

# BDV11-AA

BDV11-A A DIAG.  
CVM8AC0

AH-B062C-MC

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**digital**

MADE IN USA

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.ENABL ABS,AMA  
. =2000  
.NLIST CND,MD,MEB,ME  
.TITLE USER DOCUMENTATION  
.SBTTL IDENTIFICATION

: IDENTIFICATION  
:  
: -----

: PRODUCT CODE: AC-B061C-MC

: PRODUCT NAME: CVMBACO BDV11-AA DIAG

: MAINTAINER: DIAGNOSTIC ENGINEERING

: AUTHOR: MARY MCNALLY 18-AUG-77

: REVISED: BILL HEAVEY MAY,1979

:  
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: FUNCTIONAL DESCRIPTION: THE BDV11-AA BOOTSTRAP/TERMINATOR/  
: DIAGNOSTIC MODULE PROVIDES THE  
: FOLLOWING FUNCTIONS:  
: 1. ROM RESIDENT HARDWARE DIAGNOSTIC  
: TESTS.  
: 2. PADS FOR ROM RESIDENT BOOTSTRAP  
: ROUTINES FOR THOSE DEVICES WHICH  
: ARE SUPPORTED BY THE LSI-11 SYSTEM.  
: 3. A READ/WRITE STORAGE REGISTER FOR  
: USE BY THE RESIDENT DIAGNOSTIC TESTS.  
: 4. TWELVE DIP ROCKER SWITCHES TO SELECT  
: TESTING AND BOOTSTRAP OPTIONS AT  
: POWER UP.  
: 5. AN ARRAY OF FOUR LED'S TO PROVIDE  
: STATUS INFORMATION.  
: 6. HALT AND REBOOT TOGGLE SWITCHES FOR  
: USE IN SYSTEMS WITHOUT A CONSOLE.  
: 7. SOCKETS FOR 2K WORDS OF EPROM.  
: 8. OPTIONAL REPLACEMENT OF SYSTEM ROM  
: BY 8K WORDS OF EPROM.

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: VERSION: 00

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.SBTTL GENERAL PROGRAM INFORMATION

: PROGRAM PURPOSE: THIS DIAGNOSTIC WILL BE USED TO ESTABLISH  
: CONFIDENCE THAT THE MODULE IS FUNCTIONING  
: PROPERLY. IT WILL PROVIDE CHECKSUM VERI-  
: FICATION OF THE CONTENTS OF THE DIAGNOSTIC  
: ROMS AND ANY ADDITIONAL ROM OR EPROM. IN  
: ADDITION, IT WILL VERIFY THAT THE PROPER  
: DIAGNOSTIC ROMS ARE INSERTED IN THE MODULE  
: BY COMPARING THE ACTUAL CHECKWORDS IN THE  
: ROMS TO THOSE SPECIFIED IN THE DIAGNOSTIC  
: PROGRAM. IT WILL ALSO ACCEPT CHECKWORDS  
: FROM AN OPERATOR FOR USE IN TESTING ANY  
: ADDITIONAL ROM/EPROM. THE DIAGNOSTIC WILL  
: ALSO TEST THE PROGRAMMABLE REGISTERS AND  
: EXERCISE THE LED'S FOR OPERATOR INSPECTION.

: SYSTEM REQUIREMENTS:  
:                   HARDWARE:           LSI-11 PROCESSOR  
:                                        16K WORDS OF MEMORY  
:                                        CONSOLE TERMINAL  
:                                        DIAGNOSTIC PROGRAM LOAD DEVICE

: RELATED DOCUMENTS AND STANDARDS:  
:  
:                   CHQUSB XXDP+/SUPR USER MAN (AC-F348B-MC) TO REFERENCE  
:                   THE DIAGNOSTIC SUPERVISOR COMMAND INSTRUCTIONS.  
:  
:                   DIAGNOSTIC SUPERVISOR FUNCTIONAL SPEC (176-681-001)  
:                   APT/DIAGNOSTIC SUPERVISOR INTERFACE SPEC (176-681-003)

: DIAGNOSTIC HIERARCHY PREREQUISITES:   NONE, ALTHOUGH IT IS ASSSUMED THAT  
:                                            THE CPU IS FUNCTIONING PROPERLY.

: ASSUMPTIONS:  
:  
:                   --WHEN RUNNING UNDER APT, ALL ROCKER  
:                    SWITCHES ARE IN THE 'ON' POSITION.  
:                    THE EXCEPTION TO THIS OCCURS ONLY  
:                    WHEN AN OPERATOR CHANGES THE HARD-  
:                    WARE P-TABLE TO CORRESPOND TO THE NEW  
:                    SWITCH SETTINGS.  
:  
:                   --THE ADDRESS JUMPERS ARE CONFIGURED  
:                    AND MEMORY CHIPS INSTALLED PROPERLY.  
:                    NO TWO CHIPS CAN RESPOND TO THE SAME  
:                    ADDRESS.  
:  
:                   --THE MODULE UNDER TEST RESIDES IN THE  
:                    SAME BACKPLANE AS THAT FROM WHICH THE  
:                    LINE TIME CLOCK IS GENERATED.  
:  
:                   --THE CPU IS WORKING PROPERLY.

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.SBTTL OPERATING INSTRUCTIONS

:1. LOADING AND STARTING PROCEDURES
:   IN SYSTEMS OTHER THAN APT, THE DIAGNOSTIC PROGRAM
:   AND THE DIAGNOSTIC SUPERVISOR WILL BE LOCATED ON THE XXDP+ MEDIA
:   AS TWO SEPARATE FILES.
:
:
:   I. XXDP+ MEDIA
:
:   FOR OPERATING INSTRUCTIONS OF THE SUPERVISOR, PLEASE REFER
:   TO CHQUSB XXDP+/SUPR USER MAN (AC-F348B-MC).
:   ISSUE THE COMMAND ".R CVMBAC". THE XXDP+ MONITOR
:   WILL LOAD THE DIAGNOSTIC AND THE SUPERVISOR FILE
:   HSAA??.SYS AND GIVE CONTROL TO THE SUPERVISOR.
:
:   II. SUPERVISOR COMMANDS
:   ONCE THE SUPERVISOR HAS BEEN INVOKED AT LOCATION 200,
:   THE FOLLOWING COMMANDS SHOULD BE USED SELECTIVELY TO
:   CONTROL THE RUNNING OF THE DIAGNOSTIC:
:2. TO START
:
:   START/TEST:<TESTNOS>/PASS:<PASSCNT>/UNIT:<DEVN>/FLAG:<CF>:<CF>
:   WHERE:
:   TEST      ::= (DEFINES WHICH TESTS TO EXECUTE, IF NO
:                 SPECIFICATION EXECUTE ALL TESTS)
:   PASS      ::= (INDICATES HOW MANY PASSES TO RUN, IF NO SPEC-
:                 IFICATION RUN UNTIL DIAGNOSTIC ESCAPE SEQUENCE)
:   UNIT      ::= (SPECIFIES WHICH UNIT ENTRIES TO GET FROM THE
:                 CONFIGURATION FILE, IF NO SPECIFICATION USE ALL
:                 APPLICABLE UNIT ENTRIES)
:   FLAG      ::= (SPECIFIES THE ERROR CONTROL/REPORT FLAG OPTIONS
:                 TO BE USED)
:   <TESTNOS> ::= (LIST FOR UP TO 16 TESTS TO BE EXECUTED IN AN
:                 ASCENDING ORDER.)
:   <PASSCNT> ::= (NUMBER OF PROGRAM PASSES TO EXECUTE)
:   <DEVN>    ::= (UNIQUE, DEC STANDARD, DEVICE SPECIFIER AND
:                 UNIT NUMBER)
:   <CF>      ::= (ANY OF THE FOLLOWING CONTROL FLAGS:
:                 HOE-HALT ON ERROR
:                 LOE-LOOP ON ERROR AND ATTEMPT REPORT
:                 IER-INHIBIT ALL ERRGR REPORTS
:                 IBE-INHIBIT BASIC AND EXTENDED ERROR REPORTS
:                 IEE-INHIBIT EXTENDED ERROR REPORTS
:                 PRI-DIRECT ALL ERROR, PASS, AND STATISTICAL
:                 REPORTS TO THE LINE PRINTER.
:                 BOE-AUDIO ERROR INDICATION
:                 UAM-UNATTENDED MODE, NO OPERATOR INTERVENTION
:                 PNT-PRINT NUMBER OF TEST BEING EXECUTED.)

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:3. TO RESTART  
: THE RESTART COMMAND IS SIMILAR TO THE START COMMAND EXCEPT  
: THAT ALL PARAMETERS ARE ASSUMED TO BE ALREADY DEFINED, AND NO  
: OPERATOR DIALOGUE IS PERFORMED PRIOR TO RUNNING THE DIAGNOSTIC.  
: IF THE OPERATOR WISHES TO ALTER THE TYPE OF ADDITIONAL MEMORY  
: TO TEST, OR CHANGE THE ADDRESSES, LOCATION 'PASS' MUST BE  
: CLEARED MANUALLY PRIOR TO RESTARTING, SINCE THIS INFORMATION  
: IS SET UP ON THE FIRST PASS OF THE DIAGNOSTIC.  
:  
: RESTART/TEST:<TESTNOS>/PASS:<PASSCNT>/FLAG:<CF>:<CF>...  
:4. TO RETURN TO PROGRAM  
:  
: TO RESUME EXECUTION OF THE DIAGNOSTIC AT THE FIRST INSTRUCTION  
: FOLLOWING THE CURRENT SUPERVISOR CALL, AT WHICH TIME NEW FLAGS  
: MAY BE ASSIGNED.  
:  
: CONTINUE/FLAG:<CF>:<CF>:...  
:5. TO LOAD AND START THE DIAGNOSTIC  
: TO LOAD AND START THE DIAGNOSTIC USING DEFAULT PARAMETERS  
:  
: RUN<FILESPEC>/TEST:<TESTNOS>/PASS:<PASSCNT>/UNIT:<DEVN>/FLAG:<CF>...  
:  
: NOTE: TEST NUMBERS AND UNIT NUMBERS MAY BE SPECIFIED  
: AS SINGLE NUMBERS, RANGES OF NUMBERS (I.E. 1-6 ),  
: OR COMBINATIONS OF BOTH.  
:  
: SPECIAL ENVIRONMENTS: APT  
: TEST 7, THE TEST OF ALL RESIDENT MEMORY, WILL NOT RUN  
: UNDER APT, AS IT REQUIRES USER INTERVENTION.

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: PROGRAM OPTIONS:  
: THE HARDWARE PARAMETERS ARE STORED IN A PARAMETER TABLE WITH  
: DEFAULT VALUES. THE OPERATOR WILL HAVE THE OPTION OF CHANGING  
: THESE PARAMETERS BY RESPONDING TO THE APPROPRIATE QUESTIONS  
: GENERATED BY THE DIAGNOSTIC SUPERVISOR. THESE PARAMETERS  
: INCLUDE THE UNIT NUMBER, INTERRUPT VECTOR, PRIORITY LEVEL, AND  
: ROCKER SWITCH SETTINGS. THE DEFAULT VALUES WILL BE TYPED ALONG  
: WITH THE QUESTIONS.  
: THE ROCKER SWITCH SETTINGS ARE EXAMINED IN THE FOLLOWING  
: ORDER:  
: B4 B3 B2 B1 A8 A7 A6 A5 A4 A3 A2 A1  
: FOR EXAMPLE, IF SWITCHES A1, A2, A6, AND B1 WERE ON, THE SWITCH  
: SETTING WOULD BE:  
: B4 B3 B2 B1 A8 A7 A6 A5 A4 A3 A2 A1  
: 1 1 1 1  
: WHICH HAS AN OCTAL VALUE OF 0443.  
: THE SOFTWARE P-TABLE CONTAINS THE CHECKWORDS FOR THE 2K  
: OF DIAGNOSTIC ROM WHICH IS RESIDENT ON THE BDV11A. TO CHANGE  
: THESE CHECKWORDS, THE OPERATOR MUST RESPOND WITH A YES TO THE  
: SUPERVISOR'S QUESTION "CHANGE SW (Y/N)?" THE DEFAULT VALUES WILL  
: THEN BE PRINTED AS THE QUESTIONS ARE ASKED.  
:  
: TEST 7 CHECKS ALL THE ADDITIONAL MEMORY THAT IT IS  
: INSTRUCTED TO TEST. THIS TEST IS SET UP BY THE OPERATOR ON THE  
: FIRST PASS OF THE DIAGNOSTIC. THE DIAGNOSTIC WILL ASK IF THERE  
: IS ANY ADDITIONAL MEMORY TO TEST, AND IF SO WILL ASK WHICH  
: TYPE OF MEMORY IT IS. (THE OPERATOR CAN ANSWER THESE QUESTIONS  
: WITH LOGICAL Y/N ANSWERS.) IF ANY ADDITIONAL MEMORY IS TO BE  
: TESTED, THE OPERATOR MUST SUPPLY THE CHECKWORDS FOR THOSE  
: ROMS/EPROMS. IN THE CASE OF SYSTEM ROM/EPROM, THE OPERATOR WILL  
: ALSO HAVE TO INDICATE HOW MANY CHECKWORDS WILL BE INPUT (IN DECIMAL).  
: NOTE THAT ONCE THIS DATA IS SET UP, THIS MEMORY WILL ALWAYS BE  
: TESTED, EVEN IF THE DIAGNOSTIC IS RESTARTED, UNLESS THE LOCATION  
: "PASS" IS CLEARED (SEE SEC.3 OF LOADING AND STARTING PROCEDURES).  
:  
: EXECUTION TIMES: A SINGLE ERROR-FREE PASS WILL REQUIRE  
: LESS THAN 1 SEC. TO RUN UNDER APT. WHEN RUN  
: IN STAND-ALONE MODE, IT WILL REQUIRE LESS  
: THAN 3 SECS. TO RUN.

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.SBTTL ERROR INFORMATION

- : ERROR REPORTING PROCEDURES:  
: IN GENERAL, ALL ERROR REPORTS WILL CONTAIN THE FOLLOWING  
: INFORMATION:  
: 1. A HEADER OF TEST IDENTIFICATION INFORMATION.  
: THIS INCLUDES THE PROGRAM NAME, TYPE OF ERROR,  
: ERROR NUMBER, TEST AND SUBTEST NUMBERS, UNIT  
: NUMBER, AND AN OPTIONAL ADDITIONAL MESSAGE.  
: 2. BASIC ERROR INFORMATION.  
: THIS IS A SPECIFIC STATEMENT OF WHAT THE ERROR  
: IS AND WHICH REGISTER OR ROM WAS INVOLVED.  
: 3. EXTENDED ERROR INFORMATION.  
: THIS IS OPTIONAL INFORMATION WHICH IS USED  
: PRIMARILY TO GIVE THE EXPECTED AND ACTUAL  
: CONTENTS OF THE APPROPRIATE DEVICE REGISTER  
: DURING REGISTER TESTS.



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SBTTL SUBTEST SUMMARIES

| TEST NO. | SUBTEST NO. | PURPOSE                                                                                        |
|----------|-------------|------------------------------------------------------------------------------------------------|
| 1        | 1           | TO VERIFY THAT THE READ/WRITE REGISTER CAN HOLD ALL ZEROES.                                    |
|          | 2           | TO VERIFY THAT THE READ/WRITE REGISTER CAN HOLD ALL ONES.                                      |
|          | 3           | TO VERIFY THAT THE READ/WRITE REGISTER CAN HOLD AN ALTERNATING 1'S AND 0'S BIT PATTERN.        |
|          | 4           | TO VERIFY THAT THE READ/WRITE REGISTER IS BYTE ADDRESSABLE.                                    |
|          | 5           | TO VERIFY THAT THE READ/WRITE REGISTER CAN SWAP BYTES.                                         |
|          | 6           | TO VERIFY THAT THE READ/WRITE REGISTER CAN HOLD AN ALTERNATING 0' AND 1'S BIT PATTERN.         |
|          | 7           | TO VERIFY THAT THE READ/WRITE REGISTER IS BYTE ADDRESSABLE.                                    |
|          | 8           | TO VERIFY THAT THE READ/WRITE REGISTER CAN SWAP BYTES.                                         |
|          | 9           | TO VERIFY THAT THE READ/WRITE REGISTER CAN ROTATE A SET BIT WITHOUT PICKING UP ANY BITS.       |
|          | 10          | TO VERIFY THAT THE READ/WRITE REGISTER CAN ROTATE A CLEAR BIT WITHOUT PICKING UP ANY BITS.     |
| 2        | 1           | TEST 2 IS THE SAME AS TEST 1 EXCEPT THAT THE PAGE CONTROL REGISTER IS THE REGISTER UNDER TEST. |
|          | 2           | SAME AS TEST 1.                                                                                |
|          | 3           | SAME AS TEST 1.                                                                                |
|          | 4           | SAME AS TEST 1.                                                                                |
|          | 5           | SAME AS TEST 1.                                                                                |
|          | 6           | SAME AS TEST 1.                                                                                |
|          | 7           | SAME AS TEST 1.                                                                                |
|          | 8           | SAME AS TEST 1.                                                                                |
|          | 9           | SAME AS TEST 1.                                                                                |
|          | 10          | SAME AS TEST 1.                                                                                |
| 3        | 1           | TO VERIFY THAT THE BEVENT CLAMP DISABLE ALLOWS INTERRUPTS WHEN OFF.                            |
|          | 2           | TO VERIFY THAT THE BEVENT CLAMP DISABLE INHIBITS INTERRUPTS WHEN ON.                           |
| 6        | 1           | TO VERIFY THAT THE LOW BYTE DIAGNOSTIC ROM HAS GOOD DATA.                                      |
|          | 2           | TO VERIFY THAT THE HIGH BYTE DIAGNOSTIC ROM HAS GOOD DATA.                                     |
|          | 3           | TO INSURE THAT THE DIAGNOSTIC ROMS HAVE NOT BEEN INTERCHANGED.                                 |
| 7        | 4           | TO DETERMINE IF THERE IS ANY ADDITIONAL MEMORY TO TEST.                                        |
|          | 1           | THIS INFORMATION IS OBTAINED                                                                   |

|     |   |   |                                 |
|-----|---|---|---------------------------------|
| 336 | : |   | THROUGH USER DIALOGUE.          |
| 337 | : | 2 | TO TEST THE EXPANDED DIAGNOSTIC |
| 338 | : |   | ROM. FIRST THE REQUIRED CHECK-  |
| 339 | : |   | WORDS MUST BE INPUT, AND THE    |
| 340 | : |   | STARTING LOCATION IN MEMORY.    |
| 341 | : |   | CHECKSUMS AND CHECKWORD         |
| 342 | : |   | VERIFICATION CONFIRMS GOOD      |
| 343 | : |   | DATA IN ROMS.                   |
| 344 | : | 3 | TO TEST THE EPROM IN THE        |
| 345 | : |   | SOCKETS. TEST PROCEDURE IS AS   |
| 346 | : |   | IN SUBTEST 2.                   |
| 347 | : | 4 | TO TEST SYSTEM ROM. SAME        |
| 348 | : |   | TEST PROCEDURE AS IN SUBTEST 2. |
| 349 | : | 5 | TO TEST SYSTEM EPROM. SAME      |
| 350 | : |   | TEST PROCEDURE AS IN SUBTEST 2. |
| 351 | : |   |                                 |

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352 002000          SVC
353          000000    SVCINS=0
354          000000    SVCGBL=0
355          000000    SVCTAG=0
356          .TITLE PROGRAM HEADER AND TABLES
357          .SBTTL IDENTIFICATION
358
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360          .SBTTL PROGRAM HEADER
361
362 002000          BGNMOD MDHEDR
363 002000 MDHEDR::
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365          :++
366          : THE PROGRAM HEADER IS THE INTERFACE BETWEEN
367          : THE DIAGNOSTIC PROGRAM AND THE SUPERVISOR.
368          :--
369
370 002000          POINTER BGNSW,BGNSFT
371
372
373 002000          HEADER CVM8A,C,0,7,0
374 002000 L$NAME::          ;DIAGNOSTIC NAME
375 002000          103   .ASCII /C/
376 002001          126   .ASCII /V/
377 002002          115   .ASCII /M/
378 002003          070   .ASCII /8/
379 002004          101   .ASCII /A/
380 002005          000   .BYTE 0
381 002006          000   .BYTE 0
382 002007          000   .BYTE 0
383 002010          L$REV::          ;REVISION LEVEL
384 002010          103   .ASCII /C/
385 002011          L$DEPO::          ;0
386 002011          060   .ASCII /0/
387 002012          L$UNIT::          ;NUMBER OF UNITS
388 002012          000000 .WORD 0
389 002014          L$TIML::          ;LONGEST TEST TIME
390 002014          000007 .WORD 7
391 002016          L$HPCP::          ;PTR. TO H.W. QUES.
392 002016          014502 .WORD L$HARD
393 002020          L$SPCP::          ;PTR. TO S.W. QUES.
394 002020          014672 .WORD L$SOFT
395 002022          L$HPTP::          ;PTR. TO DEF. H.W. PTABLE
396 002022          002144 .WORD L$HW
397 002024          L$SPTP::          ;PTR. TO S.W. PTABLE
398 002024          002156 .WORD L$SW
399 002026          L$LADP::          ;DIAG. END ADDRESS
400 002026          015310 .WORD L$LAST
401 002030          L$STA::          ;RESERVED FOR APT STATS
402 002030          000000 .WORD 0
403 002032          L$CO::          ;
404 002032          000000 .WORD 0
405 002034          L$DTYP::          ;DIAGNOSTIC TYPE
406 002034          000000 .WORD 0
407 002036          L$APT::          ;APT EXPANSION

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|     |        |        |           |        |             |                                |
|-----|--------|--------|-----------|--------|-------------|--------------------------------|
| 408 | 002036 | 000000 |           | .WORD  | 0           |                                |
| 409 | 002040 |        | L\$DTP::  |        |             | ;PTR. TO DISPATCH TABLE        |
| 410 | 002040 | 002124 |           | .WORD  | L\$DISPATCH |                                |
| 411 | 002042 |        | L\$PRIO:: |        |             | ;DIAGNOSTIC RUN PRIORITY       |
| 412 | 002042 | 000000 |           | .WORD  | 0           |                                |
| 413 | 002044 |        | L\$EXP1:: |        |             | ;EXPANSION WORDS               |
| 414 | 002044 | 000000 |           | .WORD  | 0           |                                |
| 415 | 002046 |        | L\$EXP2:: |        |             |                                |
| 416 | 002046 | 000000 |           | .WORD  | 0           |                                |
| 417 | 002050 |        | L\$MREV:: |        |             | ;SVC REV AND EDIT #            |
| 418 | 002050 | 003    |           | .BYTE  | C\$REVISION |                                |
| 419 | 002051 | 002    |           | .BYTE  | C\$EDIT     |                                |
| 420 | 002052 |        | L\$EF::   |        |             | ;DIAG. EVENT FLAGS             |
| 421 | 002052 | 000000 |           | .WORD  | 0           |                                |
| 422 | 002054 | 000000 |           | .WORD  | 0           |                                |
| 423 | 002056 |        | L\$SPC::  |        |             |                                |
| 424 | 002056 | 000000 |           | .WORD  | 0           |                                |
| 425 | 002060 |        | L\$DEVP:: |        |             | ; POINTER TO DEVICE TYPE LIST  |
| 426 | 002060 | 003102 |           | .WORD  | L\$DVTYP    |                                |
| 427 | 002062 |        | L\$REPP:: |        |             | ;PTR. TO REPORT CODE           |
| 428 | 002062 | 000000 |           | .WORD  | 0           |                                |
| 429 | 002064 |        | L\$EXP4:: |        |             |                                |
| 430 | 002064 | 000000 |           | .WORD  | 0           |                                |
| 431 | 002066 |        | L\$EXP5:: |        |             |                                |
| 432 | 002066 | 000000 |           | .WORD  | 0           |                                |
| 433 | 002070 |        | L\$AUT::  |        |             | ;PTR. TO ADD UNIT CODE         |
| 434 | 002070 | 000000 |           | .WORD  | 0           |                                |
| 435 | 002072 |        | L\$DUT::  |        |             | ;PTR. TO DROP UNIT CODE        |
| 436 | 002072 | 000000 |           | .WORD  | 0           |                                |
| 437 | 002074 |        | L\$LUN::  |        |             | ; LUN FOR EXERCISERS TO FILL   |
| 438 | 002074 | 000000 |           | .WORD  | 0           |                                |
| 439 | 002076 |        | L\$DESP:: |        |             | ; POINTER TO DIAG. DESCRIPTION |
| 440 | 002076 | 003034 |           | .WORD  | L\$DESC     |                                |
| 441 | 002100 |        | L\$LOAD:: |        |             | ;GENERATE SPECIAL AUTOLOAD EMT |
| 442 | 002100 | 104035 |           | EMT    | E\$LOAD     |                                |
| 443 | 002102 |        | L\$ETP::  |        |             | ;PTR. TO ERR_TBL               |
| 444 | 002102 | 000000 |           | .WORD  | 0           |                                |
| 445 | 002104 |        | L\$ICP::  |        |             | ;PTR. TO INIT CODE             |
| 446 | 002104 | 005140 |           | .WORD  | L\$INIT     |                                |
| 447 | 002106 |        | L\$CCP::  |        |             | ;PTR. TO CLEAN-UP CODE         |
| 448 | 002106 | 005212 |           | .WORD  | L\$CLEAN    |                                |
| 449 | 002110 |        | L\$ACP::  |        |             | ;PTR. TO AUTO CODE             |
| 450 | 002110 | 005210 |           | .WORD  | L\$AUTO     |                                |
| 451 | 002112 |        | L\$PRT::  |        |             | ;PTR. TO PROTECT TABLE         |
| 452 | 002112 | 005202 |           | .WORD  | L\$PROT     |                                |
| 453 | 002114 |        | L\$TEST:: |        |             | ;TEST NUMBER                   |
| 454 | 002114 | 000000 |           | .WORD  | 0           |                                |
| 455 | 002116 |        | L\$DLY::  |        |             | ;DELAY COUNT                   |
| 456 | 002116 | 000000 |           | .WORD  | 0           |                                |
| 457 | 002120 |        | L\$HIME:: |        |             | ;PTR. TO HIGH MEM              |
| 458 | 002120 | 000000 |           | .WORD  | 0           |                                |
| 459 | 002122 |        |           | ENDMOD |             |                                |
| 460 |        |        |           |        |             |                                |

461  
462  
463  
464  
465  
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467  
468 002122  
469 002122  
470 002122  
471 002122 000007  
472 002124  
473 002124 005272  
474 002126 006136  
475 002130 007012  
476 002132 007550  
477 002134 007720  
478 002136 010500  
479 002140 011646  
480 002142  
481  
482  
483  
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485  
486  
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488  
489  
490 002142  
491 002142 000004  
492 002144  
493 002144  
494  
495  
496 002144 000000  
497 002146 000100  
498 002150 000007  
499 002152 007777  
500  
501 002154  
502 002154  
503  
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506  
507  
508  
509  
510  
511 002154  
512 002154 000010  
513 002156  
514 002156  
515  
516

.SBTTL DISPATCH TABLE

:++  
: THE DISPATCH TABLE CONTAINS THE STARTING ADDRESS OF EACH TEST.  
: IT IS USED BY THE SUPERVISOR TO DISPATCH TO EACH TEST.  
:--

BGNMOD DSPCODE  
DSPCODE::  
DISPATCH 7  
.WORD 7  
L\$DISPATCH::  
.WORD T1  
.WORD T2  
.WORD T3  
.WORD T4  
.WORD T5  
.WORD T6  
.WORD T7  
ENDMOD

.SBTTL DEFAULT HARDWARE P-TABLE

:++  
: THE DEFAULT HARDWARE P-TABLE CONTAINS DEFAULT VALUES OF  
: THE TEST-DEVICE PARAMETERS. THE STRUCTURE OF THIS TABLE  
: IS IDENTICAL TO THE STRUCTURE OF THE RUN-TIME P-TABLE.  
:--

BGNHW DFPTBL  
.WORD L10000-L\$HW/2  
L\$HW::  
DFPTBL::  
:DEFAULT VALUES FOR UP TO SIX UNITS  
.WORD 0 ;UNIT NUMBER 0  
.WORD 100 ;INTERRUPT VECTOR  
.WORD 7 ;PRIORITY LEVEL  
.WORD 7777 ;ROCKER SWITCH SETTINGS  
ENDHW  
L10000:

.SBTTL SOFTWARE P-TABLE

:++  
: THE SOFTWARE P-TABLE CONTAINS THE VALUES OF THE PROGRAM  
: PARAMETERS THAT CAN BE CHANGED BY THE OPERATOR.  
:--

BGNSW SFPTBL  
.WORD L10001-L\$SW/2  
L\$SW::  
SFPTBL::

517  
518  
519  
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530  
531

002156 017042  
002160 020656  
002162 065162  
002164 161744  
002166 124453  
002170 113667  
002172 056040  
002174 044734  
002176  
002176

:THE SOFTWARE P-TABLE IS USED TO STORE THE CHECKWORDS  
:FOR THE DIAGNOSTIC ROM WHICH IS TESTED IN TEST 6.

.WORD 17042 ;ROMA: PAGE 0,1  
.WORD 20656 ;ROMB: PAGE 2,3  
.WORD 65162 ;ROMC: PAGE 4,5  
.WORD 161744 ;ROMD: PAGE 6,7  
.WORD 124453 ;ROME: PAGE 10,11  
.WORD 113667 ;ROMF: PAGE 12,13  
.WORD 56040 ;ROMG: PAGE 14,15  
.WORD 44734 ;ROMH: PAGE 16,17  
ENDSW

L10001:

```

532 .TITLE GLOBAL AREAS
533 .SBTTL IDENTIFICATION
534
535
536 .SBTTL GLOBAL EQUATES SECTION
537
538 :++
539 : THE GLOBAL EQUATES SECTION CONTAINS PROGRAM EQUATES THAT
540 : ARE USED IN MORE THAN ONE TEST.
541 :--
542
543 002176          BGNMOD  GLBEQAT
544 002176          GLBEQAT::
545 002176          EQUALS
546
547 : BIT DEFINITIONS
548 :
549          100000      BIT15== 100000
550          040000      BIT14== 40000
551          020000      BIT13== 20000
552          010000      BIT12== 10000
553          004000      BIT11== 4000
554          002000      BIT10== 2000
555          001000      BIT09== 1000
556          000400      BIT08== 400
557          000200      BIT07== 200
558          000100      BIT06== 100
559          000040      BIT05== 40
560          000020      BIT04== 20
561          000010      BIT03== 10
562          000004      BIT02== 4
563          000002      BIT01== 2
564          000001      BIT00== 1
565 :
566          001000      BIT9==  BIT09
567          000400      BIT8==  BIT08
568          000200      BIT7==  BIT07
569          000100      BIT6==  BIT06
570          000040      BIT5==  BIT05
571          000020      BIT4==  BIT04
572          000010      BIT3==  BIT03
573          000004      BIT2==  BIT02
574          000002      BIT1==  BIT01
575          000001      BIT0==  BIT00
576 :
577 : EVENT FLAG DEFINITIONS
578 : EF32:EF17 RESERVED FOR SUPERVISOR TO PROGRAM COMMUNICATION
579 :
580          000040      EF.START==      32.          ; START COMMAND WAS ISSUED
581          000037      EF.RESTART==     31.          ; RESTART COMMAND WAS ISSUED
582          000036      EF.CONTINUE==    30.          ; CONTINUE COMMAND WAS ISSUED
583          000035      EF.NEW==         29.          ; A NEW PASS HAS BEEN STARTED
584          000034      EF.PWR==         28.          ; A POWER-FAIL/POWER-UP OCCURRED
585 :
586 :
587 : PRIORITY LEVEL DEFINITIONS

```

```
588  
589      000340      ;  
590      000300      PRI07== 340  
591      000240      PRI06== 300  
592      000200      PRI05== 240  
593      000140      PRI04== 200  
594      000100      PRI03== 140  
595      000040      PRI02== 100  
596      000000      PRI01== 40  
597                                     PRI00== 0  
598                                     ;  
599                                     ;OPERATOR FLAG BITS  
600      000004      ;  
601      000010      EVL==      4  
602      000020      LOT==      10  
603      000040      ADR==      20  
604      000100      IDU==      40  
605      000200      ISR==     100  
606      000400      UAM==     200  
607      001000      BOE==     400  
608      002000      PNT==    1000  
609      004000      PRI==    2000  
610      010000      IXE==    4000  
611      020000      IBE==   10000  
612      040000      IER==   20000  
613      100000      LOE==   40000  
614                                     HOE==  100000  
615      177520      PCR=177520  
616      177524      LSREG=177524  
617 002176                                     ENDMOD
```



618  
619  
620  
621  
622  
623  
624  
625 002176  
626 002176  
627 002176 000000  
628 002200 000000  
629 002202 000000  
630 002204 000000  
631 002206 000001  
632 002210 000000  
633 002212 000000  
634 002214 000000  
635 002216 000000  
636 002220 000000  
637 002222 000000  
638 002224 000000  
639 002226 000100  
640 002230 000000  
641 002232 000000  
642 002234 000000  
643 002236 000000  
644 002240 000000  
645 002242 000000  
646 002244 000001  
647 002246 000000  
648 002250 000000  
649 002252 000000  
650 002254 000000  
651 002256 000000  
652 002260 000010  
653 002300 000010  
654 002320 000100  
655 002520  
656  
657  
658

.SBTTL GLOBAL DATA SECTION

;++  
: THE GLOBAL DATA SECTION CONTAINS DATA THAT ARE USED  
: IN MORE THAN ONE TEST.  
:--

BGNMOD GLBDAT  
GLBDAT::  
BCF: .WORD 0  
REAL: .WORD 0  
LOPAG: .WORD 0  
COUNTR: .WORD 0  
ANSR: .WORD 1  
RFLAG: .WORD 0  
EXPSUM: .WORD 0  
ACTSUM: .WORD 0  
PASS: .WORD 0  
PASCT: .WORD 0  
ULIMIT: .WORD 0  
PAGE: .WORD 0  
VECT: .WORD 100  
SWSET: .WORD 0  
STORE: .WORD 0  
WORDCT: .WORD 0  
PRIOR: .WORD 0  
CKWD: .WORD 0  
RESPND: .WORD 0  
RSET: .WORD 1  
LORANG: .WORD 0  
HIRANG: .WORD 0  
BYTLOC: .WORD 0  
ERRFLG: .WORD 0  
DELCNT: .WORD 0  
EXPDIA: .BLKW 10  
EPROM: .BLKW 10  
SYSROM: .BLKW 100  
ENDMOD

:EXPANDED DIAG. ROM CHECKWORDS  
:EPROM CHECKWORDS  
:SYSTEM ROM/EPROM CHECKWORDS

```

659          .SBTTL  GLOBAL TEXT SECTION
660
661          :++
662          : THE GLOBAL TEXT SECTION CONTAINS FORMAT STATEMENTS,
663          : MESSAGES, AND ASCII INFORMATION THAT ARE USED IN
664          : MORE THAN ONE TEST.
665          :--
666
667          ;GLOBAL MESSAGES
668
669          RWR:  .ASCIZ  'READ/WRITE REGISTER      ADDRESS: 177522''
670 002520 042522 042101 053457
671 002526 044522 042524 051040
672 002534 043505 051511 042524
673 002542 004522 042101 051104
674 002550 051505 035123 030440
675 002556 033467 031065 000062
676
677 002564 040520 042507 041440  PACR:  .ASCIZ  /PAGE CONTROL REGISTER ADDRESS: 177520/
678 002572 047117 051124 046117
679 002600 051040 043505 051511
680 002606 042524 004522 042101
681 002614 051104 051505 035123
682 002622 030440 033467 031065
683 002630 000060
684
685 002632 044103 041505 051513  CKERR:  .ASCIZ  /CHECKSUM ERROR/
686 002640 046525 042440 051122
687 002646 051117      000
688
689 002651      111 041516 051117  CWDERR:  .ASCIZ  /INCORRECT CHECKWORD/
690 002656 042522 052103 041440
691 002664 042510 045503 047527
692 002672 042122      000
693
694 002675      105 051122 051117  LOBYT:  .ASCIZ  /ERROR OCCURRED IN A LOW BYTE PAGE/
695 002702 047440 041503 051125
696 002710 042522 020104 047111
697 002716 040440 046040 053517
698 002724 041040 052131 020105
699 002732 040520 042507      000
700
701 002737      105 051122 051117  HIBYT:  .ASCIZ  /ERROR OCCURRED IN A HIGH BYTE PAGE/
702 002744 047440 041503 051125
703 002752 042522 020104 047111
704 002760 040440 044040 043511
705 002766 020110 054502 042524
706 002774 050040 043501 000105
707
708 003002 052123 051101 020124  LOADR:  .ASCIZ  /START OF MEMORY RANGE (K)/
709 003010 043117 046440 046505
710 003016 051117 020131 040522
711 003024 043516 020105 045450
712 003032 000051
713
714          .EVEN

```

```

715
716
717
718      : NAMES OF DEVICES SUPPORTED BY PROGRAM
719      :
720      003034      DESCRIPT      <CVM8AC BDV11-AA BOOTSTRAP DIAGNOSTIC>
721      003034      L$DESC::
722      003034      053103      034115      041501      .ASCIZ /CVM8AC BDV11-AA BOOTSTRAP DIAGNOSTIC/
723      003042      041040      053104      030461
724      003050      040455      020101      047502
725      003056      052117      052123      040522
726      003064      020120      044504      043501
727      003072      047516      052123      041511
728      003100      000
729      003102      003102
730      003102      .EVEN
731      003102      DEVTYP <BDV11AA>
732      003102      042102      030526      040461      L$DVTYP::
733      003110      000101      .ASCIZ /BDV11AA/
734      .EVEN
735
736
737      :
738      : FORMAT STATEMENTS USED IN PRINT CALLS
739      :
740
741
742      003112      040445      042522      044507      ZERR: .ASCIZ /%AREGISTER CANNOT HOLD ALL ZEROES%/
743      003120      052123      051105      041440
744      003126      047101      047516      020124
745      003134      047510      042114      040440
746      003142      046114      055040      051105
747      003150      042517      022523      000116
748
749      003156      040445      042522      044507      ONERR: .ASCIZ /%AREGISTER CANNOT HOLD ALL ONES%/
750      003164      052123      051105      041440
751      003172      047101      047516      020124
752      003200      047510      042114      040440
753      003206      046114      047440      042516
754      003214      022523      000116
755
756      003220      040445      042522      044507      BDDAT: .ASCIZ /%AREGISTER CANNOT HOLD GOOD DATA%/
757      003226      052123      051105      041440
758      003234      047101      047516      020124
759      003242      047510      042114      043440
760      003250      047517      020104      040504
761      003256      040524      047045      000
762
763      003263      045      051101      043505      BYTINS: .ASCIZ /%AREGISTER IS NOT BYTE ADDRESSABLE%/
764      003270      051511      042524      020122
765      003276      051511      047040      052117
766      003304      041040      052131      020105
767      003312      042101      051104      051505
768      003320      040523      046102      022505
769      003326      000116
770

```

|     |        |        |        |        |                                                          |
|-----|--------|--------|--------|--------|----------------------------------------------------------|
| 771 | 003330 | 040445 | 042522 | 044507 | ROT1: .ASCIZ /%REGISTER PICKED UP AN EXTRA SET BIT%N/    |
| 772 | 003336 | 052123 | 051105 | 050040 |                                                          |
| 773 | 003344 | 041511 | 042513 | 020104 |                                                          |
| 774 | 003352 | 050125 | 040440 | 020116 |                                                          |
| 775 | 003360 | 054105 | 051124 | 020101 |                                                          |
| 776 | 003366 | 042523 | 020124 | 044502 |                                                          |
| 777 | 003374 | 022524 | 000116 |        |                                                          |
| 778 |        |        |        |        |                                                          |
| 779 | 003400 | 040445 | 042522 | 044507 | ROTO: .ASCIZ /%REGISTER PICKED UP AN EXTRA CLEAR BIT%N/  |
| 780 | 003406 | 052123 | 051105 | 050040 |                                                          |
| 781 | 003414 | 041511 | 042513 | 020104 |                                                          |
| 782 | 003422 | 050125 | 040440 | 020116 |                                                          |
| 783 | 003430 | 054105 | 051124 | 020101 |                                                          |
| 784 | 003436 | 046103 | 040505 | 020122 |                                                          |
| 785 | 003444 | 044502 | 022524 | 000116 |                                                          |
| 786 |        |        |        |        |                                                          |
| 787 | 003452 | 040445 | 047125 | 041101 | DIAGER: .ASCIZ /%UNABLE TO LOCATE CORRECT MEMORY PAGE%N/ |
| 788 | 003460 | 042514 | 052040 | 020117 |                                                          |
| 789 | 003466 | 047514 | 040503 | 042524 |                                                          |
| 790 | 003474 | 041440 | 051117 | 042522 |                                                          |
| 791 | 003502 | 052103 | 046440 | 046505 |                                                          |
| 792 | 003510 | 051117 | 020131 | 040520 |                                                          |
| 793 | 003516 | 042507 | 047045 | 000    |                                                          |
| 794 |        |        |        |        |                                                          |
| 795 | 003523 | 045    | 046501 | 046505 | VIRMSG: .ASCIZ /%MEMORY RANGE: %D2%A - %D2%AK%N/         |
| 796 | 003530 | 051117 | 020131 | 040522 |                                                          |
| 797 | 003536 | 043516 | 035105 | 022440 |                                                          |
| 798 | 003544 | 031104 | 040445 | 026440 |                                                          |
| 799 | 003552 | 022440 | 031104 | 040445 |                                                          |
| 800 | 003560 | 022513 | 000116 |        |                                                          |
| 801 |        |        |        |        |                                                          |
| 802 | 003564 | 040445 | 054105 | 042520 | REGDT: .ASCIZ /%EXPECTED: %06%5%RECEIVED: %06%N/         |
| 803 | 003572 | 052103 | 042105 | 020072 |                                                          |
| 804 | 003600 | 047445 | 022466 | 032523 |                                                          |
| 805 | 003606 | 040445 | 042522 | 042503 |                                                          |
| 806 | 003614 | 053111 | 042105 | 020072 |                                                          |
| 807 | 003622 | 047445 | 022466 | 000116 |                                                          |
| 808 |        |        |        |        |                                                          |
| 809 |        |        |        |        | .EVEN                                                    |

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811  
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819  
820 003630  
821 003630  
822 003630  
823 003630 012746 003112  
824 003634 012746 000001  
825 003640 010600  
826 003642 104414  
827 003644 062706 000004  
828 003650  
829 003650 010246  
830 003652 010146  
831 003654 012746 003564  
832 003660 012746 000003  
833 003664 010600  
834 003666 104415  
835 003670 062706 000010  
836 003674  
837 003674  
838 003674 104423  
839  
840 003676  
841 003676  
842 003676  
843 003676 012746 003156  
844 003702 012746 000001  
845 003706 010600  
846 003710 104414  
847 003712 062706 000004  
848 003716  
849 003716 010246  
850 003720 010146  
851 003722 012746 003564  
852 003726 012746 000003  
853 003732 010600  
854 003734 104415  
855 003736 062706 000010  
856 003742  
857 003742  
858 003742 104423  
859  
860 003744  
861 003744  
862 003744  
863 003744 012746 003220  
864 003750 012746 000001  
865 003754 010600

.SBTTL GLOBAL ERROR REPORT SECTION

```

:++
: THE GLOBAL ERROR REPORT SECTION CONTAINS THE PRINTB AND PRINTX CALLS
: THAT ARE USED IN MORE THAN ONE TEST. IT ALSO INCLUDES THE ASCII MESSAGES
: THAT ARE USED BY THE PRINTB AND PRINTX CALLS.
:--
    
```

```

BGNMSG RERR1
RERR1::
PRINTB #ZERR
      MOV #ZERR,-(SP)
      MOV #1,-(SP)
      MOV SP,R0
      TRAP C$PNTB
      ADD #4,SP
PRINTX #REGDT,R1,R2
      MOV R2,-(SP)
      MOV R1,-(SP)
      MOV #REGDT,-(SP)
      MOV #3,-(SP)
      MOV SP,R0
      TRAP C$PNTX
      ADD #10,SP
ENDMSG
L10002:
      TRAP C$MSG

BGNMSG RERR2
RERR2::
PRINTB #ONERR
      MOV #ONERR,-(SP)
      MOV #1,-(SP)
      MOV SP,R0
      TRAP C$PNTB
      ADD #4,SP
PRINTX #REGDT,R1,R2
      MOV R2,-(SP)
      MOV R1,-(SP)
      MOV #REGDT,-(SP)
      MOV #3,-(SP)
      MOV SP,R0
      TRAP C$PNTX
      ADD #10,SP
ENDMSG
L10003:
      TRAP C$MSG

BGNMSG RERR3
RERR3::
PRINTB #BDDAT
      MOV #BDDAT,-(SP)
      MOV #1,-(SP)
      MOV SP,R0
    
```

|     |        |        |        |         |               |
|-----|--------|--------|--------|---------|---------------|
| 866 | 003756 | 104414 |        | TRAP    | C\$PNTB       |
| 867 | 003760 | 062706 | 000004 | ADD     | #4,SP         |
| 868 | 003764 |        |        | PRINTX  | #REGDT,R1,R2  |
| 869 | 003764 | 010246 |        | MOV     | R2,-(SP)      |
| 870 | 003766 | 010146 |        | MOV     | R1,-(SP)      |
| 871 | 003770 | 012746 | 003564 | MOV     | #REGDT,-(SP)  |
| 872 | 003774 | 012746 | 000003 | MOV     | #3,-(SP)      |
| 873 | 004000 | 010600 |        | MOV     | SP,R0         |
| 874 | 004002 | 104415 |        | TRAP    | C\$PNTX       |
| 875 | 004004 | 062706 | 000010 | ADD     | #10,SP        |
| 876 | 004010 |        |        | ENDMSG  |               |
| 877 | 004010 |        |        | L10004: |               |
| 878 | 004010 | 104423 |        | TRAP    | C\$MSG        |
| 879 |        |        |        |         |               |
| 880 | 004012 |        |        | BGNMSG  | RERR4         |
| 881 | 004012 |        |        | RERR4:: |               |
| 882 | 004012 |        |        | PRINTB  | #BYTINS       |
| 883 | 004012 | 012746 | 003263 | MOV     | #BYTINS,-(SP) |
| 884 | 004016 | 012746 | 000001 | MOV     | #1,-(SP)      |
| 885 | 004022 | 010600 |        | MOV     | SP,R0         |
| 886 | 004024 | 104414 |        | TRAP    | C\$PNTB       |
| 887 | 004026 | 062706 | 000004 | ADD     | #4,SP         |
| 888 | 004032 |        |        | PRINTX  | #REGDT,R1,R2  |
| 889 | 004032 | 010246 |        | MOV     | R2,-(SP)      |
| 890 | 004034 | 010146 |        | MOV     | R1,-(SP)      |
| 891 | 004036 | 012746 | 003564 | MOV     | #REGDT,-(SP)  |
| 892 | 004042 | 012746 | 000003 | MOV     | #3,-(SP)      |
| 893 | 004046 | 010600 |        | MOV     | SP,R0         |
| 894 | 004050 | 104415 |        | TRAP    | C\$PNTX       |
| 895 | 004052 | 062706 | 000010 | ADD     | #10,SP        |
| 896 | 004056 |        |        | ENDMSG  |               |
| 897 | 004056 |        |        | L10005: |               |
| 898 | 004056 | 104423 |        | TRAP    | C\$MSG        |
| 899 |        |        |        |         |               |
| 900 | 004060 |        |        | BGNMSG  | RERR5         |
| 901 | 004060 |        |        | RERR5:: |               |
| 902 | 004060 |        |        | PRINTB  | #ROT1         |
| 903 | 004060 | 012746 | 003330 | MOV     | #ROT1,-(SP)   |
| 904 | 004064 | 012746 | 000001 | MOV     | #1,-(SP)      |
| 905 | 004070 | 010600 |        | MOV     | SP,R0         |
| 906 | 004072 | 104414 |        | TRAP    | C\$PNTB       |
| 907 | 004074 | 062706 | 000004 | ADD     | #4,SP         |
| 908 | 004100 |        |        | ENDMSG  |               |
| 909 | 004100 |        |        | L10006: |               |
| 910 | 004100 | 104423 |        | TRAP    | C\$MSG        |
| 911 |        |        |        |         |               |
| 912 | 004102 |        |        | BGNMSG  | RERR6         |
| 913 | 004102 |        |        | RERR6:: |               |
| 914 | 004102 |        |        | PRINTB  | #ROT0         |
| 915 | 004102 | 012746 | 003400 | MOV     | #ROT0,-(SP)   |
| 916 | 004106 | 012746 | 000001 | MOV     | #1,-(SP)      |
| 917 | 004112 | 010600 |        | MOV     | SP,R0         |
| 918 | 004114 | 104414 |        | TRAP    | C\$PNTB       |
| 919 | 004116 | 062706 | 000004 | ADD     | #4,SP         |
| 920 | 004122 |        |        | ENDMSG  |               |
| 921 | 004122 |        |        | L10007: |               |

GLOBAL ERROR REPORT SECTION

|     |        |        |        |               |                       |
|-----|--------|--------|--------|---------------|-----------------------|
| 922 | 004122 | 104423 |        | TRAP          | C\$MSG                |
| 923 |        |        |        |               |                       |
| 924 | 004124 |        |        | BGNMSG        | PAGERR                |
| 925 | 004124 |        |        | PAGERR::      |                       |
| 926 | 004124 |        |        | PRINTB        | #DIAGER               |
| 927 | 004124 | 012746 | 003452 | MOV           | #DIAGER,-(SP)         |
| 928 | 004130 | 012746 | 000001 | MOV           | #1,-(SP)              |
| 929 | 004134 | 010600 |        | MOV           | SP,R0                 |
| 930 | 004136 | 104414 |        | TRAP          | C\$PNTB               |
| 931 | 004140 | 062706 | 000004 | ADD           | #4,SP                 |
| 932 | 004144 |        |        | ENDMSG        |                       |
| 933 | 004144 |        |        | L10010:       |                       |
| 934 | 004144 | 104423 |        | TRAP          | C\$MSG                |
| 935 |        |        |        |               |                       |
| 936 |        |        |        |               |                       |
| 937 |        |        |        |               |                       |
| 938 | 004146 |        |        | VIPRI: PRINTF | #VIRMSG,LORANG,HIRANG |
| 939 | 004146 | 013746 | 002250 | MOV           | HIRANG,-(SP)          |
| 940 | 004152 | 013746 | 002246 | MOV           | LORANG,-(SP)          |
| 941 | 004156 | 012746 | 003523 | MOV           | #VIRMSG,-(SP)         |
| 942 | 004162 | 012746 | 000003 | MOV           | #3,-(SP)              |
| 943 | 004166 | 010600 |        | MOV           | SP,R0                 |
| 944 | 004170 | 104417 |        | TRAP          | C\$PNTF               |
| 945 | 004172 | 062706 | 000010 | ADD           | #10,SP                |
| 946 |        |        |        |               |                       |
| 947 |        |        |        |               |                       |
| 948 |        |        |        |               | .EVEN                 |
| 949 |        |        |        |               |                       |
| 950 |        |        |        |               |                       |
| 951 |        |        |        |               |                       |
| 952 |        |        |        |               |                       |

GLOBAL SUBROUTINES SECTION

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.SBTTL GLOBAL SUBROUTINES SECTION

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:++
: THE GLOBAL SUBROUTINES SECTION CONTAINS THE SUBROUTINES
: THAT ARE USED IN MORE THAN ONE TEST.
:--
    
```

```

:++
:FUNCTIONAL DESCRIPTION:
:SUBROUTINE TO COMPUTE A CHECKSUM IN A ROM/EPROM
:INPUT: CONTENTS OF BCF
:IMPLICIT INPUTS: CONTENTS OF PCR
:OUTPUT: A CHECKSUM VALUE STORED IN LOCATION ACTSUM
:CALLING SEQUENCE: JSR PC,CHKSUM
:--
    
```

|        |        |        |
|--------|--------|--------|
| 004176 | 012701 | 173776 |
| 004202 | 063701 | 002176 |
| 004206 | 005037 | 002214 |
| 004212 | 012702 | 173000 |
| 004216 | 063702 | 002176 |
| 004222 | 111204 |        |
| 004224 | 060437 | 002214 |
| 004230 | 062702 | 000002 |
| 004234 | 020201 |        |
| 004236 | 002771 |        |
| 004240 | 000207 |        |

```

CHKSUM: MOV     #173776,R1      ;STORE THE HIGHEST ADDRESS IN THE ROM
        ADD     BCF,R1        ;FOR EITHER LOW OR HIGH BYTES
        CLR     ACTSUM       ;CLEAR LOCATION WHICH WILL HOLD THE CHECKSUM
        MOV     #173000,R2    ;COMPUTE THE LOWEST ADDRESS IN THE ROM
        ADD     BCF,R2        ;WHERE THE DATA WILL START
1$:     MOVB    (R2),R4       ;GET DATA IN BYTES
        ADD     R4,ACTSUM     ;ADD CONTENTS OF EACH LOCATION TO THE CHECKSUM
        ADD     #2,R2        ;ADJUST ADDRESS
        CMP     R2,R1        ;COMPARE CURRENT ADDRESS WITH HIGHEST ADDRESS
        BLT    1$           ;BR IF LESS THAN
        RTS     PC           ;RETURN
    
```



GLOBAL SUBROUTINES SECTION

```

981      :++
982      :SUBROUTINE TO INPUT CHECKWORDS FROM THE OPERATOR
983      :INPUTS: NUMBER OF CHECKWORDS TO INPUT
984      :          POINTER TO STORAGE AREA
985      :OUTPUTS: CHECKWORDS STORED IN PROPER TABLE
986      :CALLING SEQUENCE: JSR PC,INPUT
987      :--
988
989      004242      INPUT: PRINTF #INSTR          ;PRINT INSTRUCTIONS
990      004242      012746      004320      MOV #INSTR,-(SP)
991      004246      012746      000001      MOV #1,-(SP)
992      004252      010600      MOV SP,R0
993      004254      104417      TRAP C$PNTF
994      004256      062706      000004      ADD #4,SP
995      004262      INLP: GMANID INWORD,STORE,G,-1,0,177777,NO
996      004262      104443      TRAP C$GMAN
997      004264      000406      BR 10000$
998      004266      002232      .WORD STORE
999      004270      000022      .WORD T$CODE
1000     004272      004406      .WORD INWORD
1001     004274      177777      .WORD -1
1002     004276      000000      .WORD T$LOLIM
1003     004300      177777      .WORD T$HILIM
1004     004302
1005     004302      013722      002232      10000$: MOV STORE,(R2)+ ;PUT CHECKWORD IN TABLE
1006     004306      005337      002234      DEC WORDCT ;DECREMENT WORD COUNT
1007     004312      001401      BEQ 1$ ;BR IF FINISHED
1008     004314      000762      BR INLP ;LOOP UNTIL TABLE IS COMPLETE
1009     004316      000207      1$: RTS PC ;RETURN
1010
1011     004320      040445      054524      042520      INSTR: .ASCIZ /%ATYPE IN THE CHECKWORDS AS LISTED IN THE PRINT SET%N/
1012     004326      044440      020116      044124
1013     004334      020105      044103      041505
1014     004342      053513      051117      051504
1015     004350      040440      020123      044514
1016     004356      052123      042105      044440
1017     004364      020116      044124      020105
1018     004372      051120      047111      020124
1019     004400      042523      022524      000116
1020
1021     004406      044103      041505      053513      INWORD: .ASCIZ /CHECKWORD: /
1022     004414      051117      035104      000040
1023
1024     .EVEN
1025

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1026      :++
1027      :SUBROUTINE TO COMPUTE THE VIRTUAL ADDRESS OF A BAD
1028      :PAGE IN MEMORY
1029      :INPUTS: PAGE IN PAGE CONTROL REGISTER
1030      :          BYTE CONTROL FLAG (BCF)
1031      :OUTPUTS: MEMORY RANGE IN WHICH ERROR OCCURRED
1032      :CALLING SEQUENCE: JSR PC,VIRTAD
1033      :--
1034
1035      004422 005001 VIRTAD: CLR      R1          ;START AT BOTTOM OF RANGE
1036      004424 012737 000007 002222      MOV      #7,ULIMIT ;SET UPPER LIMIT OF PAGE
1037      004432 113737 177520 002224      MOVB    PCR,PAGE   ;LOW PAGE ERROR
1038      004440 023737 002224 002222 LPADD:  CMP     PAGE,ULIMIT ;IS PAGE <=ULIMIT
1039      004446 003430      BLE     OUTPUT    ;BR IF YES
1040      004450 022737 000057 002222      CMP     #57,ULIMIT ;IS ULIMIT = 57
1041      004456 001006      BNE     1$        ;BR IF NO
1042      004460 012737 000207 002222      MOV     #207,ULIMIT ;CHANGE UPPER LIMIT
1043      004466 012701 000020      MOV     #20,R1     ;ADJUST MEMORY POINTER
1044      004472 000762      BR      LPADD     ;CHECK PAGE AGAIN
1045      004474 062737 000010 002222 1$:  ADD     #10,ULIMIT ;INCREASE UPPER LIMIT
1046      004502 022737 000377 002222      CMP     #377,ULIMIT ;HAS THE UPPER LIMIT EXCEEDED THE MAX. PAGE
1047      004510 002004      BGE     2$        ;BR IF NO
1048      004512      ERRDF  40,,PAGERR ;COULD NOT FIND THE PAGE OF MEMORY
1049      004512 104455      TRAP   C$ERDF
1050      004514 000050      .WORD  40
1051      004516 000000      .WORD  0
1052      004520 004124      .WORD  PAGERR
1053      004522      2$:  CKLOOP
1054      004522 104406      TRAP   C$CLP1
1055      004524 005201      INC     R1        ;ADJUST POINTER
1056      004526 000744      BR      LPADD    ;LOOP UNTIL UPPER LIMIT IS FOUND
1057      004530 010137 002246      OUTPUT: MOV    R1,LORANG ;PULL THE LOW RANGE OUT OF THE TABLE
1058      004534 013737 002246 002250      MOV    LORANG,HIRANG ;COPY THE DATA
1059      004542 005237 002250      INC    HIRANG    ;INCREMENT TO OBTAIN 1K RANGE
1060      004546 005737 002210      TST   RFLAG     ;IS IT ROM (2K SEGMENTS)
1061      004552 001402      BEQ   3$        ;BR IF NO
1062      004554 005237 002250      INC   HIRANG    ;OBTAIN 2K RANGE
1063      004560 000207      3$:  RTS    PC     ;RETURN
1064

```

```

1065      :++
1066      :SUBROUTINE TO VERIFY THE CHECKSUM VALUE OF A PAGE
1067      :OF EXISTENT MEMORY AND ALSO TEST FOR THE PROPER CHECKWORD.
1068      :INPUTS: PAGE CONTROL REGISTER, PAGE CHECKWORD.
1069      :OUTPUTS: ERROR FLAGS WHICH POINT TO THE PROPER ERROR MESSAGE
1070      :SUBORDINATE ROUTINES USED: CHKSUM
1071      :CALLING SEQUENCE: JSR PC, MEMTST
1072      :--
1073
1074      004562 005037 002200      MEMTST: CLR      REAL      ;CLEAR MEMORY INDICATOR
1075      004566 005037 002176      LOBYTE: CLR      BCF      ;SIGNAL LOW BYTES ARE BEING CHECKED
1076      004572 122737 177777 173774      CMPB     #-1,@#173774 ;DOES THE ROM EXIST
1077      004600 001421      BEQ      HIBYTE    ;BR IF NO
1078      004602 005237 002200      INC      REAL      ;INDICATE THAT MEMORY EXISTS
1079      004606 004737 004176      JSR      PC,CHKSUM ;COMPUTE THE ACTUAL CHECKSUM
1080      004612 113737 173776 002212      MOVB     @#173776,EXPSUM ;GET THE STORED CHECKSUM
1081      004620 063737 002214 002212      ADD      ACTSUM,EXPSUM ;ADD THE EXPECTED AND ACTUAL CHECKSUMS
1082      004626 105737 002212      TSTB     EXPSUM     ;TEST RESULTING CHECKBYTE
1083      004632 001404      BEQ      1$        ;BR IF NO ERROR
1084      004634 012737 000001 002254      MOV      #1,ERRFLG ;SET CHECKSUM ERROR FLAG
1085      004642 000207      RTS      PC        ;RETURN
1086      004644      1$:
1087
1088      004644 012737 000001 002176      HIBYTE: MOV      #1,BCF      ;SET BCF TO DENOTE HIGH BYTES
1089      004652 122737 177777 173775      CMPB     #-1,@#173775 ;DOES THE ROM EXIST
1090      004660 001427      BEQ      TSTCKW    ;BR IF NO
1091      004662 005737 002200      TST      REAL      ;WAS THERE A LOW ROM?
1092      004666 001003      BNE      2$        ;BR IF YES
1093      004670 005037 002200      CLR      REAL      ;DENOTE NON-EXISTENT LOW ROM
1094      004674 000207      RTS      PC        ;RETURN FOR ERROR MESSAGE
1095      004676 005237 002200      2$: INC      REAL      ;INDICATE MEMORY EXISTS
1096      004702 004737 004176      JSR      PC,CHKSUM ;COMPUTE CHECKSUM
1097      004706 113737 173777 002212      MOVB     @#173777,EXPSUM ;GET EXPECTED CHECKSUM
1098      004714 063737 002214 002212      ADD      ACTSUM,EXPSUM ;ADD THE EXPECTED AND ACTUAL CHECKSUMS
1099      004722 105737 002212      TSTB     EXPSUM     ;TEST RESULTING CHECKBYTE
1100      004726 001404      BEQ      TSTCKW    ;BR IF EQUAL
1101      004730 012737 000001 002254      MOV      #1,ERRFLG ;SET CHECKSUM ERROR FLAG
1102      004736 000207      RTS      PC        ;RETURN
1103
1104      004740 005737 002200      TSTCKW: TST      REAL      ;ANY MEMORY?
1105      004744 001420      BEQ      5$        ;BR IF NO
1106      004746 022737 000001 002200      CMP      #1,REAL    ;SINGLE ROM?
1107      004754 001005      BNE      3$        ;BR IF NO
1108      004756 123737 002240 173776      CMPB     CKWD,@#173776 ;COMPARE CHECKBYTE ONLY
1109      004764 001005      BNE      4$        ;BR IF ERROR
1110      004766 000207      RTS      PC        ;RETURN -- NO ERROR
1111      004770 023737 002240 173776      3$: CMP      CKWD,@#173776 ;COMPARE CHECKWORD
1112      004776 001403      BEQ      5$        ;BR IF NO ERROR
1113      005000 012737 000002 002254      4$: MOV      #2,ERRFLG ;DENOTE CHECKSUM ERROR
1114      005006 000207      5$: RTS      PC        ;RETURN
1115

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1172 005126 001372  
1173 005130 012602  
1174 005132 012601  
1175 005134 000205  
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1177  
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BNE 2\$  
MOV (SP)+,R2  
MOV (SP)+,R1  
RTS R5

:BRANCH AND DO ANOTHER MSEC  
:SETUP FOR RETURN AFTER DELAY

```

1194 .TITLE MISCELLANEOUS SECTIONS
1195 .SBTTL IDENTIFICATION
1196
1197
1198 .SBTTL REPORT CODING SECTION
1199
1200 005136 BGNRPT
1201 005136 L$RPT::
1202 005136 ENDRPT
1203 005136 L10011:
1204 005136 104425 TRAP C$RPT
1205
1206
1207 .SBTTL INITIALIZE SECTION
1208
1209 :++
1210 : THE INITIALIZE SECTION CONTAINS THE CODING THAT IS PERFORMED
1211 : AT THE BEGINNING OF EACH PASS.
1212 :--
1213
1214 005140 BGNINIT
1215 005140 L$INIT::
1216 005140 GPWARD #0,R1 ;GET POINTER TO BASE ADDRESS OF P-TABLE
1217 005140 012700 000000 MOV #0,R0
1218 005144 104442 TRAP C$GPWARD
1219 005146 010001 MOV R0,R1
1220 005150 016137 000002 002226 MOV 2(R1),VECT ;GET INTERRUPT VECTOR
1221 005156 016137 000004 002236 MOV 4(R1),PRIOR ;GET PRIORITY LEVEL
1222 005164 016137 000006 002230 MOV 6(R1),SWSET ;GET ROCKER SWITCH SETTINGS
1223 005172 SETPRI #PRI07 ;INHIBIT INTERRUPTS
1224 005172 012700 000340 MOV #PRI07,R0
1225 005176 104441 TRAP C$SPRI
1226
1227
1228 005200 ENDINIT
1229 005200 L10012:
1230 005200 104411 TRAP C$INIT
1231
1232 005202 BGNPROT
1233 005202 L$PROT::
1234 005202 177777 .WORD -1 ;CSR OFFSET
1235 005204 177777 .WORD -1 ;MASS BUS OFFSET
1236 005206 177777 .WORD -1 ;DRIVE OFFSET
1237 005210 ENDPROT
1238
1239 005210 BGNAUTO
1240 005210 L$AUTO::
1241 005210 ENDAUTO
1242 005210 L10014:
1243 005210 104461 TRAP C$AUTO
  
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.SBTTL CLEANUP CODING SECTION

:++  
: THE CLEANUP CODING SECTION CONTAINS THE CODING THAT IS PERFORMED  
: AT THE END OF EACH PASS.  
:--

BGNCLN

L\$CLEAN::

|        |         |                              |
|--------|---------|------------------------------|
| CLR    | PCR     | :CLEAR PAGE CONTROL REGISTER |
| CLR    | RWREG   | :CLEAR READ/WRITE REGISTER   |
| MOV    | #1,RSET | :RESTORE DEFAULT VALUE       |
| CLR    | RESPND  | :RESTORE DEFAULT             |
| CLR    | ADDON   | :RESTORE DEFAULT             |
| MOV    | #1,ANSR | :RESTORE DEFAULT             |
| INC    | PASS    | :INCREMENT PASS COUNT        |
| INC    | PASCT   | :INCREMENT TEST 4 PASS COUNT |
| CLRVEC | VECT    | :CLEAR INTERRUPT VECTOR      |
| MOV    | VECT,R0 |                              |
| TRAP   | C\$CVEC |                              |

EXIT CLN  
TRAP C\$EXIT  
.WORD L10015-

ENDCLN

L10015:

TRAP C\$CLEAN

CLEANUP CODING SECTION

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.TITLE HARDWARE TESTS  
 .SBTTL IDENTIFICATION

.SBTTL TEST 1: READ/WRITE REGISTER TEST  
 :++  
 :TEST TO VERIFY THAT THE READ/WRITE REGISTER AT ADDRESS 177522  
 :IS WORD AND BYTE ADDRESSABLE.  
 :--

177522

RWREG=177522

005272

BGNTST

005272

BGNSUB

005272 104402

TRAP C\$BSUB

005274 005037 177522

CLR RWREG

:LOAD ALL ZEROS

005300 001412

BEQ 1\$

:BR IF CLEAR

005302 005001

CLR R1

:EXPECTED DATA

005304 013702 177522

MOV RWREG,R2

:COPY CONTENTS

005310

ERRDF 1,RWR,RERR1

:REGISTER CANNOT HOLD ALL ZEROS

005310 104455

TRAP C\$ERDF

005312 000001

.WORD 1

005314 002520

.WORD RWR

005316 003630

.WORD RERR1

005320

CKLOOP

:LOOP ON ERROR IF SELECTED

005320 104406

TRAP C\$CLP1

:ABORT TEST IF LOOP ON ERROR NOT SELECTED

005322 104432

EXIT TST

005324 000610

TRAP C\$EXIT

005326

.WORD L10016-

005326 104406

1\$:

CKLOOP

:LOOP ON ERROR IF SELECTED

005330

TRAP C\$CLP1

005330

ENDSUB

005330 104403

L10017:

TRAP C\$ESUB

005332

BGNSUB

005332 104402

TRAP C\$BSUB

005334 012737 177777 177522

MOV #-1,RWREG

:LOAD ALL ONES

005342 022737 177777 177522

CMP #177777,RWREG

:CHECK THE REGISTER

005350 001413

BEQ 2\$

:BR IF HOLDING GOOD DATA

005352 012701 177777

MOV #-1,R1

:EXPECTED DATA

005356 013702 177522

MOV RWREG,R2

:COPY CONTENTS

005362

ERRDF 2,RWR,RERR2

:REGISTER CANNOT HOLD ALL ONES

005362 104455

TRAP C\$ERDF

005364 000002

.WORD 2

005366 002520

.WORD RWR

005370 003676

.WORD RERR2

005372

CKLOOP

:LOOP ON ERROR IF SELECTED

005372 104406

TRAP C\$CLP1

:ABORT TEST IF ERROR AND NO LOOPING

005374 104432

EXIT TST

005376 000536

TRAP C\$EXIT

005400

.WORD L10016-

005400 104406

2\$:

CKLOOP

:LOOP ON ERROR IF SELECTED

005402

TRAP C\$CLP1

005402

ENDSUB



TEST 1: READ/WRITE REGISTER TEST

```

1332 005402          L10020:
1333 005402 104403   TRAP    C$ESUB
1334
1335 005404          BGNSUB
1336 005404 104402   TRAP    C$BSUB
1337 005406 012737 125252 177522   MOV    #125252,RWREG   ;LOAD ALTERNATING 1'S AND 0'S BIT PATTERN
1338 005414 022737 125252 177522   CMP    #125252,RWREG   ;CHECK DATA
1339 005422 001413   BEQ    3$              ;BR IF GOOD
1340 005424 012701 125252   MOV    #125252,R1     ;EXPECTED DATA
1341 005430 013702 177522   MOV    RWREG,R2      ;COPY CONTENTS
1342 005434          ERRDF   3,RWR,RERR3   ;CANNOT HOLD GOOD DATA
1343 005434 104455   TRAP    C$ERDF
1344 005436 000003   .WORD  3
1345 005440 002520   .WORD  RWR
1346 005442 003744   .WORD  RERR3
1347 005444          CKLOOP
1348 005444 104406   TRAP    C$CLP1       ;LOOP ON ERROR IF SELECTED
1349 005446          EXIT    TST          ;ABORT TEST IF ERROR DETECTED
1350 005446 104432   TRAP    C$EXIT
1351 005450 000464   .WORD  L10016-.
1352 005452          3$: CKLOOP
1353 005452 104406   TRAP    C$CLP1       ;CHECK FOR LOOP ON ERROR AGAIN
1354 005454
1355 005454          L10021:
1356 005454 104403   TRAP    C$ESUB
1357
1358 005456          BGNSUB
1359 005456 104402   TRAP    C$BSUB
1360 005460 105037 177522   CLR    RWREG         ;CLEAR THE REGISTER'S LOW BYTE
1361 005464 022737 125000 177522   CMP    #125000,RWREG   ;DID IT CLEAR PROPERLY?
1362 005472 001413   BEQ    4$              ;BR IF YES
1363 005474 012701 125000   MOV    #125000,R1     ;EXPECTED DATA
1364 005500 013702 177522   MOV    RWREG,R2      ;COPY CONTENTS
1365 005504          ERRDF   4,RWR,RERR4   ;DID NOT RESPOND PROPERLY TO BYTE INSTRUCTION
1366 005504 104455   TRAP    C$ERDF
1367 005506 000004   .WORD  4
1368 005510 002520   .WORD  RWR
1369 005512 004012   .WORD  RERR4
1370 005514          CKLOOP
1371 005514 104406   TRAP    C$CLP1       ;LOOP ON ERROR IF SELECTED
1372 005516          EXIT    TST          ;ABORT TEST IF ERROR DETECTED
1373 005516 104432   TRAP    C$EXIT
1374 005520 000414   .WORD  L10016-.
1375 005522          4$: CKLOOP
1376 005522 104406   TRAP    C$CLP1       ;CHECK FOR LOOP ON ERROR AGAIN
1377 005524
1378 005524          L10022:
1379 005524 104403   TRAP    C$ESUB
1380
1381 005526          BGNSUB
1382 005526 104402   TRAP    C$BSUB
1383 005530 000337 177522   SWAB   RWREG         ;SWAP BYTES IN THE REGISTER
1384 005534 022737 000252 177522   CMP    #252,RWREG     ;GOOD DATA?
1385 005542 001407   BEQ    5$              ;BR IF YES
1386 005544          ERRDF   5,RWR,RERR4   ;BYTE INSTRUCTION ERROR
1387 005544 104455   TRAP    C$ERDF

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1388 005546 000005 .WORD 5
1389 005550 002520 .WORD RWR
1390 005552 004012 .WORD RERR4
1391 005554 CKLOOP ;LOOP ON ERROR IF SELECTED
1392 005554 104406 TRAP C$CLP1
1393 005556 EXIT TST ;ABORT TEST IF ERROR DETECTED
1394 005556 104432 TRAP C$EXIT
1395 005560 000354 .WORD L10016-.
1396 005562 5$: CKLOOP ;CHECK FOR LOOP ON ERROR AGAIN
1397 005562 104406 TRAP C$CLP1
1398 005564 ENDSUB
1399 005564 L10023:
1400 005564 104403 TRAP C$ESUB
1401
1402 005566 BGNSUB
1403 005566 104402 TRAP C$BSUB
1404 005570 012737 052525 177522 MOV #052525,RWREG ;LOAD AN ALTERNATING 0'S AND 1'S BIT PATTERN
1405 005576 022737 052525 177522 CMP #052525,RWREG ;CHECK IT
1406 005604 001413 BEQ 6$ ;BR IF GOOD DATA
1407 005606 012701 052525 MOV #052525,R1 ;EXPECTED DATA
1408 005612 013702 177522 MOV RWREG,R2 ;COPY CONTENTS
1409 005616 ERRDF 6,RWR,RERR3 ;CANNOT HOLD GOOD DATA
1410 005616 104455 TRAP C$ERDF
1411 005620 000006 .WORD 6
1412 005622 002520 .WORD RWR
1413 005624 003744 .WORD RERR3
1414 005626 CKLOOP ;LOOP ON ERROR IF SELECTED
1415 005626 104406 TRAP C$CLP1
1416 005630 EXIT TST ;ABORT TEST IF ERROR DETECTED
1417 005630 104432 TRAP C$EXIT
1418 005632 000302 .WORD L10016-.
1419 005634 6$: CKLOOP ;CHECK FOR LOOP ON ERROR AGAIN
1420 005634 104406 TRAP C$CLP1
1421 005636 ENDSUB
1422 005636 L10024:
1423 005636 104403 TRAP C$ESUB
1424
1425 005640 BGNSUB
1426 005640 104402 TRAP C$BSUB
1427 005642 105037 177523 CLR B RWREG+1 ;CLEAR HIGH BYTE OF REGISTER
1428 005646 022737 000125 177522 CMP #125,RWREG ;CHECK THE RESULTING CONTENTS OF THE REGISTER
1429 005654 001413 BEQ 7$ ;BR IF GOOD DATA
1430 005656 012701 000125 MOV #125,R1 ;EXPECTED DATA
1431 005662 013702 177522 MOV RWREG,R2 ;COPY CONTENTS
1432 005666 ERRDF 7,RWR,RERR4 ;BYTE INSTRUCTION ERROR
1433 005666 104455 TRAP C$ERDF
1434 005670 000007 .WORD 7
1435 005672 002520 .WORD RWR
1436 005674 004012 .WORD RERR4
1437 005676 CKLOOP ;LOOP ON ERROR IF SELECTED
1438 005676 104406 TRAP C$CLP1
1439 005700 EXIT TST ;ABORT TEST IF ERROR DETECTED
1440 005700 104432 TRAP C$EXIT
1441 005702 000232 .WORD L10016-.
1442 005704 7$: CKLOOP ;CHECK FOR LOOP ON ERROR AGAIN
1443 005704 104406 TRAP C$CLP1

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1444 005706          ENDSUB
1445 005706          L10025: TRAP      C$ESUB
1446 005706 104403
1447
1448 005710          BGNSUB
1449 005710 104402   TRAP      C$BSUB
1450 005712 000337 177522   SWAB     RWREG      ;SWAP BYTES
1451 005716 022737 052400 177522   CMP      #052400,RWREG ;DATA GOOD?
1452 005724 001413          BEQ      10$        ;BR IF YES
1453 005726 012701 052400   MOV      #52400,R1   ;EXPECTED DATA
1454 005732 013702 177522   MOV      RWREG,R2   ;COPY CONTENTS
1455 005736          ERRDF    10,RWR,RERR4 ;BYTE INSTRUCTION ERROR
1456 005736 104455   TRAP     C$ERDF
1457 005740 000012   .WORD   10
1458 005742 002520   .WORD   RWR
1459 005744 004012   .WORD   RERR4
1460 005746          CKLOOP
1461 005746 104406   TRAP     C$CLP1     ;LOOP ON ERROR IF SELECTED
1462 005750          EXIT     TST        ;ABORT TEST IF ERROR DETECTED
1463 005750 104432   TRAP     C$EXIT
1464 005752 000162   .WORD   L10016-.
1465 005754          10$:   CKLOOP
1466 005754 104406   TRAP     C$CLP1     ;CHECK FOR LOOP ON ERROR AGAIN
1467 005756          ENDSUB
1468 005756          L10026:
1469 005756 104403   TRAP     C$ESUB
1470
1471 005760          BGNSUB
1472 005760 104402   TRAP     C$BSUB
1473 005762 005037 177522   CLR      RWREG      ;MAKE SURE THE C-BIT IS CLEAR
1474 005766 052737 100000 177522   BIS      #BIT15,RWREG ;SET MSB
1475 005774 013703 177522   MOV      RWREG,R3   ;COPY DATA IN RWREG
1476 006000 023703 177522   ROTLP1: CMP      RWREG,R3  ;ARE THEY THE SAME?
1477 006004 001005          BNE      11$        ;BR IF NO
1478 006006 006003          ROR      R3         ;ROTATE THE SET BIT
1479 006010 001412          BEQ      12$        ;BR WHEN FINISHED
1480 006012 006037 177522   ROR      RWREG      ;REPEAT ROTATE
1481 006016 000770          BR       ROTLP1     ;LOOP UNTIL ROTATE IS COMPLETE
1482 006020          11$:   ERRDF    11,RWR,RERR5
1483 006020 104455   TRAP     C$ERDF
1484 006022 000013   .WORD   11
1485 006024 002520   .WORD   RWR
1486 006026 004060   .WORD   RERR5
1487 006030          CKLOOP
1488 006030 104406   TRAP     C$CLP1     ;LOOP ON ERROR IF SELECTED
1489 006032          EXIT     TST        ;SKIP REST OF TEST
1490 006032 104432   TRAP     C$EXIT
1491 006034 000100   .WORD   L10016-.
1492 006036          12$:   CKLOOP
1493 006036 104406   TRAP     C$CLP1     ;CHECK FOR LOOP ON ERROR
1494 006040          ENDSUB
1495 006040          L10027:
1496 006040 104403   TRAP     C$ESUB
1497
1498 006042          BGNSUB
1499 006042 104402   TRAP     C$BSUB

```

```

1500 006044 012737 177777 177522      MOV      #-1,RWREG      ;SET ALL ONES
1501 006052 042737 100000 177522      BIC      #BIT15,RWREG  ;CLEAR MSB
1502 006060 013703 177522      MOV      RWREG,R3     ;COPY DATA
1503 006064 023703 177522      ROTLP2:  CMP      RWREG,R3  ;ARE THEY THE SAME?
1504 006070 001010      BNE      13$          ;BR IF NO
1505 006072 000261      SEC                      ;SET C-BIT FOR ROTATE
1506 006074 006037 177522      ROR      RWREG        ;ROTATE CLEAR BIT
1507 006100 006003      ROR      R3           ;REPEAT
1508 006102 022703 077777      CMP      #077777,R3   ;FINISHED?
1509 006106 001366      BNE      ROTLP2       ;BR IF NOT YET
1510 006110 000407      BR       14$          ;SUBTEST FINISHED
1511 006112      13$:  ERRDF  12,RWR,RERR6
1512 006112 104455      TRAP    C$ERDF
1513 006114 000014      .WORD  12
1514 006116 002520      .WORD  RWR
1515 006120 004102      .WORD  RERR6
1516 006122      CKLOOP
1517 006122 104406      TRAP    C$CLP1      ;LOOP ON ERROR IF SELECTED
1518 006124      EXIT TST
1519 006124 104432      TRAP    C$EXIT
1520 006126 000006      .WORD  L10016-.
1521 006130      14$:  CKLOOP
1522 006130 104406      TRAP    C$CLP1
1523 006132      ENDSUB
1524 006132      L10030:
1525 006132 104403      TRAP    C$ESUB
1526
1527 006134      ENDTST
1528 006134      L10016:
1529 006134 104401      TRAP    C$ETST

```

TEST 2: PAGE CONTROL REGISTER TEST

```

1530          ,SBTTL TEST 2: PAGE CONTROL REGISTER TEST
1531          :++
1532          :TEST TO VERIFY THAT THE PAGE CONTROL REGISTER IS WORD
1533          :AND BYTE ADDRESSABLE.
1534          :--
1535
1536 006136          BGNTST
1537
1538 006136          BGNSUB
1539 006136 104402   TRAP      C$BSUB
1540 006140 005037 177520   CLR      PCR          ;LOAD ALL ZEROS
1541 006144 001412          BEQ      1$          ;BR IF CLEARED
1542 006146 005001          CLR      R1          ;EXPECTED DATA
1543 006150 013702 177520   MOV      PCR,R2       ;COPY CONTENTS
1544 006154          ERRDF   13,PACR,RERR1 ;REGISTER CANNOT HOLD ALL ZEROS
1545 006154 104455   TRAP      C$ERDF
1546 006156 000015          .WORD   13
1547 006160 002564          .WORD   PACR
1548 006162 003630          .WORD   RERR1
1549 006164          CKLOOP
1550 006164 104406   TRAP      C$CLP1      ;LOOP ON ERROR IF SELECTED
1551 006166          EXIT      TST          ;ABORT TEST IF ERROR DETECTED
1552 006166 104432   TRAP      C$EXIT
1553 006170 000620          .WORD   L10031-.
1554 006172          1$: CKLOOP
1555 006172 104406   TRAP      C$CLP1      ;CHECK FOR LOOP ON ERROR AGAIN
1556 006174          TRAP      C$CLP1
1557 006174          ENDSUB
1558 006174 104403   L10032: TRAP      C$ESUB
1559
1560 006176          BGNSUB
1561 006176 104402   TRAP      C$BSUB
1562 006200 012737 177777 177520   MOV      #-1,PCR     ;LOAD ALL ONES
1563 006206 022737 177777 177520   CMP      #177777,PCR ;CHECK FOR GOOD DATA
1564 006214 001413          BEQ      2$          ;BR IF GOOD
1565 006216 012701 177777          MOV      #-1,R1     ;EXPECTED DATA
1566 006222 013702 177520          MOV      PCR,R2     ;COPY CONTENTS
1567 006226          ERRDF   14,PACR,RERR2 ;REGISTER CANNOT HOLD ALL ONES
1568 006226 104455   TRAP      C$ERDF
1569 006230 000016          .WORD   14
1570 006232 002564          .WORD   PACR
1571 006234 003676          .WORD   RERR2
1572 006236          CKLOOP
1573 006236 104406   TRAP      C$CLP1      ;LOOP ON ERROR IF SELECTED
1574 006240          EXIT      TST          ;ABORT TEST IF ERROR DETECTED
1575 006240 104432   TRAP      C$EXIT
1576 006242 000546          .WORD   L10031-.
1577 006244          2$: CKLOOP
1578 006244 104406   TRAP      C$CLP1      ;CHECK FOR LOOP ON ERROR AGAIN
1579 006246          TRAP      C$CLP1
1580 006246          ENDSUB
1581 006246 104403   L10033: TRAP      C$ESUB
1582
1583
1584 006250          BGNSUB
1585 006250 104402   TRAP      C$BSUB

```

|      |        |        |        |        |         |               |                                              |
|------|--------|--------|--------|--------|---------|---------------|----------------------------------------------|
| 1586 | 006252 | 012737 | 125252 | 177520 | MOV     | #125252,PCR   | :LOAD AN ALTERNATING 1'S AND 0'S BIT PATTERN |
| 1587 | 006260 | 022737 | 125252 | 177520 | CMP     | #125252,PCR   | :CHECK THE RESULTS                           |
| 1588 | 006266 | 001413 |        |        | BEQ     | 3\$           | :BR IF GOOD DATA                             |
| 1589 | 006270 | 012701 | 125252 |        | MOV     | #125252,R1    | :EXPECTED DATA                               |
| 1590 | 006274 | 013702 | 177520 |        | MOV     | PCR,R2        | :COPY CONTENTS                               |
| 1591 | 006300 |        |        |        | ERRDF   | 15,PACR,RERR3 | :REGISTER CANNOT HOLD GOOD DATA              |
| 1592 | 006300 | 104455 |        |        | TRAP    | C\$ERDF       |                                              |
| 1593 | 006302 | 000017 |        |        | .WORD   | 15            |                                              |
| 1594 | 006304 | 002564 |        |        | .WORD   | PACR          |                                              |
| 1595 | 006306 | 003744 |        |        | .WORD   | RERR3         |                                              |
| 1596 | 006310 |        |        |        | CKLOOP  |               | :LOOP ON ERROR IF SELECTED                   |
| 1597 | 006310 | 104406 |        |        | TRAP    | C\$CLP1       |                                              |
| 1598 | 006312 |        |        |        | EXIT    | TST           | :ABORT TEST IF ERROR DETECTED                |
| 1599 | 006312 | 104432 |        |        | TRAP    | C\$EXIT       |                                              |
| 1600 | 006314 | 000474 |        |        | .WORD   | L10031-       |                                              |
| 1601 | 006316 |        |        |        | CKLOOP  |               | :CHECK FOR LOOP ON ERROR AGAIN               |
| 1602 | 006316 | 104406 |        |        | TRAP    | C\$CLP1       |                                              |
| 1603 | 006320 |        |        |        | ENDSUB  |               |                                              |
| 1604 | 006320 |        |        |        | L10034: |               |                                              |
| 1605 | 006320 | 104403 |        |        | TRAP    | C\$ESUB       |                                              |
| 1606 |        |        |        |        |         |               |                                              |
| 1607 | 006322 |        |        |        | BGNSUB  |               |                                              |
| 1608 | 006322 | 104402 |        |        | TRAP    | C\$BSUB       |                                              |
| 1609 | 006324 | 105037 | 177520 |        | CLRB    | PCR           | :CLEAR THE REGISTER'S LOW BYTE               |
| 1610 | 006330 | 022737 | 125000 | 177520 | CMP     | #125000,PCR   | :COMPARE THE RESULTS                         |
| 1611 | 006336 | 001413 |        |        | BEQ     | 4\$           | :BR IF GOOD DATA                             |
| 1612 | 006340 | 012701 | 125000 |        | MOV     | #125000,R1    | :EXPECTED DATA                               |
| 1613 | 006344 | 013702 | 177520 |        | MOV     | PCR,R2        | :COPY CONTENTS                               |
| 1614 | 006350 |        |        |        | ERRDF   | 16,PACR,RERR4 | :BYTE INSTRUCTION ERROR                      |
| 1615 | 006350 | 104455 |        |        | TRAP    | C\$ERDF       |                                              |
| 1616 | 006352 | 000020 |        |        | .WORD   | 16            |                                              |
| 1617 | 006354 | 002564 |        |        | .WORD   | PACR          |                                              |
| 1618 | 006356 | 004012 |        |        | .WORD   | RERR4         |                                              |
| 1619 | 006360 |        |        |        | CKLOOP  |               | :LOOP ON ERROR IF SELECTED                   |
| 1620 | 006360 | 104406 |        |        | TRAP    | C\$CLP1       |                                              |
| 1621 | 006362 |        |        |        | EXIT    | TST           | :ABORT TEST IF ERROR DETECTED                |
| 1622 | 006362 | 104432 |        |        | TRAP    | C\$EXIT       |                                              |
| 1623 | 006364 | 000424 |        |        | .WORD   | L10031-       |                                              |
| 1624 | 006366 |        |        |        | CKLOOP  |               | :CHECK FOR LOOP ON ERROR                     |
| 1625 | 006366 | 104406 |        |        | TRAP    | C\$CLP1       |                                              |
| 1626 | 006370 |        |        |        | ENDSUB  |               |                                              |
| 1627 | 006370 |        |        |        | L10035: |               |                                              |
| 1628 | 006370 | 104403 |        |        | TRAP    | C\$ESUB       |                                              |
| 1629 |        |        |        |        |         |               |                                              |
| 1630 | 006372 |        |        |        | BGNSUB  |               |                                              |
| 1631 | 006372 | 104402 |        |        | TRAP    | C\$BSUB       |                                              |
| 1632 | 006374 | 000337 | 177520 |        | SWAB    | PCR           | :SWAP BYTES                                  |
| 1633 | 006400 | 022737 | 000252 | 177520 | CMP     | #252,PCR      | :CHECK THE RESULTS                           |
| 1634 | 006406 | 001413 |        |        | BEQ     | 5\$           | :BR IF GOOD DATA                             |
| 1635 | 006410 | 012701 | 000252 |        | MOV     | #252,R1       | :EXPECTED DATA                               |
| 1636 | 006414 | 013702 | 177520 |        | MOV     | PCR,R2        | :COPY CONTENTS                               |
| 1637 | 006420 |        |        |        | ERRDF   | 17,PACR,RERR4 | :BYTE INSTRUCTION ERROR                      |
| 1638 | 006420 | 104455 |        |        | TRAP    | C\$ERDF       |                                              |
| 1639 | 006422 | 000021 |        |        | .WORD   | 17            |                                              |
| 1640 | 006424 | 002564 |        |        | .WORD   | PACR          |                                              |
| 1641 | 006426 | 004012 |        |        | .WORD   | RERR4         |                                              |

|      |        |        |         |        |        |               |  |  |  |  |                                              |
|------|--------|--------|---------|--------|--------|---------------|--|--|--|--|----------------------------------------------|
| 1642 | 006430 |        |         |        | CKLOOP |               |  |  |  |  | ;LOOP ON ERROR IF SELECTED                   |
| 1643 | 006430 | 104406 |         |        | TRAP   | C\$CLP1       |  |  |  |  |                                              |
| 1644 | 006432 |        |         |        | EXIT   | TST           |  |  |  |  | ;ABORT TEST IF ERROR DETECTED                |
| 1645 | 006432 | 104432 |         |        | TRAP   | C\$EXIT       |  |  |  |  |                                              |
| 1646 | 006434 | 000354 |         |        | .WORD  | L10031-       |  |  |  |  |                                              |
| 1647 | 006436 |        | 5\$:    |        | CKLOOP |               |  |  |  |  | ;CHECK FOR LOOP ON ERROR                     |
| 1648 | 006436 | 104406 |         |        | TRAP   | C\$CLP1       |  |  |  |  |                                              |
| 1649 | 006440 |        |         |        | ENDSUB |               |  |  |  |  |                                              |
| 1650 | 006440 |        | L10036: |        |        |               |  |  |  |  |                                              |
| 1651 | 006440 | 104403 |         |        | TRAP   | C\$ESUB       |  |  |  |  |                                              |
| 1652 | 006442 |        |         |        | BGNSUB |               |  |  |  |  |                                              |
| 1653 | 006442 | 104402 |         |        | TRAP   | C\$BSUB       |  |  |  |  |                                              |
| 1654 | 006444 | 012737 | 052525  | 177520 | MOV    | #052525,PCR   |  |  |  |  | ;LOAD AN ALTERNATING 0'S AND 1'S BIT PATTERN |
| 1655 | 006452 | 022737 | 052525  | 177520 | CMF    | #052525,PCR   |  |  |  |  | ;CHECK THE RESULTS                           |
| 1656 | 006460 | 001413 |         |        | BEQ    | 6\$           |  |  |  |  | ;BR IF GOOD DATA                             |
| 1657 | 006462 | 012701 | 052525  |        | MOV    | #052525,R1    |  |  |  |  | ;EXPECTED DATA                               |
| 1658 | 006466 | 013702 | 177520  |        | MOV    | PCR,R2        |  |  |  |  | ;COPY CONTENTS                               |
| 1659 | 006472 |        |         |        | ERRDF  | 20,PACR,RERR3 |  |  |  |  | ;REGISTER CANNOT HOLD GOOD DATA              |
| 1660 | 006472 | 104455 |         |        | TRAP   | C\$ERDF       |  |  |  |  |                                              |
| 1661 | 006474 | 000024 |         |        | .WORD  | 20            |  |  |  |  |                                              |
| 1662 | 006476 | 002564 |         |        | .WORD  | PACR          |  |  |  |  |                                              |
| 1663 | 006500 | 003744 |         |        | .WORD  | RERR3         |  |  |  |  |                                              |
| 1664 | 006502 |        |         |        | CKLOOP |               |  |  |  |  | ;LOOP ON ERROR IF SELECTED                   |
| 1665 | 006502 | 104406 |         |        | TRAP   | C\$CLP1       |  |  |  |  |                                              |
| 1666 | 006504 |        |         |        | EXIT   | TST           |  |  |  |  | ;ABORT TEST IF ERROR DETECTED                |
| 1667 | 006504 | 104432 |         |        | TRAP   | C\$EXIT       |  |  |  |  |                                              |
| 1668 | 006506 | 000302 |         |        | .WORD  | L10031-       |  |  |  |  |                                              |
| 1669 | 006510 |        | 6\$:    |        | CKLOOP |               |  |  |  |  | ;CHECK FOR LOOP ON ERROR                     |
| 1670 | 006510 | 104406 |         |        | TRAP   | C\$CLP1       |  |  |  |  |                                              |
| 1671 | 006512 |        |         |        | ENDSUB |               |  |  |  |  |                                              |
| 1672 | 006512 |        | L10037: |        |        |               |  |  |  |  |                                              |
| 1673 | 006512 | 104403 |         |        | TRAP   | C\$ESUB       |  |  |  |  |                                              |
| 1674 | 006514 |        |         |        | BGNSUB |               |  |  |  |  |                                              |
| 1675 | 006514 | 104402 |         |        | TRAP   | C\$BSUB       |  |  |  |  |                                              |
| 1676 | 006516 | 105037 | 177521  |        | CLRB   | PCR+1         |  |  |  |  | ;CLEAR THE HIGH BYTE                         |
| 1677 | 006522 | 022737 | 000125  | 177520 | CMF    | #125,PCR      |  |  |  |  | ;CHECK THE REGISTER CONTENTS                 |
| 1678 | 006530 | 001413 |         |        | BEQ    | 7\$           |  |  |  |  | ;BR IF GOOD DATA                             |
| 1679 | 006532 | 012701 | 000125  |        | MOV    | #125,R1       |  |  |  |  | ;EXPECTED DATA                               |
| 1680 | 006536 | 013702 | 177520  |        | MOV    | PCR,R2        |  |  |  |  | ;COPY CONTENTS                               |
| 1681 | 006542 |        |         |        | ERRDF  | 21,PACR,RERR4 |  |  |  |  | ;BYTE INSTRUCTION ERROR                      |
| 1682 | 006542 | 104455 |         |        | TRAP   | C\$ERDF       |  |  |  |  |                                              |
| 1683 | 006544 | 000025 |         |        | .WORD  | 21            |  |  |  |  |                                              |
| 1684 | 006546 | 002564 |         |        | .WORD  | PACR          |  |  |  |  |                                              |
| 1685 | 006550 | 004012 |         |        | .WORD  | RERR4         |  |  |  |  |                                              |
| 1686 | 006552 |        |         |        | CKLOOP |               |  |  |  |  | ;LOOP ON ERROR IF SELECTED                   |
| 1687 | 006552 | 104406 |         |        | TRAP   | C\$CLP1       |  |  |  |  |                                              |
| 1688 | 006554 |        |         |        | EXIT   | TST           |  |  |  |  | ;ABORT TEST IF ERROR DETECTED                |
| 1689 | 006554 | 104432 |         |        | TRAP   | C\$EXIT       |  |  |  |  |                                              |
| 1690 | 006556 | 000232 |         |        | .WORD  | L10031-       |  |  |  |  |                                              |
| 1691 | 006560 |        | 7\$:    |        | CKLOOP |               |  |  |  |  | ;CHECK FOR LOOP ON ERROR                     |
| 1692 | 006560 | 104406 |         |        | TRAP   | C\$CLP1       |  |  |  |  |                                              |
| 1693 | 006562 |        |         |        | ENDSUB |               |  |  |  |  |                                              |
| 1694 | 006562 |        | L10040: |        |        |               |  |  |  |  |                                              |
| 1695 | 006562 | 104403 |         |        | TRAP   | C\$ESUB       |  |  |  |  |                                              |
| 1696 |        |        |         |        |        |               |  |  |  |  |                                              |
| 1697 | 006564 |        |         |        | BGNSUB |               |  |  |  |  |                                              |

|      |        |        |        |         |             |               |                                |
|------|--------|--------|--------|---------|-------------|---------------|--------------------------------|
| 1698 | 006564 | 104402 |        |         | TRAP        | C\$BSUB       |                                |
| 1699 | 006566 | 000337 | 177520 |         | SWAB        | PCR           | :SWAP BYTES                    |
| 1700 | 006572 | 022737 | 052400 | 177520  | CMP         | #052400,PCR   | :CHECK RESULTING CONTENTS      |
| 1701 | 006600 | 001413 |        |         | BEQ         | 10\$          | :BR IF GOOD DATA               |
| 1702 | 006602 | 012701 | 052400 |         | MOV         | #52400,R1     | :EXPECTED DATA                 |
| 1703 | 006606 | 013702 | 177520 |         | MOV         | PCR,R2        | :COPY CONTENTS                 |
| 1704 | 006612 |        |        |         | ERRDF       | 22,PACR,RERR4 | :BYTE INSTRUCTION ERROR        |
| 1705 | 006612 | 104455 |        |         | TRAP        | C\$ERDF       |                                |
| 1706 | 006614 | 000026 |        |         | .WORD       | 22            |                                |
| 1707 | 006616 | 002564 |        |         | .WORD       | PACR          |                                |
| 1708 | 006620 | 004012 |        |         | .WORD       | RERR4         |                                |
| 1709 | 006622 |        |        |         | CKLOOP      |               | :LOOP ON ERROR IF SELECTED     |
| 1710 | 006622 | 104406 |        |         | TRAP        | C\$CLP1       |                                |
| 1711 | 006624 |        |        |         | EXIT        | TST           | :ABORT TEST IF ERROR DETECTED  |
| 1712 | 006624 | 104432 |        |         | TRAP        | C\$EXIT       |                                |
| 1713 | 006626 | 000162 |        |         | .WORD       | L10031-       |                                |
| 1714 | 006630 |        |        | 10\$:   | CKLOOP      |               | :CHECK FOR LOOP ON ERROR       |
| 1715 | 006630 | 104406 |        |         | TRAP        | C\$CLP1       |                                |
| 1716 | 006632 |        |        |         | ENDSUB      |               |                                |
| 1717 | 006632 |        |        | L10041: |             |               |                                |
| 1718 | 006632 | 104403 |        |         | TRAP        | C\$ESUB       |                                |
| 1719 |        |        |        |         |             |               |                                |
| 1720 | 006634 |        |        |         | BGNSUB      |               |                                |
| 1721 | 006634 | 104402 |        |         | TRAP        | C\$BSUB       |                                |
| 1722 | 006636 | 005037 | 177520 |         | CLR         | PCR           | :MAKE SURE THE C-BIT IS CLEAR  |
| 1723 | 006642 | 052737 | 100000 | 177520  | BIS         | #BIT15,PCR    | :SET MSB                       |
| 1724 | 006650 | 013703 | 177520 |         | MOV         | PCR,R3        | :COPY DATA IN PCR              |
| 1725 | 006654 | 023703 | 177520 |         | ROTLP3: CMP | PCR,R3        | :ARE THEY THE SAME?            |
| 1726 | 006660 | 001005 |        |         | BNE         | 11\$          | :BR IF NO                      |
| 1727 | 006662 | 006003 |        |         | ROR         | R3            | :ROTATE THE SET BIT            |
| 1728 | 006664 | 001412 |        |         | BEQ         | 12\$          | :BR IF FINISHED                |
| 1729 | 006666 | 006037 | 177520 |         | ROR         | PCR           | :REPEAT ROTATE                 |
| 1730 | 006672 | 000770 |        |         | BR          | ROTLP3        | :LOOP UNTIL ROTATE IS COMPLETE |
| 1731 | 006674 |        |        | 11\$:   | ERRDF       | 23,PACR,RERR5 |                                |
| 1732 | 006674 | 104455 |        |         | TRAP        | C\$ERDF       |                                |
| 1733 | 006676 | 000027 |        |         | .WORD       | 23            |                                |
| 1734 | 006700 | 002564 |        |         | .WORD       | PACR          |                                |
| 1735 | 006702 | 004060 |        |         | .WORD       | RERR5         |                                |
| 1736 | 006704 |        |        |         | CKLOOP      |               | :LOOP ON ERROR IF SELECTED     |
| 1737 | 006704 | 104406 |        |         | TRAP        | C\$CLP1       |                                |
| 1738 | 006706 |        |        |         | EXIT        | TST           | :SKIP REST OF TEST             |
| 1739 | 006706 | 104432 |        |         | TRAP        | C\$EXIT       |                                |
| 1740 | 006710 | 000100 |        |         | .WORD       | L10031-       |                                |
| 1741 | 006712 |        |        | 12\$:   | CKLOOP      |               | :CHECK FOR LOOP ON ERROR       |
| 1742 | 006712 | 104406 |        |         | TRAP        | C\$CLP1       |                                |
| 1743 | 006714 |        |        |         | ENDSUB      |               |                                |
| 1744 | 006714 |        |        | L10042: |             |               |                                |
| 1745 | 006714 | 104403 |        |         | TRAP        | C\$ESUB       |                                |
| 1746 |        |        |        |         |             |               |                                |
| 1747 | 006716 |        |        |         | BGNSUB      |               |                                |
| 1748 | 006716 | 104402 |        |         | TRAP        | C\$BSUB       |                                |
| 1749 | 006720 | 012737 | 177777 | 177520  | MOV         | #-1,PCR       | :SET ALL ONES                  |
| 1750 | 006726 | 042737 | 100000 | 177520  | BIC         | #BIT15,PCR    | :CLEAR MSB                     |
| 1751 | 006734 | 013703 | 177520 |         | MOV         | PCR,R3        | :COPY DATA                     |
| 1752 | 006740 | 023703 | 177520 |         | ROTLP4: CMP | PCR,R3        | :ARE THEY THE SAME?            |
| 1753 | 006744 | 001010 |        |         | BNE         | 13\$          | :BR IF NO                      |



|      |        |        |        |              |               |                            |
|------|--------|--------|--------|--------------|---------------|----------------------------|
| 1754 | 006746 | 000261 |        | SEC          |               | :SET C-BIT FOR ROTATE      |
| 1755 | 006750 | 006037 | 177520 | ROR          | PCR           | :ROTATE CLEAR BIT          |
| 1756 | 006754 | 006003 |        | ROR          | R3            | :REPEAT                    |
| 1757 | 006756 | 022703 | 077777 | CMP          | #077777,R3    | :ALL ONES?                 |
| 1758 | 006762 | 001366 |        | BNE          | ROTL P4       | :BR IF NOT YET             |
| 1759 | 006764 | 000407 |        | BR           | 14\$          | :SUBTEST FINISHED          |
| 1760 | 006766 |        |        |              |               |                            |
| 1761 | 006766 | 104455 |        | 13\$: ERRDF  | 24,PACR,RERR6 |                            |
| 1762 | 006770 | 000030 |        | TRAP         | C\$ERDF       |                            |
| 1763 | 006772 | 002564 |        | .WORD        | 24            |                            |
| 1764 | 006774 | 004102 |        | .WORD        | PACR          |                            |
| 1765 | 006776 |        |        | .WORD        | RERR6         |                            |
| 1766 | 006776 | 104406 |        | CKLOOP       |               | :LOOP ON ERROR IF SELECTED |
| 1767 | 007000 |        |        | TRAP         | C\$CLP1       |                            |
| 1768 | 007000 | 104432 |        | EXIT TST     |               |                            |
| 1769 | 007002 | 000006 |        | TRAP         | C\$EXIT       |                            |
| 1770 | 007004 |        |        | .WORD        | L10031-       |                            |
| 1771 | 007004 | 104406 |        | 14\$: CKLOOP |               |                            |
| 1772 | 007006 |        |        | TRAP         | C\$CLP1       |                            |
| 1773 | 007006 |        |        | ENDSUB       |               |                            |
| 1774 | 007006 | 104403 |        | L10043: TRAP | C\$ESUB       |                            |
| 1775 | 007010 |        |        | ENDTST       |               |                            |
| 1776 | 007010 |        |        | L10031: TRAP | C\$ETST       |                            |
| 1777 | 007010 | 104401 |        |              |               |                            |
| 1778 |        |        |        |              |               |                            |

```

1779          .SBTTL TEST 3: BEVENT CLAMP ENABLE TEST
1780          :++
1781          :TEST TO VERIFY THAT THE BEVENT CLAMP CAN BE ENABLED. THIS TEST
1782          :ASSUMES THAT SWITCH #5 OF E21 IS IN THE ON POSITION, AND THE M8012
1783          :MODULE IS LOCATED IN THE SAME BACKPLANE THAT THE LINE TIME CLOCK
1784          :IS GENERATED FROM.
1785          :--
1786
1787 007012          BGNTST
1788
1789          177546          BEVREG=177546
1790
1791 007012 005737 002216          TST          PASS          ;IF THIS IS FIRST PASS
1792 007016 001402          BEQ          1$          ;THEN DO THE TEST
1793 007020          EXIT          TST          ;ELSE DON'T
1794 007020 104432          TRAP          C$EXIT
1795 007022 000524          .WORD          L10044-.
1796 007024          1$:          BGNSUB
1797 007024 104402          TRAP          C$BSUB
1798 007026          SETVEC          VECT,#INTSR,#PRI07          ;SET INTERRUPT VECTOR,INHIBIT INTERRUPTS
1799 007026 012746 000340          MOV          #PRI07,-(SP)
1800 007032 012746 007222          MOV          #INTSR,-(SP)
1801 007036 013746 002226          MOV          VECT,-(SP)
1802 007042 012746 000003          MOV          #3,-(SP)
1803 007046 104437          TRAP          C$SVEC
1804 007050 062706 000010          ADD          #10,SP
1805 007054 052737 000100 177546          BIS          #BIT06,BEVREG          ;REMOVE BEVENT CLAMP
1806 007062          SETPRI          #PRI00          ;ALLOW INTERRUPTS
1807 007062 012700 000000          MOV          #PRI00,R0
1808 007066 104441          TRAP          C$SPRI
1809 007070 004537 005100          JSR          R5,WDELAY          ;DELAY APPROX. 40 MSECS.
1810 007074 000050          40.
1811 007076          SETPRI          #PRI07          ;INHIBIT FURTHER INTERRUPTS
1812 007076 012700 000340          MOV          #PRI07,R0
1813 007102 104441          TRAP          C$SPRI
1814 007104 022737 000002 007230          CMP          #2,ICOUNT          ;DID THE MINIMUM OF TWO INTERRUPTS OCCUR?
1815 007112 003404          BLE          2$          ;BR IF YES
1816 007114          ERRDF          25,,BVERR1          ;BEVENT CLAMP ENABLE FAILED
1817 007114 104455          TRAP          C$ERDF
1818 007116 000031          .WORD          25
1819 007120 000000          .WORD          0
1820 007122 007232          .WORD          BVERR1
1821 007124          2$:          CKLOOP          ;CHECK FOR LOOP ON ERROR
1822 007124 104406          TRAP          C$CLP1
1823 007126 005037 007230          CLR          ICOUNT          ;CLEAR INTERRUPT COUNT
1824 007132          ENDSUB
1825 007132          L10045:
1826 007132 104403          TRAP          C$ESUB
1827
1828 007134          BGNSUB
1829 007134 104402          TRAP          C$BSUB
1830 007136 042737 000100 177546          BIC          #BIT06,BEVREG          ;SET BEVENT CLAMP
1831 007144          SETPRI          #PRI00          ;ALLOW INTERRUPTS
1832 007144 012700 000000          MOV          #PRI00,R0
1833 007150 104441          TRAP          C$SPRI
1834 007152 004537 005100          JSR          R5,WDELAY          ;DELAY APPROX. 40 MSECS

```

TEST 3: BEVENT CLAMP ENABLE TEST

```

1835 007156 000050          40.          ;DELAY COUNT
1836 007160                SETPRI #PRI07 ;SET HIGHEST PRIORITY
1837 007160 012700 000340  MOV #PRI07,R0
1838 007164 104441          TRAP C$SPRI
1839 007166 022737 000001 007230  CMP #1,ICOUNT ;CHECK INTERRUPT COUNT
1840 007174 002004          BGE 4$ ;BR IF NO INTERRUPTS OCCURRED
1841 007176                ERDF 26,,BVERR2 ;BEVENT CLAMP DID NOT PREVENT INTERRUPTS
1842 007176 104455          TRAP C$ERDF
1843 007200 000032          .WORD 26
1844 007202 000000          .WORD 0
1845 007204 007300          .WORD BVERR2
1846 007206                4$: CKLOOP ;CHECK FOR LOOP ON ERROR
1847 007206 104406          TRAP C$CLP1
1848 007210 005037 007230  CLR ICOUNT ;CLEAR INTERRUPT COUNT
1849 007214                ENDSUB
1850 007214                L10046:
1851 007214 104403          TRAP C$ESUB
1852 007216                EXIT TST
1853 007216 104432          TRAP C$EXIT
1854 007220 000326          .WORD L10044-.
1855 007222                INTSR:
1856 007222                BGNSRV BEVENT ;INTERRUPT SERVICE ROUTINE
1857 007222                BEVENT::
1858 007222 005237 007230  INC ICOUNT ;INCREMENT COUNTER
1859 007226                ENDSRV
1860 007226                L10047:
1861 007226 000002          RTI
1862 007230 000000          ICOUNT: .WORD 0
1863 007232                BGNMSG BVERR1
1864 007232                BVERR1::
1865 007232                PRINTB #MSG1
1866 007232 012746 007346  MOV #MSG1,-(SP)
1867 007236 012746 000001  MOV #1,-(SP)
1868 007242 010600          MOV SP,R0
1869 007244 104414          TRAP C$PNTB
1870 007246 062706 000004  ADD #4,SP
1871 007252                PRINTB #INTCT,ICOUNT
1872 007252 013746 007230  MOV ICOUNT,-(SP)
1873 007256 012746 007422  MOV #INTCT,-(SP)
1874 007262 012746 000002  MOV #2,-(SP)
1875 007266 010600          MOV SP,R0
1876 007270 104414          TRAP C$PNTB
1877 007272 062706 000006  ADD #6,SP
1878 007276                ENDMSG
1879 007276                L10050:
1880 007276 104423          TRAP C$MSG
1881 007300                BGNMSG BVERR2
1882 007300                BVERR2::
1883 007300                PRINTB #MSG2
1884 007300 012746 007471  MOV #MSG2,-(SP)
1885 007304 012746 000001  MOV #1,-(SP)
1886 007310 010600          MOV SP,R0
1887 007312 104414          TRAP C$PNTB
    
```

|      |        |        |        |         |         |        |                                               |
|------|--------|--------|--------|---------|---------|--------|-----------------------------------------------|
| 1891 | 007314 | 062706 | 000004 |         |         | ADD    | #4,SP                                         |
| 1892 | 007320 |        |        |         |         | PRINTB | #INTCT,ICOUNT                                 |
| 1893 | 007320 | 013746 | 007230 |         |         | MOV    | ICOUNT,-(SP)                                  |
| 1894 | 007324 | 012746 | 007422 |         |         | MOV    | #INTCT,-(SP)                                  |
| 1895 | 007330 | 012746 | 000002 |         |         | MOV    | #2,-(SP)                                      |
| 1896 | 007334 | 010600 |        |         |         | MOV    | SP,R0                                         |
| 1897 | 007336 | 104414 |        |         |         | TRAP   | C\$PNTB                                       |
| 1898 | 007340 | 062706 | 000006 |         |         | ADD    | #6,SP                                         |
| 1899 | 007344 |        |        |         |         | ENDMSG |                                               |
| 1900 | 007344 |        |        | L10051: |         |        |                                               |
| 1901 | 007344 | 104423 |        |         |         | TRAP   | C\$MSG                                        |
| 1902 |        |        |        |         |         |        |                                               |
| 1903 | 007346 | 040445 | 042502 | 042526  | MSG1:   | .ASCIZ | /%ABEVENT CLAMP FAILED TO ALLOW INTERRUPTS%N/ |
| 1904 | 007354 | 052116 | 041440 | 040514  |         |        |                                               |
| 1905 | 007362 | 050115 | 043040 | 044501  |         |        |                                               |
| 1906 | 007370 | 042514 | 020104 | 047524  |         |        |                                               |
| 1907 | 007376 | 040440 | 046114 | 053517  |         |        |                                               |
| 1908 | 007404 | 044440 | 052116 | 051105  |         |        |                                               |
| 1909 | 007412 | 052522 | 052120 | 022523  |         |        |                                               |
| 1910 | 007420 | 000116 |        |         |         |        |                                               |
| 1911 | 007422 | 040445 | 052516 | 041115  | INTCT:  | .ASCIZ | /%ANUMBER OF INTERRUPTS RECEIVED: %03%N/      |
| 1912 | 007430 | 051105 | 047440 | 020106  |         |        |                                               |
| 1913 | 007436 | 047111 | 042524 | 051122  |         |        |                                               |
| 1914 | 007444 | 050125 | 051524 | 051040  |         |        |                                               |
| 1915 | 007452 | 041505 | 044505 | 042526  |         |        |                                               |
| 1916 | 007460 | 035104 | 022440 | 031517  |         |        |                                               |
| 1917 | 007466 | 047045 | 000    |         |         |        |                                               |
| 1918 | 007471 | 045    | 041101 | 053105  | MSG2:   | .ASCIZ | /%ABEVENT CLAMP DID NOT PREVENT INTERRUPTS%N/ |
| 1919 | 007476 | 047105 | 020124 | 046103  |         |        |                                               |
| 1920 | 007504 | 046501 | 020120 | 044504  |         |        |                                               |
| 1921 | 007512 | 020104 | 047516 | 020124  |         |        |                                               |
| 1922 | 007520 | 051120 | 053105 | 047105  |         |        |                                               |
| 1923 | 007526 | 020124 | 047111 | 042524  |         |        |                                               |
| 1924 | 007534 | 051122 | 050125 | 051524  |         |        |                                               |
| 1925 | 007542 | 047045 | 000    |         |         |        |                                               |
| 1926 |        | 007546 |        |         |         |        |                                               |
| 1927 | 007546 |        |        |         |         | .EVEN  |                                               |
| 1928 | 007546 |        |        |         | L10044: | ENDTST |                                               |
| 1929 | 007546 | 104401 |        |         |         | TRAP   | C\$ETST                                       |

```

1930
1931
1932
1933
1934
1935
1936 007550
1937
1938 007550 005037 177524
1939 007554 004537 005100
1940 007560 000310
1941 007562
1942 007562 104422
1943 007564 012737 000017 177524
1944 007572 004537 005100
1945 007576 000310
1946 007600
1947 007600 104450
1948 007602
1949 007602 103410
1950 007604 022737 000030 002220
1951 007612 003402
1952 007614
1953 007614 104432
1954 007616 000100
1955 007620 005037 002220 1$:
1956 007624 012737 000016 177524 2$:
1957 007632 004537 005100
1958 007636 000310
1959 007640
1960 007640 104422
1961 007642 012737 000015 177524
1962 007650 004537 005100
1963 007654 000310
1964 007656
1965 007656 104422
1966 007660 012737 000013 177524
1967 007666 004537 005100
1968 007672 000310
1969 007674
1970 007674 104422
1971 007676 012737 000007 177524
1972 007704 004537 005100
1973 007710 000310
1974 007712
1975 007712 104432
1976 007714 000002
1977
1978 007716
1979 007716
1980 007716 104401
1981

      .SBTTL TEST 4: LIGHT DISPLAY TEST
      :++
      :TEST TO VERIFY THAT THE FOUR RED LED'S ARE WORKING AND CAN BE
      :TURNED ON INDIVIDUALLY.
      :--

      BGNTST

      CLR      LSREG      ;TURN ON ALL FOUR LED'S
      JSR      R5,WDELAY  ;DELAY APPROX. 200MS
      200.
      BREAK
      TRAP     C$BRK      ;CHECK SUPERVISOR FOR CONTROL REQUESTS
      MOV      #17,LSREG
      JSR      R5,WDELAY  ;TURN OFF ALL FOUR LED'S
      200.          ;DELAY APPROX. 200 MS
      MANUAL
      TRAP     C$MANI
      BCOMPLETE 2$      ;IS MANUAL INTERVENTION ALLOWED?
      BCS      2$        ;BR IF YES
      CMP      #30,PASCT ;IS PASS COUNT >= 30?
      BLE      1$        ;BR IF YES
      EXIT     TST
      TRAP     C$EXIT
      .WORD    L10052-.
      CLR      PASCT
      MOV      #16,LSREG ;EXIT TEST
      JSR      R5,WDELAY ;TURN ON THE LED CORRESPONDING TO THE LSB
      200.          ;DELAY APPROX. 200MS
      BREAK
      TRAP     C$BRK      ;CHECK SUPR FOR CONTROL REQUESTS
      MOV      #15,LSREG ;TURN ON 2ND LED
      JSR      R5,WDELAY ;DELAY APPROX 200 MS
      200.
      BREAK
      TRAP     C$BRK      ;CHECK SUPERVISOR FOR CONTROL COMMANDS
      MOV      #13,LSREG ;TURN ON 3RD LED
      JSR      R5,WDELAY ;DELAY APPROX 200MS
      200.
      BREAK
      TRAP     C$BRK      ;CHECK SUPR FOR CONTROL REQUESTS
      MOV      #7,LSREG  ;TURN ON LED CORRESPONDING TO MSB
      JSR      R5,WDELAY ;DELAY APPROX 200MS
      200.
      EXIT     TST
      TRAP     C$EXIT
      .WORD    L10052-.
      ;EXIT

      ENDTST
      L10052:
      TRAP     C$ETST
  
```

TEST 5: ROCKER SWITCHES TEST

```

1982 .SBTTL TEST 5: ROCKER SWITCHES TEST
1983 :TEST TO CONFIRM THE ROCKER SWITCH SETTINGS. THIS TEST ASSUMES THAT,
1984 :IN MANUFACTURING, THE ROCKER SWITCHES ARE ALL IN THE ON POSITION.
1985 :THIS INCLUDES BOTH E21 AND E15. IN MANUFACTURING, THIS TEST WILL
1986 :VERIFY THAT ALL SWITCHES CAN BE READ AS ON. IN OTHER ENVIRONMENTS,
1987 :THE OPERATOR MAY SPECIFY WHAT THE SWITCH SETTINGS ARE BEFORE
1988 :THE DIAGNOSTIC IS STARTED (SEE PROGRAM OPTIONS UNDER OPERATING
1989 :INSTRUCTIONS). SWITCHES A1-A8 CORRESPOND TO E15 AND SWITCHES
1990 :B1-B4 TO E21.
1991 007720 BGNST
1992
1993 007720 MANUAL :IS MANUAL INTERVENTION ALLOWED?
1994 007720 104450 TRAP C$MANI
1995 007722 BCOMPLETE PRTSW :BR IF YES
1996 007722 103413 BCS PRTSW
1997 007724 023737 002230 177524 CMP SWSET,LSREG :ALL SWITCHES SHOULD BE ON AND BITS 0-11 SET
1998 007732 001404 BEQ 1$ :BR IF SWITCH READINGS ARE OK
1999 007734 ERRDF 27,SWERR :CANNOT READ SWITCHES PROPERLY
2000 007734 104455 TRAP C$ERRDF
2001 007736 000033 .WORD 27
2002 007740 000000 .WORD 0
2003 007742 010244 .WORD SWERR
2004 007744 1$ CKLOOP :CHECK FOR LOOP ON ERROR
2005 007744 104406 TRAP C$CLP1
2006 007746 EXIT TST :EXIT
2007 007746 104432 TRAP C$EXIT
2008 007750 000526 .WORD L10053-
2009 007752 013737 177524 010240 PRTSW: MOV LSREG,TEMP :COPY CONTENTS OF LSREG
2010 007760 005037 010242 CLR SWCHON :CLEAR MASK
2011 007764 012737 000014 010236 MOV #14,SWCNT :SET SWITCH COUNT
2012 007772 032737 000001 010240 LP: BIT #BIT0,TEMP :TEST FOR SWITCH SET
2013 010000 001403 BEQ 2$ :BR IF NOT SET
2014 010002 052737 100000 010242 BIS #BIT15,SWCHON :IF SET, THEN SET CORRESPNDING BIT IN MASK
2015 010010 000241 2$ CLC :CLEAR C-BIT FOR ROTATE
2016 010012 006037 010242 ROR SWCHON :ROTATE SWSET
2017 010016 006037 010240 ROR TEMP :GET READY TO TEST NEXT SWITCH
2018 010022 005337 010236 DEC SWCNT :DECREMENT SWITCH COUNT
2019 010026 001361 BNE LP :LOOP UNTIL ALL SWITCHES HAVE BEEN CHECKED
2020 010030 000241 CLC :CLEAR C-BIT FOR ROTATE
2021 010032 006037 010242 ROR SWCHON :ROTATE DATA
2022 010036 006037 010242 ROR SWCHON :ROTATE DATA
2023 010042 006037 010242 ROR SWCHON :ROTATE DATA
2024 010046 PRINTF #READN,SWCHON :PRINT SWITCH SETTINGS
2025 010046 013746 010242 MOV SWCHON,-(SP)
2026 010052 012746 010276 MOV #READN,-(SP)
2027 010056 012746 000002 MOV #2,-(SP)
2028 010062 010600 MOV SP,R0
2029 010064 104417 TRAP C$PNTF
2030 010066 062706 000006 ADD #6,SP
2031
2032 010072 013702 010242 MOV SWCHON,R2 :COPY SWITCH SETTINGS
2033 010076 012701 000001 MOV #1,R1 :SET SWITCH NUMBER = 1
2034 010102 032702 000001 TAG1: BIT #BIT0,R2 :IS THIS SWITCH ON?
2035 010106 001411 BEQ TAG2 :BR IF NO
2036 010110 PRINTF #MESSG1,R1 :PRINT SWITCH NUMBER
2037 010110 010146 MOV R1,-(SP)
  
```

|      |        |        |               |               |                             |                               |
|------|--------|--------|---------------|---------------|-----------------------------|-------------------------------|
| 2038 | 010112 | 012746 | 010331        | MOV           | #MESSG1,-(SP)               |                               |
| 2039 | 010116 | 012746 | 000002        | MOV           | #2,-(SP)                    |                               |
| 2040 | 010122 | 010600 |               | MOV           | SP,R0                       |                               |
| 2041 | 010124 | 104417 |               | TRAP          | C\$PNTF                     |                               |
| 2042 | 010126 | 062706 | 000006        | ADD           | #6,SP                       |                               |
| 2043 | 010132 | 005201 |               | TAG2: INC     | R1                          | : INCREMENT SWITCH NUMBER     |
| 2044 | 010134 | 006002 |               | ROR           | R2                          | : ROTATE SWITCH REGISTER      |
| 2045 | 010136 | 022701 | 000010        | CMP           | #10,R1                      | : FINISHED WITH E15?          |
| 2046 | 010142 | 002357 |               | BGE           | TAG1                        | : BR IF NO                    |
| 2047 | 010144 | 012701 | 000001        | MOV           | #1,R1                       | : RESET SWITCH NUMBER FOR E21 |
| 2048 | 010150 | 032702 | 000C01        | TAG3: BIT     | #BIT0,R2                    | : IS THIS SWITCH SET?         |
| 2049 | 010154 | 001411 |               | BEQ           | TAG4                        | : BR IF NO                    |
| 2050 | 010156 |        |               | PRINTF        | #MESSG2,R1                  | : PRINT SWITCH NUMBER         |
| 2051 | 010156 | 010146 |               | MOV           | R1,-(SP)                    |                               |
| 2052 | 010160 | 012746 | 010344        | MOV           | #MESSG2,-(SP)               |                               |
| 2053 | 010164 | 012746 | 000002        | MOV           | #2,-(SP)                    |                               |
| 2054 | 010170 | 010600 |               | MOV           | SP,R0                       |                               |
| 2055 | 010172 | 104417 |               | TRAP          | C\$PNTF                     |                               |
| 2056 | 010174 | 062706 | 000006        | ADD           | #6,SP                       |                               |
| 2057 | 010200 | 005201 |               | TAG4: INC     | R1                          | : INCREMENT SWITCH NUMBER     |
| 2058 | 010202 | 006002 |               | ROR           | R2                          | : ROTATE SWITCH REGISTER      |
| 2059 | 010204 | 022701 | 000004        | CMP           | #4,R1                       | : FINISHED?                   |
| 2060 | 010210 | 002357 |               | BGE           | TAG3                        | : BR IF NO                    |
| 2061 | 010212 |        |               | PRINTF        | #NEWLIN                     |                               |
| 2062 | 010212 | 012746 | 010357        | MOV           | #NEWLIN,-(SP)               |                               |
| 2063 | 010216 | 012746 | 000001        | MOV           | #1,-(SP)                    |                               |
| 2064 | 010222 | 010600 |               | MOV           | SP,R0                       |                               |
| 2065 | 010224 | 104417 |               | TRAP          | C\$PNTF                     |                               |
| 2066 | 010226 | 062706 | 000004        | ADD           | #4,SP                       |                               |
| 2067 |        |        |               |               |                             |                               |
| 2068 | 010232 |        |               | EXIT TST      |                             |                               |
| 2069 | 010232 | 104432 |               | TRAP          | C\$EXIT                     |                               |
| 2070 | 010234 | 000242 |               | .WORD         | L10053-                     |                               |
| 2071 |        |        |               |               |                             |                               |
| 2072 | 010236 | 000000 |               | SWCNT: .WORD  | 0                           |                               |
| 2073 | 010240 | 000000 |               | TEMP: .WORD   | 0                           |                               |
| 2074 | 010242 | 000000 |               | SWCHON: .WORD | 0                           |                               |
| 2075 |        |        |               |               |                             |                               |
| 2076 | 010244 |        |               | BGNMSG        | SWERR                       |                               |
| 2077 | 010244 |        |               | SWERR::       |                             |                               |
| 2078 | 010244 |        |               | PRINTB        | #SERR1,SWSET,LSREG          |                               |
| 2079 | 010244 | 013746 | 177524        | MOV           | LSREG,-(SP)                 |                               |
| 2080 | 010250 | 013746 | 002230        | MOV           | SWSET,-(SP)                 |                               |
| 2081 | 010254 | 012746 | 010362        | MOV           | #SERR1,-(SP)                |                               |
| 2082 | 010260 | 012746 | 000003        | MOV           | #3,-(SP)                    |                               |
| 2083 | 010264 | 010600 |               | MOV           | SP,R0                       |                               |
| 2084 | 010266 | 104414 |               | TRAP          | C\$PNTB                     |                               |
| 2085 | 010270 | 062706 | 000010        | ADD           | #10,SP                      |                               |
| 2086 | 010274 |        |               | ENDMSG        |                             |                               |
| 2087 | 010274 |        |               | L10054:       |                             |                               |
| 2088 | 010274 | 104423 |               | TRAP          | C\$MSG                      |                               |
| 2089 |        |        |               |               |                             |                               |
| 2090 | 010276 | 047045 | 040445 053523 | READN: .ASCIZ | /N%ASWITCHES ON : %06%A : / |                               |
| 2091 | 010304 | 052111 | 044103 051505 |               |                             |                               |
| 2092 | 010312 | 047440 | 020116 020072 |               |                             |                               |
| 2093 | 010320 | 047445 | 022466 020101 |               |                             |                               |

|      |        |        |        |        |                                                          |
|------|--------|--------|--------|--------|----------------------------------------------------------|
| 2094 | 010326 | 020072 | 000    |        |                                                          |
| 2095 | 010331 | 045    | 040501 | 042045 | MESSG1: .ASCIZ /%AA%D1%A, /                              |
| 2096 | 010336 | 022461 | 026101 | 000040 |                                                          |
| 2097 | 010344 | 040445 | 022502 | 030504 | MESSG2: .ASCIZ /%AB%D1%A, /                              |
| 2098 | 010352 | 040445 | 020054 | 000    |                                                          |
| 2099 | 010357 | 045    | 000116 |        | NEWLIN: .ASCIZ /%N/                                      |
| 2100 | 010362 | 040445 | 044504 | 020104 | SERR1: .ASCII /%ADID NOT RECOGNIZE ALL SWITCHES AS ON%N/ |
| 2101 | 010370 | 047516 | 020124 | 042522 |                                                          |
| 2102 | 010376 | 047503 | 047107 | 055111 |                                                          |
| 2103 | 010404 | 020105 | 046101 | 020114 |                                                          |
| 2104 | 010412 | 053523 | 052111 | 044103 |                                                          |
| 2105 | 010420 | 051505 | 040440 | 020123 |                                                          |
| 2106 | 010426 | 047117 | 047045 |        |                                                          |
| 2107 | 010432 | 040445 | 054105 | 042520 | .ASCIZ /%AEXPECTED: %06%S5%ARECEIVED:%06%N/              |
| 2108 | 010440 | 052103 | 042105 | 020072 |                                                          |
| 2109 | 010446 | 047445 | 022466 | 032523 |                                                          |
| 2110 | 010454 | 040445 | 042522 | 042503 |                                                          |
| 2111 | 010462 | 053111 | 042105 | 022472 |                                                          |
| 2112 | 010470 | 033117 | 047045 | 000    |                                                          |
| 2113 |        | 010476 |        |        |                                                          |
| 2114 | 010476 |        |        |        | .EVEN                                                    |
| 2115 | 010476 |        |        |        | ENDTST                                                   |
| 2116 | 010476 | 104401 |        |        | L10053: TRAP C\$ETST                                     |
| 2117 |        |        |        |        |                                                          |



```

2118 .SBTTL TEST 6: 2K DIAGNOSTIC ROM
2119 :++
2120 :TEST TO PERFORM CHECKSUM AND CHECKWORD VERIFICATION ON THE 2K
2121 :OF DIAGNOSTIC ROM. IN UNATTENDED MODE, THE ROM WILL BE ADDRESSED
2122 :FROM 0-2K. IN STAND-ALONE MODE, THE OPERATOR MAY CHANGE THE
2123 :ADDRESS BY RESPONDING TO QUESTIONS GENERATED ON THE FIRST PASS.
2124 :--
2125 010500          BGNTST
2126
2127 010500          BGNSUB
2128 010500 104402   TRAP    C$BSUB
2129 010502          MANUAL
2130 010502 104450   TRAP    C$MANI          ;MANUAL INTERVENTION OK?
2131 010504          BNCOMPLETE   STRT          ;BR IF NO
2132 010504 103014   BCC     STRT
2133 010506 005737 002216 TST     PASS          ;FIRST PASS?
2134 010512 001032          BNE     RSTRT        ;BR IF NO
2135 010514          GMANIL   DADDR,RSET,1,YES
2136 010514 104443   TRAP    C$GMAN
2137 010516 000404   BR      10000$
2138 010520 002244   .WORD  RSEI
2139 010522 000130   .WORD  T$CODE
2140 010524 011623   .WORD  DADDR
2141 010526 C00001   .WORD  1
2142 010530
2143 010530 005737 002244 10000$: TST     RSET          ;STANDARD JUMPERS?
2144 010534 001404          BEQ     GETAD        ;BR IF NO
2145 010536 012737 000400 011076 STRT:  MOV    #400,DRLP    ;STORE STARTING ADDRESS
2146 010544 000415          BR      RSTRT        ;GO PERFORM TEST
2147 010546          GETAD:  GMANID  LOADR,STORE,D,-1,0,24,NO
2148 010546 104443   TRAP    C$GMAN
2149 010550 000406   BR      10001$
2150 010552 002232   .WORD  STORE
2151 010554 000042   .WORD  T$CODE
2152 010556 003002   .WORD  LOADR
2153 010560 177777   .WORD  -1
2154 010562 000000   .WORD  T$LOLIM
2155 010564 000024   .WORD  T$HILIM
2156 010566
2157 010566 004737 005010 10001$: JSR    PC,SETADR    ;GET STARTING ADDRESS
2158 010572 013737 002202 011076 MOV    LOPAG,DRLP   ;STORE STARTING ADDRESS
2159 010600 013737 011076 177520 RSTRT: MOV    DRLP,PCR ;SET UP PCR
2160 010606 012737 000010 002204 DRTST: MOV    #10,COUNTR ;SET NUMBER OF CHECKWORDS TO CHECK
2161 010614 012705 002156          MOV    #SFPTBL,R5  ;LOCATION OF CHECKWORDS
2162 010620 012737 000001 002210          MOV    #1,RFLAG   ;INDICATE ROM
2163 010626 005037 002176          CLR    BCF         ;SIGNAL LOW BYTES ARE BEING CHECKED
2164 010632 122737 177777 173774 DLOOP: CMPB  #-1,@#173774 ;DOES THE ROM EXIST?
2165 010640 001007          BNE    1$         ;BR IF YES
2166 010642          ERRDF  30,,DERR1 ;DIAGNOSTIC ROM E48 NOT FOUND
2167 010642 104455   TRAP    C$ERDF
2168 010644 000036   .WORD  30
2169 010646 000000   .WORD  0
2170 010650 011100   .WORD  DERR1
2171 010652          CKLOOP
2172 010652 104406   TRAP    C$CLP1
2173 010654          EXIT   TST          ;EXIT TEST,ROM NOT FOUND
    
```

```

2174 010654 104432          TRAP      C$EXIT
2175 010656 000766          .WORD    L10055-.
2176 010660                1$:      CKLOOP          ;CHECK FOR LOOP ON ERROR
2177 010660 104406          TRAP      C$CLP1
2178 010662 004737 004176      JSR        PC,CHKSUM          ;COMPUTE THE ACTUAL CHECKSUM
2179 010666 113737 173776 002212  MOVB      @#173776,EXPSUM     ;GET THE STORED CHECKSUM
2180 010674 063737 002214 002212  ADD       ACTSUM,EXPSUM      ;ADD THE EXPECTED AND ACTUAL CHECKSUMS
2181 010702 105737 002212      TSTB     EXPSUM              ;BYTE RESULT = 0?
2182 010706 001404          BEQ       2$                  ;BR IF YES
2183 010710                ERRDF     31,,DERR2          ;CHECKSUM ERROR IN DIAGNOSTIC ROM
2184 010710 104455          TRAP      C$ERDF
2185 010712 000037          .WORD    31
2186 010714 000000          .WORD    0
2187 010716 011126          .WORD    DERR2
2188 010720                2$:      CKLOOP          ;CHECK FOR LOOP ON ERROR
2189 010720 104406          TRAP      C$CLP1
2190 010722          ENDSUB
2191 010722          L10056:
2192 010722 104403          TRAP      C$ESUB
2193
2194
2195 010724                BGNSUB
2196 010724 104402          TRAP      C$BSUB
2197 010726 012737 000001 002176  MOV       #1,BCF              ;SET BCF TO DENOTE HIGH BYTES
2198 010734 122737 177777 173775  CMPB     #-1,@#173775        ;DOES THE ROM EXIST?
2199 010742 001007          BNE      3$                  ;BR IF YES
2200 010744                ERRDF     32,,DERR3
2201 010744 104455          TRAP      C$ERDF
2202 010746 000040          .WORD    32
2203 010750 000000          .WORD    0
2204 010752 011154          .WORD    DERR3
2205 010754                CKLOOP          ;LOOP ON ERROR IF SELECTED
2206 010754 104406          TRAP      C$CLP1
2207 010756          EXIT      TST              ;EXIT TEST, ROM NOT FOUND
2208 010756 104432          TRAP      C$EXIT
2209 010760 000664          .WORD    L10055-.
2210 010762                3$:      CKLOOP          ;CHECK FOR LOOP ON ERROR
2211 010762 104406          TRAP      C$CLP1
2212 010764 004737 004176      JSR        PC,CHKSUM          ;COMPUTE THE ACTUAL CHECKSUM
2213 010770 113737 173777 002212  MOVB      @#173777,EXPSUM     ;GET EXPECTED CHECKSUM
2214 010776 063737 002214 002212  ADD       ACTSUM,EXPSUM      ;ADD THE EXPECTED AND ACTUAL CHECKSUMS
2215 011004 105737 002212      TSTB     EXPSUM              ;BYTE RESULT = 0?
2216 011010 001404          BEQ       4$                  ;BR IF YES
2217 011012                ERRDF     33,,DERR4          ;CHECKSUM ERROR IN DIAGNOSTIC ROM
2218 011012 104455          TRAP      C$ERDF
2219 011014 000041          .WORD    33
2220 011016 000000          .WORD    0
2221 011020 011202          .WORD    DERR4
2222 011022                4$:      CKLOOP
2223 011022 104406          TRAP      C$CLP1
2224 011024          ENDSUB
2225 011024          L10057:
2226 011024 104403          TRAP      C$ESUB
2227
2228 011026                BGNSUB
2229 011026 104402          TRAP      C$BSUB
    
```

|      |        |        |        |         |                |                |  |                                            |
|------|--------|--------|--------|---------|----------------|----------------|--|--------------------------------------------|
| 2230 | 011030 | 022537 | 173776 |         | CMP            | (R5)+,@#173776 |  |                                            |
| 2231 | 011034 | 001404 |        |         | BEQ            | 5\$            |  | :VERIFY THE CHECKWORD FOR THIS PAGE        |
| 2232 | 011036 |        |        |         | ERRDF          | 34,,DERR5      |  | :BR IF THE SAME                            |
| 2233 | 011036 | 104455 |        |         | TRAP           | C\$ERDF        |  | :CHECKWORD ERROR                           |
| 2234 | 011040 | 000042 |        |         | .WORD          | 34             |  |                                            |
| 2235 | 011042 | 000000 |        |         | .WORD          | 0              |  |                                            |
| 2236 | 011044 | 011230 |        |         | .WORD          | DERR5          |  |                                            |
| 2237 | 011046 |        |        | 5\$:    | CKLOOP         |                |  |                                            |
| 2238 | 011046 | 104406 |        |         | TRAP           | C\$CLP1        |  |                                            |
| 2239 | 011050 |        |        |         | ENDSUB         |                |  |                                            |
| 2240 | 011050 |        |        | L10060: |                |                |  |                                            |
| 2241 | 011050 | 104403 |        |         | TRAP           | C\$ESUB        |  |                                            |
| 2242 |        |        |        |         |                |                |  |                                            |
| 2243 |        |        |        |         |                |                |  |                                            |
| 2244 | 011052 |        |        |         | BGNSUB         |                |  |                                            |
| 2245 | 011052 | 104402 |        |         | TRAP           | C\$BSUB        |  |                                            |
| 2246 | 011054 | 062737 | 001002 | 177520  | ADD            | #1002,PCR      |  | :NEXT PAGE IN PCR                          |
| 2247 | 011062 | 005337 | 002204 |         | DEC            | COUNTR         |  | :DECREMENT CHECKWORD COUNT                 |
| 2248 | 011066 | 001257 |        |         | BNE            | DLOOP          |  | :LOOP UNTIL ALL 20 PAGES HAVE BEEN CHECKED |
| 2249 | 011070 |        |        |         | ENDSUB         |                |  |                                            |
| 2250 | 011070 |        |        | L10061: |                |                |  |                                            |
| 2251 | 011070 | 104403 |        |         | TRAP           | C\$ESUB        |  |                                            |
| 2252 |        |        |        |         |                |                |  |                                            |
| 2253 | 011072 |        |        |         | EXIT           | TST            |  |                                            |
| 2254 | 011072 | 104432 |        |         | TRAP           | C\$EXIT        |  |                                            |
| 2255 | 011074 | 000550 |        |         | .WORD          | L10055-        |  |                                            |
| 2256 |        |        |        |         |                |                |  |                                            |
| 2257 | 011076 | 000000 |        |         | DRLP:          | .WORD 0        |  |                                            |
| 2258 |        |        |        |         |                |                |  |                                            |
| 2259 | 011100 |        |        | BGNMSG  | DERR1          |                |  |                                            |
| 2260 | 011100 |        |        | DERR1:: |                |                |  |                                            |
| 2261 | 011100 |        |        | PRINTB  | #LRAERR,#NODR  |                |  |                                            |
| 2262 | 011100 | 012746 | 011577 |         | MOV            | #NODR,-(SP)    |  |                                            |
| 2263 | 011104 | 012746 | 011256 |         | MOV            | #LRAERR,-(SP)  |  |                                            |
| 2264 | 011110 | 012746 | 000002 |         | MOV            | #2,-(SP)       |  |                                            |
| 2265 | 011114 | 010600 |        |         | MOV            | SP,R0          |  |                                            |
| 2266 | 011116 | 104414 |        |         | TRAP           | C\$PNTB        |  |                                            |
| 2267 | 011120 | 062706 | 000006 |         | ADD            | #6,SP          |  |                                            |
| 2268 | 011124 |        |        | ENDMSG  |                |                |  |                                            |
| 2269 | 011124 |        |        | L10062: |                |                |  |                                            |
| 2270 | 011124 | 104423 |        |         | TRAP           | C\$MSG         |  |                                            |
| 2271 |        |        |        |         |                |                |  |                                            |
| 2272 | 011126 |        |        | BGNMSG  | DERR2          |                |  |                                            |
| 2273 | 011126 |        |        | DERR2:: |                |                |  |                                            |
| 2274 | 011126 |        |        | PRINTB  | #LOWROM,#CKERR |                |  |                                            |
| 2275 | 011126 | 012746 | 002632 |         | MOV            | #CKERR,-(SP)   |  |                                            |
| 2276 | 011132 | 012746 | 011332 |         | MOV            | #LOWROM,-(SP)  |  |                                            |
| 2277 | 011136 | 012746 | 000002 |         | MOV            | #2,-(SP)       |  |                                            |
| 2278 | 011142 | 010600 |        |         | MOV            | SP,R0          |  |                                            |
| 2279 | 011144 | 104414 |        |         | TRAP           | C\$PNTB        |  |                                            |
| 2280 | 011146 | 062706 | 000006 |         | ADD            | #6,SP          |  |                                            |
| 2281 | 011152 |        |        | ENDMSG  |                |                |  |                                            |
| 2282 | 011152 |        |        | L10063: |                |                |  |                                            |
| 2283 | 011152 | 104423 |        |         | TRAP           | C\$MSG         |  |                                            |
| 2284 |        |        |        |         |                |                |  |                                            |
| 2285 | 011154 |        |        | BGNMSG  | DERR3          |                |  |                                            |

|      |        |        |        |        |                                                              |
|------|--------|--------|--------|--------|--------------------------------------------------------------|
| 2286 | 011154 |        |        |        | DERR3::                                                      |
| 2287 | 011154 |        |        |        | PRINTB #HRAERR,#NODR                                         |
| 2288 | 011154 | 012746 | 011577 |        | MOV #NODR,-(SP)                                              |
| 2289 | 011160 | 012746 | 011401 |        | MOV #HRAERR,-(SP)                                            |
| 2290 | 011164 | 012746 | 000002 |        | MOV #2,-(SP)                                                 |
| 2291 | 011170 | 010600 |        |        | MOV SP,R0                                                    |
| 2292 | 011172 | 104414 |        |        | TRAP C\$PNTB                                                 |
| 2293 | 011174 | 062706 | 000006 |        | ADD #6,SP                                                    |
| 2294 | 011200 |        |        |        | ENDMSG                                                       |
| 2295 | 011200 |        |        |        | L10064:                                                      |
| 2296 | 011200 | 104423 |        |        | TRAP C\$MSG                                                  |
| 2297 |        |        |        |        |                                                              |
| 2298 | 011202 |        |        |        | BGNMSG DERR4                                                 |
| 2299 | 011202 |        |        |        | DERR4::                                                      |
| 2300 | 011202 |        |        |        | PRINTB #HIRUM,#CKERR                                         |
| 2301 | 011202 | 012746 | 002632 |        | MOV #CKERR,-(SP)                                             |
| 2302 | 011206 | 012746 | 011455 |        | MOV #HIRUM,-(SP)                                             |
| 2303 | 011212 | 012746 | 000002 |        | MOV #2,-(SP)                                                 |
| 2304 | 011216 | 010600 |        |        | MOV SP,R0                                                    |
| 2305 | 011220 | 104414 |        |        | TRAP C\$PNTB                                                 |
| 2306 | 011222 | 062706 | 000006 |        | ADD #6,SP                                                    |
| 2307 | 011226 |        |        |        | ENDMSG                                                       |
| 2308 | 011226 |        |        |        | L10065:                                                      |
| 2309 | 011226 | 104423 |        |        | TRAP C\$MSG                                                  |
| 2310 |        |        |        |        |                                                              |
| 2311 | 011230 |        |        |        | BGNMSG DERR5                                                 |
| 2312 | 011230 |        |        |        | DERR5::                                                      |
| 2313 | 011230 |        |        |        | PRINTB #MISTAK                                               |
| 2314 | 011230 | 012746 | 011525 |        | MOV #MISTAK,-(SP)                                            |
| 2315 | 011234 | 012746 | 000001 |        | MOV #1,-(SP)                                                 |
| 2316 | 011240 | 010600 |        |        | MOV SP,R0                                                    |
| 2317 | 011242 | 104414 |        |        | TRAP C\$PNTB                                                 |
| 2318 | 011244 | 062706 | 000004 |        | ADD #4,SP                                                    |
| 2319 | 011250 | 004737 | 004422 |        | JSR PC,VIRTAD                                                |
| 2320 | 011254 |        |        |        | ENDMSG                                                       |
| 2321 | 011254 |        |        |        | L10066:                                                      |
| 2322 | 011254 | 104423 |        |        | TRAP C\$MSG                                                  |
| 2323 |        |        |        |        |                                                              |
| 2324 | 011256 | 052045 | 047045 | 040445 | LRAERR: .ASCIZ /%T%N%ACANNOT ACCESS DIAGNOSTIC ROM IN E48%N/ |
| 2325 | 011264 | 040503 | 047116 | 052117 |                                                              |
| 2326 | 011272 | 040440 | 041503 | 051505 |                                                              |
| 2327 | 011300 | 020123 | 044504 | 043501 |                                                              |
| 2328 | 011306 | 047516 | 052123 | 041511 |                                                              |
| 2329 | 011314 | 051040 | 046517 | 044440 |                                                              |
| 2330 | 011322 | 020116 | 032105 | 022470 |                                                              |
| 2331 | 011330 | 000116 |        |        |                                                              |
| 2332 |        |        |        |        |                                                              |
| 2333 | 011332 | 052045 | 047045 | 040445 | LOWROM: .ASCIZ /%T%N%ALOW BYTE DIAGNOSTIC ROM IN E48%N/      |
| 2334 | 011340 | 047514 | 020127 | 054502 |                                                              |
| 2335 | 011346 | 042524 | 042040 | 040511 |                                                              |
| 2336 | 011354 | 047107 | 051517 | 044524 |                                                              |
| 2337 | 011362 | 020103 | 047522 | 020115 |                                                              |
| 2338 | 011370 | 047111 | 042440 | 034064 |                                                              |
| 2339 | 011376 | 047045 | 000    |        |                                                              |
| 2340 |        |        |        |        |                                                              |
| 2341 | 011401 | 045    | 022524 | 022516 | HRAERR: .ASCIZ /%T%N%ACANNOT ACCESS DIAGNOSTIC ROM IN E53%N/ |

|      |        |        |        |        |                                                            |
|------|--------|--------|--------|--------|------------------------------------------------------------|
| 2342 | 011406 | 041501 | 047101 | 047516 |                                                            |
| 2343 | 011414 | 020124 | 041501 | 042503 |                                                            |
| 2344 | 011422 | 051523 | 042040 | 040511 |                                                            |
| 2345 | 011430 | 047107 | 051517 | 044524 |                                                            |
| 2346 | 011436 | 020103 | 047522 | 020115 |                                                            |
| 2347 | 011444 | 047111 | 042440 | 031465 |                                                            |
| 2348 | 011452 | 047045 | 000    |        |                                                            |
| 2349 |        |        |        |        |                                                            |
| 2350 | 011455 | 045    | 022524 | 022516 | HIROM: .ASCIZ /%T%N%AHIGH BYTE DIAGNOSTIC ROM IN E53%N/    |
| 2351 | 011462 | 044101 | 043511 | 020110 |                                                            |
| 2352 | 011470 | 054502 | 042524 | 042040 |                                                            |
| 2353 | 011476 | 040511 | 047107 | 051517 |                                                            |
| 2354 | 011504 | 044524 | 020103 | 047522 |                                                            |
| 2355 | 011512 | 020115 | 047111 | 042440 |                                                            |
| 2356 | 011520 | 031465 | 047045 | 000    |                                                            |
| 2357 |        |        |        |        |                                                            |
| 2358 | 011525 | 045    | 044501 | 041516 | MISTAK: .ASCIZ /%AINCORRECT CHECKWORD IN DIAGNOSTIC ROM%N/ |
| 2359 | 011532 | 051117 | 042522 | 052103 |                                                            |
| 2360 | 011540 | 041440 | 042510 | 045503 |                                                            |
| 2361 | 011546 | 047527 | 042122 | 044440 |                                                            |
| 2362 | 011554 | 020116 | 044504 | 043501 |                                                            |
| 2363 | 011562 | 047516 | 052123 | 041511 |                                                            |
| 2364 | 011570 | 051040 | 046517 | 047045 |                                                            |
| 2365 | 011576 | 000    |        |        |                                                            |
| 2366 |        |        |        |        |                                                            |
| 2367 | 011577 | 116    | 047117 | 042455 | NODR: .ASCIZ /NON-EXISTENT MEMORY/                         |
| 2368 | 011604 | 044530 | 052123 | 047105 |                                                            |
| 2369 | 011612 | 020124 | 042515 | 047515 |                                                            |
| 2370 | 011620 | 054522 | 000    |        |                                                            |
| 2371 |        |        |        |        |                                                            |
| 2372 | 011623 | 123    | 040524 | 042116 | DADDR: .ASCIZ /STANDARD JUMPERS/                           |
| 2373 | 011630 | 051101 | 020104 | 052512 |                                                            |
| 2374 | 011636 | 050115 | 051105 | 000123 |                                                            |
| 2375 |        |        |        |        |                                                            |
| 2376 |        |        |        |        |                                                            |
| 2377 | 011644 |        |        |        | .EVEN<br>ENDTST                                            |
| 2378 | 011644 |        |        |        | L10055:                                                    |
| 2379 | 011644 | 104401 |        |        | TRAP CSETST                                                |

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2407 011646 104402  
2408 011650  
2409 011650 104450  
2410 011652  
2411 011652 103112  
2412 011654 005037 013710  
2413 011660 005737 002216  
2414 011664 001422  
2415 011666 005737 013714  
2416 011672 001153  
2417 011674 005737 013716  
2418 011700 001402  
2419 011702 000137 012556  
2420 011706 005737 013720  
2421 011712 001402  
2422 011714 000137 013132  
2423 011720 005737 013722  
2424 011724 001465  
2425 011726 000137 013476  
2426 011732  
2427 011732 104443  
2428 011734 000404  
2429 011736 013710  
2430 011740 000130  
2431 011742 014217  
2432 011744 000001  
2433 011746  
2434 011746 005737 013710  
2435 011752 001452

```

.SBTTL TEST 7: TEST ALL ADDITIONAL MEMORY
:++
:TEST TO LOCATE AND VERIFY CHECKSUMS IN ALL RESIDENT MEMORY
:ON A PAGE BASIS. THERE ARE FOUR STORAGE AREAS ASSOCIATED
:WITH THIS TEST WHICH HOLD THE CHECKWORDS OF ALL THE MEMORY
:THAT IS TO BE TESTED. THESE TABLES WILL HAVE DEFAULT VALUES
:ONLY IF THE ASSOCIATED MEMORY CHIP IS A STANDARD COMPONENT
:ON THE BOARD. IF NO DEFAULT VALUES EXIST, THE OPERATOR MUST
:INPUT THE CHECKWORDS AS LISTED ON THE PRINT SET. THE MEMORY
:WILL BE TESTED IN THE FOLLOWING LOCATIONS BY DEFAULT:
:
:      EXPANDABLE DIAGNOSTIC ROM      2-4K
:      EPROM IN SOCKETS              4-6K
:      SYSTEM ROM                    16-32K
:      SYSTEM EPROM                  16-24K
:
:THE TEST WILL FIRST VERIFY THE CHECKSUMS IN ALL RESIDENT ROM,
:THEN COMPARE THE ACTUAL CHECKWORDS. ERROR INFORMATION WILL
:INCLUDE THE SPECIFIC TYPE OF ERROR THAT OCCURRS, THE VIRTUAL
:ADDRESS, AND WHETHER IT WAS THE HIGH BYTE OR LOW BYTE ROM/EPROM.
:THIS INFORMATION SHOULD ALLOW A KNOWLEDGEABLE OPERATOR TO ISOLATE
:THE ERROR DOWN TO A SINGLE ROM/EPROM WITH THE AID OF THE
:ADDRESS MAP IN THE PRINT SET.
:--
      BGNTST
      BGNSUB
      TRAP      C$BSUB
      MANUAL
      TRAP      C$MANI
      BNCOMPLETE      DFLTST
      BCC      DFLTST
      CLR      ADDON
      TST      PASS
      BEQ      GET
      TST      LOD1
      BNE      LD1
      TST      LOD2
      BEQ      P1
      JMP      LD2
      TST      LOD3
      BEQ      P2
      JMP      LD3
      TST      LOD4
      BEQ      DFLTST
      JMP      LD4
      GET:     GMANIL EXEC,ADDON,1,YES
      TRAP      C$GMAN
      BR      10000$
      .WORD    ADDON
      .WORD    T$CODE
      .WORD    EXEC
      .WORD    1
      10000$: TST      ADDON
      BEQ      DFLTST
      ;UNDER APT?
      ;SKIP TEST IF YES
      ;RESTORE DEFAULT
      ;FIRST PASS?
      ;BR IF YES
      ;EXPANDED DIAGNOSTIC ROM?
      ;BR IF YES
      ;EPROM IN SOCKETS?
      ;BR IF NO
      ;TEST EPROM
      ;SYSTEM ROM ?
      ;BR IF NO
      ;TEST ROM
      ;SYSTEM EPROM?
      ;EXIT IF NO
      ;TEST EPROM
      ;ADDITIONAL MEMORY?
      ;BR IF NO

```

|      |        |        |        |          |        |                   |                           |
|------|--------|--------|--------|----------|--------|-------------------|---------------------------|
| 2436 | 011754 |        |        | DIAIN:   | GMANIL | EXPND,RESPND,1,NO |                           |
| 2437 | 011754 | 104443 |        |          | TRAP   | C\$GMAN           |                           |
| 2438 | 011756 | 000404 |        |          | BR     | 10001\$           |                           |
| 2439 | 011760 | 002242 |        |          | .WORD  | RESPND            |                           |
| 2440 | 011762 | 000120 |        |          | .WORD  | T\$CODE           |                           |
| 2441 | 011764 | 014246 |        |          | .WORD  | EXPND             |                           |
| 2442 | 011766 | 000001 |        |          | .WORD  | 1                 |                           |
| 2443 | 011770 |        |        | 10001\$: |        |                   |                           |
| 2444 | 011770 | 005737 | 002242 |          | TST    | RESPND            | :EXPANDED DIAGNOSTIC ROM? |
| 2445 | 011774 | 001045 |        |          | BNE    | EXPROM            | :BR IF YES                |
| 2446 | 011776 |        |        | EPRIN:   | GMANIL | EPRM,RESPND,1,NO  |                           |
| 2447 | 011776 | 104443 |        |          | TRAP   | C\$GMAN           |                           |
| 2448 | 012000 | 000404 |        |          | BR     | 10002\$           |                           |
| 2449 | 012002 | 002242 |        |          | .WORD  | RESPND            |                           |
| 2450 | 012004 | 000120 |        |          | .WORD  | T\$CODE           |                           |
| 2451 | 012006 | 014276 |        |          | .WORD  | EPRM              |                           |
| 2452 | 012010 | 000001 |        |          | .WORD  | 1                 |                           |
| 2453 | 012012 |        |        | 10002\$: |        |                   |                           |
| 2454 | 012012 | 005737 | 002242 |          | TST    | RESPND            | :EPROM IN SOCKETS?        |
| 2455 | 012016 | 001402 |        |          | BEQ    | SYSRIN            | :BR IF NO                 |
| 2456 | 012020 | 000137 | 012444 |          | JMP    | EPRMT             | :JUMP TO ACCEPT INPUT     |
| 2457 | 012024 |        |        | SYSRIN:  | GMANIL | SYSR,RESPND,1,NO  |                           |
| 2458 | 012024 | 104443 |        |          | TRAP   | C\$GMAN           |                           |
| 2459 | 012026 | 000404 |        |          | BR     | 10003\$           |                           |
| 2460 | 012030 | 002242 |        |          | .WORD  | RESPND            |                           |
| 2461 | 012032 | 000120 |        |          | .WORD  | T\$CODE           |                           |
| 2462 | 012034 | 014317 |        |          | .WORD  | SYSR              |                           |
| 2463 | 012036 | 000001 |        |          | .WORD  | 1                 |                           |
| 2464 | 012040 |        |        | 10003\$: |        |                   |                           |
| 2465 | 012040 | 005737 | 002242 |          | TST    | RESPND            | :SYSTEM ROM?              |
| 2466 | 012044 | 001402 |        |          | BEQ    | SYSEIN            | :BR IF NO                 |
| 2467 | 012046 | 000137 | 012772 |          | JMP    | SYSRT             | :INPUT CHECKWORDS         |
| 2468 | 012052 |        |        | SYSEIN:  | GMANIL | SYSE,RESPND,1,NO  |                           |
| 2469 | 012052 | 104443 |        |          | TRAP   | C\$GMAN           |                           |
| 2470 | 012054 | 000404 |        |          | BR     | 10004\$           |                           |
| 2471 | 012056 | 002242 |        |          | .WORD  | RESPND            |                           |
| 2472 | 012060 | 000120 |        |          | .WORD  | T\$CODE           |                           |
| 2473 | 012062 | 014332 |        |          | .WORD  | SYSE              |                           |
| 2474 | 012064 | 000001 |        |          | .WORD  | 1                 |                           |
| 2475 | 012066 |        |        | 10004\$: |        |                   |                           |
| 2476 | 012066 | 005737 | 002242 |          | TST    | RESPND            | :SYSTEM EPROM?            |
| 2477 | 012072 | 001402 |        |          | BEQ    | DFLTST            | :BR IF NO                 |
| 2478 | 012074 | 000137 | 013336 |          | JMP    | SYSET             | :INPUT CHECKWORDS         |
| 2479 | 012100 |        |        | DFLTST:  | EXIT   | TST               | :NO ADDTL. MEMORY -- EXIT |
| 2480 | 012100 | 104432 |        |          | TRAP   | C\$EXIT           |                           |
| 2481 | 012102 | 002374 |        |          | .WORD  | L10067-           |                           |
| 2482 | 012104 |        |        |          | ENDSUB |                   |                           |
| 2483 | 012104 |        |        | L10070:  |        |                   |                           |
| 2484 | 012104 | 104403 |        |          | TRAP   | C\$ESUB           |                           |
| 2485 |        |        |        |          |        |                   |                           |
| 2486 |        |        |        |          |        |                   |                           |
| 2487 | 012106 |        |        |          | BGNSUB |                   |                           |
| 2488 | 012106 | 104402 |        |          | TRAP   | C\$BSUB           |                           |
| 2489 | 012110 | 005037 | 002254 | EXPROM:  | CLR    | ERRFLG            | :CLEAR ERROR FLAG         |
| 2490 | 012114 | 012737 | 000010 |          | MOV    | #10,WORDCT        | :COUNT 8 CHECKWORDS       |
| 2491 | 012122 | 012702 | 002260 | 002234   | MOV    | #EXPDIA,R2        | :POINTER TO STORAGE TABLE |

TEST 7: TEST ALL ADDITIONAL MEMORY

|      |        |        |        |          |             |                          |                                   |
|------|--------|--------|--------|----------|-------------|--------------------------|-----------------------------------|
| 2492 | 012126 | 004737 | 004242 |          | JSR         | PC,INPUT                 | :INPUT CHECKWORDS                 |
| 2493 | 012132 |        |        |          | GMANIL      | EXADD,ANSR,1,YES         |                                   |
| 2494 | 012132 | 104443 |        |          | TRAP        | C\$GMAN                  |                                   |
| 2495 | 012134 | 000404 |        |          | BR          | 10000\$                  |                                   |
| 2496 | 012136 | 002206 |        |          | .WORD       | ANSR                     |                                   |
| 2497 | 012140 | 000130 |        |          | .WORD       | T\$CODE                  |                                   |
| 2498 | 012142 | 014347 |        |          | .WORD       | EXADD                    |                                   |
| 2499 | 012144 | 000001 |        |          | .WORD       | 1                        |                                   |
| 2500 | 012146 |        |        | 10000\$: |             |                          |                                   |
| 2501 | 012146 | 005737 | 002206 |          | TST         | ANSR                     | :STANDARD MEMORY RANGE?           |
| 2502 | 012152 | 001020 |        |          | BNE         | 1\$                      | :BR IF YES                        |
| 2503 | 012154 | 005237 | 002206 |          | INC         | ANSR                     | :RESTORE DEFAULT VALUE            |
| 2504 | 012160 |        |        |          | GMANID      | LOADR,STORE,D,-1,0,30,NO |                                   |
| 2505 | 012160 | 104443 |        |          | TRAP        | C\$GMAN                  |                                   |
| 2506 | 012162 | 000406 |        |          | BR          | 10001\$                  |                                   |
| 2507 | 012164 | 002232 |        |          | .WORD       | STORE                    |                                   |
| 2508 | 012166 | 000042 |        |          | .WORD       | T\$CODE                  |                                   |
| 2509 | 012170 | 003002 |        |          | .WORD       | LOADR                    |                                   |
| 2510 | 012172 | 177777 |        |          | .WORD       | -1                       |                                   |
| 2511 | 012174 | 000000 |        |          | .WORD       | T\$LOLIM                 |                                   |
| 2512 | 012176 | 000030 |        |          | .WORD       | T\$HILIM                 |                                   |
| 2513 | 012200 |        |        | 10001\$: |             |                          |                                   |
| 2514 | 012200 | 004737 | 005010 |          | JSR         | PC,SETADR                | :GET FIRST PAGE ADDRESS           |
| 2515 | 012204 | 013737 | 002202 | 013714   | MOV         | LOPAG,LOD1               | :STORE LOW PAGE NO.               |
| 2516 | 012212 | 000403 |        |          | BR          | LD1                      | :SKIP NEXT INSTRUCTION            |
| 2517 | 012214 | 012737 | 010420 | 013714   | 1\$:        | MOV #010420,LOD1         | :STANDARD PAGE = 20,21 2-4K RANGE |
| 2518 | 012222 | 013737 | 013714 | 177520   | LD1:        | MOV LOD1,PCR             | :LOAD STARTING PAGE               |
| 2519 | 012230 | 012737 | 000001 | 002210   | MOV         | #1,RFLAG                 | :INDICATE ROM                     |
| 2520 | 012236 | 012703 | 002260 |          | MOV         | #EXPDIAR3                | :POINTER TO CHECKWORDS            |
| 2521 | 012242 | 012737 | 000010 | 002204   | MOV         | #10,COUNTR               | :PAGE COUNT                       |
| 2522 | 012250 | 012337 | 002240 |          | EXPTST: MOV | (R3)+,CKWD               | :GET CHECKWORD FOR THIS PAGE      |
| 2523 | 012254 | 004737 | 004562 |          | JSR         | PC,MEMTST                | :TEST MEMORY                      |
| 2524 | 012260 | 005737 | 002200 |          | TST         | REAL                     | :DOES THE MEMORY EXIST?           |
| 2525 | 012264 | 001457 |        |          | BEQ         | E3                       | :BR IF NO                         |
| 2526 | 012266 | 005737 | 002254 |          | TST         | ERRFLG                   | :ANY OTHER ERRORS?                |
| 2527 | 012272 | 001421 |        |          | BEQ         | NOERR                    | :BR IF NO                         |
| 2528 | 012274 | 004737 | 004422 |          | JSR         | PC,VIRTAD                | :GET ADDRESS OF ERROR             |
| 2529 | 012300 | 005737 | 002176 |          | TST         | BCF                      | :LOW BYTE PAGE?                   |
| 2530 | 012304 | 001004 |        |          | BNE         | HIGH                     | :BR IF NO                         |
| 2531 | 012306 | 012737 | 002675 | 002252   | MOV         | #LOBYT,BYTLOC            | :SET POINTER FOR ERROR MSG.       |
| 2532 | 012314 | 000403 |        |          | BR          | DATOUT                   | :PRINT ERROR MESSAGE              |
| 2533 | 012316 | 012737 | 002737 | 002252   | HIGH:       | MOV #HIBYT,BYTLOC        | :POINTER FOR ERROR MSG.           |
| 2534 | 012324 | 022737 | 000001 | 002254   | DATOUT:     | CMP #1,ERRFLG            | :CHECKSUM ERROR?                  |
| 2535 | 012332 | 001420 |        |          | BEQ         | E1                       | :BR IF YES                        |
| 2536 | 012334 | 000425 |        |          | BR          | E2                       | :ELSE CHECKWORD ERROR             |
| 2537 | 012336 | 062737 | 001002 | 177520   | NOERR:      | ADD #1002,PCR            | :ADJUST PCR                       |
| 2538 | 012344 | 005337 | 002204 |          | DEC         | COUNTR                   | :DEC PAGE COUNT                   |
| 2539 | 012350 | 001337 |        |          | BNE         | EXPTST                   | :LOOP UNTIL ALL PAGES ARE TESTED  |
| 2540 | 012352 | 005737 | 002216 |          | MORE:       | TST PASS                 | :FIRST PASS?                      |
| 2541 | 012356 | 001002 |        |          | BNE         | 1\$                      | :BR IF NO                         |
| 2542 | 012360 | 000137 | 011776 |          | JMP         | EPRIN                    | :TEST ANY ADDITIONAL MEMORY       |
| 2543 | 012364 | 000137 | 011706 |          | 1\$:        | JMP P1                   | :FIND ANY ADDITIONAL MEMORY       |
| 2544 | 012370 |        |        |          | EXIT        | SUB                      | :END OF SUBTEST                   |
| 2545 | 012370 | 104432 |        |          | TRAP        | C\$EXIT                  |                                   |
| 2546 | 012372 | 000046 |        |          | .WORD       | L10071-                  |                                   |
| 2547 | 012374 |        |        | E1:      | ERRDF       | 35,EXPND,CKSME           |                                   |



|      |        |        |        |          |        |                          |                           |
|------|--------|--------|--------|----------|--------|--------------------------|---------------------------|
| 2548 | 012374 | 104455 |        |          | TRAP   | C\$ERDF                  |                           |
| 2549 | 012376 | 000043 |        |          | .WORD  | 35                       |                           |
| 2550 | 012400 | 014246 |        |          | .WORD  | EXPND                    |                           |
| 2551 | 012402 | 013724 |        |          | .WORD  | CKSME                    |                           |
| 2552 | 012404 |        |        |          | CKLOOP |                          |                           |
| 2553 | 012404 | 104406 |        |          | TRAP   | C\$CLP1                  |                           |
| 2554 | 012406 | 000761 |        |          | BR     | MORE                     |                           |
| 2555 | 012410 |        |        | E2:      | ERRDF  | 36,EXPND,CWKDE           |                           |
| 2556 | 012410 | 104455 |        |          | TRAP   | C\$ERDF                  |                           |
| 2557 | 012412 | 000044 |        |          | .WORD  | 36                       |                           |
| 2558 | 012414 | 014246 |        |          | .WORD  | EXPND                    |                           |
| 2559 | 012416 | 013762 |        |          | .WORD  | CWKDE                    |                           |
| 2560 | 012420 |        |        |          | CKLOOP |                          |                           |
| 2561 | 012420 | 104406 |        |          | TRAP   | C\$CLP1                  |                           |
| 2562 | 012422 | 000753 |        |          | BR     | MORE                     |                           |
| 2563 | 012424 |        |        | E3:      | ERRDF  | 37,EXPND,NONXT           |                           |
| 2564 | 012424 | 104455 |        |          | TRAP   | C\$ERDF                  |                           |
| 2565 | 012426 | 000045 |        |          | .WORD  | 37                       |                           |
| 2566 | 012430 | 014246 |        |          | .WORD  | EXPND                    |                           |
| 2567 | 012432 | 014014 |        |          | .WORD  | NONXT                    |                           |
| 2568 | 012434 |        |        |          | CKLOOP |                          |                           |
| 2569 | 012434 | 104406 |        |          | TRAP   | C\$CLP1                  |                           |
| 2570 | 012436 | 000745 |        |          | BR     | MORE                     |                           |
| 2571 | 012440 |        |        |          | ENDSUB |                          |                           |
| 2572 | 012440 |        |        | L10071:  |        |                          |                           |
| 2573 | 012440 | 104403 |        |          | TRAP   | C\$ESUB                  |                           |
| 2574 |        |        |        |          |        |                          |                           |
| 2575 | 012442 |        |        |          | BGNSUB |                          |                           |
| 2576 | 012442 | 104402 |        |          | TRAP   | C\$BSUB                  |                           |
| 2577 | 012444 | 005037 | 002254 | EPRMT:   | CLR    | ERRFLG                   | :CLEAR ERROR FLAG         |
| 2578 | 012450 | 012737 | 000010 | 002234   | MOV    | #10,WORDCT               | :INPUT 8 CHECKWORDS       |
| 2579 | 012456 | 012702 | 002300 |          | MOV    | #EPROM,R2                | :POINTER TO STORAGE TABLE |
| 2580 | 012462 | 004737 | 004242 |          | JSR    | PC,INPUT                 | :INPUT CHECKWORDS         |
| 2581 | 012466 |        |        |          | GMANIL | EPADD,ANSR,1,YES         |                           |
| 2582 | 012466 | 104443 |        |          | TRAP   | C\$GMAN                  |                           |
| 2583 | 012470 | 000404 |        |          | BR     | 10000\$                  |                           |
| 2584 | 012472 | 002206 |        |          | .WORD  | ANSR                     |                           |
| 2585 | 012474 | 000130 |        |          | .WORD  | T\$CODE                  |                           |
| 2586 | 012476 | 014375 |        |          | .WORD  | EPADD                    |                           |
| 2587 | 012500 | 000001 |        |          | .WORD  | 1                        |                           |
| 2588 | 012502 |        |        | 10000\$: |        |                          |                           |
| 2589 | 012502 | 005737 | 002206 |          | TST    | ANSR                     | :STANDARD MEMORY RANGE?   |
| 2590 | 012506 | 001020 |        |          | BNE    | 1\$                      | :BR IF YES                |
| 2591 | 012510 | 005237 | 002206 |          | INC    | ANSR                     | :RESTORE DEFAULT          |
| 2592 | 012514 |        |        |          | GMANID | LOADR,STORE,D,-1,0,30,NO |                           |
| 2593 | 012514 | 104443 |        |          | TRAP   | C\$GMAN                  |                           |
| 2594 | 012516 | 000406 |        |          | BR     | 10001\$                  |                           |
| 2595 | 012520 | 002232 |        |          | .WORD  | STORE                    |                           |
| 2596 | 012522 | 000042 |        |          | .WORD  | T\$CODE                  |                           |
| 2597 | 012524 | 003002 |        |          | .WORD  | LOADR                    |                           |
| 2598 | 012526 | 177777 |        |          | .WORD  | -1                       |                           |
| 2599 | 012530 | 000000 |        |          | .WORD  | T\$LOLIM                 |                           |
| 2600 | 012532 | 000030 |        |          | .WORD  | T\$HILIM                 |                           |
| 2601 | 012534 |        |        | 10001\$: |        |                          |                           |
| 2602 | 012534 | 004737 | 005010 |          | JSR    | PC,SETADR                | :GET FIRST PAGE ADDRESS   |
| 2603 | 012540 | 013737 | 002202 | 013716   | MOV    | LOPAG,LOD2               | :STORE LOW PAGE NO.       |

|      |        |        |        |        |         |        |                |                                   |
|------|--------|--------|--------|--------|---------|--------|----------------|-----------------------------------|
| 2604 | 012546 | 000403 |        |        |         | BR     | LD2            | :SKIP NEXT INSTRUCTION            |
| 2605 | 012550 | 012737 | 020440 | 013716 | 1\$:    | MOV    | #020440,LOD2   | :STANDARD PAGE = 40,41 4-6K RANGE |
| 2606 | 012556 | 013737 | 013716 | 177520 | LD2:    | MOV    | LOD2,PCR       | :LOAD STARTING ADDRESS            |
| 2607 | 012564 | 005037 | 002210 |        |         | CLR    | RFLAG          | :INDICATE EPROM                   |
| 2608 | 012570 | 012703 | 002300 |        |         | MOV    | #EPROM,R3      | :POINT TO CHECKWORDS              |
| 2609 | 012574 | 012737 | 000010 | 002204 |         | MOV    | #10,COUNTR     | :PAGE COUNT                       |
| 2610 | 012602 | 012337 | 002240 |        | EPRTST: | MOV    | (R3)+,CKWD     | :GET CHECKWORD FOR THIS PAGE      |
| 2611 | 012606 | 004737 | 004562 |        |         | JSR    | PC,MEMTST      | :TEST MEMORY                      |
| 2612 | 012612 | 005737 | 002200 |        |         | TST    | REAL           | :DOES THE MEMORY EXIST?           |
| 2613 | 012616 | 001455 |        |        |         | BEQ    | E6             | :BR IF NO                         |
| 2614 | 012620 | 005737 | 002254 |        |         | TST    | ERRFLG         | :ANY OTHER ERRORS?                |
| 2615 | 012624 | 001421 |        |        |         | BEQ    | NONE           | :BR IF NO                         |
| 2616 | 012626 | 004737 | 004422 |        |         | JSR    | PC,VIRTAD      | :GET ADDRESS OF ERROR             |
| 2617 | 012632 | 005737 | 002176 |        |         | TST    | BCF            | :LOW BYTE PAGE?                   |
| 2618 | 012636 | 001004 |        |        |         | BNE    | HIADD          | :BR IF NO                         |
| 2619 | 012640 | 012737 | 002675 | 002252 |         | MOV    | #LOBYT,BYTLOC  | :SET POINTER FOR ERROR MSG.       |
| 2620 | 012646 | 000403 |        |        |         | BR     | PRIOUT         | :PRINT ERROR MESSAGE              |
| 2621 | 012650 | 012737 | 002737 | 002252 | HIADD:  | MOV    | #HIBYT,BYTLOC  | :POINTER FOR ERROR MSG.           |
| 2622 | 012656 | 022737 | 000001 | 002254 | PRIOUT: | CMP    | #1,ERRFLG      | :CHECKSUM ERROR?                  |
| 2623 | 012664 | 001416 |        |        |         | BEQ    | E4             | :BR IF YES                        |
| 2624 | 012666 | 000423 |        |        |         | BR     | E5             | :ELSE CHECKWORD ERROR             |
| 2625 | 012670 | 062737 | 001002 | 177520 | NONE:   | ADD    | #1002,PCR      | :ADJUST PAGE IN PCR               |
| 2626 | 012676 | 005337 | 002204 |        |         | DEC    | COUNTR         | :DEC PAGE COUNT                   |
| 2627 | 012702 | 001337 |        |        |         | BNE    | EPRTST         | :LOOP UNTIL FINISHED              |
| 2628 | 012704 | 005737 | 002216 |        | ADDTL:  | TST    | PASS           | :FIRST PASS?                      |
| 2629 | 012710 | 001002 |        |        |         | BNE    | 1\$            | :BR IF NO                         |
| 2630 | 012712 | 000137 | 012024 |        |         | JMP    | SYSRIN         | :TEST ANY ADDITIONAL MEMORY       |
| 2631 | 012716 | 000137 | 011720 |        | 1\$:    | JMP    | P2             | :FIND ANY ADDITIONAL MEMORY       |
| 2632 | 012722 |        |        |        | E4:     | ERRDF  | 40,EPROM,CKSME |                                   |
| 2633 | 012722 | 104455 |        |        |         | TRAP   | C\$ERDF        |                                   |
| 2634 | 012724 | 000050 |        |        |         | .WORD  | 40             |                                   |
| 2635 | 012726 | 014276 |        |        |         | .WORD  | EPROM          |                                   |
| 2636 | 012730 | 013724 |        |        |         | .WORD  | CKSME          |                                   |
| 2637 | 012732 |        |        |        |         | CKLOOP |                |                                   |
| 2638 | 012732 | 104406 |        |        |         | TRAP   | C\$CLP1        |                                   |
| 2639 | 012734 | 000763 |        |        |         | BR     | ADDTL          |                                   |
| 2640 | 012736 |        |        |        | E5:     | ERRDF  | 41,EPROM,CWKDE |                                   |
| 2641 | 012736 | 104455 |        |        |         | TRAP   | C\$ERDF        |                                   |
| 2642 | 012740 | 000051 |        |        |         | .WORD  | 41             |                                   |
| 2643 | 012742 | 014276 |        |        |         | .WORD  | EPROM          |                                   |
| 2644 | 012744 | 013762 |        |        |         | .WORD  | CWKDE          |                                   |
| 2645 | 012746 |        |        |        |         | CKLOOP |                |                                   |
| 2646 | 012746 | 104406 |        |        |         | TRAP   | C\$CLP1        |                                   |
| 2647 | 012750 | 000755 |        |        |         | BR     | ADDTL          |                                   |
| 2648 | 012752 |        |        |        | E6:     | ERRDF  | 42,EPROM,NONXT |                                   |
| 2649 | 012752 | 104455 |        |        |         | TRAP   | C\$ERDF        |                                   |
| 2650 | 012754 | 000052 |        |        |         | .WORD  | 42             |                                   |
| 2651 | 012756 | 014276 |        |        |         | .WORD  | EPROM          |                                   |
| 2652 | 012760 | 014014 |        |        |         | .WORD  | NONXT          |                                   |
| 2653 | 012762 |        |        |        |         | CKLOOP |                |                                   |
| 2654 | 012762 | 104406 |        |        |         | TRAP   | C\$CLP1        |                                   |
| 2655 | 012764 | 000747 |        |        |         | BR     | ADDTL          |                                   |
| 2656 | 012766 |        |        |        |         | ENDSUB |                |                                   |
| 2657 | 012766 |        |        |        | L10072: |        |                |                                   |
| 2658 | 012766 | 104403 |        |        |         | TRAP   | C\$ESUB        |                                   |
| 2659 |        |        |        |        |         |        |                |                                   |

|      |        |        |        |        |          |        |                             |                                       |
|------|--------|--------|--------|--------|----------|--------|-----------------------------|---------------------------------------|
| 2660 | 012770 |        |        |        |          | BGNSUB |                             |                                       |
| 2661 | 012770 | 104402 |        |        |          | TRAP   | C\$BSUB                     |                                       |
| 2662 | 012772 | 005037 | 002254 |        | SYSRT:   | CLR    | ERRFLG                      | ;CLEAR ERROR FLAG                     |
| 2663 | 012776 |        |        |        |          | GMANID | RWDCT,RESPND,D,-1,10,100,NO |                                       |
| 2664 | 012776 | 104443 |        |        |          | TRAP   | C\$GMAN                     |                                       |
| 2665 | 013000 | 000406 |        |        |          | BR     | 10000\$                     |                                       |
| 2666 | 013002 | 002242 |        |        |          | .WORD  | RESPND                      |                                       |
| 2667 | 013004 | 000042 |        |        |          | .WORD  | T\$CODE                     |                                       |
| 2668 | 013006 | 014155 |        |        |          | .WORD  | RWDCT                       |                                       |
| 2669 | 013010 | 177777 |        |        |          | .WORD  | -1                          |                                       |
| 2670 | 013012 | 000010 |        |        |          | .WORD  | T\$LLOLIM                   |                                       |
| 2671 | 013014 | 000100 |        |        |          | .WORD  | T\$HILIM                    |                                       |
| 2672 | 013016 |        |        |        | 10000\$: |        |                             |                                       |
| 2673 | 013016 | 013737 | 002242 | 013712 |          | MOV    | RESPND,PGCT                 | ;STORE PAGE COUNT                     |
| 2674 | 013024 | 013737 | 002242 | 002234 |          | MOV    | RESPND,WORDCT               | ;COPY WORD COUNT                      |
| 2675 | 013032 | 012702 | 002320 |        |          | MOV    | #SYSROM,R2                  | ;POINTER TO STORAGE TABLE             |
| 2676 | 013036 | 004737 | 004242 |        |          | JSR    | PC,INPUT                    | ;INPUT CHECKWORDS                     |
| 2677 | 013042 |        |        |        |          | GMANIL | SRR,ANSR,1,YES              |                                       |
| 2678 | 013042 | 104443 |        |        |          | TRAP   | C\$GMAN                     |                                       |
| 2679 | 013044 | 000404 |        |        |          | BR     | 10001\$                     |                                       |
| 2680 | 013046 | 002206 |        |        |          | .WORD  | ANSR                        |                                       |
| 2681 | 013050 | 000130 |        |        |          | .WORD  | T\$CODE                     |                                       |
| 2682 | 013052 | 014414 |        |        |          | .WORD  | SRR                         |                                       |
| 2683 | 013054 | 000001 |        |        |          | .WORD  | 1                           |                                       |
| 2684 | 013056 |        |        |        | 10001\$: |        |                             |                                       |
| 2685 | 013056 | 005737 | 002206 |        |          | TST    | ANSR                        | ;STANDARD MEMORY RANGE?               |
| 2686 | 013062 | 001020 |        |        |          | BNE    | 1\$                         | ;BR IF YES                            |
| 2687 | 013064 | 005237 | 002206 |        |          | INC    | ANSR                        | ;RESTORE DEFAULT VALUE                |
| 2688 | 013070 |        |        |        |          | GMANID | LOADR,STORE,D,-1,0,30,NO    |                                       |
| 2689 | 013070 | 104443 |        |        |          | TRAP   | C\$GMAN                     |                                       |
| 2690 | 013072 | 000406 |        |        |          | BR     | 10002\$                     |                                       |
| 2691 | 013074 | 002232 |        |        |          | .WORD  | STORE                       |                                       |
| 2692 | 013076 | 000042 |        |        |          | .WORD  | T\$CODE                     |                                       |
| 2693 | 013100 | 003002 |        |        |          | .WORD  | LOADR                       |                                       |
| 2694 | 013102 | 177777 |        |        |          | .WORD  | -1                          |                                       |
| 2695 | 013104 | 000000 |        |        |          | .WORD  | T\$LLOLIM                   |                                       |
| 2696 | 013106 | 000030 |        |        |          | .WORD  | T\$HILIM                    |                                       |
| 2697 | 013110 |        |        |        | 10002\$: |        |                             |                                       |
| 2698 | 013110 | 004737 | 005010 |        |          | JSR    | PC,SETADR                   | ;GET FIRST PAGE ADDRESS               |
| 2699 | 013114 | 013737 | 002202 | 013720 |          | MOV    | LOPAG,LOD3                  | ;STORE LOW PAGE NO.                   |
| 2700 | 013122 | 000403 |        |        |          | BR     | LD3                         | ;SKIP NEXT INSTRUCTION                |
| 2701 | 013124 | 012737 | 100600 | 013720 | 1\$:     | MOV    | #100600,LOD3                | ;STANDARD PAGE = 200,201 16-32K RANGE |
| 2702 | 013132 | 013737 | 013720 | 177520 | LD3:     | MOV    | LOD3,PCR                    | ;LOAD STARTING ADDRESS                |
| 2703 | 013140 | 012737 | 000001 | 002210 |          | MOV    | #1,RFLAG                    | ;INDICATE ROM                         |
| 2704 | 013146 | 012703 | 002320 |        |          | MOV    | #SYSROM,R3                  | ;POINT TO CHECKWORDS                  |
| 2705 | 013152 | 013737 | 013712 | 002204 |          | MOV    | PGCT,COUNTR                 | ;PAGE COUNT                           |
| 2706 | 013160 | 012337 | 002240 |        | SYRTST:  | MOV    | (R3)+,CKWD                  | ;GET CHECKWORD FOR THIS PAGE          |
| 2707 | 013164 | 004737 | 004562 |        |          | JSR    | PC,MEMTST                   | ;TEST MEMORY                          |
| 2708 | 013170 | 005737 | 002200 |        |          | TST    | REAL                        | ;DOES THE MEMORY EXIST?               |
| 2709 | 013174 | 001450 |        |        |          | BEQ    | E11                         | ;BR IF NO                             |
| 2710 | 013176 | 005737 | 002254 |        |          | TST    | ERRFLG                      | ;ANY OTHER ERRORS?                    |
| 2711 | 013202 | 001421 |        |        |          | BEQ    | PASSED                      | ;BR IF NO                             |
| 2712 | 013204 | 004737 | 004422 |        |          | JSR    | PC,VIRTAD                   | ;GET ADDRESS OF ERROR                 |
| 2713 | 013210 | 005737 | 002176 |        |          | TST    | BCF                         | ;LOW BYTE PAGE?                       |
| 2714 | 013214 | 001004 |        |        |          | BNE    | HIGHB                       | ;BR IF NO                             |
| 2715 | 013216 | 012737 | 002675 | 002252 |          | MOV    | #LOBYT,BYTLOC               | ;SET POINTER FOR ERROR MSG.           |

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2716 013224 000403          BR      MSGOUT          ;PRINT ERROR MESSAGE
2717 013226 012737 002737 002252 HIGHB: MOV      #HIBYT,BYTLOC ;POINTER FOR ERROR MSG.
2718 013234 022737 000001 002254 MSGOUT: CMP      #1,ERRFLG   ;CHECKSUM ERROR?
2719 013242 001411          BEQ      E7              ;BR IF YES
2720 013244 000416          BR      E10             ;ELSE CHECKWORD ERROR
2721 013246 062737 001002 177520 PASSED: ADD     #1002,PCR   ;ADJUST PAGE IN PCR
2722 013254 005337 002204          DEC     COUNTR         ;DEC PAGE COUNT
2723 013260 001337          BNE     SYRTST         ;LOOP UNTIL FINISHED
2724 013262          NEXT:  EXIT      TST              ;TEST IS FINISHED
2725 013262 104432          TRAP   C$EXIT
2726 013264 001212          .WORD L10067-
2727 013266          E7:    ERRDF  43,SYSR,CKSME
2728 013266 104455          TRAP   C$ERDF
2729 013270 000053          .WORD  43
2730 013272 014317          .WORD  SYSR
2731 013274 013724          .WORD  CKSME
2732 013276          CKLOOP
2733 013276 104406          TRAP   C$CLP1
2734 013300 000770          BR      NEXT
2735 013302          E10:  ERRDF  44,SYSR,CWKDE
2736 013302 104455          TRAP   C$ERDF
2737 013304 000054          .WORD  44
2738 013306 014317          .WORD  SYSR
2739 013310 013762          .WORD  CWKDE
2740 013312          CKLOOP
2741 013312 104406          TRAP   C$CLP1
2742 013314 000762          BR      NEXT
2743 013316          E11:  ERRDF  45,SYSR,NONXT
2744 013316 104455          TRAP   C$ERDF
2745 013320 000055          .WORD  45
2746 013322 014317          .WORD  SYSR
2747 013324 014014          .WORD  NONXT
2748 013326          CKLOOP
2749 013326 104406          TRAP   C$CLP1
2750 013330 000754          BR      NEXT
2751 013332          ENDSUB
2752 013332          L10073:
2753 013332 104403          TRAP   C$ESUB
2754
2755 013334          BGNSUB
2756 013334 104402          TRAP   C$BSUB
2757 013336 005037 002254          SYSET: CLR     ERRFLG          ;CLEAR ERROR FLAG
2758 013342          GMANID RWDCT,RESPND,D,-1,10,40,NO
2759 013342 104443          TRAP   C$GMAN
2760 013344 000406          BR      10000$
2761 013346 002242          .WORD  RESPND
2762 013350 000042          .WORD  T$CODE
2763 013352 014155          .WORD  RWDCT
2764 013354 177777          .WORD  -1
2765 013356 000010          .WORD  T$LOLIM
2766 013360 000040          .WORD  T$HILIM
2767 013362          10000$:
2768 013362 013737 002242 013712 MOV     RESPND,PGCT      ;STORE PAGE COUNT
2769 013370 013737 002242 002234 MOV     RESPND,WORDCT   ;COPY WORD COUNT
2770 013376 012702 002320 MOV     #SYSROM,R2     ;POINTER TO STORAGE TABLE
2771 013402 004737 004242 JSR     PC,INPUT        ;INPUT CHECKWORDS
    
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TEST 7: TEST ALL ADDITIONAL MEMORY

|      |        |        |        |        |        |          |        |                          |  |                                       |
|------|--------|--------|--------|--------|--------|----------|--------|--------------------------|--|---------------------------------------|
| 2772 | 013406 |        |        |        |        |          | GMANIL | SYEE,ANSR,1,YES          |  |                                       |
| 2773 | 013406 | 104443 |        |        |        |          | TRAP   | C\$GMAN                  |  |                                       |
| 2774 | 013410 | 000404 |        |        |        |          | BR     | 10001\$                  |  |                                       |
| 2775 | 013412 | 002206 |        |        |        |          | .WORD  | ANSR                     |  |                                       |
| 2776 | 013414 | 000130 |        |        |        |          | .WORD  | T\$CODE                  |  |                                       |
| 2777 | 013416 | 014444 |        |        |        |          | .WORD  | SYEE                     |  |                                       |
| 2778 | 013420 | 000001 |        |        |        |          | .WORD  | 1                        |  |                                       |
| 2779 | 013422 |        |        |        |        | 10001\$: |        |                          |  |                                       |
| 2780 | 013422 | 005737 | 002206 |        |        |          | TST    | ANSR                     |  | :STANDARD MEMORY RANGE?               |
| 2781 | 013426 | 001020 |        |        |        |          | BNE    | 1\$                      |  | :BR IF YES                            |
| 2782 | 013430 | 005237 | 002206 |        |        |          | INC    | ANSR                     |  | :RESTORE DEFAULT VALUE                |
| 2783 | 013434 |        |        |        |        |          | GMANID | LOADR,STORE,D,-1,0,30,NO |  |                                       |
| 2784 | 013434 | 104443 |        |        |        |          | TRAP   | C\$GMAN                  |  |                                       |
| 2785 | 013436 | 000406 |        |        |        |          | BR     | 10002\$                  |  |                                       |
| 2786 | 013440 | 002232 |        |        |        |          | .WORD  | STORE                    |  |                                       |
| 2787 | 013442 | 000042 |        |        |        |          | .WORD  | T\$CODE                  |  |                                       |
| 2788 | 013444 | 003002 |        |        |        |          | .WORD  | LOADR                    |  |                                       |
| 2789 | 013446 | 177777 |        |        |        |          | .WORD  | -1                       |  |                                       |
| 2790 | 013450 | 000000 |        |        |        |          | .WORD  | T\$LLOLIM                |  |                                       |
| 2791 | 013452 | 000030 |        |        |        |          | .WORD  | T\$HILIM                 |  |                                       |
| 2792 | 013454 |        |        |        |        | 10002\$: |        |                          |  |                                       |
| 2793 | 013454 | 004737 | 005010 |        |        |          | JSR    | PC,SETADR                |  | :GET FIRST PAGE ADDRESS               |
| 2794 | 013460 | 013737 | 002202 | 013722 |        |          | MOV    | LOPAG,LOD4               |  | :STORE LOW PAGE NO.                   |
| 2795 | 013466 | 000403 |        |        |        |          | BR     | LD4                      |  | :SKIP NEXT INSTRUCTION                |
| 2796 | 013470 | 012737 | 100600 | 013722 | 1\$:   |          | MOV    | #100600,LOD4             |  | :STANDARD PAGE = 200,201 16-24K RANGE |
| 2797 | 013476 | 013737 | 013722 | 177520 | LD4:   |          | MOV    | LOD4,PCR                 |  | :LOAD STARTING ADDRESS                |
| 2798 | 013504 | 005037 | 002210 |        |        |          | CLR    | RFLAG                    |  | :INDICATE EPROM                       |
| 2799 | 013510 | 012703 | 002320 |        |        |          | MOV    | #SYSROM,R3               |  | :POINT TO CHECKWORDS                  |
| 2800 | 013514 | 013737 | 013712 | 002204 |        |          | MOV    | PGCT,COUNTR              |  | :PAGE COUNT                           |
| 2801 | 013522 | 012337 | 002240 |        |        | SYETST:  | MOV    | (R3)+,CKWD               |  | :GET CHECKWORD FOR THIS PAGE          |
| 2802 | 013526 | 004737 | 004562 |        |        |          | JSR    | PC,MEMTST                |  | :TEST MEMORY                          |
| 2803 | 013532 | 005737 | 002200 |        |        |          | TST    | REAL                     |  | :DOES THIS MEMORY EXIST?              |
| 2804 | 013536 | 001452 |        |        |        |          | BEQ    | E14                      |  | :BR IF NO                             |
| 2805 | 013540 | 005737 | 002254 |        |        |          | TST    | ERRFLG                   |  | :ANY ERRORS?                          |
| 2806 | 013544 | 001421 |        |        |        |          | BEQ    | CONT                     |  | :BR IF NO                             |
| 2807 | 013546 | 004737 | 004422 |        |        |          | JSR    | PC,VIRTAD                |  | :GET ADDRESS OF ERROR                 |
| 2808 | 013552 | 005737 | 002176 |        |        |          | TST    | BCF                      |  | :LOW BYTE PAGE?                       |
| 2809 | 013556 | 001004 |        |        |        |          | BNE    | HBYTE                    |  | :BR IF NO                             |
| 2810 | 013560 | 012737 | 002675 | 002252 |        |          | MOV    | #LOBYT,BYTLOC            |  | :SET POINTER FOR ERROR MSG.           |
| 2811 | 013566 | 000403 |        |        |        |          | BR     | PRIN                     |  | :PRINT ERROR MESSAGE                  |
| 2812 | 013570 | 012737 | 002737 | 002252 | HBYTE: |          | MOV    | #HIBYT,BYTLOC            |  | :POINTER FOR ERROR MSG.               |
| 2813 | 013576 | 022737 | 000001 | 002254 | PRIN:  |          | CMP    | #1,ERRFLG                |  | :CHECKSUM ERROR?                      |
| 2814 | 013604 | 001411 |        |        |        |          | BEQ    | E12                      |  | :BR IF YES                            |
| 2815 | 013606 | 000417 |        |        |        |          | BR     | E13                      |  | :ELSE CHECKWORD ERROR                 |
| 2816 | 013610 | 062737 | 001002 | 177520 | CONT:  |          | ADD    | #1002,PCR                |  | :ADJUST PAGE IN PCR                   |
| 2817 | 013616 | 005337 | 002204 |        |        |          | DEC    | COUNTR                   |  | :DEC PAGE COUNT                       |
| 2818 | 013622 | 001337 |        |        |        |          | BNE    | SYETST                   |  | :LOOP UNTIL FINISHED                  |
| 2819 | 013624 |        |        |        |        |          | EXIT   | TST                      |  | :TEST IS FINISHED                     |
| 2820 | 013624 | 104432 |        |        |        |          | TRAP   | C\$EXIT                  |  |                                       |
| 2821 | 013626 | 000650 |        |        |        |          | .WORD  | L10067-                  |  |                                       |
| 2822 | 013630 |        |        |        | E12:   |          | ERRDF  | 46,SYSE,CKSME            |  |                                       |
| 2823 | 013630 | 104455 |        |        |        |          | TRAP   | C\$ERDF                  |  |                                       |
| 2824 | 013632 | 000056 |        |        |        |          | .WORD  | 46                       |  |                                       |
| 2825 | 013634 | 014332 |        |        |        |          | .WORD  | SYSE                     |  |                                       |
| 2826 | 013636 | 013724 |        |        |        |          | .WORD  | CKSME                    |  |                                       |
| 2827 | 013640 |        |        |        |        |          | CKLOOP |                          |  |                                       |

|      |        |        |         |              |               |
|------|--------|--------|---------|--------------|---------------|
| 2828 | 013640 | 104406 |         | TRAP         | C\$CLP1       |
| 2829 | 013642 |        |         | EXIT         | TST           |
| 2830 | 013642 | 104432 |         | TRAP         | C\$EXIT       |
| 2831 | 013644 | 000632 |         | .WORD        | L10067-       |
| 2832 | 013646 |        | E13:    | ERRDF        | 47,SYSE,CWKDE |
| 2833 | 013646 | 104455 |         | TRAP         | C\$ERDF       |
| 2834 | 013650 | 000057 |         | .WORD        | 47            |
| 2835 | 013652 | 014332 |         | .WORD        | SYSE          |
| 2836 | 013654 | 013762 |         | .WORD        | CWKDE         |
| 2837 | 013656 |        |         | CKLOOP       |               |
| 2838 | 013656 | 104406 |         | TRAP         | C\$CLP1       |
| 2839 | 013660 |        |         | EXIT         | TST           |
| 2840 | 013660 | 104432 |         | TRAP         | C\$EXIT       |
| 2841 | 013662 | 000614 |         | .WORD        | L10067-       |
| 2842 | 013664 |        | E14:    | ERRDF        | 50,SYSE,NONXT |
| 2843 | 013664 | 104455 |         | TRAP         | C\$ERDF       |
| 2844 | 013666 | 000062 |         | .WORD        | 50            |
| 2845 | 013670 | 014332 |         | .WORD        | SYSE          |
| 2846 | 013672 | 014014 |         | .WORD        | NONXT         |
| 2847 | 013674 |        |         | CKLOOP       |               |
| 2848 | 013674 | 104406 |         | TRAP         | C\$CLP1       |
| 2849 | 013676 |        |         | EXIT         | TST           |
| 2850 | 013676 | 104432 |         | TRAP         | C\$EXIT       |
| 2851 | 013700 | 000576 |         | .WORD        | L10067-       |
| 2852 | 013702 |        |         | ENDSUB       |               |
| 2853 | 013702 |        | L10074: |              |               |
| 2854 | 013702 | 104403 |         | TRAP         | C\$ESUB       |
| 2855 |        |        |         |              |               |
| 2856 | 013704 |        |         | EXIT         | TST           |
| 2857 | 013704 | 104432 |         | TRAP         | C\$EXIT       |
| 2858 | 013706 | 000570 |         | .WORD        | L10067-       |
| 2859 |        |        |         |              |               |
| 2860 | 013710 | 000000 | ADDON:  | .WORD        | 0             |
| 2861 | 013712 | 000000 | PGCT:   | .WORD        | 0             |
| 2862 | 013714 | 000000 | LOD1:   | .WORD        | 0             |
| 2863 | 013716 | 000000 | LOD2:   | .WORD        | 0             |
| 2864 | 013720 | 000000 | LOD3:   | .WORD        | 0             |
| 2865 | 013722 | 000000 | LOD4:   | .WORD        | 0             |
| 2866 |        |        |         |              |               |
| 2867 |        |        |         |              |               |
| 2868 | 013724 |        | BGNMSG  | CKSME        |               |
| 2869 | 013724 |        | CKSME:: |              |               |
| 2870 | 013724 |        | PRINTB  | #ERM6,BYTLOC |               |
| 2871 | 013724 | 013746 | 002252  | MOV          | BYTLOC,-(SP)  |
| 2872 | 013730 | 012746 | 014076  | MOV          | #ERM6,-(SP)   |
| 2873 | 013734 | 012746 | 000002  | MOV          | #2,-(SP)      |
| 2874 | 013740 | 010600 |         | MOV          | SP,R0         |
| 2875 | 013742 | 104414 |         | TRAP         | C\$PNTB       |
| 2876 | 013744 | 062706 | 000006  | ADD          | #6,SP         |
| 2877 | 013750 | 004737 | 004422  | JSR          | PC,VIRTAD     |
| 2878 | 013754 | 004737 | 004146  | JSR          | PC,VIPRI      |
| 2879 | 013760 |        |         | ENDMSG       |               |
| 2880 | 013760 |        | L10075: |              |               |
| 2881 | 013760 | 104423 |         | TRAP         | C\$MSG        |
| 2882 |        |        |         |              |               |
| 2883 | 013762 |        | BGNMSG  | CWKDE        |               |

|      |        |        |        |        |         |                                            |
|------|--------|--------|--------|--------|---------|--------------------------------------------|
| 2884 | 013762 |        |        |        | CWKDE:: |                                            |
| 2885 | 013762 |        |        |        | PRINTB  | #ERMS                                      |
| 2886 | 013762 | 012746 | 014046 |        | MOV     | #ERMS,-(SP)                                |
| 2887 | 013766 | 012746 | 000001 |        | MOV     | #1,-(SP)                                   |
| 2888 | 013772 | 010600 |        |        | MOV     | SP,R0                                      |
| 2889 | 013774 | 104414 |        |        | TRAP    | C\$PNTB                                    |
| 2890 | 013776 | 062706 | 000004 |        | ADD     | #4,SP                                      |
| 2891 | 014002 | 004737 | 004422 |        | JSR     | PC,VIRTAD                                  |
| 2892 | 014006 | 004737 | 004146 |        | JSR     | PC,VIPRI                                   |
| 2893 | 014012 |        |        |        | ENDMSG  |                                            |
| 2894 | 014012 |        |        |        | L10076: |                                            |
| 2895 | 014012 | 104423 |        |        | TRAP    | C\$MSG                                     |
| 2896 |        |        |        |        |         |                                            |
| 2897 | 014014 |        |        |        | BGNMSG  | NONXT                                      |
| 2898 | 014014 |        |        |        | NONXT:: |                                            |
| 2899 | 014014 |        |        |        | PRINTB  | #LOST                                      |
| 2900 | 014014 | 012746 | 014125 |        | MOV     | #LOST,-(SP)                                |
| 2901 | 014020 | 012746 | 000001 |        | MOV     | #1,-(SP)                                   |
| 2902 | 014024 | 010600 |        |        | MOV     | SP,R0                                      |
| 2903 | 014026 | 104414 |        |        | TRAP    | C\$PNTB                                    |
| 2904 | 014030 | 062706 | 000004 |        | ADD     | #4,SP                                      |
| 2905 | 014034 | 004737 | 004422 |        | JSR     | PC,VIRTAD                                  |
| 2906 | 014040 | 004737 | 004146 |        | JSR     | PC,VIPRI                                   |
| 2907 | 014044 |        |        |        | ENDMSG  |                                            |
| 2908 | 014044 |        |        |        | L10077: |                                            |
| 2909 | 014044 | 104423 |        |        | TRAP    | C\$MSG                                     |
| 2910 |        |        |        |        |         |                                            |
| 2911 | 014046 | 040445 | 047111 | 047503 | ERMS:   | .ASCIZ /%AINCORRECT CHECKWORD%/            |
| 2912 | 014054 | 051122 | 041505 | 020124 |         |                                            |
| 2913 | 014062 | 044103 | 041505 | 053513 |         |                                            |
| 2914 | 014070 | 051117 | 022504 | 000116 |         |                                            |
| 2915 |        |        |        |        |         |                                            |
| 2916 | 014076 | 040445 | 044103 | 041505 | ERM6:   | .ASCIZ /%ACHECKSUM ERROR%N%T%N/            |
| 2917 | 014104 | 051513 | 046525 | 042440 |         |                                            |
| 2918 | 014112 | 051122 | 051117 | 047045 |         |                                            |
| 2919 | 014120 | 052045 | 047045 | 000    |         |                                            |
| 2920 |        |        |        |        |         |                                            |
| 2921 | 014125 | 045    | 047101 | 047117 | LOST:   | .ASCIZ /%ANON-EXISTENT MEMORY%/            |
| 2922 | 014132 | 042455 | 044530 | 052123 |         |                                            |
| 2923 | 014140 | 047105 | 020124 | 042515 |         |                                            |
| 2924 | 014146 | 047515 | 054522 | 047045 |         |                                            |
| 2925 | 014154 | 000    |        |        |         |                                            |
| 2926 |        |        |        |        |         |                                            |
| 2927 | 014155 | 110    | 053517 | 046440 | RWDCT:  | .ASCIZ /HOW MANY CHECKWORDS WILL BE INPUT/ |
| 2928 | 014162 | 047101 | 020131 | 044103 |         |                                            |
| 2929 | 014170 | 041505 | 053513 | 051117 |         |                                            |
| 2930 | 014176 | 051504 | 053440 | 046111 |         |                                            |
| 2931 | 014204 | 020114 | 042502 | 044440 |         |                                            |
| 2932 | 014212 | 050116 | 052125 | 000    |         |                                            |
| 2933 |        |        |        |        |         |                                            |
| 2934 | 014217 | 101    | 054516 | 040440 | EXEC:   | .ASCIZ /ANY ADDITIONAL MEMORY /            |
| 2935 | 014224 | 042104 | 052111 | 047511 |         |                                            |
| 2936 | 014232 | 040516 | 020114 | 042515 |         |                                            |
| 2937 | 014240 | 047515 | 054522 | 000040 |         |                                            |
| 2938 |        |        |        |        |         |                                            |
| 2939 | 014246 | 054105 | 040520 | 042116 | EXPND:  | .ASCIZ /EXPANDED DIAGNOSTIC ROM/           |

|      |        |        |        |        |         |        |                             |
|------|--------|--------|--------|--------|---------|--------|-----------------------------|
| 2940 | 014254 | 042105 | 042040 | 040511 |         |        |                             |
| 2941 | 014262 | 047107 | 051517 | 044524 |         |        |                             |
| 2942 | 014270 | 020103 | 047522 | 000115 |         |        |                             |
| 2943 |        |        |        |        |         |        |                             |
| 2944 | 014276 | 050105 | 047522 | 020115 | EPRM:   | .ASCIZ | /EPROM IN SOCKETS/          |
| 2945 | 014304 | 047111 | 051440 | 041517 |         |        |                             |
| 2946 | 014312 | 042513 | 051524 | 000    |         |        |                             |
| 2947 |        |        |        |        |         |        |                             |
| 2948 | 014317 | 123    | 051531 | 042524 | SYSR:   | .ASCIZ | /SYSTEM ROM/                |
| 2949 | 014324 | 020115 | 047522 | 000115 |         |        |                             |
| 2950 |        |        |        |        |         |        |                             |
| 2951 | 014332 | 054523 | 052123 | 046505 | SYSE:   | .ASCIZ | /SYSTEM EPROM/              |
| 2952 | 014340 | 042440 | 051120 | 046517 |         |        |                             |
| 2953 | 014346 | 000    |        |        |         |        |                             |
| 2954 |        |        |        |        |         |        |                             |
| 2955 | 014347 | 105    | 050130 | 047101 | EXADD:  | .ASCIZ | /EXPANDED ROM IN 2-4K /     |
| 2956 | 014354 | 042504 | 020104 | 047522 |         |        |                             |
| 2957 | 014362 | 020115 | 047111 | 031040 |         |        |                             |
| 2958 | 014370 | 032055 | 020113 | 000    |         |        |                             |
| 2959 |        |        |        |        |         |        |                             |
| 2960 | 014375 | 105    | 051120 | 046517 | EPADD:  | .ASCIZ | /EPROM IN 4-6K /            |
| 2961 | 014402 | 044440 | 020116 | 026464 |         |        |                             |
| 2962 | 014410 | 045466 | 000040 |        |         |        |                             |
| 2963 |        |        |        |        |         |        |                             |
| 2964 | 014414 | 054523 | 052123 | 046505 | SRR:    | .ASCIZ | /SYSTEM ROM START AT 16K/   |
| 2965 | 014422 | 051040 | 046517 | 051440 |         |        |                             |
| 2966 | 014430 | 040524 | 052122 | 040440 |         |        |                             |
| 2967 | 014436 | 020124 | 033061 | 000113 |         |        |                             |
| 2968 |        |        |        |        |         |        |                             |
| 2969 | 014444 | 054523 | 052123 | 046505 | SYEE:   | .ASCIZ | /SYSTEM EPROM START AT 16K/ |
| 2970 | 014452 | 042440 | 051120 | 046517 |         |        |                             |
| 2971 | 014460 | 051440 | 040524 | 052122 |         |        |                             |
| 2972 | 014466 | 040440 | 020124 | 033061 |         |        |                             |
| 2973 | 014474 | 000113 |        |        |         |        |                             |
| 2974 |        |        |        |        |         |        |                             |
| 2975 |        |        |        |        |         |        |                             |
| 2976 |        |        |        |        |         |        |                             |
| 2977 | 014476 |        |        |        |         | .EVEN  |                             |
| 2978 | 014476 |        |        |        |         | ENDTST |                             |
| 2979 | 014476 | 104401 |        |        | L10067: | TRAP   | CSETST                      |
| 2980 |        |        |        |        |         |        |                             |
| 2981 |        |        |        |        |         |        |                             |
| 2982 |        |        |        |        |         |        |                             |
| 2983 |        |        |        |        |         |        |                             |
| 2984 |        |        |        |        |         |        |                             |
| 2985 |        |        |        |        |         |        |                             |
| 2986 |        |        |        |        |         |        |                             |
| 2987 |        |        |        |        |         |        |                             |
| 2988 |        |        |        |        |         |        |                             |



PARAMETER CODING  
CVMBAC.P11

MACY11 30A(1052)  
19-JUN-79 08:46

19-JUN-79 08:52 PAGE 64  
TEST 7: TEST ALL ADDITIONAL MEMORY

M 5

PAGE: 0064

2989  
2990  
2991  
2992

.TITLE PARAMETER CODING  
.SBTTL IDENTIFICATION

2993  
2994  
2995  
2996  
2997  
2998  
2999  
3000  
3001  
3002  
3003  
3004  
3005 014500  
3006 014500 000073  
3007 014502  
3008  
3009 014502  
3010 014502 000032  
3011 014504 014554  
3012 014506 160000  
3013 014510 000000  
3014 014512 000016  
3015 014514  
3016 014514 001032  
3017 014516 014570  
3018 014520 177777  
3019 014522 000066  
3020 014524 000100  
3021 014526  
3022 014526 002032  
3023 014530 014621  
3024 014532 177777  
3025 014534 000000  
3026 014536 000007  
3027 014540  
3028 014540 003032  
3029 014542 014641  
3030 014544 177777  
3031 014546 000000  
3032 014550 007777  
3033  
3034 014552  
3035 014552 047004  
3036  
3037 014554 047125 052111 047040  
3038 014562 046525 042502 000122  
3039 014570 047111 042524 051122  
3040 014576 050125 020124 042526  
3041 014604 052103 051117 040440  
3042 014612 042104 042522 051523  
3043 014620 000  
3044 014621 111 052116 051105  
3045 014626 052522 052120 046040  
3046 014634 053105 046105 000  
3047 014641 122 041517 042513  
3048 014646 020122 053523 052111

.SBTTL HARDWARE PARAMETER CODING SECTION

```

: **
: THE HARDWARE PARAMETER CODING SECTION CONTAINS MACROS
: THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES. THE
: MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE
: INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES. THE
: MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS
: WITH THE OPERATOR.
: --

```

```

BGNHRD
.WORD L10100-L$HARD/2
L$HARD::

GPRMD UNIT,0,0,160000,0,16,YES
.WORD T$CODE
.WORD UNIT
.WORD 160000
.WORD T$LLOLIM
.WORD T$HILIM
GPRMD INTVEC,2,0,-1,66,100,YES
.WORD T$CODE
.WORD INTVEC
.WORD -1
.WORD T$LLOLIM
.WORD T$HILIM
GPRMD LEV,4,0,-1,0,7,YES
.WORD T$CODE
.WORD LEV
.WORD -1
.WORD T$LLOLIM
.WORD T$HILIM
GPRMD RKSW,6,0,-1,0,7777,YES
.WORD T$CODE
.WORD RKSW
.WORD -1
.WORD T$LLOLIM
.WORD T$HILIM

```

```

EXIT HRD
.WORD T$CODE

UNIT: .ASCIZ /UNIT NUMBER/

INTVEC: .ASCIZ /INTERRUPT VECTOR ADDRESS/

LEV: .ASCIZ /INTERRUPT LEVEL/

RKSW: .ASCIZ /ROCKER SWITCH SETTINGS/

```

3049 014654 044103 051440 052105  
3050 014662 044524 043516 000123  
3051  
3052  
3053 014670  
3054  
3055 014670

.EVEN  
ENDHRD  
.EVEN

L10100:

3056  
3057  
3058  
3059  
3060  
3061  
3062  
3063  
3064  
3065  
3066  
3067 014670  
3068 014670 000161  
3069 014672  
3070 014672  
3071 014672 000032  
3072 014674 015014  
3073 014676 177777  
3074 014700 000000  
3075 014702 177777  
3076 014704  
3077 014704 001032  
3078 014706 015071  
3079 014710 177777  
3080 014712 000000  
3081 014714 177777  
3082 014716  
3083 014716 002032  
3084 014720 015107  
3085 014722 177777  
3086 014724 000000  
3087 014726 177777  
3088 014730  
3089 014730 003032  
3090 014732 015125  
3091 014734 177777  
3092 014736 000000  
3093 014740 177777  
3094 014742  
3095 014742 004032  
3096 014744 015143  
3097 014746 177777  
3098 014750 000000  
3099 014752 177777  
3100 014754  
3101 014754 005032  
3102 014756 015161  
3103 014760 177777  
3104 014762 000000  
3105 014764 177777  
3106 014766  
3107 014766 006032  
3108 014770 015177  
3109 014772 177777  
3110 014774 000000  
3111 014776 177777

.SBTTL SOFTWARE PARAMETER CODING SECTION

:+  
: THE SOFTWARE PARAMETER CODING SECTION CONTAINS MACROS  
: THAT ARE USED BY THE SUPERVISOR TO BUILD P-TABLES. THE  
: MACROS ARE NOT EXECUTED AS MACHINE INSTRUCTIONS BUT ARE  
: INTERPRETED BY THE SUPERVISOR AS DATA STRUCTURES. THE  
: MACROS ALLOW THE SUPERVISOR TO ESTABLISH COMMUNICATIONS  
: WITH THE OPERATOR.  
:--

BGNSFT  
.WORD L10101-L\$SOFT/2  
L\$SOFT::  
GPRMD CKW1,0,0,-1,0,177777,YES  
.WORD T\$CODE  
.WORD CKW1  
.WORD -1  
.WORD T\$LLOLIM  
.WORD T\$HILIM  
GPRMD CKW2,2,0,-1,0,177777,YES  
.WORD T\$CODE  
.WORD CKW2  
.WORD -1  
.WORD T\$LLOLIM  
.WORD T\$HILIM  
GPRMD CKW3,4,0,-1,0,177777,YES  
.WORD T\$CODE  
.WORD CKW3  
.WORD -1  
.WORD T\$LLOLIM  
.WORD T\$HILIM  
GPRMD CKW4,6,0,-1,0,177777,YES  
.WORD T\$CODE  
.WORD CKW4  
.WORD -1  
.WORD T\$LLOLIM  
.WORD T\$HILIM  
GPRMD CKW5,10,0,-1,0,177777,YES  
.WORD T\$CODE  
.WORD CKW5  
.WORD -1  
.WORD T\$LLOLIM  
.WORD T\$HILIM  
GPRMD CKW6,12,0,-1,0,177777,YES  
.WORD T\$CODE  
.WORD CKW6  
.WORD -1  
.WORD T\$LLOLIM  
.WORD T\$HILIM  
GPRMD CKW7,14,0,-1,0,177777,YES  
.WORD T\$CODE  
.WORD CKW7  
.WORD -1  
.WORD T\$LLOLIM  
.WORD T\$HILIM

```

3112 015000          GPRMD  CKW8,16,0,-1,0,177777,YES
3113 015000 007032   .WORD  T$CODE
3114 015002 015215   .WORD  CKW8
3115 015004 177777   .WORD  -1
3116 015006 000000   .WORD  T$LLOLIM
3117 015010 177777   .WORD  T$HILIM
3118
3119 015012          EXIT SFT
3120 015012 111004   .WORD  T$CODE
3121
3122 015014 044103 041505 053513 CKW1:  .ASCIZ  /CHECKWORDS FOR DIAGNOSTIC ROM. CHECKWORD 1: /
3123 015022 051117 051504 043040
3124 015030 051117 042040 040511
3125 015036 047107 051517 044524
3126 015044 020103 047522 027115
3127 015052 041440 042510 045503
3128 015060 047527 042122 030440
3129 015066 020072 000
3130 015071 103 042510 045503 CKW2:  .ASCIZ  /CHECKWORD 2: /
3131 015076 047527 042122 031040
3132 015104 020072 000
3133 015107 103 042510 045503 CKW3:  .ASCIZ  /CHECKWORD 3: /
3134 015114 047527 042122 031440
3135 015122 020072 000
3136 015125 103 042510 045503 CKW4:  .ASCIZ  /CHECKWORD 4: /
3137 015132 047527 042122 032040
3138 015140 020072 000
3139 015143 103 042510 045503 CKW5:  .ASCIZ  /CHECKWORD 5: /
3140 015150 047527 042122 032440
3141 015156 020072 000
3142 015161 103 042510 045503 CKW6:  .ASCIZ  /CHECKWORD 6: /
3143 015166 047527 042122 033040
3144 015174 020072 000
3145 015177 103 042510 045503 CKW7:  .ASCIZ  /CHECKWORD 7: /
3146 015204 047527 042122 033440
3147 015212 020072 000
3148 015215 103 042510 045503 CKW8:  .ASCIZ  /CHECKWORD 8: /
3149 015222 047527 042122 034040
3150 015230 020072 000
3151 015234          .EVEN
3152
3153
3154 015234          ENDSFT
3155          .EVEN
3156 015234          L10101:
3157
3158          015304          .=. +50
3159 015304          LASTAD
3160          .EVEN
3161 015304 000000          .WORD  0
3162 015306 000000          .WORD  0
3163 015310          L$LAST::
3164
3165          000001          .END

```

|         |          |         |       |       |       |       |       |       |       |       |       |       |      |      |
|---------|----------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
| ACTSUM  | 002214   | 634#    | 971*  | 975*  | 1081  | 1098  | 2180  | 2214  |       |       |       |       |      |      |
| ADDON   | 013710   | 1258*   | 2412* | 2429  | 2434  | 2860# |       |       |       |       |       |       |      |      |
| ADDTL   | 012704   | 2628#   | 2639  | 2647  | 2655  |       |       |       |       |       |       |       |      |      |
| ADR     | = 000020 | G 602#  |       |       |       |       |       |       |       |       |       |       |      |      |
| ANSR    | 002206   | 631#    | 1259* | 2496  | 2501  | 2503* | 2584  | 2589  | 2591* | 2680  | 2685  | 2687* | 2775 | 2780 |
|         |          | 2782*   |       |       |       |       |       |       |       |       |       |       |      |      |
| ASSEMB= | 000010   | 353     |       |       |       |       |       |       |       |       |       |       |      |      |
| BCF     | 002176   | 627#    | 970   | 973   | 1075* | 1088* | 2163* | 2197* | 2529  | 2617  | 2713  | 2808  |      |      |
| BDDAT   | 003220   | 756#    | 863   |       |       |       |       |       |       |       |       |       |      |      |
| BEVENT  | 007222   | G 1857# |       |       |       |       |       |       |       |       |       |       |      |      |
| BEVREG= | 177546   | 1789#   | 1805* | 1830* |       |       |       |       |       |       |       |       |      |      |
| BIT0    | = 000001 | G 575#  | 2012  | 2034  | 2048  |       |       |       |       |       |       |       |      |      |
| BIT00   | = 000001 | G 564#  | 575   |       |       |       |       |       |       |       |       |       |      |      |
| BIT01   | = 000002 | G 563#  | 574   |       |       |       |       |       |       |       |       |       |      |      |
| BIT02   | = 000004 | G 562#  | 573   |       |       |       |       |       |       |       |       |       |      |      |
| BIT03   | = 000010 | G 561#  | 572   |       |       |       |       |       |       |       |       |       |      |      |
| BIT04   | = 000020 | G 560#  | 571   |       |       |       |       |       |       |       |       |       |      |      |
| BIT05   | = 000040 | G 559#  | 570   |       |       |       |       |       |       |       |       |       |      |      |
| BIT06   | = 000100 | G 558#  | 569   | 1805  | 1830  |       |       |       |       |       |       |       |      |      |
| BIT07   | = 000200 | G 557#  | 568   |       |       |       |       |       |       |       |       |       |      |      |
| BIT08   | = 000400 | G 556#  | 567   |       |       |       |       |       |       |       |       |       |      |      |
| BIT09   | = 001000 | G 555#  | 566   |       |       |       |       |       |       |       |       |       |      |      |
| BIT1    | = 000002 | G 574#  |       |       |       |       |       |       |       |       |       |       |      |      |
| BIT10   | = 002000 | G 554#  |       |       |       |       |       |       |       |       |       |       |      |      |
| BIT11   | = 004000 | G 553#  |       |       |       |       |       |       |       |       |       |       |      |      |
| BIT12   | = 010000 | G 552#  |       |       |       |       |       |       |       |       |       |       |      |      |
| BIT13   | = 020000 | G 551#  |       |       |       |       |       |       |       |       |       |       |      |      |
| BIT14   | = 040000 | G 550#  |       |       |       |       |       |       |       |       |       |       |      |      |
| BIT15   | = 100000 | G 549#  | 1474  | 1501  | 1723  | 1750  | 2014  |       |       |       |       |       |      |      |
| BIT2    | = 000004 | G 573#  |       |       |       |       |       |       |       |       |       |       |      |      |
| BIT3    | = 000010 | G 572#  |       |       |       |       |       |       |       |       |       |       |      |      |
| BIT4    | = 000020 | G 571#  |       |       |       |       |       |       |       |       |       |       |      |      |
| BIT5    | = 000040 | G 570#  |       |       |       |       |       |       |       |       |       |       |      |      |
| BIT6    | = 000100 | G 569#  |       |       |       |       |       |       |       |       |       |       |      |      |
| BIT7    | = 000200 | G 568#  |       |       |       |       |       |       |       |       |       |       |      |      |
| BIT8    | = 000400 | G 567#  |       |       |       |       |       |       |       |       |       |       |      |      |
| BIT9    | = 001000 | G 566#  |       |       |       |       |       |       |       |       |       |       |      |      |
| BOE     | = 000400 | G 606#  |       |       |       |       |       |       |       |       |       |       |      |      |
| BVERR1  | 007232   | G 1820  | 1866# |       |       |       |       |       |       |       |       |       |      |      |
| BVERR2  | 007300   | G 1845  | 1885# |       |       |       |       |       |       |       |       |       |      |      |
| BYTINS  | 003263   | 763#    | 883   |       |       |       |       |       |       |       |       |       |      |      |
| BYTLOC  | 002252   | 649#    | 2531* | 2533* | 2619* | 2621* | 2715* | 2717* | 2810* | 2812* | 2871  |       |      |      |
| CHKSUM  | 004176   | 969#    | 1079  | 1096  | 2178  | 2212  |       |       |       |       |       |       |      |      |
| CKERR   | 002632   | 685#    | 2275  | 2301  |       |       |       |       |       |       |       |       |      |      |
| CKSME   | 013724   | G 2551  | 2636  | 2731  | 2826  | 2869# |       |       |       |       |       |       |      |      |
| CKWD    | 002240   | 644#    | 1108  | 1111  | 2522* | 2610* | 2706* | 2801* |       |       |       |       |      |      |
| CKW1    | 015014   | 3072    | 3122# |       |       |       |       |       |       |       |       |       |      |      |
| CKW2    | 015071   | 3078    | 3130# |       |       |       |       |       |       |       |       |       |      |      |
| CKW3    | 015107   | 3084    | 3133# |       |       |       |       |       |       |       |       |       |      |      |
| CKW4    | 015125   | 3090    | 3136# |       |       |       |       |       |       |       |       |       |      |      |
| CKW5    | 015143   | 3096    | 3139# |       |       |       |       |       |       |       |       |       |      |      |
| CKW6    | 015161   | 3102    | 3142# |       |       |       |       |       |       |       |       |       |      |      |
| CKW7    | 015177   | 3108    | 3145# |       |       |       |       |       |       |       |       |       |      |      |
| CKW8    | 015215   | 3114    | 3148# |       |       |       |       |       |       |       |       |       |      |      |
| CONT    | 013610   | 2806    | 2816# |       |       |       |       |       |       |       |       |       |      |      |
| COUNTR  | 002204   | 630#    | 2160* | 2247* | 2521* | 2538* | 2609* | 2626* | 2705* | 2722* | 2800* | 2817* |      |      |

|                 |      |      |      |      |       |      |      |      |      |      |      |      |      |  |
|-----------------|------|------|------|------|-------|------|------|------|------|------|------|------|------|--|
| CWDERR 002651   | 689# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| CWKDE 013762 G  | 2559 | 2644 | 2739 | 2836 | 2884# |      |      |      |      |      |      |      |      |  |
| C\$AU = 000052  | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$AUTO= 000061 | 353# | 1243 |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$BRK = 000022 | 353# | 1942 | 1960 | 1965 | 1970  |      |      |      |      |      |      |      |      |  |
| C\$BSEG= 000004 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$BSUB= 000002 | 353# | 1291 | 1313 | 1336 | 1359  | 1382 | 1403 | 1426 | 1449 | 1472 | 1499 | 1539 | 1561 |  |
|                 | 1585 | 1608 | 1631 | 1653 | 1675  | 1698 | 1721 | 1748 | 1797 | 1829 | 2128 | 2196 | 2229 |  |
|                 | 2245 | 2407 | 2488 | 2576 | 2661  | 2756 |      |      |      |      |      |      |      |  |
| C\$CEFG= 000045 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$CLCK= 000062 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$CLEA= 000012 | 353# | 1274 |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$CLOS= 000035 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$CLP1= 000006 | 353# | 1054 | 1302 | 1307 | 1325  | 1330 | 1348 | 1353 | 1371 | 1376 | 1392 | 1397 | 1415 |  |
|                 | 1420 | 1438 | 1443 | 1461 | 1466  | 1488 | 1493 | 1517 | 1522 | 1550 | 1555 | 1573 | 1578 |  |
|                 | 1597 | 1602 | 1620 | 1625 | 1643  | 1648 | 1665 | 1670 | 1687 | 1692 | 1710 | 1715 | 1737 |  |
|                 | 1742 | 1766 | 1771 | 1822 | 1847  | 2005 | 2172 | 2177 | 2189 | 2206 | 2211 | 2223 | 2238 |  |
|                 | 2553 | 2561 | 2569 | 2638 | 2646  | 2654 | 2733 | 2741 | 2749 | 2828 | 2838 | 2848 |      |  |
| C\$CVEC= 000036 | 353# | 1264 |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$DCLN= 000044 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$DODU= 000051 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$DRPT= 000024 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$DU = 000053  | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$EDIT= 000002 | 353# | 419  |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$ERDF= 000055 | 353# | 1049 | 1297 | 1320 | 1343  | 1366 | 1387 | 1410 | 1433 | 1456 | 1483 | 1512 | 1545 |  |
|                 | 1568 | 1592 | 1615 | 1638 | 1660  | 1682 | 1705 | 1732 | 1761 | 1817 | 1842 | 2000 | 2167 |  |
|                 | 2184 | 2201 | 2218 | 2233 | 2548  | 2556 | 2564 | 2633 | 2641 | 2649 | 2728 | 2736 | 2744 |  |
|                 | 2823 | 2833 | 2843 |      |       |      |      |      |      |      |      |      |      |  |
| C\$ERHR= 000056 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$ERRO= 000060 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$ERSF= 000054 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$ERSO= 000057 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$ESCA= 000010 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$ESEG= 000005 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$ESUB= 000003 | 353# | 1310 | 1333 | 1356 | 1379  | 1400 | 1423 | 1446 | 1469 | 1496 | 1525 | 1558 | 1581 |  |
|                 | 1605 | 1628 | 1651 | 1673 | 1695  | 1718 | 1745 | 1774 | 1826 | 1851 | 2192 | 2226 | 2241 |  |
|                 | 2251 | 2484 | 2573 | 2658 | 2753  | 2854 |      |      |      |      |      |      |      |  |
| C\$ETST= 000001 | 353# | 1529 | 1777 | 1929 | 1980  | 2116 | 2379 | 2979 |      |      |      |      |      |  |
| C\$EXIT= 000032 | 353# | 1267 | 1304 | 1327 | 1350  | 1373 | 1394 | 1417 | 1440 | 1463 | 1490 | 1519 | 1552 |  |
|                 | 1575 | 1599 | 1622 | 1645 | 1667  | 1689 | 1712 | 1739 | 1768 | 1794 | 1853 | 1953 | 1975 |  |
|                 | 2007 | 2069 | 2174 | 2208 | 2254  | 2480 | 2545 | 2725 | 2820 | 2830 | 2840 | 2850 | 2857 |  |
| C\$GETB= 000026 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$GETW= 000027 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$GMAN= 000043 | 353# | 996  | 2136 | 2148 | 2427  | 2437 | 2447 | 2458 | 2469 | 2494 | 2505 | 2582 | 2593 |  |
|                 | 2664 | 2678 | 2689 | 2759 | 2773  | 2784 |      |      |      |      |      |      |      |  |
| C\$GPHR= 000042 | 353# | 1218 |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$GPLO= 000030 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$GPRI= 000040 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$INIT= 000011 | 353# | 1230 |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$INLP= 000020 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$MANI= 000050 | 353# | 1947 | 1994 | 2130 | 2409  |      |      |      |      |      |      |      |      |  |
| C\$MEM = 000031 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$MSG = 000023 | 353# | 838  | 858  | 878  | 898   | 910  | 922  | 934  | 1882 | 1901 | 2088 | 2270 | 2283 |  |
|                 | 2296 | 2309 | 2322 | 2881 | 2895  | 2909 |      |      |      |      |      |      |      |  |
| C\$OPEN= 000034 | 353# |      |      |      |       |      |      |      |      |      |      |      |      |  |
| C\$PNTB= 000014 | 353# | 826  | 846  | 866  | 886   | 906  | 918  | 930  | 1871 | 1878 | 1890 | 1897 | 2084 |  |















|         |        |        |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
|---------|--------|--------|-------|-------|-------|-------|-------|------|-------|-------|------|-------|-------|------|--|--|--|--|--|--|
| L10054  | 010274 | 2087#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10055  | 011644 | 2175   | 2209  | 2255  | 2378# |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10056  | 010722 | 2191#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10057  | 011024 | 2225#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10060  | 011050 | 2240#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10061  | 011070 | 2250#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10062  | 011124 | 2269#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10063  | 011152 | 2282#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10064  | 011200 | 2295#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10065  | 011226 | 2308#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10066  | 011254 | 2321#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10067  | 014476 | 2481   | 2726  | 2821  | 2831  | 2841  | 2851  | 2858 | 2978# |       |      |       |       |      |  |  |  |  |  |  |
| L10070  | 012104 | 2483#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10071  | 012440 | 2546   | 2572# |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10072  | 012766 | 2657#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10073  | 013332 | 2752#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10074  | 013702 | 2853#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10075  | 013760 | 2880#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10076  | 014012 | 2894#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10077  | 014044 | 2908#  |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10100  | 014670 | 3006   | 3035  | 3055# |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| L10101  | 015234 | 3068   | 3120  | 3156# |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| MDHEDR  | 002000 | G 363# |       |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| MEMTST  | 004562 | 1074#  | 2523  | 2611  | 2707  | 2802  |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| MESSG1  | 010331 | 2038   | 2095# |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| MESSG2  | 010344 | 2052   | 2097# |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| MISTAK  | 011525 | 2314   | 2358# |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| MORE    | 012352 | 2540#  | 2554  | 2562  | 2570  |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| MSGOUT  | 013234 | 2716   | 2718# |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| MSG1    | 007346 | 1868   | 1903# |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| MSG2    | 007471 | 1887   | 1918# |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| NEWLIN  | 010357 | 2062   | 2099# |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| NEXT    | 013262 | 2724#  | 2734  | 2742  | 2750  |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| NODR    | 011577 | 2262   | 2288  | 2367# |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| NOERR   | 012336 | 2527   | 2537# |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| NONE    | 012670 | 2615   | 2625# |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| NONXT   | 014014 | G 2567 | 2652  | 2747  | 2846  | 2898# |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| ONERR   | 003156 | 749#   | 843   |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| OUTPUT  | 004530 | 1039   | 1057# |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| OSAPTS= | 000000 | 353#   | 401   |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| OSAU =  | 000000 | 353#   | 433   |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| OSBGNR= | 000000 | 353#   | 427   |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| OSBGNS= | 000001 | 353#   | 371#  | 393   |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| OSDU =  | 000000 | 353#   | 435   |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| OSERRT= | 000000 | 353#   | 443   |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| OSGNSW= | 000001 | 353#   | 371#  | 397   |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| OSPOIN= | 000001 | 353#   | 371#  | 459   |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| OSSETU= | 000000 | 353#   | 387   | 3161  |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| PACR    | 002564 | 677#   | 1547  | 1570  | 1594  | 1617  | 1640  | 1662 | 1684  | 1707  | 1734 | 1763  |       |      |  |  |  |  |  |  |
| PAGE    | 002224 | 638#   | 1037* | 1038  |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| PAGERR  | 004124 | G 925# | 1052  |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| PASCT   | 002220 | 636#   | 1261* | 1950  | 1955* |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| PASS    | 002216 | 635#   | 1260* | 1791  | 2133  | 2413  | 2540  | 2628 |       |       |      |       |       |      |  |  |  |  |  |  |
| PASSED  | 013246 | 2711   | 2721# |       |       |       |       |      |       |       |      |       |       |      |  |  |  |  |  |  |
| PCR =   | 177520 | 615#   | 1037  | 1254* | 1540* | 1543  | 1562* | 1563 | 1566  | 1586* | 1587 | 1590  | 1609* | 1610 |  |  |  |  |  |  |
|         |        | 1613   | 1632* | 1633  | 1636  | 1654* | 1655  | 1658 | 1676* | 1677  | 1680 | 1699* | 1700  | 1703 |  |  |  |  |  |  |

| Parameter | Value    | 1722* | 1723* | 1724  | 1725  | 1729* | 1749* | 1750* | 1751  | 1752  | 1755* | 2159* | 2246* | 2518* |
|-----------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| PGCT      | 013712   | 2537* | 2606* | 2625* | 2702* | 2721* | 2797* | 2816* |       |       |       |       |       |       |
| PNT =     | 001000 G | 2673* | 2705  | 2768* | 2800  | 2861# |       |       |       |       |       |       |       |       |
| PRI =     | 002000 G | 607#  |       |       |       |       |       |       |       |       |       |       |       |       |
| PRIN      | 013576   | 608#  |       |       |       |       |       |       |       |       |       |       |       |       |
| PRIOR     | 002236   | 2811  | 2813# |       |       |       |       |       |       |       |       |       |       |       |
| PRIOUT    | 012656   | 643#  | 1221* |       |       |       |       |       |       |       |       |       |       |       |
| PRI00 =   | 000000 G | 2620  | 2622# |       |       |       |       |       |       |       |       |       |       |       |
| PRI01 =   | 000040 G | 596#  | 1807  | 1832  |       |       |       |       |       |       |       |       |       |       |
| PRI02 =   | 000100 G | 595#  |       |       |       |       |       |       |       |       |       |       |       |       |
| PRI03 =   | 000140 G | 594#  |       |       |       |       |       |       |       |       |       |       |       |       |
| PRI04 =   | 000200 G | 593#  |       |       |       |       |       |       |       |       |       |       |       |       |
| PRI05 =   | 000240 G | 592#  |       |       |       |       |       |       |       |       |       |       |       |       |
| PRI06 =   | 000300 G | 591#  |       |       |       |       |       |       |       |       |       |       |       |       |
| PRI07 =   | 000340 G | 590#  |       |       |       |       |       |       |       |       |       |       |       |       |
| PRTSW     | 007752   | 589#  | 1224  | 1799  | 1812  | 1837  |       |       |       |       |       |       |       |       |
| P1        | 011706   | 1996  | 2009# |       |       |       |       |       |       |       |       |       |       |       |
| P2        | 011720   | 2418  | 2420# | 2543  |       |       |       |       |       |       |       |       |       |       |
| READN     | 010276   | 2421  | 2423# | 2631  |       |       |       |       |       |       |       |       |       |       |
| REAL      | 002200   | 2026  | 2090# |       |       |       |       |       |       |       |       |       |       |       |
| REGDT     | 003564   | 628#  | 1074* | 1078* | 1091  | 1093* | 1095* | 1104  | 1106  | 2524  | 2612  | 2708  | 2803  |       |
| RERR1     | 003630 G | 802#  | 831   | 851   | 871   | 891   |       |       |       |       |       |       |       |       |
| RERR2     | 003676 G | 821#  | 1300  | 1548  |       |       |       |       |       |       |       |       |       |       |
| RERR3     | 003744 G | 841#  | 1323  | 1571  |       |       |       |       |       |       |       |       |       |       |
| RERR4     | 004012 G | 861#  | 1346  | 1413  | 1595  | 1663  |       |       |       |       |       |       |       |       |
| RERR5     | 004060 G | 881#  | 1369  | 1390  | 1436  | 1459  | 1618  | 1641  | 1685  | 1708  |       |       |       |       |
| RERR6     | 004102 G | 901#  | 1486  | 1735  |       |       |       |       |       |       |       |       |       |       |
| RESPND    | 002242   | 913#  | 1515  | 1764  |       |       |       |       |       |       |       |       |       |       |
| RFLAG     | 002210   | 645#  | 1257* | 2439  | 2444  | 2449  | 2454  | 2460  | 2465  | 2471  | 2476  | 2666  | 2673  | 2674  |
| RKSW      | 014641   | 2761  | 2768  | 2769  | 2162* | 2519* | 2607* | 2703* | 2798* |       |       |       |       |       |
| ROTL P1   | 006000   | 632#  | 1060  |       |       |       |       |       |       |       |       |       |       |       |
| ROTL P2   | 006064   | 3029  | 3047# |       |       |       |       |       |       |       |       |       |       |       |
| ROTL P3   | 006654   | 1476# | 1481  |       |       |       |       |       |       |       |       |       |       |       |
| ROTL P4   | 006740   | 1503# | 1509  |       |       |       |       |       |       |       |       |       |       |       |
| ROTO      | 003400   | 1725# | 1730  |       |       |       |       |       |       |       |       |       |       |       |
| ROT1      | 003330   | 1752# | 1758  |       |       |       |       |       |       |       |       |       |       |       |
| RSET      | 002244   | 779#  | 915   |       |       |       |       |       |       |       |       |       |       |       |
| RSTRT     | 010600   | 771#  | 903   |       |       |       |       |       |       |       |       |       |       |       |
| RWDCT     | 014155   | 646#  | 1256* | 2138  | 2143  |       |       |       |       |       |       |       |       |       |
| RWR       | 002520   | 2134  | 2146  | 2159# |       |       |       |       |       |       |       |       |       |       |
| RWREG =   | 177522   | 2668  | 2763  | 2927# |       |       |       |       |       |       |       |       |       |       |
| SEERR1    | 010362   | 670#  | 1299  | 1322  | 1345  | 1368  | 1389  | 1412  | 1435  | 1458  | 1485  | 1514  |       |       |
| SETADR    | 005010   | 1255* | 1286# | 1292* | 1295  | 1314* | 1315  | 1318  | 1337* | 1338  | 1341  | 1360* | 1361  | 1364  |
| SFPTBL    | 002156 G | 1383* | 1384  | 1404* | 1405  | 1408  | 1427* | 1428  | 1431  | 1450* | 1451  | 1454  | 1473* | 1474* |
| SRR       | 014414   | 1475  | 1476  | 1480* | 1500* | 1501* | 1502  | 1503  | 1506* |       |       |       |       |       |
| STORE     | 002232   | 2081  | 2100# |       |       |       |       |       |       |       |       |       |       |       |
| STRT      | 010536   | 1127# | 2157  | 2514  | 2602  | 2698  | 2793  |       |       |       |       |       |       |       |
| SVCGBL =  | 000000   | 514#  | 2161  |       |       |       |       |       |       |       |       |       |       |       |
|           |          | 2682  | 2564# |       |       |       |       |       |       |       |       |       |       |       |
|           |          | 641#  | 98    | 1005  | 1127  | 2150  | 2507  | 2595  | 2691  | 2786  |       |       |       |       |
|           |          | 2132  | 2145# |       |       |       |       |       |       |       |       |       |       |       |
|           |          | 353#  | 354#  | 363   | 364   | 374   | 375   | 383   | 384   | 385   | 386   | 387   | 388   | 389   |
|           |          | 390   | 391   | 392   | 393   | 394   | 395   | 396   | 397   | 398   | 399   | 400   | 401   | 402   |
|           |          | 403   | 404   | 405   | 406   | 407   | 408   | 409   | 410   | 411   | 412   | 413   | 414   | 415   |
|           |          | 416   | 417   | 418   | 420   | 421   | 423   | 424   | 425   | 426   | 427   | 428   | 429   | 430   |
|           |          | 431   | 432   | 433   | 434   | 435   | 436   | 437   | 438   | 439   | 440   | 441   | 442   | 443   |

SVCINS= 000000

|      |      |      |      |      |      |      |       |      |      |      |      |      |
|------|------|------|------|------|------|------|-------|------|------|------|------|------|
| 444  | 475  | 446  | 447  | 448  | 449  | 450  | 451   | 452  | 453  | 454  | 455  | 456  |
| 457  | 458  | 469  | 470  | 472  | 473  | 492  | 493   | 494  | 513  | 514  | 515  | 544  |
| 545  | 626  | 627  | 721  | 722  | 731  | 732  | 821   | 822  | 841  | 842  | 861  | 862  |
| 881  | 882  | 901  | 902  | 913  | 914  | 925  | 926   | 1201 | 1202 | 1215 | 1216 | 1233 |
| 1234 | 1240 | 1241 | 1252 | 1253 | 1857 | 1858 | 1866  | 1867 | 1885 | 1886 | 2077 | 2078 |
| 2260 | 2261 | 2273 | 2274 | 2286 | 2287 | 2299 | 2300  | 2312 | 2313 | 2869 | 2870 | 2884 |
| 2885 | 2898 | 2899 | 3007 | 3008 | 3069 | 3070 | 3163# | 3164 |      |      |      |      |
| 353# | 375  | 376  | 377  | 378  | 379  | 380  | 381   | 382  | 383  | 384  | 385  | 386  |
| 387  | 388  | 389  | 390  | 391  | 392  | 393  | 394   | 395  | 396  | 397  | 398  | 399  |
| 400  | 401  | 402  | 403  | 404  | 405  | 406  | 407   | 408  | 409  | 410  | 411  | 412  |
| 413  | 414  | 415  | 416  | 417  | 418  | 419  | 420   | 421  | 422  | 423  | 424  | 425  |
| 426  | 427  | 428  | 429  | 430  | 431  | 432  | 433   | 434  | 435  | 436  | 437  | 438  |
| 439  | 440  | 441  | 442  | 443  | 444  | 445  | 446   | 447  | 448  | 449  | 450  | 451  |
| 452  | 453  | 454  | 455  | 456  | 457  | 458  | 459   | 471  | 472  | 473  | 474  | 475  |
| 476  | 477  | 478  | 479  | 480  | 491  | 492  | 512   | 513  | 722  | 729  | 730  | 732  |
| 734  | 735  | 823  | 824  | 825  | 826  | 827  | 828   | 829  | 830  | 831  | 832  | 833  |
| 834  | 835  | 836  | 838  | 839  | 843  | 844  | 845   | 846  | 847  | 848  | 849  | 850  |
| 851  | 852  | 853  | 854  | 855  | 856  | 858  | 859   | 863  | 864  | 865  | 866  | 867  |
| 868  | 869  | 870  | 871  | 872  | 873  | 874  | 875   | 876  | 878  | 879  | 883  | 884  |
| 885  | 886  | 887  | 888  | 889  | 890  | 891  | 892   | 893  | 894  | 895  | 896  | 898  |
| 899  | 903  | 904  | 905  | 906  | 907  | 908  | 910   | 911  | 915  | 916  | 917  | 918  |
| 919  | 920  | 922  | 923  | 927  | 928  | 929  | 930   | 931  | 932  | 934  | 935  | 939  |
| 940  | 941  | 942  | 943  | 944  | 945  | 946  | 990   | 991  | 992  | 993  | 994  | 995  |
| 996  | 997  | 998  | 999  | 1000 | 1001 | 1002 | 1003  | 1004 | 1049 | 1050 | 1051 | 1052 |
| 1053 | 1054 | 1055 | 1204 | 1205 | 1217 | 1218 | 1219  | 1220 | 1224 | 1225 | 1226 | 1230 |
| 1231 | 1243 | 1244 | 1263 | 1264 | 1265 | 1267 | 1268  | 1269 | 1274 | 1275 | 1291 | 1292 |
| 1297 | 1298 | 1299 | 1300 | 1301 | 1302 | 1303 | 1304  | 1305 | 1306 | 1307 | 1308 | 1310 |
| 1311 | 1313 | 1314 | 1320 | 1321 | 1322 | 1323 | 1324  | 1325 | 1326 | 1327 | 1328 | 1329 |
| 1330 | 1331 | 1333 | 1334 | 1336 | 1337 | 1343 | 1344  | 1345 | 1346 | 1347 | 1348 | 1349 |
| 1350 | 1351 | 1352 | 1353 | 1354 | 1356 | 1357 | 1359  | 1360 | 1366 | 1367 | 1368 | 1369 |
| 1370 | 1371 | 1372 | 1373 | 1374 | 1375 | 1376 | 1377  | 1379 | 1380 | 1382 | 1383 | 1387 |
| 1388 | 1389 | 1390 | 1391 | 1392 | 1393 | 1394 | 1395  | 1396 | 1397 | 1398 | 1400 | 1401 |
| 1403 | 1404 | 1410 | 1411 | 1412 | 1413 | 1414 | 1415  | 1416 | 1417 | 1418 | 1419 | 1420 |
| 1421 | 1423 | 1424 | 1426 | 1427 | 1433 | 1434 | 1435  | 1436 | 1437 | 1438 | 1439 | 1440 |
| 1441 | 1442 | 1443 | 1444 | 1446 | 1447 | 1449 | 1450  | 1456 | 1457 | 1458 | 1459 | 1460 |
| 1461 | 1462 | 1463 | 1464 | 1465 | 1466 | 1467 | 1469  | 1470 | 1472 | 1473 | 1483 | 1484 |
| 1485 | 1486 | 1487 | 1488 | 1489 | 1490 | 1491 | 1492  | 1493 | 1494 | 1496 | 1497 | 1499 |
| 1500 | 1512 | 1513 | 1514 | 1515 | 1516 | 1517 | 1518  | 1519 | 1520 | 1521 | 1522 | 1523 |
| 1525 | 1526 | 1529 | 1530 | 1539 | 1540 | 1545 | 1546  | 1547 | 1548 | 1549 | 1550 | 1551 |
| 1552 | 1553 | 1554 | 1555 | 1556 | 1558 | 1559 | 1561  | 1562 | 1568 | 1569 | 1570 | 1571 |
| 1572 | 1573 | 1574 | 1575 | 1576 | 1577 | 1578 | 1579  | 1581 | 1582 | 1585 | 1586 | 1592 |
| 1593 | 1594 | 1595 | 1596 | 1597 | 1598 | 1599 | 1600  | 1601 | 1602 | 1603 | 1605 | 1606 |
| 1608 | 1609 | 1615 | 1616 | 1617 | 1618 | 1619 | 1620  | 1621 | 1622 | 1623 | 1624 | 1625 |
| 1626 | 1628 | 1629 | 1631 | 1632 | 1638 | 1639 | 1640  | 1641 | 1642 | 1643 | 1644 | 1645 |
| 1646 | 1647 | 1648 | 1649 | 1651 | 1652 | 1653 | 1654  | 1660 | 1661 | 1662 | 1663 | 1664 |
| 1665 | 1666 | 1667 | 1668 | 1669 | 1670 | 1671 | 1673  | 1674 | 1675 | 1676 | 1682 | 1683 |
| 1684 | 1685 | 1686 | 1687 | 1688 | 1689 | 1690 | 1691  | 1692 | 1693 | 1695 | 1696 | 1698 |
| 1699 | 1705 | 1706 | 1707 | 1708 | 1709 | 1710 | 1711  | 1712 | 1713 | 1714 | 1715 | 1716 |
| 1718 | 1719 | 1721 | 1722 | 1732 | 1733 | 1734 | 1735  | 1736 | 1737 | 1738 | 1739 | 1740 |
| 1741 | 1742 | 1743 | 1745 | 1746 | 1748 | 1749 | 1761  | 1762 | 1763 | 1764 | 1765 | 1766 |
| 1767 | 1768 | 1769 | 1770 | 1771 | 1772 | 1774 | 1775  | 1777 | 1778 | 1794 | 1795 | 1796 |
| 1797 | 1798 | 1799 | 1800 | 1801 | 1802 | 1803 | 1804  | 1805 | 1807 | 1808 | 1809 | 1812 |
| 1813 | 1814 | 1817 | 1818 | 1819 | 1820 | 1821 | 1822  | 1823 | 1826 | 1827 | 1829 | 1830 |
| 1832 | 1833 | 1834 | 1837 | 1838 | 1839 | 1842 | 1843  | 1844 | 1845 | 1846 | 1847 | 1848 |
| 1851 | 1852 | 1853 | 1854 | 1855 | 1861 | 1862 | 1868  | 1869 | 1870 | 1871 | 1872 | 1873 |
| 1874 | 1875 | 1876 | 1877 | 1878 | 1879 | 1880 | 1882  | 1883 | 1887 | 1888 | 1889 | 1890 |



|      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1891 | 1892 | 1893 | 1894 | 1895 | 1896 | 1897 | 1898 | 1899 | 1901 | 1902 | 1929 | 1930 |
| 1942 | 1943 | 1947 | 1948 | 1949 | 1950 | 1953 | 1954 | 1955 | 1960 | 1961 | 1965 | 1966 |
| 1970 | 1971 | 1975 | 1976 | 1977 | 1980 | 1981 | 1994 | 1995 | 1996 | 1997 | 2000 | 2001 |
| 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2025 | 2026 | 2027 | 2028 | 2029 |
| 2030 | 2031 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2051 | 2052 | 2053 | 2054 |
| 2055 | 2056 | 2057 | 2062 | 2063 | 2064 | 2065 | 2066 | 2067 | 2069 | 2070 | 2071 | 2079 |
| 2080 | 2081 | 2082 | 2083 | 2084 | 2085 | 2086 | 2088 | 2089 | 2116 | 2117 | 2128 | 2129 |
| 2130 | 2131 | 2132 | 2133 | 2136 | 2137 | 2138 | 2139 | 2140 | 2141 | 2142 | 2148 | 2149 |
| 2150 | 2151 | 2152 | 2153 | 2154 | 2155 | 2156 | 2167 | 2168 | 2169 | 2170 | 2171 | 2172 |
| 2173 | 2174 | 2175 | 2176 | 2177 | 2178 | 2184 | 2185 | 2186 | 2187 | 2188 | 2189 | 2190 |
| 2192 | 2193 | 2196 | 2197 | 2201 | 2202 | 2203 | 2204 | 2205 | 2206 | 2207 | 2208 | 2209 |
| 2210 | 2211 | 2212 | 2218 | 2219 | 2220 | 2221 | 2222 | 2223 | 2224 | 2226 | 2227 | 2229 |
| 2230 | 2233 | 2234 | 2235 | 2236 | 2237 | 2238 | 2239 | 2241 | 2242 | 2245 | 2246 | 2251 |
| 2252 | 2254 | 2255 | 2256 | 2262 | 2263 | 2264 | 2265 | 2266 | 2267 | 2268 | 2270 | 2271 |
| 2275 | 2276 | 2277 | 2278 | 2279 | 2280 | 2281 | 2283 | 2284 | 2288 | 2289 | 2290 | 2291 |
| 2292 | 2293 | 2294 | 2296 | 2297 | 2301 | 2302 | 2303 | 2304 | 2305 | 2306 | 2307 | 2309 |
| 2310 | 2314 | 2315 | 2316 | 2317 | 2318 | 2319 | 2322 | 2323 | 2379 | 2380 | 2407 | 2408 |
| 2409 | 2410 | 2411 | 2412 | 2427 | 2428 | 2429 | 2430 | 2431 | 2432 | 2433 | 2437 | 2438 |
| 2439 | 2440 | 2441 | 2442 | 2443 | 2447 | 2448 | 2449 | 2450 | 2451 | 2452 | 2453 | 2458 |
| 2459 | 2460 | 2461 | 2462 | 2463 | 2464 | 2469 | 2470 | 2471 | 2472 | 2473 | 2474 | 2475 |
| 2480 | 2481 | 2482 | 2484 | 2485 | 2488 | 2489 | 2494 | 2495 | 2496 | 2497 | 2498 | 2499 |
| 2500 | 2505 | 2506 | 2507 | 2508 | 2509 | 2510 | 2511 | 2512 | 2513 | 2545 | 2546 | 2547 |
| 2548 | 2549 | 2550 | 2551 | 2552 | 2553 | 2554 | 2556 | 2557 | 2558 | 2559 | 2560 | 2561 |
| 2562 | 2564 | 2565 | 2566 | 2567 | 2568 | 2569 | 2570 | 2573 | 2574 | 2576 | 2577 | 2582 |
| 2583 | 2584 | 2585 | 2586 | 2587 | 2588 | 2593 | 2594 | 2595 | 2596 | 2597 | 2598 | 2599 |
| 2600 | 2601 | 2633 | 2634 | 2635 | 2636 | 2637 | 2638 | 2639 | 2641 | 2642 | 2643 | 2644 |
| 2645 | 2646 | 2647 | 2649 | 2650 | 2651 | 2652 | 2653 | 2654 | 2655 | 2658 | 2659 | 2661 |
| 2662 | 2664 | 2665 | 2666 | 2667 | 2668 | 2669 | 2670 | 2671 | 2672 | 2678 | 2679 | 2680 |
| 2681 | 2682 | 2683 | 2684 | 2689 | 2690 | 2691 | 2692 | 2693 | 2694 | 2695 | 2696 | 2697 |
| 2725 | 2726 | 2727 | 2728 | 2729 | 2730 | 2731 | 2732 | 2733 | 2734 | 2736 | 2737 | 2738 |
| 2739 | 2740 | 2741 | 2742 | 2744 | 2745 | 2746 | 2747 | 2748 | 2749 | 2750 | 2753 | 2754 |
| 2756 | 2757 | 2759 | 2760 | 2761 | 2762 | 2763 | 2764 | 2765 | 2766 | 2767 | 2773 | 2774 |
| 2775 | 2776 | 2777 | 2778 | 2779 | 2784 | 2785 | 2786 | 2787 | 2788 | 2789 | 2790 | 2791 |
| 2792 | 2820 | 2821 | 2822 | 2823 | 2824 | 2825 | 2826 | 2827 | 2828 | 2829 | 2830 | 2831 |
| 2832 | 2833 | 2834 | 2835 | 2836 | 2837 | 2838 | 2839 | 2840 | 2841 | 2842 | 2843 | 2844 |
| 2845 | 2846 | 2847 | 2848 | 2849 | 2850 | 2851 | 2852 | 2854 | 2855 | 2857 | 2858 | 2859 |
| 2871 | 2872 | 2873 | 2874 | 2875 | 2876 | 2877 | 2881 | 2882 | 2886 | 2887 | 2888 | 2889 |
| 2890 | 2891 | 2895 | 2896 | 2900 | 2901 | 2902 | 2903 | 2904 | 2905 | 2909 | 2910 | 2979 |
| 2980 | 3006 | 3007 | 3010 | 3011 | 3012 | 3013 | 3014 | 3015 | 3016 | 3017 | 3018 | 3019 |
| 3020 | 3021 | 3022 | 3023 | 3024 | 3025 | 3026 | 3027 | 3028 | 3029 | 3030 | 3031 | 3032 |
| 3033 | 3035 | 3036 | 3054 | 3055 | 3068 | 3069 | 3071 | 3072 | 3073 | 3074 | 3075 | 3076 |
| 3077 | 3078 | 3079 | 3080 | 3081 | 3082 | 3083 | 3084 | 3085 | 3086 | 3087 | 3088 | 3089 |
| 3090 | 3091 | 3092 | 3093 | 3094 | 3095 | 3096 | 3097 | 3098 | 3099 | 3100 | 3101 | 3102 |
| 3103 | 3104 | 3105 | 3106 | 3107 | 3108 | 3109 | 3110 | 3111 | 3112 | 3113 | 3114 | 3115 |
| 3116 | 3117 | 3118 | 3120 | 3121 | 3155 | 3156 | 3160 | 3161 | 3162 | 3163 |      |      |
| 353# | 1291 | 1313 | 1336 | 1359 | 1382 | 1403 | 1426 | 1449 | 1472 | 1499 | 1539 | 1561 |
| 1585 | 1608 | 1631 | 1653 | 1675 | 1698 | 1721 | 1748 | 1797 | 1829 | 2128 | 2196 | 2229 |
| 2245 | 2407 | 2488 | 2576 | 2661 | 2756 |      |      |      |      |      |      |      |
| 353# | 355# | 502  | 503  | 529  | 530  | 837  | 838  | 857  | 858  | 877  | 878  | 897  |
| 898  | 909  | 910  | 921  | 922  | 933  | 934  | 1004 | 1005 | 1203 | 1204 | 1229 | 1230 |
| 1242 | 1243 | 1273 | 1274 | 1309 | 1310 | 1332 | 1333 | 1355 | 1356 | 1378 | 1379 | 1399 |
| 1400 | 1422 | 1423 | 1445 | 1446 | 1468 | 1469 | 1495 | 1496 | 1524 | 1525 | 1528 | 1529 |
| 1557 | 1558 | 1580 | 1581 | 1604 | 1605 | 1627 | 1628 | 1650 | 1651 | 1672 | 1673 | 1694 |
| 1695 | 1717 | 1718 | 1744 | 1745 | 1773 | 1774 | 1776 | 1777 | 1825 | 1826 | 1850 | 1851 |
| 1860 | 1861 | 1881 | 1882 | 1900 | 1901 | 1928 | 1929 | 1979 | 1980 | 2087 | 2088 | 2115 |
| 2116 | 2142 | 2143 | 2156 | 2157 | 2191 | 2192 | 2225 | 2226 | 2240 | 2241 | 2250 | 2251 |

SVCSUB= 177777

SVCTAG= 000000

|          |          |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|          |          | 2269  | 2270  | 2282  | 2283  | 2295  | 2296  | 2308  | 2309  | 2321  | 2322  | 2378  | 2379  | 2433  |
|          |          | 2434  | 2443  | 2444  | 2453  | 2454  | 2464  | 2465  | 2475  | 2476  | 2483  | 2484  | 2500  | 2501  |
|          |          | 2513  | 2514  | 2572  | 2573  | 2588  | 2589  | 2601  | 2602  | 2657  | 2658  | 2672  | 2673  | 2684  |
|          |          | 2685  | 2697  | 2698  | 2752  | 2753  | 2767  | 2768  | 2779  | 2780  | 2792  | 2793  | 2853  | 2854  |
|          |          | 2880  | 2881  | 2894  | 2895  | 2908  | 2909  | 2978  | 2979  | 3055  | 3056  | 3156  | 3157  |       |
| SVCTST=  | 177777   | 353#  | 1289  | 1537  | 1788  | 1937  | 1992  | 2126  | 2405  |       |       |       |       |       |
| SWCHON   | 010242   | 2010* | 2014* | 2016* | 2021* | 2022* | 2023* | 2025  | 2032  | 2074# |       |       |       |       |
| SWCNT    | 010236   | 2011* | 2018* | 2072# |       |       |       |       |       |       |       |       |       |       |
| SWERR    | 010244 G | 2003  | 2077# |       |       |       |       |       |       |       |       |       |       |       |
| SWSET    | 002230   | 640#  | 1222* | 1997  | 2080  |       |       |       |       |       |       |       |       |       |
| SYEE     | 014444   | 2777  | 2969# |       |       |       |       |       |       |       |       |       |       |       |
| SYETST   | 013522   | 2801# | 2818  |       |       |       |       |       |       |       |       |       |       |       |
| SYRTST   | 013160   | 2706# | 2723  |       |       |       |       |       |       |       |       |       |       |       |
| SYSE     | 014332   | 2473  | 2825  | 2835  | 2845  | 2951# |       |       |       |       |       |       |       |       |
| SYSEIN   | 012052   | 2466  | 2468# |       |       |       |       |       |       |       |       |       |       |       |
| SYSET    | 013336   | 2478  | 2757# |       |       |       |       |       |       |       |       |       |       |       |
| SYSR     | 014317   | 2462  | 2730  | 2738  | 2746  | 2948# |       |       |       |       |       |       |       |       |
| SYSRIN   | 012024   | 2455  | 2457# | 2630  |       |       |       |       |       |       |       |       |       |       |
| SYSROM   | 002320   | 654#  | 2675  | 2704  | 2770  | 2799  |       |       |       |       |       |       |       |       |
| SYSRT    | 012772   | 2467  | 2662# |       |       |       |       |       |       |       |       |       |       |       |
| S\$LSYM= | 010000   | 353#  | 503#  | 530#  | 838#  | 858#  | 878#  | 898#  | 910#  | 922#  | 934#  | 997   | 1004  | 1005# |
|          |          | 1204# | 1230# | 1243# | 1274# | 1310# | 1333# | 1356# | 1379# | 1400# | 1423# | 1446# | 1469# | 1496# |
|          |          | 1525# | 1529# | 1558# | 1581# | 1605# | 1628# | 1651# | 1673# | 1695# | 1718# | 1745# | 1774# | 1777# |
|          |          | 1826# | 1851# | 1861# | 1882# | 1901# | 1929# | 1980# | 2088# | 2116# | 2137  | 2142  | 2143# | 2149  |
|          |          | 2156  | 2157# | 2192# | 2226# | 2241# | 2251# | 2270# | 2283# | 2296# | 2309# | 2322# | 2379# | 2428  |
|          |          | 2433  | 2434# | 2438  | 2443  | 2444# | 2448  | 2453  | 2454# | 2459  | 2464  | 2465# | 2470  | 2475  |
|          |          | 2476# | 2484# | 2495  | 2500  | 2501# | 2506  | 2513  | 2514# | 2573# | 2583  | 2588  | 2589# | 2594  |
|          |          | 2601  | 2602# | 2658# | 2665  | 2672  | 2673# | 2679  | 2684  | 2685# | 2690  | 2697  | 2698# | 2753# |
|          |          | 2760  | 2767  | 2768# | 2774  | 2779  | 2780# | 2785  | 2792  | 2793# | 2854# | 2881# | 2895# | 2909# |
|          |          | 2979# | 3056# | 3157# |       |       |       |       |       |       |       |       |       |       |
| TAG1     | 010102   | 2034# | 2046  |       |       |       |       |       |       |       |       |       |       |       |
| TAG2     | 010132   | 2035  | 2043# |       |       |       |       |       |       |       |       |       |       |       |
| TAG3     | 010150   | 2048# | 2060  |       |       |       |       |       |       |       |       |       |       |       |
| TAG4     | 010200   | 2049  | 2057# |       |       |       |       |       |       |       |       |       |       |       |
| TEMP     | 010240   | 2009* | 2012  | 2017* | 2073# |       |       |       |       |       |       |       |       |       |
| TSTCKW   | 004740   | 1090  | 1100  | 1104# |       |       |       |       |       |       |       |       |       |       |
| T\$ARGC= | 000001   | 375#  | 376#  | 377#  | 378#  | 379#  | 380#  | 823#  | 827   | 829#  | 835   | 843#  | 847   | 849#  |
|          |          | 855   | 863#  | 867   | 869#  | 875   | 883#  | 887   | 889#  | 895   | 903#  | 907   | 915#  | 919   |
|          |          | 927#  | 931   | 939#  | 945   | 990#  | 994   | 1868# | 1872  | 1874# | 1879  | 1887# | 1891  | 1893# |
|          |          | 1898  | 2025# | 2030  | 2037# | 2042  | 2051# | 2056  | 2062# | 2066  | 2079# | 2085  | 2262# | 2267  |
|          |          | 2275# | 2280  | 2288# | 2293  | 2301# | 2306  | 2314# | 2318  | 2871# | 2876  | 2886# | 2890  | 2900# |
|          |          | 2904  |       |       |       |       |       |       |       |       |       |       |       |       |
| T\$CODE= | 111004   | 999#  | 2139# | 2151# | 2430# | 2440# | 2450# | 2461# | 2472# | 2497# | 2508# | 2585# | 2596# | 2667# |
|          |          | 2681# | 2692# | 2762# | 2776# | 2787# | 3010# | 3016# | 3022# | 3028# | 3035# | 3071# | 3077# | 3083# |
| T\$ERRN= | 000062   | 3089# | 3095# | 3101# | 3107# | 3113# | 3120# |       |       |       |       |       |       |       |
|          |          | 353#  | 1050# | 1298# | 1321# | 1344# | 1367# | 1388# | 1411# | 1434# | 1457# | 1484# | 1513# | 1546# |
|          |          | 1569# | 1593# | 1616# | 1639# | 1661# | 1683# | 1706# | 1733# | 1762# | 1818# | 1843# | 2001# | 2168# |
|          |          | 2185# | 2202# | 2219# | 2234# | 2549# | 2557# | 2565# | 2634# | 2642# | 2650# | 2729# | 2737# | 2745# |
|          |          | 2824# | 2834# | 2844# |       |       |       |       |       |       |       |       |       |       |
| T\$EXCP= | 000000   | 999#  | 1004  | 2151# | 2156  | 2508# | 2513  | 2596# | 2601  | 2667# | 2672  | 2692# | 2697  | 2762# |
|          |          | 2767  | 2787# | 2792  | 3010# | 3015  | 3016# | 3021  | 3022# | 3027  | 3028# | 3033  | 3071# | 3076  |
|          |          | 3077# | 3082  | 3083# | 3088  | 3089# | 3094  | 3095# | 3100  | 3101# | 3106  | 3107# | 3112  | 3113# |
|          |          | 3118  |       |       |       |       |       |       |       |       |       |       |       |       |
| T\$FLAG= | 000041   | 1267# | 1304# | 1327# | 1350# | 1373# | 1394# | 1417# | 1440# | 1463# | 1490# | 1519# | 1552# | 1575# |
|          |          | 1599# | 1622# | 1645# | 1667# | 1689# | 1712# | 1739# | 1768# | 1794# | 1853# | 1953# | 1975# | 2007# |
|          |          | 2069# | 2174# | 2208# | 2254# | 2480# | 2545# | 2725# | 2820# | 2830# | 2840# | 2850# | 2857# | 3035# |



|                  |       |       |       |       |       |       |       |       |       |       |       |       |       |
|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                  | 656#  | 837#  | 857#  | 877#  | 897#  | 909#  | 921#  | 933#  | 999#  | 1203# | 1229# | 1238# | 1242# |
|                  | 1267# | 1268  | 1273# | 1304# | 1305  | 1309# | 1327# | 1328  | 1332# | 1350# | 1351  | 1355# | 1373# |
|                  | 1374  | 1378# | 1394# | 1395  | 1399# | 1417# | 1418  | 1422# | 1440# | 1441  | 1445# | 1463# | 1464  |
|                  | 1468# | 1490# | 1491  | 1495# | 1519# | 1520  | 1524# | 1528# | 1552# | 1553  | 1557# | 1575# | 1576  |
|                  | 1580# | 1599# | 1600  | 1604# | 1622# | 1623  | 1627# | 1645# | 1646  | 1650# | 1667# | 1668  | 1672# |
|                  | 1689# | 1690  | 1694# | 1712# | 1713  | 1717# | 1739# | 1740  | 1744# | 1768# | 1769  | 1773# | 1776# |
|                  | 1794# | 1795  | 1825# | 1850# | 1853# | 1854  | 1860# | 1881# | 1900# | 1928# | 1953# | 1954  | 1975# |
|                  | 1976  | 1979# | 2007# | 2008  | 2069# | 2070  | 2087# | 2115# | 2139# | 2151# | 2174# | 2175  | 2191# |
|                  | 2208# | 2209  | 2225# | 2240# | 2250# | 2254# | 2255  | 2269# | 2282# | 2295# | 2308# | 2321# | 2378# |
|                  | 2430# | 2440# | 2450# | 2461# | 2472# | 2480# | 2481  | 2483# | 2497# | 2508# | 2545# | 2546  | 2572# |
|                  | 2585# | 2596# | 2657# | 2667# | 2681# | 2692# | 2725# | 2726  | 2752# | 2762# | 2776# | 2787# | 2820# |
|                  | 2821  | 2830# | 2831  | 2840# | 2841  | 2850# | 2851  | 2853# | 2857# | 2858  | 2880# | 2894# | 2908# |
|                  | 2978# | 3010# | 3016# | 3022# | 3028# | 3035# | 3054# | 3071# | 3077# | 3083# | 3089# | 3095# | 3101# |
|                  | 3107# | 3113# | 3120# | 3155# |       |       |       |       |       |       |       |       |       |
| T\$TEST= 000007  | 353#  | 1289# | 1291  | 1313  | 1336  | 1359  | 1382  | 1403  | 1426  | 1449  | 1472  | 1499  | 1537# |
|                  | 1539  | 1561  | 1585  | 1608  | 1631  | 1653  | 1675  | 1698  | 1721  | 1748  | 1788# | 1797  | 1829  |
|                  | 1937# | 1992# | 2126# | 2128  | 2196  | 2229  | 2245  | 2405# | 2407  | 2488  | 2576  | 2661  | 2756  |
|                  | 3164  |       |       |       |       |       |       |       |       |       |       |       |       |
| T\$TSTM= 177777  | 353#  | 826   | 834   | 838   | 846   | 854   | 858   | 866   | 874   | 878   | 886   | 894   | 898   |
|                  | 906   | 910   | 918   | 922   | 930   | 934   | 944   | 993   | 996   | 1049  | 1054  | 1204  | 1218  |
|                  | 1225  | 1230  | 1243  | 1264  | 1267  | 1274  | 1291  | 1297  | 1302  | 1304  | 1307  | 1310  | 1313  |
|                  | 1320  | 1325  | 1327  | 1330  | 1333  | 1336  | 1343  | 1348  | 1350  | 1353  | 1356  | 1359  | 1366  |
|                  | 1371  | 1373  | 1376  | 1379  | 1382  | 1387  | 1392  | 1394  | 1397  | 1400  | 1403  | 1410  | 1415  |
|                  | 1417  | 1420  | 1423  | 1426  | 1433  | 1438  | 1440  | 1443  | 1446  | 1449  | 1456  | 1461  | 1463  |
|                  | 1466  | 1469  | 1472  | 1483  | 1488  | 1490  | 1493  | 1496  | 1499  | 1512  | 1517  | 1519  | 1522  |
|                  | 1525  | 1529  | 1539  | 1545  | 1550  | 1552  | 1555  | 1558  | 1561  | 1568  | 1573  | 1575  | 1578  |
|                  | 1581  | 1585  | 1592  | 1597  | 1599  | 1602  | 1605  | 1608  | 1615  | 1620  | 1622  | 1625  | 1628  |
|                  | 1631  | 1638  | 1643  | 1645  | 1648  | 1651  | 1653  | 1660  | 1665  | 1667  | 1670  | 1673  | 1675  |
|                  | 1682  | 1687  | 1689  | 1692  | 1695  | 1698  | 1705  | 1710  | 1712  | 1715  | 1718  | 1721  | 1732  |
|                  | 1737  | 1739  | 1742  | 1745  | 1748  | 1761  | 1766  | 1768  | 1771  | 1774  | 1777  | 1794  | 1797  |
|                  | 1803  | 1808  | 1813  | 1817  | 1822  | 1826  | 1829  | 1833  | 1838  | 1842  | 1847  | 1851  | 1853  |
|                  | 1871  | 1878  | 1882  | 1890  | 1897  | 1901  | 1929  | 1942  | 1947  | 1953  | 1960  | 1965  | 1970  |
|                  | 1975  | 1980  | 1994  | 2000  | 2005  | 2007  | 2029  | 2041  | 2055  | 2065  | 2069  | 2084  | 2088  |
|                  | 2116  | 2128  | 2130  | 2136  | 2148  | 2167  | 2172  | 2174  | 2177  | 2184  | 2189  | 2192  | 2196  |
|                  | 2201  | 2206  | 2208  | 2211  | 2218  | 2223  | 2226  | 2229  | 2233  | 2238  | 2241  | 2245  | 2251  |
|                  | 2254  | 2266  | 2270  | 2279  | 2283  | 2292  | 2296  | 2305  | 2309  | 2317  | 2322  | 2379  | 2407  |
|                  | 2409  | 2427  | 2437  | 2447  | 2458  | 2469  | 2480  | 2484  | 2488  | 2494  | 2505  | 2545  | 2548  |
|                  | 2553  | 2556  | 2561  | 2564  | 2569  | 2573  | 2576  | 2582  | 2593  | 2633  | 2638  | 2641  | 2646  |
|                  | 2649  | 2654  | 2658  | 2661  | 2664  | 2678  | 2689  | 2725  | 2728  | 2733  | 2736  | 2741  | 2744  |
|                  | 2749  | 2753  | 2756  | 2759  | 2773  | 2784  | 2820  | 2823  | 2828  | 2830  | 2833  | 2838  | 2840  |
|                  | 2843  | 2848  | 2850  | 2854  | 2857  | 2875  | 2881  | 2889  | 2895  | 2903  | 2909  | 2979  |       |
| T\$TSTS= 000001  | 353#  | 1289# | 1537# | 1788# | 1937# | 1992# | 2126# | 2405# |       |       |       |       |       |
| T\$\$AUT= 010014 | 1240# | 1242  |       |       |       |       |       |       |       |       |       |       |       |
| T\$\$CLE= 010015 | 1252# | 1267  | 1273  |       |       |       |       |       |       |       |       |       |       |
| T\$\$HAR= 010100 | 3006# | 3035  | 3055  |       |       |       |       |       |       |       |       |       |       |
| T\$\$HW = 010000 | 491#  | 502   |       |       |       |       |       |       |       |       |       |       |       |
| T\$\$INI= 010012 | 1215# | 1229  |       |       |       |       |       |       |       |       |       |       |       |
| T\$\$MSG= 010077 | 821#  | 837   | 841#  | 857   | 861#  | 877   | 881#  | 897   | 901#  | 909   | 913#  | 921   | 925#  |
|                  | 933   | 1866# | 1881  | 1885# | 1900  | 2077# | 2087  | 2260# | 2269  | 2273# | 2282  | 2286# | 2295  |
|                  | 2299# | 2308  | 2312# | 2321  | 2869# | 2880  | 2884# | 2894  | 2898# | 2908  |       |       |       |
| T\$\$PRO= 010013 | 1233# |       |       |       |       |       |       |       |       |       |       |       |       |
| T\$\$RPT= 010011 | 1201# | 1203  |       |       |       |       |       |       |       |       |       |       |       |
| T\$\$SOF= 010101 | 3068# | 3120  | 3156  |       |       |       |       |       |       |       |       |       |       |
| T\$\$SRV= 010047 | 1857# | 1860  |       |       |       |       |       |       |       |       |       |       |       |
| T\$\$SUB= 010074 | 1291# | 1309  | 1313# | 1332  | 1336# | 1355  | 1359# | 1378  | 1382# | 1399  | 1403# | 1422  | 1426# |
|                  | 1445  | 1449# | 1468  | 1472# | 1495  | 1499# | 1524  | 1539# | 1557  | 1561# | 1580  | 1585# | 1604  |



|                 |      |      |       |      |      |      |      |       |       |       |      |      |      |  |  |  |  |  |
|-----------------|------|------|-------|------|------|------|------|-------|-------|-------|------|------|------|--|--|--|--|--|
| X\$FALS= 000040 | 353# |      |       |      |      |      |      |       |       |       |      |      |      |  |  |  |  |  |
| X\$OFFS= 000400 | 353# | 3035 | 3120  |      |      |      |      |       |       |       |      |      |      |  |  |  |  |  |
| X\$TRUE= 000020 | 353# |      |       |      |      |      |      |       |       |       |      |      |      |  |  |  |  |  |
| ZERR 003112     | 742# | 823  |       |      |      |      |      |       |       |       |      |      |      |  |  |  |  |  |
| . = 015310      | 2#   | 652# | 653#  | 654# | 729# | 1268 | 1305 | 1328  | 1351  | 1374  | 1395 | 1418 | 1441 |  |  |  |  |  |
|                 | 1464 | 1491 | 1520  | 1553 | 1576 | 1600 | 1623 | 1646  | 1668  | 1690  | 1713 | 1740 | 1769 |  |  |  |  |  |
|                 | 1795 | 1854 | 1926# | 1954 | 1976 | 2008 | 2070 | 2113# | 2175  | 2209  | 2255 | 2481 | 2546 |  |  |  |  |  |
|                 | 2726 | 2821 | 2831  | 2841 | 2851 | 2858 | 3035 | 3120  | 3151# | 3158# |      |      |      |  |  |  |  |  |

. ABS. 015310 000

ERRORS DETECTED: 0

DSKZ:CVMBAC,DSKZ:CVMBAC/SOL/CRF:SYM/NL:TOC=DSKZ:CVMBAC/ML,DSKZ:CVMBAC.P11  
 RUN-TIME: 99 89 7 SECONDS  
 RUN-TIME RATIO: 530/196=2.7  
 CORE USED: 15K (29 PAGES)