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Ask the Wombat Wizard

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Care and Feeding of RMS Files Part II - Fragmented Files

In the November column we explored the design and maintenance of RMS files, especially indexed files. We talked about how RMS does it's job, about the File Definition Language (FDL), and about the FDL editor. We saw how you can use FDL and the CONVERT utility to keep your files running smoothly - files need regular maintenance to be kept clean and efficient. This is especially true for Datatrieve users, because it is so easy for DTR users to create and use many indexed files in an application.

Even if you regularly maintain your files, there are times when you need to know a lot more about the file system and how it works, and when you may need to take extraordinary measures to improve the performance of your file-based applications. I classify the file tuning at this more advanced level into two different areas - application file tuning and system-level file tuning. Application file tuning involves modification of a single file or small number of files using advanced file tuning techniques and knowledge of how RMS works. System-level file tuning requires a knowledge of how the hardware implements a variety of file operations, an understanding of the nature of ODS-2 disk volumes, and the authority and privileges to implement changes in the operation of the entire computer system in order to improve file system performance.

In this and succeeding columns, we will examine a few of the more advanced aspects of RMS file tuning and performance, with special emphasis on DTR applications. This month we will examine one of the easiest things you can do to improve DTR RMS file performance - correct physical file fragmentation.

Fragmented Files

One of the great advantages of the VMS architecture is the way it lets you share resources with other users. The use of global buffers (which we will discuss later) is an excellent example of how shared resources lets all the sharing users run better and faster - everybody wins. But sharing resources is also the source of many performance problems on the VAX, not the least of which is sharing a disk drive with other users. There are two problems here -sharing the bandwidth and access time capacity of the drive (bandwidth contention and head contention) and sharing the physical on-disk capacity of the drive.

The biggest problem with sharing the on-disk capacity has to do with the impacts of disk fragmentation. Ideally, a file is physically stored on disk as one continuous stream of blocks - it's contiguous. However, because there are many files on the disk, and because they are constantly being created, extended and deleted, there is a tendency for the free space remaining on a disk volume to become "fragmented" - available in small, discontiguous pieces. Thus, if your favorite DTR application attempts to create a large file using DEFINE FILE, the file system may not be able to find a single free space big enough for the file. In this case, the file will be broken into smaller pieces - each piece called an EXTENT. The process of creating a bunch of extents for a single file is completely transparent to the user - you have only two choices about it. (1) You can let the file system break up your file if it has to, and (2) you can tell it that the file MUST be contiguous, in which case the file will not be created if there is not a large enough contiguous space on disk and your application will receive an error when it attempts to create the file.

Why do you care if your files become fragmented? Because it makes your applications run slower, possibly a lot slower. And not only that, fragmented files make EVERYONE's applications run slower, not just the applications that use the fragmented file. This is because of the additional disk and file system activity that

If the file is just physically fragmented and doesn't have fragmented indices, then you can just use $ COPY/CONTIGUOUS to make a copy of the file that is contiguous. Unfortunately, this only works if there is enough contiguous space on the disk for the entire file to fit in one extent. If ANALYZE/RMS shows that the file is marked as contiguous-best-try, then you can simply use $CONVERT to make a copy of the file, without applying any options at all: $ CONVERT filename newfilename. Using CONVERT has the additional advantage that it will rebuild the indices as well, and delete any pointers to deleted records. But CONVERT has the disadvantage that it will need to reconstruct the entire index for a indexed file, a process that requires considerable computer resources. Even so, it is usually worth the extra time required. Also, if you read the CONVERT manual or keep reading this column each month, you will learn how to use CONVERT in the most efficient way possible.

If you have never used FDL and CONVERT on your file, there is a chance that the file will not be marked as contiguous-best-try. In this case, unless you do something else, a COPY or CONVERT will cause the VMS file system will place the extents of the file on the disk in whatever way it sees fit, not necessarily the most efficient for your use of the file. The best way to avoid this is to go through the entire ANALYZE-EDIT/FDL process that was described in last November's column. If that is more work than you would care to do (it DOES take about 10 minutes, after all), then here's an easy hack for you:

```
$ CONVERT/FDL=SYS$INPUT:        input-file     output-file
FILE
        BEST_TRY_CONTIGUOUS     YES
$ DUMP/HEADER/BLOCK=END:0 output-file
(examine the number of extents that result)
```

Next month we'll examine one of the other no-work solutions to improving RMS file performance - establishing global buffers. If you have an application wherein more than one user accesses the same file, especially an indexed file, you may not want to wait - read the Guide to File Applications on VAX/VMS.

```
Dump of file SYS$SYSROOT:[SYSEXE]SYSUAF.DAT;2 on  1-NOV-1987 22:00:53.49
File ID (1517,20,0)   End of file block 48 / Allocated 48
```

File Header

Header area
    Identification area offset: 40
    Map area offset: 100
    Access control area offset: 255
    Reserved area offset: 255
    Extension segment number: 0
    Structure level and version: 2, 1
    File identification: (1517,20,0)
    Extension file identification: (0,0,0)
    VAX-11 RMS attributes
        Record type: Variable
        File organization: Indexed
        Record attributes: <none specified>
        Record size: 0
        Highest block: 48
        End of file block: 49
        End of file byte: 0
        Bucket size: 3
        Fixed control area size: 0
        Maximum record size: 1412
        Default extension size: 3
        Global buffer count: 0
        Directory version limit: 0

Next to the production of new information systems, another issue is relevant: that of application maintenance. This appears to be of crucial importance, but at the same time it constitutes on of the greatest bottlenecks in many organizations. Responsible for this situation again are the above mentioned causes from the application development phase. Besides this, other problems of a different nature are prominent, like badly documented programs and poorly structured systems. Particularly to obviate the forenamed difficulties, the so-called "Structured Design Techniques" were introduced during the seventies. These design methods have brought some alleviation, but certainly have not become an unqualified success. The development and maintenance of software continue to be structural problems.

In recent years, efforts have been made to change this situation fundamentally. Various manufacturers are contributing to this by launching "Application Development Systems" (ADS's). On of these ADS's is described and examined against a number of criteria in this article. For that purpose this text is arranged as follows: In Section 2 a short explanation of ADS's in general is given. Moreover this section includes a paragraph with a discussion of the evaluation criteria that are used. Section 3 gives a system description of the specifically researched ADS. Finally, Section 4 contains the evaluation and the conclusion.

2.0 Application Development Systems

2.1 What are application development systems?

In general, a distinction is made between the third and fourth generation within the current computer languages. That third generation consists of the well-known higher programming languages like COBOL, FORTRAN, Basic, etc. These languages present many advantages in relation to their predecessors, but they also have serious drawbacks, the worst of which is their procedural nature. This means that experts are required and that they need to convert all user specifications into program procedures. In other words, *HOW* the software is to perform must be specified in detail, which is a tedious and technical process. The direct consequence of this usually is a very long and error prone software development stage. Moreover the extremely important application maintenance appears to be a very labor intensive affair, mainly because of the languages used.

In response to these last disadvantages, in recent years fourth generation software has been introduced to the marketplace. This software pretends to be a non-procedural as possible. In contrast to the usual state of affairs concerning third generation languages, now the declarative aspect is prominent. This means that the priority now rests with the declaration of the specifications (*WHAT* the software is to do, instead of *HOW* it has to perform), and thus no longer with the technical translation to the program procedures. The implementation of this conversion now is taken care of automatically by the software.

In practice, the term "fourth generation software" encloses a broad spectrum of programs and tools, with mutually greatly varying feasibilities. Nevertheless, some common elements can be distinguished. Particularly:

- Databases and Database Management Systems (DBMS's);

- Program generators: i.e. advanced software that generates all required procedural programs on the basis of mainly non-procedural specifications and uses the aforementioned databases. Such generators should include "Prototyping" facilities, to enable fast development of rough program frameworks;

- Query languages: languages that allow the user to easily perform manipulations on data in a database. Of course, authorization controls are essential in this respect;

- Screen generators: tools which can be used for a clear presentation of data by way of a sophisticated layout;

- Report writers: aids to generate hardcopy printouts.

The confusion concerning the term "fourth generation software" necessitates the introduction of a new concept: Application Development Systems (ADS's):

An ADS can be described as a system that contains all the above mentioned elements, in such a way that they form a consistent unity, which enables developers to produce applications in a relatively non-procedural manner.

3.0 System Description

3.1 An Overview of VAX RALLY

After the general description of ADS's and the evaluation criteria that should be taken into consideration, now the specific ADS product, VAX RALLY of DEC, linked to a Rdb/VMS database [RDB/85], can be described. For an introduction of this package, an article has been written by R.T. Bennett [BENN86]. It was published in a former edition of this publication. In the subsequent text a summary of the most important characteristics of this ADS follows.

VAX RALLY is made up of two main systems:

- The Dialog, consisting of tools to generate an application;

- The Runtime System. This part takes care of the execution of the application. The Runtime System will not receive attention in this article.
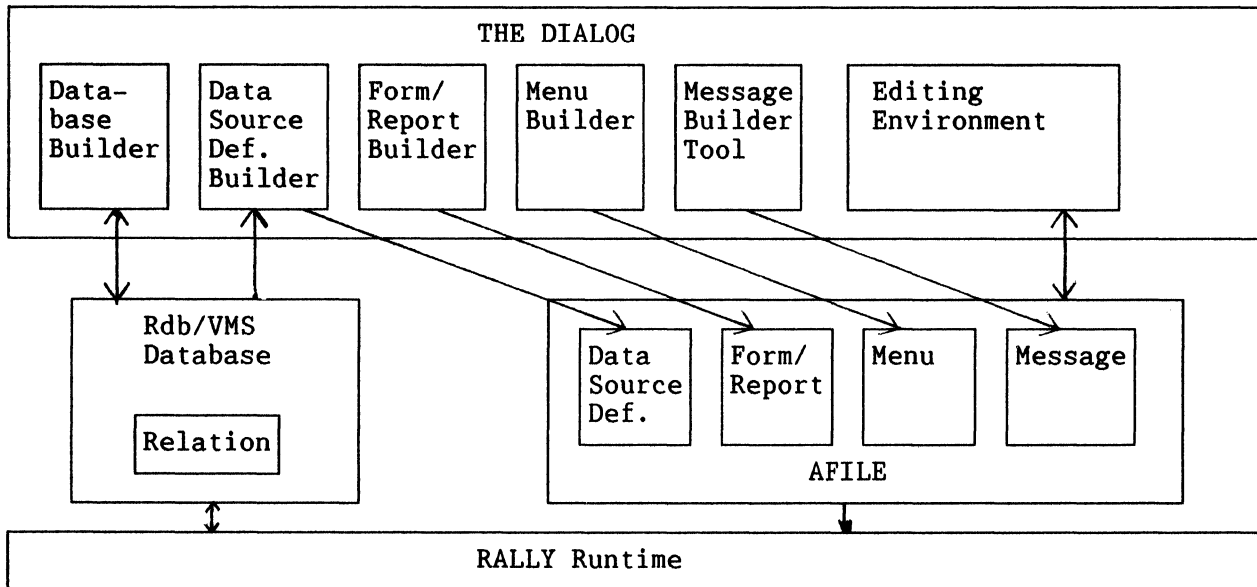
Figure 1

The Dialog shows itself as a series of menus and screens that enable the user to create a set of linked objects, which in turn form the application. Some important objects are:

- Forms;
- Reports;
- Menus;
- Help texts;
- Error messages
- Linkages to the database(s).

These objects are laid down in the form of data structures, which RALLY stores in a special application file (AFILE). The above mentioned Runtime System processes the contents of this file during the execution of the application. The Dialog itself also consists of two parts:

- The Builder Tools;
- The Editing Environment.

The Builder Tools

This is a cluster of 5 sub-tools, that can be used to start building an application. Those sub-tools are:

3.2.2 The Data Source Definition Builder

Often a database will not be involved in its totality by a manipulation. Therefore RALLY offers the possibility to redefine the database into new *sources*, that only present the required parts of that particular database. This redefinition can be seen as the translation from the conceptual level to the external level [DATE86] and takes place in two steps:

1.) The first step concerns the definition of the Data Sources. Such a Data Source establishes a bridge between the Rdb and the still-to-be-made form/report. In that Data Source Definition (DSD) the relation(s), which can be used, are registered. Besides, here the possibility exists to fix additional restraints to that use. In a DSD, relations can be coupled by way of a *join*. However, this join has limitations: updating, deleting, and inserting are not allowed. In other words, the *joining* of different relations in a DSD mainly serves report writing. Further on in this text, a method (involving another kind of join) will be shown that does allow all manipulations (including updating, deleting, and inserting);

2.) The second step in the redefinition is described in sub-paragraph 3.2.3 (Form/Report Builder).

Schematically the redefinition can be depicted as in Figure 2 (Groups will be discussed hereafter);

```
    Form/Report                      Form/Report

   Group        Group          Group        Group        EXTERNAL
     |            |              |            |
     |            |              |            |           LEVEL

   DSD          DSD            DSD          DSD
     |            |              |            |
     |            |              |            |

   R            R              R            R
   e            e              e            e
   l            l              l            l            CONCEPTUAL
   a            a              a            a
   t            t              t            t            LEVEL
   i            i              i            i
   o            o              o            o
   n            n              n            n
```
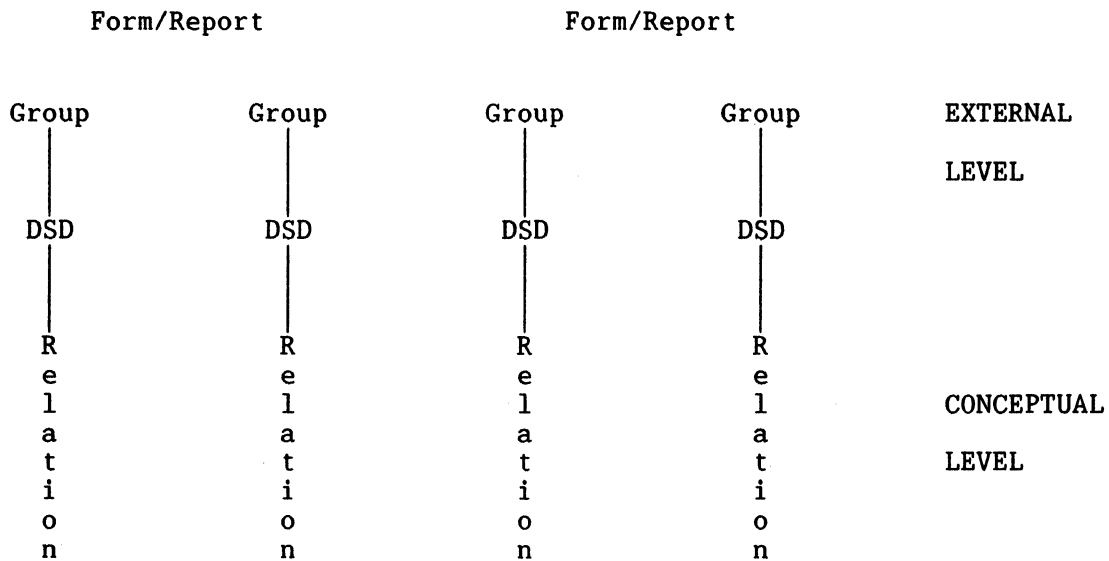
Figure 2

3.2.3 The Form/Report Builder

This tool serves to build screens, with which data can be presented to the end user. Moreover RALLY objects can be generated, that facilitate manipulations against the database. In this Form/Report Builder, the second step is made in the redefinition process. To that end, so-called *Data Source Groups* (usually abbreviated to *Groups*) are created within the forms/reports. These *group definitions* designate the DSD's that are used by a particular form/report. (In this respect only a single DSD can be defined per group; however several groups can refer to the same DSD.) A DSD is independent of any singular group definition.

The functions of the group lie in the formulation of more stringent requirements for the access to the database and in the establishment of specific characteristics (like the manipulation mode that is allowed). In other words, a group definition is restrictive toward a DSD and thus can never signify a widening of competencies. Groups can be *joined* in a so-called hierarchical form/report. RALLY calls this a *Parent-child relation*. In this case it is possible to carry out all normal database manipulations (update, delete, insert), which are not allowed when DSD's are joined. (Therefore it is evident that a form/report, in which one or more of the groups make use of joined DSD's, does not allow all these manipulations anymore.)

3.3.1 Defining (& editing) Menus

In the Builder Tools only a simple menu (the Main menu) can be created, which points exclusively to forms/reports. In the Editing Environment the possibility exists to establish several (sub-)menus and, as a consequence, even complete menu hierarchies can come into existence. Moreover, the separate menus can now be equipped with complex structures, which enable them not only to point to forms/reports, but also to other items like menus, tasks, commands and ADL procedures (as will be explained further on). Finally, there are several options that enable changing/improving the layout of menu screens. (Editing is not possible in the Menu Builder.)

3.3.2 Defining (& editing) Forms/Reports

Forms/reports themselves again consist of a number of sub-objects. To mention the most important of these:

- Groups (4 types);
- Fields;
- Text areas;
- Form/report call-packets.

The Defining Forms/Reports option gives entry to a number of techniques to create or change these sub-objects. As far as the groups are concerned, *Data Source Groups* have been treated (in 3.2.3). No further attention will be paid to the other groups and to fields and text-areas, because this would lead too far. Because they are essential for understanding some fundamental RALLY concepts, form/report call-packets (also called form/report packets, call-packets, or just packets) will now receive a short explanation.

In the Builder Tools, standard forms are created and, to enable manipulations against the Rdb, linked to the Main menu. This coupling is established through these form/report packets, which are created implicitly by the builder. In the Editing Environment, these packets can be built explicitly. In a form/report packet, the following is specified:

- which form/report must be called;
- in what *initial usage mode* the form/report stands;
- the before- & after-actions that are to be deployed (see 3.3.4).

Forms and reports are independent of form/report packets. This means that a form/report can be defined in several different packets (and, thus, in various modes and with different before- & after-actions). In other words, such a form/report is reusable.

3.3.3 Defining (& editing) Data Definitions

With the Builder Tools, among other things, DSD's are defined. In the Editing Environment, three types of DSD can be created and/or changed:

- the Base DSD;
- the View DSD;
- the Breakup DSD.

The Base DSD: This one conforms to the (above description) DSD from the Builder and forms the connection between the relations and the application:

The View DSD: As soon as a *parent-child-relation* (see the above-mentioned) within a hierarchical form/report is used, the Form/Report Builder implicitly (!) creates so-called *View DSD's* (one for each child). This is necessary to link required Base DSD's. In the Editing Environment it is possible to explicitly create View DSD's. This changes the data flow to the hierarchical form/report, because the new View DSD couples different Base DSD's and therefore inherit many characteristics from them.

```
                 ┌──────────────────────────────────┐
           ⎧     │    Form/Report (read-only)       │
  Parent   ⎪     │  ┌──────────────────┐            │
  Group    ⎨     │  │                  │            │  ⎫
           ⎪     │     ┌──────────────────────┐     │  ⎬ Child
           ⎩     │     │                      │     │  ⎭ Group
                 │  ┌──────────────────┐      │     │
                 │  │                  │      │     │
                 │     ┌──────────────────────┐     │
                 │     │                      │     │
                 │                                  │
                 ├──────────────────────────────────┤
                 │          Breakup Set             │
                 │  ┌─────────────┐ ┌─────────────┐ │
                 │  │ Parent      │ │ Child       │ │
                 │  │ Breakup     │ │ Breakup     │ │
                 │  │ DSD         │ │ DSD         │ │
                 │  └─────────────┘ └─────────────┘ │
                 └──────────────────────────────────┘
                             ↑
                      ┌─────────────┐
                      │  Base-DSD   │
                      └─────────────┘
                             ↑
                      ┌─────────────┐
                      │  Relation   │
                      └─────────────┘
```
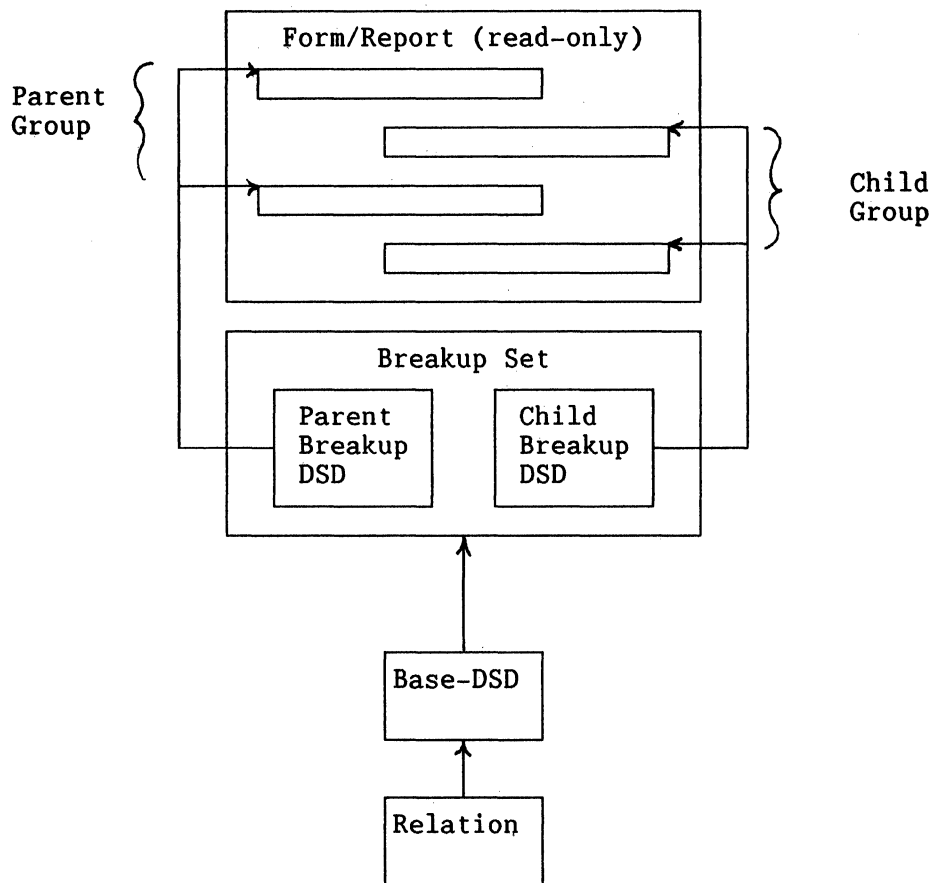
Figure 5

therefore are defined within a framework, that is called *Application Flow Control* (AFC). Within the Editing Environment, it is possible to define complex forms of Flow Control, which consist of many (sub-)objects. The most important components and their relationships will be explained in the following:

- Action: The invocation of certain RALLY objects is seen as an action. Each action can call one of the following objects:

  - a menu;
  - a form/report packet;
  - an ADL procedure (see 3.3.5);
  - a parameter packet (no attention will be paid to this);
  - an external program link (this too is not discussed);
  - an action list (no attention either).

- Task: An independent set of mutually related actions. The number of actions within such a set is not limited theoretically. Each task has its own *Action stack* (see one of the next items). Several tasks can be active at the same time. The distinct tasks can be shown simultaneously and followed in separate windows on the screen. This enables the user to switch between tasks with one of the commands (e.g. 'next- task'). With a task (among other things) the following can be accomplished:

  - the creation of additional *Entry Points*;
  - running some processes in batch;
  - linking an application command to a task;
  - the creation of a window on the screen, in which the task flow can be seen. The first two points will now be illuminated:

- Command: With commands various kinds of operations can be executed. On of these operations concerns the navigation among tasks and actions. These navigations can take place interactively or can already be defined during the design of the application. This implies that these commands have a great influence on the Flow Control.

- Action-stack (= exectuion-stack): A queue, which takes care of the management of a stream of actions that have to be executed when running an application. This queue operates according to the LIFO (last in first out) principle. Each active task has its own Action-stack. When an action calls another action, the first action stays in the stack, but the new action is placed on top of it. If this second action is completed, it is removed from the stack and the Flow Control resumes with the first action, which now is at the top of the stack. If the stack contains only a single action, when that action has been executed, the task is completed.

- Invocation type (= call type; instead of *type*, *style* is also used). This is the method, with which an action, task or command is activated, because filling the Action-stack happens through these invocation types. Examples of these invocation types are:
  - call: the present action stays in the queue; a new action is placed into the queue and executed;
  - execute: the present action is removed and a new action is placed into the queue and executed (to be sure, there are more types, but our investigation has been restricted to these).

- Action-site: a point in the application to call an action, a task, or a command. This takes place by mentioning the name of the object and stating an invocation type. Action-sites are among others:
  - the first action of a task;
  - a menu choice;
  - a form/report call packet;
  - a form/report;
  - an ADL procedure.

- Before- & after-action: This is a RALLY object, with which actions automatically can initiate other actions, without necessitating user input (in the form of an explicit menu choice).

3.3.5 Defining, maintaining, and managing applications

This menu choice leads to a miscellaneous set of *Utilities* and other matters. Of these, the following can be mentioned:

- the creation of additional Entry Points (see the Task description);

- the creation and changing of Help, Error, and Legend messages. This forms an addition to the Message Builder and is of subordinate importance to this description;

- security; this is an important issue and therefore it requires some further explanations.

It is possible to protect (parts of) an application against all unauthorized users. The protection can be accomplished in four different ways, but only the last two methods are part of RALLY itself (so called Dialog Security Mechanisms):

- on the file level, through *VMS file protection*. A feature, that controls entry to the AFILE and the Rdb/VMS database files. This control is carried out by the VMS Operating System, which can assign different authorizations to different users;

- through *Rdb/VMS Security*, a mechanism that takes care of specific relations in a database (through RDO);

- on the level of distinct RALLY objects. This happens by way of *RALLY Security Items*, which (among other things) contain passwords. Each password is linked to a specific object,

Only the left side of the figure is worked out in detail. A Main menu (in this example) consists of a number of sub-menus. Each sub-menu, in turn, can initiate several form/report packets. As said, in these packets the forms/reports, that are to be invoked, are mentioned. After the execution of these packets, another action (e.g. a print command) can be carried out, without the requirement of any user action. This then is accomplished through the after-action. The data of the database that have a bearing on a form/report are determined by the groups, which are defined in the form/report definition. The group definition relies on the Data Source Definition, which in turn contains one or more Rdb relations.

4.0 Evaluation and Assessment

4.1 Practical Experiences and Criticisms

The following remarks are derived from our specific experiences and they encompass positive as well as negative elements:

- The totality of the Builder Tools is goal oriented and transparent. In this context, goal oriented means the the user can confine himself the the declaration of his wishes without having to convert all the details into a programming language. Transparent refers to the fact that there is not a great stream of options, but always a limited number. In order to know what everything means, a somewhat tedious learning process needs to be absolved but, once this has been accomplished, it is rather easy to build a simple application with the Builder. The Editing Environment is much less clear because of the enormous amount of options. All in all, RALLY comes across as massive and therefore relatively unclear to the uninitiated. This means that a long span of experience with the ADS is required to handle it well.

- We question ourselves as whether there has to be a distinction between the Builder Tools and the Editing Environment, for in our opinion, the builder does not allow genuine *Prototyping*. While there is only one menu; the objects cannot be subdivided, etc. All this means that the possibilities for arriving at such a rough design are really too limited. Moreover, the Editing Environment has to be studied anyhow, to build a full-blown application. So, why not e.g. one single tool that contains all the options? Of course, this would necessitate a thorough tackle of the transparency problem.

- ADL pretends to be a simple programming language with statements, procedures, functions, and syntax resembling that of Pascal. In other words, it is procedural. If an application gets a little complex, extensive validation procedures are necessary to guarantee the integrity surveillance of the database. Then the use of ADL is inescapable. This means that some procedural programming turns up again. As a consequence, specialized know-how is still required so many of the RALLY advantages are neutralized again!

- The possibility to verify applications has saved much time and effort during the development of programs. However, the error messages that were displayed, when something went wrong, were not always crisp and clear.

- The *Trace-log* command (in VAX/VMS) is extremely important. Without this option, we never could have succeeded in developing a properly working ADL procedure. Besides, this command enabled the tracking down of the reasons why some other parts of the application initially did not live up to our expectations. For this trace-log option precisely denotes which form/reports are called, what ADL procedures are run through, what happens to the database, etc.

- Nowhere can it be discovered, what the underlying base language is that RALLY uses. This implies that no thorough investigations are possible in the case of persistent errors and that *tuning* by specialists cannot be undertaken.

- The application in its totality can be well protected with, among other things, Entry points and/or Passwords. In this way, several end-users can use the same application, without them having to see the total or each other's views.

It is clearly DB oriented. The DB even is indispensable and the first thing that has to be created (apart from an AFILE) in the Builder is the database. Whether RALLY is DC oriented could not be ascertained by us, though it is quite likely because of the linkage capabilities of the VMS Operating System (with among other things DB's on so-called *remote nodes*), that are mentioned in the documentation. We only had a *standalone system* at our disposal, so we could not investigate if (and when so, to what extent) network facilities can be implemented.

3.) Are the tools independent of a specific DBMS?
Probably not. We cannot make definite statements concerning this item, for we only could works with Rdb/VMS. In all Digital manuals, just this one type of DB (and related DBMS) is mentioned and discussed.

4.) Is the ADS interactively oriented and does it possess good data manipulation features, screen formatting, and report writing facilities?
The part of this question concerning interactive orientation can be answered affirmatively, though this is not the case as far as the ADL is concerned. The data manipulation facilities have been arranged in an excellent manner, by way of a QBE-like language in form/reports. With respect to report writing: the generation of reports is simple through the *print-only-mode* specification in menus and/or packets. Finally, screen formatting is excellent, through adjustments of the so-called *default layouts.*

5.) Does the ADS possess language elements (if possible non-procedural) to describe activities that cannot be directly deduced form the in/output specification?
Yes, RALLY does, in the form of ADL (mainly needed for the creation of validation procedures). However, this language is highly procedural. (N.B.: the great majority of the activities that have to be included can be described in the in/output specifications of the non-ADL part of RALLY.)

6.) Can an observable productivity improvement be witnessed in relation to third generation languages?
Yes, for in a very short time, a working new application can be build. However, we have not qualified the advantage.

7.) Is there really a higher measure of flexibility as compared to third generation languages?
Partly there is, because implementing improvements or additions is done faster and easier than with third generation languages. This too, of course, is a subjective judgment that can be subjugated to further quantification. On the other hand, flexibility is still a long way from being optimal, due to the rigid internal structure, with very extensive mutual *linkings.* This means that all sub-objects of a certain object have to be de-coupled or destroyed before any changes or additions can be made to the object itself and this, in turn, is certainly not maintenance friendly.

8.) Does the ADS still require specialized knowledge?
Yes it does, for early on in the design process, procedural language facilities have to be called in. Therefore an end-user probably will not be able to build complex applications on his own.

9.) Is fast and good *Prototyping* possible?
Indeed it is possible to create such a rough design in the Builder Tools in a short time. However, we consider the result to be too simplistic. For example, it is not possible to create more than one menu in the Builder so if more (sub-)menus are needed, it is necessary to use the Editing Environment. The same procedure has to be followed for many other objects.

10.) Does the ADS software (automatically) guarantee the integrity of the (total) application?
Yes, there is a *Verifier* that undertakes a check of every single RALLY object, whenever the definition phase of such an object is completed. Furthermore, it is possible to exercise control on the validity of the entire application through the *Verify application* command. Finally, a check is made at the beginning of any runtime session.

OFFICE

AUTOMATION

OASIS is now available for your use. The majority of the introductory information and documentation will be found on-line once you have successfully logged in, applied for and recieved your account. (This is a painless process).

To access OASIS, you may use one of four lines:

(603) 884-1738 - 1200 baud only
(603) 884-1739 - 1200 baud only
(603) 884-1740 - 1200 baud only
(603) 884-1742 - 2400 baud

REMEMBER: THE SERVICE IS FREE...YOU PAY FOR THE PHONE CALL.

To Use:

1. Once you have connected to OASUS, log into the account: OASIG.

2. You will be taken directly into VTX where you may read several pages of information on OASIS, the OASIG, etc.

3. Before logging off, be sure and fill in the account request form so your account can be created, allowing you access to the VAXNOTES system and the OASIG conferences.

If you have any difficulties completing these preliminary steps, please feel free to call or write:

Joe Whatley
OASIS System Administrator
C/O A.C. Nielson Co.
375 Patricia Ave.
Dunedin, FL 33528
(813) 734-5473 x2438

HOW TO SUBMIT ITEMS FOR SIG TAPE

Roger E. Bruner, Volunteer OA Tape Coordinator

A DECUS Symposium Swap Tape is a collection of software contributed by the members of a SIG which is assembled by a SIG volunteer tape coordinator and distributed to individual DECUS Members by the National LUG Council through the DECUS U.S. Chapter Local User Group structure. The SIG Swap Tape's purpose is to serve as a vehicle to allow DECUS members to share softeware.

Contributions are by no means limited to those collected at symposia. They can be sent directly to the volunteer tape coordinator. Usually it is convenient to use the symposium to serve as a focal point for the effort since there are so many users together at once.

If you would like to contribute to the Swap Tape, there are several guidelines to keep in mind.

*   The tape should be made in VAX/VMS BACKUP format, at a density that is acceptable to the tape coordinator (usually 1600 BPI).

*   Each submission should be in a separate "save set" that is made up of whatever files relate to that submission and a README file that briefly describes what the submission is. Typically, the README file is named "AAAREADME.TXT" so that it can be easily located in a directory listing of the tape. In submissions where there are many parts to the submission, each "piece" of the submission should have its own subdirectory as well.

*   Each submission must include a DECUS PROGRAM LIBRARY Submittal Form. These forms are available through by contacting me at the address listed below. Processing of your submission will be delayed if this form is not completed.

PERSONAL COMPUTER

SPECIAL INTEREST GROUP

NEWSLETTER

character width   character width   character wi
character width   character width   character width

line spacing

line spacing

line spacing

line spacing
line spacing
line spacing
line spacing

alphabet áìⓈèáâàô ▦╔┐Y▦╄╠╞ ㄗㄈㄨㄗツナヤ

printing style <u>printing style **printing style**</u> printing style

printing style

and fractional $_{line}$ spacing ^{which} can be useful

in making $sub_{scripts}$ $\frac{frac}{tions}$ etc.

These notes are intended as an introduction to the control of these printer features.

All of these involve inserting nonprinting control characters into the file to be printed, so I start with a discussion of how to use EDT to insert these characters into a file. Next, I will discuss specific print characteristics and how to control them. After that I will explain how to make an EDT initiation file to make <u>your</u> version of EDT do them more easily (in effect, adding "begin underline" and "end underline" keys, etc.). Finally, I will discuss some alternative ways of printing a file.

A file which prints correctly will not always look good when "typed" on the monitor screen. When there is a choice, I have tried to choose the technique which doesn't mess up the monitor version too badly.

INSERTING SPECIAL CHARACTERS IN EDT

Each of the 256 bytes 00000000=0 decimal through 11111111=255 decimal is a "character" which can be sent to the printer. Some will print, some will be treated as control characters, and some will be ignored. When you type a character, say the letter "q", on the keyboard it inserts a character, in this case 01110001=113 decimal into the file. But some characters cannot be inserted into a file in this simple manner. The keypad mode of EDT has an alternative method of inserting characters which works for <u>all</u> characters.

To insert any character, press "GOLD" (the PF1 key on the number keypad), type the decimal value of the character (using the main keyboard), and then press "GOLD" again followed by the 3 of the number keypad. When you type the number, it will appear in black on white at the bottom of the screen. When you press 3, the number will disappear and the symbol for the character will appear at the cursor position. EDT has a symbol (usually an ANSI or DEC standard) for each of the characters, even the non-printing ones (if you count blanks, tab for 9 and single blank for 32).

Examples which we will need later are:
        ^H   8
        <LF> 10
        <FF> 12 also insertible by CONTROL/L
        <CR> 13
        ^N   14

therefore desirable to use Pn=0 instead. Pn=5 selects blink and Pn=7 selects reverse video on the monitor without affecting the printer. These are also turned off by Pn=0.)

Two or more attributes at once can be selected with the same <CSI> by separating the Pn values with semicolons. (E.g., <CSI>1;4;5m for underlined boldface on the printer and underlined, bold, blinking characters on the monitor.) As an example, the line

    <CSI>1mbold <CSI>0;4munderlined <CSI>1mboth<CSI>0m neither

prints as

    bold <u>underlined **both**</u> neither

An alternative to bold printing (you can't do both at once) is "enhanced density" (called "letter quality" in Print Services), selected by

    <CSI>Pn"z

with Pn=2 and turned off by the same sequence with Pn=0 or 1. The "print style" on the first page which is on the line below the others is printed with "enhanced density".

Editor's note: The words "print style" are shown in a different font than the rest of the text in the preceding sentence. The original submission is printed in LA50 draft mode with the words "print style" done in "enhanced density". The sentence actually looked like this:

`The "print style" on the first page which is on the line below...`

The LA50 manual lists certain cases (alphabets, character widths) in which bold or enhanced density or both do not work.

5. Half line up, half line down, <CR>, <LF>, and backspace

To move the print position half a line down on the paper (move the paper half a line up) use <PLD> (character #139) or, equivalently, <ESC>K. To move the print position half a line up on the paper (move the paper half a line down) use <PLU> (character #140) or <ESC>L.

^H (character #8) moves the cursor one position to the left (backspaces), <LF> (character #10, often called ^J) produces a linefeed without a carriage return, and <CR> (character #13, often called ^M) produces a carriage return without a linefeed. (Note that on the monitor, unlike the printer, a backspace normally <u>erases</u> the character which the cursor replaces.)

An example of the use of these is

    tanx=<PLU><CSI>4msinx<CSI>0m<LF>^H^H^H^Hcosx

which prints as

        `tanx=`<u>`sinx`</u>
             `cosx`

Note that the line of the fraction was produced by writing sinx underlined.

33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
!	"	#	$	%	&	´	(	)	*	+	,	–	.	/	0	1	2	3	4	5	6	7

56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78
8	9	:	;	<	=	>	?	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N

79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
O	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^		♦	▓	⊣	⊦

100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116
⊩	⊦	°	±	⊠	⊬	⌐	┐	┌	└	+	⎺	—	–	—	_	├

117	118	119	120	121	122	123	124	125	126
┤	┴	┬	│	≤	≥	π	≠	£	·

2. Choice of alphabets

By appropriate switch settings or control sequences, one can designate four character sets, G0, G1, G2, and G3 (perhaps including duplicates) which the printer holds available and two active character sets, GL and GR, each set equal to one of the four values G0, G1, G2, or G3.

GL determines what symbols will be printed when characters in the range 33 through 126 are sent to the printer. For example, when GL is set equal to G0 and G0 is one of the four sets above, the corresponding list determines which character will print. (Character 40 will be (or ⊣ or ⊠ or (and character 97 will be a or ⊊ or á or ▒ when G0 is ASCII or Katakana or Multinational or Special Graphics.)

GR determines what symbols will be printed when characters in the range 161 through 254 are received by the printer. The procedure is like that for GL except that 128 must be added to the character numbers in the lists above. For example, if GR is set equal to G2 and G2 is set equal to the Multinational set, the characters in the range 161 through 254 will print as follows:

161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176
¡	¢	£	⊊	¥	⊊	§	¤	©	ª	«	⊊	⊊	⊊	⊊	°

177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192
±	²	³	⊊	μ	¶	·	⊊	¹	º	»	¼	½	⊊	¿	À

193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208
Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï	⊊

209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224
Ñ	Ò	Ó	Ô	Õ	Ö	Œ	Ø	Ù	Ú	Û	Ü	Ÿ	⊊	ß	à

225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï	⊊

241	242	243	244	245	246	247	248	249	250	251	252	253	254
ñ	ò	ó	ô	õ	ö	œ	ø	ù	ú	û	ü	ÿ	⊊

3. A particular choice and how to make it

Alphabet selection is somewhat complicated and is discussed in the LA50 Manual. My object here is to describe a method of making all the characters available without too much pain. I will describe here my choice, how I make it, and how it can be used.

(say DW1:[USERFILES]EDTINI.EDT) and editing EDTSYS.EDT so that that copy is always used.

The first step in setting up an initiation file is then to

$ EDIT LB:[1,2]EDTSYS.EDT

and add

SET COMMAND DW1:[USERFILES]EDTINI

as its last line.

2. The file DW1:[USERFILES]EDTINI.EDT

My version of DW1:[USERFILES]EDTINI.EDT is

```
SET NOFNF                              !turn off the "file does not exist" message
SET NOWRAP                             !turn off wrapping
DEFINE KEY GOLD 12 AS "140ASC."        !"GOLD" "UP" produces <PLU>
DEFINE KEY GOLD 13 AS "139ASC."        !"GOLD" "DOWN" produces <PLD>
DEFINE KEY GOLD [ AS "155ASCI4m^Z."    !"GOLD" [ produces <CSI>4m
                                       !(turns on underline)
DEFINE KEY GOLD ] AS "155ASCI0m^Z."    !"GOLD" ] produces <CSI>0m
                                       !(turns off underline and bold)
DEFINE KEY GOLD p AS "155ASCI1m^Z."    !"GOLD" P produces <CSI>1m
                                       !(turns on bold)
DEFINE KEY GOLD FUNCTION 23 AS "27ASC." !"GOLD" F11 produces <ESC>
DEFINE KEY GOLD FUNCTION 24 AS "27ASCIN^Z." !"GOLD" F12 produces <ESC>N
                                       !(GL=G2 for next character)
DEFINE KEY GOLD FUNCTION 25 AS "27ASCIO^Z." !"GOLD" F13 produces <ESC>O
                                       !(GL=G3 for next character)
DEFINE KEY GOLD FUNCTION 26 AS "155ASC." !"GOLD" "ADDITIONAL OPTIONS"
                                       !produces <CSI>
SET MODE CHANGE                        !starts in keypad mode
```

3. Use of EDTINI.EDT

Just edit a file with EDT in the normal manner. When you get into EDT you will have nine new key combinations available.

To start underlining	press GOLD followed by [
To start boldface	press GOLD followed by P
To stop underlining or bold	press GOLD followed by]
To insert a <CSI>	press GOLD followed by "Addtnl Options"
To insert an <ESC>	press GOLD followed by F11
To move print a half line down	press GOLD followed by "DOWN ARROW"
To move print a half line up	press GOLD followed by "UP ARROW"
To shift GL to G2 for next character	press GOLD followed by F12
To shift GL to G3 for next character	press GOLD followed by F13

These make the features I use most almost automatic. (I don't have to remember the control sequence I am using.) If I did a lot of print-size switching or other changes, I would probably define other keys in the same way.

PROgramming Quickie

By Gary Rice, PC SIG Newsletter Editor

In early 1986, I decided to write a PRO application the I wanted to protect from piracy. After looking at several alternatives to copy protection, user access, supportability, and the like, I elected to take advantage of the unique serial number that all PROs have on a ROM (Read Only Memory) chip on the system board.

Reading through the Executive Reference Manual, I found the WIMP (yes WIMP) directive. (You should hear how the PRO developers talk about their work with things like WIMP and the atom smasher BLAST routine and APPLE - DOLLAR - DIR, et cetera). WIMP, I suspect, is just another bit of deranged humor from the early PRO development days. Certainly, is seemed deranged when I first attempted to call the directive and make any sense out of what it returned.

Initially, I tried several times to just call it successfully. The first problem was: what number do you pass in argument position 1 that will give the desired result? The book used symbolic names, but did you ever try to compile a FORTRAN program with a numeric variable set to "GI.SSN"?

Well, I figured that out eventually. Then, after finding out that GI.SSN actually is the number 13 (decimal), I successfully called the WIMP routine only to discover that the numbers that were returned in the 3 word array passed as the return buffer were meaningless, at least in terms of what I thought I would get.

A thorough search of the PRO/Toolkit manuals yielded nothing further about what the numbers meant. A call to the Atlanta Hotline produced a response along the lines of: "It works for us . . .". (I have since dropped Hotline Software Support).

About this time, the PRO technical manual arrived. A casual reading of the table of contents indicated promise. Flipping to page 5-80 of the manual produced pay dirt. The manual stated:

> "5.4.8.1 ID PROM - Each system module board contains a PROM with a unique 32-byte ID.
>
> Addresses:
>
> 17773600-17773676   32 bytes PROM
>
> All 32 word locations use only the low byte. The high bytes are always read as zeros. Any attempt to write to the ID PROM locations results in a non-existent memory trap to location 4.
>
> The ID code is 12-BCD digit (6-byte) random number."

Armed with this information, I browsed through the FORTRAN manual and came up with the "Z" format specifier. A little experimentation resulted in success. The program that follows shows you what I found.

```
C  CPUID.FTN - This program obtains and displays the system CPU ID
C
C  ORIG VERS: 1.0
C
C  CURR VERS:        1.1
C
C  AUTHOR:   Gary Rice
C
C  CREATED:   January 15, 1986
```

```
;
; DEFINE CLUSTER SCHEME
;
CLSTR=PROF77,POSRES,RMSRES:RO
;
//
```

Send me your own PROgramming Quickie. I will add it to my collection of public domain software and publish it here in the Newsletters. Send it to me on an RX50, please. If you include a return mailer and postage, I will fill it with goodies and send it back to you. My address can be found in the Steering Committee Lists at the end of these Newsletters.

Printer Doesn't Have to Have DEC on Label to Work with Rainbow

John Danielson, San Diego DECUS Rainbow LUG Newsletter Editor

Four and a half years ago when I got my Rainbow (no one knew about 100As, 100Bs or the Plus then) I wanted a daisy-wheel printer. DEC's daisy-wheel printer was nice and if I were going to subject it to eight hours of use daily, I probably could have justified the price. The LA50 dot-matrix printer was more in my price range, but it wasn't up the print quality I wanted for business correspondence.

I ended up with a "third-party" printer, and I'm still amazed at all the Rainbow owners who ask me about using nonDEC printers.

It took a great deal of probing, trial and questioning to figure out what I needed to know to hook up my nonDEC printer. But, when it was all over, I was surprised at how simple it was.

I went about the whole thing in a backwards manner. I made a list of the features I wanted. First was price range of $400 to $600 (prices have come down substantially since then). Second was a daisy wheel (the "near-letter-quality" feature on dot- matrix printers just didn't cut it). Last I wanted 15 to 20 characters per second and readily available ribbons and print wheels.

I narrowed my search down to a Brother (I don't remember the model number) and the Juki 6100. I preferred the Juki for several reasons: It was a little faster, a little cheaper and it used IBM Selectric ribbons (at less than $1 each and available in many colors, I could just about pay for the DEC daisy-wheel with my savings).

There still remained one big question. Would one or both of these printers work with the Rainbow? I had some people tell me it couldn't be done, but they didn't know why. Others told me it couldn't be done because of hardware problems. And, still others told me it couldn't be done because of software problems. Then I ran into the optimists, who said it could be done, but they had no idea how to do it.

I knew I could save over $100 by mail ordering either of the printers, but I felt it was worth the $100 to buy from a local store that could set up one of the printers with my Rainbow. I went to a computer store that sold Brother printers, Juki printers and DEC Rainbows. (Remember when you could get the Rainbow from someone other than DEC?) I told their Rainbow "specialist" he had sold a printer if he could tell me how to hook it up to the Rainbow.

After weeks of being told he was sure it could be done but he "had to do a little more checking," I took a different approach. I wrote directly to Juki. I came right out and told them I was impressed with their printer and would buy one if they could tell me how to hook it up to a Rainbow. I also asked for an explanation if it couldn't be done.

GRAPHICS

lab, available at home, or when the latest graphics hard-
ware arrives by truck.

The protocols examined are:

CGM character encoding
CGM clear text encoding
GKS Metafiles (GKSM)
PostScript™
Hewlett Packard Graphics Language (HPGL™)
ReGIS
TEKTRONIX 4014 ™

Each protocol is a discrete method of storing pictures, and
each can be used for:

long—term storage
transporting between computers
transporting between operating systems
transporting from one location to another
transporting from one application to another

To switch between protocols, the Digital Equipment Cor-
poration VAX™ GKS implementation of the GKS stan-
dard provides two logical names. One logical name
(GKS$WSTYPE) tells VAX GKS which protocol to use. A
second logical name (GKS$CONID) gives VAX GKS the
name of the output file or device. The user simply redefines
the logical names and re—runs the application program that
uses VAX GKS subroutines.

Following is a brief description of each protocol.

o Computer Graphics Metafile (CGM) is a standard proto-
col for storing picture information in a data file. Three
different formats are provided for storing pictures: Stor-
ing them in the least amount of space (character encod-
ing), storing them quickly (binary encoding), and storing
them in a form that is easily readable (clear text).

o VAX GKS provides the CGM character encoding and
the CGM clear text encoding as two of the many pro-
tocols that are available.

o GKS Metafiles (GKSM) are defined by the ANS/ISO
GKS standard as a storage method for long—term filing
of graphical information. It is most similar to the CGM
clear text encoding because it is readable without being
decoded.

o PostScript is best suited to printing formatted text and
graphics. It is a favorite in industry for laser printing.

o Hewlett Packard Graphics Language (HPGL) is a
mnemonic graphics language used for plotting. The in-
struction's mnemonic is suggestive of its role. For ex-
ample, PU is used to pick up the pen from the drawing
surface, and SP is used to select a pen.

o The Remote Graphics Instruction Set (ReGIS) is a
graphics descriptor protocol for defining a graphics im-
age.

™ PostScript is a registered trademark of Adobe Systems, Inc.
™ HPGL is a registered trademark of Hewlett Packard.
™ TEKTRONIX is a registered trademark of TEKTRONIX, Inc.
™ VAX is a registered trademark of Digital Equipment Corporation

o TEKTRONIX 4014 protocol is completely encoded.

In order to compare the protocols, seven GKS programs
were run on each of the seven protocols. The files of output
were stored and their sizes tabulated (Table 1. In the first
fours tests, a single polyline, polymarker, text, or fill area
primitive was repeated 1000 times. The remaining three
tests were short GKS applications which mix output in a
typical fashion. Below is a sample of the GKS program
used. Only one of the four primitives was used in the loop.

```
        REAL  X_ARRAY( 3 ),  Y_ARRAY( 3 )
        DATA  X_ARRAY /0.2,  0.7,  0.4/
        DATA  Y_ARRAY /0.7,  0.5,  0.3/

        CALL  GKS$OPEN_GKS ( 'SYS$ERROR:' )
        CALL  GKS$OPEN_WS ( 1, 0, 0 )
        CALL  GKS$ACTIVATE_WS ( 1 )

        DO I = 1, 1000, 1
            CALL  GKS$POLYLINE( 3, X_ARRAY, Y_ARRAY )
            {or}
C           Use the "dot" style polymarker.
            CALL  GKS$SET_PMARK_TYPE( 1 )
            CALL  GKS$POLYMARKER( 3, X_ARRAY, Y_ARRAY )
                       {or}
            CALL  GKS$TEXT( 0.5, 0.5, 'Sample String' )
                       {or}
C              Use "solid" filled areas.
            CALL  GKS$SET_FILL_INT_STYLE( 1 )
            CALL  GKS$FILL_AREA( 3, X_ARRAY, Y_ARRAY )
        END DO

        CALL  GKS$DEACTIVATE_WS ( 1 )
        CALL  GKS$CLOSE_WS ( 1 )
        CALL  GKS$CLOSE_GKS ()
        END
```

NOTES:

1. The marker style is a dot of the smallest size
   the workstation can produce.

2. Filling an area was done using solid filled ar-
   eas instead of hollow, pattern, or hatched.

3. The TEKTRONIX 4014 and HPGL fill areas
   are larger because they simulate solid filled
   areas by drawing many lines to cover the re-
   gion.

4. The protocols were stored in black and white.

Table 2 is a summary of running three application pro-
grams with each of the protocols presented above. BUD-
GET is a barchart using hatched bars. REVENUE is a
stacked barchart. TRAJ is a line graph of some trajectory
equations.

For each protocol, the summary shown in Table 3 was
derived by adding the blocks used by the three application
programs to the blocks used by the four primitives repeated
100 times. This comparison uses a variety of test programs
and application programs that show some of the advantages
of using each protocol, but the test base is limited, and may
be biased in the direction of one protocol more than another.

Report on the October 1987, PHIGS+ Meeting

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A PHIGS+ meeting was held on October 26–27 at Rensselaer Polytechnic Institute in Troy, New York. The meeting was attended by about 25 individuals from about 20 organizations. New at this meeting were representatives from GE–CRD, GE–SSD, Northrop, and Pixel Machines.

This was a very productive meeting, which was primarily concerned with processing comments from the public review of PHIGS+ V2.0. It is hoped this will be the last PHIGS+ meeting.

Comment Processing

Comments were submitted by Digital Equipment Corporation, X3D–PEX, Sun, HP, Template, Puk Consulting Services, RPI, SDRC, Austrian Research Centre, and CWI (Netherlands). The meeting broke into working groups to prepare issues. As a result of the issues processing, the following changes have been made to PHIGS+:

Conditional Traversal

Conditional execution was changed from an IF–THEN–ELSE form to simply an IF–THEN form.

Color Specification

Probably the most significant change related to how color is specified in PHIGS+. Previously, PHIGS+ added the notion of direct color to PHIGS' indirect color specification. However, direct and indirect color were not uniformly applicable. At the meeting, a proposal submitted by Digital was adopted. This proposal unifies the method by which color is specified.

Briefly, any color can be specified as either an indirect color (index into the workstation color table) or direct color (color model plus value in color space). A color is specified as a (type, value) pair where the type may be one of INDEXED, RGB, CIE, etc., and the value matches the type. Indirect colors are dereferenced at traversal time before the color is passed to the rendering pipeline. This unification applies to all colors: individual colors (polyline

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color, specular color), bound colors (per vertex colors), and bundled colors (color in polyline bundle, light source color).

Pseudo Color

A new color approximation method, PSEUDO COLOR 3, was added. The specification of a color approximation table entry of this type consists of a color model and three arrays of real values (the arrays may be of different lengths). When selected, the color emerging from the rendering pipeline is first converted to the color model specified for the approximation method. Then each component of the resultant color is multiplied by the length of the one of the arrays and used as an index into that array. The result is a triple of real values which are interpreted as a color in the specified color model. This color is then realized as accurately as possible by the workstation.

Transparency

Several comments urged that the transparency coefficient either be removed or specified more fully. It was resolved to provide some minimal additional specification. Basically, the transparency coefficient is viewed as being included to support simple (e.g. screendoor) transparency and translucency. Some additional wording regarding the interaction of transparency and other aspects of PHIGS+ (HLHSR, picking, etc.) will be added.

Rendering Color Model

A new rendering color model, "workstation dependent", was added. When this color model is selected, the workstation may perform interpolation in any color model. This is the only required rendering color model. The SET RENDERING COLOR MODEL function was not otherwise changed.

Bound Data Specification

The PHIGS+ primitives–with–data functions have flag parameters that indicate which additional data is being specified. The form of these flags was changed so that they can be implemented as bit masks, thus avoiding a combinatorial explosion of value names.

workstation. COPY_SEG_TO_WS works in a similar manner.

As far as we know a linetype of 3 works on the VT125. The other problem with using GKS$SET_PLINE_INDEX to 12 probably has to do with not setting the attribute source flags to use bundled attributes. Please check out the function GKS$SET_ASF.

I will be writing an application using "C" and GKS. "C" does not understand the "BY REFERENCE" construct for passing variables to the GKS Functions. To get around this I assume I will have to put the values I need into a variable and pass the variable by Value. I think this is a sloppy way to do this and would like to know if GKS comes with a Special Library for using the function calls from a "C" program.

You don't quite have to pass something by reference right in C. Pass by reference may also be read as pass by address. Thus to call GKS$Polyline, you would have something like the following:

```
        float x[100],y[100];
        int npts;

        /* INIT GKS etc */
        .
        .
        .
        npts = 20;
        /*
         * x and y need no offsets because
         * they are arrays which are merely
         * adress references without their
         * []
         */
        GKS$POLYLINE(&npts,x,y);
        /*
         * alternately,
         * (this ONLY works in VAX C, many
         * C compilers don't allow it)
         */
        GKS$POLYLINE(&20,x,y);
```

The reason GKS$ calls require this is because they are a binding of the GKS functions to the VAX calling standard which does not allow pass by value. GKS was (and is) implemented in C and it would have been far easier to do as you suggest than to do the right thing for the multitude of other languages.

At present a binding of GKS to the C language is in review by the ANS committee. Given VAX C is now a very popular language (second only to FORTRAN I believe) we are investigating a C binding for a future version of VAX GKS. This would be MUCH different from the GKS$ binding that now exists, but would be source code portable between various GKS implementations (something GKS$ most certainly is NOT).

I am writing a graphics editor using VAX GKS for VAXstations. I would like to know how to save the screen to a disk file so that it can be reloaded for further editing. Are GKS (or UIS) calls available to do this?

In order to save/restore a graphics 'picture', just create all the primitives in segments and also have WISS active at the time of creation. Then when you want to save the picture, use 'assoc segment with workstation', 'copy segment', or 'insert segment' to a metafile workstation.

I'm having some trouble using GKS$INQ_TEXT_EXTENT with GKS metafiles. Apparently, this function is not supported on metafiles (workstation category must be OUTPUT or OUTIN). I'm a little confused. If I am using a device independent font, why shouldn't I be able to inquire the text extent? Or is this behavior specified by the GKS standard?

Can anyone suggest any workaround? I might be able to cook up a replacement using the GKS Inquire Extent of a GDP in combination with a Restricted Text GDP (and specify a huge extent).

Well, First of all the standard says that function should only work on device types out and outin. I think you are correct in that an extent could be calculated for the GKS stroke (hershy) fonts. However the standard does not have the idea of a device independent font (even stroke precision could be allowably device dependent to some degree). Thus I think that the standard disallowed this because when you write out a metafile, there is not even a guarantee that the same GKS implementation will interpret it (and in fact one of the intents of metafiles is for inter-implementation portability).

I am working with cell arrays in GKS v3.0. The reference manual, Vol II, page K-10, talks about cell array restrictions. There it says that if you define a cell array whose cells do not form a one-to-one correspondence with the number of pixels ... it causes performance degradation ...

I followed the method to take care of this and it greatly increased performance, but now it puts it out all at once rather than a raster line at a time. Is there a way in GKS to do it a raster line at a time and still avoid the GKS interpolation that degrades performance? I can do it from UIS.

Also, when it puts everything out all at once, it takes just about one minute to do so. It does something for about 50 seconds and then it takes 10 seconds to put it out. What is happening in that 50 seconds.

I think that the 50 seconds is spent converting the GKS defined cellarray to a UIS defined image. GKS uses 32 bits per cell, UIS uses 8 bits, so there is alot of memory copying going on. If the orientation of the data (as specified by the 2 corners of the cellarray call) is not right, the data will also have to be copied to the UIS format.

Look at the IMAGE ARRAY GDP which should give better performance if the data is specified in 8 bits per cell. The GDP appendix should have all the details.

To have GKS put the cellarray out 1 line at a time, just call the cellarray function once for each line. This will probably take longer overall, but there shouldn't be 50 seconds with nothing on the screen.

HARD

NEWS

HMS

VMS/MicroVMS XADRIVER Bug Fixes

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The U.S. Geological Survey recently modified XADRIVER, the VMS/MicroVMS device driver for the UNIBUS DR11-W and Q-Bus DRV11-WA. In the course of analyzing the driver for performance enhancements, several errors were discovered in the X-6 version distributed with VMS/MicroVMS V4.5. The bug fixes are described in detail here; a follow-up article will describe the complete set of performance enhancements made to the driver.

1 XADRIVER Bug Fixes

The reader may wish to refer to the source code for the driver, SYS$EXAMPLES:XADRIVER.MAR, and the update text file at the end of this article, XADRIVER_BUGS.SLP.

1.1 Correct driver operation for invalid UCB$B_DEVTYPE

The original driver uses the value in the UCB device type field (UCB$B_DEVTYPE) for proper code path selection. Since IO$_SETCHAR calls modify UCB$B_DEVTYPE, unpredictable results can occur if an incorrect or illegal value is supplied. The driver was modified to use a single status bit in the low-order byte of the second device-dependent characteristics longword (UCB$L_DEVDEPND2) for the code selection, both to shorten the instruction sequence and to remove the dependence for correct operation of the driver on a field in the UCB which can be modified by a user program. (This byte is defined symbolically as UCB$B_DRV11WA.) Bit 0 of UCB$B_DRV11WA is used with the BLBC and BLBS instructions (Branch on Low Bit Clear/Set) as a replacement for the original CMPB...BEQL two-instruction sequences (Compare Byte...Branch on Equal).

1.2 Correctly save previous map register contents

The original driver contains a typographical error that results in incorrect values stored in the error logging packet for the final and previous I/O mapping register contents (UCB$L_XA_FMPR and UCB$L_XA_PMPR) when more than one register is allocated. (The previous I/O mapping register contents are stored in the field for the final I/O mapping register, and the field for the previous I/O mapping register contains zero.) The faulty instruction was modified to reference UCB$L_XA_PMPR instead of UCB$L_XA_FMPR.

1.3 Correctly transfer byte-aligned buffers

The original driver will not properly handle all data transfers that are byte-aligned in memory. Byte-aligned buffers are rejected for block-mode transfers when the direct data path has been selected by the Function Decision Table (FDT) routine handling reads and writes. The original driver incorrectly handles the following cases:

1. For block-mode transfers:

   o The data path selection bit (XA$M_DATAPATH) in the device-dependent characteristics (UCB$L_DEVDEPEND) is tested to determine which data path has been selected. However, since the test is performed in an FDT routine, there is no guarantee that the same data path will be selected when the transfer is actually performed (e.g., an IO$_SETCHAR that is still in the device I/O request queue could change the data path selection.) This test must be properly serialized with other requests that have the potential for modifying the data path selection.

   o The XA$M_DATAPATH bit is not a reliable indicator of the current data path selection. XA$M_DATAPATH is modified by every IO$_SETMODE and IO$_SETCHAR call, whether or not the IO$M_DATAPATH modifier has been specified. Without the IO$M_DATAPATH modifier, XA$M_DATAPATH will have no effect on the selection of the data path, but the driver makes no effort to preserve this bit in UCB$L_DEVDEPEND when the IO$M_DATAPATH modifier is not specified.

   o The bus adapter may have no buffered data paths, as is the case for the Q-Bus adapter on the MicroVAX II. The documentation correctly states that requests for the buffered data path are ignored on such processors, but it fails to reject byte-aligned buffers in that case.

2. For word-mode transfers:

   o The FDT routine allows byte-aligned buffers because the driver performs word-mode transfers to and from memory itself. When updating the user buffer pointers in the driver routines MOVEFRUSER and MOVETOUSER, the original driver uses an incorrect test when the word being transferred straddles a page boundary. The result is an incorrect data transfer at best, and corrupted memory at worst.

the DRV11-WA is in 18-bit mode, and the driver BUGCHECKs, as is done for a MicroVAX I.

2 Update Procedure

The following DCL command procedure, XADRIVER_BUGS.SLP, includes an in-line driver source code update file for the SUMSLP batch editor that generates a new version of XADRIVER.MAR in the default directory. Version X-6 of XADRIVER.MAR (supplied in SYS$EXAMPLES with VAX/VMS version 4.5) is required.

Standard Macro-32 syntax is used (i.e., fields are separated by tabs).

<div align="center">Disclaimer</div>

Although this program has been tested by the Geological Survey, United States Department of the Interior, no warranty, expressed or implied, is made by the Geological Survey as to the accuracy and functioning of the program and related program material nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the Geological Survey in connection therewith.

<div align="center">NOTE</div>

> To fit all the text on the page, the first two tab stops in the listing below are 7 spaces each, instead of the normal 8 spaces. When the text is entered at a terminal with standard DEC tabs stops, there will be some visual differences from what is printed below.

<div align="center">**XADRIVER_BUGS.SLP**</div>

```
$EDIT/SUM /OUTPUT=XADRIVER.MAR /LIST=XADRIVER.SUM -
        SYS$EXAMPLES:XADRIVER.MAR/UPDATE=SYS$INPUT
\
-2,2
        .IDENT 'X-6B'
-57
;       X-6B    LMB002          L. M. Baker     27-Aug-1987
;               Preserve data path selection when the driver is
;                 reloaded (convert controller initialization routine
;                 to a unit initialization).
;               Correctly call device reset routine from controller/
;                 unit initialization routine.
;               Change instructions in controller/unit initialization
;                 that access the I/O page to use word context instead
;                 of longword context.
```

```
;               Validate 22-bit mode DRV11-WA if MicroVAX II.
;
;       X-6A    LMB001          L. M. Baker     25-Aug-1987
;               Maintain correct driver operation when IO$_SETCHAR
;                 modifies UCB$B_DEVTYPE (define bit 0 of
;                 UCB$L_DEVDEPND2 =0 if DR11-W, =1 if DRV11-WA;
;                 replace CMPB...BEQL instructions with BLBC or
;                 BLBS).
;               Correctly save previous map register contents in
;                 error log packet.
;               Correctly transfer byte-aligned buffers.
;               Restart transfer if power fails during device setup.
;
%
-186,,/; LMB001/

; Fields in second device-dependent status word in UCB
;       (UCB$L_DEVDEPND2)
UCB$B_DRV11WA = UCB$L_DEVDEPND2          ; DRV11-WA flag (=1, DR11-W =0)
-279,280,,/; LMB002/
        DPT_STORE CRB,CRB$L_INTD+VEC$L_UNITINIT,- ; Address of unit
                D,XA_UNIT_INIT       ; initialization routine
-310,310,,/; LMB002/
        .SBTTL XA_UNIT_INIT, Unit initialization
-313,314,,/; LMB002/
; XA_UNIT_INIT is called when driver is loaded, system is booted,
; or power failure recovery.
-326,328,,/; LMB002/
;       R5 = address of UCB
-338,341,,/; LMB002/
XA_UNIT_INIT:

        MOVL    R8,-(SP)                ; Save R8
        MOVL    UCB$L_CRB(R5),R8        ; Address of CRB
        MOVL    CRB$L_INTD+VEC$L_IDB(R8),R0 ; Address of IDB
        MOVL    R5,IDB$L_OWNER(R0)      ; Permanent controller owner
        MOVL    R5,R0                   ; Use R0 for address of UCB
-343,,/; LMB001/
        CLRB    UCB$B_DRV11WA(R0)       ; Assume DR11-W (clear bit 0)
-350,,/; LMB001/
        INCB    UCB$B_DRV11WA(R0)       ; Bit 0 =1 for DRV11-WA
-,,/; LMB002/

; Verify DRV11-WA is in 22-bit mode

        CLRW    XA_BAR(R4)              ; Clear low order address bits
        CLRW    XA_BAE(R4)              ; Clear high order address bits
        BISW    #XA_CSR$M_XBA,XA_CSR(R4); Set R-only addr bits in CSR
        BITW    #XA_CSR$M_XBA,XA_CSR(R4); If clear, DRV11-WA is 22-bit
        BNEQ    3$                      ; If set, DRV11-WA is 18-bit
-359,360,,/; LMB002/
        BITW    #XA_CSR$M_IE,XA_CSR(R4) ; IE already set?
        BNEQ    9$                      ; If NE, yes
-373,,/; LMB002/
        MOVL    (SP)+,R8                ; Restore R8
```
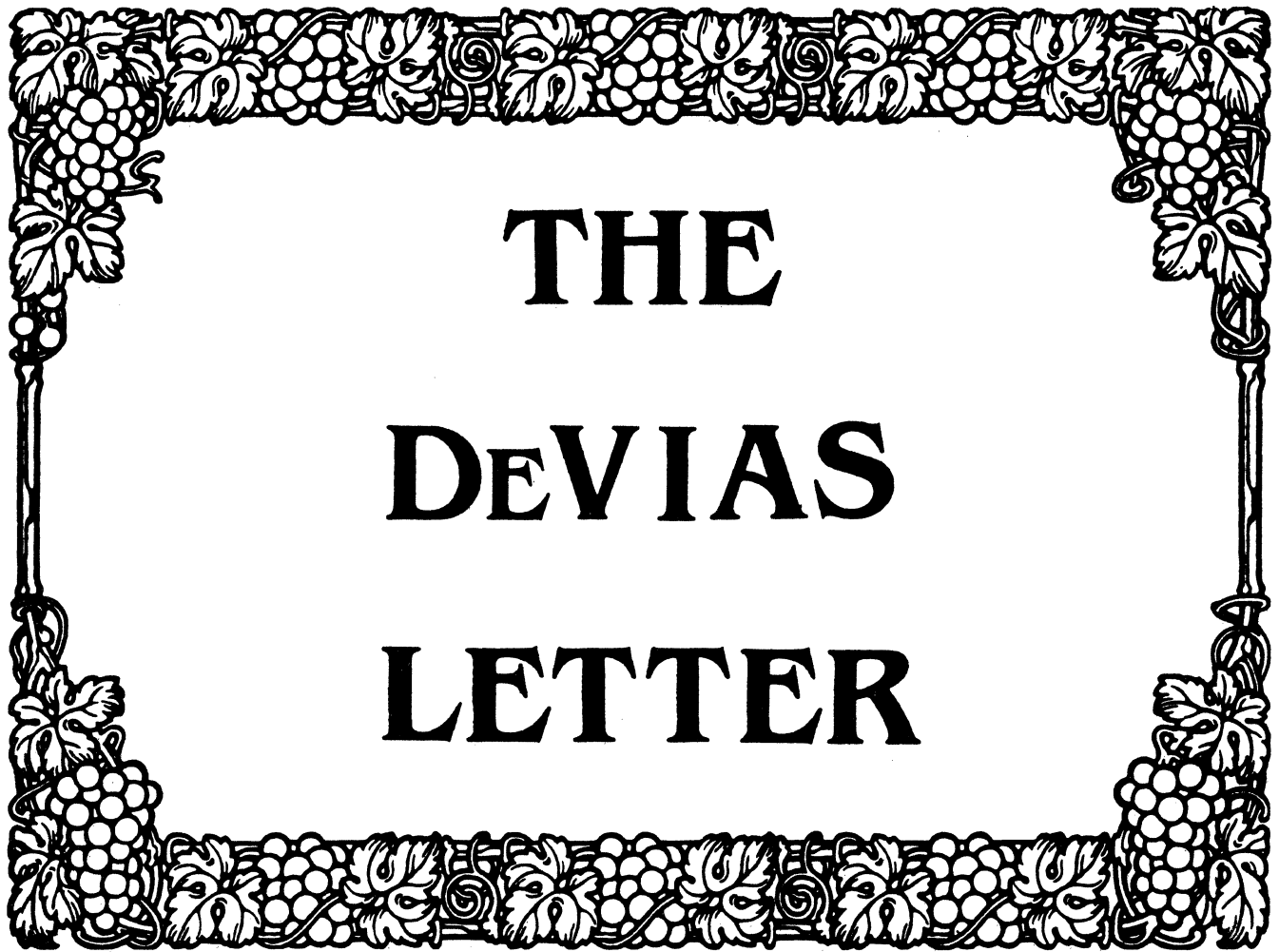
THE DeVIAS LETTER

Letter From the Chair

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Once again, the shifting sands of gainful employment have caught up with your SIG leadership. Mike Robitaille, our previous chairman, has been assigned to new duties within his company and can no longer devote the necessary time to being IAS SIG Chair. In early October, he requested that the SIG Steering Committee select a new SIG Chair.

I am honored that the Steering Committee has selected me for this position. This SIG, as well as other 16-bit SIGs, is seeing a reduction in our active membership. This means that I have a very difficult job ahead of me as I not only learn how to deal with the DECUS organization, but try to keep our SIG alive and healthy.

In order to accomplish the many tasks, I need your help. Most importantly, I need to hear from as many of you as possible. I cannot lead the SIG if I do not know where the membership (that's YOU) want it to go. There are over 5500 people subscribing to this newsletter, but I have no idea how many are active IAS users. I would like each and every one of you to take the time RIGHT NOW to either write or telephone me and tell me:

o   What IAS does for you that other operating systems cannot do (Why are you using IAS?).

o   What IAS does NOT do that you would like it to do.

o   What you would like DECUS (The IAS SIG) to help you with.

o   What you might be able to offer to DECUS (your fellow IAS users).

o   Anything else that comes to mind re IAS, DEC, DECUS or the SIG.

I know that many of you are in positions where you cannot come to DECUS symposia or otherwise participate. This newsletter may be your only contact with the rest of the DECUS membership. However, if you let your leadership know your needs, we can provide you with the support you desire.

After all of that, I suppose that I should tell you something about your new SIG Chair. I was introduced to DEC equipment with the announcement of the PDP-8 in May, 1965. Its memory (12-bit words) was *only* $1000/K and I soon had the radical idea that, if I became very wealthy, owning a computer was a possibility. Little did I know!

In 1972, my employer plopped a PDP-11 and manual on my desk and told me to start writing communications software for it. No disks, no tapes, no CRTs, no printer or card reader. Just an ASR-33 and endless piles of paper tape. I was in love!

In 1976, I graduated to a PDP-11/45 and a brand new copy of RSX-11D, version 6A. With the help of a real veteran from UCLA (he has used version 4A and still had the scars), we soon(?) had a running system. The most important thing he did for us was to give us all the DECUS goodies and make sure we all joined. He made sure we all learned TECO and never told us about EDI.

The passage of time has eased the painful memories of such things as the volumes of patches that had to be applied, the endless SYSGENs and attendant lack of sleep. What I remember best is my first DECUS symposium (Fall 1976 in Las Vegas). Here were hundreds of people that were eager to share their experiences and help me with my problems. It was also where I learned that IAS was supposed to be replacing RSX-11D.

When the 11/70 rolled in the door the following year, we felt like we were in heaven! Version 6.2 of 11-D was just out and everything was going smoothly. The operating system did everything that we needed -- much more than that upstart, RSX-11M! After all, RSX-11M didn't even have type-ahead!

The merging of RSX-11D and IAS in version 3.0 provided new mysteries to unravel. I showed up at the Fall 1979 symposium in San Diego with a dozen unanswered SPRs to embarass DEC with. They took careful notes and within a month or so I had answers to all of them. I had learned the power of DECUS!

As IAS has progressed from version 3.0 to 3.1 and now 3.2, my work has come to include RSX-11M, RSX-11M-Plus (a.k.a. IAS-Minus) and VMS. Often, I encounter people who praise some new feature of their favorite operating system. They don't realize that these are features that IAS users have had for years.

Today, I work with both PDP-11s and VAXen. My business is the design and implementation of real-time and related systems. My systems include three PDP-11s and a VAXstation, plus the most bizzare collection of DEC hardware outside a museum. Even the local DEC office uses my systems for media conversions.

The Program of the Month Club

At our institution we do midnight backups from disk to disk. The proceedure is simple: Try to mount the disk on drive DP2: using the system disk or users disk labels. If the mount succeds, the disk on DP2 is a backup disk so backup from the appropriate disk to DP2:

With the advent of BRU, 3600 foot tapes, and our Cipher drive with 3200 BPI option, we now have the capability of putting an entire 67 M-byte disk on ONE tape. (Obviously possible also with 6250BPI drives.) It was not as easy, however, to do the same tests as we did for the disk to disk backup routine.

1. If you mount the backup tape as an ansii volume, you get always get a volume name of "BACKUP".

2. You can't BRU to an ANSII tape, it must be foreign.

3. To add insult to injury, when you dismount the ANSII tape, the $%^&*# system rewinds the tape and turns the drive off-line.

This month's BASIC program solves both problems. Using REESE BASIC routines to spawn a task and to issue any system directive, BRUTAPE.BAS does the following:

1. Assigns lun 7 to MM0:

2. Mounts the Tape /CHA=[FOR,ATCH]

3. Does a read characteristics to see if the tape is ready.

4. Does reads to skip the lable block and noboot block.

5. Reads the HDR1 block, which contains the backupset name.

6. Rewinds the tape.

7. Checks for a name match and spawns BRU accordingly.

8. Rewinds the tape again.

9. Dismounts MM0:

The result is a very simple backup proceedure. Set the tape up in the drive at load point, ready, high density mode, and GO HOME. In the morning your backup is ready.

```
010 ! Read a bru tape lable and do backup if tape is there
020 dim dp%(12),bu&(80),ds%(2),na$[16]v,nb$[6](4),dv$[4](4),cm$[80]v
030 load "LB:[1,202]DIRECT.ATK"
035 ! alun$ 7,mm,0
040 dp%(0)=7+4*256 : dp%(1)= 7 : dp%(2)=oct("46515") : dp%(3)=0
050 st%=0
060 call "DIRECT"(dp%,st%)
065 b=0 : call "SPAWNB"("MOU MM:/CHA=[FOR,ATCH]",b)
070 if b<>1 then goto 1000
100 dp%(0)=3+6*256        ! Qiow$
110 dp%(1)=oct("2520")    ! read tape characteristics
120 dp%(2)=7              ! lun
130 dp%(3)=7+50*256       ! ev flag & pri
140 call "GETADR"(ds%(0),dp%(4)) ! io stat block
150 dp%(5)=0
160 call "DIRECT"(dp%,st%)
170 if ds%(1)<> 8196 then goto 1000 ! 20040oct= 9-tr, ready bits
200 dp%(0)=3+8*256        ! Qiow$
210 dp%(1)=oct("1000")    ! read logical block
220 dp%(2)=7              ! lun
230 dp%(3)=7+50*256       ! ev flag & pri
240 call "GETADR"(ds%(0),dp%(4)) ! io stat block
250 dp%(5)=0
260 call "GETADR"(bu&(0),dp%(6))
270 dp%(7)=80
280 call "DIRECT"(dp%,st%) ! read lable block
290 if ds%(0)<>1 then print "Read stat= ";oct$(ds%(0)) : goto 1000
300 na$="" : for i=0 to 15 : na$=na$+chr$(bu&(i)) : next i
310 call "DIRECT"(dp%,st%) ! skip noboot block
320 ! will get overrun error, ignore it
330 call "DIRECT"(dp%,st%) ! read hdr1 block
340 if ds%(0)<>1 then print "Read stat= ";oct$(ds%(0)) : goto 1000
350 na$="" : for i=4 to 9 : na$=na$+chr$(bu&(i)) : next i
360 print "HDR1 lable = ";na$
400 dp%(0)=3+6*256
410 dp%(1)=oct("2400")    ! IO.rew
420 dp%(2)=7              ! lun
430 dp%(3)=7+50*256       ! ev flag & pri
440 dp%(5)=0
450 call "DIRECT"(dp%,st%) ! rewind the tape
460 if ds%(0)<>1 then print "Rew. stat= ";oct$(ds%(0)) : goto 1000
500 print "        ";tim$()
510 nb$(1)="MRHV62" : dv$(1)="DP1:"
520 nb$(2)="IASUPD" : dv$(2)="DR1:"
530 nb$(3)="SYSTWO" : dv$(3)="DR2:"
540 nb$(4)="IASV32" : dv$(4)="DR3:"
550 b=0 : cm$=""
560 for i=1 to 4
570 if na$=nb$(i) then let cm$="BRU /REWIND/MOUNTED "+dv$(i)+" MM0:"
580 next i
590 print cm$
600 call "SPAWNB"(cm$,b)
610 print "        ";tim$()
620 call "DIRECT"(dp%,st%) ! rewind the tape the last time
1000 b=0 : call "SPAWNB"("DMO MM0:",b)
1010 exit
```

Leverage

Languages & Tools
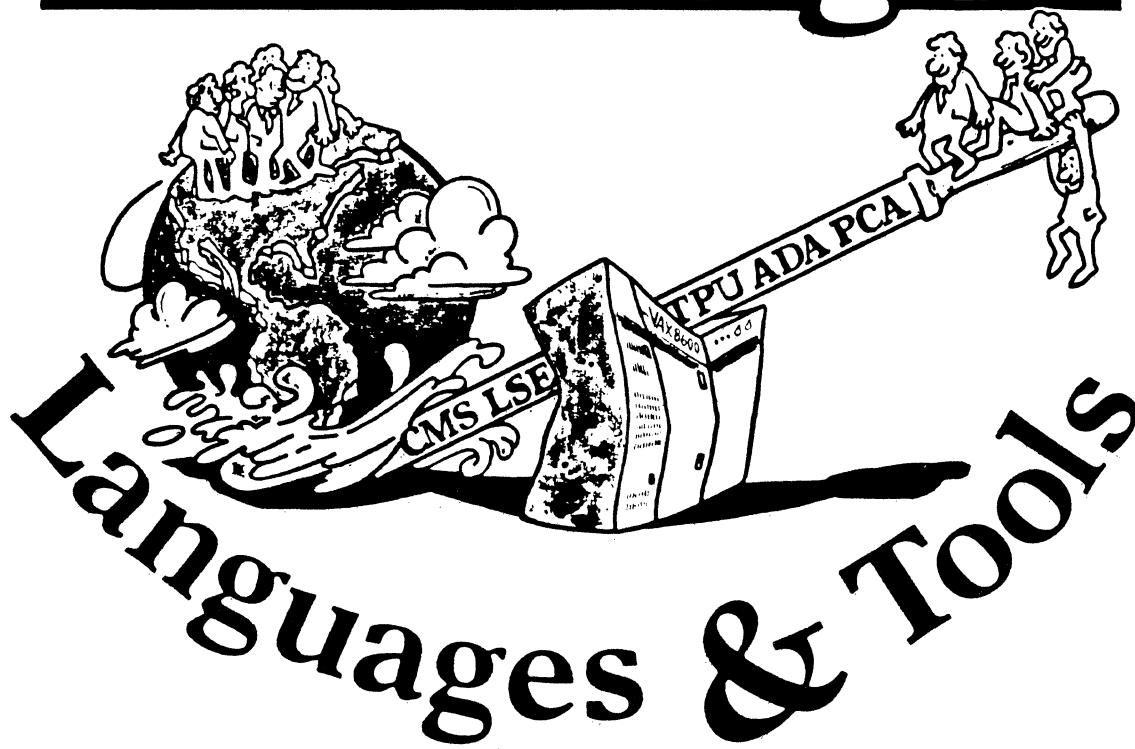
Bill Leroy, Editor

As I hope you noticed, we were missing from this area last month. The deadline came earlier than I planned, and my submission reached Al Folsom a day too late. Unfortunately, this months deadline also arrived too soon, and I had to call Al and tell him something was coming. I also did NOT receive anything to publish, so I am including a command file that Bill Tedeski of The Software House, Inc.'s Pittsburgh office generated to solve a problem we have.

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One of the many good things to do to make maintaining programs in COBOL (or any other language) easier is to have lots and lots of pre-written and debugged sub-routines. In fact, the more, the merrier. However, this means that if a sub-routine is enhanced, you have to recompile all the programs that use it. And if you don't get all of them, you get different answers from different parts of the same system. Of course, this doesn't mean that the users shouldn't get mad at us. After all, we're only human, right?

One way around this problem in VMS is to have all the sub-routines located in a shareable library. This actually improves system performance, as there are now smaller images stored on disk, and less time spent activating the image at run time. The trade-off is that every time the library grows, you have to re-link all your programs. The following discussion outlines some of the problems, what we did to fix them, and a command file we execute to do this for us.

Command procedure to build a COBOL sharable image
RTL_BUILD.COM

This command procedure was written to help maintain a sharable image of COBOL sub-routines, and eleviate the problems we had with maintaining this image.

The problems were:

1) additions to this image;

2) building of this image and of a test nonsharable object library -- at times this may happen several times a week (if not a day);

3) if the new image was larger than the old one, we needed to know immediately, so that we could relink the entire system.

The solution to the above was a command procedure to build the image and test that it was compatible to the image in the live system -- and to have a dummy sub-routine that that could be down-sized in order to minimize the number of times we have to relink the entire system.

To control the modules that are to be included in the image, we created a text file "RTL_BUILD.DAT" and inserted into it the names of all the COBOL sub-routines (making sure that all the sub-routines had the same

external name as the internal "program-id"). The command procedure starts by reading this file and verifying that all of the source files are present. If any are missing, the procedure will abort.

Then, a test program (RTLTEST.COB) is linked to the existing shareable image to set-up checking the new image after the build is completed. This program calls one of the sub-routines in the shareable image and exits. A MACRO program is created for a transfer vector table. As each routine in the image is compiled a transfer vector will be written out to this file. And finally, a new version of the nonsharable object library is created in the work directory.

For each module in the "RTL_BUILD.DAT" text file the following steps apply:

1) If the name is not preceded by an "&", a tranfer vector is written to the MACRO program. This allows modules to define globol symbols to be linked into the sharable image without a transfer vector entry.

2) It is checked to see if the modified date is greater than the date on the object for this module. If so, the sub-routine will be recompiled.

3) The object module is inserted in the nonshareable object library.

After all of the modules are compiled, the transfer vector table MACRO routine is compiled and all of the modules are linked into the shareable image.

The test program is executed, and if there are no errors, the new shareable image is copied to its permanent location and installed to replace the image that is currently being used.

```
identification division.
program-id. ZSIZE.
*
*    To put FILLER into the shareable run-time executable.
*
data division.
working-storage section.
01   FILLER-TABLE value all "X".
     02   occurs 19 times picture X(512).
*    02   occurs 20 times picture X(512).
procedure division.
Z-RTN section.
Z-A.
     move low-values to FILLER-TABLE.
     exit program.
```

```
!    RTLBUILD.DAT
!    Add new modules to the end of this file.
!    Do not change order of modules in this file.
!    Do not delete modules from this file.
!    "!" in column 1 is a comment line.
!    "&" in column 1 means do not create a transfer vector entry.
!
ACCEPTREPLY.SUB
DISKERROR.SUB
&TSHDEF.MAR
XPRINT.SUB
```

```
$ good_test:
$    say "       Source for all routines found - count = ''testcount'"
$
$!--------------------------------------------------------------------
$! Will compile and link a program using the old shareable image.
$! This program will be used to verify that old programs can run
$! with the new image built by this procedure.
$!--------------------------------------------------------------------
$
$    say f$fao("!_will compile and link test program            !%D",0)
$!
$    file_spec =f$search("rtl_test.obj")
$    if "''file_spec'" .eqs. "" then -
         cobol rtl_test.cob
$!
$    link rtl_test/nouserlib, sys$share:'tshshr/library
$!
$ skip_test:
$!--------------------------------------------------------------------
$! This will create a new 'TRANS_VECTORS.MAR file and write the first
$! part of the routine.
$!--------------------------------------------------------------------
$!
$    say f$fao("!_will create ''trans_vectors'",0)
$!
$    open/write vector_out 'trans_vectors
$!
$    write vector_out ".TITLE           ''TRANS_VECTORS'"
$    write vector_out ".IDENT           /1-001/   ''F$FAO("; !%D",0)'"
$    write vector_out " "
$    options ="$$$$''TRANS_VECTORS' ,EXE,NOWRT,SHR,GBL,PIC"
$    write vector_out ".PSECT          ''options'"
$    write vector_out " "
$
$!--------------------------------------------------------------------
$! This will compile all routines that are listed in 'module_file
$! and write the transfer vector out to 'trans_vectors.mar
$!--------------------------------------------------------------------
$
$    say f$fao("!_will build all subroutines for TSHRTL          !%D",0)
$    say f$fao("!_   and create new object library                ",0)
$!
$    open/read module_in 'module_file
$    if "sys$share:''f$search(tshshr)'" .eqs. "" then -
         library/create/object 'cbllib
$!
$ compile_loop:
$!
$    vector = "YES"
$    read/end=end_loop module_in  module_name
$    if "''f$extract(0,1,module_name)'" .eqs. "!" then goto compile_loop
$    if "''f$extract(0,1,module_name)'" .eqs. "&" then gosub  novector
$    file_spec = f$search(module_name)
$    if "''file_spec'" .eqs. "" then goto file_not_found
$    module =F$PARSE("''FILE_SPEC'",,,"NAME")
$    extention =F$PARSE("''FILE_SPEC'",,,"TYPE")
```

```
$!
$    link_list = link_list + "," + module
$!--------------------------------------------------------------------
$!    write transfer vector for module
$!--------------------------------------------------------------------
$    if "''vector'" .eqs. "NO" then goto vector_skip
$    write vector_out "                  .TRANSFER    ''MODULE'"
$    write vector_out "                  .MASK        ''MODULE'"
$    write vector_out "                  JMP          L''MODULE'+2"
$
$ vector_skip:
$!--------------------------------------------------------------------
$!    Check if .OBJ file has later date than source.
$!    If so, do not recompile.
$!--------------------------------------------------------------------
$    obj_spec =f$search("''module'.obj")
$    if obj_spec .eqs. "" then goto skip_obj_test
$    object_date = f$file_attributes("''module'.obj","RDT")
$    object_date = f$cvtime(object_date,"COMPARISON")
$    siz = f$file_attributes("''module'.obj","EOF")
$    if siz .eq. 0 then goto skip_obj_test
$    source_date = f$file_attributes(file_spec,"RDT")
$    source_date = f$cvtime(source_date,"COMPARISON")
$!
$    if source_date .lts. object_date then goto compile_loop
$!
$ skip_obj_test:
$!
$    notest = 0
$!--------------------------------------------------------------------
$!    compile module
$!--------------------------------------------------------------------
$    if "''extention'" .eqs. ".COB" then gosub cobol_compile
$    if "''extention'" .eqs. ".SUB" then gosub cobol_compile
$    if "''extention'" .eqs. ".BAS" then gosub basic_compile
$    if "''extention'" .eqs. ".MAR" then gosub macro_compile
$!
$    if notest .eq. 0 then goto compile_error
$!
$ in_library:
$!--------------------------------------------------------------------
$!    insert object in library
$!--------------------------------------------------------------------
$    obj_spec = f$search("''module'.obj")
$    library/replace  'cbllib 'obj_spec
$    goto compile_loop
$!
$ compile_error:
$!
$    say "    invalid extention on module ''module_name'"
$    say "         module not compiled"
$    goto compile_loop
$!
$ file_not_found:
$    say "    module ''module_name' was not found not compiled"
$    goto compile_loop
```

TECO Initialization for RSTS and VMS

Kelvin Smith, Financial Computer Systems, Inc., Stamford, Connecticut

Note: This article is specifically oriented to RSTS and VMS systems; much of it may apply to other TECO versions, particularly on other PDP-11 operating systems, but I can make no assurances since I do not have access to such systems. Since I no longer have access to a VMS system either, I cannot assure the accuracy of all VMS information, although it is based on previous VMS use and statements in DEC's TECO User's Guide.

The start of a TECO editing session is for many people shrouded in mystery. It may come as a surprise to many readers, for example, that the CCL (under RSTS) or DCL (under VMS) command to start TECO is handled by a TECO program, rather than the MACRO-written TECO run-time system or image. Decoding the command, with the associated memory logical or file and any switches, is the work of a magical TECO macro called TECO.TEC. (Exception: The TECO run-time system directly handles the /B, /B+, and /B2 filespec switches.) Under RSTS, the macro resides in a separate file in account TECO$: ([1,2] before V9.0). Under VMS, these operations are stored in the TECO image, but are handled by the same TECO macro.

TECO.TEC - The system initializer

An "expanded" copy (commented and reasonably readable, as TECO macros go) is available on RSTS distribution media, under the name TECO.TES (I don't know if other operating system kits include it). For those unable or unwilling to peruse the macro, here is some information you may find useful.

I am describing here the TECO.TEC which DEC distributes; some systems have versions made to fit their own needs, which means that some of the features described may not work on your system (for example, some installations delete references to TECO.INI and some of the checking for switches in order to speed up initialization a bit). For this article, I will refer to the system's initializer under both RSTS and VMS as TECO.TEC.

When TECO starts, the entire command line is made accessible to the user, as well as to the initializer. Under RSTS, the CCL command is placed immediately in the buffer. Remember that RSTS expands any CCL command to its full length: The abbreviation "TE" which is allowed on most systems becomes a full "TECO". Under VMS, TECO initially puts the command line (expanded as appropriate under DCL) in q-register Z, but it is moved from there to the buffer before TECO.TEC executes the user's initialization routines.

TECO.INI - The private initializer

RSTS TECO allows any user to operate on the CCL command in the same way that TECO.TEC does by use of a file in your own account named TECO.INI, which is executed every time you start TECO (unless you specifically disable it with the switch /NOINI). VMS has three options for start-up. Two are of the same form as the TECO.INI file: giving either a short list of commands or a file to execute. In either case, use the logical TEC$INIT, such as "ASSIGN "94EV" TEC$INIT" to automatically print out the current line before each prompt with a caret marking the pointer position, or "ASSIGN $TECO.INI TEC$INIT" to execute a file of TECO instructions. (Any file name is legal; note the dollar sign before the file name to indicate it is a file name and not a series of commands.) Since the list of commands cannot include any escapes and must be completely re-entered any time a change is desired, anyone doing more than the smallest amount of environment set-up will want to put the commands in a file. While INI files are most often used for loading q-registers with useful "library" macros and for setting up the TECO environment, operating on the command string is often also useful. In this article, TECO.INI means any personal initialization file, even though its name can be different under VMS.

For real VMS TECO enthusiasts, TECO allows you to bypass its initializer entirely. To do this, you need a file named TECO.TEC in your account, or a file defined by the logical "TECO" (this can be either a user or a system logical). If TECO finds this, it stuffs its own TECO.TEC into q-register Y and disables its execution. Thus, you can do your own initialization totally unhindered by considerations of what TECO might do afterwards, since it will simply go to "*" prompt level. If you want to use your own TECO.TEC but still want the system's TECO.TEC to execute, you must give an MY command at the appropriate point. If you use your own TECO.TEC, you must call in any INI file yourself; additionally, the DCL command string is left in q-register Z and not parsed by the system. For most people, the capability of redefining TECO.TEC is unnecessary; you can do almost anything you want through TECO.INI.

Parsing the command and switches

The normal method of determining whether the command string contains a switch is the following set of commands:
```
J :@FS%/SW%% "S ...'
```
With this method, you start at the beginning of the buffer (since a previous search may have left you elsewhere), search for switch "/SW" and if you find it, delete it and execute a list of commands. In this way, you can include in your TECO.INI file the necessary code to check for switches which you define yourself. As long as you delete them, they will cause no problem for TECO.TEC in interpreting any DEC-defined switches you may also wish to use. The sample INI file at the end of this article includes two switches which I have defined.

```
        TECO.INI - Kelvin Smith                !
Financial Computer Systems, 1 Strawberry Hill Ct., Stamford, CT 06902

This is totally unsupported by FCS and by its author, and no       !
warranty, express or implied, is made regarding its functions.     !

This initialization file does a series of loads into q-registers and
executes two user-defined switches, if present.  Note that inside !
the q-register routines, local q-registers (name preceded by a ".")
are used.  These do not exist in TECO before version 40.  If you are
running an old TECO, you must change these to regular q-register  !
names; you should push and pop the registers used at the beginning
and end of the routines.                          !

:@S%MUNG%
  "S @O!EXIT!                    ! MUNG command--don't execute this stuff
 '
)^A/Loading library functions
                          ! Let user know what's happening !


MQ - back up a file, returning to same position             !
1MQ - exit, marking position such that /FIND returns to that spot !
-1MQ - find front of file (useful if past first page)          !
  Equivalent to VTEDIT commands $1$F, $0$F, and $F respectively.  !

)^UQ}
+OU.A
@EW//
Q.A+1">                              ! Make sure we have right file name
      @I%~~/\~~                      ! OMQ or 1MQ !
;        '
Q.A-1"<                             ! Mark position (/FIND compatible)
      EC                            ! -1MQ or OMQ !
      @EB%^EQ*%                     ! Close and !
      Q.A"=                         !  reopen same file !
            @FN%~~/\~~              ! OMQ !
;%                                  ! Find marker and delete !
         @^A/File backed up
       | Y                    ! -1MQ !
         @^A/At beginning of / :G* 13^T 10^T  ! Verify the file !
       '
    | @^A/Position marked, exiting
      , EX                    ! 1MQ !
       '
```

```
[n]M1 - delete n words (default: 1), saving deleted text in q-reg 0.
  "Word" defined as series of printing characters followed by series
  of non-printing and/or space characters (ASCII<=32).          !
  Reasonably equivalent to VTEDIT [-]^B (may behave differently with
```

```
! starting blanks and one-letter words).             !
@^U1-
 +OU.B                                     ! Pick up any argument !
 Q.B"=                                     ! No argument entered !
       1U.B                                ! Default = 1 !
   '
 Q.B">                                     ! Positive direction !
       Z-."=                               ! If at end of buffer !
            @O!M1EXIT!                     ! Nothing to delete !
       '
       OU.A
       Q.B<                                ! For QB words !
           < %.AA-33:; >                   ! Skip over printing chars !

           < %.AA-33;                      ! Skip over control and space chars
               Q.AA"<                      ! Have we hit end of buffer? !
                     1;                    ! We can quit !
               '
           >
           Q.AA"<                          ! Exit main loop at buffer end !
               1;
           '
       >
 | ."=                                     ! If at start of buffer !
       @O!M1EXIT!                          ! Nothing to delete !
   '
       -1U.A                               ! Negative direction - always delet
       -Q.B<                               !  at least one character !
           < -1%.AA-33; >                  ! Back over control and space chars

           < -1%.AA-33:; >                 ! Back over printing chars !
                                           ! No check needed for beginning of
                                           !  buffer: stops automatically (AA=
           %.A                             ! Correct overrun !
           +.-1:;                          ! Exit loop if at start of buffer !
       >
   '
 .,.+Q.AXO                                 ! Save in q-reg 0 before deleting !
 Q.AD                                      ! Delete it !
!M1EXIT!
 -
```

```
! [n]M2 - Scrolling TECO for wide screen; n is lines of scrolling    !
!   command region (default: 8).  Set flag so that failing searches  !
!   preserve dot (to avoid repainting the screen), and let user know. !

@^U2-
 +OU.A                                     ! Read in any argument !
 0,16ED                                    ! Failing searches preserve dot !
 132,1:W^[                                 ! Wide screen !
 Q.A"=
```

```
! character.  Store the command in a file TECXnn.TMP (placed at the !
! beginning of the directory), where nn is the job number, zero-filled !
! (RSTS LOGOUT will automatically kill it on logging out), then EI it, !
! which won't actually execute until TECO.TEC is done.              !
!   Note that MODE will not work under non-RSTS systems, and the file !
! naming scheme is only needed if more than one person may use TECO in !
! the same account simultaneously (to avoid conflicts in file names).  !

J
:@S%/X:%
  "S
    -3D                       ! Delete switch !
    OA@^U.A%%                  ! Store delimiter char !
    C                         ! Move past it !
    .U.A                      ! Mark beginning !
    @S%^EQ.A%                 ! Search for end delimiter !
    Q.A,.-1X.A                ! Store command !
    Q.A-1,.K                  ! Wipe out it & delimiters !

    @^U.B%TECX%               ! Build file name; compatible with TMP kil
    OEJ-10"<                  !  by RSTS LOGOUT !
         @I%0%                ! Leading zero if necessary for job number
       ,
    OEJ\                      ! Necessary to go through buffer because n(
                              ! other way to make number into characters
    .-2,.:X.B -2D             ! Append job number to q-reg B !
    @:^U.B%.TMP/MODE:#3000%   ! Mode 3000 (octal) -- front of directory
    @EW%^EQ.B%                ! Open it (for output) !
    .U.P
    G.A                       ! The commands !
    @I/@EI\\/                 ! Close off input stream !
    27@I// 27@I//             ! Add double escape to execute it !
    Q.P,.PW Q.P,.K            ! Write to file and clean up !
    EF                        ! Close file !
    @EI%^EQ.B%                !  and execute it !
    @^A/Executing...
/
  ,

!EXIT!
```
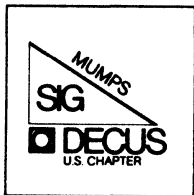
GLOBAL ACCESS

DECUS
MUMPS
SIG

MMP

SIG MUMPS
DECUS
U.S. CHAPTER

"If you don't want it in the paper, don't let it happen."

DECUS

$ORDER("Ship")

During the past three or four years, it has become stylish "DEC-speak" to contort the use of the verb *to ship*. A typical example runs something like, "VMS V4.6 is *shipping* now, but V5.0 will *ship* by Easter." This seems to be part of the current bureau-/corpocratic trend to write in the passive voice and, in general, confuse responsibility by never specifying an agent for anything. On this one, however, the good old internal compass and the dictionary are solidly together: forget it, it's just wrong. In fact, I have even seen fluent (non-DEC) English speakers dissolve into hysterics when I described it to them. When used in the sense of "to send or carry from one place to another," to ship is a transitive verb. That means that it requires both a subject to do the sending and an object to be sent. Obviously, one or the other is missing from the sentence above. And, if we follow normal rules of English syntax, it turns out to be the object. Thus, the sentence works out to mean, "VMS V4.6 is busily sending [unspecified], but V5.0 will be sending [ ] by Easter". If you want to relieve VMS of its tedious mailroom job sending hyperspace to all of us in DECland, you had better stick to the King's (or at least Daniel Webster's) English, admit your guilt, and say, "We are shipping VMS V4.6 now, but we will ship V5.0 by Easter."

$NEXT

The March issue will contain highlights from the Anaheim Symposium. In addition, stayed tuned for the next episode of "As the Stomach Turns," in which Sam and the boys try to put Humpty MUMPty back together again.

$NEXT($ORDER)="Comprise"

$RANDOM

"Things are more like they are now than they ever were before." --Dwight Eisenhower

NETwords

The NETWORKS SIG Newsletter

Application
Presentation
Session
Transport
Network
Data Link
Physical
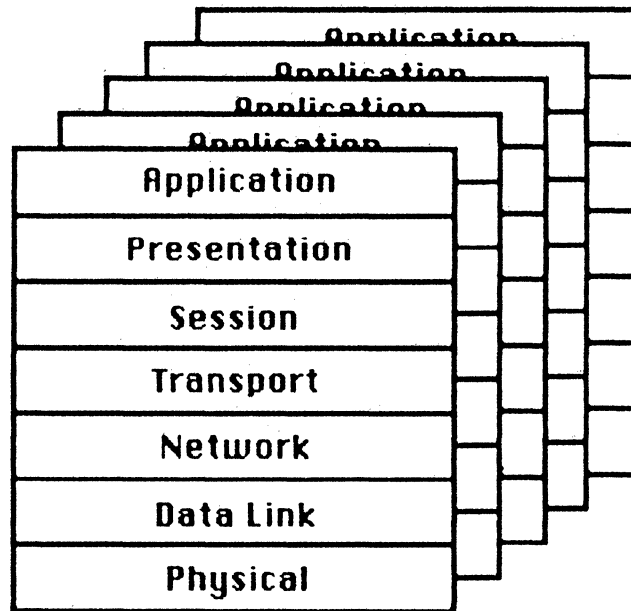
The first major movement appears to be with private, intracompany systems that link to a public network via interfaces, called gateways, which are developed specifically for each system. Linking allows companies with private networks to enjoy the services that a third-party electronic-mail vendor can offer, such as access to on-line databases and the ability to send telexes or other hard-copy messages.

This kind of connection, however, does not solve the larger problem, for example, a company on the EasyLink network is still unable to communicate electronically with a company using Telemail. Despite a bold move made last year by MCI Mail and CompuServe's EasyPlex to link their separate systems, the major electronic-mail vendors remain disparate communities. "I think that interconnectivity is very important," says Karen Chun, director of marketing services for Dialcom. "But it's a double-edged sword to some of us because it means partnering with your competitors."

Dave Kischler, a spokesman for CompuServe, says the MCI Mail-EasyPlex link is "an odd relationship" but one that benefits both companies. "[Interconnectivity is] not something that's going to happen overnight, but our feeling is the trend is inevitable," he adds.

Mr. McGrath, however, calls such a vendor-to-vendor link a "tactical rather than a strategic alternative" - a short-term manuever requiring customized software, rather than a long-term solution. Missing from most of the links are the kinds of standards that allow all telephones to interconnect.

There is, however, a long-term plan on the horizon, called X.400. Developed by the Consultative Committee on International Telephony and Telegraphy (CCITT), the X.400 standards ideally will result in one conforming, worldwide electronic-mail network. Certain portions of these standards have been published and are implementable; others have yet to be developed. Support for X.400 is strong in Europe but not in the United States, where the computer market has been long dominated by IBM, a company that presumably will oppose a non-IBM standard. Most observers, however, think that X.400 eventually will be adopted worldwide.

Another obstacle to the ongoing development of electronic mail involves directories. With electronic mail, if you don't know someone's address and that person doesn't subscribe to the same service, you're out of luck: There is no cross-vendor directory available, and it is not likely that one will be instigated by a single electronic-mail vendor, for competitive reasons. Accordingly, an independent company, National E-Mail Registry, has this year introduced the National E-Mail White Pages. While some observers believe such independent efforts are premature until the X.400 directory standards are established, others welcome the attempt to create at least a small bit of order out of the chaos.

Meanwhile, a good part of electronic mail's communicative power depends upon one-way electronic messaging: a person with a computer sending a telex or an overnight letter via electronic mail. While some deem this a compromise awaiting correction, others see this as the true future of the medium, especially if it is to penetrate the country as thoroughly as the telephone.

Mr. Arnum believes that electronic mail eventually will merge with what is known as voice mail to create a useful and ubiquitous electronic messaging medium - one that will allow computer users to send text messages to people via telephones. The system will allow messages to be stored like electronic mail but read back over the phone by voice synthesis. Mr. Arnum says putting the receiving capability in the telephone will not require new knowledge or practices on the parts of comsumers. He adds, "That's what will make electronic mail successful: removing the requirement that the receiver change his attitude drastically."

— — — — —

****

If anybody is really reading this, I'd appreciate comments and contributions. Let me know what topics are of interest, and I'll see what I can dig up!!

Please drop a line to:

Judi Mandl
Networds Newsletter Editor
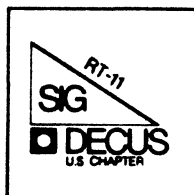University Of Connecticut Health Center
Farmington Ave.
Farmington, Ct. 06032

THE mini·tasker

DECUS
RT-11 SIG NEWSLETTER

RT

word, NO, VMS is not an upgrade path. The UNIX path is also unnecessarily complicated and in no way "real-time", but probably logical for the long term. Based on the current UNIX push, VMS will likely die, or be made to look like UNIX eventually.

From a user viewpoint "outside looking in," VMS was conceived in the days of central cpu's with a bunch of terminals hanging on, and if "real-time" or simple applications development are mentioned in the same breath, then someone is lying. Real-Time is not the only question. A simple, uncomplicated, development and application software enviroment combined on the same hardware is also very important to the "small user" installation. Lets separate the facts (my opinions) of science and engineering applications from marketing hype. The facts are that (1), the small RT users (who are primarily applications programers, not "bit jockeys,") would like to move to 32 bits on their 22-bit Q-Bus backplane for a much more reasonable price and value for the dollar (than VMS/MicroVAX upgrades), and (2), most of those 11/23s and 11/73s out there in DigitalLand are not hooked to big VAXes. For this substantial number of people, the world of computing does not "down-load". (The big IBM system syndrome.) The unavoidable facts based on DEC's recent upgrade cost are that if you have invested in Q-Bus PDP-11s for the long haul, you have been "used" to a certain extent, and they (the "suits" in old MASS) would be glad to sell you high priced software and hardware for 32 bits that may not be needed.

The new MicroVAX 2000 products are a noteworthy "cram job" judging by the effort necessary to get all of the MVII parts on a smaller board, but they are still deceptively priced. A stand alone color station is at least $20,000 with some software and a reasonable disk, and it has no (cost effective) expansion slots. Once again DEC intends for the user to be hanging on the end of a big machine (or a cluster) in a network under VMS. An appropriate colloquialism for this approach comes to mind; " More money than sense."

There is a better way for the small user, and DEC already has the hardware. The KA620 (or rtVAX) is the perfect starting option, and probably all the "small shop" applications programmer needs. Coupled with a 2MByte or 4MByte PMI memory card (for a total of 3MBytes or 5MBytes), and the basic VAX/RT package, the cost should be around $3500. I believe DEC sells the KA620 for $5000 with VAXELN. What a "rip"! Does anyone actually buy it? A MVII under VMS is still required to use the KA620 in this configuration to do anything - talk about NOT being "cost effective." I'm sure it may work well (eventually), but at what cost?

After an examination of the KA620 board, DEC cost of manufacturing must be about $300. Combined with the added 2MB memory card for another $250 cost, a list price for the package in the $3500 range with VAX/RT is about right.

The software system should be implemented as described in the VAX/RT (Sept. 1985 MT) position papers with considerations from Ian Hammond and others as noted in follow on Minitasker editions. Languages and tools would be supplied predominately by the RT community. Digital need only supply an F77 compiler for porting old FIV(F66) programs to VAX/RT. (Or maybe the crew at Multiware would continue the tradition started with F77/RT.) A C implementation would also be a consideration (to keep the "bit jockeys" happy). However, if one looks at a modern language such as Modula-2, there is no reason for a 20 year old glorified

MACRO program such as C. (I realize systems guys love it.) Disk drive hardware and graphics hardware should be up to the user, and based on the size of the system and applications task to be designed. The operating system should freely interface to the outside world, but in basic form remain a small (less than 200KByte) kernel, with clean hooks and file I/O, and essentially the same basic feature package as RT-11 Ver.5.3. VAX/RT should be firmly a single user, multitasking, operating system where the number of task slots are based on the the size of memory available, e.g. 1MB->4 task, 3MB->8 task, 5MB->16 task, and so forth. VAX/RT on the rtVAX board with 3MBytes would make a ni-i-ice, direct and to the point package.

I can hear it now, "This guy's a jerk! He knows nothing about computers, let alone operating systems. Sal, another wine cooler please. Has any one seen the financial section of the Times?" Oh come on guys, this is a little nuts and bolts guy. Are the only things that matters now pin-stripe suits, a few big banks, and inefficient corporations. I for one am not impressed by a big party on an "old" oceanliner. I would rather the money be spent on cost effective products. But then again, I do not represent a large bank or investment house. Lets face it, (I contend) DEC is not serving a large group of users. I grew up with DEC, from the PDP-8e in the EE lab, PDP-15/EAI, and the venerable PDP-11, which I am sure the young marketing whiz in Maynard will say is the root of my problem.
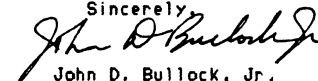
Am I way off base on this, and my comments totaly unjustified? Does anyone care out there in RTland? Should I start saving now for that 80386/80387 PC since it appears to the only cost effective semi-alternative for the future? Any comments?

-- TEX under RT --

Does anyone out there (in RTland) know of Knuth's TeX being implemented under RT-11? I know that it is large in full form (at least 10MBytes of disk), and written primarily in PASCAL. Are there any "sub-sets" of TeX out there for RT-11? I am familiar with a DECUS library program called TEXT which runs in conjunction with RUNOFF. I have made several mods to TEXT to handle equations, but it is far from TeX. Any suggestions out there?

Finally, will there ever be a DECUS meeting within 100 miles of Chicago?

Sincerely,

John D. Bullock, Jr.
JDB Systems

P.S. Kudos's also to the RT SIG boys in the West for keeping the RT Newsletter going (and also recently Bill Leroy down South in Atlanta). It seems like all the action remains out in the Ccc-c-c Aaa-a-a state. Well what the heck, they should be good out there. If I could sit around all day eating avacadoes and working on my tan while pounding the keyboard, I could be "looking good" also. Then again, maybe it's the fear

The FORTRAN Slate

Bob Walraven
Multiware, Inc.
Davis, CA

One of the smallest MACRO programs that will run under RT-11 is

```
        .enabl  mcl
test::  .exit
        .end    test
```

If you assemble and link this program and examine the link map, you
will see that the program is only one word long (the .exit programmed
directive).

The smallest FORTRAN program that will run under RT-11 is

```
        end
```

Let's assume that you have installed FORTRAN-77 V5.0A as the default
FORTRAN compiler, and have named it FORTRA.SAV. Then if you compile
this program with the command

        FORTRAN/NOLINE/SHOW:3/LIST:TEST TEST

the listing will indicate that the following code has been generated
by the compiler:

```
        .TITLE  .MAIN.
        .IDENT  07NOV

        .PSECT  $CODE1
JSR     PC,OTI$
JSR     PC,EXIT$
```

The first subroutine call initializes the FORTRAN run-time system, called
OTS (for object time system), and the second call returns control to the
RT-11 monitor. Now link the program to generate a link map and look at
it. Part of what you will see is the following information (in a
different format):

Program Section	Attributes	Address	Size (Words)
. ABS.	RW,I,GBL,ABS,OVR	000000	256.
$$NAM	RW,I,LCL,REL,CON	001000	1.
$$OTSV	RW,D,GBL,REL,CON	001002	4.
$$OTSS	RW,D,LCL,REL,CON	001012	3.
$$AOTS	RW,D,LCL,REL,CON	001020	224.
$$OBF1	RW,D,LCL,REL,OVR	001720	32.
$$OBF2	RW,D,LCL,REL,CON	002020	0.
$$FIOS	RW,D,GBL,REL,OVR	002020	0.
$$FIOC	RO,I,GBL,REL,CON	002020	0.
$$FIOD	RO,D,GBL,REL,CON	002020	0.
$$FIO2	RO,D,GBL,REL,OVR	002020	0.
$$FIOI	RO,I,GBL,REL,OVR	002020	0.
$$FIOL	RO,I,GBL,REL,OVR	002020	0.
$$FIOR	RO,I,GBL,REL,OVR	002020	0.
$$FIOZ	RO,I,GBL,REL,OVR	002020	0.
$$OTSD	RO,D,LCL,REL,CON	002020	1101.
$$OTSU	RO,I,LCL,REL,CON	006252	149.
$$OTSI	RO,I,LCL,REL,CON	006724	1171.
$SPACE	RO,D,LCL,REL,CON	013372	0.
$CODE1	RW,I,LCL,REL,CON	013372	4.
. VIR.	RW,D,GBL,REL,CON	013402	0.

Size of program = 2945. words
(includes first 256. words of memory)

Why, you might ask, does our "do-nothing" FORTRAN program become almost
3K words in size? And what are all these strange program sections that
show up in the link map? If you could see what happens to memory when
you run this program, you might also ask why even more than 2945 words
is required for the program to run.

The first thing you must understand is that the compiler assumes you are
actually going to do something in your program, so it always starts a
program with the subroutine call to OTI$ so that a useful general run-time
environment can be set up first. We will look closer at what the call to
OTI$ does later; suffice it to say for now that this subroutine allocates
additional memory for dynamic tables, causes various data structures
(some of those mysterious program sections) to be incorporated in the
program, and calls some other subroutines to help set up the general
run-time environment. The compiler also assumes that your program will
probably need to do some housekeeping cleanup before it returns to the
monitor (which it eventually does with a .EXIT, just like our simple MACRO
program). Thus the call to EXIT$. The most important thing that the OTS
subroutine EXIT$ must do is check the dynamic tables to see if any I/O is
in progress, and if there is, stop or complete the I/O and close all open
files before returning to the monitor.

In all fairness, then, comparing the size of our "do-nothing" MACRO program
with our "do-nothing" FORTRAN program is really meaningless, since any
real program that does file I/O, has error reporting, etc., will need some
code similar to what is included from the FORTRAN run-time library, OTS,
and will need to allocate some dynamic memory for run-time data tables.
You can certainly argue that less run time support is needed for a MACRO
program, but this is because most MACRO programs are written with the
precise goal in mind and do not call a general support library for such
things as file I/O such as the FORTRAN OTS. For example, you may know
that an application will only have one I/O channel open, so you can
include support for only one channel in a MACRO program written for that
application. When you code the same application in FORTRAN, however,
neither the compiler nor OTS knows how many files you intend to have open
at one time, so support for six are included by default.

It should also be pointed out that the FORTRAN program was built without
supplying the compiler and linker any information about what support the
program needed. If, for example, it had been compiled and linked with
the commands

        FORTRAN/NOLINE/UNITS:1/RECORD:0 TEST
        LINK TEST,SY:F77NER

the resulting executable program would be only 1638 words in size (which
includes the first 256 words of memory). The UNITS switch tells the OTS

o $VARS contains storage for various program variables.

o $TEMPS contains miscellaneous local storage required by the program.

- -

:fore a FORTRAN program can start executing your main code the OTS
iitialization routine OTI$ has quite a bit of work to do. Here is
iat it does (for F77 version 5.0A), in order:

1. Forces the ordering of the psects discussed above.

2. Calls $OTSH0 with the address of OTI$ in R0. The default $OTSH0
    routine just returns immediately. The call to it is provided so
    that you can supply your own custom MACRO routine to do any set
    up that must take place before the rest of OTI$ is executed.

3. Copies the initial data for the error control data into an
    impure area. The error control data is used to keep track of
    the state of all possible FORTRAN errors.

4. Sets the maximum error count to 15.

5. Performs a .TRPSET programmed request to allow interception
    of traps 4 and 10 by an internal OTS routine.

6. Loads the BPT, IOP, and power fail TRAP trap vectors with the
    addresses of internal OTS routines.

7. Allocates some free memory to be used as a Dynamic Work Area.
    The details of how this allocation is made will be discussed
    in a later column, as it is a bit complicated and depends on
    how the job is linked.

8. Starting from the top of the Dynamic Work Area and working
    down, the following are allocated:

    1. A buffer for formatted I/O records. This buffer is 136 bytes
        long by default, but can be changed with the compiler /RECORD
        switch.

    2. A Unit Table containing one byte for the FORTRAN logical
        units. If a unit has been opened, then one of the entries
        in this table will contain the logical unit number. The
        default size is six entries, but this value can be changed
        with the compiler /UNITS switch.

    3. File descriptor blocks for each FORTRAN logical units. A
        file descriptor block stores vital working information about
        an open logical unit. This information is referenced by many
        of the OTS I/O routines. The unit number with which a file
        descriptor block is associated can be found in the corre-
        sponding entry in the Unit Table. The default number of file
        descriptor blocks is six, but this can be changed with the
        compiler /UNITS switch.

    4. Queue elements that are to be used by the OTS, if they have
        not been allocated in some other location. (The location of
        the queue elements will be discussed in a later column.)

9.   The line buffer, Unit Table, file descriptor blocks, and
     queue elements are initialized.

10. The $$AOTS work area is initialized.

11. The OTS subroutine $QSET, which is in the psect $$OTSU, is
     called to issue a .QSET programmed request for adding the
     queue elements used by OTS to the RT-11 I/O queue.

12. The default exiting status is set to "SUCCESS".

13. The OTS subroutine $STFPP is called to initialize the
     Floating Point Processor.

14. If virtual arrays are used by the program, the OTS subroutine
     $VINIT is called to initialize the arrays. The real $VINIT
     routine is contained in the module VIRTXM. If your job contains
     virtual arrays, you should link it with VIRTXM, otherwise a dummy
     $VINIT that doesn't do anything will be substituted from F77OTS.

15. The OTS subroutine $OTSH1 is called. $OTSH1 simply sets the
     appropriate bits in the Job Status Word to allow lower case, then
     returns. You can supply your own $OTSH1 if you wish to set up a
     different initial environment for your program. ($OTSH1 will be
     discussed in detail in a future column.)

The way that a FORTRAN program returns to the monitor is by calling the
OTS subroutine EXIT$. This routine performs the following steps, in order

1. Scans through the file descriptor blocks looking for open
    units. All open units are closed.

2. If USEREX was used to specify a user termination routine,
    that routine is called.

3. An exit status is put in the error reporting byte in the
    System Communications Area (byte 53).

4. R0 is cleared and a .EXIT programmed request is issued to
    return to the monitor.

- -

Next time we will take a closer look at some of the entries that show
up in the map listing for our one line program.

Editor's note:

The interaction between SL and .GTLIN described last month by Bob
Schor is neither a bug nor undocumented. (Nor is it true for current
versions of SL; but more on that later.)

SL clears the current line on the terminal from the end of the prompt
to the end of the line. So in examples like:

        .PRINT #prompt
        .GTLIN #reply

The prompt string, contrary to Bob's belief, is printed regardless of
whether it is teminated by <0> or <200>. (It used to be printed twice,
I suppose to provide automatic bolding for printing terminals.) If
there is no <prompt> parameter in the .GTLIN call, the "end-of-prompt"
is at the left of the screen so far as SL is concerned. Therefore
after printing the string with the .PRINT directive, SL erases the
current line from the left of the screen (a.k.a. end-of-prompt) to the
end of the line. If the string sent by the .PRINT was terminated by
<200>, it was indeed printed, but promptly [sic] erased by SL.

This behavior has been modified in later versions of SL. In the
version I'm using now (V05.48), the "beginning-of-prompt" for the
.GTLIN is no longer the left of the screen, but the current cursor
location. So Bob's .PRINT/.GTLIN construct will work as he wants --
more or less.

There is still a problem with how SL keeps track of the end-of-prompt.
Rather than saving/restoring cursor locations, it counts the number of
prompt characters, assuming that the prompt began at the left of the
screen. This is OK, until you type ^U, whereupon SL will place the
cursor where it thinks the end-of-prompt is, and erase the current
line from there to the right of the screen.

For example: .PRINT #line1
                        .GTLIN #reply,#prompt
                           .
                           .
        line1: .ascii /Let's print this line first. /<200>
        prompt: .ascii /Now what?>/<200>

If you try to correct your input with ^U, this is what happens:

        Let's print this line first. Now what?>**abcdefg^U**

The line will be erased from the point equal to the number of
characters in <prompt>, so you'll wind up with:

        Let's prin

For the same reason, you shouldn't put such niceties as escape
sequences in your prompts. SL will just get lost if you have to
type ^U.

By the way, major kudos to **Rob Hamilton** of the RT-11 Development
Team for all the new enhancements to SL. Well done, sir!

NEWSLETTER OF THE VAX SYSTEMS SIG

Pageswapper

Our Mascot

Table of Contents

Forms at the End

VAX

o The instruction must not be extensively used by system
   software (VMS, Run Time Library, ULTRIX, ELN, etc.) or
   extensively generated by Digital's compilers.

o The instruction must be difficult to implement, either
   requiring a great deal of extra hardware or microcode.

The instructions that are allowed to be emulated on future VAX
computers are listed later in this article.

Effect on User Software: Since there will still be support for
every instruction (whether implemented in hardware/microcode or
emulated) on every VAX computer, the new instruction subset
rules have a minimal effect on user-level software. It is
anticipated that low-end VAX computers will emulate most of the
allowed instructions. However, mid-range and high-end VAX
computers will continue to implement in hardware/microcode a
majority or all of the allowed instructions. Those who write
programs in high-level languages (such as FORTRAN, COBOL,
Pascal, Ada, etc.) will see little if any change, and should not
alter anything in their programs. Nevertheless, it is possible
that those who write time-critical applications in MACRO (VAX
Assembly Language) on low-end VAX computers may experience a
slight change in the performance of the application, if the
instructions that they are using are being emulated.

Instructions allowed to be emulated: VAX computers announced
after 1986 are required to follow the guidelines below to
determine which instructions may be emulated. Emulation
software will be included in the system-level software supplied
by Digital Equipment Corporation. The VAX Architecture
Reference Manual (Digital Press, Order Number EY-3459E-DP) lists
those VAX computers which utilize instruction emulation, along
with the instructions that are emulated.

1. Instructions in an application extension group may be
    implemented or omitted only as a group. That is, if
    any instruction in one of the application groups is
    implemented (omitted), all instructions in that
    application extension group are implemented (omitted).
    All VAX computers announced after 1986 have the option
    to implement zero or more of the application extension
    groups. Digital Equipment Corporation will supply
    emulation software for any instructions that are in
    omitted application groups. VAX compilers will support
    features to complement the application extension groups

implemented in VAX computers. The application
extension groups are:

o A packed-decimal-string group with sixteen
   instructions:

ADDP4	-	Add Packed 4 Operand
ADDP6	-	Add Packed 6 Operand
ASHP	-	Arithmetic Shift and Round Packed
CMPP3	-	Compare Packed 3 Operand
CMPP4	-	Compare Packed 4 Operand
CVTLP	-	Convert Longword to Packed
CVTPL	-	Convert Packed to Longword
CVTPS	-	Convert Packed to Leading Separate Numeric
CVTPT	-	Convert Packed to Trailing Numeric
CVTSP	-	Convert Leading Separate Numeric to Packed
CVTTP	-	Convert Trailing Numeric to Packed
DIVP	-	Divide Packed
MOVP	-	Move Packed
MULP	-	Multiply Packed
SUBP4	-	Subtract Packed 4 Operand
SUBP6	-	Subtract Packed 6 Operand

o An extended-accuracy group with twenty-nine
   H-floating and octaword instructions:

ADDH2	-	Add H_floating 2 Operand
ADDH3	-	Add H_floating 3 Operand
CLRH (CLRO)	-	Clear H_floating (Octaword)
CMPH	-	Compare H_floating
CVTBH	-	Convert Byte to H_floating
CVTWH	-	Convert Word to H_floating
CVTLH	-	Convert Longword to H_floating
CVTHB	-	Convert H_floating to Byte
CVTHW	-	Convert H_floating to Word
CVTHL	-	Convert H_floating to Longword
CVTRHL	-	Convert Rounded H_floating to Longword
CVTFH	-	Convert F_Floating to H_floating
CVTDH	-	Convert D_floating to H_floating
CVTGH	-	Convert G_floating to H_floating
CVTHF	-	Convert H_floating to F_floating
CVTHD	-	Convert H_floating to D_floating
CVTHG	-	Convert H_floating to G_floating
DIVH2	-	Divide H_floating 2 Operand
DIVH3	-	Divide H_floating 3 Operand

Background: Some knowledge about the format of floating point
numbers and the internals of the POLY instruction is helpful in
order to understand the data conditions that cause the errors.

Floating Point Numbers: The VAX architecture includes four
different   types   of   floating   point   numbers, F_Floating,
D_Floating, G_Floating, and H_Floating.   Since the   POLY
deviations include only the F_Floating and D_Floating formats,
descriptions of G_Floating and H_Floating will not be included.

A floating point number is defined by three attributes, a sign,
a mantissa, and an exponent. For example, let's consider the
value -0.1875 (-3/16), in binary this can be represented as:

$$-0.0011 * 2^{0}$$

This is an example of an unnormalized representation.   However,
the VAX architecture requires the mantissa to be normalized, so
that its most significant bit must be 1. This is accomplished
by shifting the mantissa to the left and subtracting one from
the exponent for every place that is shifted. So the normalized
representation would be:

$$-0.11 * 2^{-2}$$

For this example, the sign is negative (-1), the mantissa is
.11, and the exponent is -2. The F_Floating and D_Floating
formats use 32 and 64 bits, respectively,   to   store   a
corresponding floating-point value.   The following table
describes how many bits the F_Floating and D_Floating formats
use to store each field.

	F_Floating	D_Floating
Sign	1	1
Mantissa	23	55
Exponent	8	8
Total	32	64

If two n-bit floating-point mantissas are added, the sum will be
a maximum of n+1 bits. If two n-bit floating-point mantissas
are multiplied, the product will be a maximum of 2*n bits.   All
of these bits are not used in the actual calculations internal
to the computer. Only a group of high-order bits are retained,
these bits are sufficient to maintain the calculation without
having to store all of the bits generated. The bits that are
retained are the high-order mantissa bits plus a few bits of
lower significance which are labeled "guard bits."

The POLY Instructions: The POLY instruction uses Horner's
method to evaluate a polynomial, given the degree, the argument,
and a pointer to a table of coefficients. For more information
on the POLY instructions, refer to the "VAX Architecture
Reference Manual" (Digital Press, Order number EY-3459E-DP).

Assume that:

o   The Polynomial is of degree n.

o   Coefficients are of the form (from highest degree
    to lowest degree):

    C[n], C[n-1] . . . . C[0]

o   The Argument is x.

o   The Polynomial is of the form:

$$C[n]*x^{n} + C[n-1]*x^{n-1} + ... C[1]*x + C[0]$$

The VAX-11/780 and VAX-11/785 follow these steps to implement
Horner's method:

Partial_Result = C[n]
WHILE n > 0 DO

    !Multiplication Step

    Partial_Result = Partial_Result * Argument

        !After the Partial_Result has been multiplied by the
        !Argument, the result is truncated to 31 (POLYF) or
        !63 (POLYD) bits. This is referred to as the first
        !truncation step.

    !Add Step

    Partial_Result = Partial_Result + C[n-1]

significant bit (for example, the least significant bit
of the mantissa is a 1 and the guard bits are 0100000),

o and the next coefficient to add is negative,

then the result generated will have a one in the least
significant bit of the mantissa when it should be a zero. Thus,
the magnitude of the mantissa is slightly greater than the
architecturally defined result.

CASE 4

The fourth case involves a truncation problem in the POLYF
instruction. The VAX architecture allows a VAX computer to
retain either 31 or 32 bits of precision after a truncation
step. However, the VAX computer must retain the same number of
bits (either 31 or 32) all of the time; it cannot retain 32 bits
sometimes and 31 bits the other times. The VAX-11/780 and
VAX-11/785 were designed to retain 31 bits. If the following
data conditions are met, the VAX-11/780 and VAX-11/785 will
retain 32 bits of precision instead of 31.

o If the sign of the next coefficient to add is opposite
   to that of the current partial result,

o and if bits <30:28> of the sum are all the same (000 or
   111),

o and if bit 31 of the sum is one,

then the VAX-11/780 and VAX-11/785 will retain 32 bits of
precision instead of 31.

Examples that Reflect the Data Conditions:

CASE 1 Example:

```
; The POLYD instruction below includes an underflow condition
; that occurs during the last multiplication step. The result
; would be negative if not for the underflow at the last
; iteration. The last coefficient (C0) is zero. Under these
; conditions, the result is left containing a reserved operand,
; and, even if PSL<FU> is set, a floating underflow fault is
; not initiated.
;
; POLYD Result:                0000000000008000
```

```
;                                      ~
;      Result defined
;      by VAX Architecture: 0000000000000000
;                                      ~
;
.TITLE   Test_Poly_1
.ENTRY   Test_Poly_1,^M<R2,R3,R4,R5>
;
POLYD    Arg, Degr, Table            ; Instruction
RET

Arg:     .QUAD ^X08FC91EF1F470101    ; Argument = +5.929E-39

Degr:    .LONG ^X00000001            ; Degree of 1

Table:
 .QUAD ^XAA4EAAAAAAAABFAA      ; C1 = -.33333333333333269E+00
 .QUAD ^X0000000000000000      ; C0 = 0.00000000000000000E+00

 .END    Test_Poly_1
;
;
; The POLYD instruction in the program below includes the
; identical underflow condition, but the sign of the result
; would be positive if not for the underflow. Under these
; conditions, even if PSL<FU> is set, a floating underflow
; fault is not initiated. R0 is left containing a zero,
; which would be correct had PSL<FU> not been set.
;
.TITLE   Test_Poly_2
.ENTRY   Test_Poly_2,^M<R2,R3,R4,R5>
;
POLYD    Arg, Degr, Table            ; Instruction
RET

Arg:     .QUAD ^X08FC91EF1F478101    ; Argument = -5.929E-39

Degr:    .LONG ^X00000001            ; Degree of 1

Table:
 .QUAD ^XAA4EAAAAAAAABFAA      ; C1 = -.33333333333333269E+00
 .QUAD ^X0000000000000000      ; C0 = 0.00000000000000000E+00

 .END    Test_Poly_2
```

CASE 2 Example:

these items have been reviewed by representatives from Digital's
software and hardware groups involved in the development of VAX
products. The members of these groups have concluded that since
these errors only occur with the above obscure data conditions
and since correctly written programs should not normally depend
on the least significant bits of floating point results, they
will have a minimal effect on user programs.

DECUS European VAX SIG Question and Answer Session

DECUS European Symposium
Rome 1987

Transcription provided by Tony Arnold, Chairman

SPEAKERS: (All from Digital Central Engineering)
           Vernes Fisher
           Greg Eitzman
           C W Hobbs
           Stu Farnham
           Dave Solomon
           David Nunnerley
           John Halliburton
           B G Herbison

TONY ARNOLD, University of Manchester, ENGLAND

While you are all thinking of questions, we did collect some
earlier in the week and to start us off I will read these out.
If we have difficulty understanding them, maybe the person who
asked the question can clarify it. Before that, the panel will
introduce themselves and their area of expertise.

I am Vernes Fisher. I am working on the DEC windows program
right   now.   I can also answer questions about the VAX
workstation software otherwise known as UIS.

I am the odd man out here. I am Greg Eitzman. I work for HSC
Engineering instead of VMS Engineering. I can answer questions
about storage products and HSC.

C W Hobbs. I work in VAX cluster development. I am also the
designated file system representative.

I am Stu Farnham. I can answer general executive questions and
multi-processing questions.

I am Dave Solomon, primarily representing RMS and RMS
journaling.

TONY ARNOLD

Thank you very much. Right, another guy with advance information.

4. FRED E. CUSTOMER C.E.D., INC.

Will the null driver on Version 5 on an SMP system support simultaneous I/O operations from each processor?

PANEL MEMBER

That actually is a hardware question. Bob Willard, will you tell us about the enhancements to null type devices.

BOB WILLARD

I am hard put to take this question seriously, but the real answer is, yes, of course.

5. ULRICH STRATHMEIER, BEB

Will Digital continue to provide a driver to be used for RAM disc, currently PDDRIVER with VMS 4.5.

PANEL MEMBER

The PD driver is an integral part of stand alone backups operation from a tape drive. We don't foresee changing it. There are no guarantees.

6. MR COLLING, BP PET DEV.

When will the limit of 16 of the number of nodes on a CI VAX cluster be increased?

PANEL MEMBER

Let's just say that we do recognize the need to go beyond 16 nodes and at some point in the future we would like to be able to offer this and leave it at that.

Lots of mumbling - okay, we're going to stay with that answer!

7. ALFRED WULLSCHLEGER, FIDES ZURICH

This is not actually phrased as a question. I need documentation on the implementation of a terminal device driver connected to the class driver. Is that documentation going to appear at some time?

PANEL MEMBER

That question has been asked of us several times this week, and the short and simple answer is NO. There are a certain set of interfaces which are designed for public consumption and to which VMS has committed. If we documented every interface within the operating system we would never be able to change VMS again. This is one of those interfaces which we reserve for our own use.

8. PER MAGNUS BANCK, GREATER STOCKHOLM LOCAL TRANSIT AUTHORITY

How do I, from an image, get hold of the same information that I can get at DCL level, namely - F$ENVIRONMENT (PROCEDURE), i.e., "In which command file am I at present?"

PANEL MEMBER

In a special-purpose case, if you had control of the command procedures that are running, you could use the F$ENVIRONMENT lexical function to store the procedure name in a DCL symbol. There is an RTL routine which is LIB$GET_SYMBOL which can be used by your image to extract the value of the DCL symbol. In a general purpose case, where you don't have control of the command procedures, this is not currently provided. It is internal state inside of DCL, so there is no safe way of extracting the information. The answer is a no.

9.

non-fatal bug check and the complication in the solution is guaranteeing that the logout mechanism cannot be circumvented.

ALAN REID

Why not simplify it and just give us part of the answer and just take a normal logout rather than a bug check.

PANEL MEMBER

Because when we come to DECUS with incomplete solutions, we meet with angry customers. We would rather do a complete solution now than do an incomplete solution which would constrain our ability to come up with a complete solution later. We do perceive a genuine need to provide user-specified image terminations or process termination processing, so it is a hard problem but one that we have heard about before and we are looking for solutions.

PANEL MEMBER

Can we just do a quick poll here? How many people would personally find a real use if logout simply had the ability to invoke a command procedure that could be bypassed by STOP/ID, bypassed by DELETE PROCESS?

PANEL MEMBER

We are now going to circulate a petition and all those who raise their hands will have to sign it, agreeing not to complain when we implement such a process!

13.

In a large cluster with several machines and large memories, discs seem to run out creating dump files. Under what conditions is it safe, or reasonably safe, to use common dump files in a large cluster?

PANEL MEMBER

When you are not concerned about saving your dumps! (laughter and applause) I am sorry, that was flippant! I think that Stu can address the real issue.

STU FARNHAM

Let me first say that any problems that any customer has ever had with dump files we in VMS Engineering have probably a thousand fold, because the software that we are running is under development and many times less stable than that issued to customers. So we are acutely aware of the problem and there are several things being done both in the short term and the long term to address this. We do not believe that the solution is to provide a common dump file. We believe that the solution is actually comprised of several components.

The first is to reduce the size of the dump file, and there are algorithms currently being tested to allow subsetting the portions of memory to get rid of the dump file. Beyond that I believe, this is one engineer speaking, not Digital as a whole, that we have to be able to move the dump files off the system disc. We have got to address that in a longer term than the next major release. So there is quite a bit of movement there.

PANEL MEMBER

But, to answer your original question, if you put your dump file in SYS$COMMON and [SYSEXE] and make it large enough for the largest machine in your cluster, it is perfectly safe as long as only one machine crashes. You can copy the dump out of the dump file. The only risk that you take is, if the second machine crashes before you get the first dump copied, you will potentially lose that. I have seen people who run with one bit dump file: when a machine starts acting up, they will temporarily create a dump file for that one machine in SYS$SPECIFIC to protect themselves.

PANEL MEMBER

MICHAEL TERENYI

There is a lot of software now based on batch jobs and it should be stopped in a correct manner.

17. CLAES ENGELIN, OPIAB KONSULT, SWEDEN

I have a question regarding DECnet and security, if we can mention those two things in the same breath. Will we ever here in Europe see end-to-end or point-to-point encryption over DECnet? The background is that a lot of companies, especially defense contractors, are getting a lot of heat from defense authorities about security in their systems and about information going across wires all over the place, in clear, so to say, including things like usernames and passwords. Anybody with a little PC can hook up to that net and just eavesdrop. It is really a potential disaster area.

PANEL MEMBER

As I mentioned in my talks earlier this week, some work has been done in looking at end-to-end encryption DECnet. It is a long way away, possibly even longer in Europe because of U.S. export controls, which we can try to work around but can't really change.

For DECnet there are two sorts of problems. There is all the networks in your systems and your wide area links. The wide area links can be protected using link encryption devices. There are some available, and they wouldn't affect the PC on your own site tapping in, but they would affect the information that is going across the country. That may be a partial solution for you. I have heard it several times this week, and we are taking back the message that we need to do more work on DECnet end-to-end encryption, but this can take a long time to develop.

CLAES ENGELIN

You say that the problem is two-fold but one thing is encrypting in the first place, the other part is due to restrictions on exporting algorithms. Would it make it easier if you could use a simpler encrypting algorithm that would possibly be easier to crack, something like some algorithm that would only take a year or two to

crack instead of ...?

PANEL MEMBER

Captain Midnight secret decoder rings are export controlled. It would still take a license to send it out. The weakness might make it easier to get a license but doesn't eliminate the need for a license. There is also the option of building something that uses an encryption chip, selling it to you without the encryption chip and having you input your own. An encryption device without the encryption chip is still export controlled. There are no easy ways around this.

CLAES ENGELIN

Not until after the next election, right?

PANEL MEMBER

Maybe!

18. MR MONTANA, PRACTICAL PHYSICS INSTITUTE, SPAIN

Is there any intention of providing in future releases of VMS some kind of checkpoint restart facility?

PANEL MEMBER

We have basically re-evaluated the checkpoint restart effort that we did have underway a couple of years ago. We took a look at it and decided that the product we were going to deliver really fell short of what most people wanted. The original ideas behind checkpoint restart was to allow you to protect your computation investment over a long period of time. We tend to think that it may not necessarily be the product that people really want. What people really want is the ability to keep applications running in the cluster environment and be able to recover dynamically from those kind of failures. So I would think it very likely that we will put our efforts elsewhere and not actually deliver a checkpoint restart for a while.

PANEL MEMBER

In a future release we have made a couple of leaps in that direction. We will have a separate directory for system loadable images, such as drivers and the remaining pieces of SYS. I alluded earlier to improvements in system startup – we are creating a special directory to contain the pieces of the system such as layered product command files, which are used during the startup of the system. We have no particular plans right now to make immediate additional split-ups but we are going in that direction.

23. JEAN PIERRE-PETIT, ESME, FRANCE

Is it possible to provide a system service that instructs the Job Controller to put each accounting record in a mailbox as well as in ACCOUNTNG.DAT (similar to what exists for ERRFMT)?

PANEL MEMBER

First of all I would like to ask a question in reverse. What part of the application can't deal with processing the accounting file?

JEAN PIERRE-PETIT

The application can't process the accounting record on a real time basis and increment the budget each time a process is terminated.

PANEL MEMBER

I would say we will have to take this one as a suggestion. You can redirect the accounting logical name to send the records to, if you want, a mailbox, but then they are not going to go in the accounting file, unless you put them there yourself. I understand what you are asking for and we will take that down as a suggestion.

24. MR CAMBRIEN, PHILIPS, SWEDEN

During system shutdown, why must I wait for the system to write out the whole memory to the dump file?

TONY ARNOLD

I guess the question is why do you dump all of memory on a normal system shutdown.

PANEL MEMBER

There is some confusion up here as to whether we are doing it immediately or not, but if it is not corrected in the next major release, it will be corrected shortly thereafter.

PANEL MEMBER

It will not NOT be done. (laughter)

PANEL MEMBER

It has always annoyed me as well, and we will take care of it.

MR CAMBRIEN

It takes several minutes with 56 megabytes.

PANEL MEMBER

Yes. And when you have 256 megabytes it takes considerably longer!

25. PAUL TEECE, GOLDMAN SACHS, U.K.

Will TSM work on an 8700 under VMS 4.6? We are having problems with the debnt. We have lots of protocols running, like DECnet, XNS and so on. The terminal server manager can't talk back to the terminal servers. If we switch off DECnet it works fine, but we need DECnet.

The release notes actually say that it is fixed in 4.6, but our local office tells us that it is a hardware problem on the DEBNT.

BRAD BECKER

There is a bit in the image header ... next question!
Well, that is one alternative, the other is to have two
different commands.

QUESTIONER

Yes. The question was also that there is no
possibility of putting KEYWORD /NODEBUG, there is no
such keyword in the CLD file either.

PANEL MEMBER

We are looking for a CLD expert.

PANEL MEMBER

I have an answer or trick for the first question.
Write a simple command file containing two commands,
the GO and the EXIT command, and define the logical
name DEBUG$INIT or DEBUG$INPUT to point to a command
procedure which just does a GO.

There is also DEBUG$INIT which I guess would do the
same thing.

27. SAME QUESTIONER

You can imagine the command procedure containing only
two commands. The first one is SET COMMAND and then
FILENAME and the second name is, start with "!" and
some text. And what happens, you have the warning
message - IMAGE DATA DCL-W S COPY DIT or something.
When I put the "$" sign before "!" sign it works, but
maybe there is some mistake in my CLD file.

PANEL MEMBER

The reason for the DATA SKIPPED message is that when
DCL finds text in a command procedure that has not been
read in by a program through SYS$INPUT and you are now
at the end of the command file, in essence there are
commands or lines in there that nobody has processed,
so it is telling you that it has skipped something that
no image had read in those commands. If SET COMMAND
had read in that line then the error message would not

have appeared.

BOB WILLARD

This only happens after you execute an image in the
command procedure. So you might see that if your
command had invoked an image. With a "$" sign you
would not see the message. So if it seems
inconsistent, it is only when the first line after the
image exits, that the DCL finds a malformed command.

28. ANDERS WAHLBERG, PHARMACIA, SWEDEN

On to a more policy-oriented question. (laughter) Now
and then there develop important and very dangerous
security leaks in VMS. Somehow Digital mistrusts us
systems managers and they do not tell us anything
before they have distributed a fix for the problem. On
the other hand, we have found through hard practical
experience that some of that stuff goes out to other
people through other channels, and I can imagine that
there can be problems in distributing information about
exactly what is amiss in the system, but I would like
very much to have some sort of a warning flash sent out
- "Please watch your systems a little more". There are
a lot of interesting security features that you can
enable but which you normally don't have enabled due to
the sheer mass of information that is on your system.
It would be nice to have some sort of procedure to
alert the systems manager that something is amiss, then
we could be really looking into what is happening. I
have, from personal experience, found that sometimes
the distribution of the fix gets delayed or misplaced
or something like that, and I hear (several months
after the rest of the community) about the fix to the
operating system. Then I have a feeling that we have
lived fairly dangerous lives in the meantime. I
understand that this is a problem, but this is a
problem for both of us, and you have to do something
about it.

AUDIENCE MEMBER ALAN SILVERMAN, CERN, GENEVA

PANEL MEMBER

I just did it on one disc, disc to disc on a MicroVAX.

PANEL MEMBER

As far as callable utilities, we mentioned it is
something we want to provide more of. In fact, there
is a strong, unwritten rule that at this point there is
no reason that new things should not be provided in
both callable form and utility form. It is going to
take time to go back to the other utilities.

29. PER MAGNUS BANCK, GREATER STOCKHOLM TRANSPORT

It was very nice of Digital to allow us to build our
own print symbionts. About half a year later there
arrives the LAT print symbiont, which we cannot modify,
for example, for site specific job pages, which is the
case with us. Is it possible to get the object modules
or anything like it so that we can link our own LAT
symbiont?

PANEL MEMBER

Is there anyone in network communications here who can
answer that? No. Okay, we will have to note that.

30. PAUL TEECE, GOLDMAN SACHS UK

Can you give me any indication when the problems
between the 8700 and the PRO 380 will be finally fixed?

PANEL MEMBER

To the best of my knowledge the problems that we have
heard about in VMS between the 8700 and the PRO
consoles have been fixed. Whether the fixes have been
distributed to the field or not is a problem that is
out of the hands of anyone in this room.

PAUL TEECE

We thought REV E of the console software would fix it,
and it didn't. Are we waiting for a new device driver
for the CW driver in VMS 4.6 or is it further away than
that?

PANEL MEMBER

Which particular problem are you talking about?

PAUL TEECE

There are a lot, but the one that causes the most
problems is when you try to use the console to edit a
boot file or look at the log file that lives on the
console, if a message comes through from OPCOM or
something like that, it will crash VMS.

PANEL MEMBER

I think the answer that it is fixed is right. It
sounds like a European software distribution question
though.

PAUL TEECE

I got an answer from an SPR that said they didn't know
when it would be fixed. I just wondered if you had any
more information.

TONY ARNOLD

It sounds like it is fixed but it has not reached
Europe yet, is what you are saying.

PANEL MEMBER

It does not happen to us with our 8700s in our labs,
with the revisions that we have and with VMS version
4.6 and later.

I don't know which piece is giving the problem. I
believe that it is probably a difficulty in getting the
fixes from the engineering sites, through all the
levels of reproduction and distribution, across the
Atlantic to Europe.

Do you have any comment?

PANEL MEMBER

My comment is that I believe that the earlier answers to this sort of question pertain. There is currently a shortcoming in VMS's handling of multiple languages and international character sets. The shortcomings are being addressed, one might say in a more piecemeal fashion than not, but we are making progress in that area and we intend to continue making progress in that area.

AUDIENCE MEMBER

Does that mean you are going to translate the error messages or are you going to open up the interface so that we can translate them for you?

PANEL MEMBER

I believe that at VMS, some of that is done already. There are local language versions of at least parts of VMS.

TONY ARNOLD

Does anyone know of local language versions of VMS?

(Faint mumbling, unable to hear.)

AUDIENCE MEMBER

There is a product called LOLA - this product is available in French and German. It provides a system error message in those languages and some help files. The main problem is the time between the delivery of the U.S. version and the European version of VMS, a matter of 2 or 3 months for translation purposes and availability of the product.

PANEL MEMBER

I assume you have commented on the MCS capabilities in the future. In other words, we are definitely moving in the right direction. I think it was Rally you were talking about. A layered product has yet another further layer of complexity since there may be.... It is a point-by-point issue with a layered product. We have started in the operating system to provide the tools, so that layered products can then use that facility to do the right translations more easily. We do recognise the need to get better in terms of handling foreign languages. It is an internationalisation program inside the Corporation, and I think in time you will see that we are going to get much better at it.

PANEL MEMBER

For example, in Version Future we have a new terminal facility for local character set translations; RMS, in the file system; and SORT supports international collating sequences and user-defined collating sequences. There is a new runtime library facility for local date translations. We are working on it. We realise it is a problem, but we can't fix every piece overnight.

QUESTIONER

I hope you realise that my users use different languages. When a user logs in I must ask which language he uses and then adapt the reply on that information. That is my application: I must always be able to respond in several different languages.

PANEL MEMBER

Part of our design centre for our internationalisation effort is to allow multiple languages to coexist on the machine.

36. BALTICA BANK, COPENHAGEN, DENMARK

We are using RDB and PASCAL. We have been using the precompiler up to Version 2.3 of RDB and now we have got a new RDML precompiler. We just have one problem, we can't get past the first statement in our PASCAL code and it is an external database statement.

PANEL MEMBER

One area that we are addressing is the system
management area in general. One of the big problems
with that area is that a user is currently not a well
defined object in VMS. There are several different
utilities that you have to run to manipulate the object
"user". We are making an effort to give you a coherent
interface to manipulate system management objects. We
will take your input. Do you want us to generate a
password, or do you need to specify the password for
your new users?

R. BROOKS

We would like to be able to specify the password. We
can see the algorithm on the fiche, it is just that I
think it is in PL1, and we don't have PL1 so it is a
case of translating about 8 pages of PL1 for something
that we have.

PANEL MEMBER

I think there is a situated problem in the suggestion,
because the menu of a public password algorithm is to
write a small program that generates a lot of passwords
and groups them and compares to the encrypted version
of UAF. That could be a big problem for you,
especially if you don't use DELETE/ERASE each time you
create a new version of your UAF and write some portion
of it to the disc, as an encoded version of the
password and try to generate passwords that give the
same encrypted value.

R BROOKS

I thought that was supposed to be impossible because
there are too many encrypted values, at least that is
what DEC say, isn't it?

PANEL MEMBER

They will then give 64 bits for annexing, and there are
different passwords, different strings of characters
that will lead to the same result. Because the
encrypting algorithm is not a unicorn, many strings
could lead to the same encrypted value, so suffice you

can generate one.

PANEL MEMBER

If you wish to try and break the password scheme by
constantly generating new passwords, encrypting them
and then matching them against the 64 bit value, then
you have a 50% chance of succeeding after 5.7 trillion
passwords are attempted.

PANEL MEMBER

I know some people at Digital who used this technique a
few years ago and I know that since that date we have
put in some redundant instruction that slows the
algorithm in order to make it difficult to find the
password in a reasonable time. But at the same time
you increase the problem of your CPU's load and we are
back to the same problem.

R. BROOKS

We would be quite happy to use this algorithm if you
needed something like, with which you can do anything
anyway. No way do we want this thing to be easily
accessible, we just want it there.

40. OLIVER DAVIS, ALLEN COMPUTERS, U.K.

I would quite like to be able to use $GETDVI with a
wildcard, perhaps generic wildcard, so I could look at
all DU devices and return characteristics for allof
those. Is there any chance of having that in future
releases?

PANEL MEMBER

It is something that we have looked at and will be
doing some time in the future. It is not planned for
the next release.

OLIVER DAVIS

That has been noted.

QUESTIONER

Is it possible to make all tapes on the cluster sort?

PANEL MEMBER

No. Currently there is no MSCP server for tapes and none in the near future.

QUESTION FORTY TWO
BEAT GODGLUCK, AUTOPHON AG, SWITZERLAND

Why are the system parameter descriptions incomplete in the system manual? For example, I had to install a software package for a simulation. They demanded to augment CTL pages from 250 to 500. I never found them in any documentation.

PANEL MEMBER

Did you notice that it is in the SYSGEN online help, under "HELP parameter"?

This has been noted for a version in the future and you should see complete descriptions of all of the SYSGEN parameters.

We will note that, but I believe that we are going to make an attempt to document even the special parameters.

BEAT

Okay. The second question is for better system management, I would like to have an improved monitor (for example MONITOR PROCESS/FILES or MONITOR PROCESS/CHANNELS so I can locate where the I/OS goes, what files are open and so on). Is that possible?

PANEL MEMBER

Certainly you can use SDA to show a process with open files and say SHOW PROCESS/CHANNELS, and it will list the channels that are open and the files that are in use. That is not a MONITOR display but that is certainly one way to find out the information.

BEAT

I have a slight complication with SHOW DEVICE/FILE to search on every disc. If you have a lot of discs and if you open files over DECnet and so on, the job is overwhelming.

PANEL MEMBER

Right, we have had many requests for finding who has what files open on what disc and I suppose this is something that Dave is going to note, another one of our SIR requests.

AUDIENCE MEMBER

I must ask Digital people not to listen to me. You have an unsupported DCL command, SET WATCH FILE/CLASS= DECnet. With this command you can cause the XQP to log any file activity for your process. You must type the DCL command SET WATCH FILE with FILE in four letters. Do not use abbreviations, it doesn't work. Then you specify SET CLASS= MAJOR, you have major statistics to the file, but it is unsupported, and it could lead to very important CPU consumption.

PANEL MEMBER

Can I just make a last comment on that. I believe that what you have said is in at least one, if not two, of the SIR's that were voted on for this 87 European Top Five. There was an SIR that was very similar, if not the same, but it didn't make it into the top five, so we recognise that is something that is needed but have it as a suggestion. The rest of your colleagues did not give it the votes that were needed.

Comment from audience, unable to hear.

45. HANNU KOKKO, UNIC OY, FINLAND

I would like to reuse TPU-procedures. Is there a way to do it (include call)?

Include file or call or anything with TPU.

PANEL MEMBER

There is nobody here who is representing TPU but we will take it back.

46. TONY HUNSON, ICI. UK

Will it ever be possible to close DECnet down and PSI down separately? What I want to do is close DECnet down and leave the X.25 up as long as possible.

PANEL MEMBER

Is there anyone from PSI in the audience? I am sorry, we can't even take that one home with us, as PSI is a European network engineering.

TONY ARNOLD

I have quite a nice story concerning PSI. We had a hacker get into one of our machines across X.25 and he logged in as a username called SHUTDOWN. Now if you log in as SHUTDOWN on this particular machine, you can guess what happens - the machine shutdown. Half way through this particular procedure, it switched off DECnet, switched off its PSI link and then hung, because it could no longer send its messages out to the terminal that requested the shutdown. It remained in that state for the rest of the weekend. Quite a good security feature I thought! (Laughter) Can we have another question please?

BACK TO MAIN CONFERENCE

(Mid question)

The trouble is, with coming from Version 3 and so on we don't get users to go into and understand the requirement for first being allowed into the rights list database, access to identifiers and then they have to get the access to the files by putting another ACL on the element. Some form of niche which would allow rights list to grant access to files owned by a particular user would be very nice.

PANEL MEMBER

I am not sure I understand the question. If you could catch me later on that.

QUESTION FORTY SIX
KLAUS PETERSON, DENMARK

When will system messages be available in HELP?

PANEL MEMBER

We will take that under advisement. I don't know whether it is now or will be in the future.

KLAUS

Okay, one more. What about LIB$COPY? When will that come?

PANEL MEMBER

There are no plans. However, making more utilities callable is a direction we are heading in.

47. ULRICH STRATHMEIER, BEB HANNON, GERMANY

What do you think of replacing the system UIC by a resource identifier?

PANEL MEMBER

I am not clear how I can get a dump on stand-alone backup.

PANEL MEMBER

You booted stand-alone backup on a large disc? Yes. Put a dump file on the SYSEXE directory on that large disc and when stand-alone backup crashes it will write a dump file into SYSDUMP.

EHRENSPERGER KURT

50.

Another small question. When I use ANALYZE/DISK_STRUCTURE and /REPAIR and so on, then I get some error messages on directory file, SYSEXE, that it has some bad point.

PANEL MEMBER

The back link problems? That is fixed in a future release. We begin to discriminate between the original and file directory entry and the aliases and we stop making those messages. That also means that we will no longer be alternately flipping the back links from one file to another as you backup and restore and analyse and do things like that.

EHRENSPERGER KURT

Will it be implemented in V4.6? No. Perhaps in V5?

51. FREEK DE DRUYF, COMP. CENTRE, DELFT UNIVERSITY OF TECHNOLOGY

Will there be accounting for logical links which pass through a Router node? Gathering should take place in the router node.

PANEL MEMBER

You can repeat that request for future features from the DECnet people if we get the link up - if we can establish a logical link to the States!

TONY ARNOLD

We are currently waiting for the operators to put us through. As soon as they do it will become live, and either all hell will be let loose, or we will be talking to the States. Could you please ask any further questions?

52.

When I received VMS V4 I saw something named Multinational set. I tried MAIL, SET PERSONALNAME and it rejects characters from Multinational set. You cannot use Multinational character sets with SET PERSONALNAME commands in the MAIL utility.

PANEL MEMBER

He has used it right there. I think I have seen it in his personal name. I have seen Multinational characters in his personal name.

TONY ARNOLD

Is that patch available from DEC? Could it be put on a sig tape?

PANEL MEMBER

It is noted as a problem. We will see if it has been fixed in 4.6.

53. ALAN SILVERMAN, CERN

Another security question. One of the tools we are supposed to use was CHECKSUM checking after various incidents and it provides a good idea that you provide some more tools for security. In particular, the CHECKSUM program should get some documentation so that people will know how to use it properly. It would help us if you provided us with some examples that we could use, for example, correct checksums for images after you ship them. You could provide a file in each kit which had the checksum for the images you installed which you could then install and use. CHECKSUM sounds the perfect solution and it would be nice if you would help us to check our own system.

PANEL MEMBER

The reason I ask is because there are so few of them
that we cannot decide ourselves on whether QUANTUM is
too big or too small right now and so we have elected
to leave it as it is. Because it is only one
parameter. AUTOGEN would be useful if there were a
large number of system parameters to change, but if you
only have to change one parameter maybe there are
better things to do with AUTOGEN.

PANEL MEMBER

The rate parameters, page fault rate and so on, are
based on page faults per CPU second so they naturally
adjust. If CPU runs faster you get more page faults
and faster adjustment.

QUESTIONER

My second question is about wild card characters. I
mean, for example, characters to exclude specific
beginnings for files or something like that.

PANEL MEMBER

Noted as a suggestion. There are no plans at present
to provide an extension to the wild card capabilities
in file names.

QUESTIONER

Another question is something like an INCLUDE command
to be able to expand a file dynamically. It is
possible of course in the DCL level with an @ command,
but anywhere, even if you are executing a user name.

PANEL MEMBER

There is an RTL routine to do wild card file
processing, LIB$FILESCAN, but you are talking about
interactively at the terminal? Noted.

PANEL MEMBER

A comment on the last two. Those and some of the
others in the last half hour or so have been more on
the suggestion type side than question side, so I would
add to that, submit an SIR.

TONY ARNOLD

Yes, if you could please gear your questions to
problems that are of a technical nature and submit an
SIR with suggestions.

55.

When you look into VAX VMS system, the password is
staying in the typeahead for a while. This is not good
security and should be purged automatically by a login
autotext. Will there be something done in a future
release? You can certainly write an application doing
IO$PURGE but it should be done automatically.

PANEL MEMBER

On the surface that would seem like a very
straightforward problem to solve. However, the
terminal typeahead buffer is only readable from inner
modes, and people with enough privilege to read the
type ahead buffer have enough privilege to damage you
in so many ways that closing that one is insignificant.

QUESTIONER

I am thinking that when the system crashes on mag tape,
the password remains on that tape.

PANEL MEMBER

Oh we have lots more information than passwords when
you send us a crash dump! There are all kinds of
secure information available all through a crash dump
that is now completely at the disposal of the reader.
That is just one of many problems. When you release
the crash dump you are releasing a lot of information.
Please send us more dumps! (laughter)

PAUL TEECE

We have EMACS, we had to get that as well.

TONY ARNOLD

This is a good question. Can I generalise the question a little bit and ask what plans there are for other interfaces for TPU? We have EVE, we have EDT, WPS+ has been mentioned. Are there any plans for things like an EMACS emulator, or a VI emulator... or is there an EVE emulator in TECO?

PANEL MEMBER

I don't think you have anyone here who can comment on TPU features. We can say there are no new files in Version Future.

58. BURT ZORN, T.U. DELFT, NETHERLANDS

Why can't virtual terminals be enabled on RTA terminals?

TONY ARNOLD

Disconnectable? You mean so that you can disconnect?

BURT

Yes.

PANEL MEMBER

It can't be done, and he doesn't know why.

TONY ARNOLD

I think I know somebody who has done it.

BURT

I have already tried in the SYSGEN parameters but they don't seem to work in the RT terminals.

PANEL MEMBER

He remembered why after he told him. The class driver which implements virtual terminals is only running on the original host, not on the host that you SET HOST to. That is why we haven't done it. If someone has managed to seriously subvert the will and intent of a remote terminal....

TONY ARNOLD

I think the way it was done was to set the bit in the default terminal characteristics...that doesn't work.

PANEL MEMBER

It works for LAT terminals.

TONY ARNOLD

It may have been an X.29 call that he did it for, over X.25.

PANEL MEMBER

I think that that is on the "it can't be done without a major redesign" list. No such redesign is planned.

59. PAUL TEECE, GOLDMAN SACHS, U.K.

Since the US link failed could you very quickly say whether you think there are any changes to the DEBNT driver in 4.6?

PANEL MEMBER

There are changes to ET driver in 4.6. What question were you looking for?

PAUL TEECE

My question was about using TSM and NCP to connect to terminal servers and the problem is to do with the DEBNT driver, we believe. If you are saying that there are changes in 4.6...

Locked by another user - opened by another user or
something like that.

PANEL MEMBER

Sounds like a feature to me! (laughter)

You can RENAME it with a simple XQP call which is what
the RENAME ends up doing. It does not require you to
open the file for reading. That is where you get your
access conflict, when you try read and somebody else
has the file open for exclusive operation.   You don't
have to open the file to do in order to RENAME it.

QUESTIONER

Yes, but I expect when I try to RENAME a file that is
locked by another user, it shouldn't be RENAMEd.

PANEL MEMBER

There is no problem at all because the name of a file
is not bound to the access to the file. That is all
handled by the file ID and once that is allocated, how
the name is bound to the ID is a separate operation of
entering stuff in the directories and can proceed
independently.

PANEL MEMBER

As an aside on that, in Version Future, the ability to
manipulate the filename is controlled by the protection
of the file. That is a change where currently you can
RENAME a file but you cannot delete, and effectively
delete it because you remove the name.   We are no
longer going to allow that.

QUESTION SIXTY ONE
PETER BIDDEN, EUROPEAN MOLECULAR BIOLOGY

A little MAIL question! The scenario is quite simple.
You have a four storey building. You have people on
each floor. On each floor there is a printer. Now the
man on the top floor would like his MAIL/PRINT to come
out on his printer and the man on the ground floor
would like it to come out on the ground floor printer.
I asked the Telephone Service Centre in Munich and they

said, "Ah yes, there is a MAIL log or something, we'll
call you back." And after a day or so I called them
back and they said "Whoops!" Why? Is this something
that is in Version Future that hasn't been released
yet?

PANEL MEMBER

I believe that in Version Future you will see a number
of qualifiers on that or a selection ability for mail
printing, specifying queue names, for example.

I am told that is also likely to be part of the user
profile, so you will be able to set it up on a per-user
basis.

TONY ARNOLD

Are there any more questions? Okay, if there are no
more questions, thank you very much and thank you to
the panel for attending.

THE TOP 35 SIR's AS RANKED BY ALL USERS

Total ballots in this category: 323   Fall 1987 Ballot

SIR Nr.	SIR Description	Total Votes
28	Display open files on SHOW PROCESS	173
24	Capture interactive session better	146
67	Individual field reports from AUTHORIZE	124
13	Standardize format for printable output	97
15	First/last file-specs in BACKUP log	92
26	Various VMSmail enhancements	91
11	Queued requests for ALLOCATE command	89
71	Provide more LAT accounting info	89
2	Implement cluster-accessible tape drives	83
14	Support for simple project accounting	78
54	Send more developers to Symposia	78
12	Tape automatic volume recognition	76
16	Support no CR/LF in DCL WRITE	76
19	Improve DCLTABLES manipulations	73
6	More detail in VMS accounting records	71
20	DCL return status enhancements	71
25	Enhance sysgen parameter readability	67
5	Abbreviated commands in DTR	64
42	Implement SYSGEN DISCONNECT	63
8	Improve VMS Mount service messages	62
62	Security alarm messages to a file.	61
64	Lexical for getting RIGHTSLIST info	59
23	DCL /LOG needs more consistency	57
34	Combine DEFINE, ASSIGN commands	57
55	Provide sales update for customers	56
58	Enhance COPY to copy ACL's	55
59	Enhance file access from user images	55
27	Enhance SET/HOST/DTE for more modems	55
35	Provide F$FILE_ATTRIBUTES service	54
37	$TRNLNM wildcard support	53
1	Improve heterogeneous user group support	52
18	Enhance command line editing	52
63	DECnet proxy access for SET HOST command	51
52	TPU should display all characters	51
30	DEFINE/KEY enhancements	47

THE TOP 35 SIR's AS RANKED BY VAX 8700/8800 USERS

Total ballots in this category: 44   Fall 1987 Ballot

SIR Nr.	SIR Description	Total Votes
28	Display open files on SHOW PROCESS	20
71	Provide more LAT accounting info	19
12	Tape automatic volume recognition	18
24	Capture interactive session better	18
6	More detail in VMS accounting records	17
67	Individual field reports from AUTHORIZE	17
11	Queued requests for ALLOCATE command	17
14	Support for simple project accounting	15
15	First/last file-specs in BACKUP log	15
10	Provide callable OPCOM interface	14
54	Send more developers to Symposia	14
64	Lexical for getting RIGHTSLIST info	13
59	Enhance file access from user images	12
5	Abbreviated commands in DTR	12
62	Security alarm messages to a file.	11
2	Implement cluster-accessible tape drives	11
1	Improve heterogeneous user group support	10
61	End-to-end encryption within DECnet-VAX	9
18	Enhance command line editing	9
29	Enhance MOUNT/FOR for uninitialized tapes	9
8	Improve VMS Mount service messages	9
26	Various VMSmail enhancements	9
20	DCL return status enhancements	8
13	Standardize format for printable output	8
69	Enhance MONITOR DISK	8
19	Improve DCLTABLES manipulations	8
55	Provide sales update for customers	7
37	$TRNLNM wildcard support	7
68	Provide HSC tape-to-tape utility	7
52	TPU should display all characters	7
4	Provide SCS communication services	7
30	DEFINE/KEY enhancements	6
35	Provide F$FILE_ATTRIBUTES service	6
23	DCL /LOG needs more consistency	6
63	DECnet proxy access for SET HOST command	6

THE TOP 35 SIR's AS RANKED BY VAX 8300/8200 USERS

Total ballots in this category: 61   Fall 1987 Ballot

SIR Nr.	SIR Description	Total Votes
24	Capture interactive session better	31
28	Display open files on SHOW PROCESS	27
71	Provide more LAT accounting info	27
15	First/last file-specs in BACKUP log	22
26	Various VMSmail enhancements	21
67	Individual field reports from AUTHORIZE	20
54	Send more developers to Symposia	18
6	More detail in VMS accounting records	16
2	Implement cluster-accessible tape drives	16
11	Queued requests for ALLOCATE command	15
59	Enhance file access from user images	15
12	Tape automatic volume recognition	15
1	Improve heterogeneous user group support	15
19	Improve DCLTABLES manipulations	14
4	Provide SCS communication services	14
13	Standardize format for printable output	14
5	Abbreviated commands in DTR	14
27	Enhance SET/HOST/DTE for more modems	13
68	Provide HSC tape-to-tape utility	13
25	Enhance sysgen parameter readability	13
55	Provide sales update for customers	12
8	Improve VMS Mount service messages	12
62	Security alarm messages to a file.	12
37	$TRNLNM wildcard support	12
42	Implement SYSGEN DISCONNECT	12
14	Support for simple project accounting	12
56	Enhance DECnet remote file access	11
10	Provide callable OPCOM interface	11
16	Support no CR/LF in DCL WRITE	11
18	Enhance command line editing	10
61	End-to-end encryption within DECnet-VAX	10
52	TPU should display all characters	10
63	DECnet proxy access for SET HOST command	10
64	Lexical for getting RIGHTSLIST info	10
66	STB support on more devices	10

THE TOP 35 SIR's AS RANKED BY 11/780, 11/782 and 11/785 USER

Total ballots in this category: 198   Fall 1987 Ballot

SIR Nr.	SIR Description	Total Votes
28	Display open files on SHOW PROCESS	106
24	Capture interactive session better	77
67	Individual field reports from AUTHORIZE	76
11	Queued requests for ALLOCATE command	68
2	Implement cluster-accessible tape drives	67
13	Standardize format for printable output	58
15	First/last file-specs in BACKUP log	56
12	Tape automatic volume recognition	56
71	Provide more LAT accounting info	54
54	Send more developers to Symposia	51
26	Various VMSmail enhancements	50
6	More detail in VMS accounting records	49
19	Improve DCLTABLES manipulations	47
16	Support no CR/LF in DCL WRITE	45
5	Abbreviated commands in DTR	45
62	Security alarm messages to a file.	44
8	Improve VMS Mount service messages	42
14	Support for simple project accounting	42
20	DCL return status enhancements	41
25	Enhance sysgen parameter readability	41
55	Provide sales update for customers	39
42	Implement SYSGEN DISCONNECT	37
1	Improve heterogeneous user group support	37
64	Lexical for getting RIGHTSLIST info	36
59	Enhance file access from user images	36
18	Enhance command line editing	36
34	Combine DEFINE, ASSIGN commands	34
10	Provide callable OPCOM interface	33
30	DEFINE/KEY enhancements	32
63	DECnet proxy access for SET HOST command	31
52	TPU should display all characters	31
61	End-to-end encryption within DECnet-VAX	30
23	DCL /LOG needs more consistency	30
56	Enhance DECnet remote file access	29
68	Provide HSC tape-to-tape utility	29

THE TOP 35 SIR's AS RANKED BY MicroVAX I,II USERS

Total ballots in this category: 200   Fall 1987 Ballot

SIR Nr.	SIR Description	Total Votes
28	Display open files on SHOW PROCESS	102
24	Capture interactive session better	95
67	Individual field reports from AUTHORIZE	84
71	Provide more LAT accounting info	58
11	Queued requests for ALLOCATE command	57
13	Standardize format for printable output	57
54	Send more developers to Symposia	55
26	Various VMSmail enhancements	54
16	Support no CR/LF in DCL WRITE	53
15	First/last file-specs in BACKUP log	52
2	Implement cluster-accessible tape drives	52
25	Enhance sysgen parameter readability	49
14	Support for simple project accounting	48
37	$TRNLNM wildcard support	46
35	Provide F$FILE_ATTRIBUTES service	46
19	Improve DCLTABLES manipulations	44
6	More detail in VMS accounting records	44
8	Improve VMS Mount service messages	43
20	DCL return status enhancements	42
12	Tape automatic volume recognition	42
42	Implement SYSGEN DISCONNECT	41
55	Provide sales update for customers	41
63	DECnet proxy access for SET HOST command	40
64	Lexical for getting RIGHTSLIST info	40
62	Security alarm messages to a file.	38
5	Abbreviated commands in DTR	35
27	Enhance SET/HOST/DTE for more modems	34
18	Enhance command line editing	33
58	Enhance COPY to copy ACL's	32
1	Improve heterogeneous user group support	32
52	TPU should display all characters	31
23	DCL /LOG needs more consistency	31
47	Resolve Fortran/Debug "TRUE"	31
4	Provide SCS communication services	30
59	Enhance file access from user images	29

THE TOP 35 SIR's AS RANKED BY MicroVAX 2000, VAXstation 2000

Total ballots in this category: 45   Fall 1987 Ballot

SIR Nr.	SIR Description	Total Votes
24	Capture interactive session better	17
28	Display open files on SHOW PROCESS	17
2	Implement cluster-accessible tape drives	16
71	Provide more LAT accounting info	16
67	Individual field reports from AUTHORIZE	15
54	Send more developers to Symposia	14
18	Enhance command line editing	13
35	Provide F$FILE_ATTRIBUTES service	12
5	Abbreviated commands in DTR	12
55	Provide sales update for customers	12
59	Enhance file access from user images	12
27	Enhance SET/HOST/DTE for more modems	12
1	Improve heterogeneous user group support	12
61	End-to-end encryption within DECnet-VAX	11
15	First/last file-specs in BACKUP log	11
25	Enhance sysgen parameter readability	11
14	Support for simple project accounting	10
62	Security alarm messages to a file.	10
64	Lexical for getting RIGHTSLIST info	10
12	Tape automatic volume recognition	10
16	Support no CR/LF in DCL WRITE	10
4	Provide SCS communication services	9
58	Enhance COPY to copy ACL's	9
7	Better terminal-printer support	9
19	Improve DCLTABLES manipulations	9
22	/USER for running detached jobs	9
37	$TRNLNM wildcard support	9
52	TPU should display all characters	9
11	Queued requests for ALLOCATE command	9
26	Various VMSmail enhancements	8
10	Provide callable OPCOM interface	8
13	Standardize format for printable output	8
34	Combine DEFINE, ASSIGN commands	7
8	Improve VMS Mount service messages	7
56	Enhance DECnet remote file access	7

THE TOP 35 SIR's AS RANKED BY EDUCATIONAL USERS

Total ballots in this category: 62   Fall 1987 Ballot

SIR Nr.	SIR Description	Total Votes
28	Display open files on SHOW PROCESS	34
24	Capture interactive session better	32
67	Individual field reports from AUTHORIZE	26
15	First/last file-specs in BACKUP log	21
6	More detail in VMS accounting records	21
16	Support no CR/LF in DCL WRITE	20
13	Standardize format for printable output	20
71	Provide more LAT accounting info	20
26	Various VMSmail enhancements	19
19	Improve DCLTABLES manipulations	18
12	Tape automatic volume recognition	18
11	Queued requests for ALLOCATE command	18
14	Support for simple project accounting	16
64	Lexical for getting RIGHTSLIST info	16
63	DECnet proxy access for SET HOST command	15
2	Implement cluster-accessible tape drives	15
29	Enhance MOUNT/FOR for uninitialized tapes	15
62	Security alarm messages to a file.	15
44	Add sorting capability in editors	14
59	Enhance file access from user images	13
54	Send more developers to Symposia	13
43	Provide "footers" in RUNOFF	12
25	Enhance sysgen parameter readability	12
5	Abbreviated commands in DTR	12
55	Provide sales update for customers	12
37	$TRNLNM wildcard support	12
10	Provide callable OPCOM interface	11
58	Enhance COPY to copy ACL's	11
34	Combine DEFINE, ASSIGN commands	11
1	Improve heterogeneous user group support	11
20	DCL return status enhancements	10
23	DCL /LOG needs more consistency	10
18	Enhance command line editing	10
31	Add /BELL to various DCL commands	10
8	Improve VMS Mount service messages	10

THE TOP 35 SIR's AS RANKED BY COMPUTER SCI. RESEARCHERS

Total ballots in this category: 30   Fall 1987 Ballot

SIR Nr.	SIR Description	Total Votes
12	Tape automatic volume recognition	15
11	Queued requests for ALLOCATE command	14
6	More detail in VMS accounting records	12
54	Send more developers to Symposia	12
19	Improve DCLTABLES manipulations	11
71	Provide more LAT accounting info	11
24	Capture interactive session better	10
67	Individual field reports from AUTHORIZE	10
28	Display open files on SHOW PROCESS	10
14	Support for simple project accounting	9
15	First/last file-specs in BACKUP log	8
34	Combine DEFINE, ASSIGN commands	8
16	Support no CR/LF in DCL WRITE	8
55	Provide sales update for customers	8
1	Improve heterogeneous user group support	8
5	Abbreviated commands in DTR	8
29	Enhance MOUNT/FOR for uninitialized tapes	7
58	Enhance COPY to copy ACL's	7
27	Enhance SET/HOST/DTE for more modems	7
13	Standardize format for printable output	7
63	DECnet proxy access for SET HOST command	6
10	Provide callable OPCOM interface	6
2	Implement cluster-accessible tape drives	6
56	Enhance DECnet remote file access	5
30	DEFINE/KEY enhancements	5
60	Mandatory security controls in VMS.	5
61	End-to-end encryption within DECnet-VAX	5
8	Improve VMS Mount service messages	5
64	Lexical for getting RIGHTSLIST info	5
66	STB support on more devices	5
4	Provide SCS communication services	5
26	Various VMSmail enhancements	5
22	/USER for running detached jobs	4
37	$TRNLNM wildcard support	4
41	Support for higher baud rates	4

THE TOP 35 SIR's AS RANKED BY SERVICE BUREAU OPERATORS

Total ballots in this category: 26   Fall 1987 Ballot

SIR Nr.	SIR Description	Total Votes
28	Display open files on SHOW PROCESS	16
12	Tape automatic volume recognition	11
2	Implement cluster-accessible tape drives	9
9	Provide a fast file scan.	9
5	Abbreviated commands in DTR	8
20	DCL return status enhancements	8
24	Capture interactive session better	8
1	Improve heterogeneous user group support	8
55	Provide sales update for customers	8
67	Individual field reports from AUTHORIZE	8
6	More detail in VMS accounting records	7
4	Provide SCS communication services	7
50	Provide traceback on PERFORM statements	6
19	Improve DCLTABLES manipulations	6
8	Improve VMS Mount service messages	6
68	Provide HSC tape-to-tape utility	6
11	Queued requests for ALLOCATE command	5
54	Send more developers to Symposia	5
26	Various VMSmail enhancements	5
62	Security alarm messages to a file.	5
22	/USER for running detached jobs	5
46	Standardize data-type support	5
71	Provide more LAT accounting info	5
58	Enhance COPY to copy ACL's	4
25	Enhance sysgen parameter readability	4
23	DCL /LOG needs more consistency	4
16	Support no CR/LF in DCL WRITE	4
29	Enhance MOUNT/FOR for uninitialized tapes	4
15	First/last file-specs in BACKUP log	3
27	Enhance SET/HOST/DTE for more modems	3
7	Better terminal-printer support	3
13	Standardize format for printable output	3
61	End-to-end encryption within DECnet-VAX	3
30	DEFINE/KEY enhancements	3
35	Provide F$FILE_ATTRIBUTES service	3

THE TOP 35 SIR's AS RANKED BY HARDWARE DEVELOPERS

Total ballots in this category: 35   Fall 1987 Ballot

SIR Nr.	SIR Description	Total Votes
11	Queued requests for ALLOCATE command	15
24	Capture interactive session better	15
28	Display open files on SHOW PROCESS	15
67	Individual field reports from AUTHORIZE	14
54	Send more developers to Symposia	13
2	Implement cluster-accessible tape drives	13
26	Various VMSmail enhancements	11
12	Tape automatic volume recognition	11
55	Provide sales update for customers	10
62	Security alarm messages to a file.	10
65	Identifier to be the owner of a process	10
6	More detail in VMS accounting records	10
61	End-to-end encryption within DECnet-VAX	9
14	Support for simple project accounting	9
64	Lexical for getting RIGHTSLIST info	9
10	Provide callable OPCOM interface	9
13	Standardize format for printable output	9
69	Enhance MONITOR DISK	9
20	DCL return status enhancements	8
59	Enhance file access from user images	8
71	Provide more LAT accounting info	8
52	TPU should display all characters	7
1	Improve heterogeneous user group support	7
19	Improve DCLTABLES manipulations	7
58	Enhance COPY to copy ACL's	7
4	Provide SCS communication services	6
63	DECnet proxy access for SET HOST command	6
5	Abbreviated commands in DTR	6
56	Enhance DECnet remote file access	6
66	STB support on more devices	6
30	DEFINE/KEY enhancements	6
35	Provide F$FILE_ATTRIBUTES service	6
16	Support no CR/LF in DCL WRITE	6
42	Implement SYSGEN DISCONNECT	5
15	First/last file-specs in BACKUP log	5

THE TOP 35 SIR's AS RANKED BY TELECOMMUNICATIONS USERS

Total ballots in this category: 89   Fall 1987 Ballot

SIR Nr.	SIR Description	Total Votes
28	Display open files on SHOW PROCESS	45
24	Capture interactive session better	38
67	Individual field reports from AUTHORIZE	34
11	Queued requests for ALLOCATE command	33
6	More detail in VMS accounting records	27
12	Tape automatic volume recognition	27
54	Send more developers to Symposia	27
13	Standardize format for printable output	27
26	Various VMSmail enhancements	26
8	Improve VMS Mount service messages	25
20	DCL return status enhancements	23
16	Support no CR/LF in DCL WRITE	23
55	Provide sales update for customers	22
5	Abbreviated commands in DTR	22
71	Provide more LAT accounting info	22
2	Implement cluster-accessible tape drives	21
64	Lexical for getting RIGHTSLIST info	20
15	First/last file-specs in BACKUP log	20
19	Improve DCLTABLES manipulations	20
56	Enhance DECnet remote file access	18
62	Security alarm messages to a file.	16
30	DEFINE/KEY enhancements	16
42	Implement SYSGEN DISCONNECT	15
1	Improve heterogeneous user group support	15
4	Provide SCS communication services	15
18	Enhance command line editing	15
61	End-to-end encryption within DECnet-VAX	14
23	DCL /LOG needs more consistency	14
35	Provide F$FILE_ATTRIBUTES service	14
25	Enhance sysgen parameter readability	14
59	Enhance file access from user images	14
27	Enhance SET/HOST/DTE for more modems	13
63	DECnet proxy access for SET HOST command	12
14	Support for simple project accounting	12
37	$TRNLNM wildcard support	12

THE TOP 35 SIR's AS RANKED BY OTHER

Total ballots in this category: 23   Fall 1987 Ballot

SIR Nr.	SIR Description	Total Votes
71	Provide more LAT accounting info	14
28	Display open files on SHOW PROCESS	13
67	Individual field reports from AUTHORIZE	11
14	Support for simple project accounting	11
19	Improve DCLTABLES manipulations	10
54	Send more developers to Symposia	10
41	Support for higher baud rates	9
24	Capture interactive session better	9
66	STB support on more devices	9
27	Enhance SET/HOST/DTE for more modems	9
8	Improve VMS Mount service messages	9
1	Improve heterogeneous user group support	8
13	Standardize format for printable output	8
58	Enhance COPY to copy ACL's	8
6	More detail in VMS accounting records	8
15	First/last file-specs in BACKUP log	8
30	DEFINE/KEY enhancements	8
59	Enhance file access from user images	7
46	Standardize data-type support	7
3	Remove TU-58 boot requirement for 750	7
42	Implement SYSGEN DISCONNECT	7
12	Tape automatic volume recognition	6
20	DCL return status enhancements	5
33	DCL DEFINE enhancements	5
34	Combine DEFINE, ASSIGN commands	5
26	Various VMSmail enhancements	4
31	Add /BELL to various DCL commands	4
55	Provide sales update for customers	4
29	Enhance MOUNT/FOR for uninitialized tapes	4
52	TPU should display all characters	3
25	Enhance sysgen parameter readability	3
2	Implement cluster-accessible tape drives	3
56	Enhance DECnet remote file access	3
11	Queued requests for ALLOCATE command	3
22	/USER for running detached jobs	3

For this, if no other reason, I would NEVER buy DiskKeeper or any other product from this company.

Alan E. Frisbie
Flying Disk Systems, Inc.
4759 Round Top Drive
Los Angeles, CA 90065

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================================================================
Note 660.33          Applications software standards      33 of 33
"Bob Huckins"                        48 lines   6-NOV-1987 19:24
             -< Comments from a Developer >-
----------------------------------------------------------------
```

I hope people are still watching this conference: I have some belated comments.

As an OEM, I'm a little distressed at the paranoid tone of some of the suggestions. I understand (from experience) the guarded attitude that many people have towards layered product software, but some of the suggestions would make life difficult for OEMs and less sophisticated users. For example, the suggestion that privileged software be supplied in source form would increase the size of distribution kits (remember all those systems with RX50s!), would require one or more language processors on the target system, and would be ultimately futile, since who is going to look through tens of thousands of lines of code for trojan horses? Many of the other suggestions assumed that there is a guru managing the system, which is simply not true for the majority of VAXes running today.

Another consideration for the development of standards is compatibility with older products. We have been shipping VMS-based layered products since VMS version 2, and our customers have developed procedures and programs which depend on our software being installed where it is (we patterned our software after DEC layered products, By the way: executables in SYS$SYSTEM, etc.).

We (and our customers, I hope) would be willing to adjust to a new installation scheme (by this I mean not VMSINSTAL itself but where layered products are installed, how commands are defined, etc.), if DEC would put its stamp of approval on it, and it made installing all layered products easier.

If such a scheme were developed, I would like it to have these characteristics:

1. No editing of system startup file. Have some generic mechanism by which layered products can have an initialization procedure run automatically (at system startup time) by making an installation time request.

2. No manual tuning required. This can almost be done now by changing MODPARAMS.DAT, there needs to be a foolproof mechanism.

3. No editing of login procedures. As in note 1, a generic mechanism to invoke per process login procedures.

As you can see, my concerns are more with unsophisticated users with small systems than with giant clusters managed by geniuses.

P.S. Re Frank Nagy's note about multiple DCL command tables: I believe this was one of the top 10 SIR's several years ago but was quashed by DEC for performance reasons.

Bob Huckins
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Golf & Meacham Rds.
Schaumburg, IL 60196
312-884-3659

```
================================================================
Note 663.32          Comments on the SPR process      32 of 43
"Kevin Angley"                       18 lines   2-NOV-1987 17:54
      -< DEC does care - but will they take action???? >-
----------------------------------------------------------------
```

In response to my SPR on RUNOFF which I returned for a more intelligent response, I got a call from a Peggy in Colorado who agreed that it was a stupid answer, and at least got me to believe that somebody at DEC cares that the SPR process sucks.

So ... DEC does recognize this as one of their things to work on, and it would help them to help us if you made your complaints known through every avenue .. DECUS, these notes (they read them, you know), your salesperson, and probably the best bet is your Field Service manager.

DSIN is a fantastic idea. If they could just find somebody to write good software to support it.....

DALE E. COY
LOS ALAMOS NATIONAL LAB
PO BOX 1663, MS J957
LOS ALAMOS, NM 87545
505-667-3270

==
Note 663.35   Comments on the SPR process   35 of 43
"Bill Mayhew"   43 lines   3-NOV-1987 14:54
-< If you or any of your IM force should be caught or killed... >-
----

re: co-location:

Agreed, this is an excellent idea. At least _some_ products are currently "supported" this way. After escalating a series of unresponsive SPRs to the Digital product manager, I gained a fair amount of insight into how this product (at least) is supported.

A couple of the highlights:

1. Unless the product is a high-volume product (e.g.   VMS itself) it is likely that the CSC "support team" is actually the support team for a variety of other products -- potentially dozens of them. Needless to say, they don't know any one product well. This is, IN MY HUMBLE OPINION, counterproductive, since it's the more "obscure" products that one is MOST likely to need decent support for!

2. The machine resources at hand at the CSC are often inadequate. In many instances, the software product in question is not even installed on the at-hand system, and the service contact has to install the product, _then_ try to reproduce your problem.

3. While there is (at least for this product, which shall remain nameless to protect the ... well, let's say they're still on trial) in fact a group of support developers at the main engineering center, coresident with the product developers, the communication between the support portion of the development team and the CSC support team is often fairly minimal. Unless one squeaks one's wheel fairly loudly, it is limited to Electronic mail message. If you squeak loudly enough, they actually talk to each other on the phone (after figuring out the time zone differences and compensating for lunch hours, etc.).

4. There is supposed to be a mechanism so that if a call is not responded to -- i.e. a fix or work-around or "restriction" noted -- with some period of time (I was told 7 days), then the problem is escalated to a CSC manager who gets involved with the engineering support people. In practice, if this happens, it is invisible to the customer. ("Transparent support" is not my idea of a good design criterion :-))

While I appreciated seeing all this on the table, I was, needless to say, not amused.

Bill Mayhew
Village Systems Workshop Inc
PO Box 642
Natick MA 01760
617-237-0238

==
Note 663.36   Comments on the SPR process   36 of 43
"Dale E. Coy (505) 667-3270"   25 lines   3-NOV-1987 18:04
           -< A couple of hints about telephone support >-

Of course, there are measurements and standards for support (wouldn't you do it this way?) One of them is obviously "time between customer call and closure". Another one is probably "number of calls handled per support person". This leads to some very interesting gyrations. I don't know of any good way to measure quality, but I sure wish there was one.

One little tidbit not usually recognized is that you don't have to accept "closure" of a problem from telephone support. Not that this should be used lightly, but if you get an answer that doesn't seem reasonable to you ("we don't understand what the problem is, can't duplicate it, and it will be fixed in a future release"), you can essentially demand that the problem be escalated to a manager, or even (horrors) a local office

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================================================================
Note 663.39          Comments on the SPR process          39 of 43
"Bill Mayhew"                        9 lines    5-NOV-1987 10:38
                -< Whose job is this, anyway? >-
----------------------------------------------------------------
```

re: .38, getting the problem number

Of course. I always do that. That doesn't mean, however, that it is followed up and escalated "automatically", the way it's "supposed to be". Sure, I can call them, number in hand, and say "WTH's my problem fix?"... but I have this deep-seated aversion to paying Digital for allowing me the privilege of doing their job for them.

Must be my upbringing, or something in my water...

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```
================================================================
Note 663.40          Comments on the SPR process          40 of 43
"Bruce Bowler"                      32 lines    5-NOV-1987 16:21
                         -< The loop >-
----------------------------------------------------------------
```

I had a long chat yesterday with an SPR manager (she shall remain nameless to protect her sanity) who finally described for me what happens to an SPR. First, you send it to Maynard, they transcribe it onto their system, which sends it to Colorado Springs, where they weed out duplicates, try to solve it, and then send it back to development.

As an alternate, you can enter it on DSIN, which goes through essentially the same steps except in starts in Colorado rather than maynard. But, SPR's from DSIN are not considered time critical so are only uploaded to SPR team every 3-4 days. (she assured me that this was going to change to a more time critical event)

As a final alternative, you can call Colorado and request that the support person you are talking to submit an SPR for you. This is the fastest way to get an SPR into the system.

One suggestion that I made to them was for them to periodically search their database for unanswered SPR's and send out a postcard telling us that they have not forgotten. I have an SPR that I sent in 2 years (24 months!!!) ago that I have not received an answer for. But yes they are still working on the problem.

Finally, don't be too quick to blame the developer/maintainer for lousy SPR answers. They write the original answer which then gets passed through a long chain of hands (including lawyers) before you see the answer. They may have said "patch xyz.exe as follows" and what you get is "{fixed in a future release of VMS after version 4.6". The developers/maintainers are really on our side, in many cases they want what we want, but the #%$&#^@%#$ lawyers get in the way.

Bruce Bowler
General Electric
1 River Road
Bldg 2 Room 609
Schenectady, NY 12345

```
================================================================
Note 763.15          VT320 Character Cell Terminal        15 of 16
"Bill Mayhew"                       31 lines   15-NOV-1987 19:35
                  -< Further user evaluations >-
----------------------------------------------------------------
```

Having finally gotten the VT320-DAs I ordered on announcement day (from an alternate source after it became clear that my distributor had botched the order and was trying to cover it up by blaming it on DEC)...

I have to agree that the character presentation is less than stellar. I haven't done a side-by-side comparison with the 220. I don't particularly find the 320 "objectionable", but it is definitely a disappointment. My impression is that the increase in resolution was not sufficient to compensate for the larger screen size, with the result being that the characters appear "dotty" (sort of like "grainy") in the vertical dimension. This may also be related to the size of each individual dot.

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===================================================================
Note 784.19              In search of a modem              19 of 24
"Dale E. Coy (505) 667-3270"            38 lines  21-NOV-1987 00:20
                  -< Discussion of VA2400s >-
-------------------------------------------------------------------
```

< Note 784.3 by NODE::US129532 "Larry Kilgallen" >

-< A vote against Racal-Vadic (the company) >-

The 2400 baud modem I need is one which handles the Vadic 3400
modulation scheme as well as Bell 212A.

The Vadic 3400 modulation scheme (2250/1150 Hz) was invented so
that you could do 1200 baud from an acoustic coupled modem.
That's the only advantage it has over the 212 scheme
(1200/2400). I haven't seen an acoustic coupled modem in use
for years (lots of them on shelves, though). My understanding
is that Vadic has nothing at 2400 which will also handle the
3400 modulation at 1200 baud. I understand your frustration at
not being able to get an answer, but:

Unless you have some acoustic coupled VA345x modems in use,
calling a VA345x from a VA2400 works fine. Likewise, calling a
VA2400 from a VA345x works fine. The VA345x will automatically
recognize that it needs to be in 212 mode. In other words, I
still recommend the 2400.

This connection to Pageswapper is made via 2400PA (non-MNP
version) to the rack-mount equivalent of the 2400PA in our
computer room (these support MNP), and then out via another 2400
card to your system. No problems whatsoever (if Ma Bell does a
good job). Note that the connection from our VAX to Pageswapper
TRIES to use 2400 baud and TRIES to use error correction - and
then gives up on both gently. I just get a plain old Username:
prompt.

Not so on the OASIS system, which uses DEC modems (3 at 1200 and
1 at 2400). I sometimes have to try 2 or 3 times if I call at
1200. I have given up trying to call at 2400 baud because I
always get one login failure, the Username: prompt, and am left
with about 15 characters I have to ^U before I can enter my
username. I'm sure it's the interaction with the error
correction inquiry from my end, but it's so annoying that I just
put up with 1200 baud.

DALE E. COY
LOS ALAMOS NATIONAL LAB
PO BOX 1663, MS J957
LOS ALAMOS, NM 87545
505-667-3270

```
===================================================================
Note 784.20              In search of a modem              20 of 24
"Larry Kilgallen"                       30 lines  21-NOV-1987 08:20
            -< Someone out there might require Vadic modulation >-
-------------------------------------------------------------------
```

| Note 784.19 Unless you have some acoustic-coupled Vadic 345x...

My problem is that the site in question is *this* site and I am
trying to ensure that *any* 1200 baud modem in the hands of a
DECUS member will work. I am certain I have seen in catalogs of
yore some non-acoustic (electric?) modems from Vadic which have
Vadic modulation as their only 1200 baud modulation scheme. I
do not want to exclude somebody who happens to have one of
those.

(Thank you for the information about the relationship of the
protocol design to acoustic coupling, though, I had never heard
that before.)

I share your degree of enthusiasm over DEC modems. My
particular situation is trying to call the Electronic Store (no
I have not forgotten about them, just about the chance of
ordering anything from them). Using Vadic 3451-PA modems (from
several sites) I find it takes up to 20 tries to get a
connection, and that is without any problem of busy lines. I
have no trouble with Vadic 3451-PA dialing various client sites
and connecting with Bell 212A modulation, so lacking any details
I chalk it up to the supposition that the Electronic Store must
be using DEC modems of some flavor.

I lack your technical prowess at telling what a modem is doing
to the other modem, but deepest soul-searching has not allowed
me to pin the modem handshake problem on the fact that the
Electronic Store seems to run All-In-1!

Larry Kilgallen
Box 81, MIT Station
Cambridge, MA 02139-0901

```
================================================================
Note 820.0              Foreign Disk Comments        6 replies
"Ken Robinson"                     10 lines   12-NOV-1987 08:09
----------------------------------------------------------------
```

Our sight is getting some non-DEC (SI and/or Emulex) RA-81 compatible disk drives. Anyone have any comments or warnings about them.

Ken Robinson
Bell Communications Research
444 Hoes Lane, Room 4d449
Piscataway,N.J. 08854
(201)699-8796

```
================================================================
Note 820.1              Foreign Disk Comments          1 of 6
"Brian Tillman, Smiths Industries."   2 lines  12-NOV-1987 08:55
                        -< Psst... >-
----------------------------------------------------------------
```

I've heard rumors that SI is bad and Emulex is good. No first hand knowledge, though.

Brian Tillman
Lear Siegler, Inc.
4141 Eastern Ave. MS121
Grand Rapids, MI 49518-8727
(616)241-8425

```
================================================================
Note 820.2              Foreign Disk Comments          2 of 6
"Bob Hassinger"                    10 lines   12-NOV-1987 15:34
     -< Not happy with Emulex - reputation going down hill.. >-
----------------------------------------------------------------
```

There has been discussion elsewhere recently (DECUServe?) to the effect Emulex used to be a good company with good products but they have gone down hill more recently.

I know I have had very unsatisfactory experience with them on the SC7000 and do not care to consider their products in the future as a result because I am not convinced I can depend on them to be the kind of company I need.

Bob H

Bob Hassinger
Liberty Mutual Research Center
71 Frankland Road
Hopkinton, MA 01748
617-435-9061

```
================================================================
Note 820.3              Foreign Disk Comments          3 of 6
"Terry Kennedy"                    18 lines   13-NOV-1987 03:05
                  -< Never another Emulex! >-
----------------------------------------------------------------
```

I wouldn't ever buy anything from Emulex again - I bought an SC31 (Unibus RP/RM disk emulation) and a TC02 (Q-bus MS tape emulation). I was promised a free upgrade to MSCP support for the SC31 when it became available. Later, I saw an ad for the SC41 (a MSCP'd SC31). My sales representative's response was 'Oh, we decided to make it a different model product - sorry'. We never could get the TC02 to properly emulate a TSV05 tape - it always thought it was a broken TK25 - so they finally gave us our money back on it.

They may do better in other product areas but I don't want to find out.

A good guideline to follow is to ask 'Does this controller require patches or a special driver to operate?' If the answer is yes, run far and fast - it *will* bite you in the future! If the answer is no, get it in writing before signing the check. I suggest this with any vendor.

Terry Kennedy
95 Mohawk Trail
Ringwood, N.J. 07456
(201) 435-1890

```
===============================================================
Note 821.1      Undocumented V4.6 Print system fix.      1 of 9
"Bob Hassinger"              12 lines  12-NOV-1987 15:42
      -< What the (bleep) IS going on with the fiche? >-
---------------------------------------------------------------
```

.. Has anyone else (who bought the product) received their V4.6 fiche kits?

This is getting to be a significant issue and I wonder what is going on!

DEC told us we had to order the fiche separately, we went through a great deal of difficulty placing the order and getting it processed, we gave them the money and now we do not get what we paid for! What the (bleep) is going on?

Bob H

Bob Hassinger
Liberty Mutual Research Center
71 Frankland Road
Hopkinton, MA 01748
617-435-9061

```
===============================================================
Note 821.2      Undocumented V4.6 Print system fix.      2 of 9
"JEFF KILLEEN"               4 lines  12-NOV-1987 17:53
                -< ITS COMING >-
---------------------------------------------------------------
```

What the (bleep) is going on?

The *PROPOSED* FCS date is 16-NOV-87

JEFF KILLEEN
31 HOPEDALE ST.
HOPEDALE, MA. 01747
617-478-8098

```
===============================================================
Note 821.3      Undocumented V4.6 Print system fix.      3 of 9
"Terry Kennedy"             13 lines  13-NOV-1987 03:10
                -< Beep Beep! >-
---------------------------------------------------------------
```

They must be hand-writing each slide under a microscope - after all, the code *has* been shipped - what's to change? As a matter of fact, since the mandatory update patches never make it into the fiche, the fiche could be ready well *before* the VMS kits are shipped. Doesn't DEC realize that many of us depend on the fiche for patching device drivers and can't install the release without it?

Perhaps now is the time for all of us to make a concerted 'comment' to our sales/support reps about this. The 'future unannounced major release of VMS' will probably break all of our drivers - do we really want to wait N months for the fiche for it?

Terry Kennedy
95 Mohawk Trail
Ringwood, N.J. 07456
(201) 435-1890

```
===============================================================
Note 821.4      Undocumented V4.6 Print system fix.      4 of 9
"Bob Hassinger"             17 lines  16-NOV-1987 11:35
-< Perhaps DEC knows EXACTLY what the result of the delays is... >-
---------------------------------------------------------------
```

.. Doesn't DEC realize that many of us depend on the fiche for patching device drivers and can't install the release without it?

Just an observation - DEC may be aware that certain third party vendors need to patch the drivers they provide to their customers (say, for example Emulex and the drivers for their disk systems). If access to new releases and fiche are delayed it puts such companies at a competitive disadvantage because their customers can not update to the new release until they have the patched drivers for their third party hardware.

Of course, we're all much more sophisticated today.

Murphy's Law being fully operative, some 3rd party things will break if DEC just proceeds in a routine fashion. Heck, some DEC things break when a new version of VMS comes out.

DALE E. COY
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PO BOX 1663, MS J957
LOS ALAMOS, NM 87545
505-667-3270

```
==================================================================
Note 821.8        Undocumented V4.6 Print system fix.      8 of 9
"Bob Hassinger"                    35 lines  17-NOV-1987 12:02
     -< DEC has done it in the past for sure - Warstory >-
------------------------------------------------------------------
```

I agree that in general today DEC should not and probably does not *intentionally* put traps in their hardware and software to make life harder for 3rd party vendors. I also agree that over the years the normal design process has provided plenty of problems for third parties without any special effort on DEC's part.

That does not preclude the possibility that someone at DEC did not feel compelled to go out of his way to get the microfiche out on time even given the impact a delay would have on third parties, some of whom DEC is not getting along with too well just now. That is not a technical issue and can happen on the administrative level.

That said, let me tell you from personal knowledge that no matter what the practice is today, DEC most definitely did take steps to attack a third party vendor in at least one case in the past. This is FACT:

In one release of OS/8 there was code that explicitly looked for a 3rd party clone of the PDP-8 that was being marketed at the time. If this version of OS/8 found it was running on one of these machines it not only refused to work but it also went out and intentionally erased the system image on the disk!

This was known to a number of people. I recall a public discussion in a DECUS session where John Alderman and I beat on the DEC people present, making the point that not only was this a BAD policy but John estimated it would take a good high school kid a couple of days at most to track down the trap and patch it anyway. In fact, in the next release the trap was gone and the *very* scarce space it had used was devoted to other, more productive capabilities.

Bob H

Bob Hassinger
Liberty Mutual Research Center
71 Frankland Road
Hopkinton, MA 01748
617-435-9061

```
==================================================================
Note 821.9        Undocumented V4.6 Print system fix.      9 of 9
"John Osudar"                       7 lines  17-NOV-1987 20:26
        -< DEC doesn't need to trip up 3rd parties >-
------------------------------------------------------------------
```

From what we've seen of at least a couple third party disk vendors, they don't need DEC's help to make their hardware stop working the way the salesperson claimed it was supposed to... but I do wonder why it takes over two months to get the fiche out. (Yes, I know that the scheduled FCS date was Monday; I'll believe it when that little (?) brown envelope is sitting on my desk, next to my VAXstation and portable fiche reader.)

John Osudar
Argonne National Laboratory
9700 S. Cass Ave.
Bldg. 205 A-051
Argonne, IL 60439-4837
(312) 972-7505

(617)-661-1666

```
=================================================================
Note 824.5              Questions on Oracle              5 of 6
"Alan B. Hunt"                    108 lines   23-NOV-1987 18:42
                        -< some info >-
-----------------------------------------------------------------
```

Some or all of this may be old news to Jack since we work together but I will pass along some of the things we found in researching Oracle and Rdb. We wanted Rdb (users too) but the corporate standard is Oracle and unless there was a true technical reason they wouldn't let us deviate. Here is some of what we found:

1. We finally went Rdb because it was found that V5.x of Oracle (still the current release) would not work with RS/1 put out by BBN if you wished to retain the ability to write programs which called RS/1 through its shareable image interface and also wanted to use the RS/1 - Oracle interface from BBN. You had to install RS/1 as a shared program not a shareable image. The reason is that ORACLE uses a BASED shareable image which has address conflicts with RS/1. ORACLE supposedly has come up with a work around for the lifetime of V5 using mailboxes. It is not a normal supported option, however. Their real fix is Oracle V6 which eliminates the BASED shareable image and goes to a standard shareable image. This will also hopefully eliminate the need to relink ORACLE and user programs linked to it after each VMS update.

2. If you read the manuals, you will find if using the language preprocessors and a high level language to interface to the database you must turn off the optimizer because ORACLE may have problem finding variables if the optimizer moves them to a register. We have found the optimizers to be quite effective in reducing memory and cpu usage and did not care for this.

3. Oracle is written in C. To use the language calls to Oracle they require you to conform to the C calling standard for passing parameters. Therefore you pass by value and do not use descriptors for strings. This seems awkward for the VMS environment unless you program in C.

4. Oracle tends to require you to create one physical database and all logical databases go into it. Therefore a database manager is required to coordinate it. (This was confirmed by other Oracle users in the company.) Rdb on the other hand allows any user to create his own physical database and not worry about others or a database manager. (Some might not like this but we did.) Oracle also does not support volume sets although it seems to indicate it does. More than one site we talked to said they had tried it but that it definitely would not work. Oracle does not do dynamic database expansion. The database manager must expand it manually. Just make it big when you start is the work around. You can have an Oracle database span two or more disks so large databases are possible.

5. Each physical database requires four detached processes to be active to support it. If you have two physical databases, then eight processes are required and so on. In a cluster these must exist on every machine accessing the physical database.

6. For VMS V4.0 they were 6-9 months late coming out with a database that would run. Cluster support (where two machines could access the same database) came even later.

7. Cost was high. In a cluster the second machine was more than the first from what we could tell. (They do not like and discouraged us from running it in cluster mode.)

8. Oracle does not use VMS identifiers or usernames. Each user (unless a wide open database is wanted) must be given an Oracle username and password. The Oracle username can be associated with a VMS username so Oracle can allow a user into Oracle without entering the Oracle username. You can't easily use UIC groupings or general identifier groupings in Oracle to grant or deny access.

Alan E. Frisbie
Flying Disk Systems, Inc.
4759 Round Top Drive
Los Angeles, CA 90065

RT-11 DUCM/DYC GRAF11 DEL DIR PLOT-10 IMAGE LIBED FSTATS MS/DOS TIC-TAC-TOE QIX VAX-LIB-DATMAN/VAX EDTPlus SPICE2 TREEDUPL LISPEX MCLS TYPE_PLUS MINC DISK_USE FRAG EDTEX PORT LOCATOR TECO CHPLOT NANNY DIR11-W WATCHDOG INACTIVE ACCOUNTS IMGSPL ICE TEX EDITOR VAX-LIB-4 GRAPHIC UTILITIES SETAUX.ARC STATPK FIGure KERMIT Distribution TENBACKU JUICER VTEDIT 2022 VAX-LIB-3 VISTA EDITOR MTU TDE RSTSOPEN DRAWTREE WATCHDOG PRM-1 SMARTMAILER TEN SPELL DECPoint of Sale JUICER PARALLEL Library V2 RTMULTI and Addo SMARTMAILER for RSTS/E CU FILTRA Spring 86 RT-11 SIG CP/M KERMIT S Invasion for PRO Bonner La SPLICE RUNOFF VAX-LIB-3 VAX-LIB-2 IMAGE SPELL TURBOCOM FNDFIL PC-8088 Collection #10 VT20 TOOLKIT PLATOOLS SMARTMAILER DEPROC LaTex KERMIT-11 FANCY FONTS XMIT CU ReGis to HPG CED International RUNITOFF JP5-JP6 FODT PASCAL-OS/8 ANISMT WPSIM PARALLEL LIBRARY DECSYSTEM-20 SIG Spring 85 CAMERA DELPHIN HACK BIBENTRY APFELN DIGITIZING Acid Docume Generator VAX-LIB-2 AMAR-10 AMAR-20 DATMAN/VAX IMAGE RT-11 DUCM/DYC GRAF11 DEL DIR PLOT-1 IMAGE LIBED FSTATS MS/DOS TIC-TAC-TOE QIX VAX-LIB-4 DATMAN/VAX EDTPlus SPICE2 TREEDUP LISPEX MCLS TYPE_PLUS AMAR-20 DISK_USE FRAG EDTEX PORT LOCATOR TECO CHPLOT NANN DIR11-W WATCHDOG INACTIVE ACCOUNTS IMGSPL ICE TEXT EDITOR VAX-LIB-4 GRAPHIC UTILITIE SETAUX.ARC STATPK FIGure KERMIT Distribution TENBACKUP JUICER VTEDIT 2022 VAX-LIB-3 VIST EDITOR MTU TDE RSTSOPEN DRAWTREE WATCHDOG PRM-11 SMARTMAILER TEN SPELL DECPoint of Sa JUICER PARALLEL Library V2 RTMULTI and Addons SMARTMAILER for RSTS/E CU FILTRA Spring 86 RT-1 SIG CP/M KERMIT S Invasion for PRO Bonner Labs APFELN RUNOFF VAX-LIB-3 VAX-LIB-2 IMAGE SPEL TURBOCOM FNDFIL PC-8088 Collection #10 VT200 TOOLKIT PLATOOLS SMARTMAILER DEPROC LaTe KERMIT-11 FANCY FONTS XMIT CU ReGis to HPGL CED International RUNITOFF JP5-JP6 FODT PASCAL-OS/ ANISMT TECO WPSIM DECSYSTEM-20 SIG Spring 85 CAMERA DELPHIN HACK BIBENTRY APFELN KERMI S DIGITIZING Acid Document Generator VAX-LIB-2 AMAR-10 AMAR-20 DATMAN/VAX IMAGE VT200 TOOLKI COMPRO EVENTS PC8088 Collection #9 TECO Cherry Tree Workstation Bookings System EXPORT Data Inputt Generator CMSBROWSE PERSONNEL INVENTORY MS/DOS COMMS Selection Electronic Grade Book CP/ KERMIT LaTex JUICER SPELL PORTACALC DPRINT DUNGEON MINC BUDGET BUG CALC C Langua System DPROC "DEP" DECENC DECmate II OS/278 DIAL DTC GAMMA-11 GDADL LISP for RSX-11 MEM KERMIT S VAX-LIB-6 SPICE 3A6 VT200 TOOLKIT RUNNOFF SPLICE SPY:RSX TCOPY SPELL VT-200 COMPR EVENTS CMSBROWSE UNDELETE DIAL BLOCKER SCAN CODER BITMAP DTC/PC ADDRESS BOO LaserWriter PORTACALC SPICE 3A6 PRO/Smart Mailer CBASIC2 Accts JP5-JP6 Payable/Receivable McGraw-Hi Payroll SEDT: EDT/WPS Screen CLNDRS:A Calendar Program INDEX AKCOUNT CORPHONE E-Systems Grab Ba RGT RDG PLTXSMB ICON DEVICS DATATRIEVE Library Collection CMSBROWSE EXPERT FPaint IMAG DBMS/Spreadsheet for MS/DOS AMAR-1 AMAR-2 RDIR/SQMAP PC-8088 Collection 1 UP TIME REPORTE RT-11 DUCM/DYC GRAF11 DEL DIR PLOT-10 IMAGE LIBED FSTATS MS/DOS TIC-TAC-TOE QIX VAX-LIB DATMAN/VAX EDTPlus SPICE2 TREEDUPL LISPEX MCLS TYPE_PLUS EXPORT DISK_USE FRAG EDTEX PORT LOCATOR TECO CHPLOT NANNY DIR11-W WATCHDOG INACTIVE ACCOUNTS IMGSPL ICE TEX EDITOR VAX-LIB-4 GRAPHIC UTILITIES SETAUX.ARC STATPK FIGure KERMIT Distribution TENBACKU JUICER VTEDIT 2022 VAX-LIB-3 VISTA EDITOR MTU TDE RSTSOPEN DRAWTREE WATCHDOG PRM-1 SMARTMAILER TEN SPELL DECPoint of Sale JUICER PARALLEL Library V2 RTMULTI and Addo SMARTMAILER for RSTS/E CU GRAPHKIT FILTRA Spring 86 RT-11 SIG CP/M KERMIT S Invasion for PR Bonner Labs RUNOFF VAX-LIB-3 VAX-LIB-2 IMAGE SPELL TURBOCOM FNDFIL PC-8088 Collection #10 VT2 TOOLKIT PLATOOLS SMARTMAILER DEPROC LaTex KERMIT-11 FANCY FONTS XMIT MEMO ReGis to HPG CED International RUNITOFF JP5-JP6 FODT PASCAL-OS/8 ANISMT CODER WPSIM DECSYSTEM-20 SIG Sprin 85 CAMERA DELPHIN HACK BIBENTRY APFELN REPORTER DIGITIZING Acid Document Generator VAX-LIB-AMAR-10 AMAR-20 DATMAN/VAX IMAGE VT200 TOOLKIT COMPRO EVENTS PC8088 Collection #9 TECO Cher Tree Workstation Bookings System EXPORT Data Inputter Generator CMSBROWSE PERSONNEL INVENTOR MS/DOS COMMS Selection Electronic Grade Book CP/M KERMIT LaTex JUICER SPELL PORTACALC DPRIN DUNGEON MINC BUDGET BUG CALC C Language System DPROC "DEP" DECENC DECmate II OS/278 DIA DTC GAMMA-11 GDADL LISP for RSX-11 MEMO PORTACALC VAX-LIB-6 SPICE 3A6 VT200 TOOLKI RUNNOFF SPLICE SPY:RSX TCOPY SPELL VT-200 COMPRO EVENTS CMSBROWSE UNDELETE DIA BLOCKER SCAN CODER BITMAP DTC/PC ADDRESS BOOK LaserWriter PORTACALC SPICE 3A6 PRO/Sma Mailer CBASIC2 Accts TREEDUPL Payable/Receivable McGraw-Hill Payroll SEDT: EDT/WPS Screen CLNDRS: Calendar Program INDEX AKCOUNT CORPHONE E-Systems Grab Ba RGT RDG PLTXSMB ICON DEVIC DATATRIEVE Library Collection CMSBROWSE EXPERT FPaint IMAGE DBMS/Spreadsheet for MS/DOS AMAR-1 AMAR-20 RDIR/SQMAP PC-8088 Collection #11 UP TIME REPORTER RT-11 DUCM/DYC GRAF11 DEL DIR PLO 10 IMAGE LIBED FSTATS MS/DOS TIC-TAC-TOE QIX VAX-LIB-5 DATMAN/VAX SPICE2 RT-11 DUCM/DYC G

DECUS

Program Library

SOFTWARE ABSTRACTS

"A Solution with a Future"

Restrictions: Creates a new user environment with the exception of process quotas.

Media (Service Charge Code): 600' Magnetic Tape (MA) **Format:** VMS/BACKUP

NEW LIBRARY PROGRAMS AVAILABLE FOR THE PDP-11 COMPUTER FAMILY

DECUS NO: 11-890 **Title:** RDM FORTRAN Programming Interface **Version:** May 1987

Submitted by: Walter Shpuntoff, Institute for Resource Management, Inc., Arnold, MD

Operating System: RT-11 V5.1, TSX-PLUS V6.16 **Source Language:** FORTRAN 77 **Software Required:** TSXLIB, RDM V4.0 **Keywords:** FORTRAN, Interface Routines

Abstract: RDM-F77 is a collection of FORTRAN 77 subroutines that allow the access and exchange of data between RDM data files and FORTRAN 77 programs. Records can be retrieved by record number, on a search key, or the next record. Records may be updated or added from FORTRAN. Maps are supported and RDM indexes are not. Records can be added to flat files and it supports records up to 512 bytes long.

Media (Service Charge Code): One RX01 Diskette (KA) **Format:** RT-11, 600' Magnetic Tape (MA) **Format:** RT-11

DECUS NO: 11-894 **Title:** Shared Resource Control **Version:** 1.0 August 1987

Submitted by: Richard Neitzel

Operating System: RSX-11M V4.2C **Source Language:** MACRO-11 **Keywords:** Device Handlers, Scheduling, System Management - RSX-11

Abstract: There are times when resources other than the usual I/O devices must be shared. These may include code segments, data structures, directly accessed devices, etc. In order to manage these resources a special driver is used to control access based on task priority and queue position. The driver may control a virtually unlimited number of resources. Two versions are provided, a vanilla version and one that checks to see if the requesting task is privileged. Use of a driver instead of other methods avoids resource lock up due to tasks shorting. This approach may also be of interest to VAX users.

Media (Service Charge Code): One RX01 Diskette (KA) **Format:** FILES-11, 600' Magnetic Tape (MA) **Format:** FILES-11

DECUS No: 11-895 **Title:** VTCALC: Calculator for VT100 or VT220 Terminals **Version:** 1.0, October 1987

Submitted by: Michael Chamsay

Operating System: RSTS/E V9.3 **Source Language:** BASIC-PLUS-2 **Hardware Required:** VT100 or VT220 terminal **Keywords:** Calculators

Abstract: VTCALC is an easy to use, simple calculator program that does basic calculations. All input is done via the keypad and arrow keys which are diagrammed on the screen using the line drawing character set. Like many simple calculators it has one

memory cell which is displayed on the screen and updated whenever the store key is pressed. This program was developed and tested on a VT220 look alike in VT100 mode. One of the future enhancements will be to include scientific functions such as trigonometic, and log functions.

Documentation not available.

Media (Service Charge Code): 600' Magnetic Tape (MA) **Format:** DOS-11

REVISIONS TO LIBRARY PROGRAMS

DECUS NO: V-SP-24 **Title:** AnalytiCalc (PortaCalc): A 3D Spreadsheet/Database System in VMS/BACKUP **Version:** V22.2A October 1987

Submitted by: Glenn C. Everhart, Ph.D.

Operating System: AMIGA DOS, IAS, MS/DOS, P/OS, PC DOS, RSTS/E, RSX-11D, RSX-11M, RSX-11M-PLUS, VAX/VMS **Source Language:** FORTRAN 77, FORTRAN IV-PLUS, MACRO-11, MACRO-32, VAX-11 FORTRAN **Memory Required:** N/A **Keywords:** Business Applications, Data Base Management, Mathematical, PortaCalc, Spreadsheet

Abstract: AnalytiCalc is a powerful three dimensional spreadsheet/database and analysis system with easy user extensibility designed to outperform most any commercial package available, running on PDP-11 systems able to support the F4P compiler, or VAX systems, needing the VAX FORTRAN compiler to compile. Several terminals are supported, including the VT100 series, VT52, Datamedia Colorscan 10, and Elite 1500, Televideo 925, and ANSI color terminals. A full DTR-32 interface is supported on VAX and a command mode structure similar to Visicalc or other micro spreadsheets is available as an option. Address range maxima are 32,000 rows and 32,000 columns on VAX, 10,000 by 10,000 on PDP-11 (using software virtual memory on PDP-11). A mode for "connecting" arbitrary VAX applications to AnalytiCalc is now available also with simple syntax and numerous supporting new string functions.

The program is designed for power and to be easily portable to other systems supporting FORTRAN, with peculiarities used documented, and its manual is designed to be turned into a system HELP file so that it can be read online. Tutorials are supplied as well. Recustomizing for other terminals is easy using supplied materials.

A data management system is built in, permitting spreadsheets to access a potentially unlimited number of files and records or parts of records in those files for user defined functions, numbers, formulas, text or whatnot. In fact, it has many of the attributes of a language. Every cell may contain far more complex formulas than most commercially sold programs, and indeed may be a complete program with the ability to execute most command-level spreadsheet commands, though with minor restrictions.

Merging of multiple sheets, matrix algebra, general function solving (a la TK!SOLVER, though with a less polished user interface), and easy document load/unload make this spreadsheet very significantly more powerful than all but the most elaborate mainframe packages, and infinitely easier to customize. User commands may be entered via keyword or function key and are provided with a comprehensive HELP system permitting users to individually tailor commands to their needs.

A powerful text integration function permits integration of word processing files with reports, permitting use of AnalytiCalc (PortaCalc) to integrate sections of reports which are edited with any editor. It also simplifies inserting text from external files flexibly over null cells of the spreadsheet.

The package runs on VAX, PDP-11 (RSX), Amiga, and 80x86 (MSDOS) and no compiler is required. It has been reported to work on RSTS though the author has no contact with RSTS to check this.

The current release adds some bulletproofing corrections, several new trig functions, and a few speedups to the code. It also introduces the Amiga version of AnalytiCalc (PortaCalc).

The kit contains a large number of miscellaneous system utilities and database systems as well as the spreadsheet.

Complete source code for all versions is provided. It is assumed the F4P or F77 compiler is available for PDP-11 (uses FORTRAN 66 for greatest portability; author has an 8088 version), or the Digital Equipment Corporation VAX FORTRAN compiler for VAX. Object libraries are provided for VAX systems not owning FORTRAN and task images for RSX systems without F77.

A separate graphics output task is documented in PCG.DOC and provides histograms or scatterplots of any areas of the saved spreadsheets with a simple command syntax.

SPECIAL HARDWARE: On VAX, screen-independent cursor routines are used for screen addressing normally. On PDP-11, the software must be built for the appropriate terminal. Versions of the UVT100 subroutine for VT100, VT52, Datamedia Elite, and several other types of terminals including VT100 with Advanced Video and Colorscan 10 are supplied, with command files for most combinations. The VT52 versions will show what the minimum requirements are for control. Most any terminal can Be easily interfaced to the package by editing one of the UVT100 routines to correspond to the terminal's control sequences, provided direct cursor addressing is supported.

Release Notes are distributed with each order.

Notes: PDP-11 users see DECUS No. 11-SP-47.

Changes and Improvements: Faster more bullet proof. Several new functions added. VMS terminal handling improved.

Media (Service Charge Code): 2400' Magnetic Tape (PC) **Format:** VMS/BACKUP, TK50 Tape Cartridge (TC) **Format:** VMS/BACKUP

DECUS NO: VAX-6 **Title:** SPICE3 **Version:** 3B.1, August 1987

Author: T. Quartes, A.R. Newton, D.O. Pederson,, A. Sangiovanni-Vincentelli, UCB, Dept of Elect Eng'g & Computer Sci., 479 Cory Hall, UCB-Berkeley

Submitted by: Digital Equipment Corporation

Operating System: VAX/VMS V4.3 or later **Source Language:** C **Memory Required:** 3 MB **Keywords:** Circuit Simulation

Abstract: SPICE3 is a general-purpose circuit simulation program for nonlinear dc, nonlinear transient, and linear ac analyses. Circuits may contain resistors, capacitors, inductors, mutual inductors, independent voltage and current sources, four types of dependent sources, transmission lines, and the five most common semiconductor devices: diodes, BJTS, JFETS, and MOSFETS.

The SPICE3 version is based directly on SPICE2 VG.6, DECUS No. VAX-216. While SPICE3 is being developed to include new features, it will continue to support those capabilities and models which remain in extensive use in the SPICE2 program.

The ordering information for the manuals are as follows:

- Order VAX-6 (EB) for the Programmer's Manual
- Order VAX-6 (EC) for the User's Manual and the User's Guide

Release notes are distributed with each order.

Notes: Full user's guide, user's manual and programming manual included with this submission.

Changes and Improvements: This release incorporates many new features as well as some performance improvements.

Restrictions: U.S. Government export regulations prohibit the distribution of this program outside of the United States without the appropriate export licenses.

Documentation available in hardcopy only.

Media (Service Charge Code): User's Manual (EB), User's Manual (EC), 2400' Magnetic Tapes (PB) **Format:** VAX/ANSI, or order VAX-LIB-1

DECUS No: VAX-149 **Title:** DIAL **Version:** 1.2, October 1987

Author: Roger Talkov, Emulex Corporation, Costa Mesa, CA

Operating System: VAX/VMS V4.5 **Source Language:** C **Keywords:** Security, System Management - VMS

Abstract: DIAL prevents unauthorized access from dial-in callers and allows authorized users to access the computer from a dial-back line. DIAL requires the caller to answer some questions about their access rights. If incorrect, the program will disconnect the caller. If correct, the program will notify the user of their acceptance, will disconnect the call, and then call them back at a pre-determined phone number.

Benefits include controlled access, users accessing only from a pre-determined location, and users do not have to pay for phone access.

DIAL was written in VAX-11 C and the source is included.

Changes and Improvements: Includes 2400 baud modem support and the logging of all attempts of DIAL access into DIAL.LOG. This extra security will provide information on break-in attempts as well as an audit trail of modem usage.

Media (Service Charge Code): 600' Magnetic Tape (MA) **Format:** VMS/BACKUP, or order VAX-LIB-4

DECUS No: VAX-243 **Title:** VAX - RMD **Version:** 2, November 1987

Submitted by: Wayne Bruzek, N.J. Turnpike Authority, New Brunswick, NJ

Operating System: VAX/VMS V4.5 **Source Language:** VAX FORTRAN **Keywords:** Uilities - VMS

Abstract: VAX - RMD is a pacifier for the ex-RSX user who misses the

"real-thing". Though it doesn't look quite the same and doesn't have the various screens of the old RMD, it does provide quite a bit of useful information, such as:

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o   Hard copy, like cash, is always acceptable. Camera-ready copy will save us a lot of typing, but we don't insist on it. You can also use the Hardware Submission Form in the "Questionnaires" section of the combined SIGs Newsletters.

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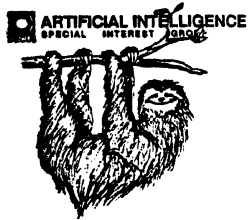
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Austin, TX 78759
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ARPANET/CSNET:CLIVE @ MCC. COM

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To Be Identified
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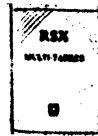
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Ask the WOMBAT WIZARD
Submission Form

To submit a problem to the WIZARD, please fill out the form below and send it to:

WW Editor, Philip A. Naecker
Consulting Software Engineer
3011 North Mount Curve Avenue
Altadena, CA 91001
USA

Name:_____ DECUS Membership No. _____

Affiliation:_____

Address:_____

        _____

        _____

Telephone Number:_____

Statement of Problem:_____

_____

_____

_____

_____

_____

Please following the following guidelines when submitting support material:

    1. If you are trying to demonstrate a method or a concept, please simplify the procedures, records, and other information to the shortest form possible.

    2. Annotate your attachments. Simple comments or hand-written notes ("Everything worked until I added this statement.") go a long way toward identifying the problem.

    3. Keep an exact copy of what you send. And number the pages on both copies. But send everything that is related to your question, even remotely.

    4. If you would like a direct response or would like your materials returned, please don't forget to include a stamped, self-addressed envelope large enough to hold the materials you send.

DATATRIEVE/4GL SIG
Product Improvement Request Submission Form

Submittor: DECUS Membership Number:
Address: 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

SUBMITTING ARTICLES TO HARD NEWS

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

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

o Items can be sent to the editor on VMS-format RX50s,
   TK50 cartridges, or IBM PC format 5 1/4" floppies. The
   SIG chair prefers RT-11 floppies but can handle any
   reasonable media.

o Hard copy, like cash, is always acceptable.
   Camera-ready copy will save us a lot of typing, but we
   don't insist on it. You can also use the Hardware
   Submission Form in the "Questionnaires" section of the
   combined SIGs Newsletters.

o Those of you with access to DCS can send things to
   WALKER or WISEMAN. DCS is usually checked on a daily
   basis.

o You can reach the SIG chair on CompuServe as
   "Bill Walker 71066,24" or via EasyLink mailbox 62752448
   or MCI Mail account 333-1675. You can reach the editor
   via EasyLink mailbox 62960090 (be sure to say ATTN: or
   TO: Carmen Wiseman somewhere in the body of the
   message).

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

Contributions can be sent to:

William K. Walker   Carmen D. Wiseman
Monsanto Research Corp.   OR   Digital Review
P.O. Box 32   A-152   ==   Prudential Tower, Suite 1390
Miamisburg, OH   45342   800 Boylston Street
(513) 865-3557   (work)   Boston, MA   02199
(513) 426-7094/0344 (home)   (617) 375-4361 (work)

```
                          *H M S   S I G*

    HARDWARE SUBMISSION FORM -- A SIG INFORMATION INTERCHANGE


    Message




















    Contact
    Name

    Address




    Telephone


    Type of equipment



    SUBMIT ANY TYPE OF HARDWARE PROBLEMS AND/OR FIXES.

    SEND TO:

    William K. Walker              Carmen D. Wiseman
    Monsanto Research Corp.   OR   Digital Review
    P.O. Box 32  A-152        ==   Prudential Tower, Suite 1390
    Miamisburg, OH  45342          800 Boylston Street
                                   Boston, MA  02199
```

WHAT: (Describe your WHIM) (Please print or type)

WHY: (Describe the reason for the WHIM)

HOW: (Make any suggestions for a possible implementation

Name: _____

Company: _____

_____

Address: _____

_____

_____

Phone: _____

Please mail to:

Kathleen M. Anderson
EATON Information Management
Systems Division
2017 Cunningham Drive
Suite 208
Hampton, Virginia 23666

Phone: (804) 326-1941

MASTERS APPLICATION

Name: _____ **Title** _____

Company: _____

Address: _____

_____

_____ **Phone: (   )** _____

Network Address: _____ **Date:** _____

The Languages & Tools SIG has established the designation "LANGUAGES AND TOOLS MASTER", to be applied to selected, qualified people willing to share their expertise in various subjects with others. Masters are people who are knowledgeable enough in one or more languages or tools to be comfortable answering questions about them. The qualifications of an L&T Master are: expertise in a specific area, a willingness to have his/her name published as a Master, and a willingness to volunteer services in different ways. Each product may have several Masters, and there is an overall Masters Coordinator who is a member of the L&T Steering Committee.

Masters are asked to serve other users (and, under some circumstances, DEC), as a resource on products within their competence. In addition to being listed in the L&T Masters Directory (published in the newsletter) as available for occasional telephone consultation, Masters may act as 'Doctors' at Symposium Clinics, present Symposium sessions on the products of interest to them, field test products, interact with DEC product managers when appropriate, or act as a reference for a product for Digital salespeople. Especially on mature products, the SIG is anxious for knowledgeable users to offer product tutorial sessions at Symposia, and Masters can be of great help here. At Symposia, Masters will wear an identifying button bearing the legend "Ask Me About....." and the name of the language or tool in which he/she specializes.

If you'd like to serve as an L&T Master, please mark the products on which you are willing to answer questions with an **"M"** (for Master). Please mark any other products running at your site with an **"A"** (for "also running") to provide users with a broader picture of your facilities. (Although not an L&T product, Mumps is included here at the request of the Mumps SIG as a service to Mumps users). You may request removal of your name from the Masters Directory at any time, although you may continue to be listed for a month or two, because of publication lead times.

I am qualified to act as an L&T Master for the following products:　　☐ Mumps

☐ Debug	☐ Bliss	☐ CMS	☐ TPU	☐ C	☐ Test Manager
☐ Pascal	☐ Basic	☐ MMS	☐ EVE	☐ Ada[1]	☐ Runoff & DSR
☐ Fortran	☐ Cobol	☐ LSE	☐ EDT	☐ APL	☐ TeX & LaTeX
☐ Document	☐ Dibol	☐ SCA	☐ TECO	☐ RPG	☐ Cobol Generator
☐ VAX Notes	☐ Emacs	☐ PCA	☐ PL/I	☐ Scan	☐ Software Project Mgr

Briefly describe your experience with those you checked. _____

_____

_____

_____

How long have you held your present position? _____

Are you able to attend at least one symposium each year? _____

Users are encouraged to seek assistance with products by calling appropriate Masters listed in the Directory. As a Master, your name and telephone number will be published in the Masters Directory, and users will call on you for limited help from time to time. Please check, below, any additional activities you might do:

☐ Field-test new versions of your product at your work site.

☐ Provide feedback on the product when needed by its DEC product manager.

☐ Act as a reference for the product at the request of Digital Sales or Marketing people.

Mail to: Dena Shelton, L&T SIG Masters Coordinator, Cullinet Software, Inc., 2860 Zanker Road, Suite 206, San Jose, CA 95134.

Languages & Tools SIG

WISHLIST QUESTIONNAIRE

Name: _____ Title _____

Company: _____

Address: _____

_____

_____ Phone: (   ) _____

Network Address: _____ Date: _____

The Languages & Tools SIG is principally concerned with the DEC and public domain software products listed below. If your request directly involves one of these products, please check which one (if you have more than one request, please use a separate form for each):

☐	Debug	☐	Bliss	☐	CMS	☐	TPU	☐	C	☐ Test Manager
☐	Pascal	☐	Basic	☐	MMS	☐	EVE	☐	Ada[1]	☐ Runoff & DSR
☐	Fortran	☐	Cobol	☐	LSE	☐	EDT	☐	APL	☐ TEX & LATEX
☐	Document	☐	Dibol	☐	SCA	☐	TECO	☐	RPG	☐ Cobol Generator
☐	VAX Notes	☐	Emacs	☐	PCA	☐	PL/I	☐	Scan	☐ Software Project Mgr

If your request or suggestion doesn't relate to one of the products listed above, check which one of the following Language & Tools SIG topics it concerns:

☐ Newsletter	☐ Symposium Sessions	☐ Pre-Symposium Seminars
☐ Masters Program	☐ Working Group Activities	☐ Session Notes
☐ Information Folder	☐ SIG Tape	☐ DECUS Store Item
☐ Other L&T SIG topic:	_____	

Wish List Request—brief description: _____

_____

_____

_____

Complete description—please explain your request thoroughly; don't assume we know details of other products or services; give examples. _____

_____

_____

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_____

_____

_____

_____

Mail to: **Shava Nerad, L&T Wishlist Coordinator, MIT, 77 Mass Ave. W91-219A, Cambridge, MA 02139; (617)253-7438**

---

[1] Ada is a trademark of the DoD

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:

JUDI MANDL
UCONN HEALTH CENTER
263 FARMINGTON AVENUE, BLDG. #19
FARMINGTON, CT 06032

Title: _____

Message: _____

_____
_____
_____
_____
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_____
_____
_____
_____
_____
_____
_____
_____

Your Name: _____
Address: _____
_____
Telephone: _____

If this is a reply to a previous DATAGRAM, what #? ___

Signature: _____ **Date:** _____

OFFICE AUTOMATION SIG
SYSTEM IMPROVEMENT REQUEST BALLOT

DECUS Membership Number _____

INSTRUCTIONS: System Improvement Request (SIR) Ballots allow you, the user, to assist in the prioritization of the submitted SIR's before they are forwarded to Digital. The total number of points which you may allocate on this ballot may not exceed 100 points (absolute value). No more than 10 points may be given to any single SIR. Your ballot must be received by __MARCH 1__ to be counted.

SIR NUMBER	POINTS
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

TOTAL   **100 POINTS**

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_____

RT-11 WISH LIST SURVEY

Name (optional) _____

Address (optional) _____

_____

_____

DECUS Number (optional) --

1.1 ___	3.1 ___	3.7u ___	3.13a ___	5.1b ___
1.2 ___	3.2a ___	3.7v ___	3.13b ___	5.2a ___
1.3 ___	3.2b ___	3.7w ___	3.13c ___	5.2b ___
1.4 ___	3.2c ___	3.7x ___	3.13d ___	6.1 ___
1.5 ___	3.2d ___	3.7y ___	3.14 ___	6.2a ___
1.6 ___	3.2e ___	3.7z ___	3.15 ___	6.2b ___
1.7a ___	3.3a ___	3.7aa ___	3.16 ___	6.2c ___
1.7b ___	3.3b ___	3.7bb ___	3.17a ___	6.2d ___
1.8 ___	3.3c ___	3.7cc ___	3.17b ___	6.3 ___
1.9a ___	3.3d ___	3.7dd ___	3.17c ___	6.4a ___
1.9b ___	3.4a ___	3.7ee ___	3.17d ___	6.4b ___
1.9c ___	3.4b ___	3.8a ___	3.17e ___	6.4c ___
1.9d ___	3.4c ___	3.8b ___	3.17f ___	6.4d ___
1.10 ___	3.5a ___	3.8c ___	3.18 ___	6.5 ___
1.11 ___	3.5b ___	3.9a ___	3.19a ___	6.6a ___
1.12 ___	3.6a ___	3.9b ___	3.19b ___	6.6b ___
1.13 ___	3.6b ___	3.9c ___	3.19c ___	6.6c ___
1.14 ___	3.6c ___	3.9d ___	4.1 ___	6.6d ___
2.1 ___	3.6d ___	3.9e ___	4.2a ___	6.7 ___
2.2 ___	3.6e ___	3.9f ___	4.2b ___	6.8a ___
2.3 ___	3.6f ___	3.9g ___	4.3 ___	6.8b ___
2.4 ___	3.6g ___	3.9h ___	4.4a ___	6.8c ___
2.5 ___	3.7a ___	3.9i ___	4.4b ___	6.8d ___
2.6 ___	3.7b ___	3.9j ___	4.5a ___	6.8e ___
2.7 ___	3.7c ___	3.9k ___	4.5b ___	7. ___
2.8 ___	3.7d ___	3.10a ___	4.6 ___	8. ___
2.9 ___	3.7e ___	3.10b ___	4.7a ___	9.1 ___
2.10 ___	3.7f ___	3.10c ___	4.7b ___	9.2a ___
2.11 ___	3.7g ___	3.10d ___	4.7c ___	9.2b ___
2.12 ___	3.7h ___	3.10e ___	4.7d ___	9.3a ___
2.13 ___	3.7i ___	3.10f ___	4.7e ___	9.3b ___
2.14 ___	3.7j ___	3.10g ___	4.7f ___	10.1 ___
2.15 ___	3.7k ___	3.10h ___	4.7g ___	10.2 ___
2.16 ___	3.7l ___	3.10i ___	4.7h ___	10.3 ___
2.17 ___	3.7m ___	3.10j ___	4.7i ___	
2.18 ___	3.7n ___	3.10k ___	4.7j ___	
2.19 ___	3.7o ___	3.10l ___	4.7k ___	
2.20 ___	3.7p ___	3.10m ___	4.7l ___	
2.21 ___	3.7q ___	3.10n ___	4.7m ___	
2.22 ___	3.7r ___	3.11a ___	4.7n ___	
2.23 ___	3.7s ___	3.11b ___	4.7o ___	
2.24 ___	3.7t ___	3.12 ___	5.1a ___	

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Page 1 of _____

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know how it's done on the XYZ system. Justify why the capability
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