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# DECUS U.S. CHAPTER SIGs NEWSLETTERS

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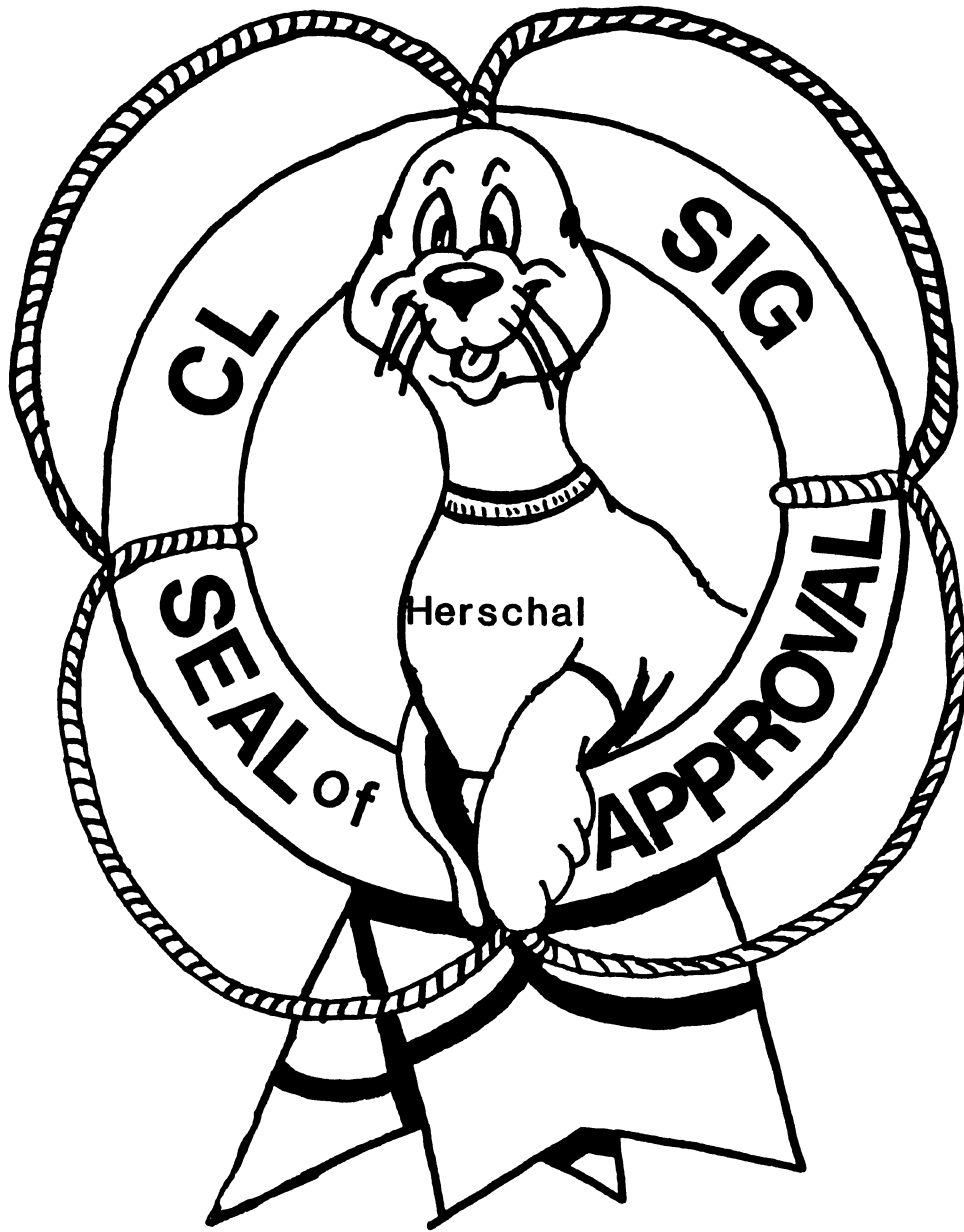
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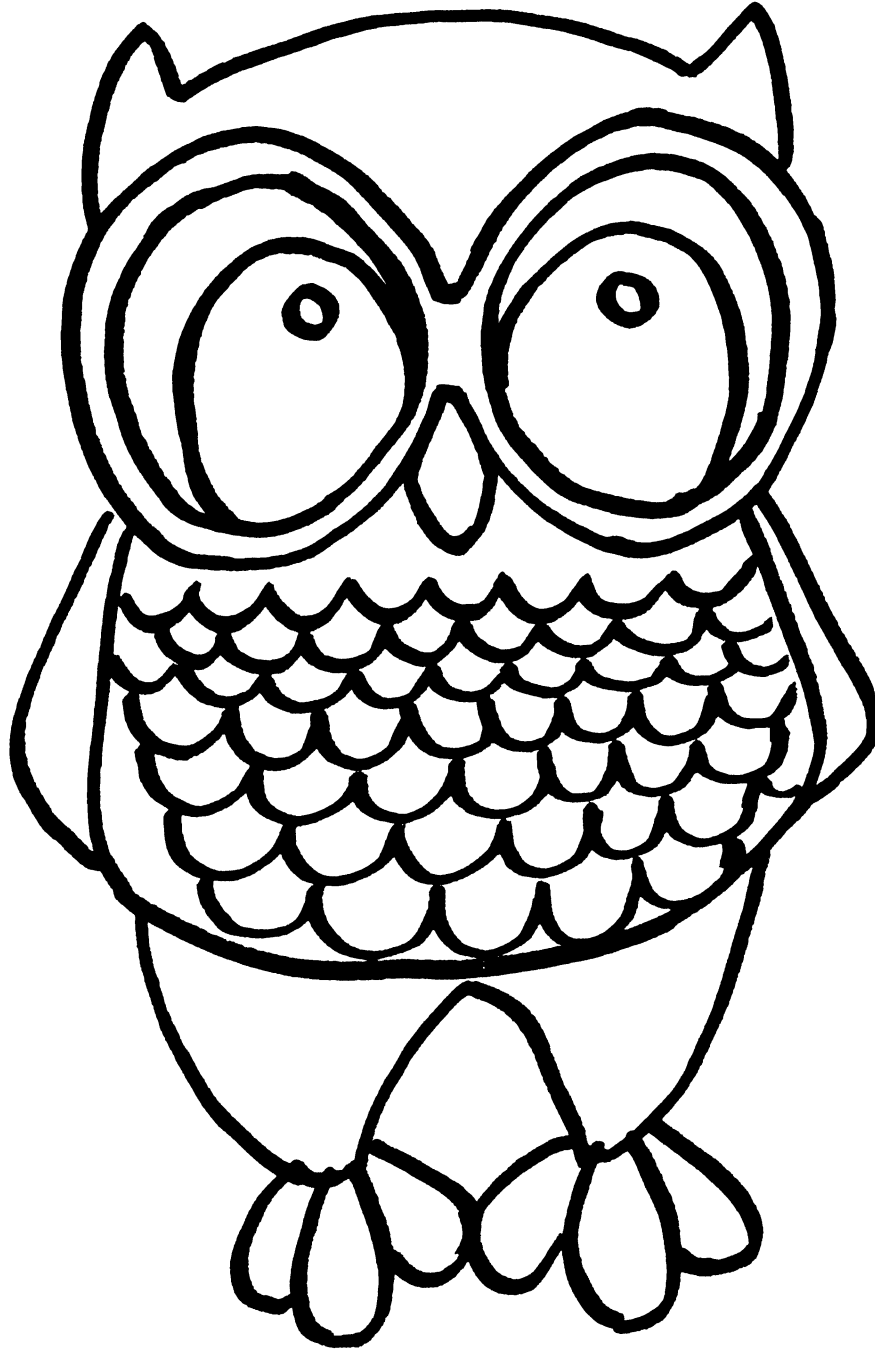
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Letters and articles for publication are requested from members of the SIG. They may include helpful hints, inquiries to other users, reports on SIG business, summaries of SPR's submitted to DEC, etc. Machine readable input is highly desirable.

Submitters should keep in mind the DECUS policy on commercialism.

xxxxxxxxxxxxxxxx here goes the article by alan schultz

WHY USE A DATA DICTIONARY

by Alan R. Schultz

As a member of the DMS SIG Steering Committee, I managed to give a session at four consecutive Symposia (S84 - F85) on why you should use the VAX CDD. In this article I am addressing the more wide open question of 'Why use a Data Dictionary at all?'

The first aspect to look at in this question is 'What really goes into the data dictionary?' A data dictionary is used as a repository for definitions of the data. While you would use a DBMS like Rdb/VMS or a simpler file management system such as VMS's RMS to physically store your data, the data dictionary is a meta-data base with the description of your data. Ie., it contains data about your data.

So now we have a simple definition of what goes into a data dictionary. What makes this single location of definitions about the data so important? Consider how much the data located in your computer systems is worth to the company you work for. More than likely your company has not placed a monetary value on this data, but where would the company be without this data. Or what would happen if a competitor managed to acquire this data.

In order to assure themselves that the 'data' does not get lost or acquired by a competitor, companies spend megabucks on computer security. And yet what is done about the definitions of what all of this data means?

Quite often, very little is done. Descriptions of the corporate data records exist on disk in multitudes of small little copy files. Many times programmers will have their own little private descriptions of the data files. This is not done out of spite, but is done because the programmer feels that it makes work easier.

This may be true initially, but it also quickly leads to the biggest problem in this situation. I am referring to the problem of control. If the programmer, or any other user, retains their own description of the data, then there is no control of the descriptions when a change is made to the data file.

While the company is spending its time watching the physical security of the data, the logical security of the data may be in jeopardy due to skewed definitions. This lack of control over the definition of the data due to the scattering of the potential definitions points out the greatest advantage in having a data dictionary.

From what I have said so far, I think you can see that in my opinion it is just as important to have secure control over the definitions of data as it is to have secure control over the data itself.

Note that almost all vendors of a DBMS provide a form of a data dictionary that must be used to keep the data definitions synchronized with the actual DBMS data files. I feel that it is just as necessary to use a data dictionary to keep non-DBMS data files in synchronization with the data definitions.

When you take a look at the DEC world, you can see that there must be some sort of agreement with this statement. The VAX Common Data Dictionary (CDD) is at the heart of the VAX Information Architecture. By being at the heart of this system, data definitions are available to such VAX products as DATATRIEVE, DBMS, TDMS, ACMS, and Rdb/VMS. Since the CDD definitions are available to Rdb, they should also be available to Teamdata and Rally. In addition, the definitions in the CDD are also available to many of the VAX languages (COBOL, BASIC, DIBOL, and others).

By having definitions available to such a multitude of products, one can see how a measure of control over the definitions made available to the user environment can and must be possible.

Some readers may feel obliged to point out that with most DBMS systems, one must recompile programs with the newest definitions (schemas) or else the program will fail the DBMS integrity checks. On the other hand, file management systems such as RMS do not require such integrity checks, and so programs may not get recompiled when definitions change.

I must agree with this statement, but by using a mechanism such as the CDD, you have the base on which to build your own controls. The organization for which I work does not use any of DEC's DBMS products, and yet we do use the CDD. This is because by using some of the features available in the CDD, we are able to instigate our own control mechanism's.

The two major controls we were able to produce from the CDD was a cross-references of programs that used any particular definition and a listing of when the programs were last compiled compared to the last time the definition was compiled in the CDD. These two control mechanism's alone are sufficient to allow supervisors of various application areas to monitor and control the correct usage of data definitions.

In addition to these control mechanisms, which use the CDD's AUDIT feature, it is also possible to control who has access to the data definitions. With the CDD, this is done through the

use of an Access Control List (ACL). By using an ACL entry, entire groups of users can be denied access to one portion of the data dictionary; and yet still have full access to other portions of the dictionary.

By having this type of feature available in a data dictionary, not only does the organization have control over the definitions that are being used, but there is control over who has access to the definitions.

This all ties back to why should a data dictionary be used.

A data dictionary should be used for the control that is made available. I have mentioned the following types of control in this article:

- control over the data definitions available to the user, be it a programmer or an end user;
- control over which programs use the current definitions by the use of monitoring definition activity; and
- control over what users even have access to the definitions stored in the dictionary.

These are obviously not all of the control mechanisms that should be available from a data dictionary. And as I mentioned earlier, the second control feature has to be developed by the user if you are using DEC's CDD; but the capability is there. But I feel that these are the most important of the control mechanisms.

After all, if it is the intention of an organization to have their data secure, then they should also use a data dictionary and have their data about the data secure.

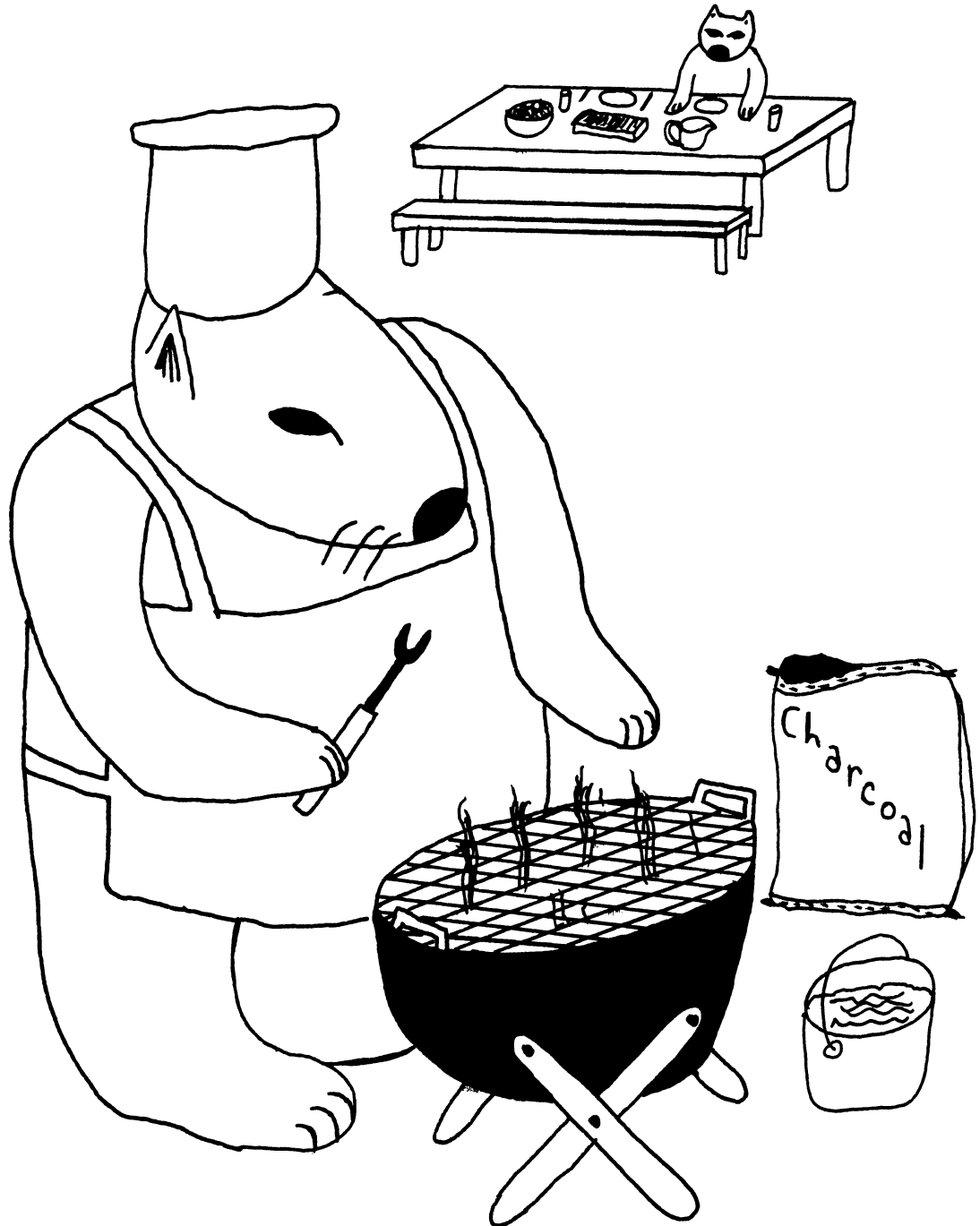
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Volume 7 Number 12



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## Contributions

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

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

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About the Cover: "Wombat Enjoying the Summer Months"

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## From the Editor's Pen

Donald E. Stern, Jr., Warner Lambert Company, Milford, CT

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Both contributors to and the editorial staff of this newsletter volunteer many hours of their time order to publish this newsletter. I would like to take this time to publicly thank each and every one. Without you, there would be no newsletter... Thanks.

As this issue is being prepared, the July issue of the newsletter has not yet been published. The June issue, however, recently arrived in the mail and is one of the worst documents, in terms of appearance, that I have ever seen. Much of the quality work which goes into publishing the newsletter has, in my opinion, been lost in the publication process. I, for one, feel that you, the subscribers to this newsletter, deserve an explanation for the recent drop in quality of the publication. Last year, DECUS management decided to combine the newsletters of the various SIG's into a single document and to offer this "Combined Newsletter" to the membership for a price far below the price of individual subscriptions to the newsletters of the various SIG's. The idea had a good deal of merit. As a subscriber, I welcomed the decision because I was able to see more at a lower cost. Subscriptions, however, did not grow to the level hoped and production costs grew so it was decided to begin publishing the newsletter in a "two up - landscape mode". By reducing the number of physical pages, publication costs would be reduced and subscription costs could be maintained.

Before the "two up" decision, the appearance as well as the content of each SIG's newsletter was the result of the efforts of the particular newsletter editor. "Two up" demands a level of cooperation between the various editors and SIG's because a single reduction factor is used for ALL the newsletters. Guidelines regarding page layouts have been provided to all the editors but have been ignored by many. The result is something like the June 1986 Newsletter.

My plea is this. Editors, Communications Committee, SIG Council, Management Council, and DECUS staff... Let's agree to have standards and ENFORCE them. The DECUS members have paid their money and deserve better than they've been getting.

I sincerely hope that, by the time this column appears in print, we, who are responsible for this publication, have been able to come to some agreement and that the appearance of this issue approaches perfection.

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**Accessing Remote RMS Files Using VAX-11 Datatrieve**  
by  
**Ray Ferrara - Internal MIS Staff, Digital Equipment Corp.**

**Edited by: Donald E. Stern, Jr. - Warner Lambert Company**

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[Ed. This article is based upon a session presented by Ray Ferrara at the Spring 1986 DECUS Symposium held in Dallas, Texas. The article was prepared using a session handout and the audio tape of the session.]

## 1.0 Introduction

There are two basic ways that Datatrieve supports to access remote data. There is no "official" name for these ways but they can be referred to as the "FAL" way and the "DDMF" way. These, FAL and DDMF, are the names of the network objects that Datatrieve actually connects to in order to get it's work done. These two mechanisms will be described in detail. Some relevant metrics and the results of testing, as well as some guidelines for the selection of a particular method will be discussed.

Whether the "FAL" way or the "DDMF" way is used is determined by the way in which the domain is defined. A domain is a dictionary object which maps a record definition to a physical data file. Using FAL, or File Access Listener, RMS on the local node communicates with RMS on the remote node. This is a very low level protocol. DDMF, or Distributed Data Manipulation Facility, employs a higher level protocol wherein the local Datatrieve image sends "Datatrieve-like" commands over the network to the remote Datatrieve image.

## 2.0 Defining Domains to Access Remote Data

### 2.1 Using FAL

A typical domain definition, in which the FAL method is used, might look like the following.

```
DEFINE DOMAIN EMPLOYEES USING EMPLOYEE REC ON
REMOTE::REMOTE$DISK:[remotedir]EMPLOYEES.DAT;
```

This definition uses the same syntax as a local domain definition but it uses the remote file specification or a logical name which translates to a remote file specification. In addition, the remote file must be world-readable (or the local USERNAME must have DECnet proxy access to it.) Since it is defined identically to a local domain, Datatrieve does nothing special. It treats the domain the same as if it were a file on a local node, passing calls to the RMS facility to access the data.

RMS, on the other hand, must access the FAL object on the remote node. FAL accepts low-level, record oriented RMS calls from the local node and returns complete records (raw data) and status codes.

### 2.2 Using DDMF

Unlike a local domain definition, or one defined in which the FAL object is used to access data, domain definitions which cause the DDMF to be used do have a different Datatrieve syntax. A typical domain definition looks like the following.

```
DEFINE DOMAIN EMPLOYEES USING
CDD$TOP.remote-path.EMPLOYEES AT
REMOTE'username password';
```

This is profoundly different from a "normal" domain definition in that what follows the USING is a domain specification on the remote node specified after the AT. The 'username password' sequence can be ignored if a proxy account exist on the remote node or if the default DECnet account has sufficient privilege to access the necessary remote dictionary objects and files. It should be pointed out that a local domain definition doesn't necessarily have to exist for DDMF to be used. One can READY a remote domain as well using the following syntax.

```
READY CDD$TOP.remote-path.EMPLOYEES AT
REMOTE'username password'
```

When domains defined this way are used the local Datatrieve prepares 'DTR-like' high level statements and commands and sends these to the DDMF object on the remote node. This object invokes the remote Datatrieve image and send back processed data. Processed data in this case means the requested data. In other words, if a Datatrieve statement to print three fields were issued, the remote object would send back a record stream consisting of only those three fields.

### 3.0 Metrics

Two basic categories of metrics will be discussed. Performance metrics, or measures of performance, which can be obtained from a local ".LOG" file (if you run your procedure in batch) and from the remote NETSERVER.LOG file. In addition to performance, there is a class of intangibles which can be classified as Usability and Manageability metrics. The only sources of data for these are in the form of documentation and general experience.

#### 3.1 Usability & Manageability Metrics

The advantages of using the "FAL" way lie in the fact that no special software is needed on the remote node. In fact, not even Datatrieve is required on the remote node. In addition, FAL is



generally very reliable. The disadvantages of using FAL include the fact that domain and record definitions for remote data must exist on the remote node (even if identical definitions exist on the remote node(s).) This makes maintainability of the definitions much more complicated than if dictionary objects were defined only in one central location. Additionally, this method is not really applicable outside of the VAX/VMS environment since it involves VAX'es talking to VAX'es.

The advantages of the 'DDMF' way include the ability to centralize the definitions of dictionary objects. This method also permits communication with the Datatrieve images running on DEC-20's and PDP-11's, including PRO's, as well. One disadvantage is that all nodes must have compatible versions of Datatrieve. In addition, the DDMF object must exist on the remote node. This means that, when the system manager installed Datatrieve on the remote node, he/she had to answer 'YES' to the question regarding remote access and, after the installation, use the NCP utility to make the DDMF object known. The third disadvantage of using DDMF, and one of the most significant, is that there will be a higher 'peak load' on the remote node since the remote Datatrieve image will be activated. Fourth, under some circumstances, 'DDMF synchronization errors' can occur. Finally, a logical name cannot be used for the remote node specification. In general, however, DDMF works very well.

### 3.2 Performance Metrics

Performance metrics are tangibles which can be measured. One of the most important, from the "user's" point of view, is elapsed time. In order for this measure to be valid, you must run your tests with identical (or nearly identical) loads on the system. [Ed. From the system manager's point of view, elapsed time is probably one of the least important measures of an application's performance.] There are other factors, some which affect elapsed time and some which do not. These are CPU-related performance measures and are applicable to both the local and remote nodes. The standard CPU and I/O statistics are available in the local .LOG files and in the remote NETSERVER.LOG files. [Ed. One can also use the Datatrieve functions FN\$INIT\_TIMER and FN\$SHOW\_TIMER on the local node to gather statistics. Another source of data is the VMS Accounting file.] There is another source of metrics which have to do with the network usage. Generally, this is much more important for wide-area networks than for local-area (Ethernet) networks. Network usage statistics are much more difficult to get and can involve modification of the network objects to get statistics on messages sent, bytes sent, etc.

### 4.0 Testing

#### 4.1 Example of DTR/FAL Session

The following is an example of a DTR/FAL session.

```
DTR> SHOW EMPLOYEES
DOMAIN EMPLOYEES USING EMPLOYEE-REC ON EMPLOYEE_FILE;

DTR> PRINT FN$TRANS_LOG("EMPLOYEE_FILE")

VISION::SAVE$:[FERRARA]EMPLOYEES.DAT

DTR> READY EMPLOYEES SHARED READ

DTR> FIND EMPLOYEES WITH LAST_NAME = "OLSEN"
[3 records found]

DTR> LIST
No record selected, printing whole collection.

BADGE           :          1
LAST_NAME       : OLSEN
FIRST_NAME      : KEN
DEPARTMENT_CODE : VIP

BADGE           : 110000
LAST_NAME       : OLSEN
FIRST_NAME      : FRED
DEPARTMENT_CODE : 34L

BADGE           : 144430
LAST_NAME       : OLSEN
FIRST_NAME      : JOHN
DEPARTMENT_CODE : 68L

DTR> PRINT LAST_NAME OF EMPLOYEES WITH BADGE = 119999

LAST
NAME

FERRARA

DTR> EXIT
```

The following is a listing of the NETSERVER.LOG file produced by the previous session.

```
$ SET NOVERIFY
```

```
-----
Connect request received at 26-APR-1986 16:00:42.03
from remote process DSTAR:"0=FERRARA"
for object "SYS$SYSROOT:[SYSEXEC]FAL.EXE"
-----
```

FERRARA job terminated at 26-APR-1986 16:06:13:51  
 Accounting information  
 Buffered I/O count: 112 Peak working set size: 279  
 Direct I/O count: 68 Peak page file size: 675  
 Page faults: 629 Mounted volumes: 0  
 Charged CPU time: 0 00:00:06.68 Elapsed time: 0 00:05:37.64

\*\*\* NOTE: Elapsed time is misleading for FAL jobs, since DECnet leaves the NETSERVER.LOG file open for several minutes in case of additional connects. Get elapsed time from local log files.

Also, make sure the netserver.log statistics apply only to desired operations. (i.e. Wait 10 or so minutes before initiating another operation to get another NETSERVER.LOG.)

#### 4.2 Example of DTR/DDMF Session

The following is an example of a DTR session which uses DDMF to access data on a remote node.

DTR> READY CDD\$TOP.FERRARA.EMPLOYEES AT  
 VISION"FERRARA MUMBLEJUMBLE"

DTR> FIND ALL EMPLOYEES WITH LAST\_NAME="OLSEN"  
 [3 records found]

DTR> LIST  
 No record selected, printing whole collection.

BADGE : 1  
 LAST\_NAME : OLSEN  
 FIRST\_NAME : KEN  
 DEPARTMENT\_CODE : VIP

BADGE : 110000  
 LAST\_NAME : OLSEN  
 FIRST\_NAME : FRED  
 DEPARTMENT\_CODE : 34L

BADGE : 144430  
 LAST\_NAME : OLSEN  
 FIRST\_NAME : JOHN  
 DEPARTMENT\_CODE : 68L

DTR> PRINT LAST\_NAME OF EMPLOYEES WITH BADGE = 119999

LAST  
 NAME

FERRARA

DTR> EXIT

The following is a listing of the NETSERVER.LOG file produced by the previous session.

\$ SET NOVERIFY

```
-----
Connect request received at 26-APR-1986 15:26:35.13
from remote process DSTAR::"0=FERRARA"
for object "SYSS$SYSROOT:[SYSEXE]DDMF.COM"
-----
```

```
VAX Datatrieve Remote Server
Protocol 3.2
READY CDD$TOP.FERRARA.EMPLOYEES AS DTR$D0 READ;
Statement completed successfully.
DISPLAY "READY";
Statement completed successfully.
BEGIN BEGIN FIND DTR$C0 IN DTR$D0 WITH (DTR$C0 . EMPLOYEE_REC .
LAST_NAME EQ "OLSEN"); DISPLAY "FIND"; END; END;
[3 records found]
Statement completed successfully.
BEGIN BEGIN DECLARE PORT DTR$0 DTR$GROUP STRUCTURE.
DTR$1 DATATYPE IS UNSIGNED NUMERIC SIZE IS 6 DIGITS .
DTR$2 DATATYPE IS TEXT SIZE IS 18 CHARACTERS .
DTR$3 DATATYPE IS TEXT SIZE IS 11 CHARACTERS .
DTR$4 DATATYPE IS TEXT SIZE IS 4 CHARACTERS .
END DTR$GROUP STRUCTURE. END.; FOR DTR$2 IN CURRENT BEGIN
STORE DTR$0 USING BEGIN DTR$1 = EMPLOYEE_REC . BADGE;
DTR$2 = EMPLOYEE_REC . LAST_NAME ;
DTR$3 = EMPLOYEE_REC . FIRST_NAME ; DTR$4 =
EMPLOYEE_REC . DEPARTMENT_CODE ; END; END; DISPLAY "DTR$0";
END; END;
Statement completed successfully.
BEGIN BEGIN DECLARE PORT DTR$0 DTR$GROUP STRUCTURE.
DTR$1 DATATYPE IS TEXT SIZE IS 18 CHARACTERS . END DTR$GROUP
STRUCTURE. END.; FOR DTR$C0 IN DTR$D0 WITH (DTR$C0 .
EMPLOYEE_REC . BADGE EQ 119999 ) BEGIN STORE DTR$0 USING BEGIN
DTR$1 - EMPLOYEE_REC . LAST_NAME ; END;
END; DISPLAY "DTR$0"; END; END;
Statement completed successfully.
FINISH DTR$D0; DISPLAY "FINISH";
Statement completed successfully.
Statement completed successfully.
VAX DATATRIEVE Remote Server terminating with status 00000001
FERRARA job terminated at 26-APR-1986 15:27:46:59
Accounting information
Buffered I/O count: 144 Peak working set size: 868
Direct I/O count: 108 Peak page file size: 904
Page faults: 1053 Mounted volumes: 0
```

Charged CPU time: 0 00:00:09.41 Elapsed time: 0 00:01:17.29

Examination of this LOG file reveals the syntax by which the DDMF object passes commands and statements to the remote Datatrieve. Closer examination reveals that the data is passed back through the use of ports. A port is declared and datatypes are declared for the port. Data, then, is stored into the port.

Normally, however, the accounting information shown is not stored into the NETSERVER.LOG file. The file SYS\$SYSTEM:DDMF.COM on the remote node must be modified as follows.

```
$!+
$! Remote VAX DATATRIEVE Server (aka DDMF)
$! Version: T2.0-3/DECNET Phase 4
$!-
$ run sys$system:DDMF.EXE
$! logout/brief          !this line commented out
$ logout                !this line substituted
```

It is possible to get even more information by spawning or submitting a MONITOR job from DDMF.COM. For FAL, you must change the FAL object on the remote node to point to FAL.COM rather than FAL.EXE.

#### 4.3 Test Results

The previous examples have conceptually described the method by which statistics were gathered. Several independent in-house experiments have been conducted. What is presented here, represents a sampling of this experimentation. Many different types of operations were tested. In one case, there were 44 different procedures to PRINT and STORE, using INDEXED and SEQUENTIAL files, using all fields, using some fields, using multiple domains, etc. A number of different configurations, using MicroVAX II, 750's, 780's and using local and wide area, networks were tested.

To develop the test results show below, the following two procedures were used.

#### TEST3X

TEST3X7 accesses an indexed file using a "find all" condition and calculates the count and average hourly rate for all 46,000 employee records in the file.

```
PRODEDURE TEST3X
READY EMP46000K
PRINT SKIP 2, "NO BEGINNING TEST 3X7" , SKIP 2
SHOW TEST3X
FIND ALL EMP46000K
```

```
ON TEST3X7.TMP
BEGIN
PRINT COUNT OF ALL CURRENT
PRINT AVERAGE(HOURLY_RATE) OF ALL CURRENT
END
END-PROCEDURE
```

#### TEST4D

TEST4D1 also accesses the same indexed file and produces the same hourly rate statistics, but for a compound RSE which yields only 446 of the total 46,000 employees.

```
PROCEDURE TEST4D
READY EMP46000K
PRINT SKIP 2, "NO BEGINNING TEST 4D1", SKIP 2
SHOW TEST4D
FIND ALL EMP46000K WITH
 (LOCATION EQ "ABO","AGO","APO","ASO","CXO","DCO","HLO",
 "MKO","MLO","MRO","NIO","NRO","OGO","PKO","PNO",
 "SGO","SPO","WFO","WMO") AND (JOB_CODE EQ "AC0",
 "AC1","AC2","AC3","AC4","AC5","AC6","AC7","AC8",
 "PA0","PA1","PA2","PA3","PA4","PA5","PA6","PA7",
 "PA8") AND (STATE_CODE EQ "MA")
```

```
ON TEST4D1.TMP
BEGIN
PRINT COUNT OF ALL CURRENT
PRINT AVERAGE(HOURLY_RATE) OF ALL CURRENT
END
END-PROCEDURE
```

For this test, the local system was a MicroVAX II and the remote system was a VAX 11/780 connected via an Ethernet LAN.

TABLE OF RESULTS

	TEST3X7 LOCAL	TEST3X7 DDMF	TEST3X FAL
Local Statistics			
Local Elapsed	807.38s	1689.26s	3523.00s
Local CPU	437.05s	261.61s	1262.57s
Peak WS Size	883	917	921
Buffered I/O	100	93067	278867
Direct I/O	14532	127	1795
Ave. CPU/ELAP	54.13%	15.49%	35.84%
Network Info			
Bytes Received		1813340	19512400
Bytes Sent		868	1765490
NSP Msgs Rec		93007	278774
NSP Msgs Sent		93007	278774

Connects rec	0	0
Connects sent	1	1
Remote Statistics		
Remote Elap	1672.91s	3502.91s
Remote CPU	1002.59s	1168.29s
Buffered I/O	93057	278789
Direct I/O	14454	12743
Ave CPU/ELAP	59.93%	33.35%

	TEST4X1 LOCAL	TEST4X1 DDMF	TEST4X FAL
Local Elapsed	820.02s	709.35s	1297.40s
Local CPU	564.58s	6.38s	629.27s
Peak WS Size	882	929	890
Buffered I/O	96	1049	55345
Direct I/O	11556	127	169
Ave. CPU/ELAP	68.85%	0.90%	48.39%

Network Info	TEST4X1 LOCAL	TEST4X1 DDMF	TEST4X FAL
Bytes Received		18872	3866450
Bytes Sent		1346	227353
NSP Msgs Rec		978	55256
NSP Msgs Sent		978	55256
Connects rec		0	0
Connects sent		1	1

#### Remote Statistics

Remote Elap	629.89s	1277.31s
Remote CPU	504.94s	319.38s
Buffered I/O	1035	55271
Direct I/O	11482	11390
Ave CPU/ELAP	72.87%	25.00%

#### 4.4 Analysis of Results

One can observe that the procedures took roughly twice as long to run using DDMF than on the local node. Using DDMF, however, was about twice as fast as using FAL. The most dramatic differences show up in the network statistics. Using FAL, the entire file is, in effect, passed over the network. DDMF, however, passes some commands and only the data requested. DDMF, on the other hand, requires more of the remote CPU since the remote Datatrieve is invoked.

#### 5.0 Cautions

DDMF does not handle validation (VALID IF) of data very well. If you try to store invalid data on the remote node, DDMF will abort with a synchronization error.

In order to use forms, the forms product must be present on the local node. If you're using forms and don't fill in all the fields, the missing values are not propagated correctly to the remote node.

These and other restrictions do not apply using the FAL method.

#### 6.0 Guidelines

Neither method is the best for all operations. FAL is generally better in horizontal operations, which are primarily record oriented in nature, such as STORE, MODIFY, or PRINT all fields (at least with a small record stream). For vertical operations, or for streams of records, DDMF is much better.

The guidelines that we use internally are... If the primary activity is updating, use FAL, if the primary activity is retrieval, use DDMF, and if both types of access are needed then use DDMF if possible.

---

Dear Wombat Wizard

WW Editor: Philip A. Naecker - Consulting Engineer, Altadena, CA

---

Dear WW

Many of the departments in my company have used Datatrieve to automate parts of their work. Over the years, we have started to share data. For example, the people in Purchasing use the Vendor Number defined in Accounting Department's AP system, and the accounting department uses the Personnel Department's files and DTR domains to get employee names from employee numbers. Everything is fine until some department decides to restructure their data files and they leave out a key that some other department was using to access the data efficiently. The Datatrieve procedure doesn't stop working (that would produce an error message that we could use to track the problem!). It just stops working efficiently, sometimes taking hours instead of seconds to execute. This is all made more complicated by the fact that many of the accesses are made indirectly via tables, and some of the domains are stored in Rdb rather than ISAM files.

Is there a way to find out which keys DTR needs (or uses) and which ones it doesn't need?

Signed,  
Unkeyed and Unhappy

Dear Unkeyed:

There are a really two issues here: (1) How can I keep this from happening at all, and (2) How do you find out which keys DTR (or Rdb) is using and which ones it's not using.

The first way to solve a problem is to avoid it altogether! That why it's important to set up a mechanism to define the keys in your domain. I suggest you do something like this at your site:

1. Every domain has a corresponding procedure that defines the file used by that domain.
2. The name of the procedure is the same as the name of the domain, with a DEFINE\_FILE\_FOR in front of the domain name. For example, the EMPLOYEES domain would have a procedure DEFINE\_FILE\_FOR\_EMPLOYEES in the same dictionary as the domain.
3. The procedure should carefully and clearly document each key and what it's purpose is. If it doesn't have a purpose, we may want to delete it
4. There should be a complete modification history for the procedure, as shown in the following example.

```
DEFINE PROCEDURE DEFINE_FILE_FOR_EMPLOYEES
!
! This procedure defines the file, allocation, and keys for the
! EMPLOYEES domain. Do not modify the file definition, remove
! or add fields to the record, or change the keys in this file
! without documenting the change in this domain.
!
! P. Naecker - 14-JUN-1983 20:34:13.71
!
DEFINE FILE FOR EMPLOYEES -
  ALLOCATION = 2000,
  KEY = EMPLOYEE_NUMBER(NO DUP, NO CHANGE),
  KEY = COST_CENTER (DUP, CHANGE),
  KEY = SUPERVISOR (DUP, CHANGE),
  KEY = LAST_NAME (DUP, CHANGE),
  KEY = COMPUTER_INITIALS (DUP, CHANGE),
  KEY = BILLING_CLASSIFICATION (DUP, CHANGE);
!
! Modification History:
!
! JAM - 24-JUL-1985 09:43:42.83
! This file is used by compiled COBOL programs. Do not
! change the file definition or key definition without
```

```
! consulting the programs referenced in the CDD Audit
! History.
!
! PAV - 12-JUN-1985 20:36:34.17
! Add COMPUTER_INITIALS index. This index is needed by
! the Information Services Department in the $ WHOIS DCL
! command procedure. Do not remove this key without mod-
! ifying that procedure accordingly.
!
! SWL - 22-DEC-1984 20:40:45.07
! Add an index for BILLING_CLASSIFICATION. This index is
! needed by the CHECK_BILLING_CLASS procedure in
! CDD$TOP.CONTRACTS_DEPARTMENT. INSURANCE dictionary.
!
! SED - 10-MAY-1984 12:27:10.24
! Remove index for NICKNAME.
!
! PAN - 14-JAN-1984 10:37:29.32
! Increase file allocation to 2000 from 1500.
!
END_PROCEDURE
```

In a future article, we will talk about using FDL to define a file. In that case, we will provide this documentation in a DCL command file, but the idea is the same.

To answer the second question, there is an easy way to find out which keys DTR or Rdb is using. When DTR is run using the debugger, it will report the keys it's using whenever you perform a retrieval (either for a query or to modify a record.) The method is illustrated below:

```
$ run sys$system:dtr32/debug ! You may have to use a different
! name than DTR32, depending on
! the name used when DTR was in-
! stalled. Ask your SYSMGR.
```

```
VAX DEBUG Version V4.2-2
%DEBUG-I-NOGLOBS, some or all global symbols not accessible
%DEBUG-I-INITIAL, language is BLISS, module set to 'DTS'
DBG> GO
VAX Datatrieve V3.3
DEC Query and Report System
Type HELP for help
DTR> READY PER_PUBLIC.PERSONAL.EMPLOYEES SHARED READ
DTR> PRINT EMPLOYEE_NUMBER OF EMPLOYEES WITH
LAST-NAME STARTING WITH NAE
```

```
"NAE" not field, assumed literal.
Performing STW boolean on RMS key field EMPLOYEES.LAST_NAME
```

```
Employee ! Here, DTR did a single lookup using the
```

```

Number          ! STW operation
716
DTR> PRINT NAME OF EMPLOYEES WITH COST-CENTER EQ 17000
Performing EQL boolean on RMS key field EMPLOYEES.COST_CENTER
Name
LAWRENCE Y. C. LIANG ! In this case,
CHRISTIE L. BAKER    ! DTR used the RMS EQL key lookup.
GAIL E. SMITH
DONALD E. SERRINE

```

```

DTR> ! Now, we will perform a much more complicated retrieval.
DTR> ! Since the EMPLOYEES domain is made up of both stored data
DTR> ! and virtual (computed-by) fields, if we ask DTR to print
DTR> ! the entire record, it must do many lookups. Note on the
DTR> ! following display how the PERSONNEL_CLASS, BILLING_CLASS,
DTR> ! EMPLOYEE_NUMBER, and OFF_NUMBER fields are all used to
DTR> ! get data from various domain tables.

```

```

DTR> PRINT EMPLOYEES WITH LAST-NAME STARTING WITH NAE
"NAE" not field, assumed literal.
Performing STW boolean on RMS key field
EMPLOYEES.LAST_NAME
Performing EQL boolean on RMS key field
BCLASS_NUMBERS.PERSONNEL_CLASS
Performing EQL boolean on RMS key field
TECHNICAL_CODES.PERSONNEL_CLASS
Performing EQL boolean on RMS key field
CLASS_CODES.PERSONNEL_CLASS
Performing EQL boolean on RMS key field
B_CLASSIFICATIONS.BILLING_CLASS
Performing EQL boolean on RMS key field
BCLASS_NUMBERS.PERSONNEL_CLASS
Performing EQL boolean on RMS key field
P_CLASSIFICATIONS.PERSONNEL_CLASS
Performing EQL boolean on RMS key field
NAMES.EMPLOYEE_NUMBER
Performing EQL boolean on RMS key field
OFFICE_NAMES.OFF_NUMBER
Performing EQL boolean on RMS key field
OFFICE_INITIALS.OFF_NUMBER
Performing EQL boolean on RMS key field
SUB_OFFICE_INITIALS.OFF_NUMBER

```

(DTR prints the entire personnel record here...)

```

DTR> EXIT
%DEBUG-I-EXITSTATUS, is '%DTR-S-EXIT,

```

```

Exit from Datatrieve requested by operator. '
DBG> EXIT
$

```

Rdb goes DTR one better - it will report two kinds of information: Strategy and Optimization. To enable this reporting, you simply define a logical name called RDMS\$DEBUG\_FLAGS with an "S" and/or "O" in the translation string. The full meaning of the strategy and optimization displays is beyond the scope of this article. For more information, consult the Rdb documentation. However, there are a number of useful things that you can get from these displays without being an Rdb jock.

In the example that follows, take note of these things;

- o The first thing that happens when you ready an Rdb Database is that a query is done. This query is actually Datatrieve trying to find out what all the relations and fields are in the database, so it can build the display for DTR> SHOW FIELDS. The result of the strategy and optimization for this query is the first S and O output you see.

- o You can see which indexes and which relations are being used to optimize the retrieval. For example, the following line appears when we do a retrieval on the DEPARTMENT field:

```

Get      Retrieval by index of relation DEPARTMENTS
Index name DEPT_INDEX

```

This roughly corresponds to the output we got from the RMS ISAM file example using the /DEBUG flag with Datatrieve, above.

- o The optimization information will allow you to compare several different ways of performing the same query. Generally, you will want to query that has the lowest "Cost of chosen solution."

- o Perhaps the most important information is obtained when a query results in a sequential lookup. Often, this is an indication that you did not properly index your database, or your query should be restructured so that Rdb can use a key. The last query in the following example produces a sequential search, as indicated by the line:

```

Conjunct Get Retrieval sequentially of relation DEPARTMENTS

```

If you remember the hints given in the Rdb documentation, there are some times when it doesn't matter if you do a sequential lookup. For example, if there are less than about 50 records in the relation, a key will probably not speed things very much. However, even with a few records a key may

help because sometimes Rdb can get the answer to a query directly from the index information, without ever accessing the records themselves. The only way to know for sure is to test it, using the DTR functions FN\$INIT\_TIMER and FN\$SHOW\_TIMER.

```

$ DEFINE RDMS$DEBUG_FLAGS "SO
$ DTR
VAX Datatrieve V3.3
Type HELP for help
DTR> SHOW DATABASES
Databases:
  TEST
DTR> READY TEST EXCLUSIVE
Solutions tried 19
Solutions blocks created 4
Created solutions pruned 0
Cost of the chosen solution      8.8811386E+01
Cardinality of chosen solution   1.0000000E+00
Sort
Cross block of 2 entries
  Cross block entry 1
    Get Retrieval by index of relation RDB$RELATION_FIELDS
    Index name RDB$RFR_REL_FLD_NAMES_NDX
    00000001 Segments in low Ikey
    00000001 Segments in high Ikey
  Cross block entry 2
    Get Retrieval by index of relation RDB$FIELDS
    Index name RDB$FIELDS_NAME_NDX direct tree lookup
    00000001 Segments in low Ikey
    00000001 Segments in high Ikey
Solutions tried 18
Solutions blocks created 5
Created solutions pruned 1
Cost of the chosen solution      5.0308731E+01
Cardinality of chosen solution   2.7712811E+01
Cross block of 2 entries
  Cross block entry 1
    Get Retrieval by index of relation RDB$INDICES
    Index name RDB$NDX_REL_NAME_NDX
    00000001 Segments in low Ikey
    00000001 Segments in high Ikey
  Cross block entry 2
    Get Retrieval by index of relation RDB$INDEX_SEGMENTS
    Index name RDB$NDX_SEG_NAM_FLD_POS_NDX
    00000001 Segments in low Ikey
    00000001 Segments in high Ikey
Solutions tried 1
Solutions blocks created 1
Created solutions pruned 0
Cost of the chosen solution      1.0000000E+01
Cardinality of chosen solution   4.0000000E+00
Conjunct Get Retrieval sequentially of relation RDB$RELATIONS

```

```

DTR> show fields
DEPARTMENTS
  DEPARTMENTS
    DEPARTMENT      <Number, indexed key>
    DEPARTMENT_NAME <Character string>
    SUPERVISOR      (EMPNO)      <Number, indexed key>
EMP_RESUME
  EMP_RESUME
    EMPLOYEE_NUMBER (EMPNO) <Number, indexed key>
    RESUME           <Segmented string>
No global variables are declared.

```

```

DTR> PRINT DEPARTMENTS WITH DEPARTMENT BT 17000 AND 17500
Solutions tried 2
Solutions blocks created 1
Created solutions pruned 0
Cost of the chosen solution      1.4759999E+01
Cardinality of chosen solution   1.1759999E+01
Get Retrieval by index of relation DEPARTMENTS
                                Index name DEPT_INDEX
00000001 Segments in low Ikey  00000001 Segments in high Ikey

```

DEPARTMENT	DEPARTMENT NAME	SUPERVISOR
17000	Specialized Resources	194
17100	Laboratory Department	465
...		
17500	Information Services	1973

```

DTR> PRINT DEPARTMENTS WITH SUPERVISOR GT 1900
Solutions tried 1
Solutions blocks created 1
Created solutions pruned 0
Cost of the chosen solution      5.0000000E+01
Cardinality of chosen solution   3.3599998E+01
Conjunct Get Retrieval sequentially of relation DEPARTMENTS

```

DEPARTMENT	DEPARTMENT NAME	SUPERVISOR
12480	Structural Division	2000
...		
...		

So, now that you know how to find out which keys are in use, you should be able to check any procedure or other retrieval to make sure that it's using the keys you THINK it should be using. This may be a tedious process, since there may be many keys used if your data is heavily normalized. One way to deal with this is to run your procedures with the debug flags turned on and save the output. (You can do this in a batch job, or with \$ SET HOST/LOG 0.) Then, if you begin to have key problems you can use the VAX

DIFFERENCES command or just compare the two listings by hand.

Sincerely,  
The Wiz

Dear Readers:

Two months ago I promised a solution to the following problem: How can I convert a domain with uppercase proper names to capitalized, lowercase names? Here is one solution, using the FN\$STR\_TRANSLATE function we created for ourselves last month.

```
DTR> DEFINE DOMAIN FOO USING FOO-REC ON FOO.DAT;
DTR> DEFINE RECORD FOO-REC USING
DFN> 01 DATA.
DFN> 03 NAME PIC X(25).
DFN> 03 FILLER REDEFINES NAME.
DFN> 05 FIRST_CHAR PIC X
DFN> 05 REST_OF_NAME PIC X(24).
DFN> ;
[Record is 25 bytes long.]
DTR> DEFINE FILE FOR FOO;
DTR> READY FOO WRITE
DTR> REPEAT 3 STORE FOO
Enter NAME: NAECKER
Enter NAME: STERN
Enter NAME: SCHNEIDER
DTR> DECLARE LOWER_CASE PIC X(26)
      DEFAULT VALUE "abcdefghijklmnopqrstuvwxy".
DTR> DECLARE UPPER_CASE PIC X(26)
      DEFAULT VALUE "ABCDEFGHIJKLMNOPQRSTUVWXY".
DTR> FOR FOO PRINT FN$STR_TRANSLATE(NAME,LOWER-CASE,UPPER-CASE)
```

Translated  
String

naecker  
stern  
schneider

```
DTR> SHOW FIELDS
FOO
  DATA
  NAME      <Character string>
Global variables
  LOWER_CASE <Character string>
  UPPER_CASE <Character string>
```

```
DTR> FOR FOO
CON> PRINT FIRST-CHAR||FN$STR_TRANSLATE(REST_OF_NAME,
                                         LOWER-CASE,UPPER-CASE)
```

Naecker  
Stern

Schneider

DTR> EXIT

Another way is shown here:

```
DTR> SHOW FOO-REC
RECORD FOO_REC USING
01  DATA.
   03 NAME PIC X(25).
   03 FILLER REDEFINES NAME.
      05 CHARACTERS OCCURS 25 TIMES.
      07 ONE_CHARACTER USAGE BYTE.
```

```
;
DTR> FOR FOO FOR CHARACTERS PRINT ONE-CHARACTER
```

ONE  
CHARACTER

78  
65  
69  
67  
75  
69  
82  
32  
32  
32

...

```
DTR> FOR FOO
CON> FOR CHARACTERS WITH ONE-CHARACTER BT 65 AND 90
CON> MODIFY USING ONE-CHARACTER = ONE-CHARACTER + 32
DTR> PRINT FOO
```

NAME

naecker  
stern  
schneider

You would then have to make another pass through the file, replacing the first character with it's uppercase equivalent by using FN\$UPCASE.

Referring to the June issue again, WW gave an example using a FILLER clause as the group field name, much as in the case just shown above. As you can see, any fields that fall below the FILLER field in the hierarchy will not be printed unless explicitly referenced in the print list. In these cases, the fields CHARACTERS, ONE\_CHARACTER, FIRST\_CHAR and REST\_OF\_NAME



were not printed when I printed the domain by name. This is often convenient if you wish to hide some magic from the user so that it is not printed out when a DTR> PRINT domain-name statement is executed. Can you imagine how ugly the results of my PRINT FOO statement would have been if I had not used FILLER to hide the REDEFINES from the user?

Dear WW

I have two fields in my record that I handle as separate fields but someone else handles as a single field. On my reports I would like to be able to print the fields in both formats. The problem is that my data is stored in standard numeric format (PIC 9(n)) and when I try to concatenate the two together, Datatrieve removes the leading zeros from the fields. I've spent hours trying various concatenation, multiplication, table, and other schemes. Can you help?

Signed,  
Need Zeros

Dear Need:

You are not the only one who has been frustrated by this "feature" of Datatrieve. DTR thinks it's doing you a favor by stripping leading zeros off the fields before concatenating them. Here's the problem and the solution:

```
DTR> declare field_1 pic 9(4).
DTR> declare field_2 pic 9(9).
DTR> field_1 = 534
DTR> field_2 = 23
DTR> print field_1, field_2
```

```
FIELD  FIELD
  1      2
```

```
0534  000000023      ! Note that DTR does indeed know
                    ! there are supposed to be
                    ! leading zeros here...
```

```
DTR> print field_1|field_2
53423                ! Now DTR seems to have forgotten about
                    ! the zeros!
```

```
DTR> print format field_1|format field_2
534000000023        ! In this case, we're using the FORMAT
                    ! specifier with the default format,
                    ! which is the edit-string specified in
                    ! the definition for the field. In
                    ! this case, there is none, so the
                    ! default edit-string is used - the
```

```
! same as the in first print statement
! above. Note, however, that the
! leading zero on the first field is
! lost! Why? And what can you do
! about it
```

```
DTR> print format field_1 using 9(5)|format field_2 using 9(8)
0053400000023        ! Here we've fixed the leading zeros on
                    ! the first field and also changed the
                    ! size of the second field
```

```
DTR> print format field_1 using 9(5)|
                    ! format field_2 using 9(8)|"Some text"
0053400000023Some text ! We've added arbitrary text...
```

```
DTR> print format field_1 using 9(5)|
                    ! format field_2 using 9(4)b9(4)|"Some text"
005340000 0023Some text ! ...and now a space in the middle
                    ! of the second field. You can
                    ! use other format items, too,
                    ! like commas, CR, DB, -, +,
                    ! etc.
```

Sincerely,  
Wombat Wizard

Have a problem with Datatrieve? Is your CDD confused? Does the Report Writer mangle your page headings? Something you can't figure out how to do efficiently in Datatrieve? WRITE THE WOMBAT WIZARD! No reasonable question will go unanswered! (Use the form in the back of this issue.)

Sincerely,  
Wombat Wizard

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**DATATRIEVE and RMS**

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Abstract

This is a transcription of a panel presentation on some of the important features of RMS as seen from the perspective of the DTR user. It will

give some basic definitions, list some of the options available to users, and how some tools may be used to optimize performance.

#### 1.0 What is RMS?

RMS stands for Record Management Services: it is a set of system services which provide for a uniform method of accessing data in files. It is built into VMS, and comes with the PDP-11 operating systems, it supports several types of file access (sequential, relative and indexed), several types of data records (fixed and variable length), arbitrates file sharing and block locking (some of these functions are being moved to other parts of the operating system, particularly within VMS clusters), and controls the conversion of data on the disk (tape) to within your program. In short, it's the way of getting stored data into your program.

#### 2.0 Types of files.

Sequential files are the simplest, they are the smallest (least amount of storage space) for a given amount of data, they are compatible with programs that don't use RMS, can be stored on magnetic tape, are easier to transmit over communications lines, and generally have the fastest access and least overhead when the data is going to be accessed sequentially. The catch is that most applications don't access data sequentially, and even when they do there are some possible drawbacks to sequential files. For example, new records may only be inserted at the end: if the file is sorted in some order and you have to add a new record, you must then re-sort the file. They can also normally only be deleted from the end of the file as well. As processing must be sequential, if you want to retrieve a record in the middle or end of the file the only way to get to it is to start at the beginning and read every record until you get the one you want. Sharing the file is limited to read-only for all accessers (this may change in the latest release of VMS).

Indexed files can be read sequentially or by one of the keys. Keys can have duplicate entries or no duplicates, there is automatic sorting in that data is automatically kept in order by the primary key so a sequential read is automatically sorted, and files can be shared for read and write. There is higher overhead in accessing the file (than for sequential), they can only be stored on disks (it will automatically be converted by most backup utilities when stored on tape, but you cannot have indexed access directly to a file on tape), and the file is larger as you are storing both the data and the index information in the file. Records may be added and deleted from any point in the file, but deleting a record does not recover all of the space used until the file is compressed or reorganized. Indexed files must have one primary key, and the data in that field may not be modified: it can only be deleted

and the entire record replaced. (Secondary keys may be modified, or modification may be prohibited as you choose when you create the file.) In nearly all applications, the advantages over sequential files far outweigh the disadvantages, and indexed files will be used in nearly all DATATRIEVE applications.

#### 3.0 Buckets

A bucket is a logical division of the space on the disk. Disks are divided into blocks: in order to use a disk, the space must be divided into manageable chunks, and all DEC disks are divided into blocks of 512 bytes. (A few older devices have smaller "blocks", but the software makes them look as if they had 512 byte blocks.) The data records you are using may be larger or smaller than 512 bytes, so the file is divided into buckets: each bucket holds one or more of your data records, and buckets are stored on the disk (as one or more blocks). One of the options available is to select the bucket size for a file. On the PDP-11, in order to conserve pool space, it should almost always be the smallest bucket size into which your record will fit, and DATATRIEVE-11 will automatically select this size. On the VAX, the option exists to choose a larger bucket size, which may or may not help performance. A larger bucket size means there are more records stored in one place, and retrieving one bucket from the disk gets you several records from the same area of the file. If you are processing the file sequentially, when you read one record you automatically get the next few records at the same time, and so when you are ready to process the next record you already have it. This will save disk accesses, and generally improve the performance of the program. If, however, your accesses are scattered more or less randomly through the file (for example, you have a telephone directory file and you are not looking up people in alphabetical order so that file retrievals are scattered throughout the whole file in no particular order) then a larger bucket size won't help, and may even hurt a little by having to read extra data from the disk that won't be used. If you have an application where you read a record and then will probably need the next few records for related processing, or you have multiple records with the same key and may need to read some or all of them at the same time, then a larger bucket size may help by obtaining more data with each disk access.

#### 4.0 File Prolog Type.

When you create a file (or display the attributes of an existing file), one of the attributes is the file Prolog, which can be Prolog 1, 2 or 3. Indexed files can be Prolog 2 or 3. Prolog 3 files have a tradeoff between speed and size: the index can be compressed, which will save space on disk, but will require more CPU work to compress and expand the data when needed. Also, it was mentioned before that deleting a record

from an indexed file left a little unusable space in the file: with a Prolog 3 file, this space may be reclaimed more easily than with a Prolog 2 file with the "CONVERT/RECLAIM" command. (See also some discussion at the end of the paper about access speed).

#### 5.0 Alternate Keys.

For each key in an indexed file, some work must be done to store the index information whenever a record is added to the file. It is clear that the time needed to store records into a file will increase as the number of key fields increase.

On the other hand, considerable savings in file overhead can be realized when retrieving with a key as opposed to retrieving without a key. In general, if you will be retrieving data fairly often by a particular field, it should be keyed since the time saved in retrieval is much greater than the time taken during storage. If, however, a field won't be used for retrieval, it should not be a key since the extra work for storing such records will not be recovered.

#### 6.0 Creating a file.

You can create a file with the "DEFINE FILE" command in DATATRIEVE. This will give you a file which will always work, and will have all of the keys in the right place with the correct data type. It may not give you a file which is optimum for your particular application and data, however. You can also use one of the RMS utilities (DFN on the PDP-11, CREATE or EDIT/FDL on the VAX): this can be quite a lot of work as you have to figure out where (in bytes) in the file each key is, and what data type it is. I recommend that you first create the file with DATATRIEVE, then use the RMS utilities to examine, and if necessary modify, the file to your particular needs.

#### 7.0 Loading a file.

Loading a file all at once, with one of the RMS utilities, is a different operation than storing single records (as with DATATRIEVE). The utilities (IFL on the 11s, CONVERT on the VAX) do an optimized file load: they sort records, pre-allocate disk space (for data and index), and store the information. If you store individual records, it will be inserted in the middle of the file if it can: if the file was loaded with a fill factor of less than 100%, there will be empty space in the middle of the file to receive extra records. The resulting file will still be in good order, and performance will be good. If the file is already full, then RMS does what is called a bucket split: a pointer must be put into the file to point to another area of the file, which will then contain the data. Subsequent read operations are slowed a little as you have to "jump around" in the file to follow the pointers to an alternate area and back

again. Generally, you want to avoid this. Similarly, there is the space that the file has requested on the disk: if there is extra empty space in the file, new records will be added into this space and all of the data will be close together. If the file has run out of space, then the operating system will try to find more on the disk (subject to user quotas, etc.). If space is available next to the existing file, it will be added, but it is possible that the next free space on disk may be physically distant. This is known as a "fragmented" file, as it is stored in several separate pieces on the disk. This results in a performance degradation, and should be avoided. When a record is deleted, there is a small amount of space which cannot be immediately recovered (until the file is reorganized).

DATATRIEVE is not the best tool for doing a complete file reorganization: the RMS utilities which were written specifically for this purpose will yield better results. If a file is being added to or modified frequently, then it is a good idea to use one of the utilities to re-organize the file at regular intervals.

#### 8.0 Some Tools.

There are a number of utilities that give useful information about your files. On the VAX, ANALYZE/RMS/FDL will yield a file full of information about the analyzed file, and you can look at this with ordinary editors or with EDIT/FDL. Much of the information will not be of interest to casual DATATRIEVE users, but a few items are important.

ALLOCATION is how many blocks on the disk are reserved for this file.

BEST TRY CONTIGUOUS means that if the file runs out of disk space and the operating system must get more, it will first try to get contiguous blocks (those immediately next to the existing file), but if it can't it will get what space it can. If the file was marked as CONTIGUOUS only, when it runs out of space if there is no more contiguous space available the attempt to expand the file will fail with an error message.

CLUSTER SIZE is generally set by the system manager for a given disk.

EXTENSION is how many blocks of disk space are added to a file by default when it has to be extended. If you know that you will be adding many records to your file, especially if they will be added at one time, then you should specify a larger extension value to get a large piece of disk space each time the file is extended: this will minimize fragmentation, and will make the application run faster as adding space to a file is a relatively slow process.

GLOBAL BUFFER has to do with sharing files, and will not be set by most users: it needs to be considered on a system wide basis.

BLOCK SPANNING: if a record spans a disk block, then you have to read both disk blocks to retrieve the record: this may be a little slower than if the record were in one block only. If your records are smaller than one block (512 bytes) in size, and you want every fraction of performance, and are willing to leave a little space at the end of each block empty (wasting a little disk space), then NO SPAN BLOCKS may give you a little extra performance, though I suspect that in most cases the improvement will be minimal.

Allocations for areas have to do with how much space is reserved for data and keys. Rather than attempt to calculate these, let the RMS utilities set them, or use one of the optimization scripts in EDIT/FDL to set them.

Each key has it's own section for description. One of the fields in this is the name of the key. DATATRIEVE does not put this information into the file: I highly recommend for documentation and maintenance purposes that you obtain an FDL description for all of your DATATRIEVE data files, and that you fill in the name of the field into the FDL key name so that you will know which keys correspond to which field in your DATATRIEVE application.

You can use this file to select some options that are also available in DATATRIEVE, such as allowing or preventing duplicates and changes. You can also enable or disable data compression and key compression. As noted before, this may save disk space as the cost of performance. It is difficult to predict how much compression will be done on a file, so you will probably want to load the data, then ANALYZE the file and see what happened. There may be a performance trade off between compressing to save space, and the work needed to compress and decompress the data and keys (see also the discussion transcribed below).

FILL can be a very important parameter. If you are working with a file whose data is fairly static (does not change often), you will probably want a fill factor of 100%, or very close, to save disk space and keep the data close together on disk for fast access. If you have a file which changes often, or to which data will be added, then you want to avoid the bucket splitting problem by using a lower fill factor during the initial load so there will be empty space scattered throughout the file to receive new records. The RMS utilities honor the fill factors to leave empty space in the file: DATATRIEVE does not, so it will use the extra space for new records.

If the file has data in it, ANALYZE/RMS/FDL will also give

you information about how much reclaimable space is in the file which is not being used, and how much compression is being done on the keys and data. This is a good indication of the state the file is in, and can also be used by EDIT/FDL optimization scripts to design a better file.

Built into the FDL editor are some scripts which work quite well in designing better files, especially if you analyze an existing file filled with data. Generally, a "flatter" file is one with better performance: the fewer the number of index levels, the fewer disk accesses will be needed to find a particular record, and this results in better performance. DIRECTORY/FULL on the VAX (DIR/ATT or DSP on the 11) gives information about the number of keys, Prolog type, number of blocks allocated, etc.

#### 9.0 Example of Reorganization

We found that when a number of records had to be added to a large indexed file with many keys, it was better to add the new records to a separate sequential file, convert the large indexed file to a sequential file, append the file with the new records, then use the combined data to re-populate an indexed file. This process can be done in a batch mode, to save time and I/O processing. It avoids the problems of adding records to indexed files (such as bucket splitting), especially when the updating is done in "chunks".

We did some benchmarks with a file containing fixed length 110 byte long records, with 5 keys, containing a total of 1778 records. DATATRIEVE was used to write the new data to the end of the sequential file that contains the updates, and again to write the sequential records back in an indexed file. This was found to take much less time than to put records into an indexed file.

We also tested the use of the CONVERT utility to do the file conversions. This was found to take much less time and system resources: the improvement is much greater than that which can be obtained from typical "system tuning" efforts, which usually try to adjust system parameters for a 5% or so improvement. Adjusting the data file parameters can yield a much greater improvement.

Tests were performed on a stand-alone 11/780 (no other users), comparing DATATRIEVE with CONVERT to do the batch update. CPU usage was reduced by about 3 orders of magnitude, I/O operations were reduced from about 35,000 for DTR to 1700 for CONVERT, Elapsed time was reduced from 14 minutes to 2 minutes. The reduction in I/O operations is especially significant for many applications.

These tests were done using the same DATATRIEVE file

definition. By using one of the FDL optimize scripts, the file can be further tuned to the particular application. You should load the data into a file first for best performance, and look at values for compression, etc. If compression shows up as a negative value, turn compression off. The scripts are nearly automatic in operation: simply select the optimize script. (Also look at the VMS Guide to File Applications manual: it may take a while to absorb all of the contents, but it's worth the effort.) We did a one pass optimization of our test file: not a lot of tuning, just some changes to bucket size, key compression, etc. When we ran the load test again, I/O operations were cut in half, Elapsed time was cut in half, and CPU time improved a bit. It took no more than 15 minutes to do the optimization with FDL.

#### 10.0 General Hints.

Big updates will cost you, as you have to work with all of the indices: use CONVERT rather than DTR. Tune your files: a little effort here yields considerable benefits. Update in batch: you can offload operations to times when the system is less used.

#### 11.0 Some final examples.

I compared the time it takes to populate the YACHTS file, as is done during installation of DATATRIEVE. These tests were done with the PDP-11, copying the installation verification procedure. An empty indexed file is created using DEFINE FILE (and I even improved the procedure by adding the ALLOCATION clause), and DATATRIEVE then reads the sequential file from the distribution kit and stores the indexed file using a FOR loop. This took 2 minutes and 46 seconds. I then create an identical empty file using DATATRIEVE again (no optimization work done), and use IFL (the PDP-11's equivalent of CONVERT) to populate the indexed file and it takes 17 seconds. The reason for the difference is that DATATRIEVE is a general query and report language whereas IFL is written for the sole purpose of populating indexed files.

Disk fragmentation: this is not directly an RMS problem, but it is something to know about. A fragmented disk causes performance degradation, and usually implies fragmented files as well. As you create and delete files, and extend files, your free space tends to be scattered about the disk in small chunks. All of the normal backup utilities (BACKUP, BRU, DSC) do disk compression as they copy disks. One way to find out if your disk is fragmented is a utility called FRAG, available through the DECUS library or SIG tapes for VMS and RSX. Because fragmentation happens gradually while the system is used, it can be a rather subtle performance degradation that may not be immediately obvious. Fragmentation is an important reason for making backup copies of your disks fairly often. If you have

fixed media disks (Winchesters) and are backing up your disks to tape, you are not compressing the disks, which are probably getting more and more fragmented. You should either get extra disks (if you can) and copy disk to disk, or else you have to copy from disk to tape, then back from tape to disk to get the benefits of compression. If you have removable disks, you should copy from disk to disk, put the old disk on the shelf as a backup and run with the new disk. This not only gives you the advantages of disk compaction, it also tells you very quickly if the copy procedure worked, and if it didn't your original disk is safely on the shelf. (There are many people who backup to tape only, or backup to disk and put the new disk on the shelf, and it's only when a disaster occurs that they find out that their backup copies aren't usable.)

#### 12.0 Questions and Answers

Steve Hicks, Rockwell International. When you create a file with DTR, is it CONTIGUOUS or CONTIGUOUS\_BEST\_TRY? Answer: sometimes. Will using FDL to set it CONTIGUOUS gain anything? Answer: perhaps, but certainly you should get the FDL file and check. Can you change a Prolog-2 to a Prolog-3 with a set command in FDL? Answer: you can specify it with the FDL editor. I have a file which has fields which are not keys. Will they be compressed? Answer: you can specify data compression independently of key data compression for this. (Joe:) Note that compression works on adjacent bytes with the same value. If your field is filled with different characters, you don't get compression. If your field is all blanks or zeroes, or some characters followed by trailing blanks, for example, then you do get compression. You need strings longer than 4 or 5 bytes to get an advantage from compression. (Gary:) There is a system parameter to set Prolog-2 or Prolog-3 as the system wide default, but there is no system wide parameter to set data compression on or off as a default. (Unidentified comment:) There may be a speedup in looking up keys when compression is on. [Much of the later comments were off the microphone: apparently the user saw a considerable improvement.] (Gary:) We just ran into problems where we tried data key compression, and found the system was deleting records. There were about 60,000 records in the file, and CPU usage greatly increased. (Joe:) It depends on the data: you cannot make a general rule of thumb about files going faster or slower with key compression. The other issue has to do with the nature of the key. If adjacent keys have a lot of commonalty (for example, the keys are values such as 12345, 12346, 12347, 12348), then you get a lot of compression: if the keys are vary different, you get much less compression. A file which has a lot of compression may well see a performance improvement. [Audience comment not audible: apparently the key in question was a ZIP code.] A ZIP code would an ideal case where you have a lot of duplicate or similar keys, resulting in considerable compression. Other types of data might not work as well.

(Gary:)

Warren Alcar, Abalene Christian University. Once you have your FDL file, do you ever need to edit it again (once it's optimized). Answer: once you have the file in a state where you are satisfied with the performance, quit. Sometimes you can keep on tuning, other times FDL may indicate that this is the best you can get. (Alcar:) I may convert the file, then a week or two later may need to convert it again. Do I use the same FDL file? Answer: if the nature of the data you have has changed significantly, then maybe you want to optimize again. If the nature of the data hasn't changed, and you are just adding records, then you can use the same FDL file.

Rick Trane, (?) Engineers, Milwaukee. You stated that if you delete a record, it is physically still in the bucket, and is not removed until you do a reclaim on the file, is that correct? Answer: some of the space does get reused. What happens is that there is a pointer in the bucket saying that there used to be a record here. If there is still enough free space in that bucket to hold a new record and a new pointer, then the space may be reused, but there is still an extra pointer from the original record. A lot depends on the size of the record: if the record is, for example, 480 bytes long and you have a bucket size of 1 which is 512 bytes, there is only room for one record and pointer. If you delete the record, there is not enough room for a record and two pointers, so the space does not get reused at all until the file is compressed. If, however, the records are only 20 bytes long, there is room for several records and pointers in a single bucket, and some space may be reused. (Joe:) If the file has a single primary key, under version 4 of VMS it can be deleted and reclaimed immediately: if there are secondary keys, it can't reclaim space, and you have to use CONVERT.

(Unidentified) Our problem is with a file that has alternate keys which allow duplicates. Any hints for access time? Answer: you must understand that if a key is not unique and there are many duplicates (for example, if sex is a key in a personnel file and about 51% have the same key), you are essentially using half of a sequential file, and there isn't much that can be done for performance. The best performance occurs when keys are unique or nearly unique. [Remainder lost from end of tape.]

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## SO WHO NEEDS A DATATRIEVE COMPILER?

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### 1. BACKGROUND

I have often wondered how many VAX sites use Datatrieve for large production application systems. DTR is really a very powerful package and in combination with FMS can be used effectively as a 4GL for commercial development. Of course, those of us who carry out large-scale development with DTR are more than familiar with the little quirks and idiosyncrasies that come back to haunt us now and again. One particular characteristic that has caused some frustration at one of the sites I support is the interpretive nature of DTR and the correspondingly lengthy delay of up to 35 minutes on login. As far as I can ascertain, DEC has no plans to provide a compilation facility for DTR that would resolve this problem. This is understandable given the new 4GL products, RALLY and TEAMDATA. However, conversion to these packages is not a practical alternative at some sites because of cost and resource constraints.

A possible solution exists in the form of the virtual terminal capabilities of VMS version 4.x. In a reasonably cooperative environment, establishing processes under virtual terminal control enables users to connect to, and disconnect from, jobs which are permanently in the compiled (ready to execute) state. This eliminates the domain readying and compilation delay completely and makes for lots of happy DTR users! Although this may not be suitable for all sites, I suspect that many of you out there can obtain benefit from this approach to DTR application systems. This article is an attempt to explain the basic process and illustrate one way of setting things up that has met with success in the particular customer site mentioned previously.

### 2. APPROACH

The virtual terminal feature is really intended for dial-in users to be able to re-dial and connect to a job which was disconnected because of a line problem (as opposed to the process-killing action that would otherwise occur). Accordingly, the DEC default for the TTY\_TIMEOUT parameter is set for 15 minutes. The first step is therefore to modify this value to something much larger, using modparams.dat and Autogen of course. In our case we use a value of 800,000 (seconds) which equates to over 9 days elapsed.

The next step is to figure out how to eliminate the clutter of disconnected processes that may hang around after you take step one. Nearly every site has some method of dropping lines on

inactive interactive users. Killer programs get written (Watchdog etc.), or dataswitch idle traffic disconnect facilities are invoked etc. Once virtual terminals are enabled (see below), VMS will disconnect processes when it sees the line go down. One answer is to create a disconnected process sieve task that regularly prunes out unwanted disconnected processes, leaving the big DTR jobs untouched of course. The command file, Killer.com at the end of this article is one of many ways to create this policing process.

Next, you want to make life as simple as possible for your users by creating a DCL menu procedure that will connect and disconnect to your permanent process for them, without their having to understand Connect and Disconnect operations. The command procedure Logdtr.com is an example of how this can be done. The example is a live one, and refers to a PROMS system which is a large (9Mb virtual memory) DTR application using FMS menu and data entry screens. The approach is applicable to any monolithic DTR application however, so hopefully you will be able to create something similar for your own use.

At this stage, virtual terminals can be enabled by getting the system manager (if that's not you) to include the following SYSGEN command line in your site-specific startup procedure (Systartup.com typically):

```
CONNECT VTA0:/DRIVER=TTDRIVER/NOADAPTER
```

If he/she also types this directly to SYSGEN, virtual terminal operation will be enabled immediately and you can start having fun. Every terminal has to be set /PERMANENT/DISCONNECT also and now would be a good time for the system manager to do this. Be sure to remember to get him/her to submit the killer.com procedure at this time if it is applicable at your site.

Your DTR systems require little or no tailoring to facilitate operation of the new features. You have to explain the ^Y and disconnect process to your users and it may help to change your DTR procedures to remind them at the appropriate point. I have included the file DTRSTART.COM at the end of this article as an example of the sort of thing you can do. This is the actual PROMS startup procedure, so please ignore the PROMS-specific stuff. The login procedure for the permanent process establishes a global symbol, BYE, which equates to the necessary 'Disconnect/continue' command that must be invoked DIRECTLY after typing ^Y. There is a danger here that a user might blow away the interrupted application if something else is typed which invokes another image. As it is in the users own interests not to do this, it has not presented a problem in my experience. I also tried 'On control\_y then disconnect/continue' in the login.com procedure but that does not work. I think that the disconnect command has to be typed at the "control-y command level", immediately after the control-y has been typed. Maybe

someone out there is really familiar with DCL internals and can offer a suggestion here?

When all the above stuff has been performed, you can create your permanent DTR process(es) simply by logging them in in the normal way, then issuing the ^Y and Disconnect/continue (or BYE) command. This recreation process also has to be done after any system re-boot of course.

### 3. OTHER COMMENTS

Terminal characteristics have to be given consideration depending upon the environment. We use a combination of DZ and DHU11 terminal multiplexors, and a dataswitch to which all terminals and microcomputers are connected. The DHU11 terminal ports in particular had to be set /Secure\_server and a <BREAK> character forced from the dataswitch to the VAX whenever a disconnection (idle traffic timeout, or user presses <BREAK>) occurs, to ensure that the process would be correctly disconnected. Our current terminal settings are:

```
SET TERMINAL/PERMANENT/MODEM/HANGUP/AUTOBAUD/SECURE_SERVER -  
/DISCONNECT/DMA TXnn:
```

Note that the book says Secure\_server is ignored if Autobaud is set, but this is not the case. Also, the book says DMA is the default for DMA controllers (like the DHU11), but this is not the case either, and the parameter must be set specifically as above for DHU11 lines. Your terminal characteristics may differ from the above of course depending upon your environment.

Although it is not a big problem to establish the permanent processes after a system reboot, it would be nice indeed to automate this process during the system startup in the site-specific startup command procedure. I have not had too much time to experiment with this possibility (my customers keep on giving me real work to do!), but so far I have not figured out how to create the disconnected processes under virtual terminal control via Systartup.com. If anyone out there knows the answer, I would appreciate the information.

Finally, it might be useful to be able to communicate data between the original login user process and the permanent process to which they connect. The only attributes that go with a terminal when it connects to a virtual terminal are understandably those of the terminal itself. In particular, logical names do not continue across a connection. We use indexed-sequential disk files for this purpose now that DCL can read and write them. This allows the DTR code in the permanent process to access a shared domain which contains the data you want that is specific to each user. The Logdtr.com procedure gives an example of this use. The domain PRREGCOLL is readied in Dtrstart.com and a computed by variable (COLLATOR FROM PRREGCOLL)

provides the collator code for the currently-connected user.  
This method could be used to pass any amount of data of course.

KILLER.COM - DISCONNECTED PROCESS KILLER.

=====

#! DESCRIPTION:

#! -----

#! This command procedure is submitted every ten minutes in the  
#! FAST batch queue, and "sniffs out" disconnected processes  
#! that have no right to be in existence. PID's for  
#! disconnected processes are stored in the group logical name  
#! table (under the logical - KILLER\_DATA), and compared on next  
#! "wake-up" with disconnected process PID's still in existence.  
#! If a match is found, the process is zapped. If no match  
#! occurs, the PID is stored in KILLER\_DATA for the next  
#! wake-up. Certain usernames are exempt from this policing  
#! operation on the understanding that they are responsible  
#! users, or are large Datatrieve jobs to and from which users  
#! connect and disconnect via DCL procedures.

#! BACKGROUND:

#! -----

#! Virtual terminals are enabled at Solicitor General via the  
#! SYSGEN command:

CONNECT VTA0:/DRIVER=TTDRIVER/NOADAPTER

#! This is performed in SYSTARTUP.COM at which time all  
#! terminals connected via the central Dataswitch are set  
#! /PERMANENT/DISCONNECT (in addition to other required  
#! characteristics). The DISCONNECT enables process  
#! disconnection under the virtual terminal if the line to the  
#! VAX is dropped for any reason. The default value of the  
#! TTY TIMEOUT Sysgen parameter has to be increased to several  
#! days (from 15 minutes!) to enable disconnected processes to  
#! hang around without being zapped by VMS. Selected processes  
#! are allowed to do this where login compilation of large  
#! Datatrieve systems causes: a) Mucho system degradation, and  
#! b) up to 35 minutes login delay! This command procedure is  
#! required to ensure that only the selected systems can operate  
#! via connect/disconnect and the VAX won't get cluttered up  
#! with processa non grata.

#! MODIFICATION:

#! -----

#! B.Gray - 6th. March 1986 - Initial creation for PROMS users.  
#! B.Gray - 8th. March 1986 - Add Correspondence Tracking system.

#! =====

#! Get last set of PID's from KILLER\_DATA and store in PID\_STORE.

```
#!
$!
$! CONTEXT = ""
$! PID_STORE = F$TRNLNM("KILLER_DATA", "LNM$GROUP", 0, "USER", , -
$! "VALUE")
$! PID_NEW = ""
$!
$! Find disconnected processes: Virtual terminal -
$! no physical terminal
$!
$! $START: PID = F$PID(CONTEXT)
$! IF PID .EQS. "" THEN GOTO STP2
$! TERMINAL = F$GETJPI(PID, "TERMINAL")
$! IF TERMINAL .EQS. "" THEN GOTO START
$! IF F$GETDVI(TERMINAL, "TT_PHYDEVNAM") .NES. "" THEN -
$! GOTO START
$!
$! OK, we have a disconnected process. Now see if it
$! should be there.
$! IF F$GETJPI(PID, "OWNER") .GT. 0 THEN GOTO START
$! USER_NAME = F$GETJPI(PID, "USERNAME")
$!
$! This is where we put the valid usernames that are allowed to
$! disconnect.
$!
$! IF USER_NAME .EQS. "PROMS" " THEN GOTO START
$! IF USER_NAME .EQS. "CTS" " THEN GOTO START
$! IF USER_NAME .EQS. "SYSTEM" " THEN GOTO START
$!
$! See if this unwelcome process was around last time we looked.
$!
$! IF F$LOCATE("/"+PID, PID_STORE) .NE. F$LENGTH(PID_STORE) -
$! THEN GOTO REMOV
$!
$! It wasn't, so store it's PID in PID_NEW, ready to set up
$! the logical name.
$!
$! PID_NEW = "'PID_NEW'/'PID'"
$! GOTO START
$!
$! We get here if we've found a disconnected process that was
$! around last time. So get rid of it!
$!
$! $REMOV: STOP/ID='PID'
$! GOTO START
$!
$! Finally, resubmit ourselves and define the logical with the
$! newly-found disconnected process PID's as the equivalence
$! string.
$!
$! $STP2: SUB/AFTER="+:10"/QUEUE=FAST/NOLOG/NOPRINT -
$! SY$MANAGER:KILLER
$! IF F$LENGTH(PID_NEW) .GT. 0 THEN DEFINE/NOLOG/GROUP -
$! KILLER_DATA "'PID_NEW'"
```



```

$      EXIT
$! *****
$!
$!      LOGDTR.COM
$!
$! This login procedure is used by the remote regions to access
$! the PROMS datatrieve system.  PROMS is a very large DTR
$! system which would normally require a 35 minute login process
$! on the VAX 11/750.  It is a very powerful system, well-liked
$! by the users, and the login delay was a necessary, but very
$! frustrating sacrifice to pay.  Now that we are operating
$! under VMS version 4.3 (at last!), we can eliminate the login
$! delay by using virtual terminals and disconnected processes.
$!
$! This menu procedure allows access only to MAIL and PROMS, and
$! PROMS is accessed by locating the disconnected process under
$! the username "REGIONS", which is permanently established for
$! them.  Using connect commands, the regional user is connected
$! to PROMS in a second, thus eliminating the frustrating and
$! system debilitating DTR compilation process.  The regional
$! user simply types ^Y then BYE (a global symbol equating to
$! "DISCONNECT/CONTINUE") to finish.  The PROMS menu options and
$! exit sequence remind the user what to do (see DTRSTART.COM).
$!
$! This approach works very well in an environment of
$! cooperative users.  It is in the interests of the regional
$! users to ensure that the disconnected process (REGIONS) does
$! not get blown away by doing silly things after typing ^Y - a
$! fact of which they are all well aware!  So far (2 months),
$! everything is working well and all users are delighted with
$! the login delay elimination.
$!
$! N.B. 1. The procedure uses global symbols defined in
$!      USR_UTIL:Termsetup.com for screen display control.
$!
$!      2. The indexed file REGCOLL.DAT consisting of one six
$! byte record is used to transfer data from the login
$! process to the REGIONS process.  This file contains
$! the appropriate regional collator code which is used
$! in PROMS for security checks that additions and
$! modifications are only performed where authorized.  A
$! 'computed by' variable (= collator from regcoll) is
$! used in Datatrieve to ensure that the REGIONS process
$! always retrieves the correct collator for the current
$! regional user.  Only one regional user is allowed at
$! a time for performance reasons, as there are already
$! four central PROMS users always active (in addition
$! to several other DTR systems that operate on the
$! 11/750).
$!
$! *****
$!

```

```

$!      Created by: Barrie Gray, Midland Microcomputers Limited.
$!                      March 1986.
$!
$! Modifications:
$! =====
$! *****
$!
$!      SET NOCONTROL=Y
$!      SET NOVERIFY
$!      SET NOON
$!      SET TERM/DEV=VT102
$!      region_list = -
$!      "PRATLANTIC/PRQUEBEC/PRONTARIO/PRPRAIRIE/PRPACIFIC/PRALBERTA"
$!      collator_list = "682/683/684/685/686/687"
$!      proms_username = "REGIONS"
$!
$! MENU:
$! !-----
$! !      DISPLAY THE MENU AND ACCEPT SELECTION
$! !-----
$! CLR
$! WRITE SYS$OUTPUT "          ", -
$!                   ESC,REV_SYM,"MENU",ESC,RESET_SYM
$! TYPE SYS$INPUT
$!
$!      1 - PROMS      : Use the PROJECT MANAGEMENT SYSTEM
$!      2 - MAIL       : Use the VAX electronic mail utility
$!      3 - LOGOUT     : Logout from the VAX
$!
$! INQUIRE selection "SELECTION"
$! IF selection .EQS. "1" THEN GOTO PROMS
$! IF selection .EQS. "2" THEN GOTO CALL_MAIL
$! IF selection .EQS. "3" THEN LOGOUT
$! POS 22
$! WRITE SYS$OUTPUT -
$!       "INVALID SELECTION - MUST BE BETWEEN 1 AND 3"
$! INQUIRE dummy "Press <RETURN> to continue"
$! GOTO MENU
$!
$! CALL_MAIL:
$! !-----
$! !      CALL VAX MAIL
$! !-----
$! CLR
$! TYPE SYS$INPUT
$!
$! *****
$!      YOU ARE NOW ENTERING THE VAX ELECTRONIC MAIL UTILITY      *
$!      TYPE "HELP" IF YOU ARE ARE UNSURE HOW TO USE MAIL      *

```

```

*      TYPE "EXIT" TO RETURN TO THE MENU      *
*****
$      ASSIGN/USER_MODE SYS$COMMAND SYS$INPUT
$      MAIL
$      GOTO MENU
$!
$PROMS:
$      !-----
$      ! ATTACH TO THE REGIONAL PROMS PROCESS (IF POSSIBLE)
$      !-----
$      context = ""
$      username = ""
$FIND_PID:
$      pid = F$PID(context)
$      IF pid .EQS. "" THEN GOTO NO_PROCESS_FOUND
$      username = F$GETJPI(pid,"USERNAME")
$      IF username .EQS. proms_username THEN -
$          GOTO TEST_FOR_CONNECT
$      GOTO FIND_PID
$!
$NO_PROCESS_FOUND:
$      TYPE SYS$INPUT

      THE REGIONAL PROMS PROCESS HAS NOT BEEN INITIATED

CONTACT COMPUTER SERVICES IN OTTAWA TO HAVE THE PROBLEM CORRECTED

$      POS 23
$      INQUIRE dummy "Press <RETURN> to continue"
$      GOTO MENU
$!
$TEST_FOR_CONNECT:
$      terminal = F$GETJPI(pid,"TERMINAL")
$      IF terminal .EQS. "" THEN GOTO PROMS_NOT_AVAILABLE
$      IF F$GETDVI(terminal, "TT_PHYDEVNAM") .EQS. "" THEN -
$          GOTO CONNECT_TO_PROMS
$!
$PROMS_NOT_AVAILABLE:
$      TYPE SYS$INPUT

      SORRY! THE REGIONAL PROMS PROCEDURE IS CURRENTLY IN USE.

      PLEASE TRY LATER.

$      POS 23
$      INQUIRE dummy "Press <RETURN> to continue"
$      GOTO MENU
$      !

```

```

$      !-----
$      ! Here we figure out which region is logging in and associate
$      ! the appropriate collator code from collator_list, storing
$      ! it in regcoll.dat
$      !-----
$      !
$CONNECT_TO_PROMS:
$      myusername = F$PROCESS( )
$      myusername = F$EDIT( myusername, "TRIM" )
$      element = 0
$CHECK_REGION:
$      region_name = F$ELEMENT( element, "/", region_list )
$      IF myusername .EQS. region_name THEN GOTO VALID_REGION
$      IF region_name .EQS. "/" THEN GOTO INVALID_REGION
$      element = element + 1
$      GOTO CHECK_REGION
$!
$VALID_REGION:
$      new_coll = F$ELEMENT( element, "/", collator_list )
$      IF new_coll .EQS. "/" THEN GOTO INVALID_REGION
$      OPEN/SHARE=WRITE/READ/WRITE COLL_FILE REGCOLL.DAT
$      READ COLL_FILE COLL_REC
$      COLL_REC = F$EXTRACT( 0, 3, COLL_REC ) + new_coll
$      WRITE/UPDATE COLL_FILE COLL_REC
$      CLOSE COLL_FILE
$      CONNECT/LOGOUT 'terminal'
$      INQUIRE dummy "Press <RETURN> to continue"
$      GOTO MENU
$!
$INVALID_REGION:
$      TYPE SYS$INPUT

      YOU HAVE NOT BEEN SET UP AS A VALID REGION IN PROMS

CONTACT COMPUTER SERVICES IN OTTAWA TO CORRECT THIS PROBLEM

$      POS 23
$      INQUIRE dummy "Press <RETURN> to continue"
$      GOTO MENU

! *****
!
! DTRSTART.COM
!
! This Datatrieve startup command procedure invokes the PROMS
! system, used for all data entry and essential reports for
! Programs Branch project and financial control. PROMS is an
! enormous application taking up nine Mb of virtual memory per
! user The system is now operated using virtual terminals and
! connect/disconnect commands to permanently-established
! processes. Central Branch staff use four PROMS processes

```

```
! concurrently, and a fifth (REGIONS) is set up for the
! Consultation Centre regional users to share. The respective
! login.com files limit the number of concurrent users for PROMS
! accordingly. Despite the large virtual demand, constraining
! PROMS in the above manner provides good performance to both
! PROMS users and other system applications.
```

```
! *****
! Created by Barrie Gray, Midland Microcomputers Ltd. Feb. 1982.
```

```
! *****
```

```
SET LOCK WAIT
SET COLUMNS PAGE=132
SET NO ABORT
:PRDECLARE ! declare global variables.
PRINT HOM|BOLD|TOY|
"10;10HNOW READING ALL DOMAINS (DATA FILES)....."
READY PRREGCOLL SHARED READ
DECLARE REGIONAL COLLATOR COMPUTED BY COLLATOR FROM PRREGCOLL .
READY PRAUDIT SHARED WRITE
READY PROJECTS SHARED WRITE
READY PRMSTONES SHARED WRITE
READY PRDESCNS SHARED WRITE
READY PRUSAGE SHARED WRITE
READY PRCONF SHARED WRITE
READY PRSUPER SHARED WRITE
READY PRCOMPLETE SHARED WRITE
READY PRCOMAUDIT SHARED WRITE
READY PRBUDGETS SHARED WRITE
READY PRPAY SHARED WRITE
PRINT HOM|BOLD|TOY|
"8;10HI WILL NOW PARSE ALL THE PROMS PROCEDURES."
PRINT TOY|
"12;10HTHIS PROCESS TAKES A FEW MINUTES DEPENDING ON SYSTEM LOAD"
PRINT TOY|
"16;10HPLEASE BE PATIENT....."|NORM
LOOP="Y"
WHILE LOOP = "Y" BEGIN
TOD = "TODAY"
DFYR = IF FORMAT TOD USING NN < 4 THEN
( FORMAT TOD USING YY ) - 1 ELSE
FORMAT TOD USING YY
DISPLAY FORM PRMN02 IN PROMS
RETRIEVE USING OPTION = GET_FORM OPTION
CHOICE
OPTION = 1 THEN BEGIN
:PR11
END
OPTION = 2 THEN BEGIN
:PR12
END
```

```
OPTION = 3 THEN BEGIN
:PR13
END
OPTION = 4 THEN BEGIN
:PR31
END
OPTION = 66,99 THEN BEGIN
PRINT HOM|BOLD|
"DO YOU REALLY WANT TO FINISH NOW?",SKIP 2
Z=FN$UPCASE(*."FINISH NOW (Y/N)?")
IF Z CONT "Y" THEN BEGIN
IF COUNT OF PRAUDIT > 0 THEN
ON LPA0:PROMS.LOG BEGIN
REPORT PRAUDIT
SET REPORT NAME = "PROMS AUDIT TRAIL"
PRINT SKIP,PROJID,CRNUM,APNUM,COLL,POINT,
PREVEX,CUREXP,TOTCOM,TOTPLN,SKIP,COL 1,
ORGNAM,SKIP,COL 1,TERMINAL,USERNAME,LOGDATE,
LOGTIME,ACTION,DELREASON,SKIP
AT BOTTOM OF REPORT PRINT SKIP 2,COL 10,
"NUMBER OF ENTRIES:",SPACE,
COUNT (-) USING ZZZ9
END REPORT
ERASE ALL OF PRAUDIT
END
IF OPTION = 99 THEN BEGIN
PRINT HOM|BOLD|BL|
"Type ^Y (Control/Y) then BYE to finish!",
SKIP 2
Z=*. "ANY KEY AND <RETURN> TO CONTINUE"
LOOP="Y"
END ELSE LOOP="N"
END ELSE LOOP="Y"
END
ELSE BEGIN
PRINT HOM|BOLD|"INVALID RESPONSE!"|BL,SKIP
Z = *. "any key followed by <RETURN> to continue."
PRINT NORM(-)
END
END_CHOICE
END
RELEASE ALL
FINISH
EXIT
```

---

DECReporter Notes -

Donald E. Stern, Jr. - Warner Lambert Co. - Milford, CT. 06460

---

Printing DECReporter Generated Reports:

Under version 1.0, in order to send DECReporter reports directly to a spooled printer, the logical name SYS\$PRINT (not a queue) must previously have been defined. It must translate to a valid device known to the system (eg. DEFINE SYS\$PRINT LPA0:). In addition, a device queue must have been established for this device. The name SYS\$PRINT, as the required logical name, was not a particularly good choice by the developers since many sites use SYS\$PRINT as the name for a generic print queue. By associating a system-wide logical name with a specific device, the advantages of a generic queue are lost.

Version 1.1 of DECReporter, which has shipped to customers, gets around this particular disadvantage by checking for the logical name REPORT\$PRINTER to determine the default printer. Of course, if REPORT\$PRINTER has not been defined, DECReporter will still look for the logical name SYS\$PRINT.

DECReporter Likes "the FAL way":

Referring to Ray Ferrara's article (see p. DTR-3) in this issue, if one intends to use DECReporter to access remote Datatrieve domains, the FAL method for specifying the domain should be used. The DDMF protocol is not supported by DECReporter.

---

## Two Across Mailing Labels Procedure

Supplied By: Ray Ferrara - Digital Equipment Corporation

---

```
DELETE TWO-ACROSS-LABELS;
DEFINE PROCEDURE TWO-ACROSS-LABELS
```

```
!
! Function - The following procedure demonstrates a brute-force
! yet workable method for printing mailing labels on 2-across
! (2-up) mailing label stock. By extrapolation, similar
! procedures may be developed for N-across mailing labels, or for
! any situation where multi-line records must be situated across
! a page. This particular procedure assumes the fields to be
! printed are NAME, COMPANY, STREET, CITY, STATE-CODE, and
! ZIP-CODE from records in a hypothetical COMPANIES domain.
!
```

```
!
! READY COMPANIES SHARED READ
DECLARE NAME-1      PIC X(25).  ! PICTURE clauses for these
DECLARE COMPANY-1  PIC X(25).  ! declared variables should
DECLARE STREET-1   PIC X(25).  ! match those in the actual
DECLARE CITY-1     PIC X(15).   ! record.
DECLARE STATE-CODE-1 PIC X(2).  !
```

```
DECLARE ZIP-CODE-1 PIC 9(5).    !
DECLARE COUNTER    PIC 9.
COUNTER = 0
FOR ALL COMPANIES SORTED BY ZIP-CODE
BEGIN
```

```
    COUNTER = COUNTER + 1
    IF COUNTER = 1 THEN
```

```
        BEGIN
            NAME-1      = NAME
            COMPANY-1   = COMPANY
            STREET-1    = STREET
            CITY-1      = CITY
            STATE-CODE-1 = STATE-CODE
            ZIP-CODE-1  = ZIP-CODE
        END
```

```
    IF COUNTER = 2 THEN
```

```
        BEGIN
            PRINT COL 1, NAME-1(-), COL 40, NAME(-), SKIP 1,
                  COL 1, COMPANY-1(-), COL 40, COMPANY(-), SKIP 1,
                  COL 1, STREET-1(-), COL 40, STREET(-), SKIP 1,
                  COL 1, CITY-1||", "||STATE-CODE-1(-), COL 22,
                      ZIP-CODE-1(-),
                  COL 40, CITY||", "||STATE-CODE(-), COL 61,
                      ZIP-CODE(-), SKIP 2
            ! Adjust columns and skips to fit the label stock.
            COUNTER = 0
        END
```

```
END
```

! Allow for exit from FOR-loop without last label being printed.

```
IF COUNTER = 1 THEN
```

```
    PRINT COL 1, NAME-1(-),      SKIP 1,
          COL 1, COMPANY-1(-),   SKIP 1,
          COL 1, STREET-1(-),   SKIP 1,
          COL 1, CITY-1||", "||STATE-CODE-1(-), COL 22,
              ZIP-CODE-1(-), SKIP 2
```

```
END-PROCEDURE
```

---

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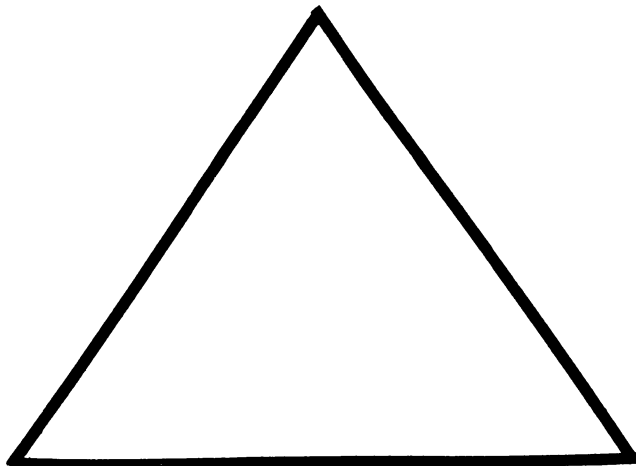
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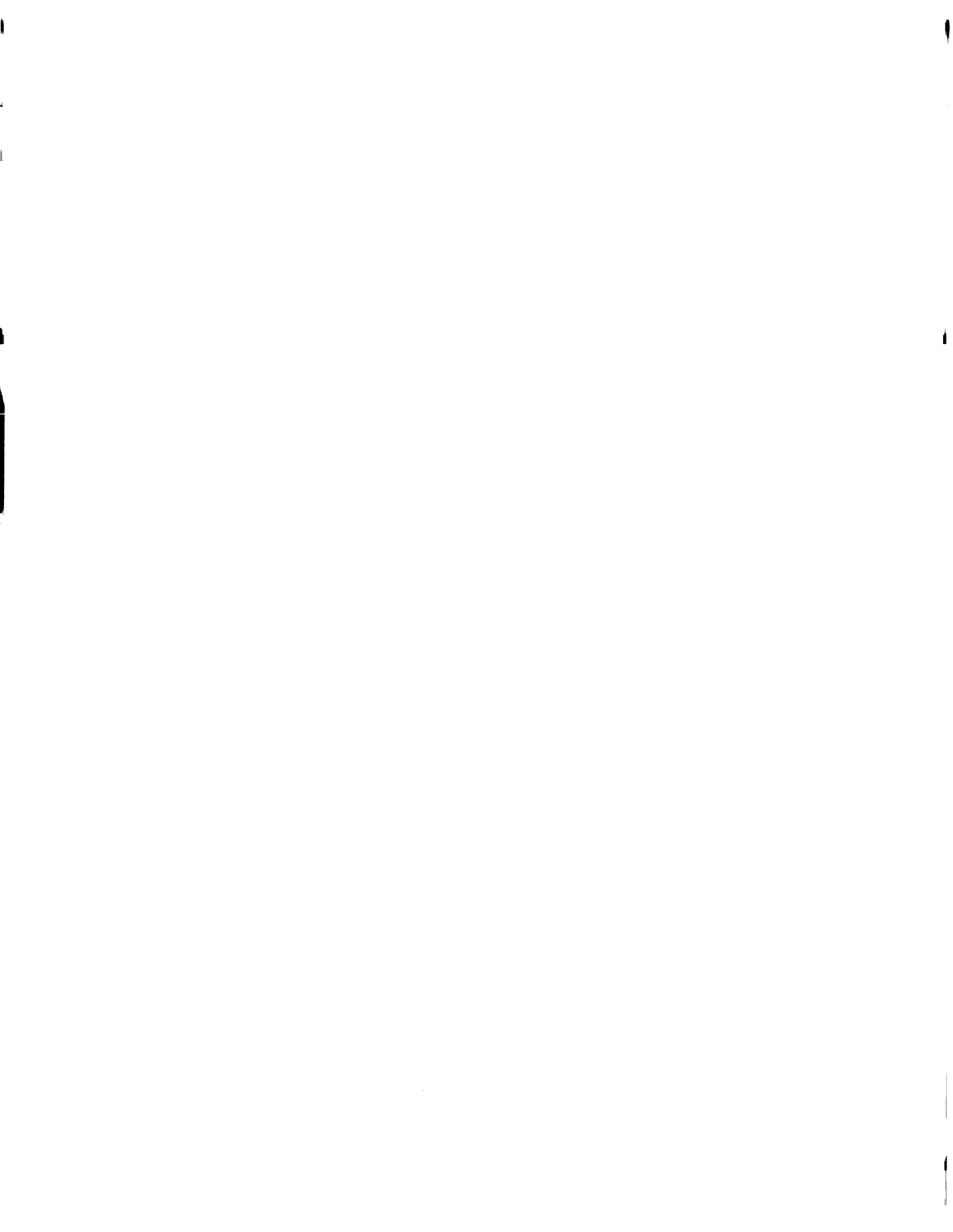
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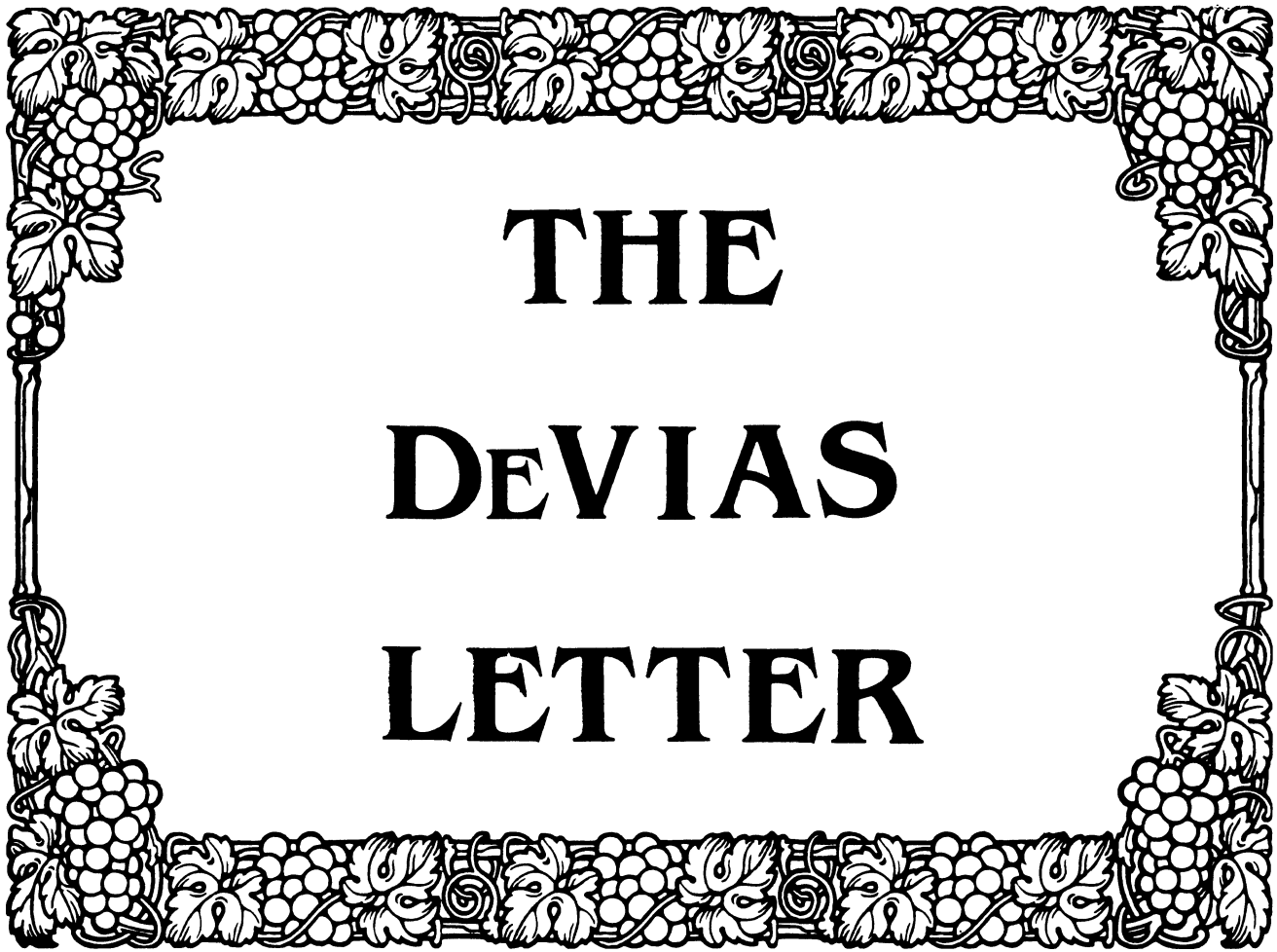
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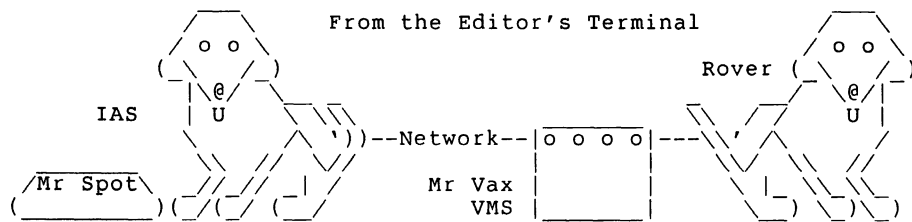
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As I sit here writing my first editorial as newsletter editor, one thought is uppermost in my mind: "How did I ever get myself talked into doing this?" But then the answer comes back, I like IAS, and if I want to see it stay around, I better support it.

I know our IAS system won't go away for a long time. We tend to keep hardware and software a long time around our place. Tim Moffitt's trivia wasn't so trivial to us, we still are running an 11/45 with a dual DC11 interface. (That 45, with a brand-x cache memory that takes advantage of the dual bus structure plus faster semiconductor memory on the unibus gives us fortran number crunching speed equal to that of our VAX 11/750 with a floating point accelerator. Not bad for a 10 year old machine.)

The winds of change are in the air, though, and I am spending a lot of time working with VMS. The new applications we have that need the large addressing capability of the VAXen belong there. (There's a high-resolution color graphics hardware and software package on the VAX that would blow away our PDP11.) Things like text editing that run fine on our 11 will stay there though. (That graphic package really slows down editing on our VAX, so I prefer to do things like this editorial on our 11. The response is just much better. In other words, "If it ain't broke, don't fix it!"

My main interest is to encourage reader submissions to the newsletter, and to encourage machine readable or telephone transferred submissions as much as possible. I'm equipped to read most magnetic media, and will be setting up accounts on both our IAS and VMS systems for phone-line submission. (Access information won't be published for obvious security reasons.) I know there is good stuff out there, I just need to get it.

There will be, (of course,) some disruption as the editorship changes hands, but hopefully the effect will only be felt for one or two issues. Please bear with us.

In this issue we have Tim Moffitt's always interesting trivia page, an update to the IAS library, and the first in a series of articles on my efforts to convert a large MACRO program to VMS native mode. I looked around for aids to converting ma-

cro programs, and found none. Hopefully my experiences will be helpful to others. (I'm working on converting REESE basic by the way, might as well go the whole 9 yards.) When I am finished, the package should be a pretty good "Rosetta Stone" to enable others to decipher the subtle differences between 16-bit and 32-bit macro.

I have received the IAS pens. If you just have to have one, the price is a really fine submission to the newsletter. I plan on making them hard to get, and just a simple article won't do, but my judgement can always be swayed by reader response to an article.

As a final note, may I vote a round of applause to John Roman for his yeoman service as editor. He is going to be a tough act to follow.

## CONTRIBUTION GUIDELINES

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

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 DECUS U.S. Chapter  
 219 Boston Post Road, BP02  
 Marlboro, MA 01752

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

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

1. Non machine readable sources, (SPR's etc,) should be reasonably dark to insure good photocopying. Text whatever should be the equivalent of 66 lines at 6 lpi, with 4-line top margin, 5-line bottom margin, left-margin 10, right margin 74 at 10cpi.
2. Machine readable sources may be submitted on 9-track Mag-tape, (800,1600, or 6250 BPI,) DEC-tape II, DecMate floppies, or whatever. Preferred format is DOS or BRU for tapes, Files-11 for DEC-tape II.
3. 1200 baud dial-up modems are available on our IAS system and our VAX, with various servers available. Give the editor a call at (312)-791-2515 (preferably later in the day,) to obtain access information, etc.

Department N436  
McDonnell Douglas Corp.  
600 McDonnell Blvd.  
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Dear IAS Enthusiasts:

Summer has arrived here, and the doldrums are well settled. Except for Decus, which has to work continuously to get ready for the next symposium, at most 6 months away. This week the Symposium Committeey is huddled in Mass., hard at work to schedule sessions for the upcoming symposium at San Fransisco. It sounds like it will be an exceptional symposium. I hope to see you there.

I just learned a new trick as I was happening to be reading through an old RSX-11D system programmers course manual. What happens when you task build a symbol table files (.STB) with the following command:

```
TKB ,LP:=[11,17]EXECUTIVE.STB
```

Why, you get a list of the symbols and their values. Very handy for all sorts of symbol tables. Especially so for the EXEC, when you are trying to remember where .SERFG is in order to crash your system. (Or .TKPS if you want your day to go a little faster.)

Remember, we are still trying to get a handle on who belongs to the IAS sig, including who they are, what they are running, what hardware, software, and how we can serve you. Please take the time to fill out the form in the tear out section of the newsletter at the end and send it in. It will help a great deal to understand the appropriate direction for the sig.

Thanks, and have a happy summer,

John Roman

Trivia and Other Stuff

Tim Moffitt

Almost everybody who has worked around older PDP11's has had the opportunity to see (and perhaps tear) the wide white Unibus cable. If you look at that cable, you'll see two pieces of foam, each about an inch wide and perhaps 1/16" thick sandwiched in between the two pieces of cable. What is the foam for?

Next question. What is the purpose of the UMR's (Unibus Mapping Registers) in the newer Unibus based PDP11's and why aren't they necessary on Q-bus based machines?

Last question. What standard disk drive comes from Digital in a dual port configuration supporting two different operating systems in two completely different physical formats?

When the Unibus was introduced it came without foam. It didn't take too long to realize that when Field Service clamped the cable down hard where it left an expansion box, intermittent problems were sure to follow. What was happening was that the signal wires in the two seperate cables were being jammed too close together allowing crosstalk to occur. The foam is used to keep signal wires apart far enough to avoid this situation. It's still a good idea to make sure that the clamps that secure the Unibus cable are left just tight enough to hold the cable and no tighter.

Answer number two. When the Unibus was designed it was assumed that nobody would ever need more than 256KB of addressable space for memory. Wrong. Memory got cheaper and everybody wanted more of it. The first PDP11 to allow more than the 256KB was the 11/70. It neatly sidestepped part of the problem by using RH70 Massbus controllers that implemented 22 bit addressing but the problem existing Unibus controllers remained. The solution was to design a set of relocation registers called Unibus Mapping Registers that would convert the 18 bit physical Unibus address into a 22 bit address on the meory bus. They function very simply. When the map is turned on, the upper five bits of the unibus address (17-13) select one of 32 mapping register sets. The contents of that register set is then added to the remaining bits of the unibus address (12-0) and the resulting 22 bit address is applied to the memory bus. You sharp folks might notice that the last register set would map the I/O page (760000-777776) and it would if it could be enabled, but it can't be. It exists and you can set and clear bits in it but relocating the I/O page won't work. Its disabled in hardware.

And why don't the newer Q-bus systems don't need UMR's? Unlike the Unibus, the Q-bus has changed over time. The Q-bus started with 16 address bits, was expanded to 18 bits, and then expanded again to a full 22 bits. Newer controllers offer 22 bit addressing eliminating the need for UMR's. Older controllers that can address only 16 or 18 bits present some "interesting"

challenges for the system programmer. That's the price of progress.

The last question is a tricky one. The disk in question is the RP06 that is used as the load device for the DECsystem 20's and some DECsystem 10's. Port A is connected to the 11/40 front end and the first part of the pack contains the standard 16 bit format. When the system is turned on the 11/40 boots off of the drive and up comes RSX20 or RSX10. Once the main processor is initialized by the 11/40 it can then access the second part of the pack that contains the 18 bit format that 20's and 10's understand and TOPS20 or TOPS10 is then free to load. As an aside, that's why the RP04/05/06 formatter allows you to format in both 16 and 18 bit mode on the same pack. Now that's trivia.

11-SP-89

IAS SIG LIBRARY

Version: Library-B

Author: Various

Submitted by: Michael Robitaille, Grumman-CTEC, Inc., McLean, VA

Operating System: IAS, V3.0, 3.1, 3.2 Source Language: FORTRAN IV, FORTRAN IV-PLUS, FORTRAN 77, MACRO-11 Keywords: Library Tapes - IAS

Abstract: This package represents the current state of the IAS SIG LIBRARY. It contains a multitude of software programs, help files, and function libraries submitted by IAS users over the years. This library is under continuous management by the IAS SIG and will be updated as additional programs are submitted and the existing programs are tested and evaluated. "LibraryB" contains 2,849 files in 87 directories requiring 45,718 blocks. Among the contents in the tape are:

- . SRX - an enhanced IAS version of SRD
- . TDS - a suite of Task Dump Services with great utility during program development and maintenance
- . ATS - a utility for displaying the current active tasks in priority order on a VT100
- . HLP files for most IAS commands (as of V3.0) and for some of the SIG Library
- . Several disassemblers and debuggers including BUG, a full screen debugger-disassembler for the VT52
- . Several games including ADVENTure and MTREK, a multi-player Star Trek
- . IAS system accounting packages
- . GTC - a Get Terminal Characteristics utility and much more

Notes: Developed for IAS, may work for other PDP Operating Systems.

Restrictions: The bulk of the software is untested by the submitter. Documentation for some of the programs and utilities are sketchy or absent. Objects are not supplied when source code exists. Since some source is in FORTRAN, a FORTRAN compiler is necessary for those utilities. All privileged programs assume IAS.

Media (Service Charge Code): 2400' Magnetic Tape (PC)  
Format: BRU

# Macro-16 to Macro-32

## A Tale of two Systems

Frank R. Borger  
Michael Reese Medical Center

This series of articles will be a chronology of the efforts involved in my conversion of a large PDP11 machine language program to run under native mode VMS. Hopefully this will be of interest to other macro programmers who wish to convert their favorite macro program to run under VMS, either because of the slow operation in RSX emulation mode, or to run on VAXen not supporting RSX emulation.

The program we chose to re-write was REESE basic. The source contained a total of about 15000 lines of source, with a net of about 6000 lines of actual code. Although one might question the wisdom of doing such a massive conversion as the first project, when one has to learn a new language, new system calls, new utility routines and a new debugger all at the same time, its the only way I can operate. (The first thing I wrote in MACRO on the PDP11 was an RSX11-D handler.) Its the programmer's equivalent of learning how to swim by falling overboard from the ocean liner.

### INTRODUCTION

When I initially started reading the VMS macro manual, and the numerous manuals that are the equivalent of the "System Library Routines", "System Directives", and "I/O Operations" manuals, I searched vainly for anything like a "rosetta stone" that would aid in a comparison of the two languages and the two operating systems. Alas, such an aid was not to be found. I did find one "conversion" program advertised in the media, but its several K\$ price was way beyond our current budget.

The only thing I did find was on the latest sig tape. A native mode version of Bonner labs RUNOFF. The code provided:

1. A series of macros to turn PDP11 code into VAX code. An example was:

```
.macro BIS ARG1,ARG2
BISL2 ARG1,ARG2
.endm
```

2. An example of the same file IO done in RSX/IAS and VMS mode.
3. An example of command line processing under RSX/IAS versus VMS.

Having gotten properly excited by the Bonner Labs submission, we decided to actively pursue the conversion.

### PHILOSOPHY

We made an initial decision that our conversion should do the following:

1. There were several large Macro source files, (on the order of 3000 to 4000 lines per file.) We wished to break them down into more manageable pieces.
2. Instead of using macros to define VAX macro equivalents of PDP11 macro source, we should edit the source files. If you are going to work in a new language you must learn to think in that language, not think in your old language and constantly translate. The only exception to this was that we kept the old SEC CLC etc codes. The idea of communicating subroutine success or failure by the C bit, (and V bit, etc) is so ingrained by now that its TRADITION.
3. As a cosmetic action, source should be converted to lower case.
4. Parts of the code of REESE basic are from the first days of the PDP11. (There still is "BR .+4" style code in parts of it.) As long as we were going to do a major re-write, we should clean this type of code up.
5. Reese basic code was sufficiently modular that we did not have to test the whole thing at once. For each module that contained one function or several quite similar functions, a separate simple test program should be written to test those functions.
6. Since it was such a large project, we set deadline of having a reasonably working version ready for submission to the FALL 86 sig tape. This would keep us from killing ourselves over the project, but give us a reasonably attainable target date.

### BASIC CONVERSION PROGRAMS

We first wrote a series of programs in REESE basic, (running in compatibility mode,) to perform most of the required edits. The programs and their normal order of execution were:

1. BREAK.BAS  
A program to take a large file (X.MAC) and
  1. Convert all text to lower case.
  2. Prompt the user for a new file name at each .SBTTL directive.
  3. Extract all text delimited by the standard ;+ and ;- notation to a separate X.TXT file.



## 2. MOV.BAS

This program did the main editing of PDP11 instructions into VAX instructions. It made the following changes:

```
mov      movw
add      addw
sub      subw
cmp      cmpw
bic      bicw2
bis      bisw2
bit      bitw
inc      incw
dec      decw
clr      clrw
tst      tstw
br       brw
beq      beql
bne      bneq
blt      blss
bmi      blss
bgt      bgtr
ble      bleq
bge      bgeq
bhi      bgtru
blo      blssu
bhis     bgequ
call     jsb
jsr pc,  jsb
return   rsb
rts pc   rsb
sob      sobgtr
neg      mnegw
negb     mnegb
com      mcomw
comb     mcomb
@sp      (sp)
```

Flags the following instructions with a leading ???, (since there is no viable equivalent on the VAX.)

```
asl
asr
rol
ror
```

Note that there are some minor differences in a couple of the op code substitutions. Also we have set our "default mode" to be 16-bit, which will cause problems. (More on this in a later article.)

## 3. WORD.BAS and POUND.BAS

Checks the text for .word and .byte directives and for pound signs followed by the digits 0 thru 9. When found, asks the operator if they wish to insert a ^O after the .word, .byte or # character. This is necessary because the default math on the vax is decimal, not octal.

## 4. FLOAT.BAS

Converts the following floating point instructions

```
ldf      movf
stf      movf
subf     subf2
addf     addf2
mulf     mulf2
divf     divf2
ldcif   cvtwf
ldcid   cvtwd
stcfi   cvtfw
stcdi   cvtdw
```

Flags the following with ??? in the first column

```
abs
mod
```

Comments out the following

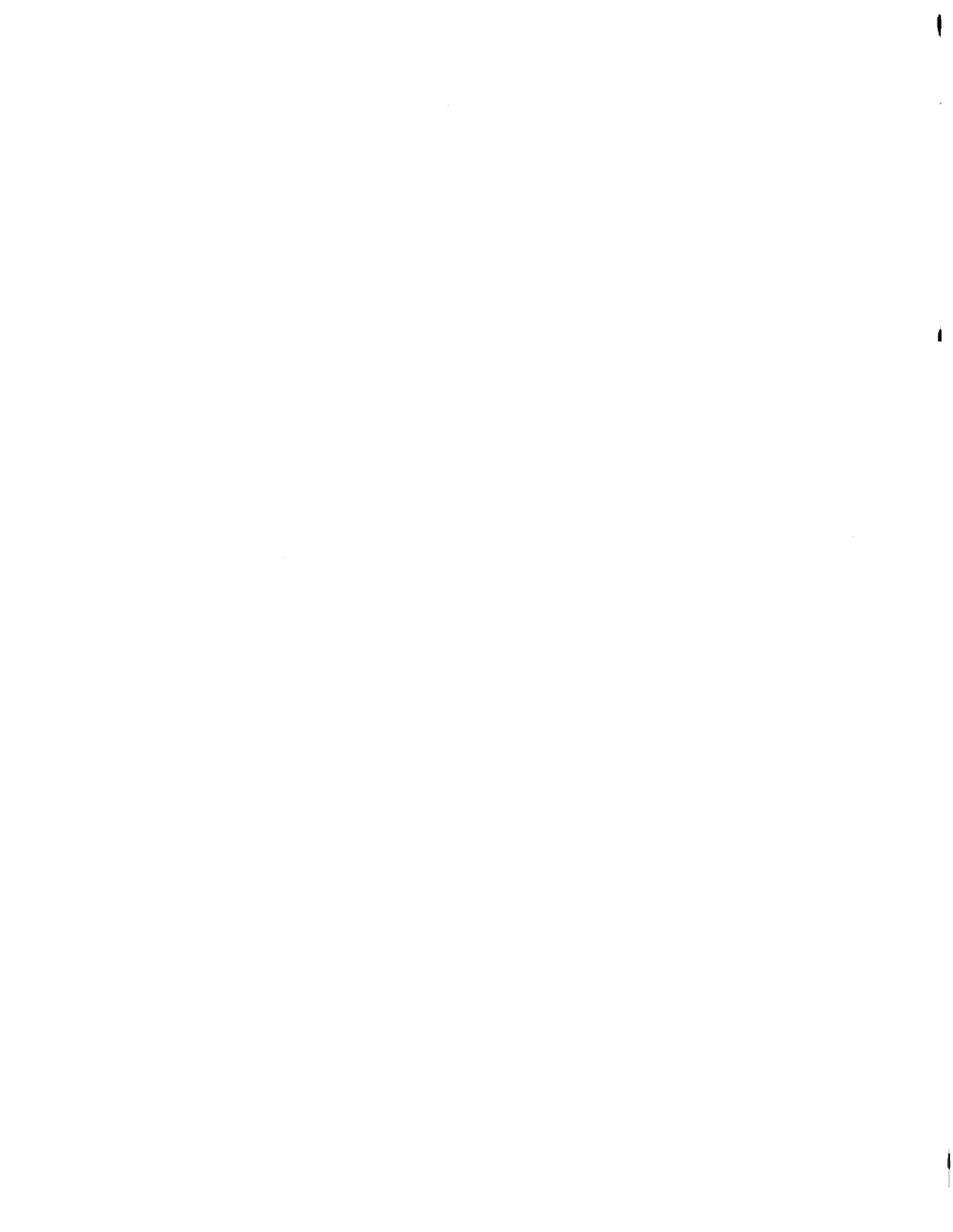
```
cfcc
setf
setd
seti
setl
```

## 5. ASCII.BAS

Converts one and two character ascii constants, (of the form "AB and 'A) to their equivalent octal notation. (VMS does not support the ascii characters.)

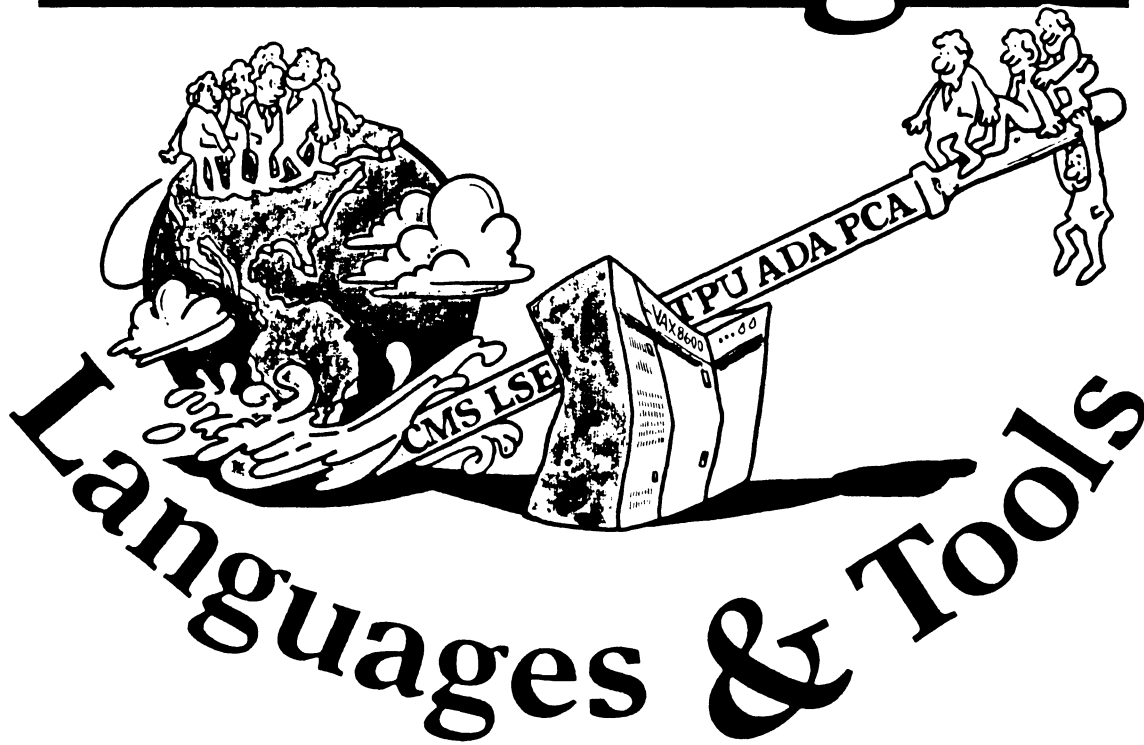
Having tested and debugged the above programs, we felt we had the proper tools to start the conversion process, (at least as far as we could go in making canned text conversion programs.)

Next month we'll talk about a big problem. Whether to chose 16-bit as your default mode, (as we did,) or go to 32 bits.



# Leverage

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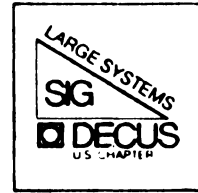


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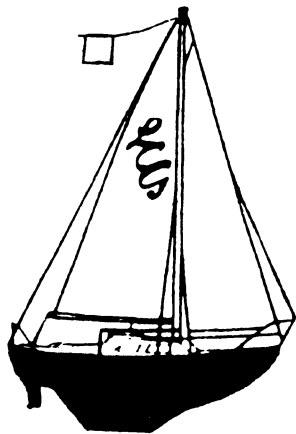
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DIGITAL EQUIPMENT COMPUTER USERS SOCIETY

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AT LARGE

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The Newsletter of the Large Systems SIG

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## From the Editor

In case you didn't notice, there is a new editor starting with this issue. I am taking the reigns from Michael Joy who has stepped down due to other commitments. He will be a tough act to follow. For me to be successful, I need your help. Are you an expert (or not so expert) in some field related to our SIG? Do you have information that you have been hoarding for years? Share your knowledge with your fellow SIG members! Send me your cards and letters along with your newsletter submissions. My address is:

Clyde T. Poole  
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In the next issue of the Large Systems SIG Newsletter you can expect the Spring Menu, a reprint of an article from the University of Western Ontario Computer Center Newsletter and I have been promised an article from our tape copy person. But this isn't enough! Send me more!

## From the European 10/20 SIG Chairman

Rolf Nordhegen  
University of Oslo Comp. Service  
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June 10 1986

DRAFT PAPER:

### LARGE SYSTEMS - NEW DIRECTIONS FOR THE 10/20 SIG.

The impact of high end systems in the VAX product line is creating a growing awareness within DECUS of the need to serve and support the users of large systems. Users of high end systems, in addition to an interest in line with more traditional users, have specific requirements which presently have less focus than the ones of the very large number of issues important to smaller systems. In DECUS, the 10/20 community has provided a strong activity aimed at supporting very similar needs, such as mainframe style computing with large user bases, management issues for complex environments with multiple processors, and large distributed and networked system bases etc.

The 10/20 SIG is recognising the need for ongoing support for the existing members. It is particularly critical to ensure that the needs of the user community are met during the final phase of DIGITAL's support for 10's and 20's. Although new products and enhanced software features will cease to be important, the continuation of service, support, and a host of problems relating to software rights and licensing issues will have to be given strong consideration. Simultaneously, the 10/20 user base is to significant degree turning to high end VAX systems for supplementing and/or replacing their existing systems.

To a large degree, the 10/20 user community is able to bring to the VAX environment a strong background in precisely the same issues which will have to be dealt with in order to make the high end VAX products a viable choice in large system computing. Within DECUS it will thus be a clear objective for the 10/20 SIG to support a large system activity aimed at the use of high end VAX systems.

It is further recognised that there may be a need for a high end activity in the VAX/VMS environment separate from the issues which today is taking the major part of the resources available in that environment.

In ongoing discussions within the European DECUS leadership, involving both the VAX SIG and the 10/20 SIG, it is resolved to create a LARGE SYSTEM activity based upon a cooperative effort between the SIG's. The present aim is to strengthen the VAX high end related activity, and if this can be successfully combined with ongoing 10/20 activities, to consider a future Large system SIG based on existing large system activities within the 10/20 SIG. This is in line with present plans for the Large System SIG of U. S. DECUS, and will also reflect the present structure of Large System Marketing and Engineering in DIGITAL. Thus, the directions for a Large System SIG will give a better focus for interacting with DIGITAL on high end issues.

To be more specific on the objectives of a Large System activity in DECUS, the following can be given as examples of issues of particular interest to users (and managers) of high-end systems and large clusters:

- \* Data Center activities: Information Management, Central Support, Operational management, Computer rooms.
- \* Large distributed environments, Multi-node Networks (The Network is the System), Large PC-environments, "Local Area Systems", Distributed Applications.
- \* Heterogenous or multi-vendor sites (IBM coexistence), Multiple Operating System environments, issues common to wide ranges of systems (micro to mainframe), Standards!
- \* High end and Mainframe functionality and support, Large user base management, Large site Field Service issues.

In general, the mainframe perspective of high end systems and large clusters will be the main challenge of a Large System activity in DECUS. This should bring together the 32 and 36-bit worlds in a cooperation for common goals in a future direction for the SIG.

In practice, how the new activities will be organised will have to be worked out in the coming year. The main objective will have to be an increased focus on high end VAX issues, bringing into the SIG users with a strong background from this type of experience. Also, a cooperative liaison between a Large system activity and the main VAX SIG activities must be established. In addition, the support from DIGITAL for the new direction must be secured. At the same time, the traditional 10/20 activities must be kept at a sufficiently high level to ensure ongoing support for these systems during the remaining years.

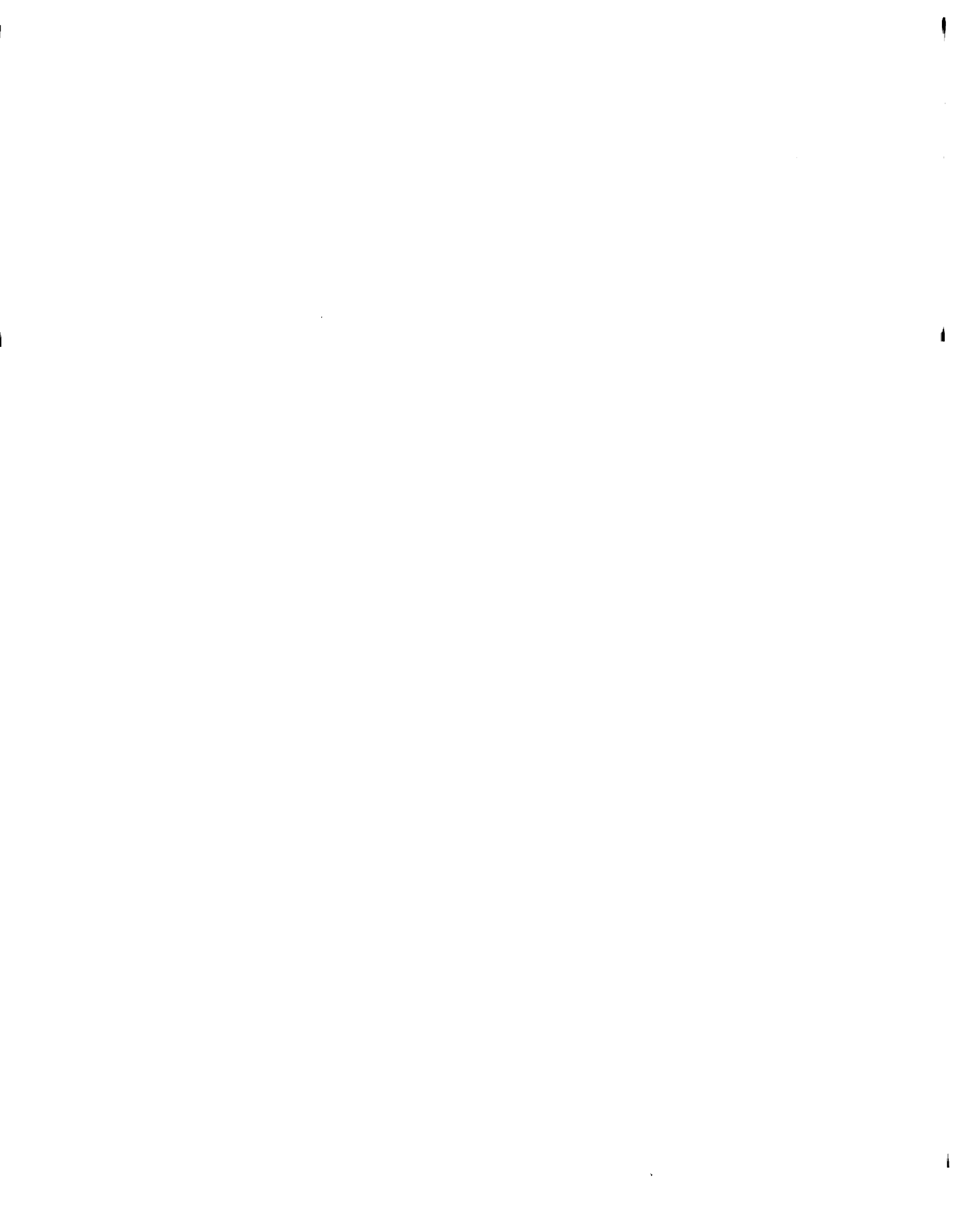
As an immediate activity, the European DECUS Hamburg symposium should see a discussion of the directions and the creation of a consensus for the future goals. Also, at the business meeting in should be clear objective to bring into the SIG steering committee members from the high end VAX community.

The Hamburg symposium itself has reached a planning stage were only a small number of sessions will be aimed at the new direction. However, it should be a clear aim to find ways to create a stronger image of a common Large System activity for the 1987 symposium.

To further strengthen a Large System activity, the National Chapters should seek to establish similar directions for national activities. It is recommended to establish a cooperation between the national 10/20 SIG chairmen and their VAX colleges. In particular, it would be valuable to establish close cooperation with active high end VAX site representatives, and the large systems DIGITAL sales representatives.

In the matter of actual SIG organisation, by-laws, name changes etc. these matters should be dealt with when the viability of the present ideas on a new direction is established.

The spirit of the large system users, once the mainstay of DECUS activity, may come to life again!





**MUMPS**

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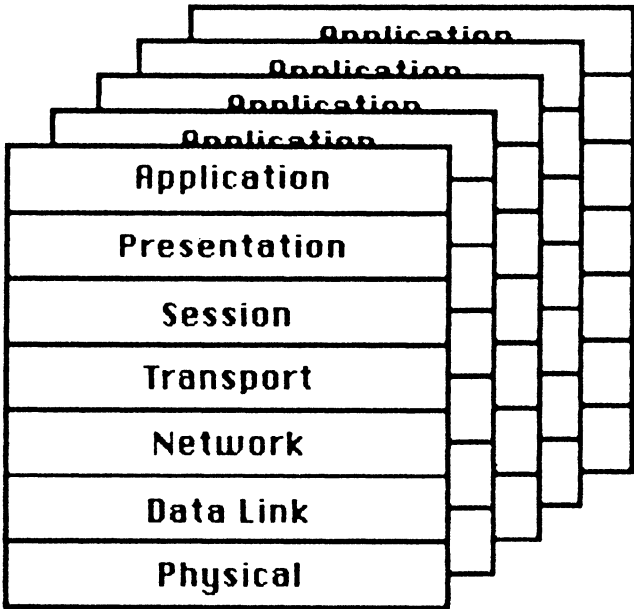
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# NETworks

The NETWORKS SIG Newsletter



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The Networks Special Interest Group (SIG) is one of 25 SIG's within in Digital Equipment Computer User's Society (DECUS). The main purpose of the Networks SIG is to promulgate information concerning the use, development, and standardization of network products that function or involve Digital Equipment Corporation systems. Additional functions of the SIG include the coordination and scheduling of symposia sessions, providing methods for free-flow communications, publication of the Networks SIG newsletter NETWords, participation in domestic and international standards committees, input to Digital for new products and corrections to existing products, promotion of working groups for special network needs and topics, and many, many other functions.

The Networks SIG Steering Committee invites you to participate in the Networks SIG. There are many ways that you can help the Networks SIG. Some of those include chairing sessions at symposium, participation in the various Networks SIG working groups, participation in special research projects, and others. If you are interested in devoting your time and expertise, contact any of the steering committee members.

DECUS is run entirely by volunteer leadership. Help us make DECUS and the Networks SIG better - take an active part in **your** SIG!

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## The Editor's Cobwebb

By: Vickie Hancock  
Networks SIG Newsletter Editor.

### Greetings!

As I sat sweating over the keyboard, (for those of you who live in our fair state or who have visited at this time of year - you know that isn't an exaggeration!) I realize how lucky we are to have machines that do so much for us. If I had to write all of this, it would probably be illegible and stuck to me as well! Instead, I can lubricate the keyboard while working - kill 2 birds with one stone!! (So much for humor!!)

Thanks to some concerned users we have a couple of interesting articles for you this month. Nikolaus Kiefhaber has some useful tips on VAX/VMS PSI software. Carole Greenfield, our DEC counterpart, has submitted an article on general network and management problems and solution models written by John Heffernan and Donna Ritter. Hopefully, these articles will be beneficial to some of you, who may be experiencing similar problems.

Stay COOL and see ya next issue!

VH

Hints and Kinks  
Installing and Using  
VAX/VMS PSI Software

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### Introduction

This paper describes the experience gained while installing DEC PSI for a client, a software development house. Some considerations are given on selecting a Public Data Network. Potential pitfalls while installing PSI are explained. Some useful tools that were added to PSI to make it more secure and more usable are shown.

### Definitions

The following loosely defines a few commonly used terms:

- Host: One end of an X.29 link. Applications run on the host. Could also be a terminal (X.29 terminal-to-terminal link).
- PAD: A Packet Assembler/Disassembler. Either a black box at a PSDN's node, reachable via dialup lines, or a piece of software, such as PSI running on a VAX. The other end of an X.29 link. X.29 terminals are connected to a PAD.
- PSDN: A Public Switched Data Network (in U.S.: Telenet, Tymnet, CSNet, Uninet, and others)
- PSI: A DEC software package that allows a host to initiate or answer X.25 and X.29 calls.
- X.25: A standard that defines a low-level protocol between two nodes in a network.
- X.29: A standard that defines the protocol between a remote terminal (the X.29 terminal) and a host.

### Customer Application

The client had several reasons for installing DEC PSI. The prime reason was a software development project that was done partially in Boulder, CO, and partially in Cambridge, England. Documents and software had to be transferred back and forth frequently, rapidly, and without errors. Magnetic tapes were too slow and too expensive for small amounts of data. FAX could only be used for documents that did not have to be re-edited at the other end. Telephone dialup was much too costly and too error-prone.

Another reason was the need to connect the VAXes at the Boulder headquarters with a 730 at the company's subsidiary in Frankfurt, West Germany, via DECnet for electronic mail and software distribution and maintenance.

Technical Support Engineers and sales staff across the U.S. needed access to an on-line demo system as well as access to their electronic mail and other files.

Occasionally there was the need to have multiple, high-speed terminal lines from some point in the U.S. to the HQ's VAXes. Such occasions were trade shows or training classes at remote sites.

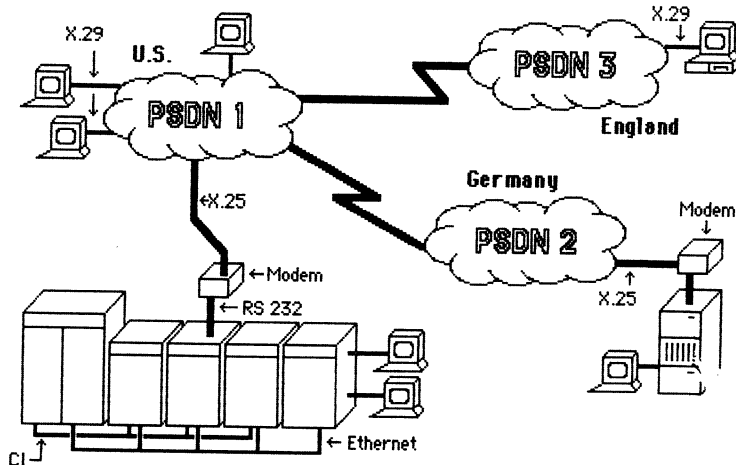
The above software project was the main reason and justification for obtaining PSI. However, the secondary projects immediately benefited without having to strain their budgets.

#### Client's Hardware Configuration

The client had five VAXes (one 785, four 750s) in Boulder, CO, plus one 730 in Frankfurt, West Germany. All VAXes in Boulder were DECnetted via Ethernet, the 785 and three 750s were also clustered. No HSC50 was used. DEC PSI was installed on one 750. DEC ACCESS was not used. A 4800 baud synchronous link existed to the PSDN.

In Frankfurt, PSI was installed on the 730, with a 9600 baud link to DATEX P-10 (the German PSDN).

At both sites the network-provided modems were connected via RS-232 cable to the synchronous port of an existing DMF32 multifunction board. No special networking hardware was used.



#### Network Selection and Configuration

It was easy to choose a network in Germany: the only one available is DATEX-P, provided by the PTT (Deutsche Bundespost).

In the U.S., several networks coexist. Their technology is very similar. The main differences are in the terminal user interface and in the cost algorithms. Some networks charge by the number of characters sent, which is more cost effective if a lot of interactive work is to be done (editing). Other networks charge by packets (full or not), which can be more cost effective when bulk data transfer occurs (graphics, file transfer). There are also differences in the call procedures, i.e., how one can reach a host (national and international). Most networks have nodes in all major cities of the U.S.

A large number of parameters have to be set properly at *subscription* time. Fortunately, in most cases the default values for the network are appropriate. PSI knows the defaults for most networks and adjusts its internal values accordingly.

Note that some PSI utilities fail to handle the subscription option *window size negotiation*. The problem was solved by defining a *fixed window size*.

#### Installation

PSI was first installed in Boulder. VMSINSTALL.COM did its usual good job, with a few exceptions that are described below. The PSDN installed a 4800 Baud dialup modem at the client's site, using an existing dialup telephone line. Within about three weeks this temporary line was replaced by a permanent, leased line. During these three weeks the dialup connection had to be reestablished only once, after a power failure. Starting with a dialup line made it possible to get PSI running on time to meet an important deadline.

After some initial installation problems (wrong cable), the link to the PSDN synchronized all by itself and X.29 dialout and dialin worked immediately. For testing, the client could call itself via an outgoing / incoming X.29 link.

PSI has a good *trace* facility that shows all incoming and outgoing data packets. Even with minimal knowledge of X.25 and X.29 formats one can easily diagnose errors that occur during call establishment. Also, the trace facility allows optimization of packet sizes depending on the application task.

#### Installation Problems

Documentation for VAX PSI 3.2 is much better than it was for version 2. However, there are still some major errors and omissions. Fortunately, by intelligent guessing one could find a solution in most cases.

The NETACP process has to run with BYPASS privilege for PSI to work correctly. This privilege is not necessary for normal DECnet operations. However, if PSI is started with NETACP not having BYPASS, the most obscure error messages will be generated. The client's SYSTEM account runs with BYPASS disabled after LOGIN. A simple fix in the command file that starts NETACP solved the problem.

The VMSINSTALL command procedure suggests strongly to turn DECnet off before continuing. However, later it asks if one wants to start PSI right after installation. If this is answered with 'YES', the procedure fails since DECnet must be running first.

The command procedure that defines permanent PSI parameters erases existing permanent DECnet parameters.

After installing PSI the client experienced frequent crashes of the system (twice a day), with PSIACP being the current process. These crashes became considerably less frequent after a PSI patch tape was installed. Software support sent this tape immediately after hearing about the crashes.

#### Local Enhancements

After PSI was installed and running, several tools were added to enhance security and functionality. These tools are described below.

## Dialup

X.29 terminals that are logged in from a remote site show up on the local VAX as NVAnnn terminals. Unfortunately, they do not show up as DIALUP, which created a security problem. Users on the client's machines are restricted as to their DIALUP login capabilities. In particular, some privileged accounts cannot use dialup lines. Fortunately, a special X.29 Server (see below) solved this problem. By the way, this is also a problem on normal DECnet, when a dialup user connects to another host via SET HOST, since the terminal suddenly becomes non-dialup (RTAn:).

## Terminal Configuration

There are several parameters that are critical to the performance of an X.29 link. They basically determine under what circumstances a packet is sent from one end to the other. The fuller a packet is (usually 128 chars max), the more data can be sent in a given amount of time (less overhead) and the less expensive it may be (packet based charges). However, it may take much longer for a character to show some effect (echoing, or other action), since characters may be stuck in a local buffer for a while waiting for the packet to become filled. Not setting these parameters appropriately can affect an X.29 link adversely.

An X.29 terminal link can be configured from both ends. One can change parameters from the PAD or from the host. If VAX PSI acts as a host (incoming call), the commands \$ SET TERMINAL and \$ SET TERMINAL /X29 are used. If VAX PSI acts as a PAD (outgoing call), parameters can be specified on the \$ SET HOST /X29 command or while in PSIPAD command mode. Other manufacturers may limit the parameters one can specify on their hosts or PADs.

Four commonly used combinations of parameters were found. These can be set with a small command file that has been made accessible system-wide:

- 1) Command mode: Used by default. PAD echoes characters. Packets are forwarded when they are full, on <CR>, or on any control character. Least expensive.
- 2) Editing mode: Used for editing only. Host echoes. Packets are forwarded on control characters, but every 1/10 th of a second at latest. Sends lots of small packets. Possibly more expensive, depending on PSDN.
- 3) Upload files mode: No echoing at all. Packets are only sent when they are full or after 10 seconds (last packet). Fast and inexpensive.
- 4) Single character I/O: Used for special applications. Similar to editing mode, but tuned for even greater speed. Packets are sent containing one character each. Very expensive. Should not be used for large quantities of data.

Note that default X.29 parameters are usually defined by the network. Their values are determined at subscription time, but can be changed later on request. A convenient solution is to use *network servers* to define X.29 parameters when a call is established.

## Network Servers

There are several items that can be specified when an X.25/X.29 call is established. The main item is the number that is to be called, e.g., 3nnmmmmmmmmmm. The digits 'nnn' specify a data network within the U.S., the digits 'mmmmmmmmmm' specify a subscriber's number. Any digits used beyond the subscriber's number may be passed on to the host; they act as *subaddress*. The host can modify its actions depending on this subaddress. For example, one has to specify which subaddress is used by the DECnet EXECUTOR to start a link.

Another parameter is the *user data field*. This field can specify which protocol is to be used, e.g., X.29 calls have the first 4 bytes in this field set to '01000000'X. PSI MAIL uses this data field to specify that the PSI MAIL-specific protocol should be used.

If one intends to use subaddresses (if one wants to start up DECnet over the X.25 link, for example), one must make sure that the PSDN actually passes extra digits on to the host. This may either be a subscription parameter, or even an extra charge item on some networks.

The establisher of an X.29 call may not be able to specify data for the *user data field* beyond the predefined first four bytes if he or she is not using VAX PSI. This may affect special software (see Queues, below).

VAX PSI has an elegant way to use these parameters when a call request comes in. One can define (using NCP) a series of *servers* that are called, in order of priority, when either a subaddress matches or when a user data field matches or partially matches. As an example, the DECnet server accepts all calls to a specific subaddress. The X.29 server accepts all calls with '01'X in the first single byte of the user data field. The PSI MAIL server accepts all calls which specify the right protocol in the user data field.

Systems programmers can add any number of servers with varying purposes. For example, the client added a server that intercepted all X.29 calls before LOGINOUT was started. After intercept, the terminal NVAnnn exists already. The server then, among other things, changed the terminal parameters to /DIALUP (using IO\$\_SETCHAR), which solved the security problem mentioned above. The servers also set X.29 packet forwarding parameters to values appropriate for the client's application.

Servers have access to the number of the network node that requested a call. This makes it possible to change parameters depending on the originator of a call, or even to reject a call from specific nodes (PSI uses that in combination with the RIGHTS/SLIST database).

## X.29 Queues

A specific application required the client to establish a print queue on an X.29 terminal line. This caused several problems. First, a queue must be started /QN=NVAnnn, where 'nnn' is not known (at least not without human intervention) since it changes from call to call. Second, as soon as one establishes a call on an X.29 line, LOGINOUT gets control and starts a user process. After LOGOUT, the NVAnnn terminal goes away and the call is cleared. The print symbiont never gets a chance to allocate that NVAnnn terminal line.

A special server program was written to intercept requests on lines that needed to be queues. There were two ways to start this server. It could be triggered by a specific subaddress. Or, for cases where a subaddress cannot be specified, it was triggered by an X.29 user data field that had the string 'QUEUE' specified in bytes 5 to 9. Whenever such a call arrived, a process was run that started a queue (X29\_QUEUE) on the then existing and known NVAnnn terminal. LOGINOUT was never executed. When the queue was stopped by an operator, the call was disconnected. If the call was disconnected first, the VMS print symbiont stalled the queue automatically. The server handled all security related questions.

## PSI MAIL vs. DECnet MAIL

The initial plan for electronic MAIL between Boulder and Frankfurt was to have a permanent DECnet link and then simply use NODE::USERNAME as MAIL addresses. However, it turned out that some networks charge DECnet links by the minute, even if no data is being transmitted. This would have resulted in a rather high daily charge (>\$100). Fortunately DEC provides a special PSI MAIL

package. PSI MAIL allows a user to send MAIL to a user on another VAX without the need for a running DECnet link. MAIL establishes its own X.25 link just for the time that it needs to send a mail message.

A minor problem with that was that MAIL had to be sent from the machine that had PSI installed, since PSI ACCESS was not available on the other machines. Since the client's cluster runs as a homogeneous cluster, this was just a minor inconvenience.

Although this is not a problem with PSI, it was found to be inconvenient that one could not call any node on the network one wanted to call without having the PSDN first authorize one to do so. This really limits the otherwise powerful PSI MAIL package. Maybe it could be extended some day to allow for non-numeric username/password combinations to be used when establishing a call.

### Security Problems

Being accessible through a PSDN can pose completely new security problems to a systems manager. In principle they are not a lot worse than telephone dialup lines, but now a hacker anywhere in the U.S. can access your machine by just making a local phone call. If you have good 'normal' security measures you are probably in good shape.

On some PSDNs a terminal user (i.e., potential hacker) can simply specify a large number to reach your machine. Trying a variety of numbers will sooner or later get a CONNECT to a valid host. At that point, the host's security measures must work.

On other PSDNs, a username/password combination is necessary to reach a specific host. This method has several advantages: First, only authorized users can reach your host, second, the users do not have to remember large numbers (14 digits), but rather a short mnemonic username. The disadvantage is that DECnet links cannot be established without special agreement with the PSDN. Each node to be reached must be listed with the network as *'access allowed without specification of username/password'*.

PSI interfaces with VMS's RIGHTSIST database. A protection scheme can be set up that allows only certain nodes (hosts) to reach your host. Unfortunately, the documentation in this regard is vague and unclear.

### Users' Reactions

The users' reactions to PSI were in general favorable. The site in England started transferring data within hours of getting PSI installed. Field personnel also started using it the next day. They liked the noise-free transmission, but were sometimes dissatisfied with character echo turnaround times. This was solved in most cases by a system-wide terminal configuration command procedure (see above). Unfortunately, they now all want 2400 baud modems (most PSDN nodes accept 300/1200/2400 baud)!

### What to Watch Out For

Two items were found that can run up a large bill quickly. One is the use of the DECnet PHONE utility, especially on overseas circuits. First of all, it is a character oriented utility and will therefore send a large number of almost empty packets. Second, the DECnet protocol wraps a large amount of control information around the data characters typed. Third, local echoing does not work since PHONE adds screen control characters to the output stream. This means that every character is paid for twice.

A second thing to watch out for is a nasty problem that can hit your pocketbook with considerable delay. The baud rate of an X.29 terminal is transmitted to the remote host shortly after a call has been established. On most networks it cannot be changed during a session. The problem occurred when the client accessed the CompuServe database via a local VT100 terminal, running at 9600 baud, then connecting through outgoing X.29 via CS-Net. Even though the intermediate link was only 4800 baud, and even though the 'reading speed' of the user was well below 9600 baud, the terminal session was billed as if it had been a local, 9600 baud link. This problem did not show up until the next monthly billing statement.

The solution is to set the speed of the local terminal to 1200 baud before doing the outgoing call.

### Cost

There is fixed and variable cost associated with using PSI. The fixed cost is the fee for the leased lines, modems, and a subscription fee. This monthly cost depends on the baudrate of the link between your VAX and the PSDN, as well as on the geographical distance to the network node.

The variable cost basically depends on the amount of data transmitted to and from your host, plus charges for terminal connect time. Care must be taken to optimize packet size depending on the charging algorithm of the PSDN, i.e., in most cases the larger the packet the smaller the bill.

### Conclusion

In general the client was pleased with PSI. There were some startup problems, but all could be solved within a few days. The second installation (on the 730) went without a flaw.

After tuning a few parameters, data from the site in England could be transmitted efficiently, quickly, and without errors. A trade show in Hanover, Germany, was run off the Frankfurt VAX. When that VAX was not available (due to a local crash), the demos were continued from the Boulder VAXes.

PSI has gotten a lot of bad press. However, it turned out to be a good product. DEC Software Support on PSI was excellent.



**A Paper related to.....**

**"Centralized Network Management of Servers"**

The attached paper was written by John Heffernan and Donna Ritter of Digital's Networks and Communications Development Group. Specifically, both Donna and John work in the Network Management Advanced Development Group in Littleton, Mass. The paper is closely related to the "Centralized Network Management of Servers" session which was presented at the Spring DECUS 1986 Symposium in Dallas.

Remote Bridge Management

John Heffernan, Donna Ritter

**ABSTRACT:** This paper describes the general network management problem and the models we have come up with to solve it. We then describe the general capabilities of network management. Next, we discuss the LAN Bridge 100, a store and forward repeater and its network management software RBMS. RBMS is a implementation of some of the concepts described in the first section.

**1 THE NETWORK MANAGEMENT PROBLEM**

As the LAN (Local Area Network) becomes a system bus and Wide Area Networks begin interconnecting LAN's to form large and complex distributed systems, the network becomes the system. The problem network management faces today is one of size, complexity, and diversity. As networks are becoming quite large, network management can no longer be thought of as an afterthought or as a part time job. Instead of multiple independent system managers managing their part of the network, we tend to see network managers who have overall network responsibility. Networks today are complex because of the sheer number of devices and many ways to configure these devices. Networks today are diverse because of the wide variety of devices and communications hardware and software on the network. The architectural models for network management that we are working on today can form the basis for products that address the management of today's and tomorrow's networks in an integrated fashion. RBMS (Remote Bridge Management) is a product based on many of the principles described in the first half of this paper.

We see below the LAN multi-access medium as the LAN system bus.

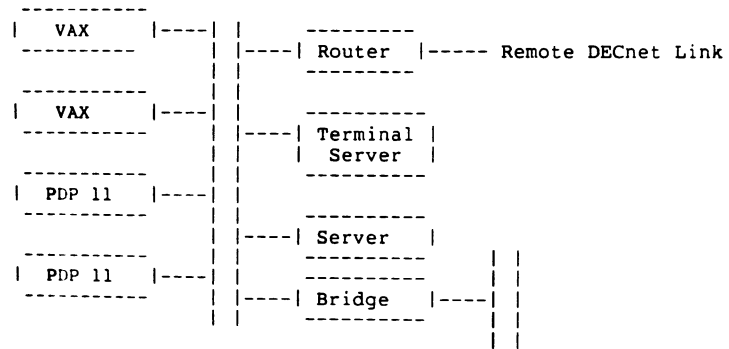


Figure 1

Ideally, the network manager logs into a host node dedicated to network management and can manage any network component such as bridges, terminal servers, and DECnet nodes. For example, the network manager should be able to do a "set line cost 10" operation of all bridges in the network with one command. Today, we are working on models that may help us construct integrated network management solutions. Some of the concepts of such a model are presented in sections one and two.

**1.1 Definitions**

Next, we present some definitions that we use later.

Entity- Fancy name for that which is managed.

Agent- Software in the entity that carries out the remote management functions.

Attribute - A perceived property of an entity, it has a value that can be examined and possibly modified.

Database- In the context of network management, we mean a management database, that is, a place where management attributes are stored.

Datagram Transport Service - Management messages are transferred via datagrams. There is one datagram per management message. The caller can not be sure that messages have been received by the other side. Also called connectionless service.

Director- Software that does the managing. This software is usually resident on the management station and has remote access to the agent via a protocol.

Directive - A directive is a management request, or action, defined upon an entity which may be applied to that entity.

Event sinks- A node where event messages are received and processed.

Multicast- On the Ethernet, this refers to sending a packet to a known group address so that the packet can be received by more than one node per transmission. Normally, packets are sent to only one node.

Protocol- The rules and regulations governing communication between the agent and the director.

Reboot- To cause the server to be started again. Generally, this means that the server is stopped and then operating software and characteristics are reloaded.

Service Element - That part of the entity that does the work that the entity is chartered to do (aside from management, which is done by the agent part of the element).

Server- General term for a product that sits on a LAN and serves multiple clients on the network.

Virtual Circuit Transport Service - Management messages may be transferred over a virtual circuit. This provided for guaranteed message delivery, that is the transport user can be assured that messages are either received by the other end or the user is notified. Also called connection oriented service.

Bridge- A device that interconnects networks at the data link level.

LAN Bridge 100- An intelligent store and forward repeater that extends Local Area Networks.

RBMS- Remote Bridge Management Software- Software that manages the LAN Bridge 100. RBMS runs under the VAX/VMS operating system.

## 2 THE NETWORK MANAGEMENT MODEL

The basic model of network management is shown below.

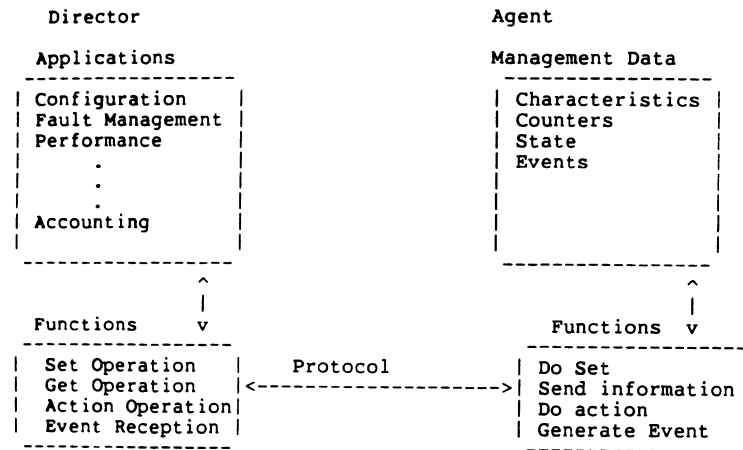


Figure 2

On the director side, we see applications built on top of more basic management functions. The functions are the primitives needed to access the management data in the agent. The application provides the added value and user interface needed to make sense of and ease the management process. In the general case, the director provides configuration, fault, accounting, performance, and security management. Note that these functions are those prescribed by the ISO model and they are not necessarily implemented by Digital.

Software on both sides carries out the functions by building and parsing messages that convey the desired operation between the director and the agent. Messages are sent back and forth between director and agent. In a typical operation, the user types a "set" command. The intention of the set command is to modify an attribute in the entity being managed. For example, the network manager may want to "SET LINE 1 COST 10" in a bridge. In this case, the application in the director, which does configuration management, calls a function that builds the appropriate message to be sent to the agent. The message is then sent over the network using an agreed upon management protocol. Depending on the entity being managed, a

datagram or virtual circuit is used. The agent receives the request and validates it. It then carries out the operation and sends status back to the director. The director reads the status and reports any errors to the user.

In the typical operation above, the context of the command is a single bridge. However, in our architectural models we allow for the concept of user defined groups of entities which may be managed essentially at the same time. RBMS, for example, allows the context of a "set" command to be all the bridges "known" to RBMS.

## 2.1 Attributes, Directives, And Events

Another way of looking at an entity is shown below.

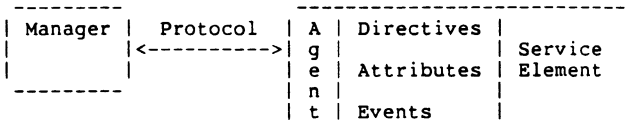


Figure 3

We see that the agent and the service element "share" directives, attributes, and events. The service element is that part of the entity not dedicated to management (that is, does whatever work the entity is chartered to do).

Attributes are values associated with the entity. These may be characteristics, counters, or status. Characteristics are operational parameters used to control the operation of the entity. Examples are baud rate on a terminal server or maximum addresses on a DECnet node. Counters are those attributes that count events. Examples are number of lost packets for a DECnet node or framing errors in a data link. Finally, status are attributes that reflect the current state of the service element.

Directives are a command to the agent to do something. We can classify them as either examine, modify, or action directives. Examine directives return the value of counters, status, or characteristics. Modify directives modify the value of attributes. Finally, actions perform some management action such as rebooting a server.

Some common actions are listed below.

- o Initialize entity- Reset the attributes to those stored in a database for the server or the factory defaults and reboot the server.
- o Create entity- Create a new instance of an entity. For example, there may be a create entity directive to create a new service on a terminal server.
- o Create link- Create a communications link between two entities. For example, there may be a directive to create a logical link between two nodes.
- o Delete link- Destroy a communication link between two entities. For example, there may be a directive to break a logical link between two nodes.

Directives may change attributes of the entity.

Events are the occurrence of conditions within the entity that are of significance to management. For example, a server may generate an event when it reboots. Events are sent over the LAN and are received by event sinks and usually put in a log file at the management station.

Higher level software in the director calls the primitive functions in order to provide an easy to use interface that controls and monitors the agent. This is illustrated graphically below.

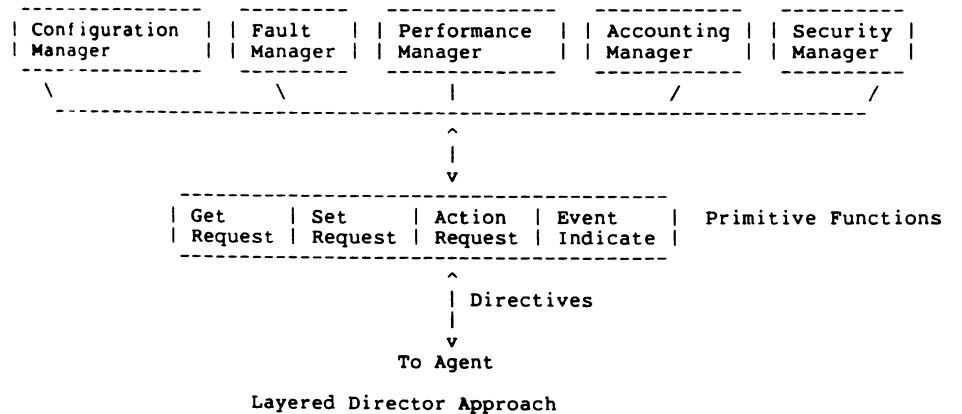


Figure 4

We see the higher level applications layered on top of the primitive functions. This is because the primitive functions can be shared by different higher level applications.

Configuration management includes the typical management in currently available products such as the maintenance of attributes and seeing what is on the network. Fault management addresses the diagnosis of failing network components and includes things like loopback testing and invoking diagnostics on the communications hardware. Performance management addresses how the network works under various loads. This might include monitoring counters or providing histograms of daily traffic.

Accounting addresses keeping track of who is using what. This might include generating usage reports so that network components can be charged back to the user.

Security management addresses keeping the network secure. This includes password maintenance and perhaps security event logging. Authentication also comes under security management. Authentication means verifying the identify of the person performing the requested management function.

## 2.2 Typical Operations

Some typical operations provided by network management are discussed next. The most common operation is to access attributes. This includes setting characteristics, reading counters, and reading status information. Network management software also includes a summary display which shows only the most important information about an entity. Counters are especially important when things go wrong. They can indicate which component is in trouble.

For fault management, the network manager may also choose to invoke diagnostics from the network management software. Most products allow at least a reboot of the product, which normally invokes self test on power up. The results of the self test may or may not be available to the network management software.

The network manager may also perform security management. He or she may set passwords on the communications product.

Another common network management operation is down line loading. The network management station sends the operational software, diagnostic software, or operational parameters to the server when the server boots up. Usually, the server multicasts a "load me" message to the network and the host responsible (it could be many) takes responsibility for down loading the server. Some products, like the LAN 100 Bridge have their operational software and characteristics stored on board since they must come up operational despite potential host problems. A similar operation is the upline dump of software and attributes when a server is in trouble. This allows support personnel to diagnose the problem with the server.

## 2.3 System Management Protocols

There are many different system management protocols around now and we are moving towards standardizing on a single protocol (most likely, whatever becomes the ISO standard). MOP and NICE are two examples of protocols that have been used for DECnet. MOP is oriented towards low level datagram operations. NICE runs over a virtual circuit and is intended for use with a running node. RBMS uses a version of the IEEE 802.1 protocol over a datagram service. In the future, we hope to use a standard protocol and a standard transport mechanism.

In general, these protocols are all request/response protocols. That is, a request is made and the initiator of the request waits for the response. The typical format for a set request packet is shown below (based on IEEE 802.1).

Ethernet data link header (Source, destination, type)
Function type (Set)
Component Type (Bridge link)
Subcomponent Type (Link 1)
Request ID (A number identifying the request to the initiator)
Action Type (Null if not an action)
Parameter List (Cost, 20 )
Ethernet Data Link Trailer (CRC)

Typical Ethernet Management Message

The request ID is copied into the response message to allow the director to uniquely identify the message. The request ID field can also be used to hold information such as user identification, retry count, and sequence number in the case of a connectionless datagram transport mechanism.

## 2.4 Management Information Databases

In general, the following databases may be present for any particular product.

- o Volatile- This is the local copy of operational parameters. Counters are always here along with the local copy of attributes. These are the ones used by the currently running service element software.

- o Local permanent- This database may or may not exist depending on the product. It may reside on local mass storage or in non-volatile RAM (NVRAM). The local permanent database is saved across a power down or reboot. The LAN 100 bridge has local permanent storage in the form of NVRAM. Usually, if local permanent storage is present, there is no need to have a host permanent database.
- o Host permanent- This is a copy of the attributes stored on the host management station. These are sent to the server when the server reboots. Usually, these are present if the product does not have local permanent storage.
- o Directory- This is a management station database that maps names to addresses and may contain other data of interest to management software. Basically, this is a list of servers that can be managed. The management software may have a command to add all responding servers to this list; this builds the directory automatically.

## 2.5 User Interfaces

The user interface is software that parses the user's command and displays the output. This is another area we hope to standardize and make consistent across all our network management products. The old style NCP style interface will probably give way to a more screen oriented display such as seen in the NMCC/DECnet Monitor. One new concept that can be seen in RBMS is the USE command. The USE command selects the entity or entities to be managed in subsequent commands. This becomes necessary as we move towards managing more than one server or more than one product by the same network management software.

## 2.6 Implementation Model

Next, we show a generic model of a single product network management package.

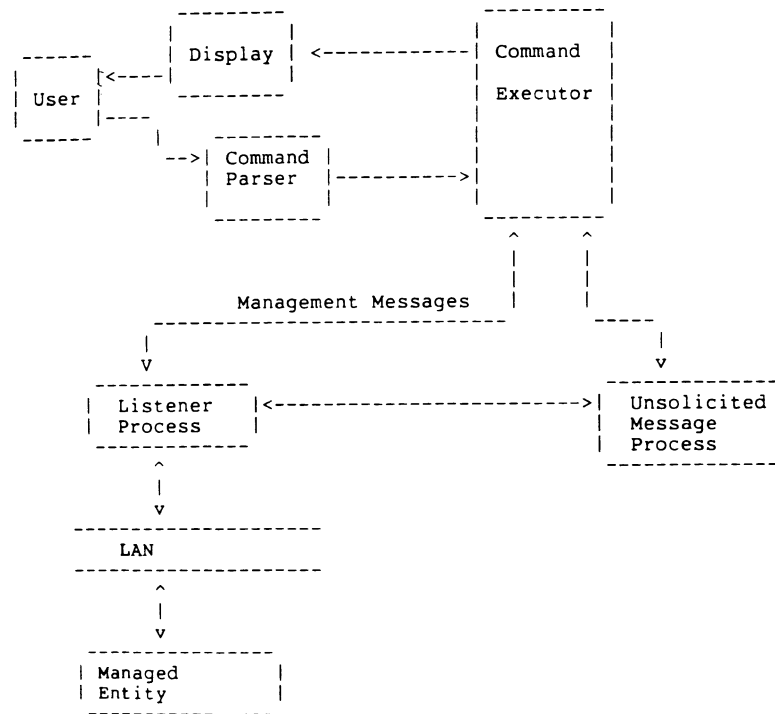


Figure 5

The display, command parser, and command executor make up the user interface. The user interface parses commands, forms messages if needed (some commands may not access the network), relays the message to the listener process, and then waits for the response from the listener process. It then decodes the status of its request and formats the result if need be.

The listener process handles communications with the network and the managed entities. It is responsible for demultiplexing any incoming traffic between the user interfaces (there may be more than one) and the unsolicited message process. If the product uses virtual circuits, it handles these. If a datagram service is used, the listener handles retries, timeouts, and sequencing.

The unsolicited message process handles any messages that arrive unsolicited. These could be events or requests for down loads.

Together, these three components show a general implementation model for a single network management product. Next, we look at RBMS, which is an actual implementation of some of the ideas we have presented. RBMS is a VMS layered product that will allow users at a VAX/VMS host to control and monitor any LAN Bridge 100 in an Extended LAN.

### 3 LAN BRIDGE 100 FEATURES

The bridging function performed by the LAN Bridge 100 operates at the data link layer, therefore it is an intelligent forwarding/filtering device which is protocol independent. It bridges two Ethernets (802.3 CSMA/CD LAN's) together. It uses the 802.1 standard request and response connectionless protocol for system management access. Bridges do not require RBMS, the management software running on VMS, to operate; however the Network manager gains a tremendous advantage with the use of RBMS. RBMS not only allows for the control of bridges, but also gives the Network Manager a tool to troubleshoot the network.

As Local Area Networks (LAN) grow they may exceed the physical limitations of signal propagation on the cable. The extension of the LAN using bridges solves this problem. This provides transparent data link connectivity. It also provides the ability to build redundancy in the network by placing bridges in parallel so that if one of them fails, the other will take over immediately. Finally, remote management capabilities provide the added feature of being able to control the filtering and forwarding of the traffic and to assist in isolating faults.

#### 3.1 Dynamic Address Learning

Digital's LAN Bridge 100 receives all frames (from both Ethernets) since it operates in promiscuous mode. It dynamically learns where nodes are in the network by observing the source address of these frames. The bridge has a cache of table entries for these addresses that includes the Ethernet on which it was received and an "aging" timer. This information is used to forward and filter frames. Periodically, the table is checked for "aged" entries that have not been heard from; these are deleted from the table.

#### 3.2 Forwarding Decision

When a packet is received, the bridge must decide whether it should be forwarded. To make this forwarding decision, the bridge looks up the destination address in its forwarding database.

Figure 6 shows an Extended LAN example where Station C is on the right side of Bridge\_1. Assuming that a packet comes in Line 1 (Ethernet 1) of

Bridge\_1 with a destination address of C, the bridge will look up C in its forwarding database. If C is found, the bridge will have an entry that marks it as last being seen on its right side, so it would be forwarded on Line 2. If destination address B was received by Bridge\_1, it would be discarded, because the packet is already on the correct side. If an address is not in the database, the bridge will flood the packet on all Ethernets except the Ethernet on which it was received. It will then learn this new address by putting it in the forwarding database.

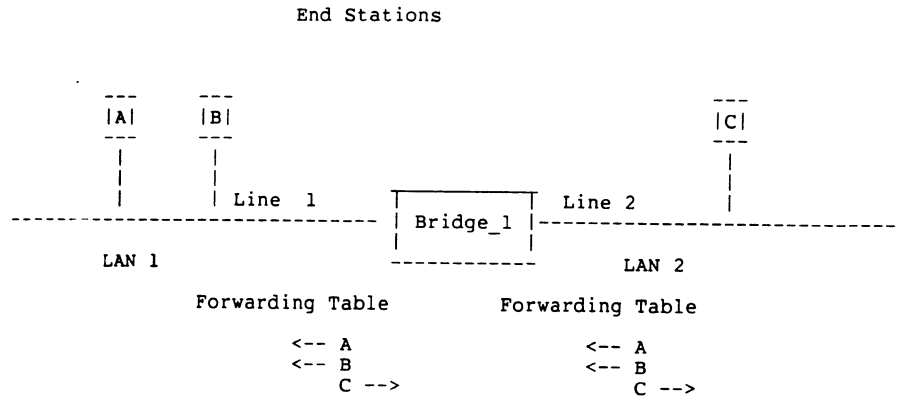


Figure 6

#### 3.3 Remote Management Module In The Bridge

The LAN Bridge 100 has a network management module that responds to management requests sent by an RBMS station. RBMS can be used to query the bridge for information, to control the bridge's state, to cause it to run self-test code and to set addresses in the forwarding database. This control over the forwarding database enables the Network Manager to filter traffic selectively on the Extended LAN.

#### 3.4 Loop Detection

If bridges are to function in an environment free from management intervention, they must be able to break any loops that might occur in the topology either intentionally (for redundancy) or unintentionally. The LAN Bridge 100 uses a Loop Detection algorithm called the Spanning Tree

Algorithm. (See reference 3 for a complete description of the Spanning Tree Algorithm.) The Spanning Tree Algorithm allows bridges in the network to automatically configure themselves into a loop free topology. This algorithm requires no management intervention, but can be tuned by Remote Bridge Management.

In very simple terms, this algorithm elects a Root Bridge by selecting the bridge with the lowest priority. The Root Bridge is the root of a loop free spanning tree. The Root's priority field is settable by management. Setting this priority field can force a choice of which bridge becomes the Root. In the case of a tie, the lowest physical address is selected.

Next, for each LAN, a Designated bridge is elected based on the lowest cost path to the Root. The Designated bridge is the bridge which forwards frames for the LAN segment. The other bridges on that LAN segment will be in a backup mode. The cost parameter is settable by management and can force the selection of a certain bridge to be the designated bridge. All bridges will turn off all of their lines, except for the single line that is the shortest path to the Root. The designated bridges will also turn on any lines attached to LANs for which they are designated.

Figure 7 is an example of some physical topology. It contains a backbone connected to 3 floors, each by a bridge. The third floor also contains a second LAN with 2 bridges in parallel.

For simplicity, we will assume that all bridge priorities and line costs are the same. These parameters could be changed by RBMS to force the topology to configure differently.

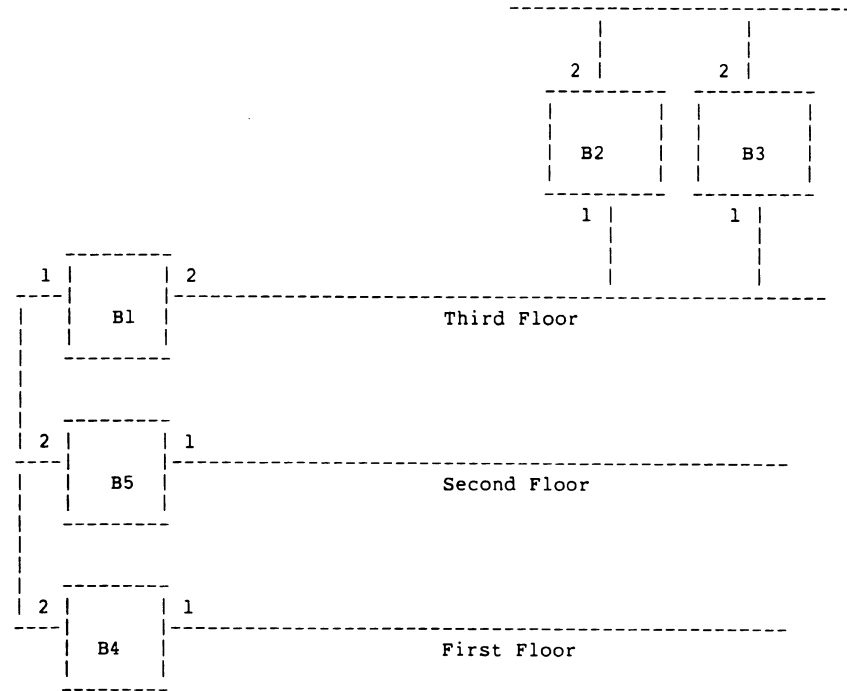


Figure 7

Figure 8 shows the results of the spanning tree algorithm. Bridge B1 with the lowest id (address/priority) is the Root. It is designated on both the Backbone LAN and LAN 3. Both of its lines are in the forwarding state.

Bridge B5 is designated on LAN 2. Line 2 is in the forwarding state because it is the least cost path to the Root. Line 1 is in forwarding state because Bridge B5 is designated on LAN 2.

A similar situation exists for Bridges B4 and B2. Bridge B3 is not a designated bridge; therefore it placed its Line 2 in the backup state to prevent loops. It left Line 1 in forwarding since it is the least cost path to the Root.

Result of the Spanning Tree Algorithm

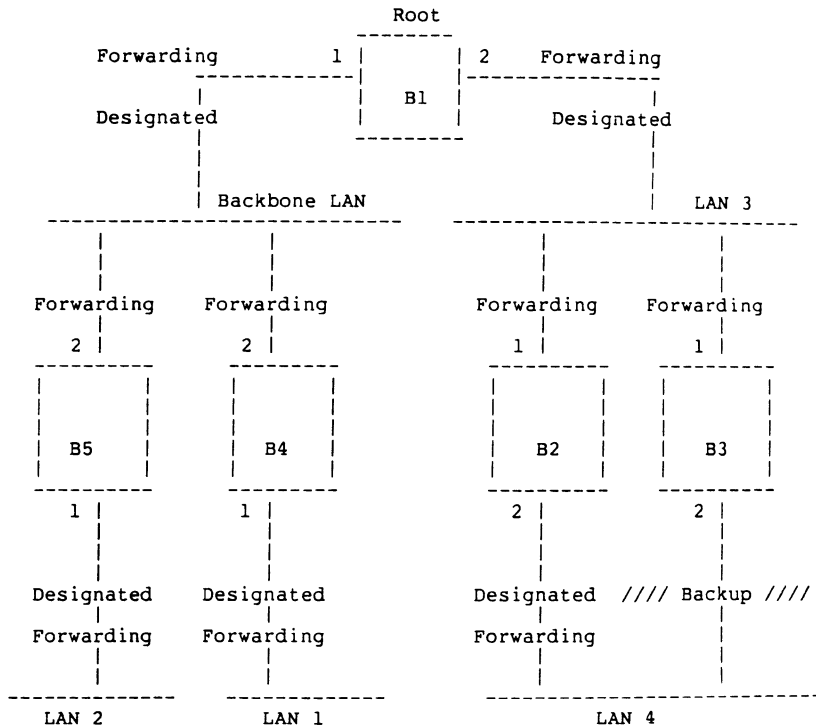


Figure 8

#### 4 REMOTE BRIDGE MANAGEMENT SOFTWARE (RBMS)

RBMS allows the Network Manager to observe and control bridges. It runs on any VAX/VMS host with a DEC Ethernet controller. RBMS gives the Network Manager a tool to troubleshoot the network. This troubleshooting

can help selectively filter traffic in the network as well as determine where potential faults have occurred. For example, if the Network Manager wanted to isolate a babbling transceiver to one network, the address could be placed in the bridge's forwarding database to be filtered.

#### 4.1 Overview Of Remote Bridge Management Software (RBMS)

RBMS is made up of 2 processes. One is the Bridge Control Process (BCP) and the other is the Bridge Management Listener (BML). Multiple users can access RBMS on a VAX/VMS system. Each user will have a BCP process.

BCP is the user interface to RBMS. It provides the translation of a user's command to a bridge protocol message. It checks to see that the user has the privileges required to execute the requested command. It sends the protocol messages to BML for transmission. When it receives a reply from a bridge through BML, it parses the answer, and displays the resulting data on the user's screen.

BML handles all communication over the Ethernet. It is responsible for multiplexing and demultiplexing the requests from BCPs. It is also responsible for command retries and timeouts.

RBMS manages several databases. It keeps a host directory to associate ASCII names to bridge addresses. This feature enables the Network Manager to give meaningful names to the bridges rather than typing in their physical addresses. The directory also contains descriptive information about the bridges. RBMS allows access to the databases kept on the bridge. The bridge keeps a database with counter and status information. It keeps a cache for all of the forwarding entries it knows about. These entries include those dynamically learned and those set by RBMS.

#### 4.2 Using RBMS In A Trouble Shooting Environment

RBMS allows the Network Manager to examine bridge or line status, characteristics and counters. It also allows examination of the forwarding database in the bridge. The forwarding database can be examined one address at a time or examined in categories (i.e. those addresses set by management, those addresses learned by the bridge, permanent entries or all entries). RBMS can be used to set certain bridge/line parameters, such as the spanning tree parameters, and to set addresses in the forwarding database.

Groups of bridges or lines can be addressed with a single command by using the KNOWN BRIDGES/KNOWN LINES command. If the Network Manager is interested only in those bridges that are in the OPERATE state, the ACTIVE BRIDGES option may be used. (The OPERATE state is the normal state of the bridge.) A USE command is also available that allows the Network Manager to establish a target for subsequent commands.



This command set gives the Network Manager a means to determine the condition of an Extended LAN and to selectively filter traffic. These capabilities allow RBMS to be used as a troubleshooting tool on an Extended LAN.

#### 4.2.1 Example 1 -

In Figure 9, there are two LANs connected together by a bridge. The fault is that node ABC and node XYZ cannot communicate.

Extended LAN Trouble Shooting Example #1

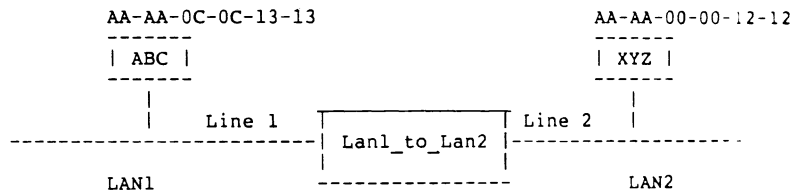


Figure 9

First the state of the bridge connecting the two LANs is examined. The "USE" command is executed to establish bridge Lan1\_to\_Lan2 as the current target for subsequent commands. Next a SHOW STATUS command is executed to determine if the bridge is in operate state (Figure 10).

```
RBMS> USE BRIDGE LAN1_TO_LAN2
```

```
RBMS> SHOW BRIDGE LAN1_TO_LAN2 STATUS
```

```
Bridge Status as of 10-APR-1986 09:53:22
Bridge LAN1_TO_LAN2, Address 08-00-2B-02-99-55
```

```
Bridge state: OPERATE
Forwarding entries - current volatile: 257
Forwarding entries - current non-volatile: 2
Management heard link: 1
```

Figure 10

The bridge is in the OPERATE state, so next the line states are examined. Given this topology, both lines should be in the FORWARDING state (see Figure 11).

```
RBMS> SHOW KNOWN LINES STATUS
```

```
Line characteristics for Line 1 as of 10-APR-1986 09:54:09
Bridge LAN1_TO_LAN2, Address 08-00-2B-02-99-55
```

```
Port id: A
State: FORWARDING
Line type: Ethernet CSMA/CD
Remote management SETs: Enabled
Collision Presence: Disabled
```

```
Line characteristics for Line 2 as of 10-APR-1986 09:54:09
Bridge LAN1_TO_LAN2, Address 08-00-2B-02-99-55
```

```
Port id: B
State: FORWARDING
Line type: Ethernet CSMA/CD
Remote management SETs: Enabled
Collision Presence: Disabled
```

Figure 11

Since both lines are in the forwarding state, the address of the unreachable node is examined in the Bridge's forwarding database (see Figure 12).

```
RBMS> SHOW BRIDGE LAN1_TO_LAN2 PHYSICAL ADDRESS AA-AA-00-00-12-12
```

```
Forwarding Entry for Address AA-AA-00-00-12-12 as of 10-APR-1986 09:55:02
Bridge LAN1_TO_LAN2, Address 08-00-2B-02-99-55
```

```
Set by: MANAGEMENT
Outbound Line: Line NONE
Last seen on: Line NONE
Destination: NONE
Auto-delete: NO
```

Figure 12

The reason the two nodes cannot communicate is that the address is in the forwarding database as being filtered (destination is set to NONE). This can be rectified by issuing a management command to set the address to be forwarded on the appropriate line as is shown in Figure 13.

```
RBMS> SET BRIDGE LAN1_TO_LAN2 PHYSICAL ADDRESS AA-AA-00-00-12-12 LINE 2
```

Figure 13

#### 4.2.2 Example 2 -

In Figure 14 there are 3 LANs interconnected by bridges. This example shows how to locate a node in the network given its address.

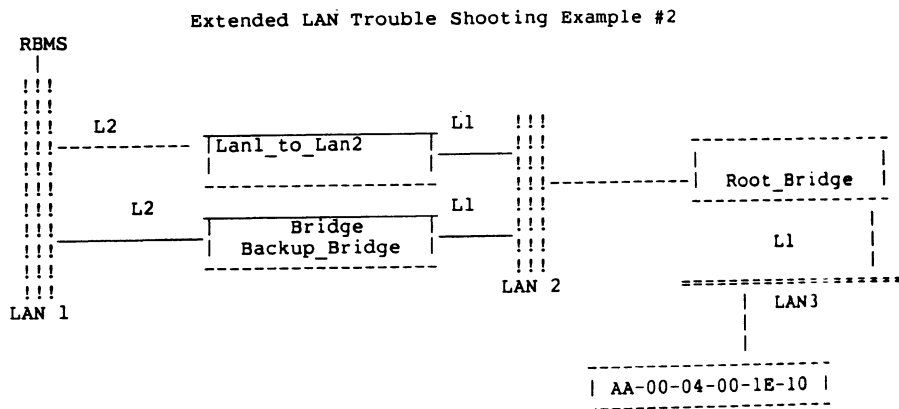


Figure 14

The address AA-00-04-00-1E-10 is the one that needs to be located. This is done by examining the forwarding databases of the bridges. Figure 15 shows the output of examining this entry in the database on Lan1\_to\_Lan2. The display shows that the bridge knows that the address is to be forwarded on Line 1.

```
RBMS> SHOW BRIDGE LAN1_TO_LAN2 FORWARDING ADDRESS AA-00-04-00-1E-10
```

```
Forwarding Entry for Address AA-00-04-00-1E-10 as of 10-APR-1986 09:55:02
Bridge LAN1_TO_LAN2, Address 08-00-2B-02-99-55
```

```
Set by:           LEARNING
Outbound Line:    Line 1
Last seen on:     Line N/A
Destination:      NORMAL
Auto-delete:      YES
```

Figure 15

Figure 16 shows the forwarding entry for the address to be located. The display indicates that the bridge ROOT\_BRIDGE has learned that the address is on its Line 1. This is indicated by the field "OutBound Line". This narrows the location of the node to be somewhere on LAN3.

```
RBMS> SHOW BRIDGE ROOT_BRIDGE PHYSICAL ADDRESS AA-00-04-00-1E-10
```

```
Forwarding Entry for Address AA-00-04-00-1E-10 as of 10-APR-1986 09:56:41
Bridge ROOT_BRIDGE, Address 08-00-2B-02-0B-1A
```

```
Set by:           LEARNING
Outbound Line:    Line 1
Last seen on:     Line N/A
Destination:      NORMAL
Auto-delete:      YES
```

Figure 16

The field "Last Seen on" only applies to addresses that are set by management. If this were an address set by management, the "Last Seen on" field would indicate which side the bridge "saw" the address on; that is which side it would have learned it on. This is because when an address is set by management the "Outbound Line" is set, even though it may not be the line the address was last seen on.

#### 5 SUMMARY

We have seen that current Networks require a distributed system of management. To facilitate this distributed system, Remote Server Management is needed to control the various network components on the Extended LAN. We discussed a general model and defined some of the desired features for Remote Server Management.

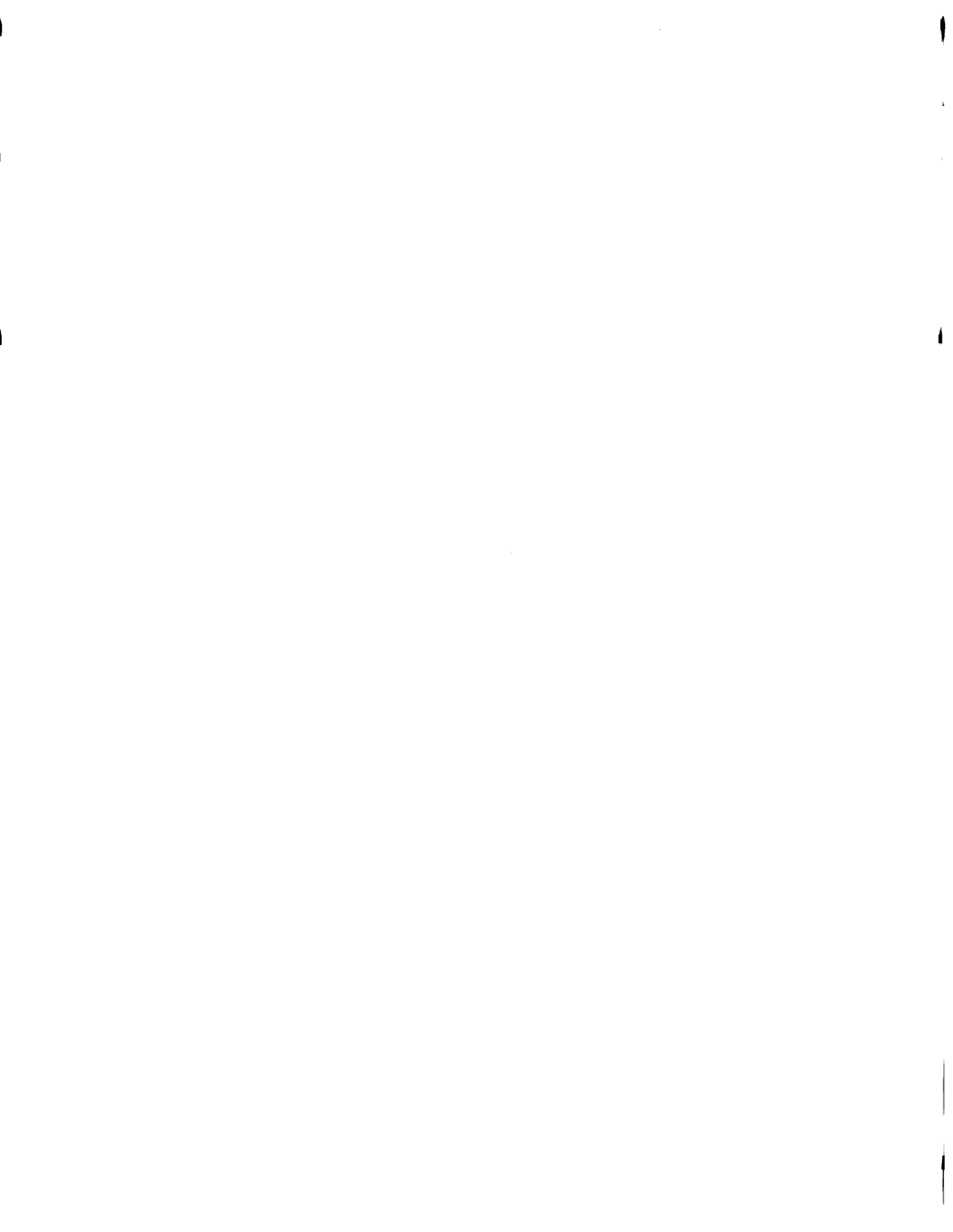
We discussed Remote Bridge Management Software (RBMS) as an example of Remote Server Management and noted that it not only gave us the ability to control and observe bridges; but also is an invaluable tool in trouble shooting an Extended LAN.

#### 6 ACKNOWLEDGMENTS

Much of the general network management discussion is based on the work of Stan Goldfarb and Nancy LaPelle and various task forces they chaired. Thanks to Nancy LaPelle and Colin Strutt for a careful review of this paper.

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AUTOMATION**

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## From The Editor

The August issue highlights the System Improvement Requests (SIR'S) collected at the Spring Symposium, as well as the responses to the itemized SIR's from Fall, 1985. Please take a few moments to read the new SIR's and fill out a ballot (in the back of this newsletter) to vote for the 10 items you feel are the most important.

Thank you all for the outstanding response to my request for articles, particularly non-All-in-1 items. We have an exceptionally diverse newsletter for you this month, with articles ranging from DECcalc Plus to the second half of "Modifiable Printer Tables". Thank you for all of the submissions, keep 'em coming!

Regards,

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## DIGITAL FEEDBACK TO DECUS SIR ITEMS

### *Editorial Comment:*

*The System Improvement Request (SIR) Process is a joint activity between the OA SIG and Digital. The members of the SIG provide Digital with a prioritized list of improvements that they wish to see included in the OA products; then, Digital provides feedback at symposium on that list. Below you'll find the feedback provided by Digital at the Spring, 1986 DECUS Symposium in Dallas.*

The following represents some general thoughts about the System Improvement Request (SIR) process. It is intended to provide some insight as to how it is utilized within Digital, the guidelines we have established for providing feedback, and the context in which we believe our customers should view the information provided.

- I. The SIR process is important to Digital, we want and value inputs from our customers.
- II. The SIR list is distributed to senior marketing, product management, and engineering managers responsible for planning Digital's office products.
- III. The SIR's are evaluated, and become part of the strategy and planning discussions for future releases of our products.
- IV. SIR's tend to generate items that are "feature oriented." as a result, implementation is considered as part of the normal release cycle for a product.
- V. It takes time to implement good ideas. If a SIR represents a new idea, the process of research, specification, development, testing, and release can take a significant amount of time for a major development item. If work has already started on an item as part of our normal product development prior to it becoming a DECUS SIR, the SIR process helps to establish priority, and to provide additional input into implementation.
- VI. In order that we not mislead customers, both DECUS and Digital places limitations on discussions of future products. In general, no commitment can be made concerning specific enhancements to the release of a particular product. Discussions of future product direction are considered as part of individual customer plans under non-disclosure agreements. As a result, although the requests generated through the SIR process are vital to our planning, feedback to DECUS must often be limited.
- VII. The feedback provided on SIR's will fall into four general categories:
  1. We currently have no plans to implement the suggestion.
  2. Good idea, we will evaluate further and consider implementation.
  3. We are currently developing a capability similar to the request.
  4. We currently provide that capability.

It is important to remember that since we are often dealing with futures, we do not suggest that our customers make operational plans based on this information. However, the information may be of some assistance to customers who are considering alternatives for investing development time in system modification.

## SPRING DECUS 1986 - OA SYSTEM IMPROVEMENT REQUEST RESPONSE

### 385047 IMPROVE PERFORMANCE OF ALL-IN-1...

Digital understands that increased performance is extremely important to our customers. Everyone wants better performance from their ALL-IN-1 systems: better response for current users and inexpensive ways of adding new users.

First, we need to dispel a few myths, and then second, give you some real ways to get the performance you need.

First, you should expect to get increased functionality through software and additional performance through hardware.

The additional code required to implement the increased functionality customers request - in both ALL-IN-1 and VMS - will offset any increases in software performance we do achieve. So therefore, customers should not expect software performance to get better, just functionality.

You will get better performance from Digital's newest processors. The new processors Digital has recently announced reduce systems costs by 25% and more, enabling you to get better performance for current and future users by adding hardware at ever-decreasing prices. This is a real benefit you can implement today!

Now, the formula for success.

The best way to get great performance is to manage it. We have found that there are two essential parts of performance management: capacity planning and system management.

All customers should develop and maintain a capacity plan for their systems. This helps you get the most out of current systems and forecast when additional capacity will be required.

A capacity plan outlines the system resources you need to support users with the response times you need. A capacity plan should describe both today's requirements and tomorrow's. It is generally straightforward to do, however if you need help Digital has recently trained a number of Software Specialists in this important area.

Good performance also requires continual attention to system management and operations. Installation and maintenance guidelines must be adhered to. Managing and operating according to the documentation is extremely important!

Customers who are concerned about performance should contact Digital Software Services to insure their systems are installed and maintained according to specifications.

We have found that the combination of accurate capacity planning and proper system management produces good performance. Combined with Digital's leadership VAX line of processors, you can get the improved performance you need and deliver the industry's leading Integrated Office System to your users.



385002 **PROVIDE A TRAINING MANUAL ON ITEMS SUCH AS ADVANCED SCRIPT WRITING AND ALL-IN-1 INTERNALS**

485019 **PROVIDE AN ALL-IN-1 V2 APPLICATION PROGRAMMING REFERENCE MANUAL OF EXAMPLES AND RESTRICTIONS**

Both of these items indicate a desire for greater information in order to do system customization. The request for additional documentation on these topics will be considered as part of enhancements for future documentation and training.

Since the introduction of ALL-IN-1 V2.0, there has been much activity surrounding the integration of applications into ALL-IN-1. There is a great deal of new information available on this topic.

1. The announced ALL-IN-1 Application Integration Standard is now available. The GUIDE TO INTEGRATING APPLICATIONS (AA-EGO1A-TE), USER INTERFACE STANDARDS (AA-EGO3A-TE), ALL-IN-1 Application Programmer's Reference Volume I (AA-N324B-TE), ALL-IN-1 Application Programmer's Reference Volume II (AA-DC93-TE), ALL-IN-1 Application Programmer's Reference Volume III (AA-DC94-TE) has the information required to integrate applications.
2. There are currently two courses under development that deal with ALL-IN-1 Application Programming

485005 **ALLOW A FOLDER TO BE TRANSFERRED TO ANOTHER USER**

385037 **SHARED FOLDER OPTION**

485003 **SHARED DOCUMENT LIBRARY**

485002 **SHARED DOCUMENTS IN ALL-IN-1 FILE CABINET**

We grouped these items together since they all deal with sharing of documents in one form or another. We agree that these enhancements are important. Some of these items are under development, and we will consider means to implement them within our products. At present the capability exists for a user to establish read only sharing of folders

385027 **CONFERENCE ROOM SCHEDULING, MEDIA SCHEDULING**

485035 **ALLOW REPEATING EVENTS TO BE SCHEDULED OVER A PERIOD OF TIME WITH A SINGLE ENTRY**

385008 **FACILITY TO ALLOW SYSTEM MANAGERS TO SCHEDULE REMINDERS ON ALL USER'S CALENDARS**

485034 **ALLOW SCHEDULING OF AN EVENT OVER MULTIPLE DAYS RATHER THAN THE ONE DAY LIMIT.**

These items, all dealing with the time management capabilities within ALL-IN-1, will be considered for implementation. Some of the items are currently under development.

485029 **ARCHIVE DOCUMENTS BY SELECTED DOCUMENT OR FOLDER**

We agree that enhancements to overall document management such as archival and retrieval are needed to compliment our current file cabinet structure. We have started development of this capability but it is still too early to discuss possible implementation plans.

485006 **ALLOW A MESSAGE TO BE CANCELED (WITHDRAWN) AFTER BEING SENT**

385023 **PROVIDE "IN TURN" ROUTING OF MAIL, AFTER ONE PERSON READS MAIL IT AUTOMATICALLY FORWARDS TO NEXT PERSON ON THE DISTRIBUTION LIST.**

485008 **IMPROVE FACILITIES FOR WORKING WITH DISTRIBUTION LISTS BY ALLOWING ENTRIES TO BE ADDED TO THE MIDDLE OF A LIST, AND ALLOW CUT AND PASTE**

These three SIR's all deal with the mail system.

Although we understand the desire to occasionally "retrieve" a message that has been sent, we currently do not have plans to implement this capability. In this respect, the concept behind the mail system is similar to posting a letter.

We currently have no plans to implement "in-turn" routing of mail. More information is needed to understand the problem this request is intended to solve. We believe that there are other means to accomplish this that have more universal application such as the forwarding capability currently in the mail system.

The requested improvements in the handling of editing distribution lists is a good suggestion that will be evaluated for implementation. Since the distribution list facility creates a text file, a work-around is possible for the list to be edited outside of the distribution list facility allowing the use of text editing functions. However you lose the name/address verification when editing outside of the distribution list facility. A more difficult problem is editing of the "TO" and "CC" list once inserted in the message header, no easy work-around exists for this.

185034 **THE ATLANTA HOT LINE SHOULD GENERATE AN SPR FOR PROBLEMS REPORTED THAT HAVE NO WORK AROUND**

485026 **REQUEST THAT THE ATLANTA HOT LINE PROVIDE AN ELECTRONIC DATA BASE OF KNOWN PROBLEMS, WORK-AROUNDS, STATUS OF OPEN PROBLEMS ETC.**

A SPR is generated for unresolved problems reported to the Atlanta Customer Support Center.

We are continually reviewing our reporting and feedback capabilities. By the end of May we will have implemented an on-line system that will provide information on known problems and solutions, and include the capability to leave problem statements that will be responded to electronically. More information will be coming directly from the Customer Support Center on this new capability.

**485050 ALLOW THE USE OF FOREIGN PRINTERS IN A WORD PROCESSING ENVIRONMENT**

WPS-PLUS/VMS V2.0 includes the capability for Software Services to modify printer tables to support "foreign" printers, and to utilize additional printer capabilities such as font selection from laser printers such as Digital's LN03. Changes to this capability are being evaluated that would allow a system manager to do the modification, and to include this capability into WPS-PLUS/ALL-IN-1.

End user print table modification is currently available with WPS-PLUS/PRO V1.0 and WPS-PLUS/PC V1.0.

**485024 ALL-IN-1 COMMAND PROCEDURES SHOULD TRAP CTRL-Y AND DO INTERRUPT HANDLING**

Under consideration.

**385039 ALLOW TWO USERS TO LOG INTO THE SAME ALL-IN-1 ACCOUNT**

In general, we are evaluating the requirements for shared or team working environments. We believe that there may be methods to supply this capability that represent a better overall solution for the user than two users in the same account. This includes items such as shared calendars (currently available), and shared documents which was quite high on the prioritized SIR list.

**TIME TO VOTE !**

by  
**E. Catherine Ditamore**  
ARA Services

Once again, it's time to vote on the SIR's! The System Improvement Request (SIR) Process provides us, Digital users, with a mechanism to help guide the development of Digital's Office Automation (OA) products. SIR's are submitted by you and then prioritized through a tally of your votes on the SIR's. It is this prioritized list that Digital will review in order to prepare their response, which will be given at the OA Wish List Session at the Fall 1986 DECUS Symposium in San Francisco. For those of you not attending the symposium, you'll find the response printed in the OA SIG Newsletter after symposium.

In order to give Digital an adequate amount of time to form their response, you need to vote TODAY! Any ballots received after August 18 cannot be counted. You'll find the ballot in the "tear-out" section at the end of the newsletter.

The list of SIR's was compiled from three sources: completed SIR forms (like the one in the "tear-out" section at the end of the Newsletter); wishes submitted at the OA Wish List session during symposium; and, SIR's to which Digital has not yet made response.

The SIR's are grouped below by category, to simplify your review. You have 100 points to allocate among the SIR's on the ballot, although you may not give any one SIR more than 10 points. You may assign the point values in either a positive or negative sense: a high positive value would strongly encourage change, and a low negative value would discourage the change. For example, if the positive points total 80 and the negative points total 20, the allowed 100 points have been fully utilized. Remember, only one ballot per DECUS member will be accepted!

**ALL-IN-1: GENERAL ENHANCEMENTS**

- 485004 Make the List function quit deleting trailing blanks and special characters; it also mishandles some Regis commands.
- 485015 Print a user defineable message on the terminal screen while ALL-IN-1 is initializing.
- 385003 Provide support for attached printers on terminals, like port LN03.
- 385011 Provide an indication on the All-In-1 screen or menus of the load on the system; when the system is heavily

loaded, the users don't mind waiting a little longer, if they know it will take a little longer.

- 486003 Support the use of arrow-keys: allow scrolling up, down, right and left; allow moving to the left or right margins, back one screen, forward one screen, and to the top or bottom of a document.
- 385016 Provide a function to scan for a common open time on multiple user's calendars.
- 385018 Provide for the integration of more editors, like TPU.
- 385024 Provide a tool for end users to generate list-processing lists from the active files in a simple manner, without the need for programming.
- 385036 I'd like to see some kind of encryption option available within the document library for sensitive documents, such as board meeting minutes. (Currently they can be easily read by a system operator.)
- 385038 Tailor the Help files for the Edit functions. If EDT is your default editor, just display the EDT keypad on the Help screen. This is very important when running at 1200 baud.
- 385048 Bring back the V1 capability of being able to create a document outside of All-In-1, updating that document, and then being able to access it in All-In-1 (by access, we mean being able to read and update it and have it be the edited document).
- 386003 The VAX-11 FMS Translator License should be included with the All-In-1 layered product.
- 386008 All of Digital's Office Automation Products should be upward compatible.
- 386013 Provide a printer option that does not display a menu, but rather goes directly to the user's default printer.
- 386014 Provide an enhanced Multiple Delete facility -- after SElect, allow documents to be "ticked" to form a new selection list that can be manipulated.
- 386017 Allow all selection lists to be editable, sortable, and printable.

#### ALL-IN-1: SYSTEM AND SYSTEM MANAGER FUNCTIONS

- 485011 ALL-IN-1 should be recoverable to the last "transaction." If the system crashes on a "vital" system, ALL-IN-1 is only recoverable up to the last backup.
- 485016 Provide a function (OA\$SYM-DELETE) to delete symbols from the permanent symbol table.
- 485017 User-defined TXL's should be supported.
- 485018 Allow /VALID on key fields of data entry forms.
- 485020 Provide documentation on Command Mode for non-technical users.
- 485022 Provide stack operations (POP, SWAP, ROT) for the message stack.
- 485025 Add a list of help libraries to be searched, similar to the existing capability for forms libraries, TXL's and command procedures.
- 485027 Provide full compilation of ALL-IN-1 scripts.
- 185004 Provide the All-In-1 system manager with the ability to manipulate mail messages.
- 185023 Include an additional 80-bytes in the user profile for customer specific use.
- 185024 Promote the All-In-1 applications development capabilities by providing the following:
  - 1. A DSAB for Rdb applications.
  - 2. Easy end-user application development facilities.
- 185029 Provide a conversion utility telling you what's been changed in your current All-In-1 system.
- 185033 The Atlanta Hot Line should provide comprehensive user support. If the Atlanta Hot Line cannot answer a question and feels it is a responsibility of Colorado Springs, Atlanta should contact Colorado directly and pursue the problem with Colorado, rather than tell the customer to call Colorado.
- 385007 Provide additional All-In-1 System Management tools; for example, utilities to delete mail messages that have been refiled; to manipulate documents in a shared area; or to help in managing a very large shared area.

- 385009 Provide the ability to manage the All-In-1 system files separately from the janitor process. By breaking these two functions apart, the amount of dedicated system time is minimized.
- 385012 Provide the ability to electronically submit SPR's to the All-In-1 Development Group.
- 385014 Provide additional development tools to aid in development of All-In-1 applications, such as cross-reference utilities.
- 385017 In the distribution of future All-In-1 releases, when menus are eliminated or modified, provide a list of them so that sites with extensive customization can more easily migrate to the new versions.
- 385030 Modify the All-In-1 Startup command procedure so that it doesn't produce error messages when it's invoked normally.
- 385040 Allow the DAF database to be split into multiple files to provide improved performance. This is extremely important in large clustered environments.
- 385041 When future releases of All-In-1 require conversion, ensure that the conversion aids work. Also, ensure that the support center is aware of existing problems.
- 385042 Recognize the All-In-1 script facility or language as a language and support it as a language, with the language standards. Also, provide a TPU interface so that we can get past the SYNTAX and get to the application building.
- 385043 Give more and better consideration to the amount of time it takes to train the Atlanta Hot Line staff and give more and better consideration to the number of calls they may receive so that they can be properly staffed.
- 385045 Provide a guarantee for All-In-1 customization work done by the local Digital office. They really should know what they are doing, and the customer shouldn't have to fix it when Digital leaves and it breaks.
- 385046 Improve All-In-1 screen painting so that redundant information is not repainted. This would be very helpful for dial-up terminals.
- 385049 Provide tools, support and/or clues on interfacing and integrating non-Digital layered products to All-In-1; such as, Telegraf, 1032 and SAS.
- 385050 Train the Digital Software Specialists. They should know what facilities are available in the product, how to use it and how to apply the available tools in solving a problem.
- 385051 The local Digital offices should have access to the listings of known problems/workarounds and should make them available to all users with Software Maintenance contracts.
- 486006 Provide a user-selectable option for the use of BELL in conjunction with Mail Notify.
- 486007 Enhance the Applications Programmer's Reference (APR) Manual: provide a Quick Reference Card and "Getting Started" guide; provide additional and more sophisticated examples to the current 3-volume APR.
- 486008 Provide the ability to run All-In-1 user main processes at a higher priority (than other users), while any All-In-1 user sub-processes would run at the normal (default) priority.
- 486010 Develop and publish a User Interface Standard for All-In-1. This standard would be adhered to by all of the different parts of All-In-1, regardless of the development location, and could be used as a guide for user customization.
- 486011 The function DATE CONVERT should accept the following data types: MMDDYY, YYMMDD, and YY/MM/DD. And, it should be able to convert TO and FROM any of the data types.
- 486012 The TRACE facility should be able to display the major operational steps of MAIL and CALENDAR functions to facilitate debugging.
- 486013 All-In-1 should support the IBM PC/XT/AT printer port; ie. the user should be able to select PORT IBM like PORT IA50 can be selected.
- 486014 Multiple fields within a scrolled region should be supported. (Note: V1.x of All-In-1 supported this facility and V2.0 does not.)
- 486015 A form or form set should support more than 255 fields, for consistency with FMS functionality.
- 486016 The All-In-1 documentation set should include a volume of error messages similar to the VAX/VMS Systems Messages and Errors manual. This manual should be updated with future All-In-1 releases.

- 386001 The Atlanta Hotline should provide an automatic call transfer facility so that the caller will get the correct software specialist.
- 386002 The Janitor function should be enhanced to include searching for expiration dates, and to delete those documents past expiration.
- 386005 The All-In-1 documentation set should include both WPS-Plus and DECPAGE documentation. Also, there should be a documentation index for WPS-Plus and DECPAGE.
- 386015 There should be a global symbol table within All-In-1 that can be locked by the VMS Lock Manager.
- 386016 The Atlanta Hotline should be manned 24-hours a day, 7-days a week.
- 386018 Provide the ability to copy an entire record from one DSAB to another.
- 386024 RMS keys and record expressions should be consistent throughout the OA products.
- 386028 Provide a mechanism that will allow the Janitor (and other system management batch functions) to be automatically resubmitted to the specified batch queue.

NEW ALL-IN-1: FEATURES AND FACILITIES

- 485028 Provide means of converting documents to International Telex. Give the user full control over ASCII-BAUDOT conversion and the ability to format the telex document.
- 485030 Be able to run ALL-IN-1 on an IBM terminal from the IBM side of the SNA Gateway.
- 485032 Provide a "private" or "confidential" category of mail that cannot be forwarded automatically or manually.
- 485033 Provide a new service: computer conferencing/bulletin board.
- 185002 The capability for system-wide nicknames.
- 185005 Add an integrated phone message function.
- 185022 Expand the user defined process (UDP) capabilities to incorporate loops, and the ability to stop during processing to obtain user input.

- 185025 Better integration of All-In-1 with the following product:
  - 1. DECslide
  - 2. DECgraph
  - 3. DECalc
- 185026 Have other applications that integrate with All-In-1 user the All-In-1 keypad. (i.e. VTX).
- 185031 Access control on the business applications menu that would do the following:
  - 1. Allow a user to know what applications are available to him/her under All-In-1.
  - 2. Provide a mechanism to specify the security levels available to each user.
- 385010 Provide a full scale office work station for the IBM PC, something on the order of the DECmate office workstation except better, ie. more functions downloaded into the PC, the calendar downloaded to some extent on the PC, allow menus to be modified on the VAX and download them onto the PC.
- 385013 Provide improved security and protection features for All-In-1, something on the order of allowing users to see the menus and the selections on them, but not be able to execute the individual functions unless they have been authorized to do so.
- 385031 Improve the packaging of OA products. With an All-In-1 system there are a large number of products that require coordination of different versions for compatibility. They should all be bundled together so that the user can receive one big package in the mail and know that they have everything needed to bring up a new version.
- 385034 For All-In-1 users, non-ALL-IN-1 users, and both, provide the ability to send, receive, and all of the other mail functions, regardless of whether the user is in All-In-1 or not, and have the receiver receive it whether or not he is in or out of All-In-1.
- 486017 Provide a version of the new VAXNotes software product that is integrated with All-In-1 and provides a user interface that is consistent with All-In-1.

- 486018 Provide a Stock Portfolio Management application or layered product that can function as an All-In-1 sub-system.
- 486019 Add a new feature to the All-In-1 Interrupt menu: an option to create/send/delete phone messages and deliver them to a separate "message box" than INBOX. Additionally, Electronic Messaging should have a unique read option for this new phone message box.
- 486020 Provide a Secretary Subsystem for All-In-1 that will allow the secretary to have access to the manager's mail and file cabinet -- similar to the SET OWNER facility in Time Management.

ALL-IN-1: ELECTRONIC MESSAGING

- 485001 Provide some kind of audit trail, notification to a user or duplicate messages indicating that something was sent to him and auto-forwarded.
- 485007 The number of addressees on mail message is checked against a preset number to determine whether to put them at the bottom or top. This present number includes To's and CC's. The preset number should either include To's only or have separate counts for To's and CC's.
- 485009 Need option to present expansion of distribution list or not, as subscribers are handled, since lists of names in excess of 20 are cumbersome.
- 485010 Names of mail-format BLP's (i.e. MAILMEMO1.BLP) are hardcoded into ALL-IN-1. Would like them to be logicals and therefore changeable.
- 485012 Provide an indication on the display of the last message on the message list of whether or not there are more messages on the stack; this will allow users to know when to use Gold-W.
- 485013 Allow users to modify headers from within the editor for ALL-IN-1 E-Mail messages.
- 485014 Add an option to allow a user to get a list of the sender and all addressees at the MAIL ANSWER prompt.
- 385019 Provide the ability to limit (via some protection scheme) the users' access to system distribution lists, ie. SUBSCRIBERS: or @ALL\_USERS.
- 385021 Upgrade the Mail function "Delete" with confirm and no-confirm options.

- 385044 Provide the ability to assign system wide distribution lists to specific users for maintenance and the ability to share those distribution lists across nodes.
- 385052 I'd like to have automatic updating of the distribution list and nickname list from the Profile database -- when the Profile changes, those lists are changed also.
- 486001 Provide a user-selectable default for Received Receipts and Read Receipts; currently, NO is the default and YES must be selected on a per document basis.
- 486002 Provide an option to allow a user see the status of mail messages that have been sent but not yet read. Message status would include the title of the message and the addresses who have not read the message.
- 486004 For INBOX documents that are SElected, have a unique menu overlay which will allow Answer, Forward, Re-file, etc., that will return to the next INBOX document. (The Multiple Delete function of File Cabinet could be a model for this function.)
- 486005 Name recognition should be able to determine that JDOE from PROFILE.DAT is the same as JDOE AT CURRENT NODE in NETWORK.DAT and display only JDOE in the selection list.
- 386004 There should be one format for sending mail to remote nodes, ie. like a local node -- with no "colon".
- 386006 Provide an "upper management" mail function so that the secretary can filter the various levels of mail.
- 386010 Provide a new filing function that will allow the message to be filed and then drop the user directly into the editor so that the message can be edited.
- 386011 Provide a "secret" classification for mail; this type of mail would require greater security than "confidential" and the secretary would not be able to read it.
- 386020 Return Receipts should display the user's name, not "Postmaster".
- 386023 Provide the ability to request Return Receipts from selected users, rather than all recipients of a mail message.

ALL-IN-1: TIME MANAGEMENT

- 485037 Provide a "PRINT ALL EVENTS" function for a week's schedule, in addition to the daily option.

485038 Print only the hours indicated on the user profile (start and end hours) when printing a week's schedule.

485039 Provide a more "natural" and/or flexible "Create/Edit Meetings" option; ie, "scan for available times" prior to scheduling the meeting would eliminate a significant amount of mail traffic.

485040 Allow "meetings" to be scheduled with one's self, also with non-ALL-IN-1 users, and with All-In-1 users on other nodes (without interacting with their calendar).

485041 Wish for the good old days: an editable calendar. (Also for multiple lines of description per appointment.)

485044 Provide Gold L and Gold S functionality in SElect in TM.

485045 Make the advanced calendar "graph" more meaningful by using A,M,C or # characters instead of asterisks.

185012 Provide a timer or alarm system to remind you of meetings or appointments. This timer or alarm should go off a few minutes before the meeting or appointment.

485046 Provide Set Owner functionality for Reminders, Action Items and To Do Lists. Current documentation is incorrect since R, AI and To Do ignore any actions taken by the Set Owner facility.

385026 Provide the capability of entering a location when scheduling an appointment.

385029 Under Time Management, if there's a conflict, give the ability to see how many there are and who they are with.

486021 Provide another option in the user profile for the date (upon entry to Time Management) to be the system date, rather than the last date accessed.

486033 Provide an editable option that will a "To Do" item to be placed on an "Action Item" list.

486034 Provide a SElectable index for To Do, Action Item and Appointment lists.

486035 In the Create Meeting facility, provide the ability to search for the "best" or "first" free time for the scheduler and attendees.

486022 For event (Meeting, Appointment, Action Item, To Do, Reminder) Creation and Display functions, reduce the

number of keystrokes -- a single multi-section screen (like Advanced Calendar) should be available to change date, create/modify an event, and display the events without going through multiple screens.

#### WORD PROCESSING

485048 WPS/WPS+ is used to write documents, but a better writer's toolbox is needed, going beyond spell checker; what is needed is a grammar checker!

485049 Allow all PC's to transfer files and WPS documents to ALL-IN-1, Rainbow and P/OS, as part of user-friendly application.

485052 Provide the ability to convert Wang VS documents to ALL-IN-1.

485054 Provide multi-column statistical capabilities in DECmate WPS and the other WPS products. These facilities should be comparable to those offered for the Xerox 860.

485055 Provide the WPS+'s DX/DT option on the Rainbow.

185006 The capability to change or add tab stops in the DPE editor.

485056 Enable DECmates, Rainbows, PRO's and anything else running WPS+ to directly exchange documents.

485057 Provide the capability to change the left margin on the DPE editor of ALL-IN-1.

385001 In Rainbow WPS+, we would like indexing facilities similar to those of DECmate WPS, or at least the ability to print the index and maybe some day create and modify dates that are existing out of MS DOS.

385004 Provide red lining and change bar facilities in DECmate WPS.

385033 Provide better journaling in WPS+ so that a little bit more of the document is left when the system crashes and comes back.

486023 WPS-Plus/PC should be more like WPS on the DECmate -- there are differences in the user interface, keystrokes and functionality.

486024 The default paste buffer in WPS should be emptied when a document is filed. (Numbered paste buffers can be used for cut and paste between documents.)

- 486025 Provide additional options for print queues for WPS-Plus/VMS, such as the Formname and Characteristics qualifiers of print queues -- this extends the current facility of Copies, Burst and Flag Pages.
- 486026 Provide a WPS-Plus overlay for the TPU editor.
- 486027 Add the functionality to WPS-Plus so that it can be a real replacement for DPE: the Gold-0 facility of All-In-1, the ability to use multiple text buffers, and the ability to paste output from VAX-11 Datatrieve via the Gold-M menu.
- 486028 Provide the ability in WPS to place an accent over a letter.
- 486036 Provide the ability in WPS to recall the index of documents on a diskette alphabetically.
- 486029 Provide an index function that will work with both WPS-Plus and DECPAGE.
- 486030 Provide the following WPS functionality: automatic footnote; auto-pagination with widow and orphan control and reformatting (Gold-Paragraph).
- 486037 Provide LN03 support for WPS: proportional spacing; mixed fonts on the same page; and, portrait and landscape modes on the same page.
- 486031 Improve the multi-column composing and editing features of WPS -- up to 5-6 columns (side by side) of text are required. The multi-column print facility also need to be improved.
- 486038 Provide an auto-wrap facility in WPS so that when "boilerplates" are merged with data the user will not have to re-wrap the paragraphs.
- 386007 Across all Digital OA products, proportional spacing should be supported in the various editors.
- 386009 All-In-1 should support either WPS or EDT, but not both.
- 386029 Provide the ability in DECmate WPS to save and rearrange multiple segments of text at a time.
- 386030 Provide a Spelling Checker as an optional software feature in DECmate WPS -- one that does not require the addition of hardware or the use of CP/M.
- 386031 In DECmate WPS, allow the screen to scroll one character at a time for wide documents, rather than jump.
- 386032 In DECmate WPS, provide simple math logic, such as addition, subtraction, multiplication, division and percentages. Also, allow the user to easily check columns of numbers and perform the math operations with a minimal number of keystrokes.
- 386033 Provide the ability in DECmate WPS to print any specified page when reset pages are used.
- 386034 Provide the ability in DECmate WPS to queue several non-consecutive pages of a document to the printer at the same time.
- 386035 Provide the ability in DECmate WPS to view or edit a document while other pages of it, or another document, are printing.
- 386036 Provide the ability in DECmate WPS to work with a document on the disk without directly affecting the disk. This provides recourse if the user "messes up" the document.
- 386037 In DECmate WPS, a wide-screen setting should be stored with the document so that when it is recalled it will automatically display in the wide-screen setting.
- 386038 Allow any amount of text to be cut in DECmate WPS.
- 386039 Allow the DECmate WPS user to see numbers/characters on the screen that have replacement characters.
- 386040 Provide the ability in DECmate WPS to use Gold <Get Document> to get only certain pages of a document.
- 386041 Provide the ability in DECmate WPS to center headings over each of several columns of material. (This is especially important for headings over statistical information in wide documents.
- 386042 Allow the use in DECmate WPS of double underscoring, with decimal tabs and without text moving over.
- 386043 Allow the text to automatically wrap when editing, so that the user doesn't have to "advance" through it.
- 386044 Provide the ability in DECmate WPS to recover documents that were accidentally deleted or documents that are on a damaged disk.



- 386045 Provide the ability in DECmate WPS to recover an index that was damaged.
- 386046 When defining UDK's in DECmate WPS, allow them to be executed as they are being defined.
- 386047 Allow vertical and horizontal lines to be easily drawn around text (to form boxes and charts) in DECmate WPS.
- 386048 Allow multiple "wraps" to be defined in DECmate WPS so that the user doesn't have to keep changing rulers.
- 386051 DECmate WPS should recognize "underlines" as part of a word.
- 386052 Allow one or more pitches to be used within a DECmate WPS document; when printing, the printer should stop to allow the printwheel to be changed.
- 386053 Provide the ability in DECmate WPS to do multiple Global Search and Replace's.
- 386054 On the DECmate, provide a different sound of keys when the LOCK key is depressed.
- 386055 Provide the ability in DECmate WPS to delete an entire page, allowing the user to verify deletion of the page.
- 386056 Sub and super-scripts in DECmate WPS should be displayed on the screen as characters above or below the line.
- 386057 Provide the ability in DECmate WPS to directly advance to the end of a word, sentence, or any other text segment.
- 386058 Provide the ability in DECmate WPS to have quarter spacing.
- 386059 Allow a special key on the DECmate that would print "bullets" that are filled in.
- 386060 The ENTER key on the DECmate should be closer to the main portion of the keyboard.
- 386061 Provide the ability in DECmate WPS to delete one or more documents at a time.

MISCELLANEOUS

- 485058 Document header formats should be identical for ALL-IN-1, DECmate and Rainbows so that a document transfer will retain keywords, subejct, author, etc.

- 385006 Provide a DECmail feature: "Mail File Clean-up." It would remail stored memos from my file back to me on the anniversary date of when they were first sent and ask me to reevaluate if I still wanted to keep them.
- 485060 Provide a callable interface to VTX.
- 385005 Provide the capability of running multiple VTX servers with separate interfaces in each one so that they could be both VTX1 or VTX2 without having to handle remote page length from a master menu.
- 185018 Provide an updated office interconnect guide that will clearly and easily outline what capabilities work in what environments.
- 185019 Provide full intelligent modem support, including looping and if-then-else capabilities.
- 385022 Provide support for additional communications media, in other words, 3270, Bisync, SNA, X.25.
- 486009 Provide a "background" file transfer facility for intelligent workstations that would run at a lower priority than dumb-terminals.
- 486032 Provide a Gold Key interface and the use of WPS-Plus for VAXNotes.
- 386013 Upon entering DECmail, enter character mode immediately.
- 386019 Support VT52 terminals in All-In-1.
- 386025 Provide a simple mechanism for easily retrieving VAX-11 Datatrieve reports.
- 386026 Recognize a "smart" terminal, as opposed to a "dumb" terminal and off-load some of the processing to the "smart" terminal.
- 386049 A printer attached to a DECmate should detect when the ribbon breaks, not just when it runs out.
- 386050 A printer attached to a DECmate should detect when no paper is in the printer, rather than print on the platen.
- 386062 The LN03 (on a DECmate) should have the ability to print double underscores.

- 386063 Thinner typestyles should be available on the LN03 to allow users to multilith documents on a press; current typestyles don't set well on presses.
- 386064 Cleaner pads and toner kits should be sold separately for the LN03.
- 386065 The LN03 should not produce controller errors everytime pages that are more than 90 characters wide are sent to it.
- 386066 The LN03 should be able to print special characters, such as a trademark sign, a registered trademark, or other symbols.
- 386067 DECSPELL's IGNORE function should not be case sensitive.
- 386068 DECSPELL should be able to display wide documents in their entirety, rather than "jumping" back and forth.
- 386069 DECdx should support an account of more than 200 documents -- possibly up to 999 if there is a 3-digit restriction.
- 386070 In DECdx, there should be a facility to recreate the index of the account, if it becomes corrupt.
- 386071 DECdx should display the document name that is being deleted (for verification purposes), if the user has selected the document by number.

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This is in response to Bart Z. Lederman's third article from the May Office Automation newsletter ("Backward Output from ALL-IN-1").

I don't use AII, but I do know how DEC programs handle records in files. The <LF> <Text...> <CR> sequence is correct.

There are several record formats and record attributes that RMS uses in files.

The current record FORMATS are:

- 1.) Fixed length (Direct access).
- 2.) Variable-length records. Each record is preceded by a 2 byte record length, followed by the data (text) itself.
- 3.) Variable-length with fixed-length control. (VFC) Same as (2) except that there is some "hidden" information of a fixed length after the 2 byte record length in each record. As an example of use, this can be used by compilers (and EDT) to hold line numbers.
- 4.) Stream record format. No record length is in each record. Stream records are terminated by <FF>, <VT>, <LF> or by <CR><LF>.
- 5.) Carriage return stream record format. Same as (4), except that each record is terminated only by a <CR>.
- 6.) Line feed stream record format. Same as (4), except that each record is terminated only by a <LF>.
- 7.) Undefined record format. This is a catch-all. Useful for files which originate from other machines.

The current record ATTRIBUTES are:

- 1.) Carriage return carriage control. Records with this attribute are output by preceding the record with a line feed, and followed by

a carriage return. This was the "error" in the mentioned article.

- 2.) FORTRAN (ASA) carriage control. The first character is used to determine how records are output, and the first character is never output.

Value (Hex)	CARRIAGE CONTROL USED
0 (Null)	implies no carriage control for this record.
20 (Space)	<LF> <Text...> <CR> like (1) above.
30 ("0")	<LF><LF> <Text...> <CR> Double space.
31 ("1")	<FF> <Text...> <CR> Eject to next page.
28 ("+")	<Text...> <CR> Overstrike printing.
24 ("\$\$")	<LF> <Text...> Used for prompting input.
All others same as the space character.	

- 3.) Print file carriage control. This is only valid on VFC sequential files where the fixed ("hidden") information is 2 bytes long. The first byte is used for carriage control before printing the record contents (prefix), and the second byte for carriage control after printing the record (postfix). The 2 bytes are interpreted the same way.

Value (hex)	CARRIAGE CONTROL USED.
00	None.
01-7F	Output from 1-127 <LF><CR> pairs. ("Newlines")
80-9F	Output the single ASCII control character specified in the least significant 5 bits.
A0-BF	<Not documented by DEC>
C0-DF	Output the single ASCII control character specified in the least significant 5 bits, but add 128 to the resulting character (i.e. Set the 8'th bit).
E0-FF	Reserved by DEC.

- 4.) None. Like undefined record formats, this is a catch-all. If the file is printable, then it must do it's own carriage control by imbedding <CR>, <LF>, <FF> and <VT> where appropriate.

Most editors on DEC machines don't like stream format type records. EDT will squawk about certain VFC files that DCL creates with \$ OPEN/WRITE, but will handle them okay. Editors don't like undefined or fixed length record formats either.

If you need to convert files from one record format to another, you can use the VMS CONVERT utility. Just create a small FDL file describing the desired record format, and record attributes. If you need an example of a valid FDL descriptor file then type

```
$ ANALYSE/RMS/FDL/OUTPUT=fdl-descriptor-filename known-good-file
```

The FDL file might look something like this (excluding the hyphen-lines):

```
-----
IDENT  "11-JUN-1986 15:37:13VAX/VMS ANALYZE/RMS_FILE Utility"
SYSTEM
SOURCE                                VAX/VMS
FILE
ALLOCATION                              9
BEST_TRY CONTIGUOUS                     no
CLUSTER_SIZE                            3
CONTIGUOUS                               no
EXTENSION                                0
GLOBAL_BUFFER_COUNT                     0
NAME                                     "DISK$USER:<ISLER.TEMP>AII.LET;1"
ORGANIZATION                             sequential
OWNER                                    [300,1]
PROTECTION                               (system:RWED, owner:RWED, group:RE, world:)
RECORD
BLOCK_SPAN                              yes
CARRIAGE_CONTROL                         carriage_return
FORMAT                                   variable
SIZE                                     255
-----
```

Once the FDL file is made, then the file can be converted by typing:

```
$ CONVERT/FDL=fdl-descriptor-filename input-filename output-filename
```

I hope this ends the confusion.

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## WPS Notes

At the Spring Symposium in Dallas I offered to help provide coverage of the WPS products for the OA SIG. I hope we can carry information that will be helpful to end users, system managers and programmers of WPS-PLUS and WPS systems.

I am presently installing WPS-PLUS/VMS and DECmate WPS here so I will be learning about them as the next few months go by. I do not have access to much information about the other members of the WPS family however. I hope you will send me contributions for this section on all the WPS products including related ones such as DECpage, DECdx and so on. Information on any level, ranging from user hints to system issues is welcome. If you have something to share, contact me to work out the details.

### External Application Link (XAL)

One of the sessions at the Symposium was a presentation by Jack Gilmore on a feature called the External Application Link or XAL. It is an advanced feature of WPS-PLUS/VMS V2.0 for users familiar with VAX/VMS command files.

This feature allows a user to execute a VMS command file by entering a keystroke from within the WPS-PLUS editor. For example, a user can use XAL to access spreadsheet software or incorporate information from a VMS data base into a WPS-PLUS document.

Since this feature is not well documented, Jack agreed to work with the OA SIG to make more information available. He has provided a twenty five page document explaining the feature and giving a number of examples. This document is for technically ori-

ented VAX/VMS users, such as system programmers and software support specialists, who want to access VMS command files from within the WPS-PLUS editor.

We had hoped to be able to publish the document in this Newsletter but tight page count constraints have forced us to delay our plans. In the mean time, I am working with Jack to make the document available in both hard copy form and on magnetic media through the DECUS Program Library.

### Printer Table Utility (PTU)

The Printer Table Utility or PTU was also discussed in a session at the Spring Symposium by John Connolly and Jack Gilmore. PTU is a utility that allows a programmer to build customized printer tables. This provides a way to support printers other than the standard ones and to provide special functions. It looks like a key feature for situations like mine where we need to be able to use non-standard printers.

PTU is included in WPS-PLUS/VMS version 2.0 but is not documented. Because many users are interested in being able to use the VMS version of PTU, Jack has also agreed to work with us to distribute information on it. I will report on the results of my efforts with it too.

As with XAL, I will try to get as much of Jack's documentation into the Newsletter as the space constraints will allow and I will work on making it available through the DECUS Program Library as soon as possible.

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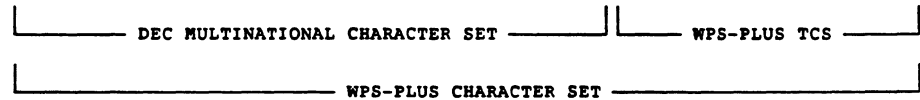
## MODIFIABLE PRINTER TABLES: PART II PRINTER CHARACTER TABLES

In addition to the attribute table, WPS-PLUS has an external character table for each printer supported. The entries in this table are used by the software to define and map each character. This table, also accessible with the PTU, contains 384 entries.

All of the character tables delivered with WPS-PLUS are built so that the printed results are as near to being identical to the DEC standard for hardcopy output as is possible. Any exceptions are due to the limitations of the various printers and deviations always attempt to adhere to established DEC fallback representations.

Some DEC printers do not support all characters and character sets. Most third party printers can be expected to vary considerably from the following examples.

0   31	32   127	128   159	160   255	256   287	288   383
	ASCII		MULTINATIONAL		TCS



Characters	Description:
0 - 31	VT100 Special graphics characters (Note 1)
32 - 127	ASCII character set
128 - 159	VT100 Special graphics characters
160 - 255	DEC Supplemental character set
256 - 287	VT100 Special graphics characters (Note 1)
288 - 383	DEC Technical Character Set

#### Note 1:

There are no control characters in the table. All printer controls are handled through the attribute tables. The positions normally held by control characters are remapped to select VT100 line drawing character from within TDE.

The characters in positions 0-31 and 256-287 are filled in with VT100 line character definitions but are not used within WPS-PLUS. These character positions are reserved for use in future releases of WPS-PLUS and need not be entered for any current printer definitions. It is recommended, however, that either VT100 line drawing characters or null values (-1 in all three cells) be entered in these character positions.

The entries are presented and modified by PTU within three cells for each character. Each cell represents two bytes of data. Figure 9 shows a composite of the table entries for the LN03 as viewed with PTU. Not all entries have been shown to allow examples from each of the regions within the table.

DEFINE PRINTER CHARACTERS

000 VT100

chr	Cell 1	Cell 2	Cell 3
000	VT100	95	-1
001	VT100	96	-1
030	VT100	125	-1
031	VT100	126	-1
032	32	-1	-1
033	33	-1	-1
125	125	-1	-1
126	126	-1	-1
127	-1	-1	-1
128	VT100	95	-1
129	VT100	96	-1
159	VT100	126	-1
160	-1	-1	-1
161	MULTI	33	-1
162	MULTI	34	-1
253	MULTI	125	-1
254	MULTI	126	-1
255	VT100	97	-1
256	VT100	95	-1
286	VT100	125	-1
287	VT100	126	-1
288	32	-1	-1
289	TECH	33	-1
290	TECH	34	-1
381	TECH	125	-1
382	TECH	126	-1
383	0	0	0

Figure 9. A composite view of the printer character table for the LN03. All numeric entries are decimal values.

The entry number is at the left of the figure. For example, characters 32 to 126 are the corresponding characters in the ASCII character set. Numeric entries in the cells are offsets

into default character sets for non-DIGITAL printers and registered DIGITAL character sets for DIGITAL printers.

Predefined constants such as VT100, MULTI and TECH represent commands to the print driver selecting registered DEC character sets. The offset position into that character set is then indicated in cell 2. An value of -1 indicates no entry. When all three cells contain a -1 the character is considered undefined and no character will be imaged if WPS-PLUS attempts to print a character from that table position.

In addition to the predefined constants shown above, there are others denoting additional DEC character sets. These predefined constants, which can be entered just as the constants VT100 and MULTI were consist of: FRANCE, GERMAN, NORWAY, SPAIN and SWEDEN. The corresponding character tables can be found in Appendix A of the LN03 Programmers Reference Manual to determine the proper offset for the desired character.

Several predefined character modifiers are also available. These modifiers are used in combination with other modifiers, characters and the symbol | to denote the logical OR operation and are interpreted as commands by the print driver.

Modifier

- ALT Bit 14 Indicates use of an alternate character set. e.g. VT100 = ALT|48 denotes the registered character set 0 (48 is decimal ASCII for 0).
- PLD Bit 10 The associated character is to be printed a partial line down. e.g. PLD|49 is a subscripted 1.
- PLU Bit 9 The associated character is to be printed a partial line up. e.g. PLD|49 is a superscripted 1.
- OVR BIT 8 The associated character will be overstruck by the character referenced in the next cell. e.g. OVR|78 in cell 1 and 94 in cell 2 is N with a circumflex.

An example of generating a fallback character demonstrates the use of command masks. The 28th entry from the LQP02 table is shown in Figure 10. This entry is designed to produce a facsimil of the character pi (=3.141...), which is not available directly from an LQP02 printer.

DEFINE PRINTER CHARACTERS

000 VT100

chr	Cell 1	Cell 2	Cell 3
028	OVR PLU 95	PLD 34	-1

Figure 10. An entry in the WPS-PLUS table for the LQP02 to represent pi.

SUMMARY

WPS-PLUS provides a means of controlling the format of printed documents through on screen formatting (e.g. with rulers), using renditions and embedding commands in control blocks.

The translation of the renditions to the printed document can be controlled by the user by changes in the tables and by using the print settings menu. The action assigned a rendition stays constant throughout a given document.

Printer commands are either predefined or user defined. The user can define keywords in the printer attribute table and use them in printer commands to invoke specific actions from the printer.

The character tables used by WPS-PLUS can be modified by the user to obtain specialized translations of video characters.

The choice of entries and keywords discussed are very much a matter of individual choice. In addition, one should realize that the way in which control sequences are used and assigned to keywords can vary greatly, as can the results of doing so.

We are finding that the tables provide a means of obtaining a wealth of flexibility in formatting which rewards the work involved in modifying a table. A user is no longer restricted to the functionality that is "designed" into WPS-PLUS. Through the use of user defined print tables, new printers and additional functions on existing printers can be incorporated into documents by anyone using WPS-PLUS print services.

LN03 Printing Features

Here are some examples of the printing features available on the LN03 using WPS-PLUS software.

C.G. Times Font Cartridge

WPS-PLUS can use the C.G. Times Font Cartridge on the LN03 to produce typeset quality documents using control blocks. Type styles are selected using WPS-PLUS attributes (bold, underline, and bold underline). The C.G. Times cartridge has three type sizes available:

- 12 Point in Roman and Bold with Underlining.
- 10 Point in Roman, Bold, and underline all on one line<sup>1</sup>.
- 8 Point in Roman and bold with Underlining.

Selectable Character Size

WPS-PLUS can select character sizes from the built-in character sets on the LN03:

- This is 10 point/10 pitch Courier 10
- This is 10 point/12 pitch Elite 12
- This is 6.7 point/13.6 pitch Courier 10

Subscripts, Superscripts and Technical Characters

The LN03 selects the 6.7 point/13.6 pitch Courier 10 Font for subscripts and superscripts with WPS-PLUS. Combined with technical characters you can create complex mathematical expressions:

$$[2niEn, \sqrt{(x^2+y^2)}] \Delta x \rightarrow 0 \quad (\text{See DeVries}^5 \text{ for a complete discussion}).$$

You can use the 6.7 point/13.6 pitch Courier 10, or 8 point C.G. Times for footnotes:

<sup>5</sup> DeVries, Arthur M., "Equations for Everyday Use," Scientific American (November 1953), pp. 78-84.

Character Sets

The LN03 prints character sets using BOLD and NONBOLD attributes. Here are some examples of the letter "a" for several languages:

á â ã ä å æ      ä å ã ä å æ

Strikethrough

The LN03 can use a redline attribute for ~~strikethrough~~.

<sup>1</sup> Please note that with the addition of the superscripted characters in the line you actually have three fonts in one line because the superscripted character is 6.7 point/13.6 pitch Courier 10.

# TALKING TO THE PRINTER

## 1. Screen Renditions

**Bold:** Printed bold or as user specified action.

**Underline:** Printed underline or as user definable action.

**Reverse:** Printed as user defined action.

**Shadow:** Chosen to replace bold, shadow or user specifiable action.

**Extra Dark:** Used same as shadow printing.

## 2. Control Blocks

---

### Built-in Monospaced Fonts

10 Point/10 Pitch Courier 10

10 Point/12 Pitch Elite 12

6.7 Point/13.6 Pitch Courier 10

### C.G. Times proportional Fonts

12 Point Roman, **Bolded** and Underlined

10 Point Roman, **Bolded** and Underlined

*10 Point Italic*

8 Point Roman, **Bolded** and Underlined

### C.G. Triumvirate Fonts

18 Point Triumvirate

18 Point Triumvirate **Bold**

14 Point Triumvirate

---

NEW SPREADSHEET TOOLS FROM DIGITAL EQUIPMENT CORPORATION

ANNOUNCING XWAY - A SPREADSHEET MODEL CONVERSION PRODUCT

Xway is a VMS product that translates data and models into other spreadsheet formats. Xway can also handle generic ASCII data stored in tabular or field formats, providing compatibility with application programs and databases.

Once a file is transferred to a VAX/VMS system by using a communications program, you can convert the file into a different spreadsheet format. For example, after a Lotus 1-2-3\* spreadsheet file is transferred to a VAX computer, you can quickly and easily translate the spreadsheet into a working DECalc grid (or any other supported format).

Xway V 1.0 supports the following formats:

- Lotus 1-2-3 (binary) -- upwardly compatible with Symphony WRK\*
- Multiplan SYLK\*
- DECalc Dump
- DIF (VisiCalc, database and graphics products)\*
- Generic tabular format (ASCII)
- Generic field format (ASCII)

---

PRINTER FORMAT { PORTRAIT, LANDSCAPE }  
Provides selection orientation formats.  
Default value is PORTRAIT.

PRINTER MODE { DRAFT, LETTER }  
Allows selection of the print density and character quality.  
Default value is DRAFT.

PRINTER SELECT { FRONT, REAR, LETTERHEAD, ENVELOPE }  
Provides method for selecting options supported by the automatic sheet feeder.

PRINTER TABLE { keyword }  
Provides access to user specified keyword for which entries have been made in the printer attribute table.

PRINTER FONT { keyword }  
Used when a user defined keyword will cause a change from one font to another.

---

Table 1

- John Connolly  
Digital Equipment Corp.  
Nashua, New Hampshire

---

Xway uses a Menu Interface, DCL Command Mode or Callable Interface

---

Xway can be used with a simple menu-driven interface which uses prompts, menus and messages. Extensive online context-dependent help is available.

Experienced users can bypass the menus by using the DCL Command Mode. The DCL Command mode can also be used to run Xway in batch mode.

The callable interface provides OEMs (Original Equipment Manufacturers) and programmers with complete access to all Xway functions. The callable interface can be used to integrate Xway functions with customized applications.



The Xway documentation set includes:

- Installation Section - containing installation requirements and instructions.
- User's Guide - containing descriptions of Xway's capabilities and step-by-step examples.
- Programmer's Guide - containing explanations of the callable routines.

The software runs on all VAX and MicroVAX computers using VMS or MicroVMS V 4.2 or later.

#### ANNOUNCING VAX DECALC-PLUS - A NEW SPREADSHEET PRODUCT

VAX DECALC-PLUS is a spreadsheet designed specifically for technical, engineering, and scientific environments. DECALC-PLUS allows users to integrate external routines, a first for any currently available spreadsheet.

The result: a powerful tool combining the extensive capabilities of analytical and statistical programs with the convenience and formatting power of an integrated VMS spreadsheet.

DECALC-PLUS is designed to a functional superset of DECALC. DECALC-PLUS will work with all of your previously developed DECALC grids.

-----  
DECALC-PLUS contains many routines to perform complex analyses  
-----

DECALC-PLUS includes over 50 mathematical and statistical routines which are commonly used in research and data analysis. You can use these routines, without ever having to write your own programs to perform complex tasks such as:

- Parametric and nonparametric statistical analyses
- Matrix mathematics
- Numerical analyses
- Linear and nonlinear curve fitting
- Regression analyses

You can also integrate user-written routines and library routines you may have purchased.

The DECALC-PLUS documentation set consists of:

- Installation Guide - containing installation requirements and instructions.
- Primer - containing an introduction to the basic DECALC-PLUS concepts and features.
- Reference Manual - containing detailed explanations of DECALC-PLUS's commands, routines and functions.

DECALC-PLUS runs on all VAX and MicroVAX computers using VMS and MicroVMS, V 4.2 or later. Although DECALC-PLUS and DECALC can coexist on one system, this is not recommended; therefore, you can order DECALC-PLUS as a DECALC upgrade.

For more information about Xway or DECALC-PLUS, call:  
(617) 480-6803.

-----  
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- Robert V. Hatcher  
Digital Equipment Corporation  
Marlboro, Mass.

The Use of Scripts  
In ALL-IN-1

by  
Don Vickers  
DIGITAL Equipment Corporation

January 8, 1986

Preface

by  
Ray Kaplan  
PIVOTAL, Inc.

Don recently dropped me a note lamenting the fact that my "ALL-IN-1 Hints and Kinks" column (see elsewhere in this issue) has not received more participation. In order to do his part, he enclosed this nice Script Tutorial.

Thanks, Don. This is EXACTLY the sort of thing that we would like to see on the "technical side" of ALL-IN-1.

Anyone else out there have anything of interest? If so, please just send it along!

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The Use Of Scripts In ALL-IN-1

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1 OVERVIEW

1.1 Introduction

One of the most powerful features offered by ALL-IN-1 V2 is the script facility. Scripts allow users and programmers to create files which contain operations to be performed by ALL-IN-1.

Chapter 15 in Volume 3 of the APR (Application Programmer's Reference) provides a fairly complete discussion of scripts. This article is intended to provide some more tutorial information along with a few examples of scripts. In an attempt to keep the discussion simple and understandable, this article does NOT cover ALL aspects of scripts

1.2 Script file format

Script files are text files made up of lines. Each line is considered either text or a script directive. The script directives are discussed in Chapter 15 of the APR. One of the most important directives is the ! which provides for comment lines. All other directives begin with a period. Lines can be continued by ending the line with a hyphen ("-"). It is critical in V2.0 to provide parameter spacing using the SPACE character. You can use TAB's for good visual appearance but you need to include at least one SPACE where spacing is required.

The format of the text lines differ between the two script modes as described below.

2 SCRIPT MODES

As readers of the APR are aware, there are two script modes. While the content and structure of both modes are similar, the operation and effect of the modes are quite different.

2.1 DO Mode

DO mode provides a function procedure to be executed by ALL-IN-1. A DO mode script is very much like a DCL command procedure. Under ALL-IN-1 V1.x, DCL command procedures were used for much of the 'programming'. Under ALL-IN-1 V2.x, DO mode scripts can and should be used in place of DCL command procedures in most cases. DCL command procedures use the sub-process whereas scripts are done in the main process which is more efficient.

The Use Of Scripts In ALL-IN-1  
SCRIPT MODES

A common mistake is to do something like:

```
SCRIPT A \ DO B
```

and to expect the keystrokes in A.SCP to be performed before the functions in B.SCP since the SCRIPT function appears before the DO function. The \ allows the functions to appear on the same line.

In fact, the functions in B.SCP will be performed before the keystrokes in A.SCP. If any of the functions in B.SCP require user inputs then the lines in A.SCP would be used to supply these inputs. A.SCP will be used for user inputs until all lines in it have been used.

### 3 EXAMPLES

The best way to learn how to program, especially with ALL-IN-1, is to look at examples of working code. This section contains an example of a DO mode script, a SCRIPT mode script, and a DCL command procedure which executes ALL-IN-1 in batch.

#### 3.1 DO mode script

This DO mode script named CLEANMAIL.SCP is intended to be used as a system management tool to clean out old mail. It functions to delete all mail messages older than a month old which have not been refiled. Any messages in the folders OUTBOX, INBOX, or READ which have a CREATED date older than a month ago are refiled to the OASWASTEBASKET folder. Note that OASWASTEBASKET is a special symbol which defines the name of the folder to be used as the wastebasket. If any messages were refiled for a given user a mail message is sent to the user indicating how many documents have been refiled.

##### 3.1.1 Execution

This script can be executed in any of several ways:

1. Add it to the janitor as documented in the comments at the beginning of the script.
2. Add an option to a menu using DO CLEANMAIL in the data portion of named data.

The Use Of Scripts In ALL-IN-1  
SCRIPT MODES

A common mistake is to do something like:

```
SCRIPT A \ DO B
```

and to expect the keystrokes in A.SCP to be performed before the functions in B.SCP since the SCRIPT function appears before the DO function. The \ allows the functions to appear on the same line.

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##### 3.1.1 Execution

This script can be executed in any of several ways:

1. Add it to the janitor as documented in the comments at the beginning of the script.
2. Add an option to a menu using DO CLEANMAIL in the data portion of named data.

The Use Of Scripts In ALL-IN-1  
EXAMPLES

3. Interactively entering <DO CLEANMAIL if the user has interactive command privilege.

This script is fairly long and contains several file CABINET functions as documented in Chapter 9 of Volume 3 of the APR, several MAIL functions as documented in Chapter 11 of Volume 3 of the APR, and symbol processing as documented in Chapter 8 of Volume 3 of the APR. The comments throughout the script provide a description of the operation of the script.

### 3.1.2 CLEANMAIL.SCP

```
! OA$LIB:CLEANMAIL.SCP          V1.0DDV          15-Sep-1985
!
! This script is used to clean up the files in the mail folders.
! Any mail that is in the OUTBOX, READ, or SENT folders will be
! placed in the WASTEBASKET
!
! Include the following line (without the !) just below the similar
! line containing "... cab janitor" in OA$LIB:SMJANITOR.SCP in order
! to effect this procedure as a part of the janitor:
!
! .if #smdoc nes "" then .if #smdaf nes "" then DO CLEANMAIL \\\-
!
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! Digital Equipment Corporation, Maynard, Mass
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!
GET #NUMBER = 0
!
! First get the current date
!
GET #CHECK_DATE = OA$DATE_NBS
```

The Use Of Scripts In ALL-IN-1  
EXAMPLES

```
!
! Break it down into the month and year
!
GET #MON = #CHECK_DATE:2:4
GET #YEAR = #CHECK_DATE:4
!
! Subtract 1 month using integers
!
DECIMAL I
COMPUTE #MON = #MON - 1
!
! Now make sure that the month is still valid
! and that it is still a two digit month
!
! .IF #MON LE '9' THEN GET #MON = '0' #MON
! .IF #MON == '00' THEN COMPUTE #YEAR = #YEAR - 1\GET #MON = '12'
!
! Put together a symbol with the NBS date
! that we are going to look for
!
GET #CHECK_DATE = #YEAR #MON #CHECK_DATE:2:6
DATE_CONVERT #CHECKED_DATE,#CHECK_DATE,9
!
! Save the current file cab context
!
CAB PUSH
!
! Start with the OUTBOX folder
!
CAB SELECT 'OUTBOX',,,#DELDOC
.LABEL LOOP_OUTBOX
!
! Make sure the select was successful
!
! .IF OA$STATUS == '0' THEN .GOTO CHECK_INBOX
!
! See if it is before the date we are checking
!
! .IF OA$CURDOC_CREATED_NBS:8 GT #CHECK_DATE THEN -
! .GOTO NEXT_OUTBOX_DOC
!
! If so then refile it
!
CAB REFILE DOCUMENT ,OA$WASTEBASKET
COMPUTE #NUMBER = #NUMBER + 1
.LABEL NEXT_OUTBOX_DOC
!
! Go select the next document in this folder
!
CAB NEXT DOCUMENT #DELDOC,#DELDOC
.GOTO LOOP_OUTBOX
```

The Use Of Scripts In ALL-IN-1  
EXAMPLES

```
.LABEL CHECK_INBOX
!
! Now check the SENT folder
!
CAB SELECT 'SENT',,,#DELDOC
.LABEL LOOP_INBOX
!
! If not selected check read folder
!
! IF OA$STATUS == '0' THEN .GOTO CHECK_READ
!
! Is this before the date we are checking
!
! IF OA$CURDOC_CREATED_NBS:8 GT #CHECK_DATE THEN -
!           .GOTO NEXT_INBOX_DOC
!
! Place in wastebasket
!
CAB REFILE DOCUMENT ,OA$WASTEBASKET
COMPUTE #NUMBER = #NUMBER + 1
.LABEL NEXT_INBOX_DOC
!
! Get next document in folder
!
CAB NEXT_DOCUMENT #DELDOC,#DELDOC
.GOTO LOOP_INBOX
.LABEL CHECK_READ
!
! Search the READ folder
!
CAB SELECT 'READ',,,#DELDOC
.LABEL LOOP_READ
!
! If at end of folder then get out
!
! IF OA$STATUS == '0' THEN .GOTO EXIT
!
! Is this document before the date we are checking?
!
! IF OA$CURDOC_CREATED_NBS:8 GT #CHECK_DATE THEN -
!           .GOTO NEXT_READ_DOC
!
! If so then place it in the wastebasket
!
CAB REFILE DOCUMENT ,OA$WASTEBASKET
COMPUTE #NUMBER = #NUMBER + 1
.LABEL NEXT_READ_DOC
!
! Get next document from folder
!
CAB NEXT_DOCUMENT #DELDOC,DELDOC
```

The Use Of Scripts In ALL-IN-1  
EXAMPLES

```
.GOTO LOOP_READ
.LABEL EXIT
!
! Restore cabinet to original state
!
CAB POP
!
! Tell user how many we found
!
OA$MSG PURGE
! IF #NUMBER EQ 0 THEN .GOTO FINI
MAIL PUSH CURMES
MAIL CREATE/OPEN/NOSEND
MAIL TO "ME"
MAIL SUBJECT "JANITOR actions"
MAIL TEXT " "
MAIL TEXT "Your WASTEBASKET has been emptied by the janitor."
MAIL TEXT " "
MAIL TEXT #NUMBER ' unfiled messages have been placed into your'
MAIL TEXT 'WASTEBASKET.'
MAIL TEXT " "
MAIL TEXT "Unfiled mail messages prior to " #CHECKED_DATE
MAIL TEXT "have been placed into your WASTEBASKET."
MAIL TEXT " "
MAIL TEXT "Use the FC menu to refile any documents that you wish"
MAIL TEXT "to save by refiling them into another folder."
MAIL TEXT " "
MAIL TEXT "Have a GREAT day,"
MAIL CLOSE_MESSAGE
MAIL SEND
CAB REFILE DOCUMENT ,OA$WASTEBASKET
MAIL POP_CURMES
.LABEL FINI
!
! [End OA$LIB:CLEANMAIL.SCP]
```

### 3.2 SCRIPT mode script

This script reads all of the new mail in the INBOX and files it into a folder named RECEIVED today's-date.

#### 3.2.1 Execution

This script can be implemented in several ways:

The Use Of Scripts In ALL-IN-1  
EXAMPLES

1. Add the script to the user's UDP's (User Defined Procedures) and press GOLD U to select it by name.
2. Add it to a menu's named data with the data portion containing SCRIPT READ\_ALL.
3. Interactively entering <SCRIPT READ\_ALL if the user has interactive command privilege.

Note that this script fails if the incoming mail requires any response other than 'normal' mail activities. For example, meeting requests which require that the user indicate an answer will disrupt the actions of the script.

3.2.2 READ\_ALL.SCP

```
! READ_ALL.SCP
!
! SCRIPT mode script to file all inbox messages into a folder
!
! Created by Hal Pryor on 15-Oct-1985
!
! This script places all the messages in the inbox into a folder name
! RECEIVED nn-mmm-yyy where nn-mmm-yyyy is the current date.
!
.LABEL TOP
!
.IF OA$MAIL_COUNT EQ 0 THEN .EXIT
RN{CR}
{KEY 0}
!
.FUNCTION CABINET REFILE @#CURDOC,"RECEIVED " OA$DATE_FULL,@#CURDOC
!
.GOTO TOP
!
![End READ_ALL.SCP]
```

3.3 Execution of ALL-IN-1 in batch

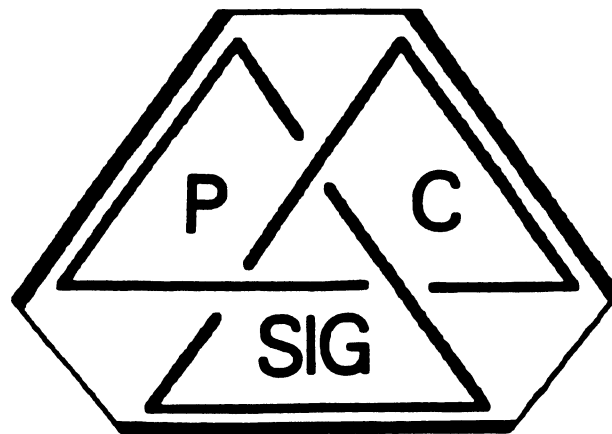
This DCL command procedure illustrates how ALL-IN-1 can be executed in batch mode. The command procedure below executes the READ\_ALL.SCP described above.

The Use Of Scripts In ALL-IN-1  
EXAMPLES

The /TERMINAL=HARD is not required. ALL-IN-1 should normally go into hardcopy mode in batch but it's always nice to document in DCL.

```
#! READ_A1_MAIL.COM           Run ALL-IN-1 in batch to read all messages
#!
#! Execute ALL-IN-1 and have it perform the READ_ALL script and leave
#!
$ ALLIN1/TERMINAL=HARD/SCRIPT=READ_ALL
EXIT{CR}
#!
#! [End READ_A1_MAIL.COM]
```

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## Newsletter

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## INTRODUCTION

<b>PC Sig Steering Committee List</b> .....	PC-i
If you ever have any questions regarding the Sig or any of its activities, get in touch somebody on this list. If that person cannot help you he will direct you to one who can.	
<b>Trademarks</b> .....	PC-ii
<b>From the Chairman</b> .....(Maaskant).....	PC-1
Our chairman, Barbara Maaskant, would like to welcome you to this issue of the PC Sig Newsletter.	
<b>How to Submit an Article</b> .....	PC-2
We need your help to make this newsletter the best that we can. Please be sure to read this page and write something for us. We are interested in what you have to say.	
<b>Trivia Answers</b> .....	PC-3
These are the answers to the trivia questions you found in the last issue.	
<b>PC Post Script</b> .....	PC-3
This is the section where your comments, questions, complaint, compliments, etc. are published. This is very similar to a Letters to the Editor column.	
<b>Writing to Express Meaning</b> .....(Maaskant).....	PC-4
If you've ever wondered what it was that was missing from electronic conversations, and you wondered why it is you still prefer to see the person with whom you're talking, this article will explain how to overcome the problem of expressing subtle meanings electronically.	
<b>Telephone Contact List</b> .....	PC-5
If you have ever met somebody at DECUS that seemed to have just the right answer for your question, you know the value of good volunteer help. This is a list of your fellow PC users that are willing to share what they know with you.	

## PROFESSIONAL SECTION

<b>Software Version List</b> .....(Rice).....	PC-6
This is a handy list of all the current versions of Professional Software. It includes both DEC and Third Party packages.	
<b>Digital's IVIS System: Questions &amp; Answers</b> .....(IVIS Mktg Group).....	PC-7
Collected and answered by the IVIS Marketing Group, here, are the most popular questions asked about Digital's Interactive Video Information Systems.	
<b>A Print Queue Manager for Background Printing under P/OS</b> .....(Baldwin).....	PC-11
This user got tired waiting for Digital to release a background print queue manager for the PROFESSIONAL, so he wrote his own. Here is his story and all of the source listings he wrote.	

## DECMATE SECTION

<b>WPS V2.1: Questions &amp; Answers</b> .....(DECmate Marketing Group).....	PC-29
Digital answers some of the most commonly asked questions about WPS V2.1 for the DECmate.	
<b>DECmate Wish List</b> .....	PC-32
Here is the list of all of those things that you've told us you wish Digital would provide in regards to the DECmate family of personal computers.	

Barbara A. Maaskant  
University of Texas  
Health Science Center  
San Antonio, Texas

RAINBOW SECTION

From the Working Group Chairman.....(Jarrett).....PC-35  
LynnJarrett, theRainbowWorkingGroupChairman, encouragesyou to read the Rainbow Section with these comments.

Wish List.....PC-37  
This is the Rainbow wish list that you have helped us to put together.

IBM ♦ DEC Disk Compatibility.....(Bahn).....PC-39  
This story relates how one user transferred files from the IBM PC to the Rainbow and back again!

Rainbow 100A to Rainbow 100B Upgrade.....(Silicon Valley).....PC-39  
You can indeed upgrade your Rainbow 100A to a 100B and this article tells you how.

Announcing Linkware for Rainbow and IBM Personal Computers.....PC-40  
This is a description of a new family of products from Linkware Corporation that links Rainbows and IBM PCs to VAX hosts.

Increasing MS-DOS Environment Space.....(LeFebvre).....PC-43  
One Rainbow MS-DOS user tells the story of how he increased his environment space.

Advanced Applications of Lotus 1-2-3.....PC-45  
Our first PSS for San Francisco is announced in this issue!

Counterpart Corner.....(Holman).....PC-46  
This is our Rainbow counterparts column in which she discusses a variety of topics including technical documentation and the GW-Basic compiler.

Rainbow Fido List.....(Elliott).....PC-48  
This is a list of all the BBSes running on, or having a reasonably sized section for DEC Rainbow 100 computers.

Rainbow User Groups.....PC-50  
This list covers all of the Rainbow User Groups that we know of. If you see one missing or find that we have erred in a listing, please tell us.

DECUS PC Sig Public Domain Software.....PC-58  
This is a list of all of the public domain programs that are available for the Professional computers in the Sig library.

In early June my thoughts drift to a Digital poster available about two years ago showing a programmer lounging outside his beach-house, feet propped up with a keyboard in his lap. After Symposia that is exactly what I felt like doing. However, planning new activities, sharing information, doing follow-up on Symposia items and laying the groundwork for October have kept the volunteer group very active.

At Dallas the SIG was fortunate in recruiting volunteers for several positions. Kenneth LeFebvre (Sytek, Inc.) is the new PC Sig Newsletter Editor. Ken has been a familiar face at Symposia for some time and has strongly supported PC SIG activities. The position of Newsletter Editor is perhaps the most demanding and I hope you will help Ken by submitting articles and following the requested format. Gary Rice (McDonnell Douglas) has also been a long term PC SIG advocate and welcome supporter. Gary is the Contributing Editor for PROfessional submissions to the newsletter. Congratulations to both Ken and Gary on this inaugural issue! Vince Perriello is the new SIG PSS Coordinator. Vince was FIDO Sysop at Dallas and a long term volunteer. On a sadder note Pierre Hahn had a change of responsibilities within DECUS and resigned as the PC SIG National Lug Organization Representative. We have enjoyed Pierre's participation on the steering committee and are very happy that he will still maintain his membership in the PC SIG.

Thanks to Ted Needleman, who has been publicizing on our behalf at meetings and presentations, I have received quite a few calls from folks interested in joining the SIG and DECUS. There is also a move to start up an Austin LUG (TX) and I will keep you posted. The PC SIG is definitely getting stronger.

Several requests were made for the collection of public domain software offered for sale at Dallas. Unfortunately, there is no mechanism to sell these between symposia. The programs are available through FIDO. Interested parties should dial Fritz Howard's FIDO board (Greylug 315/589-7361). A directory listing is available in this issue. The remaining 100 completed sets (10 diskettes) will be for sale in the DECUS store in October at \$45.00 a set. The SIG hopes to have a new collection available for the Spring Symposia at Nashville. Anyone wishing to contribute software, please contact Ron Hafner, who is our SIG Librarian.

For San Francisco, we are planning to offer a Pre Symposia Seminar on Lotus 1-2-3. Lynn Jarrett will be giving the session. Most of you who have already met Lynn are familiar with her dynamic way of speaking. Look for more information on the PSS in this issue. Another highlight for San Francisco is a session on FIDO to be given by Tom Jennings. Tom is the creator of FIDO and we are indeed fortunate to have him join us in San Francisco. If we are very lucky he will also stay for our FIDO clinic following the session. Another new item is the PC Graphics Contest. Look for the rules in this and follow-on issues.

In the meantime, I have received the questionnaires many of you have sent and am working on a "New SIG Member Welcome Packet". If you have any ideas for items to include that would be of interest to new PC users please, pass them along. All of this information should be available in the next issue. The PC SIG is unusual in that a large proportion of our members cannot attend Symposia. I hope that you will help make the newsletter a useful source of information for our entire user base.

## How to Submit an Article

The PC Sig Newsletter serves as your means to share information related to personal computing hardware and software with other members of the Sig. We depend on your contributions for survival. If you have a tutorial or item of general interest, a new and better way to do something, a routine that you've developed and are willing to share, a related enjoyable story, etc., we would like to publish it in our newsletter. The PC Sig Newsletter will be published as often as there are enough submissions, so be sure to contribute if you want to see more issues.

There are several ways you can submit your articles:

- Fill out and mail in the *PC PostScript* form in the back of this newsletter.
- Mail a Camera Ready hard copy to an address below (*Note: this method does not preclude editing*).
- On DCS, send articles to **LEFEVRE K**.
- Send an RX50 diskette to an address below in one of the following formats:
  - WPS-8                                      WPS-80
  - CP/M or MS-DOS ASCII Select
  - WordPerfect                                WPS-Plus/Rainbow
- Upload your file to the FIDO bulletin board: (315) 589-7361, *Hitchiker's Guide* 107/23, Williamson, NY; SYSOP: Fritz Howard.
- Use EasyPlex on CompuServe and send it to **Kenneth LeFebvre 72447,261**.

Contributions can be sent to:

Kenneth LeFebvre, *Editor*  
Sytek, Inc.  
19 Church Street  
Berea, Ohio 44017  
(216) 243-1613

Gary Rice, *PROfessional Ed.*  
McDonnel Douglas  
5701 Katella Avenue  
Cypress, California 90630  
(714) 952-6001

Barbara Maaskant, *Sig Chair*  
UTHSCSA-Computing Resources  
7703 Floyd Curl Drive  
San Antonio, Texas 78284  
(512) 691-7351

## TRIVIA ANSWERS

### Professional Answers

1. V1.7; October 1983
2. 4
3. DC
4. Circle with eight radiating lines
5. Circle with the right half filled and the left half empty
6. 1
7. Maroon
8. 4, 6, 6
9. Set-Up (F4), Break (F3)
10. Green (5Mb), Red (10Mb)
11. Broken, long stem glass

### DECmate Answers

1. Blue
2. PC278
3. PC238
4. V1.5
5. Math
6. 52, 100, 227, Graphics, DECmate
7. u's and a's
8. 150
9. 25
10. Red

### Rainbow Answers

1. 105
2. Comm, Printer, Video
3. 15
4. 16 — 19.2, 9600, 4800, 3600, 2400, 2000, 1800, 1200, 600, 300, 200, 150, 134.5, 110, 75, 50
5. 115 and 230
6. A high speed and low speed serial port. Also direct memory access for input/output devices and support of many communications protocols.
7. 1.2 inches above desktop
8. 250 bit/s
9. 3.8 lbs.
10. 20

*PC PostScript*

---

**THIS IS YOUR COLUMN**

In the Questionnaire section of the DECUS Newsletter book, you will find a form entitled "PC PostScript." Fill it out and send it in. You may submit any questions, comments, complaint, or compliments that you may have. We will publish them all. Once you have sent in your PostScript, be sure that you come back here to look for what your colleagues have to say, too!

## Writing to Express Meaning

Normally, when people are are talking face-to-face there are many physical signals they send back and forth to express feelings about an issue. When conferencing via computer, one's intended meaning may be misunderstood because the emotional clues such as body language and vocal inflection that are transmitted in person or by phone are not available. For example, sarcastic statements may be taken literally. Hence the idea to represent parenthetic expressions of emotion using "icons" was conceived. These icons were brought back from an IBM SHARE conference by the technical staff at the University of Florida Institute of Food and Agricultural Science. Special thanks to Tom Hintz.

(To view the icons properly, turn the page clockwise 90 degrees.)

:-)	Smiling	:-T	Keeping a straight face (tight-lipped)
:-(	Frowning	:-D	Said with a smile
'-)	Wink	:-x	Kiss kiss
;~)	Sardonic incredulity	:-c	Real unhappy
%~}	Drunk with laughter	:-C	Just totally unbelieving! (jaw dropped)
:-"	Pursing lips	:-B	Drooling
:-0	Wow!	:-,	Smirk
:-	Grim	:-	Anger
:-=	Baboon	:-\$	Uncertainty.
:-v	Speaking	:-#	Mouth zipped.
:-V	Shout	:-&	Tangled up tounge.
:-W	Speak with forked tonque	:-@	Swearing.
:-r	Sticking tonque out		
:-*	Oops! (covering mouth with hand)		

In addition to using icons, here are some other suggestions that you can use to help in getting a point across.

- CAPITALS CAN BE USED TO EXPRESS EMPHASIS
- Symbols such as \$%###!&\*^%\$%#! express frustration
- A string of periods express continued thought...
- \*CREATIVE PUNCTUATION\* can express a wide variety of feelings!!!!?
- And an occasional aaaAAGGGHHHHH!!!!!!!! may be fitting in some situations.

If you have a favorite means of making your feelings better understood electronically, please share them and I will update the list. :-)

Barbara Maaskant

## Telephone Contact List

Sorted by Areas of Expertise

If you have any questions about the hardware or software listed, feel free to call the persons below. Questions should be the sort that can be answered over the telephone in a few minutes. Contacts cannot be expected to act as consultants nor can they be expected to return long distance phone calls. (Volunteers who would like to be added to the contact list should contact the editor with their name, specialties, and a phone number.)

<b>All-In-1, V.1 &amp; V.2</b>	Andrew L. Wax	(212) 701-5231	
<b>BASIC</b>	Guy Stefan-Romano	(415) 753-5581	
<b>Communications/PRO</b>	John R. Lynn	(714) 620-6667	aft. 7pm
<b>Corvus Omnidrive</b>	Kenneth Lemay	(219) 483-0001	PST
<b>dBASE</b>	Guy Stefan-Romano	(415) 753-5581	
<b>dBASE II</b>	Paul Bottone	(516) 928-0933	aft. 7pm
<b>DBL</b>	Philip Rice	(503) 369-2706	EST
<b>DECmate</b>	Cheryl Johnson	(515) 236-2570	
	Gary Swarthout	(607) 974-3152	
<b>DECspell</b>	Cheryl Johnson	(515) 236-2570	
<b>Econometric Programming</b>	Jeff Mackie-Mason	(617) 253-8717	
<b>FCS-EPS</b>	Mark Lewis	(212) 563-5656	
<b>GraphWriter</b>	Lynn Jarrett	(619) 293-1130	
<b>Hard Disk/Rainbow</b>	Kenneth Lemay	(219) 483-0001	
<b>Hardware/PRO 350</b>	John Pratchios	(703) 385-5880	x3887
<b>Hardware/Rainbow</b>	Bob Catt	(717) 794-2430	
<b>Lotus 1-2-3</b>	Lynn Jarrett	(619) 293-1130	
	Joseph L. Marks	(404) 875-9211	
	Miles Bridgford	(312) 496-4582	
<b>Low Level I/O on PRO</b>	John R. Lynn	(714) 620-6667	
<b>LVP-16 Plotter</b>	Lynn Jarrett	(619) 293-1130	
<b>Mass-11</b>	Lynn Jarrett	(619) 293-1130	
<b>Medical Office Appl/DM</b>	J. Kaufman	(201) 937-7816	
<b>Memory Additions</b>	Caroline Mack	(703) 280-4404	
	Tom Tugman	(703) 280-4404	
<b>Multiplan</b>	Guy Stefan-Romano	(415) 753-5581	
<b>P/OS</b>	Dr. Homer Baker	(602) 251-3830	
<b>PRO Applications</b>	Tom Hintz	(904) 392-5180	
<b>PRO Ofc Workstations</b>	Carol Britton	(805) 277-4808	
<b>PRO Series</b>	Tom Hintz	(904) 392-5180	
<b>Robin (VT180)</b>	John Comella	(617) 897-5922	
<b>Samma II</b>	P. Chmielewski	(302) 777-5537	
<b>Scientific Programming</b>	Jeff Mackie-Mason	(617) 253-8717	
	Thomas R. LeBone	(603) 880-9097	
<b>Statistical Programming</b>	Jeff Mackie-Mason	(617) 253-8717	
<b>TK!Files</b>	Miles Bridgford	(312) 496-4582	
<b>TK!Solver</b>	Miles Bridgford	(312) 496-4582	
<b>Turbo-Pascal</b>	Thomas R. LeBone	(603) 880-9097	
<b>UCSD Pascal</b>	Guy Stefan-Romano	(415) 753-5581	
<b>WordPerfect</b>	Caroline Mack	(703) 280-4404	
<b>WordStar</b>	Guy Stefan-Romano	(415) 753-5581	
<b>WPS</b>	Cheryl Johnson	(515) 236-2570	

## Software Version List

One of the issues raised at the Fall '85 DECUS symposium was the lack of coordinated information from DIGITAL regarding the current versions of software available for personal computers. In an effort to provide this information, I have called several places and come up with a very incomplete list for the PRO computer family.

Here is what I found out:

DEC Software (alphabetically)	Current or Last Version	Source of Information
LOGO	1.4	DEC
P/OS	3.0	User
PRO/BASIC-11	1.2	User
PRO/BASIC Plus 2	2.3	DEC
PRO/COBOL	2.4	DEC
PRO/Comm	3.0	DEC
PRO/Datatrieve	2.0	User
PRO/DECnet	2.0	DEC
PRO/DIBOL	1.7	DEC
PRO/Pascal	1.2	DEC
PRO/Toolkit	3.0	DEC
PRO/SIGHT	1.0	User
PROSE PLUS	2.0	User
Synergy	2.0	User
WPS/Plus	1.0	DEC

Third Party Software (alphabetically)	Vendor	Current or Last Version	Source of Information
20/20	Access Technology	1.0	DEC
Online Disk Unfragmentor	By Hand	1.3	User
Phoenix-PRO	Advanced Technology	1.0A	DEC
TK!Solver	Software Arts	1.0 (2A)	User
Supercomp-20	Access Technology	1.21	User

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. I will submit a new list to the PC SIG Newsletter every time I learn of a change to the information.

You can contact me at:

Gary Rice  
P.O. Box 5536  
Bacienda Heights, CA 91745-0536  
(818) 913-7996

Gary Rice

EDITOR'S NOTE: I would like to see similar lists maintained for the DECmate and Rainbow computers as well. If you have information on software (DEC, DCS, or Third Party) for either of those two machines, please send that information to me. Thank you.

## Digital's IVIS System: Questions &amp; Answers

At the Spring '86 symposium in Dallas, eye-catching interactive video information systems drew people into the Personal Computing Systems exhibit. Digital is considered an industry leader in interactive video technology, due to the patent issuance, the number of interactive videodiscs produced (and awards won), and the number of interactive video workstations in use. Here, in concise question and answer form, is the pertinent information about Digital's IVIS system.

## Q. What is an IVIS?

A. The IVIS™ system is an interactive video workstation consisting of the following components:

- Professional 380 computer (IVIS 2000)
- IVIS "backpack" interface
- Videodisc player
- Single-user headset

The earlier IVIS 1000 was based on the Professional 350 computer, and has been replaced by the IVIS 2000 which was announced November 18, 1985.

The IVIS "backpack" includes technology patented by Digital that translates the NTSC (television signal) from the videodisc player into a RGB signal that can be displayed on a computer monitor.

## Q. What are the major application areas for interactive video?

A. The three major application areas for interactive video are:

- Industry and/or government training
- Point-of-sale and point-of-information
- On-the job aid

## Q. What are the order codes for IVIS system hardware?

Order #	Description
PC38V-AA	IVIS 2000 Color System (VR241)
PC38V-BA	IVIS 2000 DECTouch system

A hard disk subsystem, RCD51-A 10-Mbyte hard disk or RCD52-A 33-Mbyte hard disk, must be ordered to complete either IVIS system.

**Q. How does one develop IVIS applications?**

**A.** There are three possible methods of implementing IVIS applications:

1. Do-it-yourself. Use Digital's VAX Producer authoring language (see below). The application can then be delivered on IVIS via an interpreter.
2. Off-the-shelf-courseware. Digital sells the following "turn-key" IVIS courses:

Title	Course Number
Computer Communications I: Data Communications	EY-2630E-00
Computer Communications II: Networks	EY-2611E-00
Computer Comm. III: Modems and Interfaces	EY-2639E-00
Introduction to Programmable Controllers	EY-2610E-00
Introduction to DCL	EY-2697E-VS
Decision-point: A Living Case Study	EY-2684E-VS
Analyzing Performance	EY-3434E-VS

Courses may be ordered by calling toll-free 800-343-8321 OR by mailing an order form complete with the above information to:

Digital Equipment Corporation  
 Educational Services (BKO-A)  
 12-A Esquire Road  
 Billerica, MA 01862

Additional off-the-shelf courses are in development.

3. Custom IVIS Application Development. Digital's Adaptive Learning Solutions (ALS) group designs and develops customized IVIS applications. ALS works in a manner similar to Digital's Software Services organization in that they will spec and quote an entire development project, or work in a consulting role. ALS has delivered many customized IVIS applications to major U.S. corporations. For more information contact:

Digital Equipment Corporation  
 Adaptive Learning Solutions  
 30 North Avenue  
 Burlington, MA 01830  
 Contact: Bob Ostwald  
 (617) 273-7657

**Q. What are the major features of VAX Producer?**

**A.** VAX Producer is a VMS-layered product which separates the creation of visual information from the creation of logic for greater productivity. VAX Producer is a proven authoring system for the development of highly interactive applications, such as IVIS or computer-based instruction.

VAX Producer consists of three major components:

- VAX DRAW: graphics and text editor
- VAX DESIGN: logic and branching language
- ADMINISTRATION: for user tracking and reporting

The VAX Producer product includes a bundled computer-based-instruction package and a full set of user documentation.

**Q. What are the major aspects of IVIS application development using VAX Producer?**

**A.** IVIS application development can be divided into three major stages:

1. Design/Needs Analysis: includes instructional design and story-boarding for the entire application.
2. Production: includes VAX Design, VAX Draw programming as well as video shooting and production.
3. Merge/Test: includes the merging of text, graphics, and video, as well as testing. Each of these stages represents approximately one-third of the time/cost of the total project.

**Q. Is the IVIS system available through Digital OEMs?**

**A.** Yes. Several companies have developed and are marketing IVIS applications and development capabilities:

Company Name	Application
Hitech Training Houston, TX	Petroleum Operators Training
Intelligent Images, Inc. San Diego, CA	Medical simulation
ISC Lancaster, PA	Elementary and secondary education
JAM, Inc. Rochester, NY	Customized applications

**Q. Are colleges and universities utilizing IVIS technology?**

**A.** Yes. Many academic institutions are currently developing IVIS courses and curriculum. Some of them are:

Rochester Institute of Technology  
 Massachusetts Institute of Technology  
 Grove City College  
 Harvard University  
 University of Tennessee  
 University of Maryland  
 Boston University  
 Johns Hopkins University

**Q. Is a PRO-based authoring system available for stand-alone IVIS application development?**

A. Yes. But it is not a Digital product. It is available from:

Videologic, Inc.  
1903 Burr Street  
Fairfield, CT 06430  
(203) 255-9956  
Attention: Tony Sukenik

**Q. How is a videodisc made?**

A. A videodisc is pressed onto a Master Disc from one-inch videotape. (3M provides this service.)

IVIS Marketing Group

**A PRINT QUEUE MANAGER (PQM) FOR BACKGROUND PRINTING UNDER P/OS**

by Don Baldwin, US Army Corps of Engineers

Like so many other P/OS users, I have awaited a printer spooling capability for P/OS. I understand that Version 3.0 of P/OS will provide this capability - it and when it ever arrives. However, being a little bit impatient with DEC in this regard, a few months ago I decided to write my own print queue manager in FORTRAN-77 under Version 2.0 of the Tool-Kit on my PRO-380. The PQM, which is generally patterned after the printer spooling and SHOW QUEUE capabilities of VAX/VMS, has worked well for me thus far.

This particular version of PQM makes use of a fixed-in-memory 64K byte dynamic memory region which serves as the temporary buffer, holding the file currently being printed. On PROs with limited memory, the spooling module can be easily modified to delete this dynamic region whenever the spooler doesn't need it. Alternatively, the use of a dynamic region could be eliminated entirely by replacing it with an 8192 byte character array contained completely within the spooler's task image. This latter modification would, however, reduce the functionality of the PQM package slightly.

The basic features of the PQM are as follows:

1. Up to 20 file names may be entered in the print queue.
2. Unless the user specifies the print pitch to be used for a particular file, i.e. 10, 12, or 16.5 CPI, the spooler will automatically determine which pitch is required to assure that the longest line in the file will fit on an LA-50's eight and one-half inch wide paper without wrapping.
3. Allows the user to submit either individual files to be printed, or to specify the name of an "@" container file which contains a list of the names of the files to be printed. Wild card file names are not allowed. This capability allows groups of frequently printed files to be queued by merely specifying the name of their container file preceeded with the "@" symbol.
4. Allows for the printing of multiple copies (up to 9) per queue entry.
5. Allows the user to query the active queue to see what's actually going on in the background spooler process. Also allows the user to kill, restart, and modify disposition of queue entries while the spooler is working.

6. Allows the user to enter additional names to an already active queue.

## PRINT QUEUE MANAGER FOR THE DEC PROFESSIONAL

The PQM package is composed of three basic modules and an indirect command file that can be used to re-initialize the queue if it should become corrupted in some manner, causing one of the three modules to hang-up. These modules are:

- PRT The foreground process used to place entries in the queue and start the spooler.
- PSPPOOL The background process, the "spooler", that looks at the queue and prints entries.
- PR The foreground process used to look at and modify the active queue.
- IQ A CMD file used to re-initialize the queue.

On my own PRO, I normally run PRT and PQ from within a command shell operating under the Tool-Kit. I developed this shell some time ago to enable me to easily and readily create and use DCL-like command symbols and synonyms under P/OS in a manner similar to the way one creates and defines symbols and foreign commands under VAX/VMS with the LOGIN.COM file. Therefore, my normal syntax for initiating a print job is simply "PRT filename.ext" at the "\$" prompt. This concept is similar to that proposed by Harold Salwen of Stevens Institute of Technology in Vol. 1, No. 10 of the DECUS Newsletters, on page PC-74, i.e. "@PRT filename.ext", where @PRT refers to the indirect command file -

```
      ; PRT.CMD
      ;
      RUN/COMMAND: "'P1'" PRT
```

The user documentation for PQM as well as the source, PAB, and ODL file listings that follow were printed on an LA-50 using the PQM package. The documentation was composed using PROSE+ and the ODL and PAB files were generated using a FORTRAN link editor, LKED, another goodie I developed to relieve some of the tedium of using the Task Builder.

I would appreciate hearing from anyone who either discovers a bug or comes up with a good modification to the package to make it more useful.

Don Baldwin  
HQDA(DAEN-ECE-T)  
Washington, DC 20314-1000

The print queue manager (PQM) is composed of three separate but related tasks and two shared resident common areas. The two shared common areas are defined by tasks PQCCOM and PQNCOM and are installed as tasks rather than common areas.

The three functional tasks are described as follows:

PRT PRT is a process which runs interactively in the foreground allowing the user to enter one or more jobs into the print queue. Jobs may be entered in one of three ways. The first way is by passing the name of the file to be printed via the RUN command line when the user "RUNs" PRT. For example,

```
$ RUN/COMMAND:"filename.ext" PRT
```

The second way to enter a file into the queue is by specifying the filename in response to the PRT> prompt. For example,

```
$ RUN PRT
PRT> filename.ext
```

The third method enables the user to specify a list of up to twenty file names via a file containing a list of the files to be printed. This file containing the list is identified to PRT either in the command line (first method above) or at the PRT> prompt (second method above) by prefixing the file name of this special container file with the "@" symbol. The contents of this container file must be file names, one to a record (line) and each name must begin in character position one on the line. When specifying the name of this container file to PRT, PRT will assume that its file name extension is PRT unless explicitly specified otherwise. For example,

```
$ RUN/COMMAND:"@CONFIL" PRT
```

Where the container file, CONFIL.PRT, contains the following list of four different file names -

```
DW1:[1,2]XYZ.FTN
DZ1:[USERFILES]LETTER.DOC
RENUM.FOR
PCP.CMD
```

Alternatively, the user could have performed the same action with the following sequence,

```
$ RUN PRT
PRT> @CONFIL
```

Each time a file name is entered into the queue, PRT echoes back with the file name and its queue entry sequence number.



To exit PRT, the user types a carriage return in response to the PRT> prompt.

Wild cards are not permitted in specifying file names.

**PSPPOOL** PSPPOOL is the background process spawned by PRT as soon as one or more entries are placed in the print queue. It continues to run as long as there is work in the queue. Once a queue entry has been made by PRT, its disposition can be changed only by using the interactive task PQ which will be explained next. PSPPOOL reads the entire file to be printed into a dynamic memory 64K character array (DYNREG) in a packed record format. At the same time, PSPPOOL checks to determine the maximum length, in characters, of the longest record in the file and from this information determines what pitch the printer (an LA-50 is assumed) should be set at to accommodate the longest record on a single line. This automatic horizontal pitch determination (10, 12, or 16.5 characters per inch) may be overridden by explicit specification at the time the file name is entered into the queue. For example,

```
$ RUN/COMMAND:"RENUM.FOR/2,2"
```

or

```
$ RUN PRT
PRT> RENUM.FOR/2,2
```

In the above example, the first 2 following the / denotes that the user wants two instead of one copy to be printed, and the second 2 following the comma denotes that the horizontal pitch will be 12 characters per inch regardless of maximum line length determined by PSPPOOL. The maximum number of copies that can be specified is 9. The following are the three horizontal pitch codes that are allowed -

CODE	PITCH
1	10
2	12
3	16.5

**PQ** PQ is an interactive foreground process which allows the user to control printing once files have been entered into the print queue. PQ can be used to KILL the current print job and start the next one in sequence, CLEAR the entire print queue of jobs, DISPLAY the queue information on all jobs or on one specific queue entry, STOP a specific entry, or RESTART a halted entry. The STOP and RESTART functions apply only to files on which actual processing by PSPPOOL has not yet begun, whereas KILL and CLEAR are immediate. The last available function is DELETE an entry from the queue. DELETE

works like STOP and RESTART. The following is a list of the PQ queue control codes -

CODE	FUNCTION	EXAMPLE
K	KILL	PQ>0,K
C	CLEAR	PQ>0,C
D	DELETE	PQ>3,D
*	DISPLAY	PQ>3,*
<cr>	DISPLAY	PQ><cr>
S	STOP	PQ>3,S
R	RESTART	PR>3,R

Following the PQ> prompt, the first number entered in each case above designates the queue entry sequence number assigned to the entry by PRT. A zero is used in this field only on the first two commands illustrated above since the KILL function aborts only the current print job and the CLEAR function clears the entire queue of all entries. The <cr> response to the PQ> prompt displays the entire contents of the queue.

An example of the printed output from PSPPOOL is attached. In general, the first page of a print job is headed with the file name and the date and time the job was printed. Each page of output is 58 lines long. PSPPOOL form feeds before each job and after every 58 lines printed.

Files that are larger than 64K characters in length can be printed only one copy per queue entry, while files shorter than 64K may be printed up to 9 copies per queue entry. Since the queue "revolves", as soon as entry number 20 is used the next entry would become entry number one, provided it is empty at the time. When the queue is completely full, PRT exits and does not allow the user to enter any more until there is free queue space again.

This set of programs should be installed by the following DCL sequence, preferably from within the START.COM file of the PRO Tool Kit.

```
.IFNINS PQCCOM INSTALL PQCCOM
.IFNINS PQNCOM INSTALL PQNCOM
.IFNINS PRT INSTALL PRT
.IFNINS PSPPOOL INSTALL PSPPOOL
.IFNINS PQ INSTALL PQ
```

A convenient approach is to keep all of these five tasks in the [1,2] directory, and reference this directory in the above files, e.g. [1,2]PQCCOM in lieu of PQCCOM.

In the event the print queue becomes corrupted causing the print queue manager to "hang-up", typing the sequence "@!Q"

will re-initialize the queue.

## WPS V2.1: Questions & Answers

This article expands upon the DECmate/WPS description in the June 1986 edition of this newsletter.

### DECmate/WPS V2.1 and WPS-PLUS Compatibility

#### Q. Please explain compatibility.

A. Both DECmate/WPS V2.1 and WPS-PLUS use the same Gold Key Style Editing popularized by the DECmate family. Documents can be transferred between WPS-PLUS and DECmate, so no re-training is required to begin document preparation. However, there are differences in some attributes and document handling procedures.

#### Q. Can I transfer documents from a DECmate to an IBM PC with WPS-PLUS?

A. Yes. Connect a BC22D-10 cable to communons port on both the DECmate and IBM PC. This cable plus an Easycom Logon document script allows transfer of documents. The DECmate initiates the transfer, so you can choose to either send or receive a document to or from an IBM PC.

#### Q. I really like DECmate and would like it even more if it had a full-screen editor. Any plans for this?

A. When the first DECmate was introduced, a dedicated word processor for the administrative marketplace, we were faced with replacing typewriters on the desk. People at that time, used to using typewriters, were familiar with bottom line editing and felt comfortable with it. The marketplace has matured and now our customers are requesting full-screen editing. Full-screen editing will not be possible on existing DECmates.

#### Q. Are all WPS-PLUS/VMS V2.0 functions supported by DECmate?

A. No. Features on WPS-PLUS such as redlining, changing bars, TDE (two-dimensional editor), and double underlining are not supported. When transferred to DECmate, they will appear as blobs in a DECmate/WPS document. However, the features remain intact, if not edited, when transmitted back to WPS-PLUS/VMS.

*Note: If you are using DECmate/WPS 2.1 with an LN03 Laser Printer (or a draft printer), there is a strikethru feature using control blocks that is very similar to redlining.*

#### Q. Is the DECmate footnoting function the same as on WPS-PLUS?

A. We have increased compatibility relative to footnoting with DECmate/WPS V2.1 and WPS-PLUS/VMS V2.0. If you plan on transferring a DECmate-created document to WPS-PLUS, DECmate/WPS footnotes must be created using the GOLD Y keys.

Footnotes transferred from DECmate/WPS to WPS-PLUS can be no longer than 24 lines (this is a limitation of WPS-PLUS). Any footnotes longer than 24 lines will be truncated. WPS-PLUS numbers footnotes automatically. DECmate/WPS does not. (Note: You are only allowed two footnotes per screen with WPS-PLUS).

```

C      PRT.FTN
C
C      PRT inserts entries into the printer queue and spawns PSPPOOL
C
      PARAMETER      (MXF=20)
      CHARACTER*1    BUF(80),F,BLANK
      CHARACTER*4    EXT
      CHARACTER*40   QE(MXF),GQ
      COMMON /PQC/QE
      COMMON /PQN/LE(MXF),IR(MXF),IS(MXF),IN(MXF), NC(MXF),LL(MXF),ITOT,
1NXT,IQ,ISPNW,IFLG(MXF)
      DATA TASK/6RPSPOOL/,TASK2/2RPQ/,BLANK/' ','EXT/'.PRT'/
      ISTAT=0
      CALL GETMCR (BUF,ISTAT)
      KEY=0
C
C      Check to see if input file is an "@" container file.
C
      CALL AT (BUF,ISTAT,EXT,LUN)
      IF (LUN.LT.1) GO TO 70
      10 DO 20 L=1,40
      20 GQ(L:L)=BLANK
C
C      If the queue is full, stop accepting entries.
C
      IF (ITOT.LT.MXF) GO TO 40
      PRINT 30
      30 FORMAT (/// *** PRINT QUEUE IS FULL !!!'//)
      CALL EXIT
      40 IF (LUN.NE.4) GO TO 60
C
C      Get file names from container file.
C
      50 READ (LUN,90,END=190) ISTAT,(BUF(I),I=1,ISTAT)
      60 IF (ISTAT.GE.2) GO TO 100
      70 PRINT 80
      80 FORMAT (' PRT>'//)
      READ 90          , ISTAT,(BUF(I),I=1,ISTAT)
C
C      Was last entry an "@" file ?  If so, you know what to do.
C
      CALL AT (BUF,ISTAT,EXT,LUN)
      IF (LUN.EQ.4) GO TO 50
      90 FORMAT (Q,<ISTAT>A1)
      IF (LUN.LT.0) GO TO 70
      IF (ISTAT.EQ.0) GO TO 180
      100 KEY=KEY+1
      N=1
      LINLEN=0
      DO 110 I=1,ISTAT
      F=BUF(I)
      J=I
      IF (F.EQ.'/''.OR.F.EQ.' ') GO TO 120
      GQ(I:I)=F
      110 LX=I
      GO TO 130
      120 NN=ICHAR(BUF(J+1))
      IF (NN.GT.48.AND.NN.LE.57) N=NN-48

```

```

      F=BUF(J+3)
C
C Set user-specified (override) printer pitch.
C
      IF (F.EQ.'1') LINLEN=80
      IF (F.EQ.'2') LINLEN=96
      IF (F.EQ.'3') LINLEN=132
C
C Check to see if file is accessible - if not clear entry from queue.
C
130 OPEN (UNIT=2,FILE=GQ,STATUS='OLD',ERR=160)
      CLOSE (2)
140 IQ=IQ+1
      IF (IQ.GT.MXF) IQ=1
      I=IS(IQ)
      IF (I.EQ.1.OR.I.EQ.2) GO TO 140
C
C Tell PSPPOOL we are tinkering with this queue entry slot.
C
      IFLG(IQ)=1
      IN(IQ)=IQ
      ITOT=ITOT+1
      QE(IQ)=GQ
      LE(IQ)=LX
      LL(IQ)=LINLEN
      NC(IQ)=N
      IR(IQ)=1
      IS(IQ)=2
      IFLG(IQ)=0
C
C If PSPPOOL has stopped, awaiting us to finish modifying this queue
C entry slot, then resume PSPPOOL where it stopped.
C
      CALL RESUME (TASK)
      PRINT 150      , GQ,IQ
150 FORMAT (/1X,A<LX>,5X,' entered in print queue - ENTRY NO. ',I2/)
      IF (KEY.EQ.0.OR.KEY.EQ.20) CALL EXIT
C
C If PSPPOOL is not active, start it up.
C
      IF (ISPWN.NE.1) CALL SPWN (TASK)
      ISTAT=0
      GO TO 10
160 PRINT 170      , GQ
170 FORMAT (// Can not access file: ',A40/)
      KEY=KEY-1
      ISTAT=0
      CLOSE (2)
      GO TO 10
180 IF (ISPWN.EQ.1) CALL EXIT
C
C If PSPPOOL is not active, start it up.
C
      CALL SPWN(TASK)
      CALL EXIT
190 CLOSE (4)
      LUN=1
      GO TO 10
      END

```

```

C AT.FTN
C
      SUBROUTINE AT (BUF,LSTR,EXT,LUN)
      CHARACTER*1 BUF(80),CHR
      CHARACTER*4 EXT
      CHARACTER*80 BUFB
      CHARACTER*40 FNB
C
C Check to see if BUF contains an "@" file name.
C
      LUN=1
      IF (LSTR.EQ.1) RETURN
      CLOSE (4)
      KK=0
      DO 10 I=1,LSTR
        IF (BUF(I).EQ.'.') KK=1
10    BUFB(I:I)=BUF(I)
      DO 20 I=1,LSTR
        CHR=BUF(I)
        IF (CHR.EQ.' ') GO TO 20
        J=I
        GO TO 30
20    CONTINUE
      LUN=0
      RETURN
30    IF (CHR.NE.'@') GO TO 40
      J=J+1
      LX=LSTR-J+1
      FNB(1:LX)=BUFB(J:LSTR)
      IF (KK.EQ.0) FNB(LX+1:LX+4)=EXT(1:4)
C
C If we have an "@" file, open it and reset LUN to 4.
C
      OPEN (UNIT=4,FILE=FNB,STATUS='OLD',ERR=50)
      LUN=4
      RETURN
40    LUN=1
      RETURN
C
C If the "@" file we are looking for is not accessible,
C tell the user about it and return to PRT.
C
50    PRINT 60      , (FNB(I:I),I=1,LX)
60    FORMAT (/// *** PRT command file ',<LX>A1,' is not available.//)
      LUN=-1
      RETURN
      END

```

```

C   PSPOOL.FTN (Background process that does actual printing)
C
PARAMETER (MXF=20) ! MAX. SIZE OF PRINT QUEUE (FILES)
CHARACTER*1 BUF(8192)
CHARACTER*40 QEX(MXF),GG
INTEGER*2 IRDB(8),IWDB(8),IRP(8),IPG,MXR,LPP,IDS
COMMON /PQC/QEX
COMMON /PQN/LE(MXF),IR(MXF),IS(MXF),IN(MXF),NC(MXF),LL(MXF),ITOT,
1NXT,IQ,ISPWN,IFLG(MXF)
COMMON /VIRT/BUF
DATA IESC/27/,IFF/12/,IRDB/8*0/,IWDB/8*0/
DATA LUNIN/2/,LUNOUT/3/,MXLEN/133/,LPP/58/
C
C   CREATE DYNAMIC COMMON BUFFER /VIRT/BUF
C
ISPWN=1
NXT=1
IRDB(2)=1024
CALL IRAD50 (6,'DYNREG',IRDB(3))
IRDB(7)="2+20+40+100"
CALL CRRG (IRDB,IDS)
IF (IDS.NE.1) GO TO 70
IWDB(1)=3*256
IWDB(3)=128
IWDB(4)=IRDB(1)
IWDB(7)="2+400"
CALL CRAW (IWDB,IDS)
IF (IDS.NE.1) GO TO 100
C
C   CHECK QUEUE FOR PRINT JOBS
C
IF (IR(NXT).EQ.1.OR.IR(NXT).EQ.2) GO TO 30
10 IC=0
20 NXT=NXT+1
IF (NXT.GT.MXF) NXT=1
IF (IR(NXT).EQ.1.OR.IR(NXT).EQ.2) GO TO 30
IC=IC+1
IF (IC.LT.MXF) GO TO 20
NXT=1
GO TO 60
C
C   If PRT or PQ are tinkering with this queue entry slot,
C   suspend PSPOOL and wait till tinkering is completed.
C   Then PRT or PQ will resume PSPOOL.
C
30 IF (IFLG(NXT).EQ.1) CALL SUSPND (1)
GG=QEX(NXT)
IFLG(NXT)=0
IR(NXT)=0
IS(NXT)=1
LLL=LL(NXT)
ICOP=1
OPEN (UNIT=LUNIN,FILE=GG,STATUS='OLD',FORM='FORMATTED',ERR=120)
OPEN (UNIT=LUNOUT,FILE='LP:',CARRIAGECONTROL='LIST',
1 STATUS='UNKNOWN')
C
C   Print header line on first page of printer output.
C

```

```

CALL HEADER (GG,LUNOUT)
ICOP=1
C
C   Read entire file into DYNREG and check for maximum line length.
C
40 CALL BUFIN (LUNIN,IPG,IRP,IWDB,MXR,IEOF)
IF (LLL.GT.0) MXR=LLL
IF (IPG.LT.8.OR.(IPG.EQ.8.AND.IEOF.EQ.1)) ICOP=NC(NXT)
C
C   Send file in DYNREG to the line printer in paged format.
C
CALL BUFOUT (GG,LUNOUT,IPG,IRP,IWDB,MXR,LPP,ICOP)
IF (IEOF.EQ.0) GO TO 40
CLOSE (2)
CLOSE (3)
C
C   If PRT or PQ is tinkering with this queue entry slot, you know what todo.
C
50 IF (IFLG(NXT).EQ.1) CALL SUSPND (1)
IFLG(NXT)=0
IS(NXT)=0
IN(NXT)=0
LE(NXT)=0
ITOT=ITOT-1
IF (ITOT.GT.0) GO TO 10
C
C   If the queue is empty now, tell PRT and PQ and stop.
C
60 ISPWN=0
CALL EXIT
70 PRINT 80
80 FORMAT (/// *** Dynamic region DYNREG has not been created.///)
90 STOP ' PSPOOL ERROR STOP '
100 PRINT 110
110 FORMAT (/// *** Window for DYNREG has not been created.///)
GO TO 90
120 PRINT 130 , GG
130 FORMAT (// Can not access file: ',A40/)
GO TO 50
END

```

```

; PRT.ODL 31-MAR-86 09:27:47
; (Created by LKED Version 1.00)
;
.ROOT $$$-OTSROT-RMSROT
$$$ : .FCTR PRT-AT
OTSROT : .FCTR [1,5]PROF77/LB
@[1,5]RMSRLX
.END

```

[1,2]PSPPOOL.ODL

```

; PSPPOOL.ODL 31-MAR-86 09:33:12
; (Created by LKED Version 1.00)
;
.ROOT $$$-OTSROT-RMSROT
$$$ : .FCTR PSPPOOL-BUFIN-BUFOUT-HEADER
OTSROT : .FCTR [1,5]PROF77/LB
@[1,5]RMSRLX
.END

```

[1,2]PSPPOOL.PAB

```

; PSPPOOL.PAB 31-MAR-86 09:33:12
; (Created by LKED Version 1.00)
;
PSPPOOL /FP = PSPPOOL /MP
TASK=PSPPOOL
UNITS=8
MAXBUF=255
ASG=TI:1:5:6:7
GBLDEF=TT*LUN:6
GBLDEF=TT*LUN:1
GBLDEF=TT*LUN:5
GBLDEF=TT*LUN:7
GBLDEF=MS*LUN:10
GBLDEF=WC*LUN:0
GBLDEF=HL*LUN:0
GBLDEF=MN*LUN:0
GBLDEF=TT*EFN:1
RESCOM=PQCCOM/RW
RESCOM=PQNCOM/RW
MNDWS=1
VSECT=VIRT:60000:20000:2000
CLSTR=PROF77,POSRES,RMSRES:RO
//

```

```

; PRT.PAB 31-MAR-86 09:27:47
; (Created by LKED Version 1.00)
;
PRT /FP = PRT /MP
TASK=PRT
UNITS=8
MAXBUF=255
ASG=TI:1:5:6:7
GBLDEF=TT*LUN:6
GBLDEF=TT*LUN:1
GBLDEF=TT*LUN:5
GBLDEF=TT*LUN:7
GBLDEF=MS*LUN:10
GBLDEF=WC*LUN:0
GBLDEF=HL*LUN:0
GBLDEF=MN*LUN:0
GBLDEF=TT*EFN:1
RESCOM=PQCCOM/RW
RESCOM=PQNCOM/RW
CLSTR=PROF77,POSRES,RMSRES:RO
//

```

[1,2]PQ.ODL

```

; PQ.ODL 31-MAR-86 10:04:41
; (Created by LKED Version 1.00)
;
.ROOT $$$-OTSROT-RMSROT
$$$ : .FCTR PQ
OTSROT : .FCTR [1,5]PROF77/LB
@[1,5]RMSRLX
.END

```

[1,2]PQ.PAB

```

; PQ.PAB 31-MAR-86 10:04:41
; (Created by LKED Version 1.00)
;
PQ /FP = PQ /MP
TASK=PQ
UNITS=8
MAXBUF=255
ASG=TI:1:5:6:7
GBLDEF=TT*LUN:6
GBLDEF=TT*LUN:1
GBLDEF=TT*LUN:5
GBLDEF=TT*LUN:7
GBLDEF=MS*LUN:10
GBLDEF=WC*LUN:0
GBLDEF=HL*LUN:0
GBLDEF=MN*LUN:0
GBLDEF=TT*EFN:1
RESCOM=PQCCOM/RW
RESCOM=PQNCOM/RW
CLSTR=PROF77,POSRES,RMSRES:RO
//

```

[1,2]HEADER.FTN

C  
C  
C

HEADER.FTN

```

SUBROUTINE HEADER (GQ,LUN)
CHARACTER*8 LTIME
CHARACTER*9 LDATE
CHARACTER*40 GQ
BYTE ESC,FF
EQUIVALENCE (ESC,IESC),(IFF,FF)
DATA IESC/27/,IFF/12/
CALL DATE (LDATE)
CALL TIME (LTIME)
WRITE (LUN,10) ESC,FF
10 FORMAT (A1,'[0w',1X,A1)
WRITE (LUN,20) ESC,GQ,LDATE,LTIME,ESC
20 FORMAT (/1X,A1,'[1m',A40,16X,A9,1X,A8,A1,'[0m'//)
RETURN
END

```

[1,2]BUFIN.FTN

```

C   BUFIN.FTN
C
SUBROUTINE BUFIN (LUN,IPG,IRP,IWDB,MXR,IEOF)
CHARACTER*1  BUF(8192),CI
INTEGER*2    IWDB(8),IDS,IRP(8),IRC,MXR
BYTE         NI
COMMON /VIRT/BUF
EQUIVALENCE (CI,NI)
IEOF=0
IPG=0
10  IPG=IPG+1
    IF (IPG.GT.8) GO TO 60
    IWDB(5)=128*(IPG-1)
    CALL MAP (IWDB,IDS)
    IF (IDS.NE.1) GO TO 70
    IB=0
    IRC=0
C
C Read input file and pack it into DYNREG
C
20  NBYIN=0
    IB=IB+1
    READ (LUN,30,END=50) NBYIN,(BUF(IB+1),I=1,NBYIN)
30  FORMAT (Q,<NBYIN>A1)
    IRC=IRC+1
C
C Store length of record just read into one byte
C just preceding actual record's character string in BUF.
C
    NI=NBYIN-128
    BUF(IB)=CI
    IB=IB+NBYIN
C
C Is this record longer than longest record read so far?
C
    MXR=MAX(MXR,NBYIN)
    IF (IB-8060)20,20,40
40  IRP(IPG)=IRC
    GO TO 10
50  IEOF=1
    IRP(IPG)=IRC
    RETURN
60  IPG=8
    RETURN
70  PRINT 80      , IDS
80  FORMAT (// *** MAPPING ERROR - IDS = ',I//)
    STOP ' BUFIN ERROR STOP '
    END

```

[1,2]BUFOUT.FTN

```

C   BUFOUT.FTN
C
SUBROUTINE BUFOUT (GQ,LUN,IPG,IRP,IWDB,MXR,LPP,ICOP)
CHARACTER*40 GQ
CHARACTER*1  BUF(8192),CO
INTEGER*2    IWDB(8),IDS,IRP(8),IRC,LPP
BYTE         NO,ESC,FF
COMMON /VIRT/BUF
EQUIVALENCE (CO,NO),(ESC,IESC),(IFF,FF)
DATA IESC/27/,IFF/12/
C
C Lets set the printer's pitch.
C
10  IF (MXR.GT.80.AND.MXR.LE.96) WRITE (LUN,20) ESC
20  FORMAT (A1,'[2w')
    IF (MXR.GT.96) WRITE (LUN,30) ESC
30  FORMAT (A1,'[4w')
    LCNT=0
    IPGTOT=IPG
    IF (IPG.EQ.1) GO TO 50
    IPG=0
C
C Unpack and write DYNREG to the line printer in paged format.
C
40  IPG=IPG+1
    IWDB(5)=128*(IPG-1)
    CALL MAP (IWDB,IDS)
    IF (IDS.NE.1) GO TO 110
50  IB=0
    IRC=0
    IRCX=IRP(IPG)
60  IB=IB+1
C
C Determine length of next record to be printed.
C
    CO=BUF(IB)
    NBYOUT=NO+128
    WRITE (LUN,70) (BUF(IB+1),I=1,NBYOUT)
70  FORMAT (<NBYOUT>A1)
    IRC=IRC+1
    IB=IB+NBYOUT
    LCNT=LCNT+1
C
C If page is full, form feed printer and start a new page.
C
    IF (LCNT.LT.LPP) GO TO 90
    LCNT=0
    WRITE (LUN,80) FF
80  FORMAT (A1///)
90  IF (IRC-IRCX)60,100,100
100 IF (IPG.LT.IPGTOT) GO TO 40
    WRITE (LUN,80) FF
    ICOP=ICOP-1
C
C If we need another copy, print a new header and start again.
C
    IF (ICOP.LE.0) RETURN

```

CALL HEADER (GQ,LUN)  
GO TO 10  
110 PRINT 120 , IDS  
120 FORMAT (// \*\*\* MAPPING ERROR - IDS = ',I//)  
STOP ' BUFOUT ERROR STOP '  
END

```

[1,2]PQ.FTN
C   PQ.FTN
C
C   PQ displays status of queued entries and
C   allows changing of entry disposition.
C
C   PARAMETER      (MXF=20)
C   CHARACTER*1    DISP
C   CHARACTER*11   RMSG(5),SMSG(4)
C   CHARACTER*40   QE(MXF),GQ
C   COMMON /PQC/QE
C   COMMON /PQN/LE(MXF),IR(MXF),IS(MXF),IN(MXF), NC(MXF),LL(MXF),ITOT,
1NXT,IQ,ISPWN,IFLG(MXF)
C   DATA TASK/6RPSPOOL/,TASK2/6R...PIP/
C   DATA RMSG/'PRINT','RESTART','STOP','DELETE','*****'/,
1   SMSG/'PRINTING','QUEUED','HALTED','UNAVAILABLE'/
10 PRINT 20
   KQ=0
20 FORMAT ('// PQ>')
   ACCEPT 30      , KQ,DISP
30 FORMAT (I1,1X,A1)
   IF (KQ.EQ.0.AND.DISP.EQ.'K') GO TO 120
   IF (DISP.NE.'C') GO TO 70
   PRINT 40
40 FORMAT ('// *** ARE YOU SURE YOU WANT TO CLEAR THE QUEUE ? [Y/N]//')
   ACCEPT 50      , DISP
50 FORMAT (1A1)
   IF (DISP.NE.'Y') GO TO 70
   ISPWN=0
   DO 60 I=1,MXF
     IR(I)=0
     IFLG(I)=0
60 IN(I)=0
   ITOT=0
70 IF (KQ.EQ.0) GO TO 150
   IF (KQ.GT.MXF) GO TO 10
   IF (DISP.NE.'*') GO TO 180
   ISX=IS(KQ)
   IF (ISX.EQ.1) IR(KQ)=5
   IRX=IR(KQ)
   IF (IN(KQ).EQ.0) GO TO 10
   LX=LL(KQ)
   LP=LX/8
   PRINT 80      , KQ,QE(KQ),RMSG(IRX),SMSG(ISX),NC(KQ),LP,LX
80 FORMAT ('// Q entry No. ',I2,11X,'File Name: ',
1A40// Disposition: ',A11,' Status: ',A11// No. Copies: ',I2,11X,
1'Horiz. Pitch: ',I3,' (',I3,')')
90 PRINT 100
100 FORMAT ('// More ? [Y/N]//')
   ACCEPT 110     , DISP
110 FORMAT(1A1)
   IF (DISP.EQ.'N') GO TO 200
   GO TO 10
C
C   Lets KILL the current print job.
C
120 CALL ABORT (TASK)
   IR(NXT)=4
   IN(NXT)=0

```

```

ISPWN=0
LX=LE(NXT)
GQ(1:4)='PIP '
GQ(5:LX+5)=QE(NXT)(1:LX)
LX=LX+5
LP=LX+3
GQ(LX+1:LP)='//UN'
IFLG(NXT)=0
C
C   KILLing current print job (PSPPOOL) may have locked the file being
C   lets use PIP to UNLOCK it.
C
C   CALL SPAWN (TASK2,,,,,,GQ,LP)
C   IF (ITOT.LE.0) GO TO 130
C   ITOT=ITOT-1
C
C   Now lets re-start PSPPOOL again.
C
C   CALL SPAWN (TASK)
C   GO TO 150
130 PRINT 140
140 FORMAT ('// *** Print Queue is Empty ***//')
   GO TO 90
150 PRINT 160      , ITOT
160 FORMAT ('// *** There are ',I2,' jobs in the print queue ***//')
   DO 170 I=1,MXF
     IF (IN(I).EQ.0) GO TO 170
     ISX=IS(I)
     IF (ISX.EQ.1) IR(I)=5
     IRX=IR(I)
     GQ=QE(I)
     KQ=IN(I)
     LX=LL(KQ)
     LP=LX/8
     PRINT 80      , KQ,GQ,RMSG(IRX),SMSG(ISX),NC(KQ),LP,LX
170 CONTINUE
   GO TO 90
180 IF (IN(KQ).EQ.0) GO TO 90
   IFLG(KQ)=1
   IF (DISP.NE.'D') GO TO 190
   IN(KQ)=0
   ITOT=ITOT-1
190 IF (DISP.EQ.'P') IR(KQ)=1
   IF (DISP.EQ.'R') IR(KQ)=2
   IF (DISP.EQ.'S') IR(KQ)=3
   IFLG(KQ)=0
C
C   If PSPPOOL is suspended, resume it.
C
C   CALL RESUME (TASK)
C   GO TO 90
C
C   If PSPPOOL is suspended, resume it.
C
200 CALL RESUME (TASK)
   CALL EXIT
   END

```

[1,2]PQCCOM.FTN

02-JUN-86 08:54:32

```

C
C   PQCCOM.FTN (Creates static common for PRT, PSPPOOL, and PQ)
C
  BLOCK DATA
  PARAMETER (MXF=20)
  CHARACTER*40 QE(MXF)
  COMMON /PQC/QE
  END

```

[1,2]PQCCOM.PAB

02-JUN-86 08:54:37

```

PQCCOM/PI/-HD/CO,PQCCOM/-SP,PQCCOM=PQCCOM
/
STACK=0
PAR=PQCCOM:0:4000
//

```

[1,2]PQNCOM.FTN

02-JUN-86 08:54:40

```

C
C   PQNCOM.FTN (Creates static common for PRT, PSPPOOL, and PQ)
C
  BLOCK DATA
  PARAMETER (MXF=20)
  COMMON /PQN/LE(MXF),IR(MXF),IS(MXF),IN(MXF),NC(MXF),LL(MXF),ITOT,
  1 NXT,IQ,ISPNW,IFLG(MXF)
  END

```

[1,2]PQNCOM.PAB

02-JUN-86 08:54:48

```

PQNCOM/PI/-HD/CO,PQNCOM/-SP,PQNCOM=PQNCOM
/
STACK=0
PAR=PQNCOM:0:4000
//

```

[1,2]LINK.CMD

02-JUN-86 08:55:03

```

;
;   LINK.CMD
;
;   LINK Links and builds all of the PQM tasks
;
LINK @PQNCOM.PAB
LINK @PQCCOM.PAB
LINK @PRT.PAB
LINK @PSPPOOL.PAB
LINK @PQ.PAB

```

[1,2]FOR.CMD

02-JUN-86 08:54:54

```

;
;   FOR.CMD
;
;   FOR Compiles all of the PQM modules source code
;
FOR PQNCOM
FOR PQCCOM
FOR PRT
FOR AT
FOR PSPPOOL
FOR HEADER
FOR BUFIN
FOR BUFOUT
FOR PQ

```

[1,2]IQ.CMD

03-JUN-86 05:59:41

```

;
;   IQ.CMD
;
;   IQ Initializes the print queue
;
ABORT PSPPOOL
REMOVE PSPPOOL
REMOVE PRT
REMOVE PQ
REMOVE/REGION PQNCOM
REMOVE/REGION PQCCOM
LINK @DW1:[1,2]PQNCOM.PAB
LINK @DW1:[1,2]PQCCOM.PAB
PURGE DW1:[1,2]PQNCOM.*
PURGE DW1:[1,2]PQCCOM.*
INSTALL DW1:[1,2]PQNCOM.TSK
INSTALL DW1:[1,2]PQCCOM.TSK
INSTALL DW1:[1,2]PSPPOOL.TSK
INSTALL DW1:[1,2]PRT.TSK
INSTALL DW1:[1,2]PQ.TSK

```



## DECmate WPS V2.1 and the LN03 Laser Printer

**Q. I've heard the term font used many times. What does this mean?**

**A.** The LN03 has seven built-in (resident), monospaced fonts:

1. 10 Pitch Courier 10 font family. This is the default font that is assigned when the LN03 is turned on.
2. 10 Pitch Courier 10 Font Family.
3. 12 Pitch Elite Font Family.
4. 10 Pitch Courier 10 Font Family.
5. 12 Pitch Elite Font.
6. 13.6 Pitch Courier Font.
7. 10 Pitch courier 10 Font. Used for A4 (European) Size Paper

*Font* — is a collection of characters that includes an alphabet, numbers, and special symbols.

*Pitch* — measures the number of characters that fit in a 1 inch line. (Usually used in conjunction with monospaced characters.)

*Monospace* — means single width. Each character has the same width, no matter which character is printed. Most draft and letter-quality printers also use monospace characters.

*Proportional* — Proportional characters do not have a fixed width; each character's width is in proportion to its design. Proportional characters offer better character spacing than monospace characters. They are often easier to read, even in small sizes, and because they are proportionally spaced, you can put more characters in a line than is possible with monospace characters.

**Q. What fonts does DECmate/WPS V2.1 support?**

**A.** Currently, DECmate/WPS V2.1 supports all resident fonts, the RAM cartridge for landscape purposes, C.G. Times for high quality output [*this article is set in C.G. Times—editor*], and Triumvirate for presentations and/or title page layouts [*see the title and sub-titles to this article—editor*].

**Q. Can I order different fonts directly from Compugraphic for use with DECmate/WPS?**

**A.** Customers ordering font cartridges directly from a third party will be referred back to that company for support. Digital cannot guarantee the results of fonts not tested for use with DECmate/WPS.

**Q. I realize it is necessary to use control blocks in the DECmate/WPS document to choose LN03 resident fonts and cartridges. However, creating the same control blocks over and over within a document seems inefficient. Is there any easy way to get around this?**

**A.** You can either create UDK's, which include the various control blocks, or store the separate entries within a library document. Either method will be quick and easy to use as you design your page layout. We strongly suggest you keep your original document intact and create a new document using your Gold Get feature to prepare a document for LN03 output when you plan to take advantage of the various typefaces.

**Q. Is it possible to use more than one of the resident fonts in one line of a WPS document?**

**A.** Yes. By using the BOLD and NONBOLD identifiers within control blocks with the PRINTER FONT commands.

```
-----START CONTROL -----  
PRINTER FONT BOLD 6  
-----END CONTROL -----  
-----START CONTROL -----  
PRINTER FONT NONBOLD 1  
-----END CONTROL -----
```

**Q. How can italics be mixed on a line with other font styles?**

**A.** The italics font style is one of the proportional styles available on the C.G. Times Font Cartridge. It's very easy (*and attractive*) to highlight text with italics in a WPS document using a couple of control blocks.

```
-----START CONTROL -----  
PRINTER FONT NORMAL 8 100  
-----END CONTROL -----  
-----START CONTROL -----  
PRINTER UNDERLINE ITALIC  
-----END CONTROL -----
```

**Q. Is there any way for super- and subscripted characters to be printed in the tiny 13.6 font?**

**A.** With DECmate/WPS V2.1, super- and subscripted characters are automatically printed in the 13.6 Courier Font.

**Q. Can Landscape and Portrait printing appear in the same document?**

**A.** Yes, by including control blocks with the PRINTER FORMAT LANDSCAPE or PRINTER FORMAT PORTRAIT commands properly placed at the top of selected pages. In addition, you can mix portrait and landscape of the same page with appropriately placed control blocks.

**Q. Can I mix characters from two different font cartridges?**

**A.** Yes. Simply use the appropriate control blocks. As long as the cartridges are both plugged in properly, you have access to those fonts as well as resident fonts on the LN03.

**Q. What are the benefits of DECmate/WPS V2.1 and the LN03?**

**A.** You can create high quality, professional output with very limited training. In addition, the LN03 is a timesaver for a number of reasons. Because the LN03 can print directly on overhead transparencies, you save a number of steps, such as creating the overhead presentation, photocopying the pages, then putting the document through a transparency machine.

**Q. If my DECmate/WPS document contains my chosen control blocks for specific font selections, can I then transfer this document to WPS-PLUS, directing printing to another LN03 to obtain the same results?**

**A.** No. The only way to obtain the results is to connect your LN03 directly to your DECmate. Any control blocks residing within the document and transferred to WPS-PLUS will be ignored by WPS-PLUS. However, if the document is transferred back to DECmate, the commands remain intact, ready for output on the LN03.

**Q. I currently have DECmate/WPS V2.0. Can I take advantage of all the features of the LN03?**

**A.** If you are using Version 2.0, you will only be able to access the resident fonts. There are a series of Escape Sequences that will access some of the fonts. However, V2.0 with the LN03 is not supported. To be able to take advantage of font cartridges, you must be using DECmate/WPS V2.1.

**Q. What are the order codes for LN03 Laser Printer and font cartridges?**

<b>Order #</b>	<b>Description</b>
LN03-AA	LN03 Laser Printer
LN03X-CR	128K RAM Cartridge (required for landscape printing)
LN03X-CB	C.G. Times Proportional Font Cartridge
LN03X-CJ	Triumvirate Font Cartridge

DECmate Marketing Group

**DECmate WISH LIST**

If you have items you want to include on the wish list, send them either to the DECmate Working Group Chairman, Cheryl Johnson (address in the Steering Committee List).

1. Global Search and Replace: The ability to do more than one search and replace string at a time.
2. Text Wrap: Text should automatically wrap when editing so that the user doesn't have to advance through it.
3. Additional Paste Buffers: The ability to save and rearrange multiple segments of text at the same time.
4. Spelling Error Detection: The ability to check spelling of text easily and accurately without using CP/M (to be included on DECmate wordprocessing software, possibly as an optional feature), or re-arranging document in any way. The current DECspell is very slow and doesn't seem to be very reliable.
5. Simple Math Logic: The ability to have five-function math (addition, subtraction, multiplication, division and percentages) on DECmate word-processing software, possibly as an optional feature). Would like the ability to check columns of numbers and perform simple math operations with a minimal number of keystrokes. The current math software seems very complicated to use.
6. UDK's: The ability to actually do the UDK as the user is setting it up, not just displaying the typed keystrokes.
7. UDK's: The ability to edit existing UDKs which have already been filed.
8. ENTER Key: Would like it moved closer to the normal typing keyboard.
9. Print Specific Pages: The ability to print any specified page when reset pages are used; i.e., print section II, page 8.
10. Graphics: The ability to easily draw vertical and horizontal lines around text that will print out to form boxes and charts, to be an inclusion in DECmate software.
11. Background Transmission: The ability to continue to use the system while transferring documents from the VAX, converting documents, using list processing and other foreground functions.
12. Working with a "COPY" document on disk, not the actual copy, so that if the user makes an error, the original can be recalled and used again.
13. Multiple Wraps: The ability to have multiple wraps so the user doesn't have to keep changing rulers; possibly by using the GOLD TAB to indicate the specific tab wrap that you desire at that time.
14. Sub- and Superscripts Displayed: Show sub- and superscripts on the screen by actually moving the character up or down.
15. Printer Stop: The printer should have the ability to detect when the ribbon breaks (not just runs out), and stop.

16. Printer Detects Paper Out: The ability for the printer to detect when no paper is in the printer so it will not print on the platen.

17. Hard Disk Volumes: The ability to choose the size of segments on the hard disk, instead of having to break it up into seven small volumes.

18. Software "q" Problem: The ability to use GOLD SEARCH PAGE or GOLD PAGE BOTTOM without worry that a hidden "q" will be put in the document to cause various problems.

19. Screen Scrolling: Have screen scroll a single character at a time in wide documents, rather than jump.

20. Local Software Support: Provide local support to help with special set-ups and problems. Sometimes you need someone to actually be there and share ideas with, not just a voice over the phone.

21. Wide Screen Setting to Stay with the Document: With version 2.0, the user has the ability to change the size of the screen but is not allowed to store the chosen setting with the document. The chosen setting should stay with the Editor Menu (narrow or wide), to be stored with the document chosen for.

22. Cutting Text of Any Size: To have the ability to cut any amount of text, possibly by making saving and cutting separate functions. That way, since the system wouldn't be saving it, the size of the text to be cut would not matter.

23. Replacement Characters on Draft Printer: The ability to print replacement characters on a draft printer going through communications, particularly double underscores.

24. Advance Forward: To be able to advance directly to the end of a word, sentence, or segment of text.

25. Document View while Printing: The ability to view or edit a document while other pages of it are being printed.

26. Multiple Simultaneous Print Queue: The ability to queue several non-consecutive pages of a document to the printer at the same time; i.e., queue pages 2, 6, and 8; or at least be able to send page 8 of a document to the printer while page 2 of the same document is printing, so you can then work on something else.

27. Underline Recognized as Part of a Word: The ability for the DECmate to recognize underlines before text that are entered using Select and the Underline Key to be recognized as part of that word, i.e., \_\_\_\_\_846. This would make the system back up to the beginning of the underlines when "Backup Word" is pressed at the end of the word/number, or delete the word/number with underlines consecutively when "Del Word" is pressed.

28. Larger Capacity in DEC DX Account: The ability to put more than 200 documents in a DEC DX account, up to 999 or so, if limited by three digits.

29. Recreate Index: The ability to automatically recreate the index of a DEC DX account if it becomes corrupted.

30. Caps-Lock Sound Recognition: A different keying sound when the Lock key is on to signal the operator the Lock key is on.

31. Replacement Character View: The ability to see numbers/characters which have replacement characters, such as double underscores, onscreen.

32. Gold Get Docmt Page: Use Gold Get Docmt (Page) to get only certain specified pages of a document.

33. Page markers: Not removed when rulers or text are changed.

34. Delete Page Key: The ability to delete an entire page by specifying instead of selecting. Allow verification by operator.

35. Double Underscore with Decimal Tabs: The ability to use double underscoring with decimal tabs without having the text move over.

36. Simple Column Logic: The ability to set up multiple columns on a page by putting more than one set of margins on a page. This would allow the use of the sheet feeder in multi-column printing, since the page would not be going up and down.

37. Column Centering: The ability to easily center headings over a column of text.

38. A place to get detailed information addressing software for weird applications, such as PDB real time data acc replacement.

39. VT131 and VT2XX support.

40. A way to split out DX and compile it into OS278 (DECUS version).

41. Address comm port under COS 310.

42. Ability to use Print Screen with FMS forms that have line drawings.

43. Full compatibility with the LA210 and LN03.

44. Elimination of hard returns when transferring a WPS+ document from the VAX to the DECmate.

45. Capability to put escape sequences in a document, e.g., print a line at 5 characters per inch, then print the next one at 10 characters per inch, etc..

46. Support printer as a local printer, such as "VT100 printer port escape sequence".

47. Gold Q for Quit on DECmate and Rainbow WPS+.

48. The new 'search forward or backward' is great, but the user can't change direction after it is chosen. Go back to the old way.

49. Ability to use non-DEC printers.

50. The ability to call up the index in alphabetical order by document name.

51. The ability to use the system while doing list processing.

52. The ability to add information on to the end of a paste buffer before pasting, i.e., cut a paragraph then on the next page add that to another paragraph, cut again and paste both paragraphs elsewhere, in one operation.

## From the Working Group Chairman About the Rainbow Wish List

As I was reworking and prioritizing the Rainbow Wish List for this month, it was a very different feeling knowing that our number one item, for some time now, is being taken care of—the Lotus update!!!

This has been a long time coming, and I feel strongly that a lot of you people out there made the difference just by speaking up, writing letters, and phoning various people at Lotus and Digital.

Of course, we haven't seen it yet, but according to various news sources and Digital itself, it'll be released towards the end of the year. Now that we are going to get it, it's going to be interesting to see what the costs will be—software and hardware?

Another big item on the wish list that is now taken care of is the availability through DECdirect of the hard disk controllers and cables. This was a big issue with many people, so I know many of you are happy about this also.

I removed the print screen request from the wish list, too, since a program called Print Screen can now be purchased for the Rainbow to handle this from *Micro Resources, 154 Needham St., Newton, MA, phone 617/965-2890*. This program which is available in CP/M or MS-DOS, implements the Print Screen function on the Rainbow to dump the contents of a screen to a printer.

### DECUS Dallas

There were some very good well-attended Rainbow sessions at Dallas.

There was another "hot" Atlanta Hot-Line session with Bob Kramer, Manager of Personal Systems Support at Atlanta speaking at the session. It wasn't as hostile as the one in Anaheim in December since some of the problems there seem to have been ironed out.

DEC's PCSG group gave a session on New Directions in Personal Computing, again, something not too different than was done in Anaheim. Obviously, people were disappointed that the unannounced product wasn't announced.

Nevertheless, Katrina Holman from PCSG of DEC did a good job in discussing how Digital sees the evolution of DOS-based personal computing, with an emphasis on networking and the relationship of personal computers to host systems, definitely with an emphasis on the corporate and larger environments.

Digital plans to have: Integration with VMS, a single network architecture, high-speed Ethernet connection, access to individual standardized software, and planned migration and coexistence. They know that the users need IBM compatibility so they can run off-the-shelf applications and have optimized system capabilities.

Digital has settled on the server concept. It is a resource sharing machine that allows users to share data, programs, larger disks, printers and have file interchange.

The server is based on DECnet and runs with any VAX/VMS system. The files and devices on the server look "local". Using the server concept, files on the VAX are accessible to both VMS and MS-DOS applications.

Star Dargin of Digital presented a very good in-depth discussion on MS-DOS V3.0. the DEC PC Systems Group served on a panel for the Rainbow Technical Q & A and there were some interesting questions posed to them, but several were repeats of DECUS Anaheim last December.

DEC says they're considering retiring the Extended Communications Option due to lack of interest in it. As you may only have either the Extended Comms Option or the Winchester Hard Disk, most people have opted for the Winchester.

There were several requests for new items, one of which was an Ethernet controller board upgrade for the Rainbow, as well as a request for lower prices on 256K chip sets, an ongoing popular request by buyers and/or users.

Of course there was a lot of talk about the unannounced product not yet being announced and a lot of guessing about when it would be announced. Some said that this would happen when the leaves turned color this year (DEC's normal type answers). Others were not so optimistic. I often wonder what the big mystery will be once this one is solved in the very near future.

DEXPO wasn't all that interesting as far as micro material is concerned. Dr. Mohammad Shaikh of Disk Tech One was there, of course, with his RB Link hardware. Unlike Anaheim DECUS, DTO was able to obtain a booth at the show. In Anaheim they had to settle for a suite in a nearby hotel and finding them was very difficult. In Dallas, there seemed to be quite a lot of interest in the RB Link products.

The PC Sig offered a set of 10 Public Domain diskettes filled with some good programs in the DECUS store. Our feeling is that we may offer the same set again at DECUS San Francisco. The Public Domain software has been very popular at the last two symposia, and we plan to make new programs available as they are released.

Lynn Jarrett

## Wish List

Following is the Rainbow Wish List that was recently submitted to Digital by the PC Sig. This list is compiled and prioritized from users submitting their voting forms and/or letters to Lynn Jarrett. The voting forms can be found in the Questionnaire section of this newsletter. Please take the time to mail them with your comments to Lynn. Your input is greatly appreciated.

1. A new updated version of Lotus with a decent implementation of the new version. 132 column implementation.
2. Sell the Rainbow Winchester controller as a separate item with the controller cable and the latest version Winchester Utility disk.
3. Print drivers for LN03 and morenon-DEC printers on all DCS software.
4. Update dBASE III. DEC is still two major revisions behind what IBM offers.
5. Larger memory upgrades and removable hard disks at reasonable prices.
6. Ability to share hard disks with several users.
7. A second COMM port that doesn't require you to disconnect the hard disk controller to put it in.
8. More software packages for business use. Also personal use (i.e., Flight Simulator).
9. DEC hardware and software sold in retail stores.
10. Larger memory upgrades and removable hard disks at reasonable prices.
11. Ability to share hard disk with many users.
12. MS-DOS V3.1.
13. A second COMM port that doesn't require you to disconnect the hard disk controller to put it in.
14. Ability to format a single-sided IBM PC diskette under MS-DOS.
15. Larger print buffer built into printers.
16. Rainbow LAN without the need for a VAX.
17. Full-featured GW-Basic compiler.
18. Coordination between local DEC Field Service offices and Atlanta Hotline Support Center.
19. RBASE:5000, Framework, Thinktank, and Borland's Sidekick in Rainbow versions.
20. Q-Bus for the Rainbow.
21. Terminal mode to support the additional keys of the LK201 keyboard rather than just beeping.
22. Lap-top or portable Rainbow.
23. Concurrent MS-DOS.
24. ASSIGN command.
25. Remove copy-protection from DCS and DDS software.
26. MS-DOS installable graphics driver similar to GSX-86.
27. Hardware Reset and Halt keys.
28. Monitor connection for CAD products.
29. VT240 terminal emulation in firmware instead of VT102.
30. Software spooler.
31. Cheaper maintenance prices.
32. Direct Ethernet access for the Rainbow; i.e., a board that plugs into the Rainbow and doesn't preclude the use of the hard disk.
33. Field Service support for third party wares such as the disk controller and formatter as well as for the clock boards that are on the market.

## IBM \* DEC Disk Compatibility

Most of us using both the IBM PC and the DEC Rainbow find we need to transfer data between the two machines; usually we resort to either a null modem or its equivalent — a VAX!

I conducted an experiment under DOS the other day that some of you may like to repeat. I used Rainbow MS-DOS V2.11-1 and PC-AT DOS 3.1.

1. I formatted a SSDD (single-sided, double-density) disk on the IBM using the command `FORMAT B:1`. Next, I copied some files onto it and then took it to the Rainbow. These files can be read and copied by the Rainbow {The DOS command `MEDIACHK ON` must be given first. — Ed.}
2. Using the same disk on the Rainbow, I gave the DOS command to delete everything, `DEL *.*`, then copied various `DBASE` files to the tune of about 165k. That worked fine.
3. I took that disk back to the IBM PC-AT (I swiveled my chair), and found it impossible to read the disk on the non-high density drive.
4. I then put the disk in the high density drive and... it worked! I copied the Rainbow files to the IBM hard disk.

**CONCLUSION:** I no longer need 3<sup>rd</sup> party software (`MULTIMEDIA`) to go from the Rainbow and the IBM and vice versa. It looks like there is a modicum of compatibility.

Pierre M. Hahn

## Rainbow 100A to Rainbow 100B Upgrade

The "TRUMP" program is once again available from the DEC field service office in White-stone, New York. For a charge of \$— plus local New York sales tax (\$—.—), your old A mother board, and shipping and handling charges, you can obtain a motherboard for a 100B. The person to call for more information about the TRUMP program is Doreen Portelli at (718) 670-3551. I don't know how long this offer will be in effect, so if you're interested call soon.

Excerpted from the Silicon Valley PC User's Group Newsletter

## Announcing Linkware for Rainbow and IBM Personal Computers

The Linkware™ communications software is now available from Digital for Rainbow and IBM personal computers and for VAX/VMS systems. Linkware enables Rainbows, as well as IBM PCs or compatibles, to exchange information with a VAX host.

Linkware features include:

- Interface to Digital hosts as well as other host systems (i.e., IBM)
- Error free binary and ASCII file transfers
- File transformation capabilities (e.g., `FIXED` to `WKS`, etc.)
- VT100 and 3101 emulation capabilities
- Automatic log-on facilities
- Multi-user access to a shared, secured file repository
- Common end-user interface micro and host file management functions
- Command-line application-programmer interface to all Linkware functions
- Incremental backup capabilities for local workstations
- Workstation and host maintained audit trails for accounting/planning

### Linkware Architecture

Linkware uniquely provides direct access to a central file area which can reside on a VAX/VMS host or other hosts, including IBM and UNIX, and is maintained by the system administrator. On-line terminal users access the central library via the Linkware Information Server's Terminal Connection. Personal computer users can access the same central library via the Linkware Information Server's PC Connection. The Linkware administrator places new and updated files into the central library, enabling the user to get up-to-date information directly by using commands similar to VMS DCL commands. Once the user has accessed the central library, files can be transferred to or from the local system. Linkware allows the PC user to perform the following functions on files that reside in the central library:

- Change the central library default directory
- Display the list of files in the current central library directory
- Delete a file(s)
- Display the description of a file
- Transfer a file from the central library to your user library
- Display help information describing available functions
- Lock a file so that other users cannot read or write to it
- Rename a file
- Transfer a file from user library to the central library (if the user is authorized)
- Transform a file from one format to another (fixed format, `DIFTM`, Lotus 1-2-3™ print (`PRN`) format, 1-2-3 print with `MACROS` (`PRM`) format, Multi-plan™ Symbolic Link (`SYL`) format)
- Unlock a locked file

There are four key aspects of Linkware which serve to differentiate this software from other PC communication products currently available:

- Multiple host and network access
- Data transformation
- Customized interface
- MIS control facilities

#### Multiple Host and Network Access

A key concern of many Digital customers is IBM connectivity from the perspective of both IBM PCs and host system. End users working at personal computers require access to information residing on a host system. Linkware's architecture provides personal computer users with a common interface to the VAX series of processors through a variety of communication networks, as well as to other, non-Digital hosts.

#### Data Transformation

Host production data is seldom, if ever, in a format useful for end-user applications. The Linkware Information Server contains a transformation module, dedicated to filtering, re-formatting, and translating native host production into appropriate PC formats such as PRN, WKS, SYLK, DIF, etc. Production data can be delivered to the personal computer as information ready for further modification by PC applications.

#### Customized Interface

There are two audiences whose needs must be addressed in the context of information exchange: the information center audience and the distributed application programmer audience. For the information center audience, Linkware provides an easy-to-use menu interface, including automatic host log-on, extensive data translation, on-line help, and host library services to search and manage host files. The distributed application programmer's needs center around the development of production quality applications. Linkware provides this audience a command line interface allowing them to compile Linkware functionality in the context of their own programs (e.g., Pascal, BASIC, C). Additional Linkware functionality is provided for application programmers, including return codes for program recovery, PC and host maintained audit trails, data format conversion utilities, host file locking, and direct access to host production data.

#### MIS Control

Management Information Systems (MIS) typically has the responsibility of satisfying end-user requests while maintaining the security and integrity of corporate data. The Linkware Information Server provides a shared information repository allowing MIS to selectively allocate, read, write, copy privileges, maintain system usage statistics for accounting purposes, and maintain a single copy of production data which is dynamically transformed into appropriate format when accessed by end users.

*NOTE: Information regarding Linkware software on non-Digital hosts (e.g., IBM) and other micros (e.g., Macintosh and DECmate running CP/M) may be obtained by calling Linkware Corporation directly at 800-356-1212 or (617) 894-9330 in Massachusetts.*

#### Hardware/Software Prerequisites

- Rainbow 100 or 100+ running MS-DOS V2.11 or CP/M V2.0 or later
- IBM PC and compatibles running PC-DOS or MS-DOS V2.0 or later

#### Host Hardware/Software Prerequisites

- VAX 8600, VMS Version 3.0 or later
- VAX-11/750/780, VMS Version 3.0 or later
- VAX-11/730, VMS Version 3.0 or later
- MicroVAX, MicroVMS Version 1.0 or later

#### Order Codes

QAXB7-C3	Linkware for Rainbow, MS-DOS
QAXB8-C3	Linkware for Rainbow, CP/M-86/80
QAXB0-C3	Linkware for Rainbow, MS-DOS 10-pack
QAXC0-C3	Linkware for Rainbow, CP/M-86/80 10-pack
QAXB9-C3	Linkware for IBM PC-DOS
QAXC1-CI	Linkware for IBM PC-DOS, 10 pack
QAXB2-CM	Linkware for VAXcluster MT9
QAXB3-CM	Linkware for VAX8600 MT9
QAXB4-CM	Linkware for VAX-11/750/780 MT9
QAXB5-CM	Linkware for VAX-11/730 MT9
QAXB6-C3	Linkware for MicroVAX II

*NOTE: Additional licenses ONLY may be purchased directly from Linkware Corporation.*

Software Products Group

## Increasing MS-DOS Environment Space

The environment space in MS-DOS is a portion of memory that is allocated upon booting for storing system logicals, default path, and, optionally, a custom prompt. As my MS-DOS V2.11 system was supplied, this space was allocated approximately 160 bytes which is not very much, as I soon found out. If you are at all like me, then you like to take advantage of all the neat features that Microsoft has given us and you've found you absolutely need to increase that size. And, if you are like me and you've tried the BOOT program that's available on the Public Domain to fool the system into thinking it's got more room, you've found out that that is almost more trouble than it's worth (especially if you have to install and re-install it several times or more)! If you're like me, then you've said to yourself, "There **must** be some way of telling MS-DOS to increase that silly limitation!" If you're like me then you are going to be very happy when you learn about this little patch that I found.

There are two ways to read this article. If you are interested in listening to me tell you all about how I did it and explain some of the why's and how's of my technique then begin with the next paragraph. If you are only interested in patching your system now, go to the end of the article to see the "Quick Reference" section.

First, **make a backup copy of COMMAND.COM** (just in case).

Next, from the MS-DOS prompt (which, if you're like me, is probably not E) type **DEBUG COMMAND.COM**.

When you get the DEBUG prompt (-), check to see what value your system has now. The number, in hexadecimal, can be found at offset location 0DF3. You can either type **U 0DF2** (to Unassemble) or **D 0DF3** to Display this number. (If you Unassemble it, you need to begin at 0DF2 to allow for the MOV command which is on the same line before it.) The number that you see at location 0DF3 stands for the number of 16-byte paragraphs of memory to allocate for the environment. (Mine said 000A when I started.)

Now, from the DEBUG prompt, say: **A 0DF2** to put you into Assemble mode. You are going to insert the assembly code for that line with the changed number (you would have seen the whole line if you did the Unassemble in the last paragraph). The line reads as follows: **MOV BX,nnn** where nnn stands for the new number you are going to insert. For example, I typed **MOV BX,39** to expand the environment space as much as possible (see the note at the end of the article).

Once you've made the change by just typing that line, you need to type **<Ctrl/C>** to exit Assemble mode. This should bring you back to the DEBUG prompt.

From here, you need to type **W** to Write the changed COMMAND.COM back to the disk.

When you get the prompt again, you may type **Q** to Quit and return to MS-DOS.

**NOTE:** I have found from trial and error that the **MAXIMUM** number with which you may supply it is 38(hex). I don't know why, but if you say 40 or more, MS-DOS will not execute your AUTOEXEC.BAT file upon booting. Perhaps one of you systems programmers out there could figure that out and write an article for this newsletter!

Increasing MS-DOS Environment Space  
QUICK REFERENCE SECTION

**Bold type indicates what you should enter.** The rest is what you see on your screen.

MS-DOS Prompt> **DEBUG COMMAND.COM**

```
-U 0DF2
1302:0DF2 BB0A00      MOV      BX,000A
1302:0DF5 B448        MOV      AH,48
1302:0DF7 CD21        INT      21
1302:0DF9 8E1E250A    MOV      DS,[0A25]
1302:0DF0 A3250A            MOV      [0A25],AX
```

Etc.

.  
.  
.

```
-A 0DF2
1302:0DF2 mov bx,39      ;Replace 39 with the number of
1302:0DF5 ^C            ;16-byte paragraphs to allocate
```

```
-w
Writing 3E65 bytes
-q
```

MS-DOS Prompt> **<Set-Up>** **<Ctrl/Set-Up>**

**NOTE:** Maximum number of paragraphs is 39(hex). That equals 912 bytes of environment space (see the note at the end of the accompanying article).

Kenneth LeFebvre



## Advanced Applications of Lotus 1-2-3

**ANNOUNCEMENT:** The PC Sig will be offering a Pre-Symposium Seminar in October on Lotus 1-2-3. This is the announcement as it will appear in the preliminary program. This seminar will provide you with tools to assist you in using Lotus to its fullest capability. Combining the power of a personal computer and 1-2-3, you will have the tools that give you an approach to planning that is targeted ever more closely to your business activity. You can actually simulate a wide variety of business decisions and outcomes and watch the plan in action, both with numbers and with graphs.

Through this wide screen computerized video presentation, the step necessary to develop functional applications will be clearly communicated.

- Lotus 1-2-3 Review
  - Components of 1-2-3
  - The Power of 1-2-3
  - Lotus Commands
  - Working with Ranges
  - Planning for Use in Your Business
- Building the System
  - Defining the Objectives
  - Defining the Use of 1-2-3
  - Developing the Templates
  - Defining the Database
  - Developing Graphs
- Changing/Altering the System
  - System Maintenance Techniques
  - Operational Procedures
  - Backups and Disaster Planning
  - Use of Utilities
  - Printing/Plotting Tips and Tricks
- Advanced Lotus 1-2-3 Functions
  - Using the Files: Micro and Mainframe
  - Purpose and Use of Keyboard Macros
  - Defining Keyboard Macros
  - Working with 1-2-3 Functions
    - Mathematical, Logical, Special, Date, Statistical, and Financial
    - Arithmetic and Logical Operators
- Summary and Conclusions

Lynn Jarrett is the Office Systems Manager of the Union-Tribune Publishing Company in San Diego, CA., publisher of the major San Diego newspapers. She has a Masters degree in Business Administration with an emphasis in Computer Information Systems. She has been giving training seminars in software applications in the San Diego area for several years. Lynn also serves as a member of the DECUS PC Sig Executive Steering Committee.

**PREREQUISITE:** Basic knowledge of Lotus 1-2-3.

If you have any questions about the PSS please call Vince Perriello (PSS Coordinator for the PC Sig).

## Counterpart Corner

Most of the information I am submitting to this issue of the newsletter is in direct response to questions that were raised during the Dallas symposium—availability of Rainbow Field Maintenance Print Set and status of GW-BASIC compiler—or is a summation of information that was discussed by the DEC folks in the personal computing exhibit, likely also to be of interest to those of you who didn't attend the last symposium and get to ask your questions in person—namely IVIS and DECmate Q&A's.

Also in this newsletter is a write-up of a new software package for the Rainbow: Linkware. While I have done my best to ensure that all of the articles mentioned above are accurate, Digital Equipment Corporation assumes no responsibility for any errors that may appear in this document. This information is subject to change without notice and should not be construed as a commitment by Digital.

### Rainbow Technical Documentation

Digital offers a number of technical publications on the Rainbow personal computers for users who prefer to do self-maintenance. These are available through DECdirect, 800-258-1710.

#### Rainbow User's Service Guide

**EK-P100E-SV**

This manual features basic troubleshooting, diagnostic test procedures, test messages, and removal and replacement procedures. It is recommended for users who do self-maintenance on their Rainbow.

#### PC100-A Field Maintenance Print Set

**MP-01722-01**

#### PC100-B Field Maintenance Print Set

**MP-01491**

These sets contain schematics and part lists of the Rainbow motherboard and RX50 controller board. They are intended primarily for use by Field Service technicians, but are also available to customers.

#### Rainbow 100 Technical Manual

**EK-PC100-TM**

This manual provides a technical description of the basic Rainbow 100 computer: PC100-A system module, RX50 controller, RX50 diskette drive, H7842-A power supply, LK201 keyboard, and VR201 video monitor. It also has testing and troubleshooting information and includes removal and replacement procedures for the modules and mechanical assemblies.

#### Rainbow Technical Manual Addendum

for PC100-A, PC100-B, & PC100+

**EK-RB100-TM**

This manual provides a technical description of the PC100-B system module, the Winchester hard disk controller, and the H7842-D power supply. It also includes the new ROM messages, character generator ROM codes, and user-replacable parts list.

### GW-Basic Compiler

Many of you have expressed a need for the Rainbow GW-BASIC compiler. While Digital has made no commitment to date to offer this product in the future, Digital did pay for an OEM license from Microsoft to engineer—that is, tailor the software to run on Rainbow—and to manufacture this product.

The good news: This license also entitles Digital to have beta test sites. So, if there are Rainbow users who have a critical need for the Rainbow GW-BASIC compiler, Digital will consider sending them the beta test (unsupported) version for evaluation purposes.

The bad news: Because Digital has distributed this program free of charge for evaluation purposes, there has been a misconception among some Rainbow users and DECUS members that the Rainbow GW-BASIC compiler is public domain software. It is not! It should not be distributed via Fidonet or any other way among users. And naturally, the documentation that goes with it is copyrighted, so copyright laws apply. Actually, this isn't really bad news, because it's what you'd expect, right?

Back to the good news: If YOU want to talk to Digital about your desire to evaluate the Rainbow GW-BASIC compiler, contact Ray Southworth, Digital Equipment Corporation, 30 Porter Road (LJO2/I4), Littleton, MA 01460 (617-486-2494).

Katrina Holman

Published by: Rob Elliott  
Fido #115/100  
CIS [70675,1204]

This is a list of all the BBSes running on, or having a reasonably sized section for, DEC Rainbow 100 computers. BBSes with unlisted numbers, or BBSes that are otherwise inaccessible, are not listed here. Send any and all updates, corrections, etc. to me via CompuServe or through Fido 115/100.

Coding: All boards are assumed to be 300/1200 baud. A "+" before the phone number means the board has 2400 baud support also. All boards are assumed to be Fidos. If one isn't, the type of BBS program is listed instead of a node number. Node numbers of -1 cannot be reached via FidoNet at the moment.

FIDO Log-on: Upon connection, wait 5 full seconds then 300/1200 baud callers hit RETURN twice, 2400 hit SPACE twice, to start the BBS.

NODE	NAME	PHONE NUMBER	LOCATION	SYSOP
333	Rainbow BBS	602-952-2146	Phoenix.....AZ	Jim Koshner
38	Rainbow Data	+213-204-2996	Culver City.....CA	Don Brauns
666	Revelation 13	+714-537-7355	Garden Grove.....CA	Mike Hamilton
3803	Rainbow Brite	213-844-1963	Hawthorne.....CA	Bruce Headly
410	Medic	714-964-0454	Huntington Beach..CA	Phil St. Erne
350	SD Rainbow LUG	619-488-2116	San Diego.....CA	Rick Eliopoulos
1	Fido's Board	+415-864-1418	San Francisco.....CA	Tom Jennings
13	Vern's Fido	408-923-5565	San Jose.....CA	Vern Crawford
610	Sam's Rainbow	408-720-0629	Sunnyvale.....CA	Sam Rogers
383	Southbay_RB	+213-618-8454	Torrance.....CA	Glenn Bowes
430	Oberon_Systems	+805-643-0982	Ventura.....CA	Scott Johnson
210	Rainbow's End	203-453-1089	Guilford.....CT	Matt Gartner
51	Stockware	302-655-6342	Wilmington.....DE	Van D. Olmstead
46	Joe's Rainbow	305-321-2369	St. Mary.....FL	Joe Clayton
189	Illini Data	+312-759-5402	Bolingbrook.....IL	Rob Elliott
2	CLP-Fido	301-484-2831	Pikesville.....MD	John Madill
-1	Beauty Board	+301-776-2300	Laurel.....MD	John Raum
14	WayStar	617-481-7147	Marlboro.....MA	Kevin Porter
27	Daves Fido	+617-632-1861	Gardner.....MA	David Rane
44	NECS	617-646-3610	Arlington.....MA	Dave Mitton
45	Midnite DEC	+617-787-3033	Boston.....MA	David Strickler
310	Dave's Annex	617-874-4325	Westminster.....MA	David Rane
202	DEC-Line	617-721-1688	Winchester.....MA	Bill MacNeil
TOPS20	DEC MARKET	617-467-7437	Marlboro.....MA	Bernard Eiben
367	RBG-ENG HootNet	617-486-2286	Littleton.....MA	Bruce Gibson

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-1	Thieve's World	616-343-0996	Kalamazoo.....MI	Ian Schirado
16	Mikes Board	+314-726-3448	St. Louis.....MO	Mike Mellinger
17	DCA BBS	314-962-0395	St. Louis.....MO	Jon Wichman
22	PCLUG	+314-576-2743	St. Louis.....MO	Ken Kaplan
51	Decus Central	+314-432-4129	St. Louis.....MO	Ken Kaplan
82	DEC-House	609-429-6630	Cherry Hill.....NJ	Brian Sietz
317	DEC-WARE II	201-750-3748	Iselin.....NJ	David Horowitz
RDS	Albugg. PC-LUG	505-831-0205	Albuquerque.....NM	Eloy Gonzales
79	DEC-WARE	+212-535-8924	New York.....NY	Matt Kanter
-1	Scherer's	502-425-9941	Dublin.....OH	David Orr
489	Catt House Fido	717-794-5268	Blue Ridge Summit.PA	Bob Catt
348	Day Rinabow	01146-54-266988	Karlstad.....SWEDEN	Conny Johnson
-1	Big D Fido	+214-392-1121	Dallas.....TX	Dennis Forcier
67	DEC Domain	806-795-0102	Lubbock.....TX	Alan Minchew
918	DEC Bronson	806-742-5328	Lubbock.....TX	Bronson Johnson
483	Wash-a-RUG	703-359-6179	Fairfax.....VA	Kurt Reisler
74	The Bear's Den	+703-671-0598	Falls Church.....VA	Kurt Reisler
90	MidNet	608-233-8449	Madison.....WI	Mike Mansfield

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Compuserv has an active group of DEC PC users. Compuserv subscribers can type GO PCS-16 at the ! prompt and select sub-area 6. A real time conference is held on Tuesday evenings. Also has a bulletin board and software area.

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DECUS PC-SIG  
Public Domain Software  
Dallas Symposium - Spring 1986

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RB-DALAS.001 - DOSSYS-1

ARC51.COM File Archiver. Use this program to "Unarchive" any file with an .ARC extension. To create EXE and DOC files, just type ARC51. Written by Thom Henderson. MS-DOS.

ARCHRES.ARC Reset archive bit on files. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
ARCHRES.COM	729	Crunched	8%	677	28 Feb 86	0:02a	27DC
ARCHRES.DOC	10880	Crunched	49%	5555	28 Feb 86	1:41a	8C77
Total	2		47%	6232			

BAUD.ARC Set the baud rate of your communication port. 300 to 2400 baud. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
BAUD.EXE	2304	Packed	31%	1608	28 Nov 85	11:20a	2D7F
Total	1		31%	1608			

BELLBIG.ARC Displays "TASK COMPLETED" and rings bell. Use in .BAT files. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
BELLBIG.COM	9906	Squeezed	3%	9694	4 Sep 85	11:32p	86BE
Total	1		3%	9694			

CHKMEM.ARC Similar to the CHKDSK command. Verifies memory validity. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
CHKMEM.EXE	7424	crunched	16%	6303	8 Sep 85	9:56a	C3EB
Total	1		16%	6303			

CLRTSR.ARC Mark and remove memory resident programs. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
MARK.COM	1152	Packed	90%	121	15 Mar 86	5:17p	2FA4
RELEASE.COM	11904	Squeezed	3%	11559	15 Mar 86	5:15p	9190
RELEASE.DOC	1536	Crunched	39%	938	15 Mar 86	5:30p	8192

COLOR.ARC Change the default screen and writing colors. Use with ReGIS. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
COLOR.COM	19968	Squeezed	9%	18275	19 Jan 86	12:45a	FE27
Total	1		9%	18275			

COOKIE.ARC Have you had your fortune cookie today. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
COOKIE.COM	56189	crunched	50%	28271	5 Jan 86	0:22a	6EC8
Total	1		50%	28271			

COUNTRY.ARC Interrogate the Rainbow International Character Set. C source included. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
COUNTRY.C	12544	crunched	53%	6014	1 Sep 85	4:58p	CD91
COUNTRY.DOC	3584	crunched	46%	1946	1 Sep 85	4:58p	9AFE
COUNTRY.EXE	16000	crunched	14%	13788	1 Sep 85	4:58p	2749
Total	3		33%	21748			

CP19.ARC Prompted file copy wildcards, paths, etc. V1.9. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
CP19.DOC	1502	Squeezed	24%	1154	20 Jan 86	11:20p	EBFF
CP19.EXE	9216	crunched	21%	7335	20 Jan 86	11:20p	CA19
Total	2		21%	8489			

DCOPY.ARC A fast disk-copy program. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
DCOPY.DOC	1945	Crunched	34%	1284	10 Feb 86	10:17p	BBB0
DCOPY.EXE	17536	Squeezed	11%	15665	10 Feb 86	10:16p	7FCD
Total	2		13%	16949			



DE12.ARC Prompted file deleter, wildcards, paths. V1.2. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
DE12.DOC	892	crunched	11%	798	20 Jan 86	11:20p	9256
DE12.EXE	3072	crunched	30%	2175	20 Jan 86	11:20p	FOED
Total	2		25%	2973			

DELAY.ARC Wait a specified number of seconds in a batch file. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
DELAY.COM	10112	Squeezed	3%	9821	22 Jul 85	9:58a	5BCA
DELAY.DOC	1024	crunched	46%	557	22 Jul 85	9:58a	8909
Total	2		7%	10378			

DISK31.ARC A very nice directory manager. V3.1. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
DISK3.TXT	10496	Crunched	54%	4829	22 Feb 86	0:08a	4D04
DISK31.COM	31872	Squeezed	10%	28770	22 Feb 86	0:08a	75BF
DISK31.NOT	1884	Crunched	38%	1176	22 Feb 86	0:00a	3537
Total	3		22%	34775			

DJINN31.ARC Directory, file manager, editor, librarian for the Rainbow. V3.1 MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
CHANGES.-3-	1782	Squeezed	23%	1380	18 Jan 86	4:53p	58D7
DJINN.000	30464	crunched	27%	22416	18 Jan 86	5:09p	6AF2
DJINN.CNF	78	--	0%	78	18 Jan 86	4:15p	5E5E
DJINN.COM	41710	Squeezed	13%	36668	18 Jan 86	5:09p	C04C
Total	4		19%	60542			

DOSKNOWS.ARC Make MS-DOS tell all it knows. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
DOSKNOWS.EXE	5248	crunched	34%	3512	16 Dec 85	11:36p	E8B3
Total	1		34%	3512			

DPATH30.ARC A nice replacement (complement) to the PATH command. V3.0. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
DPATH30.COM	2696	Packed	8%	2494	20 Jan 85	9:54a	22AF
DPATH30.DOC	9825	Squeezed	37%	6215	5 Jun 85	9:59p	B5E6
Total	2		31%	8709			

DVORAK.ARC Change your keyboard from QWERTY to DVORAK. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
DVORAK.COM	341	Packed	2%	336	9 Aug 85	7:34p	B342
DVORAK.DOC	1720	crunched	13%	1508	8 Aug 85	7:26p	DBC8
Total	2		11%	1844			

EVENT.ARC Event timer. Put in .BAT file to time programs. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
EVENT.ASM	8380	crunched	53%	4022	14 Nov 85	2:39p	440B
EVENT.DOC	10678	crunched	48%	5582	15 Nov 85	1:52p	DC23
EVENT.EXE	1363	Packed	45%	759	14 Nov 85	2:40p	C41B
Total	3		50%	10363			

FATDUMP.ARC Dump your File Allocation Table to the screen. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
FATDUMP.COM	4608	Packed	90%	461	9 Feb 85	1:03p	A397
Total	1		90%	461			

FDF.ARC Find different files in 2 subdirectories. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
FDF.EXE	14726	crunched	18%	12128	26 Dec 85	2:20a	04AE
Total	1		18%	12128			

GLOBAL.ARC Global directory search and destroy. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
GLOBAL.COM	14768	Squeezed	4%	14217	25 Nov 85	8:13p	9962
Total	1		4%	14217			

HEAD.ARC Display the first few lines of a file. C Source included. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
HEAD.C	9180	crunched	50%	4664	21 Jan 86	4:07p	24E4
HEAD.DOC	7205	crunched	43%	4167	22 Jan 86	8:42a	3711
HEAD.EXE	12256	crunched	16%	10400	21 Jan 86	4:10p	FA13
Total	3	28641	33%	19231			

RB-DALAS.002 - DOSSYS-2

DRAW.ARC A fine graphics editor for the Rainbow. Supports b/w or color monitor, print screen and more. V1.4. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
DRAW.DOC	3490	crunched	37%	2211	16 Jul 85	7:27p	D18F
DRAW.EXE	37312	crunched	16%	31437	1 Jun 85	10:58p	1714
DRAW.HLP	3252	crunched	36%	2085	9 Jun 85	10:33p	3943
DRAW.PIC	14107	Packed	5%	13486	25 May 85	9:10p	58DC
DRAW1.DOC	1883	crunched	44%	1055	16 Jul 85	7:22p	EDF9
DRAWDEMO.BAT	15	--	0%	15	16 Jul 85	7:16p	1CC4
KEYS.PIC	16994	Packed	13%	14903	30 May 85	1:52a	9866
TEXT.PIC	15526	Packed	2%	15297	8 Mar 85	0:52a	AF61
TRIANGLE.PIC	1727	crunched	11%	1548	22 Apr 85	7:50p	0529
Total	9	94306	14%	82037			

HISTORY24.ARC Maintains a command history. V2.4 fixed for RB. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
HISTORY.DOC	7466	Crunched	56%	3320	3 Jan 85	7:10p	083F
HISTORY24.EXE	4608	Crunched	37%	2940	10 Feb 86	10:16p	AFD1
Total	2	12074	49%	6260			

INTERLAC.ARC Turn the Rainbow into Interlace (hi-res) screen mode. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
INTERLAC.ASM	256	Packed	25%	193	2 Feb 86	1:51p	B494
INTERLAC.COM	128	Packed	90%	13	2 Feb 86	1:51p	4390
INTERLAC.EXE	896	Packed	95%	51	2 Feb 86	1:51p	EF18
INTERLAC.OBJ	128	Packed	51%	63	2 Feb 86	1:51p	35DE
Total	4	1408	78%	320			

HELP.ARC A HELP command. Similar to HELP in CP/M. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
ADVAN.HLP	1024	Squeezed	11%	913	11 Jul 85	0:40a	6DFC
COPY.HLP	384	Packed	24%	293	11 Jul 85	0:40a	C303
COPYS.HLP	512	Squeezed	24%	392	11 Jul 85	0:40a	5821
COPYV.HLP	384	Packed	16%	325	11 Jul 85	0:40a	5F00
DATE.HLP	256	Packed	24%	195	11 Jul 85	0:40a	2A74
DATES.HLP	384	Packed	32%	262	11 Jul 85	0:40a	4056
DEL.HLP	256	Packed	24%	197	11 Jul 85	0:40a	5C23
DELS.HLP	384	crunched	8%	357	11 Jul 85	0:40a	BCAB
DIR.HLP	256	Packed	9%	235	11 Jul 85	0:41a	DC4D
DIRP.HLP	256	Packed	36%	166	11 Jul 85	0:41a	A0E6
DIRS.HLP	512	crunched	25%	384	11 Jul 85	0:41a	FE5D
DIRV.HLP	256	Packed	41%	152	11 Jul 85	0:41a	3802
DISKCOPY.HLP	640	crunched	28%	462	11 Jul 85	0:41a	AA66
DISKCS.HLP	512	crunched	26%	381	11 Jul 85	0:41a	3D5F
FILESPEC.HLP	256	Packed	2%	252	11 Jul 85	0:41a	DD96
FIND.HLP	384	Packed	29%	276	11 Jul 85	0:41a	DBC0
FINDC.HLP	128	Packed	29%	92	11 Jul 85	0:41a	47B9
FINDN.HLP	128	Packed	22%	101	11 Jul 85	0:41a	6080
FINDS.HLP	256	Packed	1%	255	11 Jul 85	0:41a	0737
FINDV.HLP	128	Packed	22%	101	11 Jul 85	0:41a	C7C9
FORMAT.HLP	384	Packed	19%	313	11 Jul 85	0:41a	C322
FORMATS.HLP	256	Packed	14%	222	11 Jul 85	0:41a	43B0
FORMATSP.HLP	256	Packed	46%	140	11 Jul 85	0:41a	551C
FORMATV.HLP	128	Packed	30%	90	11 Jul 85	0:41a	E2C4
HELP.DOC	896	Squeezed	11%	806	11 Jul 85	0:40a	6BFA
HELP.EXE	17920	crunched	24%	13749	11 Jul 85	0:40a	DB05
HELP.HLP	1536	crunched	53%	729	11 Jul 85	0:40a	8895
PRINT.HLP	512	crunched	24%	390	11 Jul 85	0:41a	149C
PRINTC.HLP	256	Packed	36%	166	11 Jul 85	0:41a	3BC6
PRINTP.HLP	256	Packed	39%	158	11 Jul 85	0:41a	7ACD
PRINTS.HLP	256	Packed	44%	144	11 Jul 85	0:41a	33D8
PRINTT.HLP	256	Packed	26%	190	11 Jul 85	0:41a	B204
REN.HLP	384	crunched	14%	333	11 Jul 85	0:41a	84FE
TIME.HLP	384	Packed	30%	271	11 Jul 85	0:41a	28B5
TIMES.HLP	512	Squeezed	21%	406	11 Jul 85	0:41a	2B43
TYPE.HLP	256	Packed	31%	177	11 Jul 85	0:41a	FCB9
VER.HLP	128	Packed	7%	120	11 Jul 85	0:41a	01B9
VOL.HLP	128	Packed	22%	100	11 Jul 85	0:41a	FC3E
VOLS.HLP	256	Packed	2%	251	11 Jul 85	0:41a	8B0A
Total	39	32256	24%	24546			

IPLDATE.ARC Makes setting date/time much easier. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
IPLDATE.EXE	19236	crunched	16%	16275	4 Aug 85	2:39p	B329
Total	1	19236	16%	16275			

ISSUE.ARC The DOS ISSUE command. Issue a command for a set of files. C Source included. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
ISSUE.C	6935	crunched	56%	3075	29 Dec 85	10:29p	6107
ISSUE.DOC	725	crunched	15%	618	29 Dec 85	10:37p	5F1F
ISSUE.EXE	17088	Squeezed	14%	14771	29 Dec 85	10:29p	2B94
Total	3	24748	26%	18464			

JOBSDUMP.ARC Fast (7 minute) Graphic Screen Dump. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
JOBSDUMP.COM	18757	Squeezed	7%	17514	18 Dec 85	2:55p	8034
JOBSDUMP.DOC	7287	crunched	51%	3585	18 Dec 85	2:55p	17D8
Total	2	26044	19%	21099			

JOT.ARC Time stamp short memos to yourself. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
JOT.EXE	11264	crunched	27%	8252	29 Sep 85	12:40a	6B7F
Total	1	11264	27%	8252			

LUCIFER.ARC File en/decrypter. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
LUCIFER.DOC	1565	Crunched	38%	983	14 Feb 86	11:57a	8C56
LUCIFER.EXE	10624	Crunched	19%	8648	14 Feb 86	11:55a	E00C
Total	2	12189	21%	9631			

MAKE.ARC The MAKE command by Larry Campbell. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
DOSERROR.C	1664	crunched	32%	1140	19 Jan 86	1:04p	40C6
ENVFETCH.C	1152	crunched	31%	804	19 Jan 86	1:04p	FB65
EXEC.ASM	896	crunched	27%	657	19 Jan 86	1:04p	CDC1
MAKE.C	18432	crunched	51%	9117	19 Jan 86	1:04p	1B00
MAKE.EXE	20864	crunched	24%	15998	19 Jan 86	1:04p	1771
MAKE.MEM	29592	crunched	53%	14168	19 Jan 86	1:05p	ADFB
Total	6	72600	43%	41884			

MAP.ARC Show a memory map. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
MAP.COM	9984	crunched	12%	8849	14 Jan 86	9:51a	FOE3
Total	1	9984	12%	8849			

MESSAGES.ARC Telephone message database system. Turbo Source included. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
EXIST.INC	384	Packed	27%	283	1 Sep 84	2:27a	EE48
FASTVID.INC	3584	Squeezed	37%	2275	1 Sep 84	2:27a	1D41
MESSADD.INC	5632	Squeezed	46%	3097	1 Sep 84	2:27a	6D57
MESSAGES.COM	39808	Squeezed	25%	30162	1 Sep 84	2:27a	CD01
MESSAGES.DAT	0	--	101%	0	29 Jul 85	4:23p	0000
MESSAGES.DOC	2048	Squeezed	34%	1371	1 Sep 84	2:27a	D65E
MESSAGES.MAS	47	--	0%	47	29 Jul 85	4:23p	FOB5
MESSAGES.PAS	19840	Squeezed	32%	13566	1 Sep 84	2:27a	391F
MESSMORE.INC	5632	Squeezed	47%	2989	1 Sep 84	2:27a	ED52
MESSSEAR.INC	5376	Squeezed	48%	2797	1 Sep 84	2:27a	92FE
MESSSET.INC	5504	Squeezed	44%	3106	1 Sep 84	2:27a	8422
STRING.INC	21504	Squeezed	47%	11512	1 Sep 84	2:27a	EEEB
Total	12	109359	35%	71205			

MLRB.ARC Mailing List Program. Maintain and print a mail list. Turbo source included). V2.1. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
MLRB.COM	28945	Squeezed	10%	26112	22 Mar 85	7:04p	693B
MLRB.DOC	11008	crunched	49%	5706	22 Mar 85	7:02p	810D
MLRB.PAS	39296	crunched	54%	18377	1 Apr 85	11:47p	266E
Total	3	79249	37%	50195			

RB-DALAS.003 - DOSSYS-3

MEMSCAN.ARC Check out Rainbow memory. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
MEMSCAN.ASM	6674	crunched	45%	3680	26 Oct 85	3:08p	68BE
MEMSCAN.EXE	1000	crunched	54%	467	26 Oct 85	3:08p	697D
Total	2	7674	46%	4147			

MURPHY.ARC Murphy's Sayings. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
MURF.COM	11088	Squeezed	2%	10871	4 Oct 85	0:59a	F07D
MURF.DAT	46818	crunched	72%	13235	4 Oct 85	3:43a	7A3E
MURF.DOC	5472	crunched	42%	3200	4 Oct 85	1:01a	F26B
Total	3	63378	57%	27306			

MV.ARC Move a file or list of files. This can copy files from one directory to another. V2.1. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
MV.DOC	685	crunched	12%	603	24 Jan 86	0:39a	E90F
MV.EXE	9216	crunched	21%	7358	24 Jan 86	0:35a	972D
Total	2	9901	20%	7961			

NOTEPAD.ARC A facimilie of the notepad editor from DOIT. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
NOTEPAD.BUG	8194	Packed	77%	1926	2 Jun 85	10:52p	B23D
NOTEPAD.COM	20992	Squeezed	8%	19480	1 Oct 83	3:09a	42BC
NOTEPAD.DOC	2035	Squeezed	32%	1394	1 Oct 83	3:10a	B173
NOTEPAD1.HLP	8194	Packed	82%	1554	1 Oct 83	3:11a	F4D1
NOTEPAD2.HLP	8194	Packed	78%	1878	1 Oct 83	3:11a	3EFA
NOTEPAD3.HLP	8194	Packed	78%	1841	1 Oct 83	3:11a	D195
NOTEPAD4.HLP	8194	Packed	74%	2131	1 Oct 83	3:11a	29B8
Total	7	63997	53%	30204			

PR10.ARC Print utility with VAX-like switches. Turbo source included. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
PR10.COM	13035	Squeezed	5%	12415	20 Feb 86	7:24p	C916
PR10.DOC	8591	Crunched	56%	3819	22 Feb 86	0:19a	D692
PR10.PAS	13477	Crunched	67%	4505	20 Feb 86	7:24p	59B9
Total	3	35103	41%	20739			

PARK.ARC Utility to park hard disk head in non-data area. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
PARK.COM	512	Crunched	55%	234	3 Mar 86	1:43a	3FF2
Total	1	512	55%	234			

PRTMODES.ARC Nice routine to set up your LA-50. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
PRTMODES.EXE	23680	Squeezed	13%	20658	7 Sep 85	9:37a	DAFF
Total	1	23680	13%	20658			

RBCALC.ARC A new algebraic calculator. Nice display. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
CALC.COM	17152	Squeezed	7%	16070	28 Oct 85	6:09p	F87C
CALC.DOC	2432	crunched	30%	1715	28 Oct 85	6:09p	8F4B
Total	2	19584	10%	17785			

RBCLOCK.ARC The ultimate (and hopefully last) alarm clock for the Rainbow. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
RBCLK.COM	18939	Squeezed	8%	17509	4 Oct 85	4:01a	FC46
RBCLK.DOC	8790	crunched	48%	4589	4 Oct 85	11:36p	953D
Total	2	27729	21%	22098			

RESETRB.ARC Reset Rainbow video screen attributes. V1.2. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
RESETRB.COM	11136	Squeezed	3%	10875	20 Jan 86	7:38a	5FDA
RESETRB.DOC	1496	Squeezed	30%	1054	20 Jan 86	8:05a	2514
Total	2	12632	6%	11929			

SPELLA.ARC Incredible spelling checker that works with SEDT. V2.1. Turbo source included. MS-DOS.

Name	Length	Stowage	SF	Size now	Date	Time	CRC
PABSPL.DCT	209874	Squeezed	54%	98613	20 Sep 85	10:31a	08CA
SPELLA.COM	29089	Squeezed	10%	26323	20 Sep 85	12:15a	2D38
SPELLA.DOC	14827	crunched	46%	8016	20 Sep 85	12:15a	FCEA
SPELLA.PAS	37021	crunched	34%	24633	20 Sep 85	12:16a	D6BF
Total	4	290811	46%	157585			

RB-DALAS.004 - DOSSYS-4

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SELKEY.ARC    Select foreign language keyboard on Rainbow.    MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
SKI.DOC	13844	Crunched	54%	6477	1 Sep 84	3:48a	879E
SKI.EXE	32084	Crunched	31%	22433	1 Sep 84	0:13a	F517
Total	2	45928	38%	28910			

SKII2A.ARC    Some Kinda Imitator (Sidekick type program) for the  
Rainbow. V1.2A by Bob Brodt.    MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
SKI.DOC	13844	Crunched	54%	6477	1 Sep 84	3:48a	879E
SKI.EXE	32084	Crunched	31%	22433	1 Sep 84	0:13a	F517
Total	2	45928	38%	28910			

SORTFAST.ARC    Sort files 10 times faster than MS-DOS SORT.    MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
SORTFAST.EXE	3200	Packed	27%	2364	29 Sep 85	12:42a	979F
Total	1	3200	27%	2364			

SPACEMKR.ARC    Convert larger EXE files to smaller COM files.    MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
SPACEMKR.COM	4992	crunched	6%	4728	4 Jan 85	5:27p	0E94
SPACEMKR.DOC	1433	Squeezed	25%	1086	4 Jan 85	5:45p	CFC9
Total	2	6425	10%	5814			

SPOOL.ARC    Print despooler utility.    MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
SPOOL.COM	5632	crunched	79%	1205	11 Apr 85	11:01a	3E36
SPOOL.DOC	1574	Squeezed	28%	1137	11 Apr 85	11:04a	D91F
Total	2	7206	68%	2342			

STRING.ARC    Display any ASCII strings in a file (including EXE).  
MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
STRING.COM	6912	crunched	29%	4919	16 Dec 85	11:36p	9669
Total	1	6912	29%	4919			

STUFIT.ARC    Stuff unused files into free disk space. Decreases disk  
access time.    MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
STUFIT.COM	2048	crunched	10%	1859	20 Jan 86	7:40a	67B6
STUFIT.DOC	14269	crunched	62%	5532	20 Jan 86	8:05a	A617
Total	2	16317	55%	7391			

TAIL.ARC    Prints the last 'n' lines of a file or list of files.  
MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
TAIL.DOC	1190	crunched	25%	902	2 Nov 85	4:26p	544B
TAIL.EXE	30208	crunched	22%	23616	31 Aug 85	10:54p	F610
Total	2	31398	22%	24518			

TASK.ARC    Timed ASK command for batch processing.    MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
TASK.ASM	10919	crunched	59%	4487	6 Dec 85	10:17a	9B9C
TASK.COM	786	Packed	2%	774	6 Dec 85	10:18a	6BFD
Total	2	11705	56%	5261			

TIMER.ARC    Nice utility to display the current time on your screen,  
no matter what you are doing.    MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
TIMER.DOC	1501	Squeezed	23%	1158	1 Sep 84	11:42a	6EA9
TIMER.EXE	14643	crunched	12%	12911	1 Sep 84	11:42a	97D4
Total	2	16144	13%	14069			

TODO27.ARC An impressive TO DO list program. V2.7. Source included.  
MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
DECKBD.ASM	8496	crunched	46%	4643	16 Aug 85	6:31p	B925
DECKBDW.ASM	3299	crunched	36%	2138	16 Aug 85	11:44p	F91F
RBKEYS.H	9763	crunched	72%	2768	31 Aug 85	4:23p	62BD
TD27MENU.C	10130	crunched	60%	4092	13 Oct 85	4:15p	BF41
TODO27.C	92461	crunched	48%	48701	13 Oct 85	6:40p	91A7
TODO27.DOC	21287	crunched	51%	10488	14 Oct 85	2:05p	EFC4
TODO27.EXE	46045	Squeezed	21%	36656	13 Oct 85	6:53p	9FC4
TODO27.UPD	3027	crunched	33%	2040	14 Oct 85	1:47p	E2DB
XMASLIST.TDO	670	Packed	60%	270	5 Oct 85	4:45p	884A
Total	9		43%	111796			

TYPYR3.ARC Turn your Rainbow into a very expensive typewriter. V3.0.  
MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
RBTYPER3.DOC	6272	Crunched	43%	3591	23 Mar 86	1:02p	0E9F
RBTYPER3.EXE	13928	Crunched	26%	10374	23 Mar 86	1:02p	8B5C
Total	2		31%	13965			

WDIR12.ARC Fast video directory listings. V1.2. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
ADDENDUM.P14	4480	crunched	44%	2540	31 Jan 86	11:59p	B0E4
WDIR.COM	28703	Squeezed	9%	26144	31 Jan 86	11:59p	98F5
WDIR.DOC	35968	crunched	58%	15134	31 Jan 86	11:59p	ED1A
Total	3		37%	43818			

WSSI201R.ARC A well done directory file manager/database. V201.  
MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
RAINBOW.DIF	768	crunched	25%	576	17 Feb 86	4:54p	263F
READ_ME.BOW	1920	Squeezed	37%	1225	17 Feb 86	4:18p	42E3
WSSI201.DOC	26880	crunched	58%	11477	17 Feb 86	5:05p	F356
WSSI201R.EXE	74005	Squeezed	14%	63869	18 Feb 86	10:07a	3F36
WSSINDEX.FRM	2816	crunched	36%	1820	17 Feb 86	5:01p	CB18
Total	5		26%	78967			

RB-DALAS.005 - EDITR-1

DED2.ARC A full featured editor written by Dan Pleasant. V2.02.  
MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
DED.DOC	49376	crunched	62%	18947	14 Jan 86	1:34p	4CB9
DED.EXE	49361	Squeezed	34%	32918	14 Jan 86	2:08p	BF47
FIXES.DED	8271	crunched	55%	3782	14 Jan 86	12:33a	3A37
Total	3		48%	55647			

KEDTMS.ARC KED/EDT Editor for the Rainbow. Written by Jay Jervey.  
V1.3 MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
KEDT.COM	34816	Squeezed	12%	30893	10 Aug 85	2:45a	7846
KEDT.DOC	37759	crunched	61%	14900	10 Aug 85	2:51a	F80C
KEDT.HLP	6050	crunched	42%	3563	10 Aug 85	2:50a	691D
KEDT.INF	2694	crunched	28%	1953	10 Aug 85	3:28a	84D4
Total	4		37%	51309			

REDT.ARC Remote EDT. Use your Rainbow from the Comm Port.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
REDT.EXE	25984	crunched	25%	19542	19 Jan 86	12:35a	777B
Total	1		25%	19542			

SEDT21.ARC EDT for the Rainbow. New Version 2.1(114). MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
SEDT.EXE	65024	Squeezed	14%	56522	27 Jan 86	12:03a	5E37
Total	1		14%	56522			

SEDTSML.ARC Smaller, memory resident version of SEDT.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
SEDTSML.EXE	69486	crunched	23%	53817	16 Sep 85	4:16p	2CC2
Total	1		23%	53817			

SEDTFILE.ARC Files and documentation for SEDT.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
RULERO.TXT	84	crunched	2%	83	4 Jan 86	6:38a	B342
SEDT.DOC	15073	crunched	47%	8070	4 Jan 86	6:41a	6040
SEDTADV.EDT	46968	crunched	57%	20451	4 Jan 86	6:49a	CA23
SEDTHELP.EDT	7028	crunched	46%	3848	4 Jan 86	6:50a	CB5D
SEDTHELP.GLD	7134	crunched	46%	3872	4 Jan 86	6:52a	EA1A
SEDTINTR.EDT	27047	crunched	61%	10596	4 Jan 86	6:56a	7FFF
SEDTKEYS.EDT	5920	crunched	41%	3549	4 Jan 86	6:57a	4369
SEDTKEYS.GLD	7248	crunched	41%	4328	4 Jan 86	6:58a	AOE3
SEDTMAN.EDT	51343	crunched	55%	23376	4 Jan 86	7:09a	D01D
SEDTREF.EDT	108914	crunched	66%	38109	4 Jan 86	7:25a	CB99
Total	10	276759	58%	116282			

RB-DALAS.006 - OPSYS-1

TCL.ARC Ted's Command Language. A DCL-like command interface. V1.1. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
TCL.&IN	468	Squeezed	19%	383	18 Oct 85	9:45a	CC49
TCL.&MS	85050	crunched	38%	52778	18 Oct 85	9:45a	A7D5
TCLV11.DOC	22926	crunched	42%	13409	1 Sep 84	1:46a	OBE4
TCLV11.EXE	33152	Squeezed	14%	28640	1 Sep 84	1:54a	A369
Total	4	141596	33%	95210			

Z80MU.ARC A full-featured Z80 CP/M emulator. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
820INIT.ASM	6400	Crunched	48%	3369	12 Mar 86	11:45a	786C
820INIT.COM	640	Crunched	22%	503	12 Mar 86	11:46a	FB5B
820INIT.CTL	3456	Crunched	41%	2042	12 Mar 86	11:46a	D187
820INIT.PRN	20539	Crunched	69%	6501	12 Mar 86	11:49a	B54C
README.DOC	640	Crunched	35%	417	12 Mar 86	11:49a	D24D
Z80MU.DOC	196352	Crunched	56%	86659	12 Mar 86	11:51a	6BA4
Z80MU.EXE	96640	Crunched	24%	73968	12 Mar 86	11:44a	4552
Total	7	324667	47%	173459			

CSHELL.ARC A Unix-like C-Shell implementation. C Source included. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
BACKUP.C	476	crunched	14%	411	3 Sep 85	10:53a	7BE9
CAT.C	1232	crunched	20%	993	4 Sep 85	8:51a	E611
CD.C	231	--	0%	231	4 Sep 85	8:51a	33C1
CHMOD.C	2315	crunched	40%	1409	3 Sep 85	10:53a	F42B
CHDS.C	2773	crunched	34%	1833	4 Sep 85	8:37a	541A
CP.C	3523	crunched	41%	2090	4 Sep 85	8:52a	7404
CRLF.C	59	--	0%	59	4 Sep 85	8:24a	FEAB
DOPROG.C	180	--	0%	180	5 Sep 85	2:31p	3CF9
DRIVE.C	214	--	0%	214	3 Sep 85	10:53a	9FE5
ECHO.C	193	--	0%	193	3 Sep 85	10:53a	E4B5
ENV.C	2922	crunched	35%	1913	4 Sep 85	8:53a	732A
FEEXEC.ASM	1134	crunched	22%	894	5 Sep 85	2:23p	1COD
FEEXECV.C	1119	crunched	18%	924	5 Sep 85	2:33p	8BD0
FEEXECVP.C	1017	crunched	29%	729	5 Sep 85	2:27p	90D0
FGREP.C	2093	crunched	32%	1433	4 Sep 85	8:25a	5419
GETCMD.C	1453	crunched	30%	1026	3 Sep 85	10:53a	CCE9
INVALID.C	248	--	0%	248	4 Sep 85	8:53a	APC9
LS.C	6275	crunched	46%	3392	3 Sep 85	10:53a	OC2C
MAIN.C	11582	crunched	53%	5453	5 Sep 85	10:04a	3E5D
MAKEFILE	989	crunched	24%	758	5 Sep 85	2:34p	954D
MD.C	121	--	0%	121	3 Sep 85	10:53a	7CDA
MORE.C	3888	crunched	38%	2435	3 Sep 85	3:34p	6272
MV.C	2137	crunched	37%	1361	4 Sep 85	8:53a	027F
PUSHD.C	1039	crunched	28%	753	4 Sep 85	8:54a	BE43
PWD.C	268	--	0%	268	3 Sep 85	10:53a	59FF
RM.C	537	crunched	11%	479	3 Sep 85	10:53a	0473
RMDIR.C	240	--	0%	240	4 Sep 85	8:54a	61BB
SAVESTR.C	243	--	0%	243	3 Sep 85	10:53a	12D8
SHELL.COM	26352	Squeezed	12%	23369	5 Sep 85	3:58p	F532
SHELL.DOC	15526	crunched	57%	6731	5 Sep 85	3:56p	48AF
SHELL.LNK	255	crunched	8%	236	5 Sep 85	2:18p	A563
STDSAVE.C	438	crunched	11%	393	3 Sep 85	10:53a	0646
TOUCH.C	104	--	0%	104	3 Sep 85	10:53a	0468
Y.C	2039	crunched	33%	1371	4 Sep 85	8:27a	2A8F
_CROOT.C	5369	crunched	40%	3249	5 Sep 85	11:29a	6C0F
Total	35	98584	34%	65736			

RB-DALAS.007 - COMMS-1

CPKERMIT.ARC Rainbow Kermit file transfer program. CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
CPKERMIT.COM	14976	Squeezed	19%	12207	23 Mar 86	8:06p	7AA7
Total	1	14976	19%	12207			

DECMINI.ARC Tom Jennings Fido communications program. It supports KERMIT, XMODEM, MODEM7, and TELLINK transfer protocols. Actually the "best" program to use for communicating with fido. V3.4 MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
DECMINI.DOC	42388	crunched	60%	17249	30 Mar 85	4:58a	E5DE
DECMINI.EXE	49584	Squeezed	22%	38821	26 Dec 85	7:36p	7A94
Total	2	91972	40%	56070			

DIALV23.ARC Autodialer that chains to your favorite comm program. Turbo source included. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
COMMLIB.INC	7485	crunched	48%	3894	4 Sep 85	10:12p	D270
DIAL.COM	27989	Squeezed	11%	24952	5 Sep 85	9:23p	33A9
DIAL.DOC	7246	crunched	40%	4382	5 Sep 85	9:24p	EF91
DIAL.PAS	28008	crunched	52%	13662	5 Sep 85	9:22p	7377
DIALNUM.TXT	1016	crunched	25%	765	5 Sep 85	9:26p	3F94
EXECUTE.INC	4203	crunched	38%	2625	3 Aug 85	10:25p	44FE
FINDENV.INC	2378	crunched	41%	1404	3 Aug 85	5:37p	D33B
FVCONST.INC	1724	crunched	39%	1053	3 Aug 85	5:31p	A3D5
HAYES.INC	4464	crunched	46%	2436	3 Aug 85	10:24p	CFA8
HELP.INC	5903	crunched	50%	2970	3 Aug 85	5:42p	8DE6
KEYBOARD.INC	2799	crunched	38%	1736	3 Aug 85	5:58p	B61E
KEYDFNS.INC	1327	crunched	42%	779	3 Aug 85	5:32p	3587
USR2400.INC	4536	crunched	46%	2459	5 Sep 85	8:54p	0CA9
Total	13	99078	37%	63117			

LCTERM.ARC The best Public Domain communications program for the Rainbow. Written by Larry Campbell. V3.34. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
LCTERM.DOC	31616	Squeezed	51%	15562	18 Jun 85	8:55p	2F74
LCTERM.EXE	65280	Squeezed	24%	49989	29 Nov 84	2:00a	7815
LCTERM.NEW	1280	Squeezed	18%	1056	29 Nov 84	2:12a	A5AA
Total	3	98176	33%	66607			

LCTRPAT.ARC Patch LCTerm to work with DO-IT and ReGIS. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
LCPAT.BAT	87	--	0%	87	13 Aug 85	2:04a	588E
LCPAT.DEB	34	--	0%	34	13 Aug 85	2:04a	15D2
LCPAT.DOC	984	crunched	11%	879	13 Aug 85	0:21a	1A95
Total	3	1105	10%	1000			

KERMIT.ARC Rainbow version of KERMIT. Works with versions on all other hosts. V2.28. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
MSKERMIT.DOC	9270	crunched	42%	5451	8 Jan 86	12:35a	4E25
MSKERMIT.HLP	9828	crunched	46%	5360	8 Jan 86	12:33a	6E3E
MSRB100.EXE	43760	Squeezed	36%	28162	8 Jan 86	12:30a	3107
Total	3	62858	38%	38973			

KERMDOC.ARC KERMIT Documentation.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
KERMIT.DOC	104652	Crunched	53%	49494	16 Jul 85	0:22a	6A9C
Total	1	104652	53%	49494			

TC.ARC Turbo-COMM communications program. Supports VT100 and VT2XX protocols and ReGIS graphics. Turbo source included. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
CHECKESC.INC	4059	Crunched	59%	1684	20 Jan 86	12:53a	CCDF
COMMLIB.INC	12192	Crunched	61%	4782	18 Oct 85	8:41a	CC0B
FUNKEY.INC	9115	Crunched	61%	3575	21 Nov 85	1:41p	B9E3
GETENV.INC	1990	Crunched	47%	1057	18 Oct 85	8:41a	EC6A
GETVIDLN.INC	1910	Crunched	51%	938	6 Dec 85	10:58a	61F3
REDEFINE.INC	8839	Crunched	67%	2994	25 Nov 85	3:20p	D454
TC.COM	28506	Squeezed	10%	25870	20 Jan 86	1:05p	2D78
TC.DOC	9230	Crunched	53%	4413	20 Jan 86	1:31p	8AEB
TC.PAS	31055	Crunched	61%	12321	20 Jan 86	1:05p	C873
Total	9	106896	47%	57634			



RB-DALAS.008 - GAMES-1

HACKPROG.ARC The most incredibly addicting game for the Rainbow yet. V1.03 supports VT100 Graphics and has a greatly improved command structure. This version requires 320 K of free memory. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
DATA	10035	crunched	41%	5942	30 Nov 85	0:00a	9B35
HACK103.CNF	2116	crunched	28%	1544	30 Nov 85	0:00a	229A
HACK103.DOC	33249	crunched	54%	15503	30 Nov 85	0:00a	E532
HACK103.EXE	254922	Squeezed	12%	226227	30 Nov 85	0:00a	98CA
HACKING.103	1792	crunched	31%	1251	17 Nov 85	5:49p	4D23
HELP	6645	crunched	37%	4209	30 Nov 85	0:00a	3FFA
HH	2866	Squeezed	27%	2116	30 Nov 85	0:00a	3126
READ.ME	5686	crunched	41%	3408	30 Nov 85	0:00a	0D90
RECORD	52	--	0%	52	30 Nov 85	0:00a	CF00
RUMORS	25585	crunched	48%	13307	30 Nov 85	0:00a	8587
Total	10		21%	273559			

HACKFILE.ARC This set of two programs allows you to redefine the Rainbow's keyboard for specific use with HACK V1.03. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
HACK.COM	4394	Crunched	42%	2592	4 Feb 86	0:06a	AE64
HACKMENU.COM	49777	Squeezed	14%	43092	6 Feb 86	0:08a	B173
Total	2		16%	45684			

HACKINFO.ARC A set of text files that describe the game and provide some useful hints for various types of players. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
HACK.TXT	5927	crunched	33%	3974	19 Jun 85	0:19a	D634
HACK2.TXT	6272	crunched	42%	3657	8 Jul 85	1:00p	2BC2
HACK3.TXT	2304	Squeezed	38%	1446	8 Jul 85	1:01p	43E2
HACKSPEL.TXT	4352	Squeezed	35%	2849	7 Oct 85	2:44a	0766
HACKTOUR.TXT	3456	Squeezed	35%	2265	7 Oct 85	2:44a	EDB8
SCROLL.WIS	21089	crunched	48%	10992	6 Oct 85	10:26p	1FFC
Total	6		42%	25183			

RB-DALAS.009 - GAMES-2

BLASTER.ARC Shoot-em-up space game similar to Space Invaders. Uses VT-100 graphics. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
BLASTER.COM	16335	Squeezed	10%	14795	23 Nov 85	10:55p	5966
Total	1		10%	14795			

CANON.ARC Blast the enemy silos. Requires Rainbow Graphics Option. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
CANON.COM	26763	Squeezed	8%	24687	11 Jan 86	6:51p	ABD4
CANON.DOC	2798	Squeezed	29%	1996	4 Jan 86	9:25p	FBC7
CANON.PAS	12979	crunched	51%	6407	4 Jan 86	8:59p	9CEC
Total	3		23%	33090			

CAR.ARC Speed Racer type game. Uses VT-100 graphics. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
CAR.COM	14336	Squeezed	9%	13097	19 Nov 85	0:23a	16A6
Total	1		9%	13097			

CRIB.ARC The classic game of cribbage. Turbo Pascal sources included. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
CRIB.COM	23031	Squeezed	9%	21040	25 Jul 85	5:08p	D56C
CRIBBAGE.INS	4864	crunched	44%	2741	14 Jun 85	9:58a	F31B
CRIBBAGE.PAS	21203	crunched	59%	8727	25 Jul 85	5:08p	C5E6
CRIBBAGE.PS2	1280	crunched	33%	858	14 Jun 85	9:58a	3D4D
CRIBBAGE.PS3	4224	crunched	57%	1836	14 Jun 85	9:58a	9275
Total	5		36%	35202			

LADDER.ARC Donkey Kong type game. Uses VT-100 graphics. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
LADCONV.COM	10443	Squeezed	7%	9742	1 Sep 84	0:21a	1B16
LADDER.COM	20730	Squeezed	12%	18412	1 Sep 84	6:37a	9CFB
LADDER.DAT	21120	crunched	89%	2495	1 Sep 84	3:47a	451E
LADDER.DOC	3474	crunched	44%	1979	1 Sep 84	2:04a	6B2F
LADDER.TXT	17601	crunched	88%	2172	1 Sep 84	2:19a	0A66

DND.ARC Dungeons and Dragons Game. Very good. Does not require graphics. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
AUTOEXEC.BAT	39	--	0%	39	18 Oct 85	0:00a	42E1
CAVERN.BIN	8064	crunched	81%	1604	16 Jul 85	11:21a	AB6A
CLERIC.DOC	6016	crunched	49%	3083	2 Jul 85	7:54p	59A4
DND.EXE	160768	Squeezed	30%	113362	16 Jul 85	10:51a	65F5
DNDFIX.COM	518	crunched	7%	485	9 Aug 85	8:07p	49ED
DNDFIX.DOC	759	crunched	6%	720	9 Aug 85	7:58p	25A9
INTRO.DOC	8064	crunched	42%	4715	27 Jun 85	0:51a	C1DE
KEYPAD.DOC	1664	crunched	63%	627	2 Jul 85	7:48p	B854
LAMORTE.BIN	8064	Squeezed	54%	3752	16 Jul 85	11:27a	6F9E
MAGIC.DOC	6528	crunched	51%	3236	2 Jul 85	7:50p	E464
MONSTER.DOC	3200	Squeezed	33%	2153	2 Jul 85	7:50p	4B64
NOTICE.DAT	693	crunched	10%	630	8 Dec 85	0:12a	C56B
PLAYERS.DAT	512	Packed	74%	135	8 Dec 85	0:05a	6D84
README.TXT	1081	crunched	15%	926	15 Jul 85	0:44a	BABC
SHVENK.BIN	8064	Squeezed	48%	4209	16 Jul 85	11:42a	7B65
TELENARD.BIN	8064	Squeezed	53%	3854	16 Jul 85	11:37a	AD25
WARREN.BIN	8064	Squeezed	83%	1399	16 Jul 85	11:31a	8B3B
Total	17		38%	144929			

MONSTA.ARC A great maze game from the people at DEC Rainbow Engineering. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
MONSTA.EXE	33536	Squeezed	12%	29716	13 Jun 85	1:39a	4F3A
Total	1		12%	29716			

STARTREK.ARC The classic game of Startrek. Nice implementation. MS-DOS.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
STARTREK.EXE	45184	Squeezed	15%	38541	8 Sep 85	10:20a	BAF1
STARTREK.HLP	5120	crunched	33%	3446	8 Sep 85	10:21a	D087
Total	2		17%	41987			

RB-DALAS.010 - CPMSYS-1

BUDGET.ARC Personal budget program. CP/M.

Name	Length	Stowage	SF	Size now	Date	Time	CRC
BUDGET.COM	19328	Squeezed	8%	17811	23 Mar 86	1:05p	C780

CLCULTR.ARC Reverse-Polish calculator. CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
CLCULTR.COM	22144	Squeezed	9%	20175	22 Mar 86	11:06p	D87E
Total	1		9%	20175			

CMPRND.ARC Random number generator/tester. CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
CMPRND.COM	5248	Crunched	26%	3906	22 Mar 86	11:08p	1D57
Total	1		26%	3906			

DCL.ARC 4 VMS style utilities: APPEND, COPY, PRINT, and RENAME. CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
APPEND.COM	7552	Crunched	29%	5366	22 Mar 86	11:13p	F03D
COPY.COM	8832	Crunched	23%	6836	22 Mar 86	11:13p	A5CB
PRINT.COM	8704	Crunched	24%	6660	22 Mar 86	11:13p	944A
RENAME.COM	7552	Crunched	29%	5378	22 Mar 86	11:14p	871B
Total	4		26%	24240			

FCV.ARC Fast Copy Verify. A nice diskcopy program that allows copying of selected tracks. CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
FCV.COM	4864	Crunched	16%	4112	22 Mar 86	11:21p	34A9
Total	1		16%	4112			

FINDU10.ARC Search files for a pattern. CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
FINDU10.COM	3456	Crunched	34%	2288	22 Mar 86	11:48p	A49A
FINDU10.DOC	3200	Crunched	35%	2101	22 Mar 86	11:48p	A266
Total	2		35%	4389			

FORMATER.ARC Format IBM SS and DEC Robin diskettes. CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
FORIBM.COM	3840	Crunched	30%	2691	22 Mar 86	11:32p	FCB1
FORMAT.COM	3584	Crunched	34%	2381	22 Mar 86	11:16p	1C79
FORROB.COM	3712	Crunched	32%	2534	22 Mar 86	11:16p	OBC0
Total	3	11136	32%	7606			

GRAMMER.ARC Analyzes a file for grammatical correctness. CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
PERSWORD	512	Crunched	48%	269	22 Mar 86	11:07p	FF9A
STYLE.CMD	12160	Crunched	17%	10098	22 Mar 86	11:07p	7AF3
TXTRDR.CMD	15872	Crunched	16%	13380	22 Mar 86	11:07p	ODDB
Total	3	28544	17%	23747			

LUSQUSQ.ARC File Librarian, File Squeezer, File Unsqueezer. CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
LU.COM	19456	Crunched	26%	14471	23 Mar 86	11:55a	DEAA
LU.HLP	23424	Crunched	50%	11847	23 Mar 86	11:59a	5FC5
NEWSQ.CMD	20480	Crunched	31%	14253	23 Mar 86	1:05p	2183
USQ-NEW.DOC	3072	Crunched	44%	1732	23 Mar 86	1:06p	BDB7
USQ.CMD	18304	Crunched	30%	12966	23 Mar 86	12:06a	F218
Total	5	84736	35%	55269			

PROBE.ARC Probe memory locations. CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
PROBE.BUG	512	Crunched	20%	414	22 Mar 86	11:09p	ED3A
PROBE.COM	16768	Crunched	38%	10532	22 Mar 86	11:09p	767C
PROBE.DOC	2432	Crunched	46%	1320	22 Mar 86	11:09p	7029
Total	3	19712	38%	12266			

PROFF.ARC A version of RUNOFF. CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
PROFF.CMD	29696	Crunched	27%	21802	22 Mar 86	11:10p	D3E1
PROFFMAN.PRF	47872	Crunched	52%	23381	22 Mar 86	11:10p	C507
PROFFTUT.PRF	14720	Crunched	56%	6519	22 Mar 86	11:09p	4E46
README1S.TPF	2176	Crunched	40%	1316	22 Mar 86	11:10p	76F7
Total	4	94464	44%	53018			

RPM.ARC Determine Speed of Disk Drive in RPMs. CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
RPM.ASM	8192	Crunched	47%	4361	22 Mar 86	11:12p	BCD2
RPM.COM	640	Crunched	10%	576	22 Mar 86	11:12p	5C8E
Total	2	8832	45%	4937			

SKI.ARC "Some Kinda Imitation". A Sidekick imitation that includes a notepad, calculator, calendar, and more. CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
SKI.CMD	33792	Crunched	30%	23846	22 Mar 86	11:50p	2859
SKI.DOC	9728	Crunched	52%	4739	22 Mar 86	11:50p	A692
Total	2	43520	35%	28585			

SPELL.ARC Spelling checker with huge dictionary. CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
DICT.DIC	56576	Squeezed	2%	55924	22 Mar 86	11:12p	D277
SPELLM20.COM	5632	Crunched	21%	4502	22 Mar 86	11:12p	11E9
SPELLM20.DOC	18816	Crunched	54%	8784	22 Mar 86	11:13p	AA60
SPELLM20.MSG	1152	Crunched	33%	772	22 Mar 86	11:12p	DA99
Total	4	82176	15%	69982			

TOD.ARC Make setting the date and time easier. CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
TOD.CMD	8960	Crunched	25%	6794	22 Mar 86	11:07p	EBA3
Total	1	8960	25%	6794			

UNERA.ARC Restore erased files. A must! CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
UNERA.COM	1024	Crunched	21%	819	22 Mar 86	11:08p	5881
Total	1	1024	21%	819			

XAMN.ARC Examine and modify disk sectors. CP/M.

Name	Size	Stowage	SF	Size now	Date	Time	CRC
XAMN.COM	26752	Crunched	27%	19529	23 Mar 86	12:18a	9F57



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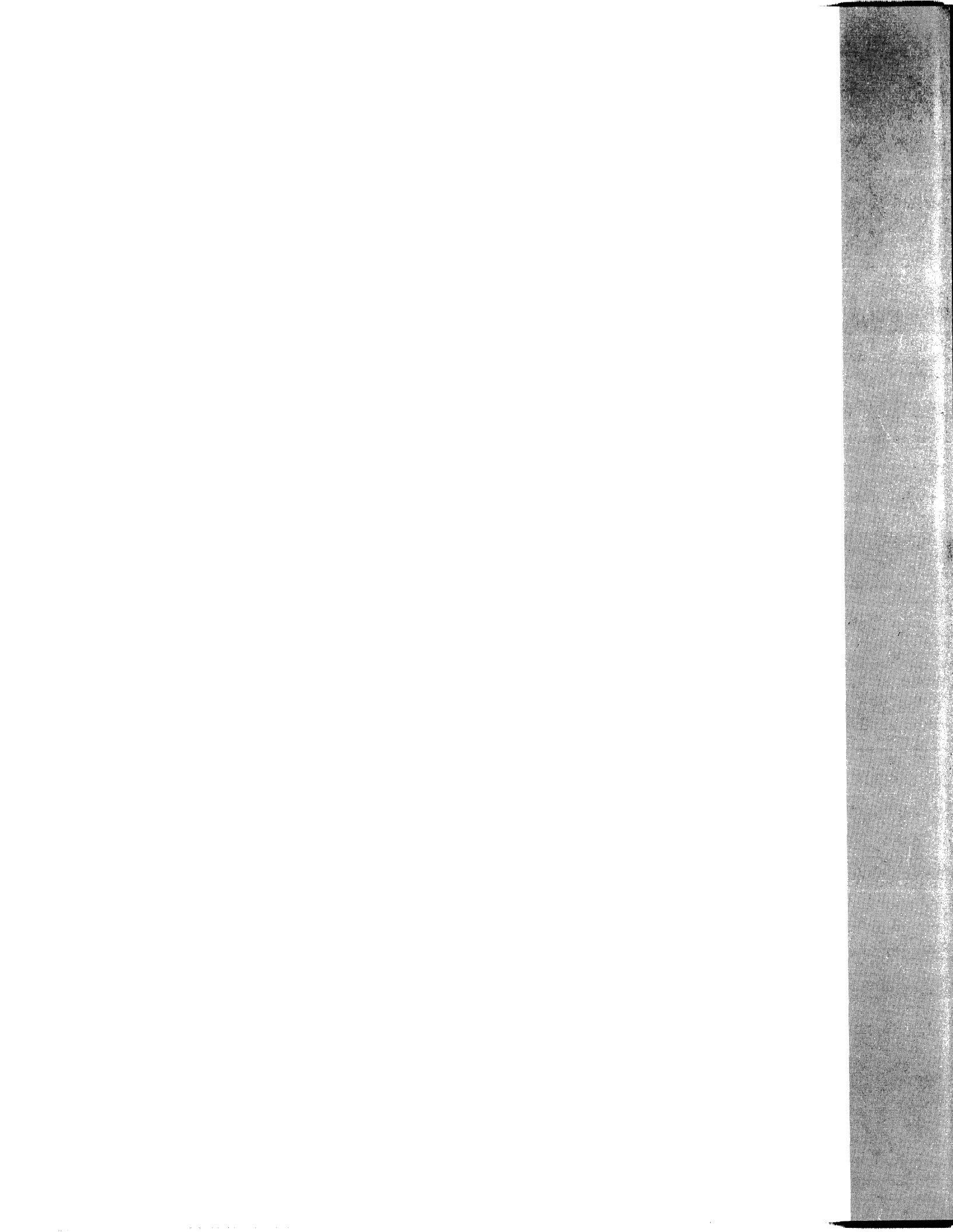
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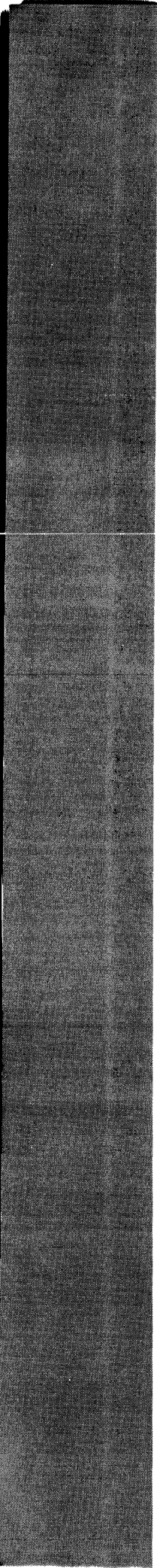


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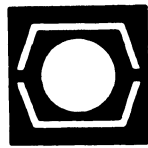






**RSX**

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# The Editor's Corner

Bruce R. Mitchell

*There was no July Multi-Tasker because I didn't get the articles before the deadline. Cutting over editorship is always hectic. My apologies. --- The Editor*

The RSX Multi-Tasker  
August, 1986

*"All the News that Fits, We Print"*

Fine Realtime Commentary Since 1975

Big news this month! I'm pleased to be able to greet all readers of the Multi-Tasker as the new editor. Dominic DiNollo has done yeoman work getting the MT out and I hope to be able to equal his record.

(Really, I've always secretly wanted this job. Now I have a forum to make outrageous statements, rattle cages, kick the dog, and in general have a real good time.)

I have a few items to discuss before we jump off into this issue.

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### ----- Newsletter Subscription Problems -----

A common complaint is that you're having subscription troubles. Regrettably, there's not much I can do to fix it. Many of us have had problems, myself included - but I'm not your best point of contact. Here's why:

Newsletter editors don't have access to the subscription processing computer. Only DECUS HQ does. If you send me an inquiry, I pass it on to DECUS HQ. This means a delay of up to two weeks in getting your answer back.

Your subscription problems should be referred to this person at DECUS HQ for swiftest resolution:

Diane Simoneau  
DECUS Order Processing  
DECUS U.S. Chapter  
(617) 480-3659

----- The High Cost of the Newsletters -----

Oh, we all know that the subscription is expensive. It's not as bad as it was two years ago, but it's still expensive. I, too, wish we could return to the thrilling days of yesteryear when the Multi-Tasker was printed on cheap paper, stapled shut and mailed free. Fourth class. And arrived chewed by every dog in six states.

Usually, when someone gripes the newsletters as too expensive, I tend to comment "TANSTAAFL". Somebody *pays* for newsletters. Many readers don't know it, but DECUS is into DEC for a significant amount of funding each year. That amount is in the bazillions of Japanese yen, humongous piles of Deutsch marks, stupendous amounts of French francs, and shiploads of Mexican pesos.

Remember now that DECUS is non-commercial, so we can't accept advertising to bring the cost down. (I have reservations, since a competing users group does it nicely. However, this is how things *are*, and unless the bylaws are changed - by YOU, the members-at-large - that's the way they will *stay*.)

Folks, regardless of how you feel about DECUS spending (and I have *strong* reservations about some of it), is it right to ask DEC to foot the bill? Even if they did, the money still eventually comes out of our pockets.

Look at the sub fee as opposed to dues in other organizations such as the ACM. It's quite a bit cheaper. So pay it yourself and deduct it as an employee business expense if your company won't buy it for you. For 35 bucks you're getting a lot to read, and it's not just about RSX.

----- Contributions to the MT -----

Your editor is pleased as can be that more contributions are coming in to the MT.

I do note, however, there are still some of you - yes, I must say it - some of you who haven't yet written an article for the Multi-Tasker.

So permit me to dispel a few common misconceptions about writing for this publication:

- o Nobody laughs at articles submitted to this newsletter.
- o No article submitted to this newsletter is so elementary that "everybody knows that".
- o No article submitted to this newsletter is too short to

publish.

If you send me something for the Multi-Tasker, it *will* be printed in the first available issue, or I will see that it gets to the editor of the appropriate newsletter.

Often, however, it takes a little incentive to get the creative juices flowing, so here's a carrot for you: For each and every submission to the Multi-Tasker, we have, absolutely free and without charge, without let or hindrance, fee simple absolute, limited to stock on hand, a blue light special -

>>> Genuine DEC paper tape diagnostics in original boxes! <<<

I will cheerfully send one to the enemy/VMS site/IBM user of your choice with an appropriate greeting. Just ask. But if that's not enough incentive ...

Permit me to share a secret with you: There are few certified RSX wizards, and I'm not one of them. I can only talk about a few things without repeating myself. After that I start telling jokes. Anyone who has heard me tell jokes will tell you they are considerably worse than Vagon poetry. So avoid it; send me articles.

Each and every article you send in is much appreciated by the poor, overworked, underpaid editorial staff.

Now, smite the keyboards of your terminals! Show them slimy VAX LUsers what real timers do! And be assured that our cause is righteous, our hearts are pure, and that if you send me something, the next issue won't be filled with more ranting in this column. Thank you.

----- Submitting Articles to the Multi-Tasker -----

Please submit machine readable media. RX01/RX02 floppy or 800/1600 BPI 9 channel magtape are best. Any format is acceptable except ROLLIN, PRESRV or VMS backup. Can't read RX50 flops yet, but we're working on it.

Submissions which aren't machine readable take longer to get into print. The editor is lazy and types mass quantities only once a month when progress reports are due.

If you preformat a submission in RUNOFF format, please set left margin 10, right margin 75, and when changing margins use incremental changes rather than absolute. The editor will bless you for the consideration.

Send all submissions to:

Bruce R. Mitchell  
Machine Intelligence and Industrial Magic  
PO Box 816  
Byron, MN 55920

----- And That's The Way Things Are -----

... this month in Pool Lowbegone, where all the typing is strong, all the code is good-looking, and all the task priorities are above average.

## The Bag of Tricks: MACRO-11

Denny Walthers  
Kendall McGaw  
PO Box 11887  
Santa Ana, CA 92711

Yes, it's the return of the dreaded Bag of Tricks. Long thought deceased or successfully lost in deepest Siberia, this column on Macro-11 coding has once more, like a Mexican dinner, made itself suddenly known.

In this segment we examine a code segment useful to driver writers. In the early stages of writing and debugging device drivers, it is not uncommon to find that buffer and parameter addressing is of more than passing interest.

There's a problem with this, though. While the QIO packet passes relocated and absolute addresses to drivers, it's not always practical to put XDT mousetraps in a driver so that buffer addresses can be examined. This is especially true of drivers where responses must be made quickly after I/O transfer begins.

This code, used in a driver test task, dumps addressing information necessary to debug a driver *before* the QIO hits the driver. This is particularly useful in finding problems such as 64K boundary crossings.

This code is obscure in places, especially in computing addresses. A full explanation of Unibus and Q-bus physical addressing seems out of place here, so it's assumed that if you need to use this, you'll understand immediately how it works or take the time to do so.

```
; Macro to load a print QIO DPB and execute the DPB
.MACRO PRINT STRING
MOV #STRING, TTYOUT+Q.IOPL
MOV #STRING'L, TTYOUT+Q.IOPL+2
DIR$ #TTYOUT
.ENDM

; Get partition parameters on self
GETPPR: GPRT$ , GPRBUF

; Get information on self
GETSLF: GTSK$ GTKBUF

; Print QIO Directive Parameter Block
TTYOUT: QIOW$ IO.WWB, LUN1, EFN1,,,, <0, 0, 40>

; Messages
MS00: .ASCII \This task's running characteristics are:\
MS00L = . - MS00

MS01: .ASCII \ o Running in partition <\
MS01A: .BLKB 6
.ASCII \>\
MS01L = . - MS01

MS02: .ASCII \ o Which has a base address of \
MS02A: .BLKB 6
.ASCII \00\
MS02L = . - MS02

MS03: .ASCII \ o This task's base address is \
MS03A: .BLKB 6
.ASCII \00\
MS03L = . - MS03

MS04: .ASCII \ o The buffer's virtual base address is \
MS04A: .BLKB 6
MS04L = . - MS04

MS05: .ASCII \ o The buffer's physical base address is \
MS05A: .BLKB 6
.ASCII \00\
MS05L = . - MS05
```

```

MS06:  .ASCII \   plus a 64-byte granularity offset of \
MS06A:  .BLKB  3
MS06L =  . - MS06

```

```

MS07:  .ASCII \ o The buffer's physical address top 6 bits are
\
MS07A:  .BLKB  6
MS07L =  . - MS07
        .EVEN

```

```

;      Block Variables

```

```

TSTBUF: .BLKB  128.      ; Test buffer
GPRBUF: .BLKW   3        ; Buffer for GPRT
GTKBUF: .BLKW  16.      ; Buffer for GTSK

```

```

;      ... preceding code ...

```

```

PRINT  MS00          ; "-I-TPI, This task's ..."

```

```

;      Get parameters of system partition task is running in

```

```

DIR$   #GETSLF          ; Get task information
MOV    GTKBUF+G.TSPN, GETPPR+G.PRPN  ; Load part'n name
MOV    GTKBUF+G.TSPN+2, GETPPR+G.PRPN+2
DIR$   #GETPPR         ; Get partition information

```

```

;      Convert and print the task's system partition name

```

```

MOV    #MS01A, R0      ; Load name field addr in R0
MOV    GTKBUF+G.TSPN, R1 ; Get 1st 3 Rad50 characters
CALL   $C5TA          ; Convert to ASCII
MOV    GTKBUF+G.TSPN+2, R1 ; Get 2nd 3 Rad50 characters
CALL   $C5TA          ; Convert to ASCII
PRINT  MS01          ; "o Running in partition "

```

```

;      Convert and print task's system partition base address

```

```

MOV    #MS02A, R0      ; Load size field addr in R0
MOV    GPRBUF+G.PRPB, R1 ; Load par'n base addr in R1
MOV    PC, R2          ; No leading zero suppression
CALL   $CBOMG         ; Convert word to octal mag
PRINT  MS02          ; "o Which has a base ..."

```

```

;      Get partition parameters on the task subpartition

```

```

CLR    GETPPR+G.PRPN   ; Clear the partition name
CLR    GETPPR+G.PRPN+2
DIR$   #GETPPR        ; Attempt to get info on it

```

```

;      Convert and print the task subpartition base address

```

```

MOV    #MS03A, R0      ; Load size field addr in R0
MOV    GPRBUF+G.PRPB, R1 ; Load par'n base addr in R1
MOV    PC, R2          ; No leading zero suppression
CALL   $CBOMG         ; Convert word to octal mag
PRINT  MS03          ; "o This task's base ..."

```

```

;      Convert and print test buffer address as a virtual offset

```

```

MOV    #MS04A, R0      ; Load buffr field addr in R0
MOV    #TSTBUF, R1     ; Load buffer base addr in R1
MOV    PC, R2          ; No leading zero suppression
CALL   $CBOMG         ; Convert word to octal mag
PRINT  MS04          ; "o The buffer's ..."

```

```

;      Convert and print test buffer addr - physical plus offset

```

```

MOV    #TSTBUF, R5     ; Load buffer base addr in R1
MOV    R5, R4          ; And copy it to R4 as well
BIC    #77, R5         ; Change to APR granularity
SUB    R5, R4          ; Find offset from granular'y
ASH    #-6, R5         ; Shift base down to 64-byte
ADD    GPRBUF+G.PRPB, R5 ; Add part'n base addr to it

```

```

MOV    #MS05A, R0      ; Load base field addr in R0
MOV    R5, R1          ; Load buffer base addr in R1
MOV    PC, R2          ; No leading zero suppression
CALL   $CBOMG         ; Convert word to octal mag
PRINT  MS05          ; "o The buffer's ..."

```

```

MOV    #MS06A, R0      ; Load gran field addr in R0
MOV    R4, R1          ; Load bufr base offset in R1
MOV    PC, R2          ; No leading zero suppression
CALL   $CBTMG         ; Convert byte to octal mag
PRINT  MS06          ; " plus a 64-byte ..."

```

```

;      Print top 6 bits in binary for 22-bit Q-bus systems

```

```

ASH    #-10., R5       ; Wipe low 10 bits phys addr
MOV    #MS07A, R0      ; Load out field addr in R0
MOV    R5, R1          ; Load upper 6 bits in R1
MOV    #31002, R2     ; 2, 6 wide, no 0 suppress
CALL   $CBTA          ; Convert binary to ASCII
PRINT  MS07          ; "o The buffer's ..."

```

```

;      ... code continues ...

```

# Multiprocessor PDP-11 Survey

Multiprocessor Working Group

A long time ago, at a Symposium far, far away, (the Spring 85 Symposium in New Orleans), the Multiprocessor Working Group took a survey of Symposium attendees regarding the desired features in a hypothetical PDP-11 multiprocessor. Through continual threats of calling up and telling jokes, the Multi-Tasker has obtained the results of that survey and is pleased to present them here.

A total of 75 responses to the survey were obtained from a variety of sites.

1. What kind of processor do you use now?

Unibus: 33  
Q-bus: 15  
Both: 27

2. What is your operating system?

RSX: 72  
RSTS: 3  
RT: 5

3. What is your main application?

Realtime: 52  
Business: 15  
Other: 12

4. Would you be interested in a multiprocessor PDP-11?

Yes: 72  
No: 3

5. If so, why?

Speed: 68  
Reliability: 23  
Retain current hardware/software: 54  
Reduce DECnet loading on a host: 15  
Avoid purchase of a VAX: 17

6. How much would you be willing to pay for such a product?

10 - 20 K\$: 20  
20 - 30 K\$: 12  
30 - 40 K\$: 10  
40 - 50 K\$: 9  
More: 11

7. What level of performance (per CPU) would you expect?

11/23: 2  
11/44: 23  
11/70: 38  
More: 24

8. What type of bus structure would you want?

Unibus: 33  
Q-bus: 23  
Both: 22

9. Would you require individual buses for each CPU, or switched sharable buses like the DT07?

Individual buses: 16  
Switched buses: 23  
One bus only: 30

10. How many CPUs would you like to see in a multiprocessor?

2: 14  
3-4: 48  
5-6: 4  
11-16: 5  
More: 2

11. How many would you buy at your given price/performance level?

1: 3  
2: 14  
3-5: 15  
5-10: 5  
10-20: 8  
20-50: 6  
50-100: 4  
More: 2

12. Is a VAX a good solution for you? If not, why not?

The general response to this question was "No".

Some comments on the responses: The main interest in multiprocessors seems to be in higher throughput and retention of investments in working hardware and software. There are a significant number of users willing to pay premium prices for a multiprocessor CPU. A number of users would like to see both Unibus and Q-bus in the same CPU; this could be a large selling point. *Between 500 and 1000 CPUs could be sold just to this sample group, disregarding the two "more" responses.*

The Multiprocessor Working Group believes that there are now some solid grounds to launch an appeal to DEC to build a multiprocessor PDP-11. The software is in place - all DEC has to do is build the hardware!

If you want to see a multiprocessor PDP-11, listen carefully. The money at DEC isn't going into 11-series; it's going into those 32-bit things. This is the last big frontier for the 11s. The only way that DEC will build multiprocessor 11s is if they are beaten over the head repeatedly to bring their attention to the fact that users want them and will buy them.

DEC's technical people would like to build it, so what is necessary now is to wake up *their* upper management to *our* wants. Tell your sales rep you want one - preferably, more than one. Demand to know why they aren't available. Write a letter to your local office sales manager. Copy it to Dick Day at Spit Brook. Send a copy to the top dog at DEC.

Remember that the squeaking chip gets the solder (or something like that).

## ***RSX PLAS Support***

RSX Implementation Group  
Digital Equipment Corporation  
Nashua, NH

(Editor's note: The following article is a collection of transparencies used during the session on RSX PLAS support at the Spring symposium in Dallas. While no supporting text is available, these figures are of such widespread use - and

self-tutorial to boot - that the Multi-Tasker is presenting them as they stand. In some areas these figures may be difficult to read; this is because they are second generation copies of the transparencies and not reproduced from the originals.)

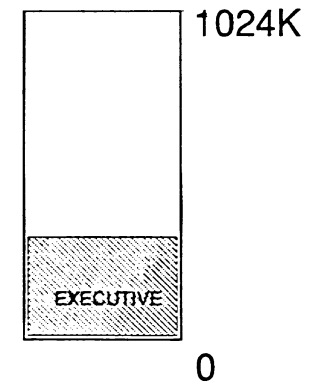


## PHYSICAL ADDRESS SPACE

### RSX PLAS Support

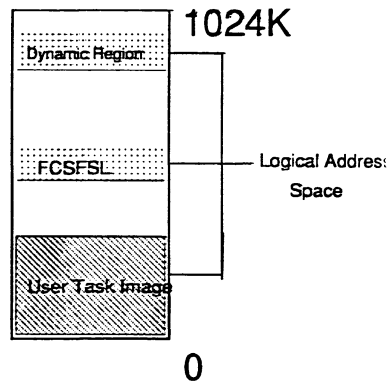
- o **PLAS** is the set of Executive memory management directives that provide the ability for a user program to manipulate its virtual to physical address translation..

- o The physical address space is the complete set of addressable memory locations that the hardware supports.



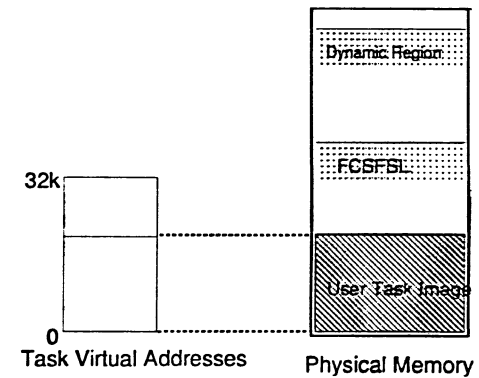
## LOGICAL ADDRESS SPACE

- o The logical address space of a task is the subset of physical address space that the task is allowed to access.



## VIRTUAL ADDRESS SPACE

- o The virtual address space of a task is the collection of addresses that the task can generate directly.



## REGION

- A region is a contiguous area of physical memory defined as a partition in an RSX system.
- Can be an installed common or multi-user task segment
- Can be a user-created dynamic entity

## ATTACHMENT

- An attachment is a declaration of a relationship between a task and a region.
- An attachment creates an Attachment Descriptor Block (ADB) between the task TCB and region PCB.

## WINDOW

- A window is the mapping of a contiguous area of virtual address space to a contiguous area of physical address space within a region.

## REGION DEFINITION BLOCK

Region ID	<b>R.GID</b>
Size of region in 32wd blocks	<b>R.GSIZ</b>
Region name in RAD50 (2 words)	<b>R.GNAM</b>
Partition name in RAD50 (2 words)	<b>R.GPAR</b>
Region status word	<b>R.GSTS</b>
Region protection word	<b>R.GPRO</b>

Data structure is defined by macro call RDBDF\$.

## WINDOW DEFINITION BLOCK

**W.NAPR**

Base APR	Window ID
Virtual base address (bytes)	
Window size (32 wd blocks)	
Region ID	
Offset in region	
Length to map	
Window status word	
Send/Receive buffer address	

**W.NID**

**W.NBAS**

**W.NSIZ**

**W.NRID**

**W.NOFF**

**W.NLEN**

**W.NSTS**

**W.NSRB**

Data structure is defined by macro call WDBDF\$

## PLAS DIRECTIVES

### Physical Memory Manipulation

#### CRRG\$ – Create Region Directive

- o Uses RDB context
- o Region can be named or unnamed
- o Named regions are placed alphabetically in the Common Block Directory (CBD)
- o Region may be optionally attached to task
- o No error if region already exists

**There is no directive to delete a region.**

## PLAS DIRECTIVES

### Logical Memory Manipulation

#### **ATRG\$ – Attach Region Directive**

- Uses RDB for context
- Defines connection between task and region via Attachment Descriptor Block (ADB)
- Returns only the Region ID if no access bits selected in RDB

#### **DTRG\$ – Detach Region Directive**

- Uses RDB for context
- Breaks connections between task and region
- Unmaps any windows to region if necessary
- Will delete specified region if it is marked delete-on-last-detach

## PLAS DIRECTIVES

### User Task Initialization

#### **CRAW\$ – Create Address Window**

- Uses WDB for context
- Fills in free slot in Task Header Window
- Unmaps existing windows that overlap specified virtual address range
- May optionally map the region

#### **ELAW\$ – Eliminate Address Window**

- Uses WDB for context
- Unmaps the window before elimination if necessary

## PLAS DIRECTIVES

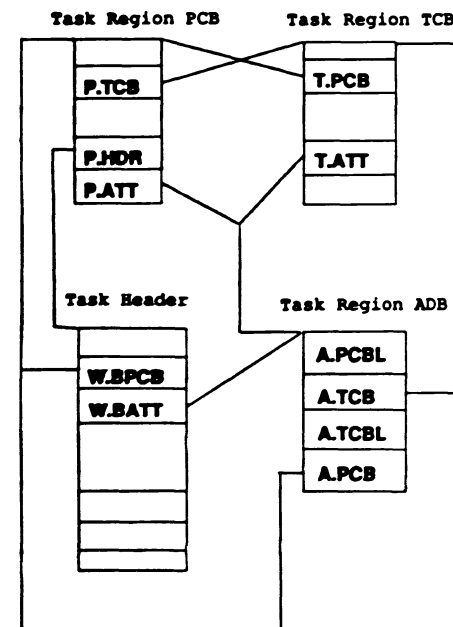
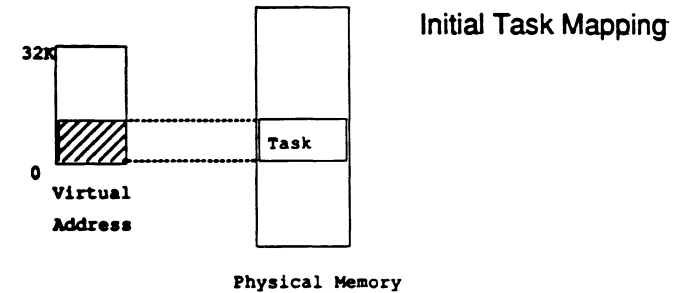
### Virtual Memory Manipulation

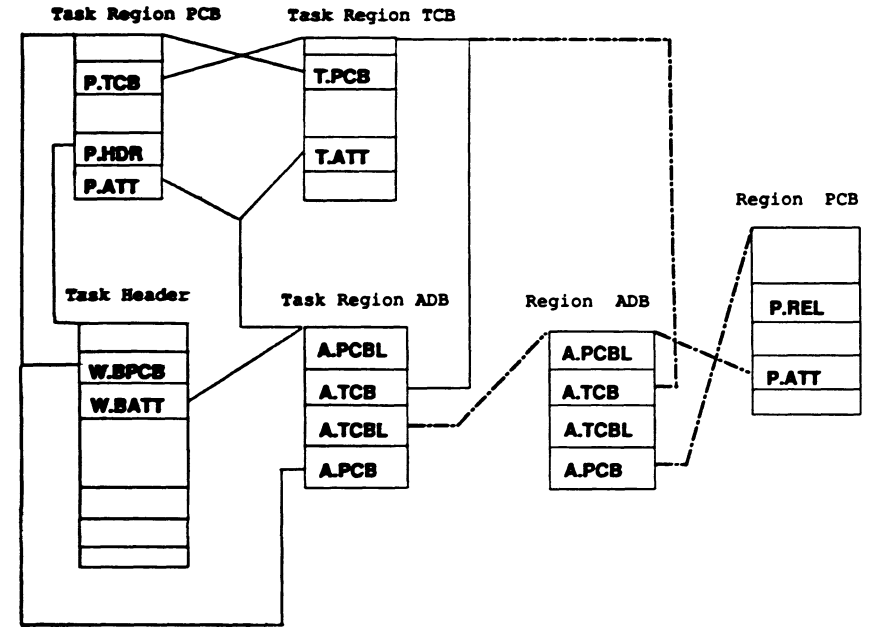
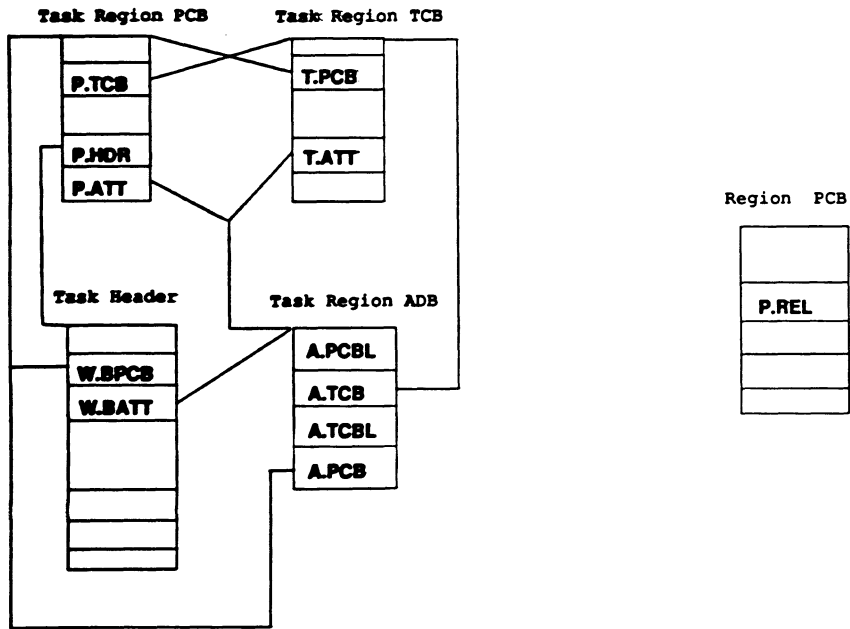
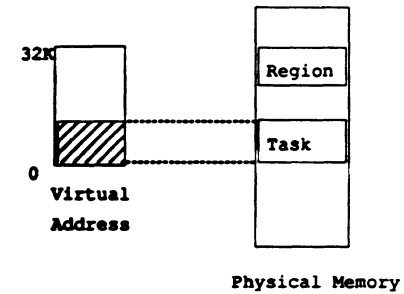
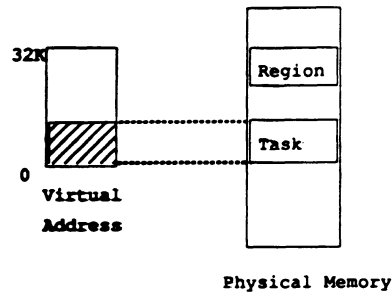
#### MAP\$ – Map Virtual Address Window

- Uses WDB for context (with associated region ID)
- Associates virtual address range with new segment of physical memory
- Unmaps previous window if it exists

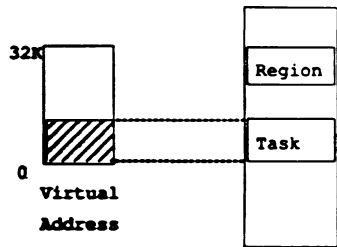
#### UMAP\$ – Unmap Virtual Address Window

- Uses WDB for context
- Resets virtual address range to original state

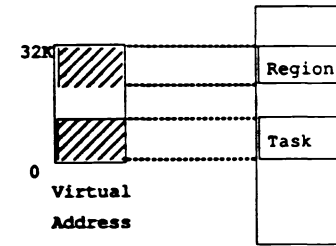




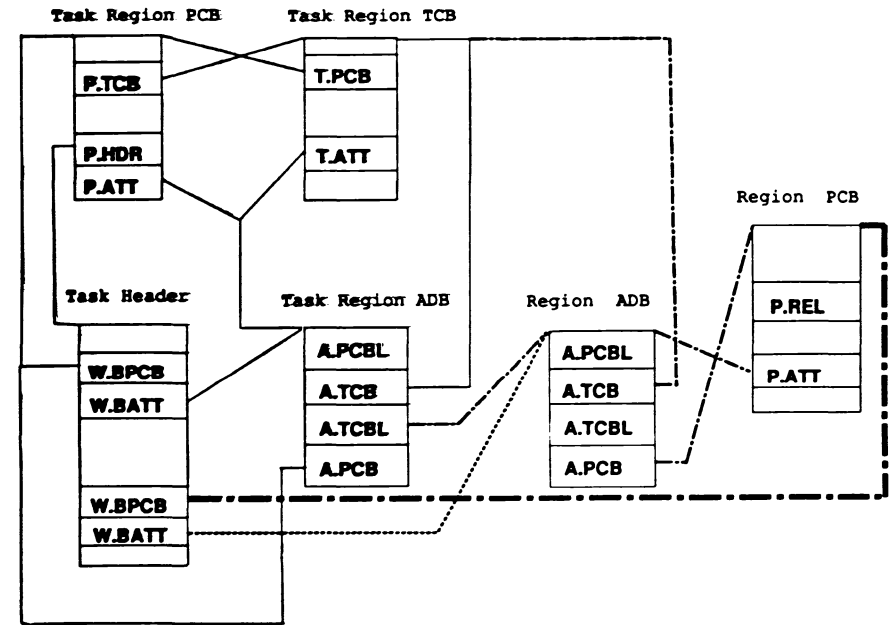
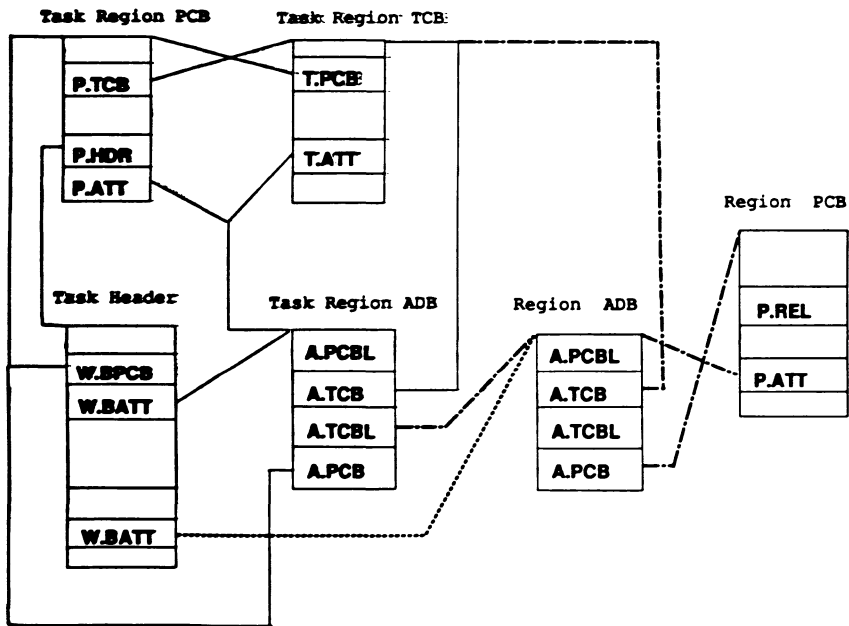




Physical Memory



Physical Memory



## FAST MAPPING SUPPORT

- Provides PLAS subset at high speed
- Can change only offset and length of window
- Parameters are passed in general registers
- Task Header enlarged
- Uses IOT instruction
- Changing offset and length is fast
- Changing offset alone is very fast

## PLAS DIRECTIVES

### Sending Region References

#### **SREF\$ – Send Region by Reference**

- Uses WDB for context (with associated region ID)
- Sends sufficient region context to allow target task map with access rights of sender
- Automatically attaches region to target task
- Allows optional 8-word buffer to be sent with reference
- Optional event flag may be specified by sender to indicate target reference reception

#### **RREF\$ – Receive Region by Reference**

#### **RRST\$ – Receive Region by Reference or Stop**

- Retrieves sent region context and places in specified WDB
- Optionally maps the region

#### **SRRA\$ – Specify Receive by Reference AST**

- Turns on or off target AST notification of reference packet arrival

## TASK HEADER WINDOW

	PCB address	W.BPCB
	Low Virtual Address	W.BLVR
	High Virtual Address	W.BHVR
	Attachment Descriptor Address	W.BATT
	Window size in 32 wd blocks	W.BSIZ
	Offset into region in 32 wd blocks	W.BoFF
W.BNPD	Number of PDRs 1st PDR address	W.BFPD
	Contents of Last PDR	W.BLPD

## STATIC COMMONS

- o Loader does implicit ATRG\$, CRAW\$, and MAP\$ directives.
- o Special region IDs
- o Libraries in  $\overline{I}$ -Space
- o Commons in  $\overline{P}$ -Space

Space is allocated in Header by TKB /WINDWs

## EXTENDING TASK VIRTUAL ADDRESS SPACE

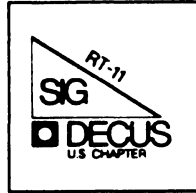
- **Include extra space** in Task Header
- **Define user data structures** in task
- **Create a region** if necessary
- **Attach region** to define as part of logical space
- **Initialize window information** in Task Header
- **Map window to region** to assign the virtual address range

## FEATURES OF RSX-11M-PLUS AND MICRO/RS

- Checkpointable commons
- Separate User I- and D-Space Support
  - Any task in an I- and D-Space system can use D-Space windows
  - WS.UDS sets D-Space on CRAW\$
  - APRs not specifically mapped to D-Space inherit I-Space mapping
- Supervisor Mode Support
  - Any task in a supervisor mode support system can use super mode windows
  - TKB maps libraries
  - WS.SIS sets Super I-Space on CRAW\$
  - APRs not specifically mapped to Super I-Space inherit User D-Space mapping
- WS.NAT on SREF\$

THE  
**mini-  
tasker**

DECUS  
RT-11 SIG NEWSLETTER



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Notes from the RT-11 World

-----  
*TRADEMARKS and COMMERCIALISM*

One of the many problems facing the volunteer editors of each of the many SIG newsletters is rejecting (or editing) any article that contains hidden trademarks or reeks of "commercialism" that can cause DECUS or DEC a problem.

This spring in Dallas, each editor was given a fairly thick stack of paper containing a list of words that are trademarked (i.e. "VAX/LSE" which is a trademarked word owned by Digital Equipment Corporation, Maynard, Massachusetts). We are then to read each article submitted to us, and seek out this hidden words and make sure that they are properly highlighted. As an example, the Coca-Cola Company constantly faces the same problem, trying to keep their trademarks from becoming "generic" words.

I ask that on any article that you submit, that you also be careful of "trademarks".

There has been a lot of controversy about an article in the May 1986 Mini-Tasker highlighting some of the technical advantages of a product called "MODULA-2". The feeling of some members of the high DECUS leadership is that it reeked of "commercialism" and did not belong in the MINI-TASKER. -- To those of you who were, are, or will be offended after you go back and read the article, I apologize. -- To those of you who "... feel the article in question is precisely what we want a newsletter for and therefore appropriate for the SIGs Newsletter. This is certainly information of interest to those RTers who might want MODULA-2.", I appreciate your support.

-----  
*FORTRAN-77*

The article by Bob Walraven of the RT-11 Steering committee was supposed to have appeared *before* the FORTRAN-77 V5.0 vs. V5.0A article that appeared in the June Mini-Tasker. Again, many thanks to Bob for his articles.

-----  
*RT-11 SIG Tape - On-line Distribution*

The May issue of the Mini-Tasker (TBO V1.9, RT-13 and 14) contained the addresses of four sites (General Scientific Corporation, Sidlinger Computer Corporation, RDB/Alpha Systems & Software, and Compuserve) that you could use to dial-up and down-load portions of the RT-11 SIG tape (long-distance toll charges at your expense). Please refer to that issue for details.

If you would like to volunteer your site, please contact Tom Shinall of the RT-11 SIG Steering Committee.

-----  
And finally, I am always looking for something to print.

Please send your submissions to *The Mini-Tasker* (RX-01, RX-50, or pieces of paper) to me at:

Bill Leroy  
The Software House, Inc.  
2964 Peachtree Road, NW #320  
P. O. Box 52661  
Atlanta, GA 30355-0661  
  
404/231-1484 or DCS (LEROY)



TO: RT-11 FORTRAN Users

FROM: Bob Walraven  
Multiware, Inc.  
437 F Street  
Davis, CA 95616  
(916) 756-3291

FORTRAN-77 has been available for RT-11 from Digital for about one and a half years now, and would you believe that there are still local DEC reps who can't find a part number for it and think it doesn't exist. Well it does, and the part number is QA609 plus an appropriate media code.

There has been a second release of FORTRAN-77/RT, the first is known as V5.0 and the second as V5.0A. It was delivered to Digital's DCS in June of last year, but as of March of this year, 9 months later, they still had not got around to shipping it. Let's hope we will see the new release soon. I'll tell you more about the differences between V5.0 and V5.0A in the next issue.

In the meantime, for those of you who have V5.0, you should know about the update kit for it. It is available on the RT tape from the Spring 1985 DECUS Symposium. (The same update kit is also be available on the Fall 1985 tape.) The update kit fixes some minor bugs in F770TS and a obscure problem with unformatted reads that was not picked up by the Federal Verification tests. The update kit also makes anything associated with the word "VIRTUAL" work better - virtual jobs, virtual overlays, and virtual arrays.

If you have complained that FORTRAN-77/RT does not support virtual arrays under the SJ and FB monitors (XM is required for virtual arrays), then you'll want to get VIRDSK off the Fall 1985 tape. When VIRDSK.OBJ is linked with a FORTRAN-77 program using virtual arrays, an external disk file is used instead of extended memory to hold the virtual array data. With VIRDSK, you can now use virtual arrays under SJ and FB. Surprisingly, in some cases programs linked with VIRDSK that use the VM handler for the virtual data disk file actually run faster than programs that use the normal extended memory virtual array support.

I plan to pass on useful FORTRAN-77 information in this publication as frequently as I can, although I cannot promise something for every issue. Here is the tidbit for this month:

The FORTRAN-77 standard actually defines two levels: the full functionality, and subset (greatly reduced) functionality. VAX FORTRAN satisfies the full standard, while PDP-11 FORTRAN-77 (RSTS, RSX, and RT) satisfies the subset standard. However, VAX FORTRAN goes well beyond the full standard, incorporating many features that will become part of the next international FORTRAN standard, which is currently known as FORTRAN-BX. Likewise, PDP-11 FORTRAN-77 goes well beyond the subset standard, incorporating most of the features of the full standard. One of the things that PDP-11 FORTRAN-77 is missing is the CHAR function, which returns in a character variable the character corresponding to an ASCII code. If use of the CHAR function is kept sufficiently simple, the following MACRO subroutine, when linked with the user's program, will implement the CHAR function.

-----  
.TITLE CHAR ; 17-Oct-85

; Implementation of CHAR function for FORTRAN-77/RT.

; Robert Walraven  
; Multiware, Inc.

; Example usage:

```
; CHARACTER CHAR  
; CHARACTER*12 STRING  
; .  
; .  
; .  
; STRING (I:I) = CHAR (IVALUE)
```

; NOTE: This routine cannot be guaranteed to work in all cases  
; because the stack contents on entry to this routine  
; are not predictable, but depend on the nature of the  
; FORTRAN code. For example, if the call is from a main  
; routine, the top two items of the stack are the length  
; and address of the destination character variable, but  
; if the call is from a subroutine, R5 is pushed on the  
; stack just before the call, which effectively moves the  
; destination length and address down the stack. This  
; situation is detected in the following way: if R5  
; is pushed on the stack, it will contain the address of  
; the argument list for the calling subroutine, which will  
; always be located after address #1000. If R5 was not  
; pushed on the stack, however, the same stack location  
; will contain the destination length, which certainly  
; will not be over #1000. Therefore a comparison of this  
; stack item with the value #1000 will determine whether  
; the call was from a subroutine or a main program.  
; Unfortunately, if the FORTRAN code is sufficiently  
; complicated, additional things are pushed on the stack  
; before the call to CHAR, and in this case the routine will  
; fail. For this reason the CHAR function should not be  
; called with a complicated argument and the destination  
; variable should be a single character expression. For  
; example,  
; CHR = CHAR ( ICHAR( STRING(I:I) ) .AND. '137'0 )  
; and  
; CHR(2:7) = CHAR ( IVALUE )  
; will not work, but  
; CHR(2:2) = CHAR ( IVALUE )  
; will.  
;  
; Since this routine will not work in all cases, heed the  
; following warning:  
;  
; USE THIS ROUTINE AT YOUR OWN RISK!

```
CHAR::  CMP      -(SP),-(SP)      ; Add four items to the stack  
        CMP      -(SP),-(SP)      ;  
        MOV      10(SP),-(SP)     ; Move the return address to top  
        CMP      12(SP),#1000     ; Were we called from a subroutine?  
        BHI      10$              ; Branch if so  
        MOV      14(SP),10(SP)    ; Copy destination address  
        MOV      12(SP),6(SP)    ; Copy destination length  
        CLR      12(SP)          ; Clear original length  
        MOV      2(R5),4(SP)     ; Store source address  
        MOV      #1,2(SP)        ; Source is one character long  
        RETURN  
  
10$:   MOV      12(SP),2(SP)      ; Move saved R5 value  
        MOV      16(SP),12(SP)   ; Copy destination address  
        MOV      14(SP),10(SP)   ; Copy destination length  
        CLR      14(SP)          ; Clear original length  
        MOV      2(R5),6(SP)     ; Store source address  
        MOV      #1,4(SP)        ; Source is one character long  
        RETURN
```

.END

\*\*\*\*\*



Spring 1986 - RT-11 SIG - Tape Directory

\*\*\*\*\*

DECUS Symposium RT-11 SIG Tape

Spring, 1986  
Dallas, TX

Annotated Directory

\*\*\*\*\*

IMPORTANT

Read the file README.1ST, which contains SIG Tape copy instructions and new information for everyone.

NOTE! We are interested in maintaining the quality of the submissions to the RT SIG tape. Therefore, we welcome feedback regarding your use of these files, any bugs you find, and any bug fixes or improvements you devise. Please send any correspondence regarding the tape to:

John Crowell  
Crow4ell Ltd.\*  
145 Andanada  
Los Alamos, NM 87544  
(505) 662-3893

\* (But not very)

DCS - CROWELL

\*\*\*\*\*

Spring 1986 - RT-11 SIG - Tape Directory

VIRTUL - Subdevice retriever for RSTS.

E.F.Beadel, Jr., Manager  
CAUSE Instructional Computer Center  
SUNY at Oswego  
Oswego, NY 13126  
(315) 341-3055

This program allows RSTS/E users to break down the subdevice files from this tape after they have been copied to disk. It has been modified by David Smith, Galileo Computer Center, to remove a few bugs and to be able to read multi-segment directories. See README.1ST for details.

VIRTUL.BAS 1 File, 43 Blocks

\*\*\*\*\*

DIRTWO - Annotated tape directories, part 2.

R. W. Barnard  
Sandia National Laboratories  
Minicomputer Software Division 7523  
P. O. Box 5800  
Albuquerque, NM 87185  
(505) 844-5115

DIRTWO contains annotated directories of the DECUS Symposia RT-11 tapes from the Fall of 1981 through the Spring of 1986 (this symposium).

DIRTWO.DSK 10 Files, 483 Blocks

\*\*\*\*\*

Spring 1986 - RT-11 SIG - Tape Directory

CONVRT - Conversion Routines.

R. W. Barnard  
Sandia National Laboratories  
Minicomputer Software Division 7523  
P. O. Box 5800  
Albuquerque, NM 87185  
(505) 844-5115

The routines are FORTRAN-77 callable and provide conversion of BYTE (or CHARACTER) strings to and from INTEGER\*2 and INTEGER\*4 variables. They include:

- CVAI - Convert ASCII to Integer
- CVAJ - Convert ASCII to Integer\*4
- CVIA - Convert Integer to ASCII
- CVJA - Convert Integer\*4 to ASCII

These routines are updates of the ones submitted to the tape previously. The updates include the conversion of negative numbers and a reduction in size of the routines by changing the error format statements.

CONVRT.DSK 2 Files, 23 Blocks

\*\*\*\*\*

**Spring 1986 - RT-11 SIG - Tape Directory**

TSXLIB - Library of TSX+ System Services.

Nick Bourgeois  
NAB Software Services, Inc.  
PO Box 20009  
Albuquerque, NM 87154  
(505) 298-2346

TSXLIB is a library of FORTRAN callable routines that implement the TSX-Plus (\*) system services which are unique to TSX-Plus. The library has been updated to include all TSX-Plus unique services through TSX-Plus V6.01. These TSX-Plus library routines provide facilities to support communication lines, detached jobs, job status monitoring, real time program execution, spooler control, windowing, and many other features.

\* TSX-Plus is a trademark of S & H Computer Systems, Inc.

TSXLB1.DSK 4 Files, 465 Blocks  
TSXLB2.DSK 22 Files, 239 Blocks

\*\*\*\*\*

**Spring 1986 - RT-11 SIG - Tape Directory**

LDMNGR - Connect to a Subdevice file.

Daniel P. Graham  
Digital Software Systems, Inc.  
20 Bendix Place  
Lindenhurst, NY 11757  
(516) 225-1154

The CD program will mount one or more subdevice files, define a logical name pointing to each, and connect (assign DK:) to the first one specified. The default superior device is SY:, and the default subdevice file type is .DSK. The logical name chosen to point to a subdevice file is always the first 3 letters of its filename.

LDMNGR.DSK 4 Files, 48 Blocks

\*\*\*\*\*

**Spring 1986 - RT-11 SIG - Tape Directory**

ERRTXT - Translate Program Error numbers into text.

Daniel P. Graham  
Digital Software Systems, Inc.  
20 Bendix Place  
Lindenhurst, NY 11757  
(516) 225-1154

This program translates a FORTRAN error number n into a verbose error message text and displays that text on the user's terminal. If n is not specified, it will be requested. At present, only FORTRAN-IV and FORTRAN-77 are supported. Support for new languages may be added by editing the file PE.TXT. The program can hold up to four different error tables.

ERRTXT.DSK 7 Files, 233 Blocks

**Spring 1986 - RT-11 SIG - Tape Directory**

VIRDSK - Virtual-to-disk Mechanism.  
DOHAND - Diagnostic Overlay Handler.  
DATUTL - FORTRAN Utilities.

Robert Walraven  
Multiware, Inc.  
139 G Street, Suite 161  
Davis, CA 95616  
(916) 756-3291

These are three utility submissions to aid the development of user programs. They are repeated from the Fall, 1985, SIG tape.

VIRDSK - Module to force VIRTUAL arrays to a disk file rather than extended memory.

DOHAND - A diagnostic overlay handler that gives an error report if you try to destroy the return path in an overlaid program.

DATUTL - A collection of FORTRAN-callable subroutines to provide a variety of disk services.

VIRDSK.DSK 4 Files, 32 Blocks  
DOHAND.DSK 16 Files, 80 Blocks  
DATUTL.DSK 13 Files, 42 Blocks

\*\*\*\*\*

**Spring 1986 - RT-11 SIG - Tape Directory**

UCLPLS - User Command Language (UCL) Program.

William K. Walker  
Monsanto Research Corp.  
P. O. Box 32 OS-123  
Miamisburg, OH 45342  
(513) 865-3557

UCL+ is upward-compatible with the UCL distributed with RT-11, Version 5.1B and later. The version submitted to this tape is V07.54A, an update from all previous versions. UCL+ contains a number of extensions, including chaining to additional UCL's, "run-by-name", path definition, display of command expansions, etc. Symbols are defined by entering a "symbol definition string" in the format: symbol == definition. The DISPLAY command can be used to output ASCII strings to the console or printer (handy for sneaky escape sequences). This version includes the ability to "quote" characters, and to have several different parameters defined in the symbol.

This version of UCL+ supports many new features of RT-11 and TSX+. It can be used with TSX+ as a "User Command Interpreter" (UCI). It minimizes disk access to improve efficiency; included on this distribution is a "memory-resident" UCL.

UCLPL1.DSK 5 Files, 373 Blocks  
UCLPL2.DSK 15 Files, 290 Blocks

Spring 1986 - RT-11 SIG - Tape Directory

EMULAT - Pseudo-Handlers to emulate EIS, FIS, and FPU.

Paul Lustgraaf  
32 Carver Hall  
Iowa State University  
Ames, IA 50011  
(515) 294-0324

This is a collection of three pseudo-device handlers for RT-11 which will enable programs that require certain hardware to be run on PDP-11's that do not have that hardware. For example, FORTRAN-77 requires the FPU option, but the PDP-11/03 does not have that option. By using this package, F77 can be run on that machine. The handlers included are:

- EI - Supports EIS instructions plus a few others:  
(MUL, DIV, ASH, ASHC, XOR, SXT, SOB)
- FI - Supports FIS instructions as used on the 11/03 and 11/40:  
(FMUL, FDIV, FSUB, FADD)
- FP - Supports FPU instructions as used on 11/45, 11/23, etc.

EMULAT.DSK 9 Files, 149 Blocks  
\*\*\*\*\*

Spring 1986 - RT-11 SIG - Tape Directory

UNMAC - Object File to Source File Translator.

Robert Walraven  
University of California  
Applied Science  
Davis, CA 95616  
(916) 752-3300

This submission is repeated from the Spring, 1984, RT SIG Tape by popular demand. UNMAC is a FORTRAN program to convert an RT-11 object file into a source or listing file. Object files are much more useful to decode than SAV files because they contain information such as subroutine names, variable names, psect info, etc. This distribution contains complete sources and a command file for building UNMAC. The file UNMAC7.SAV is an executable version that was built with the FORTRAN-77 compiler.

UNMAC7.DSK 14 Files, 297 Blocks  
\*\*\*\*\*

Spring 1986 - RT-11 SIG - Tape Directory

DIALUP - "Filter" Program for Dialup Terminal Emulator Programs.

Maarten van Swaay  
Dept. of Computer Science  
Nichols Hall  
Kansas State University  
Manhattan, Kansas 66506  
(913) 532-6350

DIALUP is a front end for terminal emulators that handle communication with a remote host over dialup lines. It runs under RT11V4. DIALUP should not require modification of existing emulators: it is designed to be invoked from a command file that will subsequently start the appropriate emulator. DIALUP returns exception reports to monitor level by discarding or replacing the command file that called DIALUP. Therefore DIALUP need not be aware of the emulator for which it is establishing a connection. Furthermore it allows the user to control the consequences of DIALUP exceptions by means of command files, without any need to modify either DIALUP or emulators.

DIALUP.DSK 2 Files, 18 Blocks  
\*\*\*\*\*

The following four submissions were obtained from the DECUS Europe Symposium RT-11 SIG Tape from Fall, 1985, held in Cannes, France:

PPAPER - Real Programmers don't use Pascal.

A funny paper from the RT Magic session at Cannes.

.PPAPER.DSK 2 Files, 104 Blocks  
\*\*\*\*\*

HAMMON - Two little utilities.

Ian HAMMOND  
Hammond Software  
Stiegbreite 1  
D-3400 GOETTINGEN  
West Germany  
Tel.: + 551/21044

PSECT - This program lists all the .PSECT-lines. It extracts the essential information out of \*.MAP files produced by the linker.

SETDH - This program allows you to set the baud rate on a DHV-multiplexer by software.

HAMMON.DSK 3 Files, 11 Blocks  
\*\*\*\*\*

Spring 1986 - RT-11 SIG - Tape Directory

REINTS - some useful programs/routines.

ir. H. REINTS,  
AKZO PHARMA bv, dept. SDA,  
P.O. Box 20  
5340 BH Oss, Netherlands

The programs/routines are:

- CALCUL - Self-explaining calculator (VT100 only!!!)
- DISK - MOUNT LDn program, see DISK.TXT
- RDIR - Read/patch directories, see RDIR.TXT
- SEARCH - Search for printable ASCII blocks or keywords on a device or file, see SEARCH.TXT
- SQMAP - Squeeze load maps, see SQMAP.TXT
- UCL - Own written User Command Language, see first page of source, UCL.FOR.
- GONLIB - Library with FORTRAN callable goniometric functions that are not in the FORTRAN library, see GONLIB.TXT
- LOGDSK - Routine to get logical disk information, see source LOGDSK.MAC, used by DISK and RDIR.
- CTRLZ - Routine to check for ^Z typed, used by RDIR, see source CTRLZ.MAC.

Sample files include:

LD1.DIR Sample RDIR output file.  
 VITRO.SMP Sample SQMAP output file.  
 UCL.DAT Sample UCL data file.

REINT1.DSK 13 Files, 293 Blocks  
 REINT2.DSK 19 Files, 283 Blocks

\*\*\*\*\*

Spring 1986 - RT-11 SIG - Tape Directory

BASUTL - Extend BASIC with Executable Modules.

Marc HENRY de HASSONVILLE  
 Universite de LIEGE  
 Hopital de baviere  
 LIEGE  
 Belgium

Add executable modules (subroutines written in MACRO, FORTRAN..) in your BASIC 'workspace' for special I/O or speed of execution. Your subroutine callable by a basic program must be linked in .REL format and loaded in the workspace. To make this work, you must patch 6 words in your BASIC.SAV file.

BASUTL.DSK 19 Files, 106 Blocks  
 \*\*\*\*\*  
 DEVILS - Ambrose Bierce's Devil's Dictionary.  
 DEVILS.RNO  
 DEVILS.DOC  
 DEVILP.DOC  
 DEVLTT.DOC

Jim Williams  
 Digital Equipment Corporation  
 .16 Bemis Rd.  
 Pepperell, MA  
 (617) 433-6747

This is a machine-readable copy of Ambrose Bierce's Devil's Dictionary. The .RNO files are input to the Bonner Lab Runoff. The DEVILP.DOC and DEVLTT.DOC files are built for printers and CRTs, respectively. Please note that the .RNO and .DOC files have been reconstructed for the tape... the instructions in the file BUILD are not completely appropriate.

DEVILS.DSK 7 Files, 11 Blocks  
 DEVILS.RNO 1 File, 1027 Blocks  
 DEVILS.DOC 1 File, 1092 Blocks  
 DEVILP.DOC 1 File, 1074 Blocks  
 DEVLTT.DOC 1 File, 1113 Blocks  
 ALEDA - Experiment Development Library.

Dennis V. Jensen  
 Ames Laboratory ISU/ USDOE  
 258H Development  
 Ames, IA 50011  
 (515) 294-7909

Aleda is a FORTRAN package which allows the programmer to gain access to devices for interfacing and for user interaction. The package includes interface routines, a print server, and a console port switch. Several examples of command managers are given.

ALEDA1.DSK 12 Files, 309 Blocks  
 ALEDA2.DSK 36 Files, 476 Blocks  
 ALEDA3.DSK 22 Files, 396 Blocks  
 ALEDA4.DSK 58 Files, 297 Blocks

C - Second DECUS C Language Update for RT-11.

Submitted by:  
 Thomas J. Shinal  
 General Scientific Corporation  
 1684 East Gude Drive  
 Rockville, MD 20850  
 (301) 340-2773

Prepared by:  
 Norman Byers  
 Saturn Systems, Inc.  
 6875 Washington Ave. S., #218  
 Minneapolis, MN 55435  
 (612) 944-2452

This is the second full update release of the DECUS C distribution. It is not supported by the RT SIG, or anyone else in authority in DECUS. Some work on floating point math has been done, but its degree of cleanliness is not known. Included in this distribution are several useful utilities. Most of these can be found in subdevices C2514\* and C2526\*.

The files on the this tape are specific for RT-11. As much as possible, all VMS, RSX, etc, files have been expunged. A pre-built C compiler and library are provided. If you decide to build them yourself, try combining subdevices C2515\* and C2516\*.

DECUSC.DSK	15 Files, 319 Blocks	C2514C.DSK	5 Files, 485 Blocks
C2501A.DSK	3 Files, 53 Blocks	C2514D.DSK	5 Files, 484 Blocks
C2502A.DSK	21 Files, 140 Blocks	C2514E.DSK	16 Files, 483 Blocks
C2503A.DSK	62 Files, 262 Blocks	C2514F.DSK	8 Files, 486 Blocks
C2503B.DSK	26 Files, 314 Blocks	C2514G.DSK	27 Files, 486 Blocks
C2503C.DSK	5 Files, 486 Blocks	C2514H.DSK	22 Files, 111 Blocks
C2503D.DSK	11 Files, 486 Blocks	C2515A.DSK	104 Files, 413 Blocks
C2503E.DSK	5 Files, 347 Blocks	C2516A.DSK	29 Files, 188 Blocks
C2504A.DSK	57 Files, 251 Blocks	C2516B.DSK	16 Files, 486 Blocks
C2504B.DSK	5 Files, 486 Blocks	C2516C.DSK	80 Files, 420 Blocks
C2504C.DSK	9 Files, 486 Blocks	C2517A.DSK	52 Files, 291 Blocks
C2504D.DSK	28 Files, 486 Blocks	C2517B.DSK	29 Files, 335 Blocks
C2505A.DSK	9 Files, 342 Blocks	C2523A.DSK	63 Files, 350 Blocks
C2505B.DSK	33 Files, 411 Blocks	C2526A.DSK	37 Files, 381 Blocks
C2506A.DSK	5 Files, 286 Blocks	C2526B.DSK	10 Files, 486 Blocks
C2506B.DSK	8 Files, 265 Blocks	C2526C.DSK	15 Files, 486 Blocks
C2512A.DSK	69 Files, 382 Blocks	C2526D.DSK	30 Files, 486 Blocks
C2512B.DSK	23 Files, 196 Blocks	C2527A.DSK	25 Files, 309 Blocks
C2513A.DSK	72 Files, 226 Blocks	C2527B.DSK	42 Files, 224 Blocks
C2514A.DSK	6 Files, 486 Blocks	C2531A.DSK	90 Files, 356 Blocks
C2514B.DSK	15 Files, 485 Blocks		

\*\*\*\*\*

The Spring, 1986, RT SIG tape contains 72 Files, 24944 Blocks.

It was prepared by:

R. W. Barnard  
 Sandia National Laboratories  
 Division 7523  
 P. O. Box 5800  
 Albuquerque, NM 87185

DCS - BARNARD

It is available from the following sources:

DECUS NLO TAPE TREE c/o Robert N. Perry Tektronix, Inc. PO Box 500 MS: 19-333 Beaverton, OR 97077 (503) 527-5410	DECUS LIBRARY  DECUS Program Library BP02 249 Northboro Road Marlboro, MA 01752
--	--

DCS - PERRY

Selected portions of the tape are available for downloading from the following nodes:

Host:	General Scientific Corporation
Phone:	(301) 340-2776
Logon/PW:	DECUS/GUEST
Available:	6 PM - 8 AM (Eastern Time)
Protocol:	KERMIT and VTCOM/TRANSF
Host:	Sidlinger Computer Corporation
Phone:	(512) 344-4845
Logon/PW:	DECUS/GUEST
Available:	11 PM - 8 AM (Central Time)
Protocol:	KERMIT
Host:	RDB/ALPHA Systems & Software
Phone:	(513) 426-0344
Logon/PW:	DECUS/GUEST
Available:	8 PM - 6 AM (Eastern Time)
Protocol:	KERMIT and VTCOM/TRANSF

For more information on Electronic Distribution of the tape, please see the May, 1986, issue of the DECUS US Chapter SIGs Newsletter, in the RT-11 SIG section.

File date: 15-May-1986  
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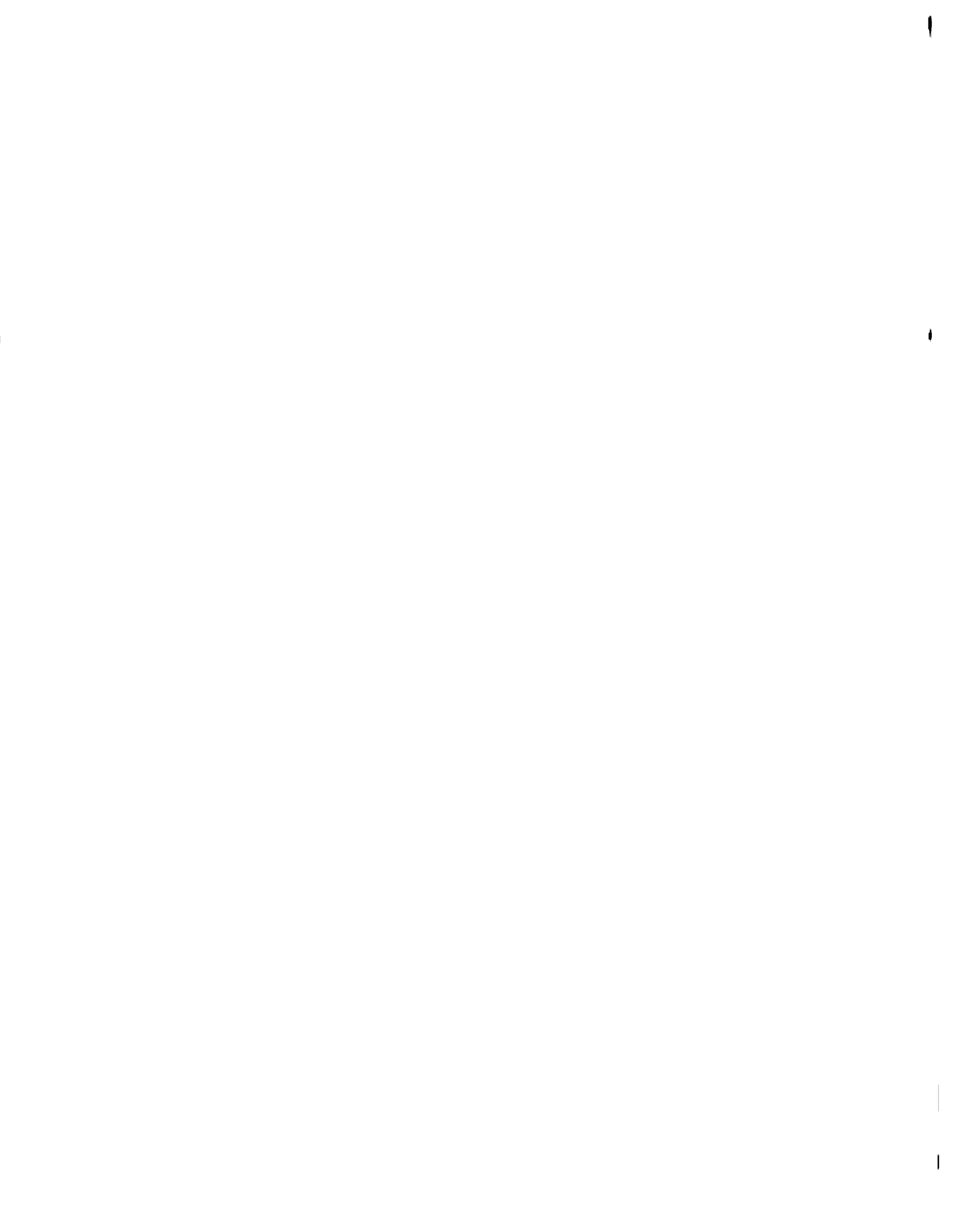
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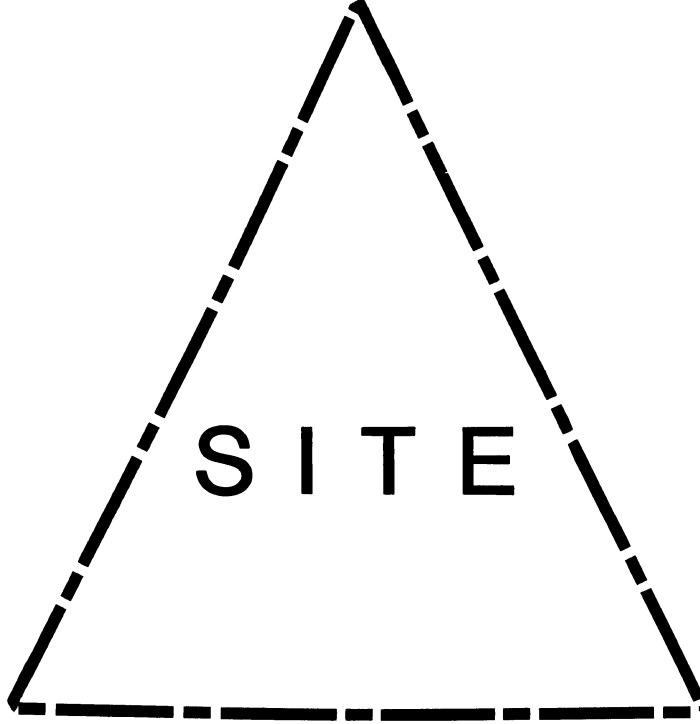
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---

Letter from the Editor

---

Welcome to the August issue of the Site Newsletter.

Oops! You probably missed us in the July Newsletter. Due to work load I missed the deadline. Apologies to all. We will resume the every other month schedule as of the September issue.

As of the Dallas Symposia Dave Hunt has retired as the Site SIG Chairman. Larry Hicks has taken over as chairman and there may be some new Steering Committee assignments in the coming months to ensure that all areas of responsibility are taken care of. The SIG Steering Committee will meet July 25th to discuss SIG projects and to make sure all organizational bases are covered. We will get any information from that meeting into the Newsletter as soon as possible so all SIG members are kept up to date.

Many thanks to Dave Hunt for all his hard work in behalf of the SIG. The SIG made very strong progress under Dave's leadership. Dave will still be associated with the SIG as a member of the steering committee. My personal thanks for all his help and support in my work with the SIG.

Articles are needed for up coming issues of the Site Newsletter. If you have an article, a Site Management hint, could transcribe a cassettes tape, (a fresh load of Dallas Site SIG Symposia session tapes have just arrived) or even just an idea for an article, I would like to hear from you. My address and phone number are listed below.

I can accept the following formats: 1600 or 6250 BPI magtape (VAX backup, ANSI, RT, DOS, etc.) RX01, RX02, RLO2, and RK05 disks in RT format, and TU-58's.

Gregory N. Brooks  
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---

Cable Management

---

With the advent of huge VAXclusters, bigger VAX machines, LANs, and the connecting of PC's to larger systems, and LAN's cable management has become more difficult for DEC system and site managers.

In the past, an old 11/34 may have had 16 lines hard wired to 16 terminals. Some of the lines may have had manual switches that allowed more than one device to connect to the line, but in general cable management was almost non existent. Every one on the system was a guru (at least they thought they were). They knew how to go thru the esoteric manuevers to connect, whatever, to the system.

Today, with VAXes and clusters capable of supporting hundreds of users, managing a site's cable plant can be a BIG job. Even small DEC sites are finding that the users of today want simple, fast, reliable access to the system(s) without the headaches of yesteryear.

To simplify accessing systems, the design and installation of the cable plant, and the selection and installation of any associated equipment must be carefully planned. System and site managers need to follow the basics of cable management from planning to implementation to allow for simple, reliable access.

#### Designing the Cable Plant

Cable plant is merely a fancy term for that conglomeration of cables that terminate inside your system and stretch out like a giant amblicle cord into various areas of your building(s).

The cable plant must be designed to meet the specific needs at a particular site. To design a cable plant, you must first determine what the cabling requirements are. What type of devices are to be connected, (RS232, switching systems, remote muxes, Ethernet, broadband, etc.) how many will be connected, and how will the cables be terminated. (what type of connectors are needed at each end)

At installation, cables are assigned and labeled with a unique identifier. (numbers, letters, or combinations) This is an arbitrary designation, but a labeling system can also be worked out which may make the cable labeling meaningful. (such as labels corresponding to room numbers, etc.)

Label designations and a description of its associated cable must be recorded. This list is refered to as the cable legend. The cable legend will serve as a master inventory list of cables and should always be kept up to date. A word processing file is very useful for this purpose.

A sample cable legend is shown below. It is short and simple, but illustrates the concept effectively

#### CABLE LEGEND

Room G5 (terminal room)

Label	Cable type
A	RS232C cable.
B	RS232C cable.
C	RS232C cable.
D	RS232C cable.
E	4 wire phone cable. (spare)
F	4 wire phone cable. (spare)

ROOM G6

Label	Cable type
I	RS232C cable.
J	4 wire phone cable. (spare)

Room G8

Label	Cable type
K	RS232C cable.
L	RS232C cable.
M	4 wire phone cable. (spare)

Room G13

Label	Cable type
G	RS232C cable.
H	RS232C cable. (for DECnet)

MUX CABLES

Cables connecting terminals and computer ports to the two muxes are labeled #0-7 according to the channel numbering of the muxes.

The mux connects various computer ports to the following offices.

Mux channel 0	G1 office.
Mux channel 1	G19 office.
Mux channel 2	G13 Conference room.
Mux channel 3	G14 office.
Mux channel 4	G17 printer room
Mux channel 5	G4 office.

Terminal Assignment Tracking

Once the cable plant is in place, you must keep track of the devices connected to it. This can be done in a number of ways. One way is to write assignments on write on labels inside a patch panel cabinet. If changes are not so dynamic, a WP file listing the assignments can be updated as changes are made and referred to when ever changes are necessary.

An example of the latter is shown below.

TERMINAL PORT ASSIGNMENTS

Port	Virtual	Description	Cable I.D.
TXA0:		DECnet 9.6kbaud. DDCMP	
TXA1:	VTA	Modem, 1200 baud. syspass.	Cable R
TXA2:	VTA	Modem, 1200 baud. syspass.	Cable S
TXA3:	VTA	Office (G6) autobaud.	Cable I
TXA4:	VTA	Office (G8) autobaud.	Cable K
TXA5:	VTA	Office (G8) autobaud.	Cable L
TXA6:	VTA	Office (G4) autobaud.	Cable Mux.5
TXA7:		Virt. term. line, autobaud	no label
TXA8:		Term. room(G5) autobaud.	Cable C
TXA9:	VTA	Office (G8),autobaud.	Cable Mux.6
TXA10:	VTA	Office (G1) autobaud.	Cable Mux.0
TXA11:	VTA	Office (G19) autobaud.	Cable Mux.1
TXA12:	VTA	Conf. room (G13) autobaud.	Cable Mux.2
TXA13:	VTA	Office (G14) autobaud.	Cable Mux.3
TXA14:		OkI. printer (G17), 9600 baud.	Cable Mux.4
TXA15:		Trilog printer, 19.2kbaud.	

Cable Wiring

It is also an excellent idea to keep a record of cable/connector wiring. This is especially true with RS 232 cables since they can vary so widely. (modem, null modem, etc.)

Along with keeping records on the wiring of the cables and connectors, each cable, and/or connector must be identified with some designation so the wiring record can be matched to individual cables.

For instance, cables can be identified as modem or null modem types. Null modem printer cables, modem printer cables, null modem cables with special connections, etc. Decide what works best at your site and is easily understood by all personnel involved.

A sample of a cable wiring records is shown below.

CABLE WIRING

Mux cables (to terminals and computer ports)

DB 25P pin #	DB 25S pin #
1-----	1
2-----	2
3-----	3
4-----	4
5-----	5
6-----	6
7-----	7
20-----	20

Cables are modem type cables.

Direct terminal cables.

DB 25P pin #	DB 25S pin #
1-----	1

2-----	3
3-----	2
4-----	4
5-----	5
6-----	6
7-----	7
20-----	20

Cables are null modem type cables.

Modem cables. (computer ports to modems)

DB 25P pin #	DB 25S pin #
1-----	1
2-----	2
3-----	3
4-----	4
5-----	5
6-----	6
7-----	7
8-----	8
20-----	20
21-----	21
23-----	23

Cables are modem type cables.

Okidata printer cables.

DB 25P pin #	DB 25S pin #
1-----	1
2-----	3
3-----	2
4	4
5	5
7-----	7
6	6
20	20

Cables are null modem types with other special characteristics.

Trilog printer cable.

DB 25P pin #	DB 25S pin #
1-----	1
2-----	3
3-----	2
4	4
5	5
7-----	7
6	6
20	20

Cables are null modem types with other special characteristics.

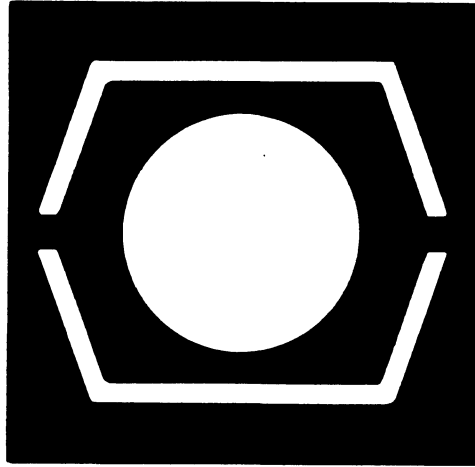
Cable management is one of the necessary evils of site and system management. Done effectively, it will add to the productivity of users and prevent the system personnel from constantly tracking down problems related to the cable plant, and will serve to increase the confidence users have in their system personnel.

Regardless of the size of the site, cable management boils down to these basic concepts. Determining cable needs, proper installation, proper labeling, and religious record keeping.

Conclusions



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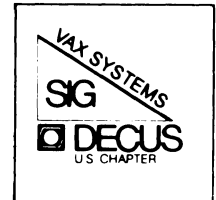


# NEWSLETTER OF THE VAX SYSTEMS SIG



# Pageswapper

*Our Mascot*



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General material for publication in the Pageswapper should 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.

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249 Northboro Road (BPO2)  
Marlborough, MA 01752  
USA

Only if discrepancies of the mailing system are reported can they be analyzed and corrected.

## Editor's Workfile

by Larry Kilgallen, Pageswapper Editor

VAXnotes has arrived -

45 days after the announcement/order date. You will find I/Os in this issue are in the form of a Notes extract (moved toward the front of the Pageswapper in honor of the event). Also, as promised, I have excerpted the VAXSIG conference from the Notes demonstration at the DECUS US Chapter Spring 1986 Symposium in Dallas. That excerpt also gives a bit of a better flavor for the interactive nature of Notes conferences, and I hope some indication of what could be accomplished in the way of Pageswapper IOs using the Notes software.

## INPUT/OUTPUT

A SIG Information Interchange

A form for INPUT/OUTPUT submissions is available at the back of the issue.

For information about on-line submission to the Pageswapper dial:

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(in the United States) using a 1200 baud modem and log in with the username PAGESWAPPER.

May 29, 1986

```
=====
Note 477.1      Using incoming modems as outgoing modems      1 of 1
NODE::PAGESWAPPER "Offline Submission"      23-JUN-1986 22:06
-< Another Incoming/Outgoing Modem Security Hazard >-
-----
```

It is evident to me that IO 493 and 497 do not address the principal problem with using an incoming modem for out-going calls. A port used for an incoming modem must be defined as /MODEM so that VMS will stop the active process if the line is disconnected. Failing to stop the process is an obvious security exposure; without /MODEM, VMS can't see the loss of carrier. Unfortunately, with /MODEM VMS insists upon seeing CD and/or DSR before it will send any output and will ignore any input without CD and/or DSR. Using an autodial modem is therefore impossible unless you strap CD high on the modem. But that defeats the ability to detect a disconnect. Does anybody have a real solution to this problem?

Dave Close  
Anadex/Printronix  
1080 Avenida Acaso  
Camarillo, CA 93010

Telephone: 805/987-9660

```
=====
Note 487.1      RX02 Drive Errors      1 of 1
NODE::PAGESWAPPER "Offline Submission"      22-JUN-1986 20:38
-< DYDRIVER Problems >-
-----
```

We have at least three DSD440 RX02 look-alikes running on VAX-11/750's that show symptoms almost identical to Dr. Branham's RX02. We can initialize some diskettes, but not others. If we format the diskettes using the drive's "hyperdiagnostics" mode (stand-alone), then we can use them all.

Robert R. Horning  
Mail Stop B270  
Los Alamos National Laboratory  
Post Office Box 1663  
Los Alamos, NM 87545

Telephone (505) 667-5113

```
=====
Note 496.1      Word Processing similar to Wang      1 of 1
NODE::PAGESWAPPER "Offline Submission"      23-JUN-1986 22:14
-< Word Processing similar to WANG >-
-----
```

WORDMARC Composer is very similar in user interface to WANG word processing and it runs on VAXen and many other systems, supporting many terminal and printer types. See the SolveWare Systems Ad in the Dec Pro or similar magazines.

Jim Cutler  
Electronic Data Systems  
26533 Evergreen  
Southfield, MI 48086-5121  
Telephone: 313 262 5572

```
=====
Note 505.0      RMS Tape Block Sizes      No replies
NODE::PAGESWAPPER "Offline Submission"      22-JUN-1986 20:38
-----
```

Is there any way around RMS's insistence that tape block sizes be a multiple of 4? We need to be able to write tapes with arbitrary block sizes to insure compatibility with non-DEC systems.

Bert Kritzer  
Department of Political Science  
University of Wisconsin  
Madison, WI 53706

Telephone (608) 263-2414

## LA50 Queue Facility

James R. Cutler  
Electronic Data Systems Corporation  
Communications Services Division  
26533 Evergreen  
Southfield, Michigan 48086-5121

6 June 1986

### Preface

When I connected my LA50 directly to the VAX and set up a private print queue, I found that I could not send an escape sequence to adjust the margins. My RUNOFF output could be adjusted to print nicely, but printouts of command files that were punched for my notebook had text missing. I was delighted to discover the VAX/VMX version 4 printer form capabilities. I immediately created a queue setup file to define several useful forms and to create and start the queue. The method I used is applicable to other printers, such as laser printers.

The LA50 escape sequences control horizontal and vertical pitch, dot density, bold and underlined rendition, and selection of character sets. I created individual form control text library modules for controlling each of these. Margin settings, page size, and which setup modules are used is controlled using form definitions.

The resulting LA50 print queue system is private to my group, but the form definitions are available to the entire system.

### Forms Defined

We use three types of forms, unmodified output, notebook output with left margin for punching, and special forms. The default form is twelve-pitch, six lines per inch, zero margins, ASCII as

the G0 character set, and VT100 Special Graphics as the G1 character set. The form description text indicates the variations from the system default form.

Form name	Description
BIG_PRINT	48 col Letter 6 cpi 4 lpi
DEFAULT	System-defined default
DOCUMENT	96 col Letter
DOCUMENT_10	80 col Letter
DOCUMENT_16	132 col Letter
DRAFT	96 col Draft
DRAFT_10	80 col Draft
LA50_DEFAULT	96 col Draft
LINE_DRAWING	80 col Bold 8 lpi
LISTING	132 col Draft
NOTEBOOK	96 col Draft LM 12
NOTEBOOK_10	80 col Draft LM 10
NOTEBOOK_16	132 col Draft LM 17
PRETTY_NOTEBOOK	96 col Letter LM 12
PRETTY_NOTEBOOK_10	80 col Letter LM 10

### Form and Queue Definition

The command procedure, `TERMINAL_PRINT_QUEUE`, is used at system boot time to define the forms, set the terminal port characteristics, spool the device, and init/start the queue itself. Note that the queue is NOT defined as a terminal queue. The Job Controller will figure that out. The procedure receives the name, queue name, and queue owner as parameters. The protection and ownership of the queue is set to make the queue private to the user group.

The first part of the procedure is standard boilerplate for any command file, giving history and interface information.

```
#!++ terminal_print_queue.com
#!
#!      25 May 1986      J. R. Cutler
#!
#!      This procedure is called at boot time to initiate a
#!      private print queue. The queue manager must be
#!      active before this procedure is invoked.
```

```

$!
$! Inputs:
$!   print_terminal   parameter 1
$!   queue_name      parameter 2
$!   queue_owner     parameter 3
$!
$! Effects:
$!   o Several forms are defined
$!   o The terminal characteristics are set
$!   o The terminal is set spooled
$!   o The queue is defined and started
$!
$!--
$!   LA50 PRINTER DEVICE and QUEUE NAME
$
$   print_terminal   = p1
$   queue_name       = p2
$   queue_owner      = p3
$
$   if print_terminal .eqs. "" then exit 274
$   if queue_name     .eqs. "" then exit 274
$   if queue_owner    .eqs. "" then exit 274

```

The form library is defined as a symbol for convenience to minimize edit required for other uses.

```

$!   DEVICE CONTROL LIBRARY
$
$   form_library     = "LA50_DEVCTL"

```

The next section defines the forms. The system-defined default form, DEFAULT, uses standard stock so that print from within MAIL will proceed. The LA50 form numbers are calculated, rather than hard coded, so that forms may be added or removed at will without having to manually calculate a form number. For brevity, I have omitted several form definitions from this example. The entire queue system described was placed in the MIVAX LUG library and will be on the next DECUS Symposium tape under the MIVAXLUG tree.

There are two important points to remember here. First is that the four margins, banner width and truncation or wrap width are set as part of the form definition. The second is that form setup may include any number of modules to produce the desired printer response.

```

$!   DEFAULT FORM

```

```

$
$   define /form  DEFAULT          0
$           /stock=standard -
$
$!   LA50 FORMS
$
$   form_number = 51   ! Arbitrary start
$
$   define /form  LA50_DEFAULT     'form_number' -
$           /description=" 96 col Draft" -
$           /setup=(defaults) -
$           /stock=standard -
$           /nottruncate -
$           /width=96
$
$   form_number = form_number + 1
$
$   define /form  BIG_PRINT        'form_number' -
$           /description=" 48 col Letter 6 cpi 4 lpi" -
$           /setup=(cpi_6,lpi_4,density_enhanced,rendition_bold_on) -
$           /stock=standard -
$           /truncate -
$           /width=48
$
$   form_number = form_number + 1
$
$   define /form  DOCUMENT        'form_number' -
$           /description=" 96 col Letter" -
$           /setup=(cpi_12,density_enhanced) -
$           /stock=standard -
$           /nottruncate -
$           /width=96
$
$   form_number = form_number + 1
$
$   define /form  DRAFT           'form_number' -
$           /description=" 96 col Draft" -
$           /setup=(cpi_12) -
$           /stock=standard -
$           /nottruncate -
$           /width=96
$
$   form_number = form_number + 1
$
$   define /form  LINE_DRAWING    'form_number' -
$           /description=" 80 col Bold 8 lpi" -
$           /setup=(cpi_10,lpi_8,rendition_bold_on) -
$           /stock=standard -
$           /width=80
$
$   form_number = form_number + 1
$
$   define /form  NOTEBOOK       'form_number' -

```

```
        /description=" 96 col Draft LM 12" -  
        /margin=left=12 -  
        /setup=(cpi_12) -  
        /stock=standard -  
        /truncate -  
        /width=96  
$ form_number = form_number + 1  
$  
$ define /form PRETTY_NOTEBOOK 'form_number' -  
        /description="96 col Letter LM 12" -  
        /margin=left=12 -  
        /setup=(cpi_12,density_enhanced) -  
        /stock=standard -  
        /truncate -  
        /width=96  
$ form_number = form_number + 1  
$
```

Terminal parameters are set here to override any system default settings. Our site uses port-powered line drivers so we use /MODEM.

```
$!      TERMINAL SETUP  
$  
$ set noon  
$  
$ set terminal 'print_terminal': -  
    /perm /speed=4800 /device=lal00 -  
    /modem /nohang /page=66 /width=132 -  
    /nowrap /nobroad /dma -  
    /noupper /noset_speed  
$  
$ set device /spooled 'print_terminal'
```

Startup of the queue includes designation of a default module to be issued at the end of the job (/separate) as well as using /schedule=nosize to make the queue First In - First Out. Protections make the queue private to the user group.

```
$!      QUEUE INITIALIZE/START  
$  
$ initialize /queue /start 'queue_name' -  
    /on='print_terminal': -  
    /form=la50_default -  
    /default=(noburst,nofeed,noflag,notrailer) -  
    /noenable_generic -  
    /schedule=nosize -
```

```
        /library='form_library' -  
        /separate=reset=defaults -  
        /owner='queue_owner' -  
        /protection=(S:rwed,o:rwed,g:rwed,w)  
$  
$ exit
```

#### Activating the Queue

The system startup procedure calls the terminal queue setup, specifying the terminal port, queue name, and queue owner.

```
$!      GMNET_PRINT QUEUE  
$  
$ gmnet_print_terminal = "TXD5"  
$ gmnet_queue_name     = "GMNET_PRINT"  
$ gmnet_queue_owner    = "[GMNET]"  
$  
$ @dev$jrc:[la50_control]terminal_print_queue -  
    'gmnet_print_terminal' -  
    'gmnet_queue_name' -  
    'gmnet_queue_owner'
```

The resulting queue is

```
$ SHOW QUEUE /DEVICE /FULL /ALL GMNET_PRINT
```

```
Remote terminal queue GMNET PRINT, on TXD5:  
/BASE_PRIORITY=4 /NOENABLE_GENERIC  
/FORM=LA50_DEFAULT /LIBRARY=LA50_DEVCTL  
Lowercase /OWNER=[GMNET,*]  
/PROTECTION=(S:RWED,O:RWED,G:RWED,W)  
/SCHEDULE=(NOSIZE) /SEPARATE=(RESET=(DEFAULTS))
```

#### Form Control Library for the LA50

The form control library is created from individual text modules containing escape sequences for particular control functions. These are called for by form definitions as needed. Note that

the Job Controller requires the library to be in SYS\$LIBRARY and also **requires it to be version 1**. The following command sequence is used to create the form library.

```
$!++ la50_library_create.com
$!
$!      5 May 1986      J. R. Cutler
$!
$!      Create a new LA50 device control library
$!--
$      la50_library = "SYS$LIBRARY:LA50_DEVCTL.TLB;1"
$      if f$search( la50_library ) .nes. "" then -
$          delete 'la50_library'
$
$      library /create /text /log 'la50_library'
$      set protection=(o:rwd,w:re) 'la50_library'
$
$      library /replace /text /log 'la50_library' *.TXT
```

#### LA50 Device Control Modules

I created the text modules for controlling the LA50 with EDT, since EDT makes inserting and viewing control characters easy to do. <ESC> is the actual escape character - what is printed here is what EDT shows on the screen as the file is edited.

- . CPI\_10.TXT - <ESC>[0w  
Set horizontal pitch to 10 characters/inch.
- . CPI\_12.TXT - <ESC>[2w  
Set horizontal pitch to 12 characters/inch.
- . CPI\_16.TXT - <ESC>[4w  
Set horizontal pitch to 16.5 characters/inch.
- . CPI\_5.TXT - <ESC>[5w

- Set horizontal pitch to 5 characters/inch.
- . CPI\_6.TXT - <ESC>[6w  
Set horizontal pitch to 6 characters/inch.
- . CPI\_8.TXT - <ESC>[8w  
Set horizontal pitch to 8 characters/inch.
- . DEFAULTS.TXT - <ESC>\<ESC>[0m<ESC>(B<ESC>0  
Exit graphics mode, reset graphic rendition, select ASCII as G0 character set, select VT100 Special Graphics as G1 character set.
- . DENSITY\_ENHANCED.TXT - <ESC>[2"z  
Select enhanced density (near letter quality) printing. This has no effect at 16.5 cpi or when using VT100 Special Graphics characters.
- . DENSITY\_NORMAL.TXT - <ESC>[0"z  
Select normal density printing.
- . LPI\_12.TXT - <ESC>[3z  
Set vertical pitch to 12 lines/inch.
- . LPI\_2.TXT - <ESC>[4z  
Set vertical pitch to 2 lines/inch.
- . LPI\_3.TXT - <ESC>[5z  
Set vertical pitch to 3 lines/inch.
- . LPI\_4.TXT - <ESC>[6z  
Set vertical pitch to 4 lines/inch.
- . LPI\_6.TXT - <ESC>[0z

- Set vertical pitch to 6 lines/inch.
- . LPI\_8.TXT - <ESC>[2z
- Set vertical pitch to 8 lines/inch.
- . RENDITION\_BOLD\_OFF.TXT - <ESC>[22m
- Turn off bold printing.
- . RENDITION\_BOLD\_ON.TXT - <ESC>[1m
- Turn on bold printing. This has no effect at 16.5 cpi.  
DENSITY\_ENHANCED takes precedence over  
RENDITION\_BOLD\_ON.
- . RENDITION\_RESET.TXT - <ESC>[0m
- Reset graphic rendition.
- . RENDITION\_UNDERLINED\_OFF - <ESC>[24m
- Turn off underlined printing.
- . RENDITION\_UNDERLINED\_ON - <ESC>[4m
- Turn on underlined printing.

#### Using the LA50 Queue

I defined several DCL command symbols to make it more convenient to use the special forms and the LA50 queue. Only the most popular have DCL symbols. For others, the form is specified as part of the print command.

```
$ print      ::= "print /notify /queue=gmnet_print"  
$  
$ docprint  ::= "'Gprint' /form=document"  
$ draftprint ::= "'Gprint' /form=draft"  
$ listprint  ::= "'Gprint' /form=listing"  
$ notebook  ::= "'Gprint' /form=notebook"  
$ qform     ::= "show queue /form"
```

```
$ qp*rint   ::= "show queue /device /full /all gmnet_print"  
$ qset      ::= "set queue gmnet_print"
```

#### Conclusion

The effort put into researching the LA50 control sequences and mining the VAX/VMS document set for queue, device, and text library information were well worth the effort. We can get printout exactly as we want it (within the printer capabilities) and have local control of our own printer queue. You can use these techniques for your laser printer and put your results into the DECUS Symposium tape, too.





```
OLD> 'CMPB #23, (R4)' ! Change check for '#'
OLD> exit
NEW> 'CMPB #21, (R4)'
NEW> exit
old:    DIAL_ROUTINE+1C:  CMPB    #23,(R4)    ! Was '#'
new:    DIAL_ROUTINE+1C:  CMPB    #21,(R4)    ! Now '!'
PATCH>replace/instr 00FF
OLD> 'CMPB #23, (R4)' ! Change this '#' check, too
OLD> exit
NEW> 'CMPB #21, (R4)'
NEW> exit
old:    DIAL_ROUTINE+6D:  CMPB    #23,(R4)    ! Was '#'
new:    DIAL_ROUTINE+6D:  CMPB    #21,(R4)    ! Now '!'
PATCH>update
%PATCH-I-WRTFIL, updating image file SYS$$SYSROOT:[SYSLIB]DTE_DF2
24.EXE;3
PATCH>exit
$!
$ purge DTE_DF224.EXE ! Clean up previous versions
$ install add SYS$LIBRARY:DTE_DF224.EXE ! Got to be installed
$!
$!
$! the following DCL command will do the connection
$! if your phone system is DTMF, start number with T, else P
$! (for pulse)
$! end the number with the (required) '!'
$! replace the TTan: with the correct tty line
$! which should be set to the right speed, and modem, etc
$!
$ set host/dte/dial=(number:"T5551212!",modem:DF224) TTan:
$!
$!Good luck!
```

## Special Images included with VAX APL V2.1

Shota Aki  
APL Development Team  
Digital Equipment Corporation

As part of the VAX APL V2.1 support of the APL character set for the VT200 series terminals, two special images are included as part of the installation kit.

- o APLSHR,EXE, a shareable image containing privileged utility routines.
- o PCDRIVER.EXE, an image containing device driver code that supports the handling of pseudo-terminals.

Since APLSHR provides VAX APL access to privileged code, its installation requirements are different from other images residing on the V2.1 kit. APLSHR must be installed as a shareable, protected image on all of the VAX/VMS systems that will be running VAX APL and using the VT200 terminal support.

The following describes the steps to be taken by a system manager to properly install APLSHR.EXE. The instructions assume that the user's current default directory is SYS\$SYSTEM,

- o Make sure that APLSHR.EXE has been correctly copied to SYS\$SHARE by the VAX APL installation procedure. Verify that the image is owned by SYSTEM, and that its file protection allows read and execute access to the world.
- o Define the install utility as a foreign command:

```
$ INSTALL := $SYS$SYSTEM:INSTALL/COMMANDMODE
```
- o Invoke the install utility, and install APLSHR.EXE with the following commands:

```
$ INSTALL
ADD
SYS$SHARE:APLSHR/SHAREABLE/PROTECTED/OPEN/HEADERRES
```

\*\*\* important \*\*\* - the /PROTECTED qualifier must be

specified for the installation to succeed.

PCDRIVER.EXE does not have to be installed, but instead it must be "loaded" via the DCL command procedure SYS\$LIBRARY:PCLOADER.COM which is provided by the VAX APL installation kit. This procedure loads the device driver code and makes the appropriate pseudo-terminal devices known to the system. This may be done while time-sharing is underway on the system.

The following illustrates the steps for loading PCDRIVER:

- o Verify that PCDRIVER has not already been loaded by executing the DCL command SHOW DEVICE.

```
$ SHOW DEVICE PC
```

If you get the following response then the PC device is already loaded:

Device Name	Device Status	Error Count
PCA0:	Unavailable alloc	0

```
$ SHOW DEVICE PTY
```

If you get the following response then the PTY device is already loaded:

Device Name	Device Status	Error Count
PTY0:	Unavailable alloc	0

If the system acknowledges the existence of both devices then loading PCDRIVER is not necessary. This situation may occur if your system is running the VAX DTM product which also ships PCDRIVER.EXE. If VAX DTM has already been installed then it is very likely that PCDRIVER.EXE has been "loaded" also.

- o Otherwise, make sure that PCDRIVER.EXE has been correctly copied to SYS\$SYSTEM by the VAX APL installation procedure. Verify that the image is owned by SYSTEM, and that its file protection allows read and execute access to the world.

Execute the DCL procedure PCLOADER.COM:

```
$ @SYS$LIBRARY:PCLOADER
```

The above command should be inserted in your SYS\$MANAGER:SYSTARTUP.COM procedure to automate the loading of PCDRIVER.EXE.

- o Verify that PCLOADER.COM was successful by repeating the SHOW DEVICE commands in the first step.

## How Secure is Your Ethernet LAN?

or  
\*"I/O Trojan Horse Away!!!"\*

by  
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Pageswapper Editor's Note

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\*A Trojan Horse: \* any software package installed on your  
system --- particularly one that uses elevated  
privileges --- that either intentionally or  
unintentionally does something other than  
what it was advertised to do.  
-----

Congratulations on being the proud 1)owner, 2)manager or 3)user  
--- select whichever is appropriate in your case --- of an  
Ethernet Local Area Network connected to your VAX System. If  
your facility is like our facility and you have a number of DEC  
VAX, PDP-11, Terminal Servers, SNA Gateways etc., all  
interconnected via Ethernet, you know just how nice Ethernet can

be. Even if you are simply using Ethernet to interconnect two  
VAX's in a simple two-node DECNET network, you no doubt have  
found out how powerful DECNET, Ethernet and Local Area Networks  
really are. (For the remainder of this article I will refer to  
Ethernet and its compatible protocol mate, IEEE 802.3, as simply  
Local Area Networks or 'LAN' for short.)

However, with the added flexibility of the LAN comes the need  
for network security. In general, DECNET provides a reasonably  
good measure of network security features and, although you  
sometimes have to dig to get at it, a good amount of  
documentation is available to describe these features. The  
problem becomes more acute when other vendors' non-DECNET  
equipment is added to the same physical LAN cable plant.  
Finally, these issues become even more critical when protocol  
translator packages are installed on your VAX system in order to  
communicate with these other networks over the same physical LAN  
cable plant.

In this article, I will relate some incidents that I recently  
encountered that caused me to be a bit more aware of possible  
\*Trojan Horses\* and their effects on system integrity and  
network security. Additionally, I will try to outline some  
common-sense guidelines that you should keep in mind in order to  
identify and hopefully minimize the risks involved by the  
addition of any software package to your system.

Before we begin our discussion on \*Trojan Horses\* and network  
security, let's lay some basic ground-work on LAN's. I have  
taken the liberty of dividing LAN's into three categories for  
the purpose of our discussion. These are:

- o Homogeneous LAN's
- o Partitioned Heterogeneous LAN's
- o Non-Partitioned Heterogeneous LAN's

Once we have defined these three categories, you should be able  
to determine in which category your LAN falls. You may also  
find that someone in your organization is already making plans  
to use your Ethernet cable plant for something other than  
DECNET. If this is the case, you should be able to identify  
which category you will soon be in and be better prepared to  
handle the problems that will soon occur.

**\*HOMOGENEOUS LAN's\***

If you are lucky enough to be one of those who happen to be using your very own private Ethernet LAN cable plant for DECNET, then you fall into the category of LAN's that I refer to as "Homogeneous LAN's". That is to say, all nodes on the network transfer information between each other using the same upper layer protocol (in our case DECNET's DNA protocol). This is obviously what DEC would like to see but as I will point out shortly, this is not always the case. In fact, after observing some trends in technology, I would say that many Homogeneous LAN's will soon give way to one of two types of Heterogeneous LAN's: Partitioned or Non-Partitioned.

**\*PARTITIONED HETEROGENEOUS LAN's\***

DEC is not the only vendor that has recognized the power of Local Area Networks and has jumped on the LAN bandwagon. Today we are seeing LAN technology becoming an integral part of many new data processing and engineering products at an astounding rate. Terminal servers, file servers, distributed processing and PC networking all use LAN technology as the corner-stone of their product.

As a result of the numerous applications of LAN's in use today (and more on the way), it is highly probable that your facility will someday -- if not already -- have in place more than one LAN. In addition, since there's been a growing push towards networking standards, it is very likely that these LAN's are all at least compatible with IEEE 802.3 standard and can operate on the same physical cable plant. Since the IEEE 802.3 standards really only defines the physical and transport layers of the protocol, the upper layers generally differ from vendor to vendor (DEC uses DNA, HP uses --- in some cases --- a form of TCP/IP, others use XNS and so on and so on). If two or more of these vendors are operating on the same physical plant but without communicating with other vendors' equipment, we have what I refer to as a 'Partitioned Heterogeneous LAN'. Until recently, our facility fell into this category. We had HP, DEC, 3Com, Daisy and a few other vendor products peacefully coexisting on the same cable but without any form of information transfer across vendor boundaries.

This type of LAN seems to work quite well (at least it has in our case) if everyone sticks to a protocol standard and packet type that has been licensed by Xerox. There are some vendors, however, that have not licensed their packet type with Xerox (we have one currently on our LAN). This is not a problem as long as such vendors are kept on their own Homogeneous LAN's or no one else uses their self-assigned packet type in a Heterogeneous LAN. However, if Xerox ever does grant a license for that vendor's self-assigned packet type to another vendor, there could be some serious LAN performance problems in a Heterogeneous LAN environment.

**\*NON-PARTITIONED HETEROGENEOUS LAN's\***

"Partitioned Heterogeneous LAN's" are actually only phase I of the evolutionary cycle of multi-vendor LAN's. Phase II of the evolutionary cycle begins when a software package is installed on one or more of the nodes in the "Partitioned Heterogeneous LAN", that will translate one vendor's protocol to another vendor's protocol and vice versa. These nodes then become Gateway nodes between the two networks. At this point we have what I refer to as a "Non-Partitioned Heterogeneous LAN": a LAN capable of transferring information (typically files) between nodes of different vendor types and using different protocols. "You mean like DEC's SNA Gateway?", you might ask. Well, yes and no. Remember, the SNA Gateway translates DNA protocol on the Ethernet LAN to IBM's SNA network on a completely separate communications line. These Gateways translate one protocol to another and put it back out on the same physical communications medium.

Phase II has already begun as more vendors come out with software packages which run on your VAX system that translates DNA to their particular protocol (and vice versa) over the LAN. It is just such third-party software packages that bring us to our main area of concern for our network security.

**\*FILE-TRANSFER UTILITY OR TROJAN HORSE?\***

Our facility has now moved into the category of a "Non-Partitioned Heterogeneous LAN" as we have installed two third-party software packages that cause the VAX to operate as a Gateway node. I didn't think much about it when the first package was brought to me by a user who wanted to do file transfers between the VAX and the HP-9000. The package was

written by HP and was designed to make the VAX look like a node on HP's network. (I was a little disappointed --- being the biased person that I am --- that HP didn't do the opposite and write a package to run on their HP-9000 to look like a DECNET node.) It wasn't until another user brought me a package for a PC-LAN product to do not only file transfers, but also do virtual terminal and file server operations that I balked. I had to ask myself, "What do I know about these software packages that I am installing?"

I decided to take the time to take a closer look at what I was doing. What I found was this: both of these packages required images to be installed that ran with elevated privileges and quotas and could create other such processes within our VAX system. These processes in turn, somehow connected (the documentation didn't explain exactly how) to computing resources outside of our DECNET environment. When I stopped to think about what I was doing I found that it was very simple:

\*I was making 'hot-line' connections directly from the heart of our VAX system to the outside world with little or no knowledge of what those 'hot-line' connections did.\*

That wasn't the half of it. Not only were these connections to the heart of our VAX system, they were also connections to just about anywhere in the our DECNET network since the VAX could be used as a gateway node to any other node in the DECNET network. \*Talk about playing Russian Roulette with your network's integrity!\*

With DECNET, you at least have plenty of documentation as to how and when processes are created by DECNET when an incoming connection is established. (See the section on "System-Level Access Control" in the "Guide to Networking on VAX/VMS", pages 2-50 through 2-52.) This information allows you to establish security and resource guidelines within your VAX system to either guarantee system integrity or at least understand where your problem areas might be. With these other two third-party software packages, I didn't have enough information to make any such determinations.

At this point, I hollered 'whoa' (using an appropriate West-Texas accent for proper emphasis) and began calling the third-party software vendors to express my concerns and to request more technical data by which I could better understand what their software did inside the VAX.

#### \*THE HP PACKAGE\*

The people at HP were contacted about their package and were both helpful and happy to give me additional technical data as to what processes were created, under what conditions and by whom, when a file transfer took place. What they told me was that it was necessary for all incoming (to the VAX) file transfer requests to specify a valid username and password. A process is then created under that user account and the file transfer image run in the context of that process. Now I knew that I could at least provide some measure of security for HP's file transfers to/from the VAX via normal file protection methods. However, that also meant that there was a high probability that users would write command procedures on the HP system to perform file transfers to their associated accounts on the VAX system. The result would be that usernames and their passwords would reside in files on the HP system that could possibly be compromised. (I am not aware what sort of file protection schemes HP is using or what system procedures are in place to protect individual users' data on the HP system.)

Although I was not completely satisfied with the situation, at least I knew what was going on and where to look if problems arose. I installed the package on the system and have had very little trouble with it to date.

#### \*THE "OTHER" COMPANY'S PACKAGE\*

On the other hand, this other company (I will do them the favor of not naming them here) was not so helpful. Their customer service representative was unable to give me the sort of technical details that I needed for my security and integrity analysis. They were also reluctant to put me in touch with anyone else that could answer my questions directly. They suggested that I go ahead and install the package and "play with it" (in my copious quantities of free time, I might add) in order to find the answers I needed. My inclination at this point was to not install the package at all. Unfortunately, since I was receiving a lot of pressure from one particular user community to install the package I had to go ahead and install it against my better judgment. And so I did, but not before making sure the rest of the user groups understood what was happening and what the risks were to network security and system integrity. (This is known as the [1]"Pontius Pilate" method of system management whereby one "washes ones hands" of the matter.)

Since installing this package, I have had a minimum of 3 mysterious system crashes that I haven't had time to analyze and numerous complaints from the user community as to the reliability of this package. We are now looking for an alternative to this software package.

\*SUMMARY -- SOME RULES TO LIVE BY\*

First of all, one must keep in mind that a balance between system security and system accessibility must be achieved. Where this balance point depends on your environment. If you are managing a small limited-access system with a community of cooperating, knowledgeable, trustworthy users then your need for security is not going to be as great as someone managing a large networked system that has access to information critical to National Security. Once you have come to grips with what your security requirements are, you can begin to analyze your system to determine if it meets those needs.

With this in mind, I will try to give you some basic common sense rules to apply when handed a software package to install on your system.

1. If the software is \*not\* installed with any privileges and is \*only\* run within the context of a normal user's process, then it is safe to be installed.
2. If the software is installed with any privileges other than TMPMBX or NETMBX, attempt to determine why it requires those privileges and how it is going to affect your security.
3. If the software requires any "Detached" processes to be running continuously, determine their process context. Pay close attention to the process's UIC, priority and privileges. Attempt to determine each process's function and how it will effect your security based on its context and function.
4. If incoming network connections cause "Detached" processes to be created, determine the rules that govern the context under which the process is created. (For example, can an incoming connection create a

-----  
[1] See also CYA methods.

process under any user's account? If so, how and under what conditions?)

There really is nothing new about these rules. They are based on good ole common-sense practices and really should go without saying. However, when things are really hectic, it's awfully easy to get into the habit of just typing:

```
$ @SYSS$SYSTEM:VMSINSTAL . . .
```

without thinking every time a new package lands on our desks to be installed.

## Installing 256K RAM Chip Memory with VMS V3.7

by John Russell  
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The following is not an exhaustive study, nor should it be construed as a recommendation to other sites. It is merely an attempt to report some of the problems confronted during our recent memory upgrade. If you use any of the information provided, it is at your own risk: we have enough problems, already! Those having corrections, rebuttals, or better explanations should put their knowledge in machine-readable format (Runoff source files preferred) and submit it to the PAGESWAPPER. (God knows that Larry is always begging for input.)

For various reasons, we here at HECO have not yet been able to upgrade our dual VAX-11/780 Energy Management System to VMS V4.x (my very next project). One of the main reasons, though, was that we were told by DEC that we would need more than the 3.5 megabytes that we had been running with in order to perform the VMS upgrade. Looking down the road, we knew we wanted to invest in the new memory technology which had become available since we purchased our systems (we had the 16k RAM chips). We decided to go with 256k RAM chips using the MS780-HC memory controller. During the preliminary evaluation phase, we believed the software requirements listed in DEC Educational Services publication EK-780EH-IN-001 ("MS780-EC/ED and MS780-HC/HD Installation Procedure"):

The following system software is required to install the MS780-EC/CD:

1. VMS Version 3.2 or higher.
2. VMB.EXE Version 3 or higher.

The MS780-HC/HD memory system requires VMS Version 4.0 when more than 8 M8374 array boards (32 Mbytes) are used. [Emphasis mine - JR.]

We interpreted that to mean that, if we were going to have less than 32 Mbytes, we didn't have to have VMS Version 4.0. Our mistake. More clearly stated, the guideline should be:

The MS780-HC/HD memory system requires VMS Version 4.0 or higher.

We purchased the upgrade kits with 8 megabytes for each machine from an OEM who was kind enough to send a complete extra kit for spares during the upgrade. That saved us quite a bit of time, as it turned out. Our Field Service Account Representative (eat your heart out, we've got one of the good ones: Tom Lau) did the installation for us.

The hardware installation went fairly well (nothing obviously wrong). Microdiagnostics completed with no errors. Looked good. We tried to boot the system:

```
%SYSBOOT-F-Unable to allocate SPT+PHD+SCB.  
HALT INST EXECUTED
```

Going to the VAX/VMS System Messages and Recovery Procedures manual, we were told to reduce sysgen parameters affecting the System Page Table count. This struck us as odd, since we hadn't modified any sysgen parameters and there should have been an extra 4.5 megabytes to play around with. We decided to doubt the accuracy of the message. Rerunning diagnostics showed everything to be bright, cheery and ready to go.

Repeated failures to either boot or locate the problem drove us to call our local VMS guru at DEC (Bill White) who asked, "What version VMB.EXE do you have?" Nonplussed, I responded, "How can I tell?" Further conversation established that the critical point was how many bytes got loaded during the bootstrap procedure. Our 4400 (hex) bytes just weren't enough. We needed a 5000 (hex) byte version. Bill brought us over a VMS V4.? console floppy. When we next tried to boot, the Force was with us, and all went well. Except ... for some reason, our sysgen parameter file had been drastically changed (maximum working set size set to 98, for example) with no human intervention. We recovered our original parameters, rebooted, and had no further problems.

That, basically, was the end of that for our first conversion. We've had no problem on that CPU since. The second CPU, however, put up much more of a fight when we upgraded it a week later. The first two M8375 memory controller boards failed microdiagnostics (hurrah for the spare kit!). When those boards were replaced, the new hardware passed microdiagnostics with flying colors. Armed with a new console floppy, we booted the system. All appeared well. Hah!



Less than an hour after Tom had packed up his kit, the system faded into the sunset. No crash. No error. No response. Halting the CPU at the console and examining the general registers and the PSL showed us to be looping in MACHINECHECK logic at IPL 31. The worst had happened: we had an intermittent problem on hardware that passed diagnostics, and the software couldn't handle the error.

A call to DEC brought Tom back. A painful period of board swapping and testing ensued, during which we tried to repeat the error reliably and isolate the bad board. Results were conflicting, probably due to our inaccurate test procedure (a DIRECTORY of a whole disk seemed, eventually, to cause the problem). We always ended up looping in the same MACHINECHECK code.

While Tom worked on hardware, I started investigating the software aspects of the problem. Whipping out my microfiche reader, I read fiche and used SDA to examine both the current system and crash dumps we had generated. The basic problem was in two images: INILOA and SYSLOA780. In both places, the software uses a memory type code to search for a matching type in a hard-coded array. The resulting index is used to map into the general memory types. INILOA uses this general type to load an address into a configuration vector (one slot per nexus) starting at MMG\$GL\_SBICONF. If no match is found, that slot in the vector is set to zero. SYSLOA780 uses the general type to vector to an action subroutine during memory error logging. The subroutine clears the error bit on the memory controller, and goes on to use the MMG\$GL\_SBICONF vector loaded by INILOA. If no match is found, the subroutine is not executed, and the error bit is not cleared. This causes more errors to be reported, and, voila, a tight loop at IPL 31!

The real trouble was that VMS V3.x knows about 16k arrays and 64k arrays, but knows nothing about 256k arrays. Since I know about the 256k arrays, I decided to patch INILOA.EXE and SYSLOA780.EXE and let VMS know about them, too. Be warned: this invalidates the Digital warranty on the software! However, the whole point of the exercise, for us, was to get enough memory to be able to upgrade to the version of VMS which wouldn't need the patch. Besides, how much support do we get on Version 3.7, anyway?

Investigating the VMS V4.4 microfiche, I got the type codes for the 256k memory, and verified the fact that the vectors and action subroutines were identical for the 256k and 64k memory.

This simplified matters considerably. All that was necessary was to replace the 64k codes with the 256k codes in both images. I created the following PATCH command files, duplicated INILOA.EXE and SYSLOA780.EXE (always leave an escape route), and applied the patches. (To be honest, I discovered the INILOA.EXE problem after patching SYSLOA780.EXE and getting into an endless crash-reboot cycle because the MMG\$GL\_SBICONF vector was not properly initialized. Keep a backup system disk around.)

SYSSYSTEM:INILOAPAT.COM:

```
INILOA.EXE
DEPOSIT 727=73727170      ! 64k codes were 6B6A6968
DEPOSIT/BYTE 72B=74 ! 64k code was 6C
UPDATE
EXIT
```

SYSSYSTEM:SYSLOAPAT.COM:

```
SYSLOA780.EXE
SET ECO 3 ! may as well
DEPOSIT 820=73727170      ! 64k codes were 6B6A6968
DEPOSIT/BYTE 824=74 ! 64k code was 6C
UPDATE
EXIT
```

Addresses were found using the map files on microfiche and verified using SDA and PATCH.

Rebooting with the patched images, we forced the error to occur, and IT WAS LOGGED! A correctable error in the lower 4 megabytes. We swapped the memory array card out, and ran our primitive test again. SAME ERROR! (Which shows that the error logger doesn't know everything.) Moving the memory controller caused the error to shift, too. Replacing the memory controller card cleared up the problem. (If you've been keeping count, that means that 3 out of 6 M8375 cards shipped to us were bad.)

In summary, we were able to install and use the new RAM technology on two VAX-11/780s running VMS V3.7 with about 4 days of effort. We had some unexpected problems (never take the published data at face value, verify it), but learned new things about how VMS works as a result. Use of the System Dump Analyzer and system microfiche enabled us to identify and correct the software incompatibilities in a relatively short time, and keeping a backup system disk with unmodified software saved us a lot of trouble while we were testing the patches.

Now all I have to look forward to is the trivial task of upgrading to VMS V4.4.

## The VAXintosh Class Workstation

A DEC Low-End, Human-Engineered, Workstation

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### Disclaimer

This document occasionally refers to existing hardware and software systems and may suggest certain possible ways of achieving a VAXintosh Class Workstation (VCW). Take this in the proper spirit. The VAXintosh Working Group is not asking DEC to just build another Macintosh (Amiga, Atari ST, ...), nor is it committed to specific hardware and software implementations which might be discussed here.

The working group is not trying to push the VCW onto DEC as a new PC although the functionality needed for a VCW probably makes it every bit as much of a PC as the VAXmate. While there are probably very few DECUS members who wouldn't encourage DEC to try to come out with a radically innovative PC, the VCW is not viewed primarily as a PC but as a workstation necessary for us to obtain needed functionality from our VAX systems.

### 1. VAXintosh Working Group

The VAXintosh Working Group was jointly formed by the VAX SIG and the Language and Tools SIG because it was felt that DEC was not addressing an area which would be critical for VAX users in the near future, namely a low cost, Human Engineered Workstation/Terminal, which in this paper is referred to as the VCW (VAXintosh Class Workstation). In discussing the VCW, two issues are intertwined and inseparable, namely:

- o Low cost, bit-mapped graphic workstation.
- o Human-engineered user interface.

The VAXintosh Working Group has two primary factions, which could be categorized as the "Planners" and "Do-ers." The "Planners" believe that if enough solid user input can be given to DEC during planning phases, it is possible that DEC might design and build a VCW. The "Do-ers" feel that DEC is incapable of addressing the VCW marketplace soon enough (if ever) and that what users need to do is pressure DEC software engineering into accepting a Macintosh (Amiga...) as a VAX-supported terminal/workstation.

Both groups have a kind of "born-again," missionary zeal about them. They are composed of experienced programmers quite used to developing standard programs. Recently, however, they have been exposed to the Macintosh computer which embodies a completely different approach (metaphor, if you will) as to how a computer should interact with a person. This has been a revelation to many.

The groups members are accustomed to hearing countless complaints about computers and programs being user-unfriendly, but given the available user-interface tools, there was little which could be done to create a truly user-friendly environment. Menu systems and hand holding programs can be developed, but they are really not the answer. The Macintosh visual human interface, however, demonstrated that there was another way. Perhaps not the best way for all situations, but a far, far better way to create a friendly software system for a general, perhaps unsophisticated, computer user.

The "Do-ers" position needs a bit of clarification. Even if VMS Development assigned the Macintosh to be a known terminal type, all would be in vain unless major amounts of software were written to allow the VMS user to take advantage of the Macintosh's capabilities as a workstation, and to provide program developers with a common user interface standard for using the Macintosh workstation.

Of course, there are some who feel "we can go it alone with third party software and minimal VMS support from DEC." Realistically, however, most of the group realize that this position would only work if there were a major commitment from DEC to use the Macintosh as a VAX workstation front end. DEC's workstation/windowing software would have to have a driver for it as well as VAXstations. GKS would have to support it, and who knows what else.

Technically, the "Do-ers" propose something not too difficult to contemplate, particularly if DEC were to use the Macintosh or its "soon to be announced" bigger-screened brother as a DEC low-end workstation. However, realistic assessment of the possibility of this happening is "slim to none." DEC is still primarily a hardware company and develops software predominantly in support of that hardware.

As a consequence, this paper will try and elucidate the position of the "Planners," those who believe that unless DEC builds the hardware, they will not develop the software necessary for an integral VCW. However, the requirements to be discussed here are also very representative of the requirements of the "Do-ers" for a VCW.

## 2. VCW Marketplace as Viewed by VAXintosh Working Group

Members of the Working Group are generally responsible for programming and support for a wide variety of users. They must address the productivity needs of entire staffs rather than just a few high-performance engineers. To meet these needs, the working group believes a VCW is required which is inexpensive enough to replace existing terminals used by these staffs. Neither the VAXmate, DEC's current workstations, or rumors of terminal and workstation futures suggests that DEC has any product planned to fill what the group believes is currently the most critical and potentially profitable workstation market segment for DEC in the coming decade.

There will always be a market place for quasi-smart (VT220-like) terminals, basically dumb CRTs. Maybe some future terminal will have full page editing, or multi-planes of memory to allow switching between VMS sessions, or maybe VT240 class graphics at a cheaper price. However, if the group's experience is any measure of the marketplace, many users now want and need much more than just simple terminals so that computers can become true productivity tools. The group believes that a VAXintosh Class Workstation meets this need.

### 2.1 Cost of a VAXintosh Class Workstation

Currently DEC and many other vendors are pushing the workstation concept. A workstation is only cost effective if the perceived value of the increase in user productivity is greater than the workstation cost. Even then, the cost of a workstation may not be allowable if it exceeds certain limits or if it can not be justified over a sufficiently short enough period.

Most members of the Working Group have commented that they need a product in the \$2-3K price range. Numerous sites say that items costing more than around \$3K fall into a special procurement categories and must undergo special review. The working group feels that at the \$3K price range, companies would buy low end, VAXintosh Class Workstations rather than terminals at \$1-2K. However, as the price rises to \$10K and above, fewer and fewer workstations would be purchased to replace terminals. Consequently, unless a VCW is priced within an acceptable price range it is unlikely to become a large demand item.

### 2.2 Searching for Productivity

Until recently, it was only programmers who had terminals on their desks. Now, however, terminals or PCs are appearing on everyone's desk, from technicians all the way up to top management. This has radically changed the audience of users who must be supported with software, applications, and productivity aids. The goal of providing computer access is, of course, to make each user more productive. Unfortunately the productivity gains for some users are marginal or negative because the computer/user interaction is not "friendly" or "familiar" in modes they can relate to.

Companies have tried to provide increased computer access in several ways. The two ways of doing this seem to be either the "PC on Every Desk" or the "Terminal on Every Desk" approach. The "PC on Every Desk" approach requires an extensive on-going user support and training to avoid maximizing long-term chaos. Except for dedicated, black-box type use (i.e. just run the PC as spread sheet machine), this approach can result in productivity gains which are often marginal or negative as the user spends more and more time trying how to figure out how to use the PC for "one more application," how to get information from one PC to another or to a host, and in supporting an ever-increasing array of totally incompatible software. Even in those areas where PCs have been significant productivity enhancers "on the whole," they have a large number of drawbacks and do not lend themselves easily for future growth.

Specific serious problems include:

- o The PC architecture and memory management system is obsolete. This imposes restrictions on software.
- o The time it takes to train a person to use an "industry standard" PC and software effectively is very considerable. Managers are having to spend inordinate amounts of time to learn the systems.
- o The PC DOS user interface is basically "user hostile."
- o The manuals and documentation are horrible. Software support and bug fixes are virtually nonexistent, integration is a myth, and user frustration is rising.
- o Staff is needed to support PC users but the software breeds, mutates, and changes faster than trained staff can learn to help. This happens because much PC software is shallow. By the time the users are proficient at one package, they have become frustrated with its limitations and are ready to buy another.
- o Dictating common software to use is a policy nightmare. All users want to use their own "favorite."
- o Enforcing a backup policy is impossible.

- o Documents aren't interchangeable between different PC programs or corporate computers. For example, transferring correctly formatted documents created using many different word processors to either the VAX or stand-alone word processors can easily turn into a semi-infinite sink of time.
- o Graphics resolution and speed is poor to marginal.
- o True networking and sharing of documents is nonexistent.

DEC future PC and network offerings may solve some of these problems. However, creating a good user interface within the limitations of a PC-DOS framework is an awesome if not impossible task. The IBM PC architecture is so limited, that it is hard to believe it will survive in the long run. IBM-PC/AT class PC's lack the CPU capacity for providing a good human-engineered workstation environment.

The second main approach, timesharing, or a "Terminal on Every Desk" is one that DEC pioneered. Assuming that one has adequate computer power to support terminals everywhere, there are still major problems with this approach. Specifically:

- o The VAX/User interface is inadequate for many classes of users. Too much knowledge is required to use a VMS system for even minor tasks. Generally DCL is great for programmers but for others it represents a "user hostile" human interface. VAX/VMS does not provide a common human interface standard for programs. Programs work different ways, and expect users to do different things.
- o Inadequate hardware. Current terminals' graphics capability is woefully inadequate. Regis and 4014 performance of the VT240 terminal is snail-like. Graphic resolution is inadequate. Graphic pointing devices are not supported. The VT240 does not really support bit-mapped graphics.
- o Inadequate integration tools to create user environments. All in One is not the answer. Neither is SMG or user-created menu systems.

- o Inadequate offloading. Current terminals are not "smart" enough to offload compute intensive graphic operations from the host computer.

Currently neither "industry compatible" PCs, nor terminals, nor workstations offer the VAX system manager a solution for improving system usability, and general staff productivity in the future. The VAXintosh Working Group believes that a VCW would offer such a solution, and offer a natural migration path to higher performance workstations for users requiring increased performance.

### 3. The VAXintosh Class Workstation

Based on many conversations with VAX users, Macintosh users, PC users, and graphics users, the VAXintosh Working Group believes a VCW must embody the following characteristics.

- o Reasonable cost. The basic price should be in the \$2-3K range. Options to expand functionality, local programmability, or storage, or screen size may be available at extra cost.
- o A common, human-engineered user interface. The VCW should be integrally meshed with the abilities of VMS to provide a common human interface for applications. This means a published set of guidelines as to how applications should look to the user and behave if they are to adhere to the standard. At this time, most of working group is leaning toward an iconic, Macintosh-like user interface or an interface combining icons and text. However, it realizes that further research may lead to developing still better human-engineered interfaces.
- o Hardware abilities to match the human-engineered interface. The hardware requirements include a bit-mapped graphic display, a graphic pointing device, the ability to do windowing, use multiple fonts, the ability to support WYSIWYG editors, the ability to offload certain functions from the host (graphic, editing, windowing, ?), and local programmability, customizability, or intelligence. Note, however, that running VMS on the VAXintosh Class Workstation is not a requirement. The VCW is a front-end graphics processor, user interface workstation, not necessarily

a stand-alone mini-VAX.

- o Software support. VT240 terminal emulation, WYSIWYG editor, multiple font support, drawing program and VCW user interface library upon first customer ship.

### 3.1 Cost and Competition

In the \$3K price range, DEC has a potentially huge workstation market; but as the price increases, the market size rapidly gets much smaller. DEC should also note that other vendors are targeting this price range. The only thing protecting DEC from real disaster in its terminal marketplace and future low- to mid-range workstation market is that to do a low-end workstation correctly, integral VMS support is a requirement.

For example, there is no question that the existing Macintosh, Amiga, or Atari ST, given the proper terminal emulation package, an LK201 style keyboard and workstation/host software package would make a powerful, low-cost workstation. Processor speed and communication speed for using (for example) a Mac as a workstation front end are no problem. Already 4014 terminal emulator programs on the Mac can do graphics much faster than the VT240. Several implementations of DECnet/Ethernet have been developed for the Macintosh and a DECnet/Ethernet/Appletalk connection is close at hand.

Moreover, Apple has demonstrated that at terminal line speeds, they can put a Macintosh Host program on a VAX, and a smart front-end program on the Mac and get good performance with Mac-like applications running on a VAX using the Macintosh as an intelligent workstation. If Apple manages to get their act together (quits fighting over keyboards, worries less about Unix and more about VMS implementations, decides to attack the problem aggressively), such software and the new high-end Macintosh workstation (the modular Mac) could make a major impact in the low end, VAX workstation marketplace.

### 3.2 Common User Interface

Developing a Common User Interface (human-engineered, visual) is CRITICAL for the success of a VCW. Many potential users of a VCW are intermittent users, not "power" users or programmers. The learning curve for them to become proficient DCL/VMS users is steep. Although DCL and existing application interfaces may have more power and potential for high productivity use than a Common User Interface interface, this potential will remain untapped and frustration will flourish if the user lacks either the time or patience to learn "VAX Speak". Consequently, both forms of user interface are required as they address different needs and classes of users.

Two areas must be addressed in creating a VCW Common User Interface. First there is the interface itself. This interface includes the user/VCW interaction metaphor, the use of the pointing device, the use of icons, menus, and commands. The user/VCW interface must be easy to use, productive, feel "friendly" (as opposed to user-hostile), and support users of varying skill levels. Second, and just as critical, is the consistency of the way applications running on the VCW appear to the user. If there is a high degree of consistency, the experience the user gains in learning one application will transfer to subsequent applications and the system as a whole will feel "easy to learn".

While DEC is unquestionably a leader in many software areas, DEC's experience with windowing systems, iconic interfaces, and human-engineered user interfaces is currently very weak. Consequently, DEC needs to study and learn from existing systems which have proven to be successful. In particular, Xerox's Star user interface, Apple's Macintosh user interface and DRI's GEM interface should be studied.

#### 3.2.1 Macintosh User Interface

The Macintosh user interface is one of its greatest strengths. With little or no training and micro-manuals, users rapidly learn to use new applications productively. There is probably no simple reason that the Macintosh user interface works but Macintosh applications always seem easy to learn, even intuitive. Maybe it is because the only possible categories of commands always are displayed on the screen. Maybe it is because the interface is very constrained.

Much of its success undoubtedly rests on the large amount of effort Apple spent in defining the user interface BEFORE they committed to a final product. The thoughts and concepts that went into their work are elucidated in an Apple publication: "Macintosh User Interface Guidelines." By adhering to guidelines on how applications should look and behave and by using the provided common user interface routines, even radically different applications generally seem to have a consistent user interface.

The concept of approaching a user interface as a "metaphor" is also important. This concept is certainly not new with Apple. The "Desktop Metaphor" chosen by Apple feels good, familiar, and friendly. Possibly other metaphors would also work well.

The Macintosh windowing system is also an important factor -- particularly when one considers the severe handicap imposed by its small screen size. The windows and pull down menus work smoothly and generally do not bombard the users with excessive or confusing displays of information. Unfortunately, DEC's current windowing software and user interface on the VAXstation II is clumsy and awkward by comparison.

#### 3.2.2 STAR Interface

The Xerox STAR system interface was the precursor to both Apple's LISA and Macintosh user interfaces. The system is in many ways outdated by Apple's work, but, if only for historical reasons, it deserves serious study.

### 3.2.3 GEM

The GEM interface is relatively new. Consequently, not enough software has yet been written to compare the overall effectiveness of the GEM interface with the Macintosh user interface. On the surface, the interface seems cruder. For example, GEMwrite is clumsy compared with MACwrite. However, this may be an artifact of either immature programs or using monitors apparently having less visual resolution.

### 3.3 Hardware Capabilities

The hardware capabilities must be constrained by removing from consideration those options which would force a \$3K, low-end workstation to be significantly more costly. Specifically,

- o Color is not necessary. It is nice, and eventually the marketplace and technology will force DEC to create a color VCW, but for now, no color.
- o VMS is not necessary. The goal of a VCW is not to run VMS applications in local, stand alone mode. Nor is the goal of a VCW to be a local VMS program development engine. This does not mean that the VCW should not be programmable in some language on a host VAX or locally programmable. In fact, it must be, and some mechanism must be provided to do this. However, the VCW should adhere to the KISS principle (keep it simple...). If VMS and a VAX CPU are not the most cost-effective way of building a VCW, then use a different CPU and simpler operating system.

The working group realizes DEC has a single VAX/VMS strategy. So what? DEC's VT240 and HSC products don't run VMS. If they had to run VMS, DEC never would have brought the products to market at a cost anyone could have afforded. This does not mean the VCW cannot emulate VMS or a VMS subset in some ways. Maybe the VCW operating system provides VMS emulation so that programs developed in a high level language on a VAX can be compiled and run on the VCW.

- o Disk storage and expandability can be limited. There is no reason for a VCW to support huge amounts of disk storage or local memory. Some disk storage is probably required for program load, but a dual density micro-floppy might be adequate. Provision should

probably exist for either a second floppy or some modest amount (say 10-20 mbytes) of local hard disk storage. However, if the VCW connects to an Ethernet and can use a virtual disk on its host, the requirements for local disk storage are not going to be high.

Defining detailed technical specifications for a VCW are beyond the scope of of this position paper. Technology changes rapidly, and the proper hardware implementation selected today may not be proper tomorrow. Instead, the required VCW specifications and capabilities will be described in terms of usage.

- o Graphic display. The VCW must have a bit-mapped graphic display which allows text and graphics to be freely intermixed on the display. Text display on the VCW is accomplished via software controlling the bit-mapped graphic display. Because of this, some care must be taken to insure that if text scrolling is accomplished by pixel replication rather than hardware, that the process is fast enough to avoid annoying visual rippling.
- o Display resolution. The VCW must have adequate resolution to produce sharp and clear displays suitable for a WYSIWYG editor capable of mixing text with multiple fonts and graphics. The required resolution depends on a variety of factors. For example, the Mac has a resolution of about 72 dpi. This resolution is probably only adequate because of the square pixel size used by the display. Anti-rastering techniques can also be used to minimize resolution requirements. The basic goal must be clarity of iconic, graphic, and multi-font display. The user must perceive the display to be sharp and clear.
- o Display screen size. The VCW needs only a moderate size display screen, however the Macintosh screen is far too small. The screen size should probably be a bit larger than the current VT240 screen which many users also feel is a too small. For most applications landscape format seems adequate. However, a significant number of users would like to be able to use WYSIWYG editors which display a full page of text in a portrait mode. If the VCW can optionally use an

- alternate portrait display, it would be useful.
- o Graphics support. The VCW must support several graphics modes, minimally Regis and 4014 emulation. Support for GKS would also be useful. Vector drawing and area fill must be much, much faster than VT240. Graphics primitives for windows, lines, and shapes (maybe display lists, etc.) must also be present. One must be able to select a graphic object with a pointer device and move it. One must be able to run a MACdraw or MACpaint type application using the VCW. DEC's new graphics coprocessor has good capabilities, particularly if its use can fit within the cost objectives of the VCW. The number of addressable points (x and y) for vector drawing should be great enough to allow 4014 emulation to work properly.
  - o Graphics pointing device. The VCW requires a graphic pointing device, probably a mouse, trackball or touchpad. It would be desirable for the device type used to be a user option.
  - o Form factor, footprint, and office impact. One reason a large monitor is neither needed nor desirable is that the VCW is targeted toward a group of users who may not either need to use a computer workstation 8 hours a day every day and who have no desire to be on aggressively friendly terms with a computer. The VCW footprint should be modest. It must not overwhelm a desk. If a system box is needed, be sure it can be unobtrusively placed under or behind a desk. If the VCW must be fan cooled, make it ultra-quiet. The VT240 terminals are obtrusively noisy. If the VCW has a disk drive, it also must be quiet.
  - o PC or not PC? The basic concept of the VCW does not require that it be a PC or a stand-alone processor. However, if cost goals can be met, PC capabilities would be a definite advantage. For example, performing word processing or text editing without host intervention would be very valuable. Whether this is possible or reasonable depends primarily on software availability and cost.
  - o Expandability. The VCW should be expandable if this can be done without compromising cost objectives. Rather than building "slots" into it, provide the VCW with a CPU bus port which can later be used for an expander box connection. At some future time, DEC may want to add voice I/O capability, a Telephone Answering System, or digitized input support, or a local CD-ROM reader. Such functions do not belong on the host VAX processor, so leave yourself hooks to expand the VCW's marketplace and usefulness.
  - o The hardware architecture of the VCW should be "open" if this can be done without compromising cost objectives. Allowing other vendors to attach their boxes to it will enlarge the marketplace for the VCW and increase its acceptance.
  - o Windowing. Here the VCW must tie in closely with VMS. A lot of thought needs to go into how this is done. The VCW needs to be able to connect windows to processes (subprocesses) and transparently handle I/O while the user is in another window. Given the proposed size of the display, serious thought must be given to how multiple windows are displayed, organized, clustered, switched between and used by a user.
  - o Menus. Serious thought needs to be given to which of menu bars, pop up, pull down, etc. menus should be used and when. In any event, the VCW hardware/software should support the majority of this work without intervention from the host.
  - o Programmability and customizability. The VCW should be able to load a program from either local storage or host which controls its behavior. Being able to offload applications or parts of applications from the host seems very desirable.
  - o Communication port and speed. It is very unlikely that a 9.6kb terminal line could have adequate bandwidth to support a VCW utilizing the VAX host as a virtual disk or for transferring significant amounts of bit-mapped graphic information. For such uses, the VCW should have a built-in high speed I/O port (Ethernet jack perhaps).



In addition to the above requirements, DEC should carefully consider the implications of tie-ins to two areas, CD-ROMs and WYSIWYG editors, which the working group believes will play major and significant rolls in the financial success of the VCW. First, there is a critical need to be able to display mixed text and graphics information from a CD-ROM at a user's workstation. CD-ROMs and optical disk technology now make it possible to retrieve and display composite documents, abstracts, and information data bases economically with a computer. CD-ROM data base display workstations will find extensive use at high tech companies, libraries (information services) and educational institutions.

However, the acceptance and use of this technology will be severely limited until terminals (workstations) can display high resolution graphics and images as well as simple text. This poses much more severe constraints on VCW/host communication than can be supported by a simple terminal interface. A high bandwidth communication bus (ethernet and higher) is required or the CD-ROM must interface locally to the VCW. If the communication bandwidth problem can be solved, the ability to easily display stored documents on a VCW would amplify sales of both a VCW and CD-ROMs.

Second, once a low cost VCW, a reasonably priced WYSIWYG editor and a page composition system are available which intermix text and graphics, users will never be satisfied with using a simple terminal again. In the technical marketplace, the savings in staff time if users were able to mix graphics and text, alter fonts and type sizes, and do equations properly could easily justify replacing a large fraction of existing terminals with VCWs. The impact outside of the technical marketplace might be equally large. At recent DECUS meetings, users representing small publishers, newspapers, and advertisers said the potential marketplace for a VCW in the desktop publishing arena was huge.

### 3.4 Software Support

The software basis for the VCW poses a number of very interesting problems. The solutions to these problems apply not only to the VCW but to high-end bit-mapped graphic workstations. Problems which need to be addressed include:

- o What is the best way to implement an iconic or visual human interface? Should it be a separate task under VMS or a separate CLI? To what extent is a pointing device required and which is the best pointing device to use?
- o Within the context of a visual human interface, what metaphors and actions best match the VMS command line paradigm? The command line paradigm allows for many modifiers on a single verb, and one or more objects for the verb's action. The Macintosh user interface, on the other hand, only allows for verb and orderless object selection. Modifiers require further selection from menus or dialog boxes. Is it reasonable or required for the VCW user interface to have access to DCL's richness for command line parsing?
- o How should the VCW manage the windows for the user? Should windows be tiled (back to front with edges showing), or should only the current main large window show with inactive windows returned to the desk top border? If multiple small windows are displayed, should they be selectable/organizeable as a group which can be put away and recalled at will? On a VCW with a screen smaller than on DEC's larger workstations, greater care must be shown in using and displaying multiple windows. Since multiple windows, if properly done, could be a significant productivity enhancer, DEC must put considerable thought into them.
- o What should be the Common User Interface standard to which VCW applications are expected to adhere? This is very important because it will determine how easy it is for users to move from one application to another. It needs to be restrictive enough to encourage applications to behave similarly, but not so restrictive that radically new applications cannot be implemented.
- o What graphic primitives should be available for programmers? Certainly the windowing system (window shape, size, borders, etc.), scroll bars, dialog boxes, etc. are primitives. What about Quick-Draw like capabilities (boxes, circles, ellipses, lines, the ability to create display lists of of these objects or their logical intersections)? What about the ability to store segments of the screen as images for later

redisplay or to display/generate bit-mapped graphic images? GKS is now the graphic standard, but GKS does not have the inherent ability to implement a Quick-Draw like system let alone manipulate bit-mapped graphics.

- o Printed output. Being able to support high resolution printed output of VCW graphics and multi-font text to a laser printer is necessary. This suggests that the VCW or the VAX host should support Postscript.
- o What about ease of programming? The Macintosh is not an easy machine to program for. Surely DEC can do better.
- o Application interruptability. The Macintosh allows work on the current application to be interrupted to use a "Desk Accessory". The VCW does not need this metaphor because the VCW supports multiple active windows. However, the VCW user interface must still be able to create a new window (subprocess) for a user at any time, retaining the context of the previous work (and any I/O to that window in the meantime).

Besides having a VCW application support library, the VCW should have a number of software applications available at first customer ship. At minimum, a WYSIWYG editor, loadable font support, full VT240 terminal emulation, and a drawing program are needed.

The VCW VT240 terminal emulation application poses some additional interesting problems. In addition to being able to respond to VAX host inquiry (SET TERM/INQUIRE), with the correct response for the currently active window, the VCW must be able to let the host know that it is a VCW acting as an emulator. The host inquiry mode must be able to tell if the VCW is in single window VT240, VT100, 4014 mode or a mode in which one of many possible windows may be emulating a terminal. This requires a more sophisticated approach than is used with DEC's current terminals. Currently, terminal inquiry status replies can get intermixed with user input. Given the simple minded way a terminal interacts with a program via the terminal driver, this problem is probably unavoidable. However, a VCW will be much more complex. So that a host program can know what is going on in the workstation, a bidirectional workstation/host communication protocol that can not be scrambled by user input may need to be developed.

## Conclusions

Digital and its customers are now poised at the threshold of being able to use computers in dramatically new and different ways. To cross this threshold the metaphor by which programmers and non-programmers alike interact with a computer must be changed.

Over the past twenty years or so, the mechanism by which a person interacts with a computer has changed radically; from punch cards and batch, to teletypes and timesharing; from dumb terminals with text, to smart terminals with graphics. However, during this period each computer still required that all important peripheral, the highly trained computer user. Each "peripheral user" had to be "computer friendly" and speak what ever language the computer needed, whenever the computer wanted to be spoken to. Even with the advent of personal computers, technology has not really created "personal" machines which can unobtrusively assist us in our daily activities. Rather, PCs have created a new class of low cost computer peripherals, the semi-trained computer users.

Hopefully this rather grim view of the user's place in the computer/user interaction is on the verge of changing radically. Applying new metaphors to the user/computer interface, using visual (iconic) interfaces, pointing devices, and mode-less programming will help evolve workstations which are far easier and more unobtrusive to use.

Proven technology now exists to do this at a cost comparable with that of terminals just several years ago. The power and sophistication of VAX systems, the dynamic expandability of DEC's network architecture, and the expertise of DEC's software engineering teams can provide the vehicle for delivering this technology to Digital's user base in the near future.

## Dallas Symposium VAXSIG Notes Conference

edited by Larry Kilgallen

From the Notes conference on the demonstration cluster at the Spring 1986 US DECUS Symposium I have extracted those notes I felt were most useful to Pageswapper readers. In the process I have also removed (with possibly some misses) references to individual and company names for two reasons:

1. Participants did not consent to being quoted.
2. There was (with a few exceptions) no authentication as to who was really entering the text we read.

The messages contained herein should thus be classed as "rumors", something that may point you in the right direction but may not.

### Topics

- Note 3.0 WPS-PLUS puts LQP02 into half=space mode
- Note 5.0 Problems with VAXTPU pattern matching
- Note 6.0 emacs-like key bindings for tpu
- Note 9.0 Decnet access to CMS libraries
- Note 14.0 LSE Templates for other stuff
- Note 16.0 How to create a log of DCL commands ??
- Note 17.0 Slave Printer Type
- Note 19.0 MODPARAMS.DAT ADDPARAMETER
- Note 20.0 Pagefile Fragmentation
- Note 21.0 TPU and SMG
- Note 24.0 emacs on VAX/VMS?
- Note 28.0 DECalc Deletion of Grids
- Note 30.0 DECnet ACP file create failure
- Note 33.0 .EXE FILE TRANSFER WITH KERMIT
- Note 37.0 creating multi-volume tape sets
- Note 55.0 HSC load balancing problem
- Note 57.0 TeX and LaTeX but not LN03
- Note 59.0 Mount Verification Timeout Recovery

- Note 61.0 Recovering from spurious XOFF
- Note 64.0 Suspected BUG in NOTES!
- Note 66.0 Bad pages in memory
- Note 71.0 BANNER PAGES AND LASER PRINTER PAGE LENGTH
- Note 72.0 LSE TPU source
- Note 73.0 DISKQUOTA problem - Disk Leakage
- Note 76.0 running out of PAGEDYN
- Note 85.0 PCA with DTM
- Note 92.0 set terminal/speed=38400
- Note 94.0 File Ownership "Leakage"
- Note 97.0 Indirect dialup access
- Note 105.0 750 w/Adage=3000 .. Bugcheck ASTDEL
- Note 108.0 CPUBIAS
- Note 109.0 RA Dual port to UDA and KDA?
- Note 111.0 Boot problem in Microvax II
- Note 122.0 Loss of Disk Quota Problem
- Note 126.0 Foreign Terminals
- Note 127.0 EVE->WPSPLUS
- Note 128.0 Cluster w/non-Digital Disks
- Note 129.0 Help implementing common page/swap file
- Note 134.0 How'bout BACK/REC'D=IMMEDIATE
- Note 138.0 TTYDMASIZE
- Note 146.0 SOURCE LIBRARIES ACCESS
- Note 147.0 Printing thru DECNET

```

=====
=====
=====
Note 3.0 WPS-PLUS puts LQP02 into half-space mode 6 replies
              4 lines 28-APR-1986 14:01
-----

```

We just installed WPS-PLUS on VMS systems, and are experiencing problems printing to LQP02's. After printing a WPS-PLUS document, the LQP02 goes into half-space mode, thus messing up the next print job that didn't come from WPS-PLUS. Any suggestions?

```
=====  
Note 3.3      WPS-PLUS puts LQP02 into half-space mode      3 of 6  
              6 lines  29-APR-1986 20:02  
-< user RESET feature of print queue commands >-  
-----
```

I'm not sure why WPS-PLUS is leaving the printer in that state, but you can use the INIT/QUEUE/SEPARATE=RESET=module command to specify the name of a module from the device control library to be sent to the printer before each print job. Create a module with the proper reset escape sequence (see the LQP02 manual) and subsequent jobs will be printed correctly.

```
=====  
Note 3.5      WPS-PLUS puts LQP02 into half-space mode      5 of 6  
              15 lines 30-APR-1986 09:56  
-< ONE WAY TO GET AROUND IT >-  
-----
```

At the present time, the only way to really clear this problem is to recycle power on your LQP02. We are running WPS-PLUS from ALL-IN-1, and the problem you described occurs when an EDT document is sent to the LQP02 immediately after a WPS-PLUS document. I think you will find, that if a WPS-PLUS document is sent after the first, you don't have this problem.

We took care of it through ALL-IN-1 by changing the script for the LQP02 so that it clears 1/2 line spacing for every document that is printed..

A real problem THAT MUST BE FIXED if DEC expects people to take WPS-PLUS seriously.

```
=====  
Note 5.0      Problems with VAXTPU pattern matching        1 reply  
              50 lines  28-APR-1986 15:50  
-----
```

I have a some problems regarding pattern matching in VAXTPU. If I attempt to do the following, it does not work as I would expect.

```
PROCEDURE SELCTIVE_DELETE
```

```
LOCAL  
  DIGITS,  
  P,  
  ANS;  
  
DIGITS := SPAN( '0123456789' );  
POSITION( BEGINNING_OF( CURRENT_BUFFER ) );  
LOOP  
  P := SEARCH( 'A = ' & DIGITS, FORWARD, EXACT );  
  EXITIF P = 0;  
  ! The following line is for highlighting only  
  P := CREATE_RANGE( BEGINNING_OF( P ), END_OF( P ), REVERSE )  
  POSITION( BEGINNING_OF( P ) );  
  UPDATE( CURRENT_WINDOW );  
  ANS := READ_LINE( 'Delete? [Y/N]: ', 1 );  
  EXITIF LAST_KEY = CTRL_Z_KEY;  
  IF ANS = 'Y' THEN  
    ERASE_LINE;  
    UPDATE( CURRENT_WINDOW );  
  ENDIF;  
ENDLOOP;  
  
ENDPROCEDURE;
```

( I appologize for any syntax errors since I am doing this all from memory)

The pattern that is matched (at least thorough VMS V4.3) is the first instance of the string 'A = ', up through the first instance of any digits after the string 'A = '. In otherwords the pattern would match the following section of text

```
A = "THIS IS A TEST"  
! FOR SHOW  
B = C  
D = 123
```

I would have expected a search failure in this case, but it does not happen. It is as though an implicit SCANL( anychar ) is done at each concatenation. I'd be gratefull if anyone can clear this up for me.

```
=====  
Note 5.1      Problems with VAXTPU pattern matching      1 of 1  
              12 lines  28-APR-1986 17:02  
              -< Yup, this is confusing >-  
-----
```

It looks like you're getting caught by one of the more confusing aspects of TPU patterns. When you combine pattern variables, the search is restarted from the current position, which is the string that matches the pattern TPU has process so far. You can force TPU to tie the search to the current position using the ANCHOR builtin.

For example, define DIGITS to be

```
DIGITS := ANCHOR & SPAN ('0123456789');
```

```
=====  
Note 6.0      emacs-like key bindings for tpu          3 replies  
              8 lines  28-APR-1986 17:05  
-----
```

I like using emacs (on vms). I would use tpu, but I can't bind anything to the ESCape key, because it's reserved so you can use the tt driver to read escape sequences. I would like to be able to define my own keymaps nearly as EASILY as I can in emacs. This includes the escape key.

p.s. I know many emacs users who would use tpu if they could get their key bindings transferred.

```
=====  
Note 6.1      emacs-like key bindings for tpu          1 of 3  
              21 lines  29-APR-1986 10:21  
              -< Key Maps with TPU for VMS 4.4 >-  
-----
```

The version of TPU shipped with VMS 4.4 sounds like the answer to your request.

As of VMS 4.4, TPU provides KEY MAPS and KEY MAP LISTS. A key map is a collection of key definitions that you can manipulate as a group. A key map list is an ordered list of key maps. You can bind a key map list to a buffer. When you are positioned to the buffer, and a key is pressed, TPU will search the key maps in the key map list bound to the buffer for a definition. The search stops after the first definition is found, so definitions in key maps in the front of the key map list override definitions in later key maps.

While you still can't use the ESC, X, S, Q, C, and Y keys, this should go a long way towards allowing you to build an EMACS style interface.

P.S. Put your EVE extensions into the DECUS library!

```
=====  
Note 6.2      emacs-like key bindings for tpu          2 of 3  
              5 lines  30-APR-1986 13:43  
              -< can use ^X, etc., in PASSALL mode >-  
-----
```

X, Y, C can be used if you set your terminal in PASSALL mode. Of course, they won't perform their usual terminal driver functions if you do this.

```
=====  
Note 6.3      emacs-like key bindings for tpu          3 of 3  
              5 lines  1-MAY-1986 11:03  
-----
```

You'd be better off using PASTHRU mode instead of PASSALL mode. PASTHRU works better. It still honors S/Q, but that can be changed with HOSTSYNC and TTSYNC.

```
=====
Note 9.0      Decnet access to CMS libraries      2 replies
              8 lines  29-APR-1986 09:30
-----
```

Does anybody know why CMS is restricted to non-decnet access ?  
Specially in a ethernet environment with a number of micro-vaxes  
or vax-stations it would be \*very\* useful to be able to do  
reserves and fetches over decnet...

```
=====
Note 9.1      Decnet access to CMS libraries      1 of 2
              11 lines 29-APR-1986 11:15
-----
```

The reason why CMS is restricted to non-DECnet access is because  
the 'data-base' used by CMS is implemented by a mapped section;  
because of this, there are no interlocking primitives available  
over DECnet.

Thank you for your suggestion. You must realize that we have  
the same problem inside DEC, and it would behoove us to provide  
a solution. :) (that's a little smiling face over thar).

```
=====
Note 14.0     LSE Templates for other stuff      4 replies
              5 lines  29-APR-1986 10:31
-----
```

Does anyone have a LSE Template for writing LSE Templates? Does  
anyone have a LSE Template for SAS or SAS/Graph?

```
=====
Note 14.1     LSE Templates for other stuff      1 of 4
              12 lines 29-APR-1986 13:17
              -< Extracting a Language Template >=
-----
```

If you would like to make a new language template, I found it  
very helpful to see an existing one, say Pascal ; In LSE, do the  
following:

```
SET LANGUAGE PASCAL EXTRACT PLACEHOLDER * EXTRACT TOKEN *
EXTRACT LANGUAGE PASCAL
```

Then, make your new language, do a DO and then SAVE  
ENVIRONMENT/NEW

Stephen Hicks Rockwell International, Richardson, TX

```
=====
Note 14.2     LSE Templates for other stuff      2 of 4
              10 lines 30-APR-1986 11:23
              -< I concur - are you listening, LSE developers? >=
-----
```

Right on! Anyone who's written and LSE knows that the damn  
syntax is a real pain. I can't believe DEC developers don't  
have an LSE template for LSE! Can you please get it in the kit?

Also, how about DCL and TPU? (I can't get the dang ; in TPU...)

```
=====
Note 14.3     LSE Templates for other stuff      3 of 4
              7 lines  30-APR-1986 13:48
              -< noted ... >=
-----
```

Yes, we're listening. We didn't do this for V1 because we were  
too busy trying to get the code to work. It's a case of the  
cobbler's children not having shoes. Rest assured that LSE  
templates for LSE, DCL, TPU, RUNOFF, System Services, and MACRO  
have a prominent place on the wish list for LSE V2.

```
=====  
Note 14.4      LSE Templates for other stuff      4 of 4  
              4 lines      1-MAY-1986 17:36  
              -< more templates... >-  
-----
```

An LSE template for Macro and TPU would be great!

```
=====  
Note 16.0      How to create a log of DCL commands ??      12 replies  
              9 lines      29-APR-1986 10:39  
-----
```

How can one create a complete log of a DCL session? I want to document both the commands I type and the output returned for documentation purposes. It would be nice to be able to log the entire session into a file and then follow up with editing so that one can provide a 'cookbook' procedure or demonstration of a particular technique.

```
=====  
Note 16.1      How to create a log of DCL commands ??      1 of 12  
              6 lines      29-APR-1986 11:14  
-----
```

Use the SET HOST /LOG command. The log file can be named, but defaults (I think) to SETHOST.LOG. The command is documented in the SET HOST section of the DCL dictionary. DECnet is not required so even a standalone system has this functionality.

```
=====  
Note 16.10     How to create a log of DCL commands ??      10 of 12  
              8 lines      1-MAY-1986 11:44  
              -< Alternative using PC emulators >-  
-----
```

You can also use terminal emulators running on PC's, if they are available. For example, I commonly use the "data capture" feature of SmartTerm-220 on my IBM PC to capture everything that goes on to a file on the PC's floppy disk.

```
=====  
Note 16.2      How to create a log of DCL commands ??      2 of 12  
              10 lines      29-APR-1986 15:02  
              -< SET HOST/LOG 0 >-  
-----
```

Use SET HOST/LOG 0

At least single node DECnet (no license is required) must be up and running. You'll be left with a SETHOST.LOG file in the default directory.

```
=====  
Note 16.8      How to create a log of DCL commands ??      8 of 12  
              6 lines      30-APR-1986 17:23  
              -< @tt:/out= >-  
-----
```

for many simple sessions, @TT:/out=filename can accomplish the same thing - but you won't get prompted for missing command parameters (you are executing a com file), and the prompt will be \$ \_

```
=====  
Note 16.9      How to create a log of DCL commands ??      9 of 12  
              5 lines      1-MAY-1986 10:27  
              -< minor bug in SET HOST/LOG >-  
-----
```

Note also that SET HOST nodename/LOG will not log blank lines. This is a bug in VMS V4.0 thru V4.3 that we expect to address in a future update.

```
=====  
Note 17.0      Slave Printer Type                  5 replies  
              10 lines      29-APR-1986 10:39  
-----
```

I need a program preferably in pascal that will identify the type of slave printer attached to a VT102 ie. LA100, LQP02 etc. I am able to achieve this for printers attached as terminal printers by sys\$getdvi using the devices's secondary characteristics. I have had very little success trying to get this information by using the escape sequences in VT102 manual

for slave printers. Also some way of determining if the slave printer is ready as opposed to existence would be appreciated.

```
=====
Note 17.2          Slave Printer Type          2 of 5
                  20 lines  30-APR-1986 00:38
-----
```

A quick check of the VT102 manual reveals the following:  
ESC [ ? 15 n - Request printer status report

Responses:

- ESC [ ? 13 n - No printer attached (DTR not seen on the printer port since power up)
- ESC [ ? 11 n - Printer not ready - DTR was once on, but is now off
- ESC [ ? 10 n - Printer is ready (DTR is on)

I believe that's all the information you can get; the VT102 will act on a Device Attributes request itself, rather than passing it on to the printer. (I may be wrong about this; you may get responses from both - the documentation doesn't say and I don't have a VT102 here to test.)

```
=====
Note 17.3          Slave Printer Type          3 of 5
                  12 lines  30-APR-1986 13:25
                  -< DCL capture of printer response? >-
-----
```

re: .2

I have difficulty obtaining the response with a QIO read. Can this response from the printer be captured by a DCL command procedure?

The solution to this problem would make my trip to DECUS worthwhile.

```
=====
Note 17.4          Slave Printer Type          4 of 5
                  9 lines  30-APR-1986 13:59
                  -< How to capture DECID/DA response >-
-----
```

It is possible to capture the output using a QIO, you need to use the IO\$MNOECHO and IO\$MNOFILTR options on the virtual read request. I have a routine to do this, catch me in V144 (System Mgmt in Research Lab, I'm the speaker) on Thursday if you want more details.

```
=====
Note 17.5          Slave Printer Type          5 of 5
                  10 lines  30-APR-1986 15:06
                  -< P.S. on capturing DECID/DA/etc responses >-
-----
```

P.S. You also need to make use of the "alternate terminator character set" feature of QIO since the responses include escape characters which the system treats as input terminators.

There may be other critical details like this that I have forgotten :-)

```
=====
Note 19.0          MODPARAMS.DAT ADD_PARAMETER 4 replies
                  7 lines  29-APR-1986 10:42
-----
```

I would like to know if when modifying MODPARAMS.DAT using the ADDparameter format if the ADDparameter is accumulative i.e. if I enter ADDpagedyn=100 followed by ADDpagedyn=100 will the pagedyn parameter be increased by 100 or by 200 over the current sysgen parameter?



```
=====  
Note 19.1          MODPARAMS.DAT ADD_PARAMETER          1 of 4  
                  8 lines 29-APR-1986 11:50  
                  -< ADD_params >-  
-----
```

ADDparameters are not cumulative in a single invocation of autogen but MAY be cumulative if you run autogen with the SAVPARAMS argument

The reason for this is that autogen 'executes' the lines in MODPARAMS to create local symbols, therefor it follows that the second definition of an ADDparam will simply replace the first. SAVPARAMS save the old parameters in a similar fashion.

```
=====  
Note 19.2          MODPARAMS.DAT ADD_PARAMETER          2 of 4  
                  17 lines 29-APR-1986 12:00  
                  -< ADD_foo not cumulative >-  
-----
```

The simple answer is no, they are not cumulative, so you have to keep track of how much you want to add to whatever parameter. I use comments on the line or in blocks to to keep track of what I've included in that ADD parameter (so I know I've kept track of all the products that need GBLPAGES for instance).

I had this same question. By examining AUTOGEN.COM I found that the various lines in MODPARAMS are the defined as symbols (after first defining the ones from SETPARAMS.DAT), then each parameter is looked at first for value (FOO=3) (with MODPARAMS overriding SETPARAMS), then the ADDFOO is added in. Frequently in the middle of all this is a procedure to make this parameter (or related parameters) fit some sort of rule (like it is supposed to be a power of 2).

```
=====  
Note 19.3          MODPARAMS.DAT ADD_PARAMETER          3 of 4  
                  11 lines 29-APR-1986 14:00  
                  -< ADD SEVERAL SYMBOLS TOGETHER. >-  
-----
```

I don't know if this will work; I'm going to try it when I get back to my site.

Since autogen creates symbols for the parameters, why not just do the following:

```
ADDxxxFORyyy = 25 ADDxxxFORzzz = 50 ADDxxx = ADDxxxFORyyy +  
ADDxxxFORzzz
```

I don't know if something like this will work - it is just a thought.

```
=====  
Note 19.4          MODPARAMS.DAT ADD_PARAMETER          4 of 4  
                  6 lines 1-MAY-1986 16:54  
                  ..< add symbols works >-  
-----
```

The suggestion in 19.3 WILL work! As long as all symbols used in the equation are defined PREVIOUSLY in MODPARAMS.DAT!

```
=====  
=====  
=====  
Note 20.0          Pagefile Fragmentation          10 replies  
                  18 lines 29-APR-1986 10:50  
-----
```

We have just got a MICRO VAX II up and running with 5 MB and 3 RD53's. The system initially came up with two page files in sys\$system: both of which were relatively small. After placing all the software required on the system disk we were left with less than 10k blocks. Therefore a third page file of about 10k blocks was created on the third disk using sysgen (contiguous was not selected) it was install in systartup.

On two occasions at least the system console has received messages about the page file being severely fragmented and saying the system was continuing. The status of the page file at the time is unknown how ever the problem looks like it will repeat itself.

Any suggestions re how to diagnose and solve this problem would be appreciated. This never occurred to me on our 780's but then we had lots of space on the RA81's.

```
=====
Note 20.1          Pagefile Fragmentation          1 of 10
                  16 lines  29-APR-1986 11:21
-----
```

Congratulations, You've been bitten by the VMS bug. The page file must be mappable in a limited number of file pointers (A single file header I think). When the file is non-contiguous, multiple pointers are necessarily required. The creation or extension of a page file must abide by the rules, or be cast out by the All Knowing Lords within VMS. The problem gets really serious when the default page file is extended (via AUTOGEN) and the system is rebooted. If the page file (as a result of the extension) becomes too fragmented, VMS will no longer boot at all (this happened at our site). VMS V4.3 supposedly has a fix which will prevent AUTOGEN from creating an invalid page file, but I have not tested this at this time. Unfortunately, there is no way to fix the problem, other than to use contiguous page files in the first place. As you stated, this has not been a problem with RA80/81 disks, but is generally a severe problem with RD52/53 disks.

```
=====
Note 20.2          Pagefile Fragmentation          2 of 10
                  9 lines  29-APR-1986 12:06
-< Build a page file on another disk >=
-----
```

The message about pagefile fragmentation seems to refer to internal fragmentation of the file when it gets mostly full. It is an indication that you need more paging file. There are instructions in the doc set for creating a secondary page file on another disk.

```
=====
Note 20.3          Pagefile Fragmentation          3 of 10
                  8 lines  29-APR-1986 13:08
-< Fragmentation ==> bad performance >=
-----
```

In addition, you should note that fragmented page and swapfiles (i.e., many retrieval pointers) mean that paging and swapping IO will take longer, resulting in longer response times. Making your page/swapfiles large enough and contiguous enough is usually worth the effort.

```
=====
Note 20.4          Pagefile Fragmentation          4 of 10
                  8 lines  29-APR-1986 13:56
-< Primary pagefile full. >=
-----
```

We had a similar message come out on the operator's console that our page file was fragmented. We finally tracked this down to the primary pagefile being full, but had plenty of space in the secondary pagefile. There was (is?) a bug in VMS when you create a global section and have backing store as the pagefile - VMS only uses the primary pagefile for the backing store - and never uses secondary pagefiles. Hence, we just increased the size of our primary pagefile and solved the problem.

```
=====
Note 20.5          Pagefile Fragmentation          5 of 10
                  11 lines 29-APR-1986 14:55
-< pagefile problem >=
-----
```

I think your problem is due to filling up the file, not so much as its fragmentation on the disk drive.

BUT if you want, If possible, remove the page file. Backup/image your system to tape. Re-install from tape, the backup/image. NOW your space left should be contiguous. Try to run sysgen and re-create your pagefile using contiguous. If at all possible, always run on a system disk that's been thru a image compress. (I know it's a waste of a Saturday, but bring a six pack).

```
=====  
Note 20.6          Pagefile Fragmentation          6 of 10  
                9 lines  30-APR-1986 00:49  
-----
```

BTW, it appears from .0 that you have two page files left in SYSS\$SYSTEM. There is never any good reason to have two page files on the same disk. It is especially a bad idea to have the primary pagefile as the only one that can be used for certain things, like backing store for global pagefile sections - on the same disk with a secondary pagefile. Combine the two pagefiles into one pagefile with the same total size. (Note: Be careful to do this in a way that does NOT involve deleting a pagefile while it's in use, or you are likely to clobber your disk!)

```
=====  
Note 20.9          Pagefile Fragmentation          9 of 10  
                18 lines  1-MAY-1986 10:58  
                -< dissertation >-  
-----
```

You can demonstrate the problem by generating a BATCH job into a queue which can handle a BIG number of concurrent jobs. Be sure the batch job re-submits a copy of itself. The net effect is to generate a GROWING number of processes, all of which require space in the PAGEFILE. You will see the 60% message, the 90% message, and finally, NO MORE MESSAGES. The bottom line is that you must have sufficient PAGEFILE/SWAPFILE/DUMPFIL for your MEMORY, WORKLOAD, CONCURRENT USERS, WORKING SET SIZES, etc. You should do a SHOW MEMORY occasionally during peak times, and observe the utilization of the PAGEFILE. If it exceeds 60%, there is a performance penalty. You can improve performance by... BUY MORE MEMORY and increase WS (this reduces pageing load) or by INCREASE/ADD SECONDARY pageing files.

```
=====  
Note 21.0          TPU and SMG                    9 replies  
                3 lines  29-APR-1986 10:51  
-----
```

Will TPU and SMG ever be combined? I would really like my windows to be less than the line width of my terminal. I would also like to have terminal independence.

```
=====  
Note 21.1          TPU and SMG                    1 of 9  
                3 lines  29-APR-1986 11:23  
-----
```

The statement from TPU development continues to be that, were they to provide this, it would only be sold separately -- i.e., NOT bundled with VMS (odd, I'll admit, since both SMG and TPU are bundled).

```
=====  
Note 21.3          TPU and SMG                    3 of 9  
                8 lines  29-APR-1986 12:01  
-----
```

Right now, TPU has no plans for SMG support. As stated in 21.1, it could be done if there was sufficient demand for it as optional (non-bundled sw). What we keep hearing is that people \*want\* it, but are not interested in purchasing it.

```
=====  
Note 21.4          TPU and SMG                    4 of 9  
                4 lines  30-APR-1986 10:13  
-----
```

-< I would buy it. >-

NOT INTERESTED in purchasing a product is relative! If it is cheap many would be sold ... I guess the thing is a business decision. I would buy it, if it had nicer windows, and could support a 6x line terminal.

```
=====  
Note 21.5                TPU and SMG                5 of 9  
                        7 lines 30-APR-1986 10:40  
-< I *could* buy it, but won't. >-  
-----
```

I'm much more interested in maintaining a common set of tools across the operating system. Sure, I'd love to have TPU with vertical split window capability, but I'm not going to pay for it even though I could quite easily because then I wouldn't be able to sell or trade anything based on that capacity. I believe that the unbundling of tools makes it necessary to reinvent the wheel everytime that you want to do something for public access.

```
=====  
Note 21.6                TPU and SMG                6 of 9  
                        8 lines 30-APR-1986 12:56  
-< SMG-TPU connection belongs bundled >-  
-----
```

PLEASE lets keep something so basic as part of the standard VMS system. The way to do this is for you, the DECUS member, to vote for it on the VAX Systems SIG System Improvement Request ballot.

```
=====  
Note 21.7                TPU and SMG                7 of 9  
                        11 lines 30-APR-1986 15:59  
-< Why unbundle it? (!) >-  
-----
```

What I don't understand is why it would have to be unbundled. Is there some sort of political war inside DEC between the TPU people and the SMG folks?

I don't understand why I should \*have\* to pay for it. If DEC is going to provide a 'uniform' interface (i.e., SMG), it seems to me to behoove DEC to use it themselves. I can see this not being possible while both TPU and SMG were in development for 4.0, but why this resistance to modifying the situation?

```
=====  
Note 21.8                TPU and SMG                8 of 9  
                        18 lines 30-APR-1986 16:13  
-< Unbundling leaves me in the cold >-  
-----
```

We didn't have to purchase TPU (it probably snuck in under just under the unbundling wire)!!! Why should we purchase enhancements to it?

I understand (and even agree to some extent) with DEC's policy of unbundling major functionality from VMS. But, this would simply bring the current product up to DEC's own screen management standards (even DEBUG is going in this direction).

Does this new direction imply that we will have to pay separately for things like making RMS more efficient?

```
=====  
Note 23.3                PRINT?SETUP                3 of 5  
                        32 lines 29-APR-1986 14:03  
-< PRINT/SETUP Problems/solutions >-  
-----
```

PRINT/SETUP= has three problems you should be aware of, two of which can be fixed by using PRINT/FORM=

1) If the setup library entry requested does not exist, you don't get any indication until the file prints. It will then give you a flag/burst page followed by a one line page saying the library entry was not found. Really convenient to learn this if your printer is busy or a long walk from your desk.

Fix: define forms (using /STOCK=DEFAULT) that specify the setup library entry. The FORM=xxxx is validated immediately and the job won't be queued if there is an error.

2) If you use /SETUP= to change the number of lines or characters per page, you may find that the print symbiont still thinks the page geometry is the same as before.

Fix: define forms with the appropriate page geometry.

3) If the library entry for a setup entry contains what VMS thinks are printable characters, it will print a page eject. This is a problem with many printers that don't use DEC standard escape codes to control the printer. Result is a bunch of wasted paper (as many as two pages per job if a /RESET string is also set on the queue).

Fix: beat on DEC to fix this silly behavior. The user should be able to tell the print symbiont whether or not a /SETUP string is printable or not.

```
=====  
Note 23.4                PRINT?SETUP                4 of 5  
                        7 lines 29-APR-1986 15:00  
-< Looong setup modules >-  
-----
```

Another limitation of having the modules in a test library is that there seems to be some kind of (undocumented?) limitation on how many bytes of control information can come out of the library and get to the printer without something (librarian? symbiont? ??) inserting carriage returns. (ie. It didn't work to download a character set to a printer {about 5000 bytes})

```
=====  
Note 23.5                PRINT?SETUP                5 of 5  
                        15 lines 29-APR-1986 20:10  
-< Use imbedded carriage control and /nowrap/notrunc >-  
-----
```

The symbiont processes modules from the library [almost] exactly like any other data obtained from the print file. Some users take advantage of this to do custom (but static) flag pages. Its difficult for the symbiont to define special processing rules for these modules, though that does lead to some inconveniences.

One thing to be aware of, modules stored in the library with the DCL LIB command retain the carriage control type of the source text file --- in some cases you can get rid of extraneous carriage control by creating the source module as "imbedded" carriage control.

However, the symbiont will still supply carriage returns or truncate the line unless you are using a form that specifies /NOWRAP /NOTRUNCATE.

```
=====  
Note 24.0                emacs on VAX/VMS?          8 replies  
                        10 lines 29-APR-1986 11:26  
-----
```

I have seen emacs mentioned in these notes. I come from a UNIX (TM) environment and use emacs there. I am now in this VAX/VMS environment and would like to have it available. Is a version available from anyplace that runs on VAX/VMS?

```
=====  
Note 24.1                emacs on VAX/VMS?          1 of 8  
                        11 lines 29-APR-1986 11:46  
-< You're in luck >-  
-----
```

Yes there are several versions of EMACS available for VMS. CCA makes a good implementation that runs on several machines. The sources to GNUEmacs was distributed on the Spring VAXSIG tape in hopes that someone would port it to VMS. Last but not least DEC has a very good version of Emacs that they use internally, I think it's being maintained by Barry Scott, but as far as I know there are no plans to release it as a layered product. However that's what they said about NOTES a couple of years ago too!

Good Luck

```
=====  
Note 24.3                emacs on VAX/VMS?          3 of 8  
                        12 lines 29-APR-1986 16:00  
-< gnu emacs port by sasaki >-  
-----
```

I brought this up in the Languages and Tools roadmap, specifically asking if the gnu emacs port that marty sasaki of harvard was working on has been completed. kevin carosso of hughes aircraft said it has and is available from somewhere via the anonymous login convention and ftp (if you have access to the arpanet of course...). other distribution status: unknown. we had hoped for a BOF on this too but as of now (tuesday 1600 odd) i haven't seen it advertised. check daily.update tomorrow

am to see if a BOF will be held on the vms-emacs question.

=====  
Note 24.4                   emacs on VAX/VMS?                   4 of 8  
                                  11 lines   30-APR-1986 13:57  
-----

Barry Scott's EMACS is based on the Gosling version for Unix. Gosling sold exclusive rights to it to a third party (CCA, I think). DEC has this available under a site license, and Barry has done some mods to the code. Unfortunately, there are sticky copyright and legal problems with DEC distributing or marketing this version of EMACS.

Your best bet is probably GNU EMACS. Marty Sasaki is reportedly very close to distributing this for VMS (if it isn't available already).

=====  
Note 24.5                   emacs on VAX/VMS?                   5 of 8  
                                  10 lines   30-APR-1986 16:06  
                                  -< Gosling's Emacs vs. CCA >=  
-----

James Gosling sold his Emacs to Unipress, not CCA. One of the 'xxx Professional' magazines featured a comparison review of CCA vs. Unipress a few months ago; the article(s) was/were quite good. I have a copy of Gosling's Emacs (as hacked by Dave Kashtan) by and with permission from James to re-distribute it to interested parties. The only caveat is: it's written for Eunice, and some heavy hackery would be needed to get it functional (or at least rebuildable) under VMS. The executable works fine, tho...

k

=====  
Note 24.6                   emacs on VAX/VMS?                   6 of 8  
                                  4 lines   1-MAY-1986 11:35  
-----

RE: .5

Is that to say the executable will run under VMS?

=====  
Note 24.7                   emacs on VAX/VMS?                   7 of 8  
                                  8 lines   1-MAY-1986 17:23  
                                  -< Look on VAX86A,B >=  
-----

I got a copy of VMS GNE Emacs from Paul Ferrill and have brought it for the Spring '86 VAX tape. If no later version surfaces before release date, at least a working version will be available. I intend to call Harvard to see if its developer has a later release to try and get the latest one for the tape. But no promises...these things sometimes fall thru.. Glenn Everhart

=====  
Note 24.8                   emacs on VAX/VMS?                   8 of 8  
                                  7 lines   1-MAY-1986 17:43  
                                  -< GNU Emacs from BITNET >=  
-----

I got a copy of VMS GNU Emacs from Harvard via BITNET. If anyone out there wants it and has JNET 2.x, let me know and I'll dig up the address to send a request to (I got it from USENET).

=====  
Note 28.0                   DECalc Deletion of Grids                   1 reply  
                                  4 lines   29-APR-1986 11:59  
-----

Does any one know the reason that DECalc allows you to delete a grid that was created with a password without using the password to delete it?

=====  
Note 28.1                   DECalc Deletion of Grids                   1 of 1  
                                  9 lines   30-APR-1986 14:44  
                                  -< No Password Necessary >=  
-----

When you create a grid in DECalc, your UIC is associated with it. The password that you add is for viewing purposes only. When the DELETE command is invoked, a check is done on your UIC. If it matches the stored one, the deletion is allowed. Therefore the password is not required.

```
=====
Note 30.0          DECnet ACP file create failure      6 replies
                  9 lines  29-APR-1986 12:33
-----
```

Does anyone know if running different versions of VMS, specifically 4.1 and 4.3 can cause the error:

ACP file create failed. Network partner exited.

when copying files between the two DECnetted systems?

This seems to occur most often when either or both of the systems are relatively busy.

```
=====
Note 30.3          DECnet ACP file create failure      3 of 6
                  18 lines 29-APR-1986 14:55
=< << TYPE NODE::NETSERVER.LOG >> >-
-----
```

Look at the NETSERVER.LOG on the remote node. (the node you're trying to get at.)

Around my site the most common error...

Check for NETWORK-mode errors in the LOGIN.COM or the SYS\$SYLOGIN procedures. If for any reason the login procedures fail with an untrapped or unhandled error the network access will fail with the "NETWORK PARTNER EXITED" message. The SYS\$SYLOGIN procedure is executed by everybody -- the LOGIN.COM procedure executes if it exists in the default directory for the login on the remote node. (Type DIRECTORY NODE:: to see where the default is -- typically it's SYS\$SYSDEVICE:[DECNET] -- unless you've set up proxy access)

```
=====
Note 30.4          DECnet ACP file create failure      4 of 6
                  14 lines 29-APR-1986 16:07
-< one possible solution to partner 'excited' >-
-----
```

We have been having this for years until recently when it became intolerable and we thought we better do something about it. The problem at OUR site was the 750s reporting the messages were just too swamped to give decent response to the incoming link...and after awhile the default timer value at the initiating node (think default is 30 seconds) would give up and report 'network partner exited'. Just because the 750s didn't have the horsepower to do all we wanted them to do. So we told the bigger machines that they should wait longer. I believe the command was something like NCP> SET OUTGOING TIMER 45 or something similar. it helps.

```
=====
Note 30.5          DECnet ACP file create failure      5 of 6
                  25 lines 29-APR-1986 22:49
=< Increasing EXEC INCOMING/OUTGOING TIMERS can help >-
-----
```

Reply .4 has got it right.

Some more general information which might be helpful: frequently, the "network partner exited" message will be seen when attempting to start up a link to a busy node; if the link fails to get completely started (i.e. acknowledged at the NSP protocol level) within the originating node's EXECUTOR OUTGOING TIMER or the target node's EXECUTOR INCOMING TIMER, this error will be seen. One reason this might occur is if a new NETSERVER process must be created to accommodate the new link, and target system loading is sufficient to make this a lengthy process. If the failure was induced at the target node, looking in that node's accounting log will frequently give you the reason.

Increasing both the timers cited to values like 60 or 90 seconds will reduce the incidence of "network partner exited" problems caused by system load. One possible down-side of doing this is the fact that this increases the duration of a real timeout being reported (for example, a truly unreachable node which is being addressed on an all-endnode Ethernet).

Hope this helps.

```
=====
Note 33.0      .EXE FILE TRANSFER WITH KERMIT      3 replies
               4 lines  29-APR-1986 13:01
-----
```

I'M HAVING TROUBLE SENDING A .EXE FILE VAX TO VAX VIA TELENET. I HAVE SET PARITY MARK ON BOTH ENDS AND SET FILE TYPE FIXED. AFTER A PERIOD OF TIME, AN ERROR OCCURS \* FILE TOO BIG. ANY HELP WOULD BE APPRECIATED.

```
=====
Note 33.1      .EXE FILE TRANSFER WITH KERMIT      1 of 3
               8 lines  30-APR-1986 09:49
               -< Maybe this will help... >-
-----
```

I've experienced the same problem, but it seems to be less of a problem when you use the KERMIT> SET FILE TYPE BINARY, although I don't remember whether you do this on the sending or receiving end (I think the latter...) Good luck.

```
=====
Note 33.2      .EXE FILE TRANSFER WITH KERMIT      2 of 3
               4 lines  1-MAY-1986 17:03
               -< Use FIXED, not BINARY >-
-----
```

I believe you should use SET FILE TYPE FIXED instead of BINARY. We have transferred EXE files successfully this way.

```
=====
Note 33.3      .EXE FILE TRANSFER WITH KERMIT      3 of 3
               3 lines  2-MAY-1986 10:53
               -< kermit 3.2 >-
-----
```

I believe a SET FILE FIXED will also fix the problem if running 3.2 of kermit.

```
=====
Note 37.0      creating multi-volume tape sets      2 replies
               23 lines  29-APR-1986 13:37
-----
```

I wonder how to create multi-volume files-ll tapesets given the following constraints:

- 1) All scratch tapes are degaussed
- 2) I have 1 tape drive.
- 3) It is not possible to determine ahead of time how many tapes will be required.
- 4) Pre-initializing tapes is not a viable alternative.

According to documentation REPLY/BLANKTAPE should do the trick BUT it doesn't (it appears that it is the requestor, not the responder who needs VOLPRO and OPER and I don't want to give users VOLPRO or OPER). It also appears that REPLY/INITIALIZE and REPLY/TO both require that the tape be pre-initialize with some valid label.

It should be noted that BACKUP handles this situation just fine whether or not the user is privileged.

Thank you for any light you might be able to shed on this subject

```
=====
Note 37.1      creating multi-volume tape sets      1 of 2
               7 lines  30-APR-1986 10:04
               -< A STEP BACKWARDS >-
-----
```

You are correct. We had a similar problem and finally got TSC to admit it. In a previous version of VMS BACKUP had the same problem, but with Version 4.3 the "feature" was moved to COPY.

Our operators init all tapes prior to use anyway. TSC gave the stock answer "Will be fixed in future release". Sorry, but that was the only workaround we received -- INIT prior to use



=====  
Note 37.2           creating multi-volume tape sets           2 of 2  
  10 lines 30-APR-1986 10:26  
  -< More info >-  
-----

This is in 4.0, 4.1, and 4.2, I am not yet on 4.3. I have not had the problem with backup since 2.n when backup came out. (note that concurrent with 4.0 was when we started degaussing the tapes primarily because we had several instances (greater than 75% of the time) that a user could not INIT a tape because the tape had an expiration date written on it that was approx 1 year into the future. We also got bit security wise on a tape which contained sensitive data, had been re-INITed but not degaussed and then the sensitive data was read (actually a VERY simple thing to do.)

=====  
=====  
=====  
Note 55.0           HSC load balancing problem           4 replies  
  13 lines 29-APR-1986 16:31  
-----

I have 2 HSC50s with 17 RA81s between them , each disk cabled to both HSCs. Normally I keep half the disks mounted from each HSC for load balancing. If 1 HSC fails, half the disks failover to the other HSC. On a power failure, whichever HSC comes up first mounts all the disks, and I'm not load-balanced unless I do it manually via drive buttons.

Is there (or will there be a way) to ensure that my disks are mounted balanced on both HSCs after a power failure?

=====  
Note 55.1           HSC load balancing problem           1 of 4  
  6 lines 29-APR-1986 16:41  
  -< Preferred Path >-  
-----

An extension of the MOUNT command that would implement a concept that I call "a preferred path" has been considered for VMS. However, no promises can be made regarding when such a feature would appear.

=====  
Note 55.2           HSC load balancing problem           2 of 4  
  9 lines 30-APR-1986 10:22  
  -< VAX/HSC after failure >-  
-----

Watch out - we have a similar environment in which we separated the drives between two HSC's by odd/even numbering. We lost a node of the VAX Cluster for a period of time (hard crash), and then later lost an HSC. When were able to finally get the VAX back up, it refused to boot properly until it could re-establish the original paths through both HSC's. It seems the machine remembers where it was last attached through and throws a conipation-fit (sp) if it can't get there. Colorado spring is unable to determine if this was intended to happen in VMS. Maybe 4.4 fixed?

=====  
Note 55.3           HSC load balancing problem           3 of 4  
  8 lines 1-MAY-1986 11:34  
-----

Same experiance - Seems to be necessary (occasionally) to reboot EVERYTHING (6 VAX, 2 HSC) if severe system bouncing has ocured. This seems to be cleanest way to insure all will come up clean

=====  
Note 55.4           HSC load balancing problem           4 of 4  
  6 lines 1-MAY-1986 14:28  
  -< Preferred Path >-  
-----

I would like to express my support to the preferred path extension to the MOUNT command. Please do it soon!!!!

```
=====
=====
=====
Note 57.0          TeX and LaTeX but not LN03          6 replies
                  11 lines  29-APR-1986 16:45
*****
```

Question regarding TeX and LaTeX

Does anyone know of device support for TeX other than the LN03?

We have LN03's but would like to give smaller departments draft-type output devices.

```
=====
Note 57.1          TeX and LaTeX but not LN03          1 of 6
                  10 lines 29-APR-1986 17:13
                  -< PC TeX >
*****
```

There is also a (gasp) PC TeX for the IBM PC. It is NOT public domain, though, and must be purchased from Addison-Wesley publishing (I have address & price if you call)

You can use other printers but I can't think of any DEC supported printers that cost less than the LN03

```
=====
Note 57.2          TeX and LaTeX but not LN03          2 of 6
                  7 lines  30-APR-1986 10:13
                  -< IMAGEN >-
*****
```

There is also support for TeX from Kellerman & Smith in Portland(?), Oregon on any of the IMAGEN laser printers, they supply TeX and Necessary Symbionts for VMS, Works reall well.

```
=====
Note 57.3          TeX and LaTeX but not LN03          3 of 6
                  5 lines  30-APR-1986 12:50
                  -< Talaris Sys - TeX >
*****
```

There is also a version of TeX for Talaris laser printers available from Talaris Sys in Calif.

```
=====
Note 57.4          TeX and LaTeX but not LN03          4 of 6
                  8 lines  30-APR-1986 13:19
                  -< VersaTeX >-
*****
```

We use Versatec printer/plotters for draft copies. We wrote our own code to do the DVI to raster conversion.

```
=====
Note 57.5          TeX and LaTeX but not LN03          5 of 6
                  12 lines 30-APR-1986 13:37
                  -< TeX User's Group >-
*****
```

There are TeX drivers for just about any laser printer you can think of. Texset in Ann Arbor is a good place to start.

The TeX User's Group newsletter (TUGboat) is published quarterly and contains an up-to-date listing of various drivers. You can get a sign-up sheet for TUG from the L&T campground in W. 103. (They also have LaTeX running on a VAXstation, with the LSE LaTeX templates).

Also, the Languages and Tools Information folder contains a list of tool sources that includes places to find TeX drivers. You can pick it up from the L&T campground.

```
=====
Note 57.6      TeX and LaTeX but not LN03      6 of 6
              19 lines 30-APR-1986 15:42
              -< draft printing and previewing >-
-----
```

original message was interested in draft copies. addison-wesley publishing's pc tex offers several printing-quality modes (including draft) for the several printers it supports. another company has tex for the ibm pc, but apparently not for different quality modes.

concerning draft quality, there are also screen previewers for viewing the output without wasting reams of paper.

addison-wesley will also be coming out with tex for the macintosh, and will have a screen previewer for it.

there is also already a screen previewer for pc tex on the ibm, but it requires a hercules (?) graphics board. i have no idea how well it works.

gotta send a note to the notes note about adding functionality (like text reformatting when you add text to the middle of a line, and cutting and pasting)

```
=====
Note 59.0      Mount Verification Timeout Recovery  2 replies
              16 lines 29-APR-1986 16:52
-----
```

I had a fault on a disk. The mount verification timed out. We observed the transaction count (greater than 1) and stopped all processes which could possibly be using the disk (we thought). We tried to remove installed images, but the the install didn't want to since the disk was "unavailable". We tried to dismount the disk despite the transaction count remaining at 2. It was marked for dismount but not dismounted. We then discovered the DISMOUNT/ABORT command and tried it. Of course we got the device not mounted message. We tried to mount it and got the device already mounted message. We finally shutdown and rebooted the system to get the disk back.

Did we have some less drastic alternative.

```
=====
Note 59.1      Mount Verification Timeout Recovery  1 of 2
              8 lines 30-APR-1986 10:11
              -< Install/Command_mode to remove KFE >-
-----
```

Yes, there is a less drastic way IF the problem is installed files. There is an option in the INSTALL/CMDMODE that will tell install to remove the entry, period, regardless if it can get to it. I believe the format is REMOVE USER1:[FOO]BAR, but am not 100% sure.

```
=====
Note 61.0      Recovering from spurious XOFF      2 replies
              10 lines 29-APR-1986 16:56
-----
```

From time to time, one or another of our devices sends a spurious XOFF. These are devices like printers and embossers running through sometimes bizarre communications gear.

How can we restore the flow of data without unplugging the device from the port, plugging in a terminal, and hitting control-Q?

```
=====
Note 61.1      Recovering from spurious XOFF      1 of 2
              5 lines 30-APR-1986 01:14
-----
```

Yes, though you'll have to write a little program to do it. There is a "mode" you can set with a SETMODE Q10 to the terminal line that clears the XOFF condition. The name escapes me, but it's really obvious - probably XON. See the chapter on terminals in the I/O User's Guide.

=====  
Note 61.2            Recovering from spurious XOFF            2 of 2  
  9 lines    30-APR-1986 16:59  
          "< easy as pie >"  
\*\*\*\*\*

You can also use SET TERM/XON ttxn:. It does the \$QIO that 61.1 mentions. You need SHARE priv.

This is not documented because it isn't perfect. If there is another I/O not done posted to the terminal, it may not get through.

=====  
=====  
=====  
Note 64.0            Suspected BUG in NOTES!            8 replies  
          9 lines    29-APR-1986 17:43  
\*\*\*\*\*

I think I have found a bug in notes. Several times now I have done a DIR /ALL and gone to the beginning (notes 1-17) of the buffer. I have then read a note and a reply. Upon going back to the directory, I have been unable to go past note 17.

Any ideas on what I am doing wrong?

=====  
Note 64.1            Suspected BUG in NOTES!            1 of 8  
          8 lines    29-APR-1986 17:54  
\*\*\*\*\*

In VAX Notes, the DIR command displays 17 entries surrounding your current Note context. So it's not a -bug-, it's the way Notes works. To get beyond 17, you have to establish a new context. The easiest thing to do is simply read the latest topic (the header shows the number of topics) and then do a DIR.

=====  
Note 64.2            Suspected BUG in NOTES!            2 of 8  
          4 lines    29-APR-1986 18:07  
\*\*\*\*\*

Or:  
Notes> DIR 999-1  
Or:  
Notes> DIR \*.\*

=====  
Note 64.3            Suspected BUG in NOTES!            3 of 8  
          3 lines    29-APR-1986 20:56  
\*\*\*\*\*

Or DIR LAST-1 (reverse listing, topics only) Or DIR \* (forward listing, topics only)

=====  
Note 64.4            Suspected BUG in NOTES!            4 of 8  
          9 lines    30-APR-1986 09:59  
          -< It's not a feature, it's a pain. >-  
\*\*\*\*\*

Come on, guys, let's call it what it is. It's a kludge to have to "re-establish context" by doing a DIR 999-1 or reading the last message. You should be able to get to higher numbered directory entries by hitting the PREV SCREEN key or the keypad 5 while displaying the directory.

=====  
Note 64.5            Suspected BUG in NOTES!            5 of 8  
          3 lines    30-APR-1986 12:37  
\*\*\*\*\*

re .4:

You are of course correct. Fixed in a future release.

```
=====
Note 64.6          Suspected BUG in NOTES!          6 of 8
                  3 lines  30-APR-1986 12:38
                  -< look again >-
-----
```

RE:64.4

Prev Screen does work as mentioned!!

```
=====
Note 64.7          Suspected BUG in NOTES!          7 of 8
                  8 lines  30-APR-1986 14:06
-----
```

RE: .6

Only if you have used NEXT SCREEN to scroll down a screen or two. It doesn't work if you're on the first screenful of the current directory listing. This is a known problem in NOTES and a correction is being investigated.

```
=====
Note 64.8          Suspected BUG in NOTES!          8 of 8
                  3 lines  1-MAY-1986 16:34
                  -< another way >-
-----
```

To get to the top, just type 9999999 and it will show you the newest message.

```
=====
Note 66.0          Bad pages in memory             2 replies
                  10 lines 30-APR-1986 09:35
-----
```

When running under VMS version 4.1, 260 bad pages show up when you do show memory. Diagnostics show that all the memory is good and no memory errors are logged. How can I find out where the bad pages are and remove them other than removing the boards one by one.

Show memory under version 3.7 will not reveal these bad pages.

System has been running fine with this problem.

```
=====
Note 66.1          Bad pages in memory             1 of 2
                  14 lines 30-APR-1986 14:10
                  -< ANALYZE/ERROR >-
-----
```

Had a problem with a VAX780 system -- bad memory was showing up occasionally. Turned out to be from two sources -- one was the diagnostics. Apparently the diagnostics left garbage out in the second memory controller which VMS saw as bad memory. The other was caused by a couple of failing boards. ANALYZE/ERROR showed which board(s) was bad for the latter. Dumping the memory power supply (while the system was down) to clear the memory and then rebooting cleared the other.

```
=====
Note 66.2          Bad pages in memory             2 of 2
                  20 lines 1-MAY-1986 09:29
                  -< SHOW MEMORY >-
-----
```

If VMS has detected memory errors and discarded pages as a result, SHOW MEMORY will indicate 3 different failure possibilities:

Dynamic: number of failures AFTER the system was booted

I/O Errors: number of failures detected during page fault handling

Static: number of failures detected during the memory test at bootstrap time

Errors that occur during the bootstrap test cause VMS to discard the pages that encountered the errors. No data is logged at this time because the boot-time environment has no way to talk to the error logger.

If memory diagnostics do not call out the problem you may have intermittent single-bit errors.

```
=====  
=====
```

Note 71.0 BANNER PAGES AND LASER PRINTER PAGE LENGTH 2 replies  
14 lines 30-APR-1986 10:57

```
-----
```

WE HAVE TO SET ARBITRARILY LONG PAGE LENGTHS (255) FOR OUR LASER PRINTER QUEUES (PRINTERS ARE NON-DEC) SO THAT WE CAN CONTROL THE PAGING WITH COMMANDS SENT TO THE PRINTER. THIS PAGE LENGTH IS SET WITH THE DEFINE/FORM COMMAND WHICH IS THEN ASSOC WITH THE QUEUE. THE PROBLEM IS THAT WE NOW HAVE BANNER PAGES THAT ARE ALSO 255 LINES AND MULTIPLE PAGES. WE ALSO HAD THIS PROBLEM WITH THE WIDTH BUT SOLVED IT BY SETTING A REASONABLE WIDTH AND USING /NOTRUNC/NOWRAP ON THE QUEUE. IS THERE A WAY TO HAVE MY BANNER PAGE FIT ON ONE PAGE AND THEN HAVE AN ARBITRARY LENGTH/PAGE FOR THE DOCUMENT BEING PRINTED?

```
=====  
=====
```

Note 71.1 BANNER PAGES AND LASER PRINTER PAGE LENGTH 1 of 2  
6 lines 30-APR-1986 14:48

```
-----  
-< ex >-
```

You can fix this by DEFINEing/FORMs (must use /STOCK=DEFAULT if no paper change is desired) that specify the page geometry and RESET entry associated with each output format. (see notes on PRINT/RESET=)

```
=====  
=====
```

Note 71.2 BANNER PAGES AND LASER PRINTER PAGE LENGTH 2 of 2  
8 lines 30-APR-1986 17:08

```
-----  
-< use INIT/QUEUE/DEFAULT=NOFEED >-
```

Initializing the queue /DEFAULT=NOFEED will probably solve your problem. Define the page length to obtain the desired banner length. Using /NOFEED (which may also be specified on the PRINT command) will cause the symbiont to allow pages to run past the page length without inserting a form feed.

```
=====  
=====
```

Note 72.0 LSE TPU source 1 reply  
12 lines 30-APR-1986 10:59

```
-----
```

I'd like to be able to extend LSE using my particular flavor of EVE.

This is a problem because of the way that LSE is implemented in TPU - that is, there is no TPU source for the section, so the only way one can modify the LSE editing interface is to write TPU code from scratch, rather than layer it on top of existing code like EVE. Is there a work-around? Is there any chance that DEC will release the LSE TPU source?

```
=====  
=====
```

Note 72.1 LSE TPU source 1 of 1  
18 lines 30-APR-1986 14:13

```
-----
```

At present, there is no work-around. We do not release the LSE TPU source because it is in a state of flux. It changes (sometimes rather radically) from update to update. We do not want to pull the rug out from our users, and we don't want to be constrained by the current state of the code. Therefore, we don't ship the sources at present.

We recognize this is a problem and we're doing a couple of things in this area. First, EVE, NOTES, and LSE are working towards adopting a "common editing kernel" of TPU procedures. These would be documented for users to use in their own TPU extensions to the products and would be available uniformly across the various products layered on the TPU editing engine. We're not there yet, though. Second, we are looking at making more of the internally-used TPU procedures in the LSE section file documented, stable, and supported so user-written code can use them.

```
=====
Note 73.0      DISKQUOTA problem = Disk Leakage      9 replies
              18 lines  30-APR-1986 11:02
=====
```

Every since installing VMS V4.x the DISKQUOTA system leaks!!! That is the space used reported by SHOW QUOTA is very often + or - by large amounts from the real space used!!

I know of the bug associated with EDT that causes the space used to get off by one block with every edit. We however are sure that this is not the only bug!!!!

In fact, recently we have seen that a PL/I program writing a disk file until the QUOTA is exceeded will bomb is such a way that when the file is delete the QUOTA used is not reduced by the size the space released. This problem is not always reproducible...

```
=====
Note 73.5      DISKQUOTA problem = Disk Leakage      5 of 9
              16 lines  30-APR-1986 15:11
              * < comments and caveats > *
=====
```

We noticed this problem back with V4.1, and a number of our users had problems with it. I called TSC. First they said you had to add one block for every file you own - however this was not enough to cover the difference (often as high as 10% over what dir/size + of files totalled). I read the other replies. It may be true that the file system sometimes loses headers, but I find it hard to believe that this would account for all the missing space either. I was told that the software engineers were "aware of the problem". Maybe in 4.4 they will have found a way to correct it. By the way, analyze /disk/repair will fix it, but it will start to accrue again afterwards, so this is not a true fix.

```
=====
Note 73.9      DISKQUOTA problem = Disk Leakage      9 of 9
              26 lines  1-MAY-1986 18:22
              * < More ways to miss files > -
=====
```

re: .5 Adding one block per file accounts for the headers. However, some files can have extension headers = if they have a lot of extents or big ACL's, for example. Hence, that's only an approximation - each extension header also costs one against the quota, but doesn't get accounted for by DIRECTORY.

Finally, depending on you have the directories themselves. If you do a

```
DIR/GRANDTOTAL [*...]
```

the directories files = and, in fact, ALL files = in [000000] are not counted. You can try:

```
DIR/GRANDTOTAL [0"000...]
```

which counts thos files, but causes another problem: any given filespec can only contain 8 levels of subdirectory, and an explicit [000000] counts as a level; so this command will miss anything in directories exactly 8 levels down.

```
DIR/GRANDTOTAL [*...],[000000]
```

should catch everything - ASSUMING that you haven't used rooted directories to create stuff that is REALLY more than 8 levels down from the MFD, and that no users have done that either.

```
=====
Note 76.0      running out of PAGEDYN              9 replies
              31 lines  30-APR-1986 11:35
=====
```

I had a VAX system that started to run out of PAGEDYN (not NPAGEDYN, but PAGEDYN.) The symptom was that users would get through LOGINOUT to the point of the Welcome message, then die with the message "Insufficient dynamic memory." I traced the problem to insufficient pagedyn, and used SDA to find out where it was going. Nothing looked too strange, though - just a few piggy logical name tables. However, I didn't want to just "add a few more thousand bytes." I want to know how PAGEDYN is allocated and used during process creation.

1. How much PAGEDYN is required to complete LOGINOUT? The problem started to evidence itself at about 10-12k bytes left. But HOW MUCH is actually required? I.e., at what point will LOGINOUT fail?

2. As processes are created and deleted, PAGEDYN doesn't change very much. Not surprising - it's dynamically allocated. But the only reason I can think of why it doesn't change much is that there is some sort of PAGEDYN sponge out there soaking up all my spare PAGEDYN to some limit. In this case, the limit must be "wrong" - i.e., not big enough to allow me to create processes?

This is all happening in a cluster, on a 780, running VMS V4.2.

Any ideas anyone?

```
=====
Note 76.1          running out of PAGEDYN          1 of 9
                  14 lines  30-APR-1986 15:33
                  -< some thoughts on pagedyn and logname tables >-
-----
```

We saw exactly the same problem when doing our conversion to v4 from a 3.7 system; we changed our user=application environment and converted what had been a bunch of separate group logname tables to system shared logname tables. lots of them. some very large. and once created, they stick around. our only solution was to vastly pump up the pagedyn. tsc recommended that we put it way up until we figured out what the system 'stable' point was; then set pagedyn about 20000 bytes higher for 'normal' use (on a 785). it seems to have worked. By 'stable' point I mean once the system has started and the first user logs in, SHO MEM shows X bytes pagedyn 'in use'. We took that number and added 20K.

```
=====
Note 76.2          running out of PAGEDYN          2 of 9
                  7 lines   1-MAY-1986 10:24
                  -< agreeded an Pagedyn. maybe decnet??? >-
-----
```

At Racal, we had the same problem, Pagedyn turned to PageOcean so bad that sho mem comes back with Pacific+Atlantic. I found Decnet to use a great deal. I dont have a solution but I agree that it sure eats you out of BYTE and home=BLOCK.

```
=====
Note 76.3          running out of PAGEDYN          3 of 9
                  12 lines  1-MAY-1986 10:37
                  -< I agree,...but check disk caching also >-
-----
```

:~) I agree as well...also any disk caching you may be doing is allocated from pagedyn....Keep that in mind...If pagedyn is to low disk caching will be effectivly turned off..ie only 7 entries will be cached..."TSC" said to add another 20K to make it work...If you are low on pagedyn...check to see that disk caching is turned on also...it may be off because of lack of space...instead of 20K addition you may have to add 50K!!!

```
=====
Note 76.4          running out of PAGEDYN          4 of 9
                  10 lines  1-MAY-1986 12:12
                  -< 20 k isn't very much cushion! >-
-----
```

You'd be better off waiting until your maximum number of users log in, then calculate PAGEDYN as used+(20 to 100)k. Each process gets a fair bit of memory - particularly if your people have discovered job logical name tables (I have!).

During process startup, the system assumes worst case shared logical name table creation (group + job + some others odds and ends). If you don't have that available, then you get insufficient memory errors. (Also do a SHOW MEMORY /POOL /FULL because it can get very fragmented.)

```
=====
Note 76.5          running out of PAGEDYN          5 of 9
                  8 lines   1-MAY-1986 14:35
                  -< Use AUTOGEN for param. changes >-
-----
```

RE: .3 If you do determine that the problem may be in the XQP caches (low hit rate (<75%), moderate attempt rate from Monitor/SPM), then you'd want to bump up the appropriate ACP\* parameter in MODPARAMS, then re=Autogen. Do NOT just bump these (or PAGEDYN) in SYSGEN, because of the effect on other parameters, like SYSMWCNT. Autogen knows about these relationships, and will correctly "trickle=down" your changes.



```
=====
Note 76.6          running out of PAGEDYN          6 of 9
                  13 lines   1-MAY-1986 15:09
                  -< PAGEDYN used by caches >-
-----
```

Recently I was doing some tuning of the ACP caches, trying to achieve a larger hit rate. I discovered that all of the ACP caches come out of PAGEDYN, and that if you increase them, you had better increase PAGEDYN as well. We had the same login problem after my increases to cache.

I did pretty much what everyone else says: bumped it up a lot, like 50K, and then did a SHOW MEM when the system got busy to see how much was actually in use.

It would be helpful if DEC would document how much paged pool is used up by each of the various ACP caches so we can calculate how much paged pool will be eaten up if we increase them.

```
=====
Note 76.7          running out of PAGEDYN          7 of 9
                  15 lines   1-MAY-1986 16:17
                  -< Possible solution ???? >-
-----
```

We recently had a somewhat similar problem but we had plenty of pagedyn available ( 300,000 bytes allocated, 156,000 used) and increasing pagedyn did not make the "insufficient virtual memory" message go away. After much harrassment of software support they found a "special" sysgen parameter called CTLPAGES (or something close to that) that controls the virtual memory for individual processes. I believe the default is 50 and we changed it to 100 and have not seen the message yet.

```
=====
Note 76.8          running out of PAGEDYN          8 of 9
                  6 lines    2-MAY-1986 07:34
                  -< Check your MOUNT command ! >-
-----
```

One thing to definitely check is to make sure that you are not doing a MOUNT/PROCESSOR=UNIQUE on your disk devices. This will create a brand new set of "shared" XQP caches for each device mounted this way. These caches come out of paged pool. Incidentally, the problem given in ;=1 is due to process IO

space reserved to RMS probably being depleted. This obviously has nothing to do with paged pool.

```
=====
Note 76.9          running out of PAGEDYN          9 of 9
                  16 lines   2-MAY-1986 11:29
                  -< Thanks for the help >-
-----
```

I found out about the CTLPAGES parameter from TSC as well. But when I looked into the Internals manual I soon realized that it had nothing to do with the problem, as SIEGAL has noted. So whatever made your problem go away was not related to the CTLPAGES parameter. (I tried it anyway - it's possible that TSC knew something that wasn't documented in the V3 internals manual - but it didn't help in our case.)

Thanks to everyone for the ideas on this. But is there anyone at DEC who can answer the original questions?...I.e., what is the "magic number" that a process requires to be created?...etc.

```
=====
Note 85.0          PCA with DTM                    1 reply
                  22 lines   30-APR-1986 14:07
-----
```

I am a novice PCA user and have never used DTM. I have a problem using PCA which I know cannot be solve within PCA but possibly there is an answer if PCA is used with DTM.

Here is the question:

I have a quality assurance requirement that I must show path coverage for all lines of executable code within a given routine. This assures no dead source code. I can use PCAs path coverage operation to do this. The problem comes when I must change a test driver routine to force coverage of lines of code that a previous test did not cover. ie. Ten routines linked to form one image is executed and shows 50% executable line coverage in one module. I must link with another driver to show coverage of the other 50%. I cannot simply use the append datafile to collect the two path coverage data for this one module because I have two different executable images.

Can I use DTM in conjunction with PCA to combine this coverage data into one printable report?

```
=====
Note 85.1          PCA with DTM          1 of 1
                28 lines  1-MAY-1986 09:39
                -< PCA and DTM >-
-----
```

I'm afraid the answer is no. DTM does not help overcome PCA's limitations. The obvious first suggestion is for you to combine your two drivers into one image, I expect that you have good reasons for not doing so. As a second suggestion, you could use the LIST command to analyze the data from both data files with a program you write. That doesn't sound like much fun and you could get the same effect by placing two listings side by side. Finally, we'll add your need to our wish list. We are aware that many contracts require coverage data and we are considering ways to enhance PCA's coverage support.

A brief explanation of DTM's interface with PCA follows:

The user must link his program with the collector and provide an initialization file which contains the collector commands necessary to gather the data. DTM provides the data file name. The user then runs those test he wants. From DTM's review mode, the PCA data can be accessed with the PCA command. DTM's review mode spawns another process and starts PCA's analyzer. DTM passes the name of the data file and sets up a filter which makes the information from the "current" test available. Thus, PCA uses DTM's paradigm, one of reviewing the results of one test at a time. Once the user is sitting at the analyzer prompt, of course, the filter could be canceled and all of the analyzer's capabilities could be used.

```
=====
Note 92.0          set terminal/speed=38400      2 replies
                7 lines  30-APR-1986 14:36
-----
```

I recently found out that I cannot use my DHV or DHU at 38.4K baud under VMS, since there is no way to use the set terminal command. Set terminal only goes to 19.2K. Calling software support got the reply "I have never heard of 38400 baud, and 19.2 is there but not supported". Any help?

```
=====
Note 92.1          set terminal/speed=38400      1 of 2
                18 lines 30-APR-1986 17:09
                -< long story... >-
-----
```

19.2 is supported, always has been.

38.4 is supported in V4.4, I think. The DHV has a feature that setting 38.4 can change the speed on another line. It has group A speeds and group B speeds. Each pair of lines of the DHV must be set to either an A group or a B group. Before 4.4, VMS only allowed A groups. V4.4 allows the /speed=38400 syntax, but I'm not sure what happens when you do that.

The DHV really isn't any faster if you do set 38400. It has a throughput maximum that is hit about 19200.

Sorry I'm not sure of the details, perhaps the 4.4 release notes have more.

```
=====
Note 92.2          set terminal/speed=38400      2 of 2
                8 lines  1-MAY-1986 15:30
                -< 38.4 with Emulex >-
-----
```

Emulex sells a DHV emulator which can fake 4.3 into doing 38.4 kbaud, but I don't know if the thing will work properly at that speed under 4.4. The Emulex DHV clone has higher throughput than the real thing.

```
=====
=====
Note 94.0      File Ownership "Leakage"      4 replies
              43 lines  30-APR-1986 14:40
-----
```

We've been having a recurring bizarre problem which we refer to as "file ownership leakage". This problem has occurred on a number of systems under V4.0, 4.1, 4.2, and 4.3. The particulars are as follows:

A user (say [100,10]) creates a file in a directory owned by [100,0]. This user has TMPMBX, GROUP, NETMBX privs only. The disk is typically one volume of a multi-volume (2) set. This has been observed on both clustered and non-clustered systems. The user does not have any ownership privs associated with the volume.

At some time during his session, usually following a WRITE and CLOSE of the file (all programming done from FORTRAN with "good" programs) the file will mysteriously change ownership - say to [143,43]. Both the original owner and the new owner appear to have new correlation with each other, and the problem is not restricted to a particular "new owner" - i.e., the new owner is random. The one clue is that the new owner has also been logged in at the same time as the original owner of the file.

Disk quotas are enabled on the system.

We have discussed this with TSC on several occasions and their suggestion has been to submit a SPR with an IMAGE BACKUP of the disks - note that this is about 6 6250 tapes! This seems like a waste of time since it only represents an after-the-fact image.

We would appreciate any suggestions (esp from VMS development) on how to debug this problem/get the info that would be necessary to VMS devel.

We have been unable to cause the problem to appear at will (of course). Our suspicion is that internal buffers are getting confused within the file system, but have no idea where to go from here. Note that no global buffers are assigned to the file.

any suggestions???

```
=====
=====
Note 94.1      File Ownership "Leakage"      1 of 4
              8 lines  30-APR-1986 15:03
              -< Reply from info in today's XQP internals seminar >=
-----
              -< fixed? in 4....>-
```

I only caught the end of XQP Internals today, but that was listed as one of the bugs (caused by losing the relative volume number and only using the FID) which has been fixed. It only happens under rare situations with volume sets. Probably fixed in 4.4 if you still have it under 4.3. Anyone from DEC with more info?

```
=====
Note 94.2      File Ownership "Leakage"      2 of 4
              6 lines  30-APR-1986 15:48
              -< Fixed in V4.4 >-
-----
```

This problem did exist prior to V4.4. It HAS been fixed for V4.4.

The problem, however, was only seen on volume sets.

```
=====
Note 94.3      File Ownership "Leakage"      3 of 4
              1 line  30-APR-1986 17:42
-----
```

Correction. The fix did not make V4.4.

```
=====
=====
Note 97.0      Indirect dialup access      3 replies
              16 lines  30-APR-1986 15:10
-----
```

Problem: Under VMS 3.7 indirect dialup could be prohibited while V4.x does not prevent it.

Under VMS 3.7 if I had VAXes on DECnet, some with dialup and some who did not permit dialup, it was possible to control the situation. If I dial in to node A and set host to node B, I could not log into any accounts set DISDIALUP. Under V4.2/4.3 I can log in.

It should be possible for security concious sites to have a network connection but still disallow indirect dialup access as was the case under V3.7. DEC seems to take the position that this was an undocumented feature (I havent found it documented, have you?) and is therefore not to be expected in any future VMS.

I consider this a security problem that should be addressed. Am I the only one who cares about it?

```
=====
Note 97.1          Indirect dialup access          1 of 3
                  13 lines  1-MAY-1986 17:43
                  -< They do provide it in V4.n >
*****
```

DEC has provided a very similar setup. I don't know the details of the syntax, but in AUTHORIZE, there is a /DIALUP qualifier for MODIFY (and others). It works in a similar way to ACCESS where you specify hours (primary and secondary) when someone can log in over a modem. You can set this to be /NODIALUP= and then specify all days all hours with (I believe) not much difficulty. Read the HELP inside AUTHORIZE for details and examples.

```
=====
Note 97.2          Indirect dialup access          2 of 3
                  20 lines  1-MAY-1986 17:53
                  -< Oops! Didn't read carefully enough! >-
*****
```

Actually I just reread your problem and realised there was a little more to it than I first thought. I don't know whether my suggestion will fix it or not - you don't mention it - have you tried it? I find it a rather convoluted security problem. If the person with that account is allowed to log in over the network, why wouldn't you want them to dial in over the phone? We have never done that because we have a couple of computers which people need to access from home, which don't have enough ports for modems (e.g. uVAXes) of their own. You have an interesting point. It is possible that in V4 they have expanded the network database and stuff so that it is completely separate

from any dialup access; also, when the RT driver passes Node B information about the source on Node A, the terminal characteristics are probably not in it, nor the process characteristics. Sorry my first reply will probably not help you - I don't know how to delete replies, or I would do that and save you the time.

```
=====
Note 97.3          Indirect dialup access          3 of 3
                  10 lines  2-MAY-1986 12:11
                  -< Not that simple... >-
*****
```

No, the point of the problem is that DISDIALUP does not disable all dialup access to an account as it used to under V3.7.

This was not an enormously effective check as it is easy to hook up a modem to a port without telling VMS it has been done. It was, however, robust enough that if you originated on a modem port and set host to some intermediate accounts on the same or other machines, you could still not log into a /DISDIALuped account.

```
=====
Note 105.0        750 w/Adage-3000 .. Bugcheck ASTDEL      8 replies
                  16 lines  30-APR-1986 16:05
*****
```

We have a 750 with an Adage 3000 ... Adage supplies their interface, the IK11. Sometimes when we boot the vax and load the IK Driver, VMS will crash with Bugcheck ASTDEL.

At the last DECUS, I found someone who had the same problem, but no fix yet. Does anyone have a similar problem, And a Fix ??

```
=====
Note 105.1        750 w/Adage-3000 .. Bugcheck ASTDEL      1 of 8
                  17 lines  30-APR-1986 16:17
                  -< IKDRIVER.MAR >-
*****
```

I had the same problem with an Adage IK-11 board. It's an easy fix - it turns out the initialization section (connect) of the driver neglects to clear R3 (I think it's R3 - look in the init code for the register that gets dumped into the CSR) out - then proceeds to load the contents of the register (plus a couple of

bits the driver AND's in) into the CSR of the IK11 board and -- if the low (go) bit is set -- goodbye VMS. CLRL the register, reassemble and relink the driver (the "No Transfer Address" message is normal). This has calmed the driver down considerably.

```
=====
Note 105.2      750 w/Adage-3000 .. Bugcheck ASTDEL      2 of 8
  2 lines  30-APR-1986 17:35
  -< THANK YOU THANK YOU THANK YOU *KISS* >-
=====
```

YAHOO!!!! That problem has cursed us for two years!!! THANK YOU!!!

```
=====
Note 105.6      750 w/Adage-3000 .. Bugcheck ASTDEL      6 of 8
  14 lines  1-MAY-1986 13:11
  -< another crash problem with adage >-
=====
```

Interesting, we have not seen that problem on our 780, but another graphics device on the same unibus has taken to crashing the system ever since we added the adage ik11. maybe it is a related problem depending on what went out to the csr... has anyone else had this type of problem? it is not a boot, but occasionally the non-adage device program crashes at the point the first ios go to it (it is a vector general). pulling the adage board seems (note, seems) to fix the problem.

```
=====
Note 105.7      750 w/Adage-3000 .. Bugcheck ASTDEL      7 of 8
  21 lines  1-MAY-1986 16:27
  -< Just a bit off... >-
=====
```

The IK-11 board driver suffered intermittant crashes under earlier versions of VMS -- but VMS V4.x did it in. The driver was originally from Adage but comments in the code indicate they picked it up from Schlumberger (Please excuse any misspellings) Doll Research Center. SDR cleaned it up quite a bit from earlier versions. The register bug was found after much digging around in the source code. (got REAL sick of picking up the pieces of the crashes)

System involved was a V750 under V4.x. (V4.0 to start -- tested thru V4.2 -- with no problems)

P.S. Don't run the interface cables long without shielding them either... This'll cause equivalent unpleasant weirdness. (25' worked fine. 50' -- unshielded -- crashed VMS)

```
=====
Note 105.8      750 w/Adage-3000 .. Bugcheck ASTDEL      8 of 8
  13 lines  1-MAY-1986 16:33
  -< Bus Hog >-
=====
```

Also:

The Adage board is a BUS HOG. We suffer UDA time-outs on the UNIBUS when somebody performs a transfer to the IK11. This results in all sorts of interesting messages in the error log. This MIGHT adversely affect other boards on the bus -- the UDA "simply" re-initialized.

The company I did the work for wasn't on great terms with Adage when I made this fix...

```
=====
Note 108.0      CPUBIAS      4 replies
  6 lines  30-APR-1986 16:46
=====
```

Is it possible to bias which CPU processes can run under on the 8800 etc., via the SET PROCESS/CPU command?

```
=====
Note 108.1      CPUBIAS      1 of 4
  13 lines  30-APR-1986 16:50
=====
```

Well, sort of...

Under VMS V4.4 there is a \$SET PROCESS/NOATTACHED which will prevent the scheduler from ever running that process on the attached processor. It really doesn't make a whole lot of sense to try and schedule a process for only the attached, cause every process does something that requires kernel mode, or at least page faults once....

```
=====  
Note 108.2                CPUBIAS                2 of 4  
                        27 lines 30-APR-1986 16:58  
-< SET PROC/CPU=[NO]ATTACH bias >-  
#####
```

Yes, there is a form of biasing that the SET PROCESS/CPU command creates. The biasing is not of the form "which processor do I run on", however, but defines whether or not the process \*can\* be run on the secondary processor.

This command tries to get around a very common 782 complaint - namely that a process doing a significant amount of I/O can be scheduled for execution on the secondary processor and then, once it is on that processor, initiate an I/O. This requires the process to be rescheduled to the primary to service the I/O - thus the wasted effort (read "inefficiency") of moving it to the secondary in the first place. Now, if you know a process is going to be predominantly doing I/O, you can prevent this from occurring by defining that process as not being executable on the secondary. (Through a SET PROCESS/CPU=NOATTACH)

If a process has not been restricted to the primary by the use of the NOATTACH option and is computable in USER mode code, there is no method of biasing which of the processors it will be executed on. If it was doable, attempting to force this bias could lead to system-wide inefficiencies by having, for example, two batch jobs biased for the secondary while the primary is happily running the NULL process.

```
=====  
Note 108.3                CPUBIAS                3 of 4  
                        8 lines 30-APR-1986 17:10  
-< VMSD2 >-  
#####
```

VMSD2 (So I've been told) holds the highest priority process allowed to run on the attached processor. Interestingly both the 8300 and the 8800 show this parameter at zero. (The way the scheduling works on compute bound processes don't get the priority boosts that the I/O-intensive processes get.)

```
=====  
Note 108.4                CPUBIAS                4 of 4  
                        10 lines 1-MAY-1986 17:13  
-< VMSD2 = 0 >-  
#####
```

Re the previous reply: a lot of parameters are set to 0 when they really mean there's no limit (e.g. MAXDETACH). This looks like one of them. After all, it wouldn't make much sense to only allow the NULL process to run on the secondary. Somebody at DEC has a sense of humour!

```
=====  
=====  
=====  
Note 109.0                RA Dual port to UDA and KDA?    5 replies  
                        11 lines 30-APR-1986 16:55  
#####
```

I would like to share data on RA81's currently on a UDA50 on a 785 with a soon to be installed MicroVAX II. They will have ethernet running between them, but I would like to have direct access to the RA devices from the MVII without adding overhead to the 785 or using the Ethernet. I do not NEED any kind of lock manager at either the File or Record level.

Can I dual porting RA81 to a UDA50 and KDA50 (or KDB50)?

```
=====  
Note 109.1                RA Dual port to UDA and KDA?    1 of 5  
                        6 lines 30-APR-1986 17:10  
-< Nope >-  
#####
```

In a word, "No." One or the other VAX system can have access to the disk at any given time, but not both at the same time. There's also no failover, as with HSC's.

```
=====  
Note 109.2      RA Dual port to UDA and KDA?      2 of 5  
                5 lines  30-APR-1986 17:16  
      ^< Follow up question >^  
*****
```

Can I switch from one to the other with just a logical DISMOUNT on the first system and MOUNT on the second (leaving A and B in), or do I have to change the A and B in the middle?

```
=====  
Note 109.3      RA Dual port to UDA and KDA?      3 of 5  
                0 lines  30-APR-1986 17:24  
      ^< It should work >^  
*****
```

```
=====  
Note 109.4      RA Dual port to UDA and KDA?      4 of 5  
                13 lines 1-MAY-1986 10:34  
      ^< Hearing no response from Colorado >^  
*****
```

Just to expand a bit on the reasons why it doesn't work with the later technology controllers: a lot of the drive state is known by the controller. The idea being that the controller is the one doing the seek and rotational optimizations that we all know so well.

Remember that the controllers are talking to different CPUs and have different work items to perform. So if you were to have an active dual port, then both controllers would be fighting each other and unable to optimize any requests. There may be other reasons as well, but this is what comes to

```
=====  
Note 109.5      RA Dual port to UDA and KDA?      5 of 5  
                6 lines 1-MAY-1986 16:17  
      ^< Be sure to explain to the operator >^  
*****
```

The both-buttons-in approach works... Just make sure everybody coordinates mount's and dismounts... (Two processes using ethernet task-to-task could control...)

```
=====  
Note 111.0      Boot problem in Micro_vax II     4 replies  
                17 lines 30-APR-1986 16:59  
*****
```

We have a MicroVax with 3 RD53s. The system disk is drive 0. Later I decided to put Standalone Backup [Syse...] on drive 1. The next time the system was booted it booted standalone Backup from drive 1 rather than VMS from drive 0 ... The Boot procedure looks at all disks starting at 0 to see if it is bootable in any way and then boots from the last drive which isn't the way it works on the other processors. When we complained to our local Field Service they say that this is a feature and not a Bug ... I find this unacceptable and no good reasons were given as to why this would be a feature for the Microvax Anybody else care to throw some light on this ?

```
=====  
Note 111.1      Boot problem in Micro_vax II     1 of 4  
                17 lines 30-APR-1986 17:08  
      ^< Removeables, then fixed >^  
*****
```

It's not supposed to work that way. The way it works is this: For each disk controller, in ascending order, it looks at all the removeable disks, in ascending unit order, then the fixed disks in ascending unit order. If a bootable system (presence of [SYSn.SYSEX]SYSBOOT.EXE) isn't found, it keeps looking. It should only choose the [SYSE] root if you explicitly asked for it on the B command. But it WILL choose a removeable disk (RX50 or removeable RC25) over the fixed disk on the same controller, even if the unit number is higher.

I realize this doesn't explain your problem, but the answer you were given isn't right either. Please see if the information I have given you helps at all. If not, please try your DEC support contact again.

```
=====
Note 111.2          Boot problem in Micro_vax II          2 of 4
                   10 lines  1-MAY-1986 12:47
                   -< S/A BACKUP ON NON-SYSTEM RD53 >-
-----
```

I HAD A SIMILAR PROBLEM AFTER CREATING S/A BACKUPS ON RD=53S. IT SEEM THAT STABAKIT LOOKS TO SEE IF THERE IS A SYS0 ON A DISK - IF SO, IT CREATES THE NEW S/A BACKUP INTO SYSE, ELSE INTO SYS0. IT TOOK ME AWHILE TO REALIZE THIS, THEN I RENAMED THE SYS0'S TO SYSE'S ON THE NON-SYSTEM DISKS (COULD HAVE DELETED THE SYS0 TRE ON THESE AND THEN SPECIFIED SYSE IN THE NEXT ATTEMPT TO CREATE S/A BACKUPS.

```
=====
Note 111.3          Boot problem in Micro_vax II          3 of 4
                   8 lines  2-MAY-1986 10:03
                   -< Boot order on uVAX-II >-
-----
```

I had the same problem, only I had a backup copy of uVMS on Drive DU2:, and it booted instead of DU0:. Perhaps the boot rom mistakenly thinks it's removable and boots it.

I don't see how it will autoboot [SYSE...] though. Could it be that your DU1: S/A-BU is really in [SYS0...]?

```
=====
Note 111.4          Boot problem in Micro_vax II          4 of 4
                   5 lines  2-MAY-1986 11:22
                   -< Bootable Software in [sys*...] >-
-----
```

No my Standalone Backup is definitely in [syse...] Bootable Software can reside on any of [sys\*...] directories? Did you call your local DEC office about your system booting off DU2?

```
=====
Note 122.0          Loss of Disk Quota Problem            1 reply
                   4 lines  1-MAY-1986 10:20
-----
```

I have two 785's on a cluster. I have seen disk quota entries that were modified go back to there pre-modified state. This seems to happen after a reboot of the system. Is this a known problem? Any work arounds? Vms version to fix this?

```
=====
Note 122.1          Loss of Disk Quota Problem            1 of 1
                   10 lines  1-MAY-1986 11:07
                   -< QUOTA.SYS cached >-
-----
```

Periodically invoke DISKQUOTA and "REBUILD" the QUOTA.SYS file. Apparently the XQP caches QUOTA.SYS. After a long enough period of time QUOTA.SYS itself becomes "stale" and if the system crashes you can lose part of the cache currency. This info comes to you from an XQP novice who heard this in the "XQP internals session."

P.S. They are working on the problem...

```
=====
Note 126.0          Foreign Terminals                    5 replies
                   24 lines  1-MAY-1986 11:11
-----
```

Is there any hope at all for support of foreign terminals for any dec full-screen product? for example, notes is great, but most of our users have non-vt compatible terminals. we have a full-screen editor for these people (vi) but they can use none of the other dec full-screen stuff. ibm recognizes the existence of non-3270 terminals, and supports their use via a 7171 or yale series-1 emulator. seems to me that dec has fallen behind here, and ought to seriously consider support for non-vt compatibles. dec has made a token step in this direction with SMG, however, it is pretty useless, since most dec full-screen software does not use it. what our site needs is a reasonably-priced product that allows us to somehow tell vms



what escape sequences to send to these foreign terminals to allow the users of these terminals to function productively with decs full-screen products.

```
=====
Note 126.1          Foreign Terminals          1 of 5
                   5 lines    1-MAY-1986 12:07
                   -< SMG, SMG, SMG! >-
-----
```

Sad but true, it can't be done so long as VT Escape Sequences are hard-coded into the utilities. We're just going to have to convince the VMS developers that this isn't a little aberration that's going to blow over. Making it the 1 vote getter for San Fiasco's SIRs will go a long way toward this!

```
=====
Note 126.2          Foreign Terminals          2 of 5
                   6 lines    1-MAY-1986 13:08
                   -< DEBUG 4.4 uses SMG >-
-----
```

Starting with version 4.4 of DEBUG the debugger will use SMG for it's screen output.

```
=====
Note 126.3          Foreign Terminals          3 of 5
                   10 lines   1-MAY-1986 13:59
                   -< Hurrah for DEBUG!!!!!! >-
-----
```

Bravo, DEBUG folks!!! Wonderful! Now, can you tell the TPU people your rationale for reworking your product into SMG? So far, they seem to be insisting that if they redo TPU to use SMG, it would be unbundled and sold separately - which seems like sheer idiocy to me. Yay again, DEBUG!

```
=====
Note 126.4          Foreign Terminals          4 of 5
                   20 lines   1-MAY-1986 15:37
                   -< smg and tpu >-
-----
```

The hard part of making TPU work with SMG has already been done in VMS 4.4. TPU's screen updater is a separate shareable image. One can invoke a different screen updater with /display=imagenname.

Very minor changes are needed to make the current screen updater in TPU to use SMG's Foreign terminal routines instead of writing the hardcoded escape sequences to the terminal. These changes could then be bundled into a separate shareable screen updater image that would be invoked on only foreign terminals.

TPU's approach to supporting foreign terminals is actually better than the debuggers' method.

VT100/VT200 users get the fast(current) screen updater image invoked on their terminals, and foreign terminal users would get the not so fast screen updater image that uses SMG.

```
=====
Note 126.5          Foreign Terminals          5 of 5
                   27 lines   1-MAY-1986 19:31
-----
```

Full-screen utilities fall into three classes:

1) Those that hard-code the screen support. TPU and products based on it, and EDT, are the only two that come to mind. These require special-case changes. EDT will never change. TPU is part way there (as noted above).

2) Those based on SMG. They automatically support foreign terminals through the SMG foreign terminal facility. Most new screen-based products are in this class. Many older ones are converting - e.g., DEBUG.

3) Those based on the old SCR library calls. These do NOT use the SMG FT facilities; but they DO use the old SCRFT.EXE facility. This was never really documented, outside of the file SYS\$EXAMPLES:SCRFT.MAR on V3 systems (probably still on V4 systems). Note that to use the SCRFT facility, the terminal

must be set to FT1, FT2, ... FT8.

Many people forgot about this facility because of a problem in V4.0 and 4.1 in which an FTn erminial could NOT be handled by the new SMG foreign terminal facility. This left you with a choice: Support SMG applications, or support SCR applications. The choice was removed in (I think) V4.2: A terminal set as FTn can be correctly supported by both facilities.

I've used systems set up this way, and they work just fine. There remains the inconvenience of calling the terminal FT1 instead of, say, DM1520, but that's pretty minor and will go away as various utilities migrate from Class 3 to Class 2.

```
=====
=====
Note 127.0                EVE->WPSPLUS                3 replies
                        11 lines  1-MAY-1986 11:12
*****
```

Is there an easy way to bind the WPS-PLUS wrap symbol [it looks like an "o" when you do a Gold-View] to the Return key? I'm familiar with the Learn command, I just don't know how to refer to the word wrap symbol. Our application would be to transfer first draft documents created with EVE to the WPSPLUS environment for attribute enhancement and text/graph merging via DECpage. Currently, all the hard CR's screw-up WPSPLUS wordwrapping.

```
=====
Note 127.1                EVE->WPSPLUS                1 of 3
                        17 lines  1-MAY-1986 18:14
-< You can do this, but... >^
*****
```

You could bind the return key to insert any text you wanted. For example,

```
DEFINEKEY ("COPYTEXT ('<RET>')", RETKEY);
```

would insert the string <RET> into your buffer whenever you pressed the return key.

However, TPU doesn't understand the WPS-Plus wrap token, so you'd run into line length problems, and wouldn't be able to see your line. You'd probably be better off writing a small utility (perhaps in SCAN) to concatenate records and separate them by the character WPS-Plus uses to indicate wrapping.

```
=====
Note 127.2                EVE->WPSPLUS                2 of 3
                        8 lines  1-MAY-1986 20:32
*****
```

You could leave EVE alone and use TPU's callable interface, specifically a user-written FILEIO routine. When you write out your file, your fileio routine gets called each time a record is to be written to the output file. You could insert the Wps wrap symbol at the end of the record then write it out.

```
=====
Note 127.3                EVE->WPSPLUS                3 of 3
                        5 lines  2-MAY-1986 10:31
-< wps+ reformatting >^
*****
```

If paragraphs are stored the way wps+ likes to see them then selecting at the top and then go to the bottom and gold paragraph. This will rejustify everything, but will take some time as screen reformatting is included in the process. If wps+ 2.1 can turn off screen update (some indication of this) this should be fairly painless.

```
=====
=====
Note 128.0                Cluster w/non-Digital Disks  1 reply
                        12 lines  1-MAY-1986 11:31
*****
```

We currently have a 750 with 3 Fujitsu Eagles using Emulex controllers (CS-21). We would like to implement a cluster by adding a 780, an HSC50, and an RA-81. Has anyone had experience with using non-Digital disks as local disks on a cluster like this? If this will work, what penalties are incurred by using MSCP?

```
=====  
Note 128.1      Cluster w/non-Digital Disks      1 of 1  
                26 lines  1-MAY-1986 14:57  
                < One user experience OK >
```

```
#####  
We currently have a similar (sort of) cluster ... three 785's  
with two HSC-50's and 15 RA81's, plus massbus controllers from  
Emulex on all three with Fujitsu Eagles on them. One string of  
drives is dual ported between two of the 785's; the third  
processor's Eagles are local only.
```

We mostly do not set the drives /SERVED right now, since we don't have a particular need for it. But we have tried it previously using CDC 9766 drives and earlier Emulex controllers and it worked fine, no problems in the cluster. Just make sure the ALLOCLASS given to the CPU's is different from that of the HSC's. We even tried using the drives dual-pathed, and that worked also, although with the earlier Emulex controllers we had to get a firmware upgrade to allow it. I think their Eagle controllers support it without any special upgrade.

The overhead from the MSCP server was minimal because we made sure that most of the users accessing those disks were on one of the two CPU's that had hard connections to the drives. The main use via MSCP was when print files from one of the massbus disks got into a print queue on the node to which they had no direct connection.

```
=====  
=====  
=====  
Note 129.0      Help implementing common page/swap file  5 replies  
                23 lines  1-MAY-1986 11:50  
#####
```

I need help. I have heard that you may use the paging file for not only paging, but for swapping and as the dump file, also. 1) Is this possible? 2) how is this implemented (logicals??, SET FILE ... ???) 3) are there any performance hits I will take by doing this? 4) anything else I should know (where is it documented?) (IDS manual?)

I have an 11/780 with an RM03 for the system disk running v3.7 and I want to upgrade it to 4.3. I'm worried about not having enough room on the RM03. I'd also like to know about how to do it if there aren't any other hits I will have to take. Oh, yes, it's an 8 Mb system with lots of memory to spare. I DON'T expect to do any swapping, or very little. Most times I have memory to spare, so don't see swapping as a potential problem. Thanks for helping.

I'll be reading NOTES a couple of times per day.

```
=====  
Note 129.1      Help implementing common page/swap file  1 of 5  
                14 lines  1-MAY-1986 13:37  
                < swap/page/dump >
```

```
#####  
Yes this is all possible. If there is no primary swap file, I believe swap file space will be automatically allocated in the primary page file...but you should install a secondary swap file asap. If you want to use the primary page file as a dump file you must be sure it is big enough. I don't know if the dump will go to the page file automatically...never tried it since I don't want my primary page file that big. I do plan, however to do away with my primary swap file, in an effort to remove as much swapping as possible off the system disk (on some of my systems) On a common system disk you probably want to do this, since the swapper uses the first swap file that has space, rather than the file that has the most space as the pager does.
```

```
=====  
Note 129.2      Help implementing common page/swap file  2 of 5  
                8 lines  1-MAY-1986 13:39  
                < its easy, but beware... >
```

```
#####  
You can do this by deleting the swapping and dump file (DO NOT actually delete them....rename them, reboot the system, then delete them; otherwise you will trash your disk!). The pagefile will be used for both paging and swapping. The dump will be written to the pagefile. See SYSGEN parameter SAVEDUMP. There may be performance problems with swapping and paging to the same file. Its usually not a good idea. And combining the files won't save you any disk space. You might consider a secondary pagefile on another disk.
```

```
=====
Note 129.3    Help implementing common page/swap file    3 of 5
              19 lines    1-MAY-1986 15:04
              -< secondary pagefile >=
*****
```

In case you didn't catch it in those last replies, one of the things you should DEFINITELY consider under V4 is installing a separate pagefile on another disk. In other words, leave your primary page file as small as possible (just big enough for the processes that are assigned to it at SYSTARTUP time before you SYSGEN>INSTALL the secondary page file) and put another pagefile on your data disk. You can do the same with your swap file. This will require that you have a separate (8MB) dump file (if you want dumps) but it will move your paging and swapping activity off the system disk - very, very important to performance.

You didn't say what your data disks were, or how big, or anything. But unless you don't have any, you will want to implement what I have described.

```
=====
Note 129.4    Help implementing common page/swap file    4 of 5
              17 lines    1-MAY-1986 15:08
              -< Some clarification >=
*****
```

.2 hit right on the head...you CAN swap in the page file, but it's kind of like driving nails with a pair of vise grips, that's not what page files were made for. There can be severe perf. problems because of the disparity in page and swap file allocation sizes; swap slots are big (usually multiples of 96 pages) and page file allocations tend to be much smaller, so over time, it becomes very difficult to find big, virtually contiguous holes in the page file for swap slots. If all the requests are big, as in a file dedicated to swapping, its not a problem. Note also, that regardless of whether you swap a lot or not, each process still needs to be allocated a swap slot, otherwise where would it go if it did have to be swapped? Another tidbit: As your working set size changes over time, your swap slot size changes as well, and it can migrate from file to file, whichever one has a hole big enough to accomodate your WS. On the other hand, you're assigned at process creation time to the page file that at that time, has the most space, and stay there for the life of the process.

```
=====
Note 129.5    Help implementing common page/swap file    5 of 5
              21 lines    1-MAY-1986 19:42
*****
```

To dump to the pagefile, you only need to not have a dump file; as long as SAVEDUMP is set, VMS will dump - to the dumpfile if possible, to the pagefile if necessary. Note that the SIZE of the dumpfile is not relevant: If you leave around a small dumpfile, you will get a truncated - and useless - dump. Whatever file the dump goes to must have room for every page in main memory, plus 4 pages of overhead.

BUT: There is a "gotcha" here: The space used up in the pagefile for a dump cannot be used for paging at the next system boot until the dump is copied (using the ANALYZE/CRASH COPY command). Hence:

Make sure the pagefile is BIGGER than the minimum size needed to store the dump so that some paging can take place, or you'll have to be very, very careful about your startup file;

Be ABSOLUTELY SURE that, as early as possible in your startup file, you do an ANALYZE/CRASH SYS\$<where-is-it, SYSTEM?>- PAGEFILE.SYS and COPY the dump somewhere.

```
=====
Note 134.0    How'bout BACK/REC'D=IMMEDIATE              8 replies
              14 lines    1-MAY-1986 14:01
*****
```

Can anyone think of why it would be a bad idea to have a BACKUP qualifier of /RECORD=IMMEDIATE that would allow an incremental (or any) backup to "post" the backup time on each file as soon as it completes the copy of that file rather than waiting til the very end of the BACKUP run?

This would be wonderful, especially when I do my nightly incrementals from my micro-VAXs to my central backup disk across the network and the operation fails due to network failure. Then all I would have to do is test the BACKUP condition code for failure and rerun if necessary; thus only backing up those files that were missed in the first pass. This could be DEC's

solution to request 108.

Could this be worked in as an enhancement?

```
=====
Note 134.1      How'bout BACK/REC'D=IMMEDIATE      1 of 8
                6 lines  1-MAY-1986 14:07
                -< Nice Idea >-
-----
```

I like it. I hate tying up my tape drives while the record pass finishes. An equally acceptable implementation would be some means of deallocating the tapes as soon as the dump phase finishes.

```
=====
Note 134.2      How'bout BACK/REC'D=IMMEDIATE      2 of 8
                5 lines  1-MAY-1986 14:31
                -< I disagree--please don't implement >-
-----
```

I doubt if you really want the backup date changed until the entire save-set is written so that the backup run is known to have been successful.

another user

```
=====
Note 134.3      How'bout BACK/REC'D=IMMEDIATE      3 of 8
                13 lines 1-MAY-1986 14:42
                -< More backup >-
-----
```

I'm willing to take responsibility to verifying that the backup completes. I have reloaded partial backup tapes before without any problems except for the last file (which was in progress when the machine crashed).

Another equally good solution would be a utility to update the backup dates from a journal file. That way, I could get maximum use from my tapes, and batch out the rather long backup date updates.

```
=====
Note 134.4      How'bout BACK/REC'D=IMMEDIATE      4 of 8
                3 lines  1-MAY-1986 16:46
                =< another disagree vote >#
-----
```

I think the idea of dismounting/deallocating the tape drive during the record pass is a better idea than /immed

```
=====
Note 134.5      How'bout BACK/REC'D=IMMEDIATE      5 of 8
                9 lines  1-MAY-1986 17:08
                -< Give me a real good reason >-
-----
```

Gosh guys, I just want it as an option, not a rewrite of the S/W. I do like the suggestion about using the terminated log file to possibly go out on the disk and update the BACKUP record date on those files. Maybe.

The request originator,

```
=====
Note 134.6      How'bout BACK/REC'D=IMMEDIATE      6 of 8
                4 lines  1-MAY-1986 17:27
                -< dismounting tapes >-
-----
```

The biggest problem with deallocating the tape is that it is usually mounted via a mount command somewhere earlier. I suppose this could be done with a /dismount/deallocate type structure.

```
=====
Note 134.7      How'bout BACK/REC'D=IMMEDIATE      7 of 8
                3 lines  2-MAY-1986 10:43
-----
```

I wouldn't use it as it would make my incremental backup incomplete and

I like complete full, incremental backup sets. My opinion

```
=====  
Note 134.8          How'bout BACK/REC'D=IMMEDIATE          8 of 8  
                  9 lines  2-MAY-1986 11:19  
                  =< Options aren't such a bad idea >=  
*****
```

If you really want to go home at night, it is safe to take the tape off the drive and let the console gestate on recording backup dates. Certainly an option wouldn't be bad for recording, but I'd rather teral have an option for dismount/deallocate ing the tape as soon as BACKUP is done.

```
=====  
=====  
=====  
Note 138.0          TTY_DMASIZE          3 replies  
                  9 lines  1-MAY-1986 14:56  
*****
```

There is a SYSGEN parameter 'TTYDMASIZE' which apparently affects the size of the packet transmitted by a dmf or dmz controller (i think). Does anyone know the performance affects of changing this parameter?

```
=====  
Note 138.1          TTY_DMASIZE          1 of 3  
                  9 lines  1-MAY-1986 15:30  
                  =< It's a threshold value. See SYSGEN documentation >=  
*****
```

This parameter really describes the minimum number of bytes that you need to request in a transfer for us to do the transfer as a DMA transfer. The reason this is there is that the initial setup for a DMA transfer is more expensive than other methods. Thus, we want to have some threshold value that we use to determine if it is worth the effort. Do you have a particular performance problem or is this something you were curious about ? If you have more questions on this then seek out John Hallyburton from the VMS performance group.

```
=====  
Note 138.2          TTY_DMASIZE          2 of 3  
                  12 lines  1-MAY-1986 15:45  
                  =< ... no need to twiddle >=  
*****
```

We did a lot of research on TTYDMASIZE when first offering DMFs. The bottom-line conclusion was that the value of 64 was a reasonable default crossover point for all processors. Small increases up or down do not have much effect. Large increases are probably only going to make things worse.

If your terminal controller only has a 1-byte output silo then perhaps you could gain something small by reducing the value to 42 or so. Odds have it that you won't notice any difference, though.

```
=====  
=====  
=====  
Note 146.0          SOURCE LIBRARIES ACCESS          1 reply  
                  10 lines  1-MAY-1986 17:04  
*****
```

WE ARE HAVING PROBLEMS WITH UPDATING THE SOURCE LIBRARIES AT THE SAME TIME AS USERS ARE ACCESSING THESE LIBRARIES. THIS HAPPENS FOR BOTH SOURCE AND FORMS LIBRARIES. IF THE USERS ONLY NEED READ ACCESS, WHY DO THEY HAVE TO BE LOCKED OUT TO UPDATE THE LIBRARY?

ANY COMMENTS ANYONE?

```
=====  
Note 146.1          SOURCE LIBRARIES ACCESS          1 of 1  
                  11 lines  1-MAY-1986 17:09  
                  =< lock it up >=  
*****
```

We had a similar problem with updating object libraries. Since everyone was already using procedures to link against and to add modules to the library calls to three simple programs were set up. Each used the lock manager to control access to the libraries as a "resource". One program requested an exclusive write lock (with wait), one requested a read lock and the last released locks held.

```

=====
=====
Note 147.0      Printing thru DECNET      4 replies
                9 lines  1=MAY-1986 17:07
=====

```

I want to know how can I use a printer that is connected to a microvax from another microvax. Can I do this using INIT/QUEUE in both machines?

I would like to be able to do this without having to copy files from one machine to the other (many of the users do not have an account in the machine with the printer).

```

=====
Note 147.1      Printing thru DECNET      1 of 4
                8 lines  1=MAY-1986 17:11
                -< nope >-
=====

```

The only currently possible way to do this is to implement a custom symbiont with knowlege of the network. Which isn't trivial. The queue manager just can't get a good enough grip on the remote printer to work right. Several outfits (outside of DEC) are working on the symbiont idea.

```

=====
Note 147.2      Printing thru DECNET      2 of 4
                43 lines 1=MAY-1986 17:29
                *< Simple network symbiont >-
=====

```

Writing a user-modified print symbiont to handle this is actually quite simple. Mine consists of 3 pages of simple BLISS code for the modified symbiont half of the thing and another 3 pages of BLISS code for the DECnet network object on the node with the printer.

The basic idea is that you use PSM\$REPLACE to supply your own output routine which opens the DECnet connection to the remote task (mine is called NETSMBSVR and then you simply write each line over the net as your output routine is called. The only difficult part is determining when the print JOB (as opposed to the print file, there may be more than one file/job) is done. The JOBCOMPLETION indicator in the PSM stuff is incorrect and

really indicates file completion.

The answer is to replace the (possibly undocumented) JOBTRAILER routine with your own that sets a flag in your code. You can even call the standard job trailer routine AFTER you set the flag so that you get the trailers. The BLISS code for this looks like:

```

routine netsmb_job_trailer (request_id, work_area, func,
                           funcdesc : ref vector, funcarg)=
begin
  builtin callg, ap;
  selectoneu ..func of
    set
      [PSM$K_CLOSE]:
        job_completing = true;
      tes;
    callg (.ap, PSM$JOB_TRAILER);
end;

```

In your main routine, you'll need:

```

PSM$REPLACE (%ref (PSM$K_JOB_TRAILER), netsmb_job_trailer);

```

This requires that the queue with your new symbiont have the attribute /SEPARATE=TRAILER. This isn't so bad...

Hopefully there'll be a few of these on the next DECUS SIG tape. If you want mine, just contact me:

```

=====
Note 147.3      Printing thru DECNET      3 of 4
                3 lines  1=MAY-1986 17:38
=====

```

There was a BOF session today on the subject of user modified symbionts. The gentleman who arranged the BOF had done what you are looking for. His name is David(?) Stone.

```

=====
Note 147.4      Printing thru DECNET      4 of 4
                13 lines 2=MAY-1986 11:27
                -< the wrong way to print thro DECNET? >-
=====

```

I was surprised to find that this appears to happen on our two microvaxes (that are ethernetned together). It turned out that the command PRINT on one machine is actually calling a DCL thing that COPYs the file to an "empty" directory on the other one which is being continually scanned by a BATCH job that PRINT/DELETES any file it finds. I might have been able to fetch the sources but the link was down as I wrote this. Maybe you can see what to do, as the directory is fully open, and no one appears to have to have accounts on the other machine..

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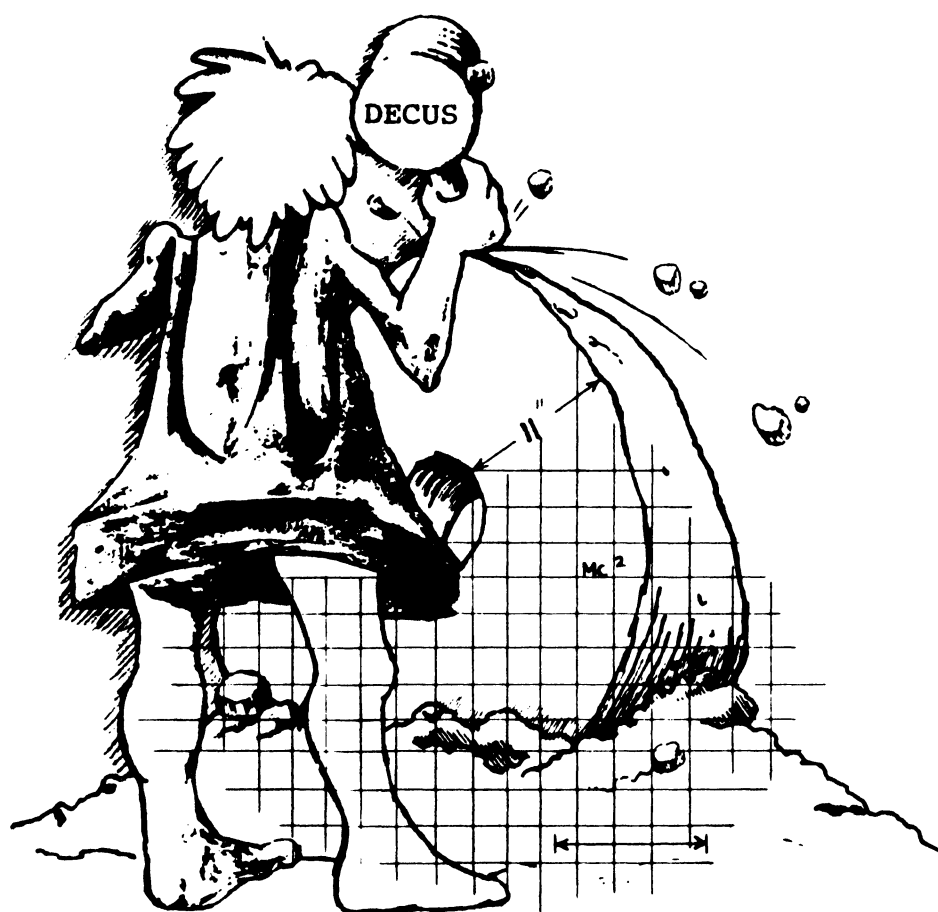
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# LIBRARY



# DECUS PROGRAM LIBRARY

## NEW LIBRARY PROGRAMS AVAILABLE FOR THE PDP-11 COMPUTER FAMILY

**DECUS NO:** 11-833 **Title:** Management Tools **Version:** January 1986

**Submitted by:** M. D. Smith, WAAY-TV (Smith Broadcasting, Inc.), Huntsville, AL **Operating System:** RSTS/E **Source Language:** BASIC-PLUS **Memory Required:** 16K Bytes **Other Software Required:** BASIC-PLUS, **Keywords:** Business Applications, Utilities - RSTS/E

**Abstract:** Management Tools is a series of four BASIC programs written by a manager with twenty-two years experience and eight years teaching management seminars. There are documentation files for each program and an overview DOC file. These programs will help in the areas of employee evaluations, time management, decision making and effective communications. The more times a manager uses these programs, the more benefits he/she will gain. There are options for hard-copy printouts of various portions of the programs as they run or they can be stored in files. Non-management personnel will also find benefits in these programs for business and private lives.

**Media (Service Charge Code):** 600' Magnetic Tape(MA) **Format:** DOS-11

**DECUS NO:** 11-834 **Title:** COMPRO **Version:** V2, May 1985

**Submitted by:** Matt S. Sargent, Ottawa, Canada K1Y-OK4 **Operating System:** RT-11 V4.0 **Source Language:** MACRO-11 **Memory Required:** 2K or 3K Words **Hardware Required:** DLV11-J serial interface, VT100 terminal **Keywords:** Data Communications

**Abstract:** COMPRO is designed to facilitate simple user friendly file transfers between PDP-11's. Well documented modular design enables quick and easy modification. COMPRO includes optional password security which when used with an auto-answer modem can serve as a remote secure unattended mass storage medium server. Other features include full duplex split screen message transfer, reception of remote start-up directory and re-direction of files to a listing device.

**Media (Service Charge Code):** 600' Magnetic Tape(MA), One RX01 Diskette (KA) **Format:** RT-11

**DECUS NO:** 11-835 **Title:** EVENTS **Version:** V1.0, December 1985

**Submitted by:** David Zumwalt, Garland, TX **Operating System:** Micro/RXS V1.1, 3.0, RSX-11M-PLUS V2.1, 3.0

**Source Language:** FORTRAN 77 **Hardware Required:** FORTRAN 77 requires Floating Point **Keywords:** Calendars

**Abstract:** EVENTS is a management program which scans a list of those important dates and alerts you to those events which are close at hand. EVENTS can be run at any time, although many people have found their salvation by running it from their LOGIN file.

The list of events is stored in a sequential, formatted ASCII file (EVENTSTAB.DAT) which you store in your own default directory or UIC. This way, everyone can use the EVENTS software, while maintaining individual events tables which are not shared across the machine. EVENTSTAB.DAT can be modified with any standard editor (EDT, EDI, SOS, EMACS...).

**Media (Service Charge Code):** One RX50 Diskette (JA) **Format:** FILES-11

## NEW LIBRARY PROGRAMS AVAILABLE FOR THE VAX/VMS FAMILY OF COMPUTERS

**DECUS NO:** V-SP-51 **Title:** PC-8088 Collection #9 **Version:** V1, February 1986

**Submitted by:** Glenn Everhart, Ph.D. **Operating System:** MS/DOS **Source Language:** ASM, BASIC, C, FORTRAN IV, FORTRAN 77, PASCAL, etc. **Hardware Required:** Varies **Keywords:** Business Applications, Engineering Applications, Mathematical

**Abstract:** This collection contains disks from PC-SIG numbered in the range 390 to 453, plus various extras from other PC public domain libraries.

The collection contains numerous 8088 programs for MS/DOS and PC/DOS plus some of interest to PDP-11 and VAX users. The PC offerings include several versions of PROLOG, XLISP1.5, an expert system, a project planner, a Warnier-Orr structured program tool, a LEX/YACC set for PC, a primitive MAKE for PC, a Tektronix 4010 simulator, a KERMIT for VT100 emulation that handles scripts, menus, KERMIT and XMODEM protocols. A version of AnalytiCalc for MS/DOS, some DBMS code, some text formatters and the current (as of 2/20/86) versions of KERMIT for PDP-11 (RSX, RSTS) as well as VAX/VMS in executable form only, is also included. Numerous engineering tools, many in PASCAL source, are present as well.

Where some BASIC programs were of interest to general users, they have been saved in ASCII format so they can be read on VMS and translated if need be. Also included is the new VMS/SWEEP program that can read .LBR and .ARC files on a VAX and the binary kits for SEDT for

VMS, MS/DOS and CP/M-86. SEDT is an EDT like screen editor able to handle multiple files. New keypad files have been added to it to allow useful operation on VT100 terminals as well as it being designed in support for VT200 class terminals. SEDT provides FAST multifile editing without having to learn a new keypad on a VAX.

**Complete sources not included.**

**Media (Service Charge Code):** 2400' Magnetic Tape (PC) **Format:** VMS/BACKUP (Blocked at 16384)

**DECUS NO:** VAX-164 **Title:** XPORT **Version:** V1.3, April 1986

**Submitted by:** Digital Equipment Corporation **Operating System:** TOPS-10, TOPS-20, VAX/VMS **Source Language:** BLISS-36, BLISS-32 **Software Required:** BLISS Compiler **Keywords:** BLISS, Tools - Software Development

**Abstract:** XPORT is a collection of transportable source-level programming tools (formerly included on the BLISS-32 and BLISS-36 kits) for use with the BLISS language. XPORT tools may be commonly applied across BLISS-32 and BLISS-36 target systems to provide such things as extensive input/output facilities, a uniform interface for obtaining operating system services (such as dynamic memory), and aids to data structuring and string handling.

**Media (Service Charge Code):** 600' Magnetic Tape(MA) **Format:** VAX/ANSI

**DECUS NO:** VAX-165 **Title:** DATMAN/VAX **Version:** 5.0, April 1986

**Submitted by:** Leonard Bass, University of Rhode Island, Kingston, RI **Operating System:** VAX/VMS V4.2 **Source Language:** VAX-11 FORTRAN **Keywords:** Data Base Management

**Abstract:** DATMAN is a scientific relational data base management system. It consists of a collection of commands available directly to an end user. These commands allow a user to build a collection of data bases, add, edit and delete data from these data bases, retrieve specified subsets and define new variables, display data retrieved in formatted or unformatted fashion and do descriptive statistics on the data retrieved.

The data base facilities of DATMAN are also available through a collection of procedures callable from an arbitrary PASCAL, FORTRAN ORC program using standard VAX data types.

One of the components of DATMAN is a screen management system including an editor and run time facility. The run time facility of the screen management system is available either through one of the DATMAN commands or through a collection of procedures callable from an arbitrary program.

**Media (Service Charge Code):** 600' Magnetic Tape(MA) **Format:** VMS/BACKUP

**DECUS NO:** VAX-166 **Title:** DIG: Data Inputter Generator **Version:** V2.0, February 1986

**Submitted by:** Tom Czyzeczko, Teshmont Consultants Inc., Winnipeg, Manitoba, Canada R3T 0P4

**Operating System:** VAX/VMS **Source Language:** FORTRAN 77 **Memory Required:** 500000 **Software Required:** \$QIOUW System Service **Hardware Required:** VT100 Terminal **Keywords:** FORTRAN, Tools - Applications Development

**Abstract:** DIG is a suite of FORTRAN 77 programs designed to generate a FORTRAN program which runs interactively on a Digital Equipment Corporation VAX and formats a VT100 compatible terminal. It was designed to take the tedium out of programming by giving a first cut at a user-friendly program. The resulting source code can then be tailored to the user's requirements.

DIG allows one to define range or look-up checks on input data and makes it easier to write HELP screens. DIG is similar to TDMS in concept.

**Notes:** Executes very quickly, allows for variable screen format dependent on data entry.

**Media (Service Charge Code):** User's Manual (EB), 600' Magnetic Tape (MA) **Format:** VMS/BACKUP

**DECUS NO:** VAX-167 **Title:** CMSBROWSE **Version:** July 1984

**Operating System:** VAX/VMS V3 **Source Language:** PASCAL **Software Required:** CMS directories, created by DEC/CMS, (Code Management System) **Keywords:** Utilities - VMS

**Abstract:** CMSBROWSE is a utility designed to access files created by Digital Equipment Corporation's Code Management System (CMS). CMSBROWSE allows easy access to CMS data files, bypassing normal CMS operations which can be quite slow. CMSBROWSE can also be of use in sites that don't have CMS, but want the ability to easily read and fetch data files stored in a CMS library (presumably created off site). CMSBROWSE supports the following operations on CMS data files: read-only edit, fetch (i.e. copy to default directory) and print.

**Media (Service Charge Code):** 600' Magnetic Tape(MA) **Format:** VMS/BACKUP

**DECUS NO:** VAX-168 **Title:** Personal Inventory **Version:** V1.0, March 1986

**Submitted by:** Robert D Schneider, Spectrum Associates **Operating System:** VAX/VMS V4.2 **Source Language:**

VAX-11 BASIC Memory Required: Program: 70K, Storage: 26K (min.) Keywords: Business Applications, Data Base Management

**Abstract:** Personal Inventory is an easy to use, menu-driven, screen-entry-oriented database that allows simple cataloging and grouping of possessions, for any number of purposes, including insurance, small business, taxes, or general housekeeping. Items may be assigned to user-defined categories and may be classified according to seven pieces of information, including item name, unit cost, quantity (if more than one unit), purchase month, purchase year, and up to 80 characters of reference information. Any item in the database can be referenced and corrected using any piece of information pertaining to it. In addition, a dated report can be printed.

**Media (Service Charge Code):** 600' Magnetic Tape(MA)  
**Format:** VMS/BACKUP

#### NEW LIBRARY PROGRAMS AVAILABLE FOR THE PDP-8

**DECUS NO:** 8-936 **Title:** Acid Document Generator  
**Version:** February 1986

**Submitted by:** Wally Kalinowski, Aerospace, Los Angeles, CA  
**Operating System:** OS/8 **Source Language:** Page 8  
**Software Required:** Page 8 - Included on disk **Keywords:** Editors

**Abstract:** ACID is an automatic cross-referencing, hyphenating and indexing text processor. Section numbers are generated automatically. Features include:

- . Line justification
- . Margin setting (upper, lower, top, bottom)
- . Centering
- . Conditional text
- . Double column mode
- . Page numbers
- . Automatic generation of table of contents

**Documentation may or may not be included on magnetic media.**

**Media (Service Charge Code):** Two RX01 Diskettes (KB) **Format:** OS/8

#### REVISIONS TO LIBRARY PROGRAMS

**DECUS NO:** VAX-138 **Title:** TECO File Manipulation Executives **Version:** February 1986

**Submitted by:** John Alexander **Operating System:** VAX/VMS **Source Language:** DCL, TECO **Memory Required:** Standard user requirement **Keywords:** TECO, Utilities - VMS

**Abstract:** The TECO file manipulation execs contains various utility programs and command files of general interest. Many of these execs allow the user to make

“global” changes to all lines of a file.

Some of these execs allow the user to utilize a “namelist” file to perform keyboard monitor commands on a group of modules. This can be very useful to the user that has 5 to 200 modules that make up a major program. A typical exec is one that will merge files into a single file to allow global edits. When finished, the user may then utilize split n to split them out again.

Some of these execs allow the user to “globally” examine all lines of a file or namelist of files. This can be very useful to the user that desires to utilize the code that has already been written and write supporting documentation. For example, several of these execs in combination were used to count the number of executable PASCAL statements in a large program (over 40,000 blocks of source).

Help files are included for all execs in this package.

The ‘execs’ call up TECO files to perform the work. The TECO Exec gets the name of modules and creates further com lines that operate on the specified files.

**Release Notes are distributed with each order.**

**Notes:** This program was developed on VAX/VMS V4.1

**Changes and Improvements:** Added new execs, improved many of the old ones.

**Restrictions:** Any that exist are explained in the appropriate execs. The user must have TECO up and running and follow the installation directions in TECO\_\_UTILITY.COM and read the top of the TECO\_\_UTILITY.HLP file. Included are Help Library Files and ABSTRACT.DOC file and all necessary support files.

**Media (Service Charge Code):** 2400' Magnetic Tape (PA) **Format:** VAX/ANSI, or order VAX-LIB-4

**DECUS NO:** VAX-147 **Title:** Cherry Tree Workstation Bookings System **Version:** V2, December 1985

**Submitted by:** Paul Clarke, Bedford College of Higher Education, Bedford, UK MK42 9AH **Operating System:** VAX/VMS V4.2 **Source Language:** PASCAL **Memory Required:** 30KB **Hardware Required:** VT100 compatible terminals **Keywords:** System Management - VMS

**Abstract:** The Cherry Tree Bookings System is an interactive system for entering and maintaining workstation bookings. It can typically be used where a room contains specialist equipment which is booked out to groups on a demand basis. At Bedford College of Higher Education, a room of 16 VT131 VAX terminals is booked out to one or more groups at a time. However, the program can be used to book out other sorts of workstations, e.g. typewriters or lathes. The program is designed to cater primarily to class bookings, no special provision has been made for single users.

Where bookings are made frequently, there is a need to have fast access to up-to-date information. Using clerical

methods, it is a difficult and painstaking task to ensure that information is kept up-to-date, that timetables are accurate and that double bookings are not made. We have found that maintaining timetable information is much easier using this system than performing a paper search. Double bookings are prevented, timetables and class/lecturer lists can easily be printed.

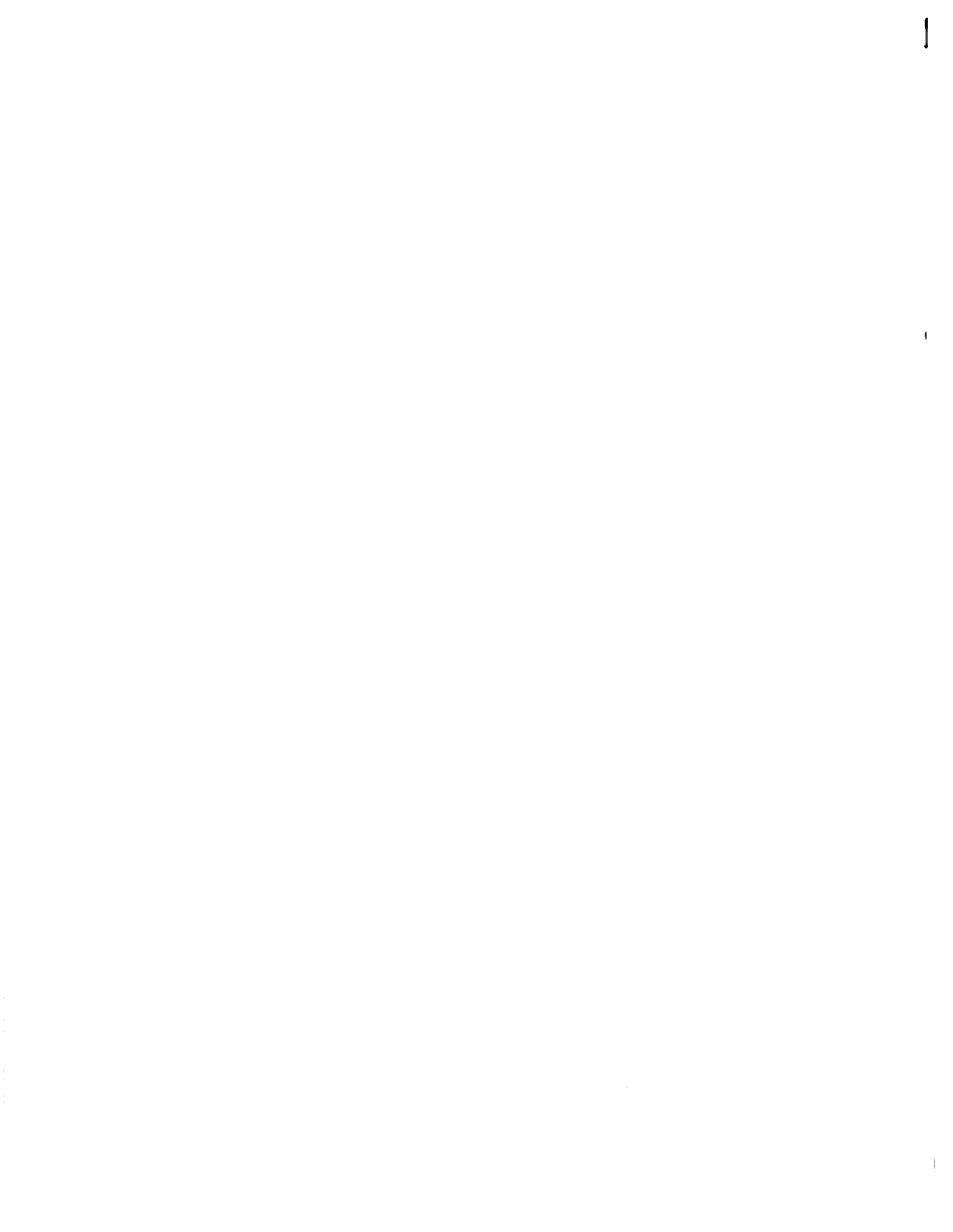
VMS version 3 users will have to edit the PASCAL source replacing references to callable EDT with an equivalent library function to spawn EDT.

Since implementing this system, we have been able to provide a faster and more reliable service to our users, removing many of the hazards, and much of the labor involved.

**Notes:** Some code adjustments needed with VMS 3.X (callable EDT).

**Changes and Improvements:** Bugfixes, some minor enhancements

**Media (Service Charge Code):** 600' Magnetic Tape(MA)  
**Format:** VMS/BACKUP, or order VAX-LIB-4



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There are several ways to submit material for the newsletter:

- o The Hardware Submission Form in the back of the newsletter can be used for brief items (there is not enough room if you have a lot to say).
- o You can send me camera-ready hard-copy (this saves me a lot of typing).
- o I will accept submissions on floppys. I can handle RX50's or 8" diskettes (either density, single or double sided). I prefer RT-11 format, if possible, but I can probably handle RSX or VMS stuff somehow. I will return your diskette(s), of course.
- o Those of you that have access to DCS can send things to username WALKER. I check DCS daily.
- o I am also on CompuServe as "Bill Walker 71066,24".

In any event, if you have anything to submit, send it! If it is a mess, but I can read it, I will get it in the newsletter somehow. Finally, if you have any question about submitting material, call me. My telephone number is listed below.

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If you need to get something to me quickly, send it to my work address.





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- 16  DIGITAL EMPLOYEE-SERVICE GROUP
- 60  EDUCATIONAL ADMINISTRATION
- 1  EDUCATION/PRIMARY
- 2  EDUCATION/SECONDARY
- 61  EDUCATION-TECHNOLOGY
- 3  EDUCATION/UNIVERSITY
- 67  ENGINEERING
- 65  FINANCE/ACCOUNTING
- 77  GOVERNMENT
- 75  GRAPHICS
- 4  HOSPITAL
- 62  INDUSTRIAL
- 55  LABORATORY/SCIENTIFIC
- 14  LIBRARY
- 58  LIFE SCIENCES
- 70  MANUFACTURING
- 79  MARKETING
- 59  MEDICAL RESEARCH
- 6  MILITARY INSTALLATION
- 73  NUMERICAL CONTROL
- 68  OEM-COMMERCIAL
- 78  OEM-TECHNICAL
- 56  PHYSICAL SCIENCES
- 20  RESEARCH/DEVELOPMENT
- 10  RETAIL
- 76  SOFTWARE DEVELOPMENT
- 53  TELECOMMUNICATIONS
- 19  TELEPHONE/UTILITIES
- 51  TIMESHARING
- 80  TRAINING/INSTRUCTION
- 66  TYPESETTING/PUBLICATION

**SPECIAL INTEREST GROUP (SIGs) ENROLLMENT**

I wish to participate in the following DECUS U.S. Chapter Special Interest Groups.

- 33  APL SIG
- 2  COMMERCIAL LANGUAGES
- 6  DATA MGMT.SYS.
- 5  DATATRIEVE
- 7  BUSINESS APPL.
- 8  EDUSIG
- 10  GRAPHICS APPL
- 11  HARDWARE AND MICRO
- 35  IAS
- 31  DAARC(LABS)
- 27  LARGE SYSTEMS
- 16  LANG. AND TOOLS
- 14  MUMPS
- 15  NETWORKS
- 34  OFFICE AUTOMATION
- 36  PERSONAL COMPUTER
- 18  RSTS/E
- 17  RSX
- 19  RT-11
- 32  SITE MGMT.& TRNG
- 21  UNISIG
- 26  VAX SYSTEMS

**JOB TITLE/POSITION - Please check:**

- 1  CORPORATE STAFF
- 2  DIVISION OR DEPARTMENT STAFF
- 3  SYSTEMS ANALYSIS
- 4  APPLICATIONS PROGRAMMING
- 5  SYSTEMS ANALYSIS/PROGRAMMING
- 6  OPERATING SYSTEM PROGRAMMING
- 7  DATABASE ADMINISTRATION
- 8  DATA COMMUNICATIONS/TELECOMMUNICATIONS
- 9  COMPUTER OPERATIONS
- 10  PRODUCTION CONTROL
- 101  CORPORATE DIRECTOR OF DP/MIS
- 102  ADMINISTRATIVE ASSISTANT
- 103  TECHNICAL ASSISTANT
- 104  SERVICES COORDINATOR
- 105  MANAGER
- 106  ANALYST
- 107  PROGRAMMER
- 108  DATABASE MANAGER
- 109  DATABASE ADMINISTRATOR
- 110  MANAGER OF DP OPERATIONS

CITIZEN OF UNITED STATES OF AMERICA?  Yes  No Country: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**Forward To:**

DECUS U.S. CHAPTER, MEMBERSHIP PROCESSING GROUP  
219 BOSTON POST ROAD  
MARLBORO, MA 01752, USA  
PHONE: (617) 480-3418

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 & PIR Coordinator  
Philip A. Naecker  
Consulting Engineer  
3011 N. Mount Curve Ave  
Altadena, CA 91001

Name: \_\_\_\_\_ DECUS Membership No. \_\_\_\_\_

Affiliation: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Telephone Number: \_\_\_\_\_

Statement of Problem: \_\_\_\_\_

\_\_\_\_\_

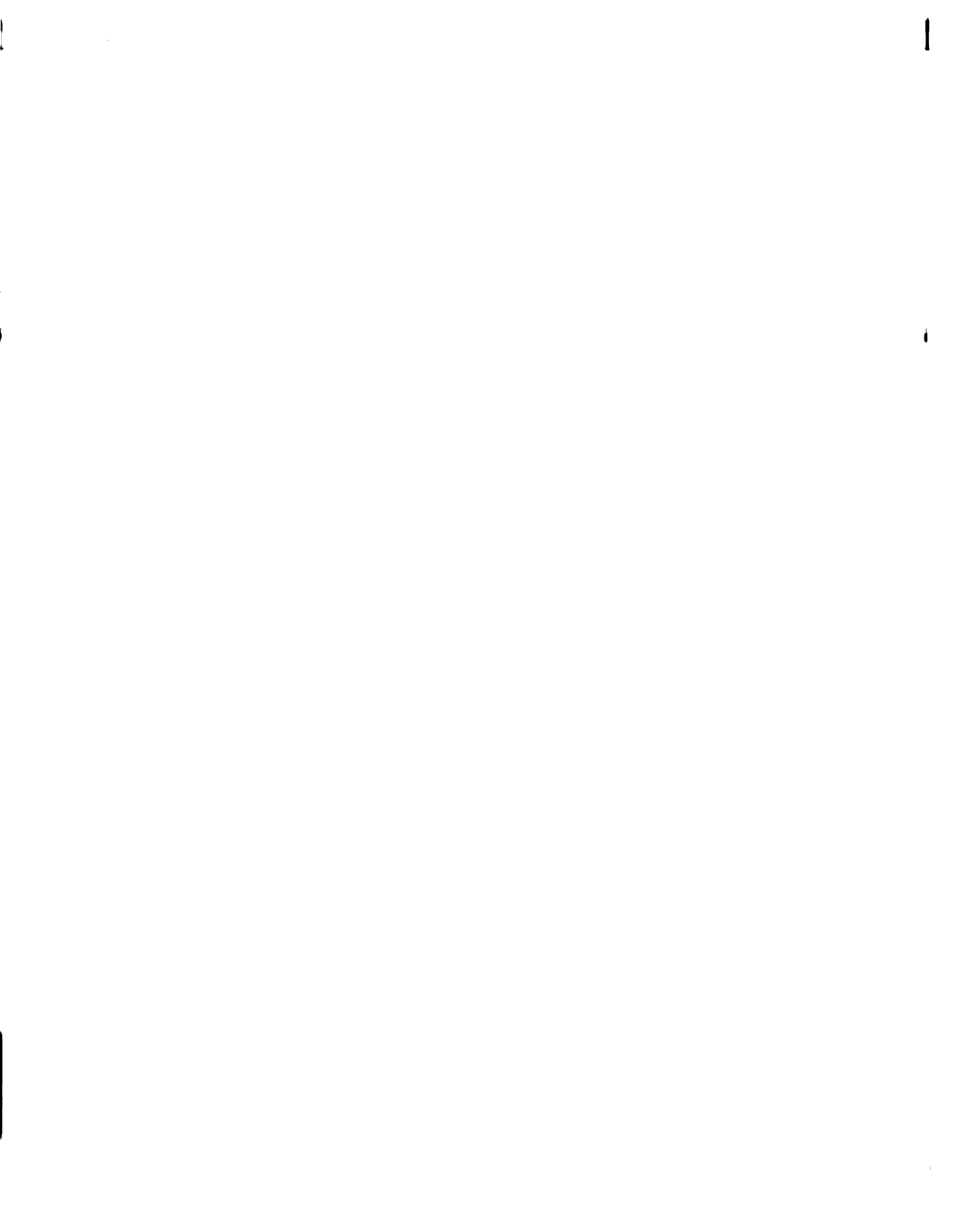
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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.



Product Improvement Request Submission Form

Submittor:  
Address:

DECUS Membership Number:  
Firm:

Phone:

Product or Products:

---

How to write a PIR

A PIR should be directed at a specific product or group of products. Be sure to give the full name of the product(s) and version numbers if applicable. Describe the functionality you would like to see in as complete terms as possible. Don't assume that the PIR editors or software developers know how it is done in some other software product - state specifically how you want the software to function. Provide justification of your request and give an example of its use. If you can, suggest a possible implementation of your request.

---

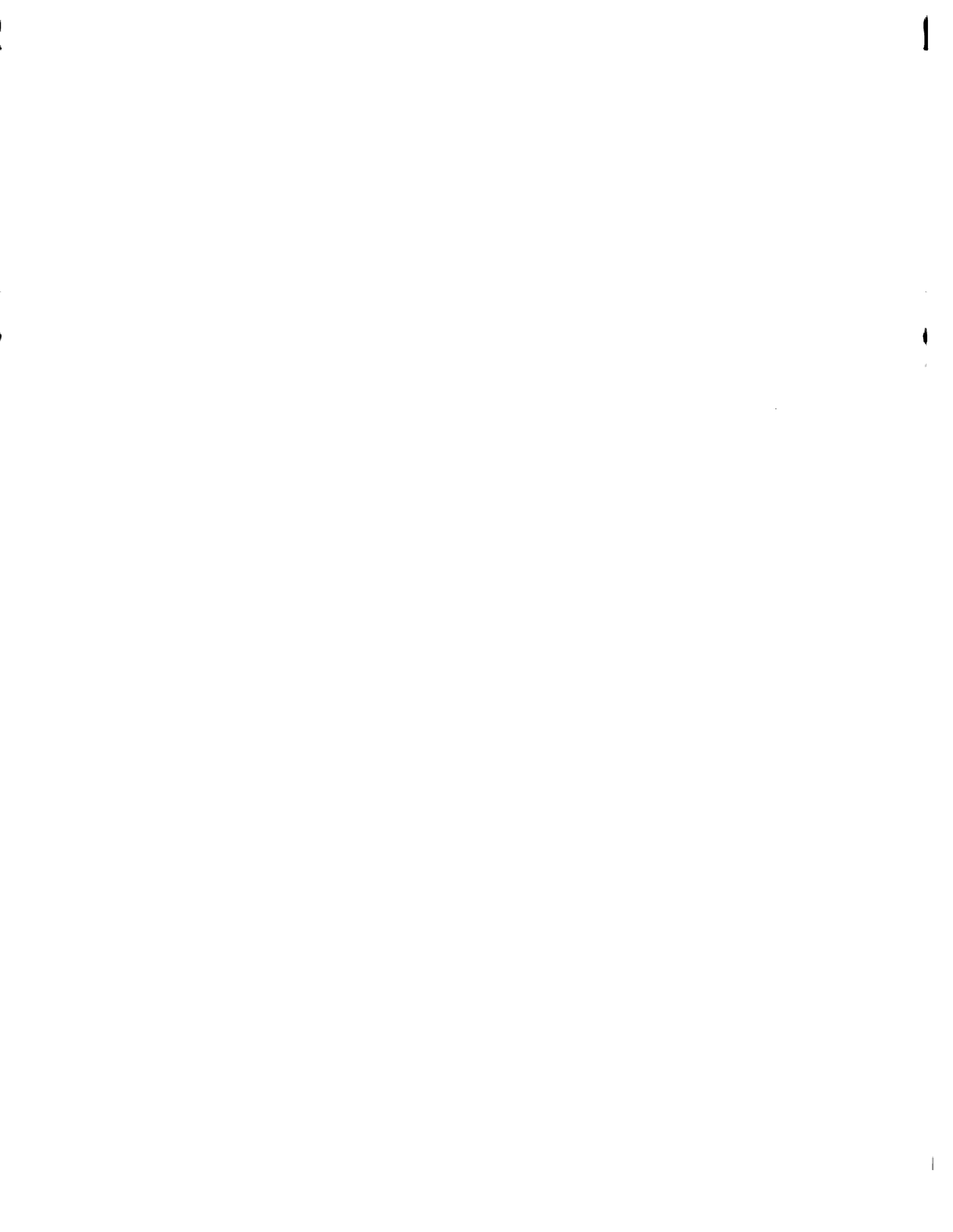
Abstract: (Please limit to one or two short sentences.)

---

Description and Examples: (Use additional pages as necessary.)

[Put my name and address on reverse side, thus:]

PIR Editor, Philip A. Naecker  
Consulting Software Engineer  
3011 North Mount Curve Avenue  
Altadena, CA 91001  
USA





IAS SIG MEMBERSHIP SURVEY

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Telephone: \_\_\_\_\_

Current Hardware: (Include number and type of processors, mass storage devices, communication devices, etc.)

IAS Release: (Indicate release of IAS under which these systems are running)

Software: (Indicate software running on these systems, i.e., DECNET, Decus C, etc.)

Application: (Indicate the type of application running on the system.)

Contacts: Would you be willing to be placed on a list of contacts? If so, what areas?

Features: Do you have any features which you would like IAS to include?

Any further comments?

IAS SIG MEMBERSHIP SURVEY

fold

---

John Roman  
McDonnell Douglas  
Department N436  
600 McDonnell Blvd.  
Hazelwood, Missouri 63042

---

IAS WHIMS

WHAT: (Describe your WHIM) (Please print or type)

WHY: (Describe the reason for the WHIM)

HOW: (Make any suggestions for a possible implementation)

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Please mail to:

Kathleen M. Anderson  
EATON Information Management  
Systems Division  
2017 Cunningham Drive  
Suite 208  
Hampton, Virginia 23666

Phone: (804) 326-1941



**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 **AUGUST 18** to be counted.

SIR NUMBER	POINTS
_____	_____
_____	_____
_____	_____
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_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

**TOTAL**

**100 POINTS**

E. Catherine Ditamore  
ARA Services  
Corp MIS  
The ARA Tower  
1101 Market Street  
Philadelphia, Pa. 19107

## OFFICE AUTOMATION SIG SYSTEM IMPROVEMENT REQUEST SUBMISSION FORM

Name \_\_\_\_\_ Address \_\_\_\_\_

Firm \_\_\_\_\_

Telephone \_\_\_\_\_

**INSTRUCTIONS:** System Improvement Requests (SIR) can be either hardware or software; please check the category addressed by this SIR. Under ABSTRACT, give a brief definition of the capability you would like. In the DESCRIPTION section, give a detailed description and examples of what you want. Be specific; don't assume that we know how other products function. Justify the usefulness of the capability and give an example of its use.

### HARDWARE IMPROVEMENT

### SOFTWARE IMPROVEMENT

DECmate \_\_\_\_\_

ALL-IN-1 \_\_\_\_\_

WPS \_\_\_\_\_

PRO-Series \_\_\_\_\_

CP/M (DECmate) \_\_\_\_\_

P/OS \_\_\_\_\_

Rainbow \_\_\_\_\_

CP/M (Rainbow) \_\_\_\_\_

MS-DOS \_\_\_\_\_

Other \_\_\_\_\_

Other \_\_\_\_\_

**ABSTRACT** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**DESCRIPTION** \_\_\_\_\_

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\_\_\_\_\_  
\_\_\_\_\_

E. Catherine Ditamore  
ARA Services  
Corp MIS  
The ARA Tower  
1101 Market Street  
Philadelphia, Pa. 19107



DECUS PERSONAL COMPUTER SIG QUESTIONNAIRE

General:

I would like information on \_\_\_\_\_
I would like to see an article
in the newsletter on \_\_\_\_\_
I would like to see a symposium
session on \_\_\_\_\_

I am willing to write an article(s) on: \_\_\_\_\_
I am willing to be contacted by PC SIG members by telephone to give
assistance/advice on: \_\_\_\_\_
Phone number to call: Area Code ( ) # \_\_\_\_\_ Times \_\_\_\_\_

I attend DECUS Symposiums : \_\_\_\_\_ always \_\_\_\_\_ Sometimes \_\_\_\_\_ never
I expect to attend these symposiums \_\_\_\_\_ Fall 85 \_\_\_\_\_ Spring 86 \_\_\_\_\_ Fall 86

I use/own: \_\_\_Rainbow(s) \_\_\_PRO(s) \_\_\_DECmate(s) \_\_\_Robin \_\_\_Other\_\_\_\_\_
I use the machine(s) checked above: \_\_\_at work \_\_\_at home \_\_\_both
If a work, total number of DEC PC's at your site: \_\_\_\_\_
I also use: \_\_\_VAX \_\_\_IBM or other mainframe \_\_\_IBM/other PC
Type of use: \_\_\_business \_\_\_educational \_\_\_government \_\_\_other\_\_\_\_\_
Primary Operating System: \_\_\_MS-DOS \_\_\_CP/M \_\_\_both equally
\_\_\_P/OS \_\_\_UNIX \_\_\_other\_\_\_\_\_

I belong to a local DEC PC Group: \_\_\_\_\_ yes \_\_\_\_\_ no
There is a user group in my geographic area: \_\_\_\_\_ yes \_\_\_\_\_ no
I would like information on starting a user group: \_\_\_\_\_ yes
I use a modem: \_\_\_\_\_ often \_\_\_\_\_ reluctantly \_\_\_\_\_ never
\_\_\_\_\_ for work \_\_\_\_\_ for pleasure \_\_\_\_\_ both

Here is information on he DEC PC User Group I belong to or know of:

Name of Group \_\_\_\_\_
Name of Contact Person \_\_\_\_\_
Address \_\_\_\_\_
Telephone ( ) \_\_\_\_\_
Supports \_\_\_Rainbow \_\_\_PRO \_\_\_DECmate \_\_\_Robin \_\_\_LUG \_\_\_Gold Key

Here is a DEC oriented bulletin board not on your list, or new information on a
listed board:

Name of Board \_\_\_\_\_
Full name of Sysop \_\_\_\_\_
Address if known \_\_\_\_\_
City and State \_\_\_\_\_
Telephone Number \_\_\_\_\_
Other Info: \_\_\_\_\_
Supports \_\_\_Rainbow \_\_\_PRO \_\_\_DECmate \_\_\_Robin

The subjects of greatest ineres to me are:

\_\_\_word processing \_\_\_\_\_project management
\_\_\_spreadsheets \_\_\_\_\_specialized vertical software
\_\_\_database \_\_\_\_\_(type)\_\_\_\_\_
\_\_\_graphics \_\_\_\_\_Other:\_\_\_\_\_
\_\_\_communications \_\_\_\_\_Rainbow
\_\_\_programming \_\_\_\_\_PRO
\_\_\_software reviews \_\_\_\_\_DECmate
\_\_\_technical articles \_\_\_\_\_Robin

DEC Gossip and News       Other: \_\_\_\_\_

If I had it to do over again, I:

- would buy another DEC Rainbow/PRO/DECmate (circle one)
- might buy another Rainbow/PRO/DECmate if it was a bargain (circle one)
- would not buy another Rainbow/PRO/DECmate (circle one)

Will you continue to subscribe at the new price of \$35/year?     yes     no

Feel free to enclose another page(s) with comments!

Do you feel that leaving the prices out of the newsletter:

- is appropriate
- is very annoying
- makes the articles less useful

Do you feel that Decus should revise its (anti)commercialism policy?

- yes
- no

Name \_\_\_\_\_  
 Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City/ST/ZIP \_\_\_\_\_  
 Work Phone (\_\_\_\_) \_\_\_\_\_  
 Home Phone (\_\_\_\_) \_\_\_\_\_

Return to:  
 Barbara Maaskant  
 Computing Resources  
 The University of Texas Health  
 Science Center at San Antonio  
 7703 Floyd Curl Drive  
 San Antonio, Texas 78284

fold here, flap under-----  
stamp

Barbara Maaskant  
 Computing Resources  
 The University of Texas Health  
 Science Center at San Antonio  
 7703 Floyd Curl Drive  
 San Antonio, Texas 78284

**PERSONAL COMPUTING SPECIAL INTEREST GROUP  
VOLUNTEER FORM**

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
Telephone \_\_\_\_\_

What special talents do you have? \_\_\_\_\_

---

**When do you attend symposia?**

- |  |   |
|--|---|
| <input type="checkbox"/> Always          | <input type="checkbox"/> Occasional Attendance  |
| <input type="checkbox"/> East Coast Only | <input type="checkbox"/> Other (please specify) |
| <input type="checkbox"/> West Coast Only | _____   |
|  | _____   |

**Please check if you are interested in helping with any of the following activities:**

**Symposia Related Activities:**

- |   |  |
|---|--|
| <input type="checkbox"/> Session Chairs _____       | <input type="checkbox"/> Articles for Update.Daily     |
| <input type="checkbox"/> Campground Volunteer _____ | <input type="checkbox"/> Write letters of appreciation |
| <input type="checkbox"/> Suite Volunteer _____      | <input type="checkbox"/> Equipment Setup               |
| <input type="checkbox"/> DECUS Store _____          |  |
| <input type="checkbox"/> Software Clinic _____      |  |
| <input type="checkbox"/> Panels _____               | (indicate topics) _____                                |
| <input type="checkbox"/> Technical Sessions _____   | (indicate topics) _____                                |

**Ongoing SIG Activities:**

- |   |                               |
|---|-------------------------------|
| <input type="checkbox"/> Working Groups _____                       | (indicate which groups) _____ |
| <input type="checkbox"/> Newsletter _____                           |                               |
| <input type="checkbox"/> Public Domain Software Project _____       |                               |
| <input type="checkbox"/> Write Software for Special SIG Needs _____ |                               |

**Other SIG Activities:** (please specify) \_\_\_\_\_

---

Do you wish to see the PCSIG undertake any activities which it is not currently doing?  
Please specify.

---

Would you be willing to coordinate the activity you have listed above?  Yes  No

Thank you



**Information Resource Sign Up Sheet**  
**Personal Computing Special Interest Group - PC SIG**

Are you willing to be an information resource for other PC SIG members? Placing your name on the *Contact List* means you are willing to answer questions within the span of a brief telephone conversation. A Contact is not expected to be a consultant. *Please Register below.* Your name and phone number (including restrictions) will be posted in the PC SIG Newsletter.

First Name: \_\_\_\_\_ Last Name: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ ZIP: \_\_\_\_\_

Phone: (\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

Areas of Expertise: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Suggestions for Additional Services the SIG can Provide:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



**PC POSTSCRIPT**

PC Postscripts are short requests, comments and responses to be published in the *Postscript Section* of the PC SIG Newsletter. Please respond to the following:

Y/N This is a reply to a previous Postscript.   Issue Mo.   No.

**Title:** \_\_\_\_\_

**Message:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Name:** \_\_\_\_\_

**Address:** \_\_\_\_\_

\_\_\_\_\_

**Phone:** (\_\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

**Signature:** \_\_\_\_\_ **Date** \_\_\_\_\_





## INPUT/OUTPUT Submission Form

A SIG Information Interchange

Please reprint in the next issue of the Pageswapper

If this is a reply to a previous I/O, which number? \_\_\_\_\_

Caption: \_\_\_\_\_

Message: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Contact:

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Telephone \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Mail this form to: Larry Kilgallen, PAGESWAPPER Editor  
Box 81, MIT Station, Cambridge, MA 02139-0901, USA

For information about online submission, dial (in the United States): (617) 262-6830 and log in with the username

PAGESWAPPER \* August 1986 \* Volume 8 Number 1  
INPUT/OUTPUT Submission Form

Tear out or photocopy reverse to submit an I/O item

Larry Kilgallen, PAGESWAPPER Editor  
Box 81, MIT Station  
Cambridge, MA 02139-0901  
USA

## System Improvement Request Submission Form

Page 1 of \_\_\_\_\_

---

Submittor: \_\_\_\_\_ Firm: \_\_\_\_\_

Address: \_\_\_\_\_ Phone: \_\_\_\_\_

---

**How to write an SIR:**

Describe the capability you would like to see available on VAX systems. Be as specific as possible. Please don't assume we know how it's done on the XYZ system. Justify why the capability would be useful and give an example of its use. If you wish, suggest a possible implementation of your request.

---

**Abstract (Please limit to four lines):**

---

**Description and examples (use additional pages if required)**

PAGESWAPPER \* August 1986 \* Volume 8 Number 1  
System Improvement Request Submission Form

Tear out or photocopy reverse to submit an SIR

Gary L. Grebus  
Battelle Columbus Division  
Room 11-6011  
505 King Avenue  
Columbus, Ohio 43201-2693  
USA

## VAX System SIG Fall 1986 SIR Ballot

DECUS membership number \_\_\_\_\_ (six digits)

Our site uses the following VAX models (check all that apply)

8800 \_\_\_\_\_ 8600/8650 \_\_\_\_\_ 8500 \_\_\_\_\_ 8300/8200 \_\_\_\_\_ MicroVAX \_\_\_\_\_  
11/780,11/782,11/785 \_\_\_\_\_ 11/750 \_\_\_\_\_ 11/730,11/725 \_\_\_\_\_

We use VAX's in the following applications (Check all that apply)

Business EDP _____	Software Development _____
Education _____	Computer Science Research _____
Data Acquisition/Control _____	CAD/CAM _____
Service Bureau _____	Hardware Development _____
Scientific/Engineering _____	Office Automation _____
Telecommunications _____	Other _____

I support the following as the most important System Improvement Requests. (List from zero to fifteen SIR's):

_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

I oppose the following SIR's as detrimental. (List from zero to five SIR's):

_____	_____	_____	_____	_____
-------	-------	-------	-------	-------

Mail to:

Gary L. Grebus  
Battelle Columbus Division  
Room 11-6011  
505 King Avenue  
Columbus, OH 43201

To be counted, your ballot must be received by August 29.

PAGESWAPPER # August 1986 - Volume 8 Number 1  
VAX Systems SIG Fall 1986 SIR Ballot

Tear out or photocopy reverse to vote on SIRs

Gary L. Grebus  
Battelle Columbus Division  
Room 11-6011  
505 King Avenue  
Columbus, Ohio 43201-2693  
USA

# DATAGRAM

DATAGRAMs are short messages, comments, requests, or answers that are published in NETwords. Please fill in the sections below and send the DATAGRAM to:

**Vickie Hancock  
NETWords Editor  
2510 Limestone Ln.  
Garland, Tx. 75040**

**Title:** \_\_\_\_\_

**Message:** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Your Name:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Telephone:** \_\_\_\_\_

**If this is a reply to a previous DATAGRAM, what #? \_\_\_**

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Place  
Stamp  
Here**

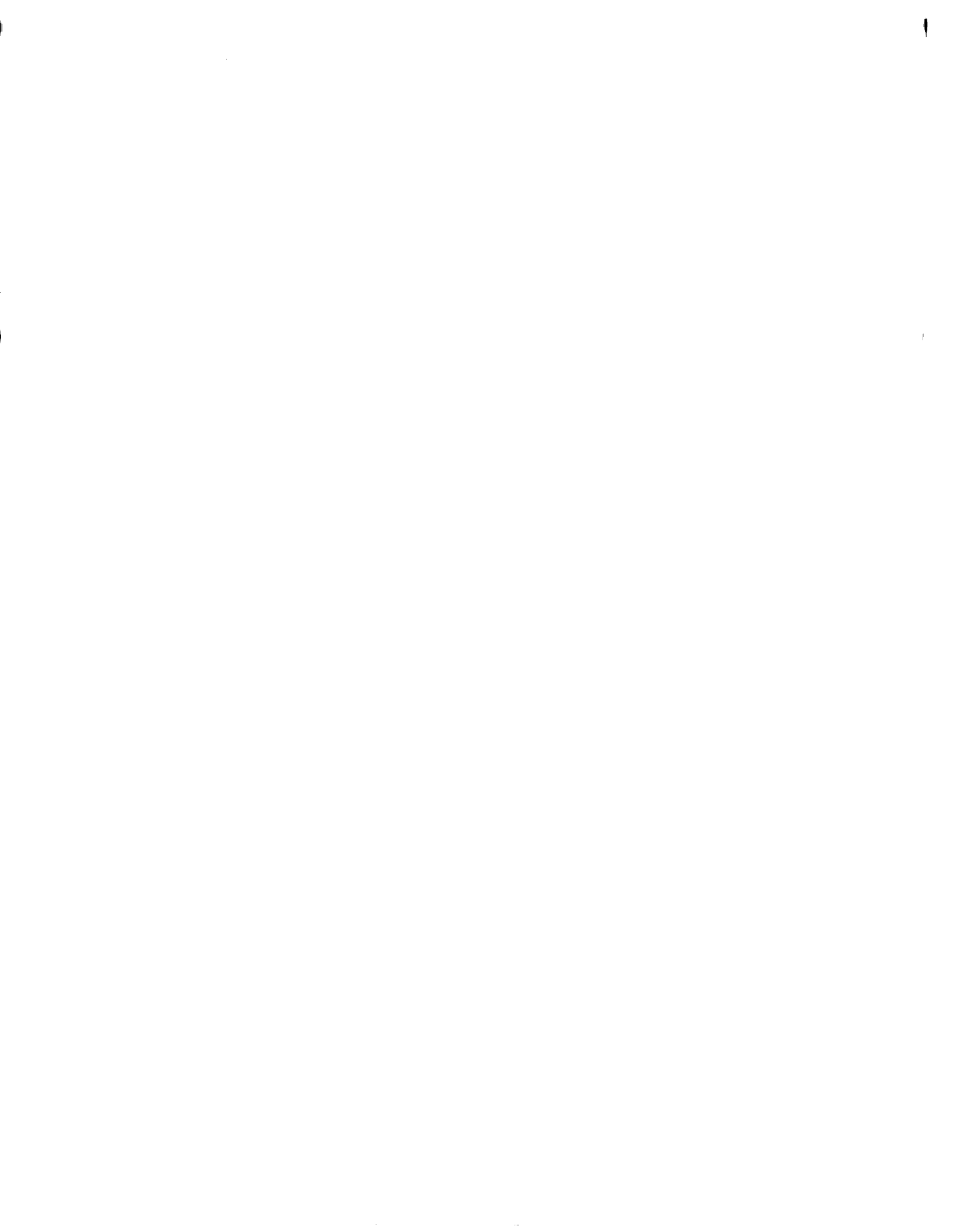
**Vickie Hancock  
NETWords Editor  
2510 Limestone Ln.  
Garland, Tx. 75040**

---

**Fold Here**







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DECalc-PLUS	MicroVAX	RSTS
DECdx	MicroVMS	RSX
DECmail	NMCC/DECnet	RX02
DECmate	PDP	TSX-PLUS
DECnet	PDP-11	UNIBUS
DECspell	PDT	VAX
DECtape II	P/OS	VAX-11
DECsystem-10	PRO/BASIC	VMS
DECSYSTEM-20	PRO/Communications	VT
DECUS	PRO/DATATRIEVE	VT240
DECwriter	PRO/DECnet	WPS
DIBOL	Professional	WPS-PLUS
Digital	PROSE	WPS-PLUS/VMS
	PRO/Tool Kit	Work Processor
		Xway

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DECUS SUBSCRIPTION SERVICE  
DIGITAL EQUIPMENT COMPUTER SOCIETY  
219 BOSTON POST ROAD, (BP02)  
MARLBORO, MA 01752-1850

**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: \_\_\_\_\_

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Marlboro, Massachusetts 01752-1850

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