



DECUS U.S. CHAPTER SIGs NEWSLETTERS

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DECmail-11	PDP-11	VAXBI
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DECspell	RMS	VAXELN
DECsystem-10	RSX	VMS
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DECUS	RSX-11M-PLUS	WPS
FMS	RT-11	WPS-PLUS
IAS (et al)	RX02 (et al)	
LA50 (et al)		
LN01 (et al)		

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Circulation: 7190

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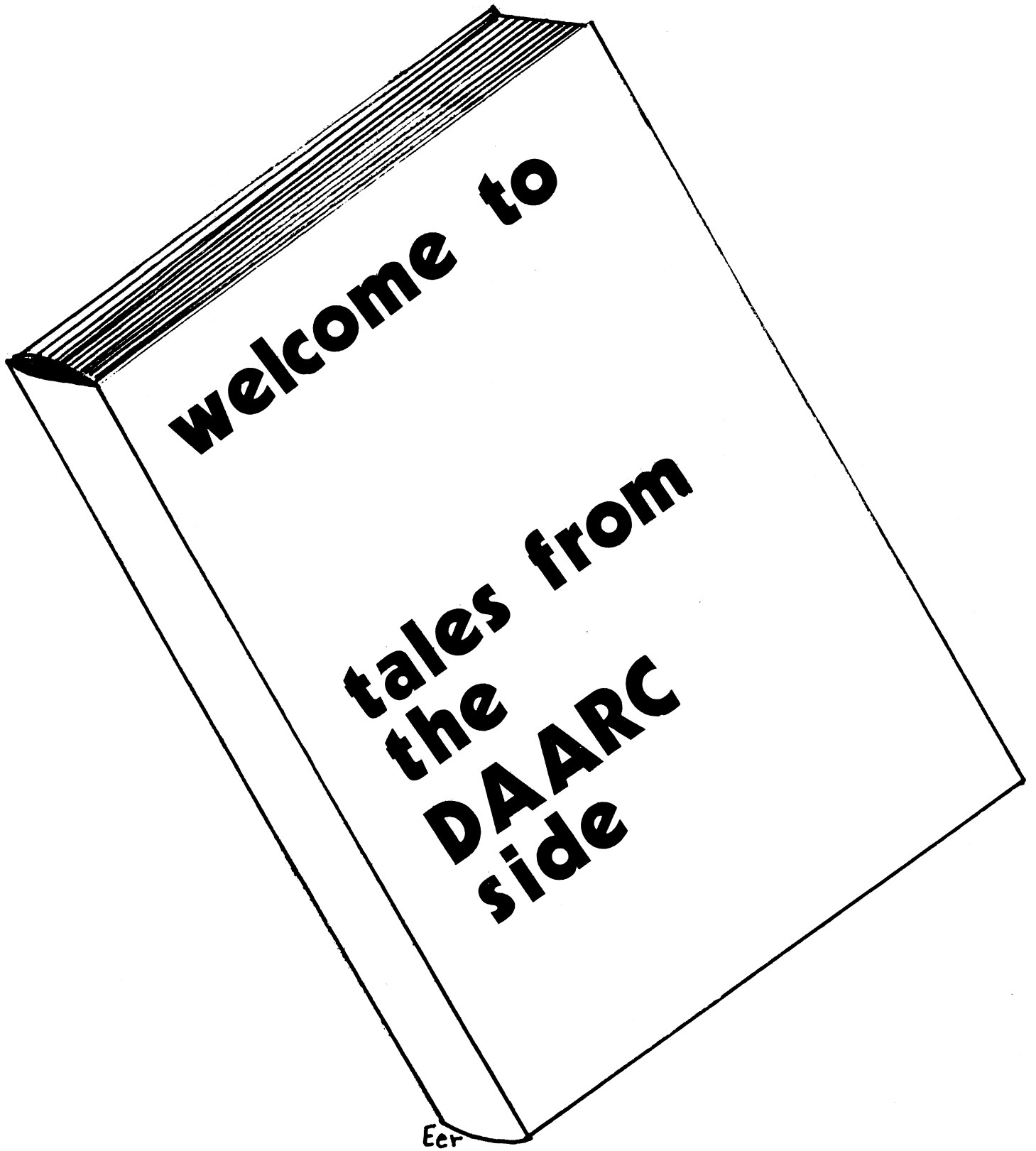
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EDITOR'S CORNER

The following list of events to be covered at the Spring Symposium was compiled by Bob Awde of the DAARC Sig. This will give you an idea of some of the topics to be covered at the spring symposium in Nashville. Make your plans to be there Now !!

Ellen Reilly

NASHVILLE SCHEDULE OF EVENTS

- MONDAY - Intro To Real Time
Micro Power Pascal
- TUESDAY - Baseway
MAP/TOP
Real Time I/O
- WEDNESDAY - MultiComputing
Factory Floor Systems
Baseview
VaxLab
Engineering Data Control Systems
- THURSDAY - LABS
LIMS, Laboratory Information Management Systems
RS/1
- FRIDAY - Computed Integrated Manufacturing Systems (CIM)
RS/1

MicroPower Pascal
John Davies

A couple of weeks ago, I received the attached latter from Magnus Patterson concerning an earlier article in the DAARC Newsletter. After testing his findings, I agree that VBGEXE does not speed up compilation. The following programette was sent to me as an answer to a SPR asking how to find the name of a static process from within that static process. It requires that a small Macro module be merged in with the Pascal program. It works, I don't know why, but it does.

```

PROGRAM testxx;
CONST  c=2;
TYPE   arrayx=PACKED ARRAY [1..62] OF CHAR;
VAR
    alst : [EXTERNAL(ALSS)] OF arrayx;
    v    : PACKED ARRAY [1..6] OF CHAR;
    i    : INTEGER;
BEGIN
    FOR i := 1 TO 6 DO
        v[i] := alst[c+i];
    Writeln('Program Name = ', v );
END.

.title .alss.
.psectr .alss. i,ro,ovr,gb1,rel
.alss.:
.end

```



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10 Oct. 1986

Dear Dr. Davies

Micropower/RT

I read with interest your article in the DAARC SIG Newsletter on the use of VBGEXE with MPP as a means of increasing throughput. Using the different methods you suggested, and looking at the compilation statistics in the listing file, it seemed that VBGEXE led to about a 50% saving in time. I then applied the technique to a large application file suite, hoping to reduce the build time from 75 minutes to around 40. However, although the perceived CPU time as in the listing files, and with the KMON TIME command, was down by close to 50%, the elapsed time was unchanged, and the system line clock had simply slowed down.

I haven't yet figured out why this could be; I have a suspicion that for some reason the line clock is not given a high priority when the VBGEXE/MPP combination is active. You might like to try some experiments for yourself to compare the compilation time in the listing file with the actual elapsed time. If I find any reason for the anomaly, then I shall let you know.

Just for your interest, our application is to control and acquire data from a two dimensional infrared detector array for use in astronomy. The Array Control Processor is the LSI-11/73 with 64 kbytes ROM (MRV11-D), 256 kbytes RAM (MSV11-LK), a parallel port card (DRV11-J) and two real time clocks (KWW11-C). We use another 11/73 as a data preprocessor, using the DRV11-WA to DMA data from the A/D and to DMA processed data into the host VAX. Because of the lack of good DEC software, we built our own handlers for most of the hardware, and would be happy to exchange ideas, handlers, ISR's (Macro-11) or anything else with Micropower enthusiasts in your own company or in the US DAARC SIG. Let me know if you have any success with VBGEXE/MPP.

With very best wishes,

Yours sincerely,

Magnus J. Paterson

Magnus J. Paterson

The Wombat

and 4GL

EXAMINER Dispatch

"Increases the Circulation of Anyone in America"

Volume 8

Number 6



Contributions

Submissions to this newsletter are constantly sought. A submission can be an article, a letter to the Wombat Wizard, a technical tip, or anything of interest to people using or considering the use of Datatrieve or any 4GL product. Submissions on magnetic media are preferred but almost any type will be considered.

Contributions for the newsletter can be sent to either of the following addresses:

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Pseudo Arrays in Datatrieve

William M. Leal - Kentucky Geologic Survey

Introduction

It is occasionally necessary to represent an array of data in Datatrieve using global variables; examples are shown. Datatrieve offers no facility for doing this directly. I show how the functionality of arrays can be simulated using other mechanisms.

Let us begin with a simple example. Suppose you work for a small company that has no more than six employees per department. You have a data file that contains DEPT, NAME, SSN. You want to be able to specify a given department and have FMS (or some similar screen manager) show on one screen all employees for each department. How can we do this? If we could set up a real array using OCCURS, there would be no problem; but structures are not valid for variables. The answer is to use a pseudo-array.

Pseudo Arrays

A pseudo-array consists of a set of like-named variables:

```
DEPT1, DEPT2, DEPT3, DEPT4, DEPT5, DEPT6  
NAME1, NAME2, NAME3, NAME4, NAME5, NAME6  
SSN1, SSN2, SSN3, SSN4, SSN5, SSN6
```

There is nothing unusual about this naming convention. The trick is to find a mechanism to manage the data efficiently. To see how to use a pseudo-array efficiently, let us begin by contrastively taking an example of how not to do it:

First we begin with our declarations

```
DECLARE DEPT1 PIC X(5).  
DECLARE DEPT2 PIC X(5).
```

We continue in like fashion for NAME1 through NAME6, and for SSN1 thru SSN6 for a total of 18 declarations. We also add:

```
DECLARE I PIC 9.  
DECLARE GET_DEPT PIC X(5).
```

Next we ready our input and ask for department desired:

```

READY COMPANY
GET_DEPT = *.DEPARTMENT

```

Now process through the data:

```

FOR COMPANY WITH DEPT = GET_DEPT BEGIN
  I = I + 1
  CHOICE
    I = 1 THEN BEGIN
      DEPT1 = DEPT
      NAME1 = NAME
      SSN1 = SSN
    END
    I = 2 THEN BEGIN
      DEPT2 = DEPT
      NAME2 = NAME
      SSN2 = SSN
    END
    .
    .
    .
  END_CHOICE
END

```

What we have here are two problems:

- Many lines of code. Datatrieve imposes a penalty by requiring start-up time depending on the number of lines of code. The FOR loop shown here will be proportionately as large as the number of variables times the number of occurrences.
- Duplication of logic. This is more serious. If your logic ever changes (needing to process another field, for instance), you must make many changes - all of the same nature but on different variables.

:ROTATE

Let us look at a more efficient way of handling this.

First add another set of declarations to the above:

```

DECLARE DEPTX PIC X(5).
DECLARE NAMEX PIC X(30).
DECLARE SSNX PIC 9(9).

```

Then define a procedure as follows:

```

DEFINE PROCEDURE ROTATE
  DEPTX = DEPT1: NAMEX = NAME1: SSNX = SSN1
  DEPT1 = DEPT2: NAME1 = NAME2: SSN1 = SSN2
  DEPT2 = DEPT3: NAME2 = NAME3: SSN2 = SSN3
  DEPT3 = DEPT4: NAME3 = NAME4: SSN3 = SSN4

```

```

DEPT4 = DEPT5: NAME4 = NAME5: SSN4 = SSN5
DEPT5 = DEPT6: NAME5 = NAME6: SSN5 = SSN6
DEPT6 = DEPTX: NAME6 = NAMEX: SSN6 = SSNX
END_PROCEDURE

```

This procedure rotates the psuedo array so that entry number 1 is saved: entry number 2 becomes entry number 1: and so forth, with entry number 6 becoming the prior entry number 1. The psuedo array is thus rotated by one position.

Now replace the FOR loop above with the following:

```

FOR COMPANY BEGIN
  DEPT1 = DEPT
  NAME1 = NAME
  SSN1 = SSN
  :ROTATE
END

```

We have thus reduced the number of lines of code required: but more importantly, we no longer have the problem of duplicate logic.

Use of the :ROTATE procedure is key to managing the psuedo array effeciently. For example, suppose we needed to clear the psuedo array:

```

REPEAT 6 BEGIN
  DEPT1 = " ": NAME1 = " ": SSN1 = " "
  :ROTATE
END

```

Or, suppose we needed to apply an edit to the psuedo array:

```

DECLARE ERROR PIC X(60).
I=1: REPEAT 6 BEGIN
  IF DEPT1 | NAME1 | SSN1 NE " " THEN IF
  DEPT1 = " " OR NAME1 = " " OR SSN1 = " " THEN
  ERROR = "Incomplete for entry number " | I
  :ROTATE
  I = I + 1
END

```

Conclusion

Given Datatrieve's lack of formal array handling facility, the psuedo array combined with :ROTATE can provide an effecient way of managing array structured data.

Ask The Wombat Wizard

Philip A. Naecker, Consulting Software Engineer

The Architecture of VAX Datatrieve, Part II

Introduction

In Part I of "The Architecture of VAX Datatrieve," we discussed the purpose of a software architecture and some of the features of the Datatrieve software architecture. We saw how the various components of Datatrieve are broken into several images and linked together using a layered approach.

In Part II, let's explore see how this layering allows you to modify Datatrieve without having to re-write your new program every time a new version of Datatrieve or any of the other components of the VIA architecture is released. Besides being an exercise to help you understand the architecture of VAX Datatrieve (which is required if you are to pass into the land of Wizardom), there are some very useful things to be done using the layered architecture of DTR.

Modifying Datatrieve Just for Yourself

Datatrieve has become an integral part of the production job stream at many sites, so you should be careful not to accidentally modify Datatrieve in a way that is going to interfere with the other users of Datatrieve. Of course, you generally will have to have privileges if you are going to modify Datatrieve for other users, because you'll want to modify or replace some system files or at least some system logical names. But you can make almost all the modifications you want for your own use WITHOUT ANY SPECIAL PRIVILEGES. And, using logical names, you can also export these modifications to other users.

Caution: There are many advantages to having a single version of Datatrieve on your system. Besides making it easier to figure out what is going on when an error occurs, there are also several performance advantages to having a single Datatrieve shareable image. If you are not familiar with performance issues and the installation of shareable images, you may want to hold off on using any of the ideas presented in this article that involve modifying the Datatrieve shareable image. In a future WW column, we're going to talk in depth about Datatrieve performance, and after you've read that you will be able to make informed decisions on running a copy of Datatrieve that isn't INSTALLED.

Logical names have a lot of power on a VAX. More than just making it easy to move your data files around, you can use logical names to point to different parts of the DTR system. In particular, there are three logical names that are used at execution time to control which version of Datatrieve you are using:

DTRMSGs Points to the Datatrieve message file.
DTRHELP Points to the Datatrieve help file.
DTRSHRxx Points to the Datatrieve shareable image.

Using these logical names, you can build and test new versions of Datatrieve without endangering the "standard" version of Datatrieve. For example, if you build yourself a new DTR messages file (like we're going to do below), you can define the logical name DTRMSGs to point to the new executable image that contains the messages. In this way, those messages can exist for your process and your process alone, unless someone else wants to define the same logical name to point to the message file you created. Similarly, you can run a different version of the DTR Help, and even a different shareable image.

This all works because DTR is "layered." It's not all one big program, but is instead made up of a series of programs. These programs (or images, in VMS parlance) are pointed to by logical names, and by changing the logical names we can control the image used for each function.

Let's try it.

Building a New Datatrieve Message File

One of the most powerful yet most often overlooked features of VMS is its Common Condition Handling and Message Facility. If you get an error message when you are using a standard VAX program, it has probably been generated by using the VAX Message Facility. The facility works like this:

- o All messages are grouped into facilities. Things like SYSTEM, RMS, DTR, COPY, FORTRAN, etc. are all facilities. Each facility has its own name and its own number. Some numbers are reserved for use by DEC, and the rest of us get the rest of the numbers.
- o Messages are either Informational, Success, Warning, Error, or Fatal.
- o Messages are defined using mnemonics. For example, if you attempt to copy a file into a non-existent directory, you will see the following error messages.

```
$ copy sys$input: [pan.foobar]foo.txt
%COPY-E-OPENOUT, error opening USER_DISK:[PAN.FOOBAR]FOO.TXT: as
output
-RMS-E-DNF, directory not found
-SYSTEM-W-NOSUCHFILE, no such file
```

OPENOUT, DNF, and NOSUCHFILE are mnemonics for the error messages, and COPY, RMS, and SYSTEM are facilities. The first error (the last in the

display, since error messages are usually displayed with the most recent error first and the oldest error last). is a warning from the system facility that the file FOOBAR.DIR is not found. That error generates and error from RMS that says it can't find the directory, which in turn causes COPY to give up and say it can't create the output file.

- o Any program can ask for the translation of any of the errors on the system using a VMS System Service. PUTMSG. You can also retrieve the severity level. Another mechanism, called signalling, allows a programmer to set up a condition handler for error messages, making programs simpler and improving software layering. (But that's another story...)
- o To create messages, the programmer defines a message file that contains the facility, the mnemonic, and the translation. This file is then compiled to generate either an object file or an executable file. The object file may be linked with a program that is using the messages. The executable file is not used until an error actually occurs, at which time the VMS image activator dynamically links to the executable image file that contains the messages.

It is this last fact, that the link to the image file containing the messages is done dynamically, that we will use to modify the Datatrieve message file for our process without affecting anyone else.

Datatrieve uses the VAX Message Facility for all its messages. In fact, just about everything that you see on the screen in Datatrieve is either data from your application (things like query-headers are really data, as far as Datatrieve is concerned) or they are modifiable messages. But you can get the message file when you install Datatrieve (you have to ask for it by answering YES to the question about "Customization files") and you can change the message text you want.

The steps you need to use to customize the messages are found in Chapter 8 of Guide to Datatrieve Programming and Customizing:

1. Copy the Datatrieve message source file DTRMSG.S.MSG from DTR\$LIBRARY to your own directory.
2. Edit the message source file.
3. Compile the message source file to create an object file.
4. Link the object file to create the file DTRMSG.S.EXE.
5. Replace the old DTRMSG.S.EXE file with the new one. OR use the logical name DTRMSG.S to point to the new file you've just created.

The last part (after the OR) is kinda hidden in the documentation, but it's a great way to test changes to DTR, as well as being a swell way to make your own version of the DTR messages. To wit:

```
$ COPY DTR$LIBRARY:DTRMSG.S.MSG [PAN.DECUS.WW]
%COPY-S-COPIED, SYS$COMMON:[DTR]DTRMSG.S.MSG:4 copied to
USER_DISK:[PAN.DECUS.WW]DTRMSG.S.MSG:4 (98 blocks)
$ EDIT DTRMSG.S.MSG (change a couple of things here and there,
as it shows you in the documentation)
$ MESSAGE DTRMSG
$ LINK DTRMSG/SHARE=FUN_DTRMSG
$ DEFINE DTRMSG USER_DISK:[PAN.DECUS.WW]FUN_DTRMSG
$ DTR Phil's Datatrieve V4.0 (more or less)
Phil's Query and Report System
Type HELP for abuse
```

```
DTR> SHOW ALL
Stuff you can READY:
KEY_DOMAIN:1 TARGET_DOMAIN:1 ZEUS_YACHTS:1
Stuff you can't:
KEY_RECORD:1 TARGET_RECORD:1
Stuff you can EXECUTE:
DEMO_DUMB_DTR:1 GROUP_KEY_LOOKUP:1
Plots from CDD$TOP.PUBLIC.PLOTS.VT200:
STATS:1
Dictionaries:
CCWD OSM PSOMAS TEST
TIME_MANAGEMENT
The default directory is CDD$TOP.USERS.PAN
No established collections, and a good thing too!
No ready sources.
No loaded tables.
DTR> SHOW COLLECTIONS
No established collections, and a good thing too!
DTR> PRINT FOO "FOO" isn't READYed yet, bozo.
DTR> READY CDD$TOP.DTR$LIB.DEMO.YACHTS
DTR> Print count of yachts with manufacturer starting with AL
"AL" not field. Too lazy to type the quotes, heh?...
COUNT
4
```

Now, the example I have shown is a rather whimsical one. Most of us have better things to do than writing cute messages. (Of course, I have this file on my system because I got tired of watching the same error messages one night.) But there is a very good use for this capability.

Consider your new users of Datatrieve. For those people, the error message

"AL" not field, assumed literal.

is pretty incomprehensible. (Let's face it - Datatrieve makes a tradeoff between being nice to new users and nice to seasoned users, and this is one of those tradeoffs.) There are even more forboding error messages, with equally innocuous true meanings:

Truncation during assignment.
MISSING VALUE not defined for LOA, using default value.

The list goes on.

So, if you want to help your new users, you can spend a couple of hours editing the message file to tailor the messages to your site. Then, compile the message file and place it in a directory where it can be accessed by everyone. Tell the new users how to define a logical name in their LOGIN.COM, and away you go!

Here is an example of what you might want to do with the DTR message file:

Change this:

```
SIGNON/FAO=4/INFORMATIONAL-  
<VAX Datatrieve !AD!UL!UL!/DEC Query and Report System  
!/Type HELP for help >
```

to this:

```
SIGNON/FAO=4/INFORMATIONAL-  
<VAX Datatrieve !AD!UL!UL!/DEC Query and Report System  
!/Type HELP for help or call Systems Support at extension 123 >
```

Change this:

```
MODACCREQ/FAO=1/ERROR-  
<Modify access is required for "!AC". >
```

to this:

```
MODACCREQ/FAO=1/ERROR-  
<Modify access is required for "!AC". Use the command READY !:AC MODIFY >
```

Change this:

```
DATCNVERR/FAO=1/WARNING-  
<Conversion error in date string "!AS". >
```

to this:

```
DATCNVERR/FAO=1/WARNING-  
<Conversion error in date string "!AS".  
I don't recognize that as a date. Try again >
```

Change this:

```
NORECSEL/FAO=0/WARNING-  
<No record selected, printing whole collection. >
```

to this:

```
NORECSEL/FAO=0/WARNING-  
<No record selected, printing whole collection.  
!/Use Control-C to stop printing.>
```

Change this:

```
BADQUOSTR/FAO=0/ERROR-  
<Expected closing quote, encountered "****END_OF_LINE****". >
```

to this:

```
BADQUOSTR/FAO=0/ERROR-  
<Quoted strings need quotes at the beginning and the end.  
!/I encountered the end of the line before I found a closing quote mark.>
```

Modifying Datatrieve Help Text

If you are going to go to all the trouble of modifying the DTR message file for users, you should also consider modifying the HELP file. The basic approach is the same as with the message files.

1. Copy the help library to your own directory.
2. Extract the help text from the library.
3. Edit the help text.
4. Put the edited help text back in the library.
5. Point to the new help library using a logical name.

```
$ COPY SYS$HELP:DTRHELP.HLB *.*  
%COPY-S-COPIED. SYS$SYSROOT:[SYSHLP]DTRHELP.HLB:4 copied to  
USER_DISK:[PAN.DECUS.WW]DTRHELP.HLB:4 (1056 blocks)  
$ Library/help/extract=show/output=show.hlp DTRHELP  
[Edit the file SHOW.HLP]  
$ LIBRARY/HELP DTRHELP SHOW  
$ DEFINE DTRHELP USER_DISK:[PAN.DECUS.WW]DTRHELP  
$ DTR  
Phil's Datatrieve V4.0 (more or less)  
Phil's Query and Report System  
Type HELP for abuse  
DTR> HELP SHOW COLL
```

SHOW COLLECTIONS

Displays the names of the collections in your workspace. If you find yourself using collections a great deal, contact the Systems Support Section (SSS) for additional training.

DTR> EXIT

Besides adding additional hints or including site-specific information such as names and phone numbers, you can also add help for your own procedures and other objects. For example, one site I know has added an entire system of Help for their Personnel Database. By using HELP inside of DTR a user can find out what domains are available, and what procedures to use to access those domains with a minimum of effort.

Modifying the Datatrieve Shareable Image

The same approach we've used for the message and HELP files can be used with the actual DTR shareable image, the "guts" of DTR. Many sites customize their DTRSHR, for that is the place where functions are created. If you have ever added new functions to your copy of Datatrieve, then you have created a new Datatrieve shareable image. But in that case you are modifying the system-wide shareable image, whereas today we want to modify just the one that you will be using yourself.

Say, for example, that you want to create some new functions and test them out to see how they work. But you don't want to cause any problems for other users until you are sure your functions work properly. So, how will you do it?

(Warning: If you have access privileges to DTR\$LIBRARY, be VERY careful before you do these commands. Be sure you work only on copies of these files, not on the original files or in the DTR\$LIBRARY directory.)

1. Make a copy of DTRFUN.OLB in your own directory. Also, copy the file DTRFND.MAR for your function definitions - you will edit this file according to the instructions in the documentation (and in previous WW columns) for adding new functions. Instead of including the compiled object module back in DTR\$LIBRARY:DTRFUN.OLB, however, add the object module to the DTRFUN in your own directory. You may want to name this library something different - I named my PHILS_DTRFUN in the example below.
2. Copy and edit the file DTR\$LIBRARY:DTRBLDxx.COM. Delete the lines at the top of the command file, before the first LINK. Also delete the lines at the end of the command file, where there are LINK commands for DDMF.EXE and DTR32.EXE. You don't need to modify either of those images.
3. In your own version of DTRBLD.COM, edit the two lines in the first link command that refer to the images DTRSHR and DTRFUN. Replace the system logical names and DTR\$LIBRARY logical name with path specifications that point to your own directory where you have the copy of DTRFUN.OLB. Leave all the UNIVERSAL = lines intact, but you can delete all the lines starting with the next "\$" that follows the LINK for DTRSHR.

When you've done it right, the new DTRBLD.COM in your directory will look something like this:

```
$ link/nosyslib/nomap/notraceback/shareable=-
PHILS_DTRSHR sys$input/options
identification="VAX DTR V4.0-0"
cluster=transfer_vector...dtr$library:DTRLIB.OLB-
/include=(dtrenry)
cluster=cddshr...sys$common:[syslib]cddshr.exe/shareable
cluster=lbrshr...sys$common:[syslib]lbrshr.exe/shareable
cluster=cobrtl...sys$common:[syslib]cobrtl.exe/shareable
cluster=forrtl...sys$common:[syslib]forrtl.exe/shareable
cluster=librtl...sys$common:[syslib]librtl.exe/shareable
```

```
cluster=mthrtl...sys$common:[syslib]mthrtl.exe/shareable
dtr$library:DTRLIB.OLB-
/library/include=(DDM)
PHILS_DTRFUN.OLB/library
sys$common:[syslib]starlet.olb/library
psect_attr=$pdata.pic.usr.con.rel.lcl.shr.exe.rd.nowrt.novec
gsmatch=lequal.1.1
UNIVERSAL = DTR$_BADBLK
...
...
...
UNIVERSAL = DTR$_CDDCORRUPT
$ EXIT
```

4. Use @DTRBLD to link a new executable shareable image. This new shareable image will have your new function definitions in it.
5. Point to the shareable image with a logical name. The logical name will be the same as the FILENAME portion of the DTRSHRxx image in SYS\$LIBRARY. You probably have an image called DTRSHR.EXE, in which case the logical name you should use would be DTRSHR. However, Datatrieve allows you to install images with two character suffixes on the name, and many sites use these to indicate the version of the Datatrieve shareable image or the type of forms product linked in. Some examples of the logical name definition are:

```
$ DEFINE DTRSHR USER_DISK:[PAN.DECUS.WW]PHILS_DTRSHR
$ ! If you have an image called DTRSHRFM for FMS, use this:
$ DEFINE DTRSHRFM USER_DISK:[PAN.DECUS.WW]PHILS_DTRSHR
$ ! If you have an image called DTRSHRV3, use this:
$ DEFINE DTRSHRV3 USER_DISK:[PAN.DECUS.WW]PHILS_DTRSHR
$ ! et cetera...
```

That's all you need to do. The next time you invoke Datatrieve in the usual way (probably \$ DTR or \$ RUN SYS\$SYSTEM:DTR32 or \$ MCR DTR32) you will be using your new shareable image with the new functions instead of the sharable image in SYS\$LIBRARY. If you don't believe me, you can do this from another terminal or a subprocess:

```
$ SHOW DEVICE/FILES/NOSYSTEM DTRSHR (or DTRSHRxx)
```

You will see that your DTR process has the new DTRSHR image in use, indicating that the image activator has dynamically linked with the new sharable image.

You will need to do the DEFINE each time you create a new process (basically, every-time you log in) but you can easily do that by putting it in your LOGIN.COM file.

Note also that the new shareable image will be used with every program that is linked with the DTRSHR image. That includes DDMF (if it runs in the context of your process and uses your LOGIN.COM to get the DEFINE) and any callable DTR programs you run. Also, many DEC layered products such as DECGraph and DECReporter use

DTRSHR - be careful that you don't break them by changing this too much. Of course, if you do have any problems, just \$ DEASSIGN DTRSHR to use the original DTR image. You can also \$ DEASSIGN DTRHELP and DTRMSGs to go back to using the originals of those files, as well.

There are other things that go into the DTR shareable image besides functions. One very useful thing to modify is the DTR fixed text (things like the names of months, prompts from DTR, and so on). You will certainly want to customize these if you are modifying DTR for use in another country, but you can also modify these items to change the default picture strings for various DTR items and the names of some DTR keywords. See the DTR Guide to Programming and Customizing for more information on changing these items.

A few warnings are in order:

1. As I mentioned above, be very careful if you have any kind of elevated privileges when you do this. An accident with your privileges enabled could make your life very miserable.
2. The new shareable image is NOT BEING SHARED. This could have some serious performance impacts. If you don't know what these are, either ask your system manager or limit your use of the new shareable image to testing of new functions and similar activities.
3. When a new version of DTR comes out, you will need to make a new copy of the DTRFUN file and you will need to re-link your shareable image. However, there are good reasons why you should not be using this separate shareable image for very long, so you will not likely be affected by a new version release during the brief test period while you using the new shareable image.
4. You need to be sure to match the logical name with the suffix to the DTR shareable image. If you don't match them and you have only one version of DTR on your system, you'll get an error when you start up DTR. But if you don't match them properly and you have multiple versions of DTR on your system, you may get quite confusing results.

Next month we'll answer a few user questions and try some Wombat Magic.

Handling Break Logic in Datatrieve

William M. Leal - Kentucky Geologic Survey

Introduction

It is frequently necessary to process sorted data, breaking on a control variable to take some special or summary action. This paper illustrates an efficient mechanism for doing that with attendant examples.

The need to work with data on a control-group basis often arises in doing certain kinds of processing. Recently, for example, I needed to group records in a file by a control variable and display both detail and summary information via FMS on one screen. Whenever the control variable changed, I needed to stop and display the information I had collected. Solving this using Datatrieve turns out to be not a trivial problem.

Let us illustrate both the problem and the solution using an example simpler than the one I described above. Suppose we have a file which is keyed by DEPT and which includes the field AMT. The goal is to produce and print the sum of AMT by DEPT. (I realize that Datatrieve's Report Writer has this mechanism available, but Report Writer would not have been appropriate for the real-life problem I had.) Let us begin by defining two procedures, COLLECT and PROCESS:

```
DEFINE PROCEDURE COLLECT
SUM = SUM + AMT
END PROCEDURE

DEFINE PROCEDURE PROCESS
PRINT LAST_DEPT, SUM
SUM = 0
END PROCEDURE
```

Now we have the main program:

```
READY ACCOUNTS
DECLARE SUM PIC 9(6).
DECLARE LAST_DEPT PIC X(5).
FOR ACCOUNTS BEGIN
  IF LAST_DEPT = " " THEN LAST_DEPT = DEPT
  IF DEPT = LAST_DEPT THEN BEGIN
    :COLLECT
  END
  IF DEPT NE LAST_DEPT THEN BEGIN
    :PROCESS
    LAST_DEPT = DEPT
  END
END
```

We also have some sample data:

DEPT	AMT
ADMIN	10
ADMIN	12
MAIL	11
MAIL	13
SALES	9
SALES	8
SALES	12

The Problems

Let us execute the main program on the sample data, tracing the progress as we go along.

DEPT	AMT	Procedure	SUM	-----Printed-----	
				LAST_DEPT	SUM
ADMIN	10	COLLECT	10		
ADMIN	12	COLLECT	22		
MAIL	11	PROCESS	0	ADMIN	22
MAIL	13	COLLECT	13		
SALES	9	PROCESS	0	MAIL	13
SALES	8	COLLECT	8		
SALES	12	COLLECT	20		

This example shows up two problems: (a) The record which causes a break (MAIL/11) will be ignored and not included in the summation and (b) the last batch (SALES) will not be processed.

We can solve this by duplicating :COLLECT and :PROCESS as follows:

```
FOR ACCOUNTS BEGIN
  IF LAST DEPT = " " THEN LAST DEPT = DEPT
  IF DEPT = LAST_DEPT THEN BEGIN
    :COLLECT
  END
  IF DEPT NE LAST_DEPT THEN BEGIN
    :PROCESS
    LAST_DEPT = DEPT
    :COLLECT
  END
END
:PROCESS
```

Let us illustrate, again with our sample data:

DEPT	AMT	Procedure	SUM	-----Printed-----	
				LAST_DEPT	SUM
ADMIN	10	COLLECT	10		
ADMIN	12	COLLECT	22		
MAIL	11	PROCESS	0	ADMIN	22
		COLLECT	11		
MAIL	13	COLLECT	24		
SALES	9	PROCESS	0	MAIL	13
		COLLECT	9		
SALES	8	COLLECT	17		
SALES	12	COLLECT	29		
		PROCESS	0	SALES	29

Adding :COLLECT after :PROCESS handles problem (a), while adding :PROCESS at the end handles problem (b). The latter has a difficulty in that if the rse (here, ACCOUNTS) were ever null, the last :PROCESS would be executed any way. Our output would then be:

DEPT	AMT	Procedure	SUM	-----Printed-----	
				LAST_DEPT	SUM
			0		

Clearly, in the case of a null rse, we would want no output at all.

Another problem is one of efficiency. Datatrieve imposes a start-up delay time proportional to the size of the code. Duplicating :COLLECT and :PROCESS here can, in some cases, add several hundred lines of code to the overall program and thus add many minutes to the time required start up.

Solving The Last-Batch Problem

A way to handle the last-batch problem is to know when we are at the end. Datatrieve can't tell us when the current record is the last, so we need to get the information ourselves. If the rse is small, the following approach works:

Scan through the rse to determine last key break field. Use this as a test for the last batch.

The code for this is:

```
DECLARE LAST KEY PIC X(5).
FOR ACCOUNTS LAST KEY = DEPT

Now revise the above code:

FOR ACCOUNTS BEGIN
  IF LAST DEPT = " " THEN LAST DEPT = DEPT
  IF DEPT = LAST_DEPT THEN BEGIN
    :COLLECT
  END
  IF DEPT NE LAST_DEPT OR LAST KEY = DEPT THEN BEGIN
    :PROCESS
    LAST_DEPT = DEPT
    :COLLECT
  END
END
```

In the case of a null rse, the FOR loop will not be executed at all. Since all instances of COLLECT and PROCESS are in the FOR loop, there will be no processing that takes place, and no output.

Solving the Duplicate-Code Problem

We have eliminated the duplicate of :PROCESS as well as the problem of a null rse. But we still have the duplicate code of :COLLECT. A way to handle that is:

Set an UNCOLLECTED switch that can be used to force two iterations on the main processing loop in the event of a control break. The first time through, DEPT will not equal LAST_DEPT so PROCESS will be executed. The next time, DEPT will equal LAST_DEPT so COLLECT will be executed. In the latter case, UNCOLLECTED is turned off so the next record can be gotten.

```

DECLARE UNCOLLECTED PIC 9.
FOR ACCOUNTS BEGIN
(A)  IF LAST_DEPT = " " THEN LAST_DEPT = DEPT
(B)  UNCOLLECTED = 1
(C)  WHILE UNCOLLECTED = 1 BEGIN
(D)      IF DEPT = LAST_DEPT THEN BEGIN
(E)          :COLLECT
(F)          UNCOLLECTED = 0
(G)      END
(H)      IF DEPT NE LAST_DEPT OR LAST_KEY = DEPT THEN
BEGIN
(I)          :PROCESS
(J)          LAST_DEPT = DEPT
(K)      END
(L)  END
END

```

This is the final solution. It handles all the problems cited above:

- Every record is handled by COLLECT.
- The last batch is handled by PROCESS.
- There is no spurious processing in the event of a null rse.
- Neither COLLECT nor PROCESS are duplicated.

Illustrations

To illustrate this final solution, consider the following cases:

- (1) Record is first in the rse. Example: ADMIN/10 (here and below, A=f means that the condition for Step A was false and the statement following THEN was not executed; similarly, A=t means the condition was true and the THEN statement was executed).

Step	LAST_DEPT	SUM	UNCOLLECTED	Print?
Init	blank	0	0	
A=t	ADMIN			
B			1	

C=t				
D=t				
E		10		
F			0	
H=f				
C=f				
Final	ADMIN	10	0	

- (2) Record does not have a control break. Example: SALES/8.

Step	LAST_DEPT	SUM	UNCOLLECTED	Print?
Init	SALES	9	0	
A=f				
B			1	
C=t				
D=t				
E		17		
F			0	
H=f				
C=f				
Final	SALES	17	0	

- (3) Record has a control break. Example: MAIL/11.

Step	LAST_DEPT	SUM	UNCOLLECTED	Print?
Init	ADMIN	22	0	
A=f				
B			1	
C=t				
D=f				
H=t				
I		0		Y
J	MAIL			
C=t				
D=t				
E		11		
F			0	

```

H=f
C=f
Final MAIL 11 0 Y

```

(4) Record is last and does not have a control break. Example: SALES/12.

```

Step LAST_DEPT SUM UNCOLLECTED Print?
Init SALES 17 0
A=f
B 1
C=t
D=t
E 29
F 0
H=t
I 0 Y
J SALES
C=f
Final SALES 0 0 Y

```

At step H, LAST_KEY contains SALES; thus, LAST_KEY = DEPT is true, so the condition is true.

(5) Record is last and does have a control break. (This means the last batch consists of only a single record.) Add a new record to our example: TRAIN/15.

```

Step LAST_DEPT SUM UNCOLLECTED Print?
Init SALES 29 0
A=f
B 1
C=t
D=f
H=t
I 0 Y
J TRAIN
C=t
D=t
E 15
F 0
H=t
I 0 Y
J TRAIN
C=f
Final TRAIN 0 0 Y (2x)

```

Conclusion

The procedures COLLECT and PROCESS which are used here can be any pair of procedures which process sorted data. Determining the last record in the rse and using an 'uncollected' switch permit us to process data by control breaks without duplication of code.

The Best of Wombat Magic

Compiled by: Donald E. Stern, Jr. - Warner Lambert Company, Milford, CT

Introduction

This article is based upon a session presented at the Fall 1986 DECUS U.S. Chapter Symposium in San Francisco.

Wombat Magic has become a tradition at the DECUS symposia. I have found these sessions to be some of the most rewarding in terms of both information content and entertainment value. While the entertainment value is nearly impossible to capture for an article, the information which has been presented is well worth the time to repeat and/or restate. What follows is based upon the programming hints and techniques presented at Wombat Magic over the past several years. It is by no means complete but is representative of the *Best of Wombat Magic*.

Datatrieve Date Magic

The DATE datatype used by Datatrieve is the same as that used by VMS (Datatrieve-11 had it first, though.) In VMS lingo, a date is stored as an integer quadword. The value of this integer contains the number of 100 nanosecond periods (clunks) since the base date/time of November 17, 1858 at 00:00. This unique method of storing date/time information together with the manner in which Datatrieve handles arithmetic operations has resulted in several presentations at Wombat Magic.

Phil Dickerson - pre-1982

DTR Date facts

```

Base Date 17-NOV-1858
1 clunk 100 nanoseconds
1 second 10,000,000 clunks
1 day 86,400 seconds
1 day 864,000,000,000 clunks

```

Thus,

```

18-NOV-1858 is stored as 864,000,000,000.
19-NOV-1858 is stored as 1,728,000,000,000, etc.

```

The result of subtraction of two dates is the number of days between dates. Other operations on date variables treats the variables as a Number!

Date Magic -

First DECLARE some variables...

```

DECLARE PD USAGE DATE.    !Used for Present Date
DECLARE PVD USAGE DATE.  !Used for various past dates
DECLARE N COMPUTED BY PD - PVD.
DECLARE M PIC 99999.      !Will contain numerical day of the week
DECLARE Z PIC 9.          !1 = Sunday, 2 = Monday, etc.)

```

To find the most recent Sunday...

```

PD = "TODAY"
PVD = "3-JAN-1982"        !The first Sunday of 1982
                          !Increase PVD by 7 days until PVD is less
                          !than 7 days before PD

```

```

WHILE N GE 7 PVD = PVD + (7 * 86400000000)
PRINT PVD ("Most"/"Recent"/"Sunday") using WWWWWW-DD-MMM-YY.
SPACE 10. PD ("Present Date")

```

To find numerical day of the week (method 1)

```

PD = "TODAY"
PVD = "3-JAN-1982"
M = PD - PVD              !M = Number of days since
                          !the first Sunday of the year
Z = M - ((M/7)*7) + 1    !Z = Remainder after subtracting
                          !whole weeks
!
!Z now contains a number from 1-7 corresponding to the day of the week.
!
PRINT PD ("Present"/"Date"), Z ("Numerical"/"Day")

```

To find numerical day of the week (method 2)

```

PD = "TODAY"
M = PD/864000000000 + 3
!M now contains the number of days since the base date + the number of
!days since the previous Sunday to the base date.
Z = M - ((M/7)*7) + 1    !Z = Remainder after subtracting
                          !whole weeks
!
!Z now contains a number from 1-7 corresponding to the day of the week.
!
PRINT PD ("Present"/"Date"), Z ("Numerical"/"Day")

```

Dick Azzi - Motorola SPS, Phoenix, AZ - Fall 1984

Date Magic - Dates and Holidays

How do you determine the number of working days (week days) in a month excluding holidays? You do it as follows:

```

declare report_month pic 99.
declare report_year pic 99.
declare first_of_month usage is date.
declare last_of_month usage is date.
declare days_to_check usage is date.
declare days_pic 99.
! a table HOLIDAY-TABLE contains the dates of all holidays
report_month = *
report_year = *
first_of_month = report_month||"/01/"||report_year
last_of_month = first_of_month + 35
last_of_month = fn$month(last_of_month)||"/01/"||fn$year(last_of_month)
last_of_month = last_of_month + (-1)
days = 0
days_to_check = first_of_month
while days_to_check le last_of_month begin
if "S" ne (format days_to_check using w) and
days_to_check not in HOLIDAY-TABLE
days = days + 1
days_to_check = days_to_check + 1
end
print days

```

Dick Azzi - Motorola SPS, Phoenix, AZ - Fall 1984

Date Magic - Unused Clunks

We want to send some notices to our users on a certain date and then keep track of whether we have sent the notice. We didn't want to change the record layout [by adding a flag field, for example]. We needed a way to flag the records without adding another field to the record. This can be done by burying a flag in the least significant bits of a date, as follows:

```

! Use a record definition like
03 OA_DATE USAGE IS DATE.
03 REDA REDEFINES OA_DATE.
   05 FLAG USAGE IS QUAD. ! DATE and QUAD both take 8 bytes

```

The statements to select and process records...

```

FOR DOMAIN WITH (RSE on the OA_DATE and records) BEGIN
IF FN$HUNDREDTH(OA_DATE) EQUAL 0 THEN BEGIN
:SEND_NOTICES_PROCEDURE
FLAG = FLAG + 1000000 !-> 0.01 SECONDS
END
END

```

This will set the date (and time) slightly past midnight (0.01 seconds) for each of the dates, indicating that a notice has been sent.

Pat Scopelleti - Corning Glass Works, Corning, NY - Spring 1986

Date Magic - Day of the Week

```

DECLARE FD USAGE IS DATE DEFAULT VALUE IS "1-JAN-85".
DECLARE DIFFS COMPUTED BY REC_DATE - FD.
DECLARE DOW COMPUTED BY DIFFS - FN$FLOOR(DIFFS/7)*7.
DEFINE TABLE DOW_TABLE
0 : "SUNDAY"
1 : "MONDAY"
2 : "TUESDAY"
3 : "WEDNESDAY"
4 : "THURSDAY"
5 : "FRIDAY"
6 : "SATURDAY"
END_TABLE

```

Screen Control without FMS or TDMS

Several individuals have presented material which show how terminal escape sequences can be added to Datatrieve procedures. These escape sequences can be used to position the cursor, clear the screen, change the display characteristics, control an attached printer, and much more.

In addition, techniques have been presented which perform other aspects of screen control without the use of FMS or TDMS.

Larry Jasmann & Jim Fulton - U.S. Coast Guard - Spring 1983

```

DEFINE PROCEDURE ESC_FUN;
DECLARE CLEAR PIC XXXX.
DECLARE HOME PIC XXX.
.
.
.
CLEAR = "<ESC>[2j"
HOME = "<ESC>[h"
.
.
.
END_PROCEDURE

```

Put the line :ESC_FUN into your DTR\$STARTUP file and the definitions will be available to you all the time.

To use:

```

DTR> PRINT OFF (-), CLEAR (-), HOME (-),
SKIP 5, COL 10, REVERSE (-),
DTOP (-), "THE GREAT WOMBAT PRESENTS",
OFF (-), SKIP, COL 10, REVERSE (-),
DBOT (-), "THE GREAT WOMBAT PRESENTS",
OFF (-), SKIP 3, COL 15, BLINK (-),
BOLD (-), REVERSE (-), DWIDTH (-),
"DATATRIEVE", OFF (-)

```

Brent Sadler - Spring 1983

An improvement or two...

```

DEFINE PROCEDURE ESC_FUN
DECLARE CLEAR
COMPUTED BY "<ESC>[2j"
QUERY_HEADER IS "-"
END_PROCEDURE

```

Don Stern - Warner Lambert Company, Milford, CT - Spring 1986

At this and past Wombat Magic sessions, it was shown how escape sequences can be programmed into Datatrieve procedures in order to achieve screen control. Escape sequences can also be used to control your LA-50 (or LA-100, etc.) printer. The following code fragment from my DTR startup file shows some of these escape sequences. (Please note that <ESC> represents a single byte which is the ASCII code for escape, decimal 27.)

```

Declare bold computed by "<esc>[1m" query-header is -.
Declare ff computed by "<ff>" query_header is -.
Declare rotate computed by "<esc>[?47h" query_header is -.
Declare compress computed by "<esc>[?43l" query_header is -.
Declare expand computed by "<esc>[?43h" query_header is -.
Declare laon computed by "<esc>[5i" query-header is -.
Declare laoff computed by "<esc>[4i" query-header is -.
Declare la132 computed by "<esc>[4w" query-header is -.
Declare la100 computed by "<esc>[2w" query-header is -.
Declare la80 computed by "<esc>[1w" query-header is -.
Declare la64 computed by "<esc>[8w" query-header is -.
Declare la48 computed by "<esc>[6w" query-header is -.
Declare la40 computed by "<esc>[5w" query-header is -.
Declare vp12 computed by "<esc>[3z" query-header is -.
Declare vp8 computed by "<esc>[2z" query-header is -.
Declare vp6 computed by "<esc>[1z" query-header is -.
Declare vp4 computed by "<esc>[6z" query-header is -.
Declare vp3 computed by "<esc>[5z" query-header is -.
Declare vp2 computed by "<esc>[4z" query-header is -.

```

The following code demonstrates the use of four of these escape sequences to cause the Datatrieve report writer to produce a hardcopy report, on an attached printer, in which the title and column headers are written with bolded print.


```

REPORT FIRST 40 YACHTS
SET REPORT_NAME="Demonstration Report of YACHTS"/"Using Bolding"
AT TOP OF REPORT PRINT LAON, NEW PAGE
AT TOP OF PAGE PRINT BOLD, SKIP 1, REPORT_HEADER, SKIP 2,
    COLUMN_HEADER, OFF
PRINT YACHT
AT BOTTOM OF REPORT PRINT LAOFF
END_REPORT

```

It is possible to control the horizontal and vertical pitch of an attached LA-50 printer using some of the escape sequences given above. Examples of their use are given below.

```

! The following statement will turn the attached printer on,
! print the first 10 yachts using the current default vertical
! and horizontal pitch, and finally turn the printer off.
!
PRINT LAON THEN
PRINT MANUFACTURER, MODEL, RIG, PRICE OF
    FIRST 10 YACHTS THEN
PRINT LAOFF

! The following statement turns the printer on, sets the pitch
! to 16.5 chars/inch (132 columns/8 inches), prints the first 10
! yachts, and turns the printer off. (NOTE: The printer will
! be left in compressed print mode.)
!
PRINT LAON, LA132 THEN
PRINT MANUFACTURER, MODEL, RIG, PRICE OF
    FIRST 10 YACHTS THEN
PRINT LAOFF

! The following statement turns the attached printer on, sets
! the horizontal pitch to 5.0 chars/inch (40 columns/8 inches),
! the vertical pitch to 3 lines/inch, prints the first 10 yachts
! and then resets the horizontal pitch to 10 chars./inch (80
! columns/8 inches), the vertical pitch to 6 lines/inch, and
! finally turns the printer off.
!
PRINT LAON, LA40, VP3 THEN
PRINT MANUFACTURER, MODEL, RIG, PRICE OF
    FIRST 10 YACHTS THEN
PRINT LA80, VP6, LAOFF

```

Phil Naecker - Fall 1983

Hold Manager

```

Report yachts sorted by loa, builder on tt:
set report-name="Easy to Read"/"Terminal Report"
set lines_page = 20
print builder, rig, loa, price
at bottom of page print skip 1,
    " " | "*" any character and <RETURN> to continue" using x
end_report:

```

Jay Vander Wall, Dow Chemical - Spring 1984

Help Manager

```

declare hold_manager pic x(14)
    valid if (hold_manager in mgr_tbl) or
        (hold_manager = "?")
hold_manager = "?"
while hold_manager = "?"
    begin
        hold_manager = *,"manager's name (<?> for help)"
        if hold_manager = "?"
            then print all name of managers
    end
end

```

Mary McKinzie - Spring 1984

We had a little problem setting up a menu for several reports for our users. Our users do not really like to read at 132 columns on their VT100 unless it is absolutely necessary. We wanted to print the menu at 80 column and the report at 132 columns. So we thought that would be easy, we have these wonderful functions FN\$WIDTH. So we set up with a WHILE LOOP so that as long as the option is not equal to zero (0) which is what they use to get out, it prints the menu with report options and all the choices and then do a FN\$WIDTH(132) and print the report. Then in FN\$WIDTH change back to 80 and reprint menu.

```

opt = 13
while opt ne 0 begin
    print "Report Options"
    .
    .
    .
    fn$width(132)
    if opt = 1 then :report1
    .
    .
    .
    fn$width(80)
end

```

Well . . . it did not quite work that way. DATATRIEVE has this wonderful thing called optimization. What that means is it takes the FN\$WIDTH out, changes the screen to 132 columns at the beginning, and that is it folks... that is the way it stays. I must give credit for the solution to my colleague because he did a lot of the work finally working it out.

```

declare c132 default value is "<ESC>...!"["<ESC>[?3h"]
declare c80 default value is "<ESC>...!"["<ESC>[?3l" lower case L]
opt = 13

```

```

fn$width(132)
while opt ne 0 begin
  print c80."Report Options"
  .
  .
  print c132
  if opt = 1 then :report1
  .
  .
end

```

What we came out with, we declared two variables. One of them you put in the escape sequences for setting a VT100 to 132 columns and the other one for setting it to 80 columns and I don't happen to remember what those are. Then you print that instead of using your FN\$WIDTH statement so when we print our menu we print the escape sequences to set it to 80 then print our menu, then print the escape sequence to set it to 132 columns and print the report. You still have to do the FN\$WIDTH 132 at the very beginning so that DATATRIEVE knows that you are going to use 132 columns otherwise it gives you tiny characters but still wraps around.

Reporting Data

One of the areas, where Datatrieve really shines, is in its ability to report data. Some of the Magic presentations in this category have illustrated imaginative ways in which to maximize and extend this capability.

Diana Washburn - Spring 1984

This is in answer to something that came up in the Pre-symposium seminar - I mentioned there that it would be answered here and I tried to get someone else to do it but failed, so I am doing it. This was part of a REPORT statement using the CHOICE within the PRINT of your report. It was used to produce actually two fields. There was one choice that produced based on the value of BEAM sale price and then the second in a second field gave kind of a commentary documentation on how much percent off that particular thing was. The question was - could it be done in one choice rather than in two. And - it can be.

```

report yachts with builder = "CHALLENGER"
print model, beam, price using $$$$.$$$
  choice
    beam le 10 then (price * 0.9)
    beam bt 11 and 20 then (price * 0.85)
    else (price * 0.80)
  end_choice ("Sale"/"Price") using $$$$.$$$
  choice
    beam le 10 then "10% off Retail"

```

```

    beam bt 11 and 20 then "15% off Retail"
    else "20% off Retail"
end_choice

```

Model	Beam	Price	Sale Price	
35	12	\$58.823	\$49.999	15% off Retail

```

choice
  beam le 10 then
    format(price * 0.9) using $$$$.$$$|" 10% off Retail"
  beam bt 11 and 20 then
    format(price * 0.85) using $$$$.$$$|" 15% off Retail"
  else
    format(price * 0.80) using $$$$.$$$|" 20% off Retail"
end_choice

```

Model	Beam	Price	Sale Price	
35	12	\$58.823	\$49.999	15% off Retail

If put it in one choice, then you can use the format on the first part and use a concatenated expression then to put in the other half. The difference in your print line is that in the first one sale price is the heading over the top of the sale price column - the second one is just kinda pushed over there a ways without a heading and in the second one the sale price is centered over the two columns together.

Richard Copeland - Spring 1985

My talk is about Horizontal Subtotals. Normal reports are "vertical." For example.

```

FIND domain WITH field = "A","B","C"
REPORT CURRENT SORTED BY field
AT BOTTOM OF field PRINT field, COUNT
AT BOTTOM OF REPORT PRINT COUNT
END-REPORT

```

gives a vertical form

field	COUNT	COUNT
A	10	
B	20	
C	15	
		45

A lot of people are using spread sheets these days and they are not really satisfied with vertical totals like that. They want horizontal totals.

How would you like to have across the page

```

COUNT  COUNT  COUNT  COUNT
OF A     OF B     OF C
10       20       15       45

```

in a horizontal form? So I had to figure out how to do it. You start off by

```

DECLARE A COMPUTED BY CHOICE OF
  field = "A" THEN 1
  ELSE 0
END-CHOICE.

```

and a similar thing for B and C. Then use the same FIND as before and

```

REPORT CURRENT
AT BOTTOM OF REPORT PRINT TOTAL A("COUNT"/"OF A").
TOTAL B("COUNT"/"OF B").
TOTAL C("COUNT"/"OF C").
COUNT
END-REPORT

```

which gives the desired result. If you take that one step farther, you can get some really fancy reports using this technique. Such a use would be cumulative percentages of quota by region. Such as

QUOTAS BY REGION

Region	At Least 20%	At Least 40%	At Least 60%	At Least 80%	# Salesmen
North	100	65	40	10	100
South . . .	100%	65%	40%	10%	

To do this declare

```

DECLARE TWENTY COMPUTED BY CHOICE
  SALES/QUOTA GE 0.2 THEN 1
  ELSE 0
END-CHOICE.

```

and the corresponding thing for FORTY, SIXTY, and EIGHTY. Then report

```

REPORT CORRENT SORTED BY REGION
AT BOTTOM OF REGION PRINT REGION.
TWENTY("At Least"/"20%").
FORTY("At Least"/"40%").

```

```

. . . COUNT("#"/"Salesmen").
SKIP.
(TWENTY/COUNT)*100 USING ZZ9%.
(FORTY/COUNT)*100 USING ...

```

```

. . .
END-REPORT

```

I use this quite a bit and there is no limit to how far you can extend this. You can get not only count, you can get total by using instead of the value 1 in the choice of use the value of the variable.

Bill Noyce - Fall 1982

Two column report.

```

DEFINE RECORD DIST-RECORD USING
01 DIST.
  02 NAME.
    03 LAST_NAME PIC X(15).
    03 FIRST_NAME PIC X(10).
  02 ADDRESS.
    03 MAIL_STOP PIC X(15).
    03 DECNET PIC X(6).
    03 USER_NAME PIC X(15).
  02 ORGANIZATION PIC X(15)
    QUERY_NAME IS "ORG".
  02 LIST_LEVEL PIC 9
    QUERY_HEADER IS "?".
:

```

```

DEFINE DOMAIN TEMP USING TWO_COLUMN_REC ON TEMP.DAT:

```

```

DEFINE RECORD TWO_COLUMN_REC
01 TWO_COL.
  02 RECORD_COUNT WORD EDIT STRING ZZ9.
  02 PAGE_NUMBER WORD EDIT STRING Z9.
  02 COL1.
    03 NAME PIC X(20).
    03 MAIL_STOP PIC X(10).
  02 COL2.
    03 NAME PIC X(20).
    03 MAIL_STOP PIC X(10).
:

```

```

DTR> READY DIST
DTR> :MAILING_LIST
Enter list heading in quotes: "WOMBAT MAGIC - a two column list"
Enter FILE: foo.out

```

```

Define procedure MAILING_LIST
Declare PAGE_LENGTH long. !number of lines on a page

```

```

PAGE_LENGTH = 40
!
!Ready TEMP write
!Erase all of TEMP:
!
!
!Restructure distribution list into temp. adding order
!and dividing the results into pages
!
!For DIST store TEMP using
!Begin
!COL1.NAME = FIRST_NAME|||LAST_NAME
!COL1.MAIL_STOP = MAIL_STOP
!RECORD_COUNT = RUNNING_COUNT
!PAGE_NUMBER = (RUNNING_COUNT - 1)/(2*PAGE_LENGTH)
!End
!
!Collapse temp on itself
!
!For B in TEMP
!For A in TEMP with RECORD_COUNT =
!B.RECORD_COUNT - PAGE_LENGTH
!Begin
!Modify using A.COL2 = B.COL1
!Erase all of TEMP with
!RECORD_COUNT = B.RECORD_COUNT:
!End
!
!Produce the mailing list
!
!READY TEMP
!Report TEMP sorted by PAGE_NUMBER. RECORD_COUNT on *.file
!Set report_name = *.list heading in quotes"
!Print col 5, col1.NAME|col1.MAIL_STOP (" ").
!col 40, col2.NAME|col2.MAIL_STOP (" ")
!
!At bottom of PAGE_NUMBER print skip 5.
!col 7, "Please address corrections to Magic Wombat".
!new_page
!End_report
!END_PROCEDURE

```

Keith Hare - Spring 1985

You have a data file that somebody wants you to write letters out of. And the question is, you want to include data from the data file and you want it to all come out neatly. And Joe's date choice of format reminded me of this. You concatenate field together with

```

PRINT "This is a line of text" |||
  FORMAT FIELD USING Z99 |||

```

```

"This is more text." ||| Joe's date stuff |||
"Even more text." USING T(65)

```

The trick is, of course, to use the T format to cause the text to be wrapped nicely.

Logical Names

The use of logical names with Datatrieve has been fertile ground for Wombat Magic material.

Peggy Racel - Spring 1983

```

$DEFINE UT "CDD$TOP.UTILITIES"
.
.
.
DTR> :UT.PR_ON
DTR> :UT.PR_OFF
DTR> :UT.CLEAR

```

Larry Jasmann - Spring 1985

Here is something i use to move around through the CDD. As part of my LOGIN.COM file I have some assignments like

```

$ ASSIGN/PROC "CDD$TOP.JASMANN" CDD$DEFAULT
$ PROJ1 := ASSIGN "CDD$TOP.PROJ1" CDD$DEFAULT
$ PROJ2 := ASSIGN "CDD$TOP.PROJ2" CDD$DEFAULT
$ NORM := ASSIGN "CDD$TOP.JASMANN" CDD$DEFAULT

```

Then when I want to change projects or return to my "home" CDD directory, I can quickly and easily point me to the location I want to be when I enter Datatrieve.

Kathy Wrobel - Digital Equipment Corp. - Fall 1985

Prompting for a Sort Key

```

DECLARE SORT_FIELD PIC X(10).
DECLARE SORT_KEY COMPUTED BY CHOICE
  SORT_FIELD CONT "RI" THEN RIG
  SORT_FIELD CONT "LO" THEN LOA
.
.
.
ELSE ""
END_CHOICE.

```

FOR YACHTS SORTED BY SORT_KEY PRINT RIG. LOA. PRICE

FIND (heaven forbid) YACHTS SORTED BY SORT_KEY also works.

Phil Naecker - Fall 1985

Solution to READY *. "Domain"

"Everybody wants to ready a domain 'on the fly' and decide which domain to ready 'on the fly'. The problem is you can't 'IF something THEN READY this ELSE READY that' but, as pointed out earlier, you can create logicals 'on the fly' inside an IF or a CHOICE and you can ready a domain via a logical. So..."

```
DECLARE WHICH_DOMAIN PIC X(32).
WHICH_DOMAIN = *. "Which one on list"
CHOICE
  WHICH_DOMAIN CONT "A" THEN
    FN$CREATE_LOG("PSEUDO","DOMAIN_A")
  WHICH_DOMAIN CONT "YAC" THEN
    FN$CREATE_LOG("PSEUDO","YACHTS")
  .
  .
  .
END_CHOICE
READY PSEUDO
```

"If your a really slick DATATRIEVER, you'll place the smallest unique string after the CONTAINING and, by using CONTAINING instead of EQUALS, it will do case translation so whether you type in lower case or upper case you'll get exactly what you want. You'll also include a list in the 'which domain' prompt to let users know which domains can be readied."

User Defined Functions (UDF's)

Creating new UDF's is a relatively simple way to extend vanilla Datatrieve far beyond it's "as delivered" functionality. While total ignored or approached with reluctance, at some sites, it is a feature well worth utilizing and has come up "more than once" during Wombat Magic sessions.

Phil Naecker - Spring 1984

UDF Function Generator

I have a simple and relatively mundane magic. How many of you have tried to use callable DATATRIEVE? And have any of you tried to write function definitions? For those of you who haven't tried to write function definitions the reason maybe that you cannot figure out, in every case, how to generate the function definition file, that is - how to extend the DATATRIEVE at the bottom and add functions into it. So I called my magic "Programming in VAX 11 DATATRIEVE or The DATATRIEVE to MACRO Code Generator" because that is what we do. As everyone well knows, it was Bell Labs that did a study awhile back that said that on the average of the time, there were two lines of codes generated in any language per man-day, or as I like to say one before lunch and after. Knowing that I have discovered that is was much easier to fill in

forms. By putting in the forms with the right fields — answering the fields and putting the right data in I could write MACRO which I cannot write in any other way. I sat down and wrote a record definition for the function. I think the guys in [doing] the DATATRIEVE documentation [group] have done the same thing, it is not very difficult to do. You make a record that has all the fields in it that are required in the DTR function definition file. These are basically things like the function name that you are going to add, and the external name of that function, and the subroutine that you add, and a few other things like that like how many arguments, and what kind of arguments the are. That is not terrible difficult, you write a record definition. I will go ahead put that into the DATATRIEVE SIG library. You make a domain with functions and actually you can even do a make a domain functions using functions on FUNC.DAT and put a form definition in there if you would like, which is what I like because I can type on forms very easily and make mistakes and backup when I am writing in MACRO.

```
define domain functions using function on funct.dat:
define record function using
01 data.
  03 function_name pic x(32).
  03 external_name pic x(32).
  03 number_of_args pic 99.
  03 . . .
:
```

So - the next step is trivial - I did not put it all on the overhead, I will submit it to the SIG again, but basically you define a procedure called BUILD_DTRFND, you ready the functions domain, for those FUNCTIONS SORTED BY FUNCTION NAME BEGIN PRINT. In your print statement there is a fairly complicated set of IF-THENS and choices and stuff like that. It is not all that difficult and what comes out of it is what looks like MACRO. If you have ever read the DATATRIEVE-32 callable manual at the back there is an example of all the MACRO in there that one has to be a MACRO programmer to generate it. Since I do not know how to do that very well and can't reliably remember all the options, I wrote once a DATATRIEVE definition that did all the rules that they gave me and I simply program all of my DATATRIEVE functions by forms now.

Doug Wegsheid, Whirlpool Corporation

We use Datatrieve for system management a lot and one of the really nasty things about it is [the USAGE DATE] datatype. The other nasty thing is that many of the system accounting and disk utilization files have UIC's in them. [Since UIC's are stored as longwords], trying to print a UIC out [so that it looks like a UIC and not an integer] is not directly possible.

To solve these formatting problems, we added these two User Defined Functions to Datatrieve.

```
$DTR$FUN_DEF FN$FAO_1Q.LIB$SYS_FAO.4
  $DTR$FUN_OUT_ARG TYPE=FUN$K_STATUS
  $DTR$FUN_IN_ARG TYPE=FUN$K_DESC.
```

```

DTYPE=DSC$K_DTYPE_T.
ORDER=1
$DTR$FUN_IN_ARG TYPE=FUN$K_NULL
$DTR$FUN_IN_ARG TYPE=FUN$K_TEST.
OUTPUT=TRUE
$DTR$FUN_IN_ARG TYPE=FUN$K_REF.
DTYPE=DSC$K_DTYPE_QU.
ORDER=2
$DTR$FUN_END_DEF

$DTR$FUN_DEF FN$FAO 1L.LIB$SYS FAO.4
$DTR$FUN_OUT_ARG TYPE=FUN$K_STATUS
$DTR$FUN_IN_ARG TYPE=FUN$K_DESC.
DTYPE=DSC$K_DTYPE_T.
ORDER=1
$DTR$FUN_IN_ARG TYPE=FUN$K_NULL
$DTR$FUN_IN_ARG TYPE=FUN$K_TEST.
OUTPUT=TRUE
$DTR$FUN_IN_ARG TYPE=FUN$K_VALUE.
DTYPE=DSC$K_DTYPE_LU.
ORDER=2
$DTR$FUN_END_DEF

```

Usage examples:

```

DECLARE Z USAGE IS DATE.
DECLARE ZZ USAGE IS DATE.

```

and

```

Z = "NOW"
! wait a while
ZZ = "NOW"

IF Z EQ ZZ THEN PRINT "SAME DAY"

```

[Nothing happens, because the test for the equality fails because the dates are at different times on the same date.] But if you form the days with

```

IF FN$FAO_1Q("!11%D".Z) EQ
  FN$FAO_1Q("!11%D".ZZ) THEN
  PRINT "SAME DAY"

```

[the function fn\$fao_1q will truncate the date and time to DD-MMM-YYYY and the test will succeed for two dates which are on the same day.] You could also format it and compare the formatted strings

```

IF FORMAT Z USING DD-MMM-YYYY EQ
  FORMAT ZZ USING DD-MMM-YYYY THEN ... ]

```

We have a couple of applications where we like to put the dates in and we set the dates equal to "NOW". Of course, this puts the time in. And so what we did instead is

```

DECLARE Z USAGE IS DATE.
DECLARE ZZ USAGE IS DATE.

```

```

Z = "NOW"
ZZ = FN$FAO_1Q("!11%D".Z)

```

and ZZ has today's date . . . at midnight. At one of the sessions earlier in the day someone was complaining about wanting their times at midnight. That's how you get your times at midnight.

And you can get your VMS date and time cut off to however many characters you want. You just specify it. And if you say you only want five [characters], it'll give you the first five.

```

DECLARE Z USAGE IS DATE.
Z = "NOW"
PRINT FN$FAO_1Q("!%D".Z)
DD-MMM-YYYY HH:MM:SS.DD

```

or

```

PRINT FN$FAO_1Q("!%T".Z)
HH:MM:SS.DD

```

or

```

PRINT FN$FAO_1Q("!5%T".Z)
HH:MM

```

This is the one I really like because I don't know who UIC 65537 is. All this one does is — well you can format your UIC's in HEX —

```

DECLARE UIC USAGE IS LONG.
UIC = 65537
PRINT UIC
65537

```

or you can format the thing and it actually does come out [1.1]

```

PRINT FN$FAO_1L("XL".UIC)
00010001
PRINT FN$FAO_1L("!%I".UIC)
[1.1]

```

and if you change it to one that actually has a sign on connected with it. DATATRIEVE will give

```

UIC = 65540
PRINT FN$FAO_1L("!%I".UIC)
[SYSTEM]

```

. . . looks really nice on your disk utilization reports.

Subscribing Variables

Diana Washburn - Fall 1984

This is an example of using subscribing or indexing in DATATRIEVE. This is very handy when you need to get information for specific fields within a list, but have no value within the list to use in the RSE with the 'ANY' Boolean expression. For instance, 12 months of data but no actual month identifier (1 - 12 or JAN - DEC). It should only be used when the normal DATATRIEVE list processing features can not be used. They said it couldn't be done, but watch:

First I'll show you the domain and record that will be used in the example.

```
DEFINE DOMAIN MAGIC USING MAGIC_REC ON DEVICE:MAGIC.DAT;
DEFINE RECORD MAGIC_REC USING
01 MAGIC_REC.
    02 MAGIC_KEY PIC X(5).
    02 MAGIC_LIST OCCURS 4 TIMES.
    03 MAGIC_LIST_FIELD PIC 9(4) QUERY_NAME QTY.
```

The data that has been stored in the file looks like this:

```
DTR> PRINT MAGIC

MAGIC    MAGIC
MAGIC    LIST
KEY      FIELD
11111    0001
          0002
          0003
          0004
22222    0010
          0020
          0030
          0040
33333    0100
          0200
          0300
          0400
44444    1000
          2000
          3000
          4000
55555    1111
          2222
          3333
          4444
```

Here is a very simple example that will allow you to enter one subscript.

```
define procedure magic_subscribing
declare counter pic 99. ! the counter is used to identify the level
subscript pic 99.
magic shared
= *.'subscript' ! the subscript is prompted here but could
! be taken from another source (screen.record)
magic begin
counter = 1
for magic_list begin
if counter = subscript then print magic_list_field
```

```
counter = counter + 1
end
end
end_procedure
```

Here is what happens when you run the procedure:

```
DTR> :MAGIC-SUBSCRIBING
Enter Subscript : 1      Enter Subscript : 2

MAGIC    MAGIC
LIST     LIST
FIELD    FIELD

0001     0002
0010     0020
0100     0200
1000     2000

DTR> :MAGIC-SUBSCRIBING
Enter Subscript : 3      Enter Subscript : 4

MAGIC    MAGIC
LIST     LIST
FIELD    FIELD

0003     0004
0030     0040
0300     0400
3000     4000
```

Now let's add a range of subscripts. In this case the values from the specified list levels are accumulated and the total is printed for each record:

```
DEFINE PROCEDURE MAGIC_SUBSCRIBING
DECLARE COUNTER PIC 99.
DECLARE BEG_SUBSCRIPT PIC 99.
DECLARE END_SUBSCRIPT PIC 99.
DECLARE MAGIC_TOTAL PIC S9(9).
READY MAGIC SHARED
BEG_SUBSCRIPT = *.'Beginning Subscript or Index'
END_SUBSCRIPT = *.'Ending Subscript of Index'
FOR MAGIC BEGIN
MAGIC_TOTAL = 0
FOR MAGIC_LIST BEGIN
IF COUNTER BT BEG_SUBSCRIPT AND END_SUBSCRIPT
MAGIC_TOTAL = MAGIC_TOTAL + MAGIC_LIST_FIELD
COUNTER = COUNTER + 1
END
PRINT MAGIC_TOTAL
```

```
END
END_PROCEDURE
```

Running this procedure gives you:

```
DTR> :MAGIC-SUBSCRIPTING      DTR> :MAGIC-SUBSCRIPTING
Enter Beginning Subscript : 1   Enter Beginning Subscript : 2
Enter Ending Subscript : 2     Enter Ending Subscript : 4

MAGIC                          MAGIC
TOTAL                          TOTAL

000000003                      000000009
000000030                      000000090
000000300                      000000900
000003000                      000009000
```

If you have data in a list that is not identified in the record but is in a fixed pattern, you can use a table lookup to get at the data without having to remember the order of the data in the list. Here is the table used in the next example:

```
DEFINE TABLE MAGIC_CODE_TABLE USING
'AA':1
'BB':2
'CC':3
'DD':4
END_TABLE

DEFINE PROCEDURE MAGIC_SUBSCRIPTING
DECLARE COUNTER PIC 99.
DECLARE SUBSCRIPT_CODE PIC XX.
READY MAGIC SHARED
SUBSCRIPT_CODE = *.'Translation code for subscript'
FOR MAGIC BEGIN
  COUNTER = 1
  PRINT COL 2. MAGIC_KEY(-)
  FOR MAGIC_LIST BEGIN
    IF COUNTER = SUBSCRIPT_CODE VIA MAGIC_CODE_TABLE
      PRINT COL 10. MAGIC_LIST_FIELD(-)
      COUNTER = COUNTER + 1
  END
END
END_PROCEDURE
```

When you run the procedure you get:

```
DTR> :MAGIC_SUBSCRIPTING
Enter Translation code for subscript : CC

11111      0003
22222
```

```
0030
33333      0300
44444
55555      3000
3333
```

There are times when you may need to get the data in several of the levels of a list that are not contiguous. In this case you can use a Datatrieve function to pull the subscripts from a string:

```
DEFINE PROCEDURE MAGIC_SUBSCRIPTING
DECLARE COUNTER PIC 99.
DECLARE SUBSCRIPTS PIC X(5).
READY MAGIC SHARED
SUBSCRIPTS = *.'Subscript(s) separated by commas'
FOR MAGIC BEGIN
  COUNTER = 1
  PRINT COL 2. MAGIC_KEY(-)
  FOR MAGIC_LIST BEGIN
    IF COUNTER = FN$STR_EXTRACT(SUBSCRIPTS.1.1).
      FN$STR_EXTRACT(SUBSCRIPTS.3.1).
      FN$STR_EXTRACT(SUBSCRIPTS.5.1) then
      PRINT COL 10. MAGIC_LIST_FIELD(-)
      COUNTER = COUNTER + 1
  END
END
END_PROCEDURE
```

Here is what happens when this procedure is run:

```
DTR> :MAGIC-SUBSCRIPTING
Enter Subscript(s) separated by commas: 1,4

11111      0001
          0004
22222      0010
          0040
33333      0100
          0400
44444      1000
          4000
55555      1111
          4444
```


In the last example you would have to set up the subscripts variable to be able to handle the maximum number of subscripts allowed. Remember to add 1 character per subscript for the separator (comma). In the example I allowed for 3 subscripts since the occurs is 4 and I would assume that the normal DTR list processing would be used if all entries in the list were desired. This gets a little more complicated when the subscripts itself can be a variable number of digits. The easiest way to handle this is to establish a fixed number of places for the subscript and require that leading zeros be entered.

The concept of subscripting can be very helpful. I use this technique to build summary files and then report the data in the summarized file. I have not found a way yet to use this within the report command.

To give you an idea of how it applies to a real life application, let me tell you how I use it. I have a record with 27 month worth of data. The record does not indicate the year/month represented in each level. This information is in another domain in a control record. My users request data from one date to another (i.e., December '82 to December '83 or September '82 to January '84). I have to locate the proper levels by using the control file. I convert the year/month to a number (1 to 27) for beginning and ending dates. Then based on a long series of if statements I accumulate the data for the appropriate months.

Miscellaneous Magic

Magic, which does not fall into any of the other groupings, has been categorized under this heading.

Bob Lott - Spring 1984

This one I call "ACCESS CONTROL". There is a lot of work going on in DATATRIEVE version 3.0 in terms of the access control. I commented earlier on the slave - the auto login that we use in our shop and we have users running procedures that generate reports and in that particular case - we do not care, anybody can get a report. But those procedures that modify data, whether it be deletes, erases, or modifying specific fields in records - we don't want those users to have access to all procedures. On the other hand when you do edits of your procedures, as you all know, the access control is lost. So we defined a little dummy procedure, which I have shown at the top, called PROGRAM and, as you can see, it does nothing but we put lots of access control on it.

```
define procedure program
end_procedure

define procedure foo
:program (*)
ready yachts
for yachts with . . .
begin
. . .
end
end_procedure

DTR> :foo
Enter Password for PROGRAM
```

I've shown another procedure which I've named appropriately as FOO. The first thing I do in FOO is invoke Procedure PROGRAM requesting a password prompt. At this point, FOO does whatever. When FOO is executed, it says Enter PASSWORD for PROGRAM. We have chosen the name PROGRAM because of all these people out there who are not computer users - they just think that they have been requested to enter the password for the program they have started (FOO in this case.) That is how we handle the access control. ACL's are defined for a single procedure (PROGRAM) which is called whenever access control is needed.

Chris Wool, E. I. DuPont, Wilmington, DE

We had a little thing I was trying to work up the other day. I was trying to establish a report or a print - I've shown the example with a FIND here, but the problems with any records selection expression - when you want to a STARTING WITH and it is fine if you want to get the values that you are starting with once so you can put it at a prompt. So you say

```
FIND domain WITH field STARTING WITH *."prompt"
```

Well, what if you want to keep the value that they are asking for - the starting value. It might be a telephone directory and they can enter B or BR or what ever they want for the first starting characters and you want to be able to use that in the title or something? So I tried this

```
declare tmp pic x(20).
tmp = *."prompt"
find domain with field starting with tmp
```

I declared a variable of twenty characters, in this case, prompted for it, and then I said FIND DOMAIN WITH FIELDS STARTING WITH the variable. Well, that does not work because the blanks in the variable; it is looking for the full twenty characters no matter how many are in it. So I said "Well, lets try something crazy" and it turned out that it worked.

```
find domain with field starting with tmp||""
```

You use the double bar concatenation [because] it takes the trailing blanks off and it works fine. By the way, this works only on VAX DATATRIEVE: I tried it in DATATRIEVE-11 and complained about the null string.

Katherine Wrobel - Digital Equipment Corporation - Fall 1984

Resetting Running Count

Consider a domain EXAMPLE with a record which consists of employee's name and employee's department like:

```
01 EXAMPLE-REC.
03 NAME PIC X(10).
03 DEPARTMENT PIC X(10).
```

An effective reset of the RUNNING COUNT can be accomplished by:

Report A in EXAMPLE sorted by department
 Print NAME, DEPARTMENT,
 ((RUNNING COUNT) - (COUNT of EXAMPLE with
 DEPARTMENT < A.DEPARTMENT), RUNNING COUNT
 End-report

This would give a report which looks like:

Joe	Accounting	1	1
Mary	Accounting	2	2
Laura	Accounting	3	3
Kathleen	Accounting	4	4
Shirley	Engineering	1	5
Mario	Engineering	2	6
Frank	Engineering	3	7
Henry	Maintenance	1	8
Philip	Maintenance	2	9

Pat Scopelliti, Corning Glass

This is a way to get histogram data. We have people who often have a set of data, and they want to see how many 3's, 4's, 5's and such. If I say SUM 1 BY X and X is like 8, 12.2, 9, 14.7, 14.2, 11.1, 3.4, etc it doesn't work, because it tells me how many 14.2's, 3.4's, and such. A Simple thing to do [is to]

```
DECLARE T COMPUTED BY FN$FLOOR(X/0.5).
SUM 1 BY T
```

and that will give you a count of how many numbers between 0 to 0.5, 0.5 to 1.0, 1.0 to 1.5, etc. And they said, "Great, but we need something else." Typical users. Of course "users" is just "losers" misspelled — but anyway. [Laughter] Bob Lott: They buy your computers, be careful. [more laughter] Pat: I know, I know. Hey, the machine would run great if it wasn't for them. OK. [more laughter] Bob: Yeh, but it wouldn't do anything. [laughter and applause] Pat: OK, second attempt was, they really wanted the count of numbers in the ranges -0.25 to +0.25, 0.25 to 0.75, 0.75 to 1.25, etc. So the expression

```
DECLARE T COMPUTED BY FN$FLOOR((X + 0.25)/0.5).
```

works pretty well. It doesn't print out the actual number on the left [the ranges], but it does get the actual total which is what they were after. Of course then they said, as users will, "We don't want [these ranges, we want different ranges]." So I said fine and gave them [something like

```
DECLARE GAP USAGE IS REAL.
DECLARE INCR COMPUTED BY (GAP/2.0) * 0.999 .
DECLARE T COMPUTED BY FN$FLOOR((X + INCR)/GAP).
```

[Pat's actual expression for INCR involved FN\$EXP and FN\$LOG functions and contained a misprint which the editor count not properly resolve.] And the desired result would be given by

```
GAP = *, "HISTORGRAM SPACING"
SUM 1 BY T
```

Chris Hines - Spring 1985

If VAX-DATATRIEVE is invoked with the /DEBUG switch by

```
$ RUN/DEBUG SYS$SYSTEM:DTR32
```

then the internal optimization criteria are displayed as statements are processed. These are very useful for resolving performance issues.]

Richard Copeland - Spring 1985

Just a comment on something that was said earlier. If you

```
$ RUN/DEBUG SYS$SYSTEM:DTR32
```

you can find out what's being sent over the network for the distributed DATATRIEVE [commands]. The commands that are being sent to the remote node are displayed on the screen.

Dynamic Record Definitions - Spring 1986

Joe Gallagher - 4GL Solutions, Kansas City, Kansas

Larry Jasmann - U.S. Coast Guard, Burke, VA

Donald Stern - Warner Lambert Company, Milford, CT

"What this magic involves is trying to deal with records of different structure and what we wanted to be able to do is to change the record layout 'on the fly' depending upon what certain fields are." "The following record has the following properties.

"The data is stored in GROUP0 but you can't see it if you attempt to print it out because it is hidden (by virtue of the FILLER). There are a couple of REDEFINES clauses which specify that the data is stored either one way 4 and 6 or another 5 and 5. The real interesting part, however, is at the end. There are a couple of fields, FOOEY and FOOBAR, which are computed by 'CHOICE OF'. FOOEY and FOOBAR change their values and linkages on the fly."

```
DEFINE RECORD FOO_REC USING
01 FOO_REC.
02 REC_TYPE PIC X.
02 GROUP0.
03 FILLER PIC X(10).
02 GROUP1 REDEFINES GROUP0.
03 REC1FLD_1 PIC X(4).
03 REC1FLD_2 PIC X(6).
02 GROUP2 REDEFINES GROUP0.
03 REC2FLD_1 PIC X(5).
03 REC2FLD_2 PIC X(5).
02 FOOEY COMPUTED BY CHOICE OF
REC_TYPE = 1 THEN REC1FLD_1
ELSE REC2FLD_1
```

```

END_CHOICE.
02 FOO_BAR COMPUTED BY CHOICE OF
  REC_TYPE = 1 THEN REC1FLD_2
  ELSE REC2FLD_2
END_CHOICE.

```

These fields can be made indexed keys because RMS does allow overlapping keys. If you search on FOOEY or FOO_BAR, however, the search is sequential. If you search on REC1FLD_1 or REC2FLD_1 an indexed search is performed.

```

DTR> SHOW FIELDS
FOO
  FOO_REC
  REC_TYPE      <Character string>
  GROUP0
  GROUP1
  REC1FLD_1 <Character string, indexed key>
  REC1FLD_2 <Character string>
  GROUP2
  REC2FLD_1 <Character string, indexed key>
  REC2FLD_2 <Character string>
  FOOEY        <Computed value>
  FOO_BAR      <Computed value>

```

"To illustrate this 'sleight of hand', we put some data together. There are two record types, REC_TYPE=1 and REC_TYPE=2. In one case the data are defined as 4 and 6 and in the other as 5 and 5." FOOEY and FOO_BAR change dynamically depending upon REC_TYPE.

If you explicitly print out all the fields, you can see all the values. If, however, you specify only the record then only the dynamically changing fields are printed.

```
DTR> PRINT REC_TYPE.GROUP1.GROUP2.FOOEY.FOO_BAR OF FOO
```

REC TYPE	REC1FLD 1	REC1FLD 2	REC2FLD 1	REC2FLD 2	FOOEY	FOO BAR
2	AAAA	BBBBBB	AAAAA	BBBBB	AAAAA	BBBBB
1	ABCD	EFGHIJ	ABCDE	FGHIJ	ABCD	EFGHIJ

```

DTR> PRINT FOO
REC      FOO
TYPE    FOOEY BAR
2       AAAAA BBBBB
1       ABCD  EFGHIJ

```

Basil Harris - Fall 1984

Problem: How do I get a plot output file to a system device?

Solution:

```

DTR> PLOT WOMBAT ON WOMBAT.DAT ! or your favorite plot
DTR> EXIT
$! Use DECslide to
$ SLIDE/NOINTERACT/SIX=WOMBAT.DAT
$! This create a file WOMBAT.SLS that can be sent to a sixel printer

```

How to Get a New Job

Bert Rosebury - Spring 1985

Basically what I am doing here is I send mail to my boss a lot of times. I kind of let out my frustrations via the MAIL utility. A lot of times I get the feeling that my boss isn't reading my mail. So what we have here is, I set up a record definition and a domain definition

Define domain mail using mail-rec on SYS\$SYSTEM:VMSMAIL.DAT:

```

DEFINE RECORD MAIL-REC USING
01 MAIL-RECORD.
  03 ACCT      PIC X(31).
  03 FILLER    PIC X(2).
  03 UNREAD    USAGE IS LONG.
  03 FILLER    PIC X(100).

```

using the VMSMAIL.DAT [file], I'm getting out of it two pieces of information: the account name and the number of unread messages that are out there. So what I do is

```

READ MAIL SHARED MODIFY
FOR MAIL WITH ACCT = "BOSS"
MODIFY USING UNREAD = 1000

```

What this is going to do, when he comes in on Monday morning, is to say that you have 1000 new unread mail messages. So the title of this is how to get the attention of your boss.

Bert Roseberry, U.S.C.G. - Fall 1985 - Boss for a Day

"For those of you who remember me from the last time I was at Magic in New Orleans, what I did was show you how to make it so that, when your boss logged into his account, it would say 'You have 1000 new mail messages.' This time I'm going to show you how to be 'Boss for a Day.' Basically, what you start out with is a record


```

        END
!
! If the password is set to 0 then it will not prompt
! for a password after the username is entered
!
        MODIFY USING PWD = 0
        END
    END
!
! Looping information so another can be entered
!
    PRINT " Add another account ? "
    YESORNO = *."yes or no "
!
END
END-PROCEDURE

```

"The interesting part is that, when you're through, you get back out and login to your own account and run a procedure called RESTOREPASSWORD. What that does is take the information you stored in the temporary file... and it puts it back."

```

DEFINE PROCEDURE RESTOREPASSWORD
!
! Created: 05 DEC 1985      Author: Bert Roseberry
!                               8th Coast Guard (dt)
! Modified: 06 DEC 1985      500 Camp Street
! Added documentation      New Orleans, LA
!                               70130
!
!
READY UAFV4 SHARED MODIFY
READY PARTUAF
!
! Change back everyone in the temporary file
!
FOR PARTUAF
BEGIN
!
! If for some reason it cannot find a particular
! username let them know
!
    IF COUNT OF UAFV4 WITH USERNAME =
        PARTUSERNAME EQ 0 THEN
    BEGIN
        PRINT " "
        PRINT "There is no account" |||
        PARTUSERNAME
        PRINT " "
    END ELSE
    BEGIN
!

```

```

! Modify the SYSUAF file with information stored
! in the temporary file by procedure SAVEPASSWORD
!
        FOR UAFV4 WITH USERNAME =
            PARTUSERNAME MODIFY USING
        BEGIN
            PWD = PARTPWD
            LAST_ILOGIN = PARTLAST_ILOGIN
            LAST_NLOGIN = PARTLAST_NLOGIN
        END
    END
END
END-PROCEDURE

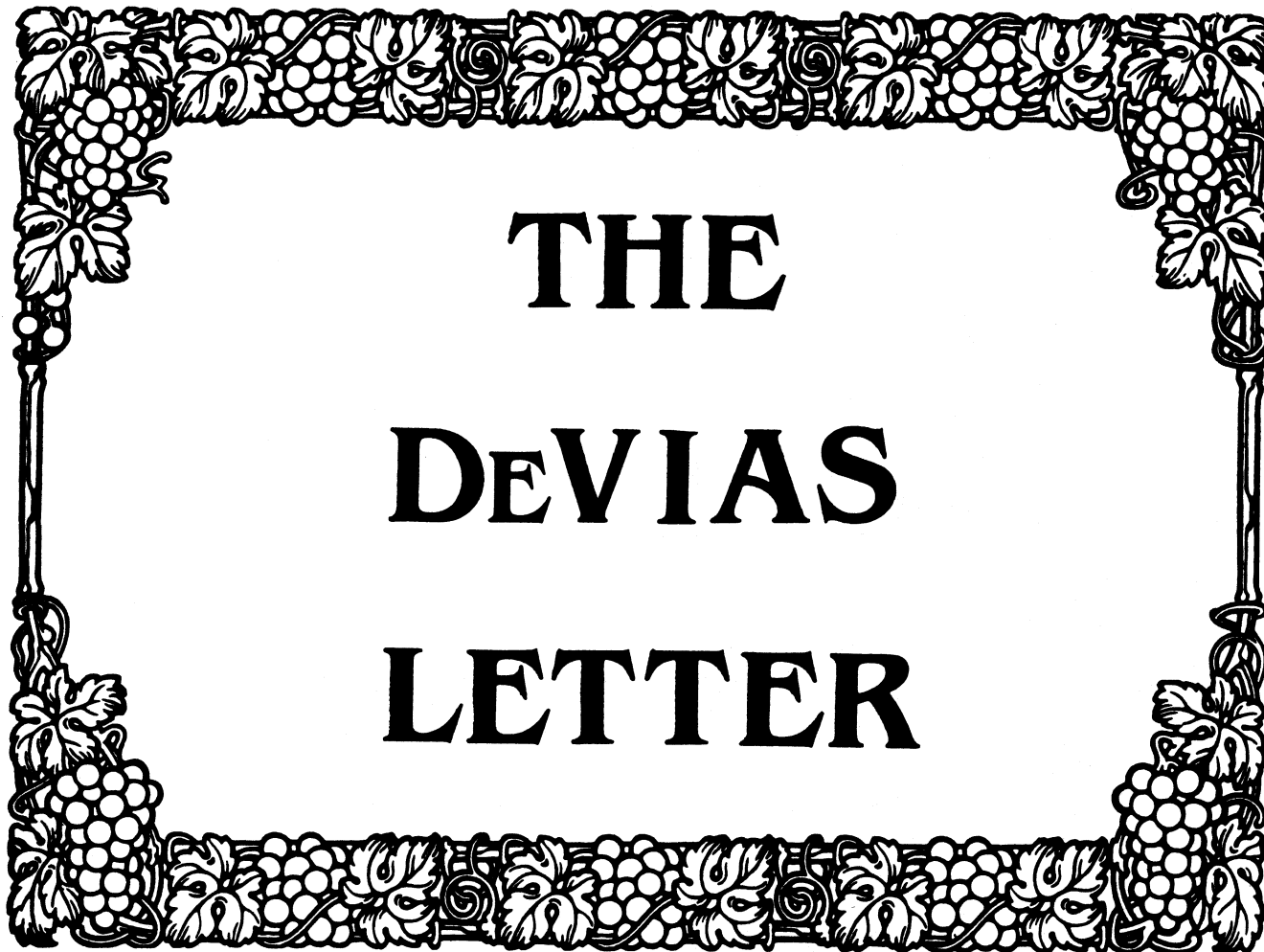
```

Coming Attractions

Coming soon in the newsletter will include the following articles

Rdb and Datatrieve
 Programming User Defined Functions
 Coping with Office Automation Products
 Ask the Wombat Wizard
 Application Design Using 4GL's
 DTR/4GL Product Update

and much more!



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CONTRIBUTION GUIDELINES

Contributions for the newsletter should be sent to:

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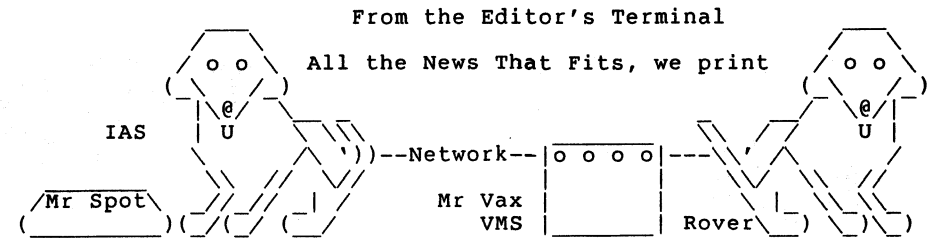
Contributions of letters, articles, important SPR's etc will be accepted in any form, (including notes jotted in pencil on gravy-stained tablecloths.) Contributions will be much more graciously accepted in one of the following formats:

1. Non machine readable sources, (SPR's etc,) should be reasonably dark to insure good photocopying. Text whatever should be the equivalent of 66 lines at 6 lpi, with 4-line top margin, 5-line bottom margin, left-margin 10, right margin 74 at 10cpi. If using a DEC LN03 for output, use left-margin 8. right margin 72.
2. Machine readable sources may be submitted on 9-track Mag-tape, (800,1600, or 6250 BPI,) DEC-tape II, DecMate floppies, or whatever. We're not fussy, we'll even accept paper tape or cards. Preferred format is DOS or BRU for tapes, Files-11 for DEC-tape II.
3. 1200 baud dial-up modems are available on our IAS system and our VAX, with various servers available. Give the editor a call at (312)-791-2515 (preferably later in the day,) to obtain access information, etc.
4. If long distance dialout is not possible on your system, we'll be willing to call your system and do the work, (unless you want to transfer the entire manual set at 300 baud.)

Any media sent to us will be promptly returned.

ASK THE DEVIAS WIZARD

If you have a problem you would like to submit to the Devias wizzard, write a letter or fill out a copy of a standard SPR and send it to the Editor at the above address. Answers to problems from members (or anyone) should also be sent to the Editor.



And yet another deadline is fast approaching... The Chicago weather is totally balmy compared to a brother editor's weather in Minnesota. Haven't even had measurable white stuff this year, and no deep freeze. If the wife and I don't get a storm for our anniversary, it won't be TRADITION. Santa arrived in shirt-sleeves this year. Had a tattoo on his arm. He left me a set of tapes from the Fall Symposium. As he left he said "Yes Frank, there is an IAS update coming with RMS version 2."

In this issue Rebecca Marks of DEC has provided us with a nice article on the recently released Update C. Although the major thrust is added device support, there are some nice additions, such as XON/XOFF generated by the TT handler for file transfer over ascii lines, an INC switch of /CMD = "... " which installs the task, passes it a command line, and removes it on exit, and wonder of wonders, an install switch to install a task with maximum task size, rather than doing the old binary search routine from the terminal. Thanks, Rebecca.

Also Wayne A. Blair of the DEC development group has provided us with a nice article on IAS System Tuning. Articles like this are extremely helpful to new managers, but even us old timers can learn a thing or two. One of the problems of having a smaller SIG whose members are often isolated is that Folklore such as this is not handed down from "Father to Son" well. Wayne, your article is greatly appreciated.

Late note from listening to the symposia tapes. The update of DECnet for IAS 3.2 has finally hit the distribution center. By now your local DEC salesman should have the updated information.

How about some of you other readers. You too can see your name in lights, (if you submit an article and shine a flashlight through the pages.)

Spring is only 7171200. clock ticks away.

Ten Years Ago Today

IAS V3.2 UPDATE C

NEW HARDWARE SUPPORT AND SOFTWARE CHANGES

Rebecca Marks

DEC Mature Products Software Engineering

The February 1977 Multi-Tasker reported that:

1. A user requested that DEC alter the operation of the RUN command, essentially so that run would not recall MCR until the task that was RUN completed execution.
2. A user noted that since version 6B of RSX11D, RSX11D and IAS included a FCS function .TRUNC to allow truncation of files to their present used length upon close. None of the DEC utilities, (EDI, FLX, MAC, FOR) however, took advantage of this function.
3. Ray French supplied the source for his famous program to recover the contents of a file left locked by a task that aborted with write access to the file.
4. A report on the fall DECUS symposium in Las Vegas included two resolutions by the SIG:
 1. The SIG requested that Digital place the old FTN (MOP, Midnight Optimized Polish) Fortran compiler and OTS sources in the DECUS program library, since DEC no longer distributed FTN with RSX11D, but many users still relied on lots of FTN code. (Oh the joys of supporting multiple versions of Fortran. We finally stopped installing FTN with version 3.1 of IAS, but still support FOR, F4P, F77, along with two versions of RATFOR.)
 2. The SIG requested that the highly successful RSX-11D hotline be expanded to include calls for IAS, RSX11M and RSX11S. "Such hot line to remain permanent until other alternatives exist for obtaining quick response to questions and problems."
5. There was also a report on the I/D Space Working Group session held at the fall DECUS. Much discussion centered around possibilities for developing (at least) USER MODE I/D space. Possibilities talked over included:
 1. Convincing DEC to develop it, (considered unlikely since it would not run on all PDP11's.)
 2. Form a group of users to pool their money and pay DEC to develop it. (Considered unlikely since it would be very difficult to equitably distribute the cost.)
 3. Form a SIG working group to develop it. (Considered very hard to co-ordinate considering geographic separation of members, problems in how to develop programming standards.)

Introduction

Because Version 3.2 Update C is shipping soon, you should be aware of the major hardware and software changes it will bring with it.

IAS V3.2 Update C is a cumulative product, incorporating all the changes from Update A and Update B. For the purposes of Update C, IAS kits have been re-mastered. Because of re-mastering, Update C includes bug fixes for all updates up to the present.

Also, re-mastering provides customers with a more compact IAS software package. When installing re-mastered Update C kits, customers will use the same procedure as if Update C were a new release rather than an update.

New Hardware Support

o Added support for DHU-11 in the terminal handler

DHU-11 is an asynchronous multiplexer that provides sixteen full-duplex, asynchronous, serial data channels on UNIBUS systems. (DHU-11 replaces the DH-11 and DM-11B multiplexer/modem control device pair.)

The following symbols have been added to the terminal handler:

D\$\$U11 (set to 1 to enable DHU-11 support)
D\$\$ODE (set to 1 to enable DHU-11 dial-up support)

o Tape MSCP (TU81/TK50) support

Support for the TU81/TK50 magtape drives is now available in IAS V3.2 Update C. The TU81 magnetic tape drives and the TK50 magnetic tape cartridge both use the Tape Mass Storage Control Protocol (TMSCP).

The TU81 is a a nine-track tape drive that uses both streaming tape and traditional start/stop technology. The controller automatically selects the speed to optimize the drive's performance for a particular application.

The TK50 is a cartridge tape subsystem for Q-bus and UNIBUS PDP-11 systems. The TK50 has a 95 Kbyte capacity. It fits into the same size slot as a minifloppy drive (for example, an RX50) in a MicroPDP-11 system box, or it can be mounted in small tabletop or rackmountable enclosures designed for 5.25-inch form factor storage devices.

The device mnemonic for the TMSCP devices is MU. Each controller will handle one MU-type unit. The following commands will incorporate TMSCP support on IAS:

```
MCR>INS LB:[11,1]TMSCP
MCR>LOA MU
```

Software Changes

o Added support for host synchronization (XON/XOFF)

Host synchronization allows a user to transfer large files from one computer to another, using terminals with XON/XOFF capabilities.

The following symbol has been added to the terminal handler:

```
H$$SYN (set to 1 to enable host synchronization support)
```

Use the MCR TER utility or the PDS SET TERM command to activate host synchronization for a specific terminal. For example:

```
MCR>TERM [terminal-list]/HOSTSYNC
```

or

```
PDS>SET TERM[:(terminal-list)] HOSTSYNC
```

where the square brackets [] indicate optional parameters and terminal-list is one or more terminals separated by commas in the form of device mnemonic and unit number (ttnn:).

o Enhancements to the INSTALL utility (INS)

Update C adds the following functionality to INS:

```
/CMD=" " This passes a command line to the task being
installed. After installation, the task
runs with the command line (in quotes).
When the installed task exist, the task is
removed.
```

```
/INC=* This automatically installs a task with the
maximum possible task increment size minus 32.
words.
```

o Added functionality in DEV.MAC

Update C adds enhancements to the DEVICE program that allow the user more control over the type of individual device information displayed.

Qualifiers have been added to make it easier to display devices that match specific or optional device criteria.

If the user types DEVIce with no parameters, a short line of information about all devices present on the system will display.

The following commands bring up terminal characteristics, where "ddnnn" is the device mnemonic and unit number:

```
MCR>DEVICE ddnnn/FULL
MCR>DEVICE ddnnn/CHAR
```

o ASN features

The ASN task performs logical device assignment creation/deletion/reassignment.

For the purposes of Update C, it is not possible to create a pseudo-device that changes the meaning of 'DV0:' since this is the name of the IAS pseudo-device that contains the overlays for the associated task. "Standard" pseudo-devices, however, such as SY:, LB:, CL:, and CD0:, can be reassigned.

o IND features

IND is the IAS indirect file processor. It includes the functionality it had prior to Update C, and has been enhanced with the following commands:

.ENABLE option	Such as: string substitution, all lines data, time, assume decimal input for numbers, allow operator responses to be terminated by escape, keep lowercase, interpret symbols as global, list commands on the TI:, enable label LRU table, cause statistics to be collected and output
.DISABLE option	Disables option enabled by .ENABLE option

KNOWN HARDWARE PROBLEMS

Power failure recovery on a PDP-11/44 without floating point option

There is a critical problem with the hardware trap mechanism in the PDP-11/44 processor. If a PDP-11/44 with no FPP hardware and a battery backup unit encounter a depletion of electrical energy (power drops below 90 volts), a trap to location 24 occurs.

At this point, a new PC and PSW are used to perform power down recovery procedures. While saving the contents of the hardware stack limit register with a "MOV" instruction, the CPU performs a trap to location 10. Such a trap indicates an attempt to execute a reserved instruction.

Once power is restored, the power up procedure is triggered. While trying to restore the contents of the hardware stack limit register with a "MOV" instruction, a trap to location 4 is taken.

This is the correct path. The PDP-11/44 does not have a stack limit register at physical address 777774, and thus a nonexistent memory error will cause a trap to 4.

Therefore, the incorrect behavior during the processor power down will impede the IAS operating system from recovering successfully during the power up procedures. This will result in unpredictable software interaction with the hardware.

In the PDP-11/84, the line time clock gains time

There is currently no short-term solution to this problem. The workaround is to change the source of the clock to be used by the hardware. To do this, the user must invoke the 11/84 console Setup Mode Command and change the current status of the Clock Select parameter by selecting values 1 (50 Hz) or 2 (60 Hz), depending on country.

Error in the FORTRAN-77 installation notes

When installing FORTRAN-77 from magnetic tape distribution, the user must substitute any reference to UIC [200,200] to [*,*].

This will ensure that all necessary files are copied correctly to the target disk.

LIMITATIONS AND RESTRICTIONS OF UPDATE C

IAS Sort utility

Sort V3.0 utility is not available for this release.

ACP

IAS supports the overlaid ACP (BIGFCP) or the memory resident ACP (RESFCP) rather than the small overlaid ACP (FCP).

PREserve

This unsupported utility has been removed from the IAS V3.2 Update C kit.

Backup and Restore utilities

These utilities sometimes fail on the verify pass of a multi-tape backup.

IAS System Tuning

FORWARD

Attached are the slides from my 1986 IAS System Tuning Fall DECUS Presentation.

These slides focus upon system tuning consideration that minimize the use of IAS variable length node pool. System performance and utilization of memory resources were subservient to pool conservation. Each pool conservation suggestion must be evaluated in light of the possible performance impact.

Due to the reduced cost, space, and cooling requirements of more recent hardware, particularly memory, this presentation assumes that physical memory is not a major limiting factor.

This presentation evolved from a live situation where a site was using IAS on a PDP-11/70 in a Timesharing environment with DBMS-11 and DECnet-IAS. The site was reasonably well tuned for their use prior to the installation of DECnet-IAS (SENPAR, FCPCOM, multiple ACP's) however, the load placed upon node pool with concurrent use of DBMS-11 and DECnet-IAS rendered the system unusable. The guidelines presented here were followed and a significant amount of node pool was made available. At the end of the presentation, before and after node pool statistics are shown.

I. Presentation is based upon the IAS PERFORMANCE AND TUNING GUIDE

A. Gives Information on:

- . System Generation Features
- . Use of Memory
- . Use of Disks
- . File System
- . IAS Scheduler

II. Focus of Presentation - Reduction in Use of System Communication Area Nodes

A. Configuration Assumptions:

- . Multi-user Terminal Handler
- . Timesharing System
- . Multiple Disks
- . DECnet

B. Areas of Interest

- . System Generation
- . File system
- . Partitions
- . Network Parameters

III. SYSGEN OPTIONS

A. SCOM - System Communication Area

- . Fixed Area, Established during SYSGEN
- . Contains Two Regions
 - . System Data and Subroutines
 - . System Data Structures (some structures are fixed length)
- . Structures to Consider:
 - . STD - System Task Directory
 - . PUD - Physical Unit Directory
 - . TPD - Task Partition Directory
 - . Variable Length Node Pool
- . SCOM Directive
 - . Allocates Space for SCOM
 - . Set to Maximum Size of 12K

B. Structure Details

- . Variable - Length Node Pool
 - . Several Names (for the same thing)
 - . Variable - Length Node Pool
 - . Node Pool
 - . SCOM Pool
 - . Pool
 - . Dynamic Storage Region

- . Used by Executive, Device Handlers, Utilities and Intertask Communication
- . 8 Words Per Node
- . Resides within SCOM
- . Size of pool is the space remaining after other elements have been established.
- . Set SCOM to 12K
- . Minimize the size of the STD, PUD, TPD, and the number of installed tasks. This creates more pool space.

- . Reduce the load upon pool use:

- . FCPcom extended
- . ACP Private data pool
- . Multiple ACP's when appropriate
- . SENPAR for intertask communication

- . STD - System Task Directory

- . Fixed Length Table of Entry Points for the maximum number of installed tasks
- . 16 Word Entry for each task that is installed
- . Allocated from Node Pool
- . Deallocated when removed

- . SCOM Directive

- . Maximum Number of Entries is specified in the SCOM Directive
- . Keep Maximum Small
 - . Uses Less Space in SCOM
 - . Limits Installed Tasks
 - . Can be Increased Later
 - . Edit [11,17] SYSBLD.COM and Remove unneeded tasks
 - . The Following Tasks Should Not Be Removed

TKTN	OPR
MCR	PDS
MFT	QUE
MCRERR	REA
BA	RED
BOO	REM
BBR	RUN
CON	SAV
DEV	SET
DU	SPR
DB	SPR2
DL	SWA

ERRLOG	SYS
F11MSG	TCP
HEL	IAS
BYE	IASTART
PWD	SDM
HELP	TER
INDIAS	TIM
INIT	TKB
LOA	TU16
LP	TS11
LUN	MTAACP
MACIAS	UFD
MO	UNL
MSM	UTL
NL	

- . TPD - Task Partition Directive

- . Fixed Length Structure describing each partition in the system

- . PAR Directive

- . Specifies Task Partitions
- . 10 Words for each PAR Directive

- . Three types of Partitions Available

- . User Controlled

- . Can contain only one task, shareable global area, or dynamic region at a time
- . User has complete control over activity within partition
- . Intended for Real Time tasks of long duration

- . System Controlled

- . Can Contain one or more concurrent tasks
- . System determines location of task
- . Executive does not shuffle tasks so memory fragmentation can occur

- . Time Sharing

- . Can contain one or more concurrent tasks
- . System determines location of tasks
- . Tasks can be shuffled
- . Tasks under control of the IAS Scheduler will only execute in a timesharing partition
- . Real time tasks can execute in any partition

- . PUD - Physical Unit Directory
 - . Fixed length Structure describing each device within the System
 - . DEV Directive
 - . Specifies each physical unit
 - . 26 Words per device
 - . PUD is also required for pseudodevices
 - . Limit Devices and Pseudodevices

IV. FILE SYSTEM

File System Data Structures can use SCOM Nodes - Four Structures to Consider

- . VCB - Volume Control Block, 23 words per mounted volume
- . FCB - File Control Block 22 words for each open file Describes files
- . File Window block - 16 words for each file that each task opens. Describes each task's access to open files
- . RMS - Locked Block List - for each open file with shared Access. Variable size
- . Two additional Areas exist to contain these structures
 - . ACP's Private Data Space - will be used for FCB's before FCPCOM. ACP space will only be used for FCB's
 - . Use Multiple ACP's
 - . Provide more space for FCB's
 - . Allows overlapped seeks on applicable disks - performance improvement
 - . FCPCOM - will be utilized for FCB's and and Window Blocks before SCOM. VCB's and Lock Block Lists will always be allocated from SCOM
- . How to increase FCPCOM and ACP's Three Fold process in this order
 - . Increase and Retask Build FCPCOM
 - . Edit [11,16]FCPCOMBLD.COM change EXTSTCT=FCPCOM:___
 - . REBUILD VIA TKB@[11,16]FCPCOMBLD
 - . Increase and Retask Build each ACP

- . Edit the appropriate Build File
 - Increase \$\$AFRI to its Maximum
 - . RESFCP can only be increased to 5,600, not 10,000 as documented.

- . Perform a new SYSGEN

V. PARTITIONS

- . Use of partitions should be limited. Timesharing systems can have user and system controlled partitions, but only Timesharing partitions can be used for tasks controlled by the IAS Scheduler.
- . SENPAR - used for intertask communications

VI. DECnet

- . DECNET uses several types of buffers and several different types of tasks.
- . Characteristics of other Nodes in your network can load Node Pool
- . NETGEN Selections Impact
 - . DECNET's Private pool
 - . Location of Private Pool
 - . Dynamic Control Block Buffer Allocation
 - . Large Data Buffer Preallocation
 - . Size of LDB (executor buffer)
 - . Routing or End Node
 - . Establish SENPAR during SYSGEN
 - . NETGEN Considerations
 - . Nonrouting vs Routing Node
 - . Routing Node requires more overhead
 - . Dynamic CCB Allocation
 - . Number of Preallocated CCB's
 - . Number of LDB's
 - . Used for Data Transfers
 - . Allocated From Pool Space
 - . Too Many Can Drain Pool
 - . Too Few Can Create Bottleneck in System and Network
- . Large Data Buffer Size

- . Value is Critical
- . Must be consistent with all Nodes
- . Sometimes called "Executor Buffer Size"
- . Extremely large Size Stresses Network Pool and may spill over into SCOM
- . Size Should be one disk Block plus some overhead
- . Number of LDB's for Receives
 - . Always need LDB's Avoid unnecessary Dynamic allocation Overhead
- . Load the Network Top Down
- . Network Pool Size Will Be Determined by NETGEN
- . After NETGEN edit[11,67]NETINS.COM and Remove infrequently used tasks
 - . The following tasks may be removed:
 - LIN
 - LOO
 - LSN
 - MIR
 - NFT
 - NTD
 - NTDEMO
 - TLK
 - ICM
 - CFE
 - RMT
 - HT

VII. TOOLS

- . VTDEMO
 - . 'Video Display' - Requires a VT52 or equivalent terminal
- . Pool
 - . For "Hardcopy" Terminals
 - . Install [11,1]POOL/TASK=...POL
 - . Invoke with ESC
- . Network Pool Dump

VIII. EXAMPLES OF NODE POOL GAINS

- . Major Changes Implemented
 - . STD Reduced From 160 to 120
 - . Removed Unnecessary Devices
 - . Removed Unnecessary Tasks
 - . Maximized ACP Data Space
 - . Multiple ACP's and FCPCOM were already being used
- . New NETGEN performed according to above guidelines
- . Resulting Pool Statistics
 - . Before Tuning - 95 Nodes/79 largest hole
 - . After System Tuning- 231 Nodes/209 largest hole (gain of 136/130)
 - . After Network Tuning - 322 Nodes/305 largest hole (gain of 91/96)
 - . Total Node Gain - 227/226

Leverage

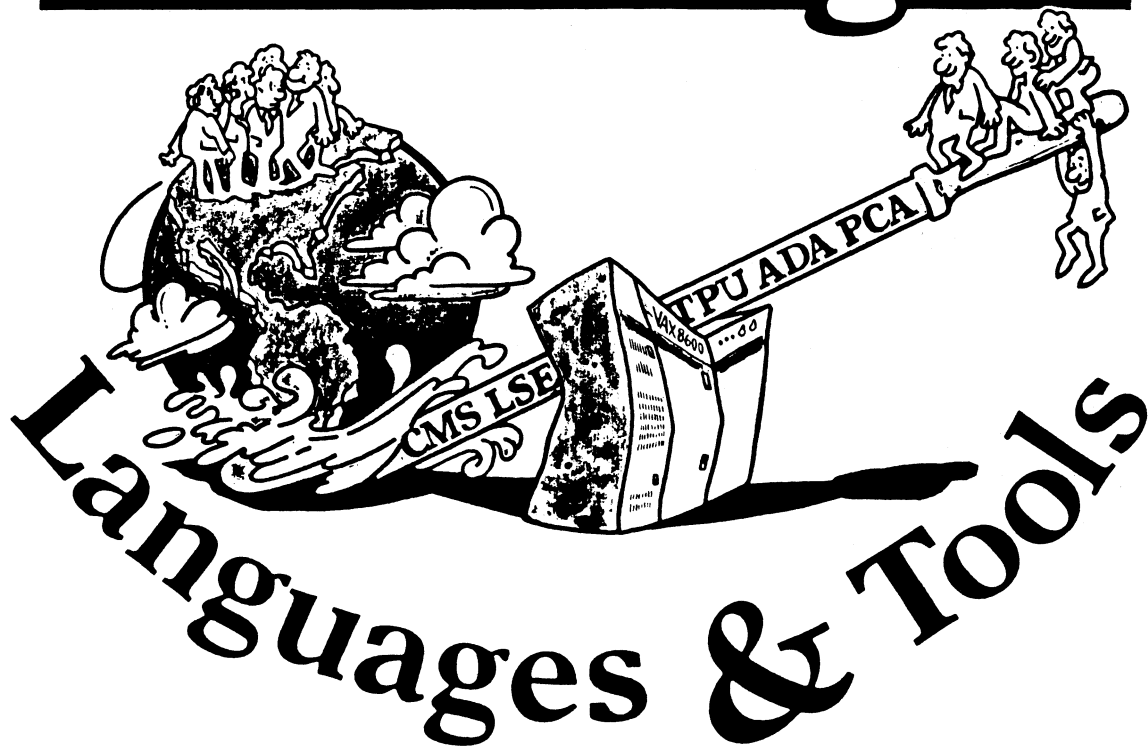


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EDITOR'S NOTES

To give you an idea of my lead time, I am writing this on my last day at work prior to the Christmas holidays. Since I'll be home in the bosom of my family for a couple of weeks, I thought I'd better get caught up to date with *Leverage*. Let me take this opportunity to wish you all a happy, healthy, peaceful and prosperous new year. Join with me in a resolution to make this a good year for DECUS also, and contribute in some way making the society better.

This issue of *Leverage* contains three submissions, which I believe will prove very interesting. First is an extremely well done trip report from the San Francisco Symposium. Wayne Sewell responded to our pleas for copies of trip reports, and his is so well put together I decided to publish it *verbatim*. If you didn't make it to San Francisco, this can give you an idea of what you missed. Maybe we can all you this when we next try to justify our attendance at symposia.

One of the most popular sessions in San Francisco was a panel discussion on philosophies for text formatters. Over the next few months, we plan on publishing various portions of this discussion. Sam Whidden, the L & T chair, gives more details in his introduction to this material. I hope this is as thought provoking for you as for me. I found it the most enjoyable portion of the symposium.

Finally, I have a short submission from Jeff Kennedy of Gould, entitled *Unravelling the Results of VAXTPU's read_key*. We are constantly appealing for user hints or help in dealing with the various tools we have available. Thanks to Jeff for his response, and his useful suggestions.

As usual, I'm going to end with a plea for submissions, letters, suggestions, animadversions, or anything else you wish to send. My address is always in the newsletter, so start the new year off by helping to make the SIG a better tool for all of us.

Trip Report for DECUS Fall Symposium, San Francisco

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October 21, 1986

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1 Introduction

During the week of 5–10 October, I attended the Digital Equipment Computer User's Society (DECUS) Fall Symposium, which was held at Moskone Center in San Francisco. There was a record attendance at this Symposium; more people *pre-registered* than had ever *attended* before. The total attendance was somewhere around 7000. Unfortunately, Moskone Center was a smaller facility than usual, and many session rooms were completely full. The Fire Marshall was adamant about not letting people stand in the back of the room—anyone who didn't have a seat had to leave. A lot of people missed out on sessions that they really wanted to attend and were extremely upset. A record number of sessions were repeated during the symposium so that these people could get another chance. Of course, the number of rooms available for repeat sessions was limited, so not all overflow sessions could be rescheduled.

This trip report is written from the viewpoint of one person, with all of the biases and personal interests that implies. Most of the sessions I actually attended were sponsored by the Languages and Tools SIG, the rest falling primarily under the VAX SIG. Some of them may be repeats from previous Symposia, but it was the first time I had heard them, so here they are. Since the bulk of the report covers Languages and Tools subjects, it was submitted to that SIG's newsletter.

2 The Source Code Analyzer

The SCA is a new product announced by DEC at the Symposium, although it won't be available for a while yet (it is just now starting field test). It is used for interactive analysis of program source files and is especially useful in the case of an executable which is built of many different modules in different source files in different languages.

One of the major functions of the SCA is cross-referencing symbols used within a program. With one command, the user can display all occurrences of a variable in the entire image. Each instance is displayed on a line by itself and contains the module in which the variable appears, the line number, and whether it is a read or write reference (such as an assignment to

the variable). Procedures and functions can be displayed the same way, with indication of whether the instance is a definition or a call. Wild cards are accepted in symbol names, allowing a search for multiple symbols simultaneously. Additionally, for procedures and functions with parameters, the SCA will verify that the formal parameters on the procedure definition match the actual parameters on the call. This cross-check is inherent in strongly-typed languages like Pascal (except for **EXTERNAL** procedures in another language), but not in most other languages. For most languages, errors of this type are not found until run-time, and are often hard to diagnose even then.

The SCA can also display include file and environment dependencies.

The Language Sensitive Editor (LSE) has been modified (Version 2) to work with the SCA. When the SCA function to show cross-references is used from within the LSE, the list of references appears in a window. When a particular reference is selected with the cursor, the source file containing that reference is automatically pulled in by the LSE and displayed in another window with the cursor sitting on the variable being referenced. The window comes up in a read-only state, but the user can make it writable with a **SET MODIFY** command. If the code displayed is not the desired reference, the user can move back to the other window, where the list of references is still displayed, and select another reference. The new reference, which may be in another source file, will also be retrieved and displayed.

In addition to the LSE changes, several of the compilers (including Pascal) have been modified to generate the binary files which contain the information SCA uses to do its job.

3 The VAXMate

There was a lot about the VAXMate, the new DEC clone of the IBM AT, most of it coming from the PC SIG. For the most part, the VAXMate appears to be just another clone, the main difference being its easy connectivity to the VAX, as you would expect. There appear to be several ways to attach it, including DECNET-DOS, the MS-DOS version of DECNET.

4 New License Agreement

Digital's new licensing agreement for the VAX probably caused the most interest, if interest is the proper word. Anguish was probably a better description of what many people were experiencing, especially those from smaller companies. Basically, a person selling a VAX can no longer transfer the software license with the hardware. The buyer has to re-license the software from DEC.

The following is quoted more-or-less verbatim from *Update.Daily*, the Symposium's on-site newspaper:

On Monday¹ Digital announced a change in its software license transfer procedure that will take effect January 1, 1987. This change is intended to ensure more compliance with Digital's software product license terms.

Digital's authorized resellers, such as OEMs, are not affected by this change in procedure. They will continue to have the right to sub-license software.

On a case-by-case basis, Digital has accepted requests from its licensees for license transfers as an exception to the nontransferability terms of Digital's Software Product License. These case-by-case requests have been processed according to Digital's license transfer procedures. According to Digital, this procedure was originally designed to encourage compliance with their license terms and assist Digital in maintaining accurate records of licensed software products. Digital states that over time they have learned that there is abuse of this procedure and continued lack of compliance leading to review of its license procedures and Monday's announcement.

A restatement of that announcement is:

Effective 1 January 1987, Digital is taking a more conservative approach towards software license transfers. On a case-by-case basis Digital will/will not authorize the movement of a software product to a different CPU or corporate entity as illustrated below.

¹October 6, 1986

(A corporate entity is defined as any legal entity related to the licensee that satisfies the majority ownership requirement under Digital's applicable discount agreement.)

Digital will no longer entertain requests for license transfers with the sale of a used CPU. (i.e. The software license will *not* accompany the hardware.)

Digital's procedures remain unchanged under the following circumstances:

- Transfer to second CPU of the same model—yes²
- Hardware upgrade in the same cabinet (such as 8500 to 8550)—yes³

Digital will no longer take requests for movement of software to a CPU of a different model and license price tier.

Until January 1, 1987 Digital will continue to review and process licensees' requests according to its current license transfer procedures.

Some of the implications of this change in procedures by Digital are:

- The fact that the new procedures applies to existing systems without a grandfather clause means that depreciation schedules which include software as a salvage cost will have to be revised to exclude the software.
- If you own a CPU (e.g. a VAX 750) with an operating system and some layered products and you buy a new CPU (e.g. a VAX 8500), you cannot sell the software with the 750, but must buy new software for the 8500. This leaves you with software which is licensed to *no* CPU.
- These procedures do not include any expansion to the software rental program. Therefore, if you do not own BI series computers the rental program will not be an option to consider.

²requires case-by-case approval

³Price tier differential charged, if applicable

- Although these new procedures do not expand the current rental program, if you own BI series CPU's and software movement is an issue with your company, rental may still be the best solution.

I am not sure how this affects us, since we probably fall under the category of OEM. In any case our CPUs are never placed on the used market anyway; they are transferred elsewhere or destroyed.

5 Multiple Versions of VMS Products

One of the sessions I attended was a description of how to install multiple versions of VMS layered products on the same system at the same time. This is a useful thing to do when you receive a new version of a product, since it allows you to perform your own testing of the new software before turning it over to the general users for production use. Also, if you have other software which will not work with the new version, it is possible to leave the old version installed on the system for an indefinite period of time.

Search lists are used to implement this function. Three new directory structures are created (OLD, NEW, and TEST), duplicating all of the system directories ([SYSEX], [SYSHELP], etc). This is similar to the way the system directories for clustering are implemented; the files that are cluster-wide are contained in the directories under SYS\$COMMON and those unique to a particular machine are under SYS\$SPECIFIC.

Whenever a user wishes to access one of the special versions, a command procedure is executed which redefines the logical name SYS\$SYSROOT so that the special directories are found first. For instance, if the user specifies the TEST version, then a search for a file in SYS\$SYSTEM will begin in [TEST.SYSEX] before the standard directories. If the executable being searched for is not under test, it will not be found in [TEST.SYSEX] and the search will ultimately find it in [SYS0.SYSEX] or, on a clustered system, in [SYS0.SYSCOMMON.SYSEX].

Installation of the software in one of these special systems is equally straightforward. Before installation begins, the installer executes the same command procedure to provide the same logical name setup. Thereafter, when the installation procedure places things into what it thinks are the

regular system directories, it is actually installing them into the special structure and the regular directories are untouched. For more information, see the VAX Session Notes, page 222.

6 Documentation Systems

6.1 T_EX/L_AT_EX

There were several sessions on T_EX (pronounced *teck* rather than *tecks*), a public domain text formatting program written by Donald Knuth, and L_AT_EX, an extension of it. This is similar to Digital Standard Runoff (DSR) in concept, though more sophisticated by a level of magnitude. Far more than just simple text formatting, T_EX is capable of boxes, viewgraph bullets, multiple fonts in different sizes, subscripts, superscripts, mathematical symbols/formulas, and anything else a bit-mapped laser printer or phototypesetter is capable of displaying. T_EX is the uppercase form of the greek word $\tau\epsilon\chi$, the root word for technology and art, which both apply in describing it. (An expert on T_EX can be referred to as a T_EXnician.) The epsilon is normally printed as an subscript on hardware capable of it, and as a lower-case letter on the same line on typewriters, terminals and line printers (T_eX).

L_AT_EX (or LaT_eX on a terminal) is a package of T_EX macros layered on top of the base system, intended to hide the complexity from casual users. With L_AT_EX, simple formatting tasks are much easier since the L_AT_EX macros handle most of the tedious details. However, since the L_AT_EX system consists only of T_EX macros, the user still has access to the full power of T_EX if it is needed, and T_EX and L_AT_EX commands can be intermixed.

The output of T_EX is a device-independent file which is converted to device-dependent control sequences by a device driver (not to be confused with the type of device drivers used in VMS). There are T_EX drivers available for dot-matrix printers, laser printers, and photo-typesetting equipment, making it possible to use the same T_EX input file (and output file, for that matter) to create rough drafts and finished documents (even typeset documents). The printed pages are guaranteed to be virtually identical on all devices supported by T_EX, differing only in resolution (dots per inch).

\TeX is like Ada in the sense that the name is copyrighted and that the name \TeX may be used only if the implementor provides the full language (even on micro systems such as the IBM PC) and all functions are performed identically to all other implementations. (Knuth provides a test suite to define compliance with the standard.) This helps insure compatibility between all implementations and makes it possible to transport document files between diverse systems with identical results. \TeX is currently available on a wide range of systems, ranging from PC's such as the Mac, Amiga, and IBM PC to the big IBM mainframes. Since \LaTeX consists only of \TeX macros supplied in source form, it is automatically transportable as well.

6.2 Pre-Symposium Seminar on \LaTeX

I attended the pre-Symposium seminar entitled " \LaTeX —A Sophisticated Text Formatting Environment", which was conducted by Leslie Lamport, the author of the \LaTeX macro package. I am somewhat familiar with \LaTeX already, since I have been using it steadily for several months, so I already knew the basics. However, I still learned a lot from the seminar. There were many subtle details covered, things that tend to get overlooked when you are reading the \LaTeX book⁴. I had hoped that Lamport would provide the pronunciation for \LaTeX , but he said it was up to the user—in his lecture he pronounced it as *lah-teck* and *lay-teck* interchangeably.

One of the sessions during the main Symposium was a debate between the advocates of WYSIWYG (What You See Is What You Get, pronounced *wizzy-wig*, the Macintosh style of document preparation) and the defenders of markup languages (\LaTeX , Scribe, Runoff). "Markup" refers to the batch approach of printing a rough draft, going through the entire document marking up changes to be made, editing in all of the changes, and printing another draft. Leslie Lamport was on the panel and repeated many of the same points in the debate that he said in the seminar, so I am sort of merging the two together and reporting what I remember from both.

Using \LaTeX forces the writer to think of the document as a logical structure. Use of the section and subsection commands allows the document to be initially created as an outline and then be filled in later. While it is

true that the \LaTeX user has no way of seeing how the document is going to look, Lamport's contention is that it doesn't *matter* how the document looks during the writing phase. The actual appearance becomes a factor only during the last stages, just before the final print of the document. If a writer is continually making incremental adjustments of the formatting as text is entered (which, of course, is the default for WYSIWYG systems), then effort is being expended that could be better spent working on the content of the paper. Many of these incremental corrections will be nullified by changes to the text anyway, making the effort wasted. For instance, during early stages of the document, a bad line break might occur. A WYSIWYG advocate would probably jump on that error instantly and force a line break in a better spot. However, text might be added to the beginning of that paragraph later, causing the original bad line break to go away on its own.

Lamport's preferred approach is to write a document in its entirety before working on formatting. For a typical paper, he spends about two hours per page working on the text of the paper, making only textual corrections (spelling, syntax, grammar, etc.), but ignoring formatting errors on any rough drafts printed. Finally, when the content of the document is finished, another five minutes per page is spent correcting the few formatting errors that \LaTeX wasn't able to handle.

Some of the few advantages of WYSIWYG over markup are lost when the screen previewer, available with many implementations of \TeX , is used. Screen previewers provide the user with the best of both worlds by allowing the document to be displayed on the screen without going to paper, but still in a markup mode rather than interactively. Previewers, like WYSIWYG systems, require graphics terminals (or PCs) to work properly; not all of us are able to acquire those.

Another major difference between the WYSIWYG and markup viewpoints is in the area of document design. Most people don't realize that there's a lot more to typographical layout than just making the words go from left to right on the page without going off the edge. With the freedom of WYSIWYG, people merrily move things around the page without regard to (or knowledge of) what constitutes readability. I have read in more than one publication that one of the principal results of the desktop publishing craze is likely to be terrible looking (but cute) newsletters, magazines, and

⁴ \LaTeX —A Document Preparation System, Addison-Wesley

books. People using \LaTeX may be just as ignorant about document design, but \LaTeX itself is not. Lamport consulted with professional designers when setting up the document styles built into \LaTeX . All of the margins, headings, paragraph indentations, and other elements of document style were specified by experts in the field. If the \LaTeX user will simply let it work on the document without trying to override anything or interfere with it, it will usually create a beautiful document on its own. Of course, it is just a computer program, so sometimes it will do something strange or need help with a line break, but the less human intervention the better.

6.3 Machine Generated \LaTeX Source

There was a session on merging machine-generated \LaTeX source with a series of template files to create reports with variable data. The application described in the session was for the generation of reports containing data about oil wells, but the technique could be used for any document where the format is fixed, including canned headings and titles, and data generated by a program (or pulled from a spreadsheet or database) is to be inserted. For more information, see the Languages and Tools Session Notes, page 85.

6.4 SDML—Standard Digital Markup Language

I went to a session on SDML, which is a tool used internally by DEC. Basically it is a markup language which provides a higher level of abstraction than a typesetting language such as \TeX . The SDML system contains translators that convert the SDML source file into either \TeX or Runoff source files for the actual printing of the document.

The VMS documentation is created using this system. During the early stages of document preparation, the rough drafts are printed using Runoff, since the formatting of the document is not important at this stage and ordinary line printers are much more convenient. As the document nears the final stages, \TeX is used so that the final form of the document can be inspected on a laser printer. Once the document is complete, the device-independent file created by \TeX is used to actually typeset the document.

6.5 PostScript

There were several sessions on PostScript, a document description language. PostScript is the native language of several laser printers, including the Apple LaserWriter. It would seem that PostScript is a replacement for \TeX , but this is not the case. In fact, since PostScript is considered a device type by \TeX , complete with a driver that generates PostScript files, they can be used together. By using this driver, \TeX documents can be printed on any PostScript printer. Graphics can be merged in using the \TeX `\special` command. For more information, see the Graphics Session Notes.

7 Multiprocessing with Ada and Sisal

There were a couple of sessions about the current research DEC is doing on parallel processing. Some of the research is an attempt to re-implement the VAX Ada tasking mechanism, which is currently implemented as an artificial multi-task construct performed within a process, to be a true multiple process operation using separate VMS processes.

Sisal is a language specifically designed with parallelism in mind. Like Occam, it has built-in constructs for parallel processing, such as functions for updating compound values and “stream” function return values that allow functions to run in parallel with their caller. For more information, see the Languages and Tools Session Notes, page 45.

Although no DEC CPU currently has more than two processors, neither of these implementations are locked into that number. Both will automatically use as many CPUs as are available in the architecture.

8 Development Tool Integration

Based on the drift of many of the sessions, it is easy to see the direction Digital is taking with its development tools. With each generation, more of the tools are able to work together. One of the sessions discussed the VAX Ada implementation of the Kernel Ada Program Support Environment (KAPSE), which was specified in the 1980 “Stoneman” directive.

When you consider the Ada Control System (ACS), LSE, Performance and Coverage Analyzer (PCA), SCA, and Debug, many of the elements of KAPSE are currently provided by DEC. One of the points made by the speaker was that many of the tools supplied by DEC for the KAPSE are equally usable by other VAX languages as well (all of them, except for the ACS). For more information, see the Languages and Tools Session Notes, page 72.

9 SPM Version 3

A new version of SPM, the System Performance Monitor, was announced. Cluster and multi-processor support and video display capability are the big enhancements. For more information, see the VAX Session Notes, page 29.

As a side note, I overheard several people talking about a new product that I *think* was called the VPA (VAX Performance Analyzer). It apparently uses AI techniques to make suggestions about system tuning. (“I think you ought to try bumping up WSMAX a coupla hundred pages.”) My information is about fourth-hand, so I don’t have any details.

10 Modula-2

As in the last two symposia, there was a BOF⁵ session on the Modula-2 language, the language designed by Niklaus Wirth as the successor to Pascal. The situation for Modula-2 has not changed much since the earlier meetings. The current implementations for the VAX were discussed. There still aren’t very many yet. The Hamburg compiler is basically the only one that is really available for use; It is available from Hamburg directly or can be acquired through Logitech. The Logitech route costs a lot more, but you get support with it; Hamburg will just send a tape. The compiler DEC is working on as a research product at their western research facility is supplied in binary form with their ULTRIX⁶ operating system, but is not

⁵Birds of a Feather—informal session for people interested in a particular topic, scheduled dynamically during the Symposium

⁶DEC’s version of Unix for the VAX

really supported. VMS users cannot get it at all, with or without support. The Tartan compiler is available only to universities. Oregon Software, creators of Pascal 2, are supposed to have a compiler in the final stages of development.

On the PC front, Logitech is again the source of the best Modula-2 compiler, at least in the MS-DOS world. The Workman Associates compiler was endorsed for the Z80 running CP/M.

The people attending the BOF agreed to publish their names in the Languages and Tools newsletter in an effort to form an informal working group for Modula-2, possibly to help with the language standards effort being undertaken by Modula-2 Users Society (MODUS).

11 The ICON Language

One of the sessions was a description of the ICON language, which is meant to be the successor to SNOBOL4. The creator of the language is one of the originators of SNOBOL4, so I guess he is certainly entitled to do that. Like SNOBOL4, ICON has strong string handling features. It has a concatenation operator, character set data type, and string scanning procedures. It would be interesting to do a comparison between ICON, SNOBOL4, TPU, and VAX Scan, all of which have superior text manipulation capabilities. For more information, see the Languages and Tools Session Notes, page 139. Also, a recent issue of *Byte* contained an article on ICON.

12 Waterloo Compilers

One of the Languages and Tools sessions was presented by the University of Waterloo. The brief title of the session was “Debugging Compilers at Waterloo”, and I attended expecting to learn some of the exotic techniques they used to debug their compilers. However, the word “debugging” was used as an adjective rather than as a verb—the session was actually a history of the various compilers developed by Waterloo for the purpose of debugging student jobs (WATFOR, WATFIV, and WATBOL).

13 Secure System Development

One session presented by Digital discussed the effort within the VMS development group to improve the security of the VMS operating system. Threats of various types were discussed, along with the current and future techniques VMS uses/will use to counteract them. One future plan is to provide a "security kernel", which can supposedly provide most secure operating system possible. Apparently there is a lot of dormant code already present in VMS Version 4 to support these new security enhancements—it is just not enabled at the current time. Digital is working toward getting VMS officially designated at the highest government security level. VMS is already more secure than a lot of other operating systems. Unix, of course, has virtually no protection at all.

14 VAXBI

There were several sessions on interfacing to the VAXBI, including user-written device drivers. For more information, see the VAX Session Notes, page 257.

A while back a design team at my facility had been discussing various ways to connect two VAX systems, and had considered direct BI, DECNET via BI, DECNET via Ethernet, and our own proprietary network (which uses Hyperchannel). One thing I learned at the Symposium is that, while the DECNET via BI approach is possible, it is not the optimum approach because DECNET is optimized with Ethernet in mind. The BI is a high-speed bus designed for small block sizes and the blocks DECNET uses are too big for efficient transfer, so the throughput on the BI is actually less than on Ethernet even though BI is a much faster bus. However, using the BI directly with small blocks should have the fastest transfer rate.

15 Trojan Horses

This was not a session on how to write a Trojan Horse type of program, but a discussion on how to protect a system from them. A Trojan Horse is

a program that performs a function radically different from the one it appears to perform. Sometimes destructive, always devious, these programs pretend to be harmless and/or useful, and may actually do something beneficial on the surface, but somewhere in the program is a section of code which performs an operation that the person running the program would probably not have done deliberately. For example, a game program, in addition to allowing you to destroy Klingons, might delete the contents of SYS\$SYSTEM (obviously, the greater the privileges of the person running the Trojan Horse, the greater the potential for damage). Another typical trick is to cause no visible harm, but to have the privileged victim copy sensitive files to the perpetrator's account or to modify the UAF to grant privileges. Worms and viruses were also discussed. For more information, see the VAX Session Notes, page 371.

This was the one session in the entire Symposium where I was bitten by the overcrowding problem. I was one of the seatless persons given walking papers. I was somewhat surprised by the attendance, since this was at 2 P.M. on Friday afternoon. I guess all the publicity about teenage hackers running amuck through the public telephone and data packet networks has system managers worried.

16 Upcoming Changes to the VMS Exec

The structure of the VMS Executive image is being changed drastically for Version 5. Basically it is being broken up into smaller executables, which are to be installed as privileged shareable images. The base image will ultimately become nothing but a vector table pointing to the actual procedures in the smaller images. The intent is for the base image to never change again while VMS is on the face of the earth. For more information, see the VAX Session Notes, page 91.

17 Re-using Sub-processes

There was a session describing a technique for re-using a sub-process rather than going through the overhead of repeatedly creating and deleting new ones. New commands for the permanent sub-process would be sent through

a mailbox, resulting in a sort of captive interactive batch job. For more information, see the VAX Session Notes, page 310.

18 DECUServe

There was a lot of talk at the Symposium about DECUServe, a proposed online conferencing system for the DECUS community. There was a blurb in *Update.Daily* about it and also a VAXNotes conference in the Exhibit Hall cluster. It's all in the proposal stage at this point. Everyone seems to think it's a good idea, but there are different opinions on how it should be implemented. Some favor a dedicated system running VAXNotes, others prefer setting up a conference on an existing service such as CompuServe.

19 Pascal Performance

There was a session on VAX Pascal performance and what the software developer can do to improve it. Most of the talk was about the optimization performed by the compiler and how to write your code to help the compiler do a better job. For example:

- Don't reuse the same local variables over and over—use different ones for different things. This allows the compiler to keep more things in hardware registers, resulting in speed improvement. The fact that more variables take up more space is irrelevant, since local variables are kept on the stack and disappear when the procedure exits.
- Don't use GOTOs. They interfere with optimization (and are poor programming technique anyway).
- Try to align your data on longword boundaries. This improves memory accesses. The compiler will do this automatically unless you override it.

Using PCA to find performance problems was also discussed. For more information, see the Languages and Tools Session Notes, page 214.

20 Dynamic Image Loading

There was a session which dealt with dynamically loading and unloading an executable image which was not originally linked to the calling image and transferring control without losing image context. Apparently the loading is the easy part. Getting rid of the loaded image requires more effort. For more information, see the VAX Session Notes, page 132.

21 Tape Copy Project

There was a session which discussed the contents of the library tape created from the submissions received at this symposium. Each of the attendees who had contributed something to the tape said a few words about his submission. The tape includes, among other things, the latest and greatest versions of the Analyticalc spreadsheet, a VMS virtual disk, an EVE spelling checker, the Kermit⁷ communications program, and the ICON language (See section 11).

22 DEXPO

I was shocked to read the first issue of *Update.Daily* for this symposium and see the schedule for the DEXPO shuttle bus included. DECUS had never mentioned DEXPO before, had never even acknowledged its existence. DECUS is non-commercial in nature and all references to pricing, delivery, etc. of products is strictly forbidden, so supporting a trade show like DEXPO was against the by-laws. Apparently DECUS leadership, which would have preferred for DEXPO to just go away, finally gave up and modified the by-laws to relax the non-commercialism rules just enough to help the members wishing to attend DEXPO, stopping far short of actually encouraging them to do so.

⁷No, it's not a acronym—it really *is* named after the frog.

23 The Rest

There were a great number of sessions that I wanted to attend, but could not due to scheduling conflicts or sheer exhaustion. These included DEC-NET internals, VAXCluster internals, Ethernet, shadowing internals, file system internals, the Prolog language, server symbionts, GKS, Autogen, Kermit, VAXELN, terminal servers, paging adjustment, SPM and system tuning, packet-switching networks, network performance, the DEC/SNA Gateway, VAX security, encryption, VMS V4, remote terminal support, VMS run-time library, and many others. Many of these are included in the session notes.

WHAT'S IN A FORMATTER? — Philosophies in Conflict

Sam Whidden, Chair, Languages & Tools SIG

November 26, 1986

At the Fall DECUS Symposium in San Francisco, the Languages & Tools SIG sponsored a panel discussion on the differences in usage and purpose between What-You-See-Is-What-You-Get editors and markup languages.

WYSIWYG formatters permit the user to arrange a document to his liking on the screen, using a mouse or a light pen or cursor commands, printing the results only when the user is satisfied with the visible image.

Markup languages require commands to be entered along with text, to be processed by the formatter. In some cases, the compiler's output can be previewed before printing, providing a chance to change the commands.

Which approach is "better"? That's a hotly-debated question, examined in this discussion by four extremely well-qualified experts: Dr. Leslie Lamport is the author of LaTeX, a system of document-formatting macros built on Knuth's TeX typesetting language. Dr. Brian Reid is the author of Scribe, a powerful and widely-used markup language. Mark Bramhall is a Consulting Software Engineer at Digital and VAX/TPU project leader. Lawrence Bohn, an experienced software developer, is Director of Product Planning at Interleaf Corporation.

We posed some questions to the panel in advance:

- What would an ideal system of each type incorporate? Which, if any, existing systems meet this ideal? Where do they fall short?
- Is one of these approaches better or worse under certain circumstances, or for certain kinds of users (an author, for example, vs. a secretary)? If so, will some users be forced to learn two systems?
- Is a markup language required at some level of document complexity, while WYSIWYG is suitable (easier to use) for single-use, possibly smaller or simpler, documents? If so, does this imply that markup languages, in order to be powerful and versatile, are likely to be too hard for non-programmers to use? And if that's so, should non-programmers stay out of the kitchen?

- How do requirements for transportability or document re-use affect the choice? Is there nowadays, in fact, an economic imperative that forces almost anything publishable to be also reusable—that is, resalable in some other format (for electronic submission or on-line retrieval, for example, or for targeted anthologies)? If so, does that circumstance force the use of markup languages, whose embedded commands can be globally redefined, instead of WYSIWYG?

- Is a viable international standard for document formatters possible?
- Is there reason to hope that the best elements of these two philosophies can be combined into a "perfect" formatter?

Some of the panelists submitted written presentations in advance of the session. **LEVERAGE** will offer these to its readers, beginning with articles by Leslie Lamport and Larry Bohn in this issue. Next month's issue will carry Mark Bramhall's thought-provoking suggestions, along with a transcription of Brian Reid's entertaining and perceptive remarks.

We expect in April to present brief transcriptions of other portions of the panel discussion, as they actually transpired, accompanied by some of the panelists' slides and followed by the sharp and interesting Q & A period that completed the discussion.

This subject is one in which feeling runs broad and deep, judgement can be colored by familiarity, and emotional preference seems as compelling as logic. How should the issues we raised be resolved? Did the panelists address them? What have we learned? What concerns have we missed completely so far? Substantial investments of time and money ride on these questions; where do we look for the right answers, if there are any? If you have ideas or experiences in this area, please share them with us. Send us your thoughts, however brief, and let us consider them in **LEVERAGE**. Write to Al Folsom, Editor of **LEVERAGE**, or to me; our addresses are in the administrative section at the back of this issue.

Remarks for DECUS Panel Discussion

Leslie Lamport

September 8, 1986

The Real Choice: Visual or Logical?

The terms *wysiwyg* and *markup* are misleading, suggesting that the distinction is between a slick bitmap display and an ASCII string of text filled with mysterious formatting commands. The real distinction is between what I will call *visual* and *logical* systems. A visual system is one in which the user describes the visual layout of the text; a logical system is one in which the user describes the logical structure of the text.

In a purely visual system, one would simply paint a collection of pixels on the screen. The word *cat* would be no different from a picture of a cat—one could change the shape of the *t* as easily as he could change the shape of the tail in a picture of a cat. Finding all instances of *cat* and replacing them by *dog* would be as hard as finding all cats in a picture and replacing them with dogs.

In a purely logical system, one enters only the logical structure of a document, describing such things as words, paragraphs, theorems, sections, and cross-references. The system translates this logical structure into a collection of dots on sheets of papers, with the user giving only general instructions—for example, specifying two-column output formatted for the DECUS proceedings.

There are no purely visual systems used for document production. All systems keep some logical representation of the document that they use to generate the pixels. The most primitive ones keep only the letters that generate the characters. In such a system one can easily find all instances of *cat*, but a search for all instances of *domestic* would miss the ones in which the word is hyphenated across lines. More sophisticated systems keep more of the logical structure, thereby acting more like logical systems. It is my thesis that such systems are good for serious document production only to the extent that they act like logical systems.

The only purely logical system I know of is Digital's *Document*. Systems like *Scribe* and \LaTeX permit the user to describe the visual appearance as well as the logical structure of the document—for example, by inserting a command to add a quarter-inch vertical space. The ability of the user to include such commands in the description of his document represents a weakness in these systems.

An ASCII text string is a cumbersome way of representing the logical structure of a document. Although current logical systems require the user to prepare his document in such a form is a sign of their primitive nature, this not an inherent feature of logical systems. Systems can be built to allow more convenient editing of the document's logical structure. I'm not interested in the question of whether the inconvenience of describing the document with an ASCII text file is bad enough to make visual systems preferable. Choosing between two evils is never pleasant. I will confine myself to arguing the inherent superiority of logical systems to visual ones.

Many of the advantages of logical systems arrive because computers are better at processing logical information than visual information. Other advantages derive from the flexibility of separating the text from the formatting instructions. Brian will discuss those advantages; I will consider why logical systems tend to produce better documents than visual ones. These considerations apply to longer documents—articles, books, technical reports, etc. Visual systems are perfectly adequate for shorter documents like laundry lists, love letters, and slides.

Writing or Formatting?

The purpose of writing is to convey ideas to the reader. The worst aspect of visual systems is that they subvert the process of communicating ideas by encouraging the writer to concentrate on form rather than content. Ideas are conveyed by the logical structure of the text; the function of the visual format is to display this structure. The author should be concerned with the structure, not any particular visual representation.

Visual systems encourage the user to substitute formatting for good writing. A simple example is the use of vertical space. If there's an awkward transition from one paragraph to the next, the user of a visual system can simply add some vertical space between the paragraphs. But, what does this space accomplish? The awkward transition is still there; the reader is still jarred by it. The extra space simply declares that there is an awkward transition and the author is either too lazy or too bad a writer to fix it.

An awkward transition is a symptom of a poorly structured document; it can be fixed only by restructuring the document. A logical system forces the writer to think in terms of the document's logical structure; it doesn't give him the illusion that he is accomplishing anything with cosmetic formatting changes.

Phosphors or Ink?

When the author is editing his document, he becomes a reader. Like any reader, he wants to be presented with the document in a format that is easy to read. A format that is adapted to the printed page is a poor one for a screen. Phosphors are different from ink, and a screen is not a piece of paper; it is not easy to read a picture of a printed page on a screen.

A computer screen differs from a printed page in many ways, including resolution, width, and the availability of different colors. Each of these differences implies differences in the way information should be displayed. In addition to the differences in the two media, the presence of a computer behind the screen also has striking implications. Consider the problem of pagination. One of the worst features of books is the splitting of text across pages. It would be easier to read a document straight through, from front to back, if it were printed as a continuous scroll. We use books rather than scrolls because they are easier to produce and because documents are not always read in such a linear fashion. The computer offers the best of both worlds. We can scroll through text, avoiding distracting page breaks, and still move easily to another part of the document. It is senseless to use a computer to simulate a book, complete with page breaks.

Who Should do the Formatting?

Logical systems attempt to remove formatting concerns from the author. The author specifies only the general form of the output—technical report, journal article, etc.—while the system makes the actual formatting decisions—amount of paragraph indentation, amount of space above a displayed equation, etc. Visual systems give free rein to the author's artistic tendencies, allowing him to format everything as he wishes. This would be fine if documents were meant to be displayed on walls and admired for their aesthetic qualities, but they're not.

The purpose of writing is to convey ideas to the reader. The purpose of formatting is to make the document easier to read, not to look pretty. Document design is a skill acquired through training and experience. A

logical system can apply the skill of a trained designer to the formatting of a document. A visual system forces the author to do his own document design, usually with disastrous results. Most authors are not competent designers and make typographic errors—formatting decisions that make the document harder to read.

[One or two examples will be given here.]

A visual system can make things hard even for a trained designer. An important principle of document design is uniformity—the same logical element should be formatted the same way throughout the document. It is difficult to achieve uniformity if the user must specify the formatting of each instance of the element. For example, all displayed quotations should be indented the same amount, but this is not likely to happen if the author must specify the amount of indentation whenever he types a quotation.

When the User Must Format

There are two reasons why the author may have to specify formatting in a logical system. First, no logical system can provide a complete assortment of predefined logical structures. For example, a general-purpose system is unlikely to provide facilities for formatting recipes. The writer of a cookbook must tell the system how to format recipes (hopefully, after consulting a professional designer). A logical system should permit the user to define his own logical structures and to specify how they are to be formatted. Several different formats might have to be specified—for example, one for a single-column page, one for a double-column page, and one for the computer screen. In a logical system he does this once; in a visual system he must format each recipe individually.

The second reason for specifying formatting is to overcome an inherent problem with computers. Embodying design principles into programs is difficult, and a designer will always be able to do a better job of formatting an individual document than will a computer program that he devises. Achieving the highest possible quality requires the ability to make changes to the system's output. This will be a matter of fine tuning, changing such things as page breaks and figure placement. This is a visual process, and one would like a visual system for doing it—one that allows the user to manipulate screen images of the final output.

If such visual editing is ultimately desirable, why not use a visual system in the first place? The answer is that the flea should not wag the dog. The final touching up of the document should represent only the tiniest fraction of the author's effort. The changes will generally be of such a minor nature that they are not worth bothering with in a preliminary version intended for a small audience, nor for any document that is not widely distributed. They will be done only when producing the final copy for the publisher.



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ANATOMY OF A WYSIWYG SYSTEM

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To begin, I want to make two points. First, I can assume we all know what WYSIWYG means: "What You See Is What You Get." The second point is that we don't really know, or at least don't agree, about what WYSIWYG means.

And the first point is that even talking about WYSIWYG editors is to load the dice. What I'm going to end up arguing is that a truly WYSIWYG system doesn't fall easily into the categories too often used in this area. After all, think about how the term "editor" came about. It's a general principle that words are introduced to announced distinctions, so one can ask "editor" as opposed to what? And the answer is "formatter." Editors and formatters belong in the world of batch, constraint-based systems. That's why it's already a mistake to talk about WYSIWYG editors. There isn't yet a really good term to replace "editor" when talking about WYSIWYG systems.

So, what does WYSIWYG mean? That depends on one's point of view. And it's interwoven with what one means by "structured document," which also has several meanings from several points of view. What I want to do today is lay out some of the complexities involved in defining and understanding these terms. This will, I think, clear up some of the misconceptions about what WYSIWYG editors are, what they do, what they can do, and what they can't do.

WYSIWYG : The User's Point of View

From the user's point of view, a WYSIWYG workstation system simply shows on screen pretty much what he or she will get on paper. I say "pretty much" because, generally, screen displays are a little smaller, the typefaces may be tuned differently for optimal screen vs. harsdcopy display, and because laser printer output tends to be about four times higher in resolution.

But this is not a precise enough definition. Unless we're going to play the *Alice in Wonderland* game of making words mean whatever we want them to mean, a WYSIWYG system, from the user's point of view contains three elements: 1) You see pretty much what you're going to get., 2) What you're going to get includes a variety of typefaces. 3) You see what you're going to get as you enter the text. In a nutshell, it's an integrated, real-time, text-and-graphics, editing-formatting system.

The Programmer's Point of View

Getting the screen to display what will be on paper is from the programmer's point of view a problem that's been solved for some years now. It's the third point—showing what you're going to get, as you type in your text—that's the challenge. And

not because it's hard to *show* the document properly. Rather, because it's hard to create the properly formatted document itself. For example, a WYSIWYG system has to show page breaks and line breaks. Both of these are necessary because, from the author's point of view, a document is something at the business end of a laser printer; it's something on paper, and paper is at least two dimensional.

But from the programmer's point of view, a document is one-dimensional. The line- and page-breaks are not actually a part of the document. Rather, the document is that which is to be segmented into lines and pages in order to be shown and printed. The hard part is constantly bringing the one-dimensional document into the two dimensions of the paper. If you wait until print-time, you have some form of batch system. If you constantly keep the document in two dimensions, so that at every moment it's displayed on screen two-dimensionally and so that any moment it's ready to be printed out, you have a system that's incidentally WYSIWYG but which is essentially something different. In fact, it's so different that we're going to have to make up a name for it.

Let me put this a little differently. The easiest way to write a document-producing program is to write a purely WYSIWYG one which forces the author to wrestle it into shape. Such a system has been on the market for a while now. It's called a typewriter.

Or you could let the author insert into the text some sort of code which will direct the formatter to wrestle the text into some sort of shape. Batch systems do this.

Batch vs. WYSIWYG

But what sort of code? Here you have to make some design decisions. If you leave it all or most up to the author, you're back in the old world of typesetting in which the machine helps by saying when the zone for an appropriate line-break has been entered, but leaves the exact placement of each line-break up to the author. In fact, with a

system such as that, one has operators, not authors. Every system, outside of a typewriter, is going to provide some sort of structured aid to the operator or author. How much aid is appropriate depends, obviously, on the task: letting the computer make a lot of decisions makes the operator's work easier and faster, but it deprives the operator of flexibility of control ... also known as freedom. There is also, obviously, the performance penalty of having to run the text through a formatter—which for long, complex documents traditionally can be an overnight job for a computer—for the operator to find out if it's come out as she or he intended.

Any such system, no matter how much help or how little is given, how much or how little freedom, is a batch system. There is much to be said in favor of having a structured batch system, one that leaves as many decisions as possible up to the computer. The operator says what the pages should look like, and the computer does it. The operator can draw from a collection of standard text objects—paragraphs, headers, lists, bulleted lists, etc—and the computer knows how to do them. For serious tech doc work, for example, life is made not only easier but more consistently consistent.

The alternative to a batch system is a WYSIWYG one, but, as I've already maintained, its WYSIWYG-ness is not at the heart of the difference. At the heart of the difference is the state of the document at the moment of authoring or editing. In a true WYSIWYG system, the document formatting decisions are made as text is entered or altered. This means the text can be displayed as it will look when printed, but it's not the display capability but rather the status of the document itself which is the distinguishing feature of a truly WYSIWYG electronic publishing system.

WYSIWYG vs. Page Layout

Much of the criticism of WYSIWYG systems comes from an over-emphasis on the display benefit derived from the fact that the formatting decisions are constantly being made in such systems. The critics have assumed that in order to

achieve a WYSIWYG display, one must make decisions the way one does when using a typewriter. This is abetted by the existence of another sort of WYSIWYG system, much in the news these days: page layout systems. A page layout system shows you what you're going to get, but it forces the author to make all the decisions. While page layout systems are, obviously, computer-based, they have little to do with workstation-based electronic publishing systems. Conceptually (although clearly not in terms of functionality), page layout systems are more akin to composition light tables than they are to Interleaf's system. They show you what you get, but they make you get it with minimal computer assistance. Great control, little computer help. For two page newsletters this is not necessarily a disadvantage.

If you think of WYSIWYG only in terms of the display, you miss the crucial distinction between page layout systems and other, more production-oriented, electronic publishing systems. A system can be both WYSIWYG and batch. In fact, it can be *structured batch*.

How? Again, conceptually, easy. The only reason to confine formatters to their own stage in the production cycle is that they're so slow. Suppose you could order a re-formatting at any stage, and suppose instead of taking overnight, it took only a few minutes. You might then interrupt your work periodically, get a cup of coffee, and see how the document looks on screen. That would still be a batch system, right?

So why not do the following, if you have the hardware and software ability to do it: Make the formatter incredibly fast so that even decisions involving repaginating entire documents can be made in a time scale unnoticeable to human users. And if you can do it that fast, then don't make the user hit the re-format button. Do it for him. After every keystroke. That way the document will always be formatted, and will always be ready to be printed, and—if you choose to do it—can be displayed on screen as it would look if it were to be printed at that moment.

That's what Interleaf does. The work of the formatter, the code that wrestles the document into

two-dimensions, is invisible to the user. It's WYSIWYG, but what's important is that it's continual batch.

Structured WYSIWYG

Now, there's another part of this story. For, if you think of WYSIWYG systems as being like typewriters or page layout systems, you must also think that there's no possibility of building structured WYSIWYG documents. But if you think of WYSIWYG the way Interleaf does, one can build structures as one desires.

Here's how Interleaf does it. Users can declare any group of lines to be a unit, or "component." Components can be assigned properties, including typographic ones, page-positioning ones, and a name. Whenever you hit the linefeed button, a new component is created; it defaults to the previous one. All text, as it is entered, conforms to the structure created by the user. At any time, that structure can be altered and the component will instantly comply. Such changes can be applied individually, selectively, or globally. This is one sense of structure.

This approach brings the following benefits: Because the document is always formatted, there is the productivity gained from avoiding the formatter. Because it is formatted as it is created or edited, there is no post-formatting editor needed; the process is seamless. Because the computer makes the decisions about how to wrestle the document into two dimensions, the burden is removed from the user. Because it's a structured document, the user retains control over the look. Because the structures can easily be altered by the user, that control is flexible. And because the document is always formatted, the display can be, and is, WYSIWYG.

Structure: Definition and Uses

But there, of course, several senses of "structure." From the *author's* point of view, the logical structure of a document is hierarchically arranged into,

say, chapters, subtitles, paragraphs, sentences, words, and characters. From the *graphic designer's* point of view, the logical structure of a document is arranged less hierarchically into volumes, pages, illustrations, and lines. From the *programmer's* point of view, the document should be structured in whatever way makes the apparent structure useful to the end users.

Now, I've explained this by drawing distinctions. But I think it just as important now to be clear about the fact that these distinctions are unenforceable and should not be enforced, at least not too strongly. For example, I've talked about the logical structure of a document from the author's point of view, and knowing about this point of view may result in designing a program to reflect the inherent structure of documents. But it is just as vital to keep in mind that no author living or dead is an author purely from the logical point of view. Every author writes something down, and in so doing has departed from the logical point of view. Instead, she considers it from the graphic artist's point of view, one that is not merely logical but necessarily must consider the materials and outward appearance of the finished manuscript.

This is not something new with electronic publishing. Every writer who ever set her typewriter to double-spacing or left it at single spacing, who chose blue ink instead of black, who picked a ball point over a fountain pen, who decided a #4 chisel would work well on this tablet, every one of them has left the logical realm and has entered the real world of writing.

Therefore, letting a writer make these sorts of decisions is not analogous to *putting a gun in the hands of a baby*. First, writers aren't babies when it comes to making decisions about the look of a document; every writer makes those decisions every time she writes. Second, the instruments that give control over the look of a page aren't guns. They're tools. A good tool lets you do what it is you want to do.

Besides, the idea that writers ought to concern themselves only with content, not with form, really is trying to make a virtue out of necessity. The old batch systems were so complicated that the producing the form took specialists, so all that writers *could* concern themselves with was form. Now that's not necessary. And because WYSIWYG documents can be structured, writers need not be given totally free rein. For example, many Interleaf customers set up templates and thus standardize the look of their documents. Finally, if a document needs careful design, a WYSIWYG electronic publishing system makes a good tool for the design specialist as well.

In short, structure by itself isn't a virtue. At the logical level, one wants the freedom to write within any structure. One shouldn't have to write according to structures imposed by software designers. But a tool that enables one to shape one's own structure would be valuable. Some batch systems aren't such good tools for shaping structure, you know. What's the virtue in having to encode a new set of tags in order to declare a new document element, especially if it can be handled more efficiently in a WYSIWYG fashion?

WYSIWYG Is Preferable

If one assumes, as this debate frequently has, that a WYSIWYG system cannot be structured, then many of the arguments against WYSIWYG systems hold. Clearly, a non-structured approach is not very functional for long documents. But once one gets past thinking of WYSIWYG purely in terms of its display, rather than in terms of the status of the document itself, it becomes clear that there's no contradiction between being WYSIWYG and being structured. Therefore, in many, if not most, applications, WYSIWYG is preferable to batch because the WYSIWYG is easier to use, easier to error check, easier to revise, and a lot more fun.

###

Unravelling the Results of VAXTPU's read_key

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June 11, 1986

The VAXTPU built-in `read_key` returns a number that is an identifier of the key that was pressed. The ASCII procedure can translate this number into the ASCII letter, but there is no way to get the ordinal value of the letter within the ASCII character set without interpreting the number. This documents the fields of the number returned by `read_key`.

Key mapping should not affect the number, but since our site `still` has not received VMS 4.4, I can't be sure. Digital has assured me that if the keypress identification convention described here changes in the future, it will be documented with blinking letters in the release notes (foreshadowing of a new printer?).

Note: when a keypress is referred to as being shifted, it does not mean the keyboard shift key that capitalizes letters, but VAXTPU's shift key. See `set(shift_key...)` in the VAXTPU Reference manual. When a key is shifted, it's always considered to be uppercase (ie., `shift/a` is the same keypress as `shift/A`).

The `read_key` procedure returns an integer; a VAX integer is made up of 4 8-bit bytes. Byte 0 (the least significant byte) will be the ordinal number of the ASCII character if the character was printable or 0 if it was not printable. Byte 1 is always the ordinal number of the ASCII character, regardless; for multi-character escape sequences the last character of the sequence is returned (the up-arrow returns 41 hex or "A"). Byte 2 is always 0 (reserved for future use?). Byte 3 always returns hex 4 in the high nibble and in the low nibble bit 0 and 1 combine to form a keypress source code (where the keypress came from, binary 00 keyboard, binary 01 keypad, binary 10 function, binary 11 control), bit 2 is set if the key was shifted, and bit 3 is always 0. The VAXTPU command `message(fao("!XL", read_key))` will display `read_key` results in hex.

Schematic Breakdown

40	00	41	41	hex result for keypress of A
			41	character value (0 if not printable)
			41	character value (last character if escape sequence)
	00			always 0
40			01 00 0 0 00	binary representation
				00 keypress source (00 kybd, 01 kypd, 10 func, 11 ctrl)
			0	set if shifted with VAXTPU's shift key
			01 00 0	always 01 00 0

Some Examples

A	40004141	uppercase A keypress was unshifted, from the keyboard, hex character 41, printable
shift/A	44004100	shifted A keypress was shifted, from the keyboard, hex character 41, not printable
ctrl/A	43000100	control A keypress was unshifted, a control character, character 01, not printable
shift/ctrl/A	47000100	shifted control A keypress was shifted, a control character, character 01, not printable

Bits and bytes are numbered from the right starting with 0.

VAXTPU Code

The following piece of VAXTPU code will read a key and return the bytes of the integer returned by `read_key` (the individual bits of the bytes may be retrieved in a similar manner for access to the shift flag and keypress source code in byte 3 of the integer):

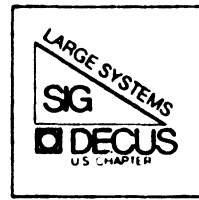
```
temp:=read_key;           !temp is integer to message
byte0:=temp-((temp/256)*256); !byte0 is low-byte of integer
temp:=temp/256;          !shift byte 1 of integer to byte 0
byte1:=temp-((temp/256)*256); ! ...
temp:=temp/256;
byte2:=temp-((temp/256)*256);
temp:=temp/256;
byte3:=temp-((temp/256)*256);
message(fao("!XL !XL !XL !XL",byte3,byte2,byte1,byte0));
```

When In Charge, Ponder;

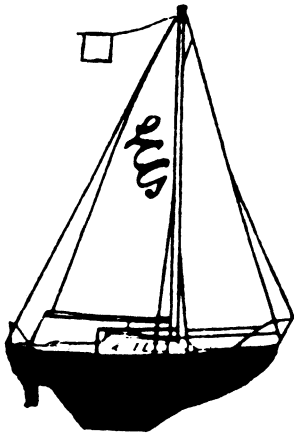
When In Trouble, Delegate;

When In Doubt, Mumble.

**- Jim Boren
Chairman of the Board,
International Association of
Professional Bureaucrats**



DIGITAL EQUIPMENT COMPUTER USERS SOCIETY



ATLARGE

LS

The Newsletter of the Large Systems SIG

Contributions

Contributions and suggestions for this newsletter are constantly needed. Articles, letters, technical tips, or anything of interest to our SIG are greatly appreciated. The editor prefers submissions be made electronically, but magnetic tape and hard copy will be accepted.

Send your contributions to:

ARPA: ctp@sally.utexas.edu
UUCP: ctp@ut-sally.uucp ({harvard,ihnp4,seismo}!ut-sally!ctp)
CIS: 75226,3135
BITNET: use the Wisconsin Gateway

or if you must, use the U. S. Mails:

Clyde T. Poole
The University of Texas at Austin
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From the Editor

Clyde T. Poole

In this issue of the newsletter we have four articles. The usual "Chairperson's Article" deals with the lack of visibility DECUS seems to have with the general public. The second article in the second appearance of "From the TOPS-20 Mailing List" and it is followed by a Regional Symposium announcement. The last article is a reprint of a Draft White Paper on "Allocating and Mounting Magnetic Tapes Under VMS" written by your editor. Comments on this Draft are solicited. Please direct your comments to the Editor at one of the addresses provided earlier on this page

The backlog of articles is drying up. Remember, *Only you can prevent an empty newsletter.*

Chairperson's Article

Leslie Maltz

Last week I participated in an activity that was a little different from my prior experiences. I was asked to talk to "the public" about DECUS at a trade show at a DECUS sponsored booth. For many of us who have been members for a considerable number of years, DECUS is a well know commodity. We know what we put into it as our efforts, and we know what the benefits are or what we get out of it. It has become a given in that we recognize that we will continue to reap the benefits as long as we keep active. What was interesting in this recent role was meeting people who do much the same things we all do for a living, but without the assistance of DECUS channels of information and communication.

Many people asked about the activities that DECUS sponsors. One of the most often asked questions was how much does it cost to join. People were amazed to hear that there was no membership fee once they heard about the long list of activities and products - national symposia, regional symposia, pre-symposium seminars, this monthly newsletter and other publications, the library, local user groups, refereed papers, special interest groups, and more. The trade press has carried many articles in recent months about Digital's software licensing policies and DECUS' efforts in behalf of the user community. This is an example of an activity beyond those already listed. Similarly, the opportunity to talk with other users and Digital developers and marketeers in the halls between sessions is a valuable activity that is encouraged. The benefits of becoming involved in a leadership capacity are yet another story that can be extremely rewarding for the individual as well as the installation.

It was amazing for me to meet so many people at this trade show who were using equipment manufactured by Digital yet who were unfamiliar with DECUS. Maybe you have been aware of all the facets of DECUS, but I'm sure that many others in your area may not be as knowledgeable. Do them and yourself a favor and spread the word. Who know, the person that you convince to participate in an activity may just be that person who has the solution to a problem that you have been encountering, and you'll both benefit for it all.

See you in Nashville in April!

-Leslie

From the TOPS-20 Mailing List

Abstracted by: Clive Dawson

The following messages are selections taken from the TOPS-20 interest group, which is a mailing list maintained on the DARPA Internet. These items appear for information purposes only. Neither DECUS nor the authors assume any responsibility regarding the usefulness or accuracy of the information herein.

Date: Tue 16 Sep 86 09:08:54-PDT
From: Mark Crispin <MRC%PANDA@SUMEX-AIM.ARPA>
Subject: LPTSPL security problem

If you've been annoyed by the security problem that LPTSPL fails to assign PLPTn: at startup (and thus a user can assign PLPTn: directly and print without spooler accounting), there is a workaround. In your SYSTEM.COMD file do a SET PRINTER 0 FORMS NORMAL before the START PRINTER 0 command, and so on for each printer which does not already have a FORMS request. LPTSPL will grab the printers right away with this change.

Thanks to Tom DeBellis for this hack!

Date: Fri 10 Oct 86 21:18:23-PDT
From: Mark Crispin <MRC%PANDA@SUMEX-AIM.Stanford.EDU>
Subject: TOPS-20 microfiche

The latest LSM Product Summary has listings for TOPS-20 microfiche. The electronic store didn't know about the part numbers, so I don't know how much they are. Maybe one of the DEC people on this list could find out for us (hint hint).

KL EXEC sources	QT101-FR
KL monitor sources	QT100-FR
Front end sources	QT029-FR
KL EXEC, monitor, FE combined	QT102-FR
KS EXEC sources	QT038-FR
KS monitor sources	QT030-FR

It is probably too much to hope that buying the fiche from DEC would be cheaper than making it yourself.

Date: Sun 26 Oct 86 13:39:29-PST
From: Mark Crispin <MRC%PANDA@SUMEX-AIM.Stanford.EDU>
Subject: summer time madness

Friends,

You may be distressed to find out that Congress has changed the rules for summer time (a.k.a. Daylight Savings Time) again. Next year summer time will start on the *first* Sunday in April instead of the last. There is no knowledge of this in TOPS-20 as of 6.1 Autopatch #13. I'm sure DEC has recognized this problem and a future Autopatch tape will address it, but I'm sure a lot of customers will be caught napping next April.

TOPS-20 presently offers the following options for summer time:

- never apply summer time
- always apply summer time
- apply summer time by algorithm, using the following values:
 - the year in which the rule became effective (presently 1975)
 - the last day of the year on which summer time starts (the day picked is the Sunday preceding it)
 - the last day of the year on which summer time ends (the day picked is the Sunday preceding it)

The simplest approach is to set the effective rule year to 1987 and set the latest start day to April 7. However, this has the effect of cancelling summer time display for earlier years (haven't you noticed that you see things like "19-Jul-73 16:20:23-PST" instead of "19-Jul-73 17:20:23-PDT"?). Tenex had code to deal with the fuel shortage summer time of the 70's; I'm thinking of making the present algorithm cells be a set of vectors.

Question: does Canadian law follow US (e.g. is Canada going to change the start of summer time as well)?

Date: Mon 27 Oct 86 22:23:01-EST
From: Ittai Hershman <Staff.Hershman@NYU20>
Subject: Re: Daylight Savings Time

Hey guys, you're really behind in such matters. DEC solved the problem in VMS - you have to change the time manually!!!

-Ittai

PS: As I recall, it has been SPRed, and DEC's response was basically that since there was no way to implement DST and make everyone happy, they felt it should not be done in the OS.

Rocky Mountain DECUS Regional Conference

The Rocky Mountain VAX Local Users Group (RMVLUG) is hosting a DECUS Regional Conference at the foot of the Rockies in Denver, Colorado March 5-6, 1987. The conference is an excellent opportunity to participate in a mini-DECUS at a fraction of the cost of attending a National Symposium. Because the RMVLUG is composed almost exclusively of VAX/VMS users, the conference will dedicate all technical sessions to material on VAX/VMS systems in single node, networked and cluster configurations.

The conference will be held at the Denver Sheraton Tech Center, 15 minutes from the Denver airport. The Sheraton offers free shuttle service to/from the airport and is making single rooms available for \$65/night.

The conference committee has information on winter ski packages through the Keystone Resort, a three area complex (Keystone, Copper Mountain and Arapahoe Basin), located 90 minutes from Denver.

For a registration kit or additional information, contact Donna Santoro at (307) 745-7366.

Draft White Paper The Allocation and Mounting of Magnetic Tapes Under VMS*

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28 October 1986

I Introduction

Most VAX/VMS¹ sites fall into one of two categories regarding the way magnetic tapes are handled.

The first is the traditional VAX site: one or more VAX's with a relatively small number of users in a "friendly" environment. The users handle the allocation of tape drives and the mounting of magnetic tapes for themselves. If all the tape drives are allocated, a user needing to mount a tape, asks around and persuades someone to relinquish a drive.

The second type of site has only recently begun to use VAX's extensively. They are usually larger sites than the first type, with large numbers of users spread across a large physical area. Magnetic tapes are mounted for the user by a trained operator. Physical access to the machine room is usually restricted. These sites either have or have had other large computers manufactured by DEC (DECsystem-10's and/or DECSYSTEM-20's²) or other vendors.

This paper is concerned with the problems of sites of the second type. The current tape allocation and mounting system in VMS seems sufficient for sites of the first type. In this paper I will present a list of problems along with some possible solutions to these problems. I will also present and examine some other possibilities and considerations.

*Prepared for the DECUS VAX SIG, Commercial Working Group and the Large Systems SIG

¹VAX and VMS are trademarks of Digital Equipment Corp.

²DECsystem-10 and DECSYSTEM-20 are trademarks of Digital Equipment Corp.

II Problems and Solutions

The following is a list of problems that have been identified. Following each problem is one or more solution. The solution numbers are prefixed with the letter S. Where more than one solution has been presented, the capital letters (A-Z) have been used to separate the solutions from each other. These problems and their associated solutions are in no particular order and therefore their order should not imply any sense of preference or seriousness.

1. The **ALLOCATE** command can be used to allocate any unallocated tape drive to a process. The operator cannot prevent this allocation except by allocating the drive to an operator process. This, in turn, prevents the **Mount** command from ever succeeding because all the tape drives are allocated. This also allows a malicious or ignorant user to stop all access to tape drives by simply allocating them all.
- S1A. The **ALLOCATE** command is really not necessary (or desirable) at most sites. Simply making it a privileged command would solve the problem.
- S1B. In TOPS-10³ there was a command called **RESTRICT** which limited direct allocation (**ASSIGNment** in TOPS-10) of a restricted device to the operator and privileged system utilities. The operator also had a command, **REASSIGN**, that allowed him to pass an allocated device to another process (job in TOPS-10). Implementing a similar pair of commands in VMS and allowing the **Mount** command to allocate a restricted tape drive to a user would work fine. When a user deallocated (**DEASSIGNed** in TOPS-10) the restricted device, its restricted nature returned automatically. This would not require any changes visible to the users of the **ALLOCATE** command. Note that simply using the device protection scheme and/or **ACL's** on a device does not produce the same behavior.
2. The **REQUEST** command is not a clean interface for requesting that the operator mount a particular tape. This command requires the user to perform a multi-step process to get a tape properly mounted. First the user allocates a drive. Then he uses the **REQUEST** command to ask the operator to load a particular tape on a particular drive. The user finally issues a **Mount** command that may now fail because the operator forgot to put the write ring in the tape reel. Many sites have implemented **.COM** files to make this operation a single step for the user. The fact that so many have done so suggests the need for a single-step mount process.
- S2. The **Mount** command alone should pass enough information to the operator and VMS to allow the completion of a mount request. If a tape is labeled, VMS should check a data base of tape protections and ensure that the user is allowed access to the tape being requested. If he is not allowed access, he should be notified and the operator should not get any mount request indication. It might be appropriate for this to be a security alarm condition. If he is allowed access, the operator should be asked to mount the tape. If the user has asked that a foreign tape (one that is not in the protection data base, see S5 below) be mounted, then a visual identification string should be required by the **Mount** command and the operator request should clearly indicate that the operator is responsible for ensuring that the user should have access to the tape. If it is an unlabeled tape, the operator should tell VMS which drive he mounted the tape on. If it is a labeled tape, VMS should detect the mount, read the label and complete the request with no further operator intervention.
3. The mount system allocates the tape drives in a manner that causes higher usage of the low numbered drives than of the high numbered drives.
- S3A. The solution S2 above solves this problem also.
- S3B. If VMS must tell the operator which tape drive to use, it should at least rotate through all available drives of the appropriate density.
4. The **Mount** command does not have a visual identifier switch. Many sites allow foreign, unlabeled tapes to be mounted. The user needs a clean method of indicating that such a visual identifier should be checked before mounting a tape.
- S4. The solution S2 above solves most of this problem. The support for a visual identifier should be extended to the error logging process to facilitate detection of failing tapes.
5. There is no tape protection system. A user can ask the operator to mount any tape. The current system relies on the visual identification of the tape and its allowed users.
- S5. Implement a known-tape protection and ownership data base. As a very minimum this data base should contain:
 - (a) the UIC (or rights identifier) of the owner of the tape
 - (b) the allowed access types for each allowed user (including the owner); read-only, read-write, write-only for interactive processes and the same set for batch processes
 - (c) an indication of whether the tape is magnetically labeled or not and the type of label (ASCII, EBCDIC, etc.)
 - (d) the tape magnetic and visual label (they could be the same but should not have to be)
 - (e) the date of the last successful mount

³TOPS-10 is a trademark of Digital Equipment Corp.

- (f) a count of the number of times it has been mounted
- (g) an expiration date
- (h) the date it was added to the data base
- (i) a location field (which cabinet, room, building, etc.)
- (j) volume set name and relative position in volume set
- (k) user defined, reserved fields

The allowed user list should be by UIC (with wild cards allowed) or rights identifier. The utility for building and maintaining this data base should allow the owner of a tape to change the protection of the tape without the intervention of anyone else. In addition, the /OVERRIDE=ID switch to the MOUNT command must be made a privileged operation when the tape is a protected tape, i.e., one in the ownership data base.

- 6. There is no mount queuing system. If all tape drives are currently allocated, all succeeding MOUNT commands fail.
- S6A. Implement a mount queuing system using a first come first served scheme with consideration given to different tape densities (see S13 below).
- S6B. Implement a mount queuing system as S6A above with the added feature that the operator have the ability to override the system and select which request he will service next.
- S6C. Implement an absolute priority mount queuing system with operator override of request priority possible.
- 7. The MOUNT command blocks DCL. If a user wants to mount more than one tape at the same time he must mount each in a sequential fashion.
- S7. The MOUNT command should make a mount request and then return to DCL command level by default. Succeeding MOUNT commands would be processed in the same way. Interactive users would get a message as each request they had pending was satisfied. A MOUNT/WAIT command could be used in batch to insure that a batch command file waited for all necessary mount requests to be completed before continuing. A MOUNT /CHECK or a SHOW QUEUE /TAPE command would allow a user to examine the status of any mount requests he has pending.
- 8. There is no way for the batch queuing mechanism to tell if all the tape resources necessary for a particular batch job are available before the job is started. Tape deadlock situations are easily produced and difficult to remedy.

- S8. Implement a switch to the SUBMIT command where a list of required resources could be provided such as:
/RESOURCES=(TAPES:(DENSITY:1600,COUNT:2))
- 9. Any automated tape protection system will probably require that the protections revolve around the magnetic tape label. Users can currently change the label written on a tape to anything they want using the INITIALIZE or MOUNT utilities.
- S9A. Make the INITIALIZE command an operator privileged command and take the /INITIALIZE switch out of the MOUNT command.
- S9B. Add a new privilege called "May Initialize Tapes" and only give it to the operator by default.
- 10. The BACKUP utility reinitializes tapes as it uses them (especially system backups). This will cause problems with any tape protection and/or allocation system that might be implemented.
- S10. Make BACKUP respect existing labels. It should be emphasized that when BACKUP is supplied with a list of tape labels, the intention is that BACKUP use those tapes. BACKUP should verify the tape mounted has the appropriate label before it writes on it and leave the same label when it is finished writing on it.
- 11. The DISMOUNT /NOUNLOAD command allows the user to leave a tape loaded but unallocated. This is a security problem. If the user has not allocated the drive, another user can now allocate the drive and get access to the first user's tape.
- S11A. Remove the /NOUNLOAD switch from the DISMOUNT command. This assumes that an appropriate REWIND command will be implemented.
- S11B. Make /NOUNLOAD a privileged command. This assumes that an appropriate REWIND command will be implemented.
- 12. The DISMOUNT command does not force a DEALLOCATE of the drive. This causes two problems. The first is a continuation of problem 11 above. The second is related to problem 1 above. Users tend to forget that they allocated a drive. If they do not enter a DEALLOCATE command, the drive will remain unusable to the rest of the user community until the offending user logs out.
- S12. Solutions S1A and S1B above solve this problem.
- 13. Users must know the device names of the tape drives available to them. This includes knowing that some drives are 800-1600 bpi drives, some are 1600 bpi only, some are 1600-6250 bpi, some are streaming and some are start/stop. On systems with many tape drives, this can be confusing.

- S13. Implement a `/DRIVE=density` switch to the `MOUNT` command that will pick a tape drive of the appropriate density. If `=density` is left off, assume some default, probably 6250. If this switch is present, don't require a device specification.
- 14. Sites that do not have 24 hour per day, 7 day a week operator coverage have a problem. There is currently no way for a user to determine that an operator is or is not on duty. A user should probably not be able to make a mount request and batch jobs that need tapes should not start if there is no operator on duty. The `REPLY /DISABLE=TAPE` option is not sufficient.
- S14. Implement a "no operator on duty" flag that can be queried in some simple manner and make the `MOUNT` command check to make sure there is an operator before making a request. Solution S8 above should also be extended to check this flag.
- 15. If a user requests that a tape be mounted "write-enabled", the mount system does not check to make sure that the drive is hardware write-enabled; that is, the write ring is in place in the mounted tape. The reverse is also true. A tape can be mounted with the write ring in place when the user requested read-only access.
- S15. Have the operator portion of the mount system check the status of the write ring and require that the operator re-mount the tape with the ring in or out as requested by the user. The user should never know that this happens.
- 16. The operator has no clean method of making a tape drive completely inaccessible. This is especially needed when a tape drive is broken. Allocating the drive to an operator process is not a good solution.
- S16. Implement a command similar to the `DETACH device` command in TOPS-10. This command completely removes the device specified from visibility to any device dependent commands. This also implies that the `ATTACH device` command is needed to restore the visibility of the device.
- 17. There is no method of removing an allocated tape drive from another process. This is especially painful when a user allocates a drive, uses the drive and then starts a long running program without deallocating the drive. The user would normally gladly give up the drive if he did not have to lose all the run time he may have already accumulated.
- S17. Implement some privileged command that will allow the operator to remove an allocated device from another process without interfering with the running image.
- 18. VMS does not support standard IBM⁴ EBCDIC labels and tapes.
- S18. The tape mounting system should recognize and process standard IBM labels. The EBCDIC translation would only be applied to the tape label portions of the volume set; no translation need be applied to the date file sections of the volume set.

- 19. There is no method of redirecting a request for a device. It sometimes occurs that only a particular drive will read a particular tape. This shouldn't happen but it does.
- S19. Allow the operator to redirect a mount request from a specific drive `xxxx:` to another specific drive `yyyy:`. This eliminates the need for a `MOUNT` followed by a `DISMOUNT` followed by another `MOUNT`.
- 20. The `MOUNT` and `DISMOUNT` command pair do not produce sufficient accounting information. Specifically, the total elapsed time that a drive is under the control of a user is not collected.
- S20. Improve the accounting entries provided by the mount system so that the total elapsed time that a drive is allocated by a user is collected in some way. A possible method is to provide both a "mount" and a "dismount" entry such that the elapsed time between the entries could be calculated.

III Other Considerations and Possibilities

I realize that systems like the tape protection data base may be very site dependent. Digital would also probably like to make any system it implemented into a separately licensed (and paid for) product. It therefore might be more appropriate to make the mount utility into a user modifiable system, somewhat like the user modifiable print symbionts. "Exits" might be provided for attaching tape security subroutines for example. I would be happy to work with Digital on the design of such a system.

Many of the problems I have presented are related to security. These need attention as soon as possible. Most have very simple and straight-forward solutions.

At least one of the problems presented concerns `BACKUP`. `BACKUP` should have no regard for the labels on a tape, except for the requirement that one be present. The labeling of tapes is an administrative nicety for tracking and protecting tapes. Most sites need to have consistent labeling for tracking tape failures and usage. Letting `BACKUP` change the tape label defeats this property of labeling.

⁴IBM is a registered trademark of International Business Machines Corp.

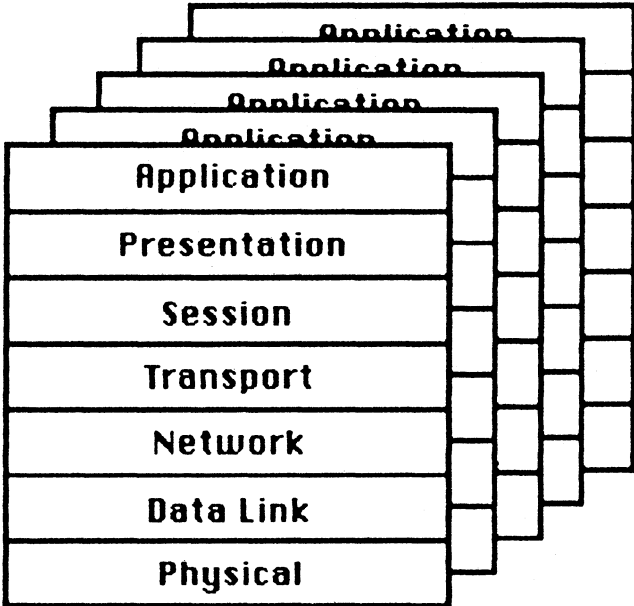
A general observation about mounting tapes is that the user has too much control over the system and the operator has none. In large computer installations, the orderly use of non-shared resources requires that the operator have some level of control over those resources. The MDA (mountable device allocator) and GALAXY systems under TOPS-10 could be used as examples of an implementation that works.

IV Acknowledgments

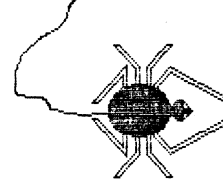
The problems and solutions presented in this paper are the results of the efforts of many people. Most of the information presented in this paper comes from the investigation and implementation of the University of New Orleans, `MOUNT` and `Magtape Inventory System`. Because of this, I owe special thanks to Charles Boyd, Robert Adam II and I. Joseph Autin; all of the UNO, Computer Research Center staff.

NETworks

The NETWORKS SIG Newsletter



The Editor's Cobwebb



By Vickie Hess

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Surprise! Surprise! Yes, this really is a Networks newsletter you are reading, and not just a steering committee list!! I apologize for not printing over the last few months, but, hopefully, now we can get back to printing on a regular basis again.

First off - there have been a few changes -
Number 1 - I am no longer Vickie Hancock, but am now Vickie Hess. I can be reached at work by calling 214-387-8636.
Number 2 - As usual, I am requesting all you writers out there to send me articles!! As we are all aware of, the Networks and Communications fields of computers are growing by leaps and bounds, so help other users stay current by sending in your hints and kinks, problems and solutions, etc. I can accept submissions on Macintosh floppies, through DCS (for those of you who have access) and good ole hard copy. If you can't submit in any of these formats, give me a call and perhaps we can work out something!!

As you are reading this you are probably starting to think about the upcoming symposia, which is scheduled for April 27-May 1 at the Opryland Hotel in Nashville, Tennessee. (Or, at least, what can you get on your boss, in order to convince him to let you go!) This symposia promises to be just as exciting and hectic as all the others have been! For those of you who haven't been yet, it is a very busy and nerve-wrecking, but informative week!! More info to follow next issue!

VH

The Chairman's Corner:
By: Bill Brindley
Networks SIG Chair

The Networks SIG has a number of exciting activities for your information and enjoyment at the upcoming DECUS Symposium in Nashville. On Sunday, April 26, 1987, we are sponsoring a comprehensive set of Networking/Communications related Pre-Symposia Seminars (9am-5pm). The titles of these seminars are provided below:

NETWORKS SIG Sponsored Pre-Symposia Seminars
(Spring DECUS 1987)

INTRODUCTION TO OSI (OPEN SYSTEMS INTERCONNECT)
By: Steve Wendler

ADVANCED TERMINAL SERVER TOPICS
By: Ken Izbicki

DESIGNING & IMPLEMENTING PERSONAL & WORKSTATION NETWORKS WITH
VAX SYSTEMS
By: Bill Hancock

DECNET/SNA PRODUCT SET OVERVIEW
By: Kelly Caudill

NETWORKS COMMUNICATIONS & PROTOCOLS: A COMPREHENSIVE SURVEY
By: Ken O'Mohundro

DIGITAL'S ETHERNET AND LAN PRODUCT SET
By: Bob Petrella

X.25 AND PSI TECHNICAL OVERVIEW
By: Skip Morris

DECNET-DOS & DECNET ULTRIX - USE & APPLICATIONS DEVELOPMENT
By: Dave Mitton

ADVANCED ETHERNET CONCEPTS AND CONFIGURATIONS
By: Rich Graham

On Monday, April 27, 1987, at 11am the Networks SIG Keynote
Address will be presented by Gordon Bell. More details are
provided below:

NETWORKS SIG KEYNOTE ADDRESS - GORDON BELL

Gordon Bell, previously Vice President, Engineering, Digital
Equipment Corporation will present the Networks SIG Keynote
address on Monday at 11am. Gordon Bell is currently the
Assistant Director, Computer and Information Science and
Engineering Directorate at the National Science Foundation in
Washington, D.C. The abstract of Gordon's Keynote address
follows.

CHALLENGES FOR COMPUTING IN THE NEXT DECADE

Since ENIAC, Government funding (eg military, NSF) has played
an important role in computing research, creating new computers
and applications. The CISE Directorate at NSF was formed to
focus on computing, and includes both research and operations

(NSFnet and five supercomputer centers). The challenges and
opportunities appear to be: a revolution in computation brought
about by the evolution of mainline computing which exhibits a
high degree of parallelism; needs for networking to
interconnect Campus/Local Area Networks sites; software
engineering and its diffusion and needs within all disciplines;
artificial intelligence and robotics; and next generation Ultra
Large Scale Integrated Systems.

++++

In addition the Networks SIG is offering a large number and
variety of sessions throughout the week on all aspects of
networking/com- munications. Do plan to come. It will be a
very informative and worthwhile experience.

See you in Nashville!

Bill Brindley

Submitted SPR: M-Plus
Submitted by: Gary Maxwell

Secondary Pool Depletion During FAL Operations

Problem:

During certain DECnet operations involving FAL on RSX-11M-Plus
systems, secondary pool becomes depleted, causing serious
system degradation. This has been observed when the following
operations are performed on a VAX/VMS node: a wildcard copy
operation from the RSX node to the VAX node, and a VMS image is
run which opens and reads many files on the RSX node. FAL uses
secondary pool to hold file logging records which are
eventually passed to the logger task, FALLOG.

Diagnosis:

Observing secondary pool using RMDEMO while performing one of
the above operations show that free pool space declines
steadily. When the operation completes, and FAL invokes FAL-
LOG, secondary pool space is recovered.

It has also been observed that if the VMS image is aborted, and
the process stopped, then FAL can exit on the RSX node without
requesting FALLOG. This causes log packets to remain in second-
ary pool until the completion of the next file operation which
invokes FALLOG.

In the situation where secondary pool is completely exhausted, FAL becomes "loop-bound," apparently waiting for secondary pool to become available. Although this is the standard "recovery method" for pool exhaustion by RSX tasks, it is NOT a satisfactory method to be used by the task which actually caused the pool exhaustion.

Solution:

FAL's handling of logging packets must be improved. FAL violates a principle rule of operating systems by assuming that secondary pool is a limitless resource. Since FAL cannot pre-determine how many log packets it will generate during the life of the logical link, FAL should periodically request FALLOG to process waiting packets. It is not acceptable to require users to apply workarounds to avoid the problem, and it is not acceptable to require additional secondary pool to be allocated just to accommodate FAL's behaviour.

Workaround:

One method to eliminate the problem is to disable logging by FAL. Discovering how to do this was not easy. To disable logging, edit the parameter file [137,10]DECPRM.COM on the DECnet-Plus distribution. Search for the symbol "\$DFLLG" and set it to false; e.g.

```
.SETF $DFLLG
```

Perform a Component Mode NETGEN to rebuild FAL. When the new version of FAL is installed, it is no longer necessary to install FALLOG.

Subject: ANSI Meeting Report/ X3S3.7
Submitted by: Joel Snyder

Meeting Report -- ASC X3S3.7

I attended the ASC X3S3.7 (public data network access) meeting in Reston, VA in November as a DECUS representative.

This meeting was primarily an informational one for the attendees. Much of the work of the past year was input to the ISO meeting in Tokyo in October, and at this meeting we reviewed the output of that meeting and considered action items to begin work on over the next study period.

ISO 8882/1 deals with X.25 conformance testing, and preliminary results of balloting indicated that this would be moved into the DIS (Draft International Standard) stage. This standard will provide a series of tests which can be used to determine conformance to Recommendation X.25 according to the principles laid out in ISO 7776/8208. This work will make the matching-up of X.25 implementations easier. Already, Digital has included some support for ISO 7776/8208 in their PSI product, and the 8882/1 standard can be used to determine conformance.

Some work was done in the area of interworking and routing. The new buzzwords used in interworking discussion are "Intermediate Systems" and "End Systems." In the connection of networks, current work is being done on ensuring that the requirements associated with interworking at the Network Layer are covered by OSI standards. Proposals (known as New Work Items) were generated to stimulate work on interworking. In routing, the discussion centered on routing protocols between End Systems and Intermediate Systems (N4053) over the Network Layer (ISO 8473). N4053 was narrowed to deal with connectionless networks. The USA and France butted heads quite heavily in routing discussions, since France is not persuaded that any routing is required at the network layer. N4053 was recommended to move to DP (Draft Protocol) status. Finally, the Canadians acted to put an end to Digital's humor with the comment that "The need for a unit expressed in micro-fortnights is less than clear. A micro-fortnight is 1.2096 seconds, and thus units of 1 second would appear to be sufficient."

DP 9068 (Provision of the Connectionless Mode Network Service by X.25) is heavily opposed by the US, mostly because no member of ANSI appears interested in implementing this. The UK, Canada, Japan, and USA all voted negatively on progression of this standard, and it will not move forward until the proponents are able to resolve those negative votes.

DP 8880 (Protocol Combinations to Provide and Support the OSI Network Service) was moved to DIS (Draft International Standard) status. There was significant editing at the meeting, mostly brought about by the progress of other ISO documents. In particular, references to 9068 (mentioned above) were removed, and a new annex from 8881 (Operation of an X.25 to X.25 Interworking Unit) was added. 8880 is strongly supported as a useful tutorial to help implementors of OSI networks.

DP 8881 (Use of the X.25 packet level protocol in local area networks) has stalled mostly over basic disputes in the issue of LLC1 or LLC2 as the underlying service provided by the LAN to the X.25 protocol. The US has always supported LLC1 very strongly. However, now that some members of ANSI have had an opportunity to attempt implementation over both LLC1 and LLC2, the general field of agreement is narrowing. In particular,

the editor of DP 8881 (F. Burg) is from AT&T, and has shown strong bias towards use of LLC1. It is perhaps his own persistence (including his position as Vice-Chair of X3S3.7) that has held this view so strongly. At the Reston meeting, X3S3.7 was instructed by Tokyo attendees to reconsider the technical merits of LLC1 vs. LLC2.

DIS 8648 (the Internal Organization of the Network Layer) will become an International Standard as soon as IS processing is completed by the ISO.

A strong current in ISO has been towards FDT, or Formal Description Techniques, for protocols and services. Two languages are currently used in most ISO discussions, LOTOS (a temporal logic system) and Estelle (a more algorithmic language). A general feeling of support for the provision of FDTs as adjunct information in ISO standards was expressed in Tokyo. However, caution with the possible lack of review of FDTs as well as intended purpose was expressed. We can expect to see a lot more of these, particularly from European ISO members. Extensive discussions involving all of these points took place.

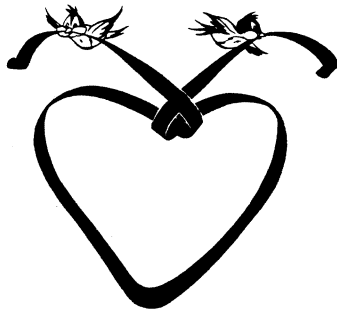
The next meeting of ASC X3S3.7 will be in Tucson, Arizona, from January 12 - January 16.



**OFFICE
AUTOMATION**

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From The Editor . . .

Due to popular demand (and some excellent data) we have reprints of data from two different Sessions presented in San Francisco. The first is a sample sheet, with explanation, on how to calculate CPU units for chargeback. This data was presented in a session by Joe Whatley (of Nielsen Media Research). After the session, Joe was flooded by requests for copies of the formula he used for these calculations...and here it is!

The second session reprint presented in this issue (in its entirety) is a humorous look at ALL-IN-1 as the "New Religion". What do you think, will we get many converts?

On the more serious side, DEC provided us with some excellent information on ALL-IN-1 in a VAXCluster environment. This is an area which has been growing in use over the last year or so, I would be happy to print any 'real-life' stories regarding your own ALL-IN-1 cluster.

Finally, we have another exciting submission for our regular 'Notes' column from Mark and C.J. I would like to hear from our readers who are using (or planning to use) the Notes product...has our Notes column been helpful to you? What other types of information would you like to see discussed in the future. (These comments will not be used for publication)

Keep up the great work...your submissions make the Office Automation section of this newsletter possible. Send submissions and comments to my attention at the address listed below, or call if you have questions or comments regarding our newsletter.

Regards,

Therese

Therese LeBlanc
0A Newsletter Editor
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Wheeling, IL 60090
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CPU UNIT DOCUMENTATION

CALCULATION OF CPU UNIT for CHARGE BACK

Total charge out for 1987	\$600,000.00
1) CPU	\$566,120.00
2) DISK	\$25,380.00
3) PRINT	\$8,500.00
o <u>Current CPU hours</u>	346.4
(based on July and August CPU hours for - both nodes of the cluster).	
o*1 <u>Current Units</u>	457.2 CPU-MIP-HRS
(current CPU hours * VAX 11/750 MIPS rating) (346.4 CPU Hrs/month * (0.66 MIPS * 2 11/750's))	
o*2 <u>Future Units</u>	2286.0 CPU-MIP-HRS
(current CPU-MIP-HRS/month) * (increase in CPU-MIP-HRS factor) (457.2 CPU-MIP-HRS) * 5	
o <u>90% utilization by 1/1/87</u>	2057.4 CPU-MIP-HRS
(2286 CPU-MIP-HRS) * 90%	
o <u>75% of utilization is Billable</u>	1543.0 CPU-MIP-HRS
o <u>Change to yearly basis</u>	18516.0 CPU-MIP-HRS
o <u>Price/Unit Calculations:</u>	
\$566,120.00 = P(72%*18516) + 50%P(19%*18516) + 25%P(9%*18516)	
	PRIME NON-PRIME HOLIDAY
\$566,120.00 = 13331.5P + 1759P + 416.6P	
\$566,120.00 = 15507.1P	

P = \$36.50 / cpu unit

Now, to get a CPU/HOUR dollar charge, multiply the **cpu unit** times the effective cluster MIP rating. e.g., \$36.5/cpu unit * 6.5 MIP yields a charge per CPU HOUR of \$237.25.

CPU UNIT DOCUMENTATION

EXPLANATIONS:

*1- Performance testing for ALL-IN-1 (DEC) provided the following information:

- o 1 VAX 11/750 may be rated in two ways:
 - . 2/3 of 1 , or 0.66 MIPS
 - . Maximum of 15 simultaneous users

In our environment, the VAX 11/750 with 8 MB of memory can effectively support 10 - 12 simultaneous users at a 90% CPU utilization level. Based on our experience with ALL-IN-1 users, whether they be DIS or Production users, a value of 10 users constitutes the 90% CPU utilization level.

*2- A VAX 8650 with 32 MB of memory may be rated in two ways:

- . 5.9 - 6.1 MIPS in an ALL-IN-1 environment
- . 90 - 100 simultaneous users

For the same reasons as the 11/750, we use 90 as the effective number of simultaneous ALL-IN-1 users available for 90% utilization of the 8650.

The combination of one 11/750 and the 8650 clustered (as they will be), provides either a combination of 6.5 MIPS or a 100 simultaneous user cluster.

- o From a 20 user cluster system to a 100 user cluster system yields an effective increase of 5 times in the CPU-MIP-HR factor.
- o From a 1.32 MIP cluster system to a 6.5 MIP cluster system also yields an effective increase of 5 times in the CPU-MIP-HR factor.

BY: -Joseph Whatley
Data Collection Computer Svces.
Nielsen Media Research
375 Patricia Ave.
Dunedin, FL 33528-8190

*** SAMPLE ***

ALL-IN-1 and Local Area VAXcluster Systems

FINAL ANALYSIS OF DATA

o	Average time saved/day/person - 0.5 hours	
o	# of subscribers actively using AI1 on a daily basis - 125	
o	60 subscribers in the \$13.5K average salary range -	\$52,255.98
o	55 subscribers in the \$22.5K average salary range -	\$79,859.36
o	10 subscribers in the \$32.5K average salary range -	\$104,838.71
TOTAL SAVED/YEAR IN TIME ALONE....		\$236,954.05
o	5 additions to complement delayed or cancelled @ \$12,000.00/year.....	\$60,000.00
TOTAL SAVED:.....		<u>\$296,954.05</u>

Calculations:

Using .5 hours saved/day --

\$13,500.00/year	==	\$1,125.00 /month
	==	\$259.64 /week
	==	\$51.93 /day
	==	\$6.70 /hour

If save .5 hours /day, then for one person:

	==	\$3.35 saved/day
	==	\$16.75 saved/week
	==	\$72.58 saved/month
	==	\$870.98 saved/year

Total saved for 60 people \$52,259.00 saved/year

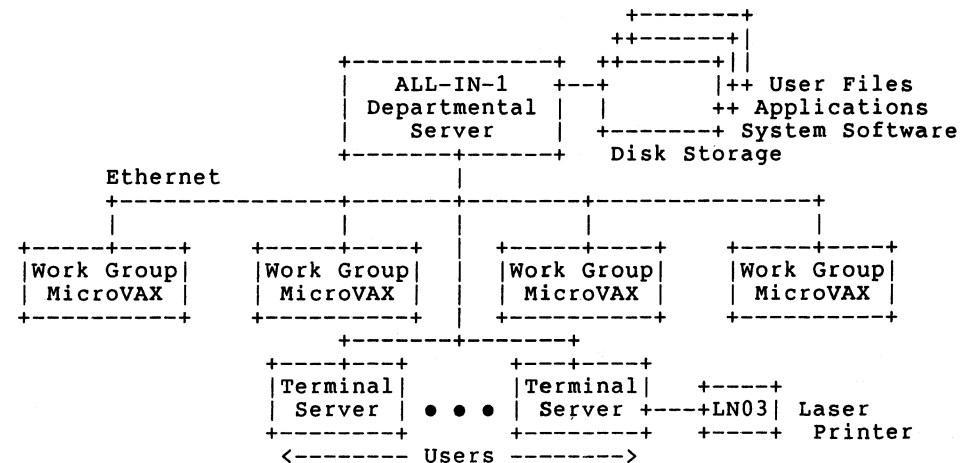
When implementing an Integrated Office and Information System, you must often address a wide variety of computing needs. While some users require only document processing, electronic mail, and other common office applications, individual work groups may need access to special applications to do their jobs.

All users demand good, predictable system response. This means often evaluating the tradeoffs between a single, centrally supported large system like the VAX 8550 and a network of MicroVAX systems which are optimized to individual work group needs.

With Digital's recent announcement of the Local Area VAXcluster software and ALL-IN-1 V2.1 you now have the flexibility to implement a network of modular, cost-effective MicroVAXes, while retaining all of the system management and support efficiencies of a large centralized VAX installation.

How does ALL-IN-1 work in a Local Area VAXcluster?

A typical ALL-IN-1 system with Local Area VAXcluster software can be configured into multiple work groups as shown below:



Depending on the number of work group MicroVAXes to be connected, the ALL-IN-1 Departmental Server can be a MicroVAX Configuration 5 or a larger system like the VAX 8500. All system software, application software, and user files reside on the disk drives connected to this Server. Software installation and updates and user file maintenance, such as BACKUP/RESTORE, are handled by a single system manager. From the user perspective, the file sharing and resource sharing provided by a single system are ensured, and the worry of having to maintain individual local systems at the work group level is eliminated. These advantages are maintained with any number of work group MicroVAXes, from two to eight or more.

While an ALL-IN-1 System with Local Area VAXcluster software retains all the advantages of a large central system, it also adds some unique advantages of its own. Because the number of work group MicroVAXes can grow incremental, computing resource planners can start with the capacity they need today without fear of running out of expansion capability in the future. To accommodate additional office applications and/or office users, work group MicroVAXes are simply added to the network in a manner which keeps the total system cost-effective on a per user basis.

Today's office and information systems perform a major role in running the business in many corporations. When the system is down for any reason, the business suffers. With the dynamic load balancing features of Digital's Local Area VAXcluster technology, you can ensure that users will have access to the office functions they need when they need them. Should any work group MicroVAX go down for any reason, the additional systems on the network can temporarily pick up the load to ensure that the business continues to operate.

With ALL-IN-1 and Local Area VAXcluster software, departments which use resource consuming applications, such as financial modeling, need no longer worry about trying to balance high computing resources demands on a single system against the needs of users who need high performance word processing and electronic mail. Now, work group MicroVAXes can be dedicated to providing good, predictable performance to the word processing and mail user community, the resource intensive user community, or both. Everyone gets the office functionality and performance they need without sacrificing the advantages of central system maintenance and user file sharing.

Guidelines for running ALL-IN-1 in a Local Area VAXcluster

Before implementing ALL-IN-1 in a Local Area VAXcluster, or any ALL-IN-1 installation, it is important that you work with Digital to develop a capacity plan. This insures that you can properly meet the growing needs of your user community. However, there are some general guidelines when implementing an ALL-IN-1 Local Area VAXcluster:

- 1) ALL-IN-1 users should not run their applications on the ALL-IN-1 Departmental Server, they should run them on a work group system. Work group systems should have a local disk for system use (paging and swapping).
- 2) When used as the Departmental Server, low end processors (MicroVAX II, VAX 8200 or equivalent) can support up to eight (8) MicroVAX II class ALL-IN-1 work group systems.
- 3) In configurations of up to three (3) MicroVAX II class work group systems, the Department Server should be configured with a minimum of 2 RA81 disk drives.
- 4) In configurations of four (4) to six (6) MicroVAX II class work group systems, the Department Server should be configured with at least 3 RA81 disk drives.
- 5) In configurations of seven (7) or eight (8) MicroVAX II class work group systems, the Department Server should be configured with a minimum of 4 RA81 disk drives.
- 6) Each MicroVAX II work group system can support up to 20 active ALL-IN-1 users provided that the work group system is configured with 16MB of memory and has a minimum of one RD53 disk to support paging and swapping.
- 7) MicroVAX II class work group systems can support up to 12 active ALL-IN-1 users provided that the system is configured with 8MB of memory, and has one RD53 disk to support paging and swapping.
- 8) Use a VAX 8500 with 16MB of memory and four (4) or more RA81 disk drives when you need to support more than eight (8) MicroVAX II class work group systems or when you need additional computing power for things such as large or frequent batch processing, large simulations, communications, etc.

When will ALL-IN-1 be supported in a Local Area VAXcluster?

ALL-IN-1: THE NEW RELIGION

The current version of ALL-IN-1, Version 2.1, will support Local Area VAXcluster.

Implementing ALL-IN-1 in a Local Area VAXcluster represents the best of both worlds! You can now have all of the cost and growth benefits of a distributed, network of MicroVAX II systems and the system management and support efficiencies of a large, centralized VAX installation.

TO: XXXXXXXX
FROM: XXXXXXXX
SUBJECT: Spellfix

Eye thought ewe mite bee interested in a revue of a currant hot software product witch is used fore finding spelling errors in word processing text.

Eye halve bin using won four quiet a wile and found it too bee in valuable. Eye halve bin trying two improve my spelling for sum time now since my sectary always commented that it isn't too grate.

Weather eye like it or knot, eye no eye cud right bettor if eye wood practice moor, and width the spelling checker two help me it will bee easier too fined my mistakes. Awl eye can say is that a spelling cheker is such a terrific program that ever business cud fair bettor if they wood use won.

The spelling checker eye am using is such a good programit has maid me interested in the vendor's grimmer checker, witch eye will bee testing next. Eye will send ewe a revue of that program two.

P.S Eye used the Spellfix on this memorandum and it didn't found won error.

Editor's Note: This article was adapted with permission from Steve Leib's article in the July 1986 issue of the OCC Newsletter, Oklahoma State University.

The following is a reprint of one of the 'lighter' sessions offered at the recent Symposium. It is reprinted here with the blessings of it's creator(s): Mark Seger & friends.

WHAT IS A RELIGION?

- 0 something that has a relatively small, but committed following which approaches fanaticism
- 0 when newer "things" come out, they're frequently ignored (a lot of older zealots refused to watch TV or use a telephone)
- 0 like most traditional religions, there is a hierarchy
 - * the implementors (usually revered and/or criticized)
 - * the high priests are the interface between the implementors and the rest of the world and if they don't have the answer at least know where to get it
 - * the "unwashed" who "think" they're priests and tell everybody the wrong thing
- 0 examples
 - * TECO (the greatest religion of them all, to which I am a chartered member!)
 - * APL, DSM, VMS, DTR
 - * and lots, lots more

WHY DO WE NEED RELIGION?

- 0 you always have a friend to turn to when in need of help
- 0 religious people word harder and are usually more productive
- 0 religious people save their bosses \$\$\$\$
- 0 contest to outdo each other tend to produce advances
- 0 it's fun to be different

WHY IS THE ALL-IN-1 RELIGION SO UNIQUE?

- 0 it has more followers than many other religions
- 0 it is gaining followers more rapidly than other religions
- 0 although it touches ALL aspect of computing (from programming to work automation) there is STILL a small percentage of members
- 0 it's so big, there's room for lots of priests

SOME RELIGIONS HAVE DIED OFF

- 0 many people no longer even remember APL
- 0 VMS used to be a religion, not it's just a way of life

SOME EXISTING PRODUCT TURN INTO RELIGIONS LATE IN LIFE

- 0 RSTS has recently achieved religious status

SOME GO ON FOREVER!!!

- 0 just about every system at DEC has TECO installed on it

WHAT'S NEGATIVE ABOUT RELIGIONS?

- 0 it can be very exhausting trying to convert the atheists

WHAT'S THE BEST PART ABOUT BELONGING TO THE ALL-IN-1 RELIGION?

- 0 converting someone and then telling them I TOLD YOU SO!!!

BUMPER STICKERS:

- ALL-IN-1 users DO it with form
- ALL-IN-1 programming is 10% inspiration and 90% plagiarism

OUR BIBLE: The Holy SCRIPTures

A GREETING CARD: ALL-IN-1 (when you care to steal from the very best!)

There are of course several curious but well established rituals associated with the ALL-IN-1 religion. The function of these rituals have been lost in time. They include:

- 0 replacing the WPSDEF.WPL
- 0 pressing GOLD-W
- 0 dumping cache
- 0 logging out and back in again
- 0 running file cabinet repair

REAL VERSION 2 TECHIES

- ...can't spell "mailbox"
- ...understand TXL's
- ...have modified OAGBL
- ...do everything in the main process
- ...use hardcopy mode
- ...don't know what CBI stands for

- ...never misspell ALL-IN-1
- ...have 10 versions of AlTRACE.LOG in their directory
- ...never use on-line help
- ...never write on-line help
- ...define their own Gold keys
- ...ALWAYS stack their commands
- ...write DSAB's for fun
- ...understand the V2 logging facility
- ...drive system managers crazy
- ...have memorized the Mini-Reference
- ...find all the bugs in ALL-IN-1 security
- ...raise their priority when there are more than 5 users
- ...try to type VMS commands with > 's
- ...know that GOLD W stands for "Wonder why (it) won't work"
- ...can tell you which modules were written in KOALA
- ...send fixes in with their bug reports
- ...think all technical writers are clairvoyant
- ...work in logical time
- ...actually prefer to eat out of machines
- ...have a UDP for everything
- ...have mighty ideas for v2.3
- ...remember their last vacation - in 1976
- ...write their shopping lists in RUNOFF

REAL ALL-IN-1 PROGRAMMERS

- ...never edit in the subprocess
- ...use MRGATE instead of VAXmail
- ...think poetry is SCRIPTS that rhyme
- ...want a date for Friday night even more
- ...login to ALEXTRAS accidentally when they're not awake yet
- ...think "open a window" means use an overlay
- ...have their own DEFAULT menu
- ...can spawn faster than any other programmer
- ...never use WPSPLUS to edit named data of forms
- ...are waiting for a TPU replacement for WPSPLUS
- ...want an animal like Datatrieve has

As you know, we ALL-IN-1 types duplicate functionality already provided by well-known, accepted software systems like VMS. Well, in taking that a step further, we've "duplicated" some rules that have been around for a long time and are fairly well accepted.

So, here are fifteen SCRIPTments (I refuse to call them COMMANDments) - or should they be DOfments...?)

- | | |
|----------------------------------|--|
| 1)This is the true religion | no one worships wombats |
| 2)Worship not graven images | that's just the User Interface |
| 3)Take not the holy name in vain | never spell ALL-IN-1 in lower case |
| 4)Keep the sabbath holy | just like most of our subsystems... |
| 5)Honor your forefathers | even if they left you to convert from V1 |
| 6)Thou shalt not commit adultery | it's bad enough our bodies get sold |
| 7)Thou shalt not kill | the main process (on VMS 4.4) |
| 8)Thou shalt not steal | anything that doesn't work |
| 9) Don't lie | you knew the UNWIND would stack dump |
| 10)Thou shalt not covet | a bad script (see #8) |

There "were" fifteen, when they got handed down, the original test couldn't be read past ten because of an obscure KOALA accvio so this is all we've got.

The missing Five?

- 0 steal from your friends
- 0 Thou shalt not use the sub-process
- 0 DO unto others...
- 0 Thou shalt not dwell on performance
- 0 RTFM!

Notes on Notes

-- Discussions on VAX Notes
Volume 1, Number 3

by Mark Hyde and C J Trayser
VAX Notes Support Specialists
Digital Equipment Corporation

With the holidays and two issues behind us, we would like to say thanks for the very favorable responses that we have had to the column.

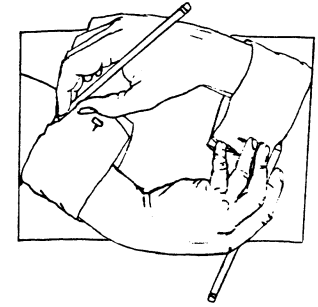
We hope that in time this column will meet most of your needs and answer your questions on VAX Notes. We plan on covering a wide variety of topics in the future, but we still have a few 'getting started' topics to cover. With that in mind, this month we are going to look at the use of editors within VAX Notes.

In our last article we looked at the various items which you could specify in your profile, one of which was the editor that you wished to use. It is NOT our goal to teach you how to use an editor, but to present and discuss the features and advantages of the built-in editors and how they compare with spawned and callable editors.

The essence of computer conferencing is entering ones thoughts into the system such that others can read them and be enlightened. This means that the method used to enter text must be easily adaptable for any skill level. In non-technical environments, the users are not likely to be experienced in using editors or word processors; therefore, for Notes to be effective, there must be a simple, easy to learn editor. On the other hand, in a very technical environment, where people sometimes consider the use of their favorite editor a religious issue, Notes must be flexible enough not to unduly impose.

The Built-in Editor - EVE

The VAX Notes human interface is written in the VAX Text Processing Utility (TPU), which was introduced with VMS V4.0. It makes sense then that the editor of choice in Notes is TPU based. In fact, the built-in editor in VAX Notes is EVE, the Extensible VAX Editor, hopefully now familiar to VMS V4 users. EVE is an easy to learn, easy to use editor which can get new 'noters' participating in conferences quickly. This editor is fully integrated into VAX Notes and offers the standard EVE keypad in addition to an EDT and WPS keypad interface. Note that these are not the 'real' EDT and WPS, just redefinitions of the EVE keypad to emulate these other editor's keypad functions. So, whether you are using the built-in EVE, WPS, or EDT interface, the



following discussions will apply.

When an editor is used to enter data into a conference everything that is typed on the screen is stored in a temporary area until the note has been finished. The temporary storage areas used by EVE are called buffers. During an editing session many buffers may be in use. The section of the terminal screen which displays the contents of a buffer during the edit session is called a window. With most other editors or word processors you are only shown one window at a time, thus only one buffer can be displayed at a time. However, TPU is designed to allow the use multiple windows and buffers at the same time, and VAX Notes makes extensive use of this ability.

Remember John Q. Noter? It's time to look in over his shoulder again for an example of an average display of a VAX Notes topic. John has just created a conference and has the following topic on his screen.

Notes>

```
-----
Note 1.0      Welcome to the Widget Conference      No replies
NODEA::J_NOTER "John, V.P. Sales"          9 lines 2-JAN-1987 08:34
-----
```

```
This is the WIDGET conference. Any and all discussions
pertaining to WIDGETS should be held in this conference
while I am out of town. I'll dial in from my hotel room
once a night while I am away to answer questions here as
they arise. Others in the production department may also
know some of the answers, so don't send me mail, post your
questions here unless they are of a personal nature.
```

```
John
[End of note]
```

This display, although it looks quite simple, actually contains 5 windows mapping 5 different buffers. If you are already a TPU user, experiment with the TPU SHOW commands while in the notes editor for some insight here.

When you create a topic with the WRITE command, you are placed in an empty buffer where you can type and edit to your heart's content. (Some of us have been known to spend the better part of an hour composing our words of wisdom!) You can also use the appropriate keypad function to include text from sources outside of Notes. All the features of the EVE editor are available from within Notes. You can set margins, spawn out to another process, create multiple windows, define keys, etc. If you have DECspell installed on your system, you can even issue the SPELL command to the editor and spell check the current buffer. When you exit the edit session, Notes prompts you for a title and then transmits your buffer to the conference file.

When you respond to a topic with the REPLY command, Notes sets you up with two windows by default. The top window contains the

text of the note you were reading when you entered the REPLY command and the bottom window is for entering your reply. Frequently what you say in your reply is based on what you were just reading. With that text available to you in an editing window, you can use the OTHER command to move to and manipulate it for reading, or for quoting from it by cutting and pasting to your reply window. This "two window" behavior can be controlled by using the REPLY/NOEXTRACT command instead of REPLY. REPLY/NOEXTRACT causes Notes not to extract the previous reply and place it into the buffer, but rather it give you an empty buffer similar to a WRITE command. This can speed up the processing of a REPLY over slow network links, or if you know exactly what you want to say.

One of the most popular things that people like to do with editors, (especially TPU based ones), is to define keys. We all have our favorite EDTINI.EDT file, and possibly already have our favorite TPUINI.TPU files. Although VAX Notes cannot currently use customized TPU editors, it does have an initialization file that can be used for, (among other things), defining keys for use within the editors.

If you create the Notes initialization file, naming it NOTES\$COMMAND.TPU in your default directory, VAX Notes will automatically read the file and process the commands during Notes startup. If you want to name the file something else or keep it somewhere other than the default directory, simply define the logical NOTES\$COMMAND to point to the file. Here is an example of a key definition command from the VAX Notes sample conference, (which comes with the product), topic number 8.

```
define_key ("eve_fill_paragraph", key_name ("F",shift_key),
           "fill paragraph", eve$x_user_keys;
```

This TPU command will define the PF1 F (Gold F for you WPS folks) key sequence to execute the eve_fill_paragraph function. A quick review of the key definition parameters:

```
eve_fill_paragraph      - the function to be bound to a key
key_name("F",shift_key) - the key to bind the function to
                        (PF1 is the default shift key)
"fill paragraph"        - text to display on help diagram
                        when you press PF2
eve$x_user_keys          - the key map where this definition
                        is to be applied (VAX Notes uses
                        several key maps and key map lists)
```

Another common use for the NOTES\$COMMAND file is to set margins for your editing sessions. If you noticed, our sample note on the previous page has margins in use for the text. A note written with good margins is much easier to read than one written with 'wall to wall' text. You could use the EVE SET LEFT MARGIN and/or EVE SET RIGHT MARGIN commands every time you enter a note, but with NOTES\$COMMAND you don't have to. Again, an example from the sample conference:

```
set (margins, notes$x_edit_buffer), 9, 74);
```

This command sets the margins in your main notes editing buffer to 9 and 74. These settings from the NOTES\$COMMAND file can always be overridden by issuing new SET MARGIN commands while in the editor.

Other Editors - Called and Spawned

The built-in editor and its different keypad interfaces offer you the most flexibility and integration with the VAX Notes product. However, for those die-hard EDT fans who just won't use anything but the real EDT - we'll let you guess which one of us falls into that category - all is not lost. VAX Notes has the ability to use most any editor you have that generates ASCII text files as its output. By the way, the VAX Notes manual indicates that WPS-Plus can be used as an editor from Notes, but this is not entirely correct. WPS-Plus files are stored in a non-ASCII format, thus Notes cannot read the input file. To use WPS/VMS you must spawn it and send the file via Document Transfer (DT) out to a VMS ASCII file.

There are two methods for using other editors, calling them and spawning them. If you have an editor that is callable (such as EDT) then you can use it from Notes without the overhead of creating a subprocess. You simply specify it in your profile by issuing the following command:

```
SET PROFILE/EDITOR=(myeditor,CALL)
```

When Notes starts to set up the editing environment in response to a WRITE or REPLY command, it will look in SYS\$SHARE for myeditor\$SHR.EXE and invoke it if it is found.

For those editors that are not callable, Notes can spawn a subprocess to run the editor. All that is required is that you have a command procedure to run the editor that can accept two parameters. When using an editor like this, Notes spawns a subprocess and invokes the command procedure passing it an input file specification and an output file specification. An example of a command procedure used to spawn an editor is in the sample conference, note number 2.1 (topic 2, reply 1).

Even if an editor does not work with ASCII files by default, such as WPS-Plus, almost every editor has an option to create an ASCII file and can probably be made to function with Notes. The important point is that Notes can pass the command procedure an ASCII input file and expects an ASCII output file to be returned.

Here is an example of a command procedure to invoke WPS-Plus as a spawned editor in VAX Notes. It is somewhat cumbersome because the user must transfer the files into and out of the WPS-Plus file cabinet. Perhaps some UDP's could help here. Also, you will not be able to maintain special WPS-Plus attributes like bolding and underlining, etc.

```
$! Command procedure to use Standalone WPS-Plus/VMS as your
$! editor from within VAX Notes
$!
$! set noverify
$!
$! If there is no P1 parameter then the command was a WRITE
$! and not a REPLY
$!
$! IF P1 .EQS. "" THEN GOTO NOINPUT
$!
$! Rename the NOTESXXXXX.TMP file to something more friendly.
$!
$! RENAME 'P1' WPSNOTES.IN
$!
$! Some reminders to the users.
$!
$! WRITE SYS$OUTPUT "The note to which you are replying is in the"
$! WRITE SYS$OUTPUT "VMS file SYS$LOGIN:WPSNOTES.IN - If you wish"
$! WRITE SYS$OUTPUT "to reference it as you compose your reply,"
$! WRITE SYS$OUTPUT "use the DT option to transfer this file into"
$! WRITE SYS$OUTPUT "your file cabinet and then edit it."
$! WRITE SYS$OUTPUT " "
$!
$! NOINPUT:
$!
$! WRITE SYS$OUTPUT "After you finish your reply, use the DT"
$! WRITE SYS$OUTPUT "option to transfer the new document to VMS."
$! WRITE SYS$OUTPUT "For this procedure you must use the output"
$! WRITE SYS$OUTPUT "file name of: SYS$LOGIN:WPSNOTES.OUT."
$! WRITE SYS$OUTPUT " "
$!
$! INQUIRE/NOPUNCTUATION X "Press return when ready..."
$!
$! DEFINE /USER SYS$INPUT 'F$TRNLNM("SYS$OUTPUT")'
$!
$! Invoke WPS-Plus. If you use some command other than WPS,
$! then insert it here.
$!
$! WPS
$!
$! Now clean up the debris
$!
$! IF F$SEARCH("SYS$LOGIN:WPSNOTES.OUT") .NES. "" THEN -
$! COPY SYS$LOGIN:WPSNOTES.OUT 'P2'
$! IF F$SEARCH("SYS$LOGIN:WPSNOTES.IN") .NES. "" THEN -
$! DELETE SYS$LOGIN:WPSNOTES.IN;*
$! IF F$SEARCH("SYS$LOGIN:WPSNOTES.OUT") .NES. "" THEN -
$! DELETE SYS$LOGIN:WPSNOTES.OUT;*
$!
$! EXIT
```

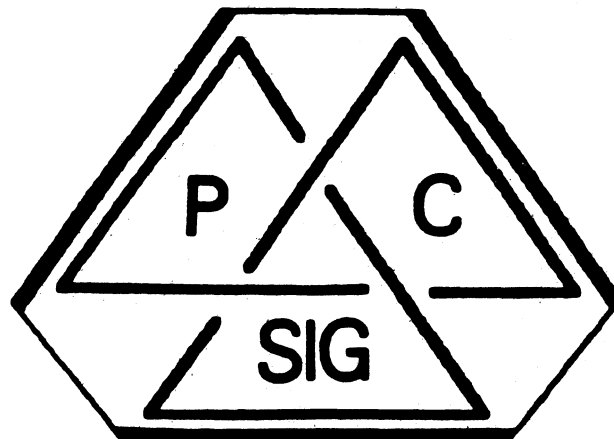
In general, the only differences that you will see when using a called or spawned editor over a built-in editor is that when REPLYing to or FORWARDing a note, the note that you are replying to or forwarding will be placed in your main editing buffer instead of in a separate window. You may, however, notice some performance differences, especially when using a spawned editor. Also, make sure that anyone using a spawned editor has sufficient PRCLM in their SYSUAF record.

This should be enough to allow you to become dangerous with the use of the editors. Even though VAX Notes is flexible enough to allow the use of most any editor, we feel that the built-in editor with its 3 interface choices should suit most users.

Now that we have our profiles and our editor choices taken care of, we hope you are all busily pounding away at your keyboards. Next month we'll look at the NOTES\$COMMAND.TPU file a little more closely.

Happy Noting!

Personal Computer Special Interest Group



Newsletter

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- Rainbow Wish List Ballot
DEC will review your responses at the Spring '87 DECUS Symposia
- DECmate Wish List Ballot
DEC will review your responses at the Spring '87 DECUS Symposia
- PC Postscript
Send in your questions or answers
- PC SIG Volunteer Form
Here is your chance to help your SIG
- Information Resource Sign Up Sheet
Do you have an area of expertise that you would be willing to share with others? Use this form to let us know

NOTE: All of the articles in this month's issue were either submitted anonymously or were written by someone from the SIG Leadership. If you want to contact an author, please refer to the contact information at the front of these Newsletters.

"A Cheap RD31 for your PRO"

by
Gary Rice, Contributing Editor

In the June '86 issue of the DECUS SIGs Newsletters, the first PRO "hardware-hacker" debuted. His article described how to add memory to your PRO. However, you had to be pretty good with a soldering iron to perform the change.

In my article, I am about to tell you how to acquire an inexpensive (in relative terms) RD31, and install it on your PRO with only a phillips screwdriver.

First of all, the RD31 half height 20 mb 5¼" hard disk is actually a Seagate Technology ST225 disk drive. Normally, DEC will form an agreement with a manufacturer to market a device with the DEC logo. Then DEC will modify the device (disk, tape, printer, etc) slightly so that it is DEC unique, thus a captive market. This time, though, they didn't do that. The RD31 is indistinguishable from the Seagate Technology ST225. I suspect that DEC IS recording serial numbers of the units it sells, though.

I have found that you can buy the ST225 from all sorts of local and mail order computer companies for a LOT LESS than DEC sells the unit for. The DECUS commercialism policy doesn't permit me to mention dollars, but a glance through BYTE magazine will give you an idea how prevalent and inexpensive the ST225 is.

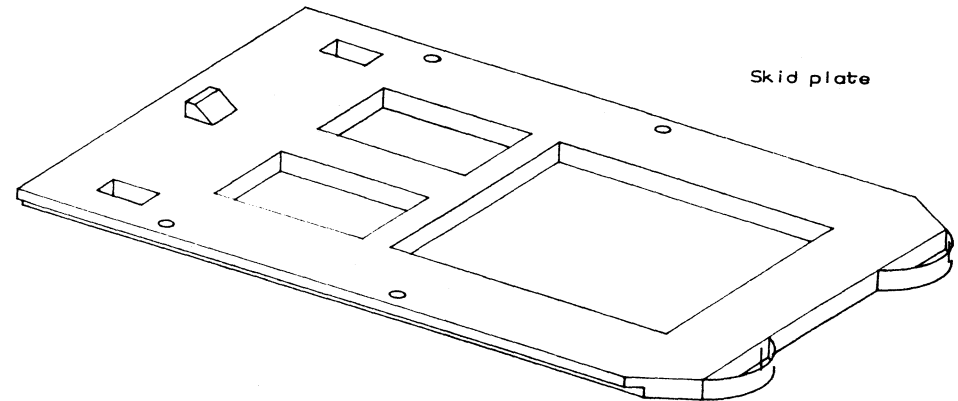
When you buy an ST225, make sure that it comes in a pink plastic envelope that is sealed. Inside the envelope there must be a printout of the Q/A diagnostic run. If you get a disk that doesn't meet these specifications, you are getting a used drive that could be a lemon.

Installation of the drive is very simple. Take it a step at a time:

- a. If you are extremely cautious, take a backup of your files on the hard disk you are going to replace. I did this when I installed my first ST225. When I installed the second one, I didn't bother. Both the ST225 and the RD51 that I started with are rugged and I have had NO problems switching the drives in and out of the system.
- b. Unplug the power cord from the system unit.
- c. Slide the release levers at each end of the system unit forward and lock them in place.
- d. Remove the system unit cover. It will lift right off.
- e. In the center of the system unit is the hard disk. Begin its removal by depressing the silver latch at the base of the drive. At the same time, slide the drive forward about an inch so that you can reach the cables attached to its rear. Also, be aware of static. You should ground yourself

to something metal before you touch the disk (after it has been slid forward). Once the disk has been slid forward, it no longer has ground protection.

- f. Disconnect the two ribbon cables (data and control cables) from the rear of the drive. I recommend disconnecting the cables from the drive rather than the controller (in the card cage) because the controller connection is a lot more delicate than the drive connection.
- g. Disconnect the power cable for the drive from the side of the power supply. There will be 2 cables, so be sure that you unplug the right one.
- h. Slide the disk out of the system unit. Treat it gently.
- i. Place the disk on a flat surface and place the ST225 next to it. Turn both disks over so that you can see the circuit boards.
- j. Remove the skid plate from the bottom of the old disk. To do this, you must remove 4 phillips screws. Once the screws are removed, the plate will lift right off. The illustration will help you identify the skid plate.



- k. Attach the skid plate to the ST225. Make sure that it is oriented in the same way. Use the phillips screws that you removed from the other disk.
- l. Turn both drives over. Carefully disconnect the power cable from the old disk. Set it aside until you have stored the old disk in a safe place. Remember that the data it contains is still intact, so select a place that is free from static, dust and most importantly MAGNETIC FIELDS!
- m. Carefully connect the power cable that you set aside to the ST225 disk. The cable must be completely seated in the

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socket, but you must be careful not to crack the circuit board when you push it into place. The location of ALL cable connections will be in the same place as the old disk so you should have no trouble locating where they go.

- n. Slide the ST225 part way into the system unit and connect the 2 remaining cables to their connection points.
- o. Slide the ST225 all the way into the slot. Make sure that the latch has locked in place.
- p. Replace the system unit cover and plug the power cord back in.

That concludes the hardware portion of the installation.

The last phase consists of loading P/OS. You may use P/OS v1.7, v2.0, v2.0A or v3.0. I have tested v1.7, v2.0 and v3.0. I don't have v2.0A so I can't tell you anything further about that release. The following table lists some comparisons that I have made:

P/OS	Disk Size ¹	Relative I/O rate ²
v1.7	10 mb	0.7
v2.0	10 mb	1.0
v3.0	20 mb	3.0

¹ This column is the "size" that P/OS actually thinks that the disk is.
² These figures represent some crude timing tests that I have run. They are the relative number of I/O's completed per second running the same program on each version of P/OS. I used v2.0 as a base point.

Loading P/OS is no different than you have done in the past. However, you MAY encounter a hardware problem being reported by the PRO on the hard disk. If the load process continues (and it should) the "hardware" problem will disappear as soon as the controller starts the formatting process.

The 2 disks that I got came with no manuals. However, I have heard that some ST225's come with manuals that say that the ST225 must me run in a horizontal position. I don't use the system stand, so I can't give you a true-life-experience recommendation about running the disk oriented vertically.

DEC maintenance may be a problem. I don't have hardware maintenance on mine. I use DEC trade-in counter repair service. The local counter is 5 miles away, and so far, it has been a lot cheaper to swap the broken parts rather than pay a flat monthly rate. On the other hand, I don't use my PRO every day so the 3-5 day turn-around is OK for my needs.

If you STILL are not convinced that you too can upgrade your hard disk, feel free to contact me. I would be interested in hearing from you.

PR0gramming Quickie

Occasionally, you may encounter a file on your system that you can't examine via normal high level language file handling instructions. Here are two MACRO routines that will open the file and allow you to read it via your favorite high level language.

```

; OPEN.MAC - This subroutine OPENS for read an input file
;             using RMS file characteristics NOT SUPPORTED
;             in a high level language
;
; AUTHOR:      Gary Rice
;
; CREATED:     October 6, 1985
;
; REVISIONS:   Dec. 8, 1985 - Added P5 to the parameter list (GAR)
;
; INPUTS:      P1 (INTEGER*2) - Number of characters in file name
;              P2 (CHARACTER*n) - The file name
;
; OUTPUTS:     P3 (INTEGER*2) - RMS Open completion code from STS field
;              P4 (INTEGER*2) - RMS Open completion code from STV field
;              P5 (INTEGER*2) - FAB address of the open file
;
; NOTES:       This routine uses logical unit #1 for the open file
;
;*****
;              .TITLE  OPEN
;              .IDENT  /V1.1/
;
; Global definitions
;
;              .GLOBL  OPEN
;
; RMS Macros
;
;              .MCALL  ORG$,POOL$B,POOL$E
;              .MCALL  FAB$B,FAB$E
;              .MCALL  $OPEN,$STORE
;
; Parameter offsets
;
P1=2.
P2=4.
P3=6.
P4=8.
P5=10.
;

```

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```

; Data section
;
.PSECT DATA,RW
.EVEN
FABLK: FAB$B
F$ALQ 10. ; File size - ignored here
F$BPA 0 ; No private buffer
F$DNA 0 ; Default file name
F$DNS 0 ; Length of def file name
F$FAC FB$REA ; Block READ access requested
F$FNA 0 ; File name - run time
F$FNS 0 ; File name length - run time
F$FOP FB$DLK ; Close Unlocked always
F$LCH 1 ; LUN assigned to the file
F$MRS 512. ; Maximum record size (bytes)
F$NAM 0 ; No name block
F$ORG FB$SEQ ; Sequential file
F$RAT FB$BLK ; Records on block boundary only
F$RFM 0 ; NO record type given
F$XAB 0 ; NO Extended attributes
FAB$E
;
.EVEN
POOL$B ; Pool buffers
P$FAB 1 ; One for the FAB
P$BDB 1
P$BUF 512. ; Buffer size
POOL$E
;
.EVEN
ORG$ SEQ,<GET> ; Open sequentially (read only)
;
.EVEN
ARGLST: .BYTE 1,0
.WORD FABLK
;
; Executable code
;
.PSECT CODE,R0
OPEN: .EVEN
; Store file name addr and length in file access block (FAB)
;
MOV #FABLK,R1 ; R1 = addr of the FAB
MOV @P1(R5),R2 ; Get count of file name chars
$STORE R2,FNS,R1 ; Store count in FAB
MOV P2(R5),R3 ; Get addr of file name
$STORE R3,FNA,R1 ; Store addr of file name in FAB
$STORE #0,RFM,R1 ; Store 0 in RFM field of FAB
;

```

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```

; Try to open the file.
;
MOV #FABLK,R1 ; Get addr of FAB
$OPEN R1
MOV O$STS(R1),@P3(R5) ; Get STS error status
MOV O$STV(R1),@P4(R5) ; Get STV error value
MOV R1,@P5(R5) ; Return the FAB address
RTS PC
.END
;
CLOSE.MAC - This subroutine CLOSES a file that was opened
; by the OPEN.MAC subroutine
;
; AUTHOR: Gary Rice
;
; CREATED: December 8, 1985
;
; REVISIONS: None
;
; INPUTS: P1 (INTEGER*2) - FAB address of the open file
;
; OUTPUTS: None
;
; NOTES: This routine closes a file who's FAB is passed
; in the argument list
;
;*****
;
.TITLE CLOSE
.IDENT /V1.0/
;
; Global definitions
;
.GLOBL CLOSE
;
; RMS Macros
;
.MCALL $CLOSE
;
; Parameter offsets
;
P1=2.
;
; Executable code
;
.EVEN
.PSECT CODE,R0
CLOSE: $CLOSE @P1(R5) ; Close the file

```

RTS PC
.END

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Here is a sample program that illustrates how to call these MACRO routines from a FORTRAN program.

```
C DECUS.FTN - This program illustrates the use of the OPEN and CLOSE
C subroutines by accessing the home block of the system
C disk and reading the volume label.
C
C AUTHOR: Gary Rice
C
C CREATED: December 10, 1985
C
C REVISIONS: None
C
C INPUTS: None
C
C OUTPUTS: None
C
C NOTES: None
C
C*****
C
C CHARACTER*1 RECORD(512)
C CHARACTER*20 FILNAM
C
C INTEGER*2 PARM(6), STATUS(2)
C INTEGER*2 ADDR
C
C Begin
C
C FILNAM(1:20) = 'LB0:[0,0]INDEXF.SYS ' ! Select the INDEX file
C CALL OPEN (19,FILNAM,STATUS(1),STATUS(2),ADDR) ! Open it
C CALL GETADR (PARM(1),RECORD) ! Get the buffer address
C PARM(2) = 512 ! Set the buffer size
C PARM(5) = 2 ! Point to record #2
C CALL WTQIO ("10400,1,1,,STATUS,PARM) ! Read the record
C IF (STATUS(1) .NE. 1) GOTO 200 ! Check for errors
C WRITE (5,10) (RECORD(I), I=15,26) ! Display the result
10 FORMAT (1X,12A1)
200 CALL CLOSE (ADDR) ! CLOSE the file
C END
```

Send me your OWN PROgramming Quickie (RX50 preferred) and I will publish it here as part of an ongoing column in the newsletter.

Software Migration from PRO 350 to PRO 380
Points of Interest and other stuff
Digital Equipment Corporation

OVERVIEW OF PRO 380 DIFFERENCES FROM PRO 325/350

The Professional 380 is the newest member of the PRO 300 series. It differs from the Professional 350 in several ways. One of the most important of these is that it uses the more powerful J-11 processor chipset instead of the F-11 processor chipset.

It also has increased graphics functionality in that it supports a new high resolution mode, and it offers a palette of 4,096 colors to choose from instead of the 256 available in the 350.

The hardware layout is somewhat different: the first 512MB of memory resides on the system module, the base video subsystem is also on the system module, and the Extended Bitmap Option is a daughtercard on the system module. This means that there are additional slots available in the cardcage for options.

The following items summarize the major factors to be aware of when migrating software to the PRO 380:

- P/OS V2.0A required for PRO 380 support
- High Level language code (Pascal, Fortran, ...) should run the same
- Odd Address Traps treated differently (of interest to Macro programmers, mainly) (FORTRAN programmers note: if you omit an argument in a subroutine call, FORTRAN fills in the missing argument with a dummy variable set to -1. This can be viewed by the system as an address, causing an "Odd Address Trap". - ed.)
- The values and usage of some Video Controller registers have been modified for greater functionality

This memo is meant as an introduction to the PRO 380 and some of its features most likely to be used by software developers. For full details of any of the hardware in the PRO 300 series, consult the Professional 300 Series Technical Documentation Set:

Volume I -- Kernel System EK-PC300-V1-001 Volume II -- System Options EK-PC300-V2-001

ODD ADDRESS TRAP DETAILS

Because the microprocessors used for the 350 and 380 are different implementations of the PDP-11 architecture, they handle certain events differently. The most common difference of importance to programmers, and only Macro programmers really, is the handling of Odd Address Traps.

The F-11 processor will attempt to execute a word instruction that has specified a byte address, by decrementing the address to start at the previous word boundary (an even address).

The J-11 chip will cause a trap to vector 4, notifying the system that an improper instruction has been attempted. P/OS will take control and halt execution of the offending program. This implies that Macro code which has been executing properly on the 350 may have been generating undetected odd addresses, which will be trapped on the 380.

An example of this type of problem is shown below. The first instruction will execute on the 350 (F-11) but will cause the 380 (J-11) processor to trap. The second instruction will execute properly on both machines.

- A. MOV 1,WORD+1 ; Move value to word
- B. MOVB 1,WORD+1 ; Move value to byte

Another example would be an attempt to branch or jump to a byte address.

To see if any problems such as this exist with your code, you need to run the task on a 380. Any odd address traps will be reported, along with the PC of the trapped instruction. With the .MAP and .LST files you can find the source code instruction and modify it. In most cases, there will be an equivalent byte instruction available to the programmer (eg CMP -> CMPB, TST -> TSTB, INC -> INCB etc.). The substitution of the corresponding byte instruction will solve the problem. In the case of branching or jumping to an odd address, you would have to modify the address to be a word address, or correct any algorithms used to calculate addresses.

Any Odd Address Traps occurring in Digital Classified software application packages should be reported to the Customer Support Center for your area. Again, it is important to note that P/OS V2.0A is required for PRO 380 support.

VIDEO SUBSYSTEM DETAILS

For those programmers doing graphics by manipulating the PRO video hardware, there are two important areas of difference in the 380 video subsystem:

- where the video logic is located, and the ID value returned
- increased functionality, which leads to register differences of interest to Macro programmers

The video controller logic is physically located on the system module, but the controller registers appear to the programmer to be in 'logical' slot 6 of the card cage. The term 'Logical' is used because the physical slots in the card cage are numbered 0 to 5. The addresses of controller registers are in the I/O page, starting at the 22-bit address 17774000, with 200 bytes reserved per controller. This puts slot 6 at the address 17775400.

The other major point to be made is that the ID value of the video controller is not the same as that of the 350 video controller. The 350 video controller returns the ID 1002 (octal). The 380 video controller can return two possible values:

- 50 (octal) No EBO present
- 10050 (octal) EBO present

Please note that the WIMP\$ system directive is still the supported means of determining the slot of a device. This call returns the ID's of all devices present in the machine, and from this you should test for the graphics configuration of the system. Also note that Bit 13 of the Control Status Register (Offset 04) remains a valid way to test for the presence of the Extended Bitmap Option.

The following notes summarize the additions and differences between the 30 video controller registers and those of the 380. They are best utilized in conjunction with the PRO 300 Technical Manual. In most cases, the registers are backwards compatible, that is, the bit definitions that have been in use continue to work in the same way, and new features can be accessed via bits that have previously been reserved.

Identification Code Register (IDR) XXXXXX00

Professional Section

- Different ID values (listed above)

ROM Address Register (RAR) XXXXXX02

- Remains reserved for system use

Control Status Register (CSR) XXXXXX04

- Bit 0 was line mode (240/256 visible lines) on PRO 350

- Bit 1 was interlace mode definition on PRO 350

- Bits 2-4 were reserved on PRO 350

- Bits 0-2 now define Line Mode on PRO 380, according to the following table:

Bit Value	Lines of Text	Scan Lines	Inter-laced	Frames
0 0 0	240	263	no	60
0 0 1	256	313	no	50
0 1 0	240	525	yes	30
0 1 1	256	625	yes	25
1 0 0	480	525	yes	30
1 0 1	512	625	yes	25
1 1 0	-----RESERVED-----			
1 1 1	-----RESERVED-----			

Note that the first four values are compatible with the values used with the PRO 350, while the latter four values are unique to the 380.

- Bit 3 was reserved on the 350, and now indicates external synchronization (read only)
- Bit 4 was reserved on the 350, it now controls video amplifiers on/off (0 is on, 1 is off)
- Bits 5-15 remain unchanged

Plane 1 Control Register (P1C) XXXXXX06

- Bits 0-5 remain unchanged
- Bit 6 was reserved on the PRO 350, it now controls Plane 1 Scroll Disable

Professional Section

- Bits 7-15 remain reserved

Plane 2 and 3 Control Register (OPC) XXXXXX10

- Low Byte remains Plane 2, High Byte remains Plane 3
- Bits 0-5 and 8-13 remain unchanged
- Bits 6 and 14 are Plane 2 and 3 Scroll Disable, respectively
- Bits 7 and 15 remain reserved
- See Plane 1 Control Register for description of use of the bits in each byte

Color Map Register (CMP) XXXXXX12

- 350 has 2 bits of blue, 3 bits each of red and green to set color intensity. 380 has 4 bits each for all three colors
- Bits 0-11 remain unchanged
- Bits 12 and 13 were reserved, now are two more bits of blue intensity
- Bit 1 is most significant bit - Bit 0 - Bit 13
- Bit 14 was reserved, now is additional bit of green intensity
- Bit 4 is most significant bit - Bit 3 - Bit 2 - Bit 14 is least significant bit
- Bit 15 was reserved, now is additional bit of red intensity
- Bit 7 is most significant bit - Bit 6 - Bit 5 - Bit 15 is least significant bit
- Old use of these bits will yield same result
- Red and green gain additional bright shade and some intermediate shades due to least significant bit being added. Blue gains intermediate shading and three additional brighter shades.

Scroll Register (SCL) XXXXXX14

- Vertical dimension of video memory has increased from

256 to 1024, with 4 pages of 256 each in low resolution mode, and two pages of 512 each with high resolution selected

- Low Resolution (240/256 visible line mode):
 - Bits 0-7 remain unchanged
 - Bits 8 and 9 select page in video memory
- High Resolution (480/512 visible line mode):
 - Bits 0-8 define vertical offset
 - Bit 9 selects page in video memory
- This register remains byte addressable for backward compatibility, i.e. INCB @ SCL has the same effect on both machines
- Use of page select bit(s) can swap video images instantaneously

X Register (X) XXXXX16

- Remains unchanged

Y Register (Y) XXXXXX20

- Bits 0-7 remain unchanged
- Bits 8 and 9 were reserved, now extend Y address range
- Bits 10-15 remain reserved

Counter Register (CNT) XXXXXX22

- Remains unchanged

Pattern Register (PAT) XXXXXX24

- Remains unchanged
- Is double buffered on 380, new value loaded when CSR ready bit is set

Memory Base Register (MBR) XXXXXX26

- Bits 0-6 were used to define starting address of video memory with:

- 32 Kbyte boundary for 350
- 128 Kbyte boundary for 380

- Bits 2-8 are now used to define this starting address
- Bits 0 and 1 are now set to 0

Professional Section

PRO Software List Update
 coordinated by
 Gary Rice, PC SIG PROfessional Editor

In an effort to keep you informed about software being shipped from various vendors, I began the following list in April, 1986. This list reflects information that I received as of December 20, 1986. An asterisk by an entry indicates that the item has changed or been added since the last time the list was published.

Last month I attempted to include list prices for the various products on this list. It was my understanding that the commercialism policy had been revised to allow this. At the last minute, I found out that the new policy is still being reviewed. When they formal decision to adopt the new policy is announced, I will add this information to the list. For now, the column will remain blank.

DEC Software	List Price	Last Rev	Source of info	Still Avail?	P/OS v3 Supported?
20/20		1.0.54	User	Yes	UNK
Athena/Graph		1.0	DEC	Yes	UNK
BASIC-11/RT-11		(Replaced -	See BASIC-PLUS/RT-11)		
BASIC-PLUS/RT-11		3.0	DEC	Yes	N/A
CT*OS		1.0	DEC	Yes	UNK
Design Graphix /Executive		1.0	User	Yes	Yes
Easyentry		3.0B	DEC	Yes	UNK
FORTTRAN IV/RT-11		2.6	DEC	Yes	N/A
LOGO		1.4	DEC	Yes	UNK
MAIL-PLUS		1.0	DEC	No	N/A
MJA Accounts Payable		5.2	DEC	Yes	UNK
MJA Accounts Receivable		5.2	DEC	Yes	UNK
MJA General Ledger		5.2	DEC	Yes	UNK
MJA Order Entry/Inventory		5.2	DEC	Yes	UNK
MJA Payroll & Personnel		5.2	DEC	Yes	UNK
NPL Information Management		1.4	DEC	*No	UNK
Phoenix-PRO		1.0A	DEC	Yes	UNK
P/OS (Diskette)		1.8	DEC	*No	No
P/OS (Hard Disk)		3.1	User	Yes	N/A
PRO 2780/3780		1.2	DEC	*No	No

Professional Section

PRO Application	Version	Vendor	Yes	No
Starter Kit	1.0	DEC	Yes	No
PRO/Associate	1.0	DEC	No	No
PRO/BASIC	*1.4	*DEC	Yes	*Yes
PRO/Comm (diskette)	1.7	DEC	*No	No
PRO/Comm (hard disk)	3.0	DEC	Yes	Yes
PRO/CPM-80	1.1	DEC	UNK	UNK
PRO/Datatrieve	2.0	User	Yes	Yes
PRO/DECnet	2.0	DEC	Yes	Yes
PRO/FORTTRAN-77 Debug	(Replaced - See	PRO/Toolkit	Symbolic	Debugger)
PRO/IVIS	3.1	DEC	Yes	*Yes
PRO/Laboratory Subroutine Lib.	1.2	DEC	Yes	*Yes
PRO/NAPLPS	1.0	DEC	*No	*No
PRO/Office Workstation	*2.0	DEC	*Yes	*Yes
PRO/PRODUCER Toolkit	1.6	DEC	Yes	*Yes
PRO/RDT	*1.1	DEC	*Yes	*Yes
PRO/Scientific Subroutine Lib.	1.3	DEC	UNK	No
PRO/SIGHT	1.0	User	Yes	Yes ¹
PRO/SNA	1.1	DEC	*No	No
PRO/Smart Mailer	1.0	User	Yes ²	UNK
PRO/Toolkit	3.1	User	Yes	Yes
PRO/Toolkit BASIC-PLUS-2	2.3	DEC	Yes	Yes
PRO/Toolkit COBOL-81	2.4	DEC	Yes	Yes
PRO/Toolkit DIBOL	1.7	DEC	Yes	Yes
PRO/Toolkit FORTRAN-77	5.0	User	Yes	Yes
PRO/Toolkit PASCAL	1.2	User	Yes	Yes
PRO/Toolkit Real Time Library	2.1	DEC	Yes	*Yes
PRO/Toolkit Symbolic Debug	2.0	DEC	Yes	Yes
PRO/VENIX	2.0	DEC	Yes	N/A
PRO/Videotex Professional	1.0	DEC	Yes	UNK
CTS-300	1.0	DEC	Yes	N/A
Professional Real Time Lib/RT-11	1.0	DEC	Yes	N/A
PROSE PLUS	2.0	User	Yes	*Yes
RS/1	12.0	*User	Yes	UNK
RSX Host Toolkit	3.0	DEC	Yes	Yes
RT-11	5.3	DEC	Yes	N/A
Supercomp-20	1.28	User	*No	UNK
Synergy	2.0	User	Yes	*Yes

Professional Section

Professional Section

VAX Host Toolkit	UNK	3.0	DEC	Yes	Yes
WPS/Plus	695	1.0	DEC	Yes	Yes ¹

PRO / SIGHT Graphics Contest

Sponsored by the DECUS PC SIG
(PROfessional Working Group)

¹ Restrictions apply or modifications required
² This product is available thru the DECUS "Tape" Library ONLY

Submission guidelines and rules:

3rd Party Software (alphabetically)	Vendor	List Price	Rev	Info Source	Still Avail?	P/OS v3.0?
Fingraph	Graphic M*I*S		2.0	DEC	No	UNK
*IT*OS	Intermation		5.2	User	Yes	UNK
Online Disk						
Unfragmentor	By Hand		1.4d	User	Yes	Yes
PRO/Menu Manager	Wasatech Computer		1.0	User	Yes	No
PRO/Session Logger	By Hand		2.0	Vendor	Yes	Yes
RDM Relational						
Data Manager	Interactive Tech.		4.0L	User	Yes	Yes
TK!Solver	Software Arts		1 (2A)	User	No	UNK

1. All images must have been generated on a PROfessional 300 using a standard PRO/SIGHT graphics program (must be editable by PRO/SIGHT).
2. Submissions may be copyrighted by author but they will be considered available for public distribution and use at no cost (public domain).
3. Images must be submitted on RX50 formatted diskette (as .GID file) and should be accompanied by a slide, photograph or other hard copy form if possible.
4. Images will be judged by members of the PC SIG Executive Steering Committee. BRIBES WILL BE ACCEPTED IMMEDIATELY AFTER AWARDS HAVE BEEN SENT TO WINNER. All decisions are final.
5. Certificates will be awarded for each actegory.
6. Multiple submissions per category or categories by an individual is permissable. INDIVIDUALS MAY RECEIVE ONLY ONE AWARD PER CATEGORY.
7. Person making submission does not have to be present to win.
8. All entries must be postmarked by 23 February 1987 and received no later than 2 March 1987.
9. Entries are to be sent to;

Thomas R. Hintz
University of Florida
IFAS Computer Network
Building 120
Gainesville, FL 32611
10. Specify the category desired for each entry. Only one category per item submitted.
11. Person submitting an image must be the original author and owner of the image.
12. The PC SIG does not take responsibility for Diskette(s) and/or files that are damaged or lost in shipping. Please pack them with sufficient protective material and provide adequate postage.
13. Each diskette containing an entry must be labeled with author's complete name and address.

If you have received a shipment of software in the last month (and you DIDN'T get it in a fire sale), please compare the documented REV level to the one I have listed. If your software is more recent (or it isn't listed at all), please let me know so I can update the list. Also, if the source of my information is listed as "DEC", I would appreciate hearing from a user, since I've found that hearing about it from DEC doesn't always mean that it is actually shipping.

I will submit a new list to the PC SIG Newsletter about the 20th of each month.

14. Special category (Experimental) entries must meet all the above rules and guidelines except #1. Submitter must provide a brief description of the method used to create the image. Images must be loadable from PRO/SIGHT.

Categories:

EMPLOYEE OF	(non-DEC)	(DEC)
B&W still images	1	7
B&W action images	2	8
Color still images	3	9
Color action images	4	10
Multiple picture (PRO/SIGHT script)	5	11
EXPERIMENTAL	6	12



The entry form is located in the Questionnaire Section.

I hope that those of you who didn't make it to the San Francisco DECUS Symposium will enjoy reading some of my notes from the DECmate sessions. The four DECmate related sessions were sponsored by the Personal Computing SIG and we were very happy to have them!

I have incorporated new wish list items from SF into the updated list and would like you to again rank the list in order of importance to you. If you have new requests, please send them to me as well so that our list can be updated. This list is presented to Digital at the Wish List/Working Group session. I have included the list and answers that Cathy Jo Butler gave.

At the Symposium, a program announcement was made regarding the new DECmate III plus. See the session note, DECmate Product Update to find out more.

The fourth session given was on DECmate Gold Key Clubs. Several Gold Key Club Coordinators from across the U.S. gave presentations on their Clubs and then participated in a question and answer period.

Thanks for all of the letters and calls I've received. I encourage you to send in your wish list ranking and new requests, as well as an article on an interesting application.

The PC SIG again sold the set of five public domain DECmate diskettes for \$25.00. The diskettes are broken down to:

- 2 games diskettes (DECmate II)
- 1 MS-DOS public domain diskette (DECmate II)[contains Kermit]
- 1 CP/M public domain diskette [contains Kermit]
- 1 CP/M diskette with Word Star to WPS Converter

If anyone is interested in the set of 5 diskettes, please let me know. Also, if anyone has any public domain diskettes for the DECmate our library would love to have them.

Cheryl Johnson
Grinnell College
Noyce Computer Center
Grinnell, IA 50112-0813
(515) 236-2570

From the Counterpart, C. J. Butler

C.J. is turning over the counterpart position to Louise Brandwein. I would like to thank C.J. for all the time that she has committed to the DECmate during the last two symposias.

Question:

What solutions are available that use the DECmate II for desktop publishing?

Answer:

At this point in time, the closest application is the DECmate WPS product with an LN03 printer. Using the optional font cartridges, and the WPS V2.1 software, the user can format text and charts into a very presentable output. The product still does not allow "pasteup" type functions, such as mixing text and graphics, but the text tools are very powerful. Digital has used the product to produce various types of product documentation without having to separately typeset the text.

Question:

What plans are there for the next release of WPS-Plus?

Answer:

In general, Digital does not discuss un-announced products. The moved recently announced release of WPS-plus, WPS-plus/workstation, is planned for mid-winter release. It will incorporate features of WPS-plus/PC into the WPS-plus/Rainbow product, and will also support the VAXmate.

DECmate WPS (not WPS-plus) has most recently shipped V2.1 (March 1986), and will be shipping V2.2 in December 1986. V2.2 contains no feature enhancements, is added support the for DECmate III-plus. No other releases have been announced at this time.

Question:

How can we make the WPS training reside and work from the hard disk?

Answer:

The release of DECmate WPS that will be announced with the DECmate III-plus (December announcement) can be installed on the DECmate II hard disk, and can then be run from the hard disk.

DECmate Wishlist

1. Text should automatically wrap when editing so that the user doesn't have to advance through it.
2. The ability to easily draw vertical and horizontal lines around text that will print out to form boxes and charts.
3. The ability to check spelling of text easily without using the APU board and have it packaged with WPS like list processing.
4. The ability to have multiple wraps so the user doesn't have to keep changing rulers.
5. The ability for the printer to detect when no paper is in the printer so it will not print on the platen.
6. The ability to use Gold Get Docmt Page to get only certain specified pages of a document.
7. The ability to queue several non-consecutive pages of a document to the printer at the same time. (print page 8 while page 2 is printing).
8. The ability to print any specified page (also when reset pages are used).
9. Show sub and superscripts on the screen.
10. The ability to center headings over a column of text.
11. The printer should have the ability to detect when the ribbon breaks and stop.
12. The ability to advance directly to the end of a word, sentence, or segment of text.
13. Gold Q for Quit of DECmate and RB/WPS-Plus.
14. The ability to install ANYTHING of the master menu.
15. The ability in DECspell to add a word to your personal dictionary as you come to the word in your document.
16. The ability to work with a copy of a document, not the original.
17. A WPSCONV program between COS310 and WPS.

DECmate Section

18. Provide technical documentation describing the hardware and programming of the DECmate II, III and III-plus including all ports, Winchester, controllers, floppies, all auxiliary boards and the software systems MS-DOS, CP/M, and WPS.
19. The ability to have more functions done in the backgrounds so that the DECmate is freed up.
20. The ability to view or edit a document while other pages of it are printing.
21. The ability to call up the index in alphabetical order by document name.
22. The ability to print accent marks on the LQP03.
23. The ability to use overstrike mode versus insert mode.
24. The ability to automatically create indexes and tables of contents with WPS-Plus.
25. More memory for the DECmate.

Use the ballot in the Questionnaire
Section to vote on these current
wish list items.

DECmate Section

DECmate Working Group Meeting and Wish List

This session was presented by Cheryl Johnson, DECmate Working Group Chair. C. J. Butler addressed the top ten wish list items.

1. The ability to do more than one Global Search and Replace string at one time.
Digital response: This is not planned for current or future releases.
2. Text should automatically wrap when editing so that the user doesn't have to advance through it.
Digital response: This is a good suggestions for other products. There is however a limitation within the DECmate and this can not be done.
3. The ability to save a rearrange multiple segments of text at the same time (additional paste buffers).
Digital response: This too is a DECmate limitation. It is, however, further up on the list than other wishes.
4. The ability to check spelling of text easily and accurately without using CP/M.
Digital response: The reliability of Version 2.1 of DECmate DECspell is good. It is, however, still slow. There is no intention of providing DECspell with out the APU board. This doesn't require CP/M, only the addition of the APU board. DECspell will run on the DECmate III plus.
5. The ability to have simple math functions on the DECmate with out using Math.
Digital response: Analogous to the calculator in All-In-One. This is not on my current list.
6. The ability to do the UDK as the user is setting it up.
Digital response: WPS-Plus has this feature in scripting. This is moderately high on my list. We are likely to see this on the DECmate.
7. The ability to edit existing UDK's which have already been filed.
Digital response: This is one of the new features of WPS Version 2.1.

8. Would like the ENTER key to be moved closer to the normal typing keyboard.

Digital response: No plans for this.

9. The ability to print specific pages.

Digital response: This is very high on the list, but I don't know if or when we'll see it.

10. The ability to draw vertical and horizontal lines around text that will print out to form boxes and charts.

Digital response: This sounds like a request for TDE (two dimensional editor which is available in WPS-Plus). I would not expect to see TDE, but we are looking at a better way to do line drawings.

11. The ability to continue to use the system while using foreground functions like list processing, transferring documents, etc.

Digital response: This will no be in the next release or so. There is not enough memory.

12. Work with a copy of the document, not the actual document so that you can use the original if you choose.

Digital response: We don't have enough memory in the DECmate to do this. We will continue to work with the original copy.

13. The ability to have multiple wraps so the user doesn't have to keep changing rulers.

Digital response: This is internally difficult.

14. The ability to show sub and superscripts on the screen.

Digital response: This is a hardware restriction. Future Digital products will be doing that, but not the DECmate.

There were other questions addressed at this time also:

Future releases will be using printer tables to set up print devices, Digital and non-Digital printers.

Users want the ability to do "global search and destroy" on rulers. What this actually means is when you change the ruler setting once, that change is made in every other ruler identical to it.

Session Notes

DECmate Product Update

This session was presented by Ron Gemma, DECmate Product Manager at Digital and Louise Brandwein, DECmate WPS Product Manager at Digital.

Louise Brandwein reported that on March 25, WPS Version 2.1 was released by Digital. There have been two patch diskette releases since then with the current one (Version 2.1.2) being released September 5, 1986.

Ron Gemma presented a 'program announcement' (This is not a product announcement) of the DECmate III plus. The goals, according to Gemma are as follows:

- a. Provide an integral 20 MB hard disk (half-height)
 - for better performance
 - lower price
 - to take advantage of the small footprint of the DECmate III
- b. Provide a packaged system for the user
 - the hard disk is installed in the factory and is certified shippable (no customer installation)
 - the software has to be installed by the customer
- c. Provide a single half-height floppy drive
- d. Provide an optional APU and graphics option

The nongoals of the III plus, according to Gemma:

- a. No plans to install XPU (means no MS-DOS)
- b. No 2nd, or 3rd, or 4th floppy drive
- c. No integral modem
- d. No DECmate III upgrade -- the only similarity between the DECmate III and III plus is the 'skin'. The DECmate III plus has a new power supply, and a new circuit board for the hard disk controller.

Beyond the DECmate II, III and III plus? Gemma would only say that Digital is converging on one single solution to turn-key word processing needs.

Brandwein noted that the following list of software and versions run on the DECmate III plus:

WPS Version 2.2
 Master Menu Version 1.2
 CP/M Version 2.2
 DECmate Office Workstation Version 2.0.1

The DECmate III plus was on the demonstration floor at DECUS and users were able to get first hand experience using it.

Brandwein also mentioned that there will be an update version of WPS out (European version). This will provide local language support, multi-national characters, VT220 emulation and hard disk support. Again, this is ONLY AN EUROPEAN VERSION. This will also provide 8-bit support. THIS WILL PROBABLY NOT BE MARKETED IN THE U.S. AND IT DOES NOT WORK WITH U.S. KEYBOARDS!

DECmate Question and Answer

The following Digital employees answered questions regarding the DECmate:

C. J. Butler, Software Development Manager
Louise Brandwein, DECmate WPS Product Manager
Ron Gemma, DECmate Product Manager
Mary Cheever, DECmate Product Manager

- 1. Where can I get technical documentation on document transmission using DX?

Answer: DX Technical Manual (EJ 29141-86).

- 2. How do I get the patch diskette for WPS Version 2.1.2?

Answer: Call Atlanta

- 3. Where can I get technical information on hard disk programming on the APU and XPU board?

Answer: There hasn't been an update made for the technical notebook for hard disk programming on the APU or XPU board.

- 4. Will there be RD-52 support for the DECmate?

Answer: No.

- 5. Will there be any archiving capabilities for the DECmate III plus?

Answer: Not explicitly.

- 6. What about clustered word processing systems?

Answer: The DECmate may be included in the network.

- 7. Will there be any way to make backups easier with the new hard disk? (We have a lot of backup diskettes now)

Answer: No response from Digital.

DECmate II SYSTEM RETIREMENT

The DECmate II system unit and packaged systems are no longer available from Digital.

The migration path for the floppy-based DECmate II customer should be the DECmate III. The DECmate III Plus should be the product of choice for the DECmate II Hard Disk customer. Those customers who want Gold Key word processing as well as industry standard PC applications should consider the VAXmate and a WPS-PLUS/PC or PC ALL-IN-1 solution.

All the DECmate II options are still available for customers to upgrade their systems. These include:

PC27X-AB	DMII APU Board
PC27X-AH	DMII 8/16-Bit Softcard 256KB
PC27X-AJ	DMII 8/16-Bit Softcard 512KB
PC27X-BA	RX02 Controller
PC27X-CA	DMII Graphics Option HW only
RCD51-CA	10MB Disk Subsystem
RX50-XA	Dual Floppy Add-on
QWA01-H3	DECmate/WPS V2.2 Update *
QWA03-A3	DECmate/WPS DECspell V2.1
QWA25-A3	DECmate CP/M O/S V2.2
QWA25-H3	DECmate CP/M Update

The LQP02, LQP03, LN03 and the new LA75 printers are supported by current DECmate/WPS software.

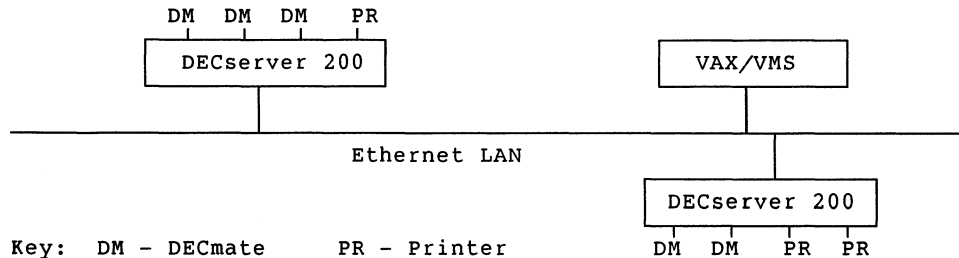
These options are available through the DECdirect Catalog.

* Not needed if you have DECmate/WPS V2.1

DECmate PRINTER SHARING ON THE DECserver 200

DECmate users who are part of a local area network (LAN) installation can share printers without having to first transfer the document to a VAX system. The DECserver 200 allows port-to-port connections so a DECmate on one port can connect to a printer on another port. Using DECmate document destination CHST ensures that all the DECmate/WPS printing features and attributes are intact.

The DECmates and printers can be connected to the same DECserver 200 or they can be on different ones. The initial set-up of the DECserver defines which ports on which servers in the network are "service" ports (in this instance PRINTER SERVICE ports).



Key: DM - DECmate PR - Printer

Once a DECserver 200 port is defined as a PRINTER SERVICE port, any DECmate on the LAN can connect to it via the CX option. When the connection is established, the DECmate/WPS PRINT option is used.

Two or more printers connected to DECserver 200's in the LAN can be given the same PRINTER SERVICE name. When the DECmate user attempts to connect to service, the DECserver 200 will search until it finds the named service which is not busy.

If the PRINTER SERVICE is "busy" the DECmate user will be notified. If the DECmate port on the DECserver 200 has been specified with AUTOCONNECT enabled, the server will keep trying to connect. When it does connect it will notify the DECmate user.

Once a document has started printing, the DECmate user can return to the Main Menu and perform other WPS functions.

The DECserver 200 also allows DECmates to exchange documents with other DECmates, WPS-plus/Workstation, as well as to a host DX product, by using the Document Transfer (DX) option.

The DECmate users still retain all the other capabilities available to them as terminal server users. With the CX option they can "CONNECT HOST" and carry on a terminal session, transfer ASCII files both ways with background WPS/ASCII/ WPS conversion and print VAX files to a printer connected to the DECmate printer port.

ANNOUNCING DECmate III Plus SOFTWARE

DECmate/WPS Version 2.2 and Master Menu Version 1.2 are packaged with the DECmate III Plus system. Both software packages have the same features that are in their previous versions -- with the addition of the ability to support the DECmate III Plus with its 20MB (RD31) hard disk and one floppy drive (RX33).

To continue with our commitment to be compatible with DECmate III and DECmate II, the RX33 drive is used in RX50 mode with RX50 diskettes. WPS Version 2.2 system and document diskettes can be used with DECmate III and DECmate II systems.

The DECmate III Plus was designed to be used as a hard disk system. The user installs the software and creates documents on the 20MB hard disk that has been formatted and contains the Master Menu utility. The floppy drive should be used mainly for making backups from the hard disk, for installing software and for media exchange with floppy-based systems.

Performance of DECmate/WPS V2.2 on the DECmate III Plus has proven to be measurably better than DECmate/WPS V2.2 on a DECmate II with a hard disk.

- o Existing DECmate/DECspell V2.0 or V2.1 will work with WPS V2.2 DECmate/ DECspell requires an APU option board. Both the DECspell software and the APU board are available for purchase as separate items.
 - o CP/M-80^R V2.2 has been enhanced to support the DECmate III Plus. It, too, can be ordered separately.
- ^RCP/M-80 is a registered trademark of Digital Research, Inc.
- o For international applications, the DECmate III Plus offers country specific keyboards and 120V or 240V power supply. The European local language version of DECmate/WPS (Version 3.0) will work with the DECmate III Plus.
 - o The computer-based instruction, "Introduction to WPS," has been modified so that it can be installed on the DECmate III Plus hard disk. This training is packaged with the DECmate III Plus.

Customers ordering a DECmate III Plus will also receive Master Menu V1.2 and WPS V2.2. Since no feature enhancements have been added to DECmate/WPS V2.2, it is not necessary for existing WPS V2.1 customers to upgrade to the new software. Please note: customers will not be automatically updated with DECmate/WPS V2.2.

ANNOUNCING THE DECmate III Plus HARD DISK SYSTEM

Digital introduces the hard disk version of the DECmate III, the DECmate III Plus. The DECmate III Plus system, like the DECmate III, ships as a complete system which includes:

- o Pre-installed 20MB (RD31) hard disk drive
- o Half-height single (RX33) floppy drive
- o Monochrome Monitor (B/W, Green, Amber) VR201
- o Keyboard Country Kit
- o DECmate/WPS Software
- o Master Menu Software
- o Documentation
- o System Test Diskette

PRODUCT DESCRIPTION

Using the same system box as the DECmate III, the DECmate III Plus replaces the dual RX50 drive of the DECmate III with a pre-installed RX33/RD31 drive combination. On the DECmate III Plus, the RX33 will read and write only to RX50 floppy diskettes, allowing DECmate floppies to be compatible between DECmate II, III, and III Plus systems (and Rainbows running WPS-PLUS/Rainbow).

The DECmate III Plus features a built-in asynchronous communications port and serial printer port. There are option slots available to support the APU Card (PC23X-AB), required to run DECspell; and the Graphics Card (PC23X-CA) options presently available on the DECmate III. NOTE: the Integral Modem will not be supported by the DECmate III Plus. However, it is still available for the DECmate III floppy-based system.

The DECmate III is not upgradable to a DECmate III Plus system.

FEATURES/BENEFITS

The DECmate III Plus combines the efficiency and cost-effectiveness of a DECmate III with the speed and convenience of a 20 megabyte hard disk. With applications and documents resident on the hard disk, the DECmate III Plus offers over 40 times the room of a diskette to store documents and files, as well as the increased performance of a hard disk.

The DECmate systems are designed for an office environment and are fully compatible across the DECmate family. Documents created on one DECmate system can be accessed by any other DECmate model.

SPECIFICATIONS

Dimensions: 15.2 cm H x 27.9 cm L x 32.3 cm W
 (6 in) (11 in) (12.7in)
 Weight: 21 lbs.
 Power: 95-128V/47-63Hz; 100 Watts (including fan)

DECmate/WPS VERSION 2.2 SUPPORT FOR THE LA75 PRINTER

The following LA75 features are supported by DECmate/WPS V2.2:

Paper Handling Back-fed paper (not bottom-fed) for multicolumn, superscripting, subscripting and attributes.

Auto-park allows single sheets and envelopes to be placed in the printer without removing the tractor-fed paper.

Single-Bin Sheet Feeder autoloads up to 100 pieces of cutsheet paper.

Print Density Draft mode is controlled by the WPS software.

Letter Quality mode controlled by the WPS software, or through printer front panel control.

Near Letter Quality mode only through printer front panel control.

Character Sets Built-in DEC Technical, National Replacement and DEC Supplemental character sets.

Character sets can be chosen in print control blocks within WPS documents. Pitches can be chosen either in print control blocks within WPS documents or from the WPS Print Menu.

An MMJ adapter is required to connect the LA75 to DECmates.

- o Use H8571-B to print from DECmate printer port (9 pin)
- o Use H8571-D to connect the LA75 to the mini-exchange.

The following LA75 features are **NOT** supported by DECmate/WPS V2.2:

- o Bottom feed for multicolumn, super/subscripting and attributes
- o Italics and double underlining attributes
- o Memo print density
- o Pitches 17.1 and 8.55
- o Half height super/subscripts
- o ISO supplemental character set
- o Kill buffer, when user stops document from printing

DECmate III Plus QUESTIONS AND ANSWERS

WHAT SHOULD I BE AWARE OF WHEN REVIEWING THE CURRENT DECmate FAMILY?

The DECmate family now consists of two product offerings, the floppy-based DECmate III and the hard disk-based DECmate III Plus. Qualify your needs carefully as to your preference for either a floppy-based or hard disk-based system and guide your purchase decision accordingly. Consider the DECmate III as the lowest cost solution if floppy capacity and performance is adequate for your needs. Consider the DECmate III Plus when hard disk capacity and performance are needed.

IS THE DECmate III Plus PHYSICALLY DIFFERENT FROM THE DECmate III?

There is absolutely no difference in size between the two products. The DECmate III floppy-based system features the RX50 dual floppy drive. The DECmate III Plus features a half-height RD31 20MB hard disk and an RX33 half-height floppy drive. Please note that the RX33 on the DECmate III Plus can only use RX50 diskettes.

CAN I UPGRADE A DECmate III TO A DECmate III Plus?

You should be made aware that there will not be an upgrade or trade-in program offered to upgrade a DECmate III floppy-based system to a DECmate III Plus hard disk-based system.

WILL THE DECmate III Plus BE OFFERED AS AN INTERNATIONAL PRODUCT FOLLOWING THE DECmate TRADITION?

Yes. The DECmate III and III Plus are offered in both 120V and 240V configurations for local language versions, which include country kit keyboard and software.

WILL IT STILL BE ABLE TO READ/WRITE TO DOCUMENT DISKETTES CREATED ON OTHER DECmate SYSTEMS?

Yes. Any document created on a DECmate II, III or III Plus is compatible. WPS documents created on DECmate/WPS using 8-1/2 inch media will need to be transferred onto a 5-1/4 inch RX50 floppy diskette or use a document transfer (DX) communications capability.

THE CURRENT VERSION OF DECmate/WPS IS VERSION 2.2. HOW DOES THIS COMPARE WITH DECmate/WPS V2.1?

There is no difference in functionality. The difference lies in the support for the 20MB hard disk and the single floppy drive on the DECmate III Plus. DECmate/WPS V2.2 is backward compatible and therefore can be used on DECmate II and III systems.

WILL CP/M^R AND MS^TM-DOS SOFTWARE PACKAGES BE SUPPORTED BY THE DECmate III AND DECmate III Plus?

DECmate III and DECmate III Plus support only certain CP/M packages. MS-DOS applications are not supported.

ARE THERE STILL THREE OPTION SLOTS ON THE DECmate SYSTEM?

Yes. Option slots are provided to support the same CP/M and Graphics Card currently available for both systems. However, the third slot (designated for the Integral Modem) is supported only by the DECmate III floppy-based system.

ARE DECmate/WPS DOCUMENTS COMPATIBLE WITH WPS-PLUS DOCUMENTS?

DECmate/WPS documents can be exchanged in revisable format with WPS-PLUS using the document transfer (DX) utilities available. In addition, Rainbows running WPS-PLUS/Rainbow can read and write DECmate II, III and III Plus document diskettes directly.

WHAT DOES THE FUTURE HOLD FOR THE DECmate FAMILY? I NEED TO BE ASSURED THAT THE DECmate FAMILY IS STILL A VIABLE INVESTMENT FOR MY BUSINESS.

With the introduction of the latest product, the DECmate III Plus, you can feel reassured of Digital's commitment to the DECmate family.

HOW IS THE DECmate POSITIONED TODAY WITH THE RECENT WORKSTATION ANNOUNCEMENTS?

The DECmate continues to be Digital's price performance leader in the dedicated word processing space. As an entry-level product targeted at the administrative market -- both in large and small business -- the DECmate is a viable solution to many user needs.

HOW IS THE DECmate POSITIONED WITH DIGITAL'S NETWORK STRATEGY?

The DECmate can be directly connected to a Digital host system or to a local area network terminal server. When the DECmate is directly connected to a host it can operate in terminal emulation or document transfer mode. When connected to the terminal server, the user obtains the additional capabilities of sharing devices on the local area network such as printers.

Overall, the DECmate product is still the best administrative workstation solution where the environment demands a high level of text processing and output. The product can be used as a standalone word processing system or as a workstation to a host system such as in a VAX environment using ALL-IN-1.

^RCP/M is a trademark of Digital Research, Inc.
^TMMS is a trademark of Microsoft Corporation

DECmate Software List Update
coordinated by
Gary Rice, PC SIG PROFESSIONAL Editor

Rainbow Wish List

In an effort to keep you informed about software being shipped from various vendors, I began this list in September, 1986. This list reflects information that I received as of December 20, 1986. An asterisk by an entry indicates that the item has changed or been added since the last time the list was published.

DEC Software	List Price	Rev	Source of information	Still Avail?	Operating System
COS-310	UNK	9.3	User	UNK	COS-310
DECmate CP/M-80	UNK	2.1W	User	Yes	CP/M
DECmate DBMS	UNK	1.0	DEC	Yes	
DECmate Graphics Terminal Emulator	UNK	2.0	DEC	Yes	
DECmate II Construction Business	UNK	1.0	DEC	Yes	
DECmate II Construction Management	UNK	1.0	DEC	Yes	
DECmate Master Menu	UNK	1.11	DEC	Yes	Menu
DECmate MS-DOS	UNK	1.0	DEC	Yes	MS-DOS
DECmate Office Workstation	UNK	2.0	DEC	Yes	
DECmate TYPEasy	UNK	1.0	DEC	Yes	
DECmate WPS	UNK	2.1	User	Yes	WPS
DECmate WPS DECspell Verifier	UNK	2.1	DEC	Yes	WPS
DECmate WPS Natural Languages	UNK	1.02	DEC	Yes	WPS
Graptalk	UNK	1.0(3.27)	User	UNK	MS-DOS
MS-DOS	UNK	2.11-1	DEC	Yes	MS-DOS
Multiplan	UNK	1.05	User	UNK	CP/M
OS/278	UNK	V2-VB3	User	UNK	OS-278
R:BASE 4000	UNK	1.1	DEC	Yes	MS-DOS

If you have received a shipment of software in the last month (and you DIDN'T get it in a fire sale), please compare the documented REV level to the one I have listed. If your software is more recent (or it isn't listed at all), please let me know so I can update the list. Also, if the source of my information is listed as "DEC", I would appreciate hearing from a user, since I've found that hearing about it from DEC doesn't always mean that it is actually shipping.

I will submit a new list to the PC SIG Newsletter about the 20th of each month.

Dear Readers:

Since DEC addressed the Rainbow Wish List officially at DECUS San Francisco, they also told me that it was the last time they'd address the wish list since the Rainbow is now a mature product. I don't buy that, and I hope you don't either. I'll continue to print the wish list here in each issue so that third party vendors will get a chance to see what the users really want, and I think it'd behoove Digital to listen to us as well.

You'll see that the Lotus update is right at the top of the list again and rightfully so. We were promised the update by DEC and Lotus also announced it for the Rainbow in their May issue of Users Forum. Nothing has happened yet, and I'm beginning to wonder if it will. I'm still working on the issue, though, so be patient.

Several third party vendors have given us a lot of good hardware add ons and some great Rainbow software. I'm sure there are several more out there continuing development of additions for you users. I am asking that you submit to me your Rainbow Wish List ballot, published in the Questionnaire section here, and let's keep in mind that we should continually request our wishes as we see fit and hope that DEC and third parties will soon address some of these issues.

I could go on for pages and discuss some of the past and present issues on this new list. Mainly, though, DEC will be addressing some of the issues with the Network Integration kit that you all know about by know, but those issues still remain on the list and will until the kit comes out. Of course, the kit, though, will not take care of the single users' needs in this area, and this is where the third parties come in.

Thanks for your participation.

RAINBOW WISH LIST

1. Lotus Release 2.01.
2. MS-DOS 3.1.
3. Larger memory upgrades and removable hard disks at reasonable prices.

Rainbow Section

4. Larger than 20MB hard disks and controllers.
5. Nationwide TRUMP upgrades--update from a 100A to 100B.
6. Printer drivers for LN03 and more non-DEC printers on all DCS software.
7. A second COMM port that doesn't require you to disconnect the hard disk controller to put it in.
8. Come up with an ANSI.SYS device driver like that of IBM that would give people the ability to redefine the function keys. This could allow users the use of extended sequence for color or monochrome shading that DEC could add as well as give the users the ability to run many IBM programs on their Rainbows.
9. MS-DOS installable graphics driver similar to GSX-86.
10. Rainbow versions of RBase 5000, Framework, Thinktank, and Borland's Sidekick.
11. A new ROM upgrade for the Rainbow that would include support for an IBM PC compatible character set. (This would allow Rainbow users to easily run all the programs that take advantage of all the IBM PC graphic characters.)
12. More software packages overall--for business and personal use.
13. Concurrent MS-DOS.
14. Better basic documentation with purchase of each unit, i.e. BIOS, firmware listing and schematics.
15. Software spooler.
16. Hardware Reset and Halt Keys.
17. Terminal mode to support the additional keys of the LK201 keyboard.
18. Larger print buffers built into printers.
19. Hardware Reset and Halt keys.
20. Concurrent MS-DOS.
21. Remove copy protection from DCS and DDS software.
22. Coordination between local DEC Field Service offices and

Rainbow Section

Atlanta Hotline Support Center.

23. ASSIGN command.
24. Cheaper maintenance prices.
25. Rainbow Draw and Paint.
26. VT220 and VT240 emulation software.
27. Lap-top or portable Rainbow.
28. Rainbow LAN without the need for a VAX.
29. Field Service support for third-party wares such as the disk controller and formatter as well as for the clock boards that are on the market.
30. Full featured GW-Basic compiler.
31. "Open" Winchester utility that allows users to specify disk geometry to take advantage of great third-party disk prices.
32. Direct Ethernet access for the Rainbow; i.e., a board that plugs into the Rainbow that doesn't preclude the use of a hard disk.
33. Liberal trade-in allowance on Rainbow to VAXmate.
34. Ability to read and write to RX33 diskette drive upgrade kit.
35. Monitor connections for CAD products.
36. DEC support for third party vendors wanting to develop and market hardware and software for Rainbows.

The ballot can be found in the Questionnaire section of this copy of the SIG Newsletters.

Lynn Jarrett

Rainbow Section

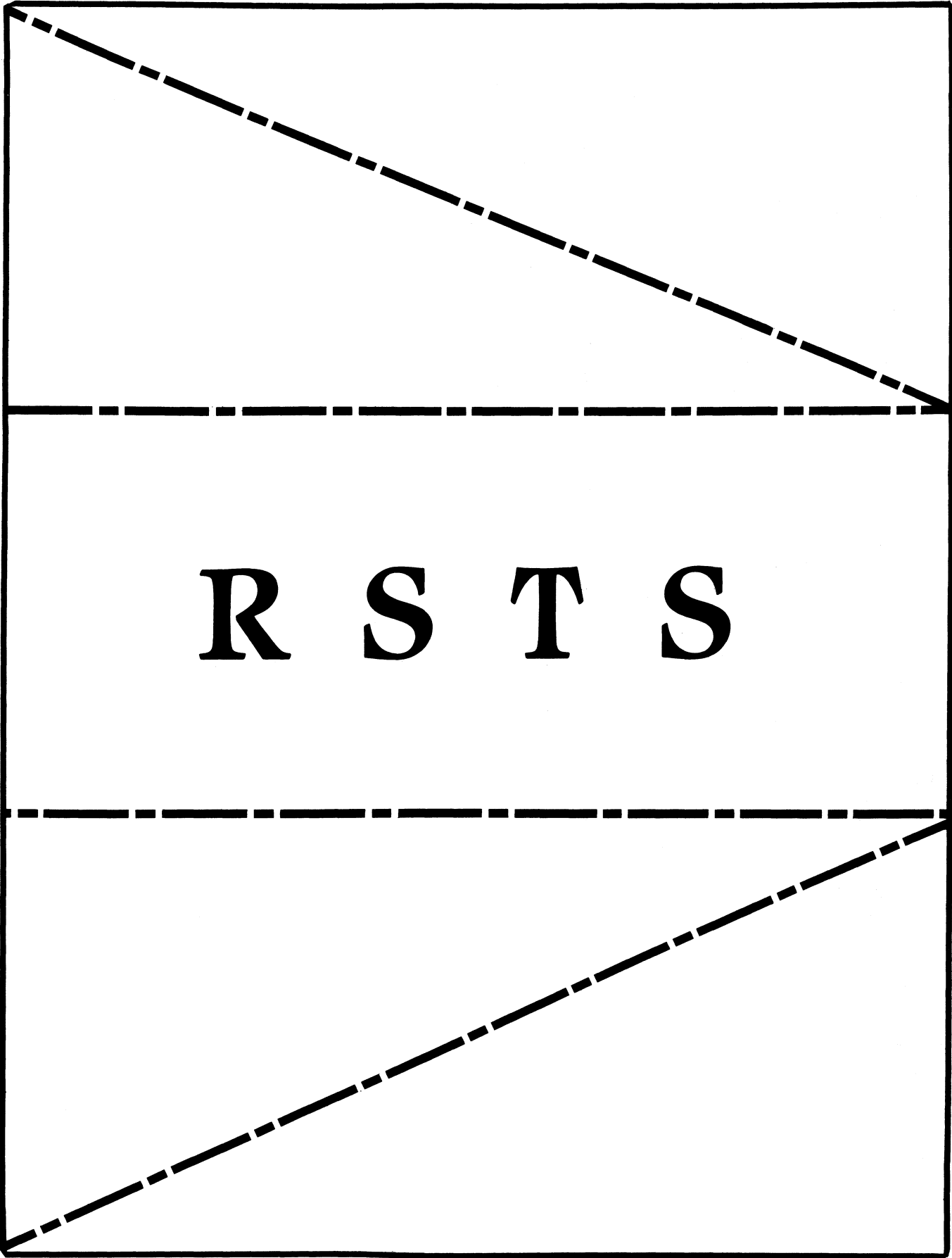
Rainbow Software List Update
coordinated by
Gary Rice, PC SIG PROfessional Editor

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CP/M-86/80	UNK	1.01	User	Yes	CP/M
DECnet-Rainbow	UNK	1.0	DEC	Yes	
GSX-86	UNK	1.0	DEC	Yes	CP/M
GW-BASIC	UNK	2.01.01	DEC	Yes	MS-DOS
MS-DOS	UNK	2.11-1	User	Yes	MS-DOS
Rainbow ATHABASCAN Kit	UNK	1.0	DEC	Yes	CP/M
Rainbow CONNECTION	UNK	1.0	DEC	Yes	MS-DOS
Rainbow Office Workstation	UNK	1.0	DEC	Yes	
WFS-PLUS/Rainbw	UNK	1.0	DEC	UNK	

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1986 Fall
San Francisco

DECUS

RSTS System Management Topics

Gary Barton
RSTS Development

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RSTS/E

October 6-10

Managing Accounts

- o One user per account is best
- o If users must share accounts, avoid giving SETPAS privilege
- o For development, consider assigning entire project (group) to people
- o For large sites, consider assigning group account managers to maintain individual projects
- o Use NOUSER accounts to logically divide software. Define system logicals to access software
- o [0,*] accounts provide additional "level" of privilege to access files
- o Use "captive" accounts to restrict certain users to pre-defined activities
- o Use "guest" accounts to allow access to "free" system services (such as on-line help)
- o Use account names to identify users and account uses

Managing Security

- o Decide how much security your system needs
- o Use the system password as a first-level defense against unauthorized access
- o Require system password for dialup and network access only if local access not a problem
- o Always use NOLOOKUP passwords. Fix applications that still need to lookup passwords
- o For system with dial-up lines, restrict access to certain accounts by using NODIALUP flag
- o Similarly, restrict network access to certain accounts by using NONETWORK flag

Managing Security (continued)

- o Other access checks can be made by defining new account attributes and checking access via system-wide LOGIN.COM command file
- o Define account privileges carefully. Be sure you understand what system functions are controlled by each privilege
- o Encourage users to cooperate in maintaining security by:
 - Choosing passwords that are hard to guess
 - Changing passwords as needed
 - Noting date/time of last login
 - Notifying system manager if anything looks suspicious
- o Design applications carefully. Avoid making programs "privileged" unless necessary
- o Let the monitor enforce security. Avoid duplicating monitor privilege checks in applications

Managing Resources

- o Main resources to consider are:
 - jobs
 - disk space
 - small buffers
 - memory, including XBUF
- o Lack of adequate resources usually means worse performance
- o Watch your system. Know how it normally "behaves" to detect resource problems
- o Use "repeating" batch jobs to perform simple system monitoring
- o Use STATUS or QSTATS/LQSTAT in UNSUPP package to perform better system monitoring

Controlling Jobs

- o When creating accounts, decide maximum jobs to allow and maximum detached jobs
- o Limit jobs by installing/removing swap files, or use SET SYSTEM/LOGINS command
- o Consider better ways to use batch processing to handle regular periodic activities
- o Use DCL command files and PBS rather than ATPK and OPSER

Controlling Disk Space

- o Lack of sufficient disk space on frequently used disks hurts everyone. Increased disk fragmentation means more FIP processing
- o Use new logged-in disk quotas to prevent malicious user from exhausting all free space on any disk
- o Use disk quotas carefully. Increase quotas slowly. Don't give users EXQTA privilege! Use UNLIMITED quotas instead
- o Use the SHOW ACCOUNT command to check disk space usage

Controlling Memory Space

- o Lack of buffers can seriously degrade performance. Pay attention to "minimum small buffers" value to determine if you are running out of buffers
- o Don't allocate "too many" buffers unless you have the memory to afford it. Don't cause more job swapping to gain a few more buffers

Controlling Memory Space (continued)

- o XBUF is now used for many more data structures than before. Use the SHOW CACHE command to see how XBUF is being used.
- o For systems doing much data caching, inadequate XBUF will erase most of the benefits of caching
- o Some performance enhancements are at the cost of memory. Weigh the trade-offs carefully
- o Virtual disk gobbles memory. Extra CPU overhead is required to manage virtual disk; systems with an "overloaded" CPU might only make matters worse

Managing Terminals

- o Use autobaud if possible; prevents "mismatched" terminal lines
- o You cannot restrict speeds on autobaud lines. Usually not a problem when applied to dialup lines
- o Learn and use new terminal "controller" syntax, especially in startup command file
- o Mark printer terminal lines NOINTERACTIVE to prevent noise on line from invoking LOGIN
- o Remember to use /PERMANENT qualifier when setting characteristics that should remain in effect after logging off
- o SET TERMINAL/INQUIRE is easy; use it when in doubt
- o Disable terminals to prevent their use. You can now re-enable them on line

Managing Disks

- o Single-user private disks should always be mounted NOSHARE to prevent access by other users
- o Off-load system disk load by relocating packages on private disks
- o Use the /NOQUOTA qualifier when mounting private disks that require no quota checking
- o Use system logicals to access regular accounts on private disks
- o AVOID MULTI-DISK PUBLIC STRUCTURES. Severe penalty on performance. Worse now than before
- o Restructure disks periodically, depending on activity. Use REORDR most frequently, BACKUP/RESTORE less often

Managing Backups

- o Plan backups during off-hours. New BACKUP package can "take over" some systems (memory and CPU) when using it at maximum throughput
- o Design a DCL command procedure to do backups. Some can automatically perform incremental backups based on date/time of last backup
- o Consider use of captive account for backups to ensure backups are always run via same procedure
- o Use supplied RECOVER.COM to create recovery medium in case system disk becomes corrupted

Managing with Command Procedures

- o DCL command procedures provide a new "language" for automating regular system management chores such as:
 - Creating/Deleting accounts
 - REORDRing accounts
 - Keeping your system free of junk
 - Nightly backups
- o CAPTIVE account login command files can be used to control access to the system
- o Share your good ideas by submitting your favorite DCL command procedures to the DECUS library

Managing with Operators

- o Give operators only enough privilege to do their job
- o Use CAPTIVE accounts with menu driven command procedures to simplify the operators job and to restrict access to the system
- o Allow BACKUP only, not RESTORE
- o Set operator accounts to NODIALUP, NONETWORK



1986 Fall
San Francisco

DECUS

Announcing DECmail-11 V3.0

Ginger Landry
DECmail-11 Product Manager

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October 6-10

- Product Capabilities
- Major New Features Included in This Release
- Hints on Customizing
- 60-Day "Free" Trial Offer
- Wishlist Requests
- Questions and Answers

INTRODUCTION

DECmail-11 is a Full Functionality Electronic Mail System for the PDP-11 family.

o Releases

- DECmail-11 V1.0 for RSTS/E - March 1983
- DECmail-11 V2.0 for RSTS/E - February 1984 (Message Router Support)
- DECmail-11 V2.0 for RSX - August 1984 (Message Router Support)

o DECMail-11 V3.0 Layered Product Running Under:

- RSTS/E V9.0 (or later)
- Micro/RSTS V2.0 (or later)
- RSX-11M-PLUS V3.0 (or later)
- Micro/RSX V3.0 (or later)

INTRODUCTION

Electronic Mail brings increased productivity to the business computer user.

- o Information WHEN (almost instantaneously) you need it WHERE you need it.
- o Remote sales, customer or service personnel can easily stay in touch with the latest information in a timely manner while at home or in a remote location.
- o Eliminates "TELEPHONE TAG" and the "Interoffice Mail Blues".
- o Search feature means no more lost, misfiled or misplaced paper.
- o Saves filing and indexing time over paper filing systems and cost of typing, revising and retyping memoranda are saved.

ENVIRONMENT

DECmail-11 can be used in three environments:

- o Single-node
- o Multi-node
- o Multi-operating System Network (Heterogenous Network)
 - RSTS/E
 - RSX-11M-PLUS
 - Micro/RSX
 - VAX/VMS
 - A-to-Z

PRODUCT CAPABILITIES

FULL RANGE OF MAIL PROCESSING FEATURES

- o MENU AND/OR COMMAND USER INTERFACE
- o CREATE, EDIT, PROCESS, AND FORWARD MESSAGES
- o READ, ANSWER, PRINT, AND DELETE MESSAGES
- o CREATE, USE AND MAINTAIN DISTRIBUTION LISTS
- o STORE MESSAGES FOR EASY RETRIEVAL USING
 - Mail Folders
 - Search Command
- o CREATE ANY NUMBER OF USER-NAMED FOLDERS
- o TRANSFER DATA TO AND FROM NATIVE FILE SYSTEM
- o SEND AND RECEIVE MESSAGES TO OTHER SYSTEMS CONNECTED VIA DECNET
- o CREATE USER-DEFINED SYNONYMS FOR STANDARD DECMail-11 COMMANDS OR STRINGS OF COMMANDS
- o SET UP USER PROFILE DEFAULTS
- o CREATE USER-DEFINED NICKNAME LOGICALS WHICH CORRESPONDS TO USER ADDRESSES

DECMail-11 IS EASY TO USE:

- o SENDING AND READING MAIL MESSAGES IS SIMPLE
- o HELP TEXT AVAILABLE AT ALL PROMPTS
- o ON-LINE HELP FACILITY
- o CUSTOMIZATION FOR INDIVIDUAL USER NEEDS
- o FRIENDLY DOCUMENTATION
 - Getting Started Guide
 - User's Guide
 - Installation and System Manager's Guide
 - Reference Card
 - On-line Release Notes (Only if needed)

Command > HELP<C/R>

WELCOME TO DECMail-11

DECMail-11 lets you send mail to users on this system, and on other RSTS, RSX, or VMS systems if your system has DECnet/E. You can create, send, answer, forward, read, edit, list, file, search, and delete your mail. You can also personalize the way DECMail-11 works for you.

--> For an introduction to the basic mail functions type: HELP INTRO <--

For help on the following topics type: HELP topic subtopic

ANSWER	CATALOG	CREATE	CLEAR	COPY	DELETE
EDIT	EXIT	EXPORT	FETCH	FILE	FORWARD
HELP	LIST	MARK	MOVE	NEXT	PRINT
PREVIOUS	PURGE	QUIT	READ	RENAME	SEARCH
SELECT	SEND	SET	SHOW	UNDELETE	
addresses	dates	distribution_lists	flags	folders	
functions	intro	message_sequences	nicknames	prompts	
reading	release_notes	summary	synonyms		

Press RETURN to recall the menu or enter a command:

(The HELP Menu)

Command> HELP CREATE
CREATE

The CREATE command creates files, command synonyms, distribution lists, folders, initialization files, and nicknames. When you use CREATE for files, distribution lists, and initialization files, you are automatically put in the editor (the default editor is EDT).

The CREATE command defaults to creating a file.

Formats: C[REATE] [FILE] [filespec]
C[REATE] COM[MAND] [command name] [=] ["command/qualifier"]
C[REATE] DIS[TRIBUTION_LIST] [list name]
C[REATE] FOL[DER] [folder name]
C[REATE] INI[TIALIZATION_FILE]
C[REATE] NIC[KNAME] [nickname] [=] ["user name"]

(See the DECmail-11 User's Guide for more information.)

Additional information is available on:

/DELETE

Press RETURN to recall the menu or enter a command

(The HELP CREATE Menu)

Command > HELP PRINT <C/R>

PRINT

The PRINT command prints a message or a sequence of messages on your system line printer. PRINT works only in your current folder.

- o PRINT prints your current message unless you specify another.
- o You can also use the PRINT command to print files.

Formats: P[PRINT] [message sequence]
P[PRINT] [FILE] filespec

(See Chapter 2 and Appendix A of the DECmail-11 User's Guide for more information.)

Additional information is available on:

/ALL /FULL /HEADER /PORT /QUEUE

Press RETURN to recall the menu or enter a command:

(The HELP PRINT Menu)

Command> SEND

To: Miller
cc: Smith
Subject: Group Meeting

Enter the text for your message. Press CTRL/Z when complete CTRL/C to quit.

There will be a group meeting in the main conference room from 1:00 to 3:00.

Please come prepared to discuss the Coexistence Strategy.

John
^Z

Message is complete. Proceed to send it? [Y/N] <Y> N<C/R>

(The SEND Command)

To: Miller
cc: Smith
Subject: Group Meeting
Message is complete. Proceed to send it? [Y/N] n<C/R>

Options available:

TO	Change To: field	FI	File the message to send later
CC	Change cc: field	BA	Queue message to BATCH mail
SU	Change Subject: field	SE	Proceed to send the message
TE	Change text	QU	Quit menu, return to command prompt
NI	Change nickname to user name	ME	Display the SEND menu options

Enter an option from the SEND menu <SE><C/R>

MILLER notified on KB32:
Mail delivered to MILLER at 08:42 AM
Mail delivered to SMITH at 08:42 AM
Command>

(The Sending Options Menu)

MAJOR NEW FEATURES WITH DECmail-11 V3.0

- o One Level Menu Interface
- o Remote VMS Message Router Support
- o Improved Batch Message Sending (Mail Queue Task)

"Ginger Landry"

** DECmail-11 Main Menu **
(You have 5 new msgs)

01-Oct-86

R	READ (new/next) message	Folder:	MAIL
S	SEND a new message	Subject:	
A	ANSWER a message	From:	
FO	FORWARD a message	Cur. msg#	none
P	PRINT (current) message		
D	DELETE (current) message		
U	UNDELETE (current) message		
L	LIST (all) messages	SEL	SELECT an alternate folder
SEA	SEARCH for messages	PU	PURGE deleted messages
H	HELP on all commands	F	FILE (current) message in a folder
EX	EXIT from DECmail-11	CA	CATALOG of folders

Command >

(The MENU Interface)

RST-17

DIFFERENCES BETWEEN LOCAL MESSAGE ROUTER (DECmail-11 V2.0)

AND

REMOTE VMS MESSAGE ROUTER SUPPORT (DECmail-11 V3.0)

- o Remote Message Router Mailboxes
- o VMS Message Router Required
- o Mailbox Passwords
- o VMS Store-and-Forward Only

NEW FEATURES

MAIL QUEUE TASK

- o Manages the delivery of queued messages
- o Rectifies problems in using BATCH as a delivery process
- o Addition of new command SHOW QUEUE

HINTS ON CUSTOMIZING

- THE NEW MAIL NOTIFIER (RSX systems only)
- USEFUL SYSTEM COMMAND SYNONYMS
- USER-DEFINED COMMANDS
- DCL COMMANDS (RSX systems only)
- BATCH MAIL FEATURE PATCHES
- RUNNING MAILSN.TSK (RSTS systems only)
- MAINTAINING THE SENT FOLDER
- INITIALIZATION FILES

RST-18

THE NEW MAIL NOTIFIER (RSX systems only)

Use the following command in your LOGIN.CMD file:

```
RUN MAIL$:NEWMAI
  .IF <EXSTAT> = 3 MAIL
```

Or if installed as ...NEW do this:

```
.IF <EXSTAT> = 3 MAIL
```

USEFUL SYSTEM COMMAND SYNONYMS

```
DEF-INE      = "_CREATE COMMAND"      ! Define command synonyms
DEL-AY       = "_SEND/AFTER=5:00PM"    ! Send msg after working hours
DI-RECTORY   = "_LIST FILES"          ! Directory listing of files
EXT-RAC      = "_EXPORT"              ! For those used to VMSmail
FIN-D        = "_SHOW USER"           ! Verify existence of username
FL-AG        = "_MARK/FLAG"           ! Flags message(s)
LA50         = "_PRINT/PORT"          ! Prints message on printer port
REP-LY       = "_ANSWER"              ! For those used to VMSmail
RET-RIEVE    = "_UNDELETE"            ! Undelete message(s)
TY-FE        = "_SHOW FILE"           ! Display contents of a file
'NF-LAG      = "_MARK/NOFLAG"         ! Remove flag marker on message
```

ADDITIONAL USER-DEFINED COMMANDS

```
.          = "_READ CURRENT"          ! Type a period to re-read msg
LN-EW      = "_LIST/NEW"              ! Lists all new messages
Q-UICK     = "_DELETE ;ANSWER/ED/NOCC" ! Don't save msg, just answer it
QUIT       = "_CLEAR ;_QUIT"          ! Clear screen before leaving
RTIC-KLE   = "_MARK/TIC=T+"           ! Relative to today (eg. T+4)
SC-AN      = "_DELETE ;_NEXT"         ! Don't save msg, read next one
>          = "_DELETE ;_NEXT"         ! Same as above
TIC-KLE    = "_MARK/TIC="             ! Tickle message for later date
UNTIC-KLE  = "_MARK/NOTIC"            ! Remove the tickle date
X          = "_CLEAR ;_EXIT"          ! Clear screen before exiting
```

DCL COMMANDS (RSX systems only)

```
Command > $SHOW USERS
Command > $COPY FILE.XYZ DIR5:
```

BATCH MAIL FEATURE PATCHES

RSTS Systems

```
-----
Symbols are:  ..QMAX
              ..QMIN
              ..QLSP
```

Default Priority = -16

Edit the MAILQ command line in MAIL\$:MAILIN.COM

(example = _SET JOB/PRIORITY=-8)

RSX Systems

(Mail queue patch locations are located in the Mail DF psect)

(note: RSX can't access symbols directly)

Default Priority = 50

Edit the MAIL\$:MAILINS.CMD file

(example = INS MAIL\$:MAILQ/PRI:70)

RUNNING MAILSN.TSK (RSTS systems only)

In START.CMD

After line "@MAIL\$:MAILIN.COM" add following commands:

```
$!+
$! Start a permanent copy of MAILSN.
$!-
  _RUN MAIL$:MAILSN
YES
$!
```

MAINTAINING THE SENT FOLDER

CREATE COMMAND EXP-UNGE -<return>

-> "_SEL SENT ;_SEA/BEFORE=T-30 ;_DEL SELECTED ;_PURGE"

INITIALIZATON FILES

DECmail-11

WISH LIST/USER FEEDBACK

_LIST/NEW

SUMMARY

- Full Functionality Mail System for the PDP-11 Family
- Command and/or Menu Mode
- Built-in online Help Feature
- User Can Tailor Own DECmail-11 Environment
- Detailed Documentation
- Sends and receives messages to other systems connected via DECnet
- Remote VMS Message Router Support

FREE
 60 DAY TRIAL OFFER

NO RISK

This 60 day free trail offer provides an opportunity to use DECmail-11 V3 absolutely free of charge for 60 days. The trial package contains the software and copy of the documentation. Distriubtion media will be 1600 bpi magtape or RX50 floppy.

WHO

This offer is being extended to users running RSTS/E V9 or later, Micro/RSTS V2 or later, RSX-11M+ V3 or later, and Micro/RSX V3 or later.

HOW

To take advantage of this trial offer you have to fill out an agreement form. As soon as we receive this signed form we will send you the trial package.

If you are interested in this free offer please see me after this session, during the week, or phone me at work (603)884-0206.

Please rank the importance of the following features. If your favorite is not on the list, enter it. If you need additional space, use the back of this sheet.

Scale from 1 to 4.

- 1 = I need it now, if not available I will purchase from another vendor
- 2 = I would like to have it but can wait for a future release
- 3 = I don't need it but think others in my group would want it
- 4 = I don't need it but am willing to talk about it out at Fisherman's Wharf...

o What operating system are you running DECmail-11 under?

RSTS ___ Micro/RSTS ___ RSX-11M-PLUS ___ Micro/RSX ___

___ o WPS-PLUS as an alternate editor (RSX & RSTS)

o Performance improvements for:

___ o Startup time to display Command > prompt (RSX only)

___ o PURGE/EXIT (RSTS only)

___ o Sending mail (RSTS & RSX)

___ o SET/NOPROFILE qualifier = allows users to temporaty set DM-11 options without recording in their profile file (RSTS & RSX)

___ o Store all print requests (/HOLD & RELEASE) (RSTS & RSX)

___ o I & D space tasks (RSTS & RSX)

___ o /STRIP qualifier for editing with WPS-PLUS = removes all C/R, line feeds from file (RSTS & RSX)

___ o Programmable function keys (RSTS & RSX)

___ o SEARCH/TEXT = for phase or word (RSTS & RSX)

___ o Transfer WPS-PLUS documents to WPS-PLUS (RSTS & RSX)

- ___ o Support Digital Document Interchange Format (DDIF) document transfers using Message Router (RSTS & RSX)
- ___ o Provide interface to Distributed Directory Service = user inquiry to corporate name data base and address (RSTS & RSX)
- ___ o New PRINT/FORM= form_name qualifier (RSTS & RSX)
- ___ o Error message = give more explicit feedback (RSTS & RSX)
- ___ o Allow and handle chaining DISTROs (RSTS & RSX)
- ___ o EXPORT/FEED with form feeds between messages (RSTS & RSX)
- ___ o Optional software support dial-up access via DECTalk to user folders (RSTS & RSX)
- ___ o /CONFIRM each distro list username (RSTS & RSX)

o Documentation:

- ___ o More examples in documentation
- ___ o More explanations about particular areas (specify)

o How would you rate the ease or difficulty of using DECmail-11?

Ease of Use (10 very difficult to 1 very easy - circle one)

10 9 8 7 6 5 4 3 2 1

o What would you change in DECmail-11 or the documentation to make it easier to use?

o Other items or comments

THANK YOU FOR YOUR FEEDBACK...

Return this wish list to the RSTS or RSX Suite or you may mail to:
 Ginger Landry, Digital Equipment Corporation, Continental Boulevard,
 Merrimack, New Hampshire 03054, MK01-2/L02

RSX

MULTI-TASKER



RSX

FOOD FOR THOUGHT

"When a man drinks water, or does anything for the sake of practice, whenever there is an opportunity he tells it to all: "I drink water." Is it for this that you drink water, for the purpose of drinking water? Man, if it is good for you to drink, drink; but if not, you are acting ridiculously. But if it is good for you and you do drink, say nothing about it to those who are displeased with water-drinkers. What then, do you wish to please these very men?"

- *Epictetus*
Discourses, Book III

The RSX Multi-Tasker
February, 1987

"Illegitimus Non Carborundum Est"

Fine Realtime Commentary Since 1975

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THE EDITOR'S CORNER

Bruce R. Mitchell

Yes, indeed, my faithful audience - once again, despite popular demand, and frequent inspections by the Committee for the Public Morals, it's the Multi-Tasker Variety Show and Digital Comedy Hour.

It's a mixed bag of entries this month. As always, the "Bag of Tricks" discusses Macro ways and means. This month - how to use that tricky Extend Task directive profitably, while minimizing trouble making it work. We also see the reappearance of a column long-absent from the Multi-Tasker, "It's In the Code", dealing with interesting little tidbits in the RSX system code.

Something else long absent from the Multi-Tasker, and particularly appropriate in view of this month's editorial, an SPR on the MT: driver which should be of interest to every

system manager whose system supports MT: and powerfail. A new series by Jim Bostwick and Jim McGlinchey debuts this issue, with "The Notebooks of Justin L. Hewser." Justin is familiar to readers of the Multi-Tasker for his guest editorials; here are some of his sow's ears of wisdom.

Rounding out the issue is a command file to translate numbers without counting on fingers or scribbling, and one of the classic RSX SIG technical articles - the "Topological Walk to an ODL".

Again, the editor thanks each and every respondent to the continuing call for more articles. Keep them coming; I've got a little something for all submitters. Sometimes it may even be useful. And - oh yes, if you don't want to write an article, at least drop a line telling what kind of articles you'd like to see in the Multi-Tasker.

Ho, varlet! Where's my boots? It's time to kick the dog again.

----- Software Dispatching -----

In recent years, Digital has tended more and more to feed its customers predigested pap when it comes to ongoing support of DEC software. The late great Software Dispatch is a prime example of this tendency.

There was a time when the Software Dispatch was the primary source of solutions for problems with RSX systems. When a problem - such as the egregious TKB problem in M-Plus V1.0 - occurred, the Dispatch had it in print in the next issue. Digital didn't have to hold releases of software for bug fixes, and the customers didn't have to wait six months for the next Autopatch to come out.

The recent history of the Dispatch, however, indicates that this once useful tool is becoming a sword suspended over the users' heads. Complaints often heard about the Dispatch include:

- o Holding back important information
- o Not telling about all the problems
- o "It will be fixed in Update n", regardless of severity
- o Fixes are at least 4 months away from when seen
- o No fixes at all for layered products
- o DECnet patches appear once a year, then it's a pile

Perhaps the most common complaint, however, is that the Dispatch, once an alternative to purchasing Autopatch service, is no longer an alternative. Patches must be purchased through Update service, and are available nowhere else.

Digital is certainly not entirely at fault in this matter. When the Dispatch was publishing patches, many SPRs were the result of incorrect and incompetent patching by users. It is certainly no surprise that DEC wanted to eliminate such overhead in the SPR process.

Yes, it is certainly much more convenient for Digital.

----- Submitting Articles to the Multi-Tasker -----

Please submit machine readable media when possible. RX01, RX02, RX50, or 9 channel magtape at 800 or 1600 BPI are best. Any RSX volume format is acceptable except ROLLIN or PRESRV. ANSI, BRU and DOS FLX formats are well-liked by the Editor's tape drive.

Submissions which aren't machine readable take longer to get into print. The editor is lazy and types mass quantities only once a month when progress reports are due.

If you preformat a submission in RUNOFF format, please set page size 58,80; left margin 10; right margin 75; and, when changing margins, use incremental changes rather than absolute. The editor blesses you for the consideration.

Send all submissions to:

Bruce R. Mitchell
Machine Intelligence and Industrial Magic
PO Box 816
Byron, MN 55920

----- And That's The Way Things Are -----

... this month in Pool Lowbegone, where Digital Equipment's earnings are strong, the future outlook is good-looking, and the industry standing is above average.

THE BAG OF TRICKS: MACRO-11

James A. McGlinchey
5 Skyline Drive
Essex Junction, VT 05452

In this month's article we examine the problem of a task getting into memory and finding out the programmer didn't allocate enough data buffer space to do <x>.

There are two ways of handling the problem of getting more data buffering space for a task in a running RSX system. The task can:

- o Be installed with a maximum increment
- o Extend itself for more workspace

It can give up, too, but this isn't very useful, so we won't look at it any further.

If a task is installed with a maximum increment, it loads more slowly than it would if installed with a minimum increment. There's also the problem of where the extra space is going to appear in the task's virtual memory space. (It hangs off the end of the task, which is probably not contiguous with the program's original buffer.)

On the other hand, if a task extends itself while running, it loads more quickly than it would if installed with a large increment. But there's still the problem of where the extra space is going to appear in the task's virtual memory space.

The task can keep track of additional buffer space through the .LIMIT assembler directive. .LIMIT tells the task its highest Taskbuild memory address; any extension appears immediately after that point. But this means that the task must manage two buffers rather than one.

It is much simpler to force the buffer in question to be the last thing in the task's virtual address space, so the whole buffer ends up contiguous and no fiddling about is necessary. This sounds tricky, but is actually pretty straightforward.

The Taskbuilder assigns .PSECTs to virtual memory in ascending Radix-50 alphabetical order. Macro accepts .PSECTs with names "AAAAAA" through ".....". This means that the highest valid .PSECT name is ".....". "\$\$\$\$\$\$" is equally good; both translate to Rad50 values higher than those of valid alphanumerics. Anything put in such a .PSECT is relocated by TKB to occupy the highest possible section of virtual memory.

So, this is where the program's expandable buffer should

reside - and to ensure that the buffer is contiguous, nothing else should reside in that .PSECT.

The following code, culled from a Macro program which reads in block-structured files, illustrates this approach.

```
.PSECT $$$$$$, RW, D
BUFFER: .BLKB <512. * BUFSIZ> ; Disk file block buffer

.PSECT CODE, RO, I
... preceding code ...

; See if file is bigger than local buffer; if so, extend
MOV F.HIBK(R0), R1 ; Load high block number
CMP R1, #BUFSIZ ; Can we read it all now?
BLOS 50$ ; If so, go read it

SUB #BUFSIZ, R1 ; Subtract buffer size
ASH #3, R1 ; Convert to 64-byte chunks
EXTK$S R1 ; Try to extend the buffer
MOV $DSW, R1 ; Extend successfully?
BPL 50$ ; If so, go read it all

... error processing ...

; File small enough to read whole, so read the whole thing
50$: ... code continues ...
```

IT'S IN THE CODE

The following article appeared, as if by magic, on the Editor's desk one day. Nobody admits to knowing from whence it came. It's the straight poop, though. --- The Editor

Ever since support for I/D space arrived on the M-Plus scene to keep me from making "just one more overlay", I have tried with only limited success to convert RSX utilities to be flat, I/D

tasks.

One of the first programs to try was MAC, the Macro-11 assembler. Anything to make SYSgen go a little faster, right? Incredibly, the work was already done for me on one of the M-Plus Field Test kits. Included in the documentation was a TKB command file for flattening the assembler.

Comparing performances of the I/D version against the "vanilla" version showed a respectable improvement which varied on the complexity of the source file.

Since that early version, the "unsupported" command file has tagged along, requiring a few changes to accommodate changes in the assembler. While bringing up V3.0C, in the process of meandering through the [1,20] UFD looking at the updated command files, I noted that "support" for I/D space had slipped in. All that has to be done to enable this feature is:

- o Edit [1,20]MACBLD.BLD
- o Change the line:
 .IFNDF \$ID .SETF \$ID
 to
 .IFNDF \$ID .SETT \$ID
- o Proceed with the SYSgen as usual.

MT: DRIVER SPR

The following article also appeared, as if by magic, on the Editor's desk one day. I don't know if this is for V2.1, V3.0 or both. --- The Editor

Power Fail Recovery Problems with MT: Driver

Problem:

RSX-11M-Plus systems do not recover from power failures if the system has devices served by the MT: driver (MTDRV).

Diagnosis:

Under M-Plus, the power fail entry point for a device driver must handle two different calls. First, the driver is called to

handle controller power fail recovery, with R2 containing the KRB address, R3 containing the CTB address, and the carry bit set. The driver is called once for each controller.

The driver is also called to handle unit power fail recovery, with R3 containing the controller index, R4 containing the SCB address, R5 containing the UCB address, and the carry bit clear. The driver is called once for each unit.

MTDRV makes no distinction between the two calls. The driver always assumes that R5 contains a UCB address as it attempts to select a tape unit. This causes unpredictable results when the controller power fail recovery call is performed.

Solution:

The following correction file to MTDRV.MAC corrects the problem. The patch utilizes the controller power fail recovery call by performing a Power Clear on the CSR in case the controller comes up in an undefined state.

```
MTDRV.MAC;2/AU:72./-BF=[11,10]MTDRV.MAC;1
-2,2
  .IDENT /05.07A/
-11,11
; Version 05.07A
-56
;
;      JLH001 -- Correct power fail logic
%
-511,511,;/JLH001/
MTPWF:  BCC      188$                  ; If cc- unit powerfail call
          BIS      #CS.CLR, @(R2)     ; Power clear the controller
          BR       189$               ; And return
188$:   BISB      #US.PWF, U.STS(R5)   ; Set power fail indicator
-512,;/JLH001/
189$:
/
```

THE NOTEBOOKS OF JUSTIN L. HEWSER

Jim Bostwick
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Minneapolis, MN 55440

At a recent LUG meeting, a stranger gave me a thick looseleaf notebook. "I'm leaving RSX for UNIX," said the stranger; "maybe somebody could use my programming notes."

I barely had time to thank the masked man, much less get his name, before he had faded into the crowd. What a treasure trove! Here was an experienced RSX person who actually kept notes on how he did things! At that moment, I resolved to give these gems the widest possible distribution. This column is the result.

However, as I began to leaf through the notebook, it became clear that rather than an undiscovered Ralph or Jim or Alan, what I possessed was something truly extraordinary: The notebook of none other than Justin L. Hewser himself!

We all know Justin: he has been seen in nearly every programming shop. His is the desk in the corner, right next to Murphy. Yes, him. Justin is a prolific programmer, and we have all at one time or another been forced to work with his product. Forced, because we'd sooner do real-time COBOL than look at his stuff voluntarily!

... all of which makes this column even more necessary. This may be the only existing documentation of the vast body of software produced by Justin L. Hewser. It must not be hoarded. Every programmer should be forced to benefit from it. So - each month, I will reproduce one of the programming notes from the book, along with explanatory notes of my own. The resulting collection should make a dandy supplement to your shop's programming notes.

(Justin, like Murphy, will always be with us. Since we have to live with his code, we need all the help in understanding it we can get.)

This month's note is from the FORTRAN section of the Notebook, though it applies equally well to most languages. It involves the use of logical assignments ("pseudodevices") to provide "device independent output".

****F231. -- Using Pseudodevices***

Never code a device name into the program. Always use a pseudodevice. That way, real devices can be

changed without redoing the program.

Do this with an ASG=dev:lun statement option to the linker. Then, install the program, and do ASN dev:=realdev: before running the program.

```
INS FOO
ASN TT5:=FO1:
ASN DLO:=FO2:
RUN FOO
```

Justin (as is often the case) is on the right track here. His boss probably dictated the use of logical assignments, and Justin is trying hard to comply. He doesn't quite get it right, however, which may explain the margin note ("This doesn't work.") found in the original.

What Justin forgot is that logical assignments are resolved at INStall time. In the example, INStall cannot find FO1: or FO2:, and defaults to SY0:. This may result in surprising behavior. Bad juju.

The quick fix is to do the device assignments before installing the program. You still have to remember to remove and reinstall it whenever the assignments change - an easy thing to forget.

The correct fix is to code Assign LUN (Macro: ALUN\$, Fortran: Call ASSIGN) directives in the program. Mapping of pseudo to real devices is then done at run time, not at install time. One is no longer dependent upon INStall to do what the task is able to do for itself.

There is a wealth of information in Justin's notebooks. I have only begun to analyze them in detail. Here are some candidates for future columns:

- o Using Disk-resident Overlays to Reduce Checkpointing
- o Finite-Element Analysis in LISP
- o Using IND for Word Processing

BASE CONVERSION COMMAND FILE

James Fullerton
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Research Division
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Wichita, KS 67219

Every now and then those of us who deal with PDP-11 hardware need to convert back and forth from decimal, octal and binary. Doing this by hand is tedious, and I am too cheap to add to my calculator collection by purchasing an HP-16C. Instead, I wrote an indirect command file to do most of those conversions. (The omitted conversions are binary to anything else).

This is one of those things that should probably be written in some real programming language, but I didn't bother for the following reasons:

- o Most base conversions I need to do involve bases 2, 8 and 10
- o The INDIRECT solution is reasonably fast
- o Space is at a premium on my system
- o Most conversion program images require more than six blocks!

```
.disable lowercase,display
.enable substitution,quiet
;-----
; CONVERT converts input arguments from one base to another.
;
; Command line format:
; @CONVERT number,from,to
; where: <number> is the number to convert,
;        <from> is the base of the number
;        <to> is the base to convert it to.
; Valid <from> values: D (decimal), O (octal).
; Valid <to> values: D (decimal), O (octal), B (binary).
;-----
.if p1 = "" .exit
.parse p1 ",," n from to
.test n
.enable lowercase
; Make sure the input is a number
.iff <number> .gosub error
.disable lowercase
; Test <from> and <to> for validity.
.setf valid
.if from = "D" .or .if from = "O" .setf valid
.enable lowercase
.iff valid .gosub error 'from' is an invalid base.
.disable lowercase
.setf valid
```

```
.if to = "D" .or .if to = "O" .or .if to = "B" .setf valid
.enable lowercase
.iff valid .gosub error 'to' is an invalid base.
; If <from> = <to> then no conversion is implied.
.if from = to .gosub error No conversion implied.
.disable lowercase
; If convert to binary is requested, convert to octal first.
.setf binary
.if to <> "B" .goto convrt
.setf binary
.sets to "O"
; Convert the number. It is possible to have conversion of
; octal to octal here, so there is no need to convert if
; that is the case.
.convrt:
.sets base10 ""
.if from = "D" .setf base10 "."
.set 'from' number
.setn number 'n'base10'
.if from <> to .set 'to' number
.iff binary .gosub shonum = 'number'
; If conversion to binary requested, build the binary table.
.sets b0 "000"
.sets b1 "001"
.sets b2 "010"
.sets b3 "011"
.sets b4 "100"
.sets b5 "101"
.sets b6 "110"
.sets b7 "111"
.sets octal "'number'"
.test octal
.sets bin ""
.setn d 1
.setn len <strlen>
.o2bin:
; Convert one digit at a time to binary.
.if d > len .gosub shonum = 'bin'
.sets odigit octal[d:d]
.sets bin bin+" "+b'odigit'
.inc d
.goto o2bin
;-----
; Number display routine.
;-----
.shonum:
.disable quiet
;'comman'
.enable quiet
.exit
;-----
; Error message routine.
;-----
```

```
.error:
      .disable quiet
;CONVERT - 'comman'
      .enable quiet
      .exit
```

TOPOLOGICAL WALK TO AN ODL

John Covert Bruce Mitchell Denny Walthers
Digital Equipment MIIM Kendall McGaw

This is the second in a series of reprints of landmark RSX technical articles. The original article has been augmented with text reprinted by permission from a forthcoming book by Messrs. Mitchell and Walthers, copyright (c) 1986. --- The Editor

1.0 The Overlay Descriptor Language

Clearly, the Taskbuilder is not intelligent enough to figure out an appropriate memory allocation for an overlaid task. Overlay structures are specified to the Taskbuilder through a simple language called ODL, the Overlay Descriptor Language.

ODL files (viz., file containing ODL specification lines) are supplied to the Taskbuilder to control the building of a task. While ODL looks rather formidable to those unfamiliar with it, as we shall use it, it is actually quite straightforward. Macro programmers will grasp it immediately, and programmers in other languages will not find it difficult.

1.1 The Topological Walk

ODL is necessary to build overlaid tasks, so it must be learned. Fortunately, there is a relatively painless way to write overlay descriptors without an extensive knowledge of ODL. This method is topologically based, and was first presented to RSX users by John Covert of the RSX implementation group. It is called the topological walk method.

The topological walk method requires the use of a memory allocation diagram and uses a simple set of rules to build the overlay descriptor:

1. Start in the lower left corner of the memory allocation diagram in the root segment.
2. Proceed up the diagram as far as possible without hitting the top or empty space, crossing into new segments as needed.
3. Proceed to the right of the diagram until a vertical line is encountered.
4. If the current location is the base of the vertical line, cross the vertical line and go back to step 2.
5. If the current location is not the base of the vertical line, proceed down the vertical line until the line terminates.
6. If the current location is not the lower right hand corner of the diagram in the root segment, cross the vertical line and go back to step 2.
7. Return to the starting point and draw arrows in the direction of the walk at every point a line was crossed into a new segment.

Now write the overlay descriptor for the task, using the following set of rules:

1. Write: `.ROOT <root-segment-name>`
2. Follow the line. Write down the next element of the overlay descriptor at each arrow, based on the direction of the arrows:
 - o For up arrows, write: `-(<new-segment-name>`
 - o For right arrows, write: `,<new-segment-name>`
 - o For down arrows, write: `)`

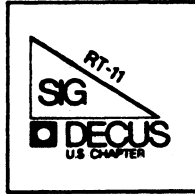
1.2 Example Walk

Here is an example walk on a simple memory allocation diagram:

THE
mini-
tasker

DECUS

RT-11 SIG NEWSLETTER



Notes from the RT-11 World

Copyright's

All copyrights in the RT-11 Mini-Tasker belong to the owner/submitter of the material in the Mini-Tasker, and not to the RT-11 SIG, DECUS or Digital Equipment Corporation. If you have a question about any article in the Mini-Tasker, please contact the author directly - not the Editor - and not DECUS.

We DO solicit signed articles for insertion in the Mini-Tasker, on or about bugs, features, nifty things, etc., all about the RT-11 operating system and its environment. Write it up, send it to me (with a note to rewrite if you wish) and I will try and get it in an upcoming issue of the Mini-Tasker.

Trivia

With thanks to Diana Miller, RT-11 Product Manager, Digital put together an interesting game on PDP-11 trivia. Following are some interesting RT-11 (and PDP-11) facts of life.

1. What does LSI stand for?
2. What are the three board level products which provide booting for LSI processors?
3. What four memory types were available when the LSI-11 was first announced?
4. What does EIS stand for?
5. What PDP-11 Processor(s) support EIS?
6. What does EAE stand for?
7. What is an EAE?

Your Guide to the Software License Certificate

There has been quite a lot of controversy recently about what was said and not said by DEC, both at DECUS and to the press, about the new (old?) software licensing policies. To help clarify some of the confusion, I am printing the booklet given to DECUS attendees at a meeting in San Francisco. I am also printing the letters to and from C. W. Goldsmith, asking and getting a response from DIGITAL.

Response to "DIGITAL supported C" Survey

So far, I have received a grand total of one (1) response (from Mountain View Radiology Associates in Provo, Utah). For those of you in the RT-11 world who would like to comment on a DIGITAL supported PDP-11 C product, I have reprinted the "C" survey. Speak out, or forever hold your peace.

Letter from Ed Judge

Ed Judge wrote an interesting letter, saying that I could print it, edit it, or scrap it. He also said that RT-11 "is the best OPSYS I have used". With a response like that, we have to include his letter. I did have to re-type it to fit our margins, so any mistakes are probably mine.

IND Examples

Many of us are not using IND as we should, partly because it is new (to some OLD-timers), partly because we read the manual and get lost, or sometimes, we would simply would like to see some REAL examples. DONE!! I am printing the examples used in a talk presented at DECUS, and hope that this will encourage more of you to use IND. If you have any questions, or would like to see more of this kind of material printed, please contact either Marty Gentry or Linda Banche at the RT-11 Development team in Marlboro.

Trivia - Answers

1. Large Scale Integration.
2. REV11, MXV11, and BDV11.
3. ROM, PROM, RAM, and CORE.
4. Extended Instruction Set.
5. PDP-11/35, PDP-11/40.
6. Extended Arithmetic Element.
7. Peripheral that does multiply (MUL), divide (DIV), and multibit shifts (SHIFT) for the PDP-11/20 and other early PDP-11's.

And finally, I am always looking for something to print.

Please send your submissions to The Mini-Tasker (on RX-01, RX-50, or pieces of paper) to me at:

Bill Leroy	Bill Leroy
The Software House, Inc.	The Software House, Inc.
P. O. Box 52661	2964 Peachtree Road, NW #300
Atlanta, GA 30355-0661	Atlanta, GA 30305-2120

404/231-1484 or DCS (LEROY)

Software product license agreements with Digital are now represented by a Software License Certificate.

This new certificate does not reflect a change in licensing policy. It represents your investment in Digital's software and Digital's investment in helping you comply with software licensing agreements.

Keeping Track of Your Investment

The license certificate is a valuable document that benefits you in several ways.

The certificate serves as evidence of your right to use a particular Digital software product for a particular central processing unit (CPU).

Because it is a physical representation of a license, the certificate is a handy tool for keeping track of the software and updating its status if conditions change.

More Than a Piece of Paper

Keeping track of license agreements helps you reinforce with your employees the fact that software is a valuable asset governed by legal requirements. And displaying the certificates heightens the awareness of those legal requirements for employees who might have a less serious view of software use.

Making Life Simpler

In summary, the proper use of the license certificate provides an extra level of assurance that you are in compliance with Digital's licensing agreement.

What a Software Product License Means

The rules regarding the use of Digital's licensed software products are found in Section 7 of Digital's *Standard Terms and Conditions of Sale*. But, as with any legal terminology in fine print, sometimes they go unread. The license terms are important, though, and it's worth the extra time to become familiar with them. We've included Section 7 at the back of this booklet.

Simply stated, you do not own licensed software. The license agreement gives you the legal right to use it. You can use the software only on the CPU authorized by the license. Of course, you can make backup copies for use on that authorized CPU. And you can use the software temporarily on another CPU until a malfunctioning authorized CPU is returned to service.

The only people who can use your licensed software are your employees or agents. If you fail to comply with these rules, Digital retains the right to terminate the software license and to require the return of the software.

In the Next Few Pages

Please take a moment to look at the next few pages. You'll find simple instructions for using the certificate as a tracking tool and as an instrument for the correction or replacement of the certificate, or termination of the license agreement.

Digital is first issuing certificates to licensees of software products for VAX 8000 series CPUs. Later, Digital will issue certificates for all members of the VAX family of CPUs.

RT-4

Digital Equipment Corporation

Your Guide to
the Software License Certificate

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RT-3

How to Replace or Cancel

If you need to replace the certificate because of loss or error, or want to cancel a periodic payment license, please submit the certificate for correction/reissue using the procedures described below.

Remember, all these procedures must be conducted using the original certificate—not a copy. Should you lose the original, promptly request a reissue in order to avoid any delays in license transactions you may wish to execute in the future.

Note: If you hold a sublicense agreement with an authorized reseller, contact your supplier to assist you in executing any of the transactions.

A Closer Look at the Software License Certificate

On the Front

Four key items are contained on the front of the certificate.

- A certificate control number assigned by Digital.
- The model and serial number of the authorized CPU.
- The company name and address of the licensee.
- The specific software product or products which are licensed.

The front of the certificate also has a summary of the key provisions of the Software Product License. The complete license terms are contained in *Digital's Standard Terms and Conditions of Sale*.

On the Back

The back of the certificate has a fill-in-the-blanks application for the most common requests regarding the correction, replacement or termination of a license agreement. These procedures are fully described in this guide.

Certificate Maintenance Procedures

I. Application for replacement certificate due to loss of the original certificate.

1. Under Application for Replacement Certificate, check (1).
2. Have an authorized representative of your company sign this section.
3. Mail a copy of the original certificate to your local Digital office, attention Software Services.
4. A new certificate will be issued.

II. Application for replacement certificate due to an error in the issued certificate.

1. Under Application for Replacement Certificate, check (2).
2. Make all corrections on the face of this certificate.
3. Have an authorized representative of your company sign this section.
4. Mail the original certificate to your local Digital office, attention Software Services.
5. A new certificate will be issued to you.

III. Termination of a Periodic Payment License. This procedure requires 90 days notice.

1. For termination of a Periodic Payment License have an authorized representative of your company sign this section.
2. Mail the original certificate to your local Digital office, attention Software Services.
3. Termination of this license is effective no earlier than 90 days after notice to Digital.

Where To Send It

Please address all correspondence to your local Digital office, attention Software Services. If you have any questions you can't get answered, contact Digital Equipment Corporation at the address on the front of the certificate.

Care and Handling of Your Software License Certificate

Who Receives the Certificate?

For software license agreements made directly with Digital, certificates are always sent separately from your computer system, the software product media, and documentation.

The *original* certificate is sent to the "SOLD TO" address specified on Digital's Acknowledgement of your purchase order. This is the party registered as the "LICENSEE" on the certificate.

In addition, a letter is sent to the "SHIP TO" address specified on the Acknowledgement informing the addressee where the original certificate has been sent.

If You Deal with an Authorized Reseller

You also receive certificates for Digital software products obtained from our authorized resellers.

First, the authorized reseller will require you to execute a sublicense agreement binding you to Digital's Software Product License terms.

Then, the authorized reseller will print your name and address in the space marked "sublicensee" on the face of the certificate.

Finally the authorized reseller will send you the original certificates for the sublicensed software products.

Copy and Store the Original

After you review the certificate for accuracy, we recommend that you *make at least one copy*, front and back, of the original and then store the original in a safe place.

Display the Copy

An ideal place to display the copy is in a location near the CPU that is listed on the certificate. The CPU serial number recorded on the certificate may be verified by comparing it with the serial number on the computer's cabinet housing.

The following letter was sent from C.W. Goldsmith to Digital.

To: Rose Ann Giordano, Vice President, Digital Delegate

At the recent DECUS U.S. Chapter Symposium in San Francisco, Digital announced significant changes in the software licensing policy. The changes described caused sufficient concern that 1200 members attended a meeting about licensing with only 3 hours notice.

We are concerned that the decisions concerning this policy were made without a clear understanding by Digital of the potential impact. Some of our members, Marge Knox and Leslie Maltz among them, are members of a joint DECUS-Digital committee on licensing and this was unknown to them. We are now concerned that future efforts by this committee are jeopardized because of this decision being made without any information from our membership.

We also understand that Digital has already changed the policy to permit the transfer of licenses between tiers. While we appreciate this response to the membership's objections in San Francisco, we do not feel that a really adequate assessment has been made of all the aspects of this policy. Therefore, we suggest that Digital delay the implementation of the policy for 6 months. During this time we would like for the joint committee to explore the rationale behind these proposed changes and to evaluate interim tactics that might better serve both DECUS members and Digital.

In addition to the concerns with the policy, the Board of Directors of the U.S. Chapter is also disappointed that Digital did not bring an issue of this magnitude to the Board prior to announcing it to the membership. We also noted that none of the Digital Counterparts seemed to be aware of this change. While it is true that our membership is primarily interested in technical information, most of them also have some responsibility for ensuring that the financial investment in computing products is sound. They were justifiably upset when the rules concerning the cost of software and the subsequent value of used equipment were changed without apparent consideration of the effects of that change.

Should you need any additional information, please contact me.

Sincerely,

C.W. Goldsmith, President

Digital's response was as follows:

Dear Clair:

Thank you for your comments relative to the recent software licensing announcement at DECUS. We share your concerns with the way the announcement was delivered. The Digital employees who were involved in the announcement clearly understand the problems that were created by not involving DECUS leadership upfront. They discussed this at length, unfortunately after the fact, in a meeting with some DECUS Board members the week of symposium.

We have heard the DECUS feedback and have thoroughly revisited the license transfer issue. The following information was sent to our U.S. Sales Force on November 11, to clarify and modify the messages heard at DECUS.

1. System Upgrade and Movement of Software within a Corporate Entity

We will protect our customers' investment in Digital Layered Software Product Licenses.

When moving layered software products to a higher price tier, the customer will pay a price equal to the difference in cost of the product on the old and new systems. This is no change from our current practice but different than the message heard at DECUS and communicated in Sales Update.

Movement of layered software will be allowed to other systems of the same or lower price tier, but no excess credit will be granted.

Our existing policy on operating systems remain unchanged. Operating systems cannot be moved between CPU's.

2. Resale of a System to another Corporate Entity

We will no longer grant permission for the transfer of either layered or operating system software licenses from one corporate entity to another.

In practice, we have frequently agreed to approve license transfer requests. As of March 1, 1987, we will no longer approve license transfer requests. The implementation date was previously communicated as January 1, 1987. New owners of used equipment must be licensed by Digital for use of Digital software products. These changes do not affect our OEM's rights to sublicense Digital software.

Digital is committed more than ever to work with the joint DECUS Digital committee on software licensing. We are working on a number of software licensing and pricing programs which we believe will address our customers' needs for flexibility, ease of compliance, pricing for volume software purchases, and protection of their software investment. We appreciate the feedback you provided on the license transfer issue and will be counting on your input and support for our evolving software license architecture.

The relationship that has grown between Digital and its customers through the efforts of the DECUS Board is very important in meeting one of the prime goals of the Corporation, that being customer satisfaction. The DECUS symposia have served us well in the past as forums for getting information to our customers. It is unfortunate that this mechanism was not utilized properly by Digital through contact with the DECUS Leadership.

Please note that Digital has indeed listened to the customers through it's follow-up meetings with DECUS leaders. The implementation date of the license transfer request has been extended by 60 days. This should allow more time for customers to analyze the effect on their organization.

A by-product of this incident, while not an excuse for it happening, is that Digital, as a Corporation, realizes even more the importance of DECUS and the service it supplies both to the customer and the Corporation.

Sincerely,

Rose Ann Giordano,
VP, Digital Delegate

Peter Jancourtz,
Digital Alternate

Ed Judge
30 Autumn Drive
Northampton, MA 01060

December 3, 1986

Dear Bill:

(* This is a submission for the RTSIG. It is a list I've been keeping and adding to as things occur to me. If you think it's worth printing, do so. If you have to edit, do it. If you think something is stupid, probably because of my ignorance, scrap it, or the whole thing if you don't take it as being of any value to the RTSIG. I think some of these ideas aren't too bad, and I seem to have seen some of them crop up in the Mini-Tasker. *)

I think RT-11 is the best OPSYS I have used, but it's not evolving nearly as fast as many of the PC OPSYS's are. I want RT-11 to help me do my work and evolve along with my new equipment and needs. The equipment should do as much of the work as possible, and RT-11 should be able to form itself around my hardware and optimize the system for my workstyle. I traded off equipment for time. RT-11 should take advantage of any special hardware - any other way is inherently contra-productive.

Perhaps someone else (Greg Adams & RT-32 ??) may also like them. Eventually something may even happen from DEC, if size and Narcissism hasn't ossified them before then. Recently Ken Olsen said that DEC was a software business that got big in hardware. I hope they want to stay that way.

Regards.

Ed Judge

RT-11 KED Extensions and Modifications

KED, used more than almost any other utility, needs several options for full utility and capability. Many could be overlaid, but with lots of memory they could be virtual or disk overlays as an option.

Non-volatile SET commands and/or a start-up file, which could do much the same, but both would be more flexible.

Split screen and/or simultaneous "sliding" full windows for easy transfer of text from one document to another, perhaps supporting this popular feature found in most new VT-220 emulators. I think split screen is best, as you could extend the idea to 3 or 4 files at one time, especially if you could change the screen size to a larger number of lines.

Letter from Ed Judge

A SET command concerning the number of lines available would allow the use of some of the new terminals' expanded line formats, such as 40 line mode. Most CRT-dependent commands could be table-driven and easily changeable, allowing most terminals to be used by KED to their fullest.

Printing and/or storing the name of the last input and output files on exit and on later demand.

A non-volatile SET command specifying the default extension.

An optional COPY and paste rather than a CUT and paste.

TECO's facilities - the conditionals for character type identification (IF, Ucase, lcase, punc, .and., .or., ="X", etc.), several registers for both "LEARN" macros and temporary buffer storage, using the keyboard number and maybe the "gold" key for selection, etc.

The ability to list and edit stored LEARN macro(s).

A WORD COUNT, perhaps with an exclusion clause for numbers, articles and/or words below a certain length (2 ?).

The ability to expand the "cut & paste" buffer, perhaps in extended memory.

SET AUTOMATIC abilities to use VM: for all work and temp files would give a quick, long-needed speed-up.

A decent but simple callable ASCII SORT command. Something would be better than nothing. Indeed, RT-11 should have a system level sort such as RTSORT (R) or ZORT (R), but not necessarily as elaborate.

An optional implementation of more flexible "WYSIWYG" (what you see is what you get) functions, such as left and right margins and pagination, overstrike mode, auto justify, dual (at least) column ability and columnar editing.

The standard SL editor's "history" could be expanded into 4 or 5 commands back, perhaps using digit keys for ID, and perhaps an implementation of the expanded TSX-Plus (R) "KED" form.

By the way, I recommend highly the FALCO 5220 VT-220 emulating terminal. The screen display is the BEST I have seen, even considering many graphics scopes. SETUP is easy and full featured, and the cost is low (less than half the cost of a VT-220 from some suppliers). It has many of the above mentioned CRT features, a 14" flat, white (and others) screen, and a nice keyboard. Check them out if you are looking for some new CRT's.

Rumor has it that RT-11 V6 will be multi-tasking. I hope "windows", such as found on TSX-Plus (R) will be implemented. Perhaps even sys-

Letter from Ed Judge

tem jobs could have their own windows.

Since memory is cheap, many functions could be optionally placed in global memory regions at start-up or call-up by some commands in START?.COM.

What about a program, much like PC users' "Sidekick" (R), that has a calculator and a "timed" calendar/memo system with a general search facility, and perhaps a "Rolodex" (R) or whatever, and a facility to allow easy addition of "home grown" tools such as spelling checkers, etc. This would be one of the best "customizing" tools available for differing workstyles.

Perhaps there could be some common general default space in both memory and a supporting LD to record or temporarily store times and other general data, perhaps with some "commands" in a file, ala "spreadsheets", to operate on them. Elapsed times, etc. would be useful in general system programs such as a notepad and a general reminder/memo system. Some could be like resettable odometers, useable generally by application and system programs. There could be an optional permanent "LD"-like structure on disk that would load facilities as they are called, keeping some resident in memory and others on the LD until needed, as chosen by SET commands. Different functions could be defined and stored in different LDs.

This would allow the ability to define the input and output defaults for all utility programs, perhaps table driven and easily accessible. This could allow a "list-driven" option for utilities such as PIP/COPY.

Some form of general global memory and/or disk area to be available for default storing the equivalent of ".COM" or "IND" files, used by programs like UCL??. (Bill Walkers UCL+ should be made standard).

Use (optionally) the heretofore underused and unused "Volume ID" and "User" fields to implement some form of user ID and project number/directory ID, and still be compatible with older RT-11 files, at least enough to convert them.

More, many more, permanent LD sub-sets for people with several projects going on. Perhaps the project or ID numbers could be or be given logical assigns.

A switch-selectable linker library "path" function would be great. Several could reside in the linkers LD in the common region.

A multi-device, list-driven, extension of the directory program like LOCATE.

A user defineable I/O buffersize parameter.

Perhaps a little AI could find its way into RT-11 and stop some of the more common stupid errors?? A "Users Friend" that would keep track of what is going on in the system and warn you of stupid copy errors, error logging, cache hit rate or whatever it is told to do,

Letter from Ed Judge

dynamically using memory as cache, VM: or special buffers, to keep the system as efficient as possible. Maybe in RT-32?

RT-32

The standard for RT-32 really needs an indexed file capability. A compact form of B and/or B* trees would be very quick and useful. For small jobs, the B tree would have only one file, whereas for big jobs, the B* tree with its separate and more efficient index file would be most effective. Some image of the key structure could alternatively default to VM: or the common memory region for speed. Could compilers be re-written easily to use this method?

The FILNAM convention. -- How about some modest extension or even doubling on the length of DEV, FILNAM and EXT along with a 1 or 2 byte field appended on them for device, version, and extension numbers. Disks are bigger now. (Is there any reason to continue RAD50 compression?). The valuable mnemonics of the characters would not be compromised to keep a version number. The system editor could optionally keep several backup versions, like VMS, if desired.

Indeed, could some of the many UNIX-type text statistical and manipulation facilities be made available at the system level and be expandable as needs change and grow?

RT-11 SIG PDP-11 C Survey

The following survey is being taken by the RT-11 SIG to determine the interest in a DIGITAL supported PDP-11 C product. The survey forms will be forwarded to DIGITAL product management as a statement of the SIG's interest in a PDP-11 C product. If you are interested, please fill out this form and mail it to:

Bill Leroy, Editor "The Mini-Tasker"
The Software House, Inc.
P. O. Box 52661
Atlanta, GA 30355-0661

1. Do you or would you like to write PDP-11 programs in C? YES ___ NO ___
2. Are you currently a C user? YES ___ NO ___
3. A) Do you use Whitesmiths C for PDP-11s? YES ___ NO ___
B) If so, are you satisfied? YES ___ NO ___
C) If not, why not.
4. A) Do you use DECUS C for PDP-11s? YES ___ NO ___
B) If so, are you satisfied? YES ___ NO ___
C) If not, why not.
5. Are you using any other C products? YES ___ NO ___
a. Which ones?
6. Would you purchase a Digital supported C? YES ___ NO ___
a. If not, why not?
7. Are you willing to compile your programs on RT-11 XM only, to run on SJ, FB, XM, and RTEM? YES ___ NO ___
8. What types of applications would you write in C?

9. Would C be replacing Macro or a high-level language? YES ___ NO ___

10. In order to bring a product to market as soon as possible, it may be necessary to leave out some features until a later release. On a scale of 1 to 5, where 1 is unimportant and 5 is very important which of the following features SHOULD be in a V1.0 product.

- An optimizing compiler?
- Direct access to system services?
- Compatibility with DECUS C?
- Compatibility with VAX C?
- Compatibility with Whitesmiths C?
- Compatibility with the proposed ANSI C standard?
- Symbolic Debugger support?
- Support for non-EIS hardware?
- Support for FIS hardware?
- Support for FPU hardware?
- Calling other languages from C?
- Calling C from other languages?
- Other features?

11. How long would you be willing to wait for a Digital supported C?

12. Comments.

IND Examples

Part 1 IND files vs. Indirect Command Files

	Indirect Control Files (IND files)	Indirect Command Files
Part 1 IND files vs. Indirect Command Files	* Contain IND directives and keyboard commands	Contain keyboard commands
Part 2 Introduction to IND	* Default file type .COM	Default file type .COM*
Part 3 Special Considerations for Programming	* Accessed by RUN IND controlfile IND controlfile	Accessed by @commandfile (KMON NOIND)
Part 4 Examples of Some Commonly Used Operations	SET KMON IND @controlfile	SET KMON IND \$@commandfile
	* Processed by a job	Processed by KMON

IND files vs. Indirect Command Files

Indirect Control Files (IND files)	Indirect Command files
* Accept options	No options
* Accept parameters on the command line	No parameters on the command line
* Do not accept the multiline CSI construct	Accept the multiline CSI construct
* Can call an Indirect Command File	Cannot call an IND file
* Comments preceded by .; or ;	Comments preceded by !

Example of an IND file and an Indirect Command File

IND File	Indirect Command File
(Loop) .SETN count 1 .SETN loop 10 .10\$: COPY A B .INC count .IF count LT loop .GOTO 10\$	(Multiple Lines Command) INIT/NOQ/VOL DZ: RTVOL RTOWN
Note:	You can't do a loop with Indirect Command Files You can't do multiple command lines directly with IND

Invoking IND

IND controlfile[/options] [parameters]

Options

- /D delete file after completion**
- /N Ignore keyboard commands**
- /Q Suppress keyboard command display**
- /T display processed command lines**

**Accepts up to 9 parameters on the CSI line
or with the @controlfile construct**

```
@DU:CONTROL A B C X Y Z
COMMAN  "DU:CONTROL A B C X Y Z"
P0      "DU:CONTROL"
P1      "A"
P2      "B"
P3      "C"
P4      "X"
P5      "Y"
P6      "Z"
P7      "" (null)
P8      "" (null)
P9      "" (null)
```

Creating Control Files

Each line can contain up to 3 elements

- * **Label**
- * **Command (IND directive or keyboard)**
- * **Comment**

Label

- * **Form is .LABEL:**
- * **Up to 6 alphanumeric characters**
- * **Referenced as "LABEL"**
- * **May be a direct access label**

Example:

.START:

.GOTO START

Comments

Internal Comment

Preceded by .; combination

Suppressed from processing

Example:

.GOSUB SUBROT .;Go to parsing routine

External Comment

Preceded by ;

Printed at the terminal

Way to follow progress from the terminal

Example:

;This will print out at the terminal

Directive and Keyboard Commands

- * Can have one or both types on a line
- * IND directives are preceded by a dot
- * Keyboard commands are not preceded by a special character

Examples:

```
.IFLOA DY: DIR/VOL DY0:  
.PARSE SYMBOL ",," A B C D E F  
COPY A B
```

Types of Directives

- * **Define Symbols**
- * **Access Files**
- * **Perform Conditional Tests**
- * **Logical Control**
- * **Set Operating Modes**
- * **Test Values**

Symbols

- * **Types of Symbols**
 - Special symbols (internal)**
 - Logical, numeric, string types**
 - Change during operation**
- Example:** `.TESTFILE 'SFIL'`
`.IF <FILERR> \diamond 1 .GOTO STRTUP`
- * **Local/Global symbols**
 - User defined and modified**
 - Logical, numeric, string types**
 - Substitution – ' ; string – "**

Directives to Define Symbols

- * **Interactive**
 .ASK, .ASKN, .ASKS
- * **Assignments**
 .SETT/.SETF, .SETN, .SETS
 .SETL, .SETD/.SETO
- * **General**
 .VOL, .PARSE

Examples:

.ASKS NAM WHAT IS YOUR NAME?
WHAT IS YOUR NAME? [S] JON<RET>

Directives to Access Files

- * **Opening files**
 .OPEN, .OPENA, .OPENR
- * **Data Transfer**
 .DATA, .READ
- * **Closing and Purging**
 .CLOSE, .PURGE

Example of file access

```
.10$: .OPEN LINK.IT  
  
      .DATA LINK/OBJ:SDDR (SDMENU+SCDATA+SCUSER)/BOUN  
  
      .DATA OVLY0  
  
      .CLOSE  
  
      $@LINK.IT  
  
      .IF <EXSTAT> = <SUCCES> .GOTO 15  
  
;Error occurred during link  
.15$: .EXIT
```

Directives to Perform Conditional Tests

Compare 2 conditons

.IF

Test logical symbols and Bit Testing

.IFT, .IFF

Test IND modes

.IFENABLED/.IFDISABLED

General

.IFDF/.IFNDF, .IFLOA/.IFNLOA

Examples:

```
.IFNDF A .OR(.IFT B .AND .IFF C) .GOTO A  
.IFT [7] NUMB .GOTO 100
```

Directives to Perform Logical Control

- * **Process control**
 .GOTO, .ONERR, .GOSUB/.RETURN
 .CHAIN
- * **Terminating Process**
 .GOTO, .ONERR, .EXIT
- * **Structure**
 .BEGIN/.END

Directives to Set Operating Modes

.ENABLE/.DISABLE

DATA	DCL
DELETE	GLOBAL
GLOBAL	LOWERCASE
OCTAL	PREFIX
QUIET	SUBSTITUTION
SUFFIX	TIMEOUT
TRACE	

Example of Operating Modes

.DISABLE PREFIX,SUFFIX ;No * or ? to .ASK directives
.ENABLE QUIET ;Don't print keyboard commands
.IF <DATE> < > " " .GOTO STRTUP

.QUEDAT:
.ASKS DATE Date [dd-mmm-yy]?
DATE 'DATE'
.ASKS [1:10] TIME Time [hh:mm:ss]?
TIME 'TIME'

.STRTUP:
.ASKS SFIL Startup file [filnam.typ]?
.PARSE SFIL ". " J J1 ;Break filename at .
.IF <STRLEN> EQ 1 .SETS SFIL SFIL+'.COM'
.TESTFILE 'SFIL'
.IF <FILERR> = 346 ;file not found - 'SFIL'
.IF <FILERR> < > 1 .GOTO STRTUP
\$_@'SFIL'

Directives to Test Values

.TEST
.TEST string
Sets various special symbols depending on the characteristics of STRING

.TEST string patrn
Searches for first occurrence of PATTRN in STRING. Sets <STRLEN> to position

.TESTFILE
.TESTFILE filespec
Checks for existence of specified file.
Sets <FILSPC> to full file specification
Sets <FILERR> depending on whether file exists

.TESTDEVICE
.TESTDEVICE device
Sets <EXTSTR> to contain 8 fields of information about DEVICE

Part 3 Special Considerations for Programming

- * **Direct Access Labels**
- * **File Nesting**
- * **Subroutines**
- * **Debugging**

Direct Access Labels

```
.ABC:  .GOTO AAA  
.BBB:  
      .EXIT  
.AAA:  .GOTO BBB
```

BBB is a direct access label. It is a label on a line by itself. IND's internal tables keep track of these labels, making access to them faster than accessing regular labels.

File Nesting

- * **Calling an IND file from within an IND file**
@controlfile[/options] [parameters]
- * **Calling an Indirect Command File from within an IND file**
\$@commandfilespec
- * **Nest up to 4 levels of files (including the original file)**

Subroutines

Passing Parameters in Internal Subroutines

```
.SETN $PAR1 1           ;Set up for call to ADD
.SETN $PAR2 2
.GOSUB ADD

.ADD: .SETN B $PAR1+$PAR2 ;B = sum of 2 numbers
      ;'B'
      .RETURN
```


Subroutines

Passing Parameters in External Subroutines
External Subroutines use P0–P9 to pass parameters

Contents of file ADD.COM

```
.ADD:      .SETN B 'P1'+ 'P2'      .;Add the 2 parameters
           ;'B'                    .;Print the result
           .RETURN

@ADD 1 2      .;Call ADD to print the sum
```

Debugging

IND TT: or @TT: to run IND from the terminal
***.ASKS NAM WHAT IS YOUR NAME?**
***WHAT IS YOUR NAME? [S] JON<RET>**

Put IND into trace mode
.ENABLE/.DISABLE TRACE
/T

IND controlfile/T

.DUMP directive – Display the symbol table
SPECIAL
LOCAL
GLOBAL

Part 4 Examples of Some Useful Operations

- * **Multiple Input Lines**
- * **Programs which Require Input**
- * **Wait for a Listing to Finish Printing**
- * **Check for a Protected File**
- * **Arrays and Matrices**

Multiple Input Lines

Set up to run a temporary command file

```
.OPEN IND.TMP  
.ENABLE DATA  
INIT/NOQ/VOL 'DEV':  
'RTVOL'  
'RTOWN'  
.DISABLE DATA  
.CLOSE  
$@IND.TMP
```

Running Programs Which Require Input

- * Use a single Input line
- * Use CCL or KMON commands

INIT/NOQ DZ: or

RUN DUP DZ:/Z/Y

Wait for a Program to Finish Listing

```
PRINT/DELETE MYFILE.LST  
; ...waiting for file to print
```

```
.10$:
```

```
.TESTFILE MYFILE.LST  
.IF <FILERR> EQ <SUCCES> .GOTO 10$  
;file has finished printing
```

(If printer is offline, program will loop)
(Used with SPOOL or QUEUE)

Checking for Protected File

DIR/OUT:IND.TMP/PROTECT SJFB.ANS

Contents of IND.TMP are

4-Jun-86

0 Files, 0 Blocks

801 Free blocks

.OPENR IND.TMP

.READ DATE ;Read first line

.READ FILES ;Read second line

.PURGE

.IF FILES EQ "" .GOTO 10\$

;Protected file already exists

.10\$: .EXIT

Arrays and Matrices

Example: Set elements of MxM matrix to 1

(MAT11,MAT12,MAT13,...MAT21,MAT22,...)

.SETN I 0 ;Init column counter

.10:

.INC I ;Increment row

.SETN J 0 ;Init row counter

.20:

.INC J ;Increment column

.SETN MAT'I'J' 1 ;Set an element

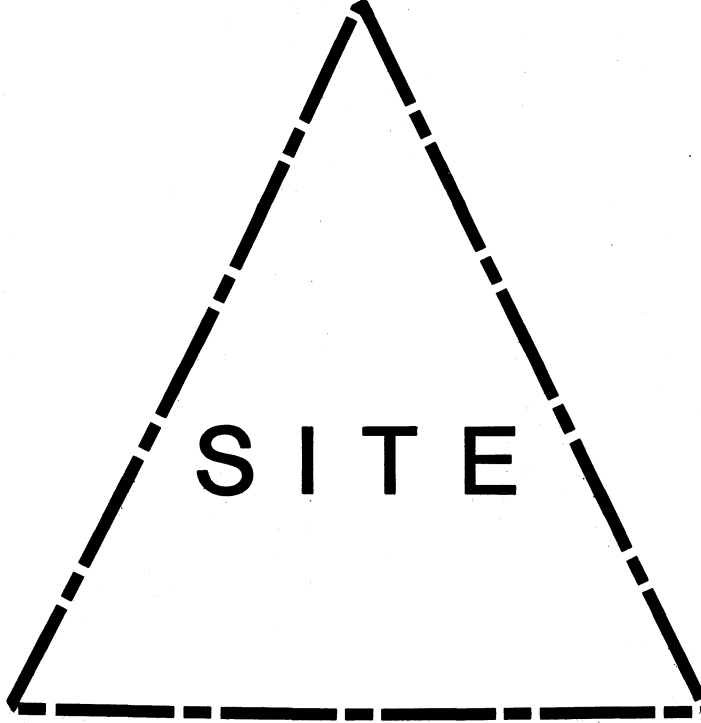
.IF J LT M .GOTO 20 ;Next column

.IF I LT M .GOTO 10 ;Next row

.EXIT



DECUS



Letter from the Editor

Welcome to the February 1987 issue of the Site SIG Newsletter.

There have been some significant moves in the on-going software licensing battle between DEC and its customers. DEC has made some retractions of the policy stated at the San Francisco Symposia. See the following article for details. Be sure to read over the details of the updated policy in the article and comment on them to you DEC Sales Representative or anyone else you deem appropriate within DEC. I would like to hear from you as well since this is an issue the Site, Management, and Training SIG will be following closely. Let your opinion be heard!

If you have not already sent in the questionnaire reply card sent to you by the DECUS Board asking you to comment on the policy, SHAME ON YOU! If you and/or your company is hurt by the change, you have only your own apathy to blame. DEC IS listening. Lets's hope they act on what they hear.

As always articles are needed for up coming issues of the Site Newsletter. If you have an article, a Site Management hint, could transcribe a cassettes tape, (a fresh load of San Francisco Site SIG Symposia session tapes will arrive shortly) or even just an idea for an article, I would like to hear from you. My address and phone number are listed below.

I can accept the following formats: 1600 or 6250 BPI magtape (VAX backup, ANSI, RT, DOS, etc.) RX01, RX02, RL02, and RK05 disks in RT format, and TU-58's. Starting next issue I will be available via BITNET and will include my network address here as well.

Gregory N. Brooks
Washington University
Department of Psychology
Behavior Research Labs.
1420 Grattan St.
St. Louis, MO. 63104
(314) 241-7600 ext. 257

Digital's New Software Licensing Policies Revisited
Gregory N. Brooks

After the furor raised at the San Francisco Symposia over announced software licensing changes, DEC has backed off from some of the proposed changes and moved back the implementation date till March 1, 1987.

The following memo is a reproduction of an internal DEC memo stating DEC's official policy, as of December 31, 1986. (Thanks to Mary Baxendale of the St. Louis office for providing me with a copy) Each DECUS member also received a copy of this policy statement in a letter from Clair Goldsmith, President of the DECUS U.S. Chapter. Included with that letter was a questionnaire to fill out and return to DECUS.

DIGITAL EQUIPMENT CORPORATION MEMO

Subject: SOFTWARE LICENSE TRANSFER POLICY

The purpose of this memo is to clarify and modify the software license transfer changes announced at DECUS and communicated through Sales Update on October 6th. Unfortunately this clarification may require some additional time to be spent with our customers. We appreciate your assistance in this matter.

What are the key elements of our new practice?

1. System Upgrade and Movement of Software within a Corporate Entity

WE WILL PROTECT OUR CUSTOMERS' INVESTMENT IN DIGITAL LAYERED SOFTWARE PRODUCT LICENSES.

When moving layered software products to a higher price tier, the customer will pay a price equal to the difference in cost of the product on the old and new systems. This is no change from our current practice but different than the message heard at DECUS and communicated in Sales Update.

Movement of layered software will be allowed to other systems of the same or lower price tier, but no excess credit will be granted.

Our existing policy on operating systems remains unchanged. Operating systems cannot be moved between CPU's

2. Resale of a System to another Corporate Entity

WE WILL NO LONGER GRANT PERMISSION FOR THE TRANSFER OF
EITHER LAYERED OR OPERATING SYSTEM SOFTWARE LICENSES FROM
ONE CORPORATE ENTITY TO ANOTHER

In practice, we have frequently agreed to approve license transfer requests. As of March 1, 1987 we will no longer approve license transfer requests. The implementation date was previously communicated as January 1, 1987. New owners of used equipment must be licensed by Digital for use of Digital software products. These changes do not effect our OEM's rights to sublicense Digital software.

END OF MEMO

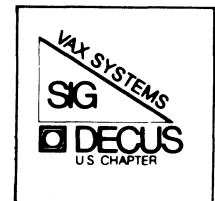
Let your feelings be known BEFORE this policy goes into effect. Make sure your sales representative, and all others you deal with at DEC know how you feel about these changes. DEC is listening at this time and we want to make sure the message is loud and clear.

NEWSLETTER OF THE VAX SYSTEMS SIG



Pageswapper

Our Mascot



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To register for on-line submission to the Pageswapper dial:

(617) 262-6830

(in the United States) using a 1200 baud modem and log in with the username PAGESWAPPER.

Articles for publication in the Pageswapper can be sent (US mail only -- no "express" services please) to:

Larry Kilgallen, PAGESWAPPER Editor
Box 81, MIT Station
Cambridge, MA 02139-0901
USA

Preference is given to material submitted as machine-readable text (best is Runoff source). Line length should not exceed 64 characters and the number of text lines per page should not exceed 48 (these limits are particularly important for sample commands, etc. where simple text justification will not produce a meaningful result).

Please do not submit program source, as that is better distributed on the VAX SIG tape.

Please do not submit "slides" from DECUS Symposia presentations (or other meetings) as they are generally a very incomplete treatment for those readers of the Pageswapper who are not so fortunate as to be able to travel to Symposia. Please DO write articles based on such slides to get the content across to a wider audience than is able to attend.

Change of address, reports of non-receipt, and other circulation correspondence should be sent to:

DECUS U.S. Chapter
Attention: Publications Department
249 Northboro Road (BPO2)
Marlborough, MA 01752
USA

Only if discrepancies of the mailing system are reported can they be analyzed and corrected.

Editor's Workfile

The name of this column -

might more properly be changed to "Dealing with DEC" based on its content of late. I wish that it were not so, but in many cases it is still a struggle to get DEC to take your money.

The once and future DEC Bookstore -

I am not enough of a world traveller to check on those in California and near Washington DC, but the Bedford, Massachusetts outlet has never recovered to its former glory (?) after being revived 18 months ago. At the time they apparently removed some of the bookshelves, so the story now (and for the past 18 months) has been that there will be more stock on the shelves when they get some shelves upon which to put the stock. The same tired manuals (how many people really NEED an extra copy of the VMS V4.x "Introduction to DCL") and nothing available for most layered products.

Meanwhile the Electronic Store -

has announced that they will no longer send things through the US Mail (regardless of what the customer wants). This is not based on weight or size but just on "policy". The notification of this came via certified mail, so I replied via certified mail asking the basis for the policy. As could be guessed from past attempts at written communication with the Electronic Store, I never got an answer. If I wanted to deal by telephone, I would use DECdirect!!!

From my weak understanding of the legal system, there isn't much grounds for a customer to sue DEC over choice of carriers. The only folks I can think of who would have standing to sue DEC would be the US Postal Service (since they are the ones who are losing business) but for them such legal action would be fraught with peril, since they hold a legal monopoly on delivering letters and the result might be some sort of a countersuit from private carriers who want to handle letters.

Rocky Mountain DECUS Regional Conference

March 5-6, 1987

Sheraton Denver Tech Center
Denver, Colorado

The Rocky Mountain VAX Local Users Group (RMVLUG) is hosting a DECUS Regional Conference at the foot of the Rockies in Denver, Colorado March 5-6, 1987. And yes, we scheduled the conference to coincide with great spring skiing on purpose!!

The conference is an excellent opportunity to participate in a mini-symposium at a fraction of the cost of attending a National Symposium. Because the RMVLUG is composed almost exclusively of VAX/VMS users, we will dedicate all technical sessions to material on VAX/VMS systems in a single node, networked, and cluster configurations.

Thursday, March 5, sessions are scheduled from 9 am through 5:30 pm, with a lunch break. Thursday evening, panel discussions will run from 7:30 to 9:30 pm. The VMS QA and the Network QA will feature major personalities from DEC and plenty of time for questions, answers, war stories and magic if you care to participate. Friday, March 6, sessions run from 9:00 am to 4:30 pm to accommodate return flights or a drive to the mountains before the traffic jams begin!

Digital Equipment Corporation is providing a major exhibit with demos of the latest and greatest to accompany the conference. Shuttle service will be provided every 15 minutes between the exhibit area and the conference site.

The conference will be held at the Denver Sheraton Tech Center, 15 minutes from the Denver airport. The Sheraton offers free shuttle service to/from the airport and is making single rooms available for \$65 per night. We have soft, padded chairs and sit-down breakfast with croissants and home-baked muffins both days. We've scheduled an hour and a half for lunch, and two hours for dinner, so you don't have to skip sessions to eat. The committee also has information on winter ski packages through the Keystone Resort, a three area complex (Keystone, Copper Mountain, and Arapahoe Basin), located 90 minutes from Denver. Early registration is advised!

For a registration kit or additional information, contact any of the committee members listed below.

DECUS Rocky Mountain Regional Conference Committee

Paula Sharick	Wildwood Associates	303-499-5700	Chair
Beth Pridgen	Anschutz Corporation	303-298-1000	Vice-Chair
Donna Santoro	Banner Associates	307-745-7366	Registration
Stan Yellott	Longmont Foods	303-534-0993	Site Chair
Tony Carrato	Mile High Info Services	303-368-7565	Session Chair

A preliminary list of sessions includes:

- VMS Update
- DEC Engineering Directions
- What's New With Clusters
- Site Management Planning
- Systems Management
- Disaster Planning/Recovery
- VMS Technical Q&A
- Performance Management
- Capacity Planning
- Memory Upgrades for Your VAX
- Configuring HSC Disks
- Volume Shadowing
- Cluster Performance
- Understanding Console Media
- Cluster Console Overview
- Usenet and VMS
- UNIX Emulators for VMS
- Batch/Print Overview
- Shared and Shareable Images
- Meet the TSC
- VMI Callback and VMS Install
- PTY: Pseudo-Terminal Driver
- ACL Management on Files and Directories
- Backup Methodology
- RMS and Disk Tuning
- Network Update
- DECnet Overview
- SNA Interconnect
- Planning a LAN

Network Management
Using T1 Links
PSI Update
Network Technical Q&A
New LAN Futures
Network Futures
Campus Networking
PC Networks
DECnet DOS
MicroVAX Workstations
FDL Tutorial
TPU Tutorial
Debug Tutorial
SMG Tutorial
Using ASTs and SETIMR
Distributed Lock Manager
Device Control Libraries
VAX Software Development Tools
MMS/CMS Tutorial
CDD Tutorial
ADA Tutorial
Managing ADA Projects
AI: A Case Study
VIA Overview
OA/All-in-One
All-in-One Performance
FMS/TDMS Tutorial
VAX-PC Spreadsheets
Distributed Processing in the Office

INPUT/OUTPUT

A SIG Information Interchange

A form for INPUT/OUTPUT submissions is available at the back of the issue.

To register for on-line submission to the Pageswapper dial:

(617) 262-6830

(in the United States) using a 1200 baud modem and log in with the username PAGESWAPPER.

```
=====
Note 243.2                Need Modem Program                2 of 2
"RICHARD WISEMAN"        11 lines    9-DEC-1986 12:04
                        -< modem program >-
=====
```

On one of the past DECUS tapes there is a program called VAXDIAL that seems to work quite well.. We here at storage tek. have used it for 3 years now with no problems..

RICHARD WISEMAN
STORAGE TECHNOLOGY CORP
2270 SOUTH 88TH STREET
MAIL STOP G4
LOUISVILLE CO 80233-0001


```
=====
Note 530.11      Remote Print Symbiont wanted      11 of 11
"Offline Submission"      18 lines  30-DEC-1986 17:24
      -< One More Kludge for Remote Printing >-
-----
```

It may not be nice, but... An easy way to set the name on the banner page is to run a privileged image that goes into kernel mode and writes a new username in the JIB. Then issue the Print command. This works even if the username is fictitious. The VMS accounting routines will associate this new user with the pages printed on a queue. Change the username back before logging out unless you want Accounting to associate the login session with the new user.

David Williams
Seismograph Service Corporation
Post Office Box 1590
Tulsa, OK 74102

Telephone: (918) 627-3330

December 22, 1986

```
=====
Note 539.2      suppressing an error message in DCL      2 of 4
"Matthew M. Wilbert"      7 lines  3-DEC-1986 23:44
      -< clarification >-
-----
```

To clarify: when a terminal is reattached to a process after having been attached to a subprocess, DCL prints a message saying that the terminal has been reattached to the process. I would like to suppress this message, because I have an application where I would like the fact that the user request has actually been serviced by a subprocess to be hidden from the user. I don't know how to do this without suppressing all messages.

Matthew M. Wilbert
6 Washington Avenue
Cambridge MA, 02140
(617)-725-3458

```
=====
Note 539.3      suppressing an error message in DCL      3 of 4
"Bruce Bowler"      3 lines  8-DEC-1986 14:56
      -< SPAWN/NOLOG >-
-----
```

I think if you use SPAWN/NOLOG, you will get what you are looking for in the way of messages (or non-messages as the case may be!).

Bruce Bowler
General Electric
1 River Road
Bldg 2 Room 609
Schenectady, NY 12345

```
=====
Note 539.4      suppressing an error message in DCL      4 of 4
"Matthew M. Wilbert"      21 lines  12-DEC-1986 22:23
      *< On the right track... >-
-----
```

Reply number 3 is correct, but not sufficient (in fact I was already doing a spawn/nolog) What happens looks something like this

```
$ spawn/nolog $ attach wilbert ! so far so good $ attach
wilbert_1 DCL-S=RETURNED control returned to process WILBERT_1 !
not so good $ attach wilbert DCL-S=RETURNED control returned to
process WILBERT ! oh well
```

In my actual application, I am not really spawning a DCL, so I don't get the WILBERT_1 message, but I get the WILBERT message every time (subsequent to the first time, which /nolog DOES suppress) control is returned to the top-level process.

Matthew M. Wilbert
6 Washington Avenue
Cambridge MA, 02140
(617)-725-3458

```
=====
Note 541.1      DZ11-A multiplexer with DF112 modem?      1 of 1
"Offline Submission"      14 lines 10-DEC-1986 22:56
      =< DZ11 Multiplexer with DF112 Modem >=
-----
```

Below each terminal port on the DZ11 there are DIP switches. Push the switch into the opposite position for each port to which you want to attach a modem. This will allow the port to support all modem commands. In SYSS\$LIBRARY, DTE_DF112.EXE when installed will dial a DF112 modem on the DZ board.

Timothy Barrett
Chalet Susse International Incorporated
Chalet Drive
Wilton, NH 03086

Telephone: (603) 654-2000

December 5, 1986

```
=====
Note 554.1      Fax/Vax interface      1 of 2
"Jack Patteeuw"      5 lines 26-NOV-1986 17:06
      =< I'm interested too ! >=
-----
```

Sorry, no help from me, but keep me clued in. It would be interesting if this "Hoffman" code could be converted into something that Postscript could understand. Then you could print the document out on a PrintServer 40. Maybe you could check with Adobe or their user group. Sorry again, no address.

Jack Patteeuw
Ford Motor Co.
Electrical and Electronics Division
31630 Wyoming
Livonia, MI 48150
313+323+8643

```
=====
Note 554.2      Fax/Vax interface      2 of 2
"Larry Kilgallen"      8 lines 29-NOV-1986 20:38
      -< Address for Adobe >=
-----
```

The address of Adobe Systems Incorporated is:

1870 Embarcadero Road
Palo Alto, CA 94303

although I understood the author of 554.0 to specifically want a bit-map representation as opposed to a Postscript representation.

Larry Kilgallen
Box 81, MIT Station
Cambridge, MA 02139-0901

```
=====
Note 556.0 VAX 8800/8300 panel members for Decus Symposium No re
"Diederik Zonneveld"      13 lines 26-NOV-1986 16:09
-----
```

I am organizing a session for the Nashville Symposium for VAX 8800 and 8300 system managers and users. I am looking for a few system managers with experience on these machines to sit on the panel to discuss their experiences and to answer questions. If you are interested, please call me at (309) 578-3102 and leave a message for me to call you back. I will return the calls in early January.

Diederik Zonneveld Caterpillar Inc. Peoria Ill

Diederik Zonneveld
Caterpillar Inc.
100 NE Adams
MS: Moss-VV-7
Peoria Ill 61629
(309) 578-3102

=====
Note 559.1 High-Order Word of a PID 1 of 1
"Martin Pensak" 15 lines 25-DEC-1986 21:25
=< Cluster-unique PIDs >=
#-----#

In a cluster, the value in the top part of the longword (I don't think it is exactly the top word) is exactly what you called it, a unique value. Each time a member of a cluster reboots, it gets the next higher value up there, so it causes PIDs to be unique for the life of the entire cluster. It starts at 202 and goes up by 2, and at 4 bits per hex character, that seems to me to be the top 11 bits of the longword.

Note that in most cases of specifying a PID, you can ignore those top digits, just enter the bottom digits and it figures it out correctly; makes the typing much simpler.

I have no idea how to force a non-zero value in there if not in a cluster, maybe somebody else can help with that.

Martin Pensak
E I DuPont de Nemours Inc
Engineering Department
Louviers 5000
Wilmington DE 19898
302-366-6381

=====
Note 560.0 DECnet Node Isolation Needed 1 reply
"Mark Oakley" 10 lines 18-DEC-1986 19:52
#-----#

My site is on a very, very large DECnet network consisting of many areas. Another node on a different DECnet network (also with many areas) would like to be DECnet'd to my site. Unfortunately there are numerous node-number and area-number conflicts. Does anyone know of a scheme or technique that would isolate nodes, so that this node could be DECnet'd to my site? TSC suggested playing with hop counts or circuit costs, but they were not optimistic about what the results would be. Is there some way to establish a DECnet Phase III circuit, that would not propagate area information?

Mark Oakley

Battelle Memorial Institute
505 King Ave.
Columbus, Ohio 43201-2693
614/424-7154

=====
Note 560.1 DECnet Node Isolation Needed 1 of 1
"Frank J. Nagy" 10 lines 27-DEC-1986 10:48
#-----#

This is possible: Fermilab is a major hub of the High Energy Physics network (oftimes called HEPNET) which has been growing continuously by the addition of new university nodes. Often these new nodes are members of other networks and conflicts result; in addition, we have run out of area numbers. The managers of the network have cooked up a scheme where one node can be on two networks and act as an area filter. However, I do not remember the details. You might try contacting Philip Demar at (312)840-2178. Phil is Fermilab's network manager and one of the people working on managing HEPNET. He should be able to explain the scheme to you.

Frank J. Nagy
Fermilab
PO Box 500 MS/220
Batavia, IL 60510
(312)840-4935

=====
Note 561.0 Pervasive Pagefaults No replies
"Offline Submission" 13 lines 24-DEC-1986 08:28
#-----#

I have been unable to reproduce the problem described in "The Case of the Pervasive Pagefaults" (December 1986 Pageswapper) on my own system. The files have been moved to 001054 all right, but INSTALL is installing them in that directory so that everybody finds the shared copy.

Michael Lambole
VAX Systems Manager
General Research Corporation
5383 Hollister Avenue
Santa Barbara, CA 93111

December 15, 1986

```
=====
Note 562.0      Ethernet to Modem Conversion      1 reply
"Offline Submission"      17 lines  24-DEC-1986 08:29
-----
```

We have a DEC UNIBUS-based computer with a DEUNA installed. Currently we are communicating with "DECnet-like" software locally over an Ethernet. Instead of connecting our transceiver cable to a DELNI or a transceiver and Ethernet, we would like to connect it to a modem for remote communications. Does anyone know of the existence of such hardware/software?

Jeffrey J. Rocca
Siemens Medical Systems, Incorporated
Research and Development
186 Wood Avenue, South
Iselin, NJ 08830

Telephone: (201) 632-2892

December 17, 1986

```
=====
Note 562.1      Ethernet to Modem Conversion      1 of 1
"Martin Pensak"      10 lines  25-DEC-1986 21:33
-< Try Vitalink bridge? >=
-----
```

I don't know of any way to connect a DEUNA to a modem; the closest thing I know of is the Vitalink TransLAN Bridge, which lets you connect multiple Ethernets together via phone lines or satellite links. This device is a little pricey, but works very nicely. Essentially you would still use an Ethernet locally, and connect it to another ethernet at the remote site.

DEC has a joint marketing agreement with these folks, so just ask your local DEC salesman (!). Otherwise, Vitalink is out in California, I can get exact address if you need it.

Martin Pensak
E I DuPont de Nemours Inc
Engineering Department
Louviers 5000
Wilmington DE 19898
302-366-6381

```
=====
Note 563.0      I am a VAXeln Person      No replies
"Offline Submission"      13 lines  24-DEC-1986 08:30
-----
```

In response to number 41.0 in the Fall 1986 US Symposium VMS Notes Conference published in the December 1986 Pageswapper, I would definitely be interested in a VAXeln SIG.

Ray Finch
Owens Valley Radio Observatory
Post Office Box 387
Big Pine, CA 93513

Telephone: (619) 938-2481

December 18, 1986

```
=====
Note 564.0      SYNCHRONOUS AUTODIALING      No replies
"CHUCK MCMICHAEL"      7 lines  30-DEC-1986 11:07
-----
```

Is there any way to force a Scholar modem to autodial when it's hooked to a DMC-11 synchronous port? We have an 11/750 from which we initiate calls only. The Scholar manual lists a control sequence for synchronous use, but gives no clue as to how to get it to the port, which is owned by NETACP. Our installation is committed to using DECNET.

CHUCK MCMICHAEL
PITTSBURGH CORNING CORP
800 PRESQUE ISLE DR
PITTSBURGH PA 15239
412-327-6100

*
*

The Port/Class Terminal Driver Interface

VMS Internals Working Group
Barbara, Nathan, Lee Leahy
Magic One
1971 Mount Pleasant Road
San Jose, CA 95148-1324

When VMS 4.0 came out I had the opportunity of upgrading a Port Terminal Driver. Through this experience I learned a little about how the Port and Terminal Driver interfaced. After I got the driver working I thought that was the end of it. Not quite. At almost every DECUS symposium I've gone to lately, someone new is asking about the interface. Therefore I am presenting our notes from our experiences with the Drivers.

The Terminal Port/Class drivers are two drivers that interact together to provide the necessary functionality of an entire driver. Neither the Port or Class driver is a whole driver. The Class driver handles the device independent characteristics. The Port driver handles the device dependent characteristics. The Port driver for instance, has routines to handle the start and stop of I/O, Xon, Xoff, Abort and Resume. The Class driver, for instance, has routines to handle the characters input and output. Below is a breakdown of some of the pertinent files and components of the DZ Port Driver and the TT Class driver.

Port Driver * DZDRIVER Components

DZ\$DDT ;DRIVER DISPATCH TABLE
DZ\$DPT ;DRIVER PROLOGUE TABLE
DZ\$INITIAL ; INTERFACE INITIALIZATION
DZ\$INITLINE ; UNIT INITIALIZATION
(recommended reading ^.)
DZ32\$INTINP ;interrupt, input
DZ32\$INTOUT ; interrupt, output
DZ32\$STARTIO ;start I/O

Class Driver

TTDRIVER
* Files that compose the driver
TTYDRVDAT ; driver data

TTYCHARI ; character input
TTYSUB ; generic terminal driver functions
TTYFDT ; fdt table
TTYSYNCH ; synchronization routines
TTYCHARO ; character output
TTYMACS ; terminal macros
TTYDEFSDL ; definitions used by drivers
TTYSTRSTP ; Terminal Start and Stop routines for I,
; Requests

These drivers "talk" through a vector table interface setup in each driver, the name of the table is PORT_VECTOR, or CLASS_VECTOR. The vector table is identified to the system in the Driver Prologue Table with the syntax:

```
VECTOR=PORT_VECTOR
```

This PORT_VECTOR table is used by the Class driver to "command the Port driver." It contains the addresses of routines that the Class driver will be calling. The Class driver calls a routine in the Port driver by finding the address of this table in the terminal UCB extension area, and then using an offset into this vector table to pick up the address of the routine it needs to execute. These offsets into the table are defined by TTYDEFS.

Example of the DZ32 PORT_VECTOR table

```
$VECINI DZ32,dz$null  
$VEC STARTIO,DZ32$STARTIO ;START NEW OUTPUT  
$VEC SET_LINE,DZ$SET_LINE ;SET NEW PARITY/SPEED  
$VEC DS_SET,DZ32$DS_SET ;OUTPUT MODEM SIGNALS  
$VEC XON,DZ32$XON ;SEND XON  
$VEC XOFF,DZ32$XOFF ;SEND XOFF  
$VEC STOP,DZ$STOP ;STOP CURRENT OUTPUT  
$VEC ABORT,DZ$ABORT ;ABORT CURRENT OUTPUT  
$VEC RESUME,DZ32$RESUME ;RESUME STOPPED OUTPUT  
$VEC MAINT,DZ32$MAINT ;INVOKE MAINT FUNCTIONS
```

\$VECEND

Transfers between the Port and Class driver basically take on two forms. One method is to pick up the Class/Port vector table address from the UCB, add an offset for the desired Class/Port routine, and then jsb or jmp to the routine.

The second method picks up the address of a routine directly from the UCB and not from the table. This second method is used for the character reading and writing routines, Getnext and Putnext, located in the Class driver. The Port driver obtains the addresses for these routines by offsetting directly from the UCB.

Method One - offsetting from vector table -
 Port Driver Calling Class driver

```
MOVL UCB$L_TT_CLASS(R5),R1    ;ADDRESS CLASS VECTOR TABLE
JSB @CLASS_SETUP_UCB(R1)      ;OFFSETTING TO A ROUTINE THAT
                              ;INITIALIZES UCB FIELDS
```

Method Two - Offsetting Directly from UCB -
 Port Driver Calling Class driver directly to
 buffer input.

```
UCB$L_TT_PUTNXT(R5)    ;contains address of the
                      ;TTY$GETNEXTCHAR routine
                      ;in the Class driver

JSB @UCB$L_TT_PUTNXT(R5) ; BUFFER THE CHAR (Class DRIVER)
```

There are many places in the fiche and on the system where information on the Port/Class terminal drivers appears. A few of the files to look at are the symbol table files. One of the files is TTYDEFS. Directions for obtaining the contents of a symbol file appears in the 3.0 Internals Manual, and the last time I looked, in the System Dump Analyzer Help Files. (I believe it used to be in under the read command.) Basically what you have to do is create a file with the name of the table definitions that you want, and then assemble that file with the /LIST option and /NOOBJECT option. I've included an example below.

\$Create tty.mar

```
$TTYDEFS GLOBAL ;GLOBAL must be in CAPITALS
.END
<ctrl z>
```

\$ macro/list/noobject tty+sys\$library:lib/lib

This is a good table to use when either reading or debugging the terminal drivers.

Symbol table - ttydefs.lis

```
CLASS_CLASS_DEF = 00000028 G
CLASS_DDT       = 00000010 G
CLASS_DISCONNECT = 00000018 G
CLASS_DS_TRAN   = 0000000C G
CLASS_FORK      = 0000001C G
CLASS_GETNXT    = 00000000 G
CLASS_POWERFAIL = 00000020 G
CLASS_PUTNXT    = 00000004 G
CLASS_READERROR = 00000014 G
CLASS_SETUP_UCB = 00000008 G
CLASS_TABLES    = 00000024 G

PORTS_PORT_DEF  = 00000038 G
PORT_ABORT      = 00000020 G
PORT_DISCONNECT = 00000004 G
PORT_DS_SET     = 0000000C G
PORT_FORKRET    = 00000034 G
PORT_LENGTH     = 00000038 G
PORT_MAINT      = 00000030 G
PORT_RESUME     = 00000024 G
PORT_SET_LINE   = 00000008 G
PORT_SET_MODEM  = 00000028 G
PORT_STARTIO    = 00000000 G
PORT_STOP       = 00000018 G
PORT_STOP2     = 0000001C G
PORT_XOFF       = 00000014 G
PORT_XON        = 00000010 G
PORT_DMA        = 0000002C G
```

Other very useful data are contained in the macro files. One very important file is TTYMACS.MAR, which contains macros used by the terminal drivers. Below is a summary of its contents.

\$VECINI - "Macro to start the port vector table", generates a "port entry vector table"

\$VEC - "Validates and generates vector table entry"

\$VECEND - "Generates the ending code for a vector table"

CLASS_CTRL_INIT - "Macro to generate code controller init code common to all port drivers." All port drivers must include this macro in its controller init code. This macro relocates the class and port vector tables.

CLASS_UNIT_INIT - Macro that must be included in port unit init routine. Note, DEC's comment on this routine is worth reading, mention is made that since this routine could change from release to release, it should be considered volatile.

Other Macros used by the system appear in the file ttydef.sdl. Some of these macros set up the vector tables.

MACROS USED BY DRIVERS

TTYDEF.SDL

\$TTYVECDEF

```
CLASS_DEF
  GETNXT
  PUTNXT
  SETUP_UCB
  DS_TRAN
  DDT
  READERROR
  DISCONNECT
  FORK
  POWERFAIL
  TABLES
END CLASS_DEF

PORT_DEF
  STARTIO
  DISCONNECT
  SET_LINE
  DS_SET
  XON
  XOFF
  STOP
  STOP2
  ABORT
  RESUME
  SET_MODEM
  DMA
  MAINT
  FORKRET
END PORT_DEF
```

These are our notes summarized with our best recollections. Please be aware that there might be some erroneous statements above, since the work was done on VMS version 4.0, and we all know that VMS has changed since then. If you want to obtain more information on these drivers then I recommend the fiche and your own machine. Besides the fiche, the System Dump Analyzer and XDELTA can be used to observe the paths the driver is taking, and the registers contents at a particular execution point.

DEC LN01 Font File Internal Structure

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Background

The DEC LN01 Laser Printer is based on the same engine as the Xerox 2700 model 2 laser printer. The DEC LN01 fonts were developed for DEC by Compugraphic Corporation and are sold through the Digital Classified Software (DCS) program. The fonts are sold in kits consisting of several sizes (e.g. 8, 10, and 12 point) and weights (e.g. roman, italic, bold, and bold italic). Each kit includes portrait and landscape orientations. The average kit is composed of 36 fonts (3 point sizes, 4 weights, 2 orientations) and costs about \$1350.

For specialized purposes, fonts can also be purchased directly from Compugraphic Corporation or Xerox (about \$75 each). Each company offers its own unique set of fonts (with some fonts identical and some fonts different). The Compugraphic fonts are directly compatible with the LN01, the Xerox fonts are not. Attempts to use the DEC Font Utility on a Xerox font produce an error message: "%FFU-F-INALNERR, Internal font misalignment; corrupted font". However, the Xerox fonts can be edited to run on the LN01. Before they can be edited, an understanding of the font file structure and storage mechanism is required. The purpose of this report is to document the internal structure of an LN01 font file.

This analysis would not have been possible without the direct contributions of Claude D. Barbe, SMR - Schlumberger Montrouge Research, 50 Avenue Jean Jaures, 92124 Montrouge Cedex, France. He has analyzed font file structure and written utility programs to convert LN01 fonts into LN03 fonts. His contributions will be submitted to the DECUS Tape Library.

Sixel to Binary Conversion

DEC uses sixel formatted files so that binary data (full 8-bit bytes) can be transmitted over data lines without interference with standard data processing characters (e.g. the escape character which starts a control sequence for the printer). Any combination of six bits can be transmitted as a sixel. Binary data is converted to sixels by selecting the next six bits to be sent and adding 3F hex. The order is from the most significant bit to the least significant bit. Thus every three bytes (24 bits) can be transmitted as four sixels (24 bits).

Example FORTRAN code for sixel to binary conversion

The following FORTRAN subroutine illustrate the process of converting four sixels to three bytes. Note that a function is used to avoid byte arithmetic.

```
SUBROUTINE SIX_TO_BYTE(ISB,IBB)
  BYTE      ISB(0:3), IBB(0:2), ITB(0:3)
  INTEGER*4  IT
  EQUIVALENCE (IT,ITB(0))

  IT        = 0
  IT        = IT + ISIX(ISB(0)) * 64 * 64 * 64
  IT        = IT + ISIX(ISB(1)) * 64 * 64
  IT        = IT + ISIX(ISB(2)) * 64
  IT        = IT + ISIX(ISB(3)) * 1
  IBB(0)    = ITB(2)
  IBB(1)    = ITB(1)
  IBB(2)    = ITB(0)
  RETURN
END

INTEGER FUNCTION ISIX(IK)
  ISIX = IK .AND. 127
  ISIX = ISIX - 63
  RETURN
END
```

Example FORTRAN code for binary to sixel conversion

The following FORTRAN subroutine illustrate the process of converting three bytes to four sixels.

```

SUBROUTINE  BYTE_TO_SIX( IBB, ISB )
BYTE       IBB(0:2), ISB(0:3), ITB(0:3)
INTEGER*4  IT
EQUIVALENCE (IT, ITB(0))

ITB(0) = IBB(2)
ITB(1) = IBB(1)
ITB(2) = IBB(0)
ITB(3) = 0
ISB(3) = MOD(IT,64) + 63
IT      = IT/64
ISB(2) = MOD(IT,64) + 63
IT      = IT/64
ISB(1) = MOD(IT,64) + 63
IT      = IT/64
ISB(0) = MOD(IT,64) + 63
RETURN
END
  
```

Font File Structure

A DEC (or Compugraphic) LN01 font file is comprised of 128-byte records. (Xerox fonts should be ordered with 128-byte records for compatibility purposes.) The bytes are stored as sixels, which are coded representations of six bits of information, and every four sixels may be decoded into three bytes (see description above). Thus the 128-byte sixel records may be considered as 96-byte binary records. All references to the font file for the remainder of this analysis will be in terms of these 96-byte binary records, with all byte values expressed in hexadecimal, and all byte offsets relative to zero.

Each font file is comprised of a header, a font character directory, the font characters themselves, and a trailer.

Font File Header

The font file header is 304 bytes (the first three records plus sixteen bytes from the fourth record). The following information has been located in the font file header. Note that two consecutive bytes are used for a 16-bit binary value.

LOCATION	FUNCTION
0 = 2	constant AA AA 01 (ascii)
4 = 5	font size (bytes)
6 = 19	font name (ascii)
1A = 1B	underline thickness (pixels)
1E	subscript offset (pixels)
1F	superscript offset (pixels)
20 = 21	descender value (pixels)
22 = 23	ascender value (pixels)
24 = 25	line spacing (pixels)
26	first character (ascii)
27	last character (ascii)
28 = 29	left side bearing (pixels)

Font Character Directory

The font character directory starts immediately after the 304-byte font file header. Each character in the font (starting with the first character stored in header location 26 and continuing consecutively to the last character stored in header location 27) has an 8-byte directory entry. Each directory entry contains the following information.

LOCATION	FUNCTION
0 = 1	length of character storage (bytes)
2 = 3	address of character storage (offset from start of file)
4	constant FF (ascii)
5	height of character (pixels)

6 vertical offset of character (pixels)
7 width of character (pixels)

Summary

NOTE: In XEROX supplied fonts, the constant FF in location 4 is uncontrolled and sometimes has the value FE, resulting in the font internal alignment message discussed above. The XEROX fonts can be fixed by converting the sixel files to binary, changing the FE's to FF's, and then reconverting from binary back to sixel.

This report has documented the various sources for DEC LN01 fonts and the structure of a DEC LN01 font file. In particular, the various locations and functions have been discussed, and the differences between Xerox-supplied and DEC-supplied LN01 fonts has been noted. Finally, examples are given for sixel to binary and binary to sixel conversion.

LN01 fonts support the concept of "bound characters". A bound character shares the same bit map storage as another character (e.g. the bold backward question mark used to indicate an undefined character). A bound character is indicated in the font character directory by specifying an address which is identical to another character's address. Thus not all font character addresses are unique.

Any questions or comments may be directed to the author at the above address.

Font Character Storage

The font characters themselves are stored immediately following the font character directory. Each font character has an address and length as specified in the font character directory. The font characters are stored sequentially, with no gaps between the end of one character and the start of the next character. Each font character is stored as a series of bits which indicate which pixels are on and off within the field of the character.

Font File Trailer

After the last font character, a series of U's are stored starting after the last character and continuing 8 bytes past the next 8-byte boundary (i.e. the number of U's ranges from 8 to 15). After the U's, the remainder of the record is padded with null characters (ascii 00).

Some LAT and LAT-Plus Internal Notes

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DECserver 100s have 8 ports, a total of 32 or 48 sessions (slots).

By looking at UCB\$LTREPID you can find your slot number.

Your Port = (LTREPID-1)/maxsessperport(4 or 6 on DECserver 100s)

Your Session = LTREPID - maxsessperport*(portnmbr-1).

Maximum Slots per virtual circuit:

Processor	Max_Slots
780	64
750	64
730	32
8600	255
8200/8300	64
8500/8700/8800	255
uVAX I	16
uVAX II	64
785	96

This means on a uVAX I or 11/730 you can't tell the difference between old and new versions of the DECserver 100 software from LAT V5.0. So upgrade your LAT software 1st then your server software, if you need to know the difference.

UCBs for LAT V5.0 are 19Cx bytes long.

UCBs for LAT-Plus V5.1 are 224 bytes long.

LAT V5.0 UCB (all values in HEX)

UCB\$L_LT_CSB = 134 ; address of CSB
 UCB\$B_LT_REPID = 140 ; your slot # on this Virtual circuit.
 UCB\$B_LT_SLOTSZ = 149

V1.0 CSB

CSB_W_SIZE = 8
 CSB_B_TYPE = A
 CSB_B_STATE = B
 CSB_Z_LCB = C
 CSB_B_SERVER = 1C ; length of server name
 CSB_T_SERVER = 1D ; server name
 CSB_B_REFC = 2D ; # of UCB on this CSB
 CSB_Z_DST = 2E ; Ethernet address

START OF CIRCUIT HEADER

CSB_B_FLAG = 5C
 CSB_B_NUM_SLOTS = 5D ;

END OF CIRCUIT HEADER

CSB_B_RSEQ = 64

CSB_B_MAX_SLOTS = 69

CSB_W_MAX_MSGSIZ = 6A

CSB_L_UCBLST = 6C

LAT-Plus V5.1 UCB (all values in HEX)

UCB_B_LT_IP_NM = 134 ; byte count of interactive port name
 UCB_T_LT_IP_NM ; interactive port name
 UCB_B_LT_IS_NM = 135+UCB_B_LT_IP_NM ; byte count of interactive server name
 UCB_T_LT_IS_NM ; interactive server name
 UCB_B_LT_AP_NM = 156 ; byte count of application port name
 UCB_T_LT_AP_NM = 157 ; application port name
 UCB_B_LT_AS_NM = 167 ; byte count of application server name
 UCB_T_LT_AS_NM = 168 ; application server name
 UCB\$L_LT_CSB = 189 ; address of CSB

UCB_Z_LT_DST = 1FB ; Ethernet address

V1.2 CSB


```
CSB_W_SIZE      = 8
CSB_B_TYPE     = A
CSB_B_STATE    = B

CSB_B_SERVER   = 1C
CSB_T_SERVER   = 1D

CSB_B_REFC     = 2D
CSB_Z_DST      = 2E

CSB_B_MAX_SLOTS = 6D

CSB_B_VRSN     = 71
```

To look into system space at UCB the following routine is handy.

```
; integer*4 val,syspeek,addr by Dr. R. Wrenn
; val=syspeek(addr,len)
; where len=1,2,4 for the # of bytes to be returned
.TITLE SYSPEEK

.LIST MEB

SYSPEEK::
.WORD ^M<IV,R4,R5,R6>
MOVL AP,R4
$CMKRNL_S PEEKIT,(R4)
MOVL R5,R0
RET

PEEKIT:
.WORD ^M<IV,R11>
MOVL @4(AP),R4
MOVL #+1,R5
CASEB @8(AP),#1,#4
1$: .WORD PBYTE+1$
.WORD PWORD+1$
.WORD NOGOOD-1$
.WORD PLONG+1$
NOGOOD: RET
PBYTE:
MOVZBL (R4),R5
RET
PWORD:
MOVZWL (R4),R5
RET
```

```
PLONG:
MOVL (R4),R5
RET

.END
; Yes Debbie, you can crash the system with this

IOC$GL_DEVLIST ; Defined in sys$system:sys.stb, or sysdef.stb
; points to list of DDB
ddb$t_name ; ascii counted string of device name
ddb$l_ucb ; link to 1st UCB for this controller
ddb$l_link ; link to next DDB
ucb$l_link ; link to next UCB
```

Spreadsheet Comparison

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NOTE

This document does not imply or guarantee any level of performance from any product mentioned in this article. This article does not imply or express any endorsement of any product and is not to be used for advertising purposes. This article is solely intended for the use of DECUS members and not for commercial venture.

The views expressed in this article are those of the author. While no guarantees can be made concerning the products, the author believes the statements are accurate. If there are errors, it is with the authors sincerest apologies. With new products and versions continually being introduced, and review time together with writing time being limited, errors and omissions are bound to occur.

All of the vendors were contacted and given a preliminary of this document and a chance to comment and make corrections. While this no doubt fixed errors, it also probably created some (see paragraph 2 above).

Introduction

I am writing this comparison with the following scenario:

A budget has to be compiled and the following items are required:

1. 60 line items per project for 7 years (1 past year, current year and five years into the future)
2. multiple projects (1-40 projects) per department (approximately 15 departments)
3. department summaries for all line items and years
4. Activity summary of all departments
5. Summarization of projects by keywords

The initial plan of attack was to create as large an empty spreadsheet as possible, with the first column being allocated to row titles, then multiples of seven columns being allocated to the seven required years. The only spreadsheet that we had on-hand had a maximum of 80 columns (I found out later that could be changed). The first two rows have a project title, organizational element, building number, keyword and a Project ID. The first column was reserved for row titles, eleven subsheets were then created, each seven columns wide. The first ten subsheets were allocated to projects, the last acted as a sheet summary. This full spreadsheet was referred to as the master spreadsheet for it had all the formulas and titles in it. All numerical references defaulted to zero. For departments with more than 10 projects, the summary sheets from those master spreadsheets would be included in the last department sheet as a project and would then be summarized for that department. As each department was summarized, these summary sheets would be written out to a file in a binary format along with the detailed project sheets and summary sheets for printing. These department summary sheets would then be recalled into a blank summary sheet and added together. With approximately 25 departments, the same method would be applied here as was applied with departments having large numbers (>10) projects. After all sheets have been put in files for printing, must go back and re-format them so they fit the prescribed format. Obviously, doing this by hand is time consuming and prone to error. Therefore, three things were extremely important.

1. Must be easy to use
2. Must be able to be used in both interactively and in-BATCH
 1. Data entries made interactively
 2. Department summaries done both in BATCH and interactively
 3. Station summary done in BATCH
3. Must be able to cut out a small piece of the spreadsheet and restore it to a different spot later (this requirement was later dropped)

For convenience, in BATCH it would be nice to have errors reported to some other source than where the output is being directed, for example have two files on batch runs, BUDGET.LOG and BUDGET.ERR. BUDGET.LOG being created from the SUBMIT command, containing the screens that are being painted and can be turned off with the /NOLOG qualifier. The BUDGET.ERR file has the commands that are being used along with any error messages.

One of the items in the description is a keyword, in the future these budgets will also have to be summarized by keywords. So the ability to do testing and logical decisions on an entire spreadsheet with a database scheme of some sort is also highly desirable.

One of the vendors suggested that instead of using my method of using multiple projects per sheet, that I put each project on a single sheet and then use links among the various sheets to Departmental and Station summaries. The Department summary would be saved for inclusion in the Station summary so that it would not have to be re-computed again and again. This suggestion made the requirement to cut out and save a piece of the file separately no longer applicable.

After reviewing some of the spreadsheets, I realized that presenting the data in some sort of graphical form is advantageous. So I reviewed graphics that were integrated into packages that were still alive. The packages reviewed included DECgraph, Saturn and Graphic Outlook. I didn't get a chance to review Digi-Graph. My own experiences with ANALYTICALC led me to conclude that users being users, that I would be lynched (one user suggested keel hauling me). The biggest problem that users have is that they have to learn new concepts and they won't

unless they are forced too.

The graphics devices that I'm interested in include VT125s, VT241s, Tektronix 4115, Tektronix 4510 rasterizer with 4692 ink jet printer, Hewlett-Packard 7221T 8-pen automatic sheet feeding plotter and a DEC LXy=12 printer/plotter (a Printronix P300 printer).

I am also interested in the graphics package selecting intelligent defaults for things. For example the standard way of picking the minimum and maximum plotting axes is to find the largest and smallest of the numbers to be plotted and that is the minimum and maximum. Take the range (maximum-minimum) and divide that number by four and that number becomes the tic-mark spacing. Intelligent defaults recognize that users usually have several things when looking at a graph. More specifically they:

1. want room between the highest data point and the top of the graph
2. round numbers that "look right"
3. tic-mark spacing should be an even number (for example 1, 2 or 5)

With the introduction over, I will now compare the seven spreadsheets that I could get, ANALYTICALC (DECUS), DECalc (DEC), DIGICALC (Why Systems), Graphic Outlook (Stone Mountain Computing), 20/20 (Access Technology), C=Calc (DSD Corporation) and SaturnCalc (Saturn Systems). I chose to examine ANALYTICALC because it was already here, DECalc was evaluated because it was integrated with DECgraph, others were evaluated because the vendors said they meet the criteria I outlined above.

NOTE

While I was at the Fall 1985 Decus Symposia in Anaheim, I went by DEXPO with copies of the preliminary draft of this evaluation. At the time, the evaluations 20/20 and SaturnCalc were not finished and so were incomplete. However I talked to the vendors and talked to them about their plans, and from this I got back an updated copy of GRAPHIC OUTLOOK.

This is not an attempt to fully describe all of the features and applications that are available from these packages. This didn't start out as an article, it grew out of my notes while I was evaluating these packages. This was started back in early to middle of 1985.

A lot of these spreadsheets have versions for PDP-11's, IBM PC's and a large number of other vendors.

The spreadsheets * advantages and disadvantages

It should be realized that my main objective is not to homogenize all spreadsheets, that is so that they all start looking alike. My objective is to point out what I think are the strengths and weaknesses of each package using my scenario.

ANALYTICALC (DECUS, PRO-123, 11-SP-47, V-SP#24, SIG tapes)

The most powerful capability of this spreadsheet is the distinction between the "physical" spreadsheet where your model resides, and the "display" sheet that you see on the screen. If you are working on a very small model with automatic updating, you can set the display boundaries also to be very small and only the items that are changed within this display boundary are updated. This occurs even if you have a very large model overall, the areas of the "physical" sheet outside of the display boundaries are not updated. Likewise, if you are working on a very large model, you must set the display boundaries to be big enough to include the entire model. This will cause a lot of flashing to go on as it writes to the 35 line of the terminal, etc., this may have changed recently since I believe that ANALYTICALC now uses the SMG routines. Since the "display" sheet is virtual, two adjacent cells may or may not have anything to do with one another, it is up to the user.

Advantages

1. right price (free)
2. written in FORTRAN
3. comes with sources
4. versions written for a wide variety of systems, IBM PC's also
5. you can have lots of pieces of the spreadsheet all over the screen
6. not a bad tutorial, not great
7. you can save a piece of a spreadsheet to a file and restore to a different spot in another one
8. only recalculates what is within display boundaries
9. if a cell is zero, saved, restored and then saved again without being recalculated, it is eliminated - MY OBSERVATION. The reason this is an advantage is that it saves disk space, store and restore time. This situation occurs where you have an empty master sheet that you fill in and save several times modifying each time (remember, most departments start out with 1 or 2 projects and accumulate more as the budget is rearranged and finalized). This last point is also a disadvantage.
10. I understand from talking with the program author at the last DECUS (Fall '85, Anaheim) that he has eliminated some of these disadvantages, if any of these disadvantages are no longer current, I apologize.
11. very powerful package, has a lot of functionality including Fast Fourier Transform (FFT), day/date manipulation

Disadvantages

1. Poor user interface * confusing * you can have lots of pieces of the spreadsheet all over the screen * this is powerful if you can become accustomed to it
2. Won't run in BATCH with filenames
3. Command files won't take file names, i.e. load this spreadsheet into this spot * limited functionality

Comments

I didn't attempt to evaluate the graphics section of this package.

In my opinion, this has the potential to be the most powerful spreadsheet around if the user interface could be improved to the point where my users wouldn't lynch me.

DECalc V2.1 & DECgraph (Digital Equipment Corp., local sales office)

Advantages

1. Excellent user interface * uses letters instead of a keypad, the right/left arrow keys can be used to "scroll" over selections, at the top command prompt as you move over them, the full command is displayed on the left * nice touch

2. Good HELP facility * you can scroll the HELP back and forth, select topics with the right/left cursor keys. The HELP function is context sensitive.
3. Runs in BATCH (somehow! the documentation says it does but never explains how to do that)
4. Users can terminate cell entries with cursor keys.
5. The documentation states that DECalc is interfaced to DECgraph and Datatrieve. Verified the first (see later discussion), didn't on the second.
6. Auto-hop is available
7. The keypad can be used for data entry
8. Has a status display of sorts always on the screen
9. Good training examples
10. Fair manual
11. An important measure of success is whether or not users are willing to learn how to use this without being forced to, and mine where willing to sit down and go through the tutorial
12. Liked the user interface to DECgraph. Even though DECgraph leaves a lot to be desired, (poor screen resolution, etc. and a lack of hi-resolution graphics devices), I like DECgraph to pick out nice round numbers for default lower and upper limits and tic-marks for plotting, (some packages pick the smallest and largest numbers and that's it for the default) and you could go out and start changing things around inside of DECgraph. For example when you initial start plotting data, you think that a bar chart is the best way to present your data and that is what you pick of of the menu, but once you get into DECgraph, you can experiment with the other chart types and see how they look.

13. Chart types included: (with DECgraph)
1. pie charts
 2. vertical bar charts
 3. stacked vertical bar charts
 4. scatter plots
 5. line plot
 6. histograms

Disadvantages

1. The available graphics devices that DECgraph support are inadequate for any serious work.
2. Natural order calculation (as opposed to row and/or column) is the only calculation method available.

Comments

1. Can't save a section of the spreadsheet and then relocate it to a different spot * no consolidations, etc. A note from the developers indicate that this has been fixed in the next release.
2. Can't reproduce a two cell section to a two4dimension section in one command, the error message is misleading by saying invalid reproduce to section, what is meant is that you can only copy something to the same dimensions. An example of is a desire to want to fill a range of lines with zeros or some other number, with some spreadsheets you can say copy from this begin point to this end point to this begin point to this other end point, for example (from no specific spreadsheet):

\copy value B1:B8 G1:I8

A note from the developers indicate the correct way to do this is:

\R B1:B8 G1:I1
Which will reproduce all 8 columns across 3 rows.

The next release is scheduled for the Spring of 1987.

DIGICALC V1.20 (Timeline Incorporated, Bellevue, WA)

Advantages

1. The commands are initiated through the gold key and the keypad * most anyway * repainting of screen can be accomplished through either Control*W or REDRAW (PF4), exiting DIGICALC is done either through Control*C or END (GOLD*GOLD*PF4)
2. Rectangular areas can be filled and summed
3. A rectangular area can be copied into another so long as the target area is a multiple of the source area
4. Good HELP facility * context sensitive * if you are copying a cell and need help, use the HELP key * PF2
5. Manual written tongue*in*cheek, introducing reader to wuffles, wufflegig, etc.
6. Seem to have a reasonable way of saving pieces of a spreadsheet and then restoring it to a different location. This was an untried feature, and I was only able to find it in the manual after calling up the vendor and asking them about this capability after the program self*destructed. It looks like it might work.

Disadvantages

1. Three deep gold-key commands, only 5 keys (out of 16 keys) have definitions at the third level
2. Putting the END command where they did may be a mistake. It is not intuitive that to exit you have to hit the GOLD=KEY once and then press the 9 key (I think that that is the right sequence).
3. Personal preference, I prefer the colon (:) over the double period (..) for ranges, ala PL/1 and PASCAL
4. Should have a manual that is much briefer and written for experienced spreadsheet users without going through all the "wufflegig" of the training manual
5. I wish they would have included a user reference in the documentation.

Comments

1. DIGICALC is now up to Version 1.4
2. A note from the developers indicates that in 1985, they re-released the manual which clear and to the point. It is meant for the experienced spreadsheet user. I commend them for their efforts on this point, but also want to mention the fact that there will still be novices out in the world that would be better served by the original manual.
3. The version I got was the first shipped of this release and had a typo in the command file used to install the package. A phone call to Why Systems got the problem resolved quickly. (All of you sharp eyed people probably caught the name change, Why Systems was bought out by Timeline, Inc). Also the version I had didn't

support the VT200 in its native mode and had to make it a VT100 to make it work. That is in the next release, due out shortly. A note from the developers indicates that now they support the VT200 series terminals.

4. I didn't get a chance to try out the three-d/consolidation features of this package before the package self-destructed. After calling them up and asking them about saving a piece of worksheet and recalling it to a different spot, I was referred to the section marked UPDATES and I found the usual level of documentation for this package, it might not be to cumbersome.
5. I didn't start out to evaluate associated Graphics packages, so I didn't evaluate Digi-Graph.
6. The keypad mode can be turned on and off, so that the keypad can be used to enter numbers.
7. Digi-Port (optional software) reads DIF files from Lotus 1-2-3. Also transfers files between a PC and the VAX. A note from the developers indicates that now Digi-Port now reads and writes additional datatypes.

Graphic Outlook (Stone Mountain Computing, Santa Barbara, CA)

Advantages

1. Good 'hop' feature, lets you specify a range (including a rectangular area) to enter data into the spreadsheet. If you specify range, the program starts overwriting the last element of the range over and over again. For some reason I can think of better things for it to do, like beep at you or go outside of the data area, with the former being preferred. In talking with the developers, this has been changed in newer releases, it now beeps at the end of ranges.

2. Like DECalc, Graphic Outlook has context sensitive help and also expands the command line from the cryptic one letter commands to the available options. You can also use the cursor keys to scroll through the available commands.
3. The biggest difference between DECalc user interface and Graphic Outlook is the HELP interface. DECalc lets you scroll forwards and backwards and use the cursor keys to get additional help.
4. Graphic Outlook supports both the colon (:) and the double period (..) as range specifiers.
5. The name GRAPHIC OUTLOOK implies some sort of relationship with graphics and surprise, there is. With any one of a number of graphics terminals (including VT125/VT240 and Tektronix 4lxx series) and some graphics plotters, you can plot data from your worksheet. Using my VT241 terminal, I went and used the GRQ command and after a little trial and error got it to work. It isn't perfect, but it's not bad. The software driver for this is from Multiware, Inc (Davis, CA) and is called MGSP.
6. The package I evaluated had a nice graphics package with it, although I would have liked it lot of better if it had picked out the ranges with intelligence and used those as a default instead of making me do all the work. I figure that I'm not a graphics specialist, but there are people out there who are. I wished it would have acted sort of like DECgraph, here's the defaults, you want to change them, OK, but it did some picking out for me first, and some hints like this combination of colors will not work together.
7. Chart types included:
 1. pie charts
 2. vertical bar charts
 3. horizontal bar charts
 4. scatter plots
 5. line plot
 6. histograms

7. slidemaker
8. Probably works with the DEC LXY=12
9. The package supports the Tektronix 4510/4692 rasterizer/printer combination by telling it the device we are plotting to is a Tektronix 4105 and printing it out to a file for printing. The only thing we had to do after that was create a second file that had a couple of escape sequences to tell the rasterizer to print out the finished graph out to the printer and then to clear the buffer. The terminal that the rasterizer is attached to has to be set to pass form feeds. The documentation said they supported the HP 7221T plotter, but we didn't have much luck with that device (it would draw part of the graph and then stop).
10. Doesn't use the numeric keypad for commands (unlike Digicalc), for those people who can use the touch method with adding machines, this is a faster method of data entry, unfortunately I can't. A note from the developer indicates that now there is a keypad mode available that looks a lot like EDT (!). This mode can be turned on and off at will through a couple of slash commands.
11. Liked the way it helped you in loading in your spreadsheets, can't remember the name, get a directory, and pick the number of the one you want and I'll load it for you, nice job. I don't know what it would do if you have over 20 or 30 spreadsheets.
12. Reads and writes DIF files from Lotus 1-2*3 as well as a couple of other formats.
13. This package now has a LOTUS mode which has essentially a built-in translator to go from the LOTUS commands and translates them into "native-mode" commands.
14. runs in BATCH but doesn't put out all the screens out to the log file just some of the responses. The command file format (for both interactive command files and BATCH) looks like gibberish until you get used to it. Use the the command files interactively to DEBUG them and then run in BATCH.

Disadvantages

1. Like DECalc, the commands don't echo back to the terminal so that once you hit the slash key, indicating a command is coming, a list of abbreviations appears third line of the screen indicating approximately three-fourths of the available commands, you can get to the rest by using the period key but the package does not tell you what keys you are hitting so that if you are a two-fingered typist like myself and never really quite sure of what you're typing, it can be unnerving. If you are new to this software you can get expansions of these abbreviations by hitting the slash key again, using the period key lets you scroll forward through the commands, the comma key goes backward.
2. Doesn't use the numeric keypad for commands (like Digicalc). I understand now that there is a default keypad functionality similar to EDT. I hope this can be turned on and off at will. Numeric keypad off for data entry, EDT keypad for model building.
3. I understand I could have written out an ASCII file with this information in it and then transferred it around to where it has to go. It probably would work okay, but it seems to be a bit of a kludge.

Comments

1. When I first evaluated this package, I got Version 2.72 of the software and Version 2.60 of the documentation, leading to some minor confusion.
2. the backslash key is described as the "I didn't mean it key", I take that to mean an "undo" or "cancel" (abort current operation) key, well it works pretty much as advertised with a minor exception (that I came across), in the middle of a copy operation with formulas, I

decided I wanted to abort the operation, and instead of removing the values it left them there, but didn't put the formulas in from where I decided to stop.

3. According to the developers, the new version (version 4) has a LOTUS look-a-like mode were the command structure is identical to LOTUS 1-2-3. Also Graphic Outlook can now link to user written programs just as good as DECalc does, which of the DEC developers says is untrue. I haven't used either, so I'm in no position to judge.

20/20 (Access Technology, South Natick, MA, phone (617)
655-9191, X111)

Advantages

1. If you want to perform a function like a sum over a range of cells you can start the command and then point to the ones you want with the cursor control keys - see the corresponding disadvantage
2. This package comes with a project planning package built-in, I don't know how extensive it is, i.e. figuring if there are holidays, etc.
3. Manuals and references are done well
4. Had a graphics package in it, documentation was not as good as I would have like. The documentation gave a lot details about what a bar chart and a pie chart what each is good for, but the details on how to get from here to there was sparse. A lot of examples would have been helpful.

5. Here is brief list of graphics charts included
 1. line graph
 2. pie chart
 3. vertical bar chart
 4. stacked vertical bar chart

6. A menu driven database section is also provided that allows conditional processing, this applies only to individual rows and columns not to the entire spreadsheet. You may be able to have a text variable in a spreadsheet cause another spreadsheet to be opened where the file name is the string. See the corresponding disadvantage.

Disadvantages

1. You have to terminate cell entries with a <return>, if you use the cursor control keys instead the package thinks you are trying to tell it to do something else to the cell * see the corresponding advantage

2. Had problems getting consolidation and definition of links to work. What I expected to do was to read in either a blank master and then have some sort of command procedure edit the spreadsheet to add the department code, etc. or have a separate master for each department with all of the storage links defined in it read it in and then write it out to file called something like D52SUM. When I tried this latter approach, the values keep accumulating, just as the documentation said it would, what the documentation didn't say was how to get around this problem. The solution I came up with was to save it to a different file name than the default which is the original input file, a bit kludgy but it works. The documentation is not real clear, but if the file name will already be in use, then you have to give it the following command line in your command file:

/SW MYFILE.SUM #/ Y

These stand for: Option: Storage: Write: MYFILE.SUM
<end-of-filename> Yes+supersede the file. It should be noted that if the file doesn't already exist, you end up confusing the package. According to the vendor, there is a limit of 20 spreadsheets that can be consolidated into one, so I would have to multiple consolidations within a department for the departments with lots of consolidations. I did not attempt to verify this limit to see what would happen if there were to many links.

3. Included is a database section. However it only applies to individual rows and columns, not to the entire spreadsheet.

4. Had trouble getting the graphics functions to work fully. Working on both a DEC VT241 and Tektronix 4115B terminal and trying to do both line and pie charts, the objects would not be fully drawn, it would stop part way through.

NOTE

One of the people at the other end of the Access Technologies Hotline said they knew the graphics section of the Demo didn't work fully, but the the production version did. He said that currently the Tektronix 4115 terminal was not a supported device, but would be real soon. He also said that he thought that the Demo version ran in batch and he did some checking, said I had to fully specify the command file to run 20/20 and then use a /PARM switch to get it to go. After several attempts (all unsuccessful) I gave up.

There isn't much hope of ever getting the Tektronix 4510/4692 combination to work as a spooled device. After a phone call to Access Technology, they said that there wasn't much hope of doing it unless we were to kludge it. For example use DECnet to log into the system and create a log file, drawing the graphs etc. and then edit the log file.

5. There is no indication in the documentation about how to make this run in BATCH or from sort of startup/initialization file. In the installation procedure, a BATCH run is mentioned, but no indication of how to perform this magic.
6. On a repeated entry (such as defining these links) once you put a different range than the default, why doesn't this become the new default?
7. It doesn't follow the normal method of using the delete key, if you try to use the delete key when editing a command or range, etc. instead of the character to the left of the cursor being deleted and then moving to the left, the character beneath the cursor is deleted.

Comments

In talking to the marketing types at Access Technology, they say a lot of the things that I didn't like have been complained about in the past and are being worked on for future releases. Don't get the idea that I don't like the package, you're wrong, there are lot of nice features here.

C=Calc (DSD, Kirkland, WA, phone (206) 822#2252)

Advantages

1. Good documentation
2. The system is menu driven to a degree, the main menu will bring some sub-menus. I wish they would have used some more standard abbreviations, such as 'EX' for exiting the spreadsheet instead of 'F' for finishing the spreadsheet, ('E' edits a spreadsheet)

3. The people on the other end of the phone tried to help and referred the first question I had (about setting the terminal) to the programmers.
4. The training introduction wasn't bad, but it did seem to drag on forever explaining about the cursor control keys (didn't get the fact that you could use the cursor control keys until page 22), I think if a user is familiar with the EDT editor they shouldn't have to much of a problem with these. I'm not sure about the number of shops that don't have any either DEC or DEC-look-a-like terminals, but I feel that that section is overdone and could probably condensed drastically.
5. Liked the "feel" of the package

Disadvantages

1. I found the documentation lacking (I have a VT240, and the installation procedure says it supports about 10 different brands of terminals, including ADM's, Tektronix, Televidios, Heath's, etc. It took a phone call and a few days to find out how to get this package to work on the VT240.
2. This package has a keypad mode and was referred to Section 11 for details but I couldn't see a diagram of the default keypad functions.
3. Also took a phone call to find out how to get this package to run in BATCH, no big deal but you will have to wade through all of the screens being painted to the log file. Probably best just to submit this with the /NOLOG qualifier, of course this means that there is no way of tracking any errors that you have made. See the note at the beginning about BATCH runs and errors.

4. I didn't have a lot of luck getting there graphics section running fully. Most of it seemed to work, but it was missing one of the four bars when I tried to use one of their examples on to use the graphics. The documentation had an example of a line chart with four lines, one solid, and three that looked the same to me, each with 2 dashes and a long bar. When I tried that same line chart, I came up with 3 different line styles, but there should have been four. I let the package go through auto-scaling thinking my fat fingers slipped and caused typos that would screw with no change in the results. Trying to plot just one column of data, I got the error message there were no active data elements available.
5. It doesn't remember links between spreadsheets. For example, using my scenario, just because I link twenty individual projects together to form a department summary once, I have to re-link them again. I can understand this, but what I don't like having to do is to have to issue the consolidate command for each department repetitively. This method does let you have essentially an unlimited number of linked spreadsheets to link together. 20/20 lets you have up to 20 spreadsheets linked together and when you recall the spreadsheet, it goes out and reconsolidates the spreadsheets for you. You are limited to 20(?) spreadsheets and this would take a long time to load the spreadsheet. The good thing about C=Calc is DSD gives you a way to automate this process through the facility of something called a 'User Defined Procedure', which is sort of like a command file that cannot be nested and must be 'compiled' before being used.
6. I didn't like their idea of an index. They list 7 spreadsheets per screen and you can hit the <Return> for additional spreadsheets (if there are any). In my scenario, I could end up having 30 spreadsheets if I put 10 projects per spreadsheet or 200 spreadsheets if I have 1 project per spreadsheet. I would probably be using this consolidate feature meaning I would have all those spreadsheets. What a pain.

Saturn=Calc/Saturn=Graph (Saturn Systems,

Minneapolis, Minnesota, (612)944-2452 or (800)328-6145, distributed through General Scientific Corporation, Rockville, MD, 301-340-2773, this is a local distributor and there should be one in your area).

Advantages

1. This spreadsheet has what amounts to an auto-hop feature, it keeps going in the same direction when you hit the carriage return as the last time you used the cursor control keys. Of course you can also use the cursor control keys to terminate an entry.
2. Good help, had no real use for the manual that I had borrowed
3. This demo had a graphics package with it, I had trouble getting this to work, something about device not in GTABLE (so much for help files, they were sparse for this section). After a couple of calls to the distributor & the authors we got it work for the Tektronix 4115.
4. Available graphics include
 1. scatter chart
 2. pie chart
 3. vertical bar chart
 4. stacked vertical bar chart
 5. horizontal bar chart
 6. stacked horizontal bar chart
 7. line chart
 8. Gantt chart (for project planning)
 9. rudimentary(?) slide maker

In the comments from Saturn Systems, they list an additional 8 items that available. While they may be nice, and in some cases mandatory to have, they are outside the scope of this review.

Disadvantages

1. To get into the spreadsheet you have to go through menu's where you put in either the item number or you can use the cursor control keys to highlight the selected item and then use the "s" key (the one between the "a" and "d" keys on the main keyboard, not what I expected as using the <Return> key. Could also have picked the selection by picking the number of the choice.

NOTE

You don't have this problem if you only have the spreadsheet. But I was also trying out the graphics package.

2. After I had set up my master (blank) project sheet and tried to write it to disk, I got two messages, the first informing me that it was compressing the spreadsheet, the second message saying that since this was a demo copy, only 150 active cells could be saved. After deleting 4 columns (leaving 3 active columns, 1 title column and 2 with zeros in them), and tried again same set of messages. After deleting all of the columns (one at a time) with zeros, I was able to "successfully" save the spreadsheet. By my count, I had at most 70 active cells (the number of titles in my spreadsheet, includes blank lines between sections). The reason that I say "successfully" is I have deleted all means that I have of making what I consider a valid comparisons among the various spreadsheets when it comes to working with large and lots of spreadsheets. I understand Saturn Systems would want to protect their investment by giving a spreadsheet that doesn't have full capability, other vendors distribute theirs with full capability but check the date every time it is used.

3. I had trouble getting all of the column widths set like I wanted with the year in the block centered.
4. I had made an error in one my entries (I tried to reference a text cell) and was given the "err" message wherever it was referenced. Once that was fixed and tried to do a recalculate, the err message didn't go away until I used the cursor keys to go over them. This only seemed to happen when the cell was going to be zero. Not really a disadvantage, maybe a bug, but worth mentioning.
5. The degree between integration the spreadsheet and the graphics functionality is not as good as it is between the spreadsheet and graphics functions in Graphic Outlook or 20/20.

Comparison Chart

At the end of this is a comparison chart showing the items that I felt were important. I'm sorry, but some of notes are very sketchy about some of the abilities and limitations of some packages.

Some of the items are rated on a scale of 1 to 10, others are yes/no/both/maybe/automatic/add-on, (depends on the context) still others are months or dollars. In places where I had no information, I left the section blank (the graphics section under the ANALYTICALC).

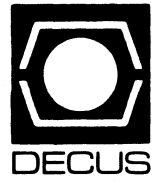
For your information, the following is the key to the table below:

1. ANALYTICALC
2. DECalc
3. DIGICALC
4. Graphic Outlook
5. 20/20
6. C-Calc

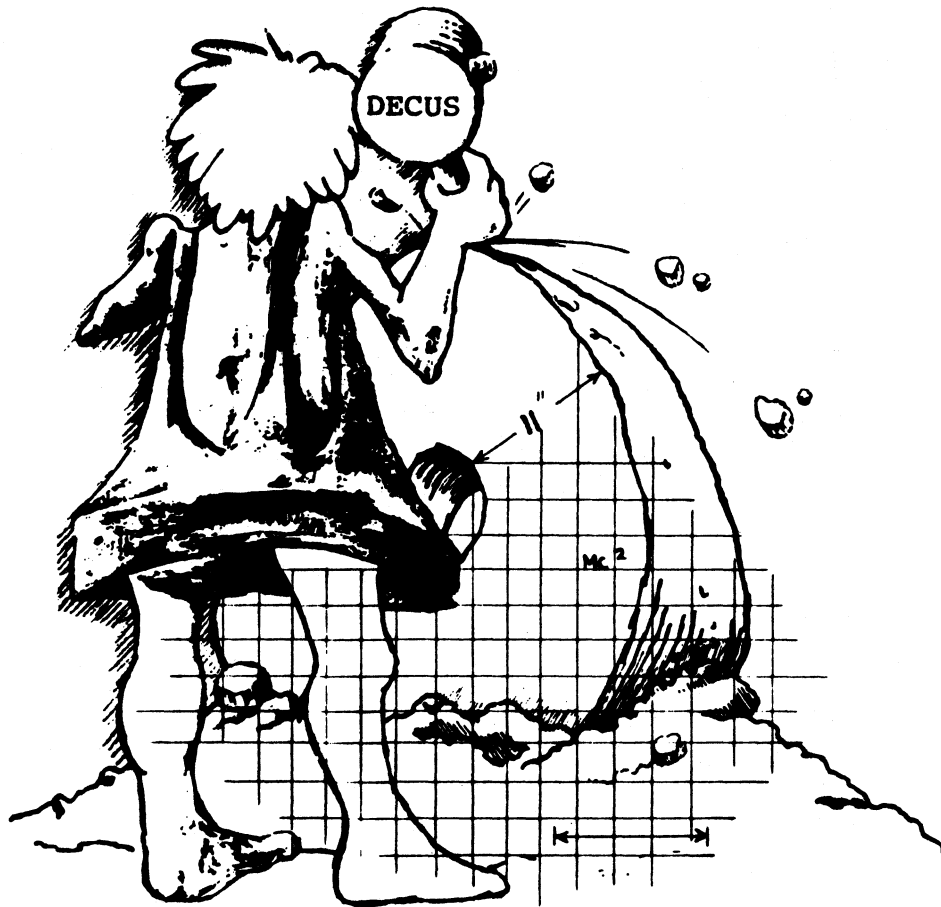
7. Saturn=Calc

Spreadsheet	#1	#2	#3	#4	#5	#6	#7
training/manuals							
tutorial	Y	Y	Y	Y	Y	Y	Y
manual	Y	Y	Y	Y	Y	Y	Y
on=line help	n	Y	Y	Y	Y	Y	Y
hotline support	n	Y	Y	Y	Y	Y	Y
sources	Y	n	n	n	n	n	n
modes of operation							
interactive	Y	Y	Y	Y	Y	Y	Y
command files	4	5	6	8	9	6	6
runs in BATCH	n	m	n	Y	m	Y	m
user interface	2	9	6	8	7	6	6
PC compatibility							
runs same way	Y	n	n	n	Y	n	n
reads DIF	m	a	a	Y	Y		n
writes DIF	m	a	a	Y	Y		n
graphics	?	Y	-	Y	Y	Y	Y
degree of	-	8		8	7		6
integration between spreadsheet and graphics							
device support		1		9	4	3	3
grap. lib. avail.	n		n	Y	n	n	n
intelligent dimensions							
lower limit		9		4	4		4
upper limit		9		4	4		4
tic mark spacing		9		4	4		4
chart types							
pie charts		Y		Y	Y		Y
horizontal bar		n		Y	n		Y
stacked horiz bar		n		Y	Y		Y
vertical bar		Y		Y	Y		Y
stacked vert bar		Y		Y	Y		Y
scatter plot		Y		Y	Y		Y
line plot		Y		Y	Y		Y
shaded line plot		Y		Y	n		Y
Gantt chart		n		Y	n		Y

slide maker		n		Y	n		Y
Display formats available							
right/left/center	Y	Y	Y	Y	Y	Y	Y
scientific	Y	Y	Y	Y	Y	Y	Y
dollars	Y	Y	Y	Y	Y	Y	Y
auto-hop	n	Y	Y	Y	m	m	n
continue direction	Y	n	Y	Y	Y	Y	Y
cursor key entry	Y	Y	Y	Y	n	Y	Y
edit entries	Y	Y	m	Y	Y	m	m
calculation order							
row	Y	n	Y	Y	Y	m	Y
column	Y	n	Y	Y	Y	m	Y
natural	n	Y	n	Y	Y	n	n
man./auto. recalc	b	b	b	b	b	m	b
number of windows	>100	2	4	4	4	m	2
.sk 1							
project planning							
CPM/PERT	Y	n	n	n	Y	m	n



LIBRARY



DECUS PROGRAM LIBRARY

NEW LIBRARY PROGRAMS AVAILABLE FOR THE VAX/VMS FAMILY OF COMPUTERS

DECUS NO: VAX-LIB-5 **Title:** The VAX Library Tape 5 **Version:** 1986/1987

Keywords: Library Tapes - VMS

Abstract: The VAX Library Tape 5 contains programs VAX-157 through VAX-159, VAX-161 through VAX-164, VAX-166 through VAX-173, VAX-175 through VAX-177, VAX-179, VAX-181, VAX-182, VAX-184 through VAX-187, VAX-190, VAX-191, VAX-193, VAX-199 and VAX-202.

Media (Service Charge Code): User's Manual (ED), 2400' Magnetic Tape (PC) **Format:** VMS/BACKUP

DECUS NO: V-SP-58 **Title:** LaTeX V.2, TeX V.1 **Version:** November 1986

Submitted by: Joseph F. Sciuto **Operating System:** VAX/VMS V4.2 **Source Language:** MACRO-32 **Memory Required:** 8MB **Hardware Required:** Laser Printer (LN01) **Keywords:** Text Formatting

Abstract: LaTeX is a powerful, easy to use, public domain text formatting package used to generate many kinds of printed documents. It is a special version of the computerized typesetting program TeX written by Donald E. Knuth. Using TeX as its base, a collection of formatting commands have been added in order to simplify its use. As well as producing various size printed text and scientific notation, lines, blocks and form layouts can be developed. An example of a LaTeX form was the DECUS store order form used at the Fall 1986 Symposia.

Media (Service Charge Code): 2400' Magnetic Tape (PC) **Format:** VMS/BACKUP

NEW LIBRARY PROGRAMS AVAILABLE FOR THE VAX/VMS FAMILY OF COMPUTERS

DECUS NO: VAX-195 **Title:** DEL DIR **Version:** V1.0, April 1986

Submitted by: Patricia M. Stockwell, General Electric Company **Operating System:** VAX/VMS V4.1 **Source Language:** DCL **Keywords:** DCL, System Management - VMS, Utilities - Disk - VMS

Abstract: This command file allows the user to delete all the files in a directory tree and then delete the tree itself using a bottom-to-top method. The procedure deletes the tree the user selects from his default directory and displays a log of all files/directories deleted. It is useful for deleting test or no-longer-used directories with many sub-directories.

The procedure first displays where you are and gives you an opportunity to exit. Next, it will display the directories found in your default directory and prompts you for the tree you would like deleted. Selecting a non-existent directory results in an error message and the procedure aborts. The procedure can be aborted by typing control Y.

Once the user selects an existing sub-directory, the procedure will delete all files, excluding directory files, found in the entire root structure. It will then begin deleting the directory files, starting with the bottom-most root and working up, displaying each file it deletes.

Notes: Uses operating system VAX/VMS V4 features, compatible with V4 and up.

Media (Service Charge Code): 600' Magnetic Tape (MA) **Format:** VMS/BACKUP

DECUS NO: VAX-197 **Title:** PLOT-10 for Non-Tektronix Hardcopy Devices **Version:** V1.00, June 1986

Submitted by: Jeremy B. Mann, United Technologies Corp., West Palm Beach, FL **Operating System:** VAX/VMS V4.2 **Source Language:** FORTRAN 77 **Memory Required:** 100KB Virtual Address **Software Required:** VAX FORTRAN, Tektronix PLOT-10 (TCS) **Hardware Required:** LA50, LA100, LN03 or HP7550A or LXYY11/Printronix P600 Printer. **Keywords:** Graphics, Plotting

Abstract: This submission consists of a set of FORTRAN modules which can be used in conjunction with an existing TCS (Tektronix) library to produce graphics output files suitable for plotting on several popular hardcopy devices. The devices known to this release of the package are the LXYYxx printer/plotter, (Printronix P-600), the HP 7550A 8-pen plotter, and any of the Digital Equipment Corporation sixel-format graphics devices such as the LA50, LA100 or LN03.

The basic approach of this software is to replace the lower levels of the TCS library with routines which can generate output data files in the format specific to each device type. This results in a reasonably good level of device independence at very little cost.

These modules have been used successfully with numerous output-only applications, including many of the example programs in the TCS user's manual.

Restrictions: No known problems, limitations as described in documentation.

Media (Service Charge Code): 600' Magnetic Tape (MA) **Format:** VMS/BACKUP

DECUS NO: VAX-208 **Title:** IMAGE **Version:** V04-003, September 1986

Submitted by: C. J. Chapman, MEL (Philips Defence

Systems), Crawley, West Sussex, England **Operating System:** MicroVMS V4.3, VAX/VMS V4.3 **Source Language:** DCL, FORTRAN 77, MACRO-32 **Memory Required:** Virtual memory allocated in link 13KB **Keywords:** System Management - VMS, Utilities - VMS

Abstract: The IMAGE utility is a system management tool that enables the system manager to obtain information on user processes or system wide processes. Image is very useful for taking a snapshot look at your system to establish what images are executing. Image runs on both hardcopy (LA120) and video terminals (VT220, VT241) and returns the following data:

- . User_name, process id, uic, process state and type
- . Base priority, current priority, CPU minutes/seconds
- . Disc i/o, page faults
- . User image executing
- . Balance set, date time update

Additional functions include:

- . Automatic system image monitoring
- . User image monitoring using detached processes

Release notes are included with this utility together with the necessary files to relink. Future releases will follow.

Notes: Operating System VMS V4.0 or later required. Program will not work under VMS 3.X.

Sources not included.

Media (Service Charge Code): 600' Magnetic Tape (MA) **Format:** VMS/BACKUP

DECUS NO: VAX-209 **Title:** Sports Pool **Version:** July 1986

Submitted by: Jerrold Schiff, Ault Foods Ltd, Etobicoke, Ontario, Canada **Operating System:** VAX/VMS **Source Language:** COBOL-81 **Hardware Required:** Cobol Compiler **Keywords:** Games

Abstract: Most hockey pools are too simplistic for programmers. This pool goes beyond the usual "guess the time of the last goal". Of the twenty weekend games, players now have to guess not only which team will pull off the win, but also by how many goals. Guessing the correct differential is the real fun. **Restriction:** Must be managed - entry of who plays whom, then entry of who wins and by how much are all functions of the "manager". Users get to put in their own picks, but generally need prodding in the form of mail messages.

Restrictions: Maintenance (needs an "owner").

Media (Service Charge Code): 600' Magnetic Tape (MA) **Format:** VMS/BACKUP

DECUS NO: VAX-211 **Title:** EDTPlus **Version:** V2.0, September 1986

Submitted by: M. Edward Nieland **Operating System:** VAX/VMS V4.2, 4.4 **Source Language:** TPU **Keywords:** Editors

Abstract: EDTPlus is a VAXTPU emulation of EDT with many special added features that increases the productivity of the user once the user becomes familiar with the editor commands. The user can become acquainted with these special functions and how to use them in the span of a couple of hours.

EDTPlus was designed such that common commands and special added features are easy to use and follow a set pattern. Such keys include GOLD X for exit, GOLD Q for quit and GOLD W for multi-window. Special features include:

- . Multi-windowing
- . User definable, expandable tabs
- . Insert or overstrike mode
- . Pagination
- . Online help by key reference
- . Global replace with optional query
- . Key definition by keystroke
- . Access to HELP from within editor
- . Able to spawn commands from within editor
- . Column (rectangular) cut and paste

Another of the special features of EDTPlus is the ability to read in user initialization files from both the login directory and the default directory. Users who wish to use this feature should look at the example file provided. ACCOUNT__EDTPINLTPU and EDTP initialization under the EDTPlus HELP (GOLD PF2).

This emulation is based upon and by the same author of the EDTPlus program as published in The DEC Professional, June 1986, (volume 5, number 6, pages 115-125). This emulation contains most of the features discussed in the article along with many new features.

Restrictions: Operating System VMS V4.2 or greater is required.

Media (Service Charge Code): 600' Magnetic Tape (MA) **Format:** VMS/BACKUP

DECUS NO: VAX-216 **Title:** SPICE2 **Version:** G6, May 1983

Author: Richard Newton, University of California, Berkeley, CA

Submitted by: Digital Equipment Corporation **Operating System:** VAX/VMS **Source Language:** VAX MACRO, FORTRAN IV **Memory Required:** 1.5 MB **Software Required:** FORTRAN IV Compiler **Keywords:** Circuit Simulation

Abstract SPICE2 is a general-purpose circuit simulation program for nonlinear dc, nonlinear transient, and linear ac analyses. Circuits may contain resistors, capacitors, inductors, mutual inductors, independent voltage and current sources, four types of dependent sources, transmission lines and the four most common semiconductor devices: diodes, BJTs, JFETs and MOSFETs.

Notes: Due to popular customer request, the DECUS Program Library has decided to make this older version of the SPICE package available once again. The latest revised version of SPICE is called SPICE 3A6 and is available as DECUS Program No. VAX-6. Please note SPICE2 needs the FORTRAN IV compiler and SPICE3A6 needs the C compiler for compilation.

Restrictions: U.S. Government export regulations prohibit the distribution of this program outside the United States without the appropriate export licenses.

Media (Service Charge Code): 600' Magnetic Tape(MA) Format: VAX/ANSI

DECUS NO: VAX-220 **Title:** LIBED **Version:** October 1986

Submitted by: G. Del Merritt, Computer Sciences Corp. **Operating System:** VAX/VMS V4.3 **Source Language:** CDU, MESSAGE, VAX FORTRAN **Memory Required:** Virtual **Software Required:** DEC/CMS V2.0 or later **Hardware Required:** Video terminal **Keywords:** Tools - Software Development

Abstract LIBED is a CMS Library Editor. It allows the user two views of elements in the CMS Library or Libraries chosen. Up to three libraries may be displayed at one time. LIBED was developed to provide an example for the Fall '86 Symposium session LT101, "Using the CMS Callable Interface".

Notes: Source and examples for Fall '86 LT101, "Using the CMS Callable Interface". Submission includes the .RNO file for the session's slides. File names in .CLD file and VMS_HELP.FOR should be changed.

Restrictions: Known bug: for displays exceeding the terminal size, do not use the "up arrow" when cursor is in the top left corner of the display.

Media (Service Charge Code): 600' Magnetic Tape(MA) Format: VMS/BACKUP

NEW LIBRARY PROGRAMS AVAILABLE FOR THE PDP-11 COMPUTER FAMILY

DECUS NO: 11-SP-93 **Title:** Symposium Collection from the RSTS SIG, Spring/Fall 1986, Dallas and San Francisco **Version:** November 1986

Submitted by: Philip Hunt **Operating System:** RSTS/E V7 - V9.2 **Source Language:** BASIC-PLUS, BASIC-PLUS2, MACRO-11 **Keywords:** Symposia Tapes - RSTS/E

Abstract: This tape is the combined Spring (Dallas) and Fall (San Francisco) 1986 DECUS Symposium tapecopy project for the RSTS SIG. Some of the items included on this tape are: a new copy of CB for RSTS V9 multiple privileges, a dynamic priority program that actually maps the monitor to function, new KERMIT, many V9 .COM files to show how things are done, some disk/tape utilities, a program to dump the symbol table of a monitor sil, a command line editor that is used under RSTS V9 and greater similar to VMS, a fast text editor and others.

The KERMIT, CLE and TED packages are on the tape uncompact as well as saved as backup V9 savesets. The tape consists of 28,000 blocks of data.

No guarantees are made as to the completeness, usability or quality of the programs on the tape and the material has not been checked or reviewed.

Media (Service Charge Code): 2400' Magnetic Tape (PS) Format: DOS-11

DECUS NO: 11-SP-94 **Title:** Symposium Collection from the RT-11 SIG, Fall 1986, San Francisco **Version:** Fall 1986

Submitted by: R. W. Barnard, Sandia National Laboratories, Albuquerque, NM **Operating System:** RT-11 V5.0 and later **Source Language:** MACRO-11, FORTRAN77, FORTRAN IV, C, BASIC-11 **Memory Required:** Varies **Software Required:** Will be specified in each submission - many submissions also run under TSX-PLUS. **Hardware Required:** Special requirements will be specified in each submission on the tape. **Keywords:** TSX, Symposia Tapes - RT-11

Abstract: The symposium collection from the RT-11 SIG, Fall 1986, San Francisco contains twenty-five packages in subdevice format. The tape includes an annotated directory TAPDIR.TXT, and instructions for RT-11 and RSTS users on recovering files from subdevices. The file TAPDIR.TXT includes a summary, cross-reference and index section. Included on the tape are some selections from the 1986 Australia DECUS RT SIG tape. The tape contains the following submissions:

- . A DU handler for very large (255 Mb) disks.
- . Two different implementations of a User Command Linkage (UCL).
- . Utilities and IND control files for easily connecting to subdevices.
- . FORTRAN IV OTS documentation.
- . Plotting library for HP-GL plotters.
- . A FORTRAN-77/RT OTS update kit, routines for writing virtual arrays to disk, diagnostic overlay handler.

- . The King James Bible and text search routines.
- . A library of useful utility routines (CVLLLLIB).
- . Data base management package.
- . A great number of "miscellaneous" utilities for RT, TSX-PLUS and other systems.

No guarantees are made as to the completeness, usability or quality of the programs on the tape, and the material has not been checked or reviewed.

Notes: All documentation provided by each submitter has been included.

Restrictions: If any, will be specified in each submission.

Media (Service Charge Code): Write-Up (AA), 2400' Magnetic Tape (PS) Format: RT-11

NEW LIBRARY PROGRAMS AVAILABLE FOR THE PDP-11 COMPUTER FAMILY

DECUS NO: 11-844 **Title:** H19PAK - RT-11 FORTRAN IV Support for VT52/H19 CRTs **Version:** V002B, April 1986

Submitted by: Anthony P. Cruz, Roseville, MI **Operating System:** RT-11 V2C (HT-11 11/79) **Source Language:** MACRO-11 **Memory Required:** 17748 or less words **Software Required:** RT-11 FORTRAN IV or equivalent. Can also be VERY USEFUL in MACRO-11 or ANY high level language that uses the same conventions for parameter passing as RT-11 FORTRAN IV. **Hardware Required:** VT52, Heath/Zenith H19 or any VT52 compatible CRT terminal. **Keywords:** FORTRAN

Abstract: This project was inspired by a need to utilize the Digital Equipment Corporation VT52 compatible features of the HEATHKIT Model H19 CRT terminal through the FORTRAN language in as straightforward a manner as possible. In order to access the features of this terminal, the non-printing {ESC} (ESCAPE) character must be used. Normally, a FORTRAN IV programmer would have to write some rather obtuse code in order to send any non-printing character to a device.

Although FORTRAN is an excellent language for technical people with little computer background, it has historically been an inconvenient language for handling alpha-numeric strings. The objective here is to simplify the use of the terminal features by accessing these features through a series of FORTRAN "CALL" statements.

All of the needed subroutines are named according to the name of the feature accessed per the HEATH instruction manual. Support subroutines are also included to enable EFFECTIVE use of the screen dump command.

Notes: Uses RT-11 V20C programmed requests through-out. However, general logic would remain unchanged if for instance RSX-11M QIOs were used instead.

Media (Service Charge Code): User's Manual (EB), One RX01 Diskette (KA) Format: RT-11, 600' Magnetic Tape (MA) Format: RT-11

DECUS NO: 11-850 **Title:** FC - A File Compression Utility **Version:** May 1986

Author: Ted Dustman, V.A. Medical Center, Salt Lake City, UT

Submitted by: Robert Dustman, V.A. Medical Center, Salt Lake City, UT **Operating System:** RT-11 V4, TSX-PLUS V5 **Source Language:** C **Memory Required:** 18KB **Keywords:** File Management

Abstract: FC is a program designed to compress and decompress text files. It is not another "squeeze" program; it actually reduces the size of text files from 35% to 50%. The compressed text file cannot be edited of course; its use is for archival purposes or for transmission to other computers via modem. The program is ineffective on small files (say one block long). It implements Huffman's variable length code algorithm for compressing text. The program is, unfortunately, somewhat slow. It takes about two minutes for it to compress a file 110 blocks long running on a PDP-11/23+ with RL02 disks. Decompression takes less time.

Restrictions: Compresses only text files.

Media (Service Charge Code): One RX01 Diskette (KA) Format: RT-11, 600' Magnetic Tape (MA) Format: RT-11

DECUS NO: 11-854 **Title:** NBS PASCAL for RT-11 **Version:** V1.6i (EC), Sept. 1986

Author: Earl Chew

Submitted by: G. Brimble, Dept of Defence GPO Adelaide, South Australia 5001 **Operating System:** RT-11 V5 **Source Language:** MACRO-11, PASCAL **Keywords:** Compilers, PASCAL

Abstract: A version of the NBS PASCAL compiler ported to RT-11 has been around on symposium tapes for some time. This has been cleaned up, modified to support both FPP and FIS hardware, and packaged with a collection of utility subroutines and programs.

The base compiler was 1.6i, with the FIS code generator from 1.6e. Much work has been done to fix bugs in the supplied software, with the result that all unresolved problems reported in the distributed NBUGS file have been resolved. The bugs that have been fixed are documented in the package.

The kit includes the new compilers, command files to rebuild them, a profiler, cross reference generators for PASCAL and BASIC, a pattern matching program like GREP, a typographical checker plus dictionary, and a couple of fun things.

Full documentation is included.

Restrictions: Compiler cannot recompile itself on machines with 4KW I/O page under SJ or FB monitors. RT-11 version 5 is required. The files are organized in sub-disks.

Media (Service Charge Code): Four RX02 Diskettes (LD) **Format:** RT-11, 600' Magnetic Tape (MA) **Format:** RT-11

DECUS NO: 11-856 **Title:** DUCM/DYC **Version:** V1, October 1986

Submitted by: Chester Wilson, Charleville, Australia 4470 **Operating System:** RT-11 V4, TSX-PLUS V6 **Source Language:** MACRO-11 **Hardware Required:** MSCP disc controller and/or RX03 controller (either SIGMA or DILOG). **Keywords:** Device Handlers

Abstract: DUCM/DYC is a set of programs which allows users to access large MSCP discs under TSX-PLUS. It has the following features:

[DUCM] The handlers are internally queuing, allowing up to 32 requests to be queued to an MSCP controller at a time. This speeds up multi-job RT-11 and TSX-PLUS usage considerably.

[DUCM/DYC] The handlers may be mapped under TSX-PLUS, saving low memory for additional jobs.

[DUCM+TSX] Any number of discs of any size may be accessed at the same time, without any need for SET commands which could compromise TSX-PLUS security. This requires a Q-bus system.

[DYC] This is a mapped DY: RX03 (double sided RX02) handler for DILOG and SIGMA controllers. Anyone who would like to extend it for other controllers is welcome; the author would appreciate a copy (on RX03 of course...). If the handler is run as a program, it allows formatting of RX01/02/03 floppies, without requiring any privileges under TSX-PLUS.

[TSMUNG] This program is included to get TSX-PLUS to allow DU and/or DY handlers to be mapped.

Media (Service Charge Code): One RX02 Diskette (LA) **Format:** RT-11, 600' Magnetic Tape (MC) **Format:** RT-11

NEW LIBRARY PROGRAMS AVAILABLE FOR THE PROFESSIONAL-300 SERIES OF COMPUTERS

DECUS NO: PRO-161 **Title:** UTILITIES FOR PRO/RT **Version:** May 1986

Submitted by: Earl Chew **Operating System:** RT-11 V5 **Source Language:** MACRO-11, PASCAL **Software Required:** NBS PASCAL required to recompile some programs. **Keywords:** Utilities - RT-11

Abstract: This is a potpourri of programs written for RT-11 V5.1 or later (except where noted) on a PRO. The following has been provided:

DIRSA directory listing program which has options to automatically search down sub-directories and to list creation times (TSX compatible). DIRS.501 provided for RT-11 versions without the plain GTLIN facility. /HELP for help.

BUILD A utility modeled on the UNIX MAKE program. Will generate the minimum set of commands required to compile a program made up of separately compiled program modules (i.e. an object module need not be recompiled if its creation time is more recent than all its sources). BUILD.501 provided for RT-11 versions without the plain GTLIN facility.

TS A handler which will time stamp files with their creation times (TSX compatible). This handler has only been tested under RT-11 XM and RT-11 FB version 5.02.

DWDISK A Winchester disk formatting program allowing the user to change the interleaving pattern, cylinder spiral and track spiral on the disk. Improvements in speed of 50% have been achieved using the standard DW: handler and formatting with an interleave of 7. This has only been tested on a Pro-350 using an RD51 (10Mb) disk. Also included is a program to time disk read operations.

DW A modified DW: handler recoded for speed and compactness. Average improvements in speed of 65% have been achieved using a disk formatted by FORMAT.SAV. The handler is 45% smaller than the standard DW: handler. This has only been tested on a Pro-350 using a RD51 (10Mb) disk.

Media (Service Charge Code): One RX50 Diskette (JA) **Format:** RT-11

NEW LIBRARY PROGRAMS AVAILABLE FOR THE RAINBOW SERIES OF COMPUTERS

DECUS NO: RB-115 **Title:** Three Dimensional Tic-Tac-Toe **for MS/DOS Version:** July 1986

Submitted by: Jay Ondracek **Operating System:** MS/DOS **Source Language:** FORTRAN IV **Keywords:** Games

Abstract: A variation on the Tic-Tac-Toe game that everyone knows. The game is played on a 4x4x4 cube, and you need four spots in a row to win. Beware!!! The computer uses 2-way and 3-way traps and an occasional bit of sarcasm to put you off your guard.

Sources not included.

Media (Service Charge Code): One RX50 Diskette (JA) **Format:** MS/DOS

DECUS NO: RB-116 **Title:** QIX: An Action Game **for MS/DOS Version:** July 1986

Author: R. Bartlein

Operating System: MS/DOS **Keywords:** Games

Abstract: This addictive game, once available only under VMS, is now available under MS/DOS on the Rainbow 100. In this game, the player battles the lethal bidirectional and unpredictable snake QIX for territory. Needless to say, the more territory you capture, the more agitated and unpredictable QIX becomes.

Sources not included.

Media (Service Charge Code): One RX50 Diskette (JA) **Format:** MS/DOS

NEW LIBRARY PROGRAMS AVAILABLE FOR THE RAINBOW SERIES OF COMPUTERS

DECUS NO: RB-120 **Title:** TREEDUPL **Version:** V2.0, October 1986

Submitted by: Digital Equipment Corporation **Operating System:** MS/DOS V2.11 **Source Language:** PASCAL (Turbo) **Memory Required:** 40 KB **Software Required:** None (DECnet-Rainbow or DECnet-DOS optional) **Keywords:** File Management, Networking

Abstract: TREEDUPL duplicates all directories and files in an MS/DOS directory tree rooted at some point to a directory tree rooted at some other point. If old versions of the files from the source directory tree are present in the target directory tree, they are replaced by the files from the source. If files in the target directory tree are not present in the source directory tree, the files in the target directory tree may optionally be deleted.

In a DECnet-Rainbow or DECnet-DOS environment, TREEDUPL may be used to back up a local hard disk to a network virtual disk, and to restore the local hard disk from the network virtual disk.

Release Notes are distributed with each order.

Notes: Operating Systems MS/DOS V2 or greater is required.

Media (Service Charge Code): User's Manual (EA), One RX50 Diskette (JA) **Format:** MS/DOS

REVISIONS TO LIBRARY PROGRAMS

DECUS NO: 11-SF-47 **Title:** PortaCalc (AnalytiCalc): A 3D Spreadsheet/Database System **Version:** V21.2, September 1986

Submitted by: Glenn C. Everhart, Ph.D. **Operating System:** P/OS, MS/DOS V2+, VAX/VMS, RSX-11M-PLUS, RSX-11M, RSTS/E, IAS, MICRO/RXS **Source Language:** n MACRO-32, MACRO-11, VAX FORTRAN, FORTRAN 77, FORTRAN IV-PLUS **Memory Required:** N/A **Keywords:** Business Applications, Data Base Management, PortaCalc, Spreadsheet

Abstract: PortaCalc is a powerful three dimensional spreadsheet/database and analysis system with easy user extensibility designed to outperform most any commercial package available, running on PDP-11 systems able to support the F4P compiler, or VAX systems, needing the VAX FORTRAN compiler to compile. Several terminals are supported, including the VT100 series, VT52, Datamedia Colorscan 10 and Elite 1500, Televideo 925, and ANSI color terminals.

The program is designed for power, and to be easily portable to other systems supporting FORTRAN, with peculiarities used documented, and its manual is designed to be turned into a system HELP file so that it can be read online.

A data management system interface is built in, permitting spreadsheets to access a potentially unlimited number of files and records or parts of records in those files for user defined functions, numbers, formulas, text, or whatnot. In fact, it has many of the attributes of a language.

A powerful text integration function permits integration of word processing files with reports, permitting use of AnalytiCalc (PortaCalc) to integrate sections of reports which are edited with any editor. It also simplifies inserting text from external files flexibly over null cells of the spreadsheet.

The current release adds an "Enter-mostly" mode of operation that provides a command structure similar to commercial spreadsheets on micros (numbers, formulas, and text just get typed in, commands prefixed with /) as an option, plus various additional capabilities.

You have the ability to access HUGE spreadsheet dimensions; up to 32,000 rows and 32,000 columns can be addressed on the VAX, and up to 10,000 by 10,000 on the PDP-11.

This version of AnalytiCalc (PortaCalc) now contains a two page memory paging algorithm for the PDP-11 version. It also has a version presented here for the first time containing a Datatrive-32 interface permitting exchange of data between DTR databases and AnalytiCalc spreadsheets in both directions. Complete source code for all versions is provided. It is assumed the F4P and F77 compiler is available for PDP-11, or the Digital Equipment Corporation VAX FORTRAN compiler for VAX. Please Note: object libraries are provided for VAX systems not wanting FORTRAN, and task images for RSX systems without F77.

Release Notes are distributed with each order.

Notes: VAX/VMS users see DECUS No. V-SP-24.

Changes and Improvements: Added cell annotation. Also, distribution now contains VMS virtual disk as well as RSX virtual disk.

Media (Service Charge Code): User's Manual (EC), 2400' Magnetic Tape (PC) **Format:** RMSBCK

REVISIONS TO LIBRARY PROGRAMS

DECUS NO: VAX-132 **Title:** MASSGRAF: A Program that Generates Graphics Images **Version:** V2.0, June 1986

Submitted by: Judi Cleary, The Standard Oil Company, Cleveland, OH **Operating System:** VAX/VMS V4.4 **Source Language:** VAX-11 FORTRAN **Memory Required:** 300-500 blocks depending on device driver used. **Software Required:** DI-3000 subroutine library and DI-Textpro, licensed by Precision Visuals, Inc. **Hardware Required:** Precision Visuals, Inc. graphics device to display graphics. **Keywords:** Graphics

Abstract: MASSGRAF is a graphics program that generates graphics images which can later be included into a word-processing document. MASSGRAF images can consist of basic geometric shapes and variations on boxes, arrows, circles, etc., and text in various fonts and size. Various line widths, line styles, pattern-fills and colors are available. MASSGRAF can also be used to make slides and overheads for presentations.

Using a command-driven interface, the user generates a graphics file, one page at a time. This "page" of graphics can be displayed on a graphics terminal or can be output to a laser printer. Once created, a graphics file can be "included" in a MASS11(tm) document and printed as a consolidated page.

MASSGRAF also allows the user to input commands via a command file. This command file can be edited using the EDT editor.

Notes: DI-3000 subroutine library must be obtained from Precision Visuals, Inc.

Changes and Improvements: Added color, pattern-fill for solids, locator input and text.

Assoc. Documentation: No, but additional documentation on DI-3000 library can be obtained from Precision Visuals, Inc.

Restrictions: This software is based on device-independent (DI-3000) graphics subroutine library. An executable file must be built for each device driver. It is also designed to be used with a word processing package called MASS-11; however, it can be used separately.

Complete sources not included.

Media (Service Charge Code): User's Manual (EB), 600' Magnetic Tape (MA) **Format:** VMS/BACKUP, or order VAX-LIB-4

DECUS NO: VAX-133 **Title:** GRAF11: A Package to Graph Scientific Data **Version:** V2.1, July 1986

Submitted by: Judi Cleary, The Standard Oil Company, Cleveland, OH **Operating System:** VAX/VMS V4.4 **Source Language:** VAX-11 FORTRAN **Memory Required:** 500-700 blocks depending on device driver used. **Software Required:** DI-3000 subroutine library, licensed by Precision Visuals, Inc. **Hardware Required:** Precision Visuals, Inc. graphics device to display graphics. **Keywords:** Graphics, Scientific Applications

Abstract: GRAF11 is a graphics package that provides an easy way to graph scientific data. GRAF11 uses an interactive, command-driven interface. Many commands have default values which can be easily overridden.

Commands and data can be entered from the keyboard or from a file. Graph formats include linegraphs, barcharts and scattergraphs, using linear, log, calendar or probability axes. Curve fitting and smoothing can also be done. GRAF11 provides flexibility for displaying and controlling all four axes, labels and tic marks.

GRAF-11 was written using DI-3000(tm) graphics library and is therefore quite "device independent" regarding graphics display. Graphs from GRAF-11 can also be merged with MASS11(tm) word-processing documents. When output to a laser printer, GRAF11 can produce graphs suitable for direct submission to technical journals.

Notes: DI-3000 subroutine library must be obtained from Precision Visuals, Inc.

Changes and Improvements: Added more control on labeling axes, optional top axis control, and solid marker types. Modified probability axis to be more useful. Also changed GET and SAVE commands to use ASCII command files; i.e., the old binary SAVE files no longer exist. There are also two new commands: MAKE and ERROR-BARS.

Assoc. Documentation: No, but additional documentation on DI-3000 library can be obtained from Precision Visuals, Inc.

Restrictions: This software is based on device-independent (DI-3000) graphics subroutine library. An executable file must be built for each device driver.

Complete sources not included.

Media (Service Charge Code): User's Manual (EC), 600' Magnetic Tape (MA) **Format:** VMS/BACKUP, or order VAX-LIB-4

DECUS NO: PRO-131 **Title:** FSTATS: Statistical Analysis Package for P/OS **Version:** June 1986

Author: Margaret Quince et al, Lincoln College

Submitted by: Stephen Hirsch, NZAEL, Canterbury, New Zealand **Operating System:** P/OS **Source Language:** FORTRAN IV, FORTRAN77 **Keywords:** Mathematical, Statistics

Abstract: FSTATS is a package of statistical routines which can analyze up to 1000 floating point variables in up to 100 groups. It includes the following options:

Data Editor, Wilcoxon's Matched Pairs Signed Rank Test, Fisher's Exact Prob. Test, T Test Paired, Histogram, Linear Regression, One Way Analysis of Variance, Graphs of Data, Data Summary, Chi Square Test on I x J Contingency Table, Pearson's Correlation Coefficient, T Test Unpaired, Mann Whitney U Test, Spearman's Rank Correlation Coeff., Kruskal-Wallis Analysis of Variance, and Transformations of Data.

FSTATS was originally developed on a system running IAS and was converted to run under RT-11 on a Professional 325. This version of FSTATS for P/OS was converted from FSTATS for RT-11 by F. Bommel, SIEMENS ZFE TPH 13, Paul-Gossen-Str. 100, D8520 Erlangen. There are almost certainly minor bugs in the program as it has not been used extensively.

Changes and Improvements: This version of FSTATS has been modified slightly for use under P/OS.

Media (Service Charge Code): One RX50 Diskette (JA) **Format:** FILES-11

DECUS NO: VAX-165 **Title:** DATMAN/VAX **Version:** V5.1, August 1986

Submitted by: Leonard Bass, University of Rhode Island, Kingston, RI **Operating System:** VAX/VMS V4.2 **Source Language:** FORTRAN IV-PLUS **Keywords:** Data Base Management

Abstract: DATMAN is a scientific relational data base management system. It consists of a collection of commands available directly to an end user. These commands allow a user to build a collection of data bases, add, edit and delete data from these data bases, retrieve specified subsets and define new variables, display data retrieved in a formatted or unformatted fashion and do descriptive statistics on the data retrieved.

The data base facilities of DATMAN are also available through a collection of procedures callable from an arbitrary PASCAL, FORTRAN or C program using standard VAX data types.

One of the components of DATMAN is a screen management system including an editor and run time facility. The run time facility of the screen management system is available either through one of the DATMAN commands or through a collection of procedures callable from an arbitrary program.

Changes and Improvements: Performance improvements and miscellaneous enhancements.

Media (Service Charge Code): 600' Magnetic Tape (MC) **Format:** VMS/BACKUP

DECUS PROGRAM LIBRARY CHANGES:

DECUS NO: CPM-105, **Title:** Vol5 BASIC-E Compilers and Interpreters, BASIC-E Programs Continued from Volume 3, Microsoft BASIC Programs, **Version:** March 1986, program EDTEXT.BAS is listed in the catalog as,

"This program allows you to edit and print text data". Please put in the following restriction: Program EDTEXT.BAS does not work properly.

DECUS NO: 11-446, **Title:** RT11/03 FORTRAN Extensions, **Version:** 1.1, August 1980, shows **Media (Service Charge Code):** Write-Up (AB) as being available. This **Media (AB)** Write-Up is no longer available.

DECUS NO: 11-772, **Title:** RAID: A Really Awesome Interactive Debugger, **Version:** V1.0, December 1984, shows **Media (Service Charge Code):** Write-Up (AA), **Source Listing (BC)**. Please change Media Codes to read User's Manual (EC).

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There are several ways to submit material for the newsletter:

- o The Hardware Submission Form in the back of the newsletter can be used for brief items (there is not enough room if you have a lot to say).
- o You can send me camera-ready hard-copy (this saves me a lot of typing).
- o I will accept submissions on floppys. I can handle RX50's or 8" diskettes (either density, single or double sided). I prefer RT-11 format, if possible, but I can probably handle RSX or VMS stuff somehow. I will return your diskette(s), of course.
- o Those of you that have access to DCS can send things to username WALKER. I check DCS daily.
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In any event, if you have anything to submit, send it! If it is a mess, but I can read it, I will get it in the newsletter somehow. Finally, if you have any question about submitting material, call me. My telephone number is listed below.

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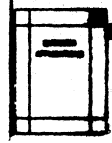
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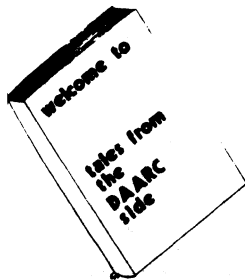
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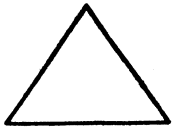
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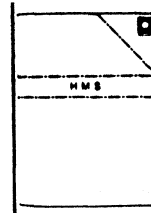
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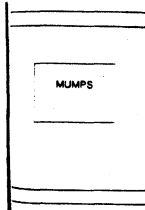
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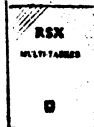
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Ask the WOMBAT WIZARD
Submission Form

To submit a problem to the WIZARD, please fill out the form below
and send it to:

WW Editor, Philip A. Naecker
Consulting Software Engineer
3011 North Mount Curve Avenue
Altadena, CA 91001
USA

Name: _____ DECUS Membership No. _____

Affiliation: _____

Address: _____

Telephone Number: _____

Statement of Problem: _____

Please following the following guidelines when submitting support
material:

1. If you are trying to demonstrate a method or a concept,
please simplify the procedures, records, and other information
to the shortest form possible.
2. Annotate your attachments. Simple comments or hand-written
notes ("Everything worked until I added this statement.") go a
long way toward identifying the problem.
3. Keep an exact copy of what you send. And number the pages
on both copies. But send everything that is related to your
question, even remotely.
4. If you would like a direct response or would like your
materials returned, please don't forget to include a stamped,
self-addressed envelope large enough to hold the materials you
send.



DATATRIEVE/4GL SIG
Product Improvement Request Submission Form

Submittor:
Address:

DECUS Membership Number:
Firm:

Phone:

Product or Products:

How to write a PIR

A PIR should be directed at a specific product or group of products. Be sure to give the full name of the product(s) and version numbers if applicable. Describe the functionality you would like to see in as complete terms as possible. Don't assume that the PIR editors or software developers know how it is done in some other software product - state specifically how you want the software to function. Provide justification of your request and give an example of its use. If you can, suggest a possible implementation of your request.

Abstract: (Please limit to one or two short sentences.)

Description and Examples: (Use additional pages as necessary.)

[Put my name and address on reverse side, thus:]

PIR Editor, Philip A. Naecker
Consulting Software Engineer
3011 North Mount Curve Avenue
Altadena, CA 91001
USA

IAS WHIMS

WHAT: (Describe your WHIM) (Please print or type)

WHY: (Describe the reason for the WHIM)

HOW: (Make any suggestions for a possible implementation)

Name: _____

Company: _____

Address: _____

Phone: _____

Please mail to:

Kathleen M. Anderson
EATON Information Management
Systems Division
2017 Cunningham Drive
Suite 208
Hampton, Virginia 23666

Phone: (804) 326-1941

DATAGRAM

DATAGRAMs are short messages, comments, requests, or answers that are published in NETwords. Please fill in the sections below and send the DATAGRAM to:

Vickie Hess
NETWords Editor
2510 Limestone Ln.
Garland, Tx. 75040

Title: _____

Message: _____

Your Name: _____

Address: _____

Telephone: _____

If this is a reply to a previous DATAGRAM, what #? _____

Signature: _____ **Date:** _____

**Place
Stamp
Here**

**Vickie Hess
NETWords Editor
2510 Limestone Ln.
Garland, Tx. 75040**

Fold Here

OFFICE AUTOMATION SIG SYSTEM IMPROVEMENT REQUEST SUBMISSION FORM

Name _____ Address _____

Firm _____

Telephone _____

INSTRUCTIONS: System Improvement Requests (SIR) can be either hardware or software; please check the category addressed by this SIR. Under ABSTRACT, give a brief definition of the capability you would like. In the DESCRIPTION section, give a detailed description and examples of what you want. Be specific; don't assume that we know how other products function. Justify the usefulness of the capability and give an example of its use.

HARDWARE IMPROVEMENT

SOFTWARE IMPROVEMENT

DECmate _____

ALL-IN-1 _____

WPS _____

PRO-Series _____

CP/M (DECmate) _____

P/OS _____

Rainbow _____

CP/M (Rainbow) _____

MS-DOS _____

Other _____

Other _____

ABSTRACT _____

DESCRIPTION _____

**E. Catherine Ditamore
ARA Services
Corp MIS
The ARA Tower
1101 Market Street
Philadelphia, Pa. 19107**

PRO/SIGHT GRAPHICS CONTEST

SPRING 1987 DECUS

<< ENTRY FORM >>

Name _____

Address _____

City _____ State _____ Zip _____

Phone (_____) _____

Image/Script Title _____

Category Number _____ File Name _____

NOTE: If diskette(s) are to be returned to the author, please send entries with self-addressed AND stamped envelope. Provide sufficient postage and packing material. The PC SIG will not be responsible for damage to diskette or entries not returned because of insufficient postage. Returned diskette will contain some .GID files from the contest if requested, so ORIGINAL IMAGE MAY BE DELETED to provide space.

If multiple entries are submitted, xerox and fill out an entry form for each submission. Multiple entries may be sent on a single diskette.

Filing Deadline:

February 23, 1987

PC POSTSCRIPT

PC Postscripts are short requests, comments and responses to be published in the *Postscript Section* of the PC SIG Newsletter. Please respond to the following:

Y/N This is a reply to a previous Postscript. Issue No. No.

Title: _____

Message: _____

Name: _____

Address: _____

Phone: (_____) _____ - _____

Signature: _____ Date _____

Information Resource Sign Up Sheet
Personal Computing Special Interest Group - PC SIG

Are you willing to be an information resource for other PC SIG members? Placing your name on the *Contact List* means you are willing to answer questions within the span of a brief telephone conversation. A Contact is not expected to be a consultant. *Please Register below.* Your name and phone number (including restrictions) will be posted in the PC SIG Newsletter.

First Name: _____ **Last Name:** _____

Address: _____

City: _____ **State:** _____ **ZIP:** _____

Phone: (____) _____ - _____

Areas of Expertise: _____

Suggestions for Additional Services the SIG can Provide:

**PERSONAL COMPUTING SPECIAL INTEREST GROUP
VOLUNTEER FORM**

Name _____
Company _____
Address _____
City _____ State _____ Zip Code _____
Telephone _____

What special talents do you have? _____

When do you attend symposia?

- | | |
|--|---|
| <input type="checkbox"/> Always | <input type="checkbox"/> Occasional Attendance |
| <input type="checkbox"/> East Coast Only | <input type="checkbox"/> Other (please specify) |
| <input type="checkbox"/> West Coast Only | _____ |
| | _____ |

Please check if you are interested in helping with any of the following activities:

Symposia Related Activities:

- | | |
|---|--|
| <input type="checkbox"/> Session Chairs _____ | <input type="checkbox"/> Articles for Update.Daily |
| <input type="checkbox"/> Campground Volunteer _____ | <input type="checkbox"/> Write letters of appreciation |
| <input type="checkbox"/> Suite Volunteer _____ | <input type="checkbox"/> Equipment Setup |
| <input type="checkbox"/> DECUS Store _____ | |
| <input type="checkbox"/> Software Clinic _____ | |
| <input type="checkbox"/> Panels _____ | (indicate topics) _____ |
| <input type="checkbox"/> Technical Sessions _____ | (indicate topics) _____ |

Ongoing SIG Activities:

- | | |
|---|-------------------------------|
| <input type="checkbox"/> Working Groups _____ | (indicate which groups) _____ |
| <input type="checkbox"/> Newsletter _____ | |
| <input type="checkbox"/> Public Domain Software Project _____ | |
| <input type="checkbox"/> Write Software for Special SIG Needs _____ | |

Other SIG Activities: (please specify) _____

Do you wish to see the PCSIG undertake any activities which it is not currently doing?
Please specify.

Would you be willing to coordinate the activity you have listed above? Yes No

Thank you

Rainbow Wish List Ballot

Use this ballot to show which items on the Rainbow Wish List are most important to you. Put the number of the most important item on the list in space 1, the next most in space 2, etc.

1. _____	10. _____	19. _____	28. _____	37. _____
2. _____	11. _____	20. _____	29. _____	38. _____
3. _____	12. _____	21. _____	30. _____	39. _____
4. _____	13. _____	22. _____	31. _____	40. _____
5. _____	14. _____	23. _____	32. _____	41. _____
6. _____	15. _____	24. _____	33. _____	42. _____
7. _____	16. _____	25. _____	34. _____	
8. _____	17. _____	26. _____	35. _____	
9. _____	18. _____	27. _____	36. _____	

Please add the following to the wish list:

Comments:

Name: _____

Company: _____

Address: _____

Work Phone: _____

Home Phone: _____

Return Ballot to:

Lynn Jarrett
DECUS Rainbow Working Group Chairman
Union Tribune Publishing Co.
Post Office Box 191
San Diego, CA 92108

(619) 299-3131

DECmate Wish List Ballot

Use this ballot to show which items on the DECmate Wish List are most important to you. Put the number of the most important item on the list in space 1, the next most in space 2, etc.

1. _____	10. _____	19. _____	28. _____	37. _____
2. _____	11. _____	20. _____	29. _____	38. _____
3. _____	12. _____	21. _____	30. _____	39. _____
4. _____	13. _____	22. _____	31. _____	40. _____
5. _____	14. _____	23. _____	32. _____	41. _____
6. _____	15. _____	24. _____	33. _____	42. _____
7. _____	16. _____	25. _____	34. _____	43. _____
8. _____	17. _____	26. _____	35. _____	44. _____
9. _____	18. _____	27. _____	36. _____	45. _____

Please add the following to the wish list:

Comments:

Name: _____

Company: _____

Address: _____

Work Phone: _____

Home Phone: _____

Return Ballot to:

**Cheryl Johnson
DECUS DECmate Working Group
Grinnell College
P.O. Box 805
Grinnell, IA 50112-0810**

INPUT/OUTPUT Submission Form

A SIG Information Interchange

Please reprint in the next issue of the Pageswapper

If this is a reply to a previous I/O, which number? _____

Caption: _____

Message: _____

Contact:

Name _____

Address _____

Telephone _____

Signature _____ Date _____

Mail this form to: Larry Kilgallen, PAGESWAPPER Editor
Box 81, MIT Station, Cambridge, MA 02139-0901, USA

To register for on-line submission, dial (in the United States):
(617) 262-6830 and log in with the username PAGESWAPPER.

PAGESWAPPER * February 1987 * Volume 8 Number 7
INPUT/OUTPUT Submission Form

Tear out or photocopy reverse to submit an I/O item

Larry Kilgallen, PAGESWAPPER Editor
Box 81, MIT Station
Cambridge, MA 02139-0901
USA

System Improvement Request Submission Form

Page 1 of _____

Submittor:

Firm:

Address:

Phone:

How to write an SIR:

Describe the capability you would like to see available on VAX systems. Be as specific as possible. Please don't assume we know how it's done on the XYZ system. Justify why the capability would be useful and give an example of its use. If you wish, suggest a possible implementation of your request.

Abstract (Please limit to four lines):

Description and examples (use additional pages if required)

PAGESWAPPER - February 1987 - Volume 8 Number 7
System Improvement Request Submission Form

Tear out or photocopy reverse to submit an SIR

Mark D. Oakley
Battelle Columbus Division
Room 11-6-008
505 King Avenue
Columbus, Ohio 43201-2369
USA

VAX System SIG Spring 1987 SIR Ballot

DECUS membership number _____ (six digits)

Our site uses the following VAX models (check all that apply)

8800 _____ 8600/8650 _____ 8500 _____ 8300/8200 _____ MicroVAX _____
11/780,11/782,11/785 _____ 11/750 _____ 11/730,11/725 _____

We use VAX's in the following applications (Check all that apply)

Business EDP _____	Software Development _____
Education _____	Computer Science Research _____
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Service Bureau _____	Hardware Development _____
Scientific/Engineering _____	Office Automation _____
Telecommunications _____	Other _____

I support the following as the most important System Improvement Requests. (List from zero to fifteen SIR's):

I oppose the following SIR's as detrimental. (List from zero to five SIR's):

Mail to:

Mark D. Oakley
Battelle Columbus Division
Room 11-6-008
505 King Avenue
Columbus, OH 43201-2369
USA

To be counted, your ballot must be received by March 20.

PAGESWAPPER * February 1987 * Volume 8 Number 7
VAX Systems SIG Spring 1987 SIR Ballot

Tear out or photocopy reverse to vote on SIRs

Mark D. Oakley
Battelle Columbus Division
Room 11-6-008
505 King Avenue
Columbus, Ohio 43201-2369
USA



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