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| DECUS NO. | 8-873 |
| TITLE | RSTS Terminal Monitor on a PDP-8 |
| AUTHOR | Andras Nagy and Peter Hanak |
| COMPANY | Technical University Budapest |
| DATE | October 1977 |
| SOURCE LANGUAGE | PAL-8 and TECO |

RSTS Terminal Monitor on a PDP-8 8-873

Version: October 1977

Author: Andras Nagy and Peter Hanak
Technical University Budapest, Hungary

Operating System: OS/8 and RSTS/E(PDP-11)

Source Language: PAL-8 and TECO

Memory Required: 12K PDP-8

Special Hardware Required: Compatible async. serial interfaces on both the PDP-8 and PDP-11.

Keywords: RSTS/E; Data Communication

The RSTS Terminal Monitor runs on a PDP-8 computer and includes the software necessary to transfer files either to or from a PDP-11 computer running RSTS/E. Its goal is to synthesize the powers and versatilities of the RSTS and OS/8 operating systems.

Serial Input/Output handlers, formerly listed as DECUS No. 8-874, are included with this package.

Note: When reading a file from the PDP-11 computer the PDP-8 waits about 30 seconds for the first character and about 8 seconds for the other ones, when timing expires the handler interprets this as an 'end-of-file' condition. When writing to the PDP-11 there is no timing at all.

# RSTS TERMINAL MONITOR ON A PDP-8

This document describes a super-monitor running on a PDP 8 small computer connected with a PDP 11/40 or 45. Its goal is to synthetize the powers and versatilities of the RSTS AND OS/8 operating systems.

Hardware requirements (to the PDP 8) are at least 12K of core, 64K of mass storage (as a disk or DECtape) and a TTY-like serial interface to the PDP 11 (connected to a DL-11 or a DH-11, etc.)

OS/8 system programs used: PDP: and PDR: handlers (built in the OS) for the PDP 11 output/input, respectively; CCL, BATCH, TECO and PIP. Files needed by this monitor: PASSWD.SV, LOGIN.BI, RSTS.BI, RSTS.TE. Files created and used: W. (temporary storage of the PDP 11s answers/messages), W.SX (messages to be send to the PDP 11), W.BI (next command sequence) and PASSWD.SX. This last must not be ever seen by the user, nor its contents found anywhere. W. can be got only after interrupting by CTRL/C the typing of the PDP 11s answer.

Naturally, the system and batch input files used must be located on the system device. The files W. and W.SX will be generated on DSK:

First time the monitor may be started by the command
.SUBMIT SYS:LOGIN/Q/T
After getting the $ (number sign or pound sign) the user should type his RSTS-ppn in the form:
#Ip,p
The next question is #PASSWORD: after which the user types his password. The password will not echo. The lines should be terminated by CR. The only editing character is the rubout, which returns the first #. After these the monitor sends the ppn. and password to the RSTS, and examines its answer. If there was a "Ready" in it, the monitor strips the first line containing "Password: XXXXXX"; types the answer and starts its normal operation by typing a % (percent sign).

Later, if the user was logged in, the monitor can be entered simply by
.SUBMIT SYS:RSTS/Q/T
which omits the log-in procedure.

The user should be aware of the way the PDR: handler works. The current version of it types a^ and waits for any character except CTRL/C from the keyboard before sending a CTRL/Q to the PDP 11 and waiting for input.

Whenever the monitor waits for keyboard input, it prompts a % Arbitrary command lines will be accepted. Generally the command line is to be send to the RSTS and the answer (temporarily saved in W.) will by typed out. If the command line is a single "C" and a CR, then a CTRL/C will be send. Upon entering a command line the only editing character in effect is the CTRL/U which returns the %.

# RSTS TERMINAL MONITOR ON A PDP 8

THE MONITOR EXAMINES THE FIRST TWO CHARACTERS OF THE COMMAND LINE. IF THE LINE BEGINS WITH 0: THEN SENDS THE REST TO AND DOES EXECUTE IT BY THE OS/8. OTHER VALUABLE PREFIXES ( AND THE RESPECTIVE COMMAND LINES ) ARE:

| | |
|---|---|
| W:RFILE<OFILE | WRITES "OFILE" FROM OS TO "RFILE" IN RSTS |
| R:OFILE<RFILE | READS "RFILE" FROM RSTS IN "OFILE" IN OS |
| S:OFILE<TEXT | SENDS "TEXT" TO THE RSTS AND SAVES ITS ANSWER IN "OFILE" IN OS |
| L:TEXT | SAME AS S:LPT:<TEXT -- LISTS THE ANSWER. |

THE "<OFILE" OR "OFILE>" MAY BE OMITTED: DEFAULT IS TTY: FOR WRITE AND READ; LPT: FOR SAVE. THE MONITOR LOOKS FOR THE FIRST "<" IN THE LINE ONLY. FOR NON FILE-STRUCTURED DEVICES THE EXPLICIT NAME IS MEANINGLESS AND MAY BE OMITTED. THE EXPLICIT DEVICE NAMES DSK: FOR OS AND SY: FOR RSTS NEED NOT BE PRESENT.

COMMAND LINES ARE TERMINATED NORMALLY BY A CR, TO WHICH A LF IS AUTOMATICALLY APPENDED. THE LF IS A LEGAL TERMINATOR, BUT A CR IS INSERTED BEFORE IT UNLESS THE LINE IS TO BE SEND DIRECTLY TO THE RSTS WITHOUT ANY PREFIXES. THE THIRD LEGAL LINE TERMINATOR IS THE ESCAPE. TERMINALS SUPPORTED WITH ALTMODE ONLY MAY GENERATE THIS CHARACTER BY CTRL/SHIFT/K OR CTRL/[ . THE ESCAPE FORCES THE LINE AND THE NEXT LINE TOO TO BE SEND TO THE RSTS EXACTLY AS-IS, NO MATTER WETHER THEY CONTAIN PREFIXES OR NOT. GETTING THE ESCAPE THE MONITOR DOES NOT SEND THE LINE RATHER WRITES IT IN A TEMPORARY FILE. THIS WAY THE USER MAY COLLECT A SET OF LINES, AND SEND THEM TOGETHER; SO ELIMINATING THE MOST OF TIME WHICH WOULD BE SPENT FOR WAITING. THE MONITOR CONVERTS THE ESCAPE TO A CR-LF SEQUENCE.

PASSWD.PA

```
/       PASSWORD
/       LOAD PASSWD=2000/8/9/P

        *2000
        XLIST

        NOP
L,      CLA
        TAD PR
        DCA L
RTRY,   TAD (BUF-1
        DCA 13
        JMS TXT
        15
        12
        "#
        JMS KBD
        TLS
        JMS TXT
        15
        12
        "P
        "A
        "S
        "S
        "W
        "O
        "R
        "D
        ":
        JMS KBD
        JMP LC
        TAD (223
        DCA I 13
        TAD (232
        DCA I 13
        CIF 10
        JMS 7700
        10
        TAD (21
        CIF 10
        JMS 200
        3
ARG1,   FNAM
        0
        JMS ERR
        TAD ARG1
        DCA ARG2
        JMS 7607
        4200
        HLT
ARG2,   7777
        JMS ERR
```

```
        CLA IAC
PRC,    CIF 10
        JMS 200
        4
        PRAR
        1
        JMS ERR
PR,     JMP 7605
ERR,    0
        CLA CLL CMA RTL
        TAD ERR
        DCA 13
        TAD 13
        DCA 14
        IAC PRC
        DCA I 13
        TAD PRC+1
        DCA I 13
        IAC (7
        DCA I 13
        CLA CLL IAC RAL
        DCA I 13
        JMP I 14
TXT,    0
        TAD I TXT
        SPA
        JMP I TXT
        ILS
        TSF
        JMP .-1
        CLA
        ISZ TXT
        JMP TXT+1
KBD,    0
        CLA
        TAD I KBD
        ISZ KBD
        DCA SW
KBC,    KSF
        JMP .-1
        KRB
        AND (177
SW,     HLT
        TSF
        JMP .-1
LD,     TAD (-177
        SMA
        JMP RTRY
        TAD (177/-15
        SMA
        JMP KBE
        TAD (15
        DCA I 13
        JMP KBC
```

```
KBE,    TAD (15
        DCA I 13
        TAD (12
        DCA I 13
        JMP I KBD
        XLIST
FNAM,   FILENAME PASSWD.SX

        PAGE

BUF,    ZBLOCK 200

        $
```

---

## ***** L O G I N . B I *****

```
$JOB LOGIN
.R PASSWD
.R PIP
*PDP:<SYS:PASSWD.SX
*SYS:PASSWD.SX</D
*SYS:DUMMY[1]<SYS:LOGIN.BI
*SYS:DUMMY</D
*W<PDR:
.MUNG RSTS,LOGIN
.SUBMIT SYS:W/Q/T
$END
```

# HOW TO TRANSFER ASCII-FILES BETWEEN PDP-8 AND PDP-11?

(INSTRUCTIONS TO THE USAGE OF THE OS/8 PDR: AND PDP: HANDLERS BY PETER HANAK, TECHN. UNIV. BUDAPEST, DEPT. FOR INSTR. AND MEASUREMENT, SEPT 30, 1977.)

## 1. GENERAL

1.1 BE SURE THE PDR: (VERSION 1.1) AND THE PDP: (VERSION 1.2) HANDLERS ARE ACTIVE IN YOUR OS/8 SYSTEM. OTHERWISE, ACTIVATE THEM BY USING OS/8 BUILD.

1.2 CHECK WHETHER RSTS/E ARE RUNNING IN THE CONNECTED PDP-11 COMPUTER. OTHERWISE, THE CONNECTION CAN NOT BE ESTABLISHED.

1.3 TRANSMISSION CAN BE ACCOMPLISHED BETWEEN ANY PERIPHERALS OF THE TWO COMPUTERS. THE ONLY LIMITING FACTOR IS THE TIMING OF THE PDR: HANDLER. ONLY THE PDP-8 OS/8 SYSTEM CAN CONTROL THE TRANSMISSION PROCEDURE.

1.4 WHEN READING A FILE FROM THE PDP-11 COMPUTER THE PDP-8 WAITS ABOUT 30 SECS FOR THE FIRST CHARACTER AND ABOUT 8 SECS FOR THE OTHER ONES. WHEN TIMING EXPIRES THE HANDLER INTERPRETS THIS AS AN 'END-OF-FILE' CONDITION. WHEN WRITING TO THE PDP-11 THERE IS NO TIMING AT ALL.

## 2. TRANSMISSION

SUPPOSE THE USER CAN ENTER THE RSTS/E HAVING THE PROJECT-PROGRAMMER NUMBER (PPN) [2,103] AND THE PASSWORD JELSZO.

### 2.1 ESTABLISHING THE CONNECTION

| COMMAND FROM THE CONSOLE: | MEANING: |
|---|---|
| .R PIP <CR> | • CALL OS/8 PIP. |
| *PDP:<TTY: <CR> | • WE INTEND TO WRITE THE COMMANDS TO RSTS/E ON THE CONSOLE (TTY:). |
| *[2,103] <CR> | • PROJECT-PROGRAMMER NUMBER. |
| JELSZO <CR> | • PASSWORD. |
| PIP <CR> | • TO CALL RSTS/E PIP. |
| ↑S↑Z | • ENCOUNTERING CTRL/S RSTS/E WAITS UNTIL PDP-8 IS ABLE TO RECEIVE MESSAGES. (IN THE EXAMPLE, ↑S STANDS FOR CTRL/S, ETC.). |
| *TTY:<PDR: <CR> | • IS THERE ANY MESSAGE FROM RSTS/E? |
| ↑ <CR> | • AFTER ↑ HIT ANY KEY ON THE CONSOLE TO ENABLE TRANSMISSION. |

## 2.2 WRITING A FILE FROM THE PDP-8 TO THE PDP-11

SUPPOSE WE WANT TO PRINT ON PDP-11 LP: A FILE STORED ON DSK: IN THE PDP-8 OS/8 UNDER THE NAME PELDA.LS.

| COMMAND FROM THE CONSOLE: | MEANING: |
|---|---|
| *PDP:<TTY: <CR> | - A NEW COMMAND FOLLOWS TO THE RSTS/E. |
| LP:<KB: <CR> | - KB: IS THE CHANNEL OF THE PDP-8 IN RSTS/E. |
| ↑S↑Z | - TO HAVE RSTS/E WAIT FOR PDP-8. |
| *TTY:<PDR: <CR> | - IS THERE ANY MESSAGE? |
| ↑ <CR> | - AFTER ↑ HIT ANY KEY. |
| ......... | - THERE MAY BE AN ERROR MESSAGE, ELSE A PAUSE OF ABOUT 90 SECS FOLLOWS. |
| ......... | |
| *PDP:<PELDA.LS <CR> | - START TRANSMISSION. |
| * | - OS/8 PIP IS WAITING FOR ANOTHER COMMAND, GO TO 2.2, 2.3 OR 2.4. |

## 2.3 READING A FILE FROM PDP-11 TO PDP-8

SUPPOSE WE WANT TO TRANSMIT A FILE STORED ON PDP-11 DT1: UNDER THE NAME PELDA.S1 TO THE PDP-8 DSK: UNDER THE SAME NAME.

| COMMAND FROM THE CONSOLE: | MEANING: |
|---|---|
| *PDP:<TTY: <CR> | - A NEW COMMAND FOLLOWS TO RSTS/E. |
| KB:<DT1:PELDA.S1 <CR> | - KB: IS THE CHANNEL OF THE PDP-8 IN RSTS/E. |
| ↑S↑Z | - TO HAVE RSTS/E WAIT FOR PDP-8. |
| *PELDA.S1<PDR: <CR> | - PREPARE PDP-8 FOR RECEIVING A FILE. |
| ↑ | - AFTER ↑ WAIT SOME TIME FOR DECTAPE MOTION AND THEN HIT ANY KEY. |
| *TTY:<PELDA.S1 <CR> | - WHEN TRANSMISSION HAS COMPLETED CHECK WHETHER THE PROPER FILE HAS BEEN TRANSMITTED. YOU MIGHT GET AN ERROR MESSAGE INSTEAD OF A FILE! DON'T FORGET YOU MAY BREAK TYPING BY CTRL/C OR CTRL/C! |
| * | - OS/8 PIP IS WAITING FOR ANOTHER COMMAND. GO TO 2.2, 2.3 OR 2.4. |

NOTE:
RSTS/E APPENDS SOME CHARACTERS TO THE END OF EVERY FILE TRANSMITTED (E.G. CR, LF AND # OR READY); DELETE THEM (BY USING EDIT) IF THEY MAY DISTURBE.

## 2.4 CANCELLING THE CONNECTION

| COMMAND FROM THE CONSOLE: | MEANING: |
|---|---|
| *PDP:<TTY:,TTY: <CR> | • TWO NEW COMMANDS FOLLOW TO RSTS/E, |
| ↑Z | • LEAVE RSTS/E PIP |
| BYE/F <CR> | AND DISCONNECT, |
| ↑S↑Z | |
| *TTY:<PDR: <CR> | • IS THERE ANY MESSAGE? |
| ↑ <CR> | • AFTER ↑ HIT ANY KEY, |
| ......... | • YOU GET IT IF ANY |
| ......... | ELSE WAIT SOME TIME, |
| * | • CONNECTION HAS CEASED. GO TO 2.1 IF YOU NEED IT AGAIN, |

GOOD LUCK!

```
PASSWORD:                       - MESSAGE FROM RSTS/E IF THE
READY                             CONNECTION HAS ESTABLISHED.
PIP - RSTS/E ...   ETC.           GO TO 2.2, 2.3 OR 2.4!
```

```
/OS/8 HANDLER FOR PDP/11-RSTS/E
/IT USES A SERIAL I/O INTERFACE WITH A
/TELETYPE-LIKE INSTRUCTION SET.
/
/PETER HANAK
/TECHN. UNIV. BP.
/DEPT. FOR INSTRUMENTATION AND MEASUREMENT
/LAST EDITED: SEPT 30, 1977
/
/
/CALLING DEVICE HANDLERS
/
/CDF N   ;WHERE N IS THE VALUE OF THE
/        CURRENT PROGRAM'S INSTRUCTION FIELD
/        TIMES 10 (OCTAL)
/CIF     ;DEVICE HANDLERS ARE ALWAYS IN FIELD 0
/JMS I ENTRY     ;ENTRY CONTAINS THE ENTRY POINT
/        ADDRESS OF THE HANDLER
/ARG(1) ;FUNCTION CONTROL WORD:
/        BIT:     MEANING:
/        0        0 FOR INPUT, 1 FOR OUTPUT
/        1 TO 5   NUMBER OF 128-WORD RECORDS
/                 TO BE TRANSFERRED, IF 0, NO
/                 OPERATION.
/        6 TO 8   MEMORY FIELD FOR TRANSFERRING
/                 DATA.
/        9 TO 11 USED FOR DECTAPES.
/ARG(2) ;BUFFER ADDRESS
/ARG(3) ;STARTING BLOCK NUMBER
/JMP ERR         ;ERROR RETURN; IF AC0=1, FATAL ERROR
/...     ;NORMAL RETURN (I/O TRANSFER COMPLETE)
/
/PERIPHERAL INSTRUCTIONS
/PEC = PERIPHERAL CODE OF 'SERIAL INPUT' INTERFACE
/PEC+10 = PERIPHERAL CODE OF 'SERIAL OUTPUT' INTERFACE

PEC=400

PKSF=KSF+30+PEC
PKCC=KCC+30+PEC
PKRS=KRS+30+PEC
PKRB=KRB+30+PEC

PTSF=TSF+30+PEC
PTLS=TLS+30+PEC
```

```
EJECT OS-8 INPUT HANDLER FOR PDP-11-RSTS-E: PDR,S1-V1.1
/USAGE:
/THIS INPUT HANDLER WORKS AS OUTPUT DEVICE OF RSTS/E
/TERMINAL KBN:. IT MUST BE LOADED AND ACTIVATED BY OS/8
/BUILD USING THE FOLLOWING COMMANDS:
/.RUN SYS BUILD
/*LOAD PTR:      ;IF TO BE LOADED FROM PAPER TAPE
/^        ;PLACE THE TAPE 'PDR.BN' INTO THE READER AND
/         HIT ANY KEY
/*INSERT PDR     ;IF TO BE ACTIVATED
/*BOOT   ;REBOOT THE SYSTEM IF THERE ARE NO MORE
/         CHANGES
/*WRITE ZERO DIRECT?NO   ;DON'T CLEAR THE DIRECTORY:
/SYS BUILT
/.SA SYS BUILD  ;SAVE THE NEW COPY OF BUILD
/
/THE RSTS/E TERMINAL KBN: MUST HAVE THE FOLLOWING
/CHARACTERISTICS: WIDTH W (80<=W<=240), TAB, FORM,
/NO LC OUTPUT, XON, LOCAL ECHO, NO LC INPUT, NO FILL, STALL,
/SPEED S, NO PARITY, NO UP ARROW, NO ESC SEQ.
/AT THE BME MUSZER ES MERESTECHNIKA TANSZEK KB14: AND
/SPEED 9600 SHOULD BE USED.
/
/TO RECEIVE A FILE FROM THE PDP/11 CALL OS/8 PIP AT THE
/CONSOLE AND TYPE:
/*DEVICE:FILENAME.EXT<PDR:       <CR>
/AFTER A ^ HAS APPEARED ON THE CONSOLE CALL RSTS/E PIP
/AT ANOTHER TERMINAL AND THEN TYPE:
/*KB14:<DEVICE:FILENAME.EXT      <CR>
/AND THEN HIT ANY KEY ON THE CONSOLE TO ENABLE TRANSMISSION.
/IF THE OPERATION IS SUCCESSFUL A # APPEARS ON THE
/RSTS/E TERMINAL AND A * (OR .) ON THE CONSOLE.

/OPERATION FOR BLOCK 0:
/         IT SENDS CTRL/S TO THE PDP/11
/         SUSPENDING TRANSMISSION, TYPES
/         A ^ AT THE CONSOLE AND WAITS
/         UNTIL THE OPERATOR HITS A KEY,
/         THEN BEGINS NORMAL OPERATION.
/NORMAL OPERATION:
/         IT OUTPUTS CTRL/Q TO THE PDP/11
/         PERMITTING DATA TRANSMISSION,RECEIVES THE
/         CHARACTERS AND STORES THEM INTO THE BUFFER.
/         WHEN 42 (DECIMAL) PLACES ARE STILL
/         FREE IN THE BUFFER, IT SENDS CTRL/S
/         TO THE PDP/11, WAITS SOME TIME FOR
/         INCOMING CHARS AND THEN FILLS THE
/         BUFFER WITH BLANKS AND TAKES THE NORMAL
/         EXIT, HOWEVER, IF THE BUFFER IS
/         NOT FULL BUT THERE ARE NO MORE
/         INCOMING CHARS IN SOME TIME
/         (CONTROLLED BY LOC 'MTIM2'), IT STORES
/         CTRL/Z AND BLANKS INTO THE BUFFER AND
/         TAKES THE NON-FATAL ERROR EXIT.
/M/FATAL ERROR EXIT:
```

```
/       IF THE HANDLER HAS BEEN CALLED FOR OUTPUT
/       OR IF THERE ARE MORE THAN 29 INCOMING
/       CHARS AFTER CTRL/S HAS BEEN SENT TO THE
/       PDP-11.
/CTRL/C:
/       RECEIVING CTRL/C FROM THE CONSOLE
/       IT SENDS CTRL/O TO THE PDP/11 INHIBITING
/       FURTHER DATA TRANSMISSION AND THEN RETURNS
/       TO THE MONITOR.




/HANDLER HEADER BLOCK
        *0

        =1                      /1 DEVICE

        DEVICE PDR
        DEVICE PDR
        2410                    /DEVICE CONTROL BLOCK: READ ONLY, READER-TYPE
        PUPR=200                /ENTRY POINT OFFSET
        ZBLOCK 2

/BODY OF HANDLER
*200
PDPR,   0
MONRED, 7600                    /CLA & MONITOR ENTRY POINT
        RDF                     /CALLING FIELD
        TAD CDFCIF
        DCA EXIT
        TAD I PDPR              /ARG1: FCN


        AND MK70                /BUFFER FIELD
        TAD CDFINS
        DCA TIMER1
        TAD I PDPR              /ARG1: FCN; BIT0=0,
        ISZ PDPR                /IF INPUT REQUESTED
        SPA
        JMP FATER1              /FATAL ERROR
        AND MK7700
        CMA                     /-# OF DOUBLEWORDS =
        DCA WCOUNT              /=-RECORD# *128/2-1
        TAD I PDPR              /ARG2: BUFFER ADDRESS
        ISZ PDPR
        DCA BUFADD
        TAD I PDPR              /ARG3: STARTING BLOCK #
```

```
TIMER1, CDF                 /BUFFER FIELD SETTING
        SZA CLA
        JMP CTRLQ           /CONTINUE NORMAL OP.
        TAD P223            /BLOCK 0 OP.
        PTLS                /SENDS CTRL/S
        TAD P113            /TYPES ?
        TLS
        KSF                 /WAITS FOR OPERATOR
        JMP .-1
        PRAB                /CLEAR FLAG&BUFFER
        KCC                 /CLEAR AC&FLAG
CTRLQ,  TAD P221            /CONTINUE NORMAL OP.
        JMS SEND            /SENDS CTRL/Q
        JMP CTRLCE          /IS THERE A CTRL/C ?
NCTRLC, TAD P16             /NO CTRL/C
        TAD WCOUNT          /PLACE FOR 42(DEC) CHARS ?
        SZA CLA
        JMP NCTRLS          /NO; NO NEED FOR CTRL/S
        TAD P223            /YES; SEND CTRL/S
        JMS SEND
NCTRLS, ISZ WCOUNT          /INCREMENT COUNT
        JMP PDPRED          /CONTINUE READING
        TAD TIMER1          /BUFFER FULL
        SZA CLA             /IF TIMER1 NONZERO, FATAL ERROR
        JMP FATER2
        TAD CTRLS           /NON FATAL ERROR RETURN
        SZA CLA             /IF BOTH TIMER1 & CTRLS ARE 0,
FATER1, ISZ PDPR            /OTHERWISE NORMAL RETURN
ERRRET, ISZ PDPR
EXIT,   HLT
        JMP I PDPR

FATER2, STA
        JMP ERRRET

PDPRED, JMS RECEIV          /ACCEPTS FIRST CHAR
        DCA I BUFADD
        JMS RECEIV          /ACCEPTS SECOND CHAR
        DCA TEMPOR
        JMS RECEIV          /ACCEPTS THIRD CHAR
        RTL
        RTL
        AND MK7400
        TAD I BUFADD
        DCA I BUFADD
        TAD CHAR
        BSW
        RTL
        AND MK7400
        TAD TEMPOR
        ISZ BUFADD
        DCA I BUFADD
        ISZ BUFADD
        KSF                 /ANY CONSOLE INPUT ?
        JMP NCTRLC          /NO
CTRLCE, KRS                 /YES; CTRL/C ?
```

```
        AND MK177
        TAD M3
        SZA CLA
        JMP NCTRLC          /NO
        TAD P217            /YES; SEND CTRL/C INHIBITING FURTHER
        JMS SEND            /TRANSMISSION
CDFCIF, CDF CIF
        JMP I MONMED        /RETURN TO MONITOR

TEMPOR,                     /TWO NAMES FOR THE SAME LOCATION !
SEND,   0                   /SEND SUBROUTINE
        PTSF
        JMP .-1
        PTLS
        AND P16
        DCA CTRLS           /UPDATES SWITCH
        JMP I SEND

RECEIV, 0                   /RECEIVE SUBROUTINE
        TAD TIMER1
        SNA CLA
        JMP TIMEUP          /TIME IS UP !
        DCA TIMER1          /INITIALIZE TIMER1
TIMLOP, ISZ TIMER1          /TIMING LOOP
        JMP WAITIN
        TAD CTRLS           /TIMER1 IS UP
        SZA CLA
        JMP TIMEUP          /AFTER CTRL/S;
        ISZ TIMER2          /WITHOUT CTRL/S WAIT LONGER
        JMP TIMLOP          /TIMER1 CAN'T REMAIN 0
        TAD P232            /TIMER2 IS UP
        JMP TIMEUP          /STORE CTRL/Z=END-OF-FILE

WAITIN,                     /THESE CONSTANTS ACT AS NOP'S
MK70,   70
MK177,  177
P16,    16
P217,   217                 /CTRL/O
P221,   221                 /CTRL/Q
P223,   223                 /CTRL/S
PR32,   232                 /CTRL/Z
P113,   336-223             /TO PRINT !
        PKSF
        JMP TIMLOP
        PKRB
TIMEUP, DCA CHAR
        TAD MTIM2           /SET UP TIMER2
        DCA TIMER2
        TAD CHAR
        JMP I RECEIV
```

```
CDFINS, CDF
MK7400, 7400
MTIM2,
MK7700, 7700      /MASK AND TIMER2 CONSTANT (=100), TO WAIT
                  /ABOUT 8 SECS FOR EVERY CHAR BUT FIRST
M3,     =3
WCOUNT, 0         /DOUBLE WORD COUNTER
BUFADD, 0         /BUFFER POINTER
TIMER2, 7400      /INITIAL VALUE TO WAIT ABOUT 35 SECS
                  /FOR THE FIRST CHAR (=400)
CHAR,   0         /TEMPORARY STORAGE
CTRLS,  2         /2 AFTER CTRL/S, 0 AFTER CTRL/G

$$$$$$$$          /END OF CODE
$$$$$$$$
```

```
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/IT USES A SERIAL I/O INTERFACE WITH A
/TELETYPE-LIKE INSTRUCTION SET.
/
/PETER HANAK
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/
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/        CURRENT PROGRAM'S INSTRUCTION FIELD
/        TIMES 10 (OCTAL)
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/JMS I ENTRY     ;ENTRY CONTAINS THE ENTRY POINT
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/ARG(1) ;FUNCTION CONTROL WORD:
/        BIT:     MEANING:
/        0        0 FOR INPUT, 1 FOR OUTPUT
/        1 TO 5   NUMBER OF 128-WORD RECORDS
/                 TO BE TRANSFERRED, IF 0, NO
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/...     ;NORMAL RETURN (I/O TRANSFER COMPLETE)
/
/PERIPHERAL INSTRUCTIONS
/PEC = PERIPHERAL CODE OF 'SERIAL INPUT' INTERFACE
/PEC+10 = PERIPHERAL CODE OF 'SERIAL OUTPUT' INTERFACE
```

```
PEC=400

PKSF=KSF=30+PEC
PKCC=KCC=30+PEC
PKRS=KRS=30+PEC
PKRB=KRB=30+PEC

PTSF=TSF=30+PEC
PTLS=TLS=30+PEC

EJECT OS=8 OUTPUT HANDLER FOR PDP-11-RSTS-E: PDP.S1-V1.2
/USAGE:
/THIS OUTPUT HANDLER WORKS AS INPUT DEVICE OF RSTS/E
/TERMINAL KBN:. IT MUST BE LOADED AND ACTIVATED BY OS/8
/BUILD USING THE FOLLOWING COMMANDS:
/.RUN SYS BUILD
/*LOAD PTR:      ;IF TO BE LOADED FROM PAPER TAPE
/^              ;PLACE THE TAPE 'PDP.BN' INTO THE READER AND
/               HIT ANY KEY
/*INSERT PDP     ;IF TO BE ACTIVATED
/*BOOT           ;REBOOT THE SYSTEM IF THERE ARE NO MORE
/               CHANGES
/*WRITE ZERO DIRECT?NO  ;DON'T CLEAR THE DIRECTORY!
/SYS BUILT
/.SA SYS BUILD  ;SAVE THE NEW COPY OF BUILD
/
/THE RSTS/E TERMINAL KBN: MUST HAVE THE FOLLOWING
/CHARACTERISTICS: WIDTH W (80<=W<=240), TAB, FORM,
/NO LC OUTPUT, XON, LOCAL ECHO, NO LC INPUT, NO FILL, STALL,
/SPEED 9, NO PARITY, NO UP ARROW, NO ESC SEQ.
/AT THE BME MUSZER ES MERESTECHNIKA TANSZEK KB14: AND
/SPEED 9600 SHOULD BE USED.
/
/TO SEND A FILE TO THE PDP/11 CALL PIP AT ANOTHER RSTS/E
/TERMINAL AND THEN TYPE, TERMINATING THE LINE WITH A
/CARRIAGE RETURN:
/#DEVICE:FILENAME.EXT<KB14:
/THEN CALL OS/8 PIP AT THE CONSOLE AND TYPE:
/*PDP:<DEVICE:FILENAME.EXT       <CR>
/IF THE OPERATION IS SUCCESSFUL A # APPEARS ON THE
/RSTS/E TERMINAL AND A * (OR .) ON THE CONSOLE.

/NORMAL OPERATION:
/       IT SENDS CHARS TO THE PDP/11, FILTERING OUT BLANKS, RUBOUTS
/       AND SCANS WHETHER A CTRL/S HAS BEEN OUTPUTTED BY THE PDP/11.
/       AFTER RECEIVING A CTRL/S IT SUSPENDS SENDING
/       CHARS UNTIL ANOTHER CHAR BUT CTRL/S COMES
/       THEN RESUMES OPERATION, WITH EMPTY BUFFER
/       IT TAKES THE NORMAL EXIT.
/
/FATAL ERROR EXIT:
/       IF THE HANDLER HAS BEEN CALLED FOR INPUT
/CTRL/C:
/       RECEIVING CTRL/C FROM THE CONSOLE IT
/       RETURNS TO THE MONITOR.
/CTRL/S:
/       IF A CTRL/S HAS BEEN SENT TO THE PDP/11, THE
/       REMAINDER OF THE BUFFER WILL BE IGNORED.
```

```
/HANDLER HEADER BLOCK
        *0

        *1                      /1 DEVICE

        DEVICE PDP
        DEVICE PDP
        1400                    /DEVICE CONTROL BLOCK;WRITE ONLY,PUNCH-TYPE
        PDPP-200                /ENTRY POINT OFFSET
        ZBLOCK 2

/BODY OF HANDLER

        *200

PDPP,   0
        CLA
        RDF                     /CALLING FIELD
        TAD CDFCIF
        DCA EXIT
        TAD I PDPP              /ARG1: FCN
        AND MK70                /BUFFER FIELD
        TAD CDFINS
        DCA CHANDF
        STL RAR                 /SET AC0
        TAD I PDPP              /ARG1: FCN; BIT0=1,
        ISZ PDPP                /IF OUTPUT REQUESTED
        SPA
        JMP FATERR              /FATAL ERROR
        AND MK7700
        CMA                     /-# OF DOUBLEWORDS=
        DCA WCOUNT              /-(RECORD# *128/2-1
        TAD I PDPP              /ARG2: BUFFER ADDRESS
        ISZ PDPP
        DCA BUFADD              /ARG3 IS NOT USED
CHANDF, CDF                     /BUFFER FIELD SETTING

        PKRR                    /PDP-READER INIT
        JMP CTRLCE              /IS THERE A CTRL/C ?
NCTRLC, ISZ WCOUNT              /INCREMENT COUNT
        JMP PDPWRI              /CONTINUE WRITING
FATERR, ISZ PDPP                /BUFFER FULL OR FATAL ERROR
        ISZ PDPP
EXIT,   HLT
        JMP I PDPP

PDPWRI, TAD I BUFADD
        JMS SEND                /SENDS FIRST CHAR
        DCA CHAR
        ISZ BUFADD
        TAD I BUFADD
        JMS SEND                /SENDS SECOND CHAR
        CLL RTR
        RTR
        TAD CHAR
        RTR
```

```
          WTW
          JMS SEND          /SENDS THIRD CHAR
          ISZ BUFADD
          KSF               /ANY CONSOLE INPUT ?
          JMP NCTRLC        /NO
CTRLCE,   KRS               /YES; CTRL/C ?
          AND MK177
          TAD M3
          SZA CLA
          JMP NCTRLC        /NO
CDFCIF,   CDF CIF           /YES
          JMP I .+1
          7600              /RETURN TO MONITOR

SEND,     0                 /SENDING SUBROUTINE
          DCA TEMPOR
          PKSF              /ANY PDP INPUT ?
          JMP SENDIT        /NO
          PKRB              /YES; CTRL/S ?
          AND MK177         /MASK IT
          TAD M23           /=CTRL/S
          SZA CLA
          JMP SENDIT        /NO
WAIT,     PKSF              /YES; WAIT FOR INPUT
          JMP WAIT
          PKRB              /CTRL/S ?
          AND MK177         /MASK IT
          TAD M23           /=CTRL/S
          SNA CLA
          JMP WAIT          /YES; WAIT FOR NEXT
SENDIT,   TAD TEMPOR        /NO, EXAM IF BLANK
          AND MK177         /MASK IT
          TAD M177          /EXAM IF RUBOUT
          SNA
          JMP RETURN        /RETURN IF RUBOUT
          TAD P162          /EXAM IF CR
          SZA
          JMP LFEXAM
          STA               /YES
          DCA CRFLAG        /NOTE CR
          JMP SENDYT        /SEND CR
LFEXAM,   TAD P3            /EXAM IF LF
          SZA CLA
          JMP SENDYD        /NO, SEND IT
          TAD CRFLAG        /YES, EXAM CRFLAG
          SNA CLA
          JMP SENDYD        /NO CR, SEND LF
          DCA CRFLAG        /YES, CLEAR CRFLAG
          JMP RETURN        /AND RETURN IMMEDIATELY
SENDYD,   DCA CRFLAG        /CLEAR CRFLAG
SENDYI,   TAD TEMPOR        /SEND CHAR
```

```
        AND MK377       /MASK IT
        SNA
        JMP RETURN      /FILTER OUT BLANKS
        PTLS
        PTSF
        JMP .-1
        AND MK177       /MASK IT
        TAD M23         /CTRL/S?
        SNA CLA
        JMP FATERR      /YES, IGNORE REMAINDER OF BUFFER
RETURN, CLA
        TAD TEMPOR
        AND MK7400
        JMP I SEND

CDFINS, CDF
MK70,   70
MK177,  177
MK377,  377
MK7400, 7400
MK7700, 7700
M3,     -3
M23,    -23     /-CTRL/S
M177,   -177    /-RUBOUT
P3,     3       /CR-LF
P162,   162     /RUBOUT-CR
WCOUNT, 0       /DOUBLE WORD COUNTER
BUFADD, 0       /BUFFER POINTER
CHAR,   0       /TEMPORARY STORAGE
TEMPOR, 0       /TEMPORARY STORAGE
CRFLAG, 0       /-1 AFTER CR, OTHERWISE 0

$$$$$$$$        /END OF CODE
$$$$$$$$
```

NOTE ON DECUS 8-873 and 8-874

Robert Hassinger

12-APR-78

These programs were originally submitted on paper tape. I have copied all of the files for both items onto one DECtape. One error was noted. In PDR the symbol name P232 is misspelled as PR32. This causes an assembly error. On the DECtape the original form of PDR including the error is in file PDRØ.PA. A corrected version is in file PDR.PA. Note that I have called this version 1.1A, to distinguish it from the original paper tape version which is designated 1.1. A SRCCOM comparison of the two files is enclosed. Persons ordering 8-874 on paper tape will have to make the correction as shown.

```
12-APR-78

OS/8  VOLUME--
DECUS 8-873 - RSMON V1.1
DECUS 8-874 - PDR V1.1A, PDP V1.2

PDP    .PA  18 07-OCT-77
PDRP   .WU  17 07-OCT-77
PDR0   .PA  22 07-OCT-77
PDR    .PA  22 12-APR-78
LOGIN  .BI   1 07-OCT-77
RSTS   .TE  10 07-OCT-77
RSTS   .BI   1 07-OCT-77
PASSWD.PA    3 07-OCT-77
RSTS   .WU  13 07-OCT-77
<EMPTY>    623

  9 FILES IN  107 BLOCKS -  623 FREE BLOCKS


SRCCOM V4A
1)      /OS/8 HANDLER FOR PDP/11-RSTS/E
2)      /OS/8 HANDLER FOR PDP/11-RSTS/E

1)001   /
****
2)001   /       12-APR-78 - V1.1A - CORRECTED ONE CHARACTER ERROR - R HASSINGER
2)      /

**********

1)001   PR32,   232             /CTRL/Z
1)      P113,   336-223         /TO PRINT ^
****
2)002   P232,   232             /CTRL/Z
2)      P113,   336-223         /TO PRINT ^

*********
```