DX11B

ON LINE EXCERCISER

CZDXHD0

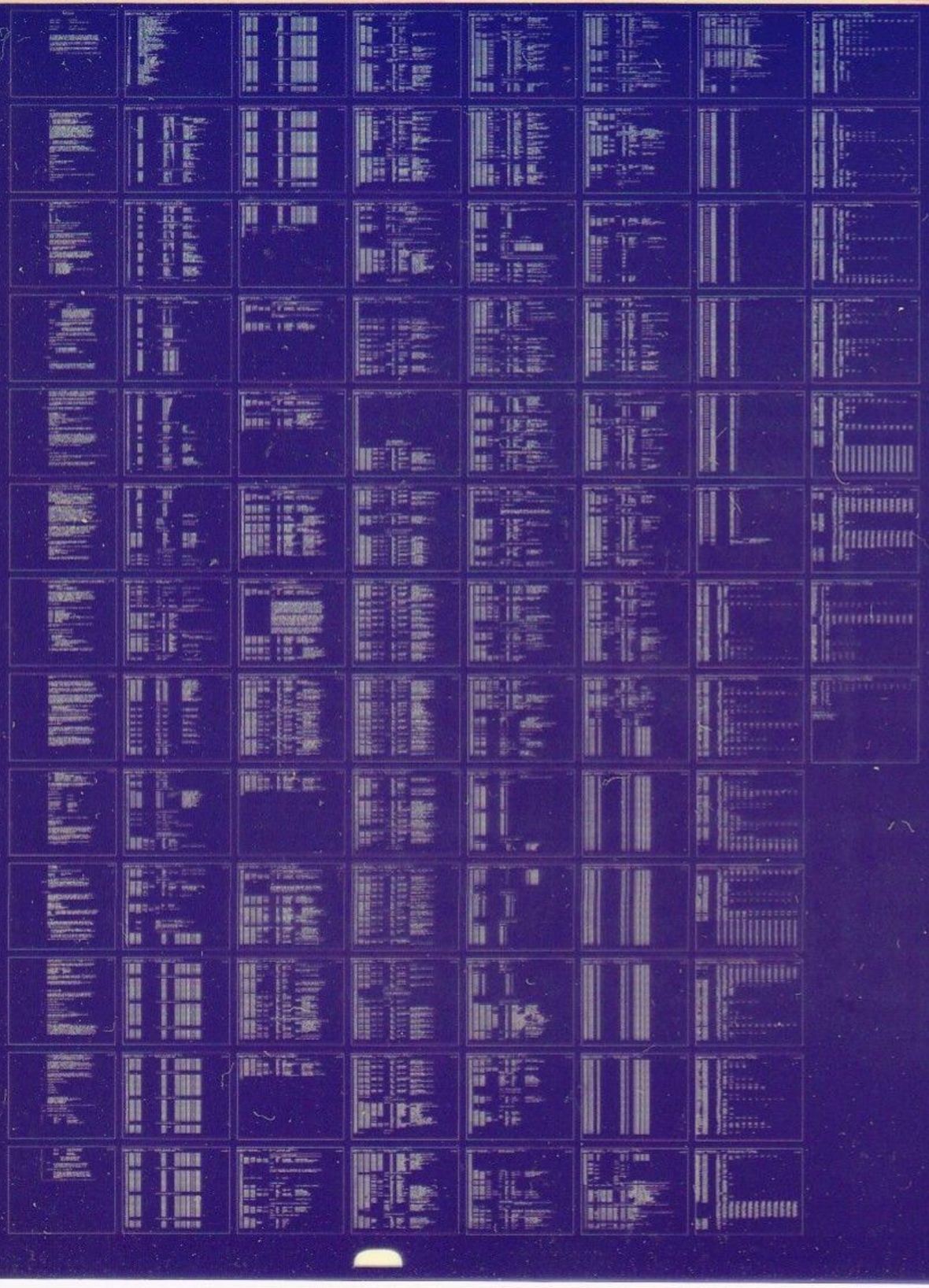
AH-8773D-MC

FICHE 1 OF 1

DEC 1978

digital

MADE IN USA



PRODUCT CODE: AC-8772D-MC

PRODUCT NAME: CZDXHD0 DX11B ONLINE EXER

PRODUCT DATE: JULY ,1978

MAINTAINER: DIAGNOSTIC ENGINEERING

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 #2
3. DZDXG-[REV] DX OFFLINE DIAGNOSTIC EXERCISER
4. CZDXH-[REV] DX11B ONLINE EXER

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
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
DX11B:

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 V006A.ODT IS NECESSARY

3. LOADING PROCEDURE

3.1 METHOD

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

SEQ 0003

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

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	OFT TRAP ON ERROR
SR 2	MULTIPLEXER CHANNEL
SR 1	SET BUSY ENABLE

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 ON PREVIOUSLY 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:

AC-XXXX[REV]-MC (TEST DESCRIPTION)

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.

TEST NUMBER: 1
BASE ADDRESS: 176200
VECTOR ADDRESS: 300
DX PRIORITY LEVEL: 4
TYPE CU ADRS'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 AGAI'N '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 SEQ 0006

'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 M908 MUST
NOT BE CUT FOR MORE THAN 16 CU ADDRESSES

THE IBM CONTROL UNITS ADDRESSES ARE SPECIFIED IN HEXADECIMAL.
FOR CONTROL UNIT 010(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 ADRS'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 M908 MUST ALSO BE STRAPPED FOR >1 SEQ 0007

''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.
THE FIRST ENTRY MUST BE NONZERO. THEREFORE IF YOU WISH YOUR FIRST COMMAND TO BE A TIO=0 YOU MUST TYPE IT IN WITH PARITY (E.G. 400). FOLLOWING THE COMMAND THE MONITOR WILL ASK FOR THE CORRESPONDING STATUS.
-TYPING <CR> WILL DEFAULT THIS PARAMETER

''SET SWITCHES''

HERE 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> ODT TRAP ON ERROR
SW<2> MUX MODE
SW<3> BSYEN MODE

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
   (SW9=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. SEQ 0008

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 THE RESPONSE TO THE CONTROL C WILL NOT BE INSTANTANEOUS.

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 B0;NNNNNN
*
```

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 TC WORD N AND STARTS PROGRAM
<CR>	CLOSES OPEN LOCATION (CARRIAGE RETURN)
<LF>	OPENS NEXT LOCATION (LINE FEED)
^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

```
005536 B0;017044
*P                      PROCEED

005640 B0;017044
*P                      PROCEED

006032 B0;017044
*176204/000500          EXAMINE DXCS
176206 /002000          EXAMINE DXOS
176210 /00300           EXAMINE DXBA
*P                      PROCEED
006504 B0;017044
*                       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
B0:020742
```

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 9 IS UP THE ERROR REPORT GENERATOR WILL
BREAK TO ODT AS INDICATED BY 'B0;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

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. T 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/MD: 000020
ORIGIN OF MAP ERROR 017602
REGISTER-CONTENTS-MAP

DXMI:     176777 000400 (DXMI IS UNREADABLE IGNORE THIS COMPARE)
DXCB:     074000 000000 (PHASE AND STATE FLOPS ARE NOT TRACED)
DXES:     000014 000010 (ERROR CONDITION IS THAT BIT2 IS SET)
B0;020742
*

D,P,S,N?

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 074000. SEQ 0011

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 4 ON THE M908, THIS TEST WILL CATCH THE ERROR. SEQ 0012
WHEN 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 M908

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

```
        CZDXHD0 DX11B ONLINE EXER
        COPYRIGHT 1972,1978 DIGITAL EQUIPMENT CORP.
        146 MAIN ST. MAYNARD, MA. 01754
        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 20 (16 DECIMAL). I.E.
;*
;*      DEVICES PER CU: 0  ''=ILLEGAL ?''
;*
;*              THE HEADER ''CU CHANNEL ADDRES:'' USED ON ERROR
;*              OUTPUT HAS BEEN CHANGED TO ''CUADRS/MO:''. I.E.
;*              IT SIGNIFIES EITHER THE CONTENTS OF THE ''DXMO''
;*              REGISTER OR THE CONTROL UNIT BASE ADDRESS WHERE
;*              MEANINGFULL.
;*
;********************** MOD APR 74 ************************************
```

```
                                ;DXDS, DX DEVICE STATUS BITS
                                
100000                                  PARER =100000           ;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                                  ISSRLJ=    10           ;ISS REJECT
000004                                  CMDCHN=     4           ;COMMAND CHAINING
000002                                  STKSTB=     2           ;STACKED STATUS B
000001                                  CMDREJ=     1           ;COMMAND REJECT

                                ;DXCS,DX CONTROL UNIT STATUS BITS

100000                                  PARSTP=100000           ;STOP ON BUSO 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                                  DXFRS =     1           ;FCTN + GO
000003                                  DXFI  =     3           ;READ (INPUT)
000005                                  DXFO  =     5           ;WRITE (OUTPUT)
000007                                  DXFST =     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 INES
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 (RO)
000400                                  PARI  =   400           ;BUSI PARITY (RO)

                                ;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
```

```
                                        DSCRSP  =2              ;DISCONNECT RESPONSE
                                        SELIBR  =4              ;SELECT IN BUFFERED


                                ;DEFINE REGISTER MAP INDICES

                                        DS=     00
                                        CA=     02
                                        CS=     04
                                        OS=     06
                                        BA=     10
                                        BC=     12
                                        MO=     14
                                        MI=     16
                                        CB=     20
                                        ND=     22
                                        ES=     24

                                ;PHASE CONTROL FLOPS OF DXCB

                                        PHASE0=00000
                                        PHASE1=10000
                                        PHASE2=20000
                                        PHASE3=30000
                                        PHASE4=40000
                                        PHASE5=50000
                                        PHASE6=60000
                                        PHASE7=70000

                                ;TIME STATE FLOP AND STATE DEFINATION

                                        TSSF=4000
                                        TS1=4000
                                        TS2=0000

                                ;PHASE AND STATE DEFINITIONS

                                        PHS01=  PHASE0! TS1
                                        PHS02=  PHASE0! TS2
                                        PHS11=  PHASE1! TS1
                                        PHS12=  PHASE1! TS2
                                        PHS21=  PHASE2! TS1
                                        PHS22=  PHASE2! TS2
                                        PHS31=  PHASE3! TS1
                                        PHS32=  PHASE3! TS2
                                        PHS41=  PHASE4! TS1
                                        PHS42=  PHASE4! TS2
                                        PHS51=  PHASE5! TS1
                                        PHS52=  PHASE5! TS2
                                        PHS61=  PHASE6! TS1
                                        PHS62=  PHASE6! TS2
                                        PHS71=  PHASE7! TS1
                                        PHS72=  PHASE7! TS2

                                .SBTTL  MISCELLANEOUS DEFINITIONS
```

```
                        104400          SCOPE=TRAP                      ;SCOPE LOOP TRAP

                        100000                  BIT15=100000
                        040000                  BIT14=40000
                        020000                  BIT13=20000
                        010000                  BIT12=10000
                        004000                  BIT11=4000
                        002000                  BIT10=2000
                        001000                  BIT9=1000
                        000400                  BIT8=400
                        000200                  BIT7=200
                        000100                  BIT6=100
                        000040                  BIT5=40
                        000020                  BIT4=20
                        000010                  BIT3=10
                        000004                  BIT2=4
                        000002                  BIT1=2
                        000001                  BIT0=1
                        000000                  HERE=0

                                        ;CHANNEL COMMANDS WITH PARITY

                        000400                  TIOC=400                ;TEST I/O
                        000001                  WRITEC=001              ;WRITE
                        000002                  READC=002               ;READ
                        000403                  NOPC=403                ;NOP
                        000004                  SENSEC=4                ;SENSE
                        000405                  ILLC=405                ;ILLEGAL COMMAND

                                        ;UTILITY FLAGS

                        100000                  INTOK=100000
                        000002                  DOFLIN=2                ;SPW BIT FOR NO DST !

                                        ;CHANNEL STATUS

                        000010                  CE=10                   ;CH END
                        000004                  DE=4                    ;DEVICE END
                        000002                  UC=2                    ;UNIT CHECK
                        000200                  ATTN=200                ;ATTENTION
                        000100                  SM=100                  ;STATUS MODIFIER
                        000040                  CUE=40                  ;CU END
                        000020                  BSY=20                  ;BUSY

                                        ;SWITCH DEFINITIONS

                        100000                  HLTSW=BIT15             ;HALT ON ERROR
                        040000                  LOPSW=BIT14             ;LOOP ON ERROR
                        020000                  PNTSW=BIT13             ;INHIBIT PRINT
                        010000                  SESW=BIT12              ;SHORT ERROR SWITCH
                        004000                  IISW=BIT11              ;INHIBIT ITERATIONS
                        002000                  MCCSW=BIT10             ;MAINTENANCE CLOCK CONTROL

                                        ;PROCESSOR PRIORITY LEVELS

                        000000                  LEVEL0= 000
```

```
                                        LEVEL1= 040
                                        LEVEL2= 100
                                        LEVEL3= 140
                                        LEVEL4= 200
                                        LEVEL5= 240
                                        LEVEL6= 300
                                        LEVEL7= 340

                                ;REGISTER DEFINITIONS

                                        R0=%0
                                        R1=%1
                                        R2=%2
                                        R3=%3
                                        R4=%4
                                        R5=%5
                                        TTY=%5
                                        R6=%6
                                        SP=%6                   ;STACK POINTER
                                        PC=%7                   ;PROGRAM COUNTER

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

                                E=0
                                EMTABLE=EMTAG

                                ;EMT DEFINITIONS

                                        ERROR                   ;TRAPS TO T.ERROR
                                        MAPERR                  ;TRAPS TO T.MAPERR
                                        TRACER                  ;TRAPS TO T.TRACER
                                        SAVRG                   ;TRAPS TO T.SAVRG
                                        RSTRG                   ;TRAPS TO T.RSTRG
                                        ACCEPTO                 ;TRAPS TO T.ACCEPTO
                                        KEY.TO.R0                       ;TRAPS TO T.KEY.TO.R0
                                        PARITY                  ;TRAPS TO T.PARITY
                                        PCH1                    ;TRAPS TO T.PCH1
                                        PCH2                    ;TRAPS TO T.PCH2
                                        PCH3                    ;TRAPS TO T.PCH3

                                .SBTTL  TRAP DEFINITIONS

                                ;TRAP INITIALIZATION

                                .=14
000014  006674  000340                  0.BRK,LEVEL7            ;BREAK TRAP

                                .=20
000020  016614  000340                  .IOT,LEVEL7             ;TTY OUTPUT TRAP,LEVEL 7

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

```
                        .=30
000030  011762  000340          EMTDECODER,LEVEL7       ;EMT DECODER TRAP,LEVEL 7

                        .=34
000034  011530  000340          SCOPEC,LEVEL7           ;SCOPE TRAP
                        .=46
000046  014020                  LOGICAL                 ;ACT11

                        .=200

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

                        .=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  006706  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  006706  INITZ:  MOV     #6,RTX
001152  000402                  BR      INITC
001154  062706  000010  INITB:  ADD     #10,SP
001160  013737  006706  006704  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  014206          CLR     @#ONESHOT               ;DO NOT EXECUTE TIME CONSUMING TESTS
001212  000137  013576          JMP     @#MON11         ;
001216  005327  000001  BGN0:   DEC     #1
001222  001002                  BNE     BGN1
001224  000137  012654          JMP     @#MONITOR
001230  032737  000200  177570  BGN1:   BIT     #200,SR         ;TEST FOR FAST START
001236  001402                  BEQ     BGN2            ;BRANCH IF FAST START
001240  000137  012724          JMP     @#MON1.0
001244  012706  001100  BGN2:   MOV     #BEGIN,SP
001250  012737  000340  177776          MOV     #LEVEL7,PS
001256  000137  013544          JMP     @#MON10         ;USE PREVIOUS PARAMETERS


                        .SBTTL  DX REGISTERS

001262  176200  DXBASE: 176200
001264  000300  DXIV:   300                     ;DX INTERRUPT VECTOR ADRS
```

```
                                        ;DX INTERRUPT STATUS
                                        ;INT PRIORITY ADRS
                                        ;DX PRIORITY MINUS ONE
                                        ;DEVICE STATUS ->TT
                                        ;COMMAND AND ADDRESS ->TT
                                        ;CONTROL UNIT STATUS
                                        ;OFFSET AND STATUS
                                        ;BUS ADDRESS FOR NPR'S
                                        ;BYTE COUNT
                                        ;MAINTENANCE OUT
                                        ;MAINTENANCE IN
                                        ;CONTROL BITS
                                        ;NPR DATA
                                        ;EXTRA SIGNALS
                                        ;MAINTENANCE OUT BUFFERED
                                        ;EXTRA EXTRA SIGNALS

                                        ;BYTE REGISTERS

                                        ;DXCA

                                        ;CU ADDRESS REGISTER
                                        ;CU COMMAND REGISTER

                                        ;DXOS

                                        ;CU STATUS REGISTER
                                        ;CU OFFSET REGISTER

                                        ;DXMO

                                        ;IBM BUS OUT
                                        ;CONTROL LINES OUT

                                        ;DXMI

                                        ;IBM BUS IN
                                        ;CONTROL LINES IN

                                        ;DXES
                                        ;MISCELLANEOUS BITS
                                        ;TUMBLE TABLE INDEX REG

                                        ;DXMOB

                                        ;BUS OUT BUFFERED
                                        ;CONTROL OUT BUFFERED

                                        ;REGISTER ADDRESSES

```

```
                                ;REGISTER TRACE TABLE

001406                          REGTT:                          ;REGISTER TRACE TABLE
001406  000000                  TDXDS:  0                       ;DEVICE STATUS TRACE
001410  000000                  TDXCA:  0                       ;COMMAND AND ADDRESS TRACE
001412  000000                  TDXCS:  0                       ;CU STATUS TRACE
001414  000000                  TDXOS:  0                       ;OFFSET AND STATUS TRACE
001416  000000                  TDXBA:  0                       ;BUS ADDRESS TRACE
001420  000000                  TDXMO:  0                       ;MAINTENANCE-OUT TRACE
001422  000000                  TDXMI:  0                       ;MAINTENANCE-IN TRACE
001424  000000                  TDXCB:  0                       ;CONTROL BIT TRACE
001426  000000                  TDXND:  0                       ;NPR DATA TRACE
001430  000000                  TDXES:  0                       ;EXTRA SIGNAL TRACE
001432  000000                  TDXES1: 0                       ;EXTRA SIGNAL TRACE 1
001434  000000                  TTTNDX: 0                       ;TTNDX TRACE


                                ;STATUS POINTER WORD ADDRESS

001436  002000                  SPW:    2000

                                ;TUMBLE TABLE ADDRESS

001440  003000                  TT:     3000

                                ;DEVICE STATUS TABLE ADDRESS

001442  017400                  DST:    DSTADRS         ;DST MUST BE MOD(400)


                                .SBTTL  POWER FAIL


                                ;POWER FAIL ROUTINE
                                ;IF SELECTED VERIFY STATUS-IN IS UP
                                ;AND CE AND DE ARE PRESENTED AS STATUS

001444  104003                  PFAIL:  SAVRG
001446  010637  001606                  MOV     R6,SAVR6
001452  012737  001530  000024        MOV     #PWRUP,24
001460  032777  020000  177622        BIT     #SELO,@DXMO
001466  001417                  BEQ     1$
001470  032777  100000  177614        BIT     #OPLI,@DXMI
001476  001001                  BNE     .+4             ;BRANCH IF NO ERROR CONDITION
001500  104000                  ERROR                   ;
001502  032777  004000  177602        BIT     #STAI,@DXMI
```

```
                                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
                                        ERROR                   ;
                                        CMPB    #CE!DE,@BUSI
                                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
                                        ERROR                   ;
                                1$:     HALT

                                ;POWER UP ROUTINE

                                PWRUP:  NOP             ;PATCH ANYONE?
                                        MOV     SAVR6,R6
                                        RSTRG
                                        MOV     #PFAIL,24       ;RESTORE POWER FAIL VECTOR
                                        MOV     SPW,@DXOS       ;RESTORE OFFSET REG
                                        JSR     PC,RESRES       ;RESET AND RESTORE
                                        CLR     (PC)+           ;STALL FOR MECHANICS
                                        0
                                        DEC     .-2
                                        BNE     .-4
                                        TYPE    ,PFLD           ;POWER FAILED

                                        MOV     (SP)+,PS
                                        JMP     @RETURN
                                SAVR6:  0
                                PFLD:   .ASCIZ  ''_POWER FAILED_''

                                .EVEN

                                .SBTTL  STATUS POINTER WORD TABLE
                                ENDSTR=.                ;DEFINE END OF START CODE
                                .=2000
                                ;DEFAULT STATUS POINTER WORD (SPW)
                                ;DEFAULT EMULATION IS OF ONE CONTROL UNIT
                                ;WITH CAPACITY OF 16 DEVICES
                                N=0

                                ;STATUS POINTER WORDS FOR CU 0

                                        ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
                                        ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
                                        ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
                                        ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
                                        ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
                                        ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
                                        ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
                                        ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
```

```
   505  002020  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   506  002022  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   507  002024  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   508  002026  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   509  002030  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   510  002032  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   511  002034  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   512  002036  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   513
   514                                  ;STATUS POINTER WORDS FOR CU 1
   515
   516  002040  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   517  002042  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   518  002044  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   519  002046  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   520  002050  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   521  002052  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   522  002054  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   523  002056  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   524  002060  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   525  002062  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   526  002064  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   527  002066  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   528  002070  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   529  002072  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   530  002074  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   531  002076  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   532
   533                                  ;STATUS POINTER WORDS FOR CU 2
   534
   535  002100  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   536  002102  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   537  002104  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   538  002106  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   539  002110  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   540  002112  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   541  002114  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   542  002116  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   543  002120  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   544  002122  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   545  002124  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   546  002126  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   547  002130  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   548  002132  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   549  002134  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   550  002136  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   551
   552                                  ;STATUS POINTER WORDS FOR CU 3
   553
   554  002140  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   555  002142  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   556  002144  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   557  002146  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   558  002150  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   559  002152  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   560  002154  016400                          ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
```

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002156  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002160  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002162  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002164  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002166  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002170  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002172  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002174  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002176  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST

                           ;STATUS POINTER WORDS FOR CU 4

002200  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002202  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002204  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002206  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002210  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002212  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002214  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002216  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002220  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002222  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002224  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002226  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002230  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002232  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002234  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002236  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST

                           ;STATUS POINTER WORDS FOR CU 5

002240  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002242  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002244  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002246  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002250  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002252  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002254  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002256  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002260  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002262  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002264  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002266  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002270  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002272  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002274  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002276  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST

                           ;STATUS POINTER WORDS FOR CU 6

002300  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002302  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002304  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002306  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002310  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
002312  016400                     ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
```

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   617  002314  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   618  002316  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   619  002320  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   620  002322  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   621  002324  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   622  002326  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   623  002330  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   624  002332  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   625  002334  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   626  002336  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   627
   628                          ;STATUS POINTER WORDS FOR CU 7
   629
   630  002340  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   631  002342  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   632  002344  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   633  002346  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   634  002350  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   635  002352  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   636  002354  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   637  002356  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   638  002360  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   639  002362  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   640  002364  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   641  002366  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   642  002370  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   643  002372  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   644  002374  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   645  002376  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   646
   647                          ;STATUS POINTER WORDS FOR CU 10
   648
   649  002400  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   650  002402  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   651  002404  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   652  002406  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   653  002410  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   654  002412  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   655  002414  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   656  002416  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   657  002420  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   658  002422  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   659  002424  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   660  002426  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   661  002430  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   662  002432  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   663  002434  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   664  002436  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   665
   666                          ;STATUS POINTER WORDS FOR CU 11
   667
   668  002440  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   669  002442  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   670  002444  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   671  002446  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   672  002450  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
```

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673  002452  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
674  002454  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
675  002456  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
676  002460  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
677  002462  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
678  002464  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
679  002466  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
680  002470  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
681  002472  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
682  002474  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
683  002476  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
684
685                          ;STATUS POINTER WORDS FOR CU 12
686
687  002500  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
688  002502  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
689  002504  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
690  002506  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
691  002510  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
692  002512  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
693  002514  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
694  002516  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
695  002520  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
696  002522  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
697  002524  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
698  002526  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
699  002530  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
700  002532  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
701  002534  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
702  002536  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
703
704                          ;STATUS POINTER WORDS FOR CU 13
705
706  002540  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
707  002542  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
708  002544  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
709  002546  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
710  002550  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
711  002552  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
712  002554  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
713  002556  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
714  002560  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
715  002562  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
716  002564  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
717  002566  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
718  002570  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
719  002572  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
720  002574  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
721  002576  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
722
723                          ;STATUS POINTER WORDS FOR CU 14
724
725  002600  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
726  002602  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
727  002604  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
728  002606  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
```

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   729  002610  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   730  002612  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   731  002614  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   732  002616  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   733  002620  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   734  002622  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   735  002624  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   736  002626  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   737  002630  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   738  002632  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   739  002634  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   740  002636  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   741
   742                          ;STATUS POINTER WORDS FOR CU 15
   743
   744  002640  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   745  002642  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   746  002644  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   747  002646  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   748  002650  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   749  002652  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   750  002654  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   751  002656  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   752  002660  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   753  002662  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   754  002664  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   755  002666  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   756  002670  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   757  002672  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   758  002674  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   759  002676  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   760
   761                          ;STATUS POINTER WORDS FOR CU 16
   762
   763  002700  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   764  002702  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   765  002704  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   766  002706  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   767  002710  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   768  002712  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   769  002714  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   770  002716  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   771  002720  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   772  002722  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   773  002724  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   774  002726  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   775  002730  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   776  002732  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   777  002734  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   778  002736  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   779
   780                          ;STATUS POINTER WORDS FOR CU 17
   781
   782  002740  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   783  002742  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
   784  002744  016400                    ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
```

```
  785  002746  016400                   ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
  786  002750  016400                   ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
  787  002752  016400                   ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
  788  002754  016400                   ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
  789  002756  016400                   ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
  790  002760  016400                   ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
  791  002762  016400                   ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
  792  002764  016400                   ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
  793  002766  016400                   ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
  794  002770  016400                   ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
  795  002772  016400                   ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
  796  002774  016400                   ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
  797  002776  016400                   ERRDST          ;DEVICE STATUS TABLE IS AT ERRDST
  798
  799                           .SBTTL  TUMBLE TABLE
  800                  003000   .=.     ;START OF  TUMBLE TABLE
  801
  802  003000  000400           .BLKW   256.    ;RESERVE 265. WORDS FOR TT
  803
  804                  004000   ENDTT=.
  805
  806
  807
```

```
                                        ; ***************************************************************
                                        ;TEST   1       TEST I/O COMMAND
                                        ; ***************************************************************
004000  104400                  011654  TST1:   SCOPE
004002  012737  000200  011654          MOV     #200,@#ICOUNT   ;ITERATION COUNT
004010  012737  000001  012636          MOV     #1,@#ERTSTN     ;SAVE TEST # FOR ERROR REPORT
004016  012737  004024  011660          MOV     #SCP1,@#RETURN  ;SCOPE LOOP RETURN ADRS
004024                                  SCP1:

                                        .REM    *
                                        THE FUNCTION OF THIS TEST IS TO VERIFY THE DX11 CAN RESPOND TO A
                                        TEST I/O COMMAND.

                                                *


004024  012737  000400  014216           MOV     #TIOC,@#CMD     ;LOAD COMMAND
004032  004737  006542                   JSR     PC,@#TRAINT     ;TT TRACE TRACE INIT
004036  012737  000200  006366           MOV     #CHIS,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
004044  013737  001272  177776           MOV     @#LESS1,PS      ;LOWER PROCESSOR STATUS
004052  012737  004052  012106           MOV     #.,@#TERPC      ;ORIGIN OF TRAP ERROR
004060  004737  007446                   JSR     PC,ISS.SUB              ;SELECT
```

```
                                        ;*****************************************************************
                                        ;TEST   2       ILLEGAL COMMAND
                                        ;*****************************************************************
004064  104400                  011654  TST2:   SCOPE
004066  012737  000200  011654          MOV     #200,@#ICOUNT   ;ITERATION COUNT
004074  012737  000002  012636          MOV     #2,@#ERTSTN     ;SAVE TEST # FOR ERROR REPORT
004102  012737  004110  011660          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  010222          BIC     #400,ISSCRJ     ;ILLC PRESENTS UNIT CHECK STATUS
                                                                ;THIS CAUSES CMDREJ
                                                                ;THEREFORE CHANGE ISS DIAGNOSTIC
                                                                ;TO LOOK FOR CMDREJ UP
004116  012737  000405  014216          MOV     #ILLC,@#CMD     ;LOAD COMMAND
004124  004737  006542                  JSR     PC,@#TRAINT     ;TT TRACE TRACE INIT
004130  012737  002201  006366          MOV     #UCHKS!CHIS!CMDREJ,@#ENTRY1     ;LOAD EXPECTED TT ENTRY 1
004136  013737  001272  177776          MOV     @#LESS1,PS      ;LOWER PROCESSOR STATUS
004144  012737  004144  012106          MOV     #.,@#TERPC      ;ORIGIN OF TRAP ERROR
004152  004737  007446                  JSR     PC,ISS.SUB              ;SELECT

004156  052737  000400  010222          BIS     #400,ISSCRJ     ;RESTORE ISS TO LOOK FOR NOT CMDREJ
```

```
                                ; ***************************************************************
                                ;TEST   3       SENSE COMMAND
                                ; ***************************************************************
004164  104400                  TST3:   SCOPE
004166  012737  000200  011654          MOV     #200,@#ICOUNT   ;ITERATION COUNT
004174  012737  000003  012636          MOV     #3,@#ERTSTN     ;SAVE TEST # FOR ERROR REPORT
004202  012737  004210  011660          MOV     #SCP3,@#RETURN  ;SCOPE LOOP RETURN ADRS
004210                          SCP3:


004210  012737  000004  014216          MOV     #SENSEC,@#CMD   ;LOAD COMMAND
004216  004737  006542                  JSR     PC,@#TRAINT     ;TT TRACE TRACE INIT
004222  012737  000200  006366          MOV     #CHIS,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
004230  013737  001272  177776          MOV     @#LESS1,PS      ;LOWER PROCESSOR STATUS
004236  012737  004236  012106          MOV     #.,@#TERPC      ;ORIGIN OF TRAP ERROR
004244  004737  007446                  JSR     PC,ISS.SUB              ;SELECT


004250  012737  000001  014252          MOV     #1,COUNT                ;INIT SOFTWARE BYTE COUNTER
004256  012777  177777  175022          MOV     #-1,@DXBC               ;SET UP DX BYTE COUNT
004264  012777  014240  175012          MOV     #SSTAT,@DXBA            ;DX BASE ADDRESS
004272  052777  000005  175000          BIS     #DXFO!GO,@DXCS          ;FUNCTION OUTPUT & GO
                                                                        ;SERVICE-IN SHOULD RISE AND
                                                                        ;(SSTAT) SHOULD BE ON BUS-IN
004300  012737  000200  006366          MOV     #CHIS,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
004306  113737  014214  006426          MOVB    @#DEV,@#ENTRY2  ;SECOND TT ENTRY = DXCA
004314  113737  014216  006427          MOVB    @#CMD,@#ENTRY2+1        ;
004322  113777  014214  174776          MOVB    @#DEV,@CUAR     ;LOAD DEV ADRS
004330  113777  014216  174772          MOVB    @#CMD,@CUCR     ;LOAD COMMAND IN CUCR
004336  012737  004336  012106          MOV     #.,@#TERPC      ;DEFINE ORIGIN OF TRACE ERROR
004344  004737  011020                  JSR     PC,CUIS.SUB             ;EXECUTE SELECTION

004350  012737  000020  006366          MOV     #CUDEND,@#ENTRY1        ;LOAD EXPECTED TT ENTRY 1
004356  113737  014214  006426          MOVB    @#DEV,@#ENTRY2          ;SECOND TT ENTRY = DXCA
004364  112737  000001  006427          MOVB    #1,@#ENTRY2+1           ;CUCR OF DXCA TT ENTRY
004372  113777  014214  174726          MOVB    @#DEV,@CUAR             ;LOAD DEV ADRS
004400  012737  004400  012106          MOV     #.,@#TERPC              ;DEFINE ORIGIN OF TRACE ERROR
004406  004737  007142                  JSR     PC,TRANSFER             ;DO TRANSFER IF REQUIRED
004412  012737  001100  006366          MOV     #CHENDS!ESEND,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
004420  113737  014214  006426          MOVB    @#DEV,@#ENTRY2          ;SECOND TT ENTRY = DXCA
004426  032737  000004  013602          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$:     MOVB    #1,@#ENTRY2+1           ;CUCR OF DXCA TT ENTRY
004454  113777  014214  174644  2$:     MOVB    @#DEV,@CUAR             ;LOAD DEV ADRS
004462  012737  004462  012106          MOV     #.,@#TERPC              ;DEFINE ORIGIN OF TRACE ERROR
004470  004737  007064                  JSR     PC,STATUSPRESENTATION   ;PRESENT STATUS
```

```
                                ; ***************************************************************
                                ;TEST   4       READ COMMAND (PDP OUTPUT)
                                ; ***************************************************************
004474  104400                  TST4:   SCOPE
004476  012737  000100  011654          MOV     #100,@#ICOUNT   ;ITERATION COUNT
004504  012737  000004  012636          MOV     #4,@#ERTSTN     ;SAVE TEST # FOR ERROR REPORT
004512  012737  004520  011660          MOV     #SCP4,@#RETURN  ;SCOPE LOOP RETURN ADRS
004520                          SCP4:


                                .REM    *

                                THE FUNCTION OF THIS TEST IS TO VERIFY THAT THE DX11 CAN PROPERLY
                                EXECUTE A READ COMMAND AND SUPPRESS DATA DURING THIS TRANSFER.
                                THIS IS ACCOMPLISHED BY EXECUTING A CHANNEL INITIATED SELECTION
                                FOLLOWED BY A CONTROL UNIT INITIATED SELECTION IF THE DX11'S SIM-
                                ULATOR IS MIMICING A MULTIPLEXOR CHANNEL.  FOLLOWING THE COMPLETION
                                OF A SUCCESSFUL SELECTION THE DX'S BYTE COUNT IS SET TO 256. AND
                                ITS BUS ADDRESS REGISTER IS LOADED TO POINT TO "DATA" A FILE OF
                                128. WORD OF FLOATING 1'S AND FLOATING 0'S.  THIS INITIALIZATION
                                IS FOLLOWED BY SETTING THE DX FUNCTION BITS TO A FUNCTION-OUTPUT
                                AND GO.
                                DURING THE ENTIRE TEST ALL TUMBLE TABLE ENTRIES ARE TRACED.  PRIOR
                                TO EACH ANTICIPATED "DONE" THE EXPECTED TUMBLE TABLE ENTRIES (DXDS
                                AND DXCA) ARE LOADED INTO ENTRY1 AND ENTRY2 RESPECTIVELY THEN UPON
                                INTERRUPT THESE EXPECTED ENTRIES ARE COMPARED WITH THE ACTUAL TT
                                ENTRIES ALONG WITH THE EXPECTED TTNDX CONTENTS.  IF A DISCREPANCY
                                OCCURS IT IS NOTED BY AN ERROR PC AND A TRACE ERROR ORIGIN PC.
                                THE ORIGIN OF THE TRACE ERROR IS CONTAINED IN TERPC WHICH IS UP-
                                DATED PRIOR TO EACH ANTICIPATED "DONE" BY A MOV #.,@#TERPC.

                                THE TRANSFER OF DATA FROM THE DX11 TO THE CHANNEL SIMULATOR IS
                                CONTROLLED BY THE SRV0-SRV1 SEQUENCE.  DURING THIS SEQUENCE DATA
                                CHECKS ARE MADE AND SUPPRESS DATA IS CHECKED BY RAISING SUPO IN
                                RESPONSE TO SRV1 AND THEN RATTLING SRV0.  NO DATE TRANSFER SHOULD
                                TAKE PLACE IF SUPO IS RAISED AFTER THE FIRST BYTE.

                                        *
004520  012737  000002  014216          MOV     #READC,@#CMD    ;LOAD COMMAND
004526  004737  006542                  JSR     PC,@#TRAINT     ;TT TRACE TRACE INIT
004532  012737  000200  006366          MOV     #CHIS,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
004540  013737  001272  177776          MOV     @#LESS1,PS      ;LOWER PROCESSOR STATUS
004546  012737  004546  012106          MOV     #.,@#TERPC      ;ORIGIN OF TRAP ERROR
004554  004737  007446                  JSR     PC,ISS.SUB              ;SELECT


004560  012737  000400  014252          MOV     #256.,COUNT             ;SOFTWARE BYTE COUNT
004566  012777  177400  174512          MOV     #-256.,@DXBC            ;DX BYTE COUNT
004574  012701  022042                  MOV     #DATA,R1                ;BASE ADRS OF TEST DATA
004600  012777  022042  174476          MOV     #DATA,@DXBA             ;FLOAT 1'S, 0'S OUTPUT DATA
004606  052777  000005  174464          BIS     #DXFO,@DXCS             ;FUNCTION OUTPUT AND GO
                                                                        ;SERVICE-IN SHOULD RAISE AND
                                                                        ;DATA SHOULD BE ON BUS-IN
004614  012737  000200  006366          MOV     #CHIS,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
004622  113737  014214  006426          MOVB    @#DEV,@#ENTRY2  ;SECOND TT ENTRY = DXCA
004630  113737  014216  006427          MOVB    @#CMD,@#ENTRY2+1        ;
```

```
                                                                I  3
  966  004636  113777  014214  174462          MOVB    @#DEV,@CUAR     ;LOAD DEV ADRS
  967  004644  113777  014216  174456          MOVB    @#CMD,@CUCR     ;LOAD COMMAND IN CUCR
  968  004652  012737  004652  012106          MOV     #.,@#TERPC      ;DEFINE ORIGIN OF TRACE ERROR
  969  004660  004737  011020                  JSR     PC,CUIS.SUB             ;EXECUTE SELECTION
  970
  971  004664  112737  000001  006427          MOVB    #1,@#ENTRY2+1
  972  004672  012737  000020  006366          MOV     #CUDEND,@#ENTRY1        ;LOAD TT ENTRY
  973  004700  012737  004700  012106          MOV     #.,@#TERPC              ;READ DONE TT TRACE ERROR PC
  974  004706  032777  002000  174376  RC0:    BIT     #SRVI,@DXMI             ;WAIT FOR SERVICE-IN
  975  004714  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
  976  004716  104000                          ERROR                   ;SRVI NOT SET
  977  004720  127711  174416                  CMPB    @BUSI,@R1               ;CHECK DATA TRANSMITTED TO 360
  978  004724  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
  979  004726  104000                          ERROR                   ;MEMORY TO BUSI TRANSFER ERROR
  980  004730  105721                          TSTB    (R1)+                   ;INC TO NEXT BYTE
  981  004732  052777  001000  174350          BIS     #SRVO,@DXMO
  982  004740  032777  001000  174342          BIT     #SRVO,@DXMO
  983  004746  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
  984  004750  104000                          ERROR                   ;SRVO NOT SET
  985  004752  032737  000004  013602          BIT     #BIT2,PARA              ;TEST FOR MUX MODE
  986  004760  001005                          BNE     RC1
  987                                  ;WHEN ON MUX CH OPLI WILL DROP WHEN TRANSMISSION IS FINISHED
  988                                  ;THIS WILL CAUSE DXMI TO BE UNREADABLE
  989  004762  032777  002000  174322          BIT     #SRVI,@DXMI             ;SERVICE-IN SHOULD DROP
  990  004770  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
  991  004772  104000                          ERROR                   ;SRVI STUCK HIGH
  992  004774  052777  010000  174306  RC1:    BIS     #SUPO,@DXMO             ;SET SUPPRESS-OUT
  993  005002  032777  010000  174300          BIT     #SUPO,@DXMO             ;VERIFY SUPO SET
  994  005010  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
  995  005012  104000                          ERROR                   ;SUPO NOT SET
  996  005014  012727  000010                  MOV     #10,(PC)+               ;SRVO COUNT
  997  005020  000000                  RC2:    0                       ;SRVO COUNT
  998  005022  052777  001000  174260  RC3:    BIS     #SRVO,@DXMO             ;KEEP SRVO CHANGING
  999  005030  032777  001000  174252          BIT     #SRVO,@DXMO             ;VERIFY SRVO SET
 1000  005036  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
 1001  005040  104000                          ERROR                   ;SRVO DID NOT SET
 1002  005042  042777  001000  174240          BIC     #SRVO,@DXMO             ;  "     "       "
 1003  005050  032777  001000  174232          BIT     #SRVO,@DXMO             ;VERIFY SRVO CLEAR
 1004  005056  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
 1005  005060  104000                          ERROR                   ;SRVO NOT 0
 1006  005062  032737  000004  013602          BIT     #BIT2,PARA              ;TEST FOR MUX MODE
 1007  005070  001005                          BNE     RC4
 1008                                  ;WHEN ON MUX CH OPLI WILL DROP WHEN TRANSMISSION IS FINISHED
 1009                                  ;THIS WILL CAUSE DXMI TO BE UNREADABLE
 1010  005072  032777  002000  174212          BIT     #SRVI,@DXMI             ;SUPO SHOULD SUPPRESS SRVI SETTING
 1011  005100  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
 1012  005102  104000                          ERROR                   ;SRVI WAS NOT SUPPRESSED BY SUPO
 1013  005104  005337  005020          RC4:    DEC     RC2                     ;DEC SRVO COUNT
 1014  005110  001344                          BNE     RC3                     ;BRANCH IF SRVO NOT DONE
 1015  005112  042777  010000  174170          BIC     #SUPO,@DXMO             ;DROP SUPPRESS-OUT
 1016  005120  032777  010000  174162          BIT     #SUPO,@DXMO             ;VERIFY SUPO CLEAR
 1017  005126  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
 1018  005130  104000                          ERROR                   ;SUPO STUCK HIGH
 1019  005132  032777  001000  174150          BIT     #SRVO,@DXMO
 1020  005140  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
 1021  005142  104000                          ERROR                   ;SRVO STUCK HIGH
```

```
 1022  005144  005337  014252                  DEC     COUNT
 1023  005150  001256                          BNE     RC0
 1024  005152  012737  001100  006366          MOV     #CHENDS!ESEND,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
 1025  005160  113737  014214  006426          MOVB    @#DEV,@#ENTRY2          ;SECOND TT ENTRY = DXCA
 1026  005166  032737  000004  013602          BIT     #BIT2,@#PARA            ;TEST FOR MUX
 1027  005174  001404                          BEQ     1$                      ;BR IF SELECTOR
 1028  005176  112737  000000  006427          MOVB    #0,@#ENTRY2+1           ;MUX TT CUCR
 1029  005204  000403                          BR      2$                      ;GO
 1030  005206  112737  000001  006427  1$:     MOVB    #1,@#ENTRY2+1           ;CUCR OF DXCA TT ENTRY
 1031  005214  113777  014214  174104  2$:     MOVB    @#DEV,@CUAR             ;LOAD DEV ADRS
 1032  005222  012737  005222  012106          MOV     #.,@#TERPC              ;DEFINE ORIGIN OF TRACE ERROR
 1033  005230  004737  007064                  JSR     PC,STATUSPRESE'ITATION  ;PRESENT STATUS
 1034
 1035
 1036
```

```
1037                                    ;*****************************************************************
1038                                    ;TEST   5       WRITE COMMAND (PDP INPUT)
1039                                    ;*****************************************************************
1040  005234  104400                    TST5:   SCOPE
1041  005236  012737  000100  011654            MOV     #100,@#ICOUNT   ;ITERATION COUNT
1042  005244  012737  000005  012636            MOV     #5,@#ERTSTN     ;SAVE TEST # FOR ERROR REPORT
1043  005252  012737  005260  011660            MOV     #SCP5,@#RETURN  ;SCOPE LOOP RETURN ADRS
1044  005260                    SCP5:
1045
1046
1047                                    .REM    *
1048
1049                                    THE FUNCTION OF THIS TEST IS TO VERIFY THAT THE DX11 CAN EXECUTE
1050                                    WRITE COMMANDS FROM THE CHANNEL SIMULATOR.  THIS TEST IS IMPLE-
1051                                    MENTED MUCH LIKE THE READ TEST IN THAT THE TRANSFER IS 256. BYTES,
1052                                    TT TRACING IS DONE AND SUPPRESS DATA IS ALSO CHECKED.  TT DIFFERS
1053                                    IN; THE DIRECTION AND TYPE OF DATA.
1054
1055                                            *
1056
1057  005260  012737  000001  014216            MOV     #WRITEC,@#CMD   ;LOAD COMMAND
1058  005266  004737  006542                    JSR     PC,@#TRAINT     ;TT TRACE TRACE INIT
1059  005272  012737  000200  006366            MOV     #CHIS,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
1060  005300  013737  001272  177776            MOV     @#LESS1,PS      ;LOWER PROCESSOR STATUS
1061  005306  012737  005306  012106            MOV     #.,@#TERPC      ;ORIGIN OF TRAP ERROR
1062  005314  004737  007446                    JSR     PC,ISS.SUB              ;SELECT
1063
1064
1065  005320  012737  000400  014252            MOV     #256.,COUNT             ;SOFTWARE COUNTER
1066  005326  012777  177400  173752            MOV     #-256.,@DXBC            ;DX BYTE COUNT
1067  005334  012777  023442  173742            MOV     #NPRDATA,@DXBA          ;ADRS FOR DATA FROM 360 SIM
1068  005342  012702  023442                    MOV     #NPRDATA,R2             ;INPUT FILE FOR NPR DATA
1069  005346  012701  022442                    MOV     #WDATA,R1               ;WRITE DATA FOR 360 SIM
1070  005352  052777  000003  173720            BIS     #DXFI!GO,@DXCS          ;FUNCTION INPUT & GO (360 WRITE)
1071  005360  012737  000200  006366            MOV     #CHIS,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
1072  005366  113737  014214  006426            MOVB    @#DEV,@#ENTRY2  ;SECOND TT ENTRY = DXCA
1073  005374  113737  014216  006427            MOVB    @#CMD,@#ENTRY2+1        ;
1074  005402  113777  014214  173716            MOVB    @#DEV,@CUAR     ;LOAD DEV ADRS
1075  005410  113777  014216  173712            MOVB    @#CMD,@CUCR     ;LOAD COMMAND IN CUCR
1076  005416  012737  005416  012106            MOV     #.,@#TERPC      ;DEFINE ORIGIN OF TRACE ERROR
1077  005424  004737  011020                    JSR     PC,CUIS.SUB             ;EXECUTE SELECTION
1078
1079
1080  005430  012737  000020  006366  WC0:     MOV     #CUDEND,@#ENTRY1        ;TT ENTRY 1
1081  005436  112737  177777  006427            MOVB    #-1,@#ENTRY2+1          ;FAKE CUCR OF ENTRY 2
1082  005444  012737  005444  012106            MOV     #.,@#TERPC              ;WRITE TRACE ERROR
1083  005452  032777  002000  173632            BIT     #SRVI,@DXMI             ;WAIT FOR SERVICE-IN
1084  005460  001001                            BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1085  005462  104000                            ERROR                   ;SRVI NOT SET
1086  005464  051177  173646                    BIS     @R1,@BUSO               ;PUT DATA ON BUS-OUT
1087  005470  121177  173642                    CMPB    @R1,@BUSO               ;VERIFY LOAD
1088  005474  001401                            BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1089  005476  104000                            ERROR                   ;BUSO INTO MEMORY DATA TRANSFER ERROR
1090  005500  052777  001000  173602            BIS     #SRVO,@DXMO
1091  005506  032777  001000  173574            BIT     #SRVO,@DXMO
1092  005514  001001                            BNE     .+4             ;BRANCH IF NO ERROR CONDITION
```

```
 1093  005516  104000                        ERROR                   ;SRVO NOT SET
 1094  005520  032737  000004  013602        BIT     #BIT2,FARA              ;CAN'T LOOK AT SRVI ON MUX CH
 1095  005526  001005                        BNE     WC00
 1096  005530  032777  002000  173554        BIT     #SRVI,@DXMI
 1097  005536  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
 1098  005540  104000                        ERROR                   ;SRVI DID NOT DROP
 1099  005542  005721                WC00:   TST     (R1)+
 1100  005544  105722                        TSTB    (R2)+
 1101  005546  032702  000001              BIT     #BIT0,R2                ;TEST FOR EVEN BOUNDRY
 1102  005552  001016                        BNE     WC1
 1103
 1104  005554  162701  000004              SUB     #4,R1
 1105  005560  162702  000002              SUB     #2,R2
 1106  005564  121112                        CMPB    @R1,@R2                 ;VERIFY 1ST DATA BYTE TRANSFER
 1107  005566  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
 1108  005570  104000                        ERROR                   ;BUSO INTO MEMORY DATA TRANSFER ERROR
 1109  005572  005721                        TST     (R1)+
 1110  005574  105722                        TSTB    (R2)+
 1111  005576  121112                        CMPB    @R1,@R2                 ;VERIFY 2ND BYTE TRANSFER
 1112  005600  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
 1113  005602  104000                        ERROR                   ;SECOND DATA BYTE INTO MEMORY
 1114
 1115  005604  005721                        TST     (R1)+
 1116  005606  105722                        TSTB    (R2)+
 1117  005610  052777  010000  173472  WC1:   BIS     #SUPO,@DXMO             ;SET SUPPRESS-OUT
 1118  005616  032777  010000  173464        BIT     #SUPO,@DXMO             ;VERIFY SUPO SET
 1119  005624  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
 1120  005626  104000                        ERROR                   ;SUPO NOT SET
 1121  005630  012727  000010                MOV     #10,(PC)+               ;SRVO COUNT
 1122  005634  000000                WC2:    0                       ;SRVO COUNT
 1123  005636  052777  001000  173444  WC3:   BIS     #SRVO,@DXMO             ;KEEP SRVO CHANGING
 1124  005644  032777  001000  173436        BIT     #SRVO,@DXMO             ;VERIFY SRVO SET
 1125  005652  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
 1126  005654  104000                        ERROR                   ;SRVO DID NOT SET
 1127  005656  042777  001000  173424        BIC     #SRVO,@DXMO             ;CLEAR SRVO
 1128  005664  032777  001000  173416        BIT     #SRVO,@DXMO             ;VERIFY SRVO CLEAR
 1129  005672  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
 1130  005674  104000                        ERROR                   ;SRVO NOT 0
 1131  005676  032737  000004  013602        BIT     #BIT2,PARA              ;TEST FOR MUX MODE
 1132  005704  001005                        BNE     WC4
 1133                                ;WHEN ON MUX CH OPLI WILL DROP WHEN TRANSMISSION IS FINISHED
 1134                                ;THIS WILL CAUSE DXMI TO BE UNREADABLE
 1135  005706  032777  002000  173376        BIT     #SRVI,@DXMI             ;SUPO SHOULD SUPPRESS SRVI SETTING
 1136  005714  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
 1137  005716  104000                        ERROR                   ;SRVI WAS NOT SUPPRESSED BY SUPO
 1138  005720  005337  005634        WC4:    DEC     WC2                     ;DEC SRVO COUNT
 1139  005724  001344                        BNE     WC3                     ;BRANCH IF SRVO NOT DONE
 1140  005726  042777  010000  173354        BIC     #SUPO,@DXMO             ;DROP SUPPRESS-OUT
 1141  005734  032777  010000  173346        BIT     #SUPO,@DXMO             ;VERIFY SUPO CLEAR
 1142  005742  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
 1143  005744  104000                        ERROR                   ;SUPO STUCK HIGH
 1144  005746  032777  001000  173334        BIT     #SRVO,@DXMO
 1145
 1146  005754  042777  001777  173326        BIC     #SRVO!777,@DXMO         ;CLR SRVO AND BUSO+PARITY
 1147  005762  032777  001000  173320        BIT     #SRVO,@DXMO
 1148  005770  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
```

```
 1149  005772  104000                          ERROR                       ;SRVC DID NOT DROP
 1150  005774  005337  014252                  DEC     COUNT
 1151  006000  001213                          BNE     WC0
 1152  006002  012737  001100  006366          MOV     #CHENDS!ESEND,@#ENTRY1  ;LOAD EXPECTED TT ENTRY 1
 1153  006010  113737  014214  006426          MOVB    @#DEV,@#ENTRY2          ;SECOND TT ENTRY = DXCA
 1154  006016  032737  000004  013602          BIT     #BIT2,@#PARA            ;TEST FOR MUX
 1155  006024  001404                          BEQ     1$                      ;BR IF SELECTOR
 1156  006026  112737  000000  006427          MOVB    #0,@#ENTRY2+1           ;MUX TT CUCR
 1157  006034  000403                          BR      2$                      ;GO
 1158  006036  112737  177777  006427  1$:     MOVB    #-1,@#ENTRY2+1          ;CUCR OF DXCA TT ENTRY
 1159  006044  113777  014214  173254  2$:     MOVB    @#DEV,@CUAR             ;LOAD DEV ADRS
 1160  006052  012737  006052  012106          MOV     #.,@#TERPC              ;DEFINE ORIGIN OF TRACE ERROR
 1161  006060  004737  007064                  JSR     PC,STATUSPRESENTATION   ;PRESENT STATUS
 1162
 1163
```

```
                                ;*****************************************************************
                                ;TEST   6       END OF TEST STRING
                                ;*****************************************************************
006064  104400                  TST6:   SCOPE
006066  012737  000001  011654          MOV     #1,@#ICOUNT     ;ITERATION COUNT
006074  012737  000006  012636          MOV     #6,@#ERTSTN     ;SAVE TEST # FOR ERROR REPORT
006102  012737  006110  011660          MOV     #SCP6,@#RETURN  ;SCOPE LOOP RETURN ADRS
006110                          SCP6:

                                .REM    *

                                THIS TEST FUNCTIONS AS A TERMINATOR FOR THE CHAINABLE TEST STRING.
                                AS SUCH IT TRANSFERS CONTROL TO THE LOOP CONTROL SUBROUTINE.

                                        *

006110  000137  013666                  JMP     @#LPCNTL


                                ;INTERRUPT HANDLERS

006114  104000                  FALSE:  ERROR                   ;FALSE OR UNEXPECTED INTERRUPT
006116  000002                          RTI

006120  032777  000200  173152  INTR:   BIT     #DONE,@DXCS     ;TEST DONE
006126  001001                          BNE     .+4             ;BRANCH ON DONE
006130  104000                          ERROR                   ;FALSE INTERRUPT
006132  042777  000200  173140          BIC     #DONE,@DXCS     ;CLEAR INT CONDTION
006140  052737  100000  006150          BIS     #INTOK,INTPAS   ;SET INT PASS FLAG
006146  000002                          RTI

006150  000000                  INTPAS: 0                       ;INTERRUPT PASS FLAG


                                ;INTERR, ROUTINE TO TEST FOR SUCCESSFUL INTERRUPT

006152                          INTERR:
006152  032737  100000  006150          BIT     #INTOK,INTPAS   ;DID INTERRUPT OCCUR
006160  001405                          BEQ     IRR             ;BRANCH IF NOT
006162  062716  000002          IRR2:   ADD     #2,@SP          ;INC RETURN PC
006166  042737  100000  006150          BIC     #INTOK,INTPAS   ;CLEAR PASS FLAG
006174  000207                  IRR:    RTS     PC

                                ;ZEROTT, ROUTINE TO ZERO TUMBLE TABLE

006176                          ZEROTT:
006176  010146                          MOV     R1,-(SP)
006200  010246                          MOV     R2,-(SP)
006202  013701  001440                  MOV     TT,R1
006206  012702  000400                  MOV     #256.,R2
006212  005021                  ZTT1:   CLR     (R1)+
006214  005302                          DEC     R2
006216  001375                          BNE     ZTT1
```

```
1220  006220  012602                        MOV     (SP)+,R2
1221  006222  012601                        MOV     (SP)+,R1
1222  006224  000207                        RTS     PC
1223
1224                                ;TTZERO, ROUTINE TO VERIFY TT ZERO
1225
1226  006226                        TTZERO:
1227  006226  010146                        MOV     R1,-(SP)
1228  006230  010246                        MOV     R2,-(SP)
1229  006232  013701  001440                MOV     TT,R1
1230  006236  012702  000400                MOV     #256.,R2
1231  006242  005721                TTZ1:   TST     (R1)+
1232  006244  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1233  006246  104000                        ERROR                   ;ILLEGAL TT ENTRY
1234  006250  005302                        DEC     R2
1235  006252  001373                        BNE     TTZ1
1236  006254  012602                        MOV     (SP)+,R2
1237  006256  012601                        MOV     (SP)+,R1
1238  006260  000207                        RTS     PC
1239
1240                                ;ISS DONE INTERRUPT SERVICE
1241  006262                        SEL.DONE:
1242  006262  032777  000200  173010        BIT     #DONE,@DXCS     ;CHECK DONE
1243  006270  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1244  006272  104000                        ERROR                   ;FALSE INTERRUPT
1245  006274  042777  000200  172776        BIC     #DONE,@DXCS     ;CLEAR DONE
1246  006302  032777  000200  172770        BIT     #DONE,@DXCS
1247  006310  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1248  006312  104000                        ERROR                   ;DONE NOT CLEAR
1249  006314  012746  006540                MOV     #SEL.X,-(SP)    ;FAKE A JSR PC,TT.TRACE
1250
1251                                ;TT.TRACE, ROUTINE TO TRACE TUMBLE TABLE ENTRIES
1252                                ;AND THE TTNDX
1253  006320                        TT.TRACE:
1254
1255  006320  010146                        MOV     R1,-(SP)
1256  006322  013701  006526                MOV     @#TTRACE,R1     ;LOAD R1 WITH SOFTWARE IT
1257  006326  020137  001440                CMP     R1,@#TT         ;CHECK FOR BOTTOM OF TABLE
1258  006332  001005                        BNE     1$              ;BRANCH IF  NOT  BOTTOM
1259  006334  005737  003776                TST     @#3776          ;LOOK AT  TOP OF TT
1260  006340  001401                        BEQ     .+4             ;BRANCH IF NO RAP AROUND
1261  006342  104002                        TRACER                  ;REPORT TT TRACE ERROR
1262  006344  000404                        BR      2$
1263  006346  005741                1$:     TST     -(R1)           ;CHECK FOR TT OVERFLOW
1264  006350  001401                        BEQ     .+4             ;BRANCH IF NO RAP AROUND
1265  006352  104002                        TRACER                  ;TT OVERFLOW ERROR
1266  006354  005721                        TST     (R1)+           ;INC TO ENTRY
1267  006356  011127                2$:     MOV     (R1),(PC)+      ;SAVE ENTRY ONE
1268  006360  000000                SENRY1: 0                       ;HERE
1269  006362  023727  006360                CMP     @#SENRY1,(PC)+  ;COMPARE SAVED ENTRY WITH
1270  006366  000000                ENTRY1: 0                       ;EXPECTED ENTRY
1271  006370  001407                        BEQ     1$              ;BRANCH IF DXDS ENTRY OK
1272  006372  013737  006360  006534        MOV     @#SENRY1,@#TTWAS
1273  006400  013737  006366  006536        MOV     @#ENTRY1,@#TTSHOULD
1274  006406  104002                        TRACER                  ;REPORT TT TRACE ERROR
1275  006410  005037  006366        1$:     CLR     ENTRY1
```

```
1276  006414  005021                          CLR     (R1)+           ;CLEAR ENTRY AND ADVANCE POINTER
1277  006416  011127                          MOV     (R1),(FC)+      ;SAVE ENTRY TWO
1278
1279  006420  000000                  SENRY2: 0                       ;HERE
1280  006422  023727  006420                  CMP     @#SENRY2,(PC)+  ;COMPARE SAVED ENTRY WITH
1281  006426  000000                  ENTRY2: 0                       ;EXPECTED ENTRY
1282  006430  001411                  TT.T0:  BEQ     2$              ;BRANCH IF DXCA ENTRY OK
1283  006432  013737  006420  006534          MOV     @#SENRY2,@#TTWAS
1284  006440  013737  006426  006536          MOV     @#ENTRY2,@#TTSHOULD
1285  006446  104002                          TRACER                  ;REPORT TT TRACE ERROR
1286  006450  005037  006426                  CLR     ENTRY2
1287  006454  005021                  2$:     CLR     (R1)+           ;CLEAR
1288  006456  022701  004000                  CMP     #TST1,R1        ;CHECK FOR SOFTWARE
1289  006462  001002                          BNE     TT.T1           ;BRANCH IF NO OVERFLOW
1290  006464  013701  001440                  MOV     @#TT,R1
1291  006470  005037  006500          TT.T1:  CLR     @#TT.T2
1292  006474  117727  172650                  MOVB    @TTNDX,(PC)+    ;SAVE TTNDX
1293  006500  000000                  TT.T2:  0                       ;HERE
1294  006502  006337  006500                  ASL     TT.T2           ;SCALE MOD(2)
1295  006506  063737  001440  006500          ADD     @#TT,@#TT.T2    ;ADD BASE OF TT TO INDEX
1296  006514  123701  006500                  CMPB    @#TT.T2,R1      ;COMPARE TT POINTERS
1297  006520  001401                          BEQ     .+4             ;BRANCH IF HARDWARE AND SOFTWARE TT POINTERS MATCH
1298  006522  104002                          TRACER                  ;REPORT TT TRACE ERROR
1299  006524  010127                          MOV     R1,(PC)+        ;SAVE TT TRACE
1300  006526  000000                  TTRACE: 0                       ;HERE
1301  006530  012601                          MOV     (SP)+,R1
1302  006532  000207                          RTS     PC              ;RETURN
1303  006534  000000                  TTWAS:          0       ;ACTUAL CONTENTS OF TT
1304  006536  000000                  TTSHOULD:       0               ;EXPECTED CONTENTS OF TT
1305
1306  006540  000002                  SEL.X:  RTI
1307
1308                                  ;SUBROUTINE TO INIT DX FOR TT TRACINR
1309
1310  006542  042777  077777  172540  TRAINT: BIC     #77777,@DXMO    ;DESELECT
1311  006550  112777  000100  172664          MOVB    #SM,@DST        ;RESPONSE TO TEST IO
1312  006556  032737  000002  013602          BIT     #BIT1,@#PARA    ;CHECK FOR CUBSY MODE
1313  006564  001410                          BEQ     TI.0            ;BRANCH IF NOT CU BUSY
1314  006566  052777  004000  172504          BIS     #BSYEN,@DXCS    ;SET BSYEN
1315  006574  032777  004000  172476          BIT     #BSYEN,@DXCS    ;VERIFY SET
1316  006602  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1317  006604  104000                          ERROR                   ;BSYEN NOT SET
1318  006606  113737  014214  006426  TI.0:   MOVB    @#DEV,@#ENTRY2  ;SECOND TT ENTRY = DXCA
1319  006614  113737  014216  006427          MOVB    @#CMD,@#ENTRY2+1        ;
1320  006622  113777  014216  172500          MOVB    @#CMD,@CUCR     ;LOAD COMMAND
1321  006630  113777  014214  172470          MOVB    @#DEV,@CUAR     ;LOAD COMMAND IN CUAR
1322  006636  052777  000100  172434          BIS     #INTEN,@DXCS    ;SET INTERRUPT ENABLE
1323  006644  032777  000100  172426          BIT     #INTEN,@DXCS    ;VERIFY SET
1324  006652  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1325  006654  104000                          ERROR                   ;INTEN NOT SET
1326  006656  013777  001270  172402          MOV     @#DXPRT,@DXIS   ;LOAD INT STATUS
1327  006664  012777  006262  172372          MOV     #SEL.DONE,@DXIV ;LOAD INT VECTOR
1328  006672  000207                          RTS     PC
1329
1330
1331
```

```
 1332  006674  104000                  O.BRK:  ERROR   ;BREAK TRAP IS ILLEGAL
 1333  006676  022626                          CMP     (SP)+,(SP)+     ;RESTORE STACK
 1334  006700  000137  012724                  JMP     @#MON1.0
 1335                                  ;****************************** MOD APR 74 ******************************
 1336                                  ;*                          11/40.11/45 RTT
 1337                                  ;*                          TRACE TRAP MOD
 1338
 1339  006704  000002                  YESRTI: RTI
 1340  006706  000002                  RTX:    RTI             ;MODIFIED FOR 11/40.11/45 TO RTT
 1341                                  ;****************************** MOD APR 74 ******************************
 1342                                  ;*                          TIMING
 1343                                  ;*                  MOS.BIPOLAR RESPONSE MOD
 1344
 1345  006710  000020                  DELAY:  20
 1346  006712  013727  006710          RDLAY:  MOV     DELAY,(PC)+
 1347  006716  000000                  1$:     0
 1348  006720  005337  006716          2$:     DEC     1$              ;DELAY FOR BIPOLAR MEMORY
 1349  006724  001375                          BNE     2$
 1350  006726  000207                          RTS     PC
 1351
 1352                                  ;****************************** MOD APR 74 ******************************
 1353                                  ;
 1354
 1355
 1356                                  .SBTTL  SETUP SELECTED PARAMETERS
 1357
 1358                                  ;SETUP, ROUTINE TO CLEAR DX AND SETUP THE FOLLOWING
 1359                                  ;       BIT2=   MUX CH
 1360                                  ;       BIT1=   BSYEN
 1361                                  ;       BIT0=   ON-LINE
 1362
 1363  006730  000240                  SETUP:  NOP
 1364  006732  042777  000200  172340          BIC     #DONE,@DXCS     ;CLR'DONE'+ THEREFORE 'LOCKO'
 1365  006740  042777  060000  172342          BIC     #HLDO!SELO,@DXMO        ;GET READY FOR NEXT ISS
 1366  006746  042777  177000  172336          BIC     #177000,@DXMI   ;
 1367  006754  052777  000010  172336          BIS     #TIMDIS,@DXES   ;SET DXTO DISABLE
 1368  006762  042737  100000  006150          BIC     #INTOK,INTPAS   ;CLEAR INTERRUPT PASS FLAG
 1369  006770  032737  000001  013602          BIT     #BIT0,PARA      ;TEST FOR ONLINE
 1370  006776  001402                          BEQ     SP1             ;BRANCH IF NOT ONLINE
 1371  007000  004737  007414                  JSR     PC,FOL          ;DO FAST ONLINE
 1372  007004  112777  000100  172430  SP1:    MOVB    #SM,@DST        ;RESPONSE TO TIO
 1373  007012  032737  000002  013602          BIT     #BIT1,PARA      ;WAS BSYEN SELECTED
 1374  007020  001405                          BEQ     SP2             ;BRANCH IF NOT
 1375  007022  052777  004000  172250          BIS     #BSYEN,@DXCS    ;SET BUSY ENABLE
 1376  007030  105077  172406                  CLRB    @DST            ;TIO GETS STATUS BY HARDWARE
 1377  007034  012777  006120  172222  SP2:    MOV     #INTR,@DXIV     ;SET UP DX INTERRUPT VECTOR
 1378  007042  013777  001270  172216          MOV     DXPRT,@DXIS     ;SET UP DX INTERRUPT STATUS
 1379  007050  052777  000100  172222          BIS     #INTEN,@DXCS    ;SET INT ENABLE
 1380  007056  005037  177776                  CLR     PS              ;CLEAR PROCESSOR STATUS
 1381  007062  000207                  SP4:    RTS     PC              ;RETURN
 1382
 1383
 1384
 1385
 1386                                  .SBTTL  STATUS PRESENTATION
 1387  007064                          STATUSPRESENTATION:
```

```
1388  007064  042777  000200  172206          BIC     #DONE,@DXCS     ;CLEAR DONE AND LOCKO
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1400
1401  007072  112777  000014  172232          MOVB    #CE+DE,@CUSR    ;LOAD CE/DE STATUS
1402
1403  007100  052777  000007  172172          BIS     #DXFST!GO,@DXCS ;SET FCTN/STATUS/GO
1404                                                                  ;STATUS-IN SHOULD RISE
1405
1406  007106  004737  011020                  JSR     %7,CUIS.SUB     ;EXECUTE CUIS
1407  007112  042777  060000  172170          BIC     #HLDO!SELO,@DXMO        ;DROP SELO!HLDO FOR NONZERO STATUS
1408  007120  052777  001000  172162          BIS     #SRVO,@DXMO     ;SERVICE-OUT UP
1409                                                                  ;STATUS-IN SHOULD FALL
1410
1411
1412  007126  042777  001000  172154          BIC     #SRVO,@DXMO     ;DROP SERVICE-OUT,
1413                                                                  ;THIS ENDS ES -- ESEND INT SHOULD
1414                                                                  ;BE UP AND CUBSY CLEAR
1415                                                                  ;CHECK FOR INTERRUPTS
1416  007134  005077  172152                  CLR     @DXMI   ;CLEAR DXMI
1417  007140  000207                          RTS     %7
1418
1419                                  .SBTTL  DATA TRANSFER ROUTINES
1420  007142                          TRANSFER:
1421  007142  052737  000001  014216          BIT     #1,CMD          ;IS COMMAND READ OR WRITE?
1422  007150  001012                          BNE     TR.WRITE        ;WRITE
1423
1424                                  ;OUTPUT HERE
1425  007152                          TR.READ:
1426  007152  052777  001000  172130          BIS     #SRVO,@DXMO     ;SERVICE-OUT UP
1427                                                                  ;SERVICE-IN SHOULD FALL
1428  007160  042777  001000  172122          BIC     #SRVO,@DXMO     ;SERVICE-OUT DOWN
1429                                                                  ;SERVICE-IN UP AGAIN IF MORE
1430  007166  005337  014252                  DEC     COUNT           ;LOOP TILL DONE
1431  007172  001367                          BNE     TR.READ         ;...
1432  007174  000416                          BR      TR.OUT
1433
1434                                  ;INPUT HERE
1435  007176                          TR.WRITE:
1436  007176  052177  172134                  BIS     (R1)+,@BUSO     ;PUT DATA ON BUS
1437  007202  052777  001000  172100          BIS     #SRVO,@DXMO     ;SERVICE-OUT UP
1438                                                                  ;SERVICE-IN SHOULD FALL
1439  007210  042777  001000  172072          BIC     #SRVO,@DXMO     ;SERVICE-OUT DOWN
1440  007216  042777  000777  172112          BIC     #777,@BUSO      ;TAKE DATA OFF BUS (SERVICE-IN UP)
1441  007224  005337  014252                  DEC     COUNT
1442  007230  001362                          BNE     TR.WRITE
1443
```

```
 1444  007232  000207                    TR.OUT: RTS     %7
 1445
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 1476
 1477                                .SBTTL  ONLINE ROUTINE
 1478                                ; **********************
 1479                                ;ONLIN, ROUTINE TO SET DX ONLINE
 1480                                ;AND WAIT FOR RELAY TO PICK
 1481                                ;
 1482
 1483  007234  012737  010000  007412  ONLIN:  MOV     #10000,CNT      ;WAIT FOR RELAY TO SETTLE
 1484  007242  005337  007412          OL4:    DEC     CNT
 1485  007246  001375                          BNE     OL4
 1486  007250  013777  001436  172024          MOV     SPW,@DXOS       ;LOAD DX OFFSET
 1487  007256  023777  001436  172016          CMP     SPW,@DXOS       ;VERIFY OFFSET IS LOADED
 1488  007264  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
 1489  007266  104000                          ERROR                   ;DXOS LOAD ERROR
 1490  007270  052777  001000  172002          BIS     #ONLINA,@DXCS   ;SET ONLINE BIT
 1491  007276  032777  001000  171774          BIT     #ONLINA,@DXCS   ;ONLINE REQUEST SET
 1492  007304  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
 1493  007306  104000                          ERROR                   ;ONLINA DID NOT SET
 1494  007310  012737  010000  007412          MOV     #10000,CNT      ;SET UP STALL FOR ONLINE RELAY
 1495  007316  005337  007412          OL2:    DEC     CNT             ;
 1496  007322  001375                          BNE     OL2
 1497  007324  032777  000004  171762          BIT     #ONLINB,@DXCB   ;IS DX ONLINE
 1498  007332  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
 1499  007334  104000                          ERROR                   ;ONLINB DID NOT SET
```

```
1500  007336  032777  100000  171744          BIT     #OPLO,@DXMO     ;
1501  007344  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1502  007346  104000                          ERROR                   ;ARE YOU REALLY MAINTENANCED CABLED?
1503  007350  052777  001000  171732  OL3:    BIS     #SRVO,@DXMO
1504  007356  032777  001000  171724          BIT     #SRVO,@DXMO     ;CHECK SERVICE OUT
1505  007364  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1506  007366  104000                          ERROR                   ;SRVO NOT SET
1507  007370  042777  001000  171712          BIC     #SRVO,@DXMO
1508  007376  032777  001000  171704          BIT     #SRVO,@DXMO     ;CHECK SERVICE OUT
1509  007404  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1510  007406  104000                          ERROR                   ;SRVO NOT ZERO
1511
1512  007410  000207                          RTS     PC
1513  007412  000000                  CNT:    0                       ;STALL
1514
1515
1516
1517                                  ;FAST ONLINE ROUTINE
1518
1519  007414  052777  001000  171656  FOL:    BIS     #ONLINA,@DXCS   ;SET ONLINE BIT
1520  007422  032777  001000  171650          BIT     #ONLINA,@DXCS   ;ONLINE REQUEST SET
1521  007430  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1522  007432  104000                          ERROR                   ;ONLINA NOT SET
1523  007434  032777  000004  171652  FOL1:   BIT     #ONLINB,@DXCB   ;IS DX ONLINE
1524  007442  001774                          BEQ     FOL1            ;WAIT FOR RELAY TO PICK
1525  007444  000207                          RTS     PC
1526
1527
1528
1529                                  .SBTTL  INITIAL SELECTION SEQUENCE
1530
1531                                  ;INITIAL SELECTION SEQUENCE
1532
1533  007446                          ISS.SUB:
1534  007446  032777  100000  171636          BIT     #OPLI,@DXMI     ;IS OPRI CLEAR
1535  007454  001401                          BEQ     1$              ;IF YES CONTINUE
1536  007456  104000                          ERROR                   ;ERROR-OPLI NOT RESET
1537  007460  052777  060400  171622  1$:     BIS     #PARO!HLDO!SELO,@DXMO   ;
1538  007466  032777  001000  171616          BIT     #CLKO,@DXMI     ;IS CLKO CLEAR
1539  007474  001001                          BNE     2$              ;IF NO CONTINUE
1540  007476  104000                          ERROR                   ;ERROR-CLKO DID NOT SET
1541  007500  032777  040000  171604  2$:     BIT     #SELI,@DXMI     ;IS SELI CLEAR
1542  007506  001001                          BNE     3$              ;IF NO CONTINUE
1543  007510  104000                          ERROR                   ;ERROR-SELI DID NOT SET
1544  007512  032777  000004  171604  3$:     BIT     #SELIBR,@DXES1  ;IS SELIBR SET
1545  007520  001001                          BNE     4$              ;IF NO CONTINUE
1546  007522  104000                          ERROR                   ;ERROR-SELIBR DID NOT SET
1547  007524  042777  060400  171556  4$:     BIC     #PARO!HLDO!SELO,@DXMO   ;
1548  007532  032777  001000  171552          BIT     #CLKO,@DXMI     ;IS CLKO CLEAR
1549  007540  001401                          BEQ     5$              ;IF YES CONTINUE
1550  007542  104000                          ERROR                   ;ERROR-CLKO NOT RESET
1551  007544  032777  040000  171540  5$:     BIT     #SELI,@DXMI     ;IS SELI CLEAR
1552  007552  001401                          BEQ     6$              ;IF YES CONTINUE
1553  007554  104000                          ERROR                   ;ERROR-SELI NOT RESET
1554  007556  032777  000004  171540  6$:     BIT     #SELIBR,@DXES1  ;IS SELIBR SET
1555  007564  001401                          BEQ     7$              ;IF YES CONTINUE
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1556  007566  104000                        ERROR                   ;ERROR-SELIBR NOT RESET
1557  007570  052777  040000  171512  7$:   BIS     #HLDO,@DXMO     ;SET HLDO
1558  007576  032777  020000  171504        BIT     #SELO,@DXMO     ;SELO SHOULD NOT SET
1559  007604  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1560  007606  104000                        ERROR                   ;SELO SHOULD NOT BE SET
1561  007610  042777  040000  171472  8$:   BIC     #HLDO,@DXMO     ;CLEAR HLDO
1562  007616  053777  014214  171464        BIS     DEV,@DXMO       ;LOAD BUSO WITH DEVICE ADRS
1563  007624  123777  014214  171504        CMPB    DEV,@BUSO       ;TEST BUSO FOR CORRECT ADRS
1564  007632  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1565  007634  104000                        ERROR                   ;BUSO DID NOT LOAD
1566                                ;****************************** MOD APR 74 ******************************
1567                                ;*              INITIAL SELECTION CLEANUP MOD
1568  007636  113777  014214  171462        MOVB    DEV,@CUAR
1569  007644  123777  014214  171454        CMPB    DEV,@CUAR
1570  007652  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1571  007654  104000                        ERROR                   ;CUAR BITS 7 THRU 0 FAILURE
1572                                ;****************************** MOD APR 74 ******************************
1573
1574  007656  052777  004000  171424        BIS     #ADRO,@DXMO     ;SET ADRS-OUT
1575  007664  132777  000010  171446        BITB    #10,@CONO       ;TEST ADRO UP
1576  007672  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1577  007674  104000                        ERROR                   ;ADRO DID NOT SET
1578
1579  007676  052777  040000  171404        BIS     #HLDO,@DXMO     ;SET HOLD-OUT
1580  007704  032777  040000  171376        BIT     #HLDO,@DXMO     ;TEST FOR HOLD-OUT UP
1581  007712  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1582  007714  104000                        ERROR                   ;HOLD OUT DID NOT SET
1583
1584  007716  052777  020000  171364        BIS     #SELO,@DXMO     ;SET SELECT-OUT
1585  007724  132777  000040  171406        BITB    #40,@CONO       ;TEST FOR SELECT-OUT
1586  007732  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1587  007734  104000                        ERROR                   ;SELECT-OUT DID NOT SET
1588
1589
1590  007736  032777  000002  171350        BIT     #ADRECC,@DXCB   ;WAS CU ADRS RECOGNISED
1591                                                                ;IS DEV A VALID CU ADRS
1592  007744  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1593  007746  104000                        ERROR                   ;DX DID NOT RECOGNISE CU ADRS
1594                                                                ;IF YES CHECK JUMPERS
1595                                                                ;ADRECC LOGIC
1596
1597
1598  007750  032777  000010  171316        BIT     #ISSREJ,@DXDS   ;TEST FOR ISS REJECT
1599  007756  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1600  007760  104000                        ERROR                   ;ISS REJECT SET
1601  007762  032777  100000  171322        BIT     #OPLI,@DXMI     ;OPLI SHOULD BE UP
1602  007770  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1603  007772  104000                        ERROR                   ;OPLI DID NOT SET
1604                                                                ;IS DEV A VALID DEVICE ON CU?
1605
1606  007774  042777  004000  171306        BIC     #ADRO,@DXMO     ;DROP ADRS-OUT
1607  010002  132777  000010  171330        BITB    #10,@CONO       ;IS ADRO DOWN
1608  010010  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1609  010012  104000                        ERROR                   ;ADRO DID NOT DROP
1610  010014  032737  000004  013602        BIT     #BIT2,PARA      ;TEST FOR MUX CH
1611  010022  001415                        BEQ     ISS3            ;BRANCH IF NOT  MUX
```

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1612  010024  042777  060000  171256          BIC     #SELO!HLDO,@DXMO  ;CLEAR SELECT-OUT, HOLD-OUT
1613  010032  032777  020000  171250          BIT     #SELO,@DXMO       ;DID SELO CLEAR
1614  010040  001401                          BEQ     .+4               ;BRANCH IF NO ERROR CONDITION
1615  010042  104000                          ERROR                     ;REPORT SELO NOT CLEAR
1616  010044  032777  040000  171236          BIT     #HLDO,@DXMO       ;DID HLDO CLEAR
1617  010052  001401                          BEQ     .+4               ;BRANCH IF NO ERROR CONDITION
1618  010054  104000                          ERROR                     ;HLDO DID NOT CLEAR
1619  010056  032777  010000  171226  ISS3:   BIT     #ADRI,@DXMI       ;ADDRESS-IN SHOULD BE UP
1620  010064  001001                          BNE     .+4               ;BRANCH IF NO ERROR CONDITION
1621  010066  104000                          ERROR                     ;ADRI DID NOT COME UP
1622
1623  010070  123777  014214  171244          CMPB    DEV,@BUSI         ;ADRS SHOULD BE ON BUSI
1624  010076  001401                          BEQ     .+4               ;BRANCH IF NO ERROR CONDITION
1625  010100  104000                          ERROR                     ;BUSI DOES NOT CONTAIN
1626                                                                    ;CORRECT ADRS
1627
1628  010102  032777  000400  171200          BIT     #PARO,@DXMO       ;IS PARO SET
1629  010110  001405                          BEQ     OFF               ;IF NO ,GO TO OFF
1630  010112  032777  000400  171172          BIT     #PARI,@DXMI       ;IS PARI SET
1631  010120  001006                          BNE     RET               ;IF YES CONTINUE
1632  010122  104000                          ERROR                     ;ERROR-PARI NOT ON
1633  010124  032777  000400  171160  OFF:    BIT     #PARI,@DXMI       ;IS PARI CLEAR
1634  010132  001401                          BEQ     RET               ;IF YES CONTINUE
1635  010134  104000                          ERROR                     ;ERROR-PARI NOT CLEAR
1636  010136  043777  014214  171172  RET:    BIC     DEV,@BUSO         ;REMOVE ADRS FROM BUS-OUT
1637  010144  105777  171166                  TSTB    @BUSO             ;ADRS REMOVED
1638  010150  001401                          BEQ     .+4               ;BRANCH IF NO ERROR CONDITION
1639  010152  104000                          ERROR                     ;BUSO DID NOT CLEAR
1640
1641  010154  053777  014216  171154          BIS     CMD,@BUSO         ;BUT COMMAND ON BUSO
1642  010162  123777  014216  171146          CMPB    CMD,@BUSO         ;DID COMMAND LOAD OK
1643  010170  001401                          BEQ     .+4               ;BRANCH IF NO ERROR CONDITION
1644  010172  104000                          ERROR                     ;CMD DID NOT LOAD PROPERLY
1645
1646  010174  052777  002000  171106          BIS     #CMDO,@DXMO       ;SET COMMAND OUT
1647  010202  132777  000004  171130          BITB    #4,@CONO                  ;DID CMDO SET
1648  010210  001001                          BNE     .+4               ;BRANCH IF NO ERROR CONDITION
1649  010212  104000                          ERROR                     ;CMDO DID NOT SET
1650
1651  010214  032777  000001  171052          BIT     #CMDREJ,@DXDS     ;TEST FOR COMMAND REJECT
1652  010222                          ISSCRJ:
1653  010222  001401                          BEQ     .+4               ;BRANCH IF NO ERROR CONDITION
1654  010224  104000                          ERROR                     ;COMMAND REJECTED
1655
1656  010226  032777  010000  171056          BIT     #ADRI,@DXMI       ;ADRI SHOULD FALL
1657  010234  001401                          BEQ     .+4               ;BRANCH IF NO ERROR CONDITION
1658  010236  104000                          ERROR                     ;ADRI DID NOT DROP
1659
1660  010240  043777  014216  171042          BIC     CMD,@DXMO         ;REMOVE CMD FROM BUSG
1661  010246  105777  171064                  TSTB    @BUSO             ;WAS CMD REMOVED
1662  010252  001401                          BEQ     .+4               ;BRANCH IF NO ERROR CONDITION
1663  010254  104000                          ERROR                     ;CMD DID NOT CLEAR
1664  010256  042777  002000  171024          BIC     #CMDO,@DXMO
1665  010264  032777  002000  171016          BIT     #CMDO,@DXMO
1666  010272  001401                          BEQ     .+4               ;BRANCH IF NO ERROR CONDITION
1667  010274  104000                          ERROR                     ;CMDO STUCK HIGH
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1668
1669
1670  010276  032777  004000  171006          BIT     #STAI,@DXMI     ;TEST FOR STATUS-IN
1671  010304  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1672  010306  104000                          ERROR                   ;STATUS-IN DID NOT RISE
1673  010310  010146                          MOV     R1,-(SP)
1674  010312  113701  014216                  MOVB    @#CMD,R1
1675  010316  042701  177400                  BIC     #177400,R1
1676  010322  063701  001442                  ADD     @#DST,R1
1677  010326  121177  171000                  CMPB    @R1,@CUSR
1678  010332  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1679  010334  104000                          ERROR                   ;STATUS FROM DST TRANSFER ERROR
1680  010336  121177  171000                  CMPB    @R1,@BUSI
1681  010342  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1682  010344  104000                          ERROR                   ;CUSR TO BUSI TRANSFER ERROR
1683  010346  012601                          MOV     (SP)+,R1
1684
1685
1686
1687  010350  032737  000004  013602          BIT     #BIT2,PARA      ;TEST FOR MUX CH
1688  010356  001023                          BNE     ISS2            ;BRANCH IF MUX
1689  010360  105737  014216                  TSTB    CMD             ;TEST FOR 'TEST I/O'' COMMAND
1690  010364  001403                          BEQ     ISS1            ;CLEAR SELO,HLDO IF T10 CMD
1691  010366  105777  170750                  TSTB    @BUSI           ;TEST BUSI FOR ZERO STATUS
1692  010372  001415                          BEQ     ISS2            ;DON'T CLEAR SELO,HLDO ON 0 STATUS
1693  010374  042777  060000  170706  ISS1:   BIC     #SELO!HLDO,@DXMO  ;CLEAR SELECT-OUT, HOLD-OUT
1694  010402  032777  020000  170700          BIT     #SELO,@DXMO     ;DID SELO CLEAR
1695  010410  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1696  010412  104000                          ERROR                   ;REPORT SELO NOT CLEAR
1697  010414  032777  040000  170666          BIT     #HLDO,@DXMO     ;DID HLDO CLEAR
1698  010422  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1699  010424  104000                          ERROR                   ;HLDO DID NOT CLEAR
1700
1701  010426  052777  001000  170654  ISS2:   BIS     #SRVO,@DXMO     ;SET SERVICE-OUT
1702  010434  032777  001000  170646          BIT     #SRVO,@DXMO     ;TEST SERVICE OUT
1703  010442  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1704  010444  104000                          ERROR                   ;SERVICE-OUT DID NOT SET
1705                                ;************** CAN'T READ DXMI ***********************************
1706                                ;       BIT     #STAI,@DXMI     ;STATUS-IN SHOULD DROP
1707                                ;                               ;STATUS-IN DID NOT DROP
1708                                ;       ERCALL  BEQ,
1709                                ;*****************************************************************
1710  010446  042777  001000  170634          BIC     #SRVO,@DXMO     ;DROP SERVICE-OUT
1711  010454  032777  001000  170626          BIT     #SRVO,@DXMO     ;TEST SERVICE-OUT
1712  010462  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1713  010464  104000                          ERROR                   ;SERVICE-OUT DID NOT CLEAR
1714
1715  010466  043777  014216  170614          BIC     CMD,@DXMO       ;CLEAR COMMAND FROM BUSO
1716  010474  105777  170636                  TSTB    @BUSO           ;TEST FOR BUSO CLEAR
1717  010500  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1718  010502  104000                          ERROR                   ;BUSO DID NOT CLEAR
1719
1720  010504  000207                          RTS     PC
1721
1722                                .SBTTL  HIO SUBROUTINE
1723
```

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1724  010506  032777  070000  170600  HIO.SUB:    BIT     #70000,@DXCB    ;TEST FOR PHASE ZERO
1725  010514  001103                  BNE     HIO.0           ;BRANCH IF SELECTED
1726
1727                                  ;SELECT
1728
1729  010516  053777  014214  170564          BIS     DEV,@DXMO       ;PUT ADRS ON BUSO
1730  010524  123777  014214  170604          CMPB    DEV,@BUSO       ;ADRS LOAD OK
1731  010532  001401                  BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1732  010534  104000                  ERROR                   ;ADRS LOAD ERROR
1733
1734  010536  052777  004000  170544          BIS     #ADRO,@DXMO     ;SET & CHECK ADRS-OUT
1735  010544  032777  004000  170536          BIT     #ADRO,@DXMO
1736  010552  001001                  BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1737  010554  104000                  ERROR                   ;ADRO NOT SET
1738  010556  052777  040000  170524          BIS     #HLDO,@DXMO     ;SET & CHECK HLDO
1739  010564  032777  040000  170516          BIT     #HLDO,@DXMO
1740  010572  001001                  BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1741  010574  104000                  ERROR                   ;HLDO NOT SET
1742
1743  010576  052777  020000  170504          BIS     #SELO,@DXMO     ;SET & CHECK SELECT-OUT
1744  010604  032777  020000  170476          BIT     #SELO,@DXMO
1745  010612  001001                  BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1746  010614  104000                  ERROR                   ;SELO NOT SET
1747
1748  010616  032737  000002  013602          BIT     #BIT1,PARA      ;TEST FOR BSY SELECT
1749  010624  001406                  BEQ     HIOS.0
1750  010626  122777  000120  170506          CMPB    #STAMOD!BSY,@BUSI       ;CHECK STATUS
1751  010634  001401                  BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1752  010636  104000                  ERROR                   ;BUSI STATUS ERROR
1753  010640  000431                  BR      HIO.0
1754  010642                  HIOS.0:
1755  010642  123777  014214  170456          CMPB    DEV,@CUAR       ;VERIFY DEVICE ADDRESS
1756  010650  001401                  BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1757  010652  104000                  ERROR                   ;BUSO TO CUAR TRANSFER ERROR
1758
1759  010654  042777  004000  170426          BIC     #ADRO,@DXMO     ;CLEAR &  CHECK
1760  010662  032777  004000  170420          BIT     #ADRO,@DXMO     ;
1761  010670  001401                  BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1762  010672  104000                  ERROR                   ;ADRO SET
1763
1764  010674  123777  014214  170440          CMPB    DEV,@BUSI       ;IS CORRECT ADRS BEING ECHOED
1765  010702  001401                  BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1766  010704  104000                  ERROR                   ;BUSI LOAD ERROR
1767                                                          ;CHECK ADRECC,D
1768
1769  010706  043777  014214  170374          BIC     DEV,@DXMO       ;REMOVE ADRS FROM BUSO
1770  010714  105737  001310                  TSTB    DXMO            ;BRANCH IF CLEAR
1771  010720  001401                  BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1772  010722  104000                  ERROR                   ;BUSO DID NOT CLEAR
1773
1774
1775
1776  010724                  HIO.0:  ;INTERFACE DISCONNECT
1777  010724  042777  060000  170356          BIC     #HLDO!SELO,@DXMO        ;
1778  010732  032777  040000  170350          BIT     #HLDO,@DXMO             ;
1779  010740  001401                  BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
```

```
1780  010742  104000                        ERROR                   ;HLDO SET
1781
1782  010744  032777  020000  170336        BIT     #SELO,@DXMO             ;
1783  010752  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1784  010754  104000                        ERROR                   ;SELO SET
1785
1786  010756  052777  004000  170324        BIS     #ADRO,@DXMO             ;
1787
1788  010764  032777  004000  170316        BIT     #ADRO,@DXMO             ;
1789  010772  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1790  010774  104000                        ERROR                   ;ADRO NOT SET
1791
1792  010776  042777  004000  170304        BIC     #ADRO,@DXMO             ;
1793
1794  011004  032777  004000  170276        BIT     #ADRO,@DXMO             ;
1795  011012  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1796  011014  104000                        ERROR                   ;ADRO SET
1797  011016  000207                HIO.2:  RTS     PC
1798                                .SBTTL  CUIS SUBROUTINE
1799
1800                                ;
1801                                ;CUIS.SUB, SUBROUTINE TO EXECUTE A
1802                                ;CONTROL UNIT INITIATED SELECTION
1803                                ;
1804                                ;
1805  011020                        CUIS.SUB:
1806
1807  011020  032737  000004  013602        BIT     #BIT2,PARA
1808  011026  001510                        BEQ     CUIS0
1809
1810  011030                        CUIS.GO:
1811
1812  011030  032777  020000  170254        BIT     #REQI,@DXMI     ;TEST FOR REQUEST-IN OP
1813  011036  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1814  011040  104000                        ERROR                   ;REQI NOT SET
1815
1816  011042  052777  060000  170240        BIS     #SELO!HLDO,@DXMO  ;SET SELECT-OUT & HOLD-OUT
1817  011050  032777  020000  170232        BIT     #SELO,@DXMO     ;TEST FOR SELECT-OUT
1818  011056  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1819  011060  104000                        ERROR                   ;SELO NOT SET
1820
1821  011062  032777  040000  170220        BIT     #HLDO,@DXMO     ;TEST FOR HOLD-OUT
1822  011070  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1823  011072  104000                        ERROR                   ;HLDO NOT SET
1824
1825  011074  032777  100000  170210        BIT     #OPLI,@DXMI     ;TEST FOR OPERATIONAL-IN
1826  011102  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1827  011104  104000                        ERROR                   ;OPLI NOT SET
1828
1829  011106  032777  020000  170176        BIT     #REQI,@DXMI     ;TEST FOR REQI
1830  011114  001401                        BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1831  011116  104000                        ERROR                   ;REQI DID NOT DROP
1832
1833  011120  032777  010000  170164        BIT     #ADRI,@DXMI     ;TEST FOR ADDRESS IN
1834  011126  001001                        BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1835  011130  104000                        ERROR                   ;ADRI NOT SET
```

```
1836
1837  011132  123777  014214  170202          CMPB    DEV,@BUSI       ;ADDRESS ON BUSI
1838  011140  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1839  011142  104000                          ERROR                   ;BUSI LOAD ERROR
1840
1841  011144  052777  002000  170136          BIS     #CMDO,@DXMO     ;SET COMMAND-OUT
1842  011152  032777  002000  170130          BIT     #CMDO,@DXMO
1843  011160  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
1844  011162  104000                          ERROR                   ;CMDO DID NOT SET
1845
1846  011164  032777  010000  170120          BIT     #ADRI,@DXMI     ;ADRI SHOULD DROP
1847  011172  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1848  011174  104000                          ERROR                   ;ADRI DID NOT DROPS
1849
1850  011176  042777  060000  170104          BIC     #SELC HLDO,@DXMO
1851  011204  032777  040000  170076          BIT     #HLDO,@DXMO     ;TEST HOLD-OUT
1852  011212  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1853  011214  104000                          ERROR                   ;HLDO SET
1854
1855  011216  032777  020000  170064          BIT     #SELO,@DXMO     ;TEST SELECT-OUT
1856  011224  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1857  011226  104000                          ERROR                   ;SELO SET
1858
1859  011230  042777  002000  170052          BIC     #CMDO,@DXMO     ;CLEAR COMMAND-OUT
1860  011236  032777  002000  170044          BIT     #CMDO,@DXMO     ;TEST FOR CMDO CLEAR
1861  011244  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
1862  011246  104000                          ERROR                   ;CMDO SET
1863
1864  011250  000207              CUISO: RTS      PC
1865
1866                              ;FAST ISS SELECTOR CH ONLY
1867
1868  011252                      FASTISS:
1869  011252  053777  014214  170030          BIS     DEV,@DXMO       ;PUT DEVICE AORS ON OUT TAGS
1870  011260  052777  004000  170022          BIS     #ADRO,@DXMO     ;RAISE ADRS-OUT
1871  011266  052777  060000  170014          BIS     #HLDO!SELO,@DXMO        ;RAISE SELECT-OUT, HOLD-OUT
1872  011274  042777  004000  170006          BIC     #ADRO,@DXMO     ;REMOVE ADRS-OUT
1873  011302  043777  014214  170000          BIC     DEV,@DXMO       ;REMOVE ADRS
1874  011310  053777  014216  167772          BIS     CMD,@DXMO       ;PUT COMMAND ON OUT TAGS
1875  011316  052777  002000  167764          BIS     #CMDO,@DXMO     ;RAISE CMD-OUT
1876  011324  043777  014216  167756          BIC     CMD,@DXMO       ;REMOVE CMD
1877  011332  042777  002000  167750          BIC     #CMDO,@DXMO     ;REMOVE CMD-OUT
1878  011340  032737  000004  013602          BIT     #BIT2,PARA      ;TEST FOR MUX CH
1879  011346  001006                          BNE     FISS1           ;BRANCH FI MUX
1880  011350  105737  014216                  TSTB    CMD             ;TEST FOR 'TEST I/O'' COMMAND
1881  011354  001403                          BEQ     FISS1           ;CLEAR SELO,HLDO IF TIO CMD
1882  011356  105777  167760                  TSTB    @BUSI           ;TEST BUSI FOR ZERO STATUS
1883  011362  001403                          BEQ     FISS2           ;DON'T CLEAR SELO,HLDO ON 0 STATUS
1884  011364  042777  060000  167716  FISS1:  BIC     #HLDO!SELO,@DXMO        ;CLEAR SELO AND HLDO
1885  011372  052777  001000  167710  FISS2:  BIS     #SRVO,@DXMO     ;RELEAVE STATUS
1886  011400  042777  001000  167702          BIC     #SRVO,@DXMO     ;
1887  011406  000207                          RTS     PC
1888
1889                              ;SEL CH ISS
1890
1891  011410                      SEL.ISS:
```

```
1892  011410  053777  014214  167710          BIS     DEV,@CUAR       ;PRESET COM/ADD REG DEV ADDRESS
1893  011416  042777  000400  167702          BIC     #400,@CUAR      ;PARITY RESET
1894  011424  053777  014214  167656          BIS     DEV,@DXMO       ;PUT DEVICE ADRS ON OUT TAGS
1895  011432  052777  004000  167650          BIS     #ADRO,@DXMO     ;RAISE ADRS-OUT
1896  011440  052777  060000  167642          BIS     #HLDO!SELO,@DXMO        ;RAISE SELECT-OUT, HOLD-OUT
1897  011446  042777  004000  167634          BIC     #ADRO,@DXMO     ;REMOVE ADRS-OUT
1898  011454  043777  014214  167626          BIC     DEV,@DXMO       ;REMOVE ADRS
1899  011462  053777  014216  167620          BIS     CMD,@DXMO       ;PUT COMMAND ON OUT TAGS
1900  011470  052777  002000  167612          BIS     #CMDO,@DXMO     ;RAISE CMD-OUT
1901  011476  043777  014216  167604          BIC     CMD,@DXMO       ;REMOVE CMD
1902  011504  042777  002000  167576          BIC     #CMDO,@DXMO     ;REMOVE CMD-OUT
1903  011512  052777  001000  167570          BIS     #SRVO,@DXMO     ;RELEAVE STATUS
1904  011520  042777  001000  167562          BIC     #SRVO,@DXMO     ;
1905  011526  000207                          RTS     PC
1906                          ;SCOPE LOOP AND CONTROL SUBROUTINE
1907
1908  011530  105777  167642          SCOPEC: TSTB    @TKS
1909  011534  100014                          BPL     SCOPEH
1910  011536  017727  167636                  MOV     @TKB,(PC)+
1911  011542  000000                  DTMP:   0
1912  011544  042737  000200  011542          BIC     #200,DTMP
1913  011552  123727  011542  000003          CMPB    DTMP,#3
1914  011560  001002                          BNE     SCOPEH
1915  011562  000137  012724                  JMP     @#MON1.0
1916  011566  032737  040000  177570  SCOPEH: BIT     #BIT14,SR       ;TEST FOR SCOPE
1917  011574  001012                          BNE     SCOPEB          ;BRANCH IF SCOPE SELECTED
1918  011576  032737  004000  177570          BIT     #BIT11,SR       ;TEST FOR ITERATIONS
1919  011604  001020                          BNE     SCOPEA          ;EXIT IF ITERATIONS INHIBITED
1920  011606  005237  011656                  INC     SCOPEF          ;INCREMENT ITERATION COUNT
1921  011612  023737  011656  011654          CMP     SCOPEF,ICOUNT   ;TEST FOR COMPLETION OF ITERATIONS
1922  011620  001410                          BEQ     SCOPEG          ;BRANCH IF COMPLETE
1923  011622  012737  177777  014206  SCOPEB: MOV     #-1,ONESHOT     ;SO YOU CAN SCOPE ON ONCE ONLY CODE
1924  011630  005726                          TST     (SP)+           ;POP RETURN PC
1925  011632  012637  177776                  MOV     (SP)+,PS        ;RESTOR PROCESSOR STATUS
1926  011636  000177  000016                  JMP     @RETURN         ;
1927  011642  011637  011660          SCOPEG: MOV     @SP,RETURN      ;SET UP SCOPE RETURN ADRS
1928  011646  005037  011656          SCOPEA: CLR     SCOPEF          ;CLEAR ITERATION COUNT
1929  011652  000002                          RTI
1930  011654  000001                  ICOUNT: 1                       ;NUMBER OF REQUESTED ITERATIONS
1931  011656  000000                  SCOPEF: 0                       ;ITERATION COUNT
1932  011660  004000                  RETURN: TST1                    ;DEFAULT RETURN
1933  011662                          TSTABLE:                        ;BEGINNING OF TABLE OF TEST ADDRESSES
1934          011762                  .=.+100                         ;TEST ADDRESS LIST
1935
1936
1937                          ;EMULATOR DECODER ROUTINE
1938
1939  011762                  EMTDECODER:
1940  011762  011646                  MOV     @R6,-(R6)       ;DUPLICATE PC ON STACK
1941  011764  162716  000002          SUB     #2,@R6          ;POINT PC TO EMT INST.
1942  011770  017616  000000          MOV     @(R6),@R6       ;MOV EMT INST ONTO STACK
1943  011774  121627  000024          CMPB    @R6,#20.        ;TEST THAT CALL IS WITHIN LIMITS
1944  012000  101401                  BLOS    EMTOK           ;BRANCH IF WITHIN LIMITS
1945  012002  104000                  ERROR
1946  012004  006116          EMTOK:  ROL     @R6             ;EMT ARGUMENT X 2.
1947  012006  042716  177001          BIC     #177001,@R6     ;CLEAR HIGH BYTE
```

```
1948  012012  062716  012024              ADD     #EMTAG,@R6      ;FORM ADRS OF ROUTINE ADRS
1949  012016  017616  000000              MOV     @(R6),@R6       ;PUT ROUTINE ADRS ON STACK
1950  012022  000136                      JMP     @(R6)+          ;JUMP TO ROUTINE
1951                                                               ;TAGS FOR EMT CALL
1952
1953  012024                      EMTAG:                           ;BEGINNING OF EMT TABLE
1954
1955  012024  000024              .BLKW   20.                      ;RESERVE 16. WORDS FOR ADRS LIST
1956
1957
1958                              ;ENTRY POINT FOR MAP ERRORS
1959  012074                      T.MAPERR:
1960  012074  012737  177777  012602      MOV     #-1,ERFLG       ;FLAG THAT THIS IS  MAP ERROR
1961  012102  000137  012244              JMP     @#OEF
1962  012106  000000              TERPC:  0               ;ORIGIN OF TRACE ERROR
1963                              ;TUMBLE TABLE TRACE ERROR TRAP
1964  012110                      T.TRACER:
1965  012110  012737  177776  012602      MOV     #-2,ERFLG
1966  012116  000004  021571              TYPE    ,TRCM1
1967  012122  010546                      MOV     TTY,-(SP)       ;SAVE TTY
1968  012124  013705  012636              MOV     ERTSTN,TTY              ;TYPE ERTSTN IN OCTAL
1969  012130  004737  017076              JSR     %7,PRINTS       ;AND SUPRESS LEADING ZERO'S
1970  012134  012605                      MOV     (SP)+,TTY       ;RESTORE TTY
1971  012136  000004  021623              TYPE    ,TRCM   ;TRACE ERROR AT:
1972  012142  010546                      MOV     TTY,-(SP)       ;SAVE TTY
1973  012144  013705  012106              MOV     TERPC,TTY               ;TYPE IN OCTAL
1974  012150  004737  017066              JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
1975  012154  012605                      MOV     (SP)+,TTY       ;RESTORE TTY
1976  012156  000004  021723              TYPE    ,TRC1
1977  012162  010546                      MOV     TTY,-(SP)       ;SAVE TTY
1978  012164  013705  006534              MOV     TTWAS,TTY               ;TYPE IN OCTAL
1979  012170  004737  017066              JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
1980  012174  012605                      MOV     (SP)+,TTY       ;RESTORE TTY
1981  012176  000004  021745              TYPE    ,TRC2
1982  012202  010546                      MOV     TTY,-(SP)       ;SAVE TTY
1983  012204  013705  006536              MOV     TTSHOULD,TTY            ;TYPE IN OCTAL
1984  012210  004737  017066              JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
1985  012214  012605                      MOV     (SP)+,TTY       ;RESTORE TTY
1986  012216  032701  000002              BIT     #BIT1,R1        ;TEST FOR DXDS OR DXCA
1987  012222  001003                      BNE     1$              ;BR IF DXCA
1988  012224  000004  021767              TYPE    ,TTDS
1989  012230  000402                      BR      2$
1990  012232  000004  022014      1$:     TYPE    ,TTCA
1991  012236                      2$:
1992  012236  000402                      BR      OEF
1993
1994                              ;ENTRY POINT FOR MOST ERRORS
1995
1996  012240                      T.ERROR:
1997  012240  005037  012602              CLR     ERFLG           ;FLAG THIS AS  NORMAL ERROR
1998  012244  005237  012634      OEF:    INC     ERRCNT          ;INC ERROR COUNT
1999  012250  010037  012640              MOV     R0,E.R0         ;SAVE R0
2000  012254  010137  012642              MOV     R1,E.R1         ;SAVE R1
2001  012260  010237  012644              MOV     R2,E.R2         ;SAVE R2
2002  012264  010337  012646              MOV     R3,E.R3         ;SAVE R3
2003  012270  010437  012650              MOV     R4,E.R4         ;SAVE R4
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2004  012274  010537  012652                    MOV     R5,E.R5         ;SAVE R5
2005  012300  032737  020000  177570            BIT     #BIT13,SR       ;TEST FOR INHIBIT  PRINT
2006  012306  001063                            BNE     PERRPC          ;BRANCH IF INHIBIED
2007  012310  000004  021305                    TYPE    ,ERPC
2008  012314  011627                            MOV     @SP,(PC)+       ;SAVE ERROR PC +2
2009  012316  000000                ETMP0:      0                       ;HERE
2010  012320  162737  000002  012316            SUB     #2,ETMP0        ;CORRECT PC
2011  012326  010546                            MOV     TTY,-(SP)       ;SAVE TTY
2012  012330  013705  012316                    MOV     @#ETMP0,TTY             ;TYPE IN OCTAL
2013  012334  004737  017066                    JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
2014  012340  012605                            MOV     (SP)+,TTY       ;RESTORE TTY
2015  012342  032737  010000  177570            BIT     #BIT12,SR       ;TEST FOR SHORT ERROR REPORT
2016  012350  001042                            BNE     PERRPC          ;BRANCH IF SHORT SELECTED
2017  012352  022737  177776  012602            CMP     #-2,ERFLG
2018  012360  001410                            BEQ     1$
2019  012362  000004  021521                    TYPE    ,MSG35          ;ERROR IN TEST:
2020  012366  010546                            MOV     TTY,-(SP)       ;SAVE TTY
2021  012370  013705  012636                    MOV     ERTSTN,TTY              ;TYPE ERTSTN IN OCTAL
2022  012374  004737  017076                    JSR     %7,PRINTS       ;AND SUPRESS LEADING ZERO'S
2023  012400  012605                            MOV     (SP)+,TTY       ;RESTORE TTY
2024  012402  000004  021450          1$:       TYPE    ,MSG26
2025  012406  010546                            MOV     TTY,-(SP)       ;SAVE TTY
2026  012410  013705  014224                    MOV     CUADRS,TTY              ;TYPE IN OCTAL
2027  012414  004737  017066                    JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
2028  012420  012605                            MOV     (SP)+,TTY       ;RESTORE TTY
2029  012422  000004  021254                    TYPE    ,CRLF
2030  012426  032737  000002  013602            BIT     #BIT1,@#PARA    ;TEST FOR BUSY ENABLE MODE
2031  012434  001402                            BEQ     EMOD1           ;BRANCH IF NOT
2032  012436  000004  021664                    TYPE    ,ABSYM          ;TYPE BUSY ENABLE
2033  012442  032737  000004  013602  EMOD1:    BIT     #BIT2,@#PARA    ;TEST FOR MUX CH
2034  012450  001402                            BEQ     EMOD2           ;BRANCH IF SELECTOR
2035  012452  000004  021703                    TYPE    ,AMUXM          ;TYPE MUX CH
2036  012456                            EMOD2:
2037  012456  032737  100000  177570  PERRPC:   BIT     #HLTSW,SR       ;TEST FOR HALT ON ERROR
2038  012464  001401                            BEQ     ERRLOP          ;BRANCH IF NO HALT
2039
2040
2041  012466  000000                            HALT                    ;HALT ON ERROR
2042  012470                            ERRLOP:
2043  012470  013700  012640                    MOV     E.R0,R0         ;RESTORE R0
2044  012474  013701  012642                    MOV     E.R1,R1         ;RESTORE R1
2045  012500  013702  012644                    MOV     E.R2,R2         ;RESTORE R2
2046  012504  013703  012646                    MOV     E.R3,R3         ;RESTORE R3
2047  012510  013704  012650                    MOV     E.R4,R4         ;RESTORE R4
2048  012514  013705  012652                    MOV     E.R5,R5         ;RESTORE R5
2049  012520  032737  040000  177570            BIT     #LOPSW,SR       ;TEST FOR SCOPE LOOP
2050  012526  001424                            BEQ     EXTR1
2051  012530  012706  001100                    MOV     #BEGIN,SP       ;REINIT STACK POINTER
2052  012534  012737  177777  014206            MOV     #-1,ONESHOT     ;REINIT ONESHOT TEST FLAGS
2053  012542  042777  000002  166550            BIC     #MCLKEN,@DXES   ;CLEAR MAINT CLOCK
2054  012550  005077  166534                    CLR     @DXMO           ;SYSTEM RESET
2055  012554  052777  000001  166516            BIS     #DXFRS,@DXCS    ;DX RESET
2056  012562  004737  015442                    JSR     PC,PREI         ;REINITIALIZE DX
2057  012566  013737  001272  177776            MOV     LESS1,PS        ;DX PRIORITY MINUS ONE
2058  012574  000177  177060                    JMP     @RETURN
2059
```

```
2060  012600  000002                  EXTR1:  RTI
2061  012602  000000                  ERFLG:  0               ;ERROR CONTROL FLAG -1=MAP ERROR
2062                                  ;LIST OF ASCII MESSAGE ADDRESSES
2063
2064  012604  021322                  ADRA:   ADXDS
2065  012606  021331                          ADXCA
2066  012610  021340                          ADXCS
2067  012612  021347                          ADXOS
2068  012614  021356                          ADXBA
2069  012616  021365                          ADXBC
2070  012620  021374                          ADXMO
2071  012622  021403                          ADXMI
2072  012624  021412                          ADXCB
2073  012626  021421                          ADXND
2074  012630  021430                          ADXES
2075  012632  021437                  ADRAE:  ADXES1
2076
2077
2078
2079                                  ;ERROR COUNT
2080
2081  012634  000000                  ERRCNT: 0
2082  012636  000000                  ERTSTN: 0               ;TEST NUMBER
2083
2084
2085                                  ;REGISTER STORAGE FOR ERROR REPORTING
2086
2087  012640  000000                  E.R0:   0       ;SAVED REGISTERS FOR ERROR REPORTING
2088  012642  000000                  E.R1:   0       ;SAVED REGISTERS FOR ERROR REPORTING
2089  012644  000000                  E.R2:   0       ;SAVED REGISTERS FOR ERROR REPORTING
2090  012646  000000                  E.R3:   0       ;SAVED REGISTERS FOR ERROR REPORTING
2091  012650  000000                  E.R4:   0       ;SAVED REGISTERS FOR ERROR REPORTING
2092  012652  000000                  E.R5:   0       ;SAVED REGISTERS FOR ERROR REPORTING
2093
2094                                  .SBTTL  MONITOR
2095
2096                                  ; ***************************************************************************
2097  012654                          MONITOR:
2098                                  ; ***************************************************************************
2099
2100
2101
2102  012654  012706  001100                  MOV     #BEGIN,SP       ;SET UP STACK POINTER
2103  012660  012737  000340  177776          MOV     #LEVEL7,PS      ;MONITOR AT LEVEL 7
2104  012666  004737  014520                  JSR     PC,@#MONDFLT    ;SET UP DEFAULT PARAMETERS
2105
2106  012672  012737  017224  000060          MOV     #TTYI,@#60      ;TTY KEYBOARD INT VEC
2107  012700  012737  000200  000062          MOV     #LEVEL4,@#62    ;LEVEL 4
2108  012706  000004  021175                  TYPE    ,HOME           ;HOME UP AND ERASE SCREEN
2109
2110  012712  000004  020074          H:      TYPE    ,HEADER
2111  012716  012737  013040  012714          MOV     #RELOD,@#H+2    ;HEADER TEXT GETS WIPED BY NPR'S
2112
2113  012724  000005                  MON1.0: RESET
2114  012726  005777  166446                  TST     @TKB            ;CLEAR FLAG
2115  012732  052777  000100  166436          BIS     #INTEN,@TKS     ;SET INTERRUPT ENABLE
```

```
2116  012740  012706  001100                  MOV     #BEGIN,SP       ;SET UP STACK POINTER
2117  012744  012737  000340  177776          MOV     #LEVEL7,PS      ;MONITOR AT LEVEL 7
2118  012752  000004  020615                  TYPE    ,FSTART
2119  012756  104006                          KEY.TO.R0
2120  012760  122700  000104                  CMPB    #'D,R0          ;D = DEFAULT PARAMETERS
2121  012764  001003                          BNE     1$
2122  012766  004737  014520                  JSR     PC,@#MONDFLT
2123  012772  000403                          BR      2$
2124  012774  122700  000120          1$:     CMPB    #'P,R0          ;P = PREVIOUSLY SELECTED PARAMETERS
2125  013000  001002                          BNE     3$
2126  013002  000137  013544          2$:     JMP     @#MON10
2127  013006  122700  000123          3$:     CMPB    #'S,R0          ;S = GO THROUGH AND SELECT PARAMETERS
2128  013012  001426                          BEQ     MON1
2129  013014  122700  000116                  CMPB    #'N,R0          ;N = START AT THIS TEST #
2130  013020  001341                          BNE     MON1.0
2131  013022  000004  020673                  TYPE    ,MSG5
2132  013026  104005                          ACCEPTO
2133  013030  013737  014232  014234          MOV     OCTNUM,FIRST.TST
2134  013036  000761                          BR      2$
2135
2136  013040  051137  046105  040517  RELOD:  .ASCIZ  ''_RELOAD FOR HEADER TEXT''
2137  013046  020104  047506  020122
2138  013054  042510  042101  051105
2139  013062  052040  054105  000124
2140                                  .EVEN
2141                                  ;SET UP TEST PARAMETERS
2142
2143  013070  004737  014520          MON1:   JSR     PC,MONDFLT      ;SET UP DEFAULT PARAMETERS
2144  013074  000004  020673                  TYPE    ,MSG5           ;FIRST TEST #
2145
2146  013100  104005                          ACCEPTO ;ACCEPT TEST NUMBER FROM KEYBOARD
2147
2148
2149  013102  005737  014232                  TST     OCTNUM          ;TEST FOR DEFAULT
2150  013106  001403                          BEQ     MON3            ;BRANCH ON DEFAULT
2151  013110  013737  014232  014234          MOV     OCTNUM,FIRST.TST        ;LOAD FIRST TEST #
2152
2153  013116  000004  020631          MON3:   TYPE    ,MSG2           ;BASE ADDRESS:
2154
2155
2156  013122  104005                          ACCEPTO                 ;ACCEPT BASE ADDRESS  FROM KEYBOARD
2157
2158  013124  005737  014232                  TST     OCTNUM          ;TEST FOR DEFAULT
2159  013130  001403                          BEQ     MON4            ;BRANCH IF DEFAULT
2160  013132  013737  014232  001262          MOV     OCTNUM,DXBASE   ;LOAD NON-DEFAULT ADDRESS
2161
2162  013140  000004  021465          MON4:   TYPE    ,MSG28          ;ACCEPT INTERRUPT VECTOR
2163  013144  104005                          ACCEPTO
2164  013146  005737  014232                  TST     OCTNUM          ;TEST FOR DEFAULT
2165  013152  001411                          BEQ     MON4.1          ;BRANCH IF DEFAULT
2166  013154  013737  014232  001264          MOV     OCTNUM,DXIV     ;LOAD NON-DEFAULT INT VECTOR ADRS
2167  013162  062737  000002  014232          ADD     #2,@#OCTNUM     ;FORM INT STATUS ADRS
2168  013170  013737  014232  001266          MOV     @#OCTNUM,@#DXIS ;INT STATUS ADDRESS
2169
2170
2171  013176  000004  021076          MON4.1: TYPE    ,MSG12          ;PRIORITY
```

```
 2172  013202  104005                          ACCEPTO          ;ACCEPT DX PRIORITY LEVEL
 2173  013204  005737  014232                  TST     OCTNUM           ;TEST FOR DEFAULT
 2174  013210  001425                          BEQ     MON6             ;BRANCH ON DEFAULT
 2175  013212  006337  014232                  ASL     OCTNUM           ;SHIFT PRIORITY
 2176  013216  006337  014232                  ASL     OCTNUM           ;INTO PROCESSOR
 2177  013222  006337  014232                  ASL     OCTNUM           ;PRIORITY BITS OF
 2178  013226  006337  014232                  ASL     OCTNUM           ;PROCESSOR STATUS WORD
 2179  013232  006337  014232                  ASL     OCTNUM
 2180  013236  013737  014232  001270          MOV     OCTNUM,DXPRT     ;LOAD PRIORITY
 2181  013244  005337  014232                  DEC     OCTNUM
 2182  013250  042737  000037  014232          BIC     #37,@#OCTNUM     ;CLEAR TNZVC
 2183  013256  013737  014232  001272          MOV     OCTNUM,LESS1     ;PRIORITY TO ALLOW DX INTERRUPTS
 2184
 2185
 2186
 2187                                  ;GENERATE A LIST OF LEGAL ADDRESSES
 2188
 2189  013264  000004  020712          MON6:   TYPE    ,MSG4            ;LEGAL ADDRESS LIST
 2190  013270  012703  014254                  MOV     #LEGAL.ADRS,R3   ;START OF LEGAL ADRS TABLE
 2191  013274  000004  021004          MON7:   TYPE    ,MSG6            ;ADRS:
 2192  013300  004737  015752                  JSR     PC,GETHEX        ;GET HEXADECIMAL CU ADDRESS
 2193  013304  104007  016410                  PARITY  ,HEXNUM          ;PUT PARITY (ODD) ON ADRS
 2194  013310  013723  016410                  MOV     HEXNUM,(R3)+     ;SAVE LEGAL ADDRESS
 2195  013314  104006                          KEY.TO.R0
 2196  013316  122700  000015                  CMPB    #CR,R0           ;ALL DONE?
 2197  013322  001364                          BNE     MON7             ;CONTINUE LIST IF NOT <CR>
 2198                                  ;****************************** MOD APR 74 ****************************
 2199                                  ;*
 2200                                  ;*                        ADDRESS RESPONSE MOD
 2201                                  ;
 2202  013324  013727  016410                  MOV     HEXNUM,(PC)+
 2203  013330  000000                  VLUHEX:0
 2204  013332  042737  000400  013330          BIC     #400,VLUHEX
 2205  013340  023727  013330  000376          CMP     VLUHEX,#376      ;TEST FOR > FF
 2206  013346  003403                          BLE     1$               ;(OK) BRANCHES
 2207  013350  000004  021123                  TYPE,   MSG13            ;OUTPUT ''= ILLEGAL ?'' I.E. > 'FF''
 2208  013354  000747                          BR      MON7             ;TRY AGAIN
 2209  013356  012723  177777          1$:     MOV     #-1,(R3)+        ;MARK END OF LIST
 2210                                  ;****************************** MOD APR 74 ****************************
 2211                                  ;*                          #DEV/CU MOD
 2212
 2213                                  ;SET UP MAXIMUM NUMBER OF DEVICES PER CONTROL UNIT
 2214                                  ;THIS INFORMATION DETERMINES WHAT THE SPW TABLE LOOKS LIKE
 2215
 2216  013362  000004  020651          MON5:   TYPE    ,MSG3            ;MAX # DEVICES/CU
 2217  013366  104005                          ACCEPTO                  ;ACCEPT NUMBER OF DEVICES/CU
 2218  013370  005737  014232                  TST     OCTNUM           ;USE 16- ON DEFAULT
 2219  013374  001003                          BNE     X1$
 2220  013376  000004  021123                  TYPE,   MSG13            ;OUTPUT ''= ILLEGAL ?'' I.E. = '00''
 2221  013402  000767                          BR      MON5             ;TRY AGAIN
 2222
 2223  013404  013727  014232          X1$:    MOV     OCTNUM,(PC)+
 2224  013410  000017                  RDXX:   17      ;THIS IS THE DEFAULT VALUE..GETS WIPED BY CONSVERSATIONAL
 2225  013412  005337  013410                  DEC     RDXX             ;RANGE MODULO 1
 2226  013416  013727  013330                  MOV     VLUHEX,(PC)+
 2227  013422  000000                  MDXX:   0                        ;RANGE MASK
```

```
2228  013424  063737  013410  013422          ADD     RDXX,MDXX       ;SCALE
2229  013432  105137  013422                  COMB    MDXX            ;FORM FINAL
2230  013436  042737  177400  013422          BIC     #177400,MDXX    ;CU PORTION CLR
2231
2232                                  ;****************************** MOD APR 74 ******************************
2233                                  ;
2234  013444  013737  014232  014236          MOV     OCTNUM,MAX.DEV.CU
2235  013452  004737  015334          MON5.1: JSR     PC,CKCUA        ;CHECK FOR LEGAL NUMBER OF DEV PER CU
2236
2237
2238                                  ;GET COMMAND LIST
2239
2240                                  .REM    *
2241
2242                                  THIS ROUTINE ACCEPTS AN IBM COMMAND LIST FROM THE CONSOL.  ALL
2243                                  COMMANDS MUST BE NON ZERO (I.E.  T10 MUST BE TYPED WITH PARITY
2244                                  400).  WITH EACH COMMAND THE MONITOR ASKS FOR ITS ASSOCIATED DST
2245                                  STATUS.
2246
2247                                          *
2248
2249  013456  012704  014500          MON8:   MOV     #CMD.STAT,R4
2250  013462  012703  014440                  MOV     #CMD.ADRS,R3
2251  013466  000004  021033                  TYPE    ,MSG9           ;LEGAL CMD LIST
2252  013472  000004  021064          MON9:   TYPE    ,MSG10          ;CMD:
2253  013476  104005                          ACCEPTO         ;ACCEPT LEGAL COMMANDS FROM KEYBOARD
2254  013500  005737  014232                  TST     OCTNUM
2255  013504  001417                          BEQ     MON10
2256  013506  104007  014232                  PARITY  ,OCTNUM
2257  013512  013723  014232                  MOV     OCTNUM,(R3)+
2258  013516  000004  021507                  TYPE    ,MSG31          ;'STATUS: ''
2259  013522  104005                          ACCEPTO
2260  013524  113724  014232                  MOVB    OCTNUM,(R4)+
2261  013530  104006                          KEY.TO.R0
2262  013532  120027  000015                  CMPB    R0,#CR
2263  013536  001355                          BNE     MON9
2264  013540  012723  177777                  MOV     #-1,(R3)+       ;LOAD TERMINATOR
2265
2266
2267                                  ;ASK FOR DYNAMIC SWITCH SETTINGS ON CONSOL SWITCHES
2268
2269  013544                          MON10:
2270  013544  012737  177777  014206          MOV     #-1,ONESHOT
2271  013552  005037  012634                  CLR     ERRCNT
2272  013556  000004  021014                  TYPE    ,MSG7           ;SET DYNAMIC SWITCHES
2273  013562  104006                          KEY.TO.R0               ;TYPE ANYTHING
2274  013564  122700  000003                  CMPB    #3,R0           ;TEST FOR CONTROL C
2275  013570  001002                          BNE     MON11           ;GO IF NO ^C
2276  013572  000137  012724                  JMP     @#MON1.0
2277
2278
2279                                  ;SET UP TABLES
2280
2281  013576  113727  177570          MON11:  MOVB    SWR,(PC)+       ;SAVE MODE CONTROL SWITCH SETTINGS
2282  013602  000000                  PARA:   0                       ;HERE
2283  013604  052737  000001  013602          BIS     #BIT0,@#PARA    ;SET ONLINE SELECT FLAG
```

```
2284  013612  004737  015334                JSR     PC,CKCUA        ;CMP ADRS VS MAX DEV PER CU
2285  013616  004737  015146                JSR     PC,SPW.SETUP    ;SET UP STATUS POINTER WORDS
2286  013622  004737  014772                JSR     PC,TT.CLR       ;CLEAR TUMBLE TABLE
2287  013626  004737  015304                JSR     PC,DST.SETUP    ;SETUP DEVICE STATUS TABLE
2288  013632  004737  015010                JSR     PC,ODAT         ;SET 360 SIM OUTPUT DATA FILE
2289  013636  004737  015646                JSR     PC,REG.SETUP    ;SCALE ADDRESSES
2290
2291  013642                        LPCSU:
2292  013642  012737  000001  014226        MOV     #1,DEVCNT       ;INIT DEVICE COUNT
2293  013650  012737  014254  014222        MOV     #LEGAL.ADRS,ACUA ;ADRS OF CU ADRS
2294  013656  117737  000340  014224        MOVB    @ACUA,CUADRS    ;CU ADDRESS
2295  013664  000472                        BR      LPC1
2296
2297  013666  000004  021200        LPCNTL: TYPE    ,BELL
2298
2299  013672  062737  000001  014224        ADD     #1,CUADRS       ;
2300  013700  005237  014226                INC     DEVCNT          ;INC DEVICE COUNT
2301  013704  023737  014226  014236        CMP     DEVCNT,MAX.DEV.CU
2302  013712  003457                        BLE     LPC1
2303  013714  012737  000001  014226        MOV     #1,DEVCNT       ;INIT DEVICE COUNT
2304  013722  027727  000274  177777        CMP     @ACUA,#-1
2305  013730  001042                        BNE     LPC2
2306  013732  062737  000002  013602        ADD     #2,PARA         ;INC TO NEXT PARA COMBINATION
2307  013740  022737  000010  013602        CMP     #10,PARA        ;HAVE ALL PARA COMBS BEEN TESTED?
2308  013746  002030                        BGE     LPC5            ;BRANCH IF NOT
2309  013750  042737  177776  013602        BIC     #177776,@#PARA  ;ALL BUT ONLINE IF SET
2310
2311                                ;************************** MOD APR 74 ********************************
2312                                ;*
2313                                ;*                      OPLI TIMEOUT RESET MOD
2314                                ;
2315  013756  012777  000001  165314        MOV     #1,@DXCS        ;DX RESET OPLI
2316
2317                                ;************************** MOD APR 74 ********************************
2318                                ;
2319  013764  000004  021202                TYPE    ,ENDTST
2320  013770  000004  021214                TYPE    ,ECM            ;ERROR COUNT MESSAGE
2321  013774  010546                        MOV     TTY,-(SP)       ;SAVE TTY
2322  013776  013705  012634                MOV     ERRCNT,TTY              ;TYPE IN OCTAL
2323  014002  004737  017066                JSR     PC,PRINTR       ;TYPE LEADING ZERO'S
2324  014006  012605                        MOV     (SP)+,TTY       ;RESTORE TTY
2325
2326                                ;THE FOLLOWING CODE IS FOR INTERFACE WITH DDP AND ACT11
2327
2328  014010  013700  000042                MOV     @#42,R0         ;IF 42 = 0 REMAIN IN DX DIAGNSTIC
2329  014014  001405                        BEQ     LPC5
2330  014016  000005                        RESET                   ;LINK TO DDP OR ACT11
2331  014020                        LOGICAL:
2332  014020  004710                        JSR     PC,@R0
2333  014022  000240                        NOP
2334  014024  000240                        NOP
2335  014026  000240                        NOP
2336  014030  012737  014254  014222  LPC5:   MOV     #LEGAL.ADRS,ACUA
2337  014036  017737  000160  014224  LPC2:   MOV     @ACUA,CUADRS
2338  014044  062737  000002  014222        ADD     #2,ACUA
2339  014052  104007  014224        LPC1:   PARITY  ,CUADRS
```

```
2340  014056  013737  014224  014214          MOV     CUADRS,DEV
2341  014064  013737  014214  014220          MOV     DEV,DEV.A       ;MULTI THREAD
2342  014072  023737  014226  014236          CMP     DEVCNT,MAX.DEV.CU
2343  014100  001404                          BEQ     LPC3
2344  014102  062737  000001  014220          ADD     #1,DEV.A
2345  014110  000403                          BR      LPC4
2346  014112  162737  000001  014220  LPC3:   SUB     #1,DEV.A
2347  014120  104007  014220          LPC4:   PARITY  ,DEV.A
2348
2349
2350  014124  004737  015442          MON12:  JSR     PC,PREI         ;DO PRE INIT
2351  014130  012777  006114  165126          MOV     #FALSE,@DXIV    ;SET UP FALSE INTERRUPT VECTOR TRAP
2352  014136  013777  001270  165122          MOV     DXPRT,@DXIS     ;SET UP INTERRUPT PRIORITY
2353  014144  013700  014234                  MOV     FIRST.TST,R0    ;TEST FOR DEFAULT
2354  014150  001002                          BNE     MON13           ;BRANCH IF NOT DEFAULT
2355  014152  005237  014234                  INC     FIRST.TST       ;DEFAULT TEST NUMBER IS ONE
2356  014156  013737  014234  012636  MON13:  MOV     FIRST.TST,ERTSTN
2357  014164  006300                          ASL     R0
2358  014166  016037  011660  011660          MOV     TSTABLE-2(R0),@#RETURN
2359  014174  062737  000024  011660          ADD     #24,@#RETURN
2360  014202  000170  011660          MON14:  JMP     @TSTABLE-2(R0)  ;JUMP TO SELECTED TEST
2361
2362
2363                                  .SBTTL  MONITOR FILES
2364
2365                                  ; ONE PASS FLAGS
2366
2367          000001                  FIVESEC=1                       ;5 SEC OPLI TIMER TEST
2368  014206  177777                  ONESHOT:        -1              ;ONE PASS FLAGS
2369  014210  000000                  CARRY:  0                       ;CARRY COUNT
2370  014212  000000                  TMP:    0               ;TEMPORARY STORAGE
2371  014214  000020                  DEV:    20              ;DEVICE ADDRESS TO SELECT - MUST INCLDE PARITY
2372                                                          ; ( I.E. 441 IS DEV=1, CU=2)
2373  014216  000403                  CMD:    403             ;COMMAND TO PRESET - MUST INCLUDE PARITY
2374                                                          ; (403 IS BASIC NOP COMMAND)
2375
2376  014220  000421                  DEV.A:  421             ;SECOND DEVICE FOR DUAL TESTS
2377
2378
2379  014222  000000                  ACUA:   0               ;ADRS OF CU ADRS
2380
2381
2382  014224  000000                  CUADRS: 0               ;CU ADRS
2383  014226  000000                  DEVCNT: 0               ;DEVICE COUNT
2384
2385  014230  002000                  OFFSET: 2000            ;OFFSET TO ADDRESS REGISTER
2386  014232  000000                  OCTNUM:         0               ;OCTAL INPUT FROM TTY
2387  014234  000000                  FIRST.TST:      0               ;FIRST TEST  TO RUN
2388  014236  000000                  MAX.DEV.CU:     0               ;MAXIMUM # OF DEVICES/CU
2389
2390                                  ;DIAGNOSTIC VARIABLES
2391
2392  014240  000777                  SSTAT:  777             ;SAVED STATUS
2393  014242  000000                  SRCCNT: 0               ;SOURCE DATA
2394  014244  000000                  DSTCNT: 0               ;DESTINATION DATA
2395  014246  000000                  SAVDEV: 0               ;SAVED DEVICE ADDRESS
```

```
2396  014250  000000                TSSFT:  0               ;TSSF TRACE
2397  014252  000000                COUNT:  0               ;USED BY CH SIM TO COUNT BYTES TRANSFFERED
2398
2399
2400                                ;LEGAL ADDRESS LIST
2401
2402  014254                        LEGAL.ADRS:
2403
2404  014254  000000                .WORD   0
2405  014256  000000                .WORD   0
2406  014260  000000                .WORD   0
2407  014262  000000                .WORD   0
2408  014264  000000                .WORD   0
2409  014266  000000                .WORD   0
2410  014270  000000                .WORD   0
2411  014272  000000                .WORD   0
2412  014274  000000                .WORD   0
2413  014276  000000                .WORD   0
2414  014300  000000                .WORD   0
2415  014302  000000                .WORD   0
2416  014304  000000                .WORD   0
2417  014306  000000                .WORD   0
2418  014310  000000                .WORD   0
2419  014312  000000                .WORD   0
2420  014314  000000                .WORD   0
2421
2422  014316                        SCALD.ADRS:
2423
2424  014316  000000                .WORD   0
2425  014320  000000                .WORD   0
2426  014322  000000                .WORD   0
2427  014324  000000                .WORD   0
2428  014326  000000                .WORD   0
2429  014330  000000                .WORD   0
2430  014332  000000                .WORD   0
2431  014334  000000                .WORD   0
2432  014336  000000                .WORD   0
2433  014340  000000                .WORD   0
2434  014342  000000                .WORD   0
2435  014344  000000                .WORD   0
2436  014346  000000                .WORD   0
2437  014350  000000                .WORD   0
2438  014352  000000                .WORD   0
2439  014354  000000                .WORD   0
2440  014356  000000                .WORD   0
2441
2442
2443                                ;LIST OF DEFAULT COMMANDS
2444
2445  014360                        DFLT.CMD:
2446
2447  014360  000400                        TIOC                    ;TEST I/O COMMAND
2448  014362  000001                        WRITEC                  ;WRITE COMMAND
2449  014364  000002                        READC                   ;READ COMMAND
2450  014366  000403                        NOPC                    ;NOP COMMAND
2451  014370  000004                        SENSEC                  ;SENSE COMMAND
```

```
2452  014372  000405                  ILLC                    ;ILLAGAL COMMAND
2453  014374  177777                  -1                      ;LIST TERMINATOR
2454  014376  177777                  -1                      ;LIST TERMINATOR
2455  014400  177777                  -1                      ;LIST TERMINATOR
2456  014402  177777                  -1                      ;LIST TERMINATOR
2457  014404  177777                  -1                      ;LIST TERMINATOR
2458  014406  177777                  -1                      ;LIST TERMINATOR
2459  014410  177777                  -1                      ;LIST TERMINATOR
2460  014412  177777                  -1                      ;LIST TERMINATOR
2461  014414  177777                  -1                      ;LIST TERMINATOR
2462  014416  177777                  -1                      ;LIST TERMINATOR
2463
2464
2465
2466
2467
2468                                  ;DEFAULT STATUS LIST
2469
2470  014420                          DFLT.STAT:
2471  014420      000                         .BYTE   0
2472  014421      000                         .BYTE   0
2473  014422      000                         .BYTE   0
2474  014423      014                         .BYTE   CE!DE
2475  014424      000                         .BYTE   0
2476  014425      002                         .BYTE   UC
2477  014426      002                         .BYTE   UC
2478  014427      002                         .BYTE   UC
2479  014430      002                         .BYTE   UC
2480  014431      002                         .BYTE   UC
2481  014432      002                         .BYTE   UC
2482  014433      002                         .BYTE   UC
2483  014434      002                         .BYTE   UC
2484  014435      002                         .BYTE   UC
2485  014436      002                         .BYTE   UC
2486  014437      002                         .BYTE   UC
2487
2488
2489
2490                                  ;LIST OF LEGAL COMMANDS
2491
2492  014440                          CMD.ADRS:
2493
2494  014440  000000                  .WORD   0
2495  014442  000000                  .WORD   0
2496  014444  000000                  .WORD   0
2497  014446  000000                  .WORD   0
2498  014450  000000                  .WORD   0
2499  014452  000000                  .WORD   0
2500  014454  000000                  .WORD   0
2501  014456  000000                  .WORD   0
2502  014460  000000                  .WORD   0
2503  014462  000000                  .WORD   0
2504  014464  000000                  .WORD   0
2505  014466  000000                  .WORD   0
2506  014470  000000                  .WORD   0
2507  014472  000000                  .WORD   0
```

```
2508  014474  000000                    .WORD   0
2509  014476  000000                    .WORD   0
2510
2511                                    ;COMMAND STATUS
2512
2513  014500                            CMD.STAT:
2514
2515  014500      000                           .BYTE   0
2516  014501      000                           .BYTE   0
2517  014502      000                           .BYTE   0
2518  014503      000                           .BYTE   0
2519  014504      000                           .BYTE   0
2520  014505      000                           .BYTE   0
2521  014506      000                           .BYTE   0
2522  014507      000                           .BYTE   0
2523  014510      000                           .BYTE   0
2524  014511      000                           .BYTE   0
2525  014512      000                           .BYTE   0
2526  014513      000                           .BYTE   0
2527  014514      000                           .BYTE   0
2528  014515      000                           .BYTE   0
2529  014516      000                           .BYTE   0
2530  014517      000                           .BYTE   0
2531
2532
2533
2534
2535                                    ;SET UP DEFAULT PARAMETERS
2536
2537  014520                            MONDFLT:
2538  014520  005037  006366                   CLR     @#ENTRY1          ;TT TRACE ENTRY1
2539  014524  005037  006426                   CLR     @#ENTRY2          ;TT TRACE ENTRY2
2540  014530  013737  001440  006526           MOV     @#TT,@#TTRACE     ;INIT TT TRACE
2541  014536  012737  177777  014206           MOV     #-1,ONESHOT       ;ONE PASS FLAGS
2542  014544  005037  014234                   CLR     FIRST.TST         ;DEFAULT TEST #
2543  014550  005037  012636                   CLR     ERTSTN            ;ERROR TEST NUMBER
2544  014554  005037  012634                   CLR     ERRCNT            ;ERROR COUNT
2545  014560  013737  014752  011660           MOV     @#D.FIRST.TST,@#RETURN  ;FIRST TEST
2546  014566  013737  014754  001262           MOV     @#D.DXBASE,@#DXBASE     ;BASE ADDRESS
2547  014574  013737  014756  001264           MOV     @#D.DXIV,@#DXIV         ;INT VECTOR ADRS
2548  014602  013737  014770  001266           MOV     @#D.DXIS,@#DXIS         ;INT STATUS ADRS
2549  014610  013737  014760  001270           MOV     @#D.DXPRT,@#DXPRT               ;PRIORITY LEVEL
2550  014616  013737  014762  014236           MOV     @#D.MAX.DEV.CU,@#MAX.DEV.CU     ;MAX DEVICES
2551  014624  013737  014766  014220           MOV     @#D.DEV.A,@#DEV.A       ;SECOND DEVICE
2552  014632  013737  014764  014254           MOV     @#D.LEGAL.ADRS,@#LEGAL.ADRS     ;CU ADRS
2553  014640  012737  177777  014256           MOV     #-1,LEGAL.ADRS+2
2554  014646  012737  017400  001442           MOV     #DSTADRS,@#DST  ;INIT DST ADRS
2555  014654  012700  014360                   MOV     #DFLT.CMD,R0    ;ADRS OF DEFAULT CMD LIST
2556  014660  012701  014440                   MOV     #CMD.ADRS,R1    ;ADRS OF LEGAL CMD LIST
2557
2558  014664  012021                    MON2:   MOV     (R0)+,(R1)+     ;LOAD DEFAULT CMD LIST
2559  014666  022710  177777                   CMP     #-1,@R0         ;TEST FOR TERMINATOR
2560  014672  001374                           BNE     MON2
2561  014674  012721  177777                   MOV     #-1,(R1)+       ;LOAD TERMINATOR
2562  014700  012727  000020                   MOV     #16.,(PC)+
2563  014704  000000                    MON2.0: 0
```

```
2564  014706  012700  014420            MOV     #DFLT.STAT,R0   ;DEFAULT STATUS
2565  014712  012701  014500            MOV     #CMD.STAT,R1    ;STATUS FOR EACH COMMAND
2566  014716  112021                MON2.1: MOVB    (R0)+,(R1)+
2567  014720  005337  014704            DEC     MON2.0
2568  014724  001374                    BNE     MON2.1
2569
2570  014726  013737  014230  001436    MOV     OFFSET,SPW      ;LOAD ADRS OF SPW
2571  014734  013737  014230  001440    MOV     OFFSET,TT       ;LOAD ADRS OF TT
2572  014742  062737  001000  001440    ADD     #1000,TT        ;  ''    ''   '' ''
2573  014750  000207                MON2.3: RTS     PC
2574                                ;DEFAULT PARAMETERS
2575
2576  014752  004000                D.FIRST.TST:    TST1            ;FIRST TEST
2577  014754  176200                D.DXBASE:       176200          ;BASE ADDRESS
2578  014756  000300                D.DXIV:         300             ;INT VECTOR ADRS
2579  014760  000200                D.DXPRT:        LEVEL4          ;DX PRIORITY LEVEL
2580  014762  000020                D.MAX.DEV.CU:   20              ;MAX # DEVICES PER CU
2581  014764  000020                D.LEGAL.ADRS:   020             ;DEFAULT CU ADRS
2582  014766  000421                D.DEV.A:        421
2583  014770  000302                D.DXIS:         302             ;INT STATUS ADRS
2584
2585
2586                                .SBTTL  MONITOR SUBROUTINES
2587
2588                                ;TT.CLR, CLEAR TUMBLE TABLE
2589
2590
2591  014772                        TT.CLR:
2592  014772  013701  001440            MOV     TT,R1           ;BOTTOM OF TT
2593  014776  005021                CL1:    CLR     (R1)+           ;CLEAR TT
2594  015000  020127  004000            CMP     R1,#ENDTT               ;TEST FOR END OF TT
2595  015004  001374                    BNE     CL1             ;BRANCH IF NOT END
2596  015006  000207                    RTS     PC
2597
2598
2599                                ;REINIT OUTPUT DATA
2600
2601
2602  015010                        ODAT:
2603  015010  010046                    MOV     R0,-(SP)
2604  015012  012700  022442            MOV     #WDATA,R0
2605  015016  005027                    CLR     (PC)+
2606  015020  000000                ODAT1:  0
2607  015022  104007  015020        ODAT2:  PARITY  ,ODAT1
2608  015026  013720  015020            MOV     ODAT1,(R0)+
2609  015032  042737  000400  015020    BIC     #PAR0,ODAT1
2610  015040  105237  015020            INCB    ODAT1
2611  015044  001366                    BNE     ODAT2
2612  015046  012600                    MOV     (SP)+,R0
2613  015050  000207                    RTS     PC
2614
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2620
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2631
2632  015052                          T.PARITY:
2633  015052  017627  000000                  MOV     @(SP),(PC)+     ;FETCH ADDRESS OF SOURCE DATA
2634  015056  000000                  SDAPG:  0                       ;SOURCE DATA ADDRESS
2635  015060  017727  177772                  MOV     @SDAPG,(PC)+    ; FETCH SOURCE DATA
2636  015064  000000                  TDAT:   0                       ;SOURCE DATA
2637  015066  005027                          CLR     (PC)+
2638  015070  000000                  PRTY:   0
2639
2640  015072  106337  015064          PG2:    ASLB    TDAT
2641  015076  102002                          BVC     PG3
2642  015100  005137  015070                  COM     PRTY
2643
2644  015104  106337  015064          PG3:    ASLB    TDAT
2645  015110  001370                          BNE     PG2
2646  015112  005737  015070                  TST     PRTY
2647  015116  100404                          BMI     PG4
2648  015120  052777  000400  177730          BIS     #PAR0,@SDAPG    ;SET PARITY BIT
2649  015126  000403                          BR      PG5
2650  015130  042777  000400  177720  PG4:    BIC     #PAR0,@SDAPG    ;CLEAR PARITY BIT
2651
2652  015136  062716  000002          PG5:    ADD     #2,@SP          ;ADD 2 TO RETURN PC
2653  015142  000002                          RTI
2654
2655                                  ;SETUP SPW TABLE
2656                                  ;************************* MOD APR 74 ******************************
2657                                  ;*                    ADDRESS RESOLUTION MOD
2658
2659  015144  177400                  MARK:   177400
2660
2661  015146                          SPW.SETUP:
2662  015146  012700  014254                  MOV     #LEGAL.ADRS,R0  ;FETCH ADRS OF LEGAL ADRS LINST
2663  015152  012701  014316                  MOV     #SCALD.ADRS,R1  ;FETCH ADDRS OF SCALED LEGAL ADRS LIST
2664
2665  015156  012011                  SP.0:   MOV     (R0)+,@R1       ;MAKE DUPLICATE ADRS LIST
2666  015160  043711  015144                  BIC     MARK,@R1        ;
2667                                  ;************************* MOD APR 74 ******************************
2668  015164  006311                          ASL     @R1             ;MAKE INDX MOD(2)
2669  015166  063721  001436                  ADD     SPW,(R1)+       ;EQUALS REAL SPW ADRS
2670  015172  021027  177777                  CMP     @R0,#-1         ;TEST FOR TERMINATION
2671  015176  001367                          BNE     SP.0            ;FETCH NEXT ADRS
2672
2673  015200  012721  177777                  MOV     #-1,(R1)+       ;MARK END OF SCALED ADRS LIST
2674
2675  015204  013701  001436                  MOV     SPW,R1          ;ADRS OF SPW
```

```
2676  015210  013702  001442                  MOV     DST,R2          ;ADRS OF DST
2677  015214  012700  014316          SP.1:   MOV     #SCALD.ADRS,R0
2678  015220  020110                  SP.2:   CMP     R1,@R0          ;RUN THRU LIST
2679  015222  001407                          BEQ     SP.3            ;BRANCH ON LEGAL ADRS
2680  015224  005720                          TST     (R0)+
2681  015226  022710  177777                  CMP     #-1,@R0         ;TEST FOR END OF LIST
2682  015232  001372                          BNE     SP.2            ;BRANCH IF NOT ENT
2683  015234  012721  016400                  MOV     #ERRDST,(R1)+   ;LOAD SPW WITH ERROR DST ADRS
2684  015240  000407                          BR      SP.6
2685  015242  013727  014236          SP.3:   MOV     MAX.DEV.CU,(PC)+
2686  015246  000000                  SP.4:   0
2687  015250  010221                  SP.5:   MOV     R2,(R1)+
2688  015252  005337  015246                  DEC     SP.4
2689  015256  001374                          BNE     SP.5
2690  015260  020137  001440          SP.6:   CMP     R1,TT           ;TEST FOR END OF SPW
2691  015264  002753                          BLT     SP.1
2692  015266  001405                          BEQ     SP.7
2693  015270  005726                          TST     (SP)+   ;POP STACK
2694  015272  000004  015404                  TYPE    ,IDVN
2695  015276  000137  012724                  JMP     MON1.0  ;GO BACK TO MONITOR
2696  015302  000207                  SP.7:   RTS     PC
2697                                  ;DEVICE STATUS TABLE SETUP
2698
2699
2700  015304                          DST.SETUP:
2701  015304  013701  001442                  MOV     DST,R1
2702  015310  012727  000020                  MOV     #16.,(PC)+
2703  015314  000000                  DS.1:   0
2704  015316  012702  014500                  MOV     #CMD.STAT,R2
2705  015322  112221                  DS.2:   MOVB    (R2)+,(R1)+
2706  015324  005337  015314                  DEC     DS.1
2707  015330  001374                          BNE     DS.2
2708  015332  000207                          RTS     PC
2709
2710                                  ;SUBROUTINE TO CHECK THAT CU ADDRESS AND THE NUMBER OF DEVICES
2711                                  ;PER CU IS LEGAL
2712
2713  015334  012700  014254          CKCUA:  MOV     #LEGAL.ADRS,R0  ;
2714  015340  005027                  CKC1:   CLR     (PC)+
2715  015342  000000                  CKC2:   0
2716  015344  111037  015342                  MOVB    @R0,@#CKC2              ;FETCH CU ADDRESS
2717                                  ;************************** MOD APR 74 ********************************
2718                                  ;*
2719                                  ;*                      ADDRESS RANGE MOD
2720                                  ;
2721  015350  122737  000020  014236  CKC3:   CMPB    #20,@#MAX.DEV.CU        ;CHECK LIMIT 16.
2722
2723                                  ;************************** MOD APR 74 ********************************
2724                                  ;
2725  015356  103005                          BHIS    CKC4    ;BRANCH IF WITHIN LIMITS
2726  015360  000004  015404                  TYPE    ,IDVN   ;ILLEGAL NUMBER OF DEVICES PER CU
2727  015364  012716  013362                  MOV     #MON5,(SP)      ;CHANGE RETURN PC
2728  015370  000207                          RTS     PC
2729  015372  005720                  CKC4:   TST     (R0)+
2730  015374  021027  177777                  CMP     @R0,#-1
2731  015400  001357                          BNE     CKC1
```

```
2732  015402  000207                          RTS     PC
2733  015404  044537  046114  043505  IDVN:   .ASCIZ  ''_ILLECAL # OF DEVICES PER CU ''
2734  015412  046101  021440  047440
2735  015420  020106  042504  044526
2736  015426  042503  020123  042520
2737  015434  020122  052503  000040
2738                                  .EVEN
2739
2740                                  ;PRE-INIT SUBROUTINE
2741
2742  015442  012737  015610  000004  PREI:   MOV     #PREITO,4
2743  015450  012737  000340  000006          MOV     #LEVEL7,6
2744  015456  005077  163636                  CLR     @DXES           ;CLEAR MAINT CLK
2745  015462  004737  015614                  JSR     PC,RESRES       ;DX RESET AND RESTORE
2746                                  ;THE FOLLOWING INSTRUCTION GET MODIFIED UPON THE COMPLETION
2747                                  ;OF THE SYSTEM RESET TEST.IF SCOPE PROBLEMS DEVELOP BEFORE THIS TEST
2748                                  ;PASSES THIS INST. CAN BE PATCHED TO A TESET,NOP.
2749  015466  004737  015570          PREI.1: JSR     PC,@#CLRMO              ;MODIFIED TO CLRMO
2750  015472  005077  163602                  CLR     @DXCS           ;CLR DONE,LOCKO
2751  015476  004737  015614                  JSR     PC,RESRES       ;DX RESET AND RESTORE
2752  015502  013777  001436  163572          MOV     SPW,@DXOS
2753  015510  023777  001436  163564          CMP     SPW,@DXOS
2754  015516  001401                          BEQ     .+4             ;BRANCH IF NO ERROR CONDITION
2755  015520  104000                          ERROR                   ;
2756  015522  052777  000010  163570          BIS     #TIMDIS,@DXES   ;TIMER DISABLE
2757  015530  032777  000010  163562          BIT     #TIMDIS,@DXES
2758  015536  001001                          BNE     .+4             ;BRANCH IF NO ERROR CONDITION
2759  015540  104000                          ERROR                   ;
2760  015542  012737  000006  000004          MOV     #6,4
2761  015550  012737  000000  000006          MOV     #HALT,6
2762  015556  004737  006176                  JSR     PC,ZEROTT       ;ZERO TUMBLE TABLE
2763  015562  004737  006226                  JSR     PC,TTZERO       ;VERIFY TT ZERO
2764  015566  000207                          RTS     PC
2765
2766
2767
2768
2769
2770
2771  015570  005077  163514          CLRMO:  CLR     @DXMO   ;DO SYSTEM RESET
2772  015574  032777  100000  163506          BIT     #OPLO,@DXMO     ;IS OPLO CLEAR
2773  015602  001401                          BEQ     NOCLR           ;IF YES CONTINUE
2774  015604  104000                          ERROR                   ;OPLO NOT RESET
2775  015606  000207                  NOCLR:  RTS     PC
2776
2777  015610  104000                  PREITO: ERROR           ;PREINIT TIME OUT ERROR
2778
2779
2780  015612  000002                          RTI
2781
2782
2783                                  ;DX RESET AND RESTORE ROUTINE
2784
2785
2786
2787
```

```
                                                                D  6
2788
2789
2790
2791
2792
2793
2794  015614                          RESRES:
2795
2796  015614  042777  000200  163456          BIC     #DONE,@DXCS     ;CLEAR LOCKO
2797  015622  012777  000001  163450          MOV     #DXFRS,@DXCS    ;DX RESET
2798  015630  013737  001440  006526          MOV     @#TT,TTRACE     ;RELOAD SOFT TT POINTER
2799  015636  000240                          NOP             ;INSERT RESET I.E.'5'' HERE IF REQUIRED
2800  015640  004737  007234                  JSR     PC,ONLIN        ;GET BACK ONLINE
2801  015644  000207                          RTS     PC
2802
2803
2804
2805
2806
2807                                  ;REGISTER ADDRESS SETUP ROUTINE
2808
2809  015646                          REG.SETUP:
2810  015646  013700  001262                  MOV     DXBASE,R0               ;FETCH BASE ADRS
2811  015652  012701  001274                  MOV     #DXDS,R1                ;FETCH ADRS OF DXDS ADRS
2812  015656  010021                  RS.1:   MOV     R0,(R1)+
2813  015660  062700  000002                  ADD     #2,R0           ;INC TO NEXT DX ADRS
2814  015664  020127  001326                  CMP     R1,#DXES1+2
2815  015670  001372                          BNE     RS.1
2816
2817  015672  004537  015726                  JSR     R5,SBYTE                ;SETUP BYTE REF REG'S
2818
2819  015676  001276                          DXCA
2820  015700  001326                          CUAR
2821
2822  015702  001302                          DXOS
2823  015704  001332                          CUSR
2824
2825  015706  001310                          DXMO
2826  015710  001336                          BUSO
2827
2828  015712  001312                          DXMI
2829  015714  001342                          BUSI
2830
2831  015716  001320                          DXES
2832  015720  001346                          MISC
2833
2834  015722  177777                          -1
2835
2836  015724  000207                          RTS     PC
2837
2838  015726                          SBYTE:
2839  015726  012500                          MOV     (R5)+,R0
2840  015730  012501                          MOV     (R5)+,R1
2841  015732  011021                          MOV     @R0,(R1)+
2842  015734  011011                          MOV     @R0,@R1
2843  015736  005221                          INC     (R1)+
```

```
2844  015740  021527  177777            CMP     @R5,#-1
2845  015744  001370                    BNE     SBYTE
2846  015746  005725                    TST     (R5)+   ;POP OVER TERMINATOR
2847  015750  000205                    RTS     R5
2848
2849
2850                          ;ACCEPT HEX NUMBER FROM TTY
2851
2852  015752  005037  016410  GETHEX: CLR     HEXNUM          ;CLEAR HEXADECIMAL NUMBER LOCATION
2853  015756  010246                    MOV     R2,-(SP)        ;SAVE R2
2854  015760  010146                    MOV     R1,-(SP)        ;SAVE R1
2855  015762  010046                    MOV     R0,-(SP)        ;SAVE R0
2856  015764  005001          ACPTH:  CLR     R1              ;
2857  015766  104006          ACPTH.1:        KEY.TO.R0       ;FETCH AN ASCII CHAR FROM KEYBOARD
2858  015770  120027  000003            CMPB    R0,#3           ;CONTROL C?
2859  015774  001002                    BNE     AH.2
2860  015776  000137  012724            JMP     @#MON1.0
2861  016002  122700  000177  AH.2:   CMPB    #177,R0         ;TEST FOR RUBOUT
2862  016006  001424                    BEQ     RUBOUH
2863  016010  122700  000015            CMPB    #15,R0          ;TEST FOR <CR>
2864  016014  001424                    BEQ     CARGH
2865  016016  120027  000040            CMPB    R0,#40          ;EXIT IF SPACE
2866  016022  001421                    BEQ     CARGH
2867  016024  120027  000000            CMPB    R0,#0           ;TEST FOR VALID HEX NUMBER
2868  016030  002413                    BLT     RUBOUH
2869  016032  120027  000071            CMPB    R0,#'9
2870  016036  003021                    BGT     AHEX
2871  016040  042700  177760  AH.3:   BIC     #177760,R0      ;CONVERT ASCII TO HEX
2872  016044  006301                    ASL     R1
2873  016046  006301                    ASL     R1
2874  016050  006301                    ASL     R1
2875  016052  006301                    ASL     R1
2876  016054  050001                    BIS     R0,R1           ;CHALK'M UP
2877  016056  000743                    BR      ACPTH.1         ;FETCH NEXT CHAR
2878
2879  016060  000004  021240  RUBOUH: TYPE    ,.QUES          ;TYPE?
2880  016064  000737                    BR      ACPTH
2881  016066  010137  016410  CARGH:  MOV     R1,HEXNUM       ;PLACE HEX NUMBER HERE
2882  016072  012600                    MOV     (SP)+,R0                ;RESTORE R0
2883  016074  012601                    MOV     (SP)+,R1                ;RESTOR R1
2884  016076  012602                    MOV     (SP)+,R2        ;RESTORE R2
2885  016100  000207                    RTS     PC
2886
2887  016102  005002          AHEX:   CLR     R2
2888  016104  120062  016412  AHEX0:  CMPB    R0,ATBL(R2)     ;LOOK THRU ASCII TABLE
2889  016110  001406                    BEQ     AHEX1           ;BRANCH ON MATCH
2890  016112  005202                    INC     R2
2891  016114  126227  016412  000000        CMPB    ATBL(R2),#0     ;LOOK FOR END OF TABLE
2892  016122  001370                    BNE     AHEX0           ;BRANCH IF NOT END
2893  016124  000755                    BR      RUBOUH          ;ERROR ON NO MATCH
2894  016126  116200  016422  AHEX1:  MOVB    HTBL(R2),R0     ;LOAD BINARY OF FIND
2895  016132  000742                    BR      AH.3
2896
2897
2898
2899                          ;************************* MOD APR 74 *******************************
```

```
2900                                    ;
2901
2902            016400                  .=.!377+1
2903
2904                                    ; ILLEGAL OR MALFUNCTIONNING CUAR ERROR STATUS TABLE MODULO 8
2905
2906    016400                          ERRDST:
2907    016400      002                         .BYTE   UC              ;UNIT CHECK ENTRIES
2908    016401      002                         .BYTE   UC              ;UNIT CHECK ENTRIES
2909    016402      002                         .BYTE   UC              ;UNIT CHECK ENTRIES
2910    016403      002                         .BYTE   UC              ;UNIT CHECK ENTRIES
2911    016404      002                         .BYTE   UC              ;UNIT CHECK ENTRIES
2912    016405      002                         .BYTE   UC              ;UNIT CHECK ENTRIES
2913    016406      002                         .BYTE   UC              ;UNIT CHECK ENTRIES
2914    016407      002                         .BYTE   UC              ;UNIT CHECK ENTRIES
2915
2916    016410  000000                  HEXNUM: 0                       ;HEX NUMBER
2917    016412  041101  042103  043105  ATBL:   .ASCII  'ABCDEF'
2918    016420  000000                  .WORD   0
2919    016422      012     013     014 HTBL:   .BYTE   10.,11.,12.,13.,14.,15.
2920    016425      015     016     017
2921
2922                                    ;ACCEPT OCTAL NUMBER FROM TTY
2923    016430                          T.ACCEPTO:
2924    016430  005037  014232                  CLR     OCTNUM          ;CLEAR OCTAL NUMBER LOCATION
2925    016434  010146                          MOV     R1,-(SP)        ;SAVE R1
2926    016436  010046                          MOV     R0,-(SP)        ;SAVE R0
2927    016440  005001                  ACPTO:  CLR     R1              ;
2928    016442  104006                  ACPTO.1:        KEY.TO.R0       ;FETCH AN ACCII CHAR FROM KEYBOARD
2929    016444  120027  000003                  CMPB    R0,#3           ;CONTROL C?
2930    016450  001002                          BNE     AO.2
2931    016452  000137  012724                  JMP     @#MON1.0
2932    016456  122700  000177          AO.2:   CMPB    #177,R0         ;TEST FOR RUBOUT
2933    016462  001423                          BEQ     RUBOUT
2934    016464  122700  000015                  CMPB    #15,R0          ;TEST FOR <CR>
2935    016470  001423                          BEQ     CARG
2936    016472  120027  000040                  CMPB    R0,#40          ;EXIT IF SPACE
2937    016476  001420                          BEQ     CARG
2938    016500  120027  000000                  CMPB    R0,#0           ;TEST FOR VALID OCTAL NUMBER
2939    016504  002412                          BLT     RUBOUT
2940    016506  120027  000067                  CMPB    R0,#'7
2941    016512  003007                          BGT     RUBOUT
2942    016514  042700  177770                  BIC     #177770,R0      ;CONVERT ASCII TO OCTAL
2943    016520  006301                          ASL     R1
2944    016522  006301                          ASL     R1
2945    016524  006301                          ASL     R1
2946    016526  050001                          BIS     R0,R1           ;CHALK'M UP
2947    016530  000744                          BR      ACPTO.1         ;FETCH NEXT CHAR
2948
2949    016532  000004  021240          RUBOUT: TYPE    ,.QUES          ;TYPE?
2950    016536  000740                          BR      ACPTO
2951    016540  010137  014232          CARG:   MOV     R1,OCTNUM       ;PLACE OCTAL NUMBER HERE
2952    016544  012600                          MOV     (SP)+,R0                ;RESTORE R0
2953    016546  012601                          MOV     (SP)+,R1                ;RESTOR R1
2954    016550  000002                          RTI                     ;RETURN
2955
```

```
                                        ;FETCH AN ASCII CHARACTER FROM KEYBOARD

016552                                  T.KEY.TO.R0:
016552  105777  162620                          TSTB    @TKS            ;TEST FOR DONE
016556  100375                                  BPL     .-4             ;WAIT FOR KEYBOARD
016560  117700  162614                          MOVB    @TKB,R0         ;FETCH CHAR
016564  117777  162610  162612                  MOVB    @TKB,@TPB       ;ECHO
016572  004737  016604                          JSR     PC,TTYFLG       ;WAIT FOR DONE
016576  042700  177600                          BIC     #177600,R0      ;7 BIT ASCII
016602  000002                                  RTI
                                        ;TEST FOR TRANSMITTER DONE

016604                                  TTYFLG:
016604  105777  162572                  2$:     TSTB    @TPS
016610  100375                                  BPL     2$
016612  000207                                  RTS     PC
                                        .SBTTL  TTY ASCII OUTPUT ROUTINE


016614  032737  020000  177570  .IOT:   BIT     #BIT13,SR       ;TEST FOR INHIBIT PRINT
016622  001040                          BNE     .IOTE
016624  010537  016732                  MOV     TTY,.SAV        ;SAVE TTY
016630  017605  000000                  MOV     @(6),TTY        ;GET ADDRESS TO BE TYPED
016634  122715  000044          .MORE:  CMPB    #'$,(TTY)       ;TERMINATOR?
016640  001425                          BEQ     .TERM
016642  105715                          TSTB    (TTY)           ;TERMINATOR?
016644  001423                          BEQ     .TERM
016646  122715  000001                  CMPB    #1,(TTY)        ;RESTORE OLD SEQUENCE
016652  001416                          BEQ     .REST
016654  122715  000137                  CMPB    #'_,(TTY)       ;SET UP CR LF
016660  001406                          BEQ     .CRLF
016662  105777  162514                  TSTB    @TPS
016666  100375                          BPL     .-4
016670  112577  162510                  MOVB    (TTY)+,@TPB
016674  000757                          BR      .MORE
016676  005205                  .CRLF:  INC     TTY
016700  010546                          MOV     TTY,-(6)
016702  012705  016734                  MOV     #.CAR,TTY
016706  000752                          BR      .MORE
016710  012605                  .REST:  MOV     (6)+,TTY
016712  000750                          BR      .MORE
016714  004737  016604          .TERM:  JSR     PC,TTYFLG       ;WAIT FOR DONE
016720  013705  016732                  MOV     .SAV,TTY
016724  062716  000002          .IOTE:  ADD     #2,(6)  ;POP
016730  000002                          RTI

016732  000000                  .SAV:   0
016734  005015  001002  001002  .CAR:   .ASCII  <CR><LF><2><2><2><2><2><2><1>
016742  001002     0C1
                016746          .EVEN
016746  000000                  .TYPE:  0
                                .SBTTL  SAVE AND RESTORE REGISTERS
                                ;SAVE REGS 0 TO 4 SUBROUTINE.
016750  012637  017006          T.SAVRG: MOV    (6)+,SVRPC      ;SAVE PC AND PSW.
016754  012637  017010                   MOV    (6)+,SVRPSW
016760  010546                           MOV    %5,-(6)
```

```
3012  016762  010446                        MOV     %4,-(6) ;SAVE REGS 0 - 4
3013  016764  010346                        MOV     %3,-(6)         ;IN STACK.
3014  016766  010246                        MOV     %2,-(6)
3015  016770  010146                        MOV     %1,-(6)
3016  016772  010046                        MOV     %0,-(6)
3017  016774  013746  017010                MOV     SVRPSW,-(6)     ;RESTORE PC AND PSW.
3018  017000  013746  017006                MOV     SVRPC,-(6)
3019  017004  000002                        RTI                     ;EXIT.
3020  017006  000000              SVRPC:    0
3021  017010  000000              SVRPSW:   0
3022                                ;RESTORE REGS 0 TO 4 SUBROUTINE.
3023  017012  012637  017050      T.RSTRG:  MOV     (6)+,RSTPC      ;SAVE PC AND PSW.
3024  017016  012637  017052              MOV     (6)+,RSTPSW
3025  017022  012600                        MOV     (6)+,%0         ;RESTORE REGS 0 - 4
3026  017024  012601                        MOV     (6)+,%1         ;FROM STACK.
3027  017026  012602                        MOV     (6)+,%2
3028  017030  012603                        MOV     (6)+,%3
3029  017032  012604                        MOV     (6)+,%4
3030  017034  012605                        MOV     (6)+,%5
3031
3032  017036  013746  017052                MOV     RSTPSW,-(6)     ;RESTORE PC AND PSW.
3033  017042  013746  017050                MOV     RSTPC,-(6)
3034  017046  000002                        RTI                     ;EXIT
3035  017050  000000              RSTPC:    0
3036  017052  000000              RSTPSW:   0
3037                                .SBTTL  OCTAL DUMP ROUTINE
3038
3039  017054  000000  000000  000000  PRINT2: .WORD   0,0,0,0
3040  017062  000000
3041  017064     000     000          PRINT3: .BYTE   0,0
3042
3043  017066  112737  000001  017064  PRINTR: MOVB    #1,PRINT3       ;SET ZERO FILL SWITCH
3044  017074  000402                        BR      .+6
3045  017076  005037  017064          PRINTS: CLR     PRINT3          ;SUPRESS LEADING ZERO'S
3046  017102  112737  177772  017065        MOVB    #-6,PRINT3+1    ;SET COUNT
3047  017110  032737  020000  177570        BIT     #BIT13,SR
3048  017116  001041                        BNE     PRTE
3049  017120  010446                        MOV     %4,-(6)         ;SAVE R4
3050  017122  012704  017054                MOV     #PRINT2,%4      ;SET POINTER TO FIRST ASCII CHAR.
3051  017126  105014                        CLRB    (4)             ;CLEAR FIRST BYTE
3052  017130  000405                        BR      PRINTF          ;ROTATE FIRST BIT
3053  017132  105014          PRINTL:   CLRB    (4)             ;CLEAR BYTE OF CHARACTER
3054  017134  006105                        ROL     TTY             ;ROTATE BIT INTO C
3055  017136  106114                        ROLB    (4)             ;PACK IT
3056  017140  006105                        ROL     TTY             ;ROTATE BIT INTO C
3057  017142  106114                        ROLB    (4)             ;PACK IT
3058  017144  006105          PRINTF:   ROL     TTY             ;ROTATE BIT INTO C
3059  017146  106114                        ROLB    (4)             ;PACK IT
3060  017150  105714                        TSTB    (4)
3061  017152  001402                        BEQ     .+6
3062  017154  105237  017064                INCB    PRINT3
3063  017160  105737  017064                TSTB    PRINT3          ;CHECK FILL SWITCH
3064  017164  001402                        BEQ     .+6
3065  017166  152724  000060                BISB    #'0,(4)+        ;MAKE INTO ASCII CHAR
3066  017172  105237  017065                INCB    PRINT3+1
3067  017176  001355                        BNE     PRINTL          ;REPEAT
```

```
3068  017200  022704  017054            CMP     #PRINT2,%4
3069  017204  001002                    BNE     .+6
3070  017206  112724  000060            MOVB    #'0,(4)+
3071  017212  105014                    CLRB    (4)
3072  017214  000004  017054            TYPE    ,PRINT2          ;TYPE IT
3073  017220  012604                    MOV     (6)+,%4          ;RESTORE R5
3074  017222  000207            PRTE:   RTS     %7
3075                            ;TTY WATCH DOG FOR CONTROL C
3076          000003            CNTLC=3                          ;ASCII CONTROL C
3077
3078  017224  117727  162150    TTYI:   MOVB    @TKB,(PC)+       ;SAVE CHAR
3079  017230  000000    SCHAR:  0                                ;HERE
3080  017232  042737  000200  017230  BIC     #200,@#SCHAR     ;SEVEN LEVEL ASCII
3081  017240  122737  000003  017230  CMPB    #CNTLC,@#SCHAR   ;CHECK FOR CONTROL C
3082  017246  001004                    BNE     TTYI0
3083  017250  000004  017274          TYPE    ,ACLC   ;TYPE CONTROL C
3084  017254  000137  012724          JMP     @#MON1.0
3085  017260  004737  016604    TTYI0:  JSR     PC,TTYFLG
3086  017264  113777  017230  162112  MOVB    @#SCHAR,@TPB     ;ECHO CHARACTER
3087  017272  000002                    RTI
3088
3089  017274  041536     000    ACLC:   .ASCIZ  <136><103>
3090          017300            .EVEN
3091
3092          017400            .=.!377+1                ;FORM MOD(400) BOUNDRY
3093
3094          017400            DSTADRS=.                ;DEFAULT DST
3095
3096  017400     000                    .BYTE   0        ;TIO
3097  017401     000                    .BYTE   0        ;WRITE
3098  017402     000                    .BYTE   0        ;READ
3099  017403     014                    .BYTE   CE!DE    ;NOP
3100  017404     000                    .BYTE   0        ;SENSE
3101
3102  017405     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3103  017406     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3104  017407     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3105  017410     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3106  017411     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3107  017412     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3108  017413     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3109  017414     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3110  017415     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3111  017416     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3112  017417     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3113  017420     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3114  017421     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3115  017422     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3116  017423     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3117  017424     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3118  017425     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3119  017426     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3120  017427     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3121  017430     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3122  017431     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
3123  017432     002                    .BYTE   UC       ;ILLEGAL ,UNIT CHECK
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3124  017433  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3125  017434  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3126  017435  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3127  017436  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3128  017437  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3129  017440  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3130  017441  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3131  017442  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3132  017443  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3133  017444  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3134  017445  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3135  017446  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3136  017447  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3137  017450  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3138  017451  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3139  017452  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3140  017453  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3141  017454  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3142  017455  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3143  017456  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3144  017457  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3145  017460  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3146  017461  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3147  017462  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3148  017463  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3149  017464  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3150  017465  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3151  017466  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3152  017467  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3153  017470  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3154  017471  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3155  017472  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3156  017473  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3157  017474  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3158  017475  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3159  017476  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3160  017477  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3161  017500  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3162  017501  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3163  017502  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3164  017503  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3165  017504  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3166  017505  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3167  017506  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3168  017507  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3169  017510  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3170  017511  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3171  017512  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3172  017513  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3173  017514  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3174  017515  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3175  017516  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3176  017517  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3177  017520  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3178  017521  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3179  017522  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
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3180  017523  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3181  017524  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3182  017525  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3183  017526  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3184  017527  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3185  017530  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3186  017531  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3187  017532  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3188  017533  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3189  017534  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3190  017535  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3191  017536  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3192  017537  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3193  017540  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3194  017541  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3195  017542  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3196  017543  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3197  017544  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3198  017545  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3199  017546  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3200  017547  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3201  017550  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3202  017551  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3203  017552  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3204  017553  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3205  017554  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
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3207  017556  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3208  017557  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3209  017560  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3210  017561  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3211  017562  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3212  017563  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3213  017564  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3214  017565  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3215  017566  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3216  017567  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3217  017570  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3218  017571  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3219  017572  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3220  017573  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3221  017574  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3222  017575  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3223  017576  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3224  017577  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3225  017600  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3226  017601  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3227  017602  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3228  017603  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3229  017604  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3230  017605  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3231  017606  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3232  017607  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3233  017610  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3234  017611  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3235  017612  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
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3236  017613  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3237  017614  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3238  017615  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3239  017616  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3240  017617  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3241  017620  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3242  017621  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3243  017622  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3244  017623  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3245  017624  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3246  017625  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3247  017626  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3248  017627  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3249  017630  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3250  017631  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3251  017632  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3252  017633  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3253  017634  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3254  017635  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3255  017636  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3256  017637  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3257  017640  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3258  017641  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3259  017642  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3260  017643  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3261  017644  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3262  017645  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3263  017646  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3264  017647  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3265  017650  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3266  017651  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3267  017652  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3268  017653  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3269  017654  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3270  017655  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3271  017656  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3272  017657  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3273  017660  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3274  017661  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3275  017662  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3276  017663  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3277  017664  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3278  017665  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3279  017666  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3280  017667  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3281  017670  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3282  017671  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3283  017672  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3284  017673  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3285  017674  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3286  017675  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3287  017676  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3288  017677  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3289  017700  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3290  017701  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3291  017702  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
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3292  017703  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3293  017704  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3294  017705  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3295  017706  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3296  017707  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3297  017710  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3298  017711  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3299  017712  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3300  017713  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3301  017714  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3302  017715  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3303  017716  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3304  017717  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3305  017720  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3306  017721  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3307  017722  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3308  017723  002                    .3YTE   UC      ;ILLEGAL ,UNIT CHECK
3309  017724  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3310  017725  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3311  017726  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3312  017727  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3313  017730  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3314  017731  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3315  017732  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3316  017733  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3317  017734  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3318  017735  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3319  017736  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3320  017737  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3321  017740  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3322  017741  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3323  017742  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3324  017743  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3325  017744  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3326  017745  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3327  017746  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3328  017747  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3329  017750  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3330  017751  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3331  017752  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3332  017753  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3333  017754  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3334  017755  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3335  017756  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3336  017757  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3337  017760  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3338  017761  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3339  017762  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3340  017763  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3341  017764  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3342  017765  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3343  017766  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3344  017767  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3345  017770  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3346  017771  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
3347  017772  002                    .BYTE   UC      ;ILLEGAL ,UNIT CHECK
```

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 3348  017773     002                          .BYTE   UC      ;ILLEGAL ,UNIT CHECK
 3349  017774     002                          .BYTE   UC      ;ILLEGAL ,UNIT CHECK
 3350  017775     002                          .BYTE   UC      ;ILLEGAL ,UNIT CHECK
 3351  017776     002                          .BYTE   UC      ;ILLEGAL ,UNIT CHECK
 3352  017777     002                          .BYTE   UC      ;ILLEGAL ,UNIT CHECK
 3353                                .EVEN
 3354
 3355  020000                               T.PCH1:
 3356  020000  000012                              .BLKW   10.
 3357
 3358  020024                               T.PCH2:
 3359  020024  000012                              .BLKW   10.
 3360
 3361  020050                               T.PCH3:
 3362  020050  000012                              .BLKW   10.
 3363
 3364                                .SBTTL  MESSAGES
 3365          000012                        LF=12
 3366          000015                        CR=15
 3367  020074                                HEADER:
 3368                                        ;*                      HEADER TEXT MOD
 3369                                        ;************************ MOD JULY 78 **********************************
 3370                                .NLIST  BEX
  (1)  020074  040537  026503  033470              .ASCII  ''_AC-8772D-MC CZDXHD0 DX11B ONLINE EXER (JUL 78)''
  (1)                                       ;*                      HEADER TEXT MOD
  (1)                                       ;************************ MOD JULY 78 **********************************
  (1)                                       ;*                      HEADER TEXT MOD
  (1)                                       ;************************ MOD JULY 78 **********************************
  (1)                                       ;*                      HEADER TEXT MOD
  (1)  020153     137  047506  020122              .ASCII  ''_FOR DYNAMIC SWITCH REGISTER SETTINGS''
  (1)  020220  051537  042505  050040              .ASCII  '',_SEE PROGRAM LISTING PAGE #1''
  (1)  020254  057537  044504  041523              .ASCII  '',_DISCONNECT 'DX11' FROM 360/370 CHANNEL_''
  (1)  020325     137  047503  047116              .ASCII  '',_CONNECT MAINTENANCE CABLES''
  (1)  020360  052137  051110  053517              .ASCII  '',_THROW ENABLE SWITCH ONLINE''
  (1)  020413     137  052137  050131              .ASCII  '',_TYPE:    <D>,DEFAULT PARAMETERS''
  (1)  020453     137  020040  020040              .ASCII  '',_        <P>,PREVIOUS PARAMETERS''
  (1)  020513     137  020040  020040              .ASCII  '',_        <S>,SELECT PARAMETERS''
  (1)  020551     137  020040  020040              .ASCIZ  '',_        <N>,START THIS TEST NUMBER''
  (1)                                       ;*                      HEADER TEXT MOD
  (1)                                       ;************************ MOD APR 74 ***********************************
  (1)  020615     137  042137  050054  FSTART: .ASCIZ  ''__D,P,S,N? ''
  (1)
  (1)  020631     137  040502  042523  MSG2:   .ASCIZ  ''_BASE ADDRESS: ''
  (1)  020651     137  042504  044526  MSG3:   .ASCIZ  '',_DEVICES PER CU: ''
  (1)  020673     137  042524  052123  MSG5:   .ASCIZ  '',_TEST NUMBER: ''
  (1)  020712  052137  050131  020105  MSG4:   .ASCIZ  '',_TYPE CU ADRS'S IN HEX <CR><LF>; <CR><CR> TERMINATES LIST''
  (1)  021004  040537  051104  035123  MSG6:   .ASCIZ  '',_ADRS: ''
  (1)  021014  051537  052105  051440  MSG7:   .ASCIZ  '',_SET SWITCHES_''
  (1)  021033     137  044514  052123  MSG9:   .ASCIZ  '',_LIST ALL LEGAL COMMANDS''
  (1)  021064  041537  046517  040515  MSG10:  .ASCIZ  '',_COMMAND:''
  (1)  021076  042137  020130  051120  MSG12:  .ASCIZ  '',_DX PRIORITY LEVEL: ''
  (1)  021123     137  036440  044440  MSG13:  .ASCIZ  '',_ = ILLEGAL ?''
  (1)
  (1)
  (1)  021141     137  042522  051507  RDH:    .ASCIZ  ''_REGSTR - SHOULD BE  -  WAS''
  (1)  021175      35  000037          HOME:   .ASCIZ  <35><37>
  (1)  021200  000207                  BELL:   .ASCIZ  <207>
  (1)  021202  042537  042116  052040  ENDTST: .ASCIZ  ''_END TEST''
```

```
(1)  021214  020137  051105  047522  ECM:     .ASCIZ  '' ERRORS DETECTED: ''
(1)  021240  057477     000          .QUES:   .ASCIZ  '? ''
(1)  021243     040  020040  020040  SPAC4:   .ASCIZ  <40><40><40><40><40><40>
(1)  021252  000040                  SPACE:   .ASCIZ  <40>
(1)  021254  000137                  CRLF:    .ASCIZ  '' ''
(1)  021256  052137  050131  020105  STALL:   .ASCIZ  '^TYPE IN STALL COUNT: ''
(1)  021305     137  042537  051122  ERPC:    .ASCIZ  '^_ERROR PC: ''
(1)
(1)  021322  042137  042130  035123  ADXDS:   .ASCIZ  ''^DXDS:''
(1)  021331     137  054104  040503  ADXCA:   .ASCIZ  '^DXCA:''
(1)  021340  042137  041530  035123  ADXCS:   .ASCIZ  '^DXCS:''
(1)  021347     137  054104  051517  ADXOS:   .ASCIZ  '^DXOS:''
(1)  021356  042137  041130  035101  ADXBA:   .ASCIZ  '^DXBA:''
(1)  021365     137  054104  041502  ADXBC:   .ASCIZ  '^DXBC:''
(1)  021374  042137  046530  035117  ADXMO:   .ASCIZ  '^DXMO:''
(1)  021403     137  054104  044515  ADXMI:   .ASCIZ  '^DXMI:''
(1)  021412  042137  041530  035102  ADXCB:   .ASCIZ  '^DXCB:''
(1)  021421     137  054104  042116  ADXND:   .ASCIZ  '^DXND:''
(1)  021430  042137  042530  035123  ADXES:   .ASCIZ  '^DXES:''
(1)  021437     137  054104  051505  ADXES1:  .ASCIZ  '^DXES1: ''
(1)                                  ;************************** MOD APR 74 ********************************
(1)                                  ;*                          ERROR TEXT MOD
(1)
(1)  021450  020137  052503  042101  MSG26:   .ASCIZ  '' CUADRS/MO:''
(1)                                  ;************************** MOD APR 74 ********************************
(1)  021465     137  042526  052103  MSG28:   .ASCIZ  '' VECTOR ADDRESS: ''
(1)  021507     137  052123  052101  MSG31:   .ASCIZ  '^STATUS: ''
(1)  021521     137  051105  047522  MSG35:   .ASCIZ  '^ERROR IN TEST: ''
(1)  021542  047537  044522  044507  MSG36:   .ASCIZ  '^ORIGIN OF MAP ERROR: ''
(1)  021571     137  052124  052040  TRCM1:   .ASCIZ  '^TT TRACE ERROR IN TEST: ''
(1)  021623     137  051117  043511  TRCM:    .ASCIZ  '^ORIGN OF LAST TT TRACE UPDATE: ''
(1)  021664  041040  051525  020131  ABSYM:   .ASCIZ  '^BUSY ENABLE  ''
(1)  021703     115  046125  044524  AMUXM:   .ASCIZ  'MULTIPLEXER  CH''
(1)  021723     137  047105  051124  TRC1:    .ASCIZ  '' ENTRY WAS      :''
(1)  021745     137  047105  051124  TRC2:    .ASCIZ  '^ENTRY SHOULD BE:''
(1)  021767     137  047105  051124  TTDS:    .ASCIZ  '^ENTRY WAS FROM DXDS''
(1)  022014  042537  052116  054522  TTCA:    .ASCIZ  '^ENTRY WAS FROM DXCA''
(1)                                  .LIST    BEX
3371
3372                                 .SBTTL   DATA BUFFERS
3373
3374                                 ;DATA BUFFER -- CONTAINS 0 - 255 IN ONE BYTE ITEMS
3375
3376                                 ;DATA FILE FOR CHANNEL SIMULATOR WRITE CMDS
3377         022042                  .EVEN
3378
3379  022042                         DATA:
3380
3381
3382
3383         000001                  N=1
3384  022042 000001                  .WORD    N
3385         000002                  N=N*2
3386  022044 000002                  .WORD    N
3387         000004                  N=N*2
3388  022046 000004                  .WORD    N
```

```
3389            000010                  N=N*2
3390  022050    000010                  .WORD   N
3391            000020                  N=N*2
3392  022052    000020                  .WORD   N
3393            000040                  N=N*2
3394  022054    000040                  .WORD   N
3395            000100                  N=N*2
3396  022056    000100                  .WORD   N
3397            000200                  N=N*2
3398  022060    000200                  .WORD   N
3399            000400                  N=N*2
3400  022062    000400                  .WORD   N
3401            001000                  N=N*2
3402  022064    001000                  .WORD   N
3403            002000                  N=N*2
3404  022066    002000                  .WORD   N
3405            004000                  N=N*2
3406  022070    004000                  .WORD   N
3407            010000                  N=N*2
3408  022072    010000                  .WORD   N
3409            020000                  N=N*2
3410  022074    020000                  .WORD   N
3411            040000                  N=N*2
3412  022076    040000                  .WORD   N
3413            100000                  N=N*2
3414  022100    100000                  .WORD   N
3415            000000                  N N*2
3416            000002                  W=2
3417  022102    177775                  .WORD   -W-1
3418            000004                  W=W+W
3419  022104    177773                  .WORD   -W-1
3420            00001C                  W=W+W
3421  022106    177767                  .WORD   -W-1
3422            000020                  W=W+W
3423  022110    177757                  .WORD   -W-1
3424            000040                  W=W+W
3425  022112    177737                  .WORD   -W-1
3426            000100                  W=W+W
3427  022114    177677                  .WORD   -W-1
3428            000200                  W=W+W
3429  022116    177577                  .WORD   -W-1
3430            000400                  W=W+W
3431  022120    177377                  .WORD   -W-1
3432            001000                  W=W+W
3433  022122    176777                  .WORD   -W-1
3434            002000                  W=W+W
3435  022124    175777                  .WORD   -W-1
3436            004000                  W=W+W
3437  022126    173777                  .WORD   -W-1
3438            010000                  W=W+W
3439  022130    167777                  .WORD   -W-1
3440            020000                  W=W+W
3441  022132    157777                  .WORD   -W-1
3442            040000                  W=W+W
3443  022134    137777                  .WORD   -W-1
3444            100000                  W=W+W
```

```
3445  022136  077777          .WORD   -W-1
3446          000000          W=W+W
3447  022140  177777          .WORD   -W-1
3448          000000          W=W+W
3449          000001          N=1
3450  022142  000001          .WORD   N
3451          000002          N=N*2
3452  022144  000002          .WORD   N
3453          000004          N=N*2
3454  022146  000004          .WORD   N
3455          000010          N=N*2
3456  022150  000010          .WORD   N
3457          000020          N=N*2
3458  022152  000020          .WORD   N
3459          000040          N=N*2
3460  022154  000040          .WORD   N
3461          000100          N=N*2
3462  022156  000100          .WORD   N
3463          000200          N=N*2
3464  022160  000200          .WORD   N
3465          000400          N=N*2
3466  022162  000400          .WORD   N
3467          001000          N=N*2
3468  022164  001000          .WORD   N
3469          002000          N=N*2
3470  022166  002000          .WORD   N
3471          004000          N=N*2
3472  022170  004000          .WORD   N
3473          010000          N=N*2
3474  022172  010000          .WORD   N
3475          020000          N=N*2
3476  022174  020000          .WORD   N
3477          040000          N=N*2
3478  022176  040000          .WORD   N
3479          100000          N=N*2
3480  022200  100000          .WORD   N
3481          000000          N=N*2
3482          000002          W=2
3483  022202  177775          .WORD   -W-1
3484          000004          W=W+W
3485  022204  177773          .WORD   -W-1
3486          000010          W=W+W
3487  022206  177767          .WORD   -W-1
3488          000020          W=W+W
3489  022210  177757          .WORD   -W-1
3490          000040          W=W+W
3491  022212  177737          .WORD   -W-1
3492          000100          W=W+W
3493  022214  177677          .WORD   -W-1
3494          000200          W=W+W
3495  022216  177577          .WORD   -W-1
3496          000400          W=W+W
3497  022220  177377          .WORD   -W-1
3498          001000          W=W+W
3499  022222  176777          .WORD   -W-1
3500          002000          W=W+W
```

```
 3501  022224  175777          .WORD   -W-1
 3502          004000          W=W+W
 3503  022226  173777          .WORD   -W-1
 3504          010000          W=W+W
 3505  022230  167777          .WORD   -W-1
 3506          020000          W=W+W
 3507  022232  157777          .WORD   -W-1
 3508          040000          W=W+W
 3509  022234  137777          .WORD   -W-1
 3510          100000          W=W+W
 3511  022236  077777          .WORD   -W-1
 3512          000000          W=W+W
 3513  022240  177777          .WORD   -W-1
 3514          000000          W=W+W
 3515          000001          N=1
 3516  022242  000001          .WORD   N
 3517          000002          N=N*2
 3518  022244  000002          .WORD   N
 3519          000004          N=N*2
 3520  022246  000004          .WORD   N
 3521          000010          N=N*2
 3522  022250  000010          .WORD   N
 3523          000020          N=N*2
 3524  022252  000020          .WORD   N
 3525          000040          N=N*2
 3526  022254  000040          .WORD   N
 3527          000100          N=N*2
 3528  022256  000100          .WORD   N
 3529          000200          N=N*2
 3530  022260  000200          .WORD   N
 3531          000400          N=N*2
 3532  022262  000400          .WORD   N
 3533          001000          N=N*2
 3534  022264  001000          .WORD   N
 3535          002000          N=N*2
 3536  022266  002000          .WORD   N
 3537          004000          N=N*2
 3538  022270  004000          .WORD   N
 3539          010000          N=N*2
 3540  022272  010000          .WORD   N
 3541          020000          N=N*2
 3542  022274  020000          .WORD   N
 3543          040000          N=N*2
 3544  022276  040000          .WORD   N
 3545          100000          N=N*2
 3546  022300  100000          .WORD   N
 3547          000000          N=N*2
 3548          000002          W=2
 3549  022302  177775          .WORD   -W-1
 3550          000004          W=W+W
 3551  022304  177773          .WORD   -W-1
 3552          000010          W=W+W
 3553  022306  177767          .WORD   -W-1
 3554          000020          W=W+W
 3555  022310  177757          .WORD   -W-1
 3556          000040          W=W+W
```

```
3557  022312  177737          .WORD   -W-1
3558          000100          W=W+W
3559  022314  177677          .WORD   -W-1
3560          000200          W=W+W
3561  022316  177577          .WORD   -W-1
3562          000400          W=W+W
3563  022320  177377          .WORD   -W-1
3564          001000          W=W+W
3565  022322  176777          .WORD   -W-1
3566          002000          W=W+W
3567  022324  175777          .WORD   -W-1
3568          004000          W=W+W
3569  022326  173777          .WORD   -W-1
3570          010000          W=W+W
3571  022330  167777          .WORD   -W-1
3572          020000          W=W+W
3573  022332  157777          .WORD   -W-1
3574          040000          W=W+W
3575  022334  137777          .WORD   -W-1
3576          100000          W=W+W
3577  022336  077777          .WORD   -W-1
3578          000000          W=W+W
3579  022340  177777          .WORD   -W-1
3580          000000          W=W+W
3581          000001          N=1
3582  022342  000001          .WORD   N
3583          000002          N=N*2
3584  022344  000002          .WORD   N
3585          000004          N=N*2
3586  022346  000004          .WORD   N
3587          000010          N=N*2
3588  022350  000010          .WORD   N
3589          000020          N=N*2
3590  022352  000020          .WORD   N
3591          000040          N=N*2
3592  022354  000040          .WORD   N
3593          000100          N=N*2
3594  022356  000100          .WORD   N
3595          000200          N=N*2
3596  022360  000200          .WORD   N
3597          000400          N=N*2
3598  022362  000400          .WORD   N
3599          001000          N=N*2
3600  022364  001000          .WORD   N
3601          002000          N=N*2
3602  022366  002000          .WORD   N
3603          004000          N=N*2
3604  022370  004000          .WORD   N
3605          010000          N=N*2
3606  022372  010000          .WORD   N
3607          020000          N=N*2
3608  022374  020000          .WORD   N
3609          040000          N=N*2
3610  022376  040000          .WORD   N
3611          100000          N=N*2
3612  022400  100000          .WORD   N
```

```
3613            000000                  N=N*2
3614            000002                  W=2
3615  022402    177775                  .WORD   -W-1
3616            000004                  W=W+W
3617  022404    177773                  .WORD   -W-1
3618            000010                  W=W+W
3619  022406    177767                  .WORD   -W-1
3620            000020                  W=W+W
3621  022410    177757                  .WORD   -W-1
3622            000040                  W=W+W
3623  022412    177737                  .WORD   -W-1
3624            000100                  W=W+W
3625  022414    177677                  .WORD   -W-1
3626            000200                  W=W+W
3627  022416    177577                  .WORD   -W-1
3628            000400                  W=W+W
3629  022420    177377                  .WORD   -W-1
3630            001000                  W=W+W
3631  022422    176777                  .WORD   -W-1
3632            002000                  W=W+W
3633  022424    175777                  .WORD   -W-1
3634            004000                  W=W+W
3635  022426    173777                  .WORD   -W-1
3636            010000                  W=W+W
3637  022430    167777                  .WORD   -W-1
3638            020000                  W-W+W
3639  022432    157777                  .WORD   -W-1
3640            040000                  W=W+W
3641  022434    137777                  .WORD   -W-1
3642            100000                  W W+W
3643  022436    077777                  .WORD   -W-1
3644            000000                  W=W+W
3645  022440    177777                  .WORD   -W-1
3646            000000                  W=W+W
3647
3648            022442                  .=.             ;INDICATE ADDRESS OF END OF BUFFER
3649  022442    000000                  WDATA:  0               ;BEGINNING OF WRITE DATA FILE
3650            023442                  NPRDATA-WDATA+512.      ;NPR INPUT DATA FILE
3651                                    ;WDATA AND NPRDAT OVER WRITE ASCII TEXT
3652            000001                  .END
```

```
ABSYM   021664            2032    3370#
ACCEPT= 104005             262#   2132    2146    2156    2163    2172    2217    2253    2259
ACLC    017274            3083    3089#
ACPTH   015764            2856#   2880
ACPTH.  015766            2857#   2877
ACPTO   016440            2927#   2950
ACPTO.  016442            2928#   2947
ACUA    014222            2293*   2294    2304    2336*   2337    2338*   2379#
ADRA    012604            2064#
ADRAE   012632            2075#
ADRECC= 000002              97#   1590
ADRECD= 000001              98#
ADRI  = 010000              76#   1619    1656    1833    1846
ADRO  = 004000              64#   1574    1606    1734    1735    1759    1760    1786    1788    1792    1794    1870    1872
                          1895    1897
ADXBA   021356            2068    3370#
ADXBC   021365            2069    3370#
ADXCA   021331            2065    3370#
ADXCB   021412            2072    3370#
ADXCS   021340            2066    3370#
ADXDS   021322            2064    3370#
ADXES   021430            2074    3370#
ADXES1  021437            2075    3370#
ADXMI   021403            2071    3370#
ADXMO   021374            2070    3370#
ADXND   021421            2073    3370#
ADXOS   021347            2067    3370#
AHEX    016102            2870    2887#
AHEX0   016104            2888#   2892
AHEX1   016126            2889    2894#
AH.2    016002            2859    2861#
AH.3    016040            2871#   2895
AMUXM   021703            2035    3370#
AO.2    016456            2930    2932#
ATBL    016412            2888    2891    2917#
ATTEN = 000200              46#
ATTN  = 000200             208#
BA    = 000010             123#
BALF  = 000010              95#
BC    = 000012             124#
BEGIN   001100             292     296#    328     2051    2102    2116
BELL    021200            2297    3370#
BGN0    001216             318     322#
BGN1    001230             323     325#
BGN2    001244             326     328#
BIT0  = 000001             186#   1101    1369    2283
BIT1  = 000002             185#   1312    1373    1748    1986    2030
BIT10 = 002000             176#    220
BIT11 = 004000             175#    219    1918
BIT12 = 010000             174#    218    2015
BIT13 = 020000             173#    217    2005    2975    3047
BIT14 = 040000             172#    216    1916
BIT15 = 100000             171#    215
BIT2  = 000004             184#    900     985    1006    1026    1094    1131    1154    1610    1687    1807    1878    2033
BIT3  = 000010             183#
BIT4  = 000020             182#
```

```
BIT5  = 000040   181#
BIT6  = 000100   180#
BIT7  = 000200   179#
BIT8  = 000400   178#
BIT9  = 001000   177#
BSY   = 000020    49#   211#  1750
BSYEN = 004000    29#  1314  1315  1375
BSYS  = 000400    13#
BUSI    001342   373#   451   977  1623  1680  1691  1750  1764  1837  1882  2829
BUSO    001336   368#  1086* 1087  1436* 1440* 1563  1636* 1637  1641* 1642  1661  1716  1730
                2826
BUSOB   001352   382#
BYPAS = 000100    92#
CA    = 000002   120#
CARG    016540  2935  2937  2951#
CARGH   016066  2864  2866  2881#
CARRY   014210  2369#
CB    = 000020   127#
CE    = 000010   205#   451  1401  2474  3099
CHDEND= 000040    16#
CHEND = 000010    50#
CHENDS= 001000    12#   898  1024  1152
CHIS  = 000200    14#   826   851   872   884   950   963  1059  1071
CKCUA   015334  2235  2284  2713#
CKC1    015340  2714#  2731
CKC2    015342  2715#  2716*
CKC3    015350  2721#
CKC4    015372  2725  2729#
CLKO  = 001000    79#  1538  1548
CLRMO   015570  2749  2771#
CL1     014776  2593#  2595
CMD     014216   824*  849*  870*  886   888   948*  965   967  1057* 1073  1075  1319  1320
                1421  1641  1642  1660  1674  1689  1715  1874  1876  1880  1899  1901  2373#
CMDCHN= 000004    19#
CMDO  = 002000    65#  1646  1664  1665  1841  1842  1859  1860  1875  1877  1900  1902
CMDREJ= 000001    21#   851  1651
CMD.AD  014440  2250  2492#  2556
CMD.ST  014500  2249  2513#  2565  2704
CNT     007412  1483* 1484* 1494* 1495* 1513#
CNTLC = 000003  3076#  3081
CONI    001344   374#
CONO    001340   369#  1575  1585  1607  1647
CONOB   001354   383#
COUNT   014252   878*  956* 1022* 1065* 1150* 1430* 1441* 2397#
CR    = 000015  2196  2262  3003  3366#
CRLF    021254  2029  3370#
CS    = 000004   121#
CS10  = 002000    30#
CS12  = 010000    28#
CUADRS  014224  2026  2294* 2299* 2337* 2339  2340  2382#
CUAR    001326   358#   887*  895*  905*  966* 1031* 1074* 1159* 1321* 1568* 1569  1755  1892*
                1893* 2820
CUBSY = 000400    32#
CUCR    001330   359#   888*  967* 1075* 1320*
CUDEND= 000020    17#   892   972  1080
CUDX  = 000400    88#
```

```
CUE    = 000040            210#
CUEND  = 000040             48#
CUFBM  = 040000             26#
CUIS.G  011030            1810#
CUIS.S  011020             890     969    1077    1406    1805#
CUISO   011250            1808    1864#
CUOR    001334             364#
CUSR    001332             363#   1401*   1677    2823
DATA    022042             958     959    3379#
DE     = 000004             206#    451    1401    2474    3099
DELAY   006710            1345#   1346
DEV     014214             885     887     893     895     899     905     964     966    1025    1031    1072    1074    1153
                          1159    1318    1321    1562    1563    1568    1569    1623    1636    1729    1730    1755    1764
                          1769    1837    1869    1873    1892    1894    1898   2340*   2341   2371#
DEVCNT  014226            2292*   2300*   2301    2303*   2342    2383#
DEVEND= 000004              51#
DEV.A   014220            2341*   2344*   2346*   2347    2376#   2551*
DFLT.C  014360            2445#   2555
DFLT.S  014420            2470#   2564
DOFLIN= 000002             201#
DONE   = 000200              33#   1191    1194    1242    1245    1246    1364    1388    2796
DS     = 000000             119#
DSCRSP= 000002             113#
DST     001442             430#   1311*   1372*   1376*   1676    2554*   2676    2701
DSTADR= 017400             430    2554    3094#
DSTCNT  014244            2394#
DST.SE  015304            2287    2700#
DS.1    015314            2703#   2706*
DS.2    015322            2705#   2707
DTMP    011542            1911#   1912*   1913
DXBA    001304             344#    880*    959*   1067*
DXBASE  001262             335#   2160*   2546*   2810
DXBC    001306             345#    879*    957*   1066*
DXCA    001276             341#   2819
DXCB    001314             348#   1497    1523    1590    1724
DXCS    001300             342#    881*    960*   1070*   1191   1194*   1242   1245*   1246   1314*   1315   1322*   1323
                          1364*   1375*   1379*   1388*   1403*   1490*   1491   1519*   1520   2055*   2315*   2750*   2796*
                          2797*
DXDS    001274             340#   1598    1651    2811
DXES    001320             350#   1367*   2053*   2744*   2756*   2757    2831
DXES1   001324             352#   1544    1554    2814
DXFI   = 000003              39#   1070
DXFO   = 000005              40#    881     960
DXFRS  = 000001              38#   2055    2797
DXFST  = 000007              41#   1403
DXIS    001266             337#   1326*   1378*   2168*   2352*   2548*
DXIV    001264             336#   1327*   1377*   2166*   2351*   2547*
DXMI    001312             347#    445     448     974     989    1010    1083    1096    1135   1366*   1416*   1534    1538
                          1541    1548    1551    1601    1619    1630    1633    1656    1670    1812    1825    1829    1833
                          1846    2828
DXMO    001310             346#    443     981*    982     992*    993     998*    999   1002*   1003   1015*   1016    1019
                          1090*   1091    1117*   1118    1123*   1124   1127*   1128   1140*   1141    1144   1146*   1147
                          1310*   1365*   1407*   1408*   1412*   1426*   1428*   1437*   1439*   1500   1503*   1504    1507*
                          1508    1537*   1547*   1557*   1558    1561*   1562*   1574*   1579*   1580   1584*   1606*   1612*
                          1613    1616    1628    1646*   1660*   1664*   1665    1693*   1694    1697   1701*   1702    1710*
                          1711    1715*   1729*   1734*   1735    1738*   1739    1743*   1744   1759*   1760    1769*   1770
```

```
                    1777*  1778   1782   1786*  1788   1792*  1794   1816*  1817   1821   1841*  1842   1850*
                    1851   1855   1859*  1860   1869*  1870*  1871*  1872*  1873*  1874*  1875*  1876*  1877*
                    1884*  1885*  1886*  1894*  1895*  1896*  1897*  1898*  1899*  1900*  1901*  1902*  1903*
                    1904*  2054*  2771*  2772   2825
DXMOB   001322       351#
DXND    001316       349#
DXOS    001302       343#   462*  1486*  1487   2752*  2753   2822
DXPRT   001270       338#  1326   1378   2180*  2352   2549*
DXTO  = 000020       106#
D.DEV.  014766      2551   2582#
D.DXBA  014754      2546   2577#
D.DXIS  014770      2548   2583#
D.DXIV  014756      2547   2578#
D.DXPR  014760      2549   2579#
D.FIRS  014752      2545   2576#
D.LEGA  014764      2552   2581#
D.MAX.  014762      2550   2580#
E     = 000013       252#   257#   258#   259#   260#   261#   262#   263#   264#   265#   266#   267#
EC    = 000001       805#
ECM     021214      2320   3370#
EMOD1   012442      2031   2033#
EMOD2   012456      2034   2036#
EMTABL= 012052       253#   257#   258#   259#   260#   261#   262#   263#   264#   265#   266#   267#
EMTAG   012024       253   1948   1953#
EMTDEC  011762       283   1939#
EMTOK   012004      1944   1946#
ENDEN = 020000        27#
ENDSTR= 001630       488#
ENDTST  021202      2319   3370#
ENDTT = 004000       804#  2594
ENTRY1  006366       826*   851*   872*   884*   892*   898*   950*   963*   972*  1024*  1059*  1071*  1080*
                    1152*  1270#  1273   1275*  2538*
ENTRY2  006426       885*   886*   893*   894*   899*   902*   904*   964*   965*   971*  1025*  1028*  1030*
                    1072*  1073*  1081*  1153*  1156*  1158*  1281#  1284   1286*  1318*  1319*  2539*
ERFLG   012602      1960*  1965*  1997*  2017   2061#
ERPC    021305      2007   3370#
ERRCNT  012634      1998*  2081#  2271*  2322   2544*
ERRDST  016400       497    498    499    500    501    502    503    504    505    506    507    508    509
                     510    511    512    516    517    518    519    520    521    522    523    524    525
                     526    527    528    529    530    531    535    536    537    538    539    540    541
                     542    543    544    545    546    547    548    549    550    554    555    556    557
                     558    559    560    561    562    563    564    565    566    567    568    569    573
                     574    575    576    577    578    579    580    581    582    583    584    585    586
                     587    588    592    593    594    595    596    597    598    599    600    601    602
                     603    604    605    606    607    611    612    613    614    615    616    617    618
                     619    620    621    622    623    624    625    626    630    631    632    633    634
                     635    636    637    638    639    640    641    642    643    644    645    649    650
                     651    652    653    654    655    656    657    658    659    660    661    662    663
                     664    668    669    670    671    672    673    674    675    676    677    678    679
                     680    681    682    683    687    688    689    690    691    692    693    694    695
                     696    697    698    699    700    701    702    706    707    708    709    710    711
                     712    713    714    715    716    717    718    719    720    721    725    726    727
                     728    729    730    731    732    733    734    735    736    737    738    739    740
                     744    745    746    747    748    749    750    751    752    753    754    755    756
                     757    758    759    763    764    765    766    767    768    769    770    771    772
                     773    774    775    776    777    778    782    783    784    785    786    787    788
```

```
                        789     790     791     792     793     794     795     796     797    2683    2906#
ERRLOP  012470         2038    2042#
ERROR = 104000          257#    447     450     453     976     979     984     991     995    1001    1005    1012    1018
                       1021    1085    1089    1093    1098    1108    1113    1120    1126    1130    1137    1143    1149
                       1188    1193    1233    1244    1248    1317    1325    1332    1489    1493    1499    1502    1506
                       1510    1522    1536    1540    1543    1546    1550    1553    1556    1560    1565    1571    1577
                       1582    1587    1593    1600    1603    1609    1615    1618    1621    1625    1632    1635    1639
                       1644    1649    1654    1658    1663    1667    1672    1679    1682    1696    1699    1704    1713
                       1718    1732    1737    1741    1746    1752    1757    1762    1766    1772    1780    1784    1790
                       1796    1814    1819    1823    1827    1831    1835    1839    1844    1848    1853    1857    1862
                       1945    2755    2759    2774    2777
ERTSTN  012636          813*    837*    864*    915*   1042*   1169*   1968    2021   2082#   2356*   2543*
ES      001030          129#    257#    258#    259#    260#    261#    262#    263#    264#    265#    266#    267#
ESEND = 000100           15#    898    1024    1152
ETMP0   012316         2009#   2010*   2012
EXR.SM= 000001            2#   2025    2037    2039    2041    2306    2541    2573    3370
EXTR1   012600         2050    2060#
E.R0    012640         1999*   2043    2087#
E.R1    012642         2000*   2044    2088#
E.R2    012644         2001*   2045    2089#
E.R3    012646         2002*   2046    2090#
E.R4    012650         2003*   2047    2091#
E.R5    012652         2004*   2048    2092#
FALSE   006114         1188#   2351
FASTCU= 002000           86#
FASTIS  011252         1868#
FCTN  = 000006           37#
FIRST.  014234         2133*   2151*   2353    2355*   2356    2387#   2542*
FISS1   011364         1879    1881    1884#
FISS2   011372         1883    1885#
FIVESE= 000001         2367#
FOL     007414         1371    1519#
FOL1    007434         1523#   1524
FSTART  020615         2118    3370#
GETHEX  015752         2192    2852#
GO    = 000001           42#    881    1070    1403
H       012712         2110#   2111*
HEADER  020074         2110    3367#
HERE  = 000000          187#
HEXNUM  016410         2193    2194    2202    2852*   2881*   2916#
HIOS.0  010642         1749    1754#
HIO.SU  010506         1724#
HIO.0   010724         1725    1753    1776#
HIO.2   011016         1797#
HLDO  = 040000           59#   1365    1407    1537    1547    1557    1561    1579    1580    1612    1616    1693    1697
                       1738    1739    1777    1778    1816    1821    1850    1851    1871    1884    1896
HLTSW = 100000          215#   2037
HOME    021175         2108    3370#
HTBL    016422         2894    2919#
IBMRST= 034000           10#
ICOUNT  011654          812*    836*    863*    914*   1041*   1168*   1921   1930#
IDVN    015404         2694    2726    2733#
IISW  = 004000          219#
ILLC  = 000405          196#    849    2452
INFDSC= 004000            9#     10
INITB   001154          303     310#
```

```
INITC   001160            309     311#
INITZ   001144            306     308#
INTEN = 000100             34#   1322    1323    1379    2115
INTERR  006152           1203#
INTOK = 100000            200#   1195    1204    1207    1361
INTPAS  006150           1195*   1198#   1204    1207*   1368*
INTR    006120           1191#   1377
INTREQ= 000200            108#
IOD   = 000200             89#
IRR     006174           1205    1208#
IRR2    006162           1206#
IRS   = 000001            112#
ISSCRJ  010222            845*    856*   1652#
ISSREJ= 000010             18#   1598
ISS.SU  007446            829     854     875     953    1062    1533#
ISS1    010374           1690    1693#
ISS2    010426           1688    1692    1701#
ISS3    010056           1611    1619#
KEY.TO= 104006            263#   2119    2195    2261    2273    2857    2928
LARS  = ****** U          2122
LEGAL.  014254            2190    2293    2336    2402#   2552*   2553*   2662    2713
LESS1   001272             339#    827     852     873     951    1060    2057    2183*
LEVEL0= 000000             224#
LEVEL1= 000040             225#
LEVEL2= 000100             226#
LEVEL3= 000140             227#    339
LEVEL4= 000200             228#    338    2107    2579
LEVEL5= 000240             229#
LEVEL6= 000300             230#
LEVEL7= 000340             231#    274     277     280     283     286     297     329    2103    2117    2743
LF    = 000012            3003    3365#
LOCKO = 100000              84#
LOGICA  014020             288    2331#
LOPSW = 040000             216#   2049
LPCNTL  013666            1182    2297#
LPCSU   013642            2291#
LPC1    014052            2295    2302    2339#
LPC2    014036            2305    2337#
LPC3    014112            2343    2346#
LPC4    014120            2345    2347#
LPC5    014030            2308    2329    2336#
MAPERR= 104001             258#
MARK    015144            2659#   2666
MAX.DE  014236            2234*   2301    2342    2388#   2550*   2685    2721
MCCSW = 002000             220#
MCLKEN= 000002             103#   2053
MCLKP = 000001             102#
MC1.SM= 000000               2#    432     477    1312    1878    2849    2897    3370
MC2.SM= 000000               2#   1312    1878    2604    3102    3353    3367    3370
MDXX    013422            2227#   2228*   2229*   2230*
MEM.SM= 000000               2#    258     332     490     805    1958    2604    2605    3370
MI    = 000016             126#
MISC    001346             377#   2832
MO    = 000014             125#
MONDFL  014520            2104    2122    2143    2537#
MONITO  012654             324    2097#
```

```
MON1    013070          2128    2143#
MON1.0  012724           327    1334    1915    2113#   2130    2276    2695    2860    2931    3084
MON10   013544           330    2126    2255    2269#
MON11   013576           321    2275    2281#
MON12   014124          2350#
MON13   014156          2354    2356#
MON14   014202          2360#
MON2    014664          2558#   2560
MON2.0  014704          2563#   2567*
MON2.1  014716          2566#   2568
MON2.3  014750          2573#
MON3    013116          2150    2153#
MON4    013140          2159    2162#
MON4.1  013176          2165    2171#
MON5    013362          2216#   2221    2727
MON5.1  013452          2235#
MON6    013264          2174    2189#
MON7    013274          2191#   2197    2208
MON8    013456          2249#
MON9    013472          2252#   2263
MSG10   021064          2252    3370#
MSG12   021076          2171    3370#
MSG13   021123          2207    2220    3370#
MSG2    020631          2153    3370#
MSG26   021450          2024    3370#
MSG28   021465          2162    3370#
MSG3    020651          2216    3370#
MSG31   021507          2258    3370#
MSG35   021521          2019    3370#
MSG36   021542          3370#
MSG4    020712          2189    3370#
MSG5    020673          2131    2144    3370#
MSG6    021004          2191    3370#
MSG7    021014          2272    3370#
MSG9    021033          2251    3370#
N       = 000000         493#    494     513#    532#    551#    570#    589#    608#    627#    646#    665#    684#    703#
                         722#    741#    760#    779#    798#    805#    808     816#    832     840#    859     867#    910
                         918#   1037    1045#   1164    1172#   3383#   3384    3385#   3386    3387#   3388    3389#   3390
                        3391#   3392    3393#   3394    3395#   3396    3397#   3398    3399#   3400    3401#   3402    3403#
                        3404    3405#   3406    3407#   3408    3409#   3410    3411#   3412    3413#   3414    3415#   3449#
                        3450    3451#   3452    3453#   3454    3455#   3456    3457#   3458    3459#   3460    3461#   3462
                        3463#   3464    3465#   3466    3467#   3468    3469#   3470    3471#   3472    3473#   3474    3475#
                        3476    3477#   3478    3479#   3480    3481#   3515#   3516    3517#   3518    3519#   3520    3521#
                        3522    3523#   3524    3525#   3526    3527#   3528    3529#   3530    3531#   3532    3533#   3534
                        3535#   3536    3537#   3538    3539#   3540    3541#   3542    3543#   3544    3545#   3546    3547#
                        3581#   3582    3583#   3584    3585#   3586    3587#   3588    3589#   3590    3591#   3592    3593#
                        3594    3595#   3596    3597#   3598    3599#   3600    3601#   3602    3603#   3604    3605#   3606
                        3607#   3608    3609#   3610    3611#   3612    3613#
ND      = 000022         128#
NOCLR     015606        2773    2775#
NOP     = 000240         247#
NOPC    = 000403         194#   2450
NPRDAT= 023442          1067    1068    3650#
NPRT    = 000020          94#
NPRTO   = 000040         107#
NPRX    = 000040          93#
```

```
NXM    = 040000            6#
OCTNUM  014232          2133    2149    2151    2158    2160    2164    2166    2167*   2168    2173    2175*   2176*   2177*
                        2178*   2179*   2180    2181*   2182*   2183    2218    2223    2234    2254    2256    2257    2260
                        2386#   2924*   2951*
ODAT    015010          2288    2602#
ODAT1   015020          2606#   2607    2608    2609*   2610*
ODAT2   015022          2607#   2611
OEF     012244          1961    1992    1998#
OFF     010124          1629    1633#
OFFSET  014230          2385#   2570    2571
OLE.SM= 000001             2#   1369    1483    2283    2800    3370
OL2     007316          1495#   1496
OL3     007350          1503#
OL4     007242          1484#   1485
ONESHO  014206           320*   1923*   2052*   2270*   2368#   2541*
ONLIN   007234          1483#   2800
ONLINA= 001000            31#   1490    1491    1519    1520
ONLINB= 000004            96#   1497    1523
OPLI   = 100000            71#    445    1534    1601    1825
OPLO   = 100000            58#   1500    2772
OS     = 000006           122#
O.BRK   006674           274    1332#
PARA    013602           900     985    1006    1026    1094    1131    1154    1312    1369    1373    1610    1687    1748
                        1807    1878    2030    2033    2282#   2283*   2306*   2307    2309*
PARER  = 100000             5#
PARI   = 000400            80#   1630    1633
PARITY= 104007           264#   2193    2256    2339    2347    2607
PARO   = 000400            67#   1537    1547    1628    2609    2648    2650
PARSTP= 100000             25#
PCH1   = 104010           265#
PCH2   = 104011           266#
PCH3   = 104012           267#
PERRPC  012456          2006    2016    2037#
PFAIL   001444           280     440#    461
PFLD    001610           468     478#
PG2     015072          2640#   2645
PG3     015104          2641    2644#
PG4     015130          2647    2650#
PG5     015136          2649    2652#
PHASE0= 000000           133#    150     151
PHASE1= 010000           134#    152     153
PHASE2= 020000           135#    154     155
PHASE3= 030000           136#    156     157
PHASE4= 040000           137#    158     159
PHASE5= 050000           138#    160     161
PHASE6= 060000           139#    162     163
PHASE7= 070000           140#    164     165
PHS    = 074000            85#
PHS01  = 004000          15C#
PHS02  = 000000          151#
PHS11  = 014000          152#
PHS12  = 010000          153#
PHS21  = 024000          154#
PHS22  = 020000          155#
PHS31  = 034000          156#
PHS32  = 030000          157#
```

```
PHS41 = 044000            158#
PHS42 = 040000            159#
PHS51 = 054000            160#
PHS52 = 050000            161#
PHS61 = 064000            162#
PHS62 = 060000            163#
PHS71 = 074000            164#
PHS72 = 070000            165#
PNTSW = 020000            217#
PREI    015442           2056    2350    2742#
PREITO  015610           2742    2777#
PREI.1  015466           2749#
PRINTF  017144           3052    3058#
PRINTL  017132           3053#   3067
PRINTR  017066           1974    1979    1984    2013    2027    2323    3043#
PRINTS  017076           1969    2022    3045#
PRINT2  017054           3039#   3050    3068    3072
PRINT3  017064           3041#   3043*   3045*   3046*   3062*   3063    3066*
PRTE    017222           3048    3074#
PRTY    015070           2638#   2642*   2646
PS    = 177776            248#    297*    329*    475*    827*    852*    873*    951*   1060*   1380*   1925*   2057*   2103*
                         2117*
PWRUP   001530            442     458#
RC0     004706            974#   1023
RC1     004774            986     992#
RC2     005020            997#   1013*
RC3     005022            998#   1014
RC4     005104           1007    1013#
RDH     021141           3370#
RDLAY   006712           1346#
RDXX    013410           2224#   2225*   2228
READC = 000002            193#    948    2449
REGTT   001406            405#
REG.SE  015646           2289    2809#
REG0    001356            387#
REG1    001360            388#
REG2    001362            389#
REG3    001364            390#
REG4    001366            391#
REG5    001370            392#
REG6    001372            393#
REG7    001374            394#
RELOD   013040           2111    2136#
REQI  = 020000             73#   1812    1829
RESRES  015614            463    2745    2751    2794#
RET     010136           1631    1634    1636#
RETURN  011660            476     814*    838*    865*    916*   1043*   1170*   1926    1927*   1932#   2058    2358*   2359*
                         2545*
RSTPC   017050           3023*   3033    3035#
RSTPSW  017052           3024*   3032    3036#
RSTRG = 104004            261#    460
RS.1    015656           2812#   2815
RTX     006706            302*    308*    311    1340#
RUBOUH  016060           2862    2868    2879#   2893
RUBOUT  016532           2933    2939    2941    2949#
S     = 000001            605#
```

```
SAVDEV  014246            2395#
SAVRG = 104003             260#   440
SAVR6   001606             441*   459    477#
SBYTE   015726            2817   2838#  2845
SCALD.  014316            2422#  2663   2677
SCHAR   017230            3079#  3080*  3081   3086
SCOPE = 104400             169#   811    835    862    913   1040   1167
SCOPEA  011646            1919   1928#
SCOPEB  011622            1917   1923#
SCOPEC  011530             286   1908#
SCOPEF  011656            1920*  1921   1928*  1931#
SCOPEG  011642            1922   1927#
SCOPEH  011566            1909   1914   1916#
SCP1    004024             814    815#
SCP2    004110             838    839#
SCP3    004210             865    866#
SCP4    004520             916    917#
SCP5    005260            1043   1044#
SCP6    006110            1170   1171#
SDAPG   015056            2634#  2635   2648*  2650*
SELI  = 040000              72#  1541   1551
SELIBR= 000004             114#  1544   1554
SELO  = 020000              60#   443   1365   1407   1537   1547   1558   1584   1612   1613   1693   1694   1743
                          1744   1777   1782   1816   1817   1850   1855   1871   1884   1896
SELRST= 020000               7#    10
SEL.DO  006262            1241#  1327
SEL.IS  011410            1891#
SEL.X   006540            1249   1306#
SENRY1  006360            1268#  1269   1272
SENRY2  006420            1279#  1280   1283
SENSEC= 000004             195#   870   2451
SESW  = 010000             218#
SETUP   006730            1363#
SM    = 000100             209#  1311   1372
SOSIEN= 000004             104#
SPACE   021252            3370#
SPAC4   021243            3370#
SPW     001436             422#   462   1486   1487   2570*  2669   2675   2752   2753
SPW.SE  015146            2285   2661#
SP.0    015156            2665#  2671
SP.1    015214            2677#  2691
SP.2    015220            2678#  2682
SP.3    015242            2679   2685#
SP.4    015246            2686#  2688*
SP.5    015250            2687#  2689
SP.6    015260            2684   2690#
SP.7    015302            2692   2696#
SP1     007004            1370   1372#
SP2     007034            1374   1377#
SP4     007062            1381#
SR    = 177570             250#   325   1916   1918   2005   2015   2037   2049   2975   3047
SRCCNT  014242            2393#
SRVI  = 002000              78#   974    989   1010   1083   1096   1135
SRVO  = 001000              66#   981    982    998    999   1002   1003   1019   1090   1091   1123   1124   1127
                          1128   1144   1146   1147   1408   1412   1426   1428   1437   1439   1503   1504   1507
                          1508   1701   1702   1710   1711   1885   1886   1903   1904
```

```
SSTAT   014240            880    2392#
STAI  = 004000             77#    448    1670
STALL   021256           3370#
STAMOD= 000100             47#   1750
START   000200            292#
STATUS  007064            907    1033    1161    1387#
STKSTA= 000040             35#
STKSTB= 000002             20#
SUPO  = 010000             61#    992     993    1015    1016    1117    1118    1140    1141
SVRPC   017006           3009*   3018    3020#
SVRPSW  017010           3010*   3017    3021#
SWR   = 177570            249#   2281
SYNC  = 001000             87#
SYSRST= 010000              8#     10
S1    = 006110            816#    840#    867#    918#   1045#   1172#
TDAT    015064           2636#   2640*   2644*
TDXBA   001416            410#
TDXCA   001410            407#
TDXCB   001424            413#
TDXCS   001412            408#
TDXDS   001406            406#
TDXES   001430            415#
TDXES1  001432            416#
TDXMI   001422            412#
TDXMO   001420            411#
TDXND   001426            414#
TDXOS   001414            409#
TERPC   012106            828*    853*    874*    889*    896*    906*    952*    968*    973*   1032*   1061*   1076*   1082*
                         1160*   1962#   1973
TESTAB= 011676            805#    816#    840#    867#    918#   1045#   1172#
TIMDIS= 000010            105#   1367    2756    2757
TIOC  = 000400            191#    824    2447
TI.O    006606           1313    1318#
TKB     001400            399#   1910    2114    2961    2962    3078
TKS     001376            398#   1908    2115*   2959
TMP     014212           2370#
TPB     001404            401#   2962*   2989*   3086*
TPS     001402            400#   2969    2987
TRACER= 104002            259#   1261    1265    1274    1285    1298
TRAINT  006542            825     850     871     949    1058    1310#
TRANSF  007142            897    1420#
TRCM    021623           1971    3370#
TRCM1   021571           1966    3370#
TRC1    021723           1976    3370#
TRC2    021745           1981    3370#
TR.OUT  007232           1432    1444#
TR.REA  007152           1425#   1431
TR.WRI  007176           1422    1435#   1442
TSSF  = 004000            144#
TSSFT   014250           2396#
TSTABL  011662            805    1933#   2358    2360
TST1    004000            811#    816    1288    1932    2576
TST2    004064            835#    840
TST3    004164            862#    867
TST4    004474            913#    918
TST5    005234           1040#   1045
```

```
TST6    006064          1167#  1172
TS1   = 004000           145#   150   152   154   156   158   160   162   164
TS2   = 000000           146#   151   153   155   157   159   161   163   165
TT      001440           426#  1215  1229  1257  1290  1295  2540  2571* 2572* 2592  2690  2798
TTCA    022014          1990   3370#
TTDS    021767          1988   3370#
TTNDX   001350           378#  1292
TTRACE  006526          1256   1300#  2540*  2798*
TTSHOU  006536          1273*  1284*  1304#  1983
TTTNDX  001434           417#
TTWAS   006534          1272*  1283*  1303#  1978
TTYFLG  016604          2963   2968#  2997   3085
TTYI    017224          2106   3078#
TTYIO   017260          3082   3085#
TTZERO  006226          1226#  2763
TTZ1    006242          1231#  1235
TT.CLR  014772          2286   2591#
TT.TRA  006320          1253#
TT.TO   006430          1282#
TT.T1   006470          1289   1291#
TT.T2   006500          1291*  1293#  1294*  1295*  1296
TYPE  = 000004           246#   468   1966  1971  1976  1981  1988  1990  2007  2019  2024  2029  2032
                        2035   2108  2110  2118  2131  2144  2153  2162  2171  2189  2191  2207  2216
                        2220   2251  2252  2258  2272  2297  2319  2320  2694  2726  2879  2949  3072
                        3083
T.ACCE  016430           262   2923#
T.ERRO  012240           257   1996#
T.KEY.  016552           263   2958#
T.MAPE  012074           258   1959#
T.PARI  015052           264   2632#
T.PCH1  020000           265   3355#
T.PCH2  020024           266   3358#
T.PCH3  020050           267   3361#
T.RSTR  017012           261   3023#
T.SAVR  016750           260   3009#
T.TRAC  012110           259   1964#
UC    = 000002           207#  2476  2477  2478  2479  2480  2481  2482  2483  2484  2485  2486  2907
                        2908  2909  2910  2911  2912  2913  2914  3102  3103  3104  3105  3106  3107
                        3108  3109  3110  3111  3112  3113  3114  3115  3116  3117  3118  3119  3120
                        3121  3122  3123  3124  3125  3126  3127  3128  3129  3130  3131  3132  3133
                        3134  3135  3136  3137  3138  3139  3140  3141  3142  3143  3144  3145  3146
                        3147  3148  3149  3150  3151  3152  3153  3154  3155  3156  3157  3158  3159
                        3160  3161  3162  3163  3164  3165  3166  3167  3168  3169  3170  3171  3172
                        3173  3174  3175  3176  3177  3178  3179  3180  3181  3182  3183  3184  3185
                        3186  3187  3188  3189  3190  3191  3192  3193  3194  3195  3196  3197  3198
                        3199  3200  3201  3202  3203  3204  3205  3206  3207  3208  3209  3210  3211
                        3212  3213  3214  3215  3216  3217  3218  3219  3220  3221  3222  3223  3224
                        3225  3226  3227  3228  3229  3230  3231  3232  3233  3234  3235  3236  3237
                        3238  3239  3240  3241  3242  3243  3244  3245  3246  3247  3248  3249  3250
                        3251  3252  3253  3254  3255  3256  3257  3258  3259  3260  3261  3262  3263
                        3264  3265  3266  3267  3268  3269  3270  3271  3272  3273  3274  3275  3276
                        3277  3278  3279  3280  3281  3282  3283  3284  3285  3286  3287  3288  3289
                        3290  3291  3292  3293  3294  3295  3296  3297  3298  3299  3300  3301  3302
                        3303  3304  3305  3306  3307  3308  3309  3310  3311  3312  3313  3314  3315
                        3316  3317  3318  3319  3320  3321  3322  3323  3324  3325  3326  3327  3328
                        3329  3330  3331  3332  3333  3334  3335  3336  3337  3338  3339  3340  3341
```

```
                        3342    3343    3344    3345    3346    3347    3348    3349    3350    3351    3352
UCHECK= 000002           52#
UCHKS = 002000           11#     851
UEXCEP= 000001           53#
VLUHEX  013330         2203#   2204*   2205    2226
W       = 000000       3416#   3417    3418#   3419    3420#   3421    3422#   3423    3424#   3425    3426#   3427    3428#
                       3429    3430#   3431    3432#   3433    3434#   3435    3436#   3437    3438#   3439    3440#   3441
                       3442#   3443    3444#   3445    3446#   3447    3448#   3482#   3483    3484#   3485    3486#   3487
                       3488#   3489    3490#   3491    3492#   3493    3494#   3495    3496#   3497    3498#   3499    3500#
                       3501    3502#   3503    3504#   3505    3506#   3507    3508#   3509    3510#   3511    3512#   3513
                       3514#   3548#   3549    3550#   3551    3552#   3553    3554#   3555    3556#   3557    3558#   3559
                       3560#   3561    3562#   3563    3564#   3565    3566#   3567    3568#   3569    3570#   3571    3572#
                       3573    3574#   3575    3576#   3577    3578#   3579    3580#   3614#   3615    3616#   3617    3618#
                       3619    3620#   3621    3622#   3623    3624#   3625    3626#   3627    3628#   3629    3630#   3631
                       3632#   3633    3634#   3635    3636#   3637    3638#   3639    3640#   3641    3642#   3643    3644#
                       3645    3646#
WC0     005430         1080#   1151
WC00    005542         1095    1099#
WC1     005610         1102    1117#
WC2     005634         1122#   1138*
WC3     005636         1123#   1139
WC4     005720         1132    1138#
WDATA   022442         1069    2604    3649#   3650
WRITEC= 000001          192#   1057    2448
XBA     = 000030         36#
X1$     013404         2219    2223#
YESRTI  006704          311*   1339#
ZEROTT  006176         1212#   2762
ZTT1    006212         1217#   1219
.       = 022444           2#    257#    258#    259#    260#    261#    262#    263#    264#    265#    266#    267#    273#
                         276#    279#    282#    285#    287#    290#    294#    446     449     452     466*    467     481#
                         488     489#    800#    802#    804     816#    828     840#    853     867#    874     889     896
                         906     918#    952     968     973     975     978     983     990     994     1000    1004    1011
                        1017    1020    1032    1045#   1061    1076    1082    1084    1088    1092    1097    1107    1112
                        1119    1125    1129    1136    1142    1148    1160    1172#   1192    1232    1243    1247    1260
                        1264    1297    1316    1324    1488    1492    1498    1501    1505    1509    1521    1559    1564
                        1570    1576    1581    1586    1592    1599    1602    1608    1614    1617    1620    1624    1638
                        1643    1648    1653    1657    1662    1666    1671    1678    1681    1695    1698    1703    1712
                        1717    1731    1736    1740    1745    1751    1756    1761    1765    1771    1779    1783    1789
                        1795    1813    1818    1822    1826    1830    1834    1838    1843    1847    1852    1856    1861
                        1934#   1955#   2754    2758    2902#   2960    2988    3005#   3044    3061    3064    3069    3090#
                        3092#   3094    3356#   3359#   3362#   3377#   3648#
.CAR    016734         2993    3003#
.CRLF   016676         2986    2991#
.IOT    016614          277    2975#
.IOTE   016724         2976    2999#
.MORE   016634         2979#   2990    2994    2996
.QUES   021240         2879    2949    3370#
.REST   016710         2984    2995#
.SAV    016732         2977*   2998    3002#
.TERM   016714         2980    2982    2997#
.TYPE   016746         3006#
```

```
ACPTHM      2#   2849
ACPTQM      2#   2922
ASCICH      2#   2956
CHECK       2#
CHECKF      2#
CINITM      2#    805
CLEAR       2#
CLKCHK      2#
CLOCK       2#
CLRSUB      2#
COPYRI      2#
DBUFS       2#   3371
DEFINE      2#    257    258    259    260    261    262    263    264    265    266    267
DSTM        2#   3092
DUMP        2#   1972   1977   1982   2011   2025   2321
DXBITS      2#      3
DXREG       2#    332
EDCOD       2#   1936
EDEF        2#    252
EDFF        2#
EOTS        2#   1162
ERCALL      2#    446    449    452    975    978    983    990    994   1000   1004   1011   1017   1020   1084
          1088   1092   1097   1107   1112   1119   1125   1129   1136   1142   1148   1232   1243   1247   1316
          1324   1488   1492   1498   1501   1505   1509   1521   1564   1570   1576   1581   1586   1592   1599
          1602   1608   1614   1617   1620   1624   1638   1643   1648   1652   1657   1662   1666   1671   1678
          1681   1695   1698   1703   1712   1717   1731   1736   1740   1745   1751   1756   1761   1765   1771
          1779   1783   1789   1795   1813   1818   1822   1826   1830   1834   1838   1843   1847   1852   1856
          1861   2754   2758
ERPGM       2#   1956
ERSTOR      2#   2042
ESAVE       2#   1999
EXRMAC      2#   1239
FASISS      2#   1865
HTIOI       2#
ILLCMD      2#    831
INTSM       2#   1183
LDNLK       2#
LOAD        2#
MACDEF      2#
MISCDE      2#    167
MMAC1       2#   3363
MONMAC      2#   2093
NUMBER      2#    808    832    859    910   1037   1164
ODM         2#   3037
PAM         2#   3354
PFM         2#    433
PRTYM       2#   2614
REDCMD      2#    908
REMOV       2#
RESTOR      2#   1220   1236   1301   1683   2612
RSRM        2#   3007
SAVE        2#   1212   1226   1255   1673   2602
SCOPEL      2#   1906
SCOPEM      2#    807    831    858    909   1036   1163
SDUMP       2#   1967   2020
SENCMD      2#    857
```

```
SHORT       2#    884    963   1071
SNAPSH      2#
SPWM        2#    494    513    532    551    570    589    608    627    646    665    684    703    722    741
          760    779
SPWMM       2#    494    513    532    551    570    589    608    627    646    665    684    703    722    741
          760    779
SS          2#    824    849    870    948   1057
STEPTS      2#
STRTM       2#    268
S.D         2#   1240
TABLES      2#    486
TIOCME      2#    806
TRAPCA      2#
TTTE        2#   1250
TYPM        2#   2972
WRICMD      2#   1034
ZEROM       2#   1209


. ABS.  022444     000


 ERRORS DETECTED:  0

 CZDXHD,CZDXHD/SOL/CRF-CZDXHD.P11
 RUN-TIME: 43 9 1 SECONDS
 RUN-TIME RATIO: 397/55=7.1
 CORE USED:  28K  (55 PAGES)
```