Micro Fiche Scan

Name of device(s) tested:
    DH11
Test description:
    DH11 ECHO TEST
MAINDEC Number or Package Identifier (after SEP 1977):
    CZDHJC0
Fiche Document Part Number:
    AH-FG28C-MC
Fiche preparation date unknown, using copyright year:
    1985
Image resolution:
    8-bit gray levels, max. quality for archiving

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IDENTIFICATION

PRODUCT CODE:	AC-8480C-MC
PRODUCT NAME:	CZDHJCO DH11 ECHO TEST
DATE:	AUGUST 1985
MAINTAINER:	NAC SOFTWARE ENGINEERING
AUTHOR:	GEORGE BAISLEY

1. ABSTRACT

THE DH11 ECHO/CABLE DIAGNOSTIC IS DIVIDED INTO TWO TESTS.
THE FIRST TEST (ECHO) IS A QUICK VERIFY TEST USING
A TTY OR VT05 ETC.

THE SECOND TEST (CABLE TEST) IS A QUICK VERIFY TEST USING THE
CABLE TERMINATOR (TEST CONNECTOR).

BOTH TESTS ASSUME 8 BITS/CHARACTER,NO PARITY GENERATION
OR CHECKING,AND A DH PRIORITY LEVEL 5 (BR:5)

1.1 THE DH11 ECHO TEST VERIFIES THAT ALL CHARACTERS (0-377)
WILL ECHO ON EACH LINE (0-17 OCTAL) WITH STANDARD DH11
TERMINAL ATTACHMENTS TTY 33,35 OR VT05 ETC. USING ASCII
ASYNCHRONOUS CODE

1.2 THE DH11 CABLE TEST VERIFIES THAT ALL CHARACTERS (0-377)
ARE TRANSMITTED AND RECEIVED ON A PER LINE BASIS.
THE LINE UNDER TEST MUST BE TERMINATED WITH THE TEST CONNECTOR !

2. REQUIREMENTS

PDP-11 FAMILY STANDARD COMPUTER WITH MINIMUM 4K MEMORY.
DH11 ASYNCHRONOUS MULTIPLEXER.

2.1 FOR THE ECHO TEST
TWO TERMINALS; ONE FOR CONSOLE, ONE FOR DH11 ECHO TEST.

2.2 FOR THE CABLE TEST
ONE CONSOLE TERMINAL, ONE TEST CONNECTOR MINIMUM

2.3 STORAGE

THE PROGRAM LOADS INTO 4KW OF MEMORY WITH ABS LOADER

3. LOADING PROCEDURE

THE STANDARD PROCEDURE FOR LOADING ABSOLUTE BINARY TAPES
IS TO BE USED.

4. STARTING PROCEDURE

CONTROL SWITCH SETTINGS

AFTER PROGRAM LOAD (INITIAL PROGRAM START)

ALL CONSOLE SWITCHES DOWN.

4.1 TO MODIFY DEVICE VECTOR AND CONTROL REGISTER ADDRESSES
AFTER PROGRAM RESTART

SW00=1

TO MODIFY DH11 LINE NUMBER AND BAUD RATE OF DH11 (WHILE RUNNING)

SW02=1 (MOMENTARILY- DO NOT LEAVE THIS SWITCH UP AFTER LINE # QUESTION)

4.2 STARTING ADDRESS

THE STARTING ADDRESS FOR ALL TESTS IS 000200

THE RESTART ADDRESS FOR ALL TESTS IS 000200

4.3 PROGRAM AND/OR OPERATOR ACTION

4.3.1 INITIAL PROGRAM START

LOAD PROGRAM INTO MEMORY

LOAD ADDRESS 000200

CLEAR CONSOLE SWITCHES

PRESS START

4.3.2 THE PROGRAM WILL TYPE "DH11 ECHO/CABLE TEST" <CR>
CZDHJ-REVISION C (ONCE ONLY)
AND WILL TYPE "WHICH TEST ECHO OR CABLE (E OR C)" AND WILL
WAIT FOR AN INPUT FROM THE CONSOLE TELETYPE KEYBOARD

TYPE IN THE TEST YOU INTEND TO RUN (E OR C) FOLLOWED BY A <CARRIAGE RETURN>

IF AN INCORRECT CHARACTER IS TYPED, THE PROGRAM WILL TYPE "?"
AND WILL THEN REPEAT THE MESSAGE

4.3.3 THE PROGRAM WILL TYPE "VECTOR ADDRESS-" AND WAIT
FOR AN INPUT FROM THE TELETYPE KEYBOARD.

TYPE IN THE ADDRESS OF THE RECEIVER INTERRUPT
VECTOR FOR THE DH11 TO BE TESTED FOLLOWED BY A
<CARRIAGE RETURN>.

4.3.3 THE PROGRAM WILL TYPE "CONTROL REGISTER ADDRESS-"
AND WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD.

TYPE IN THE ADDRESS OF THE SYSTEM CONTROL REGISTER
OF THE DH11 TO BE TESTED FOLLOWED BY <CARRIAGE RETURN>

IF AN INCORRECT ADDRESS IS TYPED, THE PROGRAM WILL
TYPE "?" AND WILL THEN REPEAT THE MESSAGE

4.3.4 THE PROGRAM WILL TYPE "LINE NUMBER IN OCTAL-" AND
WAIT FOR AN INPUT FROM THE TELETYPE KEYBOARD.

TYPE IN THE DH11 LINE NUMBER (IN OCTAL, FROM 0 TO 17)
TO BE TESTED FOLLOWED BY <CARRIAGE RETURN>.

4.3.5 THE PROGRAM WILL TYPE "BAUD RATE-" AND WAIT FOR
AN INPUT FROM THE TELETYPE KEYBOARD.

TYPE IN THE APPROPRIATE DH11 TERMINAL'S LINE
SPEED FOLLOWED BY <CARRIAGE RETURN>.

(ANY LEGAL BAUD RATE IS ACCEPTABE IN THE CABLE TEST) TRY 'EM ALL

IF AN INVALID BAUD RATE IS TYPED IN THE PROGRAM
WILL TYPE "INVALID BAUD RATE" AND REPEAT THE MESSAGE.

4.3.6 THE PROGRAM WILL TYPE "ECHO" OR "CABLE" RESP. TO INDICATE THAT IT IS
ABOUT TO START TESTING, AND THEN TESTING WILL BEGIN.

THE ECHO TEST WILL TYPE "TYPE A CHARACTER ON DH11 TERMINAL"
-TYPE OR TRANSMIT VIA PREPUNCHED TAPE ANY SEQUENCE OF CHARACTERS(EXCEPT ↑C)
A CONTROL C (↑C) WHEN TYPED ON THE DH11 TERMINAL WILL CAUSE
PROGRAM TO EXIT TO THE END OF PASS ROUTINE.

THE CABLE TEST REQUIRES NO ADDITIONAL OPERATOR INTERVENTION
UNLESS TO RESELECT LINE #,BAUD RATE, ETC.

NOTE: TO CHANGE LINE NUMBER AND/OR BAUD RATE,
SIMPLY MOMENTARILY RAISE SW02 (SW02=1).

4.4 PROGRAM RESTART WITH ALL SWITCHES DOWN

LOAD ADDRESS 000200

PRESS START

THE PROGRAM WILL TYPE "ECHO" OR "CABLE" RESPECTIVELY
AND COMMENCE TESTING AS BEFORE.

4.5 PROGRAM RESTART WITH SW00=1

LOAD ADDRESS 000200

SET SW01=1

PRESS START

THE PROGRAM WILL PERFORM AS DESCRIBED IN 4.3.2 TO 4.3.6

5. OPERATING PROCEDURE

5.1 OPERATIONAL SWITCH SETTINGS

SW15=1, HALT ON ERROR
SW14=1, LOOP ON CURRENT TEST (CABLE TEST ONLY)
SW13=1, SUPPRESS ERROR TYPEOUT
SW11=1, INHIBIT ITERATIONS (CABLE TEST ONLY)
SW10=1, ESCAPE ON ERROR
SW02=1, RESELECT LINE NUMBER AND BAUD RATE (MOMENTARILY)
SW00=1, CHANGE PARAMETERS AT PROGRAM RESTART

6.0 ERRORS

6.1 ERROR HALTS

THE ERROR MESSAGE FORMAT FOR ALL ERROR TYPEOUTS IS AS FOLLOWS:

PC+2
MESSAGE

WHERE
PC+2 IS THE ADDRESS OF THE CALL TO THE ERROR HANDLER +2
MESSAGE IS AN ASCII MESSAGE DESCRIBING (BRIEFLY) THE FAILURE

6.1.1 ERROR DESCRIPTIONS

SEE LISTING FOR DETAILS OF ERRORS

NOTE: FOR SERIOUS TROUBLESHOOTING....USE THE REGULAR DH11 DIAGNOSTICS

6.2 ERROR RECOVERY

6.2.1 SW15=0
IF THE PROGRAM IS RUN WITH SW15=0, NO OPERATOR ACTION IS REQUIRED TO CONTINUE TESTING.

6.2.2 SW15=1
IF THE PROGRAM IS RUN WITH SW15=1, TO CONTINUE TESTING AFTER THE PROGRAM HAS HALTED, PRESS THE PROCESSOR CONSOLE CONTINUE SWITCH.

6.2.3 ILLEGAL INTERRUPTS

IF AN INTERRUPT OCCURS TO A VECTOR ADDRESS NOT SELECTED DURING PROGRAM INITIALIZATION, THE PROGRAM WILL HALT IN THE TRAPCATCHER. THE ADDRESS AT WHICH THE PROGRAM HALTS IS 2 GREATER THAN THE ADDRESS TO WHICH THE INTERRUPT OCCURRED. THE PROGRAM MUST BE RESTARTED AT 200 TO RECOVER FROM THIS ERROR.

7. RESTRICTIONS

NONE

8. MISCELLANEOUS

- THE ECHO TEST DOES NOT ENABLE AUTO-ECHO

- BAUD RATE 134.5 HAS BEEN ROUNDED OFF TO 135

9. PROGRAM DESCRIPTION

BOTH TESTS CHECK OUT THE DH11 IN AN "ONLINE" FUNCTION;
ONE LINE AT A TIME AT THE FOLLOWING ASYNCHRONOUS BAUD RATES: 50,75,110,134.5,150,200,300,600,1200,1800,2400,4800,9600.

10. LISTING
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                ;DH11 ECHO/CABLE TEST
                ;COPYRIGHT 1973, 1985 DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754

                        ;STARTING PROCEDURE
                        ;LOAD PROGRAM
                        ;LOAD ADDRESS 000200
                        ;PRESS START
                        ;PROGRAM WILL TYPE DH11 ECHO/CABLE TEST
                        ;PROGRAM WILL TYPE  WHICH TEST- ECHO OR CABLE
                        ;TYPE IN  E  OR  C   RESPECTIVELY
                        ;PROGRAM WILL TYPE "VECTOR ADDRESS-"
                        ;TYPE IN THE ADDRESS OF THE RECEIVER INTERRUPT VECTOR
                        ;FOR THE DH11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
                        ;PROGRAM WILL TYPE "CONTROL REGISTER ADDRESS-"
                        ;TYPE IN THE ADDRESS OF THE SYSTEM CONTROL REGISTER
                        ;FOR THE DH11 TO BE TESTED, FOLLOWED BY <CARRIAGE RETURN>
                        ;PROGRAM WILL TYPE "LINE NUMBER-"
                        ;TYPE IN THE LINE NUMBER TO BE TESTED (IN OCTAL)
                        ;,FOLLOWED BY <CARRIAGE RETURN>
                        ;PROGRAM WILL TYPE "BAUD RATE-"
                        ;TYPE IN THE BAUD RATE OF THE DH11 TERMINAL
                        ;,FOLLOWED BY <CARRIAGE RETURN>
                                ;THE FOLLOWING BAUD RATES ARE ACCEPTED IN DECIMAL
                ;                       50
                ;                       75
                ;                       110
                ;                       135     (ROUNDED OFF   134.5)
                ;                       150
                ;                       200
                ;                       300
                ;                       600
                ;                       1200
                ;                       1800
                ;                       2400
                ;                       4800
                ;                       9600
                        ;ALL OTHERS ARE REJECTED

                        ;PROGRAM WILL TYPE "ECHO"  OR  "CABLE TEST" TO INDICATE THAT TESTING HAS STARTED
                        ;AT THE END OF A PASS, PROGRAM WILL TYPE " CZDHJ [REV] "
                        ;AND THEN RESUME TESTING

                                ;SWITCH REGISTER OPTIONS

        100000                  SW15=100000             ;=1,HALT ON ERROR
        040000                  SW14=40000              ;=1,LOOP ON CURRENT TEST
        020000                  SW13=20000              ;=1,INHIBIT ERROR TYPEOUT
        010000                  SW12=10000
        004000                  SW11=4000               ;=1,INHIBIT ITERATIONS
        002000                  SW10=2000               ;=1,ESCAPE TO NEXT TEST ON ERROR
        001000                  SW09=1000               ;=1,LOOP WITH CURRENT DATA
        000400                  SW08=400
        000100                  SW06=100
        000040                  SW05=40
        000020                  SW04=20
        000010                  SW03=10
        000004                  SW02=4          ;RESELECT DH11 LINE NUMBER AND BAUD RATE (RAISE MOMENTARILY ONLY)
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                        000002          SW01=2                  ;RESTART PROGRAM AT SELECTED TEST
                        000001          SW00=1                  ;RESELECT VECTOR AND CONTROL REGISTER
                                                                ;ADDRESS AFTER PROGRAM RESTART


                                        ;REGISTER DEFINITIONS

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

                                        ;LOCATION EQUIVALENCIES

                        177776          PS=177776       ;PROCESSOR STATUS WORD

                                        ;INSTRUCTION DEFINITIONS

                        005746          PUSH1SP=5746    ;DECREMENT PROCESSOR STACK 1 WORD
                        005726          POP1SP=5726     ;INCREMENT PROCESSOR STACK 1 WORD
                        010046          PUSHR0=10046    ;SAVE R0 ON STACK
                        012600          POPR0=12600     ;RESTORE R0 FROM STACK
                        024646          PUSH2SP=24646   ;DECREMENT STACK TWICE
                        022626          POP2SP=22626    ;INCREMENT STACK TWICE


                                100000          BIT15=100000
                                040000          BIT14=40000
                                020000          BIT13=20000
                                010000          BIT12=10000
                                004000          BIT11=4000
                                002000          BIT10=2000
                                001000          BIT09=1000
                                000400          BIT08=400
                                000200          BIT07=200
                                000100          BIT06=100
                                000040          BIT05=40
                                000020          BIT04=20
                                000010          BIT03=10
                                000004          BIT02=4
                                000002          BIT01=2
                                000001          BIT00=1
                                                ;TRAPCATCAER FOR ILLEGAL INTERRUPTS
                                000000          .=0
000000  000000                  000000          HALT
000002  000000                  000000          HALT
                                                ;STANDARD INTERRUPT VECTORS


                                000024          .=24
000024  005126                                  PFAIL                   ;POWER FAIL HANDLER
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000026  000340                          340                     ;SERVICE AT LEVEL 7
000030  002720                          ERRORS                  ;ERROR HANDLER
000032  000340                          340                     ;SERVICE AT LEVEL 7
000034  003122                          TRPSRV                  ;GENERAL HANDLER DISPATCH SERVICE
000036  000340                          340                     ;SERVICE AT LEVEL 7
        000200                  .=200
000200  000137  001104                  JMP     START           ;GO TO START OF PROGRAM



                                        ;DEFINITIONS FOR TRAP SUBROUTINE CALLS
                                        ;POINTERS TO SUBROUTINES CAN BE FOUND STARTING
                                        ;AT LOCATION "TRPTAB"

        104400                          SCOPE=TRAP+0            ;SCOPE LOOP AND ITERATION HANDLER
        104401                          TYPE=TRAP+1             ;TELETYPE OUTPUT ROUTINE
        104402                          OCTASC=TRAP+2           ;OCTAL TO ASCII CONVERSION
        104403                          INSTR=TRAP+3            ;INPUT ASCII STRING
        104404                          INSTER=TRAP+4           ;STRING INPUT ERROR
        104405                          PARAM=TRAP+5            ;CONVERT STRING TO OCTAL, CHECK LIMITS
        104406                          SAVO5P=TRAP+6           ;SAVE R0-R5, PC
        104407                          RESO5=TRAP+7            ;RESTORE R0-R5
        104410                          SCOPE1=TRAP+10          ;CHECK FOR FREEZE ON CURRENT DATA
        104411                          PARAMD=TRAP+11          ;CONVERT DECIMAL STRING TO OCTAL
        104412                          PAWCH=TRAP+12           ;SET FLAG   ECHO OR  CABLE
        104413                          SAVO5=TRAP+13           ;SAVE R0 - R5

        001000                  .=1000

001000  000000                  STACK:  .WORD                   ;PROCESSOR STACK (PS)

        001100                  .=1100

                                        ;PROGRAM INITIALIZATION
                                        ;LOCK OUT INTERRUPTS
                                        ;SET UP PROCESSOR STACK
                                        ;SET UP POWER FAIL VECTOR
                                        ;CLEAR PROGRAM FLAGS AND COUNTS
                                        ;TYPE TITLE MESSAGE

001100  177570          SWR:    .WORD   177570                  ; SWITCH REG ADDRESS
001102  177570          LIGHTS: .WORD   177570                  ; lights

001104  012737  000340  177776  START:  MOV     #340,PS         ;LOCK OUT INTERRUPTS
001112  012706  001000                  MOV     #STACK,SP       ;SET UP PROCESSOR STACK
001116  012702  000024                  MOV     #24,R2          ; POINT TO VECTOR AREA
001122  012722  005126                  MOV     #PFAIL,(R2)+    ;SET UP POWER FAIL TRAP
001126  012722  000340                  MOV     #340, (R2)+     ;SERVICE AT LEVEL 7
001132  012722  002720                  MOV     #ERRORS, (R2)+  ;ERROR HANDLER
001136  012722  000340                  MOV     #340, (R2)+     ;SERVICE AT LEVEL 7
001142  012722  003122                  MOV     #TRPSRV, (R2)+  ;GENERAL HANDLER DISPATCH SERVICE
001146  012712  000340                  MOV     #340, (R2)      ;SERVICE AT LEVEL 7
001152  012737  001104  005032          MOV     #START,RETURN   ;SET UP IN CASE OF POWER FAIL
001160  005037  005070                  CLR     STFLG           ;CLEAR TEST START FLAG
001164  005037  005026                  CLR     PASCNT          ;CLEAR PASS COUNT
001170  005037  005030                  CLR     ERRCNT          ;CLEAR ERROR COUNT
001174  005037  005024                  CLR     ERRFLG          ;CLEAR ERROR FLAG
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 190 001200  005037  005074                    CLR     LAST                    ;CLEAR LAST ERROR PC
 191 001204  013746  000004                    MOV     4, -(SP)                ; PUSH TRAP VECTOR
 192 001210  013746  000006                    MOV     6, -(SP)
 193 001214  012737  001230  000004            MOV     #1$, 4                  ; set up trap vector
 194 001222  005777  177652                    TST     @SWR                    ; TEST SWITCH REGISTER ADDRESS
 195 001226  000405                            BR      2$                      ; IF SUCCESSFUL, LEAVE IT ALONE
 196 001230                              1$:
 197 001230  012737  000176  001100            MOV     #176, SWR               ; POINT TO SOFT SWITCH REG
 198 001236  005037  001102                    CLR     LIGHTS                  ; 0 MEANS WE ARE NOT GOING TO USE LIGHTS
 199 001242                              2$:
 200 001242  005726                            TST     (SP)+                   ; CLEAN UP STACK
 201 001244  005726                            TST     (SP)+
 202 001246  012637  000006                    MOV     (SP)+, 6
 203 001252  012637  000004                    MOV     (SP)+, 4
 204 001256  005237  005064                    INC     INIFLG                  ;SET UP FOR ONCE ONLY TYPE OUT
 205 001262  001003                            BNE     VEC1                    ;DITTO
 206 001264  104401  005270                    TYPE    ,MTITLE                 ;TYPE TITLE
 207 001270  000404                            BR      VEC2
 208 001272  032777  000001  177600  VEC1:     BIT     #SW00,@SWR              ;IF SW00=1, GET NEW VECTOR
 209 001300  C01471                            BEQ     BEGIN                   ;AND CSR
 210 001302  012701  000300          VEC2:     MOV     #300,R1
 211 001306  012702  000302                    MOV     #302,R2
 212 001312  012703  000004                    MOV     #4,R3
 213 001316  010211                      1$:   MOV     R2,(R1)                 ;RESTORE TRAPCATCHER
 214 001320  005012                            CLR     (R2)                    ;IN FLOATING VECTOR AREA
 215 001322  060301                            ADD     R3,R1
 216 001324  060302                            ADD     R3,R2
 217 001326  020127  001000                    CMP     R1,#1000
 218 001332  001371                            BNE     1$
 219 001334  104403                            INSTR           ;INPUT WHICH TEST YOU ARE RUNNING
 220 001336  005722                            MWHICH          ;ECHO OR CABLE
 221 001340  104412                            PAWCH           ;SET FLAG
 222 001342  005066                            WCHFLG          ;THIS FLAG
 223 001344  104403                            INSTR                           ;INPUT ADDRESS OF DEVICE VECTOR
 224 001346  005347                            MVECTOR                         ;MESSAGE "VECTOR ADDRESS-"
 225 001350  104405                            PARAM                           ;CONVERT STRING TO OCTAL
 226 001352  000300                            300                             ;LOW LIMIT
 227 001354  000770                            770                             ;HIGH  LIMIT
 228 001356  005012                            DHRVEC                          ;LOCATIONS TO BE FILLED
 229 001360     003                    .BYTE   3                               ;LSB MASK
 230 001361     004                    .BYTE   4                               ;NUMBER OF LOCATIONS
 231 001362  104403                            INSTR                           ;INPUT ADDRESS OF DEVICE CSR
 232 001364  005372                            MREGAD                          ;MESSAGE "CONTROL REGISTER ADDRESS-"
 233 001366  104405                            PARAM                           ;CONVERT STRING TO OCTAL
 234 001370  000000                            0                               ;LOW LIMIT
 235 001372  177776                            177776                          ;HIGH LIMIT
 236 001374  004770                            DHSCR                           ;LOCATIONS TO BE FILLED
 237 001376     007                    .BYTE   7                               ;LSB MASK
 238 001377     010                    .BYTE   10                              ;NUMBER OF LOCATIONS
 239 001400  012777  004000  003362  LINE:     MOV     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
 240 001406  005037  005070                    CLR     STFLG           ;CLEAR PROGRAM START FLAG
 241 001412  104403                            INSTR                   ;INPUT LINE NUMBER
 242 001414  005610                            MLINE                   ;MESSAGE "LINE NUMBER-"
 243 001416  104405                            PARAM                   ;CONVERT  STRING TO OCTAL
 244 001420  000000                            0                       ;LOW LIMIT
 245 001422  000017                            17                      ;HIGH LIMIT
 246 001424  005110                            LINENU                  ;LOCATION TO BE FILLED
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001426  000                     .BYTE   0                       ;LSB MASK
001427  001                     .BYTE   1               ;NUMBER OF LOCATIONS
001430  104403            BAUD:   INSTR                   ;INPUT BAUD RATE
001432  005642                    MSPEED                  ;MESSAGE "BAUD RATE-"
001434  104411                    PARAMD                  ;CONVERT DECIMAL STRING TO OCTAL
001436  000062                    50.                     ;LOW LIMIT
001440  022600                    9600.                   ;HIGH LIMIT
001442  005104                    LINESP                  ;LOCATION TO BE FILLED
001444  000                     .BYTE   0                       ;LSB MASK
001445  001                     .BYTE   1                       ;NUMBER OF LOCATIONS
001446  004537  004204            JSR     R5,SET
001452  013737  005006  005010    MOV     DHSSR,DHSLR             ;SET UP ADDRESS OF SILO
001460  005237  005010            INC     DHSLR                   ;STATUS REGISTER HIGH BYTE

001464  012737  000340  177776  BEGIN:  MOV     @340,PS                 ;LOCK OUT INTERRUPTS
001472  012706  001000            MOV     @STACK,SP               ;SET UP PROCESSOR STACK
001476  005037  005072            CLR     LOCKUP                  ;CLEAR TIMEOUT
001502  005737  005066            TST     WCHFLG                  ;ECHO OR CABLE TEST ?
001506  001413                    BEQ     2$                      ;ECHO
001510  012737  002074  005032    MOV     @TEST2,RETURN           ;CABLE TEST
001516  005737  005070            TST     STFLG                   ;ARE YOU LOOPING ?
001522  001017                    BNE     1$                      ;YES
001524  005137  005070            COM     STFLG                   ;NO
001530  104401  006017            TYPE    ,MCABLE                 ;TYPE CABLE TEST
001534  000412                    BR      1$
001536  012737  001566  005032  2$:     MOV     @TEST1,RETURN           ;SET UP ECHO TEST
001544  005737  005070            TST     STFLG                   ;ARE YOU LOOPING ?
001550  001004                    BNE     1$                      ;YES
001552  005137  005070            COM     STFLG                   ;NO
001556  104401  005771            TYPE    ,MTERM                  ;TYPE ECHO TEST
001562  000177  003244      1$:   JMP     @RETURN                 ;START TESTING
                            ;THIS TEST WILL ACCEPT 1 CHARACTER AT A TIME
                            ;(IN INTERRUPT MODE) AND TRANSMIT THAT SAME CHARACTER.
                            ;ONE LINE AT A TIME. ANY LINE 0 THRU 17 (OCTAL)

001566  012737  000340  177776  TEST1:  MOV     @340,PS         ;DISABLE ALL INTERRUPTS
001574  012737  001400  005034          MOV     @LINE,ESCAPE
001602  012737  002500  005022          MOV     @EOP,NEXT
001610  052777  004000  003152          BIS     @BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
001616  013777  005112  003144          MOV     NUMLIN,@DHSCR   ;SELECT LINE # & SET INTERRUPT ENABLE
001624  013777  005106  003142          MOV     SPEED,@DHLPR    ;SET LINE SPEED AND
                                                                ;CHARACTER LENGTH (TRANS. & REC.)
001632  012777  000000  003146          MOV     @0,@DHSSR       ;SET SILO ALARM LEVEL=0
001640  012777  005124  003130          MOV     @TBUF,@DHBA     ;ADDRESS OF TRANSMITTER
                                                                ;DATA BUFFER
001646  052777  100000  003114          BIS     @100000,@DHSCR  ;SET TRANSMIT "DONE"
001654  012777  001716  003130          MOV     @INTSVC,@DHRVEC ;SET UP INTERRUPT SERVICE
001662  013777  005116  003124          MOV     PRIO,@DHRLVL    ;AND LEVEL
001670  013737  005120  177776          MOV     LESS1,PS        ;ALLOW INTERRUPTS
001676  104401  005661                  TYPE    ,MCHAR          ;TYPE "ANY CHARACTER"
001702  032777  000004  177170  DELAY:  BIT     @SW02,@SWR      ;IF SW02=1 GET NEW LINE NUMBER
001710  001774                  BEQ     DELAY           ;RETURN HERE AFTER "INTERRUPT"
001712  000137  001400          JMP     LINE            ;


                            ;THE FOLLOWING IS THE RECEIVER INTERRUPT SVC ROUTINE
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304 001716  105777  003046          INTSVC: TSTB    @DHSCR          ;TEST REC. FLAG
305 001722  100401                          BMI     .+4
306 001724  104000                          EMT     0
307 001726  005777  003040                  TST     @DHNRC          ;TEST FOR VALID CHARACTER
308 001732  100401                          BMI     .+4
309 001734  104001                          EMT     1
310 001736  017737  003030  005122          MOV     @DHNRC,@#RECDAT
311 001744  113737  005122  005124          MOVB    RECDAT,TBUF     ;MOVE CHARACTER TO OUTPUT AREA
312 001752  113737  005122  006066          MOVB    RECDAT,INBUF    ;MOVE CHARACTER TO CHECK FOR ↑C
313 001760  042737  177600  006066          BIC     #↑C<177>,INBUF  ;STRIP JUNK PLUS PARITY
314 001766  042737  170377  005122          BIC     #170377,@#RECDAT        ;SAVE ONLY LINE  NUMBER
315 001774  000337  005122                  SWAB    RECDAT
316 002000  023737  005110  005122          CMP     LINENU,RECDAT   ;DOES THE LINE # COMPARE?
317 002006  001401                          BEQ     .+4
318 002010  104002                          EMT     2
319 002012  012777  177777  002760          MOV     #-1,@DHBC       ;1 (OCTAL) BYTES WILL BE XMITTED
320 002020  032777  100000  002742          BIT     #100000,@DHSCR  ;TEST "FLAG" FOR DONE
321 002026  001001                          BNE     .+4
322 002030  104003                          EMT     3
323 002032  123727  006066  000003          CMPB    INBUF,#3                ;IS IT A ↑C ?
324 002040  001006                          BNE     1$              ;NO
325 002042  052777  004000  002720          BIS     #BIT11,@DHSCR   ;STOP DEVICE
326 002050  012716  002500                  MOV     #EOP,(SP)       ;CRUNCH STACK
327 002054  000002                          RTI
328 002056  012777  005124  002712  1$:     MOV     #TBUF,@DHBA     ;ADDRESS OF TRANSMITTER
329 002064  013777  005114  002710          MOV     NUMBAR,@DHBAR   ;START XMITTER
330 002072  000002                          RTI
331
332
333                                 ;THIS TEST TRANSMITS A BINARY COUNT PATTERN
334                                 ;VIA INTERRUPT MODE TO THE RECEIVER
335                                 ;...THE LINE UNDER TEST MUST BE TERMINATED WITH THE TEST CONNECTOR
336 002074  012737  000340  177776  TEST2:  MOV     #340,PS         ;DISABLE INTERRUPTS
337 002102  012737  001400  005034          MOV     #LINE,ESCAPE
338 002110  012737  002500  005022          MOV     #EOP,NEXT
339 002116  052777  004000  002644          BIS     #BIT11,@DHSCR   ;MASTER CLEAR INTERFACE
340 002124  013777  005112  002636          MOV     NUMLIN,@DHSCR   ;SELECT LINE # & REC.  INTERRUPT ENABLE
341 002132  052777  020000  002630          BIS     #BIT13,@DHSCR   ;SET TRANSMITTER INTERRUPT ENABLE
342                                                                 ;& NON EXISTANT MEMORY INTR ENABLE
343 002140  013777  005106  002626          MOV     SPEED,@DHLPR    ;SET LINE SPEED
344 002146  012777  000000  002632          MOV     #0,@DHSSR       ;SET SILO ALARM LEVEL =0
345 002154  012777  006664  002614          MOV     #TABLE,@DHBA    ;ADDRESS OF TRANSMITTER DATA BUFFER
346 002162  012777  177400  002610          MOV     #-256.,@DHBC    ;SET UP BYTE COUNT
347 002170  012777  002266  002614          MOV     #INTREC,@DHRVEC ;SET UP INTR SERVICE
348 002176  013777  005116  002610          MOV     PRIO,@DHRLVL    ;SET UP LEVEL
349 002204  012777  002436  002604          MOV     #INTRAN,@DHTVEC ;SET UP INTR SERVICE
350 002212  013777  005116  002600          MOV     PRIO,@DHTLVL    ;SET UP LEVEL
351 002220  012701  006664                  MOV     #TABLE,R1       ;SET UP DATA POINTER
352 002224  013737  005120  177776          MOV     LESS1,PS        ;ALLOW INTERRUPTS
353 002232  013777  005114  002542          MOV     NUMBAR,@DHBAR   ;SET UP BAR BIT
354
355                                 ;YOU RETURN HERE AFTER EVERY RECEIVER INTERRUPT
356 002240  032777  000004  176632  SPIN:   BIT     #SW02,@SWR      ;IF SW02=1  GET NEW LINE NUMBER
357 002246  001402                          BEQ     1$              ;SW02=0
358 002250  000137  001400                  JMP     LINE            ;SW02=1
359 002254  005237  005072          1$:     INC     LOCKUP          ;INC TIMEOUT FLAG
360 002260  001367                          BNE     SPIN            ;IF NOT 0  RETURN SPINNING
```

```
361 002262  104006                        EMT     6
362 002264  104400              QUITS:    SCOPE
363 002266  005037  005072      INTREC:   CLR     LOCKUP          ;CLEAR TIMEOUT FLAG
364 002272  105777  002472                TSTB    @DHSCR          ;TEST REC DONE
365 002276  100401                        BMI     .+4             ;YES
366 002300  104000                        EMT     0
367 002302  017737  002464  005122       MOV     @DHNRC,RECDAT   ;SAVE WORD
368 002310  005737  005122                TST     RECDAT          ;TEST FOR VALID CHARACTER
369 002314  100401                        BMI     .+4
370 002316  104001                        EMT     1
371 002320  032737  040000  005122       BIT     #BIT14,RECDAT   ;DATA OVERRUN ?
372 002326  001401                        BEQ     .+4             ;NO
373 002330  104007                        EMT     7
374 002332  032737  020000  005122       BIT     #BIT13,RECDAT   ;FRAMING ERROR ?
375 002340  001401                        BEQ     .+4             ;NO
376 002342  104010                        EMT     10
377 002344  032737  010000  005122       BIT     #BIT12,RECDAT   ;PARITY ERROR ?
378 002352  001401                        BEQ     .+4             ;NO
379 002354  104011                        EMT     11
380 002356  122137  005122                CMPB    (R1)+,RECDAT    ;GOOD CHARACTER ?
381 002362  001401                        BEQ     .+4             ;YES
382 002364  104005                        EMT     5
383 002366  042737  170377  005122       BIC     #170377,RECDAT          ;SAVE ONLY LINE NUMBER
384 002374  000337  005122                SWAB    RECDAT
385 002400  023737  005110  005122       CMP     LINENU,RECDAT   ;DOES THE LINE # COMPARE ?
386 002406  001401                        BEQ     .+4             ;YES
387 002410  104002                        EMT     2
388 002412  126127  177777  000377       CMPB    -1(R1),#377     ;LAST CHARACTER ?
389 002420  001003                        BNE     1$              ;NO
390 002422  012716  002264                MOV     #QUITS,(SP)     ;CRUNCH STACK
391 002426  000402                        BR      2$
392 002430  012716  002240      1$:       MOV     #SPIN,(SP)      ;CRUNCH STACK
393 002434  000002              2$:       RTI
394
395 002436  032777  100000  002324 INTRAN: BIT     #BIT15,@DHSCR   ;TEST TRANSMIT FLAG
396 002444  001001                        BNE     .+4
397 002446  104003                        EMT     3
398 002450  032777  002000  002312       BIT     #BIT10,@DHSCR   ;NON EXISTANT MEMORY ?
399 002456  001404                        BEQ     1$
400 002460  104004                        EMT     4
401 002462  042777  000400  002300       BIC     #BIT08,@DHSCR   ;CLEAR NON EXISTANT MEMORY BIT
402 002470  042777  100000  002272 1$:    BIC     #BIT15,@DHSCR   ;CLEAR DONE BIT FOR NEXT ROUND
403 002476  000002                        RTI     ;RETURN
```

```
                                        ;END OF PASS
                                        ;TYPE NAME OF TEST
                                        ;UPDATE PASS COUNT
                                        ;CHECK FOR EXIT TO ACT-11
                                        ;RESTART TEST

002500  104401              EOP:      TYPE                          ;TYPE NAME OF TEST
002502  005525                        MEPASS
002504  005037  005074                CLR       LAST                ;CLEAR LAST ERROR PC
002510  005037  005024                CLR       ERRFLG              ;CLEAR ERROR FLAG
002514  005237  005026                INC       PASCNT              ;UPDATE PASS COUNT
002520  005737  001102                TST       LIGHTS              ; ARE WE USING LIGHTS?
002524  001005                        BNE       2$                  ; BRANCH IF WE ARE
002526  104401                        TYPE                          ; TYPE PASCOUNT MESSAGE
002530  005541                        PASTXT
002532  104402                        OCTASC                        ; PRINT PASSCOUNT
002534  002574                        PASARG
002536  000403                        BR        3$                  ; CONTINUE
002540                          2$:
002540  013737  005026  001102       MOV       PASCNT,LIGHTS       ;DISPLAY PASS COUNT
002546                          3$:
002546  013701  000042              MOV       @#42,R1             ;CHECK FOR ACT-11 OR DDP
002552  001406                        BEQ       RESTRT              ;IF NOT, CONTINUE TESTING
002554  000005                        RESET
002556  004711                  LOGICAL:        JSR       PC,(R1)
002560  000240                        NOP
002562  000240                        NOP
002564  000240                        NOP
002566  000240                        NOP
002570  000137  001464          RESTRT: JMP       BEGIN
002574  000001                  PASARG: .WORD     1                   ; PARAMETERS TO PRINT PASSCOUNT
002576     006      002                .BYTE     6,2
002600  005026                        .WORD     PASCNT

                                        ;CHECK FOR LOOP ON CURRENT TEST
                                        ;CHECK FOR ITERATION SUPPRESSION

002602  032777  002000  176270  SCOPER: BIT       @#SW10,@#SWR
002610  001030                        BNE       4$
002612  032777  040000  176260  1$:     BIT       @#SW14,@#SWR
002620  001021                        BNE       3$
002622  032777  004000  176250        BIT       @#SW11,@#SWR
002630  001006                        BNE       2$
002632  005237  005042                INC       LPCNT
002636  023737  005042  005040        CMP       LPCNT,ICOUNT
002644  001007                        BNE       3$
002646  005037  005042          2$:     CLR       LPCNT
002652  005037  005024                CLR       ERRFLG
002656  013737  005022  005032        MOV       NEXT,RETURN
002664  013716  005032          3$:     MOV       RETURN,(SP)         ;LOOPING
002670  000002                        RTI
002672  005737  005024          4$:     TST       ERRFLG
002676  001745                        BEQ       1$
002700  000762                        BR        2$

                                        ;CHECK FOR FREEZE ON CURRENT DATA
```

```
462
463 002702  032777  001000  176170  SCOP1R: BIT     #SW09,@SWR
464 002710  001402                  BEQ     1$
465 002712  013716  005036          MOV     FREEZ1,(SP)
466 002716  000002              1$: RTI
467
468                                 ;ERROR HANDLER
469
470 002720  032777  020000  176152  ERRORS: BIT     #SW13,@SWR
471 002726  001051                  BNE     HALTS
472 002730  021637  005074          CMP     (SP),LAST
473 002734  001404                  BEQ     1$
474 002736  011637  005074          MOV     (SP),LAST
475 002742  005037  005024          CLR     ERRFLG
476 002746  104406              1$: SAV05P
477 002750  011605                  MOV     (SP),R5
478 002752  162705  000002          SUB     #2,R5
479 002756  011504                  MOV     (R5),R4
480 002760  006304                  ASL     R4
481 002762  006304                  ASL     R4
482 002764  042704  177001          BIC     #177001,R4
483 002770  062704  006124          ADD     #ERRTAB,R4
484 002774  012437  003034          MOV     (R4)+,ERRMSG
485 003000  011437  003046          MOV     (R4),DATABP
486 003004  005737  005024          TST     ERRFLG
487 003010  001403                  BEQ     TYPMSG
488 003012  005737  003046          TST     DATABP
489 003016  001007                  BNE     TYPDAT
490 003020  104402          TYPMSG: OCTASC
491 003022  003114                  ERTABO
492 003024  012737  000001  005024  MOV     #1,ERRFLG
493 003032  104401                  TYPE
494 003034  000000          ERRMSG: 0
495 003036  005737  003046  TYPDAT: TST     DATABP
496 003042  001402                  BEQ     RESREG
497 003044  104402                  OCTASC
498 003046  000000          DATABP: 0
499 003050  104407          RESREG: RES05
500 003052  005777  176022  HALTS:  TST     @SWR
501 003056  100005                  BPL     EXITER
502 003060  010046                  PUSHR0
503 003062  016600  000002          MOV     2(SP),R0
504 003066  000000                  HALT
505 003070  012600                  POPR0
506 003072  005237  005030  EXITER: INC     ERRCNT
507 003076  032777  002000  175774  BIT     #SW10,@SWR
508 003104  001402                  BEQ     1$
509 003106  013716  005034          MOV     ESCAPE,(SP)
510 003112  000002              1$: RTI
511 003114  000001          ERTABO: 1
512 003116     006     002          .BYTE   6,2
513 003120  005062                  SAVPC
514                                 ;TRAP DISPATCH SERVICE
515                                 ;ARGUMENT OF TRAP IS EXTRACTED
516                                 ;AND USED AS OFFSET TO OBTAIN POINTER
517                                 ;TO SELECTED SUBROUTINE
518
```

```
                                TRPSRV: MOV     (SP),-(SP)              ;GET PC OF RETURN
                                        SUB     #2,(SP)                 ;=PC OF TRAP
                                        MOV     @(SP),(SP)              ;GET TRP
                                TRPOK:  ASL     (SP)                    ;MULTIPLY TRAP ARG BY 2
                                        BIC     #177001,(SP)            ;CLEAR UNWANTED BITS
                                        ADD     #TRPTAB,(SP)            ;POINTER TO SUBROUTINE ADDRESS
                                        MOV     @(SP),(SP)              ;SUBROUTINE ADDRESS
                                        JMP     @(SP)+                  ;GO TO SUBROUTINE

                                ;SAVE PC OF TEST THAT FAILED AND R0-R5

                        005062  SV05P:  MOV     4(SP),SAVPC

                                ;SAVE R0-R5

                                SV05:   MOV     R5,SAVR5
                                        MOV     R4,SAVR4
                                        MOV     R3,SAVR3
                                        MOV     R2,SAVR2
                                        MOV     R1,SAVR1
                                        MOV     R0,SAVR0
                                        RTI
                                ;RESTORE R0-R5

                                RS05:   MOV     SAVR0,R0
                                        MOV     SAVR1,R1
                                        MOV     SAVR2,R2
                                        MOV     SAVR3,R3
                                        MOV     SAVR4,R4
                                        MOV     SAVR5,R5
                                        RTI

                                ;TELETYPE OUTPUT ROUTINE

                                TYPER:  MOV     @(SP),R5
                                        ADD     #2,(SP)
                                1$:     TSTB    @TPCSR
                                        BPL     1$
                                        TSTB    (R5)
                                        BNE     2$
                                        RTI
                                2$:     MOVB    (R5)+,@TPDBR
                                        BR      1$

                                ;ASCII STRING INPUT ROUTINE

                        003314  INSTRG: MOV     @(SP),MSG
                                        ADD     #2,(SP)
                                INSTR1: TYPE
                                MSG:    0
                                        MOV     #INBUF,R4
                                        MOV     #7,R3
                                1$:     TSTB    @TKCSR
                                        BPL     1$
                                        MOVB    @TKDBR,(R4)
                                        BICB    #200,(R4)
                                        CMPB    (R4)+,#15
```

```
                        001413                          BEQ     INSTR2
                        117777  001404  001406          MOVB    @TKDBR,@TPDBR
                        105777  001400          2$:     TSTB    @TPCSR
                        100375                          BPL     2$
                        005303                          DEC     R3
                        001356                          BNE     1$
                        104401                  INSTRE: TYPE
                        005427                          MQM
                        000745                          BR      INSTR1
                        000002                  INSTR2: RTI

                                                        ;CONVERT ASCII STRING TO OCTAL

                        011605                  PARAMS: MOV     (SP),R5
                        012537  003556                  MOV     (R5)+,LOLIM
                        012537  003560                  MOV     (R5)+,HILIM
                        012537  003562                  MOV     (R5)+,DEVADR
                        112537  003564                  MOVB    (R5)+,LOBITS
                        112537  003565                  MOVB    (R5)+,ADRCNT
                        C10516                          MOV     R5,(SP)
                        005005                  PARAM1: CLR     R5
                        012704  006066                  MOV     #INBUF,R4
                        122714  000015                  CMPB    #15,(R4)
                        001420                          BEQ     PARERR
                        121427  000060          1$:     CMPB    (R4),#60
                        002415                          BLT     PARERR
                        121427  000067                  CMPB    (R4),#67
                        003012                          BGT     PARERR
                        142714  000060                  BICB    #60,(R4)
                        152405                          BISB    (R4)+,R5
                        122714  000015                  CMPB    #15,(R4)
                        001406                          BEQ     LIMITS
                        006305                          ASL     R5
                        006305                          ASL     R5
                        006305                          ASL     R5
                        000760                          BR      1$
                        104404                  PARERR: INSTER
                        000750                          BR      PARAM1

                                                        ;TEST TO SEE IF NUMBER IS WITHIN LIMITS

                        020537  003560          LIMITS: CMP     R5,HILIM
                        101373                          BHI     PARERR
                        020537  003556                  CMP     R5,LOLIM
                        103770                          BLO     PARERR
                        133705  003564                  BITB    LOBITS,R5
                        001365                          BNE     PARERR

                                                        ;STORE NUMBER AT SPECIFIED ADDRESS

                        013704  003562                  MOV     DEVADR,R4
                        010524                  1$:     MOV     R5,(R4)+
                        062705  000002                  ADD     #2,R5
                        105337  003565                  DECB    ADRCNT
                        001372                          BNE     1$
                        000002                          RTI
                        000000                  LOLIM:  0
```

```
633 003560  000000                HILIM:  0
634 003562  000000                DEVADR: 0
635 003564     000                LOBITS: .BYTE 0
636 003565     000                ADRCNT: .BYTE 0
637
638                                       ;CONVERT DECIMAL ACCII STRING TO OCTAL
639 003566  011605                .PARAMD:        MOV     (SP),R5
640 003570  012537  003752                MOV     (R5)+,6$
641 003574  012537  003754                MOV     (R5)+,7$
642 003600  012537  003756                MOV     (R5)+,8$
643 003604  112537  003760                MOVB    (R5)+,9$
644 003610  112537  003761                MOVB    (R5)+,10$
645 003614  010516                        MOV     R5,(SP)
646 003616  005005                2$:     CLR     R5
647 003620  012704  006066                MOV     #INBUF,R4
648 003624  122714  000015                CMPB    #15,(R4)
649 003630  001424                        BEQ     3$
650 003632  121427  000060        1$:     CMPB    (R4),#'0
651 003636  002421                        BLT     3$
652 003640  121427  000071                CMPB    (R4),#'9
653 003644  003016                        BGT     3$
654 003646  142714  000060                BICB    #'0,(R4)
655 003652  005002                        CLR     R2
656 003654  152402                        BISB    (R4)+,R2
657 003656  060205                        ADD     R2,R5
658 003660  122714  000015                CMPB    #15,(R4)
659 003664  001410                        BEQ     4$
660 003666  006305                        ASL     R5      ;X2
661 003670  010502                        MOV     R5,R2   ;SAVE X2
662 003672  006305                        ASL     R5      ;X4
663 003674  006305                        ASL     R5      ;X8
664 003676  060205                        ADD     R2,R5   ;TIMES 10
665 003700  000754                        BR      1$
666 003702  104404                3$:     INSTER
667 003704  000744                        BR      2$
668
669                                       ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
670
671 003706  020537  003754        4$:     CMP     R5,7$
672 003712  101373                        BHI     3$
673 003714  020537  003752                CMP     R5,6$
674 003720  103770                        BLO     3$
675 003722  133705  003760                BITB    9$,R5
676 003726  001365                        BNE     3$
677
678                                       ;STORE NUMBER AT SPECIFIED ADDRESS
679
680 003730  013704  003756                MOV     8$,R4
681 003734  010524                5$:     MOV     R5,(R4)+
682 003736  062705  000002                ADD     #2,R5
683 003742  105337  003761                DECB    10$
684 003746  001372                        BNE     5$
685 003750  000002                        RTI
686 003752  000000                6$:     0
687 003754  000000                7$:     0
688 003756  000000                8$:     0
689 003760     000                9$:     .BYTE 0
```

```
690 003761     000                  10$:    .BYTE 0
691
692
693                                         ;COMPARE THE FIRST CHARACTER IN THE TELETYPE INPUT
694                                         ;BUFFER TO THE CHARACTERS "E" AND "C".
695                                         ;IF THE CHARACTER IS "E" CLEAR THE FLAG
696                                         ;IF THE CHARACTER IS "C" SET THE FLAG
697
698 003762  017605  000000          .PAWCH:MOV      @(SP),R5
699 003766  122737  000105  006066          CMPB    #'E,INBUF       ;IS IT "E" ?
700 003774  001002                          BNE     1$
701 003776  105015                          CLRB    (R5)            ;000
702 004000  000406                          BR      2$
703 004002  122737  000103  006066  1$:     CMPB    #'C,INBUF       ;IS IT "C" ?
704 004010  001005                          BNE     3$
705 004012  112715  177777                  MOVB    #-1,(R5)        ;377
706 004016  062716  000002          2$:     ADD     #2,(SP)
707 004022  000002                          RTI
708 004024  104404                  3$:     INSTER                  ;RETRY
709 004026  C00755                          BR      .PAWCH
710
711
712                                         ;CONVERT OCTAL NUMBER TO ASCII AND OUTPUT TO TELEPRINTER
713
714 004030  104401                  OCTASN: TYPE
715 004032  005434                          MCRLF
716 004034  104413                          SAV05
717 004036  017601  000000                  MOV     @(SP),R1
718 004042  062716  000002                  ADD     #2,(SP)
719 004046  012137  004662                  MOV     (R1)+,WRDCNT
720 004052  112137  004664          1$:     MOVB    (R1)+,CHRCNT
721 004056  112137  004665                  MOVB    (R1)+,SPACNT
722 004062  013137  004666                  MOV     @(R1)+,BINWRD
723 004066  013704  004666          2$:     MOV     BINWRD,R4
724 004072  113705  004664                  MOVB    CHRCNT,R5
725 004076  012700  006100                  MOV     #TEMP,R0
726 004102  010403                  3$:     MOV     R4,R3
727 004104  042703  177770                  BIC     #177770,R3
728 004110  062703  000260                  ADD     #260,R3
729 004114  110320                          MOVB    R3,(R0)+
730 004116  006204                          ASR     R4
731 004120  006204                          ASR     R4
732 004122  006204                          ASR     R4
733 004124  005305                          DEC     R5
734 004126  001365                          BNE     3$
735 004130  012703  006112                  MOV     #MDATA,R3
736 004134  114023                  4$:     MOVB    -(R0),(R3)+
737 004136  105337  004664                  DECB    CHRCNT
738 004142  001374                          BNE     4$
739 004144  105737  004665                  TSTB    SPACNT
740 004150  001405                          BEQ     6$
741 004152  112723  000240          5$:     MOVB    #240,(R3)+
742 004156  105337  004665                  DECB    SPACNT
743 004162  001373                          BNE     5$
744 004164  105013                  6$:     CLRB    (R3)
745 004166  104401                          TYPE
746 004170  006112                          MDATA
```

```
                                        DEC     WRDCNT
                                        BNE     1$
                                        RESET
                                        RTI
                                ;THIS ROUTINE CONVERTS LINE SPEED (LINESP) AND
                                ;LINE NUMBER (LINENU) FOR DHLPR, DHBAR AND DHSCR
                                ;REGISTER USAGE.
                                
004204  013737  005110  005112 SET:   MOV     LINENU,@#NUMLIN ;SAVE LINENU
004212  052737  000100  005112         BIS     #BIT6,@#NUMLIN ;SET REC INTERRUPT ENABLE
004220  023727  005110  000000 BAR0:   CMP     LINENU,#0       ;IS IT LINE 0?
004226  001004                        BNE     BAR1            ;NO
004230  012737  000001  005114         MOV     #1,@#NUMBAR     ;STORE BAR BIT 0
004236  000572                        BR      SET1
004240  023727  005110  000001 BAR1:   CMP     LINENU,#1       ;IS IT LINE 1?
004246  001004                        BNE     BAR2            ;NO
004250  012737  000002  005114         MOV     #2,@#NUMBAR     ;STORE BAR BIT 1
004256  000562                        BR      SET1
004260  023727  005110  000002 BAR2:   CMP     LINENU,#2       ;IS IT LINE 2?
004266  001004                        BNE     BAR3            ;NO
004270  012737  000004  005114         MOV     #4,@#NUMBAR     ;STORE BAR BIT 2
004276  000552                        BR      SET1
004300  023727  005110  000003 BAR3:   CMP     LINENU,#3       ;IS IT LINE 3?
004306  001004                        BNE     BAR4            ;NO
004310  012737  000010  005114         MOV     #10,@#NUMBAR    ;STORE BAR BIT 3
004316  000542                        BR      SET1
004320  023727  005110  000004 BAR4:   CMP     LINENU,#4       ;IS IT LINE 4?
004326  001004                        BNE     BAR5            ;NO
004330  012737  000020  005114         MOV     #20,@#NUMBAR    ;STORE BAR BIT 4
004336  000532                        BR      SET1
004340  023727  005110  000005 BAR5:   CMP     LINENU,#5       ;IS IT LINE 5?
004346  001004                        BNE     BAR6            ;NO
004350  012737  000040  005114         MOV     #40,@#NUMBAR    ;STORE BAR BIT 5
004356  000522                        BR      SET1
004360  023727  005110  000006 BAR6:   CMP     LINENU,#6       ;IS IT LINE 6?
004366  001004                        BNE     BAR7            ;NO
004370  012737  000100  005114         MOV     #100,@#NUMBAR   ;STORE BAR BIT 6
004376  000512                        BR      SET1
004400  023727  005110  000007 BAR7:   CMP     LINENU,#7       ;IS IT LINE 7 ?
004406  001004                        BNE     BAR8            ;NO
004410  012737  000200  005114         MOV     #200,@#NUMBAR   ;STORE BAR BIT 7
004416  000502                        BR      SET1
004420  023727  005110  000010 BAR8:   CMP     LINENU,#10      ;IS IT LINE 10?
004426  001004                        BNE     BAR9            ;NO
004430  012737  000400  005114         MOV     #400,@#NUMBAR   ;STORE BAR BIT 8
004436  000472                        BR      SET1
004440  023727  005110  000011 BAR9:   CMP     LINENU,#11      ;IS IT LINE 11?
004446  001004                        BNE     BAR10           ;NO
004450  012737  001000  005114         MOV     #1000,@#NUMBAR  ;STORE BAR BIT 9
004456  000462                        BR      SET1
004460  023727  005110  000012 BAR10:  CMP     LINENU,#12      ;IS IT LINE 12?
004466  001004                        BNE     BAR11           ;NO
004470  012737  002000  005114         MOV     #2000,@#NUMBAR  ;STORE BAR BIT 10
004476  000452                        BR      SET1
004500  023727  005110  000013 BAR11:  CMP     LINENU,#13      ;IS IT LINE 13?
004506  001004                        BNE     BAR12           ;NO
004510  012737  004000  005114         MOV     #4000,@#NUMBAR  ;STORE BAR BIT 11
```

```
804 004516  000442                        BR      SET1
805 004520  023727  005110  000014  BAR12:  CMP     LINENU,#14      ;IS IT LINE 14?
806 004526  001004                        BNE     BAR13           ;NO
807 004530  012737  010000  005114        MOV     #10000,@#NUMBAR ;STORE BAR BIT 12
808 004536  000432                        BR      SET1
809 004540  023727  005110  000015  BAR13:  CMP     LINENU,#15      ;IS IT LINE 15?
810 004546  001004                        BNE     BAR14           ;NO
811 004550  012737  020000  005114        MOV     #20000,@#NUMBAR ;STORE BAR BIT 13
812 004556  000422                        BR      SET1
813 004560  023727  005110  000016  BAR14:  CMP     LINENU,#16      ;IS IT LINE 16?
814 004566  001004                        BNE     BAR15           ;NO
815 004570  012737  040000  005114        MOV     #40000,@#NUMBAR ;STORE BAR BIT 14
816 004576  000412                        BR      SET1
817 004600  023727  005110  000017  BAR15:  CMP     LINENU,#17      ;IS IT LINE 17?
818 004606  001004                        BNE     BARNUN          ;NO
819 004610  012737  100000  005114        MOV     #100000,@#NUMBAR        ;STORE BAR BIT 15
820 004616  000402                        BR      SET1
821 004620  005037  005114        BARNUN: CLR     @#NUMBAR        ;CLEAR BAR BITS
822 004624  012701  004670        SET1:   MOV     #TABLE2,R1
823 004630  C22137  005104        1$:     CMP     (R1)+,LINESP
824 004634  001407                        BEQ     2$
825 004636  005721                        TST     (R1)+           ;IS IT THE END OF TABLE?
826 004640  001373                        BNE     1$              ;NO
827 004642  104401  005561                TYPE    ,MINVAL         ;INVALID BAUD RATE,BEGIN AGAIN
828 004646  012705  001430                MOV     #BAUD,R5        ;JUMP TO BAUD THRU R5
829 004652  000402                        BR      3$
830 004654  011137  005106        2$:     MOV     (R1),SPEED      ;SET UP BAUD RATE
831 004660  000205                3$:     RTS     R5
832
833
834 004662  000000                WRDCNT: 0
835 004664  000000                CHRCNT: 0
836         004665                SPACNT=CHRCNT+1
837 004666  000000                BINWRD: 0
838
839                               ;THE FOLLOWING IS A TABLE OF LEGAL BAUD RATES (8 BITS/CHAR)
840 004670  000062        TABLE2: .WORD   50.     ;50 BAUD
841 004672  002107                .WORD   2107    ;TWO STOP BITS
842 004674  000113                .WORD   75.     ;75 BAUD
843 004676  004207                .WORD   4207    ;TWO STOP BITS
844 004700  000156                .WORD   110.    ;110 BAUD
845 004702  006307                .WORD   6307    ;TWO STOP BITS
846 004704  000207                .WORD   135.    ;134.5 BAUD
847 004706  010407                .WORD   10407   ;TWO STOP BITS
848 004710  000226                .WORD   150.    ;150 BAUD
849 004712  012503                .WORD   12503   ;ONE STOP BIT
850 004714  000310                .WORD   200.    ;200 BAUD
851 004716  014603                .WORD   14603   ;ONE STOP BIT
852 004720  000454                .WORD   300.    ;300 BAUD
853 004722  016703                .WORD   16703   ;ONE STOP BIT
854 004724  001130                .WORD   600.    ;600 BAUD
855 004726  021003                .WORD   21003   ;ONE STOP BIT
856 004730  002260                .WORD   1200.   ;1200 BAUD
857 004732  023103                .WORD   23103   ;ONE STOP BIT
858 004734  003410                .WORD   1800.   ;1800 BAUD
859 004736  025203                .WORD   25203   ;ONE STOP BIT
860 004740  004540                .WORD   2400.   ;2400 BAUD
```

```
                                        .WORD   27303   ;ONE STOP BIT
                                        .WORD   4800.   ;4800 BAUD
                                        .WORD   31403   ;ONE STOP BIT
                                        .WORD   9600.   ;9600 BAUD
                                        .WORD   33503   ;ONE STOP BIT
004754  177777  000000                  .WORD   -1,0    ;TABLE TERMINATOR

                                        ;INDIRECT POINTERS

004760  177560                  TKCSR:  177560
004762  177562                  TKDBR:  177562
004764  177564                  TPCSR:  177564
004766  177566                  TPDBR:  177566
004770  000000                  DHSCR:  0
004772  000000                  DHNRC:  0
004774  000000                  DHLPR:  0
004776  000000                  DHBA:   0
005000  000000                  DHBC:   0
005002  C00000                  DHBAR:  0
005004  000000                  DHBCR:  0
005006  000000                  DHSSR:  0
005010  000000                  DHSLR:  0
005012  000000                  DHRVEC: 0
005014  000000                  DHRLVL: 0
005016  000000                  DHTVEC: 0
005020  000000                  DHTLVL: 0

                                        ;PROGRAM VARIABLES

005022  000000                  NEXT:   0               ;NEXT TEST #
005024  000000                  ERRFLG: 0               ;ERROR FLAG
005026  000000                  PASCNT: 0               ;PASS COUNT
005030  000000                  ERRCNT: 0               ;ERROR COUNT
005032  001104                  RETURN: START           ;RETURN ADDRESS
005034  000000                  ESCAPE: 0               ;ADDRESS FOR ERROR ESCAPE
005036  000000                  FREEZ1: 0               ;DATA LOOPING RETURN ADDRESS
005040  000012                  ICOUNT: 10.             ;ITERATION COUNT FOR TEST IN PROGRESS
005042  000000                  LPCNT:  0               ;NUMBER OF ITERATIONS THIS TEST
005044  000000                  SAVR0:  0               ;R0 SAVE AREA
005046  000000                  SAVR1:  0               ;R1 SAVE AREA
005050  000000                  SAVR2:  0               ;R2 SAVE AREA
005052  000000                  SAVR3:  0               ;R3 SAVE ARE
005054  000000                  SAVR4:  0               ;R4 SAVE AREA
005056  000000                  SAVR5:  0               ;R5 SAVE AREA
005060  000000                  SAVSP:  0               ;STACK POINTER SAVE AREA
005062  000000                  SAVPC:  0               ;CALLING ROUTINE SAVE AREA
005064  177777                  INIFLG: .WORD   -1              ;PROGRAM INITIALIZATION FLAG
005066  000000                  WCHFLG:0                ;ECHO OR CABLE FLAG
005070  000000                  STFLG:  0               ;PROGRAM START FLAG
005072  000000                  LOCKUP: 0               ;TIMEOUT FLAG
005074  000000                  LAST:   0               ;LAST ERROR PC
005076  000000                  TDATA:  0
005100  000000                  RDATA:  0
005102  000000                  BYTCNT: 0
005104  000156                  LINESP: 110.                    ;DEFAULT BAUD RATE
005106  006307                  SPEED:  6307                    ;DEFAULT 110 BAUD, 8 BITS/CHAR,
                                                                ;FDX, 2 STOP BITS
```

```
                                LINENU: 0                               ;DEFAULT VALUE, LINE 0
                                NUMLIN: 100                             ;DEFAULT VALUE, REC. INTERRUPT ENABLED

                                NUMBAR: 1               ;DEFAULT VALUE,BAR BIT 0
                                PRIO:   240                             ;DEFAULT DEVICE PRIORITY 5
                                LESS1:  200                             ;DEFAULT PRIORITY4, TO ALLOW INTERRUPTS
                                RECDAT: 0
                                TBUF:   0
                                        ;ENTER HERE ON POWER FAILURE


                                PFAIL:  MOV     R0,-(SP)                ;SAVE R0-R5 ON PROCESSOR STACK
                                        MOV     R1,-(SP)
                                        MOV     R2,-(SP)
                                        MOV     R3,-(SP)
                                        MOV     R4,-(SP)
                                        MOV     R5,-(SP)
                                        MOV     24,-(SP)
                                        MOV     SP,SAVSP                ;SAVE STACK POINTER
                                        MOV     #RESTART,24             ;SET UP FOR POWER UP TRAP
                                        HALT                            ;HALT ON POWER DOWN NORMAL
                                        BR      .

                                        ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED

                                RESTAR: MOV     SAVSP,SP                ;RESTORE STACK POINTER
                                        MOV     (SP)+,R5                ;RESTORE R0-R5
                                        MOV     (SP)+,R4
                                        MOV     (SP)+,R3
                                        MOV     (SP)+,R2
                                        MOV     (SP)+,R1
                                        MOV     (SP)+,R0
                                        MOV     #PFAIL,24               ;SET UP FOR POWER FAILURE
                                        MOV     #340,PS
                                        MOV     #STACK,SP
                                        CLR     TEMP
                                        INC     TEMP
                                        BNE     .-4
                                        OCTASC
                                        PFTAB
                                        TYPE
                                        MPFAIL
                                        CLR     ERRFLG
                                        CLR     LAST
                                        JMP     @RETURN
                                PFTAB:  1
                                .BYTE   6,2
                                        RETURN
                                MTITLE: .ASCII  <15><12><12>?DH11 ECHO/CABLE TEST ?<15><12>
                                        .ASCIZ  /CZDHJ REVISION CO   /
                                MVECTO: .ASCIZ  <15><12>/VECTOR ADDRESS- /
                                MREGAD: .ASCIZ  <15><12>/CONTROL REGISTER ADDRESS- /
                                MQM:    .ASCIZ  /  ? /
                                MCRLF:  .ASCIZ   <15><12>
                                MPFAIL: .ASCIZ  /  POWER FAILURE, PROGRAM RESTART AT TEST IN PROGRESS /
                                MEPASS: .ASCIZ  <15><12>/CZDHJ-CO /
                                PASTXT: .ASCIZ  <15><12>/PASS COUNT = /                                 : 5
```

```
 978 005561     015     012     111  MINVAL: .ASCIZ  <15><12>/INVALID BAUD RATE - /
 979 005610     015     012     114  MLINE:  .ASCIZ  <15><12>/LINE NUMBER IN OCTAL - /
 980 005642     015     012     102  MSPEED: .ASCIZ  <15><12>/BAUD RATE - /
 981 005661     015     012     124  MCHAR:  .ASCIZ  <15><12>/TYPE A CHAR. ON DH11 TERMINAL /
 982 005722     015     012     127  MWHICH: .ASCIZ  <15><12>/WHICH TEST ? ECHO OR CABLE (E OR C) /
 983 005771     015     012     124  MTERM:  .ASCIZ  <15><12>/TERMINAL ECHO TEST /
 984 006017     015     012     103  MCABLE: .ASCIZ  <15><12>/CABLE TEST /
 985                                  .EVEN
 989
 990                                          ;TABLE OF POINTERS FOR TRAP DECODING
 991
 992 006036  002602                  TRPTAB: SCOPER
 993 006040  003246                          TYPER
 994 006042  004030                          OCTASN
 995 006044  003300                          INSTRG
 996 006046  003372                          INSTRE
 997 006050  003402                          PARAMS
 998 006052  003154                          SV05P
 999 006054  003214                          RS05
1000 006056  C02702                          SCOP1R
1001 006060  003566                          .PARAMD
1002 006062  003762                          .PAWCH
1003 006064  003162                          SV05
1004
1005                                         ;BUFFERS FOR INPUT-OUTPUT
1006
1007 006066  000000                  INBUF:  0
1008         006100                  .=.+10
1009 006100  000000                  TEMP:   0
1010         006112                  .=.+10
1011 006112  000000                  MDATA:  0
1012         006124                  .=.+10
1013
1014                                         ;TABLE OF POINTERS TO ERROR MESSAGES AND DATA
1015
1016 006124                          ERRTAB:
1017 006124  006174                          EM1
1018 006126  000000                          0
1019 006130  006243                          EM2
1020 006132  000000                          0
1021 006134  006300                          EM3
1022 006136  000000                          0
1023 006140  006333                          EM4
1024 006142  000000                          0
1025 006144  006403                          EM5
1026 006146  000000                          0
1027 006150  006440                          EM6
1028 006152  000000                          0
1029 006154  006471                          EM7
1030 006156  000000                          0
1031 006160  006567                          EM8
1032 006162  000000                          0
1033 006164  006615                          EM9
1034 006166  000000                          0
1035 006170  006644                          EM10
1036 006172  000000                          0
1040 006174     015     012     105  EM1:    .ASCIZ  <15><12>/ERROR- INTERRUPT NOT CAUSED BY FLAG /
```

```
 1041 006243     015      012     105  EM2:    .ASCIZ  <15><12>/ERROR-NON VALID CHARACTER /
 1042 006300     015      012     105  EM3:    .ASCIZ  <15><12>/ERROR-WRONG LINE NUMBER /
 1043 006333     015      012     105  EM4:    .ASCIZ  <15><12>/ERROR-TRANSMITTER DONE SHOULD BE SET /
 1044 006403     015      012     105  EM5:    .ASCIZ  <15><12>/ERROR-NON-EXISTANT MEMORY /
 1045 006440     015      012     105  EM6:    .ASCIZ  <15><12>/ERROR-WRONG CHARACTER /
 1046 006471     015      012     105  EM7:    .ASCIZ  <15><12>/ERROR- NOT RECEIVING CHARACTERS -CHECK CABLE OR TERMINATOR /
 1047 006567     015      012     105  EM8:    .ASCIZ  <15><12>/ERROR-DATA OVERRUN /
 1048 006615     015      012     105  EM9:    .ASCIZ  <15><12>/ERROR-FRAMING ERROR /
 1049 006644     015      012     120  EM10:   .ASCIZ  <15><12>/PARITY ERROR /
 1050                                  .EVEN
 1055 006664  000400                   TABLE:  .REPT   256.
 1062 006664     000                           .BYTE   0
      006665     001                           .BYTE   1
      006666     002                           .BYTE   2
      006667     003                           .BYTE   3
      006670     004                           .BYTE   4
      006671     005                           .BYTE   5
      006672     006                           .BYTE   6
      006673     007                           .BYTE   7
      006674     010                           .BYTE   10
      006675     011                           .BYTE   11
      006676     012                           .BYTE   12
      006677     013                           .BYTE   13
      006700     014                           .BYTE   14
      006701     015                           .BYTE   15
      006702     016                           .BYTE   16
      006703     017                           .BYTE   17
      006704     020                           .BYTE   20
      006705     021                           .BYTE   21
      006706     022                           .BYTE   22
      006707     023                           .BYTE   23
      006710     024                           .BYTE   24
      006711     025                           .BYTE   25
      006712     026                           .BYTE   26
      006713     027                           .BYTE   27
      006714     030                           .BYTE   30
      006715     031                           .BYTE   31
      006716     032                           .BYTE   32
      006717     033                           .BYTE   33
      006720     034                           .BYTE   34
      006721     035                           .BYTE   35
      006722     036                           .BYTE   36
      006723     037                           .BYTE   37
      006724     040                           .BYTE   40
      006725     041                           .BYTE   41
      006726     042                           .BYTE   42
      006727     043                           .BYTE   43
      006730     044                           .BYTE   44
      006731     045                           .BYTE   45
      006732     046                           .BYTE   46
      006733     047                           .BYTE   47
      006734     050                           .BYTE   50
      006735     051                           .BYTE   51
      006736     052                           .BYTE   52
      006737     053                           .BYTE   53
      006740     054                           .BYTE   54
      006741     055                           .BYTE   55
```

```
006742     056                          .BYTE   56
006743     057                          .BYTE   57
006744     060                          .BYTE   60
006745     061                          .BYTE   61
006746     062                          .BYTE   62
006747     063                          .BYTE   63
006750     064                          .BYTE   64
006751     065                          .BYTE   65
006752     066                          .BYTE   66
006753     067                          .BYTE   67
006754     070                          .BYTE   70
006755     071                          .BYTE   71
006756     072                          .BYTE   72
006757     073                          .BYTE   73
006760     074                          .BYTE   74
006761     075                          .BYTE   75
006762     076                          .BYTE   76
006763     077                          .BYTE   77
006764     100                          .BYTE   100
006765     101                          .BYTE   101
006766     102                          .BYTE   102
006767     103                          .BYTE   103
006770     104                          .BYTE   104
006771     105                          .BYTE   105
006772     106                          .BYTE   106
006773     107                          .BYTE   107
006774     110                          .BYTE   110
006775     111                          .BYTE   111
006776     112                          .BYTE   112
006777     113                          .BYTE   113
007000     114                          .BYTE   114
007001     115                          .BYTE   115
007002     116                          .BYTE   116
007003     117                          .BYTE   117
007004     120                          .BYTE   120
007005     121                          .BYTE   121
007006     122                          .BYTE   122
007007     123                          .BYTE   123
007010     124                          .BYTE   124
007011     125                          .BYTE   125
007012     126                          .BYTE   126
007013     127                          .BYTE   127
007014     130                          .BYTE   130
007015     131                          .BYTE   131
007016     132                          .BYTE   132
007017     133                          .BYTE   133
007020     134                          .BYTE   134
007021     135                          .BYTE   135
007022     136                          .BYTE   136
007023     137                          .BYTE   137
007024     140                          .BYTE   140
007025     141                          .BYTE   141
007026     142                          .BYTE   142
007027     143                          .BYTE   143
007030     144                          .BYTE   144
007031     145                          .BYTE   145
007032     146                          .BYTE   146
```

```
007033      147                         .BYTE   147
007034      150                         .BYTE   150
007035      151                         .BYTE   151
007036      152                         .BYTE   152
007037      153                         .BYTE   153
007040      154                         .BYTE   154
007041      155                         .BYTE   155
007042      156                         .BYTE   156
007043      157                         .BYTE   157
007044      160                         .BYTE   160
007045      161                         .BYTE   161
007046      162                         .BYTE   162
007047      163                         .BYTE   163
007050      164                         .BYTE   164
007051      165                         .BYTE   165
007052      166                         .BYTE   166
007053      167                         .BYTE   167
007054      170                         .BYTE   170
007055      171                         .BYTE   171
007056      172                         .BYTE   172
007057      173                         .BYTE   173
007060      174                         .BYTE   174
007061      175                         .BYTE   175
007062      176                         .BYTE   176
007063      177                         .BYTE   177
007064      200                         .BYTE   200
007065      201                         .BYTE   201
007066      202                         .BYTE   202
007067      203                         .BYTE   203
007070      204                         .BYTE   204
007071      205                         .BYTE   205
007072      206                         .BYTE   206
007073      207                         .BYTE   207
007074      210                         .BYTE   210
007075      211                         .BYTE   211
007076      212                         .BYTE   212
007077      213                         .BYTE   213
007100      214                         .BYTE   214
007101      215                         .BYTE   215
007102      216                         .BYTE   216
007103      217                         .BYTE   217
007104      220                         .BYTE   220
007105      221                         .BYTE   221
007106      222                         .BYTE   222
007107      223                         .BYTE   223
007110      224                         .BYTE   224
007111      225                         .BYTE   225
007112      226                         .BYTE   226
007113      227                         .BYTE   227
007114      230                         .BYTE   230
007115      231                         .BYTE   231
007116      232                         .BYTE   232
007117      233                         .BYTE   233
007120      234                         .BYTE   234
007121      235                         .BYTE   235
007122      236                         .BYTE   236
007123      237                         .BYTE   237
```

```
007124      240                         .BYTE   240
007125      241                         .BYTE   241
007126      242                         .BYTE   242
007127      243                         .BYTE   243
007130      244                         .BYTE   244
007131      245                         .BYTE   245
007132      246                         .BYTE   246
007133      247                         .BYTE   247
007134      250                         .BYTE   250
007135      251                         .BYTE   251
007136      252                         .BYTE   252
007137      253                         .BYTE   253
007140      254                         .BYTE   254
007141      255                         .BYTE   255
007142      256                         .BYTE   256
007143      257                         .BYTE   257
007144      260                         .BYTE   260
007145      261                         .BYTE   261
007146      262                         .BYTE   262
007147      263                         .BYTE   263
007150      264                         .BYTE   264
007151      265                         .BYTE   265
007152      266                         .BYTE   266
007153      267                         .BYTE   267
007154      270                         .BYTE   270
007155      271                         .BYTE   271
007156      272                         .BYTE   272
007157      273                         .BYTE   273
007160      274                         .BYTE   274
007161      275                         .BYTE   275
007162      276                         .BYTE   276
007163      277                         .BYTE   277
007164      300                         .BYTE   300
007165      301                         .BYTE   301
007166      302                         .BYTE   302
007167      303                         .BYTE   303
007170      304                         .BYTE   304
007171      305                         .BYTE   305
007172      306                         .BYTE   306
007173      307                         .BYTE   307
007174      310                         .BYTE   310
007175      311                         .BYTE   311
007176      312                         .BYTE   312
007177      313                         .BYTE   313
007200      314                         .BYTE   314
007201      315                         .BYTE   315
007202      316                         .BYTE   316
007203      317                         .BYTE   317
007204      320                         .BYTE   320
007205      321                         .BYTE   321
007206      322                         .BYTE   322
007207      323                         .BYTE   323
007210      324                         .BYTE   324
007211      325                         .BYTE   325
007212      326                         .BYTE   326
007213      327                         .BYTE   327
007214      330                         .BYTE   330
```

```
007215      331                         .BYTE   331
007216      332                         .BYTE   332
007217      333                         .BYTE   333
007220      334                         .BYTE   334
007221      335                         .BYTE   335
007222      336                         .BYTE   336
007223      337                         .BYTE   337
007224      340                         .BYTE   340
007225      341                         .BYTE   341
007226      342                         .BYTE   342
007227      343                         .BYTE   343
007230      344                         .BYTE   344
007231      345                         .BYTE   345
007232      346                         .BYTE   346
007233      347                         .BYTE   347
007234      350                         .BYTE   350
007235      351                         .BYTE   351
007236      352                         .BYTE   352
007237      353                         .BYTE   353
007240      354                         .BYTE   354
007241      355                         .BYTE   355
007242      356                         .BYTE   356
007243      357                         .BYTE   357
007244      360                         .BYTE   360
007245      361                         .BYTE   361
007246      362                         .BYTE   362
007247      363                         .BYTE   363
007250      364                         .BYTE   364
007251      365                         .BYTE   365
007252      366                         .BYTE   366
007253      367                         .BYTE   367
007254      370                         .BYTE   370
007255      371                         .BYTE   371
007256      372                         .BYTE   372
007257      373                         .BYTE   373
007260      374                         .BYTE   374
007261      375                         .BYTE   375
007262      376                         .BYTE   376
007263      377                         .BYTE   377
1063        000001              .END
```

Symbol table

```
ADRCNT  003565        DHBAR   005002        INTRAN  002436        PASTXT  005541        SV05    003162
BARNUN  004620        DHBC    005000        INTREC  002266        PAWCH = 104412        SV05P   003154
BAR0    004220        DHBCR   005004        INTSVC  001716        PFAIL   005126        SWR     001100
BAR1    004240        DHLPR   004774        LAST    005074        PFTAB   005262        SW00  = 000001
BAR10   004460        DHNRC   004772        LESS1   005120        POPRO = 012600        SW01  = 000002
BAR11   004500        DHRLVL  005014        LIGHTS  001102        POP1SP= 005726        SW02  = 000004
BAR12   004520        DHRVEC  005012        LIMITS  003512        POP2SP= 022626        SW03  = 000010
BAR13   004540        DHSCR   004770        LINE    001400        PRIO    005116        SW04  = 000020
BAR14   004560        DHSLR   005010        LINENU  005110        PS    = 177776        SW05  = 000040
BAR15   004600        DHSSR   005006        LINESP  005104        PUSHRO= 010046        SW06  = 000100
BAR2    004260        DHTLVL  005020        LOBITS  003564        PUSH1S= 005746        SW08  = 000400
BAR3    004300        DHTVEC  005016        LOCKUP  005072        PUSH2S= 024646        SW09  = 001000
BAR4    004320        EM1     006174        LOGICA  002556        QUITS   002264        SW10  = 002000
BAR5    004340        EM10    006644        LOLIM   003556        RDATA   005100        SW11  = 004000
BAR6    004360        EM2     006243        LPCNT   005042        RECDAT  005122        SW12  = 010000
BAR7    004400        EM3     006300        MCABLE  006017        RESREG  003050        SW13  = 020000
BAR8    004420        EM4     006333        MCHAR   005661        RESTAR  005164        SW14  = 040000
BAR9    004440        EM5     006403        MCRLF   005434        RESTRT  002570        SW15  = 100000
BAUD    001430        EM6     006440        MDATA   006112        RES05 = 104407        TABLE   006664
BEGIN   001464        EM7     006471        MEPASS  005525        RETURN  005032        TABLE2  004670
BINWRD  004666        EM8     006567        MINVAL  005561        RS05    003214        TBUF    005124
BIT00 = 000001        EM9     006615        MLINE   005610        SAVPC   005062        TDATA   005076
BIT01 = 000002        EOP     002500        MPFAIL  005437        SAVR0   005044        TEMP    006100
BIT02 = 000004        ERRCNT  005030        MQM     005427        SAVR1   005046        TEST1   001566
BIT03 = 000010        ERRFLG  005024        MREGAD  005372        SAVR2   005050        TEST2   002074
BIT04 = 000020        ERRMSG  003034        MSG     003314        SAVR3   005052        TKCSR   004760
BIT05 = 000040        ERRORS  002720        MSPEED  005642        SAVR4   005054        TKDBR   004762
BIT06 = 000100        ERRTAB  006124        MTERM   005771        SAVR5   005056        TPCSR   004764
BIT07 = 000200        ERTABO  003114        MTITLE  005270        SAVSP   005060        TPDBR   004766
BIT08 = 000400        ESCAPE  005034        MVECTO  005347        SAV05 = 104413        TRPOK   003134
BIT09 = 001000        EXITER  003072        MWHICH  005722        SAV05P= 104406        TRPSRV  003122
BIT10 = 002000        FREEZ1  005036        NEXT    005022        SCOPE = 104400        TRPTAB  006036
BIT11 = 004000        HALTS   003052        NUMBAR  005114        SCOPER  002602        TYPDAT  003036
BIT12 = 010000        HILIM   003560        NUMLIN  005112        SCOPE1= 104410        TYPE  = 104401
BIT13 = 020000        ICOUNT  005040        OCTASC= 104402        SCOP1R  002702        TYPER   003246
BIT14 = 040000        INBUF   006066        OCTASN  004030        SET     004204        TYPMSG  003020
BIT15 = 100000        INIFLG  005064        PARAM = 104405        SET1    004624        VEC1    001272
BYTCNT  005102        INSTER= 104404        PARAMD= 104411        SPACNT= 004665        VEC2    001302
CHRCNT  004664        INSTR = 104403        PARAMS  003402        SPEED   005106        WCHFLG  005066
DATABP  003046        INSTRE  003372        PARAM1  003432        SPIN    002240        WRDCNT  004662
DELAY   001702        INSTRG  003300        PARERR  003506        STACK   001000        $$    = 000400
DEVADR  003562        INSTR1  003312        PASARG  002574        START   001104        .PARAM  003566
DHBA    004776        INSTR2  003400        PASCNT  005026        STFLG   005070        .PAWCH  003762

. ABS.  007264    000   (RW,I,GBL,ABS,OVR)
        000000    001   (RW,I,LCL,REL,CON)
Errors detected:  0

*** Assembler statistics


Work  file  reads: 0
Work  file writes: 0
Size of work file: 8350 Words  ( 33 Pages)
Size of core pool: 9596 Words  ( 36 Pages)
Operating  system: RSX-11M/PLUS
```

Symbol table

Elapsed time: 00:00:32.50
CZDHJC.CZDHJC.SEQ/-SP=CZDHJC.DOC,CZDHJC.P11