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        .REM    *
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IDENTIFICATION

PRODUCT CODE:	AC-8480C-MC
PRODUCT NAME:	CZDHJC0 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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                        SW01=2                  ;RESTART PROGRAM AT SELECTED TEST
                        SW00=1                  ;RESELECT VECTOR AND CONTROL REGISTER
                                                ;ADDRESS AFTER PROGRAM RESTART


                        ;REGISTER DEFINITIONS

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

                        ;LOCATION EQUIVALENCIES

                        PS=177776       ;PROCESSOR STATUS WORD

                        ;INSTRUCTION DEFINITIONS

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


                        BIT15=100000
                        BIT14=40000
                        BIT13=20000
                        BIT12=10000
                        BIT11=4000
                        BIT10=2000
                        BIT09=1000
                        BIT08=400
                        BIT07=200
                        BIT06=100
                        BIT05=40
                        BIT04=20
                        BIT03=10
                        BIT02=4
                        BIT01=2
                        BIT00=1
                                ;TRAPCATCAER FOR ILLEGAL INTERRUPTS
                        .=0
000000  000000          HALT
000002  000000          HALT
                                ;STANDARD INTERRUPT VECTORS


                        .=24
000024  005126                  PFAIL                  ;POWER FAIL HANDLER
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                                        340                     ;SERVICE AT LEVEL 7
                                        ERRORS                  ;ERROR HANDLER
                                        340                     ;SERVICE AT LEVEL 7
                                        TRPSRV                  ;GENERAL HANDLER DISPATCH SERVICE
                                        340                     ;SERVICE AT LEVEL 7
                                .=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"

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

                                .=1000

000000                          STACK:  .WORD                   ;PROCESSOR STACK (PS)

                                .=1100

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

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

000340  177776  START:  MOV     #340,PS                 ;LOCK OUT INTERRUPTS
001000                  MOV     #STACK,SP               ;SET UP PROCESSOR STACK
000024                  MOV     #24,R2                  ; POINT TO VECTOR AREA
005126                  MOV     #PFAIL,(R2)+            ;SET UP POWER FAIL TRAP
000340                  MOV     #340, (R2)+             ;SERVICE AT LEVEL 7
002720                  MOV     #ERRORS, (R2)+          ;ERROR HANDLER
000340                  MOV     #340, (R2)+             ;SERVICE AT LEVEL 7
003122                  MOV     #TRPSRV, (R2)+          ;GENERAL HANDLER DISPATCH SERVICE
000340                  MOV     #340, (R2)              ;SERVICE AT LEVEL 7
001104  005032          MOV     #START,RETURN           ;SET UP IN CASE OF POWER FAIL
005070                  CLR     STFLG                   ;CLEAR TEST START FLAG
005026                  CLR     PASCNT                  ;CLEAR PASS COUNT
005030                  CLR     ERRCNT                  ;CLEAR ERROR COUNT
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  001471                          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                                                  ;INPUT ADDRESS OF DEVICE VECTOR
224 001346  005347                                                  ;MESSAGE "VECTOR ADDRESS "
225 001350  104405                                                  ;CONVERT STRING TO OCTAL
226 001352  000300                                                  ;LOW LIMIT
227 001354  000770                                                  ;HIGH  LIMIT
228 001356  005012                                                  ;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 TIMEDUT 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
```

```
                                                        
002702  032777  001000  176170  SCOP1R: BIT     @SW09,@SWR
002710  001402                  BEQ     1$
002712  013716  005036          MOV     FREEZ1,(SP)
002716  000002          1$:     RTI
                                ;ERROR HANDLER
                                
002720  032777  020000  176152  ERRORS: BIT     @SW13,@SWR
002726  001051                  BNE     HALTS
002730  021637  005074          CMP     (SP),LAST
002734  001404                  BEQ     1$
002736  011637  005074          MOV     (SP),LAST
002742  005037  005024          CLR     ERRFLG
002746  104406          1$:     SAV05P
002750  011605                  MOV     (SP),R5
002752  162705  000002          SUB     #2,R5
002756  011504                  MOV     (R5),R4
002760  006304                  ASL     R4
002762  006304                  ASL     R4
002764  042704  177001          BIC     #177001,R4
002770  062704  006124          ADD     #ERRTAB,R4
002774  012437  003034          MOV     (R4)+,ERRMSG
003000  011437  003046          MOV     (R4),DATABP
003004  005737  005024          TST     ERRFLG
003010  001403                  BEQ     TYPMSG
003012  005737  003046          TST     DATABP
003016  001007                  BNE     TYPDAT
003020  104402          TYPMSG: OCTASC
003022  003114                  ERTABO
003024  012737  000001  005024  MOV     #1,ERRFLG
003032  104401                  TYPE
003034  000000          ERRMSG: 0
003036  005737  003046  TYPDAT: TST     DATABP
003042  001402                  BEQ     RESREG
003044  104402                  OCTASC
003046  000000          DATABP: 0
003050  104407          RESREG: RES05
003052  005777  176022  HALTS:  TST     @SWR
003056  100005                  BPL     EXITER
003060  010046                  PUSHR0
003062  016600  000002          MOV     2(SP),R0
003066  000000                  HALT
003070  012600                  POPR0
003072  005237  005030  EXITER: INC     ERRCNT
003076  032777  002000  175774  BIT     @SW10,@SWR
003104  001402                  BEQ     1$
003106  013716  005034          MOV     ESCAPE,(SP)
003112  000002          1$:     RTI
003114  000001          ERTABO: 1
003116     006     002          .BYTE   6,2
003120  005062                  SAVPC
                                ;TRAP DISPATCH SERVICE
                                ;ARGUMENT OF TRAP IS EXTRACTED
                                ;AND USED AS OFFSET TO OBTAIN POINTER
                                ;TO SELECTED SUBROUTINE
                                
```

```
519 003122  011646                  TRPSRV: MOV     (SP),-(SP)              ;GET PC OF RETURN
520 003124  162716  000002                  SUB     #2,(SP)                 ;=PC OF TRAP
521 003130  017616  000000                  MOV     @(SP),(SP)              ;GET TRP
522 003134  006316                  TRPOK:  ASL     (SP)                    ;MULTIPLY TRAP ARG BY 2
523 003136  042716  177001                  BIC     #177001,(SP)            ;CLEAR UNWANTED BITS
524 003142  062716  006036                  ADD     #TRPTAB,(SP)            ;POINTER TO SUBROUTINE ADDRESS
525 003146  017616  000000                  MOV     @(SP),(SP)              ;SUBROUTINE ADDRESS
526 003152  000136                          JMP     @(SP)+                  ;GO TO SUBROUTINE
527
528                                         ;SAVE PC OF TEST THAT FAILED AND R0-R5
529
530 003154  016637  000004  005062  SV05P:  MOV     4(SP),SAVPC
531
532                                         ;SAVE R0-R5
533
534 003162  010537  005056          SV05:   MOV     R5,SAVR5
535 003166  010437  005054                  MOV     R4,SAVR4
536 003172  010337  005052                  MOV     R3,SAVR3
537 003176  010237  005050                  MOV     R2,SAVR2
538 003202  010137  005046                  MOV     R1,SAVR1
539 003206  010037  005044                  MOV     R0,SAVR0
540 003212  000002                          RTI
541                                         ;RESTORE R0-R5
542
543 003214  013700  005044          RS05:   MOV     SAVR0,R0
544 003220  013701  005046                  MOV     SAVR1,R1
545 003224  013702  005050                  MOV     SAVR2,R2
546 003230  013703  005052                  MOV     SAVR3,R3
547 003234  013704  005054                  MOV     SAVR4,R4
548 003240  013705  005056                  MOV     SAVR5,R5
549 003244  000002                          RTI
550
551                                         ;TELETYPE OUTPUT ROUTINE
552
553 003246  017605  000000          TYPER:  MOV     @(SP),R5
554 003252  062716  000002                  ADD     #2,(SP)
555 003256  105777  001502          1$:     TSTB    @TPCSR
556 003262  100375                          BPL     1$
557 003264  105715                          TSTB    (R5)
558 003266  001001                          BNE     2$
559 003270  000002                          RTI
560 003272  112577  001470          2$:     MOVB    (R5)+,@TPDBR
561 003276  000767                          BR      1$
562
563                                         ;ASCII STRING INPUT ROUTINE
564
565 003300  017637  000000  003314  INSTRG: MOV     @(SP),MSG
566 003306  062716  000002                  ADD     #2,(SP)
567 003312  104401                  INSTR1: TYPE
568 003314  000000                  MSG:    0
569 003316  012704  006066                  MOV     #INBUF,R4
570 003322  012703  000007                  MOV     #7,R3
571 003326  105777  001426          1$:     TSTB    @TKCSR
572 003332  100375                          BPL     1$
573 003334  117714  001422                  MOVB    @TKDBR,(R4)
574 003340  142714  000200                  BICB    #200,(R4)
575 003344  122427  000015                  CMPB    (R4)+,#15
```

```
 576 003350  001413                        BEQ     INSTR2
 577 003352  117777  001404  001406        MOVB    @TKDBR,@TPDBR
 578 003360  105777  001400        2$:     TSTB    @TPCSR
 579 003364  100375                        BPL     2$
 580 003366  005303                        DEC     R3
 581 003370  001356                        BNE     1$
 582 003372  104401                INSTRE: TYPE
 583 003374  005427                        MQM
 584 003376  000745                        BR      INSTR1
 585 003400  000002                INSTR2: RTI
 586
 587                                       ;CONVERT ASCII STRING TO OCTAL
 588
 589 003402  011605                PARAMS: MOV     (SP),R5
 590 003404  012537  003556                MOV     (R5)+,LOLIM
 591 003410  012537  003560                MOV     (R5)+,HILIM
 592 003414  012537  003562                MOV     (R5)+,DEVADR
 593 003420  112537  003564                MOVB    (R5)+,LOBITS
 594 003424  112537  003565                MOVB    (R5)+,ADRCNT
 595 003430  010516                        MOV     R5,(SP)
 596 003432  005005                PARAM1: CLR     R5
 597 003434  012704  006066                MOV     #INBUF,R4
 598 003440  122714  000015                CMPB    #15,(R4)
 599 003444  001420                        BEQ     PARERR
 600 003446  121427  000060        1$:     CMPB    (R4),#60
 601 003452  002415                        BLT     PARERR
 602 003454  121427  000067                CMPB    (R4),#67
 603 003460  003012                        BGT     PARERR
 604 003462  142714  000060                BICB    #60,(R4)
 605 003466  152405                        BISB    (R4)+,R5
 606 003470  122714  000015                CMPB    #15,(R4)
 607 003474  001406                        BEQ     LIMITS
 608 003476  006305                        ASL     R5
 609 003500  006305                        ASL     R5
 610 003502  006305                        ASL     R5
 611 003504  000760                        BR      1$
 612 003506  104404                PARERR: INSTER
 613 003510  000750                        BR      PARAM1
 614
 615                                       ;TEST TO SEE IF NUMBER IS WITHIN LIMITS
 616
 617 003512  020537  003560        LIMITS: CMP     R5,HILIM
 618 003516  101373                        BHI     PARERR
 619 003520  020537  003556                CMP     R5,LOLIM
 620 003524  103770                        BLO     PARERR
 621 003526  133705  003564                BITB    LOBITS,R5
 622 003532  001365                        BNE     PARERR
 623
 624                                       ;STORE NUMBER AT SPECIFIED ADDRESS
 625
 626 003534  013704  003562                MOV     DEVADR,R4
 627 003540  010524                1$:     MOV     R5,(R4)+
 628 003542  062705  000002                ADD     #2,R5
 629 003546  105337  003565                DECB    ADRCNT
 630 003552  001372                        BNE     1$
 631 003554  000002                        RTI
 632 003556  000000                LOLIM:  0
```

```
003560  000000          HILIM:  0
003562  000000          DEVADR: 0
003564     000          LOBITS: .BYTE 0
003565     000          ADRCNT: .BYTE 0

                                ;CONVERT DECIMAL ACCII STRING TO OCTAL
003566  011605          .PARAMD:        MOV     (SP),R5
003570  012537  003752                  MOV     (R5)+,6$
003574  012537  003754                  MOV     (R5)+,7$
003600  012537  003756                  MOV     (R5)+,8$
003604  112537  003760                  MOVB    (R5)+,9$
003610  112537  003761                  MOVB    (R5)+,10$
003614  010516                          MOV     R5,(SP)
003616  005005          2$:             CLR     R5
003620  012704  006066                  MOV     #INBUF,R4
003624  122714  000015                  CMPB    #15,(R4)
003630  001424                          BEQ     3$
003632  121427  000060          1$:     CMPB    (R4),#'0
003636  002421                          BLT     3$
003640  121427  000071                  CMPB    (R4),#'9
003644  003016                          BGT     3$
003646  142714  000060                  BICB    #'0,(R4)
003652  005002                          CLR     R2
003654  152402                          BISB    (R4)+,R2
003656  060205                          ADD     R2,R5
003660  122714  000015                  CMPB    #15,(R4)
003664  001410                          BEQ     4$
003666  006305                          ASL     R5      ;X2
003670  010502                          MOV     R5,R2   ;SAVE X2
003672  006305                          ASL     R5      ;X4
003674  006305                          ASL     R5      ;X8
003676  060205                          ADD     R2,R5   ;TIMES 10
003700  000754                          BR      1$
003702  104404          3$:             INSTER
003704  000744                          BR      2$

                                ;TEST TO SEE IF NUMBER IS WITHIN LIMITS

003706  020537  003754      4$:         CMP     R5,7$
003712  101373                          BHI     3$
003714  020537  003752                  CMP     R5,6$
003720  103770                          BLO     3$
003722  133705  003760                  BITB    9$,R5
003726  001365                          BNE     3$

                                ;STORE NUMBER AT SPECIFIED ADDRESS

003730  013704  003756                  MOV     8$,R4
003734  010524          5$:             MOV     R5,(R4)+
003736  062705  000002                  ADD     #2,R5
003742  105337  003761                  DECB    10$
003746  001372                          BNE     5$
003750  000002                          RTI
003752  000000          6$:             0
003754  000000          7$:             0
003756  000000          8$:             0
003760     000          9$:             .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  000755                          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
```

```
                        004662                  DEC     WRDCNT
                                                BNE     1$
                        104407                  RESET
                        000002                  RTI
                                        ;THIS ROUTINE CONVERTS LINE SPEED (LINESP) AND
                                        ;LINE NUMBER (LINENU) FOR DHLPR, DHBAR AND DHSCR
                                        ;REGISTER USAGE.
                        005110  005112  SET:    MOV     LINENU,@#NUMLIN ;SAVE LINENU
                        000100  005112          BIS     #BIT06,@#NUMLIN ;SET REC INTERRUPT ENABLE
                        005110  000000  BAR0:   CMP     LINENU,#0       ;IS IT LINE 0?
                                                BNE     BAR1            ;NO
                        000001  005114          MOV     #1,@#NUMBAR     ;STORE BAR BIT 0
                        000572                  BR      SET1
                        005110  000001  BAR1:   CMP     LINENU,#1       ;IS IT LINE 1?
                                                BNE     BAR2            ;NO
                        000002  005114          MOV     #2,@#NUMBAR     ;STORE BAR BIT 1
                        000562                  BR      SET1
                        005110  000002  BAR2:   CMP     LINENU,#2       ;IS IT LINE 2?
                                                BNE     BAR3            ;NO
                        000004  005114          MOV     #4,@#NUMBAR     ;STORE BAR BIT 2
                        000552                  BR      SET1
                        005110  000003  BAR3:   CMP     LINENU,#3       ;IS IT LINE 3?
                                                BNE     BAR4            ;NO
                        000010  005114          MOV     #10,@#NUMBAR    ;STORE BAR BIT 3
                        000542                  BR      SET1
                        005110  000004  BAR4:   CMP     LINENU,#4       ;IS IT LINE 4?
                                                BNE     BAR5            ;NO
                        000020  005114          MOV     #20,@#NUMBAR    ;STORE BAR BIT 4
                        000532                  BR      SET1
                        005110  000005  BAR5:   CMP     LINENU,#5       ;IS IT LINE 5?
                                                BNE     BAR6            ;NO
                        000040  005114          MOV     #40,@#NUMBAR    ;STORE BAR BIT 5
                        000522                  BR      SET1
                        005110  000006  BAR6:   CMP     LINENU,#6       ;IS IT LINE 6?
                                                BNE     BAR7            ;NO
                        000100  005114          MOV     #100,@#NUMBAR   ;STORE BAR BIT 6
                        000512                  BR      SET1
                        005110  000007  BAR7:   CMP     LINENU,#7       ;IS IT LINE 7 ?
                                                BNE     BAR8            ;NO
                        000200  005114          MOV     #200,@#NUMBAR   ;STORE BAR BIT 7
                        000502                  BR      SET1
                        005110  000010  BAR8:   CMP     LINENU,#10      ;IS IT LINE 10?
                                                BNE     BAR9            ;NO
                        000400  005114          MOV     #400,@#NUMBAR   ;STORE BAR BIT 8
                        000472                  BR      SET1
                        005110  000011  BAR9:   CMP     LINENU,#11      ;IS IT LINE 11?
                                                BNE     BAR10           ;NO
                        001000  005114          MOV     #1000,@#NUMBAR  ;STORE BAR BIT 9
                        000462                  BR      SET1
                        005110  000012  BAR10:  CMP     LINENU,#12      ;IS IT LINE 12?
                                                BNE     BAR11           ;NO
                        002000  005114          MOV     #2000,@#NUMBAR  ;STORE BAR BIT 10
                        000452                  BR      SET1
                        005110  000013  BAR11:  CMP     LINENU,#13      ;IS IT LINE 13?
                                                BNE     BAR12           ;NO
                        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  022137  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     #8AUD,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
```

```
 861 004742  027303                        .WORD   27303   ;ONE STOP BIT
 862 004744  011300                        .WORD   4800.   ;4800 BAUD
 863 004746  031403                        .WORD   31403   ;ONE STOP BIT
 864 004750  022600                        .WORD   9600.   ;9600 BAUD
 865 004752  033503                        .WORD   33503   ;ONE STOP BIT
 866 004754  177777  000000               .WORD   -1,0    ;TABLE TERMINATOR
 867
 868
 869                                       ;INDIRECT POINTERS
 870
 871 004760  177560              TKCSR:   177560
 872 004762  177562              TKDBR:   177562
 873 004764  177564              TPCSR:   177564
 874 004766  177566              TPDBR:   177566
 875 004770  000000              DHSCR:   0
 876 004772  000000              DHNRC:   0
 877 004774  000000              DHLPR:   0
 878 004776  000000              DHBA:    0
 879 005000  000000              DHBC:    0
 880 005002  C00000              DHBAR:   0
 881 005004  000000              DHBCR:   0
 882 005006  000000              DHSSR:   0
 883 005010  000000              DHSLR:   0
 884 005012  000000              DHRVEC:  0
 885 005014  0C0000              DHRLVL:  0
 886 005016  000000              DHTVEC:  0
 887 005020  000000              DHTLVL:  0
 888                                       ;PROGRAM VARIABLES
 889
 890 005022  000000              NEXT:    0              ;NEXT TEST #
 891 005024  000000              ERRFLG:  0              ;ERROR FLAG
 892 005026  000000              PASCNT:  0              ;PASS COUNT
 893 005030  000000              ERRCNT:  0              ;ERROR COUNT
 894 005032  001104              RETURN:  START          ;RETURN ADDRESS
 895 005034  000000              ESCAPE:  0              ;ADDRESS FOR ERROR ESCAPE
 896 005036  000000              FREEZ1:  0              ;DATA LOOPING RETURN ADDRESS
 897 005040  000012              ICOUNT:  10.            ;ITERATION COUNT FOR TEST IN PROGRESS
 898 005042  000000              LPCNT:   0              ;NUMBER OF ITERATIONS THIS TEST
 899 005044  000000              SAVR0:   0              ;R0 SAVE AREA
 900 005046  000000              SAVR1:   0              ;R1 SAVE AREA
 901 005050  000000              SAVR2:   0              ;R2 SAVE AREA
 902 005052  000000              SAVR3:   0              ;R3 SAVE ARE
 903 005054  000000              SAVR4:   0              ;R4 SAVE AREA
 904 005056  000000              SAVR5:   0              ;R5 SAVE AREA
 905 005060  000000              SAVSP:   0              ;STACK POINTER SAVE AREA
 906 005062  000000              SAVPC:   0              ;CALLING ROUTINE SAVE AREA
 907 005064  177777              INIFLG: .WORD   -1              ;PROGRAM INITIALIZATION FLAG
 908 005066  000000              WCHFLG:0                ;ECHO OR CABLE FLAG
 909 005070  000000              STFLG: 0                ;PROGRAM START FLAG
 910 005072  000000              LOCKUP: 0               ;TIMEOUT FLAG
 911 005074  000000              LAST:    0              ;LAST ERROR PC
 912 005076  000000              TDATA:   0
 913 005100  000000              RDATA:   0
 914 005102  000000              BYTCNT:  0
 915 005104  000156              LINESP:  110.                           ;DEFAULT BAUD RATE
 916 005106  006307              SPEED:   6307                           ;DEFAULT 110 BAUD, 8 BITS/CHAR,
 917                                                                      ;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          POPR0 = 012600          SW01  = 000002
BAR11   004300          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          PUSHR0= 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    002250          WRDCNT  004662
DELAY   001702          INSTRG  003300          PARERR  003506          STACK   001000          $0    = 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