TM03/TU45

CONTROL LOGIC TEST PART 2

CZTUPA0

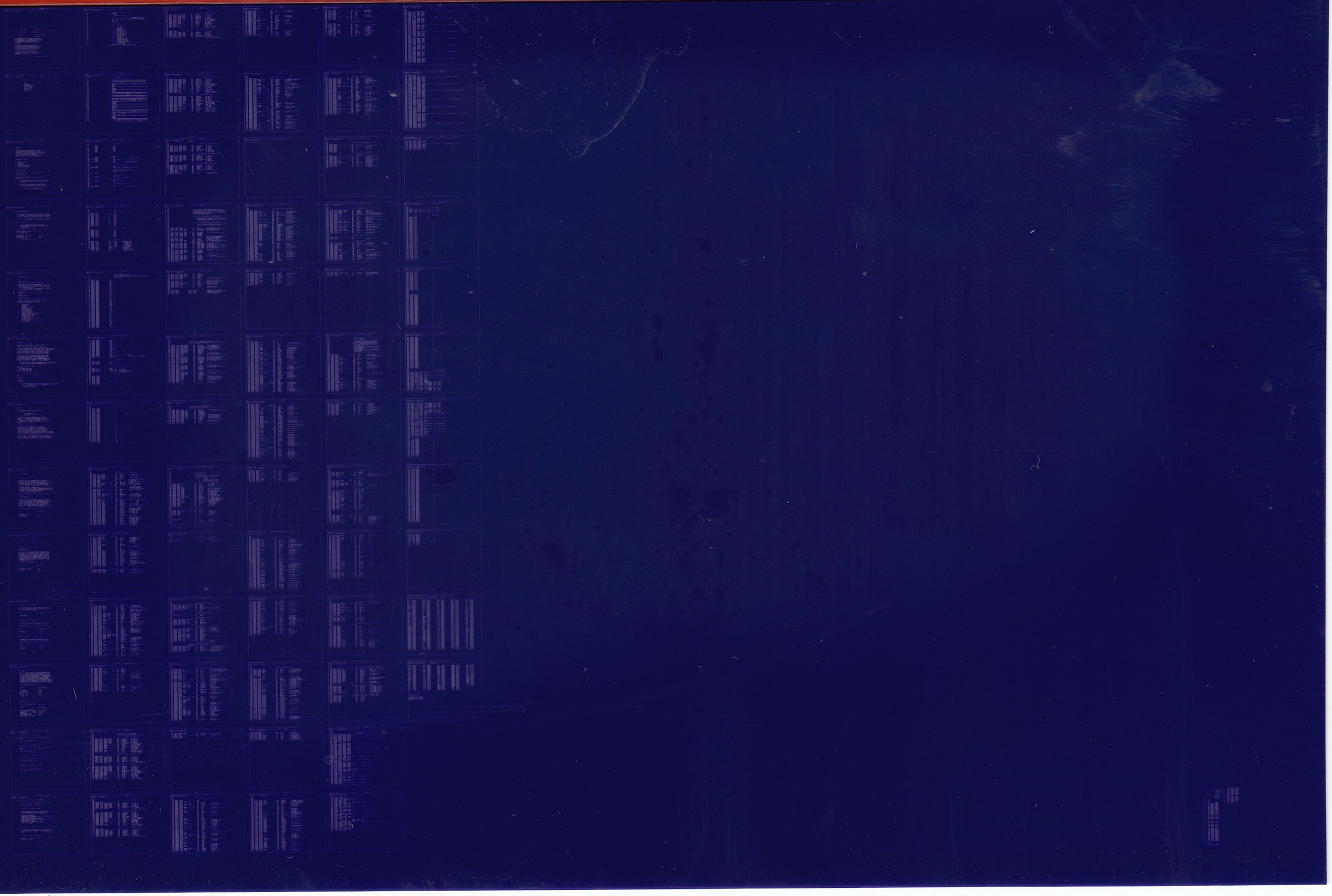
AH-E491A-MC

FICHE 1 OF 1

JUL 1978

digital

MADE IN USA



```
                .REM    %
```

IDENTIFICATION

PRODUCT CODE:	AC-E490A-MC
PRODUCT NAME:	CZTUPA0 TM03-TU45 CONTROL LOGIC TEST PART II
DATE CREATED:	25 MAY 1978
MAINTAINER:	CSS - NASHUA
AUTHOR:	J. G. ADAMS/R. J. COLLINS

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1. ABSTRACT

THIS PROGRAM IS DESIGNED TO SEQUENTIALLY TEST
THE DATA FORMATTING FUNCTIONALITY OF THE TM03
FORMATTER. EACH TEST WILL ATTEMPT TO ISOLATE FAILURES
TO THE MODULE LEVEL AND PROVIDE PRINTOUT INFORMATION
WHICH WILL IDENTIFY THE FAILING MODULE.
THE LEVEL OF FAULT ISOLATION IS POSSIBLE BECAUSE OF
TM03 THE STRUCTURE AND ITS MAINTAINENCE MODES.

2. REQUIREMENTS (HARDWARE)

A. ANY PDP-11 PROCESSOR
B. 8K OF CORE
C. CONSOLE TTY
D. TM03 MAGTAPE CONTROLLER
E. MASSBUS CONTROLLER (RH)
F. TU45 MAGTAPE TRANSPORT

3. LOADING PROCEDURE

USE STANDARD PROCEDURE FOR LOADING BINARY PAPER TAPE.

4. STARTING PROCEDURE

THERE ARE TWO (2) STARTING ADDRESSES THAT MAY BE USED:
200(8) AND 210(8).

A. 200(8): STARTING AT THIS ADDRESS WILL CAUSE A PROGRAM
IDENTIFICATION HEADER TO BE PRINTED BEFORE TESTING
IS BEGUN.

B. 210(8): STARTING AT THIS ADDRESS WILL NOT PRINT THE
IDENTIFICATION HEADER AND IS THEREFORE GENERALLY
TO BE USED FOR RESTARTS RATHER THAN INITIAL START

** NOTE: SEE ALSO SEC 5. CONSOLE SWITCH SETTINGS
** TYPE C TO RESTART PROGRAM (@200)

4.1 AUTOMATIC MODE OPERATION

IF THIS PROGRAM IS LOADED AND RUN IN AUTOMATIC (CHAIN) MODES
DEFAULT RESPONSES TO OPERATOR REQUESTS ARE USED. THE SOFTWARE
SWR IS INVOKED WITH A SWITCH SETTING OF 100000 (HALT ON ERROR)
IF IN ACT11 CHAIN MODE. NO OPERATOR INTERVENTION IS REQUIRED.

**EXCEPTION: IF THIS PROGRAM IS LOADED VIA TMDP CHAIN MODE THE
PROGRAM WILL NOT TEST TM03 DRIVE #0, TU45 SLAVE #0.

4.2 SAMPLE START AT 200

NOTE: DEFAULT RESPONSES ARE SHOWN IN ANGLE BRACKETS <>,
OPERATOR RESPONSES ARE SHOWN IN PARENTESES (), AND
MEMORY LOCATIONS CONTAINING THE DEFAULT ARE SHOWN IN
SQUARE BRACKETS .

PARAMETER REQUEST: <DEFAULT> (RESPONSE) LOCATION:

TM03-TU45 CONTROL LOGIC TEST PART II (CZTUPA0)
ASSURE TAPE IS AT BOT
TYPE C TO RESTART

REGISTER START: <172440> (CR) REGS:
VECTOR ADDRESS: <224> (CR) VECT:
TM03 DRIVE: <0> (CR) DRVN:
TU45 SLAVE: <0> (CR) SLVN:
IF THE SOFTWARE SWR IS INVOKED:
SWR = <000000> NEW = (CR) SWREG:

5. CONSOLE SWITCH SETTINGS

CONTROL:

1) CONTROL G < G>;
   SELECTS THE SOFTWARE SWR AND ALLOWS NEW SWITCH SETTINGS.

   THE MACHINE WILL THEN TYPE: SWR=XXXXXXNEW=
   WHERE: XXXXXX IS THE OCTAL CONTENTS OF THE SOFTWARE SWR.
   AFTER 'NEW=' HAS BEEN TYPED THEN THE OPERATOR CAN DO ONE
   OF THE FOLLOWING AT THE TTY:
     A) TYPE AN OCTAL NUMBER TO BE LOADED INTO THE SOFTWARE SWR.
     B) IF A <CR> IS THE FIRST KEY DEPRESSED THE SOFTWARE SWITCH
        REGISTER CONTENTS WILL NOT BE CHANGED.

2) CONTROL A < A>;
   ALTERNATES THE SWITCH REGISTER FROM HARDWARE TO SOFTWARE & VICE VERSA.

3) CONTROL C < C>;
   RESTART PROGRAM AT 200

4) CONTROL U < U>;
   DELETES ALL CHARACTERS TYPED IN RESPONSE TO A REQUEST.

ALL SWITCHES ARE USED (0-15) AND THE NORMAL, OR DEFAULT, RUN
IS DONE WITH ALL SWITCHES SET TO ZERO (0).
ALL SWITCHES ARE DYNAMIC AND MAY BE CHANGED AT ANY TIME.

```
SW15:   1=HALT ON ERROR
        0=CONTINUE
SW14:   1=LOOP ON ERROR (SCOPE)
        0=CONTINUE
SW13:   1=DO NOT PRINT ERRORS
        0=PRINT ALL ERRORS
SW12:   1=DO CONTINUOUS CYCLE
        0=HALT AT END OF PASS
SW11:   1=INHIBIT ITERATIONS
        0=ITERATE EACH TEST ITS ASSIGNED AMOUNT
SW10:   1=HALT AT END OF CURRENT TEST
        0=CONTINUE TO NEXT TEST
SW8:    1=INHIBIT WRAP AROUND DATA CHECK
        0=DO DATA CHECKS
SW7:    1=INHIBIT WRAP AROUND STATUS CHECK
        0=DO STATUS CHECK
SW6:    1=SELECTABLE WRAP DATA PATTERN (IN SINGLE TEST)
        0=AUTO PATTERN
SW5-0:  SELECT INDIVIDUAL TEST ** 00=DO ALL TESTS
```

6. ERROR PRINTOUTS

ERROR PRINTOUTS WILL APPEAR IN TWO FORMS, ONE FOR THE
CONTROL LOGIC TESTS AND ANOTHER FOR THE DATA TESTS.

CONTROL LOGIC PRINTOUTS WILL CONTAIN A HEADER WHICH CALLS
OUT THE TEST NUMBER, FUNCTION BEING TESTED, AND THE SUSPECT MODULE,
OR MODULES ON THE FIRST LINE. THE SECOND LINE WILL CONTAIN INFORMATION
AS TO THE ACTUAL ERROR. BOTH THE EXPECTED RESULT AND THE ACTUAL
RESULT OF THE TEST WILL BE GIVEN. LINE THREE WILL SHOW THE
CONTENTS OF THE MAJOR REGISTERS AT THE TIME OF THE ERROR AND
LINE FOUR WILL PRINT THE ITERATION NUMBER WHEN APPLICABLE.

DATA TESTS WILL PRINT A HEADER CONTAINING THE TEST NUMBER,
AND A DESCRIPTION OF THE WRAP AROUND FUNCTION UNDER TEST.
FOLLOWING THE HEADER WILL BE A LIST OF THE MAJOR REGISTERS
WITH THE EXPECTED AND ACTUAL VALUES. ANY BAD DATA WILL BE
PRINTED (PER CHARACTER) FOLLOWING THE REGISTER INFORMATION OR
FOLLOWING THE HEADER IF NO STATUS ERRORS WERE ENCOUNTERED.

5. THE FOLOWING ARE TWO EXAMPLES OF ERRORS DETECTED BY THE WRAP AROUND
   DATA TESTS. NOTE THAT EACH WRAP AROUND TEST MAY BE ACCOMPANIED
   BY EITHER A STATUS ERROR OF A DATA ERROR OR BOTH.

```
LOGIC TEST 1: WRAP 3, NRZ, NORMAL, ODD
BAD STATUS
CS1 EXPT 004270 RCVD 144270
CS2 EXPT 000100 RCVD 000100
DS  EXPT 010600 RCVD 150600
ER  EXPT 000000 RCVD 000100
```

THIS MESSAGE INDICATES BAD STATUS OF VPE (BIT 6 OF ER)

```
LOGIC TEST 3: WRAP 2, NRZ, NORMAL, ODD
BAD DATA
CN:0
G: 11111111
B: 11111011
CN:10
G: 00000000
B: 00001000
```

THIS MESSAGE SHOWS THAT DATA RECEIVED WAS NOT AS EXPECTED. CHARACTER
ZERO (CN: 0) SHOWS THAT BIT TWO (2) WAS DROPPED, WHILE CHARACTER
TEN (CN: 10) SHOWS BIT THREE (3) HAS BEEN PICKED UP
G: = EXPECTED DATA (GOOD)
B: = ACTUAL DATA (BAD)

7. OPERATION

THE PROCEDURES FOR OPERATING THIS PROGRAM ARE QUITE
SIMPLE AND REQUIRE ONLY A FEW STEPS:

1. LOAD ADDRESS 200 OR 210
2. SET SWITCHES FOR DESIRED TEST CYCLE
3. PRESS START

ALL CONSOLE SWITCHES ARE DYNAMIC AND MAY BE CHANGED
AT ANY TIME. THE NORMAL OPERATING SEQUENCE IS ALL SWITCHES
DOWN (0). THE TEST WILL TAKE APPROXIMATELY 3 MINUTES TO
RUN; HOWEVER, IF ITERATIONS ARE INHIBITED (SW11=1) THE TEST
WILL RUN IN ABOUT 30 SECONDS. THE END OF PASS IS
NOTED BY A PRINTOUT STATING END OF PASS, AND THE NUMBER OF
THAT PASS.

SINGLE TEST SELECTION: (SW0-SW5)

WHEN SW0-SW5 ARE SET TO ZERO (00), THE SCHEDULAR WILL
EXECUTE ALL TESTS IN SEQUENCE. IF SW0-SW5 ARE SET
TO SOME SPECIFIC TEST NUMBER THEN THAT PARTICULAR TEST
ONLY WILL BE EXECUTED UNTIL THE TEST SELECT NUMBER IS CHANGED.
WHEN YOU WISH TO SELECT A PARTICULAR TEST, SET SW10 TO
A ONE (1) IN ORDER TO STOP AT THE END OF THE CURRENT TEST BEFORE
SELECTING A DIFFERENT TEST NUMBER. YOU MAY SELECT THAT NUMBER IN
ANY DIRECTION (HIGHER OR LOWER) BECAUSE EACH TEST IS SELF CONTAINED.

WRAP AROUND DATA PATTERNS MAY BE SELECTED VIA SW6 WHEN IN
SINGLE TEST MODE. A TELETYPE REQUEST IS MADE FOR THE DESIRED DATA
PATTERN WHENEVER SWITCH TEN (SW10) AND SWITCH SIX (SW6) ARE SET TO
A ONE (1) WHILE ONE OF THE WRAP TESTS IS SELECTED IN SW0-SW5.

8. SUBTEST SUMMARIES

NOTE: FOR TESTS 1-15

FOR THE MOST PART, THIS DIAGNOSTIC TESTS PARTICULAR AREAS OF THE TM03 LOGIC INDEPENDENT OF THE TU45. HOWEVER THERE ARE A FEW SIGNALS WHICH ARE REQUIRED FROM THE TU45 TO COMPLETE THE TESTS, AND AT LEAST ONE CASE WHERE TU45 FAILURES INTERFERE WITH THE TESTS. THE KNOWN CASES ARE LISTED HERE AND SHOULD BE CHECKED AS PART OF THE DEBUGGING.

1. MOL(SB)L: REQUIRED TO ENABLE CLOCK
2. CLOCK(SB)L: REQUIRED TO GENERATE ACCELERATION AND SHUTDOWN.
3. WRITE CLOCK(SB)L: USED IN WAMO TO GENERATE DATA AND REC(SB)L
4. RSDO(SB)L: SHOULD NOT OCCUR DURING WRAP AROUND TESTS, BUT WILL INTERFERE WITH THEIR OPERATION IF CAUSED BY A FAILURE SUCH AS A GROUNDED OUTPUT FROM THE G056.

LOGIC TEST 1: WRP3, NRZ, NORMAL, ODD (BIT FIDDLER READ)

PROGRAMMED SEQUENCE:

TAPE CONTROL REGISTER IS LOADED WITH DENSITY 3, FORMAT 14, ODD PARITY WRP3 IS LOADED IN MAINT. REGISTER. READ FUNCTION IS LOADED, EXECUTING WRAP3 CONSISTS LOADING DATA CHARACTERS INTO MAINT. REGISTER DATA FIELD, WHERE THERE ARE MULTI-PLEXERS TO BIT FIDDLER, MM CLK IS TOGGLED TO CREATE RDS. THE BIT FIDDLER TRANSMIT DATA ACCESS MASSBUS DATA LINES. WHEN ALL THE DATA HAS BEEN TRANSMITTED AN EOR CLK IS TRANSMITTED TO N REGISTER WHICH BRINGS OPERATION TO A CLOSE.

LIKELY FAULT LOCATIONS: M8906, M8905-YB, MASSBUS P-LINES

CIRCUITS	PRINT REFERENCES
MASSBUS CHAR. ASSEMBLE	BF5
CLK. GENERATOR	BF2
MAINT. REGISTER DATA FIELD	MR2, MR3
RDS GENERATION	MR5

LOGIC TEST 2: WARP3, PE, NORMAL, ODD

JUST LIKE TEST 1 EXCEPT FOR DENSITY BITS.

LOGIC TEST 3: WRAP2, NRZ, NORMAL, ODD

PROGRAMMED SEQUENCE:

WRAP2 IS BIT FIDDLER WRITE. MM CLOCK IS MULTIPLEXED INTO WRT CLK SO THAT IT FORMS WRT STROBE. THE OUTPUT OF THE BIT FIDDLER IS CLOCKED INTO THE DATA FIELD OF THE MAINTENANCE REGISTER. SET UP CONSISTS OF MOVING NRZ, NORMAL FORMAT, ODD PARITY TO UNIT DESCRIPTION MAINT. REGISTER IS LOADED WITH WAM2 WRITE COMMAND IS ISSUED. AFTER THE ACCELERATION DELAY, MM CLOCK ARE GENERATED UNTIL ALL THE DATA HAS BEEN CLOCKED. SEQUENCE IS COMPLETED BY LOADING MANTENANCE REGISTER WITH EOR CLR. THE SEQUENCE IS REPEATED WITH VARYING DATA PATTERNS.

LIKELY FAULT LOCATIONS: M8906, M8905-YB, M8933

CIRCUITS	PRINT REFERENCES
BIT FIDDLER CHAR UNPACK	BF4
BIT FIDDLER DATA REQUEST	BF2
WRT STRB.	TCCM4
MAINT. REG. DATA FIELD	MR2, MR3

LOGIC TEST 4: WRP2, PE, NORMAL, ODD

THE TEST IS EXACTLY LIKE TEST 43 EXCEPT THAT PE WRT CLK ENBL L MUST BE ASSERTED BY M8932 TO ENABLE WR TO STROBE. THIS DOES NOT HAPPEN UNTIL THE PE WRITE CONTROL CIRCUIT HAS CLOCKED THROUGH THE PREAMBLE.

CIRCUITS	PRINT REFERENCES
(IN ADDITION TO TEST 44)	
PE WRITE CONTROL	TCPE3

LOGIC TEST 5: WRP1, NRZ, NORMAL, ODD

THIS TEST IS EXACTLY LIKE TEST 43 EXCEPT THE WRITE BUFFER (TCCM2) IS MULTIPLEXED TO THE MAINTENANCE REGISTER.

LIKELY FAULT LOCATIONS: M8933, M8934 (CRC GENERATOR)

CIRCUITS	PRINT REFERENCES
WRITE BUFFER	TCCM2
CRC GENERATOR	CNRZ2

LOGIC TEST 6: WRAP1, PE, NORMAL, ODD

IN PE MODE BOTH THE PREAMBLE AND POSAMBLE ARE CLOCKED THROUGH THE WRITE BUFFER IN ADDITION TO PHASE ENCODED DATA.

LIKELY FAULT LOCATIONS: M8932 (WRITE CONTROL STATES), M8933

CIRCUITS	PRINT REFERENCE
WRITE BUFFER	TCCM2
WRITE CONTROL	TCPE3

LOGIC TEST 7: WRAP0, NORMAL, ODD

WRAP 0 IS THE MOST COMPLETE OF THE TM03 WRAPAROUND DATA PATH. IT CONSISTS OF A WRITE OPERATION IN WHICH THE OUTPUT OF THE WRITE DATA BUFFER IS MULTIPLEXED TO THE READ DATA INPUTS, CHECKED AND LOADED INTO THE MAINTENANCE REGISTER FOR RETRIEVAL BY THE PROCESSOR. THE WHOLE OPERATION USES THE TYPE SYSTEM CLOCKS AND HAPPENS AT THE PROPER DATA RATES. MM CLK SERVES AS A FLAG ANNOUNCING WHEN A NEW CHARACTER HAS BEEN LOADED INTO THE MAINTENANCE REGISTER. IN PE MODE EVERY OTHER CHARACTER IS READ TO ALLOW SUFFICIENT PROCESSOR LOOP TIME. IN NRZ WRAP 0 IS EXPECTED TO PRODUCE LRC ERRORS BECAUSE THE TM03 DOES NOT WRITE THE LRC CHARACTER.

LIKELY FAULT LOCATIONS: M8934, M8933

CIRCUITS	PRINT REFERENCES
CRC GENERATOR	CNRZ2
CRC CHECKOUT	CNRZ3
CRC, CRC STROBE	TCCM4
READ LINE MULTIPLEXERS	TCCM6
MM CLK	MR5
CRC READ TIMING	CNRZ4
SHUTDOWN CIRCUITRY	TCCM5

LOGIC TEST 10: WRP0, PE, NORMAL, ODD

REPEAT OF TEST 7 IN PE MODE.

LIKELY FAULT LOCATIONS: M8901, M8932, M8933

CIRCUITS	PRINT REFERENCES
DATA DISCRIMINATOR	DS2, DS4, DS6
PHASE LOCKED CLOCK	DS3, DS5, DS7
SKEW BUFFER	DS3, DS5, DS7
PE WRITE MAJOR STATES	TCPE3
PE READ MAJOR STATES	TCPE5
WRAP 0 CIRCUIT TO BLOCK RLT RDS	TCPE3
DESKEW BUFFER READ COUNTER	TCPE4

LOGIC TEST 11: CORE DUMP WRITE, WAM2

REPEAT OF TEST 3 EXCEPT BIT FIDDLER OPERATES IN CORE DUMP MODE!

LIKELY FAULT LOCATION: M8906

LOGIC TEST 12: CORE DUMP READ, WAM3

REPEAT OF TEST 1 EXCEPT BIT FIDDLER OPERATES IN CORE DUMP MODE!

LIKELY FAULT LOCATION: M8906

LOGIC TEST 13: EVEN PARITY WRITE - WAM1

REPEAT OF TEST 5 EXCEPT EVEN PARITY IS SPECIFIED.

LIKELY FAULT LOCATION: M8933

LOGIC TEST 14: EVEN PARITY READ: WAM0,

REPEAT OF TEST 7 EXCEPT EVEN PARITY IS USED.

LIKELY FAULT LOCATIONS: M8933, M8934

```
                LOGIC TEST 15:  READ REVERSE, WAM3 (M8906)
                --------------

                REPEAT OF TEST 2 EXCEPT READ REVERSE COMMAND IS ISSUED.

                LIKELY FAULT LOCATIONS:  M8908, M8939
                -----------------------


                LOGIC TEST 16: CRC ERROR CORRECTION
                --------------

                THIS TEST SIMULATES A BAD TRACK ON TAPE RESULTING IN A CRC ERROR &
                SUBSEQUENT CORRECTION OF DATA IN THE FAILING TRACK.
                THE TEST PROCEEDS THROUGH THE FULLOWING STEPS:

                A:WRITE DATA USING WRAP 0
                B:REWRITE DATA WITH DATA BITS IN ONE TRACK ALTERED USING WRAP 4
                C:READ REVERSE USING WRAP3
                D:REWRITE DATA AS IN STEPB USING WRAP4
                AT THIS POINT THE DATA READ BACK HAS BEEN CORRECTED TO MATCH
                THE DATA WRITTEN IN STEP A
                E:REPEAT STEPS A-D ABOVE FOR EACH TRACK
                F:REPEAT STEPS A-E ABOVE FOR ALL 1'S,ALL 0'S &
                125125 DATA PATTERNS.



                LOGIC TEST 17:  CRC ERROR CORRECTION
                --------------

                THIS TEST SIMULATES MULTIPLE FAILING TRACKS & TEST THAT
                NO ERROR CORRECTION IS PERFORMED.  THE TEST SEQUENCE IS THE
                SAME AS TEST 16 STEP A--STEP E.  THE DATA PATTERN USED IS
                125125.


                LOGIC TEST 20:  READ REVERSE WAM3 NRZ
                --------------

                REPEAT OF TEST 15 ABOVE (SEE ALSO TEST 2) EXCEPT THE TEST IS
                PERFORMED IN NRZ MODE.
        %
540                                     .LIST BIN,LOC,SEQ
```

```
                        .TITLE TM03-TU45 CONTROL LOGIC TEST-PART II
                        ;CZTUPA0
                        ;25 MAY 78
                        ;J.G. ADAMS/R. J. COLLINS

                        ;REVISED JUN 1977 BY J.G.ADAMS  ;++B CHANGED MODULE TYPEOUTS TO
                                                        ;++B REFLECT TM03 REGISTER SET
                        .MCALL  .$ACT11,.$EOP,$CATCH,$SAVE,$RESTORE,$CHAIN,$CHNMODE
                        .NLIST  MC
                        .LIST   ME
                        .ENABLE ABS,AMA


                        ;CONSOLE SWITCHES*********
                        ;
                        ;SW15:  1=HALT ON ERROR
                        ;       0=CONTINUE
                        ;SW14:  1=LOOP ON ERROR
                        ;       0=CONTINUE
                        ;SW13:  1=DO NOT PRINT ERRORS
                        ;       0=PRINT ERRORS
                        ;SW12:  1=HALT AT END OF PASS
                        ;       0=CONTINOUS CYCLE
                        ;SW11:  1=INHIBIT ITERATIONS
                        ;       0=DO ITERATIONS
                        ;SW10:  1=HALT AT END OF EACH TEST
                        ;       0=CONTINUE
                        ;SW8:   1=NO WRAP DATA CHECK
                        ;       0=DO WRAP DATA CHECK
                        ;SW7:   1=NO WRAP STATUS CHECK
                        ;       0=DO WRAP STATUS CHECK
                        ;SW6:   1=SELECTABLE WRAP DATA PATTERN (IN SINGLE TEST)
                        ;       0=AUTO PATTERNS
                        ;SW0-5: SELECT TEST NUMBER :: 00=ALL TESTS
                    ;IF HARDWARE SWR <15::00> = 177777 OR NOT AVAILABLE USE SOFTWARE SWR
```

```
                        ;TU45 REGISTER BITS**********

                        ;15 ;14 ;13 ;12 ;11 ;10 ;09 ;08 ;07 ;06 ;05 ;04 ;03 ;02 ;01 ;00 ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;CS1:                   ;SC ;TRE;MCP;SPR;DWA;PSL;A17;A16;RDY;IE ;FUN;FUN;FUN;FUN;FUN;GO ;
                        ;   ;   ;   ;   ;=1 ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;WC:                    ; WORD                                                          ;
                        ; COUNT                                                         ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;BA:                    ; BUS                                                           ;
                        ; ADDRESS                                                       ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;FC:                    ; FRAME                                                         ;
                        ; COUNT                                                         ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;CS2:                   ;DLT;WCE;UPE;NED;NEM;PGE;MXF;MDP;OR ;IR ;CLR;PAT;BAI;U2 ;U1 ;U0 ;
                        ;   ;   ;   ;   ;   ;   ;   ;ERR;   ;   ;   ;   ;   ;   ;   ;   ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;DS:                    ;ATA;ERR;PIP;MOL;WRL;EOT;SPR;DPR;DRY;SSC;PES;SDN;IDB;TMK;BOT;SLA;
                        ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;   ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;ER:                    ;CDE;UNS;OPI;DTE;NEF;CS ;FCE;NSG;PEF;INC;DAT;FMT;CNT;RMR;ILR;ILF;
                        ;CRC;   ;   ;   ;ITM;   ;   ;LRC;VPE;BPE;   ;BPE;   ;   ;   ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;ATS:                   ; ATTENTION                                                     ;
                        ; SUMMARY                                                       ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;CC:                    ; CHECK                                                         ;
                        ; CHARACTER                                                     ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;DB:                    ; DATA                                                          ;
                        ; BUFFER                                                        ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;MR:                    ;DB ;DB ;DB ;DB ;DB ;DB ;DB ;DB ;DB ;WRT;MM ;OP ;OP ;OP ;OP ;MM ;
                        ; 7 ; 6 ; 5 ; 4 ; 3 ; 2 ; 1 ; 0 ; P ;CLK;CLK; 4 ; 3 ; 2 ; 1 ;GO ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;DT:                    ; DRIVE     ; 7 ;   ;SLV;                                     ;
                        ; TYPE      ;CH ;   ;PR ;                                     ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;SN:                    ; SERIAL                                                        ;
                        ; NUMBER                                                        ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
;TC:                    ;ACL;FCS;SAC;ENA;SPR;DEN;DEN;DEN;FMT;FMT;FMT;FMT;EVN;SSN;SSN;SSN;
                        ;   ;   ;   ;DT ;   ; 4 ; 2 ; 1 ; 8 ; 4 ; 2 ; 1 ;PAR; 4 ; 2 ; 1 ;
                        ;XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

```
                                        ;REGISTER EQUIVS**********

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


                                    ;ACT11 HOOK ***********
            000764                      $SVPC=.                 ;SAVE CURRENT LOCATION CTR
            000046                      .=46
000046      002310                      .WORD   $ENDAD          ;SET LOCATION 46
            000052                      .=52
000052      000000                      .WORD   0               ;SET LOCATION 52 = 0
            000764                      .=$SVPC                 ;RESTORE LOCATION CTR

                                        ;TTY INTERRUPT VECTOR**********

            000060                      .=60
000060      012306                      .WORD   TTINT   ;TTY INTERRUPT HANDLER ADDRESS
000062      000340                      .WORD   340     ;PRIORITY LEVEL 7

                                        ;SOFTWARE SWITCH REGISTER***********
                                        ;USED IF HARDWARE SWR = 177777, OR NOT AVAIL.
            000176                      .=176
000176      000000                  SWREG:  .WORD   0


                                        ;START ADDRESS***********
            000200                      .=200
000200      000137  001200              JMP     START   ;PROGRAM START

                                    ;RESTART ADDRESS**********
            000210                      .=210
000210      000137  001670              JMP     ST2

                                        ;TM03 INTERRUPT VECTOR**********

            000224                      .=224
000224      012276                      MTINT           ;TAPE INTERRUPT HANDLER ADDRESS
000226      000340                      340
```

```
                    000510                          .=510
                                                    ;MASS BUS REGISTER EQUIVS**********

000510  172440                         C1:         172440
000512  172442                         WC:         172442
000514  172444                         BA:         172444
000516  172446                         FC:         172446
000520  172450                         CS:         172450
000522  172452                         DS:         172452
000524  172454                         ER:         172454
000526  172456                         AS:         172456
000530  172460                         CC:         172460
000532  172462                         DB:         172462
000534  172464                         MR:         172464
000536  172466                         DT:         172466
000540  172470                         SN:         172470
000542  172472                         TC:         172472

                                                    ;ILLEGAL FUNCTION CODES

000544  005405                         ILFT:       5405
000546  007415                                     7415
000550  016423                                     16423
000552  020437                                     20437
000554  022443                                     22443
000556  025447                                     25447
000560  031455                                     31455
000562  033465                                     33465
000564  036473                                     36473

                                                    ;CONSTANTS**********

000566  177776                         PSW:        177776          ;PROCESSOR STATUS
000570  177570                         SWR:        177570          ;SWITCH REGISTER
000572  177560                         TKS:        177560          ;TTY READER STATUS
000574  177562                         TKB:        177562          ;TTY READ BUFFER
000576  177564                         TPS:        177564          ;TTY PUNCH STATUS
000600  177566                         TPB:        177566          ;TTY PUNCH BUFFER
000602  177777                         SERNUM:     177777          ;SERIAL NUMBER
000604  000011                         DRVTP:      011             ;DRIVE TYPE
000606  000020                         ITAMT:      20              ;ITERATION AMOUNT
000610  000224                         VECT:       224             ;INTERRUPT VECTOR(RH)
000612  172440                         REGS:       172440          ;STARTING REGISTER ADDRESS
```

```
                                        ;FLAGS AND COUNTERS**********
                                        ;NOTE ALL FLAGS AND COUNTERS ARE CLEARED ON STARTUP. PUT ANY
                                        ;ADDITIONAL FLAGS BETWEEN STFLGS (START OF FLAGS) AND ENDFLG
                                        ;(END OF FLAGS)

000614                                  STFLGS:
000614  000000                          TOB:    0
000616  000000                          TIB:    0
000620  000000                          HDRFL:  0
000622  000000                          EMADDR: 0
000624  000000                          DRVN:   0
000626  000000                          TR00:   0
000630  000000                          TR01:   0
000632  000000                          TR02:   0
000634  000000                          TR03:   0
000636  000000                          TR04:   0
000640  000000                          TR05:   0
000642  000000                          TR06:   0
000644  000000                          TR07:   0
000646  000000                          TR10:   0
000650  000000                          TR11:   0
000652  000000                          TR12:   0
000654  000000                          TR13:   0
000656  000000                          TR14:   0
000660  000000                          TR15:   0
000662  000000                          NRZOF:  0
000664  000000                          SLVN:   0
000666  000000                          PFLG:   0
000670  000000                          RTRN:   0
000672  000000                          ERADD:  0
000674  000000                          TEMP1:  0
000676  000000                          TEMP2:  0
000700  000000                          TEMP3:  0
000702  000000                          ITCNT:  0
000704  000000                          SAV1:   0
000706  000000                          SAV2:   0
000710  000000                          SAV3:   0
000712  000000                          SCOLP:  0
000714  000000                          ITRLP:  0
000716  000000                          EXFL:   0
000720  000000                          ATAF:   0
000722  000000                          SLAF:   0
000724  000000                          SSCF:   0
000726  000000                          ERRF:   0
000730  000000                          ASF:    0
000732  000000                          SCF:    0
000734  000000                          TREF:   0
000736  000000                          PEXFL:  0
000740  000000                          STFLG:  0
000742  000000                          LTADD:  0
000744  000000                          T24FL:  0
000746  000000                          ADDFL:  0
000750  000000                          WAM:    0
000752  000000                          FUN:    0
000754  000000                          DATC:   0
000756  000000                          WTAD:   0
```

```
   769  000760  000000                DATAD:  0
   770  000762  000000                RDAD:   0
   771  000764  000000                W2FLG:  0
   772  000766  000000                DERFL:  0
   773  000770  000000                PREFL:  0
   774  000772  000000                SERFL:  0
   775  000774  000000                CRCNT:  0
   776  000776  000000                UDES:   0
   777  001000  000000                WPGFL:  0
   778  001002  000000                PATRN:  0
   779  001004  000000                STATF:  0
   780  001006  000000                RDRVF:  0
   781  001010  000000                RCDP:   0
   782  001012  000000                STATC:  0
   783  001014  000000                SKAT:   0
   784  001016  000000                PCNTR:  0               ;PASS COUNTER
   785  001020  000000                DCHKFL: .WORD   0               ;DATA CHECK FLAG 0/1 = CHECK/DO NOT CHECK
   786  001022  000000                CRCFLG: .WORD   0               ;CRC CORRECTION TEST IN PROGRESS
   787  001024                        ENDFLG:
   788
   789                                       ;EXPT WRAP STATUS*******
   790
   791  001024  000000                WCS1:   0
   792  001026  000000                WCS2:   0
   793  001030  000000                WDS:    0
   794  001032  000000                WER:    0
   795
   796                                       ;DATA PATTERN GENERATORS*****
   797
   798  001034                        DATBL:
   799  001034  005076                DATA0:  DAT1    ;ALL ONE BITS
   800  001036  005116                DATA1:  DAT2    ;ALL ZERO BITS
   801  001040  005122                DATA2:  DAT3    ;ALTERNATING ONE/ZERO BITS
   802  001042  005130                DATA3:  DAT4    ;ALTERNATING PARITY CHARACTERS
   803
   804                                       ;CORE DUMP PATTERNS*******
   805
   806  001044  000005                WCDP2:  5
   807  001046  000005                        5
   808  001050  000012                        12
   809  001052  000012                        12
   810  001054  000000                        0
   811  001056  000017                WCDP0:  17
   812  001060  000017                        17
   813  001062  000017                        17
   814  001064  000017                        17
   815  001066  000000                        0
```

```
  816
  817                                   ;LOGIC TEST ENTRY TABLE**********
  818
  819  001070  000000          TSTTBL: 0
  820  001072  000000                  0
  821  001074  002352                  LT1
  822  001076  002352                  LT1
  823  001100  002464                  LT2
  824  001102  002464                  LT2
  825  001104  002536                  LT3
  826  001106  002536                  LT3
  827  001110  002644                  LT4
  828  001112  002644                  LT4
  829  001114  002716                  LT5
  830  001116  002716                  LT5
  831  001120  003024                  LT6
  832  001122  003024                  LT6
  833  001124  003102                  LT7
  834  001126  003102                  LT7
  835  001130  003210                  LT10
  836  001132  003210                  LT10
  837  001134  003262                  LT11
  838  001136  003262                  LT11
  839  001140  003374                  LT12
  840  001142  003374                  LT12
  841  001144  003522                  LT13
  842  001146  003522                  LT13
  843  001150  003572                  LT14
  844  001152  003572                  LT14
  845  001154  003642                  LT15
  846  001156  003642                  LT15
  847  001160  003724                  LT16
  848  001162  003724                  LT16
  849  001164  004312                  LT17
  850  001166  004312                  LT17
  851  001170  004624                  LT20
  852  001172  004624                  LT20
  853  001174  002244          TADX:   .WORD   TEND
  854  001176  000020          TLAST:  .WORD   20              ;CONTAINS # OF TESTS
```

```
                                                                I  2
   855                                          .EVEN
   856                                          ;PROGRAM START AND HOUSEKEEPING**********
   857
   858  001200  012706  000500          START:  MOV     #500,SP          ;SET STACK POINTER
   859  001204  013746  000004                  MOV     @#4,-(SP)        ;SAVE ERROR TRAP
   860  001210  013746  000006                  MOV     @#6,-(SP)
   861  001214  012737  001240  000004          MOV     #1$,@#4          ;SET TIME OUT TRAP TO GO TO 1$
   862  001222  005037  000006                  CLR     @#6
   863  001226  022777  177777  177334          CMP     #177777,@SWR     ;USE SOFTARE SWITCH IF SWR = 177777
   864  001234  001402                          BEQ     2$               ;OR TIMES OUT
   865  001236  000404                          BR      3$               ;OTHERWISE USE HARDWARE SWR
   866  001240  022626                  1$:     CMP     (SP)+,(SP)+      ;RESET STACK
   867  001242  012737  000176  000570  2$:     MOV     #SWREG,SWR       ;SET SWR = TO ADDRESS OF SOFTARE SWR
   868  001250  012637  000006          3$:     MOV     (SP)+,@#6        ;RESTORE ERROR TRAP
   869  001254  012637  000004                  MOV     (SP)+,@#4
   870  001260  005027                          CLR     (PC)+            ;;CLEAR CHAIN INDICATOR
   871  001262  000000                  CHNFLG: .WORD   0                ;;CHAIN MODE INDICATOR
   872                                                                   ;;1/0 = CHAIN/NOT CHAIN MODE
   873  001264  022737  002310  000042          CMP     #$ENDAD,@#42     ;;BRANCH IF LOADED VIA ACT11 CHAIN MODE
   874  001272  001404                          BEQ     50$
   875  001274  005737  000042                  TST     @#42             ;;BRANCH IF IN DUMP MODE
   876  001300  001413                          BEQ     52$
   877  001302  000406                          BR      51$
   878  001304  012737  000176  000570  50$:    MOV     #SWREG,SWR       ;;INVOKE SOFTWARE SWR
   879  001312  012777  100000  177250          MOV     #100000,@SWR     ;;WITH HALT ON ERROR SET
   880  001320  005237  001262          51$:    INC     CHNFLG           ;;SET CHNFLG = CHAIN MODE
   881  001324  000137  001714                  JMP     TSCD             ;;GO TO CHAIN ADDRESS
   882  001330                          52$:
   883  001330  122737  000006  000041  4$:     CMPB    #6,@#41          ;BRANCH IF NOT LOADED VIA TMDP
   884  001336  001004                          BNE     5$
   885  001340  012704  014471                  MOV     #MSG62,R4        ;ADVISE USER TO REMOVE MEDIA FROM UUT
   886  001344  004737  012752                  JSR     PC,TTOUT
   887  001350  012704  013674          5$:     MOV     #MSG1,R4
   888  001354  004737  012752                  JSR     PC,TTOUT         ;PRINT TITLE
   889  001360  112737  000043  013674          MOVB    #'#,MSG1         ;DO NOT PRINT TITLE ON RESTART
   890  001366  012704  014365                  MOV     #MSG44,R4
   891  001372  004737  012752                  JSR     PC,TTOUT         ;REQUEST REGISTER ADDRESS
   892  001376  013703  000612                  MOV     REGS,R3
   893  001402  004737  013100                  JSR     PC,OCTP          ;PRINT CURRENT ADDRESS
   894  001406  012705  000612                  MOV     #REGS,R5         ;SET ADDRESS SAVE LOC
   895  001412  012701  000007                  MOV     #7,R1            ;SET SIZE OF RESPONSE
   896  001416  012702  176400                  MOV     #176400,R2       ;SET UPPER LIMIT
   897  001422  012703  172300                  MOV     #172300,R3       ;SET LOWER LIMIT
   898  001426  004737  012430                  JSR     PC,TTR           ;GO GET RESPONSE
   899  001432  012704  014407                  MOV     #MSG45,R4
   900  001436  004737  012752                  JSR     PC,TTOUT         ;REQUEST VECTOR
   901  001442  013703  000610                  MOV     VECT,R3
   902  001446  004737  013100                  JSR     PC,OCTP          ;PRINT CURRENT VECTOR
   903  001452  012705  000610                  MOV     #VECT,R5         ;SET ADDRESS SAVE LOC
   904  001456  012701  000004                  MOV     #4,R1            ;SET SIZE OF RESPONSE
   905  001462  012702  000224                  MOV     #224,R2          ;SET UPPER LIMIT
   906  001466  012703  000150                  MOV     #150,R3          ;SET LOWER LIMIT
   907  001472  004737  012430                  JSR     PC,TTR           ;GO GET RESPONSE
   908  001476  013700  000610                  MOV     VECT,R0          ;GET VECTOR
   909  001502  012720  012276                  MOV     #MTINT,(R0)+     ;LOAD INTERRUPT ADDRESS IN VECTOR
   910  001506  012710  000340                  MOV     #340,(R0)        ;LOAD PRIORITY
```

```
  911  001512  013700  000612                MOV     REGS,R0         ;GET START OF REGS
  912  001516  012701  000016                MOV     #16,R1          ;SET NUMBER OF REGS
  913  001522  012702  000510                MOV     #C1,R2          ;GET START OF TABLE
  914  001526  010022                6$:     MOV     R0,(R2)+        ;BUILD TABLE
  915  001530  062700  000002                ADD     #2,R0           ;BUMP ADDRESS
  916  001534  005301                        DEC     R1              ;SEE IF DONE
  917  001536  001373                        BNE     6$              ;IF NOT: BR
  918  001540  012702  000614                MOV     #STFLGS,R2
  919  001544  012700  000210                MOV     #ENDFLG-STFLGS,R0       ;GET # OF FLAGS TO CLEAR
  920  001550  006200                        ASR     R0              ;FORM COUNT
  921  001552  005022                7$:     CLR     (R2)+           ;CLEAR FLAGS + COUNTERS
  922  001554  005300                        DEC     R0
  923  001556  001375                        BNE     7$
  924  001560  012704  014431                MOV     #MSG57,R4       ;REQUEST TM03 DRIVE #
  925  001564  004737  012752                JSR     PC,TTOUT
  926  001570  013703  000624                MOV     DRVN,R3         ;GET CURRENT DRIVE
  927  001574  004737  013100                JSR     PC,OCTP         ;AND TYPE IT
  928  001600  012705  000624                MOV     #DRVN,R5        ;TTR ROUTINE RETURNS DRIVE TO (R5)
  929  001604  012701  000002                MOV     #2,R1           ;LIMIT RESPONSE TO 1 CHARACTER
  930  001610  012702  000007                MOV     #7,R2           ;BETWEEN 0 AND 7
  931  001614  012703  000000                MOV     #0,R3
  932  001620  004737  012430                JSR     PC,TTR          ;GET RESPONSE & PUT IN DRVN
  933  001624  012704  014447                MOV     #MSG58,R4       ;REQUEST SLAVE #
  934  001630  004737  012752                JSR     PC,TTOUT
  935  001634  013703  000664                MOV     SLVN,R3         ;GET CURRENT SLAVE #
  936  001640  004737  013100                JSR     PC,OCTP         ;AND TYPE IT
  937  001644  012705  000664                MOV     #SLVN,R5        ;TTR ROUTINE RETURNS REPONSE TO (R5)
  938  001650  012701  000002                MOV     #2,R1           ;LIMIT RESPONSE TO 1 CHARACTER
  939  001654  012702  000007                MOV     #7,R2           ;BETWEEN 0-7
  940  001660  012703  000000                MOV     #0,R3
  941  001664  004737  012430                JSR     PC,TTR          ;GET RESPONSE & PUT IT IN SLVN
  942
  943                                ;START 210
  944  001670  012706  000500        ST2:    MOV     #500,SP         ;SET STACK PTR
  945  001674  005037  001006                CLR     RDRVF           ;CLEAR READ REVERSE FLAG
  946  001700  005037  001016                CLR     PCNTR
  947  001704  005037  001022                CLR     CRCFLG          ;SET CRC FLAG = CRC NOT IN PROGRESS
  948  001710  004737  013532                JSR     PC,GTSWR        ;GET SOFTWARE SWITCHES
```

```
                                        ;TEST SCHEDULAR**********
                                
001714  052777  000100  176650  TSCD:   BIS     #100,@TKS       ;SET KEYBOARD IE BIT
001722  005037  001000                  CLR     WPGFL           ;CLEAR WRAP PATRN FLAG
001726  005037  000740                  CLR     STFLG           ;CLEAR SINGLE TEST FLAG
001732  017700  176632                  MOV     @SWR,R0
001736  042700  177700                  BIC     #177700,R0      ;BRANCH IF SINGLE TEST SELECTED
001742  001122                          BNE     STSCD           ;GO SELECT SINGLE TEST
001744  005737  001262                  TST     CHNFLG          ;;BRANCH IF NOT IN CHAIN MODE
001750  001457                          BEQ     TSCDA
001752  012737  177777  000624          MOV     #-1,DRVN        ;;INITIALIZE DRIVE #
001760  012737  177777  000664  NXTDRV: MOV     #-1,SLVN        ;;INITIALIZE SLAVE #
001766  012777  000040  176524  1$:     MOV     #40,@CS         ;;INIT CONTROLLER
001774  005237  000624                  INC     DRVN            ;;STEP DRIVE #
002000  022737  000010  000624          CMP     #10,DRVN        ;;EXIT IF ALL DRIVES TESTED
002006  001521                          BEQ     $DONE           ;;FOR AVAILABILITY
002010  013777  000624  176502          MOV     DRVN,@CS        ;;LOAD DRIVE #
002016  005777  176466                  TST     @C1             ;;ACCESS DRIVE
002022  032777  010000  176470          BIT     #10000,@CS      ;;BRANCH IF DRIVE NON EXISTANT
002030  001356                          BNE     1$              ;;(NED = 1)
002032  005237  000664          NXTSLV: INC     SLVN            ;;STEP SLAVE # AND BRANCH
002036  001011                          BNE     1$              ;;IF NOT SLAVE 0
002040  005737  000624                  TST     DRVN            ;;BRANCH IF NOT DRIVE # 0
002044  001006                          BNE     1$
002046  122737  000006  000041          CMPB    #6,@#41         ;;BRANCH IF NOT TMDP
002054  001002                          BNE     1$
002056  005237  000664                  INC     SLVN            ;;STEP TO SLAVE # 1
002062  022737  000010  000664  1$:     CMP     #10,SLVN        ;;BRANCH IF ALL SLAVES TESTED
002070  001733                          BEQ     NXTDRV          ;;FOR AVAILABILITY
002072  013777  000664  176442          MOV     SLVN,@TC        ;;LOAD SLAVE UNIT #
002100  032777  002000  176430          BIT     #2000,@DT       ;;BRANCH IF SLAVE NOT
002106  001751                          BEQ     NXTSLV          ;;PRESENT (SPR = 0)
002110  012737  001070  000742  TSCDA:  MOV     #TSTTBL,LTADD
002116  062737  000004  000742  TSCD0:  ADD     #4,LTADD
002124  013737  000742  000714  TSCD1:  MOV     LTADD,ITRLP
002132  062737  000002  000714          ADD     #2,ITRLP        ;SET ITERATION ADDRESS
002140  005037  000620                  CLR     HDRFL           ;CLEAR PRINT HEADER FLAG
002144  017700  176572                  MOV     @LTADD,R0       ;SET POINTER TO TEST
002150  000110                          JMP     (R0)            ;GO TO TEST
002152  032777  002000  176410  TSCD2:  BIT     #2000,@SWR      ;SEE IF HALT ON TEST
002160  001403                          BEQ     TSCD3           ;IF NOT: BR
002162  000000                          HALT
002164  005037  001000                  CLR     WPGFL           ;CLEAR WRAP DATA GENERATOR FLAG
002170  005737  000740          TSCD3:  TST     STFLG           ;SE IF SINGLE TEST
002174  001750                          BEQ     TSCD0           ;IF NOT: BR
002176  017700  176366                  MOV     @SWR,R0
002202  042700  177700                  BIC     #177700,R0      ;MASK TEST NUMBER
002206  001642                          BEQ     TSCD            ;IF SO: BR
002210  012737  000001  000740  STSCD:  MOV     #1,STFLG        ;SET SINGLE TEST FLAG
002216  023700  001176                  CMP     TLAST,R0        ;SEE IF EXCEEDED TESTS
002222  002410                          BLT     TEND            ;IF SO: BR
002224  006300                          ASL     R0
002226  006100                          ROL     R0              ;SET TABLE MODIFIER
002230  012737  001070  000742          MOV     #TSTTBL,LTADD
002236  060037  000742                  ADD     R0,LTADD        ;SET TEST POINTER
```

```
 1005  002242  000730                      BR      TSCD1
 1006  002244  005737  001262        TEND: TST     CHNFLG          ;BRANCH IF IN CHAIN MODE
 1007  002250  001270                      BNE     NXTSLV
 1008  002252  012704  014346        $DONE: MOV    #MSG41,R4
 1009  002256  004737  012752              JSR     PC,TTOUT        ;PRINT END OF PASS
 1010  002262  013703  001016              MOV     PCNTR,R3
 1011  002266  004737  013100              JSR     PC,OCTP         ;PRINT PASS NUMBER
 1012  002272  005000                      CLR     R0
 1013  002274  005300              1$:     DEC     R0              ;DELAY WAITING FOR
 1014  002276  001376                      BNE     1$              ;TTY TO FINISH
 1015  002300  013700  000042              MOV     @#42,R0         ;GET ACT11 RETURN ADDRESS
 1016  002304  001405                      BEQ     HERE            ;BRANCH IF NOT ACT11
 1017  002306  000005                      RESET
 1018  002310  004710              $ENDAD: JSR     PC,(R0)
 1019  002312  000240                      NOP
 1020  002314  000240                      NOP
 1021  002316  000240                      NOP
 1022  002320  000240              HERE:   NOP
 1023  002322  005737  001262              TST     CHNFLG          ;BRANCH IF IN CHAIN MODE
 1024  002326  001005                      BNE     TENDX
 1025  002330  032777  010000  176232      BIT     #10000,@SWR     ;SEE IF HALT ON PASS
 1026  002336  001001                      BNE     TENDX           ;IF NOT: BR
 1027  002340  000000                      HALT
 1028  002342  005237  001016        TENDX: INC    PCNTR           ;BUMP PASS COUNTER
 1029  002346  000137  001714              JMP     TSCD            ;RESTART
 1030
```

```
1031                                        ;THESE TESTS CHECK DATA FORMATTING
1032                                        ;AND TRANSFER THROUGH THE TM03 WRAP AROUND MODES
1033
1034                                        ;LOGIC TEST 1: WRAP 3, NRZ, NORMAL ODD *****
1035
1036  002352  012737  004270  001024  LT1:    MOV     #4270,WCS1      ;SET EXPT CS1
1037  002360  012737  000100  001026          MOV     #100,WCS2       ;SET EXPT CS2
1038  002366  012737  010600  001030          MOV     #10600,WDS      ;SET EXPT DS
1039  002374  012737  000000  001032          MOV     #0,WER          ;SET EXPT ER
1040  002402  012737  014565  000622          MOV     #MSLT1,EMADDR   ;SET HEADER
1041  002410  012737  001700  000776          MOV     #1700,UDES      ;SET NRZ,NORMAL, ODD
1042  002416  005037  001002          LT1A:   CLR     PATRN           ;POINT TO PATTERN 0
1043  002422  012737  002430  000712          MOV     #LT1B,SCOLP     ;SET SCOPE ADDRESS
1044  002430  004737  005256          LT1B:   JSR     PC,WAM3         ;GO DO WRAP 3
1045  002434  005237  001002                  INC     PATRN           ;BUMP PATTERN POINTER
1046  002440  032737  000004  001002          BIT     #4,PATRN        ;SEE IF DONE
1047  002446  001770                          BEQ     LT1B            ;IF NOT: BR
1048  002450  004737  012052                  JSR     PC,ITER         ;GO SEE IF ITERATIONS
1049  002454  005037  001006                  CLR     RDRVF           ;CLEAR READ REVERSE FLAG
1050  002460  000137  002152                  JMP     TSCD2           ;RETURN TO SCHEDULAR
1051
1052                                        ;LOGIC TEST 2: WRAP 3, PE, NORMAL, ODD*****
1053
1054  002464  000240                  LT2:    NOP
1055  002466  012737  004270  001024  LT2A:   MOV     #4270,WCS1      ;SET EXPT CS1
1056  002474  012737  000100  001026          MOV     #100,WCS2       ;SET EXPT CS2
1057  002502  012737  010640  001030          MOV     #10640,WDS      ;SET EXPT DS
1058  002510  012737  000000  001032          MOV     #0,WER          ;SET EXPT WER
1059  002516  012737  014633  000622          MOV     #MSLT2,EMADDR   ;SET HEADER
1060  002524  012737  002300  000776          MOV     #2300,UDES      ;SET PE, NORMAL, ODD
1061  002532  000137  002416                  JMP     LT1A            ;EXECUTE TEST SEQUENCE
1062
1063                                        ;LOGIC TEST 3: WRAP 2, NRZ, NORMAL, ODD*****
1064
1065  002536  012737  004260  001024  LT3:    MOV     #4260,WCS1      ;SET EXPT CS1
1066  002544  012737  000100  001026          MOV     #100,WCS2       ;SET EXPT CS2
1067  002552  012737  010600  001030          MOV     #10600,WDS      ;SET EXPT DS
1068  002560  012737  000000  001032          MOV     #0,WER          ;SET EXPT WER
1069  002566  012737  014700  000622          MOV     #MSLT3,EMADDR   ;SET HEADER
1070  002574  012737  001700  000776          MOV     #1700,UDES      ;SET TO NRZ,NORMAL, ODD
1071  002602  005037  001002          LT3A:   CLR     PATRN           ;POINT TO PATTERN 0
1072  002606  012737  002614  000712          MOV     #LT3B,SCOLP     ;SET SCOPE ADDRESS
1073  002614  004737  005212          LT3B:   JSR     PC,WAM2         ;GO DO WRAP 2
1074  002620  005237  001002                  INC     PATRN           ;BUMP POINTER
1075  002624  032737  000004  001002          BIT     #4,PATRN        ;SEE IF DONE
1076  002632  001770                          BEQ     LT3B            ;IF NOT: BR
1077  002634  004737  012052                  JSR     PC,ITER         ;GO SEE IF ITERATIONS
1078  002640  000137  002152                  JMP     TSCD2           ;RETURN TO SCHEDULAR
```

```
1079
1080                                        ;LOGIC TEST 4: WRAP 2, PE, NORMAL, ODD*****
1081
1082  002644  000240                LT4:    NOP
1083  002646  012737  004260  001024 LT4A:   MOV     #4260,WCS1      ;SET EXPT CS1
1084  002654  012737  000100  001026        MOV     #100,WCS2       ;SET EXPT CS2
1085  002662  012737  010640  001030        MOV     #10640,WDS      ;SET EXPT DS
1086  002670  012737  000000  001032        MOV     #0,WER          ;SET EXPT WER
1087  002676  012737  014746  000622        MOV     #MSLT4,EMADDR   ;SET HEADER
1088  002704  012737  002300  000776        MOV     #2300,UDES      ;SET PE, NORMAL, ODD
1089  002712  000137  002602                JMP     LT3A            ;GO EXECUTE TEST SEQUENCES
1090
1091                                        ;LOGIC TEST 5: WRAP 1, NRZ, NORMAL, ODD*****
1092
1093  002716  012737  004260  001024 LT5:    MOV     #4260,WCS1      ;SET EXPT CS1
1094  002724  012737  000100  001026        MOV     #100,WCS2       ;SET EXPT CS2
1095  002732  012737  010600  001030        MOV     #10600,WDS      ;SET EXPT DS
1096  002740  012737  000000  001032        MOV     #0,WER          ;SET EXPT WER
1097  002746  012737  015013  000622        MOV     #MSLT5,EMADDR   ;SET HEADER
1098  002754  012737  001700  000776        MOV     #1700,UDES      ;SET NRZ, NORMAL, ODD
1099  002762  005037  001002        LT5A:   CLR     PATRN           ;POINT TO PATTERN ZERO
1100  002766  012737  002774  000712        MOV     #LT5B,SCOLP     ;SET SCOPE ADDRESS
1101  002774  004737  005202        LT5B:   JSR     PC,WAM1         ;GO DO WRAP 1
1102  003000  005237  001002                INC     PATRN           ;BUMP POINTER
1103  003004  032737  000004  001002        BIT     #4,PATRN        ;SEE IF DONE
1104  003012  001770                        BEQ     LT5B            ;IF NOT: BR
1105  003014  004737  012052                JSR     PC,ITER         ;GO SEE IF ITERATIONS
1106  003020  000137  002152                JMP     TSCD2           ;RETURN TO SCHEDULAR
1107
1108                                        ;LOGIC TEST 6: WRAP 1, PE, NORMAL, ODD*****
1109
1110  003024  000240                LT6:    NOP
1111  003026  004737  011550        LT6A:   JSR     PC,PPGEN        ;GO GENERATE PRE/POSTAMBLE
1112  003032  012737  004260  001024        MOV     #4260,WCS1      ;SET EXPT CS1
1113  003040  012737  000100  001026        MOV     #100,WCS2       ;SET EXPT CS2
1114  003046  012737  010640  001030        MOV     #10640,WDS      ;SET EXPT DS
1115  003054  012737  000000  001032        MOV     #0,WER          ;SET EXPT WER
1116  003062  012737  015061  000622        MOV     #MSLT6,EMADDR   ;SET HEADER
1117  003070  012737  002300  000776        MOV     #2300,UDES      ;SET PE, NORMAL, ODD
1118  003076  000137  002762                JMP     LT5A            ;GO EXECUTE TEST SEQUENCE
```

```
1119
1120                                        ;LOGIC TEST 7: WRAP 0, NRZ,NORMAL, ODD*****
1121
1122  003102  012737  144260  001024  LT7:    MOV     #144260,WCS1    ;SET EXPT CS1
1123  003110  012737  000100  001026          MOV     #100,WCS2       ;SET EXPT CS2
1124  003116  012737  150600  001030          MOV     #150600,WDS     ;SET EXPT DS
1125  003124  012737  000200  001032          MOV     #200,WER        ;SET EXPT ER
1126  003132  012737  015126  000622          MOV     #MSLT7,EMADDR   ;SET HEADER
1127  003140  012737  001700  000776          MOV     #1700,UDES      ;SET NRZ, NORMAL, ODD
1128  003146  005037  001002          LT7A:   CLR     PATRN           ;POINT TO PATTERN 0
1129  003152  012737  003160  000712          MOV     #LT7B,SCOLP     ;SET SCOPE ADDRESS
1130  003160  004737  005136          LT7B:   JSR     PC,WAM0         ;GO DO WRAP 0
1131  003164  005237  001002                  INC     PATRN           ;BUMP POINTER
1132  003170  032737  000004  001002          BIT     #4,PATRN        ;SEE IF DONE
1133  003176  001770                          BEQ     LT7B            ;IF NOT: BR
1134  003200  004737  012052                  JSR     PC,ITER         ;GO SEE IF ITERATIONS
1135  003204  000137  002152                  JMP     TSCD2           ;RETURN TO SCHEDULAR
1136
1137                                        ;LOGIC TEST 10: WRAP 0, PE, NORMAL, ODD*****
1138
1139  003210  000240          LT10:   NOP
1140  003212  012737  004260  001024  LT10A:  MOV     #4260,WCS1      ;SET EXPT CS1
1141  003220  012737  000100  001026          MOV     #100,WCS2       ;SET EXPT CS2
1142  003226  012737  010640  001030          MOV     #10640,WDS      ;SET EXPT DS
1143  003234  012737  000000  001032          MOV     #0,WER          ;SET EXPT ER
1144  003242  012737  015174  000622          MOV     #MSLT10,EMADDR  ;SET HEADER
1145  003250  012737  002300  000776          MOV     #2300,UDES      ;SET PE, NORMAL, ODD
1146  003256  000137  003146                  JMP     LT7A            ;GO EXECUTE TEST SEQUENCE
```

```
1147                                        ;LOGIC TEST 11: CORE DUMP WRITE, WAM2*******
1148
1149  003262  012737  004260  001024  LT11:   MOV     #4260,WCS1      ;SET EXPT CS1
1150  003270  012737  000100  001026          MOV     #100,WCS2       ;SET EXPT CS2
1151  003276  012737  010600  001030          MOV     #10600,WDS      ;SET EXPT DS
1152  003304  012737  000000  001032          MOV     #0,WER          ;SET EXPT ER
1153  003312  012737  015242  000622          MOV     #MSLT11,EMADDR  ;SET HEADER
1154  003320  012737  001720  000776          MOV     #1720,UDES      ;SET NRZ, CORE DUMP, ODD
1155  003326  005037  001002                  CLR     PATRN           ;POINT TO PATTERN 0
1156  003332  012737  003340  000712          MOV     #LT11A,SCOLP    ;SET SCOPE ADDRESS
1157  003340  004737  005212          LT11A:  JSR     PC,WAM2         ;GO DO WAM 2
1158  003344  022737  000002  001002          CMP     #2,PATRN        ;SEE IF DONE
1159  003352  001404                          BEQ     LT11X           ;IF SO: BR
1160  003354  012737  000002  001002          MOV     #2,PATRN        ;SELECT PATTERN 2
1161  003362  000766                          BR      LT11A           ;CONTINUE
1162  003364  004737  012052          LT11X:  JSR     PC,ITER         ;GO SEE IF ITERATIONS
1163  003370  000137  002152                  JMP     TSCD2           ;RETURN TO SCHEDULES
1164
1165                                        ;LOGIC TEST 12: CORE DUMP READ, WAM 3*****
1166
1167  003374  012737  004270  001024  LT12:   MOV     #4270,WCS1      ;SET EXPT CS1
1168  003402  012737  000100  001026          MOV     #100,WCS2       ;SET EXPT CS2
1169  003410  012737  010600  001030          MOV     #10600,WDS      ;SET EXPT DS
1170  003416  012737  000000  001032          MOV     #0,WER          ;SET EXPT ER
1171  003424  012737  015313  000622          MOV     #MSLT12,EMADDR  ;SET HEADER
1172  003432  012737  001720  000776          MOV     #1720,UDES      ;SELECT NRZ, CORE DUMP, ODD
1173  003440  005037  001002                  CLR     PATRN           ;SELECT PATTERN 0
1174  003444  012737  003460  000712          MOV     #LT12A,SCOLP    ;SET SCOPE ADDRESS
1175  003452  012737  001056  001010          MOV     #WCDP0,RCDP     ;POINT TO PATTERN 0
1176  003460  004737  005256          LT12A:  JSR     PC,WAM3         ;GO DO WAM3
1177  003464  022737  000002  001002          CMP     #2,PATRN        ;SEE IF DONE
1178  003472  001407                          BEQ     LT12X           ;IF SO: BR
1179  003474  012737  000002  001002          MOV     #2,PATRN        ;SELECT PATTERN 2
1180  003502  012737  001044  001010          MOV     #WCDP2,RCDP     ;POINT TO PATTERN 2
1181  003510  000763                          BR      LT12A           ;CONTINUE
1182  003512  004737  012052          LT12X:  JSR     PC,ITER         ;GO SEE IF ITERATION
1183  003516  000137  002152                  JMP     TSCD2           ;RETURN TO SCHEDULE
```

```
1184
1185                                        ;LOGIC TEST 13: EVEN PARITY WRITE: WAM 1(M8933)*****
1186
1187  003522  012737  004260  001024  LT13:  MOV   #4260,WCS1      ;SET EXPT CS1
1188  003530  012737  000100  001026         MOV   #100,WCS2       ;SET EXPT CS2
1189  003536  012737  010600  001030         MOV   #10600,WDS      ;SET EXPT DS
1190  003544  012737  000000  001032         MOV   #0,WER          ;SET EXPT ER
1191  003552  012737  015363  000622         MOV   #MSLT13,EMADDR  ;SET HEADER
1192  003560  012737  001710  000776         MOV   #1710,UDES      ;SET NRZ, NORMAL, EVEN
1193  003566  000137  002762                 JMP   LT5A            ;GO EXECUTE WAM 1
1194
1195                                        ;LOGIC TEST 14: EVEN PARITY READ: WAM 0(M8933 M8934)*****
1196
1197  003572  012737  144260  001024  LT14:  MOV   #144260,WCS1    ;SET EXPT CS1
1198  003600  012737  000100  001026         MOV   #100,WCS2       ;SET EXPT CS2
1199  003606  012737  150600  001030         MOV   #150600,WDS     ;SET EXPT DS
1200  003614  012737  000200  001032         MOV   #200,WER        ;SET EXPT ER
1201  003622  012737  015444  000622         MOV   #MSLT14,EMADDR  ;SET HEADER
1202  003630  012737  001710  000776         MOV   #1710,UDES      ;SET NRZ, NORMAL, EVEN
1203  003636  000137  003146                 JMP   LT7A            ;GO DO WAM 0
1204
1205                                        ;LOGIC TEST 15: READ REVERSE: WAM 3(M8906)*****
1206
1207  003642  012737  004276  001024  LT15:  MOV   #4276,WCS1      ;SET EXPT CS1
1208  003650  012737  000100  001026         MOV   #100,WCS2       ;SET EXPT CS2
1209  003656  012737  010640  001030         MOV   #10640,WDS      ;SET EXPT DS
1210  003664  012737  000000  001032         MOV   #0,WER          ;SET EXPT ER
1211  003672  012737  015523  000622         MOV   #MSLT15,EMADDR  ;SET HEADER
1212  003700  012737  002300  000776         MOV   #2300,UDES      ;SELECT PE,NORMAL,ODD
1213  003706  000240                         NOP
1214  003710  000240                         NOP
1215  003712  012737  000001  001006         MOV   #1,RDRVF        ;SET READ REVERSE FLAG
1216  003720  000137  002416                 JMP   LT1A            ;GO DO WAM 3, REVERSE
1217
```

```
1218
1219                                    ;LOGIC TEST 16: CRC CORRECTION-SINGLE TRACK,EVERY FRAME
1220                                    ;THIS IS A TEST OF THE CRC CORRECTION LOGIC. THE TEST WRITES
1221                                    ;A KNOWN PATTERN (ALL 1'S , ALL 0'S & 125252) WITH A DATA BIT
1222                                    ;ALTERED IN EACH OF THE DATA TRACKS. THIS TEST INSURES THAT A
1223                                    ;CRC CORRECTABLE ERROR IS CORRECTED.
1224                                    ;THE TEST PROCEEDS AS FOLLOWS:
1225
1226                                ;       STEP A  WRITE A KNOWN PATTERN USING WRAP AROUND MODE 0
1227
1228                                ;       STEP B  REWRITE THE PATTERN ABOVE WITH DATA BIT(S) MODIFIED
1229                                ;               IN TRACKS SPECIFIED BY CRCPAT USING WRAP AROUND MODE 4
1230                                ;               THIS WILL GENERATE A CRC ERROR
1231
1232                                ;       STEP C  EXECUTE A READ REVERSE USING WRAP AROUND MODE 3
1233
1234                                ;       STEP D  REPEAT STEP B ABOVE. UPON COMPLETION THE DATA READ
1235                                ;               BACK WILL MATCH THE DATA WRITTEN IN STEP A.
1236
1237
1238  003724  005037  001002        LT16:   CLR     PATRN           ;SELECT PATTERN # 0 (ALL 1'S)
1239  003730  012737  000401  004302        MOV     #401,CRCPAT     ;SELECT BITS TO BE ALTERED (TRACK 1)
1240  003736  012737  015570  000622        MOV     #MSLT16,EMADDR  ;SET ERROR MESSAGE HEADER
1241  003744  012737  003752  000712        MOV     #LT16A,SCOLP    ;SET SCOPE LOOP
1242
1243  003752  012737  144260  001024  LT16A: MOV     #144260,WCS1    ;SET EXPECTED VALUES UPON COMPLETION
1244  003760  012737  000100  001026        MOV     #100,WCS2
1245  003766  012737  150600  001030        MOV     #150600,WDS
1246  003774  012737  000200  001032        MOV     #200,WER
1247  004002  012737  001700  000776        MOV     #1700,UDES      ;SET UNIT DESCRIPTION-NRZ,800BPI,ODD
1248                                                                ;PARITY & PDP11 NORMAL MODE
1249  004010  005037  001022                CLR     CRCFLG          ;CLEAR CRC CORRECTION FLAG
1250  004014  004737  005136                JSR     PC,WAM0         ;DO A WRAP 0 --- STEP A
1251  004020  012737  000001  001022        MOV     #1,CRCFLG       ;SET CRC ERROR CORRECTION IN PROGRESS
1252  004026  013737  017334  004304        MOV     WBUFF,CRCDAT    ;GET DATA WRITTEN BY WRAP 0
1253                                ;XOR CRCPAT WITH CRCDAT
1254  004034  013737  004304  004306        MOV     CRCDAT,XORDAT   ;GET DATA TO BE MODIFIED
1255  004042  013737  004302  004310        MOV     CRCPAT,XORPAT   ;GET MODIFIER
1256  004050  043737  004302  004306        BIC     CRCPAT,XORDAT   ;CLEAR SET BITS IN DATA TO BE MODIFIED
1257  004056  043737  004304  004310        BIC     CRCDAT,XORPAT   ;CLEAR SETTING BITS
1258  004064  053737  004310  004306        BIS     XORPAT,XORDAT   ;SET CLEAR BITS IN DATA TO BE MODIFIED
1259  004072  013737  004306  004304        MOV     XORDAT,CRCDAT   ;RESTORE MODIFIED DATA
1260
1261  004100  012737  144260  001024        MOV     #144260,WCS1    ;SET EXPECTED VALUES UPON COMPLETION
1262  004106  012737  000110  001026        MOV     #110,WCS2       ;OF WRAP 4
1263  004114  012737  150600  001030        MOV     #150600,WDS
1264  004122  012737  100300  001032        MOV     #100300,WER
1265  004130  004737  005364                JSR     PC,WAM4         ;DO A WRAP 4 --- STEP B
1266  004134  000240                        NOP
1267  004136  012737  000001  001006        MOV     #1,RDRVF        ;SET TO READ REVERSE
1268  004144  012737  144276  001024        MOV     #144276,WCS1    ;SET EXPECTED VALUES UPON COMPLETION
1269  004152  012737  000110  001026        MOV     #110,WCS2
1270  004160  012737  150600  001030        MOV     #150600,WDS
1271  004166  012737  001000  001032        MOV     #1000,WER
1272  004174  004737  005256                JSR     PC,WAM3         ;DO A WRAP 3 --- STEP C
1273  004200  000240                        NOP
```

```
 1274  004202  012737  004260  001024          MOV     #4260,WCS1
 1275  004210  012737  000110  001026          MOV     #110,WCS2
 1276  004216  012737  010600  001030          MOV     #10600,WDS
 1277  004224  012737  000000  001032          MOV     #0,WER
 1278  004232  005037  001022                  CLR     CRCFLG          ;CLEAR CRC CORRECTION IN PROGRESS FLAG
 1279  004236  004737  005364                  JSR     PC,WAM4         ;GO TO WRAP 4 --- STEP D
 1280
 1281  004242  006337  004302                  ASL     CRCPAT          ;SELECT NEXT TRACK TO BE ALTERED
 1282  004246  103241                          BCC     LT16A           ;CONTINUE FOR ALL TRACKS
 1283  004250  012737  000401  004302          MOV     #401,CRCPAT     ;RESET BITS TO TRACK 1
 1284  004256  005237  001002                  INC     PATRN           ;SELECT NEXT PATTERN
 1285  004262  022737  000003  001002          CMP     #3,PATRN        ;BRANCH IF NOT DONE
 1286  004270  001230                          BNE     LT16A
 1287  004272  004737  012052                  JSR     PC,ITER         ;ITERATION LOOP
 1288  004276  000137  002152                  JMP     TSCD2           ;RETURN TO SCHEDULER
 1289
 1290
 1291  004302  000000          CRCPAT: .WORD   0               ;CONTAINS BITS TO BE ALTERED
 1292  004304  000000          CRCDAT: .WORD   0               ;CONTAINS DATA TO BE WRITTEN BY WRAP4
 1293  004306  000000          XORDAT: .WORD   0               ;TEMPRARY STORAGE FOR XOR
 1294  004310  000000          XORPAT: .WORD   0               ;TEMPOARY STORAGE FOR XOR
 1295
```

```
 1296
 1297
 1298                                   ;LOGIC TEST 17:CRC CORRECTION - MULTIPLE BAD TRACKS
 1299                                   ;THIS TEST CHECKS THAT CRC ERROR CORRECTION IS NOT PERFORMED WHEN
 1300                                   ;MULTIPLE BAD TRACKS ARE DETECTED.
 1301
 1302  004312  012737  000002  001002  LT17:   MOV     #2,PATRN        ;SELECT PATTERN #2 (125125)
 1303  004320  012737  001001  004302          MOV     #1001,CRCPAT    ;SELECT 2 BAD TRACKS
 1304  004326  012737  015660  000622          MOV     #MSLT17,EMADDR  ;SET ERROR MESSAGE HEADER
 1305  004334  012737  004342  000712          MOV     #LT17A,SCOLP    ;SET SCOPE LOOP ADDRESS
 1306  004342  012737  144260  001024  LT17A:  MOV     #144260,WCS1    ;SET EXPECTED VALUES ON COMPLETION
 1307  004350  012737  000100  001026          MOV     #100,WCS2       ;OF WRAP 0 BELOW
 1308  004356  012737  150600  001030          MOV     #150600,WDS
 1309  004364  012737  000200  001032          MOV     #200,WER
 1310  004372  012737  001700  000776          MOV     #1700,UDES      ;SET UNIT DESCRIPTION
 1311  004400  005037  001022                  CLR     CRCFLG          ;SET CRC CORRECTION NOT IN PROGRESS
 1312  004404  004737  005136                  JSR     PC,WAM0         ;DO A WRAP 0 --- STEP A
 1313  004410  000240                          NOP
 1314  004412  012737  000002  001022          MOV     #2,CRCFLG       ;SET CRC CORRECTION IN PROGRESS
 1315  004420  013737  017334  004304          MOV     WBUFF,CRCDAT    ;GET DATA TO BE WRITTEN
 1316  004426  043737  004302  004304          BIC     CRCPAT,CRCDAT   ;MODIFY DATA TO BE WRITTEN
 1317  004434  012737  144260  001024          MOV     #144260,WCS1    ;SET EXPECTED VALUES ON COMPLETION
 1318  004442  012737  000110  001026          MOV     #110,WCS2       ;OF WRAP 4 BELOW
 1319  004450  012737  150600  001030          MOV     #150600,WDS
 1320  004456  012737  100300  001032          MOV     #100300,WER
 1321  004464  004737  005364                  JSR     PC,WAM4         ;DO A WRAP 4 --- STEP B
 1322  004470  000240                          NOP
 1323  004472  012737  000001  001006          MOV     #1,RDRVF        ;SET READ REVERSE FLAG
 1324  004500  012737  144276  001024          MOV     #144276,WCS1    ;SET EXPECTED VALUES ON COMPLETION
 1325  004506  012737  000110  001026          MOV     #110,WCS2       ;OF WRAP 3 BELOW
 1326  004514  012737  150600  001030          MOV     #150600,WDS
 1327  004522  012737  001000  001032          MOV     #1000,WER
 1328  004530  004737  005256                  JSR     PC,WAM3         ;DO A WRAP 3 --- STEP C
 1329  004534  000240                          NOP
 1330  004536  012737  144260  001024          MOV     #144260,WCS1    ;SET EXPECTED VALUES ON COMPLETION
 1331  004544  012737  000110  001026          MOV     #110,WCS2       ;OF WRAP 4 BELOW
 1332  004552  012737  150600  001030          MOV     #150600,WDS
 1333  004560  012737  100100  001032          MOV     #100100,WER
 1334  004566  005037  001022                  CLR     CRCFLG          ;CLEAR CRC IN PROGRESS FLAG
 1335  004572  013701  004304                  MOV     CRCDAT,R1       ;GET DATA THAT WAS WRITTEN IN STEP B
 1336  004576  012703  017334                  MOV     #WBUFF,R3       ;SET START OF WRITE BUFFER
 1337  004602  004737  005102                  JSR     PC,DAT1A        ;GO SET WRITE BUFFER
 1338  004606  004737  005364                  JSR     PC,WAM4         ;GO DO A WRAP 4 --- STEP D
 1339  004612  000240                          NOP
 1340  004614  004737  012052                  JSR     PC,ITER         ;ITERATE TEST
 1341  004620  000137  002152                  JMP     TSCD2           ;RETURN TO SCHEDULER
```

```
 1342
 1343                                   ;LOGIC TEST 20: READ REVERSE,NRZ,WRAP 3
 1344                                   ;THIS TEST TESTS THAT A CRC ERROR OCCURS AFTER A READ REVERSE USING
 1345                                   ;WRAP AROUND MODE 3 IN NRZ MODE
 1346
 1347  004624  005037  001002          LT20:   CLR     PATRN           ;SET PATTERN # 0 (ALL 1'S)
 1348  004630  012737  144276  001024          MOV     #144276,WCS1    ;SET EXPECTED VALUES ON COMPLETION
 1349  004636  012737  000100  001026          MOV     #100,WCS2
 1350  004644  012737  150600  001030          MOV     #150600,WDS
 1351  004652  012737  100000  001032          MOV     #100000,WER
 1352  004660  012737  015744  000622          MOV     #MSLT20,EMADDR  ;SET ERROR MESSAGE ADDRESS
 1353  004666  012737  001700  000776          MOV     #1700,UDES      ;SET UNIT DESCRIPTION
 1354  004674  012737  004702  000712          MOV     #LT20A,SCOLP    ;SET SCOPE LOOP ADDRESS
 1355  004702  012737  000001  001006  LT20A:  MOV     #1,RDRVF        ;SET READ REVERSE FLAG
 1356  004710  012737  000001  001020          MOV     #1,DCHKFL       ;SET DATA CHECK FLAG TO NOT CHACK DATA
 1357  004716  004737  005256                  JSR     PC,WAM3
 1358  004722  005037  001006                  CLR     RDRVF           ;CLEAR READ REVERSE FLAG
 1359  004726  005037  001020                  CLR     DCHKFL          ;CLEAR DATA CHECK FLAG
 1360  004732  004737  012052                  JSR     PC,ITER
 1361  004736  000137  002152                  JMP     TSCD2           ;RETURN TO SCHEDULER
 1362
```

```
                                        ;*********************************************************
                                        ;DATA SETUP ROUTINE:
                                        ;
                                        ;THIS ROUTINE IS USED TO GENERATE THE DATA PATTERNS
                                        ;THE PATTERN TO BE WRITTEN IS SPECIFIED BY:
                                        ;PATRN  =0      ALL 1'S
                                        ;       =1      ALL 0'S
                                        ;       =2      ALTERNATE 1'S & 0'S (125125)
                                        ;       =3      ALTERNATING PARITY (177377)
                                        ;*********************************************************
004742  005737  000740          DSUP:   TST     STFLG           ;SEE IF SINGLE TEST
004746  001434                  DSUP:   BEQ     DS0             ;IF NOT: BR
004750  032777  000100  173612          BIT     #100,@SWR       ;SEE IF SELECT PATTERN
004756  001430                          BEQ     DS0             ;IF NOT: BR
004760  012704  016454                  MOV     #WMSG3,R4
004764  004737  012752                  JSR     PC,TTOUT        ;REQUEST PATTERN NUMBER
004770  013703  001002                  MOV     PATRN,R3
004774  004737  013100                  JSR     PC,OCTP         ;PRINT PATTERN NUMBER
005000  012705  001002                  MOV     #PATRN,R5       ;GET ADDRESS OF PATRN ENTRY
005004  012701  000002                  MOV     #2,R1           ;SET SIZE OF ENTRY
005010  012702  000003                  MOV     #3,R2           ;SET UPPER LIMIT
005014  012703  000000                  MOV     #0,R3           ;SET LOWER LIMIT
005020  004737  012430                  JSR     PC,TTR          ;GO GET PATTERN NUMBER
005024  112737  000001  001001          MOVB    #1,WPGFL+1      ;SET FLAG
005032  113737  001002  001000          MOVB    PATRN,WPGFL     ;SET PATTERN NUMBER
005040  012703  017334          DS0:    MOV     #WBUFF,R3       ;R3 = ADDRS OF WRITE BUFFER
005044  013701  001002                  MOV     PATRN,R1        ;R1 = PATTERN SELECTOR
005050  006301                          ASL     R1              ;MAKE PATTERN SELECTOR EVEN
005052  004771  001034                  JSR     PC,@DATBL(R1)   ;GO GENERATE PATTERN
005056  012702  000202          DS3:    MOV     #202,R2         ;R2=BUFFER SIZE +2
005062  012701  017746                  MOV     #RBUFF,R1       ;R1=READ DATA START
005066  005021                  DS4:    CLR     (R1)+           ;CLEAR BUFFER
005070  005302                          DEC     R2              ;SEE IF DONE ALL
005072  001375                          BNE     DS4             ;IF NOT: BR
005074  000207                          RTS     PC              ;EXIT

                                        ;ALL ONES**********

005076  012701  177777          DAT1:   MOV     #-1,R1          ;R1=DATA
005102  012702  000202          DAT1A:  MOV     #202,R2         ;R2=WORD COUNT +2
005106  010123                  1$:     MOV     R1,(R3)+        ;LOAD BUFFER
005110  005302                          DEC     R2              ;SEE IF DONE
005112  001375                          BNE     1$              ;IF NOT: BR
005114  000207                          RTS     PC              ;RETURN TO CALLER

                                        ;ALL ZEROS**********

005116  005001                  DAT2:   CLR     R1              ;R1=DATA
005120  000770                          BR      DAT1A           ;LOAD BUFFER

                                        ;ONE/ZERO IN ALTERNATING CHARACTERS**********

005122  012701  125125          DAT3:   MOV     #125125,R1      ;R1=DATA
```

```
1419  005126  000765                          BR      DAT1A           ;LOAD BUFFER
1420
1421                                          ;ALTERNATING PARITY CHARACTERS*********
1422
1423  005130  012701  177377        DAT4:     MOV     #177377,R1      ;R1=ALTERNATING PARITY DATA
1424  005134  000762                          BR      DAT1A           ;GO LOAD BUFFER
1425
```

```
1426
1427                                        ;WRAP AROUND MODE 0 GLOBAL*****
1428
1429  005136  012737  000006  000750  WAM0:   MOV     #6,WAM          ;SET WAM NUMBER
1430  005144  012737  000060  000752  WAM01:  MOV     #60,FUN
1431  005152  005037  000754                  CLR     DATC
1432  005156  012737  017334  000760          MOV     #WBUFF,DATAD    ;SET BUFFER ADDRESS
1433  005164  012737  017746  000762          MOV     #RBUFF,RDAD     ;SET POINTER TO READ BUFFER
1434  005172  004737  005430                  JSR     PC,SETUP        ;GO SET UP
1435  005176  000137  006010                  JMP     EXEC
1436
1437                                        ;WRAP AROUND MODE 1 WRITE BUFFER**********
1438
1439  005202  012737  000010  000750  WAM1:   MOV     #10,WAM
1440  005210  000755                  BR      WAM01
1441
1442                                        ;WRAP AROUND MODE 2 BIT FIDDLER WRITE**********
1443
1444  005212  012737  000012  000750  WAM2:   MOV     #12,WAM
1445  005220  012737  000060  000752          MOV     #60,FUN
1446  005226  005037  000754                  CLR     DATC
1447  005232  012737  017334  000760          MOV     #WBUFF,DATAD
1448  005240  012737  017746  000762          MOV     #RBUFF,RDAD
1449  005246  004737  005430          WAM2A:  JSR     PC,SETUP
1450  005252  000137  006010                  JMP     EXEC
1451
1452                                        ;WRAP AROUND MODE 3 BIT FIDDLER READ**********
1453
1454  005256  012737  000014  000750  WAM3:   MOV     #14,WAM         ;SET WAM NUMBER
1455  005264  012737  000070  000752          MOV     #70,FUN         ;SET FUNCTION
1456  005272  012737  017746  000760          MOV     #RBUFF,DATAD    ;SET BUFFER ADDRESS
1457  005300  012737  017334  000756          MOV     #WBUFF,WTAD     ;SET POINTER TO WRITE BUFFER
1458  005306  005737  001006                  TST     RDRVF
1459  005312  001411                          BEQ     WAM3A
1460  005314  062737  000376  000760          ADD     #376,DATAD
1461  005322  062737  000377  000756          ADD     #377,WTAD
1462  005330  012737  000076  000752          MOV     #76,FUN         ;SET READ REVERSE CODE
1463  005336  032737  000020  000776  WAM3A:  BIT     #20,UDES
1464  005344  001403                          BEQ     WAM3B
1465  005346  013737  001010  000756          MOV     RCDP,WTAD
1466  005354  004737  005430          WAM3B:  JSR     PC,SETUP        ;GO SET UP
1467  005360  000137  006010                  JMP     EXEC            ;GO EXECUTE
1468
1469                                        ;WRAP AROUND MODE 4 CRC CORRECTION
1470                                        ;CALL:  JSR     PC,WAM4
1471
1472  005364  012737  000030  000750  WAM4:   MOV     #30,WAM         ;SET MAINTENANCE MODE FUNCTION = WRAP 4
1473  005372  012737  000060  000752          MOV     #60,FUN         ;SET TAPE FUNCTION = WRITE FWD
1474  005400  005037  000754                  CLR     DATC
1475  005404  012737  004304  000760          MOV     #CRCDAT,DATAD   ;SET ADRS OF WRITE BUFFER
1476  005412  012737  017746  000762          MOV     #RBUFF,RDAD     ;SET READ BUFFER ADDRESS
1477  005420  004737  005430                  JSR     PC,SETUP        ;GO SETUP REGISTERS
1478  005424  000137  006010                  JMP     EXEC            ;GO EXECUTE
```

```
1479                                        ;REGISTER SETUP ROUTINE*****
1480
1481  005430  005737  001022          SETUP:  TST     CRCFLG          ;DO NOT DO DATA SETUP NOR INIT
1482  005434  001004                          BNE     1$              ;IF CRC CORRECTION IS IN PROGRESS
1483  005436  022737  000030  000750          CMP     #30,WAM         ;DO NOT INIT IF DOING WAM 4 --- STEP D
1484  005444  001004                          BNE     2$
1485  005446  012777  000011  173034  1$:     MOV     #11,@C1         ;DO DRIVE CLEAR IF WAM4---STEP D
1486  005454  000412                          BR      SET1A
1487  005456  005737  000740          2$:     TST     STFLG           ;SEE IF SINGLE TEST
1488  005462  001403                          BEQ     SET0            ;IF NOT: BR
1489  005464  005737  001000                  TST     WPGFL           ;SEE IF HAVE SELECTED PATTERN
1490  005470  001002                          BNE     SET1            ;IF SO: BR
1491  005472  004737  004742          SET0:   JSR     PC,DSUP         ;GO DO DATA SETUP
1492  005476  004737  012122          SET1:   JSR     PC,INIT         ;INIT CONTROLLER,SELECT UNIT & DRIVE
1493                                                                  ;LOAD SLAVE DESC AND MOVE OFF BOT
1494  005502  012777  177400  173006  SET1A:  MOV     #-400,@FC       ;SET FC=WCX2
1495  005510  032737  000020  000776          BIT     #20,UDES        ;SEE IF CORE DUMP
1496  005516  001403                          BEQ     SET2            ;IF NOT: BR
1497  005520  012777  177000  172770          MOV     #-1000,@FC      ;SET FC=WCX4
1498  005526  012777  177600  172756  SET2:   MOV     #-200,@WC       ;SET WC
1499  005534  013777  000760  172752          MOV     DATAD,@BA       ;SET BUS ADDRESS
1500  005542  032777  010000  172750          BIT     #10000,@CS      ;ASSURE DRIVE THERE
1501  005550  001417                          BEQ     SP1             ;IF SO: BR
1502  005552  032777  020000  173010          BIT     #20000,@SWR     ;SEE IF PRINT ERRORS
1503  005560  001004                          BNE     SP01            ;IF NOT: BR
1504  005562  012704  016475                  MOV     #WMSG4,R4
1505  005566  004737  012752                  JSR     PC,TTOUT        ;PRINT NON-EXISTANT DRIVE
1506  005572  032777  100000  172770  SP01:   BIT     #100000,@SWR    ;SEE IF HALT ON ERROR
1507  005600  001401                          BEQ     SP0             ;IF NOT: BR
1508  005602  000000                          HALT
1509  005604  000137  005476          SP0:    JMP     SET1            ;RESETUP
1510  005610  022737  000014  000750  SP1:    CMP     #14,WAM         ;SEE IF WAM 3
1511  005616  001031                          BNE     SP1B            ;IF NOT: BR
1512  005620  117737  173132  000754          MOVB    @WTAD,DATC      ;GET FIRST CHAR
1513  005626  042737  177400  000754          BIC     #177400,DATC
1514  005634  000337  000754                  SWAB    DATC
1515  005640  052737  000200  000754          BIS     #200,DATC       ;SET PARITY
1516  005646  005737  001006                  TST     RDRVF           ;SEE IF READ REVERSE
1517  005652  001403                          BEQ     SP1A            ;IF NOT: BR
1518  005654  005337  000756                  DEC     WTAD            ;DECREMENT POINTER
1519  005660  000410                          BR      SP1B
1520  005662  005237  000756          SP1A:   INC     WTAD            ;BUMP POINTER
1521  005666  032737  000020  000776          BIT     #20,UDES        ;SEE IF CORE DUMP
1522  005674  001402                          BEQ     SP1B            ;IF NOT: BR
1523  005676  005237  000756                  INC     WTAD            ;BUMP POINTER AGAIN
1524  005702  053777  000776  172632  SP1B:   BIS     UDES,@TC        ;SET UNIT DESCRIPTION (DEN,PAR,FMT)
1525  005710  052777  000001  172616          BIS     #1,@MR          ;SET MAINT MODE
1526  005716  053777  000750  172610          BIS     WAM,@MR         ;SET WAM
1527  005724  053777  000754  172602          BIS     DATC,@MR        ;SET DATA
1528  005732  013777  000752  172550          MOV     FUN,@C1         ;SET FUNCTION
1529  005740  032777  040000  172554          BIT     #40000,@DS      ;ASSURE NO ERROR
1530  005746  001002                          BNE     SP3             ;IF ERROR: BR
1531  005750  000240                          NOP
1532  005752  000207                          RTS     PC              ;RETURN
1533  005754  032777  020000  172606  SP3:    BIT     #20000,@SWR     ;SEE IF PRINT ERRORS
1534  005762  001004                          BNE     SP4             ;IF NOT: BR
```

```
 1535  005764  012704  016436                  MOV     #WMSG2,R4
 1536  005770  004737  012752                  JSR     PC,TTOUT        ;PRINT SETUP ERROR
 1537  005774  032777  100000  172566  SP4:    BIT     #100000,@SWR    ;SEE IF HALT ON ERROR
 1538  006002  001401                          BEQ     SP5             ;IF NOT: BR
 1539  006004  000000                          HALT
 1540  006006  000207                  SP5:    RTS     PC              ;RETURN
```

```
1541                                            ;EXECUTE WAM ROUTINE*****
1542
1543  006010  000240                    EXEC:   NOP
1544  006012  000240                            NOP
1545  006014  032777  000040  172512            BIT     #40,@MR
1546  006022  001403                            BEQ     EX0             ;ASSURE MAINT CLOCK IS ZERO
1547  006024  042777  000040  172502            BIC     #40,@MR         ;IF NOT: CLEAR IT
1548  006032  022737  000010  000750  EX0:     CMP     #10,WAM         ;SEE IF WAM 1 OR 2 OR 3
1549  006040  003402                            BLE     2$
1550  006042  000137  006454          1$:     JMP     EXW2            ;GO DO WAM 0
1551  006046  022737  000030  000750  2$:     CMP     #30,WAM         ;BRANCH IF WRAP AROUND MODE 4
1552  006054  001772                            BEQ     1$
1553  006056  052777  000001  172424  EX1:     BIS     #1,@C1          ;SET GO BIT
1554  006064  005000                            CLR     R0
1555  006066  012701  000002                    MOV     #2,R1           ;SET DELAY
1556  006072  032777  100000  172442  EX1A:    BIT     #100000,@TC     ;SEE IF ALPHA
1557  006100  001404                            BEQ     EX2             ;IF SO: BR
1558  006102  005300                            DEC     R0
1559  006104  001372                            BNE     EX1A            ;AWAIT ALPHA
1560  006106  005301                            DEC     R1
1561  006110  001370                            BNE     EX1A
1562  006112  005077  172450          EX2:     CLR     @PSW
1563  006116  012701  000400                    MOV     #400,R1         ;SET NUMBER OF CLKS
1564  006122  032737  000020  000776            BIT     #20,UDES        ;SEE IF CORE DUMP
1565  006130  001402                            BEQ     EX3             ;IF NOT: BR
1566  006132  012701  001000                    MOV     #1000,R1        ;SET CLOCKS LWCX4
1567  006136  022737  000014  000750  EX3:     CMP     #14,WAM         ;SEE IF WAM 3
1568  006144  001010                            BNE     1$              ;IF NOT: BR
1569  006146  032737  002000  000776            BIT     #2000,UDES      ;IS IT PE?
1570  006154  001016                            BNE     EX5A            ;IF YES: BR
1571  006156  052777  000040  172350            BIS     #40,@MR         ;CLOCK UP
1572  006164  000412                            BR      EX5A
1573  006166  032737  002000  000776  1$:     BIT     #2000,UDES      ;SEE IF PE
1574  006174  001404                            BEQ     EX5             ;IF NOT PE: BR
1575  006176  006301                            ASL     R1
1576  006200  062701  000246                    ADD     #246,R1         ;SET TO ALLOW FOR PRE/POSTAMBLE
1577  006204  000402                            BR      EX5A
1578  006206  062701  000010          EX5:     ADD     #10,R1          ;ADD CLOCKS FOR CRC AND LRC
1579  006212  022737  000014  000750  EX5A:    CMP     #14,WAM         ;SEE IF WAM 3
1580  006220  001053                            BNE     EX5C            ;IF NOT: BR
1581  006222  117700  172530                    MOVB    @WTAD,R0
1582  006226  042700  177400                    BIC     #177400,R0
1583  006232  005737  001006                    TST     RDRVF           ;SEE IF REVERSE
1584  006236  001403                            BEQ     EX5A1           ;IF NOT: BR
1585  006240  005337  000756                    DEC     WTAD            ;DEC POINTER
1586  006244  000416                            BR      EX5B
1587  006246  005237  000756          EX5A1:   INC     WTAD
1588  006252  032737  000020  000776            BIT     #20,UDES        ;SEE IF CORE DUMP
1589  006260  001410                            BEQ     EX5B            ;IF NOT: BR
1590  006262  005237  000756                    INC     WTAD            ;BUMP POINTER
1591  006266  005777  172464                    TST     @WTAD           ;SEE IF END
1592  006272  001003                            BNE     EX5B            ;IF NOT: BR
1593  006274  162737  000010  000756            SUB     #10,WTAD        ;RESTORE POINTER
1594  006302  052777  000040  172224  EX5B:    BIS     #40,@MR         ;CLOCK UP
1595  006310  017702  172220                    MOV     @MR,R2          ;READ MR
1596  006314  042702  177600                    BIC     #177600,R2      ;MASK OUT DATA
```

```
1597  006320  000300                        SWAB    R0              ;POSITION DATA
1598  006322  022700  177000                CMP     #177000,R0      ;SEE IF PATTERN 3
1599  006326  001404                        BEQ     2$              ;IF SO: BR
1600  006330  000240                        NOP
1601  006332  000240                        NOP
1602  006334  052700  000200          1$:   BIS     #200,R0         ;SET ODD PARITY
1603  006340  050002                  2$:   BIS     R0,R2           ;LOAD NEW DATA
1604  006342  010277  172166                MOV     R2,@MR          ;CLOCK DOWN AND LOAD NEW DATA
1605  006346  000426                        BR      EX5D
1606  006350  052777  000040  172156  EX5C:  BIS     #40,@MR         ;CLOCK UP
1607  006356  042777  000040  172150        BIC     #40,@MR         ;CLOCK DOWN
1608  006364  017700  172144                MOV     @MR,R0          ;GET MR
1609  006370  000300                        SWAB    R0
1610  006372  032737  000010  000776        BIT     #10,UDES        ;SEE IF EVEN PAR
1611  006400  001405                        BEQ     EX5C0           ;IF NOT: BR
1612  006402  010077  172354                MOV     R0,@RDAD
1613  006406  005237  000762                INC     RDAD
1614  006412  000402                        BR      EX5C1
1615  006414  110077  172342          EX5C0: MOVB    R0,@RDAD        ;PUT CHAR IN CORE
1616  006420  005237  000762          EX5C1: INC     RDAD
1617  006424  000240                  EX5D:  NOP
1618  006426  005301                        DEC     R1              ;SEE IF DONE CLKS
1619  006430  001270                        BNE     EX5A            ;IF NOT: BR
1620  006432  032777  000040  172074        BIT     #40,@MR         ;CLOCK UP?
1621  006440  001403                        BEQ     1$              ;IF NOT: BR
1622  006442  042777  000040  172064        BIC     #40,@MR         ;CLOCK DOWN
1623  006450  000137  011626          1$:   JMP     EORP            ;GO DO EOR
```

```
1624                                            ;EXECUTE WAM 0******
1625
1626  006454  000240                    EXW2:   NOP
1627  006456  012737  006642  000670            MOV     #EXW2H,RTRN     ;SET INTERRUPT RETURN ADDRESS
1628  006464  012701  000200                    MOV     #200,R1         ;SET NUMBER OF CLOCKS = FC/2
1629  006470  032737  002000  000776            BIT     #2000,UDES      ;SEE IF PE
1630  006476  001402                            BEQ     EXW2A           ;IF NOT: BR
1631  006500  012701  000100                    MOV     #100,R1         ;ELSE SET CLKS = FC/4
1632  006504  012702  017746            EXW2A:  MOV     #RBUFF,R2               ;SET BUFFER ADDRESS
1633  006510  022737  000030  000750            CMP     #30,WAM         ;BRANCH IF NOT WRAP 4
1634  006516  001003                            BNE     1$
1635  006520  052777  000010  171772            BIS     #10,@CS         ;SET INHIBIT BUS ADDRESS INCREMENT
1636  006526  012777  000161  171754    1$:     MOV     #161,@C1        ;SET WRITE COMMAND  AND GO
1637  006534  005077  172026                    CLR     @PSW            ;ALLOW INTERRUPT
1638  006540  032777  000040  171766    EXW2B:  BIT     #40,@MR
1639  006546  001774                            BEQ     EXW2B           ;AWAIT CLOCK UP
1640  006550  017722  171760                    MOV     @MR,(R2)+       ;GET DATA
1641  006554  032777  000040  171752    EXW2C:  BIT     #40,@MR
1642  006562  001374                            BNE     EXW2C           ;AWAIT CLOCK DOWN
1643  006564  017722  171744                    MOV     @MR,(R2)+       ;GET DATA
1644  006570  005301                            DEC     R1              ;SEE IF DONE ALL
1645  006572  001362                            BNE     EXW2B           ;IF NOT: BR
1646  006574  012701  000003            EXW2E:  MOV     #3,R1
1647  006600  005000                            CLR     R0              ;SET DELAY
1648  006602  005300                    EXW2F:  DEC     R0
1649  006604  001376                            BNE     EXW2F
1650  006606  005301                            DEC     R1
1651  006610  001374                            BNE     EXW2F           ;DELAY
1652  006612  032777  020000  171750            BIT     #20000,@SWR     ;SEE IF ERROR PRINT
1653  006620  001004                            BNE     EXW2G           ;IF NOT: BR
1654  006622  012704  016700                    MOV     #WMSG24,R4
1655  006626  004737  012752                    JSR     PC,TTOUT        ;PRINT NO INTERUPT
1656  006632  005777  171732            EXW2G:  TST     @SWR            ;SEE IF HALT ON ERROR
1657  006636  100001                            BPL     EXW2H           ;IF NOT: BR
1658  006640  000000                            HALT
1659  006642  000240                    EXW2H:  NOP
1660  006644  012701  017746                    MOV     #RBUFF,R1       ;GET START OF READ BUFFER
1661  006650  012700  000400                    MOV     #400,R0         ;SET SIZE
1662  006654  010102                            MOV     R1,R2
1663  006656  012203                    EXW2J:  MOV     (R2)+,R3
1664  006660  000303                            SWAB    R3
1665  006662  032737  000010  000776            BIT     #10,UDES        ;SEE IF EVEN PAR
1666  006670  001402                            BEQ     EXW2J0          ;IF NOT: BR
1667  006672  010321                            MOV     R3,(R1)+        ;SAVE PAR + DATA
1668  006674  000401                            BR      EXW2J1
1669  006676  110321                    EXW2J0: MOVB    R3,(R1)+        ;ASSEMBLE DATA IN BYTES
1670  006700  005300                    EXW2J1: DEC     R0
1671  006702  001365                            BNE     EXW2J           ;CONTINUE FOR ALL
1672  006704  032777  000200  171656            BIT     #200,@SWR       ;SEE IF STATUS CHECK
1673  006712  001002                            BNE     EXW2K           ;IF NOT: BR
1674  006714  004737  006742                    JSR     PC,WSTCK        ;ELSE GO CHECK STATUS
1675  006720  000240                    EXW2K:  NOP
1676  006722  032777  000400  171640            BIT     #400,@SWR       ;SEE IF DATA CHECK
1677  006730  001002                            BNE     EXW2X           ;IF NOT: BR
1678  006732  004737  007332                    JSR     PC,DCHK         ;ELSE GO CHECK DATA
1679  006736  000240                    EXW2X:  NOP
```

```
                                                                D  4
  1680  006740  000207                        RTS     PC              ;EXIT
```

```
1681
1682                                        ;WRAP AROUND STATUS CHECK ROUTINE*********
1683
1684  006742  000240                WSTCK:  NOP
1685  006744  005037  000772                CLR     SERFL           ;CLEAR ERROR FLAG
1686  006750  005037  000620                CLR     HDRFL           ;CLEAR HEADER FLAG
1687  006754  022737  014633  000622        CMP     #MSLT2,EMADDR   ;SEE IF TEST 2
1688  006762  001404                        BEQ     2$              ;IF SO: BR
1689  006764  022737  015523  000622        CMP     #MSLT15,EMADDR  ;SEE IF TEST 15
1690  006772  001025                        BNE     5$              ;IF NOT: BR
1691  006774  005737  001000          2$:   TST     WPGFL           ;SEE IF SINGLE PATTERN
1692  007000  001405                        BEQ     3$              ;IF NOT: BR
1693  007002  122737  000003  001000        CMPB    #3,WPGFL        ;SEE IF PATTERN 3
1694  007010  001016                        BNE     5$              ;IF NOT: BR
1695  007012  000404                        BR      4$              ;ELSE GO DO EXPT CHANGE
1696  007014  022737  000003  001002  3$:   CMP     #3,PATRN        ;SEE IF PATTERN 3
1697  007022  001011                        BNE     5$              ;IF NOT: BR
1698  007024  052737  140000  001024  4$:   BIS     #140000,WCS1
1699  007032  052737  140000  001030        BIS     #140000,WDS
1700  007040  052737  000100  001032        BIS     #100,WER        ;SET EXPT PARITY ERROR
1701  007046  012737  016522  000672  5$:   MOV     #WMSG6,ERADD    ;SET CODE=CS1
1702  007054  017702  171430                MOV     @C1,R2          ;GET RCVD CS1
1703  007060  013705  001024                MOV     WCS1,R5         ;GET EXPT CS1
1704  007064  004737  007206                JSR     PC,WSTG         ;GO CHK
1705  007070  012737  016547  000672        MOV     #WMSG6D,ERADD   ;SET CODE=CS2
1706  007076  017702  171416                MOV     @CS,R2          ;SET RCVD CS2
1707  007102  013705  001026                MOV     WCS2,R5         ;GET EXPT CS2
1708  007106  053705  000624                BIS     DRVN,R5         ;SET DRIVE NUMBER IN EXPT CS2
1709  007112  004737  007206                JSR     PC,WSTG         ;GO CHK
1710  007116  012737  016555  000672        MOV     #WMSG6E,ERADD   ;SET CODE=DS
1711  007124  017702  171372                MOV     @DS,R2          ;SET RCVD DS
1712  007130  013705  001030                MOV     WDS,R5          ;GET EXPT DS
1713  007134  004737  007206          1$:   JSR     PC,WSTG         ;GO CHK
1714  007140  012737  016562  000672        MOV     #WMSG6F,ERADD   ;SET CODE=ER
1715  007146  017702  171352                MOV     @ER,R2          ;GET RCVD ER
1716  007152  000240                        NOP
1717  007154  000240                        NOP
1718  007156  013705  001032                MOV     WER,R5          ;GET EXPT ER
1719  007162  004737  007206                JSR     PC,WSTG         ;GO CHK
1720  007166  005737  000772                TST     SERFL           ;SEE IF ANY ERRORS
1721  007172  001456                        BEQ     WSTX            ;IF NOT: BR
1722  007174  005777  171370                TST     @SWR            ;SEE IF HALT ON ERROR
1723  007200  100053                        BPL     WSTX            ;IF NOT: BR
1724  007202  000000                        HALT
1725  007204  000451                        BR      WSTX            ;CONTINUE
1726  007206  000240                WSTG:   NOP
1727  007210  020205                        CMP     R2,R5           ;SEE IF EXPT=RCVD
1728  007212  001446                        BEQ     WSTX            ;IF SO: BR
1729  007214  005237  000772                INC     SERFL           ;SET ERROR FLAG
1730  007220  032777  020000  171342        BIT     #20000,@SWR     ;SEE IF PRINT ERRORS
1731  007226  001040                        BNE     WSTX            ;IF NOT: BR
1732  007230  005737  000620                TST     HDRFL           ;SEE IF DONE HEADER
1733  007234  001010                        BNE     WSTG0           ;IF SO: BR
1734  007236  013704  000622                MOV     EMADDR,R4
1735  007242  004737  012752                JSR     PC,TTOUT        ;PRINT TEST HEADER
1736  007246  012704  016664                MOV     #WMSG23,R4
```

```
 1737  007252  004737  012752                    JSR     PC,TTOUT        ;PRINT STATUS TAG
 1738  007256  012737  000001  000620  WSTGO:    MOV     #1,HDRFL        ;SET HEADER FLAG
 1739  007264  013704  000672                    MOV     ERADD,R4
 1740  007270  004737  012752                    JSR     PC,TTOUT        ;PRINT CODE
 1741  007274  012704  014223                    MOV     #MSG12,R4
 1742  007300  004737  012752                    JSR     PC,TTOUT        ;PRINT EXPT TAG
 1743  007304  010503                            MOV     R5,R3
 1744  007306  004737  013100                    JSR     PC,OCTP         ;PRINT EXPT STATUS
 1745  007312  012704  014232                    MOV     #MSG13,R4
 1746  007316  004737  012752                    JSR     PC,TTOUT        ;PRINT RCVD TAG
 1747  007322  010203                            MOV     R2,R3
 1748  007324  004737  013100                    JSR     PC,OCTP         ;PRINT RCVD STATUS
 1749  007330  000207                WSTX:       RTS     PC              ;RETURN
 1750
```

```
 1751
 1752                                        ;DATA CHECK ROUTINE*****
 1753
 1754  007332  000240                DCHK:   NOP
 1755  007334  005737  001022                TST     CRCFLG          ;DO NOT DO A DATA CHACK
 1756  007340  001402                        BEQ     2$              ;IF CRC CORRECTION IN PROGRESS
 1757  007342  000137  010172        1$:     JMP     DCHKX1
 1758  007346  005737  001020        2$:     TST     DCHKFL          ;BRANCH IF DATA IS NOT TO BE CHECKED
 1759  007352  001373                        BNE     1$
 1760  007354  005037  000620                CLR     HDRFL           ;CLEAR HEADER FLAG
 1761  007360  005037  000766                CLR     DERFL           ;CLEAR DATA ERROR FLAG
 1762  007364  005037  000774                CLR     CRCNT           ;CLEAR CHAR CNTR
 1763  007370  032737  000010  000776        BIT     #10,UDES        ;SEE IF EVEN PARITY
 1764  007376  001402                        BEQ     DCHKA0          ;IF NOT: BR
 1765  007400  000137  010214                JMP     DCHKE           ;ELSE GO CHECK EVEN
 1766  007404  022737  000010  000750  DCHKA0: CMP    #10,WAM         ;SEE IF WAM 1
 1767  007412  001006                        BNE     DCHKA           ;IF NOT: BR
 1768  007414  032737  002000  000776        BIT     #2000,UDES      ;SEE IF PE
 1769  007422  001402                        BEQ     DCHKA           ;IF NOT: BR
 1770  007424  000137  010716                JMP     PRCHK           ;GO CHK DATA
 1771  007430  012700  177400        DCHKA:  MOV     #-400,R0        ;SET NUMBER OF CHARACTERS
 1772  007434  022737  000012  000750        CMP     #12,WAM
 1773  007442  001006                        BNE     DCHKA1          ;IF NOT WRAP 2: BR
 1774  007444  032737  000020  000776        BIT     #20,UDES
 1775  007452  001402                        BEQ     DCHKA1          ;IF NOT CORE DUMP: BR
 1776  007454  012700  177000                MOV     #-1000,R0
 1777  007460  022737  000030  000750  DCHKA1: CMP    #30,WAM         ;BRANCH IF WRAP 4
 1778  007466  001404                        BEQ     1$
 1779  007470  022737  000006  000750        CMP     #6,WAM          ;SEE IF WRAP 0
 1780  007476  001007                        BNE     DCHKA2          ;IF NOT: BR
 1781  007500  012700  177744        1$:     MOV     #-34,R0         ;SET NUMBER OF CHARACTERS READ
 1782  007504  012701  017344                MOV     #WBUFF+10,R1    ;SET POINTER
 1783  007510  005037  000766                CLR     DERFL           ;CLEAR DATA ERROR FLAG
 1784  007514  000431                        BR      DCHKB0
 1785  007516  022737  000012  000750  DCHKA2: CMP    #12,WAM         ;SEE IF WRAP 2
 1786  007524  001021                        BNE     DCHKB           ;IF NOT: BR
 1787  007526  032737  002000  000776        BIT     #2000,UDES      ;SEE IF PE
 1788  007534  001415                        BEQ     DCHKB           ;IF NOT: BR
 1789  007536  012700  177653                MOV     #-125,R0        ;POINT TO START OF DATA
 1790  007542  012737  000001  000764        MOV     #1,W2FLG        ;SET WRAP 2 FLAG
 1791  007550  004737  007570                JSR     PC,DCHKB        ;GO CHECK DATA
 1792  007554  004737  011216                JSR     PC,W1DCHK       ;GO CHECK WRAP 1 DATA
 1793  007560  005037  000764                CLR     W2FLG
 1794  007564  000137  010154                JMP     DCHKX
 1795  007570  005037  000766        DCHKB:  CLR     DERFL
 1796  007574  012701  017334                MOV     #WBUFF,R1       ;SET GOOD POINTER
 1797  007600  012702  017746        DCHKB0: MOV     #RBUFF,R2       ;SET READ POINTER
 1798  007604  032737  000020  000776        BIT     #20,UDES        ;SEE IF CORE DUMP
 1799  007612  001416                        BEQ     DCHKO           ;IF NOT: BR
 1800  007614  022737  000012  000750        CMP     #12,WAM         ;SEE IF WAM 2
 1801  007622  001011                        BNE     DCHKD           ;IF NOT: BR
 1802  007624  005737  001002                TST     PATRN           ;SEE IF PATTERN 0
 1803  007630  001003                        BNE     DCHKC           ;IF NOT: BR
 1804  007632  012701  001056                MOV     #WCDP0,R1       ;SET CORE DUMP PATTERN 0
 1805  007636  000404                        BR      DCHKO           ;GO CHECK DATA
 1806  007640  012701  001044        DCHKC:  MOV     #WCDP2,R1       ;SET CORE DUMP WRITE PATTERN 2
```

```
                                                                H  4
 1807  007644  000401                          BR      DCHK0           ;GO CHECK DATA
 1808  007646  000240                  DCHKD:  NOP
 1809  007650  121112                  DCHK0:  CMPB    (R1),(R2)       ;SEE IF DATA OK
 1810  007652  001466                          BEQ     DCHK2           ;IF SO: BR
 1811  007654  032777  020000  170706          BIT     #20000,@SWR     ;SEE IF PRINT ERRORS
 1812  007662  001062                          BNE     DCHK2           ;IF NOT: BR
 1813  007664  005737  000620                  TST     HDRFL           ;SEE IF DONE HEADER
 1814  007670  001004                          BNE     DCHK1           ;IF SO: BR
 1815  007672  013704  000622                  MOV     EMADDR,R4
 1816  007676  004737  012752                  JSR     PC,TTOUT        ;PRINT HEADER
 1817  007702  005737  000766          DCHK1:  TST     DERFL           ;SEE IF FIRST ERROR
 1818  007706  001014                          BNE     DCHK1A          ;IF NOT: BR
 1819  007710  012704  016632                  MOV     #WMSG16,R4
 1820  007714  004737  012752                  JSR     PC,TTOUT        ;PRINT DATA ERROR TAG
 1821  007720  012704  017057                  MOV     #WMSG32,R4
 1822  007724  004737  012752                  JSR     PC,TTOUT        ;PRINT PATRN TAG
 1823  007730  013703  001002                  MOV     PATRN,R3
 1824  007734  004737  013100                  JSR     PC,OCTP         ;PRINT PATTERN NUMBER
 1825  007740  012737  000001  000620  DCHK1A: MOV     #1,HDRFL        ;SET HEADER FLAG
 1826  007746  012737  000001  000766          MOV     #1,DERFL        ;SET DATA ERROR FLAG
 1827  007754  012704  016656                  MOV     #WMSG21,R4
 1828  007760  004737  012752                  JSR     PC,TTOUT        ;PRINT CHARACTER NUMBER TAG
 1829  007764  013703  000774                  MOV     CRCNT,R3
 1830  007770  004737  013100                  JSR     PC,OCTP         ;PRINT CHARACTER NUMBER
 1831  007774  012704  016644                  MOV     #WMSG17,R4
 1832  010000  004737  012752                  JSR     PC,TTOUT        ;PRINT GOOD TAG
 1833  010004  111103                          MOVB    (R1),R3
 1834  010006  004737  013326                  JSR     PC,DOUT         ;PRINT GOOD DATA
 1835  010012  012704  016651                  MOV     #WMSG20,R4
 1836  010016  004737  012752                  JSR     PC,TTOUT        ;PRINT BAD TAG
 1837  010022  111203                          MOVB    (R2),R3
 1838  010024  004737  013326                  JSR     PC,DOUT         ;PRINT BAD DATA
 1839  010030  005737  000764          DCHK2:  TST     W2FLG           ;SEE IF WRAP 2 NRZ
 1840  010034  001020                          BNE     DCHK2B          ;IF SO: BR
 1841  010036  005201                          INC     R1              ;BUMP POINTER
 1842  010040  032737  000020  000776          BIT     #20,UDES        ;SEE IF CORE DUMP
 1843  010046  001413                          BEQ     DCHK2B          ;IF NOT: BR
 1844  010050  022737  000012  000750          CMP     #12,WAM         ;SEE IF WAM 2
 1845  010056  001006                          BNE     DCHK2A          ;IF NOT: BR
 1846  010060  005201                          INC     R1              ;BUMP POINTER
 1847  010062  005711                          TST     (R1)            ;SEE IF END OF PATTERN
 1848  010064  001004                          BNE     DCHK2B          ;IF NOT: BR
 1849  010066  162701  000010                  SUB     #10,R1          ;RESET POINTER TO START OF PATTERN
 1850  010072  000401                          BR      DCHK2B          ;CONTINUE CHECK
 1851  010074  000240                  DCHK2A: NOP
 1852  010076  005202                  DCHK2B: INC     R2
 1853  010100  022737  000030  000750          CMP     #30,WAM         ;BRANCH IF WAM 4
 1854  010106  001404                          BEQ     1$
 1855  010110  022737  000006  000750          CMP     #6,WAM          ;SEE IF WAM 0
 1856  010116  001002                          BNE     DCHK3           ;IF NOT: BR
 1857  010120  062701  000010          1$:     ADD     #10,R1          ;BUMP POINTER
 1858  010124  005237  000774          DCHK3:  INC     CRCNT           ;BUMP CHAR CNTR
 1859  010130  032777  000400  170432          BIT     #400,@SWR       ;SEE IF CONT DATA CHK
 1860  010136  001006                          BNE     DCHKX           ;IF NOT: BR
 1861  010140  005200                          INC     R0              ;SEE IF DONE
 1862  010142  001242                          BNE     DCHK0           ;IF NOT: BR
```

```
 1863  010144  005737  000764            TST     W2FLG
 1864  010150  001401                    BEQ     DCHKX
 1865  010152  000207                    RTS     PC
 1866  010154  005777  170410  DCHKX:    TST     @SWR            ;SEE IF HALT ON ERROR
 1867  010160  100004                    BPL     DCHKX1          ;IF NOT: BR
 1868  010162  005737  000766            TST     DERFL           ;SEE IF DATA ERROR OCCURED
 1869  010166  001401                    BEQ     DCHKX1          ;IF NOT: BR
 1870  010170  000000                    HALT
 1871  010172  005037  000774  DCHKX1:   CLR     CRCNT           ;CLEAR CHAR CNTR
 1872  010176  005037  000620            CLR     HDRFL           ;CLEAR HEADER FLAG
 1873  010202  005037  000766            CLR     DERFL           ;CLEAR DATA ERROR FLAG
 1874  010206  005037  000770            CLR     PREFL           ;CLEAR PREAMBLE FLAG
 1875  010212  000207                    RTS     PC              ;RETURN
```

```
1876
1877                                        ;EVEN PARITY DATA CHECK*****
1878
1879  010214  000240                DCHKE:  NOP
1880  010216  022737  000006  000750        CMP     #6,WAM          ;SEE IF WRAP 0
1881  010224  001005                        BNE     1$              ;IF NOT: BR
1882  010226  012700  177744                MOV     #-34,R0         ;SET NUMBER OF CHARACTERS READ
1883  010232  012701  017344                MOV     #WBUFF+10,R1    ;SET POINTER
1884  010236  000404                        BR      2$
1885  010240  012700  177400        1$:     MOV     #-400,R0        ;SET NUMBER OF CHARACTERS
1886  010244  012701  017334                MOV     #WBUFF,R1       ;R1=START OF WRITE BUFFER
1887  010250  012702  017746        2$:     MOV     #RBUFF,R2       ;R2=START OF READ BUFFER
1888  010254  111105                DCKE0:  MOVB    (R1),R5         ;GET EXPT DATA
1889  010256  005003                        CLR     R3
1890  010260  012704  000010                MOV     #10,R4          ;SET NUMBER OF BITS
1891  010264  032705  000001        DCKE1:  BIT     #1,R5           ;SEE IF ONE BIT
1892  010270  001401                        BEQ     DCKE2           ;IF NOT: BR
1893  010272  005203                        INC     R3              ;COUNT ONE BITS FOR PARITY CHECK
1894  010274  005304                DCKE2:  DEC     R4              ;SEE IF DONE
1895  010276  001402                        BEQ     DCKE3           ;IF SO: BR
1896  010300  006005                        ROR     R5              ;POINT TO NEXT BIT
1897  010302  000770                        BR      DCKE1
1898  010304  000240                DCKE3:  NOP
1899  010306  111105                        MOVB    (R1),R5         ;GET EXPT DATA
1900  010310  042705  177400                BIC     #177400,R5      ;MASK DATA FIELD
1901  010314  005703                        TST     R3
1902  010316  001003                        BNE     DCKE4           ;IF NO ONE BITS SET: BR
1903  010320  012705  100020                MOV     #100020,R5
1904  010324  000405                        BR      DCKE5
1905  010326  032703  000001        DCKE4:  BIT     #1,R3           ;SEE IF ODD NUMBER OF ONE BITS
1906  010332  001402                        BEQ     DCKE5           ;IF NOT: BR
1907  010334  052705  100000                BIS     #100000,R5      ;SET EVEN PARITY BIT=1
1908  010340  042712  077400        DCKE5:  BIC     #77400,(R2)     ;MASK DATA FIELD
1909  010344  020512                        CMP     R5,(R2)         ;SEE IF DATA + PARITY GOOD
1910  010346  001477                        BEQ     DCKE10          ;IF SO: BR
1911  010350  032777  020000  170212        BIT     #20000,@SWR     ;SEE IF ERROR PRINT
1912  010356  001073                        BNE     DCKE10          ;IF NOT: BR
1913  010360  005737  000620                TST     HDRFL           ;SEE IF DONE HEADER
1914  010364  001004                        BNE     DCKE6           ;IF SO: BR
1915  010366  013704  000622                MOV     EMADDR,R4
1916  010372  004737  012752                JSR     PC,TTOUT        ;PRINT HEADER
1917  010376  005737  000766        DCKE6:  TST     DERFL           ;SEE IF FIRST BAD CHAR
1918  010402  001014                        BNE     DCKE7           ;IF NOT: BR
1919  010404  012704  016632                MOV     #WMSG16,R4
1920  010410  004737  012752                JSR     PC,TTOUT        ;PRINT BAD DATA TAG
1921  010414  012704  017057                MOV     #WMSG32,R4
1922  010420  004737  012752                JSR     PC,TTOUT        ;PRINT PATTERN TAG
1923  010424  013703  001002                MOV     PATRN,R3
1924  010430  004737  013100                JSR     PC,OCTP         ;PRINT PATTERN NUMBER
1925  010434  000240                DCKE7:  NOP
1926  010436  012737  000001  000766        MOV     #1,DERFL        ;SET DATA ERROR FLAG
1927  010444  012737  000001  000620        MOV     #1,HDRFL        ;SET HEADER FLAG
1928  010452  012704  016656                MOV     #WMSG21,R4
1929  010456  004737  012752                JSR     PC,TTOUT        ;PRINT CHAR NUMBER TAG
1930  010462  013703  000774                MOV     CRCNT,R3
1931  010466  004737  013100                JSR     PC,OCTP         ;ORINT CHAR NUMBER
```

```
 1932  010472  012704  016644                MOV     #WMSG17,R4
 1933  010476  004737  012752                JSR     PC,TTOUT        ;PRINT GOOD DATA TAG
 1934  010502  110503                        MOVB    R5,R3
 1935  010504  004737  013326                JSR     PC,DOUT         ;PRINT EXPT DATA
 1936  010510  010503                        MOV     R5,R3
 1937  010512  004737  010622                JSR     PC,DCKEP        ;GO PRINT PARITY BIT
 1938  010516  000240                        NOP
 1939  010520  012704  016651                MOV     #WMSG20,R4
 1940  010524  004737  012752                JSR     PC,TTOUT        ;PRINT BAD TAG
 1941  010530  111203                        MOVB    (R2),R3
 1942  010532  004737  013326                JSR     PC,DOUT         ;PRINT BAD DATA
 1943  010536  011203                        MOV     (R2),R3
 1944  010540  004737  010622                JSR     PC,DCKEP        ;GO PRINT PARITY BIT
 1945  010544  000240                        NOP
 1946  010546  005201              DCKE10:   INC     R1
 1947  010550  022737  000006  000750        CMP     #6,WAM          ;SEE IF WRAP 0
 1948  010556  001002                        BNE     1$              ;IF NOT: BR
 1949  010560  062701  000010                ADD     #10,R1          ;BUMP POINTER
 1950  010564  005722              1$:       TST     (R2)+           ;BUMP POINTERS
 1951  010566  005237  000774                INC     CRCNT           ;BUMP CHAR CNTR
 1952  010572  032777  000400  167770        BIT     #400,@SWR       ;SEE IF CONTINUE DATA CHECK
 1953  010600  001402                        BEQ     DCKE11          ;IF SO: BR
 1954  010602  000137  010154                JMP     DCHKX           ;GO TO END OF DATA CHECK
 1955  010606  005200              DCKE11:   INC     R0              ;SEE IF DONE
 1956  010610  001402                        BEQ     DCKE12          ;IF SO: BR
 1957  010612  000137  010254                JMP     DCKE0           ;ELSE CONTINUE
 1958  010616  000137  010154      DCKE12:   JMP     DCHKX           ;GO TO END OF DATA CHECK
 1959  010622  000240              DCKEP:    NOP
 1960  010624  012737  000240  000614        MOV     #240,TOB
 1961  010632  004737  013052                JSR     PC,TOG          ;SPACE
 1962  010636  012737  000260  000614        MOV     #260,TOB        ;SET PAR=0
 1963  010644  005703                        TST     R3              ;SEE IF PARITY REALLY=0
 1964  010646  100002                        BPL     DCKEP0          ;IF SO: BR
 1965  010650  005237  000614                INC     TOB             ;ELSE SET TO 1
 1966  010654  004737  013052      DCKEP0:   JSR     PC,TOG          ;PRINT PARITY BIT
 1967  010660  000207                        RTS     PC              ;RETURN
 1968
```

```
 1969
 1970                                          ;PREAMBLE/POSTAMBLE CHECK*******
 1971
 1972  010662  012700  000051          PSCHK:  MOV     #51,R0          ;SET SIZE OF POSTAMBLE
 1973  010666  012701  017212                  MOV     #POST,R1        ;SET POINTER TO POSTAMBLE
 1974  010672  005037  000620                  CLR     HDRFL           ;CLEAR HEADER FLAG
 1975  010676  005037  000774                  CLR     CRCNT           ;CLEAR CHAR CNTR
 1976  010702  005037  000766                  CLR     DERFL           ;CLEAR DATA ERROR FLAG
 1977  010706  000240                          NOP
 1978  010710  000240                          NOP
 1979  010712  000137  010734                  JMP     PD0             ;GO CHECK POSTAMPLE
 1980
 1981  010716  012700  000051          PRCHK:  MOV     #51,R0          ;SET SIZE OF PREAMBLE
 1982  010722  012701  017070                  MOV     #PRE,R1         ;SET POINTER TO PREAMBLE
 1983  010726  012702  017746                  MOV     #RBUFF,R2       ;SET POINTER TO START OF READ BUFFER
 1984  010732  022122                          CMP     (R1)+,(R2)+     ;BUMP ADDRESS POINTERS
 1985  010734  121112                  PD0:    CMPB    (R1),(R2)       ;CHECK DATA
 1986  010736  001004                          BNE     PD1             ;IF NOT GOOD: BR
 1987  010740  126162  000001  000001          CMPB    1(R1),1(R2)     ;COMPARE COMPLIMENT BYTE
 1988  010746  001477                          BEQ     PD5             ;IF GOOD: BR
 1989  010750  032777  020000  167612  PD1:    BIT     #20000,@SWR     ;SEE IF PRINT INHIBIT
 1990  010756  001073                          BNE     PD5             ;IF SO: BR
 1991  010760  005737  000620                  TST     HDRFL           ;SEE IF DONE HEADER
 1992  010764  001020                          BNE     PD4             ;IF SO: BR
 1993  010766  013704  000622                  MOV     EMADDR,R4
 1994  010772  004737  012752                  JSR     PC,TTOUT        ;PRINT TEST HEADER
 1995  010776  005737  000770                  TST     PREFL           ;SEE IF PREAMBLE CHECK
 1996  011002  001403                          BEQ     PD2             ;IF NOT: BR
 1997  011004  012704  017003                  MOV     #WMSG29,R4      ;SET POSTAMBLE HEADER
 1998  011010  000402                          BR      PD3
 1999  011012  012704  016765          PD2:    MOV     #WMSG28,R4      ;SET PREAMBLE HEADER
 2000  011016  004737  012752          PD3:    JSR     PC,TTOUT        ;PRINT HEADER
 2001  011022  005237  000620                  INC     HDRFL
 2002  011026  012704  016656          PD4:    MOV     #WMSG21,R4
 2003  011032  004737  012752                  JSR     PC,TTOUT        ;PRINT CHAR NUMBER TAG
 2004  011036  013703  000774                  MOV     CRCNT,R3
 2005  011042  004737  013100                  JSR     PC,OCTP         ;PRINT CHAR NUMBER
 2006  011046  012704  016644                  MOV     #WMSG17,R4
 2007  011052  004737  012752                  JSR     PC,TTOUT        ;PRINT GOOD TAG
 2008  011056  116103  000001                  MOVB    1(R1),R3
 2009  011062  004737  013326                  JSR     PC,DOUT         ;PRINT GOOD CHAR
 2010  011066  012737  000240  000614          MOV     #240,TOB
 2011  011074  004737  013052                  JSR     PC,TOG
 2012  011100  111103                          MOVB    (R1),R3
 2013  011102  004737  013326                  JSR     PC,DOUT         ;PRINT COMPLEMENT
 2014  011106  012704  016651                  MOV     #WMSG20,R4
 2015  011112  004737  012752                  JSR     PC,TTOUT        ;PRINT BAD TAG
 2016  011116  116203  000001                  MOVB    1(R2),R3
 2017  011122  004737  013326                  JSR     PC,DOUT         ;PRINT BAD CHAR
 2018  011126  012737  000240  000614          MOV     #240,TOB
 2019  011134  004737  013052                  JSR     PC,TOG
 2020  011140  111203                          MOVB    (R2),R3
 2021  011142  004737  013326                  JSR     PC,DOUT         ;PRINT COMPLEMENT
 2022  011146  022122                  PD5:    CMP     (R1)+,(R2)+     ;BUMP ADDRESS POINTERS
 2023  011150  005237  000774                  INC     CRCNT           ;BUMP CHAR NUMBER
 2024  011154  005300                          DEC     R0              ;SEE IF DONE
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 2025  011156  001266                    BNE     PD0             ;IF NOT: BR
 2026  011160  005737  000770            TST     PREFL           ;SEE IF PREAMBLE
 2027  011164  001402                    BEQ     PD6             ;IF SO: BR
 2028  011166  000137  010154            JMP     DCHKX           ;GO TO EXIT ROUTINE
 2029  011172  005237  000770    PD6:    INC     PREFL           ;SET PREAMBLE FLAG
 2030  011176  005037  000620            CLR     HDRFL           ;CLEAR HEADER FLAG
 2031  011202  005037  000774            CLR     CRCNT           ;CLEAR CHAR CNTR
 2032  011206  005037  000766            CLR     DERFL           ;CLEAR DATA ERROR FLAG
 2033  011212  000137  011216            JMP     W1DCHK          ;GO CHECK WRAP 1 DATA
 2034
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```
2035
2036                                    ;WAM 1 PE DATA CHECK*****
2037
2038  011216  012700  177400          W1DCHK: MOV     #-400,R0        ;SET NUMBER OF CHAR TO CHECK
2039  011222  012701  017334                  MOV     #WBUFF,R1       ;SET WRITE DATA POINTER
2040  011226  012702  017746                  MOV     #RBUFF,R2       ;SET READ DATA POINTER
2041  011232  062702  000124                  ADD     #124,R2         ;POINT TO START OF DATA
2042  011236  005737  000764                  TST     W2FLG           ;SEE IF WRAP 2
2043  011242  001401                          BEQ     W1D0            ;IF NOT WAM 2: BR
2044  011244  005302                          DEC     R2              ;RESET POINTER
2045  011246  111105          W1D0:   MOVB    (R1),R5
2046  011250  120512                  CMPB    R5,(R2)         ;CHECK DATA
2047  011252  001007                  BNE     W1D1            ;IF NOT GOOD:BR
2048  011254  005737  000764                  TST     W2FLG           ;SEE IF WRAP 2
2049  011260  001001                          BNE     W1D0A           ;IF SO: BR
2050  011262  105105                  COMB    R5              ;COMPLIMENT EXPT DATA
2051  011264  120562  000001          W1D0A:  CMPB    R5,1(R2)        ;CHECK COMPLIMENT DATA
2052  011270  001510                          BEQ     W1D3            ;IF GOOD: BR
2053  011272  032777  020000  167270  W1D1:   BIT     #20000,@SWR     ;SEE IF PRINT INHIBIT
2054  011300  001104                          BNE     W1D3            ;IF SO: BR
2055  011302  005737  000620                  TST     HDRFL           ;SEE IF DONE HEADER
2056  011306  001020                          BNE     W1D2            ;IF SO: BR
2057  011310  013704  000622                  MOV     EMADDR,R4
2058  011314  004737  012752                  JSR     PC,TTOUT        ;PRINT TEST HEADER
2059  011320  012704  016632                  MOV     #WMSG16,R4
2060  011324  004737  012752                  JSR     PC,TTOUT        ;PRINT BAD DATA TAG
2061  011330  012704  017057                  MOV     #WMSG32,R4
2062  011334  004737  012752                  JSR     PC,TTOUT        ;PRINT PATRN TAG
2063  011340  013703  001002                  MOV     PATRN,R3
2064  011344  004737  013100                  JSR     PC,OCTP         ;PRINT PATTERN NUMBER
2065  011350  012737  000001  000620  W1D2:   MOV     #1,HDRFL        ;SET HEADER FLAG
2066  011356  012704  016656                  MOV     #WMSG21,R4
2067  011362  004737  012752                  JSR     PC,TTOUT        ;PRINT CHAR NUMBER TAG
2068  011366  013703  000774                  MOV     CRCNT,R3
2069  011372  004737  013100                  JSR     PC,OCTP         ;PRINT CHAR NUMBER
2070  011376  012704  016644                  MOV     #WMSG17,R4
2071  011402  004737  012752                  JSR     PC,TTOUT        ;PRNT GOOD TAG
2072  011406  111105                  MOVB    (R1),R5
2073  011410  110503                  MOVB    R5,R3           ;GET GOOD CHAR
2074  011412  005737  000764                  TST     W2FLG           ;SEE IF WRAP 2
2075  011416  001001                          BNE     W1D2A           ;IF SO: BR
2076  011420  105103                  COMB    R3              ;ELSE COMPLIMENT CHAR
2077  011422  004737  013326          W1D2A:  JSR     PC,DOUT         ;PRINT CHARACTER
2078  011426  012737  000240  000614          MOV     #240,TOB
2079  011434  004737  013052                  JSR     PC,TOG          ;SPACE
2080  011440  110503                  MOVB    R5,R3
2081  011442  004737  013326                  JSR     PC,DOUT         ;PRINT CHAR
2082  011446  012704  016651                  MOV     #WMSG20,R4
2083  011452  004737  012752                  JSR     PC,TTOUT        ;PRINT BAD TAG
2084  011456  116203  000001                  MOVB    1(R2),R3
2085  011462  004737  013326                  JSR     PC,DOUT         ;PRINT BAD CHAR
2086  011466  012737  000240  000614          MOV     #240,TOB
2087  011474  004737  013052                  JSR     PC,TOG          ;SPACE
2088  011500  111203                  MOVB    (R2),R3
2089  011502  004737  013326                  JSR     PC,DOUT         ;PRINT CHAR
2090  011506  005237  000766                  INC     DERFL           ;SET DATA ERROR FLAG
```

```
 2091  011512  122122                W1D3:   CMPB    (R1)+,(R2)+     ;BUMP ADDRESS
 2092  011514  105722                        TSTB    (R2)+           ;BUMP ADDRESS
 2093  011516  005237  000774                INC     CRCNT           ;BUMP CHAR CNTR
 2094  011522  000406                        BR      W1D5
 2095  011524  005737  000764        W1D4:   TST     W2FLG           ;SEE IF WRAP 2
 2096  011530  001401                        BEQ     W1D4A           ;IF NOT: BR
 2097  011532  000207                        RTS     PC              ;ELSE RETURN
 2098  011534  000137  010662        W1D4A:  JMP     PSCHK           ;GO CHECK POSTAMBLE
 2099  011540  005200                W1D5:   INC     R0
 2100  011542  001770                        BEQ     W1D4
 2101  011544  000137  011246                JMP     W1D0
 2102
 2103                                        ;PREAMBLE/POSTAMBLE GENERATE SUBROUTINE**********
 2104
 2105  011550  000240                PPGEN:  NOP
 2106  011552  012700  000050                MOV     #50,R0          ;SET SIZE OF PREAMBLE
 2107  011556  012701  017070                MOV     #PRE,R1
 2108  011562  005721                        TST     (R1)+           ;SET ADDRESS OF PRE
 2109  011564  012721  177400        1$:     MOV     #177400,(R1)+   ;FILL TABLE
 2110  011570  005300                        DEC     R0              ;SEE IF DONE
 2111  011572  001374                        BNE     1$              ;IF NOT: BR
 2112  011574  012701  017212                MOV     #POST,R1        ;SET ADDRESS OF POST
 2113  011600  012700  000050                MOV     #50,R0          ;SET SIZE OF POST
 2114  011604  012721  000377                MOV     #377,(R1)+      ;SET SYNC CHAR
 2115  011610  012721  177400        2$:     MOV     #177400,(R1)+   ;FILL TABLE
 2116  011614  005300                        DEC     R0              ;SEE IF DONE
 2117  011616  001374                        BNE     2$              ;IF NOT: BR
 2118  011620  000207                        RTS     PC              ;RETURN
```

```
2119
2120                                        ;END OF RECORD FORCE SUBROUTINE*****
2121
2122  011622  005237  000676          EORPA:  INC     TEMP2           ;SET WRAP FLAG
2123  011626  017700  166702          EORP:   MOV     @MR,R0          ;GET MAINT REG
2124  011632  042700  000036                  BIC     #36,R0          ;CLEAR CURRENT OP CODE
2125  011636  052700  000024                  BIS     #24,R0          ;SET EOR CLEAR OP CODE
2126  011642  010077  166666                  MOV     R0,@MR          ;DO EOR
2127  011646  042777  000037  166660          BIC     #37,@MR         ;CLEAR EOR AND MM
2128  011654  005000                          CLR     R0
2129  011656  012701  000002                  MOV     #2,R1
2130  011662  032777  000001  166620  EORP1:  BIT     #1,@C1          ;SEE IF GO GONE
2131  011670  001427                          BEQ     EORP2           ;IF SO: BR
2132  011672  005300                          DEC     R0
2133  011674  001372                          BNE     EORP1           ;AWAIT GO RESET
2134  011676  005301                          DEC     R1
2135  011700  001370                          BNE     EORP1
2136  011702  032777  020000  166660          BIT     #20000,@SWR     ;SEE IF ERROR PRINT INHIBIT
2137  011710  001017                          BNE     EORP2           ;IF SO: BR
2138  011712  005737  000620                  TST     HDRFL           ;SEE IF DONE HEADER
2139  011716  001004                          BNE     EORP1A          ;IF SO: BR
2140  011720  013704  000622                  MOV     EMADDR,R4
2141  011724  004737  012752                  JSR     PC,TTOUT        ;PRINT HEADER
2142  011730  012704  017022          EORP1A: MOV     #WMSG31,R4
2143  011734  004737  012752                  JSR     PC,TTOUT        ;PRINT EOR GO BIT ERROR
2144  011740  005777  166624                  TST     @SWR            ;SEE IF HALT ON ERROR
2145  011744  100001                          BPL     EORP2           ;IF NOT: BR
2146  011746  000000                          HALT
2147  011750  000240          EORP2:  NOP
2148  011752  005737  000676                  TST     TEMP2           ;SEE IF WAM
2149  011756  001015                          BNE     EORPX           ;IF NOT: BR
2150  011760  032777  000200  166602          BIT     #200,@SWR       ;SEE IF STATUS CHECK
2151  011766  001002                          BNE     EORP3           ;IF NOT: BR
2152  011770  004737  006742                  JSR     PC,WSTCK        ;ELSE GO CHECK STATUS
2153  011774  000240          EORP3:  NOP
2154  011776  032777  000400  166564          BIT     #400,@SWR       ;SEE IF DATA CHECK
2155  012004  001002                          BNE     EORPX           ;IF NOT: BR
2156  012006  004737  007332                  JSR     PC,DCHK         ;ELSE GO CHECK DATA
2157  012012  000240          EORPX:  NOP
2158  012014  005037  000676                  CLR     TEMP2           ;CLEAR FLAG
2159  012020  000207                          RTS     PC              ;RETURN
2160
```

```
2161
2162                                        ;SCOPE LOOP ON ERROR SUBROUTINE**********
2163
2164  012022  000240                SCOPE:  NOP
2165  012024  032777  040000  166536        BIT     #40000,@SWR     ;SEE IF LOOP ON ERROR
2166  012032  001001                        BNE     1$              ;IF SO: BR
2167  012034  000207                        RTS     PC              ;ELSE EXIT
2168  012036  000240                1$:     NOP
2169  012040  005726                        TST     (SP)+           ;RESET STACK
2170  012042  000240                        NOP
2171  012044  000240                        NOP
2172  012046  000177  166640               JMP     @SCOLP          ;LOOP ON ERROR
2173
2174                                        ;TEST ITERATION SUBROUTINE**********
2175
2176  012052  032777  004000  166510  ITER:  BIT     #4000,@SWR      ;SEE IF ITERATIONS
2177  012060  001403                        BEQ     2$              ;IF SO: BR
2178  012062  005037  000702        1$:     CLR     ITCNT           ;CLEAR ITERATION COUNTER
2179  012066  000207                        RTS     PC              ;ELSE EXIT
2180  012070  005737  001016        2$:     TST     @#PCNTR         ;DO SINGLE SUBTEST ITERATION
2181  012074  001772                        BEQ     1$              ;ON FIRST PASS
2182  012076  005237  000702                INC     ITCNT           ;BUMP COUNTER
2183  012102  023737  000702  000606        CMP     ITCNT,ITAMT     ;SEE IF DONE ALL
2184  012110  001764                        BEQ     1$              ;IF SO: BR
2185  012112  005726                        TST     (SP)+           ;RESET STACK
2186  012114  017700  166574               MOV     @ITRLP,R0       ;SET ITERATION POINTER
2187  012120  000110                        JMP     (R0)            ;GO ITERATE
2188
```

```
                                        ;INITIALIZE SUBROUTINE**********
                                INIT:   MOV     #40,@CS         ;INIT
                                        MOV     DRVN,@CS        ;SELECT DRIVE
                                        MOV     SLVN,@TC        ;SELECT SLAVE
                                        MOV     UDES,-(SP)      ;GET TEST'S UNIT DESCRIPTION
                                        BIC     #174377,(SP)    ;CLEAR ALL BUT DENSITY SELECT BITS
                                        CMP     #1400,(SP)+     ;BRANCH IF NOT NRZ (800 BPI)
                                        BNE     1$
                                        BIT     #40,@DS         ;BRANCH IF SLAVE IS IN NRZ MODE
                                        BEQ     4$              ;(PES = 0)
                                        BR      2$              ;GO CHANGE DENSITY
                                1$:     BIT     #40,@DS         ;BRANCH IF SLAVE IS IN PE MODE
                                        BNE     4$              ;(PES = 1)
                                2$:     MOV     #7,@C1          ;REWIND SLAVE
                                20$:    BIT     #200,@DS        ;WAIT FOR READY
                                        BEQ     20$
                                3$:     BIT     #20000,@DS      ;LOOP UNTIL REWIND IS COMPLETE
                                        BNE     3$              ;(PIP = 0)
                                4$:     BIS     UDES,@TC        ;LOAD UNIT DESCRIPTION
                                        BIT     #2,@DS          ;BRANCH IF NOT AT BOT
                                        BEQ     6$
                                        MOV     #25,@C1         ;ERASE TO GET OFF BOT
                                5$:     BIT     #200,@DS        ;LOOP UNTIL DONE
                                        BEQ     5$
                                6$:     MOV     #11,@C1         ;DO A DRIVE CLEAR
                                        RTS     PC              ;RETURN TO CALLER

                                        ;MAG TAPE INTERRUPT HANDLER**********

                                MTINT:  NOP
                                        MOV     RTRN,(SP)       ;SET RETURN TO (RTRN)
                                        RTI                     ;RETURN

                                        ;TTY INTERRUPT HANDLER**********

                                TTINT:  MOV     @TKB,-(SP)      ;GET CHARACTER
                                        BIC     #200,(SP)       ;CLEAR PARITY BIT
                                        CMPB    #3,(SP) ;BRANCH IF NOT CONTROL C
                                        BNE     1$
                                        TST     CHNFLG          ;INHIBIT  C IF CHAIN MODE
                                        BNE     1$
                                        RESET
                                        JMP     @#200           ;RESTART PROGRAM
                                1$:     CMPB    #1,(SP)         ;BRANCH IF NOT  A
                                        BNE     2$
                                        CMP     #SWREG,SWR      ;BRANCH IF HARDWARE SWR INVOKED
                                        BNE     3$
                                        MOV     #177570,SWR     ;INVOKE HARDWARE SWR
                                        JSR     PC,.SAVE        ;SAVE REGISTERS ON THE STACK
                                        MOV     #MSG63,R4       ;TYPE 'HARDWARE SWR IN USE'
                                        JSR     PC,TTOUT
                                        JSR     PC,.RESTORE     ;RESTORE REGISTERS
                                2$:     CMP     #7,(SP)         ;BRANCH IF NOT  G
                                        BNE     4$
```

```
 2245  012412  012737  000176  000570  3$:     MOV     #SWREG,SWR      ;INVOKE SOFTWARE SWR
 2246  012420  004737  013532                  JSR     PC,GTSWR        ;GET SOFTWARE SWITCHES
 2247  012424  005726                  4$:     TST     (SP)+           ;POP CHARACTER OFF THE STACK
 2248  012426  000002                          RTI                     ;RETURN
 2249
```

```
                                        ;*********************************************************
                                        ;TTY ENTRY SUBROUTINE:
                                        ;
                                        ;THIS SUBROUTINE IS USED BY THE TEST CONDITION
                                        ;ENTRY ROUTINE TO READ THE RESPONSE ENTERED
                                        ;AT THE TTY AND CHECK THEM FOR LEGALITY AND
                                        ;LIMITS.  ALL RESPONSE MUST BE TYPED IN OCTAL
                                        ;(0-7) AND MUST FALL WITHIN THE LIMITS SET BY
                                        ;THE CALLING ROUTINE.
                                        ;IF AN ENTRY IS ILLEGAL OR OUTSIDE THE LIMITS,
                                        ;A QUESTION MARK IS TYPED (?) AND THE RESPONSE
                                        ;MAY BE REENTERED.
                                        ;ENTRIES MAY NOT EXCEED SIX (6) CHARACTERS AND
                                        ;MAY BE TERMINATED AT LESS THAN SIX BY TYPING A
                                        ;CARRIAGE RETURN
                                        ;*********************************************************

012430  010146              TTR:    MOV     R1,-(SP)        ;SAVE CHAR COUNT
012432  011601              10$:    MOV     (SP),R1         ;RESET CHAR COUNT (FOR  U)
012434  005037  000674              CLR     TEMP1           ;CLEAR FIRST CHARACTER FLAG
012440  005000                      CLR     R0
012442  004737  012710      1$:     JSR     PC,TTIN         ;GO READ CHARACTER
012446  122737  000003  000616      CMPB    #3,TIB          ;BRANCH IF NOT  C
012454  001003                      BNE     11$
012456  000005                      RESET
012460  000137  000200              JMP     @#200           ;RESTART AT 200
012464  122737  000015  000616  11$:CMPB    #15,TIB         ;SEE IF CR
012472  001004                      BNE     2$              ;IF NOT: BR
012474  005737  000674              TST     TEMP1           ;SEE IF FIRST CHARACTER
012500  001471                      BEQ     9$              ;IF SO: BR
012502  000457                      BR      6$              ;ELSE GO LOAD VALUE
012504  122737  000025  000616  2$: CMPB    #25,TIB         ;BRANCH IF NOT CONTROL U
012512  001005                      BNE     21$
012514  012704  014465              MOV     #MSG59,R4       ;TYPE<CR><LF>
012520  004737  012752              JSR     PC,TTOUT
012524  000742                      BR      10$
012526  122737  000177  000616  21$:CMPB    #177,TIB                ;BRANCH IF NOT 'RUBOUT'
012534  001012                      BNE     3$
012536  000241                      CLC                     ;REMOVE LAST TYPED CHAR
012540  006000                      ROR     R0
012542  006200                      ASR     R0
012544  006200                      ASR     R0
012546  012704  014467              MOV     #MSG60,R4       ;TYPE ' '
012552  004737  012752              JSR     PC,TTOUT
012556  005201                      INC     R1              ;DECREMENT CHAR RECEIVED COUNT
012560  000730                      BR      1$              ;GET NEXT CHAR
012562  122737  000060  000616  3$: CMPB    #60,TIB         ;SEE IF CHAR IS LESS THAN 0
012570  101402                      BLOS    4$              ;IF NOT: BR
012572  000137  012670              JMP     TINER           ;ELSE GO TO ERROR
012576  122737  000070  000616  4$: CMPB    #70,TIB         ;SEE IF CHAR IS GREATER THAN 7
012604  101002                      BHI     5$              ;IF NOT: BR
012606  000137  012670              JMP     TINER           ;ELSE GO TO ERROR
012612  005237  000674          5$: INC     TEMP1           ;SET FIRST CHARACTER FLAG
012616  006300                      ASL     R0
012620  006300                      ASL     R0              ;SHIFT 3 LEFT
012622  006300                      ASL     R0
```

```
 2306  012624  042737  177770  000616          BIC     #177770,TIB     ;STRIP ASCII
 2307  012632  053700  000616                  BIS     TIB,R0          ;LOAD CHARACTER
 2308  012636  005301                          DEC     R1              ;SEE IF DONE
 2309  012640  001300                          BNE     1$              ;IF NOT: BR
 2310  012642  020002                  6$:     CMP     R0,R2           ;SEE IF EXCEEDED MAXIMUM LIMIT
 2311  012644  101402                          BLOS    7$              ;IF NOT: BR
 2312  012646  000137  012670                  JMP     TINER           ;ELSE GO TO ERROR
 2313  012652  020300                  7$:     CMP     R3,R0           ;SEE IF BELOW MINIMUM LIMIT
 2314  012654  101402                          BLOS    8$              ;IF NOT: BR
 2315  012656  000137  012670                  JMP     TINER           ;ELSE GO TO ERROR
 2316  012662  010015                  8$:     MOV     R0,(R5)         ;LOAD VALUE
 2317  012664  005726                  9$:     TST     (SP)+           ;POP CHAR COUNT OFF STACK
 2318  012666  000207                          RTS     PC              ;EXIT
```

```
2319
2320                                        ;TTY ENTRY ERROR SUBROUTINE**********
2321
2322  012670  012704  014342        TINER:  MOV     #MSG40,R4
2323  012674  004737  012752                JSR     PC,TTOUT        ;PRINT?
2324  012700  005726                        TST     (SP)+           ;POP CHAR COUNT OFF STACK
2325  012702  162716  000020                SUB     #20,(SP)        ;RESET SP TO START OF VALUE ROUTINE
2326  012706  000207                        RTS     PC              ;REDO VALUE ENTRY
2327
2328                                        ;TTY READ SUBROUTINE**********
2329
2330  012710  005277  165656        TTIN:   INC     @TKS
2331  012714  105777  165652        1$:     TSTB    @TKS
2332  012720  100375                        BPL     1$
2333  012722  017737  165646  000616        MOV     @TKB,TIB
2334  012730  042737  000200  000616        BIC     #200,TIB
2335  012736  013737  000616  000614        MOV     TIB,TOB         ;MOVE CHAR TO TTY OUPUT BFR
2336  012744  004737  013052                JSR     PC,TOG          ;ECHO CHARACTER
2337  012750  000207                        RTS     PC
2338
2339                                        ;TTY OUTPUT SUBROUTINE***********
2340
2341  012752  112437  000614        TTOUT:  MOVB    (R4)+,TOB
2342  012756  122737  000043  000614        CMPB    #43,TOB
2343  012764  001440                        BEQ     TEX
2344  012766  122737  000045  000614        CMPB    #45,TOB
2345  012774  001403                        BEQ     1$
2346  012776  004737  013052                JSR     PC,TOG
2347  013002  000763                        BR      TTOUT
2348  013004  112737  000015  000614  1$:   MOVB    #15,TOB
2349  013012  004737  013052                JSR     PC,TOG
2350  013016  012703  000004                MOV     #4,R3
2351  013022  005037  000614          2$:   CLR     TOB
2352  013026  004737  013052                JSR     PC,TOG
2353  013032  005303                        DEC     R3
2354  013034  001372                        BNE     2$              ;DO FILLERS
2355  013036  112737  000012  000614        MOVB    #12,TOB
2356  013044  004737  013052                JSR     PC,TOG
2357  013050  000740                        BR      TTOUT
2358  013052  105777  165520          TOG:  TSTB    @TPS
2359  013056  100375                        BPL     TOG
2360  013060  113777  000614  165512        MOVB    TOB,@TPB
2361  013066  000207                TEX:    RTS     PC
2362
2363
2364                                        ;OCTAL OUTPUT SUBROUTINE***********
2365
2366  013070  012737  000001  013324  OCTPE:  MOV     #1,OFL
2367  013076  000402                        BR      OCTPE1
2368  013100  005037  013324          OCTP:   CLR     OFL             ;CLEAR FLAG FOR LEADING ZERO
2369  013104  010304                OCTPE1: MOV     R3,R4           ;SEE IF NUMBER IS ZERO
2370  013106  001007                        BNE     OCTP0           ;IF NOT ZERO: BR
2371  013110  005737  013324                TST     OFL             ;SEE IF PRINT ALL 0
2372  013114  001004                        BNE     OCTP0           ;IF SO: BR
2373  013116  004737  013304                JSR     PC,OCTPG1       ;ELSE PRINT ZERO
2374  013122  000137  013246                JMP     OCTP3           ;SPACE AND EXIT
```

```
 2375  013126  032704  100000          OCTP0:  BIT     #100000,R4      ;SEE IF MSD = 1
 2376  013132  001406                          BEQ     OCTP1           ;IF NOT: BR
 2377  013134  012704  000001                  MOV     #1,R4
 2378  013140  004737  013262                  JSR     PC,OCTPG        ;PRINT 1
 2379  013144  000137  013156                  JMP     OCTP2
 2380  013150  005004                  OCTP1:  CLR     R4
 2381  013152  004737  013262                  JSR     PC,OCTPG        ;PRINT 0
 2382  013156  010304                  OCTP2:  MOV     R3,R4
 2383  013160  006004                          ROR     R4
 2384  013162  006004                          ROR     R4
 2385  013164  006004                          ROR     R4              ;POSITION DIGIT
 2386  013166  006004                          ROR     R4
 2387  013170  000304                          SWAB    R4
 2388  013172  004737  013262                  JSR     PC,OCTPG        ;PRINT DIGIT 2
 2389  013176  010304                          MOV     R3,R4
 2390  013200  006004                          ROR     R4
 2391  013202  000304                          SWAB    R4
 2392  013204  004737  013262                  JSR     PC,OCTPG        ;PRINT DIGIT 3
 2393  013210  010304                          MOV     R3,R4
 2394  013212  006104                          ROL     R4
 2395  013214  006104                          ROL     R4
 2396  013216  000304                          SWAB    R4
 2397  013220  004737  013262                  JSR     PC,OCTPG        ;PRINT DIGIT 4
 2398  013224  010304                          MOV     R3,R4
 2399  013226  006004                          ROR     R4
 2400  013230  006004                          ROR     R4
 2401  013232  006004                          ROR     R4
 2402  013234  004737  013262                  JSR     PC,OCTPG
 2403  013240  010304                          MOV     R3,R4
 2404  013242  004737  013262                  JSR     PC,OCTPG        ;PRINT DIGIT 5
 2405  013246  012737  000240  000614  OCTP3:  MOV     #240,TOB
 2406  013254  004737  013052                  JSR     PC,TOG          ;PRINT SPACE
 2407  013260  000207                          RTS     PC              ;EXIT
 2408  013262  042704  177770          OCTPG:  BIC     #177770,R4
 2409  013266  001004                          BNE     OCTPG0
 2410  013270  005737  013324                  TST     OFL
 2411  013274  001001                          BNE     OCTPG0
 2412  013276  000207                          RTS     PC
 2413
 2414  013300  005237  013324          OCTPG0: INC     OFL
 2415  013304  052704  000260          OCTPG1: BIS     #260,R4
 2416  013310  010437  000614                  MOV     R4,TOB
 2417  013314  004737  013052                  JSR     PC,TOG
 2418  013320  010304                          MOV     R3,R4
 2419  013322  000207                          RTS     PC
 2420  013324  000000                  OFL:    0                       ;FIRST CHAR FLAG
 2421
```

```
2422
2423                                        ;DATA CHARACTER OUTPUT SUBROUTINE***********
2424
2425  013326  012704  000010        DOUT:   MOV     #10,R4          ;SET NUMBER TO PRINT
2426  013332  110337  000614                MOVB    R3,TOB
2427  013336  105777  165234        1$:     TSTB    @TPS
2428  013342  100375                        BPL     1$
2429  013344  132737  000200  000614        BITB    #200,TOB
2430  013352  001404                        BEQ     2$
2431  013354  012777  000061  165216        MOV     #061,@TPB
2432  013362  000403                        BR      3$
2433  013364  012777  000060  165206  2$:   MOV     #060,@TPB
2434  013372  006337  000614        3$:     ASL     TOB
2435  013376  005304                        DEC     R4
2436  013400  001356                        BNE     1$
2437  013402  000207                        RTS     PC
2438
2439  013404  013703  000700        DOUTD:  MOV     TEMP3,R3
2440  013410  000303                        SWAB    R3
2441  013412  004737  013326                JSR     PC,DOUT
2442  013416  013703  000700                MOV     TEMP3,R3
2443  013422  004737  013326                JSR     PC,DOUT
2444  013426  000207                        RTS     PC
2445
2446                                        ;TU45 SERIAL NUMBER PRINT SUBROUTINE**********
2447
2448  013430  010304        SNPT:   MOV     R3,R4
2449  013432  000304                MOV     R4
2450  013434  006004                ROR     R4
2451  013436  006004                ROR     R4
2452  013440  006004                ROR     R4
2453  013442  006004                ROR     R4              ;GET FIRST DIGIT
2454  013444  004737  013506        JSR     PC,SNPG         ;PRINT
2455  013450  010304                MOV     R3,R4
2456  013452  000304                SWAB    R4              ;GET SECOND DIGIT
2457  013454  004737  013506        JSR     PC,SNPG         ;PRINT
2458  013460  010304                MOV     R3,R4
2459  013462  006004                ROR     R4
2460  013464  006004                ROR     R4
2461  013466  006004                ROR     R4
2462  013470  006004                ROR     R4
2463  013472  004737  013506        JSR     PC,SNPG         ;PRINT THIRD DIGIT
2464  013476  010304                MOV     R3,R4
2465  013500  004737  013506        JSR     PC,SNPG         ;PRINT FOURTH DIGIT
2466  013504  000207                RTS     PC              ;EXIT
2467  013506  012737  000260  000614  SNPG:  MOV     #260,TOB        ;SET BASE = 0
2468  013514  042704  177760                BIC     #177760,R4      ;MASK DIGIT
2469  013520  050437  000614                BIS     R4,TOB          ;SET ASCII
2470  013524  004737  013052                JSR     PC,TOG          ;TYPE DIGIT
2471  013530  000207                        RTS     PC              ;RETURN
```

```
2472
2473                                    ;THIS ROUTINE GETS THE NEW VALUE FOR THE SOFTWARE SWITCH REG
2474
2475  013532  022737  000176  000570  GTSWR:  CMP     #SWREG,SWR      ;BRANCH IF SOFTWARE SWR NOT
2476  013540  001032                          BNE     1$              ;INVOKED
2477  013542  004737  013630                  JSR     PC,..SAVE       ;SAVE REGISTERS ON THE STACK
2478  013546  012704  016015                  MOV     #$MSWR,R4       ;TYPE 'SWR = '
2479  013552  004737  012752                  JSR     PC,TTOUT
2480  013556  017703  165006                  MOV     @SWR,R3         ;GET CURRENT SETTING
2481  013562  004737  013070                  JSR     PC,OCTPE        ;AND TYPE THEM
2482  013566  012704  016025                  MOV     #$MNEW,R4       ;TYPE ' NEW = '
2483  013572  004737  012752                  JSR     PC,TTOUT
2484  013576  013705  000570                  MOV     SWR,R5          ;TTR ROUTINE RETURN NEW VALUE TO (R5)
2485  013602  012701  000007                  MOV     #7,R1           ;LIMIT RESPONSE TO 7 CHARS
2486  013606  012702  177777                  MOV     #177777,R2      ;BETWEEN 0 AND 177777
2487  013612  012703  000000                  MOV     #0,R3
2488  013616  004737  012430                  JSR     PC,TTR          ;GET RESPONSE
2489  013622  004737  013652                  JSR     PC,..RESTORE    ;RESTORE REGISTERS
2490  013626  000207                  1$:     RTS     PC              ;RETURN TO CALLER
2491
2492                                    ;;ROUTINE TO SAVE REGISTERS ON THE STACK
2493  013630  010546                  .SAVE:  MOV     %5,-(SP)        ;;R5 IS SAVED AT 12(SP)
2494  013632  010446                          MOV     %4,-(SP)        ;;R4 IS SAVED AT 10(SP)
2495  013634  010346                          MOV     %3,-(SP)        ;;R3 IS SAVED AT 6(SP)
2496  013636  010246                          MOV     %2,-(SP)        ;;R2 IS SAVED AT 4(SP)
2497  013640  010146                          MOV     %1,-(SP)        ;;R1 IS SAVED AT 2(SP)
2498  013642  010046                          MOV     %0,-(SP)        ;;R0 IS SAVED AT (SP)
2499  013644  016646  000014                  MOV     14(SP),-(SP)    ;;PUSH RETURN PC ON THE STACK
2500  013650  000207                          RTS     PC              ;;RETURN TO CALLER
2501
2502                                    ;;ROUTINE TO RESTORE REGISTERS SAVED ON THE STACK
2503  013652  012666  000014          .RESTORE:MOV    (SP)+,14(SP)    ;;STORE RETURN PC ON STACK
2504  013656  012600                          MOV     (SP)+,%0
2505  013660  012601                          MOV     (SP)+,%1
2506  013662  012602                          MOV     (SP)+,%2
2507  013664  012603                          MOV     (SP)+,%3
2508  013666  012604                          MOV     (SP)+,%4
2509  013670  012605                          MOV     (SP)+,%5
2510  013672  000207                          RTS     PC              ;;RETURN
2511
```

```
2512
2513                                        ;MESSAGE TABLE**********
2514
2515  013674  022445  046524  031460  MSG1:   .ASCII'%%TM03-TU45 CONTROL LOGIC TEST PART II  (CZTUPA0)';++B
2516  013702  052055  032125  020065
2517  013710  047503  052116  047522
2518  013716  020114  047514  044507
2519  013724  020103  042524  052123
2520  013732  050040  051101  020124
2521  013740  044511  020040  041450
2522  013746  052132  050125  030101
2523  013754     051
2524  013755     045  025052  040452          .ASCII  /%***ASSURE TAPE IS AT BOT***/
2525  013762  051523  051125  020105
2526  013770  040524  042520  044440
2527  013776  020123  052101  041040
2528  014004  052117  025052     052
2529  014011     045  054524  042520          .ASCII  /%TYPE <CR> TO TERMINATE RESPONSE &  C TO RESTART%#/
2530  014016  036040  051103  020076
2531  014024  047524  052040  051105
2532  014032  044515  040516  042524
2533  014040  051040  051505  047520
2534  014046  051516  020105  020046
2535  014054  041536  052040  020117
2536  014062  042522  052123  051101
2537  014070  022524     043
2538  014073     105  050130  026524  MSG6:   .ASCII  /EXPT-NOT RECVD#/
2539  014100  047516  020124  042522
2540  014106  053103  021504
2541  014112  041522  042126  047055  MSG7:   .ASCII  /RCVD-NOT EXPT#/
2542  014120  052117  042440  050130
2543  014126  021524
2544  014130  047045  047117  042455  MSG9:   .ASCII  /%NON-EXIST SLAVE #/
2545  014136  044530  052123  051440
2546  014144  040514  042526  021440
2547  014152  051045  040505  020104  MSG10:  .ASCII  /%READ CONT BUS PAR #/
2548  014160  047503  052116  041040
2549  014166  051525  050040  051101
2550  014174  021440
2551  014176  053445  044522  042524  MSG11:  .ASCII  /%WRITE CONT BUS PAR #/
2552  014204  041440  047117  020124
2553  014212  052502  020123  040520
2554  014220  020122     043
2555  014223     040  054105  052120  MSG12:  .ASCII  / EXPT #/
2556  014230  021440
2557  014232  051040  053103  020104  MSG13:  .ASCII  / RCVD #/
2558  014240     043
2559  014241     045  051115  041040  MSG14:  .ASCII  /%MR BITS 4-0#/
2560  014246  052111  020123  026464
2561  014254  021460
2562  014256  046445  020122  044502  MSG15:  .ASCII  /%MR BITS 15-7#/
2563  014264  051524  030440  026465
2564  014272  021467
2565  014274  044445  042524  035122  MSG16:  .ASCII  /%ITER: #/
2566  014302  021440
2567  014304  052045  020103  044502  MSG18:  .ASCII  /%TC BITS 12-0 #/
```

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 2568  014312  051524  030440  026462
 2569  014320  020060     043
 2570  014323     045  041506  041040  MSG19:  .ASCII  /%FC BITS 15-0 #/
 2571  014330  052111  020123  032461
 2572  014336  030055  021440
 2573  014342  037440  021440          MSG40:  .ASCII  / ? #/
 2574  014346  022445  047105  020104  MSG41:  .ASCII  /%%END OF PASS #/
 2575  014354  043117  050040  051501
 2576  014362  020123     043
 2577  014365     045  042522  044507  MSG44:  .ASCII  /%REGISTER START: #/
 2578  014372  052123  051105  051440
 2579  014400  040524  052122  020072
 2580  014406     043
 2581  014407     045  042526  052103  MSG45:  .ASCII  /%VECTOR ADDRESS: #/
 2582  014414  051117  040440  042104
 2583  014422  042522  051523  020072
 2584  014430     043
 2585  014431     045  046524  031460  MSG57:  .ASCII  /%TM03 DRIVE: #/
 2586  014436  042040  044522  042526
 2587  014444  020072     043
 2588  014447     045  052524  032464  MSG58:  .ASCII  /%TU45 SLAVE: #/
 2589  014454  051440  040514  042526
 2590  014462  020072     043
 2591  014465     045     043          MSG59:  .ASCII  /%#/
 2592  014467     134     043          MSG60:  .ASCII  / #/
 2593  014471     045  042522  047515  MSG62:  .ASCII  /%REMOVE TMDP FROM SLAVE TO BE TESTED%#/
 2594  014476  042526  052040  042115
 2595  014504  020120  051106  046517
 2596  014512  051440  040514  042526
 2597  014520  052040  020117  042502
 2598  014526  052040  051505  042524
 2599  014534  022504     043
 2600  014537     045  040510  042122  MSG63:  .ASCII  /%HARDWARE SWR IN USE%#/
 2601  014544  040527  042522  051440
 2602  014552  051127  044440  020116
 2603  014560  051525  022505     043
```

```
                                                ;TEST HEADER**********

014565    045  046045  043517  MSLT1:  .ASCII  /%%LOGIC TEST 1: WRAP 3,NRZ,NORMAL,ODD#/
014572 041511  052040  051505
014600 020124  035061  053440
014606 040522  020120  026063
014614 051116  026132  047516
014622 046522  046101  047454
014630 042104     043
014633    045  046045  043517  MSLT2:  .ASCII  /%%LOGIC TEST 2: WRAP 3,PE,NORMAL,ODD#/
014640 041511  052040  051505
014646 020124  035062  053440
014654 040522  020120  026063
014662 042520  047054  051117
014670 040515  026114  042117
014676 021504
014700 022445  047514  044507  MSLT3:  .ASCII  /%%LOGIC TEST 3: WRAP 2,NRZ,NORMAL,ODD#/
014706 020103  042524  052123
014714 031440  020072  051127
014722 050101  031040  047054
014730 055122  047054  051117
014736 040515  026114  042117
014744 021504
014746 022445  047514  044507  MSLT4:  .ASCII  /%%LOGIC TEST 4: WRAP 2,PE,NORMAL,ODD#/
014754 020103  042524  052123
014762 032040  020072  051127
014770 050101  031040  050054
014776 026105  047516  046522
015004 046101  047454  042104
015012    043
015013    045  046045  043517  MSLT5:  .ASCII  /%%LOGIC TEST 5: WRAP 1,NRZ,NORMAL,ODD#/
015020 041511  052040  051505
015026 020124  035065  053440
015034 040522  020120  026061
015042 051116  026132  047516
015050 046522  046101  047454
015056 042104     043
015061    045  046045  043517  MSLT6:  .ASCII  /%%LOGIC TEST 6: WRAP 1,PE,NORMAL,ODD#/
015066 041511  052040  051505
015074 020124  035066  053440
015102 040522  020120  026061
015110 042520  047054  051117
015116 040515  026114  042117
015124 021504
015126 022445  047514  044507  MSLT7:  .ASCII  /%%LOGIC TEST 7: WRAP 0,NRZ,NORMAL,ODD#/
015134 020103  042524  052123
015142 033440  020072  051127
015150 050101  030040  047054
015156 055122  047054  051117
015164 040515  026114  042117
015172 021504
015174 022445  047514  044507  MSLT10: .ASCII  /%%LOGIC TEST 10: WRAP 0,PE,NORMAL,ODD#/
015202 020103  042524  052123
015210 030440  035060  053440
015216 040522  020120  026060
015224 042520  047054  051117
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 2660  015232  040515  026114  042117
 2661  015240  021504
 2662  015242  022445  047514  044507  MSLT11: .ASCII  /%%LOGIC TEST 11: CORE DUMP WRITE (M8906)#/
 2663  015250  020103  042524  052123
 2664  015256  030440  035061  041440
 2665  015264  051117  020105  052504
 2666  015272  050115  053440  044522
 2667  015300  042524  024040  034115
 2668  015306  030071  024466     043
 2669  015313     045  046045  043517  MSLT12: .ASCII  /%%LOGIC TEST 12: CORE DUMP READ (M8906)#/
 2670  015320  041511  052040  051505
 2671  015326  020124  031061  020072
 2672  015334  047503  042522  042040
 2673  015342  046525  020120  042522
 2674  015350  042101  024040  034115
 2675  015356  030071  024466     043
 2676  015363     045  046045  043517  MSLT13: .ASCII  /%%LOGIC TEST 13: EVEN PARITY WRITE (M8933 M8934)#/
 2677  015370  041511  052040  051505
 2678  015376  020124  031461  020072
 2679  015404  053105  047105  050040
 2680  015412  051101  052111  020131
 2681  015420  051127  052111  020105
 2682  015426  046450  034470  031463
 2683  015434  046440  034470  032063
 2684  015442  021451
 2685  015444  022445  047514  044507  MSLT14: .ASCII  /%%LOGIC TEST 14: EVEN PARITY READ(M8933 M8934)#/
 2686  015452  020103  042524  052123
 2687  015460  030440  035064  042440
 2688  015466  042526  020116  040520
 2689  015474  044522  054524  051040
 2690  015502  040505  024104  034115
 2691  015510  031471  020063  034115
 2692  015516  031471  024464     043
 2693  015523     045  046045  043517  MSLT15: .ASCII  /%%LOGIC TEST 15: READ REVERSE(M8906)#/
 2694  015530  041511  052040  051505
 2695  015536  020124  032461  020072
 2696  015544  042522  042101  051040
 2697  015552  053105  051105  042523
 2698  015560  046450  034470  033060
 2699  015566  021451
 2700  015570  022445  047514  044507  MSLT16: .ASCII  /%%LOGIC TEST 16: CRC CORRECTION SINGLE TRACK,ALL FRAMES#/
 2701  015576  020103  042524  052123
 2702  015604  030440  035066  041440
 2703  015612  041522  041440  051117
 2704  015620  042522  052103  047511
 2705  015626  020116  044523  043516
 2706  015634  042514  052040  040522
 2707  015642  045503  040454  046114
 2708  015650  043040  040522  042515
 2709  015656  021523
 2710  015660  022445  047514  044507  MSLT17: .ASCII  /%%LOGIC TEST 17: CRC CORRECTION MULTIPLE BAD TRACKS#/
 2711  015666  020103  042524  052123
 2712  015674  030440  035067  041440
 2713  015702  041522  041440  051117
 2714  015710  042522  052103  047511
 2715  015716  020116  052515  052114
```

```
 2716  015724  050111  042514  041040
 2717  015732  042101  052040  040522
 2718  015740  045503  021523
 2719  015744  022445  047514  044507  MSLT20: .ASCII  /%%LOGIC TEST 20: READ REVERSE,NRZ,WRAP 3#/
 2720  015752  020103  042524  052123
 2721  015760  031040  035060  051040
 2722  015766  040505  020104  042522
 2723  015774  042526  051522  026105
 2724  016002  051116  026132  051127
 2725  016010  050101  031440     043
```

```
                                                ;TAG MESSAGE

016015     045  053523  020122  $MSWR:  .ASCII  /%SWR = #/
016022  020075     043
016025     040  042516  020127  $MNEW:  .ASCII  / NEW = #/
016032  020075     043

          016036                        .EVEN
                                        ;WRITE BUFFER

016036  000100                  WDATA:
016036  177777                          -1
016040  177777                          -1
016042  177777                          -1
016044  177777                          -1
016046  177777                          -1
016050  177777                          -1
016052  177777                          -1
016054  177777                          -1
016056  177777                          -1
016060  177777                          -1
016062  177777                          -1
016064  177777                          -1
016066  177777                          -1
016070  177777                          -1
016072  177777                          -1
016074  177777                          -1
016076  177777                          -1
016100  177777                          -1
016102  177777                          -1
016104  177777                          -1
016106  177777                          -1
016110  177777                          -1
016112  177777                          -1
016114  177777                          -1
016116  177777                          -1
016120  177777                          -1
016122  177777                          -1
016124  177777                          -1
016126  177777                          -1
016130  177777                          -1
016132  177777                          -1
016134  177777                          -1
016136  177777                          -1
016140  177777                          -1
016142  177777                          -1
016144  177777                          -1
016146  177777                          -1
016150  177777                          -1
016152  177777                          -1
016154  177777                          -1
016156  177777                          -1
016160  177777                          -1
016162  177777                          -1
016164  177777                          -1
```

```
 2782  016166  177777                    -1
 2783  016170  177777                    -1
 2784  016172  177777                    -1
 2785  016174  177777                    -1
 2786  016176  177777                    -1
 2787  016200  177777                    -1
 2788  016202  177777                    -1
 2789  016204  177777                    -1
 2790  016206  177777                    -1
 2791  016210  177777                    -1
 2792  016212  177777                    -1
 2793  016214  177777                    -1
 2794  016216  177777                    -1
 2795  016220  177777                    -1
 2796  016222  177777                    -1
 2797  016224  177777                    -1
 2798  016226  177777                    -1
 2799  016230  177777                    -1
 2800  016232  177777                    -1
 2801  016234  177777                    -1
 2802
 2803
 2804                                    ;READ BUFFER
 2805
 2806  016236  000100              RDATA:
 2807  016236  000000                    0
 2808  016240  000000                    0
 2809  016242  000000                    0
 2810  016244  000000                    0
 2811  016246  000000                    0
 2812  016250  000000                    0
 2813  016252  000000                    0
 2814  016254  000000                    0
 2815  016256  000000                    0
 2816  016260  000000                    0
 2817  016262  000000                    0
 2818  016264  000000                    0
 2819  016266  000000                    0
 2820  016270  000000                    0
 2821  016272  000000                    0
 2822  016274  000000                    0
 2823  016276  000000                    0
 2824  016300  000000                    0
 2825  016302  000000                    0
 2826  016304  000000                    0
 2827  016306  000000                    0
 2828  016310  000000                    0
 2829  016312  000000                    0
 2830  016314  000000                    0
 2831  016316  000000                    0
 2832  016320  000000                    0
 2833  016322  000000                    0
 2834  016324  000000                    0
 2835  016326  000000                    0
 2836  016330  000000                    0
 2837  016332  000000                    0
```

```
 2838  016334  000000                          0
 2839  016336  000000                          0
 2840  016340  000000                          0
 2841  016342  000000                          0
 2842  016344  000000                          0
 2843  016346  000000                          0
 2844  016350  000000                          0
 2845  016352  000000                          0
 2846  016354  000000                          0
 2847  016356  000000                          0
 2848  016360  000000                          0
 2849  016362  000000                          0
 2850  016364  000000                          0
 2851  016366  000000                          0
 2852  016370  000000                          0
 2853  016372  000000                          0
 2854  016374  000000                          0
 2855  016376  000000                          0
 2856  016400  000000                          0
 2857  016402  000000                          0
 2858  016404  000000                          0
 2859  016406  000000                          0
 2860  016410  000000                          0
 2861  016412  000000                          0
 2862  016414  000000                          0
 2863  016416  000000                          0
 2864  016420  000000                          0
 2865  016422  000000                          0
 2866  016424  000000                          0
 2867  016426  000000                          0
 2868  016430  000000                          0
 2869  016432  000000                          0
 2870  016434  000000                          0
 2871
 2872                                          ;WRAP AROUND MESSAGES******
 2873
 2874  016436  051445  052105  050125  WMSG2:  .ASCII  /%SETUP ERROR%#/
 2875  016444  042440  051122  051117
 2876  016452  021445
 2877  016454  050045  052101  047122  WMSG3:  .ASCII  /%PATRN NUMBER = #/
 2878  016462  047040  046525  042502
 2879  016470  020122  020075     043
 2880  016475     045  047516  026516  WMSG4:  .ASCII  /%NON-EXISTANT DRIVE%#/
 2881  016502  054105  051511  040524
 2882  016510  052116  042040  044522
 2883  016516  042526  021445
 2884  016522  041445  030523  021440  WMSG6:  .ASCII  /%CS1 #/
 2885  016530  053445  020103     043  WMSG6A: .ASCII  /%WC #/
 2886  016535     045  040502  021440  WMSG6B: .ASCII  /%BA #/
 2887  016542  043045  020103     043  WMSG6C: .ASCII  /%FC #/
 2888  016547     045  051503  020062  WMSG6D: .ASCII  /%CS2 #/
 2889  016554     043
 2890  016555     045  051504  021440  WMSG6E: .ASCII  /%DS #/
 2891  016562  042445  020122     043  WMSG6F: .ASCII  /%ER #/
 2892  016567     045  051501  021440  WMSG6G: .ASCII  /%AS #/
 2893  016574  041445  020103     043  WMSG6H: .ASCII  /%CC #/
```

```
 2894  016601     045  041104  021440  WMSG6I: .ASCII  /%DB #/
 2895  016606  046445  020122     043  WMSG6J: .ASCII  /%MR #/
 2896  016613     045  052104  021440  WMSG6K: .ASCII  /%DT #/
 2897  016620  052045  020103     043  WMSG6L: .ASCII  /%TC #/
 2898  016625     045  047123  021440  WMSG6M: .ASCII  /%SN #/
 2899  016632  041045  042101  042040  WMSG16: .ASCII  /%BAD DATA#/
 2900  016640  052101  021501
 2901  016644  043445  020072     043  WMSG17: .ASCII  /%G: #/
 2902  016651     045  035102  021440  WMSG20: .ASCII  /%B: #/
 2903  016656  041445  035116  021440  WMSG21: .ASCII  /%CN: #/
 2904  016664  041045  042101  051440  WMSG23: .ASCII  /%BAD STATUS#/
 2905  016672  040524  052524  021523
 2906  016700  047045  020117  047111  WMSG24: .ASCII  /%NO INTERRUPT#/
 2907  016706  042524  051122  050125
 2908  016714  021524
 2909  016716  047045  020117  046103  WMSG25: .ASCII  /%NO CLOCK UP#/
 2910  016724  041517  020113  050125
 2911  016732     043
 2912  016733     045  047516  041440  WMSG26: .ASCII  /%NO CLOCK DOWN#/
 2913  016740  047514  045503  042040
 2914  016746  053517  021516
 2915  016752  042045  052101  020101  WMSG27: .ASCII  /%DATA PAT:#/
 2916  016760  040520  035124     043
 2917  016765     045  040502  020104  WMSG28: .ASCII  /%BAD PREAMBLE#/
 2918  016772  051120  040505  041115
 2919  017000  042514     043
 2920  017003     045  040502  020104  WMSG29: .ASCII  /%BAD POSTAMBLE#/
 2921  017010  047520  052123  046501
 2922  017016  046102  021505
 2923  017022  042445  051117  041440  WMSG31: .ASCII  /%EOR CLEAR DID NOT CLEAR GO%#/
 2924  017030  042514  051101  042040
 2925  017036  042111  047040  052117
 2926  017044  041440  042514  051101
 2927  017052  043440  022517     043
 2928  017057     040  040520  051124  WMSG32: .ASCII  / PATRN #/
 2929  017064  020116     043
 2930
 2931          017070                          .EVEN
 2932  017070  000000                  PRE:    0
 2933  017072  000000                          0
 2934  017074  000000                          0
 2935  017076  000000                          0
 2936  017100  000000                          0
 2937  017102  000000                          0
 2938  017104  000000                          0
 2939  017106  000000                          0
 2940  017110  000000                          0
 2941  017112  000000                          0
 2942  017114  000000                          0
 2943  017116  000000                          0
 2944  017120  000000                          0
 2945  017122  000000                          0
 2946  017124  000000                          0
 2947  017126  000000                          0
 2948  017130  000000                          0
 2949  017132  000000                          0
```

```
                                                                I  6
 2950  017134  000000                                0
 2951  017136  000000                                0
 2952  017140  000000                                0
 2953  017142  000000                                0
 2954  017144  000000                                0
 2955  017146  000000                                0
 2956  017150  000000                                0
 2957  017152  000000                                0
 2958  017154  000000                                0
 2959  017156  000000                                0
 2960  017160  000000                                0
 2961  017162  000000                                0
 2962  017164  000000                                0
 2963  017166  000000                                0
 2964  017170  000000                                0
 2965  017172  000000                                0
 2966  017174  000000                                0
 2967  017176  000000                                0
 2968  017200  000000                                0
 2969  017202  000000                                0
 2970  017204  000000                                0
 2971  017206  000000                                0
 2972  017210  000000                                0
 2973  017212  000000                          POST: 0
 2974  017214  000000                                0
 2975  017216  000000                                0
 2976  017220  000000                                0
 2977  017222  000000                                0
 2978  017224  000000                                0
 2979  017226  000000                                0
 2980  017230  000000                                0
 2981  017232  000000                                0
 2982  017234  000000                                0
 2983  017236  000000                                0
 2984  017240  000000                                0
 2985  017242  000000                                0
 2986  017244  000000                                0
 2987  017246  000000                                0
 2988  017250  000000                                0
 2989  017252  000000                                0
 2990  017254  000000                                0
 2991  017256  000000                                0
 2992  017260  000000                                0
 2993  017262  000000                                0
 2994  017264  000000                                0
 2995  017266  000000                                0
 2996  017270  000000                                0
 2997  017272  000000                                0
 2998  017274  000000                                0
 2999  017276  000000                                0
 3000  017300  000000                                0
 3001  017302  000000                                0
 3002  017304  000000                                0
 3003  017306  000000                                0
 3004  017310  000000                                0
 3005  017312  000000                                0
```

```
 3006  017314  000000                    0
 3007  017316  000000                    0
 3008  017320  000000                    0
 3009  017322  000000                    0
 3010  017324  000000                    0
 3011  017326  000000                    0
 3012  017330  000000                    0
 3013  017332  000000                    0
 3014  017334  000000              WBUFF:  0
 3015          017746                      .=.+410
 3016  017746  000000              RBUFF:  0
 3017
 3018          000001                      .END
```

ADDFL	000746	DCKE2	010274	EX5C	006350	MSG10	014152	PATRN	001002
AS	000526	DCKE3	010304	EX5C0	006414	MSG11	014176	PCNTR	001016
ASF	000730	DCKE4	010326	EX5C1	006420	MSG12	014223	PD0	010734
ATAF	000720	DCKE5	010340	EX5D	006424	MSG13	014232	PD1	010750
BA	000514	DCKE6	010376	FC	000516	MSG14	014241	PD2	011012
CC	000530	DCKE7	010434	FUN	000752	MSG15	014256	PD3	011016
CHNFLG	001262	DERFL	000766	GTSWR	013532	MSG16	014274	PD4	011026
CRCDAT	004304	DOUT	013326	HDRFL	000620	MSG18	014304	PD5	011146
CRCFLG	001022	DOUTD	013404	HERE	002320	MSG19	014323	PD6	011172
CRCNT	000774	DRVN	000624	ILFT	000544	MSG40	014342	PEXFL	000736
CRCPAT	004302	DRVTP	000604	INIT	012122	MSG41	014346	PFLG	000666
CS	000520	DS	000522	ITAMT	000606	MSG44	014365	POST	017212
C1	000510	DSUP	004742	ITCNT	000702	MSG45	014407	PPGEN	011550
DATAD	000760	DS0	005040	ITER	012052	MSG57	014431	PRCHK	010716
DATA0	001034	DS3	005056	ITRLP	000714	MSG58	014447	PRE	017070
DATA1	001036	DS4	005066	LTADD	000742	MSG59	014465	PREFL	000770
DATA2	001040	DT	000536	LT1	002352	MSG6	014073	PSCHK	010662
DATA3	001042	EMADDR	000622	LT1A	002416	MSG60	014467	PSW	000566
DATBL	001034	ENDFLG	001024	LT1B	002430	MSG62	014471	RBUFF	017746
DATC	000754	EORP	011626	LT10	003210	MSG63	014537	RCDP	001010
DAT1	005076	EORPA	011622	LT10A	003212	MSG7	014112	RDAD	000762
DAT1A	005102	EORPX	012012	LT11	003262	MSG9	014130	RDATA	016236
DAT2	005116	EORP1	011662	LT11A	003340	MSLT1	014565	RDRVF	001006
DAT3	005122	EORP1A	011730	LT11X	003364	MSLT10	015174	REGS	000612
DAT4	005130	EORP2	011750	LT12	003374	MSLT11	015242	RTRN	000670
DB	000532	EORP3	011774	LT12A	003460	MSLT12	015313	SAV1	000704
DCHK	007332	ER	000524	LT12X	003512	MSLT13	015363	SAV2	000706
DCHKA	007430	ERADD	000672	LT13	003522	MSLT14	015444	SAV3	000710
DCHKA0	007404	ERRF	000726	LT14	003572	MSLT15	015523	SCF	000732
DCHKA1	007460	EXEC	006010	LT15	003642	MSLT16	015570	SCOLP	000712
DCHKA2	007516	EXFL	000716	LT16	003724	MSLT17	015660	SCOPE	012022
DCHKB	007570	EXW2	006454	LT16A	003752	MSLT2	014633	SERFL	000772
DCHKB0	007600	EXW2A	006504	LT17	004312	MSLT20	015744	SERNUM	000602
DCHKC	007640	EXW2B	006540	LT17A	004342	MSLT3	014700	SETUP	005430
DCHKD	007646	EXW2C	006554	LT2	002464	MSLT4	014746	SET0	005472
DCHKE	010214	EXW2E	006574	LT2A	002466	MSLT5	015013	SET1	005476
DCHKFL	001020	EXW2F	006602	LT20	004624	MSLT6	015061	SET1A	005502
DCHKX	010154	EXW2G	006632	LT20A	004702	MSLT7	015126	SET2	005526
DCHKX1	010172	EXW2H	006642	LT3	002536	MTINT	012276	SKAT	001014
DCHK0	007650	EXW2J	006656	LT3A	002602	NRZOF	000662	SLAF	000722
DCHK1	007702	EXW2J0	006676	LT3B	002614	NXTDRV	001760	SLVN	000664
DCHK1A	007740	EXW2J1	006700	LT4	002644	NXTSLV	002032	SN	000540
DCHK2	010030	EXW2K	006720	LT4A	002646	OCTP	013100	SNPG	013506
DCHK2A	010074	EXW2X	006736	LT5	002716	OCTPE	013070	SNPT	013430
DCHK2B	010076	EX0	006032	LT5A	002762	OCTPE1	013104	SP0	005604
DCHK3	010124	EX1	006056	LT5B	002774	OCTPG	013262	SP01	005572
DCKEP	010622	EX1A	006072	LT6	003024	OCTPG0	013300	SP1	005610
DCKEP0	010654	EX2	006112	LT6A	003026	OCTPG1	013304	SP1A	005662
DCKE0	010254	EX3	006136	LT7	003102	OCTP0	013126	SP1B	005702
DCKE1	010264	EX5	006206	LT7A	003146	OCTP1	013150	SP3	005754
DCKE10	010546	EX5A	006212	LT7B	003160	OCTP2	013156	SP4	005774
DCKE11	010606	EX5A1	006246	MR	000534	OCTP3	013246	SP5	006006
DCKE12	010616	EX5B	006302	MSG1	013674	OFL	013324	SSCF	000724

```
START   001200          TR00    000626          VECT    000610          WMSG25  016716          WSTX    007330
STATC   001012          TR01    000630          WAM     000750          WMSG26  016733          WTAD    000756
STATF   001004          TR02    000632          WAM0    005136          WMSG27  016752          W1DCHK  011216
STFLG   000740          TR03    000634          WAM01   005144          WMSG28  016765          W1D0    011246
STFLGS  000614          TR04    000636          WAM1    005202          WMSG29  017003          W1D0A   011264
STSCD   002210          TR05    000640          WAM2    005212          WMSG3   016454          W1D1    011272
ST2     001670          TR06    000642          WAM2A   005246          WMSG31  017022          W1D2    011350
SWR     000570          TR07    000644          WAM3    005256          WMSG32  017057          W1D2A   011422
SWREG   000176          TR10    000646          WAM3A   005336          WMSG4   016475          W1D3    011512
TADX    001174          TR11    000650          WAM3B   005354          WMSG6   016522          W1D4    011524
TC      000542          TR12    000652          WAM4    005364          WMSG6A  016530          W1D4A   011534
TEMP1   000674          TR13    000654          WBUFF   017334          WMSG6B  016535          W1D5    011540
TEMP2   000676          TR14    000656          WC      000512          WMSG6C  016542          W2FLG   000764
TEMP3   000700          TR15    000660          WCDP0   001056          WMSG6D  016547          XORDAT  004306
TEND    002244          TSCD    001714          WCDP2   001044          WMSG6E  016555          XORPAT  004310
TENDX   002342          TSCDA   002110          WCS1    001024          WMSG6F  016562          $DONE   002252
TEX     013066          TSCD0   002116          WCS2    001026          WMSG6G  016567          $ENDAD  002310
TIB     000616          TSCD1   002124          WDATA   016036          WMSG6H  016574          $MNEW   016025
TINER   012670          TSCD2   002152          WDS     001030          WMSG6I  016601          $MSWR   016015
TKB     000574          TSCD3   002170          WER     001032          WMSG6J  016606          $SVPC =  000764
TKS     000572          TSTTBL  001070          WMSG16  016632          WMSG6K  016613          .      = 017750
TLAST   001176          TTIN    012710          WMSG17  016644          WMSG6L  016620          .RESTO  013652
TOB     000614          TTINT   012306          WMSG2   016436          WMSG6M  016625          .SAVE   013630
TOG     013052          TTOUT   012752          WMSG20  016651          WPGFL   001000
TPB     000600          TTR     012430          WMSG21  016656          WSTCK   006742
TPS     000576          T24FL   000744          WMSG23  016664          WSTG    007206
TREF    000734          UDES    000776          WMSG24  016700          WSTG0   007256

. ABS.  017750      000

ERRORS DETECTED:  0

,CZTUPA.SEQ/SOL_CZTUPA.P11
RUN-TIME: 24 42 2 SECONDS
RUN-TIME RATIO: 113/69=1.6
CORE USED:  14K  (28 PAGES)
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