PCL11-A,B

PCL11 STND ALN VO2C
CZPLBC0

AH-E263C-MC

FICHE 1 OF 1

SEP 1979
digital
MADE IN USA

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                        ;               I D E N T I F I C A T I O N
                        ;               - - - - - - - - - - - - - - -
                        ;       PROGRAM CODE            AC-E262C-MC
                        ;       PPROGRAM NAME           CZPLBC0 PCL11 STAND ALONE TEST
                        ;       DATE CREATED            22-OCT-75
                        ;       UPDATED (TO VER 02)     13-MAR-78
                        ;       MODIFIED                06-JUN-79
                        ;       MAINTAINER              SPECIAL SYSTEMS KANATA
                        ;       AUTHOR                  DAVID G. WIENS

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                        .SBTTL HEADER AND INSTRUCTIONS
000000                  .REPT 0


                1.      GENERAL

                  THE PARALLEL COMMUNICATIONS LINK (PCL11) TEST WILL VIGOROUSLY
TEST THE HARDWARE INVOLVED IN ANY ONE PDP-11 PROCESSOR CONTAINING
PCL11 HARDWARE.
  THERE ARE THREE SEPARATE SECTIONS IN THIS TEST. TO COMPLETELY
CHECK BOTH TRANSMITTER AND RECEIVER PORTIONS OF THE PCL11, ALL
THREE SECTIONS MUST BE RUN SUCCESSFULLY.
  THE FIRST TEST IS THE BASIC TRANSMITTER TEST WHICH IS
DESIGNED TO BE RUN AS A STAND ALONE DEVICE TEST
ON THE TRANSMITTER. IT WILL RUN WITH NO MANUAL INTERVENTION
(AFTER INITIAL SETUP) ASSUMING THAT THE TRANSMITTER ADDRESS
SWITCHES IN THE MASTER SECTION ARE SET TO BE AT LEAST EQUAL TO
THE TRANSMITTERS OWN ADDRESS SWITCHES. THIS ASSURES THAT TIMING
SLICES WILL SELECT THE TRANSMITTER BEING TESTED.
  THE SECOND TEST IS THE BASIC RECEIVER TEST WHICH IS DESIGNED TO
RUN AS A STAND ALONE DEVICE TEST FOR THE RECEIVER MODULE.
AFTER INITIAL SETUP, THIS TEST RUNS WITH NO MANUAL INTERVENTION.
  THE THIRD TEST IS THE TRANSMITTER-RECEIVER LOOP TEST.
THE OBJECTIVE OF THE THIRD TEST IS TO TEST ANY FUNCTIONS THAT
WERE NEGLECTED IN THE FIRST AND SECOND TESTS DUE TO THE NEED FOR
TRANSMITTER TO RECEIVER COMMUNICATIONS. IT WILL ALSO TEST THE
T.D.M. BUS DRIVERS AND RECEIVERS BY SENDING DATA PATTERNS AND
CHECKING THE DATA RECEIVED. FURTHER, IT WILL EXERCISE THE ABILITY
TO REJECT OR TRUNCATE COMMUNICATIONS.


  THE TESTS ARE SELECTED, IN THE START-UP PROCEDURE, SO THAT ANY
ONE OF THE TESTS MAY BE LOOPED INDIVIDUALLY, OR ALL THREE MAY BE
LOOPED AS AN OVERALL TEST.
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                        2.      REQUIREMENTS

                        2.1     GENERAL:

                        2.11            PDP-11 PROCESSOR WITH 8K OF MEMORY
                                        AND A CONSOLE DEVICE ON-LINE.

                        2.12            PCL11 HARDWARE ON THE UNIBUS

                        2.13            ALL PROCESSOR MAINDECS MUST HAVE BEEN RUN
                                        SUCCESSFULLY PRIOR TO RUNNING PCL11 TEST.
                        2.14            ONE PCL11 CONNECTED TO UNIBUS
                                        (SEE PCL11 OPTION DESCRIPTION SEC 2.1)
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                        3.      RESTRICTIONS

                        3.1             THIS TEST CANNOT BE LOADED INTO A PDP-11 WITH
                                        LESS THAN 8K OF MEMORY.

                        3.3             SINCE THERE ARE TIMING LOOPS IN THIS TEST,
                                        IT MAY NOT RUN SUCCESSFULLY IN SOLID-STATE MEMORY
                                        IF THE DELAY CONSTANT  (CNTRL-D)  IS LOWERED TO
                                        BELOW 6.
                                        *** THIS ALSO APPLIES TO USING FASTER PDP-11'S (45, 70, ETC.)***


                        4.      TEST SET-UP

                        4.1             ENSURE PCL11 HAS BEEN INSTALLED CORRECTLY
                                        AS PER THE INSTALLATION PROCEDURE IN SEC 2.1 OF
                                        PCL11 OPTION DESCRIPTION (YC-A20TC-00)

                        4.2             ENSURE ALL CABLES CONNECTING THE PCL11 UNDER
                                        TEST TO OTHER PCL11 UNITS OR DISPLAY PANELS
                                        ARE DISCONNECTED (OR DISABLED).

                        4.3             DETERMINE OR SET UP PROPER TDM ADDRESSES FOR
                                        THE RECEIVER AND TRANSMITTER. THE TRANSMITTER'S
                                        ADDRESS IS IN S1 ON THE M7991 MODULE; THE
                                        RECEIVER'S IS IN S1 ON THE M7997 MODULE.

                        4.4             ENSURE S1 ON THE M7994 MODULE IS SET TO A NUMBER
                                        GREATER THAN OR EQUAL TO THE TRANSMITTER'S ADDRESS.
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                5.      LOADING

                        THE PCL11 TEST IS ON PAPER TAPE IN PDP-11 .ABS
                        FORMAT. THE TAPE IS LOADED BY MEANS OF THE PDP-11
                        ABSOLUTE LOADER.

                6.      STARTING AND RESTARTING ADDRESSES

                        START ADDR              RESTART ADDR
                        ----------              ------------

                          200                     204   (FOR DIFFERENT T.D.M. BUS ADDRESSES)
                                                  224   (FOR TEST SELECT)

                7.      SWITCH REGISTER OPTIONS

                7.1     ALL TESTS

                                SW 15 - 0       HALT AFTER ERRORS
                                SW 15 - 1       DON'T HALT AFTER ERRORS
                                SW 14   0       ALLOW PRINTING
                                SW 14 = 1       INHIBIT PRINTING
                                SW 13 = 0       SEE SW 15
                                SW 13 = 1       AFTER ERROR, RE-TRY CURRENT ROUTINE
                                SW 12 = 0       CARRY ON TO NEXT SUBTEST
                                SW 12 - 1       DON'T EXIT THIS SUBTEST
                                SW 11 = 0       10 TIMES THRU ALL SUBTESTS PER PASS
                                SW 11 - 1       ONCE THRU ALL SUBTESTS PER PASS

                7.2     TRANSMITTER TEST

                                SW 10 - 0       START AT 1ST SUBTEST AND RUN
                                SW 10 = 1       START AT SUBTEST # IN SW'S <3:0>
                                SW 09 = 0       STAY IN MASTER SECTION SCOPE LOOP
                                SW 09 = 1       EXIT MASTER SECTION SCOPE LOOP

                7.3     RECEIVER TEST

                                SW 10 - 0       START AT 1ST SUBTEST AND RUN
                                SW 10 = 1       START AT SUBTEST # IN SW'S <2:0>

                7.4     TRANSMITTER-RECEIVER LOOP

                                SW 10 = 0       START AT 1ST SUBTEST AND RUN
                                SW 10 - 1       START AT SUBTEST # IN SW'S <2:0>
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                7.5     SWITCH REGISTER OPTION USE ON NON-SWITCH-REGISTER PDP-11'S

                AT START UP TIME
                THE PROGRAM WILL DECIDE WHETHER A HARDWARE SWITCH REGISTER
                EXSISTS ON THE PDP-11. IF NONE EXSISTS, A SOFTWARE
                FLAG WILL BE SET INDICATING TO THE REST OF THE PROGRAM THAT
                THE ''SWITCH MONITOR'' IS TO BE USED TO ACHIEVE CHANGING OF
                SWITCH OPTIONS.
                  THE MONITOR IS ENTERED AT THE START OF THE TEST PROGRAM
                AUTOMATICALLY. IT IS ALSO ENTERED AUTOMATICALLY ON AN ERROR
                HALT IF SW 15 = 0. AT OTHER TIMES IT MUST BE CALLED BY THE
                OPERATER BY TYPING CNTRL-S
                  WHEN THE MONITOR IS ENTERED THE FOLLOWING IS PRINTED:
                        SWR - XXXXXX  :
                SHOWING THE OPERATER THE PRESENT CONTENTS OF THE SOFTWARE
                SWITCH REGISTER LOCATION. HE MAY CHANGE THE LOCATION BY TYPING:
                        YYYYYY <CR>
                IN RESPONSE; OR HE MAY LEAVE THE LOCATION UNCHANGED BY TYPING
                ONLY <CR>.
                  REFERENCE PAGE 9 OF THIS LISTING FOR ''SWITCH'' BIT POSITIONS.
                UPON DETECTING A <CR> THE MONITOR WILL TYPE:
                        CNTRL-P TO CONTINUE
                  THE OPERATER NOW HAS THE OPTION OF TYPING ^P TO CONTINUE
                THE PROGRAM WHERE IT LEFT OFF, OR ^S TO RE-ENTER THE
                SWITCH MONITOR.



                8.      TEST DESCRIPTION

                8.1     TEST 1 - TRANSMITTER TEST:

                        SUBTEST 00      TEST INITIAL CONDITIONS AFTER RESET
                        SUBTEST 01      COMMAND REGISTER TEST
                        SUBTEST 02      BYTE COUNT REGISTER TEST
                        SUBTEST 03      BUS ADDRESS REGISTER TEST
                        SUBTEST 04      MASTER SECTION TEST
                        SUBTEST 05      DATA SILO TEST
                        SUBTEST 06      STATUS REGISTER AND ERRORS TEST
                        SUBTEST 07      INTERRUPT TEST
                        SUBTEST 10      C.R.C GENERATION TEST

                8.2     TEST 2 - RECEIVER TEST:

                        SUBTEST 00      TEST INITIAL CONDITIONS AFTER RESET
                        SUBTEST 01      COMMAND REGISTER TEST
                        SUBTEST 02      BYTE COUNT REGISTER TEST
                        SUBTEST 03      BUS ADDRESS REGISTER TEST
                        SUBTEST 04      DATA SILO TEST
                        SUBTEST 05      STATUS REGISTER AND ERRORS TEST
                        SUBTEST 06      INTERRUPT TEST
                        SUBTEST 07      C.R.C GENERATION TEST

                8.3     TEST 3 - XMTR-RCVR LOOP TEST:

                        SUBTEST 00      CHK NPR FROM RCVR SILO TO XMTR SILO
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                                SUBTEST 01      DATA LOOPS TEST
                                SUBTEST 02      TRANSMISSION ERRORS TEST
                                SUBTEST 03      REJECT AND TRUNCATE TEST


                        8.4     TEST 4 - COMBINATION RUN

                                RUN TEST 1 THEN
                                RUN TEST 2 THEN
                                RUN TEST 3 THEN
                                RUN TEST 1 ETC .



                        8.5     THE TESTS WILL IDENTIFY THEMSELVES UPON SELECTION, IN THE
                                FOLLOWING WAY:

                                TEST 1  ''PCL11 TRANSMITTER TEST''

                                TEST 2  ''PCL11 RECEIVER TEST''

                                TEST 3  ''TRANSMITTER - RECEIVER LOOP TESTS''

                                TEST 4  ''PCL11 TESTS 1 - 3 SEQUENCE''


                        8.6     THE TESTS WILL SIGNIFY COMPLETION BY PRINTING THE FOLLOWING
                                END PASS MESSAGES ALONG WITH THE PASS COUNT IN DECIMAL:

                                TEST 1  -- END PASS # N

                                TEST 2  -- END PASS # NA

                                TEST 3  -- END PASS # NB

                                TEST 4  -- END PASS # NC
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                        9.      STARTING AND OPERATING PROCEDURE

                                LOAD THE PROGRAM TAPE USING THE PDP-11 ABSOLUTE LOADER

                        9.1     START UP:

                                START PROGRAM AT 200
                                PROGRAM WILL ASK THE FOLLOWING (ONE AT A TIME)
                        XMTR 1ST UNIBUS ADDR..  (DEFAULT = 164200)
                        RCVR 1ST UNIBUS ADDR... (DEFAULT = 164220)
                        XMTR VECTOR..           (DEFAULT = 170)
                        RCVR VECTOR..           (DEFAULT   174)
                        XMTR PRIORITY (4-7)..   (DEFAULT = 5)
                        RCVR PRIORITY (4-7)..   (DEFAULT = 5)
                        XMTR TDM BUS ADDR (1-37)..      (DEFAULT = 1)
                        RCVR TDM BUS ADDR (1-37)..      (DEFAULT   1)

                        RESPOND TO EACH PROMPT WITH:
                        <CR> IF DEFAULT IS DESIRED
                        XXXXX <CR> IF XXXXX IS DESIRED FOR NEW ENTRY

                        9.11    SELECT TEST:

                                THE PROGRAM THEN TYPES:

                                SELECT TEST (<CR> FOR HELP)..

                        THE OPERATOR HAS THE FOLLOWING CHOICES:

                        1 = SELECT TEST 1 TO RUN ONLY (TRANSMITTER LOGIC TEST)
                        2 = SELECT TEST 2 TO RUN ONLY (RECEIVER LOGIC TEST)
                        3 = SELECT TEST 3 TO RUN ONLY (XMTR -TO- RCVR LOOP TEST)
                        4 = SEQUENCE TEST 1, TEST 2, TEST 3  REPETEDLY.
                        <CR>  PRINT THIS HELP MESSAGE.


                        9.12            POSSIBLE INTERVENTION:

                        9.121            IF SW 12 IS UP AT START TIME, THE FIRST SUBTEST
                                        WILL RUN CONTINUOUSLY AND THE TEST WILL NEVER
                                        ACHIEVE A SUCCESSFUL PASS COMPLETE. SWITCH 12
                                        MUST BE LEFT DOWN UNLESS AN INTERMITTENT ERROR
                                        OCCURS IN A SUBTEST AND IT IS DESIRED TO SCOPE
                                        THE MODULE WITH THE SAME SUBTEST RUNNING CONTINUOUSLY.
                                        AT ANY TIME, SW 12 MAY BE LOWERED AND THE TEST
                                        SEQUENCE WILL RESUME.

                        9.122            ANY PARTICULAR SUBTEST MAY BE STARTED BY
                                        STARTING WITH OPTION SWITCH 10 = 1 AND THE
                                        NUMBER OF THE DESIRED SUBTEST IN SW'S <3:0>.
                                        IF IT IS DESIRED, HOWEVER, TO CONTINUOUSLY
                                        RUN ONLY THE SELECTED SUBTEST, SW 12 MUST BE RAISED
                                        AS WELL AS SW 10 AT START UP TIME.

                        9.123            WHEN THE MASTER SECTION TEST HAS IT'S TURN TO RUN
                                        THE FOLLOWING MESSAGE WILL APPEAR ON THE CONSOLE
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                                PRINTER

                                   SCOPE SECTION FOR SLICE TIMING
                                   RAISE SW 09 TO EXIT THIS LOOP

                                THIS IS A ''HANG-UP'' PROVIDED FOR MAINTENANCE
                                PURPOSES OF CHECKING AND ADJUSTING SLICE
                                TIMING IN THE MASTER SECTION. NEITHER THE
                                PRINTOUT NOR THE ''HANG-UP'' WILL OCCUR IF
                                SW 09 IS UP.


                    9.124        NORMALLY, 10 (OCTAL) PASSES ARE MADE OF THE
                                COMPLETE TEST BEFORE A PASS COMPLETE IS
                                ACHIEVED AND

                                        END PASS XX

                                IS PRINTED ON THE CONSOLE PRINTER.
                                HOWEVER, RAISING SW 11 WILL CAUSE EVERY SINGLE
                                PASS TO BE CONSIDERED AS COMPLETE.

                    9.13        RESTARTING:

                                THE TEST MAY BE RE-STARTED AT LOC. 204
                                THIS WILL OMIT MOST OPENING DIALOGUE.
                                THE FOLLOWING WILL STILL BE REQUESTED, HOWEVER:

                                TRANSMITTER TDM BUS ADDRESS IS (1-37).. (DEFAULT - 1)
                                RECEIVER TDM BUS ADDRESS IS (1-37)..    (DEFAULT   1)

                                OR --THE TEST MAY BE RE-STARTED AT LOC. 224
                                THIS WILL OMIT ALL OF THE OPENING DIALOGUE
                                AND BEGIN RIGHT AT THE TEST SELECTOR.

                9.14    (CONTROL CHARACTERS)

                                CNTRL-C RESTART TO SELECT NEW TDM BUS ADDRESSES
                                CNTRL-T RESTART AT TEST SELECTOR
                                CNTRL-D MODIFY DELAY CONSTANT
                                        (NORMALLY SET FOR FASTEST PDP-11)
                                CNTRL-S MODIFY SWITCH OPTIONS ON NON-
                                        SWITCH REGISTER PDP-11'S
                                CNTRL-P CONTINUE AFTER CONTROL FUNCTION
                                CNTRL-F MODIFY CONSOLE FILL COUNT
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                        10      ERRORS

                                BASICALLY, THE ERRORS IN THIS TEST ARE IN THE FORM:

                                **ERROR X AT LOCATION YYYYYY

                                WHERE X IS THE ERROR NUMBER:

                                   TRANSMITTER TEST ERROR #'S 1 TO 121  (TEST # 1)
                                   RECEIVER TEST ERROR #'S 200-262      (TEST # 2)
                                   LOOP TEST ERROR #'S 300-355          (TEST # 3)

                                AND YYYYYY IS THE ADDRESS IN THE LISTING WHERE THE
                                ERROR OCCURRED.

                                REFER TO THE LISTING ABOVE THE COMMENT:

                                   ******* ERROR X *******

                                TO DETERMINE THE CAUSE OF THE ERROR PRINTOUT.

                                DATA ERRORS WILL CAUSE A FURTHER PRINTOUT INDICATING
                                THE ERRONEOUS DATA:

                                   SHOULD BE AAAAAA, WAS BBBBBB


                                OTHER ERRORS WILL CAUSE THE FOLLOWING FURTHER
                                PRINTOUTS:

                                   TRANSMITTER STATUS REGISTER = CCCCCC

                                   RECEIVER STATUS REGISTER = DDDDDD

                                   NO. OF WORDS RECEIVED = EEEEEE

                                   SILO OUTPUT WORD WAS FFFFFF

                                   SILO INPUT WORD WAS HHHHHH
```

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                        .ENDR
                .TITLE  CZPLBC0 PCL11 STND ALN V02C
                        .SBTTL SYMBOLIC DEFINITIONS
                        .NLIST  TTM                     ;****THESE ADDED FOR SAFETY***
                        .LIST   ME                      ;******************************

                ;INTERNAL DEFINITIONS:

177776          PS      =       177776
177570          HWSWR   =       177570
032406          SSWR    =       SWREG

                ;REGISTER DEFINITIONS

000000          R0      =       %0
000001          R1      =       %1
000002          R2      =       %2
000003          R3      =       %3
000004          R4      =       %4
000005          R5      =       %5
000006          SP      =       %6
000007          PC      =       %7

                ;BUS REQUEST DEFINITIONS:

000340          P7      =       340
000300          P6      =       300
000240          P5      =       240
000200          P4      =       200
000140          P3      =       140
000100          P2      =       100
000040          P1      =       40

                ;BIT DEFINITIONS:

100000          B15     =       100000
040000          B14     =       40000
020000          B13     =       20000
010000          B12     =       10000
004000          B11     =       4000
002000          B10     =       2000
001000          B09     =       1000
000400          B08     =       400
000200          B07     =       200
000100          B06     =       100
000040          B05     =       40
000020          B04     =       20
000010          B03     =       10
000004          B02     =       4
000002          B01     =       2
000001          B00     =       1

                ;OTHER DEFINITIONS:

002000          ISP     =       BEGIN                   ;INITIAL STACK POINTER
```

```
                        .SBTTL MACRO DEFINITIONS

                        ;BOARD INITIALIZE MACRO

                                .MACRO  BDINIT  DEV
                                .NLIST
                        .IF     IDN     <DEV>,<XMTR>
                                BIS     #B01,@TCR
                        .IFF
                            .IF IDN     <DEV>,<RCVR>
                                BIS     #B01,@RCR
                            .IFF
                                .ERROR          ;BAD ARGUMENT FOR BDINIT
                            .ENDC
                        .ENDC
                                .LIST
                                .ENDM

000001                  N       =       1                       ;INITIAL ERROR NUMBER
                        ;ERROR MACROS

                                .MACRO  ERROR   P
                                                                ;******* ERROR P *******
                                BIT     #B14,@SR
                                BNE     .+14
                                MOV     #P,ERRNUM
                                JSR     PC,E.R
                        N       =       N+1
                                .ENDM

                                .MACRO  DATERR  P
                                                                ;******* ERROR P *******
                                BIT     #B14,@SR
                                BNE     .+14
                                MOV     #P,ERRNUM
                                JSR     PC,DERR
                        N       =       N+1
                                .ENDM

                                .MACRO  HLT
                                JSR     PC,SWHLT
                                .ENDM

                        ;PRINT MACRO (MSG ADDR IN R0)

                                .MACRO  PNTM    A
                                MOV     #A,R0           ;PRINT MESSAGE
                                JSR     PC,TYPOUT               ;POINTED TO BY A
                                .ENDM

                        ;SCOPE LOOP MACRO

                                .MACRO  SCOPE   X
                                JSR     R5,SCPRTN
                                X
                                .ENDM
```

```
                        ;INTER-PDP-11 COMPATABLE MOVE TO PS
                        ;TO RUN ON LSI-11: CHANGE THIS MACRO TO:
                        ;       MOV     SRC,-(SP)
                        ;       MOV     #LLL,-(SP)
                        ;       RTI
                        ;
                        ;LLL:

                                .MACRO  MTPS    SRC,?LLL
                                MOV     SRC,@#PS
                                .ENDM

                        ;REGISTER SAVE AND RESTORE MACRO'S


                                .MACRO  REGSAV
                                JSR     R5,REGSAV
                                .ENDM

                                .MACRO  REGRES
                                JSR     R5,REGRES
                                .ENDM
```

```
                                .SBTTL TRAP CATCHERS
                                .ENABLE ABS
                        000000  .       =       0
000000  000002                  .WORD   .+2
000002  000000                  .WORD   0
000004  004476                  .WORD   ERRTRP                  ;TRAP BAD DEVICE ADDRESSES
000006  000340                  .WORD   340
        000176                  .REPT   126.
                                .WORD   .+2
                                .WORD   0
                                .ENDR
(1)     000010  000012          .WORD   .+2
(1)     000012  000000          .WORD   0
(1)     000014  000016          .WORD   .+2
(1)     000016  000000          .WORD   0
(1)     000020  000022          .WORD   .+2
(1)     000022  000000          .WORD   0
(1)     000024  000026          .WORD   .+2
(1)     000026  000000          .WORD   0
(1)     000030  000032          .WORD   .+2
(1)     000032  000000          .WORD   0
(1)     000034  000036          .WORD   .+2
(1)     000036  000000          .WORD   0
(1)     000040  000042          .WORD   .+2
(1)     000042  000000          .WORD   0
(1)     000044  000046          .WORD   .+2
(1)     000046  000000          .WORD   0
(1)     000050  000052          .WORD   .+2
(1)     000052  000000          .WORD   0
(1)     000054  000056          .WORD   .+2
(1)     000056  000000          WORD    0
(1)     000060  000062          .WORD   .+2
(1)     000062  000000          .WORD   0
(1)     000064  000066          .WORD   .+2
(1)     000066  000000          .WORD   0
(1)     000070  000072          .WORD   .+2
(1)     000072  000000          .WORD   0
(1)     000074  000076          .WORD   .+2
(1)     000076  000000          .WORD   0
(1)     000100  000102          .WORD   .+2
(1)     000102  000000          .WORD   0
(1)     000104  000106          .WORD   .+2
(1)     000106  000000          .WORD   0
(1)     000110  000112          .WORD   .+2
(1)     000112  000000          .WORD   0
(1)     000114  000116          .WORD   .+2
(1)     000116  000000          .WORD   0
(1)     000120  000122          .WORD   .+2
(1)     000122  000000          .WORD   0
(1)     000124  000126          .WORD   .+2
(1)     000126  000000          .WORD   0
(1)     000130  000132          .WORD   .+2
(1)     000132  000000          .WORD   0
(1)     000134  000136          .WORD   .+2
(1)     000136  000000          .WORD   0
(1)     000140  000142          .WORD   .+2
```

```
(1)  000142  000000                .WORD   0
(1)  000144  000146                .WORD   .+2
(1)  000146  000000                .WORD   0
(1)  000150  000152                .WORD   .+2
(1)  000152  000000                .WORD   0
(1)  000154  000156                .WORD   .+2
(1)  000156  000000                .WORD   0
(1)  000160  000162                .WORD   .+2
(1)  000162  000000                .WORD   0
(1)  000164  000166                .WORD   .+2
(1)  000166  000000                .WORD   0
(1)  000170  000172                .WORD   .+2
(1)  000172  000000                .WORD   0
(1)  000174  000176                .WORD   .+2
(1)  000176  000000                .WORD   0
(1)  000200  000202                .WORD   .+2
(1)  000202  000000                .WORD   0
(1)  000204  000206                .WORD   .+2
(1)  000206  000000                .WORD   0
(1)  000210  000212                .WORD   .+2
(1)  000212  000000                .WORD   0
(1)  000214  000216                .WORD   .+2
(1)  000216  000000                .WORD   0
(1)  000220  000222                .WORD   .+2
(1)  000222  000000                .WORD   0
(1)  000224  000226                .WORD   .+2
(1)  000226  000000                .WORD   0
(1)  000230  000232                .WORD   .+2
(1)  000232  000000                .WORD   0
(1)  000234  000236                .WORD   .+2
(1)  000236  000000                .WORD   0
(1)  000240  000242                .WORD   .+2
(1)  000242  000000                .WORD   0
(1)  000244  000246                .WORD   .+2
(1)  000246  000000                .WORD   0
(1)  000250  000252                .WORD   .+2
(1)  000252  000000                .WORD   0
(1)  000254  000256                .WORD   .+2
(1)  000256  000000                .WORD   0
(1)  000260  000262                .WORD   .+2
(1)  000262  000000                .WORD   0
(1)  000264  000266                .WORD   .+2
(1)  000266  000000                .WORD   0
(1)  000270  000272                .WORD   .+2
(1)  000272  000000                .WORD   0
(1)  000274  000276                .WORD   .+2
(1)  000276  000000                .WORD   0
(1)  000300  000302                .WORD   .+2
(1)  000302  000000                .WORD   0
(1)  000304  000306                .WORD   .+2
(1)  000306  000000                .WORD   0
(1)  000310  000312                .WORD   .+2
(1)  000312  000000                .WORD   0
(1)  000314  000316                .WORD   .+2
(1)  000316  000000                .WORD   0
(1)  000320  000322                .WORD   .+2
```

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(1)  000322  000000                    .WORD   0
(1)  000324  000326                    .WORD   .+2
(1)  000326  000000                    .WORD   0
(1)  000330  000332                    .WORD   .+2
(1)  000332  000000                    .WORD   0
(1)  000334  000336                    .WORD   .+2
(1)  000336  000000                    .WORD   0
(1)  000340  000342                    .WORD   .+2
(1)  000342  000000                    .WORD   0
(1)  000344  000346                    .WORD   .+2
(1)  000346  000000                    .WORD   0
(1)  000350  000352                    .WORD   .+2
(1)  000352  000000                    .WORD   0
(1)  000354  000356                    .WORD   .+2
(1)  000356  000000                    .WORD   0
(1)  000360  000362                    .WORD   .+2
(1)  000362  000000                    .WORD   0
(1)  000364  000366                    .WORD   .+2
(1)  000366  000000                    .WORD   0
(1)  000370  000372                    .WORD   .+2
(1)  000372  000000                    .WORD   0
(1)  000374  000376                    .WORD   .+2
(1)  000376  000000                    .WORD   0
(1)  000400  000402                    .WORD   .+2
(1)  000402  000000                    .WORD   0
(1)  000404  000406                    .WORD   .+2
(1)  000406  000000                    .WORD   0
(1)  000410  000412                    .WORD   .+2
(1)  000412  000000                    .WORD   0
(1)  000414  000416                    .WORD   .+2
(1)  000416  000000                    .WORD   0
(1)  000420  000422                    .WORD   .+2
(1)  000422  000000                    .WORD   0
(1)  000424  000426                    .WORD   .+2
(1)  000426  000000                    .WORD   0
(1)  000430  000432                    .WORD   .+2
(1)  000432  000000                    .WORD   0
(1)  000434  000436                    .WORD   .+2
(1)  000436  000000                    .WORD   0
(1)  000440  000442                    .WORD   .+2
(1)  000442  000000                    .WORD   0
(1)  000444  000446                    .WORD   .+2
(1)  000446  000000                    .WORD   0
(1)  000450  000452                    .WORD   .+2
(1)  000452  000000                    .WORD   0
(1)  000454  000456                    .WORD   .+2
(1)  000456  000000                    .WORD   0
(1)  000460  000462                    .WORD   .+2
(1)  000462  000000                    .WORD   0
(1)  000464  000466                    .WORD   .+2
(1)  000466  000000                    .WORD   0
(1)  000470  000472                    .WORD   .+2
(1)  000472  000000                    .WORD   0
(1)  000474  000476                    .WORD   .+2
(1)  000476  000000                    .WORD   0
(1)  000500  000502                    .WORD   .+2
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(1)  000502  000000                    .WORD   0
(1)  000504  000506                    .WORD   .+2
(1)  000506  000000                    .WORD   0
(1)  000510  000512                    .WORD   .+2
(1)  000512  000000                    .WORD   0
(1)  000514  000516                    .WORD   .+2
(1)  000516  000000                    .WORD   0
(1)  000520  000522                    .WORD   .+2
(1)  000522  000000                    .WORD   0
(1)  000524  000526                    .WORD   .+2
(1)  000526  000000                    .WORD   0
(1)  000530  000532                    .WORD   .+2
(1)  000532  000000                    .WORD   0
(1)  000534  000536                    .WORD   .+2
(1)  000536  000000                    .WORD   0
(1)  000540  000542                    .WORD   .+2
(1)  000542  000000                    .WORD   0
(1)  000544  000546                    .WORD   .+2
(1)  000546  000000                    .WORD   0
(1)  000550  000552                    .WORD   .+2
(1)  000552  000000                    .WORD   0
(1)  000554  000556                    .WORD   .+2
(1)  000556  000000                    .WORD   0
(1)  000560  000562                    .WORD   .+2
(1)  000562  000000                    .WORD   0
(1)  000564  000566                    .WORD   .+2
(1)  000566  000000                    .WORD   0
(1)  000570  000572                    .WORD   .+2
(1)  000572  000000                    .WORD   0
(1)  000574  000576                    .WORD   .+2
(1)  000576  000000                    .WORD   0
(1)  000600  000602                    .WORD   .+2
(1)  000602  000000                    .WORD   0
(1)  000604  000606                    .WORD   .+2
(1)  000606  000000                    .WORD   0
(1)  000610  000612                    .WORD   .+2
(1)  000612  000000                    .WORD   0
(1)  000614  000616                    .WORD   .+2
(1)  000616  000000                    .WORD   0
(1)  000620  000622                    .WORD   .+2
(1)  000622  000000                    .WORD   0
(1)  000624  000626                    .WORD   .+2
(1)  000626  000000                    .WORD   0
(1)  000630  000632                    .WORD   .+2
(1)  000632  000000                    .WORD   0
(1)  000634  000636                    .WORD   .+2
(1)  000636  000000                    .WORD   0
(1)  000640  000642                    .WORD   .+2
(1)  000642  000000                    .WORD   0
(1)  000644  000646                    .WORD   .+2
(1)  000646  000000                    .WORD   0
(1)  000650  000652                    .WORD   .+2
(1)  000652  000000                    .WORD   0
(1)  000654  000656                    .WORD   .+2
(1)  000656  000000                    .WORD   0
(1)  000660  000662                    .WORD   .+2
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(1)  000662  000000                    .WORD   0
(1)  000664  000666                    .WORD   .+2
(1)  000666  000000                    .WORD   0
(1)  000670  000672                    .WORD   .+2
(1)  000672  000000                    .WORD   0
(1)  000674  000676                    .WORD   .+2
(1)  000676  000000                    .WORD   0
(1)  000700  000702                    .WORD   .+2
(1)  000702  000000                    .WORD   0
(1)  000704  000706                    .WORD   .+2
(1)  000706  000000                    .WORD   0
(1)  000710  000712                    .WORD   .+2
(1)  000712  000000                    .WORD   0
(1)  000714  000716                    .WORD   .+2
(1)  000716  000000                    .WORD   0
(1)  000720  000722                    .WORD   .+2
(1)  000722  000000                    .WORD   0
(1)  000724  000726                    .WORD   .+2
(1)  000726  000000                    .WORD   0
(1)  000730  000732                    .WORD   .+2
(1)  000732  000000                    .WORD   0
(1)  000734  000736                    .WORD   .+2
(1)  000736  000000                    .WORD   0
(1)  000740  000742                    .WORD   .+2
(1)  000742  000000                    .WORD   0
(1)  000744  000746                    .WORD   .+2
(1)  000746  000000                    .WORD   0
(1)  000750  000752                    .WORD   .+2
(1)  000752  000000                    .WORD   0
(1)  000754  000756                    .WORD   .+2
(1)  000756  000000                    .WORD   0
(1)  000760  000762                    .WORD   .+2
(1)  000762  000000                    .WORD   0
(1)  000764  000766                    .WORD   .+2
(1)  000766  000000                    .WORD   0
(1)  000770  000772                    .WORD   .+2
(1)  000772  000000                    .WORD   0
(1)  000774  000776                    .WORD   .+2
(1)  000776  000000                    .WORD   0
```

```
                                        .SBTTL TEST SUPERVISOR

        000200                  .       =       200

000200  000167  001574                  JMP     BEGIN                   ;TEST STARTS AT 200
000204  012706  002000                  MOV     #ISP,SP
000210                                  MTPS    #P7
000210  012737  000340  177776          MOV     #P7,@#PS
000216  000005                          RESET
000220  000167  002646                  JMP     RESTRT
000224  012706  002000                  MOV     #ISP,SP
000230                                  MTPS    #P7
000230  012737  000340  177776          MOV     #P7,@#PS
000236  000167  003104                  JMP     BCONT                   ;GO TO TEST SELECT

        002000                  .       =       2000

002000  000005                  BEGIN:  RESET                           ;CLEAR ALL
002002  012706  002000                  MOV     #ISP,SP                 ;SET UP STACK
002006                                  MTPS    #P7                     ;DISABLE C.P. INTERRUPT
002006  012737  000340  177776          MOV     #P7,@#PS
002014  005067  034032                  CLR     SWRFLG                  ;CLEAR SWR FLAG
002020  012737  004210  000004          MOV     #SRTST,@#4              ;SET UP TO TRAP IF NO HSWR
002026  012737  000340  000006          MOV     #P7,@#6
002034  012767  177570  030346          MOV     #HWSWR,SR               ;SET SR TO HDWARE SW REG
002042  005777  030342                  TST     @SR                     ;SEE IF IT'S THERE
002046                                  PNTM    TSTHDR                  ;PRINT TEST HEADER
002046  012700  035447                  MOV     #TSTHDR,R0              ;PRINT MESSAGE
002052  004767  030572                  JSR     PC,TYPOUT               ;POINTED TO BY TSTHDR
002056                          PROMT:  PNTM    TMTR                    ;PRINT ''TRANSMITTER''
002056  012700  035065                  MOV     #TMTR,R0                ;PRINT MESSAGE
002062  004767  030562                  JSR     PC,TYPOUT               ;POINTED TO BY TMTR
002066                                  PNTM    FRAD                    ;PRINT ''1ST BUS ADDR''
002066  012700  035103                  MOV     #FRAD,R0                ;PRINT MESSAGE
002072  004767  030552                  JSR     PC,TYPOUT               ;POINTED TO BY FRAD
002076  016700  034104                  MOV     TXMADR,R0               ;PRINT DEFAULT ADDR
002102  004767  031060                  JSR     PC,OCTPNT
002106                                  PNTM    TWOSP
002106  012700  032401                  MOV     #TWOSP,R0               ;PRINT MESSAGE
002112  004767  030532                  JSR     PC,TYPOUT               ;POINTED TO BY TWOSP
002116  016767  034064  031040          MOV     TXMADR,KBBUF            ;LOAD DEFAULT ADDR
002124  004767  030562                  JSR     PC,INPKB                ;GET KBD INPUT
002130  016767  031030  034050          MOV     KBBUF,TXMADR            ;REPLACE XMTR ADDR
002136  026727  034044  164000          CMP     TXMADR,#164000          ;IS IT WITHIN LIMITS?
002144  103006                          BHIS    PRMT1                   ;YES, CARRY ON
002146                                  PNTM    TOOLOW                  ;NO ERROR, ASK AGAIN
002146  012700  035125                  MOV     #TOOLOW,R0              ;PRINT MESSAGE
002152  004767  030472                  JSR     PC,TYPOUT               ;POINTED TO BY TOOLOW
002156  000167  177674                  JMP     PROMT
002162  012737  004456  000004  PRMT1:  MOV     #DVATST,@#4
002170  005777  034012                  TST     @TXMADR                 ;IS IT A GOOD ADDRESS?
002174                          PRMT2:  PNTM    RECVR                   ;PRINT ''RECEIVER''
002174  012700  035074                  MOV     #RECVR,R0               ;PRINT MESSAGE
002200  004767  030444                  JSR     PC,TYPOUT               ;POINTED TO BY RECVR
002204                                  PNTM    FRAD                    ;PRINT 1ST UNIBUS ADDR''
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(1)  002204  012700  035103                MOV     #FRAD,R0                ;PRINT MESSAGE
(1)  002210  004767  030434                JSR     PC,TYPOUT               ;POINTED TO BY FRAD
604  002214  016700  033770                MOV     RCVADR,R0               ;PRINT DEFAULT ADDRESS
605  002220  004767  030742                JSR     PC,OCTPNT
606  002224                                PNTM    TWOSP
(1)  002224  012700  032401                MOV     #TWOSP,R0               ;PRINT MESSAGE
(1)  002230  004767  030414                JSR     PC,TYPOUT               ;POINTED TO BY TWOSP
607  002234  016767  033750  030722        MOV     RCVADR,KBBUF            ;LOAD DEFAULT ADDRESS
608  002242  004767  030444                JSR     PC,INPKB                ;GET KBD INPUT
609  002246  016767  030712  033734        MOV     KBBUF,RCVADR            ;LOAD NEW ADDRESS
610  002254  026727  033730  164000        CMP     RCVADR,#164000          ;IS IT WITHIN LIMITS?
611  002262  103006                        BHIS    PRMT3                   ;YES, CARRY ON
612  002264                                PNTM    TOOLOW
(1)  002264  012700  035125                MOV     #TOOLOW,R0              ;PRINT MESSAGE
(1)  002270  004767  030354                JSR     PC,TYPOUT               ;POINTED TO BY TOOLOW
613  002274  000167  177674                JMP     PRMT2
614  002300  005777  033704        PRMT3:  TST     @RCVADR                 ;IS IT A GOOD ADDRESS?
615  002304  012737  004476  000004        MOV     #ERRTRP,@#4             ;SET UP FOR FURTHER TRAPS
616  002312                        PRMT4:  PNTM    TMTR                    ;PRINT 'TRANSMITTER'
(1)  002312  012700  035065                MOV     #TMTR,R0                ;PRINT MESSAGE
(1)  002316  004767  030326                JSR     PC,TYPOUT               ;POINTED TO BY TMTR
617  002322                                PNTM    VCTR                    ;PRINT 'VECTOR IS'
(1)  002322  012700  035245                MOV     #VCTR,R0                ;PRINT MESSAGE
(1)  002326  004767  030316                JSR     PC,TYPOUT               ;POINTED TO BY VCTR
618  002332  016700  033644                MOV     TXMVEC,R0               ;PRINT DEFAULT VECTOR
619  002336  004767  030624                JSR     PC,OCTPNT
620  002342                                PNTM    TWOSP
(1)  002342  012700  032401                MOV     #TWOSP,R0               ;PRINT MESSAGE
(1)  002346  004767  030276                JSR     PC,TYPOUT               ;POINTED TO BY TWOSP
621  002352  016767  033624  030604        MOV     TXMVEC,KBBUF            ;LOAD DEFAULT VECTOR
622  002360  004767  030326                JSR     PC,INPKB                ;GET KBD INPUT
623  002364  016767  030574  033610        MOV     KBBUF,TXMVEC            ;REPLACE XMTR VECTOR
624  002372  026727  030566  000776        CMP     KBBUF,#776              ;IS IT WITHIN LIMITS?
625  002400  101406                        BLOS    PRMT5
626  002402                                PNTM    AGAIN                   ;NO, TELL HIM
(1)  002402  012700  035211                MOV     #AGAIN,R0               ;PRINT MESSAGE
(1)  002406  004767  030236                JSR     PC,TYPOUT               ;POINTED TO BY AGAIN
627  002412  000167  177674                JMP     PRMT4
628  002416                        PRMT5:  PNTM    RECVR                   ;PRINT 'RECEIVER'
(1)  002416  012700  035074                MOV     #RECVR,R0               ;PRINT MESSAGE
(1)  002422  004767  030222                JSR     PC,TYPOUT               ;POINTED TO BY RECVR
629  002426                                PNTM    VCTR                    ;PRINT 'VECTOR IS'
(1)  002426  012700  035245                MOV     #VCTR,R0                ;PRINT MESSAGE
(1)  002432  004767  030212                JSR     PC,TYPOUT               ;POINTED TO BY VCTR
630  002436  016700  033542                MOV     RCVVEC,R0               ;PRINT DEFAULT VECTOR
631  002442  004767  030520                JSR     PC,OCTPNT
632  002446                                PNTM    TWOSP
(1)  002446  012700  032401                MOV     #TWOSP,R0               ;PRINT MESSAGE
(1)  002452  004767  030172                JSR     PC,TYPOUT               ;POINTED TO BY TWOSP
633  002456  016767  033522  030500        MOV     RCVVEC,KBBUF            ;LOAD DEFAULT VECTOR
634  002464  004767  030222                JSR     PC,INPKB                ;GET KEYBOARD INPUT
635  002470  016767  030470  033506        MOV     KBBUF,RCVVEC            ;LOAD NEW VECTOR
636  002476  026727  030462  000776        CMP     KBBUF,#776              ;IS IT WITHIN LIMITS
637  002504  101406                        BLOS    PRMT6
638  002506                                PNTM    AGAIN
(1)  002506  012700  035211                MOV     #AGAIN,R0               ;PRINT MESSAGE
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(1)  002512  004767  030132                  JSR     PC,TYPOUT               ;POINTED TO BY AGAIN
639  002516  000167  177674                  JMP     PRMT5
640  002522                          PRMT6:  PNTM    TMTR                    ;PRINT 'TRANSMITTER'
(1)  002522  012700  035065                  MOV     #TMTR,R0                ;PRINT MESSAGE
(1)  002526  004767  030116                  JSR     PC,TYPOUT               ;POINTED TO BY TMTR
641  002532                                  PNTM    PRIOTY                  ;PRINT 'PRIORITY LEVEL IS'
(1)  002532  012700  035256                  MOV     #PRIOTY,R0              ;PRINT MESSAGE
(1)  002536  004767  030106                  JSR     PC,TYPOUT               ;POINTED TO BY PRIOTY
642  002542  016700  033350                  MOV     FKPRI0,R0               ;PRINT DEFAULT PRIORITY
643  002546  004767  030414                  JSR     PC,OCTPNT
644  002552                                  PNTM    TWOSP
(1)  002552  012700  032401                  MOV     #TWOSP,R0               ;PRINT MESSAGE
(1)  002556  004767  030066                  JSR     PC,TYPOUT               ;POINTED TO BY TWOSP
645  002562  016767  033330  030374          MOV     FKPRI0,KBBUF            ;LOAD DEFAULT PRIORITY
646  002570  004767  030116                  JSR     PC,INPKB                ;GET KBD INPUT
647  002574  026727  030364  000007          CMP     KBBUF,#7                ;IS IT WITHIN LIMITS
648  002602  003406                          BLE     PRMT7                   ;LOW ENOUGH, O.K.
649  002604                                  PNTM    AGAIN
(1)  002604  012700  035211                  MOV     #AGAIN,R0               ;PRINT MESSAGE
(1)  002610  004767  030034                  JSR     PC,TYPOUT               ;POINTED TO BY AGAIN
650  002614  000167  177702                  JMP     PRMT6
651  002620  026727  030340  000004  PRMT7:  CMP     KBBUF,#4                ;HIGH ENOUGH?
652  002626  002006                          BGE     PRMT8
653  002630                                  PNTM    AGAIN
(1)  002630  012700  035211                  MOV     #AGAIN,R0               ;PRINT MESSAGE
(1)  002634  004767  030010                  JSR     PC,TYPOUT               ;POINTED TO BY AGAIN
654  002640  000167  177656                  JMP     PRMT6
655  002644  016767  030314  033244  PRMT8:  MOV     KBBUF,FKPRI0
656  002652  006367  030306                  ASL     KBBUF
657  002656  006367  030302                  ASL     KBBUF
658  002662  006367  030276                  ASL     KBBUF
659  002666  006367  030272                  ASL     KBBUF
660  002672  006367  030266                  ASL     KBBUF                   ;SHIFT INTO PLACE
661  002676  016767  030262  033222          MOV     KBBUF,XPRIO             ;LOAD NEW PRIORITY.
662  002704                          PRMT9:  PNTM    RECVR                   ;PRINT 'RECEIVER
(1)  002704  012700  035074                  MOV     #RECVR,R0               ;PRINT MESSAGE
(1)  002710  004767  027734                  JSR     PC,TYPOUT               ;POINTED TO BY RECVR
663  002714                                  PNTM    PRIOTY                  ;PRINT 'PRIORITY LEVEL IS '
(1)  002714  012700  035256                  MOV     #PRIOTY,R0              ;PRINT MESSAGE
(1)  002720  004767  027724                  JSR     PC,TYPOUT               ;POINTED TO BY PRIOTY
664  002724  016700  033170                  MOV     FKPRI1,R0               ;PRINT DEFAULT PRIORITY
665  002730  004767  030232                  JSR     PC,OCTPNT
666  002734                                  PNTM    TWOSP
(1)  002734  012700  032401                  MOV     #TWOSP,R0               ;PRINT MESSAGE
(1)  00274C  004767  027704                  JSR     PC,TYPOUT               ;POINTED TO BY TWOSP
667  002744  016767  033150  030212          MOV     FKPRI1,KBBUF            ;LOAD DEFAULT PRIORITY
668  002752  004767  027734                  JSR     PC,INPKB                ;GET KBD INPUT
669  002756  026727  030202  000007          CMP     KBBUF,#7                ;LOW ENOUGH, O.K.
670  002764  003406                          BLE     3$
671  002766                                  PNTM    AGAIN
(1)  002766  012700  035211                  MOV     #AGAIN,R0               ;PRINT MESSAGE
(1)  002772  004767  027652                  JSR     PC,TYPOUT               ;POINTED TO BY AGAIN
672  002776  000167  177702                  JMP     PRMT9
673  003002  026727  030156  000004  3$:     CMP     KBBUF,#4                ;HIGH ENOUGH?
674  003010  002006                          BGE     4$
675  003012                                  PNTM    AGAIN
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 (1)  003012  012700  035211                     MOV     #AGAIN,R0               ;PRINT MESSAGE
 (1)  003016  004767  027626                     JSR     PC,TYPOUT               ;POINTED TO BY AGAIN
      003022  000167  177656                     JMP     PRMT9
      003026  016767  030132  033064  4$:        MOV     KBBUF,FKPRI1
      003034  006367  030124                     ASL     KBBUF
      003040  006367  030120                     ASL     KBBUF
      003044  006367  030114                     ASL     KBBUF
      003050  006367  030110                     ASL     KBBUF
      003054  006367  030104                     ASL     KBBUF                   ;SHIFT INTO PLACE
      003060  016767  030100  033042             MOV     KBBUF,RPRIO             ;LOAD NEW PRIORITY
      003066  004767  001172                     JSR     PC,DEVGEN               ;GENERATE PCL-11 ADDRESSES
      003072                          RESTRT:    PNTM    TMTR                    ;PRINT 'TRANSMITTER'
 (1)  003072  012700  035065                     MOV     #TMTR,R0                ;PRINT MESSAGE
 (1)  003076  004767  027546                     JSR     PC,TYPOUT               ;POINTED TO BY TMTR
      003102                                     PNTM    TDMAD                   ;PRINT 'TDM BUS ADDRESS'
 (1)  003102  012700  035300                     MOV     #TDMAD,R0               ;PRINT MESSAGE
 (1)  003106  004767  027536                     JSR     PC,TYPOUT               ;POINTED TO BY TDMAD
      003112  012700  000001                     MOV     #1,R0                   ;PRINT '1' AS DEFAULT
      003116  004767  030044                     JSR     PC,OCTPNT
      003122                                     PNTM    TWOSP
 (1)  003122  012700  032401                     MOV     #TWOSP,R0               ;PRINT MESSAGE
 (1)  003126  004767  027516                     JSR     PC,TYPOUT               ;POINTED TO BY TWOSP
      003132  012767  000001  030024             MOV     #1,KBBUF                ;LOAD DEFAULT OF '1'
      003140  004767  027546                     JSR     PC,INPKB                ;GET KBD INPUT.
      003144  005767  030014                     TST     KBBUF                   ;DON'T ALLOW 0
      003150  001006                             BNE     ADOK
      003152                                     PNTM    AGAIN
 (1)  003152  012700  035211                     MOV     #AGAIN,R0               ;PRINT MESSAGE
 (1)  003156  004767  027466                     JSR     PC,TYPOUT               ;POINTED TO BY AGAIN
      003162  000167  177704                     JMP     RESTRT
      003166  026727  027772  000040  ADOK:      CMP     KBBUF,#40               ;CAN'T BE 40 OR HIGHER
      003174  103406                             BLO     ADGD
      003176                                     PNTM    AGAIN
 (1)  003176  012700  035211                     MOV     #AGAIN,R0               ;PRINT MESSAGE
 (1)  003202  004767  027442                     JSR     PC,TYPOUT               ;POINTED TO BY AGAIN
      003206  000167  177660                     JMP     RESTRT
      003212  116767  027746  032667  ADGD:      MOVB    KBBUF,TRAD+1            ;SAVE ADDR IN UPPER BYTE
      003220                          PRMT10:    PNTM    RECVR                   ;PRINT 'RECIEVER'
 (1)  003220  012700  035074                     MOV     #RECVR,R0               ;PRINT MESSAGE
 (1)  003224  004767  027420                     JSR     PC,TYPOUT               ;POINTED TO BY RECVR
      003230                                     PNTM    TDMAD                   ;PRINT 'TDM BUS ADDRESS'
 (1)  003230  012700  035300                     MOV     #TDMAD,R0               ;PRINT MESSAGE
 (1)  003234  004767  027410                     JSR     PC,TYPOUT               ;POINTED TO BY TDMAD
      003240  012700  000001                     MOV     #1,R0                   ;PRINT '1' AS DEFAULT
      003244  004767  027716                     JSR     PC,OCTPNT
      003250                                     PNTM    TWOSP
 (1)  003250  012700  032401                     MOV     #TWOSP,R0               ;PRINT MESSAGE
 (1)  003254  004767  027370                     JSR     PC,TYPOUT               ;POINTED TO BY TWOSP
      003260  012767  000001  027676             MOV     #1,KBBUF                ;LOAD DEFAULT OF 1
      003266  004767  027420                     JSR     PC,INPKB                ;GET KBD INPUT
      003272  005767  027666                     TST     KBBUF                   ;DON'T ALLOW 0
      003276  001006                             BNE     ADROK
      003300                                     PNTM    AGAIN
 (1)  003300  012700  035211                     MOV     #AGAIN,R0               ;PRINT MESSAGE
 (1)  003304  004767  027340                     JSR     PC,TYPOUT               ;POINTED TO BY AGAIN
      003310  000167  177704                     JMP     PRMT10
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  712  003314  026727  027644  000040  ADROK:  CMP     KBBUF,#40               ;CAN'T BE 40 OR HIGHER
  713  003322  103406                          BLO     ADRGD
  714  003324                                  PNTM    AGAIN
(1)    003324  012700  035211                  MOV     #AGAIN,R0               ;PRINT MESSAGE
(1)    003330  004767  027314                  JSR     PC,TYPOUT               ;POINTED TO BY AGAIN
  715  003334  000167  177660                  JMP     PRMT10
  716  003340  116767  027620  032537  ADRGD:  MOVB    KBBUF,RCAD+1            ;SAVE ADDR IN UPPER BYTE
  717  003346                          BCONT:  PNTM    TSTSEL                  ;PRINT "SELECT TEST <CR> = HELP"
(1)    003346  012700  035533                  MOV     #TSTSEL,R0              ;PRINT MESSAGE
(1)    003352  004767  027272                  JSR     PC,TYPOUT               ;POINTED TO BY TSTSEL
  718  003356  012767  000077  027600          MOV     #77,KBBUF               ;DEFAULT TO HELP
  719  003364  004767  027322                  JSR     PC,INPKB                ;GET KEYBOARD INPUT
  720  003370  026727  027570  000005          CMP     KBBUF,#5                ;DID HE TYPE 5 OR HIGHER?
  721  003376  103005                          BHIS    BHLPMG                  ;YES, GIVE ASSISTANCE.
  722  003400  005767  027560                  TST     KBBUF                   ;HOPE IT WASN'T '0'
  723  003404  001402                          BEQ     BHLPMG                  ;'CAUSE THAT'S NO GOOD EITHER
  724  003406  000167  000014                  JMP     TESTGO                  ;EVERYTHING OK. GO TO TESTS
  725  003412                          BHLPMG: PNTM    HLPMSG                  ;NO GOOD, PRINT HELP MESSAGE.
(1)    003412  012700  035570                  MOV     #HLPMSG,R0              ;PRINT MESSAGE
(1)    003416  004767  027226                  JSR     PC,TYPOUT               ;POINTED TO BY HLPMSG
  726  003422  000167  177720                  JMP     BCONT
  727
  728  003426  016767  027532  032444  TESTGO: MOV     KBBUF,TESTNO            ;SAVE TEST NUMBER
  729  003434  005767  032412                  TST     SWRFLG                  ;GOT ANY SWITCHES?
  730  003440  001402                          BEQ     1$                      ;YES, YOU'RE ON YOUR OWN
  731  003442  004767  026256                  JSR     PC,SWDMP                ;OTHERWISE, SHOW SW OPTIONS.
  732  003446  005067  032414          1$:     CLR     PSNO1                   ;CLEAR END PASS COUNTER
  733  003452  005067  032412                  CLR     PSNO2                   ;CLEAR END PASS A COUNTER
  734  003456  005067  032410                  CLR     PSNO3                   ;CLEAR END PASS B COUNTER
  735  003462  005067  032406                  CLR     PSNO4                   ;CLEAR END PASS C COUNTER
  736  003466  026727  032406  000001          CMP     TESTNO,#1               ;SELECT TEST 1?
  737  003474  001012                          BNE     2$                      ;NO.
  738  003476  005067  032400                  CLR     $4FLAG                  ;CLEAR END PASS INHIBIT FLAG
  739  003502                                  PNTM    TXHDR                   ;PRINT XMTR TEST HEADER
(1)    003502  012700  034671                  MOV     #TXHDR,R0               ;PRINT MESSAGE
(1)    003506  004767  027136                  JSR     PC,TYPOUT               ;POINTED TO BY TXHDR
  740  003512  004767  000220          11$:    JSR     PC,TEST1                ;YES, GO DO IT (LOOP)
  741  003516  000167  177770                  JMP     11$
  742  003522  026727  032352  000002  2$:     CMP     TESTNO,#2               ;SELECT TEST 2?
  743  003530  001012                          BNE     3$                      ;NO.
  744  003532  005067  032344                  CLR     $4FLAG                  ;CLEAR END PASS INHIBIT FLAG
  745  003536                                  PNTM    RCHDR                   ;PRINT RCVR TEST HEADER
(1)    003536  012700  034725                  MOV     #RCHDR,R0               ;PRINT MESSAGE
(1)    003542  004767  027102                  JSR     PC,TYPOUT               ;POINTED TO BY RCHDR
  746  003546  004767  011362          21$:    JSR     PC,TEST2                ;YES, GO DO IT (LOOP)
  747  003552  000167  177770                  JMP     21$
  748  003556  026727  032316  000003  3$:     CMP     TESTNO,#3               ;SELECT TEST 3?
  749  003564  001012                          BNE     4$                      ;NO.
  750  003566  005067  032310                  CLR     $4FLAG                  ;CLEAR END PASS INHIBIT FLAG
  751  003572                                  PNTM    XRHDR                   ;PRINT LOOP TEST HEADER
(1)    003572  012700  034756                  MOV     #XRHDR,R0               ;PRINT MESSAGE
(1)    003576  004767  027046                  JSR     PC,TYPOUT               ;POINTED TO BY XRHDR
  752  003602  004767  017246          31$:    JSR     PC,TEST3                ;YES, GO DO IT.
  753  003606  000167  177770                  JMP     31$
  754  003612  026727  032262  000004  4$:     CMP     TESTNO,#4               ;SELECT TEST 4?
  755  003620  001044                          BNE     5$                      ;NO?????
```

```
 756  003622  012767  177777  032252          MOV     #-1,$4FLAG              ;SET FLAG TO INHIBIT END PASS
 757  003630                                  PNTM    ALTHDR                  ;PRINT TRIPLE TEST HEADER
(1)   003630  012700  035025                  MOV     #ALTHDR,R0              ;PRINT MESSAGE
(1)   003634  004767  027010                  JSR     PC,TYPOUT               ;POINTED TO BY ALTHDR
 758  003640  004767  000072          41$:    JSR     PC,TEST1
 759  003644  004767  011264                  JSR     PC,TEST2
 760  003650  004767  017200                  JSR     PC,TEST3                ;DO ALL TESTS (LOOP)
 761  003654  005267  032214                  INC     PSNO4                   ;UPDATE PASS COUNTER
 762  003660                                  PNTM    PEND                    ;PRINT END PASS #
(1)   003660  012700  034443                  MOV     #PEND,R0                ;PRINT MESSAGE
(1)   003664  004767  026760                  JSR     PC,TYPOUT               ;POINTED TO BY PEND
 763  003670  016700  032200                  MOV     PSNO4,R0                ;GET PASS # TO R0
 764  003674  004767  027372                  JSR     PC,DECPNT               ;PRINT IT IN DECIMAL
 765  003700  012700  000040                  MOV     #40,R0                  ;ALSO, PRINT ''C''
 766  003704  004767  027562                  JSR     PC,TTO
 767  003710  012700  000103                  MOV     #'C,R0                  ;TO IDENTIFY END PASS OF
 768  003714  004767  027552                  JSR     PC,TTO                  ;TEST 4
 769  003720  005000                          CLR     R0
 770  003722  004767  027544                  JSR     PC,TTO                  ;NULLS TO ALLOW PASS #
 771  003726  004767  027540                  JSR     PC,TTO
 772  003732  000167  177702          5$:     JMP     41$
```

```
                        .SBTTL  TRANSMITTER TESTS

                        ;TEST 1: TRANSMITTER LOGIC TESTS
                        ;  (00) RESET TEST
                        ;  (01) TCR REG. TEST
                        ;  (02) TSBC REG TEST
                        ;  (03) TSBA REG TEST
                        ;  (04) MASTER SECT. TEST
                        ;  (05) DATA SILO TEST
                        ;  (06) TSR REG. & ERRORS TEST
                        ;  (07) INTERRUPT TEST
                        ;  (10) C.R.C. TEST

003736                  TEST1:  MTPS    #P7
(1) 003736  012737  000340  177776      MOV     #P7,@#PS
789 003744  012767  000010  032104      MOV     #10,ITER        ;INITIAL ITERATION OF 10 PER PASS
790 003752  004767  025714              JSR     PC,MONIT        ;CHECK FOR KBD INPUT
791 003756  032777  002000  026424      BIT     #B10,@SR                ;CHECK SW 10
792 003764  001424                      BEQ     LOOP            ;IF 0, RUN SEQUENTIALLY
793 003766  017767  026416  032064      MOV     @SR,SWI         ;IF SET, GET TEST # FROM SWR
794 003774  042767  177760  032056      BIC     #-20,SWI        ;MASK LOW DIGIT
795 004002  026727  032052  000010      CMP     SWI,#10         ;DON'T ALLOW SW = >10
796 004010  003012                      BGT     LOOP            ;IF GREATER, START 1'ST TEST
797 004012  000241                      CLC                     ;CLEAR "C" BIT BEFORE ROTATE
798 004014  006167  032040              ROL     SWI
799 004020  006167  032034              ROL     SWI             ;MULTIPLY BY 4
800 004024  062767  004036  032026      ADD     #LOOP,SWI       ;GENERATE OFFSET
801 004032  000177  032022              JMP     @SWI            ;GO TO SELECTED TEST
802 004036  004767  000602      LOOP:   JSR     PC,XINIT                ;DO INITIAL CLR TEST
803 004042  004767  001230              JSR     PC,TCRTST       ;DO TCR REG TEST
804 004046  004767  002012              JSR     PC,BCTST        ;DO BYTE COUNT REG TST
805 004052  004767  002170              JSR     PC,BATST        ;DO BYTE ADDR REG TEST
806 004056  004767  002346              JSR     PC,MSRTST       ;DO MASTER SECTION TEST
807 004062  004767  004360              JSR     PC,SILTST       ;DO DATA SILO TEST
808 004066  004767  006026              JSR     PC,TSRTST       ;DO TSR REG & ERRORS TEST
809 004072  004767  010064              JSR     PC,INTST        ;DO INTERRUPT TEST
810 004076  004767  010544              JSR     PC,CRCTST       ;DO CRC GENERATION TEST
811 004102  032777  004000  026300      BIT     #B11,@SR        ;CHECK SWITCH 11
812 004110  001003                      BNE     XEND            ;PRINT END IF SET
813 004112  005367  031740              DEC     ITER            ;OTHERWISE, REITERATE
814 004116  001347                      BNE     LOOP
815 004120  005767  031756      XEND:   TST     $4FLAG          ;SHOULD WE PRINT END PASS?
816 004124  001020                      BNE     REPEAT          ;NO, LEAVE
817 004126  005267  031734              INC     PSNO1           ;UPDATE PASS NUMBER
818 004132                              PNTM    PEND            ;PRINT "END PASS # "
(1) 004132  012700  034443              MOV     #PEND,R0        ;PRINT MESSAGE
(1) 004136  004767  026506              JSR     PC,TYPOUT       ;POINTED TO BY PEND
819 004142  016700  031720              MOV     PSNO1,R0
820 004146  004767  027120              JSR     PC,DECPNT       ;PRINT PASSNO.
821 004152  005000                      CLR     R0
822 004154  004767  027312              JSR     PC,TTO          ;PRINT NULLS TO ALLOW TIME
823 004160  005000                      CLR     R0              ;FOR PASS # TO BE PRINTED
824 004162  004767  027304              JSR     PC,TTO
825 004166  000207      REPEAT: RTS     PC                      ;RETURN TO SUPERVISOR
826
```

```
                                        ;NON-SWR PROCESSOR HALT SUBROUTINE
                                        
004170  005767  031656          SWHLT:  TST     SWRFLG                  ;ANY HARDWARE SWR?
004174  001403                          BEQ     1$                      ;IF YES GO HALT
004176  004767  025522                  JSR     PC,SWDMP                ;IF NOT GO GET SW LOC
004202  000207                          RTS     PC
004204  000000                  1$:     HALT
004206  000207                          RTS     PC                      ;RETURN IF CONT KEY HIT
                                        
004210  012767  032406  026172  SRTST:  MOV     #SSWR,SR                ;NO HDWARE SWR, USE MEM LOC
004216  012767  177777  031626          MOV     #-1,SWRFLG              ;SET SOFT SWR FLAG
004224  000002                          RTI                             ;RETURN
                                        
                                        ;THIS ROUTINE ENTERED FOR SCOPE ROUTINES
                                        
004226  004767  025440          SCPRTN: JSR     PC,MONIT                ;SEE IF ^S WAS TYPED
004232  005777  026152                  TST     @SR                     ;BIT 15 SET?
004236  100402                          BMI     SBAK                    ;YES, DON'T HALT
004240                                  HLT                             ;COMMON ERROR HALT. EXAMINE
(1) 004240  004767  177724              JSR     PC,SWHLT
                                                                        ;R5 FOR PC OF ERROR
004244  012500          SBAK:   MOV     (R5)+,R0                        ;GET DIRECTION FOR SCOPE LOOP
004246  032777  020000  026134          BIT     #B13,@SR                ;SW 13 SET?
004254  001402                          BEQ     SCONT                   ;NO, DON'T LOOP
004256  012605                          MOV     (SP)+,R5                ;YES, RESTORE R5
004260  000110                          JMP     (R0)                    ;AND LOOP
004262  000205          SCONT:  RTS     R5                              ;JUST RETURN
```

```
                                        .SBTTL UTILITY ROUTINES
                                ;DEVICE ADDRESS GENERATION
                        DEVGEN: MOV     TXMADR,R0               ;GET BASIC XMTR ADDRESS
                                MOV     R0,TCR                  ;GENERATE TCR
                                ADD     #2,R0
                                MOV     R0,TSR                  ;GENERATE TSR
                                ADD     #2,R0
                                MOV     R0,TSDB                 ;GENERATE TSDB
                                ADD     #2,R0
                                MOV     R0,TSBC                 ;GENERATE TSBC
                                ADD     #2,R0
                                MOV     R0,TSBA                 ;GENERATE TSBA
                                ADD     #2,R0
                                MOV     R0,TMMR                 ;GENERATE TMMR
                                INC     R0
                                MOV     R0,TMMRH                ;GEN. TMMR HIGH BYTE
                                INC     R0
                                MOV     R0,TSCRC                ;GENERATE TSCRC
                                MOV     TXMVEC,TXVEC            ;GENERATE TXVEC
                                MOV     RCVADR,R0               ;GET BASIC RCVR ADDRESS
                                MOV     R0,RCR                  ;GENERATE RCR
                                ADD     #2,R0
                                MOV     R0,RSR                  ;GENERATE RSR
                                ADD     #2,R0
                                MOV     R0,RDDB                 ;GENERATE RDDB
                                ADD     #2,R0
                                MOV     R0,RDBC                 ;GENERATE RDBC
                                ADD     #2,R0
                                MOV     R0,RDBA                 ;GENERATE RDBA
                                ADD     #4,R0
                                MOV     R0,RDCRC                ;GENERATE RDCRC
                                MOV     RCVVEC,RCVEC            ;GENERATE RCVEC
                                RTS     PC                      ;RETURN.


                                ;DEVICE TEST TRAP HANDLER

                        DVATST: MOV     #ISP,SP
                                PNTM    INVLAD                  ;PRINT NON-EXST ADDR MSG
(1)                             MOV     #INVLAD,R0              ;PRINT MESSAGE
(1)                             JSR     PC,TYPOUT               ;POINTED TO BY INVLAD
                                JMP     PROMT                   ;RETURN TO ASK ALL AGAIN


                                ;ROUTINE TO CATCH TRAPS TO 4

                        ERRTRP: MOV     (SP),TEMP               ;SAVE STACK FOR ADDRESS OF TRAP
                                MOV     #P7,@#PS                ;RAISE PRIORITY
                                MOV     #ISP,SP                 ;FIX THE STACK
                                PNTM    TRAP4                   ;PRINT "TRAPPED TO 4 " MSG
(1)                             MOV     #TRAP4,R0               ;PRINT MESSAGE
(1)                             JSR     PC,TYPOUT               ;POINTED TO BY TRAP4
```

```
 906  004524  162767  000002  031344          SUB     #2,TEMP
 907  004532  016700  031340                  MOV     TEMP,R0
 908  004536  004767  026424                  JSR     PC,OCTPNT               ;PRINT WHERE FROM.
 909  004542  000167  176600                  JMP     BCONT
 910
 911
 912                                  ;STANDARD DELAY SUBROUTINE
 913                                  ;MODIFY LOCATION 'DLCON' TO CHANGE
 914                                  ;DELAY PERIOD.
 915
 916  004546  012567  031274          DELAY:  MOV     (R5)+,DILLY             ;GET DELAY PARAMETER
 917  004552  005767  025634                  TST     DLCON                   ;IS DLCON = 0?
 918  004556  001003                          BNE     DLWT                    ;IF NOT, CARRY ON
 919  004560  012767  000001  025624          MOV     #1,DLCON                ;IF SO, MAKE IT = 1
 920  004566  016767  025620  031254  DLWT:   MOV     DLCON,DLY               ;GET DELAY CONSTANT
 921  004574  005367  031250          DLWT1:  DEC     DLY
 922  004600  001375                          BNE     DLWT1
 923  004602  005367  031240                  DEC     DILLY
 924  004606  001367                          BNE     DLWT
 925  004610  000205                          RTS     R5
 926
 927                                  ;REGISTER SAVE & RESTORE ROUTINES
 928
 929  004612  010446                  REGSAV: MOV     R4,-(SP)
 930  004614  010346                          MOV     R3,-(SP)
 931  004616  010246                          MOV     R2,-(SP)
 932  004620  010146                          MOV     R1,-(SP)
 933  004622  010046                          MOV     R0,-(SP)
 934  004624  000115                          JMP     @R5
 935
 936  004626  030026                  REGRES: BIT     R0,(SP)+
 937  004630  012600                          MOV     (SP)+,R0
 938  004632  012601                          MOV     (SP)+,R1
 939  004634  012602                          MOV     (SP)+,R2
 940  004636  012603                          MOV     (SP)+,R3
 941  004640  012604                          MOV     (SP)+,R4
 942  004642  000205                          RTS     R5
```

```
                                        .SBTTL  INITIALIZE TEST

                                        ;CHECK INITIAL CONDITIONS AFTER A RESET

004644  000005                  XINIT:  RESET                           ;CLEAR ALL
004646  017767  031266  025770          MOV     @TSBC,BAD               ;GET BYTE COUNT REGISTER
004654  005067  025766                  CLR     GOOD
004660  005767  025760                  TST     BAD                     ;WAS TSBC = 0?
004664  001414                          BEQ     XA1
004666                                  DATERR  \N              ;ERROR:TSBC NOT CLEARED BY RESET
(1)                                             ;******* ERROR 1 *******
(1)     004666  032777  040000  025514          BIT     #B14,@SR
(1)     004674  001005                  BNE     .+14
(1)     004676  012767  000001  025736          MOV     #1,ERRNUM
(1)     004704  004767  025570          JSR     PC,DERR
(1)             000002                  N       =       N+1
004710                                  SCOPE   XINIT
(1)     004710  004567  177312          JSR     R5,SCPRTN
(1)     004714  004644                  XINIT
004716  017767  031220  025720  XA1:    MOV     @TSBA,BAD               ;GET BYTE ADDRESS REGISTER
004724  005067  025716                  CLR     GOOD
004730  005767  025710                  TST     BAD                     ;WAS TSBA = 0?
004734  001414                          BEQ     XA2
004736                                  DATERR  \N              ;ERROR:TSBA NOT CLEARED BY RESET
(1)                                             ;******* ERROR 2 *******
(1)     004736  032777  040000  025444          BIT     #B14,@SR
(1)     004744  001005                  BNE     .+14
(1)     004746  012767  000002  025666          MOV     #2,ERRNUM
(1)     004754  004767  025520          JSR     PC,DERR
(1)             000003                  N       =       N+1
004760                                  SCOPE   XINIT
(1)     004760  004567  177242          JSR     R5,SCPRTN
(1)     004764  004644                  XINIT
004766  017767  031152  025650  XA2:    MOV     @TMMR,BAD               ;GET TMMR REGISTER
004774  042767  000377  025642          BIC     #377,BAD                ;MASK OFF ANY ADDR SILO DATA
005002  012767  050000  025636          MOV     #50000,GOOD             ;SET UP GOOD FOR COMPARE
005010  026767  025632  025626          CMP     GOOD,BAD                ;IGNORE BIT 8 WHEN DETERMINING
005016  001420                          BEQ     XA3                     ;ERROR
005020  022767  050400  025616          CMP     #50400,BAD
005026  001414                          BEQ     XA3
005030                                  DATERR  \N              ;ERROR:TMMR NOT INITIATED BY RESET
(1)                                             ;******* ERROR 3 *******
(1)     005030  032777  040000  025352          BIT     #B14,@SR
(1)     005036  001005                  BNE     .+14
(1)     005040  012767  000003  025574          MOV     #3,ERRNUM
(1)     005046  004767  025426          JSR     PC,DERR
(1)             000004                  N       =       N+1
005052                                  SCOPE   XINIT
(1)     005052  004567  177150          JSR     R5,SCPRTN
(1)     005056  004644                  XINIT
005060  017767  031050  025556  XA3:    MOV     @TSR,BAD                ;GET TSR REGISTER
005066  012767  000400  025552          MOV     #400,GOOD               ;SET UP GOOD FOR COMPARE
005074  026767  025546  025542  XA4:    CMP     GOOD,BAD
005102  001414                          BEQ     XA5
005104                                  DATERR  \N              ;ERROR:TSR NOT INITIALIZED BY RESET
(1)                                             ;******* ERROR 4 *******
```

```
(1)  005104  032777  040000  025276          BIT     #B14,@SR
(1)  005112  001005                          BNE     .+14
(1)  005114  012767  000004  025520          MOV     #4,ERRNUM
(1)  005122  004767  025352                  JSR     PC,DERR
(1)          000005                  N       -       N+1
975  005126                                  SCOPE   XINIT
(1)  005126  004567  177074                  JSR     R5,SCPRTN
(1)  005132  004644                          XINIT
976  005134  017767  030772  025502  XA5:    MOV     @TCR,BAD                ;GET TCR REGISTER
977  005142  005067  025500                  CLR     GOOD
978  005146  005767  025472                  TST     BAD                     ;WAS TCR = 0?
979  005152  001414                          BEQ     XA6
980  005154                                  DATERR  \N              ;ERROR:TCR NOT CLR'D BY RESET
(1)                                                                     ;******* ERROR 5 *******
(1)  005154  032777  040000  025226          BIT     #B14,@SR
(1)  005162  001005                          BNE     .+14
(1)  005164  012767  000005  025450          MOV     #5,ERRNUM
(1)  005172  004767  025302                  JSR     PC,DERR
(1)          000006                  N       -       N+1
981  005176                                  SCOPE   XINIT
(1)  005176  004567  177024                  JSR     R5,SCPRTN
(1)  005202  004644                          XINIT
982  005204  017767  030740  025432  XA6:    MOV     @TSCRC,BAD
983  005212  005067  025430                  CLR     GOOD                    ;CHECK CRC REGISTER
984  005216  005767  025422                  TST     BAD                     ;WAS IT 0?
985  005222  001414                          BEQ     XA7                     ;YES,CONTINUE
986  005224                                  DATERR  \N              ;ERROR:TSCRC NOT CLEARED BY RESET
(1)                                                                     ;******* ERROR 6 *******
(1)  005224  032777  040000  025156          BIT     #B14,@SR
(1)  005232  001005                          BNE     .+14
(1)  005234  012767  000006  025400          MOV     #6,ERRNUM
(1)  005242  004767  025232                  JSR     PC,DERR
(1)          000007                  N       =       N+1
987  005246                                  SCOPE   XINIT
(1)  005246  004567  176754                  JSR     R5,SCPRTN
(1)  005252  004644                          XINIT
988  005254  004767  024412          XA7:    JSR     PC,MONIT
989  005260  032777  010000  025122          BIT     #B12,@SR                ;CHECK EXIT SW (SW 12)
990  005266  001402                          BEQ     XART
991  005270  000167  177350                  JMP     XINIT                   ;IF SET, STAY IN THIS TEST
992  005274  000207                  XART:   RTS     PC
```

```
                                        .SBTTL  TCR TEST

                                        ;TRANSMITTER COMMAND REGISTER TEST

005276  005077  030630        TCRTST: CLR     @TCR                    ;CLEAR TCR REG
005302  012767  017400  025336 XD1:    MOV     #17400,GOOD             ;SET ALL DEST. CODE BITS
005310  016777  025332  030614        MOV     GOOD,@TCR
005316  017767  030610  025320        MOV     @TCR,BAD                ;AND READ THEM BACK
005324  026767  025316  025312        CMP     GOOD,BAD                ;ALL DEST CODE BITS SET?
005332  001414                        BEQ     XD2
005334                                DATERR  \N              ;ERROR:CANNOT SET SOME DEST. CODE BITS
                                                                        ;******* ERROR 7 *******
005334  032777  040000  025046        BIT     #B14,@SR
005342  001005                        BNE     .+14
005344  012767  000007  025270        MOV     #7,ERRNUM
005352  004767  025122                JSR     PC,DERR
        000010                  N       =       N+1
005356                                SCOPE   XD1
005356  004567  176644                JSR     R5,SCPRTN
005362  005302                        XD1
005364  005067  025256        XD2:    CLR     GOOD                    ;NOW CLR DEST. CODE BITS AFTER
005370  005077  030536                CLR     @TCR                    ;SETTING THEM
005374  017767  030532  025242        MOV     @TCR,BAD                ;READ THEM BACK
005402  042767  160377  025234        BIC     #160377,BAD             ;IGNORE ALL BUT DEST. CODE BITS
005410  026767  025232  025226        CMP     GOOD,BAD                ;ALL CLEAR?
005416  001414                        BEQ     XD3
005420                                DATERR  \N              ;ERROR:CANNOT CLR SOME DEST.CODE BITS
                                                                        ;******* ERROR 10 *******
005420  032777  040000  024762        BIT     #B14,@SR
005426  001005                        BNE     .+14
005430  012767  000010  025204        MOV     #10,ERRNUM
005436  004767  025036                JSR     PC,DERR
        000011                  N       =       N+1
005442                                SCOPE   XD2
005442  004567  176560                JSR     R5,SCPRTN
005446  005364                        XD2
005450  005077  030456        XD3:    CLR     @TCR
005454  005077  030454                CLR     @TSR                    ;CLEAR POSSIBLE TIMEOUT
005460  012767  120365  025160        MOV     #120365,GOOD            ;SET ST TXM,INH ADR INC,EA 16&17,
005466  016777  025154  030436        MOV     GOOD,@TCR               ;IE,RD SILO,SND WD,&RIB
005474  017767  030432  025142        MOV     @TCR,BAD                ;SEE IF THEY ALL SET
005502  026767  025140  025134        CMP     GOOD,BAD
005510  001414                        BEQ     XD4
005512                                DATERR  \N              ;ERROR:BAD BITS IN TCR
                                                                        ;******* ERROR 11 *******
005512  032777  040000  024670        BIT     #B14,@SR
005520  001005                        BNE     .+14
005522  012767  000011  025112        MOV     #11,ERRNUM
005530  004767  024744                JSR     PC,DERR
        000012                  N       -       N+1
005534                                SCOPE   XD3
005534  004567  176466                JSR     R5,SCPRTN
005540  005450                        XD3
005542  012777  137765  030362 XD4:    MOV     #137765,@TCR            ;SET ALL SETTABLE BITS IN TCR
005550  012777  177777  030362        MOV     #-1,@TSBC               ;AND IN TSBC
005556  012777  177777  030356        MOV     #-1,@TSBA               ;AND IN TSBA
```

```
1026  005564  012777  037240  030342          MOV     #37240,@TSR             ;AND IN TSR
1027  005572  052777  000002  030332          BIS     #2,@TCR                 ;B O A R D  I N ! '
1028  005600  017767  030326  025036          MOV     @TCR,BAD                ;CHK TCR
1029  005606  005067  025034                  CLR     GOOD
1030  005612  026767  025030  025024          CMP     GOOD,BAD                ;TCR = 0?
1031  005620  001414                          BEQ     XD5
1032  005622                                  DATERR  \N              ;ERROR:TCR NOT CLR'D BY BOARD INIT
 (1)                                                                ;******* ERROR 12 *******
 (1)  005622  032777  040000  024560          BIT     #B14,@SR
 (1)  005630  001005                          BNE     .+14
 (1)  005632  012767  000012  025002          MOV     #12,ERRNUM
 (1)  005640  004767  024634                  JSR     PC,DERR
 (1)          000013                  N       =       N+1
1033  005644                                  SCOPE   XD4
 (1)  005644  004567  176356                  JSR     R5,SCPRTN
 (1)  005650  005542                          XD4
1034  005652  017767  030262  024764  XD5:    MOV     @TSBC,BAD               ;CHECK TSBC
1035  005660  026767  024762  024756          CMP     GOOD,BAD                ;TSBC = 0?
1036  005666  001414                          BEQ     XD6
1037  005670                                  DATERR  \N              ;ERROR:TSBC NOT CLR'D BY BD INIT
 (1)                                                                ;******* ERROR 13 *******
 (1)  005670  032777  040000  024512          BIT     #B14,@SR
 (1)  005676  001005                          BNE     .+14
 (1)  005700  012767  000013  024734          MOV     #13,ERRNUM
 (1)  005706  004767  024566                  JSR     PC,DERR
 (1)          000014                  N       =       N+1
1038  005712                                  SCOPE   XD4
 (1)  005712  004567  176310                  JSR     R5,SCPRTN
 (1)  005716  005542                          XD4
1039  005720  017767  030216  024716  XD6:    MOV     @TSBA,BAD               ;TSBA   0?
1040  005726  026767  024714  024710          CMP     GOOD,BAD
1041  005734  001414                          BEQ     XD7
1042  005736                                  DATERR  \N              ;ERROR:TSBA NOT CLR'D BY BD INIT
 (1)                                                                ;******* ERROR 14 *******
 (1)  005736  032777  040000  024444          BIT     #B14,@SR
 (1)  005744  001005                          BNE     .+14
 (1)  005746  012767  000014  024666          MOV     #14,ERRNUM
 (1)  005754  004767  024520                  JSR     PC,DERR
 (1)          000015                  N       -       N+1
1043  005760                                  SCOPE   XD4
 (1)  005760  004567  176242                  JSR     R5,SCPRTN
 (1)  005764  005542                          XD4
1044  005766  017767  030142  024650  XD7:    MOV     @TSR,BAD                - ;TSR OK?
1045  005774  012767  000400  024644          MOV     #400,GOOD
1046  006002  026767  024640  024634  XD8:    CMP     GOOD,BAD
1047  006010  001414                          BEQ     XD9
1048  006012                                  DATERR  \N              ;ERROR:TSR BAD AFTER BD INIT
 (1)                                                                ;******* ERROR 15 *******
 (1)  006012  032777  040000  024370          BIT     #B14,@SR
 (1)  006020  001005                          BNE     .+14
 (1)  006022  012767  000015  024612          MOV     #15,ERRNUM
 (1)  006030  004767  024444                  JSR     PC,DERR
 (1)          000016                  N       -       N+1
1049  006034                                  SCOPE XD4
 (1)  006034  004567  176166                  JSR     R5,SCPRTN
 (1)  006040  005542                          XD4
```

```
 1050  006042  004767  023624            XD9:    JSR     PC,MONIT
 1051  006046  032777  010000  024334            BIT     #B12,@SR
 1052  006054  001402          ;;;               BEQ     XDRT                    ;LEAVE IF SW 12 - 0
 1053  006056  000167  177214                    JMP     TCRTST                  ;OTHERWISE, MUST STAY
 1054  006062  000207                    XDRT:   RTS     PC
```

```
                                                .SBTTL  TSBC TEST

                                                ;BYTE COUNT REG. DATA TEST

006064                                  BCTST:  BDINIT  XMTR                    ;INIT XMTR MODULE
006072  012767  177777  027762                  MOV     #-1,PAT                 ;SET PATTERN
006100  012767  000001  027756                  MOV     #B00,MASK               ;SET BIT MASK
006106  016767  027750  024532          XB1:    MOV     PAT,GOOD                ;LOAD "GOOD" WITH PATTERN
006114  016777  024526  030016                  MOV     GOOD,@TSBC              ;LOAD PATTERN INTO TSBC
006122  017767  030012  024514                  MOV     @TSBC,BAD               ;READ TSBC
006130  026767  024512  024506                  CMP     GOOD,BAD
006136  001414                                  BEQ     XB2
006140                                          DATERR  \N              ;ERROR:BAD DATA IN TSBC
 (1)                                                                    ;******* ERROR 16 *******
 (1)    006140  032777  040000  024242          BIT     #B14,@SR
 (1)    006146  001005                          BNE     .+14
 (1)    006150  012767  000016  024464          MOV     #16,ERRNUM
 (1)    006156  004767  024316                  JSR     PC,DERR
 (1)            000017                  N       =       N+1
006162                                          SCOPE   XB1
 (1)    006162  004567  176040                  JSR     R5,SCPRTN
 (1)    006166  006106                          XB1
006170  032767  100000  027664          XB2:    BIT     #B15,PAT                ;DONE WHOLE REGISTER?
006176  001412                                  BEQ     XB3                     ;IF YES, DONE
006200  012767  177777  027654                  MOV     #-1,PAT
006206  046767  027652  027646                  BIC     MASK,PAT                ;NO, PREPARE FOR NEXT BIT
006214  006367  027644                          ASL     MASK                    ;ROTATE MASK
006220  000167  177662                          JMP     XB1                     ;AND CONTINUE
006224  004767  023442          XB3:    JSR     PC,MONIT
006230  032777  010000  024152                  BIT     #B12,@SR                ;IF SO, CONSIDER LEAVING
006236  001402                                  BEQ     XBRT                    ;EXIT IF SW 12 - 0
006240  000167  177620                          JMP     BCTST                   ;STAY HERE IF SW 12 - 1
006244  000207                  XBRT:   RTS     PC
```

```
                                        .SBTTL  TSBA TEST

                                        ;BYTE ADDRESS REGISTER TEST

006246                          BATST:  BDINIT  XMTR                    ;INIT XMTR MODULE
006254  012767  177777  027600        MOV     #-1,PAT                 ;SET PATTERN
006262  012767  000001  027574        MOV     #B00,MASK               ;SET BIT MASK
006270  016767  027566  024350  XC1:   MOV     PAT,GOOD                ;LOAD ''GOOD'' WITH PATTERN
006276  016777  024344  027636        MOV     GOOD,@TSBA              ;LOAD PATTERN INTO TSBA
006304  017767  027632  024332        MOV     @TSBA,BAD               ;READ IT BACK
006312  026767  024330  024324        CMP     GOOD,BAD
006320  001414                      BEQ     XC2
006322                              DATERR  \N              ;ERROR:BAD DATA IN TSBA
 (1)                                                    ;******* ERROR 17 *******
 (1)    006322  032777  040000  024060        BIT     #B14,@SR
 (1)    006330  001005                      BNE     .+14
 (1)    006332  012767  000017  024302        MOV     #17,ERRNUM
 (1)    006340  004767  024134              JSR     PC,DERR
 (1)            000020                  N       -       N+1
006344                              SCOPE   XC1
 (1)    006344  004567  175656              JSR     R5,SCPRTN
 (1)    006350  006270                      XC1
006352  032767  100000  027502  XC2:   BIT     #B15,PAT                ;DONE WHOLE REGISTER?
006360  001412                      BEQ     XC3                     ;IF YES, DONE
006362  012767  177777  027472        MOV     #-1,PAT
006370  046767  027470  027464        BIC     MASK,PAT                ;NO,PREPARE FOR NEXT BIT
006376  006367  027462                ASL     MASK                    ;ROTATE MASK
006402  000167  177662                JMP     XC1                     ;AND CONTINUE
006406  004767  023260          XC3:  JSR     PC,MONIT
006412  032777  010000  023770        BIT     #B12,@SR                ;IF SO, CONSIDER LEAVING
006420  001402                      BEQ     XCRT                    ;EXIT IF SW 12 - 0
006422  000167  177620                JMP     BATST                   ;STAY HERE IF SW 12 - 1
006426  000207                  XCRT: RTS     PC
```

```
 1108                                          .SBTTL  MASTER SECTION TEST
 1109
 1110                                          ;TEST MASTER CONTROL AND ADDRESS SILO
 1111
 1112  006430                                  MSRTST: BDINIT  XMTR                    ;INIT BOADR
 1113  006436  112777  000001  027502                  MOVB    #1,@TMMRH               ;SET MASTER FLOP
 1114  006444  132777  000001  027474                  BITB    #1,@TMMRH               ;IS MASTER SET?
 1115  006452  001014                                  BNE     XE1
 1116  006454                                          ERPOR   \N              ;ERROR:COULD NOT SET MASTER FLOP
  (1)                                                                             ;******* ERROR 20 *******
  (1)   006454  032777  040000  023'26                BIT     #B14,@SR
  (1)   006462  001005                                BNE     .+14
  (1)   006464  012767  000020  024150                MOV     #20,ERRNUM
  (1)   006472  004767  023716                        JSR     PC,ERR
  (1)           000021                          N             N+1
 1117  006476                                          SCOPE   MSRTST
  (1)   006476  004567  175524                        JSR     R5,SCPRTN
  (1)   006502  006430                                MSRTST
 1118  006504  004767  023162                  XE1:    JSR     PC,MONIT
 1119  006510  032777  001000  023672                  BIT     #B09,@SR                ;CHECK SW 09
 1120  006516  001024                                  BNE     XE3                     ;IF ON, SKIP SCOPE LOOP
 1121  006520  012767  177777  027326                  MOV     #-1,PNTFLG              ;SET PRINT ALLOW FLAG
 1122  006526                                          PNTM    SCSEC                   ;OTHERWISE PRINT ''SCOPE SECTION..ETC''
  (1)   006526  012700  034457                        MOV     #SCSEC,R0               ;PRINT MESSAGE
  (1)   006532  004767  024112                        JSR     PC,TYPOUT               ;POINTED TO BY SCSEC
 1123  006536  005067  027312                        CLR     PNTFLG                  ;CLEAR PRINT ALLOW FLAG
 1124  006542  005767  027304                        TST     SWRFLG                  ;REAL SW REG?
 1125  006546  001402                                BEQ     XE2                     ;YES, SKIP
 1126  006550  004767  023150                        JSR     PC,SWDMP
 1127  006554  004767  023112                  XE2:  JSR     PC,MONIT
 1128  006560  032777  001000  023622                  BIT     #B09,@SR                ;KEEP AN EYE ON SW 09
 1129  006566  001772                                  BEQ     XE2                     ;STAY HERE 'TILL IT GETS SET
 1130  006570  142777  000001  027350  XE3:           BICB    #1,@TMMRH               ;CLR MASTER FLOP
 1131  006576  132777  000001  027342                  BITB    #1,@TMMRH               ;IS MASTER CLEAR?
 1132  006604  001414                                  BEQ     XE3A
 1133  006606                                          ERROR   \N              ;ERROR:COULD NOT CLR MASTER FLOP
  (1)                                                                             ;******* ERROR 21 *******
  (1)   006606  032777  040000  023574                BIT     #B14,@SR
  (1)   006614  001005                                BNE     .+14
  (1)   006616  012767  000021  024016                MOV     #21,ERRNUM
  (1)   006624  004767  023564                        JSR     PC,ERR
  (1)           000022                          N     =       N+1
 1134  006630                                          SCOPE   XE3
  (1)   006630  004567  175372                        JSR     R5,SCPRTN
  (1)   006634  006570                                XE3
 1135  006636  152777  000004  027302  XE3A:   BISB    #4,@TMMRH               ;SET 'NOW MASTER'' FLOP
 1136  006644  132777  000004  027274                  BITB    #4,@TMMRH               ;IS IT SET?
 1137  006652  001014                                  BNE     XE3B                    ;YES, GO TO CLEAP IT
 1138  006654                                          ERROR   \N              ;ERROR:COULD NOT SET 'NOW MASTER FLOP
  (1)                                                                             ;******* ERROR 22 *******
  (1)   006654  032777  040000  023526                BIT     #B14,@SR
  (1)   006662  001005                                BNE     .+14
  (1)   006664  012767  000022  023750                MOV     #22,ERRNUM
  (1)   006672  004767  023516                        JSR     PC,ERR
  (1)           000023                          N     -       N+1
 1139  006676                                          SCOPE   XE3A
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  (1)  006676  004567  175324                 JSR     R5,SCPRTN
  (1)  006702  006636                         XE3A
*1140  006704  142777  000004  027234  XE3B:  BICB    #4,@TMMRH          ;OKAY, NOW CLEAR 'NOW MASTER'
 1141  006712  132777  000004  027226        BITB    #4,@TMMRH          ;IS IT CLEAR?
 1142  006720  001414                        BEQ     XE5A               ;YES, OKAY.
 1143  006722                              ERROR   \N           ;ERROR:COULD NOT CLEAR 'NOW MASTER'
  (1)                                                         ;******* ERROR 23 *******
  (1)  006722  032777  040000  023460        BIT     #B14,@SR
  (1)  006730  001005                        BNE     .+14
  (1)  006732  012767  000023  023702        MOV     #23,ERRNUM
  (1)  006740  004767  023450                JSR     PC,ERR
  (1)          000024                 N      =       N+1
 1144  006744                              SCOPE   XE3B
  (1)  006744  004567  175256                JSR     R5,SCPRTN
  (1)  006750  006704                        XE3B
 1145  006752  112777  000002  027166  XE5A:  MOVB    #2,@TMMRH          ;SET SECONDARY FLOP
 1146  006760  132777  000001  027160        BITB    #1,@TMMRH          ;IS MASTER SET?
 1147  006766  001017                        BNE     XE6
 1148  006770  142777  000002  027150        BICB    #2,@TMMRH          ;CLR SEC FOR RE-TRY
 1149  006776                              ERROR   \N           ;ERROR:SETTING SEC DID NOT SET MASTER
  (1)                                                         ;******* ERROR 24 *******
  (1)  006776  032777  040000  023404        BIT     #B14,@SR
  (1)  007004  001005                        BNE     .+14
  (1)  007006  012767  000024  023626        MOV     #24,ERRNUM
  (1)  007014  004767  023374                JSR     PC,ERR
  (1)          000025                 N      -       N+1
 1150  007020                              SCOPE   XE5A
  (1)  007020  004567  175202                JSR     R5,SCPRTN
  (1)  007024  006752                        XE5A
 1151  007026  132777  000002  027112  XE6:   BITB    #2,@TMMRH          ;IS SEC CLR?
 1152  007034  001417                        BEQ     XE6A
 1153  007036  142777  000002  027102        BICB    #2,@TMMRH          ;CLR SEC FOR RETRY
*1154  007044                              ERROR   \N           ;ERROR:SEC NOT CLR'D BY THE SETTING OF MASTER
  (1)                                                         ;******* ERROR 25 *******
  (1)  007044  032777  040000  023336        BIT     #B14,@SR
  (1)  007052  001005                        BNE     .+14
  (1)  007054  012767  000025  023560        MOV     #25,ERRNUM
  (1)  007062  004767  023326                JSR     PC,ERR
  (1)          000026                 N      -       N+1
 1155  007066                              SCOPE   XE5A
  (1)  007066  004567  175134                JSR     R5,SCPRTN
  (1)  007072  006752                        XE5A
 1156  007074  132777  000004  027044  XE6A:  BITB    #4,@TMMRH          ;IS 'NOW MASTER '' SET?
 1157  007102  001017                        BNE     XE7                ;YES, OKAY
 1158  007104  142777  000002  027034        BICB    #2,@TMMRH          ;CLR SEC FOR RETRY.
 1159  007112                              ERROR   \N           ;ERROR:'NOW MASTER'' NOT SET VIA SECONDARY
  (1)                                                         ;******* ERROR 26 *******
  (1)  007112  032777  040000  023270        BIT     #B14,@SR
  (1)  007120  001005                        BNE     .+14
  (1)  007122  012767  000026  023512        MOV     #26,ERRNUM
  (1)  007130  004767  023260                JSR     PC,ERR
  (1)          000027                 N      =       N+1
 1160  007134                              SCOPE   XE5A
  (1)  007134  004567  175066                JSR     R5,SCPRTN
  (1)  007140  006752                        XE5A
```

```
 1162                                        ;ADDRESS SILO TEST
 1163
 1164  007142  152777  000060  026776  XE7:   BISB    #60,@TMMRH              ;SET AUT ADR TO LD SILO &CLR SILO
 1165  007150  132777  000020  026770         BITB    #20,@TMMRH              ;IS AUT ADR SET?
 1166  007156  001014                         BNE     XE7A
 1167  007160                                 ERROR   \N              ;ERROR:COULD NOT SET TMMR BIT 12
  (1)                                                                        ;******* ERROR 27 *******
  (1)  007160  032777  040000  023222         BIT     #B14,@SR
  (1)  007166  001005                         BNE     .+14
  (1)  007170  012767  000027  023444         MOV     #27,ERRNUM
  (1)  007176  004767  023212                 JSR     PC,ERR
  (1)          000030                 N       =       N+1
 1168  007202                                 SCOPE   XE7
  (1)  007202  004567  175020                 JSR     R5,SCPRTN
  (1)  007206  007142                         XE7
 1169  007210  132777  000200  026730  XE7A:  BITB    #200,@TMMRH             ;CHECK FOR OUTPUT RDY
 1170  007216  001414                         BEQ     XE8
 1171  007220                                 ERROR   \N              ;ERROR:TMMR BIT 13 DOES NOT CLR ADDR SILO
  (1)                                                                        ;******* ERROR 30 *******
  (1)  007220  032777  040000  023162         BIT     #B14,@SR
  (1)  007226  001005                         BNE     .+14
  (1)  007230  012767  000030  023404         MOV     #30,ERRNUM
  (1)  007236  004767  023152                 JSR     PC,ERR
  (1)          000031                 N       =       N+1
 1172  007242                                 SCOPE   XE7
  (1)  007242  004567  174760                 JSR     R5,SCPRTN
  (1)  007246  007142                         XE7
 1173  007250  012704  177700         XE8:   MOV     #-64.,R4                ;R4 IS COUNTER
 1174  007254  005003                         CLR     R3                      ;R3 IS DATA
 1175  007256  132777  000100  026662         BITB    #100,@TMMRH             ;ADR SILO INPUT RDY?
 1176  007264  001014                         BNE     XE9
 1177  007266                                 ERROR   \N              ;ERROR:ADR SILO INPUT NOT RDY
  (1)                                                                        ;******* ERROR 31 *******
  (1)  007266  032777  040000  023114         BIT     #B14,@SR
  (1)  007274  001005                         BNE     .+14
  (1)  007276  012767  000031  023336         MOV     #31,ERRNUM
  (1)  007304  004767  023104                 JSR     PC,ERR
  (1)          000032                 N       =       N+1
 1178  007310                                 SCOPE   XE8
  (1)  007310  004567  174712                 JSR     R5,SCPRTN
  (1)  007314  007250                         XE8
 1179  007316  110377  026622         XE9:   MOVB    R3,@TMMR                ;LOAD ADDR SILO
 1180  007322  005203                         INC     R3
 1181  007324  005204                         INC     R4
 1182  007326  001420                         BEQ     XE11
 1183  007330  132777  000100  026610  XE10:  BITB    #100,@TMMRH             ;INPUT READY?
 1184  007336  001367                         BNE     XE9
 1185  007340                                 ERROR   \N              ;ERROR:INPUT NOT RDY-PREMATURLY FULL?
  (1)                                                                        ;******* ERROR 32 *******
  (1)  007340  032777  040000  023042         BIT     #B14,@SR
  (1)  007346  001005                         BNE     .+14
  (1)  007350  012767  000032  023264         MOV     #32,ERRNUM
  (1)  007356  004767  023032                 JSR     PC,ERR
  (1)          000033                 N       =       N+1
 1186  007362                                 SCOPE   XE7
  (1)  007362  004567  174640                 JSR     R5,SCPRTN
```

```
  (1)  007366  007142                          XE7
1187   007370  132777  000100  026550  XE11:   BITB    #100,@TMMRH          ;SILO SHOULD BE FULL NOW
1188   007376  001414                          BEQ     XE12                 ;INPUT READY?
1189   007400                                  ERROR   \N           ;ERROR:SILO FULL-BUT STILL RDY FOR INPUT
  (1)                                                                ;******* ERROR 33 *******
  (1)  007400  032777  040000  023002          BIT     #B14,@SR
  (1)  007406  001005                          BNE     .+14
  (1)  007410  012767  000033  023224          MOV     #33,ERRNUM
  (1)  007416  004767  022772                  JSR     PC,ERR
  (1)          000034                  N       -       N+1
1190   007422                                  SCOPE   XE7
  (1)  007422  004567  174600                  JSR     R5,SCPRTN
  (1)  007426  007142                          XE7
1191   007430  132777  000200  026510  XE12:   BITB    #200,@TMMRH          ;SILO OUTPUT RDY?
1192   007436  001014                          BNE     XE13
1193   007440                                  ERROR   \N           ;ERROR:FULL SILO NOT RDY FOR OUTPUT
  (1)                                                                ;******* ERROR 34 *******
  (1)  007440  032777  040000  022742          BIT     #B14,@SR
  (1)  007446  001005                          BNE     .+14
  (1)  007450  012767  000034  023164          MOV     #34,ERRNUM
  (1)  007456  004767  022732                  JSR     PC,ERR
  (1)          000035                  N       =       N+1
1194   007462                                  SCOPE   XE7
  (1)  007462  004567  174540                  JSR     R5,SCPRTN
  (1)  007466  007142                          XE7
1195   007470  005003                  XE13:   CLR     R3                   ;R3 IS FOR DATA COMPARE
1196   007472  012704  177700                  MOV     #-64.,R4             ;R4 IS COUNTER
1197   007476  052777  000200  026426  XE14:   BIS     #B07,@TCR            ;SET RD SILO
1198   007504  117767  026434  023132          MOVB    @TMMR,BAD            ;READ WORD FROM ADDRESS SILO
1199   007512  005077  026414                  CLR     @TCR                 ;CLEAR RD SILO BIT
1200   007516  042767  177400  023120          BIC     #177400,BAD          ;ONLY INTERRESTED IN LOW BYTE
1201   007524  010367  023116                  MOV     R3,GOOD
1202   007530  026767  023112  023106  XE15:   CMP     GOOD,BAD             ;SILO OUTPUT OK?
1203   007536  001414                          BEQ     XE16
1204   007540                                  DATERR  \N           ;ERROR:BAD DATA READ FROM ADDR SILO
  (1)                                                                ;******* ERROR 35 *******
  (1)  007540  032777  040000  022642          BIT     #B14,@SR
  (1)  007546  001005                          BNE     .+14
  (1)  007550  012767  000035  023064          MOV     #35,ERRNUM
  (1)  007556  004767  022716                  JSR     PC,DERR
  (1)          000036                  N       -       N+1
1205   007562                                  SCOPE   XE7
  (1)  007562  004567  174440                  JSR     R5,SCPRTN
  (1)  007566  007142                          XE7
1206   007570  005203                  XE16:   INC     R3
1207   007572  042703  177740                  BIC     #177740,R3           ;KEEP R3 DOWN TO 5 BITS
1208   007576  005204                          INC     R4
1209   007600  001420                          BEQ     XE18                 ;AFTER 64 WDS, EXIT
1210   007602  132777  000200  026336  XE17:   BITB    #200,@TMMRH          ;SILO OUTPUT READY?
1211   007610  001332                          BNE     XE14
1212   007612                                  ERROR   \N           ;ERROR:SILO OUT NOT RDY-SILO NOT EMPTY
  (1)                                                                ;******* ERROR 36 *******
  (1)  007612  032777  040000  022570          BIT     #B14,@SR
  (1)  007620  001005                          BNE     .+14
  (1)  007622  012767  000036  023012          MOV     #36,ERRNUM
  (1)  007630  004767  022560                  JSR     PC,ERR
```

```
 (1)              000037                   N       =       N+1
1213  007634                                       SCOPE   XE7
 (1)  007634  004567  174366                       JSR     R5,SCPRTN
 (1)  007640  007142                               XE7
1214  007642  132777  000200  026276  XE18:   BITB    #200,@TMMRH          ;SILO OUT RDY AFTER 64 READS?
1215  007650  001414                               BEQ     XE19
1216  007652                                       ERROR   \N          ;ERROR:EMPTY SILO READY FOR OUTPUT
 (1)                                                                         ;******* ERROR 37 *******
 (1)  007652  032777  040000  022530               BIT     #B14,@SR
 (1)  007660  001005                               BNE     .+14
 (1)  007662  012767  000037  022752               MOV     #37,ERRNUM
 (1)  007670  004767  022520                       JSR     PC,ERR
 (1)              000040                   N       =       N+1
1217  007674                                       SCOPE   XE7
 (1)  007674  004567  174326                       JSR     R5,SCPRTN
 (1)  007700  007142                               XE7
1218  007702  005077  026224          XE19:   CLR     @TCR                 ;CLR RD SILO
1219  007706  112777  000000  026230          MOVB    #0,@TMMR             ;LOAD A WORD INTO SILO
1220  007714  004567  174626                       JSR     R5,DELAY             ;WAIT FOR MIGRATION
1221  007720  000010                               .WORD   10
1222  007722  132777  000200  026216               BITB    #200,@TMMRH          ;CHECK OUT RDY AFTER DELAY
1223  007730  001022                               BNE     XE20
1224  007732                                       ERROR   \N          ;ERROR:SILO SETTLING TIME TOO LONG
 (1)                                                                         ;******* ERROR 40 *******
 (1)  007732  032777  040000  022450               BIT     #B14,@SR
 (1)  007740  001005                               BNE     .+14
 (1)  007742  012767  000040  022672               MOV     #40,ERRNUM
 (1)  007750  004767  022440                       JSR     PC,ERR
 (1)              000041                   N       =       N+1
1225  007754  052777  000200  026150               BIS     #B07,@TCR            ;SET RD SILO BIT
1226  007762  117767  026156  022654               MOVB    @TMMR,BAD            ;GET RID OF THE WORD IN SILO
1227  007770                                       SCOPE   XE19
 (1)  007770  004567  174232                       JSR     R5,SCPRTN
 (1)  007774  007702                               XE19
1228  007776  152777  000041  026142  XE20:   BISB    #41,@TMMRH           ;SET 'CLR SILO' BIT & SET MASTER
1229  010004  132777  000200  026134               BITB    #200,@TMMRH          ;SILO RDY?
1230  010012  001414                               BEQ     XE21
1231  010014                                       ERROR   \N          ;ERROR:BIT 13 OF TMMR DID NOT CLR ADR SILO
 (1)                                                                         ;******* ERROR 41 *******
 (1)  010014  032777  040000  022366               BIT     #B14,@SR
 (1)  010022  001005                               BNE     .+14
 (1)  010024  012767  000041  022610               MOV     #41,ERRNUM
 (1)  010032  004767  022356                       JSR     PC,ERR
 (1)              000042                   N       =       N+1
1232  010036                                       SCOPE   XE20
 (1)  010036  004567  174164                       JSR     R5,SCPRTN
 (1)  010042  007776                               XE20
1233  010044  112777  000037  026072  XE21:   MOVB    #37,@TMMR            ;LOAD SILO WITH TEST WORD
1234  010052  132777  000200  026066  XE22:   BITB    #200,@TMMRH          ;SILO OUT RDY?
1235  010060  001774                               BEQ     XE22                 ;WAIT FOR IT
1236  010062  142777  000020  026056  XE22A:  BICB    #20,@TMMRH           ;CLR AUT ADR
1237  010070  016704  022316                       MOV     DLCON,R4
1238  010074  012703  177000              XE22B:  MOV     #177000,R3           ;SET UP FOR ABOUT 5MS DELAY
1239  010100  132777  000200  026040  XE23:   BITB    #200,@TMMRH          ;OUTPUT RDY?
1240  010106  001420                               BEQ     XE24                 ;IF NO - CARRY ON
1241  010110  005203                               INC     R3                   ;WAITED 5MS?
```

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 1242  010112  001372                          BNE     XE23                    ;NOT YET
 1243  010114  005304                          DEC     R4
 1244  010116  001366                          BNE     XE22B
 1245  010120                                  ERROR   \N              ;ERROR:ADDRESS SILO IS NOT CYCLING
  (1)                                                                           ;******* ERROR 42 *******
  (1)  010120  032777  040000  022262          BIT     #B14,@SR
  (1)  010126  001005                          BNE     .+14
  (1)  010130  012767  000042  022504          MOV     #42,ERRNUM
  (1)  010136  004767  022252                  JSR     PC,ERR
  (1)          000043                  N       =       N+1
 1246  010142                                  SCOPE   XE22A
  (1)  010142  004567  174060                  JSR     R5,SCPRTN
  (1)  010146  010062                          XE22A
 1247  010150  142777  000001  025770  XE24:   BICB    #1,@TMMRH               ;CLEAR MASTER FOR SYNC.
 1248  010156  004567  174364                  JSR     R5,DELAY
 1249  010162  000010                          .WORD   10
 1250  010164  132777  000200  025754          BITB    #200,@TMMRH             ;OUTPUT READY
 1251  010172  001014                          BNE     XE25
 1252  010174                                  ERROR   \N              ;ERROR:CYCLED WORD WAS LOST-OUT NOT RDY
  (1)                                                                           ;******* ERROR 43 *******
  (1)  010174  032777  040000  022206          BIT     #B14,@SR
  (1)  010202  001005                          BNE     .+14
  (1)  010204  012767  000043  022430          MOV     #43,ERRNUM
  (1)  010212  004767  022176                  JSR     PC,ERR
  (1)          000044                  N       =       N+1
 1253  010216                                  SCOPE   XE20
  (1)  010216  004567  174004                  JSR     R5,SCPRTN
  (1)  010222  007776                          XE20
 1254  010224  004567  174316          XF25:   JSR     R5,DELAY
 1255  010230  000010                          .WORD   10
 1256  010232  152777  000021  025706          BISB    #21,@TMMRH              ;SET AUTO ADDR & MASTER
 1257  010240  052777  000200  025664          BIS     #B07,@TCR               ;SET RD SILO
 1258  010246  117767  025672  022370          MOVB    @TMMR,BAD               ;CHECK VALIDITY OF OUTPUT
 1259  010254  042767  177400  022362          BIC     #177400,BAD             ;ONLY INTERRESTED IN LOW BYTE
 1260  010262  012767  000037  022356          MOV     #37,GOOD
 1261  010270  026767  022352  022346          CMP     GOOD,BAD                ;OUTPUT SHOULD BE 37
 1262  010276  001417                          BEQ     XE26
 1263  010300                                  DATERR  \N              ;ERROR:CYCLED WORD IS BAD DATA
  (1)                                                                           ;******* ERROR 44 *******
  (1)  010300  032777  040000  022102          BIT     #B14,@SR
  (1)  010306  001005                          BNE     .+14
  (1)  010310  012767  000044  022324          MOV     #44,ERRNUM
  (1)  010316  004767  022156                  JSR     PC,DERR
  (1)          000045                  N       =       N+1
 1264  010322  042777  000200  025602          BIC     #B07,@TCR               ;CLR RD SILO BIT FOR SCOPE
 1265  010330                                  SCOPE   XE20
  (1)  010330  004567  173672                  JSR     R5,SCPRTN
  (1)  010334  007776                          XE20
 1266  010336  004567  174204          XE26:   JSR     R5,DELAY                ;WAIT ANOTHER SETTLING TIME
 1267  010342  000010                          .WORD   10
 1268  010344  132777  000200  025574          BITB    #200,@TMMRH             ;IS SILO OUT RDY (SHOULDN'T BE)?
 1269  010352  001417                          BEQ     XE27                    ;NO, LEAVE
 1270  010354                                  ERROR   \N              ;ERROR:EXTRA WORD FOUND IN SILO
  (1)                                                                           ;******* ERROR 45 *******
  (1)  010354  032777  040000  022026          BI      #B14,@SR
  (1)  010362  001005                          BNE     .+14
```

```
   (1)  010364  012767  000045  022250          MOV     #45,ERRNUM
   (1)  010372  004767  022016                  JSR     PC,ERR
   (1)          000046                  N       -       N+1
  1271  010376  042777  000200  025526          BIC     #B07,@TCR               ;CLR RD SILO
  1272  010404                                  SCOPE   XE2C
   (1)  010404  004567  173616                  JSR     R5,SCPRTN
   (1)  010410  007776                          XE20
  1273  010412  152777  000060  025526  XE27:   BISB    #60,@TMMRH              ;SET AUTO ADDRESS & CLR ADDR SILO
  1274  010420  005077  025506                  CLR     @TCR                    ;CLEAR RD SILO
  1275  010424  004767  021242                  JSR     PC,MONIT
  1276  010430  032777  0*0000  021752          BIT     #B12,@SR                ;OK TO EXIT IF SW 12 = 0
  1277  010436  001402                          BEQ     XERT
  1278  010440  000167  175764                  JMP     @SRTST                  ;OTHERWISE, STAY HERE
  1279  010444  000207                  XERT:   RTS     PC
```

```
                        .SBTTL  DATA SILO TEST

                        ;TRANSMITTER DATA SILO TEST

010446                  SILTST: BDINIT  XMTR                    ;CLEAR BOARD
010454  004567  174066          JSR     R5,DELAY
010460  000010                  .WORD   10
010462  032777  000010  025442  BIT     #B03,@TCR               ;SILO OUTPUT READY?
010470  001414                  BEQ     XF1
010472                          ERROR   \N              ;ERROR:BD INIT DID NOT CLEAR DATA SILO
                                                                ;******* ERROR 46 *******
(1)
(1) 010472  032777  040000  021710  BIT     #B14,@SR
(1) 010500  001005                  BNE     .+14
(1) 010502  012767  000046  022132  MOV     #46,ERRNUM
(1) 010510  004767  021700          JSR     PC,ERR
(1)         000047              N   -       N+1
010514                          SCOPE   SILTST
(1) 010514  004567  173506          JSR     R5,SCPRTN
(1) 010520  010446                  SILTST
010522  032777  000400  025404  XF1:    BIT     #B08,@TSR               ;SILO INPUT READY?
010530  001014                  BNE     XF2
010532                          ERROR   \N              ;ERROR:BD INIT DID NOT SET INPUT READY
(1)                                                             ;******* ERROR 47 *******
(1) 010532  032777  040000  021650  BIT     #B14,@SR
(1) 010540  001005                  BNE     .+14
(1) 010542  012767  000047  022072  MOV     #47,ERRNUM
(1) 010550  004767  021640          JSR     PC,ERR
(1)         000050              N   =       N+1
010554                          SCOPE   SILTST
(1) 010554  004567  173446          JSR     R5,SCPRTN
(1) 010560  010446                  SILTST
010562  012777  177777  025346  XF2:    MOV     #-1,@TSDB               ;LOAD 177777 INTO DATA SILO
010570  004567  173752          JSR     R5,DELAY
010574  000010                  .WORD   10
010576  032777  000010  025326  BIT     #B03,@TCR               ;SILO OUTPUT READY?
010604  001017                  BNE     XF3
010606                          ERROR   \N              ;ERROR:NO SILO OUTPUT 37 US. AFTER LOAD
                                                                ;******* ERROR 50 *******
(1)
(1) 010606  032777  040000  021574  BIT     #B14,@SR
(1) 010614  001005                  BNE     .+14
(1) 010616  012767  000050  022016  MOV     #50,ERRNUM
(1) 010624  004767  021564          JSR     PC,ERR
(1)         000051              N   -       N+1
010630                          BDINIT  XMTR                    ;CLEAR SILO
010636                          SCOPE   XF2
(1) 010636  004567  173364          JSR     R5,SCPRTN
(1) 010642  010562                  XF2
010644  017767  025266  021772  XF3:    MOV     @TSDB,BAD               ;READ WORD FROM SILO
010652  012767  177777  021766          MOV     #-1,GOOD
010660  026767  021762  021756          CMP     GOOD,BAD                ;SILO OUTPUT = 177777
010666  001417                  BEQ     XF3A
010670                          DATEP   \N              ;ERROR:DROPPED BITS IN DATA SILO
(1)                                                             ;******* ERROR 51 *******
(1) 010670  032777  040000  021512  BIT     #B14,@SR
(1) 010676  001005                  BNE     .+14
(1) 010700  012767  000051  021734  MOV     #51,ERRNUM
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  (1)  010706  004767  021566                   JSR     PC,DERR
  (1)          000052                   N       =       N+1
 1309  010712                                   BDINIT  XMTR                    ;CLEAR SILO
 1310  010720                                   SCOPE   XF2
  (1)  010720  004567  173302                   JSR     R5,SCPRTN
  (1)  010724  010562                           XF2
 1311  010726  052777  000200  025176   XF3A:   BIS     #B07,@TCR               ;SET RD SILO BIT IN TCR
 1312  010734  017703  025176                   MOV     @TSDB,R3                ;POP WORD FROM SILO
 1313  010740  032777  000010  025164           BIT     #B03,@TCR               ;SILO OUTPUT READY?
 1314  010746  001414                           BEQ     XF5
 1315  010750                                   ERROR   \N              ;ERROR:WORD DID NOT GET POPPED FROM SILO
  (1)                                                                           ;******* ERROR 52 *******
  (1)  010750  032777  040000  021432           BIT     #B14,@SR
  (1)  010756  001005                           BNE     .+14
  (1)  010760  012767  000052  021654           MOV     #52,ERRNUM
  (1)  010766  004767  021422                   JSR     PC,ERR
  (1)          000053                   N       =       N+1
 1316  010772                                   SCOPE   XF3
  (1)  010772  004567  173230                   JSR     R5,SCPRTN
  (1)  010776  010644                           XF3
 1317  011000  032777  000400  025126   XF5:    BIT     #B08,@TSR               ;IS INPUT READY?
 1318  011006  001014                           BNE     XF6
 1319  011010                                   ERROR   \N              ;ERROR:DATA SILO INPUT NOT READY
  (1)                                                                           ;******* ERROR 53 *******
  (1)  011010  032777  040000  021372           BIT     #B14,@SR
  (1)  011016  001005                           BNE     .+14
  (1)  011020  012767  000053  021614           MOV     #53,ERRNUM
  (1)  011026  004767  021362                   JSR     PC,ERR
  (1)          000054                   N       =       N+1
 1320  011032                                   SCOPE   XF5
  (1)  011032  004567  173170                   JSR     R5,SCPRTN
  (1)  011036  011000                           XF5
 1321  011040  042777  000200  025064   XF6:    BIC     #B07,@TCR               ;CLEAR RD SILO BIT
 1322  011046  005077  025064                   CLR     @TSDB                   ;LOAD 0'S INTO SILO
 1323  011052  032777  000010  025052   XF6A:   BIT     #B03,@TCR               ;OUTPUT RDY?
 1324  011060  001774                           BEQ     XF6A                    ;WAIT FOR IT
 1325  011062  017767  025050  021554           MOV     @TSDB,BAD               ;READ OUTPUT OF SILO
 1326  011070  005067  021552                   CLR     GOOD
 1327  011074  026767  021546  021542           CMP     GOOD,BAD                ;OUTPUT = 0?
 1328  011102  001417                           BEQ     XF7
 1329  011104                                   DATERR  \N              ;ERROR:BITS PICKED UP IN DATA SILO
  (1)                                                                           ;******* ERROR 54 *******
  (1)  011104  032777  040000  021276           BIT     #B14,@SR
  (1)  011112  001005                           BNE     .+14
  (1)  011114  012767  000054  021520           MOV     #54,ERRNUM
  (1)  011122  004767  021352                   JSR     PC,DERR
  (1)          000055                   N       =       N+1
 1330  011126                                   BDINIT  XMTR                    ;CLR SILO
 1331  011134                                   SCOPE   XF6
  (1)  011134  004567  173066                   JSR     R5,SCPRTN
  (1)  011140  011040                           XF6
 1332  011142                           XF7:    BDINIT  XMTR                    ;CLR XMITTER BOARD
 1333  011150  012777  177600  024762           MOV     #-128.,@TSBC            ;SET BYTE COUNT TO -128
 1334  011156  012777  033564  024756           MOV     #SILDAT,@TSBA           ;POINT DEVICE AT CORE BUFFER
 1335  011164  052777  040000  024740           BIS     #B14,@TCR               ;SET TX NPR
 1336  011172  032777  040000  024732           BIT     #B14,@TCR               ;IS TX NPR SET?
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1337  011200  001014                          BNE     XF8
1338  011202                                  ERROR   \N              ;ERROR:CANNOT SET TX NPR
 (1)                                                                  ;******* ERROR 55 *******
 (1)  011202  032777  040000  021200          BIT     #B14,@SR
 (1)  011210  001005                          BNE     .+14
 (1)  011212  012767  000055  021422          MOV     #55,ERRNUM
 (1)  011220  004767  021170                  JSR     PC,ERR
 (1)          000056                  N       =       N+1
1339  011224                                  SCOPE   XF7
 (1)  011224  004567  172776                  JSR     R5,SCPRTN
 (1)  011230  011142                          XF7
1340  011232  016704  021154          XF8:    MOV     DLCON,R4
1341  011236  012703  177500          XF8A:   MOV     #177500,R3      ;SET UP 2 MS DELAY
1342  011242  005777  024672          XF9:    TST     @TSBC           ;IS BYTE COUNT 0?
1343  011246  001420                          BEQ     XF10
1344  011250  005203                          INC     R3              ;WAITED 2 MS?
1345  011252  001373                          BNE     XF9             ;NO, KEEP LOOKING
1346  011254  005304                          DEC     R4
1347  011256  001367                          BNE     XF8A
1348  011260                                  ERROR   \N              ;ERROR: NPR NOT COMPLETE AFTER 2 MS
 (1)                                                                  ;******* ERROR 56 *******
 (1)  011260  032777  040000  021122          BIT     #B14,@SR
 (1)  011266  001005                          BNE     .+14
 (1)  011270  012767  000056  021344          MOV     #56,ERRNUM
 (1)  011276  004767  021112                  JSR     PC,ERR
 (1)          000057                  N       =       N+1
1349  011302                                  SCOPE   XF7
 (1)  011302  004567  172720                  JSR     R5,SCPRTN
 (1)  011306  011142                          XF7
1350  011310  032777  000400  024616  XF10:   BIT     #B08,@TSR       ;INPUT READY?
1351  011316  001414                          BEQ     XF11
1352  011320                                  ERROR   \N              ;ERROR:SILO FULL BUT INPUT RDY SE
 (1)                                                                  ;******* ERROR 57 *******
 (1)  011320  032777  040000  021062          BIT     #B14,@SR
 (1)  011326  001005                          BNE     .+14
 (1)  011330  012767  000057  021304          MOV     #57,ERRNUM
 (1)  011336  004767  021052                  JSR     PC,ERR
 (1)          000060                  N       =       N+1
1353  011342                                  SCOPE   XF10
 (1)  011342  004567  172660                  JSR     R5,SCPRTN
 (1)  011346  011310                          XF10
1354  011350  032777  000010  024554  XF11:   BIT     #B03,@TCR       ;OUTPUT READY?
1355  011356  001014                          BNE     XF12
1356  011360                                  ERROR   \N              ;ERROR:FULL SILO NOT RDY FOR OUTPUT
 (1)                                                                  ;******* ERROR 60 *******
 (1)  011360  032777  040000  021022          BIT     #B14,@SR
 (1)  011366  001005                          BNE     .+14
 (1)  011370  012767  000060  021244          MOV     #60,ERRNUM
 (1)  011376  004767  021012                  JSR     PC,ERR
 (1)          000061                  N       =       N+1
1357  011402                                  SCOPE   XF11
 (1)  011402  004567  172620                  JSR     R5,SCPRTN
 (1)  011406  011350                          XF11
1358  011410  052777  000200  024514  XF12:   BIS     #B07,@TCR       ;SET RD SILO BIT
1359  011416  012704  033564                  MOV     #SILDAT,R4      ;R4 IS DATA POINTER
1360  011422  012703  177700                  MOV     #-64.,R3        ;R3 IS COUNTER
```

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 1361  011426  017767  024504  021210  XF13:   MOV     @TSDB,BAD               ;POP WORD FROM SILO TO 'BAD'
 1362  011434  012467  021206                  MOV     (R4)+,GOOD              ;AND POP A WORD FROM BUFFER
 1363  011440  026767  021202  021176          CMP     GOOD,BAD                ;DATA OK?
 1364  011446  001422                          BEQ     XF14
 1365  011450                                  DATERR  \N              ;ERROR:DATA FROM SILO IS WRONG
  (1)                                                                    ;******* ERROR 61 *******
  (1)  011450  032777  040000  020732          BIT     #B14,@SR
  (1)  011456  001005                          BNE     .+14
  (1)  011460  012767  000061  021154          MOV     #61,ERRNUM
  (1)  011466  004767  021006                  JSR     PC,DERR
  (1)          000062                  N       =       N+1
 1366  011472  042777  000200  024432          BIC     #B07,@TCR               ;CLR RD SILO BIT
 1367  011500                                  SCOPE   XF7                     ;GO TO RE-FILL SILO FOR RE-TRY
  (1)  011500  004567  172522                  JSR     R5,SCPRTN
  (1)  011504  011142                          XF7
 1368  011506  052777  000200  024416          BIS     #B07,@TCR               ;RE-SET RD SILO BIT
 1369  011514  005203                  XF14:   INC     R3                      ;ALL DONE?
 1370  011516  001343                          BNE     XF13                    ;IF NOT, POP ANOTHER WORD
 1371  011520                          XF17:   BDINIT  XMTR                    ;CLEAR THE BOARD
 1372  011526  012777  177774  024404          MOV     #-4,@TSBC               ;SET BYTE COUNT TO -4
 1373  011534  012777  033564  024400          MOV     #SILDAT,@TSBA           ;POINT NPR TO DATA BUFFER
 1374  011542  012767  033564  021076          MOV     #SILDAT,GOOD
 1375  011550  052777  040004  024354          BIS     #40004,@TCR             ;SET TX NPR AND INH ADR INC
 1376  011556  005777  024356          XF18:   TST     @TSBC                   ;WAIT FOR NPR TO FINISH
 1377  011562  001375                          BNE     XF18
 1378  011564  017767  024352  021052          MOV     @TSBA,BAD               ;READ BYTE ADDRESS
 1379  011572  026767  021050  021044          CMP GOOD,BAD                    ;HAS IT CHANGED?
 1380  011600  001417                          BEQ     XF19
 1381  011602                                  DATERR  \N              ;ERROR:TSBA SHD NOT CHANGE WITH INH ADR INC SET
  (1)                                                                    ;******* ERROR 62 *******
  (1)  011602  032777  040000  020600          BIT     #B14,@SR
  (1)  011610  001005                          BNE     .+14
  (1)  011612  012767  000062  021022          MOV     #62,ERRNUM
  (1)  011620  004767  020654                  JSR     PC,DERR
  (1)          000063                  N       =       N+1
 1382  011624                                  BDINIT  XMTR
 1383  011632                                  SCOPE   XF17
  (1)  011632  004567  172370                  JSR     R5,SCPRTN
  (1)  011636  011520                          XF17
```

```
                                        .SBTTL  DATA SILO BLOCK COUNTER TEST

                                ;THIS TESTS THAT, AFTER PULLING 200 (OCTAL) WORDS THRU THE SILO
                                ;THE BLOCK COUNTER COUNTS THE 200 WORDS AND HOLDS SILO OUTPUT READY
                                ;IN A FALSE STATE.

011640                          XF19:   BDINIT  XMTR                    ;CLEAR THE BOARD
011646  142777  000001  024272          BICB    #800,@TMMRH             ;CLEAR MASTER FOR THIS TEST
011654  004767  000136                  JSR     PC,XFSR                 ;FILL THE DATA SILO
011660  012702  000100                  MOV     #64.,R2
011664  004767  000176                  JSR     PC,XFEMT                ;POP ALL 64 WORDS OUT
011670  004767  000122                  JSR     PC,XFSR                 ;FILL SILO AGAIN
011674  012702  000020                  MOV     #20,R2
011700  004767  000162                  JSR     PC,XFEMT                ;POP 20 (OCTAL) WORDS OUT
011704  004767  000106                  JSR     PC,XFSR                 ;FILL SILO AGAIN
011710  012702  000060                  MOV     #60,R2
011714  004767  000146                  JSR     PC,XFEMT                ;POP 60 (OCTAL) WORDS OUT
                                                                        ;  LEAVING 20 (OCTAL) IN SILO
                                                                        ;  AND HAVING PULLED OUT 200 TOTAL (OCTAL)
011720  032777  000010  024204          BIT     #803,@TSR               ;NOW CHECK OUTPUT READY
011726  001414                          BEQ     XF19A                   ;IF IT'S CLEAR, OKAY
011730                                  ERROR   \N                      .ERROR:OUTPUT RDY AFTER 200 WORD BLOCK
 (1)                                                                    .******* ERROR 63 *******
 (1)    011730  032777  040000  020452          BIT     #B14,@SR
 (1)    011736  001005                  BNE     .+14
 (1)    011740  012767  000063  020674          MOV     #63,ERRNUM
 (1)    011746  004767  020442                  JSR     PC,ERR
 (1)            000064          N       =       N+1
011752                                  SCOPE   XF19
 (1)    011752  004567  172250                  JSR     R5,SCPRTN
 (1)    011756  011640                  XF19
011760                          XF19A:  BDINIT  XMTR                    ;CLEAN UP.
011766  152777  000020  024152  XF20:   BISB    #20,@TMMRH              ;SET AUT ADR
011774  004767  017672                  JSR     PC,MONIT
012000  032777  010000  020402          BIT     #B12,@SR                ;CAN WE EXIT NOW?
012006  001402                          BEQ     XFRT                    ;OK IF SW 12 = 0
012010  000167  176432                  JMP     SILTST                  ;NO IF SW 12 = 1
012014  000207                  XFRT:   RTS     PC

                                ;ROUTINE TO FILL DATA SILO VIA NPR

012016  012777  177600  024114  XFSR:   MOV     #-128.,@TSBC            ;SET BYTE COUNT FOR FILL-UP
012024  012777  033564  024110          MOV     #SILDAT,@TSBA           ;POINT DEVICE AT CORE BUFFER
012032  052777  040000  024072          BIS     #B14,@TCR               ;START NPR
012040  016704  020346                  MOV     DLCON,R4
012044  012703  175000          XFSR1:  MOV     #175000,R3              ;SET UP TO WAIT FOR CMPL
012050  005203                  XFSRW:  INC     R3
012052  001376                          BNE     XFSRW                   ;WAIT FOR NPR COMPLETION
012054  005304                          DEC     R4
012056  001372                          BNE     XFSR1
012060  005077  024046                  CLR     @TCR                    ;CLEAR TXNPR
012064  000207                          RTS     PC                      ;RETURN WITH SILO FULL

                                ;ROUTINE TO POP (R2) NUMBER OF WORDS FROM DATA SILO

012066  052777  000200  024036  XFEMT:  BIS     #B07,@TCR               ;SET RD SILO
```

```
 1433  012074  010203                          MOV     R2,R3
 1434  012076  017767  024034  020540  XFMTW:  MOV     @TSDB,BAD       ;POP A WORD OUT
 1435  012104  005303                          DEC     R3              ;KEEP TRACK OF # OF WORDS
 1436  012106  001373                          BNE     XFMTW
 1437  012110  042777  000200  024014          BIC     #B07,@TCR       ;LEAVE WITH RD SILO CLEAR
 1438  012116  000207                          RTS     PC
```

```
1440                                            .SBTTL  TSRTST
1441
1442                                            ;STATUS REGISTER AND ERRORS TEST
1443
1444  012120                                    TSRTST: BDINIT  XMTR                    ;CLR BOARD
1445  012126  052777  000200  024000                    BIS     #B07,@TSR               ;SET SUCC XFER
1446  012134  032777  000200  023772                    BIT     #B07,@TSR               ;IS IT SET?
1447  012142  001014                                    BNE     XH1
1448  012144                                            ERROR   \N              ;ERROR:CANNOT SET TSR BIT 07
 (1)                                                                                ;******* ERROR 64 *******
 (1)  012144  032777  040000  020236                    BIT     #B14,@SR
 (1)  012152  001005                                    BNE     .+14
 (1)  012154  012767  000064  020460                    MOV     #64,ERRNUM
 (1)  012162  004767  020226                            JSR     PC,ERR
 (1)          000065                            N       =       N+1
1449  012166                                            SCOPE   TSRTST
 (1)  012166  004567  172034                            JSR     R5,SCPRTN
 (1)  012172  012120                                    TSRTST
1450  012174  042777  000200  023732            XH1:    BIC     #B07,@TSR               ;CLR SUCC XFER
1451  012202  032777  000200  023724                    BIT     #B07,@TSR               ;IS IT CLR?
1452  012210  001414                                    BEQ     XH2
1453  012212                                            ERROR   \N              ;ERROR:CANNOT CLR SUCC XFR
 (1)                                                                                ;******* ERROR 65 *******
 (1)  012212  032777  040000  020170                    BIT     #B14,@SR
 (1)  012220  001005                                    BNE     .+14
 (1)  012222  012767  000065  020412                    MOV     #65,ERRNUM
 (1)  012230  004767  020160                            JSR     PC,ERR
 (1)          000066                            N       =       N+1
1454  012234                                            SCOPE   XH1
 (1)  012234  004567  171766                            JSR     R5,SCPRTN
 (1)  012240  012174                                    XH1
1455  012242                                    XH2:    BDINIT  XMTR                    ;CLEAR BOARD
1456  012250  012777  177777  023660                    MOV     #-1,@TSDB               ;LOAD WORD INTO SILO
1457  012256  032777  000010  023646                    BIT     #B03,@TCR               ;OUTPUT READY?
1458  012264  001774                                    BEQ     .-6                     ;WAIT FOR WORD TO HIT BOTTOM
1459  012266  152777  000001  023652                    BISB    #1,@TMMRH               ;SET MASTER FOR TIME SLICES
1460  012274  012777  120000  023630                    MOV     #120000,@TCR            ;SET RIB AND SND WD
1461  012302  016704  020104                            MOV     DLCON,R4
1462  012306  012703  177763                    XH2B:   MOV     #177763,R3              ;SET UP FOR 100 U.S. ALARM
1463  012312  032777  000020  023614            XH2A:   BIT     #B04,@TSR               ;TDM BUS BSY SET?
1464  012320  001020                                    BNE     XH3
1465  012322  005203                                    INC     R3                      ;WAIT 100 US.
1466  012324  001372                                    BNE     XH2A
1467  012326  005304                                    DEC     R4
1468  012330  001366                                    BNE     XH2B
1469  012332                                            ERROR   \N              ;ERROR:TDM BUS BSY NOT SET
 (1)                                                                                ;******* ERROR 66 *******
 (1)  012332  032777  040000  020050                    BIT     #B14,@SR
 (1)  012340  001005                                    BNE     .+14
 (1)  012342  012767  000066  020272                    MOV     #66,ERRNUM
 (1)  012350  004767  020040                            JSR     PC,ERR
 (1)          000067                            N       =       N+1
1470  012354                                            SCOPE   XH2
 (1)  012354  004567  171646                            JSR     R5,SCPRTN
 (1)  012360  012242                                    XH2
1471  012362  032777  000100  023544            XH3:    BIT     #B06,@TSR               ;IS BUSY SET?
```

```
1472  012370  001014                          BNE     XH4
1473  012372                                  ERROR   \N              ;ERROR:BUSY NOT SET WITH SND WD & RIB
 (1)                                                                  ;******* ERROR 67 *******
 (1)  012372  032777  040000  020010          BIT     #B14,@SR
 (1)  012400  001005                          BNE     .+14
 (1)  012402  012767  000067  020232          MOV     #67,ERRNUM
 (1)  012410  004767  020000                  JSR     PC,ERR
 (1)          000070                  N       =       N+1
1474  012414                                  SCOPE   XH2
 (1)  012414  004567  171606                  JSR     R5,SCPRTN
 (1)  012420  012242                          XH2
1475  012422  042777  100000  023502  XH4:    BIC     #B15,@TCR               ;CLEAR RIB
1476  012430  000240                          NOP                             ;WAIT FOR TIME SLICE
1477  012432  032777  020000  023472          BIT     #B13,@TCR               ;IS SND WD CLR?
1478  012440  001414                          BEQ     XH5
1479  012442                                  ERROR   \N              ;ERROR:INTR REQ DID NOT CLR SND WD
 (1)                                                                  ;******* ERROR 70 *******
 (1)  012442  032777  040000  017740          BIT     #B14,@SR
 (1)  012450  001005                          BNE     .+14
 (1)  012452  012767  000070  020162          MOV     #70,ERRNUM
 (1)  012460  004767  017730                  JSR     PC,ERR
 (1)          000071                  N       =       N+1
1480  012464                                  SCOPE   XH2
 (1)  012464  004567  171536                  JSR     R5,SCPRTN
 (1)  012470  012242                          XH2
1481  012472  032777  000100  023434  XH5:    BIT     #B06,@TSR               ;IS BUSY CLR?
1482  012500  001414                          BEQ     XH6
1483  012502                                  ERROR   \N              ;ERROR:SND WD-0 DID NOT CLR BUSY
 (1)                                                                  ;******* ERROR 71 *******
 (1)  012502  032777  040000  017700          BIT     #B14,@SR
 (1)  012510  001005                          BNE     .+14
 (1)  012512  012767  000071  020122          MOV     #71,ERRNUM
 (1)  012520  004767  017670                  JSR     PC,ERR
 (1)          000072                  N       =       N+1
1484  012524                                  SCOPE   XH2
 (1)  012524  004567  171476                  JSR     R5,SCPRTN
 (1)  012530  012242                          XH2
1485  012532  005077  023376          XH6:    CLR     @TSR                    ;CLEAR TSR
1486  012536  052777  120000  023366          BIS     #120000,@TCR            ;SET RIB & SND WD
1487  012544  052777  001000  023362          BIS     #B09,@TSR               ;SET OVERRUN ERR BIT
1488  012552  032777  001000  023354          BIT     #B09,@TSR               ;IS IT SET?
1489  012560  001014                          BNE     XH7
1490  012562                                  ERROR   \N              ;ERROR:CANNOT SET TSR BIT 09
 (1)                                                                  ;******* ERROR 72 *******
 (1)  012562  032777  040000  017620          BIT     #B14,@SR
 (1)  012570  001005                          BNE     .+14
 (1)  012572  012767  000072  020042          MOV     #72,ERRNUM
 (1)  012600  004767  017610                  JSR     PC,ERR
 (1)          000073                  N       =       N+1
1491  012604                                  SCOPE   XH6
 (1)  012604  004567  171416                  JSR     R5,SCPRTN
 (1)  012610  012532                          XH6
1492  012612  032777  100000  023314  XH7:    BIT     #B15,@TSR               ;IS ERROR BIT SET (BIT 15)
1493  012620  001014                          BNE     XH8
1494  012622                                  ERROR   \N              ;ERROR:OVERRUN DID NOT SET ERROR BIT 15 IN TSR
 (1)                                                                  ;******* ERROR 73 *******
```

```
  (1)  012622  032777  040000  017560          BIT     #B14,@SR
  (1)  012630  001005                          BNE     .+14
  (1)  012632  012767  000073  020002          MOV     #73,ERRNUM
  (1)  012640  004767  017550                  JSR     PC,ERR
  (1)          000074                  N       =       N+1
1495   012644                                  SCOPE   XH6
  (1)  012644  004567  171356                  JSR     R5,SCPRTN
  (1)  012650  012532                          XH6
1496   012652  032777  020000  023252  XH8:    BIT     #B13,@TCR               ;IS SND WD CLR?
1497   012660  001414                          BEQ     XH8A
1498   012662                                  ERROR   \N              ;ERROR:TSR BIT 15 DID NOT CAUSE INTR REQ
  (1)                                                                   ;******* ERROR 74 *******
  (1)  012662  032777  040000  017520          BIT     #B14,@SR
  (1)  012670  001005                          BNE     .+14
  (1)  012672  012767  000074  017742          MOV     #74,ERRNUM
  (1)  012700  004767  017510                  JSR     PC,ERR
  (1)          000075                  N       =       N+1
1499   012704                                  SCOPE   XH6
  (1)  012704  004567  171316                  JSR     R5,SCPRTN
  (1)  012710  012532                          XH6
1500   012712                          XH8A:   BDINIT  XMTR                    ;CLEAR ALL IN XMTR
1501   012720  012777  000000  023210          MOV     #0,@TSDB                ;LOAD A WORD INTO SILO
1502   012726  032777  001000  023200          BIT     #B09,@TSR               ;IS OVERRUN SET??
1503   012734  001414                          BEQ     XH9
1504   012736                                  ERROR   \N              ;ERROR:LOADING EMPTY SILO GIVES OVERRUN ERROR
  (1)                                                                   ;******* ERROR 75 *******
  (1)  012736  032777  040000  017444          BIT     #B14,@SR
  (1)  012744  001005                          BNE     .+14
  (1)  012746  012767  000075  017666          MOV     #75,ERRNUM
  (1)  012754  004767  017434                  JSR     PC,ERR
  (1)          000076                  N       =       N+1
1505   012760                                  SCOPE   XH8A
  (1)  012760  004567  171242                  JSR     R5,SCPRTN
  (1)  012764  012712                          XH8A
1506   012766  005077  023142          XH9:    CLR     @TSR
1507   012772  052777  002000  023134          BIS     #B10,@TSR               ;SET TIMEOUT BIT IN TSR
1508   013000  032777  002000  023126          BIT     #B10,@TSR               ;IS IT SET?
1509   013006  001014                          BNE     XH10
1510   013010                                  ERROR   \N              ;ERROR:CANNOT SET TSR BIT 10
  (1)                                                                   ;******* ERROR 76 *******
  (1)  013010  032777  040000  017372          BIT     #B14,@SR
  (1)  013016  001005                          BNE     .+14
  (1)  013020  012767  000076  017614          MOV     #76,ERRNUM
  (1)  013026  004767  017362                  JSR     PC,ERR
  (1)          000077                  N       -       N+1
1511   013032                                  SCOPE   XH9
  (1)  013032  004567  171170                  JSR     R5,SCPRTN
  (1)  013036  012766                          XH9
1512   013040  032777  100000  023066  XH10:   BIT     #B15,@TSR               ;IS ERROR BIT SET?
1513   013046  001014                          BNE     XH11
1514   013050                                  ERROR   \N              ;ERROR:TIMEOUT DID NOT SET TSR BIT 15
  (1)                                                                   ;******* ERROR 77 *******
  (1)  013050  032777  040000  017332          BIT     #B14,@SR
  (1)  013056  001005                          BNE     .+14
  (1)  013060  012767  000077  017554          MOV     #77,ERRNUM
  (1)  013066  004767  017322                  JSR     PC,ERR
```

```
  (1)           000100                      N       =       N+1
 1515   013072                                      SCOPE   XH9
  (1)   013072  004567  171130                      JSR     R5,SCPRTN
  (1)   013076  012766                              XH9
 1516   013100  005077  023030          XH11:       CLR     @TSR                    ;CLR TSR
 1517   013104  052777  004000  023022              BIS     #B11,@TSR               ;SET MST DWN
 1518   013112  032777  004000  023014              BIT     #B11,@TSR               ;IS IT SET?
 1519   013120  001014                              BNE     XH12
 1520   013122                                      ERROR   \N              ;ERROR:CANNOT SET TSR BIT 11
  (1)                                                                               ;******* ERROR 100 *******
  (1)   013122  032777  040000  017260              BIT     #B14,@SR
  (1)   013130  001005                              BNE     .+14
  (1)   013132  012767  000100  017502              MOV     #100,ERRNUM
  (1)   013140  004767  017250                      JSR     PC,ERR
  (1)           000101                      N       =       N+1
 1521   013144                                      SCOPE   XH11
  (1)   013144  004567  171056                      JSR     R5,SCPRTN
  (1)   013150  013100                              XH11
 1522   013152  032777  100000  022754  XH12:       BIT     #B15,@TSR               ;IS ERROR BIT SET?
 1523   013160  001014                              BNE     XH13
 1524   013162                                      ERROR   \N              ;ERROR:MST DWN DIDN'T SET TSR BIT 15
  (1)                                                                               ;******* ERROR 101 *******
  (1)   013162  032777  040000  017220              BIT     #B14,@SR
  (1)   013170  001005                              BNE     .+14
  (1)   013172  012767  000101  017442              MOV     #101,ERRNUM
  (1)   013200  004767  017210                      JSR     PC,ERR
  (1)           000102                      N       =       N+1
 1525   013204                                      SCOPE   XH11
  (1)   013204  004567  171016                      JSR     R5,SCPRTN
  (1)   013210  013100                              XH11
 1526   013212  005077  022716          XH13:       CLR     @TSR
 1527   013216  052777  010000  022710              BIS     #B12,@TSR               ;SET TXM ERR
 1528   013224  032777  010000  022702              BIT     #B12,@TSR               ;IS IT SET?
 1529   013232  001014                              BNE     XH14
 1530   013234                                      ERROR   \N              ;ERROR:CANNOT SET TSR BIT 12
  (1)                                                                               ;******* ERROR 102 *******
  (1)   013234  032777  040000  017146              BIT     #B14,@SR
  (1)   013242  001005                              BNE     .+14
  (1)   013244  012767  000102  017370              MOV     #102,ERRNUM
  (1)   013252  004767  017136                      JSR     PC,ERR
  (1)           000103                      N       =       N+1
 1531   013256                                      SCOPE   XH13
  (1)   013256  004567  170744                      JSR     R5,SCPRTN
  (1)   013262  013212                              XH13
 1532   013264  032777  100000  022642  XH14:       BIT     #B15,@TSR               ;IS ERROR BIT SET?
 1533   013272  001014                              BNE     XH15
 1534   013274                                      ERROR   \N              ;ERROR:TXM ERR DIDN'T SET TSR BIT 15
  (1)                                                                               ;******* ERROR 103 *******
  (1)   013274  032777  040000  017106              BIT     #B14,@SR
  (1)   013302  001005                              BNE     .+14
  (1)   013304  012767  000103  017330              MOV     #103,ERRNUM
  (1)   013312  004767  017076                      JSR     PC,ERR
  (1)           000104                      N       =       N+1
 1535   013316                                      SCOPE   XH13
  (1)   013316  004567  170704                      JSR     R5,SCPRTN
  (1)   013322  013212                              XH13
```

```
 1536  013324  005077  022604          XH15:   CLR     @TSR
 1537  013330  052777  020000  022576          BIS     #B13,@TSR               ;SET MEM OFL
 1538  013336  032777  020000  022570          BIT     #B13,@TSR               ;IS IT SET?
 1539  013344  001014                          BNE     XH16
 1540  013346                                  ERROR   \N              ;ERROR:CANNOT SET TSR BIT 13
  (1)                                                                    ;******* ERROR 104 *******
  (1)  013346  032777  040000  017034          BIT     #B14,@SR
  (1)  013354  001005                          BNE     .+14
  (1)  013356  012767  000104  017256          MOV     #104,ERRNUM
  (1)  013364  004767  017024                  JSR     PC,ERR
  (1)          000105                  N       =       N+1
 1541  013370                                  SCOPE   XH15
  (1)  013370  004567  170632                  JSR     R5,SCPRTN
  (1)  013374  013324                          XH15
 1542  013376  032777  100000  022530  XH16:   BIT     #B15,@TSR               ;IS ERROR BIT SET?
 1543  013404  001014                          BNE     XH17
 1544  013406                                  ERROR   \N              ;ERROR:MEM OFL DIDN'T SET TSR BIT 15
  (1)                                                                    ;******* ERROR 105 *******
  (1)  013406  032777  040000  016774          BIT     #B14,@SR
  (1)  013414  001005                          BNE     .+14
  (1)  013416  012767  000105  017216          MOV     #105,ERRNUM
  (1)  013424  004767  016764                  JSR     PC,ERR
  (1)          000106                  N       =       N+1
 1545  013430                                  SCOPE   XH15
  (1)  013430  004567  170572                  JSR     R5,SCPRTN
  (1)  013434  013324                          XH15
```

```
1547                                        ;ERROR GENERATION TESTS
1548
1549  013436                                XH17:   BDINIT  XMTR            ;CLEAR BOARD
1550  013444  012777  177774  022466              MOV     #-4,@TSBC       ;SET UP TO GENERATE NXM ERR
1551  013452  012777  160000  022462              MOV     #160000,@TSBA   ;LOAD NON-EXST ADDR INTO TSBA
1552  013460  052777  040060  022444              BIS     #40060,@TCR     ;START NPR AND SET EXT ADD BITS
1553  013466  000240                              NOP
1554  013470  000240                              NOP
1555  013472  005777  022442                      TST     @TSBC           ;DID BYTE COUNT GO TO 0 ?
1556  013476  001014                              BNE     XH18
1557  013500                                      ERROR   \N      ;ERROR:TXM NPR COMPL TO NEX ADDRESS
 (1)                                                          ;******* ERROR 106 *******
 (1)  013500  032777  040000  016702              BIT     #B14,@SR
 (1)  013506  001005                              BNE     .+14
 (1)  013510  012767  000106  017124              MOV     #106,ERRNUM
 (1)  013516  004767  016672                      JSR     PC,ERR
 (1)          000107                      N       =       N+1
1558  013522                                      SCOPE   XH17
 (1)  013522  004567  170500                      JSR     R5,SCPRTN
 (1)  013526  013436                              XH17
1559  013530  032777  040000  022376  XH18:       BIT     #B14,@TSR       ;NOW CHECK NXL ERR BIT
1560  013536  001014                              BNE     XH19
1561  013540                                      ERROR   \N      ;ERROR:NPR TO NON-EXST ADDR DIDN'T SET NXL ERR
 (1)                                                          ;******* ERROR 107 *******
 (1)  013540  032777  040000  016642              BIT     #B14,@SR
 (1)  013546  001005                              BNE     .+14
 (1)  013550  012767  000107  017064              MOV     #107,ERRNUM
 (1)  013556  004767  016632                      JSR     PC,ERR
 (1)          000110                      N       =       N+1
1562  013562                                      SCOPE   XH17
 (1)  013562  004567  170440                      JSR     R5,SCPRTN
 (1)  013566  013436                              XH17
1563  013570  032777  100000  022336  XH19:       BIT     #B15,@TSR       ;IS ERROR BIT (15) SET?
1564  013576  001014                              BNE     XH20
1565  013600                                      ERROR   \N      ;ERROR:NXL ERR DIDN'T SET TSR BIT 15
 (1)                                                          ;******* ERROR 110 *******
 (1)  013600  032777  040000  016602              BIT     #B14,@SR
 (1)  013606  001005                              BNE     .+14
 (1)  013610  012767  000110  017024              MOV     #110,ERRNUM
 (1)  013616  004767  016572                      JSR     PC,ERR
 (1)          000111                      N       =       N+1
1566  013622                                      SCOPE   XH17
 (1)  013622  004567  170400                      JSR     R5,SCPRTN
 (1)  013626  013436                              XH17
1567  013630                                XH20:   BDINIT  XMTR            ;CLEAR BOARD
1568  013636  016777  177774  022272  XH20L:     MOV     XH20L,@TSDB     ;FILL THE SILO WITH GARBAGE
1569  013644  000240                              NOP
1570  013646  000240                              NOP
1571  013650  032777  000400  022256              BIT     #B08,@TSR       ;SILO INPUT READY?
1572  013656  001367                              BNE     XH20L           ;IF YES, KEEP LOADING
1573  013660  016777  177752  022250              MOV     XH20L,@TSDB     ;NO,SILO FULL;LOAD 1 MORE WORD
1574  013666  032777  001000  022240              BIT     #B09,@TSR       ;IS TSR BIT 9 SET?
1575  013674  001014                              BNE     XH21
1576  013676                                      ERROR   \N      ;ERROR:LOADING FULL SILO DIDN'T SET TSR-09
 (1)                                                          ;******* ERROR 111 *******
 (1)  013676  032777  040000  016504              BIT     #B14,@SR
```

```
   (1) 013704 001005                    BNE     .+14
   (1) 013706 012767 000111 016726      MOV     #111,ERRNUM
   (1) 013714 004767 016474             JSR     PC,ERR
   (1)        000112            N       =       N+1
 1577 013720                            SCOPE   XH20L
   (1) 013720 004567 170302             JSR     R5,SCPRTN
   (1) 013724 013636                    XH20L
 1578 013726                    XH21:   BDINIT  XMTR                    ;CLEAR BOARD
 1579 013734 052777 120000 022170       BIS     #120000,@TCR            ;SET SND WD & RIB
 1580 013742 016702 016444              MOV     DLCON,R2
 1581 013746 005003             XH21A:  CLR     R3                      ;R3 AND R4 ARE COUNTERS
 1582 013750 012704 177773              MOV     #-5,R4
 1583 013754 032777 002000 022152 XH22:  BIT     #B10,@TSR               ;IS TIMEOUT SET?
 1584 013762 001022                     BNE     XH22A
 1585 013764 005203                     INC     R3                      ;WATCH IT FOR A SEC
 1586 013766 001372                     BNE     XH22
 1587 013770 005204                     INC     R4
 1588 013772 001370                     BNE     XH22
 1589 013774 005302                     DEC     R2
 1590 013776 001363                     BNE     XH21A
 1591 014000                            ERROR   \N              ;ERROR:NO TIMEOUT IN A SECOND
   (1)                                                          ;******* ERROR 112 *******
   (1) 014000 032777 040000 016402      BIT     #B14,@SR
   (1) 014006 001005                    BNE     .+14
   (1) 014010 012767 000112 016624      MOV     #112,ERRNUM
   (1) 014016 004767 016372             JSR     PC,ERR
   (1)        000113            N       =       N+1
 1592 014022                            SCOPE   XH21
   (1) 014022 004567 170200             JSR     R5,SCPRTN
   (1) 014026 013726                    XH21
 1593 014030                    XH22A:  BDINIT  XMTR                    ;CLR XMTR
 1594 014036 105077 022104              CLRB    @TMMRH                  ;CLEAR MASTER
 1595 014042 012777 177777 022066       MOV     #-1,@TSDB               ;LOAD A WORD INTO XMTR DATA SILO
 1596 014050 004567 170472              JSR     R5,DELAY                ;WAIT FOR MIGRATION
 1597 014054 000010                     .WORD   10
 1598 014056 052777 120000 022046       BIS     #120000,@TCR            ;SET RIB AND SND WORD
 1599 014064 004567 170456              JSR     R5,DELAY
 1600 014070 000010                     .WORD   10
 1601 014072 032777 004000 022034       BIT     #B11,@TSR               ;CHECK FOR MASTER DOWN
 1602 014100 001014                     BNE     XH23            ;ERROR:ATTEMPT TO SEND WORD WITH MASTER CLEAR
 1603 014102                            ERROR   \N                      ;DID NOT SET MASTER DOWN
   (1)                                                          ;******* ERROR 113 *******
   (1) 014102 032777 040000 016300      BIT     #B14,@SR
   (1) 014110 001005                    BNE     .+14
   (1) 014112 012767 000113 016522      MOV     #113,ERRNUM
   (1) 014120 004767 016270             JSR     PC,ERR
   (1)        000114            N       =       N+1
 1604 014124                            SCOPE   XH22A
   (1) 014124 004567 170076             JSR     R5,SCPRTN
   (1) 014130 014030                    XH22A
 1605 014132                    XH23:   BDINIT  XMTR
 1606 014140 004767 015526              JSR     PC,MONIT
 1607 014144 032777 010000 016236       BIT     #B12,@SR                ;IS SW 12 = 1?
 1608 014152 001402                     BEQ     XHRT
 1609 014154 000167 175740              JMP     TSRTST                  ;IF SO, TRY THIS TEST OVER
 1610 014160 000207             XHRT:   RTS     PC
```

```
1612                                            .SBTTL  INTERRUPT TEST
1613
1614                                            ;TRANSMITTER INTERRUPT TEST
1615
1616  014162                                    INTST:  MTPS    #P7                     ;DIS-ALLOW INTERRUPT
  (1) 014162  012737  000340  177776                    MOV     #P7,@#PS
1617  014170                                            BDINIT  XMTR                    ;CLR THE BOARD
1618  014176  016700  021720                           MOV     TXVEC,R0
1619  014202  012760  000340  000002                   MOV     #340,2(R0)              ;SET NEW PS = P7
1620  014210  012777  014240  021704                   MOV     #ERRINT,@TXVEC          ;SET-UP FOR ERROR INTERRUPT
1621  014216  052777  000100  021706                   BIS     #B06,@TCR               ;SET INTERRUPT ENABLE
1622  014224                                            MTPS    #0                      ;ALLOW INTERRUPT
  (1) 014224  012737  000000  177776                    MOV     #0,@#PS
1623  014232  000240                                   NOP
1624  014234  000167  000046                           JMP     XJ0                     ;SKIP ERROR IF NO INTERRUPT
1625  014240                                    ERRINT: MTPS    #P7                     ;INTERRUPT OFF
  (1) 014240  012737  000340  177776                    MOV     #P7,@#PS
1626  014246  022626                                   CMP     (SP)+,(SP)+             ;CORRECT STACK
1627  014250  042777  000100  021654                   BIC     #B06,@TCR               ;CLR INTERRUPT ENABLE
1628  014256                                            ERROR   \N              ;ERROR:ERRONEOUS INTERRUPT;NO FLAGS SET
  (1)                                                                               ;******* ERROR 114 *******
  (1) 014256  032777  040000  016124                    BIT     #B14,@SR
  (1) 014264  001005                                    BNE     .+14
  (1) 014266  012767  000114  016346                    MOV     #114,ERRNUM
  (1) 014274  004767  016114                            JSR     PC,ERR
  (1)         000115                        N           =       N+1
1629  014300                                            SCOPE   INTST
  (1) 014300  004567  167722                            JSR     R5,SCPRTN
  (1) 014304  014162                                    INTST
1630  014306  005067  021602                   XJ0:    CLR     TMPRIO                  ;START WITH C.P. AT PRIORITY 0
1631  014312  012777  014566  021602                   MOV     #INTA,@TXVEC            ;SET VECTOR FOR GOOD INTERRUPT
1632  014320                                    XJ1:    MTPS    #P7                     ;INTERRUPT OFF
  (1) 014320  012737  000340  177776                    MOV     #P7,@#PS
1633  014326  052777  000100  021576                   BIS     #B06,@TCR               ;ENABLE XMTR INTERRUPT
1634  014334  052777  000200  021572                   BIS     #B07,@TSR               ;FORCE INTR WITH SUCC XFER
1635  014342                                            MTPS    TMPRIO                  ;ALLOW INTERRUPT
  (1) 014342  016737  021546  177776                    MOV     TMPRIO,@#PS
1636  014350  000240                                   NOP
1637  014352  000240                                   NOP                             ;WAIT FOR IT
1638  014354  005767  021534                           TST     TMPRIO                  ;IS PSW = 0?
1639  014360  001014                                   BNE     XJ2
1640  014362                                            ERROR   \N              ;ERROR:NO INTERRUPT FROM TRANSMITTER
  (1)                                                                               ;******* ERROR 115 *******
  (1) 014362  032777  040000  016020                    BIT     #B14,@SR
  (1) 014370  001005                                    BNE     .+14
  (1) 014372  012767  000115  016242                    MOV     #115,ERRNUM
  (1) 014400  004767  016010                            JSR     PC,ERR
  (1)         000116                        N           =       N+1
1641  014404                                            SCOPE   INTST
  (1) 014404  004567  167616                            JSR     R5,SCPRTN
  (1) 014410  014162                                    INTST
1642  014412  026767  021510  021474           XJ2:    CMP     XPRIO,TMPRIO            ;HAVE WE REACHED EXPECTED PRIORITY?
1643  014420  001414                                   BEQ     XJ3
1644  014422                                            ERROR   \N              ;ERROR:DEVICE NOT JUMPERED TO EXPECTED PRIORITY
  (1)                                                                               ;******* ERROR 116 *******
  (1) 014422  032777  040000  015760                    BIT     #B14,@SR
```

```
  (1)  014430  001005                          BNE     .+14
  (1)  014432  012767  000116  016202          MOV     #116,ERRNUM
  (1)  014440  004767  015750                  JSR     PC,ERR
  (1)          000117                  N       =       N+1
 1645  014444                                  SCOPE   INTST
  (1)  014444  004567  167556                  JSR     R5,SCPRTN
  (1)  014450  014162                          INTST
 1646  014452  022767  000340  021434  XJ3:    CMP     #340,TMPRIO             ;IS PSW - 7?
 1647  014460  001426                          BEQ     XJ4
 1648  014462                                  BDINIT  XMTR
 1649  014470  062767  000040  021416          ADD     #40,TMPRIO
 1650  014476  012777  014610  021416  XJ3S:   MOV     #INTB,@TXVEC            ;SET VECTOR FOR ERROR INTR.
 1651  014504  052777  000100  021420          BIS     #B06,@TCR               ;ENABLE XMTR INTERRUPT
 1652  014512  052777  000200  021414          BIS     #B07,@TSR               ;FORCE INTERRUPT REQUEST
 1653  014520                                  MTPS    TMPRIO                  ;SET CP TO NEXT PRIORITY
  (1)  014520  016737  021370  177776          MOV     TMPRIO,@#PS
 1654  014526  000240                          NOP
 1655  014530  000240                          NOP                             ;WAIT FOR POSSIBLE INTERRUPT
 1656  014532  000167  177714                  JMP     XJ3
 1657  014536                          XJ4:    BDINIT  XMTR                    ;CLEAR BOARD
 1658  014544  004767  015122                  JSR     PC,MONIT
 1659  014550  032777  010000  015632          BIT     #B12,@SR                ;SW 12 - 1?
 1660  014556  001402                          BEQ     XJRT
 1661  014560  000167  177376                  JMP     INTST                   ;YES, DO TEST OVER
 1662  014564  000207                  XJRT:   RTS     PC                      ;NO, LEAVE THIS TEST
 1663
 1664  014566                          INTA:   BDINIT  XMTR                    ;CLR INTERRUPT ETC
 1665  014574  062767  000040  021312          ADD     #40,TMPRIO              ;INCR TEMP PRIORITY
 1666  014602  022626                          CMP     (SP)+,(SP)+             ;CORRECT STACK POINTER
 1667  014604  000167  177510                  JMP     XJ1                     ;TRY AGAIN
 1668
 1669  014610  022626                  INTB:   CMP     (SP)+,(SP)+             ;CORRECT STACK
 1670  014612                                  ERROR   \N              ;ERROR:GOT INTR WHEN C.P. AT HIGHER PRIORITY
  (1)                                                                     ;******* ERROR 117 *******
  (1)  014612  032777  040000  015570          BIT     #B14,@SR
  (1)  014620  001005                          BNE     .+14
  (1)  014622  012767  000117  016012          MOV     #117,ERRNUM
  (1)  014630  004767  015560                  JSR     PC,ERR
  (1)          000120                  N       =       N+1
 1671  014634                                  SCOPE   XJ3S
  (1)  014634  004567  167366                  JSR     R5,SCPRTN
  (1)  014640  014476                          XJ3S
 1672  014642  000167  177604                  JMP     XJ3
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                                        .SBTTL  C.R.C. CHECK

                                        ;CYCLIC REDUNDANCY CHECK CHARACTER TEST

014646                          CRCTST: BDINIT  XMTR                    ;CLEAR BOARD
014654  012777  177600  021256        MOV     #-128.,@TSBC            ;SET UP BYTE COUNT TO FILL SILO
014662  012777  033564  021252        MOV     #SILDAT,@TSBA
014670  052777  040000  021234        BIS     #B14,@TCR               ;START NPR
014676  005777  021236          XK1:  TST     @TSBC                   ;IS BYTE COUNT 0?
014702  001375                        BNE     XK1                     ;WAIT FOR NPR TO FINISH
014704  032777  040000  021220        BIT     #B14,@TCR               ;NOW CHECK      TX NPR BIT
014712  001414                        BEQ     XK2
014714                              1 ERROR   \N                ;ERROR:TX NPR NOT CLR'D BY TSBC OFL
                                    (1)                             ;******* ERROR 120 *******
014714  032777  040000  015466      (1) BIT     #B14,@SR
014722  001005                      (1) BNE     .+14
014724  012767  000120  015710      (1) MOV     #120,ERRNUM
014732  004767  015456              (1) JSR     PC,ERR
000121                          N       -       N+1
014736                              1 SCOPE   CRCTST
014736  004567  167264              (1) JSR     R5,SCPRTN
014742  014646                      (1) CRCTST
014744  052777  000200  021160  XK2:  BIS     #B07,@TCR               ;SET RD SILO BIT
014752  012767  177700  021130        MOV     #-64.,COUNT             ;COUNT READS
014760  012704  033764                MOV     #SILCRC,R4              ;R4 POINTS TO GOOD CRC'S
014764  000240                  XK3:  NOP
014766  017767  021156  015650        MOV     @TSCRC,BAD              ;GET CRC CHAR FOR LAST SILO WORD
014774  017703  021136                MOV     @TSDB,R3                ;R3 HOLDS SILO DATA WORD
015000  011467  015642                MOV     (R4),GOOD               ;GET GOOD CRC FROM BUFFER
015004  026767  015636  015632        CMP     GOOD,BAD                ;IS CRC OK?
015012  001427                        BEQ     XK4
015014  032777  040000  015366        BIT     #B14,@SR                ;PRINT ALLOWED?
015022  001020                        BNE     XK3S                    ;IF NOT, SKIP IT
015024                              1 PNTM    SLOWD                   ;PRINT "SILO OUTPUT WORD WAS "
015024  012700  034364              (1) MOV     #SLOWD,R0               ;PRINT MESSAGE
015030  004767  015614              (1) JSR     PC,TYPOUT               ;POINTED TO BY SLOWD
015034  010300                      1 MOV     R3,R0
015036  004767  016124              1 JSR     PC,OCTPNT               ;PRINT SILO DATA WORD
015042                              1 DATERR  \N                ;ERROR:BAD CRC FOR ABOVE WORD
                                    (1)                             ;******* ERROR 121 *******
015042  032777  040000  015340      (1) BIT     #B14,@SR
015050  001005                      (1) BNE     .+14
015052  012767  000121  015562      (1) MOV     #121,ERRNUM
015060  004767  015414              (1) JSR     PC,DERR
000122                          N       =       N+1
015064                          XK3S: SCOPE   CRCTST
015064  004567  167136              (1) JSR     R5,SCPRTN
015070  014646                      (1) CRCTST
015072  062704  000002          XK4:  ADD     #2,R4                   ;UPDATE CRC POINTER
015076  005267  021006                INC     COUNT                   ;HAVE WE CHECKED 64 WORDS?
015102  001330                        BNE     XK3                     ;NO, CONTINUE
015104  004767  014562                JSR     PC,MONIT
015110  032777  010000  015272        BIT     #B12,@SR                ;CHECK SW 12
015116  001402                        BEQ     XKRT                    ;IF CLR, EXIT
015120  000167  177522                JMP     CRCTST                  ;IF SET STAY
015124                          XKRT: BDINIT  XMTR
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1712  015132  000207                        RTS     PC
1713
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                                        .SBTTL RECEIVER TESTS

                                        ;TEST 2: RECEIVER TESTS
                                        ;  (00) RESET TEST
                                        ;  (01) RCR REG TEST
                                        ;  (02) RDBC REG TEST
                                        ;  (03) RDBA REG TEST
                                        ;  (04) DATA SILO TESTS
                                        ;  (05) RSR & ERRORS TESTS
                                        ;  (06) INTERRUPT TEST
                                        ;  (07) C.R.C. TEST

            000200                      N       =       200                 ;RECEIVER ERRORS START AT 200

015134                                  TEST2:  MTPS    #P7
 (1)  015134  012737  000340  177776            MOV     #P7,@#PS
015142  012767  000010  020706                  MOV     #10,ITER            ;INITIAL ITERATION OF 10 PER PASS
015150  004767  014516                          JSR     PC,MONIT
 033  015154  032777  002000  015226            BIT     #B10,@SR            ;CHECK SW 10
015162  001420                                  BEQ     LOOPR               ;IF 0, RUN SEQUENTIALLY
015164  017767  015220  020666                  MOV     @SR,SWI         ;IF SET, GET TEST # FROM SWR
015172  042767  177770  020660                  BIC     #-10,SWI            ;MASK LOW DIGIT
015200  000241                                  CLC                         ;CLR C BIT BEFORE ROTATE
015202  006167  020652                          ROL     SWI
015206  006167  020646                          ROL     SWI                 ;MULTIPLY BY 4
015212  062767  015224  020640                  ADD     #LOOPR,SWI          ;GENERATE OFFSET
015220  000177  020634                          JMP     @SWI                ;GO TO SELECTED TEST
015224  004767  000142                  LOOPR:  JSR     PC,RINIT            ;DO INITIAL CLEAR TEST
015230  004767  000476                          JSR     PC,RCRTST           ;DO RCR REG TEST
015234  004767  001176                          JSR     PC,RBCTST           ;DO BYTE COUNT REG TEST
015240  004767  001354                          JSR     PC,RBATST           ;DO BYTE ADDR REG TEST
015244  004767  001532                          JSR     PC,SLOTST           ;DO RECVR DATA SILO TEST
015250  004767  003056                          JSR     PC,RSRTST           ;DO RSR REG & ERRORS TEST
015254  004767  004646                          JSR     PC,RINTST           ;DO INTERRUPT TEST
015260  004767  005360                          JSR     PC,RCRCTS           ;DO RCVR CRC GENERATION TEST
015264  032777  004000  015116                  BIT     #B11,@SR            ;CHECK SW 11
015272  001003                                  BNE     REND                ;PRINT END IF SET
015274  005367  020556                          DEC     ITER                ;OTHERWISE, REITERATE
015300  001351                                  BNE     LOOPR
015302  005767  020574                  REND:   TST     $4FLAG              ;CAN WE PRINT END PASS?
015306  001030                                  BNE     REPEET              ;NO, LEAVE
015310  005267  020554                          INC     PSNO2               ;UPDATE PASS NO.
015314                                          PNTM    PEND                ;PRINT 'END PASS # ''
 (1)  015314  012700  034443                    MOV     #PEND,R0            ;PRINT MESSAGE
 (1)  015320  004767  015324                    JSR     PC,TYPOUT           ;POINTED TO BY PEND
015324  016700  020540                          MOV     PSNO2,R0
015330  004767  015736                          JSR     PC,DECPNT           ;PRINT PASS NO.
015334  012700  000040                          MOV     #40,R0
015340  004767  016126                          JSR     PC,TTO              ;PRINT A SPACE
015344  012700  000101                          MOV     #101,R0
015350  004767  016116                          JSR     PC,TTO              ;PRINT "A" (TO INDICATE RCVR TST)
015354  005000                                  CLR     R0
015356  004767  016110                          JSR     PC,TTO
015362  005000                                  CLR     R0
015364  004767  016102                          JSR     PC,TTO              ;NULLS IN CASE RESET FOLLOWS
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 1768  015370  000207                 REPEET: RTS     PC                      ;RETURN
```

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                                        .SBTTL  INITIALIZE TEST

                                        ;CHECK INITIAL CONDITIONS AFTER RESET

015372  000005                  RINIT:  RESET                           ;CLEAR THE WORLD
015374  017767  020560  015242        MOV     @RDBC,BAD               ;GET BYTE COUNT REG
015402  005067  015240                CLR     GOOD
015406  005767  015232                TST     BAD                     ;WAS RDBC 0?
015412  001414                        BEQ     RA1
015414                                DATERR  \N              ;ERROR:RDBC NOT CLR'D BY RESET
(1)                                                             ;******* ERROR 200 *******
(1)     015414  032777  040000  014766        BIT     #B14,@SR
(1)     015422  001005                BNE     .+14
(1)     015424  012767  000200  015210        MOV     #200,ERRNUM
(1)     015432  004767  015042                JSR     PC,DERR
(1)             000201                  N       =       N+1
015436                                  SCOPE   RINIT
(1)     015436  004567  166564                JSR     R5,SCPRTN
(1)     015442  015372                        RINIT
015444  017767  020512  015172  RA1:  MOV     @RDBA,BAD               ;GET BYTE ADDRESS REG
015452  005067  015170                CLR     GOOD
015456  005767  015162                TST     BAD                     ;WAS RDBA 0?
015462  001414                        BEQ     RA2
015464                                DATERR  \N              ;ERROR:RDBA NOT CLR'D BY RESET
(1)                                                             ;******* ERROR 201 *******
(1)     015464  032777  040000  014716        BIT     #B14,@SR
(1)     015472  001005                BNE     .+14
(1)     015474  012767  000201  015140        MOV     #201,ERRNUM
(1)     015502  004767  014772                JSR     PC,DERR
(1)             000202                  N       =       N+1
015506                                  SCOPE   RINIT
(1)     015506  004567  166514                JSR     R5,SCPRTN
(1)     015512  015372                        RINIT
015514  017767  020432  015122  RA2:  MOV     @RCR,BAD                ;GET RCR REGISTER
015522  012767  000010  015116        MOV     #10,GOOD                ;SET UP GOOD FOR COMPARE
015530  026767  015112  015106        CMP     GOOD,BAD
015536  001414                        BEQ     RA3
015540                                DATERR  \N              ;ERROR:RCR NOT INITIALIZED BY RESET
(1)                                                             ;******* ERROR 202 *******
(1)     015540  032777  040000  014642        BIT     #B14,@SR
(1)     015546  001005                BNE     .+14
(1)     015550  012767  000202  015064        MOV     #202,ERRNUM
(1)     015556  004767  014716                JSR     PC,DERR
(1)             000203                  N       =       N+1
015562                                  SCOPE   RINIT
(1)     015562  004567  166440                JSR     R5,SCPRTN
(1)     015566  015372                        RINIT
015570  017767  020370  015046  RA3:  MOV     @RDCRC,BAD              ;GET CRC REG
015576  005067  015044                CLR     GOOD
015602  005767  015036                TST     BAD                     ;IS CRC REG 0?
015606  001414                        BEQ     RA4
015610                                DATERR  \N              ;ERROR:RCVR CRC NOT CLR'D BY RESET
(1)                                                             ;******* ERROR 203 *******
(1)     015610  032777  040000  014572        BIT     #B14,@SR
(1)     015616  001005                BNE     .+14
(1)     015620  012767  000203  015014        MOV     #203,ERRNUM
```

```
  (1)  015626  004767  014646              JSR     PC,DERR
  (1)          000204              N       =       N+1
1798   015632                              SCOPE   RINIT
  (1)  015632  004567  166370              JSR     R5,SCPRTN
  (1)  015636  015372                      RINIT
1799   015640  017767  020310  014776  RA4:MOV     @RSR,BAD                ;GET RSR REG
1800   015646  005067  014774              CLR     GOOD
1801   015652  005767  014766              TST     BAD                     ;IS RSR REG 0?
1802   015656  001414                      BEQ     RA5
1803   015660                              DATERR  \N                  ;ERROR:RSR REG NOT CLR'D BY RESET
  (1)                                                                 ;******* ERROR 204 *******
  (1)  015660  032777  040000  014522      BIT     #B14,@SR
  (1)  015666  001005                      BNE     .+14
  (1)  015670  012767  000204  014744      MOV     #204,ERRNUM
  (1)  015676  004767  014576              JSR     PC,DERR
  (1)          000205              N       =       N+1
1804   015702                              SCOPE   RINIT
  (1)  015702  004567  166320              JSR     R5,SCPRTN
  (1)  015706  015372                      RINIT
1805   015710  004767  013756      RA5:    JSR     PC,MONIT
1806   015714  032777  010000  014466      BIT     #B12,@SR                ;CHK SW 12 FOR EXIT VISA
1807   015722  001402                      BEQ     RART
1808   015724  000167  177442              JMP     RINIT                   ;IF SET,STAY IN THIS TEST
1809   015730  000207              RART:   RTS     PC                      ;OTHERWISE, EXIT
```

```
                                                .SBTTL  RCR TEST

                                                ;RECEIVER COMMAND REGISTER TEST

                                        RCRTST: CLR     @RCR                    ;CLEAR RCR REGISTER
                                        RD1:    MOV     #160375,GOOD            ;SET ALL SETTABLE BITS IN RCR
                                                MOV     GOOD,@RCR
                                                MOV     @RCR,BAD                ;AND READ THEM BACK
                                                CMP     GOOD,BAD                ;ALL BITS SET?
                                                BEQ     RD2
                                                DATERR  \N              ;ERROR:CANNOT SET ALL SETTABLE RCR BITS
                                                                                ;******* ERROR 205 *******
                                                BIT     #B14,@SR
                                                BNE     .+14
                                                MOV     #205,ERRNUM
                                                JSR     PC,DERR
                                        N       =       N+1
                                                SCOPE   RD1
                                                JSR     R5,SCPRTN
                                                RD1
                                        RD2:    CLR     GOOD                    ;NOW CLR BITS AFTER SETTING THEM
                                                CLR     @RCR
                                                MOV     @RCR,BAD                ;READ THEM BACK
                                                BIC     #17412,BAD              ;IGNORE R/O BITS
                                                CMP     GOOD,BAD                ;ALL CLR?
                                                BEQ     RD3
                                                DATERR  \N              ;ERROR:CANNOT CLR ALL RCR BITS
                                                                                ;******* ERROR 206 *******
                                                BIT     #B14,@SR
                                                BNE     .+14
                                                MOV     #206,ERRNUM
                                                JSR     PC,DERR
                                        N       =       N+1
                                                SCOPE   RD2
                                                JSR     R5,SCPRTN
                                                RD2
                                        RD3:    MOV     #160375,@RCR            ;SET ALL SETTABLE BITS IN RCR
                                                MOV     #-1,@RDBC               ;AND IN RDBC
                                                MOV     #-1,@RDBA               ;AND IN RDBA
                                                MOV     #37200,@RSR             ;AND IN RSR
                                                BIS     #B01,@RCR               ;B O A R D  I N I T
                                                MOV     @RCR,BAD                ;CHECK RCR
                                                MOV     #10,GOOD                ;SEE IF RCR - 10
                                                CMP     GOOD,BAD
                                                BEQ     RD4
                                                DATERR  \N              ;ERROR:RCR NOT INIT'D BY BD INIT
                                                                                ;******* ERROR 207 *******
                                                BIT     #B14,@SR
                                                BNE     .+14
                                                MOV     #207,ERRNUM
                                                JSR     PC,DERR
                                        N       =       N+1
                                                SCOPE   RD3
                                                JSR     R5,SCPRTN
                                                RD3
                                        RD4:    MOV     @RSR,BAD                ;CHECK RSR
```

```
 1843  016224  005067  014416                    CLR     GOOD
 1844  016230  026767  014412  014406            CMP     GOOD,BAD                ;RSR = 0?
 1845  016236  001414                            BEQ     RD5
 1846  016240                                    DATERR  \N              ;ERROR:RSR NOT CLR'D BY BD INIT
  (1)                                                                   ;******* ERROR 210 *******
  (1)   016240  032777  040000  014142            BIT     #B14,@SR
  (1)   016246  001005                            BNE     .+14
  (1)   016250  012767  000210  014364            MOV     #210,ERRNUM
  (1)   016256  004767  014216                    JSR     PC,DERR
  (1)           000211                  N         =       N+1
 1847  016262                                    SCOPE   RD3
  (1)   016262  004567  165740                    JSR     R5,SCPRTN
  (1)   016266  016104                            RD3
 1848  016270  017767  017664  014346  RD5:      MOV     @RDBC,BAD               ;CHECK RDBC
 1849  016276  005067  014344                    CLR     GOOD
 1850  016302  026767  014340  014334            CMP     GOOD,BAD                ;RDBC = 0?
 1851  016310  001414                            BEQ     RD6
 1852  016312                                    DATERR  \N              ;ERROR:RDBC NOT CLR'D BY BD INIT
  (1)                                                                   ;******* ERROR 211 *******
  (1)   016312  032777  040000  014070            BIT     #B14,@SR
  (1)   016320  001005                            BNE     .+14
  (1)   016322  012767  000211  014312            MOV     #211,ERRNUM
  (1)   016330  004767  014144                    JSR     PC,DERR
  (1)           000212                  N         =       N+1
 1853  016334                                    SCOPE   RD3
  (1)   016334  004567  165666                    JSR     R5,SCPRTN
  (1)   016340  016104                            RD3
 1854  016342  017767  017614  014274  RD6:      MOV     @RDBA,BAD               ;CHECK RDBA
 1855  016350  005067  014272                    CLR     GOOD
 1856  016354  026767  014266  014262            CMP     GOOD,BAD                ;RDBA = 0?
 1857  016362  001414                            BEQ     RD7
 1858  016364                                    DATERR  \N              ;ERROR:RDBA NOT CLR'D BY BD INIT
  (1)                                                                   ;******* ERROR 212 *******
  (1)   016364  032777  040000  014016            BIT     #B14,@SR
  (1)   016372  001005                            BNE     .+14
  (1)   016374  012767  000212  014240            MOV     #212,ERRNUM
  (1)   016402  004767  014072                    JSR     PC,DERR
  (1)           000213                  N         =       N+1
 1859  016406                                    SCOPE   RD3
  (1)   016406  004567  165614                    JSR     R5,SCPRTN
  (1)   016412  016104                            RD3
 1860  016414  004767  013252          RD7:      JSR     PC,MONIT
 1861  016420  032777  010000  013762            BIT     #B12,@SR                ;CHECK SW 12
 1862  016426  001402                            BEQ     RDRT
 1863  0 6430  000167  177276                    JMP     RCRTST                  ;STAY IN THIS LOOP IF SW 12 = 1
 1864  016434  000207                  RDRT:     RTS     PC
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                                        .SBTTL  RDBC TEST

                                        ;BYTE COUNT REG DATA TEST

                                RBCTST: BDINIT  RCVR                    ;INIT RCVR MODULE
                                        MOV     #-1,PAT                 ;SET PATTERN
                                        MOV     #B00,MASK               ;SET BIT MASK
                                RB1:    MOV     PAT,GOOD                ;LOAD "GOOD" WITH PATTERN
                                        MOV     GOOD,@RDBC              ;LOAD PATTERN INTO RDBC
                                        MOV     @RDBC,BAD               ;READ RDBC
                                        CMP     GOOD,BAD                ;DATA OK?
                                        BEQ     RB2
                                        DATERR  \N                      .ERROR:BAD DATA IN RDBC
                                                                        ;******* ERROR 213 *******
                                        BIT     #B14,@SR
                                        BNE     .+14
                                        MOV     #213,ERRNUM
                                        JSR     PC,DERR
                                N       =       N+1
                                        SCOPE   RB1
                                        JSR     R5,SCPRTN
                                        RB1
                                RB2:    BIT     #B15,PAT                ;DONE WHOLE REGISTER?
                                        BEQ     RB3                     ;IF YES, DONE
                                        MOV     #-1,PAT
                                        BIC     MASK,PAT                ;NO, PREPARE FOR NEXT BIT
                                        ASL     MASK                    ;ROTATE MASK
                                        JMP     RB1                     ;AND CONTINUE
                                RB3:    JSR     PC,MONIT
                                        BIT     #B12,@SR                ;IF SO, CONSIDER LEAVING
                                        BEQ     RBRT                    ;EXIT IF SW 12 = 0
                                        JMP     RBCTST                  ;STAY HERE IF SW 12 = 1
                                RBRT:   RTS     PC
```

```
                                        .SBTTL  RDBA TEST

                                ;BYTE ADDRESS REG DATA TEST

                        RBATST: BDINIT  RCVR                    ;INIT RECEIVER MODULE
016626  012767  177777  017226        MOV     #-1,PAT           ;SET PATTERN
016634  012767  000001  017222        MOV     #B00,MASK         ;SET BIT MASK
016642  016767  017214  013776  RC1:   MOV     PAT,GOOD          ;LOAD "GOOD" WITH PATTERN
016650  016777  013772  017304        MOV     GOOD,@RDBA        ;LOAD PATTERN INTO RDBA
016656  017767  017300  013760        MOV     @RDBA,BAD         ;READ RDBA
016664  026767  013756  013752        CMP     GOOD,BAD
016672  001414                      BEQ     RC2
016674                              DATERR  \N              ;ERROR:BAD DATA IN RDBA REG
(1)                                                             ;******* ERROR 214 *******
(1)     016674  032777  040000  013506        BIT     #B14,@SR
(1)     016702  001005                      BNE     .+14
(1)     016704  012767  000214  013730        MOV     #214,ERRNUM
(1)     016712  004767  013562              JSR     PC,DERR
(1)             000215                  N       =       N+1
                                        SCOPE   RC1
016716  004567  165304                      JSR     R5,SCPRTN
(1)     016722  016642                      RC1
016724  032767  100000  017130  RC2:   BIT     #B15,PAT          ;DONE WHOLE REGISTER?
016732  001412                      BEQ     RC3               ;IF YES, DONE
016734  012767  177777  017120        MOV     #-1,PAT
016742  046767  017116  017112        BIC     MASK,PAT          ;NO, PREPARE FOR NEXT BIT
016750  006367  017110              ASL     MASK              ;ROTATE MASK
016754  000167  177662              JMP     RC1               ;AND CONTINUE
016760  004767  012706  RC3:   JSR     PC,MONIT
016764  032777  010000  013416        BIT     #B12,@SR          ;EXIT IF SW 12 = 0
016772  001402                      BEQ     RCRT
016774  000167  177620              JMP     RBATST            ;STAY HERE IF SW 12 = 1
017000  000207                  RCRT:   RTS     PC
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 1918                                           .SBTTL  DATA SILO TEST
 1919
 1920                                           ;RECEIVER DATA SILO TEST
 1921
 1922  017002                                   SLOTST: BDINIT  RCVR                    ;CLEAR RCVR MODULE
 1923  017010  004567  165532                           JSR     R5,DELAY
 1924  017014  000010                                   .WORD   10
 1925  017016  032777  000400  017130                   BIT     #B08,@RSR               ;SILO OUTPUT READY?
 1926  017024  001414                                   BEQ     RE1
 1927  017026                                           ERROR   \N              ;ERROR:BD INIT DID NOT CLR SILO
  (1)                                                                                    ;******* ERROR 215 *******
  (1)  017026  032777  040000  013354                   BIT     #B14,@SR
  (1)  017034  001005                                   BNE     .+14
  (1)  017036  012767  000215  013576                   MOV     #215,ERRNUM
  (1)  017044  004767  013344                           JSR     PC,ERR
  (1)          000216                           N       =       N+1
 1928  017050                                           SCOPE   SLOTST
  (1)  017050  004567  165152                           JSR     R5,SCPRTN
  (1)  017054  017002                                   SLOTST
  929  017056  032777  000010  017066  RE1:     BIT     #B03,@RCR               ;SILO INPUT RDY?
 1930  017064  001014                                   BNE     RE2
 1931  017066                                           ERROR   \N              ;ERROR:BD INIT DID NOT SET SILO INPUT RDY
  (1)                                                                                    ;******* ERROR 216 *******
  (1)  017066  032777  040000  013314                   BIT     #B14,@SR
  (1)  017074  001005                                   BNE     .+14
  (1)  017076  012767  000216  013536                   MOV     #216,ERRNUM
  (1)  017104  004767  013304                           JSR     PC,ERR
  (1)          000217                           N       =       N+1
 1932  017110                                           SCOPE   SLOTST
  (1)  017110  004567  165112                           JSR     R5,SCPRTN
  (1)  017114  017002                                   SLOTST
 1933  017116  052777  000200  017026  RE2:     BIS     #B07,@RCR               ;SET LD SILO BIT
 1934  017124  012777  177777  017024                   MOV     #-1,@RDDB               ;LOAD 177777 INTO DATA SILO
 1935  017132  042777  000200  017012                   BIC     #B07,@RCR               ;CLR LD SILO BIT
 1936  017140  004567  165402                           JSR     R5,DELAY
 1937  017144  000010                                   .WORD   10
 1938  017146  032777  000400  017000                   BIT     #B08,@RSR               ;SILO OUTPUT RDY NOW?
 1939  017154  001017                                   BNE     RE3
 1940  017156                                           ERROR   \N              ;ERROR:NO SILO OUTPUT  AFTER LOAD
  (1)                                                                                    ;******* ERROR 217 *******
  (1)  017156  032777  040000  013224                   BIT     #B14,@SR
  (1)  017164  001005                                   BNE     .+14
  (1)  017166  012767  000217  013446                   MOV     #217,ERRNUM
  (1)  017174  004767  013214                           JSR     PC,ERR
  (1)          000220                           N       =       N+1
 1941  017200                                           BDINIT  RCVR                    ;CLR SILO
 1942  017206                                           SCOPE   RE2
  (1)  017206  004567  165014                           JSR     R5,SCPRTN
  (1)  017212  017116                                   RE2
 1943  017214  017767  016736  013422  RE3:     MOV     @RDDB,BAD               ;POP WORD FROM SILO
 1944  017222  012767  177777  013416                   MOV     #-1,GOOD
 1945  017230  026767  013412  013406                   CMP     GOOD,BAD                ;SILO OUTPUT = 177777
 1946  017236  001417                                   BEQ     RE4
 1947  017240                                           DATERR  \N              ;ERROR:DROPPED BITS IN DATA SILO
  (1)                                                                                    ;******* ERROR 220 *******
  (1)  017240  032777  040000  013142                   BIT     #B14,@SR
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                (1)  017246  001005                          BNE     .+14
                (1)  017250  012767  000220  013364         MOV     #220,ERRNUM
                (1)  017256  004767  013216                  JSR     PC,DERR
                (1)          000221                  N       =       N+1
1948            017262                                       BDINIT  RCVR
1949            017270                                       SCOPE   RE2
                (1)  017270  004567  164732                  JSR     R5,SCPRTN
                (1)  017274  017116                          RE2
1950            017276  032777  000400  016650  RE4:    BIT     #B08,@RSR               ;SILO OUTPUT RDY?
1951            017304  001414                          BEQ     RE5
1952            017306                                       ERROR   \N              ;ERROR:WORD DID NOT GET POPPED FROM SILO
                (1)                                                                  ;******* ERROR 221 *******
                (1)  017306  032777  040000  013074          BIT     #B14,@SR
                (1)  017314  001005                          BNE     .+14
                (1)  017316  012767  000221  013316          MOV     #221,ERRNUM
                (1)  017324  004767  013064                  JSR     PC,ERR
                (1)          000222                  N       =       N+1
1953            017330                                       SCOPE   RE3
                (1)  017330  004567  164672                  JSR     R5,SCPRTN
                (1)  017334  017214                          RE3
1954            017336  032777  000010  016606  RE5:    BIT     #B03,@RCR               ;SILO INPUT RDY?
1955            017344  001014                          BNE     RE6
1956            017346                                       ERROR   \N              ;ERROR:SILO INPUT NOT READY
                (1)                                                                  ;******* ERROR 222 *******
                (1)  017346  032777  040000  013034          BIT     #B14,@SR
                (1)  017354  001005                          BNE     .+14
                (1)  017356  012767  000222  013256          MOV     #222,ERRNUM
                (1)  017364  004767  013024                  JSR     PC,ERR
                (1)          000223                  N               N+1
1957            017370                                       SCOPE   RE5
                (1)  017370  004567  164632                  JSR     R5,SCPRTN
                (1)  017374  017336                          RE5
1958            017376  052777  000200  016546  RE6:    BIS     #B07,@RCR               ;SET LD SILO BIT
1959            017404  005077  016546                  CLR     @RDDB                   ;LOAD 0'S INTO SILO
1960            017410  042777  000200  016534          BIC     #B07,@RCR               ;CLR LD SILO BIT
1961            017416  032777  000400  016530  RE7:    BIT     #B08,@RSR               ;SILO OUTPUT RDY?
1962            017424  001774                          BEQ     RE7                     ;WAIT FOR IT
1963            017426  017767  016524  013210          MOV     @RDDB,BAD               ;READ SILO OUTPUT
1964            017434  005067  013206                  CLR     GOOD
1965            017440  026767  013202  013176          CMP     GOOD,BAD                ;SILO OUTPUT = 0?
1966            017446  001417                          BEQ     RE7A
1967            017450                                       DATERR  \N              ;ERROR:PICKED UP BITS IN DATA SILO
                (1)                                                                  ;******* ERROR 223 *******
                (1)  017450  032777  040000  012732          BIT     #B14,@SR
                (1)  017456  001005                          BNE     .+14
                (1)  017460  012767  000223  013154          MOV     #223,ERRNUM
                (1)  017466  004767  013006                  JSR     PC,DERR
                (1)          000224                  N       -       N+1
1968            017472                                       BDINIT  RCVR                    ;CLR SILO
1969            017500                                       SCOPE   RE6
                (1)  017500  004567  164522                  JSR     R5,SCPRTN
                (1)  017504  017376                          RE6
1970            017506  004767  000476          RE7A:   JSR     PC,CLRCBF               ;MAKE SURE BUFF IS CLR
1971            017512                          RE8:    BDINIT  RCVR                    ;CLR RCVR BOARD
1972            017520  052777  000200  016424          BIS     #B07,@RCR               ;SET LD SILO BIT
1973            017526  012704  033564                  MOV     #SILDAT,R4              ;R4 POINTS TO DATA FOR SILO
```

```
1974  017532  012703  177700                RE9:    MOV     #-64.,R3                ;R3 COUNTS WORDS
1975  017536  012477  016414                        MOV     (R4)+,@RDDB             ;LOAD DATA INTO SILO
1976  017542  005203                                INC     R3
1977  017544  001374                                BNE     RE9                     ;KEEP LOADING FOR 64 WORDS
1978  017546  032777  000010  016376                BIT     #B03,@RCR               ;FULL...IS SILO INPUT RDY?
1979  017554  001414                                BEQ     RE10
1980  017556                                        ERROR   \N              ;ERROR:FULL SILO STILL RDY FOR INPUT
 (1)                                                                            ;******* ERROR 224 *******
 (1)  017556  032777  040000  012624                BIT     #B14,@SR
 (1)  017564  001005                                BNE     .+14
 (1)  017566  012767  000224  013046                MOV     #224,ERRNUM
 (1)  017574  004767  012614                        JSR     PC,ERR
 (1)          000225                        N       -       N+1
1981  017600                                        SCOPE   RE8
 (1)  017600  004567  164422                        JSR     R5,SCPRTN
 (1)  017604  017512                                RE8
1982  017606  042777  000200  016336  RE10:   BIC     #B07,@RCR               ;CLR LD SILO BIT
1983  017614  012777  177600  016336                MOV     #-128.,@RDBC            ;SET UP BYTE COUNT FOR 64 WORDS
1984  017622  012777  034164  016332                MOV     #CMPBUF,@RDBA           ;POINT INTERF AT 64 WD BUFFER
1985  017630  052777  040000  016314                BIS     #B14,@RCR               ;SET RC NPR
1986  017636  016704  012550                        MOV     DLCON,R4
1987  017642  012703  177500        RE10A:  MOV     #177500,R3              ;SET UP FOR 2 MS DELAY
1988  017646  005777  016306        RE11:   TST     @RDBC                   ;IS BYTE COUNT 0?
1989  017652  001420                                BEQ     RE12
1990  017654  005203                                INC     R3                      ;WAITED 2 MS ?
1991  017656  001373                                BNE     RE11                    ;NO, KEEP LOOKING
1992  017660  005304                                DEC     R4
1993  017662  001367                                BNE     RE10A
1994  017664                                        ERROR   \N              ;ERROR:NPR NOT COMPLETE AFTER 2 MS
 (1)                                                                            ;******* ERROR 225 *******
 (1)  017664  032777  040000  012516                BIT     #B14,@SR
 (1)  017672  001005                                BNE     .+14
 (1)  017674  012767  000225  012740                MOV     #225,ERRNUM
 (1)  017702  004767  012506                        JSR     PC,ERR
 (1)          000226                        N       =       N+1
1995  017706                                        SCOPE   RE8
 (1)  017706  004567  164314                        JSR     R5,SCPRTN
 (1)  017712  017512                                RE8
1996  017714  042777  040000  016230  RE12:   BIC     #B14,@RCR               ;CLEAR RC NPR
1997  017722  012702  033564                        MOV     #SILDAT,R2              ;SET UP TO CHECK SILO OUTPUT
1998  017726  012703  034164                        MOV     #CMPBUF,R3              ;R2 & R3 ARE DATA POINTERS
1999  017732  012704  177700                        MOV     #-64.,R4                ;R4 IS COUNTER
2000  017736  012267  012704        RE13:   MOV     (R2)+,GOOD              ;GET GOOD DATA
2001  017742  012367  012676                MOV     (R3)+,BAD               ;GET SILO DATA
2002  017746  026767  012674  012670                CMP     GOOD,BAD                ;COMPARE MEM BUFFERS
2003  017754  001414                                BEQ     RE14
2004  017756                                        DATERR  \N              ;ERROR:DATA FROM SILO IS WRONG
 (1)                                                                            ;******* ERROR 226 *******
 (1)  017756  032777  040000  012424                BIT     #B14,@SR
 (1)  017764  001005                                BNE     .+14
 (1)  017766  012767  000226  012646                MOV     #226,ERRNUM
 (1)  017774  004767  012500                        JSR     PC,DERR
 (1)          000227                        N       -       N+1
2005  020000                                        SCOPE   RE8
 (1)  020000  004567  164222                        JSR     R5,SCPRTN
 (1)  020004  017512                                RE8
```

```
 2006  020006  005204                  RE14:   INC     R4                      ;DONE COMPARE?
 2007  020010  001352                          BNE     RE13
 2008  020012  032777  000400  016134          BIT     #B08,@RSR               ;YES,SEE IF SILO WAS EMPTIED
 2009  020020  001414                          BEQ     RE15
 2010  020022                                  ERROR   \N              ;ERROR:SILO OUT RDY, BUT SILO SHD BE EMPTY
   (1)                                                                   ;******* ERROR 227 *******
   (1)  020022  032777  040000  012360          BIT     #B14,@SR
   (1)  020030  001005                          BNE     .+14
   (1)  020032  012767  000227  012602          MOV     #227,ERRNUM
   (1)  020040  004767  012350                  JSR     PC,ERR
   (1)          000230                  N       =       N+1
 2011  020044                                  SCOPE   RE8
   (1)  020044  004567  164156                  JSR     R5,SCPRTN
   (1)  020050  017512                          RE8
```

```
2013                                        .SBTTL  DATA SILO BLOCK COUNTER TEST
2014
2015                                        ;THIS TESTS THAT, AFTER PUTTING 200 (OCTAL) WORDS INTO THE DATA SILO
2016                                        ;THE BLOCK COUNTER COUNTS THE 200 WORDS AND HOLDS SILO INPUT READY
2017                                        ;IN THE FALSE STATE.
2018
2019  020052                                RE15:   BDINIT  RCVR                    ;CLEAR THE BOARD
2020  020060  012702  000100                        MOV     #64.,R2
2021  020064  004767  000140                        JSR     PC,RESR                 ;PUT 100 (OCTAL) WORDS INTO SILO
2022  020070  004767  000166                        JSR     PC,REEMT                ;EMPTY IT VIA NPR
2023  020074  012702  000020                        MOV     #20,R2
2024  020100  004767  000124                        JSR     PC,RESR                 ;PUT 20 (OCTAL) WORDS INTO SILO
2025  020104  004767  000152                        JSR     PC,REEMT                ;EMPTY IT AGAIN
2026  020110  012702  000060                        MOV     #60,R2
2027  020114  004767  000110                        JSR     PC,RESR                 ;PUT 60 (OCTAL) WORDS INTO SILO
2028                                                                                ;  MAKING A TOTAL OF 200 IN WHILE
2029                                                                                ;  THERE IS ROOM FOR 20 MORE.
2030  020120  032777  000010  016024                BIT     #B03,@RCR               ;IS SILO INPUT READY?
2031  020126  001414                                BEQ     PE16                    ;IF NOT, OKAY
2032  020130                                        ERROR   \N              ;ERROR:INPUT READY AFTER A 200 WORD BLOCK
  (1)                                                                               ;******* ERROR 230 *******
  (1)   020130  032777  040000  012252              BIT     #B14,@SR
  (1)   020136  001003                              BNE     .+14
  (1)   020140  012767  000230  012474              MOV     #230,ERRNUM
  (1)   020146  004767  012242                      JSR     PC,ERR
  (1)           000231                      N       -       N+1
2033  020152                                        SCOPE   RE15
  (1)   020152  004567  164050                      JSR     R5,SCPRTN
  (1)   020156  020052                              RE15
2034  020160                                RE16:   BDINIT  RCVR
2035  020166  004767  011500                        JSR     PC,MONIT
2036  020172  032777  010000  012210                BIT     #B12,@SR                ;CHECK SW 12
2037  020200  001402                                BEQ     RERT
2038  020202  000167  176574                        JMP     SLOTST                  ;STAY IN THIS TEST IF SW 12 - 1
2039  020206  000207                        RERT:   RTS     PC
2040  020210  012703  177700                CLRCBF: MOV     #-64.,R3                ;ROUTINE TO CLR BUFFER AREA
2041  020214  012704  034164                        MOV     #CMPBUF,R4
2042  020220  005024                        RECB:   CLR     (R4)+
2043  020222  005203                                INC     R3
2044  020224  001375                                BNE     RECB
2045  020226  000207                                RTS     PC
2046
2047                                        ;ROUTINE TO FILL DATA SILO WITH (R2) NUMBER OF WORDS
2048
2049  020230  052777  000200  015714        RESR:   BIS     #B07,@RCR               ;SET LOAD SILO
2050  020236  010203                                MOV     R2,R3
2051  020240  012777  012345  015710        RESRW:  MOV     #12345,@RDDB            ;LOAD A WORD
2052  020246  005303                                DEC     R3                      ;KEEP TRACK OF # OF WORDS
2053  020250  001373                                BNE     RESRW
2054  020252  042777  000200  015672                BIC     #B07,@RCR               ;LEAVE WITH LD SILO CLR
2055  020260  000207                                RTS     PC
2056
2057                                        ;ROUTINE TO EMPTY DATA SILO VIA RC NPR
2058
2059  020262  012777  177600  015670        REEMT:  MOV     #-128.,@RDBC            ;SET BYTE COUNT TO EMPTY SILO
2060  020270  012777  034164  015664                MOV     #CMPBUF,@RDBA           ;POINT SILO AT DAT BUFFER
```

```
2061  020276  052777  040000  015646          BIS     #B14,@RCR               ;START NPR
2062  020304  016704  012102                  MOV     DLCON,R4
2063  020310  012703  175000          REEMT1: MOV     #175000,R3              ;SET UP TO WAIT FOR COMPL
2064  020314  005203                  REMTW:  INC     R3
2065  020316  001376                          BNE     REMTW                   ;WAIT FOR NPR COMPLETION
2066  020320  005077  015626                  CLR     @RCR                    ;CLEAR RC NPR
2067  020324  005304                          DEC     R4
2068  020326  001370                          BNE     REEMT1
2069  020330  000207                          RTS     PC                      ;RETURN WITH SILO EMPTY
```

```
2071                                            .SBTTL  RSR TEST
2072
2073                                            ;RCVR STATUS REG & ERRORS TEST
2074
2075  020332                                    RSRTST: BDINIT  RCVR                    ;CLEAR THE BOARD
2076  020340  052777  020000  015604                    BIS     #B13,@RCR               ;SET RCV WD
2077  020346  032777  000100  015600                    BIT     #B06,@RSR               ;IS BUSY SET?
2078  020354  001014                                    BNE     RF1
2079  020356                                            ERROR   \N              ;ERROR:RCV WD DID NOT SET BUSY
  (1)                                                                               ;******* ERROR 231 *******
  (1)  020356  032777  040000  012024                    BIT     #B14,@SR
  (1)  020364  001005                                    BNE     .+14
  (1)  020366  012767  000231  012246                    MOV     #231,ERRNUM
  (1)  020374  004767  012014                            JSR     PC,ERR
  (1)          000232                             N      =       N+1
2080  020400                                            SCOPE   RSRTST
  (1)  020400  004567  163622                            JSR     R5,SCPRTN
  (1)  020404  020332                                    RSRTST
2081  020406  052777  000200  015540          RF1:      BIS     #B07,@RSR               ;SET SUC XFR
2082  020414  032777  000200  015532                    BIT     #B07,@RSR               ;IS SUC XFR SET?
2083  020422  001014                                    BNE     RF2
2084  020424                                            ERROR   \N              ;ERROR:CANNOT SET RSR BIT 07
  (1)                                                                               ;******* ERROR 232 *******
  (1)  020424  032777  040000  011756                    BIT     #B14,@SR
  (1)  020432  001005                                    BNE     .+14
  (1)  020434  012767  000232  012200                    MOV     #232,ERRNUM
  (1)  020442  004767  011746                            JSR     PC,ERR
  (1)          000233                             N      =       N+1
2085  020446                                            SCOPE   RF1
  (1)  020446  004567  163554                            JSR     R5,SCPRTN
  (1)  020452  020406                                    RF1
2086  020454  032777  020000  015470          RF2:      BIT     #B13,@RCR               ;IS RCV WD CLR?
2087  020462  001414                                    BEQ     RF3
2088  020464                                            ERROR   \N              ;ERROR:SUC XFR DID NOT CLR RCV WD
  (1)                                                                               ;******* ERROR 233 *******
  (1)  020464  032777  040000  011716                    BIT     #B14,@SR
  (1)  020472  001005                                    BNE     .+14
  (1)  020474  012767  000233  012140                    MOV     #233,ERRNUM
  (1)  020502  004767  011706                            JSR     PC,ERR
  (1)          000234                             N      =       N+1
2089  020506                                            SCOPE   RSRTST
  (1)  020506  004567  163514                            JSR     R5,SCPRTN
  (1)  020512  020332                                    RSRTST
2090  020514  042777  000200  015432          RF3:      BIC     #B07,@RSR               ;CLR SUC XFR
2091  020522  032777  000200  015424                    BIT     #B07,@RSR               ;SEE IF IT CLR'D
2092  020530  001414                                    BEQ     RF4
2093  020532                                            ERROR   \N              ;ERROR:CANNOT CLR SUC XFR
  (1)                                                                               ;******* ERROR 234 *******
  (1)  020532  032777  040000  011650                    BIT     #B14,@SR
  (1)  020540  001005                                    BNE     .+14
  (1)  020542  012767  000234  012072                    MOV     #234,ERRNUM
  (1)  020550  004767  011640                            JSR     PC,ERR
  (1)          000235                             N      =       N+1
2094  020554                                            SCOPE   RF3
  (1)  020554  004567  163446                            JSR     R5,SCPRTN
  (1)  020560  020514                                    RF3
```

```
2095  020562                                  RF4:    BDINIT  RCVR                    ;CLEAR THE BOARD
2096  020570  052777  020200  015354                  BIS     #20200,@RCR             ;SET LD SILO & RCV WD
2097  020576  012703  177774                          MOV     #-4,R3
2098  020602  012777  177777  015346          RF5.    MOV     #-1,@RDDB               ;MOVE 4 -1'S INTO SILO
2099  020610  000240                                  NOP
2100  020612  000240                                  NOP
2101  020614  005203                                  INC     R3
2102  020616  001371                                  BNE     RF5
2103  020620  012777  177776  015332          RF6:    MOV     #-2,@RDBC               ;SET BYTE COUNT FOR 1 WORD
2104  020626  052777  000004  015316                  BIS     #B02,@RCR               ;SET INH ADDR INC
2105  020634  012777  034164  015320                  MOV     #CMPBUF,@RDBA           ;POINT NPR TO MEM BUFF.
2106  020642  052777  040000  015302                  BIS     #B14,@RCR               ;START NPR
2107  020650  005777  015304          RF7:    TST     @RDBC                   ;BYTE COUNT   0?
2108  020654  001375                                  BNE     RF7
2109  020656  032777  000400  015270                  BIT     #B08,@RSR               ;SILO OUTPUT RDY?
2110  020664  001014                                  BNE     RF8
2111  020666                                          ERROR   \N              ;ERROR:SILO SHOULD NOT BE EMPTY
 (1)                                                                            ;******* ERROR 235 *******
 (1)  020666  032777  040000  011514                  BIT     #B14,@SR
 (1)  020674  001005                                  BNE     .+14
 (1)  020676  012767  000235  011736                  MOV     #235,ERRNUM
 (1)  020704  004767  011504                          JSR     PC,ERR
 (1)          000236                  N       =       N+1
2112  020710                                          SCOPE   RF4
 (1)  020710  004567  163312                          JSR     R5,SCPRTN
 (1)  020714  020562                                  RF4
2113  020716  012767  034164  011722  RF8:    MOV     #CMPBUF,GOOD            ;BYTE ADDRESS SHD NOT INCREMENT
2114  020724  017767  015232  011712                  MOV     @RDBA,BAD               ;READ BYTE ADDRESS
2115  020732  026767  011710  011704                  CMP     GOOD,BAD                ;SAME AS BEFORE?
2116  020740  001414                                  BEQ     RF9
2117  020742                                          DATERR  \N              ;ERROR:RCR BIT 2 DID NOT INH ADR INCREMENT
 (1)                                                                            ;******* ERROR 236 *******
 (1)  020742  032777  040000  011440                  BIT     #B14,@SR
 (1)  020750  001005                                  BNE     .+14
 (1)  020752  012767  000236  011662                  MOV     #236,ERRNUM
 (1)  020760  004767  011514                          JSR     PC,DERR
 (1)          000237                  N               N+1
2118  020764                                          SCOPE   RF4
 (1)  020764  004567  163236                          JSR     R5,SCPRTN
 (1)  020770  020562                                  RF4
2119  020772  032777  001000  015154  RF9:    BIT     #B09,@RSR               ;IS BYTE COUNT OFL SET?
2120  021000  001014                                  BNE     RF9A
2121  021002                                          ERROR   \N              ;ERROR:PDBC -0, SILO NOT EMPTY, BUT BC OFL - 0
 (1)                                                                            ;******* ERROR 237 *******
 (1)  021002  032777  040000  011400                  BIT     #B14,@SR
 (1)  021010  001005                                  BNE     .+14
 (1)  021012  012767  000237  011622                  MOV     #237,ERRNUM
 (1)  021020  004767  011370                          JSR     PC,ERR
 (1)          000240                  N       =       N+1
2122  021024                                          SCOPE   RF4
 (1)  021024  004567  163176                          JSR     R5,SCPRTN
 (1)  021030  020562                                  RF4
2123  021032  032777  100000  015114  RF9A:   BIT     #B15,@RSR               ;IS RSR BIT 15 SET?
2124  021040  001014                                  BNE     RF10                    ;IF YES, CHECK FOR INTR REQ
2125  021042                                          ERROR   \N              ;ERROR:BYTE COUNT OFL DID NOT SET RSR BIT 15
 (1)                                                                            ;******* ERROR 240 *******
```

```
  (1)  021042  032777  040000  011340          BIT     #B14,@SR
  (1)  021050  001005                          BNE     .+14
  (1)  021052  012767  000240  011562          MOV     #240,ERRNUM
  (1)  021060  004767  011330                  JSR     PC,ERR
  (1)          000241                  N       =       N+1
2126   021064                                  SCOPE   RF4
  (1)  021064  004567  163136                  JSR     R5,SCPRTN
  (1)  021070  020562                          RF4
2127   021072  032777  020000  015052  RF10:   BIT     #B13,@RCR               ;IS RCV WD = 0?
2128   021100  001414                          BEQ     RF11
2129   021102                                  ERROR   \N              ;ERROR:BC OFL DID NOT REQUEST INTERRUPT
  (1)                                                                   ;******* ERROR 241 *******
  (1)  021102  032777  040000  011300          BIT     #B14,@SR
  (1)  021110  001005                          BNE     .+14
  (1)  021112  012767  000241  011522          MOV     #241,ERRNUM
  (1)  021120  004767  011270                  JSR     PC,ERR
  (1)          000242                  N       -       N+1
2130   021124                                  SCOPE   RF4
  (1)  021124  004567  163076                  JSR     R5,SCPRTN
  (1)  021130  020562                          RF4
2131   021132                          RF11:   BDINIT  RCVR
2132   021140  052777  020000  015004          BIS     #B13,@RCR               ;SET RCV WD
2133   021146  052777  002000  015000          BIS     #B10,@RSR               ;SET TIMEOUT
2134   021154  032777  002000  014772          BIT     #B10,@RSR               ;IS TIMEOUT SET?
2135   021162  001014                          BNE     RF12
2136   021164                                  ERRCR   \N              ;ERROR:CANNOT SET RSR BIT 10
  (1)                                                                   ;******* ERROR 242 *******
  (1)  021164  032777  040000  011216          BIT     #B14,@SR
  (1)  021172  001005                          BNE     .+14
  (1)  021174  012767  000242  011440          MOV     #242,ERRNUM
  (1)  021202  004767  011206                  JSR     PC,ERR
  (1)          000243                  N       =       N+1
2137   021206                                  SCOPE   RF11
  (1)  021206  004567  163014                  JSR     R5,SCPRTN
  (1)  021212  021132                          RF11
2138   021214  032777  100000  014732  RF12:   BIT     #B15,@RSR               ;IS ERROR BIT SET?
2139   021222  001014                          BNE     RF13
2140   021224                                  ERROR   \N              ;ERROR:TIMEOUT DIDN'T SET RSR BIT 15
  (1)                                                                   ;******* ERROR 243 *******
  (1)  021224  032777  040000  011156          BIT     #B14,@SR
  (1)  021232  001005                          BNE     .+14
  (1)  021234  012767  000243  011400          MOV     #243,ERRNUM
  (1)  021242  004767  011146                  JSR     PC,ERR
  (1)          000244                  N       -       N+1
2141   021246                                  SCOPE   RF11
  (1)  021246  004567  162754                  JSR     R5,SCPRTN
  (1)  021252  021132                          RF11
2142   021254  032777  020000  014670  RF13:   BIT     #B13,@RCR               ;IS RCV WD CLR?
2143   021262  001414                          BEQ     RF14
2144   021264                                  ERROR   \N              ;ERROR:RSR BIT 15 DIDN'T REQUEST INTERRUPT
  (1)                                                                   ;******* ERROR 244 *******
  (1)  021264  032777  040000  011116          BIT     #B14,@SR
  (1)  021272  001005                          BNE     .+14
  (1)  021274  012767  000244  011340          MOV     #244,ERRNUM
  (1)  021302  004767  011106                  JSR     PC,ERR
  (1)          000245                  N       =       N+1
```

```
2145 021306                                  SCOPE   RF11
 (1) 021306 004567 162714                    JSR     R5,SCPRTN
 (1) 021312 021132                           RF11
2146 021314 005077 014634           RF14:    CLR     @RSR                  ;CLEAR RSR
2147 021320 052777 004000 014626             BIS     #B11,@RSR             ;SET PAR (PARITY ERROR) BIT
2148 021326 032777 004000 014620             BIT     #B11,@RSR             ;IS IT SET?
2149 021334 001014                           BNE     RF15
2150 021336                                  ERROR   \N          ;ERROR:CANNOT SET RSR BIT 11
 (1)                                                                       ;******* ERROR 245 *******
 (1) 021336 032777 040000 011044             BIT     #B14,@SR
 (1) 021344 001005                           BNE     .+14
 (1) 021346 012767 000245 011266             MOV     #245,ERRNUM
 (1) 021354 004767 011034                    JSR     PC,ERR
 (1)        000246                  N        =       N+1
2151 021360                                  SCOPE   RF14
 (1) 021360 004567 162642                    JSR     R5,SCPRTN
 (1) 021364 021314                           RF14
2152 021366 032777 100000 014560    RF15:    BIT     #B15,@RSR             ;IS ERROR BIT SET?
2153 021374 001014                           BNE     RF16
2154 021376                                  ERROR   \N          ;ERROR:PAR ERR DIDN'T SET RSR BIT 15
 (1)                                                                       ;******* ERROR 246 *******
 (1) 021376 032777 040000 011004             BIT     #B14,@SR
 (1) 021404 001005                           BNE     .+14
 (1) 021406 012767 000246 011226             MOV     #246,ERRNUM
 (1) 021414 004767 010774                    JSR     PC,ERR
 (1)        000247                  N        =       N+1
2155 021420                                  SCOPE   RF14
 (1) 021420 004567 162602                    JSR     R5,SCPRTN
 (1) 021424 021314                           RF14
2156 021426 005077 014522           RF16:    CLR     @RSR                  ;CLEAR RSR
2157 021432 052777 010000 014514             BIS     #B12,@RSR             ;SET TXM ERR
2158 021440 032777 010000 014506             BIT     #B12,@RSR             ;IS IT SET?
2159 021446 001014                           BNE     RF17
2160 021450                                  ERROR   \N          ;ERROR:CANNOT SET RSR BIT 12
 (1)                                                                       ;******* ERROR 247 *******
 (1) 021450 032777 040000 010732             BIT     #B14,@SR
 (1) 021456 001005                           BNE     .+14
 (1) 021460 012767 000247 011154             MOV     #247,ERRNUM
 (1) 021466 004767 010722                    JSR     PC,ERR
 (1)        000250                  N        =       N+1
2161 021472                                  SCOPE   RF16
 (1) 021472 004567 162530                    JSR     R5,SCPRTN
 (1) 021476 021426                           RF16
2162 021500 032777 100000 014446    RF17:    BIT     #B15,@RSR             ;IS ERROR BIT SET?
2163 021506 001014                           BNE     RF18
2164 021510                                  ERROR   \N          ;ERROR:TXM ERR DIDN'T SET RSR BIT 15
 (1)                                                                       ;******* ERROR 250 *******
 (1) 021510 032777 040000 010672             BIT     #B14,@SR
 (1) 021516 001005                           BNE     .+14
 (1) 021520 012767 000250 011114             MOV     #250,ERRNUM
 (1) 021526 004767 010662                    JSR     PC,ERR
 (1)        000251                  N        =       N+1
2165 021532                                  SCOPE   RF16
 (1) 021532 004567 162470                    JSR     R5,SCPRTN
 (1) 021536 021426                           RF16
2166 021540 005077 014410           RF18:    CLR     @RSR                  ;CLEAR RSR
```

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                                                                N 6
 2167  021544  052777  020000  014402          BIS     #B13,@RSR               ;SET MEM OFL
 2168  021552  032777  020000  014374          BIT     #B13,@RSR               ;IS IT SET?
 2169  021560  001014                          BNE     RF19
 2170  021562                                  ERROR   \N              ;ERROR:CANNOT SET RSR BIT 13
  (1)                                                                   ;******* ERROR 251 *******
  (1)  021562  032777  040000  010620          BIT     #B14,@SR
  (1)  021570  001005                          BNE     .+14
  (1)  021572  012767  000251  011042          MOV     #251,ERRNUM
  (1)  021600  004767  010610                  JSR     PC,ERR
  (1)          000252                  N       =       N+1
 2171  021604                                  SCOPE   RF18
  (1)  021604  004567  162416                  JSR     R5,SCPRTN
  (1)  021610  021540                          RF18
 2172  021612  032777  100000  014334  RF19:   BIT     #B15,@RSR               ;IS ERROR BIT SET?
 2173  021620  001014                          BNE     RF20
 2174  021622                                  ERROR   \N              ;ERROR:MEM OFL DIDN'T SET RSR BIT 15
  (1)                                                                   ;******* ERROR 252 *******
  (1)  021622  032777  040000  010560          BIT     #B14,@SR
  (1)  021630  001005                          BNE     .+14
  (1)  021632  012767  000252  011002          MOV     #252,ERRNUM
  (1)  021640  004767  010550                  JSR     PC,ERR
  (1)          000253                  N       =       N+1
 2175  021644                                  SCOPE   RF18
  (1)  021644  004567  162356                  JSR     R5,SCPRTN
  (1)  021650  021540                          RF18
```

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                                            ;ERROR GENERATION TESTS

      021652                                RF20:   BDINIT  RCVR                    ;CLEAR THE BOARD
      021660  052777  000200  014264                BIS     #B07,@RCR               ;SET LD SILO BIT
      021666  012777  177777  014262                MOV     #-1,@RDDB               ;LOAD A WORD INTO SILO
      021674  032777  000400  014252        RF21:   BIT     #B08,@RSR               ;SILO OUTPUT RDY?
      021702  001774                                BEQ     RF21                    ;WAIT FOR IT
      021704  042777  000200  014240                BIC     #B07,@RCR               ;CLEAR LD SILO BIT
      021712  012777  177774  014240                MOV     #-4,@RDBC               ;SET BYTE COUNT FOR 1 WD XFER
      021720  012777  160000  014234                MOV     #160000,@RDBA           ;PUT NON-EXST LOC IN RDBA
      021726  052777  040060  014216                BIS     #40060,@RCR             ;START NPR AND SET EXT ADD BITS
      021734  000240                                NOP
      021736  000240                                NOP
      021740  005777  014214                        TST     @RDBC                   ;IS BYTE COUNT 0?
      021744  001014                                BNE     RF22
      021746                                        ERROR   \N              ;ERROR:RCV NPR COMPL TO NEX ADDRESS
 (1)                                                                                ;******* ERROR 253 *******
 (1)  021746  032777  040000  010434                BIT     #B14,@SR
 (1)  021754  001005                                BNE     .+14
 (1)  021756  012767  000253  010656                MOV     #253,ERRNUM
 (1)  021764  004767  010424                        JSR     PC,ERR
 (1)          000254                        N       =       N+1
      021770                                        SCOPE   RF20
 (1)  021770  004567  162232                        JSR     R5,SCPRTN
 (1)  021774  021652                                RF20
      021776  032777  040000  014150        RF22:   BIT     #B14,@RSR               ;IS NON EXST LOC SET?
      022004  001014                                BNE     RF23
      022006                                        ERROR   \N              ;ERROR:NPR TO NXM DIDN'T SET NON-EXST LOC
 (1)                                                                                ;******* ERROR 254 *******
 (1)  022006  032777  040000  010374                BIT     #B14,@SR
 (1)  022014  001005                                BNE     .+14
 (1)  022016  012767  000254  010616                MOV     #254,ERRNUM
 (1)  022024  004767  010364                        JSR     PC,ERR
 (1)          000255                        N       =       N+1
      022030                                        SCOPE   RF20
 (1)  022030  004567  162172                        JSR     R5,SCPRTN
 (1)  022034  021652                                RF20
      022036  032777  100000  014110        RF23:   BIT     #B15,@RSR               ;IS ERROR BIT SET?
      022044  001014                                BNE     RF24
      022046                                        ERROR   \N              ;ERROR:NON-EXST LOC DIDN'T SET RSR BIT 15
 (1)                                                                                ;******* ERROR 255 *******
 (1)  022046  032777  040000  010334                BIT     #B14,@SR
 (1)  022054  001005                                BNE     .+14
 (1)  022056  012767  000255  010556                MOV     #255,ERRNUM
 (1)  022064  004767  010324                        JSR     PC,ERR
 (1)          000256                        N       =       N+1
      022070                                        SCOPE   RF20
 (1)  022070  004567  162132                        JSR     R5,SCPRTN
 (1)  022074  021652                                RF20
      022076                                RF24:   BDINIT  RCVR                    ;CLR BOARD BEFORE LEAVING
      022104  004767  007562                        JSR     PC,MONIT
      022110  032777  010000  010272                BIT     #B12,@SR                ;IS SW 12 SET?
      022116  001402                                BEQ     RFRT
      022120  000167  176206                        JMP     RSRTST                  ;YES,REPEAT THIS TEST
      022124  000207                        RFRT:   RTS     PC
```

```
                        .SBTTL  INTERRUPT TEST

                        ;RECEIVER INTERRUPT TEST

022126                  RINTST: MTPS    #P7                     ;DIS-ALLOW INTERRUPT
022126  012737  000340  177776          MOV     #P7,@#PS
022134                          BDINIT  RCVR                    ;CLEAR THE BOARD
022142  016700  013756          MOV     RCVEC,R0
022146  012760  000340  000002          MOV     #340,2(R0)      ;SET NEW PS = P7
022154  012777  022204  013742          MOV     #ERDINT,@RCVEC  ;SET-UP FOR ERROR INTERRUPT
022162  052777  000100  013762          BIS     #B06,@RCR       ;SET INTERRUPT ENABLE
022170                          MTPS    #0                      ;ALLOW INTERRUPT
022170  012737  000000  177776          MOV     #0,@#PS
022176  000240                  NOP
022200  000167  000046          JMP     RH0                      SKIP ERROR IF NO INTERRUPT
022204                  ERDINT: MTPS    #P7                     ;INTERRUPT OFF
022204  012737  000340  177776          MOV     #P7,@#PS
022212  022626                  CMP     (SP)+,(SP)+             ;CORRECT STACK
022214  042777  000100  013730          BIC     #B06,@RCR       ;CLR INTERRUPT ENABLE
022222                          ERROR   \N              ;ERROR:ERRONEOUS INTERRUPT;NO FLAGS SET
                                                                ;******* ERROR 256 *******
022222  032777  040000  010160          BIT     #B14,@SR
022230  001005                  BNE     .+14
022232  012767  000256  010402          MOV     #256,ERRNUM
022240  004767  010150                  JSR     PC,ERR
        000257          N       =       N+1
022244                          SCOPE   RINTST
022244  004567  161756                  JSR     R5,SCPRTN
022250  022126                          RINTST
022252  005067  013636          RH0:    CLR     TMPRIO                  ;START WITH CP AT PRIORITY 0
022256  012777  022556  013640          MOV     #INTRA,@RCVEC           ;SET VECTOR FOR GOOD INTERRUPT
022264                  RH1:    MTPS    #P7                     ;INTERRUPT OFF
022264  012737  000340  177776          MOV     #P7,@#PS
022272  052777  000100  013652          BIS     #B06,@RCR       ;ENABLE RCVR INTERRUPT
022300  052777  000200  013644          BIS     #B07,@RCR       ;SET LD SILO BIT
022306  012777  177777  013642          MOV     #-1,@RDDB       ;PUT A WORD INTO RCVR SILO
022314  042777  000200  013630          BIC     #B07,@RCR       ;CLR LD SILO BIT
022322  032777  000400  013624  RH1A:   BIT     #B08,@RSR       ;SILO OUTPUT READY?
022330  001774                  BEQ     RH1A                    ;WAIT FOR IT
022332                          MTPS    TMPRIO                  ;ALLOW INTERRUPT
022332  016737  013556  177776          MOV     TMPRIO,@#PS
022340  000240                  NOP
022342  000240                  NOP
022344  005767  013544                  TST     TMPRIO                  ;NO INTERRUPT;IS PSW = 0?
022350  001014                  BNE     RH2
022352                          ERROR   \N              ;ERROR:NO INTERRUPT FROM RECEIVER
                                                                ;******* ERROR 257 *******
022352  032777  040000  010030          BIT     #B14,@SR
022360  001005                  BNE     .+14
022362  012767  000257  010252          MOV     #257,ERRNUM
022370  004767  010020                  JSR     PC,ERR
        000260          N       =       N+1
022374                          SCOPE   RINTST
022374  004567  161626                  JSR     R5,SCPRTN
022400  022126                          RINTST
022402  026767  013522  013504  RH2:    CMP     RPRIO,TMPRIO            ;HAVE WE REACHED EXPECTED PRIORITY?
```

```
2244  022410  001414                          BEQ     RH3
2245  022412                                  ERROR   \N              ;ERROR:DEVICE NOT JUMPERED TO EXPECTED PRIORITY
 (1)                                                                  ;******* ERROR 260 *******
 (1)  022412  032777  040000  007770          BIT     #B14,@SR
 (1)  022420  001005                          BNE     .+14
 (1)  022422  012767  000260  010212          MOV     #260,ERRNUM
 (1)  022430  004767  007760                  JSR     PC,ERR
 (1)          000261                  N       =       N+1
2246  022434                                  SCOPE   RINTST
 (1)  022434  004567  161566                  JSR     R5,SCPRTN
 (1)  022440  022126                          RINTST
2247  022442  022767  000340  013444  RH3:    CMP     #340,TMPRIO             ;IS PSW - 7?
2248  022450  001426                          BEQ     RH4
2249  022452                                  BDINIT  RCVR
2250  022460  062767  000040  013426          ADD     #40,TMPRIO
2251  022466  012777  022600  013430  RH3S:   MOV     #INTRB,@RCVEC           ;SET VECTOR FOR ERROR INTERRUPT
2252  022474  052777  000100  013450          BIS     #B06,@RCR               ;ENABLE RCVR INTERRUPT
2253  022502  052777  000200  013444          BIS     #B07,@RSR               ;FORCE INTERRUPT REQUEST
2254  022510                                  MTPS    TMPRIO                  ;SET CP TO NEXT PRIORITY
 (1)  022510  016737  013400  177776          MOV     TMPRIO,@#PS
2255  022516  000240                          NOP
2256  022520  000240                          NOP
2257  022522  000167  177714                  JMP     RH3
2258  022526                          RH4:    BDINIT  RCVR                    ;CLEAR THE BOARD
2259  022534  004767  007132                  JSR     PC,MONIT
2260  022540  032777  010000  007642          BIT     #B12,@SR                ;SW 12 = 1?
2261  022546  001402                          BEQ     RHRT
2262  022550  000167  177352                  JMP     RINTST                  ;YES,DO THIS TEST OVER
2263  022554  000207                  RHRT:   RTS     PC                      ;NO,EXIT
2264
2265  022556                          INTRA:  BDINIT  RCVR                    ;CLR INTERRUPT ETC.
2266  022564  062767  000040  013322          ADD     #40,TMPRIO              ;INCR TEMP PRIORITY
2267  022572  022626                          CMP     (SP)+,(SP)+             ;CORRECT STACK POINTER
2268  022574  000167  177464                  JMP     RH1                     ;TRY AGAIN
2269
2270  022600  022626                  INTRB:  CMP     (SP)+,(SP)+             ;POP THE STACK
2271  022602                                  BDINIT  RCVR                    ;CLR EVRYTHING
2272  022610                                  ERROR   \N              ;ERROR:GOT INTR WHITH CP AT HIGHER PRIORITY
 (1)                                                                  ;******* ERROR 261 *******
 (1)  022610  032777  040000  007572          BIT     #B14,@SR
 (1)  022616  001005                          BNE     .+14
 (1)  022620  012767  000261  010014          MOV     #261,ERRNUM
 (1)  022626  004767  007562                  JSR     PC,ERR
 (1)          000262                  N       =       N+1
2273  022632                                  SCOPE   RH3S
 (1)  022632  004567  161370                  JSR     R5,SCPRTN
 (1)  022636  022466                          RH3S
2274  022640  000167  177576                  JMP     RH3
```

```
                                        .SBTTL  C.R.C. CHECK

                                ;CYCLIC REDUNDANCY CHECK CHARACTER TEST

                        RCRCTS: BDINIT  RCVR                    ;CLR THE BOARD
                                BIS     #B07,@RCR               ;SET LD SILO BIT
                                MOV     #SILCRC,R2              ;R2 POINTS TO GOOD CRC'S
                                MOV     #SILDAT,R3              ;R3 POINTS TO MEM DATA
                                MOV     #-64.,R4                ;R4 IS WORD COUNTER
                        RJ1:    MOV     (R3),DATWD              ;SAVE INPUT WORD
                                MOV     DATWD,@RDDB             ;LOAD SILO
                                MOV     (R2),GOOD               ;GET GOOD CRC FOR COMPARISON
                                MOV     @RDCRC,BAD              ;GET GENERATED CRC
                                CMP     GOOD,BAD                ;IS CRC OK?
                                BEQ     RJ2
                                BIT     #B14,@SR                ;PRINT ALLOWED?
                                BNE     RJ1S                    ;IF NOT, SKIP IT
                                PNTM    SLIWD                   ;PRINT "SILO INPUT WORD WAS "
 (1)                            MOV     #SLIWD,R0               ;PRINT MESSAGE
 (1)                            JSR     PC,TYPOUT               ;POINTED TO BY SLIWD
                                MOV     DATWD,R0
                                JSR     PC,OCTPNT               ;PRINT SILO INPUT WORD
                                DATERR  \N              ;ERROR:BAD CRC FOR ABOVE WORD
 (1)                                                            ;******* ERROR 262 *******
 (1)                            BIT     #B14,@SR
 (1)                            BNE     .+14
 (1)                            MOV     #262,ERRNUM
 (1)                            JSR     PC,DERR
 (1)                    N       =       N+1
                        RJ1S:   SCOPE   RCRCTS
 (1)                            JSR     R5,SCPRTN
 (1)                            RCRCTS
                        RJ2:    ADD     #2,R2                   ;UPDATE CRC POINTER
                                ADD     #2,R3                   ;UPDATE DATA POINTER
                                INC     R4                      ;HAVE WE CHECKED 64 WDS?
                                BNE     RJ1
                                JSR     PC,MONIT
                                BIT     #B12,@SR                ;CHECK SW 12
                                BEQ     RJRT                    ;IF 0, EXIT
                                JMP     RCRCTS                  ;IF 1, STAY
                        RJRT:   BDINIT  RCVR                    ;CLR BOARD BEFORE EXIT
                                RTS     PC
```

```
                                        .SBTTL XMTR-RCVR LOOP TESTS

                                ;TEST 3 - XMTR - RCVR LOOP TESTS
                                ;   (00) NPR TESTS SILO TO SILO
                                ;   (01) DATA LOOPS TESTS
                                ;   (02) TXM ERRORS TESTS
                                ;   (03) REJECT & TRUNCATE TESTS

000300                          N       =       300                     ;LOOP TEST ERRORS START AT 300

023054                          TEST3:  MTPS    #P7
 (1) 023054 012737 000340 177776        MOV     #P7,@#PS
2320 023062 012767 000010 012766        MOV     #10,ITER                ;INITIAL ITERATION OF 10 PER PASS
2321 023070 004767 006576               JSR     PC,MONIT
2322 023074 032777 002000 007306        BIT     #B10,@SR                ;CHECK SW 10
2323 023102 001424                      BEQ     LOOPL                   ;IF CLR, RUN ALL TESTS
2324 023104 017767 007300 012746        MOV     @SR,SWI                 ;IF SET, START AT TEST # IN SW'S <1:0>
2325 023112 042767 177770 012740        BIC     #-10,SWI
2326 023120 026727 012734 000003        CMP     SWI,#3                  ;DON'T ALLOW SWI > 3
2327 023126 003012                      BGT     LOOPL
2328 023130 000241                      CLC                             ;CLR C-BIT BEFORE ROTATE
2329 023132 006167 012722               ROL     SWI
2330 023136 006167 012716               ROL     SWI
2331 023142 062767 023154 012710        ADD     #LOOPL,SWI              ;GENERATE CORRECT OFFSET
2332 023150 000177 012704               JMP     @SWI                    ;GO TO SELECTED TEST
2333 023154 004767 000120               LOOPL:  JSR     PC,NPRTST       ;CHECK NPR ..SILO TO SILO
2334 023160 004767 000710               JSR     PC,DATLPS               ;DO DATA LOOPS TEST
2335 023164 004767 003236               JSR     PC,TXMERS               ;CHECK TXM ERRORS
2336 023170 004767 005520               JSR     PC,XRC20                ;DO REJECT AND TRUNCATE TEST
2337 023174 032777 004000 007206        BIT     #B11,@SR                ;CHECK SW 11
2338 023202 001003                      BNE     TREND                   ;PRINT END IF SET
2339 023204 005367 012646               DEC     ITER                    ;OTHERWISE, RE-ITERATE
2340 023210 001361                      BNE     LOOPL
2341 023212 005767 012664               TREND:  TST     $4FLAG          ;TEST END PASS INHIBIT FLAG
2342 023216 001027                      BNE     REPETL                  ;CAN'T PRINT, EXIT.
2343 023220 005267 012646               INC     PSN03                   ;UPDATE PASS NO.
2344 023224                             PNTM    PEND                    ;PRINT 'END PASS # ''
 (1) 023224 012700 034443               MOV     #PEND,R0                ;PRINT MESSAGE
 (1) 023230 004767 007414               JSR     PC,TYPOUT               ;POINTED TO BY PEND
2345 023234 016700 012632               MOV     PSN03,R0
2346 023240 004767 010026               JSR     PC,DECPNT               ;PRINT PASS NO.
2347 023244 012700 000040               MOV     #40,R0
2348 023250 004767 010216               JSR     PC,TTO                  ;PRINT A SPACE
2349 023254 012700 000102               MOV     #'B,R0
2350 023260 004767 010206               JSR     PC,TTO                  ;PRINT 'B'' (TO INDICATE 'LOOP TEST')
2351 023264 005000                      CLR     R0
2352 023266 004767 010200               JSR     PC,TTO                  ;PRINT NULLS TO ALLOW PRINT
2353 023272 004767 010174               JSR     PC,TTO                  ;OF PASS NO. IN CASE RESET FOLLOWS
2354 023276 000207                      REPETL: RTS     PC              ;RETURN
```

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                                        .SBTTL  NPR TESTS

023300                          NPRTST: BDINIT  RCVR                    ;CLEAR RECEIVER
023306                                  BDINIT  XMTR                    ;CLEAR XMTR
023314  012777  010400  012622          MOV     #10400,@TMMR            ;SET MASTER AND AUTO ADDR
023322  004767  000424                  JSR     PC,FILRCV               ;FILL RCVR SILO
023326  012777  177600  012624          MOV     #-128.,@RDBC            ;SET UP RCVR TO INITIATE
023334  016777  012576  012620          MOV     TSDB,@RDBA              ;NPR TO XMTR SILO
023342  012777  040064  012602          MOV     #40064,@RCR             ;START NPR, INHIB ADDR INCR
023350  016702  007036                  MOV     DLCON,R2
023354  005003                  NPTST1: CLR     R3
023356  012704  177777                  MOV     #-1,R4                  ;SET UP FOR  DELAY
023362  022777  000200  012550  XRA1:   CMP     #128 .,@TSBC            ;TRANSFERRED 64 WORDS?
023370  001422                          BEQ     XRA2                    ;NO, KEEP LOOKING FOR A SECOND
023372  005203                          INC     R3
023374  001372                          BNE     XRA1
023376  005204                          INC     R4
023400  001370                          BNE     XRA1
023402  005302                          DEC     R2
023404  001363                          BNE     NPTST1
023406                                  ERROR   \N              ;ERROR:RCVR NPR NOT COMPLETE IN TIME
                                                                ;******* ERROR 300 *******
 (1)
 (1)    023406  032777  040000  006774          BIT     #B14,@SR
 (1)    023414  001005                          BNE     .+14
 (1)    023416  012767  000300  007216          MOV     #300,ERRNUM
 (1)    023424  004767  006764                  JSR     PC,ERR
 (1)            000301                  N       =       N+1
023430                                  SCOPE   NPRTST
 (1)    023430  004567  160572                  JSR     R5,SCPRTN
 (1)    023434  023300                          NPRTST
023436  004767  000352          XRA2:   JSR     PC,CHXDAT               ;CHECK DATA IN XMTR SILO
023442  000414                          BR      XRA2A                   ;DATA O.K. , CONTINUE
023444                                  DATERR  \N              ;ERROR:BAD DATA NPR'D TO XMTR SILO
 (1)                                                            ;******* ERROR 301 *******
 (1)    023444  032777  040000  006736          BIT     #B14,@SR
 (1)    023452  001005                          BNE     .+14
 (1)    023454  012767  000301  007160          MOV     #301,ERRNUM
 (1)    023462  004767  007012                  JSR     PC,DERR
 (1)            000302                  N       =       N+1
023466                                  SCOPE   NPRTST
 (1)    023466  004567  160534                  JSR     R5,SCPRTN
 (1)    023472  023300                          NPRTST
023474  005777  012460          XRA2A:  TST     @RDBC                   ;CHECK THAT RDBC = 0
023500  001421                          BEQ     XRA3
023502  005067  007140                  CLR     GOOD
023506  017767  012446  007130          MOV     @RDBC,BAD
023514                                  DATERR  \N              ;ERROR:RCV BYTE COUNT SHD BE 0 AT END [illegible]
                                                                ;******* ERROR 302 *******
 (1)
 (1)    023514  032777  040000  006666          BIT     #B14,@SR
 (1)    023522  001005                          BNE     .+14
 (1)    023524  012767  000302  007110          MOV     #302,ERRNUM
 (1)    023532  004767  006742                  JSR     PC,DERR
 (1)            000303                  N       =       N+1
023536                                  SCOPE   NPRTST
 (1)    023536  004567  160464                  JSR     R5,SCPRTN
 (1)    023542  023300                          NPRTST
```

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2388  023544                                  XRA3:   BDINIT  XMTR                    ;CLR    XMTR
2389  023552                                          BDINIT  RCVR                    ;CLR RCVR
2390  023560  004767  000166                         JSR     PC,FILRCV               ;FILL RECEIVER SILO
2391  023564  012777  177600  012346                 MOV     #-128.,@TSBC            ;SET UP FOR XMTR TO INITIATE
2392  023572  016777  012360  012342                 MOV     RDDB,@TSBA              ;NPR FROM RCVR SILO
2393  023600  012777  040064  012324                 MOV     #40064,@TCR             ;SET TX NPR, INHIB ADR INC
2394  023606  016702  006600                         MOV     DLCON,R2
2395  023612  005003                          XRA3A:  CLR     R3
2396  023614  012704  177777                         MOV     #-1,R4                  ;SET UP FOR 1 SEC DELAY
2397  023620  005777  012314                 XRA4:   TST     @TSBC                   ;TRANSFERRED 64 WORDS?
2398  023624  001422                                 BEQ     XRA5
2399  023626  005203                                 INC     R3                      ;IF NOT, WATCH FOR A SECOND
2400  023630  001373                                 BNE     XRA4
2401  023632  005204                                 INC     R4
2402  023634  001371                                 BNE     XRA4
2403  023636  005302                                 DEC     R2
2404  023640  001364                                 BNE     XRA3A
2405  023642                                         ERROR   \N              ;ERROR:XMTR NPR NOT COMPLETE IN 1 SEC
 (1)                                                                             ;******* ERROR 303 *******
 (1)  023642  032777  040000  006540                 BIT     #B14,@SR
 (1)  023650  001005                                 BNE     .+14
 (1)  023652  012767  000303  006762                 MOV     #303,ERRNUM
 (1)  023660  004767  006530                         JSR     PC,ERR
 (1)          000304                         N       -       N+1
2406  023664                                         SCOPE   XRA3
 (1)  023664  004567  160336                         JSR     R5,SCPRTN
 (1)  023670  023544                                 XRA3
2407  023672  004767  000116                 XRA5:   JSR     PC,CHXDAT               ;CHK DATA IN XMTR SILO
2408  023676  000414                                 BR      XRA6
2409  023700                                         DATERR  \N              ;ERROR:BAD DATA NPR'D TO XMTR SILO
 (1)                                                                             ;******* ERROR 304 *******
 (1)  023700  032777  040000  006502                 BIT     #B14,@SR
 (1)  023706  001005                                 BNE     .+14
 (1)  023710  012767  000304  006724                 MOV     #304,ERRNUM
 (1)  023716  004767  006556                         JSR     PC,DERR
 (1)          000305                         N       -       N+1
2410  023722                                         SCOPE   XRA3
 (1)  023722  004567  160300                         JSR     R5,SCPRTN
 (1)  023726  023544                                 XRA3
2411  023730  004767  005736                 XRA6:   JSR     PC,MONIT
2412  023734  032777  010000  006446                 BIT     #B12,@SR                ;SW 12 = 1?
2413  023742  001402                                 BEQ     XRART                   ;NO, EXIT
2414  023744  000167  177330                         JMP     NPRTST                  ;YES, STAY HERE
2415  023750  000207                         XRART:  RTS     PC
2416  023752  012700  033564                 FILRCV: MOV     #SILDAT,R0              ;R0 IS DATA POINTER
2417  023756  012777  000200  012166                 MOV     #B07,@RCR               ;SET RCVR 'LD SILO'
2418  023764  012701  000100                         MOV     #64.,R1                 ;R1 IS WORD COUNTER
2419  023770  012077  012162                 LDLP:   MOV     (R0)+,@RDDB             ;MOVE WORDS INTO SILO
2420  023774  004567  160546                         JSR     R5,DELAY                ;WAIT FOR INPUT RDY
2421  024000  000005                                 .WORD   5
2422  024002  005301                                 DEC     R1                      ;LOADED ALL 64 WORDS?
2423  024004  001371                                 BNE     LDLP                    ;IF NOT, CONTINUE LOADING
2424  024006  005077  012140                         CLR     @RCR                    ;CLR RCR AND EXIT
2425  024012  000207                                 RTS     PC
2426
2427  024014  012702  000100                 CHXDAT: MOV     #64.,R2                 ;R2 IS WORD COUNTER
```

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2428  024020  012701  033564                MOV     #SILDAT,R1          ;R1 POINTS TO GOOD DATA
2429  024024  052777  000200  012100        BIS     #B07,@TCR           ;SET 'RD SILO' IN XMTR
2430  024032  017767  012100  006604  XRCNT: MOV     @TSDB,BAD           ;POP SILO WORD INTO BAD
2431  024040  012167  006602                MOV     (R1)+,GOOD          ;POP LIST WORD INTO GOOD
2432  024044  026767  006576  006572        CMP     GOOD,BAD
2433  024052  001005                        BNE     XRERXT              ;IF DATA BAD, ERROR EXIT
2434  024054  005302                        DEC     R2                  ;DONE CHECKING SILO?
2435  024056  001365                        BNE     XRCNT               ;NO, CONTINUE
2436  024060  005077  012046          XRLV: CLR     @TCR                ;CLR COMMAND REG
2437  024064  000207                        RTS     PC                  ;EXIT
2438  024066  062716  000002        XRERXT: ADD     #2,(SP)             ;FIX PC FOR ERROR RETURN
2439  024072  000772                        BR      XRLV
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                                        .SBTTL  DATA LOOPS TESTS

024074                          DATLPS: BDINIT  XMTR                    ;CLR XMTR
024102                                  BDINIT  RCVR                    ;CLR RCVR
024110  012777  177777  012020        MOV     #-1,@TSDB               ;LOAD A WORD INTO TXM SILO
024116  012777  010400  012020        MOV     #10400,@TMMR            ;SET MASTER FLOP & SET AUTO ADDR
024124  012777  177776  012026        MOV     #-2,@RDBC               ;SET BYTE COUNT FOR 1 WORD
024132  016777  011746  011772        MOV     RCAD,@TCR               ;LOAD DESTINATION CODE
024140  052777  020000  012004        BIS     #B13,@RCR               ;SET RCV WD
024146  012777  177776  011764        MOV     #-2,@TSBC               ;SET XMTR BYTE CNT FOR 1 WORD
024154  052777  020000  011750        BIS     #B13,@TCR               ;SET SEND WORD
024162  016704  006224                MOV     DLCON,R4
024166  012703  177500          DTLPS1: MOV     #177500,R3              ;SET UP 2 MS DELAY
024172  005777  011756          XRB1:   TST     @RSR                    ;ANY ERRORS?
024176  100427                          BMI     2$                      ;YES
024200  032777  000400  011746        BIT     #B08,@RSR               ;IS DAT OUTP RDY SET IN RCVR?
024206  001020                        BNE     1$
024210  005203                        INC     R3                      ;WAIT A COUPLE OF MS FOR IT
024212  001367                        BNE     XRB1
024214  005304                        DEC     R4
024216  001363                        BNE     DTLPS1
024220                                  ERROR   \N              ;ERROR:DAT OUTP RDY IN RCVR NOT SET IN 2 MS.
                                                                ;******* ERROR 305 *******
(1)
(1)     024220  032777  040000  006162        BIT     #B14,@SR
(1)     024226  001005                        BNE     .+14
(1)     024230  012767  000305  006404        MOV     #305,ERRNUM
(1)     024236  004767  006152                JSR     PC,ERR
(1)             000306                  N       =       N+1
024242                                  SCOPE   DATLPS
(1)     024242  004567  157760                JSR     R5,SCPRTN
(1)     024246  024074                        DATLPS
024250  005777  011700          1$:     TST     @RSR                    ;ANY HARD ERRORS?
024254  100030                          BPL     XRB2
024256                          2$:     ERROR   \N              ;ERROR; HARD ERROR ON 1 WD XFER
                                                                ;******* ERROR 306 *******
(1)
(1)     024256  032777  040000  006124        BIT     #B14,@SR
(1)     024264  001005                        BNE     .+14
(1)     024266  012767  000306  006346        MOV     #306,ERRNUM
(1)     024274  004767  006114                JSR     PC,ERR
(1)             000307                  N       =       N+1
024300  032777  040000  006102        BIT     #B14,@SR                ;CHECK FOR PRINT INHIBIT
024306  001010                        BNE     XRB1S                   ;SKIP EXT PRINTOUT IF SW 14 1
024310                                  PNTM    RCSTAT                  ;ELSE PRINT 'RECEIVER STATUS - ''
(1)     024310  012700  034607                MOV     #RCSTAT,R0              ;PRINT MESSAGE
(1)     024314  004767  006330                JSR     PC,TYPOUT               ;POINTED TO BY RCSTAT
024320  017700  011630                MOV     @RSR,R0
024324  004767  006636                JSR     PC,OCTPNT               ;PRINT CONTENTS OF RSR
024330                          XRB1S:  SCOPE   DATLPS
(1)     024330  004567  157672                JSR     R5,SCPRTN
(1)     024334  024074                        DATLPS
024336  105777  011572          XRB2:   TSTB    @TSR                    ;IS SUC TXF SET IN XMTR?
024342  100433                          BMI     XRB3
024344                                  ERROR   \N              ;ERROR:SUC TXF IN XMTR NOT SET IN 2 MS.
                                                                ;******* ERROR 307 *******
(1)
(1)     024344  032777  040000  006036        BIT     #B14,@SR
(1)     024352  001005                        BNE     .+14
```

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  (1) 024354 012767 000307 006260          MOV     #307,ERRNUM
  (1) 024362 004767 006026                 JSR     PC,ERR
  (1)        000310                N       =       N+1
2476 024366 005777 011542                  TST     @TSR                    ;ANY HARD ERRORS?
2477 024372 100014                         BPL     XRBS2
2478 024374 032777 040000 006006           BIT     #B14,@SR                ;CHECK IF PRINT ALLOWED
2479 024402 001010                         BNE     XRBS2                   ;IF NOT, SKIP IT.
2480 024404                                PNTM    TXSTAT                  ;IF SO, PRINT 'TRANSMITTER STATUS = ''
  (1) 024404 012700 034554                 MOV     #TXSTAT,R0              ;PRINT MESSAGE
  (1) 024410 004767 006234                 JSR     PC,TYPOUT               ;POINTED TO BY TXSTAT
2481 024414 017700 011514                  MOV     @TSR,R0
2482 024420 004767 006542                  JSR     PC,OCTPNT               ;PRINT CONTENTS OF TSR
2483 024424                        XRBS2:  SCOPE   DATLPS
  (1) 024424 004567 157576                 JSR     R5,SCPRTN
  (1) 024430 024074                        DATLPS
2484 024432 012767 177777 006206   XRB3:   MOV     #-1,GOOD
2485 024440 017767 011512 006176           MOV     @RDDB,BAD               ;CHECK DATA RECEIVED
2486 024446 026767 006174 006170           CMP     GOOD,BAD                ;IS IT O.K. ?
2487 024454 001414                         BEQ     XRB4
2488 024456                                DATERR  \N              ;ERROR:DATA RECEIVED IS WRONG (DROPPED BITS)
  (1)                                                           ;******* ERROR 310 *******
  (1) 024456 032777 040000 005724          BIT     #B14,@SR
  (1) 024464 001005                        BNE     .+14
  (1) 024466 012767 000310 006146          MOV     #310,ERRNUM
  (1) 024474 004767 006000                 JSR     PC,DERR
  (1)        000311                N       =       N+1
2489 024500                                SCOPE DATLPS
  (1) 024500 004567 157522                 JSR     R5,SCPRTN
  (1) 024504 024074                        DATLPS
2490 024506 016767 011374 006132   XRB4:   MOV     TRAD,GOOD               ;GET TRANSMITTER IDM BUS ADDRESS
2491 024514 017767 011432 006122           MOV     @RCR,BAD                ;READ IDENT BITS IN RCR
2492 024522 042767 160377 006114           BIC     #160377,BAD             ;IGNORE ALL OTHER BITS
2493 024530 026767 006112 006106           CMP     GOOD,BAD                ;D.C. RECEIVED OK?
2494 024536 001414                         BEQ     XRB4C
2495 024540                                DATERR  \N              ;ERROR:XMTR IDENT BITS NOT REC'D BY RCVR
  (1)                                                           ;******* ERROR 311 *******
  (1) 024540 032777 040000 005642          BIT     #B14,@SR
  (1) 024546 001005                        BNE     .+14
  (1) 024550 012767 000311 006064          MOV     #311,ERRNUM
  (1) 024556 004767 005716                 JSR     PC,DERR
  (1)        000312                N       -       N+1
2496 024562                                SCOPE   DATLPS
  (1) 024562 004567 157440                 JSR     R5,SCPRTN
  (1) 024566 024074                        DATLPS
2497 024570                        XRB4C:  BDINIT  XMTR                    ;CLR XMTR
2498 024576                                BDINIT  RCVR                    ;CLR RCVR
2499 024604 012777 000000 011324           MOV     #0,@TSDB                ;LOAD A WORD OF 0'S INTO SILO
2500 024612 012777 177776 011320           MOV     #-2,@TSBC               ;SET BYTE CNT FOR 1 WORD
2501 024620 012777 177776 011332           MOV     #-2,@RDBC
2502 024626 016777 011252 011276           MOV     RCAD,@TCR               ;POINT XMTR AT RCVR
2503 024634 052777 020000 011310           BIS     #B13,@RCR               ;SET RCV WD
2504 024642 052777 020000 011262           BIS     #B13,@TCR               ;SET SND WD
2505 024650 016704 005536                  MOV     DLCON,R4
2506 024654 012703 177570          XRB4D:  MOV     #177570,R3              ;SET UP 2 MS DELAY
2507 024660 005777 011270          XRB5:   TST     @RSR                    ;ANY ERRORS?
2508 024664 100427                         BMI     2$                      ;YES, ERROR
```

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 2509  024666  032777  000400  011260          BIT     #B08,@RSR               ;DATA OUTPUT READY YET?
 2510  024674  001020                          BNE     1$
 2511  024676  005203                          INC     R3                      ;WAIT A COUPLE OF MS FOR IT
 2512  024700  001367                          BNE     XRB5
 2513  024702  005304                          DEC     R4
 2514  024704  001363                          BNE     XRB4D
 2515  024706                                  ERROR   \N              ;ERROR:DAT OUTP RDY IN RCVR NOT SET IN 2 MS.
  (1)                                                                     ;******* ERROR 312 *******
  (1)   024706  032777  040000  005474          BIT     #B14,@SR
  (1)   024714  001005                          BNE     .+14
  (1)   024716  012767  000312  005716          MOV     #312,ERRNUM
  (1)   024724  004767  005464                  JSR     PC,ERR
  (1)           000313                  N       =       N+1
 2516  024730                                  SCOPE   XRB4C
  (1)   024730  004567  157272                  JSR     R5,SCPRTN
  (1)   024734  024570                          XRB4C
 2517  024736  005777  011212          1$:     TST     @RSR                    ;ANY HARD ERRORS IN RCVR?
 2518  024742  100030                          BPL     XRB6
 2519  024744                          2$:     ERROR   \N              ;ERROR:HARD ERROR ON 1 WD XFER
  (1)                                                                     ;******* ERROR 313 *******
  (1)   024744  032777  040000  005436          BIT     #B14,@SR
  (1)   024752  001005                          BNE     .+14
  (1)   024754  012767  000313  005660          MOV     #313,ERRNUM
  (1)   024762  004767  005426                  JSR     PC,ERR
  (1)           000314                  N       =       N+1
 2520  024766  032777  040000  005414          BIT     #B14,@SR                ;CHECK IF PRINT ALLOWED
 2521  024774  001013                          BNE     XRB6                    ;IF NOT, SKIP IT.
 2522  024776                                  PNTM    RCSTAT                  ;IF SO, PRINT 'RECEIVER STATUS  ''
  (1)   024776  012700  034607                  MOV     #RCSTAT,R0              ;PRINT MESSAGE
  (1)   025002  004767  005642                  JSR     PC,TYPOUT               ;POINTED TO BY RCSTAT
 2523  025006  017700  011142                  MOV     @RSR,R0
 2524  025012  004767  006150                  JSR     PC,OCTPNT               ;PRINT CONTENTS OF RSR
 2525  025016                                  SCOPE   XRB4C
  (1)   025016  004567  157204                  JSR     R5,SCPRTN
  (1)   025022  024570                          XRB4C
 2526  025024  105777  011104          XRB6:   TSTB    @TSR                    ;IS SUC TXF SET IN XMTR?
 2527  025030  100433                          BMI     XRB7
 2528  025032                                  ERROR   \N              ;ERROR:SUC TXF IN XMTR NOT SET IN 2 MS.
  (1)                                                                     ;******* ERROR 314 *******
  (1)   025032  032777  040000  005350          BIT     #B14,@SR
  (1)   025040  001005                          BNE     .+14
  (1)   025042  012767  000314  005572          MOV     #314,ERRNUM
  (1)   025050  004767  005340                  JSR     PC,ERR
  (1)           000315                  N       =       N+1
 2529  025054  005777  011054                  TST     @TSR                    ;ANY HARD ERRORS IN XMTR?
 2530  025060  100014                          BPL     XRB6S
 2531  025062  032777  040000  005320          BIT     #B14,@SR                ;CHECK IF PRINT ALLOWED
 2532  025070  001010                          BNE     XRB6S                   ;IF NOT, SKIP IT
 2533  025072                                  PNTM    TXSTAT                  ;IF SO, PRINT 'TRANSMITTER STATUS = ''
  (1)   025072  012700  034554                  MOV     #TXSTAT,R0              ;PRINT MESSAGE
  (1)   025076  004767  005546                  JSR     PC,TYPOUT               ;POINTED TO BY TXSTAT
 2534  025102  017700  011026                  MOV     @TSR,R0
 2535  025106  004767  006054                  JSR     PC,OCTPNT               ;PRINT CONTENTS OF TSR
 2536  025112                          XRB6S:  SCOPE   XRB4C
  (1)   025112  004567  157110                  JSR     R5,SCPRTN
  (1)   025116  024570                          XRB4C
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 2537  025120  005067  005522          XRB7:   CLR     GOOD
 2538  025124  017767  011026  005512          MOV     @RDDB,BAD               ;CHECK DATA RECEIVED
 2539  025132  026767  005510  005504          CMP     GOOD,BAD                ;IS IT O.K.?
 2540  025140  001414                          BEQ     XRB8
 2541  025142                                  DATERR  \N              ;ERROR:DATA RECEIVED IS WRONG (PICKED UP BITS)
  (1)                                                                    ;******* ERROR 315 *******
  (1)  025142  032777  040000  005240          BIT     #B14,@SR
  (1)  025150  001005                          BNE     .+14
  (1)  025152  012767  000315  005462          MOV     #315,ERRNUM
  (1)  025160  004767  005314                  JSR     PC,DERR
  (1)          000316                  N               N+1
 2542  025164                                  SCOPE   XRB4C
  (1)  025164  004567  157036                  JSR     R5,SCPRTN
  (1)  025170  024570                          XRB4C
 2543  025172  004767  173012          XRB8:   JSR     PC,CLRCBF               ;MAKE SURE CMPBUF IS CLEAR
 2544  025176                                  BDINIT  XMTR                    ;CLR XMTR
 2545  025204                                  BDINIT  RCVR                    ;CLR RCVR
 2546  025212  012777  033564  010722          MOV     #SILDAT,@TSBA           ;GET XMTR DATA FROM SILDAT
 2547  025220  012777  034164  010734          MOV     #CMPBUF,@RDBA           ;PUT RCV'D DATA IN CMPBUF
 2548  025226  012777  177600  010704          MOV     #-128.,@TSBC            ;SET UP TO SEND 64 WORDS
 2549  025234  012777  177600  010716          MOV     #-128.,@RDBC            ;SET UP TO RECEIVE 64 WORDS
 2550  025242  016777  010636  010662          MOV     RCAD,@TCR               ;POINT XMTR AT RCVR
 2551  025250  052777  060001  010674          BIS     #60001,@RCR             ;SET RC NPR, RCV WD, & ST TXF IN RCVR
 2552  025256  052777  060001  010646          BIS     #60001,@TCR             ;AND IN XMTR
 2553  025264  016702  005122                  MOV     DLCON,R2
 2554  025270  005003                  XRB8A:  CLR     R3
 2555  025272  012704  177777                  MOV     #-1,R4                  ;SET UP 1 SEC DELAY
 2556  025276  105777  010632          XRB9:   TSTB    @TSR                    ;IS SUC TXF SET IN XMTR?
 2557  025302  100447                          BMI     XRB10                   ;YES, GO CHECK RECEIVER
 2558  025304  005777  010624                  TST     @TSR                    ;ERROR BIT SET?
 2559  025310  100411                          BMI     $2$
 2560  025312  005777  010636                  TST     @RSR                    ;RCVR ERROR BIT SET?
 2561  025316  100444                          BMI     $3$
 2562  025320  005203                          INC     R3                      ;NO, WATCH FOR A SECOND
 2563  025322  001365                          BNE     XRB9
 2564  025324  005204                          INC     R4
 2565  025326  001363                          BNE     XRB9
 2566  025330  005302                          DEC     R2
 2567  025332  001356                          BNE     XRB8A
 2568  025334                          $2$:    ERROR   \N              ;ERROR:NO SUC TXF IN XMTR IN 1 SEC
  (1)                                                                    ;******* ERROR 316 *******
  (1)  025334  032777  040000  005046          BIT     #B14,@SR
  (1)  025342  001005                          BNE     .+14
  (1)  025344  012767  000316  005270          MOV     #316,ERRNUM
  (1)  025352  004767  005036                  JSR     PC,ERR
  (1)          000317                  N       =       N+1
 2569  025356  005777  010552                  TST     @TSR                    ;ANY HARD ERRORS IN XMTR?
 2570  025362  100014                          BPL     XRB9S
 2571  025364  032777  040000  005016          BIT     #B14,@SR                ;CHECK IF PRINT ALLOWED
 2572  025372  001010                          BNE     XRB9S                   ;IF NOT, SKIP IT
 2573  025374                                  PNTM    TXSTAT                  ;IF SO, PRINT "TRANSMITTER STATUS = "
  (1)  025374  012700  034554                  MOV     #TXSTAT,R0              ;PRINT MESSAGE
  (1)  025400  004767  005244                  JSR     PC,TYPOUT               ;POINTED TO BY TXSTAT
 2574  025404  017700  010524                  MOV     @TSR,R0
 2575  025410  004767  005552                  JSR     PC,OCTPNT               ;PRINT CONTENTS OF TSR
 2576  025414                          XRB9S:  SCOPE   XRB8
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  (1)  025414  004567  156606            JSR     R5,SCPRTN
  (1)  025420  025172                    XRB8
2577   025422  105777  010526  XRB10:    TSTB    @RSR                    ;IS SUC TXF SET IN RCVR?
2578   025426  100433                    BMI     XRB11                   ;YES, GO CHECK DATA
2579   025430                  $3$:      ERROR   \N              ;ERROR:NO SUC TXF IN RCVR IN 1 SEC
  (1)                                                           ;******* ERROR 317 *******
  (1)  025430  032777  040000  004752    BIT     #B14,@SR
  (1)  025436  001005                    BNE     .+14
  (1)  025440  012767  000317  005174    MOV     #317,ERRNUM
  (1)  025446  004767  004742            JSR     PC,ERR
  (1)          000320            N       =       N+1
2580   025452  005777  010476            TST     @RSR                    ;ANY HARD ERRORS IN RCVR?
2581   025456  100014                    BPL     XRB10S
2582   025460  032777  040000  004722    BIT     #B14,@SR                ;CHECK IF PRINT ALLOWED
2583   025466  001010                    BNE     XRB10S                  ;IF NOT, SKIP IT
2584   025470                            PNTM    RCSTAT                  ;IF SO, PRINT 'RECEIVER STATUS   ''
  (1)  025470  012700  034607            MOV     #RCSTAT,R0              ;PRINT MESSAGE
  (1)  025474  004767  005150            JSR     PC,TYPOUT               ;POINTED TO BY RCSTAT
2585   025500  017700  010450            MOV     @RSR,R0
2586   025504  004767  005456            JSR     PC,OCTPNT               ;PRINT CONTENTS OF RSR
2587   025510                  XRB10S:   SCOPE   XRB8
  (1)  025510  004567  156512            JSR     R5,SCPRTN
  (1)  025514  025172                    XRB8
2588   025516  012703  000100  XRB11:    MOV     #64.,R3                 ;R3 IS WORD COUNTER
2589   025522  012701  033564            MOV     #SILDAT,R1              ;R1 IS GOOD DATA POINTER
2590   025526  012702  034164            MOV     #CMPBUF,R2              ;R2 IS 'BAD'DATA POINTER
2591   025532  012167  005110  XRB11L:   MOV     (R1)+,GOOD
2592   025536  012267  005102            MOV     (R2)+,BAD
2593   025542  026767  005100  005074    CMP     GOOD,BAD                ;DATA WORD OK?
2594   025550  001420                    BEQ     XRB11C                  ;IF SO, CONTINUE
2595   025552                            DATERR  \N              ;ERROR:BAD DATA RECEIVED FROM XMTR
  (1)                                                           ;******* ERROR 320 *******
  (1)  025552  032777  040000  004630    BIT     #B14,@SR
  (1)  025560  001005                    BNE     .+14
  (1)  025562  012767  000320  005052    MOV     #320,ERRNUM
  (1)  025570  004767  004704            JSR     PC,DERR
  (1)          000321            N       =       N+1
2596   025574  005303                    DEC     R3                      ;CHECKED ALL WORDS?
2597   025576  001355                    BNE     XRB11L
2598   025600                            SCOPE   XRB8                    ;RE-TRY BECAUSE OF ERROR
  (1)  025600  004567  156422            JSR     R5,SCPRTN
  (1)  025604  025172                    XRB8
2599   025606  000167  000004            JMP     XRB12
2600   025612  005303          XRB11C:   DEC     R3                      ;CHECKED ALL WORDS?
2601   025614  001346                    BNE     XRB11L
2602   025616                  XRB12:    BDINIT  XMTR                    ;CLR XMTR
2603   025624                            BDINIT  RCVR                    ;CLR RCVR
2604   025632  012777  036200  010302    MOV     #TSTWRD,@TSBA           ;POINT XMTR AT LOC WITH TEST WORD
2605   025640  012777  177200  010272    MOV     #-600,@TSBC             ;SET UP FOR 300 WORD XFR
2606   025646  016777  010232  010256    MOV     RCAD,@TCR               ;POINT XMTR AT RCVR
2607   025654  012777  020001  010270    MOV     #20001,@RCR             ;SET RCV WD, RCV DAT, IN RCVR
2608   025662  052777  060005  010242    BIS     #60005,@TCR             ;SET TX NPR, INH ADR INC, ST TXM,&SND WD
2609   025670  012701  000300            MOV     #300,R1                 ;R1 COUNTS WORDS RECEIVED
2610   025674  016704  004512  XRB12L:   MOV     DLCON,R4
2611   025700  012703  177700  XRB12K:   MOV     #-100,R3                ;SET UP 10 MS COUNTER
2612   025704  032777  000400  010242  XRB12M:   BIT     #B08,@RSR       ;RCVR SILO RDY FOR OUTPUT?
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 2613  025712  001063                    BNE     XRB13                   ;YES. LOOK AT WORD
 2614  025714  005203                    INC     R3
 2615  025716  001372                    BNE     XRB12M                  ;IF NOT, WAIT 10 MS.
 2616  025720  005304                    DEC     R4
 2617  025722  001366                    BNE     XRB12K
 2618  025724                            ERROR   \N              ;ERROR:NO DATA WORD IN RCVR SILO IN 10 MS.
  (1)                                               ;******* ERROR 321 *******
  (1)   025724  032777  040000  004456          BIT     #B14,@SR
  (1)   025732  001005                    BNE     .+14
  (1)   025734  012767  000321  004700          MOV     #321,ERRNUM
  (1)   025742  004767  004446                  JSR     PC,ERR
  (1)           000322                  N       =       N+1
 2619  025746  005777  010162                  TST     @TSR                    ;ANY HARD ERRORS IN XMTR?
 2620  025752  100014                    BPL     XRB12R
 2621  025754  032777  040000  004426          BIT     #B14,@SR                ;CHECK IF PRINT ALLOWED
 2622  025762  001034                    BNE     XRB12S                  ;IF NOT, SKIP IT
 2623  025764                            PNTM    TXSTAT                  ;IF SO, PRINT 'TRANSMITTER STATUS = ''
  (1)   025764  012700  034554                  MOV     #TXSTAT,R0              ;PRINT MESSAGE
  (1)   025770  004767  004654                  JSR     PC,TYPOUT               ;POINTED TO BY TXSTAT
 2624  025774  017700  010134                  MOV     @TSR,R0
 2625  026000  004767  005162                  JSR     PC,OCTPNT               ;PRINT CONTENTS OF TSR
 2626  026004  005777  010144          XRB12R: TST     @RSR                    ;ANY HARD ERRORS IN RCVR?
 2627  026010  100010                    BPL     XRB12T
 2628  026012                            PNTM    RCSTAT                  ;IF SO, PRINT 'RECEIVER STATUS = ''
  (1)   026012  012700  034607                  MOV     #RCSTAT,R0              ;PRINT MESSAGE
  (1)   026016  004767  004626                  JSR     PC,TYPOUT               ;POINTED TO BY RCSTAT
 2629  026022  017700  010126                  MOV     @RSR,R0
 2630  026026  004767  005134                  JSR     PC,OCTPNT               ;PRINT CONTENTS OF RSR
 2631  026032                          XRB12T: PNTM    RCBTCN                  ;PRINT 'NO. OF WORDS RECEIVED = ''
  (1)   026032  012700  034637                  MOV     #RCBTCN,R0              ;PRINT MESSAGE
  (1)   026036  004767  004606                  JSR     PC,TYPOUT               ;POINTED TO BY RCBTCN
 2632  026042  012700  000300                  MOV     #300,R0
 2633  026046  160100                    SUB     R1,R0                   ;CALCULATE WORDS RECV'D
 2634  026050  004767  005112                  JSR     PC,OCTPNT               ;PRINT RESULT
 2635  026054                          XRB12S: SCOPE   XRB12                   ;START ALL OVER
  (1)   026054  004567  156146                  JSR     R5,SCPRTN
  (1)   026060  025616                          XRB12
 2636  026062  016767  010112  004556  XRB13:  MOV     TSTWRD,GOOD
 2637  026070  017767  010062  004546          MOV     @RDDB,BAD               ;GET WORD FROM SILO
 2638  026076  026767  004544  004540          CMP     GOOD,BAD                ;WAS IT = TEST WORD?
 2639  026104  001431                    BEQ     XRB13C
 2640  026106                            DATERR  \N              ;ERROR:DATA WORD IN RCVR SILO WRONG
  (1)                                               ;******* ERROR 322 *******
  (1)   026106  032777  040000  004274          BIT     #B14,@SR
  (1)   026114  001005                    BNE     .+14
  (1)   026116  012767  000322  004516          MOV     #322,ERRNUM
  (1)   026124  004767  004350                  JSR     PC,DERR
  (1)           000323                  N       =       N+1
 2641  026130  032777  040000  004252          BIT     #B14,@SR                ;CHECK IF PRINT ALLOWED
 2642  026136  001011                    BNE     XRB13L                  ;IF NOT, SKIP IT.
 2643  026140                            PNTM    RCBTCN                  ;PRINT 'NO. OF WORDS RECEIVED = ''
  (1)   026140  012700  034637                  MOV     #RCBTCN,R0              ;PRINT MESSAGE
  (1)   026144  004767  004500                  JSR     PC,TYPOUT               ;POINTED TO BY RCBTCN
 2644  026150  012700  000301                  MOV     #301,R0
 2645  026154  160100                    SUB     R1,R0                   ;CALCULATE WORDS RECV'D
 2646  026156  004767  005004                  JSR     PC,OCTPNT               ;PRINT RESULT
```

```
 2647  026162                                  XRB13L: SCOPE   XRB12                   ;START ALL OVER
  (1)  026162  004567  156040                          JSR     R5,SCPRTN
  (1)  026166  025616                                  XRB12
 2648  026170  005301                          XRB13C: DEC     R1                      ;UPDATE RCVR WORD COUNT
 2649  026172  001240                                  BNE     XRB12L                  ;GET ANOTHER WORD
 2650  026174  016704  004212                          MOV     DLCON,R4
 2651  026200  012703  177000                  XRB13E: MOV     #177000,R3              ;SET UP TO WAIT FOR TXFR
 2652  026204  005203                          XRB13D: INC     R3
 2653  026206  001376                                  BNE     XRB13D                  ;WAIT FOR LATEST POSSIBLE TIMSL
 2654  026210  105777  007720                          TSTB    @TSR                    ;XMTR SUC TXF SET?
 2655  026214  100435                                  BMI     XRB14                   ;YES,GO CHECK RCVR
 2656  026216  005304                                  DEC     R4
 2657  026220  001367                                  BNE     XRB13E
 2658  026222                                          ERROR   \N              ;ERROR:XMTR SUC TXF NOT SET
  (1)                                                                             ;******* ERROR 323 *******
  (1)  026222  032777  040000  004160                  BIT     #B14,@SR
  (1)  026230  001005                                  BNE     .+14
  (1)  026232  012767  000323  004402                  MOV     #323,ERRNUM
  (1)  026240  004767  004150                          JSR     PC,ERR
  (1)          000324                          N       =       N+1
 2659  026244  005777  007664                          TST     @TSR                    ;ANY HARD ERRORS IN XMTR?
 2660  026250  100014                                  BPL     XRB13S
 2661  026252  032777  040000  004130                  BIT     #B14,@SR                ;CHECK IF PRINT ALLOWED
 2662  026260  001010                                  BNE     XRB13S                  ;IF NOT, SKIP IT.
 2663  026262                                          PNTM    TXSTAT                  ;IF SO, PRINT 'TRANSMITTER STATUS = ''
  (1)  026262  012700  034554                          MOV     #TXSTAT,R0              ;PRINT MESSAGE
  (1)  026266  004767  004356                          JSR     PC,TYPOUT               ;POINTED TO BY TXSTAT
 2664  026272  017700  007636                          MOV     @TSR,R0
 2665  026276  004767  004664                          JSR     PC,OCTPNT               ;PRINT CONTENTS OF TSR
 2666  026302                                  XRB13S: SCOPE   XRB12                   ;START OVER
  (1)  026302  004567  155720                          JSR     R5,SCPRTN
  (1)  026306  025616                                  XRB12
 2667  026310  105777  007640                  XRB14:  TSTB    @RSR                    ;RCVR SUC TXF SET?
 2668  026314  100433                                  BMI     XRB15                   ;YES, ALL DONE
 2669  026316                                          ERROR   \N              ;ERROR:RCVR SUC TXF NOT SET
  (1)                                                                             ;******* ERROR 324 *******
  (1)  026316  032777  040000  004064                  BIT     #B14,@SR
  (1)  026324  001005                                  BNE     .+14
  (1)  026326  012767  000324  004306                  MOV     #324,ERRNUM
  (1)  026334  004767  004054                          JSR     PC,ERR
  (1)          000325                          N       =       N+1
 2670  026340  005777  007610                          TST     @RSR                    ;ANY HARD ERRORS IN RCVR?
 2671  026344  100014                                  BPL     XRB14S
 2672  026346  032777  040000  004034                  BIT     #B14,@SR                ;CHECK IF PRINT ALLOWED
 2673  026354  001010                                  BNE     XRB14S                  ;IF NOT, SKIP IT.
 2674  026356                                          PNTM    RCSTAT                  ;IF SO, PRINT 'RECEIVER STATUS = ''
  (1)  026356  012700  034607                          MOV     #RCSTAT,R0              ;PRINT MESSAGE
  (1)  026362  004767  004262                          JSR     PC,TYPOUT               ;POINTED TO BY RCSTAT
 2675  026366  017700  007562                          MOV     @RSR,R0
 2676  026372  004767  004570                          JSR     PC,OCTPNT               ;PRINT CONTENTS OF RSR
 2677  026376                                  XRB14S: SCOPE   XRB12                   ;START OVER
  (1)  026376  004567  155624                          JSR     R5,SCPRTN
  (1)  026402  025616                                  XRB12
 2678  026404  004767  003262                  XRB15:  JSR     PC,MONIT
 2679  026410  032777  010000  003772                  BIT     #B12,@SR                ;SW 12 = 1?
 2680  026416  001402                                  BEQ     XRBRT                   ;NO, EXIT
```

```
2681  026420  000167  175450                    JMP     DATLPS                  ;YES, DON'T EXIT
2682  026424  000207                    XRBRT:  RTS     PC
```

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                                        .SBTTL  TRANSMISSION ERRORS TESTS

                                ;TEST TO CHECK FOR RCVR TIMEOUT.
                                ;OPEN CHANNEL, THEN DON'T SEND ANY DATA FOR
                                ; 3 SECONDS.


026426                          TXMERS: BDINIT  XMTR                    ;CLR XMTR
026434                                  BDINIT  RCVR                    ;CLR RCVR
026442  052777  010400  007474          BIS     #10400,@TMMR            ;SET MASTER & AUTO ADDR
026450  012777  177774  007462          MOV     #-4,@TSBC               ;INDICATE 2 WD XFR
026456  012777  177777  007452          MOV     #-1,@TSDB               ;PUT 1 WD IN XMTR SILO
026464  016777  007414  007440          MOV     RCAD,@TCR               ;POINT XMTR AT RCVR
026472  052777  020000  007452          BIS     #B13,@RCR               ;SET RCV WD
026500  052777  020000  007424          BIS     #B13,@TCR               ;SET SND WD
026506  016702  003700                  MOV     DLCON,R2
026512  005003                  TXMR1:  CLR     R3
026514  012704  177775                  MOV     #-3,R4                  ;SET UP 1 SEC DELAY
026520  032777  002000  007426  XRC1:   BIT     #B10,@RSR               ;IS RCVR TIMEOUT SET?
026526  001022                          BNE     XRC2
026530  005203                          INC     R3                      ;IF NOT, WAIT 3 SEC FOR IT
026532  001372                          BNE     XRC1
026534  005204                          INC     R4
026536  001370                          BNE     XRC1
026540  005302                          DEC     R2
026542  001363                          BNE     TXMR1
026544                                  ERROR   \N              ;ERROR:NO TIMEOUT IN 3 SEC WITH NULL ON INPUT
  (1)                                                           ;******* ERROR 325 *******
  (1)   026544  032777  040000  003636          BIT     #B14,@SR
  (1)   026552  001005                          BNE     .+14
  (1)   026554  012767  000325  004060          MOV     #325,ERRNUM
  (1)   026562  004767  003626                  JSR     PC,ERR
  (1)           000326                  N       =       N+1
026566                                  SCOPE   TXMERS
  (1)   026566  004567  155434                  JSR     R5,SCPRTN
  (1)   026572  026426                          TXMERS

                                ;TEST TO DETERMINE THAT ADDRESSING RCVR AND GENERATING A NULL
                                ;CYCLE FIRST PROPERLY GENERATES CORRECT RESPONSE CODES
                                ;AND THAT THE RECEIVER DOES NOT RESPOND.
                                ;CHANNEL IS OPENED BY POPPING A WORD FROM XMTR SILO.

026574                          XRC2:   BDINIT  XMTR                    ;CLR XMTR
026602                                  BDINIT  RCVR                    ;CLR RCVR
026610  012777  177774  007322          MOV     #-4,@TSBC               ;SET UP FOR 1 WD XFR
026616  016777  007262  007306          MOV     RCAD,@TCR               ;POINT XMTR AT RCVR
026624  012777  177777  007304          MOV     #-1,@TSDB               ;PUT 1 WD INTO TXM SILO
026632  052777  000200  007272          BIS     #B07,@TCR               ;SET RD SILO
026640  052777  020001  007304          BIS     #B13+B00,@RCR           ;SET RCV WD AND RCV DATA
026646  004567  155674                  JSR     R5,DELAY                ;WAIT FOR WORD TO HIT BOTTOM
026652  000010                          .WORD   10
026654  005777  007256                  TST     @TSDB                   ;POP WORD OUT
026660  042777  000200  007244          BIC     #B07,@TCR               ;CLR RD SILO
026666  016704  003520                  MOV     DLCON,R4
026672  012703  177757          XRC2D:  MOV     #177757,R3              ;SET UP TO STALL 100 US.
026676  005203                  XRC2A:  INC     R3
```

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 2732  026700  001376                          BNE     XRC2A                   ;STALL (WAIT FOR TIME SLICE
 2733  026702  005304                          DEC     R4
 2734  026704  001372                          BNE     XRC2D
 2735  026706  012767  000000  003732          MOV     #0,GOOD
 2736  026714  017767  007234  003722          MOV     @RSR,BAD                ;CHK RESPONSE CODES IN RCVR
 2737  026722  042767  177760  003714          BIC     #177760,BAD
 2738  026730  026767  003712  003706          CMP     GOOD,BAD                ;RSP CODES = 00 & 00 ?
 2739  026736  001414                          BEQ     XRC3
 2740  026740                                  DATERR  \N              ;ERROR:RESPONSE CODES AT RECEIVER WRONG
   (1)                                                                   ;******* ERROR 326 *******
   (1)  026740  032777  040000  003442          BIT     #B14,@SR
   (1)  026746  001005                          BNE     .+14
   (1)  026750  012767  000326  003664          MOV     #326,ERRNUM
   (1)  026756  004767  003516                  JSR     PC,DERP
   (1)          000327                  N               N+1
 2741  026762                                  SCOPE   XRC2
   (1)  026762  004567  155240                  JSR     R5,SCPRTN
   (1)  026766  026574                          XRC2
 2742  026770  012767  000001  003650  XRC3:   MOV     #1,GOOD
 2743  026776  017767  007132  003640          MOV     @TSR,BAD                ;CHECK RESPONSE CODES IN XMTR
 2744  027004  042767  177760  003632          BIC     #177760,BAD
 2745  027012  026767  003630  003624          CMP     GOOD,BAD                ;RSP CODES = 00 & 01 ?
 2746  027020  001414                          BEQ     XRC4
 2747  027022                                  DATERR  \N              ;ERROR:RSP CODES AT XMTR WRONG
   (1)                                                                   ;******* ERROR 327 *******
   (1)  027022  032777  040000  003360          BIT     #B14,@SR
   (1)  027030  001005                          BNE     .+14
   (1)  027032  012767  000327  003602          MOV     #327,ERRNUM
   (1)  027040  004767  003434                  JSR     PC,DERR
   (1)          000330                  N       =       N+1
 2748  027044                                  SCOPE   XRC2
   (1)  027044  004567  155156                  JSR     R5,SCPRTN
   (1)  027050  026574                          XRC2
 2749  027052  032777  010000  007074  XRC4:   BIT     #B12,@RSR               ;IS RSR BIT 12 (TXM ERR) SET?
 2750  027060  001414                          BEQ     XRC5            ;ERROR:RCVR SHOULD NOT BE ADDRESSED
 2751  027062                                  ERROR   \N              ;UPON OPENING A CHANNEL WITH INVALID WORD
   (1)                                                                   ;******* ERROR 330 *******
   (1)  027062  032777  040000  003320          BIT     #B14,@SR
   (1)  027070  001005                          BNE     .+14
   (1)  027072  012767  000330  003542          MOV     #330,ERRNUM
   (1)  027100  004767  003310                  JSR     PC,ERR
   (1)          000331                  N       =       N+1
 2752  027104                                  SCOPE   XRC2
   (1)  027104  004567  155116                  JSR     R5,SCPRTN
   (1)  027110  026574                          XRC2
 2753
 2754                                  ;TEST TO DETERMINE THAT CHANNEL OPEN CAN BE ACHEIVED LEGALLY
 2755                                  ;AND THAT, ONCE ACHIEVED, KNOCKING DOWN THE TRANSMITTER BY
 2756                                  ;FAKING A XMTR TXM ERROR CAUSES THE CORRECT RESPONSES AND
 2757                                  ;CAUSES A RECVR TXM ERROR.
 2758
 2759  027112                          XRC5:   BDINIT  XMTR                    ;CLR XMTR
 2760  027120                                  BDINIT  RCVR                    ;CLR RCVR
 2761  027126  012777  177774  007004          MOV     #-4,@TSBC               ;SET UP FOR 2 WD XFR
 2762  027134  012777  177777  006774          MOV     #-1,@TSDB               ;LOAD A WORD INTO XMTR SILO
 2763  027142  016777  006736  006762          MOV     RCAD,@TCR               ;POINT XMTR AT RCVR
```

```
2764  027150  012777  177777  006760          MOV     #-1,@TSDB               ;LOAD 2ND WORD
2765  027156  052777  020000  006766          BIS     #B13,@RCR               ;SET RCV WORD
2766  027164  052777  020000  006740          BIS     #B13,@TCR               ;SET SND WORD
2767  027172  016704  003214                  MOV     DLCON,R4
2768  027176  012703  177500          XRC5A:  MOV     #177500,R3              ;SET UP FOR DELAY
2769  027202  132777  000010  006736  XRC6:   BITB    #B03,@TMMRH             ;CHECK FOR CHANNEL OPEN
2770  027210  001020                  BNE     XRC6A
2771  027212  005203                  INC     R3                      ;WAIT A BIT
2772  027214  001372                  BNE     XRC6
2773  027216  005304                  DEC     R4
2774  027220  001366                  BNE     XRC5A
2775  027222                          ERROR   \N              ;ERROR:CANNOT GET ''CHAN OPEN'' IN XMTR
  (1)                                                     ;******* ERROR 331 *******
  (1)   027222  032777  040000  003160          BIT     #B14,@SR
  (1)   027230  001005                  BNE     .+14
  (1)   027232  012767  000331  003402          MOV     #331,ERRNUM
  (1)   027240  004767  003150                  JSR     PC,ERR
  (1)           000332                  N       N+1
2776  027244                          SCOPE   XRC5
  (1)   027244  004567  154756                  JSR     R5,SCPRTN
  (1)   027250  027112                  XRC5
2777  027252  132777  000020  006674  XRC6A:  BITB    #B04,@RSR               ;CHECK FOR CHANNEL OPEN IN RCVR
2778  027260  001014                  BNE     XRC7
2779  027262                          ERROR   \N              ;ERROR:CANNOT GET ''CHANNEL OPEN'' IN RCVR
  (1)                                                     ;******* ERROR 332 *******
  (1)   027262  032777  040000  003120          BIT     #B14,@SR
  (1)   027270  001005                  BNE     .+14
  (1)   027272  012767  000332  003342          MOV     #332,ERRNUM
  (1)   027300  004767  003110                  JSR     PC,ERR
  (1)           000333                  N       N+1
2780  027304                          SCOPE   XRC5
  (1)   027304  004567  154716                  JSR     R5,SCPRTN
  (1)   027310  027112                  XRC5
2781
2782  027312  052777  010000  006614  XRC7:   BIS     #B12,@TSR               ;[illegible]
2783  027320  016704  003066                  MOV     DLCON,R4
2784  027324  012703  177757          XRC7D:  MOV     #177757,R3              ;[illegible]
2785  027330  005203                  XRC7A:  INC     R3
2786  027332  001376                  BNE     XRC7A                   ;[illegible]
2787  027334  005304                  DEC     R4
2788  027336  001372                  BNE     XRC7D
2789  027340  012767  000004  003300          MOV     #4,GOOD
2790  027346  017767  006602  003270          MOV     @RSR,BAD
2791  027354  042767  177760  003262          BIC     #177760,BAD             ;[illegible]
2792  027362  026767  003260  003254          CMP     GOOD,BAD
2793  027370  001414                  BEQ     XRC8
2794  027372                          DATERR  \N              ;[illegible]
                                                        ;******* [illegible] *******
      027372  032777  040000  003010          BIT     #B14,@SR
      027400  001005                  BNE     .+14
      027402  012767  000333  003232          MOV     #333,ERRNUM
      027410  004767  003064                  JSR     PC,DERR
              000334                  N       -       N+1
      027414                          SCOPE   XRC5
      027414  004567  154606                  JSR     R5,SCPRTN
      027420  027112                  XRC5
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2796  027422  032777  010000  006524  XR.8:   BIT     #B12,@RSR               ;IS RSR BIT 12 (TXM ERR) SET
2797  027430  001014                          BNE     XRC9            ;ERROR:XMTR OFF LINE WHILE CHAN OPEN
2798  027432                                  ERROR   \N                      ;DIDN'T SET RCVR TXM ERR
 (1)                                                                      ;******* ERROR 334 *******
 (1)  027432  032777  040000  002750          BIT     #B14,@SR
 (1)  027440  001005                          BNE     .+14
 (1)  027442  012767  000334  003172          MOV     #334,ERRNUM
 (1)  027450  004767  002740                  JSR     PC,ERR
 (1)          000335                  N       =       N+1
2799  027454                                  SCOPE   XRC5
 (1)  027454  004567  154546                  JSR     R5,SCPRTN
 (1)  027460  027112                          XRC5
2800
2801                                    ;TEST TO DETERMINE IF INCORRECT CRC WILL CAUSE A CHECK-FAIL
2802                                    ;AND GENERATE CORRECT RESPONSES IN RCVR AND XMTR THEREBY CAUSING
2803                                    ;TRANSMISSION ERRORS IN BOTH.
2804
2805  027462                            XRC9:   BDINIT  XMTR                    ;CLR XMTR
2806  027470                                    BDINIT  RCVR                    ;CLR RCVR
2807  027476  012777  177772  006434            MOV     #-6,@TSBC               ;SET UP FOR 3 WD XFR
2808  027504  012777  177777  006424            MOV     #-1,@TSDB               ;LOAD A WORD INTO XMTR SILO
2809  027512  012777  000002  006416            MOV     #2,@TSDB                ;LOAD 2ND WORD INTO XMTR SILO
2810  027520  012777  177772  006432            MOV     #-6,@RDBC
2811  027526  012777  177775  006402            MOV     #-3,@TSDB               ;LOAD 3RD WORD INTO XMTR SILO
2812  027534  016777  006344  006370            MOV     RCAD,@TCR               ;POINT XMTR AT RCVR
2813  027542  052777  020000  006402            BIS     #B13,@RCR               ;SET RCV WD
2814  027550  052777  020000  006354            BIS     #B13,@TCR               ;SET SND WD
2815  027556  105777  006352          XRC10:    TSTB    @TSR                    ;WAIT FOR SUC TXF
2816  027562  100375                            BPL     XRC10
2817  027564  052777  000200  006340            BIS     #B07,@TCR               ;SET XMTR RD SILO
2818  027572  005777  006340                    TST     @TSDB                   ;POP A WORD FROM SILO
2819  027576  042777  000200  006326            BIC     #B07,@TCR               ;CLR RD SILO
2820  027604  052777  000200  006340            BIS     #B07,@RCR               ;SET RCVR LD SILO
2821  027612  012777  000014  006336            MOV     #14,@RDDB               ;LOAD DIFFERENT 2ND WORD
2822  027620  042777  000200  006324            BIC     #B07,@RCR               ;CLR LD SILO
2823  027626  042777  000200  006300            BIC     #B07,@TSR               ;CLR SUC TXF
2824  027634  042777  000200  006312            BIC     #B07,@RSR
2825  027642  052777  000001  006302            BIS     #B00,@RCR               ;SET RCV DATA
2826  027650  052777  000001  006254            BIS     #B00,@TCR               ;SET ST TXM
2827  027656  016704  002530                    MOV     DLCON,R4
2828  027662  012703  177000          XRC10B:   MOV     #177000,R3              ;SET UP TO STALL
2829  027666  005203                  XRC10A:   INC     R3
2830  027670  001376                            BNE     XRC10A                  ;STALL (WAIT FOR LAST 2 WORDS)
2831  027672  005304                            DEC     R4
2832  027674  001372                            BNE     XRC10B
2833  027676  012767  000013  002742            MOV     #13,GOOD
2834  027704  017767  006244  002732            MOV     @RSR,BAD                ;CHECK RCVR RSP CODES
2835  027712  042767  177760  002724            BIC     #177760,BAD
2836  027720  026767  002722  002716            CMP     GOOD,BAD                ;ARE RSP CODES = 10 & 11 ?
2837  027726  001414                            BEQ     XRC11
2838  027730                                    DATERR  \N              ;ERROR:RCVR RSP CODES WRONG
 (1)                                                                      ;******* ERROR 335 *******
 (1)  027730  032777  040000  002452          BIT     #B14,@SR
 (1)  027736  001005                          BNE     .+14
 (1)  027740  012767  000335  002674          MOV     #335,ERRNUM
 (1)  027746  004767  002526                  JSR     PC,DFRR
```

```
 (1)              000336                      N         =       N+1
2839   027752                                           SCOPE   XRC9
 (1)   027752     004567    154250                      JSR     R5,SCPRTN
 (1)   027756     027462                                XRC9
2840   027760     017767    006150   002656  XRC11:     MOV     @TSR,BAD
2841   027766     042767    177760   002650             BIC     #177760,BAD          ;CHK XMTR RSP CODES
2842   027774     026767    002646   002642             CMP     GOOD,BAD             ;ARE THEY 10 & 11 ?
2843   030002     001414                                BEQ     XRC12
2844   030004                                           DATERR  \N                ;ERROR:XMTR RSP CODES WRONG
 (1)                                                                                 ;******* ERROR 336 *******
 (1)   030004     032777    040000   002376             BIT     #B14,@SR
 (1)   030012     001005                                BNE     .+14
 (1)   030014     012767    000336   002620             MOV     #336,ERRNUM
 (1)   030022     004767    002452                      JSR     PC,DERR
 (1)              000337                      N         =       N+1
2845   030026                                           SCOPE   XRC9
 (1)   030026     004567    154174                      JSR     R5,SCPRTN
 (1)   030032     027462                                XRC9
2846   030034     032777    010000   006072  XRC12:     BIT     #B12,@TSR            ;IS TXM ERR SET IN THE XMTR ?
2847   030042     001014                                BNE     XRC13
2848   030044                                           ERROR   \N                ;ERROR:XMTR TXM ERR NOT SET WITH INVALID DATA
 (1)                                                                                 ;******* ERROR 337 *******
 (1)   030044     032777    040000   002336             BIT     #B14,@SR
 (1)   030052     001005                                BNE     .+14
 (1)   030054     012767    000337   002560             MOV     #337,ERRNUM
 (1)   030062     004767    002326                      JSR     PC,ERR
 (1)              000340                      N         =       N+1
2849   030066                                           SCOPE   XRC9
 (1)   030066     004567    154134                      JSR     R5,SCPRTN
 (1)   030072     027462                                XRC9
2850   030074     032777    010000   006052  XRC13:     BIT     #B12,@RSR            ;IS TXM ERR SET IN THE RCVR?
2851   030102     001014                                BNE     XRC14
2852   030104                                           ERROR   \N                ;ERROR:RCVR TXM ERR NOT SET WITH INVALID DATA
 (1)                                                                                 ;******* ERROR 340 *******
 (1)   030104     032777    040000   002276             BIT     #B14,@SR
 (1)   030112     001005                                BNE     .+14
 (1)   030114     012767    000340   002520             MOV     #340,ERRNUM
 (1)   030122     004767    002266                      JSR     PC,ERR
 (1)              000341                      N         =       N+1
2853   030126                                           SCOPE   XRC9
 (1)   030126     004567    154074                      JSR     R5,SCPRTN
 (1)   030132     027462                                XRC9
2854
2855                                          ;TEST THAT IF THE CHANNEL IS OPENED AND THE RECEIVER RESPONDS
2856                                          ;TO THE FIRST VALID WORD WITH A NULL, A XMTR TXM ERR RESULTS
2857                                          ;  NULL ON FIRST WORD IS ACHEIVED BY MANUALLY FILLING UP THE
2858                                          ;PECVR SILO, THEN TRYING TO SEND A WORD FROM XMTR TO RCVR.
2859
2860   030134                                 XRC14:    BDINIT  XMTR
2861   030142                                           BDINIT  RCVR
2862   030150     052777    000200   005774             BIS     #B07,@RCR            ;SET LD SILO IN RCVR
2863   030156     012703    000100                      MOV     #64.,R3              ;R3 IS WORD COUNTER
2864   030162     012704    033564                      MOV     #SILDAT,R4           ;R4 IS CURRENT ADDRESS
2865   030166     012477    005764           XRC15:     MOV     (R4)+,@RDDB          ;FILL UP RCVR SILO
2866   030172     005303                                DEC     R3                   ;FULL?
2867   030174     001374                                BNE     XRC15
```

```
 2868  030174  016777  005702  005726          MOV     RCAD,@TCR               ;POINT XMTR AT RCVR
 2869  030204  042777  000200  005740          BIC     #B07,@RCR               ;CLR LD SILO IN RCVR
 2870  030212  012777  177777  005716          MOV     #-1,@TSDB               ;LOAD A WORD INTO XMTR SILO
 2871  030220  012777  177774  005712          MOV     #-4,@TSBC               ;SET UP TO XFR 2 WDS
 2872  030226  012777  177777  005702          MOV     #-1,@TSDB               ;LOAD 2ND WORD INTO XMTR SILO
 2873  030234  052777  020001  005710          BIS     #B13+B00,@RCR           ;SET RCV WD & RCV DATA
 2874  030242  052777  020001  005662          BIS     #B13+B00,@TCR           ;SET SND WD & ST TXM
 2875  030250  016704  002136                  MOV     DLCON,R4
 2876  030254  012703  177000          XRC15B: MOV     #177000,R3              ;SET UP TO STALL
 2877  030260  005203                  XRC15A: INC     R3
 2878  030262  001376                          BNE     XRC15A                  ;STALL (WAIT FOR TIME SLICE)
 2879  030264  005304                          DEC     R4
 2880  030266  001372                          BNE     XRC15B
 2881  030270  012767  000006  002350          MOV     #6,GOOD                 ;CHK TXM RSP CODES
 2882  030276  017767  005632  002340          MOV     @TSR,BAD
 2883  030304  042767  177760  002332          BIC     #177760,BAD
 2884  030312  026767  002330  002324          CMP     GOOD,BAD                ;ARE THEY 01 & 10 ?
 2885  030320  001414                          BEQ     XRC16
 2886  030322                                  DATERR  \N              ;ERROR:XMTR RSP CODES WRONG
   (1)                                                                   ;******* ERROR 341 *******
   (1)  030322  032777  040000  002060          BIT     #B14,@SR
   (1)  030330  001005                          BNE     .+14
   (1)  030332  012767  000341  002302          MOV     #341,ERRNUM
   (1)  030340  004767  002134                  JSR     PC,DERR
   (1)          000342                  N       -       N+1
 2887  030344                                  SCOPE   XRC14
   (1)  030344  004567  153656                  JSR     R5,SCPRTN
   (1)  030350  030134                          .XRC14
 2888  030352  032777  010000  005554  XRC16:  BIT     #B12,@TSR               ;IS XMTR TXM ERR SET?
 2889  030360  001014                          BNE     XRC17           ;ERROR:XMISSION TO FULL RCVR SILO
 2890  030362                                  ERROR   \N                      ;DID NOT SET TXM ERR IN XMTR
   (1)                                                                   ;******* ERROR 342 *******
   (1)  030362  032777  040000  002020          BIT     #B14,@SR
   (1)  030370  001005                          BNE     .+14
   (1)  030372  012767  000342  002242          MOV     #342,ERRNUM
   (1)  030400  004767  002010                  JSR     PC,ERR
   (1)          000343                  N       =       N+1
 2891  030404                                  SCOPE   XRC14
   (1)  030404  004567  153616                  JSR     R5,SCPRTN
   (1)  030410  030134                          XRC14
 2892
 2893                                  ;TEST TO DETERMINE IF , WITH CHANNEL OPEN, THE RECVR IS KNOCKED DOWN
 2894                                  ;THE CORRECT RESPONSE CODES ARE GENERATED AND THE XMTR
 2895                                  ;GETS A TXM ERROR.
 2896                                  ;   THE RECVR IS KNOCKED DOWN VIA FORCING A TIMEOUT IN THE RCVR.
 2897
 2898  030412                  XRC17:  BDINIT  XMTR
 2899  030420                          BDINIT  RCVR
 2900  030426  012777  177777  005502          MOV     #-1,@TSDB               ;LOAD A WORD INTO XMTR SILO
 2901  030434  012777  177774  005476          MOV     #-4,@TSBC               ;SETUP FOR 2 WD XFR
 2902  030442  012777  177777  005466          MOV     #-1,@TSDB               ;LOAD 2ND WD INTO XMTR SILO
 2903  030450  016777  005430  005454          MOV     RCAD,@TCR               ;POINT XMTR AT RCVR
 2904  030456  052777  020000  005466          BIS     #B13,@RCR               ;SET RCV WD
 2905  030464  052777  020000  005440          BIS     #B13,@TCR               ;SET SND WD
 2906  030472  132777  000010  005446  XRC18:  BITB    #BC3,@TMMRH             ;IS CHANNEL OPEN SET?
 2907  030500  001774                          BEQ     XRC18                   ;WAIT FOR IT
```

```
 2908  030502  016704  001704                    MOV     DLCON,R4
 2909  030506  012703  177000          XRC18X:   MOV     #177000,R3          ;DELAY FOR SYNC
 2910  030512  005203                  XRC18L:   INC     R3
 2911  030514  001376                            BNE     XRC18L
 2912  030516  005304                            DEC     R4
 2913  030520  001372                            BNE     XRC18X
 2914  030522  052777  002000  005424            BIS     #B10,@RSR           ;KNOCK DOWN RCVR WITH TIMEOUT
 2915  030530  016704  001656                    MOV     DLCON,R4
 2916  030534  012703  177000          XRC18Y:   MOV     #177000,R3          ;SET UP FOR STALL
 2917  030540  005203                  XRC18A:   INC     R3
 2918  030542  001376                            BNE     XRC18A              ;STALL (WAIT FOR TIME SLICE)
 2919  030544  005304                            DEC     R4
 2920  030546  001372                            BNE     XRC18Y
 2921  030550  012767  000001  002070            MOV     #1,GOOD
 2922  030556  017767  005352  002060            MOV     @TSR,BAD            ;CHECK TXM RESP CODES
 2923  030564  042767  177760  002052            BIC     #177760,BAD
 2924  030572  026767  002050  002044            CMP     GOOD,BAD            ;ARE THEY 00 & 01 ?
 2925  030600  001414                            BEQ     XRC19
 2926  030602                                    DATERR  \N                  ;ERROR:XMTR RSP CODES WRONG
   (1)                                                                       ;******* ERROR 343 *******
   (1)  030602  032777  040000  001600            BIT     #B14,@SR
   (1)  030610  001005                            BNE     .+14
   (1)  030612  012767  000343  002022            MOV     #343,ERRNUM
   (1)  030620  004767  001654                    JSR     PC,DERR
   (1)          000344                  N         =       N+1
 2927  030624                                    SCOPE   XRC17
   (1)  030624  004567  153376                    JSR     R5,SCPRTN
   (1)  030630  030412                            XRC17
 2928  030632  032777  010000  005274  XRC19:    BIT     #B12,@TSR           ;IS TX ERR SET IN XMTR
 2929  030640  001014                            BNE     XRC19A      ;ERROR:XMIT TO OFFLINE RCVR DIDN'T
 2930  030642                                    ERROR   \N                  ;CAUSE TXM ERR IN XMTR
   (1)                                                                       ;******* ERROR 344 *******
   (1)  030642  032777  040000  001540            BIT     #B14,@SR
   (1)  030650  001005                            BNE     .+14
   (1)  030652  012767  000344  001762            MOV     #344,ERRNUM
   (1)  030660  004767  001530                    JSR     PC,ERR
   (1)          000345                  N         =       N+1
 2931  030664                                    SCOPE   XRC17
   (1)  030664  004567  153336                    JSR     R5,SCPRTN
   (1)  030670  030412                            XRC17
 2932  030672  004767  000774          XRC19A:   JSR     PC,MONIT
 2933  030676  032777  010000  001504            BIT     #B12,@SR            ;IS SW 12 SET?
 2934  030704  001402                            BEQ     XRCRET              ;NO, EXIT
 2935  030706  000167  175514                    JMP     TXMERS              ;YES, STAY HERE
 2936  030712  000207                  XRCRET:   RTS     PC
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                        .SBTTL  REJECT TEST


                        ;TEST OF THE REJECT-RELATED HARDWARE
                        ; CAUSE A REJECT IN THE RECVR AND CHECK ALL RELATED
                        ;RESPONSES IN RCVR AND XMTR

030714                  XRC20:  BDINIT  XMTR                    ;CLR XMTR
030722                          BDINIT  RCVR                    ;CLR RCVR
030730  012777  177777  005200          MOV     #-1,@TSDB       ;LOAD A WORD INTO SILO
030736  012777  177774  005174          MOV     #-4,@TSBC       ;BYTE COUNT FOR 2 WD XFR
030744  012777  177777  005164          MOV     #-1,@TSDB       ;LOAD 2ND WD INTO SILO
030752  012777  177774  005200          MOV     #-4,@RDBC
030760  016777  005120  005144          MOV     RCAD,@TCR       ;POINT XMTR AT RCVR
030766  052777  020000  005156          BIS     #B13,@RCR       ;SET RCV WD
030774  052777  020001  005130          BIS     #B13+B00,@TCR   ;SET SND WD & ST TXM
031002  032777  000400  005144  XRC21:  BIT     #B08,@RSR       ;DAT OUTP RDY IN XMTR?
031010  001774                          BEQ     XRC21
031012  052777  100000  005132          BIS     #B15,@RCR       ;SET R E J E C T
031020  016704  001366                  MOV     DLCON,R4
031024  012703  177500          XRC21A: MOV     #177500,R3
031030  032777  000040  005116  XRC22:  BIT     #B05,@RSR       ;CHECK FOR RECOM IN RCVR
031036  001020                          BNE     XRC23
031040  005203                          INC     R3
031042  001372                          BNE     XRC22           ;WAIT A COUPLE OF MS FOR IT
031044  005304                          DEC     R4
031046  001366                          BNE     XRC21A
031050                                  ERROR   \N              ;ERROR:REJECT DID NOT RESULT IN SETTING RSR-05
(1)                                                             ;******* FRROR 345 *******
(1)     031050  032777  040000  001332          BIT     #B14,@SR
(1)     031056  001005                  BNE     .+14
(1)     031060  012767  000345  001554          MOV     #345,ERRNUM
(1)     031066  004767  001322                  JSR     PC,ERR
(1)             000346                  N       =       N+1
031072                                  SCOPE   XRC20
(1)     031072  004567  153130                  JSR     R5,SCPRTN
(1)     031076  030714                          XRC20
031100  032777  000001  005024  XRC23:  BIT     #B00,@TCR       ;IS ST TXM CLR (CLR'D BY INTR REQ)?
031106  001414                          BEQ     XRC24
031110                                  ERROR   \N              ;ERROR: SORE DID NOT INTERRUPT XMTR
(1)                                                             ;******* ERROR 346 *******
(1)     031110  032777  040000  001272          BIT     #B14,@SR
(1)     031116  001005                  BNE     .+14
(1)     031120  012767  000346  001514          MOV     #346,ERRNUM
(1)     031126  004767  001262                  JSR     PC,ERR
(1)             000347                  N       -       N+1
031132                                  SCOPE   XRC20
(1)     031132  004567  153070                  JSR     R5,SCPRTN
(1)     031136  030714                          XRC20
031140  032777  100000  005004  XRC24:  BIT     #B15,@RCR       ;CHECK IF REJECT GOT CLR'D
031146  001414                          BEQ     XRC25
031150                                  ERROR   \N              ;ERROR:RECOM DID NOT CLR REJECT
(1)                                                             ;******* ERROR 347 *******
(1)     031150  032777  040000  001232          BIT     #B14,@SR
(1)     031156  001005                  BNE     .+14
(1)     031160  012767  000347  001454          MOV     #347,ERRNUM
```

```
  (1)  031166  004767  001222            JSR     PC,ERR
  (1)          000350                N   =       N+1
 2974  031172                            SCOPE   XRC20
  (1)  031172  004567  153030            JSR     R5,SCPRTN
  (1)  031176  030714                    XRC20
 2975  031200  032777  000040  004726  XRC25:  BIT     #B05,@TSR          ;CHECK IF REJECT SET SORE IN XMTR
 2976  031206  001014                    BNE     XRC26
 2977  031210                            ERROR   \N              ;ERROR:REJECT DID NOT SET SORE IN XMTR
  (1)                                               ;******* ERROR 350 *******
  (1)  031210  032777  040000  001172    BIT     #B14,@SR
  (1)  031216  001005                    BNE     .+14
  (1)  031220  012767  000350  001414    MOV     #350,ERRNUM
  (1)  031226  004767  001162            JSR     PC,ERR
  (1)          000351                N   =       N+1
 2978  031232                            SCOPE   XRC20
  (1)  031232  004567  152770            JSR     R5,SCPRTN
  (1)  031236  030714                    XRC20
 2979  031240                         XRC26:  BDINIT  RCVR
 2980  031246                                 BDINIT  XMTR
 2981  031254  052777  020000  004670        BIS     #B13,@RCR          ;SET RCV WD IN RCVR
 2982  031262  052777  000040  004664        BIS     #B05,@RSR          ;SET RECOM
 2983  031270  032777  020000  004654        BIT     #B13,@RCR          ;CHECK IF RCV WD GOT CLR'D
 2984  031276  001414                        BEQ     XRC27
 2985  031300                                ERROR   \N              ;ERROR:RECOM DID NOT INTERRUPT RCVR
  (1)                                               ;******* ERROR 351 *******
  (1)  031300  032777  040000  001102        BIT     #B14,@SR
  (1)  031306  001005                        BNE     .+14
  (1)  031310  012767  000351  001324        MOV     #351,ERRNUM
  (1)  031316  004767  001072                JSR     PC,ERR
  (1)          000352                    N   =       N+1
 2986  031322                                SCOPE   XRC26
  (1)  031322  004567  152700                JSR     R5,SCPRTN
  (1)  031326  031240                        XRC26
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                                        .SBTTL  TRUNCATION TEST


                                        ;TEST OF THE TRUNCATE-RELATED HARDWARE
                                        ; CAUSE A TRUNCATE IN THE RECVR AND CHECK ALL RELATED
                                        ;RESPONSES IN RCVR AND XMTR.

031330                                  XRC27:  BDINIT  XMTR                    ;CLR XMTR
031336                                          BDINIT  RCVR                    ;CLR RCVR
031344  012777  177754  004566                MOV     #-20.,@TSBC             ;SET TXM BYTE CNT FOR 10 WORD XFR
031352  012777  177770  004600                MOV     #-8.,@RDBC              ;SET RCVR BYTE CNT FOR 4 WORDS
031360  012777  033564  004554                MOV     #SILDAT,@TSBA           ;POINT XMTR SILO AT DATA BUFFER
031366  012777  034164  004566                MOV     #CMPBUF,@RDBA           ;POINT RCVR SILO TO DATA BUFFER
031374  016777  004504  004530                MOV     RCAD,@TCR               ;POINT XMTR AT RCVR
031402  052777  060001  004542                BIS     #B14+B13+B00,@RCR       ;SET RCV WD & RCV DATA &START NPR
031410  052777  060001  004514                BIS     #B14+B13+B00,@TCR       ;SET SND WD & ST TXM & START NPR
031416  032777  001000  004530  XRC29:        BIT     #B09,@RSR
031424  001774                                BEQ     XRC29                   ;WAIT FOR BYTE COUNT OVERFLOW
031426  052777  100000  004516                BIS     #B15,@RCR               ;SET REJECT (TRUNCATE MESSAGE)
031434  016704  000752                        MOV     DLCON,R4
031440  012703  175000          XRC29A: MOV     #175000,R3
031444  105777  004464          XRC30:  TSTB    @TSR                    ;LOOK FOR XMTR SUC TXF
031450  100420                          BMI     XRC31
031452  005203                          INC     R3
031454  001373                          BNE     XRC30                   ;WAIT ABOUT 20 MS
031456  005304                          DEC     R4
031460  001367                          BNE     XRC29A
031462                                  ERROR   \N              ;ERROR:NO SUC TXF AFTER TRUNCATION
                                                                ;******* ERROR 352 *******
(1)
(1)     031462  032777  040000  000720          BIT     #B14,@SR
(1)     031470  001005                          BNE     .+14
(1)     031472  012767  000352  001142          MOV     #352,ERRNUM
(1)     031500  004767  000710                  JSR     PC,ERR
(1)             000353                  N       =       N+1
031504                                  SCOPE   XRC27
(1)     031504  004567  152516                JSR     R5,SCPRTN
(1)     031510  031330                          XRC27
031512  032777  000040  004414  XRC31:  BIT     #B05,@TSR               ;IS SORE SET?
031520  001014                          BNE     XRC32
031522                                  ERROR   \N              ;ERROR:SORE NOT SET BY TRUNCATION
                                                                ;******* ERROR 353 *******
(1)
(1)     031522  032777  040000  000660          BIT     #B14,@SR
(1)     031530  001005                          BNE     .+14
(1)     031532  012767  000353  001102          MOV     #353,ERRNUM
(1)     031540  004767  000650                  JSR     PC,ERR
(1)             000354                  N       =       N+1
031544                                  SCOPE   XRC27
(1)     031544  004567  152456                JSR     R5,SCPRTN
(1)     031550  031330                          XRC27
031552  105777  004376          XRC32:  TSTB    @RSR                    ;IS RCVR SUC TXF SET?
031556  100414                          BMI     XRC33
031560                                  ERROR   \N              ;ERROR:NO RCVR SUC TXF AFTER TRUNCATION
                                                                ;******* ERROR 354 *******
(1)
(1)     031560  032777  040000  000622          BIT     #B14,@SR
(1)     031566  001005                          BNE     .+14
(1)     031570  012767  000354  001044          MOV     #354,ERRNUM
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 (1)  031576  004767  000612                 JSR    PC,ERR
 (1)          000355                 N       =      N+1
3024  031602                                 SCOPE  XRC27
 (1)  031602  004567  152420                 JSR    R5,SCPRTN
 (1)  031606  031330                         XRC27
3025  031610  032777  000040  004336 XRC33:  BIT    #B05,@RSR           ;IS RECOM SET?
3026  031616  001014                         BNE    XRC34
3027  031620                                 ERROR  \N              ;ERROR:RECOM NOT SET BY TRUNCATION
 (1)                                                                    ;******* ERROR 355 *******
 (1)  031620  032777  040000  000562         BIT    #B14,@SR
 (1)  031626  001005                         BNE    .+14
 (1)  031630  012767  000355  001004         MOV    #355,ERRNUM
 (1)  031636  004767  000552                 JSR    PC,ERR
 (1)          000356                 N       =      N+1
3028  031642                                 SCOPE  XRC27
 (1)  031642  004567  152360                 JSR    R5,SCPRTN
 (1)  031646  031330                         XRC27
3029  031650  004767  000016         XRC34:  JSR    PC,MONIT
3030  031654  032777  010000  000526         BIT    #B12,@SR            ;IS SW 12 SET?
3031  031662  001402                         BEQ    XRCRT               ;NO, EXIT
3032  031664  000167  177024                 JMP    XRC20               ;YES, STAY HERE
3033  031670  000207                 XRCRT:  RTS    PC
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                        .SBTTL  'SWITCH' MONITOR ROUTINE

                ;ENTER AT MONIT FROM EVERY SUB-TEST TO SEE IF CNTRL-S OR CNTRL-C WAS TYPED
                ;ENTER AT SWDMP FROM ERROR HALTS IF SW 15 = 0
                ;ALSO MONITORS THE FOLLOWING CONTROL FUNCTIONS:
                ;       CNTRL-T RESTART TEST SELECTOR
                ;       CNTRL-D ALLOW CHANGING OF DELAY
                ;       CNTRL-P CONTINUE (PROCEED)

031672 005000           MONIT:  CLR     R0
031674 105777 004266            TSTB    @KBS                    ;CHECK KEYBOARD FLAG
031700 100402                   BMI     MONIC                   ;IF SET, CHECK WHAT CHAR.
031702 000167 000372            JMP     EX5                     ;OTHERWISE, EXIT
031706 017700 004256    MONIC:  MOV     @KBD,R0
031712 042700 177600    MONCH:  BIC     #177600,R0              ;TRIM OFF PARITY BIT
031716 020027 000023            CMP     R0,#23                  ;WAS IT ^S?
031722 001056                   BNE     EX1                     ;NO, EXIT
031724                  SWDMP:  PNTM    SWRMSG                  ;PRINT 'SWR = ''
 (1)  031724 012700 032302              MOV     #SWRMSG,R0      ;PRINT MESSAGE
 (1)  031730 004767 000714              JSR     PC,TYPOUT       ;POINTED TO BY SWRMSG
031734 017700 000450            MOV     @SR,R0                  ;GET CONTENTS OF SR
031740 004767 001222            JSR     PC,OCTPNT               ;PRINT IT
031744                          PNTM    TWOSP                   ;SPACE AND PROMPT (:)
 (1)  031744 012700 032401              MOV     #TWOSP,R0       ;PRINT MESSAGE
 (1)  031750 004767 000674              JSR     PC,TYPOUT       ;POINTED TO BY TWOSP
031754 017767 000430 001202     MOV     @SR,KBBUF               ;LOAD OLD SWITCHES
031762 004767 000724            JSR     PC,INPKB                ;GET KBD INPUT
031766 016777 001172 000414     MOV     KBBUF,@SR               ;LOAD NEW SWITCHES
031774                  CCRTN:  PNTM    TYPCTP                  ;PRINT ''CNTRL-P TO CONTINUE''
 (1)  031774 012700 032335              MOV     #TYPCTP,R0      ;PRINT MESSAGE
 (1)  032000 004767 000644              JSR     PC,TYPOUT       ;POINTED TO BY TYPCTP
032004 105777 004156    CONTW1: TSTB    @KBS
032010 100375                   BPL     CONTW1
032012 017700 004152            MOV     @KBD,R0
032016 042700 177600            BIC     #177600,R0              ;TRIM OFF PARITY BIT
032022 020027 000023            CMP     R0,#23                  ;^S?
032026 001736                   BEQ     SWDMP                   ;YES, GET SWR AGAIN
032030 020027 000020            CMP     R0,#20                  ;^P?
032034 001363                   BNE     CONTW1                  ;NO, KEEP LOOKING
032036 012700 000015            MOV     #15,R0                  ;RETURN LINE
032042 004767 001424            JSR     PC,TTO
032046 005000                   CLR     R0                      ;FILL CHARACTERS
032050 004767 001416            JSR     PC,TTO
032054 004767 001412            JSR     PC,TTO
032060 020027 000024    EX1:    CMP     R0,#24                  ;WAS A ^T TYPED?
032064 001004                   BNE     EX2                     ;NO, EXIT
032066 012706 002000            MOV     #ISP,SP                 ;YES,  RENEW STACK
032072 000167 151250            JMP     BCONT                   ;BACK TO DISPATCHER
032076 020027 000004    EX2:    CMP     R0,#4                   ;CNTRL-D TYPED?
032102 001026                   BNE     EX3                     ;NO, KEEP LOOKING
032104                  EX2A:   PNTM    DELYMG                  ;PRINT 'DELAY CONSTANT = ''
 (1)  032104 012700 032312              MOV     #DELYMG,R0      ;PRINT MESSAGE
 (1)  032110 004767 000534              JSR     PC,TYPOUT       ;POINTED TO BY DELYMG
032114 016767 000272 001042     MOV     DLCON,KBBUF             ;DEFAULT OLD VALUE
032122 016700 000264            MOV     DLCON,R0                ;GET CONSTANT
```

```
3083  032126  004767  001034                    JSR     PC,OCTPNT       ;PRINT IT
3084  032132                                    PNTM    TWOSP           ;SPACE AND PROMPT
 (1)  032132  012700  032401                    MOV     #TWOSP,R0       ;PRINT MESSAGE
 (1)  032136  004767  000506                    JSR     PC,TYPOUT       ;POINTED TO BY TWOSP
3085  032142  004767  000544                    JSR     PC,INPKB        ;GET KBD INPUT
3086  032146  016767  001012  000236  EX2B:     MOV     KBBUF,DLCON     ;LOAD NEW CONSTANT
3087  032154  000167  177614                    JMP     CCRTN           ;NOW WAIT FOR CNTRL-P
3088
3089  032160  020027  000003          EX3:      CMP     R0,#3           ;WAS CNTRL-C TYPED?
3090  032164  001004                    BNE     EX4             ;NO,
3091  032166  012706  002000                    MOV     #ISP,SP         ;YES, REFRESH STACK
3092  032172  000167  150674                    JMP     RESTRT          ;AND RESTART
3093  032176  020027  000006          EX4:      CMP     R0,#6           ;WAS CNTRL-F TYPED?
3094  032202  001036                    BNE     EX5             ;NO, EXIT
3095  032204                            EX4B:   PNTM    FILMSG          ;PRINT 'FILL COUNT = ''
 (1)  032204  012700  032362                    MOV     #FILMSG,R0      ;PRINT MESSAGE
 (1)  032210  004767  000434                    JSR     PC,TYPOUT       ;POINTED TO BY FILMSG
3096  032214  016700  001340                    MOV     FILL,R0         ;PRINT THE FILL COUNT
3097  032220  004767  000742                    JSR     PC,OCTPNT
3098  032224                                    PNTM    TWOSP
 (1)  032224  012700  032401                    MOV     #TWOSP,R0       ;PRINT MESSAGE
 (1)  032230  004767  000414                    JSR     PC,TYPOUT       ;POINTED TO BY TWOSP
3099  032234  016767  001320  000722            MOV     FILL,KBBUF      ;LOAD DEFAULT
3100  032242  004767  000444                    JSR     PC,INPKB        ;GET NEW INPUT
3101  032246  026727  000712  000500            CMP     KBBUF,#500      ;NO NEED TO PASS 500
3102  032254  101406                    BLOS    2$
3103  032256                                    PNTM    AGAIN
 (1)  032256  012700  035211                    MOV     #AGAIN,R0       ;PRINT MESSAGE
 (1)  032262  004767  000362                    JSR     PC,TYPOUT       ;POINTED TO BY AGAIN
3104  032266  000167  177712                    JMP     EX4B
3105  032272  016767  000666  001260  2$:       MOV     KBBUF,FILL      ;LOAD NEW FILL COUNT
3106  032300  000207                    EX5:    RTS     PC
3107
3108
3109
3110                                    ;ASSOCIATED ASCII FOR THIS MODULE:
3111
3112  032302  051446  051127  036440  SWRMSG: .ASCII  /&SWR = @/
      032310  040040
3113  032312  042046  046105  054501  DELYMG: .ASCII  /&DELAY CONSTANT - @/
      032320  041440  047117  052123
      032326  047101  020124  020075
      032334     100
3114  032335     046  047103  051124  TYPCTP: .ASCII  /&CNTRL-P TO CONTINUE@/
      032342  026514  020120  047524
      032350  041440  047117  044524
      032356  052516  040105
3115  032362  043046  046111  020114  FILMSG: .ASCII  /&FILL COUNT - @/
      032370  047503  047125  020124
      032376  020075     100
3116  032401     040  035040     100  TWOSP:  .ASCII  /  :@/
3117
3118
3119          032406                            .EVEN
3120                                    ;OTHER VARIABLES:
3121
```

```
 3122  032406  000000                SWREG:  .WORD   0               ; SOFTWARE SWITCH REGISTER
 3123
 3124  032410  000000                SR:     .WORD   0               ; SWITCH REGISTER POINTER
 3125
 3126  032412  000006                DLCON:  .WORD   6               ;DELAY CONSTANT
```

```
                                        .SBTTL COMMON SUBROUTINES

                                ;ERROR ROUTINE

032414  011667  000220          ERR:    MOV     (SP),ERRAD      ;GET ADDRESS OF ERROR CALL
032420  162767  000022  000212          SUB     #22,ERRAD       ;OFFSET IT
032426                        ERR1:   PNTM    ERRM            ;PRINT "**ERROR "
(1) 032426  012700  032564            MOV     #ERRM,R0        ;PRINT MESSAGE
(1) 032432  004767  000212            JSR     PC,TYPOUT       ;POINTED TO BY ERRM
032436  016700  000200                MOV     ERRNUM,R0
032442  004767  000520                JSR     PC,OCTPNT       ;PRINT ERROR NUMBER (R0)
032446                                PNTM    WDAT            ;PRINT "AT LOCATION "
(1) 032446  012700  032577            MOV     #WDAT,R0        ;PRINT MESSAGE
(1) 032452  004767  000172            JSR     PC,TYPOUT       ;POINTED TO BY WDAT
032456  016700  000156                MOV     ERRAD,R0
032462  004767  000500                JSR     PC,OCTPNT       ;PRINT ADDRESS OF ERROR
032466  004767  177200                JSR     PC,MONIT
032472  004767  000652                JSR     PC,NULLS        ;PRINT NULLS IN CASE OF "RESET"
032476  000207                        RTS     PC              ;RETURN

                                ;DATA ERROR ROUTINE

032500  011667  000134          DERR:   MOV     (SP),ERRAD      ;GET ADDRESS OF ERROR CALL
032504  162767  000022  000126          SUB     #22,ERRAD       ;OFFSET IT
032512  004767  177710                JSR     PC,ERR1         ;PRINT "**ERROR (R0) AT LOCATION XXX
032516                                PNTM    WDSDB           ;PRINT "SHOULD BE "
(1) 032516  012700  032615            MOV     #WDSDB,R0       ;PRINT MESSAGE
(1) 032522  004767  000122            JSR     PC,TYPOUT       ;POINTED TO BY WDSDB
032526  016700  000114                MOV     GOOD,R0
032532  004767  000430                JSR     PC,OCTPNT       ;PRINT GOOD DATA
032536                                PNTM    WDWAS           ;PRINT ", WAS "
(1) 032536  012700  032631            MOV     #WDWAS,R0       ;PRINT MESSAGE
(1) 032542  004767  000102            JSR     PC,TYPOUT       ;POINTED TO BY WDWAS
032546  016700  000072                MOV     BAD,R0
032552  004767  000410                JSR     PC,OCTPNT       ;PRINT BAD DATA
032556  004767  000566                JSR     PC,NULLS        ;PRINT NULLS IN CASE OF "RESET"
032562  000207                        RTS     PC



                                ;ASSOCIOATED ASCII FOR THIS MODULE:

032564  023046  025052  051105  ERRM:   .ASCII  /&&**ERROR @/
032572  047522  020122    100
032577    040   052101  046040  WDAT:   .ASCII  / AT LOCATION @/
032604  041517  052101  047511
032612  020116    100
032615    046   044123  052517  WDSDB:  .ASCII  /&SHOULD BE @/
032622  042114  041040  020105
032630    100
032631    054   053440  051501  WDWAS:  .ASCII  /, WAS @/
032636  040040



                                        .EVEN
                                ;OTHER VARIABLES:
```

```
 3170
 3171  032640  000000                ERRAD:   .WORD   0
 3172  032642  000000                ERRNUM:  .WORD   0
 3173  032644  000000                BAD:     .WORD   0
 3174  032646  000000                GOOD:    .WORD   0
```

```
3176                                            .SBTTL  MESSAGE PRINT ROUTINE
3177
3178                                    ;MESSAGE TYPOUT ROUTINE (CALLED BY MACRO PNTM A)
3179                                    ;MESSAGES ARE IN THE FORMAT:
3180                                    ;   MESG:     .ASCII     /&MESSAGE&@/
3181                                    ;
3182                                    ;WHERE: & IS TRANSLATED INTO CR. AND LF.
3183                                    ;
3184                                    ;USES THE SUBROUTINE 'TTO'
3185                                    ;WHICH PRINTS CR. & LF. UPON SEEING A CR. CODE.
3186                                    ;AND    @ IS MESSAGE TERMINATOR
3187                                    ;
3188                                    ;ENTER WITH ADDRESS OF MESSAGE IN R0
3189
3190  032650  010046                    TYPOUT: MOV     R0,-(SP)            ;STACK ADDRESS OF MESSAGE
3191  032652  117600  000000            TPOFCH: MOVB    @(SP),R0            ;FETCH ASCII BYTE
3192  032656  022700  000100                    CMP     #100,R0             ;IS IT @ (TERMINATOR)?
3193  032662  001411                            BEQ     TPOUTX              ;YES-EXIT
3194  032664  022700  000046                    CMP     #46,R0              ;IS IT CR|F FLAG?
3195  032670  001002                            BNE     TPCONT              ;NO-TYPE CHARACTER
3196  032672  012700  000015                    MOV     #15,R0              ;YES, CHANGE DATA TO CR
3197  032676  004767  000570            TPCONT: JSR     PC,TTO              ;TYPE IT
3198  032702  005216                            INC     (SP)                ;MOVE POINTER TO NEXT BYTE
3199  032704  000762                            BR      TPOFCH              ;FETCH NEXT CHARACTER
3200  032706  005726                    TPOUTX: TST     (SP)+               ;POP STACK TO REACH RETURN VECTOR
3201  032710  000207                            RTS     PC
3202
```

```
                                        .SBTTL  KEYBOARD INPUT ROUTINE

                                ;KEYBOARD INPUT ROUTINE CALLED BY JSR   PC,INPKB
                                ;ENTERED WITH OLD CONTENTS IN KBBUF
                                ;IF JUST <CR> TYPED, EXIT WITH SAME CONTENTS IN KBBUF
                                ;IF NEW NUMBER TYPED, EXIT WITH NEW CONTENTS IN KBBUF

032712  005067  000244      INPKB:  CLR     NOKEFL          ;CLEAR NO NUMBER FLAG
032716  010146                  MOV     R1,-(SP)        ;STACK OLD R1
032720  016746  000240          MOV     KBBUF,-(SP)     ;STACK 'OLD CONTENTS'
032724  005067  000234          CLR     KBBUF           ;CLEAR INPUT BUFFER
032730  004767  000206      GETCHR: JSR     PC,KBRD         ;FETCH A CHARACTER IN R0
032734  004767  000532          JSR     PC,TTO          ;ECHO IT
032740  020027  000012          CMP     R0,#12          ;WAS IT A <CR> OR <LF>?
032744  001002                  BNE     1$              ;NO
032746  000167  000144          JMP     NRTRN           ;YES, RETURN WITH PROPER KBBUF
032752  010001              1$: MOV     R0,R1           ;SET UP TO CHECK FOR A NUMBER
032754  042701  177407          BIC     #177407,R1      ;MASK ALL BUT # CODE
032760  020127  000060          CMP     R1,#60          ;IS IT A # FROM 0-7?
032764  001435                  BEQ     3$              ;YES, PACK IT
032766  020027  000177          CMP     R0,#177         ;WAS IT A DELETE/RUBOUT?
032772  001024                  BNE     2$              ;NO, MUST BE GARBAGE
032774  012700  000057          MOV     #57,R0          ;YES, BUT PRINT '\'
033000  004767  000466          JSR     PC,TTO
033004  000241                  CLC                     ;CLEAR THE C-BIT
033006  006067  000152          ROR     KBBUF           ;DELETE LAST DIGIT
033012  000241                  CLC
033014  006067  000144          ROR     KBBUF           ;  THAT WAS STUFFED
033020  000241                  CLC
033022  006067  000136          ROR     KBBUF           ;  INTO KBBUF
033026  005767  000132          TST     KBBUF           ;HAVE WE DELETED EVERYTHING?
033032  001002                  BNE     11$             ;NO
033034  005067  000122          CLR     NOKEFL          ;YES, BACK TO NO NUMBER INPUT
033040  000167  177664      11$:    JMP     GETCHR          ;GO FOR MORE INPUT
033044  012700  000077      2$:     MOV     #77,R0          ;ECHO '?' FOR ERRONEOUS INPUT
033050  004767  000416          JSR     PC,TTO
033054  000167  177650          JMP     GETCHR          ;AND GET ANOTHER CHARACTER
033060  012767  177777  000074  3$:     MOV     #-1,NOKEFL      ;GOT A DIGIT. SET FLAG
033066  042700  177770          BIC     #177770,R0      ;GET THE DIGIT PART OF THE CHARACTER
033072  006367  000066          ASL     KBBUF           ;SHIFT KBBUF BUFFER
033076  006367  000062          ASL     KBBUF           ;  TO ACCEPT THE
033102  006367  000056          ASL     KBBUF           ;  NEW DIGIT.
033106  050067  000052          BIS     R0,KBBUF        ;ADD THE NEW DIGIT
033112  000167  177612          JMP     GETCHR          ;GO FOR MORE INPUT

033116  005767  000040      NRTRN:  TST     NOKEFL          ;WAS THERE NEW DATA?
033122  001004                  BNE     NEK             ;YES, GO BACK WITH IT
033124  012667  000034          MOV     (SP)+,KBBUF     ;NO, RETRIEVE OLD DATA
033130  012601                  MOV     (SP)+,R1        ;RESTORE R1
033132  000207                  RTS     PC              ;AND RETURN
033134  005726              NEK:    TST     (SP)+           ;DUMP OLD DATA
033136  012601                  MOV     (SP)+,R1        ;RESTORE R1
033140  000207                  RTS     PC              ;AND RETURN

033142  105777  003020      KBRD:   TSTB    @KBS            ;WAIT FOR INPUT FROM CONSOLE
033146  100375                  BPL     KBRD
```

```
3260  033150  017700  003014                  MOV     @KBD,R0          ;PUT THE CHAR INTO R0
3261  033154  042700  177600          KBRET:  BIC     #177600,R0       ;TRIM PARITY
3262  033160  000207                  RTS     PC
```

```
                                ;ASSOCIATED VARIABLE STORAGE:

033162  000000                  NOKEFL: .WORD   0
033164  000000                  KBBUF:  .WORD   0
```

```
                                        .SBTTL BINARY TO ASCII CONVERSION ROUTINES

                                ;CONVERTS BINARY TO BINARY, BINARY TO
                                ;OCTAL, AND BINARY TO DECIMAL; EITHER
                                ;UNJUSTIFIED WITH LEADING ZERO'S SUPPRESSED
                                ;OR RIGHT JUSTIFIED WITH LEADING 0'S
                                ;SUPPRESSED


                                ;REGILAR BIN-OCTAL UNJUSTIFIED:

033166                          OCTPNT: REGSAV
(1) 033166  004567  151420              JSR     R5,REGSAV
033172  005067  000356                  CLR     RJFLG                   ;CLEAR RIGHT JUSTIFY FLAG
033176  012701  000010                  MOV     #10,R1                  ;SET RADIX FOR OCTAL
033202  004767  000156                  JSR     PC,NUMPNT               ;CONVERT & PRINT
033206                                  REGRES
(1) 033206  004567  151414              JSR     R5,REGRES
033212  000207                          RTS     PC                      ;RETURN


                                ;BIN-OCTAL JUSTIFIED:

033214                          OCTJSP: REGSAV
(1) 033214  004567  151372              JSR     R5,REGSAV
033220  012767  177777  000326        MOV     #-1,RJFLG               ;SET RIGHT JUSTIFY FLAG
033226  012701  000010                  MOV     #10,R1                  ;SET RADIX FOR OCTAL
033232  004767  000126                  JSR     PC,NUMPNT               ;CONVERT & PRINT
033236                                  REGRES
(1) 033236  004567  151364              JSR     R5,REGRES
033242  000207                          RTS     PC


                                ;BIN-BIN

033244                          BINPNT: REGSAV
(1) 033244  004567  151342              JSR     R5,REGSAV
033250  005067  000300                  CLR     RJFLG                   ;CLEAR RIGHT JUSTIFY FLAG
033254  012701  000002                  MOV     #2,R1                   ;SET RADIX FOR BINARY
033260  004767  000100                  JSR     PC,NUMPNT               ;CONVERT & PRINT
033264                                  REGRES
(1) 033264  004567  151336              JSR     R5,REGRES
033270  000207                          RTS     PC


                                ;BIN-DECIMAL UNJUSTIFIED:

033272                          DECPNT: REGSAV
(1) 033272  004567  151314              JSR     R5,REGSAV
033276  005067  000252                  CLR     RJFLG                   ;CLEAR RIGHT JUSTIFY FLAG
033302  012701  000012                  MOV     #12,R1                  ;SE1 RADIX FOR DECIMAL
033306  004767  000052                  JSR     PC,NUMPNT               ;CONVERT & PRINT
033312                                  REGRES
(1) 033312  004567  151310              JSR     R5,REGRES
033316  000207                          RTS     PC


                                ;BIN-DECIMAL JUSTIFIED (6 PLACES)

033320                          DECJSP: REGSAV
```

```
  (1)  033320  004567  151266                    JSR     R5,REGSAV
3317   033324  012767  177777  000222            MOV     #-1,RJFLG          ;SET RIGHT JUSTIFY FLAG
3318   033332  012701  000012                    MOV     #12,R1             ;SET RADIX FOR DECIMAL
3319   033336  004767  000022                    JSR     PC,NUMPNT          ;CONVERT & PRINT
3320   033342                                    REGRES
  (1)  033342  004567  151260                    JSR     R5,REGRES
3321   033346  000207                            RTS     PC
3322
3323
3324   033350  005000                    NULLS:  CLR     R0
3325   033352  004767  000114                    JSR     PC,TTO
3326   033356  004767  000110                    JSR     PC,TTO
3327   033362  000207                    NULOUT: RTS     PC
```

```
3329                                    ;UNSIGNED CONVERT-PRINT ROUTINE (BIN - ASCII)
3330
3331  033364  010167  000166            NUMPNT: MOV     R1,RADIX            ;SAVE RADIX
3332  033370  005002                            CLR     R2                  ;CLEAR TAB COUNTER
3333  033372  005001                    DIVSET: CLR     R1                  ;CLEAR WORK REGISTER
3334  033374  020067  000156            DIVID:  CMP     R0,RADIX            ;IS NUMBER BELOW RADIX?
3335  033400  103404                            BLO     GETDG               ;IF YES, STORE DIGIT
3336  033402  166700  000150                    SUB     RADIX,R0            ;ELSE, KEEP SUBTRACTING
3337  033406  005201                            INC     R1                  ;AND KEEP COUNT
3338  033410  000771                            BR      DIVID
3339  033412  010046                    GETDG:  MOV     R0,-(SP)            ;STACK REMAINDER
3340  033414  010100                            MOV     R1,R0
3341  033416  001403                            BEQ     PNTEXT              ;PRINT IF HIGHEST ORDER STACKED
3342  033420  005202                            INC     R2                  ;ELSE COUNT DIGITS FOR R. JUSTIFY
3343  033422  004767  177744                    JSR     PC,DIVSET
3344
3345  033426  012703  000006            PNTEXT: MOV     #6,R3               ;GET DIGIT COUNT CONSTANT
3346  033432  160203                            SUB     R2,R3               ;HAVE WE PRODUCED 6 DIGITS?
3347  033434  003413                            BLE     PNT                 ;YES, JUSTIFICATION UNNECESSARY
3348  033436  005767  000112                    TST     RJFLG               ;IS THE JUSTIFY FLAG SET?
3349  033442  001410                            BEQ     PNT                 ;NO-DON'T JUSTIFY
3350  033444  012700  000040            JUST:   MOV     #40,R0              ;YES, PRINT LEADING SPACES
3351  033450  004767  000016                    JSR     PC,TTO
3352  033454  005303                            DEC     R3
3353  033456  001372                            BNE     JUST
3354  033460  005067  000070                    CLR     RJFLG               ;CLEAR JUSTIFY FLG WHEN DONE
3355  033464  012600                    PNT:    MOV     (SP)+,R0            ;GET REST OF DIGITS OFF STACK
3356  033466  052700  000060                    BIS     #'0,R0              ;MAKE THEM ASCII
3357                                    ;TYPE OUT ROUTINE
3358                                    ;PRINTS A CHARACTER WHICH IS IN R0
3359                                    ;IF THE CHARACTER IS ''CR.'', ALSO PRINT A 'LF.'.
3360
3361
3362  033472  010077  002476            TTO:    MOV     R0,@TTB             ;PRINT CONTENTS OF R0
3363  033476  105777  002470            TTOLP:  TSTB    @TTS                ;WAIT TILL PRINT DONE
3364  033502  100375                            BPL     TTOLP
3365  033504  022700  000015                    CMP     #15,R0              ;WAS IT A <CR>?
3366  033510  001401                            BEQ     TTOLF               ;YES, ECHO A LF AS WELL
3367  033512  000207                            RTS     PC                  ;NO, JUST RETURN
3368  033514  012700  000012            TTOLF:  MOV     #12,R0
3369  033520  004767  177746                    JSR     PC,TTO
3370  033524  016767  000030  000030          MOV     FILL,FILCNT         ;PREPARE TO PRINT NULLS
3371  033532  005000                            CLR     R0
3372  033534  004767  177732            1$:     JSR     PC,TTO
3373  033540  005367  000016                    DEC     FILCNT              ;AS MANY AS FILL COUNT
3374  033544  003373                            BGT     1$
3375  033546  012700  000012                    MOV     #12,R0              ;RESTORE LOST R0
3376  033552  000207                            RTS     PC                  ;AND RETURN
3377
3378
3379                                    ;ASSOCIATED VARIABLE STORAGE:
3380
3381  033554  000000                    RJFLG:  .WORD   0
3382  033556  000000                    RADIX:  .WORD   0
3383  033560  000010                    FILL:   .WORD   10
3384  033562  000000                    FILCNT: .WORD   0
```

```
                                    .SBTTL  TEST BUFFERS

                                    ;DATA CILD  DATA-BUFFER

033564  125252                      $$DAT:  125252
033566  052525                              052525
033570  125252                              125252
033572  052525                              052525
033574  125252                              125252
033576  052525                              052525
033600  125252                              125252
033602  052525                              052525
033604  125252                              125252
033606  052525                              052525

033610  177400                              177400
033612  000377                              000377
033614  177400                              177400
033616  000377                              000377
033620  177400                              177400
033622  000377                              000377
033624  177400                              177400
033626  000377                              000377
033630  177400                              177400
033632  000377                              000377

033634  000000                              000000
033636  177777                              177777
033640  000000                              000000
033642  177777                              177777
033644  000000                              000000
033646  177777                              177777
033650  000000                              000000
033652  177777                              177777
033654  000000                              000000
033656  177777                              177777

033660  010421                              010421
033662  021042                              021042
033664  031463                              031463
033666  042104                              042104
033670  052525                              052525
033672  063146                              063146
033674  076567                              076567
033676  104210                              104210
033700  114631                              114631
033702  125252                              125252

033704  000001                              000001
033706  177776                              177776
033710  000002                              000002
033712  177775                              177775
033714  000003                              000003
033716  177774                              177774
033720  000004                              000004
033722  177773                              177773
```

```
3442 033724 000005          000005
3443 033726 177772          177772
3444
3445 033730 000000          000000
3446 033732 000000          000000
3447 033734 000000          000000
3448 033736 000000          000000
3449 033740 000000          000000
3450 033742 111111          111111
3451 033744 111111          111111
3452 033746 111111          111111
3453 033750 111111          111111
3454 033752 111111          111111
3455
3456 033754 125252          125252
3457 033756 052525          052525
3458 033760 177777          177777
3459 033762 000000          000000
```

```
                              ;CRC TEST BUFFER

033764  125252                SILCRC: 125252
033766  050521                        050521
033770  124200                        124200
033772  000665                        000665
033774  141436                        141436
033776  164003                        164003
034000  075106                        075106
034002  027371                        027371
034004  002562                        002562
034006  135105                        135105

034010  002640                        002640
034012  045405                        045405
034014  060152                        060152
034016  013403                        013403
034020  153756                        153756
034022  072577                        072577
034024  164176                        164176
034026  025435                        025435
034030  111272                        111272
034032  052673                        052673

034034  157140                        157140
034036  102461                        102461
034040  066234                        066234
034042  016141                        016141
034044  175726                        175726
034046  121477                        121477
034050  036420                        036420
034052  122203                        122203
034054  045272                        045272
034056  016435                        016435

034060  010703                        010703
034062  103142                        103142
034064  177121                        177121
034066  016654                        016654
034070  033047                        033047
034072  042734                        042734
034074  046205                        046205
034076  014300                        014300
034100  024677                        024677
034102  103302                        103302

034104  106245                        106245
034106  124160                        124160
034110  132304                        132304
034112  015025                        015025
034114  017305                        017305
034116  044754                        044754
034120  044406                        044406
034122  061203                        061203
034124  140621                        140621
034126  054620                        054620
```

```

034130 110312                     110312
034132 130174                     130174
034134 116116                     116116
034136 120462                     120462
034140 021446                     021446
034142 114411                     114411
034144 133325                     133325
034146 050737                     050737
034150 106501                     106501
034152 007625                     007625

034154 117626                     117626
034156 041245                     041245
034160 031477                     031477
034162 014726                     014726
```

```
 3534                                   ;RECEIVER DATA COMPARE BUFFER
 3535                                           .EVEN
 3536  036164  000100                   (MPBUF: .BLKW   64.
```

```
3538                                              .SBTTL ASCII STORAGE
3539
3540  034364  023046  044523  047514  SLOWD.  .ASCII  /&&SILO OUTPUT WORD WAS @/
      034372  047440  052125  052520
      034400  020124  047527  042122
      034406  053440  051501  040040
3541  034414  023046  044523  047514  SLIWD:  .ASCII  /&&SILO INPUT WORD WAS @/
      034422  044440  050116  052125
      034430  053440  051117  020104
      034436  040527  020123     100
3542  034443     046  047105  020104  PEND:   .ASCII  /&END PASS #@/
      034450  040520  051523  021440
      034456     100
3543  034457     046  041523  050117  SCSEC:  .ASCII  /&SCOPE SECTION FOR SLICE TIMING&SET SW 09 TO EXIT THIS LOOP.@/
      034464  020105  042523  052103
      034472  047511  020116  047506
      034500  020122  046123  041511
      034506  020105  044524  044515
      034514  043516  051446  052105
      034522  051440  020127  034460
      034530  052040  020117  054105
      034536  052111  052040  044510
      034544  020123  047514  050117
      034552  040056
3544  034554  052046  040522  051516  TXSTAT: .ASCII  /&TRANSMITTER STATUS REG = @/
      034562  044515  052124  051105
      034570  051440  040524  052524
      034576  020123  042522  020107
      034604  020075     100
3545  034607     046  042522  042503  RCSTAT: .ASCII  /&RECEIVER STATUS REG = @/
      034614  053111  051105  051440
      034622  040524  052524  020123
      034630  042522  020107  020075
      034636     100
3546  034637     046  047516  020056  RCBTCN: .ASCII  /&NO. OF WORDS RECEIVED = @/
      034644  043117  053440  051117
      034652  051504  051040  041505
      034660  044505  042526  020104
      034666  020075     100
3547  034671     046  041520  030514  TXHDR:  .ASCII  /&PCL11 TRANSMITTER TEST &  @/
      034676  020061  051124  047101
      034704  046523  052111  042524
      034712  020122  042524  052123
      034720  023040  020040     100
3548  034725     046  041520  030514  RCHDR:  .ASCII  /&PCL11 RECEIVER TEST&   @/
      034732  020061  042522  042503
      034740  053111  051105  052040
      034746  051505  023124  020040
      034754  040040
3549  034756  052046  040522  051516  XRHDR:  .ASCII  /&TRANSMITTER - RECEIVER LOOP TESTS&   @/
      034764  044515  052124  051105
      034772  026440  051040  041505
      035000  044505  042526  020122
      035006  047514  050117  052040
      035014  051505  051524  020046
      035022  020040     100
```

```
3550 035025    046  041520  030514  AUTHOR: .ASCII  &P   TESTS 1 - 3 SEQUENCE&  @/
     035032 020061  042524  052123
     035040 020123  020061  020055
     035046 020063  042523  05252
     035054 047105  042503  020046
     035062 020040     100
3551 035065    046  046530  051124  TMTR:   .ASCII  /&XMTR @/
     035072 040040
3552 035074 051046  053103  020122  RECVR:  .ASCII  /&RCVR @/
     035102    100
3553 035103    061  052123  052440  FRAD:   .ASCII  /1ST UNIBUS ADDR..@/
     035110 044516  052502  020123
     035116 042101  051104  027056
     035124    100
3554 035125    046  044124  052101  TOOLOW: .ASCII  /&THAT WAS TOO LOW. I'LL GIVE YOU ANOTHER CHANCE...&@/
     035132 053440  051501  052040
     035140 047517  046040  053517
     035146 020041  023511  046114
     035154 043440  053111  020105
     035162 047531  020125  047101
     035170 052117  042510  020122
     035176 044103  04710   042503
     035204 027056  023056     100
3555 035211    046  044124  05210   AGAIN:  .ASCII  /&THAT WON'T DO. TRY AGAIN!&@/
     035216 053440  047117  052047
     035224 042040  027117  052040
     035232 054522  040440  040507
     035240 047111  02304      100
3556 035245    126  041505  047524  VCTR:   .ASCII  /VECTOR..@/
     035252 027122  040056
3557 035256 051120  047511  044522  PRIOTY: .ASCII  /PRIORITY   4-7)..@/
     035264 054524  020040  032050
     035272 033455  027051  040056
3558 035300 042124  0201 5  052502  TDMAD:  .ASCII  /TDM BUS ADDR (1-37)..@/
     035306 020123  042101  051104
     035314 024040  026461  033463
     035322 027051  040056
3559 035326 044446  053116  04610   INVLAD: .ASCII  /&INVALID DEVICE ADDRESS...(IT'S NOT THERE)@/
     035334 042111  042040  053105
     035342 041511  020105  042101
     035350 051104  051505  027123
     035356 027056  044450  023524
     035364 020123  047516  020124
     035372 044124  051105  024505
     035400    100
3560 035401    046  051124  050101  TRAP4:  .ASCII  /&TRAPPED TO LOCATION 4 FROM LOCATION @/
     035406 042520  020104  047524
     035414 046040  041517  052101
     035422 047511  020116  020064
     035430 051106  046517  046040
     035436 041517  05210   047511
     035444 020116     100
3561 035447    046  050046  046103  TSTHDR: .ASCII  /&&PCL11 STANDALONE TESTS V02C   CZPLBCO  06-JUN-79&@/
     035454 030461  051440  040524
     035462 042116  046101  047117
     035470 020105  042524  052123
```

```
      035476  020123  030126  041462
      035504  020040  041440  050132
      035512  041114  030103  020040
      035520  033060  045055  047125
      035526  033455  023071     100
3562  035533     046  042523  042514   TSTSEL: .ASCII  /&SELECT TEST (<CR> - HELP)..@/
      035540  052103  052040  051505
      035546  020124  036050  051103
      035554  020076  020075  042510
      035562  050114  027051  040056
3563  035570  023046  042522  050123   HLPMSG: .ASCII  /&&RESPOND WITH ONE OF THE FOLLOWING:/
      035576  047117  020104  044527
      035604  044124  047440  042516
      035612  047440  020106  044124
      035620  020105  047506  046114
      035626  053517  047111  035107
3564  035634  020046  020040  020040           .ASCII  /&      1 - RUN TRANSMITTER TEST/
      035642  020061  020075  052522
      035650  020116  051124  047101
      035656  046523  052111  042524
      035664  020122  042524  052123
3565  035672  020046  020040  020040           .ASCII  /&      2 - RUN RECEIVER TEST/
      035700  020062  020075  052522
      035706  020116  042522  042503
      035714  053111  051105  052040
      035722  051505     124
3566  035725     046  020040  020040           .ASCII  /&      3 - RUN XMTR-RCVR LOOP TEST/
      035732  031440  036440  051040
      035740  047125  054040  052115
      035746  026522  041522  051126
      035754  046040  047517  020120
      035762  042524  052123
3567  035766  020046  020040  020040           .ASCII  /&      4 - RUN TEST 1, THEN TEST 2, THEN TEST 3&@/
      035774  020064  020075  052522
      036002  020116  042524  052123
      036010  030440  020054  044124
      036016  047105  052040  051505
      036024  020124  026062  052040
      036032  042510  020116  042524
      036040  052123  031440  040046
```

```
                                 .SBTTL CONSTANTS AND VARIABLE STORAGE
                                 .EVEN


                         ;VARIABLES

036046  000000           DILLY:  .WORD   0
036050  000000           DLY:    .WORD   0
036052  000000           SWRFLG: .WORD   0
036054  000000           PNTFLG: .WORD   0
036056  000000           ITER:   .WORD   0
036060  000000           SWI:    .WORD   0
036062  000000           PAT:    .WORD   0
036064  000000           MASK:   .WORD   0
036066  000000           PSNO1:  .WORD   0
036070  000000           PSNO2:  .WORD   0
036072  000000           PSNO3:  .WORD   0
036074  000000           PSNO4:  .WORD   0
036076  000000           TEMP:   .WORD   0
036100  000000           TESTNO: .WORD   0
036102  000000           $4FLAG: .WORD   0
036104  000000           RCAD:   .WORD   0                       ;RECEIVER ADDRESS
036106  000000           TRAD:   .WORD   0                       ;TRANSMITTER ADDRESS
036110  000000           COUNT:  .WORD   0
036112  000000           DATWD:  .WORD   0
036114  000000           TMPRIO: .WORD   0

                         ;CONSTANTS:


036116  000005           FKPRIO: .WORD   5
036120  000005           FKPRI1: .WORD   5
036122  000170           TXVEC:  .WORD   170
036124  000174           RCVEC:  .WORD   174
036126  000240           XPRIO:  .WORD   240
036130  000240           RPRIO:  .WORD   240
036132  164200           TCR:    .WORD   164200
036134  164202           TSR:    .WORD   164202
036136  164204           TSDB:   .WORD   164204
036140  164206           TSBC:   .WORD   164206
036142  164210           TSBA:   .WORD   164210
036144  164212           TMMR:   .WORD   164212
036146  164213           TMMRH:  .WORD   164213
036150  164214           TSCRC:  .WORD   164214
036152  164220           RCR:    .WORD   164220
036154  164222           RSR:    .WORD   164222
036156  164224           RDDB:   .WORD   164224
036160  164226           RDBC:   .WORD   164226
036162  164230           RDBA:   .WORD   164230
036164  164234           RDCRC:  .WORD   164234
036166  177560           KBS:    .WORD   177560
036170  177562           KBD:    .WORD   177562
036172  177564           TTS:    .WORD   177564
036174  177566           TTB:    .WORD   177566
036176  036176           MEM:    .WORD   MEM
036200  177777           TSTWRD: .WORD   177777
```

```
3625
3626
```

```
3628  036202  000170                  TXMVEC: .WORD   170             ;170 IS XMTR DEFAULT VECTOR
3629  036204  000174                  RCVVEC: .WORD   174             ;174 IS RCVR DEFAULT VECTOR
3630  036206  164200                  TXMADR: .WORD   164200          ;164200 IS XMTR DEFAULT BASIC ADDR
3631  036210  164220                  RCVADR: .WORD   164220          ;164220 IS RCVR DEFAULT BASIC ADDR
3632          000001                          .END
```

```
ADGD    003212   697  700#
ADOK    003166   693  696#
ADRGD   003340   713  716#
ADROK   003314   709  712#
AGAIN   035211   626  638   649   653   671   675   694   698   710   714  3103  3555#
ALTHDR  035025   757 3550#
BAD     032644   949* 951   955*  957   961*  962*  964   966   970*  972   976*  978   982*
                 984 1001*  1002 1008* 1009* 1010  1018* 1019  1028* 1030  1034* 1035  1039*
                1040 1044*  1046 1065* 1066  1091* 1092  1198* 1200* 1202  1226* 1258* 1259*
                1261 1304*  1306 1325* 1327  1361* 1363  1378* 1379  1434* 1692* 1695  1775*
                1777 1781*  1783 1787* 1789  1793* 1795  1799* 1801  1818* 1819  1825* 1826*
                1827 1836*  1838 1842* 1844  1848* 1850  1854* 1856  1875* 1876  1901* 1902
                1943* 1945  1963* 1965 2001* 2002  2114* 2115  2288* 2289  2385* 2430* 2432
                2485* 2486  2491* 2492* 2493 2538* 2539  2592* 2593  2637* 2638  2736* 2737*
                2738 2743*  2744* 2745 2790* 2791* 2792  2834* 2835* 2836  2840* 2841* 2842
                2882* 2883* 2884  2922* 2923* 2924  3153  3173#
BATST   006246   805 1086#  1105
BCONT   003346   575  717#   726   909  3077
BCTST   006064   804 1060#  1079
BEGIN   002000   471  568   579#
BHLPMG  003412   721  723   725#
BINPNT  033244  3298#
B00  =  000001   467# 1062  1088  1392  1872  1898  2724  2825  2826  2873  2874  2953  2967
                3002 3003
B01  =  000002   466# 1060  1086  1112  1285  1302  1309  1330  1332  1371  1382  1391  1408
                1444 1455  1500  1549  1567  1578  1593  1605  1617  1648  1657  1664  1678
                1711 1835  1870  1896  1922  1941  1948  1968  1971  2019  2034  2075  2095
                2131 2179  2202  2214  2249  2258  2265  2271  2280  2306  2358  2359  2388
                2389 2443  2444  2497  2498  2544  2545  2602  2603  2691  2692  2718  2719
                2759 2760  2805  2806  2860  2861  2898  2899  2945  2946  2979  2980  2995
                2996
B02  =  000004   465# 2104
B03  =  000010   464# 1288  1299  1313  1323  1354  1404  1457  1929  1954  1978  2030  2769
                2906
B04  =  000020   463# 1463  2777
B05  =  000040   462# 2959  2975  2982  3017  3025
B06  =  000100   461# 1471  1481  1621  1627  1633  1651  2077  2218  2224  2230  2252
B07  =  000200   460# 1197  1225  1257  1264  1271  1311  1321  1358  1366  1368  1432  1437
                1445 1446  1450  1451  1634  1652  1688  1933  1935  1958  1960  1972  1982
                2049 2054  2081  2082  2090  2091  2180  2184  2231  2233  2253  2281  2417
                2429 2723  2728  2817  2819  2820  2822  2823  2824  2862  2869
B08  =  000400   459# 1292  1317  1350  1571  1925  1938  1950  1961  2008  2109  2182  2234
                2456 2509  2612  2954
B09  =  001000   458# 1119  1128  1487  1488  1502  1574  2119  3004
B10  =  002000   457#  791  1507  1508  1583  1733  2133  2134  2322  2702  2914
B11  =  004000   456#  811  1517  1518  1601  1750  2147  2148  2337
B12  =  010000   455#  989  1051  1077  1103  1276  1411  1527  1528  1607  1659  1708  1806
                1861 1887  1913  2036  2157  2158  2204  2260  2303  2412  2679  2749  2782
                2796 2846  2850  2888  2928  2933  3070
B13  =  020000   454#  848  1477  1496  1537  1538  2076  2086  2127  2132  2142  2167  2168
                2449 2451  2503  2504  2697  2698  2724  2765  2766  2813  2814  2873  2874
                2904 2905  2952  2953  2981  2983  3002  3003
B14  =  040000   453#  953   959   968   974   980   986  1004  1012  1021  1032  1037  1042
                1048 1068  1094  1116  1133  1138  1143  1149  1154  1159  1167  1171  1177
                1185 1189  1193  1204  1212  1216  1224  1231  1245  1252  1263  1270  1290
                1294 1301  1308  1315  1319  1329  1335  1336  1338  1348  1352  1356  1365
```

		1381 1406 1420 1448 1453 1469 1473 1479 1483 1490 1494 1498 1504
		1510 1514 1520 1524 1530 1534 1540 1544 1557 1559 1561 1565 1576
		1591 1603 1628 1640 1644 1670 1681 1684 1686 1697 1702 1779 1785
		1791 1797 1803 1821 1829 1840 1846 1852 1858 1878 1904 1927 1931
		1940 1947 1952 1956 1967 1980 1985 1994 1996 2004 2010 2032 2061
		2079 2084 2088 2093 2106 2111 2117 2121 2125 2129 2136 2140 2144
		2150 2154 2160 2164 2170 2174 2192 2194 2196 2200 2225 2241 2245
		2272 2291 2296 2376 2380 2386 2405 2409 2462 2466 2467 2475 2478
		2488 2495 2515 2519 2520 2528 2531 2541 2568 2571 2579 2582 2595
		2618 2621 2640 2641 2658 2661 2669 2672 2710 2740 2747 2751 2775
		2779 2794 2798 2838 2844 2848 2852 2886 2890 2926 2930 2965 2969
		2973 2977 2985 3002 3003 3015 3019 3023 3027
B15	= 100000	452# 1070 1096 1475 1492 1512 1522 1532 1542 1563 1880 1906 2123
		2138 2152 2162 2172 2198 2956 2971 3006
CCRTN	031774	3060# 3087
CHXDAT	024014	2378 2407 2427#
CLRCBF	020210	1970 2040# 2543
CMPBUF	034164	1984 1998 2041 2060 2105 2113 2547 2590 3000 3536#
CONTW1	032004	3061# 3062 3068
COUNT	036110	1689* 1705* 3592#
CRCTST	014646	810 1678# 1687 1703 1710
DATLPS	024074	2334 2443# 2463 2472 2483 2489 2496 2681
DATWD	036112	2285* 2286 2294 3593#
DECJSP	033320	3316#
DECPNT	033272	764 820 1759 2346 3307#
DELAY	004546	916# 1220 1248 1254 1266 1286 1297 1596 1599 1923 1936 2420 2725
DELYMG	032312	3080 3113#
DERR	032500	953 959 968 974 980 986 1004 1012 1021 1032 1037 1042 1048
		1068 1094 1204 1263 1308 1329 1365 1381 1702 1779 1785 1791 1797
"		1803 1821 1829 1840 1846 1852 1858 1878 1904 1947 1967 2004 2117
		2296 2380 2386 2409 2488 2495 2541 2595 2640 2740 2747 2794 2838
		2844 2886 2926 3146#
DEVGEN	004264	684 859#
DILLY	036046	916* 923* 3575#
DIVID	033374	3334# 3338
DIVSET	033372	3333# 3343
DLCON	032412	917 919* 920 1237 1340 1421 1461 1580 1986 2062 2365 2394 2452
		2505 2553 2610 2650 2699 2729 2767 2783 2827 2875 2908 2915 2957
		3007 3081 3082 3086* 3126#
DLWT	004566	918 920# 924
DLWT1	004574	921# 922
DLY	036050	920* 921* 3576#
DTLPS1	024166	2453# 2461
DVATST	004456	600 894#
EROINT	022204	2217 2222#
ERR	032414	1116 1133 1138 1143 1149 1154 1159 1167 1171 1177 1185 1189 1193
		1212 1216 1224 1231 1245 1252 1270 1290 1294 1301 1315 1319 1338
		1348 1352 1356 1406 1448 1453 1469 1473 1479 1483 1490 1494 1498
		1504 1510 1514 1520 1524 1530 1534 1540 1544 1557 1561 1565 1576
		1591 1603 1628 1640 1644 1670 1686 1927 1931 1940 1952 1956 1980
		1994 2010 2032 2079 2084 2088 2093 2111 2121 2125 2129 2136 2140
		2144 2150 2154 2160 2164 2170 2174 2192 2196 2200 2225 2241 2245
		2272 2376 2405 2462 2466 2475 2515 2519 2528 2568 2579 2618 2658
		2669 2710 2751 2775 2779 2798 2848 2852 2890 2930 2965 2969 2973
		2977 2985 3015 3019 3023 3027 3132#
ERRAD	032640	3132* 3133* 3138 3146* 3147* 3171#

```
ERRINT  014240  1620  1625#
ERRM    032564  3134  3162#
ERRNUM  032642   953*  959*  968*  974*  980*  986* 1004* 1012* 1021* 1032* 1037* 1042* 1048*
                1068* 1094* 1116* 1133* 1138* 1143* 1149* 1154* 1159* 1167* 1171* 1177* 1185*
                1189* 1193* 1204* 1212* 1216* 1224* 1231* 1245* 1252* 1263* 1270* 1290* 1294*
                1301* 1308* 1315* 1319* 1329* 1338* 1348* 1352* 1356* 1365* 1381* 1406* 1448*
                1453* 1469* 1473* 1479* 1483* 1490* 1494* 1498* 1504* 1510* 1514* 1520* 1524*
                1530* 1534* 1540* 1544* 1557* 1561* 1565* 1576* 1591* 1603* 1628* 1640* 1644*
                1670* 1686* 1702* 1779* 1785* 1791* 1797* 1803* 1821* 1829* 1840* 1846* 1852*
                1858* 1878* 1904* 1927* 1931* 1940* 1947* 1952* 1956* 1967* 1980* 1954* 2004*
                2010* 2032* 2079* 2084* 2088* 2093* 2111* 2117* 2121* 2125* 2129* 2136* 2140*
                2144* 2150* 2154* 2160* 2164* 2170* 2174* 2192* 2196* 2200* 2225* 2241* 2245*
                2272* 2296* 2376* 2380* 2386* 2405* 2409* 2462* 2466* 2475* 2488* 2495* 2515*
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INTB    014610  1650  1669#
INTRA   022556  2228  2265#
INTRB   022600  2251  2270#
INTST   014162   809  1616#  1629  1641  1645  1661
INVLAD  035526   895  3559#
ISP =   002000   471#  569   573   580   894   904  3076  3091
ITER    036056   789*  813*  1731* 1752* 2320* 2339* 3579#
JUST    033444  3350# 3353
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		655	656*	657*	658*	659*	660*	661	667*	669	673	677	678*	679*
		680*	681*	682*	683	690*	692	696	700	706*	708	712	716	718*
		720	722	728	3057*	3059	3081*	3086	3099*	3101	3105	3213	3214*	3229*
		3231*	3233*	3234	3243*	3244*	3245*	3246*	3251*	3267#				
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LOOPL	023154	2323	2327	2331	2333#	2340								
LOOPR	015224	1734	1740	1742#	1753									
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MEM	036176	3623#												
MONCH	031712	3050#												
MONIC	031706	3047	3049#											
MONIT	031672	790	842	988	1050	1076	1102	1118	1127	1275	1410	1606	1658	1707
		1732	1805	1860	1886	1912	2035	2203	2259	2302	2321	2411	2678	2932
		3029	3045#	3140										
MSRTST	006430	806	1112#	1117	1278									
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		1048#	1068#	1094#	1116#	1133#	1138#	1143#	1149#	1154#	1159#	1167#	1171#	1177#
		1185#	1189#	1193#	1204#	1212#	1216#	1224#	1231#	1245#	1252#	1263#	1270#	1290#
		1294#	1301#	1308#	1315#	1319#	1329#	1338#	1348#	1352#	1356#	1365#	1381#	1406#
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PRMT7   002620          648     651#
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PRMT9   002704          662#    672     676
PROMT   002056          588#    599     896
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                        2213*   2219*   2222*   2229*   2236*   2254*   2319*
PSNO1   036066          732*    817*    819     3583#
PSNO2   036070          733*    1756*   1758    3584#
PSNO3   036072          734*    2343*   2345    3585#
PSNO4   036074          735*    761*    763     3586#
P1      = 000040        448#
P2      = 000100        447#
P3      = 000140        446#
P4      = 000200        445#
P5      = 000240        444#
P6      = 000300        443#
P7      = 000340        442#    570     574     581     584     788     903     1616    1625    1632    1730    2213    2222
                        2229    2319
RADIX   033556          3331*   3334    3336    3382#
RART    015730          1807    1809#
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RA3     015570          1790    1793#
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RA5     015710          1802    1805#
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G 11

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		1594*	2769	2906	3611#									
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		2250*	2254	2266*	3594#									
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        2155  2161  2165  2171  2175  2193  2197  2201  2226  2242  2246  2273  2297  2377  2381
        2387  2406  2410  2463  2472  2483  2489  2496  2516  2525  2536  2542  2576  2587  2598
        2635  2647  2666  2677  2711  2741  2748  2752  2776  2780  2795  2799  2839  2845  2849
        2853  2887  2891  2927  2931  2966  2970  2974  2978  2986  3016  3020  3024  3028

. ABS.  036212     000

 ERRORS DETECTED:  0

 CZPLBC,CZPLBC/CR=CZPLBC
 RUN-TIME: 17 36 5 SECONDS
 RUN-TIME RATIO: 127/60=2.1
 CORE USED:  12K  (23 PAGES)
```