	M9301YC CARRY SUM
643					
644	002256	165000	M93ADR:	165000	M9301 LOWER ADDRESS
645					
646	002262	022464	M94HI:	22464	M9400 HIGH SUM
647	002264	000203	M94LO:	203	M9400 CARRY SUM
648					
649	002266	146474	SEBMC:	146474	BM873 SE HI CHECKSUM
650	002268	000063	SEBMC1:	63	LOW
651					
652	002270	015456	SCBMC:	15456	BM873 SC HI CHECKSUM
653	002272	000117	SCBMC1:	117	LOW
654					
655	002274	146054	M93SBH:	146054	M9301 SB HI CHECKSUM
656	002276	000207	M93SBL:	207	LOW
657					
658	002300	025332	M93SAH:	25332	M9301 SA HI CHECKSUM
659	002302	000175	M93SAL:	175	LOW
660					
661	002304	132311	M93VDH:	132311	M9301 VD HI CHECKSUM
662	002306	000177	M93VDL:	177	

663					
664	002310	040774	M94VHH:	40774	M9400 VH HI CHECKSUM
665	002312	000174	M94VHL:	174	M9400 VH LOW CHECKSUM
666					
667	002314	112445	M93VFH:	112445	M9301 VF HIGH CHECKSUM
668	002316	000215	M93VFL:	215	M9301 VF LOW CHECKSUM
669					
670	002320	175261	M93VHH:	175261	M9301 VH HIGH CHECKSUM
671	002322	000174	M93VHL:	174	M9301 VH LOW CHECKSUM
672					
673	002324	024457	M93VEH:	24457	M9301 VE HIGH CHECKSUM
674	002326	000164	M93VEL:	164	M9301 VE LOW CHECKSUM
675					
676	002330	162632	M93VJH:	162632	M9301 VJ HIGH CHECKSUM
677	002332	000153	M93VJL:	153	M9301 VJ LOW CHECKSUM
678					
679	002334	000000	GR11ADR:	0	GRIT 11 ADDRESS
680	002336	000000	GR11LTM:	0	GRIT 11 LIMIT
681	002340	000000	GR11HT:	0	HIGH CHECKSUM
682	002342	000000	GR11LO:	0	CARRY CHECKSUM
683					
684	002344	000000	GR12ADR:	0	GRIT 12 ADDRESS
685	002346	000000	GR12LTM:	0	GRIT 12 LIMIT
686	002350	000000	GR12HT:	0	HIGH CHECKSUM
687	002352	000000	GR12LO:	0	CARRY CHECKSUM
688					
689	002354	000000	GR13ADR:	0	GRIT 13 ADDRESS
690	002356	000000	GR13LTM:	0	GRIT 13 LIMIT
691	002360	000000	GR13HT:	0	HIGH CHECKSUM
692	002362	000000	GR13LO:	0	CARRY CHECKSUM
693					
694	002364	000000	GR14ADR:	0	GRIT 14 ADDRESS
695	002366	000000	GR14LTM:	0	GRIT 14 LIMIT
696	002370	000000	GR14HT:	0	HIGH CHECKSUM
697	002372	000000	GR14LO:	0	CARRY CHECKSUM
698					
699	002374	000000	TEST:	0	HOLDS START OF GROUP A OR B ROM SFTOPS
700	002376	000000	HOLD:	0	SRI SAVED
701	002400	000000	SAVE:	0	SAVE ADDRESS
702	002402	000000	SAVEI:	0	SAVE LIMIT
703	002404	000000	HOLDI:	0	
704					
705					
706					
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 RM873 ROM
711					
712					
713	002416	002422	MRSI:	0000	
714	002418	177777		177777	
715					
716					
717	002422	020045 051104 050117	DROP:	.ASCIZ	* DROPPED OFFENDING ROM *
718	002436	042520 020104 043117			

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719 002436* 042506 042116 047111
720 002444* 020107 047522 020115
721 002452* 000045
722
723
724
725
726
727 000001 .END

```

SEQ 0016

[illegible]

SEQ 0018

286 309 315 708#

[illegible]

PSW	= 177776	229#			
PSW	= 005746	229#			
PSH2	= 024646	229#			
RANNO	= 104417	229#			
RANNO	= 000054R	198#			
RES1	= 000224R	21#	232#		
RES1	= 000056R	200#			
RES2	= 000060R	201#			
RST2T	= 000117R	217#			
SAVF	= 002400R	263#	307	314	701#
SAVF1	= 002402R	265#	316	702#	
SADR	= 000102R	210#			
SHMCK	= 002235R	454			632#
SHMCK1	= 002240R	455			633#
SHMCK	= 002270R	470			657#
SHMCK1	= 002272R	471			658#
SHMCK	= 002264R	462			649#
SHMCK1	= 002265R	463			650#
SETTP	= 000606R	218			329#
SDFCNT	= 000042R	193#			
SDFERS	= 104405	229#			
SDFPAS	= 000046R	198#			
SDFINP	= 000037R	199#			
SPSTZ	= 000040	1#	222		
SR1	= 000016R	182#	232		
SR2	= 000020R	183#			
SR3	= 000022R	184#			
SR4	= 000024R	185#			
START	= 000224R	188	231#		
STAT	= 000026R	187#			
STR	= 000250R	226#	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	= 000057R	197#			
TEST	= 002174R	434*	238*	244	699#
TRPDPR	= 000022	229#			
VPCUR	= 000010R	178#			
WASADR	= 000104R	212#			
WDR	= 000116R	219#			
WDT0	= 000114R	218#			
XFLAG	= 000005R	176#			
YLADR	= 002142R	431	590#		
YLHIGH	= 002144R	433	591#		
YLOW	= 002146R	434	592#		

* ARS. 000000 000
 002454 001

ERRORS DETECTED: 0

DEFAULT GLOBALS GENERATED: 0

YBMCH0, XRMCH0/SOL/CRP:SYM=DDXCOM,XRMCH0
 RUN-TIME: 1 2 4 SECONDS
 RUN-TIME RATIO: 18/4=4.3
 CORE USED: 7K (13 PAGES)