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;
; PCPUT This CP/M program will send a CP/M file to a PC sent via a serial
; port. The program on the PC should send the file in a XModem format/protocol.
; (Use Absolute Telnet).
;
; The program seems to work up to at least 19000 Baud fine. Have not tested
; it yet with faster chips.
; Note this is just the gutted Ward Christenson Modem program,
;
TRUE EQU    0FFH
FALSE EQU   NOT TRUE

BASE$PORT EQU    010H           ;>>> SETUP FOR SD SYSTEMS I/O8 Board <<<
MODEM$CTL$PORT EQU   BASE$PORT ;010H
MODEM$SEND$MASK EQU   4
SEND$READY EQU    4           ;VALUE WHEN READY
MODEM$RECV$MASK EQU   1
RECV$READY EQU    1           ;BIT ON WHEN READY
MODEM$DATA$PORT EQU  BASE$PORT+2 ;012H
MODEM$SSC$SELECT EQU  14H      ;Port to select 1 of 4 SSC's on the board

KEY$CTL$PORT EQU    0           ;KEYBOARD STATUS
KEY$READY$MASK EQU  2
KEY$READY EQU      2           ;VALUE WHEN KEYBOARD READY
KEY$DATA$PORT EQU   1
ERROR$LIMIT EQU    5           ;MAX ALLOWABLE ERRORS
EXIT$CHAR EQU      'C'-40H     ;CHAR TO EXIT FROM T OR C
;
    ORG    100H

    CALL   START           ;GO PRINT ID

    DB    'Send a File to a PC using a SD '
    DB    'Systems IO-8 Serial Board',13,10,'$'
;
;DEFINE ASCII CHARACTERS USED
SOH EQU    1
EOT EQU    4
ACK EQU    6
NAK EQU    15H
LF EQU     10
CR EQU     13
;
START POP   D              ;GET ID MESSAGE
        MVI  C,PRINT
        CALL BDOS          ;PRINT ID MESSAGE
                        ;INIT PRIVATE STACK
        LXI  H,0           ;HL=0
        DAD  SP            ;HL=STACK FROM CP/M
        SHLD STACK        ;..SAVE IT
        LXI  SP,STACK     ;SP=MY STACK
;
        CALL INIT$ACIA    ;MASTER RESET THE ACIA
                        ;GOBBLE UP GARBAGE CHARS FROM THE LINE
        MVI  B,1          ;TIMEOUT DELAY
        CALL RECV
        MVI  B,1

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        LDA    SECTNO
        CALL  SEND
        LDA    SECTNO
        CMA
        CALL  SEND
        MVI   C,0           ;INIT CKSUM
        LXI   H,80H
SENDC  MOV    A,M
        CALL  SEND
        INX   H
        MOV   A,H
        CPI   1           ;DONE WITH SECTOR?
        JNZ   SENDC

                                ;SECTOR SENT, SEND CKSUM
        MOV   A,C           ;GET CKSUM
        CALL  SEND

                                ;GET ACK ON SECTOR
        MVI   B,4           ;WAIT 4 SECONDS MAX
        CALL  RECV
        JNC   SNT0         ;NO TIMEOUT
                                ;TIMED OUT WAITING FOR ACK
        CALL  TOUT         ;PRINT 'TIMEOUT', ERRCT
DATERR LDA    ERRCT
        INR   A
        STA  ERRCT
        CPI  ERROR$LIMIT
        JC   REPTB         ;REPEAT SECTOR
                                ;SECTOR SEND NO GOOD AFTER X TRIES
        CALL CHECK$FOR$QUIT
        JZ   REPTB         ;KEEP ON TRYIN'
        CALL ERXIT

        DB   'CAN''T SEND SECTOR - ABORTING',13,10,'$'
SECTMSG DB   'SENDING SECTOR $'

                                ;NO TIMEOUT SENDING SECTOR
SNT0   CPI   ACK           ;ACK RECIEVED?
        JZ   SENDB         ;..YES, SEND NEXT SECT
                                ;ACK NOT RECIEVED
        CALL HEXO         ;TYPE CHR IN HEX
        LXI  D,ERR1
        CALL PRINT$MESSAGE
        JMP  DATERR        ;GO TO DATA ERROR

ERR1   DB   'H RECEIVED, NOT ACK',13,10,'$'
OPENM  DB   'FILE OPEN',13,10,'$'
;
;
; S U B R O U T I N E S
;
;OPEN FILE
OPEN$FILE LXI  D,FCB
        MVI  C,OPEN
        CALL BDOS
        INR  A           ;OPEN OK?
        RNZ  ;GOOD OPEN
        CALL ERXIT

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        DB      'CAN'T OPEN FILE$'
; - - - - -
PRINT$MESSAGE:
        MVI     C,PRINT
        JMP     BDOS          ;PRINT MESSAGE, RETURN
; - - - - -
;EXIT PRINTING MESSAGE FOLLOWING 'CALL ERXIT'
ERXIT POP     D              ;GET MESSAGE
        CALL   PRINT$MESSAGE ;PRINT IT
EXIT  LHL     STACK         ;GET ORIGINAL STACK
        SPHL                      ;RESTORE IT
        RET      ;--EXIT-- TO CP/M
; - - - - -
;MODEM RECV
;-----
RECV  PUSH    D              ;SAVE
MSEC  LXI     D,0BBBBH      ;1 SEC DCR COUNT
;
        MVI     A,55H        ;LOWER RTS
        OUT     MODEM$CTL$PORT
        MVI     A,11101010B
        OUT     MODEM$CTL$PORT
        NOP
        NOP
;
MWTI:  IN      MODEM$CTL$PORT
        ANI     MODEM$RCV$MASK
        CPI     RCV$READY
        JZ      MCHAR        ;GOT CHAR
        DCR     E              ;COUNT DOWN
        JNZ     MWTI         ;FOR TIMEOUT
        DCR     D
        JNZ     MWTI
        DCR     B              ;DCR # OF SECONDS
        JNZ     MSEC
;
;MODEM TIMED OUT RECEIVING
        POP     D              ;RESTORE D,E
        STC                      ;CARRY SHOWS TIMEOUT
        RET
;
;GOT MODEM CHAR
MCHAR IN      MODEM$DATA$PORT
        POP     D              ;RESTORE DE
;CALC CHECKSUM
        PUSH   PSW
        ADD    C
        MOV    C,A
;
        MVI     A,5H          ;Raise RTS line
        OUT     MODEM$CTL$PORT ;Sel Reg 5
        MVI     A,11101000B
        OUT     MODEM$CTL$PORT
;
        POP     PSW
        ORA    A              ;TURN OFF CARRY TO SHOW NO TIMEOUT
        RET
; - - - - -

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;MODEM SEND CHAR ROUTINE
;-----
;
SEND  PUSH  PSW          ;CHECK IF MONITORING OUTPUT
      ADD   C            ;CALC CKSUM
      MOV   C,A
SENDW IN  MODEM$CTL$PORT
      ANI  MODEM$SEND$MASK
      CPI  SEND$READY
      JNZ  SENDW
      POP  PSW          ;GET CHAR
      OUT  MODEM$DATA$PORT
      RET

;
;-----
;PRINT TIMEOUT MESSAGE
;-----
;
TOUTM DB  'TIMEOUT $'
TOUT  LXI  D,TOUTM
      CALL PRINT$MESSAGE
PRINT$ERRCT:
      LDA  ERRCT
      CALL HEXO          ;FALL INTO CR/LF

;
CRLF  MVI  A,13
      CALL TYPE
      MVI  A,10

;
TYPE  PUSH  PSW
      PUSH  B
      PUSH  D
      PUSH  H
      MOV  E,A
      MVI  C,WRCON
      CALL BDOS
      POP  H
      POP  D
      POP  B
      POP  PSW
      RET

;
;HEX OUTPUT
;
HEXO  PUSH  PSW
      RAR
      RAR
      RAR
      RAR
      CALL NIBBL
      POP  PSW
NIBBL ANI  0FH
      CPI  10
      JC  ISNUM
      ADI  7
ISNUM ADI  '0'
      JMP  TYPE

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;
;MULTIPLE ERRORS, ASK IF TIME TO QUIT
;
CHECK$FOR$QUIT:
    XRA    A            ;GET 0
    STA    ERRCT       ;RESET ERROR COUNT
    LXI    D,QUITM
    CALL   PRINT$MESSAGE
    MVI    C,RDCON
    CALL   BDOS
    PUSH   PSW         ;SAVE CHAR
    CALL   CRLF
    POP    PSW
    CPI    'R'
    RZ                    ;RETURN IF RETRY
    CPI    'r'
    RZ
    CPI    'Q'         ;QUIT?
    JNZ    LCQ
    ORA    A            ;TURN OFF ZERO FLAG
    RET
LCQ:   CPI    'q'
    JNZ    CHECK$FOR$QUIT
    ORA    A            ;TURN OFF ZERO FLAG
    RET

QUITM DB    0DH,0AH,'++MULTIPLE ERRORS ENCOUNTERED.'
       DB    0DH,0AH,'TYPE Q TO QUIT, R TO RETRY:$'
;
;FILE READ ROUTINE
;
READ$SECTOR:
    LXI    D,FCB
    MVI    C,READ
    CALL   BDOS
    ORA    A
    RZ
    DCR    A            ;EOF?
    JNZ    RDERR
                    ;EOF

    XRA    A
    STA    ERRCT
    LXI    D,FSENTM    ;FILE SENT MESSAGE
    CALL   PRINT$MESSAGE
SEOT   MVI    A,EOT
    CALL   SEND
    MVI    B,5         ;WAIT 5 SEC FOR TIMEOUT
    CALL   RECV
    JC     EOTTOT      ;EOT TIMEOUT
    CPI    ACK
    JZ     XFER$CPLT
                    ;ACK NOT RECIEVED

    CALL   HEXO
    LXI    D,ERR1
    CALL   PRINT$MESSAGE
EOTERR LDA    ERRCT
    INR    A

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        STA  ERRCT
        CPI  ERROR$LIMIT
        JC   SEOT
        CALL ERXIT

        DB   'NO ACK RECIEVED ON EOT$',10,13
FSENTM  DB   13,10,'FILE SENT, SENDING EOT''S',10,13,'$'
;
;TIMEOUT ON EOT
;
EOTTOT  CALL  TOUT
        JMP  EOTERR
;
;READ ERROR
;
RDERR  CALL  ERXIT
        DB   '++FILE READ ERROR$'
; - - - - -
;DONE - CLOSE UP SHOP
XFER$CPLT:
        CALL  ERXIT
        DB   13,10,'TRANSFER COMPLETE$'
        DS   40      ;STACK AREA
STACK  DS   2       ;STACK POINTER
RECVD$SECT$NO  DB   0
SECTNO  DB   0      ;CURRENT SECTOR NUMBER
ERRCT  DB   0      ;ERROR COUNT
;
; BDOS EQUATES (VERSION 2)
;
RDCON  EQU  1
WRCON  EQU  2
PRINT  EQU  9
CONST  EQU  11     ;CONSOLE STAT
OPEN   EQU  15     ;0FFH=NOT FOUND
CLOSE  EQU  16     ;   " "
SRCHF  EQU  17     ;   " "
SRCHN  EQU  18     ;   " "
ERASE  EQU  19     ;NO RET CODE
READ   EQU  20     ;0=OK, 1=EOF
WRITE  EQU  21     ;0=OK, 1=ERR, 2=?, 0FFH=NO DIR SPC
MAKE   EQU  22     ;0FFH=BAD
REN    EQU  23     ;0FFH=BAD
STDMA  EQU  26
BDOS   EQU  5
REIPL  EQU  0
FCB    EQU  5CH    ;SYSTEM FCB
;
; END

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