<table>
<thead>
<tr>
<th>DECUS U.S. CHAPTER SIGs NEWSLETTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATATRIEVE/4GL SIG</td>
</tr>
<tr>
<td>LARGE SYSTEMS SIG</td>
</tr>
<tr>
<td>OFFICE AUTOMATION SIG</td>
</tr>
<tr>
<td>PERSONAL COMPUTER SIG</td>
</tr>
<tr>
<td>ARTIFICIAL INTELLIGENCE SIG</td>
</tr>
<tr>
<td>BUSINESS APPLICATIONS SIG</td>
</tr>
<tr>
<td>DAARC SIG</td>
</tr>
<tr>
<td>DATA MANAGEMENT SIG</td>
</tr>
<tr>
<td>EDUSIG</td>
</tr>
<tr>
<td>GRAPHICS SIG</td>
</tr>
<tr>
<td>HARDWARE MICRO SIG</td>
</tr>
<tr>
<td>IAS SIG</td>
</tr>
<tr>
<td>LANGUAGES AND TOOLS SIG</td>
</tr>
<tr>
<td>MUMPS SIG</td>
</tr>
<tr>
<td>NETWORKS SIG</td>
</tr>
<tr>
<td>RSTS SIG</td>
</tr>
<tr>
<td>RSX SIG</td>
</tr>
<tr>
<td>RT SIG</td>
</tr>
<tr>
<td>SITE MANAGEMENT &amp; TRAINING SIG</td>
</tr>
<tr>
<td>UNISIG</td>
</tr>
<tr>
<td>VAX SYSTEMS SIG</td>
</tr>
<tr>
<td>LIBRARY INFORMATION SECTION</td>
</tr>
<tr>
<td>&quot;HOW TO&quot; SUBMIT AN ARTICLE ... GROUP FORMS</td>
</tr>
<tr>
<td>SIG INFORMATION SECTION</td>
</tr>
<tr>
<td>QUESTIONNAIRE SECTION</td>
</tr>
</tbody>
</table>

April 1988 Volume 3, Number 8
# GENERAL TABLE OF CONTENTS

## SECTIONS

### DATATRIEVE/4GL SIG
- Context Recognition in VAX DATATRIEVE ....................................................... DTR-2
- The Story of P ........................................................................................................ DTR-22
- Documenting and Manipulating SYSGEN Parameters using DATATRIEVE .......... DTR-25
- Womat Wizard Errata ......................................................................................... DTR-28
- Ask the WOMBAT Wizard Submission Form ....................................................... QU-1
- DATATRIEVE/4GL Product Improvement Request Submission Form ............... QU-3
- DTR/4GL Spring 1988 PIR Ballot .................................................................... QU-5

### LARGE SYSTEMS SIG
- Letter from the Chairman ................................................................................. LS-2
- White Paper, VAX/VMS Accounting ................................................................. LS-2

### OFFICE AUTOMATION SIG
- From the Editor .................................................................................................... OA-1
- OA SIG Tape Now Available Though LUG ....................................................... OA-2
- Executive Forum in Cincinnati .......................................................................... OA-2
- Wanted: Session chairs for Cincinnati ............................................................... OA-3
- Sorting the to-Do List in Time Management ..................................................... OA-4
- OA System Improvement Request Ballot ........................................................... QU-19

### PERSONAL COMPUTER SIG
- Updates to the PRO Public Domain Software Collection ................................ PC-1
- Correction to an Article ....................................................................................... PC-7
- PRO Software Update ......................................................................................... PC-7
- PROgramming Quickie ....................................................................................... PC-10
- Digital's DEPCA .................................................................................................. PC-11

### ARTIFICIAL INTELLIGENCE SIG
- The Linked List .................................................................................................... AI-1
- The Expert-Shell Game ...................................................................................... AI-2
- VAX OPS5 Version 2.2 Debuts ..................................................................... AI-9

### EDUSIG
- Letter: Computer Friends .................................................................................. EDU-1
- Free Utilities ........................................................................................................ EDU-1
- Education SIG Operating Procedures ................................................................. EDU-3

### GRAPHICS SIG
- From the Editor .................................................................................................... GRA-1
- The Fractal Factory: What Mandelbrot Hath Wrought ..................................... GRA-1
- Mechanical CAD/CAM Workstation Applications .......................................... GRA-4

### HMS SIG
- From the Editor .................................................................................................... HMS-1
- Submitting Material to Hard News .................................................................... HMS-3
- FCO/ECO Corner ................................................................................................. HMS-4
- Hardware Hints and Kinks ................................................................................ HMS-7
- Benchmark Blitz, Part I ...................................................................................... HMS-10
- Benchmark Blitz, Part II ................................................................................... HMS-17
- Submitting Articles to Hard News ...................................................................... QU-7
- HMS Submission Form ....................................................................................... QU-9
DEVIAS SIG
.Contribution Guidelines ........................................... IAS-1
.From the Editor's Keyboard ....................................... IAS-1
.Spring DECUS IAS Schedule ...................................... IAS-2
.Ten Years Ago This Month ....................................... IAS-2
.The Program of the Month Club ................................. IAS-3
.IAS WHIMS ................................................................. QU-11

L&T SIG
.Editor's Notes ......................................................... L&T-2
.CERN Users' Votes on Fortran 8X ............................. L&T-3
.Software Metrics Resources ...................................... L&T-6
.L&T SIG FY89 Activities Overview ............................ L&T-10
.Languages and Tools SIG Masters Directory ............... L&T-15
.L&T Masters Application ......................................... QU-13
.L&T Wishlist Questionnaire ................................... QU-15

NETWORDS SIG
.From the Editor ............................................................. NTW-1
.The Real Network Definitions, by Bill Hancock .......... NTW-3
.DATAGRAM .................................................................. QU-17

RSTS/E SIG
.From the Editor ............................................................. RST-2
.Letters to the Editor ..................................................... RST-3
.Terminal Interface Tips ............................................... RST-10
.Hardware Update Bulletin ........................................... RST-11
.Software Update Bulletin ............................................ RST-11
.Software Performance Report (SPR) Log .................. RST-11

RSX SIG
.Food for Thought ........................................................ RSX-1
.The Editor's Corner .................................................... RSX-1
.Submitting Articles to the Multi-Tasker .................. RSX-2
.And That's The Way Things Are ................................. RSX-2
.Announcing VMS - IAS Compatibility Mode .......... RSX-3
.Bulletin Board Notes ................................................. RSX-4
.DECUS Europe / Rome Q&A ......................................... RSX-5
.Implementing Secure User Environments ................. RSX-8
.Timer Support for User Written Drivers ................ RSX-11
.Virtual Disk Driver Problem Fix ............................. RSX-16

RT SIG
.From the Editor ............................................................. RSX-1
.More on TeX .................................................................. RSX-1
.Analysis of Wish List Survey ..................................... RSX-2
.RT-11 Sessions at DECUS ......................................... RSX-2
.RT-11 Wish List Survey ............................................. RSX-2

UNISIG
.From the Editor ............................................................. UNI-3
.Help Wanted ................................................................ UNI-3
.Calendar of Up-Coming Events ................................ UNI-3
.AWK Programming Language Tutorial ................. UNI-3

VAX SIG
.Editor's Workfile ....................................................... VAX-3
.Fastest SIR Response in History ............................. VAX-3
Get System Performance Information Service ...................................................... VAX-5
The SIR Lobby ........................................................................................................ VAX-26
LUG News .............................................................................................................. VAX-37
A New VMS System Management Architecture .................................................. VAX-38
INPUT/OUTPUT ....................................................................................................... VAX-59
System Improvement Request Submission Form .................................................... QU-23
VAX Systems SIG Spring 1988 SIR Ballot ............................................................ QU-25

LIBRARY
New Library Programs Available ............................................................................. LIB-1
New UNIX Software ................................................................................................. LIB-7
Revisions to Library Programs ................................................................................ LIB-8
DECUS Program Library Catalog Changes ........................................................... LIB-13
Catalog Instructions ................................................................................................. LIB-13

HOW TO SUBMIT TO A SPECIFIC SECTION OF THE NEWSLETTER
Submitting Articles to Hard News .......................................................................... HOW-1
Suscription Service SIGs Newsletter Order Form .................................................. HOW-3
DECUS U.S. Chapter Application for Membership ................................................ HOW-5

SIG INFORMATION SECTION
Special Interest Committee Lists ............................................................................ SIC-1

QUESTIONNAIRE SECTION
Ask the WOMBAT Wizard ..................................................................................... QU-1
DATATRIEVE/4GL PIR Submission Form ........................................................... QU-3
DTR/4GL SIG Spring 1988 PIR Ballot ................................................................. QU-5
Submitting Articles to Hard News .......................................................................... QU-7
HMS Submission Form ......................................................................................... QU-9
IAS WHIMS ........................................................................................................... QU-11
L&T Masters Application ....................................................................................... QU-13
L&T Wishlist Questionnaire ............................................................................... QU-15
DATAGRAM .......................................................................................................... QU-17
OA System Improvement Request Ballot .............................................................. QU-19
RT-11 Wish List Survey ....................................................................................... QU-21
System Improvement Request Submission Form ................................................ QU-23
VAX System SIG Spring 1988 SIR Ballot ............................................................ QU-25
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:

Editor, DATATRIEVE Newsletter  
c/o DECUS U.S. Chapter  
219 Boston Post Road, BP02  
Marlboro, MA 01752

Joseph Gallagher, Ph.D.  
Research Medical Center  
2316 East Meyer Blvd.  
Kansas City, MO 64132

Table of Contents

DECUS U.S. Chapter SIG Newsletters, Volume 3, No. 8, Apr. 1988  
Wombat Examiner and 4GL Dispatch, Volume 9, No. 8

<table>
<thead>
<tr>
<th>DTR-2</th>
<th>-</th>
<th>Context Recognition in VAX Datatrieve</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTR-22</td>
<td>-</td>
<td>The Story of P</td>
</tr>
<tr>
<td>DTR-25</td>
<td>-</td>
<td>Documenting and Manipulating SYSGEN Parameters using Datatrieve</td>
</tr>
<tr>
<td>DTR-28</td>
<td>-</td>
<td>Wombat Wizard Errata</td>
</tr>
</tbody>
</table>
CONTEXT RECOGNITION IN VAX DATATRIEVE

Donna Brown and Sue Harris - Digital Equipment Corp., Nashua, NH

1 OVERVIEW

This paper will describe context resolution within DATATRIEVE. It explains the impact context has on you as a DATATRIEVE user. It covers how you specify context within DATATRIEVE as well as common pitfalls in the area of DATATRIEVE context. It explores the internals of context resolution in DATATRIEVE.

2 WHAT IS CONTEXT?

Context is described as the set of mechanisms by which DATATRIEVE recognizes field names and identifies target records for statements. Changing the context in which a DATATRIEVE statement executes can change the statement's outcome. This is why it is important for you to understand context's impact upon DATATRIEVE statements.

Context answers questions such as "which one" and "how many". For example, assume that the statement "MODIFY EMP_NUM" modifies employee numbers from personnel records, such as those illustrated below. We know that the EMP_NUM field is changed, but which record is modified? How many records are modified, one or many? These are the types of questions that DATATRIEVE resolves using context.

<table>
<thead>
<tr>
<th>Harris</th>
<th>Jones</th>
<th>Brown</th>
</tr>
</thead>
<tbody>
<tr>
<td>7544</td>
<td>7329</td>
<td>7542</td>
</tr>
</tbody>
</table>

DTR> MODIFY EMP_NUM

2.1 WHY IS CONTEXT IMPORTANT?

The following sections describe the part context plays within DATATRIEVE.

2.1.1 Naming

DATATRIEVE does not require that every identifier name used within a DATATRIEVE session be unique. The following example shows that two different records can contain fields with the same name:

```
DEFINE RECORD A USING
  01 TOP.
  03 EMP_NUM PIC XX.
  03 ADDRESS PIC X(30).;
```

```
DEFINE RECORD B USING
  01 TOP.
  03 EMP_NUM PIC 999.
  03 SUPERVISOR PIC X(20).;
```

Both records contain EMP_NUM fields. To which field does the following statement refer?

DTR> MODIFY EMP_NUM

Because there are two fields named EMP_NUM, DATATRIEVE must take into account factors other than the field name when deciding which field to modify. DATATRIEVE follows a set of conventions when deciding which field to act upon. These conventions are the rules of context resolution. By understanding these rules, you will be better able to anticipate the behavior of the DATATRIEVE statements you enter.
2.1.2 List Fields

In the following FAMILY record, the field KIDS is defined with an OCCURS clause. Each FAMILY record thus contains a “LIST” of kids. This LIST can contain information pertaining to one kid up to ten kids, or the list may be empty.

```
01 FAMILY.
 03 NUMBER_KIDS PIC 99 EDIT_STRING IS Z9.
 03 KIDS OCCURS 0 TO 10 TIMES DEPENDING ON NUMBER_KIDS.
 06 EACH_KID.
    09 KID_NAME PIC X(10) QUERY_NAME IS KID. :
```

The following diagram shows that for each FAMILY record there can be a variable number of KIDS fields. The first record contains 2 KIDS the second one kid, etc.

```
<table>
<thead>
<tr>
<th>Harris</th>
<th>..</th>
<th>Jones</th>
<th>..</th>
<th>Brown</th>
<th>..</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bob</td>
<td></td>
<td>Betty</td>
<td></td>
<td>Tom</td>
<td></td>
<td>Alex</td>
</tr>
<tr>
<td>Alice</td>
<td></td>
<td></td>
<td></td>
<td>Dick</td>
<td></td>
<td>Jen</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Harry</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

Context resolution becomes more complex when you use list records. Where a list is involved, there are even more possible choices. Besides answering the question “which family” DATATRIEVE must also answer the question “which kid”? For example, the following PRINT statement refers to the list field KIDS.

```
DTR> PRINT ALL KIDS
```

But, each record may have more than one KIDS field. Which KIDS field should be printed? ALL occurrences of KIDS for a particular record? ALL occurrences of all KIDS for all records? We will look at these question in more detail in a later section.

2.1.3 Control Of DATATRIEVE Statements

If you enter a statement or sequence of statements incorrectly, DATATRIEVE may not have enough information to determine which field a name in a statement refers to. You can tell when this happens, because DATATRIEVE displays the familiar message:

"<...> is undefined or used out of context"

What happens if you do not correctly express the context of your statement, but your statement can be interpreted in another context within your DATATRIEVE session? In this case, an error message will not be produced. DATATRIEVE will execute your statement, but in a different manner than you had intended. The results can be surprising and may even change data in ways that you do not expect. This is certainly not a desirable situation. By understanding context resolution in DATATRIEVE and by specifying all context explicitly you can avoid this type of accident.

2.2 TYPES OF CONTEXT RECOGNITION

There are two levels of context recognition within DATATRIEVE. They are IMPLICIT context recognition and EXPLICIT context recognition. Implicit means that context is implied by the environment in which a statement is executed. Explicit means that the context for a statement is entered as part of that statement.
2.2.1 Implicit Context Recognition

DATATRIEVE is sometimes said to be "context-sensitive". This is because the meaning of a given DATATRIEVE statement varies depending on the environment in which it is executed. This is an important aspect of the DATATRIEVE language. It gives power and flexibility not seen in third generation programming languages.

**NOTE**

In this discussion, we are not referring to the mathematical linguistic concept of context-sensitive, as it applies to classification of grammars. We use this terminology (as well as "left context" and "right context") in a more intuitive and informal way, as a method of highlighting and explaining a particular characteristic of VAX DATATRIEVE.

The following example shows how the environment set up by different DATATRIEVE commands causes the statement "PRINT XYZ" to produce different results. In the first example, a character string is printed. In the second, a number is printed. And in the last example multiple fields of different types are printed.

<table>
<thead>
<tr>
<th>Context 1 (field):</th>
<th>Context 2 (variable):</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTR&gt;READY DOMAIN1</td>
<td></td>
</tr>
<tr>
<td>DTR&gt;SHOW FIELDS</td>
<td></td>
</tr>
<tr>
<td>:</td>
<td></td>
</tr>
<tr>
<td>XYZ &lt;Character string&gt;</td>
<td></td>
</tr>
<tr>
<td>DTR&gt;FIND DOMAIN1</td>
<td></td>
</tr>
<tr>
<td>DTR&gt;PRINT XYZ</td>
<td></td>
</tr>
<tr>
<td>XYZ</td>
<td></td>
</tr>
<tr>
<td>&quot;ALF &quot;</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Context 2 (variable):</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTR&gt;DECLARE XYZ PIC 9V9.</td>
</tr>
<tr>
<td>DTR&gt;XYZ = 3.2</td>
</tr>
<tr>
<td>DTR&gt;PRINT XYZ</td>
</tr>
<tr>
<td>XYZ</td>
</tr>
<tr>
<td>3.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Context 3 (domain):</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTR&gt;READY XYZ</td>
</tr>
<tr>
<td>DTR&gt;PRINT XYZ</td>
</tr>
<tr>
<td>Field1</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>22</td>
</tr>
<tr>
<td>33</td>
</tr>
<tr>
<td>etc.</td>
</tr>
</tbody>
</table>

So you see, the output of "PRINT XYZ" can be greatly altered by the environment in which it executes. That environment is determined by the commands preceding the statement "PRINT XYZ". Implicit context recognition is at work in each of these examples.
The context-sensitive nature of DATATRIEVE has a number of implications. One is that DATATRIEVE procedures are not compiled. The previous example illustrates why this is so. Suppose "PRINT XYZ" were in a procedure. What would it mean to compile that procedure without knowing the datatype of XYZ? Without even knowing whether XYZ is the name of a domain, field or variable? The high degree of flexibility provided by DATATRIEVE limits the assumptions that can be made at compilation time.

Context sensitivity is also the reason that the distinction between "commands" and "statements" exists in DATATRIEVE. Commands set up the context in which statements execute. Because of this, restrictions exist in the way commands can be used (see the VAX DATATRIEVE Reference Manual for a list of commands and statements.) One restriction is that commands cannot be used within a compound statement. In the following example, the REPEAT loop is a compound statement. The READY command within the REPEAT loop is therefore illegal:

```
DTR> DECLARE XYZ LONG.
DTR> REPEAT 5
CON> BEGIN
CON> PRINT XYZ
CON> READY XYZ ! this is NOT allowed!!!
CON> END

"Expected statement, encountered "READY".
```

If DATATRIEVE allowed commands within compound statements, the first iteration of the above REPEAT loop would print the variable XYZ, and subsequent iterations would print the entire domain of XYZ. Besides being confusing, this would create technical difficulties.

Enforcing a stable environment for a compound statement allows DATATRIEVE to make decisions about the type and size of the data being processed just once at the start of processing of that compound statement. If commands were permitted inside of compound statements, then decisions about data type and size would have to be made during each iteration of a compound statement, thereby increasing execution time.

Context sensitivity also contributes a more "English-like" feeling to the DATATRIEVE language. As in the English language, certain ambiguities can occur, but in DATATRIEVE these can be resolved through the context mechanism.

2.2.2 Explicit Context Recognition

There may be times when you need to override implicit context recognition in DATATRIEVE in order to get the results you desire. You do this using explicit context specification within your DATATRIEVE statements. By using explicit context specification as a general practice, you will be sure to always get the data that you intend to.

The example below shows a case where XYZ has two possible meanings. XYZ can refer to either a variable or to a field within the domain DOMAIN1. If no special direction is given, the variable XYZ will be printed.

```
DTR> READY DOMAIN1
DTR> DECLARE XYZ PIC 9V9.
DTR> XYZ = 3.2
DTR> PRINT XYZ

XYZ

3.2
```

To print the field XYZ, DATATRIEVE must be instructed to obtain the value for XYZ from DOMAIN1. This is done below using the clause "OF DOMAIN1". This is an example of explicit context recognition.
Other methods of explicit context recognition will be discussed in a later section.

3 Using DATATRIEVE Context

Context recognition (both implicit and explicit) performs two different functions within DATATRIEVE. These functions are Target Record Identification, which answers the question "how many", and Name Recognition, which answers the question "which one".

3.1 Target Record Identification

Context determines which records will be the target of statements such as PRINT, MODIFY and ERASE. That is, which records are printed, modified or erased. How does DATATRIEVE identify the target records for a particular operation?

Target records for PRINT, MODIFY and ERASE statements are determined in part by the form of the statement you enter. The syntax of these statements provides three basic context specifications. Specification of context in a statement can be implicit or explicit. By implicit we mean that the target record is not specified in the statement syntax, but is implied by the environment in which the statement executes. Explicit specification means that the target record is specified in the statement syntax.

The target of a PRINT, MODIFY or ERASE may be a single record, a collection of records, or a stream of records. The syntax of a statement determines the number of records operated on. That is, the syntax may imply either single-record context or multiple-record context.

These different options are shown in the following examples:

1. IMPLICIT, SINGLE-RECORD CONTEXT
   No context is specified; it is implicit. Only one record will be modified.
   
   DTR> MODIFY

2. PARTIALLY EXPLICIT, MULTIPLE-RECORD CONTEXT
   Context is expressed by the keyword "ALL" rather than by an explicit RSE (record selection expression.) A group of records will be modified.

   DTR> ERASE ALL

3. EXPLICIT, MULTIPLE-RECORD CONTEXT
   Context is detailed in the "OF RSE" clause. A group of records will be modified.

   DTR> MODIFY PRICE OF YACHTS

Each of these categories are detailed below.

3.1.1 Single-Record Context

There are different ways to specify a single-record as the target of a statement. One is by means of a "selected record". The SELECT statement identifies one target record in a collection. A record is selected by first forming a "collection" of records using the FIND statement and then choosing a particular record from that collection using the SELECT statement.

In the example below, a collection of all of the YACHTS records is formed using a FIND statement. The first record of the collection is then selected. Since a target is not explicitly specified on the PRINT statement, the selected record will be printed.
Another method of specifying single-record context is the FOR loop. A FOR loop identifies individual records of a record stream, in turn.

It may seem that the FOR construct actually provides multiple-record context, because it produces a stream of records. However, there is only one target record per iteration of a FOR loop. The FOR construct allows you to work with many records at once, while dealing with each record individually. Therefore, the single-record form of a statement is used within a FOR loop to operate on the target record of the FOR loop.

In the example below, all of the records from the YACHTS domain will be printed. Notice that the single-record context form of the print statement is used within the FOR loop.

```
DTR> FOR YACHTS
CON> PRINT
```

What if two possible targets, one a selected record and one the target of a FOR loop, are available at once? Which one will be used?

If more than one record qualifies as a target record, then DATATRIEVE will always use the most recent context. In the example below, the stream of records from the domain OWNERS will be printed, rather than the selected YACHTS record.

```
DTR> FIND YACHTS
DTR> SELECT
DTR> FOR OWNERS
CON> PRINT
```

3.1.2 Multiple-Record Context

You can specify multiple record context in one of two ways. One way is to use the keyword “ALL”, without an RSE, on the command line. When used in this way, ALL identifies all of the records in the current collection as the target of the statement.

In the example below, the FIND forms a collection containing the first two records in the domain YACHTS. The keyword ALL on the PRINT and ERASE statements specify both records in the current collection as targets. After the ERASE statement is executed, both of the records in the collection are erased. Therefore, the second PRINT does not display any records.

```
DTR> FIND FIRST 2 YACHTS
DTR> PRINT ALL

<table>
<thead>
<tr>
<th>MANUFACTURER</th>
<th>MODEL</th>
<th>RIG</th>
<th>LENGTH</th>
<th>WEIGHT</th>
<th>BEAM</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALBERG</td>
<td>37 MK II</td>
<td>KETCH</td>
<td>37</td>
<td>20,000</td>
<td>12</td>
<td>$36,951</td>
</tr>
<tr>
<td>ALBIN</td>
<td>79</td>
<td>SLOOP</td>
<td>26</td>
<td>4,200</td>
<td>10</td>
<td>$17,900</td>
</tr>
</tbody>
</table>

DTR> ERASE ALL
DTR> PRINT ALL
```

DTR-7
You can also specify multiple record context using the "OF RSE" clause. The "OF RSE" clause identifies a target record stream made up of records meeting the conditions set in the RSE. In the example below, the "OF YACHTS" clause on the MODIFY statement specifies that the record stream made up of all the records from the YACHTS domain will be modified. The result is that the PRICE field of every record in YACHTS is changed to 0.

```
DTR> MODIFY PRICE OF YACHTS
    Enter PRICE: 0
DTR>
```

Contrast this with the single-record context produced by the FOR loop below. Each record is handled individually and you are prompted for a PRICE value for each record in the record stream. You should use extreme caution when utilizing a multiple-record context technique (such as OF RSE) to avoid inadvertently modifying all of the records in a domain at once when you actually want to modify the records individually.

```
DTR> FOR YACHTS MODIFY PRICE
    Enter PRICE: 33000
    Enter PRICE: 21000
    etc. (for each record)
```

### 3.2 Name Recognition

Given a statement such as:

```
PRINT PRICE
```

DATATRIEVE must determine what is meant by PRICE. Is PRICE a domain, a variable, or a field? If PRICE is a field, which domain is it from? What if more than one readied source has a PRICE field? DATATRIEVE determines the answer to these questions through the process of name recognition. DATATRIEVE uses two methods of name recognition: implicit and explicit.

#### 3.2.1 Implicit Name Recognition

DATATRIEVE keeps track of possible contexts using a stack. A stack is an internal data structure which is manipulated in such a way that the most recently added items are the first to be accessed (last on, first off.)

DATATRIEVE uses the stack to resolve context. When DATATRIEVE encounters a name in a DATATRIEVE statement, the stack is searched for that name. If the stack contains more than one entry for a particular name, the name from the most recent context will be used.

In the example below, the FIND and SELECT statements make entries on the stack. When the PRINT statement is executed, DATATRIEVE looks for a context for the name TYPE. Looking on the stack, the name TYPE is found to be a field from the selected record.

```
DTR> READY YACHTS
DTR> FIND YACHTS WITH PRICE NE 0
DTR> SELECT FIRST
DTR> PRINT TYPE
```

In the example below, stack entries are again made as a result of FIND and SELECT statements. A stack entry for OWNERS is also made as a result of the FOR statement. When the PRINT statement is executed, OWNERS is on top of the stack. The OWNERS record does not contain a PRICE field though. So, DATATRIEVE looks further down the stack until a reference to PRICE is found. In this case, PRICE is found in the selected YACHTS record. That single PRICE field will be printed 18 times, once for each record in OWNERS.
What is the ordering on the stack? What is meant by most recent or “closest” context? The answer to these questions is generally intuitive. The diagram below outlines the arrangement of the stack. The diagram shows that the environment set up by the statement currently being executed will be considered before a selected record, a collection, or global variables.

This diagram shows that context from the innermost statement is placed on top of the stack. Innermost refers to the statement which is the most nested of a group of statements. In the example below, the innermost statements are those within the compound statement under the FOR OWNERS statement. The stack diagram shows that the context from the outer FOR YACHTS loop is placed on the stack followed by the context set up by the FOR OWNERS statement. The variable INNER1 declared in the innermost statement is placed on top of the stack last.

This is what the context stack looks like at the time of the assignment of 2.2 to INNER1:
DATATRIEVE actually uses two stacks to keep track of context. The first stack, the general context stack, keeps track of possible name resolutions for most DATATRIEVE statements. The second stack, the update stack, keeps track of fields which are possible targets for updates or assignments. DATATRIEVE checks the update stack to ensure that you assign only to those fields that can accept updates, that is, a field which is part of a record which is being stored or modified, or a variable.

The table below shows that a field will be placed on the update stack if the field is named in a STORE or MODIFY statement or is part of a record named in a STORE or MODIFY statement, or if the field is a declared variable. Local variables and the targets of STOREs and MODIFYs remain on the update stack only for the duration of the statements of which they are a part.

**CONTEXTS PLACED ON THE UPDATE STACK**

<table>
<thead>
<tr>
<th>CONTEXT TYPE</th>
<th>CONTEXT</th>
<th>SCOPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>STORE USING</td>
<td>TARGET OF STORE</td>
<td>STORE USING</td>
</tr>
<tr>
<td>MODIFY USING</td>
<td>TARGET OF MODIFY</td>
<td>MODIFY USING</td>
</tr>
<tr>
<td>LOCAL VARIABLE</td>
<td>VARIABLE</td>
<td>BEGIN-END BLOCK</td>
</tr>
<tr>
<td>GLOBAL VARIABLE</td>
<td>VARIABLE</td>
<td>ANY STATEMENT</td>
</tr>
</tbody>
</table>

The table above shows that a source referenced in a STORE statement is placed on the update stack. The context for the source being stored is not placed on the general context stack, however. In the statement below for example, OLD_YACHTS is placed only on the update context stack. NEW_YACHTS is placed on the general context stack. So, even though both the source and destination records contain BOAT fields, DATATRIEVE will be able to determine the correct domain by referring to the appropriate stack.

```
DTR> FOR OLD-YACHTS
    STORE NEW-YACHTS USING BOAT = BOAT
```

You may sometimes see the general context stack referred to as the Right context stack and the update context stack referred to as the Left context stack.
The ordering rules for the update stack are basically the same as those for the general stack. The difference is that fewer entries are made on the update stack. As shown below, only variable declarations and STORE and MODIFY statements make entries on the update stack.

**ORDERING OF THE UPDATE CONTEXT STACK**

```
TOP

Context blocks created by the statement:
(innermost blocks at top of stack)

STORE     | MODIFY     | LOCAL VARIABLES

Global variables

BOTTOM
```

The example below shows the ordering of both context stacks. The state of the stacks at the time the STORE statement (indicated by the arrow) is shown. YACHTS is pushed onto both stacks when the FOR YACHTS MODIFY statement is executed, and will remain on both stacks until the FOR loop ends. OWNERS is pushed onto the update stack each time the STORE statement is executed and is popped off when the store is completed. The local variable NEW MODEL is placed on both stacks at the time it is declared and remains until the termination of the FOR loop.

```
DTR> FOR YACHTS MODIFY USING
BEGIN
  PRICE = PRICE * 2
  DECLARE NEW_MODEL PIC X(10).
  NEW_MODEL = *."new model"
  STORE OWNERS USING
-----------------------> MODEL = NEW_MODEL
END

STACK CONTENTS AT TIME OF ASSIGN

Left Context stack
(Update Context stack) | Right Context Stack
(General Context Stack)

| OWNERS context | | NEW_MODEL context |
|----------------| |-------------------|
| NEW_MODEL context | | YACHTS context |
|-------------------| | Collections (with SELECTed record) |
| YACHTS context | |-------------------|
|-----------------| | Global variables |
| Global variables | |-------------------|
```

### 3.2.2 Explicit Name Recognition

The previous section discussed how name recognition takes place automatically in DATATRIEVE. Now we will discuss how you can override DATATRIEVE's implicit name recognition by specifying the name explicitly. There are two ways of forcing name recognition. One is by using name qualification and the other is by using context variables.
3.2.2.1 NAME QUALIFICATION

Name qualification allows you to override the context established by DATATRIEVE's implicit name recognition. This is done by providing a fully qualified name in a DATATRIEVE statement. A fully qualified name includes a specification for the readied source (the domain name or database name), all group fields of which the field is a part, and the field name itself. A portion of the record definition for the record YACHT is shown below. If a readied domain called YACHTS references the record YACHT, then the fully qualified name for the field MODEL is: YACHTS.YACHT.BOAT.TYPE.MODEL.

RECORD YACHT
  01 BOAT.
    03 TYPE.
      05 MANUFACTURER PIC X(10) QUERY NAME BUILDER.
      05 MODEL PIC X(10).
    03 SPECIFICATIONS
      
You should use name qualification when DATATRIEVE's default implicit qualification is not what you want. For example, suppose that you want to print a list of yachts and for each yacht list all of the owners who own that type of yacht. You might try the following:

DTR> FOR YACHTS FOR OWNERS WITH TYPE EQ TYPE PRINT TYPE, NAME

This will not produce the desired results, however. The problem lies in the RSE "TYPE EQ TYPE". The intent is to find owners with TYPE equal to TYPE from YACHTS. But, since OWNERS is higher on the context stack than YACHTS, both references to TYPE in the RSE will resolve to OWNERS. You must force DATATRIEVE to resolve one of the TYPEs to YACHTS. You can do this by qualifying TYPE, as in the following example. Note that TYPE does not have to be fully qualified, just enough to determine uniqueness.

DTR> FOR YACHTS
   FOR OWNERS WITH TYPE EQ YACHTS.TYPE
   PRINT TYPE, NAME

3.2.2.2 Context Variables

Name qualification can be used to differentiate between fields of the same name from different domains. But what if the duplicate names are from the same domain? For example, suppose you want to print a list of builders who build boats of more than one kind of rig. This requires comparing the RIG field of one YACHTS record to the RIG field of another YACHTS record. You might try the following:

DTR> FOR YACHTS
   CON> FOR YACHTS WITH BUILDER EQ BUILDER AND RIG NE RIG
   PRINT BUILDER, RIG, RIG

The problem again is that context resolves to the inner FOR loop. So, BUILDER will be compared to BUILDER from the same record and RIG will be compared to RIG from the same record. Using the domain name will not help, because YACHTS is the domain name in both cases. So, how can you distinguish BUILDERS and RIG?

You can use context variables to distinguish names from the same domain. In the following example, the context variable A is supplied for the outer FOR loop and B for the inner FOR loop. The context variables are then used within the RSE to qualify BUILDER and RIG.
DTR> FOR A IN YACHTS
CON> FOR B IN YACHTS WITH B.BUILDER EQ A.BUILDER AND
CON> B.RIG NE A.RIG
CON> PRINT BUILDER, A.RIG, B.RIG

A context variable is an artificial or "dummy" variable. A context variable can be specified as part of an RSE and is valid only for the duration of the statement containing the RSE. Use of a context variable is a form of EXPLICIT context specification.

Context variables can be useful in other situations also. Earlier we mentioned that the target of a STORE or MODIFY operation is placed only on the update context stack, not the general context stack. As a result, fields from the record that is being updated cannot be used on the right hand side of an assignment. For example, suppose you want to use previously entered values more than once, as in the example below. The statement "FIELD3 = FIELD1 + FIELD2" will cause DATATRIEVE to complain that FIELD1 is undefined. This is because FIELD1 is found only on the update stack.

DTR> STORE DOMANE USING
CON> BEGIN
CON> FIELD1 = *."Field1 value"
CON> FIELD2 = *."Field2 value"
CON> FIELD3 = FIELD1 + FIELD2
CON> END

"FIELD1" is undefined or used out of context.

If you happen to have another selected record which contains fields named FIELD1 and FIELD2, then FIELD3 will take its value from the FIELD1 and FIELD2 values of the selected record rather than the record being stored, producing different results than you expected.

You can get around these problems by using a context variable. In the following example, using the context variable Y has the effect of establishing an entry for DOMANE on the general context stack. This allows the values just entered for FIELD1 and FIELD2 to be used as the source of an assignment statement.

DTR> STORE Y IN DOMANE USING
CON> BEGIN
CON> FIELD1 = *."Field1 value"
CON> FIELD2 = *."Field2 value"
CON> FIELD3 = Y.FIELD1 + Y.FIELD2
CON> END

Context variables can also be used to avoid an exhaustive search on certain CROSS lookups. In the example below, BUILDER is a key for both OWNERS and YACHTS. If no context variable is used, a keyed lookup will be done on BUILDER from OWNERS. The same is true if the context variable for the second source, OWNERS (Z), is used in the RSE. If the context variable for the second source, YACHTS (Y), is used, then a keyed lookup will be done on both OWNERS and BUILDERS. The moral of this example is: when in doubt, use a context variable!

DTR> FIND Y IN YACHTS CROSS Z IN OWNERS OVER BUILDER WITH
   BUILDER = "ALBIN"
Performing EQL boolean on RMS key field Z.OWNERS.BUILDER
DTR> FIND Y IN YACHTS CROSS Z IN OWNERS OVER BUILDER WITH
   Z.BUILDER = "ALBIN"
Performing EQL boolean on RMS key field Z.OWNERS.BUILDER

DTR> FIND Y IN YACHTS CROSS Z IN OWNERS OVER BUILDER WITH
   Y.BUILDER = "ALBIN"
Performing EQL boolean on RMS key field Y.YACHTS.MANUFACTURER
Performing EQL boolean on RMS key field Z.OWNERS.BUILDER

DTR-13
3.3 CONTEXT AND HIERARCHICAL FIELDS

Hierarchical fields or lists are defined with an OCCURS clause in a record or a view. As mentioned earlier, context resolution becomes more complex when you use list records. Besides identifying a target record, you must identify a particular list occurrence.

Unless otherwise stated, throughout the rest of this section "LIST" means any hierarchical field, including those defined in views.

3.3.1 General Techniques

You can think of a list as a "pseudo-domain" within a domain and list items as records within that pseudo-domain. In the diagram below, the outer box represents the FAMILIES domain, and the inner box represents the pseudo-domain formed by the KIDS list within the FAMILIES domain.

```plaintext
01 FAMILY.
   03 NUMBER_KIDS PIC 99.
   03 KIDS OCCURS 0 TO 10 TIMES . .
      06 EACH_KID.
         09 KID_NAME PIC X(10).
         09 AGE PIC 99.
```

You must supply context for the pseudo-domain as well as the actual domain.

Some of the techniques to aid in target record identification include:

- Use successive FIND and SELECT statements
- Use nested FOR statements
- Use the CROSS clause to "flatten" the hierarchy
- Use an inner print list specification
- Use OF RSE clauses where possible
- Use the Context Searcher (SET SEARCH)

Note that several of these techniques are also used for target record identification. This is because the techniques that are used on domains can also be applied to pseudo-domains.

3.3.1.1 Using FIND/SELECT

One method of getting at records that are in the pseudo-domain is to use successive FIND and SELECT statements.

First, let's look at an example of how you might naturally phrase a query on a list field. First you find and select a record from FAMILIES and then you try to print out the fields KID_NAME and AGE. The example below shows that the PRINT statement will fail because KID_NAME is undefined.

```plaintext
DTR> FIND FAMILIES; SELECT
DTR> PRINT ALL KID_NAME, AGE
"KID_NAME" is undefined or used out of context
```

DTR-14
Extra context must be provided to specify which item from the KIDS list is to be printed. Use an extra FIND to form a collection of "pseudo-records" from the KIDS pseudo-domain.

```plaintext
DTR> FIND FAMILIES; SELECT
DTR> FIND KIDS
DTR> PRINT ALL KID_NAME, AGE
```

<table>
<thead>
<tr>
<th>KID</th>
<th>NAME</th>
<th>AGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>URSULA</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>RALPH</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

3.3.1.2 Nested FORs

The following is an example of an unsuccessful attempt to print items from the KIDS list using a FOR loop. The statement fails because it does not specify which occurrence of the list to print.

```plaintext
DTR> FOR FAMILIES
CON> PRINT KID_NAME, AGE
"KID_NAME" is undefined or used out of context.
```

In much the same way that you can access a pseudo-domain using an extra FIND, you can access the pseudo-domain using an extra FOR loop. In the following example the inner FOR loop provides a record stream from the pseudo-domain, providing context for KID_NAME and AGE. A list of kid names and ages will be printed.

```plaintext
DTR> FOR FAMILIES
CON> FOR KIDS
CON> PRINT KID_NAME, AGE
```

3.3.1.3 Using CROSS

The following is another example of a statement that does not provide context for the KIDS list.

```plaintext
DTR> PRINT MOTHER, KID_NAME, AGE OF FIRST 1 FAMILIES
"KID_NAME" is undefined or used out of context.
```

The solution shown below is to use a CROSS clause to flatten the hierarchy. The CROSS provides a stream of records that contain fields from both the FAMILIES domain and the pseudo-domain providing context for KID_NAME and AGE.

```plaintext
DTR> PRINT MOTHER, KID_NAME, AGE OF FIRST 1 FAMILIES CROSS KIDS
```

<table>
<thead>
<tr>
<th>MOTHER</th>
<th>NAME</th>
<th>AGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANN</td>
<td>URSULA</td>
<td>7</td>
</tr>
</tbody>
</table>

3.3.1.4 Inner Print Lists

When accessing list fields through a PRINT statement, another option is available to you. That option is the use of the inner print list specification. The syntax of the inner print list is:

```plaintext
{ALL print-list OF RSE}
```
The print statement below does not provide context for the KIDS list.

DTR> PRINT MOTHER, KID NAME, AGE OF FIRST 1 FAMILIES
"KID NAME" is undefined or used out of context.

The inner print list construct provides a way to specify context for a list field. Think of an inner print list as a print statement within a print statement which is used to access a pseudo-domain. The example below shows the inner print list portion of a print statement.

```
                     print-list
                     |-------------------------|
                     | Inner print list         |
                     |                        |
                     |                       |
                     | print-list             |
                     |                      |
                     |                      |
DTR> PRINT MOTHER, ALL KID NAME, AGE OF KIDS OF FIRST 1 FAMILIES

            KID
           MOTHER NAME AGE

ANN    URSULA    7
RALPH   3
```

This method is most useful when you want to print all of the occurrences of a list. Note the difference in results from the previous CROSS example where only the first KID was retrieved.

When using inner print lists keep in mind that if the print list starts with an inner print list, you need an additional "ALL" keyword:

```
ALL {ALL print-list OF RSE}
```

The following print statement is the same as the one in the previous example, but without the MOTHER print item. It produces a syntax error.

DTR> PRINT ALL KID NAME, AGE OF KIDS OF FIRST 1 FAMILIES
Expected end of statement, encountered "OF".

The print statement below contains an additional ALL to properly denote the beginning of the inner print list.

```
             inner print list
             |----------------------|
             | print-list           |
             |                     |
DTR> PRINT ALL ALL KID NAME, AGE OF KIDS OF FIRST 1 FAMILIES

            KID
           NAME AGE

URSULA    7
RALPH     3
```
It is possible to define a list field within another list field. This is known as a nested list. The definition below shows the list PET defined within the list KIDS.

```
01 FAMILY.
  03 PARENTS.
    06 FATHER PIC X(10).
    06 MOTHER PIC X(10).
  03 NUMBER_KIDS PIC 99.
    03 KIDS OCCURS 0 TO 10 TIMES DEPENDING ON NUMBER_KIDS.
      06 EACH_KID.
        09 KID_NAME PIC X(10).
        09 KID_AGE PIC 99.
    109 PET OCCURS 2 TIMES.
      13 PET_NAME PIC X(10).
      13 PET_AGE PIC 99.
```

Such a record requires yet another level of context resolution. The example below shows that an additional inner print list can be used to resolve the context for the list within the list.

```
DTR> PRINT FATHER, ALL KID_NAME, ALL PET_NAME OF PET OF KIDS
```

<table>
<thead>
<tr>
<th>FATHER</th>
<th>PET</th>
</tr>
</thead>
<tbody>
<tr>
<td>JIM</td>
<td>POP</td>
</tr>
<tr>
<td></td>
<td>SODA</td>
</tr>
<tr>
<td>SUE</td>
<td>MOUSE</td>
</tr>
<tr>
<td></td>
<td>SHORTY</td>
</tr>
</tbody>
</table>

3.3.1.5 OF RSE Clauses

There are cases when you want to find a record with a list item of a certain value, but you do not care which occurrence of the list meets your qualifications. In other words, you want to find the records in which any of the list items satisfy an RSE. If you wanted to find all FAMILIES with one or more children over five years old, you might use the following FIND statement. The statement will fail, because even though you do not care which KIDS item meets your qualifications, DATATRIEVE needs to know how to resolve the reference to AGE.

```
DTR> FIND FAMILIES WITH AGE GE 5
"AGE" is undefined or used out of context.
```
You cannot use inner print lists on anything but a PRINT statement, so what can you do? You can use successive FIND/SELECT statements, but another possibility is to use an ANY boolean.

Since the ANY boolean includes an "OF RSE" clause, it allows you to get through that extra pseudo-domain of KIDS as shown in the following FIND statement.

```
<table>
<thead>
<tr>
<th>Boolean expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;inner&quot; RSE</td>
</tr>
</tbody>
</table>
```

DTR> FIND FAMILIES WITH ANY KIDS WITH AGE GE 5
[10 records found]

3.3.2 Report Writer Techniques

Referencing list fields in the Report Writer is more of a challenge because only a few of the techniques discussed in the previous section can be used from within the report writer. To access lists from within the report writer, you can use:

- An inner print list specification
- The Context Searcher (SET SEARCH)
- CROSS to flatten the hierarchy

The example below shows the inner print list technique being used inside of the report writer. A couple of points to note are:

- The inner print list is made up of KID_NAME and AGE as well as a column specification.
- Use of the TOTAL function on the field AGE requires the OF RSE specification, but TOTAL of NUMBER_KIDS does not. This is because AGE is a list field and needs additional context.

```
DTR> REPORT FAMILIES
RW> PRINT COL 1, MOTHER, COL 20, ALL KID NAME, COL 40, RY> AGE OF KIDS -
RW> AT BOTTOM OF MOTHER PRINT TOTAL NUMBER_KIDS, TOTAL AGE OF KIDS
RW> END REPORT -
```

3.4 The CONTEXT SEARCHER

Another method of providing the extra context needed for list fields is the use of the CONTEXT SEARCHER. In addition, the CONTEXT SEARCHER can provide context for access through DBMS sets.

The CONTEXT SEARCHER is activated by the SET SEARCH command. The following example shows the CONTEXT SEARCHER being used to automatically create an inner print list for KIDS. The print statement below is the same one that failed in a previous example. Note that DATATRIEVE displays an informative message when context is resolved by the CONTEXT SEARCHER.

```
DTR> SET SEARCH
DTR> PRINT MOTHER, KID_NAME, AGE OF FIRST 1 FAMILIES
Not enough context. Some field names resolved by Context Searcher.
```

```
KID
MOTHER NAME AGE
ANN URSULA 7
RALPH 3
```
The CONTEXT SEARCHER also allows you to search DBMS records without specifying set relationships explicitly.

Consider the following DBMS record/set structure:

```
<table>
<thead>
<tr>
<th>DIVISIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
|           | /
| CONSISTS_OF |  MANAGES |
|           |       |
|           | /
<p>| |
|           |
|           |
|           |</p>
<table>
<thead>
<tr>
<th>EMPLOYEE</th>
</tr>
</thead>
</table>
```

The following example prints the division name associated with the first employee. An EMPLOYEE record is selected and then the print statement accesses the associated DIVISION record through the CONSISTS_OF set.

```
DTR> FIND FIRST 1 EMPLOYEE
[1 record found]
DTR> SELECT
DTR> PRINT DIV_NAME OF DIVISION OWNER OF CONSISTS_OF

Division Name-------
ENG BUILD -& TEST
```

In the following example the CONTEXT SEARCHER is used, so set access does not need to be specified in the print statement. Note that in this example, the Context Searcher traverses the MANAGES set instead of the CONSISTS_OF set. This is because the Context Searcher may use any of the paths available through a set structure. You should exercise caution when using the CONTEXT SEARCHER with DBMS because it may not choose the expected path.

```
DTR> SET SEARCH
DTR> FIND FIRST 1 EMPLOYEE
[1 record found]
DTR> SELECT
DTR> PRINT DIV_NAME
Not enough context. Some field names resolved by Context Searcher.

Division Name-------
ENG STOCKROOM
```

4 COMMON MISTAKES AND PITFALLS

When you see the following message, it means that DATATRIEVE does not have enough context to do what you want it to.

DTR-19
"...> is undefined or used out of context"

There are a number of possible causes for context problems. Here is a check list to consider:

- Check for misspellings
- Check for duplicate names, especially from other sources
- Does a referenced collection have a SELECTed record? Check the CURRENT as well as named collections.
- Is a list involved (either from OCCURS or views)? Especially in the Report Writer, you may need to use a CROSS to flatten lists, use inner print lists or the CONTEXT SEARCHER.
- Does a STORE operation need to use a context variable in order to reference just-stored values?
- For DBMS sources, does a set name need to be referenced?
- Is there a FIND inside a compound statement? This can sometimes cause unexpected results rather than an error message. In the following example, a YACHTS record will be printed even though a FIND OWNERS/SELECT was done just before the PRINT statement.

```
READY YACHTS, OWNERS
FIND ALL YACHTS
BEGIN
  FIND OWNERS ! Not supported
  SELECT ! Not supported
  PRINT
END
```

Note: A YACHTS record is printed!

- Some query-names from records defined with RDO and CDDL are not handled correctly by DATATRIEVE. Those are CDDL records with query names containing a hyphen and RDO records containing a hyphen or lower-case letters. DATATRIEVE does not convert the hyphens and lower case letters as it should, resulting in an undefined field name. This problem will be corrected in a version of DATATRIEVE following version 4.1.

The example below illustrates this problem.

CDDL:

```
define record qph.
tmpr structure.
dat1 datatype is date query_name for dtr is "quad-one".
end tmpr structure.
end qph record.
```

```
DTR> show fields
QPHD
TMPR
DATE1 (quad-one) <DATE>
DTR> find qphd
DTR> print all quad-one
"QUAD_ONE" is undefined or used out of context.
```

- Check that all variables referenced in a procedure are declared. Do not assume that a variable referenced in code which is branched around with a CHOICE or IF-THEN-ELSE statement does not need to be declared. Even if that code is never executed, it still must be compiled. For example:
DTR> X = 0
    DTR> IF X = 1 THEN PRINT x + z
"Z" is undefined or used out of context.

- Context errors do not always result in an error message! Forgetting about implicit context can also cause unexpected data results. You would expect the example below to produce a context error message because context is not provided for KIDS. But, it turns out that there is a selected record with URSULA targeted as the KID. Remember that the general context stack also includes collections with selected records!

DTR> SET NO SEARCH
    DTR> FOR FAMILIES PRINT KID_NAME, AGE

<table>
<thead>
<tr>
<th>KID NAME</th>
<th>AGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>URSULA</td>
<td>7</td>
</tr>
<tr>
<td>URSULA</td>
<td>7</td>
</tr>
<tr>
<td>URSULA</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- A CROSS of two collections from the same domain may give incorrect answers. To avoid this problem ready the domain twice, once with an alias and once without, and proceed as if you were dealing with two separate domains. For example:

DTR> READY DOM, DOM AS EXTRA
    DTR> FIND COLLECTION-A IN DOM
    DTR> FIND COLLECTION-B IN EXTRA
    DTR> FIND A IN COLLECTION-A CROSS B IN COLLECTION-B

5 Summary

The outcome of a DATATRIEVE statement is affected by the context in which it executes. This makes DATATRIEVE a more powerful tool for you, because you do not have to supply every detail of execution on a DATATRIEVE statement.

Context resolution in DATATRIEVE can sometimes be confusing. If you keep in mind how DATATRIEVE handles context, as described in this paper, you can avoid confusion and make context work for you.
The Story of P

Mr. R, Oldest Seagoing Service, Washington, DC 20593

The story of 'P' is not that of any particular person, but rather that of a mythical entity I came across while working for the oldest seagoing service in the United States. I am a system manager/programmer/comic relief for the oldest sea-going service in the United States. My boss has a secretary that works for him as well as handling overflow tasks for other division chiefs. I'll call that secretary "P." in order to protect the innocent (and the guilty). There was a problem in the office that we could never find "P." when we needed her. She would appear to play her boss against the other people that gave her work to do. She would also take inordinate amounts of times to perform simple tasks. After much cajoling and discussion with no long term improvement my boss said something had to be done. That's where I come in. I looked at what information my boss needed and saw three items, the time 'P.' left her desk, where 'P.' went, and when 'P.' returned to her desk. The record definition I came up with looked like this:

```
DEFINE RECORD LOCATION_REC USING
   01 LOCATION_RECORD.
      03 TIME_OUT USAGE DATE
         EDIT_STRING IS X(20).
      03 TIME_IN USAGE DATE
         EDIT_STRING IS X(20).
      03 DESTIN PIC X(70).

I then went ahead and defined the domain LOCATION like this:

DEFINE DOMAIN LOCATION USING CDD$TOP.APA.P.LOCATION_REC
   ON USER1:[APA.P]LOCATION.DAT;

Next I defined a file using something like the command:

DEFINE FILE FOR LOCATION KEY = TIME-OUT;

Now I wanted to come up with two very simple procedures for 'P.' to use, one to say when she was leaving and one to use when she was back. I wanted the procedures to be "foolproof" as possible so I needed to make sure "P." could not be out to someplace without having returned from her last "adventure" and that the time was recorded automatically. Here is what I came up with:

DEFINE PROCEDURE LEAVE
READY LOCATION SHARED WRITE
IF COUNT OF LOCATION WITH TIME_IN = "" GT 0 THEN
   BEGIN
      PRINT " "
      PRINT " You must first log in from your last adventure!"
      PRINT " Please type: BACK "
      PRINT " 
   END ELSE
   BEGIN
      STORE LOCATION USING
      BEGIN
         TIME_OUT = "NOW"
         DESTIN = "."your destination"
      END
   END
END_PROCEDURE
```
Now for when 'P.' returned, I needed to make sure she had first recorded her leaving and that time was recorded automatically. Here is what I came up with:

DEFINE PROCEDURE BACK
DECLARE TIC USAGE DATE EDIT STRING X(20).
TIC = "now"
READY LOCATION SHARED
MODIFY IF COUNT OF LOCATION WITH TIME_IN = "" EQ 0 THEN
BEGIN
    PRINT " "
    PRINT " You must first leave on an adventure!" 
    PRINT " Please type: LEAVE 
    PRINT " "
END ELSE
BEGIN
    MODIFY LOCATION WITH TIME_IN = "" USING
    TIME_IN = "NOW" PRINT " Logged in. Time is " | (FORMAT(TIC) USING X(20))
END
END_PROCEDURE

Now my boss needed some way to tell where 'P.' was. The hard part of this was deciding what to call it. Since I think my boss had spent some time in Matamoras, Mexico, we decided to call it "DONDE" which is Spanish for "Where". Here's what I came up with:

DEFINE PROCEDURE DONDE
SET DICTIONARY CDD$TOP.APA.P
READY LOCATION SHARED
IF COUNT OF LOCATION WITH TIME_IN = "" EQ 0 THEN
BEGIN
    PRINT " Not logged out anywhere 
END ELSE
BEGIN
    FOR LOCATION WITH TIME_IN = ""
    PRINT TIME_OUT(-), SKIP, DESTIN(-)
END
END_PROCEDURE

I then set up symbols in LOGIN.COM for 'P.' and my boss. They looked like:

    BACK := "'/DTR32' ; :CDD$TOP.APA.P.BACK"
    LEAVE:= "'/DTR32' ; :CDD$TOP.APA.P.LEAVE"
    DONDE:= "'/DTR32' ; :CDD$TOP.APA.P.DONDE"

Datatrieve was defined as a symbol elsewhere like:

    DTR*32 := $SYS$SYSTEM:DTR32411

This went pretty good for the first day but then my boss said he wanted to know how long each trip lasted. I told him, "I got five records out there and you are not going to destroy all my work by creating a new data file."

He replied, "How are you going to do it then?"
I said, “Well, you could use that old favorite of Cobol programmers, Mr. REDEFINES. You and I both know that a Datatrieve date field uses the same amount of space as a quad field. So you take the date, convert it to a quad, subtract the two dates as quads, and convert the resulting value back to minutes.” “A value of '1' in a quad field is also known as a clunk. But how many clunks are there in a minute?” “That’s trivia and I don’t know know. But I do know that 17-NOV-1858 at 00:00:00.0 is equal to '0' clunks since time for all Datatrievers starts at that date. I would suspect that if you take the date 18-NOV 1858 at 00:00:00.0 you could put that in a variable with usage quad and see what it is in clunks and then divide by twenty-four to get the number of hours and again by sixty to get the number of minutes.” “And you tell me that 17-NOV-1858 at 00:00:00.0 is not trivia?”

So what I guess he did was something like this:

```
DTR> declare TIC usage date.
DTR> declare TIC usage date.
DTR> declare TOC usage quad.
DTR> TIC = "18-NOV-1858 00:00:00.00"
DTR> TOC = TIC
DTR> TOC = TOC / 24
DTR> TOC = TOC / 60
DTR> print TOC(-)
```

600000000

```
DTR>
```

Because what I ended up with was:

```
REDEFINE RECORD LOCATION_REC USING
01 LOCATION_RECORD.
  03 TIME_OUT USAGE DATE
     EDIT-STRING IS X(20).
  03 TIME_OUT_REDEFINES TIME OUT.
     05 TIME_OUT_QUAD USAGE IS QUA.
  03 TIME_IN USAGE DATE
     EDIT-STRING IS X(20).
  03 TIME_IN_REDEFINES TIME IN.
     05 TIME_IN_QUAD USAGE IS QUA.
  03 DESTIN USAGE PIC X(70).
  03 TOT TIME COMPUTED BY (TIME_IN_QUAD - TIME_OUT_QUAD)/
     (600000000).
```

The COMPUTED BY field works quite nicely at figuring up the time away. The reports we are now getting are too hard to believe and we have decided not to share them with you. (Would you believe 'P.' was at the supply locker for 187 minutes? I thought not!)

We now are having a better time keeping track of 'P.' with the use of Datatrieve. I am happy, my boss is happy, and everyone except 'P.' is happy.
As a system manager, I have to keep track of the SYSGEN parameters on my system. I also have to keep such files as MODPARAMS.DAT up to date, and with various changes in VMS and layered products add the proper changes. Part of this process can be automated using Datatrieve.

One of the things any system manager should do is save a copy of the SYSGEN parameters. This is done as follows:

```
$ SET DEFAULT SYS$SYSTEM
$ MC SYSGEN
SYSGEN> USE CURRENT
SYSGEN> SET /OUTPUT = PARAMS.28JAN88
SYSGEN> SHOW /ALL
SYSGEN> EXIT
```

The output file can of course be named as you choose: I like to put on the date for reference. Also, you should occasionally make such a record doing a "SHOW /SPECIAL" in addition to "SHOW /ALL": but what I am doing here is generating a change list, and since special parameters normally should not be changed I'm not including them here. A small section of this file looks like this:

```
Parameters in use: Active
Parameter Name   Current  Default  Minimum  Maximum  Unit  Dynamic
---------------  -------  -------  -------  -------  -----  -----
PFCDEFAULT       64      32      0       127     Pages  D
KFILSTCNT        16      4       2       255     Slots
GBLSECTIONS      400     128     20      4095    Sections
GBLPAGES         20500   4096    512    -1      Pages
GBLFAGFIL        2048    1024    128    -1      Pages
MAXPROCESSCNT    128     72      12      8192    Processes
PROCSECTCNT      32      32      5       1024    Sections
MINWSCNT         20      20      10     -1      Pages
PAGFILCNT        2       2       1       63      Files
....
```

The hard part comes in looking through all of the parameters on this listing and finding the ones that are not at default values. This is where Datatrieve makes things easier. A domain can be defined to read this text file:

```
REDEFINE RECORD TPARAMS_RECORD
01 TPARAMS REC.
!
! Read in a "Raw" text file output of parameters from SYSGEN
!
! B. Z. Lederman
!
10 NAME PIC X(16).
10 CURRENT PIC X(18).
10 SUBCUR REDEFINES CURRENT.
```
REDEFINE RECORD PARAMS_RECORD
!
! Write out "normalized" SYSGEN parameters.
!
! B. Z. Lederman
!
01 PARAMS_REC.
   10 NAME PIC X(16).
   10 CURRENT USAGE LONG EDIT-STRING ZZZ,ZZZ,ZZ9.
   10 DEFAULT USAGE LONG EDIT-STRING ZZZ,ZZZ,ZZ9.
   10 MINIMUM USAGE LONG EDIT-STRING ZZZ,ZZZ,ZZ9.
   10 MAXIMUM USAGE LONG EDIT-STRING ZZZ,ZZZ,ZZ9.
   10 UNIT PIC X(12).
   10 DYNAMIC PIC X.
!
REDEFINE DOMAIN PARAMS USING PARAMS_RECORD ON PARAMS.SEQ;

Now all I have to do is move the data from one domain to the other. Since the input is in a text file with a title, I want to eliminate the title lines: I also don't want to move over any parameters which are text rather than numbers (such as QUORUM_DISK and SCSNODENAME):

REDEFINE PROCEDURE CONVERT_PARAMETERS
!
! Convert SYSGEN parameters from text to "normalized" numbers.
! TPARAMS must first be defined to read the correct file.
! Only numeric parameters are converted.
!
! B. Z. Lederman
!
READY TPARAMS
DEFINE FILE FOR PARAMS;   ! remember to purge old files
READY PARAMS WRITE
!
FOR TPARAMS WITH UNIT NE "Ascii", "Unit Dynami", ""
   STORE PARAMS USING PARAMS_RECORD = TPARAMS_RECORD
END PROCEDURE

DTR-26
Note that there are two blank spaces between "Unit" and "Dynami".

Now, I can manipulate this record of my SYSGEN parameters as I please. For example, If I had multiple machines with different parameters I could define a separate domain for each machine and compare the two to see where they differ. What I am most interested in now, however, is to generate a list of commands for MODPARAMS.DAT which will restore my current system settings from the VMS default settings.

REDEFINE PROCEDURE PRINT_PARAMETERS
  !
  ! Print out the normalized parameters in "ADD_" format.
  ! Values are current minus default.
  !
  ! B. Z. Lederman
  !
  FOR PARAMS WITH CURRENT NE DEFAULT SORTED BY NAME
      PRINT "ADD_" I NAME ||| "=" ||| (CURRENT - DEFAULT) ON *.TT or filespec
  END_PROCEDURE

The portion of the output from this procedure looks like this:

ADD_ACP_DINDXCACHE = 24
ADD_ACP_DIRCACHE = 118
ADD_ACP_HDRCACHE = 70
ADD_ACP_MAPCACHE = 16
ADD_ACP_QUOCACHE = -64
ADD_BALSETCNT = 63
ADD_BORROWLIM = 518
ADD_DEADLOCK_WAIT = -8
ADD_FREEGOAL = 455
ADD_FREELEIM = 87
ADD_GBLPAGES = 16404
ADD_GBLPAGFIL = 1024
ADD_GBLSECTIONS = 272

and so on. While this file is not completely ready to use as it is (the ASCII parameters must be re-inserted, and some parameters may be better off as absolutes as, for example, ACP_QUOCACHE which I am setting to zero as we don’t use quotas), it is certainly very much easier to have Datatrieve search all of the parameters and find out which ones have changed than to have to do it all by hand. And, it saves a lot of typing to have Datatrieve output the changes in the form where they are ready to go into MODPARAMS.DAT.

It would also be possible to move the ASCII parameters into a separate file, or make the record definition a little more elaborate and have them in the same file. But there aren’t many of them, and I don’t change system parameters very often, so I consider the process to be sufficiently useful in it’s present form.
Errata for Wombat Wizard's column, February 1988, Volume 3, Number 6

The second paragraph on page DTR-5 should read:

A VAX Date is measured in units called "klunks." Each klunk is 100 nanoseconds long (0.1 microseconds), so there are 10,000,000 or 10**7 klunks in a second. The VAX date is a number of klunks since a base time, and is stored in the VAX as a quadword (four 16-bit words, or 64 bits). The VAX base time (the "zero" time) is the same as the base time for the Smithsonian Astrophysical time, midnight on November 17, 1858. The VAX Date for that time is a quadword with a value of zero. For each second since that time, the quadword is incremented by 10,000,000, and each day is represented by an additional number of klunks that can be computed by the formula

klunks/day = 24 hours/day * 60 minutes/hour * 60 seconds/minute * 10,000,000 klunks/second
= 864,000,000,000

The next to last paragraph on page DTR-6 should read:

In this example, 10**7 klunks were added to a quadword, yielding a date (plus time) one second later. However, ...

See you in Cincinatti!
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:
ARPAnet/CSnet: ctp@sally.utexas.edu
UUCP: ctp@ut-sally.uucp ({harvard,ihnp4,uunet}!ut-sally!ctp)
BITNET: CTP@UTADNX
CIS: 75226,3135

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

Clyde T. Poole
The University of Texas at Austin
Department of Computer Sciences
Taylor Hall 2.124
Austin, Texas 78712-1188

Table of Contents

Letter from the Chairman ............................................................ LS-2
White Paper, VAX/VMS Accounting.............................................. LS-2
Letter from the Chairman

E. F. Berkley Shands, Washington University, St. Louis, MO

Greetings to all! As the spring symposia in Cincinnati, Ohio will quickly be upon us, I want to take some time to highlight a few “New” activities we have planned. One night during the symposia, the Large System SIG Suite will be open for an informal gathering of High End System Programmers and Managers. This two hour meeting is designed to give high end/large system users a chance to meet each other and discuss common problems. If your site has high end concerns, or issues you would like to see addressed, come on by and let the steering committee know about them. Ask the other attendees if they have the same concerns. UPDATE.DAILY will have an article detailing the location and time of this gathering.

The steering committee is presenting a White Paper on VMS Accounting. The issues and basic requirements for system accounting will be discussed. The paper covers only the items to be recorded, and does not focus on the report generating mechanism. Topics such as CPU, DISK, TAPE and NETWORK accounting are detailed. If you have any ideas that should be included in this paper, or just want to see what is proposed, please come.

Are you an officer of your company? Are you a president or vice-president of your company? The Large Systems SIG Steering Committee would like to hear from you. What can DECUS do to assist your company? Would you like to have more information on DECUS and the benefits of the Symposia? Tell us!

White Paper

VAX/VMS Accounting

E. F. Berkley Shands, Washington University, St. Louis, MO

1. Accounting on the VAX REV 2.1

Accounting for a commercial VAX/VMS system must have a central philosophy by which the system works. This should be “Accuracy, Repeatability, and Completeness”. All information from the accounting system must be accurate. How much CPU time did User X use? How much disk space did User SYSHOG tie up running that sort? How many pages of form type BIGBUCKS did that print job consume? If a user runs a program today, and runs the same program tomorrow, the runtimes should not differ to any extreme. Knowing the nature of timesharing, accounting to the micro-second is not practical. However, accounting accurate and repeatable is certainly within the realm of engineering. This paper concerns itself with the types of data to be collected, and suggests some possible formats for storage and management. The paper does not consider technical details that would change from processor to processor or release to release. Further, this paper is not designed to describe a package that would process the accounting records and produce reports. Such a task is best left to the customer to decide what information is important to present.

1 VAX and VMS are trademarks of Digital Equipment Corporation
The accounting hooks developed today must be flexible enough to last through the 1990's into the year 2000 (or as long as VMS is supported). It is better to think about that now, than wish you had done so later; provisions should be made for extensibility. Providing a complete solution (a VMS hallmark) is the prime objective. This solution must take into account laser disks, print servers, back end disk systems, network devices, Symmetric Multi-Processor (SMP) systems, attached processors (CMP systems) etc. Further it must take into account that some sites may only want parts of the full accounting system.

1.1 Functional Specifications For Accounting

An accounting system must provide the "hooks" and basis for tracking system usage. This includes all peripherals and attached processors. Consider the possibility of an array processor being part of the system. Or consider the work performed in the HSC or even DECnet\(^2\) hardware. The prime function for VMS is to collect these data items. Analyzing them and producing a report is secondary.

1.1.1 Classes Of Resource Usage -

Historically, system usage has been based on charging for CPU time, disk space, tape drive time, and printed/punched output. In the era of networking and SMP computers, this doesn't cover all bases. Today there is static and transient disk usage, network terminal and file access. Virtual addressing space usage as well as physical memory usage and paging are distinct but inseparable quantities. Line printers, plotters and laser output devices can have multiple forms, fonts, pens, belts and the like. Some port switching systems can bill by characters in and out. Tape drives still require operator intervention for their care and feeding. Laser based write-once-media (WORM) are appearing in the marketplace. How can all these different entities be organized to provide a minimum number of resource classes?

1.1.1.1 Processor Resource -

Under this title comes the bulk of the CPU and memory domains. Virtual addressing consumes swapping and paging space. Working set management consumes physical memory. Poorly written programs stress the machine more than tightly written non-thrashing ones. Page faults drive up overhead and cause more memory accesses. Programs that have a tight (cacheable) code make less demands on the slow memory system than do the spaghetti variety.

Tracking memory references (i.e. MBOX cycle counters) provides a way for the system manager to keep track of program performance. Clearly this requires special hardware not found in the majority of the VAX line. Therefore absolute counts are not obtainable. What is needed is some machine independent metric. Perhaps the Kilo-Core-Second and the Virtual-Kilo-Core-Second? A KCS is two pages of physical memory in use for one second. A VKCS is two pages of virtual address space (PO) in use for one second. If there is a good way to account for Floating Point Accelerator (FPA) usage, it should be included. Records for each process should be kept, updated and checkpointed. For those processes that never terminate (SWAPPER, OPCOM...) the checkpointed values may be used to complete the used cycle totals.

Some sites wish to charge different rates based on the time of day. Therefore a method for flushing the entries for all active processes is required. When the "shift" changes, all counters are zeroed and processing continues without user intervention. These shift changes need to be automatic. Forcing an operator or a batch job to change the accounting shift would not be repeatable or reliable.

\(^2\) DECnet is a trademark of Digital Equipment Corporation
1.1.1.2 Disk System Resource -

Xerox\(^3\) and IBM\(^4\) systems view two kinds of disk usage; Static and dynamic. Static usage is the familiar “What’s on disk now, and who owns it?” Dynamic usage is somewhat more complex, since it deals with logged in disk use versus logged out disk usage. For example, a user wants to sort an address file. The sorting program creates a temporary file which is never closed, but chews up 1.4 million disk blocks for an hour while it runs. A static disk analysis would never see that use. A dynamic recorder would compute 1.4 Mega-blocks for 3,600 seconds and arrive at a Kilo-Byte-Disk-Second figure. Here is where completeness comes in. Clearly this amounts to using a fair chunk of system resource. To be fair, such usage would have to be recorded. However, to continue being fair, a file should not be billed for both static and dynamic charges. Therefore some clear procedure must be established as to when a charge is assessed.

A further area of concern in disk usage is that of overhead blocks and directory blocks. A file header takes up room. TOPS-10\(^5\) charges for that space. TOPS-20\(^6\) hides it. VMS hides it too, but records directory usage. TOPS-20 hides directory blocks, but TOPS-10 doesn’t. With allocation cluster factors getting higher and higher, there is a larger percentage of the disk that is allocated but unused. Is it fair to bill on allocated space when the user has no control over the cluster factor? Is it fair to bill on used space when a user can allocate far more than is needed (to be used at the users whim)? This needs to be a site dependent decision. Collect both, let the user pick which one to use.

Deeper inside the disk usage issue is how to record file/disk use. The scheme of a UIC owning a file is fine for access, but what happens when a user is working on multiple projects at one time? A secure system is required to have a one to one mapping between users and usernames/UIC’s. How can the standard UIC system handle multiple projects by a single user? The solution in the TOPS-10 and TOPS-20 operating systems was to assign an independent string for billing that did not reflect the owner. This string is validated for the user (and a utility looks for files that have invalid charge strings after data base changes). This keeps the user honest, and the disks clean. But what about the user that doesn’t care about charges, and leaves mountains of files on disk while never touching them. If the user is paying for such storage, this may not be so terrible. In other environments this “disk hog” must be dealt with in other ways to reduce the overall impact. There should be several fields in the file header which are reserved for tracking use of that file(s). A last read date, last write date, who wrote it, who owns it, when it expires, when it was archived, when it was returned from archiving and others must be kept! If a file is migrated onto WORM storage, that should be recorded too. How should WORM disk usage be treated? A user cannot delete such a file once created! A further complication is SET FILE/ENTER. The physical file may reside in several directories, with one user archiving the file and another desiring no archiving. This sticky problem must be addressed outside of the scope of this paper.

1.1.1.3 Tape Usage -

Some large commercial sites have thousands of tapes in their libraries. Large IBM shops have floors full of tape drives. Even smaller shops often have four to six tape drives. As a resource, any tape related activity must be recorded. Tapes are operator intensive by nature. For sites that must cost recover, recording operator interactions is required.

All tape events need to be recorded; mounts and dismounts, reads and writes, rewinds and skips (controller based today, host based yesterday) and errors. These events need to be tracked on a per-tape drive and Volume ID / Reel ID basis. A charge string (the current default for the user) would be used for recording purposes. If everything needs to be recorded, don’t forget the type of drive (some are faster), the density, and the time of day.

---

\(^3\) Xerox is a registered trademark of Xerox Corporation

\(^4\) IBM is a registered trademark of International Business Machines Corporation

\(^5\) TOPS-10 is a trademark of Digital Equipment Corporation

\(^6\) TOPS-20 is a trademark of Digital Equipment Corporation
1.1.1.4 Operator Usage -

How do you use your operator? The system operator(s) have a tough job in a busy machine room. It was once suggested that they wear roller skates. They perform or coordinate disk and tape mounts and dismounts, printer and plotter feeding, backups (Digital disks never crash?), shift changes and accounting updates. All of these items need to be tracked, as well as how long it took the operator to respond to the request. If the disk request didn't need operator intervention, fine. Record it anyway.

File archiving takes lots of operator effort and tape drive use (today, but maybe WORM use tomorrow). A user can create an operational nightmare by requesting files all day. Such requests should be recorded for possible charge-back.

1.1.1.5 Spooling Usage -

The input and output spoolers do a fair amount of work. This includes disk and CPU and related resource consumption. Any activity done on behalf of a user should be charged to that user. Spooled line printer output files need to be charged just as regular disk files do.

The forms used, the time of day the spooler ran, the queue name (batch too), must all be recorded. Some field must be provided for the operator to add comments “Printer munched 1/2 box of form BIGBUKS” or “The plotter ran out of ink”.

1.1.1.6 Network Usage -

This is a very tricky area to track. Should a user be billed for using DECnet to transfer a file from a remote site? Should that user be billed for SET HOST to another site? Should a transaction processing system be billed for task to task I/O requests? How should a user be billed for dial-out DECnet access to a remote host? What about task to task within a machine or cluster? Who gets charged for the time used on the remote machine? What about routers? How do you bill for the overhead of “pass through” packets?

What is clear is that whatever information is available should be recorded. If the local site wants to treat routing work as overhead, that is a local decision. The more accurate the recording, the better the justification for adding additional equipment.

1.1.2 User Features -

A user must be able to change account strings rapidly. Under security rules (government type), one user = one login name. You can't get around that by giving multiple user names. Changing sessions (with remarks) must be quick and transparent to the user. This is known as “SET ACCOUNT”. The account string must be valid, and it must be usable by that user for that function. For example, a charge string may be good for disk storage but not for CPU or tape mounts. It might be good only from 09:00 until 11:00. To further complicate things, each account string may be associated with a particular scheduler class. Changing accounts may change your scheduler class setting too (Process Priority).

Every accounting entry generated by the user's actions would carry a charge string, unless another was substituted by design. The system must be capable of mass updates to the database of valid charge numbers. Third party retro-fits for accounting usually do not handle this mass change. The system must be able to handle thousands of charge strings (that means no linear searching too!). Utilities must be provided to find files, queues and other entities that have a particular charge identifier (valid or not). Some user will complain “Why do I have a $20,000 charge for disk space? I only have 30 blocks in my directory!” Right, but you have 1.9 million disk blocks in queue waiting to print. The system manager friendliness of the accounting subsystem is very important!

7 Digital is a trademark of Digital Equipment Corporation
The accounting system must checkpoint its data to protect against system crashes. The active accounting data should be written to disk at regular intervals controlled by the individual sites. This data should not be written after every action, because that would seriously impact system performance. The accounting data could be kept in an in-core queue, to be written at the specified time or when the queue became full. Consider a user program generating 1K accounting entries per minute. What would happen if each entry required disk accesses?

A user should be able to get a directory based on charge number; DIR/CHARGE=Bogus-account-51. LOGINOUT should prompt for missing charge strings at login time. “.DIR” files should have their own overriding default charge strings for files created in them like ACLs with /OPT=DEFAULT.

The hooks for a user supplied accounting record should be provided for those facilities that want to track finer detail than is normally available.

1.2 What Won’t Work

Access Control List (ACL) identifiers should not be used as account strings. In large commercial sites, account string databases may contain 10K entries, of which 2K will change each week. Further, when an entry is deleted from RIGHTSLIST.DAT, all that remains in the file header is %X8001BEEF. This number is very hard to correlate with the original account string.

Any system that does not provide for account to user validation. It would be best if the validation process could be user written, with a template supplied by VMS Engineering.

Several other areas reflect government regulations for security and ease of use concerns:

1) Grafted on accounting that requires a change of UIC to track usage.
2) Anything that requires multiple user IDs for a single user.
3) Anything not supporting shift changes on the fly.
4) Anything that will not provide a straight dump of the accounting database. A callable interface would suffice, since you could read records right out of the active file. The interface would need a call for “Give Me Info On The Next Record” and “Give Me The Data Of The Next Record”.
5) Anything that does not allow the user program to validate a charge number. (i.e. a System call to validate a charge number for a user.) Spoolers should be able to validate access to charge strings like they validate file access.

2. Accounting Record Formats

Every record written to the accounting data file should be prefixed with information on what system wrote that record. At the very least the actual SID register data and a text string should be supplied. The text string should be at least 10 characters (node names are too short). This provides for the centralized processing of accounting data in a corporation which has a large number of networked and clustered systems. Accounting data from one system could not be interchanged with that of another. With each system identified on the accounting record, the whole networks’ data could be appended to one file and processed.

In the following list, some items are redundant. This is due to the need to have all the needed information in one record. The system administrator should not have to determine by context the other items needed.
3. Accounting Records - Disk System

3.1 File Header Items

Note: changing the file header should not cause the data to be backed up on an incremental BACKUP.

1) Date of last user read
2) Date of last user write
3) Date of last archive
4) Date of last archive restore
5) Name of last writer
6) Name of last reader
7) Name of owner
8) Charge string (from CREATE or SET FILE)
9) Archive reason (age, request, etc)
10) File status flags
11) UIC of owner

3.2 Disk Usage Entries

3.2.1 Static Snapshot -
1) Charge string
2) Owner
3) Allocated blocks
4) Used blocks
5) Cluster factor
6) Name of directory
7) Total blocks in directory
8) Overhead blocks in directory
9) Date/time
10) Volume name
11) Device/type (DBA0/RP07)

3.2.2 Dynamic Disk Usage -
1) Charge string
2) Date/time
3) Owner
4) Kilo-Byte-Seconds of use
5) Name of file
6) Directory of file
7) Max blocks used
8) Max blocks allocated
9) Volume name
10) Device/type (DJA2/RA60)

3.2.3 Disk Volume Mount/dismount -
1) Date/time
2) Charge string
3) user name
4) Requested disk
5) Disk drive used (type/device)
6) Operator response delta time
7) Status flags (WRITE/Success/automount)
8) Operator comments
3.3 Tape Drives

3.3.1 Tape Mount -
1) Date/time
2) Charge string
3) User name
4) Requested tape VOLID/REELID
5) Tape drive used (type/device)
6) Operator response delta time
7) Status flags (WRITE/Success)
8) Operator comments
9) Type of tape (labeled/unlabeled)
10) If labeled, type of label (ASCII/EBCDIC/OTHER)

3.3.2 Tape Usage -
1) Date/time start
2) Date/time stop
3) Charge string
4) User name
5) Reads
6) Writes
7) Rewinds/file skips
8) Errors
9) Drive/type/density
10) Operator comments

3.4 Spooler Entries

3.4.1 Line Printer Usage -
1) Date/time
2) Charge string
3) User name
4) Device/type/location
5) Pages printed
6) Forms type
7) Ribbon type
8) Number of files
9) Number of copies
10) Completion date/time
11) Operator comments
12) CPU usage entry (process type)
13) Disk usage entry (dynamic)
14) Priority/queue name/entry number

3.4.2 Plotter Usage -
1) Date/time
2) Charge string
3) User name
4) Device/type/location
5) Feet plotted/pages plotted
6) Forms type
7) Pens type
8) Number of files
9) Number of copies
10) Completion date/time
11) Operator comments

LS-8
12) CPU usage entry (process type)
13) Disk usage entry (dynamic)
14) Priority/queue name/entry number

3.4.3 Other Spooler Types... -

- 1) Date/time
- 2) Charge string
- 3) User name
- 4) Device/type/location
- 5) Number of files
- 6) Number of copies
- 7) Completion date/time
- 8) Operator comments
- 9) CPU usage entry (process type)
- 10) Disk usage entry (dynamic)
- 11) Priority/queue name/entry number

3.4.4 Attach/Detach Entries -

This entry is written each time the user “CONNECTS” or “DISCONNECTS” (ATTACH/DETACH) a process from a terminal. This is completely distinct from the PROCESS type entries. Some sites may want to charge different rates for DIAL-UP terminal vs. DECnet connections.

- 1) Date/time
- 2) Type of terminal connection (LAT/DECnet/Hardwire)
- 3) Source of connection (DECSERVER 200 CLYDE port 3 or DECnet node YAHOO:::process 2065B410)
- 4) Username
- 5) Process ID
- 6) Account string active at the time
- 7) Characters sent since last Attach/Detach
- 8) Characters received since last Attach/Detach
- 9) Elapsed time port was used on Detach
- 10) Elapsed time process was detached on Attach
- 11) Port specific info (line speed, etc.)

3.5 System Configuration Changes

3.5.1 Accounting Changes -

- 1) Shift change record
- 2) Account validation database update
- 3) Operator coverage change

3.5.2 Scheduler Type Change -

- 1) Priority
- 2) Class
- 3) Round-robin
- 4) Other

3.5.3 Device Status -

- 1) Disk/tape offline
- 2) Network link down
- 3) Terminal baud rate change
- 4) Terminal ADVISE/LINKING records
3.6 CPU Resources (at Process Termination Or Account Change)

3.6.1 Memory Usage -
1) User name
2) Process name
3) Charge string
4) Physical KCS used
5) Virtual KCS used
6) Mbox cycles
7) Working set size
8) Pager traps
9) Date/time
10) Scheduler class used (% allocated, number of class)
11) Type of scheduling in use (prio/RR/Class)

3.6.2 Processor Usage -
1) User name
2) Process name
3) Charge string
4) CPU time used (to MS)
5) Flags (incl/excl interrupts + overhead)
6) CPU SID of processor (SMP tracking)
7) Floating point use cycles
8) Vector CPU use
9) Time of day/date

3.7 Process Usage

3.7.1 Resources Used -
1) User name
2) Process name
3) Charge string
4) Date/time
5) Node of session origin
6) Last node origin
7) This node name
8) Session start
9) Session end
10) Session remark
11) TTY I/O chars in/out
12) Flags (batch/network/etc)
13) Physical terminal name
14) Virtual terminal name
15) Kilo-Byte-Network data transmitted
16) CPU spent compiling
17) CPU spent executing
18) Baud rate of terminal
19) Number of operator requests
20) Spooler proxy data

3.8 Network Usage

Some sites may wish to charge back network usage to the specific individual or site (CPU) responsible for its use. Items include: file transfers, records transferred, virtual terminal usage, network spooling, etc. Note that each record transferred doesn’t need an entry. Just that User X made 124,498,200 record transfers.
3.8.1 Specifics -
   1) Time of day
   2) Network connection (source/dest, node::object)
   3) Volume of data transferred (bytes or Kbytes) in and out
   4) Type of entry (open/close)
   5) User name
   6) Account string at host
   7) File transfer stats
   8) NVT stats

3.9 Other Concern Areas

   It would be nice to be able to track usage of 3rd party hardware too. If each driver had a 
routine to record calls, CPU time, etc, this would allow the system manager to see what devices are 
consuming the systems resources. This could also be used as a hook for accounting on attached 
array processors, BI based funny devices, user-written pseudo devices (like PTYDRIVER/PHOTO) 
and the like.

   A clean way to perform this would be to extend the current system calls for writing accounting 
entries. Since these entries would be in a user defined format, the only way to read them would 
be with the callable accounting file reader. If the type of record were known beforehand, a real 
"CPU usage" record could be written. There is no documented way of writing such an entry 
today.

   Any change to the accounting system would force a change in the format of the system 
accounting file, SYS$MANAGER:ACCOUNTING.DAT. Obviously this would break a large percentage of 
the currently available third party packages. Which would you rather have, a system that patches 
SYS.EXE and breaks at each release? Or all data collection done by VMS, and processed by your 
favorite third party package?
IN THIS ISSUE...

From The Editor ................................................................. OA - 1
  • Therese LeBlanc, T.M. LeBlanc & Assoc.

OA SIG Tape Now Available Through LUG .................................. OA - 2
  • Roger Bruner, Foreign Mission Board

Executive Forum in Cincinnati ............................................... OA - 2
  • Katherine Trim, OA SIG Chair

Wanted: Session Chairs for Cincinnati ...................................... OA - 3
  • Lynda Peach, Mustang Energy Corp.

Sorting the To-Do List in Time Management ................................ OA - 4
  • Trace Roth, O.H. Materials Corp.

FROM THE EDITOR...

April is here already and we’re just around the corner from our Spring 1988 symposium. For those of you who are attending, this promises to be one of the OA SIG’s best yet. With an exciting line-up of sessions and special activities planned by all of our new (as well as the old) volunteers.

Please make note of the article on obtaining the SIG tape. It has proved to be so popular that Roger & Co. have been swamped with blank tapes to copy.

Our feature article this month provides some help with sorting your “TO-DO” lists in Time Management. (Another great article by Trace Roth.) If you have tried or implemented some of our technical articles, we’d love to hear from you. Did they solve a specific problem you’ve been having? Were the users pleased to see the new (additional) functionality? Did it get you thinking and working on other customizations or modifications?

Just a reminder. I welcome articles on DEC OA products other than ALL-IN-1. WPS/DOS is a very popular product right now, as is PC ALL-IN-1 and a host of other OA products. The ALL-IN-1 articles are wonderful. I always look forward to receiving them, but I would really like to include some articles on other OA products. Call me if you have ideas for non ALL-IN-1 articles, or send them in.

I look forward to seeing you all in Cinci!

Regards.

Therese LeBlanc
OA Newsletter Editor
— NEWS FLASH —

OA SIG TAPE CAN NOW BE OBTAINED
FROM YOUR LOCAL USER GROUP

Roger Bruner, Foreign Mission Board

Send us your tired and your poor if you must....
But — please — send us NO MORE BLANK TAPES!

Response to the new OA SIG TAPE has been so overwhelming that the Foreign Mission Board is being forced out of the tape-duplicating business! (Just as quickly as we can process the many orders received to date, that is)

Distribution will then be taken over by the National LUG organization through its regional tape distributors. More specific information will be published by the NLC in the SIG newsletters and in DECUSCOPE in the very near future.

Look for a complete listing of the contents of the new tape in next month’s newsletter.

Special thanks to those of you who submitted material to the tape. We’ll all be looking forward to finding out in Cincinnati who won the competition for the best SIG TAPE SUBMISSION!

— EXECUTIVE FORUM IN CINCINNATI: —

OA IN A MULTIVENDOR ENVIRONMENT

Katherine Trimm, OA SIG Chair

The Office Automation Special Interest Group Would Like To Invite You To Participate In: The OA Executive Forum on Office Automation.

Our topic this time will be "Office Automation in a Multivendor Environment."

The OA Executive Forum with take place Tuesday May 17th. As part of the Cincinnati Symposium our Executive Program will take place from 9:00 am through 5:00pm followed by a reception in the OA Suite in the OMNI Hotel.

We encourage you to bring managers from your organization who would benefit from seeing how other users have tackled the problem of a Multivendor office solution.

For more information and to get invitations please contact me:

   Katherine "Kit" Trimm
   OA SIG Chair
   (602) 886-5563

We look forward to seeing you there!

OA-2
WANTED: Session Chairs for Cincinnati Symposium

Lynda Peach, Mustang Energy Corp.

Sign up now!!! If you’ve been thinking that you might like to get more involved with the OA SIG at the Cincinnati Symposium, but don’t have alot of spare time on your hands... we have just the thing. Become a VOLUNTEER session chair. It's easy and fun. you get to meet alot of new people and feel more involved in what’s going on.

What does a session chair do?

Session chairs welcome the group and introduce the speaker. They try to make sure that the session runs smoothly (dim lights if necessary, flip overheads perhaps, etc.), and reminds everyone with a question to step up to the microphone so that the whole group can hear the question. Plus whatever little things might be needed.

How long does it take?

That depends on the length of the session. Choose sessions you are interested in, then be there a few minutes before the session begins to meet the speaker, find out how to pronounce their name and a little something for the introduction. That’s it.

Will I get any special instructions from DECUS?

There is usually a short meeting on Sunday evening before the Welcoming Reception just for Session Chairs. It will give you some more specific information if you feel you need it and a little overview of "How to be a good session chair".

It sounds great! How do I sign up?

You can Answer the “Be a Session Chair in Cinci” Conference on OASIS.

- or -

Call/write:

Lynda Peach
OA Session Chair Coordinator
Mustang Energy Corp.
1100 First Nat’l Center East
Oklahoma City, OK 73102
(405) 232-9471, Ext. 280

You can request specific sessions to chair. Requests will be honored on a first-come first-served basis. Requests can be made by Session Name, Session Speaker, type of session (technical, WPS-PLUS, etc.).

Help make Cincinnati the best Symposium ever! Participate!

Being a session chair is a great way to meet the speaker(s) and you’re definitely guaranteed a "chair"!!! It’s easy to do and it’s a vital job that must be done for every session given at Symposium.
SORTING THE TO-DO LIST IN TIME MANAGEMENT

Trace Roth, O.H. Materials Corp.

I have written a basic program and modified the name data of several forms to display and print the To-Do list items in priority order.

The to-do records are sorted by the DCL SORT command in priority and then number order. This command sorts all of the records in ACTITEM.DAT and writes them to a sequential file, SORT.DAT, that is read by the basic program, TODO.EXE. If you look at the sort command in the TODO.COM file, you can see which bytes of the ACTITEM.DAT records are the sort keys.

The basic program takes only the to-do records from SORT.DAT and writes a file, SORT TODO.TMP, that is then converted into an index file, OUT TODO.TMP, that can be used by the scroll functions in ALL-IN-1. The basic program simply formats the to-do records and places a blank line between each priority. I have chosen to display item priority, number, status, and description. All of the files used are placed into the user’s ALL-IN-1 directory by using the OAUSER logical that is set up when ALL-IN-1 is run.

When displayed, the OUT TODO.TMP file is accessed directly and placed on either form DISPTD or form TMDAC.

When printed, the SORT TODO.TMP file is merged with a header file so that the data records are properly labeled. The index file OUT TODO.TMP is not referenced in the print procedure. I have not set up anything to handle multiple page headings. I assume most users will not have more that one page of to-do items. If you have more that one page, delegate some of the to-do items or let me know how you handle multiple pages. That sounds like another item for your to-do list.

Name data changed for form TMD in OAFORM. Changes are noted in bold. Only the modified part of name data is shown to minimize the number of pages printed.

```
;;TYPE;;

MENU /CHOICE=CHOICE/PRE FUN='CAL INIT MONTH\..IF #CAL SET DATE NES ""THEN GET
 STD_DATE_SAVE = #CAL SET DATE\..IF STD_DATE_SAVE NES "" AND STD_DATE_SAVE NES
 OA$TM DATE THEN CAL SET DATE STD DATE SAVE"/CLEAR/DAT=DATE/
 USER=USER/MAIL=MAIL\MORE='TMDDE,TMD MORE,TM'/GET=MONTH3,OA$TM MONTH3;MONTH4,OA$TM MONTH4;
 MONTH1,OA$TM MONTH1;MONTH2,OA$TM MONTH2;MONTH,OA$TM MONTH;MONTH5,OA$TM MONTH5;
 MONTH6,OA$TM MONTH6;YEAR,OA$TM YEAR;DATE,OA$TM DATE;DAY,OA$TM DAY/HARD="To=Do List"/TITLE=TITLE/POST='GET #CAL_SET_DATE = ""

;;C;;

DO TMCRETD\GET STD_DATE_SAVE=OA$TM DATE\GET STD_NUMBER_SAVE=SAM SELECT1\GET
 STD_SEL2_SAVE=SAM SELECT2\GET #TODOFLAG=0

;;D;;

. IF $AM SELECT1 EQS "" THEN DISPLAY There is no item to delete\FORCE ELSE
 FORM TODOENT/MODE=DELETE/ONE ENTRY/START="T','TO DO LIST',SAM SELECT1"
 IFEXIT\GET $AM SELECT1=""\DISPLAY List item deleted\GET STD DATE SAVE=OA$TM
 DATE\GET STD NUMBER_SAVE=SAM SELECT1\GET STD_SEL2_SAVE=SAM SELECT2
 \GET #TODOFLAG=0
```
Any following name data of TMTD is unchanged. Here are the name data changes for the TMTDDE and TMTD_PRINT forms in OAFORM. The changes made to these forms in this portion of the name data are the same. The changes are listed here in bold.

Any following name data of TMTDDE is unchanged. See the following information about TMxx PRINT forms for an additional change to TMTD PRINT.

Name Data changes for form TMTDAC in OAFORM. Changes are noted in bold.
\IF #TODOFLAG NE 1 THEN GET OA$DCL="@DISK$SYSTEM:[ALLIN1.BASIC]TODO.COM"
\OA$CNV TO SCROLL OAUSER:SORT_TODO.TMP,OAUSER:OUT_TODO.TMP\GET #TODOFLAG = 1' /USER=USER/GET=MONT, OA$TM_MONTH;MONTH1,OA$TM_MONTH1;MONTH2,OA$TM_MONTH2;MONTH3,OA$TM_MONTH3;MONTH4, OA$TM_MONTH4;MONTH5,OA$TM_MONTH5;MONTH6,OA$TM_MONTH6;YEAR,OA$TM_YEAR;CDATE, OA$TM_DATE;DAY,OA$DAY;CUSER,OA$TM_OWNER;MEETIN,OA$MEETING_COUNT_DISPLAY;CDAY, OA$TM DAY;DAY1,OA$TM DAY1;DAY2,OA$TM DAY2;DAY3,OA$TM DAY3;DAY4,OA$TM DAY4;DAY5, OA$TM DAY5;DAY6,OA$TM DAY6;DAY7,OA$TM DAY7;WEEK1,OA$TM_GRAPH1;WEEK2,OA$TM GRAPH2;WEEK3,OA$TM_GRAPH3;WEEK4,OA$TM_GRAPH4;WEEK5,OA$TM_GRAPH5;WEEK6,OA$TM GRAPH6;WEEK7,OA$TM_GRAPH7;HEADER,OA$TM_GRAPH_TITLE/HARD="To-Do list"/TITLE=" 
/TITLE/POST="GET #CAL ADVCAL='''

;;DESC;;

/SCROLL=96,OUT_TODO.TMP

;;GOLD TAB;;
OA$SCL_SET_FIELD 96,OUT_TODO.TMP,1,,DESC\OA$SCL_NEXT_PAGE\OA$FLD_STAY

;;GOLD BS;;
OA$SCL_SET_FIELD 96,OUT_TODO.TMP,1,,DESC\OA$SCL_PRIOR_PAGE\OA$FLD_STAY

;;DOWN;;
CAL SET DATE +1W

Any following name data of TMTDAC is unchanged.
Name data changes for DISPTD in OAFORM. Changes are noted in bold.

;;TYPE;;
ARG /CLEAR/GET=USER,OA$TM_OWNER;CDAY,OA$TM DAY;CDATE,OA$TM_DATE/PRE=' .IF #TODOFLAG NE 1 THEN GET OA$DCL="@DISK$SYSTEM:[ALLIN1.BASIC]TODO.COM"
\OA$CNV TO SCROLL OAUSER:SORT_TODO.TMP,OAUSER:OUT_TODO.TMP\GET #TODOFLAG=1'

;;DESC;;

/SCROLL=96,OUT_TODO.TMP

;;DUMMY;;
/HARD="Press RETURN to continue"

;;PERIOD;;
CALENDAR SET DATE +1D\FORM .

;;UP;;
OA$SCL_SET_FIELD 96,OUT_TODO.TMP,1,,DESC
\OA$SCL_TOP\OA$SCL_UP\OA$FLD_STAY

;;DOWN;;
Here are the name data changes made to all TMxx PRINT forms in OAFORM. The same change has been made to all of these forms and the change is made to the TL option. Changes are noted in bold. Only the TL part of the name data is shown here to save space.

TO-DO Items

Pri  Num  Stat  Description

$!  TODO.COM  PLACED IN [ALLIN1.BASIC]
$!  TRACE ROTH  DECEMBER 18, 1987
$!  O.H. Materials Corp.
$!
$ SET MESSAGE/NOFAC/NOIDENT/NOSEV/NOTEXT
$ SORT/KEY=(POSITION:226,SIZE:2)/KEY=(POSITION:18,SIZE:3) -
OAUSER:ACTITEM.DAT OAUSER:SORT.DAT/SEQUENTIAL
$ SET MESSAGE/FAC/IDENT/SEV/TEXT
$ RUN DISK$SYSTEM:[ALLIN1.BASIC]TODO
$ PURGE OAUSER:SORT TODO.TMP
$ PURGE OAUSER:OUT TODO.TMP
$ PURGE OAUSER:CALENDAR.TMP
$ EXIT
1 ! TODO.BAS PLACED IN [ALLIN1.BASIC]
! TRACE ROTH DECEMBER 1, 1987
! O.H. Materials Corp.
!
5 MAP (AI_REC) STRING AI_TYPE = 1, &
    STRINGFIL1 = 17, &
    STRINGAI_ITEM = 3, &
    STRINGFIL2 = 63, &
    STRINGAI DESC = 65, &
    STRINGFIL3 = 76, &
    STRINGAI_PRIO = 2, &
    STRINGAI_STATUS = 1, &
    STRINGFIL4 = 141
!
! Open the sorted data file from ACTITEM.DAT
!
10 OPEN "OAUSER:SORT.DAT" FOR INPUT AS FILE #1, &
    ORGANIZATION SEQUENTIAL VARIABLE, MAP AI_REC
!
! Open output file
!
OPEN "OAUSER:SORT TODO.TMP" FOR OUTPUT AS FILE #2, &
    ORGANIZATION SEQUENTIAL VARIABLE, ACCESS WRITE, RECORDSIZE 80
WHEN ERROR USE ERROR_ROUTINE
FLAG=0
FILL1$=
FILL2$=
!
! Until there are no more records in File #1
!
20 UNTIL AI_TYPE = ""
    GET #1
!
! See if the record is a TODO record
!
    IF AI_TYPE = "T" THEN
!
    ! See if the priority has changed from last record
    ! If it has, move a blank line to output
!
    IF (AI_PRIO LAST$ <> AI_PRIO) AND (FLAG=1) THEN
      FILL_OUTS=FILL1$+FILL2$
      MOVE TO #2, FILL_OUTS
      PUT #2
    END IF
!
! Move the designated fields to output
!
    TODO_INFO$=AI_PRIO+" +AI_ITEM+" +AI_STATUS+" +AI_DESC

MOVE TO #2, TODO_INFO$ 
PUT #2 
AI_Prio_Last$ = AI_Prio 
FLAG=1 
END IF 
NEXT 
END WHEN 

HANDLER ERROR_ROUTINE 
CLOSE #1 
CLOSE #2 
END HANDLER 
40 END 

WPS ON THE VT340 
WPS+ version 2.1 will not startup correctly from a VT340, unless it has been set (on the “General Set-Up” menu) to emulate a VT200 family or older terminal. The message “Unrecognized Terminal, please see your System Manager.” appears on the screen and the menus do not appear on the screen at all. 

Upon investigation, the problem lies in WPSPLUS_LOGIN.COM and is easily fixed by adding the following line: 

$ IF term_type .eq. 112 THEN GOTO setup_for_VT300 

immediately before this line: 

$ IF term_type .eq. 111 THEN GOTO setup_for_pro 

and the line: 

$ setup_for_vt300: 

immediately before this line: 

$ setup_for_vt200: 

Digital’s response to this suggestion indicated that this was an unsupported mode of operation. In the past several months of operation, the only problem I’ve seen occurred when the VT340 Page Arrangement (on the Display Set-Up menu screen) was set to 1x72. The terminal would not scroll correctly. Setting the page arrangement to 3x24 (in dual session mode) or 6x24 (single session mode) cured the problem. 

I don’t expect any other ‘gotchas’ in using 340s this way, but Digital apparently does. It seems to me that if we all try this, we can either send in SPRs when problems do crop up, or beat on the WPS product management to properly support the 340. After all, it is absurd to Digital not to support their flagship word processing program on their flagship terminal, one year after the terminal was announced.
PERSONAL COMPUTER
SPECIAL INTEREST GROUP

NEWSLETTER
TABLE OF CONTENTS

PRO Section

Updates to the PRO Public Domain Software Collection ........................................ PC-1
By Gary Rice - New to the "catalog" this month
Correction to an Article ............................................................................................. PC-7
By Tom Hintz - Hard disk controller ROM updates
PRO Software Update .................................................................................................. PC-7
By Gary Rice - YES, there is STILL some updating going on
PROgramming Quickie ................................................................................................. PC-10
By Gary Rice - Fooling PIP into accepting more than an 80 character command

General Section

Digital's DEPCA ........................................................................................................ PC-11
By Digital Equipment Corporation - Connect Ethernet to your IBM-PC

Workstations Section
No submissions this month.

MACINTOSH Section
No submissions this month.

VAXmate Section
No submissions this month.

Rainbow Section
No submissions this month.

DECmate Section
No submissions this month.

Catalog Updates to the PRO Public Domain Software Collection

By Gary Rice, PC SIG Newsletter Editor

Since last month, the following software has been added to the collection and/or added to the catalog.

<table>
<thead>
<tr>
<th>Catalog #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F81-1</td>
<td>This directory contains the following programs: DSP.FTN - Converts input format to output format. Currently supported formats are: BYTE REAL<em>4 ASCII INTEGER</em>2 REAL<em>8 RAD50 INTEGER</em>4 OCTAL FCB.MAC - Prints out F11ACP file control blocks (open file information) of a disk device. Updated output format from Spring '81 source. LUT.MAC - Prints out the logical unit table of a running task including open file information. Updated output format from Spring '81 source. SFQ.MAC - Prints out the spool queue OR the receive queue of ANY task. ALSO: BLKIO - Fast Universal Fortran I/O Routines providing (very) fast Fortran block I/O to either normal or virtual arrays. CSH - Checkpoint Space Handler and TKTN Bug Fix Here's our Checkpoint Space Handler, a tool which will show you what's on your checkpoint files</td>
</tr>
</tbody>
</table>
NOTES -- Larry Baker's notes on Fortran, performance, and tapes

1 diskette; Sources included; NO objects; NO task images
MACRO, FORTRAN-77

F81-2  FORTRAN SYMBOLIC DEBUGGING TOOL (SDT)
ALSO:
This UIC contains the ICR FORTRAN IV Plus Symbolic debugger. It is designed for IAS, but should also work under RSX-11M if you uncomment the line which defines RSX11M in FDT.MAC. ALSO: CPL is a utility which compiles your programs in a compiler independent manner. It alleviates the headache of having to remember the syntax quirks of all the compilers on your system. CPL also aids in the maintenance of programs consisting of many modules since it compiles files based on the dates of the source and object files and maintains a user library.

1 diskette; Sources included; NO objects; NO task images
MACRO, FORTRAN-77

F81-3  This directory, [307,22] contains all the programs described in a talk titled "Recovering From Disk Disasters"

1 diskette; Sources included; SOME objects; SOME task images
MACRO, FORTRAN-77

F81-4  This directory contains a number of utilities and subroutines which are likely to be of interest to a substantial proportion of the RSX/IAS community. Complete programs:
ADDDBAD - Adds bad blocks to the bad block file (BADBLK.SYS) without requiring volume re-initialization.
AFT - Prints all of the file names on a volume modified after a specified date. This was originally written when we had a disk hardware problem and wanted to recover as many files as we could from a rather corrupted disk.
ASG - This task will reassign the logical unit numbers of a task image without requiring the user to re-taskbuild with different ASG directives in the command file.
BLK - Locates the file which has a specific physical block allocated. Useful when there is a block showing up as bad in the error log which can be removed from circulation by moving the file and running 'ADDDBAD' on the block.
COMP - Compares two files on a block-by-block basis rather than the line-by-line basis used by CMP.
CPY - Copies files 63 blocks at a time for a faster transfer than PIP provides.
DAC - Sums up the disk space used by each UIC on the disk.
DELFID - Removes a file by file ID even if the file has a bad file header. This allows such files to be deleted without having to ZAP the INDEXF.SYS file manually or running DSC.
FIL - A utility which tries to reconstruct locked files.
FRG - Prints out disk space fragmentation information. This is a corrected and enhanced version of the FRG which was on the DECUS tape some time ago.
GREP - A utility for locating search patterns within a group of files. This is a much enhanced version of the GREP which appeared in an earlier DECUS tape.
PRECIS - This is an enhanced DMP-like utility which produces amore useable listing.
TRANSLATE - RT-11 supports ANSI magtape but it produces a format which isn't palatable to RSX/IAS systems. This program will convert a file transferred from an RT-11 magtape into something useful on a Files-11 system.
UNDELETE - This task will undelete a file under certain restrictions.
VOL - This allows modification of disk volume names and other characteristics.
INDEX - is a FORTRAN cross referencing program. A FORTRAN source file processed by index will be checked for all of its variable name and label usage.
PROFILE - the profile package is a set of two macro modules and this document that will allow the user to determine how often instruction memory locations are executed at run(crawl) time and a summary of what instructions were executed and registers and addressing modes used on both the instruction and program level.
MAZE - This is a modification of the vt-100 maze program that appeared on the Spring 81 VAX SIG tape to run under RSX.

BURSTF bursts the subroutines, functions, programs, and block datas in a FORTRAN source file into their own individual files.
ALSO:
TRU truncates files. Though PIP will also truncate files, PIP will change the revision date on all files specified, even if they did not require truncation. This will cause an incremental backup program (such as BRU) to needlessly backup files which have not been changed.
ALSO:
The program SCHEDULE allows a system manager to schedule tasks to be run at specified times and days. For example, you may schedule a timesharing parameter be changed each weekday at 08:00, and again at 18:00 on weekdays, or that a file be printed each saturday at 20:00.
ALSO:
PROBE is a system performance measuring tool. It indicates the amount of time being spent in interrupt processing, kernel space processing, user space processing, and null time. In addition, it provides some subroutine time histogramming for an adjustable number of (FORTRAN usually) tasks by taking advantage of the exit traceback information provided by the OTS. It is intended for use on a CRT, and is presently set for a VT100.
ALSO:
UNDELETE - the function of this program is to attempt to recover a recently deleted file. ALSO:
SEE is a real-time memory display which permits selective display of up to eight 'windows' anywhere in memory in word, byte or character modes on a VT-52. ALSO: This program will read a file under RSX-11M which was created by RSX-11M PIP but copied from an ASCII tape whose file was created by RT-11 PIP, and reformat the RT-11 file to RSX FILES-11 format. This works only for source code files, text files, DOC files, any ASCII file.

This area has a newer DTC (Desk Top Calendar) from C. Garman of RCA MSR. In particular meeting scheduling and instant queries of your schedule are much easier with this than with older versions. Also the display is much faster and more readable. ALSO: Keypad Macros for AnalytiCalc

TAR(Tape Archive & Retrieval) This directory contains all files necessary to build TAR, an RSX utility to manipulate UNIX TAR floppy volumes, either in normal UNIX format or in Tektronix TNIX(8560) format. This version of TAR has been modified so that: 1. It will assemble and run correctly with the supplied version of SUPERMAC, and 2. It works with RX50 drives that are
mounted foreign (e.g., by the supplied UTIL program). It is useful for communicating with VENIX or ULTRIX systems using RX50 media since they typically do not have magtape.

**ALSO:**

**SUPERMAC - Structured Programming Macros for MACRO-11**

1 diskette; Sources included; SOME objects; Task image included

**MACRO**

---

**S85-6**  
**Skeleton Device Drivers for RSX-11M, RSX-11M-PLUS**

**ALSO:**  
How Fast is your CPU? A set of programs which will measure CPU instruction execution speed, with test results for the PDP-11/70, PDP-11/84 and PRO-350, and a description of how the tests work. Also, a preliminary version of a speed test for the VAX.

**ALSO:**

**TIZ - Task Image Zapper**

**CALC - Calculator and radix converter.**

**BRU - BRU command line builder.**

1 diskette; Sources included; NO objects; NO task images

**MACRO ,FORTRAN-77**

---

**S85-7**  
**COMPOSE**  
The COMPOSE program permits you to design and automatically generate custom character sets for the VT200 family of terminals. **ALSO:**  
LABEL.TSK - A file called LABEL.CMD/1 is created in your current UIC; if you then include the command "@LABEL" in an indirect command file, the global string symbol "$LABEL" will be defined as the volume label of the specified disk. MAIN.CMD INDEX.CMD I'm not claiming wonderful things for these, but they're the best I could do in the middle of the night when I discovered how poorly the modules in [1,2]INDSYS.CLB worked on my system (RSX-11M+ V2.1E).

1 diskette; Sources included; SOME objects; SOME task images

**MACRO ,FORTRAN-77**

---

**F86-1**  
**APFELM - Graphical Presentation of Mandelbrot_Set.** APFELM displays in graphical form the so-called Mandelbrot_Set. With the help of a 'graphic-microscope' the complex-plane can be scanned for nice looking pictures.

**ALSO:**

This program converts a file of ReGIS graphics commands (as used by the VT125 and VT240 terminals) into Hewlett-Packard Graphics Language (HP-GL) (as used on the 7470A plotter), and sends them to the plotter via an HPIB interface.

1 diskette; Sources included; NO Objects, Task images included

**FORTRAN-77, MACRO**

---

**F86-2**  
**RSX BASIC - MICHAEL REESE VERSION**  
Reese Basic is a highly upgraded version of what used to be a DECUS library program for DOS.

4 diskettes; Sources included; SOME objects; NO task images

**MACRO**

---

**F86-3**  
**Script** is a menu-driven, command-language-level user interface. Simply put, Script reads its own DCL-like control language files and creates menus, from these and executes whatever commands are
associated with each chosen menu selection. Its target terminal device is any ANSI supporting CRT, but it will deal with hardcopy devices with some grace.

1 diskette; Sources included; Objects included; Task images included
FORTRAN-77

F86-4 EMPIRE - War Game of the Century  Empire is a strategy and tactics war game, you against the computer. It is played on a computer generated map containing land areas, sea areas, and cities. The object is to eliminate the opponent by capturing cities and destroying enemy forces. Cities, once captured, have production capability, and can produce units such as armies, fighters, destroyers, etc. for offense or defense.

ALSO:
This directory contains RENUM, a program which will renumber a Fortran program so that all statement labels in each compilation unit are numbered in ascending order.

1 diskette; Sources included; NO objects; Task images included
FORTRAN-77, MACRO

F86-5 This area contains four packages which we have found useful.
VIRTUAL DISKS: This is a composite of previous VD (and VE) software, with a few additions.
CLUNK CONVERSION: We pulled a CLUNK time routine from an old article, then discovered it told time like a 2 dollar watch! This is the fixed up version.
EFN: Everyone sooner or later writes or borrows an event flag manipulator. This is ours. Works from indirect command file or TI, can set or clear ranges of flags with a single command.
KEY: Time to put those VT220 programmable keys to work! This is our program to setup the programmable keys (shifted function keys) on the VT220 terminals.

1 diskette; Sources included; NO objects; NO task images
MACRO, FORTRAN-77, PASCAL

F86-6 This program is used to list file(s) on a VT100 family terminal. The file(s) are displayed one screen at a time for easy viewing. Various commands can be entered to change listing parameters or to position to a particular portion of the file.

2 diskettes; Sources included; SOME objects; NO task images
MACRO

F86-7 The DIRECTORY command lists the files contained in a directory. When you use certain qualifiers with the command, additional information is displayed, along with the names of the files. The output of the DIRECTORY command depends on certain formatting qualifiers and their defaults. These qualifiers are: /COLUMNS, /DATE, /FULL, /OWNER, /PROTECTION, and /SIZE.

1 diskette; Sources included; SOME objects; NO task images
MACRO

F86-8 The AUX program allows VT100 auxillary key definitions and command line editing ala VAX/VMS V4.x systems. The program also saves the last twenty commands which can then be recalled.

1 diskette; Sources included; SOME objects; NO task images
MACRO
This directory contains two papers that were to be presented at the Fall 1986 DECUS U.S. Symposium: - Introduction to the RSX, P/OS, and RT Indirect Command File Processor (RX018) - Programming in the RSX Indirect Command Language (RX019) Also included are the command files from which the examples in RX019 came. ALSO: This account contains material relevant to DATATRIEVE Plots.

ALSO: This directory contains some transcriptions or proceedings submissions of DECUS Symposia sessions relating to DATATRIEVE.

1 diskette; NO sources; NO objects; NO task images
RUNOFF, Indirect Command files

QUAD.* is an account of how to read DATATRIEVE Quadword dates in FORTRAN and other languages. QUADAS.MAC goes with this. CONSOLE.* is a way to process the RSX consol log file with DATATRIEVE to pull out various items like batch and print jobs, logins, etc. Most of the rest of the stuff has to do with processing RSX-11M-Plus System Accounting information with DATATRIEVE, and with some FORTRAN programs (one to rectify the data, the others are for graphing the data on a PRO-3xx system).

1 diskette; Sources included; NO Objects; NO task images
FORTRAN-77, MACRO

BASPOS (file BASPOS.TSK) is essentially an RSX-11M form of the Michael Reese BASIC interpreter for a PDP-11 as contained on DECUS tape 11-SP-72. I have generated a simplified single-user modification of the RSX-11M form for the PRO-350/380 under hard disk P/OS; either v2.x or v3.x should be ok.

2 diskettes; Sources included; NO Objects; Task images included
MACRO, FORTRAN-77

Distribution of the Public Domain Library is handled in the following way: After looking through the "catalog" and selecting the items you want, send me enough diskettes to hold the software you desire. Diskette counts are listed with each catalog entry. Include a return mailer, box, carton, palette, etc. sufficiently large to hold the diskettes. Include enough postage to pay for the return trip. I will NOT use UPS. Sorry. 1st class mail is recommended, but parcel post is ok. I will then copy the requested software for you and send it along. Give me at least a week for ANYTHING (plus travel time). Large (more that 5 diskettes) orders will likely take longer. Specify the software you want by catalog number.

PLEASE don't ask for "specials". It took a lot of time to put THIS collection together.

Contributions are also welcome. However, if the work is NOT YOURS TO GIVE, please DON'T.

In addition to this diskette based distribution, we are planning a tape distribution as well. The tape will be available after the Spring '88 symposium in the following formats: RSX BRU (1/2 " 9 track 1600 BPI and TK50); VMS BACKUP (1/2" 9 track 1600 BPI and TK50). The tape will contain EVERYTHING that we can assemble by then.

Send your diskette based contributions and/or software requests to me:
Gary Rice
PC SIG Newsletter Editor
McDonnell Douglas
5555 Garden Grove Blvd.
Westminster, CA 92683
Send your tape based contributions ONLY to:

Tom Hintz
PRO/MAC/WORKSTATIONS Working Group Chair
University of Florida
IFAS Computer Network
Bldg 120
Gainesville, FL 32611

OR BRING THEM WITH YOU TO SPRING SYMPOSIUM IN CINCINNATI!

If you are submitting something to the collection, please include a signed copy of the following statement with your submission:

_The program that I am submitting to the Public Domain titled ______________________________ does not contain technical data/information that is proprietary, classified under US Government Secrecy Laws, controlled by non-disclosure agreements with the US Government or third parties or governed by US Department of State’s International Traffic in Arms Regulations (ITAR)._ 

_Full and irrevocable permission and consent is hereby given to DECUS to reproduce, distribute and publish in whole or in part, in any form and without restriction, this program or revision and any information relating thereto. The undersigned hereby warrants and represents that s/he has good and sufficient right, interest and title in and to this program or revision and the related information to grant such permission to DECUS._

**Correction to Article**

**By Tom Hintz, PRO/MAC/Workstations Working Group Chair**

I read the article by Tony Klancar ("BIGger Disk Drives and the PRO" with great interest. However, I could not figure out why he could not determine the disk controller board rev levels from my previous article ("Hard Disks and Controller Boards for the PRO", July, 1987). After going back and reviewing my published article I found that the table had been reproduced incorrectly. Three columns of ROM values were identical. The corrected table of ROM controller chips is given below.

<table>
<thead>
<tr>
<th>CONTROLLER board no.</th>
<th>OLD (REV. 0)</th>
<th>NEW (REV. 0)</th>
<th>??? (REV. 0)</th>
<th>NEW (REV. 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROM #1</td>
<td>54-15134</td>
<td>54-15134</td>
<td>54-15134</td>
<td>54-15134-01</td>
</tr>
<tr>
<td>ROM #3</td>
<td>014B2</td>
<td>014B2</td>
<td>014B2</td>
<td>073B2</td>
</tr>
<tr>
<td>ROM #3</td>
<td>012B2</td>
<td>021B2</td>
<td>063B2</td>
<td>071B2</td>
</tr>
</tbody>
</table>

Table 2. Numbers found on various components of hard disk controller board.

Sorry for any inconvenience. In the future I will try to review my published articles for accuracy as soon as they appear in print.

Tom Hintz

**PRO Software List Update**

**Coordinated by Gary Rice, PC SIG Newsletter 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 was last published in the March, 1988 issue of these Newsletters. The updated list reflects information that I have received as of February 20, 1988. An asterisk by an entry indicates that the item has changed or been added since the last time the list was published.
<table>
<thead>
<tr>
<th>DEC Software</th>
<th>List Price</th>
<th>Last Rev</th>
<th>Source of info</th>
<th>Still Supported?</th>
<th>P/OS v3 Supported?</th>
</tr>
</thead>
<tbody>
<tr>
<td>20/20</td>
<td>495</td>
<td>1.0.54</td>
<td>User</td>
<td>Yes</td>
<td>UNK</td>
</tr>
<tr>
<td>Athena/Graph</td>
<td>450</td>
<td>1.0</td>
<td>DEC</td>
<td>Yes</td>
<td>UNK</td>
</tr>
<tr>
<td>BASIC-11/RT-11</td>
<td>(Replaced - See BASIC-PLUS/RT-11)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BASIC-PLUS/RT-11</td>
<td>UNK</td>
<td>3.0</td>
<td>DEC</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>CT*OS</td>
<td>UNK</td>
<td>1.0</td>
<td>DEC</td>
<td>Yes</td>
<td>UNK</td>
</tr>
<tr>
<td>Design Graphix/Executive</td>
<td>595</td>
<td>1.0</td>
<td>User</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Easentry</td>
<td>995</td>
<td>3.0B</td>
<td>DEC</td>
<td>Yes</td>
<td>UNK</td>
</tr>
<tr>
<td>FORTRAN IV/RT-11</td>
<td>495</td>
<td>2.8</td>
<td>DEC</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>Installation &amp; Maintenance</td>
<td>UNK</td>
<td>3.2</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>LOGO</td>
<td>350</td>
<td>1.4</td>
<td>DEC</td>
<td>Yes</td>
<td>UNK</td>
</tr>
<tr>
<td>MAIL-PLUS</td>
<td>N/A</td>
<td>1.0</td>
<td>DEC</td>
<td>No</td>
<td>N/A</td>
</tr>
<tr>
<td>MJA Accounts Payable</td>
<td>600</td>
<td>5.2</td>
<td>DEC</td>
<td>Yes</td>
<td>UNK</td>
</tr>
<tr>
<td>MJA Accounts Receivable</td>
<td>600</td>
<td>5.2</td>
<td>DEC</td>
<td>Yes</td>
<td>UNK</td>
</tr>
<tr>
<td>MJA General Ledger</td>
<td>600</td>
<td>5.2</td>
<td>DEC</td>
<td>Yes</td>
<td>UNK</td>
</tr>
<tr>
<td>MJA Order Entry/Inventory</td>
<td>600</td>
<td>5.2</td>
<td>DEC</td>
<td>Yes</td>
<td>UNK</td>
</tr>
<tr>
<td>MJA Payroll &amp; Personnel</td>
<td>600</td>
<td>5.2</td>
<td>DEC</td>
<td>Yes</td>
<td>UNK</td>
</tr>
<tr>
<td>NPL Information Management</td>
<td>N/A</td>
<td>1.4</td>
<td>DEC</td>
<td>No</td>
<td>UNK</td>
</tr>
<tr>
<td>Phoenix-PRO</td>
<td>1795</td>
<td>1.0A</td>
<td>DEC</td>
<td>Yes</td>
<td>UNK</td>
</tr>
<tr>
<td>P/OS ADCCP Driver</td>
<td>UNK</td>
<td>1.0</td>
<td>DEC</td>
<td>UNK</td>
<td>UNK</td>
</tr>
<tr>
<td>P/OS (Diskette)</td>
<td>N/A</td>
<td>1.8</td>
<td>DEC</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>P/OS (Hard Disk)</td>
<td>475</td>
<td>3.2</td>
<td>User</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>P/OS Hard Disk (Arabic)</td>
<td>783</td>
<td>R3.1</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO 2780/3780</td>
<td>53</td>
<td>1.2</td>
<td>DEC</td>
<td>DECUS</td>
<td>No</td>
</tr>
<tr>
<td>PRO Application Starter Kit</td>
<td>399</td>
<td>1.0</td>
<td>DEC</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>PRO/Associate</td>
<td>N/A</td>
<td>1.0</td>
<td>DEC</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>PRO/BASIC</td>
<td>195</td>
<td>1.4</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/Comm (diskette)</td>
<td>N/A</td>
<td>1.8</td>
<td>DEC</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>PRO/Comm (hard disk)</td>
<td>195</td>
<td>3.0</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/CPM-80</td>
<td>UNK</td>
<td>1.1</td>
<td>DEC</td>
<td>UNK</td>
<td>UNK</td>
</tr>
<tr>
<td>PRO/Datatrieve</td>
<td>495</td>
<td>2.0</td>
<td>User</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/DECNet</td>
<td>250</td>
<td>2.1</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/FORTRAN-77 Debug (See PRO/Toolkit Symbolic Debugger)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRO/IVIS</td>
<td>UNK</td>
<td>3.1</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/Laboratory Subroutine Lib.</td>
<td>300</td>
<td>1.2</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/NAPLPS</td>
<td>N/A</td>
<td>1.0</td>
<td>DEC</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>PRO/Office Workstation</td>
<td>UNK</td>
<td>2.0</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/PRODUCER Toolkit</td>
<td>300</td>
<td>1.6</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/RDT</td>
<td>495</td>
<td>1.1</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/Scientific Subroutine Library</td>
<td>300</td>
<td>1.3</td>
<td>DEC</td>
<td>UNK</td>
<td>No</td>
</tr>
<tr>
<td>PRO/SIGHT</td>
<td>295</td>
<td>1.1</td>
<td>User</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/SNA</td>
<td>N/A</td>
<td>1.1</td>
<td>DEC</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>PRO/Smart Mailer</td>
<td>53</td>
<td>1.0</td>
<td>User</td>
<td>DECUS</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/Toolkit</td>
<td>520</td>
<td>3.2</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/Toolkit BASIC-PLUS-2</td>
<td>495</td>
<td>2.5</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/Toolkit COBOL-81</td>
<td>495</td>
<td>2.4</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/Toolkit DIBOL</td>
<td>495</td>
<td>1.7</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/Toolkit FORTRAN-77</td>
<td>495</td>
<td>5.2</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/Toolkit PASCAL</td>
<td>495</td>
<td>1.3</td>
<td>User</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/Toolkit Real Time Library</td>
<td>150</td>
<td>2.1</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/Toolkit Symbolic Debug</td>
<td>200</td>
<td>2.0</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PRO/VENIX</td>
<td>495</td>
<td>2.0</td>
<td>DEC</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>PRO/Videotex</td>
<td>895</td>
<td>1.0</td>
<td>DEC</td>
<td>Yes</td>
<td>UNK</td>
</tr>
<tr>
<td>Professional CTS-300</td>
<td>995</td>
<td>1.0</td>
<td>DEC</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>DEC Software</td>
<td>List</td>
<td>Last</td>
<td>Source of info</td>
<td>Still Available?</td>
<td>P/OS v3 Supported?</td>
</tr>
<tr>
<td>--------------</td>
<td>------</td>
<td>------</td>
<td>----------------</td>
<td>------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Professional Real Time Lib/RT-11</td>
<td>250</td>
<td>1.0</td>
<td>DEC</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>PROSE PLUS</td>
<td>295</td>
<td>2.0</td>
<td>User</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>RS/1</td>
<td>1900</td>
<td>12.0</td>
<td>User</td>
<td>Yes</td>
<td>UNK</td>
</tr>
<tr>
<td>RSX Host Toolkit</td>
<td>UNK</td>
<td>3.0</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>RT-11</td>
<td>550</td>
<td>5.4B</td>
<td>DEC</td>
<td>Yes</td>
<td>N/A</td>
</tr>
<tr>
<td>Supercomp-20</td>
<td>N/A</td>
<td>1.28</td>
<td>User</td>
<td>No</td>
<td>UNK</td>
</tr>
<tr>
<td>Synergy</td>
<td>695</td>
<td>2.0</td>
<td>User</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>VAX Host Toolkit</td>
<td>UNK</td>
<td>3.0</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>WPS/Plus</td>
<td>695</td>
<td>1.0</td>
<td>DEC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3rd Party Software</th>
<th>List</th>
<th>Last</th>
<th>Source of info</th>
<th>Still Available?</th>
<th>P/OS v3 Supported?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Vendor)</td>
<td>List</td>
<td>Last</td>
<td>Source of info</td>
<td>Still Available?</td>
<td>P/OS v3 Supported?</td>
</tr>
<tr>
<td>D-M-DRIVER for P/OS</td>
<td>295</td>
<td>V2/V3a</td>
<td>Vendor</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>(PROTO SYSTEMS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fingraph</td>
<td>N/A</td>
<td>2.0</td>
<td>DEC</td>
<td>No</td>
<td>UNK</td>
</tr>
<tr>
<td>(Graphic M<em>I</em>S)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT*OS</td>
<td>UNK</td>
<td>5.2</td>
<td>User</td>
<td>Yes</td>
<td>UNK</td>
</tr>
<tr>
<td>(Intermation)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online Disk Unfragmentor</td>
<td>59</td>
<td>2.0</td>
<td>Vendor</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>(By Hand)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRO/Menu Manager</td>
<td>25</td>
<td>1.0</td>
<td>User</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>(Wasetech Computer)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRO/Sentinel</td>
<td>47</td>
<td>1.0</td>
<td>Vendor</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>(By Hand)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRO/Session Logger</td>
<td>29</td>
<td>2.0</td>
<td>Vendor</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>(By Hand)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRO/Text Locator</td>
<td>43</td>
<td>1.1</td>
<td>Vendor</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>(By Hand)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RDM Relational Data Manager</td>
<td>995</td>
<td>4.0L</td>
<td>User</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>(Interactive Technology)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*SATURN-BASE</td>
<td>750</td>
<td>1.4</td>
<td>Vendor</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>(SATURN SYSTEMS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*SATURN-CALC</td>
<td>500</td>
<td>3.0</td>
<td>Vendor</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>(SATURN SYSTEMS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*SATURN-GRAPH</td>
<td>500</td>
<td>2.0</td>
<td>Vendor</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>(SATURN SYSTEMS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*SATURN-WP</td>
<td>600</td>
<td>4.5</td>
<td>Vendor</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>(SATURN SYSTEMS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPSS/Pro</td>
<td>UNK</td>
<td>1.1</td>
<td>Vendor</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>(SPSS Inc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TKISolver</td>
<td>N/A</td>
<td>1 (2A)</td>
<td>User</td>
<td>No</td>
<td>UNK</td>
</tr>
<tr>
<td>(Software Arts)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 publish a new list each time it changes.

You can contact me at: McDonnell Douglas
5555 Garden Grove Blvd.
MS: K20 77/200
Westminster, CA 92683
(714) 952-6582

PC-9
This month's "Quickie" was born in true Shakespearean fashion: as "A Comedy of Errors". Back in the "Good-Olde-Days" of P/OS version 2, I developed an application that manipulated files by using the DCL copy program PIP.TSK. The program would build a command line and then SPAWN PIP with the command line included. This worked fine with the 80 character command line buffer that I built into the program.

With the introduction of P/OS version 3, DEC created "sub-directories" that my application then had to worry about. The 80 character command line turned out to be too short to hold the worst case situation of renaming a file from one sub-directory to another where all of the various pieces of the command were at maximum length. That is, each directory was 9 characters, each sub-directory was 9 characters, etc. NO PROBLEM, I simply extended the command line buffer in the program to the documented maximum of 255 characters.

The program began to fail with PIP syntax errors. After checking several things, I examined the command line buffer. It seemed that after the "SPAWN" call, the buffer contained only 80 characters and the 80th one was a dash ("-"), the DCL continuation indicator. Since I didn't put it there, I had to assume that the system did. After several hours of fiddling and coaxing, I decided that there was NO WAY to get PIP to accept a command longer than 80 characters from the "SPAWN" system call.

Next approach: Shorten the command line presented to PIP. The obvious choice was to set my current default to the source directory so that the command wouldn't need to reference the disk, directory or sub-directory. By taking that approach, I could get the command length down to under 80 characters in a worst case situation. Setting a new default seemed easy since there was a PRO specific call in the POSSUM Library known as PROLOG that would do it. I set up a call to PROLOG and tried it. Strange things happened. The call itself returned no errors, but my current default value ended up in Never-Never Land. After working on it for quite awhile, I gave up. The "SET DEFAULT" function of PROLOG refused to put me where I wanted to be.

Well, I STILL had the original problem, so I asked myself "How does P/OS perform a "SET DEFAULT" request?" Taking THAT approach, I discovered a nice little program that comes with the Command Language application that performs the request flawlessly. The program is LCT.TSK and it is conveniently installed for you when you activate Command Language. After a little experimentation, I figured out the proper command to send to LCT for both P/OS version 2 as well as P/OS version 3. The following subroutine shows you what I found.

It assumes that LCT.TSK has been installed previously.

```c
C SETDEF.FTN - This subroutine sets or restores the default directory
C
C ORIG VERS: 1.0
C CURR VERS: 1.0
C AUTHOR: Gary Rice
C CREATED: January 17, 1988
C REVISIONS: None
C
C INPUTS: CHARACTER*40 DEFALT value to establish as the new default
directory. This MUST contain a disk AND directory reference.
C
C OUTPUTS: INTEGER*2 DSW (Directive Status Word) returned by SPAWN
(and TRALOG) - set to 1 if success
```
C NOTES: None

SUBROUTINE SETDEF (DEFALT, DSW)

INTEGER*2 FLAG, DSW, SIZE, EXST

INTEGER*4 TASK

CHARACTER*8 POSVER

CHARACTER*40 DEFALT

CHARACTER*60 COMAND

Begin by getting the version of P/OS being used

CALL TRALOG (0,,,'POS$VER',7,POSVER,8,SIZE,,DSW)

IF (DSW .NE. 1) RETURN

IF (POSVER(2:2) .EQ. '1') RETURN ! I didn't do it for P/OS v1.n

Begin setting up the command to send to LCT

COMAND=''

IF (POSVER(2:2) .EQ. '2') THEN

    COMAND(1:4) = 'LCT'
    COMAND(5:6) = 'K'
    SIZE=6
    CALL IRAD50 (6,'...LCT',TASK)
    COMAND(1:4) = 'MMV'
    COMAND(5:16) ='SET DEFAULT'
    SIZE=16
    CALL IRAD50 (6,'...MMV',TASK)

ELSE

    COMAND(1:4) = 'MMV'
    COMAND(5:16) ='SET DEFAULT'
    SIZE=16
    CALL IRAD50 (6,'...MMV',TASK)

END IF

I = INDEX (DEFALT(1:),']') ! Point to the "[" in DEFALT

COMAND(SIZE+1:SIZE+I) = DEFALT(1:I) ! Add DEFALT to COMAND

SIZE = SIZE + I ! Determine the length of COMAND

FLAG = 1 ! Pick an event flag for SPAWN

CALL SPAWN (TASK,,FLAG,,EXST,,COMAND,SIZE,0,,DSW) ! Issue the command

IF (DSW .NE. 1) RETURN ! See if the command was right

CALL WAITFR (FLAG)

RETURN

END

Send me your own PROgramming Quickie and I will publish it here in this on-going column in these Newsletters. (RXSO Please)

Digital's DEPCA

By The Personal Computer Systems Group, Digital Equipment Corporation Littleton, Massachusetts

Now you can get a high-performance Ethernet/802.3 local area network controller for use in your PCs. Digital's DEPCA board brings the power of Ethernet LAN connectivity to personal computers. The DEPCA is a component...
of Digital’s solution to the integration of IBM PC/XT/AT personal computers into a VAX/VMS and DECnet/Ethernet computing environment.

The DEPCA controller supports the use of Digital's DECnet-DOS, VAX/VMS Services for MS-DOS and PC ALL-IN-1 software for networked PCs. The DEPCA connects directly to Ethernet and also supports Digital's mouse for use with Microsoft's MS-Windows user interface.

**Highlights**

- Connects IBM PC family personal computers to Ethernet and IEEE 802.3 Local Area Networks
- ThinWire Ethernet connection is standard, conventional Ethernet connection is optionally available *
- High-performance LANCE-based network controller, with 48 Kbytes of RAM for multi-buffering, handles high network traffic loads without performance degradation
- Includes Data Link layer and self-test firmware in on-card ROM
- Connection for Digital's mouse supports MS-Windows
- Available as separate option or as part of Digital's IBM PC Network Integration Packages

**High-Performance Controller Features**

The DEPCA provides enhanced performance capability and operates at 10 Mb/s. Actual device speed and throughput depend on current operating system limitations, system configuration and system CPU clock speed and applications in use. The DEPCA contains 48 Kbytes of RAM memory, used primarily for buffering of network data at the high bus data rate. The personal computer's CPU is used for access to the buffer memory. The CPU is also used to execute data link and self-test firmware contained in a 16-Kbyte ROM memory located on the DEPCA module.

The DEPCA board implements all data link and physical channel level access functions to ensure maximum throughput. It provides significant network maintainability features including remote loopback of data from other stations, resident self-test diagnostics, and system identification.

The use of second generation LSI controller technology, coupled with the efficient high-speed dual-ported buffer memory, allows the DEPCA to handle high levels of network traffic without performance degradation. Multiple transmit and receive buffers and multicast address filtering contribute to the DEPCA's high performance. The DEPCA is capable of receiving bursts of several back-to-back Ethernet frames, reducing the incidence of network time-outs and retransmission of frames on a busy network. Controllers without this capability suffer performance degradation under heavy network loads.

The DEPCA board implements as asynchronous serial channel for connection to Digital's VSXXX-AA three-button mouse. This interface may be operated in an interrupt-driven environment.

**Connects to ThinWire and Conventional Ethernet**

The DEPCA interfaces to the network in one of two ways. In the standard configuration, the DEPCA connects directly to the ThinWire Ethernet coaxial cable, using integral transceiver (MAU) circuitry. The second, optional, configuration uses the AUI Connector Option (DEPCA-AU) to connect to the network via a transceiver (AUI) cable (BCC06-15) and a transceiver (H4000) or Local Network Interconnect (DELNI).

The DEPCA-AA option is comprised of the DEPCA module, Owner's Manual, and a ThinWire Ethernet cable kit (BC16T-12). The DEPCA-AU option is comprised of an AUI connector assembly and a mating transceiver (AUI) cable (BCC06-15). The DEPCA module is also available in the IBM PC Network Integration Package along with a license for Digital's DECnet-DOS and PCSA/PC Client software, for use with VAX/VMS Services for MS-DOS server software.

**Interfaces Easily to the PC System Bus**

The DEPCA module is an IBM PC form factor circuit card, using the 8-bit bus connector, with no "overhang" interference. The DEPCA will operate in PC and PC/XT systems with a 4.77 MHz or 8 MHz bus clock and PC/AT systems with either a 6 MHz or 8 MHz bus clock. The DEPCA utilizes 64 Kbytes of system memory address space, 16 I/O port addresses, and two interrupt vectors. The memory and I/O addresses are selectable as primary or secondary assignments, and the interrupt vectors are selectable among five possible assignments.
Selection of these assignments is provided to allow maximum flexibility in configuring systems with multiple possible IBM or third-party option cards.

**Operating Requirements**

To use the DEPCA Ethernet controller in your PC, it must meet the following configuration requirements:
- IBM power supply is at least 130 W.
- 128 Kbytes of memory to run DEPCA service diagnostics; additional memory (up to 640 KB) may be required to run networked software. (Refer to the appropriate Software Product Description.)
- ROM BIOS revision date of 10-27-82 or later (IBM PC only).

**Electrical Specifications**

<table>
<thead>
<tr>
<th>Address assignments:</th>
<th>Primary</th>
<th>Secondary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory</td>
<td>D0000-DFFFF</td>
<td>E0000-EFFFFF</td>
</tr>
<tr>
<td>I/O</td>
<td>300-30F</td>
<td>200-20F</td>
</tr>
</tbody>
</table>

Interrupt vector assignments:

- Network interface controller: IRQ2, IRQ3, IRQ4, IRQ5, IRQ7
- Mouse interface controller: IRQ2, IRQ3, IRQ4, IRQ5, IRQ7

Prior to installation of the DEPCA module, all potential address and interrupt vector conflicts with other option cards must be resolved. NOTE that the secondary memory address assignments cannot be used on the IBM PC/AT.

Power requirements:
- DC amps drawn at +5V: 2.0 A (max)
- DC amps drawn at +12V: 1.35 (max) (1.0 A to power the H4000 transceiver)
- DC amps drawn at -12V: 0.05 (max)
- Bus loads: 2 LSITTL loads

**Physical Characteristics**

- Form Factor: IBM PC-bus, 8-bit connector, full length card
- Mounting Code: 1 8-bit PC-bus slot (2 when used with DEPCA-AU)
- I/O Connection Panel Inserts: 1 slot (2 when used with DEPCA-AU)

**Operating Environment**

The DEPCA board will operate when installed in a personal computer system box located in the following operating environment:
- Temperature (at sea level) 59 - 90 degrees F
- Relative Humidity: 8 - 80 percent (non-condensing)
- Radiated Emissions: FCC Class B

For more information on Digital's integrated personal computing solutions, contact your local Digital sales representative. An information sheet on VAX/VMS Services for MS-DOS (ED-31203-69) and an information sheet on Network Integration for the IBM-PC Family (ED-31148-69) are available from your local Digital sales office.

The following are trademarks of Digital Equipment Corporation:
- DEC, DECnet, DELNI, DEPCA, PCSA, ThinWire, VAX and VMS.

IBM, PC/XT and PC/AT are trademarks of International Business Machines Corporation.
- MS and MS-Windows are trademarks of Microsoft Corporation.
- Ethernet is a trademark of Xerox Corporation.
"Sloths are so human in appearance-- and in some of their ways-- that inevitably one tends to judge them by human standards."

--Hermann Tirler, A Sloth in the Family
The Newsletter of the DECUS Artificial Intelligence
Special Interest Group

Vol. 3 No. 8 April 1988

FROM THE EDITOR:
Welcome to the first 1988 edition of the DECUS AI SIG newsletter. Although this issue is devoid of late-breaking AI news, I am pleased to report that the AI SIG steering committee has resolved to improve the quality, consistency and scope of YOUR newsletter. While many of the salient features of THE LINKED LIST, Version 2 are unresolved, we are considering topics such as a revised publishing schedule and the exchange of AI-related material with international DECUS publications. If you have any suggestions or ideas for the Version 2 project, please drop me a line or give me a call at work or home.

And speaking of work and home, I began the new year with a new job and a new home address. In early January, I hung up my trenchcoat and resigned from Digital Review to accept a job with Computer Information Systems, Inc., in Braintree, Mass. My new position includes some AI-related responsibilities that may form the basis for a future series of articles. In the meantime, you are cordially invited to contact me at my new business address:

Terry C. Shannon
Technical Consultant
Computer Information Systems, Inc.
165 Bay State Blvd
Braintree, MA
(617) 848-7516

For those of you who prefer to send material to a non-business address, Chez Shannon is at:

8 Calvary Street
Waltham, MA 02154

As always, I look forward to receiving your submissions and suggestions for THE LINKED LIST.

Terry C. Shannon
DECUS AI SIG Newsletter Editor

SIG Notes

By Cheryl Jalbert
DECUS AI SIG Chair

There are several things brewing that I’d like to share with you. Please let me hear your opinions on them.

In April at our steering committee meeting, we will discuss THE LINKED LIST and other forms of written communication among AI SIG members. Jean-Pierre Bierdot, Chair of SIG IA (the Al SIG of France), will be attending our meeting and we expect him to participate enthusiastically in the newsletter discussion. Jean-Pierre and Alexis Santoni, Chair of the newly formed AI working group in European DECUS, have been eager to participate with us in defining what sort of newsletter will be valuable as a joint effort for all DECUS members interested in AI. What would you like to see in the way of a newsletter or other communication?

Later in April, Don Rosenthal, Art Beane, and I will be attending the French DECUS Symposium. I’ll be giving a pre-symposium seminar, and we’ll each be giving a session. Jean-Pierre tells me that they are planning 42 AI sessions for the three day symposium.

For our own symposium in May, we have some exciting plans. I’d like to share just a few comments.

We’ve been holding a Great Tool Debate on Thursday evenings. We gather several people who are specialists in one or another tools and ask them questions intended to get a debate going. This symposium, we will still have the usual debate about what characteristics are important in an AI tool, but there’s a new issue that may color the debate. The vendors of AI tools are redefining the market place. As classic names in AI tools withdraw products from the market to concentrate on producing complete applications, we have to wonder what answers will take their place.

If you’ll be attending the symposium please notice that the Roadmap is at 10 Monday morning following the Introduction to AI session. (We thought we’d give the novice a chance to catch some of the vocabulary. We’ll be looking for comments on this scheduling approach.) The roadmap is a good way to find out what the plans for the week are and to catch last minute announcements.

Please also note that we have potentially excellent sessions scheduled all day long on Friday. Don’t think of leaving early Friday! After an incredible week of sessions, maybe a pre-symposium seminar on Sunday, playing with a variety of software in the campground, talking with Digital’s AI developers and researchers, staying up until all hours in the suite talking AI, and establishing those relationships that let you call someone who may have an answer when you need help, come to the suite Friday evening and celebrate with us the conclusion of a great experience!

If you have been wanting to participate more in the AI SIG or if you will be coming to Cincinnati on Saturday before the symposium and think that you might like to check in with us, please give me a call or write me a note to tell me so. (That’s Box 381, Granville, Ohio 43023 or 614-587-0157.) We generally have a meeting on Saturday before the symposium in the suite. That way, anyone can join us who is coming in early for a PSS or for any other reason. This symposium we may have the meeting in another location and I don’t want to miss any of you who are interested.

THE EXPERT-SHELL GAME

By Judith A. Friel

Copyright © 1987 by Ziff Communications Corp.

Editor’s Note: The following article is reprinted from the 23 November 1987 issue of Digital Review with the permission of the author and Ziff Communications Corp.

Skeptics are quick to point to the recent financial troubles of leading AI vendors as final proof that artificial intelligence is indeed much hype and no substance. From its inception in the 1950s, AI has been the focus of controversy and hearsay. AI has appeared to many as nothing more than pie-in-the-sky technology and has already been dismissed by some industry watchers as overpriced and inefficient.

Industry leaders, however, are by no means ready to agree with this dismissal and have altered their approach to marketing by stressing integration with existing systems and user accessibility. New and still-to-be announced products alike point towards a less restrictive and less formidable technology. Vendors are deliberately taking AI out of the laboratory and into the marketplace, while striving for the first time to tailor their products to user needs.

Market analysts perceive this change in focus as crucial. A major obstacle in AI’s development has been the schism between customer needs and vendor offerings. say market analysts. Likewise, the shift from expert systems to customized applications is a promising one and analysts expect AI to become a leading force in software technology by 1990.

*Filling In Expert Shells*

Expert systems are the most visible and easily marketable aspect of artificial intelligence technology. As defined by DEC and most other vendors, an expert system is a “computer program that contains knowledge about a particular domain, and emulates the reasoning process of human experts.” Los Angeles-based Inference Corp. stresses that expert systems “provide complex problem solving in areas not served by conventional computer programs.”
Tools are expert system shells and are usually sold with only an inference structure and framework in place. Tool vendors claim that this allows for optimum customization, whereas critics point to the high cost of knowledge extraction, which is passed on to the user. Relatively new on the scene are preconfigured applications or filled-in shells. These are suitable for fields that share common procedures as there is less room for customization. Applications are generally packaged to increase accessibility and remove the time-consuming process of extracting knowledge from an in-house expert.

Analysts express optimism when focusing on expert system shells and tools. Beth R. Krasnow of Dataquest Inc., a market research firm in La Jolla, Calif., sees this as an "exciting, healthy year. People are getting practical and are no longer stressing razzle-dazzle." Krasnow also feels that the "major shakeout" that is occurring is a healthy one.

"I see the promise of AI fulfilled in a very down-to-earth way," she said. Based on research done by Dataquest, she projects that worldwide revenues for expert system development tools will reach $294 million by 1990.

Donald Sundue, vice president of program management at the Cambridge, Mass.-based Symbolics Inc., likewise sees the market doing well, despite the $25.54 million loss that Symbolics posted this year. Part of the loss was attributed to the company's real estate dealings, he said.

Harvey Newquist, editor of the Scottsdale, Arizona, publication, "AI Trends," explained that the market has slowed down somewhat and is "regrouping and retrenching." Senior analyst Bill Martorelli, of New Science Associates Inc., a market research firm in South Norwalk, Connecticut, feels that expert systems are slowly "getting ready for the marketplace."

*Packages, Not Shells*

"The people we're dealing with don't care whether or not they're using AI," explained APEX's Luconi. "but they are concerned with what the software does." Cheryl Jalbert, Chair of the Digital Equipment Users Society (DECUS) AI Special Interest Group and analyst with JCC Consulting of Granville, Ohio, concurred: "AI questions aren't of interest to the person with the problem."

There is a definite trend towards marketing applications as a total AI product. Some vendors feel that users are more likely to purchase a complete package than an empty shell. As Esther Dyson, editor of "Release 1.0," a software information newsletter in New York observed, "There are demands for applications today, not tools. Vendors are therefore spending more on applications and implementations."

Intellercorp's Kehler explained, "The market is experiencing a broadening of applications to more than expert systems." Valuable applications, he stated, were gained not only by looking at a rule base, but by interfacing knowledge representation capabilities with databases.

Martorelli of New Science Associates, however, stressed that the trend towards applications will not supplant the need for expert system shells. "Naked shell tools won't go away," he stated. "They are a part of the business." The trends emphasizing shells are present, though not overwhelming." Martorelli said. "The old stuff won't disappear."

A need for customer consulting has also arisen. Most major vendors do some form of consulting to augment their products, and special consulting firms provide their services to potential AI users as well.

Jalbert of JCC Consulting stressed that the best approach is to market solutions as opposed to tools. She and other consultants help the user decide which is the most powerful and least restrictive tool that will meet their needs, then follow through with training, further consulting, and "hand-holding if necessary."

"Inference Corp.'s Jacobson states that their professional services operation, which primarily does consulting, is growing at 100 percent a year and is responsible for 40 percent of their revenue.

*Slow Integration Process*

This shift of offering solutions in the marketplace represents a change in focus for most AI vendors. As Newquist explains, "Vendors have been technologically driven, as opposed to market driven." Howard Austin, president of Knowledge Analysis Inc. of Concord, Mass., agrees. "Some pretty obvious issues weren't caught. There was little concern for solving real market problems."

As some analysts point out, time is the key issue in assessing the success or failure of expert systems.

"We're dealing with maturing technologies that are just becoming commercialized," Dataquest's Krasnow stated. Fred Luconi, president of the Cambridge, Mass.-firm Applied Expert Systems Inc. (APEX), feels that the relatively slow progress of AI is due to its complexity. "AI can be a strategic technology, which can cause changes in an organization. This process of change within organizations takes a long time."

Alexander D. Jacobson, president of Infrence Corp., a Los Angeles-based firm that markets the Automated Reasoning Tool (ART), agrees that there is no reason to prematurely predict AI's downfall. "It takes business roughly ten years to assimilate a new technology. My sense is that we're right on schedule, four years down the line."

Despite these bright projections, many vendors are suffering financially. Inference is a privately held firm, for which figures are unavailable, but is widely believed to have sustained recent losses. Intellercorp. Inc. of Mountain View, Calif., the manufacturer of the Knowledge Engineering Environment (KEE), posted a net loss of approximately $4 million for fiscal 1987.

Tom Schwartz, founder of the consulting firm Tom Schwartz Associates, also located in Mountain View, explained, "Vendors are losing money because they expected the research and development market to go on forever." The research community, according to Schwartz, is saturated. "The resulting shift entails moving expert systems out of research and development, toward management of information systems [MIS]."

Harvey Newquist also stressed the saturation of the current market. "Vendors missed the boot on mainstreaming by relying too heavily on technology."

*Pleasing the Customer*

The distinct movement of expert systems away from a focus on pure technology can only be beneficial to the industry. As Knowledge Analysis's Austin put it, "Pleasing customers is a standard business practice."

The science of artificial intelligence originated in university laboratories, and vendors are just now coming to grips with the necessity of competing in the marketplace. Products were not designed with the end user in mind and did not meet immediate needs. "Vendors basically said, 'this is what we have; if you don't like it, tough.'" Schwartz of Schwartz Associates observed.

Accessibility is another emerging factor that bodes well for AI. There is often a stigma attached to artificial intelligence, which is linked to its potential complexity. By making expert systems more friendly, users are more likely to incorporate AI into their systems.

JCC's Jalbert observed: "The tools that will succeed in the next five years are those aimed at the technical person, not necessarily the AI technical expert."

Christopher Locke, vice president of corporate communications at the Pittsburgh firm Intelligent Technology Group Inc. (ITG), explained that the newly formed company hired a technical staff with strong credentials but not necessarily AI expertise. "We are training our own people in AI use to prove it can be done successfully in-house." The firm was founded in April 1986 by Larry Geisel, formerly of Carnegie Group, who predicted that they will begin "the real commercialization of AI."

*No System an Island*

Perhaps the most important trend in establishing AI as a marketable solution is its integration with existing technology. There is a strong movement towards connectivity in the overall market, and expert system companies are finally beginning to take note. "Vendors have typically said, 'Here is an amazing technology, all you have to do is change your entire business to use it,'" ITG's Locke explained.
IntelliCorp CEO Kehler also stressed the value of integration. "The key is connection. There is a need for a general-purpose link between a knowledge system and a database and for integration tools which enable users to get more utility out of existing equipment." As Symbolics's Sundue put it, "The marketplace emphasizes integration into conventional computer environments."

Julie Kaewert, spokesperson for DEC in Hudson, Mass., claims that this is not new information to Digital Equipment Corp. "We always knew it would have to be functional, and we always knew it would have to be integrated with VMS. People are just beginning to understand the potential of AI, especially when it is integrated."

Today's industry leaders feel strongly that AI is not a total solution in itself. The benefits of making AI a part of the problem-solving process are becoming increasingly evident. Rob Sagwitz, public relations coordinator at Pittsburgh's GSI Transcomm, said, "Our goal is to do what our users want. We won't develop AI because it's AI, but because it's the best way to do what we need to do. Our solutions are driven: how we accomplish something is not as important as what we accomplish."

Most experts agree that ultimately, people will use AI without being aware of its presence. Expert systems will only be an "invisible part" of the software, which is used to increase efficiency.

"Users Fear AI"

One of the major problems facing expert system vendors is the mystique associated with artificial intelligence. It is understood that much of the early publicity surrounding AI only succeeded in frightening people away from the technology. AI was promoted as being too powerful, and many feared that machines would indeed take over the world. Dataquest's Krasnoff said that AI is still a "dirty word." and that "many companies don't even want to attach something that has anything to do with AI."

"AI and expert systems are neat words." GSI Transcomm's Sagwitz observed, "but they really don't help to sell the product. People want to read about it, but they're almost afraid of it."

One common fear is that AI will displace segments of the work force. Critics worry that AI will take jobs away from people, yet supporters insist that the primary goal is to reduce the time spent on low-level decision making. Schwartz of Schwartz Associates noted that "eighty percent of the problems can be solved with twenty percent of the solutions." He explained that 80 percent of an expert's time is usually spent on minimal diagnostic tasks. By incorporating an expert system, 40 percent of the expert's time is freed up to perform more complex reasoning.

Schwartz also stressed that workplace procedures need to be dealt with. He cited an example of expert system deployment in a GTE unionized shop. Previously, promotions and pay increases were based on volume, not productivity. With the expert system in place, new criteria based promotions on the ability to articulate how the employee functioned with the expert system.

Another reason many shy away from expert systems is the knowledge extraction process, which is described as the main bottleneck of AI. To fill in an expert system shell, a knowledge engineer must literally extract knowledge from experts in the field. This can be a long and painful process, as the human mind does not function as efficiently as a computer. Knowledge engineers often find it hard to keep up with the demand for deployed systems.

Applications are one means of relieving this tension. By designing an expert system broad enough to be applied by a range of companies with similar concerns, the need for many individual customized systems is dissipated.

However, Knowledge Analysis's Austin stressed that, "You can't get away from the need for laborious, time-consuming knowledge extraction. The mind is a recognition machine, and extracting knowledge is an anthropological process. Efforts to automate it have failed."

Yet Locke feels that the half-year-old Intelligent Technology Group has a significant handle on the knowledge acquisition process. Unannounced developments, he stated, can speed the knowledge acquisitions tremendously.

A strong movement to bring AI to PCs has also sprung up. The goal there is to expose AI to the mass public and increase its ease and accessibility while lowering the price. As Schwartz of Schwartz Associates put it, "on a PC one "could build an expert system and still think that Lisp was a speech impediment." Although PCs enable a user to construct an expert system without a broad knowledge of AI, they are not yet capable of the high-powered programming that VAX systems offer.

"Combating AI Phobia"

Emerging trends display a focus on integration and meeting market needs. New products, such as Technology Group's developments in the field of knowledge acquisition, show this to be a continued emphasis.

Symbolics's Sundue stated that they "expect to provide one-stop shopping for our customers." With the introduction of their new Ivory chip, a proprietary integrated circuit chip that is optimized for the rapid execution of Lisp programs, they plan to dramatically increase their presence in the AI marketplace.

"The ideal piece of software," Schwartz noted, "is one that can deal with the standard flow of problems and is smart enough to know the difference."

Future marketing strategies include tapping other software markets. "There is a much stronger market for AI abroad," Luconi, of APEX, noted. Dataquest's Krasnoff agreed and observed that users were not as AI-phobic in Europe as in the United States.

Luconi's firm feels that focusing on key or strategic accounts is crucial for financial success. APEX has recently begun commercial shipment of Client Profiling, an expert system designed for the financial services industry, which is a field many vendors have targeted. It was developed in partnership with the John Hancock Mutual Life Insurance Co. so that at the time of the product's announcement, it was already in use. APEX has also had success with a rental approach, where profits are based on volume, not installation.

Industry leaders and analysts agree that although the financial picture may not look overwhelmingly promising at present, AI will not disappear from the marketplace. "As the U.S. becomes more service-based," Inference Corp.'s Jacobson said, "AI will be necessary. Information will be turned into a commodity, an asset."

Dataquest's Krasnoff agreed. "This is definitely an industry that is only beginning to emerge." Schwartz predicted that, "Within ten years, you won't be able to get an engineering degree without knowing AI."

KA's Austin summed up the importance of AI by stating, "AI is not a niche within regular computer science—it's the next computer science."

DENNIS O'CONNOR: THE HUMAN EXPERT BEHIND DEC'S EXPERT-SYSTEM SUCCESSES

By Terry C. Shannon

Copyright (c) 1987 by Ziff Communications Corp.

Editor's Note: The following article is reprinted from the 23 November 1987 issue of Digital Review with the permission of the author and Ziff Communications Corp.

Editor's Note: DECUS AISIG Newsletter Editor Terry C. Shannon recently interviewed Dennis E. O'Connor, senior group manager for the Intelligent Systems Technologies Group at DEC's Corporate AI Technology Center in Marlboro, Mass. Since 1979 O'Connor has guided DEC's AI programs, including the pioneering development of XCON. With 26 years' engineering experience, he is now responsible for disseminating AI technology to universities and within DEC.

SHANNON: How did Digital get started in AI?
O'CONNOR: We got started when we realized that we had a problem that could not be solved through traditional computing methodologies. Sam Fuller, DEC's Vice President of Research, put me in touch with Professor John McDermott of Carnegie-Mellon University early in 1979. John and I looked at using AI technology to solve configuration problems, specifically for the newly-announced VAX family that was destined to be a major part of Digital's revenue stream through the 1980s.

Prior to the development of XCON (the eXpert CONfiguring program), Digital computer systems were configured by tech editors who manually translated customer orders into bills of material and assembly instructions. We maintained two plants where workers assembled and tested each new computer system based on the information supplied by the tech editor.

We realized that additional final assembly and test plants would be needed to handle the production of VAX systems unless we could generate accurate system configurations way up front in the order process. With [McDermott's] help, we essentially solved the configuration problem with XCON. John brought the AI expertise to the problem. As Digital's group technology manager for worldwide systems manufacturing, I provided the domain expertise.

To date, well over 100,000 system orders have been configured by XCON and a staff of 13 tech editors. Without the expertise and knowledge embodied in XCON, Digital would need an additional 600 to 700 tech editors to maintain current production levels.

SHANNON: What spinoffs have come from XCON?

O'CONNOR: The first spinoff was XSEL, an interactive front end to XCON that is used by Digital's sales force. XSEL helps generate customer quotes rapidly and accurately by ensuring that a proposed computer system is based on a valid, complete configuration. XSEL can also be directed to provide all the spatial and environmental information needed to assure a successful system installation.

Next we addressed knowledge-intensive tasks in the manufacturing and customer service portions of the production cycle. If XCON could generate accurate system configurations and XSEL could shorten the order cycle, we felt that AI technology could help schedule orders across a number of factories and streamline the distribution of finished products to customers.

The expert systems that manage these tasks have been linked together to form a VAX-based Knowledge Network that helps improve employee productivity, manufacturing efficiency and customer satisfaction. This is the basic game plan for all the work we've done since 1981. We're still working on different pieces and subsets of the Knowledge Network, especially in the engineering, customer service and installation portions of the production cycle.

SHANNON: Lisp and Prolog are frequently cited as AI-oriented languages, but OPS5 has received very little attention. What role do OPS5 and similar production system languages play in AI application development at Digital?

O'CONNOR: OPS5 has played a major role at Digital. The majority of our AI applications involve planning, building and scheduling tasks which are well suited to OPS5's rapid execution speed and forwarding-chaining inference strategy.

The programmer productivity provided by OPS5 has been extremely beneficial to us. Novice programmers can get up to speed quite rapidly and OPS5 is well suited to application prototyping.

The programmer productivity provided by OPS5 has been extremely beneficial to us. Novice programmers can get up to speed quite rapidly and OPS5 is well suited to application prototyping.

SHANNON: A generally accepted heuristic among AI developers is that an expert system rule base cannot exceed 10,000 rules. What can be done to manage larger rule bases and deal with dynamic information?

O'CONNOR: There is no magic number or ceiling on the size of an expert system rule base. Software engineering and programmer productivity are the main issues. You have to consider the architecture and the modularity of the system you are building as well as the people who are contributing to the development effort.

With respect to system architecture, partitioning, consistency and style of input and coding are important considerations. Similarly, it is important to provide a development methodology that lets programmers work efficiently but precludes their tendency to personalize every rule they put into a system. To this end, we are developing tools that help ensure consistency and programming style.

SHANNON: The Knowledge Network is based on multiple, cooperative expert systems. Is this "divide-and-conquer" form of task decomposition valid for other applications?

O'CONNOR: Certainly. You can take almost any engineering, manufacturing or distribution application and ask "what cooperating systems can be put in place to streamline the decisionmaking process or help workers make better decisions?"

In addition, the development of cooperative applications that include both AI and traditional components helps users preserve their investments in traditional systems.

SHANNON: Another major obstacle to expert system implementation is knowledge acquisition, or "putting the knowledge into a box." What is DEC doing to surmount this obstacle?

O'CONNOR: Digital has an eight-week knowledge engineering training program that places special emphasis on problem identification and interviewing techniques. These techniques help the knowledge engineer get the appropriate information from the domain expert, which in turn makes it easier to build a knowledge-based application.

We also provide a means for domain experts and end users to send their comments and observations to the developers who are responsible for building and maintaining knowledge-based systems. User feedback can be incorporated into the next version of the application. This is a form of knowledge acquisition in that the system becomes smarter and more accurate as time goes on.

SHANNON: A number of successful AI applications were developed through DEC's External Research Program. Can you amplify on the program and its resulting applications?

O'CONNOR: We view the External Research Program as an investment in learning. The major application developed through the program is XCON. We've funded a number of additional projects, some of which were successful and some of which were not. Having a mixture of success and failure is important. For the mixed results taught us to use different techniques and to approach problems from different perspectives.

SHANNON: With the exception of applications such as XCON and the Knowledge Network, AI "success stories" seem to be few and far between. Do you feel that users and vendors are reluctant to discuss their successful AI applications because the underlying technology can provide a significant competitive advantage?

O'CONNOR: People are often reluctant to discuss AI applications that provide a competitive advantage. At the same time, many potentially successful expert systems are not deployed because developers have not figured out how to transfer these systems to the end user base in the form of viable applications.

SHANNON: The VAX is an extremely popular AI development and delivery platform. What are the relative advantages of dedicated symbolic processors or Lisp machines and VAX systems?

O'CONNOR: I think the basic question is "what style of problem are you trying to solve?" Symbolic processors are high performance Lisp engines that are well suited to researchers involved in performance testing, simulation work or other applications that demand extremely fast Lisp program execution.

We certainly focus on using VAXes to solve AI problems. We've run a number of simulations using the VAX and AI languages and so far we've been very satisfied with the results.
SHANNON: According to Digital AI specialist Dr. Neil Pundit, the next generation of expert systems will feature enhanced planning and problem solving capabilities, improved user interfaces and knowledge acquisition facilities. Can you speculate on the capabilities of the AI tools of the future?

O’CONNOR: Our customers have requested AI facilities that will boost productivity by helping users make better decisions, so you can expect that some of the items you mentioned will be available in future systems and programs.

VAX OPS5 VERSION 2.2 DEBUTS

By Terry C. Shannon

MARLBORO, Mass. — Aiming to simplify the integration of AI capabilities into applications written in conventional VAX programming languages, Digital has unveiled an enhanced release of its OPS5 expert system development tool.

OPS5 is a rule-based production system language that is widely used for building AI applications such as Digital’s internal knowledge network of cooperative expert systems.

New with VAX OPS5 version 2.2 are callable interfaces to the VAX C and VAX Ada languages, improved debugging facilities and the elimination of arbitrary restrictions on run-time programs.

According to a Digital AI spokesman, VAX OPS5 version 2.2 lets C and Ada programmers integrate OPS5 routines into their applications without having to learn how to program in OPS5. Moreover, the spokesman claimed, the new OPS5 release emphasizes consistency and ease of use.

“While the VAX Calling Standard allows programmers to develop multilanguage applications, each programmer is responsible for developing and maintaining a consistent calling style. VAX OPS5 version 2.2 includes fully supported calling interfaces that improve program consistency and simplify the program development process,” the spokesman said.

VAX OPS5 version 2.2 also lets users write applications that are not constrained by arbitrary program size limitations. Finally, the new release includes an improved debugging facility that lets a user independently observe an OPS5 program’s working memory, conflict set and rule firings.

VAX OPS5 version 2.2 runs on the entire VAX computer family and is available for immediate delivery.
Computer Friends:

This introductory article will be short and to the point. Yours truly has met his fate. The score is Hong Kong flu 10 my side - 1, put we are pushing for the Gold.

-----Free Utilities----- Take a good look. There might be something worthwhile.

----- Operating Procedure--Some night when you are having trouble sleeping, take a look at this. We are trying to do it right. Ardoth Hassler has put more time on this project than anyone. Thank you for your devotion, Ardoth. The next few lines are from her.

The EDUSIG Steering Committee has worked over the last six months to bring the Operating Guidelines for the SIG up to date. The Guidelines printed here were adopted by the Steering Committee in December in Anaheim. They have subsequently been approved by the SIG Council. We have already started to "operate" under these new guidelines, though the final transition of terms for the officers is not completely decided as of this writing. The transition will be complete by the Fall 1988 Symposium in Anaheim when our first general election will be held.

FREE Utilities

Dr. Pete Boysen
Iowa State University

For the past three years, we have developed numerous Digital Authoring Language (DAL) utilities which we have found useful in lesson development. We are offering them to DAL users for the cost of shipping and handling. To get your copy, send a purchase order for $20 to:

The CLEARINGHOUSE for Academic Software
The Computation Center
104 Computer Science Building
Ames, Iowa 50011

You may also request that the utility package be included at no extra charge when you order other CLEARINGHOUSE software.

Included in the utility package is:

* A single line editor which lets you edit a string using functions similar to those available in DCL/insert/edit mode.
* An index unit which displays a multi-line, multi-column index of options and lets the student select from those options.
* A menu unit which lets you select from a menu of options.
* A keychar unit which will load and display a font of function keys like RETURN, F1 etc.
* A locator unit which will invoke the terminal locator and return the x,y position of the locator and last key pressed. It works for GIGI, VT241, VT340 and Rainbow Regis (it is emulated for the Rainbow).
* A group of units which let you control the mouse on the VT340.
* A group of units which support random selection without replacement.
* A group of string functions.
* A unit which presents and evaluates a matching exercise.
* Many more functions and units.
* A help library which documents all the utilities with examples and notes.
* A help library which briefly describes all the DAL commands.

To use the units, just reference them in your DAL program and they will be incorporated at link time. Users can access the documentation by issuing commands like

$ help @dalutil util editor
or
$ help @dalcom erase

Call the CLEARINGHOUSE and save yourself some time and effort!

EDU-1

EDU-2
Article I
NAME

1. The name of the organization is the Education Special Interest Group, EDUSIG.

Article II
PURPOSE AND SCOPE

2. EDUSIG is established as a SPECIAL INTEREST GROUP under the operating procedures of the DECUS US Chapter.

a. EDUSIG is established to serve its members having a common interest as follows:

i. Promote the interchange of information and ideas concerning the utilization of computers, computer peripheral equipment, software, and other products and services marketed or otherwise made available by Digital Equipment Corporation (Digital) as they relate to education.

ii. Advance the art of computer usage through mutual education and exchange of ideas and information.

iii. Establish standards and provide channels to facilitate the exchange of programs and related information among EDUSIG members.

iv. Provide ideas for future products and feedback to Digital on equipment, software, product services, and other needs which may arise.

b. EDUSIG encourages participation and communication with other education computing related organizations. It should establish communications with the other International Chapters of DECUS as well as organizations such as EDUCOM, ACM, ADCIS, CAUSE, AACJC, LICC, NECC and IEEE.

Article III
MEMBERSHIP

3. Any member of the DECUS/US Chapter who expresses the interests described in Article II above is accepted as a member of EDUSIG.

Article IV
STRUCTURE

4. Executive Council

The administration of EDUSIG is entrusted to an Executive Council composed of six representatives, elected by EDUSIG members, and a Digital Counterpart. Members of the Executive Council of EDUSIG serve a three-year term. It is generally expected that Executive Council members will attend both symposia, EDUSIG Woods Meetings and functional area meetings.

5. Officers

The Executive Council will elect, at a minimum, four officers from the six elected members: Chair, Vice-Chair, Symposium Coordinator, and Communications Coordinator. Each officer must be a member of EDUSIG. Officers will serve a one year term and may succeed themselves.

a. Chair

The Chair is the chief executive and operating officer of EDUSIG. The responsibilities of the Chair are:

i. To perform the normal administrative functions necessary to the accomplishment of EDUSIG goals.

ii. To preserve the partnership between Digital and EDUSIG.

iii. To interface with Digital and DECUS as main liaison for EDUSIG which includes regular communication with the Digital Counterpart and DECUS staff.

iv. To appoint ad-hoc committee members as necessary.

v. To adopt interim procedures and policies when necessary on behalf of EDUSIG as a whole.

b. Vice-Chair

The Vice-Chair serves in the absence of the Chair. The responsibilities of the Vice-Chair are:

i. To ensure that an appropriate record of meetings and other EDUSIG activities is made and distributed.

ii. To be responsible for EDUSIG elections.
iii. To perform long range planning.

c. Symposium Coordinator

The Symposium Coordinator coordinates EDUSIG's activities for DECUS symposia. The responsibilities of the Symposium Coordinator are:

i. To serve on and represent the interests of EDUSIG to the Symposium Committee of DECUS.

ii. To solicit input from EDUSIG members.

iii. To solicit support for sessions from the Digital Counterpart.

iv. To organize Symposium submissions received and prepare a Symposium schedule.

v. To negotiate scheduling with the DECUS Symposium Committee.

vi. To solicit persons from the EDUSIG membership for any portion of these duties as might be deemed useful and expedient to their completion.

d. Communications Coordinator

The Communications Coordinator is responsible for EDUSIG communications of all types. The responsibilities of the Communications Coordinator are:

i. To serve on and represent the interests of EDUSIG to the Communications Committee of DECUS.

ii. To solicit communications from the Digital counterpart.

iii. To work with the Newsletter Editor toward the editing and publishing of an EDUSIG newsletter.

iv. To maintain close contact with the DECUS publication staff and have primary responsibility for the production and distribution of any hard copy materials EDUSIG may produce.

v. To be responsible for any other ways in which EDUSIG communicates with its members.

vi. To solicit persons from the EDUSIG membership for any portion of these duties as might be deemed useful and expedient to their completion.

e. Digital Equipment Corporation Counterpart

The Digital Counterpart is appointed by Digital Equipment Corporation to serve as liaison between EDUSIG and Digital's Education Industry Marketing Organization. It is expected that the person appointed will serve so as to build an effective partnership between EDUSIG and Digital to provide for continuity of communication. A multi-year commitment is desired.

6. Steering Committee

The Steering Committee is made up of members of the Executive Council and Ad-Hoc members appointed by the Chair upon consultation with other members of the Executive Council. The Chair may appoint any number of Ad-Hoc members as the business of EDUSIG requires. Ad-Hoc members serve at the pleasure of the Chair. Such members may include those with positions such as Seminars Coordinator, Librarian, Newsletter Editor, Courseware Coordinator, Networks Coordinator, University Coordinator, Two-Year and Four-Year College Coordinator, Secondary School Coordinator, Associate Symposium Coordinator, Session Chair Coordinator, LUG Coordinator, Product Planning Coordinator, Liaison to Other SIGS and others as deemed necessary. Ad-hoc members serve for one year and may be reappointed by the Chair with the concurrence of the Executive Council.

7. Working Groups

The Chair may, from time to time, establish such working groups as the business of EDUSIG requires.

8. LUGS

The members of EDUSIG are encouraged to associate themselves with Local User Groups (LUGs) in their area, and all such LUGs are encouraged and invited to maintain communications with the EDUSIG Steering Committee.

Article V
ELECTIONS

9. Nominations

a. The EDUSIG Steering Committee, at its meeting at each semi-annual Symposium shall nominate a slate of candidates to fill one position on the Executive Council. This slate will be published by the Communications Coordinator in the first EDUSIG Newsletter following the symposium. Additional nominations may be submitted to the DECUS-US Chapter Activities Manager in writing with a statement of qualifications and the signatures of ten (10) EDUSIG members. Such nominations will be accepted for thirty (30) days after the publication date of the newsletter in which the nominations are first published.

b. Should any position have only one nominee after the close of nominations, that nominee shall be declared elected.
10. Voting will take place at the following DECUS Symposium. All EDUSIG members present at the EDUSIG Business Meeting are eligible to vote. Runoff elections between the top candidates will be held if no candidate receives a simple majority.

11. The person elected to the Executive Council will take office at the end of the symposium at which she is elected.

ARTICLE VI
RECALL

12. Elected members of the Executive Council may be recalled at any time by a vote of the members of EDUSIG. The procedure for recall is as follows:

a. A recall petition stating the name and position of the Executive Council member(s) to be recalled, accompanied by a formal statement of the reasons for which the recall is being sought, is to be submitted to the DECUS/US Activities Manager. This petition is to be signed by a minimum of ten (10) voting members of EDUSIG, one of whom must be named as spokesperson for the group seeking the recall.

b. During the thirty (30) days following receipt of the petition, the petition may be withdrawn by a majority of its signers.

c. EDUSIG members will vote on the recall petition at the next DECUS Symposium during a scheduled EDUSIG Business Meeting. An Executive Council member will be recalled if two-thirds of the EDUSIG members present vote for recall.

d. The recall becomes effective immediately upon notification of the results of the election.

13. Elected members of the Executive Council may be recalled because of non-participation by a two-thirds vote of the Executive Council. Recall is effective immediately.

14. Vacancies created through recall proceedings are to be filled as are all other vacancies as specified in Article VII.

Article VII
VACANCY IN AN EDUSIG ELECTED OFFICE

15. Should any elected position of EDUSIG become vacant, it will be immediately filled by the Executive Council member-elect for that position, should such member-elect be available. Should no member-elect be available, the Executive Council will fill the vacant position by a simple majority vote of the remaining Executive Council members. The term for such an appointment is the remaining term for the vacated office.

ARTICLE VIII
GRIEVANCES

16. If a DECUS member has a grievance against EDUSIG, that person may petition for services to the DECUS SIG Council and through the normal petition cycle up to the Board of Directors.

ARTICLE IX
AMENDMENTS

17. Amendments to these operating procedures may be proposed by the Steering Committee or by the written petition of ten (10) voting members of EDUSIG.

18. Amendments shall be ratified by a two-thirds (2/3) majority of the Executive Council.

19. Amendments to these operating procedures shall not conflict with any provisions of the DECUS/US Chapter Bylaws or Operating Procedures.

ARTICLE X
IMPLEMENTATION

20. These operating procedures shall take effect immediately upon approval by a simple majority vote of the Steering Committee and acceptance by the DECUS/US Board of Directors or its designee.

21. Upon approval of these procedures, the current EDUSIG Chair shall become the EDUSIG Chair until the first election according to this operating procedure.

22. The EDUSIG Chair, with the concurrence of the Executive Council, will appoint persons to fill all other Steering Committee positions.

23. The first election will be held at the Fall 1988 DECUS Symposium.

Article XI
INTERPRETATION

24. Should any dispute arise from the interpretation of these operating procedures, a simple majority of the Executive Council shall be considered the final authority for any interpretation. As in other disputes within DECUS, the normal appeals process is used, the final authority resting in the Board of Directors.
From the Editor

Bob Hays
KMS Fusion, Inc.
3621 South State Road
Ann Arbor, Ml 48106
(313) 769-8500 x 458

This is my second issue as editor, and there’s more good stuff here this month. First, a bibliography from Steven Szep of Chase Manhattan Bank from Steve’s talk at the Fall Symposium on “The Fractal Factory: What Mandelbrot Hath Wrought.” The bibliography failed to make it into the session notes, so here it is!

Next up, “Mechanical CAD/CAM Workstation Applications Past, Present, and Future” from a set of viewgraphs provided by Bernie Barcellos, Chad Hansen, and Robert Schneider. This is a nice general overview of the history and coming developments in CAD/CAM. The article was edited by the editor based directly upon the slides submitted.

In general, I plan to write up slides as articles when time allows rather than just photocopy the slides directly; I think articles read better than viewgraphs in most cases. However, if viewgraphs come in that contain graphic images or the submitter requests, I will put copies of viewgraphs into the newsletter as-is.

Submissions are always welcome! Please send any tips, questions, articles or ideas to Bob Hays at the address at the left. As you can expect, I prefer electronic submissions which means tape (VMSBACKUP or RSX BRU) or on-line on DCS. Hopefully, I’ll gain access to a major network this year, which would make electronic submissions even easier. However, if you cannot make a submission via electrons, use paper! I type mass quantities a couple of times a month.

I’d like to end with a question: how do you, the people getting this newsletter, feel about it? If you have any ideas about this newsletter in particular or the sum of the DECUS newsletters, please mail me a note. I am particularly interested in whether this newsletter should be in the same two-column format as the other newsletters, and how graphics can be integrated into the newsletter, since that is what GAPSIG is about.

The Fractal Factory: What Mandelbrot Hath Wrought

Steven Szep
Chase Manhattan Bank

Mathematical Background


The Fractal Factory: What Mandelbrot Hath Wrought (Cont’d)

Vision

Fractal Geometry
Casey, D. "Formulating Fractals". Computer Language (April, 1987), pages 24 - 40. F

(Continued on next page)

Fractal Geometry (cont’d)

Cellular Automata
Reiter, Carla. "Life and Death on a Computer Screen". Discover (August, 1984), pages 81 - 83. B
Thornton, Eric. "Not So Basic". ST Applications (June, 1987), pages 43 - 47. B
The Fractal Factory: What Mandelbrot Hath Wrought (Cont’d)

**Space-Fitting Curves**
Thornburg, David D. *Discovering Apple Logo*. Addison-Wesley, 1983. L

**Trees and Plant Growth**
Thornburg, David D. *Discovering Apple Logo*. Addison-Wesley, 1983. L

**Worm Paths**

**Catastrophe Theory**

**Miscellaneous Recursive Techniques**

**Legend**
- Recommended for people new to computer graphics.
- Recommended for people interested in a particular area of computer graphics.
B Basic
F FORTRAN
M Modula-2
C C Programming Language
P Pascal
L LOGO Language
Mechanical CAD/CAM Workstation Applications

Chad S. Hansen
3M Information Systems and Data Processing
Robert A. Schneider
Rockwell International Corporation

History

CAD/CAM (Computer Aided Design/Computer Aided Manufacturing) began with the development of APT in the late 1950's. Although this was an important milestone, the system was not interactive; it was instrumental, however, in proving CAM concepts. The next major development was the light pen, which enabled interaction with CRT (Cathode Ray Tube) based RADAR systems. This marked the first interactive graphics capability.

The 1960's saw many large firms develop software for internal use; some of these programs went on to become commercial products. Project “Sketchpad” at MIT was the first interactive manipulation of graphics. “Sketchpad” was demonstrated in 1963.

The first dedicated CAD/CAM vendors appeared on the market in the late 1960's with “turnkey” systems. Some of the most important were: Calma with circuit board digitizing equipment in 1968, and Computervision and Applicon mechanical design software in 1969. The 1970's and 80's saw many vendors enter the marketplace, including Matra Datavision, Intergraph, and McAuto.

Hardware

From 1975 through 1980, CAD/CAM hardware was characterized by large main frame systems using 16-bit technology operated from dumb terminals using poor communications systems. Vendor-provided workstations were largely based on proprietary designs, and the cost of the hardware for a CAD/CAM system required transfers of funds from Fort Knox!

From 1980 to 1983, most systems were in a host - terminal environment using 32-bit technology. This period saw the introduction of high-powered, stand-alone workstations. Communications improved over this period, and hardware costs came down a lot.

The period from 1983 through 1986 saw the population of stand-alone workstations swell to 40% of the market. These stand-alone systems became more powerful, and the hardware costs fell below software costs in many cases. Workstation development extended to many major hardware vendors, with PC development taking a major role in the basic CAD/CAM environment.

Today, workstations comprise about 65% of all CAD/CAM/CAE systems. High and low end systems are now available. Distributed networks now allow local CPUs to work with a central processor system. UNIX-based systems are here to stay!

Software

From 1975 to 1980, software was only available from a limited number of vendors. The systems were 2D planer with no CAE (Computer Aided Engineering) tools. As 1980 came around, 3D wire frame technology was introduced. Research and development was done in a vacuum. Users had to be imaginative and expert in using the selected CAD/CAM system. Software costs were much less than hardware charges.

Between 1980 and 1983, 3D surface technology was perfected and introduced in products. Software provided color, shaded images with multiple windows and simultaneous active views. CAM applications began to get attention. But, the systems still required a dedicated user.

Solid modelling became a reality in the period from 1983 through 1986. CAM became a major development area. New and improved algorithms for hidden line removal and multiple light sources were developed. CAE and CAM production systems appeared. Perhaps the largest area of improvement was in the user interface, which became much easier to use, which allowed occasional users to perform CAD/CAM operations fairly quickly.

Since 1986, solid modelling has become state of the art. The database for a CAD/CAM system has become the key for most advanced packages. End-to-end solutions are now available with solid modelling. Systems have become more user friendly. Software vendors are now providing software for standard hardware platforms, and the cost for software has decreased, but still exceeds the cost of hardware in most cases.

Users

Most of the systems developed between 1975 and 1980 were used by large, government-supported contractors who didn't know the level of commitment required in this early stage of development.

From 1980 to 1983, the technology began filtering down to medium sized companies with less beta testing and experimental conditions. Drafters became the largest group of users. There were, however, not too many success stories, as gains from adding CAD systems still resulted in only slightly more than 1 to 1 returns.

Downstream benefits began accumulating from CAD/CAM/CAE use between 1983 and 1986. However, the product pool became confused due to the influx of many vendors and the PC environment. Manufacturing groups finally became involved in product development.

Since 1986, CAD/CAM/CAE has penetrated to even very small companies. Users now range from very sophisticated to very occasional. There is now a desire for UNIX-based systems.

The Future

Look for hardware costs to continue to decline but performance to improve. PC-based workstations as we know them will play a less important part in CAD/CAM environments. UNIX will become a standard to the benefit of all users. Communications will become more transparent and faster. Windowing will be standardized to make software more portable. At the high end, stand-alone workstations will be available that allow interacting with real-time rotations of shaded images, hidden lines, and wire frame models.

Software costs will continue to decline and exceed hardware costs. More software will automatically include information for manufacturing that is transparent to users. Integration between software packages will continue to improve. Database systems will become the key to success.

Users will have workstations on their desks in the future, with the workstations accommodating all the user's needs. Casual use will diminish, and engineers will become more involved in down-stream processes. Evaluation will be done hands-on. Networks will allow any size company to share information between systems.
You may have noticed something of an HMS newsletter drought over the past couple of months. That's because of some unexpected turbulence in the life of Yr. Okt. Svt., and not because of a shortage of material--far from it! Actually, we now have enough Bard News copy to fill the newsletter for several months to come.

When those issues appear, however, there will be a different name on the Bard News masthead. As of February 29, I became a part-time Digital Review editor and a full-time employee of Literacy Volunteers of Massachusetts (LVM), a nonprofit organization that matches functionally illiterate adults with volunteers for one-to-one tutoring in reading, writing and other basic skills. It's a wonderful and worthy cause, and I'm delighted to be a part of it.

The only glitch is that to work both a full- and a part-time job, I've had to give up a few things. One of them, I'm sorry to say, is DECUS. There are several reasons for my decision to curtail my DECUS involvement. First, I won't be able to attend the symposia because of my commitments to LVM. Second, I really don't have the time to do the newsletter any more. Finally, LVM uses (gasp!) IBM PC clones, so I'm not spending that much time with DEC equipment.

Don't worry, though--now that I've brought Hard News up to fighting weight, I'm not going to let it die. My replacement will be Gene Grygo, a capable young assistant editor at Digital Review. While I teach him the ropes, Gene will also serve as assistant editor of Hard News for a couple of issues. He'll probably take over in time for the summer issues, and you'll see him at the May symposium in Cincinnati in any case. Don't be shy about giving him the same kind of help and great material you've been giving me!

Speaking of which, wait 'til you see the goodies I've crammed into this issue of Hard News--almost all contributed by readers. Stanley Rosen has thoughtfully accumulated most of the engineering and field change orders given out at the fall 1987 symposium in Anaheim. There are some interesting nibbles 'n' bytes from Michael Lamboley and Bob Whitefield. Bill Wallace offers pertinent disk and CPU benchmark results. And Scott Taylor, who did a memory benchmarking article in last year's HMS newsletter, returns with a tutorial on disk benchmarking that might contain a few surprises. (The second installment of Scott's article provides the results of his testing, and will appear in the next issue of Hard News.)

Well, there it is. I bet you'll find at least one thing of value in this issue, so join me in extending humongous thanks to all the contributors.

If you'd like to get lavishly praised in print and also receive a free issue of Hard News and perhaps some other form of graft, take a look at the guidelines for contributors on the next page.

Until next month, happy trails!

cdw
SUBMITTING ARTICLES TO HARD NEWS

The purpose of HARD NEWS, the HMS SIG newsletter, is to serve as a forum to share information related to DEC hardware with the members of the SIG. As such, the existence of the newsletter is entirely dependent on your contributions. If you have an HHK item, a better or safer way to do something, product news, a tutorial article of general interest, etc., we would like to publish it in the newsletter. We hope that HARD NEWS will be published at least six times a year.

You can submit material to the editors, Carmen Wiseman or Gene Grygo, or to the HMS SIG chair, Bill Walker. We can accept submissions in a wide variety of formats:

- Items can be sent to the editors on VMS-format RX50s, TK50 cartridges, or IBM PC-format 5 1/4" floppies. The SIG chair prefers RT-11 floppies but can handle any reasonable media.
- Hard copy, like cash, is always acceptable. Camera-ready copy will save us a lot of typing, but we don't insist on it. You can also use the Hardware Submission Form in the "Questionnaires" section of the combined SIGs Newsletters.
- Those of you with access to DCS can send things to WALKER or WISEMAN. DCS is usually checked on a daily basis.
- You can reach the SIG chair on CompuServe as "Bill Walker 71066,24" or via EasyLink mailbox 62752448 or MCI Mail account 333-1675. You can reach the editors via EasyLink mailbox 62960090 (be sure to say TO: Carmen Wiseman or Gene Grygo somewhere in the body of the message).

If you have anything to submit, send it! If it is a mess, but we can read it, we will get it into the newsletter somehow. Finally, if you have any questions about submitting material, call one of us. The telephone numbers are listed below.

Contributions can be sent to:

William K. Walker  
Monsanto Research Corp.  OR  Digital Review  
F.O. Box 37  A-152  \Prudential Tower, Suite 1390  
Miamisburg, OH  45342  800 Boylston Street  
(work)  Boston, MA 02199  
(513) 865-3557 (home)  (617) 375-4361 (9 a.m.-1 p.m. EST)

HMS-3

FCO/ECO CORNER -- Stanley M. Rose

Field Change Orders from the Anaheim DECUS

Stanley M. Rose  
Vice-President, Distributed Processing Technical Support  
Bankers Trust Company  
New York, NY

NOTE

This article is a compilation of FCOs that were presented in various sessions at the 1987 Anaheim symposium. I have listed the individuals who gave the sessions. Please keep in mind that each session provided different amounts and types of information.

The following FCOs were provided by Jack Toto in session H046, "Hardware ECO Update":

- KDJ11-A M8192-MK009  
  Upgrade to rev D1
- KA630 (MicroVAX II)  
  M7606-AH upgraded to M7606-AS  
  ECO M7606-ML006  
  Upgrade kit #5Q-01358-02  
  Fixes memory errors under Ultrix
- MS630-A (MicroVAX II memory)  
  M7607-AH upgraded to M7607-AS  
  Fixes machine check "80" (under Ultrix?)
- RDQX3  
  M7555 upgraded to etch B1  
  ECO M7555-ML003  
  Fixes IRQ Detect Logic error
- RDQXE (External RD Drive)  
  M7513 upgraded to rev level B1  
  ECO M7513-ML001  
  12/12/86  
  Fixes corrupted data and/or loss of drive format

HMS-4
Upgrade to rev level Fl
ECO M7513-ML002
Fixes signal lines not properly terminated

DEQNA
M7504
ECO M7504-MK005
Upgrade to rev level E1 (Note: Current revision is much higher.)

TQ550  M7546
ECO M7546-SH002  4/4/86
Upgrade to rev level B2
Board has intermittent short circuits

ECO M7546-SH003  6/17/86
Upgrade to rev level C1
new EPROMs

ECO M7546-SH004
Upgrade to rev level D1
Fixes a problem with PDP-11 memory

ECO M7546-SH005  2/2/87
Upgrade to rev level E1
Replaced EPROMs

ECO M7546-SH006  8/5/87
Upgrade to etch rev level Fl
Fixes a bus grant problem

BA23-A
ECO BA23-A-MK003
Upgrade to BA23-A rev C1
Power cable replaced with higher-capacity cable

ECO BA23-A-MK004
Upgrade to BA23-A rev D1
Connector replaced with higher-capacity connector

***********

The following FCOs were provided in session N030, "Communications Hardware and ECOs," by Ed Badger, Perry Sutton and Brian Williams:

DEBNT
All DEBNTs will be replaced with DEBNAs, rev F
Upgrade kit #EQ-01486-01

DEBNA rev D
To be upgraded to DEBNA, rev E
Upgrade kit #EQ-01500-01
Notes: (1) DEBNA rev E and rev F are functionally identical, and differ only in board layout. (2) Harriet Cohen stated in session V070, "VMS Update," that the DEBNT will not be supported under VMS, effective with V4.6.

Both revisions of the DEBNA also need the following:
New ETdriver: Part #EQ-01500-02 (Good for V4.5 and V4.6)
New Diagnostics: Part #EQ-01500-03

DELUA
M7521 to revision Fl
(FCO to be available in spring '88.)
Fixes:
(1) Self-test problem on 83XX processors
(2) Problems with TSM/LAT/LAVC (slowdowns)

DEQNA
M7504 to rev K4
Problems:
(1) Late collision may cause data to be altered on receive packet.

DEBET (LAN Bridge 100)
Upgrade to rev D8
Upgrade kit #EQ-01479-01
Fixes:
(1) Overrun of Ethernet address table in large networks.
(2) Forwards loopback messages with wrong next address.
(3) Supports LAN Monitor.

DEMPR
Upgrade to rev C1
Upgrade part #EQ-01491-01 (120volt)
#EQ-01491-02 (240volt)
Fixes:
(1) Cable short brings down whole network. Revised unit segments the shorted section from the whole.

DMB32
Upgrade of module T1012 to rev H2
ECO to be issued in late spring
Fixes:
(1) Printer port performance
(2) Receive sync characters

**********
Verification of module M8398 to rev H1
Upgrade kit #EQ-01457-01
Fees:
(1) DMA transaction timing problem
(2) Split-speed baud rate problem
(3) Received incorrect character problem

The following information was supplied by Alan Schmidt in a "birds-of-a-feather" (BOF) session on PRO 380 consoles, and applies to the 85XX, 8700 and 8800 processors.

Revision 7 of the PRO console code was scheduled to go to the SDC in mid-January, with availability after the normal ramp-up time. Rev. 7 fixes most of the outstanding problems, including loss of time on a reboot.

Schmidt presented the following chart:

<table>
<thead>
<tr>
<th>Diagnostic</th>
<th>Release</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>22D</td>
<td>22</td>
<td>D</td>
</tr>
<tr>
<td>22E</td>
<td>22</td>
<td>E</td>
</tr>
<tr>
<td>28</td>
<td>28</td>
<td>E/6.0</td>
</tr>
<tr>
<td>29</td>
<td>29</td>
<td>1/88</td>
</tr>
<tr>
<td>30</td>
<td>30</td>
<td>G/7.0</td>
</tr>
<tr>
<td>31</td>
<td>31</td>
<td>Q4/88</td>
</tr>
</tbody>
</table>

---

HARDWARE HINTS AND KINFS -- M. Lamboley and B. Whitefield

Warning: Soft Errors Ahead

Some time ago, Standard Memories in Irvine made an ill-advised change to its manufacturing process. This was soon discovered and corrected. None of the substandard boards ever failed, however, so Standard Memories decided not to recall them.

Unfortunately, by the time Standard Memories had deemed it was too late for a recall, people had begun to upgrade the systems into which the memories had been inserted.

The board failure rate varies widely, depending on just what kind of upgrade is putting the increased pressure on the boards. For an upgrade similar to the one we underwent, the failure rate is about 20 percent. (Our system currently operates with 12MB of memory.)

We sent the offending boards back to Irvine for a no-charge repairs. While they were being repaired, I learned a bit more about the problem.

Standard Memories apparently didn't know about the failures until people started calling the company to describe strange errors in bit 37. By the time users had figured it out, a pattern had already established itself. People would see soft errors and call Standard Memories. There were never any crashes or actual damage, though, so Standard Memories determined that no mailing to the board owners was called for. Our site was an exception to this pattern.

Although I'm sympathetic, I'm not convinced. At least in hindsight, the company should have anticipated the potential for wasting a lot of people's time by making it appear that an upgrade was causing perfectly good boards to log errors. When there are problems, it is natural to suspect newly installed components, rather than those that have been working fine for years.

Michael Lamboley
VAX Systems Manager
General Research Corp.
Santa Barbara, CA

Reinking LA100/LA210 Ribbon Cartridges

There is a relatively easy (if messy) way to reink the cartridge ribbon used by the LA100 and LA210 printers. All you need is WD-40 and the printer itself.

The cartridge contains an ink reservoir tube (at least, DEC's ribbons do) that can be refilled. Since there is usually plenty of dried ink left on the ribbon, applying WD-40 will restore it to almost new quality. The nonprinting self-test mode of the printer (which just moves the cartridge back and forth) can be used to distribute the WD-40 evenly over the ribbon.

I have reinked a single cartridge as many as five times [including the one used to print the original copy from which this item was taken—ed.], but the time required in the printer increases somewhat each time you reink.

Here's how to get your hands dirty (I use disposable gloves and lots of newspaper):

Using a small screwdriver, carefully pry open the left side of the cartridge (it's the one without the knob). Remove the ink reservoir and pull off the black cap. Spray some WD-40 into a small container. Pour the WD-40 into the top of the reservoir tube until it begins to leak from the bottom. Pour a few drops into the black cap and put it back on the tube. Place the
reservoir back in the cartridge. Be sure the felt pad on the reservoir is pressed tightly against the center of the roller by the metal spring. Snap the cartridge closed.

Place the cartridge in the LA100/LA210. If margins are set, power the printer off and on again to reset them. Place the printer in nonprinting self-test mode. On the LA100, you do this by pressing the OFF LINE and SELF TEST buttons down, and then pressing FORM FEED three times. The procedure for the LA210 should be similar.

Let the printer run for at least 30 minutes. Check the print quality periodically until it is dark enough. It is quite possible to overink a ribbon, particularly if it has never been reinked before.

By the way, while you’ve got the WD-40 handy, this is a good time to lubricate the carriage shafts. And no, I don’t work for the company that makes WD-40!

Bob Whitefield
Decatur, AL

BENCHMARK BLITZ, PART I -- Scott Taylor

EDITOR’S NOTE

An abridged version of this article appeared in a DEC-related trade publication last year. The author was dissatisfied with the way the article came out in print, and because he felt that important information had been deleted or munged, he submitted the original article to HARD NEWS. He apologizes for any incorrect, inaccurate or misleading material that appeared in the commercially published version.

Scott Taylor has put a lot of effort into benchmarking DEC-compatible disk controllers and drives from several manufacturers, and he tells it like he sees it. In this issue of HARD NEWS, he presents an overview of disk subsystem specs and how they affect benchmarking. Several short benchmarking tutorials and the results of Scott’s labors will appear in the next issue. If you’d like to talk to Scott about this material, give him a call at (714) 868-1319 (desk) or (714) 868-6035 (lab).

********

DISK CONTROLLERS: WHAT DO THE SPECS MEAN?
WHICH ONES REALLY COUNT?

All else being equal, if time is money, faster is better. But it’s not quite that easy when you’re evaluating disk controllers.

I have evaluated ESDI disk controllers from Aviv, Sigma, Webster, Micro Technology Inc. (MTI), Dilog and Emulex. In my benchmark tests, I used Maxtor XT-8760 and CDC Wren 3 drives, along with memory boards from Andromeda and Clearpoint. In this article, I’ll tell you some of the things I’ve learned to watch out for in assessing controller and drive performance.

Controller Specs

In reading controller specs, the tough part is knowing what counts and why one controller can be—and is—faster than another. When you truly understand what’s behind the specs, you can clear up some common misconceptions resulting from clever marketing.

For instance, if you think high-performance MSCP controllers are being designed with the MicroVax II (and now the MicroVax 3500/3600) in mind and not the PDP-11, consider this: All the ESDI disk controllers I evaluated contain on-board bootstrapping...
capabilities for booting 2 to 13 devices, and these bootstraps must be disabled when the controller is used with a MicroVax. (By the way, the same is true of most ST506, SMD and SCSI controllers.)

A note of caution: Many people look at a set of disk controller benchmarks and decide that the controller with the fastest benchmark time will be the fastest controller for their application. This may be true for a specific benchmark. But the number of users, the frequency of disk accesses and the amount of disk fragmentation are all factors that change from day to day and even minute to minute—and can have an overriding effect on disk performance.

General Assumptions

Unless otherwise mentioned, I am assuming in this article and the one to follow that operating system overhead, disk rotational latency and head-seek times that are not determined by the controller are equal for all controllers. But it is important to keep in mind that while these times are equal, they're also the major time-consuming elements (50 percent or more) in disk accessing.

Is a megabyte one million bytes or 1,024 x 1,024 bytes when you're talking about transfer rates? The same question can be asked about kilobytes. Several definitions were presented by several manufacturers. The safest way is to ask the source of the particular data sheet. For this discussion, megabytes are one million bytes and kilobytes are one thousand bytes when used as transfer rates. One kilobyte is 1,024 bytes and one megabyte is 1,024 x 1,024 bytes when used to describe capacity (i.e., memory or disk size).

Drive Specs

If you're looking for the fastest disk subsystem, start with the disk drive. Controllers can do a lot, but if a drive is slow, it will stay slow.

The clock rate for a drive indicates the rate at which data will be transmitted when it is actually under the head. Because of gaps between the sectors, headers, phase-lock bytes and spare sectors, the number of bytes actually being used is 80 to 85 percent of the total number of bytes per track. At 15 MHz, this comes to 1.5 to 1.6 MB/sec; at 25 MHz (SMDE drives), this is 2.5 to 2.65 MB/sec. (These figures are peak numbers that drop rapidly—below 1 MB/sec in some cases—if track seeks, bad-block replacement or head switching is involved.)

When transferring data from a disk to memory, the rotational latency will be 0 to 16.67 msec, the head seek time 10 to 30 msec (or more) per track, the controller overhead 1 to 8 msec, and the operating system overhead up to several milliseconds, depending on operating system and current operation.

Benchmarks, including the ones for this article and the next, generally eliminate the effects of such delays with the understanding that they are common to all controllers and therefore don't count. Well, they are, and they don't—at least, not until the controllers are placed in the real world where real results are expected.

In real-life situations, the dominant factors in the overall transfer rate are the rotational and head-seek latencies, which average near 23 msec for fast drives. You also need to figure in operating system overhead, which varies from about 1 msec to tens of milliseconds.

Disk drive rotational latency and head seek latency are random, a result of the last request and elapsed time since that request. Operating system overhead is constant if the same operating system and driver are used for all controllers. One block (512 bytes) of data can be transferred from disk to memory in under 300 µsec. This leaves controller overhead as the single most significant factor in overall transfer performance that a disk controller can effect—a range of over 400 percent in the ESDI controllers I tested, but still less than 25 percent of the average time taken for a complete disk access.

Spiral Offsetting

Also known as track skewing, spiral offsetting is a means of allowing for disk drive head-switch and seek times. A controller takes time to switch heads on the drive, and the drive takes time when moving the head from one track to another. To avoid having to wait for the disk to rotate an entire revolution when switching or moving heads, the next track begins where the disk will be when the new head becomes active.

If a program reads a large contiguous section of a disk, head switches occur only 3 percent of the time and head seeks only 0.2 percent of the time for the CDC Wren drive (both are averages), and two-thirds of these percentages for the Maxtor drive. This is a good argument for keeping disks from fragmenting in operating systems that allow it to occur (RSX, VMS and others).

The result? Spiral offsetting, while impressive and apparent for benchmarking, will mean very little to the average application. A single request can only cause one head seek and two or three head switches (using the CDC or Maxtor drive), and only for a maximum request of 128 blocks, assuming the files are contiguous. A 128-block transfer rarely occurs, and is also a ceiling for VMS and the LSI operating systems.

Thus, head seek spiral offsetting is valid for one track seeks only and requires:

1. that the head-switch spiral offset be zero; or
2. that the seek/switch be from the last sector of the last head
to the first sector of the first head, or from a sector using one head on one track to the same number sector using the same head on the very next track. The seek/switch must be one of these alternatives, not both or either (controller-specific).

Head seeks of more than one track, or a seek with a head switch when head-switch spiral offset is not zero, will always cause a rotational position delay.

Controller Performance Tradeoffs

Here are some techniques that allow a controller to "cheat":

1. Storing portions of a disk in separate memory on the disk controller (called "disk cache memory")
2. Reading ahead in anticipation of the next request.
3. Processing multiple requests for transfers simultaneously and executing them in the order that requires the smallest amount of head motion and disk rotation.

In many applications a program will ask for the same data to be read from the disk more than one time during program execution. By storing or caching the data read from the disk in the controller the first time it is requested, the controller can supply the same data from its cache for each subsequent request without having to wait for the disk-drive-related delays.

The catch is that not all data will be asked for again, at least not before the controller uses the same portion of its cache to store some other section of the disk. Storing data in the cache usually takes extra time. If the desired data has been written over or flushed, the time taken to store the data is wasted.

The larger the cache or the more complex the caching algorithm, the less often this will occur. If the controller can supply the data at least one time from its cache, the extra time is well spent. Writes must eventually go to the disk, lest data could be lost at system shutdown or power failure, so caching doesn't add much for writes.

"Read-ahead" assumes that if a program requests a block of data to be read from the disk, it will very likely request the next sequential block or blocks to be read at a later time. Since most of the time taken to read data from the disk involves finding it, time can be saved by combining the current read request with the next anticipated request(s). Again, if the program actually does issue several consecutive requests, performance improves; if not, the time taken to read the extra blocks could delay the next read.

When a controller has commands to execute, it can sort them in several ways: none, nearest, forward, start from the outside track working in, then jump back to the outside or elevator; or work in and then back out, changing directions only at the outer and innermost requests. "Closest" and "none" sorting could prevent a request on an outer track from being executed if usage were heavy on the middle tracks. To prevent this, a "fairness value" can be set, so that a command that has been passed over a "fair" number of times would become the highest-priority request (does not apply to "none" on some controllers).

The more requests a controller has at one time, the greater its overhead due to command sorting and cueing. This increased overhead is traded off for reduced disk drive seek and rotational delays. The result is that the optimum number of commands will be less than the maximum number a controller will allow. Controller manufacturers recommend an average value as a place to start; beyond that value, system and application-specific testing will show what number is best.

When a requested file is fragmented, what looks like a single request from the user's point of view is actually one request per file fragment. Some operating systems (e.g., RT-11 and TSX) do not issue multiple requests using DEC-supplied drivers, and do not take advantage of this option.

The number of blocks to read ahead is actually set indirectly on the boards tested. The user sets the minimum number of blocks to be read for any request. If the requested number exceeds this amount, no additional blocks are read.

Drive Transfer Rate and Performance

Disk drive transfer rate sets an upper limit on disk controller performance. Read tests were performed using a 10 MHz CDC WREN III drive and a 15 MHz Maxtor XT-8760 drive; write tests used the CDC drive only (the Maxtor drive had already been returned). The difference during writes for all controllers and reads for noncaching controllers was due to the transfer rate differences between the drives, 10 versus 15 megabits per second. On caching controllers, read speed was independent of the drive transfer rate if the desired data was in the controller cache. Drive capacity itself does not directly affect transfer rate, but can reduce the number of track-to-track seeks required.

Both the CDC and Maxtor drives spin at 3600 rpm. The 10 MHz CDC drive has 34 to 36 sectors per track, and the Maxtor 15 MHz drive has 51 sectors per track. As a result, on the 15 MHz drive, data passes the head 50 percent faster, or 50 percent more data passes the head in the same period of time. This translates to a 50 percent higher drive-to-controller transfer rate once the data is under the head. Latency to rotate the data to the head is the same on both drives.
Controller-to-memory direct memory access (DMA) transfer rate has little to do with overall transfer speed. For the controllers that used burst-mode DMA when block mode was not available, the overall transfer rate didn’t change even though the DMA transfer rate decreased a minimum of 33 percent.

The truth about the DMA transfer rate, as applied to a disk controller, is that this variable need not affect overall transfer speed until it drops below the drive-to-controller transfer rate of 1.105 MB/sec for the 10 MHz drive and 1.566 MB/sec for the 15 MHz drive (currently the fastest available ESDI rate). New SMD drives have peak transfer rates near 3 MB/sec, making controller-to-memory DMA transfer rates an important factor for small transfers that don’t require head switches or seeks.

What the DMA transfer rate did determine, however, was the amount of bus time (bandwidth) left over for the CPU and the other devices on the bus. The simplest way to measure this was to issue a request to the disk controller and then start incrementing a variable, starting at zero, until the request was complete. The ratio of results between the different controllers gave a measure of DMA efficiency, with higher numbers indicating more efficient bus use by the disk controller and memory if the overall transfer time was the same.

This value is greatly CPU-dependent; therefore, all controllers were tested with the same CPU. Note: The MicroVax II is an exception due to its private memory. It can function independently of Q-Bus DMA activity, and is relatively unaffected by Q-Bus DMA transfer rate. PDP-11s, however, can support a considerably higher DMA transfer rate.

Q-Bus DIN to REPLY and REPLY to DIN times are two variables that the Q-Bus specs give as having no minimum. These times directly affect DMA transfer rate, but are dependent on the slave—in this case, memory. Based on the memory comparison I did a little while ago (see Hardcopy, January 1987), I selected the two fastest memory boards, the Andromeda MM22 and the Clearpoint Q-Ram 44 (with 120-nsec DRAMS), to compare DMA transfer speeds.

Although both boards were evenly matched as seen from the CPU, the following differences were observed during block-mode DMA transfers when using three different disk controllers:

<table>
<thead>
<tr>
<th>DMA Transfer Rate</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5MB/sec</td>
<td>10.9%</td>
</tr>
<tr>
<td>2.5MB/sec</td>
<td>3.8%</td>
</tr>
<tr>
<td>&gt;2MB/sec</td>
<td>no diff.</td>
</tr>
</tbody>
</table>

Originally, the Andromeda memory was incompatible with an FPJ11 floating-point chip problem: If a divide by zero occurs, the memory’s contents can become corrupted. (This does not apply to 11/73 floating-point microcode.) Andromeda eventually sent a board with new PROMs to correct this problem, thereby making its DMA transfer rate approximately equivalent to the Clearpoint board in some cases. Several other memory manufacturers still have not corrected the floating-point incompatibility problem. (See the March 1987 edition of the HMS newsletter for a test program.)

Words to the Wise

Failures do occur, even after thorough testing and burn-in. If a controller does not appear to be functioning correctly, reread the manual, make several attempts and then call for telephone technical support. Of the eight controllers I received for evaluation, one was dead on arrival, one died before testing was completed, and two were not the latest revision.

Finally, it should be pointed out that all of the disk controllers I evaluated are regularly upgraded by their manufacturers. One of the most recent upgrades was to provide 15 MHz drive compatibility. Thus, options offered by some of the controllers are not fully mature, or even operational.

Here, then, are some important questions to consider when choosing a controller:

(1) What features are functional now?
(2) What additional features are anticipated and when will they be available?
(3) Are firmware or ECO upgrades included, and for how long? How much will they cost if not?

The answers to these questions will indicate if a manufacturer is concerned with producing and maintaining a high-quality, high-performance product line or just selling controllers as fast as possible. On-site technical support, same-day telephone support and 24-hour replacement policies are also very important.
--- BENCHMARK BLITZ, PART II -- William L. Wallace ---

<table>
<thead>
<tr>
<th></th>
<th>11/73</th>
<th>11/84</th>
<th>MV-II</th>
<th>VAX780</th>
<th>VAX785</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Benchmark</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compile &amp; link</td>
<td>42&quot;</td>
<td>29&quot;</td>
<td>9&quot;</td>
<td>5&quot;</td>
<td>9&quot;</td>
</tr>
<tr>
<td>Run</td>
<td>8.6&quot;</td>
<td>6.1&quot;</td>
<td>1.6&quot;</td>
<td>1.3&quot;</td>
<td>.96&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>51&quot;</th>
<th>34&quot;</th>
<th>10&quot;</th>
<th>7&quot;</th>
<th>11&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disk Benchmark</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compile &amp; Link</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run Random</td>
<td>77&quot;</td>
<td>32&quot;</td>
<td>33&quot;</td>
<td>32&quot;</td>
<td>32&quot;</td>
</tr>
<tr>
<td>Sequential</td>
<td>49&quot;</td>
<td>28&quot;</td>
<td>24&quot;</td>
<td>22&quot;</td>
<td>23&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>126&quot;</th>
<th>67&quot;</th>
<th>55&quot;</th>
<th>55&quot;</th>
<th>95&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Batch Times:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPU seconds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Best</td>
<td>100&quot;</td>
<td>83&quot;</td>
<td>39&quot;</td>
<td>38&quot;</td>
<td>27&quot;</td>
</tr>
<tr>
<td>Average</td>
<td>87&quot;</td>
<td>41&quot;</td>
<td>33&quot;</td>
<td>32&quot;</td>
<td>32&quot;</td>
</tr>
<tr>
<td>Maximum</td>
<td>101&quot;</td>
<td>42&quot;</td>
<td>39&quot;</td>
<td>35&quot;</td>
<td>35&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>237&quot;</th>
<th>144&quot;</th>
<th>66&quot;</th>
<th>76&quot;</th>
<th>122&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elapsed seconds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPU seconds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Best</td>
<td>237&quot;</td>
<td>144&quot;</td>
<td>66&quot;</td>
<td>76&quot;</td>
<td>122&quot;</td>
</tr>
<tr>
<td>Average</td>
<td>171&quot;</td>
<td>104&quot;</td>
<td>201&quot;</td>
<td>174&quot;</td>
<td>244&quot;</td>
</tr>
<tr>
<td>Maximum</td>
<td>241&quot;</td>
<td>157&quot;</td>
<td>334&quot;</td>
<td>357&quot;</td>
<td>957&quot;</td>
</tr>
</tbody>
</table>

--- MICROVAX-II TIMINGS ---

<table>
<thead>
<tr>
<th>disk &amp; ctrlr.</th>
<th>Random</th>
<th>Sequential</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD53/BQDX3</td>
<td>59&quot;</td>
<td>43&quot;</td>
<td>102&quot;</td>
</tr>
<tr>
<td>RA81/KDA50</td>
<td>32&quot;</td>
<td>39&quot;</td>
<td>71&quot;</td>
</tr>
<tr>
<td>CDC9715/EMX-SC03</td>
<td>44&quot;</td>
<td>36&quot;</td>
<td>80&quot;</td>
</tr>
<tr>
<td>CDC-WRENS/DILOG858</td>
<td>32&quot;</td>
<td>24&quot;</td>
<td>56&quot;</td>
</tr>
<tr>
<td>FUJ.2361A/EMX-QD32</td>
<td>33&quot;</td>
<td>23&quot;</td>
<td>56&quot;</td>
</tr>
</tbody>
</table>

--- ETHERNET TIMINGS ---

<table>
<thead>
<tr>
<th></th>
<th>elapsed time</th>
<th>eff. rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDP11/73 to MICROVAX-II</td>
<td>1170 seconds</td>
<td>71.1 Kbaud</td>
</tr>
<tr>
<td>MICROVAX-II to MICROVAX-II</td>
<td>316 seconds</td>
<td>265.5 Kbaud</td>
</tr>
</tbody>
</table>

--- DMR11 TIMING (64 KBAUD) ---

<table>
<thead>
<tr>
<th></th>
<th>elapsed time</th>
<th>eff. rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICROVAX-II to VAX11/780</td>
<td>111 seconds</td>
<td>46.0 Kbaud</td>
</tr>
</tbody>
</table>

--- ETHERNET BRIDGED OVER T1 CARRIER ---

<table>
<thead>
<tr>
<th></th>
<th>elapsed time</th>
<th>eff. rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICROVAX-II to Clustered VAX785</td>
<td>105 seconds</td>
<td>399 Kbaud</td>
</tr>
<tr>
<td>MICROVAX-II to Clustered VAX785</td>
<td>122 seconds</td>
<td>344 Kbaud</td>
</tr>
</tbody>
</table>

--- ETHERNET BRIDGED OVER T1 CARRIER REROUTED OVER 64 Kbaud DMR11 ---

<table>
<thead>
<tr>
<th></th>
<th>elapsed time</th>
<th>eff. rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clustered VAX785 to VAX11/780</td>
<td>845 seconds</td>
<td>49 Kbaud</td>
</tr>
</tbody>
</table>

--- MICROVAX-II TIMINGS ---

--- ETHERNET TIMINGS ---

<table>
<thead>
<tr>
<th></th>
<th>elapsed time</th>
<th>eff. rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDP11/73 to MICROVAX-II</td>
<td>1170 seconds</td>
<td>71.1 Kbaud</td>
</tr>
<tr>
<td>MICROVAX-II to MICROVAX-II</td>
<td>316 seconds</td>
<td>265.5 Kbaud</td>
</tr>
</tbody>
</table>

--- DMR11 TIMING (64 KBAUD) ---

<table>
<thead>
<tr>
<th></th>
<th>elapsed time</th>
<th>eff. rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICROVAX-II to VAX11/780</td>
<td>111 seconds</td>
<td>46.0 Kbaud</td>
</tr>
</tbody>
</table>

--- ETHERNET BRIDGED OVER T1 CARRIER ---

<table>
<thead>
<tr>
<th></th>
<th>elapsed time</th>
<th>eff. rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICROVAX-II to Clustered VAX785</td>
<td>105 seconds</td>
<td>399 Kbaud</td>
</tr>
<tr>
<td>MICROVAX-II to Clustered VAX785</td>
<td>122 seconds</td>
<td>344 Kbaud</td>
</tr>
</tbody>
</table>

--- ETHERNET BRIDGED OVER T1 CARRIER REROUTED OVER 64 Kbaud DMR11 ---

<table>
<thead>
<tr>
<th></th>
<th>elapsed time</th>
<th>eff. rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clustered VAX785 to VAX11/780</td>
<td>845 seconds</td>
<td>49 Kbaud</td>
</tr>
</tbody>
</table>

--- MICROVAX-II TIMINGS ---
### BACKUP TIMES, MICROVAX-II

<table>
<thead>
<tr>
<th>Disk Drive</th>
<th>Directory Files</th>
<th>Blocks</th>
<th>Backup Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>RD53</td>
<td>32</td>
<td>1518</td>
<td>81,330</td>
</tr>
<tr>
<td>CDC9715</td>
<td>391</td>
<td>740</td>
<td>144,391</td>
</tr>
<tr>
<td>WREN-III</td>
<td>18</td>
<td>740</td>
<td>53,936</td>
</tr>
<tr>
<td>WREN-III</td>
<td>31</td>
<td>1517</td>
<td>81,110</td>
</tr>
</tbody>
</table>

### BACKUP TIMES, MICROVAX-II

<table>
<thead>
<tr>
<th>Default Options</th>
<th>Backup Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>/CRC/BUF=3/BLOCK=8192</td>
<td>52.6'</td>
</tr>
<tr>
<td>/NOCRC</td>
<td>38.4'</td>
</tr>
<tr>
<td>/BUF=5</td>
<td>62.5'</td>
</tr>
<tr>
<td>/NOCRC/BUF=5</td>
<td>34.1'</td>
</tr>
<tr>
<td>/NOCRC/BLOCK=32768</td>
<td>29.3'</td>
</tr>
</tbody>
</table>

(32 dir, 1518 files, 80576 blocks)
THE DeVIAS LETTER

Contribution guidelines.......................... 1
From the Editor's Keyboard.......................... 1
Spring DECUS IAS Schedule.......................... 2
Ten Years Ago This Month............................ 2
The Program of the Month Club...................... 3
THE DevIAS Letter
All the News That Fits, we print

CONTRIBUTION GUIDELINES

Contributions should be sent to:

Frank R. Borger
Michael Reese Medical Center
Department of Radiation Therapy
Lake Shore Drive at 31st St
Chicago, IL 60616

Contributions of letters, articles, SPR’s etc will be accepted in any form, (including notes jotted on stained tablecloths.) They will be more graciously accepted in one of the following formats:

Non machine readable sources, (SPR’s etc,) should be reasonably dark to insure good photocopying. Text should be 66 lines at 6 lpi, with 4-line top margin, 5-line bottom margin, left-margin 10, right margin 74 at 10cpi. We can also accept submissions by FAX.

Contributions may be submitted on 9-track Mag-tape, (800,1600, 3200 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 otherwise.

We have 1200 baud modems on our IAS system and our VAX, with KERMIT for electronic submission. Give the editor a call @ (312)-791-2515 (preferably later in the day,) to obtain access information, etc. Any media sent to us will be promptly returned.

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.

FROM THE EDITOR’S KEYBOARD

You can tell it’s nearing the newsletter deadline, the LNO3 is acting up again. The fuser unit seems to be on all the time, and after several hours of power on, the unit overheats. Currently we’re running on a "Turn it on when you need it" basis.

Guess what. DEC service was just here and could find nothing wrong. Their only disclaimer was that the room was too warm. (It was 76 degrees, and the LNO3 manual quotes operating temperatures of up to 90 degrees.) So much for DEC’s statement in DECdirect that "You can use it in an open office...."
That same service person also told us that the ready indicator flashed during the warmup period because "There was a zener diode in the unit that had to warm up." (And if you believe that, I've got this little used PDP11/60 with RK07 drives for sale cheap.) Oh well, when it really goes down for the count, we'll move it into the computer room and then call DEC again. Anybody wonder why the third-party service market is a booming business?

A couple of issues ago, I included some disparaging remarks about RT11 coding standards, and the lack of any source code comments in our copy of the card reader handler. I was properly chastised by Milton D. Campbell, who "Leapt to the defense of the RT-11 Development Group." Milton informed me that the standard RT-11 distribution removed all comments except copyright to reduce the size of the distribution. He also "often wished for commented sources." Guess what Milt, in the earlier days of RSX11D, the teletype handler was distributed commentless on the system disk, to reduce the size of the distribution. But if one went to the full distribution magtape, one got the commented version. I don't think it would cost the RT11 group much to provide a fully commented distribution on a suitable media as an extra cost option.

Milt's closing comment, thou, was wonderful. "In any case, I imagine that all the development groups are about equal in terms of code quality, which means of course that it is not as good as you or I would do, but better than average."

Lynda Roenicke has provided an advanced look at the Spring meeting in Cincinnati. Your editor likes the new format of putting things together rather than scattering it all over the week. Thanks for the great work Lynda.

SPRING DECUS
IAS SCHEDULE

Tuesday is IAS day

9:00- 9:30  Opening session/roadmap
9:30-10:00  IAS Product Panel
10:00-11:00 An Autodailing Device Handler for IAS
11:00-12:00 The Internal Structures of RMS-11 Indexed Disk Files
12:00- 1:30 Files-11 ODS-1: The on-disk structure for PDP-11 systems

1:30- 2:00 The Real RSX-11D Programmers Nostalgia Quiz
2:00- 3:00 IAS User Forum
3:00- 3:30 IASSIG Planning Session

Wednesday is Working Group Day

4:00- 4:30 IAS SIG Library
4:30- 5:00 IAS+ Working Group
5:00- 5:30 RSX-11D Working Group
5:30- 6:00 AN/GYQ-21(V) Working Group

Thursday we finish up

6:30- 7:00 IAS Closing Session

TEN YEARS
AGO THIS MONTH

The report on the Fall 1977 Symposium in San Diego reported among other things that:
The most successful innovation was the establishment of a room set aside for informal discussions, notices and impromptu meetings. (I’m not sure when the name was adopted, but campgrounds were invented at this symposium, ed.)

The tape copy facility produced TWENTY-FOUR sets of tapes for LUG representatives to take back to the LUGs. (In those days, the entire tape was assembled and all copies produced in one marathon all night session.)

An interesting SPR reported that a real-time task called from a timesharing program executed under the UIC specified at task build time, rather than the UIC of the calling task. HOWEVER, if one rebuilt the task with the TKB command line "UIC=[0,0]" the task then executed under the calling task’s UIC.

And the SIG chair, Sally Shlaer, suggested that "the Multi-Tasker staff should consist of 3-6 people" and that "volunteers are needed." (Any volunteers out there? ed.)

THE PROGRAM OF THE MONTH CLUB

Don’t you wish OPE could be called from an indirect command file, or executed via a spawn directive? Often times you want to play with a location in SCOM, and you can do it, but $%^#$ OPE only works from the terminal, it doesn’t do a GETMCR.

This month’s program has been around a long time. Its CZP, CoreZaP. It works just like OPE, except that it can change a single location in SCOM for each call. Just the thing to change the line length for LP1: after you changed from 14-inch to 8½/2-inch paper. The command format is:

CZP aaaaaa/nlnnnnn

to change contents of location aaaaaa to nlnnnnn. It also includes a verification function.

CZP aaaaaa:vvvvvv/nlnnnnn

will only change the contents if the current contents are vvvvvv.

.TITLE CORZAP - ZAP CORE (SCOM) ROUTINE
.DEF VOl/

; This routine operates much like the open command, but as a one line command. This allows its use in indirect command files or via spawn. The only area of memory operated upon is scom. The addresses must be within 100000 to 160000.
; command format: czp <address>[::<verification>]/<newvalue>
; <address>= The scom address of the word.
;<verification>=A verification value for current contents of that location.
;<newvalue>= The new data value to be placed in the cell.
; note: all values are unsigned octal numbers

IAS-3
taskbuild : -cp/-fx/pr/-fp task=...CZP asg=ti:1

.mcall gmcr$,exit$s,qiov$,dir$

local data area

.addr: .word 0 ; the address to be modified
$vfy: .word 0 ; optional verification value
$vflg: .word 0 ; verification flag
$val: .word 0 ; new value for location

directive parameter blocks

mcr: gmcr$ ; define the get mcr DPB
out: qiov$ io.wvb,1,1,,,,<.-.,.-.,40>; define the qio dpb
outbuf= out+q.iopl ; qio buffer address parameter
outlen= out+q.iopl+2 ; qio buffer length parameter

error messages

.syntax: .ascii /CZP - syntax error/
synlen= .-syntax
verify: .ascii /CZP - verification error/
verlen= .-verify
addres: .ascii /CZP - address range error/
addlen= .-addres
prvmes: .ascii /CZP - priviledge violation/
prvlen= .-prvmes
.even

First get command line and check for syntax errors

corzap::dir$ #mcr,exit ; try for mcr buffer
mov $dsr,r5 ; save the length in r5
call privck ; is the caller priviledged
bcc 10$ ; yes, continue
; no, priviledge violation
mov #prvmes,outbuf ; set up the qio
mov #prvlen,outlen ;...
dir$ #out ; and tell him about it
jmp exit ; and exit
10$: mov #mcr+5,r0 ; point to char after 'czp'
add #mcr+2,r5 ; point to end of data
clr mcr+80. ; insure against an overrun.
clr $vflg ; reset the verify flag
call $cotb ; get address & convert it
bic #1,r1 ; force to a word boundary
mov r1,$addr ; and store it for future
cmp r0,r5 ; have we overrun the data?
bhis synerr ; yes - tell the user
cmpb "/",r2 ; terminated with a slash?
beq 40$ ; yes - process the value field
cmpb #':',r2 ;no - is verification supported?
bne synerr ;no - a user syntax error
call $cotb ;convert the verify value
cmp r0,r5 ;have we overrun the data?
bhis synerr ;syntax error
cmpb '#/',r2 ;terminator must be a slash
bne synerr ;syntax error
inc $vflg ;indicate verify is to be done
mov r1,$vfy ;save the value

; evaluate the replacement value
;
40$: call $cotb ;convert the value to binary
mov r1,$val ;save the value

; validate the address, verify old contents and update
;
cmp $addr,#100000 ;greater or equal to scorn base?
blt $addr,#160000 ;less than apr 7? (scorn top)
bhis $addr ;error if greater
tst $vflg ;verify desired?
beq 60$ ;no - continue
cmp $vfy,$addr ;compare to existing data
beq 60$ ;it checks, continue
mov #verify,$outbuf ;doesn’t check set mess address
mov #verlen,$outlen ; and length
dir$ #out ;tell the user he blew it
br exit ;and exit
60$: mov $val,$addr ;update the data item
exit: exit$s

; syntax error
;
synerr: mov #syntax,$outbuf ;load message addr
mov #synlen,$outlen ;and its length
dir$ #out ;tell the user
br exit ;and exit

; privck check users priviledge based on the pud bits
;
returns: cc-clear if priviledged - set if not
; modifies r0.
;
privck: clc ;reset the carry flag bit
mov .crtsk,0 ;get my atl address
mov a.ti(0),0 ;then get my pud address
mov #ut.pr,0.tf(0) ;is my ti priviledge bit set?
beq 10$ ;yes - ok
mov $addr @syn

10$: return

; adrerr address range error
Since this program only changes locations in SCOM, one still does not have the capability to change absolute 18 or 22 bit addresses in memory. A second program, AZP, is used to patch absolute core locations.

The above source can be changed to patch absolute core locations by making the following changes. (Also change the TKB command file to be AZP instead of CZP.)

(1) change $addr to be a two-word buffer
$addr: .word 0 ;the address of the cell to be modified
$addr: .word 0,0 ;the address of the cell to be modified

(2) Edit four error messages so task name is AZP
syntax:  .ascii /AZP - syntax error/
verify:  .ascii /AZP - verification error/
address: .ascii /AZP - address range error/
prvimes: .ascii /AZP - priveledge violation/

(3) Delete 13 lines starting at the label 10$:
10$: mov #mcr+5,r0 ;point to 1st char after 'cor' in buffer
     .
     .
     cmpb '#',r2 ;no - is verification supported?
bne synerr ;no - a user syntax error

(4) Insert the following code
10$: mov #mcr+6,r2 ;point to 1st char after 'azp' in buffer
     add #mcr+2,r5 ;point to end of returned data
     mov r5,-(sp) ;save it
     clr mcr+80. ;insure against a buffer overrun.
     clr $vflg
12$: cmpb (r2)+,'#' ;find end of address string
     beq 15$ ;could be verify also
     beq 15$
     tstb (r2) ;end of command ?
     beq synerr ;if so, syntax error
     br 12$ ;if not, keep looking for / or :
15$: dec r2 ;back up r2 to / or :
     mov r2,r4 ;calc length of address string
     sub #mcr+6,r4 ;for system call
mov  #mcr+6,r5 ;point r5 to start of string
mov  #addr,r3 ;point r3 to output conversion area
call .od2ct ;convert to double precision octal
bic  #1,addr+2 ;make sure word boundary
mov  (sp)+,r5 ;restore end of data flag
cmp  r2,r5 ;have we overrun the end of the data
bhis synerr ;yes - tell the user
mov  r2,r0 ;restore pointer for ctb calls
inc  r0 ;bump past terminator
cmpb #'/,(r2) ;did the field terminate with a slash?
beq  40$ ;yes - go process the value field
cmpb #':,(r2) ;no - is verification supported?
bnz synerr ;no - ??? crazy user. syntax error

(5) Delete the following 4 lines
cmp  addr,#100000 ;greater or equal to scom base?
blo  adrrr ;no - address range error
cmp  addr,#160000 ;less than apr 7? (scom top)
bhis adrrr ;error if greater

(6) Replace them with the following code
mov  addr+2,r1 ;low order address -> r1
mov  addr,r0 ;high order address -> r0
ashc #3,r0 ;shift par part of address to r1
ash  #3,r1 ;reset lower 13 bits of address
bic  #160000,r1 ;clear bits carried from bit 15
ash  #7,r0 ;put upper address in right bits
bis  #60000,r1 ;map r1 to use par/pdr 3
mov  #77406,-(sp) ;4k read/write pdr -> stack
mov  r0,-(sp) ;new par -> stack
call .spd3 ;swap par/pdr 3

(7) edit the line:
cmp  $vfy,$addr ;compare to existing data
so that it read:
cmp  $vfy,r1 ;compare to existing data

(8) edit the line:
60$:  mov  $val,$addr ;update the data item
so that it reads
60$:  mov  $val,r1 ;update the data item

delete the following code:
;
adrrr: mov  #address,oubuf ;setup message addr
mov  #adlen,outlen ;and its length
dirs# out ;output the message
br  exit ;done
EDITOR'S NOTES

I was very sad to learn, yesterday, that Bill Leroy is withdrawing from his various positions within DECUS, including both his editorship of the COBOL column usually presented here, and his position as chair of the SIG PUBS committee within DECUS. As I understand, his career advancement has necessarily caused him to reevaluate both his capability to commit to DECUS, and the value of that commitment to him and his company. We of the L & T SIG will all miss him and his considerable talents, and we wish him the best of luck in his career.

With Bill’s retirement, I’ve lost my most successful columnist. Over the past few months, the COBOL working group has had considerable representation here in the newsletter. I’m sure other areas of interest have just as much information floating around, and just need someone to coordinate it. I would love to have regular (monthly or bimonthly) in a variety of areas. Possibilities include:

- Public Domain Tools
- Software Metrics
- ADA
- PDP-11 Languages & Tools
- "C"
- Fortran
- Standards Activities
- etc ...

Do you see something there that interests you? Are you angered by something I left out? Let me know, and I’ll put you in touch with the appropriate Working Group Coordinator. Together you can work up a plan to get more, and more useful, information to those who share your interests.

This issue of Leverage contains several items of interest. First is more regarding the ongoing discussion of the proposed Fortran 8X standard. This submission was received from France, and is by M. Metcalf of the European Organization for Nuclear Research (Organisation Européen Pour La Recherche Nucléaire). It relates a series of votes taken at CERN regarding the standard. Those of you interested in Fortran should consider the results.

The second article is by Anne Duncan Smith of Digital, who has provided an excellent bibliography of material relating to Software Metrics. I think for this SIG, this may be one of the most useful types of submissions. Thank you, Anne.

Our SIG Chair, Sam Whidden, has submitted a report prepared for DECUS regarding the FY89 activities for our SIG. If you are interested in what we do, how we do it, and what our plans are, here is a good overview of what’s coming up. The final submission is the latest edition of the L&T Masters Directory. This Directory supersedes all earlier versions.

Al Folsom  Leverage Editor
CERN USERS' VOTES ON FORTRAN 8X

M. Metcalf
European Organization for Nuclear Research
European Laboratory for Particle Physics

On the 13th of January an extended seminar and discussion on the draft proposed standard for a replacement of Fortran 77 was held for European high-energy physicists at CERN, Geneva, Switzerland, and was followed by a series of votes on many of the issues involved. These votes are reproduced below, and their meaning is open to various interpretations. However, a number of points are clear: the overwhelming support for BIT data type, I/O facilities for binary, octal, and hexadecimal edit descriptors, and for the principle of obsolescent and deprecated features; the support for varying length characters, significant blanks and vector-valued subscripts; and the desire to see the range facility removed. At the same time, we see a division of opinion on storage association, pointers and on whether we should get what we have quickly, or wait longer for something better. We note that the position taken by the meeting on obsolescence and deprecation is quite different to the one taken by Digital, supposedly on behalf of its users.

I will communicate the results to ANSI as part of CERN's public comment. Anyone who feels strongly on any of the issues, either for or against, may make an individual comment to:

X3 Secretariat
CEMA
311 First St., N.W.
Suite 500
Washington, D.C. 20001-2178
USA

preferably as soon as possible (the formal deadline is 23 February, but some latitude is allowed).

The three votes are yes/no/abstain, where abstain also means don't care or don't know.

1. Should there be a bit data type? 45/1/5
   A. If yes, is the proposal in Appendix F. adequate? 36/2/13
   B. Should there be a set of BIT intrinsics if no BIT data type is introduced? 43/0/8

2. Should there be a pointer facility? 18/22/11
   A. If yes, should it be explicit? 20/1/30
   B. If yes, should it be strongly typed? 18/5/28
   C. And should pointer arithmetic be allowed? 19/5/29

3. Should blanks be significant in the new source form? 29/11/11

4. Should there be I/O facilities for binary/octal/hex numbers? 47/3/1

5. Should there be provision for multi-byte characters? 15/22/14

6. Should there be a facility for varying length strings? 35/9/7

7. Should there be a facility for vector-valued subscripts? 30/10/1

8. Is the proposed language 'too big'? 10/21/20

9. Is the obsolescent and deprecated mechanism a good one (on the whole)? 37/1/13

10. Are you prepared to give up storage association in 20 - 30 years' time? 15/19/17

11. Should multiple and trailing underscores be forbidden? 21/18/12
12. Should multiple statements on a single source line be forbidden? 15/27/9

13. Should the RANGE facility be removed? 36/3/12


15. Should the NAMELIST facility be removed? 22/9/20

16. Should keyword and optional arguments be removed? 5/29/17

17. Should the proposal for generalised precision be replaced by another having the effect of retaining double-precision and adding double-precision complex? 10/19/22

18. Would you prefer to see the current proposal implemented with little further delay, rather than wait 2 - 3 years for new features to be introduced? 21/21/9

SOFTWARE METRICS RESOURCES

Anne Smith Duncan
Digital Equipment Corporation

At the Spring 1987 Symposium, the L&T SIG Software Metrics Working Group met to discuss Software Metrics and our experiences. I've put together a non-inclusive list of books which discuss and relate experiences in the areas of software metrics, quality, cost estimation, and statistical quality control techniques. There is a broad range of topics and detail represented by this list. I've also included a list of periodicals and journals which frequently publish papers and articles concerning these areas.

These references are not endorsed as the most appropriate, best, or complete—it's just a list I thought would be a beginning for the individual who is interested in learning more about the areas of Software Productivity and Software Metrics. The opinions expressed in the annotations are my own.

BOOKS

  One of the early and most complete reference books available on the subject of software metrics and software development project management. Project estimating and estimation models are discussed in detail. The data reflects experiences of software development at TRW through the 1970's. Extensive bibliography, not annotated.

- Fred Brooks, The Mythical Man-Month, Reading MA: Addison-Wesley, 1975
  A classic source on the pitfalls and myths of software development especially regarding large products.

  Applicable to the statistician and non-statistician, the scientific application developer and the commercial application developer, this book applies statistical quality control techniques (as developed by Deming) to software


An excellent reference book for the various software metrics and models published and studied to 1986. Topics include software metrics, micro-models of effort estimation, macro-models of productivity and effort estimation, and defect models. An extensive, non-annotated bibliography is included.


An easy-to-read book that addresses measurements, data collection and analysis during the entire software development process. Topics discussed include Chaos and Order in the Software Development Process (issues of control, estimating dilemma, projecting software costs, and the cost of measurement), System Models and System Metrics (specification, design, implementation, result metrics), Cost Models, and Software Quality.


Statistical quality control and how it can help improve competitive position. Deming is the "father" of statistical quality control and its application to industry, especially manufacturing processes. This book is a summary of his fourteen points of management; it is not a "how-to" book nor is it specifically directed to software development. It is a foundation reference in the areas of productivity and management.


This is a recently published description of the authors' experiences of starting and implementing a software metrics program at the Hewlett-Packard Company. The background of the metrics program, achievements through 1986, and a strategy for the future of the program are included. This is a practical book; it provides a study of a real software metrics program, and the pitfalls and problems one could encounter along the way. Includes an extensive bibliography, partially annotated.

- *Proceedings—n-th International Conference on Software Engineering* [where n = 1..9], IEEE Computer Science Press.

Sponsored by IEEE and ACM as well as many other computer societies, these bi-annual conferences cover a wide range of software engineering topics, including software metrics. Nine have been held through 1986, and proceedings have been published for all of them.


Written in 1986, this recently revised handbook is an explanation and summary of various quality control tools and techniques. Included are practice problems which provide the reader the opportunity to understand when to use a particular tool, not only how. Chapter topics include How to Collect Data, Histograms, Pareto Diagrams, Control Charts, and Sampling. Practical statistics for the non-statistician.


Includes discussions of the problems and paradoxes of measuring software, various metrics (lines-of-code, complexity metrics, programming functions metrics, hybrid measurements), and the many factors affecting programming productivity, some of which can be measured.


A tutorial of many papers addressing a wide range of "programming" productivity issues, including costs, quality, software metrics, and the software development lifecycle.


A lovely book which provides the history of data graphics of the last two centuries, and then a discussion of the effective presentation of data in graphic form. For an individual presenting statistics and graphic information, or for the reader of such graphs and statistics, this book is a wealth of subtle and useful ideas.
PERIODICALS AND JOURNALS

Many journals publish articles on the subjects of productivity in software development, software metrics, and software maintenance, including:

- ACM Sigsoft, Software Engineering News
- ACM Sigplan Notices
- AT&T Technical Journal
- Communications of the ACM
- Computer
- The Computer Journal (published by the British Computer Society)
- Computerworld
- Datamation
- IEEE Transactions on Engineering Management
- IEEE Software
- IBM Systems Journal
- IEEE Transactions on Software Engineering
- The Journal of Systems and Software
- MIS Quarterly
- Software—Practice and Experience
- System Development

LANGUAGES & TOOLS SIG

FY89 ACTIVITIES OVERVIEW

Sam Whidden, Chair
January 15, 1988

The Languages & Tools SIG will continue to improve its product offerings during FY89. Existing products and projects will be strengthened and some new ones added.

SIG Directions

During FY88, L&T increased its emphasis on languages to match its interest in Digital's offerings of new and improved tools. Some ways of doing this have been to work closely with Digital on the balance of session offerings and to solicit user language tutorials. In FY88, L&T and the Commercial Languages SIG merged and have smoothly integrated. The commercial languages have strengthened L&T's support of languages generally, and members of the former CL SIG have contributed greatly to L&T's participation in language standards activities.

In FY89, the SIG's emphasis will expand further to stress its fundamental concern with development methodologies. L&T's statement of mission reads "To promote the interchange of information concerning maximizing software development productivity and quality through effective use of computer languages, software development tools, and software development methodologies, utilizing Digital Equipment Corporation computer equipment and software." (In fact, L&T's European counterpart is named the Languages, Tools, and Methods Special Interest Group). It is important that L&T not exist simply as a collection of individuals and groups with interests in various languages and tools, but that it have as one of its central focuses the use of those languages and tools in organized and systematic ways to construct computer applications.

CASE

Computer Aided Software Engineering is one discipline which increasingly emphasizes the integration of the tools and steps of system development into a coherent whole, and L&T will explore this field aggressively. Other aspects and elements of tools integration will also be given attention, and L&T has encouraged the growth of Working Groups in Configuration Management, Software Metrics, Tools Integration, Project Management, and other facets of system development.
PDP-11 Layered Software

Another area of special concern to L&T is the support of PDP-11 Layered Products. L&T's Working Group in this area is chaired by the SIG's representative to the DECUS-wide PDP-11 Working Group, and special emphasis will be put on ways in which L&T can best serve the PDP-11 user during FY89.

Information Exchange

A broad area of interest to L&T is the direct, individual, interactive exchange of information among users and between users and Digital developers. L&T conducts a number of feedback sessions—Q&A, Users Forum, DEC Asks the User, Wishlists, Wizards, and others, but one of the most effective ways to bring about such exchanges has been through the L&T Campground. Extensive use is made of the Campground, and, to an only slightly lesser extent, the Suite, to provide time and place for conversations between users and Digital developers. The L&T Clinic has been a multiple-hour activity conducted in the Campground during which developers (and L&T Masters) are scheduled for specific times, permitting users to deliver their problems, questions and suggestions one-on-one to those who can actually do something about them.

The L&T Campground and Digital Developers

Like his predecessor, the SIG Chair has visited Digital on various occasions to describe to the developers who will attend Symposium the huge value placed by users on direct discourse with them. The developers have responded outstandingly, spending much more time in the Campground than required by their official schedules, winning praise from many sources for their accessibility and their willingness to spend time with questioners. L&T considers its Campground one of its most valuable projects.

The Masters Program

The L&T Masters Program continues to identify users who are willing and able to spend telephone time answering questions on software topics. The SIG's Masters Coordinator (a former Chair of the Commercial Languages SIG) has received good reports of the assistance rendered by Masters. The program expands with new volunteers at each Symposium. The VAX SIG has expressed an interest in creating its own Masters Directory. L&T has given its full cooperation, and further efforts should see a VAX SIG Masters Program underway. The hope remains that this program will expand eventually into a DECUS-wide activity rather than a SIG-sponsored activity.

Seminars

L&T's energetic Seminars Committee Representative has expanded the SIG's offering of presymposium seminars from three at the Fall '86 Symposium to seven for Spring '88, covering a wide range of subjects, and we expect this effort to continue to be successful. Our Seminars Rep is active in that committee, having taken on the job of Planning Committee Chair.

The SIG Tape

Following the Fall '86 Symposium in San Francisco, L&T offered a SIG Library Tape for the first time in recent years. The SIG expects to continue to issue tapes at least once a year.

Sessions: Quantity and Quality

In Nashville, L&T and CL together offered some 95 sessions. That total rose to 150 for L&T in Anaheim and to 170 for Cincinnati, necessitating a shortening of most sessions to 45 minutes to meet limitations imposed by the symposium facilities. The SIG is investigating two methods of working around these limits. Session Quality Control has become an important L&T project. Session evaluation cards are distributed at most L&T sessions and are returned at a rate of 2,000 to 3,000 per symposium. These are evaluated to identify the best and worst subjects and speakers, for continuing reference. The SIG also makes use of the Symposium Committee's Session Chair Forms as soon after Symposium as they are available. Various forms and evaluation techniques for use by L&T Steering Committee members have been tested. A Session Quality Control Coordinator has been appointed to oversee the SIG's effort to ensure that poor-quality sessions are screened out.

The Session BOF Experiment

Another effort to cope with limited symposium facilities is the 'Session BOF', an idea which will not be tried until Cincinnati. If it works, the Session BOF will be pre-scheduled after certain sessions likely to need more time than the allotted 45 minutes for question and answer (the part of the session usually lost with reduced session time). Urgent questioners may go with the Speaker to this pre-scheduled BOF to complete the interchange. Whether scheduling and space constraints will permit this idea to be successful remains to be seen.

Working Groups

Another important project for L&T is the development and support of Working Groups. There are presently 23 groups operating in the three L&T areas: languages, tools, and methods. L&T's policy is to include its Working Group Chairs as members of the Steering Committee both to enhance communication between the technical and administrative SIG leadership, and to ensure that Working Group Chairs see themselves, and are seen, as integral members of SIG leadership. In Anaheim, the Working Groups prepared roadmaps of L&T sessions of interest to their members, wrote statements of their missions and goals for inclusion in the L&T Information Folder, and held scheduled open Working Group meetings (these meetings were included in the SAG, permitting all attendees to be aware of them). Interest in these groups is increasing, and Digital is participating in each at levels reflecting its own degree of interest in the subject.

The Information Folder

The L&T Information Folder, distributed at Symposia, serves several useful functions. It provides a vehicle for survey questionnaires by several Digital groups. It contains an L&T SIGSAG, Working Group Roadmaps and goal statements, an L&T Volunteer and Symposium Feedback Form.
The L&T Masters Directory (with Masters Volunteer Form). Rogues Gallery Photographs of both the attending Digital developers and L&T Steering Committee members, the L&T Steering Committee Roster, a schedule of Campground and Clinic availability of developers and Masters, a report by Digital on the release status of all layered software, requests from Digital for beta test sites for various software, a SIG Wishlist Questionnaire, a description of the SIG's activities, L&T Symposium Highlights, a source list of DEC-compatible software of all types, and other valuable material for the attendee. There's even an invitation to the joint AI L&T UNISIG Reception. The Folder is an excellent source of information and a reference document for the Symposium attendee.

The Newsletter; Session Notes

The L&T Newsletter, Leverage, is normally published monthly as part of the combined SIG newsletters. It contains technical articles, reports of meetings, reports of standards activities, and other interesting and useful material. L&T's well-presented Session Notes are the product of an experienced Editor who sees to it that a significant proportion of L&T's sessions are represented. The newsletter, the Session Notes, and the Folder are part of L&T's effort to support information exchange in the DECUS environment, and all will receive continued SIG support during FY89.

Volunteers

Volunteer development is another important part of L&T's strategy. New volunteers are needed continually to carry on the work of the SIG, to contribute to the pool of new ideas, and to provide new leadership. L&T distributes a Volunteer Form in its Folder and in the Campground. SIG 'business cards' are handed out liberally, giving the functions, names, and addresses of many SIG Steering Committee members. Badge stickers are distributed in the Campground and attractive L&T Volunteer lapel pins are given to volunteers. The Sunday night reception has become a major focus of L&T's effort to attract new members to the SIG. A Volunteers Coordinator has been appointed who will consider constructing an L&T volunteers database.

The SIG Suite

Along with the Campground, the SIG Suite at Symposia provides an essential setting for informal discussion of technical issues, for planning, and for social mixing of Steering Committee members, developers, new and potential SIG members, and those generally interested in L&T's aims. It also serves for small formal meetings. L&T shares its Suite (as it does its Campground) with the AI SIG and UNISIG, an arrangement which has substantial cost saving benefits, as well as improving cross-SIG awareness. The Tri-SIG Suite is open and staffed during most of the time the Campground is closed. The Campground is staffed by official Hosts from 9 am to 5 pm on most days, and the Suite from 5 pm until midnight or later. At recent past Symposia, the Suite has been in busy use during virtually all of its open hours.

Standards

L&T's participation in ANSI Standards activities has increased markedly in FY88, and will continue to grow during FY89 under the SIG's new standards coordinator, another former member of the Commercial Languages SIG. From having only a single observer in FY87, L&T plans to sponsor membership on 6 ANSI X3 language subcommittees in FY89: Basic, Cobol, Dibol, Pascal, Fortran, and C. Three of these memberships came to L&T through CL and three have been, or will be, established in FY88 and 89. In most of these cases, L&T has both a representative and an alternate, to ensure the continuity of attendance at committee meetings required for continued membership. These representatives act for the DECUS membership as a whole, are available to interact with the membership at Symposia, and are required to provide reports of their committee meetings for publication by the SIG and/or DECUS.

The Symposium Organization Meeting

To make all these efforts possible, to coordinate them, and to make them work successfully, the L&T Steering Committee meets face to face at Symposia and at Woods Meetings. The Steering Committee holds a Symposium Organization Meeting on the Saturday afternoon preceding each Symposium. There, last minute details are settled, assignments are made or revised, new plans made and new proposals studied. When possible, the Digital Counterpart updates the Steering Committee, in non-disclosure mode, on forthcoming new software releases. Usually, between 25 and 30 of the 50 Steering Committee Members are able to attend. The SIG bears the cost of lodging for one night for those members who would otherwise be unable to attend.

Woods Meetings

The SIG meets twice a year at 2-day Woods Meetings. The SIG considers these face to face meetings fundamental to its successful functioning, and normally 15 to 20 members of the Steering Committee are invited to attend. Most Woods attendees are administrative members of the Steering Committee-Officers, Product Unit Reps, and Project Leaders (such as newsletter editor, Masters Coordinator, Working Groups Coordinator, Clinic Director, etc.). The SIG's Digital Counterpart, and sometimes additional development counterparts, attend as fully participating members of the SIG. When possible, a few (2 or 3) Working Group Chairs are invited also, especially those who are new or those whose contribution is especially needed. Often, new members of the Steering Committee are first introduced to intensive SIG operations at Woods Meetings. At Woods Meetings, in-depth reviews of the previous symposium take place, as well as detailed discussions of plans for the next, of new ideas for products and services, and of special areas of concern to the SIG. The Summer Woods Meeting is held in Nashua, NH, permitting a full and direct exchange of information between the SIG and the technical and commercial language developers and managers.

A Continuing Effort

The Languages & Tools SIG is a growing and involved part of DECUS. Its products and projects demand a substantial amount of volunteer time. They benefit in a major way from the interactive give and take of personal meetings, especially those removed from the pressures of Symposium. L&T expects FY89 to see a continued growth of volunteer effort and a continued testing of new ideas.
LANGUAGES & TOOLS SIG

MASTERS DIRECTORY

February 18, 1988

Those listed here have agreed to answer questions from users, normally by telephone, on the products or subjects listed beside their names. Expertise is generally in VMS layered software, unless otherwise noted. A State Code in braces {} follows each name to help the user locate Masters in appropriate geographical areas. Complete addresses and phone numbers appear in an alphabetical list following this directory. The alphabetical listing includes [notes] on other software in use at the Master's installation, where this information could be helpful to a user in selecting a Master and where the Master has supplied it.

The list will become fuller as time goes on. Not all L&T products are listed here, and we await volunteer Masters in all the missing areas. A few non-L&T products are mentioned to accommodate individual Masters with interests broader than L&T's. Mumps is included by special request of the Mumps SIG, as a service to Mumps users.

The expertise of these volunteer Masters overlaps; you may find it necessary to call more than one. Please remember that these Masters can provide you with brief assistance, not with long-term support. Some Masters are professional consultants who have agreed to donate their time and talent in their areas of expertise; it is not L&T's intent to provide a reference service for consultants, and any instance of unwanted commercialism should be reported to the L&T Masters Coordinator (see below). Neither L&T nor DECUS make any claim that the information you receive will necessarily be correct or complete.

Please also notify the L&T Masters Coordinator of any errors in the entries in this Directory, or if you experience real difficulty in your effort to obtain help through this list. Please note that this list expires three months from the date appearing above. After that time, please consult a more recent issue of the Newsletter for a current list.

If you can participate as a Master yourself, please fill out the attached Masters Program application. Submit it to the L&T Campground Host during symposium or mail it to either:

Dena Shelton, L&T Masters Coordinator, Cullinet Software, Inc., 2860 Zanker Road, Suite 206, San Jose, CA 95134; (408)434-6636

or

George Scott, Assistant L&T Masters Coordinator, Computer Sciences Corporation, 304 West Route #38, P.O. Box N, Moorestown, NJ 08057; (609)234-1100

---

### L&T MASTERS SUBJECT LISTING

#### Ada
- Donald E. Amby {WI}
- Philip D. Brooke {MA}
- William Graham {AZ}
- Richard Wallace {OH}

#### APL
- Daniel J. Garvin {KY}
- Richard Golden {IL}
- Daniel P. Thompson {MA}

#### Basic
- Ted A. Bear {CA}
- Joel Finkle {IL}
- Daniel J. Garvin {KY}
- Stephen Jackson {MN}
- Noah Kaufman {MA}
- Brian Lomasky {MA}
- David Santistevan {CO}
- Gary A. Slater {CA}
- Kelvin Smith {CT}
- Tom Stewart {CO}
- William Tabor {FL}
- Robert van Keuren {CA}

#### Basic-Plus
- Stephen Jackson {MN}
- Tom Stewart {CO}
- Robert van Keuren {CA}

#### Basic Plus 2
- William Tabor {FL}
- Robert van Keuren {CA}
<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Languages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ted A. Bear</td>
<td>CA</td>
<td>*Basic (incl. VAX) • Basic Plus 2</td>
</tr>
<tr>
<td>Joel Garty</td>
<td>CA</td>
<td>*Basic Plus 2</td>
</tr>
<tr>
<td>Stephen Jackson</td>
<td>MN</td>
<td>*Basic (VAX) • Basic-Plus • Basic Plus 2</td>
</tr>
<tr>
<td>Brian Lomasky</td>
<td>MA</td>
<td>*Basic (VAX) • Basic Plus 2 (RSX) • FMS</td>
</tr>
<tr>
<td>Tom Stewart</td>
<td>CO</td>
<td>*Basic (INCL. VAX) • Basic-Plus • Basic Plus 2 • Cobol (RSTS/E. VAX)</td>
</tr>
<tr>
<td>William Tabor</td>
<td>FL</td>
<td>*Basic (VAX) • Basic Plus 2 (RSX) • Cobol</td>
</tr>
<tr>
<td>Christopher Thorn</td>
<td>NY</td>
<td>*Basic Plus 2 • EDT • Kermit • Runoff &amp; DSR</td>
</tr>
<tr>
<td>Robert van Keuren</td>
<td>CA</td>
<td>*Basic (INCL. VAX) • Basic-Plus • Basic Plus 2 • Eve</td>
</tr>
<tr>
<td>M. Erik Husby</td>
<td>MA</td>
<td>*Bliss • Debug • EVE • LSE • TPU</td>
</tr>
<tr>
<td>Lawrence J. Kilgallen</td>
<td>MA</td>
<td>*Bliss • TECO</td>
</tr>
<tr>
<td>Donald E. Amby</td>
<td>WI</td>
<td>*Ada • C • CMS • EDT • LSE • MMS • Pascal • Runoff &amp; DSR • TPU</td>
</tr>
<tr>
<td>Fred Avolio</td>
<td>MD</td>
<td>*C • C • Macro</td>
</tr>
<tr>
<td>Dale Hites</td>
<td>IL</td>
<td>*C • EDT</td>
</tr>
<tr>
<td>Lawrence J. Jones</td>
<td>OH</td>
<td>*C • CMS • Debug • LSE</td>
</tr>
<tr>
<td>Jim Maves</td>
<td>CA</td>
<td>*C (incl. VAX/ELN) • Debug • Macro-32 • Pascal (incl VAX/ELN) • TeX and LaTeX • TPU</td>
</tr>
<tr>
<td>Teri McNamara</td>
<td>MN</td>
<td>*C • CMS • Debug • EVE • MMS</td>
</tr>
<tr>
<td>Lorin M. Ricker</td>
<td>OR</td>
<td>*C • Debug • EDT • Macro • SQL (Oracle)</td>
</tr>
<tr>
<td>Kenneth Robinson</td>
<td>NJ</td>
<td>*Ada • C • Cobol • Fortran • Pascal</td>
</tr>
<tr>
<td>Mike Terrazas</td>
<td>TX</td>
<td>*Ada • C • CMS • EDT • LSE • MMS • Pascal • Runoff &amp; DSR • TPU</td>
</tr>
<tr>
<td>Richard Wallace</td>
<td>OH</td>
<td>*CMS • Debug • C • CMS • DCL • EDT • Fortran • LSE • Runoff &amp; DSR • TPU</td>
</tr>
<tr>
<td>Edward Woodward</td>
<td>CA</td>
<td>*DCL • EDT • Fortran • LSE • Runoff &amp; DSR • TPU</td>
</tr>
<tr>
<td>G. Del Merritt</td>
<td>MA</td>
<td>*CMS • Config Mgmt • Emacs • Fortran • MMS</td>
</tr>
<tr>
<td>Joseph A. Pollizzi 3rd</td>
<td>MD</td>
<td>*CMS • MMS • SCAN</td>
</tr>
<tr>
<td>Kenneth Robinson</td>
<td>NJ</td>
<td>*C • CMS • Debug • EVE • MMS</td>
</tr>
<tr>
<td>George Scott</td>
<td>NJ</td>
<td>*CMS • Config Mgmt</td>
</tr>
<tr>
<td>Jay Wiley</td>
<td>CA</td>
<td>*CMS • Fortran • LSE • Test Manager</td>
</tr>
<tr>
<td>John Wilson</td>
<td>CT</td>
<td>*CMS • Cobol • EVE • TPU</td>
</tr>
<tr>
<td>Mark Woodford</td>
<td>IL</td>
<td>*CMS • MMS</td>
</tr>
<tr>
<td>William Jeter</td>
<td>FL</td>
<td>*Cobol</td>
</tr>
<tr>
<td>Scott Krusemark</td>
<td>OH</td>
<td>*Cobol • EDT • FMS • Fortran • Test Manager</td>
</tr>
<tr>
<td>Walter W. Leroy</td>
<td>GA</td>
<td>*Cobol</td>
</tr>
<tr>
<td>David K. Ream</td>
<td>OH</td>
<td>*Cobol • FL/I • SCAN</td>
</tr>
<tr>
<td>Kenneth Richardson</td>
<td>CO</td>
<td>*Cobol</td>
</tr>
<tr>
<td>Patrick Stair</td>
<td>AR</td>
<td>*Cobol • EDT • Runoff &amp; DSR</td>
</tr>
<tr>
<td>Tom Stewart</td>
<td>CO</td>
<td>*Basic (incl. VAX) • Basic-Plus • Basic Plus 2 • Cobol (RSTS/E, VAX)</td>
</tr>
<tr>
<td>Richard Wallace</td>
<td>OH</td>
<td>*Dibol (RT, RSTS/E, VAX)</td>
</tr>
<tr>
<td>John Wilson</td>
<td>CT</td>
<td>*Ada • C • Cobol • Fortran • Pascal</td>
</tr>
<tr>
<td>Edward Woodward</td>
<td>CA</td>
<td>*CMS • Cobol • EVE • TPU</td>
</tr>
<tr>
<td>J.M. Ivler</td>
<td>CA</td>
<td>*CMS • Config Mgmt • DCL • EDT • Runoff &amp; DSR</td>
</tr>
<tr>
<td>Mark Kidwell</td>
<td>TX</td>
<td>*Config Mgmt</td>
</tr>
<tr>
<td>Teri McNamara</td>
<td>MN</td>
<td>*C (CP/M,First Sys,VAX) • Config Mgmt</td>
</tr>
<tr>
<td>G. Del Merritt</td>
<td>MA</td>
<td>*CMS • Config Mgmt • Emacs • Fortran • MMS</td>
</tr>
<tr>
<td>George Scott</td>
<td>NJ</td>
<td>*CMS • Config Mgmt</td>
</tr>
<tr>
<td>Earl Cory</td>
<td>CA</td>
<td>*CMS • DCL • EDT • Fortran • LSE • Runoff &amp; DSR</td>
</tr>
<tr>
<td>J.M. Ivler</td>
<td>CA</td>
<td>*CMS • DCL • EDT • Fortran • LSE • Runoff &amp; DSR</td>
</tr>
<tr>
<td>Philip D. Brooke</td>
<td>MA</td>
<td>*Ada • Debug • EDT • Fortran</td>
</tr>
<tr>
<td>Jack Davis</td>
<td>TN</td>
<td>*Debug • Fortran (VMS) • LSE • Modula II</td>
</tr>
<tr>
<td>William Graham</td>
<td>AZ</td>
<td>*Ada • CMS • Debug • Fortran • Runoff &amp; DSR</td>
</tr>
<tr>
<td>Jim Gursha</td>
<td>NY</td>
<td>*CMS • CMS • Debug • Fortran • Runoff &amp; DSR</td>
</tr>
<tr>
<td>M. Erik Husby</td>
<td>MA</td>
<td>*Bliss • Debug • EVE • LSE • TPU</td>
</tr>
</tbody>
</table>
Languages & Tools SIG — Masters Directory

Jim Maves (CA) • C • CMS • Debug • LSE • Micro-32 • Pascal • TeX and LaTeX • TPU
Lorin M. Rickert (OR) • C (incl VAX/ELX) • Debug • Micro-32 • Pascal (incl VAX, ELX) • TeX and LaTeX • TPU
Kenneth Robinson (NJ) • C • CMS • Debug • EVE • MMS
Mike Terrazas (UT) • C • Debug • EDT • Macro • SQL (Oracle)

• Dibol
Jim Ancona (NH) • Dibol
Rod Brayman (NY) • Dibol
Mark Crego (VA) • Dibol
Dave L. Dirks (MN) • Dibol
Stewart F. Flood (SC) • Dibol
Bruce L. Mebus (MN) • Dibol • TECO
Lyle Phillips (CA) • Dibol
Tom Stewart (CO) • Basic (incl VAX) • Basic-Plus • Basic Plus 2 • Cobol (RSTS E, VAX)
Stan Tucker (TX) • Dibol

• DSR
Ray Ontko (IN) • DSR • Pascal • TPU

• EDT
Donald E. Amby (WI) • Ada • C • CMS • EDT • LSE • MMS • Pascal • Runoff & DSR • TPU
Al Beer (CA) • EDT • Runoff & DSR
Philip D. Brooke (MA) • Ada • Debug • EDT • Fortran
Earl Cory (CA) • CMS • DCL • EDT • Runoff • LSE • Runoff & DSR
Jack Davis (TN) • CMS • Config Mgmt • DCL • EDT • Runoff & DSR
C. J. Meeks (TN) • EDT
Lawrence J. Jones (OH) • Cobol • EDT • FMS • Fortran • Test Manager
Scott Krusemark (OH) • EDT • EVE • TPU
James Meeks (TN) • EDT • EVE • TPU
Pat Stair (AR) • Cobol • EDT • Runoff & DSR
Mike Terrazas (UT) • C • Debug • EDT • Macro • SQL (Oracle)
Christopher Thorn (NY) • Basic Plus 2 • EDT • Kermit • Runoff & DSR
Allen Watson (NJ) • EDT • EVE • Runoff & TPU • TECO • TPU • VAX Notes

• Emacs
L&T-19

Languages & Tools SIG — Masters Directory

G. Del Merritt (MA) • CMS • Config Mgmt • Emacs • Fortran • MMS

• EVE
M. Erik Busby (MA) • Bliss • Debug • EVE • LSE • TPU
Jef Kennedy (OH) • EVE • TPU
Gerald Lester (LA) • EVE • Macro • TPU
David Medvedeff (NY) • EVE • Fortran • TPU • VAX Notes
James Meeks (TN) • EVE • TPU
Kenneth Robinson (NJ) • CMS • Debug • EVE • MMS
Rick Stacks (AR) • CMS • Fortran • TPU
Dennis Thury (TX) • EVE • Pascal • TPU
John Wilson (CT) • CMS • Cobol • EVE • TPU
Robert von Kuenen (CA) • Basic (incl VAX) • Basic-Plus • Basic Plus 2 • Eve

• FMS
Scott Krusemark (OH) • Cobol • EDT • FMS • Fortran • Test Manager
Brian Lonasky (MA) • Basic (VAX) • Basic Plus 2 (Rex) • FMS

• Focus
John Pajak (TX) • Focus (VAX)

• Fortran
John Lundin Jr. (VA) • Fortran (CPM, & MS-DOS, VAX)

• APL
Philip D. Brooke (MA) • Ada • Debug • EDT • Fortran
Donna Calhoun (TN) • Fortran • Runoff & DSR
Earl Cory (CA) • CMS • DCL • EDT • Fortran • LSE • Runoff & DSR
Jack Davis (TN) • Debug • Fortran (VM) • LSE • Modula II
Joel Finkle (IL) • Basic • CMS • Fortran • MMS • Pascal • Test Manager • TPU
David-medvedeff (NY) • APL • Basic • Fortran • Software Proj Mgr
William Graham (AZ) • Ada • CMS • Debug • Fortran • Runoff & DSR • TPU
Howard Holcombe (NJ) • CMS • Fortran • MMS • Runoff & DSR
Noah Kaufman (MA) • Basic • Fortran (Rex)
Scott Krusemark (OH) • CMS • Fortran • MMS • Runoff & DSR

L&T-20
Languages & Tools SIG — Masters Directory

David Medvedeff (NY)
G. Del Merritt (MA)
John Miano (NJ)
Paul Plum (PA)
Andrew Potter (NY)
Rick Stacks (AB)
Lindsay Todd (NY)
Richard Wallace (OH)
Jay Wiley (CA)

•EVE •Fortran •TPU •VAX Notes
•CMS •Config Mgmt •Emacs •Fortran •MMS
•Fortran
•Fortran & F77
•Fortran •Runoff & DSR •VAX Notes
•EVE •Fortran •TPU
•Fortran •PL/I
•Ada •C •Cobol •Fortran •Pascal
•CMS •Fortran •LSE •Test Manager

•Kermit

Christopher Thorn (NY)

•Basic Plus 2 •EDT •Kermit •Runoff & DSR

•LaTeX

Barbara Beeton (RI)
Kent McPherson (MI)
E. Wayne Sewell (TX)
J.R. Westmoreland (UT)

•LaTeX •TeX

•LaTeX •LSE •TeX
•LaTeX •Modula II (MS-DOS) •Pascal [incl real-time use] •TeX •Web
•LaTeX •TeX

•LSE

Donald E. Amby (WI)
Jeff Boes (MI)
Earl Cory (CA)
Jack Davis (TN)
M. Erik Husby (MA)
Mark Katz (MA)
Jim Maves (CA)
Kent McPherson (MI)
Lyle Sutton (MD)
James Thompson (MD)
Jay Wiley (CA)

•Ada •C •CMS •EDT •LSE •MMS •Pascal •Runoff & DSR •TPU
•LSE •MMS •SCAN
•CMS •DCL •EDT •Fortran •LSE •Runoff & DSR
•Debug •Fortran (VMS) •LSE •Modula II
•Bliss •Debug •EVE •LSE •TPU
•CMS •LSE •MMS •Runoff & DSR •SCA •TECO •TPU
•C •CMS •Debug •LSE
•LaTeX •LSE •TeX
•LSE •Test Manager
•LSE
•CMS •Fortran •LSE •Test Manager

•Macro

Dale Hites (IL)
Gerald Lester (LA)
Mike Terrazas (CT)

•C •Macro
•EVE •Macro •TPU
•C •Debug •EDT •Macro •SQL (Oracle)

•LaTeX •TeX and LaTeX •VAX Notes

•Mumps

Mark V. Berryman (MA)
Brad Hanson (MN)
Jerry Hsu (TX)
Mark J. Hyde (NY)
Michael McIntyre (MA)
Chris Richardson (CA)

•Mumps

•Pascal

Donald E. Amby (WI)
Anthony J. Carter (MA)
Rick Evans (OR)
Joel Finkle (IL)

•Ada •C •CMS •EDT •LSE •MMS •Pascal •Runoff & DSR •TPU
•Pascal •TeX and LaTeX •TPU

L&T-22
Languages & Tools SIG — Masters Directory

Thomas Lane (TX)
Ray Ontko (IN)
Lorin M. Ricker (OR)
Scott Sewall (MN)
E. Wayne Sewell (TX)
Dean Stephan (CA)
Dennis Thury (TX)
Richard Wallace (OH)

• PL/I
Steven Duff (CA)
Matthew Madison (NY)
David K. Ream (OH)
Lindsay Todd (NY)

• RXPG
Chas. O Williamson Jr (SC)

• Runoff & DSR
Donald E. Amby (WI)
Al Beer (CA)
Donna Calhoun (TN)
Earl Cory (CA)
William Graham (AZ)
Howard Holcombe (NJ)
J.M. Ivler (CA)
Mark Katz (MA)
Andrew Potter (NY)
Patrick Stair (AR)
Christopher Thorn (NY)
Allen Watson (NJ)

• SCA
Jim Gursha (NY)
Mark Katz (MA)

Languages & Tools SIG — Masters Directory

• SCAN
Jeff Boes (MI)
Joseph A. Pollizzi 3rd (MD)
David K. Ream (OH)
Steven Step (NY)

• Software Proj Mgr
Daniel J. Garvin (KY)
Gary A. Slater (CA)

• SQL
Mike Terrazas (UT)

• TECO
Mark J. Hyde (NY)
Mark Katz (MA)
Lawrence J. Kilgallen (MA)
Bruce L. Mebust (MN)
Kelvin Smith (CT)
Allen Watson (NJ)
Phil Wettersten (OH)

• Test Manager
Joel Finkle (IL)
Scott Krueman (OH)
David J. Powell (MI)
Lyle Sutton (MD)
Jay Wiley (CA)

• TeX
Barbara Beeton (RI)
Kent McPherson (MI)
E. Wayne Sewell (TX)
Languages & Tools SIG — Masters Directory

L&T-25

J.R. Westmoreland {UT}

•LaTeX •TeX

TeX and LaTeX

Rick Evans {OR} Lorin M. Ricker {OR}

•Pascal •TeX and LaTeX •TPU

C (incl VAX/ELN) •Debug •Macro-32 •Pascal (incl VAX/ELN) •TPU

TPU

Donald E. Amby {WI}

•Ada •C •CMS •EDT •LSE •MMS •Pascal •Runoff & DSR •TPU

Pascal •TeX and LaTeX •TPU

Rick Evans {OR} Joel Finkle {IL} Donald E. Amby {WI} Rick Evans {OR} Lorin M. Ricker {OR}

•Basic •CMS •Fortran •MMS •Pascal •Test Manager •TPU

Ada •CMS •Debug •Fortran •Runoff & DSR •TPU

Bliss •Debug •EVE •LSE •TPU

CMS •LSE •MMS •Runoff & DSR •TPU •TECO •TPU

EVE •TPU •EVE •Macro •TPU

EVE •Fortran •TPU •VAX Notes

EDT •EVE •TPU •DSR •Pascal •TPU

Pascal •VAX Notes

EDT •EVE •Pascal •TPU

Scan •TPU •EVE •Pascal •TPU

EDT •EVE •Runoff & DSR •TECO •TPU •VAX Notes

CMS •Cobol •EVE •TPU

VAX Notes

B. Lee Jones {CA} David Medvedeff {NY}

•VAX Notes •EVE •Fortran •TPU •VAX Notes

Fortran •Runoff & DSR •VAX Notes

Fortran •Runoff & DSR •VAX Notes

EDT •EVE •Runoff & DSR •TECO •TPU •VAX Notes

Web

E. Wayne Sewell {TX}

•LaTeX •Modula II (MS-DOS) •Pascal (incl real-time use) •TeX •Web

L&T-26

L&T MASTERS ALPHABETICAL LISTING

Donald E. Amby Delco Systems Operations, P.O. Box 471; M/S 1A21, Milwaukee, WI 53201; (414)768-2682;

Jim Ancona Colt Software Technologies, P.O. Box 336, Framocl, NH 03830; (603)823-8766;

Fred Avolio, 8300 Professional Place, M/S DCO/913 Landover, MD 20785; (301)731-4100;

Ted A. Bear Ramek, 2211 Lawson Lane, Santa Clara, CA 95950; (408)887-2211; MEB.T,E.MC.1.

Al Beer VAX VAX Coordinator Ask Computer Systems Inc., 730 Distel Drive, Los Altos, CA 94022; (415)696-4442 X4103; Debug, Fortran, VAX Notes, TPU, EVE;

Barbara Beeton American Mathematical Society, P.O. Box 6248, Providence, RI 02940; (401)272-9500;

Mark V. Berryman Digital Equipment Corp., 3 Results Way (MR03-2/11), Marlboro, MA 01752; (617)476-4775; BITNET: BERRYMAN@DSM.DEC.COM

Jeff Bees Lear Siegler, 4141 Eastern SE, M/S 121, Grand Rapids, MI 49508; (616)241-8157;

Rod Brayman Phoenix Beverages, Inc., 37-88 Review Ave., Long Island City, NY 11101; (718)729-2000;

Philip D. Brooke President Future Generations, Inc., 5 Prospect Street, Rowley, MA 01969; (617)948-7812; Pascal, Basic, LSE, Runoff & DSR;

R. Alan Bruns Allied Electronics, Inc., 401 E. Eighth Street, Fort Worth, TX 76102; (800)228-6705;

Donna Calhoun Computer Engineering, 704 S. Illinois Avenue, P.O. Box 3174 Oak Ridge, TX 37831; (615)468-0000;

Anthony J. Carter Systems Programmer Bates Linear Accelerator Center, Massachusetts Institute of Technology, P.O. Box 646, 21 Manning Road Middlesex, MA 01940-2464; (617)245-6600; CARTER@MIT.BATES/BITNET; Debug, Fortran, CTE, VAX and LaTeX;

Earl Cory Eaton Corporation, 31717 Latienda Drive, Westlake Village, CA 91359; (818)706-5385;

Mark Crego Integrated Data Systems, 8203 Carbonbale Way, Springfield, VA 22153; (703)838-5677;

Jack Davis XAP Consumer Electronics Corp., Videowriter Business Unit, 1111 North Shore Dr. Knoxville, TN 37919; (615)568-5206; CMS, LSE, RMS;

Dave L. Dirks Bedforo Industries, Inc., 1659 Rowe Ave., Box 39 Worthington, MN 56187; (507)376-4138;

Steven Duff Software Factory, 2401 E. 17th St., Suite 190, Santa Ana, CA 92701; (714)542-9155;

Stewart F. Flood Asten Group, Inc., 4999 Corporate Road, P.O. Box 10700 Charleston, SC 29411; (803)747-7800; [Macro 32, Macro 11];

Joel Finkle G.D. Searle, 4901 Searle Parkway, Skokie, IL 60077; (312)982-8010;

Stewart F. Flood Asten Group, Inc., 4999 Corporate Road, P.O. Box 10700 Charleston, SC 29411; (803)747-7800; [Macro, RMS];

Joel Garry Beck Computers, 5372 Long Beach Blvd, Long Beach, CA 90805; (213)468-1245;

Daniel J. Garvin System Analyst Littion Industrial Automation Systems, 2300 Littion Lane, Hebron, CA 91048; (606)334-2810;

Richard Golden Systems Manager, 300 S. Riverside Plaza, Suite 1054 Chicago, IL 60606;

(J31)930-9800;

William Graham U.S.A.F., OC-ALC/Det. MMCZA, P.O. Box 11037, Tucson IAP, AZ 85734; (602)573-2391;

Jim Gursha VP & Dir. Information Service Goldman Sachs & Co., Financial Strategies Group, 85 Broad St., 25th Floor New York, NY 10007; (212)920-3009;

Brad Hanson Group Health, Inc., 2829 University Ave. S.E. Minneapolis, MN 55414;
Languages & Tools SIG — Masters Directory

(612)622-8427;

David Hites Health Chicago, 1624 Bay Ct, Naperville, IL 60565; (312)601-0825;

Howard Holcombe RCA, Front & Cooper St., Camden, NJ 08105; (609)338-4946; (Config Mgmt)

Project Mgmt)

Jerry Hsu Rubicon Corp., 1200 E. Campbell, Richardson, TX 75083; (214)231-6591;

M. Erik Husby Mgr, Technical Development Project Software and Development, Inc., 20 University Road, Cambridge, MA 02138; (617)661-1444; [Forres, CMS, MMS, EDT, C, DSR]

Mark J. Hyde Advanced Computing Services, 209 Ardsley Drive, DeWitt, NY 13214; (315)446-7223

BITNET:MHYDE@SVM

J. M. Ivler MTS Applications Support De La Rue Printrak, 1250 Newbury St. South, Cambridge, MA. 02138; (617)661-1444; !Fortran, CMS, MMS, EDT, C, DSR

Jef Kennedy PBR & Associates, 6549 Park N A-1, Solon, OH 44139; (216)340-5877;

Mark Kidwell Software Design Engineer Texas Instruments, P.O. Box 89200, M/S 8435, Plano, TX 75086; (214)575-3547

Lawrence J. Kilgallen , Box 81, MIT Station, Cambridge, MA 02139-0901;

Scott Krusemark Systems/Software Consultant Systemation, Inc., 8473 Tustin Ave., Anaheim, CA 92807; (213)698-8214;

Thomas Lane Software Engineer, 1310 Electronics Dr., Carrell, TX 77050;

Walter W. Leroy The Softwear House, P.O. Box 52661, Atlanta, GA 30321; (404)234-1100

Gerald Lestor Computerized Processes Unlimited, 2901 Houma Blvd., Suite 5, Metairie, LA 70006; (504)889-2784;

Brian Lomasky Teradyne, Inc., 321 Harrison Ave., Boston, MA 02118; (617)482-2700 X3559;

John Lundin Jr. Technical Asst Academic Computing, University of Richmond, Richmond, VA 23173; (804)289-8652;

Teri McNamara Sr. Software Eng./Sys. Manager Data Card Corporation, 11 Bredon Road West, Minnetonka, MN 55343; (612)931-1792;

Kent McPherson , 4141 Eastern Ave, SE M/S 121, Grand Rapids, MI 49508; (616)241-7458;

Bruce Lomasky Viscom, Inc., 9713 Valley View Road, Eden Prairie, MN 55344; (612)944-7135;

David Medvedeff Rochester Institute Technology, One Lomb Memorial Dr., Rochester, NY 14623; (716)475-2810; DJMACC@RITVAX.BITNET;

 languages & tools sig — masters directory

James McFeely Trevco Research, 332 Murfreesboro Road, Nashville, TN 37210; (615)248-1236;

G. Del Merritt TAS, 55 Walkers Brook Drive, Reading, MA 01867; (617)944-6850 X2693;

John Miano Berlex Laboratories, 110 East Hanover Ave., Cedar Knoll, NJ 07927;

Ray Ontko System Manager Computing Center, Earlham College, Richmond, IN 47374;

J. M. Ivler MTS Applications Support De La Rue Printrak, 1250 Newbury St. South, Cambridge, MA. 02138; (617)661-1444; !Fortran, CMS, MMS, EDT, C, DSR

Mark J. Hyde Advanced Computing Services, 209 Ardsley Drive, DeWitt, NY 13214; (315)446-7223

BITNET:MHYDE@SVM

J. M. Ivler MTS Applications Support De La Rue Printrak, 1250 Newbury St. South, Cambridge, MA. 02138; (617)661-1444; !Fortran, CMS, MMS, EDT, C, DSR

Languages & Tools SIG — Masters Directory

James McKe 3 Trevco Research, 332 Murfreesboro Road, Nashville, TN 37210; (615)248-1236;

G. Del Merritt TAS, 55 Walkers Brook Drive, Reading, MA 01867; (617)944-6850 X2693;

John Miano Berlex Laboratories, 110 East Hanover Ave., Cedar Knoll, NJ 07927;

Ray Ontko System Manager Computing Center, Earlham College, Richmond, IN 47374;

J. M. Ivler MTS Applications Support De La Rue Printrak, 1250 Newbury St. South, Cambridge, MA. 02138; (617)661-1444; !Fortran, CMS, MMS, EDT, C, DSR

Mark J. Hyde Advanced Computing Services, 209 Ardsley Drive, DeWitt, NY 13214; (315)446-7223

BITNET:MHYDE@SVM
Languages & Tools SIG — Masters Directory

Steven Szep Consultant Szep Consulting, P.O. Box 450, Bowling Green Station New York, NY 10274; (718)789-3020; [Debug, Pascal, CMS, MMS, EDT]
William Tabor W.I. Tabor, Inc., P.O. Box 8078, Coral Springs, FL 33075; (305)528-9802; [BP2(RTS), CMS, MMS, TPU]
Mike Terrazas LDS Church, 50 E. North Temple, Salt Lake City, UT 84110; (801)351-3246;
Daniel P. Thompson Assoc. Dir., Mktg Research The Gillette Company, Safety Razor Division, Gillette Park Boston, MA 02106-2131; (617)465-2536;
James Thompson Applications Analyst, 20000 Cypress Way, Alderwood Manor, WA 98036; (206)775-8471;
Christopher Thorn Elias Sports Bureau, 500 Fifth Avenue, Suite 2114, New York, NY 10110-2977; (212)869-1530;
Dennis Thury Texas Instruments Inc., Box 801 M/S 8006, McKinney, TX 75069; (214)952-2066; CSNet:THURY@MCCORE@TI-EG;
Lindsay Todd Rensselaer Polytechnic Inst., Troy, NY 12180-3590; (518)276-6751; TODDRPICIC@BITNET;
Stan Tucker Compu-share, Inc., Suite 200, 5214 68th Street Lubbock, TX 79424; (806)794-1400;
Richard Wallace AFWAL/AADE, WPAFB, OH 45433; (513)255-4448 x8654;
Allen Watson Watson Consulting, Inc., 3 River St., Suite 30, Little Ferry, NJ 07643; (201)641-2468;
J.R. Westmoreland Custom Software Products, Utah Power & Light, 1407 W.N. Temple, Annex 6/208 Salt Lake City, UT 84116; (801)535-4784;
Phil Wettersten Borden, Inc., E. Broad Street, Columbus, OH 43215;
Jay Wiley Manager, Advanced Technology Group Bechtel Power Corp., 12440 E. Imperial Highway, Norwalk, CA 90650; (213)807-4016;
Chas. O Williamson Jr Hargray Telephone Co., P.O. Box 5519, Hilton Head Island, SC 29938; (803)686-1204;
John Wilson Sr. DEC Consultant Aetna Life & Casualty, City Place - YFB3, Hartford, CT 06103; (203)279-2264; [Debug,Pascal,Fortran,MMS,LSE,SCA]
Mark Woodford G.D. Searle Research & Development, 4901 Searle Parkway, Skokie, IL 60077; (312)482-4992; [Fortran,Basic,TPU,Test Manager]
Edward Woodward SAIC, M/S #24, 10210 Campus Point Drive San Diego, CA 92121; (619)546-3758;
Robert van Keuren UserWare International, Inc., 2235 Meyers Ave., Escondido, CA 92025; (619)745-6006; [TPU, EDT]
The NETWORKS SIG Newsletter
From the Editor

Its spring: that special time of rejuvenation, to come out of hibernation and rub your sleepy eyes. Its been a long cold snowy winter here in the Northeast. I've rounded up some interesting items for this spring issue.

BUT FIRST, A WORD FROM OUR SPONSOR.

L. Stuart Vance, of Balcones Research Center in Austin, Texas, has graciously volunteered to coordinate a collective networks "WISH LIST". On behalf of the user community, suggestions for new utilities, desirable features, things you'd like to see work better or be easier to user, will be presented to the appropriate DEC authorities. Contact Stu if you want to help shape PHASE VI!

L. STUART VANCE  
UT SYSTEM OTS  
BALCONES RESEARCH CENTER  
10100 BURNET ROAD  
AUSTIN TEXAS 78758-4497  
(512)471-2416  
S.VANCE@CHPC.BRC.UTEXAS.EDU

AND NOW, BACK TO THE SHOW!

Ah, as the chickadees dart from tree to tree, our thoughts turn to... CINCINNATTI! Yes, the wheels are in motion. It takes an incredible amount of coordination and planning to pull off a smooth symposium. A potpourri of sessions and Pre-Symposium Seminars will be available through the NETWORKS SIG. As many as 80 sessions are being lined up and quite a few interesting PSS's with something for everyone. Stay tuned.

In the meantime, here's some stuff to ponder. Bill Hancock, our illustrious and prolific mentor, has some thoughts on how to prepare for the upcoming DECNET PHASE V. (I happened to catch this interesting talk at the NY Metro LUG February meeting in lower Manhattan). This will be a hot topic at the upcoming symposium, so check out the PSS offerings early as these will probably fill up early. Here's just a bit to whet your appetites!

JUDI MANDL  
University of Connecticut Health Center  
263 Farmington Avenue  
Farmington, Ct 06032

Preparing for DECnet Phase V

- Excerpts from DECUS Metro LUG presentation by Bill Hancock, of ERI Training, NYC., February 1988.

First a little history. DEC's first generation communication product was built to sell machines. Phase II was funded by AT&T, to make customizations for AT&T. Phase III and IV had performance improvements. Phase IV was OSI-like (same layers, but different names).

Phase V was announced in December 1987 by DEC. It is re-coded and re-engineered Digital Network Architecture. It is considerably more complex than Phase IV - the code increased to 200mb from 75mb.

The implementation will take place "in pieces" over 3 years. Full backward compatibility will be maintained. However, you won't get the full benefits of Phase V new features until all Phase IV nodes on your whole network are gone. Phase IV features are maintained, but the routing algorithms are not compatible. (The new link-state algorithm is more efficient than Phase IV vector tables; you will elevate through states as you transition through protocol layers).
The initial implementation, expected sometime in 1988, will include the following items:
FTAM, VTP & NVT, x4.00, MAIL-11 (enabling mail between PDP and VAX nodes), SNA Gateway access, Digital Time Service, Distributed Services (DSS): Distributed Naming Service, Distributed Queueing Service, and Distributed File Service.

The major goals of DECnet Phase V (DNA) are to conceal network operation from the user, support a wider range of applications, support a wide range of communication facilities and network topologies. It is flexible enough to handle 802 series, MAP and token ring. Maximum use of standards are made. Minimum management intervention is required, but at the same time the network is manageable (if you want it to be). Growth, migration, subsettability, high availability, ability to become highly distributed, and to allow for security, are additional goals.

Phase V is very OSI-oriented. The terminology used to describe the architecture is OSI terms, (as opposed to Phase IV). The current OSI architecture is identical to Phase V architecture through the session control layer. There will be support of DDCMP and HDLC as Data Link layer protocols. Also support for LAPB. The network layer support of connection-less and connection-mode network services using ISO internetwork protocol (IS 8473). DECnet adaptive routing is supplied by DEC’s proprietary routing protocol at the same level. (OSI allows for multiple protocols at the same level). The transport layer uses the standard OSI transport protocol (IS 8073) Class 4. There is also support for Class 0 and 2.

The naming service is integral to the network architecture. Hierarchical in nature, the naming service is called a “directory” and is distributed through the network. Directory updates are synchronized by the network software and is transparent. Directories are replicated on more than one system for recovery and backup purposes. Some address translation capabilities exist.

New network management features are Network management “agents”, security “agents”, local and remote “directors”. The new utility that will replace NCP is NCL. Communication between a director and the target node agent (as in the NCP “TELL” command) are handled by CMIP, the Common Management Information Protocol (IS 9596). This protocol augments NICE.

More complex and larger networks will be possible. The OSI addressing scheme allows 20 byte addresses, that allow you to interconnect to all kinds of networks. One more new feature is domains, in addition to areas.

What Should You Do To Get Ready?
1) Get any nodes in Area 1 out of it. (Area 1 will be reserved).
2) Learn OSI terminology.
3) Get ready to re-code non-transparent applications.
4) Prepare for phase out of all pre-Phase IV nodes as soon as possible.
5) To gain Phase V features, Phase IV nodes must be eliminated.
6) Expect a deluge of new products (more than 300 new products from DEC!)
7) Keep network hardware as OSI-oriented as possible.
8) Expect to re-code any NCP procedures in the very near future.
9) Network management tools will change causing network management at a site to change.
10) Be prepared for more complex and much larger networks made possible by 20-byte addressing.

For more information:
DECUS Cincinnati Phase V seminar will be given by Phase V developers.
DNA Phase V General Description - EK-DNAPV-GD (Sep 1987). OSI Books:
- Computer Networks (A. Tannenbaum)
- Standards for Open Systems Interconnection (Knightson, Knowles, Larmouth - McGraw-Hill)
- Handbook of Computer-Communications Standards Vol 1.
- (Stallings-Macmillan)

ERI Training:
- VMS v5.0 Update Seminar
- DECnet Phase V Update Seminar

NTW-2
The REAL Network Definitions, by Bill Hancock

At the risk of being called flippant, I think that it is high time that communications terminology was defined in the way that we all know it truly works. Sure, you can go out and buy a $90.00 book that tells you all about what word means what, but what the book does not tell you is what those definitions REALLY mean and how they apply to the problems of the modern day communications analyst.

Fear not, for I have saved you the problem of trying to figure it all out. In the following definitions, you will find the true meanings of many of the more popular communications and networking terms that we are faced with in our everyday computing lives.

Enjoy.

Network - n.
(see GOSSIP) 1) a method by which confused entities are connected together to pass information around and effectively confuse other entities, 2) a group of entities that send distorted data to other entities (also see ROUTING), 3) computer to computer communication for the sole reason for management to claim “we have a network”, 4) a method to confuse and amaze otherwise competent programmers and system managers, 5) (adj) to connect otherwise non-connected nervous system components (“he’s over-networked: last week he tried to send a file to the Mr. Coffee.”), 6) Connecting of dissimilar peripherals for mutual satisfaction and benefit (see sexual aberration).

Packet - n.
(latin PACKETUS: to get stuffed in a small place against one’s will). 1) a method by which common items are collected (see RESTAURANT SUGAR), 2) a small entity of data that will spend its short life being trounced, mangled, distorted, and then discarded, 3) something usually unintelligible to those who need to figure it out, 4) a method of data encryption, 5) (adj) to place in a small place (“Packet up your rectum!”), 6) part of a child’s poem (“a tisket, a tasket, a 40 octet packet.”)

Homogeneous - adj.
1) two computers with either totally male or totally female cable connections who REALLY want to hook up with each other, 2) two packets of equal sex, parity, and can get into their own space.man, 3) bizarre communications behavior not explained by normal, programmed sexual response, 4) consenting networks of equal gender and not using sex changer connectors.

Link - n.
(from the Texas LINK: a tubular sausage that is not as exciting as they would like to make you think it is) 1) a type of crane used in the construction of buildings, 2) a type of Texas sausage, 3) a method used to communicate between two computers that resembles a Texas sausage (tubular, made of grotesque left over parts of carcass, usually hard to stomach, and causer of indigestion).

Bandwidth - n.
1) girth of a fat group of musicians.

Broadband - n.
1) group of female musicians, 2) secondary way to describe bandwidth.

Baseband - n.
1) a shabby, inferior quality communications method (see BASE), 2) of comparatively little value (e.g. base metals, baseband, etc.)
ACK - adj.
(from the Latin ACK: to choke, as on something distasteful) 1) sounds made by the character Bill the Cat from the comic strip "Bloom County", 2) hiccup from a remote computer acknowledging digestion and screw up of a received packet, 3) sounds usually made by the department manager at budget submission time.

Router - n.
1) device used to unclog stuck toilets, 2) dispatcher at a police station, 3) a device used to send communications packets to the incorrect destination.

Guru - adj.
(from TOMLINSON: "Good Understanding, but Relatively Useless") 1) person generally used to confuse and amaze management at exorbitant rates, 2) someone to blame when things go wrong in the project development cycle, 3) all-knower, all-seer with a severe case of myopia who tries to describe Utopia.

Engaged Signal - n.
1) a ring around a woman's left ring finger.

Full duplex - adj.
1) an abode that is divided into two halves, each of which has occupants.

MODEM - n.
(from the Norwegian MO: a proper name and DEM: slang for "them") 1) a sophisticated looking device used frequently by programmers and owners of personal computers to amaze friends and neighbors ("here is my MODEM. Don't you wish you had one?"). 2) a device useful for determining the temperature of the room as, if it is too hot in the room, the MODEM is the first device to fail. 3) a device useful for determining how much noise is on a communications line.

To be continued...

Thanks to Bill Hancock (ERI), author, and Bob Gustavson (Northeast Utilities), who passed it on to Dave Washer (UConn Health Center), who passed this on to me, who passed it on to you.
Table of Contents

From the Editor . . . . . . . . . . . . . . . . . . . RST-2
Letters to the Editor . . . . . . . . . . . . . . . . . . RST-3
Terminal Interface Tips . . . . . . . . . . . . . . . . . RST-10
Hardware Update Bulletin . . . . . . . . . . . . . . . RST-11
Software Update Bulletin . . . . . . . . . . . . . . . RST-11
Software Performance Report (SPR) Log . . . . . . RST-11
From the Editor
Terry Kennedy

This is a monthly newsletter, honest! It's just that sometimes Murphy gets in the way. Last month we had some real zingers - more on that later. I've collected a backlog of articles now, so I will have an 'emergency' newsletter ready to go if it is needed. Therefore, you should see us in these pages every month from now on. (Oh no, now I've done it - I wonder what will happen next month!...)

Anyway, normally I wouldn't go into what sort of computer problems I may have here, but this past month's problems affected many of you by making me miss the newsletter deadline, and also by causing me to be late sending my contribution to the Tape Copy project. Well, the tape has been sent, so you should hear more about it soon - I'll try to print the directory in the next issue or two. So, here's what happened:

I had been noticing assorted console error messages on my main 11/44 system, little things like (uStep CP) and (Halted). So, I called my field service rep (whose name and company will remain nameless). He came out with a replacement board and installed it. The new board gave the message (CP didn't start), which indicates a hung bus. Oh well, time to order another spare. Next day, the spare arrived and was installed. Things looked good, and the rep left. Meanwhile, I commenced editing the material for the tape copy project. When I returned from dinner, one of our users said the system was running very slowly. A quick look at the DISPLAY output showed over 2000 errors logged. Upon trying to log in, I was greeted with the error message `??Fatal system I/O failure'. Oh no, I thought - something is *really* wrong now. Called field service again, and was told 'that incident is closed - you'll have to wait till tomorrow for service'. Oh well, we closed up shop early and went home. The next day, another rep arrived with a replacement board. Changed board, got (CP didn't start) again. Rep said problem wasn't in that board, would have to pull all cards from bus and try again. I replied that that was silly, and pulled the same board from another '44 and he tried that. System ran, but wouldn't boot the disk. Rep mumbled something about a run of bad boards and left to find another one.

This went on until the original board had been replaced seven times, over a period of a week. Repeated calls to the company's corporate complaint line were answered with comments that the local branch was doing the best they could, and why was I so upset. No one seemed to consider seven bad boards in a row an unusual occurrence. The seventh board was also defective, but I convinced the rep that ordering another one was equally useless, and I replaced the defective switch on it.

After all that was done and the rep ejected, I discovered that the failed board had wiped the format off my disk drive. A not-so-quick reformat of my 500Mb drive and a restore from my backup tapes got us back in business, except for the tape copy work in progress.

We immediately canceled our service agreement with the vendor and initiated a contract with another. As an academic institution with no 'business' users and a redundant 11/44 system, it did not have a major impact on our site. If you are a small business user, though, you should consider carefully the impact a week of no computer use would have on your business, and make appropriate contingency arrangements. These could be as simple as an agreement with another site to share systems in the event of a failure, all the way to contracting with a commercial disaster recovery firm for a dedicated system.

Since the how-to form has been removed, here is how to contact me for submissions, etc.:

Via US Mail: Terence M. Kennedy
St. Peter's College
Department of Comp. Science
2641 Kennedy Blvd.
Jersey City, N.J. 07306
(201) 435-1890

Via UPS, FedEx, etc.: Terence M. Kennedy
St. Peter's College
Department of Comp. Science
121 Glenwood Avenue
Jersey City, N.J. 07306
(201) 435-1890

You may electronically submit material by calling the RSTS SIG bulletin board system at (201) 915-9361, or you may reach me as user KENNEDY on both DCS and DECUServe, if you have access to either of those systems.

You may submit material on RX50's or RX33's (in RSTS or RT11 format), on 800, 1600, 3200, or 6250 BPI 9-track tape (in DOS, ANSI, BRU, RSTS BACKUP or VMS BACKUP format), or on PC-DOS floppy's (5½ or 3½ inch format). If you are really desperate, I can also accept RSTS or RT11 format RL02 and RK07 disks. You may also submit hardcopy documents, but these will take longer to get into print.

Letters to the Editor

This month we have two articles from the same reader! (Hint, hint...) Paul Flaherty has supplied two routines which should be helpful to RSTS DIBOL users, and can be modified for other tasks as well.
Paul writes:

In my account is a file REQUE.COM, a DCL command file which other RSTS users may find useful. [Ed. note - this file is now in the download area (account [49,1]) on the Newsletter System.] Some sites (particularly RSTS/DIBOL sites, like us) are still locked into using the OPSER package for printer spooling for some applications. This routine, which runs under PBS control at a preset interval (or on demand for users with WACNT privilege), can eliminate the need for SPOOL to be running in most instances. (OPSER and QUEMAN still have to run, however). It takes a full queue listing (Q/L) and extracts the appropriate information to submit the print jobs to PBS.

The current restrictions are:

1. It only looks at the LP0: queue. A loop could easily be "wrapped around" this routine, however, to process queues LP0: through LP7:.

2. It does not honor the "status" of the queue entry, i.e., if the entry is on "hold", it will not be held by PBS. However, if SPOOL is not running and this routine is only used in conjunction with applications which submit print jobs to OPSER, and users only use PBS for direct submission of print jobs, it's unlikely that an entry would be "on hold".

3. If a job is submitted to OPSER with a form name that is not defined in PBSS:FORMS.SYS, it will cause problems, and entries in the queue after it will not be processed until it is removed or modified, or the form is defined in PBSS:FORMS.SYS.

The advantages are:

1. Saves memory and at least one job slot.

2. Prevents most opportunities for jobs to print on the wrong form, since only one spooler is in control of the output device.

I hope this is helpful to some newsletter readers. - Paul

$ ! REQUE.COM - requeues OPSER print entries to PBS. Runs under batch control (in which case it resubmits itself to run an hour later) or on demand for a user with WREAD privilege (to insure that the user has read access to all files to be printed).
$MAIN_LOOP:
$gosub READ_RECORD
$POS = f$instr(1,QUE_DATA,"/SE:"
$if POS .eq. 0 then goto MAIN_LOOP

SGOT_ONE:
$ENTRY = f$mid(QUE_DATA,3,POS-3)
$POS = f$instr(1,QUE_DATA,"/FO:"
$if POS .eq. 0 then goto ABBY_NORMAL
$FORM_NAME = f$right(QUE_DATA,POS+4)
$POS = f$instr(POS,QUE_DATA,"[")
$OWNER = f$mid(QUE_DATA,POS,POS1-POS)+1)
_read 1 QUE_DATA

SGET_FILE_NAMES:
$gosub READ_RECORD
$QUE_DATA = f$edit(QUE_DATA,2)
$if QUE_DATA .eqs. "" then goto MAIN_LOOP
$DELETE = ""
$POS = f$instr(1,QUE_DATA,"/C:"
$if POS .eq. 0 then DELETE = "DELETE"
$POS1 = f$instr(1,QUE_DATA,"/")
$if POS .ne. 0 then COPY—I = f$right(QUE_DATA,POS+3)
$if POS .ne. 0 then COPY—I = f$right(QUE_DATA,POS+3)

$DO_NAME_NOW:
$if POS .eq. 0 .and. POS1 .eq. 0 then FILE_NAME = QUE_DATA
$if POS .ne. 0 then FILE_NAME = f$left(QUE_DATA,POS1)
$if POS .ne. 0 then FILE_NAME = f$left(QUE_DATA,POS1)
$if f$search(FILE_NAME) .eqs. "" then goto FILE_NOT_FOUND
_print/form='FORM_NAME'/copies='COPY—I'/owner='OWNER''DELETE' 'FILE_NAME'

$FILE_NOT_FOUND:
$cq/k 'ENTRY'
$goto GET_FILE_NAMES
$ ! Here is the subroutine where we do the actual read and reformat
$ ! of the records.

$READ_RECORD:
$read/end_of_file=NO_MORE 1 QUE_DATA
$QUE_DATA = f$edit(QUE_DATA,444)
$return
$ ! General error trap. Notify humans that an error occurred and append

$SMAIN_LOOP:
$gosub READ_RECORD
$POS = f$instr(1,QUE_DATA,"/SE:"
$if POS .eq. 0 then goto MAIN_LOOP

SGOT_ONE:
$ENTRY = f$mid(QUE_DATA,3,POS-3)
$POS = f$instr(1,QUE_DATA,"/FO:"
$if POS .eq. 0 then goto ABBY_NORMAL
$FORM_NAME = f$right(QUE_DATA,POS+4)
$POS = f$instr(POS,QUE_DATA,"[")
$OWNER = f$mid(QUE_DATA,POS,POS1-POS)+1)
_read 1 QUE_DATA

SGET_FILE_NAMES:
$gosub READ_RECORD
$QUE_DATA = f$edit(QUE_DATA,2)
$if QUE_DATA .eqs. "" then goto MAIN_LOOP
$DELETE = ""
$POS = f$instr(1,QUE_DATA,"/C:"
$if POS .eq. 0 then DELETE = "DELETE"
$POS1 = f$instr(1,QUE_DATA,"/")
$if POS .ne. 0 then COPY—I = f$right(QUE_DATA,POS+3)
$if POS .ne. 0 then COPY—I = f$right(QUE_DATA,POS+3)

$DO_NAME_NOW:
$if POS .eq. 0 .and. POS1 .eq. 0 then FILE_NAME = QUE_DATA
$if POS .ne. 0 then FILE_NAME = f$left(QUE_DATA,POS1)
$if POS .ne. 0 then FILE_NAME = f$left(QUE_DATA,POS1)
$if f$search(FILE_NAME) .eqs. "" then goto FILE_NOT_FOUND
_print/form='FORM_NAME'/copies='COPY—I'/owner='OWNER''DELETE' 'FILE_NAME'

$FILE_NOT_FOUND:
$cq/k 'ENTRY'
$goto GET_FILE_NAMES
$ ! Here is the subroutine where we do the actual read and reformat
$ ! of the records.

$READ_RECORD:
$read/end_of_file=NO_MORE 1 QUE_DATA
$QUE_DATA = f$edit(QUE_DATA,444)
$return
$ ! General error trap. Notify humans that an error occurred and append

SMAIN_LOOP:
$gosub READ_RECORD
$POS = f$instr(1,QUE_DATA,"/SE:"
$if POS .eq. 0 then goto MAIN_LOOP

SGOT_ONE:
$ENTRY = f$mid(QUE_DATA,3,POS-3)
$POS = f$instr(1,QUE_DATA,"/FO:"
$if POS .eq. 0 then goto ABBY_NORMAL
$FORM_NAME = f$right(QUE_DATA,POS+4)
$POS = f$instr(POS,QUE_DATA,"[")
$OWNER = f$mid(QUE_DATA,POS,POS1-POS)+1)
_read 1 QUE_DATA

SGET_FILE_NAMES:
$gosub READ_RECORD
$QUE_DATA = f$edit(QUE_DATA,2)
$if QUE_DATA .eqs. "" then goto MAIN_LOOP
$DELETE = ""
$POS = f$instr(1,QUE_DATA,"/C:"
$if POS .eq. 0 then DELETE = "DELETE"
$POS1 = f$instr(1,QUE_DATA,"/")
$if POS .ne. 0 then COPY—I = f$right(QUE_DATA,POS+3)
$if POS .ne. 0 then COPY—I = f$right(QUE_DATA,POS+3)

$DO_NAME_NOW:
$if POS .eq. 0 .and. POS1 .eq. 0 then FILE_NAME = QUE_DATA
$if POS .ne. 0 then FILE_NAME = f$left(QUE_DATA,POS1)
$if POS .ne. 0 then FILE_NAME = f$left(QUE_DATA,POS1)
$if f$search(FILE_NAME) .eqs. "" then goto FILE_NOT_FOUND
_print/form='FORM_NAME'/copies='COPY—I'/owner='OWNER''DELETE' 'FILE_NAME'

$FILE_NOT_FOUND:
$cq/k 'ENTRY'
$goto GET_FILE_NAMES
$ ! Here is the subroutine where we do the actual read and reformat
$ ! of the records.

$READ_RECORD:
$read/end_of_file=NO_MORE 1 QUE_DATA
$QUE_DATA = f$edit(QUE_DATA,444)
$return
$ ! General error trap. Notify humans that an error occurred and append

$ ! Q.DAT to the message. By comparing Q.DAT to the current state of the
$ ! LPO: queue, a good guess can be made as to where the error occurred
$ ! and how to recover.

SABBY_NORMAL:
_on warning then _exit
_close/all
_open/write/replace 1 REQUE.ERR
_write 1 """"REQUE.COM ERROR LOG"""="
_write 1 "An error or warning occurred while processing the following"
_write 1 """"QUEUE listing in REQUE.COM. Please have the system manager"
_write 1 "compare this listing with the current queue to determine"
_write 1 """"recovery procedures."
_write 1 ""
_write 1 ""
_close 1
_append Q.DAT REQUE.ERR
_print REQUE.ERR
! If running under PBS control resubmit to run again later, close file(s),
! get rid of Q.DAT, and exit.

SNO_MORE:
_if f$access() .eqs. "BATCH" then _submit/after=+1HOUR PBS$:REQUE.COM
_close/all
_delete/noconfirm/nolog Q.DAT
_exit

In my account is a file called CNAME.MAC. [Ed. note - this file
is now in the download area (account [49,1]) on the Newsletter
System.) It is a Macro-11 subroutine callable from DIBOL
(version 5) under RSTS/E, which allows a running DIBOL program
to change its SYSTAT name. I find it particularly useful in
keeping track of large programs with lots of overlaid
subroutines. It may be useful to some of the other newsletter
readers. Feel free to make it available.

- Paul

;+ File CNAME.MAC
;+
This is a MACRO-11 subroutine written in conformance with the Digital Equipment Corporation document entitled "Writing MACRO Subroutines for RSTS/E DIBOL V5.1." It is used to change the program name of a running job, with .FSS used to load the FIRQB with the appropriate RAD-50 characters, and .NAME used to do the actual change. It is called from a DIBOL program in the format:

alpha record
XCALL CNAME (alpha field)
alpha literal

where the argument passed is the desired program name.

Passing more or less than one argument will cause a fatal DIBOL error 6.
Passing a null string will cause no change in the name. Only the first six characters of the passed argument are used.

Restrictions

Since we use .FSS to load the FIRQB, we cannot include things like dollar signs and periods in the name, e.g., a name like ...EDT won't work. The load of the FIRQB could, however, be recoded to handle such names.

Revision History

When   Who    What
------- ------ -----
29-June-1987  PFFJr  Initial source
23-July-1987  PFFJr  Added description of the use of XCALL FSS and XCALL EXEMT to achieve the same functionality

| top9=177760  | ;used to clear nine high order bits
|------------  |-------------------------------
cname:: cmp   (r4)+, #2          ;one argument?
       beq  10$             ;yes, continue
       trap  6.+200       ;no, trap to DIBOL with fatal error 6
|---------  |-------------------------------
10$:     mov   #2, r1            ;argument read only, for literals
       trap  0             ;pop it off the DIBOL stack
       cmp  r0, #0         ;size gt 0?
       bgt  20$           ;yes, continue
       rts  pc            ;no, so just return to DIBOL
|-------  |-------------------------------
20$:     clr   r3             ;clear for use in 30$      
       mov   r1, -(sp)     ;save r1
       cmp  r0, #6         ;size le 6?
       blos  30$          ;yes, continue
       mov  #6, r0         ;no, so make it 6
|------  |-------------------------------
30$:     inc   r3             ;check for blanks (legal but useless)
       cmp  r3, r0        ;beyond size of argument?
Terminal Interface Tips

A frequently asked RSTS question at Symposia is "Why do we occasionally get LOGIN looping on a terminal, and how can we kill it - simply killing the job doesn't seem to help?"

There are several causes of this problem. The first is the case where a user turns off the terminal before BYE has completed typing the logoff message. The second comes from running cables longer than the specified maximum length, or from using poor-quality cables. The third possibility is marginal or defective hardware (the terminal interface in the CPU).

Because of the way the RS-232 interface works, the data line from a powered-off terminal is neither at a 0 level or a 1 level. It is at an undefined middle ground. On long cable runs, or in electrically noisy environments, this line may pick up enough noise from either the other data line in the cable or from outside noise to trigger LOGIN on the system. LOGIN then prints the user prompt, which is reflected back to the system as more noise, and the problem loops forever.

There are several ways to attack the problem. The easiest is simply to set all terminal lines to /PERM/AUTOBAUD under RSTS V9. Since autobaud requires two carriage returns in a row to start LOGIN, it is unlikely for noisy lines to cause problems, because the noise almost never appears as valid data.

The next way is a hardware solution. Note that it will certainly void any warranty you have, and should only be approached as a last resort. From the discussion above, we saw that the problem stems from noise induced in the terminal cables. If we apply a small 'bias voltage' on the receive data lines on the terminal interface (such as a DZll), we can prevent the noise from triggering LOGIN. We need to use a part which will put the required voltage on the input data line, but not enough to cause valid data from the terminal to be ignored. I have used 5.1K 1/8W resistors in the past with good results, soldered directly to the 1489 RS-232 receivers on the DZll. If this means anything to you, you might want to try it. On the other hand, if this makes no sense, you shouldn't try it.

Hardware Update Bulletin

In the last issue, I reported several FCO (Field Change Order) kits for various devices. In response to your requests, here are some more FCO's for the TU80:

- TU80 'hangs' during backup - Jan '85 - kit EQ-01323-01
- TU80 dislikes 11/84 - Nov '85 - kit EQ-01397-01
- TU80 cover slams - May '85 - kit EQ-01341-01

Software Update Bulletin

RSTS/E V9.5 arrived right after the February issue was sent to the printer. This release seems quite well-done and bug-free (in the sense that no new bugs crept in). Some of the long-standing bugs, such as RSTS not reading RT-11 magtapes, are still present, however. The Feb '88 RSTS/E Dispatch contains two patches for the 9.5 monitor - one enables the new file truncation feature, and the other apparently fixes a bug where RSTS was 'allergic' to certain PPN's (files could not be created in these PPN's, for example). This release also includes the source for the SHUTUP program, which has been requested by several users.

Software Problem Report (SPR) Log

Please send the newsletter editor copies of any SPR's (and Digital's answer) on RSTS/E, DECNET/E, or RSTS layered

RST-10

RST-11
products. We will print any that are of general interest. The reason for this is that many SPR's are answered with a patch or a notice of restriction, but due to space considerations, they are not published in the Software Dispatch. Since we're desperate for material, this should be useful information and we will print it.

The Newsletter system will be expanded in the near future to allow bulletin-board style messages to be posted for users to exchange this information, which should make it much more timely.

A problem with INIT 'losing' the status of RA-series disks was reported. If a drive starts out with the port select button out, pressing it in while at "Start timesharing?" will be ignored by INIT, and the drive remains unavailable. However, if you press it in while the system is up, the drive will become available.

When running the disk test programs in the TESTS: account, if the account you are logged into does not exist on the disk being tested, you will get the '?Can't file file or account' error message.
Opinions expressed in the editorial section of the Multi-Tasker are those of the Editor. They do not represent the official position of the RSX SIG or that of DECUS leadership in general.
Announcing VMS - IAS Compatibility Mode

Bruce R. Mitchell
Machine Intelligence and Industrial Magic

Well, all you RSX hackers out there who are afraid that "everybody" feels IAS and RSX have no place in the VMS world, read on. You'll be happy to know that someone is actively doing something about it.

First, some history and mutual admiration. The RSX and IAS SIGs have enjoyed the closest relationship since their separation some years back. The DevIAS Newsletter and The Multi-Tasker editors, their respective SIG chairs and steering committees have the greatest respect and admiration for each other (since a big collective drunk two years ago).

With such commonality of interest between these two SIGs (both parties a lot and both systems run on PDP-lls) it is not surprising to find that there is much cross-fertilization between the two SIGs.

A case in point is that of the new IAS SIG chair, Alan Frisbie. Alan is and has been an active and well-respected member of the RSX SIG since before the beginning. A successful, and independently wealthy, consultant to both the highest levels of Digital and the users of their equipment, his recent assumption of the IAS SIG chair office can only bode well for that SIG. We wish him the acme of success in that office, and hope that he gets his garage cleaned up real soon.

Another case is that of Sharon Johnson, until recently of the RSX SIG Steering Committee and now of the VMS SIG. Having served well and discharged her position with RSX well and honorably, Sharon now moves on to a new position in the VAX Systems SIG. It is interesting to note that leadership from RSX is always ready to assume new positions.

(What has this all to do with VMS - IAS compatibility mode, you ask? Read on. We're getting there. Have patience.)

Alan, of course, has the best of relationships with VMS as well. He enjoys writing VMS drivers, which is good; with the impending release of VMS V5.0, he will be rewriting a lot of them. In fact, Alan is now so taken with VMS, or as we RSX hackers say, "punch-drunk; loopy as a loon", that he has recently chosen to marry into that august, respected and generally overfed organization.

Literally.

hearts and flowers, please -
Alan Frisbie, of Flying Disk Systems, and Sharon Johnson, of the University of Minnesota Division of Epidemiology, announce their intent to form a tightly coupled VMS - IAS heterogeneous cluster.

The implications of this are staggering. One can almost see the future fully debugged VMS - IAS tightly coupled cluster with lots of little RSX nodes hanging around the net. While Alan insists that no such plans are contemplated, the Editor has found that in such trial situations it is always well to be watching for unexpected new releases.

The Editor sees many such possibilities, all interesting; but chooses not to elaborate further here, having been warned several times to clean up his act.

In the best traditions of both Digital and Big Blue, this announcement is made without a firm release date. The actual field test is expected to begin sometime in the fall of 1988; updates will be published as they come in. Neither party to the agreement would comment on the expected duration of the field test period, but we hope that it will be both long and fruitful for both parties involved.

Bulletin Board Notes

The BBS is running reliably these days. As of late February, the number of users is approaching 100. RSX MAIL, Kermit, old issues of The Multi-Tasker and various other items are available. Conferencing is still unavailable but remains a high priority.

A Vadic 212LC modem was installed on the system in December, replacing the previous 3451P.

The system still needs hardware. Anything. The biggest needs right now are a couple 80 Mb SMD winchesters and a 2400 baud modem. But anything and everything goes, so pack up all your disused treasure and ship it off to the BBS management c/o your friendly Multi-Tasker editor at the address above.

The BBS number: 1-612-SPR-PONG / 1-612-777-7664. This line is autobaud 110 - 1200 baud. To request an account, log in with account name ACCOUNT, password REQUEST.

RSX Question and Answer Session
DECUS Europe / Rome Symposium
September 1987

Dr. Adrian Bottoms
XDT Computer Systems

Top Ten Wish List Questions

1. Q: Will DEC provide a command line editor?
   A: Only place to put it is in the terminal driver which is already too big and complex to support such an enhancement. For time being use DECUS command line editor.

2. Q: On-line and in place disk compression?
   A: Some effort investigating problem but no plans for near future.

3. Q: Selective copy with BRU or PIP
   A: No effort being put in, but it's a good idea.

4. Q: Vectored executive?
   A: Already done for 1LM-PLUS in V3.0. As of V4.0 most privileged utilities will also be vectored, but SAV probably never, and LOA in near future.
   As of V4.0 distribution philosophy will be changed. Each version and update will consist of a complete distribution kit. Old privileged tasks should run on newer execs.

5. Q: Limitation on length of MCR queue to prevent pool being lost due to rubbish input from terminals etc.
   A: Would like to see the problem better defined.

   A: Use SRO. Development group uses SRD too, and it is faster than PIP.
   Aud: Want DEC supported utilities!
   A: No plans to do it.

7. Q: Want BRU /DIR to be sent to a file.
   A: No plans to do this soon. Use BRU in batch job and look at log file. Or use BRUDIR from RSX SIG tape. Or LOG of old M-Plus V1.0 kit.

8. Q: Support a general magtape file utility; VMS version of BRU?; or RSX version of BACKUP.
   A: Could use ANSI magtape support or BRU under VAX-11 RSX.
   Aud: ANSI does not support directories. It is not an adequate solution.
   A: Would like to do it but can't see enough need. Have
discussed VMS BACKUP for RSX. Won't be done for a couple of releases.
Aud: Adrian Bottoms reported he had sent a Fortran source which will read BRU tapes to Bruce Mitchell.

9. Q: Preserve creation date by default on PIP copies.
A: PIP can be built to do this by default. BRU already preserves creation date.
Aud: PREGEN systems have default set as no preserve. Wants it the other way around.
A: We have to maintain compatibility with previous releases.
Aud: Provide a ZAP location that allows customers to change the default.
A: Could do it - prefer to use logical name.

10. Q: Reserve some pool space for an abort command. Allows task to be aborted when pool is low.
A: Problem somewhat removed with external headers since the pool no longer needs to be in pool to allow it to be aborted.
Aud: Problem with tasks with outstanding I/O.
A: We will NEVER NEVER NEVER support an abort of a task with outstanding I/O since there's no safe way to do it.

Q & A Section

1. Q: Steve Balteskonis - DEC, Germany
What is the difference between DLX and the RSX DEUNA device driver?
A: Has no direct experience of DEUNA driver. One difference is that the new DLX interface in DECnet supports both Ethernet standards.

2. Q: Why is there no generic DEQNA driver?
A: DECnet group had no connection with the RSX DEUNA driver.

3. Q: What are plans from DECnet group to support DELQA and from RSX group to support a DELQA driver?
A: DECnet will support all new devices. No answer from RSX group.

4. Q: Alan Frisbie, Flying Disk Systems, USA.
Since there is to be no RSX-11S-Plus will it be possible to get some M-Plus features into 11S, e.g. variable length send/receive data.
A: Official answer is no, since RSX-11M and RSX-11S are mature.

5. Q: Adrian Bottoms, XDT Computer Systems, U.K.
Is there a known problem writing files with fixed length 1024. byte records to ANSI magtape?

6. Q: Peter Moews - DEC, Germany
Are there any plans to remove the 498. block restriction in SAV in RSX-11M/11S?
A: No plans but there has been some talk about doing it. Does not see the need for it.
Aud: Adrian Bottoms has systems with all 256 Kb full of tasks and need the extended support.
A: Not planned for 4.3 but thinks they have done it for a particular customer. May consider it for a future release.

7. Q: Peter Korthoven - Promis, The Netherlands
On M-Plus system crash gets PC, Error code and System error codes. What are the error codes and where are they documented?

8. Q: Jan Belgraver - Organon, The Netherlands
In update D RSX-11M V4.2 we got DTE, but it is not documented and when I built it, it did not work. There were no build files on the kit (got them from Software Support). There was also a missing library.
Aud: The missing library is FDVL1B.

What is the use of the $ERSEQ data and what does it count?
A: Not certain but thinks it counts all hard- and software errors.
Aud: It counts the start/stop mode for TK50 which are ignored by ELI.

Problem with multibuffering and direct access files; last byte gets lost if record size and specified record size in OPEN are equal to 212 bytes. Sent SPR, but he had no response yet.
A: [No understandable answer on tape]

11. Q: Jan Belgraver - Organon, The Netherlands
When there is an error packet with an internal error, RPT reports an error and dumps internal data; does not know how to skip such a bad entry.
A: Send an SPR with file demonstrating problem.

12. Q: Jan Belgraver - Organon, The Netherlands
BRU64K - CONFIGURE shows mag tape device present but attempting to do a backup gets "DEVICE NOT IN SYSTEM" error.
A: No idea what's wrong - RSX developers try to stay away from it! Would anybody object if BRU64K was dropped? (This doesn't remove BRUSYS support). Can BRUSYS replace BRU64K? (nobody in the audience depends on BRU64K).
Implementing Secure User Environments
Wayne Steffen
Cap Gemini America
134 Cedar Ave.
Stirling, NJ 07980

To implement a secure environment on RSX-11M-PLUS, one can use captive command procedures with slaved terminals, or write a restricted user-written command language interpreter (CLI).

A problem with captive command procedures is - what can the user do when the procedure bombs? The terminal is slaved and nothing can be entered from that terminal, until unslaved by a privileged user.

A problem with restricted CLIs is - how to implement a command you don't want entered directly, but is part of a procedure. For example, BRU is a command executed as part of a user backup procedure after the necessary MOUNT commands are issued. If the CLI passes BRU as a valid command, the user can execute it by typing it in.

This article deals with getting around the direct-entry problem so that we restrict the user, but allow command procedures to issue any commands necessary to execute the procedure, without slaving the terminal.

The GCCI$ (Get Command for Command Interpreter) Exec directive can return an optional information buffer. This buffer contains the name of the parent task in four bytes starting at byte 3 for FORTRAN, or offset G.CCPT for MACRO-11 relative to the base of the buffer. If this location is zero, there is no parent task for this command. Commands entered by the user at the terminal have NO parent, but commands executed as part of a INDirect command procedure DO have a parent task.

In the CLI, validation of commands should be done first to allow for procedures that call other procedures, such as a backup procedure that uses a mount procedure rather than MOUNTing directly. If the command is not a valid command defined for user entry then we check parentage. If there is no parent then display a firm but friendly message about typing illegal commands. If the parent is specified then pass the command to MCR or DCL, almost as is.

Many INDirect procedures check to see which CLI is in use before issuing a command. This is done to prefix the command with "MCR " or "DCL" as needed to allow the command to work in different CLI environments. Our CLI won't be MCR or DCL, though, so the prefix MCR will probably be added by the command procedure. That is assuming the command procedure looks like this:

\[ .SETS PREFIX "" .IF CCLI> NE "MCR" .SETS PREFIX "MCR " 'PREFIX'MOU MUO:/FOR/NOS \]

Before the command is passed to MCR, the "MCR " will have to be stripped from the command, or "DCL" if the default was DCL.

Some of the following example is copied from [USER]TMCLI.MAC supplied with RSX-11M-PLUS, and some is from a user-written CLI. This example has only two commands implemented, T and H. See the original source TMCLI.MAC or TMCLI.FTN to see how actual commands are implemented by a CLI.
(Editor’s note: In the following example, some branches may need to be replaced with alternate-sense jumps depending on the size and number of the execution setup code routines.)

; Check for legal commands T OR H
CMP #$T, G.CCBF(R0) ; Is it a "T" command?
BEQ TCMD ; If so, go process it
CMP #$H, G.CCBF(R0) ; Is it a "H" command?
BEQ HCMD ; If so, go process it

; Not a valid direct command; see if a parent task exists
TST IBUF+G.CCPT ; Does parent task exist?
BEQ ILLCMD ; If not, go error out

; The command has a parent task, so give it to MCR as is.
MOV #MCRNAM, R2 ; MCR... is task name
MOV #CMDBUF, R4 ; Point to command buffer
MOV #RPOI, R5 ; Point to RPOI$ dir DBP
MOVB #R.POEX, R.POSC(R5) ; Load string addr in DPB
MOVB G.CCCT(R4), R1 ; Put length in RPOI DPB

; Except if command starts with "MCR " skip the "MCR ",
; NOTE: It is assumed that R0 points at an even address!
CMP #$MC, (R0) ; First 2 characters "MC"?
BNE XQTCMD ; If not, go do it now
CMP #$R .2(R0) ; Second 2 chars "R ",?
BNE XQTCMD ; If not, go do it now

; Yup it's got it so strip it from the line
ADD #4, R0 ; Bump pointer past "MCR ",
SUB #4, R1 ; Shorten buffer by four
BR XQTCMD ; And go do the command

; Create TYPE command
TCMD: <specific code goes here>
BR XQTCMD ; And go do the command

; Create HELP command
HCMD: <specific code goes here>
BR XQTCMD ; And go do the command

; Execute pending command
XQTCMD: CALL ISSCMD
BR GETCMD ; And get the next command

; Illegal command processing
ILLCMD: <necessary processing goes here>
MOV #ERROR1, R0 ; Point at error message
CALL ISSMSG ; Issue the message
BR GETCMD ; And get the next command

This is just a starting point for a specific restricted CLI, a programmer should study the DEC supplied [USER]TMCLI.MAC or .FTN routines for further information.

Timer Support for User Written Drivers

Jim Bostwick
Cargill Research
PO Box 9300
Minneapolis, MN 55440

While presenting a talk at the Nashville Symposium on ASTs, I made the somewhat brash remark that I had "once used Kernel ASTs to implement timer support for a driver". This remark generated a number of questions and requests for more information. The result is this article, which discusses how to get internal timer services into an RSX device driver.

We'll meet kernel ASTs and bounce off a few other subjects along the way. The truth of the matter is, there's not much to putting timers in a driver, so I've thrown in more information to pad the article.

A disclaimer: This is an article about device driver and RSX internals. I assume that you are familiar with the basics. In particular, you must know what SCB, UCB, and other TLAs mean. If you've never read the "Guide to Writing an I/O Driver", you may want to file this article for future reference. On the other hand, it IS written in English and really isn't all that arcane. So, if you're just interested in a peek under the hood, read on.

There are two ways to get timers into your RSX driver. The first is called "device timeout". Device timeout is one of the services provided by RSX for all device drivers. It exists primarily to prevent a driver from hanging on a lost interrupt.
To use device timeout, simply stuff the interval in seconds into byte offset S.CTM of the unit's SCB. Normally, you do this at I/O initiation, but you can initialize or reinitialize this location at any time.

As the RSX clock interrupt service routine ticks off each second, it scans the SCBs, looking for non-zero S.CTM values. When one is found, it is decremented. If an S.CTM value reaches zero, the driver is called at its timeout entry point. Thus, the driver regains control, and can take whatever action is necessary. Part of the QIO completion code in the executive clears the S.CTM offset, to avoid spurious timeouts.

Although device timeout is useful for dealing with a hung device, this facility is not really suitable for general timing within a driver. For starters, there is only one timeout entry point, and only one timer value. This is fine for the function's intended purpose. However, for general timing, having only one timer available is a bit restrictive.

A more troublesome restriction is that the time increment is fixed at 1 second, and is not synchronized with the system clock. This means that there is a -1, +0 second slop in the timeout. For a value of n, you actually get n-1 seconds, plus however many clock ticks are left in the current second.

Why is it like that? S.CTM is a byte value, and 255 ticks let you time only up to about 4 seconds. Not good for a slow typist. Higher precision would cost cpu cycles during the SCB scan (once per second), plus more code in the Exec, plus 3 more words of pool for each SCB. So the answer is "it's simpler, smaller, and faster to do it this way, and it's accurate enough as it is."

A digression: Ever wonder why the terminal driver uses 10 second timeout increments? Some time back, there was a patch to TTDRV which turned the timeout parameter into second, rather than 10 second increments. We used it for a while, but fairly quickly went back to the standard driver, and rolled our own timeouts in the user program for short intervals.

Why? Having TTDRV accept increments down to one second was just too tempting, and we started specifying 1 second timeout for instrument or other non-human serial links. A rash of link failures resulted, because a given QIO might time out after only 1 tick due to the inherent slop in the driver timeout code.

I suspect that the RSX developers set up 10 second increments to avoid having to answer gobs of SPRs on "broken" timeout functions! Before you scream to DEC about ineffective facilities, consider that the driver timeout is an ineffective mechanism of entirely satisfactory precision - for it's intended purpose.

Back to the subject at hand. The second, and much better, way to set a timer from your driver is to roll your own clock block, and insert it in the RSX clock queue. Although this sounds a bit intimidating, it is really quite simple. There is even ersatz documentation in the "RSX Guide to Writing an I/O Driver".

True, there is no mention of it in the index or table of contents, or for that matter anywhere in the main text. But the necessary data structures and system subroutine (CLINS$) are included in the reference section. If you look closely, there is even an example in one of the sample drivers! You still have to go to the Executive sources to figure it all out, but you find lots of interesting things in there, which usually makes such a trip worthwhile.

Using the clock queue gives you many of the same timer services that are available from user state with the MRKT$ directive. Intervals are in ticks, the precision is to -1, +0 ticks, and you can set up as many timers as you need.

Not all of the MRKT$ features are available, however. In fact, you are dealing with the Executive routines which the MRKT$ directive calls for you. RSX assumes that if you are tough enough to go right to the CLINS$ routine, you don't need any hand holding.

The only increment at this level is ticks, so if you want your driver to wait for 13 hours, you need to come up with a large number (1000 ticks) to stuff into the clock block. You also need to be sensitive to what a tick means to the system your driver is running on. There are usually 60 ticks per second, but may be 50, especially if you drink a lot of tea. If your system has SPM, there are probably 100 ticks per second. With a KWll-1 as the system clock, it could be almost anything. The right number can be picked up at run time from the Executive data area.

Although you can certainly build a clock queue entry which will set an event flag in a user task, a driver doesn't have the proper context for an event flag or an AST service routine. Instead, a special clock block is used which results in "AST-like" calls to the specified service routine in the driver when the timer expires.

"AST-like" calls sounds like it could be related to this mysterious "Kernel AST" thingy. Right. An "AST-like" service whose action routine is in the Executive or other system state code is called a Kernel AST. The routine may not really be in the kernel, although it is mapped through the kernel APRs. It will definitely NOT be a real AST! Trapping off the system stack is reserved for REALLY significant events. But Kernel AST is a descriptive name, and has sort of a nice ring to it, so that's what they're called. That, or simply KASTs.
There are several types of these creatures, all among the more obscure inhabitants in the RSX pet shop. They do the same kinds of things that "real" ASTs do in user mode: allow a process to suspend itself pending some event.

Consider the following example. When a buffered read I/O completes, the issuing task may have to be checkpointed in and mapped before the driver can copy the data to the user buffers. To do this, the I/O completion code tickles the Loader to bring the task back into memory, and posts a Kernel AST. When the task is available, the AST fires, and the suspended I/O completion code finishes. Before the AST fires, the system is doing something more useful than waiting around for the Loader — perhaps executing the Loader.

But I digress. We are interested in timer support, and one of the several types of clock queue entry will generate a Kernel AST. The driver posts the timer, then goes on about its business. When the timer expires, the driver is re-entered.

There are several types of clock queue entry. Type 6, "Single Shot Internal System Subroutine" is the one needed. The request type identifier (6) is also defined symbolically as C.SYST. This, plus the offsets into the clock block are defined by macro CLKDFS.

To set up a timer, first allocate a clock block, by calling $ALCLK. The clock block is carved out of system primary Pool (don't worry, it is not large), and its address is returned in R0.

The clock block is initialized, and the timer started, by system routine $CLINS. The call to $CLINS is set up as follows:

- R0 = Address of clock block (as returned by $ALCLK)
- R1 = High order of interval in ticks
- R2 = Low order of interval in ticks
- R3
- R4 = Request type (C.SYST = 6)
- R5 = Service routine address relocated through APR 5

$CLINS converts the interval to an absolute time by adding it to the system time of day clock and adjusting for midnight as necessary. It then copies the adjusted time, the other parameters, and the driver (or caller) APR5 mapping into the clock block, and queues the block in the system clock queue.

Note that if you are in the habit of writing very large drivers which overflow into APR 6 (TDRV does this), then among many other headaches, you must ensure that any timer service routines are mapped via APR 5.

When the timer expires, the Executive maps the driver and calls it at the specified entry point. The driver wakes up at system state, with the clock block address in R4. When the driver finishes whatever processing is necessary to handle the timer expiration, it does a RETURN, which gives control back to the Executive.

Unlike user mode ASTs, there is no cleaning of the stack prior to return, and no ASTX$ call needed (or allowed!). All registers MUST be preserved by the service routine. Failure to do so usually leads to sudden activity on the system crash notification device.

And that is that. Once you know how to set up the SCLINS call, putting timers into a driver is no more difficult than using MRKTS with an AST routine in user state. However, you do have a bit more housekeeping to do.

The Executive does not deallocate the clock block after the driver returns. This is actually friendly behavior, as it saves the driver the trouble of allocating a new clock block for each request. Normally, one or more clock blocks will be allocated during driver initialization, and never given back, unless you plan to unload the driver. That would leave the clock block(s) orphaned, and those chunks of Pool lost forever.

By the way, I would strongly suggest NOT unloading a driver with timers posted. There's no analog to TKTN to clean up a driver. The timer WILL expire and the service routine WILL be called, whether it's there or not. If not, the consequences would be — ah — interesting.

If you must unload the driver, put in a special QIO function to tell the driver to close up shop. This would wait for any pending timers to expire, and deallocate the clock blocks. Of course, it would also necessarily cause any subsequent QIOs to be rejected out of hand.

This raises another potential caveat: there is no way, short of running down the clock queue yourself, to cancel a timer once it's been posted. Thus, you probably need a flag to tell the service routine "never mind".

Great care must be exercised within the timer service routine. Just as with user-mode ASTs, the mainline code is completely unaware that the AST routine has come and gone. It is all too easy to do something in the AST routine which damages the driver's internal context. The driver will usually share its insanity with RSX. You know the rest.

By the way, a Kernel AST provides a neat way to get a driver to do something even though NO QIO IS EVER POSTED to it! Like recursion, this is an esthetically pleasing concept with limited (though real) practical use. Its best application may be for establishing your hacker's credentials over a few brews at the local pub. Or, perhaps you have a device which simply pines away from lonliness and croaks if not tickled every so often.
The way this trick works is as follows: At the online entry point, post a clock queue entry for some convenient interval. In the KAST service routine, tickle your device or whatever, then call $CINS again to perpetuate the timer. Around and around it goes.

Come to think of it, this might also be a neat way to embed truly weird code in the Executive where no one will ever find it. After all, system state is system state, no matter how you get there. Simply graft your trick code and the appropriate $CINS calls onto some unsuspecting driver (the one running the system disk might be a good choice), and turn it loose. Just the ticket for a routine that selectively increments the saved PC of all programs running under your shop bozo’s UIC. Except for BYE, of course. Amaze your friends! Befuddle your enemies! Give yourself some job security!

Enough of that. I hope that I’ve shown how adding timer support to your drivers is not at all difficult. No more trouble in fact than putting similar support into a user task. As with most things, once you know how, it’s easy.

This article may also have piqued your interest in the remaining types of clock queue entries (one could surmise that there are at least 6 types), the other kinds of Kernel ASTs (there are several), or both. If so, haul out your trusty RSX listing, and have at it.

And by all means, let us know what you find.

Virtual Disk Driver Problem Fix

Editor’s note: I have no record of who submitted this. The problem exists due to use of DV.MSD in the latest release, and this is the correct fix. The same fix should be applied to all other virtual disk drivers.

After installing RSX-11M-Plus V4.0 I encountered a small problem trying to BRU to a virtual disk. This letter describes the problem and a how I solved it.

I have used the virtual disk package the Spring 1983 SIG tape, UIC [370,21]. This software is Ralph Stamerjohn’s original VD package for RSX-11M, modified for M-Plus by T.K. Pang and L.M. Fraser. Although their comments say this version was done for an M-Plus V2.0 field test, I have used it with V2.0 thru V3.0 Update E without the slightest problem.

This venerable VD also worked with M-Plus V4.0 with one minor exception: BRU (Ident 08.16 and later) refused to use VD devices. If I mounted a VD device Files-11 or as a foreign device and tried to BRU to it, I got either of the following messages:

BRU -- *FATAL* -- Device not mounted files 11 on VDO:
BRU -- *FATAL* -- Device not mounted foreign on VDO:

A BRU.TSK from M-Plus V3.0 Update E running on the V4.0 system allowed access to the VD device, so the problem was with BRU itself, not the operating system.

I poked around in the VDO: device data base using FCB (file control block lister) from the Fall 1983 SIG tape, UIC [300,70]. I compared the unit control block of VDO: to a UCB of a "real" disk and discovered differences in the word U.CW1 (unit characteristics word 1):

<table>
<thead>
<tr>
<th>DB0:</th>
<th>VDO:</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VDO:</td>
<td>Value</td>
<td>Description</td>
</tr>
<tr>
<td>-----</td>
<td>-----</td>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>DV.DIR</td>
<td>DV.DIR</td>
<td>10</td>
<td>File structured device</td>
</tr>
<tr>
<td>DV.MSD</td>
<td>100</td>
<td>Mass storage device</td>
<td></td>
</tr>
<tr>
<td>DV.UMD</td>
<td>200</td>
<td>User mode diagnostics supported</td>
<td></td>
</tr>
<tr>
<td>DV.FI1</td>
<td>DV.FI1</td>
<td>40000</td>
<td>Mountable as FILES-11 device</td>
</tr>
<tr>
<td>DV.MNT</td>
<td>DV.MNT</td>
<td>100000</td>
<td>Device is mountable</td>
</tr>
</tbody>
</table>

The decoding of the bits in U.CW1 was found in the "RSX-11M-PLUS and Micro/RSX Crash Dump Analyzer Reference Manual", page C-86 (DEC p/n AA-JS13A-TC) distributed as part of the M-Plus manual set.

I used the MCR OPEn command to set the DV.MSD bit in U.CW1 for VDO: and found that BRU worked. The conclusion was that for some mysterious reason BRU now checks the DV.MSD bit.

To make the fix permanent, I changed the device driver data base (VDTAB.MAC) to set the DV.MSD bit, and rebuilt the VD package. After that, everything was back to normal.
From the Editor:

Another DECUS Symposium is coming up. For those of you who need to know, or need to make up your minds, or need to persuade your bosses to send you to Cincinnati, Milton Campbell has provided the abstracts of the RT-11 sessions so you can know ahead of time what to expect. Bob Walraven fills out his analysis of the RT-11 Wish List. Shal Farley has some more comments about using Tex, Web, Pascal and Modula 2.

We are celebrating the 15th anniversary of RT-11's beginnings this year. I, for one have been using RT-11 throughout that entire period (except for a brief tergiversation to RSX-11M). I'd like to put some war stories from you other old-timers in the Newsletters. So send your favorite RT-11 anecdote to:

John M. Crowell
RT-11 Newsletter Editor
Multiware, Inc.
2121-B Second St. Suite 107
Davis, CA 95616

re: A postscript to my letter of 13-Jan about \TeX

Dear Mr. Crowell:

If a Pascal to Modula-2 translator does not exist there may be a simpler solution than implementing one: modify Web to generate Modula-2 directly. Of course, this would require access to a system which already runs Web.

Also, Wirth claims (on the back cover of his book '\TeX: The Program') that "Semi-automatic translation to other languages is also feasible, because the program ... does not make extensive use of features that are peculiar to Pascal." I have not purchased or read the book yet, so I'm not sure if he meant translation of the Web sources or of the code it produces. I presume the latter because he was talking specifically of porting \TeX to other machines.

Sincerely,

Shal Farley
Analysis of the RT-11 Wish List Survey

1 INTRODUCTION

The RT-11 Wish List Survey is now over. We have collected all the data, analyzed it, presented results at the Fall DECUS Symposium, and given the results to the RT-11 Development Team. We would like to now present the results of the survey to those of you who were not able to make it to the Fall Symposium.

The purpose of the survey was to rank by importance the features the user community would like to see in RT-11, and compare those results with the ease or difficulty of implementing those features. The benefit of such a survey to Digital is that it would allow the RT-11 Development Team to understand what its user community would like to see it working on. The benefit of the survey to the RT-11 users is that it would give us a feeling of shaping the RT-11 of tomorrow.

2 RESPONSE

How well did the RT-11 readers respond? 56 forms were returned to us. That doesn’t sound like a lot, but it may not be as bad as it seems. There are approximately 50,000 DECUS members, but only a little over 5,000 currently subscribe to the newsletter. Let’s make an educated guess that 5 percent of those are active RT-11 users (actually use it to do development, not people who once used RT-11). Then we are only talking about 250 readers who might have an opinion to express. If these numbers are right, then we got better than 20 percent return. Not so bad after all.

Let’s look at what this tells us in a different light. We know that Digital has sold a little over 100,000 RT-11 licenses. We don’t know how many of these are still active – maybe 20,000-30,000? The problem with these numbers is that many of the currently installed RT-11 systems are not being used for development; they may be buried in a laboratory or inside a piece of equipment, and are just sitting there quietly doing their job. Furthermore, many RT-11 users are really responsible for several systems, so the actual number of active RT-11 system managers who are doing program development may only be a few thousand. Let’s say the number is 2,500-5,000. Can we confirm this number in another way? Yes, we can. The number of active FORTRAN-77 users is something like 1,400. Digital has recently informed me that FORTRAN-77 and FORTRAN-IV sell in about equal numbers, so we have about 2,800 FORTRAN users. At a DECUS session a year or so ago I asked the audience what languages people use. Most use MACRO and FORTRAN, and few use anything else. So the number of active RT-11 users, computed this way is probably around 3,000 to 4,000.

If we believe these numbers, it appears that a little less than 10 percent of the active RT-11 community reads the newsletter. That is only slightly worse than the rate for the entire Digital community, which is just a little over 10 percent. But we would expect the RT-11 readership to be a little worse than average because the typical RT-11 user doesn’t have as much money to spend as the typical VAX user.

The numbers above also seem to indicate that we had a slightly better than 1 percent sample of the entire RT-11 community. Although we would have liked to have seen a larger response, we feel that the sample was large enough to be a significant representation of the views of the entire community.

3 SCORING

For each item on the wish list we asked the respondents to give us a score as follows:

4 = Very important
3 = Mildly important
2 = Mildly undesirable
1 = Very undesirable

Many respondents voted only on those items that they had a strong opinion about, so for each item, in addition to the distribution of 4’s, 3’s, 2’s, and 1’s, we had an additional statistic: the number of votes of all kinds for that item.

Summing over all items, there was a total of 4857 votes, which means that the typical respondent voted for (or against) a little less than half of the items. The breakdown of votes is as follows:

<table>
<thead>
<tr>
<th>Score</th>
<th>Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>2178</td>
</tr>
<tr>
<td>3</td>
<td>2288</td>
</tr>
<tr>
<td>2</td>
<td>285</td>
</tr>
<tr>
<td>1</td>
<td>106</td>
</tr>
</tbody>
</table>

That is, people were generally in favor of the items they voted on, but there was some feeling that some particular items were not desirable.

We wanted to come up with a single number that represented the relative score of an item. For lack of a better idea, we settled on using the average of the four responses, weighted by the response numbers, and normalizing so that the average of all scores was zero. In mathematical terms, we computed

\[
\text{SCORE} = \frac{N_1 + N_2 - N_3 + N_4}{(N_1 + N_2 + N_3 + N_4)}
\]

where \( N_1 \) is the number of 1 responses, \( N_2 \) is the number of 2 responses, etc., and the average reply over all questions was computed to be 3.35. Computing the item scores in this way gave us a nice distribution of values such that approximately half the items had positive scores (more desirable than the average), and half the items had negative scores (less desirable than the average).

4 RANKING

Figure 1 shows how the scores were distributed as a function of the number of votes an item received. Notice that there is essentially no correlation between the score and the number of votes (well maybe a little tiny bit). This means that these two quantities are statistically independent. That is, they each express something unique about an item. Perhaps it is best to think of the score as being "Desirability" and the number of votes as being "Importance". Thus, an item with a high score and number of votes is not only very desirable, but also important to many respondents.
We wanted a single measure to rank the items by, where the the top of the list contained the items that the respondents clearly felt should be implemented in RT-11, the middle of the list contained items that were not really important, and the bottom of the list contained the items that should not be included in RT-11. Given the way we defined the score, the items can be ranked in this way by defining

$$RANK = \frac{SCORE}{NUMBER\ of\ VOTES}$$

5 THE DIGITAL RATING

We gave the Wish List to the RT-11 Development Team without letting them see any respondent statistics, and asked them to rank each item by the ease or difficulty with which it could be implemented in RT-11. They ranked all the items on the following scale:

0 = Already done or easy workaround
1 = Very easy
2 = Moderately easy
3 = Somewhat difficult
4 = Very difficult
5 = Irrational or Impossible
6 = Didn't understand request

Figure 2 shows how the scores were distributed as a function of the Digital Rating. Notice that most of the items had a Digital Rating of 1, 2, or 3. Each Digital Rating category seems to have a distribution of scores somewhat like the total distribution (approximately Gaussian about zero). That is, there does not seem to be any noticeable correlation between score and Digital Rating.

6 PRESENTATION OF RESULTS

For each item on the Wish List we will give the number of votes, the score, and the Digital rating. Instead of using the Wish List ordering of items, they will be presented in order of rank for each of the Digital rating values. In this way, it is hoped that you will be able to get a quicker feel for which items fared well and which didn’t.

If anyone is interested in the complete raw data, please let us know and we will send it to you.

6.1 The Items you get for free

There were only 6 items that fell into the "already done or there is a workaround" category (Digital rating of zero). Unfortunately only one of these items had a positive score. The following table lists these items in order of RANK.

<table>
<thead>
<tr>
<th>Score</th>
<th>Votes</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.11</td>
<td>26</td>
<td>VTCOM: Restore the packet size after it has been reduced (Coming in Version 5.5)</td>
</tr>
<tr>
<td>-0.06</td>
<td>24</td>
<td>Provide EMTs to mount/dismount logical disks (Available now as a special function)</td>
</tr>
<tr>
<td>-0.10</td>
<td>24</td>
<td>KED: Provide a way to go to an absolute line number (Can do &lt;gold&gt;&lt;gold&gt;&lt;number&gt; now)</td>
</tr>
<tr>
<td>-0.12</td>
<td>13</td>
<td>Provide an EMT to return address of channel 10SB (Can be done now with GTJOB + arithmetic with less monitor overhead)</td>
</tr>
<tr>
<td>-0.16</td>
<td>21</td>
<td>VTCOM: Provide a way of bypassing halving algorithm</td>
</tr>
<tr>
<td>-0.22</td>
<td>15</td>
<td>BUF: Provide /NOVERIFY switch (Coming in Version 5.5)</td>
</tr>
</tbody>
</table>

6.2 The Very Easy Items

There were 34 items that were ranked "Very easy" by Digital. Roughly half had positive scores. The following table lists these items in order of RANK.

<table>
<thead>
<tr>
<th>Score</th>
<th>Votes</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.24</td>
<td>44</td>
<td>Make IND extension &quot;.CMD&quot;</td>
</tr>
<tr>
<td>0.33</td>
<td>28</td>
<td>BUF: allow /DIRECTORY switch to show files within backup save set</td>
</tr>
<tr>
<td>0.20</td>
<td>38</td>
<td>Multiple learn sequences for KED</td>
</tr>
<tr>
<td>0.20</td>
<td>31</td>
<td>Lover case &quot;T&quot; answers in PIP, DUP and BUF</td>
</tr>
<tr>
<td>0.17</td>
<td>33</td>
<td>LIBR switch for removing module from library</td>
</tr>
<tr>
<td>0.14</td>
<td>37</td>
<td>KMON F77 command (with switches)</td>
</tr>
<tr>
<td>0.13</td>
<td>25</td>
<td>TSK-like DISPLAY statement for command files</td>
</tr>
<tr>
<td>0.09</td>
<td>36</td>
<td>TSK-like PAUSE statement for command files</td>
</tr>
<tr>
<td>0.15</td>
<td>16</td>
<td>SYMSAM macro for easily calling FORTRAN routines</td>
</tr>
<tr>
<td>0.10</td>
<td>22</td>
<td>KED: allow section to be cleared without having to clear past buffer first</td>
</tr>
<tr>
<td>0.07</td>
<td>26</td>
<td>KED: implement BACKSPACE key like EDT</td>
</tr>
<tr>
<td>0.06</td>
<td>27</td>
<td>KED: implement SET REGION HOLD so that marked region is not lost after it is used</td>
</tr>
<tr>
<td>0.06</td>
<td>27</td>
<td>Provide DATE functions in SYSLIB</td>
</tr>
<tr>
<td>0.08</td>
<td>14</td>
<td>SIFF: Let ctrl-C abort search and verify rather than SIFF itself</td>
</tr>
<tr>
<td>0.06</td>
<td>17</td>
<td>Let command lines start with a number</td>
</tr>
<tr>
<td>0.01</td>
<td>25</td>
<td>Provide 8-bit support in XC/XL</td>
</tr>
<tr>
<td>0.01</td>
<td>11</td>
<td>MACRO: provide alternate to .PRINT to avoid conflict with SYSLIB macro</td>
</tr>
<tr>
<td>-0.02</td>
<td>21</td>
<td>Allow HEXadecimal radix in MACRO</td>
</tr>
<tr>
<td>-0.02</td>
<td>21</td>
<td>Provide terminal emulator hooks in XC/XL</td>
</tr>
<tr>
<td>-0.04</td>
<td>16</td>
<td>Allow control of READONLY PDR bits in global region directives</td>
</tr>
<tr>
<td>-0.08</td>
<td>15</td>
<td>Provide HEX support for MACRO inputs/listings</td>
</tr>
<tr>
<td>-0.24</td>
<td>9</td>
<td>Allow patch to make /O switch permanent</td>
</tr>
<tr>
<td>-0.11</td>
<td>25</td>
<td>KED: allow SET WRAP nnn</td>
</tr>
<tr>
<td>-0.22</td>
<td>15</td>
<td>MACRO: let .IF, .ENDIF have option name argument similar to .MACRO, .ENDM</td>
</tr>
<tr>
<td>-0.19</td>
<td>19</td>
<td>Distribute source to FILEX</td>
</tr>
<tr>
<td>-0.29</td>
<td>16</td>
<td>Tidy up messages on BINCOM . comparisons</td>
</tr>
<tr>
<td>-0.29</td>
<td>18</td>
<td>KED: let ctrl-H mean &quot;move to start of current line&quot;</td>
</tr>
</tbody>
</table>
### 6.3 The Moderately Easy Items

There were 83 items that were ranked "Moderately easy" by Digital. Roughly half had positive scores. The following table lists these items in order of RANK.

<table>
<thead>
<tr>
<th>Score</th>
<th>Votes</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.42</td>
<td>48</td>
<td>KED: allow startup initialization command file</td>
</tr>
<tr>
<td>0.31</td>
<td>35</td>
<td>KED: allow &lt;gold&gt;&lt;find&gt; to search for special characters</td>
</tr>
<tr>
<td>0.42</td>
<td>22</td>
<td>KED: keep original date when copying files to magtape</td>
</tr>
<tr>
<td>0.22</td>
<td>35</td>
<td>INDI: provide easy way to express ASCII characters</td>
</tr>
<tr>
<td>0.22</td>
<td>30</td>
<td>LINK: provide switch for abbreviated maps</td>
</tr>
<tr>
<td>0.24</td>
<td>27</td>
<td>MACRO: include source line numbers with errors</td>
</tr>
<tr>
<td>0.17</td>
<td>33</td>
<td>MACRO: provideEqualityTerminal logging capability</td>
</tr>
<tr>
<td>0.15</td>
<td>32</td>
<td>IND: allow KMON commands to be issued while IND has other files open</td>
</tr>
<tr>
<td>0.40</td>
<td>12</td>
<td>LINK: allow library modules to be put in high memory part of XM job</td>
</tr>
<tr>
<td>0.15</td>
<td>32</td>
<td>Provide a SEARCH utility</td>
</tr>
<tr>
<td>0.13</td>
<td>47</td>
<td>Put creation time in directory when file is made permanent</td>
</tr>
<tr>
<td>0.11</td>
<td>41</td>
<td>INDI: let @filnam search for filnam.COM, then filnam.CMD</td>
</tr>
<tr>
<td>0.22</td>
<td>14</td>
<td>SIPP: allow lowercase input with &quot;A&quot;</td>
</tr>
<tr>
<td>0.09</td>
<td>34</td>
<td>When command file aborts, restore [NO]QUIET TT status and ERROR LEVELS to original values</td>
</tr>
<tr>
<td>0.08</td>
<td>37</td>
<td>SHOW: add /OUT:filename switch</td>
</tr>
<tr>
<td>0.09</td>
<td>32</td>
<td>LINK: provide way for PARTICULAR modules to be included in an overlay</td>
</tr>
<tr>
<td>0.07</td>
<td>40</td>
<td>DIR: allow alphabetically ordered directories to run horizontally instead of vertically</td>
</tr>
<tr>
<td>0.13</td>
<td>21</td>
<td>Extend date support beyond 40 years</td>
</tr>
<tr>
<td>0.13</td>
<td>21</td>
<td>Provide a FLUSH routine for FORTRAN and BASIC that forces writes of records currently in memory</td>
</tr>
<tr>
<td>0.11</td>
<td>24</td>
<td>MACRO: provide macro for including date and time of assembly in a program</td>
</tr>
<tr>
<td>0.09</td>
<td>27</td>
<td>Provide EMTS to access monitors internal conversion algorithms</td>
</tr>
<tr>
<td>0.08</td>
<td>30</td>
<td>LS: allow multiple dismounting</td>
</tr>
<tr>
<td>0.12</td>
<td>17</td>
<td>FILEX: provide interchange for MAINDEC progs.</td>
</tr>
<tr>
<td>0.10</td>
<td>20</td>
<td>Provide way for VBGEXE run jobs to connect to an interrupt vector</td>
</tr>
</tbody>
</table>
There were 62 items that were ranked "Somewhat Difficult" by Digital. Roughly two-thirds had positive scores. The following table lists these items in order of Rank.

<table>
<thead>
<tr>
<th>Score</th>
<th>Votes Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.44</td>
<td>34 Add support for separate I and D space</td>
</tr>
<tr>
<td>0.33</td>
<td>41 LINK: Include referencing module in undefined global</td>
</tr>
<tr>
<td>0.36</td>
<td>35 VTCOM: allow wildcard specifications</td>
</tr>
<tr>
<td>0.28</td>
<td>43 Add SET xx SHOW to display handler set options</td>
</tr>
<tr>
<td>0.32</td>
<td>36 Map XM monitor out of user space by default</td>
</tr>
<tr>
<td>0.31</td>
<td>29 KED: provide 8-byte support</td>
</tr>
<tr>
<td>0.28</td>
<td>30 PIP: add 8-bit support for ASCII copies</td>
</tr>
<tr>
<td>0.18</td>
<td>43 KED: make screen scrolling more efficient</td>
</tr>
<tr>
<td>0.25</td>
<td>25 Document how to load foreground, system, and handler code into high memory</td>
</tr>
<tr>
<td>0.20</td>
<td>29 LINK: add support for ISD object records</td>
</tr>
<tr>
<td>0.10</td>
<td>51 RENAME: if not specified, assume device of second filename is same as first</td>
</tr>
<tr>
<td>0.25</td>
<td>20 .GTLIN: add completion mode</td>
</tr>
<tr>
<td>0.14</td>
<td>35 INDI: provide way to get strings/values from user programs when they exit</td>
</tr>
<tr>
<td>0.22</td>
<td>21 .GTLIN: allow up to 6 optional parameter strings to be passed to command files (ala TSX+)</td>
</tr>
<tr>
<td>0.23</td>
<td>19 Support more than 256 Mb on MSCP devices</td>
</tr>
<tr>
<td>0.29</td>
<td>14 Provide a true multiterminal handler</td>
</tr>
<tr>
<td>0.12</td>
<td>32 KED: provide columnar cut and paste</td>
</tr>
<tr>
<td>0.13</td>
<td>29 VTCOM/TRANSF: allow command file capability</td>
</tr>
<tr>
<td>0.15</td>
<td>22 Remove internal TT: support from FB and XM</td>
</tr>
<tr>
<td>0.15</td>
<td>22 Provide handlers for DHVII and DHO11</td>
</tr>
<tr>
<td>0.10</td>
<td>31 KED: provide split-screen editing</td>
</tr>
<tr>
<td>0.13</td>
<td>21 Add EMT to get line, but if no characters available, to return immediately with C set</td>
</tr>
<tr>
<td>0.13</td>
<td>21 Add memory protection and chaining EMTs</td>
</tr>
<tr>
<td>0.18</td>
<td>15 SIPP: allow string input mode</td>
</tr>
<tr>
<td>0.11</td>
<td>24 Provide symbolic debugger like RSX F77 one</td>
</tr>
<tr>
<td>0.10</td>
<td>22 Allow suppression of character echoing on type-ahead</td>
</tr>
<tr>
<td>0.10</td>
<td>22 Pass raw command lines in chain area</td>
</tr>
<tr>
<td>0.08</td>
<td>26 Support supervisor mod libraries</td>
</tr>
<tr>
<td>0.06</td>
<td>22 Allow logical disk to be booted</td>
</tr>
<tr>
<td>0.05</td>
<td>25 Put TECO on the distribution kit</td>
</tr>
<tr>
<td>0.05</td>
<td>20 Add completion routine version of .GTLIN</td>
</tr>
<tr>
<td>0.03</td>
<td>29 SET: allow filenames in addition to devices to be specified</td>
</tr>
<tr>
<td>0.09</td>
<td>9 Allow LET to work with console handler in the same way as SL</td>
</tr>
<tr>
<td>0.05</td>
<td>15 Provide single char version of .GTLIN</td>
</tr>
<tr>
<td>0.04</td>
<td>18 Provide a wait mode for .PRINT to synchronize with .TTYOUT</td>
</tr>
<tr>
<td>0.02</td>
<td>35 KED: provide optional journaling</td>
</tr>
<tr>
<td>0.02</td>
<td>8 Provide programmed request that runs handler</td>
</tr>
<tr>
<td>0.00</td>
<td>34 SET code as non-overlaid background job</td>
</tr>
<tr>
<td>0.00</td>
<td>14 Provide SET options for specific FORTRAN compilers and libraries</td>
</tr>
<tr>
<td>0.02</td>
<td>12 SIPP: implement BACKSPACE key</td>
</tr>
<tr>
<td>0.05</td>
<td>10 .PRINT: add optional completion routine for .GTLIN</td>
</tr>
<tr>
<td>0.05</td>
<td>10 Remove unnecessary information from handler block 0</td>
</tr>
<tr>
<td>0.02</td>
<td>30 Provide generalized SET interface for programs</td>
</tr>
<tr>
<td>0.06</td>
<td>14 .SCCA: add optional completion routine address for library</td>
</tr>
<tr>
<td>0.04</td>
<td>26 KED: allow search mask constructs in search for occurrence</td>
</tr>
<tr>
<td>0.10</td>
<td>12 KED: allow library searches for external files</td>
</tr>
<tr>
<td>0.06</td>
<td>31 KED: provide optional overstrike mode</td>
</tr>
<tr>
<td>0.05</td>
<td>44 Allow a filename to be assigned to a logical name</td>
</tr>
<tr>
<td>0.10</td>
<td>24 Add special directory wildcard operation support</td>
</tr>
<tr>
<td>0.25</td>
<td>10 .DRSET: add CMD argument</td>
</tr>
<tr>
<td>0.26</td>
<td>11 LIBR: allow /UPDATE on multi-line commands</td>
</tr>
<tr>
<td>0.21</td>
<td>14 On chained .EXIT, don't require &quot;E&quot; file to be at last line</td>
</tr>
<tr>
<td>0.13</td>
<td>27 KED: do not let monitors grow more than 10 percent</td>
</tr>
<tr>
<td>0.13</td>
<td>25 KED: provide switch for setting multiple tabs</td>
</tr>
<tr>
<td>0.23</td>
<td>17 Allow FORMAT to call user-written formatters</td>
</tr>
<tr>
<td>0.20</td>
<td>20 MACRO: Provide a reversed .IRP list mode</td>
</tr>
<tr>
<td>0.16</td>
<td>26 Allow handlers to be installed even if suffix isn't right for monitor</td>
</tr>
<tr>
<td>0.57</td>
<td>9 SPOOL: allow switch to start banner page on even or odd page number</td>
</tr>
<tr>
<td>0.43</td>
<td>12 LINK: automatically enable /G and /F switches when /FORTRAN used in COMPILE or EXECUTE</td>
</tr>
<tr>
<td>0.42</td>
<td>14 Provide EIS, FIS/FPF and CIS simulation routines</td>
</tr>
<tr>
<td>0.42</td>
<td>30 Provide SETDATE command for changing file date</td>
</tr>
<tr>
<td>0.37</td>
<td>42 Remove backward compatible baggage from monitors for versions before V5.0</td>
</tr>
</tbody>
</table>
6.5 The Very Difficult Items

There were only 8 items that were ranked "Very Difficult" by Digital. The following table lists these items in order of RANK.

<table>
<thead>
<tr>
<th>Score</th>
<th>Votes</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.35</td>
<td>27</td>
<td>Document all storage formats used by Digital</td>
</tr>
<tr>
<td>0.18</td>
<td>49</td>
<td>Don't require filename twice on RENAME/SETDATE</td>
</tr>
<tr>
<td>0.26</td>
<td>28</td>
<td>FILEX: make it work with all current DEC formats</td>
</tr>
<tr>
<td>0.15</td>
<td>22</td>
<td>Put UCL+ on the distribution kit</td>
</tr>
<tr>
<td>-0.06</td>
<td>17</td>
<td>Include more information in .DSTATUS request</td>
</tr>
<tr>
<td>-0.13</td>
<td>9</td>
<td>Add EMT to get selected I/O packet from handler queue</td>
</tr>
<tr>
<td>-0.12</td>
<td>13</td>
<td>Add I/O status block to I/O EMT requests</td>
</tr>
<tr>
<td>-0.31</td>
<td>24</td>
<td>Provide a MAINT utility (ala MS-DOS)</td>
</tr>
</tbody>
</table>

6.6 The Irrational or Impossible Items

There were 9 items that Digital felt were either irrational or impossible. None of these items, which are listed in the following table in order of RANK, had a very high RANK.

<table>
<thead>
<tr>
<th>Score</th>
<th>Votes</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.02</td>
<td>24</td>
<td>KEQ: make commands consistent with VAX EDT</td>
</tr>
<tr>
<td>-0.05</td>
<td>10</td>
<td>Set RETRY=n for ALL magtape handlers</td>
</tr>
<tr>
<td>-0.21</td>
<td>7</td>
<td>Support SET TT DVORAK</td>
</tr>
<tr>
<td>-0.07</td>
<td>29</td>
<td>Provide RESET switch for hardware reset</td>
</tr>
<tr>
<td>-0.22</td>
<td>15</td>
<td>Allow SL to remain ON across a reboot</td>
</tr>
<tr>
<td>-0.14</td>
<td>29</td>
<td>Provide fully functional word processor</td>
</tr>
<tr>
<td>-0.52</td>
<td>18</td>
<td>Provide PASSWORD protection for LD files</td>
</tr>
<tr>
<td>-0.28</td>
<td>41</td>
<td>Allow files with version numbers in directories</td>
</tr>
<tr>
<td>-0.99</td>
<td>14</td>
<td>Provide protection mechanism for multi-terminal support</td>
</tr>
</tbody>
</table>

6.7 The Items Digital Did Not Understand

There were 4 items that Digital did not understand. The following table lists these items in order of RANK. Only the first item had a significant rank.

<table>
<thead>
<tr>
<th>Score</th>
<th>Votes</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.30</td>
<td>17</td>
<td>Allow sellers of RT-11 related products to put RT-11 on their distribution kits</td>
</tr>
<tr>
<td>0.04</td>
<td>28</td>
<td>Expand setup support for VT100, VT200, LA100</td>
</tr>
<tr>
<td>-0.28</td>
<td>28</td>
<td>KEQ: Allow escape sequences to be entered easily as &quot;soft interrupts&quot;</td>
</tr>
<tr>
<td>-0.47</td>
<td>17</td>
<td>Allow completion routines to appear to the user</td>
</tr>
</tbody>
</table>

7 DISCUSSION

At this point we might go into a long discussion of how to interpret the wish list results, but it is probably more constructive for you to draw your own conclusions, since we are not really sure how to interpret SOME of the results.

The important thing is that the RT-11 Development Team has these results and they are using them to determine which new features would be welcome by the RT-11 community, which would receive a lukewarm reception, and which should not be implemented.

If your favorite wish list item did not do well, maybe it was because people did not understand the significance of the item. In that case, please resubmit the item with a clearer, more detailed description.

We are going to conduct another survey during the next year, but it will be a bit different. It will be considerably shorter and will contain a lot of questions from the RT-11 Development Team and other units of Digital. If you have a suggestion for a survey item, send it to us right away.
Here is an overview of the RT-11 SIG-Sponsored Sessions for the DECUS Spring Symposium in Cincinnati, May 16 - May 20. The abstracts of the sessions are given here so that you can preplan your week. You can also show them to your boss to explain to the poor dear why it's important to send you to DECUS.

Thanks to Milton Campbell for his hard work on the Symposium Committee and for providing this information to the newsletter.

All rooms are in the Cincinnati Convention Center.

MONDAY - May 16
Room: North 204 & 214
9:00am RT033 RT-11 SIG ROADMAP
John Rasted

9:30am RT032 RT-11 SIG BUSINESS MEETING
John Rasted

10:00am RT013 RT-11 PRODUCT PANEL
Connie Pawelczak

Room: West 252 & 253
12:30pm RT007 RT-11 TO VMS MIGRATION
Ned Rhodes

1:30pm RT011 RUNNING IN RT-11
RT-11 Engineering

2:30pm RT015 DECNET/RT-11
RT-11 Engineering

3:30pm RT003 HIGH-SPEED ETHERNET FOR TASK-TO-TASK MESSAGING BETWEEN RT-11 AND VAX/VMS
Glen Macko

TUESDAY - May 17
Room: West 252 & 253
2:00pm RT009 RT-11 RUNNING ON THE KXJ
RT-11 Engineering

3:00pm RT038 WHAT DIGITALS REAL-TIME STRATEGY SHOULD BE
Robert Walraven & panel

4:00pm RT035 RT-11 CONTROLLING THE WORLD'S LARGEST COLOR DISPLAY
James Maloney

5:00pm RT019 RT-11 ANNIVERSARY SESSION - THE EARLY DAYS
Milton Campbell & others

WEDNESDAY - May 18
Room: West 242
1:00pm RT037 FORTRAN-77/RT PROGRAMMING STYLE
Robert Walraven

2:00pm RT018 TKS EMULATOR FOR RT-11 (OR HOW TO REALLY DO NETWORKING & MULTI-PROCESSING)
Greg Adams

3:00pm RT016 RUNNING TKS-X PLUS ON A Q-BUS CO-PROCESSOR
Milton Campbell

4:00pm RT040 TKS-X-32 OPERATING SYSTEM DEVELOPMENT
Phillip H. Sherrod & Jack Peterson & panel

5:00pm RT020 TKS-X PLUS MAGIC

THURSDAY - May 19
Room: West 242
9:00am RT002 CONFESSIONS OF AN RT-11 HANDLERHOLIC
John M. Crowell

10:00am RT006 THE EQ HANDLER: DATA ACQUISITION WITH A COPY COMMAND
William Walker

Room: North 207 & 215
12:00n RT004 ADEP: SOFTWARE FOR REAL TIME DATA ACQUISITION AND CONTROL
Ellen Bachmann & Jim Lindemith

1:00pm RT014 RT-11 INTERRUPTS AND TRAPS
RT-11 Engineering

Room: West 242
6:00pm RT008 RT-11 PERFORMANCE REPORT AGAIN
Ned Rhodes

7:00pm RT039 STRATEGIES FOR MAKING LARGE PROGRAMS RUN UNDER RT-11 AND TSX-PLUS
Jeffrey S. Goldner

Room: North 207 & 215
8:00pm RT036 RT-11 GEMS AND NUGGETS
Ralston Barnard & others

9:00pm RT001 RT-11 USERS SPEAK OUT
John M. Crowell & RT-SIG

FRIDAY - May 20
Room: West 242
10:00am RT010 RT-11 MAGNETIC TAPE USAGE
RT-11 Engineering

11:00am RT017 RT-11 APPLICATIONS WORKSHOP
Laura DeChellis-Barry & others

Room: West 250
12:30pm RT012 RT-11 FEEDBACK SESSION
RT-11 Engineering

1:30pm RT034 RT-11 SIG SYMPOSIUM WRAP-UP
John Rasted

Sessions that may be of particular interest to RT-11 users. Of particular note are the first two, which provide an opportunity for users to influence Digital's renewed awareness of the PDP-11.

RX003 Mon 6:00p DIGITAL MICROSYSTEMS DEVELOPMENT MEETS DECUS - OR WHAT MSD ALWAYS WANTED TO KNOW ABOUT DECUS BUT WAS AFRAID TO ASK.

RX004 Mon 4:30p PDP-11 FUTURES - A USER'S PERSPECTIVE

H032 Wed 12:00n MICRODIP-11 UPDATE

H061 Thu 2:00p MICRO SYSTEMS HARDWARE PANEL

H061 Thu 5:00p FOREIGN PERIPHERALS FORUM

N054 Tue 9:00a UNDERSTANDING ETHERNET

LT028 Mon 9:30p GETTING MORE FROM PDP-11 FORTRAN-77

LT031 Mon 11:15a PDP-11 LANGUAGES STATUS AND FUTURE DIRECTION

LT032 Thu 6:00p PDP-11 LANGUAGES & LAYERED PRODUCTS QUESTION AND ANSWER SESSION
RT001  RT-11 USERS SPEAK OUT

Moderator: John M. Crowell
Multware, Inc.

Room: North 207 & 215  Thursday 9:00 p.m.-11:00 p.m.

Abstract:
A panel of alleged RT-11 experts conducts a program of fun, history, war stories, and technical information which is unavailable from any other source for all RT-11 users. Audience participation is encouraged and expected.

The panel is prepared to answer questions from the floor to the best of their ability. Scheduled presentations may include slide shows of historic RT-11 installations, lessons on how to knot flat ribbon cables, minimal keystroke methods of destroying your system disk, magical chants to revive down systems, and field circus approved locations on the computer which improve system performance when direct force is applied.

The highlight of the evening may be the semi-annual awards presentation for most sensitive response to a user question. All in all, this is a fun and informative evening. The only rule is that you cannot ask a question the panel cannot answer (of course, you cannot know this until you ask the question). Proper dress is requested; costumes are optional.

RT002  CONFESSIONS OF AN RT-11 HANDLERHOLIC

Speaker: John M. Crowell
Multware, Inc.

Room: West 242  Thursday 9:00 a.m.-10:00 a.m.

Abstract:
"My name is Jack, and I'm a handlerholic." I confess to writing overlaid SET code. I write handlers that refuse to install for no apparent reason. Once even wrote a handler in position-dependent code (gaspi), and linked it as a .REL file so that the load-code could perform the relocation.

Along the way I've learned a few things about the "run-time" environment of RT-11 handlers (as distinguished from the I/O environment). In this session I'll share some of the nuggets of information I've gleaned about what goes on during handler installation, handler loading, and SET option execution. If time permits (and we hope it does not), I'll expound lightly upon the vagrancies of aborting I/O.

Some of the questions I hope to answer in this hour include:
1. Do I really have to overlay large SET code?
2. How do I go about it?

RT003  HIGH-SPEED ETHERNET FOR TASK-TO-TASK MESSAGING BETWEEN RT-11 AND VAX/VMS

Speaker: Glen Macko
Chair: Dennis Jensen
Digital Equipment Corp.  AMES Labs.

Room: West 252 & 253  Monday 3:30-4:00 p.m.

Abstract:
The availability of Ethernet drivers in the RT-11 XM monitor allows high-speed connectivity to hosts systems, especially VMS backbone CPUs. An easy-to-use message facility, known as the PAMS Message Bus has been extended to encompass the RT-11 environment in addition to previous implementations on VAX/VMS, RSX-11M and VAXELN. A review is made of the techniques utilized and performed when using the task-to-task interface or file transfer utilities between RT-11 and VAX/VMS.

RT004  ADEP: SOFTWARE FOR REAL TIME DATA ACQUISITION AND CONTROL

Speakers: Ellen Bachmann  Jim Lindesmith
Monsanto Research Corp.  Monsanto Research Corp.

Room: North 207 & 215  Thursday 12:00 noon-1:00 p.m.

Abstract:
This session describes the content, use, and rationale of the Applications Development Package (ADEP). ADEP is a generalized set of software tools that aids in the efficient implementation of laboratory data acquisition and control systems. It consists of an integrated package of handlers, utilities and standards for data acquisition, control, listing and graphics.

ADEP is divided into three parts. Section I consists of the basic utilities and software to initialize data files, control the data acquisition process, acquire data and place it in a given file. The software includes an RT-11 device handler (EQ) which provides the control, sequencing and data acquisition functionality, and a set of basic support utilities. Section II provides report generating facilities, while Section III includes the basic utilities and application software for graphic output. In general, the ADEP routines are used either as is, or as the functional core of a more complex, customized system.
RT006  THE EQ HANDLER: DATA ACQUISITION WITH A COPY COMMAND

Speaker: William Walker
Monsanto Research Corp.

Chair: Nick Bourgeois
NAB Software Services, Inc.

Room: West 242
Thursday 10:00 a.m.-11:00 a.m.

Abstract:

The Applications DEvelopment Package (ADEP) is a general set of software tools, which has been developed to aid in the efficient implementation of laboratory data acquisition and control systems. The core of this package is the "event queue" (EQ) handler which performs all control, sequencing, and data acquisition. EQ appears to programs running under RT-11 as standard, non-file-structured data device. Programs can read and write data to EQ using regular, device-independent I/O statements (FORTRAN READ's and WRITE's, for example). In most cases, an entire data acquisition/control sequence can be set up and executed using the RT-11 COPY command. The design, usage, and limitations of the EQ handler are discussed, with the emphasis on internals and structure.

A more general, applications oriented discussion of the entire ADEP package is also presented at this symposium.

RT007  RT-11 TO VMS MIGRATION

Speaker: Ned Rhodes
Software Systems Group

Chair: Jim Crapuchettes
Omnex Corp.

Room: West 252 & 253
Monday 12:30 p.m.-1:30 p.m.

Abstract:

Many RT-11 users have the opportunity to develop code on VAX/VMS systems, but many die-hard RT-11 users are resisting because they perceive that VMS does not allow them to do the same types of things that they are used to under RT-11. This session shows RT-11 programmers how to develop programs under VMS using the concepts that were learned under RT-11. Some of the key differences and similarities between the two operating systems are shown.

RT008  RT-11 PERFORMANCE REPORT AGAIN

Speaker: Ned Rhodes
Software Systems Group

Chair: Laura DeChellis-Barry
MDB Systems, Inc.

Room: West 242
Thursday 6:00 p.m.-7:00 p.m.

Abstract:

This is an update of the performance report that was presented in 1981. In this session, the relative performance of all the RT-11 monitors and TSX-Plus are compared and contrasted. The report should point out whether the performance of the RT-11 operating system has improved over the years or whether it has remained the same.

RT009  RT-11 RUNNING ON THE KXJ

Speaker: RT-11 Engineering
Digital Equipment Corp

Chair: John M. Crowell
Multiware, Inc.

Room: West 252 & 253
Tuesday 2:00 p.m.-3:00 p.m.

Abstract: Not available

RT010  RT-11 MAGNETIC TAPE USAGE

Speaker: RT-11 Engineering
Digital Equipment Corp

Chair: Nick Bourgeois
NAB Software Services, Inc.

Room: West 242
Friday 10:00 a.m.-11:00 a.m.

Abstract:

This talk includes a discussion of how the RT-11 operating system interfaces to various magnetic tape devices. An overview of tape handlers, tape-related SPFUNs, as well as PIP and BUP tape formats are presented.

RT011  RUNNING IN RT-11

Speaker: RT-11 Engineering
Digital Equipment Corp.

Chair: Robert Roddy
Naval Ship Research Ctr.

Room: West 252 & 253
Monday 1:30 p.m.-2:30 p.m.

Abstract:

This presentation covers the different types of jobs that RT-11 allows and some implications of using each. File formats, job loading, memory utilization (including overlays), job priorities, context switching, and I/O restrictions are discussed. The use of VBGEXE to allow XM jobs to avoid memory constraints along with constraints attendant to using VBGEXE are included in this presentation.

RT012  RT-11 FEEDBACK SESSION

Speaker: RT-11 Engineering
Digital Equipment Corp.

Chair: Milton Campbell
Talisman Systems

Room: West 250
Friday 12:30 p.m.-1:30 p.m.

Abstract:

In this session RT-11 Engineering reviews the customer wishlist items that accrue during the week and since the previous DECUS. Wishlist items can be deposited in the wishlist box located in the booth area next to the RT-11 Demo System or can be given to an RT-11 SIG member or a representative from RT-11 Engineering.
RT013 RT-11 PRODUCT PANEL

Speaker: Connie Pawelczak
Digital Equipment Corp
Room: North 204 & 214

Abstract:
This session presents an overview of RT-11 Engineering, the current product releases and features of each, the future direction of RT-11 and Digital's software licensing policies as they apply to RT-11.

RT014 RT-11 INTERRUPTS AND TRAPS

Speaker: RT-11 Engineering
Digital Equipment Corp.
Room: North 207 & 215

Abstract:
This session discusses interrupt processing under RT-11. It includes information about the operating system's processing under the FM and KM versions. The talk requires no particular level of familiarity with RT-11. It should be of interest for the novice and guru alike.

RT015 DECNET/RT-11

Speaker: RT-11 Engineering
Digital Equipment Corp.
Room: West 252 & 253

Abstract:
This session will present an overview of DECnet/RT-11. Topics to be covered include:
- DECnet Phase IV and Ethernet/802.3 support
- Comparison of DECnet/RT-11 V2.1 and V3.0
- enhancements
- dependencies
- Network generation, installation, and tuning
- DECnet/RT-11 utilities
- Application design on DECnet/RT-11
- MACRO-11 and FORTRAN language capabilities
- NSP vs Direct Line Access

RT016 RUNNING TSX-PLUS ON A Q-BUS CO-PROCESSOR

Speaker: Milton D. Campbell
Talisman Systems
Room: West 242

Abstract:
The availability of several J-11 based co-processors for the Q-bus has opened up some interesting possibilities. This session discusses some of the considerations in getting TSX-PLUS running on the MDB JFEP-11 co-processor. Included in the presentation is a discussion of how to use the co-processor with a TSX-PLUS host, some of the problems involved and what can be done about them. The use of a TSX-PLUS and co-processor combination with a MicroVAX/VMS host are also discussed.

RT017 RT-11 APPLICATIONS WORKSHOP

Moderator: Laura DeChellis-Barry
MDB Systems, Inc.
Room: West 242

Abstract:
The RT-11 Applications Workshop is an opportunity for Symposium attendees to describe how they use their RT-11-based computer systems in their day-to-day jobs. The session consists of a number of 5 to 10 minute descriptions. This is an audience driven session and is the opportunity to tell the RT-11 community what you do with your system.

RT018 TSX EMULATOR FOR RT-11
(OR HOW TO REALLY DO NETWORKING & MULTI-PROCESSING)

Speaker: Greg Adams
GABA
Room: West 242

Abstract:
The wheel has come full cycle. In the beginning, TSX layered on top of RT-11 and tried to look as much like RT-11 as possible. Now this emulator makes pure RT-11 look just like TSX-PLUS (well, almost).
RT019  RT-11 ANNIVERSARY SESSION - THE EARLY DAYS
Moderator: Milton D. Campbell
Talisman Systems
Room: West 252 & 253 Tuesday 5:00 p.m.-6:00 p.m.
Abstract:
1988 marks the fifteen anniversary of the introduction of the RT-11 Operating System for the PDP-11. We have assembled a number of the people important in the early development of RT-11 to take a look back. This is an opportunity for all RT-11 users, current and former, to come to the "reunion" and remember what it was like when computers were used for real (-time) work. Bring your RT-11 memorabilia to show how far we have come.

RT020  TSX-PLUS MAGIC
Moderator: Jack Peterson
Horizon Data Systems
Room: West 242 Wednesday 5:00 p.m.-6:00 p.m.
Abstract:
A panel of experienced TSX-PLUS users, system managers and system programmers are on hand to assist users in making more effective use of their TSX-PLUS systems. Some brief presentations of special techniques, utilities, handlers, command files, and programs may be made by panel members, but most of the session is oriented toward audience questions, problems, solutions, and wish-list items.

All TSX-PLUS users are encouraged to attend. This is your chance to get an answer to that elusive problem, to learn how others have made their systems better, and to share the knowledge you have gained while using TSX-PLUS.

RT032  RT-11 SIG BUSINESS MEETING
Speaker: John Rasted
JTR Associates
Room: North 204 & 214 Monday 9:30 a.m.-10:00 a.m.
Abstract:
This session begins with an overview of the RT-11 Special Interest Group (SIG), followed by SIG activity at the symposium and those areas of SIG activity which are not related to the symposium. These areas include:
- Minitasker (the SIG Newsletter);
- SIG tape copy;
- SIG DECUS Library activity;
- Local User Groups (LUGs); and
- VAX/RT.

In this session, the SIG also begins the planning for the next DECUS symposium.

RT033  RT-11 SIG ROADMAP
Speaker: John Rasted
JTR Associates
Room: North 204 & 214 Monday 9:00 a.m.-9:30 a.m.
Abstract:
This session is designed to help the attendee obtain the most benefit from the symposium. Veteran attendees discuss the tried and true techniques that new attendees can use to make the most of the week and still survive the experience. There is a brief description of those sessions which are relevant to RT-11 users. Schedule changes and possible session repeats are also discussed. Plan to attend so you can avoid the disappointment of missing an important session.

RT034  RT-11 SIG SYMPOSIUM WRAP-UP
Speaker: John Rasted
JTR Associates
Room: West 250 Friday 1:30 p.m.-2:00 p.m.
Abstract:
This is your chance to respond to the SIG and Digital presentations at the symposium and to influence future plans. The SIG is looking for input from the attendees to aid in selecting desirable sessions for the next symposium. At this session you have the opportunity to have questions answered that may have arisen during the symposium. Representatives from Digital are also present.

All TSX-PLUS users are encouraged to attend. This is your chance to get an answer to that elusive problem, to learn how others have made their systems better, and to share the knowledge you have gained while using TSX-PLUS.

RT035  RT-11 CONTROLLING WORLDS LARGEST COLOR DISPLAY
Speaker: James Maloney
Goodyear Tire and Rubber Company
Chair: Jack Peterson
Horizon Data Systems
Room: West 252 & 253 Tuesday 4:00 p.m.-5:00 p.m.
Abstract:
The worlds largest color display is one of the most highly recognized objects. After sunset, several ships are launched with DEC equipment on board utilizing RT-11 to control the color display mounted on the port and starboard sides of the ships. The ships are actually airships and are commonly referred to as Goodyear Blimps. This session addresses the interactive graphic hardware and software tools required to draw an
animation for the very large display sign. The airborne hardware and software required to control the Super Skytacular sign in real time are also covered in this session. Future plans include a new generation of hardware and software with a fourfold increase in resolution and 127 different colors available. In addition, the next generation of equipment will provide a significant reduction of the fixed and carry-on weights. The new sign has been designated the Spectacular Skytacular sign.

---

**RT036**

**RT-11 GEMS AND NUGGETS**

**Moderator:** Ralston Barnard  
**Sandia National Laboratories**

**Room:** North 207 & 215  
**Thursday 8:00 p.m.-9:00 p.m.**

**Abstract:**
The first Gems and Nuggets at the Fall, 1987, Symposium met with critical acclaim, so the tradition continues. This is a chance for RT-11 "experts" to describe some of their tricks and time saving techniques. It is also a chance for anyone to ask the experts for suggestions on problems they may have with their systems. The session format consists of several presentations of about ten minutes each.

---

**RT037**

**FORTRAN-77/RT PROGRAMMING STYLE**

**Speaker:** Robert Walraven  
**Multiware, Inc.**

**Chair:** Jeffrey Goldner  
**New Unit Inc.**

**Room:** West 242  
**Wednesday 1:00 p.m.-2:00 p.m.**

**Abstract:**
Examples of good FORTRAN programming style are presented. Ample time is allowed for audience participation.

---

**RT038**

**WHAT DIGITALS REAL-TIME STRATEGY SHOULD BE**

**Moderator:** Robert Walraven  
**Multiware, Inc.**

**Speakers:** Panel of Real-time Experts

**Room:** West 252 & 253  
**Tuesday 3:00 p.m.-4:00 p.m.**

**Abstract:**
Digital has told us what their real-time strategy is. This session is a workshop to discuss what the users think Digital's real-time strategy should be. A panel of real-time experts give brief statements on the subject, then the audience is encouraged to give their opinions.
This month we are reprinting the slides from Steve Stepanek's session from Anaheim entitled “AWK PROGRAMMING LANGUAGE TUTORIAL” (U048). If you attended this session and didn’t get a set of notes, here they are. If you weren't fortunate enough to attend the session (or the symposium), I think the slides are informative (though terse) on their own.

We are also starting a new feature - the Joke of the Month column and contest. Please see the Joke of the Month column for contest details.

To start the information exchange ball rolling, I have put in a Help Wanted piece about a project that I am currently involved in - SCCS. If you have nothing to say about SCCS, but are in a position similar to mine with another product, drop me a line. Somebody out there has probably done what you’re trying to do, and might save you some hassle by sharing their wisdom.

And for those of you who don’t have access to usenet news, we have reprinted a calendar of up-coming events. If you want to take a trip to, say, San Francisco, look at USENIX this year, or UniForum next year.

What do you think of re-printing symposium slides in the newsletter? Is it helpful? Boring? You've had 2 issues to evaluate. so, let me know what you think. In fact, let me know what you think about anything at all. Send me your suggestions, complaints, or articles about anything ultrix/unix related.

Send all electronic correspondence to: amdahl@iat-vax!ndc!sgf

and hardcopy/magnetic media to:

Sharon Gates-Fishman
NDC Systems
730 E. Cypress Ave.
Monrovia CA 91016

Help Wanted

This newsletter should be a forum for exchanging knowledge and experience. Do you have knowledge of or experience with SCCS (the source code control system)? My shop is starting to use SCCS to control a medium-sized project. We have four programmers working on seven related software packages. These packages overlap significantly, and we'd like to reduce the amount of code that is currently duplicated in a number of directories. We also want to do all the usual SCCS things like prevent multiple copies of a file from being edited, be able to recreate a particular version of a file, etc. Most of the code has been written already. We will be using SCCS to assist us as we maintain and enhance our software. I am just now starting to set up our SCCS system, and would greatly appreciate any advice or warnings from anyone who has gone through a similar process. If you currently use SCCS, or have used it in the past, I'd like to hear about your experience. What works for you? What doesn't work for you? If you were starting over, what would you do differently? What are pitfalls to watch out for? Send any relevant information to the address in the From the Editor section.

Calendar of Up-Coming Events (or - when can I go to Hawaii?)

Here is a combined calendar of planned conferences, workshops, and standards meetings by various organizations. It was taken from usenet news, with (greatly appreciated) assistance from Jim Livingston.

Abbreviations: U for UNIX, W for Workshop, C for Center. The sponsors of the USENIX, EUUG (the European UNIX systems Users Group), and AUUG (the Australian UNIX systems Users Group) conferences are the organizations of the same name, and the sponsor of UniForum is /usr/group. Dates and places for IEEE 1003 after Oct 1988 are tentative, and also for the 1992 UniForum.

<table>
<thead>
<tr>
<th>year mon days</th>
<th>conference name</th>
<th>(sponsor.) (hotel,) location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988 Feb 8-11</td>
<td>UniForum</td>
<td>Infomart, Dallas, TX</td>
</tr>
<tr>
<td>1988 Feb 9-12</td>
<td>USENIX</td>
<td>Grand Kempinski, Dallas, TX</td>
</tr>
<tr>
<td>1988 Mar 14-18</td>
<td>IEEE 1003</td>
<td>Ritz-Carlton, Washington, DC</td>
</tr>
<tr>
<td>1988 May 3-5</td>
<td>U Exposition</td>
<td>AFUU, Palais des Congress, Paris</td>
</tr>
<tr>
<td>1988 May 17-19</td>
<td>UNIX 88/etc.</td>
<td>/usr/group/cdn, Convention C, Toronto</td>
</tr>
<tr>
<td>1988 Jun 27-Jul 1</td>
<td>IEEE 1003</td>
<td>Colorado Springs, CO</td>
</tr>
<tr>
<td>1988 Jun 8</td>
<td>UNIX 88</td>
<td>NZSUGI, Wellington, New Zealand</td>
</tr>
<tr>
<td>1988 Jul</td>
<td>U Symposium</td>
<td>JUS, Tokyo, Japan</td>
</tr>
<tr>
<td>1988 Sep 13-15</td>
<td>AUUG</td>
<td>Melbourne, Australia</td>
</tr>
<tr>
<td>1988 Sep 26-27</td>
<td>UKSupercomputing W</td>
<td>USENIX, Pittsburgh, PA</td>
</tr>
<tr>
<td>1988 Oct 3-7</td>
<td>EUUG</td>
<td>Lisbon, Portugal</td>
</tr>
<tr>
<td>1988 Oct 10-14</td>
<td>IEEE 1003</td>
<td>Hawaii</td>
</tr>
<tr>
<td>1988 Oct 17-19+</td>
<td>ISO SC22 &amp; WG15</td>
<td>Tokyo, Japan</td>
</tr>
<tr>
<td>1988 Oct 17-21</td>
<td>C++ Conference</td>
<td>USENIX, Denver, CO</td>
</tr>
<tr>
<td>1988 Oct 19-21</td>
<td>UNIX Expo</td>
<td>New York, NY</td>
</tr>
<tr>
<td>1988 Nov 17-18</td>
<td>Large Installation</td>
<td>Syst. Adm. W II, USENIX, Monterey, CA</td>
</tr>
<tr>
<td>1988 Nov</td>
<td>U Symposium</td>
<td>JUS, Osaka, Japan</td>
</tr>
<tr>
<td>1988 Dec</td>
<td>Sun User Group</td>
<td>southern U.S.A.</td>
</tr>
<tr>
<td>1988 Dec</td>
<td>UNIX Fair</td>
<td>JUS, Tokyo, Japan</td>
</tr>
<tr>
<td>1989 Jan</td>
<td>IEEE 1003</td>
<td>Ft. Lauderdale, FL</td>
</tr>
<tr>
<td>1989 Jan 31-Feb 3</td>
<td>USENIX</td>
<td>Town and Country, San Diego, CA</td>
</tr>
<tr>
<td>1989 Feb 28-Mar 3</td>
<td>UniForum</td>
<td>Moscone Center, San Francisco, CA</td>
</tr>
<tr>
<td>1989 Apr</td>
<td>IEEE 1003</td>
<td>Minneapolis-St. Paul, MN</td>
</tr>
<tr>
<td>1989 Jun 12-16</td>
<td>USENIX</td>
<td>Hyatt Regency, Baltimore, MD</td>
</tr>
<tr>
<td>1989 Jun</td>
<td>IEEE 1003</td>
<td>Monterey, CA</td>
</tr>
<tr>
<td>1989 Oct</td>
<td>IEEE 1003</td>
<td>Brussels (or Amsterdam)</td>
</tr>
<tr>
<td>1990 Jan 23-26</td>
<td>USENIX</td>
<td>Washington, DC</td>
</tr>
<tr>
<td>1990 Jan</td>
<td>IEEE 1003</td>
<td>New Orleans, LA</td>
</tr>
<tr>
<td>1990 Jan</td>
<td>USENIX</td>
<td>Marriott, Anaheim, CA</td>
</tr>
<tr>
<td>1991 Jan 23-25</td>
<td>USENIX</td>
<td>Dallas, TX</td>
</tr>
<tr>
<td>1991 Jan 22-25</td>
<td>UniForum</td>
<td>Infomart, Dallas, TX</td>
</tr>
<tr>
<td>1991 Jun 10-14</td>
<td>USENIX</td>
<td>Opryland, Nashville, TN</td>
</tr>
<tr>
<td>1992 Jan 21-24</td>
<td>UniForum (?)</td>
<td>Moscone Center, San Francisco CA</td>
</tr>
</tbody>
</table>
**INTRODUCTION**

AWK was designed at AT&T Bell Labs by:

Aho
Weinberger
Kernighan

Using language structures similar to C, it can perform pattern scanning to select records for processing.

**AWK utility:**

awk [-Fc] ‘awkprogram’ [datafile ...]

-FC change input field separator to c

AWK defines a "record" as consisting of the stream of characters up to a record separator (default is newline).

Each record is divided into "fields" according to the current input field separator (default is blanks and tabs with scanning).

**Example #1**

$ cat report.awk

BEGIN { actions }

pattern { actions }

END { actions }

Basic execution flow:

execute BEGIN actions;
while not EOF begin
read Input "record";
for each pattern that is true, execute related actions;
end while;
execute END actions;
terminate execution;

$ awk .. report.awk order

<table>
<thead>
<tr>
<th>Part</th>
<th>Number</th>
<th>Quantity</th>
<th>Unit Price</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>01004</td>
<td>100</td>
<td>1.25</td>
<td>4.75</td>
<td>47.50</td>
</tr>
<tr>
<td>01044</td>
<td>1</td>
<td>3.75</td>
<td>10.00</td>
<td>37.50</td>
</tr>
<tr>
<td>01007</td>
<td>100</td>
<td>2.00</td>
<td>3.75</td>
<td>75.00</td>
</tr>
<tr>
<td>00445</td>
<td>500</td>
<td>1.00</td>
<td>0.75</td>
<td>375.00</td>
</tr>
</tbody>
</table>

AWK is a filter utility, it reads input "records", processes the data and generates output.

**Example #2**

$ cat operator console Sep 20 13:33

$ who

Sep 20 13:33 tty20

Oct 3 11:06

$ who | awk '/^[a-zA-Z]/{print $2}'

tty20

$ who | awk '/^[a-zA-Z]/{print $2} | tty20

Dec 1987
2. DATA HANDLING

AWK has two data types:
1. numeric (floating point)
2. strings

Variables are automatically defined and data typed during assignment.

The initial value of a variable is the null string. A null string equates to zero in an arithmetic expression.

Data conversion is automatic, based on operation being performed.

Example #3

```
$ cat line.num
awk '{
    printf("%d	%a
", NR, $0);
}'

$ ls -l line.num
-rwxr-xr-x 1 user 56 Dec 4 22:29 line.num
$ line.num line.num
1 awk {'
    printf("%d	%a
", NR, $0);
    y = y + 2;
    printf("\n", y);
} '
```

```
Example #4

$ cat wc.awk
awk '{
    printf("%d %d %d %d %d
", length($0), $0);
}'
```

User defined variables:
A variable name consists of a sequence of letters, digits and underscores that does not start with a digit.

Predefined variables:

- FS: Input field separator (default is blank and tab with spanning; otherwise must be a single non-blank character without spanning; can be set by -Fc option)
- RS: Input record separator (newline)
- OFS: Output field separator (blank)
- ORS: Output record separator (newline)
- NF: Number of fields in current input record
- NR: Number of input records read

Arrays (associative based):

- Numeric subscripts:
  ```
  hold[k++] = 0
  ```
- String subscripts:
  ```
  inventory["nuts"]++
  ```

Expression operators:
(decreasing order of precedence)

- Arithmetic:
  ```
  a++  --b
  a * b  a / b  a % b  a + b  a - b
  ```

- Strings:
  ```
  a b
  ```
3. ACTION STATEMENTS

Statements appearing in an "action" section of an AWK program are terminated by either a newline, semicolon, close brace, or "#" character.

Action statements can be blocked by the use of brace characters ("{", "}") as in C.

The "#" character denotes the beginning of a comment. Only the newline character can be used to terminate a comment.

Example #5

```
$ cat gpsy.awk
#
# list accounts validated to a cc:11 a group
#
BEGIN { 
    FS = " ";
    $4 = "$"; 
    count = split($4, groups, "$" );
    for (i = 1; i <= count; i++)
        printf("{field}", $i, groups[i]); 

$ awk -f gpsy.awk /etc/group
root: root,demons
bin: bin,demons
adm: adm,demons
wheel: wheel,demons
weep: weep,demons
```
Example #6

```
$ cat uniq.awk
# do something similar to uniq
#
# array
#
# $ awk -f uniq.awk list
#
$ cat uniq awk
```

Looping statements:

```
while (condition)  
  statement
```

for (expr1 ; expr2 ; expr3 )

```
statement ;
expr3;
```

Implied jump statements:

```
ext [n] if not an END action, invoke
```

```
next  ignore remaining instructions pertaining to the current
```

```
break  break out of current
```

```
continue  continue execution with the
```

```
print  stop processing
```

```
exit [n] if process
```

```
break out of current
```

```
next iteration of current
```

```
break out of current
```

```
next iteration of current
```

```
break out of current
```

```
next iteration of current
```

```
break out of current
```

4. PATTERNS

For each successful pattern in an AWK program, a related body
of actions will be executed.

An AWK pattern may consist of:

a) a regular expression surrounded by slashes

```
/\d+/  \d+  
```

b) a relational expression

```
$0 == $2  $1 == $2
```

c) a range consisting of two patterns separated by a comma

```
(first,/last/)
```

Example #7

```
$ cat logon.awk
# compute number of logons per account
#
# $ awk 'for (uaer in array)
#   printf "%c\n", user, count[user]
#
$ awk 'for (uaer in array)
   printf "%c\n", user, count[user]
```

Regular expression characters:

```
c  non-special character
\c  quote character
^  beginning of line
\^  end of line
$  any single character
[ ]  any one character from the group
[^]  any one character not in the group
r*  zero or more occurrences
r+  one or more occurrences
r?  zero or one occurrences
r1 r2  r1 followed by r2
```

Example #8

```
$ cat awk.awk
# define a pattern to use with wv100
#
$ awk '/\S+/ {print $2, $3} /
```

```
$c  non-special character
\c  quote character
^  beginning of line
\^  end of line
$  any single character
[ ]  any one character from the group
[^]  any one character not in the group
r*  zero or more occurrences
r+  one or more occurrences
r?  zero or one occurrences
r1 r2  r1 followed by r2
(r)  nesting
```
5. DEBUGGING

The best AWK programs are those that work correctly the first time!

$ cat bad.awk
begin { print "hello, world"; exit } $ awk -f bad.awk
awk: syntax error near line 1
awk: syntax error near line 1

REFERENCES


The Joke of the Month

The Joke of the Month will be a regular column in this newsletter. There are three requirements for joke submissions:

- humor,
- taste,
- and relevancy

The first is self-explanatory and self-defined, the second means nothing off-color, the third means computer- or unix-related. Send me your jokes, and the winning entry (or entries) will be published each month. The prize for submitting the winning joke is the satisfaction of seeing your name in print, and the knowledge that everybody in the Unisig thinks that you think you're funny.

To get things started, here's an old favorite:

Three computer salesmen are walking in the forest, when they come upon some tracks. The IBM salesman says "Those are bear tracks." The HP salesman says "Nope, those are dear tracks." The DEC salesman was hit by the train.
Table of Contents

Editor’s Workfile ........................................... VAX-3
Fastest SIR Response in History ........................ VAX-3
Get System Performance Information Service ........ VAX-5
The SIR Lobby .............................................. VAX-26
LUG News ...................................................... VAX-37
A New VMS System Management Architecture ...... VAX-38
INPUT/OUTPUT .............................................. VAX-59

Forms at the End

System Improvement Request Submission Form ........ OU-23
VAX Systems SIG Spring 1988 SIR Ballot ............ OU-25
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 (BP02)
Marlborough, MA 01752
USA

Only if discrepancies of the mailing system are reported can
they be analyzed and corrected.

---

SIR Voting Time

April 8 is the deadline for voting on the Spring 1988 System
Improvement Request ballot. Even if you are reading this on
April 1, the time is short. Dial-up contributors to the
Pageswapper have been participating in a debate as to the
relative merits of the various SIR’s, and in this issue Jonathan
Pinkley summarizes that discussion for the rest of our readers
who have not had a chance to get their arm twisted for this
ballot.

If there is still time for you to vote, the form is in this
issue, but you will have to go to the February issue for the
text of SIR’s (SIR voting can also be done on-line by those with
Pageswapper submission accounts).

Fastest SIR Response in History

(before the vote)

Digital Equipment Corporation
110 Spit Brook Road
Nashua, NH 03062-2698

12 February 1988

Larry Kilgallen, Pageswapper Editor
Box 81, MIT Station
Cambridge, MA 02139-0901

Dear Larry,
While reviewing the Spring 1988 SIRs published in the February edition of PAGESWAPPER, I discovered two that may not get voted into the top ten, but for which some response seems appropriate.

The first is S88-24 -- Abstract: MOUNT/FOREIGN and uninitialized tapes. I believe that symptoms described in the SIR result from known bugs in the HSC microcode. I also believe that these bugs have been or are being corrected, and that new HSC microcode releases will eliminate the observed behavior. I attempted the described operations on both a non-HSC and an HSC tape drive here and found the MOUNT/FOREIGN command to work properly in both cases. (Of course, we are running the "latest and greatest" of everything here, which also means that I am not able to reproduce the environment in which the problem is being experienced.)

It should also be noted that SIR-24 represents a bug report, and probably should be handled by means other than SIRs.

The second SIR is S88-15 -- Abstract: DCL status enhancements. To the best of my knowledge, utilities such as DIFFERENCES already return useful status information in the $STATUS DCL variable. In the case of DIFFERENCES identical files produce a $STATUS that equals %x006C8009, and different files produce a $STATUS that equals %x006C8013. Personally, I would not check the exact status values, but rather note that a SUCCESS status is returned if the files are identical and an INFORMATIONAL status is returned if the files are different.

Returning useful information in $STATUS is the expected behavior for all VMS utilities. In this respect, I believe that we are already doing that which SIR 88-15 requests. Of course there may be cases where the normal VMS standards are not being observed. I think customers who observe abnormal behavior, in the form of insufficient "value" in $STATUS returns, should report those problems as the bugs that they are.

Thanks,

Ralph O. Weber
Consultant Software Engineer
VAX/VMS Operating System Development

Get System Performance Information Service

Frank J. Nagy
Fermi National Accelerator Laboratory
P. O. Box 500 Mail Stop 220
Batavia, IL 60510

Disclaimer

The information in this document is subject to change without notice and should not be construed as a commitment by the author nor, certainly, by the Digital Equipment Corporation. Digital Equipment Corporation assumes no responsibility for any errors that may appear in this document.

The VMS MONITOR program gathers and displays information on the performance of a VAX/VMS system. MONITOR collects much of its information from the VMS Executive by means of a special Get System Performance Information service. The calling sequence for $GETSPI is described later in this document. $GETSPI is not implemented as part of the VMS Executive, but as an external system service in the manner of user-written system services. As such, the $GETSPI system service is implemented in the SPISHR.EXE shareable image found in SYS$SHARE: on the VMS system disk. Normally, this image is installed as a protected shareable image at system startup. To use this service, your program must link to this shared image with an explicit Linker command as shown:

$ link myprogram,...,sys$input:/options...
sys$share:spishr/shareable

to link MYPROGRAM and other object modules with the SPISHR image.
The $GETSPI service collects performance information based on an item list similar to the item lists used by the other get-information system services, such as $GETJPI or $GETSYI. The item codes used by $GETSPI are defined as constants for VAX C in a SPIDEF module for the LCLCDEF.TLB text library located in RDCS$LIB at Fermilab (see the appendix for a listing of these constants). Most of the item codes return a longword value which is either the current level value (such as the current amount of free nonpaged pool) or the current counter value (such as the number of system page faults). Counters are converted to rates by requesting the performance information twice, subtracting the first value from the second and dividing by the time interval between collections. The SPI$SYSTIME item code returns the current system time in standard VMS format (quadword) and may be included in an item with other performance information items to provide a time stamp marking the time when the items in the list were collected. Other items with units of time are returned in longwords as counts of 10 millisecond clock ticks.

Several items (SPI$DISK, SPI$PROC and SPI$SCS) return lists of structured information. Each list begins with a longword count which gives the number of items in the array of records which is the remainder of the list. The SPIDEF module defines struct’s for VAX C for these items. The DiskRecord structure is returned by the SPI$DISK item code for each disk device on the system. The information returned in the DiskRecord is:

- Allocation class number.
- Short form (four character) device name.
- Unit number.
- VAXCluster node name.
- Volume name.
- Count of I/O operations.
- Queue length accumulator.

The ProcRecord structure is returned by the SPI$PROC item code for each process in the system. The information returned in the ProcRecord structure is:

- Internal process identification (PID).
- UIC of process owner.
- Process’ current state.
- Process’ priority.
- Process’ name.
- Global page count.
- Process page count.
- Status vector from Process Control Block (PCB). Process is swapped out if PCB$V_RES bit is clear.
- Direct I/O count.
- Page fault count.
- Accumulated CPU time in clock ticks.
- Buffered I/O count.
- Extended PID.
- Event flag wait mask and MWAIT code.

The SCSRecord structure is returned by the SPI$SCS item code for each node in the cluster. The information returned in the SCSRecord structure is:

- System node name.
- Count of application datagrams sent.
- Count of datagrams received.
- Count of datagrams discarded.
- Count of application messages sent.
Get System Performance Information Service

- Count of messages received.
- Count of block Send Data's initiated.
- KBytes sent via Send Data's.
- Count of block Request Data's initiated.
- KBytes received via Request Data's.
- KBytes mapped for block transfers.
- Times connection queued awaiting send credit.
- Times connection queued awaiting buffer descriptor.

Refer to the appendix or the source of the SPIDEF include module for the exact struct field declarations.

The next section of this document is a description of the individual $GETSPI system service and its arguments.

This service allows a process to request performance information about the system. This undocumented system service is used by the MONITOR utility and is implemented in the SPISHR.EXE shareable image found in SYS$SHARE:. Items are requested using an item descriptor list similar to that used by the other $GETxxx system services. An item descriptor has the format:

```
  +-----------------------------+
  | Item Code     | Buf. Length |
  +-----------------------------+
  | Buffer Address           |
  +-----------------------------+
  | Address to return length  |
  +-----------------------------+
```

Refer to the documentation on the Get System-Wide Information ($GETSYI) system service for more information on the arguments to $GETSPI (except for the item codes and the returned information).

```
status = EXE_$GETSPI( efn, csidadr, nodename, itmlst, iosb, astadr, astprm )
```

status returns as VMS condition code:

- SS$NORMAL success
- SS$NOMORENODE a wildcard operation was requested, and $GETSPI has returned information about all available VAX nodes in the cluster. This is a success status.
- SS$NOSUCHNODE the specified VAX node does not exist or is not currently a member of the VAXCluster.
- SS$EXASTLM AST quota exceeded
- SS$ACCVIO itmlst can not be read by the calling access mode or the return buffer or return length word can not be written by the calling access mode.
Get System Performance Information Service

- SS$ BADPARAM an invalid item identifier was supplied

efn number of the event flag to set when all of the requested data is valid. Passed by value.

csidadr cluster system identification (csid) of the VAX node about which $GETSPI is to return performance information. The csid is a longword passed by reference. The initial value of the csid is $-1$ for a $GETSPI$ wildcard operation for all nodes in a VAXcluster (see $GETSYI$ documentation for more details). NOTE: UNUSED at the present time.

nodename name of the VAX node about which $GETSPI$ is to return performance information. Passed by descriptor. NOTE: UNUSED at the present time.

itmlst list of item descriptors. Passed by reference. The list is ended by a longword of 0. Most of the item codes return a single longword value; the exceptions are noted in the list below:

- SPI$_ACCESS$ Number of file accesses
- SPI$_ACCLCK$ Number of Access locks
- SPI$_ALLOC$ Number of file extends
- SPI$_ARRLOCPK$ Arriving local packets
- SPI$_ARRTRAPK$ Arriving transit packets
- SPI$_BIGHOLE$ Largest block in dynamic memory

- SPI$_BLKAST$ Number of blocking ASTs
- SPI$_BLKIN$ Blocking ASTs queued (incoming)
- SPI$_BLKLOC$ Blocking ASTs queued (local)
- SPI$_BLKOUT$ Blocking ASTs queued (outgoing)
- SPI$_BUFFUNAVAIL$ System buffer unavailable
- SPI$_BUFIO$ Count of buffered I/Os
- SPI$_CEF$ Common event flag wait
- SPI$_COLPG$ Collided page wait
- SPI$_COM$ Computable
- SPI$_COMO$ Outswapped and computable
- SPI$_CUR$ Currently executing
- SPI$_DEPLCKPK$ Departing local packets
- SPI$_DEQ$ Number of DEQ’s
- SPI$_DEQIN$ Dequeues (incoming)
- SPI$_DEQLOC$ Dequeues (local)
- SPI$_DEQOUT$ Dequeues (outgoing)
- SPI$_DGDISCARD$ SCS application datagrams discarded
- SPI$_DGRCVD$ SCS application datagrams received
- SPI$_DGSENT$ SCS application datagrams sent
- SPI$_DIRDATA_HIT$ Count of Directory data cache hits
- SPI$_DIRDATA_HITPCNT$ Percent of directory data cache hits
<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPI_DIRDATA_TRIES</td>
<td>Count of Directory data cache attempts</td>
</tr>
<tr>
<td>SPI_DIRDEL</td>
<td>Directory deletes</td>
</tr>
<tr>
<td>SPI_DIRFCB_HITPCNT</td>
<td>Percent of directory block cache hits</td>
</tr>
<tr>
<td>SPI_DIRFCB_HITS</td>
<td>Count of Directory block cache hits</td>
</tr>
<tr>
<td>SPI_DIRFCB_MISS</td>
<td>Count of Directory block misses</td>
</tr>
<tr>
<td>SPI_DIRFCB_TRIES</td>
<td>Count of Directory block attempts</td>
</tr>
<tr>
<td>SPI_DIRIN</td>
<td>Directory operations (incoming)</td>
</tr>
<tr>
<td>SPI_DIRINS</td>
<td>Directory inserts</td>
</tr>
<tr>
<td>SPI_DIRIO</td>
<td>Count of direct I/Os</td>
</tr>
<tr>
<td>SPI_DIRLOOK</td>
<td>Directory lookups</td>
</tr>
<tr>
<td>SPI_DIROUT</td>
<td>Directory operations (outgoing)</td>
</tr>
<tr>
<td>SPI_DISKRESPTIM</td>
<td>Disk I/O response time</td>
</tr>
<tr>
<td>SPI_DISKS</td>
<td>All disk data. Returns a list which begins with a longword count of the number of disk drives and then has an array of information records (one for each disk).</td>
</tr>
<tr>
<td>SPI_DLCKFND</td>
<td>Number of deadlocks found</td>
</tr>
<tr>
<td>SPI_DLCKMSGS</td>
<td>Deadlock detection messages (in out)</td>
</tr>
<tr>
<td>SPI_DLCKSRCH</td>
<td>Number of deadlock searches</td>
</tr>
<tr>
<td>SPI_DYNINUSE</td>
<td>Dynamic memory space in use</td>
</tr>
<tr>
<td>SPI_DZROFLTS</td>
<td>Demand zero faults</td>
</tr>
<tr>
<td>SPI_ENQCVT</td>
<td>Number of ENQ’s (conversions)</td>
</tr>
<tr>
<td>SPI_ENQCVTIN</td>
<td>Lock conversion requests (incoming)</td>
</tr>
<tr>
<td>SPI_ENQCVTLOC</td>
<td>Lock conversion requests (local)</td>
</tr>
<tr>
<td>SPI_ENQCVTOUT</td>
<td>Lock conversion requests (outgoing)</td>
</tr>
<tr>
<td>SPI_ENQNEW</td>
<td>Number of ENQ’s (new)</td>
</tr>
<tr>
<td>SPI_ENQNEWIN</td>
<td>New lock requests (incoming)</td>
</tr>
<tr>
<td>SPI_ENQNEWLOC</td>
<td>New lock requests (local)</td>
</tr>
<tr>
<td>SPI_ENQNEWOUT</td>
<td>New lock requests (outgoing)</td>
</tr>
<tr>
<td>SPI_ENQNOTQD</td>
<td>Number of ENQ’s no queued</td>
</tr>
<tr>
<td>SPI_ENQWAIT</td>
<td>Number of ENQ’s forced to wait</td>
</tr>
<tr>
<td>SPI_EXTHIT</td>
<td>Count of Extent cache hits</td>
</tr>
<tr>
<td>SPI_EXTHITPCNT</td>
<td>Percent of extent cache hits</td>
</tr>
<tr>
<td>SPI_EXTMISS</td>
<td>Count of Extent cache misses</td>
</tr>
<tr>
<td>SPI_EXT_TRIES</td>
<td>Count of Extent cache attempts</td>
</tr>
<tr>
<td>SPI_FAULTS</td>
<td>Page fault count</td>
</tr>
<tr>
<td>SPI_FCPCACHE</td>
<td>Number of FCP cache hits</td>
</tr>
<tr>
<td>SPI_FCPCALLS</td>
<td>Total FCP calls</td>
</tr>
<tr>
<td>SPI_FCPCPU</td>
<td>Number of CPU ticks used by FCP</td>
</tr>
<tr>
<td>SPI_FCPCREATE</td>
<td>Number of file creations</td>
</tr>
<tr>
<td>SPI_FCPERASE</td>
<td>Number of erase calls</td>
</tr>
<tr>
<td>SPI_FCPFAULT</td>
<td>Number of FCP page faults</td>
</tr>
<tr>
<td>SPI_FCPHIT</td>
<td>Number of window hits</td>
</tr>
</tbody>
</table>
Get System Performance Information Service

- SPI$_FCPREAD Number of disk reads by FCP
- SPI$_FCPSPLIT Number of split transfers
- SPI$_FCTURN Number of window turns
- SPI$_FCWRITE Number of disk writes by FCP
- SPI$_FIDHIT Count of File Id cache hits
- SPI$_FIDHITPCNT Percent of file id cache hits
- SPI$_FIDMISS Count of File Id cache misses
- SPI$_FID_TRIES Count of File Id cache attempts
- SPI$_FILHDR_HIT Count of File Header cache hits
- SPI$_FILHDR_HITPCNT Percent of file header cache hits
- SPI$_FILHDR_TRIES Count of File Header cache attempts
- SPI$_FPG Fragmented paging wait
- SPI$_FREFLTS Faults from free page list
- SPI$_FRLIST Size of free page list
- SPI$_GVALFLTS Global valid page faults
- SPI$_HIB Hibernating
- SPI$_HIBO Outswapped and hibernating
- SPI$_HOLECNT Number of blocks in dynamic memory
- SPI$_HOLESUM Total available dynamic memory
- SPI$_INITDEFER Transmit initially deferred
- SPI$_INTERNALBUFERR Receive internal buffer error
- SPI$_IOAQUELEN Accurate disk I/O queue length
- SPI$_IOQUELEN Disk I/O queue length
- SPI$_IRPCNT Number of IRP packets available
- SPI$_IRPINUSE Number of IRP packets in use
- SPI$_ISWPCNT Total inswaps
- SPI$_JDEXCNT Journal device extend count
- SPI$_JDFQLEN Journal device force I/O queue length
- SPI$_JDNQLEN Journal device normal I/O queue length
- SPI$_JDNQLEN Journal device normal I/O queue length
- SPI$_JDNQLEN Journal device normal I/O queue length
- SPI$_JDNQLEN Journal device normal I/O queue length
- SPI$_JDNQLEN Journal device normal I/O queue length
- SPI$_JDNQLEN Journal device normal I/O queue length
- SPI$_JDAYQLEN Journal device wait IRP queue length
- SPI$_JNLBUFIO Journal buffered I/Os
- SPI$_JNLBUFWR Journal buffer writes
- SPI$_JNLCHNLS Journal channels assigned
- SPI$_JNLDIRIO Journal direct I/Os
- SPI$_JNLFORFL Force writes -- flushed
- SPI$_JNLFORNL Force writes -- NULL operation
- SPI$_JNLOCINT Journal I/O operation count (for disks)
- SPI$_JNLJRNLS Active journals
- SPI$_JNLWRTAI A1 journal write operations
- SPI$_JNLWRTAT AT journal write operations
- SPI$_JNLWRTBI BI journal write operations
- SPI$_JNLWRTFM Force modifier writes
Get System Performance Information Service

- SPI$_JNLWRTRU RU journal write operations
- SPI$_JNLWRTSS Journal write ops to sec stg
- SPI$_KBYTES KBytes/second
- SPI$_KBYTMAPD SCS Kbytes mapped for block transfer
- SPI$_KBYTEREQD SCS KBytes received via request data
- SPI$_KBYTESEND SCS KBytes send via send datas
- SPI$_LEF Local event flag wait
- SPI$_LEFO Outswapped local event flag wait
- SPI$_LOCBUFERR Receive local buffer error
- SPI$_LOGNAM Logical name translations
- SPI$_LRPCNT Number of LRP packets available
- SPI$_LRPINUSE Number of LRP packets in use
- SPI$_MBREADS Total mailbox reads
- SPI$_MBWRITES Total mailbox writes
- SPI$_MFYFLTS Faults from modified page list
- SPI$_MKBYTES Multicast KBytes/second
- SPI$_MODLIST Size of modified page list
- SPI$_MPACKETS Multicast packets/second
- SPI$_MPACKETSIZE Multicast packet size (bytes)
- SPI$_MSGRCVD SCS application messages received
- SPI$_MSGSENT SCS application messages sent
- SPI$_MULTICOLL Transmit multi collisions detected
- SPI$_MWAIT Misc. wait
- SPI$_NUMLOCKS Total locks
- SPI$_NUMRES Total resources
- SPI$_OPCNT Disk I/O operation count
- SPI$_OPENS Number of file opens
- SPI$_OTHSTAT OBSOLETE item, returns 0
- SPI$_PACKETS Ethernet packets/second
- SPI$_PACKETSIZE Packets size (bytes)
- SPI$_PCOMPAT Time in compatability mode in ticks
- SPI$_PEXEC Time in executive mode in ticks
- SPI$_PFW Page fault wait
- SPI$_PIDLE Idle time in ticks
- SPI$_PINTERRUPT Time on interrupt stack in ticks
- SPI$_PKERNEL Time in kernel mode in ticks
- SPI$_PREADIO Physical page read I/Os
- SPI$_PREADS Page reads
- SPI$_PROC Process information. Returns a list which begins with a longword count of the number of processes on the system and then has an array of information records (one for each process).
- SPI$_PROCS Process count for SYSTEM class
- SPI$_PSUPER Time in supervisor mode in ticks
Get System Performance Information Service

- SPI$_PUSER Time in user mode in ticks
- SPI$_PWRITES Page writes
- SPI$_PWRITIO Physical page write I/Os
- SPI$_QBDT_CNT SCS times connection queued for buffer descriptor
- SPI$_QCR_CNT SCS times connection queued for send credit
- SPI$_QUOHIT Count of Quota cache hits
- SPI$_QUOHITPCNT Percent of quota cache hits
- SPI$_QUOMISS Count of Quota cache misses
- SPI$_QUO_TRIES Count of Quota cache attempts
- SPI$_RCVBUFFL Receiver buffer failures
- SPI$_REQDATS SCS block request datas initiated
- SPI$_RUFABORT Count of RU abort operations
- SPI$_RUFACTIVE Active recovery units
- SPI$_RUFCHNLS RU journal channels
- SPI$_RUFNJLS Active RU journals
- SPI$_RUFMARK Count of Mark IDs written
- SPI$_RUFMRKRB Count of Mark ID rollbacks
- SPI$_RUFREADS RU journal reads
- SPI$_RUFWRITS RU journal writes
- SPI$_RUFXTNDS RU journal extends
- SPI$_SCOMPAT Time in compatability mode in ticks

SPI$ SCS All SCS information. Returns a list which begins with a longword count of the number of systems in the cluster and then has an array of information records (one for each system).

- SPI$ SEEXEC Time in executive mode in ticks
- SPI$ SIDLE Idle time in ticks
- SPI$ SINGLECOLL Transmit single collision detected
- SPI$ SINTERRUPT Time on interrupt stack in ticks
- SPI$ SKERNEL Time in kernel mode in ticks
- SPI$ SMALLCNT Number of blocks $<$ 32 bytes in size
- SPI$ SMALLHOLE Smallest block in dynamic memory
- SPI$ SRPCNT Number of SRP packets available
- SPI$ SRPINUSE Number of SRP packets in use
- SPI$ SSUPER Time in supervisor mode in ticks
- SPI$ STORAGMAP_HIT Count of Storage bitmap cache hits
- SPI$ STORAGMAP_HITPCNT Percent of storage bitmap cache hits
- SPI$ STORAGMAP_TRIES Count of Storage bitmap cache attempts

- SPI$ SUSER Time in user mode in ticks
- SPI$ SUSP Suspended
- SPI$ SUSPO Outswapped and suspended
Declarations of information return struct's used by the SPI$_DISK, SPI$_PROC and SPI$_SCS items.

```c
struct DiskRecord {
    unsigned char allocclass;  /* Allocation class */
    char devname[4];            /* Device name */
    unsigned short unitnum;     /* Unit number */
    char nodename[8];           /* Node name */
    char volname[12];           /* Volume name */
    unsigned long optcnt;       /* Operation count */
    unsigned long qcount;       /* Queue length accumulator */
};

struct ProcRecord {
    unsigned long ipid;        /* Internal PID */
    unsigned long uic;         /* UIC */
    unsigned short state;      /* State value */
    unsigned char pri;         /* Priority (negative value) */
    struct {
        unsigned char count;     /* Text length count */
        char text[15];           /* Process name (counted string) */
    } lname;
    unsigned short gpgcnt;     /* Global page count */
    unsigned short ppgccnt;    /* Process page count */
    unsigned long long sts;    /* PCB Status Vector */
    unsigned long long diocnt; /* Direct I/O count */
    unsigned long long pageflts; /* Page fault count */
    unsigned long long cputim; /* Accumulated CPU time (in ticks */
    unsigned long long biocnt; /* Buffered I/O count */
    unsigned long long epid;   /* Extended PID */
    unsigned long long efwm;   /* Event flag wait mask (for MWAI */
};
```

iosb = quadword I/O status block to receive final status. Passed by reference.

astadr = AST routine to be called when all of the requested data has been supplied. Passed by reference.

astprm = longword AST routine parameter. Passed by value.
struct SCSRecord {
    char nodename[8]; /* System node name */
    unsigned long dgsent; /* Application datagrams sent */
    unsigned long dgrcvd; /* Application datagrams received */
    unsigned long dgdiscard; /* Application datagrams discarde */
    unsigned long msgsent; /* Application messages sent */
    unsigned long msgrcvd; /* Application messages received */
    unsigned long snddats; /* Block send datas initiated */
    unsigned long kbytsent; /* KBytes send via send datas */
    unsigned long reqdats; /* Block request datas initiated */
    unsigned long kbytreqd; /* KBytes received via request da */
    unsigned long kbytmapd; /* KBytes mapped for block transf */
    unsigned long qcr_cnt; /* Times queued for send credit */
    unsigned long qbd_e_cnt; /* Times queued for buffer descri */
};
This is a short summary of comments regarding current SIRs made by various dial-up contributors on the PAGESWAPPER system. I have tried to remain objective, but I am human and I have my own opinions. The summaries are mine, and may show inadvertent bias.

This summary is from the Pageswapper SIR LOBBY Notes conference as it was on Monday, February 22, 1988. The following is the method I have used to summarize. I have arranged the replies into four categories; Yes, No, Indifferent, and Discussion. Following are my definitions of the categories:

- **Yes** -- This is a vote for the SIR. I have limited this to one per person, i.e. if John Doe has left 5 replies in favor of a particular SIR, I count only one as a Yes, the others will be counted as discussion.

- **No** -- This is a vote AGAINST the SIR; i.e. a negative vote. The same one vote per person as above applies.

- **Indifferent** -- Not a Yes, but not a negative vote.

- **Discussion** -- This is a reply that discusses previous replies or possible enhancements to the SIR for a future submission.

I have listed these in the numeric order of the SIRs. I have omitted all SIRs for which no replies have been left.

- **S88-1**: SCS Communications Access for Users
  1 Indifferent -- Not sure what it means, if it's for cluster compatible utilities I'm for it.

- **S88-2**: Better Batch Job Load Balancing
  1 Yes -- Would really be best if DEC gave us "user written job (sub-)controller".

- **S88-3**: Privileged Deallocation of Tapes Away from Users
  4 Discussion -- how to do it now, what is needed etc.

- **S88-5**: Batch Execution Queue Assignment "Filtering"
  2 Discussion -- What does it mean, should it be part of S88-2?

- **S88-6**: "Virtual Disk" Capability
  2 Yes -- V5 will probably break most device drivers, therefore DEC should support this. Fall 87 VAX SIG tape will have "memory" disk driver.

- **S88-7**: Identity Information About LAT Sessions
  1 Yes -- This needs to be done by LOGINOUT so that login failures will contain the information.

- **S88-8**: Queued ALLOCATE Service
  2 Yes -- Good for shops that only have a single tape drive. Also good for shops with 10 drives.

- **S88-9**: Support For Simple Project Accounting
  2 Discussion -- DEC indicates security problems with the simple model in the DECUS proposal.

- **S88-10**: BACKUP Added Logging and Incremental Restore
  2 Discussion -- Don’t BACKUP journals provide logging information?
- S88-11: DCL WRITE Without CR/LF
  1 Yes -- This would make the job much easier to talk to "Smart" modems, etc. !
  3 Discussion -- Work around with READ /PROMPT=string /TIME_OUT=0

- S88-12: More Capabilities for VAX-11 RSX BRU
  4 Indifferent -- Discussion about whether this should be in the VAX SIR area. Summary: anything that is related to VAXes that might be resolved by DEC is ok; not just software, not just VMS, not just the operating system. Problem: due to the limited constituency, not likely to make top-10, and therefore the vote may be "wasted".

- S88-13: Enhanced Command Line RECALL Capabilities
  2 Discussion -- Want to add new features to the SIR

- S88-14: Extend DCL TABLES
  2 Discussion -- Want to add new features to the SIR

- S88-15: DCL Status Return Enhancements
  3 Discussion -- The example given already has different status return! Don't waste a vote.
  1 Yes -- Need this capability with stable or symbolic return codes.

- S88-18: DCL /LOG Qualifier Consistency
  1 No -- Not a new different qualifier; at least don't break the old ones!

- S88-19: Command for "Control Print Screen" To A File
  2 Discussion -- DEC doesn't plan to implement this because they already provide this with SET HOST/LOG. But the whole point is to change DEC's plans!

1 Indifferent -- It would be nice...

- S88-21: Mail Enhancements
  3 No -- Too Much Effort, Too Little Payback
  4 Indifferent -- Nice ideas but there are other things that are more important. Only agree with part of the SIR.

3 Discussion -- How the SIR should be changed.

- S88-22: SET HOST/DTE Enhancement For More Modems
  1 No -- DEC provides for custom DTE dialer modules. There is a Hayes-compatible one on this system in [US197634] for general consumption. DEC should provide for their own modems, not everyone else's.
  1 Yes -- DEC should provide this. Also now there is DMCL (DEC Modem Command Language) for their new modems (See V4.6 release notes.)

- S88-23: Enhance SHOW PROCESS Command
  2 Indifferent -- Nice but... both liked the SHOW PROCESS/FILES part.

(jlp) The last paragraph of the SIR states "SHOW DEVICE/FILES on one drive system with many installed images provides too much output." DEC agrees with this and that is why they provided SHOW DEVICE/FILES/NOSYSTEM

1 Discussion -- Shouldn't be able to show files used in a protected subsystem without privilege.

- S88-24: MOUNT/FOREIGN and Uninitialized Tapes
  1 Yes -- It is a pain to have to initialize tapes that are new.
  1 No -- It is negligent to use uninitialized tapes.
16 Discussion -- Is "MOUNT /FOREIGN /INITIALIZE /LABEL= /DENSITY= " what people really want? MOUNT (and INIT) /OVERRIDE=(ACCESSIBILITY, EXPIRATION, OWNER IDENTIFIER, SETID) does it already. Should it be SPRed?

- S88-26: /BELL Qualifier for Certain DCL Commands
1 No -- Don’t waste a top-10 slot for something that is easily done with the current system.
3 Indifferent -- Not needed, easy work-arounds available.
Command files use $ bell[0,7]=7 ... $ write sys$output
Interactive; just type ahead a CTRL/V CTRL/G.

- S88-28: Improving VMS Define Utility
1 No -- Just not worth wasting a top-10 slot for, just don’t use ASSIGN if you don’t like the way it works.

- S88-29: "Wild Card" Capability in SYS$GETDVI
1 Discussion -- Home grown version available from John Ferriby

- S88-32: Protection and Ownership Attributes of Directory File
This one gets the prize for the most replies.
1 Yes -- There is no way for a non-privileged user to find out where he has copied files to that are being charged to his quota. It is not possible to use identifiers to create a "write only" directory. If the person that copied the file into the directory does not give delete access, the person who owns the directory can not delete it. (jlp) This may lead to "lost" files, since the person could SET FILE/REMOVE to get it out of their directory.

- S88-33: Provide A Real-Time Debugger
9 Discussion -- What does this really mean?

- S88-35: Control DECnet File Transfer Priority
2 Discussion -- Priority of what? process or decnet channel?
1 No -- If it means changing the NCP or NETSERVER process priorities.

- S88-36: Descriptive Text For Files
1 Indifferent -- capability is there via ACL
4 Yes -- It would provide a needed functionality, and it needs to be part of the file as opposed to being in a description file (ala the Norton Utilities under MS-DOS.)

4 Discussion -- Application ACEs are described on page 3-18 of the System Services Reference Manual, section 3.4.1.2. Up to 253 bytes of your choice. This could form the basis for the needed functionality. This was previously in the top-10 and DEC said that the underlying capability was there via the "informational
ACE" and that they would provide the DCL interface in a future release.

- S88-37: READALL Should Only Permit a File To Be Read
  1 Indifferent -- This should be an SPR not an SIR.
  2 Yes -- Yes it's a bug, but we need to let DEC know we know it's a BUG.
  1 Discussion -- It's a documented feature, but it should be changed.

- S88-38: Run New Images Under Old Major Versions
  2 No -- Would cause too many nasty side effects.
  5 Discussion -- Several work-arounds discussed.

- S88-40: SMG/non-SMG Screen Interaction
  1 Discussion -- An example

- S88-41: DECnet Copy Performance to Same Node
  2 No -- Causes security alarms, etc.
  1 Indifferent -- Only if transparent.
  1 Discussion -- Will be in Future Major Release.

- S88-42: Install Images Memory-Resident
  1 Yes -- This could help
  2 Indifferent -- Not needed, is the right thing being optimized?
  4 Discussion -- What about RAM disk, etc.

- S88-44: Multiple MACRO Modules Per Source File
  4 Indifferent -- Slightly pro or con

- S88-38: Run New Images Under Old Major Versions
  2 No -- Would cause too many nasty side effects.
  5 Discussion -- Several work-arounds discussed.

- S88-40: SMG/non-SMG Screen Interaction
  1 Discussion -- An example

- S88-41: DECnet Copy Performance to Same Node
  2 No -- Causes security alarms, etc.
  1 Indifferent -- Only if transparent.
  1 Discussion -- Will be in Future Major Release.

- S88-42: Install Images Memory-Resident
  1 Yes -- This could help
  2 Indifferent -- Not needed, is the right thing being optimized?
  4 Discussion -- What about RAM disk, etc.

- S88-44: Multiple MACRO Modules Per Source File
  4 Indifferent -- Slightly pro or con

6 Discussion -- Is it better to have only a single module per source file for software tracking?

- S88-45: VAX Ada Package for VMS Run-Time Library
  2 Discussion -- Why only Ada? Strong type checking too!

- S88-46: Line-Number Support In TPU
  3 Yes -- No efficient way to do this now.

- S88-47: Eliminate Automatic Unsolicited ACE on File Creation
  3 Yes -- The "Magic ACE" causes too many problems.

- S88-48: Prevent Password Reuse by Users
  3 Yes -- This is a necessary part of password expiration.
  1 Indifferent -- 1984 was four years ago...
  10 Discussion -- Best way to implement, and how not to.

- S88-49: Suppress Login Failure "Error reading command input"
  1 Yes -- This is not really a login failure.

- S88-50: No File Modification Date Update on Protection Change
  1 No -- Will break existing method of determining if something has changed when things stop working.
  2 Indifferent -- The file contents haven't changed, why set the modified date?
  4 Discussion -- More date fields in the file header would solve the problem.
- S88-51: Protected Subsystems
  1 Yes

- S88-54: DECnet-VAX End-to-End Encryption
  1 Indifferent -- Need ability to use hardware if it exists already.

- S88-55: Support DECnet Proxy Access for SET HOST Command
  1 Yes -- This would eliminate one more of the remaining situations where a password has to appear in plain text.

- S88-56: Better Control Over DECnet Remote File Access
  1 Indifferent -- Only through special ACL's so it would be optional.

- S88-57: Enhance COPY to Copy ACL's
  1 No -- The ACL should be determined by the destination.

- S88-59: General Identifier as the Owner of a Process
  1 Yes -- This is working toward an environment without System, Owner, Group, World. It should be kept as an option.

- S88-60: Security Alarm ACE Bypass by Certain Users
  2 Indifferent -- Good Idea but...

- S88-61: Print Form Setup and Reset Modules Verbatim
  4 Yes -- This must be fixed!

1 Indifferent -- But this should be an SPR
4 Discussion -- But DEC ignores SPR's ...

- S88-62: BACKUP Dismount and Deallocate Tape Drives
  1 Yes -- but it must not be the default.

- S88-63: Bell Character to Certain BACKUP Messages
  1 Indifferent -- Cute but is it worth a vote?

1 Yes -- This has been needed for a long time
7 Discussion -- Suggestion for a generic way; SET MESSAGE /FACILITY /IDENT /SEVERITY /TEXT /TIME /BELL

- S88-64: Limit Simultaneous Interactive Logins
  1 Yes -- No easy way to do this.

2 Indifferent -- What about something in SYLOGIN?
5 Discussion -- Why MAXJOBS won't work

- S88-65: Distributed Management of UAF Parameters
  1 Indifferent -- Write your own using SETUAI and send it to DECUS

- S88-66: Working Set Quota/Extent Via INSTALL
  1 Indifferent -- Not really necessary

1 Yes -- Good for All-In-One users

- S88-67: Execution Priority Via INSTALL
  1 Indifferent -- Incomplete specification, would this affect all types of access? Would it be absolute priority?

- S88-68: Multiple Layered Product Versions on One Machine
2 Yes -- Would make upgrades much smoother.
  2 Indifferent -- The problem is the ROMs
  1 Yes -- Let there be ROMs
7 Discussion -- How it's handled on the 11/73 etc.
- S88-70: More Output File Qualifiers for BACKUP Restoration
  1 Indifferent -- "Oh Gawd, not MORE qualifiers!!"

LUG News
Meeting topics for April - from respective LUG Newsletters

St Louis Local User's Group:
Second Tuesday of every month
at the Salad Bowl Restaurant
3949 Lindell Boulevard
5:30 pm - social time
6:00 pm - dinner
7:00 pm - program
April - PDP Topics - (possibly a case history of a migration from PDP to VAX given by Ken Denson).

MIVAXLUG:
Lawrence Institute of Technology
Management Building, Room M336
10-Mile Road
Southfield, MI
6:15 Open Steering Committee meeting
7:00 Main Meeting
April 12 - Configuring Ethernet LANs - Jim Raquepau
Most of you were probably here for the system management talk I gave two hours ago. Then I talked more about the nuts and bolts and practicalities of the day-to-day improvements we have been doing or thinking of doing. This talk is different—I am going to talk about something called architecture.

Have you heard the definition of an architect, particularly in software terms? Well, an architect is someone who knows a thousand ways to make love, but has never been on a date. Architecture is a framework in the strictest sense. A way to think about a problem and a way to put this problem in the context of a framework it never had before. I am not describing any one thing. I am going to describe generally some thinking we have had and solicit your feedback. The next major release may have the beginning pieces of this. We want to put our system management software in over the next several years, in several major releases, not just the next one.

First, I will talk about what this problem is we are trying to solve and give a summary of the approach taken to solve this problem. Then I will present the new architecture, including a major component called a "human interface." We want to run by you a separate set of strategies for that component. Since this is a relatively short presentation, there will be time for questions and answers at the end.

What is the problem? There are a lot of professional system managers in this audience so this doesn’t come as news to people. Our system management facilities are based on the original 11/780 mode. The 11/780 system management model is a derivative of the PDP-11 model—a part-time technical user who ran into the computer room twice a day, authorized the users, backed up the tape, and was very knowledgeable. It was a part-time job. Our audience was the same type person when we went to the 780. He just continued in that direction. Today we have the so-called "desk-top data center," a breadth of range of configuration, yet we still use that same, very simple-minded "system management model." The feedback indicates that we have strained that model at both ends.

At the high end—many of you people here are system managers of very complex configurations. The world is distributed; people are managing multiple systems. Unfortunately, there are many, many utilities and interfaces to learn. There is much repetitive work, repeating what you are doing on all the systems you deal with. We have professionals at the high end, dedicated operators, dedicated administrators, yet we don’t have any special facilities for them. We basically tell everybody, "Give yourself some privileges, use the general purpose interface, and a few odd utilities."

At the low end—we are into workstations and very small systems competing with the PC-mentality, as I call it. That sounds like a derogatory term, when, in fact, it is a very good model. It comes out of the box and it works; we don’t worry about system management. Yet, this low-end user is faced with the same plethora and array of system management utilities as the high-end user, yet essentially must learn to use them all in order to deal with a small system. There are reasons why we arrived at this situation, but a lot of it has to do with there not being internal software architecture for system management. There’s nothing written down saying, "If I’m going to add a new facility to VMS, this is what to do."

Let’s pick a major new category, local area VAX clusters. Local area VAX clusters have a system management component. There is nothing written down anywhere saying how I implement the system management component. What rules shall I follow? Does it become a part of some utility? Do I add some DCL commands? Do I provide SHOW commands to monitor some things? None of this stuff has been defined. Over time, whenever a new facility of system management content was added, we came up with whatever was convenient. We have a broad range of interfaces in the system management area, including DCL commands, special utilities with special syntaxes, special editors, like the ACL editor, canned command procedures like VMSINSTALL, SHUTDOWN, AUTOGEN, things like that.
There are probably four or five different interface models. We have a real problem now because of extensibility. We’d like to say "We have new audiences, and we have a new configuration we never had before." We want to deal with this situation, make help available in some easy to use, very specialized way, but there is no easy way to do so. Everything is there. There is no layering, so layering is what we really want. The distributed stuff is the other big problem to solve--the world is distributed. We have had some success in giving the illusion of a nondistributed system for end users. Our file systems and applications packages essentially make the data location and the data processing transparent. We have done a pretty good job there and our customers and applications packages have also done a good job there. We haven’t done a good job in the system manager’s arena, separate systems are here and things are distributed. The exact nature of that distribution has to be understood. In general, there are very few support tools for dealing with problems.

I call the other thing a consolidation problem. We really do not distinguish, at this point, between system management and end user human interfaces—the system manager’s interface on the VMS is the end user interface with some privileged extensions. There is something to be said for that if the user and the system manager are the same person, but as I stated earlier, these are diverging. The system manager at the high end is a professional, not necessarily doing the same thing as an end user, and at the low end, maybe a system manager, but not by choice. These are some of the problems we are trying to solve.

We did an organizational focus first. We have a group which worries about such—the management within VMS. VMS has been around a long time, almost ten years now, and we never had a system management project per se. We had a security project, and we had the volume shadowing project. We had a DECnet project and an exec project. Any system managing all those things was invented in those projects without any coordinating body. We are not trying to do everything in this group, but we are trying to act as a clearing house and provide a place where people can come within the Digital development organization.

Say we add a piece to VMS—a new product, a new layered product, or a new optional function and here is the system management piece. What should it look like? We’ve never done this before. I think this is a big step in the right direction.
all the privileges, switches, and options. We don’t want to rewrite the underlying function to maintain a user authorization file every time we have a new requirement for user interface.

Goal - Documented Interface

Next, we would like to document all these interfaces in the recognition that VMS Development is certainly not omniscient in all the human interface will require in the future. There will always be special-purpose audiences. We even have groups inside Digital which are not in our group. For example, the Office and Information Systems group has an All-in-One product targeting an office/secretarial environment. Perhaps these people would like to have a system management interface specific to that audience. They should be able to look at some document and write a human interface for that audience without introducing hacks of layering onto something which was never intended to be layered on, or worse. The last goal of this architecture is to recognize there are other management architectures. The significant one we deal with daily is network management. We want to provide inter-operability of VMS management system architecture with network management architectures in it, including any other ones which come along.

Layers of Implementation

Now let’s have a technical overview of what we have done. We divided the components dealing with technical management problems into three layers. I’ll describe them from bottom to top in some detail. At the bottom we have a primitive function layer; above that layer, another layer we call integration and common services; above that, another layer we simply call the human interface, of which there are many. Subsequent slides show each layer in some detail.

Starting at the bottom, the primitive layer. What does that word mean? System service, RTO routines or other callable modules performing some lowest level, atomic function, for example, an ACP QIO to modify a parameter into the callable SYSGEN utility which is something we created as part of SYSTEM CHANGE, a system parameter, etc. There are many examples. Something modifying a record in the user authorization file. These are lowest level, atomic functions in the sense that they can’t decompose into any functions which themselves would interest system management. In that sense they are atomic.

Many of these parameters are shared with the general user interface. Access control, various other things, not necessarily a directory creation of something to be used by system management when we create a new user. Yet the end user does directory creation all the time when creating a subdirectory. That is another characteristic. Uses of these low-level components are mixed between system management and the regular user programming interface.

Another characteristic, an implicit acknowledgment of what exists. There are different types of call interfaces. Some are system services, some are QIO functions. There are a number of different pieces in the system. We have to live with the fact that in this architecture we have a number of low-level primitives implemented over a period of time in different styles. We don’t want to rewrite all this when we have a new system management architecture.

Last, the primitive layer is very notions distributive. Some of these low-level primitives, for example, operate databases on cluster-wide disks for automatic cluster-wide distribution. Some operate only on in-memory databases. Depends on what you look at. Some things are distributed and some things aren’t. We have a set of low-level functions, variable in terms of distribution and in the style of call interface. How they are used between system management and non-system management programming interfaces to solve the problem of all these different low-level functions inside the system.
Integrator Layer

The next layer up is the integrator. The integrator layer is designed to smooth out the differences of all these low-level functions and provide a single, common call interface to the human interface layer sitting on top. There is one integrator per system—this is the common control point for all system management functions. We finally have a thing inside VMS we can call a system management control point, not some random piece of code somewhere. This is nice because if we want to deal with something such as logging or various security things, there is someplace we can go. All system management functions pass through this layer. That is the first good point about it.

Another good point: integration translates the nonuniform, primitive call interface onto the uniform call interface seen by the user of the integrator. The integrator also provides the form distribution mechanics, despite what is going on at a lower level. For example, if a low-level, atomic function is not inherently cluster-wide, the call interface to the system integrator to the higher human interface is to do cluster-wide functions. The integrator does those things necessary by repeating that function on each node in the cluster so the human interface doesn’t have to worry about that particular problem. I mentioned before about the architectural anchor point through which all functions pass; I’ll go over that point again, just as an implementation point. The integrators talk to each other. That is how we do distribution. The call interface to the integrator is exactly the same regardless of the atomic function being implemented—whether it is in the local system or a remote system. Implementing human interfaces which deal with distributed configurations is easily accomplished without going through tremendous gyrations. The user needn’t worry about where these things are being executed.

The last point of the integrator: it is human interface independent. The call interface to the integrator is not dependent on any particular syntax or style of implementation, character cell workstation, whatever. This call interface can support multiple human interfaces in the same system. An easy-to-use interface and a more sophisticated interface can run in the same system against the same integrator. In fact, the human interface might not even be human. It could be an AI-type interface or, in the future, a type of sensing interface which figures out your thoughts about your system and then does it.

Human Interface Layer

The top layer is the human interface layer. We have a separate strategy associated with this one. I will go into some detail as this is important. Multiple instances are possible for human interfaces, each one for a specific audience. All low-level services are provided by the integrator call interface. These human interfaces do not do any system management, low-level functions themselves. They worry about presentation, dealing with the user, user assistance, help, formatting of error messages, all those things which are very audience-specific. They don’t worry about whether the fifth bit of the fourth field contains the privileges. As I said before, it doesn’t have to be a human interface. It can be some kind of automatic mechanism or some other kind of layer. It is important that an architecture like this be somewhat open-ended. Do not assume the human interface is going to be the last layer. Doesn’t have to be a human interface, it can be a program talking to something else. The human interface is free to aggregate or subset the lower level functions as necessary. Example, in a simpleminded user authorization scheme you might want to automatically add a proxy account, add some disk quota, create a top level directory, do all kinds of automatic things the system manager wouldn’t deal with, and they all default. Those functions should be separate in a sophisticated environment because the system manager requires separate control of those things. The human interface does that kind of aggregation as necessary, as well as subsetting. It doesn’t have to implement all the functions available at the integrator level. The human interface also can provide any view of the distributed system appropriate to the audience being served. You might, going back to the example of the simpleminded, low-level interface, want to hide everything that is cluster-wide in the human interface. All things are the same in a homogeneous cluster—why should the system manager worry about that. Let the human interface internally figure that out. In the more sophisticated case, you may want a human interface to provide control when dealing with individual systems.

Human Interface Categories
I've discussed the lower levels, now let's talk a little more about human interface. "Sysman" is the first human interface under this new architecture and we would like to build new ones on it. A new terminal medium is needed for system management, particularly in larger systems. We've announced the DEC windows program. At this point that program is the target for all future work with human interface. The DEC windows program uses the X-protocol where something as inexpensive as an IBM-PC or a PC clone can run the X-server and provide a bit map interface in a system, at a cost comparable to a character cell terminal. We don't believe that reduces the cost problem any more. The need for additional real estate on a workstation screen is obvious when we manage a cluster or a complex, distributed configurations environment. To that end, we think it is a good idea since we can't do everything to minimize investment and character cell terminals in terms of system management and human interfaces.

To target the multiple audience problem, we have divided the audience: Class I, Class II, and Class III. We define three audiences, which I'll run by you in the next few slides. These are interfaces we think we need. We start from the bottom, the top in terms of capability of the person doing the system management.

Class I - Human Interface for Workstations

Class I is a stand-alone workstation, or a workstation loosely coupled to a network in the Ethernet, or a light area network connection. This is the PC-mentality user I mentioned before: somebody who is using a workstation to accomplish a job, a person not versed in system management and probably doesn't even want to do it. In some cases we have tools. For example, we have our RSM to do remote backup and loading of optional software. This person might be helped by some centralized network service. At this time, however, a substantial subset of the full VMS system management functions is required to deal with the management of small workstations. That is a big problem. The PC mentality is good here because we can think of this problem in a completely different way now.

Class II - Human Interface for the Desktop

Class II is essential to what we call a desk-top strategy. We are very high on local area VAX clusters. We think they eliminate all system management problems for end users. You boot off the common system. All system management is essentially done for you by the system manager of the boot node. We have not dealt with the system manager of the boot node. We see local areas VAX clusters being deployed in office environments. For example, half a secretary's time is spent system managing this local area VAX cluster. We've done that within Digital in a couple of test installations without much success. Most interfaces require full CI cluster knowledge. We think there is an important intermediate user audience between the workstation and the user in the full blown, large cluster manager. I'm talking about a Class II audience. We don't want to assume extensive DCL knowledge or knowledge of the VMS utilities, as I said before. Clusters are not making the progress we would like at the low end of the marketplace. The system management problem is a big, big piece of improving this progress and why we want to deal with it.

Class III - Human Interface for Traditional Environments

Class III is everybody else, traditional audience, a lot of people in this room. These systems have become complex enough--enough systems and enough software to manage them--that we are talking about dedicated jobs. You are also going to be talking about a multi-role environment. A typical large environment consists of security managers, operators, technical administrators, non-technical administrators, accountants, people like that. All these roles are possible. These people are system managers. It is important that the model we produce allows the creation of multiple user interfaces. We could have an operator interface completely centered around the functions of the dedicated operator role. A technical user interface and a technical system management interface in the same site, both working as parallel human interfaces off the same set of lower level, system management architecture components. Some of this is conjecture. If you think this is really off the wall, please let me know, but this is the way we see it going. I'll go in...
A New VMS System Management Architecture

the reverse order this time. In the Class III area we've done the "sysman" work for the next major release to make distributive configurations easier to manage and consolidate a few things.

Future Development

We think a DEC windows version of the same thing is the next important thing to do. DEC windows here are not so much for the mouse- and ease-of-use-type things of the PC mentality because we are not dealing with that kind of user. But the operator interface and the screen-use interface are essential when managing large configurations. To have a recognizable subsystem we need to continue consolidating the bits and pieces in various corners. Other major new subsystems within VMS will have a system management component. We want to make sure everything coming out in the future is architecturally compliant with this new model so we need to minimize the number of new random utilities for the system manager. We want to do something about these new specialized role interfaces. The operator interface bothers us at the moment -- the opcom request reply interface. We feel this is inadequate for the professional computer room operator.

We have an advanced development project underway again. This is just advanced development, nothing necessarily is going to happen with this as a product. We have a DEC windows-based, Class II human interface for the system manager of the boot node of a local area VAX cluster which is relatively bounded and isn't mixed or interconnected. Something we can get our arms around. It's a single interface for all functions. A menu-driven, DEC windows-based thing doing nine or ten major system management functions: authorizing users, backup, restore, printing error logs, configuring satellites, configuring a controlling network, installing optional products, shut down, dealing with the queue manager, some media disk structure and maintenance management. All from one user interface. We can produce something like this. We will be able to sell people local area VAX clusters and succeed at our goal: a nonprofessional system manager who doesn't have a great deal of knowledge, in particular doesn't know DCL, and hasn't managed the system. It's not going to be easy, but we think we can do it. The Class I human interface strategy there involves recognizing the I-don't-want-to-do-system-management syndrome. We are working on various advanced development projects to pre-install VMS and have it work coming out of the box. This kind of thing totally hides system management. Where we do have to have some, it would also probably be DEC windows based and a subset of the Class II interface.

Question and Answer

I think that's all; I was going to make up these big question slides for the end but I forgot. That's the end of the formal presentation. At the risk of repeating myself, this is a bunch of ideas. We've done some work in some areas, we have some advanced development in projects in other areas. I'd be interested in comments on this as opposed to the last session. I'm not telling you that you shouldn't ask certain questions, but things like the backup utility needing a new bar switch probably aren't appropriate for this presentation. I'd like to keep it at a higher level in terms of the technology.

Q: Dick Picard, Kalamazoo College. I'm delighted with your direction. I think a couple of things are likely to be common to a number of...at least college environments, if not commercial ones. Every fall we get this surge of new account creations as the new students arrive and every June old account deletion. We have this extensive DCL which is doing very nicely and obviously will need to be reworked. That doesn't bother me, but I hope you give us as much documentation as possible to study before we try to put version N up. Also, we have operators who are, in many cases, students working part time, and a very limited staff. Many of the specialized roles you project are, in fact, going to be one person. Even though you may envision this specialized role in your mind, keep a human interface consistent across all those roles. At least one of the interfaces available should be consistent.
A: Well, I think stylistic consistency...human interface is very important for the multiple roles in a given shop. I think your first question is probably the hardest problem we deal with on a day-to-day basis: how to evolve VMS, do new and better things, and not mess up existing stuff that works. We intend that the old stuff will always work. We are not going to throw anything away, but we hope people will migrate to the new stuff because it is better. I wouldn’t be too concerned that suddenly things may stop working. We’ve tried pretty hard to not stop things in the past; not always successfully, but we tried hard.

Q: Mike Lynch, 3-M. I came a little late so forgive me if I missed this. Did you talk about AI tools in terms of tuning a performance management system as part of this whole bundle and, also, are you suggesting from the biasing of your slides that most likely we will see this thing in LAVC support before we see it in large clusters?

A: I wouldn’t say you will see it anywhere before anything else. We thought this area needed work and was particularly interesting. At the moment, this is just an advanced development project which isn’t necessarily going to show up anywhere. What was the other part of your question?

Q: What about performance tuning?

A: Oh, AI tools and stuff. We look at the idea as an open-ended architecture to support multiple human or non-human interfaces and make creation of those things easier or the architecture itself does not deal with those things. People are looking at that stuff from other groups though.

Q: Is it more likely to be further away than the other things you are talking about?

A: I can’t make any comment on that, sorry.

Q: Lawrence MacIntyre, Martin-Marietta. I might add that I am delighted with your direction, too. We’ve everything from the large systems to the MicroVAXes on some scientist’s desk. I would say Class I is probably going to see the most use. We have a lot of phase one, Class I at our installation and those people don’t have any help. Some kind of logging facility would be nice. We have this problem with operators. They do something at night and say, “Well, I tried this and it didn’t work,” and the machine will be down. We would like to capture what they did.

A: In theory, if we ever implement this, we would have a central point. We could do consistent system management auditing and not have the place in three different logs or not at all. The potential is there and is one reason the thing is designed the way it is, so we can do this. We had experimental versions of things which in fact do log all system management functions.

Q: As far as Class III, the large systems, only the distributed stuff would be really nice. The rest of it...

A: Yep, I understand.

Q: Ted Bolson, University of Washington. I thought my 750 was a PC (talk about my mentality). I want to reiterate the thing about performance tuning before I get to my question. My feeling for a long time has been that a DEC system initially performs badly so they can sell you their software tuning tool. I’d rather have a management tool do it for me and not have to integrate all kinds of extra software. Queue management definitely is a big thing to look at for your new interface, a current method of stop-start, show queue, etc, etc, needs--I can’t even imagine how much...it’s like you have to start over from scratch. I’ve got people who take longer to figure out how to stop the queue than it takes for the garbage to print out 40 pages. That’s the kind of single person management...

A: A classic case of the problem I was talking about. It started out as a very simple thing and there is a mixture in that queue interface between end user function and system manager functions. They become all mashed together. That’s a classic example of why we need new architecture.

Q: The most important thing is speed. It is a user interface issue because you don’t want to run "Sysman" and set your environment, etc., etc., etc. By the time you have done all those things, the system has already thrown...from too much stuff all over the place.
A: Right. The system management function is legitimately run by end users in many cases and we want to support that.

Q: Jim Wheeler, Bureau of Reclamation, Sacramento. We have a distributed means of system management. Have you planned into your architecture a means whereby you can have feedback from one level of system management to another. For example, we have 730s on the site. We do a great deal of our own work, and they should, but actually I have a lot of visibility with what they do. My calling them would be more useful than their calling me, saying "Mother, may I."

A: I'm having a lot of trouble hearing you. Would you run your question by again.

Q: Have you built into the architecture a means of communicating between level 2 and level 3 automatically so a level 2 manager and a level 1 manager, or level 3 manager, can interact without having to pick up the telephone.

A: That's what's nice about having your own theoretical architecture. Yes, it is possible. Just a small matter of programming. There is a formal split in this architecture between human interface and underlying components. Yes, you can do so if that is the case.

Q: Phil Naecker, Professional Press. Back to your layering diagram, can we play, too. Can I write at all three of those layers? Do you intend that I will be able to write my own user interface? Can I add things at layer 2 and layer 3 and in some way buy in to the work you have done?

A: Good point. Having the formal call interface at the top level is more important initially. We also recognize that other people are going to create functionality which adds to VMS and has a system management component. It would be very nice if they could come into the low levels of this architecture also. This requires documenting the architecture at all three levels which is of course a much...I would have to say a much longer term goal. Very desirable.

Q: You might consider the remote portion so at least we can play the remote game with you.

Q: David Richie from Fermi Lab. The ability to decentralize certain things to a particular user managing a group or project is helpful to a large system environment. This immediately comes to mind--I would like to take all the quota stuff and say to experiment xyz, "Okay, you have got 100,000 blocks of quota. You divvy it up between your users." There are other areas where new accounts...a person joins the experiment...I'd like to say to the group manager, "Okay, within some parameters you create some kind of account." That ability would be interesting.

A: That's come to us, we've had SIRs on that in the past, too. It's called hierarchical system management group system management. We have been looking at this area and find it is a real problem.

Q: Dave Schafer, State of Texas. Are you looking at the OPER utility under TOPS-10 as a possible interface for the operator under VMS?

A: I'm not familiar with it. Are you telling me I should look at it?

Q: I'd suggest you look at it as a possible starting point.

Q: Louise Whooley, Measurex. Since this is sky-blue-type activity, I'm a naive VAX user. I just bought 15 nodes of and I am going to stick 'em in all the engineer's offices. I want to plug it in, have something come up ask me a few questions, maybe something about how many queues I want or what kind of user things I want. Have it build up a nice database and plug all that stuff into all the system management tools automatically. Whatever has to run to make the system come up every time I boot it with all that information.

A: That's what we want to do. We'd sell millions.

Q: Gary Bellum, Monsanto. I assume a normal DCL interface to all these functions will be available, which means you will be able to get around all this, or any automatic logging features, or anything like this...bypass.
A: We have upper compatibility reasons as well as sites very happy with what they are doing now. We don’t want to supersede anything we have. We are not going to enhance the DCL interface because we have limited resources. We think we should put our money in advanced development over the next few years as I outlined in this presentation. That’s our best guess at this point.

Q: You will be up against making assumptions and using them to make decisions. You may find that your decisions do not match users’ reality, and they will hesitate to use your work.

A: Right, but I can argue on that one. We got in trouble by going too far in that direction in the past. We avoided making a decision. Every time there are two possible ways of doing things, guess what we do. A SYSGEN parameter...let the end user decide which one to use. We have done so to extreme within the system and perhaps it is time to go in the other direction. We may make a few wrong decisions here and there, but the capability of multiple human interfaces, etc., minimizes the problem. There are ways to get around it, but let’s lower the choices for at least some of the new audiences. Make system managers out of everybody.

The interface should be easily customized. Come up with a basic human interface they can tweak to their heart’s content and make it as they want. That, of course, is my long-term, idealistic dream—to supply a tool kit so the user can put together a system management interface for whatever audience he or she has. That would be wonderful, but also hard problem.

Q: Spencer Coskiss, from John Hancock. I agree with your direction, but aren’t you potentially creating another problem? I agree with the direction if the reluctant system manager’s job is easier. By forcing him to learn a lot, are you not lessening the probability of his keeping the system up and running well? Aren’t you creating another problem?

A: Well, we are trying to do a good enough job to keep the system up and running despite him. We have to solve that problem.

Q: How will you facilitate this thing if you are not going to make a self-tuning system? Tuning will find bottlenecks and correct them before there is a problem.

A: I think in the long term we have to, all the vendors do. You think about it. The programmer productivity problem of 1970 is now a system manager problem of the 1980s...we can’t find enough system managers with enough talent to handle all the hardware out there. We have to solve the problem and so does everybody else.

Q: ..., Eastwest Center. I’m glad you addressed that issue, because it is clearly the problem we face. We have two system managers—one is a junior grade, the other is standing in front of you. More products like this will enable more senior members to come to DECUS while the junior members run the shop. DEC windows implies the use of VAX stations; that makes a lot of sense from the presentation point of view. The upper limit for a number of LAVC VAX stations is 26. I wonder what your thoughts on that would be. We would have to pull one workstation away from our user base for our operator or manager.

A: We are not talking about a full-time management job. It will be shared along with other functions. If you don’t want to lose a workstation, I understand.

Q: I wonder what are your thoughts on that. Are you saying losing a workstation is the cost of coming to DECUS?

A: I think it is, but...

Q: Joe King, University of Wisconsin. I think you are addressing my case more than most of the people who come to the mike. I thought I would state what that case is. I’m actually a scientist who has been forced into systems management. The only way to use our workstations is to have some sort of management. We’ve been forced into LAVC, meaning I’m the only one who spends enough time managing them. No one else wants to. This ideal is what you are talking about and I think a lot of the audience doesn’t quite see because they haven’t lived in my shoes.
A: The interface at the moment is a VAX-calling, standard compatible program. You would have to call it from a program, a third generation language.

Q: Would there be an interface in it, like lexicals with DCL, that type of thing?

A: I understand that would be more of a system manager productivity thing for creating other system manager human interfaces. I understand the problem you are trying to solve. I'm not sure we have been able to put a short term effort into it. I do hear you.

Q: That second layer would probably run time-library routines.

Q: Keith Chadwick from Fermi Lab. Will there be support for the VAX cluster console interface? Or enhanced support for the VAX cluster console?

A: I hadn't thought about it. I'm dealing with architecture here, I am not interfaced to any particular product.

Q: Jeff Brunkorst, Mayo Foundation. Is your position held within the VMS group or is it a DEC strategy? I.e., I see myself in a position of managing a VAX cluster, MicroVAX stand-alone, LAVCs, Unix workstations, and PCs. Can this product or, a set of these products distributed like DECnet, fit into your architecture?

A: As a long-term goal. The interface with other architectures is important, particularly the network management architecture. In that case, of course, the integrator protocol that talks to the other integrators would be a public protocol of some kind and you could have other implementations of that. A very nice thing to do down the road.

Q: Are you working from a VMS position or is this something DEC supports? Do you see DEC supporting this overall?

A: I think probably both as long as DEC is supporting multiple architectures. We try to cooperate with that support in the VMS group. It is probably not realistic to expect something like that immediately.

Thank you very much.
VAX Performance Working Group

The VAX Performance Working Group is just starting and is open to suggestions for projects. We're also looking for members who can contribute their efforts to the projects.

Projects already on the agenda are:

1. Developing a list of the important performance data, along with the places the data are reported. This will result in a valuable reference for VAX performance people, and will also help us catalog important data that are missing. (For example, it seems impossible to get the I/O's on a disk broken down by workload or process. Also Monitor still does not report any data on sizes or lengths of disk I/O's, so you may have very long seeks without realizing it.)

2. Developing methods of obtaining and reporting reliable performance information on new hardware and software releases.

3. Of course, a lot of war stories and hints/tops will be traded.

If you have a suggestion or are interested in joining a project, please contact John at the address/phone below:

John T. Peterson
Datametrics Systems Corporation
5270 Lyngate Court
Burke, VA 22015
703-425-1006

INPUT/OUTPUT

A SIG Information Interchange

Mail written I/O submissions (no special form required) to:

Larry Kilgallen, PAGESWAPPER Editor
Box 81, MIT Station
Cambridge, MA 02139-0901
USA

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 542.4 Diagnostics on the system disk of the u-VAX 4 of 4
"Michael A. Stams" 26 lines 13-FEB-1988 19:40
-&lt; Installing MDM on your system disk &gt;

Antecedent IO(s) published in:
Pageswapper Volume 8 Number 5 (December, 1986) through
Pageswapper Volume 8 Number 6 (January, 1987)

> I am interested in a way to run diagnostic on a Micro-VAX from
> the system disk (Instead of the TK-50 or floppy )

Using v1.12 of MDM I have done this two different ways.

Copy the diagnostics SYSBOOT.EXE into an alternate system root or into [SYSSMAINT]DIAGBOOT.EXE.

Copy all the "loadable images" into SYS$SYSTEM. The diagnostic monitor has been written to load these from "bootstrap":[SYS0.SYSEXE].
To boot from the alternate root:

>>>B/20000000 ! where the alternate root is SYS2

To boot from [SYSMAINT]

>>>B/10 ! as indicated in a previous reply

I have yet to try it on later 1.xx versions.

Have fun and write protect everything!

Michael A. Starns
Boeing Aerospace Corporation
P.O. Box 3999
Mail Stop 31-09
Seattle WA 98124-2499

-< New information on Software Portfolio >-

Note 547.1 Software Development Portfolio Licenses 1 of 3
"Harry Herman" 56 lines 25-FEB-1988 16:06

We have been looking at the Software Portfolio Licenses that Larry mentioned in the previous note. Thanks Larry, we would not have known about them if you had not published the information in the Pageswapper!

In looking at the portfolio licenses, we asked the local sales office for a current list of what products were on the portfolio, in case things had changed since 1986. We were sent a photocopy of page 9-35 of the January-March 1988 VAX Systems and Options catalog. In comparing that list with the list from the above note, I noticed that the current list did not mention VAX Notes or VAX Teamdata. I called our salesman and mentioned it to him, and asked if he could find out an 'official' answer as to whether or not Notes and Teamdata were dropped from the list. He passed me off to somebody else at the local office, and after several attempts to describe the situation to her, she said she would see what she could find out. I then asked her if she could call Mass. and get an official answer. About 2 hours later, I get a call telling me that the Systems and Options book is wrong and that the Pageswapper article is right. She also requested the product manager to send a current list of products in the portfolio, which she then forwarded to me. She then thanked me for pointing out the error, and hoped that the next VAX Systems and Options book will be corrected. Since that is the third piece of incorrect information I had found in writing (the others were in apparently outdated SPDs in the Electronic Store), I have my doubts about it being fixed anytime soon.

The only differences I see between the information in the previous note and the 'new' flier (number ED-30642-48 (c) 1987) is three additions to the Runtime Option Program Development Portfolio License (Q22DC-1P/Q22DC-JP):

VAX ACMS Remote Access Option
VAX LISP
VAX OPS-5

Note that the VAX ACMS Remote Access Option is in addition to the existing VAX ACMS RTO mentioned in the previous note, it is not replacing it. Both names are given.

Hope this information is of use to somebody else out there.

Harry Herman
Corporate Industries
10100 Bluegrass Parkway
Louisville, KY 40299
(502) 491-4433
Antecedent IO(s) published in:
Pageswapper Volume 8 Number 6 (January, 1987)

Just to make things a little more interesting...

The Program Development Portfolios are also itemized in the "Official" U.S. Price List. I have the 12/28/87 version of that in front of me (to my knowledge the newest) and it indeed lists Notes and Teamdata as part of the base portfolio. It does not list any of the other three products as part of the runtime-only portfolio.

The U.S. Price List has somewhat more standing as an "official" document than the SOC does. I, certainly, would have no compunctions about using any of the products that are listed, in the USPL, as being part of the Portfolio, if I bought the Portfolio. But I would, on the other hand, want to get some additional reassurance before I started to use a product that was not listed in the USPL, e.g. a specific letter from at least the local sales manager authorizing it, which probably still would have no particular legal basis but would "help."

Bill Mayhew  
Village Systems Workshop Inc  
PO Box 642  
Natick MA 01760  
617-237-0238

Antecedent IO(s) published in:
Pageswapper Volume 8 Number 9 (April, 1987) through Pageswapper Volume 9 Number 7 (February, 1988)

I have used it on line in a batch mode with no problem. I started it on a badly fragmented disk, less than 20% free space, without doing a backup/restore and it cleaned it up. Cluster disks - no problem; even the cluster-wide system disk. So far, I am a satisfied customer.

Jerry Taylor  
c/o Monsanto Chemical Company  
River Road  
Addyston, Ohio 45001  
Telephone: (513) 467-2387

Date: January 26, 1988

Antecedent IO(s) published in:
Pageswapper Volume 8 Number 9 (April, 1987)

Update - After working the problem with CSC for some time and getting them to confirm it they told me to submitted an SPR which I did (including a request to at least confirm or deny the problem, even if they could not provide a fix right away) on February 12, 1987. It was acknowledged in a reasonable amount of time as ICA-4265.

When no response had been received by the Nashville Symposium I asked about the problem and SPR in the VAX Advanced Q&A session. The person answering for BACKUP said he had never heard of the problem or SPR but that he would be sure I got a response. (Later investigation indicates the SPR was received by the screening people at CSC on February 19th and sent on to
Engineering on March 4th - which they consider quite quick and only because of the previous efforts by phone confirming the problem."

Since then I have had a number of contacts with the SPR Administration people in Maynard and customer service people in Colorado, each promising to find out what the trouble was and, in the cases when they got back to me, returning the answer that it had been sent to Engineering, they had inquired about it with no response, and there was nothing more they could do.

Now, in the last week or two when I had a conversation about other problems with the *Atlanta* support center and when I explained why I no longer considered submitting SPRs a viable way to get problems fixed they put me in contact with *their* customer assistance people (after I indicated I wanted the number for *corporate customer assistance* or I would just write a letter to Ken Olsen). This time I got action! Everyone up and down the line has been calling and today (Monday) I got a call from the engineering manager for BACKUP. He says "late Friday" was the FIRST time he had been aware of my SPR!!! He tells me this is a problem they were aware of independent of my SPR that has been recognized for a long time and that they intended to try to fix it in the first "functional" release after VS.O. (I take it that most likely means VS.2?) The indication is that if they can they would like to fix the failure-to-delete-directories problem as well as the failure-to-free-up-space-first problem at that point.

We also had a nice chat about letting people know about the problem and available work-arounds. He indicated he thought he might let CSC know about the problem so they could "put it in their data base so users could see it". I told him about the fact DSIN has one data base and the specialists had another, larger one and the need to be sure it went in the data base the customers have access to. I also encouraged him to put it in the Dispatch for those who can not or do not look in DSIN regularly. In addition I encouraged him to document and publish in both places the work-arounds I found so that if others have the same problem they will know what to do. He agreed that those suggestions sound like good ideas that he would look into (!).

I have no idea what finally got this thing unstuck and got me some response. Everyone agrees I did everything a customer can be expected to do and more. It might be that my company has been recognized as a rather strategic account recently or it might be that DEC really is trying harder to fix the badly broken SPR process now or maybe it was just dumb luck, stumbling onto someone who bothered to actually get the wheels turning.

Bob Hassinger
Liberty Mutual Research Center
71 Frankland Road
Hopkinton, MA 01748
617-435-9061

We have been using Digi-Data "Gigastore" VHS-based tape drives since the middle of November for archival storage purposes on our LAVC. The Gigastores are connected to a pair of MicroVAX-IIs which are the boot and core nodes (each serves a pair of RA8is to the entire cluster).

We experienced one initial problem common to both drives -- occasionally, BACKUP would fail in the middle of a save signalling a message like "device offline or not in configuration". Digi-Data shipped us a new drive which we swapped with the most-failure-prone drive of the two. Since we have done so (a few weeks ago) we have not seen a recurrence of this failure on either drive! Both drives are functioning well enough that we are now depending upon them for our system backups. We offer no explanation for the reason that such errors have abated from the formerly less-failure-prone drive (and, indeed, the second drive as well).
We have 4 RA8ls as system disk and user file store. A pair of RA8ls is served by each of the core MicroVAX-IIIs (each equipped with a Gigastore drive). A batch job runs at 3 AM and saves a pair of RA8ls onto a cassette in each Gigastore; the system manager replaces the cassettes in the morning with a fresh set. Of course, we organized operations so the RA8ls saved by a particular MicroVAX are those RA8ls directly connected to that MicroVAX (thus eliminating any unnecessary Ethernet overhead). Discounting the files marked /NOBACKUP, we are currently saving about 360 MB to each of the Gigastores (total of roughly 720 MB in use).

From MONITOR records made during running of these jobs, we find that the CPU utilization (on the MicroVAX-II) is in the range of 20-30%. The backups are done /NOCRC (in order to reduce loading on the MicroVAX.) We see the disk I/O rate averaging on the order of about 15 requests per second. This is in the middle of the night and the systems are otherwise idle.

All this results in an effective useable I/O bandwidth to the Gigastore of about 60-65 KBytes/sec. (Digi-Data claims -- and there is no evidence to the contrary -- that the Gigastore is capable of sustaining 120 KBytes/sec.) A test, saving all 4 RA8ls to a single Gigastore cassette, saved 713 Megabytes in 3 hours and 9 minutes -- an effective rate of 64 KBytes/sec.

The Gigastore is serving our basic needs even though we are a bit disappointed in the overall performance. BACKUP seems incapable of pumping data out fast enough for the Gigastore even though its usage of the CPU and disk are very modest.

The Gigastore looks like a Pertec tape drive and is connected to a Dilog controller which emulates a TSll. A modified version of the standard TSll driver is used as some timeouts in the software had to be adjusted. This is a bit of a concern and we are wondering what experience people are having with Exabyte systems on TMSCP controllers.

Does anyone have experience with tape systems using the Exabyte drive which uses the 8 mm cassettes? The Exabyte system is claimed to run at 250 KBytes/second. What type of performance are you seeing?

Frank J. Nagy
Fermilab
PO Box 500 MS/220
Batavia, IL 60510

---

Note 704.15 Digi-Data Gigastore System 15 of 22
"John Osudar" 20 lines 12-FEB-1988 20:49
---

Antecedent IO(s) published in:
Pageswapper Volume 9 Number 2 (September, 1987)
Pageswapper Volume 9 Number 7 (February, 1988)

Our Gigastore has been in use for about two months now. In early January, we used the Gigastore for a "production" backup for the first time -- backed up all three of our user disks (RP07, 2xRA81) and two others (RA81, RM05) with no problems. The user disks all fit onto one tape, no telling how much room to spare -- but we did these backups on a 785 using the default /CRC and /GROUP settings, and still got about 1.3Gb of real data onto the tape. (I was cautious and did a verify pass, so each backup/verify took about 4 hours.) In early February, I got really brave and did both a backup and a compress for each user disk. Total time, about 6 hours per disk; again, no problems. I found that the amount of time it takes to back up a disk depends greatly upon the degree of disk fragmentation -- e.g. our least full, but most fragmented disk took considerably longer to back up than our fullest disk. Still fit all three user disks onto a single tape. (And I haven't had to come in to work for a sixteen-hour Saturday backup marathon since December! :)) We haven't had the problems that Frank ran into. I saw one "device offline or not in configuration" message, but it occurred after the system had crashed with a tape in the Gigastore, and not at load point. Rewinding the tape fixed the problem.

John Osudar
Argonne National Laboratory
9700 S. Cass Ave.
Bldg. 205 A-051
Argonne, IL 60439-4837
(312) 972-7505
As far as the Exabyte drive is concerned, there are some nice articles in January 88 Hardcopy.

The Exabyte drive is not available directly but through OEM's such as Avi, Summus, Contemporary Cybernetics, etc. - each with a different twist.

I kind of think I like the Exabyte over the VHS because 1) the media is more compact, 2) even though the drive itself is single sourced, there are several sources for the complete package, and 3) at least there is a chance that it may evolve into a standard.

Frank - if you had it to do over again, would you do Digi-data or VHS?

Kevin Angle
3301 Terminal Drive
Raleigh, NC 27604
(919) 890-1416

I, too, am considering a helical scan technology drive and would appreciate any info that people have gathered.

Frank - if you had it to do over again... >-
These are the sort of questions I’m looking for answers from 8mm users: is it truly compatible with the TUDRIVER? Are you getting the full tape capacity or only a small (25%) fraction of it due to the streaming (on a MicroVAX-II, please note)?

Frank J. Nagy  
Fermilab  
PO Box 500 MS/220  
Batavia, IL 60510  
(312) 840-4935

I’d like to second what Frank said. Although our Gigastore has been OK (and with a 785 all to itself, it seems to get about 60% to 65% of rated capacity), if we had waited four or five months longer (i.e. until now) we’d probably go 8mm. But we’re looking for an 8mm tape backup that will get full capacity (or close to it) regardless of how fast you feed it data -- our 785 can’t keep up with the Gigastore, and we’re likely to “upgrade” soon to a couple of 8350’s, which, of course, are slower CPU’s than the 785.

John Osudar  
Argonne National Laboratory  
9700 S. Cass Ave.  
Bldg. 205 A-051  
Argonne, IL 60439-4837  
(312) 972-7505

I love my Emulex equipment. I’ve had Fuji Eagles running on a V-master controller emulating RP06’s for over 5 years. 24/7 and no failures. The secret is the RP06 emulation. It does not use a patched driver, and I have been able to make all VMS updates, including 3.7 to 4.0 with no problems. I just bought the Emulex SMDI controller that makes other disks look like RA series. I’ve only had it a month, but with disks connected to an HSC50 or a KDB50 (BI bus) everything is working fine.

Jerry Taylor c/o Monsanto Chemical Company  
River Road Addyston, Ohio 45001
The secret is the RP06 emulation. It does not use a patched...

This is what I had with my Emulex subsystem (SC31 w/ M2351A). However, having to give up a sizable percentage of the disk capacity to make 2 RP06's was rather distressing. If you can live with the loss of space, it should be fine. Recently, I beat up on Emulex to swap my SC31 for the 'latest', a UD33, which does MSCP emulation. I discovered some interesting new problems you might like to hear about:

- The UD33 reports garbage for controller hardware and firmware revision levels. If your OS ever starts enforcing minimum acceptable revision levels, this board will *stop working*.
- Despite the fact that the board prompts you to enter a drive serial number during formatting, the number emitted to the host is a constant, *not* the number you supplied.
- The board (unlike the SC31), does not come with a boot PROM. If you have a PDP-11 or a VAX 750, you'll have to order the PROM from DEC spare parts.
- Most seriously, the board has bus loading problems. In some slots of an empty backplane, it works. In others it doesn't. Replacing the CPU's bus drive module seems to help.

On the plus side, it is a good deal faster (with the same drive) as the SC31. However, this may be due mainly to the differences between MSCP and the RP protocols, and not anything to praise Emulex about.

---

Note 849.5 MicroVAX 2000's serial line expander "arrives" 5 of 8
"Bill Mayhew" 7 lines 2-FEB-1988 13:01

Very interesting...

the announcement info on the DHT32-1A showed up today, finally, and it says that the DHT32 is "application-compatible" with the DHV/DHQ11; and that the user can expect "approximately" the same performance on a 2000/DHT32 as on a II/DHV or II/DHQ; but that the DHT does NOT do DMA...!

Bill Mayhew
Village Systems Workshop Inc
PO Box 642
Natick MA 01760
617-237-0238

---

Check the Electronic Store! I'm almost certain that it said there that is does do DMA but no modem control was included.

By the way, DEC was showing a DHB32 16 channel async multiplexer for BI bus machines at Anaheim but no one at my local office could find out anything for me.

Turns out this board (which is functionally equivalent to a DHUI1, ie. 16 RS232 ports with full modem control **OR** 14 DEC423 and 2 RS232 w/modem control) is designed/built by the Computer Special Service (CSS) in Digital. These guys don't do high volume stuff and I guess they didn't have all their i's crossed and j's dotted so the big boys wouldn't let them release the card yet.
By the way, DEC's marketing people are getting smarter (and we lose). The cost compared to a DHU11 is 50% more (for the same function, just different bus) but very close to what 2 DECserver 200's would cost!

Jack Patteeuw
Ford Motor Co.
Electrical and Electronics Division
31630 Wyoming
Livonia, MI 48150
313-323-8643

---------------------------------------------------------------------
Note 849.7 MicroVAX 2000's serial line expander "arrives" 7 of 8
"Bob McCormick"
28 lines 18-FEB-1988 11:14
<- More DHT32 and 5VAX 2000 info ->
---------------------------------------------------------------------

What I know about the DHT32...

It's a small card that you stuff in the 2000 box in the cramped area where memory expansion and ethernet live. You can have the DHT 8 line multiplexer or the (program announced) sync interface, but not both.

The DHT provides 8 DECconnect style lines, through the harmonica H3104 and cable - same as with the DECserver 200/DL and appropriate DHU11 cab kits.

You can't install a DHT in a 'old' 2000 box -- the original units did not come standard with the expansion adaptor, which is a $1,200 option now included on ALL 2000 configurations. This box is required to cable from the interface module to the FCC certified cable bulkhead.

If you're not witty and good at mechanics I suggest you take caution when taking apart a 2000 box with the expansion adaptor. Its really tight with cables (lengths), and which screws you should/shouldn't remove!

As for DMA, don't know [didn't care, either!] But you should be aware that SYSGEN works differently with the 2000, which has no spine (bus) -- I believe the ROMS upon boot set up a structure which is read by AUTOCONFIGURE/ALL ... You'll notice this when you don't have your TK50Z or external disk connected, and try to connect after boot time (sorry, charlie!)
RAF's VT100 emulator was better than the one with Mobius; you don't have to keep hitting CTRL-W to refresh in EDT. It wasn't perfect; one downside is that if you have any printer port programs those escape sequences were totally ignored and the file would display on your screen. Mobius does turn on the printer, but as I recall it did something weird like double space everything (this is one area that I have found a lot of VT100 emulators fall short; not a biggie, I suppose, but still an annoyance if you are used to generating listings off of your terminal).

More notes (in no particular order):
- RAF created text files on the VAX that are readable from DCL (under Mobius you must TEXTIFY them to 7 bit).
- RAF supports up to 16 drives (vs. 26 for Mobius) and you can't redefine A-C (which can be a problem for some old programs insisting on files from the floppies).
- RAF is copyright-protected (Mobius isn't).
- RAF did not have color support, although I believe the new version does.
- Disconnect from the RAF server was kludgy (hitting 6 CTRL-C's vs. a QUIT command under Mobius).
- Mobius has a mechanism for setting the micro's clock (synching you with the VAX).
- Mobius has disk logging capability (RAF didn't).
- Both programs are TSR's; Mobius has a NOMOBIUS program to deinstall it but RAF did not provide that feature. Of course if you have a stack management program for the PC you can do it yourself.

The main plus that I noted with RAF was the VAX directory mapping (you can even do a TREE/F on the VAX and can also CD up and down). I found Mobius handy for creating command files to backup software that I was developing on the PC to the VAX directory; obvious the same could be accomplished with RAF. I purchased Mobius although I am still keeping tabs on RAF (I have noted that 1-2 terminal emulation packages have now claimed that they work with RAF which would be a way around some of the VT100 shortcomings). I hope this is of some help.

Lisa Pokel
AM Multigraphics
1800 W Central Road
Mount Prospect IL 60056

Note 882.11 Diarrhea of the Modem and SET HOST/DTE 11 of 18
"Terry Kennedy" 15 lines 19-FEB-1988 18:36
< Use SET TERMINAL/PERMANENT/XON >

What seems to be really happening is that the port gets an XOFF (control-S), but never receives an XON (control-Q). The solution I tried at first was to use a program I wrote some time ago that did a $FORCEX (force exit) on the process. That got the process freed up, but the port was still in a wait state.

If you're running VMS 4.x (presumably you are), you can use the undocumented, unsupported command:

SET TERMINAL/PERMANENT/XON ddcu:

which fakes the driver into thinking that a ^Q has come in, which should un wedge the port. You do need some privilege or other to issue the command, as the /PERMANENT part is required.

Terry Kennedy
95 Mohawk Trail
Ringwood, N.J. 07456
(201) 435-1890

Note 885.5 VAX DEBUG V4.6-9 Bug on VAX 8550 Processors 5 of 6
"Bill Mayhew" 12 lines 2-FEB-1988 13:13

Re: .1 (exam/ascii bug)

Got a reply on DSIN, within about 4 work days of logging the call, confirming that this is a known problem that will be "fixed in the proverbial next release of DEBUG."
Stupidly, I did not ask what the relationship was between the
next release of DEBUG and the next release of VMS.

The reply was signed by one of DSIN’s busier software support
specialists, as follows:

Regards,

<NO MORE TEXT>

I did not report, and have no info on, the bug in .0 however.

Bill Mayhew
Village Systems Workshop Inc
PO Box 642
Natick MA 01760
617-237-0238

Note 885.6 VAX DEBUG V4.6-9 Bug on VAX 8550 Processors 6 of 6
"Kevin Angley" 2 lines 3-FEB-1988 10:59

--< DEBUG 4.7 >--

Antecedent IO(s) published in:
Pageswapper Volume 9 Number 8 (March, 1988)

There is a patch to DEBUG for version 4.7, but the only bug they
claim to fix is control-Y handling.

Kevin Angley
3301 Terminal Drive
Raleigh, NC 27604
(919) 890-1416

Note 886.0 Privileged queues? 13 replies
"Terry Kennedy" 19 lines 22-JAN-1988 23:44

Is there an easy way to disallow entry of print jobs to a
particular queue? I’ve tried to discover this in the
documentation, but have had no luck. Here is what I have
tried/thought about:

1) ACL on the queue manager workfile - no good as it
   applies to ALL queues.

2) ACL on physical output device - no good as jobs could
   still be entered but not executed. Also may have
   problems because might check the print symbiont’s
   access rather than the submitters.

RSTS has the ability to require the user to have a particular
privilege to create entries in a queue. I thought VMS might
have something similar, but it appears not to from my look at
the manuals. I’m sure I’m missing something simple and obvious,
though...

Terry Kennedy
95 Mohawk Trail
Ringwood, N.J. 07456
(201) 435-1890

Note 886.5 Privileged queues? 5 of 13
"Chris Erskine" 2 lines 5-FEB-1988 07:32

--< This is what compilers are for >--

You could roll your own print command which does the checking
first, set UIC and then put file in the queue.

Chris Erskine
23 S Holcomb
Clarkston, MI 48016
(313) 524-8836
This is what compilers are for.

No, this is what operating systems are for! I am unsure what (besides a 32-bit virtual address space, which wasn't the operating system's doing after all) the bloat of VMS does for me.

You could roll your own print command which does the checking first, set UIC and then put file in the queue.

1) Several problems - first, whatever I do has to work for ALL users without breaking such things as existing .COM files (such as VMSINSTAL). It has to prevent users from using the 'real' system print command (remember, that was the original request?). Next, it has to be simple, yet work on several releases of VMS at several sites.

2) One would expect this sort of functionality from an advanced operating system like VMS. I will have to put this on my list of 'reasons I'd rather not deal with VMS, which currently reads as follows (in part):

   o *NO* group account management facility to speak of. As an example, on RSTS you can give a faculty member the GACNT privilege, and they can create/delete multiple accounts with a single, simple DCL command.

   o *NO* functional session logging facility. Again, RSTS has it. Yes, I know about SET HOST 0/LOG and @TT:, but both have serious limitations.

   o A truly brain-dead print/batch services implementation. There are too many examples to list, but my original question is a good case.
Well, I have this idea...

Back when you were using your favorite 16-bit DEC operating system, chances are there was a good deal of similarity between your use of the system and XYZ's use of the same operating system at their site. DEC encouraged a wide variety of PDP-11 operating systems, each targeted at a particular area. Sure, some are no longer around, and others may have changed focus, but the statement still holds.

Now, with the VAX, DEC has generated a 'standard' environment in VMS, targeted to appeal to a wide variety of user types. The problem is, this makes certain system area inefficient or just plain unusable for some users. These users justly vote improvements to these items on the SIR. However, the parts of the system which are just *slightly* a pain in the %A& to *all* the users don't make it up to the top, because most of the users have something more important to vote on.

This is compounded by the legions of DEC people coding for VMS. Trying to find the right person to ask a question of is becoming more and more impossible ["technical Q&A", anyone?]. At least in the 16-bit area, where there are fewer people involved, you can actually find someone to answer your question (and possibly implement a fix). As an example, I asked for a feature in RSTS to beep the terminal when a user autobauds at LOGIN time [See, there *are* things I admire in VMS!]. Total time from my suggestion to the feature appearing in an official release: less than 6 months. To contrast this, I asked VMS development about a VMS LOGINOUT bug, where if user A dials in, gets to the Username: prompt, types "S", and hangs up, the next user to dial in on the same port is greeted with dead air. The closest I came to an answer was a comment that "we cannot address this problem as some users may depend on this feature." Depend on something being unpredictable and broken? Give me a break! [This came from a developer at Nashville, not an SPR answer. Apparently some of the really stupid answers *do* come from developers!]

I have a suggestion, but I don’t think it will ever happen due to inertia (mainly DEC's). There are three ways changes (other than bug fixes) are planned for a product:

1. Loud, vocal request from the users (SIR, etc.)
2. By implementing DEC's strategic plans for the product.
3. Ideas added by the developers

Now, I'm not saying that developer's ideas aren't valid, or that they should be ignored. I also know that some amount of 'fun' is necessary to keep talented programmers around. However, if the developers paid more attention to 1, then they might find that 2 would follow along naturally. Perhaps we could vote on the developer's items before they are actually implemented in the system.

Terry Kennedy
95 Mohawk Trail
Ringwood, N.J. 07456
(201) 435-1890

The point about narrow-purpose operating systems having the capability to be more responsive to change is certainly a good one. I think it points up the need for considerable improvement in the SIR/SPR handling area. Let me list a few things I consider necessary for this:

1. DEC must get their SPR act together.

Given the time it takes to get a wrong answer to a serious bug, does anyone *really* believe that suggestion SPR's have a chance? If they do have a chance, then let's get some better responses to suggestion SPR's. The current ones all seem to have been written by a lawyer. It is possible to not be bland and still not commit the corporation. Let's get some "feedback", such as "All the developers think it's
a neat idea, but time doesn't permit us to put it in for at least 3 minor versions.". "We have problems doing this because of the security impact" (that is the answer they gave about simple project accounting, indicating they had a more complicated way in mind but that it will take longer).

It is not like it will take tremendous effort to compose these answer -- typically they already exist. If you ask Keith Walls at a Symposium why Backup does not do X, he really knows the answer, does a quick mental calculation, and can give a good approximation as to the chances of it happening in the foreseeable future.

The problem is, how does DEC internally provide these quality answers and still leave Keith time to code. That is a subject too long for inclusion in this topic, but it is critical.

Now this will not directly address sheer inertia matters, such as the release cycle time, but few ideas are that startling. Terry, somebody else may have previously thought of a bell on autobaud for RSTS but not been in a position to put it into the proper channel. If a reasonable (not the current) pipeline delay were there starting with the "first" time a given suggestion were made, it would still be a tremendous improvement.

2. DECUS needs to refine its feedback mechanisms

A few of the VMS developers on Friday night in Anaheim said they have a problem with not having enough background on *why* a particular SIR has reached the Top 10. Knowing that people want timestamps in their batch log just gives them a chance to implement a point-feature without an overall design. If they want timestamps because TOPS-10 had them, that is important information because perhaps there is something else in the TOPS-10 batch area they need to consider. If, on the other hand, the votes for timestamps were because some branch of the Federal government is requiring it for their in-house VAX machines, then *that* is important to know so that DEC can get a copy of that Federal regulation to learn what the *next* SIR down the pike will be. Not that they would necessarily go off and implement number 2 immediately (especially if it would slow down number 1), but at least they would be able to schedule number 2 to coincide with when somebody was changing that part of VMS anyway.

The major reason the developers expressed for needing more information about SIRs, however, was that DEC may be working on some feature (which they want to keep secret until release) which could benefit from better understanding of how people use computers in the field. To understand "why" people want feature X helps DEC to better integrate the features.

I am afraid we will never reach the point where my marvelous suggestions will be implemented in VMS in less than six months. My unique ideas, however, so often provoke developer responses that "yes, we have heard that from a lot of people", that I would be resigned to be happy if they made it in 9 months after the "first" person suggested the idea to DEC. It would be disappointing, however, to never be able to think of a capability which was missing.

Larry Kilgallen
Box 81, MIT Station
Cambridge, MA 02139-0901

Note 886.10
Privileged queues?
--------------------
But enough of that. How did a company which know how to do better manage to start off with such a pathetic Batch/Print system? Folklore has it that when somebody at DEC said "32-bit" there were raised clenched fists from RSTS developers saying "16-bits forever", and even at DECUS symposia there are T-shirts that say "36-bits forever". So VMS came out looking like RSX.

No! - the truth is VMS is David N.*Cutler's baby - and the project team was a closed group. That is the Cutler of RSX-18 and RSX-11 fame - and Cutler only seems to know how to write one type of 0/S. Rumor has it you pick up an RSX-18 system service manual you feel like you are reading VMS system service calls. Mark Bramhall, the senior RSTS architect, left RSTS for VMS
right after VMS V1 and found a very bad case of not invented here think. Peter Conklin was part of the original VMS team. Peter was from the 10/20 world.

I like Terry am going through the pain of moving from the RSTS world to the VMS world. The VMS kernel is a better architected system then RSTS however the user friendly polish on the utilities is poor when compared to RSTS.

JEFF KILLEEN
31 HOPEDALE ST.
HOPEDALE, MA. 01747
617-478-8098

I got the impression, when I first learned VMS (2.x) that VAX/VMS was considered a follow on to the 11 series (11/7xx, looks a lot like 11/xx, after all), and NOT a mainframe system, and not something to replace the 10s, 20s, and TOPS with. I even seem to remember that a lot of people got real upset when DEC canned the 10s,20s and TOPS.

It appears that the original VMS was never designed for what it is currently being used for, and never meant to be used with as BIG a system as it now can be. This feeling was reinforced at Nashville where one of the futures speakers noted that the whole concept of VMS and crashes was going to have to be redone since it was designed when no one could envision a physical address space bigger than eight mega-bytes. That VMS can do all that it can is amazing to me.

(Oh yes, I certainly think some of the VMS/DCL commands make a lot more sense than some of the RSTS commands I used — COPY makes a lot more sense to me than PIP... but then RSTS may have changed since V6)

Seton R. Droppers
Public Broadcasting Service
1320 Braddock Place
Alexandria, VA 22314
(703)739-5100
Note 888.4

Another SPR classic
4 of 4
"Alan B. Hunt"
9 lines 5-FEB-1988 13:10

Antecedent IO(s) published in:
Pageswapper Volume 9 Number 8 (March, 1988)

I SPR’ed this during VMS V4.1/4.2 days because I wanted to use F$GETDVI to determine if a tape drive was allocated in a cluster. Turns out it tells you only if it is allocated on the same machine. However, SHOW DEVICE MU will tell you which machine.

They said it wasn’t a bug but enough complaints had been received that they were looking at changing it but no promises. To me this is a bad bug and a real headache. Their idea of bugs and ours seem to differ radically at times.

ALAN B. HUNT
26803 BERG RD. #301
SOUTHFIELD, MI 48034

Note 898.2

ANY INGRES USERS OUT THERE???
2 of 2
"Bob Huckins"
10 lines 11-FEB-1988 18:26

Before I babble on too much, what are the symptoms?

I don’t use Ingres personally, but our company (Nuclear Data) does sell several products based on it. It has lots of good capability, but from what I can tell, some of the 4th-GL functionality is overstated. The people developing our products almost always had to write a program to do what they wanted, due to either performance or functionality considerations. Supposedly, gobs of development time was saved in forms and journaling development.

There is a very active Ingres users group, sponsored by RTI. If you ask your local RTI representative, they will put you on the mailing list.

Bob Huckins
Nuclear Data Instrumentation Div.
Golf & Meacham Rds.

Note 900.0

Asynch DECnet on MicroVAX 2000
9 replies
"Thomas P. Berk"
5 lines 9-FEB-1988 15:14

I’ve been trying to set up asynchronous DECnet between a 750 and a MicroVAX 2000. I haven’t been having much luck. I’ve been working with DEC, and they suspect some problem in the RS423 serial communications on the MicroVAX 2000. Has anybody out there had any luck setting up asynchronous DECnet using a MicroVAX 2000?

Thomas P. Berk
Inter-Tel Incorporated
6505 W Chandler Blvd
Chandler, AZ 85226
602-961-9000

Note 900.1

Asynch DECnet on MicroVAX 2000
1 of 9
"Jonathan M. Prigot"
10 lines 10-FEB-1988 10:22

Before I babble on too much, what are the symptoms?

I’m not exactly sure how much good this will do, but we use async DECnet between a VAXstation 2000 and our 8250. We ‘borrowed’ the DECnet components from the 8250, and run it over the RS232 port on the VS 2000. One sneaky thing that bit us is having to specify TRANSMIT PASSWORD (on the 2000) and RECEIVE PASSWORD (on the 8250) before things cranked up (circuits went from ON-STARTING to ON). (Sneaky, because I don’t remember this being enforced with earlier versions of VMS V4.x).
We, too, run async DECnet between a VAXstation 2000 and, in our case, a 785. Dynamic async DECnet, in fact. Same caveat re: transmit and receive passwords.

Possibly our success, and .l's, may not be relevant to .0 since we're both using the RS232 port, not the DEC423 port that .0 is trying.

I do, however, have a second (static) async circuit set up between my VS2000 and a MicroPDP-11/73 running DECnet/RSX. In this case, I'm using the VS2000's "printer" port, thru an H8571 9-pin-to-DEC423 converter, thru a DECconnect cable, thru a DEC423-to-male-RS232 converter, thru a BC22D null modem cable, to the PDP. No problems except that we've had some strong static discharges in the immediate vicinity of the BC22D shut down the circuit (actually they typically halt or crash the 11/73, which makes the 2000 think the circuit went down).

Bill Mayhew
Village Systems Workshop Inc
PO Box 642
Natick MA 01760
617-237-0238

From what I've heard so far, it sounds like the problem has to do with the 423 ports on the MicroVAX. DEC has been pretty sluggish in responding, so my guess is that the problem is real.

Thomas P. Berk
Inter-Tel Incorporated
6505 W Chandler Blvd
Chandler, AZ 85226
602-961-9000

Everything seems to go pretty well until we actually try to bring up the circuit. It seems do come up momentarily, and then aborts because of a line error (I don't recall the exact error). I have specified the receive and transmit passwords on both machines, and it appears to be getting past that stage.

Thomas P. Berk
Inter-Tel Incorporated
6505 W Chandler Blvd
Chandler, AZ 85226
602-961-9000
Does anyone know of any problems with the new circuitry that DEC is putting in some of the TU/TA78's in the field. DEC upgrades our TA78 and put a 'TU78X' sticker on it.

We are having intermittent machine checks on our 8600 when using the upgraded tape drive (They may not be related ... but you never know ...)

The TA78 is connected to an HSC50. Our other systems (785, 8700) seem to have no problem with the drive.)

Robert Gerber
Gillette Co
Tech Services Dept 4U-3
1 Gillette Park
Boston, MA 02106
617/463-3636

I can't see any way that a TA-78 hanging on an HSC-50 could cause machine checks in anything past the HSC-50 (and probably not that, either). Even if they changed the "firmware" in the HSC (and I haven't heard about that), the connection between the HSC and the rest of the "nodes" is essentially a software connection. Maybe system crashes, but if you're truly seeing machine checks I don't think it could be the TA-78X.

DALE E. COY
LOS ALAMOS NATIONAL LAB
PO BOX 1663, MS J957
LOS ALAMOS, NM 87545
505-667-3270

Has anyone out there used Western Data Comm line guards with Vadic 4224e modems for dialback security? If so, do they seem reliable to you?

Brian Tillman
Lear Siegler, Inc.
4141 Eastern Ave. MS121
Grand Rapids, MI 49518-8727
(616)241-8425
We use Western Datacomm 424 modems with Western Datacomm Lineguard 3060 dial-back security system and Western Datacomm 1801 dialer in a Racal-Vadic 1600 chassis. Racal-Vadic modems DO NOT work with the Western Datacomm dialer. Found this gem out two years ago... Other than that, the system is solid as a rock for us - NO FAILURES TWO YEARS. Works out really nice for restricting phone access to our VAXen...

RYTIS T. BALCIUNAS
CALGON CARBON CORPORATION
PO BOX 717
PITTSBURGH PA 15230-0717
(412) 787-6784

We have the 306x systems with Racal-Vadic modems installed at several locations and have not had problems.

Chris Erskine
23 S Holcomb
Clarkston, MI 48016
(313) 524-8836

Brian Tillman
Lear Siegler, Inc.
4141 Eastern Ave. MS121
Grand Rapids, MI 49518-8727
(616)241-8425

My, how things have changed in two years --- Western Datacomm people were the ones that finally admitted to us that the Vadics did not work at the time (late 1985)....
I am looking for a *good* VT100 emulator for the Macintosh. I have just been using MicroPhone (v1.1) and have ran into problems with some of the keyboard mappings (not a real big problem) but also it did not update the screen when using a word processor on my PDP (and thus lost track of where it was).

I have also tried MacTerminal but that was choking on some of the escape sequences for screen display. I am running on a Mac-512 with (until the enhanced keyboard comes in) the standard keyboard and a plug in auxiliary keypad; while the word processor (LEX) uses the application keypad, they also (conveniently) duplicate the cut/paste/etc. functions using ESC & CTRL keys on the main keyboard so I know that it wasn't that. I have a list of about 10 different emulators from various magazine articles so what I am looking for is some first-hand opinions (both for & against) of the various emulators. Thanks in advance.

Lisa Pokel
AM Multigraphics
1800 W Central Road
Mount Prospect IL 60056

I haven't tried Mac240, but can speak kindly about VersaTERM. Lately (since I went to 4.7) it has been having problems with SET TERMINAL/INQUIRE. It supports KERMIT, MacBinary, MacTerminal and emulates VT100, DG something-or-other, and Tek 4010 (or is it 4014?).

Bruce Bowler
General Electric
1 River Road
Bldg 2 Room 609
Schenectady, NY 12345
In addition to the previous capabilities of MAC240, you also have the capability with additional software from White Pine to translate and display regis. I have already displayed sixel files on my MAC and am currently working on displaying MACpaint type files on my VT240 at work. Also, trying to print MACpaint files on a LN03.

MAC240 is a driver based emulator (Don’t hold your breath but LAT may be in the future... ) meaning that new drivers (Serial, etc.) may be used for communicating. MAC240 also works with TSSNET for those who need DECnet capability.

In addition to the previous capabilities of MAC240, you also have the capability with additional software from White Pine to translate and display regis. I have already displayed sixel files on my MAC and am currently working on displaying MACpaint type files on my VT240 at work. Also, trying to print MACpaint files on a LN03.

MAC240 is a driver based emulator (Don’t hold your breath but LAT may be in the future...) meaning that new drivers (Serial, etc.) may be used for communicating. MAC240 also works with TSSNET for those who need DECnet capability.
Note 913.1 Looking for Exabyte 8mm users 1 of 4
"Bob Huckins"

3 lines 25-FEB-1988 18:41

-- Maybe not coincidental... --

Re your comment about Sony: if you look at the Consumer Reports reviews of VCRs, Sony has one of the worst reliability records. Maybe you'd have had better luck if Magnavox made the drive!

Bob Huckins  
Nuclear Data Instrumentation Div.  
Golf & Meacham Rds.  
Schaumburg, IL 60196  
312-884-3659

Note 913.2 Looking for Exabyte 8mm users 2 of 4
"Terry Kennedy"

12 lines 26-FEB-1988 00:30

-- Put the 'It's a Sony' sticker on the garbage can... --

Sony seems to be good at developing technology, but bad at mass-manufacturing it. After about 10 assorted pieces of gear from Sony, I have given up on them. Every single piece of equipment developed severe mechanical problems soon after purchase (in some cases, instantly thereafter).

Also, their service facilities do not 'repair' equipment - they sit on it until you call and complain, and then charge you for a supposed repair when you pick it up. [Note: the above was determined by putting colored screw sealer on all the case screws - when the item was returned, all the seals were intact...]

Terry Kennedy  
95 Mohawk Trail  
Ringwood, N.J. 07456  
(201) 435-1890

Note 913.3 Looking for Exabyte 8mm users 3 of 4
"Bill Mayhew"

9 lines 26-FEB-1988 10:34

-- This ain't the Sony User's Society, but... --

I have had nothing but good luck with Sony equipment including 2 of their VCRs, one of which did need new heads after two years of two-hour-a-day (minimum) use, but so what.

The local Sony authorized repair facility also did a very good job on fixing it, particularly after I tried to fix it myself first (VERY embarrassed grimace...). The reason I tried to do it myself is that the local repair facilities were all backed up for four weeks, minimum.

There is a market out there for DECservice on VCRs, methinks.

Bill Mayhew  
Village Systems Workshop Inc  
PO Box 642  
Natick MA 01760  
617-237-0238

Note 913.4 Looking for Exabyte 8mm users 4 of 4
"Terry Kennedy"

8 lines 27-FEB-1988 20:07

-- A distinction --

The local Sony authorized repair facility...

As opposed to a "Sony factory service center"? If so, you dealt with some non-Sony people who were trained and approved by Sony to fix Sony equipment. Yes, they seem much better than "real" Sony service, but I wouldn't bet on them fixing 8mm backup equipment where Sony only makes part of the mechanism.

Terry Kennedy  
95 Mohawk Trail  
Ringwood, N.J. 07456  
(201) 435-1890
I am planning to implement an electronic signature system for documents. What I want to be able to do is prompt the user for his password (with no echo and a verification, of course) and verify the password against his UAF record.

There is nothing in the system services or RTL manuals about this. I called Colorado, and they told me this was probably intentional, but they weren't sure why. The only reason I could think of is that good data encryption algorithms require a key for decryption so that even if you know the algorithm you can't decrypt the data without the key. Since there is no key used for the encryption of passwords, knowing the password encryption algorithm could allow someone to decrypt the password.

One problem: the encryption algorithm is in the VMS microfiche! Does this mean all our systems are vulnerable to attack? Lawd, I hope not! But, if knowing the algorithm as presented in the fiche is not enough to allow decrypting of passwords, why can't there be a system service to allow suitably privileged users to do password verification?

Anyway, since DEC doesn't supply such a routine, does anyone out there know where can get my hands on one? I'm not fluent in MACRO or BLISS, so I don't want to try to reverse engineer the routine in the fiche (and that may not be legal).

Michael R. Pizolato
AT&T Technology Systems
Dept. 323610
555 Union Blvd.
Allentown, PA 18103
215/439-5500

The password encryption algorithm used in VMS is supposed to be "one-way" i.e. you can encrypt the original password to get the encrypted result, but you can't take the encrypted password and arrive at the original password. VMS checks passwords by encrypting the password being tested, and comparing the result against the encrypted valid password. Thus, having the encryption routine published in the fiche doesn't present a "significant" risk. (Of course, you COULD write a program that tests every possible password by encrypting it using the algorithm, and comparing the result against the valid encrypted password. Having the routine in the fiche makes this easier, but I can't imagine wanting to spend the effort required to do this, if a system mandates reasonable minimum password lengths.) Having the encryption routine available for general use seems to make sense -- you could then use it to password-protect your own software in a manner similar to VMS. Why it's not available is unclear, but keep in mind that a lot of other useful routines that VMS calls all over the place (e.g. LIB$FID TO NAME) aren't available in any library, and are undocumented except in the fiche. (Some of them may make it into V5.0 as documented and supported library routines, however.) Legal or not, a lot of people have copied useful subroutines out of the fiche and used them for their own software. (Actually, I don't see why it would be illegal as long as you stay within the restrictions that are placed on other DEC subroutines linked into your own code.) As I recall, the routine in question is not all that long (a couple of pages?) so typing it in shouldn't be too horrible -- but it is a shame that you have to do it at all.

John Osudar
Argonne National Laboratory
9700 S. Cass Ave.
Bldg. 205 A-051
Argonne, IL 60439-4837
(312) 972-7505
Note 920.2  My kingdom for a password...  2 of 2
<- DEC Provides It - you just have to know where! ->

Get out your copy of the VMS4.7 distribution tape. Unpack the
save-set, and look at:

VMS$CHECK-DIGITAL-ACCOUNTS.COM and VMS$SECUREPWD.EXE

This is used to check if passwords on an account are easily
guessable (is the FIELD password MAINTENANCE?), but could be
simply modified to do exactly what you want.

It's not left behind by VMSINSTAL, but since it comes on the
distribution it must be legal to have/use/modify it.

DALE E. COY
LOS ALAMOS NATIONAL LAB
PO BOX 1663, MS J957
LOS ALAMOS, NM 87545
505-667-3270
DECUS PROGRAM LIBRARY

NEW LIBRARY PROGRAMS AVAILABLE FOR THE VAX/VMS FAMILY OF COMPUTERS

DECUS No: V-SP-47 Title: The LIMS/SM Utilities Collection Version: 1, November 1987
Submitted by: Digital Equipment Corporation
Operating System: VAX/VMS Source Language: BASIC, VAX FORTRAN Keywords: Utilities - VMS
Abstract: The LIMS/SM Utilities Collection consists of:

  AUDIT_REPORT
  Media (Service Charge Code): 300' Magnetic Tape (TM)  Format: VMS/BACKUP

  DECUS No: V-SP-48 Title: The LIMS/SM Utilities Collection Version: 1, November 1987
Submitted by: Digital Equipment Corporation
Operating System: VAX/VMS Source Language: BASIC, VAX FORTRAN Keywords: Utilities - VMS
Abstract: This package contains items introduced for Amiga PD consumption since the "AMIGA Utilities Collection 1," DECUS Program No. V-SP-48, tape became available. Numerous source programs make these programs valuable even on non-Amiga computer configurations.

  DIGITAL_EQUIPMENT CORPORATION

- DIGITAL_EQUIPMENT CORPORATION

  Media (Service Charge Code): 300' Magnetic Tape (TM)  Format: VMS/BACKUP

- SAMPTY

  Media (Service Charge Code): 300' Magnetic Tape (TM)  Format: VMS/BACKUP

- AUDIT_REPORT

  Media (Service Charge Code): 300' Magnetic Tape (TM)  Format: VMS/BACKUP

LIB-1

LIB-2
Notes: Operating System VAX/VMS V4.X or higher is required. Media (Service Charge Code): 600' Magnetic Tape (MA) Format: VMS/BACKUP

DECUS No: VAX-301 Title: DIVOUT - DIVI Output Driver Version: 1.0, December 1987 Submitted by: Scott Campbell, PAR Government Systems Corporation

Operating System: VAX/VMS V4.5 Source Language: C. MACRO-32 Memory Required: 2MB Source Software: TeX, METAFONT, and associated utilities Hardware Required: Laser printer or graphics output device. Symbiont requires Apple LaserWriter. Keywords: Conversions, Graphics

Abstract:DIVOUT is a program for converting DIVI files produced by TeX for use by specific output devices, including laser printers and high resolution graphics devices. Features include:

- Support for multiple output devices. The currently supported devices include the Apple LaserWriter (and PostScript, in general), and the Tektronix 4014. An uninstalled IMGGEN driver is also included. Additional output devices can be supported by providing a few low-level routines to perform the basic device output functions.
- Inclusion of Tektronix 4014/4019 and MacPaint graphics files in the formatted output. The output resulting from the graphics file interpretation can be scaled, translated and rotated (in any of four orientations).
- Line, arc, point and filled polygon graphics operations.
- Automatic top and bottom page markings.
- Command line options for page selection and collating order.
- Landscape page orientation and various paper sizes.
- Support for PostScript native fonts.
- Support for right-to-left text within left-to-right text.
- Pixel, packed or generic font pixel files.
- Also included is a print symbiotic designed to control the Apple LaserWriter printer. Features include:
  - Capability to drive up to four LaserWriters simultaneously.
  - All PostScript-generated output is printed at the end of job.
  - Detection and error and machine problems from the LaserWriter.
  - Generation of file trailer and burst pages.
  - Inclusion of modules from the device control library.
  - Notification to the printer operator of specific events resulting from the printer requests.
  - A utility program is also provided that will allow the font metric information for the LaserWriter fonts to be obtained.

Notes: Operating System VAX/VMS V4.4 or later is required. Associated Documentation: Descriptions of XML, PK, GF and DVI file formats (with TeX distribution).

Restrictions: Print symbiotic requires READDLL, TPMBIX, ALLPOOL and SHARE privileges.

Media (Service Charge Code): 600' Magnetic Tape (MA) Format: VMS/BACKUP


Operating System: MicroVMS V4.6, RSX-11M V4.2C Source Language: PASCAL from DECUS, Program No. 11-346 Software Required: PASCAL Compiler, DECUS Program No. 11-346 (however object modules are supplied) Hardware Required: VT100 Series Terminal or compatible Keywords: Games

Abstract: GO is a variation of the Oriental game Go-Moku. The object of the game is rather like that of Tic-Tac-Toe. Players take turns placing their markers on a 20 X 20 playing board in an attempt to get five markers in a row.

The game is written in VAX PASCAL and uses the SM2 routines from the VMS Run Time Library for terminal I/O. The original version was written in DECUS PASCAL (DECUS Program No. 11-346) on a PDP-11/70 running RSX-11M. The PDP version is also included in this submission.

The algorithm that GO uses to select a counter move mimics my own style of play but with no lookahead in a rather brute-force manner. Any improvements to the counter move algorithm or to the user interface (especially the PDP version) are welcome.

If reprogramming the necessary command for both the VAX and PDP versions are supplied. PDP-11 users will require DECUS Program No. 11-346. The submitter welcomes any questions or comments.

Documentation not available.

Media (Service Charge Code): 600' Magnetic Tape (MA) Format: VMS/BACKUP

DECUS No: VAX-304 Title: DISPLAY_OPENFILES Version: January 1988 Submitted by: Rick Orr, The Jonathan Corporation, Norfolk, VA

Operating System: MicroVMS V4.2 through V4.6, VAX/VMS V4.2 through V4.6 Source Language: MACRO-32, VAX FORTRAN Keywords: File Management, Utilities - VMS

Abstract: FORTRAN_OPEN_FILE uses the system service GETFWA (Get File Work Area) to provide access to all files open to the image or open to the process for all processes/subjects on the system for specific files based on pid number.

The GETFWA system service will return information about the files open to the process/image based on the PID list supplied to it. The service does this by accessing impure data areas (PIRGW_HOMPA/PIRGW_POINTPA) located in P1 address space. The user of this program will need the proper privileges to use this program for access to other processes P1 address space. For more information on GETFWA please read GETFWA._TXT which describes the call in more detail.

DISPLAY_OPEN_FILE will return the following information and display it to the screen:

- The user name
- The file name
- The current key buffer value for index files.
- The block high number
- The EOF block number

Notes: Program has crashed system. Some debugging has occurred but please use the program at your own risk.

Restrictions: Must have privileges to access other processes. Need a MARKUP size of 2500 bytes minimum.

Media (Service Charge Code): 600' Magnetic Tape (MA) Format: VMS/BACKUP

DECUS No: VAX-305 Title: ADAM Text Editor Version: 1.0, December 1987 Submitted by: A. Ragoosta & L. Jurgeleit US Army ARTA, MS 219-3, Moffett Field, CA

Operating System: VAX/VMS V4.5 Source Language: MACRO-32, MPU, VAX FORTRAN Software Required: MPU Keywords: Editors, Tools - Software Development

Abstract: ADAM is a powerful text editor based on EVE. The Extensible Editor from Digital Equipment Corporation. Major changes have been made to EVE to increase power, flexibility and scope. The ADAM editor has a built-in "FRED" dialect which may be entered by invoking the editor with the FRED command or editing a FORTRAN source code. FRED has special modifications useful for editing FORTRAN files.

All of the source code except the portions of EVE that are still used is included (EVE is protected by Digital Equipment Corporation copyright notices, but should be available in the SYSLIBRARY directory of all licensed sites).

Notes: VAX/VMS Operating System V4.3 or later is required. Complete sources not included.

Media (Service Charge Code): 600' Magnetic Tape (MA) Format: VMS/BACKUP

DECUS No: VAX-306 Title: BLOCK_CHARACTERS Version: 1.0, January 1988 Submitted by: James H. Norman, Las Cruces, NM

Operating System: VAX/VMS V4.6 Source Language: VAX FORTRAN Memory Required: 1KB Keywords: Tools - Applications Development

Abstract: The BLCHAR subroutine will write large block characters to a printer file or a line printer. Each block character area is seven columns wide and nine rows high. Up to eighteen block characters may be printed on each call to BLCHAR, two blank lines are output after a group of block characters are written. This subroutine is useful for writing header pages on reports and data listings. It will handle all ASCII characters from BLANK (octal 40) through UNDERSCORE (octal 137).

Notes: Program has crashed system. Some debugging has occurred but please use the program at your own risk.

Restrictions: Must have privileges to access other processes. Need a MARKUP size of 2500 bytes minimum.

Media (Service Charge Code): 600' Magnetic Tape (MA) Format: VMS/ASCI

DECUS No: VAX-311 Title: LSE-PLUS: Language Sensitive Editor Extensions Version: 2.3, January 1988 Submitted by: David Spencer, Foundation Health Plan, Sacramento, CA

Operating System: MicroVMS V4.4 and later VAX/VMS V4.4 and later Source Language: VAX BASIC, VAXTPU Software Required: VAX Language Sensitive Editor, V2.0 or later Keywords: Editors, Utilities - VMS

Abstract: LSE-PLUS is a series of additional routines and procedures coded in VAXTPU to extend the functionality of the "out of the box" Language Sensitive Editor. LSE-PLUS gives the user all the standard LSE functions, plus GOLD-key keystroke sequences for:

- Additional screen editing commands, such as:
  - Swap characters, words, lines.
  - Toggle screen width.
  - Clear message window.
On-Screen multi-buffer management:
- Change text to all upper/lower case.
- Advance paragraph.
- Insert/find file mark.

- On-screen multi-buffer management:
  - Jump into buffer.
  - Jump directly to main buffer.
  - Jump to previous buffer.
  - Write out buffer.
  - Create empty buffer.
  - Delete buffer.

- DIRECTORY SCAN built in!
- DECUS Program No. VAX-228, SCAN. A Directory Scan utility for VMS, integrated into editor, making multi-file editing a breeze. View your directory in a buffer, hit a key and the file under the cursor is brought into an editing buffer, plus a lot more.

- Other features:
  - Easy to use learn mode.
  - Toggle between vi-view tabs mode.
  - Read in a file by name.
  - Swap a sub-process

Users familiar with the EDIT-PLUS extensions found in my article published in "DEC Professional", will feel at home. All of the EDIT-PLUS features have been added to LSE-PLUS.

This package is a must for "power users" of LSE. It also includes a large body of examples of structured coding in TPF. If you have the Language Sensitive Editor, you will want to be able to extend it. LSE-PLUS shows you how plus you give a great point to a great start.

Notes: Operating System VAX/VMS V4.2 or later is required.
Operating System Micro/VMS V4.2 or later is required.

Media (Service Charge Code): 600' Magnetic Tape (MA) Format VMS/BACKUP

DECUS No. VAX-314 Title: VAX Capacity Management Tool Version: 3.0, December 1987
Submitted by: Digital Equipment Corporation

DECUS No. VAX-312 Title: EDIT-PLUS; EDIT Editor Extensions Version: 3.0, January 1988
Submitted by: David Spencer, Foundation Health Plan, Sacramento, CA.
Operating System: Micro/VMS V4.2 and later, VAX/VMS V4.2 and later

Keywords: Editors, File Management, Utilities - VMS

Abstract: EDIT-PLUS is a series of EDIT initializer and help files that extend the ease of text editing of the VAX/EDIT editor. The EDIT-PLUS distribution has initializer files for both normal EDIT keypad and a VPS editor keypad, as well as these additional GOLP-key keystroke features:

- Buffer management keys:
  - Show list of buffers.
  - Write buffer to file.
  - Read file to buffer.
  - Create a buffer.
  - Delete a buffer.
  - Select buffer to edit.
  - Jump directly to main buffer.
  - Jump to previous buffer.

- Text editing keys:
  - Swap character, word, line, paragraph.
  - Toggle screen width.
  - Insert/find file mark.

- Change text to all upper/lower case.
- Advance paragraph.
- Simple undo.
- Abort edit with verify.

This is the EDT environment originally described in my articles published in "DEC Professional". It includes all the initialization files as well as complete documentation for all normal and EDT-PLUS editing keys. Many people have typed this package in by hand: this is the original comments and help already done and tested for you. Any "power user" of EDT will want this package to improve their productivity today.

Notes: Operating System VAX/VMS V4.2 and later is required.
Operating System Micro/VMS V4.2 and later is required.

Media (Service Charge Code): 600' Magnetic Tape (MA) Format VMS/BACKUP

DECUS No. VAX-315 Title: Language Sensitive Editor Template for RUNOFF Version: 1.3, October 1987
Submitted by: Bart L. Lademann, Scientific Micro Systems (SMS), Mountain View, CA.
Operating System: VAX/VMS V4.6, V4.7 Source Language: LSE Software Required: LSE V20 or V21 Keywords: Editors, RUNOFF

Abstract: Language Sensitive Editor for FORTRAN contains a RUNOFF template. This template simplifies the production of documents in RUNOFF by making RUNOFF commands available within the editor, and allowing the user to enter abbreviations and have the editor expand them to the full command, with any parameters in the correct places.

This software does not by itself explain what RUNOFF is. A RUNOFF manual should be supplied with the operating system. However, the template does make it easier for new users to become familiar with RUNOFF.

Although a compiled environment file is included, you may wish to recompile from the source. Instructions on doing this, and setting up your default environment to include the new instructions, are in sections 6.5 and 7.2 of the manual, "Guide to VAX Language-Sensitive Editor and VAX Source Code Analyzer", August 1987.

The RUNOFF template currently looks for language help in the system help directory. You will have to create a help library for the following commands:

- LIBRARY/CREATE/HELP ENOLH NL FNLHLP and put the library into SYSDHELP.

RUNOFF is quite comprehensive, and should contain all of the commands in DSR as supplied with VMS: the help file is less so, and could really use some more help there.

This software also includes an LSE template for LSE. This template is a crude one, but was enough to greatly simplify the task of creating the RUNOFF template.

Notes: The language (RUNOFF) help file does not have help for some keywords: LIBRARY/CREATE/HELP.

Media (Service Charge Code): One RX00 Diskette (KA) Format: VAXANSI 600' Magnetic Tape (MA) Format: VAX/SMS

DECUS No. VAX-316 Title: VAXWindow Version 1.00, January 1988
Submitted by: Andre Baskin, SysCon Corporation, Williamsburg, VA
Operating System: VAX/VMS V4.2, V4.3 Source Language: C Hardware Required: CRT Terminal/Keywords: Utilities - VMS

Abstract: VAXWindow is an implementation of a windowing system under VMS. Using VAXWindow, one is able to create windows which allow sections of virtual screens of output to be displayed on one physical screen. The number of windows is limited by the number of subprocesses which the process is allowed to create. Commands exist which allow the user to manipulate existing windows and create new windows.

VAXWindow is able to execute any DCL command which does not require a terminal for output (i.e. is able to send output to a mailbox).

Notes: Operating system VAX/VMS V4.0 or later is required for SMG.

Restrictions: Executing process must be able to create a sub-process.

Media (Service Charge Code): 600' Magnetic Tape (MA) Format: VAX/SMS

NEW LIBRARY PROGRAMS AVAILABLE FOR THE PDP-11 COMPUTER FAMILY

DECUS No. 11-898 Title: FDC. Floppy Diskette Copy Version: 1. December 1987
Submitted by: K.F. Uhland, Scientific Micro Systems (SMS), Mountain View, CA.
Operating System: REX-11M V4.2 Source Language: MACRO-11 Memory Required: 32K Words Keywords: Utilities - RXS-11

Abstract: This program reads a floppy diskette, creating an image file of it on the hard disk. The image file can then be used to create a blank floppy an exact copy of the original diskette. The program is independent of floppy size (5, 7, 1/4", etc.), capacity (number of logical blocks), format (RX01, RX02, RX03, RX06, RX07, etc.), file structure (ODS-1, ODS-2, ODS-3, etc.), or the actual data on the diskette. Any floppy that can be read by the device driver, disk controller, and disk drive can be read by this program. A feature file image file can be created for about any random access Device, provided space exists on the hard disk. Media to be copied are assumed to be free of hardware defects.

Notes: Operating systems REX-11M V4.0 and RXS-11M PLUS V0.4 or higher is required. May also run on earlier versions of these operating systems.

Restrictions: Author's system uses full function executive, full duplex terminal driver; program may not run if less is available.

Media (Service Charge Code): One RX00 Diskette (KA) Format: FILES-11, 600' Magnetic Tape (MA) Format: FILES-11

DECUS No 11-900 Title: FND - A Global Disk Utility Version: 1.0, December 1987
Submitted by: Richard Neitzel, Golden, CO, Operating System: REX-11M V4.2 Source Language: FORTRAN-77, MACRO-11 Keywords: System Management - RXS-11, Utilities - RXS-11

Abstract: REXS users normally cannot use wildcard specifications to access different disks from one command line. FND allows the user to either specify a single class of devices (example, all DISK drives) or by default use all drives. The system device structures are searched for mounted FILES on this drive, matching the operating system. FND also allows the user to specify any one device on the command line. The specified device name is supplied. Any legal PIP command is then performed on that disk. FND understands virtual disks, RAM disks, boot-sy-boot loaded disks, etc. FND is especially suited for the user with many directories scattered across disks and for system manager.

Media (Service Charge Code): One RX00 Diskette (KA) Format: FILES-11, 600' Magnetic Tape (MA) Format: FILES-11
NEW LIBRARY PROGRAMS AVAILABLE FOR THE PROFESSIONAL-300 SERIES OF COMPUTERS

DECUS No: PRO-171 Title: DSKDIR: Diskette Directory Utility
Version: 1. December 1987
Submitted by: Michael Catania, Michael Catania Enterprises, Glen Cove, NY
Operating System: P/OS V3.0 Source Language: FORTRAN
Abstract: The DSKDIR utility is used to store information about your diskettes in an orderly fashion. If you have more than fifty diskettes with your personal files on them, then this utility is for you. You can sort through the information by volume, file or extension.
There are two versions of the DSKDIR utility, one uses the P/OS Menu Facility, the other does not. You can also install the package from the tools installation command files are supplied. Both versions were developed under P/OS V3.0, but they should work for earlier versions, although no guarantees are implied.
Media (Service Charge Code): One RX50 Diskette (JA) Format: P/OS

DECUS No: PRO-172 Title: SIDE: Development Improvements for the PRO version
Version: 2.1. December 1987
Operating System: P/OS V3.1 Source Language: FORTRAN 77. MACRO-11 Memory Required: 512KB Software Required: Native Toolkit, PRTL, FORTRAN Keywords: Software Development
Abstract: Program development on the PRO is well supported, but a time consuming task. The main reason for this situation is that
there are slow compilers, cluster laboratories and the sophisticated task
building. To change this situation takes very little effort. A faster FORTRAN compiler, the FTB, and a SYSLIB.OPL containing
most require only DATATRIEVE. Keywords: DATATRIEVE.

NEW UNIX SOFTWARE

DECUS No: UX-102 Title: KIC2 Version: 2. October 1983
Submitted by: University of California at Berkeley, through Digital Equipment Corp.
Operating System: ULTRIX/UNIX Source Language: C Keywords: Artwork Editor, Graphics, Utilities - ULTRIX
Abstract: KIC2 is an interactive, two-dimensional, color graphics editor intended primarily for the mask level design of integrated circuits. KIC2 has been designed as a powerful, inexpensive, user-friendly graphics editor that will run on most low to medium performance graphics terminals. Data that is generated by KIC2 can be represented by an intermediate graphic description language called CIF (Caltech Intermediate Form) or Calmas STREAM, which permits the data to be easily transported to other layout systems. Also, the geometric database used by KIC2 can be used to interface to other tools, such as a layout rules checking program.
Notes: This program was developed by the Computer-Aided Design Group, Department of Electrical Engineering and Computer Sciences, University of California at Berkeley.
Restrictions: U.S. Government export regulations prohibit the distribution of this program outside the United States without the appropriate export licenses.

REVISIONS TO LIBRARY PROGRAMS

DECUS No: V-SPG-08 Title: KERMIT Distribution Version: January 1988
Submitted by: Virginia C. Everhart, Ph.D.
Operating System: CP/M, IAS, MS/DOS, OS/278, OS/2, P/OS, RSTS/E, RSX-11M, RSX-11M-PLUS, RT, TOPS-10, TOPS-20, TOPS-20, VMS Source Language: ALGOL, BLISS-16, BLISS-32, BLISS-66, C, FORTRAN V77, FORTRAN IV, FORTRAN IV-PLUS, MACRO-10, MACRO-11, MACRO-32, PASCAL, VAX-11 BASIC, VAX-11 FORTRAN Keywords: Data Communications, KERMIT
Abstract: This is a combined effort by the DATATRIEVE/ KIC2 developers to consolidate all KERMITS known to Columbia as of that date plus a KERMITS documentation and booting instructions are on the appropriate export licenses.
The Columbia distribution is in five (5) reels of tape. To reduce costs, the distribution has been placed on TWO (2) reels of tape for DECUS in VMS/BACKUP format at 1600 BPI. Because the distribution has grown too large for a single reel, compression with DTR also RSX console logs. and a routine for all PDP-11's to convert DTR and VMS DATE types to from ASCII outside of DTR.

NEW LIBRARY PROGRAMS AVAILABLE FOR THE RAINBOW FAMILY OF COMPUTERS

DECUS No: RB-129 Title: KRAMDEN Utilities Version: December 1987
Submitted by: Bryan Higgins, DHB Associates, Berkeley, CA
Operating System: MS/DOS Source Language: C Keywords: Utilities - MS/DOS
Abstract: The KRAMDEN Utilities are a set of programs for the Digital Equipment Corporation Rainbow 100 running Operating System MS/DOS V2.0 or higher. Some of the functions include:
- File utilities, including alternatives to DIR, COPY, RENAME, and DEL.
- A file backup utility.
- A command editor which allows recall, edit and re-execution of previously typed DOS commands.
- A listing Print for printers.
- A program which simplifies date and time settings when booting.
- Clock programs.
Media (Service Charge Code): One RX50 Diskette (JA) Format: MS/DOS

Submitted by: University of California at Berkeley, through Digital Equipment Corp.
Operating System: ULTRIX/UNIX Source Language: C Memory Required: 40MB Keywords: Libraries - ULTRIX
Abstract: The OCT Tools are a collection of libraries which together form an integrated system for VLSI design. The system also includes tools for multi-level logic synthesis, standard cell placement and routing, custom cell design, and a variety of utility programs for manipulating symbolic and geometric design data. All tools are integrated with the OCT VLSI data manager and the VEM graphic user interface.
The ordering information for the manuals is as follows:
- Order UX-SP-101 (ED) for the Berkeley CAD Tools User’s Manual
Notes: Operating system ULTRIX V2.0 is required. This program was developed by the Computer-Aided Design Group, Department of Electrical Engineering and Computer Sciences, University of California Berkeley.
Restrictions: U.S. Government export regulations prohibit the distribution of this program outside the United States without the appropriate export licenses.

NEW UNIX SOFTWARE

DECUS No: UX-102 Title: KIC2 Version: 2. October 1983
Submitted by: University of California at Berkeley, through Digital Equipment Corp.
Operating System: ULTRIX/UNIX Source Language: C Keywords: Artwork Editor, Graphics, Utilities - ULTRIX
Abstract: KIC2 is an interactive, two-dimensional, color graphics editor intended primarily for the mask level design of integrated circuits. KIC2 has been designed as a powerful, inexpensive, user-friendly graphics editor that will run on most low to medium performance graphics terminals. Data that is generated by KIC2 can be represented by an intermediate graphic description language called CIF (Caltech Intermediate Form) or Calmas STREAM, which permits the data to be easily transported to other layout systems. Also, the geometric database used by KIC2 can be used to interface to other tools, such as a layout rules checking program.
Notes: This program was developed by the Computer-Aided Design Group, Department of Electrical Engineering and Computer Sciences, University of California at Berkeley.
Restrictions: U.S. Government export regulations prohibit the distribution of this program outside the United States without the appropriate export licenses.

REVISIONS TO NEW LIBRARY PROGRAMS

DECUS No: V-SPG-08 Title: KERMIT Distribution Version: January 1988
Submitted by: Virginia C. Everhart, Ph.D.
Operating System: CP/M, IAS, MS/DOS, OS/278, OS/2, P/OS, RSTS/E, RSX-11M, RSX-11M-PLUS, RT, TOPS-10, TOPS-20, TOPS-20, VMS Source Language: ALGOL, BLISS-16, BLISS-32, BLISS-66, C, FORTRAN V77, FORTRAN IV, FORTRAN IV-PLUS, MACRO-10, MACRO-11, MACRO-32, PASCAL, VAX-11 BASIC, VAX-11 FORTRAN Keywords: Data Communications, KERMIT
Abstract: This is a combined effort by the DATATRIEVE/ KIC2 developers to consolidate all KERMITS known to Columbia as of that date plus a KERMITS documentation and booting instructions are on the appropriate export licenses.
The Columbia distribution is in five (5) reels of tape. To reduce costs, the distribution has been placed on TWO (2) reels of tape for DECUS in VMS/BACKUP format at 1600 BPI. Because the distribution has grown too large for a single reel, compression with DTR also RSX console logs. and a routine for all PDP-11's to convert DTR and VMS DATE types to from ASCII outside of DTR.

NEW LIBRARY PROGRAMS AVAILABLE FOR THE RAINBOW FAMILY OF COMPUTERS

DECUS No: RB-129 Title: KRAMDEN Utilities Version: December 1987
Submitted by: Bryan Higgins, DHB Associates, Berkeley, CA
Operating System: MS/DOS Source Language: C Keywords: Utilities - MS/DOS
Abstract: The KRAMDEN Utilities are a set of programs for the Digital Equipment Corporation Rainbow 100 running Operating System MS/DOS V2.0 or higher. Some of the functions include:
- File utilities, including alternatives to DIR, COPY, RENAME, and DEL.
- A file backup utility.
- A command editor which allows recall, edit and re-execution of previously typed DOS commands.
- A listing Print for printers.
- A program which simplifies date and time settings when booting.
- Clock programs.
Media (Service Charge Code): One RX50 Diskette (JA) Format: MS/DOS

Submitted by: University of California at Berkeley, through Digital Equipment Corp.
Operating System: ULTRIX/UNIX Source Language: C Memory Required: 40MB Keywords: Libraries - ULTRIX
Abstract: The OCT Tools are a collection of libraries which together form an integrated system for VLSI design. The system also includes tools for multi-level logic synthesis, standard cell placement and routing, custom cell design, and a variety of utility programs for manipulating symbolic and geometric design data. All tools are integrated with the OCT VLSI data manager and the VEM graphic user interface.
The ordering information for the manuals is as follows:
- Order UX-SP-101 (ED) for the Berkeley CAD Tools User’s Manual
Notes: Operating system ULTRIX V2.0 is required. This program was developed by the Computer-Aided Design Group, Department of Electrical Engineering and Computer Sciences, University of California Berkeley.
Restrictions: U.S. Government export regulations prohibit the distribution of this program outside the United States without the appropriate export licenses.

NEW UNIVERSITY SOFTWARE

NEW UNIX SOFTWARE
Restrictions: Some portions of the collection are VMS specific and will not work in TPF/VAX.

Media (Service Charge Code): 600' Magnetic Tape (MA) Format: VMS/BACKUP

DECUS No: VAX-66 Title: NANNY Version: V2.4, January 1988
Submitted by: Daniel Zirin, VAR Limited, Pasadena, CA


Abstract: Intended for VAX/VMS system managers. Nanny is a detached system process, gives your VAX the attention needed to survive the harsh real user environment. Able to manage memory, monitor disk and queue accesses, schedule processes to avoid CPU hogging, seek and destroy idle users, and send wake-up calls. NANNY can be instructed to be strict or lax with your VAX system, or order VAX-LIB-2 disks and queues. VAX/VMS V4.1, V4.3-V4.6.

Changes and Improvements:

This version adds a Hewlett Packard type calculator, moves the text segment feature from a FORTRAN program to a TPU procedure making it much faster. The Hewlett Packard calculator is handled with a CALLUSER routine written in FORTRAN. Text segments are editable while using TPU, allowing them to be defined on the fly. A number of procedures have been cleaned up and streamlined. The Goto Line function now has relative as well as absolute movement. A function, "where", has been added which indicates the current line and column number. The ability to remove trailing blanks when writing out buffers is also a new feature.

Media (Service Charge Code): User's Manual (EA); 600' Magnetic Tape (MA) Format: VAX/ANSL or order VAX-LIB-5

DECUS No: VAX-252 Title: KEYPADS Version: November 1987
Submitted by: Ronald William Burke, Westinghouse Electric Corporation, Baltimore, MD

Operating System: Micro VMS V4.2, V4.3-V4.6 Source Language: DCL Keywords: Tools - Applications Development Language: DCL

Abstract: This is an upgrade to the TPU software with the following enhancements: 

1. Bug fixes, efficiency improvements, additional features including: feature editing, searching, replacing, etc., WPE provides two-window editing, the most useful features of TPUPlus, and several other extensions. Included are some Language Sensitivity features for editing.COM files. A "read-only" option, called MORE, is an outstanding replacement for the TYPEnote command. It's easy to"get started" with WPE, but a large set of advanced features is available to the curious user. Full on-line help and extensive documentation are provided. An additional advantage of WPE is that the user who uses WPEPlus has essentially the same keyboard interface to WPE (voids having to remember several editors).

Features include:

- All of WPS-PLUS that is reasonable (full function editing).
- Two-window editing.
- Multiple files.
- Bookmarks.
- Insert and examine special characters.
- Print files with special characters.
- Fix up files by removing CR/LF.
- Automatic tailoring for .COM, .HLP, .FOR, and .TPU files.
- Read-only interface (called MORE).
- WPE is written in VAX90 and built on VAX, so it's inherently extendable. DM, SD, and WPE work well together, or separately.

Colors (Colors Management) is a suite of programs for managing and setting "default" colors for ReGIS color terminals. Having a VT221, VT-340 (or other color ReGIS terminal) is much more fun if you use color combinations other than red, blue, green, yellow, cyan. Color terminals allow the user to control his/her terminal colors. A side effect is the provision of a "system default" set of pleasant colors.

DM (Directory Manager V2.2A) is a utility which allows you to manage directories, change directory structures, copy files and directory structures. DM is particularly useful if you have large numbers of files or sub-directories and is helpful in encouraging users to clean up their directories (by making it easy to do so). It is invaluable for sorting through the DECUS SIG tapes after they have been loaded. DM displays the files in your current directory (or your directory tree). With one or two keystrokes you can do most DCL commands; delete, copy, purge, print, edit, view, rename, etc. The keystrokes are ALL- IN-1 like. DM's favori...
These programs are lots of fun (if you have a VT-241 or VT-34C terminal), and the PCO and XCO programs have a nice user interface.

The submitter welcomes comments, suggestions, etc. Bug fix requests will also be considered.

Notes: If operating system VAX/VMS V4.3 or less is used, a FORTRAN Compiler is required after modifying the source code of DM and SD. Full documentation is provided for all of the programs. In TXT, WPL, and WPS PLUS, and LSNO (very fancy) forms. Two memory cartridges are required to print the 

Changes and Improvements: All programs now recognize VT-340 terminals. In particular, the Colors programs have been extensively modified for the VT-340 terminal. It is possible to disable dynamic highlighting for DM and SD, for faster execution (useful on slow, dial-up lines). Other feature enhancements and minor bug fixes.

Media (Service Charge Code): 600' Magnetic Tape (MA) Format: VMS/BACKUP

DECUS No: VAX-286 Title: VIEW Version: 5.0. December 1987


Operating System: MicroVMS V4.0, VAX/VMS V4.0 Source Language: MACRO-32 Allocation Hardware Required: VT200 Series terminal Key-words: System Management - VMS

Abstract: The VIEW utility is a system management tool that enables the Systems Manager to obtain information on system processes or user processes. VIEW is very useful for taking a snapshot look at your system to establish what images are running, and what processes are associated with those images. It also provides a simple way to track the state of processes and to manage the system. VIEW provides a detailed view of the system, including information about the processes running on the system, and the segments of the system.

The GETFWA system service is written in the VMS system language GETFWA. The GETFWA system service will retrieve information about the files open to the process/image based on the file name supplied to it. The service does this by accessing the VMS system image GETFWA. The GETFWA system service will return information about the files open to the process/image based on the file name supplied to it. The service does this by accessing the VMS system image GETFWA. The GETFWA system service will return information about the files open to the process/image based on the file name supplied to it. The service does this by accessing the VMS system image GETFWA.

Other utilities included:

- **CALCUL**
  - VT100 calculator program.
- **CLOCK**
  - Real-time VT100 clock program.
- **DISASM**
  - SAV file disassembler.
- **GONLIB**
  - Geometric library, used by CALCUL.
- **HRLIB**
  - General purpose library, used by many of the utilities.
- **HBRMCA**
  - Useful macro library.
- **INCLUD**
  - FORTRAN IV pre-processor to update COMMON areas.
- **SEARCH**
  - Keyword search utility.
- **UCL**
  - User Command Language for RT-11 V5 or later.

Chang and Improvements: Improved functionality of RDIFR new utility. OVLAYA: converted to RT-11 overlay structure. RDIFR is a program that generates ASCII formatted dumps of the directory segments of an RT-11 volume. This can be very useful to search through directory segments after a crash. It is much easier than DUMP, because of the formatted output. RDIFR performs several directory operations such as creating or deleting directory segments without initializing the volume, skipping a corrupted segment, and deleting a named file, patching a directory segment, splitting/merging files, and many other options.

SQMAP is a program to squeeze load maps of overlaid FORTRAN programs into a readable format removing all globals and saving only the own subroutine names and the segment sizes. It also produces a one page plot of the overlaid memory usage and an optioned plot. SQMAP is very useful in combination with OVLAYA.

Other features:

- **Enable/Disable Highlight(Find)**
- **Process Alternate(Select)**
- **Inteval Time Up**, **Interval Time Down**, **Interval Time Next**, **Interval Time Previous**
- **Clear Page**
- **Clear Page(Do)**
- **Rename Process(NamSelect)**
- **Delete Process(Excl)**
- **Windowing(Ext)**
- **Function**
- **ZOOM**
- **VIEW**
- **COPY**
- **HELP**
- **EXIT**
- **To exit system**
- **To continuously VIEW balance set, idlecpu, and Data Time, use the following procedure:**
PROPLOT does least squares curve fitting to polynomial equations, graphs the resulting curves on the monitor, and has provisions for hard copy to an LA50, LA100 or Digital Equipment Corporation (HP) two or six pen plotter.

PROPLOT V3.1 automatically supports color monitor and/or HP7450, HP7440 or Digital Equipment Corporation LVP16 plotters, if present. This provides color graphics support.

Data can be input from the keyboard or from a data file. The program asks the user questions regarding parameters and allows creation of data files for later recall. Scaling is automatic or controlled by the user.

PROPLOT V3.1 supports .CTL file for repetitive re-plotting of same data sets. The .CTL file contains the answers to the questions PROPLOT asks. See CTLDOC for details.

Notes: Operating system P/OS V2.0 or higher is required.

Changes and Improvements: Control files, additional plotter support.


DECUS Program Library Catalog Changes:
These corrections are to be made to the 1987/1988 Software Catalog.

DECUS No. VAX-91, Title: SPLICE: A Mixed-Mode Simulation Program and DECUS No. VAX-92, Title: WOMBAT: A Netlist Comparison Program are no longer available on DECUS No. VAX-LIB-1 Title: VAX Library Collection 1.

DECUS No. VAX-92, Title: WOMBAT: A Netlist Comparison Program and DECUS No. VAX-174, Title: PLA TOOLS, please include the following note:

"Restrictions: U.S. Government export regulations prohibit the distribution of this program outside the United States without the appropriate export licenses."

DECUS No. VAX-6, Title: SPEICE 3 A6, DECUS No. VAX-44, Title: KICS and CIF to STRM; STRM to CIF Utilities, DECUS No. VAX-91, Title: SPLICE: A Mixed-Mode Simulation Program, DECUS No. VAX-92, Title: WOMBAT: A Netlist Comparison Program, DECUS No. VAX-141, Title: RELAX2.2: An Analysis of Metal-Oxide Semiconductor Integrated Circuits (MOS), DECUS No. VAX-174, Title: PLA TOOLS, DECUS No. VAX-216, Title: SPEICE2, and DECUS No. VAX-238, Title: CAYENNE, please include the following:

"Note: This program was developed by the Computer-Aided Design Group, Department of Electrical Engineering and Computer Sciences, University of California Berkeley."
The purpose of HARD NEWS, the HMS SIG newsletter, is to serve as a forum to share information related to DEC hardware with the members of the SIG. As such, the existence of the newsletter is entirely dependent on your contributions. If you have an HHK item, a better or safer way to do something, product news, a tutorial article of general interest, etc., we would like to publish it in the newsletter. We hope that HARD NEWS will be published at least six times a year.

You can submit material to the editor, Carmen Wiseman, or to the HMS SIG chair, Bill Walker. We can accept submissions in a wide variety of formats:

- Items can be sent to the editor on VMS-format RX50s, TK50 cartridges, or IBM PC format 5 1/4" floppies. The SIG chair prefers RT-11 floppies but can handle any reasonable media.
- Hard copy, like cash, is always acceptable. Camera-ready copy will save us a lot of typing, but we don't insist on it. You can also use the Hardware Submission Form in the "Questionnaires" section of the combined SIGs Newsletters.
- Those of you with access to DCS can send things to WALKER or WISEMAN. DCS is usually checked on a daily basis.
- You can reach the SIG chair on CompuServe as "Bill Walker 71066,24" or via EasyLink mailbox 62752448 or MCI Mail account 333-1675. You can reach the editor via EasyLink mailbox 62960090 (be sure to say ATTN: or TO: Carmen Wiseman somewhere in the body of the message).

If you have anything to submit, send it! If it is a mess, but we can read it, we will get it into the newsletter somehow. Finally, if you have any questions about submitting material, call one of us. The telephone numbers are listed below.

Contributions can be sent to:

William K. Walker
Monsanto Research Corp. OR Carmen D. Wiseman
P.O. Box 32 A-152 == Digital Review
Miamisburg, OH 45342 == Prudential Tower, Suite 1390
(513) 865-3557 (work) 800 Boylston Street
(513) 426-7094/0344 (home) Boston, MA 02199
(617) 375-4361 (work)
As a member of DECUS U.S. Chapter, you are entitled to contribute and subscribe to the DECUS monthly publication, SIGs Newsletters. You also have the opportunity to subscribe to the Symposia Proceedings which are a compilation of the reports from various speakers at the U.S. National DECUS Symposia.

- No Purchase Orders will be accepted.
- The order form below must be used as an invoice.
- All checks must be made payable to DECUS.
- All orders MUST be paid in full.
- Minimum of $25.00 for orders placed via a credit card.
- No refunds will be made.
- The address provided below will be used for all DECUS mailings, i.e. Membership, Subscription Service and Symposia.

SIGs Newsletters Price is for a one-year subscription beginning the month following receipt of payment.

Name ______________________ DECUS Member # ______________________
Company ____________________________
Address ______________________________________________________
City ___________________ State __________ Zip ________
Telephone # ____________________________

Subscription Service Offering | Unit Price | Quantity | Total
--- | --- | --- | ---
SIGs Newsletters | $35.00 | | |
Fall ’86 Proceedings (FA6) | 15.00 | | |
Spring ’87 Proceedings (SP7) | 15.00 | | |
Fall ’87 Proceedings (FA7) | 15.00 | | |
Spring ’88 Proceedings (SP8) | 15.00 | | |

Total Amt. $ ______________________

☐ MASTERCARD ☐ VISA ☐ DINERS CLUB/CARTE BLANCHE®
Credit Card # __________ Expiration Date __________

I understand that there will be no refunds even if I decide to cancel my subscription.

Signature ____________________________

FOR DIGITAL EMPLOYEES ONLY

Badge # ____________________________ Cost Center ____________________________
Cost Center Mgr. Name ____________________________ Cost Center Mgr. Signature ____________________________

MAIL TO: Subscription Service, DECUS (BP02), 219 Boston Post Road, Marlboro, MA 01752-1850, (617) 480-3659.

FOR DECUS OFFICE ONLY

Check Number ____________________________ Bank Number ____________________________
Amount $ ____________________________
DECUS U.S. CHAPTER
APPLICATION FOR MEMBERSHIP

- New Membership  - Update to current membership profile  - Current DECUS Member.# _______ _______ _______

Please provide a complete mailing address, include zip code in accordance with postal regulations for your locality.

- Are you an employee of Digital Equipment Corporation?  - YES  - NO

NOTE: Please print clearly or type!

Name: ____________________________________________

(First) (Middle Initial) (Last/Family Name)

Company: _________________________________________

Address: __________________________________________

City/Town/State/Zip: ________________________________

Telephone: Home ( ) ___________________________ Work ( ) _______________________

How Did You Learn About DECUS? Please Check Applicable Item.

1  - ANOTHER DECUS MEMBER  4  - DIGITAL SALES  13  - LOCAL USERS GROUP
2  - SYMPOSIA  5  - HARDWARE PACKAGE  14  - SPECIAL INTEREST GROUP
8  - DECUS CHAPTER OFFICE  6  - SOFTWARE PACKAGE  7  - SOFTWARE DISPATCH (Digital Newsletter)
10  - DIGITAL STORE  12  - ADVERTISING

Do you wish to be included in mailings conducted by Digital (for marketing purposes etc.)?  - Permission

Type Of Digital Hardware Used: Please Check Those Applicable To You.

20  - DECMATE  52  - LSI-11  21  - PROFESSIONAL  5  - WPS-8
82  - DECSYSTEM-10  3  - PDP-8 FAMILY  22  - RAINBOW  51  - WPS-11
83  - DECSYSTEM-20  50  - PDP-11 FAMILY  54  - VAX FAMILY

Major Operating Systems? Languages Used: Please Check Those Applicable To You.

1  - ADA  26  - CORAL-66  47  - FOCAL  67  - OS/8  109  - RT-11
2  - ALGOL  28  - COS  48  - FORTRAN  68  - PASCAL  97  - TECO
5  - APL  34  - DATATRIEVE  51  - GAMMA  72  - PL-11  70  - TOPS-10
7  - BASIC  35  - DBMS  110  - IAS  92  - RPG  71  - TOPS-20
17  - BLISS  38  - DECNAT  53  - IQL  81  - RSTS/E  111  - ULTRIX/UNIX
19  - C  43  - DIBOL  58  - MACRO  83  - RSX  104  - VMS
22  - COBOL  45  - DOS-11  65  - MUMPS  91  - RMS  107  - WPS-8
### Type Of Business (Environment)/Computer Applications

Please check that which best describes your business/application.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>ACCOUNTANCY</td>
</tr>
<tr>
<td>1</td>
<td>EDUCATION/PRIMARY</td>
</tr>
<tr>
<td>23</td>
<td>NUMERICAL CONTROL</td>
</tr>
<tr>
<td>7</td>
<td>BANK</td>
</tr>
<tr>
<td>2</td>
<td>EDUCATION/SECONDARY</td>
</tr>
<tr>
<td>68</td>
<td>OEM-COMMERCIAL</td>
</tr>
<tr>
<td>64</td>
<td>BUSINESS/COMMERCIAL</td>
</tr>
<tr>
<td>61</td>
<td>EDUCATION-TECHNOLOGY</td>
</tr>
<tr>
<td>78</td>
<td>OEM-TECHNICAL</td>
</tr>
<tr>
<td>74</td>
<td>BUSINESS/INFORMATION SYSTEMS</td>
</tr>
<tr>
<td>3</td>
<td>EDUCATION/UNIVERSITY</td>
</tr>
<tr>
<td>56</td>
<td>PHYSICAL SCIENCES</td>
</tr>
<tr>
<td>57</td>
<td>CHEMISTRY</td>
</tr>
<tr>
<td>67</td>
<td>ENGINEERING</td>
</tr>
<tr>
<td>20</td>
<td>RESEARCH/DEVELOPMENT</td>
</tr>
<tr>
<td>54</td>
<td>CLINICAL LABORATORY</td>
</tr>
<tr>
<td>65</td>
<td>FINANCE/ACCOUNTING</td>
</tr>
<tr>
<td>10</td>
<td>RETAIL</td>
</tr>
<tr>
<td>63</td>
<td>COMPUTATION</td>
</tr>
<tr>
<td>77</td>
<td>GOVERNMENT</td>
</tr>
<tr>
<td>73</td>
<td>SOFTWARE DEVELOPMENT</td>
</tr>
<tr>
<td>11</td>
<td>CONSUMER ELECTRONICS</td>
</tr>
<tr>
<td>75</td>
<td>GRAPHICS</td>
</tr>
<tr>
<td>53</td>
<td>TELECOMMUNICATIONS</td>
</tr>
<tr>
<td>18</td>
<td>CONSULTANT</td>
</tr>
<tr>
<td>4</td>
<td>HOSPITAL</td>
</tr>
<tr>
<td>19</td>
<td>TELEPHONE/UTILITIES</td>
</tr>
<tr>
<td>72</td>
<td>DATA ACQUISITION</td>
</tr>
<tr>
<td>62</td>
<td>INDUSTRIAL</td>
</tr>
<tr>
<td>51</td>
<td>TIMESHIRING</td>
</tr>
<tr>
<td>52</td>
<td>DATA COMMUNICATIONS</td>
</tr>
<tr>
<td>55</td>
<td>LABORATORY/SCIENTIFIC</td>
</tr>
<tr>
<td>80</td>
<td>TRAINING/INSTRUCTION</td>
</tr>
<tr>
<td>13</td>
<td>DATA PROCESSING SERVICES</td>
</tr>
<tr>
<td>14</td>
<td>LIBRARY</td>
</tr>
<tr>
<td>66</td>
<td>TYPESETTING/PUBLICATION</td>
</tr>
<tr>
<td>71</td>
<td>DATA REDUCTION</td>
</tr>
<tr>
<td>58</td>
<td>LIFE SCIENCES</td>
</tr>
<tr>
<td>17</td>
<td>DIGITAL EMPLOYEE-ENGINEERING</td>
</tr>
<tr>
<td>70</td>
<td>MANUFACTURING</td>
</tr>
<tr>
<td>15</td>
<td>DIGITAL EMPLOYEE-MARKETING</td>
</tr>
<tr>
<td>79</td>
<td>MARKETING</td>
</tr>
<tr>
<td>16</td>
<td>DIGITAL EMPLOYEE-SERVICE GROUP</td>
</tr>
<tr>
<td>59</td>
<td>MEDICAL RESEARCH</td>
</tr>
<tr>
<td>60</td>
<td>EDUCATIONAL ADMINISTRATION</td>
</tr>
<tr>
<td>6</td>
<td>MILITARY INSTALLATION</td>
</tr>
</tbody>
</table>

### Special Interest Groups (SIGs) Enrollment

I wish to participate in the following DECUS U.S. Chapter Special Interest Groups.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>ARTIFICIAL INTELLIGENCE</td>
</tr>
<tr>
<td>11</td>
<td>HARDWARE AND MICRO</td>
</tr>
<tr>
<td>36</td>
<td>PERSONAL COMPUTER</td>
</tr>
<tr>
<td>7</td>
<td>BUSINESS APPLICATIONS</td>
</tr>
<tr>
<td>35</td>
<td>IAS</td>
</tr>
<tr>
<td>18</td>
<td>RSTS/E</td>
</tr>
<tr>
<td>2</td>
<td>COMMERCIAL LANGUAGES</td>
</tr>
<tr>
<td>27</td>
<td>LARGE SYSTEMS</td>
</tr>
<tr>
<td>17</td>
<td>RSX</td>
</tr>
<tr>
<td>6</td>
<td>DATA MGMT. SYSTEMS</td>
</tr>
<tr>
<td>16</td>
<td>L &amp; T</td>
</tr>
<tr>
<td>19</td>
<td>RT-11</td>
</tr>
<tr>
<td>31</td>
<td>DAARC (LABS)</td>
</tr>
<tr>
<td>14</td>
<td>MUMPS</td>
</tr>
<tr>
<td>32</td>
<td>SITE MGMT. &amp; TRNG</td>
</tr>
<tr>
<td>5</td>
<td>DATATRIEVE/4GL</td>
</tr>
<tr>
<td>15</td>
<td>NETWORKS</td>
</tr>
<tr>
<td>21</td>
<td>UNISIG</td>
</tr>
<tr>
<td>8</td>
<td>EDUSIG</td>
</tr>
<tr>
<td>34</td>
<td>OFFICE AUTOMATION</td>
</tr>
<tr>
<td>26</td>
<td>VAX</td>
</tr>
</tbody>
</table>

### Job Title/Position - Please Check:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CORPORATE STAFF</td>
</tr>
<tr>
<td>101</td>
<td>CORPORATE DIRECTOR OF DP/MIS</td>
</tr>
<tr>
<td>2</td>
<td>DIVISION OR DEPARTMENT STAFF</td>
</tr>
<tr>
<td>102</td>
<td>ADMINISTRATIVE ASSISTANT</td>
</tr>
<tr>
<td>3</td>
<td>SYSTEMS ANALYSIS</td>
</tr>
<tr>
<td>103</td>
<td>TECHNICAL ASSISTANT</td>
</tr>
<tr>
<td>4</td>
<td>APPLICATIONS PROGRAMMING</td>
</tr>
<tr>
<td>104</td>
<td>SERVICES COORDINATOR</td>
</tr>
<tr>
<td>5</td>
<td>SYSTEMS ANALYSIS/PROGRAMMING</td>
</tr>
<tr>
<td>105</td>
<td>MANAGER</td>
</tr>
<tr>
<td>6</td>
<td>OPERATING SYSTEM PROGRAMMING</td>
</tr>
<tr>
<td>106</td>
<td>ANALYST</td>
</tr>
<tr>
<td>7</td>
<td>DATABASE ADMINISTRATION</td>
</tr>
<tr>
<td>107</td>
<td>PROGRAMMER</td>
</tr>
<tr>
<td>8</td>
<td>DATA COMMUNICATIONS/TELECOMMUNICATIONS</td>
</tr>
<tr>
<td>108</td>
<td>DATABASE MANAGER</td>
</tr>
<tr>
<td>9</td>
<td>COMPUTER OPERATIONS</td>
</tr>
<tr>
<td>109</td>
<td>DATABASE ADMINISTRATOR</td>
</tr>
<tr>
<td>10</td>
<td>PRODUCTION CONTROL</td>
</tr>
<tr>
<td>110</td>
<td>MANAGER OF DP OPERATIONS</td>
</tr>
</tbody>
</table>

Citizen of the United States of America? □ YES □ NO
Country: __________________________________________

Signature: ___________________________ Date: ______

Forward To: DECUS U.S. Chapter
Digital Equipment Computer Users Society
Membership Processing Group
219 Boston Post Road, BOPO
Marlboro, MA 01752-1850
Phone: (617)480-3418
DTN: 8-296-3418

HOW-6
STEERING COMMITTEE LISTS

ARTIFICIAL INTELLIGENCE SIG
CHAIR
Cheryl Jalbert
JCC
128 West Broadway
Granville, OH 43023
(614) 587-0177

VICE-CHAIR
OPSS WORKING GROUP CHAIR
Don Rosenthal
Space Telescope Science Inst.
Homewood Campus
Baltimore, MD 21218
(301) 338-4844

NEWSLETTER TASK FORCE CHAIR
Becky Wise
Amdahl CSD
2200 North Greenville Ave.
Richardson, TX 75081
(214) 699-9500 x 272

NEWSLETTER EDITOR
Terry Shannon
Computer Info. Sys., Inc.
Technical Consultant
165 Bay State Drive
Braintree, MA 02184
(617) 848-7515

SYMPOSIA COORDINATOR
Pe.m Vavra
Hughes Aircraft EDSG
P.O. Box 902 E52/D220
El Segundo, CA 90245-0902
(213) 616-7071

MEMBERSHIP COORDINATOR
SUITE COORDINATOR
Chris Goddard
Simpaet Associates
9210 Skypark Court
San Diego, CA 92123
(619) 561-1865

SESSION NOTE EDITOR
George Humfeld
Naval Sea Systems Command
PMS 350 ED Dept of the Navy
Washington, DC 20362-5101
(202) 692-0137

ASS'T SESSION NOTES EDITOR
David Frydenlund

STORE REPRESENTATIVE
Sally Townsend
Just, Defense Analysis
1801 N. Beauregard St.
Alexandria, VA 22311
(703) 845-2122

PUBLIC DOMAIN SOFTWARE TF CHAIR
Jim Sills
Space Telescope Science Inst.
2700 San Martin Drive
Baltimore, MD 21218
(301) 338-4949

AI LUG COORDINATOR
ASSISTANT STORE REP.
Don Rosenthal
Space Telescope Science Inst.
Homewood Campus
Baltimore, MD 21218
(301) 338-4844

REPORTER TO THE UPDATE DAILY
Bill Lennon

SEMINAR UNIT REP.
CAMPBOARD COORDINATOR
Leona Fluck
Educational Testing Service
Route 82 Road
Princeton, NJ 8540
(609) 734-1543

DEC COUNTERPART
Art Boese
Hodson, MA

MEMBERS-AT-LARGE
David Slater
George Winkler
Jeff Fox
John Williamson
Wayne Graves
Matt Mathews
Dave Campbell
Shirley Rockstahle-Brandt
Barry Bream
Tom Viana

BUSINESS APPLICATIONS SIG
CHAIRMAN
George Dyer
Gallaudet University
800 Florida Ave. NE
Washington, DC 20002
(202) 651-5300

COMMUNICATIONS COORDINATOR
Steve Lacativa
Price Waterhouse
153 East 53rd Street
New York, NY 10022
(212) 371-2000 x 3107

SYMPOSIA COORDINATOR
Mark Hults
USSA Administrative Systems
USSA Bldgc BOlE
San Antonio, TX 78288
(512) 498-8725

LUG COORDINATOR
Patrick Lesesne
U.S. Coast Guard
Room 1416E 2100 2nd St SW
Washington, DC 20593
(202) 267-0354

MARKETING COORDINATOR
Tom Byrne
L. Karp & Sons
1301 Estes
Elk Grove Village, IL 60007
(312) 593-5706

PROGRAM PLANNING COORDINATOR
Stuart Lewis
Douglas Furniture Corp.
P.O. Box 97
Bedford, PA 6049
(617) 458-1505

SYMPOSIA COORDINATOR
Lisa M. Pratt
Vitro Corporation
Nuwco Code 3141
Kerport, WA 98343
(509) 396-2551

ASS'T SYMPOSIA REPRESENTATIVE
James Sills

DATATRIEVE/4GL SIG
CHAIRMAN
Joe H. Gallagher
Research Medical Center
2206 East Meyer Blvd
Kansas City, MO 64132
(816) 276-2320

SYMPOSIA COORDINATOR
Liza M. Pratt
Vitro Corporation
Nuwco Code 3141
Kerport, WA 98343
(509) 396-2551

ASS'T SYMPOSIA REPRESENTATIVE
T.C. Wool

LIBRARY REPRESENTATIVE
David Hittner
Projects Unlimited
3680 Wyse Road
Dayton, OH 45414
(513) 890-1800

DEC COUNTERPARTS
Sue Yarger
Digital Equipment Corporation
Merrimack, NH 03054-0430
Paula Daley
Digital Equipment Corporation
Merrimack, NH 03054-0430
Pam Kukla
Digital Equipment Corporation
Maynard, MA 01754

CL SIG LIAISON
Becky Berkus-Bam

DMS SIG LIAISON
Joe Sciuto
MEMBERS-AT-LARGE
Robert D. Lazenby
Dixie Beer Dist., Inc.
Louisville, KY
Robert Kayne
Gallaudet College
Washington, DC
Ray Evenson
Paragon Data Systems
Winona, MN

SESSION NOTE EDITOR
Marty Schmitt
Harris Publishing
3 Barker Avenue
White Plains, NY 10601
(914) 946-7500 x 287

LIBRARY REPRESENTATIVE
David Hittner
Projects Unlimited
3680 Wyse Road
Dayton, OH 45414
(513) 890-1800

CL SIG LIAISON
Becky Berkus-Bam

DMS SIG LIAISON
Joe Sciuto MEMBERS-AT-LARGE
Robert D. Lazenby
Dixie Beer Dist., Inc.
Louisville, KY
Robert Kayne
Gallaudet College
Washington, DC
Ray Evenson
Paragon Data Systems
Winona, MN

BUSINESS APPLICATIONS SIG
CHAIRMAN
George Dyer
Gallaudet University
800 Florida Ave. NE
Washington, DC 20002
(202) 651-5300

COMMUNICATIONS COORDINATOR
Steve Lacativa
Price Waterhouse
153 East 53rd Street
New York, NY 10022
(212) 371-2000 x 3107
SESSION NOTES EDITOR
Bob Van Keuren
UserWare Interactive International, Inc.
2250 Meyers Avenue
Essexfial, CA 92025
(619) 745-6006

PAST CHAIR
MUMPS DEV. COMMITTEE REP.
Mark Berryman
Digital Equipment Corp.
3 Sussex Way (MB08-2/S17)
Marlborough, MA 01752
(617) 407-3075
BITNET: BERRYMAN@DSM.DEC.COM

DEC COUNTERPART
Dave Smith
Digital Equipment Corp.
2 Iron Way (MB08-2/S17)
Marlborough, MA 01752
(617) 407-3075

ALTERNATE DEC COUNTERPART
Denise Simon
Digital Equipment Corp.
120 Parker Street (PK02-1/M23)
Maynard, MA 01754
(617) 458-097

OFFICE AUTOMATION SIG
CHAIR
Katherine "Kit" Trimm
Pivotal, Inc
Tucson, AZ
(602) 896-5563

VICE CHAIRMAN
Ralph Bradshaw
Johnson and Johnson
Raritan, NJ
(201) 685-3434

COMMUNICATIONS REPRESENTATIVE
Mary Jane Bolling
Foreign Mission Board
3806 Monument Avenue
Richmond, VA 23229
(804) 353-0151

SYMPOSIUM COORDINATOR
Mitie Brown
GenRad, Ind.
Waltham, MA
(617) 889-4400 x3002

NEW MEMBER COORDINATOR
Trista Cross
American Mathematical Society
P.O. Box 6248
Providence, RI 02940
(401) 270-8990

BOF COORDINATOR
Ray Kaplan
Pivotal, Inc
Tucson, AZ
(602) 896-5563

NEWSLETTER EDITOR
Therese LeBlanc
T.M. LeBlanc & Assoc.
Wheeling, IL
(312) 459-1784

LIBRARY
Bob Hassinger
Liberty Mutual Research Center
Hopkinton, MA
(617) 435-9061

OA TAPE COORDINATOR
Cynthia Reynolds
Foreign Mission Board
3806 Monument Avenue
Richmond, VA 23229
(804) 353-0151

SYMPOSIUM ASSISTANT
Sai Gianni
Northeast Utilities
Montgomery, MA
(617) 896-5563

STORE COORDINATOR
Mike Jackson
Air Force Operational Test and Evaluation Center
Kirtland AFB, NM
(505) 466-5561

PERSONAL COMPUTER SIG LIAISON
Cheryl Johnson
Grinnell College
Grinnell, IA
(515) 269-2870

OA LUG COORDINATOR
Tami Orlowski
American Council on Education
1 DuPont Circle (Suite 110)
Washington, DC
(202) 393-0971
COMMUNICATIONS COMMITTEE REPRESENTATIVE
AI SIG Liaison
Terry C. Shannon
Digital Review
160 State St.
6th Floor
Boston, MA 02110
(617) 267-7730

PRE-SYMPOSIUM SEMINAR COORDINATOR
Philip Ventura
STAFF MANAGEMENT
Adam Zarubia
Simmons Precision IC
3100 Highland Blvd.
Baltimore, MD 21218
(301) 870-9300

MEMBERS-AT-LARGE
Ann Gengen
Texas Instruments
1530 N. Central
M/S 417
Dallas, TX 75206
(214) 968-4859

HMS SIG Liaison
RT SIG Liaison
David Hunt
Lawrence Livermore National Lab
MS L-630
Livermore, CA 94550
(415) 422-3200

Glen Everhart
Computer Services
Box 81, MIT Station
Cambridge, MA 02139
(617) 253-2200

DEC COUNTERPARTS
Joe Allen
Stow, MA

VAX SYSTEMS SIG
SYMPOSIUM COORD., ASSISTANT
David Coffey
Computer Center
Union College
Schenectady, NY 12308

SESSION NOTES EDITOR
Ken Johnson
Meridian Technology Corp.
P.O. Box 3006
St. Louis, MO 63101

NEWSLETTER EDITOR
Sharon Gates-Fishman
NTC Corporation
730 E. Cypress Avenue
Monrovia, CA 91016
(818) 359-3800 or 1871
sandahl@ntc-vax.xdce@ntc

COMM/COMM REPRESENTATIVE
James W. Livingston, Jr.
Misurex Automation Systems
10411 Bobo Rd
Cupertino, CA 95014-4110
(408) 973-1800 x 366
ihmp4@email1

ADMINISTRATIVE DAEMON
Dorothy A. Guiper
The Wellington Group
40 Shoshone Drive, # 461
Mountain View, CA 94040
(415) 948-1003
ihmp4@decvax.dec

TAPE LIBRARIAN
Carl Lavenstein
Marine Physical Laboratory
Scripps Institute of Oceanography, P-604
La Jolla, CA 92038
(619) 294-2678
ihmp4@decvax.dec

USENET LIAISON
Joe Kelsey
FirstComm Corporation
711 Powell Avenue, SW
Renton, WA 98055
alice@alice@6800

STANDARDS COORDINATOR
Ed Gilby
M. Xu
25177 7th St
Six 128
Berkeley, CA 94710
(415) 444-0146
velva@velva@velva

MINISTER WITHOUT PORTFOLIO
Norman Wilson
Bell Laboratories, 2C-629
600 Mountain Avenue
Murray Hill, NJ 07974
(201) 582-2842
ihmp4@ihmp4@research

SEMINARS COORDINATOR
Stephen Stavhanik
Computer Science Dept.
College of Eng. & Computer Science
18111 Nordhoff St.
Northridge, CA 91330
(818) 885-2799 or 4398
ihmp4@decvax.dec

DEC COUNTERPART
Gary Otten
Digital Equipment Corporation
Continental Blvd, MX02
(603) 884-5111
decvax@decvax

NETWORK WORKING GROUP
Bill Hancock
Dimension Data Systems, Inc.
P.O. Box 13057
Arlington, TX 76094-5057

MicroVAX WORKING GROUP
Ray Kaplan
Pitbow, Inc.
6992 East Dorado Court
Tucson, AZ 85718-3864
(602) 968-2560

SYSTEM IMPROVEMENT REQUEST (CORE)
Mark D. Oakley
Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201-2697

MULTIPROCESSOR WORKING GROUP
Eugene Pai
U.S. Army
CAORA (ATOCRATI)
Fort Leavenworth, KANS

PRE-SYMPOSIUM SEMINAR COORD., HISTORIAN
Jeff Jubert
JCC
P.O. Box 361
Granville, OH 43023

PRE-SYMPOSIUM SEMINAR COORD. (ACTING)
June Baker
Computer Sciences Corp.
665 E Arlington Blvd.
Falls Church, VA 22046

FIELD SERVICE WORKING GROUP
Dave Slater
Computer Sciences Corp.
665 E Arlington Blvd.
Falls Church, VA 22046

LARGE SYSTEMS INTEGRATION WORKING GP
Leslie Malta
Stevens Institute of Tech.
Computer Center
Holbek, NJ 07070

VOlUNTEER COORDINATOR
Elizabeth Bailey
222 CEB
Tennessee Valley Authority
Muscle Shoals, AL 35661

COMMERCIAL WORKING GROUP
Bob Floyd
GE Microelectronics Center
P.O. Box 1549
Research Triangle Park, NC 27709

SECURITY
C. Douglas Brown
Sandia National Labs
Division 2844
P.O. Box 5800
Albuquerque, NM 87185

MIGRATION AND HOST DEVELOPMENT
VA/Intel Working GROUP
Jim Downward
KMS Fusion Incorporated
downsac@kmsfus@kmsfus

REAL TIME/PROCESS CONTROL
Dennis Frayne
McDonnell Douglas
5901 Boba Avenue
Huntington Beach, CA 92646

Larry Robertson
Bear Computer Systems
56512 Case Avenue
North Hollywood, CA 91605

INTErnALs WORKING GROUP
Carl F. Friedberg
Seaport Systems, Inc.
165 William Street, 9th Floor
New York, NY 10038

COMMUNICATIONS ASSISTANT
David L. Wyse
Professional Business Software
3000 Wye Road
Dayton, OH 45414-2559

CAMPGROUND COORDINATOR
Bill Kestnirk
Shell Oil Co.
335 Highway G, MS-D-2146
Houston, TX 77025-8892
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.
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.)
DECUS Membership Number: __ __ __ __

CPU Types (Check all that apply):
VAXes ___ PDP-ll’s ___ DECsystems ___ Other(Specify) ___

Application Types at your site (Check all that apply):
___ Business EDP/MIS ___ Software Development
___ Education ___ Engineering/Scientific
___ Office Automation ___ Service Bureau
___ Other (Specify) __________

Number of years using computers: ___ Number of years using 4GL’s: ___

Products Used (Check all that apply):

<table>
<thead>
<tr>
<th>PIR Number</th>
<th>Points</th>
<th>PIR Number</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>RALLY</td>
<td></td>
<td>VAX-DATATRIEVE (cont)</td>
<td></td>
</tr>
<tr>
<td>S88-1</td>
<td></td>
<td>S88-22</td>
<td></td>
</tr>
<tr>
<td>S88-2</td>
<td></td>
<td>S88-23</td>
<td></td>
</tr>
<tr>
<td>S88-3</td>
<td></td>
<td>S88-24</td>
<td></td>
</tr>
<tr>
<td>S88-4</td>
<td></td>
<td>S88-25</td>
<td></td>
</tr>
<tr>
<td>S88-5</td>
<td></td>
<td>S88-26</td>
<td></td>
</tr>
<tr>
<td>VAX-DATATRIEVE</td>
<td></td>
<td>S88-27</td>
<td></td>
</tr>
<tr>
<td>S88-6</td>
<td></td>
<td>S88-28</td>
<td></td>
</tr>
<tr>
<td>S88-7</td>
<td></td>
<td>S88-29</td>
<td></td>
</tr>
<tr>
<td>S88-8</td>
<td></td>
<td>S88-30</td>
<td></td>
</tr>
<tr>
<td>S88-9</td>
<td></td>
<td>S88-31</td>
<td></td>
</tr>
<tr>
<td>S88-10</td>
<td></td>
<td>S88-32</td>
<td></td>
</tr>
<tr>
<td>S88-11</td>
<td></td>
<td>S88-33</td>
<td></td>
</tr>
<tr>
<td>S88-12</td>
<td></td>
<td>TEAMDATA   (+-0)</td>
<td></td>
</tr>
<tr>
<td>S88-13</td>
<td></td>
<td>S88-34</td>
<td></td>
</tr>
<tr>
<td>S88-14</td>
<td></td>
<td>S88-35</td>
<td></td>
</tr>
<tr>
<td>S88-15</td>
<td></td>
<td>DATATRIEVE-11 (+-0)</td>
<td></td>
</tr>
<tr>
<td>S88-16</td>
<td></td>
<td>S88-36</td>
<td></td>
</tr>
<tr>
<td>S88-17</td>
<td></td>
<td>S88-37</td>
<td></td>
</tr>
<tr>
<td>S88-18</td>
<td></td>
<td>S88-38</td>
<td></td>
</tr>
<tr>
<td>S88-19</td>
<td></td>
<td>DECreporter (+-0)</td>
<td></td>
</tr>
<tr>
<td>S88-20</td>
<td></td>
<td>S88-39</td>
<td></td>
</tr>
<tr>
<td>S88-21</td>
<td></td>
<td>S88-40</td>
<td></td>
</tr>
</tbody>
</table>

Return your ballot to arrive by April 18, 1988, to:

T.C. Wool
E.I. duPont
Engineering Department
P.O. Box 6090
Newark, DE 19714-6090
SUBMITTING ARTICLES TO HARD NEWS

The purpose of HARD NEWS, the HMS SIG newsletter, is to serve as a forum to share information related to DEC hardware with the members of the SIG. As such, the existence of the newsletter is entirely dependent on your contributions. If you have an HHK item, a better or safer way to do something, product news, a tutorial article of general interest, etc., we would like to publish it in the newsletter. We hope that HARD NEWS will be published at least six times a year.

You can submit material to the editor, Carmen Wiseman, or to the HMS SIG chair, Bill Walker. We can accept submissions in a wide variety of formats:

- Items can be sent to the editor on VMS-format RX50s, TK50 cartridges, or IBM PC format 5 1/4" floppies. The SIG chair prefers RT-11 floppies but can handle any reasonable media.

- Hard copy, like cash, is always acceptable. Camera-ready copy will save us a lot of typing, but we don't insist on it. You can also use the Hardware Submission Form in the "Questionnaires" section of the combined SIGs Newsletters.

- Those of you with access to DCS can send things to WALKER or WISEMAN. DCS is usually checked on a daily basis.

- You can reach the SIG chair on CompuServe as "Bill Walker 71066,24" or via EasyLink mailbox 62752448 or MCI Mail account 333-1675. You can reach the editor via EasyLink mailbox 62960090 (be sure to say ATTN: or TO: Carmen Wiseman somewhere in the body of the message).

If you have anything to submit, send it! If it is a mess, but we can read it, we will get it into the newsletter somehow. Finally, if you have any questions about submitting material, call one of us. The telephone numbers are listed below.

Contributions can be sent to:

William K. Walker
Monsanto Research Corp. OR Carmen D. Wiseman
P.O. Box 32 A-152 Digital Review
Miamisburg, OH 45342 Prudential Tower, Suite 1390
(513) 865-3557 (work) 800 Boylston Street
(513) 426-7094/0344 (home) Boston, MA 02199

(617) 375-4361 (work)
*H M S S I G*

HARDWARE SUBMISSION FORM -- A SIG INFORMATION INTERCHANGE

Message

Contact
Name
Address

Telephone

Type of equipment

SUBMIT ANY TYPE OF HARDWARE PROBLEMS AND/OR FIXES.

SEND TO:

William K. Walker
Monsanto Research Corp.
P.O. Box 32 A-152
Miamisburg, OH 45342

OR

Carmen D. Wiseman
Digital Review
Prudential Tower, Suite 1390
800 Boylston Street
Boston, MA 02199
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
The Languages & Tools SIG has established the designation "LANGUAGES AND TOOLS MASTER", to be applied to selected, qualified people willing to share their expertise in various subjects with others. Masters are people who are knowledgeable enough in one or more languages or tools to be comfortable answering questions about them. The qualifications of an L&T Master are: expertise in a specific area, a willingness to have his/her name published as a Master, and a willingness to volunteer services in different ways. Each product may have several Masters, and there is an overall Masters Coordinator who is a member of the L&T Steering Committee.

Masters are asked to serve other users (and, under some circumstances, DEC), as a resource on products within their competence. In addition to being listed in the L&T Masters Directory (published in the newsletter) as available for occasional telephone consultation, Masters may act as 'Doctors' at Symposium Clinics, present Symposium sessions on the products of interest to them, field test products, interact with DEC product managers when appropriate, or act as a reference for a product for Digital salespeople. Especially on mature products, the SIG is anxious for knowledgeable users to offer product tutorial sessions at Symposia, and Masters can be of great help here. At Symposia, Masters will wear an identifying button bearing the legend "Ask Me About....." and the name of the language or tool in which he/she specializes.

If you'd like to serve as an L&T Master, please mark the products on which you are willing to answer questions with an "M" (for Master). Please mark any other products running at your site with an "A" (for "also running") to provide users with a broader picture of your facilities. (Although not an L&T product, Mumps is included here at the request of the Mumps SIG as a service to Mumps users). You may request removal of your name from the Masters Directory at any time, although you may continue to be listed for a month or two, because of publication lead times.

I am qualified to act as an L&T Master for the following products:

- Debug
- Bliss
- CMS
- TPU
- C
- Test Manager
- Pascal
- Basic
- MMS
- EVE
- Ada
- Runoff & DSR
- Fortran
- Cobol
- LSE
- EDT
- APL
- \TeX\ & \LaTeX\!
- Document
- Dibol
- SCA
- TECO
- RPG
- Cobol Generator
- VAX Notes
- Emacs
- PCA
- PL/I
- Scan
- Software Project Mgr

Briefly describe your experience with those you checked.

How long have you held your present position?

Are you able to attend at least one symposium each year?

Users are encouraged to seek assistance with products by calling appropriate Masters listed in the Directory. As a Master, your name and telephone number will be published in the Masters Directory, and users will call on you for limited help from time to time. Please check, below, any additional activities you might do:

- Field-test new versions of your product at your work site.
- Provide feedback on the product when needed by its DEC product manager.
- Act as a reference for the product at the request of Digital Sales or Marketing people.

Mail to: Dena Shelton, L&T SIG Masters Coordinator, Cullinet Software, Inc., 2860 Zanker Road, Suite 206, San Jose, CA 95134.

1 Ada is a trademark of the DoD
Languages & Tools SIG
WISHLIST QUESTIONNAIRE

Name: ____________________________ Title ____________________________

Company: ____________________________________________________________________________________

Address: _______________________________________________________________________________________

______________________________________________________________________________________________

Phone: ( ) ____________________________ Date: ____________________________

Network Address: ______________________________________________________________________________

The Languages & Tools SIG is principally concerned with the DEC and public domain software products listed below. If your request directly involves one of these products, please check which one (if you have more than one request, please use a separate form for each):

- [ ] Debug
- [ ] Bliss
- [ ] CMS
- [ ] TPU
- [ ] C
- [ ] Test Manager
- [ ] Pascal
- [ ] Basic
- [ ] MMS
- [ ] EVE
- [ ] Ada
- [ ] Runoff & DSR
- [ ] Fortran
- [ ] Cobol
- [ ] LSE
- [ ] EDT
- [ ] APL
- [ ] TeX & \LaTeX
- [ ] Document
- [ ] Dibol
- [ ] SCA
- [ ] TECO
- [ ] RPG
- [ ] Cobol Generator
- [ ] VAX Notes
- [ ] Emacs
- [ ] PCA
- [ ] PL/I
- [ ] Scan
- [ ] Software Project Mgr

If your request or suggestion doesn’t relate to one of the products listed above, check which one of the following Language & Tools SIG topics it concerns:

- [ ] Newsletter
- [ ] Symposium Sessions
- [ ] Pre-Symposium Seminars
- [ ] Masters Program
- [ ] Working Group Activities
- [ ] Session Notes
- [ ] Information Folder
- [ ] SIG Tape
- [ ] DECUS Store Item
- [ ] Other L&T SIG topic: ____________________________

Wish List Request—brief description: ________________________________________________________________

______________________________________________________________________________________________

______________________________________________________________________________________________

______________________________________________________________________________________________

______________________________________________________________________________________________

______________________________________________________________________________________________

______________________________________________________________________________________________

Complete description—please explain your request thoroughly; don’t assume we know details of other products or services; give examples.

______________________________________________________________________________________________

______________________________________________________________________________________________

______________________________________________________________________________________________

______________________________________________________________________________________________

______________________________________________________________________________________________

______________________________________________________________________________________________

______________________________________________________________________________________________

Mail to: Shava Nerad, L&T Wishlist Coordinator, MIT, 77 Mass Ave. W91-219A, Cambridge, MA 02139; (617)253-7438
DATAGRAMs are short messages, comments, requests, or answers that are published in NETwords. Please fill in the sections below and send the DATAGRAM to:

JUDI MANDL
UCONN HEALTH CENTER
263 FARMINGTON AVENUE, BLDG. #19
FARMINGTON, CT 06032

Title: ____________________________________________

Message: __________________________________________
 __________________________________________
 __________________________________________
 __________________________________________
 __________________________________________
 __________________________________________
 __________________________________________
 __________________________________________
 __________________________________________
 __________________________________________

Your Name: __________________________________________
Address: __________________________________________
Telephone: __________________________________________

If this is a reply to a previous DATAGRAM, what #? __
Signature: __________________________________________ Date: ___
OFFICE AUTOMATION SIG
SYSTEM IMPROVEMENT REQUEST BALLOT

DECUS Membership Number __________

INSTRUCTIONS: System Improvement Request (SIR) Ballots allow you, the user, to assist in the prioritization of the submitted SIR's before they are forwarded to Digital. The total number of points which you may allocate on this ballot may not exceed 100 points (absolute value). No more than 10 points may be given to any single SIR. Your ballot must be received by MARCH 28 to be counted.

<table>
<thead>
<tr>
<th>SIR NUMBER</th>
<th>POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL 100 POINTS
E. Catherine Ditamore
ARA Services
Corp MIS
The ARA Tower
1101 Market Street
Philadelphia, Pa. 19107
## RT-11 WISH LIST SURVEY

Name (optional)  

Address (optional)  

DECUS Number (optional)  

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>3.1</td>
<td>3.7u</td>
<td>3.13a</td>
<td>5.1b</td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>3.2a</td>
<td>3.7v</td>
<td>3.13b</td>
<td>5.2a</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>3.2b</td>
<td>3.7w</td>
<td>3.13c</td>
<td>5.2b</td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td>3.2c</td>
<td>3.7x</td>
<td>3.13d</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>3.2d</td>
<td>3.7y</td>
<td>3.14</td>
<td>6.2a</td>
<td></td>
</tr>
<tr>
<td>1.6</td>
<td>3.2e</td>
<td>3.7z</td>
<td>3.15</td>
<td>6.2b</td>
<td></td>
</tr>
<tr>
<td>1.7a</td>
<td>3.3a</td>
<td>3.7aa</td>
<td>3.16</td>
<td>6.2c</td>
<td></td>
</tr>
<tr>
<td>1.7b</td>
<td>3.3b</td>
<td>3.7bb</td>
<td>3.17a</td>
<td>6.2d</td>
<td></td>
</tr>
<tr>
<td>1.8</td>
<td>3.3c</td>
<td>3.7ccc</td>
<td>3.17b</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>1.9a</td>
<td>3.3d</td>
<td>3.7dd</td>
<td>3.17c</td>
<td>6.4a</td>
<td></td>
</tr>
<tr>
<td>1.9b</td>
<td>3.4a</td>
<td>3.7ee</td>
<td>3.17d</td>
<td>6.4b</td>
<td></td>
</tr>
<tr>
<td>1.9c</td>
<td>3.4b</td>
<td>3.8a</td>
<td>3.17e</td>
<td>6.4c</td>
<td></td>
</tr>
<tr>
<td>1.9d</td>
<td>3.4c</td>
<td>3.8b</td>
<td>3.17f</td>
<td>6.4d</td>
<td></td>
</tr>
<tr>
<td>1.10</td>
<td>3.5a</td>
<td>3.8c</td>
<td>3.18</td>
<td>6.5</td>
<td></td>
</tr>
<tr>
<td>1.11</td>
<td>3.5b</td>
<td>3.9a</td>
<td>3.19a</td>
<td>6.6a</td>
<td></td>
</tr>
<tr>
<td>1.12</td>
<td>3.6a</td>
<td>3.9b</td>
<td>3.19b</td>
<td>6.6b</td>
<td></td>
</tr>
<tr>
<td>1.13</td>
<td>3.6b</td>
<td>3.9c</td>
<td>3.19c</td>
<td>6.6c</td>
<td></td>
</tr>
<tr>
<td>1.14</td>
<td>3.6c</td>
<td>3.9d</td>
<td>4.1</td>
<td>6.6d</td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>3.6d</td>
<td>3.9e</td>
<td>4.2a</td>
<td>6.7</td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td>3.6e</td>
<td>3.9f</td>
<td>4.2b</td>
<td>6.8a</td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>3.6f</td>
<td>3.9g</td>
<td>4.3</td>
<td>6.8b</td>
<td></td>
</tr>
<tr>
<td>2.4</td>
<td>3.6g</td>
<td>3.9h</td>
<td>4.4a</td>
<td>6.8c</td>
<td></td>
</tr>
<tr>
<td>2.5</td>
<td>3.7a</td>
<td>3.9i</td>
<td>4.4b</td>
<td>6.8d</td>
<td></td>
</tr>
<tr>
<td>2.6</td>
<td>3.7b</td>
<td>3.9j</td>
<td>4.5a</td>
<td>6.8e</td>
<td></td>
</tr>
<tr>
<td>2.7</td>
<td>3.7c</td>
<td>3.9k</td>
<td>4.5b</td>
<td>7.</td>
<td></td>
</tr>
<tr>
<td>2.8</td>
<td>3.7d</td>
<td>3.10a</td>
<td>4.6</td>
<td>8.</td>
<td></td>
</tr>
<tr>
<td>2.9</td>
<td>3.7e</td>
<td>3.10b</td>
<td>4.7a</td>
<td>9.1</td>
<td></td>
</tr>
<tr>
<td>2.10</td>
<td>3.7f</td>
<td>3.10c</td>
<td>4.7b</td>
<td>9.2a</td>
<td></td>
</tr>
<tr>
<td>2.11</td>
<td>3.7g</td>
<td>3.10d</td>
<td>4.7c</td>
<td>9.2b</td>
<td></td>
</tr>
<tr>
<td>2.12</td>
<td>3.7h</td>
<td>3.10e</td>
<td>4.7d</td>
<td>9.3a</td>
<td></td>
</tr>
<tr>
<td>2.13</td>
<td>3.7i</td>
<td>3.10f</td>
<td>4.7e</td>
<td>9.3b</td>
<td></td>
</tr>
<tr>
<td>2.14</td>
<td>3.7j</td>
<td>3.10g</td>
<td>4.7f</td>
<td>10.1</td>
<td></td>
</tr>
<tr>
<td>2.15</td>
<td>3.7k</td>
<td>3.10h</td>
<td>4.7g</td>
<td>10.2</td>
<td></td>
</tr>
<tr>
<td>2.16</td>
<td>3.7l</td>
<td>3.10i</td>
<td>4.7h</td>
<td>10.3</td>
<td></td>
</tr>
<tr>
<td>2.17</td>
<td>3.7m</td>
<td>3.10j</td>
<td>4.7i</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.18</td>
<td>3.7n</td>
<td>3.10k</td>
<td>4.7j</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.19</td>
<td>3.7o</td>
<td>3.10l</td>
<td>4.7k</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.20</td>
<td>3.7p</td>
<td>3.10m</td>
<td>4.7l</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.21</td>
<td>3.7q</td>
<td>3.10n</td>
<td>4.7m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.22</td>
<td>3.7r</td>
<td>3.11a</td>
<td>4.7n</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.23</td>
<td>3.7s</td>
<td>3.11b</td>
<td>4.7o</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.24</td>
<td>3.7t</td>
<td>3.12</td>
<td>5.1a</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Send Responses to: RT-11 Wish List Survey  
Multiware, Inc.  
2121-B Second St. Suite 107  
Davis, CA 95616  

OU-21
System Improvement Request Submission form

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)
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
"The Following are Trademarks of Digital Equipment Corporation"

<table>
<thead>
<tr>
<th>ALL-IN-1</th>
<th>MicroVAX I (et.al)</th>
<th>RX02 (et.al)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATATRIEVE</td>
<td>PDP-11/24 (et.al)</td>
<td>TOPS-10</td>
</tr>
<tr>
<td>DEC</td>
<td>PDP-11</td>
<td>TOPS-20</td>
</tr>
<tr>
<td>DECconnect</td>
<td>P/OS</td>
<td>VAX</td>
</tr>
<tr>
<td>DECnet</td>
<td>Rainbow</td>
<td>VAX DATATRIEVE</td>
</tr>
<tr>
<td>DECnet/E</td>
<td>ReGIS</td>
<td>VAXcluster</td>
</tr>
<tr>
<td>DECUS</td>
<td>RSTS</td>
<td>VAXELN</td>
</tr>
<tr>
<td>GIGI</td>
<td>RSX</td>
<td>VAXstation</td>
</tr>
<tr>
<td>HSC-50</td>
<td>RSX-11M</td>
<td>VMS</td>
</tr>
<tr>
<td>IAS (et. al)</td>
<td>RSX-11M-PLUS</td>
<td>VT50 (et.al)</td>
</tr>
<tr>
<td>LA50 (et. al)</td>
<td>RT-11</td>
<td>WPS/PLUS</td>
</tr>
<tr>
<td>MicroVAX</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Copyright © DECUS and Digital Equipment Corporation 1987
All Rights Reserved

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation or DECUS. Digital Equipment Corporation and DECUS assume no responsibility for any errors that may appear in this document.

It is assumed that all articles submitted to the editor of this newsletter are with the authors' permission to publish in any DECUS publication. The articles are the responsibility of the authors and, therefore, DECUS Digital Equipment Corporation, and the editor assume no responsibility of liability for articles or information appearing in the document. The views herein expressed are those of the authors and do not necessarily express the views of DECUS or Digital Equipment Corporation.

AT&T is a trademark of American Telephone & Telegraph Company; Ada is a registered trademark of U.S. Government; IBM is a registered trademark of International Business Machines Corporation; MS-DOS is a trademark of Microsoft Corporation; MS is a registered trademark of Microsoft Corporation; PC/XT is a trademark of International Business Machines Corporation; RAF is a trademark of Datability Software Systems, Inc.; TSX-PLUS is a trademark of S&H Computer Systems, Inc.; UNIX is a registered trademark of American Telephone & Telegraph Company; Xerox is a registered trademark of Xerox Corporation.

Production Staff:
Beverly Welborne: Communications Committee Chair
R.E. Center
Don Golden: SIG Publications Chair
Shell Oil
Judy Arsenault: Publications Manager
DECUS
Judy Tessier: Phototypographer/Graphics Designer
DECUS

Circulation: 5833
STATUS CHANGE

Please notify us immediately to guarantee continuing receipt of DECUS literature. Allow up to six weeks for change to take effect.

( ) Change of Address
( ) Please Delete My Membership Record
( ) I Do Not Wish To Remain A Member

DECUS Membership No: _______
Name: ______________________
Company: ____________________
Address: ____________________
State/Country: _____________
Zip/Postal Code: ____________

Mail to: DECUS - Attn: Subscription Service
219 Boston Post Road, BP02
Marlboro, Massachusetts 01752-1850
USA