DIGITAL SOFTWARE NEWS

FOR THE

PDP-8 & PDP-12

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PDP-8 & PDP-12 SOFTWARE NEWS

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Programming Note for LS8E line printer handler

The LS8E line printer is currently being sold with OS/8
configurations. The device handler for the LS8E is quite
similar to the LE8 (LPØ8) handler, but there are enough
differences between the printers such that the current
LPØ8 handler will not work properly when used with the LS8E.
There are two possible courses of action to take if the LS8E
line printer is to be used as the system line printer:

I) A new BUILD format LS8E handler has been generated
   and will be distributed with LS8E printers. This
   handler can be used with OS/8 BUILD to insert the
   handler into the system.

II) For installations without paper tape readers, the
    standard line printer handler supplied with BUILD
    can be modified to drive the LS8E. The ALTER com-
    mand available in BUILD should be used to do this.
    To change the standard line printer handler for
    LS8E, run BUILD, and enter the following:

$ ALTER LPØ8,100 = 1371

$ ALTER LPØ8,157 = 724Ø

$ ALTER LPØ8,161 = 76ØØ

$ ALTER LPØ8,164 = 7762

$ ALTER LPØ8,171 = 6

These instructions alter the standard handler to drive the
LS8E. Continue the BUILD procedure as needed, and terminate
with

$BOOT

when the

SYSTEM BUILT

message occurs, the LS8E handler is on the system with the
name LPT.

Programming note on configuring OS/8 systems
_____

With the release of OS/8, a new system configurator program,
BUILD, has been introduced. BUILD allows the user to efficiently
alter his peripheral devices quickly and easily. BUILD can also
generate a system using the OS/8 and CD binary paper tapes. CONFIG.
Ø5 is also distributed and can still be used to configure systems.
Any of the procedures that could be used to build PS/8 systems
can be used with OS/8. In addition, CONFIG.Ø5 has several addi-
tional parameters:

    TD8E: Setting TD8E = 1 will cause handlers for TD8E DECtape
              drives Ø&1 to be used rather than TCØ8 DECtape.
              The units are non-system drives.

    TD8ESYS: Setting TD8ESYS - 1 will cause an assembly for the
              TD8E (12K core) as the system device. Unit Ø is
              the system device, unit 1 is resident at location 7614.

    ROM: For the 8K-ROM version of TD8E, set ROM = 1. Note
              that the ROM hardware must be present to use this
              option. If not, the user must have minimum 12K of core.

    RKØ1:   The RK8 disk can be used as a non-system device by
              setting RKØ1 = n, where n is the number of drives
              available. The RK8 handlers will replace DECtape
              drives starting with DTA7. Thus, setting RKØ1 = 2
              at assembly time will assemble handlers for RKAØ
              and RKA1, and will delete devices DTA7 and DTA6.

Thus, CONFIG, as well as BUILD provides facilities for creating OS/8
systems. Any new peripherals, however, will be distributed in
BUILD format, or as modifications to BUILD itself. No major ex-
pansions of CONFIG are planned at this time.

PS/8 AND OS/8 SYMBOLIC EDITOR

Patch to correct timing problem

Both the PS/8 and OS/8 Symbolic Editor program (EDIT) exhibit
timing problems when running on certain PDP-8/E's. Since some
8/E's are faster than others, the . = and / = commands will only
print 3 digits of line number.   The following corrects this
problem.

PS/8 Editor

        . GET SYS EDIT
        . ODT

        1226/6041 6046
        1227/5226 6041
        1230/6046 5227
        7600G

        . SAVE SYS EDIT
        .

OS/8 Editor

        . GET SYS EDIT
        . ODT

        1222/6041 6046
        1223/5222 6041
        1224/6046 5223
        7600G
        . SAVE SYS EDIT

        .

OS/8

Programming Note on use with TD8E DECtape

The following information applies only to TD8E configurations,
either 8K with MR8E Read-Only-Memory or 12K.

1)   Making OS/8 system backup tapes.

     Users should create a backup system tape immediately on
     receipt of the DECtape. The backup should be made before
     initializing the DECtape. Currently, no TD8E tape copy
     routine is being distributed. However, such a program
     will become a standard part of the TD8E kit. Meanwhile,
     a backup can be made by using the TD8E subroutine which
     is supplied as a standard tape in the kit. The procedure
     to follow to make a backup OS/8 system follows:

     1. Using the Binary Loader, load the TD8E subroutine
         (DEC-8E-UZTA=PB) into core in field Ø.

     2. Mount the unused OS/8 system tape (DEC-S8-OSYSA-A-UC)
         on unit Ø, WRITE LOCKED with the switch in the REMOTE
         position.

     3. Mount a certified DECtape on unit 1, WRITE ENABLED,
         with the switch set to REMOTE.

         Note: Be sure to wind a fair amount of tape onto the
                righthand reel of both units to get past the
                end zone region.

     4. Toggle the following program into core in field Ø:
         (see following page)

/SIMPLE TD8E COPY PROGRAM

```
            0200                *200
00200   3205            DCA REC1        /START AT TAPE BLOCK 0
00201   3212            DCA REC2
00202   4632    LOOP,   JMS I K7200     /READ OS/8 TAPE
00203   3610            3610
00204   0000            0
00205   0000    REC1,   0               /USES FIELD 1 AS BUFFER
00206   7402            HLT             /INPUT ERROR
00207   4633            JMS I K7204     /WRITE COPY
00210   7610            7610
00211   0000            0
00212   0000    REC2,   0               /THAT'S A WRITE ERROR! NEVER HAPPEN
00213   7402            HLT
00214   1205            TAD REC1
00215   1230            TAD K36         /UPDATE BLOCK TO COPY
00216   3205            DCA REC1
00217   1205            TAD REC1
00220   3212            DCA REC2
00221   1205            TAD REC1        /COPY 1000 OS/8 BLOCKS
00222   1231            TAD KM2000      /WHICH IS 2000 TAPE BLOCKS
00223   7710            SPA CLA
00224   5202            JMP LOOP        /KEEP COPYING
00225   7240            CLA CMA         /7777 TO AC
00226   7402            HLT
00227   5226            JMP .-1         /PROTECTION
00230   0036    K36,    36
00231   6000    KM2000, -2000
00232   7200    K7200,  7200
00233   7204    K7204,  7204
                $$$$$$$
```

This program uses the subroutine at 7200 to read the tape on unit 0
and copy 1000 OS/8 records to unit 1. The program terminates normally
with 7777 in the AC. Any other value in the AC indicates a tape error
has occured. Restart at 0200 to try the copy again.

This procedure can be used to make as many copies as needed. After
copying, the master tape should be stored safely, and a copy tape
should be initialized.

II)   TD8E Initialization Program

      Once the master tape is backed up, a copy tape should be initia-
      lized to a TD8E configuration. Instructions to do this can be
      found in the OS/8 Users Guide. The initialization program con-
      sists of two parts:

      A)   The RIM format paper tape supplied with the OS/8 kits.

      B)   Records 2-6 of the OS/8 system tape contain the actual ini-
           tializer program. This is put onto every system tape de-
           livered from the Library.

The RIM format tape reads in blocks 2-6 and starts execution. The
program in blocks 2-6 contains all code needed to transform the tape.
Users should also be aware of the following information about the
initializer:

      A)   Blocks 2-6 are OS/8 directory records. If the directory is
           expanded enough to move into block 2, the initializer program
           is destroyed. That is why the initializer program should be
           run immediately after copying the system tape.

      B)   PIP using the /Y option does not copy blocks 2-6 to the
           output tape. Thus, a tape that passes through the /Y option
           should never be used with the initializer. This will be
           corrected in a future version of PIP.

      C)   The initializer can be used repeatedly, until block 2 is used
           for directory functions. This should not be necessary, how-
           ever, and is not recommended.

III) Write Locked System Device

      The initializer will print random characters on the TTY if the
      system tape is WRITE LOCKED during initialization. This is due
      to an erroneous indirect operation in the initializer. The type-
      out should be:

           DEVICE ERROR

      and the system should halt. If typeout occurs, halt the machine
      WRITE ENABLE the drive, and start the RIM format initializer
      again at either location 20 (8K-ROM) or 21 (12K).

Programming note, formatted end of file

The run-time handling of end of file for formatted files
is designed so that if end of file is encountered during
program execution, the program continues at the start of
the file, rather than generating a fatal error. The next
release of FORTRAN may include a library function to
check for end of file at the users option.

Programming Note, constants in call list

As specified in the ANSI standard, constants in call lists
of subroutines and function subprograms are not protected.

Therefore, a function such as the following will result in
erroneous values.

```
FUNCTION FNCl(Y)

FNCl = 100.0

Y = Y+2.0

RETURN

END
```

Arithmetic statement function definitions

The arguments of an RTPS FORTRAN IV arithmetic statement
function definition are not dummy arguments.

RTPS FORTRAN IV users should note section 11.1.1 of the
FORTRAN manual which concerns dummy arguments in arithmetic
statement function definitions. It should read as follows:

   Form: name (arg1,....) = expression

  Where: arg1,.. are arguments. These variables will be altered
           whenever the function is used and should not be used
           elsewhere in the program.

 Effect: defines an internal function.

The BLOCK DATA statement

The BLOCK DATA statement does not function properly.

However, the BLOCK DATA subprogram is not required by RTPS FORTRAN
IV. Data statements associated with variables in COMMON may
appear in the main program or any subprogram.

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PDP-8/12 RTPS FORTRAN IV

Problem with expression in I/O statement

In an I/O statement (READ, WRITE, DEFINE FILE), an expression should not be used in the rightmost field. Thus,

READ (4'NXT-2)M

is not stored properly by the compiler, but

READ (4'SEC)M

is acceptable. This problem will be corrected in the next release of the compiler.

Problem with logical expressions

When an arithmetic expression is on the right-hand side of
a logical expression, and the logical condition is greater
than (.GT.), greater than or equal to (.GE.), less than (.LT.),
or less than or equal to (.LE.), the zero condition will not
be properly checked. Specifically, .GT. and .LT. do check
for zero, but, .GE. and .LE. do not.

This problem will be corrected in the next release of the
FORTRAN system. The problem can be easily avoided by cal-
culating the arithmetic expression first and then using it
in the logical expression. Thus,

```
        J=K-1
        IF (L.GT.J) GO TO 10
```

will work correctly, but

```
        IF (L.GT.K-1) GO TO 10
```

will not.

FOCAL 8

Patch to correct Altmode location

The following patch allows 376 to be accepted as Altmode instead of 375. The ASCll code 375 will no longer be valid if this patch is made:

LOCATION	OLD CONTENTS	NEW CONTENTS
7002	0375	0376

For these teletypes which have only an ESCape key ASCII code 0233 may be inserted as follows:

LOCATION	OLD CONTENTS	NEW CONTENTS
7002	0375	0233

FOCAL-8 and FOCAL '69

Problem with M Command

A problem occurs in both versions of FOCAL when the M command is used to modify lines with line numbers that end in .63.

To avoid problems when modifying any line numbered xx.63, the entire line should be deleted using the ERASE command and re-entered.

TC58 IT PART 1 (MAINDEC-08-D9DE)

Patch to correct short stall loops

Because of the increased cycle time of the PDP-8/E, the current
stall loops of TC58 IT Part 1 may be marginally too short. To
correct this, change the following locations to increase this
particular stall.

LOCATION	OLD CONTENTS	NEW CONTENTS
3262	5253	5340
3340		2337
3341		5340
3342		5253

KE-8E (EAE) Instruction Test 2 Multiply and Divide

MAINDEC-8E-DØMA

There have been three problems diagnosed in this program.

1. The binary tape does not entirely match the listing.

2. The teletype reader will not read a tape for interrupt testing.

3. Halts defined in the document must be changed to conform to binary tape.

The corrections for these problems are as follows:

1. A new MAINDEC will be released at a later date.

2. To start the TTY reader, press any key on the teletype keyboard.

3. Change the following halts defined in the document:

Paragraph 5.1.1.
Ø2Ø1 to Ø2ØØ
Ø251 to Ø25Ø