DX11B

DIAGNOSTIC

MD-11-DZDXH-C

(ON-LINE EXERCISER)

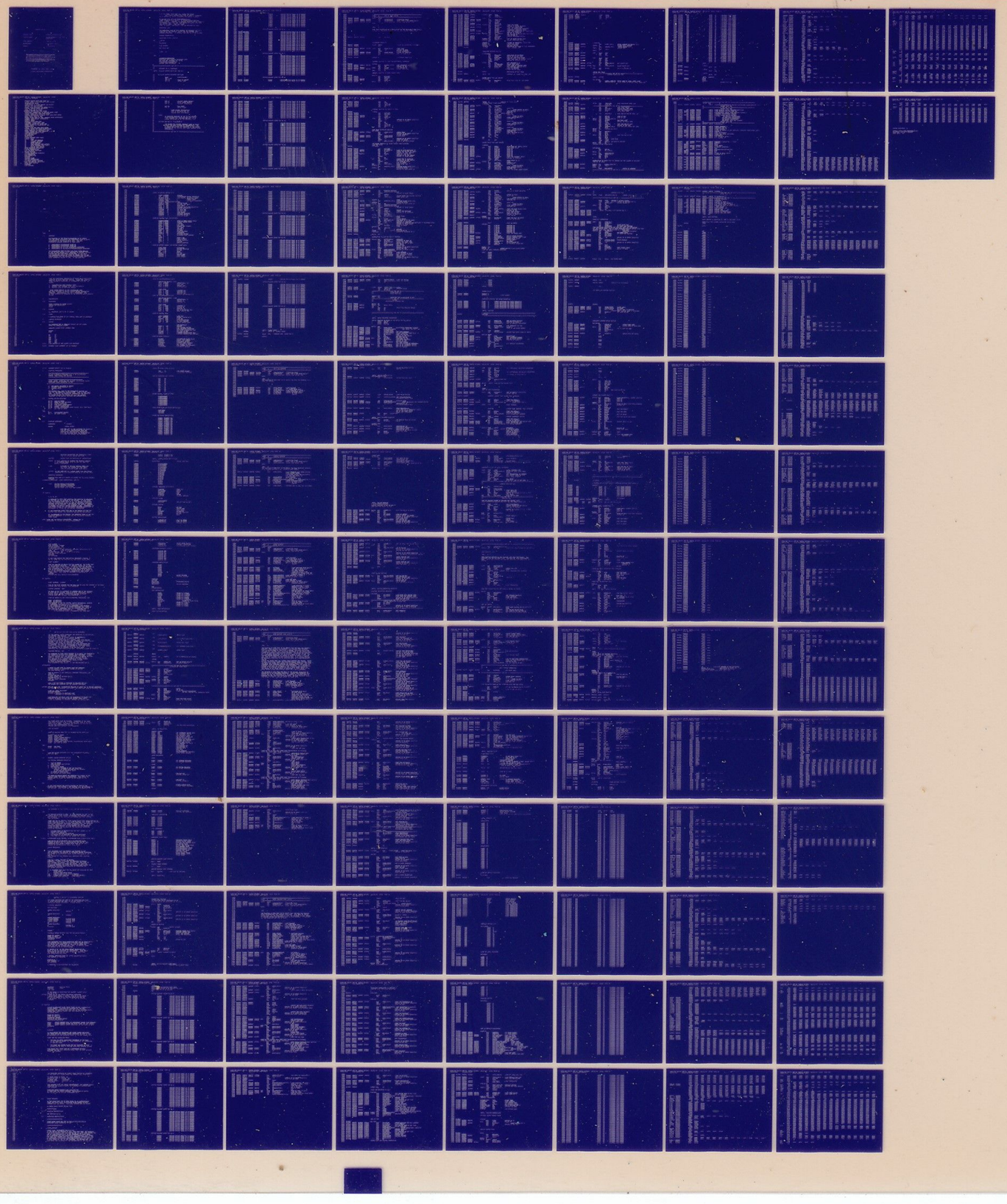
EP DZDXH C DL

FICHE 1 OF 1

MAY 1978

digital

MADE IN USA



IDENTIFICATION

PRODUCT CODE:	MAINDEC-11-DZDXH-C-D
PRODUCT NAME:	DX11B DIAGNOSTIC (ON LINE EXERCISER)
DATE CREATED:	JUNE 21, 1974
MAINTAINER:	DIAGNOSTIC GROUP
AUTHOR:	J. FRIEDRICH

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                                        1.      ABSTRACT

                                                THE FUNCTION OF THE DX11B DIAGNOSTICS IS TO VERIFY
                                                THAT THE DX11B IMPLEMENTS THE FUNCTIONAL FLOW DIAGRAMS
                                                ILLUSTRATED IN THE DX11B PRINT SET.  THE DX11
                                                DIAGNOSTIC PACKAGE CONSISTS OF FOUR TAPES

                                                1.  DZDXA-[REV] MAINTENANCE CLOCK #1
                                                2.  DXDXF-[REV] MAINTENANCE CLOCK C2
                                                3.  DZDXG-[REV] DX OFFLINE DIAGNOSTIC EXERCISER
                                                4.  DZDXH-[REV] DX ONLINE-MAINTENANCE-CABLED EXERCISER

                                                THE DIAGNOSTICS WERE DIVIDED INTO FOUR TAPES BECAUSE
                                                OF THE 8K WORD MEMORY LIMIT REQUIRED TO SUPPORT MINIMUM
                                                SYSTEMS AND FOR FUNCTIONAL SAFEGUARDS. IT WAS FELT
                                                THAT SAFEGUARDS SHOULD BE TAKEN TO INSURE THAT NO ONE
                                                INADVERTENTLY RAN THE ONLINE-MAINTENANCE-CABLE EXERCISER
                                                WHILE CONNECTED ONLINE TO IBM.  IT WAS ALSO FELT
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                                        THAT THE FUNCTIONAL SEPARATION OF TESTS WOULD FACILITATE
                                        ADAPTION TO ACT11 AND DDP TESTING.  THERE ARE ALSO TWO
                                        OTHER MAINDEC'S SUPPORTED BY DIAGNOSTICS THAT RUN THE
                                        DX11B1

                                        1.  COMMUNICATION TEST PROGRAM (CTP)
                                        2.  GENERAL TEST PROGRAM (GTP) WITH DX OVERLAY
                                        3.  DEC/X11 WITH DX SOFTWARE MODULE

                                         THESE TESTS OPERATE IN THE MAINTENANCE MODE
                                        AND WERE DESIGNED TO DETECT UNIBUS DEVICE INTERACTION
                                        PROBLEMS.  ADDITIONALLY CTP HAS A "RESPONDER" MODE
                                        SO THAT INTERACTION PROBLEMS MAY BE DETECTED WHILE RUNNING
                                        ONLINE;

                                2.      REQUIREMENTS

                                2.1     EQUIPMENT

                                        PDP11 (MINIMUM 8K WORDS MEMORY)
                                        ASR-33 (OR EQUIVALENT)
                                        DX11B

                                2.2     STORAGE

                                        ALL PROGRAMS LOAD IN 8K OF MEMORY

                                2.3     OTHER

                                        A WORKING KNOWLEDGE OF ODT VERSION V05A,ODT IS NECESSARY

                                3.      LOADING PROCEDURE

                                3.1     METHOD

                                        ALL PROGRAMS ARE IN ABSOLUTE FORMAT AND ARE LOADED
                                        USING THE ABSOLUTE LOADER;

                                        ABSOLUTE LOADER START ADDRESS =500

                                        MEMORY  =
                                        SIZE

                                        4K      17
                                        8K      37
                                        12K     57
                                        16K     77
                                        20K     117
                                        24K     137
                                        28K     157
                                3.1.1   LOAD ADDRESS OF ABS LOADER INTO SWITCHES

                                3.1.2   DEPRESS "LOAD ADDRESS" KEY ON CONSOLE
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                                3.1.3   DEPRESS "START" KEY ON CONSOLE

                                4.      STARTING PROCEDURE

                                        **********************************************
                                        ONLINE DIAGNOSTIC REQUIRES THAT IT BE MAINTENANCE
                                        CABLED  -SEE MANUAL FOR DETAILS
                                        **********************************************

                                        **********************************************
                                        NEVER  NEVER  NEVER RUN THE ONLINE MAINTENANCE CABLED
                                        EXERCISER WHILE CONNECTED TO IBM
                                        **********************************************

                                        A.  SET SWITCH REGISTER TO 000200
                                        B.  DEPRESS "LOAD ADDRESS" KEY
                                        C.  DEPRESS START

                                        THE PROGRAM WILL JUMP TO THE DIAGNOSTIC MONITOR AND
                                        TYPE OUT THE OPERATING INSTRUCTIONS.  THIS IS ONCE ONLY
                                        CODE.  TO RETYPE THE OPERATING INSTRUCTION THE OPERATOR
                                        MAY EITHER RELOAD THE PROGRAM OR LOAD THE ADDRESS
                                        "MONITOR" IN THE SWITCH REGISTER AND DEPRESS START.

                                4.1     CONTROL SWITCH SETTINGS

                                        SR 15   HALT ON ERROR
                                        SR 14   SCOPE ON TEST OR ERROR
                                        SR 13   INHIBIT PRINTING
                                        SR 12   TYPE SHORT ERROR REPORT
                                        SR 11   INHIBIT INTERATIONS
                                        SR 10   CONTROL MAINTENANCE CLOCK (MAINT, CLK, TEST ONLY)
                                        SR 9    ODT TRAP ON ERROR
                                .REM    !
                                .REM    !
                                        SR 2    MULTIPLEXER CHANNEL
                                        SR 1    SEL BUSY ENABLE
                                .REM    !
                                .REM    !


                                4.2     STARTING ADDRESSES

                                        ADDRESSES               COMMENT

                                        000200                  NORMAL START

                                                        WITH 200 LEFT IN THE SWITCHES THE PROGRAMS
                                                        TYPE OUT FULL INSTRUCTIONS ONCE AND
                                                        ABBREVIATED INSTRUCTIONS THEREAFTER.
                                                        WITH THE SWITCHES ZERO THE PROGRAMS SET
                                                        UP EITHER THE DEFAULT OR PREVIOUSLY
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                                        SELECTED PARAMETERS AND IMMEDIATELY ASKS
                                        FOR THE DYNAMIC SWITCH SETTINGS

                                MONITOR         RELOAD TAPE FOR RETYPING OF INSTRUCTIONS

                                000042  IF THIS LOCATION IS NONZERO THE PROGRAM ASSUMES
                                        IT IS RUNNING UNDER ACT11 OR DDP AND USES THE
                                        DEFAULT PARAMETERS

                                0,ODT           ENTRANCE TO ODT-11X VERSION V006A,ODT
                                                MAY START THE PROGRAM BY TYPE 200$G
                                                <CR>,(MAINTENANCE CLOCK TESTS ONLY)

                                NOTICE:  HE WHO USES ODT IN A MEANS OTHER THAN EXPLICITLY
                                         DIRECTED BY THIS DOCUMENT DOES SO AT HIS OWN RISK.

                        5'.     OPERATING PROCEDURE

                                STARTING FROM 200 WITH SR<07> UP CAUSES THE FOLLOWING GENERAL
                                TYPEOUT:
                        MAINDEC-11-DZDXX-X-D  (TEST DESCRIPTION) (APR 74)


                                TYPE:   <D>,FOR DEFAULT PARAMETERS
                                        <P>,FOR PREVIOUS PARAMETERS
                                        <S>,FOR SELECT PARAMETERS
                                        <N>,FOR START WITH THIS TEST NUMBER


                        (5'. CONT'D)


                                D, P, S, N?

                                IN RESPONSE TO THIS LAST QUESTION THE OPERATOR IS REQUIRED
                                TO TYPE ONE OF THE LETTERS IN THE STRING.  AT AUTO START
                                TIME THE PROGRAM FIRST SETS UP ALL THE DEFAULT PARAMETERS
                                "DEFAULT PARAMETERS" MEANS THE SET OF OPERATING VARIABLES
                                SELECTED AT THE FACTORY.  FOR EXAMPLE, THE DEFAULT ADDRESS
                                IS 176200, THE DEFAULT VECTOR ADDRESS IS 300.  THEREFORE, AT
                                AUTO START TYPING "P" FOR PREVIOUSLY SELECTED PARAMETERS IS
                                EQUIVALENT TO TYPING "D" FOR DEFAULT PARAMETERS.

                                IF ANY CHARACTER OTHER THAN ONE IN THE STRING IS TYPE THE
                                MONITOR WILL REJECT THE CHARACTER AND RETYPE THE STRING.

                                IF, IN RESPONSE TO THE STRING, THE OPERATOR TYPES AN "S" THE
                                SELECTION SEQUENCE IS ENTERED AND THE FOLLOWING DIALOGUE
                                TAKES PLACE.

                        NOTE:  THESE ARE THE DEFAULT PARAMETERS'.  TYPING <D> IS
                               EQUIVALENT TO TYPING THE DEFAULT PARAMETERS.
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                                        TEST NUMBER! 1
                                        BASE ADDRESS! 176200
                                        VECTOR ADDRESS! 300
                                        DX PRIORITY LEVEL! 4
                                        TYPE CU ADR'S IN HEX <CR><LF>! <CR><CR> TERMINATES LIST
                                        ADRS! 10        (THIS IS IN HEX)
                                        DEVICES PER CU! 20      (THIS IS IN OCTAL)
                                        LIST ALL LEGAL COMMANDS
                                        COMMAND!
                                        SET SWITCHES

                                        AT ANY TIME DURING THE "SE"LECTION SEQUENCE A CONTROL C
                                        MAY BE TYPED AND THE MONITOR WILL ASK AGAIN "D,P,S,N?",

                                        "TEST NUMBER!"

                                        HERE THE MONITOR IS ASKING FOR THE NUMBER OF  THE FIRST TEST
                                        IN THE CHAINING SEQUENCE,  THE DEFAULT ANSWER IS "1" ONE,
                                        THE FIRST TEST IN THE CHAIN,  IT MAY BE THAT THE OPERATOR IS
                                        ONLY INTERESTED IN THE LAST FEW TESTS AND THEREFORE WOULD
                                        TYPE 22 OR WHATEVER,  AT THIS WRITING THERE IS NO CHECK TO
                                        SEE IF THE OPERATOR SELECTED A NONEXISTANT TEST NUMBER (E,G,
                                        PI,-2,4 MEG),  SEE TABLE OF CONTENTS IN BEGINNING OF
                                        LISTING,
                                        -TYPING <CR> WILL DEFAULT THIS PARAMETER


                                (5', CONT'D)


                                        "BASE ADDRESS! 176200"

                                        THIS IS THE BASE ADDRESS FOR THE DX11 AND IS ALSO THE ADDRESS OF THE DXDS,
                                        -TYPING <CR> WILL DEFAULT THIS PARAMETER

                                        "VECTOR ADDRESS! 300"

                                        THE DX11 IS CUT TO INTERRUPT TO ADDRESS 300 AT THE FACTORY',
                                        ON SITE THE DX FOLLOWS, DC'S KL'S DP'S, DM'S DN'S, DMBB'S,
                                        DR11'S, DR11A, DR11B, TYPESETTING AND BUS SWITCHES',
                                        -TYPING <CR> WILL DEFAULT THIS PARAMETER

                                        "TYPE CU ADRS'S IN HEX <CR>LF>!<CR><CR> TERMINATES LIST

                                        ADRS!  10 (CR><LF>
                                        ADRS!  20 )CR><CR>
                                        THIS REQUEST IS FOR THE CONTROL UNIT'S HEXIDECIMAL ADDRESS
                                        OR ADDRESSES, CAUTION!!!!!!!!!!!!!!!!!!!!!!!!
                                        DO NOT EXCEED 16 ENTRIES OF CU ADDRESSES .;THE PROGRAM
                                        MAY SELF DESTRUCT.;..IF THE SYSTEM REQUIRES THAT THERE BE
                                        MORE THAN 16 CU ADDRESSES THEN THE DIAGNOSTICS MUST BE
                                        RUN AGAIN FOR THOSE EXCEEDING 16       CAUTION!!!!
                                                IN MAINTENANCE CLOCK 1 DIAGNOSTIC THE M900 MUST
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                                        NOT BE CUT FOR MORE THAN 16 CU ADDRESSES

                                THE IBM CONTROL UNITS ADDRESSES ARE SPECIFIED IN HEXADECIMAL.
                                FOR CONTROL UNIT #16(16)  THE
                                RESPONSE TO ADRS: IS 10(HEX) WHICH IS 00010000(2).
                                THE DX11 CAN EMULATE UP TO 128(10) CONTROL
                                UNITS WITH 1 DEVICE EACH OR 1 CONTROL UNIT WITH 128(10)
                                DEVICES OR AS IS THE DEFAULT CASE 1 CONTROL UNIT WITH 16(10)
                                DEVICES.  THE ADRS: AND RESPONSE WILL CONTINUE
                                INDEFINITELY AS LONG AS <CR><LF> IS TYPED FOLLOWING THE
                                CU ADDRESS!  THE LIST IS TERMINATED BY TYPING <CR><CR>;
                                NOTE!!!! TYPING <CR><CR> IN RESPONSE TO THE FIRST ADRS:
                                WILL DEFAULT THE CU ADDRESS TO 00 AND WILL ALSO
                                TERMINATE THE LIST;(DEFAULT=10 HEX). THE ACTUAL # MUST BE TYPED IN

                                "DEVICES PER CU:  20"

                                THE RESPONSE TO THIS INPUT REQUEST IS IN OCTAL AND REPRESENTS
                                THE NUMBER OF DEVICES THIS CONTROL UNIT SERVICES.  A DX11
                                EMULATED CONTROL UNIT CAN SERVICE FROM 1 TO 200(8) DEVICES.
                                NOTE!!!! TYPING <CR> IN RESPONSE TO DEVICES PER CU:
                                WILL DEFAULT TO 0, THEREBY CAUSING AN ILLEGAL NUMBER
                                OF DEVICES PER CU MESSAGE;;;THE ACTUAL # MUST
                                BE TYPED IN.(DEFAULT=20 OCTAL)
                                THIS DIAGNOSTIC WILL REJECT  <1 AND >20 DEVICES PER CU

                        (5', CONT'D)

                                A CHECK IS MADE HERE TO INSURE THAT THE OPERATOR
                                DID NOT ASSIGN AN IMPOSSIBLE NUMBER OF DEVICES
                                FOR EACH CONTROL UNIT;

                                TYPE CU ADDS'S IN HEX <CR><LF>: <CR><CR> TERMINATES LIST
                                ADRS: F0
                                DEVICES PER CU: 0
                                ILLEGAL NUMBER OF DEVICES PER CU
                                DEVICES PER CU: 4
                                LIST ALL LEGAL COMMANDS
                                COMMAND:

                                WHEN A "4" WAS TYPED IN RESPONSE TO DEVICES PER CU:,
                                THE NUMBER WAS ACCEPTED AND THE MONITOR CONTINUED.

                        NOTICE: OFFLINE & ONLINE  DIAGNOSTICS REQUIRE AT LEAST TWO CU DEVICE ADDRESSES
                                FOR TESTING MULTIPLEXOR FUNCTIONS...THE M900 MUST ALSO BE STRAPPED FOR >1

                                "LIST ALL LEGAL COMMANDS"
                                COMMAND: 400<CR>
                                STATUS: 0 ?CR><LF> TO CONTINUE LIST
                                          ?CR><CR> TO TERMINATE LIST

                                THIS FACILITY WAS BUILT INTO THE DIAGNOSTIC TO ENABLE THE
                                OPERATOR TO BUILD HIS OWN DEVICE STATUS TABLE (DST).
                                A <CR> IN RESPONSE TO COMMAND: ASSUMES THE DEFAULT DST;
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                                        THE FIRST ENTRY MUST BE NONZERO,  THEREFORE IF YOU WISH
                                        YOUR FIRST COMMAND TO BE A T10-8 YOU MUST TYPE IT IN WITH
                                        PARITY (E,O, 400),  FOLLOWING THE COMMAND THE MONITOR WILL
                                        ASK FOR THE CORRESPONDING STATUS.
                                        -TYPING <CR> WILL DEFAULT THIS PARAMETER

                                        "SET SWITCHES"


                                        WERE THE MONITOR ASKS FOR THE CONSOLE SWITCH SETTINGS.

                                        SW<15>  HALT ON ERROR
                                        SW<14>  SCOPE LOOP
                                        <SW13>  INHIBIT ERROR PRINTOUT
                                        SW<12>  SHORT ERROR REPORT
                                        SW<11>  INHIBIT ITERATIONS
                                        SW<10>  MAINTENANCE CLOCK CONTROL (MAINTENANCE TESTS ONLY)
                                        SW<9>   OD. TRAP ON ERROR
                                !
                                .REM !
                                        SW<2>   MUX MODE
                                        SW<3>   BSYEN MODE
                                !
                                .REM !

                                        LOAD THE SWITCH REGISTER WITH THE APPROPRIATE FUNCTION
                                        AND TYPE <CR>.


                                5.2     PROGRAM AND/OR OPERATOR ACTION

                                        THE TYPICAL APPROACH SHOULD BE

                                        1.  HALT ON ERROR
                                            WHEN AN ERROR HALT OCCURS
                                        2.  CLEAR SW<15>
                                        3.  SET SW<14>, SCOPE
                                        4.  TYPE <P> FOR PROCEED IF ODT WAS SELECTED
                                                ($19=1), OR PRESS CONTINUE ON THE CONSOLE
                                                IF ODT WAS NOT SELECTED SW9=0
                                            IF ERROR IS REPETITIVE;
                                        5.  SET SW<13> AND SCOPE ERROR

                                        THE ERROR PC SHOULD BRING THE OPERATOR TO A POINT IN THE
                                        LISTING WHERE THE ERROR IS DOCUMENTED.  THEN USING THE
                                        PRINTS AND THE FLOWS THE ERROR CAN BE TRACED TO ITS
                                        SOURCE.

                                        !
                                .REM    !

                                        AT ANY TIME DURING THE INITIALIZATION OR TESTING THE
                                        OPERATOR CAN TYPE CONTROL C AND CONTROL WILL BE RETURNED TO
                                        THE MONITOR.  SOME TESTS ARE 5-10 SECONDS IN DURATION SO
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                        THE RESPONSE TO THE CONTROL C WILL NOT BE INSTANTANEOUS.
                        !
                .REM    !

                        THE RESTART ADDRESS IS 200', IF THIS ADDRESS IS LEFT IN THE
                        CONSOLE SWITCH WHEN "START" IS PRESSED THE MONITOR WILL TYPE
                        OUT D,P,S,N?  IF THE SWITCHES ARE ZEROED THE TYPE WILL BE
                        "SET SWITCHES",

                        THERE ARE TWO CALIBRATION TESTS (MAINT CLK1) THAT SHOULD BE RUN IN
                        SCOPE MODE(T15 & T16).  IT IS QUITE POSSIBLE THAT USING THE STANDARD
                        OPERATIONS PROCEDURE PREVIOUSLY SUGGESTED THAT THE OPERATOR
                        WILL FALL NATURALLY INTO THESE CALIBRATION TESTS.  IF THE
                        SYSTEM HAS BEEN BROUGHT UP ONCE BEFORE AND THE OPERATOR
                        WISHES TO CHECK THE CALIBRATION THE FOLLOWING PROCEDURE
                        SHOULD BE FOLLOWED!

                        1.  EXAMINE TABLE OF CONTENTS FOR THE TEST NUMBER (N) OF
                            CALIBRATION ROUTINES.
                        2.  TYPE N IN RESPONSE TO D,P,S,N?
                        3.  PUT SW<14> UP IN RESPONSE TO "SWITCH SETTINGS"
                        4.  TYPE <CR> IF ERROR TYPE OUT OCCURS SET SW<13>.

                5.2.1   MAINTENANCE CLOCK CONTROL (MAINTENANCE CLK1 & CLK2 DIAG. ONLY)

                        WHEN SWITCH 10 IS SELECTED AND A MAINTENANCE CLOCK
                        PROGRAM IS BEING RUN THE EXECUTION OF THE JSR PC, CLK
                        SUBROUTINE WILL CAUSE A BREAK POINT TRAP TO ODT AND A
                        TYPEOUT OF THE FOLLOWING FORMAT WILL OCCUR!

                        AAAAAA BBINNNNNN
                        .

                        THIS INDICATES THAT THE PROGRAM HAS TRAPPED TO ODT
                        AND IS AWAITING THE COMMAND TO "P"ROCEED BEFORE EXECUTING
                        THE NUMBER OF MAINTENANCE CLOCK PULSES SPECIFIED BY JSR PC,
                        CLK N.
                        UPON TYPING "P" THE PROGRAM WILL CONTINUE FROM LOCATION
                        AAAAAA'.

                        THIS IS A USEFUL FEATURE IN SEVERAL
                        RESPECTS .  FIRST, IT ALLOWS THE OPERATOR TO SINGLE
                        STEP THROUGH THE FLOWS'.  THE LISTING AIDS HERE ALSO IN
                        THAT IT HIGHLIGHTS THE PHASE AND STATE'.  IN ADDITION
                        TO WALKING THROUGH THE FLOWS THIS FEATURE ALSO ALLOWS THE
                        OPERATOR TO EXAMINE DONE DISPLAYED DX REGISTERS AND
                        KEY MEMORY LOCATIONS.

                        IT IS REQUIRED THAT ONLY THE FOLLOWING ODT COMMANDS BE USED
                        N/      OPENS WORD N
                        P       PROCEED FROM BREAK POINT
                        N!G     GOES TO WORD N AND STARTS PROGRAM
                        <CR>    CLOSES OPEN LOCATION    (CARRIAGE RETURN)
                        <LF>    OPENS NEXT LOCATION     (LINE FEED)
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                                    ^C      CONTROL C, RETURN TO DIAGNOSTIC MONITOR

                                    ANY OTHER COMMANDS ARE USED AT THE OPERATORS OWN RISK.
                                    IF OTHER COMMANDS ARE USED THE DX AND THEREFORE THE DIAG-
                                    NOSTIC MAY BEHAVE STRANGELY.  PLEASE RELOAD.

                                    A TYPICAL SEQUENCE

                                    SET SWITCHES

                                    000536 001017044
                                    ^P                          PROCEED

                                    000640 001017044
                                    ^P                          PROCEED

                                    000032 001017044
                                    ^176204/000000              EXAMINE 0XC5
                                    176206 /000000              EXAMINE 0X08
                                    176210 /000300              EXAMINE 0X8A
                                    ^P                          PROCEED
                                    000504 001017044
                                    ^                           CONTROL C
                                    D,P,S,N?                    MONITOR MODE


                            6.      ERRORS

                                    TYPICALLY ERROR REPORTS TAKE THE FOLLOWING FORMAT.

                                    ERROR PC: 017274
                                    ERROR IN TEST:  17
                                    CUADRS/MO: 000020
                                    001020742

                                    THIS INDICATES THAT WHILE EXECUTING TEST #17 ON ERROR STATE
                                    WAS DETECTED AND IS DOCUMENTED AT PROGRAM COUNT 017274.
                                    THE CONTRL UNIT UNDER TEST OF THE TIME OF ERROR WAS
                                    20(8) AND THE IBM COMMAND WAS A NOP.  IN SEVERAL CASES
                                    THE COMMAND IS OF NO SIGNIFICANCE.

                                    IF SWITCH 0 IS  UP THE ERROR REPORT GENERATOR WILL
                                    BREAK TO OUT AS INDICATED BY "00;NNNNNN".  HERE AGAIN
                                    THE POWER OF ODT MAY BE USED TO COLLECT ADDITIONAL
                                    DATA CONCERNING THE FAULT.

                                    A TYPICAL APPROACH MIGHT BE (AFTER COLLECTING DATA):
                                    TYPE CONTROL C, RESULTS:

                                    D,P,S,N? N
                                    TEST NUMBER:  17
                                    SET SWITCHES

                                    IN RESPONSE TO SWITCHES SET THE FOLLOWING
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```
                                        SR<15>=0        HALT ON ERROR
                                        SR<14>=1        SCOPE
                                        TYPE <CR>

                                        IF THE ERROR IS REPEATABLE SET SR<13>, INHIBIT PRINT
                                        AND GO AT IT.
                                NOTICE: A TYPE OUT OF THE FORMAT BE;NNNNNN INDICATES
                                        A BREAK POINT ERROR AT NNNNNN, THIS IS AN ODT ERROR
                                        AND CAN BE CAUSED BY 1', PLAYING GAMES WITH ODT OR
                                        2', AN ILLEGAL BREAK TRAP I.E. 7 BIT SET OR EXECUTE
                                        A 000003.



                                (6', CONT'D)

                                        DURING MAINTENANCE CLOCK TESTS THERE EXISTS A SUBROUTINE
                                        CALLED CHKREG,  THIS ROUTINE EXAMINES ALL THE DX11
                                        REGISTERS AND VERIFIES THAT THEY ARE IN THE EXPECTED STATE.
                                        CHKREG HAS A SPECIAL ERROR TRAP THAT RESULTS IN THE
                                        FOLLOWING TEXT;

                                        ERROR PC; 017446
                                        ERROR IN TEST; 17
                                        CUADRS/MO; 000020
                                        ORIGIN OF MAP ERROR 017662
                                        REGISTER=CONTENTS=MAP

                                        DXMI;   170777 000400 (DXMI IS UNREADABLE IGNORE THIS COMPARE)
                                        DXCS;   174000 000000 (PHASE AND STATE FLOPS ARE NOT TRACED)
                                        DXES;   000014 000010 (ERROR CONDITION IS THAT BIT2 IS SET)
                                        $$;020742
                                        .

                                        D,P,S,N7

                                        IN THIS REPORT THE REGISTERS ARE NAMED (UNDER REGISTER)
                                        AND THERE CONTENTS DUMPED (UNDER CONTENTS) SO THAT IT MAY
                                        BE COMPARED WITH THE EXPECTED STATE IN THE MAP (UNDER MAP).

                                        THERE ARE TWO ANOMALIES HERE;

                                        1'.  THE DXMI IS OFTEN UNREADABLE THEREFORE IF THE DXMI
                                             IS ALL ONES OR ALMOST ALL ONES DISREGARD THE COMPARISON
                                             IT WAS NOT MADE.

                                        2.   THE PHASE AND STATES FLOPS ARE NOT COMPARED SO THAT
                                             CHKREG CAN BE USED IN ROUTINE WITH FREE RUNNING CLOCKS'.

                                        THIS MEANS THAT THERE MUST BE A DIFFERENCE BETWEEN
                                        CONTENTS AND MAP IN A REGISTER OTHER THAN THE DXMI OR BITS
                                        OTHER THAN 174000.
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                                    THE EXERCISER PROGRAMS DO TUMBLE TABLE TRACING ON INTERRUPT.
                                    IN THE EVENT OF A TRACE ERROR THE PROGRAM WILL TYPE OUT:

                                    TT TRACE ERROR IN TEST:  N1
                                    ORIGIN OF LAST TT UPDATE:  N2
                                    TT ENTRY WAS:      "WHATEVER"
                                    EXPECTED ENTRY:    "WHATEVER +1"
                                    TT POINTER         N3

                                    THEN PROCEED WITH THE NORMAL ERROR REPORT. THE ADDRESS XXXXXX
                                    SPECIFIES THE LOCATION WHERE THE EXPECTED TT ENTRIES WERE
                                    LAST UPDATED.

                                    EXERCISER ERROR REPORTS ALSO INDICATE THE
                                    DX MODE WHEN THE ERROR OCCURED:  MULTIPLEXOR OR BUSYEN
                                    (DX ONLINE AND DX OFFLINE EXERCISERS ONLY)



                            6.2     ERROR RECOVERY

                                    IN THE EVENT THAT THE DX GETS STUCK IN AN UNRECOVERABLE
                                    PHASE AND STATE WHILE MAINTENANCE CLOCK ENABLE IS SET,
                                    DEPRESS HALT AND START,  THEN LOAD ADDRESS 200 AND START.

                                    ON BREAK POINT ERRORS RELOAD TAPE

                            7.      RESTRICTIONS

                            7.1     STARTING RESTRICTIONS

                                    SEE SECTION 4.2

                            7.2     OPERATING RESTRICTIONS

                                    ••••••••••••••••••

                                    NEVER NEVER NEVER RUN THE ONLINE-MAINTENANCE-CABLED
                                    EXERCISER WHILE CONNECTED TO IBM

                                    ••••••••••••••••••

                            8.      MISCELLANEOUS

                                    MAINT, CLK1  DIAGNOSTIC ONLY!!!!!!!!
                                    AT THE END OF THE PROGRAM IT WILL TYPE "END TEST  SET SW3=1",
                                    THIS IS TO SIGNIFY THAT SW3 MUST BE SET AT LEAST ONCE DURING THE
                                    USE OF THIS DIAGNOSTIC;IT IS NOT NECESSARY TO LEAVE SW3=1
                                    AS IT CONSUMES TOO MUCH DIAGNOSTIC TIME,BASICALLY THIS OPENS
                                    THE TEST THAT CHECKS THAT YOU HAVE CORRECTLY ANSWERED ALL THE
                                    CU ADDRESSES & DEVICES/CU QUESTIONS CORRECTLY;;;..IF YOU LIED
                                    IT WILL CATCH IT, IE, IF YOU ANSWERED  THE DEVICES PER  CU
                                    WITH 10(8) AND IN ACTUALITY THE DEVICES PER CU ARE CUT TO
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                                        4 ON THE M900, THIS TEST WILL CATCH THE ERROR,
                                                WH N SW3=1 PROGRAM RUN TIME IS GREATLY INCREASED
                                        AS IT CHECKS ALL OTHER ADDRESSES FOR ADRECC & ADRECD.

                                        DX ONLINE & DX OFFLINE EXERCISERS!!!!!!!!
                                        THESE PROGRAMS WILL DEFAULT TO AUTOMATICALLY SETTING
                                        SW1=1 & SW2=1 , HOWEVER, TO EXECUTE THEIR FUNCTINS EARLY IN
                                        THE PROGRAM RUN TIME. SET THEM BEFORE STRIKING <CR> WHEN
                                        THE MONITOR ASKS   "SET SWITCHES"
                                        NOTE! AT LEAST 2 DEVICES/CU MUST BE STRAPPED ON M900

                                8.1     EXECUTION TIME

                                        THE EXECUTION TIME OF EACH PROGRAM IS VARIABLE AND IS A
                                        FUNCTION OF THE PROGRAM LENGTH AND THE CONTROL UNIT
                                        ADDRESS STRUCTURE,  IN GENERAL THEY RUN 10 TO 20 MINUTES,

                                9.      PROGRAM DESCRIPTION

                                        CONTAINED WITHIN LISTING,

                                10.     LISTING

                                        FOLLOWING

                                11.     FLOW CHARTS

                                        SEE PRINT SET

                                        !
                                        .LIST   MD


                                .REM    *

                                        MAINDEC-11-DZDXG-C-D
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                                        MAINTAINER! DIAGNOSTICS
                                        AUTHOR! JOHN FRIEDRICH
                                *
                                !********************* MOD APR 74 **********************************
                                !*
                                !*      REVISED! BY W, ARMSTRONG

                                .SBTTL  DYNAMIC SWITCH SETTINGS (SWR #1)


                                !*      DYNAMIC SWITCH REGISTER SETTINGS
                                !*
                                !*              SWR#            SIGNIFICANCE!
                                !*              SET = ONE
                                !*              SWR 15          "HALT ON ERROR"
                                !*              SWR 14          "SCOPE LOOP"
```

```
                        ;*              SWR 13          "INHIBIT ERROR REPORT"
                        ;*              SWR 12          "SHORT ERROR REPORT"
                        ;*              SWR 11          "INHIBIT ITERATIONS"
                        ;*
                        ;*              SWR 02          "MUX MODE"
                        ;*              SWR 01          "BSYEN MODE"
                        ;*
                        ;*                      "USER CHANGE INFORMATION"
                        ;*                      "DUE TO REVISION APR 74"
                        ;*                      "PLEASE READ INFO BELOW"
                        ;*
                        ;*      NOTE:
                        ;*              AN OPERATOR RESPONSE OF "0" TO THE PROGRAM
                        ;*              "TTY" REQUEST FOR "DEVICES PER CU:" IS NO
                        ;*              LONGER DEFAULTED TO 28 (16 DECIMAL), I.E.,
                        ;*
                        ;*      DEVICES PER CU: 0  "=ILLEGAL ?"
                        ;*
                        ;*              THE HEADER "CU CHANNEL ADDRES:" USED ON ERROR
                        ;*              OUTPUT HAS BEEN CHANGED TO "CUADRS/MOD", I.E.,
                        ;*              IT SIGNIFIES EITHER THE CONTENTS OF THE "DXMD"
                        ;*              REGISTER OR THE CONTROL UNIT BASE ADDRESS WHERE
                        ;*              MEANINGFULL.
                        ;*
                        ;********************** MOD APR 74 **********************************
```

```
                                ;DXDS, DX DEVICE STATUS BITS

100000                          PARER =100200           ;ERRORS
040000                          NXM   = 40000           ;NONEXISTANT MEMORY REFERENCE
020000                          SELRST= 20000           ;IBM RESETS; SELECTIVE RESET
010000                          SYSRST= 10000           ;             SYSTEM RESET
004000                          INFDSC= 4000            ;             INTERFACE DISCONNECT
034000                          IBMRST= SELRST!SYSRST!INFDSC
002000                          UCHKS = 2000            ;STATUS FLAGS
001000                          CHENDS= 1000            ;CHANNEL END SENT
000400                          BSYS  = 400             ;BUSY SENT
000200                          CHIS  = 200             ;CHANNEL INITIATED SELECTION
000100                          ESEND = 100             ;ENDING STATUS END
000040                          CHDEND= 40              ;CH DATA END
000020                          CUDEND= 20              ;CU DATA END
000010                          ISSREJ= 10              ;ISS REJECT
000004                          CMDCHN= 4               ;COMMAND CHAINING
000002                          STKST0= 2               ;STACKED STATUS 0
000001                          CMDREJ= 1               ;COMMAND REJECT

                                ;DXCS,DX CONTROL UNIT STATUS BITS

100000                          PARSTP=100000           ;STOP ON BOS0 PARITY ERROR
040000                          CUFBM = 40000           ;SELECT FORCED BURST
020000                          ENDEN = 20000           ;'CUEND'
010000                          CS12  = 10000           ;NOT USED
004000                          BSYEN = 4000            ;ENABLE SET 'CUBSY'
002000                          CS10  = 2000            ;NOT USED
001000                          ONLINA= 1000            ;ONLINE A
000400                          CUBSY = 400             ;CU BUSY
000200                          DONE  = 200             ;FUNCTION DONE
000100                          INTEN = 100             ;INTERRUPT
000040                          STKSTA= 40              ;STACKED STATUS
000030                          XBA   = 30              ;EXTENDED BASE ADDRESS
000006                          FCTN  = 6
000001                          DXPRS = 1               ;FCTN = 00
000003                          DXPI  = 3               ;READ (INPUT)
000005                          DXPO  = 5               ;WRITE (OUTPUT)
000007                          DXPST = 7               ;STATUS
000001                          GO    = 1               ;BEGIN FUNCTION

                                ;DXOS DX OFFSET (CUOR) AND STATUS (CUSR) BITS

000200                          ATTEN =200              ;ATTENTION
000100                          STAMOD=100              ;STATUS MODIFIER
000040                          CUEND = 40              ;CU END
000020                          BSY   = 20              ;BUSY
000010                          CHEND = 10              ;CH END
000004                          DEVEND= 4               ;DEVICE END
000002                          UCHECK= 2               ;UNIT CHECK
000001                          UEXCEP= 1               ;UNIT EXCEPT
```

```
                                    ;DXMO DX MAINTENANCE-OUT BITS
                                    ;
                                    ;SELECTION CONTROL LINES
100000                              OPLO  =100000           ;OPERATIONAL OUT
040000                              HLDO  = 40000           ;HOLD OUT
020000                              SELO  = 20000           ;SELECT OUT
010000                              SUPO  = 10000           ;SUPPRESS OUT
                                    ;
                                    ;TAG LINES
004000                              ADRO  =  4000           ;ADDRESS OUT
002000                              CMDO  =  2000           ;COMMAND OUT
001000                              SRVO  =  1000           ;SERVICE OUT
000400                              PARO  =   400           ;PARITY OF/FOR BUS OUT
                                    ;DXMI DX MAINTENANCE-IN BITS
                                    ;
                                    ;SELECTION CONTROL LINES
100000                              OPLI  =100000           ;OPERATIONAL IN
040000                              SELI  = 40000           ;SELECT IN
020000                              REQI  = 20000           ;REQUEST IN
                                    ;
                                    ;TAG LINES
010000                              ADRI  = 10000           ;ADDRESS IN
004000                              STAI  =  4000           ;STATUS IN
002000                              SRVI  =  2000           ;SERVICE IN
001000                              CLKO  =  1000           ;OK TO GO ONLINE (RB)
000400                              PARI  =   400           ;BUS PARITY (RB)
                                    ;
                                    ;DXCB DX CONTROL BITS
                                    ;
100000                              LOCKO =100000           ;LOCK OUT
074000                              PHS   =074000           ;PHASE - STATE BITS
002000                              FASTCU=  2000           ;FAST CU
001000                              SYNC  =  1000           ;SYNCHRONIZATION
000400                              CUDX  =   400           ;CU DATA CONTROL
000200                              IOD   =   200           ;INPUT OUTPUT DONE
                                    ;
                                    ;NPR CONTROLS
000100                              BYPAS =   100           ;BYPASS
000040                              NPRX  =    40           ;NPR CONTROL SWITCH
000020                              NPRT  =    20           ;NPR TRANSFER DIRECTION
000010                              BALF  =    10           ;BUFFERED ALTERNATOR FLOP
000004                              ONLINB=     4           ;ON LINE TO IBM
000002                              ADRECC=     2           ;ADDRESS RECOGNITION (CU)
000001                              ADRECD=     1           ;ADDRESS RECOGNITION (DEVICE)
                                    ;
                                    ;DXES DX EXTRA SIGNALS
                                    ;
000001                              MCLKP=1                 ;MAINTENANCE CLOCK PULSE
000002                              MCLKEN=2                ;MAINT. CLK ENABLE
000004                              SOSIEN=4                ;SRVO-SRVI ENABLE
000010                              TIMDIS=10               ;TIMER(5 SEC) DISABLE
000020                              DXTO=20                 ;DX TIMEOUT (5 SEC)
000040                              NPRTO=40                ;NPR TIMEOUT (8 MICROSEC)
000200                              INTREQ=200              ;INTERRUPT REQUEST
```

```
                                ;DXES1 DX EXTRA EXTRA SIGNALS

000001                          IRS     =1              ;IBM RESET STORED
000002                          DSCRSP  =2              ;DISCONNECT RESPONSE


                                ;DEFINE REGISTER MAP INDICES

000000                          DS=     00
000002                          CA=     02
000004                          CS=     04
000006                          OS=     06
000010                          BA=     10
000012                          BC=     12
000014                          MO=     14
000016                          MI=     16
000020                          CB=     20
000022                          ND=     22
000024                          ES=     24


                                ;PHASE CONTROL FLOPS OF DXCB

000000                          PHASE0=00000
010000                          PHASE1=10000
020000                          PHASE2=20000
030000                          PHASE3=30000
040000                          PHASE4=40000
050000                          PHASE5=50000
060000                          PHASE6=60000
070000                          PHASE7=70000


                                ;TIME STATE FLOP AND STATE DEFINATION

004000                          TSSF=4000
004000                          TS1=4000
000000                          TS2=0000


                                ;PHASE AND STATE DEFINITIONS

004000                          PH0010  PHASE0!  TS1
000000                          PH0020  PHASE0!  TS2
014000                          PH0110  PHASE1!  TS1
010000                          PH0120  PHASE1!  TS2
024000                          PH0210  PHASE2!  TS1
020000                          PH0220  PHASE2!  TS2
034000                          PH0310  PHASE3!  TS1
030000                          PH0320  PHASE3!  TS2
044000                          PH0410  PHASE4!  TS1
040000                          PH0420  PHASE4!  TS2
054000                          PH0510  PHASE5!  TS1
050000                          PH0520  PHASE5!  TS2
064000                          PH0610  PHASE6!  TS1
060000                          PH0620  PHASE6!  TS2
```

```
                        PHS71=  PHASE7! TS1
                        PHS72=  PHASE7! TS2

                .SBTTL  MISCELLANEOUS DEFINITIONS

                SCOPE=TRAP                      ;SCOPE LOOP TRAP

                        B!?15=100000
                        B!?14=40000
                        B!?13=20000
                        B!?12=10000
                        B!?11=4000
                        B!?10=2000
                        B!?9=1000
                        B!?8=400
                        B!?7=200
                        B!?6=100
                        B!?5=40
                        B!?4=20
                        B!?3=10
                        B!?2=4
                        B!?1=2
                        B!?0=1
                        WERE=0

                ;CHANNEL COMMANDS WITH PARITY

                        TIOC=400                ;TEST I/O
                        WRITEC=001              ;WRITE
                        READC=002               ;READ
                        NOPC=403                ;NOP
                        SENSEC=4                ;SENSE
                        ILLC=405                ;ILLEGAL COMMAND

                ;UTILITY FLAGS

                        INTOK=100000
                        DOPLIN=2                ;SPW BIT FOR NO DBT !

                ;CHANNEL STATUS

                        CE=10                   ;CH END
                        DE=4                    ;DEVICE END
                        UC=2                    ;UNIT CHECK
                        ATTN=200                ;ATTENTION
                        SM=100                  ;STATUS MODIFIER
                        CUE=40                  ;CU END
                        BSY=20                  ;BUSY

                ;SWITCH DEFINITIONS

                        HLTSW=BIT15             ;HALT ON ERROR
                        LOPSW=BIT14             ;LOOP ON ERROR
                        PNTSW=BIT13             ;INHIBIT PRINT
```

```
                000200          SESW=BIT12              ;SHORT ERROR SWITCH
                004000          IISW=BIT11              ;INHIBIT ITERATIONS
                002000          MCCSW=BIT10             ;MAINTENANCE CLOCK CONTROL

                                ;PROCESSOR PRIORITY LEVELS

                000000          LEVEL0= 000
                000040          LEVEL1= 040
                000100          LEVEL2= 100
                000140          LEVEL3= 140
                000200          LEVEL4= 200
                000240          LEVEL5= 240
                000300          LEVEL6= 300
                000340          LEVEL7= 340

                                ;REGISTER DEFINITIONS

                000000          R0=%0
                000001          R1=%1
                000002          R2=%2
                000003          R3=%3
                000004          R4=%4
                000005          R5=%5
                000005          TTY=%5
                000006          R6=%6
                000006          SP=%6                   ;STACK POINTER
                000007          PC=%7                   ;PROGRAM COUNTER

                000034          TYPE=IOT
                000240          NOP=240
                177776          PS=177776               ;PROCESSOR STATUS
                177570          SWR=177570
                177570          SR=177570               ;SWITCH REGISTER

                000000          E=0
                011620          EMTABLE=EMTAG

                                ;EMT DEFINITIONS

000104  104000                        ERROR           ;TRAPS TO T,ERROR
000106  104001                        MAPERR          ;TRAPS TO T,MAPERR
000110  104002                        TRACER          ;TRAPS TO T,TRACER
000112  104003                        SAVRG           ;TRAPS TO T,SAVRG
000114  104004                        RSTRG           ;TRAPS TO T,RSTRG
000116  104005                        ACCEPTO         ;TRAPS TO T,ACCEPTO
000120  104006                        KEY,TO',R0              ;TRAPS TO T,KEY,TO',R0
000122  104007                        PARITY          ;TRAPS TO T,PARITY
000124  104010                        PCW1            ;TRAPS TO T,PCW1
000126  104011                        PCW2            ;TRAPS TO T,PCW2
000130  104012                        PCW3            ;TRAPS TO T,PCW3

                                .SBTTL  TRAP DEFINITIONS

                                ;TRAP INITIALIZATION
```

```
                000014                          .=14
        000014  006674  000340                          O,BRK,LEVEL7            ;BREAK TRAP

                000020                          .=20
        000020  016214  000340                          .IOT,LEVEL7             ;TTY OUTPUT TRAP,LEVEL 7

                000024                          .=24
        000024  001444  000340                          PFAIL,LEVEL7            ;POWER FAIL TRAP

                000030                          .=30
        000030  011556  000340                          EMTDECODER,LEVEL7       ;EMT DECODER TRAP,LEVEL 7

                000034                          .=34
        000034  011324  000340                          SCOPEC,LEVEL7           ;SCOPE TRAP


                000200                          .=200

        000200  000137  001100                  START:  JMP     @#BEGIN         ;GO TO BEGINNING OF PROGRAM

                001100                          .=1100

        001100  012706  001100                  BEGIN:  MOV     #BEGIN,SP       ;SET UP STACK POINTER
        001104  012737  000340  177776                  MOV     #LEVEL7,PS      ;PRIORITY LEVEL 7

                                                ;************************** MOD APR 74 ****************************
                                                ;*                         11/40,11/45 TRACE TRAP

        001112  012737  000002  000706                  MOV     #2,RTX
        001120  012737  001154  000010                  MOV     #INITB,@#10
        001126  012737  000340  000012                  MOV     #340,@#12
        001134  005046                                  CLR     -(SP)
        001136  012746  001144                          MOV     #INITZ,-(SP)
        001142  000006                                  RTT
        001144  012737  000006  000706          INITZ:  MOV     #6,RTX
        001152  000402                                  BR      INITC
        001154  062706  000010                  INITB:  ADD     #10,SP
        001160  013737  000706  000704          INITC:  MOV     RTX,YESRTI
        001166  012737  000012  000010                  MOV     #12,@#10
        001174  005037  000012                          CLR     @#12

                                                ;************************** MOD APR 74 ****************************

        001200  005737  000042                          TST     @#42            ;ACT11
        001204  001404                                  BEQ     BGN0            ;BR IF NO
                                                ;       JSR     PC,MONDFLT      ;INSERT DEFAULT PARAMETERS
        001206  005037  014002                          CLR     @#ONESHOT               ;DO NOT EXECUTE TIME CONSUMING TESTS
        001212  000137  013372                          JMP     @#MON11         ;
        001216  005327  000001                  BGN0:   DEC     #1
        001222  001002                                  BNE     BGN1
        001224  000137  012450                          JMP     @#MONITOR
        001230  032737  000200  177570          BGN1:   BIT     #200,SR         ;TEST FOR FAST START
        001236  001402                                  BEQ     BGN2            ;BRANCH IF FAST START
```

```
 998  001240  000137  012520            JMP     @#MON1,0
 999  001244  012706  001100    BGN2I:  MOV     #BEGIN,SP
1000  001250  012737  000340  177776    MOV     #LEVEL7,PS
1001  001256  000137  013340            JMP     @#MON1P         ;USE PREVIOUS PARAMETERS
1002
1003
1004                              .SBTTL  DX REGISTERS
1005
1006  001262  176200            DXBASE: 176200
1007  001264  000300            DXIVI:  300                     ;DX INTERRUPT VECTOR ADRS
1008  001266  000302            DXISI:  302                     ;DX INTERRUPT STATUS
1009  001270  000200            DXPRTI: LEVEL4                  ;INT PRIORITY ADRS
1010  001272  000140            LESS1I: LEVEL3                  ;DX PRIORITY MINUS ONE
1011  001274  176200            DXDSI:  176200                  ;DEVICE STATUS ->TT
1012  001276  176202            DXCAI:  176202                  ;COMMAND AND ADDRESS ->TT
1013  001300  176204            DXCSI:  176204                  ;CONTROL UNIT STATUS
1014  001302  176206            DXOSI:  176206                  ;OFFSET AND STATUS
1015  001304  176210            DXBAI:  176210                  ;BUS ADDRESS FOR NPR'S
1016  001306  176212            DXBCI:  176212                  ;BYTE COUNT
1017  001310  176214            DXMOI:  176214                  ;MAINTENANCE OUT
1018  001312  176216            DXMII:  176216                  ;MAINTENANCE IN
1019  001314  176220            DXCBI:  176220                  ;CONTROL BITS
1020  001316  176222            DXNDI:  176222                  ;NPR DATA
1021  001320  176224            DXESI:  176224                  ;EXTRA SIGNALS
1022  001322  176226            DXMOBI: 176226                  ;MAINTENANCE OUT BUFFERED
1023  001324  176230            DXES1I: 176230                  ;EXTRA EXTRA SIGNALS
1024
1025                              ;BYTE REGISTERS
1026
1027                              ;DXCA
1028
1029  001326  176202            CUARI:  176202                  ;CU ADDRESS REGISTER
1030  001330  176203            CUCRI:  176203                  ;CU COMMAND REGISTER
1031
1032                              ;DXOS
1033
1034  001332  176206            CUSRI:  176206                  ;CU STATUS REGISTER
1035  001334  176207            CUORI:  176207                  ;CU OFFSET REGISTER
1036
1037                              ;DXMO
1038
1039  001336  176214            BUSOI:  176214                  ;IBM BUS OUT
1040  001340  176215            CONOI:  176215                  ;CONTROL LINES OUT
1041
1042                              ;DXMI
1043
1044  001342  176216            BUSII:  176216                  ;IBM BUS IN
1045  001344  176217            CONII:  176217                  ;CONTROL LINES IN
1046
1047                              ;DXES
1048  001346  176224            MISCI:  176224                  ;MISCELLANEOUS BITS
1049  001350  176225            TTNDXI: 176225                  ;TUMBLE TABLE INDEX REG
1050
1051                              ;DXMOB
```

```
1052
1053  001352  176226                BUSOB:  176226                  ;BUS OUT BUFFERED
1054  001354  176227                CONOB:  176227                  ;CONTROL OUT BUFFERED
1055
1056                                ;REGISTER ADDRESSES
1057
1058  001356  177700                REG0:   177700
1059  001360  177701                REG1:   177701
1060  001362  177702                REG2:   177702
1061  001364  177703                REG3:   177703
1062  001366  177704                REG4:   177704
1063  001370  177705                REG5:   177705
1064  001372  177706                REG6:   177706
1065  001374  177707                REG7:   177707
1066
1067                                ;TTY ADDRESSES
1068
1069  001376  177560                TKS:    177560
1070  001400  177562                TKB:    177562
1071  001402  177564                TPS:    177564
1072  001404  177566                TPB:    177566
1073
1074                                ;REGISTER TRACE TABLE
1075
1076  001406                        REGTT:                          ;REGISTER TRACE TABLE
1077  001406  000000                TDXDS:  0                       ;DEVICE STATUS TRACE
1078  001410  000000                TDXCA:  0                       ;COMMAND AND ADDRESS TRACE
1079  001412  000000                TDXCS:  0                       ;CU STATUS TRACE
1080  001414  000000                TDXOS:  0                       ;OFFSET AND STATUS TRACE
1081  001416  000000                TDXBA:  0                       ;BUS ADDRESS TRACE
1082  001420  000000                TDXMO:  0                       ;MAINTENANCE-OUT TRACE
1083  001422  000000                TDXMI:  0                       ;MAINTENANCE-IN TRACE
1084  001424  000000                TDXCB:  0                       ;CONTROL BIT TRACE
1085  001426  000000                TDXND:  0                       ;NPR DATA TRACE
1086  001430  000000                TDXES:  0                       ;EXTRA SIGNAL TRACE
1087  001432  000000                TDXES1: 0                       ;EXTRA SIGNAL TRACE 1
1088  001434  000000                TTYNDX: 0                       ;TTYNDX TRACE
1089
1090
1091                                ;STATUS POINTER WORD ADDRESS
1092
1093  001436  002000                SPW:    2000
1094
1095                                ;TUMBLE TABLE ADDRESS
1096
1097  001440  003000                TT:     3000
1098
1099                                ;DEVICE STATUS TABLE ADDRESS
1100
1101  001442  017000                DST:    DSTADRS         ;DST MUST BE MOD(400)
1102
1103
1104                                .SBTTL  POWER FAIL
1105
```

```
1106
1107                                    ;POWER FAIL ROUTINE
1108                                    ;IF SELECTED VERIFY STATUS.IN IS UP
1109                                    ;AND CE AND DE ARE PRESENTED AS STATUS
1110
1111  001444  104003                    PFAIL:  SAVRG
1112  001446  010637  001606                    MOV     R0,SAVR0
1113  001452  012737  001536  000024             MOV     #PWRUP,24
1114  001460  032777  020000  177622             BIT     #S:LO,@DXMO
1115  001466  001417                             BEQ     1$
1116  001470  032777  100000  177614             BIT     #OPLI,@DXMI
1117  001476  001001                             BNE     .+4                     ;BRANCH IF NO ERROR CONDITION
1118  001500  104000                             ERROR                           ;
1119  001502  032777  004000  177602             BIT     #STAI,@DXMI
1120  001510  001001                             BNE     .+2                     ;BRANCH IF NO ERROR CONDITION
1121  001512  104000                             ERROR                           ;
1122  001514  122777  000014  177620             CMPB    #CE!DE,@BUSI
1123  001522  001401                             BEQ     .+2                     ;BRANCH IF NO ERROR CONDITION
1124  001524  104000                             ERROR                           ;
1125  001526  000000                    1$:     HALT
1126
1127                                    ;POWER UP ROUTINE
1128
1129  001530  000240                    PWRUP:  NOP                     ;PATCH ANYONE?
1130  001532  013706  001606                    MOV     SAVR0,R0
1131  001536  104004                            RSTRG
1132  001540  012737  001444  000024             MOV     #PFAIL,24               ;RESTORE POWER FAIL VECTOR
1133  001546  013777  001436  177526             MOV     SPW,@DXOS               ;RESTORE OFFSET REG
1134  001554  004737  015370                    JSR     PC,RESRES               ;RESET AND RESTORE
1135  001560  005027                            CLR     (PC)+                   ;STALL FOR MECHANICS
1136  001562  000000                            0
1137  001564  005337  001562                    DEC     .-2
1138  001570  001375                            BNE     .-4
1139  001572  000004  001610                    TYPE    ,PFLD                   ;POWER FAILED
1140
1141
1142
1143
1144
1145
1146  001576  012637  177776                    MOV     (SP)+,PS
1147  001602  000177  007040                    JMP     @RETURN
1148  001606  000000                    SAVR0:  0
1149  001610  050137  053517  051105  PFLD:    .ASCIZ  "<CR>POWER FAILED<CR>"
1150  001616  043040  044501  042514
1151  001624  057504  000
1152          001630                    .EVEN
1153
1154
1155
1156
1157
1158                                    .SBTTL  STATUS POINTER WORD TABLE
1159          001630                    ENDSTR=.                        ;DEFINE END OF START CODE
```

```
1160            002000                  .=2000
1161                                    ;DEFAUL    ATUS POINTER WORD (SPW)
1162                                    ;DEFAUL  .-ULATION IS OF ONE CONTROL UNIT
1163                                    ;WITH CAPACITY OF 16 DEVICES
1164            000000                  N=0
1165
1166                                    ;STATUS POINTER WORDS FOR CU 0
1167
1168  002000  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1169  002002  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1170  002004  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1171  002006  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1172  002010  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1173  002012  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1174  002014  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1175  002016  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1176  002020  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1177  002022  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1178  002024  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1179  002026  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1180  002030  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1181  002032  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1182  002034  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1183  002036  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1184
1185                                    ;STATUS POINTER WORDS FOR CU 1
1186
1187  002040  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1188  002042  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1189  002044  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1190  002046  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1191  002050  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1192  002052  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1193  002054  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1194  002056  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1195  002060  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1196  002062  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1197  002064  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1198  002066  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1199  002070  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1200  002072  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1201  002074  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1202  002076  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1203
1204                                    ;STATUS POINTER WORDS FOR CU 2
1205
1206  002100  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1207  002102  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1208  002104  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1209  002106  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1210  002110  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1211  002112  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1212  002114  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1213  002116  016000                            ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
```

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1214  002120  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1215  002122  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1216  002124  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1217  002126  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1218  002130  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1219  002132  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1220  002134  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1221  002136  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1222
1223                            ;STATUS POINTER WORDS FOR CU 3
1224
1225  002140  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1226  002142  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1227  002144  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1228  002146  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1229  002150  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1230  002152  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1231  002154  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1232  002156  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1233  002160  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1234  002162  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1235  002164  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1236  002166  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1237  002170  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1238  002172  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1239  002174  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1240  002176  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1241
1242                            ;STATUS POINTER WORDS FOR CU 4
1243
1244  002200  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1245  002202  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1246  002204  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1247  002206  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1248  002210  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1249  002212  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1250  002214  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1251  002216  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1252  002220  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1253  002222  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1254  002224  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1255  002226  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1256  002230  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1257  002232  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1258  002234  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1259  002236  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1260
1261                            ;STATUS POINTER WORDS FOR CU 5
1262
1263  002240  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1264  002242  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1265  002244  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1266  002246  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1267  002250  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
```

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1268  002252  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1269  002254  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1270  002256  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1271  002260  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1272  002262  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1273  002264  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1274  002266  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1275  002270  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1276  002272  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1277  002274  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1278  002276  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1279
1280                          ;STATUS POINTER WORDS FOR CU 6
1281
1282  002300  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1283  002302  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1284  002304  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1285  002306  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1286  002310  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1287  002312  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1288  002314  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1289  002316  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1290  002320  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1291  002322  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1292  002324  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1293  002326  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1294  002330  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1295  002332  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1296  002334  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1297  002336  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1298
1299                          ;STATUS POINTER WORDS FOR CU 7
1300
1301  002340  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1302  002342  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1303  002344  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1304  002346  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1305  002350  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1306  002352  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1307  002354  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1308  002356  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1309  002360  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1310  002362  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1311  002364  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1312  002366  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1313  002370  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1314  002372  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1315  002374  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1316  002376  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1317
1318                          ;STATUS POINTER WORDS FOR CU 10
1319
1320  002400  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1321  002402  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
```

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1322  002404  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1323  002406  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1324  002410  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1325  002412  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1326  002414  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1327  002416  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1328  002420  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1329  002422  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1330  002424  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1331  002426  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1332  002430  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1333  002432  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1334  002434  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1335  002436  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1336
1337                                ;STATUS POINTER WORDS FOR CU 11
1338
1339  002440  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1340  002442  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1341  002444  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1342  002446  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1343  002450  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1344  002452  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1345  002454  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1346  002456  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1347  002460  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1348  002462  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1349  002464  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1350  002466  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1351  002470  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1352  002472  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1353  002474  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1354  002476  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1355
1356                                ;STATUS POINTER WORDS FOR CU 12
1357
1358  002500  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1359  002502  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1360  002504  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1361  002506  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1362  002510  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1363  002512  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1364  002514  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1365  002516  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1366  002520  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1367  002522  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1368  002524  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1369  002526  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1370  002530  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1371  002532  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1372  002534  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1373  002536  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1374
1375                                ;STATUS POINTER WORDS FOR CU 13
```

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1376
1377  002540  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1378  002542  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1379  002544  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1380  002546  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1381  002550  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1382  002552  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1383  002554  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1384  002556  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1385  002560  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1386  002562  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1387  002564  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1388  002566  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1389  002570  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1390  002572  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1391  002574  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1392  002576  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1393
1394                          ;STATUS POINTER WORDS FOR CU 14
1395
1396  002600  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1397  002602  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1398  002604  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1399  002606  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1400  002610  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1401  002612  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1402  002614  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1403  002616  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1404  002620  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1405  002622  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1406  002624  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1407  002626  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1408  002630  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1409  002632  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1410  002634  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1411  002636  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1412
1413                          ;STATUS POINTER WORDS FOR CU 15
1414
1415  002640  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1416  002642  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1417  002644  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1418  002646  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1419  002650  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1420  002652  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1421  002654  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1422  002656  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1423  002660  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1424  002662  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1425  002664  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1426  002666  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1427  002670  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1428  002672  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1429  002674  016000                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
```

```
1430  002676  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1431
1432                                  ;STATUS POINTER WORDS FOR CU 16
1433
1434  002700  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1435  002702  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1436  002704  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1437  002706  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1438  002710  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1439  002712  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1440  002714  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1441  002716  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1442  002720  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1443  002722  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1444  002724  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1445  002726  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1446  002730  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1447  002732  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1448  002734  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1449  002736  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1450
1451                                  ;STATUS POINTER WORDS FOR CU 17
1452
1453  002740  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1454  002742  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1455  002744  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1456  002746  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1457  002750  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1458  002752  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1459  002754  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1460  002756  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1461  002760  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1462  002762  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1463  002764  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1464  002766  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1465  002770  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1466  002772  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1467  002774  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1468  002776  016000                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
1469
1470                                  .SBTTL  TUMBLE TABLE
1471          003000                  .=.     ;START OF  TUMBLE TABLE
1472
1473  003000  000400                  .BLKW   256.    ;RESERVE 265. WORDS FOR TT
1474
1475          004000                  ENDTT=.
1476
1477
1478
```

```
1479                                    ; ***************************************************************
1480                                    ;TEST   1       TEST I/O COMMAND
1481                                    ; ***************************************************************
1482  004000  104400                   TST11   SCOPE
1483  004002  012737  000200  011490            MOV     #200,@#ICOUNT   ;ITERATION COUNT
1484  004010  012737  000001  012432            MOV     #1,@#ERTSTN     ;SAVE TEST # FOR ERROR REPORT
1485  004016  012737  004024  011494            MOV     #SCP1,@#RETURN  ;SCOPE LOOP RETURN ADRS
1486  004024                            SCP11
1487
1488                                    .REM    *
1489                                    THE FUNCTION OF THIS TEST IS TO VERIFY THE DX11 CAN RESPOND TO A
1490                                    TEST I/O COMMAND.
1491
1492                                            *
1493
1494
1495  004024  012737  000400  014012            MOV     #TIOC,@#CMD     ;LOAD COMMAND
1496  004032  004737  006542                    JSR     PC,@#TRAINT     ;TT TRACE TRACE INIT
1497  004036  012737  000200  006306            MOV     #CHIS,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
1498  004044  013737  001272  177776            MOV     @#LESS1,PS      ;LOWER PROCESSOR STATUS
1499  004052  012737  004062  011702            MOV     #.,@#TERPC      ;ORIGIN OF TRAP ERROR
1500  004060  004737  007446                    JSR     PC,ISS,SUB              ;SELECT
1501
1502
```

```
                                        ; ************************************************************
                                        ;TEST   2       ILLEGAL COMMAND
                                        ; ************************************************************
004064  104400                          TST2:   SCOPE
004066  012737  000200  011450                  MOV     #200,@#ICOUNT   ;ITERATION COUNT
004074  012737  000002  012432                  MOV     #2,@#ERTSTN     ;SAVE TEST # FOR ERROR REPORT
004102  012737  004110  011404                  MOV     #SCP2,@#RETURN  ;SCOPE LOOP RETURN ADRS
004110                                  SCP2:

                                        .REM    *
                                        THE FUNCTION OF THIS TEST IS TO VERIFY THE DX11 RESPONDS CORRECTLY
                                        TO AN ILLEGAL COMMAND (I.E. PRESENTS UNIT CHECK).
                                                *
004110  042737  000400  010016                  BIC     #400,@#ISSCRJ   ;ILLC PRESENTS UNIT CHECK STATUS
                                                                        ;THIS CAUSES CMDREJ
                                                                        ;THEREFORE CHANGE ISS DIAGNOSTIC
                                                                        ;TO LOOK FOR CMDREJ UP
004116  012737  000405  014012                  MOV     #ILLC,@#CMD     ;LOAD COMMAND
004124  004737  006542                          JSR     PC,@#TRAINT     ;TT TRACE TRACE INIT
004130  012737  002201  006366                  MOV     #UCHKS!CHI!CMDREJ,@#ENTRY1      ;LOAD EXPECTED TT ENTRY 1
004136  013737  001272  177776                  MOV     @#LESS1,PS      ;LOWER PROCESSOR STATUS
004144  012737  004144  011702                  MOV     #.,@#TERPC      ;ORIGIN OF TRAP ERROR
004152  004737  007446                          JSR     PC,@#ISS.SUB            ;SELECT

004156  052737  000400  010016                  BIS     #400,@#ISSCRJ   ;RESTORE ISS TO LOOK FOR NOT CMDREJ
```

```
                                        ; *************************************************************
                                        ;TEST    3       SENSE COMMAND
                                        ; *************************************************************
004164  104400                          TST3:   SCOPE
004166  012737  000200  011450                  MOV     #200,@#ICOUNT   ;ITERATION COUNT
004174  012737  000003  012432                  MOV     #3,@#ERTSTN     ;SAVE TEST # FOR ERROR REPORT
004202  012737  004210  011454                  MOV     #SCP3,@#RETURN  ;SCOPE LOOP RETURN ADRS
004210                                  SCP3:



004210  012737  000004  014012                  MOV     #SENSEC,@#CMD   ;LOAD COMMAND
004216  004737  006542                          JSR     PC,@#TRAINT     ;TT TRACE TRACE INIT
004222  012737  000200  006306                  MOV     #CHIS,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
004230  013737  001272  177776                  MOV     @#LESS1,PS      ;LOWER PROCESSOR STATUS
004236  012737  004236  011702                  MOV     #.,@#TERPC      ;ORIGIN OF TRAP ERROR
004244  004737  007440                          JSR     PC,ISS.SUB              ;SELECT

 .
004250  012737  000001  014046                  MOV     #1,COUNT                ;INIT SOFTWARE BYTE COUNTER
004256  012777  177777  173022                  MOV     #-1,@DXBC               ;SET UP DX BYTE COUNT
004264  012777  014034  173012                  MOV     #SSTAT,@DXBA            ;DX BASE ADDRESS
004272  052777  000005  173000                  BIS     #DXFO!GO,@DXCS          ;FUNCTION OUTPUT & GO
                                                                                ;SERVICE-IN SHOULD RISE AND
                                                                                ;(SSTAT) SHOULD BE ON BUS-IN
004300  012737  000200  006306                  MOV     #CHIS,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
004306  113737  014010  006426                  MOVB    @#DEV,@#ENTRY2  ;SECOND TT ENTRY = DXCA
004314  113737  014012  006427                  MOVB    @#CMD,@#ENTRY2+1        ;
004322  113777  014010  174776                  MOVB    @#DEV,@CUAR     ;LOAD DEV ADRS
004330  113777  014012  174772                  MOVB    @#CMD,@CUCR     ;LOAD COMMAND IN CUCR
004336  012737  004336  011702                  MOV     #.,@#TERPC      ;DEFINE ORIGIN OF TRACE ERROR
004344  004737  010614                          JSR     PC,CUIS.SUB             ;EXECUTE SELECTION

004350  012737  000020  006306                  MOV     #CUDEND,@#ENTRY1        ;LOAD EXPECTED TT ENTRY 1
004356  113737  014010  006426                  MOVB    @#DEV,@#ENTRY2          ;SECOND TT ENTRY = DXCA
004364  112737  000001  006427                  MOVB    #1,@#ENTRY2+1           ;CUCR OF DXCA TT ENTRY
004372  113777  014010  174726                  MOVB    @#DEV,@CUAR             ;LOAD DEV ADRS
004400  012737  004400  011702                  MOV     #.,@#TERPC              ;DEFINE ORIGIN OF TRACE ERROR
004406  004737  007142                          JSR     PC,TRANSFER             ;DO TRANSFER IF REQUIRED
004412  012737  001100  006306                  MOV     #CHENDS!ESEND,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
004420  113737  014010  006426                  MOVB    @#DEV,@#ENTRY2          ;SECOND TT ENTRY = DXCA
004426  032737  000004  013376                  BIT     #BIT2,@#PARA            ;TEST FOR MUX
004434  001404                                  BEQ     1$                      ;BR IF SELECTOR
004436  112737  000000  006427                  MOVB    #0,@#ENTRY2+1           ;MUX TT CUCR
004444  000403                                  BR      2$                      ;GO
004446  112737  000001  006427  1$:             MOVB    #1,@#ENTRY2+1           ;CUCR OF DXCA TT ENTRY
004454  113777  014010  174644  2$:             MOVB    @#DEV,@CUAR             ;LOAD DEV ADRS
004462  012737  004462  011702                  MOV     #.,@#TERPC              ;DEFINE ORIGIN OF TRACE ERROR
004470  004737  007064                          JSR     PC,STATUSPRESENTATION   ;PRESENT STATUS
```

```
1581                                    ;*****************************************************************
1582                                    ;TEST  4        READ COMMAND (PDP OUTPUT)
1583                                    ;*****************************************************************
1584  004474  104420                    TST4:   SCOPE
1585  004476  012737  000100  011490            MOV     #100,@#ICOUNT   ;ITERATION COUNT
1586  004504  012737  000004  012432            MOV     #4,@#ERTSTN     ;SAVE TEST # FOR ERROR REPORT
1587  004512  012737  004520  011494            MOV     #SCP4,@#RETURN  ;SCOPE LOOP RETURN ADRS
1588  004520                            SCP4:
1589
1590
1591                                    .REM    <
1592
1593                                    THE FUNCTION OF THIS TEST IS TO VERIFY THAT THE DX11 CAN PROPERLY
1594                                    EXECUTE A READ COMMAND AND SUPPRESS DATA DURING THIS TRANSFER.
1595                                    THIS IS ACCOMPLISHED BY EXECUTING A CHANNEL INITIATED SELECTION
1596                                    FOLLOWED BY A CONTROL UNIT INITIATED SELECTION IF THE DX11'S SIM-
1597                                    ULATOR IS MIMICING A MULTIPLEXOR CHANNEL.  FOLLOWING THE COMPLETION
1598                                    OF A SUCCESSFUL SELECTION THE DX'S BYTE COUNT IS SET TO 256. AND
1599                                    ITS BUS ADDRESS REGISTER IS LOADED TO POINT TO "DATA" A FILE OF
1600                                    128. WORD OF FLOATING 1'S AND FLOATING 0'S.  THIS INITIALIZATION
1601                                    IS FOLLOWED BY SETTING THE DX FUNCTION BITS TO A FUNCTION-OUTPUT
1602                                    AND GO.
1603                                    DURING THE ENTIRE TEST ALL TUMBLE TABLE ENTRIES ARE TRACED.  PRIOR
1604                                    TO EACH ANTICIPATED "DONE" THE EXPECTED TUMBLE TABLE ENTRIES (DXDS
1605                                    AND DXCA) ARE LOADED INTO ENTRY1 AND ENTRY2 RESPECTIVELY THEN UPON
1606                                    INTERRUPT THESE EXPECTED ENTRIES ARE COMPARED WITH THE ACTUAL TT
1607                                    ENTRIES ALONG WITH THE EXPECTED TTNDX CONTENTS.  IF A DISCREPANCY
1608                                    OCCURS IT IS NOTED BY AN ERROR PC AND A TRACE ERROR ORIGIN PC.
1609                                    THE ORIGIN OF THE TRACE ERROR IS CONTAINED IN TERPC WHICH IS UP-
1610                                    DATED PRIOR TO EACH ANTICIPATED "DONE" BY A MOV #,,@#TERPC.
1611
1612                                    THE TRANSFER OF DATA FROM THE DX11 TO THE CHANNEL SIMULATOR IS
1613                                    CONTROLLED BY THE SRV0-SRV1 SEQUENCE.  DURING THIS SEQUENCE DATA
1614                                    CHECKS ARE MADE AND SUPPRESS DATA IS CHECKED BY RAISING SUPO IN
1615                                    RESPONSE TO SRV1 AND THEN RATTLING SRV0.  NO DATE TRANSFER SHOULD
1616                                    TAKE PLACE IF SUPO IS RAISED AFTER THE FIRST BYTE.
1617
1618                                    >
1619  004520  012737  000002  014012            MOV     #READC,@#CMD    ;LOAD COMMAND
1620  004526  004737  006542                    JSR     PC,@#TRAINT     ;TT TRACE TRACE INIT
1621  004532  012737  000200  006306            MOV     #CHIS,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
1622  004540  013737  001272  177776            MOV     @#LESS1,PS      ;LOWER PROCESSOR STATUS
1623  004546  012737  004546  011702            MOV     #.,@#TERPC      ;ORIGIN OF TRAP ERROR
1624  004554  004737  007446                    JSR     PC,ISS,SUB              ;SELECT
1625
1626
1627  004560  012737  000400  014046            MOV     #256.,COUNT             ;SOFTWARE BYTE COUNT
1628  004566  012777  177400  174512            MOV     #-256.,,@DXBC           ;DX BYTE COUNT
1629  004574  012701  021456                    MOV     #DATA,R1                ;BASE ADRS OF TEST DATA
1630  004600  012777  021456  174476            MOV     #DATA,@DXBA             ;FLOAT 1'S, 0'S OUTPUT DATA
1631  004606  052777  000005  174464            BIS     #DXFO,@DXCS             ;FUNCTION OUTPUT AND GO
1632                                                                            ;SERVICE-IN SHOULD RAISE AND
1633                                                                            ;DATA SHOULD BE ON BUS-IN
1634  004614  012737  000200  006306            MOV     #CHIS,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
```

```
1635  004622  113737  014010  000426          MOVB    @#DEV,@#ENTRY2  ;SECOND TT ENTRY = DXCA
1636  004630  113737  014012  000427          MOVB    @#CMD,@#ENTRY2+1        ;
1637  004636  113777  014010  174402          MOVB    @#DEV,@CUAR     ;LOAD DEV ADRS
1638  004644  113777  014012  174456          MOVB    @#CMD,@CUCR     ;LOAD COMMAND IN CUCR
1639  004652  012737  004652  011702          MOV     #.,@#TERPC      ;DEFINE ORIGIN OF TRACE ERROR
1640  004660  004737  010014                  JSR     PC,@CUIS,SUB            ;EXECUTE SELECTION
1641
1642  004664  112737  000001  000427          MOVB    #1,@#ENTRY2+1
1643  004672  012737  000020  000366          MOV     #CYDEND,@#ENTRY+1       ;LOAD TT ENTRY
1644  004700  012737  004700  011702          MOV     #.,@#TERPC              ;READ DONE TT TRACE ERROR PC
1645  004706  032777  002000  174376  RC01:   BIT     #SRVI,@DXMI             ;WAIT FOR SERVICE-IN
1646  004714  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1647  004716  104000                          ERROR                   ;SRVI NOT SET
1648  004720  127711  174416                  CMPB    @BUSI,@R1               ;CHECK DATA TRANSMITTED TO 368
1649  004724  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1650  004726  104000                          ERROR                   ;MEMORY TO BUSI TRANSFER ERROR
1651  004730  105721                          TSTB    (R1)+                   ;INC TO NEXT BYTE
1652  004732  052777  001000  174390          BIS     #SRVO,@DXMO
1653  004740  032777  001000  174342          BIT     #SRVO,@DXMO
1654  004746  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1655  004750  104000                          ERROR                   ;SRVO NOT SET
1656  004752  032737  000004  013376          BIT     #BIT2,PARA              ;TEST FOR MUX MODE
1657  004760  001005                          BNE     RC3
1658                                  ;WHEN ON MUX CH OPLI WILL DROP WHEN TRANSMISSION IS FINISHED
1659                                  ;THIS WILL CAUSE DXMI TO BE UNREADABLE
1660  004762  032777  002000  174322          BIT     #SRVI,@DXMI             ;SERVICE-IN SHOULD DROP
1661  004770  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1662  004772  104000                          ERROR                   ;SRVI STUCK HIGH
1663  004774  052777  010000  174306  RC11:   BIS     #SUPO,@DXMO             ;SET SUPPRESS-OUT
1664  005002  032777  010000  174300          BIT     #SUPO,@DXMO             ;VERIFY SUPO SET
1665  005010  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1666  005012  104000                          ERROR                   ;SUPO NOT SET
1667  005014  012727  000010                  MOV     #10,(PC)+               ;SRVO COUNT
1668  005020  000000          RC21:   0                               ;SRVO COUNT
1669  005022  052777  001000  174200  RC31:   BIS     #SRVO,@DXMO             ;KEEP SRVO CHANGING
1670  005030  032777  001000  174292          BIT     #SRVO,@DXMO             ;VERIFY SRVO SET
1671  005036  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1672  005040  104000                          ERROR                   ;SRVO DID NOT SET
1673  005042  042777  001000  174240          BIC     #SRVO,@DXMO             ;  "     "       "
1674  005050  032777  001000  174232          BIT     #SRVO,@DXMO             ;VERIFY SRVO CLEAR
1675  005056  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1676  005060  104000                          ERROR                   ;SRVO NOT 0
1677  005062  032737  000004  013376          BIT     #BIT2,PARA              ;TEST FOR MUX MODE
1678  005070  001005                          BNE     RC3
1679                                  ;WHEN ON MUX CH OPLI WILL DROP WHEN TRANSMISSION IS FINISHED
1680                                  ;THIS WILL CAUSE DXMI TO BE UNREADABLE
1681  005072  032777  002000  174212          BIT     #SRVI,@DXMI             ;SUPO SHOULD SUPPRESS SRVI SETTING
1682  005100  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1683  005102  104000                          ERROR                   ;SRVI WAS NOT SUPPRESSED BY SUPO
1684  005104  005337  005020          RC41:   DEC     RC2                     ;DEC SRVO COUNT
1685  005110  001344                          BNE     RC3             ;BRANCH IF SRVO NOT DONE
1686  005112  042777  010000  174170          BIC     #SUPO,@DXMO             ;DROP SUPPRESS-OUT
1687  005120  032777  010000  174162          BIT     #SUPO,@DXMO             ;VERIFY SUPO CLEAR
1688  005126  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
```

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1689  005130  104000                        ERROR                           ;SUPC STUCK HIGH
1690  005132  032777  001000  174198        BIT     #SRVC,@DXHC
1691  005140  001401                        BEQ     .+4                     ;BRANCH IF NO ERROR CONDITION
1692  005142  104000                        ERROR                           ;SRVC STUCK HIGH
1693  005144  005337  014046                DEC     COUNT
1694  005150  001256                        BNE     RCV
1695  005152  012737  001100  000306        MOV     #CHENDS!ESEND,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
1696  005160  113737  014010  000426        MOVB    @#DEV,@#ENTRY2          ;SECOND TT ENTRY = DXCA
1697  005166  032737  000004  013376        BIT     #BIT2,@#PARA            ;TEST FOR MUX
1698  005174  001404                        BEQ     1$                      ;BR IF SELECTOR
1699  005176  112737  000000  000427        MOVB    #0,@#ENTRY2+1           ;MUX TT CUCR
1700  005204  000403                        BR      2$                      ;GO
1701  005206  112737  000001  000427  1$:   MOVB    #1,@#ENTRY2+1           ;CUCR OF DXCA TT ENTRY
1702  005214  113777  014010  174104  2$:   MOVB    @#DEV,@CUAR             ;LOAD DEV ADRS
1703  005222  012737  005222  011702        MOV     #.,@#ERPC               ;DEFINE ORIGIN OF TRACE ERROR
1704  005230  004737  007004                JSR     PC,STATUSPRESENTATION   ;PRESENT STATUS
1705
1706
1707
```

```
1708                                    ;*****************************************************
1709                                    ;TEST   5       WRITE COMMAND (POP INPUT)
1710                                    ;*****************************************************
1711  005234  104400                    TST5:   SCOPE
1712  005236  012737  000100  011490            MOV     #100,@#ICOUNT   ;ITERATION COUNT
1713  005244  012737  000005  012432            MOV     #5,@#ERTSTN     ;SAVE TEST # FOR ERROR REPORT
1714  005252  012737  005260  011494            MOV     #SCP5,@#RETURN  ;SCOPE LOOP RETURN ADRS
1715  005260                                    SCP5:
1716
1717
1718                                    .REM    *
1719
1720                                    THE FUNCTION OF THIS TEST IS TO VERIFY THAT THE DX11 CAN EXECUTE
1721                                    WRITE COMMANDS FROM THE CHANNEL SIMULATOR.  THIS TEST IS IMPLE-
1722                                    MENTED MUCH LIKE THE READ TEST IN THAT THE TRANSFER IS 256. BYTES,
1723                                    TT TRACING IS DONE AND SUPPRESS DATA IS ALSO CHECKED.  TT DIFFERS
1724                                    IN THE DIRECTION AND TYPE OF DATA.
1725
1726                                            *
1727
1728  005260  012737  000001  014012            MOV     #WRITEC,@#CMD   ;LOAD COMMAND
1729  005266  004737  006542                    JSR     PC,@#TRAINT     ;TT TRACE TRACE INIT
1730  005272  012737  000200  006366            MOV     #CHIS,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
1731  005300  013737  001272  177776            MOV     @#LESS1,PS      ;LOWER PROCESSOR STATUS
1732  005306  012737  005306  011702            MOV     #.,@#TERPC      ;ORIGIN OF TRAP ERROR
1733  005314  004737  007446                    JSR     PC,ISS,SUB              ;SELECT
1734
1735
1736  005320  012737  000400  014046            MOV     #256.,COUNT             ;SOFTWARE COUNTER
1737  005326  012777  177400  173752            MOV     #-256.,@DXBC            ;DX BYTE COUNT
1738  005334  012777  023056  173742            MOV     #NPRDATA,@DXBA          ;ADRS FOR DATA FROM 360 SIM
1739  005342  012702  023056                    MOV     #NPRDATA,R2             ;INPUT FILE FOR NPR DATA
1740  005346  012701  022856                    MOV     #WDATA,R1               ;WRITE DATA FOR 360 SIM
1741  005352  052777  000003  173720            BIS     #D.FI!60,@DXCS          ;FUNCTION INPUT & 60 (360 WRITE)
1742  005360  012737  000200  006366            MOV     #CHIS,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
1743  005366  113737  014015  006426            MOVB    @#DEV,@#ENTRY2  ;SECOND TT ENTRY & DXCA
1744  005374  113737  014012  006427            MOVB    @#.CMD,@#ENTRY2+1       ;
1745  005402  113777  014015  173716            MOVB    @#DEV,@CUAR     ;LOAD DEV ADRS
1746  005410  113777  014012  173712            MOVB    @#CMD,@CUCR     ;LOAD COMMAND IN CUCR
1747  005416  012737  005416  011702            MOV     #.,@#TERPC      ;DEFINE ORIGIN OF TRACE ERROR
1748  005424  004737  010614                    JSR     PC,CUIS,SUB             ;EXECUTE SELECTION
1749
1750
1751  005430  012737  000020  006366  WC01      MOV     #CUDEND,@#ENTRY1        ;TT ENTRY 1
1752  005436  112737  177777  006427            MOVB    #-1,@#ENTRY2+1          ;FAKE CUCR OF ENTRY 2
1753  005444  012737  005444  011702            MOV     #.,@#TERPC              ;WRITE TRACE ERROR
1754  005452  032777  002000  173632            BIT     #SRV1,@DXMI             ;WAIT FOR SERVICE-IN
1755  005460  001401                            BNE     .+2             ;BRANCH IF NO ERROR CONDITION
1756  005462  104000                            ERROR                   ;SRV1 NOT SET
1757  005464  051177  173646                    BIS     @R1,@#BUSO              ;PUT DATA ON BUS-OUT
1758  005470  121177  173642                    CMPB    @R1,@#BUSO              ;VERIFY LOAD
1759  005474  001401                            BEQ     .+2             ;BRANCH IF NO ERROR CONDITION
1760  005476  104000                            ERROR                   ;BUSO INTO MEMORY DATA TRANSFER ERROR
1761  005500  052777  001000  173602            BIS     #SRVO,@DXMO
```

```
1762  005506  032777  001000  173574          BIT     #SRVO,@DXMO
1763  005514  001001                          BNE     .+4                 ;BRANCH IF NO ERROR CONDITION
1764  005516  104000                          ERROR                       ;SRVO NOT SET
1765  005520  032737  000004  013376          BIT     #BIT2,PARA                  ;CAN'T LOOK AT SRVI ON MUX CH
1766  005526  001005                          BNE     WC 0
1767  005530  032777  002000  173554          BIT     #SRVI,@DXMI
1768  005536  001401                          BEQ     .+4                 ;BRANCH IF NO ERROR CONDITION
1769  005540  104000                          ERROR                       ;SRVI DID NOT DROP
1770  005542  005721                  WC001   TST     (R1)+
1771  005544  105722                          TSTB    (R2)+
1772  005546  032702  000001                  BIT     #BIT0,R2                    ;TEST FOR EVEN BOUNDRY
1773  005552  001016                          BNE     WC1
1774
1775  005554  162701  000004                  SUB     #4,R1
1776  005560  162702  000002                  SUB     #2,R2
1777  005564  121112                          CMPB    @R1,@R2                     ;VERIFY 1ST DATA BYTE TRANSFER
1778  005566  001401                          BEQ     .+4                 ;BRANCH IF NO ERROR CONDITION
1779  005570  104000                          ERROR                       ;BUSC INTO MEMORY DATA TRANSFER ERROR
1780  005572  005721                          TST     (R1)+
1781  005574  105722                          TSTB    (R2)+
1782  005576  121112                          CMPB    @R1,@R2                     ;VERIFY 2ND BYTE TRANSFER
1783  005600  001401                          BEQ     .+6                 ;BRANCH IF NO ERROR CONDITION
1784  005602  104000                          ERROR                       ;SECOND DATA BYTE INTO MEMORY
1785
1786  005604  005721                          TST     (R1)+
1787  005606  105722                          TSTB    (R2)+
1788  005610  052777  010000  173472  WC1:    BIS     #SUPO,@DXMO                 ;SET SUPPRESS-OUT
1789  005616  032777  010000  173464          BIT     #SUPO,@DXMO                 ;VERIFY SUPO SET
1790  005624  001001                          BNE     .+6                 ;BRANCH IF NO ERROR CONDITION
1791  005626  104000                          ERROR                       ;SUPO NOT SET
1792  005630  012727  000010                  MOV     #10,(PC)+                   ;SRVO COUNT
1793  005634  000000          WC2:    0                                   ;SRVO COUNT
1794  005636  052777  001000  173444  WC3:    BIS     #SRVO,@DXMO                 ;KEEP SRVO CHANGING
1795  005644  032777  001000  173436          BIT     #SRVO,@DXMO                 ;VERIFY SRVO SET
1796  005652  001001                          BNE     .+4                 ;BRANCH IF NO ERROR CONDITION
1797  005654  104000                          ERROR                       ;SRVO DID NOT SET
1798  005656  042777  001000  173424          BIC     #SRVO,@DXMO                 ;CLEAR SRVO
1799  005664  032777  001000  173416          BIT     #SRVO,@DXMO                 ;VERIFY SRVO CLEAR
1800  005672  001401                          BEQ     .+10                ;BRANCH IF NO ERROR CONDITION
1801  005674  104000                          ERROR                       ;SRVO NOT 0
1802  005676  032737  000004  013376          BIT     #BIT2,PARA                  ;TEST FOR MUX MODE
1803  005704  001005                          BNE     WC4
1804                          ;WHEN ON MUX CH OPLI WILL DROP WHEN TRANSMISSION IS FINISHED
1805                          ;THIS WILL CAUSE DXMI TO BE UNREADABLE
1806  005706  032777  002000  173376          BIT     #SRVI,@DXMI                 ;SUPO SHOULD SUPPRESS SRVI SETTING
1807  005714  001401                          BEQ     .+4                 ;BRANCH IF NO ERROR CONDITION
1808  005716  104000                          ERROR                       ;SRVI WAS NOT SUPPRESSED BY SUPO
1809  005720  005337  005634          WC4:    DEC     WC2                         ;DEC SRVO COUNT
1810  005724  001344                          BNE     WC3                 ;BRANCH IF SRVO NOT DONE
1811  005726  042777  010000  173394          BIC     #SUPO,@DXMO                 ;DROP SUPPRESS-OUT
1812  005734  032777  010000  173346          BIT     #SUPO,@DXMO                 ;VERIFY SUPO CLEAR
1813  005742  001401                          BEQ     .+4                 ;BRANCH IF NO ERROR CONDITION
1814  005744  104000                          ERROR                       ;SUPO STUCK HIGH
1815  005746  032777  001000  173334          BIT     #SRVO,@DXMO
```

```
1816
1817  005754  042777  001777  173326          BIC     #SRVO!777,@DXMO         ;CLR SRVO AND BUS0+PARITY
1818  005762  032777  001000  173326          BIT     #SRVO,@DXMO
1819  005770  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1820  005772  104000                          ERROR                   ;SRVO DID NOT DROP
1821  005774  005337  014046                  DEC     COUNT
1822  006000  001213                          BNE     WC.
1823  006002  012737  001100  006366          MOV     #CHENDS!ESEND,@ENTRY1   ;LOAD EXPECTED TT ENTRY 1
1824  006010  113737  014010  006426          MOVB    @DEV,@ENTRY2            ;SECOND TT ENTRY = DXCA
1825  006016  032737  000004  013376          BIT     #BIT2,@PARA             ;TEST FOR MUX
1826  006024  001404                          BEQ     1$                      ;BR IF SELECTOR
1827  006026  112737  000000  006427          MOVB    #0!0,@ENTRY2+1          ;MUX TT CUCR
1828  006034  000403                          BR      2$                      ;GO
1829  006036  112737  177777  006427  1$:     MOVB    #-1,@ENTRY2+1           ;CUCR OF DXCA TT ENTRY
1830  006044  113777  014010  173294  2$:     MOVB    @DEV,@CUAR              ;LOAD DEV ADRS
1831  006052  012737  006052  011702          MOV     .,,@TERPC               ;DEFINE ORIGIN OF TRACE ERROR
1832  006060  004737  007064                  JSR     PC,STATUSPRESENTATION   ;PRESENT STATUS
1833
1834
```

```
1835                                    ;*****************************************************************
1836                                    ;TEST  6        END OF TEST STRING
1837                                    ;*****************************************************************
1838  006064  104420                   TST6:   SCOPE
1839  006066  012737  000001  011490           MOV     #1,@#ICOUNT     ;ITERATION COUNT
1840  006074  012737  000006  012432           MOV     #6,@#ERTSTN     ;SAVE TEST # FOR ERROR REPORT
1841  006102  012737  006110  011494           MOV     #SCP6,@#RETURN  ;SCOPE LOOP RETURN ADRS
1842  006110                           SCP6:
1843
1844
1845                                    .REM    *
1846
1847                                    THIS TEST FUNCTIONS AS A TERMINATOR FOR THE CHAINABLE TEST STRING,
1848                                    AS SUCH IT TRANSFERS CONTROL TO THE LOOP CONTROL SUBROUTINE.
1849
1850                                            *
1851
1852
1853  006110  000137  013462                   JMP     @#LPCNTL
1854
1855
1856
1857                                    ;INTERRUPT HANDLERS
1858
1859  006114  104000                   FALSE:  ERROR                   ;FALSE OR UNEXPECTED INTERRUPT
1860  006116  000002                           RTI
1861
1862  006120  032777  000200  173152   INTR:   BIT     #DONE,@#XCS     ;TEST DONE
1863  006126  001001                           BNE     .+4             ;BRANCH ON DONE
1864  006130  104000                           ERROR                   ;FALSE INTERRUPT
1865  006132  042777  000200  173140           BIC     #DONE,@#XCS     ;CLEAR INT CONDTION
1866  006140  052737  100000  006150           BIS     #INTOK,INTPAS   ;SET INT PASS FLAG
1867  006146  000002                           RTI
1868
1869  006150  000000                   INTPAS: 0                       ;INTERRUPT PASS FLAG
1870
1871
1872                                    ;INTERR. ROUTINE TO TEST FOR SUCCESSFUL INTERRUPT
1873
1874  006152                           INTERR:
1875  006152  032737  100000  006150           BIT     #INTOK,INTPAS   ;DID INTERRUPT OCCUR
1876  006160  001405                           BEQ     IRR             ;BRANCH IF NOT
1877  006162  062716  000002           IRR2:   ADD     #2,@SP          ;INC RETURN PC
1878  006166  042737  100000  006150           BIC     #INTOK,INTPAS   ;CLEAR PASS FLAG
1879  006174  000207                   IRR:    RTS     PC
1880
1881                                    ;ZEROTT. ROUTINE TO ZERO TUMBLE TABLE
1882
1883  006176                           ZEROTT:
1884  006176  010146                           MOV     R1,-(SP)
1885  006200  010246                           MOV     R2,-(SP)
1886  006202  013701  001440                   MOV     TT,R1
1887  006206  012702  000400                   MOV     #256.,R2
1888  006212  005021                   ZTT1:   CLR     (R1)+
```

```
1889  006214  005302                          DEC     R2
1890  006216  001375                          BNE     ZTY1
1891  006220  012602                          MOV     (SP)+,R2
1892  006222  012601                          MOV     (SP)+,R1
1893  006224  000207                          RTS     PC
1894
1895                                  ;TTZERO, ROUTINE TO VERIFY TT ZERO
1896
1897  006226                          TTZERO:
1898  006226  010146                          MOV     R1,-(SP)
1899  006230  010246                          MOV     R2,-(SP)
1900  006232  013701  001440                  MOV     TT,R1
1901  006236  012702  000400                  MOV     #256.,R2
1902  006242  005721                  TTZ1:   TST     (R1)+
1903  006244  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1904  006246  104000                          ERROR                   ;ILLEGAL TT ENTRY
1905  006250  005302                          DEC     R2
1906  006252  001373                          BNE     TTZ1
1907  006254  012602                          MOV     (SP)+,R2
1908  006256  012601                          MOV     (SP)+,R1
1909  006260  000207                          RTS     PC
1910
1911                                  ;KBS DONE INTERRUPT SERVICE
1912  006262                          SEL,DONE:
1913  006262  032777  000200  173010          BIT     #DONE,@DXCS     ;CHECK DONE
1914  006270  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1915  006272  104000                          ERROR                   ;FALSE INTERRUPT
1916  006274  042777  000200  172776          BIC     #DONE,@DXCS     ;CLEAR DONE
1917  006302  032777  000200  172770          BIT     #DONE,@DXCS
1918  006310  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1919  006312  104000                          ERROR                   ;DONE NOT CLEAR
1920  006314  012746  006540                  MOV     #SEL,X,-(SP)    ;FAKE A JSR PC,TT,TRACE
1921
1922                                  ;TT.TRACE, ROUTINE TO TRACE TUMBLE TABLE ENTRIES
1923                                  ;AND THE TTNDX
1924  006320                          TT.TRACE:
1925
1926  006320  010146                          MOV     R1,-(SP)
1927  006322  013701  006526                  MOV     @#.TRACE,R1     ;LOAD R1 WITH SOFTWARE IT
1928  006326  020137  001440                  CMP     R1,@#TT         ;CHECK FOR BOTTOM OF TABLE
1929  006332  001005                          BNE     1$              ;BRANCH IF  NOT  BOTTOM
1930  006334  005737  003776                  TST     @#3776          ;LOOK AT  TOP OF TT
1931  006340  001401                          BEQ     .+4             ;BRANCH IF NO RAP AROUND
1932  006342  104002                          TRACER                  ;REPORT TT TRACE ERROR
1933  006344  000404                          BR      2$
1934  006346  005741                  1$:     TST     -(R1)           ;CHECK FOR TT OVERFLOW
1935  006350  001401                          BEQ     .+4             ;BRANCH IF NO RAP AROUND
1936  006352  104002                          TRACER                  ;TT OVERFLOW ERROR
1937  006354  005721                          TST     (R1)+           ;INC TO ENTRY
1938  006356  011127                  2$:     MOV     (R1),(PC)+      ;SAVE ENTRY ONE
1939  006360  000000                  SENRY1: 0                       ;HERE
1940  006362  023727  006360                  CMP     @#SENRY1,(PC)+  ;COMPARE SAVED ENTRY WITH
1941  006366  000000                  ENTRY1: 0                       ;EXPECTED ENTRY
1942  006370  001407                          BEQ     1$              ;BRANCH IF DXDS ENTRY OK
```

```
1943  000372  013737  000360  000534          MOV     @#SENRY1,@#TTWAS
1944  000400  013737  000366  000536          MOV     @#ENTRY1,@#TTSHOULD
1945  000406  104002                          TRACER                  ;REPORT TT TRACE ERROR
1946  000410  005037  000366          1$:     CLR     ENTRY1
1947  000414  005021                          CLR     (R1)+           ;CLEAR ENTRY AND ADVANCE POINTER
1948  000416  011127                          MOV     (R1),(PC)+      ;SAVE ENTRY TWO
1949
1950  000420  000000                  SENRY21: 0                      ;HERE
1951  000422  023727  000420                  CMP     @#SENRY2,(PC)+  ;COMPARE SAVED ENTRY WITH
1952  000426  000000                  ENTRY21: 0                      ;EXPECTED ENTRY
1953  000430  001411                  TT'T0:  BEQ     2$              ;BRANCH IF DXCA ENTRY OK
1954  000432  013737  000420  000534          MOV     @#SENRY2,@#TTWAS
1955  000440  013737  000426  000536          MOV     @#ENTRY2,@#TTSHOULD
1956  000446  104002                          TRACER                  ;REPORT TT TRACE ERROR
1957  000450  005037  000426                  CLR     ENTRY2
1958  000454  005021                  2$:     CLR     (R1)+           ;CLEAR
1959  000456  022701  004000                  CMP     #TST1,R1        ;CHECK FOR SOFTWARE
1960  000462  001002                          BNE     TT'T1           ;BRANCH IF NO OVERFLOW
1961  000464  013701  001440                  MOV     @#TT,R1
1962  000470  005037  000500          TT'T1:  CLR     @#TT,T2
1963  000474  117727  172650                  MOVB    @TTNDX,(PC)+    ;SAVE TTNDX
1964  000500  000000                  TT'T2:  0                       ;HERE
1965  000502  006337  000500                  ASL     TT'T2           ;SCALE MOD(2)
1966  000506  063737  001440  000500          ADD     @#TT,@#TT,T2    ;ADD BASE OF TT TO INDEX
1967  000514  123701  000500                  CMPB    @#TT,T2,R1      ;COMPARE TT POINTERS
1968  000520  001401                          BEQ     .+4             ;BRANCH IF HARDWARE AND SOFTWARE TT POINTERS MATCH
1969  000522  104002                          TRACER                  ;REPORT TT TRACE ERROR
1970  000524  010127                          MOV     R1,(PC)+        ;SAVE TT TRACE
1971  000526  000000                  TTRACE1: 0                      ;HERE
1972  000530  012601                          MOV     (SP)+,R1
1973  000532  000207                          RTS     PC              ;RETURN
1974  000534  000000                  TTWAS:  0       ;ACTUAL CONTENTS OF TT
1975  000536  000000                  TTSHOULD: 0     ;EXPECTED CONTENTS OF TT
1976
1977  000540  000002                  SEL.X:  RTI
1978
1979                                  ;SUBROUTINE TO INIT DX FOR TT TRACING
1980
1981  000542  042777  077777  172540  TRAINT: BIC     #77777,@DXMO    ;DESELECT
1982  000550  112777  000100  172664          MOVB    #SM,@DST        ;RESPONSE TO TEST IO
1983  000556  032737  000002  013376          BIT     #BIT1,@#PARA    ;CHECK FOR CUBSY MODE
1984  000564  001410                          BEQ     TI'8            ;BRANCH IF NOT CU BUSY
1985  000566  052777  004000  172504          BIS     #BSYEN,@DXCS    ;SET BSYEN
1986  000574  032777  004000  172476          BIT     #BSYEN,@DXCS    ;VERIFY SET
1987  000602  001001                          BNE     .+2             ;BRANCH IF NO ERROR CONDITION
1988  000604  104000                          ERROR                   ;BSYEN NOT SET
1989  000606  113737  014010  000426  TI'8I:  MOVB    @#DEV,@#ENTRY2  ;SECOND TT ENTRY = DXCA
1990  000614  113737  014012  000427          MOVB    @#CMD,@#ENTRY2+1        ;
1991  000622  113777  014012  172500          MOVB    @#CMD,@CUCR     ;LOAD COMMAND
1992  000630  113777  014010  172470          MOVB    @#DEV,@CUAR     ;LOAD COMMAND IN CUAR
1993  000636  052777  000100  172434          BIS     #INTEN,@DXCS    ;SET INTERRUPT ENABLE
1994  000644  032777  000100  172426          BIT     #INTEN,@DXCS    ;VERIFY SET
1995  000652  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1996  000654  104000                          ERROR                   ;INTEN NOT SET
```

```
006656  013777  001270  172402          MOV     @#DXPRT,@DXIS   ;LOAD INT STATUS
006664  012777  006262  172372          MOV     #SEL,DONE,@DXIV ;LOAD INT VECTOR
006672  000207                          RTS     PC



006674  104000                  O.BRK:  ERROR   ;BREAK TRAP IS ILLEGAL
006676  022626                          CMP     (SP)+,(SP)+     ;RESTORE STACK
006700  000137  012520                  JMP     @# ON1.0
                                ;************************** MOD APR 74 **************************
                                ;*                      11/40,11/45 RTT
                                ;*                      TRACE TRAP MOD

006704  000002                  YESRTI: RTI
006706  000002                  RTX:    RTI             ;MODIFIED FOR 11/40,11/45 TO RTT
                                ;************************** MOD APR 74 **************************
                                ;*                         TIMING
                                ;*                  MOS,BIPOLAR RESPONSE MOD

006710  000020                  DELAY:  20
006712  013727  006710          RDLAY:  MOV     DELAY,(PC)+
006716  000000                  1$:     0
006720  005337  006716          2$:     DEC     1$              ;DELAY FOR BIPOLAR MEMORY
006724  001375                          BNE     2$
006726  000207                          RTS     PC

                                ;************************** MOD APR 74 **************************
                                ;



                                .SBTTL  SETUP SELECTED PARAMETERS

                                ;SETUP, ROUTINE TO CLEAR DX AND SETUP THE FOLLOWING
                                ;       BIT2=   MUX CH
                                ;       BIT1=   BSYEN
                                ;       BIT0=   ON-LINE

006730  000240                  SETUP:  NOP
006732  042777  000200  172340          BIC     #DONE,@DXCS     ;CLR"DONE"& THEREFORE "LOCKO"
006740  042777  060000  172342          BIC     #HLDO!SELO,@DXMO        ;GET READY FOR NEXT ISS
006746  042777  177000  172336          BIC     #177000,@DXMI   ;
006754  052777  000010  172336          BIS     #TIMDIS,@DXES   ;SET DXTO DISABLE
006762  042737  100000  006150          BIC     #INTOK,INTPAS   ;CLEAR INTERRUPT PASS FLAG
006770  032737  000001  013376          BIT     #BIT0,PARA      ;TEST FOR ONLINE
006776  001402                          BEQ     SP1             ;BRANCH IF NOT ONLINE
007000  004737  007414                  JSR     PC,FOL          ;DO FAST ONLINE
007004  112777  000100  172430  SP1:    MOVB    #BM,@DST        ;RESPONSE TO TIO
007012  032737  000002  013376          BIT     #BIT1,PARA      ;WAS BSYEN SELECTED
007020  001405                          BEQ     SP2             ;BRANCH IF NOT
007022  052777  004000  172290          BIS     #BSYEN,@DXCS    ;SET BUSY ENABLE
007030  105077  172400                  CLRB    @DST            ;TIO GETS STATUS BY HARDWARE
007034  012777  006120  172222  SP2:    MOV     #INTR,@DXIV     ;SET UP DX INTERRUPT VECTOR
007042  013777  001270  172216          MOV     DXPRT,@DXIS     ;SET UP DX INTERRUPT STATUS
007050  052777  000100  172222          BIS     #INTEN,@DXCS    ;SET INT ENABLE
```

```
2251  007056  005037  177776                CLR     PS              ;CLEAR PROCESSOR STATUS
2252  007062  000207            SP41:       RTS     PC              ;RETURN
2253
2254
2255
2256
2257                              .SBTTL  STATUS PRESENTATION
2258  007064                    STATUSPRESENTATION:
2259  007064  042777  000200  172206          BIC     #DONE,@DXCS     ;CLEAR DONE AND LOCKO
2260
2261
2262
2263
2264
2265
2266
2267
2268
2269
2270
2271
2272  007072  112777  000014  172232          MOVB    #CE+DE,@CUSR    ;LOAD CE/DE STATUS
2273
2274  007100  052777  000007  172172          BIS     #DAFSTI!GO,@DXCS ;SET FCTN/STATUS/GO
2275                                                                  ;STATUS-IN SHOULD RISE
2276
2277  007106  004737  010614                  JSR     %7,CUIS,SUB     ;EXECUTE CUIS
2278  007112  042777  000000  172170          BIC     #WLDO!SELO,@DXMO        ;DROP SELO!WLDO FOR NONZERO STATUS
2279  007120  052777  001000  172162          BIS     #SRVO,@DXMO     ;SERVICE-OUT UP
2280                                                                  ;STATUS-IN SHOULD FALL
2281
2282
2283  007126  042777  001000  172194          BIC     #SRVO,@DXMO     ;DROP SERVICE-OUT,
2284                                                                  ;THIS ENDS ES -- ESEND INT SHOULD
2285                                                                  ;BE UP AND CUBSY CLEAR
2286                                                                  ;CHECK FOR INTERRUPTS
2287  007134  005077  172152                   CLR     @DXMI   ;CLEAR DXMI
2288  007140  000207                           RTS     %7
2289
2290                              .SBTTL  DATA TRANSFER ROUTINES
2291  007142                    TRANSFER:
2292  007142  032737  000001  014012           BIT     #1,CMD          ;IS COMMAND READ OR WRITE?
2293  007150  001012                           BNE     TR,WRITE        ;WRITE
2294
2295                            ;OUTPUT HERE
2296  007152                    TR',READ:
2297  007152  052777  001000  172138          BIS     #SRVO,@DXMO     ;SERVICE-OUT UP
2298                                                                  ;SERVICE-IN SHOULD FALL
2299  007160  042777  001000  172122          BIC     #SRVO,@DXMO     ;SERVICE-OUT DOWN
2100                                                                  ;SERVICE-IN UP AGAIN IF MORE
2101  007166  005337  014046                  DEC     COUNT           ;LOOP TILL DONE
2102  007172  001367                           BNE     TR,READ         ;...
2103  007174  000416                           BR      TR,OUT
2104
```

```
                                        ;INPUT HERE
001076                                  TR.WRITE:
001076  052177  172134                          BIS     (R1)+,@BUSO     ;PUT DATA ON BUS
001102  052777  001000  172100                  BIS     #SRVO,@DXMO     ;SERVICE-OUT UP
                                                                        ;SERVICE-IN SHOULD FALL
001210  042777  001000  172072                  BIC     #SRVO,@DXMO     ;SERVICE-OUT DOWN
001216  042777  000777  172112                  BIC     #777,@BUSO      ;TAKE DATA OFF BUS (SERVICE-IN UP)
001224  005337  014046                          DEC     COUNT
001230  001362                                  BNE     TR.WRITE

001232  000207                          TR.OUT: RTS     %7
```

```
                                        .SBTTL  ONLINE ROUTINE
                                        ;+++++++++++++++++++++
                                        ;ONLIN: ROUTINE TO SET DX ONLINE
                                        ;AND WAIT FOR RELAY TO PICK
                                        ;

001234  012737  010000  007412  ONLIN:  MOV     #10000,CNT      ;WAIT FOR RELAY TO SETTLE
001242  005337  007412          OL4:    DEC     CNT
001246  001375                          BNE     OL4
001250  013777  001430  172824          MOV     SPT,@DXDS       ;LOAD DX OFFSET
001256  023777  001430  172816          CMP     SPW,@DXDS       ;VERIFY OFFSET IS LOADED
001264  001401                          BEQ     .+3             ;BRANCH IF NO ERROR CONDITION
001266  104000                          ERROR                   ;DXDS LOAD ERROR
001270  052777  001000  172802          BIS     #ONLINA,@DXCS   ;SET ONLINE BIT
001276  032777  001000  171774          BIT     #ONLINA,@DXCS   ;ONLINE REQUEST SET
001304  001001                          BNE     .+3             ;BRANCH IF NO ERROR CONDITION
001306  104000                          ERROR                   ;ONLINA DID NOT SET
```

```
2159  007310  012737  010000  007412          MOV     #10000,CNT      ;SET UP STALL FOR ONLINE RELAY
2160  007316  005337  007412          OL2:    DEC     CNT             ;
2161  007322  001375                          BNE     OL2
2162  007324  032777  000004  171702          BIT     #ONLINB,@DXCR   ;IS DX ONLINE
2163  007332  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
2164  007334  104000                          ERROR                   ;ONLINB BIT NOT SET
2165  007336  032777  100000  171744          BIT     #OPLO,@DXMO     ;
2166  007344  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
2167  007346  104000                          ERROR                   ;ARE YOU REALLY MAINTENANCED CABLED?
2168  007350  052777  001000  171732  OL3:    BIS     #SRVO,@DXMO
2169  007356  032777  001000  171724          BIT     #SRVO,@DXMO     ;CHECK SERVICE OUT
2170  007364  001001                          BNE     .+2             ;BRANCH IF NO ERROR CONDITION
2171  007366  104000                          ERROR                   ;SRVO NOT SET
2172  007370  042777  001000  171712          BIC     #SRVO,@DXMO
2173  007376  032777  001000  171704          BIT     #SRVO,@DXMO     ;CHECK SERVICE OUT
2174  007404  001401                          BEQ     .+2             ;BRANCH IF NO ERROR CONDITION
2175  007406  104000                          ERROR                   ;SRVO NOT ZERO
2176
2177  007410  000207                          RTS     PC
2178  007412  000000          CNT:    0                               ;STALL
2179
2180
2181
2182                                  ;FAST ONLINE ROUTINE
2183
2184  007414  052777  001000  171696  FOL1:   BIS     #ONLINA,@DXCS   ;SET ONLINE BIT
2185  007422  032777  001000  171690          BIT     #ONLINA,@DXCS   ;ONLINE REQUEST SET
2186  007430  001001                          BNE     .+1             ;BRANCH IF NO ERROR CONDITION
2187  007432  104000                          ERROR                   ;ONLINA NOT SET
2188  007434  032777  000004  171682  FOL11:  BIT     #ONLINB,@DXCR   ;IS DX ONLINE
2189  007442  001774                          BEQ     FOL1            ;WAIT FOR RELAY TO PICK
2190  007444  000207                          RTS     PC
2191
2192
2193
2194                                  .SBTTL  INITIAL SELECTION SEQUENCE
2195
2196                                  ;INITIAL SELECTION SEQUENCE
2197
2198  007446                          ;SS.SUB:
2199  007446  053777  014010  171634          BIS     DEV,@DXMO       ;LOAD BUSO WITH DEVICE ADRS
2200  007454  123777  014010  171634          CMPB    DEV,@BUSO       ;TEST BUSO FOR CORRECT ADRS
2201  007462  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2202  007464  104000                          ERROR                   ;BUSO DID NOT LOAD
2203                                  ;.....MOD APR 74 .....
2204                                  ;       INITIAL SELECTION CLEANUP MOD
2205  007466  113777  014010  171632          MOVB    DEV,@CUAR
2206  007474  123777  014010  171624          CMPB    DEV,@CUAR
2207  007502  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2208  007504  104000                          ERROR                   ;CUAR BITS 7 THRU 0 FAILURE
2209                                  ;.....MOD APR 74 .....
2210
2211  007506  052777  004000  171574          BIS     #ADRO,@DXMO     ;SET ADRS-OUT
2212  007514  132777  000010  171616          BITB    #10,@CONO       ;TEST ADRO UP
```

```
2213  007522  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
2214  007524  104000                        ERROR                   ;ADRO DID NOT SET
2215
2216  007526  052777  040000  171594        BIS     #HLDO,@DXMO     ;SET HOLD-OUT
2217  007534  032777  040000  171546        BIT     #HLDO,@DXMO     ;TEST FOR HOLD-OUT UP
2218  007542  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
2219  007544  104000                        ERROR                   ;HOLD OUT DID NOT SET
2220
2221  007546  052777  020000  171534        BIS     #SELO,@DXMO     ;SET SELECT-OUT
2222  007554  132777  000040  171556        BITB    #40,@CONO       ;TEST FOR SELECT-OUT
2223  007562  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
2224  007564  104000                        ERROR                   ;SELECT-OUT DID NOT SET
2225
2226
2227  007566  032777  000002  171520        BIT     #ADRECC,@DXCB   ;WAS CU ADRS RECOGNISED
2228                                                                ;IS DEV A VALID CU ADRS
2229  007574  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
2230  007576  104000                        ERROR                   ;DX DID NOT RECOGNISE CU ADRS
2231                                                                ;IF YES CHECK JUMPERS
2232                                                                ;ADRECC LOGIC
2233
2234
2235  007600  032777  000010  171466        BIT     #ISSREJ,@DXDS   ;TEST FOR ISS REJECT
2236  007606  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2237  007610  104000                        ERROR                   ;ISS REJECT SET
2238  007612  032777  100000  171472        BIT     #OPLI,@DXMI     ;OPLI SHOULD BE UP
2239  007620  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
2240  007622  104000                        ERROR                   ;OPLI DID NOT SET
2241                                                                ;IS DEV A VALID DEVICE ON CU?
2242
2243  007624  042777  004000  171456        BIC     #ADRO,@DXMO     ;DROP ADRS-OUT
2244  007632  132777  000010  171500        BITB    #10,@CONO       ;IS ADRO DOWN
2245  007640  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2246  007642  104000                        ERROR                   ;ADRO DID NOT DROP
2247  007644  032737  000004  013376        BIT     #BIT2,PARA      ;TEST FOR MUX CH
2248  007652  001415                        BEQ     1$3             ;BRANCH IF NOT  MUX
2249  007654  042777  060000  171426        BIC     #SELO!HLDO,@DXMO  ;CLEAR SELECT-OUT, HOLD-OUT
2250  007662  032777  020000  171420        BIT     #SELO,@DXMO     ;DID SELO CLEAR
2251  007670  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2252  007672  104000                        ERROR                   ;REPORT SELO NOT CLEAR
2253  007674  032777  040000  171406        BIT     #HLDO,@DXMO     ;DID HLDO CLEAR
2254  007702  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2255  007704  104000                        ERROR                   ;HLDO DID NOT CLEAR
2256  007706  032777  010000  171376  !SS3!  BIT     #ADRI,@DXMI     ;ADDRESS-IN SHOULD BE UP
2257  007714  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
2258  007716  104000                        ERROR                   ;ADRI DID NOT COME UP
2259
2260  007720  123777  014010  171414        CMPB    DEV,@BUS!       ;ADRS SHOULD BE ON BUS!
2261  007726  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2262  007730  104000                        ERROR                   ;BUS! DOES NOT CONTAIN
2263                                                                ;CORRECT ADRS
2264
2265  007732  043777  014010  171376        BIC     DEV,@BUSO       ;REMOVE ADRS FROM BUS-OUT
2266  007740  105777  171372                TSTB    @BUSO           ;ADRS REMOVED
```

```
2267  007744  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2268  007746  104000                          ERROR                   ;BUSO DID NOT CLEAR
2269
2270  007750  053777  014012  171300          BIS     CMD,@#BUSO      ;PUT COMMAND ON BUSO
2271  007756  123777  014012  171392          CMPB    CMD,@#BUSO      ;DID COMMAND LOAD OK
2272  007764  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2273  007766  104000                          ERROR                   ;CMD DID NOT LOAD PROPERLY
2274
2275  007770  052777  002000  171312          BIS     #CMDO,@#DXMO    ;SET COMMAND OUT
2276  007776  132777  000004  171334          BITB    #4,@#CONO               ;DID CMDO SET
2277  010004  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
2278  010006  104000                          ERROR                   ;CMDO DID NOT SET
2279
2280  010010  032777  000001  171256          BIT     #CMDREJ,@#DXDS  ;TEST FOR COMMAND REJECT
2281  010016                          ISSCRJ1
2282  010016  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2283  010020  104000                          ERROR                   ;COMMAND REJECTED
2284
2285  010022  032777  010000  171202          BIT     #ADRI,@#DXMI    ;ADRI SHOULD FALL
2286  010030  001401                          BEQ     .+3             ;BRANCH IF NO ERROR CONDITION
2287  010032  104000                          ERROR                   ;ADRI DID NOT DROP
2288
2289  010034  043777  014012  171246          BIC     CMD,@#DXMO      ;REMOVE CMD FROM BUSO
2290  010042  105777  171270                  TSTB    @#BUSO          ;WAS CMD REMOVED
2291  010046  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2292  010050  104000                          ERROR                   ;CMD DID NOT CLEAR
2293  010052  042777  002000  171230          BIC     #CMDO,@#DXMO
2294  010060  032777  002000  171222          BIT     #CMDO,@#DXMO
2295  010066  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2296  010070  104000                          ERROR                   ;CMDO STUCK HIGH
2297
2298
2299  010072  032737  004000  001312          BIT     #STAI,@#DXMI    ;TEST FOR STATUS-IN
2300  010100  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
2301  010102  104000                          ERROR                   ;STATUS-IN DID NOT RISE
2302  010104  010146                          MOV     R1,-(SP)
2303  010106  113701  014012                  MOVB    @#XMD,R1
2304  010112  042701  177400                  BIC     #177400,R1
2305  010116  063701  001442                  ADD     @#RST,R1
2306  010122  121177  171204                  CMPB    @RE,@#CUSR
2307  010126  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2308  010130  104000                          ERROR                   ;STATUS FROM DST TRANSFER ERROR
2309  010132  121177  171204                  CMPB    @RE,@#BUSI
2310  010136  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2311  010140  104000                          ERROR                   ;CUSR TO BUSI TRANSFER ERROR
2312  010142  012601                          MOV     (SP)+,R1
2313
2314
2315
2316  010144  032737  000004  013376          BIT     #BIT2,PARA      ;TEST FOR MUX CH
2317  010152  001023                          BNE     1$$2            ;BRANCH IF MUX
2318  010154  105737  014012                  TSTB    CMR             ;TEST FOR "TEST I/O" COMMAND
2319  010160  001403                          BEQ     1$$1            ;CLEAR SEL0,WLDO IF T10 CMD
2320  010162  105777  171154                  TSTB    @#BUSI          ;TEST BUSI FOR ZERO STATUS
```

```
2321  010166  001415                          BEQ     ISS2            ;DON'T CLEAR SELO,HLDO ON 0 STATUS
2322  010170  042777  000800  171112  ISS1:   BIC     #SELO!HLDO,@DXMO  ;CLEAR SELECT-OUT, HOLD-OUT
2323  010176  032777  020000  171104          BIT     #SELO,@DXMO     ;DID SELO CLEAR
2324  010204  001401                          BEQ     .+3             ;BRANCH IF NO ERROR CONDITION
2325  010206  104000                          ERROR                   ;REPORT SELO NOT CLEAR
2326  010210  032777  040000  171072          BIT     #HLDO,@DXMO     ;DID HLDO CLEAR
2327  010216  001401                          BEQ     .+3             ;BRANCH IF NO ERROR CONDITION
2328  010220  104000                          ERROR                   ;HLDO DID NOT CLEAR
2329
2330  010222  052777  001000  171060  ISS2:   BIS     #SRVO,@DXMO     ;SET SERVICE-OUT
2331  010230  032777  001000  171052          BIT     #SRVO,@DXMO     ;TEST SERVICE OUT
2332  010236  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
2333  010240  104000                          ERROR                   ;SERVICE-OUT DID NOT SET
2334                                ; ************** CAN'T READ DXMI ***********************************
2335                                ;       BIT     #STAI,@DXMI     ;STATUS-IN SHOULD DROP
2336                                ;                               ;STATUS-IN DID NOT DROP
2337                                ;       ERCALL  BEQ,
2338                                ; ***************** ****************************************
2339  010242  042777  001000  171040          BIC     #S VO,@DXMO     ;DROP SERVICE-OUT
2340  010250  032777  001000  171032          BIT     #SRVO,@DXMO     ;TEST SERVICE-OUT
2341  010256  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2342  010260  104000                          ERROR                   ;SERVICE-OUT DID NOT CLEAR
2343
2344  010262  043777  014012  171020          BIC     CMD,@DXMO       ;CLEAR COMMAND FROM BUSO
2345  010270  105777  171042                  TSTB    @BUSO           ;TEST FOR BUSO CLEAR
2346  010274  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2347  010276  104000                          ERROR                   ;BUSO DID NOT CLEAR
2348
2349  010300  000207                          RTS     PC
2350
2351                                .SBTTL  MIO SUBROUTINE
2352
2353  010302  032777  070000  171004  MIO.SUB: BIT     #70000,@DXCB    ;TEST FOR PHASE ZERO
2354  010310  001103                          BNE     MIO,0           ;BRANCH IF SELECTED
2355
2356                                ;SELECT
2357
2358  010312  053777  014010  170770          BIS     DEV,@DXMO       ;PUT ADRS ON BUSO
2359  010320  123777  014010  171010          CMPB    DEV,@BUSO       ;ADRS LOAD OK
2360  010326  001401                          BEQ     .+2             ;BRANCH IF NO ERROR CONDITION
2361  010330  104000                          ERROR                   ;ADRS LOAD ERROR
2362
2363  010332  052777  004000  170750          BIS     #ADRO,@DXMO     ;SET & CHECK ADRS-OUT
2364  010340  032777  004000  170742          BIT     #ADRO,@DXMO
2365  010346  001001                          BNE     .+2             ;BRANCH IF NO ERROR CONDITION
2366  010350  104000                          ERROR                   ;ADRO NOT SET
2367  010352  052777  040000  170730          BIS     #HLDO,@DXMO     ;SET & CHECK HLDO
2368  010360  032777  040000  170722          BIT     #HLDO,@DXMO
2369  010366  001001                          BNE     .+3             ;BRANCH IF NO ERROR CONDITION
2370  010370  104000                          ERROR                   ;HLDO NOT SET
2371
2372  010372  052777  020000  170710          BIS     #SELO,@DXMO     ;SET & CHECK SELECT-OUT
2373  010400  032777  020000  170702          BIT     #SELO,@DXMO
2374  010406  001001                          BNE     .+3             ;BRANCH IF NO ERROR CONDITION
```

```
2375  010410  104000                        ERROR                   ;SELC NOT SET
2376
2377  010412  032737  000002  013376        BIT     #BIT1,PARA      ;TEST FOR BSY SELECT
2378  010420  001404                        BEQ     HI'S,.
2379  010422  122777  000120  170712        CMPB    #STAMOD!BSY,@BUSI       ;CHECK STATUS
2380  010430  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2381  010432  104000                        ERROR                   ;BUSI STATUS ERROR
2382  010434  000431                        BR      HIO,.
2383  010436                        HIOS,.I
2384  010436  123777  014010  170662        CMPB    DEV,@CUAR       ;VERIFY DEVICE ADDRESS
2385  010444  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2386  010446  104000                        ERROR                   ;BUSO TO CUAR TRANSFER ERROR
2387
2388  010450  042777  004000  170652        BIC     #ADRO,@DXMO     ;CLEAR & CHECK
2389  010456  032777  004000  170624        BIT     #ADRO,@DXMO     ;
2390  010464  001401                        BEQ     .+3             ;BRANCH IF NO ERROR CONDITION
2391  010466  104000                        ERROR                   ;ADRO SET
2392
2393  010470  123777  014010  170644        CMPB    DEV,@BUSI       ;IS CORRECT ADRS BEING ECHOED
2394  010476  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2395  010500  104000                        ERROR                   ;BUSI LOAD ERROR
2396                                        ;CHECK ADDRESS,D
2397
2398  010502  043777  014010  170600        BIC     DEV,@DXMO       ;REMOVE ADRS FROM BUSO
2399  010510  105737  001310                TSTB    DXMO            ;BRANCH IF CLEAR
2400  010514  001401                        BEQ     .+3             ;BRANCH IF NO ERROR CONDITION
2401  010516  104000                        ERROR                   ;BUSO DID NOT CLEAR
2402
2403
2404
2405  010520                        HIO.0I  ;INTERFACE DISCONNECT
2406  010520  042777  000000  170502        BIC     #HLDO!SELO,@DXMO        ;
2407  010526  032777  040000  170474        BIT     #HLDO,@DXMO             ;
2408  010534  001401                        BEQ     .+3             ;BRANCH IF NO ERROR CONDITION
2409  010536  104000                        ERROR                   ;HLDO SET
2410
2411  010540  032777  020000  170442        BIT     #SELO,@DXMO             ;
2412  010546  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2413  010550  104000                        ERROR                   ;SELO SET
2414
2415  010552  052777  004000  170436        BIS     #ADRO,@DXMO             ;
2416
2417  010560  032777  004000  170422        BIT     #ADRO,@DXMO             ;
2418  010566  001401                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
2419  010570  104000                        ERROR                   ;ADRO NOT SET
2420
2421  010572  042777  004000  170410        BIC     #ADRO,@DXMO             ;
2422
2423  010600  032777  004000  170362        BIT     #ADRO,@DXMO             ;
2424  010606  001401                        BEQ     .+3             ;BRANCH IF NO ERROR CONDITION
2425  010610  104000                        ERROR                   ;ADRO SET
2426  010612  000207                HIO.2I  RTS     PC
2427                                  ,SBTTL  CUIS SUBROUTINE
2428
```

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2429                                    ;
2430                                    ;CUIS.SUB, SUBROUTINE TO EXECUTE A
2431                                    ;CONTROL UNIT INITIATED SELECTION
2432                                    ;
2433                                    ;
2434  018614                            CUIS.SUB:
2435
2436  018614  032737  000004  013376          BIT     #BIT2,PARA
2437  018622  001510                          BEQ     CUISE
2438
2439  018624                            CUIS.GO:
2440
2441  018624  032777  020000  173468          BIT     #REQI,@DXMI     ;TEST FOR REQUEST-IN UP
2442  018632  001001                          BNE     .+2             ;BRANCH IF NO ERROR CONDITION
2443  018634  104000                          ERROR                   ;REQI NOT SET
2444
2445  018636  032777  060000  173444          BIS     #SELO!HLDO,@DXMO  ;SET SELECT-OUT & HOLD-OUT
2446  018644  032777  020000  173436          BIT     #SELO,@DXMO     ;TEST FOR SELECT-OUT
2447  018652  001001                          BNE     .+2             ;BRANCH IF NO ERROR CONDITION
2448  018654  104000                          ERROR                   ;SELO NOT SET
2449
2450  018656  032777  040000  173424          BIT     #HLDO,@DXMO     ;TEST FOR HOLD-OUT
2451  018664  001001                          BNE     .+2             ;BRANCH IF NO ERROR CONDITION
2452  018666  104000                          ERROR                   ;HLDO NOT SET
2453
2454  018670  032777  100000  173414          BIT     #OPLI,@DXMI     ;TEST FOR OPERATIONAL-IN
2455  018676  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
2456  018700  104000                          ERROR                   ;OPLI NOT SET
2457
2458  018702  032777  020000  173402          BIT     #REQI,@DXMI     ;TEST FOR REQI
2459  018710  001401                          BEQ     .+2             ;BRANCH IF NO ERROR CONDITION
2460  018712  104000                          ERROR                   ;REQI DID NOT DROP
2461
2462  018714  032777  010000  173370          BIT     #ADRI,@DXMI     ;TEST FOR ADDRESS IN
2463  018722  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
2464  018724  104000                          ERROR                   ;ADRI NOT SET
2465
2466  018726  123777  014010  173466          CMPB    DEV,@BUSI       ;ADDRESS ON BUSI
2467  018734  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2468  018736  104000                          ERROR                   ;BUSI LOAD ERROR
2469
2470  018740  052777  002000  173342          BIS     #CMDO,@DXMO     ;SET COMMAND-OUT
2471  018746  032777  002000  173334          BIT     #CMDO,@DXMO
2472  018754  001001                          BNE     .+2             ;BRANCH IF NO ERROR CONDITION
2473  018756  104000                          ERROR                   ;CMDO DID NOT SET
2474
2475  018760  032777  010000  173324          BIT     #ADRI,@DXMI     ;ADRI SHOULD DROP
2476  018766  001401                          BEQ     .+2             ;BRANCH IF NO ERROR CONDITION
2477  018770  104000                          ERROR                   ;ADRI DID NOT DROP
2478
2479  018772  042777  060000  173310          BIC     #SELO!HLDO,@DXMO
2480  019000  032777  040000  173302          BIT     #HLDO,@DXMO     ;TEST HOLD-OUT
2481  019006  001401                          BEQ     .+2             ;BRANCH IF NO ERROR CONDITION
2482  019010  104000                          ERROR                   ;HLDO SET
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2483
2484  011812  032777  020000  173278          BIT     #SELO,@DXMO     ;TEST SELECT-OUT
2485  011820  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2486  011822  104000                          ERROR                   ;SELO SET
2487
2488  011824  042777  002000  173296          BIC     #CMDO,@DXMO     ;CLEAR COMMAND-OUT
2489  011832  032777  002000  173290          BIT     #CMDO,@DXMO     ;TEST FOR CMDO CLEAR
2490  011840  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2491  011842  104000                          ERROR                   ;CMDO SET
2492
2493  011844  000207                  CUIS8:  RTS     PC
2494
2495                                  ;FAST ISS SELECTOR CH ONLY
2496
2497  011846                          FASTISS:
2498  011846  053777  014010  173234          BIS     DEV,@DXMO       ;PUT DEVICE ADRS ON OUT TAGS
2499  011854  052777  004000  173226          BIS     #ADRO,@DXMO     ;RAISE ADRS-OUT
2500  011862  052777  060000  173220          BIS     #HLDO!SELO,@DXMO        ;RAISE SELECT-OUT, HOLD-OUT
2501  011870  042777  004000  173212          BIC     #ADRO,@DXMO     ;REMOVE ADRS-OUT
2502  011876  043777  014010  173204          BIC     DEV,@DXMO       ;REMOVE ADRS
2503  011104  053777  014012  173176          BIS     CMD,@DXMO       ;PUT COMMAND ON OUT TAGS
2504  011112  052777  002000  173170          BIS     #CMDO,@DXMO     ;RAISE CMD-OUT
2505  011120  043777  014012  173162          BIC     CMD,@DXMO       ;REMOVE CMD
2506  011126  042777  002000  173154          BIC     #CMDO,@DXMO     ;REMOVE CMD-OUT
2507  011134  032737  000004  013376          BIT     #BIT2,PARA      ;TEST FOR MUX CH
2508  011142  001006                          BNE     FISS1           ;BRANCH IF MUX
2509  011144  105737  014012                  TSTB    CMD             ;TEST FOR "TEST I/O" COMMAND
2510  011150  001403                          BEQ     FISS1           ;CLEAR SELO,HLDO IF TIO CMD
2511  011152  105777  170164                  TSTB    @BUSI           ;TEST BUSI FOR ZERO STATUS
2512  011156  001403                          BEQ     FISS2           ;DON'T CLEAR SELO,HLDO ON 0 STATUS
2513  011160  042777  060000  173122  FISS1:  BIC     #HLDO!SELO,@DXMO        ;CLEAR SELO AND HLDO
2514  011166  052777  001000  173114  FISS2:  BIS     #SRVO,@DXMO     ;RELEAVE STATUS
2515  011174  042777  001000  173106          BIC     #SRVO,@DXMO     ;
2516  011202  000207                          RTS     PC
2517
2518                                  ;SEL CH ISS
2519
2520  011204                          SEL.ISS:
2521  011204  053777  014010  173114          BIS     DEV,@CUAR       ;PRESET COM/ADD REG DEV ADDRESS
2522  011212  042777  000400  173106          BIC     #4.0,@CUAR      ;PARITY RESET
2523  011220  053777  014010  173062          BIS     DEV,@DXMO       ;PUT DEVICE ADRS ON OUT TAGS
2524  011226  052777  004000  173054          BIS     #ADRO,@DXMO     ;RAISE ADRS-OUT
2525  011234  052777  060000  173046          BIS     #HLDO!SELO,@DXMO        ;RAISE SELECT-OUT, HOLD-OUT
2526  011242  042777  004000  173040          BIC     #ADRO,@DXMO     ;REMOVE ADRS-OUT
2527  011250  043777  014010  173032          BIC     DEV,@DXMO       ;REMOVE ADRS
2528  011256  053777  014012  173024          BIS     CMD,@DXMO       ;PUT COMMAND ON OUT TAGS
2529  011264  052777  002000  173016          BIS     #CMDO,@DXMO     ;RAISE CMD-OUT
2530  011272  043777  014012  173010          BIC     CMD,@DXMO       ;REMOVE CMD
2531  011300  042777  002000  173002          BIC     #CMDO,@DXMO     ;REMOVE CMD-OUT
2532  011306  052777  001000  167774          BIS     #SRVO,@DXMO     ;RELEAVE STATUS
2533  011314  042777  001000  167766          BIC     #SRVO,@DXMO     ;
2534  011322  000207                          RTS     PC
2535                                  ;SCOPE LOOP AND CONTROL SUBROUTINE
2536
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```
2537  011324  105777  170046          SCOPEC: TSTB    @TKS
2538  011330  100014                  BPL     SCOPEH
2539  011332  017727  170042          MOV     @TKB,(PC)+
2540  011336  000000                  DTMP:   0
2541  011340  042737  000200  011336  BIC     #200,DTMP
2542  011346  123727  011336  000003  CMPB    DTMP,#3
2543  011354  001002                  BNE     SCOPEH
2544  011356  000137  012520          JMP     @#MON1,0
2545  011362  032737  040000  177570  SCOPEH: BIT     #BIT14,SR       ;TEST FOR SCOPE
2546  011370  001012                  BNE     SCOPEB                  ;BRANCH IF SCOPE SELECTED
2547  011372  032737  004000  177570  BIT     #B T11,SR               ;TEST FOR ITERATIONS
2548  011400  001020                  BNE     SCOPEA                  ;EXIT IF ITERATIONS INHIBITED
2549  011402  005237  011452          INC     SCOPEF                  ;INCREMENT ITERATION COUNT
2550  011406  023737  011452  011450  CMP     SCOPEF,ICOUNT           ;TEST FOR COMPLETION OF ITERATIONS
2551  011414  001410                  BEQ     SCOPEC                  ;BRANCH IF COMPLETE
2552  011416  012737  177777  014002  SCOPEB: MOV     #-1,ONESHOT     ;SO YOU CAN SCOPE ON ONCE ONLY CODE
2553  011424  005726                  TST     (SP)+                   ;POP RETURN PC
2554  011426  012637  177776          MOV     (SP)+,PS                ;RESTOR PROCESSOR STATUS
2555  011432  000177  000010          JMP     @RETURN                 ;
2556  011436  011637  011454  SCOPEC: MOV     @SP,RETURN              ;SET UP SCOPE RETURN ADRS
2557  011442  005037  011452  SCOPEA: CLR     SCOPEF                  ;CLEAR ITERATION COUNT
2558  011446  000002                  RTI
2559  011450  000001          ICOUNT: 1                               ;NUMBER OF REQUESTED ITERATIONS
2560  011452  000000          SCOPEF: 0                               ;ITERATION COUNT
2561  011454  004000          RETURN: TST1                            ;DEFAULT RETURN
2562  011456                  TSTABLE:                                ;BEGINNING OF TABLE OF TEST ADDRESSES
2563          011556                  .=.+100                         ;TEST ADDRESS LIST
2564
2565
2566                                  ;EMULATOR DECODER ROUTINE
2567
2568  011556                  EMTDECODER:
2569  011556  011646                  MOV     @R6,-(R6)               ;DUPLICATE PC ON STACK
2570  011560  162716  000002          SUB     #2,@R6                  ;POINT PC TO EMT INST,
2571  011564  017616  000000          MOV     0(R6),@R6               ;MOV EMT INST ONTO STACK
2572  011570  121627  000024          CMPB    @R6,#24.                ;TEST THAT CALL IS WITHIN LIMITS
2573  011574  101401                  BLOS    EMTOK                   ;BRANCH IF WITHIN LIMITS
2574  011576  104000                  ERROR
2575  011600  000611          EMTOK:  ROL     @R6                     ;EMT ARGUMENT X 2,
2576  011602  042716  177001          BIC     #177001,@R6             ;CLEAR HIGH BYTE
2577  011606  062716  011620          ADD     #EMTAG,@R6              ;FORM ADRS OF ROUTINE ADRS
2578  011612  017616  000000          MOV     0(R6),@R6               ;PUT ROUTINE ADRS ON STACK
2579  011616  000136                  JMP     0(R6)+                  ;JUMP TO ROUTINE
2580                                                                  ;TAGS FOR EMT CALL
2581
2582  011620                  EMTAG:                                  ;BEGINNING OF EMT TABLE
2583
2584  011620  000024                  .BLKW   24.                     ;RESERVE 16. WORDS FOR ADRS LIST
2585
2586
2587                                  ;ENTRY POINT FOR MAP ERRORS
2588  011670                  .=1670
2589  011670  012737  177777  012376          MOV     #-1,EMFLG       ;FLAG THAT THIS IS  MAP ERROR
2590  011676  000137  012040          JMP     @#OEF
```

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2591  011702  000000                  TERPC:  0               ;ORIGIN OF TRACE ERROR
2592                                  ;TUMBLE TABLE TRACE ERROR TRAP
2593  011704                          T.TRACER:
2594  011704  012737  177770  012376          MOV     #-2,ERFLG
2595  011712  000004  021285                  TYPE    ,TRC"1
2596  011716  010546                          MOV     TTY,-(SP)       ;SAVE TTY
2597  011720  013705  012432                  MOV     ER.STN,TTY              ;TYPE ERTSTN IN OCTAL
2598  011724  004737  016470                  JSR     %7,PRINTS       ;AND SUPRESS LEADING ZERO'S
2599  011730  012605                          MOV     (S.)+,TTY       ;RESTORE TTY
2600  011732  000004  021237                  TYPE    ,TRC"   ;TRACE ERROR AT;
2601  011736  010546                          MOV     TTY,-(SP)       ;SAVE TTY
2602  011740  013705  011702                  MOV     TERPC,TTY               ;TYPE IN OCTAL
2603  011744  004737  016466                  JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
2604  011750  012605                          MOV     (SP)+,TTY       ;RESTORE TTY
2605  011752  000004  021337                  TYPE    ,TRC1
2606  011756  010546                          MOV     TTY,-(SP)       ;SAVE TTY
2607  011760  013705  000534                  MOV     TTYAS,TTY               ;TYPE IN OCTAL
2608  011764  004737  016466                  JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
2609  011770  012605                          MOV     (SP)+,TTY       ;RESTORE TTY
2610  011772  000004  021361                  TYPE    ,TRC2
2611  011776  010546                          MOV     TTY,-(SP)       ;SAVE TTY
2612  012000  013705  000536                  MOV     TTSHOULD,TTY            ;TYPE IN OCTAL
2613  012004  004737  016466                  JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
2614  012010  012605                          MOV     (SP)+,TTY       ;RESTORE TTY
2615  012012  032701  000002                  BIT     #BIT1,R1        ;TEST FOR DXDS OR DXCA
2616  012016  001003                          BNE     1$              ;BR IF DXCA
2617  012020  000004  021403                  TYPE    ,TYDS
2618  012024  000402                          BR      2$
2619  012026  000004  021430          1$:     TYPE    ,TYCA
2620  012032                          2$:
2621  012032  000402                          BR      0EP
2622
2623                                  ;ENTRY POINT FOR MOST ERRORS
2624
2625  012034                          T.ERROR:
2626  012034  005037  012376                  CLR     ERFLG           ;FLAG THIS AS  NORMAL ERROR
2627  012040  005237  012430          0EP:    INC     ERRCNT          ;INC ERROR COUNT
2628  012044  010037  012434                  MOV     R0,R0           ;SAVE R0
2629  012050  010137  012436                  MOV     R1,R1           ;SAVE R1
2630  012054  010237  012440                  MOV     R2,R2           ;SAVE R2
2631  012060  010337  012442                  MOV     R3,R3           ;SAVE R3
2632  012064  010437  012444                  MOV     R4,R4           ;SAVE R4
2633  012070  010537  012446                  MOV     R5,R5           ;SAVE R5
2634  012074  032737  020000  177570          BIT     #BIT13,SR       ;TEST FOR INHIBIT  PRINT
2635  012102  001003                          BNE     PERRPC          ;BRANCH IF INHIBIED
2636  012104  000004  020721                  TYPE    ,ERPC
2637  012110  011627                          MOV     @#,(PC)+        ;SAVE ERROR PC +2
2638  012112  000000                  ETMP0:  0                       ;HERE
2639  012114  162737  000002  012112          SUB     #2,ETMP0        ;CORRECT PC
2640  012122  010546                          MOV     TTY,-(SP)       ;SAVE TTY
2641  012124  013705  012112                  MOV     @#ETMP0,TTY             ;TYPE IN OCTAL
2642  012130  004737  016466                  JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
2643  012134  012605                          MOV     (S.)+,TTY       ;RESTORE TTY
2644  012136  032737  010000  177570          BIT     #BIT12,SR       ;TEST FOR SHORT ERROR REPORT
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```
2645  012144  001042                          BNE     PERRPC          ;BRANCH IF SHORT SELECTED
2646  012146  022737  177776  012376          CMP     #2,ERFLG
2647  012154  001410                          BEQ     1$
2648  012156  000004  021135                  TYPE    ,MSG39          ;ERROR IN TEST!
2649  012162  010546                          MOV     TTY,-(SP)       ;SAVE TTY
2650  012164  013705  012432                  MOV     ERTSTN,TTY              ;TYPE ERTSTN IN OCTAL
2651  012170  004737  016476                  JSR     %7!PRINTS       ;AND SUPRESS LEADING ZERO'S
2652  012174  112605                          MOV     (SP)+,TTY       ;RESTORE TTY
2653  012176  000004  021564          1$!     TYPE    ,MSG26
2654  012202  010546                          MOV     TTY,-(SP)       ;SAVE TTY
2655  012204  013705  014020                  MOV     CURSRS,TTY              ;TYPE IN OCTAL
2656  012210  004737  016466                  JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
2657  012214  012605                          MOV     (SP)+,TTY       ;RESTORE TTY
2658  012216  000004  020670                  TYPE    ,CRLF
2659  012222  032737  000002  013376          BIT     #BIT1,@#PARA    ;TEST FOR BUSY ENABLE MODE
2660  012230  001402                          BEQ     EMOD1           ;BRANCH IF NOT
2661  012232  000004  021300                  TYPE    ,ABSYM          ;TYPE BUSY ENABLE
2662  012236  032737  000004  013376  EMOD1:  BIT     #BIT2,@#PARA    ;TEST FOR MUX CH
2663  012244  001402                          BEQ     EMOD2           ;BRANCH IF SELECTOR
2664  012246  000004  021317                  TYPE    ,AMUXM          ;TYPE MUX CH
2665  012252                          EMOD2:
2666  012252  032737  100000  177570  PERRPC: BIT     #HLTSW,SR       ;TEST FOR HALT ON ERROR
2667  012260  001401                          BEQ     ERRLOP          ;BRANCH IF NO HALT
2668
2669
2670  012262  000000                          HALT                    ;HALT ON ERROR
2671  012264                          ERRLOP:
2672  012264  013700  012434                  MOV     E,R0,R0         ;RESTORE R0
2673  012270  013701  012436                  MOV     E,R1,R1         ;RESTORE R1
2674  012274  013702  012440                  MOV     E,R2,R2         ;RESTORE R2
2675  012300  013703  012442                  MOV     E,R3,R3         ;RESTORE R3
2676  012304  013704  012444                  MOV     E,R4,R4         ;RESTORE R4
2677  012310  013705  012446                  MOV     E,R5,R5         ;RESTORE R5
2678  012314  032737  040000  177570          BIT     #LOPSW,SR       ;TEST FOR SCOPE LOOP
2679  012322  001424                          BEQ     EXTR1
2680  012324  012706  001100                  MOV     #BEGIN,SP       ;REINIT STACK POINTER
2681  012330  012737  177777  014002          MOV     #-1,ONESHOT     ;REINIT ONESHOT TEST FLAGS
2682  012336  042777  000002  166754          BIC     #MCLKEN,@DXES   ;CLEAR MAINT CLOCK
2683  012344  005077  166740                  CLR     @DXMO           ;SYSTEM RESET
2684  012350  052777  000001  166722          BIS     #DXPRS,@DXCS    ;DX RESET
2685  012356  004737  015230                  JSR     PC,PRE1         ;REINITIALIZE DX
2686  012362  013737  001272  177776          MOV     LESS1,PS        ;DX PRIORITY MINUS ONE
2687  012370  000177  177060                  JMP     @RETURN
2688
2689  012374  000002                  EXTR1:  RTI
2690  012376  000000                  ERFLG:  0               ;ERROR CONTROL FLAG 1=MAP ERROR
2691                                  ;LIST OF ASCII MESSAGE ADDRESSES
2692
2693  012400  020736                  ADRA1:  ADXDS
2694  012402  020745                          ADXCA
2695  012404  020754                          ADXCS
2696  012406  020763                          ADXDS
2697  012410  020772                          ADXBA
2698  012412  021001                          ADXBC
```

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2699   012414  021818                          ADXMO
2700   012416  021817                          ADXMI
2701   012420  021826                          ADXCB
2702   012422  021835                          ADXND
2703   012424  021844                          ADXES
2704   012426  021853                  ADRAE1: ADXES1
2705
2706
2707
2708                                   ;ERROR COUNT
2709
2710   012430  000000                  ERRCNT: 0
2711   012432  000000                  ERTSTN: 0               ;TEST NUMBER
2712
2713
2714                                   ;REGISTER STORAGE FOR ERROR REPORTING
2715
2716   012434  000000                  E.R0:   0       ;SAVED REGISTERS FOR ERROR REPORTING
2717   012436  000000                  E.R1:   0       ;SAVED REGISTERS FOR ERROR REPORTING
2718   012440  000000                  E.R2:   0       ;SAVED REGISTERS FOR ERROR REPORTING
2719   012442  000000                  E.R3:   0       ;SAVED REGISTERS FOR ERROR REPORTING
2720   012444  000000                  E.R4:   0       ;SAVED REGISTERS FOR ERROR REPORTING
2721   012446  000000                  E.R5:   0       ;SAVED REGISTERS FOR ERROR REPORTING
2722
2723                                   .SBTTL  MONITOR
2724
2725                                   ;*****************************************************************
2726   012450                          MONITOR:
2727                                   ;*****************************************************************
2728
2729
2730
2731   012450  012706  001100                  MOV     #BEGIN,SP       ;SET UP STACK POINTER
2732   012454  012737  000340  177776          MOV     #LEVEL7,PS      ;MONITOR AT LEVEL 7
2733   012462  004737  014314                  JSR     PC,@#MONDFLT    ;SET UP DEFAULT PARAMETERS
2734
2735   012466  012737  016024  000060          MOV     #TTYI,@#60      ;TTY KEYBOARD INT VEC
2736   012474  012737  000200  000062          MOV     #LEVEL4,@#62    ;LEVEL 4
2737   012502  000004  020011                  TYPE    ,HOME           ;HOME UP AND ERASE SCREEN
2738
2739   012506  000004  017474          M1      TYPE    ,HEADER
2740   012512  012737  012634  012516          MOV     #RELOD,@#62     ;HEADER TEXT GETS WIPED BY MPRIS
2741
2742   012520  000005                  MON1,01 RESET
2743   012522  005777  166652                  TST     @TKB            ;CLEAR FLAG
2744   012526  052777  000100  166642          BIS     #100!TEN,@TKS   ;SET INTERRUPT ENABLE
2745   012534  012706  001100                  MOV     #BEGIN,SP       ;SET UP STACK POINTER
2746   012540  012737  000340  177776          MOV     #LEVEL7,PS      ;MONITOR AT LEVEL 7
2747   012546  000004  020231                  TYPE    ,FSTART
2748   012552  104006                          KEY,TO,R0
2749   012554  122700  000104                  CMPB    #'D,R0          ;D = DEFAULT PARAMETERS
2750   012560  001003                          BNE     1$
2751   012562  004737  014314                  JSR     PC,@#MONDFLT
2752   012566  000403                          BR      2$
```

```
2753  012570  122708  000120          1$:     CMPB    #'P,R0          ;P = PREVIOUSLY SELECTED PARAMETERS
2754  012574  001002                          BNE     3$
2755  012576  000137  013340          2$:     JMP     @#MON10
2756  012602  122708  000123          3$:     CMPB    #'S,R0          ;S = GO THROUGH AND SELECT PARAMETERS
2757  012606  001426                          BEQ     MON1
2758  012610  122708  000116                  CMPB    #'N,R0          ;N = START AT THIS TEST #
2759  012614  001341                          BNE     MON1,@
2760  012616  000004  020307                  TYPE    ,MSG9
2761  012622  104005                          ACCEPTO
2762  012624  013737  014020  014030          MOV     OCTNUM,FIRST,TST
2763  012632  000761                          BR      2$
2764
2765  012634  051137  040105  040517  RELOD:  .ASCIZ  "*RELOAD FOR HEADER TEXT"
2766  012642  020104  047500  020122
2767  012650  042516  042101  051105
2768  012656  052040  054105  000124
2769                                  .EVEN
2770                                  ;SET UP TEST PARAMETERS
2771
2772  012664  004737  014314          MON1:   JSR     PC,@#MONDFLT    ;SET UP DEFAULT PARAMETERS
2773  012670  000004  020307                  TYPE    ,MSG9           ;FIRST TEST #
2774
2775  012674  104005                          ACCEPTO ;ACCEPT TEST NUMBER FROM KEYBOARD
2776
2777
2778  012676  005737  014020                  TST     OCTNUM          ;TEST FOR DEFAULT
2779  012702  001403                          BEQ     MON3            ;BRANCH ON DEFAULT
2780  012704  013737  014020  014030          MOV     OC.NUM,FIRST,TST        ;LOAD FIRST TEST #
2781
2782  012712  000004  020245          MON3:   TYPE    ,MSG2           ;BASE ADDRESS:
2783
2784
2785  012716  104005                          ACCEPTO                 ;ACCEPT BASE ADDRESS  FROM KEYBOARD
2786
2787  012720  005737  014020                  TST     OCTNUM          ;TEST FOR DEFAULT
2788  012724  001403                          BEQ     MON4            ;BRANCH IF DEFAULT
2789  012726  013737  014020  001202          MOV     OCTNUM,@#XBASE  ;LOAD NON-DEFAULT ADDRESS
2790
2791  012734  000004  021101          MON4:   TYPE    ,MSG20          ;ACCEPT INTERRUPT VECTOR
2792  012740  104005                          ACCEPTO
2793  012742  005737  014020                  TST     OCTNUM          ;TEST FOR DEFAULT
2794  012746  001411                          BEQ     MON4,1          ;BRANCH IF DEFAULT
2795  012750  013737  014020  001204          MOV     OCTNUM,@#XIV    ;LOAD NON-DEFAULT INT VECTOR ADRS
2796  012756  062737  000002  014020          ADD     #2,@#OCTNUM     ;FORM INT STATUS ADRS
2797  012764  013737  014020  001206          MOV     @#OCTNUM,@#XIS  ;INT STATUS ADDRESS
2798
2799
2800  012772  000004  020512          MON4.1: TYPE    ,MSG12          ;PRIORITY
2801  012776  104005                          ACCEPTO                 ;ACCEPT XX PRIORITY LEVEL
2802  013000  005737  014020                  TST     OCTNUM          ;TEST FOR DEFAULT
2803  013004  001425                          BEQ     MON6            ;BRANCH ON DEFAULT
2804  013006  006337  014020                  ASL     OCTNUM          ;SHIFT PRIORITY
2805  013012  006337  014020                  ASL     OCTNUM          ;INTO PROCESSOR
2806  013016  006337  014020                  ASL     OCTNUM          ;PRIORITY BITS OF
```

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2827  013022  006337  014026          ASL     OCTNUM          ;PROCESSOR STATUS WORD
2828  013026  006337  014026          ASL     OCTNUM
2829  013032  013737  014026  001270  MOV     OCTNUM,DXPRT    ;LOAD PRIORITY
2830  013040  005337  014026          DEC     OCTNUM
2831  013044  042737  000037  014026  BIC     #37,@#OCTNUM    ;CLEAR TNZVC
2832  013052  013737  014026  001272  MOV     OCTNUM,LESS1    ;PRIORITY TO ALLOW DX INTERRUPTS
2833
2834
2835
2836                                  ;GENERATE A LIST OF LEGAL ADDRESSES
2837
2838  013060  000004  028326  MON61   TYPE    ,MSG4           ;LEGAL ADDRESS LIST
2839  013064  012703  014058          MOV     #LEGAL,ADRS,R3  ;START OF LEGAL ADRS TABLE
2840  013070  000004  028420  MON71   TYPE    ,MSG0           ;ADRS:
2841  013074  004737  015534          JSR     PC,GETHEX       ;GET HEXADECIMAL CU ADDRESS
2842  013100  104007  016016          PARITY  ,HEXNUM         ;PUT PARITY (ODD) ON ADRS
2843  013104  013723  016016          MOV     HEXNUM,(R3)+    ;SAVE LEGAL ADDRESS
2844  013110  104006                  KEY,TO,R0
2845  013112  122700  000015          CMPB    #CR,R0          ;ALL DONE?
2846  013116  001364                  BNE     MON7            ;CONTINUE LIST IF NOT <CR>
2847                                  ;.....MOD APR 74 .....
2848                                  ;@
2849                                  ;@                      ADDRESS RESPONSE MOD
2850                                  ;
2851  013120  013727  016016          MOV     HEXNUM,(PC)+
2852  013124  000000                  \LUHEX:@
2853  013126  042737  000400  013124  BIC     #400,VLUHEX
2854  013134  023727  013124  000376  CMP     VL'HEX,#376     ;TEST FOR > FF
2855  013142  003403                  BLE     1$              ;(OK) BRANCHES
2856  013144  000004  028537          TYPE,   MSG13           ;OUTPUT "@ ILLEGAL ?" I.E. > "FF"
2857  013150  000747                  BR      MON7            ;TRY AGAIN
2858  013152  012723  177777  1$:     MOV     #-1,(R3)+       ;MARK END OF LIST
2859                                  ;.....MOD APR 74 .....
2860                                  ;@                      @DEV/CU MOD
2861
2862                                  ;SET UP MAXIMUM NUMBER OF DEVICES PER CONTROL UNIT
2863                                  ;THIS INFORMATION DETERMINES WHAT THE SPW TABLE LOOKS LIKE
2864
2865  013156  000004  028265  MON51   TYPE    ,MSG3           ;MAX # DEVICES/CU
2866  013162  104005                  ACCEPTO                 ;ACCEPT NUMBER OF DEVICES/CU
2867  013164  005737  014026          TST     OCTNUM          ;USE 10. ON DEFAULT
2868  013170  001003                  BNE     X1$:
2869  013172  000004  028537          TYPE,   MSG13           ;OUTPUT "@ ILLEGAL ?" I.E. @ "00"
2870  013176  000767                  BR      MON5            ;TRY AGAIN
2871
2872  013200  013727  014026  X1$:    MOV     OCTNUM,(PC)+
2873  013204  000000  RDXX:   0
2874  013206  005337  013204          DEC     RDXX            ;RANGE MODULO 1
2875  013212  013727  013124          MOV     VLUHEX,(PC)+
2876  013216  000000  MDXX:   0                               ;RANGE MASK
2877  013220  063737  013204  013216  ADD     RDXX,MDXX       ;SCALE
2878  013226  105137  013216          COMB    MDXX            ;FORM FINAL
2879  013232  042737  177400  013216  BIC     #177400,MDXX    ;CU PORTION CLR
2880
```

```
2861                                    ;***************************** MOD APR 74 ****************************
2862                                    ;
2863  013240  013737  014826  014832            MOV     @CTNUM,MAX.DEV,CU
2864  013246  004737  015130          MON5,1:   JSR     PC,CKCUA        ;CHECK FOR LEGAL NUMBER OF DEV PER CU
2865
2866
2867                                    ;GET COMMAND LIST
2868
2869                                    .REM    *
2870
2871                                    THIS ROUTINE ACCEPTS AN IBM COMMAND LIST FROM THE CONSOL.  ALL
2872                                    COMMANDS MUST BE NON ZERO (I.E.  T1B MUST BE TYPED WITH PARITY
2873                                    488).  WITH EACH COMMAND THE MONITOR ASKS FOR ITS ASSOCIATED DST
2874                                    STATUS.
2875
2876                                            *
2877
2878  013252  012704  014274          MON81:    MOV     @CMD,STAT,R4
2879  013256  012703  014234                    MOV     @CMD,ADRS,R3
2880  013262  000004  020447                    TYPE    ,MSG9           ;LEGAL CMD LIST
2881  013266  000004  020508          MON9:     TYPE    ,MSG10          ;CMD:
2882  013272  104005                           ACCEPTO         ;ACCEPT LEGAL COMMANDS FROM KEYBOARD
2883  013274  005737  014826                    TST     OCTNUM
2884  013300  001417                           BEQ     MON10
2885  013302  104007  014826                    PARITY  ,OCTNUM
2886  013306  013723  014826                    MOV     OC.NUM,(R3)+
2887  013312  000004  021123                    TYPE    ,MSG31          ;"STATUS: "
2888  013316  104005                           ACCEPTO
2889  013320  113724  014826                    MOVB    OCTNUM,(R4)+
2890  013324  104006                           KEY.TO,R0
2891  013326  120027  000015                    CMPB    R0,#CR
2892  013332  001355                           BNE     MON9
2893  013334  012723  177777                    MOV     #-1,(R3)+       ;LOAD TERMINATOR
2894
2895
2896                                    ;ASK FOR DYNAMIC SWITCH SETTINGS ON CONSOL SWITCHES
2897
2898  013340                          MON10:
2899  013340  012737  177777  014002            MOV     #-1,ONESHOT
2900  013346  005037  012436                    CLR     ERRCNT
2901  013352  000004  020436                    TYPE    ,MSG7           ;SET DYNAMIC SWITCHES
2902  013356  104006                           KEY.TO,R0               ;TYPE ANYTHING
2903  013360  122700  000003                    CMPB    #3,R0           ;TEST FOR CONTROL C
2904  013364  001002                           BNE     MON11           ;GO IF NO ^C
2905  013366  000137  012520                    JMP     @#MON1,0
2906
2907
2908                                    ;SET UP TABLES
2909
2910  013372  113727  177570          MON11:    MOVB    SWR,(PC)+       ;SAVE MODE CONTROL SWITCH SETTINGS
2911  013376  000000                  PARA1:    0                       ;WHERE
2912  013400  052737  000001  013376            BIS     #BIT0,@#PARA    ;SET ONLINE SELECT FLAG
2913  013406  004737  015130                    JSR     PC,CKCUA        ;CMP ADRS VS MAX DEV PER CU
2914  013412  004737  014742                    JSR     PC,SPW,SETUP    ;SET UP STATUS POINTER WORDS
```

```
2915  013416  004737  014566          JSR     PC,TT.CLR       ;CLEAR TUMBLE TABLE
2916  013422  004737  015100          JSR     PC,DST,SETUP    ;SETUP DEVICE STATUS TABLE
2917  013426  004737  014004          JSR     PC,ODAT         ;SET 360 SIM OUTPUT DATA FILE
2918  013432  004737  015430          JSR     PC,REG,SETUP    ;SCALE ADDRESSES
2919
2920  013436                  LPCSU:
2921  013436  012737  000001  014022          MOV     #1,DEVCNT       ;INIT DEVICE COUNT
2922  013444  012737  014050  014016          MOV     #LEGAL,ADRS,ACUA ;ADRS OF CU ADRS
2923  013452  117737  000340  014020          MOVB    @ACUA,CUADRS    ;CU ADDRESS
2924  013460  000472                  BR      LPC1
2925
2926  013462  000004  020014          LPCNTL: TYPE    ,BELL
2927
2928  013466  062737  000001  014020          ADD     #1,CUADRS       ;
2929  013474  005237  014022                  INC     DEVCNT          ;INC DEVICE COUNT
2930  013500  023737  014022  014032          CMP     DEVCNT,MAX.DEV.CU
2931  013506  003457                  BLE     LPC1
2932  013510  012737  000001  014022          MOV     #1,DEVCNT       ;INIT DEVICE COUNT
2933  013516  027727  000274  177777          CMP     @ACUA,#-1
2934  013524  001042                  BNE     LPC2
2935  013526  062737  000002  013376          ADD     #2,PARA         ;INC TO NEXT PARA COMBINATION
2936  013534  022737  000010  013376          CMP     #10,PARA        ;HAVE ALL PARA COMBS BEEN TESTED?
2937  013542  002030                  BGE     LPC3            ;BRANCH IF NOT
2938  013544  042737  177776  013376          BIC     #1.7776,@#PARA  ;ALL BUT ONLINE IF SET
2939
2940                          ;********** MOD APR 74 **********
2941                          ;*
2942                          ;*                      OPLI TIMEOUT RESET MOD
2943                          ;
2944  013552  012777  000001  169520          MOV     #1,@DXCS        ;DX RESET OPLI
2945
2946                          ;********** MOD APR 74 **********
2947                          ;
2948  013560  000004  020016          TYPE    ,ENDTST
2949  013564  000004  020030          TYPE    ,E#M            ;ERROR COUNT MESSAGE
2950  013570  010546                  MOV     TTY,-(SP)       ;SAVE TTY
2951  013572  013705  012430                  MOV     ERRCNT,TTY              ;TYPE IN OCTAL
2952  013576  004737  016466          JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
2953  013602  012605                  MOV     (SP)+,TTY       ;RESTORE TTY
2954
2955                          ;THE FOLLOWING CODE IS FOR INTERFACE WITH DDP AND ACT11
2956
2957  013604  013700  000042          MOV     @#42,R0         ;IF 42 = 0 REMAIN IN DX DIAGNSTIC
2958  013610  001405                  BEQ     LPC5
2959  013612  000005                  RESET                   ;LINK TO DDP OR ACT11
2960  013614                  LOGICAL:
2961  013614  004710                  JSR     PC,@R0
2962  013616  000240                  NOP
2963  013620  000240                  NOP
2964  013622  000240                  NOP
2965  013624  012737  014050  014016  LPC3:   MOV     #LEGAL,ADRS,ACUA
2966  013632  017737  000160  014020  LPC2:   MOV     @ACUA,CUADRS
2967  013640  062737  000002  014016          ADD     #2,ACUA
2968  013646  104007  014020          LPC1:   PARITY  ,CUADRS
```

```
2969  013652  013737  014020  014010          MOV     CUADRS,DEV
2970  013660  013737  014010  014014          MOV     DEV,DEV,A       ;MULTI THREAD
2971  013666  023737  014022  014032          CMP     DEVCNT,MAX,DEV,CU
2972  013674  001404                          BEQ     LPC3
2973  013676  062737  000001  014014          ADD     #1,DEV,A
2974  013704  000403                          BR      LPC4
2975  013706  162737  000001  014014  LPC3:   SUB     #1,DEV,A
2976  013714  104007  014014          LPC4:   PARITY  ,DEV,A
2977
2978
2979  013720  004737  015236          MON12:  JSR     PC,PRE1         ;DO PRE INIT
2980  013724  012777  000114  165332          MOV     #FALSE,@DXIV    ;SET UP FALSE INTERRUPT VECTOR TRAP
2981  013732  013777  000170  165326          MOV     DXCRT,@DXIB     ;SET UP INTERRUPT PRIORITY
2982  013740  013700  014030                  MOV     FIRST,TST,R0    ;TEST FOR DEFAULT
2983  013744  001002                          BNE     MON13           ;BRANCH IF NOT DEFAULT
2984  013746  005237  014030                  INC     FIRST,TST       ;DEFAULT TEST NUMBER IS ONE
2985  013752  013737  014030  012432  MON13:  MOV     FIRST,TST,ERTSTN
2986  013760  006300                          ASL     R0
2987  013762  016037  011454  011454          MOV     TSTABLE-2(R0),@#RETURN
2988  013770  062737  000024  011454          ADD     #2,@#RETURN
2989  013776  000170  011454          MON14:  JMP     @TSTABLE-2(R0)  ;JUMP TO SELECTED TEST
2990
2991
2992                                  .SBTTL  MONITOR FILES
2993
2994                                  ; ONE PASS FLAGS
2995
2996          000001                  FIVESEC=1                       ;5 SEC OPLI TIMER TEST
2997  014002  177777                  ONESHOT:        -1              ;ONE PASS FLAGS
2998  014004  000000                  CARRY:  0                       ;CARRY COUNT
2999  014006  000000                  TMP:    0               ;TEMPORARY STORAGE
3000  014010  000020                  DEV:    20              ;DEVICE ADDRESS TO SELECT - MUST INCLDE PARITY
3001                                                          ; ( I.E, 441 IS DEV=1, CU=2)
3002  014012  000403                  CMD:    403             ;COMMAND TO PRESET - MUST INCLUDE PARITY
3003                                                          ; (403 IS BASIC NOP COMMAND)
3004
3005  014014  000421                  DEV.A:  421             ;SECOND DEVICE FOR DUAL TESTS
3006
3007
3008  014016  000000                  ACUA:   0               ;ADRS OF CU ADRS
3009
3010
3011  014020  000000                  CUADRS: 0               ;CU ADRS
3012  014022  000000                  DEVCNT: 0               ;DEVICE COUNT
3013
3014  014024  002000                  OFFSET: 2000            ;OFFSET TO ADDRESS REGISTER
3015  014026  000000                  OCTNUM:         0               ;OCTAL INPUT FROM TTY
3016  014030  000000                  FIRST,TST:      0               ;FIRST TEST  TO RUN
3017  014032  000000                  MAX.DEV.CU:     0               ;MAXIMUM # OF DEVICES/CU
3018
3019                                  ;DIAGNOSTIC VARIABLES
3020
3021  014034  000777                  SSTAT:  777             ;SAVED STATUS
3022  014036  000000                  SRCCNT: 0               ;SOURCE DATA
```

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3023  014040  000000                  DSPCNT: 0               ;DESTINATION DATA
3024  014042  000000                  SAVDEV: 0               ;SAVED DEVICE ADDRESS
3025  014044  000000                  TSSFT: 0                ;TSSF TRACE
3026  014046  000000                  COUNT: 0                ;USED BY CH SIM TO COUNT BYTES TRANSFFERED
3027
3028
3029                                  ;LEGAL ADDRESS LIST
3030
3031  014050                          LEGAL.ADRS:
3032
3033  014050  000000                  .WORD   0
3034  014052  000000                  .WORD   0
3035  014054  000000                  .WORD   0
3036  014056  000000                  .WORD   0
3037  014060  000000                  .WORD   0
3038  014062  000000                  .WORD   0
3039  014064  000000                  .WORD   0
3040  014066  000000                  .WORD   0
3041  014070  000000                  .WORD   0
3042  014072  000000                  .WORD   0
3043  014074  000000                  .WORD   0
3044  014076  000000                  .WORD   0
3045  014100  000000                  .WORD   0
3046  014102  000000                  .WORD   0
3047  014104  000000                  .WORD   0
3048  014106  000000                  .WORD   0
3049  014110  000000                  .WORD   0
3050
3051  014112                          SCALD.ADRS:
3052
3053  014112  000000                  .WORD   0
3054  014114  000000                  .WORD   0
3055  014116  000000                  .WORD   0
3056  014120  000000                  .WORD   0
3057  014122  000000                  .WORD   0
3058  014124  000000                  .WORD   0
3059  014126  000000                  .WORD   0
3060  014130  000000                  .WORD   0
3061  014132  000000                  .WORD   0
3062  014134  000000                  .WORD   0
3063  014136  000000                  .WORD   0
3064  014140  000000                  .WORD   0
3065  014142  000000                  .WORD   0
3066  014144  000000                  .WORD   0
3067  014146  000000                  .WORD   0
3068  014150  000000                  .WORD   0
3069  014152  000000                  .WORD   0
3070
3071
3072                                  ;LIST OF DEFAULT COMMANDS
3073
3074  014154                          DFLT.CMD:
3075
3076  014154  000400                          TIOC                    ;TEST I/O COMMAND
```

```
3077  014156  000001                    WRITEC          ;WRITE COMMAND
3078  014160  000002                    READC           ;READ COMMAND
3079  014162  000003                    NOPC            ;NOP COMMAND
3080  014164  000004                    SENSEC          ;SENSE COMMAND
3081  014166  000005                    ILLC            ;ILLAGAL COMMAND
3082  014170  177777                    -1              ;LIST TERMINATOR
3083  014172  177777                    -1              ;LIST TERMINATOR
3084  014174  177777                    -1              ;LIST TERMINATOR
3085  014176  177777                    -1              ;LIST TERMINATOR
3086  014200  177777                    -1              ;LIST TERMINATOR
3087  014202  177777                    -1              ;LIST TERMINATOR
3088  014204  177777                    -1              ;LIST TERMINATOR
3089  014206  177777                    -1              ;LIST TERMINATOR
3090  014210  177777                    -1              ;LIST TERMINATOR
3091  014212  177777                    -1              ;LIST TERMINATOR
3092
3093
3094
3095
3096
3097                                    ;DEFAULT STATUS LIST
3098
3099  014214                            DFLT,STAT:
3100  014214     000                            ,BYTE   0
3101  014215     000                            ,BYTE   0
3102  014216     000                            ,BYTE   0
3103  014217     014                            ,BYTE   CE!DE
3104  014220     000                            ,BYTE   0
3105  014221     002                            ,BYTE   UC
3106  014222     002                            ,BYTE   UC
3107  014223     002                            ,BYTE   UC
3108  014224     002                            ,BYTE   UC
3109  014225     002                            ,BYTE   UC
3110  014226     002                            ,BYTE   UC
3111  014227     002                            ,BYTE   UC
3112  014230     002                            ,BYTE   UC
3113  014231     002                            ,BYTE   UC
3114  014232     002                            ,BYTE   UC
3115  014233     002                            ,BYTE   UC
3116
3117
3118
3119                                    ;LIST OF LEGAL COMMANDS
3120
3121  014234                            CMD:,ADRS:
3122
3123  014234  000000                    ,WORD   0
3124  014236  000000                    ,WORD   0
3125  014240  000000                    ,WORD   0
3126  014242  000000                    ,WORD   0
3127  014244  000000                    ,WORD   0
3128  014246  000000                    ,WORD   0
3129  014250  000000                    ,WORD   0
3130  014252  000000                    ,WORD   0
```

```
3131  014254  000000                    .WORD   0
3132  014256  000000                    .WORD   0
3133  014260  000000                    .WORD   0
3134  014262  000000                    .WORD   0
3135  014264  000000                    .WORD   0
3136  014266  000000                    .WORD   0
3137  014270  000000                    .WORD   0
3138  014272  000000                    .WORD   0
3139
3140                                    ;COMMAND STATUS
3141
3142  014274                            CMD.STAT:
3143
3144  014274     000                            .BYTE   0
3145  014275     000                            .BYTE   0
3146  014276     000                            .BYTE   0
3147  014277     000                            .BYTE   0
3148  014300     000                            .BYTE   0
3149  014301     000                            .BYTE   0
3150  014302     000                            .BYTE   0
3151  014303     000                            .BYTE   0
3152  014304     000                            .BYTE   0
3153  014305     000                            .BYTE   0
3154  014306     000                            .BYTE   0
3155  014307     000                            .BYTE   0
3156  014310     000                            .BYTE   0
3157  014311     000                            .BYTE   0
3158  014312     000                            .BYTE   0
3159  014313     000                            .BYTE   0
3160
3161
3162
3163
3164                                    ;SET UP DEFAULT PARAMETERS
3165
3166  014314                            MONDFLT:
3167  014314  005037  000360                    CLR     @#ENTRY1        ;TT TRACE ENTRY1
3168  014320  005037  000420                    CLR     @#ENTRY2        ;TT TRACE ENTRY2
3169  014324  013737  001440  000520          MOV     @#TT,@#TTRACE   ;INIT TT TRACE
3170  014332  012737  177777  014002          MOV     #-1,ONESHOT     ;ONE PASS FLAGS
3171  014340  005037  014030                    CLR     FIRST.TST       ;DEFAULT TEST 0
3172  014344  005037  012432                    CLR     ERISTN          ;ERROR TEST NUMBER
3173  014350  005037  012430                    CLR     ERRCNT          ;ERROR COUNT
3174  014354  013737  014340  011494          MOV     @#.,FIRST.TST,@#RETURN  ;FIRST TEST
3175  014362  013737  014350  001262          MOV     @#E,DXBASE,@#DXBASE     ;BASE ADDRESS
3176  014370  013737  014352  001264          MOV     @#E,DXIV,@#DXIV         ;INT VECTOR ADRS
3177  014376  013737  014354  001266          MOV     @#D,DXIS,@#DXIS         ;INT STATUS ADRS
3178  014404  013737  014356  001270          MOV     @#4,DXPRT,@#DXPRT               ;PRIORITY LEVEL
3179  014412  013737  014360  014032          MOV     @#D,MAX.DEV,CU,@#MAX.DEV.CO     ;MAX DEVICES
3180  014420  013737  014362  014014          MOV     @#E,DEV,A,@#DEV,A       ;SECOND DEVICE
3181  014426  013737  014366  014030          MOV     @#D,LEGAL.ADRS,@#LEGAL.ADRS     ;CU ADRS
3182  014434  012737  177777  014032          MOV     #-1,LEGAL.ADRS+2
3183  014442  012737  017000  001442          MOV     #DSTADRS,@#DST  ;INIT DST ADRS
3184  014450  012700  014154                  MOV     #DFLT.CMD,R0    ;ADRS OF DEFAULT CMD LIST
```

```
3185  014454  012701  014234          MOV     #CMD,ADRS,R1    ;ADRS OF LEGAL CMD LIST
3186
3187  014460  012021                  MON2:   MOV     (R0)+,(R1)+     ;LOAD DEFAULT CMD LIST
3188  014462  022710  177777                  CMP     #-1,(R0)        ;TEST FOR TERMINATOR
3189  014466  001374                          BNE     MON2
3190  014470  012721  177777                  MOV     #-1,(R1)+       ;LOAD TERMINATOR
3191  014474  012727  000020                  MOV     #12.,(PC)+
3192  014500  000000                  MON2.0: 0
3193  014502  012700  014214                  MOV     #DFLT.STAT,R0   ;DEFAULT STATUS
3194  014506  012701  014274                  MOV     #CMD.STAT,R1    ;STATUS FOR EACH COMMAND
3195  014512  112021                  MON2.1: MOVB    (R0)+,(R1)+
3196  014514  005337  014500                  DEC     MON2.0
3197  014520  001374                          BNE     MON2.1
3198
3199  014522  013737  014024  001436          MOV     OFFSET,SPM      ;LOAD ADRS OF SPM
3200  014530  013737  014024  001440          MOV     OFFSET,TT       ;LOAD ADRS OF TT
3201  014536  062737  001000  001440          ADD     #1000,TT        ; "   "   "  "
3202  014544  000207                  MON2.3: RTS     PC
3203                                  ;DEFAULT PARAMETERS
3204
3205  014546  004000                  D;P;RST,TST:    TST1            ;FIRST TEST
3206  014550  176200                  D;0XBASE:       176200          ;BASE ADDRESS
3207  014552  000300                  D;0XIV:         300             ;INT VECTOR ADRS
3208  014554  000200                  D;0XPRT:        LEVEL4          ;DX PRIORITY LEVEL
3209  014556  000020                  D;MAX.DEV.CU:   20              ;MAX # DEVICES PER CU
3210  014560  000020                  D;LEGAL.ADRS:   020             ;DEFAULT CO ADRS
3211  014562  000421                  D;DEV.A:        421
3212  014564  000302                  D;0XIS:         302             ;INT STATUS ADRS
3213
3214
3215                                  .SBTTL  MONITOR SUBROUTINES
3216
3217                                  ;TT.CLR, CLEAR TUMBLE TABLE
3218
3219
3220  014566                          TT.CLR:
3221  014566  013701  001440                  MOV     TT,R1           ;BOTTOM OF TT
3222  014572  005021                  CLE:    CLR     (R0)+           ;CLEAR TT
3223  014574  020127  004000                  CMP     R1,#ENDTT               ;TEST FOR END OF TT
3224  014600  001374                          BNE     CLE             ;BRANCH IF NOT END
3225  014602  000207                          RTS     PC
3226
3227
3228                                  ;REINIT OUTPUT DATA
3229
3230
3231  014604                          ODAT:
3232  014604  010046                          MOV     R0,-(SP)
3233  014606  012700  022056                  MOV     #WDATA,R0
3234  014612  005020                          CLR     (R0)+
3235  014614  000000                  ODAT1:  0
3236  014616  104007  014614          ODAT2:  PARITY  ,ODAT1
3237  014622  013720  014614                  MOV     ODAT1,(R0)+
3238  014626  042737  000400  014614          BIC     #PARD,ODAT1
```

```
3239  014634  105237  014614                  INCB    ODAT1
3240  014640  001366                          BNE     ODAT2
3241  014642  012670                          MOV     (SP)+,R0
3242  014644  000207                          RTS     PC
3243
3244
3245
3246
3247
3248
3249
3250
3251
3252
3253
3254
3255
3256
3257
3258
3259
3260
3261  014646                        T,PARITY!
3262  014646  017627  000000                  MOV     @(SP),(PC)+     ;FETCH ADDRESS OF SOURCE DATA
3263  014652  000000                SDAPG:  0                       ;SOURCE DATA ADDRESS
3264  014654  017727  177772                  MOV     @SDAPG,(PC)+    ; FETCH SOURCE DATA
3265  014660  000000                TDAT:   0                       ;SOURCE DATA
3266  014662  005027                          CLR     (PC)+
3267  014664  000000                PRTY:   0
3268
3269  014666  106337  014660        PG2:    ASLB    TDAT
3270  014672  102002                          BVC     PG4
3271  014674  005137  014664                  COM     PRTY
3272
3273  014700  106337  014660        PG3:    ASLB    TDAT
3274  014704  001370                          BNE     PG4
3275  014706  005737  014664                  TST     PRTY
3276  014712  100404                          BMI     PG5
3277  014714  052777  000400  177730          BIS     @PARO,@SDAPG    ;SET PARITY BIT
3278  014722  000403                          BR      PG5
3279  014724  042777  000400  177720  PG4:    BIC     @PARO,@SDAPG    ;CLEAR PARITY BIT
3280
3281  014732  062716  000002        PG5:    ADD     #2,@SP          ;ADD 2 TO RETURN PC
3282  014736  000002                          RTI
3283
3284                                ;SETUP SPW TABLE
3285                                ;.......................... MOD APR 74 ..............................
3286                                ;*                  ADDRESS RESOLUTION MOD
3287
3288  014740  177400                MARK!   177400
3289
3290  014742                        SPW.SETUP!
3291  014742  012700  014858                  MOV     #LEGAL,ADRS,R0  ;FETCH ADRS OF LEGAL ADRS LINST
3292  014746  012701  014112                  MOV     #SCALD,ADRS,R1  ;FETCH ADDRS OF SCALED LEGAL ADRS LIST
```

```
3293
3294  014752  012811              SP.81   MOV     (R0)+,@R1       ;MAKE DUPLICATE ADRS LIST
3295  014754  043711  014748              BIC     MASK,@R1        ;
3296                              ;****************** MOD APR 74 ****************************
3297  014760  006311              SP.91   ASL     @R1             ;MAKE INDX MOD(2)
3298  014762  063721  001436              ADD     SPW,(R1)+       ;EQUALS REAL SPW ADRS
3299  014766  021027  177777              CMP     @R1,#-1         ;TEST FOR TERMINATOR
3300  014772  001367                      BNE     SP.8            ;FETCH NEXT ADRS
3301
3302  014774  012721  177777              MOV     #-1,(R1)+       ;MARK END OF SCALED ADRS LIST
3303
3304  015000  013701  001436              MOV     SPW,R1          ;ADRS OF SPW
3305  015004  013702  001442              MOV     DST,R2          ;ADRS OF DST
3306  015010  012700  014112      SP.11   MOV     #$$ALD,ADRS,R0
3307  015014  020110              SP.21   CMP     R1,@R0          ;RUN THRU LIST
3308  015016  001407                      BEQ     SP.3            ;BRANCH ON LEGAL ADRS
3309  015020  005720                      TST     (R0)+
3310  015022  022710  177777              CMP     #-1,@R0         ;TEST FOR END OF LIST
3311  015026  001372                      BNE     SP.2            ;BRANCH IF NOT ENT
3312  015030  012721  016000              MOV     #ERRDST,(R1)+   ;LOAD SPW WITH ERROR DST ADRS
3313  015034  000407                      BR      SP.6
3314  015036  013727  014032      SP.31   MOV     MAX,DEV,CU,(PC)+
3315  015042  000000              SP.41   0
3316  015044  010221              SP.51   MOV     R2,(R1)+
3317  015046  005337  015042              DEC     SP.4
3318  015052  001374                      BNE     SP.5
3319  015054  020137  001440      SP.61   CMP     R1,TT           ;TEST FOR END OF SPW
3320  015060  002753                      BLT     SP.1
3321  015062  001405                      BEQ     SP.7
3322  015064  005726                      TST     (SP)+   ;POP STACK
3323  015066  000004  015200              TYPE    ,IOVN
3324  015072  000137  012520              JMP     MON1,0  ;GO BACK TO MONITOR
3325  015076  000207              SP.71   RTS     PC
3326                              ;DEVICE STATUS TABLE SETUP
3327
3328
3329  015100                      DST.SETUP:
3330  015100  013701  001442              MOV     DST,R1
3331  015104  012727  000020              MOV     #1*,,(PC)+
3332  015110  000000              DS.11   0
3333  015112  012702  014274              MOV     #CMD,STAT,R2
3334  015116  112221              DS.21   MOVB    (R2)+,(R1)+
3335  015120  005337  015116              DEC     DS.11
3336  015124  001374                      BNE     DS.2
3337  015126  000207                      RTS     PC
3338
3339                              ;SUBROUTINE TO CHECK THAT CU ADDRESS AND THE NUMBER OF DEVICES
3340                              ;PER CU IS LEGAL
3341
3342  015130  012700  014050      CKCUA:  MOV     #LEGAL,ADRS,R0  ;
3343  015134  005027              CKC11:  CLR     (PC)+
3344  015136  000000              CKC21:  0
3345  015140  111037  015136              MOVB    @R0,@#CKC2              ;FETCH CU ADDRESS
3346                              ;****************** MOD APR 74 ****************************
```

```
                                        ;*
                                        ;*                       ADDRESS RANGE MOD
                                        ;
 015144  122737  000020  014032  CKC3:   CMPB    #20,@#MAX.DEV.CU        ;CHECK LIMIT 16.

                                        ;*************************** MOD APR 74 ******************************
                                        ;
 015152  103005                          BHIS    CKC4    ;BRANCH IF WITHIN LIMITS
 015154  000004  015200                  TYPE    ,IDVN   ;ILLEGAL NUMBER OF DEVICES PER CU
 015160  012716  013156                  MOV     #MNS,(SP)       ;CHANGE RETURN PC
 015164  000207                          RTS     PC
 015166  005720                  CKC4:   TST     (R0)+
 015170  021027  177777                  CMP     @R0,#-1
 015174  001357                          BNE     CKC1
 015176  000207                          RTS     PC
 015200  044537  040114  043505  IDVN:   .ASCIZ  "*ILLEGAL # OF DEVICES PER CU "
 015206  046101  021440  047440
 015214  020106  042504  044526
 015222  042503  020123  042520
 015230  020122  052503  000040
                                        .EVEN

                                        ;PRE-INIT SUBROUTINE

 015236  012737  015372  000004  PREI:   MOV     #PREITO,4
 015244  012737  000340  000006          MOV     #LEVEL7,6
 015252  005077  164042                  CLR     @DXES           ;CLEAR MAINT CLK
 015256  004737  015376                  JSR     PC,RESRES       ;DX RESET AND RESTORE
                                        ;THE FOLLOWING INSTRUCTION GET MODIFIED UPON THE COMPLETION
                                        ;OF THE SYSTEM RESET TEST,IF SCOPE PROBLEMS DEVELOP BEFORE THIS TEST
                                        ;PASSES THIS INST. CAN BE PATCHED TO A TESET,NOP.
 015262  004737  015370          PREI.1: JSR     PC,@#NOCLR              ;MODIFIED TO CLRMO
 015266  005077  164006                  CLR     @DXCS           ;CLR DONE,LOCKO
 015272  004737  015376                  JSR     PC,RESRES       ;DX RESET AND RESTORE
 015276  013777  001436  163776          MOV     SPW,@DXOS
 015304  023777  001436  163770          CMP     SP4,@DXOS
 015312  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
 015314  104000                          ERROR                   ;
 015316  052777  000010  163774          BIS     #TIMDIS,@DXES   ;TIMER DISABLE
 015324  032777  000010  163766          BIT     #TIMDIS,@DXES
 015332  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
 015334  104000                          ERROR                   ;
 015336  012737  000006  000004          MOV     #6,4
 015344  012737  000000  000006          MOV     #HALT,6
 015352  004737  006176                  JSR     PC,ZEROTT       ;ZERO TUMBLE TABLE
 015356  004737  006226                  JSR     PC,TTZERO       ;VERIFY TT ZERO
 015362  000207                          RTS     PC






 015364  005077  163720          CLRMO:  CLR     @DXMO   ;DO SYSTEM RESET
```

```
3401  015370  000207                  NOCLR: RTS     PC
3402
3403  015372  104000                  PREINT: ERROR          ;PREINIT TIME OUT ERROR
3404
3405
3406  015374  000002                          RTI
3407
3408
3409                                  ;DX RESET AND RESTORE ROUTINE
3410
3411
3412
3413
3414
3415
3416
3417
3418
3419
3420  015376                          RESRES:
3421
3422  015376  042777  000200  163674          BIC     #DONE,@DXCS     ;CLEAR LOCKO
3423  015404  012777  000001  163666          MOV     #DXFRS,@DXCS    ;DX RESET
3424  015412  013737  001440  000926          MOV     @#.T,TTRACE     ;RELOAD SOFT TT POINTER
3425  015420  000240                          NOP             ;INSERT RESET !,@'#5" HERE IF REQUIRED
3426  015422  004737  007234                  JSR     PC,ONLIN        ;GET BACK ONLINE
3427  015426  000207                          RTS     PC
3428
3429
3430
3431
3432
3433                                  ;REGISTER ADDRESS SETUP ROUTINE
3434
3435  015430                          REG.SETUP:
3436  015430  013700  001262                  MOV     DXBASE,R0               ;FETCH BASE ADRS
3437  015434  012701  001274                  MOV     #DXDS,R1                ;FETCH ADRS OF DXDS ADRS
3438  015440  010021                  RS',1:  MOV     R0,(R1)+
3439  015442  062700  000002                  ADD     #2,R0           ;INC TO NEXT DX ADRS
3440  015446  020127  001326                  CMP     R1,#DXES1+2
3441  015452  001372                          BNE     RS%1
3442
3443  015454  004537  015516                  JSR     R5,SBYTE                ;SETUP BYTE REF REG'S
3444
3445  015460  001276                          DXCA
3446  015462  001326                          CUAR
3447
3448  015464  001302                          DXCS
3449  015466  001332                          CUSR
3450
3451  015470  001310                          DXMO
3452  015472  001336                          BUSO
3453
3454  015474  001312                          DXMI
```

```
3455  015476  001342                        BUSI
3456
3457  015500  001320                        DXES
3458  015502  001346                        MISC
3459
3460  015504  177777                        -1
3461
3462  015506  000207                        RTS     PC
3463
3464  015510                          SBYTE:
3465  015510  012500                        MOV     (R5)+,R0
3466  015512  012501                        MOV     (R1)+,R1
3467  015514  011021                        MOV     @R0,(R1)+
3468  015516  011011                        MOV     @R0,@R1
3469  015520  005221                        INC     (R1)+
3470  015522  021527  177777                CMP     @R5,#-1
3471  015526  001370                        BNE     SBYTE
3472  015530  005725                        TST     (R5)+   ;POP OVER TERMINATOR
3473  015532  000205                        RTS     R5
3474
3475
3476                                  ;ACCEPT HEX NUMBER FROM TTY
3477
3478  015534  005037  016010          GETHEX: CLR     HEXNUM          ;CLEAR HEXADECIMAL NUMBER LOCATION
3479  015540  010246                        MOV     R2,-(SP)        ;SAVE R2
3480  015542  010146                        MOV     R1,-(SP)        ;SAVE R1
3481  015544  010046                        MOV     R0,-(SP)        ;SAVE R0
3482  015546  005001                  ACPTH:: CLR     R1              ;
3483  015550  104006                  ACPTH.1:        KEY,TO,R0       ;FETCH AN ASCII CHAR FROM KEYBOARD
3484  015552  120027  000003                CMPB    R0,#3           ;CONTROL C?
3485  015556  001002                        BNE     AH.2
3486  015560  000137  012520                JMP     @#MON1,0
3487  015564  122700  000177          AH.2: CMPB    #177,R0         ;TEST FOR RUBOUT
3488  015570  001424                        BEQ     RUBOUH
3489  015572  122700  000015                CMPB    #15,R0          ;TEST FOR <CR>
3490  015576  001424                        BEQ     CARGH
3491  015600  120027  000040                CMPB    R0,#40          ;EXIT IF SPACE
3492  015604  001421                        BEQ     CARGH
3493  015606  120027  000060                CMPB    R0,#60          ;TEST FOR VALID HEX NUMBER
3494  015612  002413                        BLT     RUBOUH
3495  015614  120027  000071                CMPB    R0,#71
3496  015620  003021                        BGT     AHEX
3497  015622  042700  177760          AH.3: BIC     #177760,R0      ;CONVERT ASCII TO HEX
3498  015626  006301                        ASL     R1
3499  015630  006301                        ASL     R1
3500  015632  006301                        ASL     R1
3501  015634  006301                        ASL     R1
3502  015636  050001                        BIS     R0,R1           ;CHALK'M UP
3503  015640  000743                        BR      ACPTH,1         ;FETCH NEXT CHAR
3504
3505  015642  000004  020054          RUBOUH: TYPE    ,,QUES          ;TYPE?
3506  015646  000737                        BR      ACPTH
3507  015650  010137  016010          CARGH:  MOV     R1,@#HEXNUM     ;PLACE HEX NUMBER HERE
3508  015654  012600                        MOV     (SP)+,R0                ;RESTORE R0
```

```
3509  016656  012601                        MOV     (SP)+,R1            ;RESTOR R1
3510  016660  012602                        MOV     (SP)+,R2            ;RESTORE R2
3511  016662  000207                        RTS     PC
3512
3513  016664  005002                AHEX1   CLR     R2
3514  016666  120062  016012        AHEX0:  CMPB    R0,ATBL(R2)         ;LOOK THRU ASCII TABLE
3515  016672  001406                        BEQ     AHEX1               ;BRANCH ON MATCH
3516  016674  005202                        INC     R2
3517  016676  126227  016012  000000        CMPB    ATBL(R2),#0         ;LOOK FOR END OF TABLE
3518  016704  001370                        BNE     AHEX0               ;BRANCH IF NOT END
3519  016706  000755                        BR      RUBOUH              ;ERROR ON NO MATCH
3520  016710  116200  016022        AHEX11: MOVB    HTBL(R2),R0         ;LOAD BINARY OF FIND
3521  016714  000742                        BR      AH.3
3522
3523
3524
3525                                ;********************** MOD APR 74 ******************************
3526                                ;
3527
3528          016000                .=.+1377+1
3529
3530                                ; ILLEGAL OR MALFUNCTIONNING GUAR ERROR STATUS TABLE MODULO 8
3531
3532  016000                        ERRDST:
3533  016000      002                       .BYTE   UC                  ;UNIT CHECK ENTRIES
3534  016001      002                       .BYTE   UC                  ;UNIT CHECK ENTRIES
3535  016002      002                       .BYTE   UC                  ;UNIT CHECK ENTRIES
3536  016003      002                       .BYTE   UC                  ;UNIT CHECK ENTRIES
3537  016004      002                       .BYTE   UC                  ;UNIT CHECK ENTRIES
3538  016005      002                       .BYTE   UC                  ;UNIT CHECK ENTRIES
3539  016006      002                       .BYTE   UC                  ;UNIT CHECK ENTRIES
3540  016007      002                       .BYTE   UC                  ;UNIT CHECK ENTRIES
3541
3542  016010  000000                HEXNUM: 0                           ;HEX NUMBER
3543  016012  041101  042103  043105  ATBL:   .ASCII  'ABCDEF'
3544  016020  000000                        .WORD   0
3545  016022     012     013     014  HTBL:   .BYTE   10.,11.,12.,13.,14.,15.
3546  016025     015     016     017
3547
3548                                ;ACCEPT OCTAL NUMBER FROM TTY
3549  016030                        T.ACCEPTO:
3550  016030  005037  016026                CLR     OCTNUM              ;CLEAR OCTAL NUMBER LOCATION
3551  016034  010146                        MOV     R1,-(SP)            ;SAVE R1
3552  016036  010046                        MOV     R0,-(SP)            ;SAVE R0
3553  016040  005001                ACPTO:  CLR     R1                  ;
3554  016042  104006                ACPTO.1:        KEY.TO,R0           ;FETCH AN ASCII CHAR FROM KEYBOARD
3555  016044  120027  000003                CMPB    R0,#3               ;CONTROL C?
3556  016050  001002                        BNE     A0:2
3557  016052  000137  012520                JMP     @#MON1,#
3558  016056  122700  000177        A0.2:   CMPB    #177,R0             ;TEST FOR RUBOUT
3559  016062  001423                        BEQ     RUBOUT
3560  016064  122700  000015                CMPB    #15,R0              ;TEST FOR <CR>
3561  016070  001423                        BEQ     CARG
3562  016072  120027  000040                CMPB    R0,#40              ;EXIT IF SPACE
```

```
3563  016076  001426                        BEQ     CARG
3564  016100  120027  000060                CMPB    R0,#60          ;TEST FOR VALID OCTAL NUMBER
3565  016104  002412                        BLT     RUBOUT
3566  016106  120027  000067                CMPB    R0,#'7
3567  016112  003007                        BGT     RUBOUT
3568  016114  042700  177770                BIC     #177770,R0      ;CONVERT ASCII TO OCTAL
3569  016120  006301                        ASL     R1
3570  016122  006301                        ASL     R1
3571  016124  006301                        ASL     R1
3572  016126  050001                        BIS     R0,R1           ;CHALK'M UP
3573  016130  000744                        BR      ACPTO,1         ;FETCH NEXT CHAR
3574
3575  016132  000004  020654        RUBOUT: TYPE    ,,QUES          ;TYPE?
3576  016136  000740                        BR      ACPTO
3577  016140  010137  014020        CARG:   MOV     R1,OCTNUM       ;PLACE OCTAL NUMBER HERE
3578  016144  012600                        MOV     (SP)+,R0                ;RESTORE R0
3579  016146  012601                        MOV     (SP)+,R1                ;RESTOR R1
3580  016150  000002                        RTI                     ;RETURN
3581
3582                                ;FETCH AN ASCII CHARACTER FROM KEYBOARD
3583
3584  016152                        T',KEY',TO,R0:
3585  016152  105777  163220                TSTB    @TKS            ;TEST FOR DONE
3586  016156  100375                        BPL     .-2             ;WAIT FOR KEYBOARD
3587  016160  117700  163214                MOVB    @TKB,R0         ;FETCH CHAR
3588  016164  117777  163210  163212        MOVB    @TKB,@TPB       ;ECHO
3589  016172  004737  016204                JSR     PC,TTYFLG       ;WAIT FOR DONE
3590  016176  042700  177600                BIC     #177600,R0      ;7 BIT ASCII
3591  016202  000002                        RTI
3592                                ;TEST FOR TRANSMITTER DONE
3593
3594  016204                        TTYFLG:
3595  016204  105777  163172        2$:     TSTB    @TPS
3596  016210  100375                        BPL     2$
3597  016212  000207                        RTS     PC
3598                                .SBTTL  TTY ASCII OUTPUT ROUTINE
3599
3600
3601  016214  032737  020000  177570  .IOT:   BIT     #BIT13,$R       ;TEST FOR INHIBIT PRINT
3602  016222  001040                        BNE     .IOTE
3603  016224  016537  016332                MOV     TTY,.SAV        ;SAVE TTY
3604  016230  017605  000000                MOV     @(R5),TTY       ;GET ADDRESS TO BE TYPED
3605  016234  122715  000044        .MORE:  CMPB    #'$,(TTY)       ;TERMINATOR?
3606  016240  001425                        BEQ     .TERM
3607  016242  105715                        TSTB    (TTY)           ;TERMINATOR?
3608  016244  001423                        BEQ     .TERM
3609  016246  122715  000001                CMPB    #1,(TTY)        ;RESTORE OLD SEQUENCE
3610  016252  001416                        BEQ     .RSET
3611  016254  122715  000137                CMPB    #'_,(TTY)       ;SET UP CR LF
3612  016260  001406                        BEQ     .CRLF
3613  016262  105777  163114                TSTB    @TPS
3614  016266  100375                        BPL     .-4
3615  016270  112577  163110                MOVB    (TTY)+,@TPB
3616  016274  000757                        BR      .MORE
```

```
3617  016276  005205                  .CRLF:  INC     TTY
3618  016302  010546                          MOV     TTY,-(6)
3619  016304  012705  016334                  MOV     #,AR,TTY
3620  016310  000752                          BR      .MORE
3621  016312  012605                  .REST:  MOV     (6)+,TTY
3622  016314  000750                          BR      .MORE
3623  016316  004737  016264          .TERM:  JSR     PC,TTYFLG       ;WAIT FOR DONE
3624  016322  013705  016332                  MOV     .SAV,TTY
3625  016326  062716  000002          .IOTE:  ADD     #2,(6)  ;POP
3626  016332  000002                          RTI
3627
3628  016334  000000                  .SAV:   0
3629  016336  005015  001002  001002  .CAR:   .ASCII  <CR><LF><2><2><2><2><2><2><1>
3630  016344  001002      001
3631          016350                  .EVEN
3632  016350  000000                  .TYPE:  0
3633                                  .SBTTL  SAVE AND RESTORE REGISTERS
3634                                  ;SAVE REGS 0 TO 4 SUBROUTINE,
3635  016352  012637  016466          T.SAVRG: MOV    (6)+,SVRPC      ;SAVE PC AND PSW,
3636  016356  012637  016410                  MOV     (6)+,SVRPSW
3637  016362  010546                          MOV     %5,-(6)
3638  016364  010446                          MOV     %4,-(6) ;SAVE REGS 0 - 4
3639  016366  010346                          MOV     %3,-(6)         ;IN STACK,
3640  016370  010246                          MOV     %2,-(6)
3641  016372  010146                          MOV     %1,-(6)
3642  016374  010046                          MOV     %0,-(6)
3643  016376  013746  016410                  MOV     SVRPSW,-(6)     ;RESTORE PC AND PSW,
3644  016402  013746  016466                  MOV     SVRPC,-(6)
3645  016406  000002                          RTI                     ;EXIT,
3646  016410  000000                  SVRPC:  0
3647  016412  000000                  SVRPSW: 0
3648                                  ;RESTORE REGS 0 TO 4 SUBROUTINE,
3649  016414  012637  016460          T.RSTRG: MOV    (6)+,RSTPC      ;SAVE PC AND PSW,
3650  016420  012637  016454                  MOV     (6)+,RSTPSW
3651  016424  012600                          MOV     (6)+,%0         ;RESTORE REGS 0 - 4
3652  016426  012601                          MOV     (6)+,%1         ;FROM STACK,
3653  016430  012602                          MOV     (6)+,%2
3654  016432  012603                          MOV     (6)+,%3
3655  016434  012604                          MOV     (6)+,%4
3656  016436  012605                          MOV     (6)+,%5
3657
3658  016440  013746  016454                  MOV     RSTPSW,-(6)     ;RESTORE PC AND PSW,
3659  016444  013746  016460                  MOV     RSTPC,-(6)
3660  016450  000002                          RTI                     ;EXIT
3661  016452  000000                  RSTPC:  0
3662  016454  000000                  RSTPSW: 0
3663                                  .SBTTL  OCTAL DUMP ROUTINE
3664
3665  016456  000000  000000  000000  PRINT2: .WORD   0,0,0,0
3666  016464  000000
3667  016466      000     000         PRINT3: .BYTE   0,0
3668
3669  016470  112737  000001  016466  PRINTR: MOVB    #1,PRINT3       ;SET ZERO FILL SWITCH
3670  016476  000402                          BR      .+6
```

```
3671  016476  005037  016464          PRINTSI CLR     PRINTJ          ;SUPRESS LEADING ZERO'S
3672  016502  112737  177772  016465          MOVB    #-6,PRINTJ+1    ;SET COUNT
3673  016510  032737  020000  177570          BIT     #BIT13,SR
3674  016516  001041                          BNE     PRTE
3675  016520  010446                          MOV     %4,-(6)         ;SAVE R4
3676  016522  012704  016454                  MOV     #PRINT2,%4      ;SET POINTER TO FIRST ASCII CHAR.
3677  016526  105014                          CLRB    (4)             ;CLEAR FIRST BYTE
3678  016530  000405                          BR      PRINTF          ;ROTATE FIRST BIT
3679  016532  105014                  PRINTL: CLRB    (4)             ;CLEAR BYTE OF CHARACTER
3680  016534  006105                          ROL     TTY             ;ROTATE BIT INTO C
3681  016536  106114                          ROLB    (4)             ;PACK IT
3682  016540  006105                          ROL     TTY             ;ROTATE BIT INTO C
3683  016542  106114                          ROLB    (4)             ;PACK IT
3684  016544  006105                  PRINTF: ROL     TTY             ;ROTATE BIT INTO C
3685  016546  106114                          ROLB    (4)             ;PACK IT
3686  016550  105714                          TSTB    (4)
3687  016552  001402                          BEQ     .+8
3688  016554  105237  016464                  INCB    PRINTJ
3689  016560  105737  016464                  TSTB    PRINTJ          ;CHECK FILL SWITCH
3690  016564  001402                          BEQ     .+8
3691  016566  152724  000060                  BISB    #'0,(4)+        ;MAKE INTO ASCII CHAR
3692  016572  105237  016465                  INCB    PRINTJ+1
3693  016576  001355                          BNE     PRINTL          ;REPEAT
3694  016600  022704  016454                  CMP     #PRINT2,%4
3695  016604  001002                          BNE     .+4
3696  016606  112724  000060                  MOVB    #'0,(4)+
3697  016612  105014                          CLRB    (4)
3698  016614  000004  016454                  TYPE    ,PRINT2         ;TYPE IT
3699  016620  012604                          MOV     (6)+,%4         ;RESTORE R5
3700  016622  000207                  PRTE:   RTS     %7
3701                                  ;TTY WATCH DOG FOR CONTROL C
3702          000003                  CNTLC=3                         ;ASCII CONTROL C
3703
3704  016624  117727  162550          TTYI:   MOVB    @TKB,(PC)+      ;SAVE CHAR
3705  016630  000000                  SCHAR:  0                       ;HERE
3706  016632  042737  000200  016630          BIC     #200,@#SCHAR    ;SEVEN LEVEL ASCII
3707  016640  122737  000003  016630          CMPB    #CNTLC,@#SCHAR  ;CHECK FOR CONTROL C
3708  016646  001004                          BNE     TTYI0
3709  016650  000004  016674                  TYPE    ,ACLC   ;TYPE CONTROL C
3710  016654  000137  012520                  JMP     @#MON1,0
3711  016660  004737  016204          TTYI0:  JSR     PC TTYPLG
3712  016664  113777  016630  162512          MOVB    @#SCHAR,@TPB    ;ECHO CHARACTER
3713  016672  000002                          RTI
3714
3715  016674  041536      000         ACLC:   .ASCIZ  <136><103>
3716          016700                  .EVEN
3717
3718          017000                  .=.+1377+1                      ;FORM MOD(400) BOUNDRY
3719
3720          017000                  DSTADRS=.                       ;DEFAULT DST
3721
3722  017000      000                         .BYTE   0               ;TIO
3723  017001      000                         .BYTE   0               ;WRITE
3724  017002      000                         .BYTE   0               ;READ
```

```
3725  017003  014                     .BYTE   CEIDE   ;NOP
3726  017004  000                     .BYTE   0       ;SENSE
3727
3728  017005  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3729  017006  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3730  017007  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3731  017010  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3732  017011  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3733  017012  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3734  017013  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3735  017014  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3736  017015  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3737  017016  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3738  017017  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3739  017020  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3740  017021  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3741  017022  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3742  017023  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3743  017024  002                     .BYTE   UC      ;ILLLGAL ,UNIT CHECK
3744  017025  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3745  017026  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3746  017027  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3747  017030  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3748  017031  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3749  017032  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3750  017033  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3751  017034  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3752  017035  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3753  017036  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3754  017037  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3755  017040  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3756  017041  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3757  017042  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3758  017043  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3759  017044  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3760  017045  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3761  017046  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3762  017047  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3763  017050  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3764  017051  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3765  017052  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3766  017053  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3767  017054  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3768  017055  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3769  017056  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3770  017057  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3771  017060  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3772  017061  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3773  017062  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3774  017063  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3775  017064  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3776  017065  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3777  017066  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3778  017067  002                     .BYTE   UC      ;ILLEGAL ,UNIT CHECK
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3779  017878    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3780  017879    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3781  017880    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3782  017881    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3783  017882    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3784  017883    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3785  017884    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3786  017885    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3787  017886    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3788  017887    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3789  017888    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3790  017889    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3791  017890    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3792  017891    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3793  017892    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3794  017893    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3795  017894    002                    .BYTE   JC      ILLEGAL ,UNIT CHECK
3796  017895    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3797  017896    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3798  017897    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3799  017898    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3800  017899    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3801  017900    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3802  017901    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3803  017902    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3804  017903    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3805  017904    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3806  017905    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3807  017906    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3808  017907    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3809  017908    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3810  017909    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3811  017910    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3812  017911    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3813  017912    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3814  017913    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3815  017914    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3816  017915    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3817  017916    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3818  017917    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3819  017920    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3820  017921    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3821  017922    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3822  017923    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3823  017924    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3824  017925    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3825  017926    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3826  017927    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3827  017930    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3828  017931    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3829  017932    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3830  017933    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3831  017934    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3832  017935    002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
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3833  017156  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3834  017157  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3835  017160  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3836  017161  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3837  017162  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3838  017163  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3839  017164  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3840  017165  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3841  017166  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3842  017167  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3843  017170  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3844  017171  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3845  017172  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3846  017173  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3847  017174  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3848  017175  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3849  017176  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3850  017177  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3851  017200  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3852  017201  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3853  017202  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3854  017203  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3855  017204  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3856  017205  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3857  017206  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3858  017207  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3859  017210  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3860  017211  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3861  017212  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3862  017213  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3863  017214  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3864  017215  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3865  017216  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3866  017217  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3867  017220  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3868  017221  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3869  017222  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3870  017223  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3871  017224  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3872  017225  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3873  017226  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3874  017227  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3875  017230  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3876  017231  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3877  017232  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3878  017233  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3879  017234  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3880  017235  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3881  017236  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3882  017237  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3883  017240  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3884  017241  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3885  017242  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
3886  017243  002                    .BYTE   UC      ILLEGAL ,UNIT CHECK
```

```
3887  017244  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3888  017245  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3889  017246  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3890  017247  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3891  017250  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3892  017251  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3893  017252  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3894  017253  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3895  017254  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3896  017255  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3897  017256  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3898  017257  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3899  017260  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3900  017261  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3901  017262  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3902  017263  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3903  017264  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3904  017265  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3905  017266  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3906  017267  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3907  017270  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3908  017271  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3909  017272  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3910  017273  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3911  017274  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3912  017275  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3913  017276  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3914  017277  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3915  017300  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3916  017301  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3917  017302  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3918  017303  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3919  017304  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3920  017305  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3921  017306  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3922  017307  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3923  017310  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3924  017311  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3925  017312  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3926  017313  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3927  017314  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3928  017315  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3929  017316  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3930  017317  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3931  017320  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3932  017321  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3933  017322  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3934  017323  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3935  017324  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3936  017325  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3937  017326  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3938  017327  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3939  017330  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3940  017331  002                    .BYTE   UC      ;ILLEGAL ;UNIT CHECK
```

```
3941  017332  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3942  017333  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3943  017334  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3944  017335  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3945  017336  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3946  017337  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3947  017340  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3948  017341  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3949  017342  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3950  017343  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3951  017344  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3952  017345  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3953  017346  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3954  017347  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3955  017350  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3956  017351  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3957  017352  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3958  017353  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3959  017354  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3960  017355  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3961  017356  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3962  017357  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3963  017360  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3964  017361  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3965  017362  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3966  017363  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3967  017364  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3968  017365  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3969  017366  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3970  017367  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3971  017370  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3972  017371  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3973  017372  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3974  017373  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3975  017374  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3976  017375  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3977  017376  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3978  017377  002                     .BYTE   UC      ;ILLEGAL ;UNIT CHECK
3979                          .EVEN
3980
3981  017400                  T',PCH1!
3982  017400  000012                  .BLKW   10';
3983
3984  017424                  T',PCH2!
3985  017424  000012                  .BLKW   10';
3986
3987  017450                  T',PCH3!
3988  017450  000012                  .BLKW   10';
3989
3990                          .SBTTL  MESSAGES
3991          000012          LF=12
3992          000015          CR=15
3993  017474                  HEADER!
3994                          !=                      ;HEADER TEXT MOD
```

```
3995                                    ;************************ MOD APR 74 ********************************
3996                                    .NLIST  BEX
 (1)  017474  046537  044501  042116            .ASCII  "-MAINDEC-11-DZDXH-C-D ONLINE MAINTENANCE EXERCISER(APR 74) "
 (1)                                    ;-                      HEADER TEXT MOD
 (1)                                    ;************************ MOD APR 74 ********************************
 (1)                                    ;-                      HEADER TEXT MOD
 (1)  017567     137  047506  020122            .ASCII  "-FOR DYNAMIC SWITCH REGISTER SETTINGS"
 (1)  017634  051537  042505  050040            .ASCII  "-SEE PROGRAM LISTING PAGE #1"
 (1)  017670  057537  044504  041523            .ASCII  "-!DISCONNECT 'DX11' FROM 360/370 CHANNEL-"
 (1)  017741     137  047503  047116            .ASCII  "-!ONNECT MAINTENANCE CABLES"
 (1)  017774  052137  051110  053517            .ASCII  "-THROW ENABLE SWITCH ONLINE"
 (1)  020027     137  052137  050131            .ASCII  "--TYPE!   <D>,DEFAULT PARAMETERS"
 (1)  020065     137  020040  020040            .ASCII  "-        <P>,PREVIOUS PARAMETERS"
 (1)  020127     137  020040  020040            .ASCII  "-        <S>,SELECT PARAMETERS"
 (1)  020165     137  020040  020040            .ASCII  "-        <N>,START THIS TEST NUMBER"
 (1)                                    ;-                      HEADER TEXT MOD
 (1)                                    ;************************ MOD APR 74 ********************************
 (1)  020231     137  040137  050004  PSTART!  .ASCIZ  "-!D,P,S,N? "
 (1)
 (1)  020245     137  040502  042523  MSG2!    .ASCIZ  "-BASE ADDRESS! "
 (1)  020265     137  042504  044526  MSG3!    .ASCIZ  "-#EVICES PER CU! "
 (1)  020307     137  042524  052123  MSG5!    .ASCIZ  "-TEST NUMBER! "
 (1)  020326  052137  050131  020105  MSG4!    .ASCIZ  "-,YPE CU ADRS'S IN HEX <CR><LF>! <CR><CR> TERMINATES LIST"
 (1)  020420  040537  051104  035123  MSG6!    .ASCIZ  "-ADRS! "
 (1)  020430  051537  052105  051440  MSG7!    .ASCIZ  "-#ET SWITCHES-"
 (1)  020447     137  044514  052123  MSG9!    .ASCIZ  "-LIST ALL LEGAL COMMANDS"
 (1)  020500  041537  040517  040515  MSG10!   .ASCIZ  "-%OMMAND!"
 (1)  020512  042137  020130  051120  MSG12!   .ASCIZ  "-DX PRIORITY LEVEL! "
 (1)  020537     137  036440  044440  MSG13!   .ASCIZ  "- = ILLEGAL ?"
 (1)
 (1)  020555     137  042522  051507  RDH!     .ASCIZ  "-REGSTR = SHOULD BE  =  WAS"
 (1)  020611     033  000037          HOME!    .ASCIZ  <33><37>
 (1)  020614  000207                  BELL!    .ASCIZ  <207>
 (1)  020616  042537  042116  052040  ENDTST!  .ASCIZ  "-END TEST"
 (1)  020630  020137  051105  047522  ECM!     .ASCIZ  "- ERRORS DETECTED! "
 (1)  020654  057477     000          ,QUES!   .ASCIZ  "?-"
 (1)  020657     040  020040  020040  SPAC4!   .ASCIZ  <40><40><40><40><40><40>
 (1)  020666  000040                  SPACE!   .ASCIZ  <40>
 (1)  020670  000137                  CRLF!    .ASCIZ  "-"
 (1)  020672  052137  050131  020105  STALL!   .ASCIZ  "-TYPE IN STALL COUNT! "
 (1)  020721     137  042537  051122  ERPC!    .ASCIZ  "-!ERROR PC! "
 (1)
 (1)  020736  042137  042130  035123  ADXDS!   .ASCIZ  "-DXDS!"
 (1)  020745     137  054104  040503  ADXCA!   .ASCIZ  "-#XCA!"
 (1)  020754  042137  041530  035123  ADXCS!   .ASCIZ  "-$XCS!"
 (1)  020763     137  054104  051517  ADXOS!   .ASCIZ  "-QXOS!"
 (1)  020772  042137  041133  035101  ADXBA!   .ASCIZ  "-QXBA!"
 (1)  021001     137  054104  041502  ADXBC!   .ASCIZ  "-QXBC!"
 (1)  021010  042137  040530  035117  ADXMO!   .ASCIZ  "-QXMO!"
 (1)  021017     137  054104  044515  ADXMI!   .ASCIZ  "-DXMI!"
 (1)  021026  042137  041530  035102  ADXCB!   .ASCIZ  "-CXCB!"
 (1)  021035     137  054104  042116  ADXND!   .ASCIZ  "-QXND!"
 (1)  021044  042137  040530  035123  ADXES!   .ASCIZ  "-DXES!"
```

```
  (1)  021053  000137  054104  051505  ADXES1: .ASCIZ  "?DXES1: "
  (1)                                  ;*********************** MOD APR 74 ********************************
  (1)                                  ;*                          ERROR TEXT MOD
  (1)
  (1)  021064  020137  052503  042101  MSG26: .ASCIZ  "? CUADRS/MOD:"
  (1)                                  ;*********************** MOD APR 74 ********************************
  (1)  021101  000137  042520  052103  MSG28: .ASCIZ  "?VECTOR ADDRESS: "
  (1)  021123  000137  052123  052101  MSG31: .ASCIZ  "?STATUS: "
  (1)  021135  000137  051105  047522  MSG35: .ASCIZ  "?ERROR IN TEST: "
  (1)  021156  047537  044522  044507  MSG36: .ASCIZ  "?ORIGIN OF MAP ERROR: "
  (1)  021205  000137  052124  052040  TRCM1: .ASCIZ  "?!T TRACE ERROR IN TEST: "
  (1)  021237  000137  051117  043511  TRCM:  .ASCIZ  "?ORIGN OF LAST TT TRACE UPDATE: "
  (1)  021300  041040  051525  020131  ABSYM: .ASCIZ  " %USY ENABLE  "
  (1)  021317  000115  040125  044524  AMUXM: .ASCIZ  "MULTIPLEXER  CH"
  (1)  021337  000137  047105  051124  TRC1:  .ASCIZ  "?ENTRY WAS      !"
  (1)  021361  000137  047105  051124  TRC2:  .ASCIZ  "?ENTRY SHOULD BE!"
  (1)  021403  000137  047105  051124  TTDS:  .ASCIZ  "?ENTRY WAS FROM DXDS"
  (1)  021430  042537  052116  054522  TTCA:  .ASCIZ  "?ENTRY WAS FROM DXCA"
  (1)                                  .LIST   BEX
 3997
 3998                                  .SBTTL  DATA BUFFERS
 3999
 4000                                  ;DATA BUFFER ** CONTAINS 0 - 255 IN ONE BYTE ITEMS
 4001
 4002                                  ;DATA FILE FOR CHANNEL SIMULATOR WRITE CMDS
 4003         021456                   .EVEN
 4004
 4005  021456                          DATA:
 4006
 4007
 4008
 4009         000001                   N=1
 4010  021456 000001                   .WORD   N
 4011         000002                   N=N*2
 4012  021460 000002                   .WORD   N
 4013         000004                   N=N*2
 4014  021462 000004                   .WORD   N
 4015         000010                   N=N*2
 4016  021464 000010                   .WORD   N
 4017         000020                   N=N*2
 4018  021466 000020                   .WORD   N
 4019         000040                   N=N*2
 4020  021470 000040                   .WORD   N
 4021         000100                   N=N*2
 4022  021472 000100                   .WORD   N
 4023         000200                   N=N*2
 4024  021474 000200                   .WORD   N
 4025         000400                   N=N*2
 4026  021476 000400                   .WORD   N
 4027         001000                   N=N*2
 4028  021500 001000                   .WORD   N
 4029         002000                   N=N*2
 4030  021502 002000                   .WORD   N
 4031         004000                   N=N*2
```

```
4032  021504  004000                    .WORD   N
4033          010000                    N=N+2
4034  021506  010000                    .WORD   N
4035          020000                    N=N+2
4036  021510  020000                    .WORD   N
4037          040000                    N=N+2
4038  021512  040000                    .WORD   N
4039          100000                    N=N+2
4040  021514  100000                    .WORD   N
4041          000000                    N=N+2
4042          000002                    W=2
4043  021516  177775                    .WORD   -W-1
4044          000004                    W=W+W
4045  021520  177773                    .WORD   -W-1
4046          000010                    W=W+W
4047  021522  177767                    .WORD   -W-1
4048          000020                    W=W+W
4049  021524  177757                    .WORD   -W-1
4050          000040                    W=W+W
4051  021526  177737                    .WORD   -W-1
4052          000100                    W=W+W
4053  021530  177677                    .WORD   -W-1
4054          000200                    W=W+W
4055  021532  177577                    .WORD   -W-1
4056          000400                    W=W+W
4057  021534  177377                    .WORD   -W-1
4058          001000                    W=W+W
4059  021536  176777                    .WORD   -W-1
4060          002000                    W=W+W
4061  021540  175777                    .WORD   -W-1
4062          004000                    W=W+W
4063  021542  173777                    .WORD   -W-1
4064          010000                    W=W+W
4065  021544  167777                    .WORD   -W-1
4066          020000                    W=W+W
4067  021546  157777                    .WORD   -W-1
4068          040000                    W=W+W
4069  021550  137777                    .WORD   -W-1
4070          100000                    W=W+W
4071  021552  077777                    .WORD   -W-1
4072          000000                    W=W+W
4073  021554  177777                    .WORD   -W-1
4074          000000                    W=W+W
4075          000001                    N=1
4076  021556  000001                    .WORD   N
4077          000002                    N=N+2
4078  021560  000002                    .WORD   N
4079          000004                    N=N+2
4080  021562  000004                    .WORD   N
4081          000010                    N=N+2
4082  021564  000010                    .WORD   N
4083          000020                    N=N+2
4084  021566  000020                    .WORD   N
4085          000040                    N=N+2
```

```
4086  021570  000040          .WORD   N
4087          000100          N=N+2
4088  021572  000100          .WORD   N
4089          000200          N=N+2
4090  021574  000200          .WORD   N
4091          000400          N=N+2
4092  021576  000400          .WORD   N
4093          001000          N=N+2
4094  021600  001000          .WORD   N
4095          002000          N=N+2
4096  021602  002000          .WORD   N
4097          004000          N=N+2
4098  021604  004000          .WORD   N
4099          010000          N=N+2
4100  021606  010000          .WORD   N
4101          020000          N=N+2
4102  021610  020000          .WORD   N
4103          040000          N=N+2
4104  021612  040000          .WORD   N
4105          100000          N=N+2
4106  021614  100000          .WORD   N
4107          000000          N=N+2
4108          000002          W=2
4109  021616  177775          .WORD   -W-1
4110          000004          W=W+W
4111  021620  177773          .WORD   -W-1
4112          000010          W=W+W
4113  021622  177767          .WORD   -W-1
4114          000020          W=W+W
4115  021624  177757          .WORD   -W-1
4116          000040          W=W+W
4117  021626  177737          .WORD   -W-1
4118          000100          W=W+W
4119  021630  177677          .WORD   -W-1
4120          000200          W=W+W
4121  021632  177577          .WORD   -W-1
4122          000400          W=W+W
4123  021634  177377          .WORD   -W-1
4124          001000          W=W+W
4125  021636  176777          .WORD   -W-1
4126          002000          W=W+W
4127  021640  175777          .WORD   -W-1
4128          004000          W=W+W
4129  021642  173777          .WORD   -W-1
4130          010000          W=W+W
4131  021644  167777          .WORD   -W-1
4132          020000          W=W+W
4133  021646  157777          .WORD   -W-1
4134          040000          W=W+W
4135  021650  137777          .WORD   -W-1
4136          100000          W=W+W
4137  021652  077777          .WORD   -W-1
4138          000000          W=W+W
4139  021654  177777          .WORD   -W-1
```

```
4140            000000                  W=W=W
4141            000001                  N=.
4142  021656    000001                  .WORD   N
4143            000002                  N=N=2
4144  021660    000002                  .WORD   N
4145            000004                  N=N=2
4146  021662    000004                  .WORD   N
4147            000010                  N=N=2
4148  021664    000010                  .WORD   N
4149            000020                  N=N=2
4150  021666    000020                  .WORD   N
4151            000040                  N=N=2
4152  021670    000040                  .WORD   N
4153            000100                  N=N=2
4154  021672    000100                  .WORD   N
4155            000200                  N=N=2
4156  021674    000200                  .WORD   N
4157            000400                  N=N=2
4158  021676    000400                  .WORD   N
4159            001000                  N=N=2
4160  021700    001000                  .WORD   N
4161            002000                  N=N=2
4162  021702    002000                  .WORD   N
4163            004000                  N=N=2
4164  021704    004000                  .WORD   N
4165            010000                  N=N=2
4166  021706    010000                  .WORD   N
4167            020000                  N=N=2
4168  021710    020000                  .WORD   N
4169            040000                  N=N=2
4170  021712    040000                  .WORD   N
4171            100000                  N=N=2
4172  021714    100000                  .WORD   N
4173            000000                  N=N=2
4174            000002                  W=2
4175  021716    177775                  .WORD   =W=1
4176            000004                  W=W=W
4177  021720    177773                  .WORD   =W=1
4178            000010                  W=W=W
4179  021722    177767                  .WORD   =W=1
4180            000020                  W=W=W
4181  021724    177757                  .WORD   =W=1
4182            000040                  W=W=W
4183  021726    177737                  .WORD   =W=1
4184            000100                  W=W=W
4185  021730    177677                  .WORD   =W=1
4186            000200                  W=W=W
4187  021732    177577                  .WORD   =W=1
4188            000400                  W=W=W
4189  021734    177377                  .WORD   =W=1
4190            001000                  W=W=W
4191  021736    176777                  .WORD   =W=1
4192            002000                  W=W=W
4193  021740    175777                  .WORD   =W=1
```

```
                004000                  W=W+W
        021742  173777                  .WORD   -W-1
                010000                  W=W+W
        021744  167777                  .WORD   -W-1
                020000                  W=W+W
        021746  157777                  .WORD   -W-1
                040000                  W=W+W
        021750  137777                  .WORD   -W-1
                100000                  W=W+W
        021752  077777                  .WORD   -W-1
                000000                  W=W+W
        021754  177777                  .WORD   -W-1
                000000                  W=W+W
                000001                  N=1
        021756  000001                  .WORD   N
                000002                  N=N*2
        021760  000002                  .WORD   N
                000004                  N=N*2
        021762  000004                  .WORD   N
                000010                  N=N*2
        021764  000010                  .WORD   N
                000020                  N=N*2
        021766  000020                  .WORD   N
                000040                  N=N*2
        021770  000040                  .WORD   N
                000100                  N=N*2
        021772  000100                  .WORD   N
                000200                  N=N*2
        021774  000200                  .WORD   N
                000400                  N=N*2
        021776  000400                  .WORD   N
                001000                  N=N*2
        022000  001000                  .WORD   N
                002000                  N=N*2
        022002  002000                  .WORD   N
                004000                  N=N*2
        022004  004000                  .WORD   N
                010000                  N=N*2
        022006  010000                  .WORD   N
                020000                  N=N*2
        022010  020000                  .WORD   N
                040000                  N=N*2
        022012  040000                  .WORD   N
                100000                  N=N*2
        022014  100000                  .WORD   N
                000000                  N=N*2
                000002                  W=2
        022016  177775                  .WORD   -W-1
                000004                  W=W+W
        022020  177773                  .WORD   -W-1
                000010                  W=W+W
        022022  177767                  .WORD   -W-1
                000020                  W=W+W
        022024  177757                  .WORD   -W-1
```

```
4248                    000040                  W=W+W
4249    022026  177737                          .WORD   -W-1
4250                    000100                  W=W+W
4251    022030  177677                          .WORD   -W-1
4252                    000200                  W=W+W
4253    022032  177577                          .WORD   -W-1
4254                    000400                  W=W+W
4255    022034  177377                          .WORD   -W-1
4256                    001000                  W=W+W
4257    022036  176777                          .WORD   -W-1
4258                    002000                  W=W+W
4259    022040  175777                          .WORD   -W-1
4260                    004000                  W=W+W
4261    022042  173777                          .WORD   -W-1
4262                    010000                  W=W+W
4263    022044  167777                          .WORD   -W-1
4264                    020000                  W=W+W
4265    022046  157777                          .WORD   -W-1
4266                    040000                  W=W+W
4267    022050  137777                          .WORD   -W-1
4268                    100000                  W=W+W
4269    022052  077777                          .WORD   -W-1
4270                    000000                  W=W+W
4271    022054  177777                          .WORD   -W-1
4272                    000000                  W=W+W
4273
4274                    022056                  .=.             ;INDICATE ADDRESS OF END OF BUFFER
4275    022056  000000                          WDATA:  0               ;BEGINNING OF WRITE DATA FILE
4276                    023056                  NPRDATA=WDATA+512.      ;NPR INPUT DATA FILE
4277                                            ;WDATA AND NPRDAT OVER WRITE ASCII TEXT
4278            000001                          .END
```

```
ADSYM    021300          2601     3990#
ACCEPT=  104005           934#    2761     2775     2785     2792     2801     2846     2882     2888
ACLC     016674          3709     3719#
ACPTH    015546          3402#    3900
ACPTH.   015550          3403#    3903
ACPTO    016040          3553#    3570
ACPTO.   016042          3554#    3573
ACUA     014016          2922*    2923     2933     2965*    2966     2967*    3000#
ADRA     012400          2693#
ADRAE    012426          2704#
ADRECC=  000002           770#    2227
ADRECD=  000001           771#
ADRI   = 010000           749#    2250     2285     2462     2479
ADRO   = 004000           737#    2211     2243     2363     2364     2388     2389     2415     2417     2421     2423     2499     2501
                         2524     2520
ADXBA    020772          2697     3990#
ADXBC    021001          2698     3990#
ADXCA    020745          2694     3990#
ADXCB    021026          2701     3990#
ADXCS    020754          2695     3990#
ADXDS    020736          2693     3990#
ADXES    021044          2703     3990#
ADXES1   021053          2704     3990#
ADXMI    021017          2700     3990#
ADXMO    021010          2699     3990#
ADXND    021035          2702     3990#
ADXOS    020763          2696     3990#
AHEX     015664          3496     3513#
AHEX0    015666          3514#    3510
AHEX1    015710          3515     3520#
AH.2     015564          3485     3487#
AH.3     015622          3497#    3521
AMUXM    021317          2604     3990#
AO.2     016056          3556     3550#
ATBL     016012          3514     3517     3943#
ATTEN  = 000200           719#
ATTN   = 000200           800#
BA     = 000010           795#
BALF   = 000010           760#
BC     = 000012           796#
BEGIN    001100           963      967#     999     2680     2731     2745
BELL     020614          2926     3990#
BGN0     001216           989      993#
BGN1     001230           994      996#
BGN2     001244           997      999#
BIT0   = 000001           858#    1772     2040     2912
BIT1   = 000002           857#    1783     2044     2377     2615     2659
BIT10  = 002000           848#     892
BIT11  = 004000           847#     891     2547
BIT12  = 010000           846#     890     2644
BIT13  = 020000           845#     889     2634     3601     3673
BIT14  = 040000           844#     888     2545
BIT15  = 100000           843#     887
BIT2   = 000004           856#    1571     1656     1677     1697     1765     1802     1825     2247     2316     2436     2507     2602
```

```
BIT3  = 000010          855#
BIT4  = 000020          854#
BIT5  = 000040          853#
BIT6  = 000100          852#
BIT7  = 000200          851#
BIT8  = 000400          850#
BIT9  = 001000          849#
BSY   = 000020          722#    883#    2379
BSYEN = 004000          782#    1989    1986    2046
BSYS  = 000400          686#
BUSI    001342          1044#   1122    1648    2268    2389    2329    2379    2393    2466    2511    3455
BUSO    001336          1039#   1757-   1758    2187-   2111-   2289    2265-   2266    2278-   2271    2298    2345    2359
                        3452
BUSOB   001352          1053#
BYPAS = 000100          765#
CA    = 000002          792#
CARG    016148          3561    3963    3977#
CARGH   015658          3498    3492    3987#
CARRY   014004          2998#
CB    = 000020          799#
CE    = 000010          877#    1122    2072    3183    3729
CHDEND= 000040          689#
CHEND = 000010          723#
CHENDS= 001000          685#    1309    1695    1823
CHIS  = 000200          687#    1497    1522    1943    1559    1621    1634    1738    1742
CKCUA   015130          2864    2913    3342#
CKC1    015134          3343#   3368
CKC2    015136          3344#   3349-
CKC3    015144          3358#
CKC4    015166          3354    3358#
CLKO  = 001000          752#
CLRMO   015364          3488#
CL1     014572          3222#   3224
CMD     014012          1495-   1528-   1541-   1557    1559    1619-   1636    1638    1728-   1744    1746    1998    1991
                        2092    2278    2271    2289    2283    2318    2344    2383    2385    2389    2528    2938    3082#
CMDCHN= 000004          692#
CMDD  = 002000          738#    2279    2293    2294    2478    2471    2488    2489    2504    2506    2529    2531
CMDREJ= 000001          694#    1522    2288
CMD.AD  014234          2879    3121#   3185
CMD.ST  014274          2878    3142#   3194    3333
CNT     007412          2148-   2149-   2159-   2168-   2178#
CNTLC = 000003          3782#   3787
CONI    001344          1045#
CONO    001340          1040#   2212    2222    2244    2276
CONOB   001354          1054#
COUNT   014046          1549-   1627-   1693-   1736-   1821-   2181-   2112-   3026#
CR    = 000015          2825    2891    3629    3992#
CRLF    020670          2658    3990#
CS    = 000004          793#
CS10  = 002000          783#
CS12  = 010000          781#
CUADRS  014020          2655    2923-   2928-   2966-   2968    2969    3011#
CUAR    001326          1029#   1558-   1566-   1576-   1437-   1782-   1745-   1836-   1992-   2285-   2286    2384    2521-
                        2522-   3448
```

```
CUBSY  = 000400         785#
CUCR     001330        1030#    1559*    1638*    1746*    1991*
CUDEND=  000020         690#    1563     1643     1751
CUDX   = 000400         761#
CUE    = 000040         882#
CUEND  = 000040         721#
CUPBM  = 040000         699#
CUIS.G   010624        2439#
CUIS.S   016014        1561     1640     1748     2077     2434#
CUIS0    011044        2437     2493#
CUOR     001334        1035#
CUSR     001332        1034#    2072*    2386     3449
DATA     021456        1629     1630     4005#
DE     = 000004         878#    1122     2072     3103     3725
DELAY    006710        2016#    2017
DEV      014010        1556     1558     1564     1566     1570     1576     1635     1637     1696     1702     1743     1745     1824
                       1838     1989     1992     2199     2200     2205     2206     2260     2265     2358     2359     2384     2393
                       2398     2460     2498     2502     2521     2523     2527     2969*    2978     3000F#
DEVCNT   014022        2921*    2929*    2930     2932*    2971     3012#
DEVEND=  000004         724#
DEV.A    014014        2970*    2973*    2975*    2976     3005#    3180*
DFLT.C   014154        3074#    3184
DFLT.S   014214        3099#    3193
DOPLIN=  000002         873#
DONE   = 000200         780#    1862     1865     1913     1910     1917     2035     2059     3422
DS     = 000002         791#
DSCRSP=  000002         786#
DST      001442        1101#    1782*    2043*    2047*    2305     3183*    3305     3330
DSTADR=  017000        1101     3183     3720#
DSTCNT   014040        3023#
DST.SE   015100        2916     3329#
DS.1     015110        3332#    3335*
DS.2     015116        3334#    3336
DTMP     011336        2540#    2541*    2542
DXBA     001304        1015#    1951*    1630*    1738*
DXBASE   001262        1006#    2789*    3175*    3436
DXBC     001306        1016#    1950*    1628*    1737*
DXCA     001276        1012#    3449
DXCB     001314        1019#    2162     2188     2227     2353
DXCS     001300        1013#    1952*    1631*    1741*    1862     1865*    1913     1916*    1917     1985*    1986     1993*    1994
                       2035*    2040*    2058*    2059*    2074*    2155*    2156     2184*    2185     2684*    2944*    3379*    3422*
                       3423*
DXDS     001274        1011#    2239     2280     3437
DXES     001320        1021#    2030*    2682*    3373*    3385*    3386     3457
DXES1    001324        1023#    3448
DXFI   = 000003         712#    1741
DXFO   = 000005         713#    1952     1631
DXPRS  = 000001         711#    2684     3423
DXPST  = 000007         714#    2074
DXIS     001266        1008#    1997*    2049*    2797*    2981*    3177*
DXIV     001264        1007#    1998*    2048*    2795*    2980*    3176*
DXMI     001312        1018#    1110     1119     1645     1660     1681     1754     1767     1806     2037*    2087*    2238     2256
                       2285     2299     2441     2454     2358     2462     2475     3454
DXMO     001310        1017#    1114     1652*    1653     1663*    1664     1669*    1670     1673*    1674     1686*    1687     1690
```

```
                    1701#  1702   1788#  1789   1794#  1795   1798#  1799   1811#  1812   1815   1817#  1818
                    1981#  2036#  2078#  2079#  2083#  2097#  2099#  2108#  2118#  2165   2168#  2169   2172#
                    2173   2199#  2211#  2216#  2217   2221#  2243#  2249#  2258   2253   2275#  2289#  2293#
                    2294   2322#  2323   2326   2330#  2331   2339#  2348   2344#  2358#  2363#  2364   2367#
                    2368   2372#  2373   2388#  2389   2398#  2399   2406#  2407   2411   2415#  2417   2421#
                    2423   2449#  2446   2458   2470#  2471   2479#  2488   2484   2488#  2489   2498#  2499#
                    2588#  2581#  2582#  2583#  2584#  2585#  2586#  2513#  2514#  2515#  2523#  2524#  2525#
                    2526#  2527#  2528#  2529#  2538#  2531#  2532#  2533#  2683#  3488#  3451
DXMOB    F01322     1822#
DXND     001316     1828#
DXOS     001302     1814#  1133#  2151#  2152   3381#  3382   3448
DXPRT    001278     1889#  1997   2849   2889#  2981   3178#
DXTO   = 000020      779#
D',DEV', 014562     3188   3211#
D',DXBA  014558     3175   3200#
D',DXIS  014564     3177   3212#
D',DXIV  014552     3176   3207#
D',DXPR  014554     3178   3208#
D',FIRS  014546     3174   3209#
D',LEGA  014568     3181   3219#
D',MAX', 014556     3179   3289#
E      = 000013      924#   929#   938#   931#   932#   933#   934#   939#   936#   937#   938#   939#
EC     = 000001     1476#
ECM      020638     2949   3990#
EMOD1    012236     2668   2662#
EMOD2    012252     2663   2669#
EMTABL=  011646      925#   929#   938#   931#   932#   933#   934#   939#   936#   937#   938#   939#
EMTAG    011628      925   2577   2582#
EMTDEC   011556      959   2588#
EMTOK    011678     2573   2579#
ENDEN  = 020078     7888#
ENDSTR=  001638     1159#
ENDTST   020616     2948   3998#
ENDTT  = 004888     1479#  3223
ENTRY1   006366     1497#  1522#  1543#  1555#  1563#  1569#  1621#  1634#  1643#  1695#  1738#  1742#  1751#
                    1823#  1941#  1944   1946#  3167#
ENTRY2   006426     1556#  1557#  1564#  1565#  1578#  1573#  1575#  1635#  1636#  1642#  1696#  1699#  1781#
                    1743#  1744#  1752#  1824#  1827#  1829#  1952#  1955   1957#  1989#  1998#  3168#
ERPLG    012376     2589#  2594#  2626#  2646   2698#
ERPC     020721     2636   3998#
ERRCNT   012438     2627#  2718#  2988#  2951   3173#
ERRDST   016888     1168   1169   1178   1171   1172   1173   1174   1175   1176   1177   1178   1179   1188
                    1181   1182   1183   1187   1188   1189   1198   1191   1192   1193   1194   1195   1196
                    1197   1198   1199   1288   1281   1282   1286   1287   1288   1289   1218   1211   1212
                    1213   1214   1215   1216   1217   1218   1219   1228   1221   1225   1226   1227   1228
                    1229   1238   1231   1232   1233   1234   1235   1236   1237   1238   1239   1248   1244
                    1245   1246   1247   1248   1249   1258   1251   1252   1253   1254   1255   1256   1257
                    1258   1259   1263   1264   1265   1266   1267   1268   1269   127#   1271   1272   1273
                    1274   1279   1276   1277   1478   1282   1283   1284   1285   1286   1287   1288   1289
                    1298   1291   1292   1293   1294   1295   1296   1297   1381   1382   1383   1384   1385
                    1386   1387   1388   1389   1218   1311   1312   1313   1314   1315   1316   1328   1321
                    1322   1323   1324   1325   1428   1327   1328   1329   1338   1331   1332   1333   1334
                    1335   1339   1348   1341   1342   1343   1344   1345   1346   1347   1348   1349   1358
                    1351   1352   1353   1354   1358   1359   1368   1361   1362   1363   1364   1365   1366
```

```
IBMRST= 034000              683#
ICOUNT  011450             1403*   1507*   1534*   1585*   1712*   1839*   255^    2559#
IDVN    015200             3323    3359    3362#
IISW  = 004000              891#
ILLC  = 000405              868#   1920    3081
INFDSC= 004000              682#    683
INITB   001154              974     981#
INITC   001160              980     982#
INITZ   001144              977     979#
INTEN = 000100              707#   1993    1994    2050    2744
INTERR  006152             1874#
INTOK = 100000              872#   1960    1875    1878    2339
INTPAS  006150             1866*   1869#   1875    1878*   2'.39*
INTR    006120             1862#   2040
INTREQ= 000200              781#
IOD   = 000200              762#
IRR     006174             1876    1879#
IRR2    006162             1877#
IRS   = 000001              785#
ISSCRJ  010016             1516*   1527*   2281#
ISSREJ= 000010              691#   2235
ISS,SU  007446             1500    1525    1546    1624    1733    2198#
ISS1    010170             2319    2322#
ISS2    010222             2317    2321    2330#
ISS3    007706             2248    2256#
KEY,TO= 104006              935#   2740    2824    2890    2902    3483    3554
LEGAL.  014050             2819    2922    2965    3031#   3181*   3182*   3291    3342
LESS1   001272             1010#   1498    1523    1544    1622    1731    2606    2812*
LEVEL0= 000000              896#
LEVEL1= 000040              897#
LEVEL2= 000100              898#
LEVEL3= 000140              899#   1310
LEVEL4= 000200              900#   1309    2736    3208
LEVEL5= 000240              901#
LEVEL6= 000300              902#
LEVEL7= 000340              903#    946     949     952     955     958     968    1008    2732    2746    3372
LF    = 000012             3629    3991#
LOCKO = 100000              757#
LOGICA  013614             2960#
LOPSW = 040000              808#   2670
LPCNTL  013462             1053    2926#
LPCSU   013436             2920#
LPC1    013646             2924    2931    2968#
LPC2    013632             2934    2960#
LPC3    013706             2972    2979#
LPC4    013714             2974    2976#
LPC5    013624             2937    2958    2965#
MAPERR= 104001              930#
MARK    014740             3200#   3295
MAX,DE  014032             2063*   2938    2971    3017#   3179*   3314    3350
MCCSW = 002000              892#
MCLKEN= 000002              776#   2602
MCLKP = 000001              775#
MC1,SM= 000000                2#      9     144     344     653    1103    1148    1903    2507    3475    3523    3996
```

```
MC2.SM= 000000     2#     9    144    344   1903   2587   3233   3728   3979   3993   3996
MDXX    013216  2856#  2857*  2858*  2859*
MEM.SM= 000000     2#    16    374    381    930   1003   1101   1476   2587   3233   3234   3996
MI    = 000016   798#
MISC    001346  1048#  3450
MO    = 000014   797#
MONDFL  014314  2733   2751   2772   3166#
MONITO  012450   995   2720#
MON1    012664  2757   2772#
MON1.0  012520   998   2005   2944   2742#  2759   2905   3324   3486   3557   3710
MON10   013340  1001   2759   2884   2898#
MON11   013372   992   2904   2910#
MON12   013720  2979#
MON13   013752  2983   2989#
MON14   013776  2989#
MON2    014460  3187#  3189
MON2.0  014500  3192#  3190*
MON2.1  014512  3195#  3197
MON2.3  014544  3202#
MON3    012712  2779   2782#
MON4    012734  2788   2791#
MON4.1  012772  2794   2800#
MON5    013156  2845#  2850   3356
MON5.1  013246  2864#
MON6    013060  2803   2810#
MON7    013070  2020#  2026   2837
MON8    013252  2878#
MON9    013266  2881#  2892
MSG10   020500  2801   3996#
MSG12   020512  2800   3996#
MSG13   020537  2836   2849   3996#
MSG2    020245  2782   3996#
MSG26   021064  2053   3996#
MSG28   021101  2791   3996#
MSG3    020265  2845   3996#
MSG31   021123  2887   3996#
MSG35   021135  2048   3996#
MSG36   021156  3996#
MSG4    020326  2818   3996#
MSG5    020307  2760   2773   3996#
MSG6    020420  2820   3996#
MSG7    020430  2901   3996#
MSG9    020447  2880   3996#
N     = 000000  1164#  1169   1184#  1203#  1222#  1241#  1260#  1279#  1298#  1317#  1336#  1355#  1374#
                1393#  1412#  1431#  1450#  1469#  1476#  1479   1489#  1503   1511#  1530   1538#  1581
                1589#  1700   1716#  1835   1843#  4009#  4010   4011#  4012   4013#  4014   4015#  4016
                4017#  4018   4019#  4020   4021#  4022   4023#  4024   4025#  4026   4027#  4028   4029#
                4030   4031#  4032   4033#  4034   4035#  4036   4037#  4038   4039#  4040   4041#  4075#
                4076   4077#  4078   4079#  4080   4081#  4082   4083#  4084   4085#  4086   4087#  4088
                4089#  4090   4091#  4092   4093#  4094   4095#  4096   4097#  4098   4099#  4100   4101#
                4102   4103#  4104   4105#  4106   4107#  4141#  4142   4143#  4144   4145#  4146   4147#
                4148   4149#  4150   4151#  4152   4153#  4154   4155#  4156   4157#  4158   4159#  4160
                4161#  4162   4163#  4164   4165#  4166   4167#  4168   4169#  4170   4171#  4172   4173#
                4207#  4208   4209#  4210   4211#  4212   4213#  4214   4215#  4216   4217#  4218   4219#
```

```
                         4220   4221#  4222   4223#  4224   4225#  4226   4227#  4228   4229#  4230   4231#  4232
                         4233#  4234   4235#  4236   4237#  4238   4239#
ND      = 000022          000#
NOCLR     015372         3378   3401#
NOP     = 000240          919#
NOPC    = 000403          866#  3379
NPRDAT= 023056           1738   1739   4276#
NPRT    = 000020          767#
NPRTO   = 000040          780#
NPRX    = 000040          766#
NXM     = 040000          679#
OCTNUM    014026         2762   2778   2780   2787   2789   2793   2795   2796*  2797   2802   2804*  2805*  2806*
                         2807*  2808*  2809   2810*  2811*  2812   2847   2852   2863   2883   2885   2886   2889
                         3015#  3550*  3577*
ODAT      014604         2917   3231#
ODAT1     014614         3235#  3236   3237   3238*  3239*
ODAT2     014616         3236#  3240
OEP       012040         2590   2621   2627#
OFFSET    014024         3014#  3199   3200
OLE.SM= 000001             20      9   2040   2148   2912   3426   3996
OL2       007316         2160#  2161
OL3       007352         2160#
OL4       007242         2149#  2150
ONESHO    014002          991*  2552*  2681*  2899*  2997#  3170*
ONLIN     007234         2148#  3426
ONLINA= 001000            784#  2159   2156   2184   2189
ONLINB= 000004            769#  2162   2188
OPLI    = 100000          744#  1110   2238   2454
OPLO    = 100000          731#  2169
OS      = 000006          794#
O.BRK     006674          946   2003#
PARA      013376         1971   1050   1677   1697   1769   1802   1825   1983   2040   2044   2247   2316   2377
                         2436   2907   2659   2662   2911#  2912*  2935*  2936   2938*
PARER   = 100000          678#
PARI    = 000400          753#
PARITY= 104007            936#  2022   2885   2968   2976   3236
PARO    = 000400          748#  3230   3277   3279
PARSTP= 100000            698#
PC      =%000007          916#  1134*  1135*  1496*  1500*  1521*  1525*  1542*  1546*  1561*  1568*  1578*  1620*
                         1624*  1640*  1667*  1704*  1729*  1733*  1740*  1792*  1832*  1879*  1893*  1909*  1938*
                         1940   1940*  1951   1963*  1970*  1973*  1999*  2017*  2021*  2042*  2052*  2177*  2190*
                         2349*  2420*  2493*  2516*  2534*  2539*  2603*  2608*  2613*  2637*  2642*  2656*  2685*
                         2733*  2751*  2772*  2821*  2831*  2852*  2859*  2864*  2910*  2913*  2914*  2915*  2916*
                         2917*  2918*  2952*  2961*  2979*  3191*  3202*  3225*  3234*  3242*  3262*  3264*  3266*
                         3314*  3329*  3331*  3337*  3343*  3357*  3361*  3374*  3378*  3380*  3391*  3392*  3393*
                         3401*  3420*  3427*  3462*  3511*  3589*  3597*  3623*  3704*  3711*
PCH1    = 104010          937#
PCH2    = 104011          938#
PCH3    = 104012          939#
PERRPC    012252         2635   2649   2666#
PFAIL     001444          952   1111#  1132
PFLD      001610         1139   1149#
PG2       014666         3269#  3274
PG3       014700         3270   3273#
```

```
PG4     014724          3276    3279#
PG5     014732          3278    3281#
PHASE0= 000000           805#    822     823
PHASE1= 010000           806#    824     825
PHASE2= 020000           807#    826     827
PHASE3= 030000           808#    828     829
PHASE4= 040000           809#    830     831
PHASE5= 050000           810#    832     833
PHASE6= 060000           811#    834     835
PHASE7= 070000           812#    836     837
PHS   = 074000           750#
PHS01 = 004000           822#
PHS02 = 000000           823#
PHS11 = 014000           824#
PHS12 = 010000           825#
PHS21 = 024000           826#
PHS22 = 020000           827#
PHS31 = 034000           828#
PHS32 = 030000           829#
PHS41 = 044000           830#
PHS42 = 040000           831#
PHS51 = 054000           832#
PHS52 = 050000           833#
PHS61 = 064000           834#
PHS62 = 060000           835#
PHS71 = 074000           836#
PHS72 = 070000           837#
PNTSW = 020000           809#
PREI    015236          2685    2979    3371#
PREITO  015372          3371    3483#
PREI.1  015262          3378#
PRINTF  016544          3678    3684#
PRINTL  016532          3679#   3693
PRINTR  016466          2683    2688    2613    2642    2650    2952    3669#
PRINTS  016476          2598    2651    3671#
PRINT2  016454          3665#   3676    3694    3698
PRINT3  016464          3667#   3669*   3671*   3672*   3688*   3689    3692*
PRTE    016622          3674    3788#
PRTY    014664          3267#   3271*   3275
PS    = 177776           928#    968*   1088*   1146*   1498*   1523*   1544*   1622*   1731*   2851*   2554*   2686*   2732*
                        2746*
PWRUP   001530          1113    1129#
RC0     004706          1645#   1694
RC1     004774          1657    1663#
RC2     005020          1668#   1684*
RC3     005022          1669#   1689
RC4     005104          1678    1684#
RDW     020555          3996#
RDLAY   006712          2817#
RDXX    013204          2853#   2854*   2857
READC = 000002           805#   1619    3878
REGTY   001406          1876#
REG.SE  015430          2918    3439#
REGS    001356          1858#
```

```
REG1    P01360          1059#
REG2    P01362          1060#
REG3    001364          1061#
REG4    P01366          1062#
REG5    001370          1063#
REG6    P01372          1064#
REG7    P01374          1065#
RELOD   012634          2748    2769#
REQI  = P20000           746#   2441    2458
RESRES  015376          1134    3374    3330    3420#
RETURN  011454          1147    1489*   1589*   1536*   1587*   1714*   1841*   2559    2556*   2961#   2687    2987*   2988*
                        3174*
RSTPC   016450          3649*   3659    3661#
RSTPSW  016452          3658*   3650    3662#
RSTRG = 104004           933#   1131
RS',1   015440          3430#   3441
RTX     P06706           973*    979*    982    2011#
RUBOUH  015642          3488    3494    3505#   3519
RUBOUT  016132          3559    3569    3567    3575#
R0    =X000000           987#   2020    2672*   2749    2753    2756    2758    2825    2891    2903    2957*   2961    2982*
                        2986*   2987    2989    3184*   3187    3188    3193*   3195    3232    3233*   3237*   3241*   3291*
                        3294    3299    3306*   3307    3309    3310    3342*   3345    3350    3359    3436*   3438    3439*
                        3465*   3467    3468    3481    3484    3487    3489    3491    3493    3495    3497*   3502    3508*
                        3514    3520*   3552    3555    3558    3560    3562    3564    3566    3568*   3572    3578*   3587*
                        3598*
R1    =X000001           988#   1029*   1648    1651    1748*   1757    1758    1778    1775*   1777    1788    1782    1786
                        1804    1805*   1808*   1892*   1898    1900*   1902    1908*   1926    1927*   1928    1934    1937
                        1938    1947*   1948    1958*   1959    1961*   1967    1978    1972*   2107    2302    2303*   2304*
                        2305*   2306    2309    2312*   2615    2629    2673*   3185*   3187*   3198*   3194*   3195*   3221*
                        3222*   3223    3292*   3294*   3499*   3297*   3298*   3302*   3304*   3307    3312*   3316*   3319
                        3330*   3334*   3437*   3438*   3448    3466*   3467*   3468*   3469*   3488    3482*   3498*   3499*
                        3500*   3501*   3502*   3507    3509*   3551    3553*   3569*   3578*   3571*   3572*   3577    3579*
R2    =X000002           989#   1739*   1771    1772    1776*   1777    1781    1782    1787    1805    1807*   1809*   1811*
                        1899    1901*   1905*   1907*   2630    2674*   3305*   3316    3333*   3334    3479    3518*   3513*
                        3514    3516*   3517    3520
R3    =X000003           918#   2031    2675*   2819*   2823*   2838*   2879*   2886*   2893*
R4    =X000004           911#   2032    2676*   2878*   2889*
R5    =X000005           912#   2033    2677*   3443*   3465    3466    347F    3472    3473*
R6    =X000006           914#   1112    1138*   2569*   2570*   2571*   2572    2575*   2576*   2577*   2578*   2579
S     = 000001          1476#
SAVDEV  014042          3824#
SAVRG = 104003           932#   1111
SAVR6   001606          1112*   1130    1148#
SBYTE   015510          3443    3464#   3471
SCALD'  014112          3051#   3292    3306
SCHAR   016630          3705#   3706*   3707    3712
SCOPE = 104400           841#   1402    1586    1933    1584    1711    1838
SCOPEA  011442          2548    2557#
SCOPEB  011416          2546    2552#
SCOPEC  011324           958    2537#
SCOPEF  011452          2549*   2558    2557*   2560#
SCOPEG  011436          2551    2556#
SCOPEH  011362          2538    2543    2545#
SCP1    004024          1485    1486#
```

```
SCP2    000110          1589    1510#
SCP3    000210          1536    1937#
SCP4    000520          1587    1588#
SCP5    000260          1714    1719#
SCP6    000110          1841    1842#
SDAPG   014052          3203#   3204    3277*   3279*
SEL1  * 000000           745#
SELO  * 000000           733#   1114    2036    2078    2221    2249    2257    2322    2323    2372    2373    2406    2411
                        2445    2446    2479    2484    2508    2513    2525
SELRST* 000000           688#    683
SEL.DO  000262          1912#   1998
SEL.IS  011204          2528#
SEL.X   000540          1920    1977#
SENRY1  000360          1939#   1948    1943
SENRY2  000420          1950#   1951    1954
SENSEC* 000004           867#   1941    3008
SESW  * 010000           898#
SETUP   000730          2034#
SM    * 000100           881#   1982    2043
SOSIEN* 000004           777#
SP    *X000006           915#    967*    976*    977*    981*    999*   1146    1877*   1884*   1885*   1891    1892    1898*
                       1899*   1907    1908    1920*   1926*   1972    2004    2302*   2312    2553    2554    2556    2596*
                       2599    2601*   2604    2606*   2609    2611*   2614    2637    2648*   2643    2649*   2692    2654*
                       2657    2688*   2731*   2745*   2958*   2953    3232*   3241    3262    3281*   3322    3356*   3479*
                       3488*   3481*   3508    3509    3518    3551*   3552*   3578    3579
SPACE   020666          3996#
SPAC4   020657          3996#
SPW     001436          1893#   1133    2151    2152    3199*   3298    3304    3301    3302
SPW.SE  014742          2914    3298#
SP.0    014752          3294#   3308
SP.1    015010          3306#   3328
SP.2    015014          3307#   3311
SP.3    015036          3308    3314#
SP.4    015042          3315#   3317*
SP.5    015044          3316#   3318
SP.6    015054          3313    3319#
SP.7    015076          3321    3329#
SP1     007004          2041    2043#
SP2     007034          2045    2048#
SP4     007062          2052#
SR    * 177570          922#    996     2545    2547    2634    2644    2666    2678    3001    3073
SRCCNT  014036          3022#
SRVI  * 002000           751#   1049    1668    1681    1754    1767    1806
SRVJ  * 001000           739#   1052    1653    1669    1678    1673    1674    1698    1761    1762    1794    1795    1798
                       1799    1819    1817    1818    2079    2083    2097    2099    2108    2110    2168    2169    2172
                       2173    2330    2331    2339    2348    2514    2515    2532    2533
SSTAT   014034          1551    3021#
STAI  * 004000           758#   1119    2299
STALL   020672          3996#
STAMOD* 000100           728#   2379
START   000200           963#
STATUS  007764          1578    1784    1832    2058#
STKSTA* 000040           788#
STKSTB* 000002           693#
```

```
SUPO   = 010300        734#    1663    1664    1686    1687    1788    1789    1811    1812
SVRPC    016406        3635*   3644    3646#
SVRPSW   016410        3636*   3643    3647#
SWR    = 177570        921#    2910
SYNC   = 001000        760#
SYSRST= 010000         681#     683
S1     = 006110        1487#   1511#   1538#   1589#   1716#   1843#
TDAT     014060        3265#   3269*   3273*
TDXBA    001416        1081#
TDXCA    001410        1078#
TDXCB    001424        1084#
TDXCS    001412        1079#
TDXDS    001406        1077#
TDXES    001430        1086#
TDXES1   001432        1087#
TDXMI    001422        1083#
TDXMO    001420        1082#
TDXND    001426        1085#
TDXOS    001414        1080#
TERPC    011702        1499*   1524*   1545*   1560*   1567*   1577*   1623*   1639*   1644*   1703*   1732*   1747*   1753*
                       1831*   2591#   2682
TESTAB= 011472         1476#   1487#   1511#   1538#   1589#   1716#   1843#
TIMDIS= 000010         778#    2830    3385    3386
TIOC   = 000400        863#    1499    3076
TI.0     006606        1984    1989#
TKB      001400        1070#   2539    2743    3587    3588    3704
TKS      001376        1069#   2537    2744*   3585
TMP      014006        2999#
TPB      001404        1072#   3580*   3615*   3712*
TPS      001402        1071#   3595    3613
TRACER= 104002         931#    1932    1936    1945    1956    1969
TRAINT   006542        1496    1521    1542    1620    1?29    1981#
TRANSF   007142        1568    2891#
TRCM     021237        2600    3990#
TRCM1    021205        2595    3990#
TRC1     021337        2605    3990#
TRC2     021361        2610    3990#
TR.OUT   007232        2103    2119#
TR.REA   007152        2096#   2102
TR.WRI   007176        2093    2100#   2113
TSSF   = 004000        816#
TSSFT    014044        3025#
TSTABL   011456        1476    2562#   2987    2989
TST1     004000        1482#   1487    1959    2561    3285
TST2     004064        1506#   1511
TST3     004164        1533#   1538
TST4     004474        1584#   1589
TST5     005234        1711#   1716
TST6     006064        1838#   1843
TS1    = 004000        817#     822     824     826     828     830     832     834     836
TS2    = 000400        818#     823     825     827     829     831     833     835     837
TT       001440        1097#   1880    1908    1928    1961    1966    3169    3280*   3281*   3221    3319    3424
TTCA     021430        2619    3996#
TTDS     021403        2617    3996#
```

```
TTNDX   000353          1849#   1963
TTRACE  000526          1927    1971#   3169*   3424*
TTSHOU  000536          1944*   1959*   1975#   2612
TTTNDX  001434          1888#
TTWAS   000534          1943*   1954*   1974#   2607
TTY     =XP3P005         913#   2590    2597*   2599*   2601    2602*   2604*   2606    2607*   2609*   2611    2612*   2614*
                        2648    2641*   2643*   2649    2151*   2652*   2654    2655*   2657*   2958    2951*   2953*   3683
                        3684*   3685    3687    3689    3611    3615    3617*   3618    3619*   3621*   3624*   3688*   3682*
                        3684*
TTYFLG  P16264          3589    3594#   3623    3711
TTYI    P16624          2735    3784#
TTYIP   P16668          3780    3711#
TTZERO  P06226          1897#   3392
TTZ1    000242          1982#   1986
TT.CLR  014566          2915    3228#
TT.TRA  000320          1924#
TT.TP   000430          1953#
TT.T1   000470          1960    1962#
TT.T2   000500          1962*   1964#   1965*   1966*   1967
TYPE    = 00P004         918#   1139    2595    2600    2605    261P    2617    2619    2636    2648    2653    2658    2661
                        2664    2737    2739    2747    2760    2773    2782    2991    2808    2818    2828    2836    2845
                        2849    2888    2881    2887    2981    2926    2948    2949    3323    3355    3385    3575    3698
                        3789
T.ACCE  016030           934    3949#
T.ERRO  012034           929    2629#
T.KEY.  016152           935    3984#
T.MAPE  011670           938    2588#
T.PARI  014646           936    3261#
T.PCH1  017400           937    3981#
T.PCH2  017424           938    3984#
T.PCH3  017450           939    3987#
T.RSTR  016412           933    3649#
T.SAVR  016350           932    3639#
T.TRAC  011704           931    2593#
UC      = 00P002         879#   3189    3186    3187    3188    3189    3110    3111    3112    3113    3114    3115    3933
                        3534    3535    3536    3537    3538    3539    3540    3728    3729    373P    3731    3732    3733
                        3734    3735    3736    3737    3738    3739    3740    3741    3742    3743    3744    3745    3746
                        3747    3748    3749    3750    3151    3752    3753    3754    3755    3756    3757    3758    3759
                        3760    3761    3762    3763    3764    3765    3766    3767    3768    3769    3770    3771    3772
                        3773    3774    3775    3776    3177    3778    3779    3780    3781    3782    3783    3784    3785
                        3786    3787    3788    3789    3790    3791    3792    3793    3794    3795    3796    3797    3798
                        3799    3800    3801    3802    3803    3804    3805    3806    3807    3808    3809    3810    3811
                        3812    3813    3814    3815    3816    3817    3818    3819    3820    3821    3822    3823    3824
                        3825    3826    3827    3828    3829    3830    3831    3832    3833    3834    3835    3836    3837
                        3838    3839    3840    3841    3842    3843    3844    3845    3846    3847    3848    3849    3850
                        3851    3852    3853    3854    3855    3856    3857    3858    3859    3860    3861    3862    3863
                        3864    3869    3866    3867    3868    3869    387P    3871    3872    3873    3874    3875    3876
                        3877    3878    3879    3880    3881    3882    3883    3884    3885    3886    3887    3888    3889
                        3890    3891    3892    3893    3894    3895    3896    3899    3898    3859    3900    3901    3902
                        3903    3904    3905    3906    3907    3908    3909    3910    3911    3912    3913    3914    3915
                        3916    3917    3918    3919    3920    3921    3922    3923    3924    3925    3926    3927    3928
                        3929    3930    3931    3932    3933    3934    3935    3936    3937    3938    3939    3940    3941
                        3942    3943    3944    3945    3946    3947    3948    3949    3950    3951    3952    3953    3954
                        3955    3956    3957    3958    3959    3960    3961    3962    3963    3964    3965    3966    3967
```

```
                        3968    3969    3970    3971    3972    3973    3974    3975    3976    3977    3978
UCHECK= 03F0F2           725#
UCHKS = F02BF3           684#    1522
UEXCEP= F00001           726#
VLUHEX  013124          2832#   2833-   2834    2855
W       = 00F000        4042#   4043    4044#   4045    4046#   4047    4F48#   4049    4050#   4F51    4052#   4053    4054#
                        4055    4056#   4057    4058#   4059    406F#   4F61    4062#   4063    4064#   4065    4066#   4067
                        4068#   4069    4070#   4071    4072#   4073    4F74#   4100#   4109    4110#   4111    4112#   4113
                        4114#   4115    4116#   4117    4118#   4119    412F#   4121    4122#   4123    4124#   4125    4126#
                        4127    4128#   4129    4130#   4131    4132#   4133    4134#   4135    4136#   4137    4138#   4139
                        4140#   4174#   4175    4176#   4177    4178#   4179    4180#   4181    4182#   4183    4184#   4185
                        4186#   4187    4188#   4189    4190#   4191    4192#   4193    4194#   4195    4196#   4197    4198#
                        4199    4200#   4201    4202#   4203    4204#   4205    4206#   4240#   4241    4242#   4243    4244#
                        4245    4246#   4247    4248#   4249    425F#   4251    4252#   4253    4254#   4255    4256#   4257
                        4258#   4259    4260#   4261    4262#   4263    4264#   4265    4266#   4267    4268#   4269    4270#
                        4271    4272#
WC0     000430          1751#   1022
WC00    000542          1766    1778#
WC1     000610          1773    1780#
WC2     000634          1793#   1809-
WC3     000636          1794#   1810
WC4     000720          1803    1809#
WDATA   F22056          1748    3233    4275#   4276
WRITEC= 00F001           864#   1720    3077
XOA     = 00003#         789#
X1S     013200          2848    2852#
YESRTI  006704           982-   2819#
ZEROTT  006176          1803#   3391
ZTTI    006212          1808#   1090
.       = 022060         675#    929#    938#    931#    932#    933#    934#    935#    936#    937#    938#    939#    945#
                         948#    951#    954#    957#    961#    965#   1117    1120    1123    1137-   1138    1152#   1159
                        1160#   1471#   1473#   1475    1487#   1499    1511#   1524    1538#   1545    1560    1567    1577
                        1589#   1623    1639    1644    1648    1649    1654    1661    1665    1671    1675    1682    1688
                        1691    1703    1716#   1732    1747    1753    1755    1759    1763    1768    1778    1783    1790
                        1796    1808    1807    1813    1819    1831    1843#   1863    1983    1914    1918    1931    1935
                        1968    1987    1998    2153    2157    2163    2166    2178    2174    2186    2201    2207    2213
                        2218    2223    2229    2236    2239    2245    2291    2254    2257    2261    2267    2272    2277
                        2282    2286    2291    2295    2300    2307    2310    2324    2327    2332    2341    2346    2360
                        2365    2369    2374    2380    2385    2390    2394    2400    2408    2412    2418    2424    2442
                        2447    2451    2455    2459    2463    2467    2472    2476    2481    2485    2498    2563#   2584#
                        3303    3307    3520#   3586    3614    3631#   3670    3687    3698    3695    3710#   3718#   3720
                        3902#   3909#   3980#   4003#   4074#
.CAR    016334          3619    3629#
.CRLF   016276          3612    3617#
.IOT    016214           949    3001#
.IOTE   016324          3002    3029#
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.QUES   020054          3505    3579    3996#
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CLEAR     675#
CLKCHK    675#
CLOCK     675#
CLRSUB    675#
COPYRI      2#    627
DBUFS       2#   3997
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DSTM        2#   3718
DUMP      675#   2601   2606   2611   2640   2654   2958
DXBITS      2#    676
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EDCOD       2#   2565
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          1995   2153   2157   2163   2166   2170   2174   2186   2201   2207   2213   2218   2223   2229   2236
          2239   2245   2251   2254   2257   2261   2267   2272   2277   2281   2286   2291   2295   2300   2307
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          2490   3383   3387
ERPGM       2#   2585
ERSTOR    675#   2671
ESAVE     675#   2628
EXRMAC      2#   1910
FASISS      2#   2494
HTIOI       2#
ILLCMD      2#   1582
INTSM       2#   1854
LDNLK     675#
LOAD      675#
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MMAC1       2#   3989
MONMAC      2#   2722
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PAM         2#   3988
PFM         2#   1184
PRTYM       2#   3243
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REMOV     675#
RESTOR    675#   1891   1987   1972   2312   3241
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SCOPEL    675#   2535
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CROSS REFERENCE TABLE

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COM     3271
COMB    2858
DEC      993  1137  1684  1693  1889  1821  1889  1985  2019  2101  2112  2149  2168  2818  2854
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EMT      929   930   931   932   933   934   935   936   937   938   939
HALT     675  1125  2078  3398
INC     2549  2627  2929  2984  3469  3516  3617
INCB    3239  3688  3692
IOT      918
JMP      963   992   995   998  1881  1147  1853  2085  2544  2555  2579  2598  2687  2755  2985
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JSR     1134  1496  1588  1921  1925  1942  1946  1961  1968  1978  1628  1624  1648  1784  1729
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MOV      967   968   973   974   975   977   979   982   983   999  1888  1112  1113  1138  1132
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NOP     1129  2834  2902  2963  2963  3425
RESET   2742  2959
ROL     2575  3688  3682  3684
ROLB    3681  3683  3685
RTI     1868  1867  1977  2818  2811  2558  2689  3282  3486  3588  3591  3626  3645  3668  3713
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        3788
RTT      978
SUB     1775  1776  2578  2639  2975
TRAP     841
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        4181    4183    4185    4187   4189    4191    4193    4195    4197    4199    4201    4203    4205    4208    4210
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        4243    4245    4247    4249   4251    4253    4255    4257    4259    4261    4263    4265    4267    4269    4271


ERRORS DETECTED:  0

*DXONLI,DXONLI/SOL/CRF=DXONLI.P11
RUN-TIME:  144 38 6 SECONDS
CORE USED:  33K
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