DECUS U.S. CHAPTER SIGs NEWSLETTERS

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Dear SIGs NEWSLETTERS reader:

This month I will continue a long tradition, (started last month,) by reporting on topics of general interest to the readers. This column may not always appear, but it will appear when I find I have problems with this 21-ring circus and feel that the problems directly affect you, the subscriber.

This month, I will be talking about the problems with our subscription services, (or more accurately, with our REsubscription services.) Currently our subscription service leaves much to be desired. Much of the problem revolves around our current subscription software. Eventually we WILL be getting new software, but for now I will be talking about some short-term fixes and workarounds. Anyway, the major problems I see are:

- It takes a long time to start a subscription.
- It's not easy to tell when your subscription expires, or when you should re-subscribe, and we don't make it easy enough to re-subscribe.

The simplest thing that is wrong with subscribing is that the subscription form (and DECUS membership form,) are included in the "How To" Submit an Article section. Starting this month, they will have their own section, clearly marked as such on the front cover, so you can FIND THEM.

The simplest thing that is wrong with renewing is that we only send you one renewal form. (Yes, only one form is not enough, most magazines send at least 3 forms.) We're working on that, soon you will be getting multiple forms, so if the U S Snail loses one, you still have a chance. Anyway, until we get this working, there are some simple things you can do.

As far as general questions about renewal, here are some typical questions about subscriptions, along with some (hopefully helpful) answers.

Question: I found the form in the newsletter and sent it in. When will I get my first (or renewal) newsletter?

Answer: When your form gets to DECUS, it takes a couple of days to process, (maybe a little longer right around Symposium.) Usually about a week elapses from the time you mail your subscription. Let's say the subscription is processed on April 15th. You will eventually know this date because it is printed on your mailing label. (The first 6 digits are your DECUS number, the next 6 are the date in the format yymmdd.)

On about the first of the month, your subscription is counted for the next production run of the newsletter. But since we start working on the JUNE issue on the first of May, you end up getting your first issue with the June issue, a month and a half later. (Not the next issue as it states on the subscription form.)

Question: When should I renew?

Answer: You should have received a renewal notice and sent it in by the date one year later than the date on your subscription.

Question: What should I do if don't receive a renewal form?

Answer: If necessary, you can tear out the form from the newsletter and send it in, but mark it clearly "RENEWAL". (Yes we don't have separate boxes to check for "NEW" and "RENEWAL" on the form.)

Question: Can I subscribe or renew by phone?

Answer: Yes, if you can pay by MasterCard, VISA, American Express or DinersClub/ Carte Blanche®. Just call (617) 480-3659, and have your membership number ready. (Just to complicate things further, after July 15th, the telephone company is changing the Marlboro area code to 508.)

Question: I renewed my subscription, but the date on my label didn't change, why not?

Answer: Our current subscription software can't handle renewals. What happens is that your renewal effectively gets entered as a whole NEW subscription. When your current subscription runs out, your new one starts automatically. You can tell because the date code on your label will change when your new one starts.

Question: I think I renewed twice this year, once by mail and once at the fall symposium. How can I tell?

Answer: Like the previous answer, renewals get queued up behind current subscriptions. If you renewed twice, you may have a couple of subscriptions stacked up. (A few of our subscribers have a couple of years stacked up!) If in doubt, call the office.

Question: I want a different address on my newsletter than the one I get regular DECUS mailings sent to. Why can't you do that.

Answer: All DECUS mailings are tied into a master address data file, keyed to your DECUS membership number. This address must be the same for Library mailings, DECUSCOPE, Newsletter, etc.

Question: I submitted a change of address using the form on the back cover. How long should that take?

Answer: The same as a subscription entry or renewal. About a month and a half.

Question: For any other problems, what should I do?

Answer: When in doubt, call. Once again, the magic number is, (617) 480-3659. Remember, after July 15th, the area code changes to 508.

That's all for this month folks, hope this information has been helpful.

Frank "Ringmaster" Borger

welcome to
tales from
the
DAARC
side
Eer

Letter from the Editor

By: Dale Hutchison
Cummins Engine Company
4720 Baker Street Extension
Lakewood, New York 14750

Its been a few months since you've heard from me. Glad to see that you are still reading the newsletter. Remember, even you can have your article published in the DAARC SIG section of the newsletter. Forward your article to me at the above address. Be sure to include your name, address and phone number. The phone number is for me, just in case I have a question regarding your article.

In this issue we have another article from Jim Duba. His article is about a project he has worked on, involving the use of a personal computer in a computer integrated manufacturing application.

Note: For those of you that were unable to attend the spring symposia in Cincinnati, you can order a copy of the Proceedings. Contact the DECUS Office

219 Boston Post Road
Marlboro, MA 01752-1850

Until next month.

AN APPLICATION OF CIM USING A PERSONAL COMPUTER

By: Jim Duba
Cummins Engine Company
4720 Baker Street Ext.
Lakewood, New York 14750

1 Purpose

The purpose of this project was to measure hole location and diameter in a part with reamed and drilled holes. The results of the measurements are intended to be used in adjusting machine performance on the spot and for evaluating long term performance.

2 How It Works (in general)

The part has two holes all the way through. The start of each hole is considered a separate hole. This means that the left hole is numbered hole one on the back of the part and hole four on the front of the part. They are numbered one through four. Hole one is coaxial with hole four and hole two is coaxial with hole three. Holes one, two, and three are the same diameter. Hole four is slightly smaller. We are concerned with measuring the diameter of each hole, the location of each hole in the part, and the distances from the center of holes two and three to the center of hole four.

The part is first placed in a gauging fixture, then probes are inserted through the fixture into the part. The fixture holds the probe securely in place (the shoulder of the probe is held in place by the gauging fixture). Near the end of the probe there is a small, spring-loaded button that presses against the side of the hole in the part. The distance it sticks out is changed into an electrical signal that is sampled and converted into a number in a personal computer. The probe is rotated around the hole by the operator and the signal is sampled every ninety degrees. The numbers obtained from measuring a part this way are compared with the numbers obtained by measuring a master with known dimensions in an identical fashion

3 Electrically - Very Briefly

The button on the probe actuates a transducer. This transducer feeds an amplifier that is connected to an analog to digital conversion board in an AT compatible. The transducer amplifier produces a voltage that is proportional to the distance the button on the probe has moved. This voltage is amplified and then converted into a number between -2047 and +2047 by an analog to digital converter card in the AT compatible. The mechanics and electronics combine to produce numbers that get larger the further the probe is pushed in.

4 Calibration

Calibration is the process of relating the electrical signals to a linear measurement unit such as millimeters. The small button on the probe tip is depressed a known amount, usually with a gauge block. This signal value can then be used in converting the voltage readings into actual measurements.

For example, lets assume we place the probe between two pieces of metal, the button is slightly depressed and produces a reading of 1947 in the personal computer. A one mm gauge block is inserted between the button and its piece of metal which produces a reading of 1352. This means that each unit of measurement from the analog to digital converter is worth .00168mm.

5 Mastering

A part with precisely known dimensions known as the master, is placed in the gauging fixture. The operator goes through the same measuring process described below for a part. The numbers obtained from the probe tips are saved and when a part is measured, the actual values obtained from the part are compared to the numbers obtained from the master. Since the master has known dimensions and the probe has been calibrated, the dimensions of the part can be calculated.

6 Taking a Measurement

This section will only describe the process of taking a single set of measurements for one hole. In actual practice, four such measurement sets are taken, one set through each of the holes in the gauging fixture. This section is intended only to describe the physical process; the computations will be detailed below.

The part is clamped securely into the gauging fixture. Because the hole locations are being compared to the hole locations of the master, it is important that this is done the same way each time. A probe is inserted into the hole with the button down, this is considered zero degrees. The reading from the transducer is recorded and the probe is rotated 90 degrees clockwise, to the ninety degree position. The reading is recorded and the probe is rotated clockwise another 90 degrees to the one hundred eighty degree position. This reading is recorded and the probe is rotated 90 degrees clockwise once more to two hundred seventy degrees and the final reading is recorded. A program running on the personal computer prompts the operator through each step to insure that the probe is in the right place before it's sampled.

7 Calculating the Results

We'll assume that we got the following readings from the process described above. It's not important to know the actual dimensions of the master.

Part

A - 0 degrees - 1397
B - 90 degrees - 1351
C - 180 degrees - 1511
D - 270 degrees - 1394

Master

E - 0 degrees - 1395
F - 90 degrees - 1588
G - 180 degrees - 1394
H - 270 degrees - 1520

Calibration for this probe is .000459 millimeters per division.

7.1 Hole Diameter

Zero and one hundred eighty degrees are the vertical diameter. Ninety and two hundred seventy degrees are the horizontal diameter. E is smaller than A so the master is larger than the part:

E - A = -2

G is smaller than C:

G - C = -117

This means that the part hole is -119 times .000459 or .0537 millimeters smaller in diameter than the same hole in the master.

The same calculations for the horizontal diameter:

F - B = 237

H - D = 126

237 + 126 = 363

363 * .00459 = 1.666mm

which means that the part is 1.66mm larger than the master.

7.2 Hole Location (Displacement)

Hole location is a little trickier because the signs are not as intuitive. In this case the directions are the same as ordinary Cartesian coordinates. Up (as the part is placed in the fixture) is considered positive Y axis, and right is positive X axis. The direction is from the master to the part. So a positive Y means that the part is above the master, and a positive X means that the part is to the right of the master. Let's work through the computations with the same hole measurements that were used for hole diameter above.

At zero degrees, the part is below the master (negative):

E - A = -2

and at one hundred eighty degrees, the part is above the master (positive):

C - G = 117

Thus the center of the parts hole is:

.000459 * (-2 + 117) / 2 = .0264mm

above the center of where the master was.

Horizontally it works out as follows:

B - F = -237
H - D = 126
.000459 * (-237 + 126) / 2 = -.0255mm

Which means that the center of the hole in the part is .0255mm left of the center of the hole in the master.

7.3 Distance Between Holes

It's easy to see how the distances between the holes on the part can be calculated knowing the same dimensions on the master. Assuming that the hole we just calculated values for, is the left hole and the right hole measures -.0132. Then:

140 - .0132 + .0255 = 140.0123

gives the distance between the holes in the part.

8 Wrapping It All Up

This system is implemented on a standard AT compatible with an A/D card. We are adding a DEPCA kit to provide communications to our VAX system where our quality database resides. This will provide immediate update of the quality system at the time measurements are made.

Editors Note:

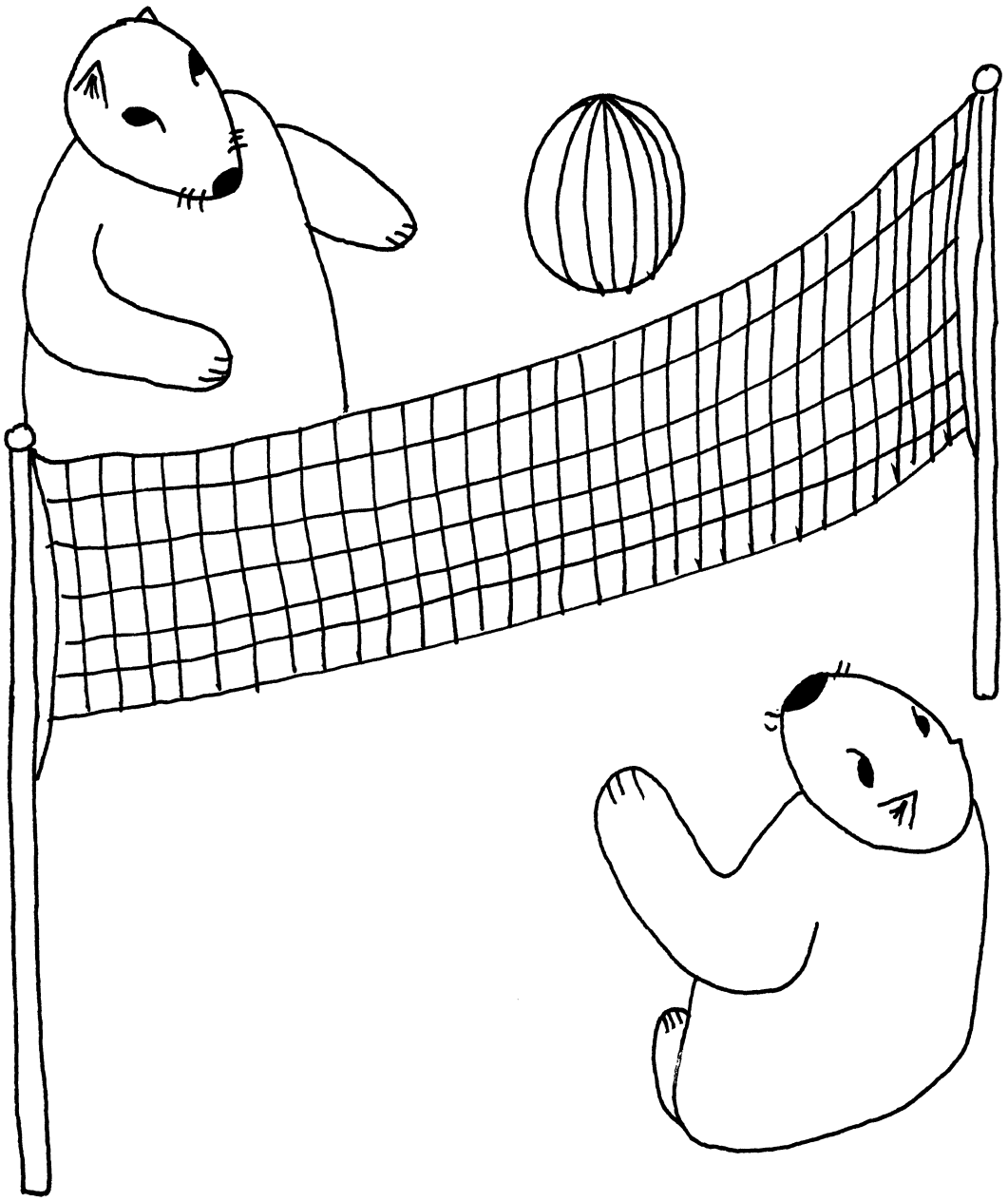
The DEPCA kit referred to is a product of Digital Equipment Corporation, used to integrate personal computers into a local area network.

The Wombat

EXAMINER and 4GL Dispatch

DTR

"Increases the Circulation of Anyone in America" Volume 9 Number 10



Contributions

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

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Marlboro, MA 01752

Joe H. Gallagher, Ph. D.
4GL Solutions
10308 Metcalf, Suite 109
Overland Park, KS 66212

Letters and articles for publication are requested from members of the SIG. They may include helpful hints, inquiries to other users, reports on SIG business, summaries of SPRs submitted to Digital or other information for members of the DATATRIEVE SIG. Machine readable input is highly desirable and machine-to-machine transfer of material is preferred, but most anything legible will be considered. However, this newsletter is not a forum for job and/or head hunting, nor is commercialism appropriate.

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Anothony D. Rogers is a principal Software Engineer at Digital Equipment Corporation. He has been the VAX RALLY project leader for two years, and has been working on the RALLY project for four years.

How NOT To Define Your Default Dictionary In DCL

B. Z. Lederman, WU World Communications, New York, NY 10004-2464

I have to work in several different CDD dictionaries during the day, depending upon the job at hand. In order to make this easier, I do two things in my LOGIN.COM file. First I define the logical name CDD$DEFAULT to point to my desired default dictionary: then I define some symbols which make it easier for me to change my default dictionary. The relevant section of my LOGIN.COM file USED to look like this:

```
$ DEFINE CDD$DEFAULT "CDD$TOP.DTR$USERS.LEDERMAN"
$!
$ CDDAI1 :== DEFINE CDD$DEFAULT "CDD$TOP.DTR$USERS.ALLIN1"
$ CDDHOME :== DEFINE CDD$DEFAULT "CDD$TOP.DTR$USERS.LEDERMAN"
```

This all looks perfectly reasonable and proper, and used to work perfectly well. When I logged in, my default dictionary was CDD$TOP.DTR$USERS.LEDERMAN, and if I typed in CDDAI1 at the DCL prompt, CDD$DEFAULT was redefined to CDD$TOP.DTR$USERS.ALLIN1, and so on.

Everything worked well until I added some additional dictionaries below my normal dictionary like this:

```
$ CDDDMF  :== DEFINE CDD$DEFAULT "CDD$TOP.DTR$USERS.LEDERMAN.DMF"
$ CDDACC  :== DEFINE CDD$DEFAULT "CDD$TOP.DTR$USERS.LEDERMAN.ACCOUNTING"
```

Now, if I typed in CDDACC at the DCL prompt I got the error:

```
%DCL-W-PARMDEL, invalid parameter delimiter - check use of special characters \.ACCOUNTING\
```

which didn't seem to make much sense. Worse, if I typed in the DEFINE command at DCL level, it worked.

TSC eventually ran this down, and it is documented somewhere in the VMS documentation set that you are not allowed to have special characters in a logical name definition unless they are surrounded by quotes, and a period is a special character. Now, the definition above appears to be surrounded by quotes, but you are also not allowed to have special characters in a symbol definition unless they are surrounded by quotes as well, and the ones above are not. In order to insure that the definitions always work, I have changed my LOGIN.COM file to look like this:

```
$ DEFINE CDD$DEFAULT "CDD$TOP.DTR$USERS.LEDERMAN"
$!
$ CDDAI1  :== DEFINE "CDD$DEFAULT ""CDD$TOP.DTR$USERS.ALLIN1""
$ CDDHOME :== DEFINE "CDD$DEFAULT ""CDD$TOP.DTR$USERS.LEDERMAN""
$ CDDDMF  :== "DEFINE CDD$DEFAULT ""CDD$TOP.DTR$USERS.LEDERMAN.DMF""
$ CDDACC  :== "DEFINE CDD$DEFAULT ""CDD$TOP.DTR$USERS.LEDERMAN.ACCOUNTING""
```

You may well ask, "If there has to be quotes around special characters, why did the CDDAI1 and CDDHOME symbols work before the fix?" It appears that there is a hidden

bug in VMS/DCL which allows some invalid definitions to work, and the magic number of special characters appears to be two. With two periods the definitions work, but with three or more they fail. I don't think anyone knows why yet.

Also note that when a definition is enclosed in quotes, that no lower case to upper case translation takes place. In the above examples I don't thin that matters much as I believe CDD will itself do the case translation: but in other cases you may have to be careful to enter your definition in upper case if the person/program/utility which uses that definition is going to search in upper case and is case sensitive.

Wombat Wizard

Dear Wombat Wizard:

I have written a large multi-user, menu-driven application in DATATRIEVE (about a dozen domains with about 75 procedures). Within the menu-driven procedures, all domains are readied SHARED except under some special circumstances which don't pertain to my problem. Multiple users can work within the menu-driven system without any file access conflict. My problem occurs when the boss (who knows enough DATATRIEVE to be dangerous and who has privilege to leave the menu-driven application) works in DATATRIEVE interactively. When the boss accesses domains, sometimes my menu-driven procedures fail with

```
Error using RMS file "FILENAME.EXT".
%RMS-E-FLK, file currently locked by another user
```

Sometimes the procedure "aborts" and the user is returned to the menu screen (that's the good news); other times the procedure continues processing and writes bad data in other domains (that's the bad news). With much less frequency, we get the message

```
%RMS-I-FLK, file currently locked by another user
Couldn't change access to readied domain.
```

and the procedure continues processing sometimes corrupting the data.

What can I do to fix this problem? Is there something I can do which will keep the boss' interactive sessions from blowing up concurrent menu-driven sessions? Or are there some coding changes I can make in the procedure to test for and trap the conditions?

Signed,

Confused by simultaneous access

Dear Simultaneously Confused,

As you have surmised, your problem stems from conflicting simultaneous RMS file access. The READY command is where the problem occurs.

Most of the time DATATRIEVE programmers and DATATRIEVE end-users operate in a single user, single process context. In this situation, one only has to worry about what

occurs within that process. In the situation which you have described, multiple users are concurrently accessing many domains. This is a much more complex situation in which most DATATRIEVE programmers, including the Wombat Wizard, have some difficulties.

Before we can proceed to the solution to your problem, we need to review the conditions under which simultaneous access conflicts arise. Recall that you can specify in the READY command the mode of access to the domain with READ, WRITE, MODIFY, or EXTEND and control the access of other users with SHARED, PROTECTED, or EXCLUSIVE. It appears that there are 12 possible combinations of "users access" and "other user control" to consider. However, WRITE, MODIFY, and EXTEND are essentially equivalent (with respect to this analysis); these access modes change (or potentially change) the data. READ mode doesn't. Therefore, there are really only six combinations. Consider the following six by six table showing where conflicts arise. "OK" means no conflict; "X" means conflict and the second READY will fail.

		SHARED		PROTECTED		EXCLUSIVE	
		R	WME	R	WME	R	WME
SHARED	R	OK	OK	OK	OK	X	X
	WME	OK	OK	X	X	X	X
PROTECTED	R	OK	X	OK	X	X	X
	WME	OK	X	X	X	X	X
EXCLUSIVE	R	X	X	X	X	X	X
	WME	X	X	X	X	X	X

Since you state that all your procedures control the access of others by the use of SHARED (you allow all access by others) but the boss causes the problem with interactive access (which by default is PROTECTED), the problem is occurring between PROTECTED READ or WRITE with SHARED READ or WRITE. See the area in the box in the table above.

The default access to domains is PROTECTED; this has been the case since the earliest version of DATATRIEVE. However, since version 4.0 of VAX DATATRIEVE, it has been possible to specify the default access control. The logical DTR$READY_MODE, if specified, will override the default of PROTECTED. One easy way around your problem is to slip the following line of DCL code into your boss' LOGIN.COM file:

```
$ASSIGN "SHARED" DTR$READY_MODE
```

This will work just fine if your boss only knows how to ready domains without specifying any mode control. However, if your boss is like mine, he is compulsive, unpredictable, and slightly crazy, and this change in his defaults ready mode will not completely solve your problem.

A more realistic way to attack your problem is to modify the DATATRIEVE code in your procedures. The apparent unpredictability of your procedures when the file access conflict occurs is due to the state of SET ABORT. If SET ABORT is in effect, DATATRIEVE will abort the remainder of your procedure or command file when

1. an ABORT statement is executed
2. a CTRL/Z is enter at a prompt
3. a logical or syntax error occurs during the execution of a command or statement (except the DELETE command)

It is the third case which you are experiencing; the "%RMS-E-FLK" error is treated as a logical error and your procedure is aborted if ABORT is set. If ABORT is NOT set, then you get the error message, but the procedure continues to execute.

Thus, if you want to make sure that you don't do any processing if you can not gain access to a domain, then your procedure should contain a SET ABORT before any critical READY. If the READY fails, all the other statements and commands will be ignored.

Now we have taken care of everything except the case when you get the informational message

```
%RMS-I-FLK, file currently locked by another user
Couldn't change access to readied domain.
```

In this case, the menu-driven process initially had the domain readied SHARED READ. The boss then accessed the domain with a PROTECTED WRITE. Then the menu-driven process tried to change the ready access to SHARED WRITE. This last READY fails with the error message above and the domain is left in SHARED READ access. In this situation, the error is only an INFORMATIONAL error not a FATAL error. So even if ABORT is set, the procedure will not abort!

There are a couple of work-arounds to this. First (and simplest) is to always ready domains in menu-driven application as SHARED WRITE. This will cause the boss' ready to fail rather than the menu-driven application's. The disadvantage to this is that if the menu-driven application has a record selected (even if the record is not going to be changed) there will be a record lock on that record which may block searches by other users. Second is to explicitly re-ready the domain with ABORT set. Consider the following ways to ready a domain SHARED WRITE:

```
!  Case 1                          !  Case 2

SET ABORT                          SET ABORT
                                   READY FOO SHARED READ
                                   FINISH FOO
READY FOO SHARED WRITE             READY FOO SHARED WRITE
. . .
```

In Case 1, if the domain FOO is already readied SHARED READ, and the RE-READY fails with an INFORMATIONAL error message, the procedure is not aborted. In Case 2, the domain is explicitly readied SHARED READ. If someone else has the domain exclusively, this READY will fail and the procedure will abort. If the ready SHARED READ does not fail, then it doesn't matter if the domain was previously ready or not; it is now ready. It can then be explicitly FINISHed. Then the following READY SHARED WRITE will either succeed or will fail with a FATAL error (rather than an INFORMATIONAL error) and abort!

We have described how to solve your problem; however, the solutions is not very user friendly in that the ABORT occurs (protecting the rest of the data base) but no message is given (nor can one be given) to the user to alert him/her as to what has happened.

A much "cleaner" solution to this problem would be to get the DATATRIEVE developers to add a new function to DATATRIEVE which would report the status of domains. When you type SHOW READY, you get a report of the status of all readied domains. That looks like:

```
DTR> ready foo
DTR> show ready
FOO:   Domain, RMS indexed, protected read
. . .
```

If we had a function like FN$DOMAIN_STATUS(domain_name) which would return the status "Domain, RMS indexed, protected read" or the string "Not ready", then you could use the following type of DATATRIEVE code:

```
SET NO ABORT
READY FOO SHARED WRITE
SET ABORT
if (fn$domain_status(FOO) not containing "shared write") then begin
    print "Domain FOO could not be readied for write access."
    abort "Aborting procedure."
    end
. . .
```

I guess someone will have to put in a PIR (product improvement request) for such a function. Hope this solves your problem and your domains can be simultaneously accessed.

Signed,

The Wombat Wizard

Using DATATRIEVE Record Definitions with the SORT/MERGE Utility

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Most VMS users are (I hope) familiar with the SORT/MERGE utility. Apparently, not so many people are aware that this utility can also change file layouts (delete fields or change the positions of fields in records), eliminate duplicate records, change file organization (sequential to indexed or variable length to fixed length records), and it can often perform these functions faster than DATATRIEVE.

One of reasons SORT/MERGE isn't used as often as it might be is that in order to do such functions as record re-organization, you have to describe where all the fields are in the record. This normally means writing a sort specification file with the fields identified by size and position in the record. Laying out a record and counting bytes to find the locations of all of the fields is tedious and error-prone.

Fortunately, if you have a record definition for your file in the CDD such as a DATATRIEVE record definition, then SORT/MERGE can use the same definition and you don't have to try to figure out where the fields are; you can simply use the same field names you used in DATATRIEVE. This feature is not very well documented in the SORT/MERGE manual, and there are a few oddities to using it. So I will describe what I have learned about it.

Consider the following very simplified DATATRIEVE record definition named ORDER_RECORD in CDD node CDD$TOP.SHIPPING

```
01 ORDER_REC.
    10 ORDER_NUMBER USAGE INTEGER.
    10 SHIP_TO.
       20 NAME PIC X(10).
       20 ZIP_CODE PIC 99999.
    10 SOLD_TO.
       20 NAME PIC X(10).
       20 ZIP_CODE PIC 99999.
;
```

Suppose I want to sort this file by ORDER_NUMBER. First I must create a sort specification file which tells sort where this record is and what field to use for sorting. I will call this EXAMPLE1.SRT, and it will contain the following:

```
/CDD_PATH_NAME="CDD$TOP.SHIPPING.ORDER_RECORD"
/KEY=(ORDER_NUMBER)
```

Now all I have to do is tell SORT to use this specification when it sorts my file. For example:

```
$ SORT/SPEC=EXAMPLE1 INPUT.FILE OUTPUT.FILE
```

where INPUT.FILE and OUTPUT.FILE are of course the names of the files which have my data to sort and the file into which the data will be placed; they can both be the same name. Notice that I didn't have to put any "/KEY=(xxx)" qualifiers on the DCL command line because there is one in the specification file.

Special handling for group fields

In the above example record, there are two ZIP_CODE fields. A problem arises in sorting one of these fields, because SORT/MERGE doesn't know quite as much about CDD records as other products (or as much as it should know). You can't just specify a path name such as:

```
/KEY=(SOLD_TO.ZIP_CODE)
```

as you would in DATATRIEVE or other languages. Fortunately, there is a work-around suggested by a member of the CDD support group in the Telephone Support Center that appears to function properly (at least the times I've tried it), and that is to pretend to sort on the group header. The sort specification file would become:

```
/CDD_PATH_NAME="CDD$TOP.SHIPPING.ORDER_RECORD"
/KEY=(SOLD_TO)
/KEY=(ZIP_CODE)
```

Even though SOLD_TO isn't a "real" field, this seems to make SORT/MERGE happy and allows it to find the right ZIP_CODE. I've also sent in an SPR on this, and perhaps some day this may be improved.

Reorganizing files / extracting fields

As an example of how SORT/MERGE can be used to reduce data, I decided to try producing a subset of the system authorization file.[1] This would reduce the size of the

---

1/ A record definition for SYSUAF.DAT is in the DTR/4GL SIG Library collection and appears in "Accessing SYSUAF.DAT and QUOTA.SYS with VAX DATATRIEVE", by Donald E. Stern, Jr., DECUS U. S. Chapter SIGs Newsletters, Volume 1, Number 2, pp. DTR-12 - DTR-14, October 1985; and an Errata in Volume 1, Number 4, pp. DTR-17 - DTR-18, December 1985.

record, eliminate blank spaces and fields I don't need, and in this example allows extraction of only "nonsensitive" data. It also allows me to experiment with the data without accidentally changing or locking the system authorization file. My sort specification file SYSUAF.SRT looks like this:

```
/CDD_PATH_NAME="CDD$TOP.DTR$USERS.SYSTEM.SYSUAF_RECORD"
/KEY=(USERNAME)
/DATA=USERNAME
/DATA=ACCOUNT
/DATA=OWNER
/DATA=DIRECTORY
/DATA=LOGFAILS
/DATA=DATE_LAST_INTERACTIVE_LOGIN
```

and the DCL command I used with this file was

```
$ SORT/STAT/SPEC=SYSUAF SYS$SYSTEM:SYSUAF.DAT SYSUAF.SEQ
```

I received an error message from SORT because the input file is indexed and I had not created a blank indexed file into which SORT could insert the data; so it went ahead and created a sequential file, which happened to be what I wanted anyway. If I had used an additional switch to tell SORT that I wanted a sequential file the error message would not have been produced. Note again that because a CDD record definition is used, all that is necessary to produce a reformatted output record is to name the desired fields in the desired order. Also note that when you are converting from one record layout to another, the one you use in the sort specification file is the INPUT file record layout.

Benefits

There are times when a domain contains a large number of records, and each record contains many fields; yet a report has to be done on only a few fields, or must be done by sorting the data on a field which is not a key, or by sorting in descending order when the key is ascending. In these situations, it may be faster to sort the data into a sequential file with SORT/MERGE, and then report on it without sorting in DATATRIEVE. This is especially true if the /DATA option is used in SORT/MERGE to pull out only the fields which are actually needed, and this can in turn save a significant amount of disk space.

Special note for PDP-11 users

There is a SORT-11 utility available for RSX (and, I think, RSTS) which has most of the functionality of VMS SORT/MERGE, especially SORT-11 Version 3. Unfortunately, it can't read DATATRIEVE dictionaries, so you have to describe the fields individually using the /FIELD command and giving the position and size. However, it is often well worth the effort especially when reporting large domains. DTR-11 often runs out of pool space when doing complicated reports, and especially when sorting large domains. By using SORT-11 first to put only the necessary fields into a sequential file which is already properly sorted, the DATATRIEVE report will take much less time to execute and reports which would have failed for lack of pool space may be obtained.

VAX RALLY Application Development Topics

Anthony D. Rogers

VAX RALLY is a fourth generation application development system from Digital Equipment Corporation. This article is the first in a series that will describe an assortment of special techniques that customers have found useful when developing applications with RALLY. The theme of this article is form/report formatting. The following topics are covered: computed text fields, multi-line text fields, floating aggregate fields, and first/middle/last formatting.

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Computed Text Fields

One technique for use with VAX RALLY that is useful in many applications is to define a computed field that concatenates data fields and string constants together. Take as an example an employee name that is defined in the database as 3 text fields, FIRST, MIDDLE, and LAST. That's fine for data entry and is especially useful for queries, since it allows people to query on the different fields separately, but on reports, people normally prefer to see names displayed in a more natural way.

The solution to this is very simple. Define a computed field to display the formatted name, and mark the three data fields as non-displayed. The computation is defined using an ADL (Application Development Language) procedure:

```
fr.formatted_name :=
    fr.first || ' ' ||
    fr.middle || '. ' ||
    fr.last;
```

The double bar ("||") is the ADL concatenation operator.

Anthony D. Rogers is a Principal Software Engineer at Digital Equipment Corporation. He has been the VAX RALLY project leader for two years, and has been working on the RALLY project for four years.

Multi-line Text Fields

There are two ways to handle multi-line text fields in RALLY:

- Using multi-line form/report fields—limit of 512 characters
- Using a callable editor—no limit on size

Both methods are described below.

Using Multi-line Form/Report Fields

The easiest method is to define an Rdb text field that is large enough to hold multiple lines of text. Use any of the normal RALLY procedures for creating a form/report, and then change the vertical size of the field to be more than one line long. This means changing the end line so that it is greater than the start line.

The length of fields in RALLY is restricted to 512 characters or less, so this method is useful only for small amounts of text.

If the field is to be used for entering or modifying the text, then you must edit the field's input and validation options:

Input options:

- Lines horizontally scroll: clear
- Up, down and newline can exit field: clear

Validation options:

- Newline characters not allowed: clear

Automatic Word Wrapping

RALLY provides a feature for automatic word wrapping. When this feature is enabled, the user can enter multi-line text without pressing RETURN to separate lines. RALLY will automatically insert a carriage return at the nearest word break each time that the text fills up the width of the field.

Rather than turning word wrap on and leaving it on, we advise that you turn word wrapping on each time that you enter a multi-line field and off when you exit the field:

- use 'set word_wrap' when you enter field
- use 'clear word_wrap' when you exit field

Unfortunately these commands cannot be executed directly from any of the form/report action sites; they can, however, be executed from within macros and local functions.

To make your application turn word wrap on and off automatically using macros, just define one macro to turn word wrapping on and one to turn it off, and then save them in a special macro file that is always used with the application. You can then invoke the macros from the action sites directly using the CALL_CMD call type.

To use a local function, write an ADL procedure that sets word wrap on or off depending on the state of a global variable. You must use the ADL aliases for the commands with the CALL_CMD function:

```
IF turn_word_wrap_on THEN
    { Set word_wrap }
    CALL_CMD(setpwrtype);
ELSE
    { Clear word_wrap }
    CALL_CMD(clrpwrtype);
```

Use the *Edit a Packet's Local Function Options* form to make that procedure the local function for the form/report.

Then define two more ADL procedures, one for the before field action and one for the after field action. Make the before action procedure set the global variable to indicate that word wrap should be turned on and then execute the local function:

```
{ Set state variable }
turn_word_wrap_on := 1;
{ Use local function }
CALL_CMD(frfunction);
```

Make the after action procedure set the global variable to indicate that word wrap should be turned off and then execute the local function:

```
{ Set state variable }
turn_word_wrap_on := 0;
{ Use local function }
CALL_CMD(frfunction);
```

With a Callable Editor

If your application requires that pieces of text more than 512 bytes long must be displayed, then you should use a callable text editor to display the text. Write 3GL code (e.g. BASIC, COBOL) that invokes a callable editor (e.g. TPU, EDT). Store file names in the database, instead of the text, and create RALLY external program links to invoke the 3GL code and pass the file name from the database to the program.

One useful technique is to set up your application so that the user views the text by positioning to the record of interest, then using 'use local_function'. For example, you could have a directory style report that listed all of your employees. To see the résumé for any employee you would move your cursor to the employee and press GOLD–M. This would invoke the 'use local_function' command, which would invoke the external program link, which would in turn invoke the callable editor. Use the *Edit a Packet's Local Function Options* form to set the form/report's local function to call the external link.

Floating An Aggregate Field

When you define a form/report aggregate in RALLY, you normally put the aggregate field on the output order for the parent group—one group higher than the group over which the aggregation will take place. This means that the aggregate field, and any text that you create for it, will be positioned relative to the parent group, not to the child group. If there will be a varying number of records in the child group, and you would like the aggregate to float up and down on the page, so that it always appears directly below the last child record, then you must use the "relative positioning" form/report feature. For example, say that you wanted to make the following form/report:

Sales by Salespeople

```
Lew Lasher
     9-Jan-1988          $  12.31
                         --------
        Total            $  12.31

Tony Rogers
     3-Jan-1988          $  47.43
    12-Jan-1988          $  12.23
    23-Jan-1988          $   8.76
                         --------
        Total            $  68.42
```

You do this by putting the aggregate (the total) and its text area (for the word "Total" and the line above the total) within a format group, and positioning the format group relative to the end of the child group. You specify this on the *Edit a Group's Display Options Relative to a Group* form:

```
Display below group: ORDERS_GROUP
```

You will usually want to mark the format group as not displayed on first and middle pages, so that it only appears once for each parent group, regardless of how many pages the child records for that child take. Make sure that you always leave room for the format group at the bottom of the form/report.

When using relative positioning, be sure to clear the subform attribute when you create your format groups. The subform attribute is set by default when you create a format group, but subforms are used only to create pop–ups.

First/Middle/Last Formatting

First/middle/last formatting is most often used to create header and trailer pages. It also gives you the ability to specify special formatting for the first page of data for a given parent, for middle pages, and for the last page.

First/middle/last formatting can be applied to groups, fields and text areas. It is applied most often with format groups.

Output Orders Are Significant

In ordinary situations you need not be concerned about the order of objects on the output order for a group. In such cases you can think of the output order as an ownership list—a list of the objects owned by the group. However, when using advanced formatting features such as first/middle/last formatting, you should make the output orders for all groups reflect the order that the objects will be displayed. For example, objects that will be displayed only on the first page of a report should always be before objects that will appear on middle pages, and objects that will appear only on the last page should always be at the end of their parent's output orders.

Image Editor State

To help you forsee what your form/report is going to look like with real data, the Dialog provides you with the ability to tell the form/report image editor to display the form/report as it will look in different situations. For example, to see how the last page of data for a group will be formatted, use the *Change a Group's Image Editor State* form to select last page formatting for the group in question:

```
Page location of group: LAST
```

Leave the group name blank when you want to set the state for the main group.

Similarly, when you set "start new page" for an object, then the logical page numbers for the object, and all of the objects that follow it in the form/report, are incremented by one. By default, you will always be shown logical page 1 in the image editor. There is an example of how to view later pages below.

Header and Trailer Pages

If the parent group is the main group, first, middle and last refer to the entire form/report—first page means the first page of the form/report, last page means the last page, and middle page means all the pages in between.

Header Pages

To create a header page for a form/report, create a format group and put it at the beginning of the main group's output order. Clear the format group's subform attribute, then mark the it as not displayed on middle or last pages:

```
Do not display on
First page:
Middle pages: X
Last page:    X
```

Create the text area explicitly, rather than relying on the image editor to create it for you. Put the header page text area and any special header fields into the header format group just created.

Set "start new page on first page" for the title text to be displayed on regular (middle) pages:

```
Start new page on
First page:   X
Middle pages:
Last page:
```

Setting the "start new page" attribute for the title text on the data page is like inserting a form feed right in between the the header page and the data pages. The resulting page break makes the first instance of the data page the second page of the report, so to view it after making this change you must use the *Change a Group's Image Editor State* form to select page 2:

```
Page number to display:  2
```

Trailer Pages

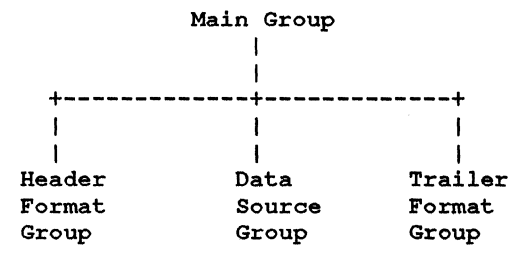
Create a format group and put it at the end of the main group's output order. Clear the subform attribute for the format group, mark it as not displayed on first or middle pages, and set "start new page on last page":

```
Do not display on
First page:   X
Middle pages: X
Last page:

Start new page on
First page:
Middle pages:
Last page:    X
```

Create the text are for the trailer page text explicitly. Put the text, and any special trailer page fields into the trailer page format group. Because two page breaks occur before the trailer page is formatted, the trailer page is on logical page 3, so you must use the *Change a Group's Image Editor State* form to select page 3 in order to use the image editor to edit the trailer page:

```
Page number to display:  3
```

The resulting form/report structure will be:



Using First/Middle/Last With Data Groups

If an object is within a data group, first, middle, and last refer to the pages spanned by the current record of the parent data group. If an object has its attributes set so that it is not displayed on first and middle pages, and there are several pages worth of child group records for a given parent value, then the child object will not appear on the first page for the parent, or the middle pages, but only on the last page for that parent value.

For example, above it was suggested that when the data for a group with a floating aggregates spans multiple pages, the floating aggregate should only appear on the last page. To implement this, the format group that contains the aggregate and its label should have the following attributes:

	Do not display on
First page:	X
Middle pages:	X
Last page:	_

Making First Pages Distinctive

It is common for the child records for a given parent record to appear on more than one page. If you have reports where this happens, you may find it useful to use first/middle/last formatting to make it easy to tell the first page from the overflow pages.

For example, you could create a special text area that is only displayed on first pages, and/or have a special text area that just says "Continued", and have that only appear on middle and last pages. If this technique was applied to the form/report shown above, the first page with information about Lew Lasher might look like this:

```
Page 1

================================
Lew Lasher

    23-Jan-1988          $  47.43
    24-Jan-1988          $  47.43
    25-Jan-1988          $  47.43
    26-Jan-1988          $  47.43
    27-Jan-1988          $  47.43
```

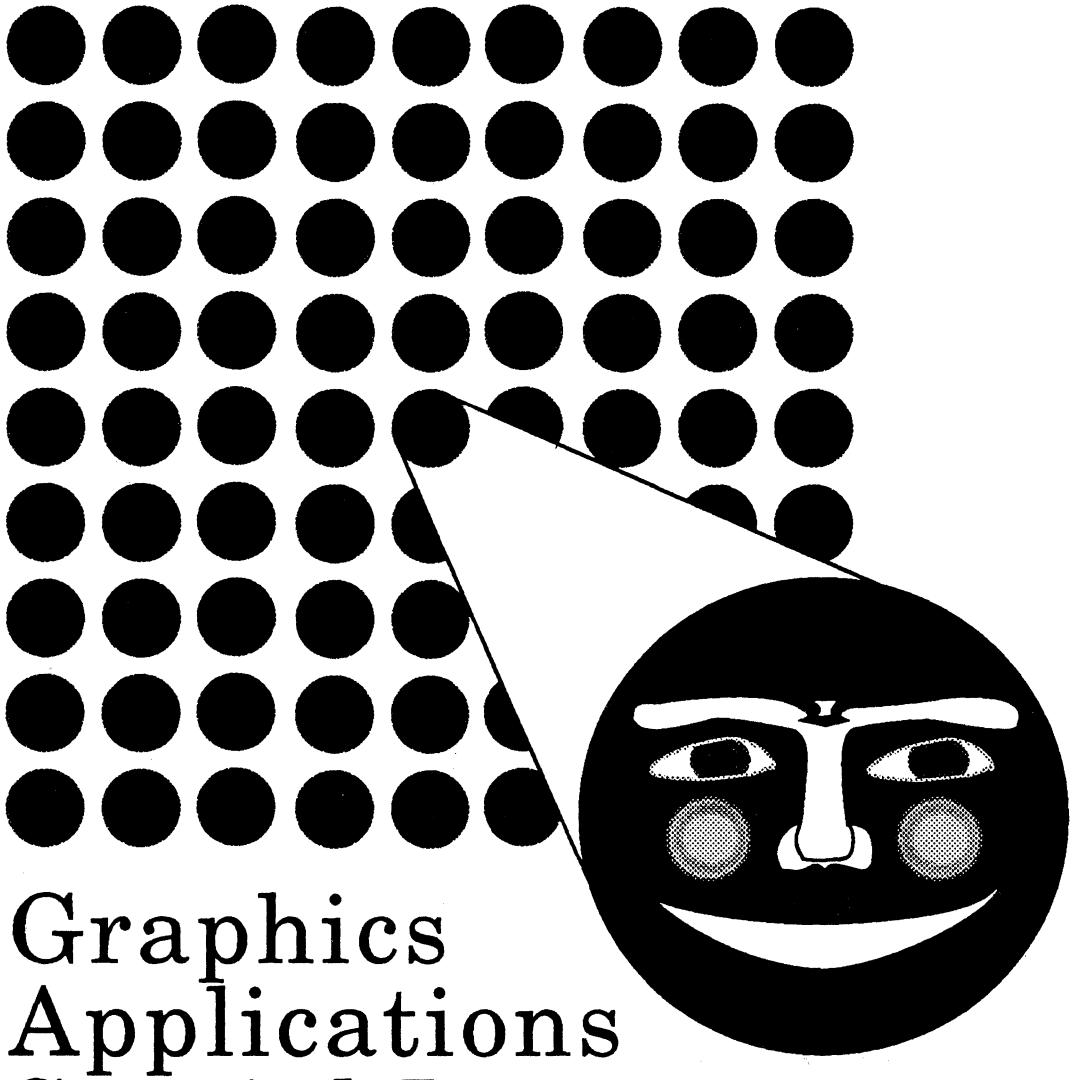
While the second page might look like this:

```
Page 2

Lew Lasher [Continued]

    28-Jan-1988          $  47.43
    29-Jan-1988          $  47.43


================================
Tony Rogers

    23-Jan-1988          $  47.43
    26-Jan-1988          $  47.43
    29-Jan-1988          $  47.43
```

To do this, explicitly create a text area for the bar and a text area for the "continued" message. As noted above, make the parent group's output order reflect the order in which the child objects will be displayed. Put the first page text (the bar) at the beginning of the parent group's output order, and the middle/last page text ("continued") at the end of the output order.

Use the *Edit a Text Area's Location on Page Options* form to mark the first text area as not displayed on middle and last pages, and the second text area as not displayed on first pages.

Use the *Text Area to Edit* form to explitly select the text areas whenever you to edit them. This will keep the image editor from getting these text areas confused with other text areas in the form/report.



Graphics Applications Special Interest Group Newsletter

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Submissions

Articles, copies of viewgraphs, tips and tricks, and graphics output are all welcome submissions for the Graphics Applications Special Interest Group (GAPSIG) newsletter. There are many ways to make submissions:

1) Send in a tape. Tapes can be 1600 or 6250 BPI density; VMSBACKUP or RSX BRU formats are acceptable. Your editor uses the Mass-11 word processing system from Microsystems Engineering Corporation, so submissions in this format are okay. Otherwise, provide straight ASCII documents. Please place any charts into a separate file. And, please enclose a letter with your address and any notes and description for format that you desire.

2) Send in paper. Hey, your editor can type and chew gum at the same time, so don't be afraid to send in hard-copy. And, if all you have is notes, FINE! Send them in!!! We have many folks who can take the ideas and flesh them out with English language extensions. Questions are desirable, too; DECUS should, in the opinion of your humble editor, be a place to trade information, so questions count for as much as answers here.

3) Mail to HAYS on DCS. If you have a DCS account and the article is all textual, mail it to HAYS on the DCS system.

Your editor's address appears in the **From the editor** section, so mail yours in today!

From the editor

Bob Hays
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This is a sparse issue of the newsletter for many reasons, including the upcoming Symposium (the newsletter is prepared two months before the issue date on the cover, so this is being done in April) and new plans growing from the GAPSIG Woods Meeting in March. I personally found the meeting really helpful thanks to many ideas forthcoming from all the attendees. Combined with the newsletter survey, there has been much new thinking in my cubbyhole.

Most obvious is the changeover to two-up format, or landscape mode printing much like other SIG newsletters. While some newsletter survey replys disliked landscape format, more wanted a unified look-and-feel (hope another computer vendor isn't taking a bite out of this issue).

I'd like to try some new things out which were discussed by the SIG steering committee. First, let's try a "Graphic-of-the-Month". For this, submit any single black and white graphic image that conveys a useful idea and was created on a DEC-based system or with the help of a DEC-based product.

Include a short (100 or less word) description of: how the image was manipulated and generated, what equipment was used, any neat portions of algorithms applied, etc.

Which leads in to another desired end result: I want more graphics in the Graphics Applications SIG newsletter! Please, include final-quality plots, graphs, images, etc. for articles if you have time. I know people are doing really fun and useful things graphical today, so let's see it.

I plan to provide a three-year index every year in a newsletter issue. Which issue is up-in-the-air, since it depends on page counts and other mundane things. However, many members (myself included) have always wanted to find that certain article. The initial index will be by subject and possibly, space permitting, by title.

We want your ideas for a new logo! GAPSIG has lacked a spiffy, modern logo for quite long enough. Submissions for this also should be addressed to me at the above address, and should be in hard-copy form.

I've blow on long enough for this issue. Suffice it to say that there are new plans and additions to your GAPSIG newsletter planned over the next year!

Woods meeting minutes

Mike York

The DECUS GAPSIG Steering Committee woods meeting was held in Phoenix, Arizona, March 26 and 27. Those attending were:

Bob Goldstein	Image processing working Group Coordinator
Bob Hays	Newsletter Editor
Rick Landau	Counterpart
Mike McPherson	Library, Vice Chair
Bijoy Misra	SIG Chair
Jim Sims	Engineering Working Group Coordinator
Henry Schneiker	Hardcopy Working Group
Paul Waterstraat	Standards Coordinator
Mike York	Member at Large

The woods meeting began the morning of March 26 with a review of the Anaheim Symposium. Overall, the Steering Committee members had quite favorable reactions to how the GAPSIG performed at Anaheim, but a few problems were brought up: cancelled sessions were more of a problem than usual since some speakers couldn't make the symposium due to budgetary considerations and some sessions were scheduled by someone other than the intended speaker, with the actual speaker being notified too close to the symposium to adequately prepare.

The campground was another concern; security issues and the lack of traffic through the campground were noted. It was suggested that more announcements about the campground be included in symposia sessions at future symposia.

There was also some discussion about session notes. It was pointed out that Digital is submitting much more material for the session notes, but many other speakers are failing to submit material. It was explained that many presenters prepare for sessions in the two weeks before symposia, long after the deadline for session note submissions. There was some discussion about the GAPSIG publishing its own session notes, but that idea was abandoned when it was revealed that the session notes could not then be pre-sold. It was then suggested that the GAPSIG could publish an addendum to the session notes, to

include materials submitted after the deadline. It was finally decided to have Steering Committee members and other volunteers gently remind scheduled session speakers of the deadline for session note submittals.

Members of the Steering Committee then gave brief reports on their functional areas. Henry Schneiker, coordinator for the hardcopy working group, reported that he has not yet been able to schedule a meeting with Digital concerning hardcopy futures, but would work on scheduling the meeting within the next few months.

Mike McPherson, Library Coordinator, reported that a Library Committee meeting was recently held in Washington, D.C. Mike reported that the meeting had a good representation of SIGS and was well organized. Discussed at the meeting were catalog restructuring, indexing the catalog, and electronic distribution of library programs.

Bob Hays, Newsletter Editor, was next. Bob reported that a survey of newsletter readers had been conducted. The survey results indicate that readers:

- want more technical articles
- want more how to articles
- don't like landscape orientation
- want common format for newsletters
- want an index
- want reviews of library programs
- want articles rated by expertise
- want a list of current versions of products

Bob then went on to briefly discuss other newsletter issues, such as electronic submission of articles, color in the newsletters, and a graphic of the month feature.

There was then some discussion about using the newsletter for publishing symposia information. The general consensus of the Steering Committee was that the lead time for publishing the newsletters was too long to be useful for symposia information. Some other forms of communication were then briefly discussed, such as bulletin boards & networks, a special GAPSIG publication, and LUG chair mailings.

Paul Waterstraat, the new Standards Coordinator, discussed the turnover from the old standards coordinator, Jim Flatten. Paul reported that there are three ANSI meetings a year, which prompted some discussion about budgeting for attending the meetings. There was then some discussion about the GAPSIG sponsoring a simple "standard" graphics application that could be written using various standards and used as a basis for comparison of standards.

A general discussion about third party involvement in the GAPSIG followed. The SIG has historically had a great deal of third party involvement, because Digital had few serious graphics products until a few years ago. However, with the emergence of workstations and laser printers, Digital is now in the mainstream of graphics products. Should the SIG actively solicit third party involvement? The consensus of the Steering was yes, but commercialism guidelines will have to be adhered to.

A brief discussion about the technical content of symposia sessions followed, with the general opinion of the Steering Committee being that over all, the technical content of symposia sessions has gone down, but the GAPSIG sessions have retained their technical content.

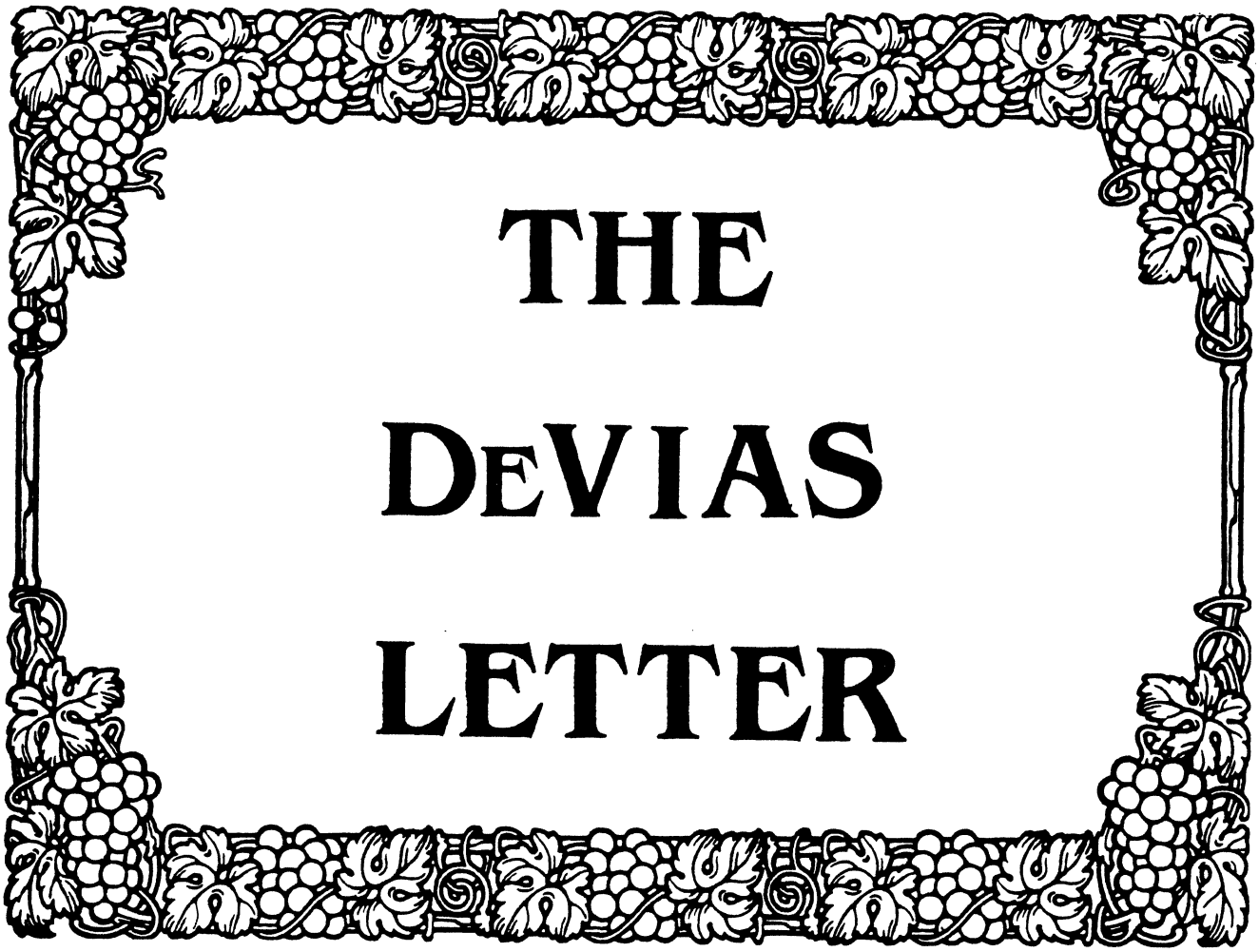
The rest of the day, and one hour the following morning, was spent on each Steering Committee member giving a short presentation on the particular applications they are involved with. While the content of these presentations is too much to publish in these minutes, it was apparent that there is a tremendous amount of experience and expertise on the Steering Committee, and it was very interesting to

see what the other Steering Committee members are involved in. The presentations were very well received by the Steering Committee.

A good portion of the second day was spent revisiting a problem the SIG has been dealing with for some time: should the SIG expand its scope to include more activities pertaining to workstations, even if some of these activities may not directly relate graphics? This question was brought up after some complaints were received in Nashville about a lack of support for workstations is DECUS. After a great deal of conversation, the Steering Committee reached a consensus that the GAPSIG is supporting workstations within the scope of its charter, and to expand its scope would not be a good idea.

The next item of business was some discussion about a questionaire to be distributed to the GAPSIG membership. It was decided that the questionaire will be one sheet of paper, and will probably be distributed at symposia, published in the newsletter, and a random mailing to GAPSIG members.

The last item of business was assigning tasks for the upcoming symposium. Bob Hays will be the session chair coordinator, Mike McPherson will be the campground coordinator, and Henry Schneiker will be the on-site coordinator.



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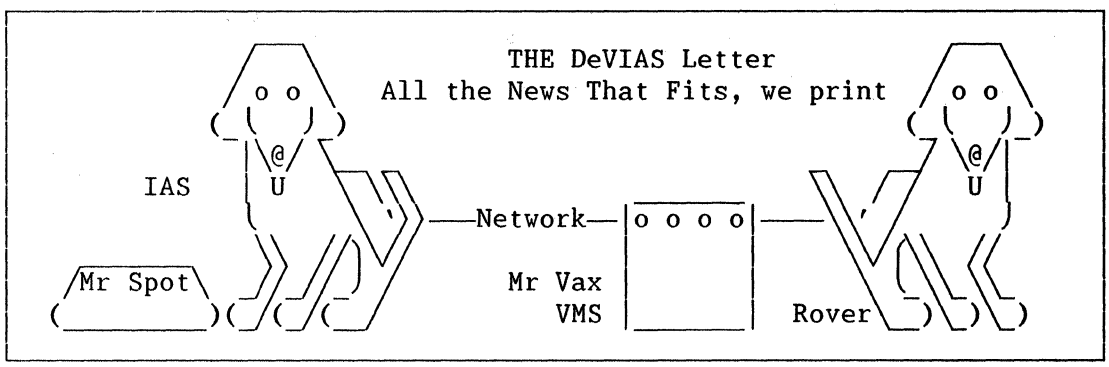


FROM THE EDITOR'S KEYBOARD

The following editorial is solely the opinion of the author, and does not represent the views of DECUS or of Digital Equipment Corp. Responses to the Editor's remarks are heartily welcomed.

I don't know what to do, it's almost deadline, and we have no hardware problems to report. (The roof is still leaking, but not over the printer room or my office, it's the conference room this month!)

Just to keep things lively, Milt Campbell has replied to a previous editorial where I stated, "I don't think it would cost the RT11 group much to provide a fully commented distribution on a suitable media as an extra cost option." Turns out your editor didn't know beans about the mechanism of RT11 distribution. Milt informed me that if you purchase the RT11 source license and distribution, you get just that, Fully commented sources. (Just what I asked for.) My apologies to the RT11 developers and to Milt.

As you may have noticed, (if you read the front of the May issue,) your editor has agreed to accept an even more involved role with the SIG's Newsletters. Since I stepped into Bill Leroy's shoes at the worst possible time, (I had to wrestle with Budget, work out the bugs on a new set of operating proceedures, and prepare for Spring DECUS) the DeVIAS letter has taken a back seat for a time. Be advised that the Letter is my first love, and it will NOT suffer greatly as a result of my new responsibilities.

IN THIS ISSUE

Your editor has finally caught up with things, and has included in this issue a talk from the fall Symposium on the IAS product panel by Jack Lockhart of DEC, manager of the mature software products group. If you really want to help Jack direct the efforts of the IAS maintenance crew, any feed-back from readers would be greatly appreciated.

CONTRIBUTION GUIDLINES

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

Paper submissions will always be accepted. Publishing may be delayed until the editor gets some time at the keyboard to convert them to our current format. We can accept submissions by FAX.

Contributions may be submitted on tape, (800,1600, 3200 or 6250 BPI,) DECtape II, and DecMate or RT11 floppies. We're not fussy, we'll even accept paper tape or cards. We can read any IAS/RSX, RT11, VMS format. Any media sent to us will be promptly returned.

We have 2400/1200 baud modems on our IAS system and our VAX, with KERMIT for electronic submission. Give the editor a call @ (312)-791-8075 (preferably later

in the day,) to obtain access info, etc.

If you have a problem you would like to submit to the Devias Demon, send it to the Editor at the following address. Answers to problems from members (or anyone) should also be sent to the Editor.

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

TEN YEARS AGO THIS MONTH

A report on the DECUS Spring Symposium mentioned the DEC announcement of "TRAX, a totally new operating system for transaction processing. This system is similar in function to IBM CISC-type systems. All screen formatting, error recovery, journaling, transaction queuing, etc. is handled by TRAX. All the user has to do is write the application code in either BASIC PLUS- 2 or COBOL." (Oh where oh where has my little Trax gone? ed.)

DEC also anounced the "ONE PRODUCT STRATEGY" whereby RSX-11D and IAS would be combined into one integrated system. IAS 3.0 is planned for release in late 1978 or early 1979.

The issue also contained an early release of "Files-11 QIO notes" an article by Ralph Stammerjohn (updated by Mike Blake-Knox.) For users who wanted direct QIO access to the Files- 11 disk structure, it was the first light on a subject never properly documented by DEC.

And finally Glen Everhart announced in a letter the availability of the latest RSX11M-RSX11D-IAS version of FOCAL!

IAS PRODUCT PANEL

Jack Lockhart, Manager
Mature Sorftware Products Group
Digital Equipment Corporation

There is an ongoing Digital committment to IAS.

Most of the user community today is in 2 or 3 different sections. There is a strong contingent in the intelligence agency, who typically does not come to DECUS, there is a commercial segment, and a couple of spin-offs in the newspaper field. Over the last couple of years, Digital's efforts toward IAS have grown, and further growth is expected over the next couple of years.

We are also beginning to do a better job of field support for IAS. As the community grows, and most of the growth is in the government area, that increases our ability to provide support for the entire community.

Digital's basic Engineering goals as reguards IAS are as follows:

Increase reliability.

Increase support responsiveness.

We believe we have done a lot to increase the reliability of the product, but we still have a ways to go to improve support. At present we have a backlog of approximately 20 SPR's. The developers are holding their own, last month the number of resolved SPR's equaled the number of new SPR's. Update D is now in field test, and we are generating internal SPR's and getting problem reports, (QAR's) from the field. Once that these are resolved, we hope to get the backlog of SPRs down.

Telephone support service.

There is telephone support for IAS. That is one area we have target that needs some improvment in the way that we organize that support.

Improved predictability.

It's still not predictable when releases of updates occur. Essentially we have a five man engineering organization that covers a lot besides IAS. IAS is a full blown operating system with a lot of complexity to it. We must not only maintain the operating system, but all the layered products. It takes a lot of work to keep up with it. The end result is that we are not as predictable as we would like. We are always looking for information from the

user community to help us prioritize our efforts. What new features should be added, what is valuable to you and what is not valuable to you, what we should not be wasting our time on.

Update D

Update D has been in field test since September. There are a number of problems that have been found with layered products and have been resolved. We have a tentative date of closing field testing in January or February. If we feel we need more testing before we put the product out we may extend field test. (Editor's note, field test was finished in January.)

Some of the functionality that you probably will be interested in in update D include:

- o DUMU, which is a multi-user MSCP handler which supports Digital Storage Architecture devices. It will help you with some through-put issues and conserve system resources.
- o Crash support has been extended to non-tape devices.
- o RMS version 2 is now supported. It provides disk overlay RMS. It does NOT support Supervisor mode libraries, and does not support clustered libraries.
- o Sort Version 3.0 is supported.
- o There are some improvements to the task builder, mainly dealing with Autoload vector handling.
- o Datatrieve 3.0 is supported.
- o Fortran 5.0 is supported.
- o Macro 5.5 is supported.
- o VT3xx terminals are supported.
- o A number of bug fixes are done.

We also provide a limited amount of strategic consulting to what we consider strategic accounts, which allows access to internal engineering resources. Essentially this has to be pre-arranged, via an agreement between the account and Digital, that they want to take advantage of this kind of service. There are some times and some commitments that Digital makes, and there is a pre-arranged escalation criteria and some commitments of what kind of services Digital can provide and what level of services.

Question and Answer

Question: On your DUMU handler. In the past, DEC hasn't supported multi -user disk handlers. Is this going to be a complete support? For example, can you do a sysgen etcetera on disks connected to the second controller?

Answer: I don't know. Give Nancy Fay Autenzio, the product manager for IAS a call, and she can get the specific technical information to you.

Question: Your slide showed support for Fortran version 5.0. I note that on the M and M+ side, version 5.2 is already out in the field. Is support limited to 5.0?

Answer: As far as I know, support is limited to version 5.0.

For the layered products, often times there is nothing significantly done to the layered products. After you build the new operating system, you test the layered products underneath it. Just because it works under C may or may not mean that it works under D. Whatever the current version of the layered product is at the time it was tested determines what version of the layered product has been validated, and as far as we know, works correctly. In some cases that means that some work was done, probably to the operating system, to make that happen. In some cases little of anything was done. It is a statement of validation rather than a statement that any changes were made to the operating system.

Question: Does DEC have any intention of supporting C under IAS?

Answer: No.

Question: Does DEC have any intention of supporting Ethernet under IAS, (for example DECNET phase IV?)

Answer: There is no intention of supporting DECNET phase IV under IAS. In fact, as you know there has been considerable concern about DECNET-IAS

altogether. It currently only supports Phase III, it really in the SPD only allows you to talk to other IAS systems. VMS is going to be going to phase V, the other PDP11 operating systems are or will be going to phase IV, IAS DECNET will probably be facing retirement before too long.

Question: So there is no intention of supporting Ethernet in any fashion?

Answer: There is no intention of supporting it through IAS decnet.

THE PROGRAM OF THE MONTH CLUB

One of the things wrong with hard copy documentation of short BASIC programs, indirect command files, etc is that with no compiler there is no nicely paginated output, no date/time stamp, and no indication of disk and uic.

This program produces a paginated output listing, along with a specification of Date/time disk and UIC.

Note that the header line should be customized with the local organization's name, etc. It is designed for 132-character output, but output to 80-character devices will still have all the relavent header information.

```
        .title  pag
        .ident  /mrh001/
        .mcall  finit$,fsrsz$,qiow$,dir$,call,return
        .mcall  open$w,open$,open$r,get$,put$,close$
        .mcall  csi$,csi$1,csi$2,csi$sw,gmcr$,exit$s,gtim$
        .mcall  gcml$,rcml$,gcmlb$,print$,csi$nd
        .mcall  fdbdf$,fdat$a,fdrc$a,fdop$a,fdbf$a
        .mcall  fdop$r,nmblk$
;
; pag   paginate listing program
;
;       provides listings of programs etc on a paginated basis
;       header lines contain device, uic name etc and date time
;       listing a max of 55 lines/page so dont print over fold
;
;calling sequence
;               mcr>pag[elist] dev:[uic]name.type
;
;               optional switch "/ta" puts leading tab in for
;               use with lp1 so can punch and put in ring binder
;
;               mcr>pag[elist] dev:[uic]name.typ=dev:[uic]name.typ
;
;if no output file spec is given, the output defaults to: sy:name.lst
;and the file is automatically spooled to lp:
;
; evf's and luns
;
outlun  =1      ;output file lun
outevf  =1      ;and evf
tilun   =2      ;terminal io lun
tievf   =2      ;and evf
tiflun  =3      ;terminal "file" lun
tifevf  =3      ;and evf
influn  =4      ;the first in-file lun
infevf  =4      ;and evf

        .sbttl  main line code
start:  finit$                  ;set up for file io for file i/o
        jsr     pc,.rdfui       ;get uic i'm running under
```

```
        mov     r1,uic          ;save the uic (binary)
        gcml$   #gcblk          ;get the command line
        cmpb    #ge.eof,gcblk+g.err ;end of file on command input ?
        bne     5$              ;no
        exit$s                  ;yes, quit
5$:     tstb    gcblk+g.err     ;any other errors ?
        bpl     6$              ;no
        dir$    #erpri          ;report command line file error
        dir$    #cmderr
        exit$s
6$:     mov     #1,inpflg       ;set flag that input file spec seen
                                ;fill in pointers in csi block
        mov     gcblk+g.cmld+2,csblk+c.cmld+2
        mov     gcblk+g.cmld,csblk+c.cmld
        csi$1   #csblk          ;and parse it
        csi$2   #csblk,input,#switch    ;try for an input spec
        bitb    #cs.nmf,c.stat(r0) ;was input spec'd
        bne     7$              ;br if it was
        clr     inpflg          ;else clear flag that says it was
        csi$2   #csblk,output   ;default to file spec to be spooled
7$:     bitb    #cs.dif,c.stat(r0) ;did they spec a uic ?
        beq     22$             ;no
        mov     #csblk+c.dird,r2 ;yes point to descriptor
        mov     #uic,r3         ;place to store it
        jsr     pc,.ascpp       ;convert string to octal number
22$:    bitb    #cs.nmf,c.stat(r0) ;is a name given?
        bne     4$              ;yes
        dir$    #erpri
        dir$    #namerr
        exit$s
4$:     fdop$r  #infdb,,#csblk+c.dsds ;fill in file name to be listed
        open$r  #infdb          ;and open it
        bcc     44$             ;br if ok
        dir$    #erpri          ;else report problem
        dir$    #namerr
        exit$s
44$:                                    ;change output file type to "lst
        mov     csblk+c.dsds+10,r1      ;get length of name string
        mov     r1,namlen               ;save length
        mov     csblk+c.dsds+12,r2      ;and start
441$:   cmpb    (r2)+,#'.               ;found the "." in the file name
        beq     442$                    ;yes
        sob     r1,441$                 ;no, get another
                                        ;had to have "." so assume ok
442$:   movb    #'l,(r2)+               ;overwrite "typ" with "lst"
        movb    #'s,(r2)+
        movb    #'t,(r2)+
        mov     namlen,r1               ;get length again
        mov     csblk+c.dsds+12,r2      ;and start
        mov     #namsav,r3              ;point to save area
444$:   movb    (r2)+,(r3)+             ;save name string
        sob     r1,444$
        tst     inpflg                  ;was there an input file spec
        beq     333$                    ;if not, default to name.lst
        csi$2   #csblk,output           ;get output file name
        bitb    #cs.dif,c.stat(r0)      ;did they spec a uic ?
        beq     222$                    ;no
        mov     #csblk+c.dird,r2        ;yes point to descriptor
        mov     #uic,r3                 ;place to store it
        jsr     pc,.ascpp               ;convert string to octal number
222$:   bitb    #cs.nmf,c.stat(r0)      ;is a name given?
        bne     333$                    ;branch if name ok
        mov     namlen,r1               ;get length again
```

```
        mov     csblk+c.dsds+12,r2      ;point to csi block
        mov     #namsav,r3              ;point to save area
244$:   movb    (r3)+,(r2)+             ;restore name string
        sob     r1,244$
333$:   fdop$r  #outfdb,,#csblk+c.dsds  ;fill in filename of output file
        open$w  #outfdb                 ;and open it
        bcc     2$                      ;br if open went
        dir$    #erpri                  ;tell him file problems
        dir$    #filerr
        jmp     die                     ;and close input, then exit

        .sbttl  transfer to listing file
2$:
        dir$    #gettim         ;get date and time
        mov     #1,page         ;set page # to 1
        movb    infdb+f.fnb+n.unit,devnum ;fill in device unit number in block
rego:   mov     #edblk,r0       ;set for edmsg
        mov     #hdrme0,r1      ;address of input line
        tst     tabflg          ;want leading tab ?
        beq     11$             ;br if not
        mov     #hdrmea,r1      ;else change format
11$:    mov     #hdrbf0,r2      ;address of buffer
        jsr     pc,$edmsg       ;fill in name
        mov     #hdrme1,r1      ;address of buffer
        mov     #page,r2;address of buffer
        jsr     pc,$edmsg       ;fill in page #
        sub     #edblk,r0       ;get length of xfer
        mov     r0,outfdb+f.nrbd ;tell sys length
        put$    #outfdb,#edblk  ;put the first header line
        mov     #edblk,r0       ;address of output buffer
        mov     #edmes0,r1      ;address of input line
        tst     tabflg          ;want leading tab ?
        beq     12$             ;no
        mov     #edmesa,r1      ;change input line
12$:    mov     #edbuf,r2       ;address of data buffer
        jsr     pc,$edmsg       ;do device and uic
        mov     #edmes1,r1      ;point to 2nd decode line
        mov     #edbuf1,r2      ;and 2nd data buffer
        jsr     pc,$edmsg       ;do name.type;version
        mov     #edmes2,r1      ;point to last decode line
        mov     #edbuf2,r2      ;and last data buffer
        jsr     pc,$edmsg       ;and do date, time, page #
        sub     #edblk,r0       ;sub start of resultant header line
        clr     r5              ;clear lines/page counter
        mov     r0,outfdb+f.nrbd ;set length of variable line
        put$    #outfdb,#edblk  ;put out variable header line
in:     get$    #infdb,#buf1,#132. ;get a record
        cmpb    infdb+f.err,#ie.eof ;end of file
        beq     done            ;yes
        tst     infdb+f.err     ;no
        bpl     333$            ;if plus ok
        dir$    #erpri
        dir$    #filerr
        jmp     done            ;and exit
333$:   mov     infdb+f.nrbd,outfdb+f.nrbd ;transfer size of line
        add     tabflg,outfdb+f.nrbd ;adjust for leading tab
        tst     tabflg          ;is there leading tab
        beq     335$            ;no
        put$    #outfdb,#buf0   ;yes
        br      336$
335$:   put$    #outfdb,#buf1   ;and put the record
336$:   bcc     334$            ;br if ok
        dir$    #erpri
```

```
        dir$    #filerr
        jmp     done            ;and exit
334$:   inc     r5              ;count a line
        cmp     r5,#54.         ;near end of page ?
        blt     in              ;no, just do next line
        clr     r5              ;yes, clear counter
        inc     page            ;inc page number for printout
        jmp     rego            ;print header line again
done:                           ;normal exit
        tst     inpflg          ;spool the output ?
        bne     1$              ;not if two files were specified
        print$  #outfdb         ;spool the file to lp
        br      die             ;and quit
1$:     close$  #outfdb         ;close the output file if not spooled
die:    close$  #infdb          ;close input file
        exit$s                  ;and exit

        .sbttl  fdb's
        .sbttl          input fdb
;
infdb:  fdbdf$                  ;define fdb block
        fdat$a  r.var,fd.cr     ;file attributes
        fdrc$a  ,buf1,132.      ;record
        fdop$a  influn          ;file name
        fdbf$a  infevf          ;evf
;
        .sbttl          output fdb
;
outfdb: fdbdf$                  ;define fdb block
        fdat$a  r.var,fd.cr     ;file attributes
        fdrc$a  ,buf1,132.      ;record
        fdop$a  outlun          ;file name
        fdbf$a  outevf          ;evf
;
        .sbttl          terminal fdb
;
tifdb:  fdbdf$                  ;define fdb block
        fdat$a  r.var,fd.cr     ;files attributes
        fdrc$a  ,buf1,80.       ;record
        fdop$a  tiflun,tidsds   ;file name
        fdbf$a  tifevf          ;file evf
;
tidsds: .word   lti,ti
        .word   0,0
        .word   0,0
ti:     .ascii  /ti:/
lti=.-ti
        .even

        .sbttl          error messages
;
erpri:  qiow$   io.wvb,tilun,tievf,,,,<primes,prilen,44>
primes: .ascii  /***PAG---/
prilen=.-primes
        .even
namerr: qiow$   io.wvb,tilun,tievf,,,,<nammes,namlng,53>
nammes: .ascii  /Bad file name***/
namlng=.-nammes
        .even
filerr: qiow$   io.wvb,tilun,tievf,,,,<filmes,fillen,53>
filmes: .ascii  /Error on file io***/
fillen=.-filmes
        .even
```

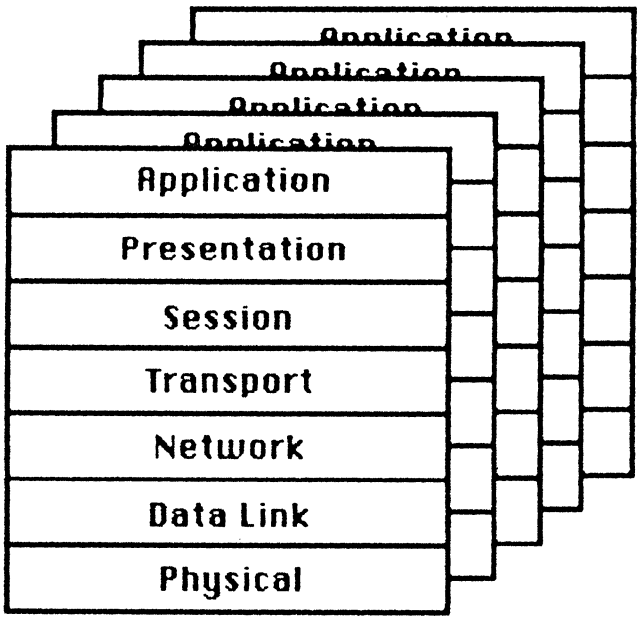
```
cmderr: qiow$   io.wvb,tilun,tievf,,,,<cmdmes,cmdlen,53>
cmdmes: .ascii  /Error on indirect command file***/
cmdlen=.-cmdmes
        .even

        .sbttl  miscellaneous
        .sbttl          csi control block
;
        csi$
csblk:  .blkb   c.size
        .even
;
        .sbttl          gcml control block
;
gclun   =tilun
gcblk:  gcmlb$  2,rnp,,gclun
;
        .sbttl          switch table
;
switch: csi$sw  ta,2,tabflg     ;specify switch itself
        csi$nd
;
        .sbttl          other things
;
tabflg: .word   0               ;flag to put in leading tab
edlen:  .word   0               ;length of header line
gettim: gtim$   edbuf2          ;get time in 2nd edmsg buffer
buf0:   .byte   0,11            ;leading tab
buf1:   .blkw   132.            ;the record buffer
        fsrsz$  3               ;make room for file storage

    .sbttl      edmsg data
;
hdrme0: .ascii   /%F%NMichael Reese Medical Center    - - -   /
        .asciz  /Department of Medical Physics Computer%25S%X/
        .even
hdrmea: .ascii   /%F%N%8SMichael Reese Medical Center    - -   /
        .asciz  /Department of Medical Physics Computer%25S%X/
        .even
hdrbf0=infdb+f.fnb+n.fnam
hdrme1: .asciz   / Page %D/
        .even
edmes0: .ascii  /%NListing of %2A%M:/   ;device and number
        .asciz  /[%B,%B]/       ;uic
        .even
edmesa: .ascii  /%N%8SListing of %2A%M:/;device and number
        .asciz  /[%B,%B]/       ;uic
        .even
edbuf:  .word   infdb+f.fnb+n.dvnm ;device string
devnum: .word   0               ;device number
        .word   guic            ;group uic
        .word   muic            ;member uic
;
uic:                            ;start code stores uic here
muic:   .byte   0               ;save member uic here
guic:   .byte   0               ;save group uic
;
;storage for file name for output
inpflg: .word   0               ;flag for input file specified
namlen: .word   0               ;length of string
namsav: .blkb   40.             ;buffer to store string
;
edmes1: .asciz  /%X%4S/                 ;name,type version
```

```
        .even
edbuf1=infdb+f.fnb+n.fnam               ;point him to input fdb
;
edmes2: .asciz  /on %Y at %3Z   Page %D%2N/ ;date,time page #
        .even
edbuf2: .blkw   6               ;room for date and time
page:   .blkw   2               ;do time, then set page # to whatever
;
;now the output buffer
;
edblk:  .blkb   150.            ;one line of output
        .end    start



;
;       Task build command file for the PAGinate program
;
PAG/-FP/MU=PAG
/
TASK=...PAG
ASG=TI:2:3
ACTFIL=3
//
```

NETwords

NTW

The NETWORKS SIG Newsletter



Happy Campers!

Welcome to Camp DECUS. This issue of NETWORDS contains two noteworthy items:

First, the announcement of Networks and Communications SIG Wishlist, coordinated by L. Stuart Vance. Cincinnati campers might wish to have your ideas for improvements or new product suggestions sent to "the right people"; here's the vehicle.

Second, a very informative article provided by the Digital Technical Journal, on the conception, birth and evolution of the LAT protocol, used in connecting terminals to hosts on an Ethernet. Digital's Terminal Server products (The Ethernet Terminal Server, and DECservers) use this protocol. The authors are intimately involved in the development of this protocol; their biographies (as of September 1986) follow the article.

The week of DECUS "camp" will go by fast; so don't try and digest everything at once. And don't forget to write home!

Judi Mandl
Network SIG Newsletter Editor
University of Connecticut Health Center
263 Farmington Ave.
Farmington, Connecticut 06032

Networks and Communications SIG Wishlist

Ever thought that LAN Bridge 100's should be password protected from unauthorized use of RBMS? Or that DEC's router product line should be improved to handle multiple T1 line cards? Or even that DEC should establish a "Network Advisor" expert system accessible by a toll-free number to aid in the diagnosis of network problems? If you have a suggestion for how DEC might improve an existing product, or have an idea for a new product or service that DEC might provide, then be sure to stop by the Networks and Communications SIG suite and fill out a Networking Improvement Request (NIR). After a number of NIR's have been gathered, a summary of the suggestions will be published in a SIGs Newsletter issue, and circulated among LUG's, where DECUS members will be given the opportunity to prioritize the list before presentation to DEC.

If you have a suggestion, from product specific to visionary, please stop by and let us know!

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Digital Technical Journal, No. 3 September 1986

(The Networks SIG Newsletter Condensed Version)

TERMINAL SERVERS ON ETHERNET LOCAL AREA NETWORKS

Bruce E. Mann
Colin Strutt
Mark F. Kempf

Digital's terminal servers provide flexible, cost-effective connections between terminals and host systems in a local area network (LAN). The product developers tried several approaches before developing the Local

Area Transport (LAT) protocol as the basis for all terminal servers. The LAT architecture supports connections to multiple hosts over a high-bandwidth Ethernet LAN. LAT establishes a single virtual circuit between a terminal server and each host, and individual sessions are multiplexed over a virtual circuit. A unique directory service permits terminal servers to be configured automatically, learning about hosts as they become available. The latest implementations support mixed-vendor environments and Digital's major operating systems.

The Original Problem

In 1981, Digital faced the task of designing a method for connecting a few hundred "dumb" terminals and printers to a VAXcluster system. If, as in the past, the terminal were connected to a single computer, then many of the advantages of clustering would be negated. Instead, it was proposed that terminals be connected to a "front-end" terminal server shared by all members of the cluster. This front end would then allow more flexible connections. A user terminal, for example, could connect to any processor in the VAXcluster group, rather than directly connecting to just one. Our goal was to migrate our existing installed terminal base gracefully from single-processor attachments to VAXcluster systems.

The original effort to provide this server was called the CI-Mercury project by our development groups. We aimed to attach this terminal server directly to the high-speed cluster inter-connect, called the CI, so that the server functioned as a switch. However, the cost of this scheme proved to be excessive. (The cost for the interface to the CI itself was about $20,000.) Moreover, a connection to the CI would have resulted in a server that could connect only to nodes in a single cluster.

We also studied other vendors' switch offerings as front-end terminal switches. These products function much as do the data-switch products available today; that is, backplane multiplexers on the CPUs are switched to the terminals. The problems with this approach were excessive cost, the lack of Digital technology in this product area, and poor availability.

Because of these complexity and cost factors, the original CI-Mercury project was replaced with one called Pluto. This product envisioned using an Ethernet as the interconnect, thus lowering the attachment cost dramatically. This server was based on a PDP-11 central processor,and we chose a variant of the RSX-11S operating system for the initial kernel software. The lower-layer communications protocols used between Pluto and the VAXcluster nodes were the DECnet protocols, successfully used in other products.

We believed that Pluto could be cost effective in large installations; however, its initial cost was too high to be competitive in smaller configurations. This cost factor was especially important as Ethernet became an integral part of Digital's strategy. With Ethernet, it became practical and cost effective to distribute small terminal servers throughout an office environment rather than concentrating all terminal interfaces in a large, centrally located server. Therefore, in late 1981, work began on an eight-line terminal server, the primary goals being low cost and high performance. Internally, their project was dubbed Pluto Junior, later called Poseidon.

Late in 1983, significant problems were encountered in the design of the Pluto and Poseidon terminal servers. The CTERM protocol, a new design of a layered DECnet protocol off-loading character-processing overhead from the host to the terminal server, proved to be more complex than anticipated. Measurements of message-processing overhead and estimates of the overhead in the DECnet/VAX software showed that CPU consumption in the host system would be a problem for keystroke editors. Existing studies showed that terminals were used in keystroke modes, rather than command-line modes, more than fifty percent of the time. Moreover, the Pluto server itself was experiencing severe performance problems. For example, CPU saturation occurred when running less than six terminals at 9600 baud, even when their terminal interfaces used direct memory access (DMA).

Finally, a number of issues, not considered during the requirements phase, became more apparent:

- How could a VAXcluster system be viewed as a single system rather than as individually addressable nodes?
- How could the terminal load be balanced across nodes in the VAXcluster system?
- How could the management of the terminal servers be automated?

Thus the use of the CTERM protocol for terminal servers in both Pluto and Poseidon was halted. (In fact, the Pluto project with an RSX kernel was used successfully as the basis for a number of different servers in the Ethernet Communications server, or DECSA, family, including the DECnet Router, DECnet Router/X.25 Gateway, and DECnet/SNA Gateway products. The same hardware base, though with a completely rewritten software kernel, formed the basis for the final Ethernet Terminal Server.)

However, the original task still remained; therefore, an alternative solution was proposed, based upon work done using a new architecture called local area transport (LAT). The LAT solution involved three essential components that were unique to that architecture:

- A new transport and naming architecture to replace the DNA routing, transport, and session layers
- A new operating system for the terminal server
- A new "port" driver for the terminal driver of the VMS operating system.

The Development of LAT

In late 1981, the prototype of the original LAT server was developed on a VT103 terminal server, which contained a small Q-bus backplane with a PDP-11/23 system and an Ethernet controller. (An Ethernet controller made by 3COM Corporation was used since Digital had no Ether-net products available at that time.) This early work involved quantifying the maximum character-echo delay that a person could comfortably tolerate. We learned that an experienced touch typist encounters difficulties when the echo time exceeds 100 milliseconds. By extrapolating from this fact, we deemed that the network and CPU efficiency of the entire LAT subsystem should be dramatically improved. The approach was to "procrastinate" for up to 80 Milliseconds after characters were received from the terminals at each server. This delay had the very desirable effect of reducing the number of messages processed by the Ethernet, the host systems, and the terminal servers. (Eighty milliseconds is implementable as a multiple of either the 60-Hz line-frequency clock common in the United States or the 50-Hz line-frequency clock common in Europe and other countries.)

In early 1982, we created a VMS driver (LTDRIVER) using a dedicated Ethernet controller to support the LAT server prototype. By April 1982, log-in to a VMS system from a server was achieved; about two weeks later, the performance relative to the then current multiplexer, the DZ-11, was measured. The LAT connection was easily able to out-perform the DZ-11 (a programmed-interrupt controller) under a wide variety of loads. Under many loads, the LAT connection was shown to out-perform the DMF-32 (one of a number of DMA controllers).

In early summer 1982, we converted LTDRIVER to the shared Ethernet port driver. This conversion allowed a single Ethernet controller to be used simultaneously for LAT soft-ware, and DECnet and other communications software. Unfortunately, this change yielded a significant performance degradation. At this time, however, the VMS Development Group was designing a lower-level program interface to the Ethernet driver that would allow system-level VMS usage of the Ethernet. Currently, this inter-face is used to implement VAXcluster support via the Ethernet.

By late 1982, we decided to include both LAT and CTERM support in the Pluto terminal server, but only LAT support in Poseidon. In addition, the original code from the prototype VT103 terminal server was migrated to a UNIBUS PDP-11 system; this code was called LAT-11.

By early 1983, a significant number of VMS developers were using the prototype LAT-11 servers. This software was maintained by the LAT developers. It was important that the software worked reliably since the VMS developers were using it in developing the VAXcluster software.

As noted earlier, the original development team for the CTERM terminal server on Pluto experienced a number of problems. Therefore, in early 1984, a new terminal server was implemented on Pluto, based on the LAT-11 code and not on the RSX software. This new server, containing software only from LAT, was referred to internally as Plato.

The prototype LAT-11 code was developed into a product to run on version 3.7 of the VMS system. This product became available in July 1984, somewhat before VMS VAXcluster support appeared in VAX/VMS version 4.0. one month later, the Ethernet Terminal Server, the product name for the Pluto terminal server, became avail-able. The risk of having the VAXcluster offering adversely affected by an unproven terminal server was limited by releasing it with the earlier version of the VMS system. Thus we took advantage of extensive "free" testing from over 1000 internal users.

In March 1985, the DECserver 100, the product name for the Poseidon terminal server, was released. The DECserver 100 implementation was radically different from the other terminal servers.

DECserver 100

Although the Ethernet Terminal Server and LAT-11 products provided the benefits of server-based terminal interconnect, they did not fully implement Digital's terminal server strategy. For server technology to become pervasive, it must compete with other terminal connection methods on the basis of cost alone. In cluster and multi-host systems, servers provide necessary and desirable added functions. Therefore, they should be compared with other connection methods by assigning some value to the additional features and then using cost/performance as the deciding factor. In small single-system environments, the added features of server technology are not necessarily perceived as adding value; then cost becomes the sole factor for comparison. Digital's servers are at a disadvantage in this situation because they offer features that cost more. Digital must pursue a dual path to develop servers for some applications and to maintain and expand backplane terminal interfaces for others.

The first decision we made was an important one: the product would be a local terminal server and nothing more. Telephone data lines usually terminate inside computer rooms. There-fore Pluto, which is suited to computer room configurations, already filled the need for a terminal server with modem control capabilities. Poseidon was specifically designed to be distributed along an Ethernet throughout an office environment, near the attached terminals. Of course, multiple Poseidons could also be used in wiring closets and computer rooms.

We also believed that Pluto already provided a hardware base for other communication server applications; therefore, Poseidon need not support applications other than terminal serving. Although often desirable from the standpoint of the company's total product set, generality is also the archenemy of low cost. Hardware that serves many functions also has capabilities that are unused in some applications. Those unused capabilities represent a cost from which no bene-fit is derived when an isolated application is viewed.

On the other hand, hardware designed for a particular application can optimize cost and performance by eliminating any unnecessary capabilities. The Ethernet Terminal Server and DECserver 100 illustrate both ends of this spectrum. The hardware base for the former functions in a number of general roles related to communications, such as the DECnet Router or DECnet/SNA Gateway products. Consequently, this product has a high entry cost, but a low incremental cost as each terminal is added. The DECserver 100, being a specialized server, has a low entry cost as well as a low incremental cost.

A second equally important decision was made early in the project: the product managers de-fined and then enforced a very aggressive cost goal in terms of dollars per connection. Although some cost reductions seemed quite insignificant and not worth the effort, in the end the old adage of "watch the pennies and the dollars will watch themselves" proved to be true. The insistence on meeting the cost goal also prevented us from adding "bells and whistles" with their associated costs and complexity, to the requirements list as the project progressed.

Work started on the hardware design with a clear cost goal, but with no preconceived requirements for the implementation. It seemed fairly obvious that an eight-line server could be built on a single printed circuit board. Since there is a substantial expense simply in connecting multiple boards, we decided very early that directly incorporating any pieces of existing products was too expensive. The server would be a single board designed from scratch, although we were free to borrow design ideas from other products. We also decided to use only high-volume, and therefore inexpensive, components where possible - a decision driven partially by the desire to shorten the design time.

One of the most important issues was making sure there was enough processing power. Since Poseidon would not be programmed by customers, the extensive PDP-11 and VAX instruction sets were not really needed. We decided finally to use the Motorola 68000 chip, which was the lowest cost, most readily available micro-processor with sufficient power.

As the design progressed, we considered every possible cost reduction option. For example, the dynamic RAMs are refreshed by software since sufficient processing time exists to do that; the cost of refresh hardware could thus be eliminated. Chips were selected to perform multiple functions whenever possible. For example, the terminal interface (UART) chips have integral timers used to control the software refresh, the timer interrupt, and the watch dog timer. Essentially, the interrupt logic uses very little external logic to turn around the interrupt priority level to generate the vector address.

Thus the design resulted in an extremely low-cost, fixed-function terminal server, the DECserver 100, which has proven to be, by far, the most popular member of Digital's terminal server family.

THE LAT ARCHITECTURE

The LAT Protocol

One initial goal of the LAT architecture was to connect terminals to host system using the Ethernet as a data link. Even today, LAT is still used primarily for connecting terminals to hosts. However, its application has spread to connecting other asynchronous devices, such as printers or links to hosts other than those directly connected to an Ethernet.

The goals of the LAT protocol are as follows:

- To permit dumb terminals to be connected to multiple hosts
- To be a transparent character transport mechanism (implying that character echo must be performed by the host and not by a server)
- To support a high-bandwidth LAN technology (specifically the Ethernet)
- To use a fixed maximum bandwidth that is much less than the total LAN bandwidth, which should be used in a fair and predictable manner
- To be an efficient data link protocol, relative to the higher-layer DECnet protocols, such as CTERM operating in a LAN environment
- To provide for low CPU loads and memory use on the host system at the expense of higher CPU and memory utilization on the terminal servers
- To allow for simple terminal server implementations, which means low-cost and high-performance hardware implementations
- To permit automatic configuration so that, for example, servers can determine, without manual intervention, the names and addresses of hosts on the Ethernet.

The LAT protocol makes certain simplifying assumptions:

- Communication is local to a single logical Ethernet (possibly connected by repeaters and bridges); thus no routing capability is required
- Communication is inherently asymmetric, which simplifies connection management and permits straightforward host implementation
- The bandwidth of the Ethernet (10 megabits per second) is much greater than the band-width needed for a given terminal (e.g. 9600 bits per second), so that a timer-based protocol is appropriate.

The normal model of dumb terminal usage is one of low-speed data entry, say a few characters per second, and higher-speed display in bursts of several hundred characters at a time, taking several seconds to display. In addition, a user is usually sitting at his terminal while a program operates at the host. LAT takes advantage of this asymmetrical relationship. Also, the terminal connection normally takes place at

the explicit request of the user rather than of the host system. LAT also takes advantage of this asymmetric aspect.

The server does not communicate characters to a host system as they are entered by the user; rather, it collects characters and periodically transmits them to the host. The time interval of this period, the "circuit timer", is quite short -typically 80 milliseconds. With many users connected, a host is interrupted much less often by gathering together all the characters typed by those users and sending them as a single message.

The LAT protocol is divided into two distinct layers, the virtual circuit layer and the slot layer.

VIRTUAL CIRCUIT LAYER

The virtual circuit layer establishes and maintains an error-free communications path (a virtual circuit) between two nodes, typically a terminal server and a host. The connection is initiated by one end of the communications path and operates under the control of the initiator. However, the circuit can be terminated by either end. Typically, the virtual circuit connection is initiated when the first terminal user requests a connection to a host system to which no virtual circuit yet exists. The initiator of the virtual circuit is referred to as the "master node", the other end as the "slave node." Thus the terminal server is normally the master, and the host the slave.

The establishment of a virtual circuit connection requires a single message exchange. Information such as protocol versions, message sizes, and node names are included in these messages.

Once established, the data exchange occurs as follows:

- Every 80 milliseconds, the master sends to the slave a message containing any data that must be sent.
- On receiving this message, the slave processes any data in that message and sends back a reply containing any data waiting to be sent in that direction.
- On receiving this reply, the master processes any data that was in the message.
- Eighty milliseconds after one message was sent, the next message is sent from the master.

The message round-trip time is typically less than 10 milliseconds. This operation is timer driven on the master, the terminal server, and event driven (by message receipt) on the slave, the host.

The virtual circuit layer provides reliable communication between a pair of nodes. It also provides a datapath that is bidirectional, sequential, timely, and error-free. All users desiring to communicate over that path are multiplexed over the same virtual circuit, consequently lowering the CPU cost per user on the host. This multiplexing function is the responsibility of the slot layer.

THE SLOT LAYER

The slot layer establishes user sessions, transfers data bidirectionally, and multiplexes and demultiplexes sessions over virtual circuits. In this context a session can be envisioned as a connection from one user's terminal to one host system.

A terminal user first identifies the computer system with which he desires to communicate. A virtual circuit is then established - if one does not already exist - from the terminal server to the host system. A session is then established on top of the virtual circuit. The service access point at the host would normally be represented as a virtual terminal port into the host operating system. Thus the user would perceive the virtual terminal as being directly connected to the host system. For example, on the VMS system, the LOGINOUT function can be run to log in and continue with the normal interactive use of the system.

At the slot layer, data is passed to the virtual circuit layer as "slots", which are addressed units of data. A number of different types of slots have been defined. Each session has a unique slot number on the virtual circuit to aid in the multiplexing and demultiplexing of sessions over virtual circuits. Slots are only sent over virtual circuit run messages. Because slots all share the underlying virtual circuit, no explicit error detection and correction need be performed by the slot layer.

The establishment of a session is accomplished using one of the assigned slot types called a start slot. First, the master sends a start slot requesting a connection to the slave. If the slave is able to accept the connection, it replies with a start slot; if not, due perhaps to lack of resources, the slave may reject the connection with a reject slot containing an appropriate reason code.

Owing to the mismatch of speed between terminal and host, some flow-control mechanism is needed to prevent one end from overloading the other. (This mechanism is independent of the flow control required between the terminal server and the terminal itself. That control is normally handled by using the ANSI flow-control characters XON and XOFF.)
The LAT protocol defines a credit-based flow-control scheme at the slot layer. In this control scheme, the receiver must give permission to a transmitter to send each data unit, containing one or a collection of bytes. Data may be exchanged in units of up to 255 bytes in a slot type called a data-A slot. The sending of a data-A slot (if it contains any data at all) uses up a single "credit". If one end of a session desires to send some data, that end must have a credit outstanding.

The initial credit allocation is passed in a start slot. There are three additional slot types defined for the slot layer. The first, the data-B slot, communicates the following information:

- The physical port characteristics, such as baud rate, character size, and parity
- The session characteristics, such as whether the ANSI flow-control characters (XOFF/XON) should be treated as data or flow-control messages
- The in-band signaling of break conditions or signaling errors (parity or framing errors)

The data-B slot is subject to the same credit mechanism as the data-A slot and indeed shares the same credits.

The next slot type, the attention slot, is not subject to credits and is used for out-of-band signaling. This slot is currently used for an abort-output operation (as in cancel output ^O).

A session may be terminated by either end via the final slot type, the stop-slot. Typically, the stop slot is sent by the host system after the user logs out of the system.

DIRECTORY SERVICE

One goal of the LAT protocol is to permit the automatic configuration of the LAN. The important information that needs to be disseminated through-out the LAN is the name of each service that may be used. Rather than requiring that each terminal server possess this information a priori, LAT provides a mechanism that permits each server to "learn" about the configuration.

To accomplish this learning process, and additional message type is used, the "service advertisement". This message is multicast from each slave node to all master nodes and gives the names of all services that the slave node is currently offering. (A multicast message is a single message addressed to and received by multiple nodes.) An advertisement is transmitted periodically, typically every 60 seconds. Thus on start-up, a server can "listen" for service advertisements and build a directory of available services. This directory can be then presented to the user, on demand, enabling him to choose whichever services he wants from those available when a connection to a host system is desired.

There is no restriction that any node may offer just one single service. LAT allows a given node to offer multiple services. One common use for multiple service names is in a VAXcluster environment. When a user requests a connection to the service name representing the cluster, the terminal server can select one of the available nodes. In this case all nodes offering the same service will be presumed to be offering identical capabilities to the user.

To assist the terminal server in choosing a node, the service nodes provide a "rating" associated with each service offered. The rating is a numeric value that represents some measure of the resources avail-able to apply to that service. For example, the current VMS LTDRIVER implementation takes into account the most recent CPU idle time, the CPU type, the amount of memory, and the number of remaining inter-

active job slots. VMS LTDRIVER also allows the system manager to specify a rating. The terminal server can then choose, at any instant, the node that offers a requested service with the highest rating and use that node as the one to which to form the connection. This choice ensures that the load can be shared among the nodes in a VAXcluster system.

By carefully managing the service advertisements, the server makes the service directories reflect the current service list and their associated ratings, If a server fails to hear from a service provided for some period, the server can assume that the service provided has failed, or crashed. The server can then remove the service from its directory of available services.

The LAT "load-balancing" and "fail-over" features are most often associated with VAXcluster systems. However, although they enhance Digital's VAXcluster offering, these LAT features are independent of it.

"Equivalent services" may also be offered by multiple nodes using the directory service. Consider services that are network based, such as Videotex and dial-out modems. With an Ethernet LAN, many independent nodes might offer such services; typically, however, users can access the service only through nodes on which they have accounts. If a user's system is down, he is denied access to the service, even though the service remains available on other nodes. For example, consider a Videotex-based service, such as LIVE_WIRE (an in-house electronic bulletin board), that can be offered by many independent LAT host systems. If a LAT user connects to LIVE_WIRE, the terminal server software will detect that the service is offered from multiple sources. The software will then make a connection to the source believed to be currently offering the best level of service. If that service should fail (i.e. stops sending Ethernet LAT messages), the terminal server software will automatically reconnect the user to an alternate provided of the same service if one exists; this action is known as fail-over.

Future versions of Digital's LAT products may make more extensive use of the LAT service capability. That would make it possible to install applications that are accessible to the extended LAN but not to the wide area network. A form of nondiscretionary access control is implicit in this design.

PRODUCT IMPLICATIONS OF THE LAT ARCHITECTURE

Although not originally conceived as a distributed terminal switch, an Ethernet can be used effectively in that role if combined with the terminal server products. This fact remains true even when the Ethernet and host system are running other protocols simultaneously, such as DECnet and VAXcluster systems based on Ethernet. Our experience has shown that a single dedicated Ethernet segment, without bridges, can easily support several thousand concurrent users.

Functioning as a distributed terminal switch in the Digital computing environment, LAT offers significant advantages over dataswitches and backplane multiplexers. The most prominent of these advantages is that any terminal server user can connect to any host system. "Blocking" connections to host systems (more accurately called "port contention") is not an issue because host-system ports are logical, not physical. A VAX/VMS system is limited by the LAT architecture to about 6 million simultaneous connections, or 32,000 terminal servers, each with up to 255 sessions. This large number rep-resents a significant cost advantage, especially considering that Ethernet controllers are standard options on many of Digital's processors. In this case the host-processor terminal connection cost then becomes negligible, making backplane-oriented terminal switches much less attractive. This cost advantage improves as the size of the system increases.

Some additional advantages afforded by using LAT are as follows:

- Multi-session capability, not offered by data-switches
- Simplified installation and management (especially where users and computer systems are often added or moved around)
- Higher availability due to the lack of any single point of system failure
- Simplified, incremental expansion and migration capabilities inherent in Digital's extended LAN architecture, utilizing bridges.

THE ORIGINAL IMPLEMENTATION

Digital's original terminal server family had three members: LAT-11, the Ethernet Terminal Server, and the DECserver 100. These LAT products support interactive terminal users. These products use the unique naming capabilities of LAT (service names, load-balancing, fail-over, and auto-configuration) and feature multi-session support and complete application transparency. The servers implement an easy-to-learn user interface that allows users to change parameters, view available services, and connect and disconnect from these services. In addition, the same user interface allows a local manager to control the operation of the server and ports. The DECserver 100 and the Ethernet Terminal Server also implement a remote console feature that allows remote management from the server by using a convenient, centrally located host system.

The LAT-11 product, unlike the other two terminal servers, is a software product. It was originally sold to enable users with PDP-11 systems that were no longer being used for general computing facilities to take advantage of the server technology, but without incurring any initial hardware investment. The software ran on some of the older UNIBUS PDP-11 systems, using 124KB of memory, up to eight DZ-11 multiplexers, and a DEUNA Ethernet controller. The software was loaded either via the Ethernet or from a local disk. LAT-11 offered a user interface and capabilities similar to those on the original version of the Ethernet Terminal Server and could connect up to 64 users to the Ethernet. Being based on PDP-11 technology, servers using LAT-11 would normally be located in computer room environments.

The Ethernet Terminal Server uses the Ether-net Communications Server (DECSA) hardware. This is a special-purpose PDP-11/24 system with 512KB of memory, a DEUNA UNIBUS-to-Ethernet controller, and two protocol assist modules (PAM). PAM's are intelligent microprocessor-controlled interfaces based on the AMD 2901 from Advanced Micro Devices Inc. Each PAM interface connects up to eight line cards, each of which is a dual RS232C interface with full modem-control capability. The server also has a console boot terminator (CBT) module for self-test code, bootstrap code, and remote console support. The Ethernet Terminal Server offers a user interface similar to that on the DECserver 100. Using the LAT protocol, the server can connect up to 32 terminals (either locally or remotely via modems) to the Ethernet. The Ether-net Terminal Server can be located in a computer room environment or a communications closet. The software is always down-line loaded into the unit from a DECnet load host across the Ethernet.

Internally, the DECserver 100 is radically different from the other two members of the terminal server family, yet still retains the same external characteristics. The DECserver 100 is a low-cost terminal server capable of connecting eight asynchronous ASCII terminal to an Ethernet using LAT protocol. This server is a very compact unit and can be located in a computer room, a communications closet, or in an office environment. The server has no modem control. Modem control is implemented using an 8-MHz Motorola 68000 chip, with 128KB of RAM, and 512 bytes of nonvolatile RAM (NVRAM). Like the Ethernet Terminal Server software, the DECserver 100 software is down-line loaded from a DECnet host.

EXTENSIONS TO THE ORIGINAL IMPLEMENTATIONS

The initial implementations of the LAT protocol were on the terminal servers described above and on VAX/VMS systems. The servers implemented only the master end of the LAT protocol, whereas the hosts implemented the slave end. Follow-on implementations have added similar support for additional host systems: MicroVMS, RSX-11M-PLUS, MicroRSX, ULTRIX-32, ULTRIX-32m, TOPS-10, and TOPS-20 systems. Each system implementation offers access to the command interpreter as the service access point.

Version 2.0 of the Ethernet Terminal Server added the reverse-LAT implementation, permitting a server to offer additional services to which terminal users can connect. This implementation permits sessions to be created within the box as well as across the network, thus forming a switch style of operation in a single server. The types of services that may be offered by the terminal server can be grouped into the following three categories.

The first category is connections to non-LAT hosts. In this mode, the server acts as the Ether-net connection for systems (typically not made by Digital) that cannot themselves offer LAT services on the Ethernet. Asynchronous ASCII ports on these systems are connected to a terminal server. Terminal users on the same or different terminal servers can connect to the service offered. They can then communicate with the non-LAT host as though it were connected to the Ethernet.

The second category is service for dial-out modems. Terminal users can connect to a port in a pool of dial-out modems. The users can then use the appropriate ASCII protocol to create a dialed connection and then access the remote system via its own dial-in port.

The third category is service for personal computers (PC). They can be connected to terminal servers and run in either of the terminal emulation modes. Each PC thus acts as though it were a dumb terminal. A PC can also run in file transfer mode when connected to another PC via the same, or another, terminal server.

Subsequent versions of the Ethernet Terminal Server, DECserver 100, and the VMS LTDRIVER soft-ware all permit asynchronous printers to connect to terminal servers. These versions also allow print queues to be directed to the printers from hosts. The LAT protocol has been enhanced so that the connection mechanism remains under the control of the terminal server (for efficiency reasons mentioned previously). That enhancement allows a host to "solicit" a connection from a port on a terminal server. Once the connection has been made, data transfer can occur as in the normal interactive terminal case, except that the printer output is under the direction of a VMS print symbiont. It is possible, with these implementations, to direct the queues from multiple systems to a single printer or bank of printers being offered as a common service. When a connection request is made while the printer is being used by another system, the connection request can be queued. This queuing provides a basic mechanism for sharing printers among multiple systems. Within the LAT environment, the service name offered by a host system does not always have to represent the command interpreter on a given system, though this is by far the most common use today. Instead, a service name could represent an application program, which might be run automatically when a connection request is made. Alternatively, using the solicited-connection mechanism currently employed for printers, application programs could initiate connections to terminals (or other asynchronous devices) located within the LAN.

DECSERVER 200

The DECserver 100 interconnects terminals in an office environment at a very low price. Soon after it was announced, it became clear that modem-controlled lines and connections to non-LAT host systems should also be priced just as low.

Thus the DECserver 200 project was initiated to produce a new server based on the DEC-server 100 design, but with modem control capabilities. Moreover, this product had to meet the original cost goals of the DECserver 100. This project involved a redesign of the printed circuit board, yet retained the same system architecture. A faster version (10 MHz) of the same MC68000 microprocessor was used, and memory was increased from 128KB to 384KB of RAM and from 512 bytes to 2KB of NVRAM. This increase allowed room for the implementation of modem control software and support for non-LAT hosts (i.e. reverse-LAT capabilities). The increase also allowed a larger service directory database to be stored and an enhanced on-line help capability to be added.

Another feature of the DECserver 200 takes advantage of the DECconnect cabling scheme, allowing connections to be made using DEC423 wiring. This feature allows communications at up to 19.2 Kbaud over cable that is neither twisted pair nor shielded, for relatively long distances of up to 1000 feet.

SUMMARY

Unlike other existing packet-oriented transport layer architectures, the LAT transport layer implements asymmetric connection management, asymmetric data flows, and timer-based message exchanges.

The most unusual innovation of the LAT architecture is the use of multicasting as a presentation level naming service. On Ethernet, packets are normally addressed to the adapter of a specific system. However, the Ethernet specification de-scribes a form of logical addressing called multicast addressing. In this scheme a packet addressed to a multicast address is received nearly simultaneously by many independent systems. LAT uses these messages to completely configure the topology automatically. This action means that installing a terminal server is as simple as plugging it into the Ethernet and waiting for services to be advertised.

Asymmetric connection management considerably simplifies the complexity of the protocol in which terminal servers initiate connections to host systems. If a host system wants to connect to a terminal server, that connection must be solicited from the terminal server. This protocol solves the problem of having many host systems competing independently for the same resource. The first "solicitation" is serviced by a connection, and subsequent requests are queued on a first-in, first-out basis.

On a particular terminal server, all devices that are logically connected to the same host system share messages both to and from that host. Within each message, each users' data is contained within slots. This multiplexing, in conjunction with the delay timer, reduces further the number of messages exchanged. For example, as more users log in to a host system, the number of messages exchanged remains constant at approximately 12 per second in each direction, even as the lengths of the messages increase.

The DECserver 100 and DECserver 200 are low-cost implementations of the LAT architecture, allowing terminals and other asynchronous devices to be configured in a flexible and cost-effective manner in a LAN.

BIOGRAPHIES

MARK F. KEMPF

Mark Kempf is currently involved in planning Digital's next generation of interconnect products. A consulting engineer, he was the project manager for advanced development of the LANBridge 100 and DECserver 100. Coming to Digital in 1979, Mark worked on software for a DECnet front end and one of Digital's first implementations of Ethernet. Earlier, he worked at Standard Oil of Indiana on real-time process control systems. Mark earned a B.S. degree from Northwestern University in 1972. He holds three patents, including one in bridge technology.

BRUCE E. MANN

A consulting engineer, Bruce Mann is now studying the application of Digital architectures to commercial on-line transaction processing. He wrote the LAT architecture, creating its first prototypes and products. An early contributor to Ethernet projects, Bruce helped to design the system interfaces. In 1987 he used networking to automate engine tests at the Volkswagon Research Laboratories. Before joining Digital in 1976, he designed medical computer systems at the Harvard Medical School. Bruce earned a B.S.E.E. degree in 1971 from Cornell University and with three other engineers has applied for a patent on the LAT protocol.

COLIN STRUTT

Joining Digital in 1980, Colin Strutt was project leader on several communications products, including DECnet-IAS and the Ethernet Terminal Server. He is currently a consulting engineer responsible for product strategy of the terminal server family. Colin is the LAT architect and a member of the DECnet Review Group. Formerly, he worked for British Airways, specializing in network support and operating systems. Colin received his B.A. (Hons) degree in 1972 and his PH.D. degree in 1978, both from Essex University. He is a member of the British Computer Society and the ACM.

OFFICE AUTOMATION

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- *Therese LeBlanc, T.M. LeBlanc & Assoc.*

Notes on Notes **OA-2**

- *Mark Hyde & C.J. Trayser*

FROM THE EDITOR...

We have a short issue this month featuring the return of our Notes column!
Many thanks to those of you who took part in the reader survey last fall. The comments and information you provided about the OA section were very helpful to us in structuring the content of future issues.

Keep an eye on August and September issues for post-Symposia articles, informationa and the new SIR listing.

Regards,

Therese LeBlanc
OA Newsletter Editor
275 London Place
Wheeling, IL 60090

NOTES ON NOTES

Discussions on VAX Notes
Volume 2, Number 1

Mark Hyde and C.J. Trayser, Digital Equipment Corporation

Well, its been a while since we wrote the last article. We have both been quite busy with new jobs (Buck is now an Educational Services Instructor and Mark is busy supporting VMS and DECnet). There are still many things to write about so we will be sending in articles every now and then, but not quite so regular as last year. Volume 2 will consist of more occasional articles written by one or both of us as we encounter interesting topics.

In the past we discussed a lot of user features, but left the system management issues lightly covered. So we will try to cover some of those in this article.

In the pre-sales cycle we are often asked "How much disk space does VAX Notes use?" Well, as you can probably guess, the answer is "It depends." There are three distinct "consumers" in disk space: 1) the installation, 2) the conference creation/growth and 3) users notebooks and storage.

The installation is usually the smallest user of disk space over the long run. The space used depends slightly on the version, but all use less than 3000 blocks. Most of this space is for shareable images and TPU code for the user interface. There are several small files, such as some command files, and a few executables in SYS$SYSTEM and the NOTES$LIBRARY directories. The other file of significant size is the sample conference which is placed in the NOTES$LIBRARY directory.

A major user of disk space (and the hardest to manage) is the individual user. The space is used in three ways: 1) extracting notes to text files, 2) creation of personal conferences and 3) growth of NOTES$NOTEBOOK.NOTE. Although extracting notes and creating conferences are obvious uses of disk space, the (unknown) growth of a notebook can be quite amazing. Because of the way VAX Notes keeps track of which entries are seen and unseen in the notebook, (a topic for another article) it can grow to enormous proportions unless it is managed. Since the notebook file is formatted and organized the same as a conference file, the same routines for compression can be used quite effectively on both conferences and notebooks. Here is an example command procedure that can be used to compress these files.

```
$! NOTEFILE_CONVERT.COM
$!
$! To use this procedure supply the name of the file to compress such
   as...
$!
$! @NOTEFILE_CONVERT.COM SYS$LOGIN:NOTES$NOTEBOOK.NOTE
$!
$ fdl = f$parse(f$environment("default")+".fdl",p1)
$ analyze /rms /fdl 'p1 /output='fdl
$ edit /fdl /analysis='fdl /nointeractive 'fdl /output='fdl
$ convert /fdl='fdl 'p1 'p1 /statistics
```

The most obvious consumers of disk space are the conference files. Physically these are indexed-sequential files which are subject to most of the standard "symptoms" of indexed files. Among these problems are growth

and fragmentation - both of which can be managed but not necessarily controlled.

These files are the actual repositories of the data (notes, replies, etc.) of a conference. As such, they grow in direct proportion to the amount of data that is placed in the conference. Other than the compression routines, which will only help minimally, deleting information from the conference is the only way to shrink a conference. The problem with this is that a subjective decision must be made as to what information should be deleted. We say "subjective" because the use of each conference may differ, therefore deleting notes due to a specific measurement, such as age, may not be reasonable.

As the conference continues to grow its size can become cumbersome. We have seen some conferences with over 10,000 entries consuming thousands of disk blocks. Among other things this makes incremental backups take longer because with any change or addition to the file it is marked as modified and a backup routine looking for modified files will encounter a potentially huge conference. To accommodate this we suggest "retiring" conferences periodically. One way to do this would be similar to our hypothetical conference on Trucks:

1. A note should be posted (possibly a reply to topic 1.0) that all new discussions should be started in the next version of the TRUCKS conference called TRUCKS_V2. The note should be modified to allow the participants to press the SELECT key to add the conference to their notebook:

   ```
   Notes> SET NOTE/CONFERENCE=MYNODE::TRUCKS_V2
   ```

2. Modify the Conference Notice about a week or more ahead of time that the conference will be retired and that they should read note number 1.x for more information.

   ```
   Notes> SET CONF/NOTICE="Conference being retired. See note 1.4"
   ```

3. At the prescribed time the moderator sets the old conference to disable writing (and replying),

   ```
   Notes> SET CONF/NOWRITE
   ```

   modifies the NOTICE and posts a follow-up note indicating the conference is closed. This is best done when the moderator knows there is no one accessing the file to avoid any confusion.

4. Generate a full directory listing of the old (retired) conference

   ```
   Notes> DIRECTORY *.* /OUTPUT=TMP.LIS
   ```

   and post this as a note in the new conference - preferably as one of the first topics or even as a reply to 1.0.

5. The retired conference file should have the file protection set to (S:RE,O:RE,G:RE,W:RE). This will allow anyone to access the file to read it, but prevent them from writing to it. This is sometimes necessary as any MODERATOR can get past the /NOWRITE

setting, but unless they have exceptional VMS privileges, this prevents accidental writings by the moderators.

After a period of time it may be reasonable for the file to be archived to tape so the moderator can delete the file, saving disk space. This is a judgment call as it depends greatly on the contents of the file.

In addition to disk space, VAX Notes can be a consumer of network resources. Assuming you have VAX Notes running on several nodes in your network and you access conferences on other nodes, this can be a point of concern. If you have the most popular conference in the company on your node, you may find that there are large numbers of network links to the Notes server on your system using up resources that you would rather be using somewhere else. If you have a lot of other network activity, you may even bump into the maximum links limit specified in your DECnet parameters.

The VAX Notes server is multi-threaded, which means that many links at once can be serviced by a single server process. By default the maximum number of links handled by a single server is 16. When the maximum number of links on a server has been reached, Notes will obligingly fire up another server to handle another 16 links. By default there is no maximum number of servers that will be started.

Unless you are used to using NCP to view the total number of links into your system, you may not perceive either of these things happening. Of course, VAX Notes offers a way to control both the number of links per server and the number of servers as well as monitoring them. To see how many VAX Notes server processes are on your system issue a SHOW SYSTEM/NETWORK command at DCL and looking for the processes that look similar to the following:

```
VAX/VMS V4.7 on node BATON  6-APR-1988 20:16:02.55  Uptime  12 01:31:37
  Pid    Process Name    State  Pri      I/O       CPU       Page flts Ph.Mem
20200725 EVL             HIB      6     1109   0 00:00:22.84    47621     51  N
202003B8 NOTES$000E_1*   HIB      4      148   0 00:00:03.78      653     45  N
```

In this case, the VAX Notes server process is the one with the process name of "NOTES$000E_1*". The interesting items are actually part of the process name. The asterisk ("*") indicated that this is the "declared" server, or the one that will accept the next incoming VAX Notes link. The number in front of the asterisk, in this case the "1", indicated how many links this process is currently serving.

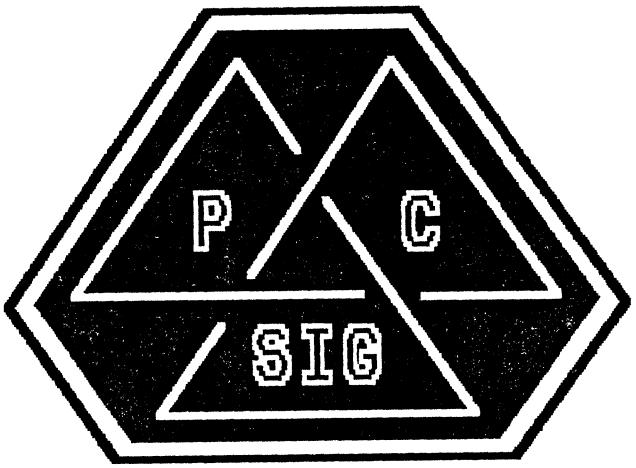
You can modify the default number of servers as well as the default number of links per server via logicals. As a rule the defaults will be fine except in the busiest of VAX Notes environments. However, if you feel they need adjusting, you can adjust the following logicals to either increase or decrease the defaults.

```
$ DEFINE /SYSTEM /EXEC NOTES$SERVER_MAX_SERVERS  4   !per system
$ DEFINE /SYSTEM /EXEC NOTES$SERVER_MAX_LINKS    16  !per server
```

Happy Noting :-)

PERSONAL COMPUTER

SPECIAL INTEREST GROUP



PC

NEWSLETTER

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PROTO SYSTEMS Memory Upgrade - A Review

By Gary Rice , PC SIG Newsletter Editor

For the last several weeks, I have been using a 1 megabyte PRO 350. Now, for those of you who have a Macintosh or a VAXstation, this may not seem like a "big deal". But for me as a PRO user, it was quite a novel experience. For the first time, I could actually install my Ethernet card. Now what does a memory upgrade have to do with an Ethernet card? Well, the PROTO SYSTEMS memory upgrade consists of either 1 or 2 small cards (your choice) that attach to the system board directly. When I installed the first card, I was able to remove the memory board that occupied one of the option slots on the CTI Bus. This freed up a slot (that I used for the Ethernet card) and still gave me the same amount of memory that I had before (512K) which is the minimum required for P/OS version 2 or above.

The PROTO SYSTEMS card is an "exact replacement" for the small (3" x 5") daughter memory cards attached to the system board on the PRO 350. However, there is an important difference. The original memory card from DEC has a capacity of 128K bytes while the PROTO SYSTEMS board has a 512K bytes capacity. This is done through PROTO SYSTEMS use of newer technology chips. The PROTO SYSTEMS board also uses fewer components than the DEC board. More on that later.

The shipment from PROTO SYSTEMS arrived containing 2 memory boards and installation/troubleshooting instructions. It was well packed with "bubble-pack" and anti-static wrappers for the 2 boards.

Installation of the boards was simple. The instructions provided by PROTO SYSTEMS were clear and easy to follow. However, I found 2 things that were 1) annoying; and 2) confusing. The annoying part was the step in the instructions that stated that I needed to detach all of the peripheral connections from the back of the system. You know, the printer, MODEM, TMS, etc. Well, the only one that I ACTUALLY needed to remove was the power cord. The confusing part was the area of the instructions describing the removal of the old memory boards. The instructions were somewhat unclear about this.

However, I succeeded in installing BOTH boards without any real trouble and both came "on-line" without error straight from the box.

To verify that I actually had a 1 megabyte system, I issued a "$ SHOW MEMORY" command from the Toolkit. Here is a pictorial of the resulting display on the next page.

```
F/OS V3.1  BL26.0       (PRO    )  512K   UF 000:00:04      23-APR-88
TASK=  *IDLE*                    FREE=   SY0:14257.    DZ1:DM0
                                         LB0:14257.    DZ2:DM0
POOL=6016.:6298.:27.             SECPOOL=154.:290.:53%
     6016.:6298.:27.                     154.:290.:53%

IN:   DDT.D  F  R I T $$TQUT P    S C S  D  Q P F   D  S
12    ZWT.I  1  M N F VDFMMI 0    $ 0 $  $  M R C   C  H
45K   ::::.R 1  S S W TFWGNM S    G M G  M  G 0 S   L  0
OUT:     L1  A  R R . 20. LE R    R M R  T  C F R   T  T
0        D1  C  E E . 0N. IR E    A G A  1  0 7 E   1  1
0K       RM  P  S M . 0T. B  S    F R F     M 7 S
     ))))>=!==>==!=]=>!!+>!>--! <-->>+-+-->!-!-!-!<--->>
0*******32******64******96******128*****160*****192*****224*****
E-P--D-D-------------DD-------------------------------------------
-----------------------------------------------------------------D
256*****288*****320*****352*****384*****416*****448*****480*****
                                                        ()))>==!!!
                                                         XXC $ $S
                                                         TK$ G AE
                                                         ::C I LC
                                                           T D P$
                                                           E I 0F
                                                           X S 0L
```

The "512K" on the first line did INDEED indicate that I actually had 1 megabyte, since the text reports the number of 2 byte WORDS available to the system.

Next, I decided to make some comaprisons between the PROTO SYSTEMS board and the DEC equivalent the MSC11-B memory board. The DEC board is specifically sold as a PRO 380 option, but it will work in the 350 as well. It is a 512K daughter board similar to the PROTO SYSTEMS board. I happened to have one of the DEC boards so I could make some legitimate comparisons.

Physically, the two boards are the same size. The number of components on each board is different. The DEC board has 61 while the PROTO SYSTEMS board has 37. The memory chips on the DEC board were Japanese. The PROTO SYSTEMS board used Korean chips. Both boards used a double sized foil design, but the foils on the DEC board tended to have narrower control and power foils than the PROTO SYSTEMS board.

To see if there were any differences in performance between the two boards, I set up the following test. First, I wrote a simple memory access program. The listing appears at the end of this article. Then, I ran the program 10 times with the DEC board installed in the PRO 350. Next, I removed the DEC board and substituted the PROTO SYSTEMS board. I ran the program again 10 times. The differences that I found are detailed in the table that follows. The numbers listed in the table are the averaged results for both reading from and writing to a program memory location 1,000,000 times.

To summarize the information that I have previously presented, on the next page is the comparison in table form.

	DEC	PROTO SYSTEMS
Card Size	3"x5"	3"x5"
Components	61	37
Chip maker	Japanese	Korean
Cost	572	250
Timing results		
averaged read	15.870313 sec	15.892188 sec
averaged write	14.092188 sec	14.078125 sec

I will leave it up to you to decide if these numbers are significant.

Just for fun, I ran the same test program on a PRO 380 (using a DEC board) and came up with the following timings:

read	7.406250 sec
write	7.015625 sec

PROTO SYSTEMS is located at 1238 Josephine Street, Berkley, CA, 94703. Contact Everett Harvey (phone (415)420-9579) for more information.

Timing program

```
      BYTE JUNK(10000)
C
      REAL*4 SECNDS, A, B, C
C
      A = SECNDS (0.0)
      DO 400, K = 1, 1000
            DO 200, I = 1, 250
                  JUNK(I) = I
                  JUNK(I+7000) = I
200         CONTINUE
            DO 300, I = 1, 250
                  JUNK(I+500) = I
                  JUNK(I+7500) = I
300         CONTINUE
400   CONTINUE
      B = SECNDS(A)
      A = SECNDS (0.0)
      DO 600, K = 1, 1000
            DO 500, I = 1, 500
                  J = JUNK(I) J = JUNK(I+7000)
500         CONTINUE
600   CONTINUE
      C = SECNDS(A)
      WRITE (5,10) B
      WRITE (5,10) C
10    FORMAT (1X,F10.7)
      END
```

PROgramming Quickie

By Gary Rice, PC SIG Newsletter Editor

This month's "Quickie" consists of a MACRO subroutine (callable from the high level language of your choice) that will create a contiguous file of any size AT A SPECIFIC LOCATION on the disk. You can do the same thing

with the PRO/Toolkit program RMSDES.TSK, but this routine let me do it from an application that I wrote.

The routine itself is listed first followed by a FORTRAN fragment showing the calling sequence.

```
; CREATE.MAC - This subroutine CREATES a sequential file of a ;specific size at a specific place on the disk.
;
; AUTHOR:           Gary Rice
;
; CREATED:          January 2, 1988
;
; REVISIONS:        None
;
; INPUTS:           IN1 - INTEGER*2 Number of characters in  device-directory-file name
;                   IN2 - CHARACTER*n The device-directory-file name
;                   IN3 - INTEGER*4 The block on the disk where the file should start
;                   IN4 - INTEGER*4 The size of the file
;
; OUTPUTS:          OUT5 - INTEGER*2 RMS Open completion code from STS field
;                   OUT6 - INTEGER*2 RMS Open completion code from STV field
;
; NOTES:            This routine uses logical unit #1 to create the file. The
;                   LUN must NOT be in use when this routine is called.
;
;                   The file will ALWAYS be contiguous or no file will be created.
;
;                   If the requested disk location is in use, RMS will attempt
;                   to create the file as close to the specified location as it
;                   can.
;
;*******************************************************
;
                .TITLE      CREATE
                .IDENT      /V1.0/
;
; Global definitions
;
                .GLOBL      CREATE
;
; RMS Macros
;               .MCALL      POOL$B,POOL$E
                .MCALL      FAB$B,FAB$E,XAB$B,XAB$E
                .MCALL      $CREATE,$STORE,$CLOSE
;
; Parameter offsets
;
IN1=2.
IN2=4.
IN3=6.
IN4=8.
OUT5=10.
OUT6=12.
;
; Data section
;
                .PSECT      DATA,RW
```

```
;
;
                .EVEN
FABBLK:         FAB$B       F$ALQ       10.     ; File size - ignored here
                F$BPA0                          ; No private buffer
                F$DNA0                          ; Default file name
                F$DNS0                          ; Length of def file name
                F$FAC       FB$WRT              ; Block WRITEaccess requested
                F$FNA0                          ; File name - run time
                F$FNS0                          ; File name length - run time
                F$FOP       FB$DLK!FB$CTG       ; No lock on abnormal close & Contiguous
                F$LCH       1                   ; LUN assigned to the file
                F$MRS       512.                ; Maximum record size (bytes)
                F$ORG       FB$SEQ              ; Sequential file
                F$RAT       FB$BLK              ; Carriage control = "NONE"
                F$RFM       FB$FIX              ; Fixed length records
                F$XAB       ALLBLK              ; Use an ALL block for locatability
                FAB$E
;
;
                .EVEN
ALLBLK:         XAB$B       XB$ALL              ;Set up ALL block
                X$AID       0                   ; Use area 0 for this block
                X$NXT       0                   ; No more XAB blocks follow
                X$ALN       XB$LBN              ; Logical block alignment
                X$AOP       XB$HRD!XB$CTG       ; Hard area location & contiguous
                X$ALQ       0                   ; Allocation size (filled in at run time)
                X$LOC       0                   ; Placement filled in at run time
                XAB$E                           ; That's it for the XAB
;
;
                .EVEN
;
                POOL$B                          ;Pool buffers
                P$FAB       1                   ; One for the FAB
                P$BDB       1                   ;  and the "Buffer Descriptor Block"
                P$BUF       512.                ; Buffer size
                POOL$E                          ; That's it for RMS Pools space
;
                .EVEN
;
;
; Double words are needed for the starting block and file length
;
START:          .WORD       0,0
SIZE:           .WORD       0,0
;
;
; Executable code
;
                .PSECT      CODE,RO
CREATE:         .EVEN
;
; Store file name addr and length in file access block (FAB)
;
                MOV         #FABBLK,R1          ; R1 = addr of the FAB
                MOV         @IN1(R5),R2         ; Get count of file name chars
```

```
                $STORE      R2,FNS,R1           ; Store count in FAB
                MOV         IN2(R5),R3          ; Get addr of file name
                $STORE      R3,FNA,R1           ; Store addr of file name in FAB
                MOV         @IN3(R5),START      ; Get the starting block number
                MOV         #ALLBLK,R1          ; R1 = addr of the ALL
                $STORE      START,LOC,R1        ; Put the block # in the ALL block
                MOV         @IN4(R5),SIZE       ; Get the # of blocks to allocate
                $STORE      SIZE,ALQ,R1         ; Put the # of blocks in the ALL block
;
; Try to create the file.
;
                MOV         #FABBLK,R1          ; Get addr of FAB
                $CREATE     R1                  ; CREATE it
                MOV         O$STS(R1),@OUT5(R5)     ; Get STS error ststus
                MOV         O$STV(R1),@OUT6(R5)     ; Get STV error value
                $CLOSE      R1                  ;CLOSE the file
                RTS         PC                  ; & return
                .END
```

A sample call to the "CREATE" routine looks like this:

```
      INTEGER*4 START, SIZE
      INTEGER*2 ERROR(2)
C
      START = 200
      SIZE = 100
      CALL CREATE (26,'SY:[USERFILES]MYFILE.TMP;1',START,SIZE,
     +            ERROR(1),ERROR(2))
      END
```

This program will create a file starting at disk block 200. It will be 100 contiguous blocks long.

Send me your own PROgramming Quickie and I will publish it here in this on-going column in these Newsletters. (RX50 Please)

Printing Macintosh Output on Your DEC Postscript Printer

By Mark Sebern, Sebern Engineering Inc., P. O. Box 268, Cedarburg, WI 53012 414/375-2200

Introduction

As even DEC and Apple have belatedly figured out, many DEC users also have a Macintosh. Some such users even have DEC Postscript printers, and would like to use them to print Macintosh output intended for a Laserwriter. If you have a big system with a lot of Mac's, one way is to use commercial products which implement Appletalk on a VAX. For a small user with a single Mac, though, this is not very cost effective. It may be old news, but I did stumble across a cheaper way to get Macintosh laser output on a DEC printer.

The Environment

I am running a Macintosh SE with 20 Mb hard disk, a VAXstation II/GPX, and an LN03R Scriptprinter. The Mac is hooked to the VAXstation via a DHQ11 (TXcn:) port, with Red Ryder on the Mac. The only printer on the Mac itself is an Imagewriter II.

Making a Postscript File

The first step is to get the Mac to produce a Postscript file instead of looking for a Laserwriter on Appletalk. To do this, install the Laserwriter driver and use the Chooser to select the Laserwriter. It will want to turn on Appletalk, which is ok, but turn off your Imagewriter first unless you want to see a lot of garbage. The Chooser won't be able to find any Laserwriters, but once you have selected the Laserwriter and enabled Appletalk, just click on the close box to leave the Chooser.

Next, go into your favorite application. I have tested this technique with Microsoft Word, Superpaint, and Hypercard. Select the print function as usual, but when it comes time to OK the actual printing, quickly press and hold the OPTION and F keys immediately after saying OK. If you are successful, you will get a message that says "creating Postscript file" instead of "looking for Laserwriter". If you're too slow, just wait for it to give up, and then try again. With Hypercard, it's a little trickier, since the normal print setup box does not appear, but it still works if you press OPTION-F at the right time.

Now, exit the application and look around for a file with the name "Postscriptn", where "n" is a digit. Normally this file will be in your "root" folder, but it may take a little looking. If you open this file with your favorite word processor, you will see the desired Postscript instructions. Step one is now complete.

Getting the Laser Prep File

Unfortunately, the Postscript file you produced above depends on some Postscript definitions which are stored in the "laser prep" file in the system folder. In older systems, you could use a variant of the OPTION-F trick to get that file, too, but not any more.

The solution here is a piece of shareware called "AddLPrep" which is available on the Compuserve MACPRO Forum as ADDLPREP.SIT, and requires StuffIt for unpacking after downloading. You can get StuffIt from the same forum's data library. StuffIt is also shareware, but carries a fee only if you use it for packing uploads.
AddLPrep creates a file which contains both your original Postscript file and the laser prep file. In my experience, you really only need to do this once, since the prep file can be concatenated onto the beginning of any Postscript file later created with OPTION-F. Take a look at it with an editor or word processor and you'll see what I mean.

Getting the File to the Printer

The files I wanted to print were fairly short, so I just used Red Ryder in straight "ASCII send" mode to dump the files up to the VAXstation. Then I printed the files using a Postscript queue on the LN03R. Other file transfer techniques (including a Mac implementation of DECnet) could probably be used. Although I didn't try it, I suspect that you could use a Mac communication program to dump the combined file directly to an LN03R connected to the Mac's communication port.

7While sophisticated techniques may be more flexible, this simple process allows inexpensive Macintosh output on a DEC Postscript printer. If you need a modest amount of high quality output and don't want to buy two laser printers or an expensive network, it may be just the ticket.

UNISIG

Editor's Corner

By now everyone should have recovered from the Cincinnati Symposium. I was unable to attend, so my recovery was swift. If you were a speaker whose notes/slides didn't make it into the Unisig Session Notes, please send them to me and I'll publish them here. If you attended a session that you'd like the notes from, and those notes didn't make it into the Session Notes, let me know and I'll try to get a hold of the speaker and publish the notes.

Turning to this month's newsletter - First, we have **Using ucbmail** from Steve Gilgut. Steve has included some very handy reference sheets for ucbmail. Great for those of us who learned a couple of functions when we first learned how to use mail, and haven't learned anything new since (at least, in the mail area). Next, our esteemed Unisig Chairperson has contributed **Unix as a Window to the World,** about usenet and the new UUNET. And last, **The Way It Is,** pulled from usenet and submitted by Steve Gilgut. I suppose we could categorize this last article as the *Joke of the Month,* though it's probably only funny to a certain segment of the computer-literate population. For those who don't see the humor, I'd be happy to print opposing viewpoints. I am a firm believer in freedom of expression for anyone who sends me something to publish.

As always, your comments, suggestions, articles are encouraged and welcomed. Please send hardcopy to :

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Using ucbmail

First, to elliminate confusion, when I speak of UNIX, I refer to 4.2 Berkeley, or Ultrix. I don't do System V (yet...). Unix, generally comes with two flavors of mail. /bin/mail, and /usr/ucb/Mail. The first is the original mail utility, that (I believe) came from AT&T. To supplement this, Berkeley put out Mail, sometimes called *ucbmail*. Ultrix V2.0 also provides both.

The *ucbmail* version supports **many** features; among them, the ability to drop into the editor of your choice, have a local *configuration* file, which is named **.mailrc**, and a multitude of others.

Most users have */bin* ahead of */usr/ucb* in their PATH variable. Typing *mail*, gets you /bin/mail. Mail is usually linked to /usr/ucb/mail as well, so a simple path change will allow you to use *mail* instead of /bin/mail.

If you use csh, another way is to define an alias, as in:

alias mail Mail

This gets you Berkeley mail by default. An easy way to tell which version you are using is by the prompt you get when you are reading your mail. If it is a **?**, you are using /bin/mail. The **&** denotes /usr/ucb/Mail. For your enjoyment, I have added as a supplement, my *Mail Users Quick Reference* and *Command Summary* sheets.

Take a quick look at these before you read on....

Confused? Good. Lesson 2....

Mail programs in general, are like most Ice Cream. You can't please all the people, all of the time. As a result, there are **many** public domain mail interfaces. To name a few, *uumail, MUSH, Elm,* and *SMAIL*. Some of these resolve internet addresses, do auto-routing, (such as figuring out the path to, say, joe@ucbvax [Hi Joe!]), while others provide curses style user interfaces, and even Sun style icons of rural mailboxes. It really ends up being a case of whatever turns you on.

I also should mention that almost every one of these mailers has a command set that's somewhat unique to it. A lot of the commands are the same, but there seems to be new and different functionality in each. The power in some of these staggers the mind.

Steve Gilgut

Steve Gilgut, Compugraphic Corp. Wilmington, Mass. 01887 (617)658-5600 X5277
UNISIG Suite/Campground Coordinator; DECUS U.S. Chapter
"Of all the things I've lost, I miss my mind the most."
...!{decvax,ima,ism780c,ulowell,laidbak,denning,wizvax,cgeuro,cg-f}!cg-atla!gilgut

Ucbmail Qwick Reference Sheet

-	previous
?	help
!	shell
Print	prints ignored
Reply	Reply to originator only
Type	like Print
alias	print, or change arg
chdir	cd
copy	save, no delete
delete	delete
dp	delete, print next
edit	text editor
exit	exit, no chage
file	folder
folders	list folders
fo	current folder name
fo #	previous
fo +file	switch file
fo %	switch to system mbox
fo &	switch to $HOME/mbox
from	header contents
headers	list headers
help	?
hold	save in system mbox
ignore	add to ignore list
mail	mail to user
mbox	save in $HOME/mbox
next	print next
preserve	hold
print	prints
quit	quit, save in $HOME/mbox
reply	reply to all
respond	same as reply
save	append to file
set	set option
shell	shell
size	prints size
source	read commands from file
top	print top lines
type	print
unalias	reverse alias
undelete	marks as NOT deleted
unset	reverse set
visual	editor
write	save
xit	exit
z	presents headers + forward
z-	move backward

~!cmd	shell
~c	add to CC
~d	read dead.letter
~e	editor
~f	read in msg
~h	edit header
~m	same as ~f with >
~p	print msg
~q	abort
~r	read in file
~s	subject
~t	add to list
~v	editor
~w	write msg out
~|cmd	pipe for filter
~~	precede by ~
append	append to mbox
ask	for subject
askcc	for CC
autoprint	d like dp
debug	doesn't work
dot	period is terminator
hold	save in system mbox
ignore	break & cntl C off
ignoreeof	ignore cntl D
metoo	sender included
nosave	no dead.letter
quiet	supress version
verbose	doesn't work
EDITOR	your editor
SHELL	your shell
VISUAL	your editor
crt	length before "more"
escape	escape character
folder	path for folder storage
record	path to record outgoing
toplines	# of lines with top

Ucbmail Summary Reference Sheet

commands in mail:

-	prints previous message
?	prints help
!	executes shell command
Print	Like 'p', but prints ignored lines
Reply	Reply to originator only
Type	like Print
alias	no arg prints all defined. arg prints arg. args sets or changes arg
alternates	setmail handles this. don't bother with it
chdir	change working directory
copy	same as save, but no delete
delete	marks as deleted
dp	delete, then print next
edit	invoke text editor on msg
exit	exit, no chages to anything
file	same as folder
folders	list names of folders in folder dir
folder	(fo) fo - print current folder fo # -previous folder fo +filename -switch to filename in folder dir fo % -switch to system mbox fo & -switch to $HOME/mbox
from	prints contents of headers
headers	prints list of headers
help	same as ?
hold	save messages in /usr/spool/mail/yourlogin
ignore	add list of header fields to ignore list
mail username	mail to a user
mbox	default action (save in $HOME/mbox)
next	print next message
preserve	same as hold
print	prints message
quit	quit, saving unresolved in $HOME/mbox
reply	reply to all people in header
respond	same as reply
save file	append to end of file
set	set an option
shell	jump into a shell
size	prints size of message
source	read mail commands from a file
top	print top few lines of message
type	same as print
unalias	reverse of alias (undefines)
undelete	marks a message as NOT deleted
unset	reverse of set command
visual	invokes display editor
write	same as save
xit	same as exit
z	presents msg headers in windofuls. move forward: z move backward: z-

Tilde Escapes

~!command	execute shell command
~c name ...	add names to CC list
~d	read in dead.letter
~e	invoke text editor
~f messages	read in a message
~h	edit the header
~m messages	same as ~f, but shift right 1 tab
~p	print message as is so far
~q	abort this message (like 2 breaks)
~r filename	read in filename
~s string	makes a subject field
~t name	add name to recipient list
~v	invoke display editor
~w	write msg into file
~|command	pipe through command for filtering
~~string	insert string preceded by a ~

Set Options For .mailrc

append	append to mbox rather than prepend. is default
ask	prompt for a subject
askcc	prompt for CC list
autoprint	d command behaves like dp
debug	doesn't seem to work, should be like verbose
dot	a period is the terminator. is default
hold	always save messages in /usr/spool/mail (bad idea)
ignore	break & cntl C ignored
ignoreeof	ignore cntl D
metoo	sender included in group alias
nosave	don't make dead.letter files
quiet	supress version when mail is invoked
verbose	doesn't work either. see debug

Set Options With A String Value

EDITOR	set to your favorite editor(line or screen)
SHELL	set to your favorite shell
VISUAL	set to your favorite editor(screen)
crt	msg length before "more" is invoked on it
escape	the escape character. default is ~
folder	path/directory for folder storage. like _Mail
record	path/file to record all outgoing mail
toplines	number of top lines to print with top command

Unix as a Window to the World

Informal Communications Networks

by
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USA
!uunet!hadron!klr

Much has been said of the portability of the Unix operating system, and its suitability as a development environment. Articles have appeared in numerous publications discussing the distributed file systems techniques available to unix systems. However, there is another aspect to unix networking that is often overlooked. This is the uucp network or usenet. It is the implementation of the uucp network and its capabilities that make the Unix operating system and the unix community unique. Because of its capabilities, there are more unix users and developers in communication with each other on a world-wide basis than any other operating system community. In a sense, the usenet community is a technical window on the world.

Unix as an operating system is remarkable. It has developed into an operating system that is used on a huge variety of hardware suites, of various manufacture, of dissimilar hardware configurations, and of a wide range of computing power. Variants of the Unix operating system are found on systems as small as personal computers, and as large as super computers. Yet all of these unix systems have many things in common, including the heart of usenet, the uucp programs.

The uucp programs were originally envisioned as a means of copying files between unix systems. Extensions to the original concept have also provided the ability to execute commands between unix systems. The logical extension of the uucp programs is to use them to move mail messages between systems. After all, a mail message is nothing more than a file. The final piece that makes unix connectivity on the informal usenet complete is the fact that uucp connections can take place both between directly connected systems, and systems that are only connected through the telephone system. This allows users on one system to communicate with users on another system on a regular basis, regardless of the physical location of the systems. All of these parts combine to form a very large, informal computer network that is composed of heterogeneous hardware configurations, running a variety of variants of the Unix operating system, located in many countries around the world. This international network is known as *usenet*.

Systems participating in usenet can connect with each other directly, using either a dedicated or a dial-up line, or they can communicate using other systems as relays (or hops). For example, I can send mail directly to a user at *decuac* by addressing the message to *decuac!user*, since my system *hadron* has a direct uucp link to *decuac*. If I want to send mail to a user at *harvard*, I would use a more extensive path,

uunet!lll-winken!uwvax!harvard!user

where the *!* character in the address is used to separate the network names of each system, or hop, along the mail path.

One of the obvious problems with this type of network is determining a path to a given system, much less an optimum path. However, as with so many other potential problems in the Unix world, there is a user-developed solution. There is a *usenet map* distributed on a nearly monthly basis to several systems in the United States, along with the *pathalias* software to compute optimized mail paths to the systems listed in the maps. The most recently distributed usenet maps include Unix systems located in Austria, Belgium, Denmark, Finland, France, Greece, Iceland, Ireland, Italy, Luxenburg, Portugal, Spain, Sweden, Switzerland, The Netherlands, The United Kingdom, and West Germany as well as numerous sites in Asia and (of course) the United States. Although there is a designated coordinating site for each country, the maps themselves are available from several usenet sites around the US. If you are a part of the uucp network, you can ask your site manager about mapping and path information.

If you are not presently connected to either usenet or the uusp network, you have 2 options, you can attempt to get connected to a system that is local to you, or you can establish an account with UUNET. UUNET is a non-profit communications service that provides access to USENET news, UUCP mail, and many standards (including the Internet RFCs and comp.std.unix archives). UUNET is the newest experimental project of the USENIX Association and has the unprecedented cooperation of DARPA. Without violating DECUS commercialism policies, I can state that the cost of using UUNET to access the Unix community is minimal. For additional information, you should contact

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{seismo,uunet,ucbvax,cbosgd,ames,amdahl}!usenix!uunet-request

Although *net.news* is sometimes referred to as a *glorified bulletin board system,* it is one of the most popular uses of usenet. It permits an even more rapid exchange of information, because you do not need to know to *whom* to address your mail. All that is required (other than a connection or feed for the news) is to post a suitable message into the appropriate *news group* and in a short time the responses will come in, both in the news group and as direct mail. Of course, there will probably be as many different solutions to any given problem as there are people responding, but it is better then attempting to solve a problem *in the dark.* The news groups circulate messages, sources and some executables (converted to ascii representations using *uuencode*) in a wide variety of technical and non-technical news groups. In a later column I will provide more information about *net.news.*

In conclusion, there are many options available for use with a Unix system to provide networking capabilities and the distribution of resources. The inherent capabilities of the Unix uucp programs, and the resources provided by the uucp network provide enables unix systems that are a part of usenet to be connected to a technical window on the world.

The Way It Is

Warner/Davis

Recently someone called me from one of the "Out on the Floor Offices", an ethereal place rumored to exist only in hyperspace, populated by mysterious beings called Users.

She was quite frantic. She was having trouble running a program through the computer, and her message was clear enough, although rather ill-conceived: "MY FILES ARE FULL!"

I furrowed my brow, lit a smoke, and explained to her, "Really now, Miss Butterman, I don't have time for this." I slowly exhaled the menthol vapors as I stopped her process, crushing any hope she may have had of ever again seeing that document she had spent three hours slaving over.

> "I was typing this REALLY important letter, and it HAS to be ready in an hour... there's all this stuff on my screen that I didn't type... it says something about an error, should I read it to you?"
>
> "No point. Just press return."
>
> "Oh my, it wants my username. Can I restart that where I left off?"
>
> "Not a chance." I drew another puff and tossed the phone aside. It occurred to me that if I had to hear one more of those whining complaint sessions, heads were gonna roll. Where do you people GET this stuff? I'm going to tell you what's really going on here. Now LISTEN UP. I'm not going over this a second time:

Computer
: The black box that does your work for you. That's all you need to know.

Response Time
: Usually measured in nanoseconds; sometimes measured in calendar months. The general rule is: Shut up your complaining about response time.

Hardware
: See "Computer." Again, not your concern.

Software
: If we want you to know, we'll tell you about it, otherwise, leave us alone.

Network

Don't worry about it, we'll take care of it. Use it to send mail among your half-wit selves, and don't think we won't read it all. What do you think we do all day? By the way, Butterman... shame about your mother's pancreas.

Data

The general rule is: Don't use any data files and if you find any, delete them before I find out about them. In fact, just stay off the computer. (See "Response Time")

System Crash

Don't ever call the system manager to tell him you think the computer is down. Don't call him to ask him when it will be up again. The more you bother him, the longer it takes.

Downtime

Like I said, don't ask.

Uptime

Be thankful for it, use it wisely, and get out of my face.

Overtime

Don't be ridiculous.

Vacation

A time during which I don't have to put up with your sniveling. Don't try calling. There's no point.

Computer Room

Keep out, you're not invited. Don't knock on the door - don't even think about it. I broke the phone last time one of you jerks called me, and I'm not about to replace it. And keep your greasy fingers off the windows.

My Office

The name says it all... it's mine; stay out.

Your Problems

Not my concern.

Deadlines

The general rule is: Deadlines are not acknowledged by me; they're not my responsibility. Go tell somebody who cares.

Maintenance

a) A Valid reason for shutting down the system at any time
b) Much more important than anything any of you bozos do.
c) Anything I choose to call maintenance.

Software Upgrades

Far too complex for you to comprehend. If I tell you I'm upgrading the system, just be quietly thankful. It's for your own good, even if it does mean extensive downtime during peak hours.

Electronic Mail

I delete it before reading it, so don't bother sending any to me.

Defaults

We like them just like they are; we chose them for a reason. Don't mess with them; consider them mandatory.

Error Messages

I'm not interested. I'm going to kill your process anyway, so keep them to yourself.

Killing your Process

a) Don't ever ask why
b) Beyond your control
c) No warnings given
d) The highlight of my day
e) If you call, it's going to happen. No exceptions.

Passwords

I reserve the right to change them without notice at any time. I choose them, and the more you bother me, the more degrading yours will be. (Example: BUTTERMAN: SNOTFACE)

Users

a) They slow down the computer
b) They waste my time
c) A general nuisance
d) Worse than that, actually

Software Modifications

You don't know what you want - we'll tell you what you want. It stays like it is. Period.

Privileges

I've got them, you don't need them. Enough said.

Priority
Mine is higher than yours, accept it. That's the reason my games run faster than your lousy accounting package. (See "Response Time")

Terminals
Before calling me with a terminal problem, consider this:
a) Are you prepared to do without one for weeks?
b) Do you REALLY want your process killed?
c) Did you just trip over the cord again?
d) Of course you did

Disk Space
I set the quotas, you live with them. If you need more space, check "Data Files".

Operator
I hired him and I trained him. He does what I tell him to. Usually armed; always dangerous.

Backups
a) A good idea
b) If I gave a sh*t
c) Which of course I don't

Lunch
The only time that calling my office won't result in the killing of your process.

Data Security
That's your problem. I'm certainly not going to lose any sleep over it. My files are locked up tight. I feel secure.

Jiffy Length of time it takes me to resolve your problem by killing your process.

Eternity
Length of time it takes me to give a sh*t about any problem that can't be resolved by killing your process.

Impossible
a) It can't be done (as far as you know)
b) I can't be bothered
c) You're starting to annoy me

Inevitable
a) Couldn't have been avoided
b) Not my fault (as far as you know)
c) The result of annoying me

Menus
If it's not on the menu, don't ask for it. It's not available. If it is on the menu, it's probably of no use or it doesn't work. We're working on it (See "Eternity").

Utilities
I find them quite useful, you'll find them quite inaccessible. Besides, they're not on your menu, are they. What did I tell you about that?

Nuisance
You.

Of course, I reserve the right to add, change, or remove anything from the above list. I'm not asking you to accept these matters without question, I'm telling you.

Now that we all know where we stand, I'm sure there'll be no future problems. If you have any questions or comments please feel free to keep them to yourself. If you feel the need for more information, I highly recommend that you ask someone else.

Sincerely,

System Manager

P.S. The new disk quota of 30 blocks per user became effective yesterday. Anyone caught exceeding the quota will lose their accounts (this means you, Butterman!)

NEWSLETTER OF THE VAX SYSTEMS SIG

Pageswapper

Our Mascot

VAX SYSTEMS SIG
DECUS U.S. CHAPTER

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Contributions

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

Please do not submit program source. It is difficult to typeset and is better distributed on the VAX SIG tape. Please do not submit "slides" from DECUS Symposia presentations or other meetings. They are generally a very incomplete treatment for those readers of the *Pageswapper* who are not so fortunate as to be able to travel to Symposia. Please DO write articles based on such slides.

Send your contributions to:

ARPAnet/CSnet/NSFnet: ctp@cs.utexas.edu
UUCP: ctp@ut-sally.uucp ({harvard,ihnp4,uunet}!ut-sally!ctp)
BITNET: CTP@UTADNX
CompuServe: 75226,3135
DCS: POOLE

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

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

A New Hand at the Tiller

David L. Wyse, VAX Systems SIG, Communications Committee Representative

On behalf of the Executive Committee of the VAX Systems SIG, I would like to welcome the new editor of the *Pageswapper*, Clyde T. Poole.

Clyde has had considerable experience with DECUS and has been the editor of *At Large*, the Large Systems SIG newsletter. Clyde is very active in the Communications Committee and we look forward to some stimulating issues of the *Pageswapper*.

It will now be easier to submit to the *Pageswapper*. If you will take a look at the new "Contributions" article (above), you'll see that Clyde has access to a host of networks and DCS. This should facilitate your contributions to your favorite newsletter.

You should also have noticed one other change in the *Pageswapper*. Clyde will be typesetting the information sent to him so we should no longer have to turn the page around to read your favorite article.

Lastly, this note would not be complete without our sincere thanks to Larry Kilgallen for the countless hours spent in editing the *Pageswapper*, including shepherding our publication through the genesis and evolution of "The Big One". Thanks Larry, from all of us.

Spring 1988 SIR Ballot Results

Mark Oakley, SIR Coordinator

A total of 315 ballots were counted in the latest SIR ballot, a slight decline over the past two ballots. The number of ballots cast electronically on the *Pageswapper* VAX continues to increase. I want to thank Larry Kilgallen again for the use of this machine.

There was a tie in the voting for tenth place between SIR S88-28 (improve VMS DEFINE utility) and SIR S88-11 (no CR/FL for DCL WRITE command). I have asked Digital to respond to both SIR's.

I am hopeful that participation will continue to build, and will look for ways to encourage you to vote.

The SIR ballot is the only on-going program by which the SIG provides input to Digital. Top 10 (and other) SIR's continue to be incorporated into VMS. Digital has repeatedly encouraged the use of this channel of communication.

The summary of this voting appears below. Digital's response to the top 11 requests overall will be presented at the Spring 1988 DECUS Symposium in Cincinnati.

Interpreting the SIR Ballot Results

The results of the System Improvement Request ballot are shown on the following pages. All of the reports have the same one page format. Following the report title is the number of ballots counted for that report. The number shown on the "All Users" report is the total number of ballots which were returned. The ballots on the "11/780 Users" report is the number of ballots which checked the "11/780" blank on the ballot questionnaire, and so on.

The SIR's are listed on the page in order of points received, from highest to lowest. The entry for each SIR begins with the SIR number (from the ballot), a brief description, and the total number of votes (positive and negative) received by that SIR.

The data is summarized in two different ways. First, there are a series of reports broken down by user category. The user categories are defined by the questionnaire portion of the SIR ballot. A ballot was counted in each user category which was checked off, for example "11/780 user". Finally, there are a series of reports ranking the SIR's within SIR category. The SIR categories are those shown on the ballot, for example "DCL and Utilities" and "Commercial". The reports by SIR category use the data from all ballots received.

Spring 1988 Ballot

The Top 35 SIR's as Ranked by All Users

Total ballots in this category: 315

SIR Nr.	SIR Description	Total Votes
7	LAT sessions identity information	120
19	"Control Print Screen" capability	117
37	Corrrect READALL behavior	115
10	Various BACKUP enhancements	111
23	Enhance SHOW PROCESS command	102
3	Provide deallocation capability	97
61	Enhance print form modules	94
62	Provide BACKUP dismount/deallocate	94
8	Provide queued ALLOCATE requests	91
28	Improving VMS define utility	80
11	No CR/LF for DCL WRITE command	80
64	Provide limits on simultaneous logins	78
14	Extend DCL TABLES	76
42	Provide installed memory-resident code	75
29	Provide $GETDVI "wild card" capability	74
9	Provide project accounting	72
20	Enhance sysgen parameter readability	72
48	Prevent password reuse by users	69
21	Provide Mail enhancements	67
15	DCL status return enhancements	67
68	Support multiple version products	64
52	Security alarm messages to a file	60
63	Support bell character in BACKUP	58
6	Provide a "virtual disk" capability	54
66	WSQUOTA/WSEXTENT for INSTALL	53
49	Suppress certain login failures	52
58	Provide RIGHTSLIST lexical function	52
22	SET HOST/DTE for more modems	48
54	Provide DECnet end-to-end encryption	47
57	Enhance COPY to copy ACL's	47
2	Enhance batch load balancing	47
30	Enhance $GETUAI and $SETUAI	44
13	Enhanced command RECALL capabilities	44
24	MOUNT/FOREIGN and uninitialized tapes	44
1	Provide SCS communication services	43

Spring 1988 Ballot

The Top 35 SIR's as Ranked by VAX 8700/8800

Total ballots in this category: 65

SIR Nr.	SIR Description	Total Votes
7	LAT sessions identity information	32
37	Corrrect READALL behavior	28
29	Provide $GETDVI "wild card" capability	25
9	Provide project accounting	24
48	Prevent password reuse by users	24
52	Security alarm messages to a file	23
23	Enhance SHOW PROCESS command	22
8	Provide queued ALLOCATE requests	21
19	"Control Print Screen" capability	19
3	Provide deallocation capability	19
20	Enhance sysgen parameter readability	18
36	Provide descriptive text for files	17
6	Provide a "virtual disk" capability	16
61	Enhance print form modules	16
54	Provide DECnet end-to-end encryption	15
11	No CR/LF for DCL WRITE command	15
62	Provide BACKUP dismount/deallocate	15
51	Control file access via an image	14
58	Provide RIGHTSLIST lexical function	14
55	Support SET HOST proxy access	13
64	Provide limits on simultaneous logins	13
68	Support multiple version products	13
15	DCL status return enhancements	12
42	Provide installed memory-resident code	12
30	Enhance $GETUAI and $SETUAI	12
10	Various BACKUP enhancements	12
1	Provide SCS communication services	11
47	Eliminate unsolicited file creation ACE	11
14	Extend DCL TABLES	11
31	Improve terminal comm data display	11
2	Enhance batch load balancing	11
28	Improving VMS define utility	11
57	Enhance COPY to copy ACL's	10
4	Improve tape label recognition	10
49	Suppress certain login failures	10

Spring 1988 Ballot

The Top 35 SIR's as Ranked by VAX 86nn

Total ballots in this category: 111

SIR Nr.	SIR Description	Total Votes
8	Provide queued ALLOCATE requests	45
37	Corrrect READALL behavior	43
7	LAT sessions identity information	40
29	Provide $GETDVI "wild card" capability	39
52	Security alarm messages to a file	37
19	"Control Print Screen" capability	36
48	Prevent password reuse by users	36
10	Various BACKUP enhancements	36
23	Enhance SHOW PROCESS command	35
14	Extend DCL TABLES	34
42	Provide installed memory-resident code	34
3	Provide deallocation capability	33
68	Support multiple version products	31
58	Provide RIGHTSLIST lexical function	28
9	Provide project accounting	28
61	Enhance print form modules	26
15	DCL status return enhancements	25
62	Provide BACKUP dismount/deallocate	24
64	Provide limits on simultaneous logins	24
11	No CR/LF for DCL WRITE command	24
1	Provide SCS communication services	23
57	Enhance COPY to copy ACL's	22
66	WSQUOTA/WSEXTENT for INSTALL	22
20	Enhance sysgen parameter readability	22
51	Control file access via an image	21
2	Enhance batch load balancing	20
28	Improving VMS define utility	18
6	Provide a "virtual disk" capability	18
13	Enhanced command RECALL capabilities	17
31	Improve terminal comm data display	17
54	Provide DECnet end-to-end encryption	16
55	Support SET HOST proxy access	16
21	Provide Mail enhancements	16
60	Support ACE security alarm ACE bypass	15
36	Provide descriptive text for files	15

Spring 1988 Ballot

The Top 35 SIR's as Ranked by VAX 85nn

Total ballots in this category: 53

SIR Nr.	SIR Description	Total Votes
19	"Control Print Screen" capability	24
7	LAT sessions identity information	23
10	Various BACKUP enhancements	20
8	Provide queued ALLOCATE requests	20
23	Enhance SHOW PROCESS command	19
11	No CR/LF for DCL WRITE command	18
21	Provide Mail enhancements	15
42	Provide installed memory-resident code	15
9	Provide project accounting	14
61	Enhance print form modules	13
28	Improving VMS define utility	12
15	DCL status return enhancements	12
1	Provide SCS communication services	12
62	Provide BACKUP dismount/deallocate	12
37	Corrrect READALL behavior	11
13	Enhanced command RECALL capabilities	11
49	Suppress certain login failures	11
54	Provide DECnet end-to-end encryption	11
3	Provide deallocation capability	11
2	Enhance batch load balancing	11
47	Eliminate unsolicited file creation ACE	10
48	Prevent password reuse by users	10
36	Provide descriptive text for files	10
68	Support multiple version products	10
29	Provide $GETDVI "wild card" capability	9
52	Security alarm messages to a file	9
64	Provide limits on simultaneous logins	9
14	Extend DCL TABLES	9
6	Provide a "virtual disk" capability	8
53	Provide ACL class names management	8
31	Improve terminal comm data display	8
66	WSQUOTA/WSEXTENT for INSTALL	8
56	Improve DECnet file access control	8
26	Support DCL command /BELL qualifier	7
25	Enhanced DEFINE/KEY capabilities	7

Spring 1988 Ballot

The Top 35 SIR's as Ranked by VAX 83nn/82nn

Total ballots in this category: 87

SIR Nr.	SIR Description	Total Votes
7	LAT sessions identity information	45
10	Various BACKUP enhancements	32
37	Corrrect READALL behavior	32
19	"Control Print Screen" capability	31
9	Provide project accounting	29
23	Enhance SHOW PROCESS command	28
11	No CR/LF for DCL WRITE command	26
3	Provide deallocation capability	26
61	Enhance print form modules	26
62	Provide BACKUP dismount/deallocate	25
8	Provide queued ALLOCATE requests	21
48	Prevent password reuse by users	21
64	Provide limits on simultaneous logins	20
36	Provide descriptive text for files	19
21	Provide Mail enhancements	19
15	DCL status return enhancements	19
2	Enhance batch load balancing	18
20	Enhance sysgen parameter readability	18
63	Support bell character in BACKUP	18
29	Provide $GETDVI "wild card" capability	18
42	Provide installed memory-resident code	17
49	Suppress certain login failures	17
1	Provide SCS communication services	16
47	Eliminate unsolicited file creation ACE	16
22	SET HOST/DTE for more modems	15
54	Provide DECnet end-to-end encryption	15
55	Support SET HOST proxy access	15
6	Provide a "virtual disk" capability	15
28	Improving VMS define utility	15
13	Enhanced command RECALL capabilities	15
30	Enhance $GETUAI and $SETUAI	15
66	WSQUOTA/WSEXTENT for INSTALL	15
52	Security alarm messages to a file	13
58	Provide RIGHTSLIST lexical function	12
14	Extend DCL TABLES	12

Spring 1988 Ballot

The Top 35 SIR's as Ranked by VAX 11/780, 11/782, 11/785

Total ballots in this category: 196

SIR Nr.	SIR Description	Total Votes
37	Corrrect READALL behavior	77
10	Various BACKUP enhancements	72
7	LAT sessions identity information	72
19	"Control Print Screen" capability	71
8	Provide queued ALLOCATE requests	68
3	Provide deallocation capability	66
23	Enhance SHOW PROCESS command	61
62	Provide BACKUP dismount/deallocate	57
29	Provide $GETDVI "wild card" capability	55
61	Enhance print form modules	54
14	Extend DCL TABLES	53
48	Prevent password reuse by users	53
52	Security alarm messages to a file	51
9	Provide project accounting	48
42	Provide installed memory-resident code	48
11	No CR/LF for DCL WRITE command	48
68	Support multiple version products	47
64	Provide limits on simultaneous logins	46
28	Improving VMS define utility	46
20	Enhance sysgen parameter readability	40
58	Provide RIGHTSLIST lexical function	40
15	DCL status return enhancements	38
54	Provide DECnet end-to-end encryption	36
21	Provide Mail enhancements	36
13	Enhanced command RECALL capabilities	34
6	Provide a "virtual disk" capability	33
66	WSQUOTA/WSEXTENT for INSTALL	32
63	Support bell character in BACKUP	32
30	Enhance $GETUAI and $SETUAI	31
49	Suppress certain login failures	30
57	Enhance COPY to copy ACL's	30
2	Enhance batch load balancing	30
1	Provide SCS communication services	29
51	Control file access via an image	29
25	Enhanced DEFINE/KEY capabilities	28

Spring 1988 Ballot

The Top 35 SIR's as Ranked by VAX 11/750

Total ballots in this category: 137

SIR Nr.	SIR Description	Total Votes
7	LAT sessions identity information	51
19	"Control Print Screen" capability	50
37	Corrrect READALL behavior	46
10	Various BACKUP enhancements	43
61	Enhance print form modules	43
23	Enhance SHOW PROCESS command	42
8	Provide queued ALLOCATE requests	40
3	Provide deallocation capability	39
11	No CR/LF for DCL WRITE command	39
62	Provide BACKUP dismount/deallocate	37
28	Improving VMS define utility	36
15	DCL status return enhancements	36
42	Provide installed memory-resident code	34
9	Provide project accounting	33
20	Enhance sysgen parameter readability	31
64	Provide limits on simultaneous logins	31
29	Provide $GETDVI "wild card" capability	29
63	Support bell character in BACKUP	27
1	Provide SCS communication services	26
48	Prevent password reuse by users	26
21	Provide Mail enhancements	26
55	Support SET HOST proxy access	24
68	Support multiple version products	24
66	WSQUOTA/WSEXTENT for INSTALL	23
6	Provide a "virtual disk" capability	23
18	Make DCL /LOG qualifier consistent	21
14	Extend DCL TABLES	20
58	Provide RIGHTSLIST lexical function	20
24	MOUNT/FOREIGN and uninitialized tapes	20
67	Priority for INSTALL	20
31	Improve terminal comm data display	20
50	No file update when protections change	19
47	Eliminate unsolicited file creation ACE	19
36	Provide descriptive text for files	18
46	Provide line-number support in TPU	18

Spring 1988 Ballot

The Top 35 SIR's as Ranked by VAX 11/730, 11/725

Total ballots in this category: 57

SIR Nr.	SIR Description	Total Votes
7	LAT sessions identity information	24
37	Corrrect READALL behavior	22
19	"Control Print Screen" capability	21
8	Provide queued ALLOCATE requests	20
61	Enhance print form modules	19
28	Improving VMS define utility	15
15	DCL status return enhancements	15
3	Provide deallocation capability	15
10	Various BACKUP enhancements	14
62	Provide BACKUP dismount/deallocate	14
66	WSQUOTA/WSEXTENT for INSTALL	14
68	Support multiple version products	14
1	Provide SCS communication services	13
23	Enhance SHOW PROCESS command	12
42	Provide installed memory-resident code	12
11	No CR/LF for DCL WRITE command	12
29	Provide $GETDVI "wild card" capability	11
67	Priority for INSTALL	11
36	Provide descriptive text for files	11
31	Improve terminal comm data display	10
9	Provide project accounting	10
64	Provide limits on simultaneous logins	10
13	Enhanced command RECALL capabilities	9
52	Security alarm messages to a file	9
56	Improve DECnet file access control	9
58	Provide RIGHTSLIST lexical function	9
14	Extend DCL TABLES	9
49	Suppress certain login failures	8
21	Provide Mail enhancements	8
54	Provide DECnet end-to-end encryption	8
55	Support SET HOST proxy access	8
2	Enhance batch load balancing	8
25	Enhanced DEFINE/KEY capabilities	8
24	MOUNT/FOREIGN and uninitialized tapes	7
20	Enhance sysgen parameter readability	7

Spring 1988 Ballot

The Top 35 SIR's as Ranked by MicroVAX I, II

Total ballots in this category: 218

SIR Nr.	SIR Description	Total Votes
7	LAT sessions identity information	83
19	"Control Print Screen" capability	75
8	Provide queued ALLOCATE requests	74
10	Various BACKUP enhancements	73
3	Provide deallocation capability	73
23	Enhance SHOW PROCESS command	72
37	Corrrect READALL behavior	72
61	Enhance print form modules	68
29	Provide $GETDVI "wild card" capability	62
48	Prevent password reuse by users	56
42	Provide installed memory-resident code	54
11	No CR/LF for DCL WRITE command	53
62	Provide BACKUP dismount/deallocate	53
14	Extend DCL TABLES	51
9	Provide project accounting	50
28	Improving VMS define utility	50
20	Enhance sysgen parameter readability	46
64	Provide limits on simultaneous logins	45
52	Security alarm messages to a file	44
15	DCL status return enhancements	44
68	Support multiple version products	43
58	Provide RIGHTSLIST lexical function	41
6	Provide a "virtual disk" capability	40
21	Provide Mail enhancements	39
2	Enhance batch load balancing	38
57	Enhance COPY to copy ACL's	37
1	Provide SCS communication services	35
55	Support SET HOST proxy access	34
13	Enhanced command RECALL capabilities	32
63	Support bell character in BACKUP	32
54	Provide DECnet end-to-end encryption	32
66	WSQUOTA/WSEXTENT for INSTALL	32
49	Suppress certain login failures	32
36	Provide descriptive text for files	31
24	MOUNT/FOREIGN and uninitialized tapes	30

Spring 1988 Ballot

The Top 35 SIR's as Ranked by MicroVAX 2000

Total ballots in this category: 64

SIR Nr.	SIR Description	Total Votes
7	LAT sessions identity information	30
8	Provide queued ALLOCATE requests	25
23	Enhance SHOW PROCESS command	24
37	Corrrect READALL behavior	23
19	"Control Print Screen" capability	22
28	Improving VMS define utility	21
10	Various BACKUP enhancements	19
3	Provide deallocation capability	18
11	No CR/LF for DCL WRITE command	18
9	Provide project accounting	18
48	Prevent password reuse by users	18
15	DCL status return enhancements	16
29	Provide $GETDVI "wild card" capability	14
36	Provide descriptive text for files	14
6	Provide a "virtual disk" capability	14
20	Enhance sysgen parameter readability	14
52	Security alarm messages to a file	14
55	Support SET HOST proxy access	14
61	Enhance print form modules	14
62	Provide BACKUP dismount/deallocate	14
1	Provide SCS communication services	13
21	Provide Mail enhancements	13
14	Extend DCL TABLES	13
42	Provide installed memory-resident code	12
58	Provide RIGHTSLIST lexical function	12
68	Support multiple version products	12
54	Provide DECnet end-to-end encryption	11
31	Improve terminal comm data display	11
51	Control file access via an image	10
66	WSQUOTA/WSEXTENT for INSTALL	10
2	Enhance batch load balancing	10
22	SET HOST/DTE for more modems	9
13	Enhanced command RECALL capabilities	9
64	Provide limits on simultaneous logins	9
49	Suppress certain login failures	9

Spring 1988 Ballot

The Top 35 SIR's as Ranked by MicroVAX 3n00

Total ballots in this category: 17

SIR Nr.	SIR Description	Total Votes
7	LAT sessions identity information	9
37	Corrrect READALL behavior	8
3	Provide deallocation capability	7
19	"Control Print Screen" capability	7
6	Provide a "virtual disk" capability	7
48	Prevent password reuse by users	6
52	Security alarm messages to a file	6
61	Enhance print form modules	6
64	Provide limits on simultaneous logins	6
8	Provide queued ALLOCATE requests	5
9	Provide project accounting	5
2	Enhance batch load balancing	5
21	Provide Mail enhancements	5
22	SET HOST/DTE for more modems	5
47	Eliminate unsolicited file creation ACE	4
11	No CR/LF for DCL WRITE command	4
10	Various BACKUP enhancements	4
54	Provide DECnet end-to-end encryption	4
58	Provide RIGHTSLIST lexical function	4
28	Improving VMS define utility	4
62	Provide BACKUP dismount/deallocate	4
20	Enhance sysgen parameter readability	4
49	Suppress certain login failures	3
13	Enhanced command RECALL capabilities	3
29	Provide $GETDVI "wild card" capability	3
15	DCL status return enhancements	3
45	VAX ADA needs complete VMS RTL package	3
1	Provide SCS communication services	3
63	Support bell character in BACKUP	3
23	Enhance SHOW PROCESS command	3
68	Support multiple version products	3
43	Provide /NOWAIT switch for TPU	2
57	Enhance COPY to copy ACL's	2
26	Support DCL command /BELL qualifier	2
31	Improve terminal comm data display	2

Spring 1988 Ballot

The Top 35 SIR's as Ranked by Business EDP

Total ballots in this category: 116

SIR Nr.	SIR Description	Total Votes
7	LAT sessions identity information	53
10	Various BACKUP enhancements	50
61	Enhance print form modules	43
37	Corrrect READALL behavior	42
23	Enhance SHOW PROCESS command	40
29	Provide $GETDVI "wild card" capability	40
48	Prevent password reuse by users	39
19	"Control Print Screen" capability	37
3	Provide deallocation capability	35
68	Support multiple version products	33
14	Extend DCL TABLES	32
62	Provide BACKUP dismount/deallocate	31
42	Provide installed memory-resident code	31
58	Provide RIGHTSLIST lexical function	30
8	Provide queued ALLOCATE requests	29
9	Provide project accounting	26
63	Support bell character in BACKUP	26
64	Provide limits on simultaneous logins	26
52	Security alarm messages to a file	26
11	No CR/LF for DCL WRITE command	25
22	SET HOST/DTE for more modems	25
28	Improving VMS define utility	24
57	Enhance COPY to copy ACL's	24
55	Support SET HOST proxy access	22
6	Provide a "virtual disk" capability	22
49	Suppress certain login failures	22
20	Enhance sysgen parameter readability	22
21	Provide Mail enhancements	21
66	WSQUOTA/WSEXTENT for INSTALL	20
15	DCL status return enhancements	20
54	Provide DECnet end-to-end encryption	19
36	Provide descriptive text for files	18
2	Enhance batch load balancing	17
51	Control file access via an image	16
31	Improve terminal comm data display	16

Spring 1988 Ballot

The Top 35 SIR's as Ranked by Education

Total ballots in this category: 53

SIR Nr.	SIR Description	Total Votes
37	Corrrect READALL behavior	27
19	"Control Print Screen" capability	26
10	Various BACKUP enhancements	24
7	LAT sessions identity information	20
62	Provide BACKUP dismount/deallocate	20
64	Provide limits on simultaneous logins	20
30	Enhance $GETUAI and $SETUAI	18
28	Improving VMS define utility	17
23	Enhance SHOW PROCESS command	16
11	No CR/LF for DCL WRITE command	16
21	Provide Mail enhancements	16
66	WSQUOTA/WSEXTENT for INSTALL	16
14	Extend DCL TABLES	15
20	Enhance sysgen parameter readability	15
61	Enhance print form modules	14
52	Security alarm messages to a file	13
54	Provide DECnet end-to-end encryption	13
51	Control file access via an image	12
15	DCL status return enhancements	11
22	SET HOST/DTE for more modems	11
49	Suppress certain login failures	11
9	Provide project accounting	11
8	Provide queued ALLOCATE requests	11
67	Priority for INSTALL	11
68	Support multiple version products	11
57	Enhance COPY to copy ACL's	10
42	Provide installed memory-resident code	10
65	Provide UAF distributed management	10
63	Support bell character in BACKUP	9
31	Improve terminal comm data display	9
3	Provide deallocation capability	9
55	Support SET HOST proxy access	8
18	Make DCL /LOG qualifier consistent	8
32	Provide directory file enhancements	8
29	Provide $GETDVI "wild card" capability	8

Spring 1988 Ballot

The Top 35 SIR's as Ranked by Data Acquisition/Control

Total ballots in this category: 65

SIR Nr.	SIR Description	Total Votes
7	LAT sessions identity information	29
37	Corrrect READALL behavior	29
23	Enhance SHOW PROCESS command	24
11	No CR/LF for DCL WRITE command	23
19	"Control Print Screen" capability	23
28	Improving VMS define utility	20
8	Provide queued ALLOCATE requests	20
20	Enhance sysgen parameter readability	19
3	Provide deallocation capability	19
42	Provide installed memory-resident code	19
62	Provide BACKUP dismount/deallocate	19
61	Enhance print form modules	18
31	Improve terminal comm data display	18
10	Various BACKUP enhancements	17
15	DCL status return enhancements	15
14	Extend DCL TABLES	15
64	Provide limits on simultaneous logins	15
48	Prevent password reuse by users	14
55	Support SET HOST proxy access	13
29	Provide $GETDVI "wild card" capability	13
6	Provide a "virtual disk" capability	13
36	Provide descriptive text for files	13
9	Provide project accounting	12
68	Support multiple version products	12
66	WSQUOTA/WSEXTENT for INSTALL	11
18	Make DCL /LOG qualifier consistent	11
21	Provide Mail enhancements	10
57	Enhance COPY to copy ACL's	9
58	Provide RIGHTSLIST lexical function	9
2	Enhance batch load balancing	9
51	Control file access via an image	9
53	Provide ACL class names management	9
54	Provide DECnet end-to-end encryption	9
47	Eliminate unsolicited file creation ACE	9
13	Enhanced command RECALL capabilities	8

Spring 1988 Ballot

The Top 35 SIR's as Ranked by Service Bureau

Total ballots in this category: 23

SIR Nr.	SIR Description	Total Votes
8	Provide queued ALLOCATE requests	11
10	Various BACKUP enhancements	10
14	Extend DCL TABLES	8
37	Corrrect READALL behavior	8
23	Enhance SHOW PROCESS command	7
31	Improve terminal comm data display	7
36	Provide descriptive text for files	7
7	LAT sessions identity information	7
68	Support multiple version products	7
21	Provide Mail enhancements	6
13	Enhanced command RECALL capabilities	6
52	Security alarm messages to a file	6
55	Support SET HOST proxy access	6
11	No CR/LF for DCL WRITE command	6
38	Support image backward compatibility	5
39	Enhance DYNSWITCH software	5
47	Eliminate unsolicited file creation ACE	5
6	Provide a "virtual disk" capability	5
19	"Control Print Screen" capability	5
58	Provide RIGHTSLIST lexical function	5
61	Enhance print form modules	5
62	Provide BACKUP dismount/deallocate	5
65	Provide UAF distributed management	5
29	Provide $GETDVI "wild card" capability	5
28	Improving VMS define utility	4
42	Provide installed memory-resident code	4
15	DCL status return enhancements	4
48	Prevent password reuse by users	4
64	Provide limits on simultaneous logins	4
9	Provide project accounting	4
54	Provide DECnet end-to-end encryption	4
44	Multiple ".END" statements in Macro	3
2	Enhance batch load balancing	3
3	Provide deallocation capability	3
51	Control file access via an image	3

Spring 1988 Ballot

The Top 35 SIR's as Ranked by Scientific/Engineering

Total ballots in this category: 194

SIR Nr.	SIR Description	Total Votes
37	Corrrect READALL behavior	76
8	Provide queued ALLOCATE requests	71
3	Provide deallocation capability	71
19	"Control Print Screen" capability	69
7	LAT sessions identity information	62
10	Various BACKUP enhancements	62
23	Enhance SHOW PROCESS command	59
61	Enhance print form modules	59
62	Provide BACKUP dismount/deallocate	57
29	Provide $GETDVI "wild card" capability	49
9	Provide project accounting	48
14	Extend DCL TABLES	47
11	No CR/LF for DCL WRITE command	46
28	Improving VMS define utility	46
42	Provide installed memory-resident code	44
52	Security alarm messages to a file	44
20	Enhance sysgen parameter readability	43
68	Support multiple version products	43
48	Prevent password reuse by users	42
64	Provide limits on simultaneous logins	38
15	DCL status return enhancements	38
57	Enhance COPY to copy ACL's	36
58	Provide RIGHTSLIST lexical function	35
21	Provide Mail enhancements	34
63	Support bell character in BACKUP	33
2	Enhance batch load balancing	29
49	Suppress certain login failures	29
66	WSQUOTA/WSEXTENT for INSTALL	28
47	Eliminate unsolicited file creation ACE	27
13	Enhanced command RECALL capabilities	27
24	MOUNT/FOREIGN and uninitialized tapes	27
6	Provide a "virtual disk" capability	25
1	Provide SCS communication services	25
36	Provide descriptive text for files	24
55	Support SET HOST proxy access	24

Spring 1988 Ballot

The Top 35 SIR's as Ranked by Telecommunications

Total ballots in this category: 93

SIR Nr.	SIR Description	Total Votes
8	Provide queued ALLOCATE requests	40
10	Various BACKUP enhancements	36
3	Provide deallocation capability	35
7	LAT sessions identity information	33
42	Provide installed memory-resident code	33
52	Security alarm messages to a file	31
37	Corrrect READALL behavior	30
19	"Control Print Screen" capability	29
61	Enhance print form modules	28
48	Prevent password reuse by users	27
58	Provide RIGHTSLIST lexical function	26
29	Provide $GETDVI "wild card" capability	26
14	Extend DCL TABLES	25
9	Provide project accounting	23
68	Support multiple version products	23
11	No CR/LF for DCL WRITE command	22
28	Improving VMS define utility	22
23	Enhance SHOW PROCESS command	21
62	Provide BACKUP dismount/deallocate	19
15	DCL status return enhancements	18
57	Enhance COPY to copy ACL's	18
60	Support ACE security alarm ACE bypass	17
6	Provide a "virtual disk" capability	17
13	Enhanced command RECALL capabilities	16
20	Enhance sysgen parameter readability	15
2	Enhance batch load balancing	15
54	Provide DECnet end-to-end encryption	15
55	Support SET HOST proxy access	15
64	Provide limits on simultaneous logins	15
1	Provide SCS communication services	15
70	Enhance BACKUP file attribute	15
21	Provide Mail enhancements	13
36	Provide descriptive text for files	13
31	Improve terminal comm data display	12
66	WSQUOTA/WSEXTENT for INSTALL	12

Spring 1988 Ballot

The Top 35 SIR's as Ranked by Software Development

Total ballots in this category: 238

SIR Nr.	SIR Description	Total Votes
37	Corrrect READALL behavior	90
7	LAT sessions identity information	86
23	Enhance SHOW PROCESS command	79
10	Various BACKUP enhancements	79
19	"Control Print Screen" capability	78
3	Provide deallocation capability	77
61	Enhance print form modules	77
8	Provide queued ALLOCATE requests	75
11	No CR/LF for DCL WRITE command	63
29	Provide $GETDVI "wild card" capability	63
9	Provide project accounting	60
14	Extend DCL TABLES	59
62	Provide BACKUP dismount/deallocate	59
42	Provide installed memory-resident code	58
15	DCL status return enhancements	54
48	Prevent password reuse by users	53
64	Provide limits on simultaneous logins	52
28	Improving VMS define utility	51
20	Enhance sysgen parameter readability	50
52	Security alarm messages to a file	47
21	Provide Mail enhancements	47
68	Support multiple version products	47
58	Provide RIGHTSLIST lexical function	42
57	Enhance COPY to copy ACL's	41
6	Provide a "virtual disk" capability	39
63	Support bell character in BACKUP	39
54	Provide DECnet end-to-end encryption	38
66	WSQUOTA/WSEXTENT for INSTALL	38
2	Enhance batch load balancing	38
13	Enhanced command RECALL capabilities	36
1	Provide SCS communication services	36
31	Improve terminal comm data display	34
30	Enhance $GETUAI and $SETUAI	33
55	Support SET HOST proxy access	33
22	SET HOST/DTE for more modems	32

Spring 1988 Ballot

The Top 35 SIR's as Ranked by Computer Science Research

Total ballots in this category: 31

SIR Nr.	SIR Description	Total Votes
37	Corrrect READALL behavior	14
9	Provide project accounting	13
48	Prevent password reuse by users	12
7	LAT sessions identity information	11
19	"Control Print Screen" capability	11
28	Improving VMS define utility	9
3	Provide deallocation capability	9
23	Enhance SHOW PROCESS command	9
62	Provide BACKUP dismount/deallocate	9
8	Provide queued ALLOCATE requests	8
6	Provide a "virtual disk" capability	8
10	Various BACKUP enhancements	8
68	Support multiple version products	8
14	Extend DCL TABLES	7
54	Provide DECnet end-to-end encryption	7
52	Security alarm messages to a file	6
11	No CR/LF for DCL WRITE command	6
55	Support SET HOST proxy access	6
31	Improve terminal comm data display	6
49	Suppress certain login failures	6
24	MOUNT/FOREIGN and uninitialized tapes	5
27	Restore CONTROL_U behavior	5
1	Provide SCS communication services	5
20	Enhance sysgen parameter readability	5
2	Enhance batch load balancing	5
56	Improve DECnet file access control	5
58	Provide RIGHTSLIST lexical function	5
61	Enhance print form modules	5
42	Provide installed memory-resident code	5
47	Eliminate unsolicited file creation ACE	5
15	DCL status return enhancements	4
21	Provide Mail enhancements	4
18	Make DCL /LOG qualifier consistent	4
35	Priority control of DECnet processes	4
36	Provide descriptive text for files	4

Spring 1988 Ballot

The Top 35 SIR's as Ranked by CAD/CAM

Total ballots in this category: 87

SIR Nr.	SIR Description	Total Votes
3	Provide deallocation capability	38
8	Provide queued ALLOCATE requests	36
10	Various BACKUP enhancements	36
19	"Control Print Screen" capability	33
61	Enhance print form modules	32
48	Prevent password reuse by users	31
37	Corrrect READALL behavior	30
29	Provide $GETDVI "wild card" capability	29
7	LAT sessions identity information	29
68	Support multiple version products	28
62	Provide BACKUP dismount/deallocate	26
42	Provide installed memory-resident code	26
23	Enhance SHOW PROCESS command	24
11	No CR/LF for DCL WRITE command	24
9	Provide project accounting	23
14	Extend DCL TABLES	23
52	Security alarm messages to a file	23
58	Provide RIGHTSLIST lexical function	22
28	Improving VMS define utility	19
15	DCL status return enhancements	19
57	Enhance COPY to copy ACL's	16
49	Suppress certain login failures	15
70	Enhance BACKUP file attribute	15
54	Provide DECnet end-to-end encryption	13
63	Support bell character in BACKUP	13
47	Eliminate unsolicited file creation ACE	12
6	Provide a "virtual disk" capability	12
60	Support ACE security alarm ACE bypass	11
46	Provide line-number support in TPU	11
1	Provide SCS communication services	10
64	Provide limits on simultaneous logins	10
31	Improve terminal comm data display	10
20	Enhance sysgen parameter readability	10
2	Enhance batch load balancing	9
18	Make DCL /LOG qualifier consistent	9

Spring 1988 Ballot

The Top 35 SIR's as Ranked by Hardware Development

Total ballots in this category: 33

SIR Nr.	SIR Description	Total Votes
3	Provide deallocation capability	12
8	Provide queued ALLOCATE requests	12
19	"Control Print Screen" capability	12
37	Corrrect READALL behavior	12
7	LAT sessions identity information	11
10	Various BACKUP enhancements	11
61	Enhance print form modules	11
9	Provide project accounting	9
62	Provide BACKUP dismount/deallocate	9
42	Provide installed memory-resident code	8
1	Provide SCS communication services	8
15	DCL status return enhancements	8
11	No CR/LF for DCL WRITE command	7
23	Enhance SHOW PROCESS command	7
2	Enhance batch load balancing	7
66	WSQUOTA/WSEXTENT for INSTALL	7
68	Support multiple version products	7
21	Provide Mail enhancements	6
29	Provide $GETDVI "wild card" capability	6
47	Eliminate unsolicited file creation ACE	6
49	Suppress certain login failures	6
5	Providing batch job "filtering"	5
20	Enhance sysgen parameter readability	5
14	Extend DCL TABLES	5
6	Provide a "virtual disk" capability	5
54	Provide DECnet end-to-end encryption	5
28	Improving VMS define utility	5
18	Make DCL /LOG qualifier consistent	5
64	Provide limits on simultaneous logins	5
33	Provide a real-time debugger	5
36	Provide descriptive text for files	5
58	Provide RIGHTSLIST lexical function	4
46	Provide line-number support in TPU	4
31	Improve terminal comm data display	4
63	Support bell character in BACKUP	4

Spring 1988 Ballot

The Top 35 SIR's as Ranked by Office Automation

Total ballots in this category: 145

SIR Nr.	SIR Description	Total Votes
7	LAT sessions identity information	64
10	Various BACKUP enhancements	60
37	Corrrect READALL behavior	55
61	Enhance print form modules	55
3	Provide deallocation capability	49
48	Prevent password reuse by users	48
42	Provide installed memory-resident code	47
19	"Control Print Screen" capability	45
23	Enhance SHOW PROCESS command	45
8	Provide queued ALLOCATE requests	44
29	Provide $GETDVI "wild card" capability	42
11	No CR/LF for DCL WRITE command	38
62	Provide BACKUP dismount/deallocate	38
14	Extend DCL TABLES	37
68	Support multiple version products	35
58	Provide RIGHTSLIST lexical function	34
52	Security alarm messages to a file	34
9	Provide project accounting	31
20	Enhance sysgen parameter readability	31
64	Provide limits on simultaneous logins	30
15	DCL status return enhancements	30
54	Provide DECnet end-to-end encryption	29
28	Improving VMS define utility	29
55	Support SET HOST proxy access	27
22	SET HOST/DTE for more modems	27
36	Provide descriptive text for files	26
66	WSQUOTA/WSEXTENT for INSTALL	25
57	Enhance COPY to copy ACL's	25
49	Suppress certain login failures	24
6	Provide a "virtual disk" capability	23
63	Support bell character in BACKUP	22
21	Provide Mail enhancements	22
51	Control file access via an image	21
31	Improve terminal comm data display	21
25	Enhanced DEFINE/KEY capabilities	21

Spring 1988 Ballot

The Top 35 SIR's as Ranked by Other

Total ballots in this category: 21

SIR Nr.	SIR Description	Total Votes
7	LAT sessions identity information	11
20	Enhance sysgen parameter readability	9
23	Enhance SHOW PROCESS command	9
28	Improving VMS define utility	9
37	Corrrect READALL behavior	9
21	Provide Mail enhancements	7
15	DCL status return enhancements	7
19	"Control Print Screen" capability	7
6	Provide a "virtual disk" capability	7
62	Provide BACKUP dismount/deallocate	7
64	Provide limits on simultaneous logins	7
67	Priority for INSTALL	7
10	Various BACKUP enhancements	6
1	Provide SCS communication services	6
42	Provide installed memory-resident code	6
68	Support multiple version products	6
48	Prevent password reuse by users	5
61	Enhance print form modules	5
3	Provide deallocation capability	5
63	Support bell character in BACKUP	5
29	Provide $GETDVI "wild card" capability	5
8	Provide queued ALLOCATE requests	5
24	MOUNT/FOREIGN and uninitialized tapes	5
11	No CR/LF for DCL WRITE command	4
18	Make DCL /LOG qualifier consistent	4
54	Provide DECnet end-to-end encryption	4
26	Support DCL command /BELL qualifier	3
2	Enhance batch load balancing	3
56	Improve DECnet file access control	3
22	SET HOST/DTE for more modems	3
36	Provide descriptive text for files	3
14	Extend DCL TABLES	3
5	Providing batch job "filtering"	3
43	Provide /NOWAIT switch for TPU	3
46	Provide line-number support in TPU	3

It's On The Tapes

Glenn Everhart

Did you ever wish you had a VAXstation on your desk instead of a VT100 or VT200? Ever feel that you could be more productive with lots of windows and processes so you could avoid waiting for the VAX to get finished with something?

Well, you can (almost).

A VT terminal usually has too few characters to be usefully split up, and applications that run multiple processes through windows on a VT (using SMG$ or the like) are CPU hogs. However, software that can let you use the whole VT screen as a window exists. It's called BOSS and a version can be found in the [vax87d.rcaf87.netnew] directory. This is a program written by Charles Karney and released via the ARPAnet. It uses the pseudo terminal driver submitted to the tapes by Kevin Carosso and allows you to manage up to 8 subprocesses at a time, switching dynamically between them via a "hotkey". Its system overhead is negligible and it can swap out of a process at any time. Because it uses the PY/TP driver combination, the applications are running at real terminal devices, so they all act normally. Also, one can spawn a new process (if one hasn't used all available) at any time without disturbing the context.

Full screen applications are generally able to repaint the screen, so BOSS does nothing to keep track of what's on any screen. You do lose the contents of a screen in non-full screen applications, as they scroll off screen, but this generally presents few problems.

A new version, which should be on the Spring '88 tape, has been released which buffers output from the hidden processes and displays it when you bring up their windows. This is very handy for many applications.

The F87 version of BOSS introduced the ability of one process to send controlling input to another too. With a little work, this can be used to create a hypertext system, with the restriction that only one "box" can be displayed at a time. The random connections between "boxes" (where a box is implemented as one of the subprocesses, and another "master" subprocess has the program that fires up the commands to move from one subprocess to another) can be implemented using fairly crude techniques. It takes only the will to build it and a use for it.

To use such a system, you'd get into a "master" process to bring up the "window" of what to link to. The master process would allow selection of one of several possible commands to be sent to a "slave" process (e.g. to edit text or pictures) by accessing some data base or data file based on the "current" (or last) subordinate command selected. One possible command might result in editing the list of commands at any point in the database, allowing links between subordinate commands to be modified. The master process could then, via the good offices of BOSS, send the command to another BOSS subprocess and thus run any desired command. Full screen applications would present no problems this way, as they might where mailboxes were used. Also, more elaborate implementations that permitted several open applications could be devised.

BOSS is an enabling technology for terminal users which has abilities that should not be overlooked. I recommend that if you use a VT terminal, you look it over.

VAX/VMS Security

One in a Series

Ray Kaplan, PIVOTAL, Inc., Tucson, AZ

On Hackers

The usage of the term "hacker" has changed over the last few years. Of late, the term "hacker" has come to mean what I consider to be a "computer criminal" in its current common use by the lay public and press. Even the current trade press abuses the term.

By some definitions, a hacker is the ultimate expert programmer of days of old when memory, disk and CPU cycles were very scarce. A hacker could produce a most beautiful and elegant solution to a problem in a very few lines of code. By some definitions, a hacker is a consummate programmer that can completely exploit their machine resources so well that they end up with absolutely no extraneous code and a problem solution that is perfectly tight and elegant. And, by some definitions, a hacker is anyone that "plays" at anything that they do. You know, folks that hack at golf, tennis, flying or whatever their interests are! All I know is that I must be a hacker. After all, my friends all say that I hack code and my significant other says that I hack at our relationship!

While I (and many other "old timers" in this game) strenuously resist the change that is taking place in the common usage of the term "hacker", I also feel that it may be a bit of a lost cause to resist the change. This feeling is based on my observation that the media (like the trade press) has more power over the "common law" definitions in the language than we do (as the technicians that control our technical language.)

Thanks, Criminals

I will attempt to set the record straight in some future writings on the hacker matter, but for now I want to say a big "thanks" to to the computer criminals that have caused the recent stirs in the world's data processing community with their break-ins from overseas. Yes, that is correct. As a practicing computer security consultant, I want to say thanks to the computer criminals! Fact is, I think that you ought to join me in thanking them. If you have not recovered from the shock of reading that last statements, please read on.

Ater statements like that, I figure that you either believe that I have a legitimate point to make or believe that I am ready to give up my VAX/VMS and DECnet-VAX related computer security consulting practice! I assure you that I am not ready to give up my consulting practice, so let's get started figuring out why we should thank computer criminals.

Have you heard Retired Admiral Grace Hopper speak on the "state of the world of information processing?" If not, you are in for a shocker of a technical entertainment experience. Your DECUS Local User Group (LUG) can get a video tape of her address to the 25th anniversary celebration at the DECUS U.S. National Symposium in Dallas from the DECUS National LUG Organization video tape library. If your LUG has not seen the tape, have your LUG chairperson get a copy of it for the next LUG meeting. If you don't know where your LUG is, find it by writing the national DECUS office at the address contained elsewhere in this newsletter. If you don't have a LUG in your area, go start one! (I'll even help you do it.)

In her talk, Admiral Hopper proposes that we (as the data processing industry) are woefully unaware of how important the data that we process is and show an amazing lack of interest in its well being and correctness as a result. She presents quite an articulate argument that we had better get ourselves oriented to not only the value and importance of the data that our machines process, but oriented to the potential for a first order societal disaster that could be induced by errors that are introduced into the data by our improper custodianship and/or processing as well. In addition she asserts that as a society, we only change as a result of large and self induced crises that do significant damage to us all.

Given the nature of the data that our systems hold and process, you can probably accurately detail any sort of disaster that you can imagine. Failure to launch, an incorrect medical operation being performed, a sizable business bankruptcy and the ruin of someone's credit life are but a few of the scenarios that you could come up with that could result from lax custodianship of data or out and out negligence. Simple examples of her theme can easily be found in the contemporary examples of commercial computer crimes that are well documented these days. Stories about dishonest and inept employees top the list. Remember the Equity Funding Scandal where the management of an insurance company inflated their stock's value with scads of computer generated fraudulent insurance policies? Then there is the not-so-well documented case of the insurance executive that was retired with a gold watch after it was discovered that he had successfully embezzled $28 million from his employeer (you see, they didn't prosecute since they didn't want the bad PR!).

With all of this as background, you'd think that the right thing do do with a computer criminal would be to shoot them on sight! After all, they are a menace to society and they have collectively cost everyone a lot of trouble. System down time, lost productivity, data corruption, monetary losses - and - lots of lost sleep and ulcers for us system and security managers! Why the nasty computer criminal creeps! After a system that I am responsible for has been attacked, I angrily shout "Hang the bastards!"

Wait a moment. Is this a multiple personality here? I say that we ought to thank computer criminals and then I call them creepy bastards? What gives?

As a final piece to the puzzle, you need to understand my argument is my experience as a technical trainer and a VAX/VMS consultant. By far the biggest problem that we find in the DEC based DP shops that we see and hear about is a severe lack of system and network management resources. Out of the things that we generally find missing, the most common is very simple - lack of time for the system and network managers to do their jobs. Of course, the jobs of system and network management includes system and network security management. Stated plainly, most system and network managers do not seem to have the time to do the security management portion of their jobs! Further, we typically find that the problem is really a manager that has not budgeted any time or resources for the system and network security job. Most system and network managers that we meet are sufficiently interested in this important aspect of their job to be doing the best that they can with it by begging, borrowing and stealing resources from other tasks that are "officially funded" to insure that their systems and networks are secure. The refrain "I'll be a little late tonight, honey" wears thin after a time.

There is one more piece to consider before you can see my justification in thanking the computer criminals. Currently, when a security related problem is discovered with either the operating system, the network, or layered applications software - it is not discussed in any way that system and network managers can expediently find out about them. Using the two security problems that have recently been fixed by DEC as examples, it is plain to see that both DEC and DECUS have been unable to come up with a way to discuss these sorts of problems in the sort of an open forum that would allow many of our systems from being compromised. While DEC built and shipped fixes to the problems as quickly as they could, all of our systems were wide open to attack during the time that it took them to do this. Worse, no one would talk about the problems so that we could at least monitor our systems more closely. The reasoning behind this behavior

that is being given is that if the problems are discussed openly, systems will be subjected to unnecessary exposure to "bad guys" that know about the problem. They say that there are many systems out there that are not even being protected at a minimal level and that to distribute information about the problem is needlessly arming criminals to do those systems harm. Just for the record, I say that these arguments are as flawed as those that the fundamentalist religious people use against sex education in grammer school. A typical fundamentalist argument against it is that sex education at a young age will "corrupt the morality" of our young people by inducing them to experiment with sex. I say that sex education is one of the only ways that we will ever put a cap on the AIDS epidemic!

Now that you've read all of this, try the following on for size.

Given:

- That the safety and integrity of the data on our systems is at the very core of our infrastructure,
- The fact that we (as system and network security managers) generally have a hard time gathering the resources that we need to do the security part of our system and network management jobs
- The fact that often security patches and information about security problems arrive to late to do us any good

maybe it is appropriate for some force, "external" to our infrastructure, to "shake us up with a bit of reality therapy." Come on now, when you last asked your manager for additional resources to do a better job of system or network management, what did they say? I'll bet they sent you away feeling that it was **your** fault that system and network management **even** needs to be done (let alone not giving you the resources that you need to do the job!)

Maybe we ought to thank computer criminals for reminding the custodians of the societies data that its safety and integrity are **very** important. Maybe we ought to thank the computer criminals for getting themselves on the front pages of newspapers across the country where managers and controllers of organizational resources can be told publically that they have problems that are not being properly addressed. Maybe we ought to thank computer criminals for reminding managers that our technology is not only fragile, but that it needs to be carefully managed as well. Maybe we ought to thank computer criminals for reminding DEC and DECUS that hiding from problems and management by ignorance is not appropriate - **especially** when our hardware, software and practices are so widely known and understood.

Maybe we ought to thank computer criminals. What do you think?

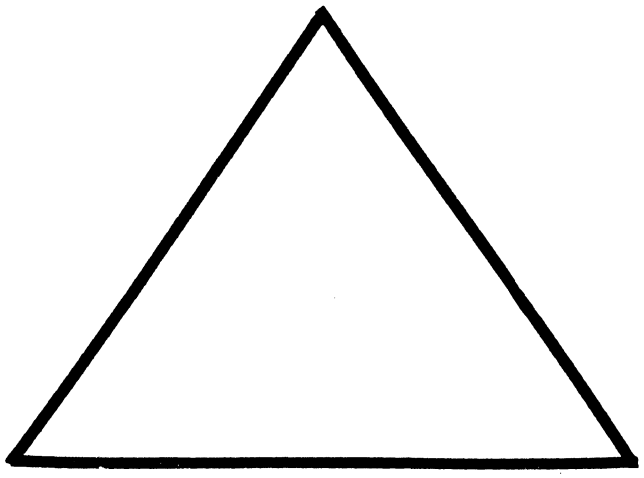
Let me hear from you on this!

Until we meet again - Happy VAXing!

Ray Kaplan, PIVOTAL, Inc., P.O. Box 32647, Tucson, Arizona 86751

DECUS

edusig



EDU

Fellow educators:

The dust should have settled on the spring DECUS in Cincinnati. I hope that you found many useful tools and thought provoking ideas. It is time to think about the Woods meeting in June and the fall DECUS. There is never any rest for the ones who are willing.

If you are not familiar with a Woods meeting let me enlighten you. The Woods meeting is a time for the officers of the Sig , in this case EDUSIG, to get togather and plan out strategies for the up coming year. Many old questions will crop up as well as new ones. Costs, quality, presenters, new DEC products (both hardware and software) and the courtship with our counter parts in DEC are among the many things discussed at these meetings. Now is the time to add your thoughts to the list. We need input.

F.G.B.
Taft College
Taft, CA 93268

The TESTGEN article discribes a software product that can be obtained from the Clearinghouse at Iowa State University.

TESTGEN

TESTGEN, in one form or another, has a long history. Those of us at Taft College are grateful for the use of a prototype provided by Bakersfield College in 1981. This version of TESTGEN was produced by Fred Bell of Taft College and Dan Esbensen, president of Touch Technologies, San Diego. TESTGEN is written using "Intouch", a next generation language developed by Touch Technologies, Inc. A free run version of Intouch (TM) is included, courtesy of Touch Technologies.

TESTGEN is a unique, easy to use, test generating program. It uses the "KISS" principle to make it superior to other generating packages. TESTGEN can handle multiple-choice, true-false and matching type questions. It is completely menu driven with on-line help for each menu. The main menu gives the user following choices:

ADD - Add New Questions
CHA - Change an Existing Question
DEL - Delete an Existing Question
LIS - List Existing Questions
GEN - Generate a Test

Entering questions or correct existing ones:

The main menu will prompt the user for the type of task to perform, "ADD" for adding new question either to an existing chapter or a new one. If the user types "new" the menu prompts the user for the name of the chapter (max of 8 characters), with the usual rules for VMS file names.

One of the unique features of TESTGEN is that it uses EDT as the editor for correcting or modifying test questions. Users do not have to learn to use another editor. When typing the question TESTGEN uses prompts for the type of question (multiple-choice, true-flase or matching). Each question is terminated by a blank return. Backing up is another helpful feature. If an error was made in the previous responses for correction. Control-Z or "EXIT" will take the user from a sub-menu to the main menu or exit the program altogether.

Generating a test or getting a list of questions:

The user is prompted for the test title, instructor's name, class type, letter or number choices, computer-selected or user-selected question in each test generating operation. The user has the folowing printing options:

SCR - Print to Screen
PRI - Print to Printer Port
SYS Print to System Printer

The option of printing from the printer port saves time and equipment.

Instructional strategies:

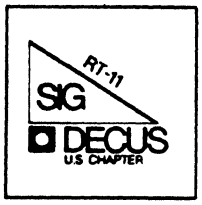
The ease of use of TESTGEN makes it especially valuable for the comonly accepted practice of pretesting. It is not difficult to prepare two versions of an exam and allow students to practice the pretest from a terminal at their time and convenience.

Such practice is consistent with the view that testing should measure learning and yet not become "game playing" barriers to student success. If used with a package such as Digital's Courseware Authoring System (CAS), then computer managed learning (CML) components come into play, allowing instructors to measure the time and effort that students are putting forth.

THE mini·tasker

DECUS

RT-11 SIG NEWSLETTER



RT

RT-11 MINITASKER
June, 1988

Contents

From the Editor RT-1
Introduction to KERMIT/RT RT-2
The FORTRAN Slate RT-13

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From the Editor:

Hey folks! The Minitasker Folder is empty. There were only two articles for This newsletter is your medium for exchanging ideas, so send me some.
Are there any of you out there who (like I) used Version 1 of RT-11? (Of course it wasn't called Version 1 at the time.) For our 15th anniversary, I'd like to collect your recollections of RT-11 over the years. Send your war stories, bugs, fixes, questions, comments, or ramblings to:

John M. Crowell
RT-11 Newsletter Editor
Multiware, Inc.
2121-B Second St. Suite 107
Davis, CA 95616

Gary Sallee's Introduction to KERMIT/RT is long enough that I'm splitting it between this month's and next month's issues. (Mostly so I know I'll have something to publish next month.) I found this article particularly useful. I think you will too. Bob Walravenn's FORTRAN SLATE addresses the problem of Virtual Arrays that get mapped into oblivion. It's all done with smoke and mirrors!

Kermit/RT/TSX Introduction

Gary F. Sallee

From Brian Nelson's K11ART.DOC, K11F85.DOC, and K11INS.DOC
Presented at the Regular SCURT LUG Meeting
Southern California Users Of RT-11
Pasadena, California

ABSTRACT

This is an introduction to Brian Nelson's KERMIT from the University of Toledo as it may be used in an RT-11 or TSX-plus computer system. Topics covered will be what Kermit does, how I use Kermit, what SYSGEN options are needed, how to set up the needed hardware, how to install Kermit, how Kermit talks to other Kermits, how to use KERMIT.INI, how to set up a dialing list, and anticipated futures by Toledo and by SCURT.

USES

Kermit is used to support file transfers to and from superminis such as the VAX and PDP-11 and remote personal computers, such as the PC, the Rainbow, and the MacIntosh. Kermit is used as a basic terminal emulator. Kermit has a log file capability that can record data and/or commands from the terminal or the communication link. It is possible to control several RT-11 systems from one "master" RT-11 multi-terminal system by wiring the "master" DL ports to the the "slave" console lines. Because there is an existing Kermit for almost any DEC configuration, then Kermit can be used as a poor man's Decnet.

HOW I USE KERMIT

I routinely use Kermit for transferring files between a TSX-plus system, RT-11 systems, RSTS/E systems, and VMS systems. I also use Kermit to control "slave" systems from a "master" TSX-plus system over DL serial lines. This provides a "super set host". I use Kermit's log file to record anomalies like crashes and ODT interactions on the "slave" systems. I use the Kermit log file to record data from a connected system or from dial up services such as DECUSERV and DECdirect: (800) 258-1710 (1200/2400 baud).

I have obtained the Toledo Kermit by dialing into the VAX 11/785 at the University of Toledo: (419) 537-4411 (1200 baud, Service Class: VX785A, Account: KERMIT, Password: KERMIT).

CONCLUSIONS

Kermit-11 is useful, easy to run, and easy to install.

TERMINAL EMULATOR

Terminal emulation can be done several ways: A Kermit program can provide a simple "glass tty" mode. A Kermit might provide an intelligent terminal emulation. In the case of a PC the emulation is likely to be of a VT100 series terminal. MacKermit provides this. Some mode of terminal emulation is generally required since the file transfer operation of Kermit requires that two Kermits to be running; one on the LOCAL system and one on the REMOTE system. The simplest method of running two Kermits at once is to use terminal emulator mode (CONNECT) on the local system as a terminal to log into the remote system. Then invoke the host's Kermit program.

While logged onto the Host with the terminal emulator it is possible to use any of the host's services and programs. You are not limited to "RUN KERMIT", as far as the host allows you privileges.

MY HARDWARE

I have a DLV11-E modem port with the programmable baud rate enabled. The DLV11-E for a modem port is well supported in RT-11. I am using a DITTO 2400XL, a Hayes compatible modem which is made by Rockwell, Newport Beach (TR24-D310). I also have a SmarTEAM 103/212A Hayes compatible modem that I have used on the DLV11-E.

I put my modem on CSR 176530 and Vector 330. This allows my first DLV11-J to have the console port and my second DLV11-J to start at an even CSR 176540 and vector 340. Be sure to set the jumpers for the desired CSR and vector on the serial card.

OTHER HARDWARE

The DZ/DZV11 ports which support modem control can also be used. The DH/DHV11 port may be used but Kermit does not support the SET SPEED command yet. A plain vanilla DL port can be used to dial out if you do not want to change the transmission speed from the operating system. The SET SPEED command is not supported for RT-11; it is supported for TSX-plus. So for a dial out line with RT-11 Kermit-11 V3.56, there is no disadvantage to using a vanilla DL line.

HOW I SET UP MY HAYES COMPATIBLE MODEM

DTR forced on (Not good for RSTS/E or RSX, but ok for RT-11)
Hayes word result codes
Send Hayes result codes
No echo in command mode (Important with TSX+. RT-11 echo is ok.)
Auto answer enabled (Probably no reason for this for RT-11)
Set CCITT V.22 bisync mode (This is for 2400 baud)
Set default speed 2400 baud

Hayes commands are enabled.
RTS is disconnected
RLSD/CD to DSR loop is off
Asynchronous line communication mode
Internal Sync Clock

The Cable from the DLV11-E to the Modem RS232-C includes null modem

RS232-C DB25 EIA	PIN	NAME		NAME	DLV11-E 50-PIN BURG PIN	NAME
AA	1-	P-GND	--	*protective ground	A	protective ground
AA	1-	P-GND	--	*protective ground	VV	protective ground
BA	2-	TD	<--	*transmit data	F	transmit data
BB	3-	RD	-->*	receive data	J	receive data
CB	5-	CTS	-->*	clear to send	T	clear to send
AB	7-	S-GND	--	*signal ground	B	signal ground
AB	7-	S-GND	--	*signal ground	UU	signal ground
CF	8-	RLSD	-->*	carrier detect (CD)	BB	rcv. line signal detect
CD	20-	DTR	<--	*data terminal ready	DD	data terminal ready
CE	22-	RI	-->*	ring detect	X	ring indicator
			*		M	EIA interlock
			*		E	EIA interlock
CA	4-	RTS	<--	request to send	none (V)	
CC	6-	DSR	-->	data set ready	none	
SBA	14-	STD	<--	2nd transmit data	none (FF)	
SBB	16-	RD	-->	2nd receive data	none (JJ)	
	17-	RxCLK	-->	receiver clock	none	
	23-	SPDS	<--	speed select	none	
	24-	TxCLK	<--	transmitter clock	none	
	25-	FB	<--	force busy	none (C)	

Note: * is a real wire. Signal ground is connected to protective ground. 6-DSR from modem is not connected. 4-RTS to modem is not connected.

FORCING DTR

Forcing the assertion the DTR signal to the modem is normally not recommended if full function auto answer from the operating system is desired. But DTR control and auto answer are normally not used with RT-11; and TSX-plus does not treat the DTR signal in a manner compatible with non-DEC modems. So forcing DTR becomes a necessity in most RT-11 or TSX-plus environments. The cost of forcing DTR is in reduced utility: the HANGUP and the BYE commands will not hang up the remote line.

Some people will go to great lengths to make their TSX-plus system work without forcing DTR. Greg Adams has a "fix-it" program that wakes up every minute. It resets DTR, then sets DTR, for any inactive modem dial in line. This program for the DTR compatibility problem will allow the BYE command to work as

a log off and hang up operation. Greg claims that this is what VMS does with it's modem lines.

RT-11 OPERATING SYSTEM SET UP

RT-11 Sysgen options must include 1) timer support and 2) multi-terminal support or the XL handler (XC for pro). Do not use multi-terminal support faster than 1200 baud. Multi-Terminal support is not required if the XL handler is used. FB or XM is desired because timer support is in the distributed systems, but SJ with sysgened timer support is ok.

Kermit-11 supports the XL and XC handlers, supports the multiple terminal service, and supports the use of the console line for connecting to the RT-11 system.

The best modem handler for RT-11 is the XL driver (XC on pro), available on RT-11 version 5.1 and later. This driver makes very efficient use of a DL11 or DLV11 interface. It's the same handler that is used by VTCOM. To use XL, you must have an extra DL11/DLV11 interface port in addition to the console interface.

The XL handler supports two DCL commands:

```
SET XL CSR=n,VECTOR=m
```

Where: "n" is the control status register address and "m" is the interrupt vector address.

The first default sysgen DL address is 176500 for the CSR, and 300 for the interrupt vector. Be sure to set the handler's CSR and the vector according to your hardware straps on the serial module.

The XC handler, used ONLY on the PRO/300 series, has it's CSR and vector fixed at 173300 and 210 respectively. Kermit-11, upon finding itself running on a PRO/3xx under RT-11, does an implicit SET LINE XC. The DCL command SET XC SPEED=N must be used outside of Kermit to change the XC line speed from the default of 1200 baud.

The Multiple Terminal (MT) support requires a SYSGEN. Serial lines in the MT case are designated by numbers; the console is always line zero. The next line, say a DLV11E, is line one. These line numbers are assigned during SYSGEN based upon the order of entry during SYSGEN (under RT V5.2, the questions start with question number 180). You can also use a DZ11 or DZV11. The actual assignments may be viewed on a running system with the DCL command SHOW TERMINAL (SHO TER).

If there is no way to get an additional interface into your system (perhaps you have a four slot QBUS back plane), then you

can force Kermit to use the console. This implies, of course, that it will not be possible to dial out from the RT-11 system; the system could be used only for a remote Kermit to connect to it via the console port. If Kermit finds that the XL handler is not present, and that multiple terminal service is absent, it will force the use of the console.

To force the console to be used, command:

```
Kermit-11>SET LINE TT:
```

In summary, the following commands specify serial lines for RT-11:

```
Kermit-11>SET LINE 1     use terminal line one
Kermit-11>SET LINE XL    use the XL handler
Kermit-11>SET LINE TT:   force use of the console line
```

Kermit-11 also requires the presence of timer support in the executive. This is required to support the .TWAIT directive; FB and XM systems always have support for this; SJ systems by default do not. If Kermit decides that it does not have a clock, which it would think if .TWAIT support is missing, it will try to fake .TWAIT's with cpu bound loops. The best thing is to insure that you have a FB or XM monitor available for use with Kermit.

KERMIT.INI FOR RT-11

The file KERMIT.INI must be on SY:

```
!*TITLE* - KERMIT.INI - Customize Kermit for RT-11
SET MODEM HAYES
SET CONSOLE 8
SET PROMPT K-11 LOW BALL>
SET LOGFILE K11LOG.TXT
SET PHONE TONE
SET PHONE NUMBER DECDEMO 1,800,3323366
SET PHONE NUMBER DCS 1,800,2477003
SET PHONE NUMBER DECUSE 1,617,485,2574
SET PHONE NUMBER WORK 5551212
SET LINE XL
DIAL WORK
CONNECT
```

TSX-PLUS OPERATING SYSTEM SET UP

The TSX-plus SYSGEN options that must be included are 1) 100. blocks of PLAS swap file (SEGBLK) and 2) one spare CL unit or the XL driver. The CL may be dedicated (for dial out only), or may be spare (the time share line can be used for dial in, too). The PLAS swap file is not needed if the K11RT4.SAV image is used for KERMIT.SAV.

Kermit-11 can be used on TSX-plus (a product of S&H Computing) as either a LOCAL and a REMOTE. A LOCAL Kermit (you connect out to another system using the CL handler) is similar to Kermit use on RT-11 with the XL/XC handler. A REMOTE TSX-plus Kermit (you log into a TSX-plus system and run Kermit-11 on the REMOTE) is identical to Kermit use on most multiuser systems (for example, TOPS-20 and RSTS/E).

In order to CONNECT out from TSX Kermit to another system, you need to associate the appropriate DL line with a CL or an XL. This association can be at SYSGEN time or with an ASSIGN. See the examples below:

```
     Kermit-11>SET LINE CL2
or:
     .SET CL2 LINE=4,NOLFOUT
     .ASS CL2 XL
     .KERMIT
     Kermit-11>SET LINE XL .
```

The image K11XM.SAV will use approximately 100 blocks of PLAS swap file space. If Kermit fails to load, then the TSGEN.MAC parameter SEGBLK may be too small to contain K11XM's virtual overlay; the TSX-plus system manager will need to increase SEGBLK and reboot TSX-plus. If adding 100 PLAS blocks is excessive, then the disk overlayed image K11RT4.SAV may be used for KERMIT.SAV.

In TSX-plus, I find no degradation in using K11RT4.SAV. The generalized data cache is probably of assistance on a busy system.

Note that if you have 256 Kbytes or less of memory on your TSX-plus system, then Kermit can be a system hog. If you have 256 Kbytes or less, please don't do anything else while Kermit is running (i.e. B to print screen or Wn to window). If you do, then the system will probably slow to a snail under tortoise pace.

Without the added concurrent task on a 256 Kbyte system, Kermit is good and fast. But with the low cost of memory now, please put in another 256 Kbytes or more. You will like it.

KERMIT.INI FOR TSX-PLUS

The file KERMIT.INI must be on SY:

```
     !*TITLE* - KERMIT.INI - Customize Kermit for TSX+
     SET MODEM HAYES
     SET CONSOLE 8
     SET PROMPT K-11 HIJACK>
     SET LOGFILE K11LOG.TXT
     SET PHONE TONE
```


Kermit will fetch the handler if it is not resident.

CONNECTING THE SYSTEMS

The first thing to do, before starting Kermit, is to get the modem turned on and set up. I have a separate power switch on my modem. The modem is only on when I anticipate a need. I modify some of the modem's set up parameters. This modification is not necessary and for initial check of a set up nor for many applications.

The command files that I use for the modem set up are below:

```
     !*TITLE* - LOADMM.COM - Load Modem parameters
     SET CL2 LINE=3,SPEED=1200,NOLFOUT,DTR
     COPY SY:LOADMM.000 CL2:
     COPY SY:LOADMM.010 CL2:  i 5 SET CL2 LINE=0
```

The LOADMM.000 file is Hayes attention:

```
     AT
```

The file LOADMM.010 sets some Hayes modem parameters:

```
     AT T S0=2 S6=4 S7=95 S10=13 S11=100 X1
```

Hayes parameters explained:

```
T        ! TONE DIAL:                DEFAULT IS PULSE DIAL
S0=2     ! 2 RINGS BEFORE ANSWER:    DEFAULT IS ANSWER FIRST
         RING
S6=4     ! WAIT FOR DIAL TONE 4 SECONDS: DEFAULT IS 2 SECONDS
S7=95    ! WAIT FOR REMOTE CARRIER 95 SECONDS: DEFAULT IS 30
         SEC.
S10=13   ! CARRIER LOSS TIME 1300 MS.: DEFAULT IS 700 MS.
S11=100  ! TONE DIAL SPEED 100 MS:   DEFAULT IS 70 MS.
X1       ! EXTENDED RESPONSE SET:    DEFAULT IS X0: BASIC SET
```

If we wish to dial out, then the DIAL command is issued. The "number" for the DIAL can be a predefined symbol from the SET PHONE NUMBER command, or can be an input number typed in.

When the two modems agree on a speed and protocol, then Kermit will issue the message:

```
     Connection made, type CONNECT to access remote
```

The normal next thing to do is to type CONNECT<RETURN> to start the remote system logon operation. But now is the time to enter any other command that needs to be issued, like SET SPEED 300, before the CONNECT. Also, if the remote system is a PC or an RT-11 with the console as the communication port, then the remote will already be running Kermit, so the CONNECT is

inappropriate.

When we are connecting two physically close systems without a modem, we would simply connect DL ports together with a NULL modem cable and then invoke Kermit on each system.

If the REMOTE is a single user system (i.e. RT-11 or a PC), then the single user system would most often be set up as a Kermit "server". This allows the LOCAL system to control the server and to initiate file transfer requests without the need for the operator to move between the two machines.

STARTING KERMIT

Once the physical link has been made, we would log into the remote system, then invoke Kermit on that system and run it as a server. This is done by typing SERVER on the remote Kermit. Then escape back to the LOCAL Kermit with the <CTRL>C.

RUDIMENTARY KERMIT COMMANDS

Now that we have established the physical link, how do we get files transferred? Quite simple. First we give the remote Kermit the SERVER command, then we continue as below:

```
REMOTE Kermit-11>SERVER              Request the remote
                                     Kermit to SERVE
<CTRL>C
LOCAL Kermit-11>GET [file.type]      Request a file from the
                                     remote system
LOCAL Kermit-11>SEND [file.type]     Send a file to the
                                     remote system
LOCAL Kermit-11>FINISH               Request the remote exit
                                     Kermit
LOCAL Kermit-11>CONNECT              Connect to the remote
                                     system.
.LOGOFF
<CTRL>C
LOCAL Kermit-11>EXIT                 Exit kermit
.
```

The BYE command does not work for REMOTE TSX-plus or for REMOTE RT-11.

These are the commands we need when talking to a Kermit server. There are, of course, many other commands which support file manipulation on the host, as well as obtaining REMOTE HELP. These commands are normally thought of as REMOTE commands. Indeed, they are prefixed by the REMOTE keyword, as in:

```
Kermit-11>REMOTE HELP
Kermit-11>REMOTE COPY FILE1.TYP FILE2.TYP
Kermit-11>REMOTE CWD [USERFILES]
```



```
SET PHONE NUMBER DECDEMO 1,800,3323366
SET PHONE NUMBER DCS 1,800,2477003
SET PHONE NUMBER DECUSE 1,617,485,2574
!SET LINE CL2
```

Note that the SET LINE CL2 command is commented out with the "!". This is only because Kermit is sometimes used for dial in. If the SET LINE CL2 is attempted from a dial in line, then there will be an assignment conflict. I leave the comment line in the KERMIT.INI file to remind me which line I am supposed to set when I am dialing out. If kermit is only used for dialing out, then it is ok to activate the SET LINE CL2 command in the KERMIT.INI file.

INSTALLING KERMIT ON RT-11 AND TSX-PLUS

KERMIT.SAV is required, all other files are optional.

The RX02 floppies distributed at the SCURT meeting contain the files:

```
K11XM.SAV     Copy to SY:KERMIT.SAV for RT-11 XM, PRO/RT-11 and
              TSX-plus
K11RT4.SAV    Copy to SY:KERMIT.SAV for RT-11 SJ and FB, usable
              on TSX-plus
K11HLP.HLP    Copy to SY:  or DK:  for online help file.  This is
              optional.
K11USR.DOC    Print file of the Kermit-11 user's guide
KERMIT.INI    is created on SY:.  This is optional.
```

Note that on the PRO/350 RT-11 you may have to UNLOAD XC before Kermit-11 can be started via a .FRUN command. Additionally, when running in the foreground, you will likely want to give the command:

```
.FRUN K11XM.SAV
......
^F
Kermit-11>SET QUIET
```

In the event that you are using RT-11 with multiple terminal support, you could use a command of the form:

```
 .SHO TER
 Unit  Owner       Type   Width  Tab  CRLF  FORM SCOPE SPEED
 0     S-Console    DL    132    No   Yes    No    No    N/A
 1     Remote       DL     80    Yes  Yes    No    No    N/A

 .KERMIT
 Kermit-11 T3.44 Last Edit: 04-Feb-86
 Kermit-11>SET LINE 1
```

If you are you are using the XL handler (XC for the PRO), then the XL handler must be installed; it does not have to be loaded.

Kermit-11 has the following commands available:

@	Synonym for TAKE
BYE	Log out a remote server
CONNECT	Connect to a remote system
COPY	Local copy of a file(s)
CWD	Set new working directory
DELETE	Local delete of a file(s)
DIAL	Have a connected modem dial a number
DIRECT	Local directory display
DISCONNECT	Hang up a remote line
DISPLAY	Internal debugging
ERASE	Local delete of a file(s)
EXIT	Exit to system
FINISH	Stop a remote server without logging out
GET	Get a file(s) from a remote server
HANGUP	Hang up a remote line
HOST	Execute system command locally (where applicable)
LOCAL	Force interpretation of command to the local system
LOGFILE	Create a log file
QUIT	Same as EXIT
PRINT	Print a file locally (where applicable)
RECEIVE	Receive a file(s) from a remote kermit
REDIAL	Have a connected modem redial a number several times
REMOTE	Prefix for file management commands to a server
RENAME	Local rename of filename(s)
SEND	Send a file(s) to a remote Kermit
SERVER	start a Kermit server
SET	Change Kermit parameters
SHOW	Display Kermit parameters
TAKE	Execute indirect command file
TRANSFER	Send an ASCII file without Kermit protocol
TYPE	Local display of file on terminal
WHO	Local display of logged in users (RSTS/E only)

Commands for File Transfer
SEND, TRANSFER, Abort control characters
RECEIVE, GET

Server operation
SERVER, BYE, FINISH
REMOTE
REMOTE COPY, REMOTE CWD, REMOTE DELETE
REMOTE DIRECTORY, REMOTE HELP, REMOTE HOST
REMOTE LOGIN, REMOTE RENAME, REMOTE SPACE
REMOTE TYPE, REMOTE WHO

Commands for Local File Management

The Connect Command
CONNECT

The Set Command
SET ATTRIBUTES, SET BAUD, SET BINARY-TYPE,
SET BLOCK-CHECK, SET CONSOLE, SET DEBUG
SET DELAY, SET DEFAULT
SET DIAL, SET MODEM USERDEFINED
SET DTR, SET DUPLEX
SET END-OF-LINE, SET ESCAPE, SET FILE
SET HOME, SET IBM-MODE, SET LINE
SET LOGFILE, SET MODEM, SET PACKET-LENGTH
SET PARITY, SET PAUSE, SET PHONE, SET POS
SET PROMPT, SET RECEIVE
SET RECORD-FORMAT, SET RETRY
SET RSX, SET RT-11
SET SEND, SET SPEED
SET TIMEOUT, SET TERMINAL, SET UPDATE

The Dial Command
DIAL
REDIAL

Before continuing, please note that Kermit programs do not necessarily implement the same level of support. In general, the large system Kermits, such as Kermit-32 (VMS), Kermit-20 (Tops-20) and Kermit-11 (PDP-11 and PRO) support a large command set. No single command is really required by Kermit; the protocol specifies the transportation of files, not the command interface. At a minimum, however, a Kermit program requires the SEND and RECEIVE commands to effect file transfer. SERVER support is optional. If we don't have server support available then we must use the SEND and RECEIVE commands and tell each Kermit such for every time we want to move a file.

****

Editor's note:
Part 2 of this article will appear next month.
It will include descriptions of the KERMIT
Protocol and how KERMIT transfers files.

The FORTRAN Slate

Bob Walraven
Multiware, Inc.

Last time I said I would say more about running FORTRAN-77 programs as RT-11 system jobs, but an interesting F77 SPR came in that I wanted to tell you about, so we'll continue the discussion about system jobs next time.

The SPR reported a problem accessing virtual arrays both from a program's mainline code and from a completion routine: after the completion routine is called and control is returned to the mainline code, the pointers to the virtual arrays may be incorrect. The FORTRAN-77 documentation doesn't explicitly say you can't access virtual arrays from both the mainline and a completion routine, but a little thought will tell you that it can lead to problems.

The FORTRAN-77 (and FORTRAN-IV) virtual array support is based on the assumption that a single thread of code will be accessing the extended memory area where the virtual arrays are stored. For example, you would not expect virtual array support to work correctly if both a foreground and a background program were independently reading the same area of extended memory because each program would change the the mapping into the extended memory without informing the other program.

Although RT-11 completion routines are built into a program so that they can pass data back and forth with the mainline code, they are run almost as if they were an independent program. That is, when RT-11 decides to run a completion routine, it interrupts the mainline code at wherever it happens to be and saves the register context before calling the completion routine. On return from the completion routine, the register context for the mainline code is restored and the mainline is started up where it left off.

I was talking to one of the RT-11 engineers recently and mentioned this SPR. He said that they had talked about the possibility a while back of changing RT-11 so that when a completion routine is run the mapping register contents are also saved, but they have not made that change so far. The important point is that RT-11 DOES NOT SAVE THE MAPPING REGISTER CONTEXT WHEN A COMPLETION ROUTINE IS CALLED. The implication of this is

that unless the user explicitly saves and restores the mapping register context on completion routine entry and exit, virtual array mapping may be corrupted on return to the mainline code. The mainline code can also change the mapping the completion routine thought was in effect, so on the second call to the completion routine its virtual array mapping may also be corrupted.

The bad news is that you can't blithly reference virtual arrays in the mainline code and a completion routine, but the good news is that there is very little you have to add to the completion routine to make it work. The following MACRO module describes how to modify your completion routine and supplies two FORTRAN-callable routines you need to use. The MACRO module is followed by a sample FORTRAN-77 program to demonstrate the use of virtual arrays in the mainline and a completion routine.

```
   .title  VIRMAP

;-----------------------------------------------------------------------
; This module contains two FORTRAN-77-callable subroutines that make it
; possible to reference a virtual array element in an RT-11 completion
; routine.
;
; DISCUSSION:
;
;  For a FORTRAN-77 program that has virtual arrays, PAR7 is used as
;  a window into the extended memory address space where the virtual
;  arrays reside.  Whenever a FORTRAN-77 virtual array element is
;  referenced in a program, the F77OTS virtual array support routines
;  check to see if the element is in the window that is currently
;  mapped into PAR7.  If it is not in the window, PAR7 is remapped
;  to a window that contains the element.
;
;  RT-11 FORTRAN completion routines can be scheduled from several
;  SYSLIB programmed requests.  Completion routines can interrupt
;  the mainline code at any point.  RT-11 calls FORTRAN completion
;  routines as co-routines so that all registers can be saved before
;  the completion routine is called and the registers automatically
;  restored when the completion routine returns.  This is done to
;  preserve the register context of the mainline code and to allow
;  any FORTRAN subroutine to be used as a completion routine.
;
;  If a FORTRAN-77 virtual array element is referenced in an RT-11
;  completion routine and remapping is performed, then the mapping that
;  was in effect when the completion routine was entered is no longer
;  valid.  If the original mapping is not restored when the completion
```

```
;  routine finishes, then subsequent virtual array references in the
;  mainline code may corrupt data in the virtual array that the
;  completion routine last referenced.  This problem can be corrected
;  by saving the FORTRAN virtual array mapping context at the start
;  of the completion routine and restoring it when the completion
;  routine is done.  The two FORTRAN-77-callable subroutines GETMAP
;  and PUTMAP in this module provide this capability.
;
;  Likewise, if the virtual array mapping is changed in the mainline
;  code between calls to the completion routine, the completion
;  routine doesn't know this has occured, so it may corrupt whatever
;  virtual array data the mainline was accessing at the time the
;  completion routine was run.  This problem can be corrected by
;  forcing the completion routine to ALWAYS remap on entry.
;
;  Note that these problems are not caused by a bug in FORTRAN-77, but
;  result because of the way an RT-11 completion routine can
;  asynchronously interrupt the mainline code.  FORTRAN-77 has no
;  way of knowing that a particular subroutine is going to be used
;  as a completion routine, so it can't take any corrective action.
;
;  The virtual array mapping data consists of a 7-word Window
;  Definition Block (WDB) plus the current low and high window
;  addresses.  This data is contained in the OTS impure area.  The
;  routine GETMAP saves the mapping data in a user-supplied array,
;  and the routine PUTMAP restores the mapping data and remaps PAR7
;  to the original window as indicated by the WDB.
;
; USAGE:
;
;  The following FORTRAN-77 completion routine demonstrates how
;  GETMAP and PUTMAP are to be used:
;
;          subroutine INIT ( VARRAY )
;
;  C-----  This subroutine must be called once in the mainline code
;  C-----  so that virtual array address information for VARRAY can
;  C-----  be picked up for the completion routine entry point COMPLT.
;  C-----  The mainline code must declare VARRAY to be a virtual
;  C-----  array.
;
;          virtual   VARRAY(0:100) ! A virtual array defined in the
;                                  ! mainline code that is to be
;                                  ! referenced by completion routine
;          virtual   IDUMMY(1)     ! A dummy virtual array to force
;                                  ! correct completion routine mapping
;          integer*2 mapdat(9)     ! Mainline mapping data stored here
;          return
```



```
;
;  C-----  This entry point is the actual completion routine:
;
;          entry   COMPLT(id)
;
;  C-----  Save the mainline virtual array mapping information
;
;          call GET MAP ( mapdat )
;
;  C-----  Reference the dummy virtual array to force the code below
;  C-----  to remap on the first reference to the virtual array VARRAY.
;  C-----  This must be done because this routine does not know that
;  C-----  the mainline code may change virtual array mapping between
;  C-----  calls to this routine.
;
;          i = IDUMMY(1)
;            :
;            :
;          (Reference the virtual array VARRAY here as needed)
;            :
;            :
;  C-----  Restore the mainline virtual array mapping information
;
;          call PUT MAP ( mapdat )
;
;          end
;
;-------------------------------------------------------------------------

   .mcall  .WDBDF  .MAP    .PRINT  .EXIT
   .WDBDF

; Offsets to OTS impure area current low and high window addresses

   w.wnlo = 260
   w.wnhi = 262

; Error Message

   .psect  MAP$D,d
MSG:       .asciz  /?PUTMAP-F-window mapping error/
   .even
```

```
; The FORTRAN-77-callable routines:

   .psect  MAP$I,i

GETMAP::
   mov     2(r5),r2              ; r2 -> mapdat
   mov     #wndow$,r1            ; r1 -> OTS impure area WDB
   mov     #7,r0                 ; r0 = length of a WDB
10$:       mov     (r1)+,(r2)+           ; Move WDB to mapdat
   sob     r0,10$

20$:       mov     #$OTSVA,r3            ; r3 -> start of OTS impure area
   mov     w.wnlo(r3),(r2)+      ; Save low  window address in mapdat
   mov     w.wnhi(r3),(r2)+      ; Save high window address in mapdat

   return

PUTMAP::
   mov     2(r5),r2              ; r2 -> mapdat
   mov     #wndow$,r1            ; r1 -> OTS impure area WDB
   mov     #7,r0                 ; r0 = length of a WDB
20$:       mov     (r2)+,(r1)+           ; Move mapdat to WDB
   sob     r0,20$

   .MAP    #WNMAP$,#WNDOW$       ; Remap to the original window
   bcc     30$                   ; Branch if no error
   .PRINT  #MSG                  ; Otherwise throw up on user's
   return                        ; console

30$:       mov     #$OTSVA,r3            ; r3 -> start of OTS impure area
   mov     (r2)+,w.wnlo(r3)      ; Restore low  window address
   mov     (r2)+,w.wnhi(r3)      ; Restore high window address
   return

   .end
```



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

   program SPR081

!.........................................................................
! This program demonstrates by example how to access virtual arrays from a
! completion routine.  It uses the FORTRAN-77-callable MACRO routines GETMAP
! and PUTMAP in the module VIRMAP.MAC to save and restore the mainline code
! mapping.
!
! Build the program as follows:
!  .fortran spr081
!  .macro virmap
!  .link spr081,virmap,sy:virtxm/xm
!.........................................................................

   virtual fill(30000)     ! array continuously filled in mainline
   virtual iget(0:4095)    ! array sampled by completion routine

   type *, 'SPR081 demonstration:'
   type *, ' '
   type *, 'This program uses the RT-11 request ITIMER to schedule a'
   type *, 'completion routine that types out the first 20 elements'
   type *, 'of a virtual array.  The completion reschedules itself'
   type *, 'to run at one second intervals.  The data displayed by'
   type *, 'the completion routine should be the numbers 0 through 19,'
   type *, 'consecutive.  If any other data is printed, the virtual'
   type *, 'array referenced by the completion routine was corrupted'
   type *, 'by the mainline program.  When the completion routine is'
   type *, 'not running, the mainline fills a different virtual array'
   type *, 'and verifies it has not been corrupted by the completion'
   type *, 'routine.  If it has, the program will stop with error.'
   type *, ' '
   type *, 'If this program is running correctly, it will run'
   type *, 'continuously until you type a double ctrl-C.'
   type *, ' '
   type *, 'Press RETURN to start demonstration:'
   accept '(A1)' , i

! ITIMER requires one extra queue element

   i = IQSET (1)
```

```
! Initialize the array to be sampled by completion routine

   do 10 i=0,4095
      iget(i) = i
10 continue

! Pass virtual array address information to the completion routine

   call INIT (iget)

! Start the timer

   call TIMER1

! Loop here filling and verifying the local virtual array forever

20 continue

   do 30 i=1,10000
      fill(i) = i
30 continue

   do 40 i=1,10000
      if ( fill(i) .ne. float(i) ) then
         type *, '?SPRXXX-F-fill error at i = ',i
         stop 'Use of virtual arrays in completion routine incorrect'
      end if
40 continue

   go to 20

   end

!-------------------------------------------------------------------------

   subroutine TIMER1

!  TIMER1 schedules completion routine PLAYBK to be run after 1 second.

   integer*2  area(4)
   external   PLAYBK
   call ITIMER ( 0 , 0 , 1 , 0 , area , 1 , PLAYBK )
   end
```



```
!-------------------------------------------------------------------------

   subroutine INIT ( IGET )

!  INIT must be called once in the mainline code so that virtual array
!  address information for IGET can be picked up for the completion
!  routine entry point PLAYBK.  The mainline code must declare IGET
!  to be a virtual array

   virtual   IGET(0:4095)  ! Array to be sampled by completion routine
   virtual   IDUMMY(1)     ! A dummy virtual array used to force the
                           ! completion routine to map correctly
   integer*2 mapdat(9)     ! Mainline mapping data stored here
   return

!.........................................................................
! This is the entry point for the timer completion request:

   entry   PLAYBK(id)

! Schedule another timeout interval

   call TIMER1

! Save the mainline virtual array mapping information

   call GET MAP ( mapdat )

! Reference the dummy virtual array to force the code below to remap on
! the first reference to the virtual array IGET.  This must be done
! because this routine does not know that the mainline maps away the
! virtual array IGET between calls.

   i = IDUMMY(1)

! Print the first 20 elements of the virtual array IGET to verify that
! they are correct.

   write (5,'(1x,10I7/1x,10I7/)') (IGET(j),j=0,19)

! Restore the mainline virtual array mapping information

   call PUT MAP ( mapdat )

   end

*************************************************************************
```

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
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KERMIT LaTex JUICER SPELL PORTACALC DPRINT DUNGEON MINC BUDGET BUG CALC C Langua
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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-10 AMAR-20 RDIR/SQMAP PC-8088 Collection #11 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
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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
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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 JP5-JP6 Payable/Receivable McGraw-Hill Payroll SEDT: EDT/WPS Screen CLNDRS:
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10 IMAGE LIBED FSTATS MS/DOS TIC-TAC-TOE QIX VAX-LIB-5 DATMAN/VAX SPICE2 RT-11 DUCM/DYC G

DECUS PROGRAM LIBRARY

Corrections to programs that have been announced through this report.

DECUS No. VAX-288, Title: REPORT WRITER, add "Submitted by: W29-50, Los Angeles ,CA".

NEW LIBRARY PROGRAMS AVAILABLE FOR THE VAX/VMS FAMILY OF COMPUTERS

DECUS No: V-SP-74 **Title:** Symposium Collection from the OA SIG, Fall 1987, Anaheim **Version:** March 1988

Author: Various

Operating System: VAX/VMS **Source Language:** ALL-IN-1 **Keywords:** ALL-IN-1, Symposia Tapes - VMS

Abstract: This submission contains the programs submitted to the OA SIG at the Fall 1987, DECUS U.S. Symposium in Anaheim, California. It includes the following subdirectories and topics located in directory [.OA88A]. (For more specific and detailed information, please refer to the AAAREADME.TXT in each directory/subdirectory). The following is a brief summary of the contents of the office automation collection.

I.

[.BRUNER]

[.ANSWER_FILE_OR_DELETE]	An ALL-IN-1 script to enable the user to dispose of the originalmail message as part of the Answer procedure.
[.A_ONE_HELPS]	Contains articles "3 HELPS" and "YOURS, MINE, & OURS "and related forms, scripts, and command procedures.
[.INTERFACE]	An ALL-IN-1 application for controlling access to ALL-IN-1functions, DCL commands, and external applications.
[MULTIPLE_ATTACH]	An ALL-IN-1 function to allow the contents of a selection list to be attached automatically to the current mail message (replaces previous MAIL FOLDER function).
[.NEXT_OR_PREVIOUS]	Two ALL-IN-1 functions for locating the next or the previous document in numeric sequence from the current document.
[.QUEUE_MANAGEMENT]	Four ALL-IN-1 functions which allow the users to specify a form name for printing, reset the queue, show queue ,and delete a job from the queue.
[.SYS_DICT]	An ALL-IN-1 facility for creating and using site-specific System Dictionaries.
[.SYS_UDP]	An ALL-IN-1 facility for accessing User or System UDP's.

II.

[.COY]	
[COLORS]	A package for managing and setting "default" colors for VT241and VT340 terminals.
[.DM$SD]	An extensive revision of the Hayre/Gregory Directory Management package. A revision of Alan L. Zirkle's SET DEFAULT program.
[.MAKE_TLB]	Procedures for making a DXC Compressed Text Library from all "text" files in a directory.
[MCL]	Two programs for producing multi-column listings.
[SHOWME]	Program which provides users with node, terminal, and process information.
[.VAXNOTES]	Some useful things for systems running VAXNOTES.
[WPE]	A "complete" and extended implementation of WPS-PLUS for editing ASCII files, including some language sensitive features for .COM files.
[WPELSE]	An implementation of WPS-PLUS for LSE.

III

[.GILBERT]	
[.EMP]	A hierachical Employee Data phone directory and database, which replaces "ALL" and "COR" phone directories under ALL-IN-1.
[.LN03]	A modification to the LN03.PRA file which enables printing 66 lines per inch in portrait orientation, fixes total line count error when using eight lines per inch, and will count lines correctly when using "GOLD PAGE" (if down-line load fonts are available).
[.SWP]	A Shared Word Processing System under ALL-IN-1.

IV.

[.IOELE]	
[.A1CALCHK]	An ALL-IN-1 function to allow a user to determine for a given day when one or more users have activities on their own calendars.

V.

[.LEDERMAN]	
[.ACCOUNTING]	Programs to convert System Accounting and PSI Accounting data to a normalized form readable by DATATRIEVE and other languages with record definitions.
[.ALL-IN-1]	Contains DTR definitions to work ALL-IN-1 logging and data files: document database also works with WPS-PLUS/VMS.
[.CORPHONE]	DTR replacement for ALL-IN-1 corporate phone directory.
[.FUNCTIONS]	User defined functions: DTR procedures for cataloging, defining, and generating functions.
[.NEWSLETTERS]	Past issues of the "Wombat Examiner" newsletter.
[.PLOTS]	Additional PLOTS and articles on adding your own plots.
[.RECALL]	Uses SMG to provide command line recall in DTR; plus DAB definitions in "C", MACRO-32.
[.RSX_ACCOUNTING]	Process RSX-11M-PLUS system accounting and RSX console logs with DTR.
[.SESSIONS]	Transcriptions of some Symposia sessions.
[.SIXEL]	A program to convert ReGIS to SIXEL.
[.SYSMGR]	DTR definitions for Disk Quotas, SYSUAF, etc.; procedures to record user login history and terminal/line usage.

VI.

[.ROTH]	
[.LG02]	Allows use of available fonts resident in LG02 line printer with ALL-IN-1.
[.PENDING]	Shows ALL-IN-1 PENDING file by user-specified number of pending messages.
[.RMN]	An ALL-IN-1 Multiple Read for mail which allows users to read new mail sequentially and answer, print, or delete it as they read.
[.TMPRINT]	Allows ALL-IN-1 user to specify a window of time (rather than the 24 hour default window) for printing week's schedule and calendars.
[.TODO]	Sorts "to do" list in ALL-IN-1 by priority and number; results may be displayed or printed.

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

DECUS No: VAX-323 **Title:** Systems Services **Version:** March 1988

Submitted by: David N. Mitchell, Information Systems & Networks, Inc., Durham, NC

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

Abstract: This package contains the following programs:

CRELNM.C	The program utilizes system services to create a logical name and place it in one of the processes logical name tables. The program should be passed the name of the logical name table where the logicalwill be placed, the logical name to be set and the equivalence which the logical will be equated. T which are included in the progra cessary:

- "descrip.h" which holds the stru the necessary descriptors.
- "lnmdef.h" which holds definitio logical name flags.
- "psldef.h" which contains the ac definition to be used.

The descriptors for the logical name the logical name are set up along single item list in which to return th lence string. A final zeroed out item up and then the system service to tra logical is called followed by an error to be printed if the call should fail.

SNDJBCW.C and GETSJC DEF.FOR	The program utilizes system servic mit command procedures to batch The program has four parameter into it:

- The name of the procedure to be su
- The name of the queue to which submitted.
- A string containing up to eight ar to be passed to the submitted pr These eight parameters must be s by commas and the string mus minated with a comma. All string to this routine must be null termir use with C functions. This progr written to be called by PL/1 and but should work with most any lan long as the aforementioned requi are followed. This program calls TRAN routine which includes the r definitions for the send to job c system service and the translat name system service. The reaso necessary is because this definiti not available in the C language. The sets up the necessary item list st and enters the proper informatio includes:

- The queue name logical.
- The procedure file specification lo DCL procedure to be submitted).
- The log file specification.
- No log delete to prevent the log being erased.
- No log spool to prevent the log being printed.
- Job name to set the process nam submitted job.
- Eight parameters.

These routines can easily be modif clude or exclude qualifiers required ticular application.

TRNLNM.C	The program utilizes system servic slate logical names. The program

the address of the character array containing the logical name to be translated .This array must be declared in the calling program to be 256characters. This is the maximum possible length of an equivalence string. If the array is smaller, there is a possibility of over-writing other variables in memory. Two include files are necessary :

- "descrip.h" which holds the structures of the necessary descriptors.
- "lnmdef.h" which holds definitions for the logical name flags.

The descriptors for the logical name table and the logical name are set up along with the single item list in which to return the equivalence string .A final zeroed out item list is set up and then the system service to translate the logical is called followed by an error message to be printed if the call should fail.

Notes: A FORTRAN routine had to be called in order to get the

"Send To Job Controller" MACRO difinitions. Digital Equipment Corporation has not converted these definition files to the C Language.

Documentation not available.

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

DECUS No: VAX-324 **Title:** TPU Hebrew Functionality **Version:** 1, January 1988

Submitted by: Digital Equipment Corporation

Operating System: MicroVMS V4.6, VAX/VMS V4.6 **Software Required:** TPU English versionHardware Required: Printer and terminals to support Hebrew option. **Keywords:** Editors

Abstract: VAX users who find themselves with a need to be able to easily create/edit text files in Hebrew yet do not require sophisticated word processing capabilities will find H_EDIT a reliable solution.

H_EDIT is a TPU based editor which enables the user to create/edit Hebrew text files. It allows for the typing of text from either right_to_left or left_to_right. Direction switching is accomplished by simple keystrokes.

H_EDIT utilizes the EDT style Keypad Emulator and functionality.

Notes: Terminals must contain Hebrew firmware for this program to perform properly.

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

DECUS No: VAX-325 **Title:** RDB Report Writer **Version:** 1, March 1988

Submitted by: David Cohen, Security Pacific Automation Co, W29-50, Los Angeles, CA

Operating System: VAX/VMS V4.5 **Source Language:** DCL, VAX COBOL **Software Required:** COBOL **Keywords:** Tools - Applications Development **Abstract:** This package can generate a COBOL subprogram (with a linkage section) which can be called from an RCO program. The subprogram will handle all the report logic, including control breaks, totals, formatting, and creating the actual print file. Accepts as input four user supplied files which define the report and the data file record. Validates input files. Handles up to eight levels of control breaks, with totals available for each level. Options include:

- At Top of Control Group.
- At Bottom of Control Group.
- At Top of Page.
- At Bottom of Report.
- New Page.

These terms have the same meaning as in DATATRIEVE. Grand totals are available. Grand totals and "At Bottom of Report" are in addition to the eight allowable control breaks. Report column positions are computed automatically, from Layout Chart created by the user, in any editor. Output program can be edited and modified, if desired.

The generated subprogram is designed to be called from an RCO program, once for every database record in the stream.

Notes: Operating system VMS 4.0 and later is required. Filenames are greater than nine letters.

Media (Service Charge Code): User's Manual (EA), 600' Magnetic Tape (MA)Format: VMS/BACKUP

DECUS No: VAX-326 **Title:** Protect **Version:** 1.00, February 1988

Submitted by: Andre Baskin, SYSCON Corp, Williamsburg, VA

Operating System: VAX/VMS V4.5 **Source Language:** C, MACRO-32 **Keywords:** Security

Abstract: Protect is a system to protect VMS executables from attack by computer viruses by detecting any tampering with the executable done by the virus. A virus is a program which has the ability to infect other programs by inserting a new section of code into another program. This new code will cause some harm to the system (i.e., corrupt data, delete files, etc.). In addition, the code inserted by the virus will infect other programs, thus spreading itself throughout the system. Protect is able to provide protection from computer viruses by signaling when the executable code of a program has been tampered with in any way. This is done by using the Protect program to place a stamp on the executable. This stamp will be used to check for any changes to the file and will in no way affect the program at run time. Once the program has been stamped by Protect, there are two ways in which tampering can be detected. The first method is to include a call to the function check_program either in the initialization function used by LIB$INITIALIZE or in the first line of executable code. This function will return either "1" which means the program has not been tampered with, or "0" which means the program has been tampered with. In the case of a program for which the source code is unavailable, once it has been stamped by Protect, the program Check can be run and will set the symbol $STATUS to either "1" if the executable has not been tampered with, or to "0" if the executable has been tampered with.

Documentation may or may not be on magnetic media. Sources not included.

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

DECUS No: VAX-327 **Title:** VCU VAX/VMS Calendar Utility **Version:** 3.7, March 1988

Submitted by: Michael C. Johnson, Spuds Software, Brookline, MA

Operating System: MicroVMS V4.5, VAX/VMS V4.6 **Source Language:** VAX BASIC **Memory Required:** 350K **Hardware Required:** VT100, VT220 Terminals **Keywords:** Calendars

Abstract: VCU is an interactive perpetual calendar for the VAX/VMS operating system. It provides you with a simple way to store and retrieve messages for any day.

Features include:

- A complete pull-down menu system with command keys.
- A display consisting of the time, date, previous month, current month, next month, day of the year, days left in the year, yearly messages, weekly message, and daily messages.
- A search function.
- Output capability.
- On screen message editing.
- Qualifiers and parameters to provide complete access from 1DCL.
- Toggling of the yearly, weekly, and daily message displays.
- A full year display.
- On-line help.

Notes: Operating system VMS V4.0 or later is required, because the program utilizes system routines, screen management routines, and utility routines.

Sources not included.

Media (Service Charge Code): User's Manual (EA), 600' Magnetic Tape (MA) **Format:** VMS/BACKUP

DECUS No: VAX-328 **Title:** SCOPY **Version:** 1.0, March 1988

Submitted by: John T. Carroll III, Columbus, IN

Operating System: MicroVMS V4.6 **Source Language:** VAX FORTRAN **Hardware Required:** VT200 or VT300 Terminal **Keywords:** FORTRAN, Graphics, ReGIS

Abstract: SCOPY is a FORTRAN subroutine that transfers images displayed on Digital Equipment Corporation's VT200 and VT300 series graphics terminals to a plot file. The transfer is accomplished by initiating a remote screen copy and redirecting the screen image from the printer port to the host. The resulting plot file can be printed on any one of Digital Equipment Corporation's graphics printers or rapidly redisplayed at the terminal.

Media (Service Charge Code): One RX50 Diskette (JA) **Format:** VAX/ANSI, 600' Magnetic Tape (MA) **Format:** VAX/ANSI

NEW LIBRARY PROGRAMS AVAILABLE FOR THE PROFESSIONAL-300 SERIES OF COMPUTERS

DECUS No: PRO-173 **Title:** SIXELPRINT **Version:** 2.22, July 1987

Submitted by: Digital Equipment Corporation

Operating System: P/OS V3.1 **Source Language:** PASCAL **Memory Required:** 512KB **Hardware Required:** LA50, LA75, LA100, LA210 OR LN03 printer **Keywords:** Graphics, Text Formatting

Abstract: SIXELPRINT and FONTEDIT are two applications which make up a publishing package for flyers, slides, front pages or even small documentations.

SIXELPRINT formats text for output to any printer capable of handling sixel data. The input text is supplied by a file which you may create using your favorite editor. SIXELPRINT uses fonts supplied with the application or generated by FONTEDIT, and creates a sixel file (SPRINT.SIX) containing the sequences which draw those characters on the printer. SIXELPRINT also knows how to do text justification, center, indent, underline and other document formatting operations.

FONTEDIT is a special-purpose editor, used to create and edit font files which will be used by SIXELPRINT. It allows the user to work with the way characters look and takes care of the encoding of the font in the language that printers understand, transparently to the user.

The package includes seventeen ASCII fonts, three multinational fonts, two numeric only fonts, two fancy fonts, a Digital Equipment Corporation Logo font and a chess font. The fonts come in sizes of 12, 18, and 24 points (72 points = 1 inch).

Notes: Operating system P/OS V3.0 or later is required.

Media (Service Charge Code): User's Manual (EA), Two RX50 Diskettes (JB) **Format:** FILES-11

NEW LIBRARY PROGRAMS AVAILABLE FOR THE PDP-11 COMPUTER FAMILY

DECUS No: 11-902 **Title:** Routine Backup Facilitator **Version:** 1.0, March 1988

Submitted by: Richard Desper, Army Materials Technology Lab., Watertown, MA

Operating System: RT-11 V5.0 **Source Language:** IND **Memory Required:** 56K **Software Required:** IND.SAV **Keywords:** Utilities -Disk - RT-11

Abstract: This pair of IND files, FULLBAK.COM and PARBAK.COM, smoothly leads you through RT-11 to perform disk backups. The two files perform the following tasks:

FULLBAK.COM	Writes full backups from a large disk (default: DL0) to a magnetic tape unit (default: MT0), supporting possible multi-volume output.
PARBAK.COM	Writes partial backups of the same large disk to a smaller removeable media disk (default: DY0), consisting of all files since the date of the last full backup.

Directory listings and dates of the most recent full and partial backups are maintained on DY0 along with the most recent partial backup. Devices definitions may be changed readily by editing the .COM files. More extensive comments are available in the file COMENT.LST.

A separate removeable output disk (e.g., DY0) should be supported for each device (e.g., DL0) to be backed up to receive data specific to that device. FULLBAK.COM AND PARBAK.COM may optionally reside on this disk as well.

The partial backup will fail when the size of the partial backup exceeds a limit (about 900 blocks for DY0) on partial output device .The partial backup will not copy undated files, nor will it copy recent files within a logical disk file on DL0 where the logical disk file itself bears an earlier date. Also, the partial backup procedure temporarily defines logical disk LD3, causing potential conflict with user definition of LD3. COMENT.LST offers remedies for all of these restrictions.

Notes: Operating system RT-11 V5.0 or higher is required. Defines, uses logical disk LD3.

Restrictions: Partial backups limited to size of partial backup volume. Undated files not copied in partial backup.

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

NEW ULTRIX PROGRAMS

DECUS No: UX-111 **Title:** PLAtools **Version:** November 1987

Submitted by: University of California at Berkeley, through Digital Equipment Corporation

Operating System: ULTRIX/UNIX **Source Language:** C, RATFOR **Memory Required:** 1.5MB **Software Required:** VAX C Compiler, RATFOR Compiler **Keywords:** Utilities - ULTRIX

Abstract: The Berkeley PLA Tools are a set of tools designed for performing logical and topological optimization as well as test pattern generation of programmable logic arrays (PLAs). The tools form a system encompassing the design of PLAs from the specification of algebraic equations, through logic minimization and folding, to final physical layout and test pattern generation. These tools also support the optimization of finite-state machines (FSMs) when the machine is implemented as a programmable logic array.

Notes: Operating system UNIX V4.1, V4.2, or V4.3BSD is required. This program was developed by the Computer-Aided Design Group, Department of Electrical Engineering and Computer Sciences, University of California-Berkeley.

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

Media (Service Charge Code): User's Manual (EE), 600' Magnetic Tape (MA) **Format:** TAR

DECUS No: UX-112 **Title:** SPLICE3 **Version:** 3.0, March 1988

Submitted by: University of California at Berkeley, through Digital Equipment Corp.

Operating System: ULTRIX/UNIX **Source Language:** C **Memory Required:** 1.5MB **Software Required:** VAX C Compiler **Keywords:** Circuit Simulation

Abstract: SPLICE3 is a circuit simulation program for large-scale integrated circuits. It performs electrical simulation using event-driven selective-trace techniques. This analysis is done using the Iterated Timing Analysis (ITA) algorithm, which performs an accurate electrical waveform analysis up to fifty times faster than SPICE2.

Release notes are distributed with each order.

Notes: Operating system UNIX V4.2 or V4.3BSD is required. This program was developed by the Computer-Aided Design Group, Department of Electrical Engineering and Computer Sciences, University of California-Berkeley.

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

Media (Service Charge Code): User's Manual (EE), 600' Magnetic Tape (MA)Format: TAR

REVISIONS TO LIBRARY PROGRAMS

DECUS No: 11-SP-47 **Title:** AnalytiCalc (PortaCalc): A 3D Spreadsheet/Database System **Version:** V22.3B, March 1988

Author: Glenn C. Everhart, Ph.D.

Operating System: AMIGA DOS, IAS, MS/DOS, MicroVMS, RSX-11M, RSX-11M-PLUS, VAX/VMS **Source Language:** FORTRAN 77, MACRO-11, MACRO-32 **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 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.

A data management system interface is built in, permitting spreadsheets to access a potentially unlimited number of files and records or parts of records in those files for user defined functions, numbers, formulas, text, or whatnot. In fact, it has many of the attributes of a language. 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.

This package runs on PDP-11, or on VAX in NATIVE MODE. Versions have been built for RSX-11M, RSX-11M-PLUS, VMS, and RSTS, though supplied build files are for the RSX and VMS versions only. Speed of the VAX versions is higher than many of the expensive commercial VAX versions. An AMIGA and a MS/DOS version of AnalytiCalc are presented here also.

Several new trig functions and some bulletproofing corrections have been added to this version, plus some new code speedups.

The ability to call UNMODIFIED FORTRAN callable subroutines (plus a few hundred example routines) has been added, and performance for really huge VAX sheets has been improved via better hashing methods. It is now trivial to add almost any desired functionality to AnalytiCalc.

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: VAX/VMS users see DECUS No. V-SP-24.

Changes and Improvements: Faster VAX, Amiga versions. VAX version can now call any unmodified FORTRAN callable subroutines.

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

DECUS No: V-SP-24 **Title:** AnalytiCalc (PortaCalc): A 3D Spreadsheet/Database System in VMS/BACKUP **Version:** V22.3B, March 1988

Author: Glenn C. Everhart, Ph.D.

Operating System: AMIGA DOS, IAS, MS/DOS, RSX-11M, RSX-11M-PLUS, VAX/VMS **Source Language:** FORTRAN 77, MACRO-11, MACRO-32 **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.

A data management system interface is built in, permitting spreadsheets to access a potentially unlimited number of files and recordsor 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.

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Release Notes are distributed with each order.

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

Changes and Improvements: Faster VAX, AMIGA versions. VAX version can now call any unmodified FORTRAN callable subroutines.

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

DECUS No: VAX-183 **Title:** JUICER **Version:** March 1988

Submitted by: Michael N. LeVine, Naval Weapons Center, China Lake, CA

Operating System: VAX/VMS V4.X **Source Language:** MACRO-32 **Software Required:** RUNOFF **Keywords:** Utilities - Disk - VMS

Abstract: The JUICER package of programs and command files is provided to the system manager to allow him to monitor VAX/VMS ODS-2 disks for disk and file fragmentation, disk usage and to do such compression as might be needed. The package is made up of eight parts:

- JUICER_1 to do stand alone disk compression.
- JUICER_2 to do online disk and file defragmentation while disk is in use by other users.
- FRAG to monitor disk fragmentation.
- FILE to monitor and optionally compress fragmented files.
- DIR to make a map of disk directory structure and its file/block usage.
- DISK to show by user and account the number of disk blocks in use, authorized and overdraft.
- DISKMON to run as a detached process to provide a constant monitor of all disk(s) free space.
- BAD to scan a selected disk for bad blocks and on user authorization, try to repair them.

JUICER_1 is an inplace disk compression utility for VAX/VMS ODS-2 disks suffering from excessive fragmentation. This program, within limitations, attempts to move portions of files from the high end of the disk to any unused areas (fragments) at the low end, freeing up larger contiguous free areas at the high end.

JUICER_2 is an on-line in-place disk and file compression utility for VAX/VMS ODS-2 disks suffering from excessive fragmentation. This program runs on-line while other users are also using the disk. It defragments the most defragmented files it can find that will fit in the largest contiguous free areas on disk, and moves other files as far down toward the low end of the disk as it can, filling up free fragments at the low end and freeing up more space at the high end.

FRAG is run on a disk to see how badly the target disk free space is fragmented, giving a histogram of fragmented areas by size, a calculated measure of the disk free space fragmentation and, if wanted, a map of free fragments by starting LBN vs size.

FILE scans all the file headers on the target disk and outputs two list files, one containing a list of the 100 files having the most retrieval pointers in use, and the second being a matrix of file size versus number of pointersin use. The command file CONTIG is used which reads one of the list files produced by FILE and running interactively with the user, converts the listed files from fragmented to contiguous.

DIR scans a target disk and creates an output file DIRECTORY.MAP containing a graphical output showing the on disk directory structure, with a notation for each directory showing the number of files and blocks contained therein.

DISK.COM sets up data for the program DISK.EXE which produces a list by user and account (for each disk specified) of disk blocks in use, authorized and permitted overdrafts.

DISKMON is a program that I found on a VAX SIG tape submitted by Eric Richards of Gould Ocean Systems, 18901 Euclid Ave, Cleveland, Ohio 44117. It is a detached process which constantly monitors all disks on the system and warns when free space falls below preset values.

BAD scans a selected disk for bad blocks. When a bad block is found, the user is asked if BAD should attempt to rewritethe block, assuming a soft error. If the rewrite is selected, the user can select to edit the contents of the bad block before the rewrite is attempted.

Notes: JUICER_1 is V1.13 and JUICER_2 is V2.17.

Changes and Improvements: Bug fix to JUICER-2.

Restrictions: Does not do volume setting.

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

DECUS No: VAX-193 **Title:** VTEDIT: Keypad Text Editor and Corrector for VAXTPU **Version:** 4.5, January 1988

Submitted by: Dr. Gerhard Weck, Infodas GmbH, D-5000 Koeln 71, West Germany

Operating System: MicroVMS V4.5, V4.6, VAX/VMS V4.6 **Source Language:** VAX FORTRAN, VAXTPU **Memory Required:** Virtual **Hardware Required:** Digital Equipment Corporation ANSI Terminal (VT100, VT200, VT300 compatible) **Keywords:** Editors

Abstract: The Video Terminal Editor VTEDIT is an editing interface for the VAX Text Processing Utility VAXTPU, and optionally for VAX LSE. The VTEDIT interface is an efficient, keypad driven editor allowing multi-window editing and providing semi-automatic, context dependent text formatting. VTEDIT implements, among others, the following features:

- Multi-file and multi-buffer editing.
- Split screen editing.
- Insert and overstrike editing.
- Free and bound cursor movement.
- Recognition of all TECO match control constructs and access to VAXTPU pattern building constructs.
- Journaling the editing session.
- Access to the VMS operating system via DCL, SPAWN and Attach commands.
- Access to VAXTPU.

Many additional editor functions like:

- Search and replace.
- Rectangular cut, paste, and delete.
- Remember and retrieve buffer positions.
- Insertion of date, time, file and buffer names.
- Case and position control for searches.
- Case conversion and capitalization of words.
- Center line and fill paragraph.
- Control of tabulator setting.
- Replace Tabs with spaces.
- Deletion of trailing blanks.
- Sorting of buffers and ranges.
- Wildcard filename search and selection.
- Selection of user and system buffers from a list.

Optional semi-automatic, context dependent text formatting providing the following functions:

- Case conversion/automatic case control.
- Automatic indentation.
- Manual correction of indentation.
- Automatic word wrap
- Automatic line justification.
- Optional automatic insertion of closing parentheses and string delimiters.
- Optional highlighting of the matching opening parenthesis and string delimiter.
- Extensive online help.

Optional access to the Language-Sensitive Editor VAX LSE, providing operations to:

- Fill and align program comments.
- Specify a directory search list.
- Retrieve sources from a CMS library.
- Protect buffers against modification.
- Move to and/or delete placeholders.
- Expand tokens, routines, placeholders, and aliases.
- Define aliases for use in later expansions.
- Compile sources and review errors.
- Locate errors and retrieve the corresponding source text.
- Load language definitions and environments at run time.
- Access the LSE command interpreter directly.

Optional access to the Source Code Analyzer VAX SCA, providing operations to:

- Find declarations of symbols.
- List positions of variable declarations and/or references.
- Retrieve corresponding sources.
- Access the SCA command interpreter directly.

Notes: Operating system VMS V4.4 or later is required. Installation via VMSINSTAL; needs at least 1600 blocks; may interface to VAX LSE (this requires additional 800 blocks).

Changes and Improvements: Additional interfaces to VAX LSE and SCA.

Media (Service Charge Code): User's Manual (EC), 600' Magnetic Tape (MA) **Format:** VMS/BACKUP

DECUS No: VAX-214 **Title:** NEWS **Version:** 5.1, March 1988

Submitted by: Geoff Huston, Australian National University, Canberra City, A.C.T. Australia, 2601

Operating System: MicroVMS V4.6, VAX/VMS V4.6 **Source Language:** C **Keywords:** Bulletin Board

Abstract: NEWS is a software product which manages user, system and network news items. The news items are a set of text files which have been posted on the system for general public view.

NEWS complies with the USENET Standard for Interchange of Messages, Request For Comment (RFC) 1036. The program includes network management (for inclusion of a VAX node into the USENET NEWS network), local news data management and screen-based user presentation modules. The release also includes a DECNET implementation of the Network News Transfer Protocol (NNTP), as defined in RFC 977, allowing server/client configurations of NEWS.

The program supports similar functionality to that of the rnews (b2.11) and related USENET news readers as well as Digital Equipment Corporation's VAXNOTES.

Changes and Improvements: Compiles with Usenet RFC 1036.

Media (Service Charge Code): 600' Magnetic Tape (MA) **Format:** VMS/BACKUP, or order VAX-LIB-6

DECUS No: VAX-297 **Title:** ReGIS to HPGL Conversion Program **Version:** 2.K, February 1988

Submitted by: Dr. N.S. Hoult, Racal Research Ltd., Reading, Berkshire, EnglandRG2 OSB

Operating System: VAX/VMS V4.5, V4.6 **Source Language:** DCL, VAX FORTRAN **Memory Required:** 36KB **Software Required:** FORTRAN run-time system **Keywords:** Graphics, Hewlett Packard, ReGIS

Abstract: This program converts a file of ReGIS graphics commands, as used by the VT125 and VT240 terminals, into Hewlett-Packard Graphics Language (HP-GL), as used on the 7580B plotter. It sends them to a file or directly to the plotter, which may be connected "in-line" with the terminal. Other plotters which accept HP-GL may be accommodated by slight changes to the initialization sequences. All ReGIS commands are parsed, but only a subset (sufficient for line graphs with labelling, and including macrographs) is sent to the plotter. The resulting graphs may be scaled to fit the paper, or specified explicitly as A1, A2, etc., or in mm. The program is designed to facilitate the addition of extra ReGIS commands.

Changes and Improvements: Mixed absolute and relative coordinates are allowed.

Restrictions: Not all ReGIS commands are interpreted, although all are accepted.

Documentation may or may not be on magnetic media.

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

DECUS No: VAX-314 Title: VAX Capacity Management Tool Version: 3.1, April 1988

Submitted by: Digital Equipment Corporation

Operating System: VAX/VMS V4.3 - V4.6 Source Language: MACRO-32, VAX BASIC Memory Required: 102KB Software Required: VAX RETOS if hardcopy graphs to spooled sixel printers is required. Hardware Required: VT240 Terminal, VT330 Terminal or VT340 Terminal Keywords: System Management - VMS

Abstract: This system is designed as a tool for use by those people responsible for capacity management of a VAX or VAXcluster. It is not necessary to have VMS internal knowledge or system management knowledge to make use of this package. It is mainly designed for medium or large scale VAX installations.

This package collects statistics on the utilization of CPU, memory and disk devices on the monitored VAX or VAXcluster. It also collects information on the CPU response of the machine and the number of processes executing. In addition to the VAX wide and VAXcluster wide information collected, this package also collects information for each UIC group. If your VAX system is arranged with each application in a separate UIC group then this allows the total system utilization to be broken down by application.

The information collected can be displayed in a graphic form on VT240, VT330 or VT340 terminals. The capacity manager uses an interactive display program that has a DCL-like command syntax. The user can display histograms or frequency diagrams with hourly, daily or monthly information. The UIC group statistics can be added or subtracted from system wide statistics so graphic answers to questions like, "What will happen to the system if I take that application off?", can be seen.

Hardcopy output to printers that handle ReGIS is possible. If the Digital Equipment Corporation product RETOS is available, output to printers like the LA100 that support sixel graphics can be performed.

A machine uptime subsystem is included which records VAX uptime accurate to five minutes. These statistics can be reported between date ranges, hour ranges and weekends can be either included or excluded from the calculation.

Complete user documentation, help text and installation documentation is included on the media.

Changes and Improvements: Correction to MASSBUS disk statistic collection.

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

DECUS No: 11-462 Title: TERM.FOR Version: 5.0, March 1988

Submitted by: Richard Desper, Army Materials Technology Lab., Watertown, MA

Operating System: RT-11 V5.0 Source Language: FORTRAN IV Memory Required: 56KB Hardware Required: LSI-11 with DLV-11J (Standard MINC Hardware) Keywords: Data Communications, Emulators

Abstract: TERM is a program written in FORTRAN to convert a PDP-11/23 with a DLV-11J Quad Serial Interface into a smart terminal. The program allows the PDP-11/23 console terminal to converse with a remote computer. Disk files on the PDP-11/23 may be accessed as either sources or sinks for ASCII data files. File transfer is limited to ASCII files and is not automatically checked for errors, but is quite reliable at speeds up to 2400 baud. (A second speed limitation is that the remote computer baud rate must be slower than the PDP-11/23 console terminal rate. 9600 baud at this installation.)TERM is sufficiently transparent to the user to allow editing operations on the remote computer. e.g. VAX/VMS EDT using VT100 or VT200 terminal support. For possible use with a remote VAX, a VMS file TERM.COM is also provided to facilitate file transfer. Further details are in the file TERM.DOC and as comments in TERM.-FOR.

Notes: Operating system RT-11 V5.0 or higher is required. Multi-terminal support is required. Bold and reverse video controls of VT100 or VT200 terminals are used. VT100 or VT200 support is not essential. High speed ring buffer support in RT-11 is highly recommended.

Changes and Improvements: Run-time control of file transfer Echo, automatic control-Z termination of transmit files, added VMS TERM.COM file for easy conversation with VAX, transparency to EDT Editor controls.

Restrictions: Record length 132 characters; ASCII Files only.

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

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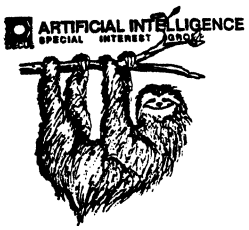

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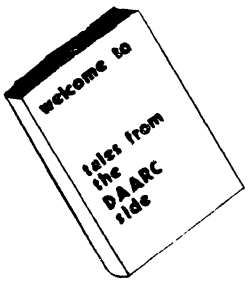

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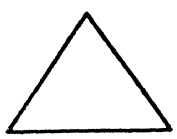

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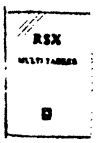

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You can submit material to the editor, Carmen Wiseman, or to the HMS SIG chair, Bill Walker. We can accept submissions in a wide variety of formats:

- Items can be sent to the editor on VMS-format RX50s, TK50 cartridges, or IBM PC format 5 1/4" floppies. The SIG chair prefers RT-11 floppies but can handle any reasonable media.

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

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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.**

[1]Ada is a trademark of the DoD

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: _____

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Telephone: _____

If this is a reply to a previous DATAGRAM, what #? ___

Signature: _____ **Date:** _____

Place Stamp Here

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UCONN HEALTH CENTER
263 FARMINGTON AVENUE, BLDG. #19
FARMINGTON, CT 06032

Fold Here

RT-11 WISH LIST SURVEY

Name (optional) _____

Address (optional) _____

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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	___		

Send Responses to: RT-11 Wish List Survey
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82 ☐ DECSYSTEM-10	3 ☐ PDP-8 FAMILY	22 ☐ RAINBOW	51 ☐ WPS-11
83 ☐ DECSYSTEM-20	50 ☐ PDP-11 FAMILY	54 ☐ VAX FAMILY	

Major Operating Systems? Languages Used: Please Check Those Applicable To You.

1 ☐ ADA	26 ☐ CORAL-66	47 ☐ FOCAL	67 ☐ OS/8	109 ☐ RT-11
2 ☐ ALGOL	28 ☐ COS	48 ☐ FORTRAN	68 ☐ PASCAL	97 ☐ TECO
5 ☐ APL	34 ☐ DATATRIEVE	51 ☐ GAMMA	72 ☐ PL-11	70 ☐ TOPS-10
7 ☐ BASIC	35 ☐ DBMS	110 ☐ IAS	92 ☐ RPG	71 ☐ TOPS-20
17 ☐ BLISS	38 ☐ DECNET	53 ☐ IQL	81 ☐ RSTS/E	111 ☐ ULTRIX/UNIX
19 ☐ C	43 ☐ DIBOL	58 ☐ MACRO	83 ☐ RSX	104 ☐ VMS
22 ☐ COBOL	45 ☐ DOS-11	65 ☐ MUMPS	91 ☐ RMS	107 ☐ WPS-8

Type Of Business (Environment)/Computer Applications
Please Check That Which Best Describes Your Business/Application.

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74 ☐ BUSINESS/INFORMATION SYSTEMS
57 ☐ CHEMISTRY
54 ☐ CLINICAL LABORATORY
63 ☐ COMPUTATION
11 ☐ CONSUMER ELECTRONICS
18 ☐ CONSULTANT
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52 ☐ DATA COMMUNICATIONS
13 ☐ DATA PROCESSING SERVICES
71 ☐ DATA REDUCTION
17 ☐ DIGITAL EMPLOYEE-ENGINEERING
15 ☐ DIGITAL EMPLOYEE-MARKETING
16 ☐ DIGITAL EMPLOYEE-SERVICE GROUP
60 ☐ EDUCATIONAL ADMINISTRATION
1 ☐ EDUCATION/PRIMARY
2 ☐ EDUCATION/SECONDARY
61 ☐ EDUCATION-TECHNOLOGY
3 ☐ EDUCATION/UNIVERSITY
67 ☐ ENGINEERING
65 ☐ FINANCE/ACCOUNTING
77 ☐ GOVERNMENT
75 ☐ GRAPHICS
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8 ☐ EDUSIG
10 ☐ GRAPHICS APPLICATIONS
11 ☐ HARDWARE AND MICRO
35 ☐ IAS
27 ☐ LARGE SYSTEMS
16 ☐ L & T
14 ☐ MUMPS
15 ☐ NETWORKS
34 ☐ OFFICE AUTOMATION
36 ☐ PERSONAL COMPUTER
18 ☐ RSTS/E
17 ☐ RSX
19 ☐ RT-11
32 ☐ SITE MGMT. & TRNG
21 ☐ UNISIG
26 ☐ VAX

Job Title/Position - Please Check:

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4 ☐ APPLICATIONS PROGRAMMING
5 ☐ SYSTEMS ANALYSIS/PROGRAMMING
6 ☐ OPERATING SYSTEM PROGRAMMING
7 ☐ DATABASE ADMINISTRATION
8 ☐ DATA COMMUNICATIONS/TELECOMMUNICATIONS
9 ☐ COMPUTER OPERATIONS
10 ☐ PRODUCTION CONTROL
101 ☐ CORPORATE DIRECTOR OF DP/MIS
102 ☐ ADMINISTRATIVE ASSISTANT
103 ☐ TECHNICAL ASSISTANT
104 ☐ SERVICES COORDINATOR
105 ☐ MANAGER
106 ☐ ANALYST
107 ☐ PROGRAMMER
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