



DECUS U.S. CHAPTER SIGs NEWSLETTERS

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Dear DECUS Member:

During November 1987, the DECUS US Chapter sent out a survey form to you, the readers of the SIGs Newsletters. My first act upon assuming the reins of SIG publications chair, is that of reporting the results of this survey to you.

Of approximately 8000 forms mailed, 1386 were returned by the subscribers. This itself is remarkable, since no return envelope was enclosed, and the dead-line was on the order of two or three weeks. Although more exhaustive analysis is available from Joel Snyder, (who I herein thank for his detailed statistical analysis of the data,) I will try to summarize the results here.

It appears that the great majority of the respondents have subscribed to the newsletter since its inception, (86%,) and plan to re-subscribe, (96%.) Most were also satisfied with the current arrangement of articles, (90%,) and liked the combined mailing, (the "BIG ONE") better than separate SIG newsletters, (94%.)

As far as price, 70% of you think that 35\$ is a realistic price for the news-letters, while 22 % would even spend 50\$ for it. In retrospect, however, I don't think we would find many subscribers that would take the time to respond to a survey if they thought the newsletters weren't worth the money.

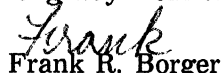
Also surprising was the level of reader response back to the SIGs. Fully 26% of you had sent in a questionnaire page, and about 10% had actually submitted an article. That last percentage seems very high to me. As an editor, it warms the cockles of my heart.

A large majority, (77%,) preferred technical articles over managerial, or liked both types, (14%.) Only 8% of the readers wanted more managerial articles, which means that the newsletter doesn't end up on too many V-P's desks. We're read by the shirt-sleeves and blue-jeans types more than the pin strippers.

The newsletter bounces around a lot. 76% of you pass it on to from 1-3 people, 14% hand it down to 3-6, and only 6% are the only readers.

All in all we are heartened by this response. We seem to be delivering a product that you people want. The only trouble with this survey is that we seem to have a self-selection process. The 17% or so who did respond seem to be "gimmee that old-time computing" DECUS stalwarts who bemoaned the passing of front panels and switch registers. DECUS is a society constantly in flux, and the Newsletters should change with that flow. It's hard, however, to chart a course without good data about the currents, and we seem to only have data about the waters astern of us. If any of you readers feel the newsletter isn't delivering what you want and are willing to spend some time writing a letter telling us why, I would greatly appreciate it. (See my address in the IAS SIG information section.)

In closing, let me state that there are 21 hard-working editors, 21 SIG chairs, and numerous other DECUS members committed to improving this product. We're looking at marketing issues, trying to improve the looks, trying to streamline submission methods, and still stay within budget. We've come a long way from the first issue of the "Big one" but we still have a ways to go.


Frank R. Borger
SIG Pubs Chair

(See the reverse side for condensed survey results.)

- 1) How long have you subscribed to the DECUS SIG's Newsletter?
 [6.9%] less than 1 year [5.8%] 1 year [86.4%] 2 years
- 2) Do you plan on resubscribing to the newsletter when your subscription expires?
 [96.5%] yes [2.9%] no
- 3) Have you ever used the questionnaire section?
 [26.0%] yes [11.1%] no
 If no, check reason:
 [5.8%] too many different questionnaires
 [21.8%] not interested
 [35.0%] other
- 4) I prefer [77.4%] technical [8.1%] management articles (both 14.5%)
- 5) Have You ever submitted an article?
 [9.6%] yes [90.4%] no
 If no, check reason:
 [50.5%] nothing to say
 [2.2%] don't know how
 [2.2%] didn't know I could
 [1.4%] why should I
 [35.8%] other
- 6) Are there specific type articles you would like the newsletter to include?
 [39.2%] yes [60.8%] no
 If yes, please identify: (Many asked for more in-depth and how-to articles)
- 7) Do you perceive yourself aligned with a SIG?
 [76.1%] yes [23.9%] no
- 8) Are you satisfied with the current arrangement of articles?
 [90.2%] yes [9.6%] no (both 0.2%)
- 9) Would you prefer [94.3%] combined or [5.5%] separate mailings per month?
- 10) The value of the current newsletter is:
 [70.0%] \$35.00
 [21.8%] \$50.00
 [3.4%] \$75.00
 [3.0%] \$100.00
- 11) How many co-workers read your copy of the newsletter?
 [75.9%] 1-3 [13.6%] 3-6 [3.7%] 6-10 [0.7%] more than 10
- 12) What do you consider the best feature of the newsletter?
 246 responded with "All of it together"
 117 responded with "Pageswapper - correspondence"
 116 responded with "Good Technical information"
- 13) What do you consider the worst feature of the newsletter?
 99 responded with "Some SIGs appear inactive - drop or realign"
 90 objected to the landscape mode
- 14) Do you have any additional suggestions?
 25 suggested a yearly index of articles

The Wombat

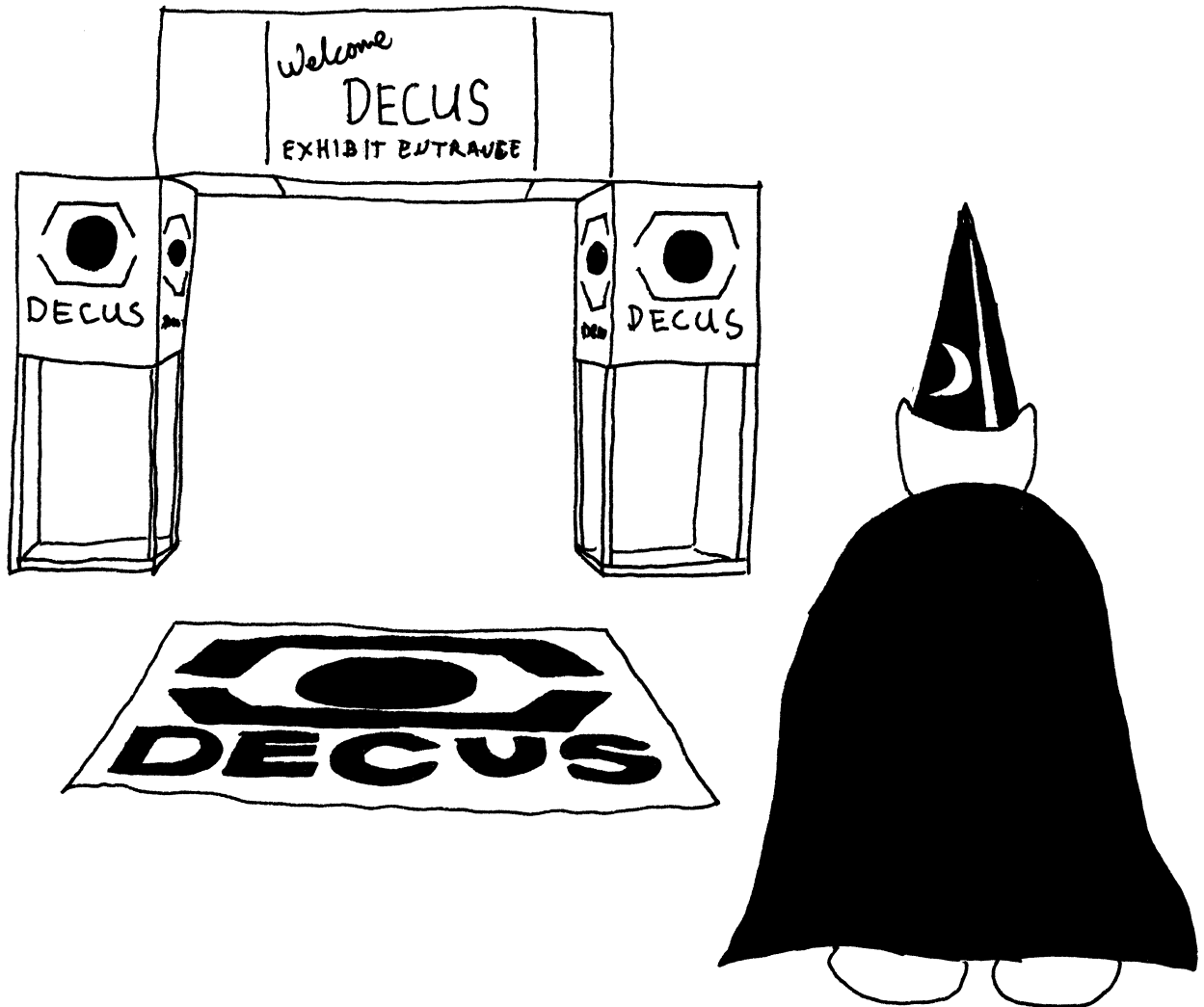
EXAMINER

and 46th Dispatch

"Increases the Circulation of Anyone in America"

Volume 9 Number 9

DTR



Contributions

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

Editor, DATATRIEVE Newsletter
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Company 219 Boston Post Road, BP02
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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Chairman's Corner

Joe H. Gallagher, Ph. D., 4GL Solutions, Overland Park, KS 66212

It seems like only yesterday that I took over as Chair of the DATATRIEVE/4GL SIG at the Dallas Symposium in the Spring of 1986. Time really does go quickly when you are having fun! However, if I do the same thing for very long, I get lazy and complacent. So when it was time to decide if I would seek another two year term as Chair, it was an easy decision for several reasons - an excellent (and probably superior) replacement was available and I was eager to return to my first love of editing the newsletter.

The activities of the SIG have changed significantly during the last two years. Two and one-half years ago DATATRIEVE in its various versions was our only interest; we were a one-product SIG. Now, at least at Symposia, more than half of our activities are centered around DEC and non-DEC fourth generation languages. Computers change; computer languages change; we change; and the organizations we participate in change.

This is really not good-bye; I am only changing hats. Please give Don Stern, the new SIG Chair, all your support and best wishes. And I will now look forward to receiving your submissions to the newsletter.

We look forward to seeing you in Cincinnati at the Spring Symposium. As always, we will make new friends and learn new things.

=====

Letters to Editor

Dear Editor,

In my recent article, "DATATRIEVE DATES and Leap Years" (DECUS U. S. Chapter SIGS Newsletters, February 1988, Volume 3, Number 6, DTR-15 - DTR-16), there is an error in the comparison of lengths of tropical years and mean modified Gregorian years. The stated values are correct, but since the mean modified Gregorian year is slightly longer than the tropical year, the modified Gregorian calendar will slowly fall behind (rather than gain on) the tropical year. Hence, about every 3320 years, an additional day (in addition to leap day) would have to be inserted to bring the modified Gregorian calendar back into approximate agreement with the earth's position in its orbit.

I apologize for the error.

Sincerely

James J. Fullerton (signed)
Institute of Logopedics
Wichita, Kansas

Dear Editor,

I read with interest James Fullerton's letter in the February 1988 Wombat Examiner and 4GL Dispatch concerning the method of determining leap years. I don't have any astronomy texts here myself, being a Chemical Engineer, but it did bring to mind the

way the folks out here in Arizona sometime back used to do their timing/dating. The HOHOKAM people used an algorithm similar to the following:

```
DEFINE PROCEDURE CBS
  DECLARE AZMUTH PIC 999.
  DECLARE ELEVATION PIC 999.
    FOR MUD_HOUSE WITH WALL_THICKNESS_IN_FEET GE 2
      ! construct an enclosure, multipurpose,
      ! including living quarters.
    BORE_HOLE USING BEGIN
      AZMUTH = DETERMINE ! watch the sun and see where shadows
      ELEVATION = DETERMINE ! fall at beginning of planting season,
      ! year after year after year.
    END
  FIND STAKE ! a Saguaro rib might work well
  READY STAKE
    FOR STAKE ALIGNED WITH HOLE USING ROCK BEGIN
      DRIVE STAKE
      END
  READY GROUND SHARED ! lots of mouths to feed
    WHILE SUNLIGHT_THROUGH_HOLE = STAKE BEGIN
      PLANT CORN
      PLANT BEANS
      PLANT SQUASH
      END
  END_PROCEDURE
```

Leonard E. Herzmark, P. E. (signed)
Maricopa County Health Department
Phoenix, Arizona

=====

WOMBAT WIZARD

Dear Wombat Wizard:

I have run into a very peculiar problem with VAX-DATATRIEVE V4.1, which I'm certain did not exist in earlier versions. I have two domains, DELIVERIES and HEADERS, each of which has two keyed fields; both of which are USAGE LONG. I need to match up these two domains on both fields: SA_SOM (the primary key which is "Seconds at Start of Message") and UMID (the secondary key which is "Unique Message ID"). No matter how I phrase the statements, DATATRIEVE uses only the primary key and ignores the secondary key. This results in a very slow retrieval. Procedures which used to take less than 1/2 hour now fail to complete after more than 15 hours. No matter how I phrase the query or add parenthesis, I can't get DATATRIEVE to use both keys to match the two domains.

The applicable part of the record definition for the domain HEADERS is:

```
DEFINE RECORD HEADER_REC USING
01 HEAD.
  03 SYSTEM_ID PIC X(5).
  03 SA_SOM    USAGE IS LONG.      ! <Number, primary key>
  03 UMID     USAGE IS LONG.      ! <Number, alternate key>
  03 DATE     USAGE IS DATE.
  03 TIME COMPUTED BY FN$TIME(DATE).
  . . . ! OTHER FIELDS
;
```

The applicable part of the record definition for the domain DELIVERIES is:

```
DEFINE RECORD DELIVERY_REC USING
01 DELIV.
  03 SYSTEM_ID PIC X(5).
  03 SA_SOM    USAGE IS LONG.      ! <Number, primary key>
  03 UMID     USAGE IS LONG.      ! <Number, alternate key>
  03 DATE     USAGE IS DATE.
  03 TIME COMPUTED BY FN$TIME(DATE).
  . . . ! OTHER FIELDS
;
```

When I execute the statements in DATATRIEVE:

```
FOR HEADERS WITH SA_SOM GT 0 BEGIN
  PRINT SA_SOM, UMID, TIME
  FOR DELIVERIES WITH DELIV.UMID = HEAD.UMID AND
    DELIV.SA_SOM = HEAD.SA_SOM BEGIN
    PRINT SA_SOM, UMID, TIME
  END
END
```

with the /DEBUG qualifier and the output is directed to a logfile with an OPEN statement, the relevant part of the log file reveals:

```
Performing GTR boolean on RMS key field HEADERS.SA_SOM
Performing EQL boolean on RMS key field DELIVERIES.SA_SOM
```

Seconds at Start of Message	Unique Message ID	TIME
17,778	12,763,793	15:02:34
17,781	2,631,798	00:00:05

Seconds at Start of Message	Unique Message ID	TIME
17,781	2,631,798	00:05:24
17,781	2,631,843	00:02:55
. . .		

Am I specifying the query incorrectly? I'm certain I've set up expressions like this before, and I'm equally certain that this specific definitions used to retrieve data much faster than it does now. The only thing I can think of which changed recently is that I moved the data files off of my default login disk and onto a secondary disk.

Signed,

Chasing Two Keys

Dear Two Keys,

Your attacked your problem very well with

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

and the use of a logfile with the statement

```
DTR> OPEN LOGFILE.LOG
```

However, it takes a key ring to manage two keys, but in DATATRIEVE there are some definite rules for the evaluations of compound Booleans. DATATRIEVE sets up a priority to evaluate compound Boolean expressions that include key fields. For any domain, the (one and only) key that is chosen depends on three factors:

1. Exact or range retrieval
Exact retrievals use EQUALS or STARTING WITH,
Range retrievals us GT, GE, LE, LT, or BT
2. Key is NO DUP or DUP
3. Primary or alternate key

DATATRIEVE's priority in choosing a key is:

Order	Type of Retrieval	DUP/NO DUP	Type of Key
1	Exact	NO DUP	Primary
2	Exact	NO DUP	Alternate
3	Exact	DUP	Primary
4	Exact	DUP	Alternate
5	Range	NO DUP	Primary
6	Range	NO DUP	Alternate
7	Range	DUP	Primary
8	Range	DUP	Alternate

Thus, even if you specify a retrieval on two or more keys, DATATREIVE will choose only one according to its priority.

Since you have moved your file to a secondary disk, the Wizard's crystal ball says that your file is now much larger now than it was originally. It is thus likely that when the file access had acceptable performance, the number of duplicate records with the same primary key was small. Now that your file has grown larger, there are probably many (perhaps hundreds or thousands) of duplicates for each primary key; sequentially searching these duplicates leads to very poor retrieval performance.

One way to beat this performance hit is to give up a little disk space by changing the data types of the two fields, SA_SOM and UMID, to strings and use a composite key. Consider record definitions like

```
DEFINE RECORD HEADER_REC USING      DEFINE RECORD DELIVERY_REC USING
  01 HEAD.                            01 DELIV.
  03 SYSTEM_ID PIC X(5).              03 SYSTEM_ID PIC X(5).
  03 NEW-KEY. ! primary key           03 NEW-KEY.      ! primary key
  05 SA_SOM PIC 9(8).                 05 SA_SOM PIC 9(8).
  05 UMID PIC 9(8).                   05 UMID PIC 9(8).
```



```

03 DATE    USAGE IS DATE.      03 DATE    USAGE IS DATE.
03 TIME COMPUTED BY           03 TIME COMPUTED BY
FN$TIME(DATE).                FN$TIME(DATE).
... ! OTHER FIELDS           ... ! OTHER FIELDS
;                               ;

```

The records are now eight bytes larger than before, but the new primary key, NEW-KEY, will give very much better performance when the records are joined.

The Wizard

=====

Tracking User Logins

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

There are various reasons why someone would want to keep track of who logged into a system, when, for how long. One is for security purposes to see when people are logging in, if an account is being used excessively, and so on. Another is to track users to see if they are logging in when they are supposed to. As part of the operation of the DECUServe system, moderators are supposed to log in regularly and check their conferences, and DECUServe management wanted a method for checking this. What follows are some of the procedures I put together for them, and which, in most cases, I'm running on my own system as well.

Unused Accounts

One thing I had to check for on my system was to see if there were accounts which were no longer being used. For example, on my system some accounts were created for test purposes, but we don't always get notified when use of the account stops. This may be obtained from a listing created by AUTHORIZE from the information in the SYSUAF.DAT file, the format does not lend itself to easy scanning to find accounts which have not been used for some time. I created a simple report that lets me know when each users' last login date was by directly reading the SYSUAF.DAT file.¹

```

REDEFINE PROCEDURE REPORT_LAST_LOGIN
!
! Quick report of who logged in when.
!
READY SYSUAF
  REPORT SYSUAF WITH USERNAME NOT CONT "SYSTEM","PASSWORD" SORTED BY ACCOUNT,
    USERNAME ON *."Filename or TT"
  SET REPORT_NAME = "Date of Last Login"
  PRINT ACCOUNT, USERNAME USING T(20), DATE_LAST_INTERACTIVE_LOGIN,
    DIRECTORY USING T(24)
  AT BOTTOM OF ACCOUNT PRINT SKIP 1
END_REPORT
END_PROCEDURE

```

ACCOUNT	USERNAME	DATE LAST INTERACTIVE LOGIN	DIRECTORY
	DDSNET		[MB\$.DDS.SCR]
	SNACSV		[SNACSV]
ALLIN1	ALLIN1	1-Feb-1988	[ALLIN1]
ASD	JONES	1-Feb-1988	[JONES]
ASD	LEDERMAN	1-Feb-1988	[LEDERMAN]
DECNET	DECNET		[DECNET]
FIELD	FIELD	4-Nov-1987	[SYSMAINT]
MBWATCH	MBWATCH		[MB\$.MB.MB\$SCRATCH]
MROUTER	MBMANAGER	25-Jan-1988	[MB\$.TOOLS]
MROUTER	MRMANAGER	25-Jan-1988	[MB\$.MR.WRK]

This could just as easily be sorted by `DATE_LAST_INTERACTIVE_LOGIN` to put the oldest accounts first, but for my purposes it was easier to read sorted by user name. Note that since this procedure requires read access to `SYSUAF.DAT`, which is normally protected against access by anyone except the system manager and similar privileged accounts, the procedure must be run by someone who is privileged, or submitted as a batch job under a privileged account. Also note that all of these reports were actually generated on my system with the procedures shown, but I have edited the output to disguise some of the user names. If they are not in alphabetical order, it's not a bug in `DATATRIEVE`.

Who Logged in Recently?

One report desired by DECUServe management is a list of who logged in in the past 72 hours. This may also be obtained from `SYSUAF.DAT`, and in this case is certainly obtained more easily with `DATATRIEVE`.

```

REDEFINE PROCEDURE LOGIN72
!
! Report users who have logged in in the past 72 hours.
!
DECLARE SELECT_DATE USAGE DATE.
DECLARE SELECT_QUAD USAGE QUAD.
!
    SELECT_DATE = "NOW"
!
! Convert date to clunks, subtract 72 hours in clunks,
! convert back to date.

```

```

!
SELECT_QUAD = SELECT_DATE
SELECT_QUAD = SELECT_QUAD - 72 * 60 * 60 * 1000000
SELECT_DATE = SELECT_QUAD
!
READY SYSUAF SHARED READ
!
! Read the SYSUAF.DAT file (requires the user to have the proper privileges).
!
REPORT SYSUAF WITH DATE_LAST_INTERACTIVE_LOGIN GE
    SELECT_DATE SORTED BY ACCOUNT, USERNAME ON *."Filename or TT"
    SET REPORT_NAME = "Logins in the past 72 hours"
    PRINT ACCOUNT, USERNAME USING T(20), DATE_LAST_INTERACTIVE_LOGIN,
        FN$TIME(DATE_LAST_INTERACTIVE_LOGIN)("TIME"/"LAST"/"LOGIN") USING X(11)
    AT BOTTOM OF ACCOUNT PRINT SKIP 1
END_REPORT
END_PROCEDURE

```

Logins in the past 72 hours 1-Feb-1988
Page 1

ACCOUNT	USERNAME	DATE	TIME
		LAST INTERACTIVE LOGIN	LAST LOGIN
ALLIN1	ALLIN1	1-Feb-1988	08:13:31.30
ASD	BROWN	1-Feb-1988	12:22:22.21
ASD	WILLIAMS	1-Feb-1988	10:37:58.85
SYSMGR	SYS_LEDERMAN	1-Feb-1988	15:45:20.34

Failed Logins

Something which can be very important to know is how many attempts to log into a system failed. This is often an important indication that someone is attempting to break into a system. It can also signal a bad communication line ("garbage" is causing the users' attempts to log in to fail), or a bad installation (Message Router was installed with the wrong password so all of the network logins fail), or just that a user is having difficulties. This information can be recorded by VMS System Accounting, supplied with the VAX/VMS operating system. System accounting is normally started when you boot your system with commands in SYS\$MANAGER:SYSTARTUP.COM similar to the following:

```

$ SET ACCOUNTING/ENABLE=(BATCH, DETACHED, INTER, LOGIN_FAIL,
    MESSAGE, NET, PROC, SUBPROC)

```

You can select which types of events are logged; I normally activate everything EXCEPT image accounting. Specifically, I activate all types of login activity, and login failures.

The information normally goes into SYS\$MANAGER:ACCOUNTING.DAT, but I find it much easier if I have one file per day. Therefore, I have a batch job that runs every night at midnight which (among various other duties) creates a new file like this:

```

$ yday = F$CVTIME( "YESTERDAY", "ABSOLUTE", "DAY")
$ ymon = F$CVTIME( "YESTERDAY", "ABSOLUTE", "MONTH")
$!
$! The System Accounting file is reset.
$!
$ WRITE SYS$OUTPUT "Set new System accounting file"
$!
$ SET ACCOUNTING/NEW_FILE
$ file = F$SEARCH("ACCOUNTNG.DAT;-1")
$ IF file .EQS. "" THEN file = F$SEARCH("ACCOUNTING.DAT;-1")
$ IF file .EQS. "" THEN GOTO errlog
$ RENAME 'file' accounting.'yday''ymon'

```

This automatically gives me one accounting file per day. Unfortunately, the resulting file is almost impossible to read directly with DATATRIEVE (or most other VAX languages) because of it's format. I therefore wrote a program which converts the System Accounting file into a file with normalized records and fixed length fields which can easily be read by DATATRIEVE (or anything else).²

Once the System Accounting file is in an easily processed format, it is simple to report login failures:

```

REDEFINE PROCEDURE LOGFAIL_REPORT
!
! This reports on login failures in an accounting file.
!
READY ACC
  REPORT ACC WITH PACKET = "Logfail" ON *."File or TT"
  SET REPORT_NAME = "Login Failures"
  SET NO DATE
  AT TOP OF PAGE PRINT REPORT_HEADER, SYSTEM_DATE(-), SKIP, COLUMN_HEADER
  PRINT SYSTEM_TIME, USERNAME, ACCOUNT, NODE, TERMINAL, REMOTE_ID
END_REPORT
END_PROCEDURE

```

Login Failures

Page 1
25-Jan-1988

SYSTEM TIME	USERNAME	ACCOUNT	NODE	TERMINAL	REMOTE ID
10:29:24.26	LEDERMAN	<net>	SYS30		SYS_LEDERMAN
10:36:01.12	WILLIAMS	<login>		VTA67:	
11:35:01.59	<login>	<login>		LTA175	
12:37:02.60	MRGATE	<login>	SYS31	RTA1:	LEDERMAN
16:32:56.72	BROWN	<login>		VTA69:	
19:20:04.25	<login>	<login>	SYS31	RTA1:	SMITH

I now have my nightly batch job print out this report on a regular basis, so it's ready when I come in in the morning.

Reporting User Logins

Another report requested by the DECUServe management, and one which may be of interest to others, is a report of when users logged in, and how much time they spent on the system. This is easily obtained from the System Accounting file once it has been converted.

```
REDEFINE PROCEDURE REPORT_USER_SESSION_DETAILS
!
! Report the number of user interactive sessions, and the amount
! of time spent (in detail).
!
READY ACC
  REPORT ACC WITH PACKET = "Interactive" SORTED BY ACCOUNT,
    USERNAME ON *."File or TT"
  PRINT ACCOUNT, USERNAME, ELAPSED_MINUTES
  AT BOTTOM OF USERNAME PRINT SKIP, "Totals",
    TOTAL(ELAPSED_MINUTES) USING ZZZ,ZZ9,
    COUNT ("Number"/"of"/"Sessions"), SKIP
  AT BOTTOM OF ACCOUNT PRINT SKIP
END_REPORT
END_PROCEDURE
```

A portion of this report looks like:

1-Feb-1988
Page 1

ACCOUNT	USERNAME	ELAPSED MINUTES	Number of Sessions
ASD	BROWN	405.73	
ASD	BROWN	95.78	
Totals		502	2
ASD	JONES	40.55	
ASD	JONES	95.53	
ASD	JONES	110.14	
ASD	JONES	13.78	
Totals		260	4
ASD	SMITH	228.94	
Totals		229	1
ASD	WILLIAMS	183.92	
ASD	WILLIAMS	24.77	
Totals		209	2

I also have a similar report which only gives the summary, without the individual logins. For my purposes, I organize users by account, then by name. The account

corresponds to the account field in SYSUAF.DAT, but it is filled in by System Accounting so that a user who runs this report does NOT have to have access to SYSUAF, and therefore does not have to be privileged.

Although this report includes only interactive sessions, it is also possible to obtain reports for network and batch sessions, and for subprocesses, if they were enabled when System Accounting is started.

A Login History

In addition to knowing which people logged in recently, there may also be reasons to know how people logged in over a period of time. While it would be possible to simply examine the System Accounting files for that number of days, or let System Accounting run continuously for the desired time frame, there are drawbacks to both of these approaches. First, the System Accounting file can get quite large. I have Message Router on my system which runs a lot of batch jobs and network logins, my System Accounting file runs up to 500 blocks a day, and sometimes more. A month's worth of data can easily run 14,000 blocks, and would take a long time to process in one file or even longer as 28 to 31 separate files. Therefore, I decided to create a separate domain just to store user's login histories and update it nightly. What I am storing is how many times a user logged in on each particular day (I could also store elapsed time, or each individual login, but based on what I interpreted as was needed for DECUServe, just the number of logins was needed).

```
DEFINE RECORD LOGIN_HISTORY_RECORD OPTIMIZE
!
! This record tracks the login history of a user. There should be
! one record for each user/account per day logged in.
!
01 LOGIN_HISTORY_REC.
  10 USERNAME PIC X(16)
    QUERY_HEADER "User Name".
  10 ACCOUNT PIC X(8)
    QUERY_HEADER "Account".
  10 LOGIN_DATE USAGE DATE.
  10 LOGINS PIC 99
    EDIT_STRING Z9
    QUERY_HEADER "Times"/"Logged"/"In".
;
```

This is updated nightly from the converted System Accounting file:

```
DEFINE PROCEDURE LOGIN_HISTORY_FROM_ACC
!
! Create a history of number of times each user logged in on
! each date by reading the processed System Accounting Files
!
READY ACC
READY LOGIN_HISTORY WRITE
!
DECLARE N PIC 99.
DECLARE DATE_ONLY USAGE DATE.
DECLARE DATE_STRING PIC X(11).
!
! Count interactive sessions only (could later separate logfails
! with the same pass if desired).
```

```

!
  FOR ACC WITH PACKET = "Interactive" BEGIN
!
! Must extract date only portion (no time)
!
    DATE_STRING =
      FN$UPCASE(FORMAT(ACC_REC.SYSTEM_DATE) USING DD_MMM_YYYY)
    DATE_ONLY = FN$DATE(DATE_STRING | " 00:00:00.00")
!
! Check to see if this person has a history record.
! If so, update it.
!
    N = 0
    FOR LOGIN_HISTORY WITH
      LOGIN_HISTORY.USERNAME = ACC_REC.USERNAME AND
      LOGIN_HISTORY.LOGIN_DATE = DATE_ONLY BEGIN
!
! This person logged in before, so the record can be updated.
!
      MODIFY USING LOGINS = LOGINS + 1
      N = N + 1
    END
!
    IF N = 0 THEN BEGIN
!
! No login history record for this person, create one
!
      STORE LOGIN_HISTORY USING BEGIN
        USERNAME = ACC_REC.USERNAME
        ACCOUNT = ACC_REC.ACCOUNT
        LOGIN_DATE = DATE_ONLY
        LOGINS = 1
      END
    END
!
! This shouldn't happen.
!
    IF N > 1 THEN BEGIN
      PRINT "Error with login history, N = ", N, USERNAME, ACCOUNT
    END
!
  END
END_PROCEDURE

```

Note that this procedure is "self updating". When a new user is added, the procedure will automatically start recording information for that user, but will not create any new records for people who don't log in.

Once this history file is created, there are various ways the information can be used. Again, one of the reports desired for DECUServe was a history of how users logged in over the past 28 days.

This report looks like:

```

DEFINE PROCEDURE LOGIN28
!
! Report on login performance for the previous 28 days.
!
DECLARE SELECT_DATE USAGE DATE.
SELECT_DATE = "TODAY"
SELECT_DATE = SELECT_DATE + (-28)      ! Go back 28 days from today
!
READY LOGIN_HISTORY
  REPORT LOGIN_HISTORY WITH LOGIN_DATE GE SELECT_DATE SORTED BY
    ACCOUNT, USERNAME ON *."File or TT"
  SET REPORT_NAME = "Login Performance"/"for the previous 28 days"
  AT TOP OF ACCOUNT PRINT COL 5, ACCOUNT
  AT BOTTOM OF USERNAME PRINT COL 15, USERNAME, SPACE 1,
    COUNT ("Number"/"of Days"/"Logged In"), SPACE 1,
    MIN(LOGINS) USING Z9, SPACE 1,
    AVERAGE(LOGINS) USING ZZ9, SPACE 1,
    MAX(LOGINS) USING ZZ9
  END_REPORT
END_PROCEDURE

```

A portion of this report looks like this:

Login Performance 1-Feb-1988
for the previous 28 days Page 1

Account	User Name	Number of Days Logged In	MIN Times Logged In	AVERAGE Times Logged In	MAX Times Logged In
ALLIN1	ALLIN1	9	1	2	3
ASD	BROWN	16	1	2	4
	JONES	15	1	2	6
	LEDERMAN	22	1	4	10
	SMITH	19	1	2	10
	WILLIAMS	20	1	3	10
MROUTER	MBMANAGER	3	1	2	2
	MRMANAGER	3	1	1	2
SYSMGR	SYSTEM	6	1	2	2
	SYS_LEDERMAN	20	1	4	19

The purpose of this report for DECUServe is to find moderators who don't log in; others might be looking for employees who don't log in. I would be more interested in finding excessive logins (a possible security breach).

Some "GRAPHS" of Login History

It is often much easier to appreciate data in a graphical form than in columns of numbers. I therefore derived a type of graph which shows how people logged in over a given month. This requires two record definitions working on the same file, but both the domains LOGIN_HISTORY_BAR and LOGIN_HISTORY_STRING use the same data file.³


```

DEFINE RECORD LOGIN_HISTORY_BAR_RECORD OPTIMIZE
!
! This is used to create a "graph" of the login history
! of any number of users.
!
01 LOGIN_HISTORY_BAR_REC.
    10 USERNAME PIC X(16).
    10 ACCOUNT PIC X(8).
    10 MONTH PIC 99.
    10 YEAR PIC 9999.
    10 BAR PIC X(62)
        QUERY_HEADER " ".
;

REDEFINE RECORD LOGIN_HISTORY_STRING_RECORD OPTIMIZE
!
! This gives an alternate access to the login history graph record
! so that the individual days can be filled in.
!
01 LOGIN_HISTORY_STRING_REC.
    10 USERNAME PIC X(16).
    10 ACCOUNT PIC X(8).
    10 MONTH PIC 99.
    10 YEAR PIC 9999.
    10 STRING OCCURS 31 TIMES.
        20 CHAR PIC XX.
        20 NUMBERS REDEFINES CHAR.
            30 FILLER PIC X.
            30 NUM PIC 9.
;

DEFINE DOMAIN LOGIN_HISTORY_BAR USING LOGIN_HISTORY_BAR_RECORD ON
    LOGIN_HISTORY_BAR.SEQ;

DEFINE DOMAIN LOGIN_HISTORY_STRING USING LOGIN_HISTORY_STRING_RECORD ON
    LOGIN_HISTORY_BAR.SEQ;

```

With these two definitions, it is possible to process the login history file. I have graphed this with one and two columns per day; the two column is a little easier to read so I will show it here. Except for the size of the display fields, the processes are identical.

```

DEFINE PROCEDURE MAKE_LOGIN_HISTORY_GRAPH
!
! Plot login history for a month.
!
READY LOGIN_HISTORY
DECLARE BLANK PIC X(62).
DECLARE INC PIC 999.
DECLARE TMP PIC 999.
DECLARE TDAY PIC 99.
DECLARE TMONTH PIC 99.
DECLARE TYEAR PIC 9999.
!

```

```

! Fill in the plot pattern.
!
BLANK = "      +      |      +      |      +      |      "
INC = 1
!
! Prompt the user for the desired month and year
!
TMONTH = *."Month (numeric)"
TYEAR = *."Year (4 digits)"
!
! The following is a fast way to make a new empty file, if you
! remember to purge old files.
!
DEFINE FILE FOR LOGIN_HISTORY_BAR KEY=USERNAME(DUP), KEY=ACCOUNT(DUP);
READY LOGIN_HISTORY_BAR WRITE
READY LOGIN_HISTORY_STRING MODIFY
      FOR LOGIN_HISTORY WITH FN$MONTH(LOGIN_DATE) = TMONTH AND
      FN$YEAR(LOGIN_DATE) = TYEAR BEGIN
!
! Find out if there is a plot record for this person/account already.
!
      TMP = 0
      FOR LOGIN_HISTORY_BAR WITH USERNAME = LOGIN_HISTORY_REC.USERNAME AND
      ACCOUNT = LOGIN_HISTORY_REC.ACCOUNT BEGIN
        TMP = TMP + 1
      END
!
      IF TMP = 0 STORE LOGIN_HISTORY_BAR USING BEGIN      ! no record,
        USERNAME = USERNAME                               ! must create one
        ACCOUNT = ACCOUNT
        MONTH = TMONTH
        YEAR = TYEAR
        BAR = BLANK                                       ! Put in a "blank" line.
      END
      TDAY = FN$DAY(LOGIN_DATE)
!
! Retrieve the corresponding user/account record
!
      FOR LOGIN_HISTORY_STRING WITH
        USERNAME = LOGIN_HISTORY_REC.USERNAME AND
        ACCOUNT = LOGIN_HISTORY_REC.ACCOUNT
      BEGIN
        TMP = INC                                       ! start at beginning of line
!
        ! Now move along the string and mark of the current day
!
        FOR STRING MODIFY USING BEGIN
          IF TMP = TDAY CHOICE OF                       ! if correct day
            LOGINS GT 9 THEN CHAR = "*" ! too many logins
            LOGINS BETWEEN 1, 9 THEN NUM = LOGINS
          END_CHOICE
          TMP = TMP + INC                               ! increment to next day
        END
      END
      END
      FINISH LOGIN_HISTORY_BAR
      FINISH LOGIN_HISTORY_STRING
END_PROCEDURE

```

Once this processing is done, actually printing the graph is fairly simple.

```

DEFINE PROCEDURE LOGIN_HISTORY_GRAPH
!
! This procedure reads a login history and creates a graph
! of the days each user logged in.
!
READY LOGIN_HISTORY_BAR
  REPORT LOGIN_HISTORY_BAR SORTED BY ACCOUNT, USERNAME ON *."File or TT"
  SET COLUMNS_PAGE = 80
  SET REPORT_NAME = "Login History"
  SET NO DATE
!
  AT TOP OF PAGE PRINT REPORT_HEADER,
    COL 5, MONTH VIA MONTH_NAMES(-), SPACE 1, YEAR (-), SKIP,
    COL 17, "          1          1          2          2          3", SKIP,
    COL 17, "          5          0          5          0          5          0"
!
  AT TOP OF ACCOUNT PRINT COL 9, ACCOUNT(-),
    COL 17, "          +          |          +          |          +          |"
!
  PRINT COL 1, USERNAME, COL 17, BAR
!
  AT BOTTOM OF PAGE PRINT
    COL 17, "          1          1          2          2          3", SKIP,
    COL 17, "          5          0          5          0          5          0"
  END_REPORT
END_PROCEDURE

```

A typical report looks like the following:

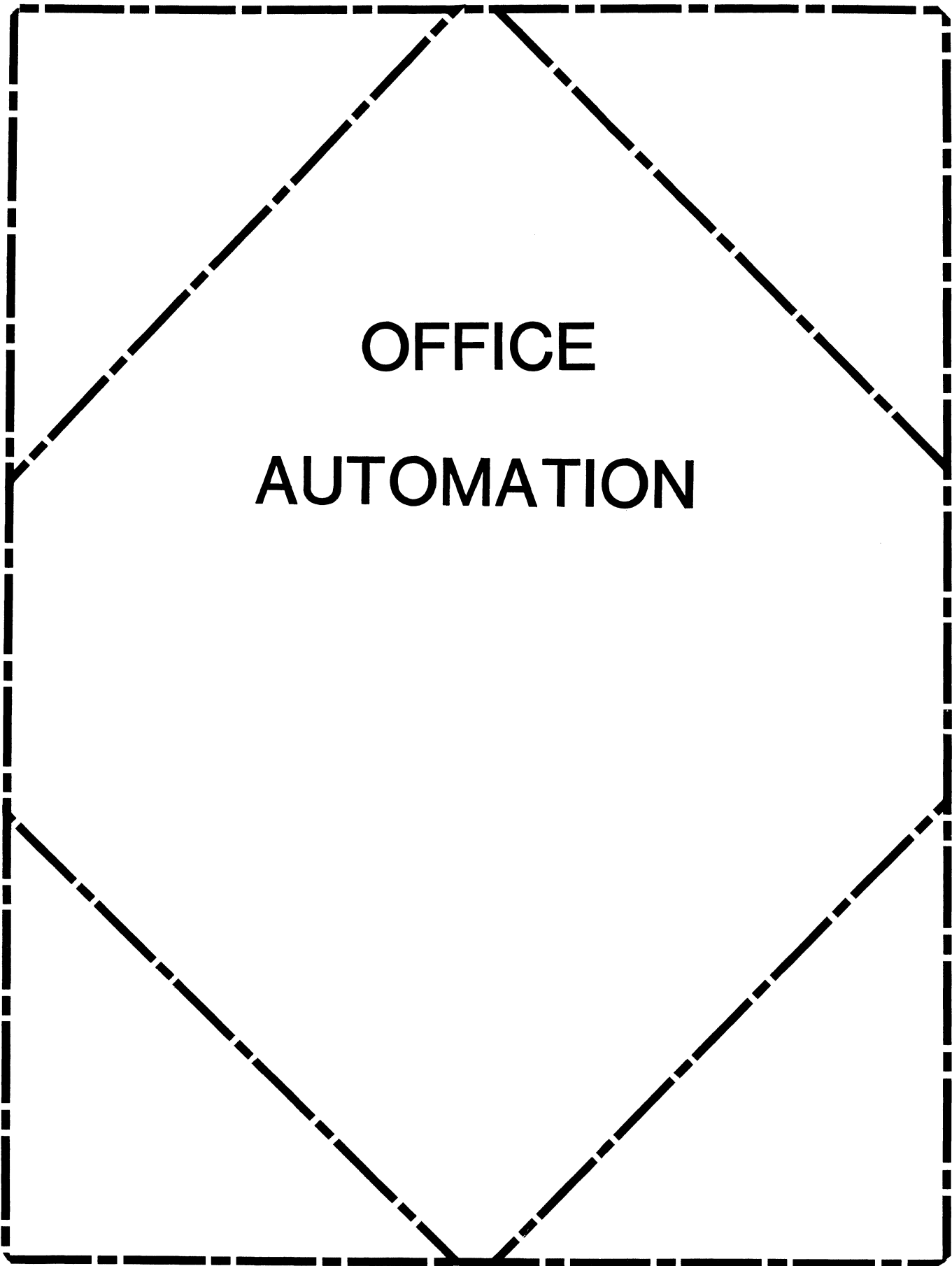
		Login History						Page 1
December 1987			1	1	2	2	3	
		5	0	5	0	5	0	
ALLIN1		+		+		+		
ALLIN1	1 1 +		+	1 1	+	2	1	
ASD		+		+		+		
BROWN	1 5 1 + 4	2 3	3 2	2 4	3 2 2	+	4 4	
JONES	4 6 2 3 + 1 9 4 4 5 7		3 3 2 1	1	6 1 1 2	+		
LEDERMAN	3 6 3 4 +	1	+		2 3 4 4 2	+	2 * 6 4	
SMITH	4 7 1 + 4 1		+		1 2 4 2 2		3 8 3 3	
WILLIAMS	1 * 1 2 + 3 1 1 1		2 2 3 2 1		2 2 1 5 1		5 3 2 1	
MROUTER		+		+		+		
MBMANAGER	1 1 +		+		+	+		
MRMANAGER	1 +		+		+	+		
SYSMGR		+		+		+		
SYSTEM	1 5 4 +		+	1	+	2 2		
SYS_LEDERMAN	6 9 3 6 +	1	+		1 3 3 1 2	+	1 5 * 6 5	
SYSTEST		+		+		+		
SYSTEST	1 +		+		+	+		
		1	1	2	2	3		
		5	0	5	0	5	0	

Footnotes

- 1/ The record definition for SYSUAF was published in "Accessing SYSUAF.DAT and QUOTA.SYS with DATATRIEVE" by Donald E. Stern, Jr. in the DECUS U. S. Chapter SIGs Newsletters, Volume 1, Number 2, pages DTR-12 - DTR-12, October 1985 with an Errata in Volume 1, Number 4, page DTR-18. The record definition is also included in the DTR/4GL SIG Tape Collection.

- 2/ The program is too long to include here. It has been placed in the DTR/4GL SIG Tape collection, which has been on several past VAX SIG Tapes, and is in the DECUS library as V-SP-59. Older releases only convert process deletion records; the newest version, which will be submitted to the Spring 1988 tape copy in Cincinnati, will include conversion of login failures and image accounting, and will also include the procedures shown in this article, the daily batch job command file, the accounting file record definition, etc.

- 3/ This technique was published in the Newsletter (Volume 7, Number 1, pages DTR-4 - DTR-9, September 1985, "Horizontal Bargraphs Without Graphics Devices". The material is also in the DTR/4GL SIG Tape collection.



OFFICE

AUTOMATION

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FROM THE EDITOR...

In this month's issue we have two great technical articles, one sheds a new light on the "Janitor" facility used to keep wastebaskets emptied on a regular basis. The other article discusses ways of keeping your modified scripts, forms, etc. separated from the standard or 'vanilla' parts of ALL-IN-1. It is a follow up to the article Roger submitted last month called "Three Helps for ALL-IN-1 Testing".

Also in this issue (Fanfare please) we have the updated OA SIG TAPE listing. The new listing contains items submitted at and since the Nashville Symposium April 1987 - February 29, 1988). Keep in mind that the tape is now available through your Local User Groups.

I have been very pleased with the quality and quantity of technical articles we have received for publication. I encourage you all to keep up the good work! Remember, you can submit articles at any time: technical or general in nature. I will let you know when it is received and in which issue the article will appear.

As usual I will be attending the Cincinnati Symposium this month. I encourage those of you who are attending to take a moment or two and give me some feedback on the newsletter. I am always interested in your comments, criticisms, suggestions and ideas.

Regards,

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

COULD "JANITOR" BE AFFECTING YOUR SYSTEMS' PERFORMANCE?

Kae Sobczyk, Cooper Tire & Rubber Co.

Regularly running the ALL-IN-1 Janitor is supposed to improve performance by cleaning out and reorganizing user and system data files. However, I recently discovered something that indicates the ALL-IN-1 Janitor may *hurt* your performance.

The Tuning chapter of the ALL-IN-1 Manager's Guide recommends setting global buffer counts for your system data files, based on the maximum number of concurrent ALL-IN-1 users you expect on your system. During installation or upgrade, the procedure prompts for this max users estimate and sets the global buffer counts accordingly.

However, this global buffer count is not propagated to new versions of the files recreated by SMJANITOR. These files are OA\$DATA:DAF.DAT, OA\$DATA:PENDING.DAT, OA\$DATA:MEETING.DAT and OA\$DATA:ATTENDEE.DAT. The SMJANITOR uses FDL files located in OA\$LIB to recreate these system data files, The installation/upgrade procedure does not set the global buffer counts in the FDL files when it sets the counts on the .DAT files mentioned above. Therefore, when SMJANITOR recreates these files, they default to global buffer counts of 0.

I have submitted an SPR requesting a change to the installation/upgrade procedure. In the meantime, you may want to check the global buffer counts on your system data files (with DIR/FULL), and use the SET FILE/GLOBAL_BUFF= command to correct the counts. Recommendations for global buffer count values are in Chapter 9 of the ALL-IN-1 Manager's Guide. You will need to shut down ALL-IN-1 to modify these files. Then use the EDIT/FDL command to modify the FDL files in OA\$LIB that correspond to the system data files.

```
OA$DATA:DAF.DAT => OA$LIB:SDAF.FDL
OA$DATA:PENDING.DAT => OA$LIB:PENDING.FDL
OA$DATA:MEETING.DAT => OA$LIB:MEETING.FDL
OA$DATA:ATTENDEE.DAT => OA$LIB:Attendee.FDL
```

If you have any questions about the problem itself or the solution I have suggested, you can call me at (419) 424-4283.

Kae Sobczyk
Cooper Tire & Rubber Co.
Findlay, Ohio

YOURS, MINE, & OURS

Isolating New and Modified Forms,

Scripts, & Command Procedures

from the ALL-IN-1 Originals

Roger Ellis Bruner, Baptist Foreign Mission Board

INTRODUCTION:

Can the new and modified forms, scripts, and command procedures of customized ALL-IN-1 be kept isolated from the "plain vanilla" ALL-IN-1 versions and yet be properly accessible?

And can ALL-IN-1 users be set up to operate at different "levels" of use, each of which requires a different combination of form libraries, file search order, and TXL search sequence?

We believe the answer to both questions is "yes".

If you read "3 HELPS FOR ALL-IN-1 TESTING" in the February DECUS Newsletter, you know that we have been using an OA\$DEVLIB:DEVOAFORM forms library for development and testing at the Foreign Mission Board. "3 HELPS" describes the need to open and close libraries and to reverse the OA\$TXL_SEARCH_LAST at will. It also gives some details about the two menu screens, TLIB and SETLIB, which perform those functions. You may wish to review "3 HELPS" for some of the details which have been purposely omitted from this article.

Just in the short time since that article was written, we have begun to expand upon the concept of separating the new from the old in the hopes of creating a more flexible ALL-IN-1 environment. The most important change involves the separation of DEVELOPMENT from TEST.

We owe our inspiration for recent work to one of Rick Warford's DECUS sessions. Rick had explained that OA\$LIB: "belongs to" DIGITAL and should be reserved for DIGITAL's use. That started us on the search for an appropriate "where" for new and modified scripts, command procedures, and forms. He also told us about the OA\$FILE_SEARCH_ORDER function, with which we had been unfamiliar. That was our first clue to an appropriate "how". Finally, Rick made us aware of the OAINI.SCP "script" script which runs after the MAIN menu displays. That helped to complete our concept of "how".

The remainder of this article describes the approach we are currently testing. We are anxious to receive your comments about our methods. If you see problems or potential shortcomings or have suggestions otherwise, your reaction will be greatly appreciated.

THREE LEVELS OF USE:

We have three levels of use within ALL-IN-1:

**D DEVELOPMENT
T TESTING
P PRODUCTION**

Each user has been designated as 'D' or 'T' or 'P' in the UFLAG10 field of his or her PROFIL record. The OAINI.SCP opens and then closes the form libraries appropriate for that category of user to assure that future access occurs in a pre-specified order. Only the two libraries actually used in production are left open, thus assuring that each type of user enters ALL-IN-1 in PRODUCTION mode. TEST and DEVELOPMENT users have options to turn their special libraries on, to set the appropriate file search order, and to reverse the TXL search order.

These THREE LEVELS are outlined next in some detail:

1. DEVELOPMENT (by ALL-IN-1 MANAGER & PROGRAMMER)

- a) new and modified forms are developed in the
OA\$DEVLIB:DEVOAFORM library
- b) new and modified scripts and command procedures are
developed in the OA\$DEVLIB: directory
- c) the OA\$TXL_SEARCH_LAST order is reversed
- d) the OA\$FILE_SEARCH_ORDER is set to "OA\$DEVLIB:,OA\$TESTLIB:,
OA\$DO:,OA\$MODLIB:,OA\$LIB:,OA\$DATA:,[]"
- e) libraries are opened in this order:

```
USER
OA$LIB:MANAGER
OA$DEVLIB:DEVOAFORM
OA$TESTLIB:TESTOAFORM
OA$MODLIB:MODOAFORM
OA$LIB:OAFORM
```

2. TESTING (by a QUALITY CONTROL group of 12 users)

- a) new and modified forms that are ready for testing have
been copied to OA\$TESTLIB:TESTOAFORM from
OA\$DEVLIB:DEVOAFORM
- b) new and modified scripts and command procedures that are
ready for testing have been copied to the OA\$TESTLIB:
directory from OA\$DEVLIB:
- c) the OA\$TXL_SEARCH_LAST order is reversed
- d) the OA\$FILE_SEARCH_ORDER is set to
"OA\$TESTLIB:,OA\$DO:,OA\$MODLIB:,OA\$LIB:,OA\$DATA:,[]"
- e) libraries are opened in this order:

```
OA$TESTLIB:TESTOAFORM
OA$MODLIB:MODOAFORM
OA$LIB:OAFORM
```

3. PRODUCTION (the whole user community)

- a) new and modified forms that have been approved for use by
all users have been copied to OA\$MODLIB:MODOAFORM from
OA\$TESTLIB:TESTOAFORM
- b) new and modified scripts and command procedures that have
been approved for all users have been copied to the
OA\$MODLIB: or OA\$MOD directories from OA\$TESTLIB:
- c) the OA\$TXL_SEARCH_LAST order is normal

- d) the OA\$FILE SEARCH ORDER is set to "OA\$MODLIB:,OA\$DO:,
OA\$LIB:,OA\$DATA:,[]"
- e) libraries are opened in this order:

OA\$MODLIB:MODOAFORM
OA\$LIB:OAFORM

COMPILING SCRIPTS:

In order to separate new and modified scripts from the original versions and still be able to compile them for the production environment, we maintain an OA\$ORIGDO: directory which contains all of the original OA\$DO: scripts. To compile the TXL, we delete everything from OA\$DO:, copy in everything from OA\$ORIGDO:, and then copy in everything from OA\$MODDO:, overlaying and replacing any original versions that exist.

This same method applies to OA\$BLP: and OA\$SCP:, since they contain boilerplates and "script" scripts which are compiled as part of the TXL.

However, boilerplates and "script" scripts are *developed* in OA\$DEVLIB: and tested in OA\$TESTLIB:. Because of the File Search Order and the reversal of the TXL Search Last order, newer versions will be "found" ahead of older, previously compiled versions. Thus, we feel it would be fruitless to maintain OA\$DEVBLP:, OA\$TESTBLP:, OA\$DEVSCP:, and OA\$TESTSCP: directories.

OAFORMS & MEMRES:

We anticipate no real need to recompile or reinstall the OA\$LIB:OAFORM forms library as part of the forms modification process, since it will never contain anything but the original "plain vanilla" forms.

However, there is a very small number of new or modified forms which we must put in OA\$LIB:MEMRES simply because they won't work anywhere else. For example, we must put in MEMRES the screen which contains the options ũfor switching between PRODUCTION and TEST or PRODUCTION and DEVELOPMENT modes. Otherwise, the user might easily end up closing the library which contains that screen!

KNOWN PROBLEMS:

Known problems with this approach have been few so far.

The ALL-IN-1 MANAGER account will not initialize with the correct library sequence in spite of the fact that it seemingly goes through the exact same process other accounts go through. No account other than MANAGER has ever failed. Our concern is whether one could. The HOTLINE is working on this problem.

Also, should a DEVELOPMENT user switch a number of times between DEVELOPMENT, TEST, and PRODUCTION mode, the library sequence can get out of sync. This problem is avoidable.

ALL-IN-1 UPDATES & RELEASES:

We hope to save a great deal of time, effort, and frustration when we install an update or new release of ALL-IN-1. By copying the new ALL-IN-1 files to appropriate OA\$ORIGxxx directories and then laying our changes over the new ALL-IN-1 files in their normal directories, we hope to have a minimum of actual changes to make.

Careful study of the documentation for the new release should help us determine what new options or modified functions we may need to revise our versions to include.

OA SIG TAPE:

For your convenience, the files related to "3 HELPS" and to "YOURS, MINE, & OURS" can be found in the [.OA88A.BRUNER.A_ONE_HELP] subdirectory on the new OA SIG TAPE.

CONCLUSION:

We hope to maintain separation (and therefore control) over what is "YOURS" (DIGITAL originals), "MINE" (our originals), and "OURS" (modifications to DIGITAL originals) for forms, scripts, and command procedures through use of the approach described in this article.

By opening form libraries in a specified sequence and by setting the OA\$TXL_SEARCH_LAST and the OA\$FILE_SEARCH_ORDER, we plan to designate three different levels of ALL-IN-1 use at the Foreign Mission Board.

=====

APPENDIX:

```
!      OAINI.SCP
        .function get $syslogin=log$sys$login
        .function get #in = oa$date_nbs
        .FUNCTION DO OA$MODLIB:LIB_SWITCH
        .function get #out = oa$date_nbs
```

ABOVE: The OAINI.SCP runs after the MAIN menu displays. Here it performs a "do" script basically to establish the library access order (see LIB_SWITCH below).

#IN and #OUT are local symbols used to capture the time at the beginning and end of this script. We use a "compute #time = #out - #in" to calculate how long the procedure takes per type of user. That also allows us to test the effects of modifications to the script coding.

```
!      LIB SWITCH.SCP
oa$flo_close_lib oa$lib:oaform
dump_cache
get #lib_type= profil.uflag10[oa$user]
.if #lib_type eqs "p" then .goto p
.if #lib_type eqs "t" then .goto t
.if #lib_type eqs "d" then .goto d
.goto p
.label d
get oa$function="oa$flo_open_lib " oa$profil_direct "user"
oa$flo_open_lib oa$lib:manager
oa$flo_open_lib oa$devlib:devoaform
oa$flo_close_lib oa$devlib:devoaform
.label t
oa$flo_open_lib oa$testlib:testoaform
oa$flo_close_lib oa$testlib:testoaform
.label p
oa$flo_open_lib oa$modlib:modoaform
oa$flo_open_lib oa$lib:oaform
dump_cache
get oa$file_search_order="--
"oa$modlib:,oa$do:,oa$lib:,oa$data:,["
.exit
```

ABOVE: Pay particular attention to the libraries that are opened for each type of user. Notice also which ones are subsequently closed. This procedure is necessary to "cement" the library order for later use. Then the DEVELOPMENT and TEST users use options of the LIBMODE screen to place their account in the desired MODE.

SETLIB	MY Manager Library On	
	MN Manager Library Off	NEWLIB
	NM NEWLIB Manager Library	
OY Oaform Library On	UY User Library On	
ON Oaform Library Off	UN User Library Off	
NO NEWLIB Oaform Library	NU NEWLIB User Library	
MOY ModOaform Library On	SY Specific Library On	
MON ModOaform Library Off	SN Specific Library Off	
NMO NEWLIB ModOaform Library	NS NEWLIB Specific Library	
DY DevOaform Library On	TY TestOaform Library On	
DN DevOaform Library Off	TN TestOaform Library Off	
ND NEWLIB DevOaform Library	NT NEWLIB TestOaform Library	
FST Set FILE SEARCH Testing	DC Dump Cache	
FSD Set FILE SEARCH Development	FLS Form Libraries Search	
FSP Set FILE SEARCH Production	LL List Libraries Open	
FSO Show FILE SEARCH Order	TXL 0	

ABOVE: Form SETLIB has been updated from "3 HELPS". It is used by DEVELOPMENT users only. See "3 HELPS" for more information as well as excerpts of Named Data from SETLIB.

LIBRARY MODE MENU

T	TEST LIBRARY On	Open Library:
P	PRODUCTION LIBRARY On	PRODUCTION
TXL1	Reverse Script Order	
TXL0	Normal Script Order	TXL Status:
LL	List Libraries	NORMAL
FSO	File Search Order	

ABOVE: Form LIBMODE replaces form TLIB as described in "3 HELPS". It is used by both DEVELOPMENT and TEST users to switch back and forth between PRODUCTION and DEVELOPMENT or TEST mode. Entering 'T', 'D', or 'P' causes the proper libraries to be opened or closed, the File Search Order to be set correctly, and the TXL search order to be

established. 'D' is a "hidden option". See "3 HELPS" for more information and excerpts from the Named Data on LIBMODE (TLIB).

```
$255$DUA8:[ALLIN1.LIB]MEMRES.FLB;
-- .FLB open=1, .FLC open=1, Forms=47, Ref count=4
$255$DUA4:[ROGERB.OA]USER.FLB;
-- .FLB open=1, .FLC open=1, Forms=8, Ref count=0
$255$DUA8:[ALLIN1.LIB]MANAGER.FLB;
-- .FLB open=1, .FLC open=1, Forms=46, Ref count=0
$255$DUA8:[ALLIN1.DEVLIB]DEVOAFORM.FLB;
-- .FLB open=0, .FLC open=0, Forms=0, Ref count=0
$255$DUA8:[ALLIN1.TESTLIB]TESTOAFORM.FLB;
-- .FLB open=0, .FLC open=0, Forms=0, Ref count=0
$255$DUA8:[ALLIN1.MODLIB]MODOAFORM.FLB;
-- .FLB open=1, .FLC open=1, Forms=69, Ref count=0
$255$DUA8:[ALLIN1.LIB]OAFORM.FLB;
-- .FLB open=1, .FLC open=1, Forms=407, Ref count=1
```

Open libraries are indicated by '--.FLB open=1'. Press RETURN to continue.

ABOVE: The OA\$FBT_LIST_LIBTREE functions serves to monitor the access order and status of all form libraries within the current session ('LL' option on SETLIB and LIBMODE). Above is a sample of output from this function for a DEVELOPMENT user upon initial entry into ALL-IN-1. Note that the libraries maintain their place in order in spite of whether they are open or closed.

A SUMMARY OF OUR ALL-IN-1 DIRECTORIES:

```
OA$LIB: OA$DO: OA$BLP: OA$SCP:
=====
OA$ORIGLIB: OA$ORIGDO: OA$ORIGBLP: OA$ORIGSCP:
OA$DEVLIB: * * *
OA$TESTLIB: ** ** **
A$MODBLP: OA$MODDO: OA$MODBLP: OA$MODSCP:
```

* OA\$DEVLIB is used

** OA\$TESTLIB
is used

NEW SIG TAPE NOW AVAILABLE

Roger Bruner, Foreign Mission Board

The latest tape is an updated version of the OA SIG tape made available after the 1987 Spring DECUS in Nashville. The previously released material is in directory [.OA86B].

Please note that some of the NEW material consists of updates and revisions to material in [.OA86B].

The NEW material (April 1987 through February 29, 1988) is in directory [.OA88A] and includes the following subdirectories and topics. (For more specific and detailed information, please refer to the AAAREADME.TXT in each directory/subdirectory.)

Many thanks to the submitters from all of us in the OA SIG!

I. [.BRUNER]

- (A) [.ANSWER_FILE_OR_DELETE] An ALL-IN-1 script to enable the user to dispose of the Original mail message as part of the Answer procedure
- (B) [.A_ONE_HELP] Contains articles "3 HELPS" and "YOURS, MINE, & OURS" and related forms, scripts, and command procedures
- (C) [.INTERFACE] An ALL-IN-1 application for controlling access to ALL-IN-1 functions, DCL commands, and external applications
- (D) [.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)
- (E) [.NEXT_OR_PREVIOUS] Two ALL-IN-1 functions for locating the next or the previous document in numeric sequence from the current document
- (F) [.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
- (G) [.SYS_DICT] An ALL-IN-1 facility for creating and using site-specific System Dictionaries
- (H) [.SYS_UDP] An ALL-IN-1 facility for accessing User or System UDP's

Roger E. Bruner
Foreign Mission Board, S. B. C.
P. O. Box 6767
Richmond, VA 23230
(804)353-0151, ext. 606

II. [.COY]

- (A) [.COLORS] A package for managing and setting "default" colors for VT-241 and VT-340 terminals (revision of previous version)

- (B) [.DM\$SD] An extensive revision of the Hayre/Gregory Directory Management package (updated)
A revision of Alan L. Zirkle's SET DEFAULT program (updated)
- (C) [.MAKE_TLB] Procedures for making a DXC Compressed Text Library from all "text" files in a directory
- (D) [.MCL] Two programs for producing multi-column listings
- (E) [.SHOWME] Program which provides users with node, terminal, and process information
- (F) [.VAXNOTES] Some useful things for systems running VAXNOTES
- (G) [.WPE] A "complete" and extended implementation of WPSPLUS (TM) for editing ASCII files, including some language sensitive features for .COM files
- (H) [.WPELSE] An implementation of WPSPLUS (TM) for LSE
Dale E. Coy
E-8, MS/J957
Los Alamos National Laboratory
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Los Alamos, NM 87545
(505)667-3270

III. [.GILBERT]

- (A) A hierarchical Employee Data phone directory and database, which replaces "ALL" and "COR" phone directories under ALL-IN-1
- (B) [.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 8 lines per inch, and will count incorrectly when using "GOLD PAGE" (if down-line load fonts are available)
- (C) [.SWP] A Shared Word Processing System under ALL-IN-1

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Seattle, WA 98124-2499
(206)773-1795

IV. [.IOELE]

- (A) [.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

Tony Ioele
Technical Software Specialist
ARA Services, Inc.
The ARA Tower
1101 Market Street
Philadelphia, PA 19107

V. [.LEDERMAN]*

- (A) [.ACCOUNTING] Programs to convert System Accounting and PSI Accounting data to a normalized form readable by DATATRIEVE and other languages with record definitions
- (B) [.ALLIN1] Contains DTR definitions to work ALL-IN-1 logging and data files; document database also works with WPSPLUS/VMS (revised)
- (C) [.CORPHONE] DTR replacement for ALL-IN-1 corporate phone directory
- (D) [.FUNCTIONS] User defined functions; DTR procedures for cataloging, defining, and generating functions
- (E) [.NEWSLETTERS] Past issues of the Wombat Examiner Newsletter
- (F) [.PLOTS] Additional PLOTS and articles on adding your own plots
- (G) [.RECALL] Uses SMG to provide command line recall in DTR; plus DAB definitions in "C", Macro-32
- (H) [.RSX_ACCOUNTING] Process RSX-11M-PLUS system accounting and RSX console logs with DTR
- (I) [.SESSIONS] Transcriptions of some Symposia sessions
- (J) [.SIXEL] A program to convert ReGIS to SIXEL
- (K) [.SYSMGR] DTR definitions for Disk Quotas, SYSUAF, etc.; procedures to record user login history and terminal /line usage

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*Bart's submissions are also part of the DATATRIEVE/4GL SIG Library Collection (V-SP-59). Because of the relevance of this material to Office Automation, he was asked to share with the OA SIG as well.

VI. [.ROTH]

- (A) [.LG02] Allows use of available fonts resident in LG02 line printer with ALL-IN-1
- (B) [.PENDING] Shows ALL-IN-1 PENDING file by user-specified number of pending messages
- (C) [.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
- (D) [.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
- (E) [.TODO] Sorts "to do" list in ALL-IN-1 by priority and number; results may be displayed or printed

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PERSONAL COMPUTER SPECIAL INTEREST GROUP



NEWSLETTER

PC

CHAIRMAN'S COLUMN

By Lynn Jarrett, PC SIG Chair

Here it is--time for another great DECUS symposium--and the PC SIG is raring to go.

The sessions by the SIG this month are yet another round of excellent offerings by Digital Equipment and Digital Equipment users as well as some other "outsiders" who are entering the world of Digital and its customers.

The PCSA sessions are a great mix of varying degrees of technical expertise and interest ranging from a user panel on the subject to a "Configuration Considerations for Better Performance" session. There will also be sessions on MS-Windows. We are just offering attendees more of the same of what they have requested from the last symposium.

Additionally, there will be some very interesting VAXstation sessions of interest across several SIGs within the user community. Mark Sebern of Sebern Engineering, a member of the PC SIG, is giving several of these sessions and we welcome him bringing his technical expertise and assistance back to Symposia again and again.

From the Macintosh world, we are pleased to have the president of Pacer Software, Garth Conboy, present a session on the Mac to VAX connection, and I'm sure that our keynote speaker, Bob Soucy of Interleaf, will give an outstanding presentation in his session on the use of desktop publishing applications in the Macintosh and VAXstation world.

Sessions on the Rainbow, PRO and the DECmates are also going to be of interest to many DECUS attendees and I'm sure these sessions will be well attended by all, as usual.

During the week of Symposia, our SIG puts on an excellent Magic session, hosted and chaired by our own Fritz Howard, (VAXmate Working Group Chair), and it is always a resounding success. Users get together and share war and horror stories, and it's a most fun event. Following Magic, we host a party in the SIG suite that is always a popular event at DECUS with attendees from many SIGs, at which prizes are awarded for the winners of Magic.

Digital Equipment Corporation has been most supporting of the PC SIG, and we are grateful to counterpart Anita Uhler from the PCSG group, and to Jeff Slayback, our PRO counterpart, for all their support and assistance in their work with this SIG. Without them and our troop of great volunteers, this SIG wouldn't exist.

Hopefully you may make it to DECUS and visit our Campground with all the equipment we have to display and to try out if you like. The vast array of different devices and software represents the varying interests and uses of equipment that is supported within the PC SIG. These devices include a VAXmate, Rainbow, PRO, VAXstation 2000, Macintosh, and more. They also will be networked to their own MicroVAX using via PCSA. And you may be surprised as to the software that will be running on these machines.

Jim Hobbs is our excellent Campground Coordinator and I want to thank him here for his outstanding job in gathering all of this hardware and software together so that symposia attendees can gather together and enjoy the use of the equipment as well as a meeting and "camping out" place.

Jimbo Wilson, our new Symposia Coordinator, has done an excellent job of putting together the sessions, recruiting both the session speakers and session chairs and a lot of behind the scenes work that has to be done by the person in this position. And on behalf of the entire SIG, I want to thank him for all his work in this area as well as the assistance he gave to Jim Hobbs in his role as Campground Coordinator.

Ken Stricker, our button and art coordinator, and a new volunteer in our organization, worked hard to get our art work ready for the T-shirts being sold in the DECUS store as well as the art for all the buttons and the

Volunteer mugs and this work was appreciated by all.

Another new volunteer who has come on board with us is Tim Bundrick, our new seminars representative, and his work in this area is going to prove to be extremely valuable to us and DECUS.

Our newsletter editor, Gary Rice, is doing a lot of work behind the scenes what with editing the material he gets for the newsletter (I don't know what we'd do without him), as well as producing several articles himself, and, additionally, serving as a moderator on DECUServe. Many thanks to Gary for a great job.

Another behind-the-scenes job that may go unnoticed by many, but certainly not by the SIG steering committee and the buyers of the session notes is that of our Session Notes Editor. Tom Warren has been serving in this position for a year now and is doing a great job.

Other hard workers in our SIG include Tom Hintz, VAXstation/PRO/MAC Working Group Chair and Vince Perriello, Rainbow/Decmate Working Group Chair. They recruit sessions and speakers or DECUS and field a lot of calls from the users in their area of expertise. Also, too, thanks to Ken LeFebvre for his representation of the PC SIG on the Comm Comm Committee. A lot of work goes on here on behalf of the newsletter.

We are always looking for additional volunteers and still have some steering committee positions available. We welcome anyone who wants to join our team. I have to say it's a fun team of which I'm proud to be a part.

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PRO/TOOL KIT FORTRAN-77 V5.0/V5.2 COMPATIBILITY PROBLEMS

By Digital Equipment Corporation

With the release of PRO/Tool Kit FORTRAN-77 V5.2, two problems have been encountered.

1. The vectored entry points into the resident library, are different between V5.0 and V5.2. Because of this, tasks built with V5.2 will fail or function improperly if they are run on a system that does not have V5.2 OTS installed.

2. A problem in the Task Builder caused the V5.0 Library to be built improperly. This problem causes tasks built with V5.0 to be un-installable on a system that has V5.2 installed.

To correct these problems, follow the procedure below after PRO/Tool Kit FORTRAN-77 V5.2 is installed.

1. Log into a privileged account on the PRO.
2. Enter the PRO/Tool Kit application.
3. At the "\$" prompt, Enter the following three commands:

```
$ RENAME LB0:[1,5]PROF77.TSK LB0:[1,5]F77V52.TSK
$ RENAME LB0:[1,5]PROF77.STB LB0:[1,5]F77V52.STB
$ COPY LB0:[1,5]F77V52.TSK LB0:[ZZSYS]
```

This will give unique names to the files supplied with PRO/Toolkit Fortran V5.2.

4. Place the diskette labeled

PROUTILV2 for P/OS V2.0 or V2.0A systems,
PROLIBRV30 for P/OS V3.0 or V3.1 systems, or
PROLIBRV32 for P/OS V3.2 systems

into diskette drive 1 and enter the following command:

```
$ COPY DZ1:[ZZSYS]PROF77.TSK LB0:[ZZSYS]PROF77.TSK
```

This places the V5.0 OTS into [ZZSYS] so that applications built with V5.0 will continue to operate correctly.

5. The system should now be re-booted.

TASK BUILD COMMAND FILE MODIFICATIONS

The task build command files for programs using PRO/Tool Kit FORTRAN-77 should be modified to change the cluster library references from PROF77 to F77V52. Using an editor modify the line that begins:

```
CLSTR=PROF77,
```

to read

```
CLSTR=F77V52,
```

You should now task build the program with the renamed V5.2 files.

INSTALLATION COMMAND FILE MODIFICATIONS

If the program has a .INS and/or a .INB file, they should be modified as described below. The V5.2 OTS must be placed on the application diskette, so that the application can be run on a system that does not have PRO/Tool Kit FORTRAN-77 V5.2 installed.

- For a .INS file, add the following lines

```
FILE [ZZSYS]F77V52.TSK/KEEP
INSTALL [ZZSYS]F77V52.TSK/LIBRARY
```

- For a .INB file, add the following lines in the appropriate locations:

```
FILE [ZZSYS]F77V52.TSK/KEEP/CLUSTER
INSTALL [ZZSYS]F77V52.TSK/LIBRARY/CLUSTER
```

You should now use the Application Diskette Builder to re-build the application diskette(s). If you do not use ADB, then make sure that you place a copy of F77V52.TSK in directory [ZZSYS] of the appropriate diskette.

PROgramming Quickie - Reading the TYPEAHEAD Buffer

By Gary Rice, PC SIG Newsletter Editor

In the March '88 issue, the PROgramming Quickie detailed how to "fake" an AST in FORTRAN. One of the problems with that program sample was its inability to process the QWERTY keys properly. This was caused because the program had no way to know how many characters were waiting to be processed. The QIO call that was used expected a particular character to signal that the last character had been read. That character was NOT one of the QWERTY characters.

To allow literally ANY keystroke to be honored as an "AST" trigger, it is necessary to know how many characters to read. To find out, it is necessary to examine the contents of the TYPEAHEAD buffer.

You can use the knowledge of what is in the TYPEAHEAD buffer for other things as well. For example, EDT examines the TYPEAHEAD buffer to avoid displaying things unnecessarily. Synergy does the same thing.

This month's Quickie illustrates how to find out if anything is in the TYPEAHEAD buffer and if there is, it reads the contents into a program buffer.

C TYPAMD.FTN - This program reads the contents of the TYPEAHEAD buffer

C

C ORIG VERS: 1.0

C

C CURR VERS: 1.0

C

C AUTHOR: Gary Rice

C

C CREATED: March 6, 1988

C

C REVISIONS: None

C

C INPUTS: None

C

C OUTPUTS: None

C

C NOTES: None

C

C*****

C

PROGRAM TYPAMD

C

```

C
    BYTE BUFFER(36), CHARS(2)
C
    INTEGER*2 PARM1(6), PARM2(6), STATUS(2)
C
C
C A call to the system WAIT routine will allow you to actually put something
C into the TYPEAHEAD buffer so you can retrieve it
    CALL WAIT (2,2)                ! Wait for 2 seconds
C
C The TYPEAHEAD buffer is queried via a call to the terminal driver's "Get
C Multiple Characteristics" (SF.GMC) function
    CALL GETADR (PARM1(1),CHARS) ! Get the addr of the CHARS buffer
    CHARS(1) = "71"              ! Set the "TC.TBF" bit
    PARM1(2) = 2                  ! CHARS is 2 bytes long
C
C Issue the "Get Multiple Characteristics" QIO on LUN #5
    CALL WTQIO ("2560,5,5,,STATUS,PARM1)
    IF (CHARS(2) .EQ. 0) GOTO 999 ! If zero, the TYPEAHEAD buffer is empty
C
C Set up to READ the TYPEAHEAD buffer using the "Read passing all data bits"
C form of the QIO
    CALL GETADR (PARM2(1),BUFFER) ! Get the program buffer address
    PARM2(2) = CHARS(2)           ! Tell QIO how many bytes are waiting
    PARM2(5) = 1                  ! Read only "block 1"
    CALL WTQIO ("1010,5,5,,STATUS,PARM2) ! Do it on LUN #5
999    CONTINUE
    END

```

The command file that I used to link this program is as follows:

```

TYP AHD/CP/FP=TYP AHD
LB:[1,5]PROF77/LB
/
;
;EQUATE P/OS SYMBOLS TO LUNS
;
GBLDEF=TT$LUN:5
GBLDEF=WC$LUN:0
GBLDEF=MS$LUN:4
GBLDEF=FL$LUN:0
GBLDEF=HL$LUN:0
GBLDEF=MN$LUN:0
;
; DEFINE EVENT FLAG
;
GBLDEF=TT$EFN:1
;
; DEFINE CLUSTER SCHEME
;
CLSTR=PROF77,POSRES,RMSRES:RO
//

```

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

An Introductory Guide to the Professional 300 Video Bitmap

By Thomas R. Hintz, S. Sachs and Kefeng Chen, Institute of Food and Agricultural Sciences, University of Florida

Introduction

1.1 Intent

The Professional 300 computer has proven to be an excellent graphics workstation. The use of GIDIS graphics is straight forward and easy to use, CORE graphics is only slightly more complex. However, to take full advantage of the graphics capabilities of the PRO requires a knowledge of directly addressing the bitmap. The intent of this document is to provide an introductory explanation of the workings of the PRO/300 screen bitmap. This information was accumulated through trial and error as a result of our need to improve the graphical performance and capability of our programs.

While I try to explain some of the arcana known as "mapping to the I/O page", I can't say why certain things work the way they do. This is because I either have not been able to find it referenced in the plethora of documentation (see appendix A), or maybe it has not been documented. Consequently, some of the information provided is based on experimentation.

Although quite a bit of technical information is provided textually, some things are more easily demonstrated than explained. Therefore, the source code for several graphics demonstration programs that manipulate the contents of the bitmap are also available (see appendix D). Reference to these programs are made throughout this document. The last chapter of this document provides instructions for various actions that can be performed with the programs. If you are interested in a copy they can be obtained by sending four RX50 diskettes and a self-addressed stamped envelope to the author.

1.2 Hardware Requirements

The documentation and sample programs assume that you have a PRO/350 with an Extended Bitmap Options card and a color monitor. However, if you have a different configuration, you should still find enough information in this guide and the noted references to deduce the proper manner for playing with your system.

If you have a PRO/380, you will need to refer to the Professional 300 Series Technical Manual for the proper bitmap addresses for your machine.

1.3 Languages

Most bitmap accesses require 1 APR (active page register), while the fancier screen saves/restores from a region or file requires 3 APRs. Since a task has allocated to it 8 APRs (each APR may address 4kw, hence $8 \times 4 = 32\text{kw}$, the maximum task size), each APR used by you leaves less room for your own code and data. (Note that high-level languages like FORTRAN and PASCAL require at least one APR for their run-time libraries).

For this reason, the bitmap manipulating code is usually written as a MACRO task, and other tasks (of any language) can then spawn the MACRO task. Or, if your needs are simple, you might just write the whole program as a single MACRO task.

If your application is not large or is well overlaid, you may get by with a higher-level main routine with high-level subroutines and MACRO subroutines to handle the bitmap. In most cases, you will be restricted to MACRO bitmap-handling routines unless you can wring its addressing modes out of PASCAL or C.

The sample programs available from the authors use MACRO subroutines to access the bitmap. This was done so that the subroutines may be used with just about any high-level language. This is a lot easier than writing the same routines two or three times in different languages.

1.4 What is the Bitmap

The bitmap is the region of PRO memory set aside to contain all of the information necessary to display everything that appears on the monitor screen, which may include text and/or graphics. This region also indicates the color of every pixel that makes up the text and graphics in the display.

The PRO comes with one plane of the bitmap. This allows the computer to display either black or white text and graphics. No shades of grey are possible with only one plane.

1.5 The Bitmap Options Card

Available separately, the addition of the extended bitmap options card (EBO) provides two more bitmap planes, thereby allowing shades of grey on a monochrome monitor and color on a color monitor.

THE BITMAP

2.1 Partition and Region

The bitmap video (BMV) memory occupies a partition called BITMAP, and the system video handler creates a region called TFWBMP (terminal firmware bitmap) to fill it.

- A partition divides the physical memory into separate, distinct work-areas for handling by a particular processor or controller. A task may specify the partition it wishes to access. The typical application resides in and makes use of the GEN (general) partition.
- A region is a portion of physical memory within a partition to which a task has access. The task may read or write (depending upon the privilege bestowed upon the region by its creator) any data it wishes to a region.

BITMAP is set up in such a way that another application can also attach to the region TFWBMP and map to all or a portion of it. Or, an application can use certain registers provided by the BMV (discussed in Chapter 3) to manipulate this region data.

If your application simply attaches to the TFWBMP region, the application can read and write to it; however, this limits the images appearing on the screen to whatever the current attributes are. If you wish to draw with different colors, for example, you must set and pass data through the BITMAP registers. The demonstrations and discussions in this document refer to the more structured approach of manipulating the bitmap data via its provided registers.

The BMV data is the first 30kb of the 32kb associated with TFWBMP. The least significant portion of the first word of the region corresponds to the upper left corner of the screen.

If there is an EBO in the system, all three planes of memory share the same 32kb bus address space; the plane you wish to access is specified at the time the request or data is sent.

2.2 Video Resolution

The video hardware normally displays an image with a resolution of 1024 by 240 pixels (1024 times 240, divided by 8 is 30kb of data) per provided plane. This means that a non-EBO system displays black or white pixels only (pixel on/off), and an EBO system can display eight colors or grey levels at a time (pixel on/off for 3 planes = $2 \times 2 \times 2 = 8$ colors); black (pixel off) is included as a color in the above calculations.

If you reduce the horizontal resolution from 1024 to 512 pixels, two memory bits control each pixel; the pixels are displayed twice as big by the video controller and each pixel can now have four grey levels for a monochrome system or 64 colors in a color system.

Further reduction of resolution from 512 to 256 pixels yields four memory bits per pixel; the pixels are now displayed four times as big as compared to the 1024 mode, and 16 grey levels or 4096 colors may be specified.

Note: This reduction of resolution to provide more colors is also known as "folding the bitmap."

<u>Res.</u>	Pixel Size	Each Bit Controls	Monochrome/ Color Values per Plane	Total Mono Choice	Total Color Choice
1024	1:1	1 pixel	0-1 0-1 0-1	2	8
512	2:1	2 pixels	0-3 0-3 0-3	4	64
256	4:1	4 pixels	0-15 0-15 0-15	16	4096

Table 2-1 Horizontal Resolution and Associated Color Values

Note: Monochrome grey scale is determined by the BMV controller based upon plane values; while you have as many choices as for color, the controller will round to the nearest grey-scale.

Note: $(1024 \times 1) = (512 \times 2) = (256 \times 4)$. The 1, 2, and 4 come from the "Each Bit Controls" column.

THE BITMAP REGISTERS

3.1 Introduction

Normally, you use the provided graphics libraries (CORE Graphics or GIDIS) to draw on the screen, and text is placed on the screen via print or write statements.

If you wish, you may bypass the above libraries and handle all bitmap manipulations yourself. This is more primitive than CORE or GIDIS in that if you want to draw a line, you must set all of the pixels for the line yourself, for example.

All communication with the BMV is performed through certain system- maintained registers. With these registers, you may place data into and read data from the bitmap.

WARNING

Improper use of the video registers may crash your system. If you try to compete with P/OS in accessing the BMV, you will lose. You must plan this out so that your application does not access the registers at the wrong time or try to dictate the use of the registers for other applications you did not write.

Note

"Crashing your system" as mentioned above only means that you will have to turn the PRO off to clear memory; toying with the BMV does not harm your hardware.

Note

Because register access of the BMV bypasses the provided methods for drawing to the screen, neither Print Screen, GIDIS, nor CORE graphics will be notified of any access or manipulations your program may perform. Therefore, subsequent use of the above mentioned items may produce unknown results until the screen is fully cleared (like with a terminal-reset escape sequence).

3.2 Where Are the BMV Registers?

A task cannot just start playing with the BMV registers. You must tell the system what you plan to do.

Normally, a task's data will be placed in and region-mapping will occur in the (default) GEN partition. You must indicate that you want read/write access to the BITMAP partition.

Also, the BMV registers do not reside within your task's reach as, say, registers 0 through 7 are to a MACRO programmer. You must indicate that you are going to use the BMV registers that are located along the BMV control bus.

In the PRO's CTI (Computer Terminal Interconnect) architecture, as on other PDP-11 buses, devices are controlled via device registers which appear as memory in the top 8 kb (the I/O page) of the bus address space. Note: 4 kb of ROM is in the I/O page, so only 4 kb out of the 8 kb is potentially writable.

The I/O page addresses extend from 17760000o through 17777777o. (This is 4096o words or 8 kb.)

Unlike those on UNIBUS and the Q-bus devices, the device registers on a CTI device do not have fixed addresses on the bus. Instead, each option slot has a 128-byte device register address space, the location of which can be found in the table below:

Slot	I/O Option Slot Page Addresses
0	17774000-17774177
1	17774200-17774377
2	17774400-17774577
3	17774600-17774777
4	17775000-17775177
5	17775200-17775377

Table 3-1. PRO/350 Option Slot Addresses

Note: Addresses are in octal. While slots 0-7 may be mentioned, there are only 6 physical slots (0-5) available.

The registers for a given module will appear at the fixed displacement within the address space of the slot the module is in.

The registers associated with the bitmap are for the plane 1 bitmap card that comes with all PROs. Even if you have an EBO, you will still send your instructions through the plane 1 bitmap card registers; the system will handle accessing the EBO card.

Therefore, before you can access the BMV registers, you need to know what slot the plane 1 card is in. In this manner, you can determine the slot address. You may then access the registers through the resident common CTPAGE, which covers the I/O page for each slot. CTPAGE contains readable and/or writable data; the BMV slot registers are a part of this data:

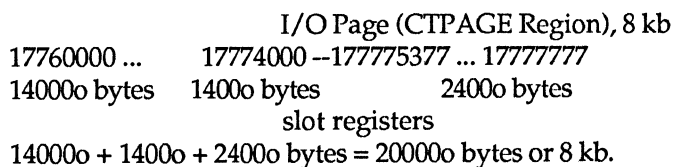


Figure 3-1. I/O Page/CTPAGE Region Layout

3.2.1 SLOTTEST

The SLOTTEST program searches for the bitmap card by examining each slot in the card cage until it finds a card ID of 1002o (the BMV card's ID). The actual subroutine that performs the search is called IDSLOT (compares slot ID's), and it is used by other demo programs.

SLOTTEST maps APR 5 to CTPAGE in order to gain access to the I/O page.

Note

To recap, this means we will be accessing the bitmap data through the bitmap registers; the bitmap registers are in the CTPAGE region. Therefore, we are NOT attaching to or manipulating the TFWBMP region data directly. We are letting the registers handle the TFWBMP data.

3.3 Mapping to the Bitmap Video Control Registers

Once you have determined the BMV slot, you can map to the video controller registers (VCRs) through an APR. The APR you use may be arbitrary if your task is all in MACRO; if you use a higher-level language, you must be aware that the lower APR values are usually used by the run-time libraries (for run-time error posting, file I/O, etc.).

The sample programs all use APR 5 to map to the VCRs since that APR seems to be relatively free -- as long as you don't have so much code or data that that APR is necessary.

As you can see, this is a matter of trial and error.

Anyway, to map to the VCRs, you need to calculate an address using the slot address and the APR. Each APR can access a certain virtual address, as listed below.

APR No.	Virtual Address Range	K Words
0	000000 - 017777	00 - 04
1	020000 - 037777	04 - 08
2	040000 - 057777	08 - 12
3	060000 - 077777	12 - 16
4	100000 - 117777	16 - 20
5	120000 - 137777	20 - 24
6	140000 - 157777	24 - 28
7	160000 - 177777	28 - 32

Table 3-2. APR and Virtual Address Correspondence

Note: Addresses are in octal.

To get the VCR base address, use the following formula:

- (a) Remove the leading "1777" from the slot address and replace it with "1". (This is done to turn the 22-bit address into a 16-bit address.)
- (b) Add octal value from (a) to the beginning APR virtual address range.

If, for example, the BMV card was in slot 2, and APR 5 is to be used, (a) would be 14400 and (b) would be $14400 + 120000 = 134400$.

If a program were to use APR 4 and slot 2, (a) would be 14400 and (b) would be $14400 + 100000 = 114400$.

Your choice of APR will typically not change from one run to the next, so this value is usually put in code as a constant.

Note

You might think that the higher the APR, the "closer" that APR's address should be to the CTPAGE region that's sitting in the top 8 kb of memory, and hence the calculated APR and slot address figure should be getting smaller. But as you can see, using APR 5 gives you a figure (134400) that's higher than if you used APR 4 (114400). So, you might think that the APRs are lined up in reverse or something. This is not true, either.

Actually, I could not find an explanation anywhere that stated why these numbers are used this way at all; but, they were always used this way. If you want some conjecture, I say that offsets to the CTPAGE region are determined from the APR 0 address, and that maybe you add higher offsets as the APRs increase (as if to make up for the offset back down to APR 0 and then to the CTPAGE address). Of course, this sounds strange, and if someone will direct a clear explanation my way, I'd be glad to add it to this document.

The BMV card address, on the other hand, may be coded as a constant if the program you are writing is for a machine whose BMV slot you already know, or it may be determined during run-time as in the SLOTTTEST program. Be aware that the BMV and EBO cards may be in any slot, so if you wish to write an application for others to use, do not make assumptions. With the routines in the demo programs, it is not that difficult to search for the proper slot.

Having determined the VCR address, you must map a part of your task (the part whose APR you specified) to the CTPAGE so that you can access the registers. There are two ways to map to the CTPAGE, and so two demo programs are available.

3.3.1 TASK-BUILT CTPAGE ACCESS

You may have access to the CTPAGE built into your task so that when the application is run, the system performs the mapping "automatically" for you. AUTOCT demonstrates this procedure. Note: Since the proper mapping is built into the task data itself, you must determine the slot and APR beforehand.

The procedure to follow is to have two tasks. Task 1 is your regular task with code and data; Task 2 is a task that will be loaded into the CTPAGE region.

Applications using this method usually have a small task named CTPAGE that consists of the following (this is CTPAGE.MAC in the demo):

```
APR = 5           ; Place APR value in a constant (symbol).
. = 0             ; Start assembling at memory addr. zero.
.blkb <APR*20000>+14400 ; Assume slot 2.
.even
```

```
...global VCR list ...
.end
```

Notice that this method assumes the BMV card is in slot 2 and hence cannot be altered during runtime. The $\langle \text{APR} * 20000 \rangle$ is evaluated when the MACRO routine is compiled, and the value comes out to the proper 120000 value for APR 5, which is then added to the altered slot 2 address (14400) to yield 134400. The ".blkb" instruction tells the MACRO compiler to provide 134400 bytes for storage; this storage space will eventually be overlaid upon the CTPAGE region to encompass all data within it up to and including the slot 2 data registers:

```

<-- I/O Page (CTPAGE Region), 8 kb -->
17760000 ... 17774000 -- 177775377 ... 17777777
    0 ...1 ...2 ... etc
    slot registers

<- CTPAGE.TSK region ->
<- AUTOCT.TSK window ->

```

Figure 3-2. AUTOCT Mapping to CTPAGE

As you can see, your CTPAGE.TSK's region must be large enough to lay over the data preceding the slot 2 registers; you will then use only that part of the region coinciding with the slot 2 registers and ignore the rest.

CTPAGE.CMD, the linker command file for CTPAGE.MAC, instructs that the task be built without a stack (since it is just data -- no code). A portion of CTPAGE.CMD is listed:

```

STACK = 0
PAR = CTPAGE:120000:20000

```

120000o indicates the byte address of the start of the CTPAGE partition. The 20000o is the number of bytes contained in the partition (or at least the portion thereof you wish to access).

The linking of CTPAGE will produce two files: CTPAGE.TSK and CTPAGE.STB (the symbol table file that includes the global label names listed in CTPAGE.MAC).

The main task, AUTOCT, includes the following lines in its linker command file:

```

WNDWS = 1
RESCOM = CTPAGE/RW:5

```

WNDWS declares the number of address windows required by the task (in addition to those normally needed to map the task image). RESCOM indicates the region to be mapped (widowed) to, its type of access (read/write), and the APR to be used in this mapping. (The linker also assumes that there is an .STB file with the same name as the region specified in the RESCOM line.)

Once all of this has been set up, the task can simply start using the VCR variables listed in the CTPAGE.MAC file.

To create the AUTOCT task yourself, first compile and link the CTPAGE task. Then, compile and link the AUTOCT task. When AUTOCT is linked, the linker will pull the CTPAGE.STB data into the AUTOCT task image. Therefore, after everything is linked, you may discard the CTPAGE files. Do not try to install or run the CTPAGE task; install and/or run the AUTOCT task instead.

Note: While it is confusing to call your own task/region CTPAGE while trying to discuss the system's CTPAGE region, the name CTPAGE is required for proper I/O page access.

3.3.2 RUN-TIME CTPAGE ACCESS

If you will only be writing bitmap programs for your own PRO, you can get by with the task-built CTPAGE procedure explained above. However, if you wish to distribute your application for others to use, you cannot assume the slot in which the BMV will reside, nor can you distribute your code and expect others to alter and link your tasks. It would also be bad form to create 8 versions of your task, one for each slot, and have the user try each until something works.

The easiest manner for resolving this problem is to determine the BMV slot during run-time and then perform the subsequent map to the CTPAGE yourself.

RUNTCT demonstrates how to map to the CTPAGE during "run-time." The program's output is identical to that of AUTOCT.

Like AUTOCT, RUNTCT must create a window within CTPAGE that it can access. RUNTCT's window could have been made smaller, but since that would require some additional explanations (I could probably do it but not explain why it worked that way), it was left as large as AUTOCT's. (Again, if anyone can set me straight on this matter, please do so!)

Remember, the slot may vary, because RUNTCT gets the slot information and maps to the proper portion of CTPAGE during run-time.

To create the RUNTCT task yourself, compile the elements and link. You do not have to install the task before running it.

RUNTCT uses the subroutine MAPCT to map to the CTPAGE at the indicated slot and with the given APR. The GETREG routine reads the contents of the readable registers.

3.4 What Are the BMV Registers?

The above demo programs showed how to access the BMV registers in the CTPAGE region. This section will discuss what each of the registers do. (Note: A complete explanation of the registers can be found in the PRO 300 Series Technical Manual.)

The bitmap is in "mapped" mode when the color map is enabled (via CSR bit 10). If the color map is disabled, then the bitmap is said to be in "unmapped" mode. The mapped/unmapped state affects how certain register contents are used by the BMV; the relationship is between colors and resolution.

Note: It does not matter what you place into the "reserved" bits in writable registers. The system will ignore what you set there and probably replace it with its own values. The demonstration programs usually place zeros in the reserved bits.

3.4.1 (IDR) IDENTIFICATION CODE

The Technical Manual states that this register contains the card I.D., which for the BMV card is 1002o or 514d. However, I have actually found it to contain 177402o (-254d) on several PROs. Read only.

3.4.2 (RES) RESERVED

The contents of this register should not be read or written to (though reading it appears to be safe, if unnecessary); the purpose of its contents are unknown. However, a word of storage must be allocated to preserve the space this register occupies.

3.4.3 (CSR) CONTROL STATUS

This register controls the general operation and video timing of the BMV controller and the extended bitmap module. The register has the following bits:

<u>Bit</u>	<u>Operation</u>	<u>R/W</u>
0	Line mode (interlaced/nonint.) (0 = 525/526, 1 = 625/626)	R/W
1	Interlace mode definition (0 = off, 1 = on)	R/W
2	reserved 1	
3	reserved 2	
4	reserved 3	
5	Odd/even frame definition (0 = scan odd lines, 1= even)	R
6	End of frame interrupt enable (0 = disabled, 1= enabled)	R/W

7	End of frame definition (1 = performing vert. retrace)	R
8	Class of operation def. 1	R/W
9	Class of operation def. 2 (indicate ops. to perform)	R/W
10	Color map enable definition	R/W
11	reserved 1	
12	reserved 2	
13	Option module presence def.	R
14	Done interrupt enable def.	R/W
15	Transfer done definition	R

Table 3-3. Control Status Register Bits

3.4.4 (P1C) PLANE 1 CONTROL

This register defines a logical operation, or update modification, to be performed on the plane 1 video memory. Read/write.

Bits 0 - 2 contain information regarding the movement of bit patterns to screen memory.

Bits 3 and 4 indicate the horizontal resolution: 00b = 1024, 01b = 512, 10b = 256, and 11b = turn display off.

Bit 5 indicates whether the system perform reads or writes to plane 1 memory. Set bit means access permitted, cleared bit means access denied.

Bits 6 - 15 are reserved for system use.

3.4.5 (OPC) PLANE 2 AND 3 CONTROL

This register defines the logical operation, or update modification, to be performed on the plane 2 and 3 video memories. Read/write.

The bit definitions for this register are identical to those of the plane 1 register. The bits themselves are as follows.

Bits 0 - 5 are identical in function to the plane 1 register bits, except these are for plane 2 memory.

Bits 8 - 13 are identical in function to the plane 1 register bits 0 - 5, except these are for plane 3 memory.

Bits 6, 7, 14, and 15 are reserved.

3.4.6 (CMP) COLOR MAP

The color map register allows for programming of the color map when the BMV is in "mapped" mode (via the CSR register). A mono output always contains the sum of all the intensity levels. Write only.

Bits 0 - 1 indicate the blue intensity.

Bits 2 - 4 indicate the green intensity.

Bits 5 - 7 indicate the red intensity.

Bits 8, 9, and 10 indicate the plane 1, 2, and 3 addresses, respectively.

Bits 11 - 15 are reserved.

3.4.7 (SCL) SCROLL REGISTER

The scroll register controls the addressing of the video memory planes for all operations. This register's contents are always added to the Y coordinate addresses when writing and reading to the bit map. Changing the contents causes a vertical scroll on the screen (increment scrolls up; decrement scrolls down).

Operations with the scroll register can be absolute. However, the scroll register may have any value when a program begins. Therefore, the register contents must be incremented/decremented or added to /subtracted from. After writing to the screen, the data is moved up or down by changing the scroll register contents. Read/write.

Bits 0 - 7 indicate the scroll address offset.

Bits 8 - 15 are reserved.

3.4.8 (X) X COORDINATE

The X register holds the horizontal scan location of all transfers to the BMV planes. It can be modified at any time during an operation with no effect on the operation. Read/write.

In 1024 resolution, you will typically use X values of zero through 1023.

Bits 0 - 9 indicate the X coordinate.

Bits 10 - 15 are reserved.

3.4.9 (Y) Y COORDINATE

The Y register holds the starting screen location of all video operations defined in the P1C or OPC registers to the BMV planes. It can be modified at any time during the operation with no effect on the operation. Read/write.

The typical values for Y will be zero through 239.

Bits 0 - 7 indicate the Y coordinate.

Bits 8 - 15 are reserved.

3.4.10 (CNT) COUNTER

When the counter register is loaded with anything but a zero, a transfer is started. The counter decrements after each cycle (bit or word) until the counter is zero. When zero, the counter is stopped and the transfer done bit (CSR bit 15) is set. The counter can only be loaded if the transfer done bit is set. Loading the CNT register clears the done bit. Write only.

Bits 0 - 15 are available for use (hence the count may be from 0 to 65535 cycles).

3.4.11 (PAT) PATTERN

During a transfer, the least significant bit of this register can be used as data during an update modification cycle for each plane. After each cycle in bit mode (see CSR bits 8 and 9), the pattern register contents are rotated right one bit (for example, bit 0 shifts to 15, 1 to 0, 2 to 1, etc.). The pattern register can only be loaded if the done bit (CSR bit 15) is set (the CNT register is zero). Write only.

Bits 0 - 15 are available for indicating the pattern.

The pattern is indicated with ones (draw pixel) and zeros (don't draw pixel). For example, 101010b (52o) could be used to draw a dotted line.

3.4.12 (MBR) MEMORY BASE

This register assigns the starting address of the 32kb BMV memories page that the bit map video controller responds to. The starting addresses, as they appear on the CTI bus (I/O page/CTPAGE), are on any 32kb boundary. The register contents are then compared to the CTI bus DAL lines (bits 15 - 21) respectively. Write only.

Bits 0 - 6 indicates the memory base address.

Bits 7 - 15 are reserved.

WARNING

Altering the memory base value may crash the system. I do not know what values are safe to use with this register, hence the demonstration programs do not write to this register. Since MBR is write-only, there is no way of determining what value is in there to begin with.

PLAYBMV PROGRAM -- PLAY WITH THE BITMAP REGISTERS

4.1 Introduction

This sample program allows you to manipulate the BMV registers.

After running the program, the IDSLOT subroutine is used to find the BMV card slot. MAPCT is then used to map to the CTPAGE region with the slot number and APR specified.

PLAYBMV uses the GETREG subroutine to read the values of the readable registers. PUTREG is used to place the user-specified values into the writable registers.

The user specifies the registers and corresponding values. The values are not sent until the user indicates so.

4.2 Entry Screen

The entry screen lists the registers and their contents.

You refer to a register by using its associated number in the # column.

There are two Got and Put columns; DEC lists values in positive integer format and OCT lists values in octal.

The Got columns list the values found in the readable registers after performing a "send values" command. (The registers are read once during start-up.) The Put columns list the values that you have entered (or those assigned after a clear/reset command); these values are placed in the BMV registers via the "send values" command.

Registers marked with an asterisk (*) mean that the associated Put values will NOT be placed into the corresponding registers when you issue a "send values" command, even if you place new values into the Put columns. This is done either because the register is read-only (BMIDR), is ignored by the system (BMRES), or the effects are unknown (BMMBR). As mentioned in section 3.4.12, altering this value may crash the system.

Note

If you later wish to have PLAYBMV place the MBR value into the register, you may edit the PUTREG.MAC file and uncomment the MBR's MOV line.

Decimal values are the default mode of entry. To change a register's value. type the register number, a comma, then the value. To send all values in the Put column to the registers, enter a 0,0 (zero, comma, zero). To quit

PLAYBMV, enter 0,1. To clear the screen and reset the Put column values, enter 0,2. To toggle between entering register values in decimal or octal, enter 0,3; the first value (register #) will ALWAYS be decimal.

Decimal register values may be positive or negative. A negative value is made positive by adding it to 65536. Decimal values may be no more than 6 places (including minus sign). Octal values may be no greater than 177777.

Note that some register values may be larger than what this program allows; this limitation is just for fitting the values in columns on the screen.

4.3 Sample Entries

When you run PLAYBMV, you will press RESUME to reach the entry screen. Both your commands and the BMV's drawings will appear on this same screen.

Besides scrolling and color changing, the only other visible actions performed by the BMV is line or dot drawing. If you want to draw a box -- filled or otherwise -- you must draw all four sides and optionally fill it (with more lines) yourself. There are no box commands as in CORE graphics; there are no fill commands as in GIDIS. If you want to draw a circle, you must use your own trig functions and draw each dot of the circle yourself. The same holds true for text or fonts: You must set each pixel yourself.

Therefore, you probably want to limit your BMV usage to only those aspects that are speed critical, and these are usually related to dot, line, or curve drawing. For extra things like text or colorful borders, you can still use CORE or GIDIS. Be aware, however, that by changing the BMV registers yourself, and subsequently using CORE or GIDIS, you can cause some strange things to happen. Again, this sort of thing is a matter of trial and error. You are never just limited to using the BMV when you take control of the registers; but, you must be aware that conflicts can occur if you pass the reigns.

4.3.1 DRAWING LINES

Enter the following pairs of values, pressing RETURN after each. A comment is listed after each: DO NOT ENTER THE COMMENTS.

If an error message appears, try entering the line again. If you make a mistake, enter 0,2 to clear the screen. If you get into real trouble, control-C out of the program and run it again, or turn off the computer for a moment.

If OCTAL mode is already set (it is if the prompt asks you for an octal value instead of a decimal value), then do not enter the 0,3.

0,3	(Toggle OCTAL mode)
3,142300	(Set control status)
4,42	(Set plane 1)
5,21042	(Set planes 2 and 3)
7,0	(Set no scroll)
10,1000	(Set counter)
11,22222	(Set pattern)
0,0	(Send values to register)

The above instructions have the BMV draw a line about halfway across the screen (horizontally), underlining some of the column headers. The actual origin of the line may vary, because it depends what values are currently in the X and Y registers (and PLAYBMV's type and write statements are eventually resolved through the BMV, and hence they affect the X and Y registers, too). If you cannot see the line or the line gets erased, don't worry -- you'll see how to position it in a moment.

Note: PLAYBMV retains your entry values, so you only need change those registers you wish to modify -- you do not have to retype the entire list above unless you have issued a 0,1 or 0,2 command.

Note: Green cursor-sized "ghosts" may appear. These have to do with the Logical Operations set by the above procedures. If you do not want these ghosts to appear in your applications, you will have to turn off the cursor for the duration of the application, unless you reset the Logical Operations to compliment for each bitmap plane.

3,142300 sets the control status register. This is done to "clean" it up, since the value may be anything at this time. This value allows for proper horizontal line drawing.

4,42 sets plane 1. 42o is 1 00 010b. This action tells the BMV to move the pattern to the screen, and to set 1024 horizontal resolution. (Remember that bits 6 through 15 are reserved, so you needn't worry about trying to place values into those bits.)

5,21042 sets plane 2 and 3. 21042o in binary is 00 1 00 010 00 1 00 010b. This sets plane 2 as follows: Move pattern to screen, 1024 horizontal resolution, and video memory enable. Plane 3 is set the same as plane 2.

7,0 clears the scroll register. Scroll will be examined later. .

10,1000 sets the counter to 1000o or 512d. With a horizontal resolution of 1024d, this is half of the screen. The number you put in the counter is another trial and error matter, depending on how long a line you want. The number itself represents the number of pixels to be drawn (either on or off) beginning at the current X and Y positions, heading in the positive X direction a pixel at a time. If the line reaches the end of a screen line, it will be continued on the next screen line. Try it: Enter 10,100000 then 0,0. The line will extend over 32 screen lines ($32768d/1024d = 32d$, where $100000o = 32768d$).

11,22222 indicates the pattern to be used for drawing the line. 22222o is 010010010010010b. The pattern can occupy 16 bits, but the number is too large to input into the current version of PLAYBMV. "1" tells the BMV to draw a pixel, "0" says to not draw a pixel. If you want a solid line, try entering 11,177777 and then 0,0. If you had made the line longer with the 10,100000 instruction above, then a solid strip of white will appear. To cut the line length back, reduce the counter value.

To draw a dot, use a counter of 1. Be sure that the pattern's zero bit is a one, otherwise nothing will be drawn. For example, you can use:

10,1	(Set counter to 1)
11,1	(Set pattern to 1)

To draw a dot. You may have to change the X and/or Y positions to see the dot, though.

4.3.2 SETTING THE X,Y POSITION

To set the origin of a line or dot, enter the new values in the appropriate registers. X is usually 0 through (horizontal resolution minus one), which for this example is 0 through 1023. Y is usually 0 through 239. If you use larger values, the BMV will "wrap" the position around the appropriate axis, just like it wraps lines with high counter values over several screen lines.

To play with the X and Y positions, set the counter and pattern registers to draw a visible line. Then, do the following (in octal):

8,0	(Set X register)
9,256	(Set Y register)

and enter 0,0 to send the values to the BMV. The line should now appear above the enter-value prompt line. Try different X and Y settings. When you change X or Y values, you do not have to alter any other registers; PLAYBMV will use the previous count and pattern you specified.

4.3.3 DRAWING VERTICALLY

So far, all of the lines have been drawn in the horizontal direction. You may also have the BMV draw in the vertical direction. To do so, enter a counter value and pattern, and then in octal enter:

```
3,142700      (Set drawing top to bottom)
0,0           (Send values to registers)
```

If you wish to reset CSR to draw horizontally, use:

```
3,142300      (Set drawing left to right)
```

The CSR values given above may differ from those returned by the system because the system manipulates the reserved bits. When you set the CSR register, you do not have to send back the same reserved bit settings, and in fact the above values set the reserved bits to zero.

4.3.4 SETTING COLORS

The BMCMP register allows you to set the 8 (numbered 0 through 7) color entries for the color map. Bits 0 through 7 indicate the color value, bits 8 through 10 indicate the location; bits 11 through 15 are ignored (reserved).

To change the background color to blue (map entry 0), type in the following:

```
6,3          (Set entry 0 to blue)
0,0          (Pass to registers)
```

To change the background to green, try 6,20; for red, use 6,200. To change the background back to black, enter 6,0. To change the text to red, issue the following:

```
6,700        (Set entry 1 to red)
0,0          (Pass to registers)
```

Notice that this only changes the "old" text; the text that is rewritten by PLAYBMV is still in white. To change the "old" text back to white, enter 6,777. Notice here that the "old" text is now whiter than the redrawn text. You will have to play with the values to determine what RGB settings are necessary for displaying a text-normal white.

To change the redrawn (current) text to red, type:

```
6,3700       (Set entry 7 to red)
0,0          (Pass to registers)
```

To change this text back to white, enter 6,3777.

Note

The operating system draws normal text onto whatever plane(s) are currently enabled. (The PLAYBMV ends up using different planes in the course of your entries above.) The combination of enabled planes is 8. And, since you can set each of these combinations to a different color, you can effectively have 7 (not counting background/black) different colors of normal text on the screen at the same time! (Just enable the plane combination before drawing the text.) GIDIS and CORE graphics both use this method for drawing their graphics text. Now you can apply the same techniques to normal text.

(Note: You can force the text to appear on plane(s) of your choice in PLAYBMV by disabling the planes you wish, then by issuing a reset (0,2); the subsequent text display will then only be on the planes you specified.)

To change the cursor "ghosts" from green to blue, enter:

6,3003	(Set entry 6 to blue)
0,0	(Pass to registers)

While it is unknown what causes the "ghosts" to appear, by entering 6,3000 you can at least make them disappear (this sets their color to black), or you can change their color if you require their presence to flag certain parts of your application's screen display.

You will have to play with the other color entries to see what they affect.

By default (at least in this demo), the BMV uses color map entry 7 for any lines you may draw. This is all well and good until you try to draw separate lines with different colors: Changing entry 7 will affect ALL lines previously drawn.

To draw differently colored lines, you must set the plane combination before you draw the line. The color of the plane combination (there are 8 combinations, and hence 8 color map entries -- one for each combination) also needs to be set in advance of the draw if you wish the line to appear in the desired color. Color map entry values may be changed at any time; changing an entry value immediately changes all pixels drawn with that entry.

Note: You do not have to set the pattern, count, X, or Y registers to set the color map; in other words, you do not have to draw something to use this register.

4.3.5 SCROLLING

Before trying to scroll, you should reissue the commands given in section 4.3.1 above. This is to ensure that all of the planes will be used in the scrolling process.

The BMV adds the value you place into the scroll register and uses the sum to scroll the screen by the indicated number of screen lines (a screen line being a pixel thick). Unlike a text scroll, as performed with escape sequences, a bitmap scroll wraps the entire screen; in other words, an upward scroll would cause the lines at the top of the screen to appear at the bottom, and everything else would be moved up accordingly.

You must change the contents of the scroll register every time you wish the screen to scroll, as the BMV performs scrolls in relation to the offset of the last value. Hence, putting the same value into the scroll register twice in a row will not do anything.

For an example, enter the following commands:

7,10	(Set scroll value)
0,0	(Send values to registers)

The entire screen will be scrolled upward. To scroll upwards again, try entering 7,20. A 7,5 will scroll the screen down. You can test large and small values to see how far the screen will scroll. To reset the screen, you must clear it, as with the 0,2 command.

4.3.6 CHANGING THE HORIZONTAL RESOLUTION

So far in the above demonstrations, the horizontal resolution has been left at the default 1024. To use a different resolution, you must first disable color mapping (CSR bit 10) and then specify the resolution in registers P1C and OPC.

To set the horizontal resolution to 512, enter the following commands. (You may wish to clear the screen with

0,2 and then reenter the section 4.3.1 commands to properly enable the planes.)

3,140300	(Disable the color map)
4,52	(Set plane 1 to 512 res.)
5,25052	(Set planes 2 and 3 to 512)
0,0	(Send values to registers)

After entering the 0,0 the text on the screen should appear flaky, and some of the colors should have changed. Also, any lines that might be drawn should have half the horizontal resolution. To reset the resolution to 1024, enter the following:

```
3,142300
4,42
5,21042
0,0
```

The text should appear normal again, and the colors should be reset as the color map "kicks in."

To set the screen to 256 resolution, enter the following:

3,140300	(Disable the color map)
4,62	(Set plane 1 to 512 res.)
5,31062	(Set planes 2 and 3 to 512)
0,0	(Send values to registers)

Section 2.2 mentions that more colors are available in reduced resolutions. This is possible because the adjacent pixels are not used for display, they are used for determining the color. (In 1024 mode, all pixels are used for display and the color map determines the colors.)

To see this affect, first enable all planes and set them to the same resolution (512 or 256). Then, enabling one plane at a time, draw a line; use a different pattern for each plane. The resulting overlaid lines should be in several colors.

REFERENCES

If you wish to take advantage of all of the bitmap's capabilities, you must purchase at least the Professional 300 Series Technical Manual listed below. It contains brief descriptions of all of the bitmap registers and their appropriate bit settings.

The other references aided in mapping to the CTPAGE region or in providing some helpful explanations.

1. Programming RSX-11M in Fortran - Contains FORTRAN and MACRO mapping examples. Three volumes. Order numbers EY-0061E-SG-0101, EY-0061E-SG-0201, and EY-0061e-TP-0001.
2. Professional 300 Series Technical Manual - Detailed bitmap register information. (No programming examples, though.) Two volumes. Order numbers EK-PC300-V1-001 and EK-PC300-V2-001.
3. The ("Shelf-Cracker") Professional Toolkit ringbinder series - You'll at least need the P/OS System Reference Manual for the list of mapping functions. About eight volumes. Order number QBA14-A3.
4. PDP11 Processor Handbook - Explains how the APRs are used by a task, and how they're used in mapping.

FURTHER NOTES

If you wish to use GIDIS or CORE Graphics and then manipulate the BMV registers, be sure to initialize GIDIS

or CORE once at the beginning of the application. Be aware that you may crash GIDIS or CORE if you alter a register whose value they are counting on to be under their control.

If you are multitasking, you should only allow one task to be in control of the BMV registers at one time. You may lock up the system if several tasks try to do things to the BMV at the same time.

You do not always have to change all BMV register values at once. Some actions only require changes to one register. Therefore, you can create separate subroutines for loading various registers and leaving others alone.

OCTAL is easier to use in figuring out what values to place into what bits than DECIMAL. Each OCTAL digit can represent three binary digits, as illustrated below.

OCT	BIN	Dissection
1	001	
12	001 010	876 543 210 -bits
123	001 010 011 -->	001 010 011 -BINARY values
1234	001 010 011 100	∖ ∖ ∖ -groups of 3
1777	001 111 111 111	1 2 3 -OCTAL
7777	111 111 111 111	

Pad bits with zero if you need to complete a group of three.

The monochrome/color setting on the P/OS Setups Menu affects the performance of certain Extended Bitmap Options card functions. Generally, a monochrome setting will inhibit the use of certain color/plane modes, even if you have a color monitor attached to your system.

However, do not specify a color setting if you do not have a color monitor, or you may cause your monochrome monitor to be overdriven and subsequently damaged.

ABBREVIATIONS

APR	Active page register (section 1.3)
b	Indicates preceding value is binary (ex: 101b)
BITMAP	BITMAP region (section 2.1)
BMV	Bitmap video (section 2.1)
CTI	Computer Terminal Interconnect (section 3.2)
CTPAGE	CTPAGE resident common (section 3.2)
d	Indicates preceding value is decimal (ex: 82d)
EBO	Extended bitmap option card (section 1.5)
GEN	GEN partition (section 3,2)
kb	Kilobytes (ex: 2kb = 2 x 1024 = 2048d bytes)
o	Indicates preceding value is octal (ex: 1776o)
PRO	Professional series computers (300 through 380)
TFWBMP	TFWBMP region (section 2.1)
VCR	Video control registers (section 3.3)

Contents of Graphics Demo Disks

Diskette 1 - BITMAP DEMO DISKETTE

These programs were compiled and linked on P/OS V2.0 on a PRO/350. The programs were test-run on P/OS 2.0 and 3.0 on PRO/350s.

SLOTTEST - Finds the bitmap card in any slot.

AUTOCT - Maps to bitmap through the CTPAGE and displays register contents.
RUNTCT - Maps to bitmap through the CTPAGE and displays register contents.
PLAYBMV - Maps to bitmap through the CTPAGE and displays register contents. Allows user to change contents.

Diskette 2 - BITMAP DEMO SOURCE CODE

This diskette contains the source code to the four applications.

[SLOTTEST] - Finds the bitmap card in any slot.

[AUTOCT] - Maps to bitmap through the CTPAGE and displays register contents.

[RUNTCT] - Maps to bitmap through the CTPAGE and displays register contents.

[PLAYBMV] - Maps to bitmap through the CTPAGE and displays register contents. Allows user to change contents.

Diskette 3 - Draw Cardioid Patterns in Color

This program accesses the bitmap to draw varying color patterns.

This is a public domain program, written by someone in DEC. The only "documentation" that came with this is that provided in the source code.

Diskette 4 - Screen Save and Redraw Demos

[BWDEMO] - This directory contains a demonstration program for the BWBMP text-only bitmap (screen) saving/restoring program. PASCAL source code is provided.

[COLDEMO] - This directory contains a demonstration program for the COLBMP graphics-and-text bitmap (screen) saving/restoring program. PASCAL source code is provided.

[BWBMP] - This directory contains the MACRO-11 source code for the BWBMP task.

[COLBMP] - This directory contains the MACRO-11 source code for the COLBMP task.

Editor's note: This collection has been added to the PRO Public Domain collection as MISC-5. It also includes a fifth diskette that contains this article. See the next article for more details.

Catalog Updates to the PRO Public Domain Software Collection

By Gary Rice, PC SIG Newsletter Editor

Since last month, the following software has been added to the collection and/or added to the catalog. Please note that the "descriptions" are just extracts from the "README.1ST" file that generally accompanies each software offering on the SIG tape or other source.

The "catalog" has grown to a size now that I have put it on it's own diskette. As I publish updates, they are also entered into the "catalog" at the same time. Therefore, if you want an "up-to-the-minute" listing of the PD collection, simply send a diskette and ask for "CATALOG".

<u>Catalog #</u>	<u>Description</u>
CATALOG	The current diskette based PD collection
1	diskette

- F81-7 Version 23 of RSX RATFOR
- 2 diskettes; Sources included; NO objects; NO task images
RATFOR, FORTRAN-77, MACRO
- F81-8 Ratfiv Version 2
- Ratfiv is a structured Fortran preprocessor providing SWITCH, IF - ELSE, WHILE, FOR, DO, REPEAT - UNTIL, STRING, and BREAK and NEXT constructs. Also supported are INCLUDE files, DEFINE for symbolic constants and macros with arguments, conditional compilation, formats in read, write, encode, and decode statements, use of >, <, etc. instead of .GT., .LT., etc. and the RETURN VALUE construct in functions.
- 2 diskettes; Sources included; NO objects; NO task images
RATFOR, FORTRAN-77, MACRO
- F81-9 BOGGLE: This program plays "Big Boggle", a game in which the players try to form words of 3 or more letters from an 5x5 array of letter cubes using contiguous cubes. This game acts as an opponent. Use a real Big Boggle board, run the program and enter in the letters as requested. The program will write out the words it finds on the terminal and to a file BOGGLE.OUT. Sorry, it doesn't support the "Qu" cube. No need to install the task, put BOGGLE.DIC in your UIC.
SORT: This is a major rewrite of the "sortc" program on the DECUS C kit. It's a lot faster, and needs essentially no stack, and a temp file only slightly larger than the input file. Runs as task "...SOR"
SUPERDUMP: A "full bore" file/device dump utility. Documentation and source in SOD.RNO and SOD.C. Does everything you'll ever want, including file header dumps, with multi-header support. Runs as task "...DUM".
CHAT: This program allows users to chat with each other from terminal to terminal. Install, runs as "...CHA". Uses IO.WBT's so you get auto ^R while typing. Looks a bit kludgy, but it's convenient and prevents full-duplex garbage when both parties type at once. If the called party's terminal is attached, it announces "Request to chat" and waits for the terminal to become available. The caller sees "CHAT" when he has attached the other terminal. The caller types ^Z to terminate chatting.
TODAY: Writes out date and time in English, per the format used by Robert J. Lurtsema, a classical radio announcer in the Boston area. Also says the phase of the moon. Written by Martin Minow. Runs as task "...TOD".
HANOI: Does the "Tower of Hanoi" on a VT-52 or a '100 in '52 mode, actually moving the rings visually between posts. The first time I ran it I cracked up. Install it with /TASK=...HAN and say HANOI n, where "n" is the number of rings. Try 4 the first time. I think Dave Conroy wrote it, and Martin Minow hacked on it.
JARGON: This file is a riot! It contains a valuable dictionary of computerese, straight from the Stanford/MIT Artificial Intelligientia. I got a big kick out of reading it, and keep my listing close by at all times for ready reference.
- 1 diskette; SOME sources; NO objects; SOME task images
C
- S84-1 Michael Reese BASIC - original version This version of BASIC runs on RSX, IAS, and VMS.
- 3 diskettes; Sources included; SOME objects; SOME task images
MACRO
- MISC-5 An Introductory Guide to the Professional 300 Video Bitmap
- The Professional 300 computer has proven to be an excellent graphics workstation. The use of GIDIS graphics is straight forward and easy to use, CORE graphics is only slightly more complex. However,

to take full advantage of the graphics capabilities of the PRO requires a knowledge of directly addressing the bitmap. The intent of this offering is to provide an introductory explanation of the workings of the PRO/300 screen bitmap.

5 diskettes; Sources included; NO objects; Task images included
FORTRAN-77, MACRO, Pascal

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

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

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

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

Send your diskette based contributions and/or software requests to me:

Gary Rice
PC SIG Newsletter Editor
McDonnell Douglas
5555 Garden Grove Blvd.
Westminster, CA 92683

Send your tape based contributions ONLY to:

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

OR BRING THEM WITH YOU TO SPRING SYMPOSIUM IN CINCINNATI!

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

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

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

PRO Software List Update

Coordinated by Gary Rice, PC SIG Newsletter Editor

In an effort to keep you informed about software being shipped from various vendors, I began the following list in April, 1986. This list was last published in the April, 1988 issue of these Newsletters. The updated list reflects information that I have received as of March 19, 1988. An asterisk by an entry indicates that the item has changed or been added since the last time the list was published.

<u>DEC Software</u>	<u>List Price</u>	<u>Last Rev</u>	<u>Source of info</u>	<u>Still Avail?</u>	<u>P/OS v3 Supported?</u>
20/20	495	1.0.54	User	Yes	UNK
Athena/Graph	450	1.0	DEC	Yes	UNK
BASIC-11/RT-11 (Replaced - See BASIC-PLUS/RT-11)					
BASIC-PLUS/RT-11	UNK	3.0	DEC	Yes	N/A
CT*OS	UNK	1.0	DEC	Yes	UNK
Design Graphix/Executive	595	1.0	User	Yes	Yes
Easyentry	995	3.0B	DEC	Yes	UNK
FORTTRAN IV/RT-11	495	2.8	DEC	Yes	N/A
Installation & Maintenance	UNK	3.2	DEC	Yes	Yes
LOGO	350	1.4	DEC	Yes	UNK
MAIL-PLUS	N/A	1.0	DEC	No	N/A
MJA Accounts Payable	600	5.2	DEC	Yes	UNK
MJA Accounts Receivable	600	5.2	DEC	Yes	UNK
MJA General Ledger	600	5.2	DEC	Yes	UNK
MJA Order Entry/Inventory	600	5.2	DEC	Yes	UNK
MJA Payroll & Personnel	600	5.2	DEC	Yes	UNK
NPL Information Management	N/A	1.4	DEC	No	UNK
Phoenix-PRO	1795	1.0A	DEC	Yes	UNK
P/OS ADCCP Driver	UNK	1.0	DEC	UNK	UNK
P/OS (Diskette)	N/A	1.8	DEC	No	No
P/OS (Hard Disk)	475	3.2	User	Yes	Yes
P/OS Hard Disk (Arabic)	783	R3.1	DEC	Yes	Yes
PRO 2780/3780	53	1.2	DEC	DECUS	No
PRO Application Starter Kit	399	1.0	DEC	Yes	No
PRO/Associate	N/A	1.0	DEC	No	No
PRO/BASIC	195	1.4	DEC	Yes	Yes
PRO/Comm (diskette)	N/A	1.8	DEC	No	No
PRO/Comm (hard disk)	195	3.0	DEC	Yes	Yes
PRO/CPM-80	UNK	1.1	DEC	UNK	UNK
PRO/Datatrieve	495	2.0	User	Yes	Yes
PRO/DECnet	250	2.1	DEC	Yes	Yes
PRO/FORTTRAN-77 Debug (See PRO/Toolkit Symbolic Debugger)					
PRO/IVIS	UNK	3.1	DEC	Yes	Yes
PRO/Laboratory Subroutine Lib.	300	1.2	DEC	Yes	Yes
PRO/NAPLPS	N/A	1.0	DEC	No	No
PRO/Office Workstation	UNK	2.0	DEC	Yes	Yes
PRO/PRODUCER Toolkit	300	1.6	DEC	Yes	Yes
PRO/RDT	495	1.1	DEC	Yes	Yes
PRO/Scientific Subroutine Library	300	1.3	DEC	UNK	No
PRO/SIGHT	295	1.1	User	Yes	Yes
PRO/SNA	N/A	1.1	DEC	No	No
PRO/Smart Mailer	53	1.0	User	DECUS	Yes
PRO/Toolkit	520	3.2	DEC	Yes	Yes
PRO/Toolkit BASIC-PLUS-2	495	2.5	DEC	Yes	Yes

<u>DEC Software</u>	<u>List Price</u>	<u>Last Rev</u>	<u>Source of info</u>	<u>Still Avail?</u>	<u>P/OS v3 Supported?</u>
PRO/Toolkit COBOL-81	495	2.4	DEC	Yes	Yes
PRO/Toolkit DIBOL	495	1.7	DEC	Yes	Yes
PRO/Toolkit FORTRAN-77	495	5.2	DEC	Yes	Yes
PRO/Toolkit PASCAL	495	1.3	User	Yes	Yes
PRO/Toolkit Real Time Library	150	2.1	DEC	Yes	Yes
PRO/Toolkit Symbolic Debug	200	2.0	DEC	Yes	Yes
PRO/UNIX	495	2.0	DEC	Yes	N/A
PRO/Videotex	895	1.0	DEC	Yes	UNK
Professional CTS-300	995	1.0	DEC	Yes	N/A
Professional Real Time Lib/RT-11	250	1.0	DEC	Yes	N/A
PROSE PLUS	295	2.0	User	Yes	Yes
RS/1	1900	12.0	User	Yes	UNK
RSX Host Toolkit	UNK	3.0	DEC	Yes	Yes
RT-11	550	5.4B	DEC	Yes	N/A
Supercomp-20	N/A	1.28	User	No	UNK
Synergy	695	2.0	User	Yes	Yes
VAX Host Toolkit	UNK	3.0	DEC	Yes	Yes
WPS/Plus	695	1.0	DEC	Yes	Yes

<u>3rd Party Software</u> <u>(Vendor)</u>	<u>List Price</u>	<u>Rev</u>	<u>Info Source</u>	<u>Still Avail?</u>	<u>P/OS v3?</u>
D-M-DRIVER for P/OS (PROTO SYSTEMS)	*195	*V2/V3c	Vendor	Yes	Yes
Fingraph (Graphic M*I*S)	N/A	2.0	DEC	No	UNK
IT*OS (Intermation)	UNK	5.2	User	Yes	UNK
Online Disk Unfragmentor (By Hand)	59	2.0	Vendor	Yes	Yes
PRO/Menu Manager (Wasatech Computer)	25	1.0	User	*No	No
PRO/Sentinel (By Hand)	47	1.0	Vendor	Yes	Yes
PRO/Session Logger (By Hand)	29	2.0	Vendor	Yes	Yes
PRO/Text Locator (By Hand)	43	1.1	Vendor	Yes	Yes
RDM Relational Data Manager (Interactive Technology)	995	*4.1C	User	Yes	Yes
SATURN-BASE (SATURN SYSTEMS)	750	1.4	Vendor	Yes	Yes
SATURN-CALC (SATURN SYSTEMS)	500	3.0	Vendor	Yes	Yes
SATURN-GRAPH (SATURN SYSTEMS)	500	2.0	Vendor	Yes	Yes
SATURN-WP (SATURN SYSTEMS)	600	*5.0	Vendor	Yes	Yes
SPSS/Pro (SPSS Inc.)	UNK	1.1	Vendor	Yes	Yes
TK!Solver (Software Arts)	N/A	1 (2A)	User	No	UNK

If you have received a shipment of software in the last month (and you DIDN'T get it in a fire sale), please compare the documented REV level to the one I have listed. If your software is more recent (or it isn't listed at

all), please let me know so I can update the list. Also, if the source of my information is listed as "DEC", I would appreciate hearing from a user, since I've found that hearing about it from DEC doesn't always mean that it is actually shipping. I will publish a new list each time it changes.

You can contact me at: McDonnell Douglas
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Workstations Section

Are We Crazy? Come to Cincinnati and Find Out!

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

My New PC is a What?

Many DECUS old timers shook their heads in Anaheim, upon seeing the PC SIG's session entitled "My New PC is a VAXstation". After all, one asked, how could anyone possibly view a VAX, even a desktop VAXstation priced in four figures, as a personal computer? Everyone knows that VAXstations are for engineering departments of the Fortune 100, are bought in large quantities, and are dedicated to a single application. If you don't think so, just ask your local DEC sales rep. Oh, I forgot; she won't talk to you because you do less than \$500K a year with DEC. I guess you'll just have to take my word for it.

Even so, there are a perverse band of users who insist on buying VAXstations and adopting them as their own "personal" computers. Maybe some see the VAXstation as the logical upgrade from the now "mature" Professional series. Perhaps others want to do PC style desktop publishing, but with a little more capability. Some may even have realized that DEC's licensing price structure has made the VAXstation the obvious low end entry into the VAX family. Most have more than one job to do, but want the comfort of a PC with the power of a "real" computer.

Still the skeptics persist. One Cincinnati session was almost rejected because some on the scheduling committee felt that "PC to VAXstation Migration" was not an appropriate topic for the PC SIG. In the face of this incredulity, even the true believers tend to be shaken. Are we helping to move the PC SIG into the future, or are we off on a tangent?

What do you think?

Your cards and letters are always welcome. The people who would like to hear from you include:

Lynn Jarrett, PC SIG Chair
San Diego Union-Tribune Pub. Co.
350 Camino de la Reina
San Diego, CA 92108
(619) 293-1130

Tom Hintz, Workstations/Macs/Pro Working Group Chair
University of Florida IFAS Computer Network
Bldg. 120 Gainesville, FL 32611
(904) 392-5180

Gary Rice, Newsletter Editor
McDonnell Douglas
5555 Garden Grove Blvd.
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Westminster, CA 92683
(714) 952-6582

A Symposium Preview

If you're coming to Cincinnati, you are welcome to join the discussion. Sessions of interest might include:

My New PC is a VAXstation
Tuesday 9:00A - 10:00A
Clarion - Bronze P009

Electronic Publishing Keynote
Tuesday 10:00A - 11:00A
Clarion - Bronze P027

A User's View of Interleaf
Tuesday 11:00A - 12:00N
Clarion - Bronze P011

Color Maps on Workstations
Tuesday 4:00P - 4:30P
West 242 P017

PC SIG Business Meeting
Wednesday 12:00N - 1:00P
West 250 & 251 P003

Workstations Working Group
Thursday 9:00A - 10:00A
Clarion - Bamboo A P033

PC to VAXstation Migration
Friday 10:00A - 11:00A
Clarion - Ivory A & B P010

PC SIG Wrap-Up
Friday 11:30A - 1:00P
Clarion - Ivory A & B P006

It's Your Move!

So, all of you out there in the silent minority, let the SIG know what you think. If "VAXstation as a PC" information is of interest to you, you better say so before the naysayers get the better of us. If you've got something to contribute, send it in! If you make it to Cincinnati, let's get together. But however you do it, we need your expert opinion. Are we the crazy ones?

A Communication Program for Your VAXstation?

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

Introduction

In setting up my VAXstation as a personal computer, one of the functions I have been reluctant to tackle is that of a communication program. After all, Pro/Communications running under Synergy on my Pro-350 has provided trouble-free service, and it was only recently that I installed a DHQ11 on my VAXstation II/GPX, a prerequisite for full modem control.

However, as I type up this article in one window on the VAXstation screen, while downloading a program from CompuServe in another window, I think I waited a little too long to get started. But I'm getting ahead of myself.

The Environment

The testing described here was done on a VAXstation II/GPX, running MicroVMS 4.7 and VWS 3.2. A "brand P" Hayes-compatible 2400 baud modem was used, connected to a DHQ11 (TXcn:) port. I set the port to MODEM, HOSTSYNC, TTSYNC, and ALTYPAMD. I'm not sure that all of these characteristics are necessary for all the programs tested, and some comm programs make changes on their own.

Communication Programs Tested

There may be more that I'm not aware of, but I tried out four communication programs that run under VMS. They are:

SET HOST/DTE (comes with MicroVMS)
Kermit-32 (in the DECUS library)
HOST32 (from CompuServe's VAX Forum)
VAXNET (from the DECUS library or CompuServe)

SET HOST/DTE

The VMS DCL command "SET HOST/DTE" provides a limited terminal emulator. It also claims to support auto-dialing with Digital modems, though I was not able to test that. The documentation (DCL Dictionary page DCL-456 and MicroVMS V4.7 Release Notes page 2-5) states that a template autodialer routine is provided in SYS\$EXAMPLES:DTE_DF03.MAR; however, I could not find that file in the MicroVMS kit. I was finally able to get a copy from a full VMS site, but did not pursue it further.

The main reason I stopped fooling with "SET HOST/DTE" was that it seemed to mess up my VT220 emulator window under VWS. Specifically, after invoking DTE and then exiting, I found that the DELETE (<X>) key acted like the RETURN key, and that the right and left cursor keys acted more like ^R. Using the "reset terminal" option on the KB window menu did not clear the condition; it was necessary to delete the window and log in again. I did not pursue this further, since DTE's limited capabilities didn't seem worth the trouble.

Kermit-32

I used Kermit version 3.3.111 from the DECUS library. It is available on the VAX86D portion of the Fall 86 VAX SIG Symposium Tape (V-SP-61) under directory [.VMSKERMIT]. This collection is available on TK50.

I ran into the usual problems, like forgetting to set the correct access protection on KERMIT.EXE and on the DHQ11 line (TXAn:), so that I could access it as a non-privileged user, but those were easy to fix from the SYSTEM account.

I was disappointed that the VMS version of Kermit does not have the modem and autodial support provided by Kermit-11, but maybe that is only a matter of time. Kermit-32 seems to be set up mostly as a server, assuming that you are dialing INTO the VAX, not OUT FROM it. Because of this, it is necessary to type your own "AT

DT 555-1212" command to the modem to get it to dial the phone.

Nevertheless, Kermit-32 did work reasonably well as a terminal emulator. I didn't make any careful measurements, but it seemed to run a little more slowly than Pro/Communications at 2400 baud. When I captured an ASCII file ("LOG SESSION filename"), the BANNER display on the VAXstation registered almost solid 100% CPU usage by Kermit. It's not nearly so bad during Kermit protocol transfers, perhaps partially because of the lower throughput of the protocol.

HOST32

HOST32 is available on the Compuserve VAX Forum ("GO VAXSIG"). The accompanying documentation states: "HOST32 is copyrighted (c) 1986 by Stuart R. Fuller, and is released for private use. It may not be sold, either alone or as part of a package."

HOST32 may be downloaded from Compuserve in a "hexified" form, and a VAX MACRO program is available to convert it to an executable image. I had a little trouble getting it to run, because I failed to set up the LOG_IO privilege, which is necessary for correct operation of HOST32. Note that the program still runs without this privilege, but several features do not work!

HOST32 supports the Compuserve "B" protocol, which is very convenient for downloading from the various Compuserve forums (formerly called SIG's). It also supports ASCII file transmission and capture, without an error correcting protocol. Like Kermit-32, it does not include autodial support.

VAXNET

VAXNET was written by Robin Miller of Northern Telecom. I got it from the VAX Forum on Compuserve, but I think the same package is available as VAX-137 from the DECUS Library, or as part of the VAX-LIB-4 collection.

VAXNET is a VERY comprehensive package. It supports multiple protocols, modems, modes of operation, etc. It includes a full HELP library, with about the same content as the included (.RNO) documentation. The documentation is mainly for reference and is very weak on examples. It takes a while to figure out how to set up all the parameters. On Compuserve, for instance, I wanted the equivalent of "7 data bits, ignore parity", but "ignore" is not one of VAXNET's options. I worked around the problem by setting the local terminal (i.e., VT220 window) to "NOEIGHTBIT", but it would be a lot more convenient if VAXNET would do it. If it can, I don't know how.

VAXNET offers some features not present in the programs mentioned previously, notably autodial modem support for several different modem types. There is also a script feature which can automatically interact with the remote system. The questions normally asked by VAXNET's opening dialog can be answered in advance by defining DCL symbols; you can set up a command procedure to set parameters for the host you wish to dial and then invoke VAXNET automatically.

VAXNET supports KERMIT and XMODEM protocols, in addition to one of its own. An EASYLINK interface is provided, though I did not test it. The ASCII capture feature creates a stream file which must then be reformatted by a utility which is included in the kit.

I was able to get VAXNET hung up once, to the point that I had to delete the process to clear the problem, but overall it seems fairly reliable. When filling a screen, the output is rather jerky, but the interactive editing response is quite tolerable.

Missing Features

As near as I can tell, none of these programs offers the equivalent of "PRINTSCREEN" or "<ctrl> PRINTSCREEN" to a designated printer. The PRINTSCREEN function can be largely handled by the VWS "print portion of screen" option, if you have a printer that understands SIXEL graphics. It's true that all of these programs can capture the incoming data in a file, for later printing. Still, it's not as convenient as the "printer port" protocol supported by Pro/Communications or real terminals.

What about PFT/CFT/MFT?

Many Pro-300 users are familiar with the old Professional File Transfer (PFT/CFT) protocol, which is also supported on RSX systems as MFT. On Micro-RSX, you can invoke MFT as a server using "COPY/REMOTE". I don't know of any support for MFT on the VAXstation (as a "terminal", not a "server"), though there are times when it would be handy. In the meantime, I use PFT/CFT on the Pro under Pro/Communications, and then copy the files across Ethernet to the VAXstation.

Where Are the Radio Buttons?

Absent among the programs mentioned here are any which truly exploit the VAXstation display. No Macintosh-style bells and whistles are in evidence, such as graphic "file transfer progress" reports or pushbutton protocol choices. I suppose we'll have to wait for DECwindows (Real Soon Now?) before we see such goodies.

Summary

Maybe there are other communication programs for the VAXstation that I haven't seen, but none of those tested here really measures up in all respects. Still, HOST32 is very handy for working with Compuserve, because of the built in "B" protocol. VAXNET comes pretty close to meeting my expectations, though printer port emulation and an "ignore parity" option would be handy. Kermit-32 works well, but lacks the autodial features of Kermit-11. The only commercial product tested, DEC's SET HOST/DTE, has little to recommend it, even with a DEC modem.

All in all, these programs do offer enough capability to get me off the Pro-350 and onto the VAXstation for most of my terminal emulation and file transfer. Speaking of which, it looks like my file transfer in the other window has finished; time to get back to work . . .

VAXmate Section

DMI Announces 60 MEG Portable Tape System for the VAXmate and AT/XT Compatibles

By Lynn Jarrett, PC SIG Chair

DMI, INC. an innovator of enhancement products for Digital Equipment Corporation personal computers is now marketing their newest portable tape system for the VAXmate and AT/XT compatibles.

The system, known as the DM 371, operates with both the DMI DM 300 and the DEC RCD Expansion Systems for the VAXmate, and the IBM AT/XT compatibles.

The DM 371 utilizes a ruggedized 3 1/4" streaming cartridge tape drive with the newest high density/high speed DC-2000 mini data cartridge which provides data reliability 100 times greater than previous larger cartridge backup systems.

The required cables, controllers, and easy-to-use proprietary software are supplied by DMI based upon the system configuration it is backing up.

The system allows you to store unlimited amounts of data in increments of up to 60MB per cartridge. It is truly the most cost effective portable tape system in the marketplace today."

Unattended operation, automatic time and date backup, and file-by-file backup and restore are just some of the main features which are the result of the easy-to-use software supplied with the unit. DEC installations that have VAXmates and AT/XT compatible will now be able to resource-share the DM 371 across many computers.

The DM 371 simply plugs into the back of the P.C., weighs less than 3 pounds, and simple disconnect allows the user to easily transport the sytem to another PC. In addition to backup application, the DM 371 is ideal for transferring files from PC to PC, and also for archival storage of data.

DMI is headquartered in Irvine, Calif., and can be phoned at (714) 583-1800.

Rainbow Section

Intersecting Concepts Announces MEDIA MASTER 5.0

By Lynn Jarrett, PC SIG Chair

Intersecting Concepts of Thousand Oaks, Calif., has released Media Master 5.0, a disk-to-disk format conversion utility for the IBM PC and PS/2 family of computers.

The utility permits an IBM PC, XT, AT, PS/2, or compatible to read, write and format over 200 CP/M, MS-DOS, and TurboDOS disks. With Media Master, users can share information between previously incompatible computers by breaking the disk format barriers associated with different operating systems.

New features in version 5.0 include support for the IBM PS/2 family of computer using 1.44 megabyte and 720k floppy drives, the capability to customize the program through setup files, full color support, on- line context sensitive help, first letter menu selection, and a much easier installation procedure.

In addition, the program supports a "power user" mode which allows one physical floppy drive to have two logical names, one for normal DOS disks, and one for any special disk format the user may choose. For example, the A: logical drive would be used for normal DOS transfer, and another logical drive letter, say F: would be used for Kaypro transfers to the same drive.

Registered end users can obtain upgrades for a small fee until May 1, 1988 and after that the upgrade price will be a little more. Because Media Master is included in the company's Media Master Plus and Accelerate 8/16 products, similar upgrade terms apply.

The five year old company publishes Media Master for the DEC Rainbow, Osborne, Kaypro, Sanyo 555 and Z-100 computers, Display Master, an EGA/VGA screen enhancement program for the IBM PC, and Code Blue, an IBM PC emulator for the DEC Rainbow. For more information contact: Mark Graybill, Intersecting Concepts Inc., 80 Long Court, Suite 1A, Thousand Oaks, CA.; or call 800-422-8018 (in CA 805-373-3900).

NEWSLETTER OF THE VAX SYSTEMS SIG



Pageswapper

Our Mascot

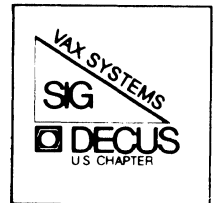


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VAX

PAGESWAPPER – May 1988 – Volume 9 Number 10

To register for on-line submission to the *Pageswapper* dial:

(617) 262-6830

(in the United States) using a 1200 baud modem and log in with the username PAGESWAPPER.

Articles for publication in the *Pageswapper* can be sent (US mail only—no “express” services please) to:

Clyde T. Poole, *Pageswapper* Editor
University of Texas at Austin
Dept. of Computer Sciences
Taylor Hall 2,124
Austin, Texas 78712-1188

Preference is given to material submitted as machine-readable text (best is Runoff source).

Please do not submit program source, as that is better distributed on the VAX SIG tape.

Please do not submit “slides” from DECUS Symposia presentations (or other meetings) as they are generally a very incomplete treatment for those readers of the *Pageswapper* who are not so fortunate as to be able to travel to Symposia. Please *do* write articles based on such slides to get the content across to a wider audience than is able to attend.

Change of address, reports of non-receipt, and other circulation correspondence should be sent to:

DECUS U.S. Chapter
Attention: Publications Department
249 Northboro Road (BPO2)
Marlborough, MA 01752
USA

Only if discrepancies of the mailing system are reported can they be analyzed and corrected.

Editor's Workfile

Larry Kilgallen

NET*.DAT File Security

Be sure to read topic 942 in the Input/Output section this month. It tells about an undesirable loosening of file protection some sites have been discovering after the upgrade to VMS V4.6 or VMS V4.7.

***Pageswapper* Typography**

Well, we have finally made the plunge into the world of proportionally spaced fonts. The type size is chosen to make the average line easy to read, according to the guideline of 75 characters per line indicated by Leslie Lamport in one of his talks. The front end, however, is VAX Document V1.0, and it prevents a designer from getting at any monospaced font between 9 points and 16 points. Until that is resolved I have chosen the smaller size, making examples hard to read but ensuring they will fit on the page.

Your submissions are still welcome in Runoff format, and I think I can also convert LaTeX.

VMSnet Address Correction

by Tom Allebrandi

In Jamie Hanrahan's VMSnet article in the February *Pageswapper*, my address was listed as the place to send TK50's for the VMSnet release. As of March 1 we are no longer at that address. The correct address is:

Tom Allebrandi
c/o Advanced Computer Consulting, Incorporated
700 Harris Street, Suite 101
Charlottesville, VA 22901
(804) 977-4272

A Tale of IBM Field Service

by Terence M. Kennedy
St. Peter's College
Department of Computer Science
2641 Kennedy Boulevard
Jersey City, NJ 07306

Originally submitted to DECUServe

[This might enlighten one as to an appropriate route a company might take to correct a difficult service problem — remember, this is the “Evil Blue Empire” that we are discussing . . .]

About 3 years ago, an IBM 3138 (that's a 370 Model 138 CPU) I also manage was having strange problems. This machine was built about 1972, by the way. It would report irrecoverable errors on a disk drive, but when the operating system asked for the error status, the control unit returned a response that there had never been an error. Needless to say, this had the operating system taking fits. We called our regular service guy (you *always* get the same guy). He came out and couldn't find anything broken, although the system was obviously misbehaving “It passes the diagnostics . . . ”). So, he called in the next level of tech support. Same thing. Next level — this guy arrives in worn-out jeans and a flannel shirt — so much for the IBM image — this guy manages to isolate the problem to one area, but he's stumped too.

Now, I have 3 IBM guys standing around. On the edge of their conversation, I hear things like “should we get **Him?**”. The consensus was yes. The next morning, this really strange-looking person shows up at our door. He manages to wheeze out “I'm from IBM to fix your 138”. So, we take him downstairs to the other 3. He doesn't even look at them — he just goes into the CPU and looks around. About 3 minutes later he shows the other 3 which wire to change. After he left, I asked who he was . . .

The answer — he was the original design engineer for that part of the CPU!

No I'm not saying that this is a reasonable system for DEC to emulate, but it *did* get the system fixed. Yes, whole assemblies can be replaced by minimally-trained personnel, but they lack the in-depth knowledge to determine *why* something complicated isn't working, and they also lack the *authority* to order a complete swap of the failing subsystem. Without one or the other, they (DEC Field Service) are doomed to repeat the problem they had at my site, and will continue to lose business. True, the majority of service calls are of the swap-a-board or change-the-fuse type, and DEC does fairly well with this. Beyond that, things go downhill . . .

LUG News

Meeting topics for May – from respective LUG Newsletters

St Louis Local User's Group

5:30 pm — social time

6:00 pm — dinner

7:00 pm — program

May — Digital picnic and Open House (at the Digital branch office, not the Salad Bowl)

MIVAXLUG

Lawrence Institute of Technology
Management Building, Room M336
10-Mile Road
Southfield, MI

6:15 Open Steering Committee meeting

7:00 Main Meeting

May 10 EMC — Optical Disks

Fall 1987 VAX SIG Tape

by Glenn C. Everhart
 25 Sleigh Ride Rd
 Glen Mills, PA 19342

Here is a listing of the Fall 1987 symposium tape from the DECUS US Symposium held at Anaheim, California. Due to the large volume of submissions, three tapes at 1600BPI are required to hold them. The following is a brief summary of their contents.

Table 1-1 Fall 1987 VAX SIG Symposium Tapes

Directory	Contents
	[VAX87C...] Directory tree and tape
[.an]johno]	DCL interface for automatic submission of single command batch jobs. General multi-threaded VMS exec server symbiont. DECnet \$GETxxl server. Memory virtual disk driver much more efficient than PDDRIVER. From John Osudar, ANL
[.arc]	Print on HP Laserjet including forms. EVE Plus updates. EBCDIC <-> ASCII converters. From Steve MacNeil, Access Research
[.bassett]	Loan and investment programs. Golf handicap system. Idle process watchdog. Fortran based menu system. VT241 colors, auto-dialer, DCL menu, Talaris fonts, DTRFIND. News update. Reminder (update from VPW version). Show users in Cobol. from Fred Bassett, JG Boswell.
[.battelle]	ARGNUM – find number of arguments passed to a subroutine. User UIC change via custom sys service. Filename from FID. File locate based on size, uic, etc. Pascal environment files. Save/restore hashed password in UAF. Struct. Macro library. TPU show/set directory, add function. keys, encode/decode. From Mark Oakley, Battelle Institute.
[.bzl]	LSE templates for Runoff and LSE. Sample for outgoing connection to PSI. Erlang blocking formulas. Programs to measure real VAX CPU speed. From Bart Lederman, ITT World Communications.
[.ci]	Monthly close VMS accounting. Count records in file. DIALUPINI for dialup modem stat set. DROIDS game (moved to [games.ci]). ENPAGE – paginate documents for LN03 & set margins etc. FORCEX – force exit on images. Print reminders from REMINDER program. System status report (SYSTATUS) with lots of abilities. From Ken Richardson, Compassion International.
[.clement]	Update to Bonner Runoff (large superset of DSR). Spy, another continuous system status routine. From John Clement, Bonner Lab, Rice Univ.
[.clib]	Non-DEC C library and a few utilities using it. From Eric Levy, Bear Systems.

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Table 1-1 (Cont.) Fall 1987 VAX SIG Symposium Tapes

Directory	Contents
[VAX87C...] Directory tree and tape	
[.costello]	Update (minor; bug fix) to TPC, a tape -> disk -> tape format independent copy utility. From Dennis Costello, National Nanofab Facility.
[.csdhbo]	Filter repetitive broadcasts on consoles on cluster so each console gets messages from its own CPU only. System services library. From Jonathan Welch, HBO &Co.
[.djm]	Elect. Telephone book; run AUTHorize in any directory. Define VT2xx keys. info re identifier. Tell what files will be purged. See who uses a command procedure. List of VMS documentation set. From D. J. Maus, Fermilab.
[.dolgen]	Utilities to make conversion to DECalc V3.0 a little easier. Utilities to reorganize a disk. From Wimpy Hudson, Dollar General.
[.down]	DOWN – utility to move around directory tree more easily. From Michael Wheeler, Tenn. Tech. Univ.
[.dtredit]	Utility to facilitate editing DTR fields where you don't have FMS or TDMS, DTREDIT. From David Swan, Greenville, Nova Scotia, Canada.
[.dtrsig]	ACCOUNTING – convert VMS accounting to something DTR can handle. Also terminal measuring process. ALLIN1 – DTR definitions for A1 files. CORPHONE – corporate phone directory in DTR. FUNCTIONS – more DTR functions including spawn and string length. NEWSLETTERS – old Wombat Examiner issues. PLOTS – more DTR plots. RECALL – use SMG to add command line recall to DTR. SYSUAF definitions for DTR. RSX accounting with DTR. Method of processing INSTALL/LIST/FULL to see what are most used images, shared images, etc. From DTR SIG, Bart Lederman, Librarian.
[.ellis]	Numerous kernel mode programming examples from the master of the art, Bruce Ellis. Such items as show process/files, purge working set of a process, etc... much more, very powerful but potentially dangerous utilities. Titles include: ADDRESS_TRANSLATION, DEADPT, DEALO, DUMP_BLOCK_COUNTS, LOAD_BLOCK_COUNTER, UNLOAD_BLOCK_COUNTER, SHOW_PROC_FILES, GET_HIT, PFM, PFMFILWRT, PFM_FORMAT, SHOWBASE, SHOW_SHARE, WSBLASTER, FAULT, PERF.
[.eros]	BATCHACC – set account of batch job to submitter process. CPU hogs monitor. LIMITER – limit the number of sessions per username. NOPE – list what files (+ sizes etc.) of files that would be deleted in a purge. PASS – disallow reuse of passwords. PCT – show % use of CPU. SYSTAT and MEMSTAT – info on system processes and memory use. From Tom Bodoh, USGS Earth Resources Observation Systems (EROS).
[.eveupds]	Update to EVEPLUS, from Denny Thury.
[.flecsvms]	FLECS and ALECS structured preprocessors for Fortran and Macro. Now totally native mode. From Michael Oothoudt, Los Alamos Lab.

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Table 1–1 (Cont.) Fall 1987 VAX SIG Symposium Tapes

Directory	Contents
	[VAX87C...] Directory tree and tape
[.flowers]	Delete zero length files. Show disk space. Move around directory tree and/or draw tree. EDT ini files and wildcard editing. Differences of file uppercased, compressed, and trimmed. Documents in beautified form for EVEPLSPLS (from 87B tape). LaTeX document style manual. Mail UAF maintenance tools. VT2xx key definition support. Backup control command procedures. From Harry Flowers, Custom Computer Applications.
[.games]	HACK game from Dean Grover and CRIB game from MNVAXLUG
[.grc]	CALC2SMG – Emulates HP calculator. EDT super emulator for TPU. Directory from within EDT. MODOBJ – fixup object files for more general addressing. Time VAX instructions accurately. From Rich Harris, General Research Corp.
[.grover]	Updated EDT–Plus extensions to EVEPLUS. SWING graphical and screen oriented directory management program. From Dean Grover, Hughes Aircraft.
[.howe]	EVE extensions, from Herb Howe, Oak Ridge National Lab.
[.jcslug]	SETUSER – change username to that of another user w/o login. MAILUTIL – let a user see if mail from him has been read. SPEEDLOGIN – fast symbol definitions at login. LAB I/O control system. Local print of file to VT102 terminal printer. Load foreign tapes. TELEMAIL – bulletin board mail built on VAXNET. WATCH – watch other processes. From William Baker, Ford Aerospace.
[.ketech]	Standard menu interface software (with FMS or without). SETUSER – “become” another user if privileged enough. From Richard Snyder, KeTech Corp.
[.kka]	Foreign tape reader, VERY flexible. EVE extensions. VMS_SHAR VMS “shell archive” for packing files for mailing. From Kurt Andersen, JPL.
[.latshaw]	EDTEM – very extended EDT emulator in TPU, many extensions. From Mike Latshaw, Pacific Power and Light.

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Table 1–1 (Cont.) Fall 1987 VAX SIG Symposium Tapes

Directory	Contents
[VAX87D...] Directory tree and tape	
[.coy]	DM – directory manager. SD – set default program. WPS-PLUS emulator in TPU, plus extensions. Color setup for VT241. WPS-PLUS emulator for LSE. SHOWME – show all the system can find out about a terminal. MCL – multicolumn file lister. NOTES update utilities. Procedures to build text libraries (.TLB). From Dale Coy, Los Alamos National Lab.
[.levine]	BREAKOUT – Building blocks for extended accounting utilities. HELLO – Command file for VT terminals; cookie type. INDEX – powerful Fortran cross referencer, static analyzer, and flowcharter. JUICER – Online and offline disk compression and file defragmenting. MUTEX – find sources of MWAIT states. NETLIST – condensed SHOW NET listing. QUICFONT – font editor for Talaris printers. SNAPSHOT – system snapshot utility runs every 15 minutes. TAPE – read/write blocked card images in ASCII or EBCDIC to tape, record length 132 or less. TQE – print timer queue elements. VAXPAINT – convert MACPaint document into Talaris bitmap for plotting on Talaris. From Michael Levine, Naval Weapons Center.
[.rcaf87]	AMIGA – editors (including uEmacs 3.9e), spell checkers, graphics and Postscript access routines, VT100 emulators, convert Amiga pictures to form printable on DEC printers, AnalytiCalc spreadsheet for Amiga. Sources generally present. AnalytiCalc spreadsheet update for VAX, RSX, IBMPC, and AmigaDos. Update to LISTRS multicolumn lister from Chris Doran. RIM5 DBMS updated documents, source. Desktop Calendar update. FINGER update, supports VMS 4.6, LAT identification, secure operation (security bugs squashed), many customizations. LZW – Lempel Ziv Welch compress/decompress utilities used. NETNEW – about 10,000 blocks of utilities from Internet, indexed; includes VI in TPU, controllers for several processes from a terminal, LEX & YACC inputs for Ada parsers, Bulletin, SWING, much more. SSP – Scientific Subroutine Package w/comments. TARRDR – TAR tape format read & write from VMS. VMSDS – VMS disassembler to convert .EXE files to (recognizable!) .MAR files. Submitted by Glenn Everhart, RCA.
[.sewell]	MWEB – WEB adapted to Modula 2. WEBMERGE – merge multiple change files. SCANTEX – strip out parts of a WEB file not changed. LaTeX slides for LT005 session on WEB structured documentation system. From Wayne Sewell, E-Systems.

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Table 1-1 (Cont.) Fall 1987 VAX SIG Symposium Tapes

Directory	Contents
[VAX87E...] Directory tree and tape	
[.lilug]	TIMESUM – make plot of no. processes vs time. PUTGET – fast file I/O for Fortran. TRAIN.DAT – VT100 demo. From John Hasstedt and Pierre Hahn, SUNY Stonybrook.
[.matuscak]	WANG IIS WP document conversion to MASS-11. From Joseph Matuscak, Babcock and Wilcox.

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Table 1–1 (Cont.) Fall 1987 VAX SIG Symposium Tapes

Directory	Contents
[VAX87E...] Directory tree and tape	
[.meadows]	FILE – Change RMS attributes or dates on any files without copy. INDEX – find files based on lots of criteria (size, length, date, fragmentation, etc.) FAST. STATUS – fancy SHOW USERS plus DECnet info. VERB – decompiler for DCL tables, converts them to CLD files. From Joe Meadows, Jr., Fred Hutchinson Cancer Research Center.
[.merrimack]	BATCH – command proc to generate Batch jobs interactively. Directory sharing utilities. Checkmail – see if you have mail. INTRO – poke in a system w/o privileges. LATHACK – find where a LAT terminal is. PANDORA – super TPU editor. More. From Rand Hall, Merrimack College.
[.mivaxlug]	PRIVILEGE – set/reset privileges in menu fashion. CALCULATOR – SMG based calculator. GETQUI – get queue info. SWING rewrite from DEC. More. From John Gordon, MIVAXLUG.
[.mnvax]	Subroutine for standard keyboard input in Basic. Force user to change his password. Video Attribute Text Formatter. Extended EVE. Statistical program. Editing and Runoff control program. Program to let privileged user become almost invisible. From Mark Van Overbecke, Macalester College.
[.nanny]	Powerful system management aid/idle terminal killer/priority monitor, from Dan Zirin, ZAR Ltd.
[.nds]	Fast spelling checker from Jack Harvey, NDS
[.news_src]	Un*x NEWS rewritten for VMS; the celebrated Geoff Huston NEWS program. Handles USENET newsgroups on a VMS VAX. From Geoff Huston, Australian National Univ.
[.nstl]	SETDEF – set default program. FRED – powerful editor, complete but written in TPU. FLEXISMB – rewrite of print symbiont, flags etc. settable. From Pery Wischow, NORDA.
[.nswc]	BATCH – “instant” one – liner BATCH commands. MAILUAF – maintain mail files and forwarding. REMINDER – appointment reminder/tickler. OTHERNODE – execute commands on another node in DECnet object. NSWC_Server – time based and DECnet daemon. Check_Sessions – tell user where he’s logged in, where else on the cluster they may be logged in too. From Al Zirkle, Naval Surface Weapons Center.
[.pageswapper]	<i>Pageswapper</i> issues since Spring 1987 symposium and compressed VAXNotes file. From Larry Kilgallen, <i>Pageswapper</i> editor.

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Table 1-1 (Cont.) Fall 1987 VAX SIG Symposium Tapes

Directory	Contents
	[VAX87E...] Directory tree and tape
[.perfmon]	VMS Performance monitoring (response time, % idle, average users, I/O, memory, disk usage, etc.) utility. From S. Charles Spriggs, E.I. DuPont.
[.piccard]	EDT TPU enhancements. From Richard Piccard, Kalamazoo College.
[.remprint]	REMPRINT – print one or more files on a remote system device. From Marty Adkins, Westinghouse.

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Fall 1987 VAX SIG Tape

Table 1-1 (Cont.) Fall 1987 VAX SIG Symposium Tapes

Directory	Contents
[VAX87E...] Directory tree and tape	
[.restore]	RESTORE – recover deleted files from Files-11 ODS-2 disks. From W. B. Langdon, CERL.
[.rwk]	DTR system management aids. Pascal environment files. Command procedures for system management. From Ronald Kaltenbaugh, SYSCON.
[.rsxfinger]	FINGER utility for RSX which communicates with Columbia University FINGER over DECnet. Shows users, what they are doing, and acts as a remote name server.
[.schumann]	ARCHIVE – Procedures to archive disk directories to tape. INCREMENTALS – locate which tape contains a file. OPRESPOND – method to do 2 way communications with operator during a batch job. Poker game. TERMTYPE – set symbol for a terminal type. WPS – WPS Plus emulator under TPU. From Dar Schumann, Farm Credit.
[.sealug]	MACINTOSH – read MAC files on VAX; file transfer; MAC tech notes. DECNET – conversational DECnet object. Remote print and batch control. Remote command execution. SHARE_EXE – builder for shareable .EXE builder. XMODEM – XMODEM communications program with much faster CRC. MODEM7 – Dialout companion to XMODEM. From J. James Belonis II, Univ. of Washington.
[.smith]	Remote print and form control over DECnet. Network time maintenance utility. From David Smith, USMC.
[.softquo]	Soft Quota disk management system, from Marty Adkins, Westinghouse.
[.spencer]	EDT enhancements (including WPS keypad style too). TECO emulator for EDT. LSE section file implementing EDT initializer extensions. From David Spencer, Foundation Health Plan.
[.sysmon]	Multiple process monitor utility to watch paging and page trimming. From William Flatt, Intercompany Pool, Spokane, WA.
[.tulug]	Menu program in Cobol. Amortization program. Define logicals from a central file. Give text of VMS error numbers. EDT enhancements. Purge working set. LG02 control files. Reminders. Operations help libraries. Save/restore recall buffer. Text library menu. More. From Les Stockton, Williams Co's.
[.t_nieland]	EDTPLUS – EDT emulator in TPU with many additions. SEND – broadcast short message to other user. SETDEF – IN foreign utility. WSLTEX – WordStar to LaTeX filter. From Ted Nieland, Systems Research Labs.
[.ualr]	BBS- FULL function BBS system for VAX (message, conferences, uploads, downloads). CB – CB simulator for VAX. ETAPE – read/write EBCDIC or nonstandard ASCII tapes. OPERMENU – menu driven operator system. WHO – cluster-wide who's on the system. From Dale Miller, UALR
[.vfe]	Vax File Editor, binary/hex/ASCII, EBCDIC, etc. disk editor or file editor. From Ward Condit, Maricopa Community Colleges.

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Password of the Month

Table 1-1 (Cont.) Fall 1987 VAX SIG Symposium Tapes

Directory	Contents
[VAX87E...] Directory tree and tape	
[.vt2xx]	Program VT2xx function keys F6 to F20, from E. Denise Anderson, Cordis Pacing.
[.watson]	EVE and EVEPLUS extensions; merged from many earlier ones with additions by Al Watson. Includes Emacs-like Dired, mail interface, interface to Denison Univ. Spell Checker. From Allan Watson, Watson Consult.
[.wolfe]	Extended EVE with simple spell checker. Print symbiont with user defined headers (on each page). Virtual block (fast) I/O in Fortran. Demos. Lines of code counter. From Tom Wolfe, JPL.

Password of the Month

The VMS Password Generator, in addition to providing a pseudo-random “pronouncable” password, also provides guidance (similar to that in a dictionary) as to how the password should be pronounced. Did you know, for instance, that:

kiemtshij

is properly pronounced:

kiemtsh-ij

?

DECnet–VAX Tips

Originally Published in March 1988 *Longwords*
the Newsletter of DFWLUG

Problems in mixed PHASE III/PHASE IV Networks

Description:

Areas are supported with TOPS–10 V7.03 (Phase IV) over Ethernet. Phase III nodes in a multiple–area network must not be in the routing path between Phase IV nodes and must not be linked to nodes outside their own area. These limitations are based on the following restrictions under which Phase III nodes operate in a Phase IV network:

- DECnet–VAX Phase III nodes cannot assume a node address greater than 255, and cannot directly address a node with a node address greater than 255. They also cannot route through traffic for nodes with addresses greater than 255. (Note that this limit may vary for other DECnet Phase III nodes, up to a maximum possible address of 1023.)
- Phase III nodes cannot recognize area numbers in node addresses. A Phase III node cannot assume an area address, directly address a node outside its own area, or route through traffic for nodes in other areas.
- Phase III nodes cannot be connected directly to an Ethernet.
- Phase III nodes must use routing initialization passwords when they are initialized in a Phase IV network.

For more information on Area Routing Configuration, reference Appendix A in the *Guide to Networking* or Appendix A of the *VMS V4.4 Networking Manual*.

MicroVMS V4.4+ Static Async Takes Long Time To Establish Circuit

Symptom:

MicroVMS V4.4 Static Asynchronous DECNET takes a long time to establish link. This scenario will extent itself to microVMS V4.6 if a site upgrades from earlier versions and does not correct the problem.

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Analysis:

There are several problems with Static Asynchronous DECnet under microVMS V4.4. One is that circuits come up as “on”, but it can take some time (about 15 minutes) to establish a link to the remote node under certain conditions. After around 15 minutes, you then get the event 4.14 Node Reachability Change when it finally establishes the link to the remote node. The second problem is when two circuits are toggled (OFF/ON), the asynch circuit never gains control of DECNET circuit even when it’s circuit cost is lower.

Example: (Expected Behavior)

- With circuits QNA-0 (cost 5) and TT-0-2 (cost 10), we see both circuits come up as ON and the QNA circuit is the active DECNET link because of the lower cost. You can lower the cost of circuit TT-0-2 to 1, and it will become the DECNET circuit in use.
- If both circuits come up in ON state with a lower cost on the QNA and you turn the QNA-0 state OFF, the TT-0-2 circuit will then become the active DECNET circuit.

The above two scenarios are what we would expect.

What we see with QNA-0 (cost 5) and TT-0-2 (cost 1):

```
NCP> SHOW KNOWN CIRCUITS
```

```
QNA-0    on      1.1 (VAXA)  
TT-0-2   on      1.2 (VAXB)
```

```
NCP> SHOW KNOWN NODES
```

```
1.1 (VAXA)  reachable      TT-0-2      1.1 (VAXA)  
1.2 (VAXB)  reachable      TT-0-2      1.2 (VAXB)
```

Then if we toggle circuit TT-0-2 (state OFF then back ON):

```
NCP> SET CIRCUIT TT-0-2 STATE OFF  
NCP> SET CIRCUIT TT-0-2 STATE ON
```

and,

```
NCP> SHOW KNOWN NODES
```

```
1.1 (VAXA)  reachable      QNA-0      1.1 (VAXA)  
1.2 (VAXB)  reachable      QNA-0      1.2 (VAXB)
```

and both circuits are still in an “ON” state with TT-0-2 still at a cost of 1 but reachable over circuit QNA-0.

Now, if you set circuit QNA-0 to state OFF, all nodes become unreachable. If you leave everything as is, it will log an event 4.14 Node Reachability Change after approximately 15 minutes and then circuit TT-0-2 will become the active circuit. However, if you turn QNA-0 back ON, circuit TT-0-2 (with a cost of 1) will become the active DECNET circuit.

Solution:

Apparently, NODRIVER has been modified on V4.4 VMS. The problem was seen when the executor buffer size and the segment buffer size were lowered to 192, as was suggested with earlier versions of VMS. Now with V4.4 VMS, we can leave the buffer sizes at 576 (default). This scenarios seen above went away when the buffer size was set to 576.

How To Set Up ALIAS For Members of a VAXcluster with VMS 4.4

How do you configure a cluster to be referred to by a name other than the specific node name of the individual cluster members?

Description:

With VMS Version 4.4, VAXCLUSTER members may now be referred to by a single node name. This node name is an ALIAS by which each member of a cluster may choose to be referred to. The cluster ALIAS address and name follow the same rules of any non-cluster DECnet node. The assignment of the ALIAS to a node is accomplished by using the NCP utility. NCP can make all references to this new cluster name permanent in the DECnet database.

Procedure for using an alias:

In order to use an ALIAS, one node within the cluster MUST BE a DECnet Level 1 router. This is accomplished with the following commands to NCP on that node. If routing is already enabled on one node within the cluster, this step can be disregarded.

```
$ MCR NCP
NCP> DEFINE EXECUTOR TYPE ROUTING IV !requires DECnet reboot for activation
NCP> EXIT
```

The following commands issued to NCP will establish the cluster ALIAS as a permanent DECnet node name in the database, and subsequent reboots of the node will allow ALIAS access. These commands should be invoked on each member node of a cluster that is to be referenced using the ALIAS. Member nodes that do not issue these commands will not participate in the ALIAS feature:

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```
$ MCR NCP
NCP> DEFINE ADDRESS area.number NODE cluster_name
NCP> DEFINE EXECUTOR ALIAS NODE cluster_name
```

Note:

By default, the ALIAS INCOMING parameter is enabled for a node if an alias node identifier has been defined for the node. The next command is only supplied for completeness and is not required.

```
NCP> DEFINE EXECUTOR ALIAS INCOMING ENABLED
```

Note:

By default most network objects have ALIAS INCOMING/OUTGOING either disabled or enabled depending on the nature of the object. PHONE for example is by default DISABLED for both since it requires specific node interfacing to isolate the desired user. The following commands are not required but serve as an illustration for object access via the ALIAS:

```
NCP> DEFINE OBJECT ALL ALIAS INCOMING ENABLED
NCP> DEFINE OBJECT PHONE ALIAS INCOMING DISABLED !override PHONE
NCP> DEFINE OBJECT ALL ALIAS OUTGOING ENABLED
NCP> DEFINE OBJECT PHONE ALIAS OUTGOING DISABLED !override PHONE
NCP> EXIT
```

In order to activate the ALIAS, you must shutdown DECnet on each cluster node via the NCP command:

```
$ MCR NCP SET EXECUTOR STATE OFF      !shutdown ONLY DECnet on the node
(or reboot the whole cluster at once with the SHUTDOWN.COM)
```

After DECnet is shutdown (DCL command SHOW SYSTEM indicates process NETACP and REMACP are gone) restart it using the SYS\$MANAGER:STARTNET.COM command procedure.

New Features in DECnet-VAX V4.4

Description:

Several new features have been added to DECnet-VAX V4.4. These new features include the addition of a cluster alias, changes to the permanent database, the ability to downline load using a software id, improved performance over asynchronous lines and satellite links, and a QIO interface for 802 support. The following is a detailed description of the new features.

- **Cluster Alias**

A cluster alias enables nodes in a VAXcluster to be accessed using a single node name while retaining the ability to be accessed individually. The alias node name is perceived by other nodes in the network as representing a single node. When users specify the cluster alias as the remote node name, they will be connected to one of the cluster nodes that is currently available. Users no longer need to know which nodes in the cluster are active in order to successfully connect to the cluster.

There must be at least one routing node in the cluster in order for the cluster alias to be available. The routing node maintains a table of all nodes in the cluster using the alias node name and advertises that it is exactly one hop away from the alias node. This results in all packets destined for the alias node being sent to this router. Connect request packets received are passed to nodes participating in the cluster alias in a round robin fashion. All other packets received for logical links created to the alias node are forwarded to the appropriate node in the cluster by the router. Because the existence of a router is required for the availability of the cluster alias, it is recommended that there are at least 2 routing nodes in the cluster to maintain the availability of the cluster alias. The second router will automatically replace the router that is handling the alias traffic in the event that it becomes unavailable.

Because a minimum of two routing nodes are recommended when using the cluster alias, a change in the routing algorithm has been implemented to alleviate some of the overhead incurred by a routing node. The change in the algorithm causes the routing node to claim that it is infinite hops from all nodes in the network except itself and the alias node, and to send out routing update messages only when the broadcast routing timer expires, rather than

every time there is a change in the network topology. The default value for the broadcast routing timer has been increased from 40 seconds to 180 seconds. This algorithm is used when a router has only one active circuit.

It is important to note that there is no automatic failover to other nodes in the cluster for logical links created using the cluster alias. If the node in the cluster handling the logical link goes down for any reason, another node in the cluster will NOT automatically take over the logical link. The logical link is terminated and the remote user must re-establish the connection to the cluster alias to get another available node in the cluster.

By default, the EXECUTOR is set up to enable the node to accept incoming connections that are destined for the alias node. If the system manager does not want the node to accept incoming connections for the alias, then this feature must be manually disabled.

Network objects may also be set up to use the alias node name. By default, most network objects will accept incoming connections destined for the alias node address, but the system manager must enable the use of the alias for outgoing connections. MAIL is the only network object that, by default, will use the alias for both incoming and outgoing connections. The alias should not be enabled for network objects, such as PHONE, that require multiple concurrent logical links to a single node. The reason for this is because incoming connections for the cluster alias are assigned in a round robin fashion to nodes in the cluster and there is no guarantee that all connections from the object will be created to a single node. If a proxy account is set up on a remote node using the cluster alias, the objects on the local node that would utilize the remote proxy account should be set up to use the alias node name for outgoing connections. This would enable the alias node name to be used in the connect request, rather than the actual node name.

- Setting up a Cluster Alias
 - At least one node in the cluster must be set up as a routing node, though it is recommended that there be more than one routing node to ensure the availability of the alias node name.

- Define the alias node name and address in the node database. This definition, like any other node definition, must describe a unique node name and number.

```
NCP> DEFINE NODE alias_name ADDRESS a.nn
```

- Associate the alias node name or address with the executor and enable the node to accept incoming connections for the alias.

```
NCP> DEFINE EXECUTOR ALIAS NODE alias_name
```

- On smaller systems in a cluster or systems with few available resources, the system manager may want to prohibit the node from accepting incoming connections for the alias, though still allow it to use the alias on outgoing connections.

```
NCP> DEFINE EXECUTOR ALIAS INCOMING DISABLED
```

- Configure network objects to use the alias for incoming and outgoing connections. If proxy accounts are set up on remote nodes using the cluster alias, objects such as FAL, that enable a user to access a node using a proxy account, should have the use of the alias for outgoing connections enabled. This will cause the alias node name to be used in the connect request, rather than the actual node name. By default, all objects except PHONE will accept incoming connections for the alias. Mail is the only network object that, by default, will use the alias for outgoing connections.

```
NCP> DEFINE OBJECT object ALIAS OUTGOING ENABLED
```

- Changes to the Permanent Database

In DECnet–VAX V4.4, the permanent node database (NETNODE.DAT) has been divided into 2 separate files NETNODE_REMOTE.DAT and NETNODE_LOCAL.DAT. NETNODE_REMOTE.DAT contains all remote node information and, in a cluster, can reside in SYSS\$COMMON:[SYSEXE] so only one node database needs to be maintained for all the nodes in the cluster. This database should also contain an entry defining the node name and address of the executor. Node information can easily be propagated by copying this database to remote nodes.

The database NETNODE_LOCAL.DAT contains all of the executor information, except the actual node name. The node name is obtained from the entry in the file NETNODE_REMOTE.DAT which contains it. If there is redundant executor node information in the file NETNODE_REMOTE.DAT entry, it is superceded by the information in the file NETNODE_LOCAL.DAT. This file resides in SYS\$SPECIFIC:[SYSEXE] DECnet-VAX will convert NETNODE.DAT into NETNODE_LOCAL.DAT and NETNODE_REMOTE.DAT when DECnet-VAX V4.4 is started for the first time.

- **Improved Downline Load Capability**

A DECnet-VAX node can now provide load assistance to systems that are not defined in the node database, but supply a software id in the load request message, providing the load file is available on the node. When MOM receives a load request, it first looks for a software id in the request. If an id is present in the message, MOM verifies that the load file is present and then offers load assistance. If the load file is not present, it will ignore the load request. If a software id is not present in the load request, MOM will check the node database for an entry for node making the request. If an entry exists, MOM will offer load assistance using the information contained in the database entry.

Currently, only DEC Servers provide a software id in the load request.

- **Improved Satellite Link Performance**

A new parameter, TRANSMIT PIPELINE, has been added to the SET LINE command to enhance performance over DMR11 lines for satellite links. The system manager can now set the number of DDCMP messages that can be transmitted over the DMR11 line before an acknowledgement must be received. The optimum value for this parameter can be calculated by using the following algorithm:

$$\text{MESSAGES} = (\text{DELAY} * \text{RATE}) / (\text{SIZE} * 8)$$

DELAY = Link's total round trip delay time in seconds. It can be determined from the information provided by the carrier or by monitoring the circuit to calculate the delay
RATE = Line speed in bits per second
SIZE = Size of average DDCMP message in bytes. This can be calculated by dividing the number of bytes transmitted by the number of transmissions

- Improved Performance for Asynchronous Lines

The reply timeout for asynchronous circuits will automatically be recalculated if there is constant timeouts occurring on the circuit. This enhancement eliminates the need to use small transmit buffers on an asynchronous line and should help to improve performance over these lines.

- 802 Support

The Ethernet drivers have been enhanced to include a QIO interface for 802 support. IEEE 802.3 and 802.2 packet formats are supported, and the source and destination address fields must be 6 bytes long. Neither the 2 byte nor the mixed 2 byte/6 byte address field formats are supported. IEEE 802.2 Class I service is supplied by the driver. Class II service can be provided by the user if user supplied service is specified.

The Ethernet physical characteristics have been adapted for the 802.3 implementation. This means that physical layer for 802 is identified as type 10BASE5 (10Mb/s baseband medium with a maximum segment length of 500 m).

Information on using 802 QIO interface is documented in the *I/O User's Guide*. Currently, DECnet-VAX does not utilize the 802 support.

- Miscellaneous

Currently the DMV-11 is the only synchronous device supported by DECnet-VAX on the MicroVAX II and the VAXStation II; the DPV-11 is not supported as a DECnet-VAX device. In the future, higher performance synchronous devices will be available for the MicroVAX II and support for these devices will be added to DECnet-VAX.

A full function kit (Q4D05) and an upgrade from end node to full function kit (Q4D09) will be offered for the VAXStation II.

DMB32 Sync Port Problem Under VMS 4.6, NMLRSP Error Message

Symptom:

This problem has been seen when the synchronous port of the DMB32 is configured with the default values in VMS 4.6. The following error is reported, when trying to bring the line and circuit up in NCP with STARTNET.COM:

```
%NMLRSP, listener response message number 756C
```

Analysis:

The DMB32 is setup with a default of 4 Receive Buffers. This is not adequate for DECNET operation.

Solution:

The line DMB-n is configured with receive buffers 4, to correct the problem in NCP input the following commands:

```
NCP> SET CIRCUIT DMB-n STATE OFF
NCP> SET LINE DMB-n STATE OFF
NCP> DEFINE LINE DMB-n PROTOCOL DDCMP POINT RECEIVE BUFFERS 8 STATE ON
NCP> DEFINE CIRCUIT DMB-n STATE ON
NCP> SET LINE DMB-n ALL
NCP> SET CIRCUIT DMB-n ALL
```

Engineering is aware of the problem. They expect this problem will be corrected in a future release.

RMS-W-RTB 'nnn' byte record too large for user's buffer error

Symptom:

The command:

```
COPY filename remote_node::disk:[directory]*.*
```

results in the error:

```
RMS-W-RTB 'nnnn' byte record too large for user's buffer.
```

Analysis:

The largest record in the file being transferred is greater than the SYSGEN parameter RMS_DFNBC. The default value for this parameter is 8 or 4096 (8*512) bytes. Usually the default value is adequate but occasionally, large records are encountered, and when using DECnet, the value must be increased. The sysgen value RMS_DFNBC places an upper limit on the network buffer size for the system that will be used for network access to remote, sequential, indexed sequential, and relative files. It places an upper limit on the largest record that can be transferred to or from a remote file. Thus, the largest record that can be transferred must be less than or equal to RMS_DFNBC multiplied by 512 bytes.

Solution:

Reset the value of RMS_DFNBC as appropriate on target VMS system. This parameter is dynamic and can be changed while the system is running by executing the following commands:

```
SYSGEN> SET RMS_DFNBC 16 ! or whatever value is needed in
                          ! increments of 512 bytes.

SYSGEN> WRITE CURRENT
SYSGEN> WRITE ACTIVE

SYSGEN> USE ACTIVE      ! verify update
SYSGEN> SHOW RMS_DFNBC
```

Make sure that the values have indeed been altered in SYSGEN before executing the COPY command again.

Footnote:

The DCL command SHOW RMS will list current RMS default parameters in a table format. THE SYSGEN parameter RMS_DFNBC equates to the NETWORK BLOCK COUNT and is setable at the process and system level. Thus, if you need to quickly modify the network block count system wide use the command:

```
$SET RMS_DEFAULT/SYSTEM/NETWORK_BLOCK_COUNT=n
(where n is a multiple of 512 bytes)
```

This will update the SYSGEN parameter RMS_DFNBC automatically and you may attempt the copy again, assuming the remote node has been updated too.

NCP DEFINE LOGGING commands return RMS-F-AID error

Symptom:

While using the NCP DEFINE LOGGING commands the following error is seen:

```
%NMLRSP, listener response, file IO error using permanent database
-RMS-F-AID,invalid area number ID=!UL
```

Analysis:

The SYSS\$SYSTEM:NETLOGGING.DAT file has become corrupted.

Solution:

DELETE or RENAME the SYSS\$SYSTEM:NETLOGGING.DAT file and invoke NCP again. DEFINE/SET the logging parameters desired. This will create a new version of the file and the error should not reappear.

ANALYZE/IMAGE Truncates Resulting File Over the Network

Symptom:

The following command produces a truncated file when directed over the network:

```
ANALYZE/IMAGE/OUTPUT=NODE::OUT_FILE IN_FILE
```

An example using SYS\$SYSTEM:LOGINOUT.EXE produces a file with an 8/9 block allocation, whereas without the NODE:: specification the resultant file is 13/15 in size.

RMS defaults have no control of this scenario. The NETWORK_BLOCK_COUNT was increased from 8 to 16. On executing the above command with NODE:: equal to 0::, the resultant file had a 0/0 block allocation.

Other parameters checked were: SYSGEN MAXBUF = 8192, UAF BYTLIM = 10400, which are known to be acceptable in this environment.

Analysis:

The ANALYZE/IMAGE utility does not appear to close the file specified by /OUTPUT correctly and thus when the image runs down, only those buffers that have been written to the remote node are currently available.

In the case of a local file, RMS rundown does all the necessary flushing. For the remote file, FAL does not appear to do the same thing for you, so you get a truncated file.

Restriction:

Use of ANALYZE/IMAGE and directing output over the network is unpredictable. The resulting file is truncated depending on its length and when the source node initiates a disconnect of the link.

Solution:

Engineering is aware of the problem. They expect this problem will be corrected in a future release.

REMACP Fails or Disappears After Increasing SYSGEN's MAXBUF

After upgrading to V4.4, REMACP would “disappear” immediately after being started by RTLOAD.COM. It was determined that during the upgrade the SYSGEN parameter MAXBUF was increased to 5000. Reducing MAXBUF below 5000 fixed the problem but caused some needed applications to fail.

Description:

REMACP allocates virtual memory at startup to hold the various data structures associated with remote terminals, including receive buffers and UCB's.

It calculates the number of pages as follows:

$$((RJOBLIM*GL_VECSIZE*511)/512)+1 + ((RJOBLIM*MAXBUF*511)/512)+1$$

Therefore, if you don't have a large enough page file quota for REMACP, it will die. Other parameters that will kill REMACP would be insufficient working set limit or virtual address space full.

You can increase the page file quota for REMACP by adding the line

```
/PAGE_FILE = N
```

to the file SYSS\$MANAGER:RTTLOAD.COM. Or you can up the SYSGEN parameter PQL_DPGFLQUOTA, which increases everyone's quota.

DEQNA Connected to BROADBAND Ethernet Causes Send Errors

DEQNA connected to BROADBAND clocks short circuit errors in NCP.

Description:

When connected to BROADBAND the DEQNA NCP counters will report send errors (in particular "short circuits") for each transmit. This is due to the LOSS OF CARRIER status caused by signal latency (propagation delay to and from HEADEND) in BROADBAND.

Solution:

Disregard this error when using the DEQNA on BROADBAND.
Nonheartbeat Transceiver Required in LAN DELNI/DEMPR Setup

Symptom:

A DELNI/DEMPR ThinWire combination is connected to an Ethernet LAN. Communication from nodes on the DEMPR to nodes on the DELNI do not work. But nodes on the DEMPR can communicate to nodes on the Ethernet backbone and the same for nodes on the DELNI. The only lack of communication is local to those nodes on the DELNI/DEMPR combination.

Analysis:

DELNI/DEMPR ThinWire configurations do not require heartbeat. In this scenario the H4000 connecting the DELNI to the Ethernet backbone is providing heartbeat.

Solution:

The DELNI/DEMPR combination requires a transceiver without heartbeat. The Digital H4000-BA is the transceiver that provides this functionality. Installation of a nonheartbeat transceiver with the DELNI/DEMPR combination should resolve this problem.

MAIL/PHONE Troubleshooting For “Login Invalid At Remote Node” message

Troubleshooting the MAIL or PHONE utility over the network.

Description:

ERROR RECEIVED: Login information invalid at the remote node.

The first step is determine which node is at fault. MAIL and PHONE use the default DECNET account for network access so we can force a local and remote network access using this account as follows:

`DIR 0""::`

Forces a directory of the default DECNET account on the local node. If the error occurs, then a problem exists at this end.

`DIR REMOTE""::`

Attempts the same test on the remote. If the error occurs, then the problem exists at the remote end.

If the error occurs with both tests then both nodes have problems and the following troubleshooting steps should be taken on each end:

The most obvious cause for this error is that the account/password for the default DECNET account on the remote has changed or is inconsistent with what the NCP EXECUTOR database has stored for this type of access. Once this has been checked more detailed analysis is necessary to pinpoint the cause.

Invalid login errors at remote are most often due to changes in the SYLOGIN or user's LOGIN.COM that are not valid for a NETWORK process. Since the error occurs during LOGINOUT.EXE the error would imply that there is a problem with the account/password rather than an error with a command file, and is somewhat misleading. One way to test this would be to edit the SYLOGIN.COM and enter a SET VERIFY to monitor execution of DCL commands during the network access. A failing command is

isolated in the NETSERVER. LOG file of the receiving account. In any case it is wise to include the following command as the first line of the SYSS\$MANAGER:SYLOGIN.COM file:

```
$ IF F$MODE() .EQS. "NETWORK" THEN EXIT
```

If the problem lingers the likely place to continue would be to use the AUTHORIZE utility to review the default DECNET account parameters:

```
$SET DEFAULT SYSS$SYSTEM  
$MCR AUTHORIZE  
SHOW DECNET
```

The following parameters should be reviewed:

- LGICMD Should be set to NL: (Null).
- DEFAULT Should be set to either of the following devices as needed:

```
SYSS$SYSDEVICE: [DECNET]  
SYSS$SPECIFIC: [DECNET]  
SYSS$COMMON: [DECNET]
```

and the directory MUST exist!

The most common parameter problems causing this error:

- TABLES should be set to DCLTABLES. Can be corrected by the following command:

```
AUTHORIZE> MODIFY DECNET/CLITABLES=DCLTABLES
```

- FLAGS should be set to LOCKPWD, and CAPTIVE.
- NETWORK access should be set to FULL ACCESS for primary and secondary days all other forms of access like batch, local, dialup, and remote should be set to “no access” for primary and secondary days.
- DEFAULT PRIVILEGES: NETMBX,TMPMBX
- AUTHORIZED PRIVILEGES: NETMBX,TMPMBX
- PWDCHANGE: Verify password has not EXPIRED or PRE-EXPIRED, or when in doubt MODIFY DECNET/PASS=password.

If the error persists at this time use the NCP utility on the target node:

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DECnet-VAX Tips

- In EXECUTOR CHARACTERISTICS check for NONPRIVILEGED USER ID and PASSWORD. The default setup should be (BYPASS required to view password):

```
Nonprivileged user id:      DECNET
Nonprivileged user password: DECNET
(This password should match the password
by the AUTHORIZE utility for the DECNET
default account, it does not have to be
DECNET, just consistent in both places.)
```

- Check the object characteristics in the NCP database as it should have the following minimum characteristics:

```
Number      = 27                or   Number = 29
File Id     = MAIL.EXE          File Id = PHONE.EXE
Proxy Access = OUTGOING         Proxy Access = Outgoing
Alias Outgoing = ENABLED (where applies)
```

Note: If ACCOUNT is indicated it must match what the EXECUTOR has set for Nonprivileged User.

- If all else fails then check the protection on the following files, they should at least have the following minimum protections:

```
SYS$MANAGER:SYLOGIN.COM      (S:RWE,O:RWE,G:RE,W:E)
SYS$SYSTEM:NETSERVER.COM    (S:RWE,O:RWE,G:RE,W:E)
SYS$SYSTEM:NETSERVER.EXE    (S:RWE,O:RWE,G:RE,W:E)
SYS$SYSDEVICE:[000000]DECNET.DIR (S:RWE,O:RWE,G:RE,W:E)
SYS$SPECIFIC:[000000]DECNET.DIR (S:RWE,O:RWE,G:RE,W:E)
SYS$COMMON:[000000]DECNET.DIR (S:RWE,O:RWE,G:RE,W:E)
```

Footnote:

A NETSERVER.LOG file is created in the default DECNET account of the node receiving the connection and may contain the log of activities the user performed during the connection. Often it will provide more detail as to the cause of the error which can then be rectified.

There are other causes for this type of failure but they are the exception and will not be discussed here.

Extra Characters Appear In Editor While SET HOST From VAX

Symptom:

Users on a VAXstation II are experiencing erroneous characters when SET HOST to VAX/VMS systems and running full screen editors like EDT and WPS. These characters appear when using the autorepeat feature of the keyboard and include “9”, “[”, and “=” at this time. The systems involved were running VMS 4.5 level software.

Analysis:

This scenario has been seen in Ethernet configurations and seems to be a timing issue between the VAXstation and the VAX system when SET HOST.

Workaround:

If a DECserver 100 or 200 is available in the configuration and users are allowed to connect to it via NCP then the following workaround is available until a solution is reached:

While on the VAXstation use:

- NCP to CONNECT VIA CIRCUIT QNA-0 PHYSICAL ADDRESS (DECserver address)
- Use the required procedure/password to access the DECserver port and reach the LOCAL> prompt.
- CONNECT “service” to a VAX/VMS node and run the editor.

Engineering is aware of the problem. They expect this problem will be corrected in a future release.

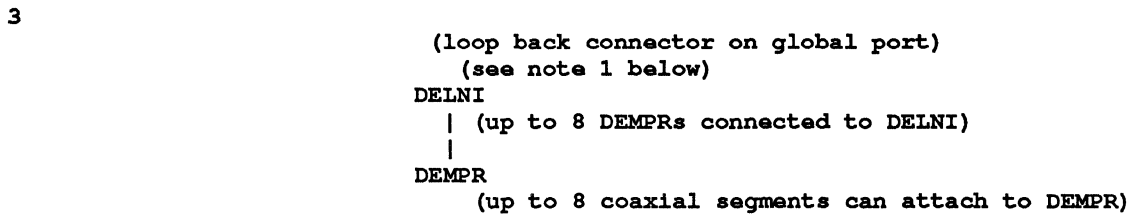
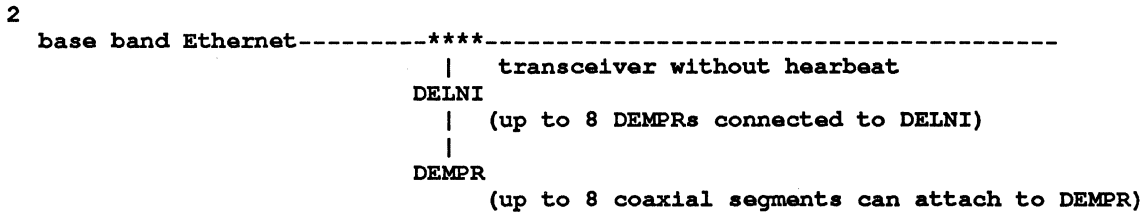
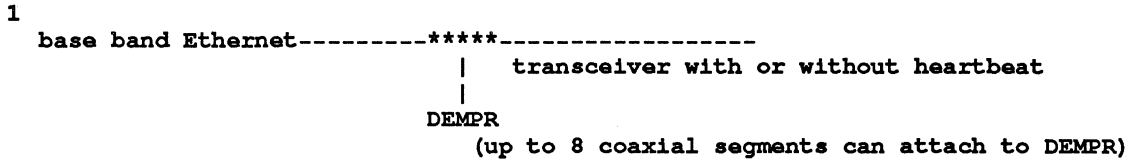
DELNI/DEMPR ThinWire Configuration Guidelines

ThinWire Ethernet DELNI/DEMPR configuration guidelines.

Description:

When a DEMPR/DELNI combination is used heartbeat must be disabled. The H4000-BA can be ordered which does not have heartbeat or an H4000 can be modified as per FCO #FA-04744-01 to disable heartbeat.

The following are 3 standard configurations:



- 1 This needs more discussion. In order to get a standalone DELNI to work with DEMPRs the DELNI must be set in GLOBAL mode with a loop back connector on the global port (H3278 or P/N 12-22196-01). The reason the DELNI can not be put into LOCAL mode is because the DELNI would then provide its own heartbeat.
- 2 NonThinwire VMS systems do not require heartbeat. Therefore in the above configurations it is legal to mix Thinwire and nonThinwire systems. At present if a non-Thinwire system is attached to a nonheartbeat transceiver the NCP LINE COUNTER COLLISION DETECT CHECK FAILURE will increment, however this does not indicate a problem.

Current Versions of Network Software Products

Table 1-2 Current Versions of Networks Products as of February 10th, 1988

Ethernet Terminal Server (DECSA)	v2.2
Router Server (DECSA)	v1.2
SNA Gateway (DECSA)	v1.4
X25 Gateway (DECSA)	v1.0
DECserver 100	v1.3
DECserver 200	v2.0
DECserver 500	v1.0
MUXserver 100	v2.1
DECrouter 200	v1.0
VAX/PSI	v4.1
RSX/PSI	v3.0
Terminal Server Manager (TSM)	v1.1
Remote Bridge Management Software	v1.1
Ethernim	v2.0
NMCC	v1.1
LAN Traffic Monitor (LTM)	v1.0
DECnet	phase IV
DECnet-VAX	v4.7
DECnet-Ultrix	v2.2

Table 1-3 Operating Systems

VMS	v4.7
RSX 11M	v4.3
RSX 11M+	v4.0
RSTS/E	v9.4
ULTRIX	v2.2

VMS V4.7 Upgrade: PATCH-W-DIFVAL Error On LTDRIVER

Symptom:

During an upgrade from Version 4.6 to Version 4.7 of VMS, the user receives the following error message:

PATCH-W-DIFVAL, memory contains different values than specified.
(for LTDRIVER)

Analysis:

This message means that the Version 4.7 upgrade did not patch the LTDRIVER file.

The root of the problem is that an LTDRIVER from the LATplus/VMS kit was present (LTDRIVER 1.1-23), or the LTDRIVER was version X7N-14 or greater. X7N-14 LTDRIVER is a maintenance release which would be obtained from DIGITAL support channels. The LATplus/VMS LTDRIVER versions are usually 'LAT+ v1.x-yyy'. The V4.7 upgrade expects to find the copy of the LTDRIVER X6N-8, which is the version that shipped with v4.6 of VMS.

To check which version of the LTDRIVER is present on the system, the DCL 'ANALYZE/IMAGE SYSS\$SYSTEM:LTDRIVER.EXE' command can be used. The information needed is contained in the 'Image Identification Information' section. The field within this section that contains the version information is 'image file identification:'.

Solution:

If the LTDRIVER is X7N-14 or greater, no further action is needed as this version already includes all patches in the VMS 4.7 upgrade. If the LTDRIVER is not X6N-8 then the LTDRIVER from the v4.6 distribution should be restored and the v4.7 patches applied.

Restore the V4.6 LTDRIVER and get the V4.7 patch file from the V4.6 and V4.7 distribution tapes, respectively. Apply the patch manually.

```
$ Set Default SYS$UPDATE
$ Mount/Foreign mtcu: label      ! VMS V4.6 distribution tape
$ Backup/Select=LTDRIVER.EXE mtcu:LIBRARY/Save []/Log
$ Dismount mtcu:
$ Mount/Foreign mtcu: label      ! VMS V4.7 distribution tape
$ Backup/Select=LTDRIVER.VUP mtcu:VMS047.A/Save []/Log
$ Dismount mtcu:
$ Define/User SYS$INPUT LTDRIVER.VUP
$ Patch LTDRIVER
$ Rename/Log LTDRIVER.EXE SYS$COMMON:[SYSEXE]
```

SYSS\$SYSTEM may be substituted for SYS\$COMMON:[SYSEXE] if this is not a cluster system. All systems must be rebooted to use the proper driver.

For uVMS, the LTDRIVER.EXE image can be obtained from the UTIL046.K saveset and the LTDRIVER.VUP file can be UVMS047.A saveset.

If ANALYZE/IMAGE is run against the new image, the ident should be X6N-8 with an DEC ECO level of ‘%x0000003F’. This will indicate that the patches applied by the 4.7 updates were successful. If this is successful, the system must be rebooted in order to load the new LTDRIVER image.

VMSINSTAL Flags DECnet As Running When It Has Been Shut Down

Symptom:

When using VMSINSTAL.COM to install VMS updates or layered products it reports the message:

```
Your DECnet network is running
```

when proceeding through the installation. The network was shut down via the NCP command SET EXECUTOR STATE OFF, and the NETACP and REMACP processes do not show up on the system.

Solution:

The VMSINSTAL.COM command file translates the logical name SYS\$NODE to determine if the network is still up and running. If the logical name is a null “” string, it assumes that the network has been shut down. If the logical name is defined on the system in some other fashion, the message may appear, although DECnet is not running.

Deassigning the logical name via DCL will resolve VMSINSTAL.COM printing the message. The logical may be deassigned from an account with SYSNAM privilege as follows:

```
$DEASSIGN/SYS/EXEC SYS$NODE
```

Circuits Remain ON-SYNCHRONIZING After STARTNET.COM is Run

Problem:

After STARTNET.COM is run, all the lines and circuits appear in the database, but NCP indicates that all the circuits are in an ON-SYNCHRONIZING state.

Suggestion:

Verify that the executor is on by entering the NCP command “show executor status”.

If the NCP database has defined for the executor STATE OFF, STARTNET will load all the NCP characteristics into the running system, but the executor will be off. In some cases an NCP SET EXECUTOR STATE ON command will correct the condition, and the circuits will initialize.

In any case, be sure to use the NCP DEFINE EXECUTOR STATE ON command to permanently set the executor state to ON for future restarts of DECnet.

How To Deny SET HOST By A User or Multiple Users

How to prevent a single user or several users from using SET HOST function.

Description:

By associating an ACL with the SYSS\$SYSTEM:RTPAD.EXE task and giving that user no access privileges, you will prevent that user from invoking the RTPAD executable for outbound SET HOST.

Note:

This will not go into effect until the next time the user logs in.

IEEE Ethernet Interface And H4000 Transceiver Compatibility

Use of IEEE Ethernet transceiver instead of H4000 transceiver on Ethernet

Description:

Some sites may be using the IEEE standard Ethernet transceivers instead of H4000 transceivers. The IEEE transceiver operates basically the same as the H4000.

The only noticeable difference between the H4000 transceiver and the IEEE standard transceiver is, when the IEEE standard transceiver is used there will be as many COLLISION DETECT CHECK FAILURES on the UNA-X line as the number of packets sent on that line.

The reason for the appearance of the collision detect check failures on the line is that the “collision test generator” is turned on at the end of each transmission on the H4000 transceiver to simulate a collision condition.

The IEEE transceiver on the other hand does not generate the collision test signals, and as a result the DEUNA/DELUA will register a collision check failure for every packet sent on that line. Thus, these errors can be ignored in this configuration.

The collision test generator signal is also called the “heartbeat” since it occurs on a fairly regular basis.

Circuits Remain ON–SYNCHRONIZING When Turned On

Problem:

When attempting to turn on a circuit, the circuit remains in ON–SYNCHRONIZING state.

Suggestion:

First check that the LINE associated with this circuit is ON, and attempt to set it ON if it is not. If the system in question has several other circuits already defined and running, check the settings for the SYSS\$MANAGER:LOADNET.COM logicals that adjust the working set size for the NETACP process. In some cases when there are many circuits, the NETACP process will need more resources to allow the circuit to initialize.

NCP LIST Fails With NMLRSP, File I/O Error, Permanent Database

Symptom:

When executing a LIST or DEFINE on the permanent DECnet database using NCP the user gets following error:

```
%NCP-I-NMLRSP, Listener response file I/O error, permanent database  
-RMS-W-RTB !UL Byte record to large for user buffer
```

The above error occurs whenever an NCP LIST or DEFINE is attempted. Yet the volatile database is correct and can be assessed and modified.

Analysis:

SYSS\$SYSTEM:NETNODE_REMOTE.DAT is corrupted. The error is a result of RMS posting a \$GET on the file and having trouble opening the file.

Solution:

To see if this is the problem rename the NETNODE_REMOTE.DAT and try a LIST. If this proves to be the problem the file should be rebuilt locally using the NCP DEFINE command, or the NCP COPY KNOWN NODES command may be used. Either approach will create a new copy of the NETNODE_REMOTE.DAT in its absence.

How To Compile And/Or Link Over the Network

Description:

It is possible to compile and link programs over the network using DECnet in an effort to offload compute intensive processes; however, some restrictions apply. Namely, compiled or linked images cannot be directed over the network directly with the compile or link commands. Only the input file can be obtained via the network, and the resulting image left on the system that processed the compile or the link. The executable image can then be copied to the desired system.

For example, let's say that VAXA is the busy node and VAXB is a less busy remote node:

- Log on VAXB, and compile a file located on VAXA:

```
$ CC VAXA"USER PASS":::ddnn:[directory]FILENAME.C (C program example)
```

This will use VAXB's C compiler, and the output will reside on VAXB.

- Log on VAXA, and link the object (.OBJ) file located on VAXB:

```
$ LINK VAXB"USER PASS":::ddnn:[directory]FILENAME.OBJ
```

This will use VAXA's linker, and the output will reside on VAXA.

Footnote:

A DCL command procedure can be developed to prompt for a compiler type and file name. It can then trigger a remote task to compile and link the program name passed, and once complete send the resulting executable image back to the local node.

OPCOM Prints Stored DECnet Events On The Console

Symptom:

Old DECnet events print on the console after the printer is turned on.

Analysis:

When DECNET event logging is enabled NCP>SET LOGGING MONITOR STATE ON event messages are sent to the CONSOLE printer via OPCOM. If the printer is turned offline the messages continue to be logged and saved by OPCOM. When the printer is turned back on, all of the messages that were generated while it was offline will still print out until real time is reached.

Solution:

The way to clear the messages that would be printed is to stop the OPCOM process. STOP/ID=PROCESS_ID. OPCOM can be restarted by doing @SYSS\$SYSTEM:STARTUP OPCOM. When the printer is turned back online, everything will return to normal and only current events will be logged.

How To Determine NUM_ETHERNET

What is NUM_ETHERNET and where does it come from?

Description:

NUM_ETHERNET is the total number of Ethernet devices shown in a SHOW DEVICES/BRIEF that is performed when AUTOGEN.COM is executed. The value of this number is not a limit of any kind. It is only a reflection of the number of Ethernet devices that are present on the system at the time AUTOGEN is executed.

Ethernet devices include XEcu, XQcu, ETcu, etc.

FAL Access From VMS To DECnet-DOS Gets STACKDUMP With V4.

Symptom:

DIRECTORY from VMS to DECnet-DOS gets STACKDUMP/VMS FAL problem

Analysis:

When attempting access to DECNET-DOS FAL from a VMS system you may see a STACKDUMP intermittently. For instance, when attempting a DIR/FULL of a DECNET-DOS system from a DECNET-VAX system the following error may be seen followed by a STACKDUMP:

```
%SYSTEM-F-ACCVIO, access violation, reason mask = 00,  
virtual address = 00000003, pc = 0000280A, ps1 = 13C00009  
Improperly handled condition, image exit forced
```

This will usually end up with the user having to log back into the VAX.

Solution:

The problem has been traced to VMS receiving only device-name and file-name messages in directory list (no directory-name). The problem has been fixed for VAX/VMS V4.6.

How To Configure A DMB32 Synchronous Port

Description:

The DMB-32 has one synchronous port, eight asynchronous ports and one parallel printer port. The SIDRIVER is used for synchronous communications and must be installed as a layered product in order to use the controller's "synchronous port" (See VMS 4.5 Release Notes, page 3-7).

The SIDRIVER.EXE is NOT bundled as part of the VMS operating system and must be purchased and installed with VMSINSTAL separately (See the software installation kit that comes with the driver for installation details).

VAX/VMS requires that an adapter cable be connected to the synchronous port before it will configure the synchronous device (SIx0). This means that a normal AUTOCONFIGURE in SYSGEN will not configure the synchronous port until a cable is attached on the bulkhead port. The DMB-0 line and circuit can then be configured using the Network Control Program (NCP).

The Asynchronous ports and the Printer port are configured normally. The NODRIVER is used for DECnet, (DDCMP) asynchronous communications.

Note:

Modem control is provided on all synchronous and asynchronous ports for Public Switched Telephone Networks, or private leased lines.

DECSA Router Server Used As An SNA Gateway

Description:

A DECSA Router Server used as an SNA Gateway node must be configured in the same "area" as the HOST node because the server uses DECnet protocol instead of LAT protocol.

Note:

The SNACSV.DIR, located on the HOST, must have privileges for WORLD set to READ, EXECUTE. This directory is where the SNA Gateway configuration files are placed on the Host.

Local Area VAX Cluster Guidelines

Description:

All MicroVAX II and VAXstation II systems in a Local Area VAXcluster configuration must use Revision E (or later), DEQNA Ethernet communications interface for supported operation.

The Local Area VAX Cluster software Version 4.5A/4.6/4.7, must be installed on the boot node and the proper update kit must have been applied. (See the *Local Area VAXcluster Manual* on how to install or upgrade the VMS Version to LAVc.)

The Local Area VAX Cluster Software KEY must also be installed on the boot node for cluster operation. The saveset name for the KEY is LAV010.

The MicroVAX 2000 or VAXstation 2000 must be installed with the Version 4.5C/4.6/4.7 installation/update kit for supported LAVc operation.

The DECnet–VAX network must be up and running, if already installed, with the QNA–0, UNA–0, or BNT–0 circuit on the boot node set to service ENABLED so that the boot node will accept and process the boot request from the satellite node, and downline load the required root directories as identified in the SYS\$SPECIFIC:[SYSMGR]NETNODE_UPDATE.COM file. This file is created when SATELLITE_CONFIG.COM is used for the first time to add the satellite node(s).

All nodes in a LAVc must be configured in the same DECnet Area.

Mail Received With Header And No Text

Symptom:

A user sends mail to another node, and the recipient of the mail receives only the header, and no text.

Analysis:

This can be caused by the default DECnet account (or the account used for default access by the MAIL object) having its device/directory specified in the authorization file as “NL:”. This allows for the MAIL header to be written out, but since the text cannot be written to a temporary file, it is lost.

Solution:

To correct this, make sure the default MAIL account has a working directory for the writing of temporary files.

STARTNET Stuck In A Loop, “Permanent Database Not Configured”

Symptom:

After upgrading to VAX/VMS and DECnet V4.4 attempts to start the network with SYSSMANAGER:STARTNET.COM returns an error message:

“You have not configured your DECNET permanent data base. You must either use NCP to define your DECNET database, or invoke the procedure SYSSMANAGER:NETCONFIG.COM, which will do it for you.”

You comply by configuring it with one of the two methods and try to start the network again and again get the same error message about configuring the permanent database. It seems to be stuck in a loop.

Analysis:

With V4.4 of VAX/VMS the STARTNET command procedure does an IF F\$LOGICAL of (“NETNODE_LOCAL”). If it does not find one it goes to NO_DATABASE: which gives the above error message. In V4.4 VMS, NETNODE.DAT was broken up into NETNODE_LOCAL.DAT and NETNODE_REMOTE.DAT and these new DECnet permanent database files are not being found. What has most likely happened is that either an old version of STARTNET.COM exists which looks for NETNODE.DAT, or a site specific STARTUP.COM from an older version of VMS is being called.

Solution:

Verify that V4.4 STARTNET.COM supplied with V4.4 VAX/VMS is being invoked. If it has been purged it should be retrieved from V4.4 distribution media.

If this checks out there may be corruption with one of these new files. In this case they should be renamed or deleted and NETCONFIG.COM or NCP invoked to create new copies of the files.

DEBNT Microcode Incompatible With Driver When Reboot after VMS V4.5 upgrade

Symptom:

A warning message “DEBNT Microcode incompatible with driver” will appear during re-boot after VMS V4.5 upgrade.

Information:

This warning message will appear with revision level 38.3, 38.4, and 40 of the DEBNT Firmware Microcode. The revisions before revision 40 will cause NOBUFCKT Bugchecks when trying to access the DEBNT with VMS V4.5. The message will appear with every revision of the DEBNT microcode less than revision 100, which is available with VMS V4.6 distributions.

NOBUFCKT Bugcheck With VMS 4.4/4.5 Using DEBNT And ETDRIVER

Symptom:

VAX/VMS V4.4 or V4.5 systems with DEBNT Ethernet controller crash with a NOBUFCKT Bugcheck when attempting NCP commands to the EXECUTOR or BNT circuit or line.

Analysis:

The crash dump will list NETACP as the current process and the stack pointers will show ETDRIVER as the culprit. The problem has been isolated to compatibility problems between the different versions of the DEBNT Firmware Microcode and the different versions of the ETDRIVER.EXE image file.

Solution:

If running V4.4 VMS, the ETDRIVER.EXE image file should have an image identification of X-13C. This is a patched image to make the ETDRIVER compatible with the DEBNT and 4.4. If running V4.5 of VMS, the ETDRIVER image identification should be X-15. This is the ETDRIVER.EXE delivered with the 4.5 release. Note: Use ANALYZE/IMAGE ETDRIVER to determine the value of the image identification parameter.

The revision level of the Firmware Microcode for the DEBNT should be at revision 40 or above. Revision level 38.3 or 38.4 will cause the bugcheck problem.

AUTOCONFIGURE Does Not Configure XGDRIVER For DMF32

Description:

The XGDRIVER is the driver for the Synchronous EIA Port on the DMF32 controller and is used by several products: PSI, DECnet and 2780/3780. When the DMF32 is installed, there are switch settings to configure which ports on the DMF32 will AUTOCONFIGURE. This is documented in the *DMF32 Users Guide* (supplied with the DMF32) in Chapter 2. Ports that the DMF32 has to select from are the Synchronous EIA Port (XG), 0-7 Asynchronous Ports (TX) and Printer Port (LC). The setting of switch pack S3 determines which ports are activated.

For example, if the SYNC. Port, Printer Port and ASYNC. Ports are needed switch pack S3 should have switches 4 and 5 OFF. There are different combinations for ports that can be enabled or disabled. Refer to the *DMF32 Users Guide* Chapter 2 or call DEC Field Service.

INPUT/OUTPUT

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Does Anyone Use Defragmenter Programs?

Antecedent IO(s) published in: *Pageswapper* Volume 8 Number 9 (April, 1987)
through: *Pageswapper* Volume 9 Number 9 (April, 1988)

BACKUP/RECORD & /FAST operation

585.29 dated 4-MAR-1988 23:55

From: Recurring contrapuntal themes

In 585.27 John posed the suspicion that BACKUP/RECORD keeps track of file header information between the time the file is backed up and the time the recording pass occurs. This is not correct. BACKUP constructs a list of file-IDs during its backup pass which it later uses for /RECORD (and marking RMS journal files as being backed-up as well). But it does not store retrieval information.

The reason for the original user's VAXCluster disk corruption problem in the presence of Rabbit-7 must be explained by some other theory.

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Also, the use of /FAST does not change the inner workings of BACKUP very greatly at all—the only difference is that in /FAST mode, BACKUP makes a serial search of all files in file-ID order to match files against the file selection criteria. /NOFAST causes BACKUP to create the selection list by scanning directory files instead. After the selected files list is created, there is no difference whatsoever.

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what's happening

585.33 dated 10-MAR-1988 12:02

From: John Osudar

BACKUP certainly doesn't retain headers from the save pass to the record pass (where would it put them all?!), but what it DOES do, of course, is read the header, change the backup date, and write the header (whether directly or through appropriate file system calls)—and the assumption is made that the header, once read, doesn't change before it's written out again. I suspect that the disk compressor bypasses whatever mechanisms exist for assuring that this is true—so the sequence is, BACKUP reads the header to prepare for recording the date; disk compressor moves the file; BACKUP rewrites the header with the new backup date and the old retrieval pointers.

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Digi-Data Gigastore System

Antecedent IO(s) published in: *Pageswapper* Volume 9 Number 2 (September, 1987)
through: *Pageswapper* Volume 9 Number 9 (April, 1988)

A Gigastore problem and solution

704.23 dated 2-MAR-1988 15:56

From: John Osudar

Just had our first serious problem with the Gigastore. Last weekend we scheduled automatic backups of our 785's three user disks. The first of the three disks, an RP07 that's 94% full (954000 blocks used!), required more than a full six-hour tape (actually, only about 2/3 of the disk fit onto the tape). This is in comparison with the usual backup time of about two hours for the entire disk. Naturally, this was quite disturbing. I checked everything I could think of—and found that there were no tape errors logged by VMS, that the BACKUP process was the only non-system process running during that entire time, and that BACKUP used less than 10% of the CPU during its run. The SPM record of disk activity showed that through most of the run, disk activity was far below normal. All in all, it appeared that the Gigastore drive had just plain slowed down, from its rated 120Kb/sec to something around 20Kb/sec.

I spoke to someone at Digi-Data and got a reasonable explanation for the problem:

In preparation for this month's backups, I had followed recommendations contained in the Gigastore manual that suggest cleaning the drive with a commercial VCR cleaner (which they supply) every 20 hours of use. Apparently, the Gigastore read/write heads are very sensitive, and cleaning the drive does far more bad than good. So it appears that the reason for the great slowdown in Gigastore throughput was that the drive was detecting errors with its read-after-write logic, and retrying the write operations repeatedly.

Digi-Data claims that they use the Gigastore in-house daily for months at a time without cleaning the drive. Their recommendation is to watch drive performance carefully, and avoid cleaning the drive until performance drops off measurably; then, clean the drive as documented, and follow by writing (several hours?) of junk data to a scratch tape, to re-"break in" the heads. I tried this technique, and last night I backed up my RP07 in one hour and 38 minutes.

One other comment about Gigastore throughput: from our experiences, it appears that a very significant factor in BACKUP throughput is the degree of fragmentation of the disk being backed up. The RP07 in question took over two hours to back up when it hadn't been compressed for about three months.

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Now, after compressing it a month ago, the drive is more full than at the last backup, but it took considerably less time to back up.

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Gigastore progress report
704.24 dated 10-MAR-1988 12:46

From: John Osudar

Just completed our first set of post-“cleaning incident” (see .23) full-volume backups to the Gigastore. This time around, I broke out the /VERIFY pass as a separate /COMPARE, and got timings for everything. Here are some results:

<u>disk type</u>	<u>% full</u>	<u>time to back up</u>	<u>time to compare</u>	<u>time to restore</u>
RA81	90	93.7 minutes	106.1 minutes	96.9 minutes
RP07	94	99.7 minutes	110.6 minutes	103.2 minutes
RA81	84	81.7 minutes	91.5 minutes	82.4 minutes

Each disk had been compressed about a month earlier; each backup/compare/restore job was run on an essentially idle system (actually, run overnight at base priority 15 with only networks, SPM, and similar stuff active).

Since it's the backup pass that's important (as that determines how much of the tape is used), this says that the three disks took just over 3/4 of one six-hour VHS tape. I'd settle for that kind of throughput any time!

(The interesting thing will be to see what happens to these figures when we reinstall our Gigastore on our new 8350 system, where it will run in a BI Unibus adapter on a processor that's rated at 80% of our 11/785 in speed!)

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

Has anybody used the SIDRIVER

Antecedent IO(s) published in: *Pageswapper* Volume 9 Number 8 (March, 1988)

v1.0-7 driver is available for an SPR

859.12 dated 7-MAR-1988 17:50

From: gerson cohen

In response to an SPR, I have received a new sub-release for the SIDRIVER labelled 1.0-7. While this does not seem to fix my application, its release notes mention a slew of problems that make me wonder how the product even got out of the door. Suggestion – if in doubt file an SPR, mine was answered within one week!

gerson cohen
nih
bldg 2 rm 312
bethesda md 20205
301-496-4295

VMS 4.7 is here!

Antecedent IO(s) published in: *Pageswapper* Volume 9 Number 8 (March, 1988)
through: *Pageswapper* Volume 9 Number 9 (April, 1988)

I've seen that before

866.66 dated 11-MAR-1988 18:40

From: John McGrath

RE: 866.60:

“ it gets confused (at very random times) and begins kicking off batch jobs with “licensed number of users exceeded”. It's **never** suppose to limit batch jobs. So either manually enforce the 2 ”

I've seen a similar problem in V4.6. It seems to happen when you exceed (yes, exceed) the interactive limit. Say you are licensed for 16 users. If you try to login when there are 16 interactive users logged in, it does actually create the 17th interactive process. LOGINOUT runs in that process, and tells you that you can't log in. While that 17th interactive process is running, you can get

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“Licensed number of users exceeded” in network jobs. I have not seen it in batch jobs, but I would not be surprised if it occurred there also.

John P. McGrath
Software Consulting Services
3162 Bath Pike
Nazareth, PA 18064
(215) 837-8484

ARE 4.6 SYMBIONT PROBLEMS REALLY GONE???

Our latest version of LATSYM/LTDRIVER

897.2 dated 14-MAR-1988 14:09

From: Frank Hattyar

We chased Colorado Springs around on some problems and they sent us LATSYM V2.3 and LTDRIVER X7N-15 as the latest versions. Neither seems to be in VMS 4.7. Is there indeed a LATSYM V2.4 out there?

Frank Hattyar
Wells Fargo Bank
1415 King Avenue
Napa, CA 94559

V2.4 exists

897.3 dated 14-MAR-1988 22:02

From: Dale E. Coy (505) 667-3270

We got a new LATSYM.EXE from Colorado Springs (actually from the Dallas office but the Springs called them). Its Image File Identification: “V2.4-001”.

The LTDRIVER.EXE which came with it is “LAT X7N-15”.

I’m not about to say that it fixed any problems (it may have fixed some and created others).

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

DIGITAL has it now, but it doesn't work yet.

897.4 dated 17-MAR-1988 10:40

From: George Bone

We received (and installed) LATSYP 2.4-001 and LTDRIVER X7N-17 from C. Springs. Unfortunately it doesn't seem to fully fix the problems, as we had a LATSYP crash 4 days after 2.4 was installed. After 4 calls and 5 hours of waiting, we finally got someone in C. Springs. They said that LATSYP 2.5 would fix our problems (?!?!?!?!). A week later when it had not arrived, I called C.S. again and (after 4.5 hours callback time) they told me that 2.5 would only fix the problem if DELETE/ENTRY on a stalled queue caused the crash. Later that day I ascertained that this did not seem to be our problem (I tried doing it, but no crash). I called C. S. to inform them and get encouraging words. 5 hours later (Does this seem to be a trend?) they called back and said Engineering was not releasing 2.5 AT ALL! They suggested submitting an SPR with a copy of the LATSYP.DMP file. NOW I find out (fortunately before sending the tape and SPR) that the LATSYP.DMP file contains remnants of the documents being printed at crash time. Since we have classified material on our system, this means that I can't send out our dump. I'm waiting to hear from C. S. today, but I don't know just what is going to happen.

Anybody know of a good deal for a WANG?

George Bone
Code 2301.2 Mail Stop T-11
Mare Island Naval Shipyard
Vallejo, CA 94592-5100
(707)646-2531

VT100 Emulators for the Mac

Antecedent IO(s) published in: *Pageswapper* Volume 9 Number 9 (April, 1988)

Digital Hears It Now?

911.17 dated 10-MAR-1988 11:14

From: Bill Mayhew

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RE:

“ By the way the board is switch selectable for thin wire
or thick wire (DEC, ARE YOU LISTENING...) ”

At least part of DEC seems to be listening... we were notified a few weeks ago that MicroVAX/VAXstation 2000s manufactured after some date in January '88 would support either thinwire or 'classic' Ethernet. Not retrofittable, though. I have not actually seen one of these to determine how they implemented it.

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

Digital had it THEN – but didn't tell anyone.

911.18 dated 10-MAR-1988 18:53

From: Dale E. Coy (505) 667-3270

The DEPCA-AA consists of the board, card guide, ... AND: AUI Transceiver Cable and AUI Connector/Bracket Assembly

The latter gadget is an additional metal panel which fits in the back of the PC (after removing the blank one), and has a regular transceiver connector – with ribbon cable to plug into the DEPCA. It thus takes up two back-panel holes, but it IS a standard transceiver connection

The DEC designers were listening. This has been available all along. It is NOT something brand new for the DEPCA (my book was printed Dec. 1986).

Of course, it seems that the message never made it from the designers through the sales force to the customer – but that's not a hardware problem!

DALE E. COY
LOS ALAMOS NATIONAL LAB

PO BOX 1663, MS J957
LOS ALAMOS, NM 87545
505-667-3270

PCFS and File Locking

914.0 dated 23-FEB-1988 17:00

From: Howard W. Pinsley

Does anyone have any info on whether PCFS does file locking. I am interested in preventing two VAXMATE users from accessing the same file on a virtual disk and also in preventing a Vax accessor to the file in the server directory.

Howard W. Pinsley
145 West 79th. Apt 11D
New York, NY 10024

Details?

914.1 dated 23-FEB-1988 19:44

From: Dale E. Coy (505) 667-3270

Can you clarify the question a little? Are you interested in preventing simultaneous access by multiple users, or sequential access? Are you concerned with executables, or data files, or both?

Files accessed thru PCFS can be private (in a user's VMS personal area, via the login password mechanism) or public, and protected in some ways (but not currently all VMS mechanisms). If you'll describe exactly what you're trying to prevent, and what you are trying to allow, I'll try to give a better answer.

DALE E. COY
LOS ALAMOS NATIONAL LAB
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505-667-3270

Wordperfect Locking

914.2 dated 24-FEB-1988 10:25

From: Howard W. Pinsley

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I'm trying to prevent simultaneous access to the same data file (in this case Wordperfect documents). I would like multiple vaxmate users to be able to edit documents stored on a virtual disk—but obviously not at the same time.

To make matters more interesting... I would also like to use the VMS version of Wordperfect to also access the PC wordperfect documents on the virtual disks (note that this does indeed work, locking issues aside). Thus the ultimate would be to give anyone who is running Wordperfect, either on a Vaxmate or a Vax, the ability to edit any Wordperfect document stored in a shared virtual disk.

Any ideas?

Howard W. Pinsley
145 West 79th. Apt 11D
New York, NY 10024

OK – it seems reasonable.
914.3 dated 24-FEB-1988 21:20

From: Dale E. Coy (505) 667-3270

Well, I understand what you're trying to do. It's not obvious from the documentation exactly what the situation is, but I'll try to set up a test case in the next couple of days and let you know.

By the way, I presume that you're aware that (in its present incarnation) PCFS is a file server, not a virtual disk server, although that's a subtle distinction. The VMS files are stream record format (I presume that won't give VMS WP a problem).

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

I still wonder if PCFS has been "fixed"
914.4 dated 24-FEB-1988 21:57

From: Larry Kilgallen

Dale, do you know if PCFS still uses a single server process for all users, or has it been converted to separate processes for each user? The original single server interacted badly with audit alarms.

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

Please define "interacted badly"..
914.5 dated 25-FEB-1988 09:46

From: Bill Mayhew

Larry, can you expand a little (let me rephrase that—please expand...) on “the original single server interacted badly with audit alarms.”

VMS Services V2.0, which is currently in beta test, is supposed to solve most of the performance problems resulting from a single server process, but the information I’ve read suggests that the solution is properly multi-threading a single server process. I’m not intimate with the product nor with what’s in the new release, but am interested in any comments you might have about an inherent design problem in a single-server-process scheme w/r/t security audits. “The competition” makes a good deal of noise about the single- vs. multiple-server-process issue, and I’m not convinced how much of it is “real” vs. “noise”.

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

V2.0 of PCFS and DECNet-DOS
914.6 dated 25-FEB-1988 21:43

From: Dale E. Coy (505) 667-3270

There isn't a new version yet, so any prior problems still exist. However, the announcement of V2.0 specifies:

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Support of NETBIOS, async DECnet connections, third-party Ethernet cards currently supported by DECnet-DOS (note: 3Com and Micom), faster file server and “new” virtual disk, sharing of PC files across a VAXcluster (note: a big improvement), diskless boot for DEPCA-card-equipped PCs, better terminal emulation, keyboard mapping (non-DEC keyboards), better LAT.

The answer to your question is probably what I’ve left to last. I quote: “Security will be improved through the support of VMS Access Control Lists.”

My understanding is that it will probably be a multi-threaded approach, which matches DEC’s tradition and (as far as I can see) doesn’t have any inherent drawbacks.

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

How VMS Services for MS-DOS interacted badly

914.7 dated 25-FEB-1988 21:46

From: Larry Kilgallen

If one turns on audit alarms for successful file accesses which are successful only through their use of BYPASS privilege, the original VMS Services for MS-DOS caused many alarms because it had a single server which carefully checked user-supplied passwords against SYSUAF but then proceeded to give access through the use of BYPASS. This is contrary to the spirit of a reference monitor, the concept which forms the cornerstone of current thinking about operating system security implementations.

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

Shared Word Processing

914.8 dated 25-FEB-1988 21:57

From: Dale E. Coy (505) 667-3270

RE:

“ I’m trying to prevent simultaneous access to the same data file (in this case Wordperfect documents). I would like multiple vaxmate users to be able to edit documents stored on a virtual disk—but obviously not at the same time. ”

This is a tough one to get a handle on, since I don’t have Wordperfect. Can’t find a thing in documentation (of course), but here’s what I learned. PLEASE note the parts which are speculation below.

FACT: If the file on the VAX is opened (I used a simple OPEN/APPEND XX filename), then PCFS claims it doesn’t exist, when asked to access it by anything I did. It displays the file name in the directory of the “virtual disk”, and will actually rename it if asked, but any other operation fails.

CONCLUSION: If Wordperfect on the VAX “correctly” opens the file, and holds it, then no PC will be able to simultaneously use the file. SUGGESTED TEST: Try VMS Wordperfect on the same file, simultaneously by 2 users.

SPECULATION: If PC Wordperfect “correctly” opens the file, and holds it open, then nothing else (PC or VMS) can simultaneously use the file.

I don’t have any way to test any more than this. Perhaps someone will turn up with the answer. Note that (probably) the answer to PC Wordperfect probably will be the same regardless of the type of LAN – not specific to PCFS.

Please let us all know if you confirm/refute the speculation, or find out anything else.

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

VAX and PC WordPerfect files

914.9 dated 2-MAR-1988 23:27

From: Bob Doherty

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You should be aware that when you edit (and save) a WP file with VAX WP, the file is changed into a FB 512 byte record file. PC WP will in fact open that file, and will allow you to edit it, but it will not allow you to save it, since PCFS will only update stream files. You must save the edited file under another name.

The problem is with PCFS and not with WP. I do not know whether this same situation obtains if you allow multiple file versions when you set up the server.

Robert Doherty
US DEPT of AGRICULTURE
NUTRITION INSTITUTE
B.161, R.102, BARC-EAST
BELTSVILLE MD 20785
(301)-344-2147

Incomplete tape I/O hangs cluster???

HSC 350

918.2 dated 4-MAR-1988 00:51

From: Don Hamparian – BATTELLE

Definitely go to HSC V350. Big improvements in the tape subsystem.

Don Hamparian
Battelle Memorial Institute
Room 11-6013
505 King Ave
Columbus OH 43202
614-424-5086

My kingdom for a password...

Antecedent IO(s) published in: *Pageswapper* Volume 9 Number 9 (April, 1988)

How about using DECnet??

920.3 dated 29-FEB-1988 05:38

From: Rytis T. Balciunas

If all you want to do is verify that the user printed on the document is the “correct” user, why not just use the DECnet facility to do the checking for you??

Have the user enter in his/her password (no echo, of course), then do something like DIRECTORY "node"username password"::

Success means the user is who it should be, failure means no go. Of course, the obvious loophole is if the user hands out his/her password to someone else.

RYTIS T. BALCIUNAS
CALGON CARBON CORPORATION
PO BOX 717
PITTSBURGH PA 15230-0717
(412)787-6784

Flow control on DECservers

921.0 dated 1-MAR-1988 12:16

From: Larry A. Cannell

We have several DECserver 200s which are connected to modems used for dialup. Is it really necessary to have flow control set on the DECserver? Or will setting readsync/ttsync on the associated lta: terminal line suffice for anyone who needs flow control?

Larry A. Cannell
8649 Wayside, Apt. 8
Brighton, MI, 48116
(313)322-7272

I don't think you should do that.

921.1 dated 1-MAR-1988 17:02

From: Brian Tillman, Smiths Industries.

Note 921.0 Flow control on DECservers:

“ We have several DECserver 200s which are connected to modems used for dialup. Is it really necessary to have flow control set on the DECserver? ”

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I'd say so. It seems to me that since the server buffers all input intended for a single node between two pulses of the service circuit timer into a single packet (or more if the input is large and won't fit in one), at high terminal-server data rates, the server may want to XOFF a terminal momentarily.

Besides, why would you WANT to turn it off? By default, XON-XOFF flow control is enabled and you have to do extra work to disable it. Besides, if you disable flow control, the server sends a message to the service telling it to disable flow control as well (at least that's what the server manual says).

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

I would use RTS/CTS if possible

921.2 dated 1-MAR-1988 22:22

From: Harry Herman

We are using U.S. Robotics and Microcom modems with error correction, and I was never able to get the modems to work reliably with the terminal server's default of XON flow control. If I started typing a large file and tried to use the ^S/^Q, or hold screen keys, the modems would start dropping characters and lines (I do like to see what I am typing, and can't quite read at 19,200 over the phone lines yet!) This may be due to the DECserver 200 software we have being the original base level with the XON/XOFF bug. This may also have been compounded because the modems were originally configured to send XON/XOFFs to the DECserver if the DECserver was sending too fast. It seemed like the listings could go a lot farther before there was noticeable errors if I did not use the hold screen key, than it would if I actually used the hold screen key so I could read what I was typing.

I was able to get around the problem recently by switching the modems and the terminal server lines to use CTS/RTS flow control instead of XON/XOFF flow control. For the last two weeks, I have never noticed a dropped character in any listings I have done to my terminal.

Harry Herman

Corpane Industries
10100 Bluegrass Parkway
Louisville, KY 40299
(502) 491-4433

Can a 2400 baud modem beat up a DECserver

921.3 dated 2-MAR-1988 13:53

From: Larry A. Cannell

RE:

“ Besides, why would you WANT to turn it off? ”

Turning flow control off makes it easier to do binary file transfers with protocols other than Kermit(ie. Xmodem/Ymodem etc.)

These modems are coming in at most at 2400 baud. Is it possible to overload a server within a circuit timer tic? If that was the case couldn't you just lower the circuit timer?

Larry A. Cannell
8649 Wayside, Apt. 8
Brighton, MI, 48116
(313)322-7272

To handle lots of data

921.4 dated 3-MAR-1988 13:32

From: Seton Droppers, PBS, (703)739-5100

Off the wall, but...

If your terminal server had to fill more than one packet to transfer all the data from the TERMINAL SERVER to the “host” then it will want to X-OFF the incoming data. As I remember, the terminal server can send data from more than one session or connection to the host in a single packet, as it is set up to pack characters from all sessions connected to a single host in as few packets as possible.

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Seton

Seton R. Droppers
Public Broadcasting Service
1320 Braddock Place
Alexandria, VA 22314
(703)739-5100

hard to overload a server

921.5 dated 7-MAR-1988 19:58

From: George Merriman CCA/NY

RE:

“ Is it possible to overload a server within a circuit timer
tic? ”

I have used terminal servers to monitor simplex news wire circuits with no flow control at speeds to 9600 BPS. Even with all channels of the server monitoring these channels, which almost never stop sending, I have not seen any evidence of server overflow. In fact, they seem to be much more efficient at this type of work than a silo-type multiplexor (DHV, DZV).

George Merriman
Cambridge Computer Associates
56 Beaver Street 3rd Floor
New York NY 10004
212-425-5830

Need help choosing right DBMS

922.0 dated 2-MAR-1988 09:46

From: Mark N. Katz

We are undergoing a DBMS evaluation. The goal is to pick the best DBMS for our VAX application, which will be a large, complex database, in a transaction-processing environment. We have a few years experience with VAX DBMS but don't consider ourselves all that knowledgeable, especially in areas related to performance.

We would like to get in touch with a company that is using VAX DBMS or Rdb in a large, complex production environment. We would like to hear about experiences, good or bad. Also would like to hear about studies done comparing DEC database products with 3rd party stuff.

I think that there have been a lot of people asking these questions lately but not too many answers have appeared.

Mark N. Katz
GTE Government Systems
100 First Ave. MS:1240
Waltham MA 02154

922.1 dated 2-MAR-1988 20:48

From: Bill Mayhew

Since you mentioned “transaction processing”, you should look into Software AG (of North America, SAGNA)’s ADABAS product family, originally developed (and semi-famous) on Big Blue mainframes. They’ve been on VAXen for a year or more now and are making a fairly hefty push into the VAX area.

I don’t know a lot about the product yet (I’m looking at it, myself), but they are running VAX-oriented seminars in various cities around the country in the next month or so. I have a friend who uses it in an IBM environment who is very high on it. One of SAGNA’s major claims is strength in the transaction processing area.

The Boston seminar is on 3/22 and requires pre-registration. The company is at 11800 Sunrise Valley Drive, Reston VA 22091, 703-860-5050, and a guy named Mike Schowalter is “Director of Digital Programs.”

This is not an endorsement, advertisement, or anything else for this product. It may be a complete crock of ___ for all I know at this point.

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I have designed, implemented and supported a relational DBMS myself that has been evolving over a number of years, so I hope to be able to ask them some intelligent questions. My particular interest is in distributed databases and transaction processing. Given enough time I hope to examine the other leading candidates, including Rdb, as well.

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

System/Security Managers beware of ADABAS

922.2 dated 3-MAR-1988 12:47

From: Larry Kilgallen

My direct discussions with Software AG are a year and a half old, but I believe their attitude has not changed in the interim.

I believe the overall problem stems from the Software AG mind-set that if a VAX is running ADABAS then that is all it will be used for. The result is a fuzzing of the line between system management and database administration, to the detriment of security. Database vendors often have such an egocentric attitude, but at the time I talked to them, Software AG was intractable. I have seen such an attitude in the past on the part of some DEC database folks, but exposure to DECUS has beaten them into submission (who? me? unkind?) and I think DEC databases today provide good capability for separation of responsibilities.

VAX ADABAS came to the client site in question because they wanted a common development environment for their VMS, VM and MVS machines. It is definitely a port from IBM-land, which also affects performance considerations, but I will constrain these remarks to security.

The first aspect of ADABAS to make one grit one's teeth was the failure to use VMSINSTAL. To this day (I just checked with someone else) at least some of the optional products Software AG puts on top of ADABAS have an

involved series of manual procedures combined with manually-executed DCL command procedures for installations. I have been told their (relatively) new “NETWORK” product has installation deficiencies in that “the documentation is wrong, especially for clusters”.

Back to the base product though. Software AG insists that the database administrator must have xxx_IO privilege (I forget whether it is physical or logical, but it hardly matters). The stated reason is that in order to be compatible with their IBM version they do IO based on cylinder and track rather than virtual block numbers. The code they provide makes these privileged calls in order to be able to reason in terms of cylinders and tracks. The master file which contains all the data for various databases must be aligned on a cylinder (or track, I forget) boundary. I argued in vain that if the file were *created* on that boundary then actual access to it could be on the basis of virtual block numbers since mathematical conversions could be used to find a new even boundary based on the knowledge of the disk geometry and the fact that the file (contiguous) *started* on an even boundary. No soap.

Another example of their unfamiliarity with the VMS environment is that they take OPER5 and presume it is for the use of the database administrator. No asking the installer what the site policy is, they just do it. If you try to modify their DCL (thank goodness they don't do it in a compiled image) you find it a maze of twisty passages looking all alike.

If you really want a stand-alone machine to do database and are planning on the system/security manager and the database administrator being the same, ADABAS may be acceptable. But if you want some degree of separation of duties (and if I were your stockholder I would hope you would), Software AG has a lot to learn.

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

Try FOCUS – Information Builders
922.3 dated 4-MAR-1988 06:17

From: Rytis T. Balciunas

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Another product to consider is FOCUS by Information Builders. Its database portion is a little flukey on VMS, but from what I've seen, they've come a LONG way since the release we bought in 1986... The newest version comes with all kinds of goodies (expert systems, file sharing on PCs, etc.) It is pricey... We use it mostly for reporting from RMS files.

I also agree with Larry's comments on ADABAS – we saw the same problems when we were looking for a reporting/database package... Call me at (412)787-6784 if you want to ask details about FOCUS....

RYTIS T. BALCIUNAS
CALGON CARBON CORPORATION
PO BOX 717
PITTSBURGH PA 15230-0717
(412)787-6784

Do you require DSRI-compliance?

922.4 dated 4-MAR-1988 08:35

From: MARK SHAFFER

I'm more or less in the same boat as .0. I've spoken with reps of at least two dozen companies providing relational data base products for DEC VAX/VMS in the past several months. One question you might ask which may eliminate a good many (assuming it's a requirement in your case as in mine): "Are your products DSRI-compliant?" If both the underlying database guts and the application-development toolkit stuff are DSRI-compliant, it means you'll be able to mix and match with other DSRI-compliant products present and presumably future (like Rdb). This sounds like a good idea to me; otherwise one is tied to a proprietary, vendor-specific architecture. So far I've encountered about a half-dozen or so third parties who claim DSRI-compliance; the rest all say things like "planned for 3rd quarter 1988" or "what's DSRI?".

MARK SHAFFER
INFORMATION CONTROL TECHNOLOGIES,INC.
17 POLLY DRUMMOND PROF. BLDG.
SUITE 105
NEWARK, DE 19711
302-366-8211

ADD KEYWORD ",KWD," 922",DOT,"5")

Remember, DSRI implies relational...

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922.5 dated 4-MAR-1988 09:43

From: Larry Kilgallen

Although I think the DSRI-compliant criterion is a good one for relational products, it may be that the problem originally expressed in .0 would be better served by an implementation which is not relational. The DEC party line has typically been that high-contention transaction processing with multiple updaters is better done with DBMS (Codasyl) than Rdb (Relational). They go further to say that even with DBMS, multiple update performance is better filtering it through ACMS (as unnatural as that may seem to those of us from the VMS timesharing world).

Now the vendors of INGRES and ORACLE will tell you that *their* relational products are faster than Rdb and as fast as any Codasyl implementation. Since they don't have a Codasyl implementation to sell, they have a natural interest in touting the superiority of the relational approach. Most of the articles I have read about the superiority of relational databases, however, have dealt with ease-of-use rather than performance. What some VAX sites do is use DBMS for transaction processing and perform a nightly extraction into an Rdb database for ad-hoc query. Such an approach would presumably work with some other vendor's relational database as well.

To give another example of a "different" database, there is BASIS, which is optimized for text retrievals. That is a database which is not Network (Codasyl), Relational, or hierarchical (ancient IBM) in nature, but does one type of work better than the "standard" approaches according to the rumor mill.

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

922.6 dated 4-MAR-1988 17:05

From: Bill Mayhew

Re: .2

Thanks, Larry, you've given me a bunch of good stuff to prod the ADABAS people about.

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You're not the only one with such a list of non-VMS-like attributes, by the way, though I think yours are all different from the other list I've seen (and hope I can find again...!)

Re: .4

A good argument can be made that DSRI is, itself, a proprietary, vendor-specific architecture... it just happens to be associated with our hardware vendor, which is just fine. But I haven't detected a groundswell of support for DSRI in the industry, so your (and my!) hopes for a bevy of DSRI-compliant products to mix and match may be in vain. Then you have to raise the question about how DSRI relates to a multiple-hardware-vendor world; I haven't studied DSRI enough myself, nor (more importantly) Digital's plans for it, to have an opinion on that one, and would be interested to hear yours!

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

Some Databases do and some don't...

922.7 dated 5-MAR-1988 11:16

From: GREG P. SCHULZ

Keep in mind that some applications are not suited for RELATIONAL databases while others are. How many reservation type applications do you know of that are running with relational databases. Another thing to keep in mind when looking at products and benchmarks, is that some products perform better under different circumstances. For example some databases perform better on mass deletes while others choke. But the one that chokes may have faster single transaction performance and better end user tools.

Good luck with your search...

P.S. We currently have INGRES, RDB, and FOCUS on the shelf.

Greg Schulz

GREG P. SCHULZ
BURLINGTON NORTHERN RR
ISS LOC 3
176 E 5TH STT
ST. PAUL, MN 55164
612 298-7344

Some areas to look out for

922.8 dated 5-MAR-1988 21:33

From: Alan B. Hunt

I agree with the others that the application will determine the best type of database product (relational vs. CODASYL). If you are looking at a Cluster implementation, I would say beware of Oracle since in clusters they do their locking on disk (under V5). I don't know of any plans to change it.

I would investigate any product very very carefully if you planning to use it in a cluster. NON-DEC shops often don't understand clusters. Another area we found weaknesses in was whether the database could make use of VMS based security features (identifiers, usernames, UIC's, etc).

ALAN B. HUNT
26803 BERG RD. #301
SOUTHFIELD, MI 48034

Yes, beware of "master process" implementations

922.9 dated 6-MAR-1988 08:41

From: Larry Kilgallen

Even if you are not planning on running your database in a cluster, your plans might change in the future, so it is best to consider cluster behaviour from the start.

The two DEC databases (3, if you count RMS) perform disk IO directly from the user process with no intermediate master process. Likewise they use the distributed lock manager to detect contention across the cluster. I know of one other database (System 1032) which does IO directly from the user process. In that case they do intra-node locking with a global section and inter-node locking with the distributed lock manager. The point is that these databases

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do not shuffle data across to a master process for disk I/O (which would incur process context switch overhead as well as transfer overhead) and they are also well-suited to keep on running when a node crashes (at least if you happen to be on one of the surviving nodes of the cluster).

The typical approach for databases ported from IBM machines (where there is nothing comparable to a VAXcluster) is to establish a central process which will handle all the disk IO. In defending that approach, vendors will say that a central process is more efficient than the distributed lock manager. With the adjustable locking granularity algorithms DEC uses in their databases I think that view is questionable (although it is always possible to construct pathological examples). I *know* the implementation of data transfer to a central process on another *node* in a cluster is inefficient, and I doubt that any of these databases with a central process has the ability to have some users keep on running if the node with the central process crashes. (The last point merely increases an individual user's exposure from $1/n$ to $2/n$, but it does lead to situations where, from a system management standpoint, 100% of the users are mad, vs $1/n$ of the users.)

So what does System 1032 have in common with DEC databases? They were all written with VAX/VMS in mind!

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

Thanks

922.10 dated 8-MAR-1988 18:51

From: Mark N. Katz

Thanks to everyone for some great information and pointers to other notes with more good info but..

Is there anyone out there who is TODAY running a large VAX DBMS or Rdb application out there. We have been running DBMS and we haven't been happy with performance. Over the last few weeks, with some help from DBMS development, we have found some problem areas – but we still don't know whether we are running DBMS at its limit or misusing it into the ground.

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The new project we are embarking on has similar, maybe higher, performance requirements and we need to make some decisions pretty soon. Anybody out there willing to give us their experience on transactions per second, nature of transactions, machine environment, other stuff happening on machine at same time, etc.

I realize that this is a lot of stuff to type in to a Notes system, so a phone call might be quicker for some of you. I will try to update this note with any data received that way if it makes your life easier – or keep it private if you don't want it spread around.

You can reach me at (617)466-3437 or call Elaine Ng at (617)466-3607

Mark Katz (and thanks again for all the help so far)

Mark N. Katz
GTE Government Systems
100 First Ave. MS:1240
Waltham MA 02154

The limitations of this discussion medium

922.11 dated 8-MAR-1988 20:30

From: Larry Kilgallen

Lest there be any fear that people are not making heavy use of these products, let me say that I know of sites which are doing so. The problem is that they have not chosen to participate in these (or other) DECUS discussions. Whether by intent or by accident, we unfortunately have to respect their self-imposed isolation.

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

Well, I tried

922.12 dated 10-MAR-1988 11:27

From: Mark N. Katz

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Of course. Just trying to drag some people out of the woodwork if they're there. Wish there was a similar service offered by the DMS SIG or some kind member thereof.

Mark N. Katz
GTE Government Systems
100 First Ave. MS:1240
Waltham MA 02154

Some good data base discussion starting on DECUServe...

922.13 dated 10-MAR-1988 13:37

From: Bob Hassinger

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

Keep this discussion going...

922.14 dated 10-MAR-1988 18:46

From: GREG P. SCHULZ

Mark, we are in the process of implementing a rather large (Gigabytes shadowed) database application using either RDB or INGRES or both. We to are interested in interacting with others who are using or developing large database applications.

GREG P. SCHULZ
BURLINGTON NORTHERN RR
ISS LOC 3
176 E 5TH STT
ST. PAUL, MN 55164
612 298-7344

A compliment, for a change

927.0 dated 5-MAR-1988 22:28

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From: Dale E. Coy (505) 667-3270

We've beat up on DEC fairly heavily in the support area, so it's appropriate to recognize the good stuff, too.

The Terminal Server area in DSIN has a large number of helpful hints, example programs, etc., and seems to get updated and added to frequently. Whoever is doing that deserves a big hand for providing an example of good support.

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

Great job...

927.1 dated 9-MAR-1988 21:59

From: GREG P. SCHULZ

It would be great if some of the other product groups followed the terminal server (NETWORK) group in the are of DSIN items. My compliments to DSIN on the DS200 V2.0 index of articles.

P.S. Thanks also to the SNA group for finally placing some very good information into DSIN...

GREG P. SCHULZ
BURLINGTON NORTHERN RR
ISS LOC 3
176 E 5TH STT
ST. PAUL, MN 55164
612 298-7344

927.2 dated 10-MAR-1988 11:06

From: Bill Mayhew

I agree, wholeheartedly. I also note that an index to the terminal server articles, with supporting info (like the fact that the terminal server needs to be on your "supported product list" for you to access them), has popped up among the VMS articles.

The terminal server group is doing something right; let's encourage the other groups to follow their example.

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

V4.7 TTDRIVER Speed Problem

929.0 dated 8-MAR-1988 08:01

From: Bob Doherty

Has anyone else noticed any anomalies with the v4.7 TT driver?

We regularly downline load files from our VAX to a MAC][over a 19.2 kb serial line(hardwired DMF32 port) and with the 4.6 driver using VMODEM from the VAXNet distribution we would normally get transmission speeds of 3200 to 4200 baud with the 128 byte XMODEM packets. When we upgraded to 4.7, this rate went down to ca. 1400 baud. When we restore the 4.6 driver, the problem goes away.

According to the release notes(I haven't checked the fiche yet), the change in TTDRIVER was to cure problems with multiple sessions with VWS. Is this related to that change, or has something else been introduced?

Robert Doherty
US DEPT of AGRICULTURE
NUTRITION INSTITUTE
B.161, R.102, BARC-EAST
BELTSVILLE MD 20785
(301)-344-2147

Something changed, alright!

929.1 dated 9-MAR-1988 14:54

From: Stuart Renes, DFWLug Chair

I too have had problems with the VMS V4.7 TTDRIVER. My particular problem is that my user-written pseudo-terminal driver now returns data overrun errors. This driver had been working for several years and still works on small, presumably slower VAXes such as a VAXstation 2000 and a VAX 11/725 running V4.7 but not on an 8530.

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I'm waiting (patiently?) for the 4.7 fiche so I can find out just what DEC did to the driver.

By the way, they claimed to fix some VWS windowing problems with the new driver code *BUT* my VAXstation 2000 has DEVELOPED problems with the new driver.

Stuart Renes
AT&T Technologies, Inc.
Mail Stop: 2793
3000 Skyline Dr.
Mesquite, TX 75149
(214) 288-2286

Don't be patient!

929.2 dated 9-MAR-1988 16:46

From: Larry Kilgallen

RE:

“ I'm waiting (patiently?) for the 4.7 fiche so I can find out just what DEC did to the driver. ”

The V4.7 microfiche arrived in Boston some time ago.

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

929.3 dated 9-MAR-1988 22:06

From: GREG P. SCHULZ

We to are still waiting for fiche in St. Paul. We have noticed some abnormal behaviors lately on terminal server ports that may or may not be related to the TTDRIVER. In one case a system administrator reported a data under-run error. We have one system that is connected to our main ethernet via reverse lat (until translan is installed) via DECmux II and DS200. Lately we have been noticing degradation as time and usage increase to the point where terminals lock up. Is it the TTDRIVER or could it be time to look at ETDRIVER.EXE again.

GREG P. SCHULZ

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Kermit weirdness

929.4 dated 10-MAR-1988 09:19

From: G. Del Merritt

I too have noticed a problem with PC transfers when using Kermit. I first saw it when the PC was connected to a TCP/IP terminal server. Then I switched it over to a direct connect to my DMZ32, but saw no change. The Kermit being used on the PC end was the PROCOMM version. For lack of time, I haven't looked much further. A side note, though, is that I see no problem or difference down/uploading to the Pageswapper at 1200 baud using my VAX Kermit, so I was figuring it was the PC at fault...

G. Del Merritt
55 Walkers Brook Drive
Reading, MA 01867

Weird here, too

929.5 dated 11-MAR-1988 05:04

From: Terry Kennedy

I've had some oddities since installing 4.7, too. I have terminals (VT102's) on a data switch at 4800 baud. The data switch connects to ABLE VMZ32's, which have been quite reliable. Now, all of a sudden, I have things happening like SHOW DEVICE TXA0: reporting 417 errors on the terminal. Yet at other times things are just fine. I swapped the VMZ32's without effect. I think I'm going to try the 4.6 TTDRIVER next.

Terence M. Kennedy
St. Peter's College
Department of Computer Science
2641 Kennedy Boulevard
Jersey City, NJ 07306
(201) 435-1890

Good Idea.

929.6 dated 11-MAR-1988 09:07

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From: Stuart Renes, DFWLug Chair

I think I too will re-install the VMS 4.6 TTDRIVER on my VAXstation 2000 to see if things reverse themselves.

Does anyone who *HAS* the 4.7 fiche know exactly what was changed in the terminal class driver? (I just KNOW you all have scads of time available to scan the microfiche!! :-)

Stuart Renes
AT&T Technologies, Inc.
Mail Stop: 2793
3000 Skyline Dr.
Mesquite, TX 75149
(214) 288-2286

Cures our problem

929.7 dated 11-MAR-1988 19:07

From: Bob Doherty

RE:

“ I think I too will re-install the VMS 4.6 TTDRIVER on my VaxStation 2000 to see if things reverse themselves. ”

I reinstalled the 4.6 driver and the bizarre speeds went away. So, at least for the problem which I originally reported, the problem is in the TTDRIVER.

Robert Doherty
US DEPT of AGRICULTURE
NUTRITION INSTITUTE
B.161, R.102, BARC-EAST
BELTSVILLE MD 20785
(301)-344-2147

The fiche are biting

929.8 dated 14-MAR-1988 04:06

From: Terry Kennedy

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RE:

“ Does anyone who *HAS* the 4.7 fiche know exactly what was changed in the terminal class driver? ”

Well, I looked... The problem is that:

- The 'new image' is a patched 'old image' – they are both Version 'X-4'
- Patches are *not* reflected in the fiche (usually)
- Comments in the fiche header do not indicate changes of the “While I'm here, this looks wrong so I'll change it” variety. These are usually what kill you...

Terence M. Kennedy
St. Peter's College
Department of Computer Science
2641 Kennedy Boulevard
Jersey City, NJ 07306
(201) 435-1890

Can't fix something if you don't know!

929.9 dated 16-MAR-1988 21:27

From: Mark Schell (919) 773-7040

If this is as bad a problem as it sounds, PLEASE SPR IT!!!

Mark Schell
DIGITAL EQUIPMENT CORPORATION
8025 NORTH POINT BLVD
SUITE 100 WEST
WINSTON SALEM NC 27106

It *has* been...

929.10 dated 16-MAR-1988 23:14

From: Terry Kennedy

I have SPR'd this as an addendum to my 3 other SPR's, all dating back to V4.4:

- If a /MODEM/DIALUP port is XOFF'd, the next caller must type a ^Q at the *same baud rate* to unhang the port.
- There is no typeahead at the Username: prompt – you have to wait until the welcome message is done – so lengthening the welcome message will break automated login scripts
- On ports set /EIGHTBIT, characters with the parity bit set are treated as multinational in usernames and passwords.

DEC has not seen fit to respond to any of these. When contacted, the person I spoke to said there is a backlog of about 2 years from report date to Dispatch publication, let alone fixing it. Furthermore, I was told that these things are only fixed when VMS isn't actively working on a new release (about a 2-week period every 6 months).

Terence M. Kennedy
St. Peter's College
Department of Computer Science
2641 Kennedy Boulevard
Jersey City, NJ 07306
(201) 435-1890

VMS 4.7 BACKUP BUG???

937.0 dated 10-MAR-1988 22:57

From: HANK VANDER WAAL

I WAS TOLD BY SOMEONE (OR READ SOME WHERE) THAT THERE IS A BUG IN 4.7 BACKUP WHERE THE FIRST TAPE WILL FINISH AND REWIND AND INSTEAD OF DISMOUNTING IT THE SYSTEM WILL START WRITING OVER IT ONE WHAT IT THINKS IS THE 2ND VOLUME!!!! IF SO IS IT FOR ONE TYPE OF DRIVE???

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HANK VANDER WAAL
CDS
4714 FENWOOD SW
GRAND RAPIDS MI 49504
6164530630

TK50, I believe

937.1 dated 11-MAR-1988 07:31

From: Larry Kilgallen

I have heard this bug is specific to the MicroVAX/VAXstation 2000.

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

I called C. Springs

937.2 dated 14-MAR-1988 11:38

From: George Bone

I called Colorado Springs about it, and the representative I talked to told me that they had not received any reports on a problem such as this.

The rumour *I* heard was from a column in a widely read Digital products specific newspaper, and was actually in a “rumours” type of column. It could be that the person who experienced the problem was suffering from rectal-cranial inversion (I know I often suffer from that).

George Bone
Code 2301.2 Mail Stop T-11
Mare Island Naval Shipyard
Vallejo, CA 94592-5100
(707)646-2531

NO TROUBLE HERE

937.3 dated 16-MAR-1988 10:52

From: CHUCK MCMICHAEL

Using the V4.7 on-line backup with an 11/750 and TU80, I've had no such trouble.

CHUCK MCMICHAEL
PITTSBURGH CORNING CORP

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800 PRESQUE ISLE DR
PITTSBURGH PA 15239
412-327-6100

I've seen it – and so has DEC!

937.4 dated 16-MAR-1988 20:53

From: Bob McCormick

And here's the real POOP!

I've seen it!... On a MicroVAX 2000 with the SCSI TK50Z-FA tape drive, I was backing up an RD54 to the tape – and it completely filled the tape (I didn't expect it to).

This thing ran unattended (for quite some time). Oddly enough, when I came back I found that all by its lonesome it had rewound the tape and –yes virginia– decided to play real two on top of one!

Well, I ignored that problem (I wasn't sitting there watching it; I think it sat for over a weekend)...

But... I was talking to someone last week (Friday sounds specific) regarding another backup problem I was having and they mentioned (without anything from me to prod it) the backup rewinding the tape, and if you didn't mount another tape (and respond) in a certain amount of time, the last tape would be automatically mounted and written over. In case you're wondering: MicroVMS V4.6

Is it a bug, or a feature? Is it unique to the SCSI driver – or all systems? What's the timer value? Can it be changed? Ho Hum

BOB MCCORMICK
39 FORGE ST
FEEDING HILLS MA 01030

addendum to 937.4

937.5 dated 16-MAR-1988 20:55

From: Bob McCormick

that someone was 'someone' out at Colorado CUser Support

BOB MCCORMICK
39 FORGE ST
FEEDING HILLS MA 01030

Setting NET*.DAT to be WORLD READ

942.0 dated 19-MAR-1988 07:34

From: Larry Kilgallen

A couple of sites in the Boston area have reported that the upgrade to VMS V4.6 and/or VMS V4.7 has unprotected NETUAF.DAT and other files matching the specification SYSSYSTEM:NET*.DAT to be WORLD:RE. This is looser than specified in the Guide to VAX/VMS Security. These are *not* sites particularly susceptible to Chaos Computer Club attacks.

Have others seen this, or have people at these sites been smoking funny cigarettes?

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

same thing here

942.1 dated 19-MAR-1988 18:34

From: George Merriman CCA/NY

I can confirm that a client's 4.7 LAVC has the world protection set as you note for files in sys\$common:[sysexe]. The files in sys\$sysroot:[sysexe] have no world access granted. I can't say if this was true in 4.6. On a non-clustered 4.7 system at the same site in New York City none of the NET*.DAT files have world access granted.

George Merriman
Cambridge Computer Associates
56 Beaver Street 3rd Floor
New York NY 10004
212-425-5830

Imagine my surprise...

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942.2 dated 21-MAR-1988 20:06

From: Saul Tannenbaum

Having just looked at my system, NETUAF is world:re. I certainly didn't do that myself. All the other net files seem protected correctly. This is on{VMS 4.7, cluster common system disk.

Saul Tannenbaum
Tufts University
HNRC
711 Washington Str.
Boston, MA 02111
(617)556-3346

Well, I'll be!

942.3 dated 22-MAR-1988 10:15

From: Jonathan M. Prigot

I just checked on our three DECnetted VAXen. NETUAF on ours (V4.6) does not grant WORLD anything. The other two (V4.6 and V4.7) both have W:RE. We overhauled our security a few months ago, so that is probably why ours is set properly. To the best of my knowledge, no similar thing has ever been done with the others.

Jonathan M. Prigot
W.R. Grace & Company
55 Hayden Avenue
Lexington, MA 02173
617-861-6600 x2148

50 – 50

942.4 dated 22-MAR-1988 12:38

From: G. Del Merritt

My 4.7 standalone system has NETUAF unreadable by the world, but there are several NET*.DAT files that allow W:RWE. I know that I have done nothing to change any of the protections...

G. Del Merritt
55 Walkers Brook Drive
Reading, MA 01867

Choices abound

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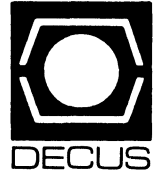
942.5 dated 22-MAR-1988 17:21

From: Kevin Angley

On my cluster common system disk, NETUAF.DAT is not world-accessible.

On a standalone Vaxstation II/GPX, NETUAF.DAT has w:re. This system was upgraded to 4.7 using a VMS kit, not a MicroVMS kit, by the way if that gives any clue.

Kevin Angley
3301 Terminal Drive
Raleigh, NC 27604
(919) 890-1416



BUSINESS APPLICATIONS

Cincinnati Symposium Preview

Thomas M. Byrne, Business Application SIG Marketing Coordinator

With Uncle Sam's help and cooperation, you should be receiving this month's Newsletter in time to help you plan what to see and where to go during the Spring 1988 Symposium.

In talking to those who were fortunate enough to attend the last Cincinnati Symposium, a few years ago, I hear the facilities are first rate.

If the weather is poor, the Convention Center and the major Symposium hotels are all connected by an enclosed Skywalk.

If the weather is good, and it should be great at this time of year, everything is within easy strolling distance.

Friends in the "Queen City" tell me that this is their Bicentennial Year and they are pulling out all stops to make it a memorable one for residents and visitors. A check with your travel agent or the Convention Bureau should provide you with a host of special activities to take advantage of.

The Business Application SIG is also going all out to provide you with the best Symposium program possible. We have scheduled 51 hours of sessions filled with more information than that breakfast cereal has raisins!

Some of the highlights are 14 hours on managing your DP shop and/or Information Center, 6 hours on Transaction Processing, 9 hours on AI issues and Application Development Tools, plus the proverbial much, much more.

In addition to the usual horde of Digital speakers, folks from companies like Cognos, Touch Technologies, and Clyde Digital Systems are scheduled to appear.

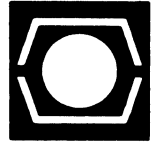
We also have "real users", just like you! Folks from the U.S. Coast Guard, Corning Glass Works, and E & J Gallo Winery, to name a few, will be sharing with you problems and solutions, benefits and pit-falls of real world applications.

Let's not forget "Late Night with BA"! On Monday night, our very own refulgent Dan Esbensen will play the Caterpillar in an "Alice in Wonderland" journey through speaker interviews, wizardly magic acts, and good clean fun! This session was standing room only in Anaheim, so be sure to arrive before the curtain goes up on one of the most memorable sessions you'll ever attend!

Last, but definitely not least, stop in the Business Application Suite.

The BA Suite may be the best place in town to stop in and spend a moment or two. You will have a chance to meet and talk with many of our speakers. You can also chat with the folks of BA and give them your ideas about what makes a Symposium worthwhile for you.

We'll see you in Cincinnati!



DECUS

GRAPHICS

From the Editor

Bob Hays

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

This month the newsletter survey is being mulled over by DECUS leadership. A large number of surveys were returned, which is pleasing, and most of the surveys have what I consider very constructive ideas. More information will appear as I get it....

The DECUS symposium is this month; I hope everyone in attendance has fun and gets all their questions answered. The symposia are THE place to ask developers from Digital Equipment about products, problems, and futures. I've attended two symposia and have always had my questions answered (not always as I would have preferred, but that's not the issue).

The GAPSIG Woods meeting is the weekend of March 26th and 27th. A summary of the meeting should appear in the June newsletter (there is currently a two month lag between delivering a newsletter to the DECUS national office and having it published).

This month, the NOTES session on GRAPHICS from the Fall Symposium are finally provided (sorry they didn't get into last month's issue - RLH). There's also an article on desktop publishing from Henry Schneiker.

Submissions are always welcome! Please send any tips, questions, articles or ideas to Bob Hays at the address at the left. As you can expect, I prefer electronic submissions which means tape (VMSBACKUP or RSX BRU) or on-line on DCS. However, if you cannot make a submission via electrons, use paper! I type mass quantities a couple of times a month and my fingers still work great!

Graphics NOTES session DECUS Fall 1987 Symposium

Note 2.2 Registry
VAXFAM::MMCPHERSON
13 lines 7-DEC-1987 11:26

Hi everyone. I am:

Mike McPherson
Acting Chair, Graphics SIG
A. H. Case Center for CAEM
236 Engineering
Michigan State University (Go State! Beat USC!)
East Lansing, MI 48824
517-353-9769

Interests: Workstations
Workstation Management
GAPSIG Issues

Note 2.6 Registry
VAXFAM::RGOLDSTEIN
8 lines 8-DEC-1987 16:06

Bob Goldstein
Head of Automated Information Processing Systems
Eye Research Institute of Retina Foundation
20 Staniford St
Boston, MA 02114
(617) 742-3140 x404

Note 2.4 Registry
VAXFAM::LCANNELL
7 lines 7-DEC-1987 16:35

Larry Cannell
System Manager/Programmer
Ford Motor Co
21500 Oakwood Blvd
Dearborn, MI 48121

Interests: Finding out more about GKS.

Note 2.3 Registry
VAXFAM::GMERRITT
11 lines 7-DEC-1987 15:15

G. Del Merritt
TASC
55 Walkers Brook Dr.
Reading, MA 01867
(617)942-2000

Interests: GKS
Image Processing
Image Understanding
High quality animation (we have PIXAR #1)
Fast rendering

Note 2.5 Registry
VAXFAM::MHENDERSON
10 lines 8-DEC-1987 08:50

Matthew C. Henderson
CAPS Network and Systems Manager
Unisys Defense Systems
600 Gemini Avenue, M.S. U06C
Houston, Texas 77058-2775

Interests: Graphics standards
Workstations
Graphical hardcopy devices
User interface standards

Note 3.0 Redirecting GKS output to a file
VAXFAM::LCANNELL
10 lines 7-DEC-1987 16:34

Is GKS capable of redirecting the output that would normally go to the hardcopy device (in this case a plotter) to a file? That file would then be spool to that device at some later time using a symbiont. I don't mean a metafile, that won't do be any good in this case. It has to be a file that can be simply copied or printed to the particular hardcopy unit.

Note 2.1 Registry
VAXFAM::JBLOOM
12 line 7-DEC-1987 11:25

John Bloom
Senior Research Mathematician
Chevron Oil Field Research Co.
P.O. Box 446
La Habra, Ca. 90633-0446

I have been programming high performance graphics applications for 7 years, and am trying to port some of the applications to a GPX under VMS. In order to efficiently provide the "plane-mask" feature, I am attempting to use DOPS under UIS. I would appreciate making contact with anyone with knowledge of DOPS, especially the bit-mask features. I cannot seem to get the use_mask flag to work.

Note 2.7 Registry
VAXFAM::DSTONE
20 lines 9-DEC-1987 13:13

David M. Stone
System Manager/Programmer
Shriners Burns Institute
51 Blossom st.
Boston MA 02114
(617) 722-3000 x260

Interests: Almost every aspect of programming a computer (It's not just an adventure; it's a job)

I have several applications which I have put up on a GPX, including 3-d reconstructions. I need a small amount of help using DOPS, namely how does one use bitmaps for dashed lines?? The book isn't very clear on color bitmaps, and everything I've tried has failed.

I also need a lot of help with synchronization problems and lack of good documentation.

If anyone is looking for help in other areas (such as plain old UIS calls), I'd be glad to help (or at least trade horror stories).

Note 2.8 Registry
VAXFAM::JBLOOM
16 lines 9-DEC-1987 14:36

Yes, the DOPS documentation is poor when it gets to bitmap (especially multiplane bitmap) use. I am having trouble with bitmasks, and also in figuring out where and how DEC stores its fonts (so that I can use them from DOPS.) Furthermore, it is very difficult to find anyone at DEC to answer a question. There was supposed to be one VMS graphics expert at DECUS, but he got sick and couldn't come.

If DEC is serious about attracting graphics users, they must realize that we want performance, and that we want to use all the features on a particular device. For now, that means DOPS. Waiting a year for X is too long. (In the computer graphics field, a year is forever.) Even with X, many of the features of the GPX chip will be hidden (such as copying offscreen bitmaps with scaling: bit replication will have to be done on the host, and full-screen images transferred from client to server.)

Note 3.1 Redirecting GKS output to a file
VAXFAM::BAXTELL
10 lines 8-DEC-1987 12:02

GKS is capable of redirecting hardcopy protocols. To do this, choose the workstation type as the type of device you wish to use, and define the connection id to be a VMS file specification. The output will then be directed to a file by the specification and the file may then be spooled to a graphics device.

Brian Axtell
Base Graphic Systems Group
Digital

Note 4.0 Higher Level Graphics Tools
VAXFAM::MODERATOR
17 lines 8-DEC-1987 07:50

There will be an informal session this afternoon (Tuesday) in the GAPSIG campground. The subject is "Higher Level GraphicTools" and the purpose is to give user's a chance to tell DEC what they require in a graphics toolkit to do their job. The topic comes up because many people think that packages like VAX GKS and VAX PHIGS provide tools that are at to low a level. For example, with VAX GKS and VAX PHIGS, functions are supplied for drawing lines, markers, text etc. No functions are provided to draw an axis for a graph, or a bar chart in one call, etc.

If you want to have the advantages of a device independent package like VAX GKS or VAX PHIGS, but find them too "primitive", come to the GAPSIG campground at 4:00 today to tell DEC what you really need.

Jim Flatten
VAX GKS/VAX PHIGS Product Manager

Note 5.0 RGL (ReGIS) Users Out There???
VAXFAM::MODERATOR
5 lines 8-DEC-1987 07:55

I'd like to hear from anyone here that is an RGL (ReGIS Library user). What is keeping you from moving to GKS or PHIGS? How many of you are there out there? How many would move if you could?

Jim F.

Note 5.1 RGL (ReGIS) Users Out There???
VAXFAM::RHAYS
6 lines 9-DEC-1987 12:23

Yes, Jim, we use ReGIS a little at our site for various old (OLD) code. We just don't have time to re-code all that good "stuff". If you can find a way to minimize rewriting, then I'm all for it.

Bob Hays, KMS Fusion

Note 5.4 RGL (ReGIS) Users Out There???
VAXFAM::DBOLTHOUSE
5 lines 11-DEC-1987 11:38

When are DEC products (i.e., Datatrieve) going to move away from RGL?

David L. Bolthouse
Texas Instruments

Note 5.2 RGL (ReGIS) Users Out There???
VAXFAM::JBURNET
8 lines 10-DEC-1987 17:03

>- If you can find a way to minimize rewriting, then I'm all for it.

If you have a *lot* of code that uses RGL calls, you could of course write an "RGL emulator" library that would turn RGL calls into Gkor PHIGS calls. This would only be worthwhile if you stand to lose a lot of time by converting the code some other way, but you could of course donate the resulting RGL-to-GKS-or-PHIGS routines to the DECUS library and earn the eternal gratitude of the other 5 RGL users in the world.

Note 5.3- RGL (ReGIS) Users Out There???
VAXFAM::WWEISSBORN
18 lines 10-DEC-1987 17:05

I use it at my site but I think that I am the only one. The main reason I use it is because of speed(?) and simplicity. Let me explain.

My company has a development license for a product called UNIRAS which supports GKS. But to do terminal io I only have drivers for Tek 41xx and Tek 42xx terminals. Since I am but a lowly sys manager and programmer, I don't get the really neat toys so I am "stuck" with a VT240. So I use REGIS. That what I mean about simplicity. It is easier for me to crank out my little plots with REGIS that trying to have to wrestle a Tek terminal away from an engineer.

As far as speed is concerned. I mean speed of coding, not necessarily speed of execution. Again, our "wonderful" UNIRAS, has a lot of bugs when it comes to terminal i/o, so it is usually faster for me to use REGIS and to try and debug UNIRAS's code.

Hope that helps

Note 7.0 Problems, problems with VAX GKS V3
VAXFAM::FNAGY
20 lines 9-DEC-1987 09:36

Configuration is VMS V4.6, VAX GKS 3.0 and (where appropriate) VWS V3.2.

#1: With a VT330, using a pick input device and a string input device alternately - but both devices are using EVENT mode - the string input buffer often receives cursor update information.

#2: With a VAXStation, a call to GKSSINQ_WS XFORM returns x- and y-maxima which are greater than the size of the screen if the open viewport is in the upper right hand corner.

#3: With a VAXStation, the echo area for a pick device apparently needs to be the entire screen in order to pick segments from an entire viewport. Seems that the transforms may be wrong...

#4: When calling GKSSAWAIT EVENT event at AST level, if a GKSSCREATE SEG or GKSSDELETE SEG has been interrupted by the delivery of the AST, an error condition exists and the program crashes.

[Problems passed on for Brian Kramper, Fermilab (312) 840-3927]

Note 7.1 Problems, problems with VAX GKS V3
VAXFAM::JFLATTEN
5 lines 9-DEC-1987 11:27

I have extracted your note and will pass it on to the GKS development group. Thanks for your input.

J. Flatten
VAX GKS Product Manager

Note 6.0 Any UNIRAS users out there
VAXFAM::WWEISSBORN
10 lines 8-DEC-1987 14:41

I am interested in hearing from anyone else out there that is using UNIRAS. Do you have problems with:

- 1) Performance - taking a loooong time to create files
- 2) Buggy releases
- 3) Poor documentation.

We seem to suffer from all of the above and would like to know if it is just us or what?

Note 6.1 Any UNIRAS users out there
VAXFAM::JBLOOM
17 lines 9-DEC-1987 14:11

Our initial installation of UNIRAS was quite buggy, but we refused to pay for it until it worked, which did wonders. Some operations are slow vs using customized code, but that is the problem with using a generic system. UNIRAS seems no slower than other general purpose systems, and contains a lot of functionality.

We find UNIRAS extremely useful for scientists and engineers who need to draw something, but don't want to become graphics experts.

We do not find UNIRAS usefull for writing production systems that will be used over and over, especially not for interactive ones. However, we have found no other suitable general purpose system, and have ended up using home grown "standards".

The hope is that "X" will remedy this situation by providing a fast standard that understands raster devices. Wait two years, and then we'll know.

Note 8.0 UIS-Tool-Box on top of DECwindows
VAXFAM::DROBERTS
21 lines 11-DEC-1987 11:33

I want to know if it is wrong to think that a "UIS-ToolBox" could be put on-top of DECwindows. I've heard that the X-window server is dumb, and the real programming is done by the client software.

Well then, couldn't a tool box be developed by DEC which uses the standard UIS calls, and send them off to the DECwindow Server? It would allow current UIS Development to operate transparently under X windows.

Also, can you download an Image using UISSIMAGE to 4 plane GPX?. It seems to only load one bit plane.

Keith Roberts
ST Systems Corp
109 Mass Ave
Lexington, Ma 02173
(617) 377-5959

Note 9.0 Flight simulator for VAXStations
VAXFAM::DSTONE
20 lines 11-DEC-1987 12:07

This is the beginning of a campaign to get DEC to release Flight Simulator to the DECUS tapes. This is one of the best example programs that could be used to show non-computer oriented people what VAXstations can do. Besides that, it's a great game to play.

We should also get DEC to release the source code for all of the DEMO's as well as the executables. I understand why DEC doesn't want to do this (after all, you may not want your company name on a product that is a midnite hack job, etc.)

Electronic Publishing

Henry Schneider

The current state of publishing falls into two broad categories. First are the traditional typesetters. They use photocomposition units that have been in use for the last 10 to 15 years. These machines can perform all the standard typesetting tasks used for layout of flyers, brochures, periodicals and books. Typical typesetting involves creating parts of a page with the photocomposition system, printing them and then pasting the parts together by hand in order to create the final camera ready page. Typical costs run from \$20 to \$40 per page produced. One major problem with traditional typesetting is that, if a change is needed, the entire page, or publication, may have to be laid out again from scratch.

The second broad category is electronic publishing. Electronic publishing is a recent phenomenon that uses a computer with special software programs to electronically create a full page (or several pages) on a computer screen. The software allows for electronic cut and paste, before the page is ever printed. Text can be inserted or deleted at will, and will "flow" back and forth along the layout automatically. Typical costs with electronic publishing methods run from \$10 to \$20 per page produced. This is a substantial decrease in cost over traditional typesetting for creating the same page.

In addition, the computer can save the page for later use and can be easily revised if a mistake is encountered or if changes are desired. Typically, 10 pages can get minor revisions for the same price as creating the first original. This revision capability can reduce the final page cost by 50% to 70% for a single publication.

The Macintosh computer has been credited with bringing "Desktop Publishing" to the mass market, which is simply electronic publishing with a small computer system. The Macintosh is used to lay out a page or full publication, and then the image of those pages are sent to a laser printer (Apple Laserwriter or other laser printers that use PostScript). What Apple really did was to make Desktop Publishing a common term and make cheap publishing a reality. There are many software packages on computers made by Apple, IBM, DEC, Prime, DG, CDC and others currently available for doing the same thing.

The resulting output of the laser printers is very nice. They are a big leap from the older "dot matrix" printers, which has a resolution of about 75 dpi, used with most low end computer systems. Pages from these laser printers are suitable for office memos, correspondence and other standard uses where typewriter quality was once needed. The current technology in laser printers produces output with a resolution of 300 dpi by using almost the same technology used in the typical office

However, I feel that the examples given in the actual code may be the best way of showing others how to do some of the nice things that the demos can do that a normal programmer can't figure out.

Maybe we should all get together and send lots of postcards and phone calls to the DECUS graphics counterpart in DEC. I think it's someone named Jim Flatten (sorry Jim; I couldn't resist). Actually, it would be a great program to have, and it really should be made public.

photocopier. The average person does not notice the "jaggies" or roughness of the characters or other artwork at these resolutions unless they look closely. However, 300 dpi is not suitable for halftone picture production or other high quality end products. However, it is a good proofing device for both these areas.

A new breed of laser printers are just emerging with a resolution of 600 dpi. These have been long in coming because of the problems with toner particle size. The visual quality is much higher than the current technology. Again, as with the 300 dpi models, these printers are not suitable for producing halftone pictures.

Traditional typesetters have established 900 to 1000 dpi as the threshold of typeset quality. This is the minimum required to process text only. For producing halftone pictures, you need to be able to produce about 256 shades of gray for good quality work. When your printer talks about halftones, he makes use of a different measure, called lines. At the low end, 85 line halftone screens are the minimum quality used for newsprint applications. At the high end, halftone screens with over 150 lines per inch are used. Most good typesetters use halftone screens in the 133 to 150 line per inch range. Printing technology is limited to reproducing halftones of about 250 lines per inch. About 1200 dpi is required to produce a halftone picture at 90 lines per inch.

Laser typeset machines are capable of resolutions in the 2500 dpi range. This is equivalent to the quality used by publications such as National Geographic and Smithsonian. These high resolutions allow halftone screens of 150 lines per inch with no perceptible change from one shade to the next.

Once these high resolutions are available, it is possible to fully automate the page layout process so that no mechanical cut and paste is necessary. These printers print on photographic roll film, not with toner. The current genre of software is capable of making full use of this technology. A benefit of this technology is that a publication can be produced electronically and sent by phone or other electronic means to a distant site for final, faithful, reproduction and distribution. In fact, it is possible for the high resolution laser printers to print directly on offset plate material, eliminating the last intermediate step between editor and pressman.

In 1984, Adobe Systems introduce a new printer language called PostScript. PostScript is a page description language that allows characters in any font describable, line art and halftones, to be combined on the same page in any way. Apple's Laserwriter was the first printer to make use of this language. Since then, PostScript has been accepted as the industry de facto standard, for low resolution printers all the way up to the high end printers

such as Linotron 300, even by the likes of IBM, DEC, HP and Xerox, not to mention most of the major laser printer manufacturers. Many of the page generation software packages today generates PostScript, and PostScript printers cover the whole range from inexpensive laser printers to the high resolution laser printers. PostScript files may be generated on one system and printed on another without any loss of quality. This is a first for the computer industry.

Photocopying smears the 300 dpi jaggies produced by laser printers. As it turns out, second generation photocopies of the original laser printer output yield the best results from a high quality photocopier. This method of reproduction is fine for small quantities of fliers, business memos and the like.

However, offset printing, with its much higher resolution, preserves the jaggies and the final printed page reveals the true source of the original. Offset printing is desirable whenever large (over 200) quantities are required or when more professional looking output is desired.

The paper used also has an effect on the final quality. Rough papers tend to smear the edges of lines and characters. Glossy papers show everything, including defects and jaggies, in great detail.

In addition to service centers, many businesses, authors and individuals have similar systems. Many need typeset quality, but there is nowhere to get it. There are over 400 packages on the market that generate PostScript output including TEX, Scribe, PageMaker and Interleaf, which are some of the main products used for the production of books, magazines and newsletters.

Typesetters are estimating about 20% to 30% of their business has already been lost to electronic publishing. They are, themselves, looking at electronic publishing as a way to lower their cost and capture new business.

The Linotron 300 has a rated resolution of 2540 dpi. It can print on standard rolls of RC photographic paper, transparency film and offset plate material. The latter can be taken straight to an offset press, mounted and run for 25,000 copies.

The Linotron can produce output at about 3 inches per minute. With 12" wide rolls, that's about 3.5 minutes per page of text. Graphics and font changes proceed slower while lower resolutions proceed faster. A realistic average is about 4 minutes per page at full resolution or 15 pages per hour at 2540 dpi. About 80% of all typesetting involves text without graphics or pictures. A resolution of 1270 is adequate for text and allows a much faster production rate. The Linotron 300 can operate at 2540, 1270 and 635 dpi.

The Linotron comes with PostScript. This is the only high quality (over 600 dpi) PostScript printer on the market. The Linotron comes with a hard disk that can hold the available fonts and is also used for font caching. This allows most PostScript print jobs to be run without any intervention for font changing by an operator.

The printer rolls exposed film onto a take up reel. From here, the take-up reel is placed in a developing machine for automatic developing and drying. The operator then takes the completed job(s) from the output tray, cuts the pages and packages them for delivery to the customer.

GAPSIG Symposium Tape

Mike McPherson, GAPSIG Librarian

It is time for the Spring Symposium. That means that it's about time for another Symposium tape. The Symposium tapes are a great way to share software that you have written with others around the world who have similar interests and needs. Anything is fair game, including subroutines and libraries, complete programs, graphic images and databases, and write-ups on technical or other topics.

As usual, there are two ways to submit to the Graphics tape: at Symposium or by mail. If you plan to attend the Spring Symposium in Cincinnati, bring your tape to the Symposium and drop it at the Library booth in the Exhibit Hall. It will be copied and returned to you.

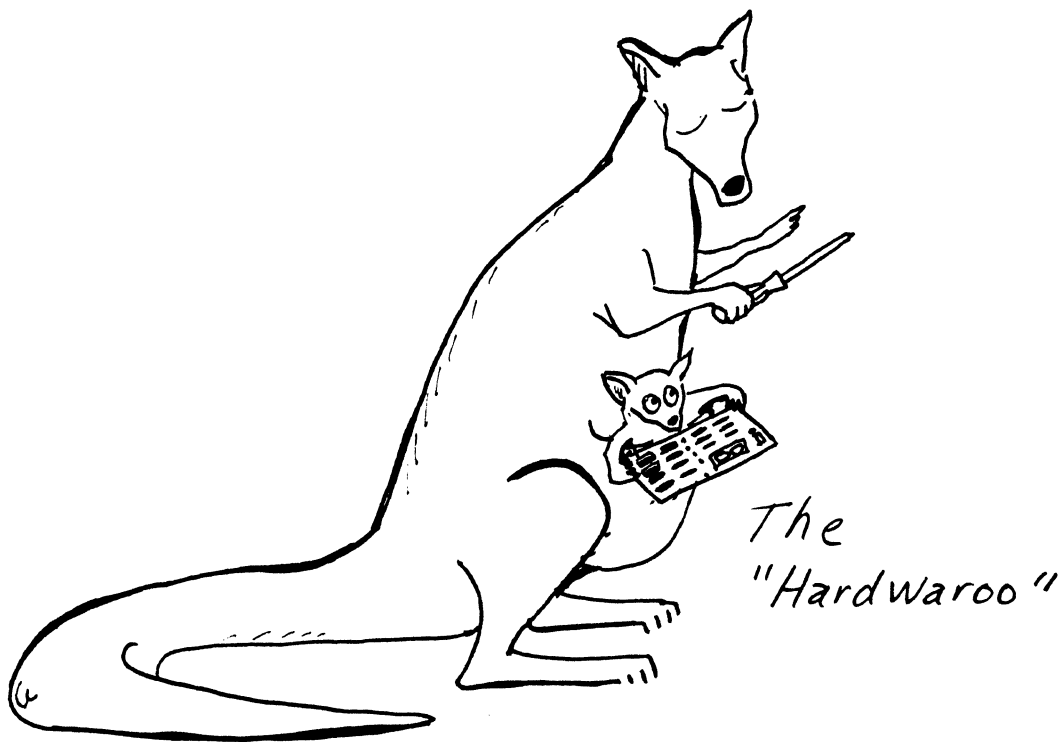
I can accept any of the currently supported media and formats, but I would prefer 9-track, 1600bpi, VMS Backup format if possible. If you can't attend the Symposium at Cincinnati, you can still submit. Just fill out the Tape Copy submission form at the back of the Cincinnati Preliminary Program and send it and your submission to me:

Mike McPherson
A. H. Case Center for CAEM
Michigan State University
236 Engineering
East Lansing, MI 48824.

If you have any questions, give me a call. My phone number is 517-353-9769.

HARD NEWS

The Newsletter of the DECUS Hardware/Micro SIG



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FROM THE EDITOR -- Carmen D. Wiseman

DEADLINE FOR THE NEXT ISSUE: MAY 23, 1988

Time for another symposium! You may have noticed that there was no Cincinnati "roadmap" article in the last issue. Well, there won't be one in this issue, either; the usual list of sessions has had to give way to all the excellent technical contributions we've received over the past few months.

Are articles like symposium roadmaps valuable to you, or would you rather see more technical articles in **HARD NEWS**? If the former, tell me or someone else in HMS leadership; if the latter, keep sending along terrific material such as the articles by Dennis Sullivan and Scott Taylor in this issue. I don't manufacture these newsletters out of spit and chewing gum, you know--a strong and appropriately "byte-headed" HMS newsletter depends on you and your contributions.

Speaking of manufacturing newsletters, this will probably be my last **HARD NEWS**. Unfortunately, the person I drafted as my replacement has other commitments that prevent him from taking on the editorship, so we're sending out a call for volunteers for the position of HMS newsletter editor. Interested parties should get in touch with HMS SIG chair Bill Walker at the symposium, or contact him at the address on the facing page.

We're also sending out a call for HMS session chairs at the Cincinnati symposium. There's a nonstop stream of sessions, and we need volunteers to spell symposium coordinator Mike Allen, who often ends up chairing many more sessions than any human being should. So, if you're planning to attend HMS sessions anyway, why not help out the HMS SIG by being a session chair? For details, contact Mike Allen at (415) 422-8326 or via DCS.

cdw

HMS-1

SUBMITTING ARTICLES TO HARD NEWS

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

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

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

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

Contributions can be sent to:

William K. Walker		Carmen D. Wiseman
Monsanto Research Corp.	OR	Digital Review
P.O. Box 32 A-152	==	Prudential Tower, Suite 1390
Miamisburg, OH 45342		800 Boylston Street
(513) 865-3557 (work)		Boston, MA 02199
(513) 426-7094/0344 (home)		(617) 375-4361 (9 a.m.-1 p.m. EST)

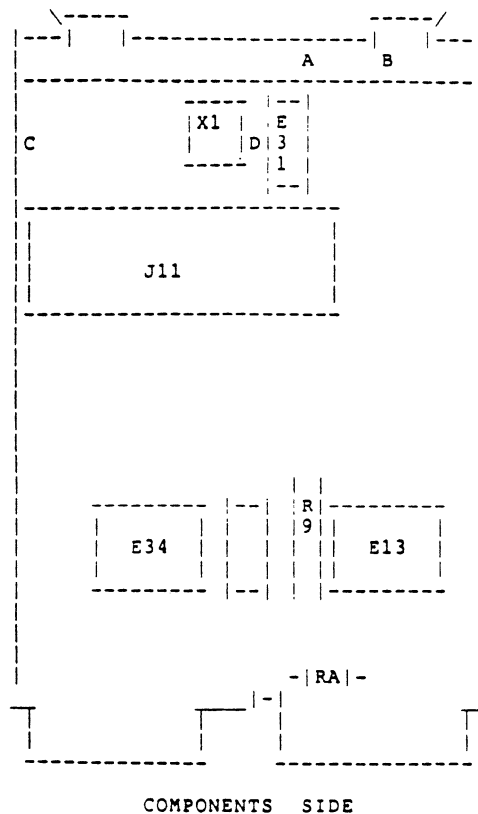
HMS-2

 FCO/ECO CORNER

FPJ11-AA Compatibility with the KDJ11-AB Option

OPTION: KDJ11-AB
 MODULE: M8192-YB

To support the use of the FPJ11-AA floating-point accelerator on your KDJ11-AB CPU board, you should ensure that the following FCO revisions have been made:



RA : Location of a resistor of 680 ohms for both etch, C1 and D1. The colors are blue, gray, and brown.

- A : Module part revision stamp; on side 2 of module. (i. e. B2 , C1)
- B : Module datecode stamp; on side 2 of module. (504 , 625)
- C : Location of the etch revision and part number. (side 2)

C1 : 50-15394-01 REV C1
 D1 : 50-15394-01 REV D1

- D : Location of 1,000 ohms resistor, soldered from pin 4 and 7 of IC, E31.

This resistor is only used, if the etch revision is "C1". the colors are brown, black, red, and gold.

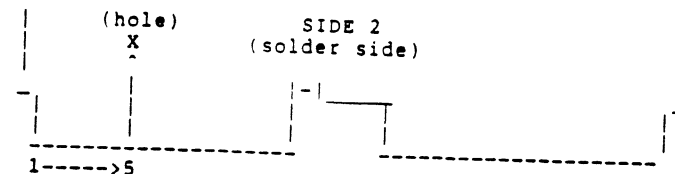
- R9 : Location of resistor R9. The value of R9 changes depending on the etch revision of PC Board.

** C1 : R9= 8,250 ohms (gray, red, green, brown, brown)

D1 : R9= 1,000 ohms (brown, black, red, gold)

HMS-3

M8192 YB-YC Etch Cut

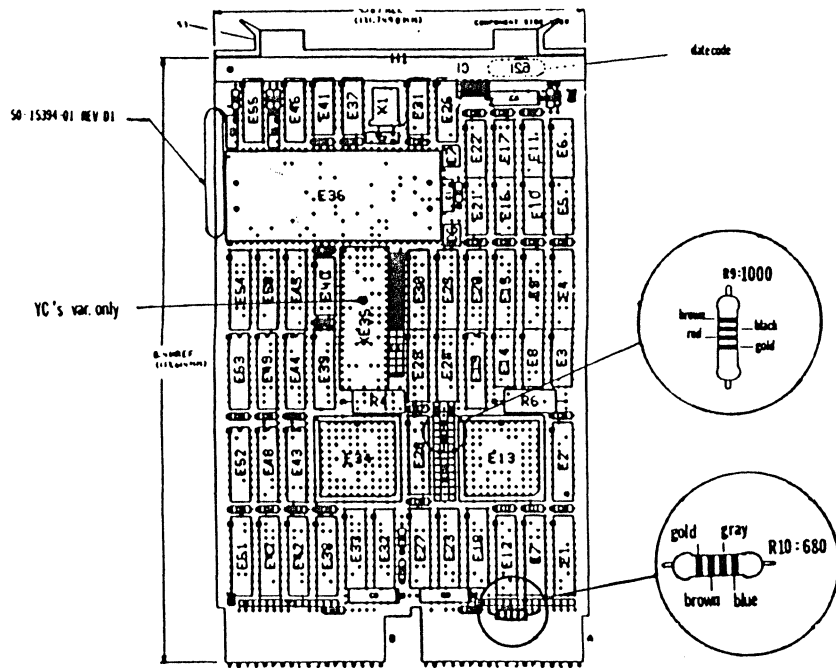


X : the etch cut location is in the second layer.

ECO wires

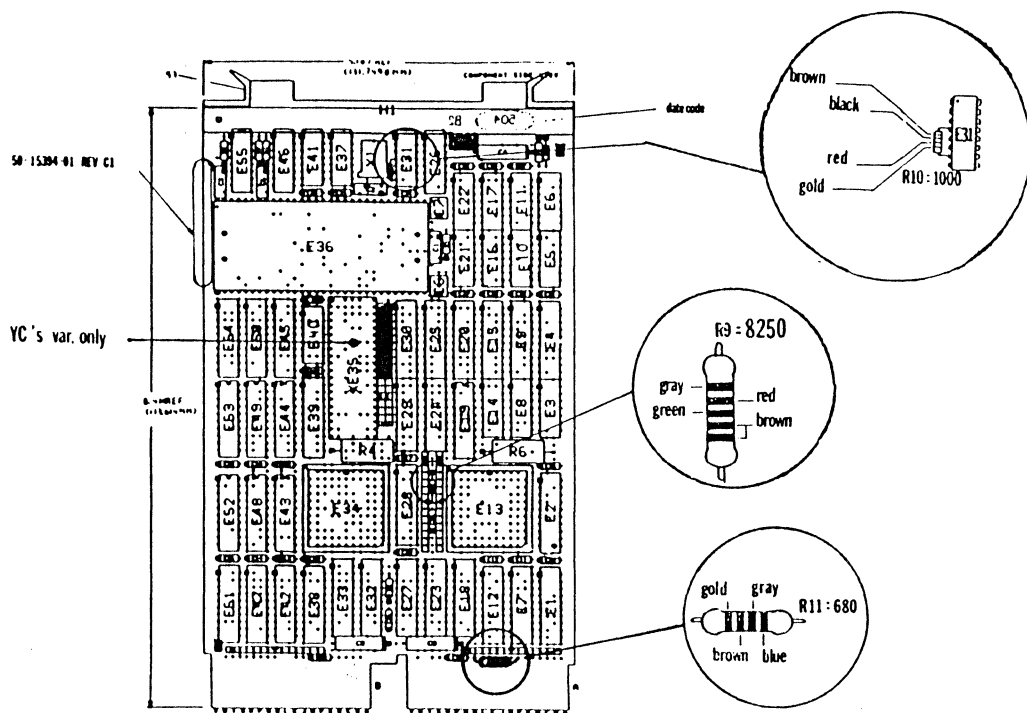
ETCH	WIRE
C1	1) Wire from E22 . 9 to E7 . 13
	2) Wire from E7 . 7 to E7 . 14
	3) Wire from E17 . 9 to E5 . 2
	4) Wire from E16 . 13 to E13 . 41
D1	1) Wire from E22 . 9 to E7 . 13
	2) Wire from E7 . 7 to E7 . 14

HMS-4



M8192 Modules (KDJ11- AB or AC)
with an etch revision D1.

HMS-6



M8192 Modules (KDJ11- AB or AC)
with an etch revision C1.

HMS-5

EDITOR'S NOTE

This article comes to us from Dennis Sullivan of Medisys in Phoenix, Arizona. Dennis comments that the information it contains is "an accumulation of bits and pieces I have picked up from reading and from talking to DEC engineers at DECUS symposia. I know of no other single place to read about and understand bad blocks on MicroPDP-11 systems. I felt compelled to write this article so that other people in my company besides myself could deal with the problem; now that I have written it, I would like to share it with other DEC users."

Dennis adds that there may be other techniques for dealing with bad blocks and RQDX controllers: "Perhaps this article can serve as a catalyst to generate more discussion on the same topic. At the very least, someone out there must know how to use RSTS well enough to deal with this problem."

We think this is what HARD NEWS is all about, and we thank Dennis Sullivan for contributing such a fine compendium of useful information. If you do have other techniques or comments, contact Dennis at (602) 993-4771 and/or send a submission to HARD NEWS (details elsewhere in this issue).

Introduction

Winchester drives develop bad blocks. The RQDX family of controllers is designed to automatically map out these bad blocks in such a way as to cause as little trouble as possible to the user. Sometimes it causes a lot of trouble.

How the Hardware Works

The RQDX family of controllers all try to automatically map out bad blocks. Engineers continually make improvements, so the latest version of the RQDX3 controller does a better job than any of its predecessors. For the purposes of this write-up, the differences between these controllers is not important, only the basic design for bad block replacement.

The winchester contains more blocks than are normally used. Spare blocks at the end of the disk are available to replace bad blocks. A bad block replacement table is maintained on the disk listing all of the bad blocks and their replacement blocks. Before reading or writing a block the controller always checks against this list. If the desired block is listed as bad, then the controller will automatically use its listed replacement block. The RQDX controller automatically uses and updates this table.

Whenever the controller tries to read a block on the disk and experiences an error, it decides that a bad block is developing and the blocks should be replaced. A spare block is selected and the bad block replacement table is updated. The controller automatically tries several times to read the block that it had trouble with. Usually it gets a good read of the data and the user never knows anything happened.

Sometimes the controller is unable to recover the data. It still maps out the bad block. It writes whatever data it could read into the replacement block. Because that data is no longer good, it marks that block as bad. Usually it will mark the block with a parity error. Sometimes it will mark it with a CRC error. Perhaps there are other ways to mark the data as bad.

Regardless, if the replacement block is marked as having bad data, then this causes problems for the software. The software reports that it cannot read the block so the user assumes the block is bad. The truth is that the block is good, but the data is bad. This is a hard concept to understand, that on a Micro-11 the user never has to deal with bad blocks, only with bad data in the block.

Software Perspective

System programmers have always been fighting with bad blocks. The operating systems have developed various schemes for handling bad blocks. RT-11 and RSX operating systems are discussed in more detail. The RT-11 and RSX operating system designers came up with different approaches for handling bad blocks. Now that the function is handled in the hardware, both of these two operating systems are faced with coping with the modern world.

RT-11 Systems

In RT-11, when a bad block is discovered on a RX01 or a RK05, the operator can avoid using that block by creating a file named .BAD in that location. The INITIALIZE command contains an option (/BADBLOCKS) which will automatically cover the bad spots with .BAD files. If a bad block develops in an existing file, then the user must find a good back-up copy of that file, and put it on a different part of the disk after first marking that block with a .BAD file.

A new family of disk handlers came along with the RK06, RK07, RL01, and RL02 disk drives. The software handler for these drives maintains a bad block replacement table on the disks. The software handler automatically automatically reads and writes the replacement blocks. The software handler does not automatically replace the bad blocks though. The user must manually replace any bad blocks found, normally with the INITIALIZE/REPLACE command. If a bad block develops in an existing file, then the user must find a good back-up copy of that file and put it on the disk after replacing the bad block.

Now that we have RQDX controllers, the rules have changed again. The hardware automatically handles the bad block replacement and mapping. The operator now needs to deal, not with bad blocks, but rather with bad data that most programs can't read because the programs are taught to give up if there is an error. If the problem is with an RX50 or RX33 floppy, throw it away. If the problem is with an RD51, RD52, RD53, RD54, RD31, or RD32 then read on.

Using RT-11 to Fix Bad Blocks on Winchesters with RQDX controllers.

The block is fixed by writing to it. Either the same file or another file must be written to that location. After fixing

it, use the DIR/BAD command to verify that the block has been written into.

First, identify the block with bad data as well as the file containing the bad block. Use the DIR/BAD/FILES command.

If the bad block is not in a file, then copy a file to that location. If necessary, just keep copying files until you have written over that block. When you copy a file RT-11 will use the first space big enough to accommodate the file. Use the DIR/FULL/BLOCKS command to identify just what blocks need to be filled up before the bad block is written.

If the file is easily replaced from a back-up set, then by all means do that. COPY/PRE the file to the disk, or reload the entire back-up.

If there is no back-up, and the file must be saved, then someone has to be able to identify what should be in that block. Once it is identified, recover the rest of the file by deleting the file and creating two files, one in the portion before the bad block and the other in the portion after the bad block. Use the CREATE/START:n/ALLOCATE:m command to position these new files. Now the bad block is unused, so copy a file over it as described above. Once you have done this, you can delete the one block file, and the file covering the second portion. Use the CREATE/EXTENSION:n command to extend the first file to the proper size. Finally use SIPP to patch in the data you really want.

RSX Systems

The FILES-11 filing system used by RSX (also known as ODS-1) has the built in capability to take care of bad blocks. This is the way it has always been. RSX maintains a list of all of the bad blocks on the disk and avoids using those blocks. Before a disk is used by RSX, it must be initialized with the ANALYZE/MEDIA command which puts the FILES-11 structure, including the bad block list file, on the disk. When a bad block develops on the disk, it is not necessary to re-initialize the disk. With the oldest disk drives, (RK05s etc.) a new bad block is added to the list with the VFY utility.

When the RK06, RK07, RL01, and RL02 disk drives came along, they fit in fine because the operating system software was still in charge of mapping out the bad blocks. The only difference is that the list of bad blocks is in a different place and the original list will normally never contain any bad blocks. When a bad block develops on the disk, it is still not necessary to re-initialize the disk. With these disk drives, a new bad block is added to the list with that same VFY utility.

Now that DEC has developed MSCP (Mass Storage Communication Protocol) devices (this includes the RQDX controllers with RD disks) the water is muddier. The list of bad blocks is now maintained by the hardware. The software still maintains its own list, but this list should never be used. When a bad block develops on the disk, it is not necessary to re-initialize the disk. It does no good to add the bad block to the bad block list. The VFY utility is handy to identify the bad block, but cannot be used to make the block readable again.

Using RSX to Fix Bad Blocks on Winchester with RQDX controllers.

Remember that the hardware reports the blocks as bad because they contain bad data. The blocks are actually good because the hardware automatically mapped them out. The only way to fix that block is by writing into it. However, the block does not have to be fixed. The problem is that the block cannot be read. This means that the file cannot be backed up. Since RSX backs up only the existing files (ignoring the unused portions of the disk), deleting the file with the bad block is all that is required. The next time that block is used, it will be written into and it will no longer contain bad data.

The problem is to identify the file with the bad block of data. Once the file is identified, it must be deleted and, if it is a required file, a good copy of the file must be put on the disk.

If you are getting read errors on a data file, you already know which file has the bad block. If you are getting an error reported while making a back-up copy of the disk, then all you know is the file I.D. The trick is to translate that file I.D. into a file name. If BRU reports the file ID as 000236000145 read that as file I.D. (236,145,?) where the ? is probably a 0. Only the first two numbers are required to uniquely identify a file and BRU reports them as two six-digit numbers run together. To find out the file name, use the

```
DIR/OUT:CAT.DIR/ATT [*]*.*;*
```

command to create a file CAT.DIR containing the file I.D. for all of the files on the disk. Use the editor to search this file to identify the file name for the known file I.D.

An easier way to translate the file I.D. number to the file name is to use the VFY option /LI. However, most MicroRSX systems do not have the VFY utility program on them.

Once you know the file name, delete it. If the file is necessary, then get a good copy of the file from a back-up set. If the file is part of a data set, then replace the entire data set to maintain a consistent set of data.

If there is no back-up, and the file must be saved, then someone has to be able to identify what should be in that block. Worse yet, someone needs to be able to identify what should be in the whole rest of the file. The original file can be shortened with a

```
SET FILE/END:(BLOCK:n, BYTE:0) fname
```

command. The file can be re-extended by concatenating files with the COPY command.

```
COPY BOOKS.GJC,ZERO.10 BOOKS.GJC
```

is a command that makes a new copy of BOOKS.GJC with the file ZERO.10 appended to it. On my system, ZERO.10 is a ten block file full of null words. Be sure to

```
PURGE BOOKS.GJC
```

to remove the copy with the bad block of data. Finally, use ZAP to patch the file with the data that should be there.

EDITOR'S NOTE

With this article, we continue Scott Taylor's series on disk benchmarking, which commenced in the last issue of *HARD NEWS*, with a tutorial on benchmarking methodology and DMA. Next time, we'll finish up with the specific results of Scott's benchmark tests of controllers from Aviv, Sigma, Webster, Micro Technology Inc. (MTI), Dilog, and Emulex. Stay tuned!

TEST METHODOLOGY

The first hurdle encountered when testing disk controllers is separating the disk controller overhead from the operating system overhead. I tried several different programming methods that reportedly "eliminate" operating system overhead, but none worked reliably or repeatably. That's why I opted for a "hardware" approach which, combined with RT-11 V5.2, offers simple, repeatable control over disk controllers (or any I/O page device).

By adding a Q-Bus signal decoding interface to the timer used for the memory response timing (see *Hardcopy*, January 1987, "Q-Bus Memory Access Times are the Result of Several Factors," and the HMS newsletter in DECUS SIGs Newsletters, March 1987), I was able to measure disk controller performance directly. Using only MSCP protocol information, no device-specific technical information was required for the controllers.

MSCP and RT-11

The RT-11 V5.2 manual set gave a brief (not nearly detailed enough) explanation regarding setting up a DU driver using the SET commands. RT-11 requires a disk larger than 33MB to be partitioned (divided up), with a maximum of 33MB in up to eight partitions (268MB maximum per drive). Some disk controllers also give you the ability to partition a disk "in hardware," but this may further confuse the issue for a user new to MSCP.

If you want help in using the standard DU drives, contact Omnex Inc. in Mountain View, California, (415) 966-8400. The company offers a "giga-handler" DU driver that enables using disks larger than 268MB.

Disk Controller Benchmark
Definitions and Descriptions

Under MSCP, the sequence of events for a controller benchmark is always the same, regardless, of CPU or operating system (including MicroVMS):

1. The CPU polls the controller (says "hey, you!") by reading the IP (initialization and polling) register.
2. The controller reads command information from the DU driver using direct memory access (DMA).
3. The controller transfers data to or from disk to memory.
4. The controller writes command completion information back to the driver using DMA.
5. The controller interrupts the CPU to indicate command completion.

The controller poll can be detected by decoding the controller address (172150 in this case) off the Q-Bus.

You can separate the command and data DMA transfers by watching the Q-Bus address used for the transfer. If the transfer is in the program space, it is data; if not, it is command DMA. I determined program bounds from the .SAV image link map.

An interrupt on the Q-Bus always includes asserting BIRQ4L (interrupt request level 4) independent of interrupt priority. If you watch BIRQ4L and remove or don't use any other interrupting device during tests (in particular, avoid console terminal output), all interrupts will be from the disk controller.

You can measure the total transfer time by having the poll start a timer and letting the interrupt (BIRQ4L) stop it. You can then divide the number of bytes transferred by the total transfer time to determine overall bytes per second (overall transfer rate).

CONTROLLER OVERHEAD

Front and Back End

The front end is the interval between the time when the controller is polled until the time when the first data transfer occurs, not including head seek time or rotational latency. This time is controller dependent.

The back end is the interval between the last data transfer and the time when the controller generates an interrupt. This time is also controller dependent.

In my tests, read results for front- and back-end controller overhead were generally in the range expected. Write results may look a little unusual: The time between the last [DMA] data transfer and BIRQ4L can include some disk rotational latency, which is not a delay caused by the controller.

Seek, Latency and Other Variables

Head seek and rotational latency are the unknowns; they are dependent on the head position resulting from the previous request and the rotational position due to time. The method I used to "eliminate" both of these factors was to perform each operation 300 times, staggering the start time a little for each operation. (Delay = delay + $\sim 3.0E-03$ seconds; when delay was greater than $16.E-03$, or about one revolution of the disk, $16.E-03$ was subtracted.) Differences between maximum and minimum times approached 16.67 milliseconds (one revolution of rotational latency) for repetitions above 100 tries, indicating the technique was valid.

Here are explanations of some of the important (and sometimes confusing) variables relating to seek and latency:

Head seek time: The time taken for the disk drive to move the head from the track it is currently on to the desired track. These times are commonly called "seek times" and may be given as average, track-to-track or maximum. This time is disk drive dependent.

Rotational latency: The time taken for the disk to spin from its current position to a position where the desired data is under the head. This time will be between 0 and 16.67 msec (3600 rpm = 60 rev/sec = 16.67 msec/rev) for most newer drives. The disk drive specs usually give 8.3 msec (one-half revolution) as average rotational latency. This time is also disk drive dependent.

Disk transfer rate: The rate at which the disk passes data to the controller. This rate is determined by the disk clock rate, 10 and 15 MHz respectively for the CDC and Maxtor drives I used in my tests. The actual data rate will be 16.67 msec divided by the number of sectors per track times 512 (512 bytes per sector; sectors = blocks).

The transfer rate for the CDC drive is 1.044 to 1.105 MB/sec (34 to 36 sectors per track, depending on the controller used) and 1.566 MB/sec for the Maxtor drive (51 sectors/track for each of the controllers tested). This figure doesn't include spare sectors, as they don't actually contain data--or rather, the sector they replaced doesn't.

DMA data transfer rate: The rate that the controller passes data to the memory [over the Q-Bus]. First, the number of words read or written are counted while the time that the controller has DMA privileges is measured (BSack is asserted). Then the number of words transferred times two (2 bytes per word) is divided by the "BSack" time. This yields the DMA transfer rate, which is both controller and memory dependent. I performed my tests using a Clearpoint memory in block mode and an Andromeda memory in both block mode and non-block mode (BREF response disabled).

Important: I used the Andromeda memory in non-block mode to simulate the effect of using a high-performance controller with non-block mode memory. I do not recommended disabling block mode on any device without knowing what you are doing!

Dwell time: The time between when a controller gives up the bus and asks for it again. For testing, I used BSack negated to BSack reasserted. Sometimes BSack negated to BDMR (DMA request) is used; DMA protocol specs are unclear as to which is correct. The difference between the two is CPU dependent and was constant for all controllers tested. Dwell time is controller dependent (a small minimum is caused by the CPU DMA grant latency and grant handshaking). Depending on the machine, the CPU itself may execute a single bus cycle (memory fetch or store) between the negation of BSack and assertion of BDMR by the controller even if BSack and BDMR occur simultaneously.

DMA, BLOCK-MODE AND OTHERWISE--WHAT IS IT?

All forms of DMA have one thing in common: in each case the disk controller, the device wishing to become bus master, must ask the CPU, the bus arbitrator, for permission to use the bus--in other words, to become the bus master--before beginning a transfer. The CPU will always grant the request, usually when the current bus cycle is complete. When the DMA transfer is complete, the disk controller releases control of the bus.

Since the CPU cannot service any other requests or respond to another device on the bus, certain limits have been set to prevent any device from "hogging" the bus:

1. A bus master must wait a minimum of 4 μ sec (dwell time) after completing one transfer before beginning another in all DMA modes. BSack negated to BDMR asserted (or BSack reasserted, depending on interpretation).
2. A maximum of 16 words (8 if another device wants the bus) in block mode and 4 words in burst mode may be transferred per DMA request.

The first limit is an attempt to give other devices a chance to have their DMA requests granted and to allow the CPU enough time to service interrupts. If an interrupt from a serial port is not serviced before the next character arrives, the data [in the serial port UART] gets written over or lost. One indication of this is when input from a keyboard is ignored during a disk transfer. (Note: "Ignored" means never acted on, "delayed" means not fast enough to suit the operator.) Data-late errors can indicate that other DMA devices (especially tape controllers) are not getting fast enough access to the bus.

The second limit is an extension of the first. If two devices want the bus, both must settle for less time more often. This helps to avoid the problem of data-late errors.

In block-mode DMA, the disk controller gives the memory one address and then transfers up to 16 words (maximum) of data--8 words maximum if a DMA request is outstanding from another device. When the transfer is done, the controller releases the bus until ready to begin the next transfer.

In single-word DMA, the disk controller gives the memory one address and one word of data. The controller then gives back the bus and asks again when it is ready for the next transfer.

In burst-mode DMA, the disk controller gives the memory one address and one word of data. This can be repeated for a total of 4 words. The controller must then give back the bus and ask again when it is ready for the next transfer.

Actually, the phrase that needs to be added to each of these explanations to make the rules clearer is "until it is ready for the next transfer or 4 μ sec, whichever is longer".

Using block-mode DMA (at approximately 3MB/sec, a controller will require the bus for 10 μ sec. It must then stay off for 4 μ sec. If another device requests the bus, it can use that 4 μ sec left by the first device plus 6 μ sec more. This means that two devices can use up 100 percent of the bus time (until one is finished) without violating any spec limits.

Sixteen words take 8 μ sec (or longer) to transfer, plus address cycle time. Add to that time 1 or 2 μ sec of CPU DMA grant latency. The result is about 10 μ sec for 16 words (32 bytes). In the case of the a single transfer, the total time would be 5 msec. For double-buffered I/O using two 16,384-byte buffers, the bus could be tied up for at least 10 msec, best case! Granted, this situation is rare and requires very fast disk drives, caching controllers or RAM disks, but it does occur and is not easy to diagnose.

When two controllers want the bus, each will use it for 6 μ sec--long enough to transfer 8 words at 3MB/sec plus DMA grant time. Since the second controller will use the bus for 6 μ sec, the first controller can request the bus before the second controller completes its transfer. As DMA requests take priority over CPU operations--including interrupt servicing--the CPU will grant the requests immediately and the controllers will use 100 percent of the bus time.

Strangely, the DMA specs limit the number of words transferred, not the amount of time taken to do it. Bus timeout specs do limit any single transfer (at least the DIN to REPLY portion of it) to a maximum of 10 μ sec. This means that a controller could take 160 μ sec or longer to transfer 16 words and still within remain in bus spec.

A better approach would have been to set a maximum limit on the time used during a transfer rather than a limit on the number of words--for example, 20 μ sec maximum per DMA transfer and a

minimum of 6 μ sec "dwell" between transfers. (In this case, "dwell" means that no DMA device can request the bus.)

The device just completing a transfer must wait an additional 2 μ sec to allow lower-priority devices time to make a DMA request. This would let most devices keep up with their disk or tape without blocking the CPU from servicing interrupts. Faster controllers would be able to transfer more than 16 words per DMA arbitration, providing an extra incentive to make better use of DMA time. Note: The MicroPDP-11/73 and 11/83 cache invalidation counters require an address cycle, not DMA re-arbitration, whenever a 16-word boundary is crossed.

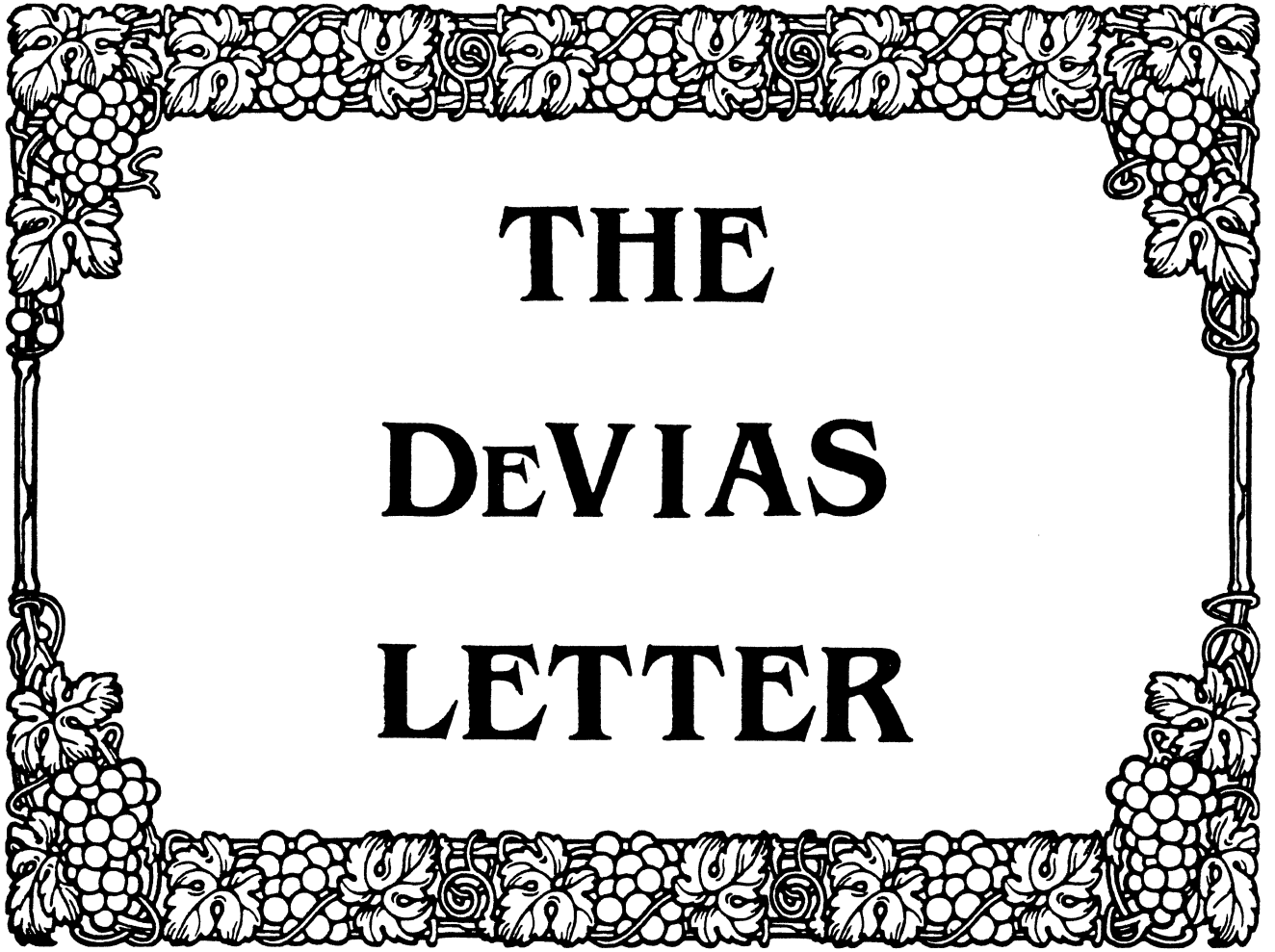
Some manufacturers include the word "adaptive" along with block-mode DMA. This usually means that the controller transfers up to 16 words while watching to see if another device wants the bus, implying that "nonadaptive" devices either do not transfer 16 words or do not watch to see if other devices want the bus. As far as I could tell, this term didn't originate in any DEC literature. block-mode DMA specs require devices to give up the bus after 8 words if another device wants the bus, period. Devices that do not monitor for other devices must stop at 8.

References

DEC Supermicrosystems Handbook, 1986

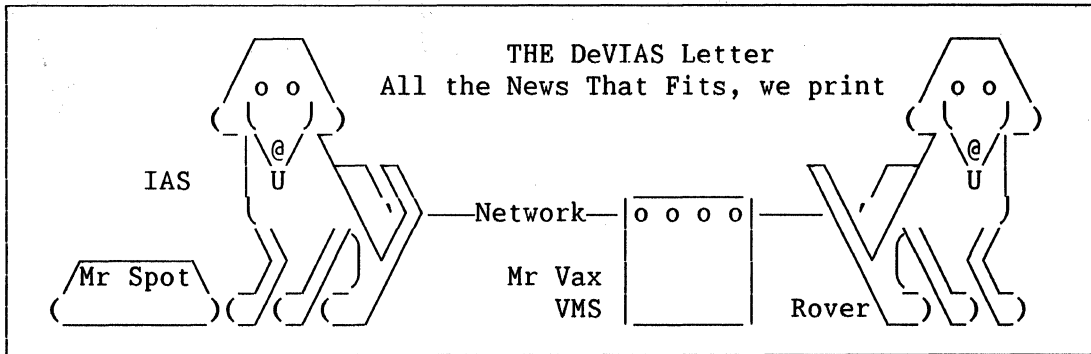
OEM Micronote 002, "Block Mode DMA," June 1, 1983, Scott Tincher and Mike Collins

OEM Micronote 012, "DMA On the Q-Bus," Sept. 6, 1984, Jack Toto



THE DEVIAS LETTER

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FROM THE
EDITOR'S KEYBOARD

Your editor must admit to a crushing blow. He has been scooped by a rival editor, Bruce Mitchell of the Multitasker. Bruce was first to the presses with earth-shaking news concerning a joint development project between Alan Frisbie, fearless leader of the intrepid IAS forces and Sharon Johnson of the VMS SIG, (nee RSX.) When I read a preview of his article for the April M/T, I immediately realized that I had been beaten to the keyboard. Please check the Multi-Tasker for full details on this important project. (Now I understand his DCS mail remark about the phone not ringing in his bedroom.)

This issue contains an article by Steve LeFevre on running IAS on 11/84's to take advantage of all available memory. Had hardware and software deadlines not intervened, it would have been in last month's issue. Thanks Steve.

Remember the problems we had with the LN03 overheating last month? Turns out we had a problem with a bad ozone filter blocking the exhaust fan. Soon as Danny removed the filter, the LN03 went back to normal. Since it makes little sense to filter out ozone there and then generate it

with an anti-static device on the line printer right next to the LN03, we are running with the filter temporarily out.

And finally, in our program of the month department, Peter Desselt of AECL Medical and Hans Goebel of Michael Reese Medical Center have pooled their efforts to provide a "Universal Debugging Flowchart" we hope it meets with your approval.

CONTRIBUTION
GUIDELINES

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

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

Contributions may be submitted on 9-track Mag-tape, (800,1600, 3200 or 6250 BPI,) DEC-tape 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.

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 information, etc. Any media sent to us will be promptly returned.

If you have a problem you would like to submit to the Devias wizzard, 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 letter to the Editor requested help in booting an 11/40 from RK06 drives. The user could boot their RK05 drives, but their BM873-YA bootstrap would not boot their newer RK06 drives. That user didn't know beans about their hardware. The M873-XX series was a very early diode rom bootstrap, containing a massive 128 words per quad card, and it never was upgraded to boot the RK06/RK07 drives. That user must have gone on to bigger and better things with the Shuttle software, since they worked for NASA at the Kennedy Space Center.

A report on a working group session on SPR problems at the Fall DECUS mentioned concerns with SPR reporting that seem to be with us even today. Some of the items mentioned were (1) A machine readable SPR form, (2) Publish all Patches, (3) How do I get SPR forms when I run out?, and (4) I'm not getting my copy of the Software Dispatch.

And finally, one rather naive SPR complained that macro listings went to LPO: rather than CL: as the user expected. (Evidently the user never understood the effect of redirecting luns of programs like MACRO.)

4 MBYTE MEMORY
ON PDP-11/84'S

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PDP-11/84, 11/70 and 11/44 can support 4 Mbytes of memory with certain restrictions. This article will outline the restrictions on 11/84 and 11/70 computers. Details of PDP-11/44 memory management will not be covered. The Oct. 1987 Multi-Tasker (contained in the Dec. 1987 SIGS newsletters) contains a very good article on 11/34 and 11/44 memory by Barry Essig and Michael M. Tsuji of Grumman.

The PDP-11/84 and 11/70 processors both use twenty-two address lines to access memory. Twenty-two address lines provide an address space of 4 Mbytes. While 4 Mbytes can be addressed, not all of the address space can be used for memory. Some of the address space is reserved for I/O devices and the UNIBUS.

The highest order 8 Kbytes of the address space is reserved for the UNIBUS I/O page. The I/O page is reserved for CPU and I/O registers. The I/O page is where the Command and Status registers (CSR) of peripheral device controllers are located in the memory space. References to addresses 17760000 to 17777777 will access the I/O page.

PDP-11/70s have a further restriction on the amount of memory usable. The hardware memory management of PDP-11/70 limits main memory to 3840 Kbytes (1920 Kwords.) The additional 248 Kbytes are reserved for the UNIBUS map for DMA transfers between main memory and UNIBUS devices. Memory could be placed in the UNIBUS map address space, but at the cost of losing the use of UMR registers in the UNIBUS map which are used for DMA mapping between UNIBUS devices and memory.

PDP-11/84 memory does not have the restriction on the use of the 248 Kbytes UNIBUS Map space that the PDP-11/70 memory has. Only the 8 Kbytes I/O page address space is restricted from use by memory on the 11/84.

The PDP-11/84 can still use the UNIBUS map to perform DMA, but it does so without giving up main memory address space. The PDP-11/84 then can use slightly more memory than a PDP-11/70. Figure 1 on the last page compares the address space of the PDP-11/70 and the 11/84.

NOTE: The "PDP-11 UNIBUS Processor Handbook" incorrectly specifies the maximum physical memory of the PDP-11/84 as being 3840 Kbytes (Appendix A.) The "PDP-11/84 Technical manual" and the "KDJ11-B CPU Module User's Guide" give the correct information on addressability of PMI memory.

A source of confusion about the amount of memory available for a PDP-11/84 running IAS is due to the different methods used by IAS and the PDP-11/84 hardware to display the amount of available memory. A PDP-11/84 with a full 4.0 Mbytes will display the message.

Memory Size is 4088 K bytes.

After a reset or on power up. Notice that the PDP-11/84 has already

subtracted the 8 kbyte I/O page from the 4.0 Mbytes, (4 mbytes = 4096 Kbytes,) of installed memory. When IAS is booted on the PDP-11/84 with 4.0 Mbytes of memory, the following message is displayed.

2043K (word) IAS version 3.2B

The IAS boot message uses word size measurements, while the PDP-11/84 hardware uses byte size measurements. Notice also that IAS has also subtracted the 8 Kbyte I/O Page. Additionally IAS has rounded down the memory size to the nearest Kbyte. The display message only shows to the Kbyte, not to the exact byte count. Since IAS begins its count at 0 rather than 1, the memory size is rounded down by 1024-1. The memory is this last unreported Kbyte is still accessible by the IAS software.

Why put a full 4 Mbytes of memory in a system if it is not all usable? Because memory comes only in 1 Mbyte increments for the 11/84. The loss of the user of 8 Kbytes on a PDP-11/84 or even 256 kbytes on a PDP-11/70 is small compared to the total capacity of a 1 Mbyte or 2 Mbyte memory board.

The only problem identified with a 4.0 Mbyte PDP-11/84 is with the IAS [11,17]QASGN.COMD command file. This command file will abort at line 111 or 126 when the question if memory size is asked. The maximum range specified is 1920K words but the default is set to the <MEMSIZ> of the indirect command file processor. The command file bombs with a BAD RANGE OR DEFAULT SPECIFICATION error. The simple fix is to edit [11,17]QASGN.COMD and change the max range to 2043 at lines 111 and 126.

Nothing else needs to be done to configure a system with 4 Mbytes of memory. The hardware automatically disables memory in the unusable memory space and the IAS operating

system automatically sizes available memory each time it is booted.

PDP-11/84 Physical Address Space		PDP-11/70 Physical Address Space	
4.0 Mbytes	+-----+ I/O Page 8 Kbytes +-----+	17777777	+-----+ I/O Page 8 Kbytes +-----+
	+-----+	17760000	+-----+
	Available Memory +-----+		UNIBUS Map Address space +-----+
3.75 Mbytes	+-----+	17000000	+-----+
/	/	/	/
/	/	/	Available Memory +-----+
	4088 Kbytes +-----+		3840 Kbytes +-----+
0.0 Mbytes	+-----+	00000000	+-----+

THE PROGRAM OF
THE MONTH CLUB

Peter Desselt
Hans Goebel

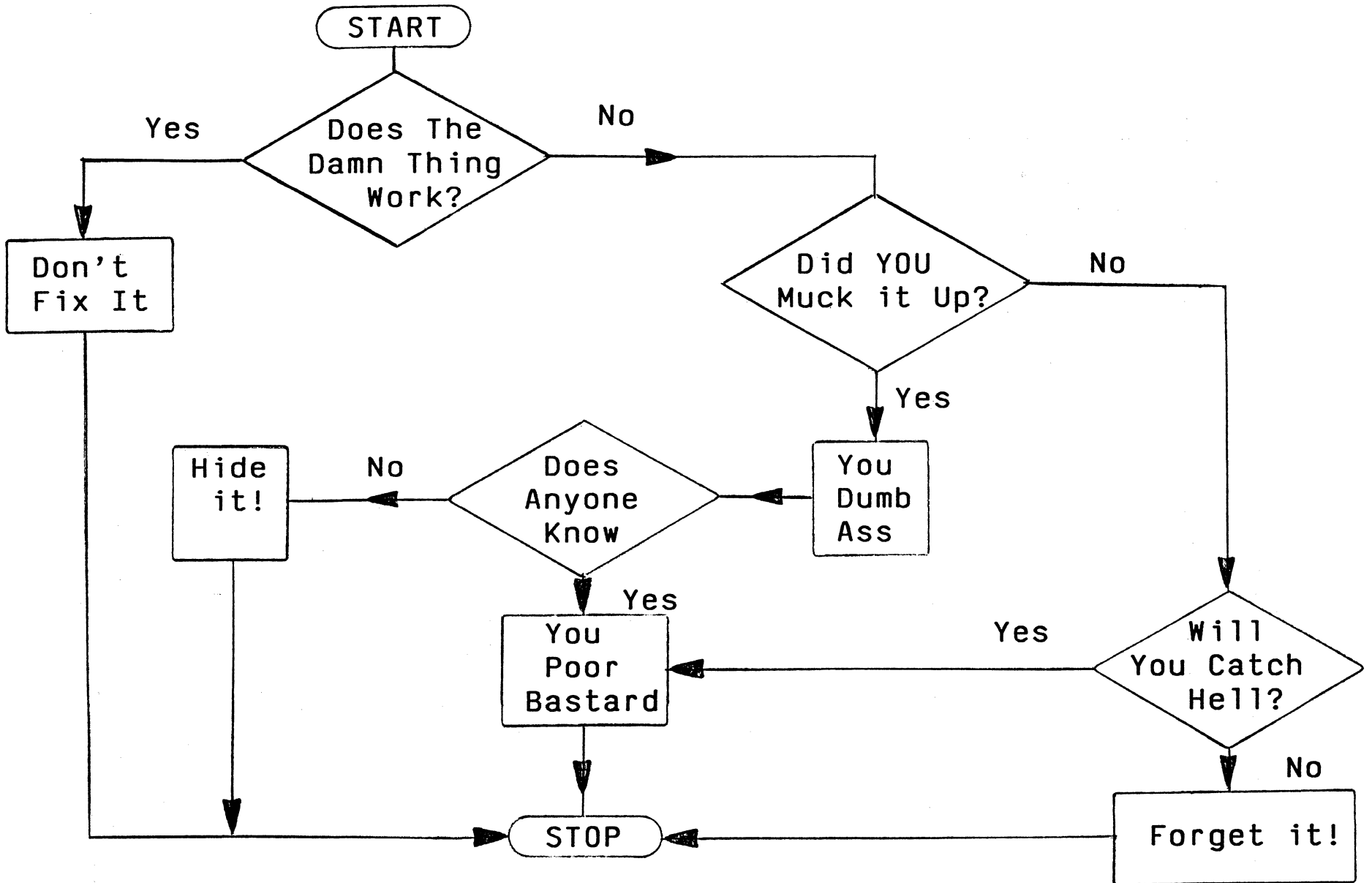
Often when trouble-shooting a recalcitrant piece of code, even seasoned veterans will fail to find all the bugs, or take too much time to fix a problem, (at least that's what my boss says!) This is often due to not following a sound, logical trouble-shooting procedure.

The following flow chart, if used properly, will enable even rank beginners to completely debug fiendishly diabolical problems with speed and ease. It can be applied to all levels of code, from machine language up to n-th generation languages, with equal facility.

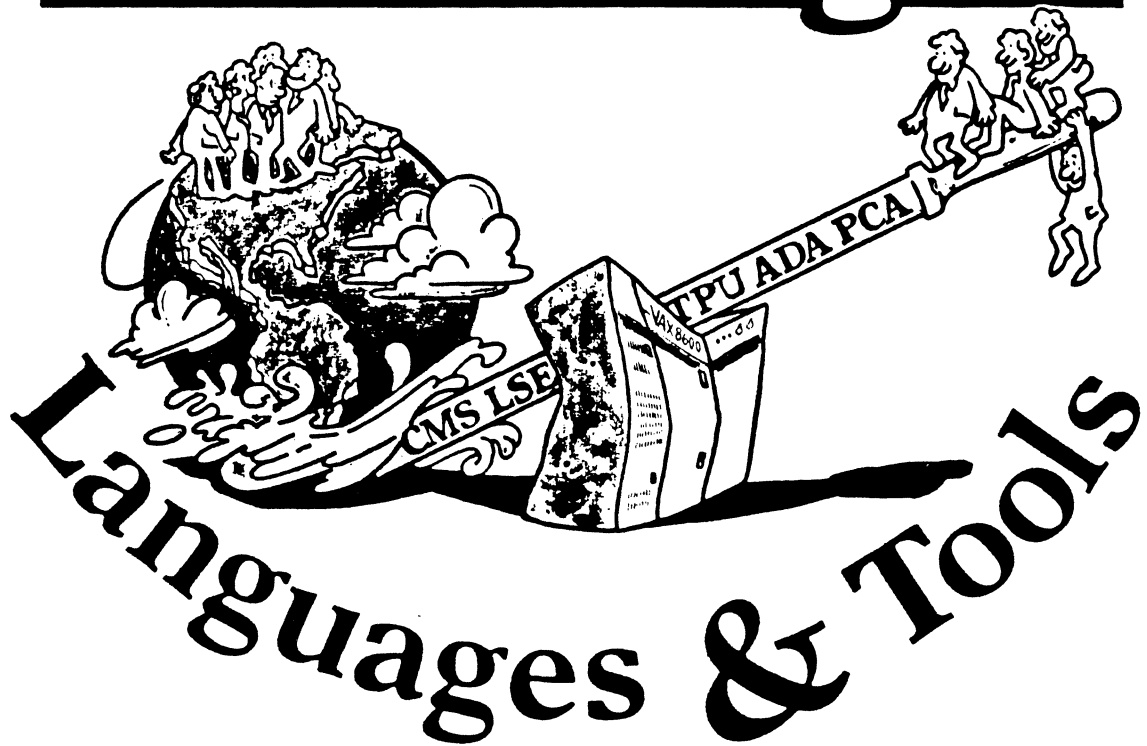
Remember, the flow-chart must be followed rigorously, or its true advantage will not be felt.

UNIVERSAL TROUBLESHOOTING FLOWCHART

IAS-5



Leverage



EDITOR'S NOTES

Things are definitely gearing up for the Spring Symposium. This issue of *Leverage* should reach you just prior to the symposium, and there are some items of interest for that symposium included.

The continuing saga of the Fortran 8X standard continues. DEC's responses to the standard are presented here by Joel Clinkenbeard and Denise Lagassé. I'm sure the issue of the Fortran standard will be discussed in Cincinnati.

The results of a survey taken at the fall symposium by CSSE are presented by Pamela Blotcky of Digital. Many surveys have been taken at the symposia, but this group consistently feeds the results back to us. Thank you.

Notes from the last L & T Woods meeting give you an idea of the functioning of the SIG, and the directions we are pursuing. If you are interested in contributing to the SIG, or have concerns regarding where we are going, this should give you a good idea of what we are about.

Next is the ever popular Release Status information for the various VAX Languages and Tools.

Finally, the wishlist questionnaire for the L & T SIG is included. We would like to make the wishlist procedure a major part of the functioning of the SIG, but it will work only if you contribute. Please fill in the questionnaire, and return it to the indicated address.

On a final note, I'm still looking for submissions for forthcoming newsletters. If you would like to submit electronically, I can give instructions for logging into my system and using Kermit. If you submit hardcopy and go to all the trouble of formatting the material nicely, please, PLEASE make sure you print in a large (12pt or so) type. By the time the newsletter is reduced for printing, normal 10 pt type is nearly unreadable. In any event, please consider submitting *something*, in whatever format.

Al Folsom
Leverage Editor

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Trip Report for ANSI Pascal Standards Committee Meeting March 1988, Monterey, California

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1 Introduction

During the week of 7-11 March, I attended the first-quarter meeting of the Joint Pascal Committee, which was held in Monterey, California.

The Joint Pascal Committee, hereafter referred to as the JPC, is jointly sponsored by ANSI and the IEEE. JPC works closely with its ISO counterpart, ISO/IEC JTC1/SC22/WG2.

In October of 1986, JPC produced a draft for the new Extended Pascal standard. The draft contains some interesting extensions that would make standard Pascal a viable language.

The comment period for the draft ended May 1st of 1987. At this meeting, JPC finished evaluating the over 700 distinct comments from 35 different sources received during the public comment stage.

2 Issues

There were not as many substantive issues discussed at this meeting compared to previous meetings, because most of the issues had been resolved except for details. Much of the meeting consisted of proofreading the new draft and reconciliation of all of the changes that have been made.

I was somewhat thrilled that text I had personally written made it into the draft document itself. (Of course, it was only the foreword, which officially isn't part of the Standard, but hey, it's the only place in the document where regular English appears anyway—the rest is in Standardese.

Some of the proposals were rejected for the current draft, but were passed on to the Extensions Task Group (ETG) for possible inclusion in a future version of an unnamed standard.

Many of us were determined to finish up at this meeting to keep from delaying the standard any more than it has been delayed already, so I

voted against anything that couldn't be implemented during the meeting, no matter how much I would have liked to have it. A standard that doesn't have everything that you would like is better than no standard at all, which is the probable result if the process keeps dragging on.

The following issues were discussed:

2.1 Short Circuit Evaluation of Boolean Expressions

The short-circuiting issue raised its head again, at least temporarily. This had finally been resolved at the December Miami meeting, with refinement at the WG2 meeting in February (short-circuiting was simplified by giving **and.then** and **or.else** the same precedence as the regular **and** and **or**), but one of the comments resurrected once again the idea of implementing short-circuiting by subverting the **and** and **or** operators. I was expecting another fierce battle and was ready to jump in with both feet, but the committee rejected the proposal immediately, not wanting to turn that rock over again.

2.2 Spam, Spam, Spam

Much time at the meeting was consumed with debate on the topic designated (for reasons too complex to go into here, although Monty Python and Vikings were involved) as the "spam" issue. The heart of the problem was that the operation of the textual I/O procedures (*read*, *readln*, etc.) as specified in the draft was ambiguous under certain conditions, causing the possibility of different results from different implementations. After wrangling with this offline several times during the week, the Spam Task Group finally hit upon the right wording to lock down the definition.

A similar problem with the end-of-line processing was resolved.

2.3 Comparison Data Type

It was proposed that a new predefined type *comparison* be added to Extended Pascal, defined as the enumerated type consisting of *greater*, *equal*, *less*, *connected*, *unrelated*, *sub*, and *super*, and that a new operator to compare two operands and return a result of type *comparison* should also be

added. This value could then be used in a **case** statement.

This proposal was far too complicated to be considered at this late date, but was passed to the ETG for future consideration.

2.4 Storage Allocation Control

A proposal for direct control of the storage allocation of variables was evaluated. Many times a system programmer needs to access an object external to the Pascal run-time environment, such as an operating system data structure. It would be convenient to access this object with regular Pascal record notation, but the physical layout of records is implementation-dependent and cannot necessarily be mapped to match the external object. A means for forcing size and alignment (bit, byte, word, etc.) of fields would solve this problem.

The proposal was rejected for the current draft due to time constraints, but was passed to ETG for future consideration.

2.5 Time Granularity

There was a proposal that finer granularity be added to the time facilities of Extended Pascal, since the current version of the draft only goes down to the second. While higher resolution is very desirable, it is very complicated to add this feature in a portable way, given the wide range of hardware and clock resolutions.

The proposal was rejected for the current draft, but was passed to ETG.

2.6 Pointer Comparison

The only comparisons which can be performed on pointers are equality and inequality, since no other comparisons make sense with pointers. One of the proposals suggested '<' and '>' be allowed also. This would allow you to use

(p < q)

as a shorthand for

(p = nil) and (q <> nil)

While this saves a few keystrokes, it is obscure to the point of incomprehensibility. Furthermore, although this wasn't brought up in the meeting, it assumes that the underlying value of *nil* is zero, or at least less than a valid pointer, which is not a requirement of the standard. The value of *nil* can be any value the implementation wishes to use, as long as it can be differentiated from a valid pointer. The committee soundly rejected this concept.

2.7 Record and Array Comparison

There was a proposal to allow comparison of complete structures such as arrays and records. On the surface, this seems like a simple thing to do if all you are talking about is equal or not equal (other operations like less than or greater than are meaningless for records and arrays—one field in a record could be greater than its counterpart in the other record while a different field could be less than its counterpart), but the compiler implementors present said that even equality is not as straightforward as it appears to be because of slop bits, variants in records (especially untagged variants), and other gotchas. The slop bits, which are a result of alignment to byte and word boundaries, are not really part of the record, but are physically present within it. A block comparison of two records (such as with the VAX `cmpc3` instruction), would compare the slop bits of the records as well, which are undefined and probably contain garbage. Initializing the slop bits could eliminate this problem, but not without cost. Static records could possibly be initialized at compile-time, although many (if not most) compilers don't initialize static variables to zero or other known states like the VAX does. Heap and stack records can be initialized only with run-time overhead.

Since block compare appeared infeasible, the suggestion was made that the compiler generate inline code to compare the individual fields of the record separately. While a lot of code would have to be generated to do this, the user would have to generate an equivalent amount manually, and hopefully the compiler code would be more efficient. The variants are the problem here. Unless the compiler does full variant checking, there is no way for it to determine which fields are currently active and should be included in the comparison. With untagged variants, it is impossible, since

knowledge of the active variant is present only in the mind of the programmer.

Even with all of this, I might have voted for record and array comparison, possibly accepting the restriction that untagged variants could not be used, but it was too significant a change to be incorporated by the end of the meeting.

2.8 Relvalue

The *relvalue* procedure, which is used as a general type escape for ordinal types, was eliminated and was replaced with a two-parameter generalization of the *succ* (successor) procedure.

2.9 Bindability

The bindability issue returned again. This time the debate centered on details about bindability, such as: if you have a bound record containing a field which is itself bound, and you unbind the record, what is the state of the field?

Some topics were easy to resolve, such as

- it is an error if the *bind* or *unbind* procedures are used on a variable that has not been designated as bindable
- it is OK to *unbind* a variable that is not currently bound
- it is *not* OK if an already-bound variable is bound a second time without first being unbound from the first thing. While the implementation could do an automatic unbind, this is a hidden operation masking a probable error

2.10 File Variables With Variants

The ability to have file variables within the variant part of a record had been removed at a previous meeting. It was decided at this meeting that the capability must be restored, since it is currently permitted in "classic" (unextended) Pascal, and the committee is obligated to remain compatible whenever possible.

2.11 Rampant GOTO

One of the more bizarre proposals received by the committee was to completely relax any restrictions on `goto` targets—including jumping into the middle of loops and other blocks and I suppose into the middle of procedures. Apparently the idea was to allow a programmer to bypass all of Pascal's control structures and do all branches manually with `goto` statements, making it possible to write BASIC "spaghetti code" in Pascal.

Needless to say, this comment was vehemently rejected.

3 Standards on Floppy Disk

X3 has indicated that in the near future, standards documents may be available in machine readable form, such as floppy disk, as well as paper. This would make it much easier for manufacturers to incorporate parts of the standard into their manuals. Unless the disks are a lot cheaper than the printed documents (unlikely), it is unclear if there is any advantage in getting the standard on disk for someone who only wants to read the document.

4 Next Meeting

The next meeting of the Joint Pascal Committee will be held in Alexandria, Minnesota, June 13-17.

5 New Draft

Since technical changes have been made, a new draft will be published and the review cycle will begin again. Once the draft is available, I will make sure that an announcement is made in a DECUS publication so that people can get copies of it. The draft will be too big (100+ pages) to be printed by DECUS in its entirety, but possibly the foreword (including the immortal prose written by yours truly that was mentioned above) can be printed.

I will be working with the committee member responsible for publicity and he will supply me with a machine-readable press release and foreword

when they become available.

The draft will be available from Global Engineering, same as the FORTRAN 8X draft, for a similar price. I believe the document number will be ANSI/IEEE770X3.160-198X, although this should be verified before ordering.

While anyone who wishes to make a public comment on the draft may do so, serious comments are preferred since the committee is *required* to respond to every comment and the comments and responses are distributed worldwide. The comments can either be sent directly to the X3 Secretariat or to me to be forwarded to X3 with a cover letter. The comment period will probably be in the August-September timeframe, and will only be two months long this time. If you relay your comment through me, be sure to send it well before the close of the comment period.

When a public comment is submitted, there are a few things the submitter can do to make life easier for the committee. The printing should be as legible as possible, since the comment will be reproduced many, many times, often with reduction. The various issues should be cleanly separated with paragraphs, bullets, etc., because the committee evaluates them independently. Because we have to wade through a *lot* of text, headings and/or numbering would be very helpful, such as:

1. *Bindability*. I feel that the concept of bindability is a load of ...
2. *Private Types*. This is nice feature, but I would suggest ...

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EXECUTIVE SUMMARY

Digital strongly opposes the adoption of the language described in S8.104, hereafter referred to as Fortran 8x, as a new FORTRAN standard. We have voiced our objections on many occasions, both inside and outside the X3J3 FORTRAN standards committee. We believe that X3J3 has undertaken much too ambitious a program in attempting both to modernize and significantly enhance FORTRAN. As a result Fortran 8x lacks focus, is difficult to learn and teach, is difficult to implement, and is difficult to use. The economic impact on the FORTRAN user base is severely negative.

Digital agrees that there is a need for a new standard. Advances in Software engineering and computer technology have outstripped FORTRAN 77 in many areas. We do not argue against the appropriateness of any one of the major areas of enhancement in Fortran 8x for consideration by X3J3. We do argue that the committee has gone too far in generalizing almost every single feature and in introducing so many new features in a single revision of the FORTRAN standard. We have specific objections to many of the features, but our primary objection is at a much higher level. We object to the fact that Fortran 8x is a new language, or more precisely, a new language unevenly glued on to an existing language. It is pointless to debate the merits of individual features when we believe that the whole approach—evolution by replacement—is so fundamentally unsound.

Because Digital does believe that a revision to FORTRAN 77 is necessary, but that Fortran 8x is seriously off track, we support some variation on two proposals made during discussions of Fortran 8x. The first is the proposal by Dick Weaver, the X3J3 representative from IBM, that FORTRAN standardization be separated into two charters, one to develop a more modest revision to FORTRAN 77 and another to continue the more ambitious job of modernizing FORTRAN represented by Fortran 8x. The second is the proposal by Thomas M. Lahey ("The Fortran 8x Standard", FORTRAN FORUM, Volume 6, Number 3, December 1987) that the FORTRAN standardization committee(s) should have a publicly reviewed charter that clearly spells out the ground rules for standardization. We believe that the negative economic impact of Fortran 8x is such that, if the above proposals are not adopted, it is imperative at least that Fortran 8x not supersede FORTRAN 77, but exist as an alternative language standard.

1 GENERAL OVERVIEW

Digital affirms that a revised FORTRAN standard is long overdue, and we recognize the intention of the ANSI FORTRAN Standards Committee (X3J3) to standardize many worthwhile new language capabilities. We believe that the Fortran 8x language, as described in X3J3/S8.104, is a consistently defined language that would be implementable, at least in theory. However, we believe adoption of the S8.104 draft would necessitate radical and untested changes from existing practice in the use and implementation of the FORTRAN language. Further, we feel that such a departure from common practice is non-conformant with the charter of the X3J3 ANSI Standards Committee.

Digital believes that approval of the proposed draft of S8.104 as a national standard for the FORTRAN language would not be in the best interest of FORTRAN users. We do not believe that the language defined in S8.104 will enjoy widespread acceptance in the FORTRAN user community. We believe that vendors will be slow to implement the full language, both because of the complexity of the language and because of the questionable market. We believe that early implementations are likely to be slow and prone to bugs as vendors learn to deal with concepts completely new to FORTRAN, and we expect a long transition period when large numbers of interpretations are necessary as vendors discover unexpected interactions among features.

The result will be reduced portability of programs because of subset implementations and conflicting interpretations of the standard.

Digital recognizes that years of hard work have gone into producing the current draft, and that it would be difficult to shelve work that any particular individual has invested a lot of effort in. Nevertheless we urge X3J3 to withdraw the current proposal and consider a more evolutionary approach to modernizing FORTRAN 77. X3J3 should concentrate on standardizing existing practice and perhaps introducing a single major area of extension, such as array processing or language extensibility. This would permit a much better understanding of language interaction, compatibility, and implementability, as well as faster adoption and implementation. If work on Fortran 8x continues, it belongs with a new technical committee whose charter is more in line with the ambitious goals of Fortran 8x.

2 COST VS. BENEFIT

The FORTRAN language has enjoyed considerable success despite the fact that it is more than 30 years old and that computer science and computer technology have evolved enormously during that time. The primary reasons for its success have been portability, performance, existing software, familiarity, and ease of use. None of these success factors is particularly inherent to FORTRAN, nor are they independent; rather they have developed over time. The fact is that there is a huge investment in FORTRAN software, in training for FORTRAN users, and in technology for implementing FORTRAN development systems. Fortran 8x puts this investment in jeopardy.

Fortran 8x attempts to improve FORTRAN in some areas where it has been successful, namely portability and ease of use. In addition it attempts to modernize the language to address software engineering areas where FORTRAN 77 is weak, such as reliability and maintainability of complex software systems. We claim that these attempts to improve and modernize FORTRAN fall considerably short of their goals, and that their costs do not justify their benefits.

The following sections describe the costs and benefits in more detail.

2.1 Fortran 8x jeopardizes investment in user training

Fortran 8x is a larger language than FORTRAN 77 and has a very different flavor. There has been much debate about how much larger Fortran 8x is and about how complex it actually is, based on statement counts, keyword counts, grammar rule counts, etc. Such quantitative arguments miss the point that Fortran 8x is qualitatively much different from FORTRAN 77. Using the new language requires new methods of software engineering (e.g., MODULES/USE, user defined data types and operators), new ways of expressing algorithms (e.g., array extensions, numerical precision specification), and new language syntax (e.g., control constructs, attribute declarations). Differences permeate all aspects of the language; for example, array extensions and user defined types each require extensions to the semantics of assignment statements, I/O statements, and existing declaration statements, even though these are not themselves new language statements.

Users will need to invest large amounts of time and money in retraining FORTRAN programmers and revamping FORTRAN curricula. Effective use of Fortran 8x requires new methodological training, not just updating users on new syntax. The emphasis is on replacing existing practice with something better, not in building on the existing foundation.

FORTTRAN users face an additional problem in that they have to learn both the old "inferior" way of doing things and the newer way. This is because of the large body of existing code that must be maintained. It is impractical to assume that all this code could be converted to the Fortran 8x preferred style, but it is equally impractical to think that programmers would constrain themselves to FORTRAN 77 once Fortran 8x is available. The result is that improved language features are going to be mixed with the features that they are designed to replace for a long time to come. Maintainers of FORTRAN code will have to know all the features and how they interact.

2.2 Fortran 8x endangers investment in existing software

Fortran 8x endangers investment in existing software in three aspects: compatibility, performance, and reliability.

S8.104 states that no FORTRAN 77 language features are being removed from Fortran 8x and that standard conforming FORTRAN 77 programs continue to be standard conforming Fortran 8x programs. Even if these statements turn out to be true—and we believe that there will be many problematical areas once full-scale implementations get underway—they only address part of the compatibility problem. They make it possible for a user to continue to use an old FORTRAN 77 development

system for programs that use only the FORTRAN 77 subset. The way FORTRAN is used in practice reveals more serious compatibility issues.

First of all, there is the problem of how well the incremental features work with the core and decremental features. The X3J3 language design strategy focuses first on specifying a new capability, then on worrying about how it fits onto the existing language. Many interactions have been found and clarified through the iterations of the draft, but it is reasonable to suppose that many more will remain uninterpreted given the volume and pervasiveness of the extensions. Users will be in for surprises as they attempt to use new features and run into differences of interpretation or outright errors that affect their old code. For example, what is the level of confidence that all the interactions have been worked out between FORTRAN 77 forms of storage allocation and association, such as SAVE, COMMON, and EQUIVALENCE, and new forms of allocation and aliasing, such as allocatable arrays, recursion, IDENTIFY, RANGE, and rename-lists in the USE statement.

Second, there is the problem of compatibility with de facto standards that are in fact non-conforming FORTRAN 77, such as parts of MIL-STD 1753. Since X3J3 did not in general take existing extensions as a starting point, there is the danger that compilers will no longer be able to support these extensions where they conflict with Fortran 8x, and that the interaction of these extensions with Fortran 8x will vary from implementation to implementation. Specific examples of common extensions that were not standardized include DO WHILE, INCLUDE, bit manipulation functions, and the *n notation for integer and floating point declarations. X3J3 cannot ignore the widespread use of these features, especially considering the length of time between revisions.

Third is the problem of system compatibility. X3J3 only has to worry about language compatibility. Users also have to worry about the tools that they use to process programs and the output of those tools. Fortran 8x is enough different from FORTRAN 77 that it is likely that it will require new compilers, new linkers and loaders, new library formats, and new runtime systems. It will likely be complicated and costly to use existing libraries with newly compiled Fortran 8x. For example, array features require that calling routines pass much more information about array arguments than FORTRAN 77 requires, thus requiring the passing of array descriptors ("dope vectors") instead of simple addresses. Compiled routines in existing libraries may not be set up to process this type of passing mechanism. A similar situation arose in FORTRAN 77 with passing character constants to library routines, and caused many problems. If character constant arguments caused problems for existing libraries—a new language feature replacing a non-standard usage—one can imagine the problems that new passing mechanisms for array arguments would cause.

The second area where Fortran 8x threatens the investment in existing code is performance. One example is the necessity for array descriptors for array arguments described above. Even if compatibility problems are solved, new runtime overhead will be introduced for packing and unpacking the descriptors, even for programs that make no use whatsoever of new features.

Of more significance is the likelihood that the new features will not achieve the level of runtime performance that FORTRAN users are accustomed to, and that mixing new and old constructs will slow down the old ones. One example is the use of array constructs on scalar machines. The semantics of array constructs are such that it is

often necessary to create temporary copies of the array. Vector machines can handle these in hardware or microcode, but they introduce significant overhead on scalar machines. Another example is that the use of explicit ranges and precisions for real variables may require the use of larger, but slower hardware data types than the user realizes. In general many of the new features inhibit compilers from optimizing or at least require considerably more analysis than compilers currently do; e.g., data object information (size, shape, type parameters) that is not known until runtime, recursion, runtime storage allocation, and runtime mapping of data objects.

Finally, the adoption of Fortran 8x endangers the reliability of existing software. Vendors will have to produce new compilers or at least make major changes to every phase of existing compilers. Furthermore, it is likely that existing software will have to be recompiled to be compatible with new software. The risk of breaking existing programs is very high, whether from compiler errors or from differences in implementation specific details. Similarly users run the risk of incompletely understanding the implications of using new features with existing software. The situation is familiar to any user who has ever switched compiler vendors or received a new and improved version of a vendor's compiler. Regardless of what benefits the new compiler provides, there are always some unexpected problems, and the greater the magnitude of changes, the more problems there are.

2.3 Fortran 8x increases implementation costs

The difference between Fortran 8x and FORTRAN 77 is at least an order of magnitude greater than the difference between FORTRAN 77 and FORTRAN 66. The major enhancements for FORTRAN 77 would hardly be noticeable if they were being added to Fortran 8x. For example, FORTRAN 77 added one major new data type, and it was fairly constrained at that, namely the fixed length character data type. Fortran 8x on the other hand adds user defined data types, user defined operators, user specifiable floating point range and precision, use of arrays as data objects, array operations, and a variety of ways to parameterize all of these. Where FORTRAN 77 added IF-THEN-ELSEIF-ENDIF, Fortran 8x adds CASE, new forms of DO loop, EXIT, and CYCLE. FORTRAN 77 added nothing comparable to Fortran 8x additions such as WHERE, RANGE, IDENTIFY, MODULE blocks, USE, interface blocks, optional and named arguments, internal procedures, attribute lists, or free source form.

It is not just the number of new features or the difficulty of implementing any single feature that causes problems. It is the extent to which the new features pervade all aspects of the language: declarations, expressions, procedure interfaces, I/O, storage allocation, name space. The character data type in FORTRAN 77 was the only feature that had such repercussions, but Fortran 8x has arrays, user-defined data types, range and precision specification, and dependent compilation, any one of which introduces at least as much specification and implementation difficulty as the character data type.

FORTRAN 77 did not require great advances in implementation technology. Most of the new features were straightforward enhancements that could be added to existing compilers. This is not the case with Fortran 8x. Most of the features have never been implemented in commercial FORTRAN compilers and some of them have only been implemented experimentally in any compiler, if at all. Combined with the need to maintain compatibility with existing FORTRAN 77 programs, this means that

much research will be required before complete Fortran 8x implementations appear. Even some relatively simple features, such as recursion, that already exist in many implementations, require careful design and significant implementation effort to add to implementations that are based on assumptions that conflict with such features.

Despite the fact that FORTRAN 77 was a relatively modest extension to FORTRAN 66, it still took several years for the first validated compilers to appear and several more years before the language achieved widespread acceptance. The situation will certainly be worse with Fortran 8x. Not only does Fortran 8x introduce many new, complex, and untried features, but it also changes so many fundamental properties of the language that it is unlikely that existing compilers can be used as a base.

The situation will be similar to that with other large new languages such as PLI or Ada. Early compilers will have to concentrate on just getting features to work, and not on code quality or compile speed or additional programming tools. This will compound whatever performance problems are inherent. Early compilers will also be prone to bugs, both because of the magnitude of the implementation effort and the lack of experience and tests for the new features.

2.4 Fortran 8x increases resource costs

A previous section noted that in some cases Fortran 8x affects the runtime performance of existing software. This is just part of the overall resource cost. Fortran 8x contains new features that significantly increase compile-time costs and program size, as well as those that are extremely costly at execution time. Examples of features that increase compile time are operator and function overloading and the module facility. One need only compare the compilation speed of Ada compilers to get an idea of the cost. Extra compile time is also required for the extra analysis that must be done to generate good code for array operations, user-defined data types, and new control structures.

The many features that Fortran 8x provides for the runtime parameterization of data types—assumed types, assumed range and precision, assumed size arrays, assumed length character strings—all increase program size. The compiler must generate code to fill in the information at runtime, and even worse, may have to generate multiple versions of the routines that contain the parameterized data objects, one for each possible hardware data type. The semantics of simple array operations may require the generation of temporary array copies particularly on scalar architectures that do not directly support vector operations; e.g., when assignments overlap or when the arrays in the body of a WHERE construct overlap the condition array. More complex array operations for dynamically mapping arrays or parts of arrays, such as RANGE and IDENTIFY, similarly may require temporary copies.

The same features that increase program size generally also decrease program performance; e.g., data types that cannot be determined until runtime and array operations that require extensive use of temporaries. Many other features have been defined without regard to their implementability. Abstract data types make it difficult for compilers to exploit data types built into the hardware. The CASE statement is too general to allow for optimizing the dispatch to the individual cases. Dynamic allocation and dynamic aliasing make optimization much more difficult.

2.5 Fortran 8x hampers portability

Fortran 8x fails to achieve its goal of increasing portability on several counts. First, there is the simple fact that the language is large and hard to implement. This will lead to subset implementations because of the length of time it takes to implement the full language and because the full language will be too large or too slow for some classes of machine.

Second, there is the problem of practical portability of array features. Programmers will discover that certain uses of array features perform well on vector architectures, others on multiprocessors, and still others on scalar machines. Thus although programs written for one machine are nominally portable, they are not practically portable for performance reasons. The smaller the set of features for expressing the same semantics, the more likely it is that programs will perform well across a variety of architectures. Is the increase in expressiveness that the array features provide sufficient justification if they are not usable on certain classes of machines because of their performance?

Third, there are features that solve one portability problem, but introduce another. The Fortran 8x features for numerical precision are an example. In theory they provide the numerical analyst complete control over the numerical properties of an algorithm if the range and precision of input and intermediate results are carefully chosen. Such programs can then be more easily ported than those in which a compiler chooses the a particular storage representation for real data types. In reality, the required range and precision for the real variables in a program may not be precisely known. What is known is that the binary storage representation on a particular machine is sufficient. The user thus needs a way to guarantee that a program uses an equal or larger representation when it is ported to a different machine. The Fortran 8x features, rather than practically improving portability, will just cause programmers to learn the right codes for forcing a particular hardware data type, just as PL/I programmers use FLOAT BINARY 24 as code for a 32 bit floating point number on a certain architecture.

2.6 Fortran 8x does not increase maintainability or reliability

Fortran 8x provides replacements for many FORTRAN 77 features. For example, MODULE blocks replace the use of COMMON for global data, USE replaces the non-standard INCLUDE, general precision and range specification replace DOUBLE PRECISION, USE with renaming and IDENTIFY replace the aliasing capability of EQUIVALENCE. Fortran 8x also provides new source form, new DO loop syntax, and new declaration syntax. These are a few of the many redundant features added to improve the style of FORTRAN programs. Finally, Fortran 8x attempts to encourage the use of the improved features, rather than the old ones that they replace, by relegating certain older features to a decremented features appendix with the threat of possible deletion in a future revision of the standard.

Despite these attempts to improve maintainability and reliability, FORTRAN 8X will be less maintainable than FORTRAN 77. First, the old features will not disappear from existing programs; they will coexist. The new language will be larger, with more redundancy and more feature interactions than FORTRAN 77. Only programs written entirely from scratch in Fortran 8x would benefit from the improved maintainability

of the replacement features, and then only if programmers are careful to follow the Fortran 8x style recommendations.

Second, Fortran 8x introduces many new maintainability problems of its own. IDENTIFY provides dynamic aliasing that makes it difficult to determine the global effects of local modification of an element. The RANGE facility allows the scope of whole array operations to vary dynamically. User defined operators allow arbitrary side effects in simple expressions, which can lead to particularly subtle problems when one of the standard operators is overloaded. Name space management and scoping are much more complex in Fortran 8x than in FORTRAN 77 because of the MODULE facility, USE, internal procedures. This provides additional flexibility, but also additional opportunity for inadvertent aliasing.

Third, Fortran 8x is less readable than FORTRAN 77 in one major area where FORTRAN 77 was already weak. The Fortran 8x declaration syntax is even more baroque than FORTRAN 77. The FORTRAN 77 attribute oriented declaration model is extended to allow lists of attributes. The attributes are separated by commas and are delimited from the entities by a double colon. There are a lot of new attributes. This syntax in itself is unwieldy, but it is complicated by the fact that complete information about an attribute may be contained in both the attribute list and with the defined entity. For example an initial value is assigned by putting the DATA attribute in the attribute list and the value with the entity, type parameters in the attribute list such as array bounds or character length can be overridden in the entity list. In addition the traditional FORTRAN practice of declaring attributes across multiple statements is retained and new statements are added for most of the new attributes. The attributes declared in FUNCTION statements use a different syntax. The new attribute list notation thus does not really solve the problem it addresses.

3 MORE DETAILED ANALYSIS

Detailed analysis of individual sections of Fortran 8x would require volumes and does not seem worthwhile, given our strong disagreement with the overall philosophy of Fortran 8x. We believe that each major feature needs to be analyzed thoroughly for its impact on the language as a whole and on existing programs. The only way that the necessary analysis is practical is first to reduce the total number of new features. As it stands now the new features are so interrelated that it is impossible to address one completely without pursuing its impact through all the others, and it becomes impossible to understand the overall impact.

To give a flavor of Digital's objections, we provide more detailed comments on several sections:

- Array operations: the generality of the proposed features will in many cases prevent compilers from generating high performance code on scalar, parallel, or vector machines, not only for new features, but even for programs that don't use new features at all.

- **Portability of numerical software:** these features are untested in practice, nor do they offer a preferable solution to the REAL and DOUBLE PRECISION declarations in the FORTRAN 77 language.
- **Language extensibility:** these features provide syntactical flexibility, but no semantic improvement, since they do not provide an opportunity for the exploitation of available hardware capabilities.
- **Deprecated features:** the features chosen for deprecation are not justifiable on the basis of potential cost and benefit.

These problems are detailed below.

3.1 Array Operations

For array operations, the Fortran 8x language proposes many new and complicated features, intended to provide more concise and expressible mechanisms for the specification of array-valued operations. These new features extend the support given by FORTRAN 77 for arithmetic, logical, and character operations with respect to arrays. The draft Fortran 8x standard includes:

- Array notational syntax, allowing for operations on whole arrays, and contiguous and non-contiguous array sections.
- User-supplied array-valued functions are allowed, assuming whole arrays and contiguous or non-contiguous array sections as parameters.
- With the RANGE feature, the caller program passes a ranged array to a called program, wherein the range may be changed globally; the range is then returned to the caller.
- The IDENTIFY statement allows a subset of an array, especially a multidimensional array, to be mapped by a linear mapping function, for reference from a single dimension. For example, a diagonal element of a square matrix could be referred to as a unidimensional entity.
- ALLOCATABLE arrays have no memory allocated to them, until that memory is allocated explicitly from storage, specified as heap, not stack (both are possible), storage in the Fortran 8x draft.
- Intrinsic functions construct and transform arrays, to perform scatter/gather operations, and to support expanded computational capabilities for arrays.

In addition, characteristics of arrays may be specified, such as <assume-shape, assume-size, explicit-shape, alias>, to determine shape and contiguity; the specification of such attributes influences array conformance with respect to other arrays.

The proposed Fortran 8x array features were designed for supercomputer users, at a time when an array syntax notation was thought necessary to allow the exploitation of vector processing from FORTRAN programs. The Fortran 8x array syntax notation also is intended to provide a convenient means for coding array-intensive algorithms. Since the original work on array features was conducted by X3J3, compiler techniques have been developed where automatic vectorization has become a viable approach that avoids the need to revise the language definition. Thus, the new syntax notation for manipulating arrays is no longer necessary for exploiting the capabilities of vector processing hardware. Although it is true that an array syntax notation might well be convenient for programmers of array-intensive applications, Digital does not find that such expedience is reasonably sufficient to justify enlarging the language in this way, especially since execution speed of existing programs will be degraded.

Were the proposed 8x array features to be added to the FORTRAN language, in order to generate scalar code of performance comparable to FORTRAN 77, the analysis for dependencies that would be required would be at least as extensive as for automatic vectorization. The Fortran 8x constructs require excessive loop overhead on scalar machines, since loop dependencies would have to be exposed to generate high performance scalar code. That is, Fortran 8x constructs will execute more slowly than equivalent FORTRAN 77 code on scalar machines, where no dependence analysis is done.

Furthermore, array features imply a different programming style, where multiple array operations that are merged into a single DO-loop in programs for scalar machines, are expressed as a series of whole array operations. In order to maintain the present efficiency of FORTRAN 77 algorithms for processing in Fortran 8x, vectorizing compilers would have to do dependence analysis to perform correct loop merging of scalar code. Thus, FORTRAN 77 constructs will execute more slowly than before in the presence of FORTRAN 8x capabilities.

Dummy argument array references, which assume that the caller program is passing non-contiguous arrays, would be most problematic. The discontiguity of these arrays disallows passing by direct address, and, in fact, imposes a compiler requirement that all arrays be passed by descriptor; i.e., a structure with information about the characteristics of the array, such as size and data type of elements, dimensions and extents, and addressing algorithm. All actual parameters which are arrays would necessarily be passed by descriptor, since all formal parameters which are arrays must be accepted by descriptor, so as to handle non-contiguous arrays. In many FORTRAN compilers, arrays are passed by reference; the technical solution for maintaining semantic consistency for such code would be likely to result in a degradation of execution speed.

The costs associated with the inclusion of the Fortran 8x array features would be borne by vendor and user alike, in the form of development and testing, heavy training and maintenance costs, and degraded code execution. Finally, there is a lost opportunity cost in that the attention given to the proposed array features diverts the interest of researchers and vendors from striving toward automatic technologies to accommodate advances in hardware development.

3.2 Numerical Portability

Most FORTRAN users have large numbers of computational programs, which have been devised for use on various machines with different word sizes. The Fortran 8x language proposes the addition of the PRECISION and EXPONENT_RANGE attributes which are intended to provide improved portability among processors with different word sizes. The PRECISION and EXPONENT_RANGE attributes allow the user to specify a range and precision for a given allocated quantity of type REAL or COMPLEX. Also, the Fortran 8x language provides some intrinsic functions that are designed to work within this numerical model.

Digital, IBM, and many other vendors allow the "*n" notation (e.g., "REAL*4", "COMPLEX*16"). Although it lacks a well-defined model of floating point computation and a detailed definition for precision and exponent range requirements, the "*n" notational syntax retains consistent numerical behavior from one machine to another. Because of the "fixed" nature of the REAL and DOUBLE PRECISION declarations in Fortran 77, the programmer can be certain of the range and precision of the computation that the program performs. For example, the following program,

```
REAL A
DOUBLE PRECISION B,C
READ (5, *) A, B
C = A + B
WRITE (6, *) C
END
```

when compiled on a given machine, uses a particular representation with a known range and precision for A, and a different particular representation with a greater precision for B, C, and the temporary result of the expression "A + B."

Although these particular representations differ on CPUs from different vendors, there is one certainty: if a program gives correct results on a given machine, without generating underflow or overflow conditions, then the program could not possibly have required greater range or precision than was used in its computation. For example, if a simulation program gives a correct answer, without generating overflow conditions, using DOUBLE PRECISION on an IBM 3090, then that computation did not require more than 15 decimal digits of precision or an exponent range greater than 10^{**+75} . When the simulation program is brought to a VAX, with a precision and exponent range using the VAX G_floating data type, the results will be comparable, and extensive numerical analysis generally will not be necessary.

In Fortran 8x, the definition of the attributes, "PRECISION=p" and "EXPONENT_RANGE=r," mandates that the processor use a representation to guarantee a minimum of p decimal digits of precision and an exponent range of at least 10^{**+r} when allocating storage for this quantity. Generally, the processor selects a representation with greater precision and range. Thus, the user no longer has any knowledge of the precision and range that the program actually requires in order to deliver a correct result on a particular machine.

For a working program that is ported from one machine to another, therefore, incorrect results may be obtained. For an IBM 3090, if a PRECISION=7 is specified for the program's variables, a representation that provides 15 digits of precision (REAL*8) will be used. So, although the program obtains correct results on the IBM system, it may not yield useful results when ported to a VAX, where a specification of PRECISION=7 provides 7 decimal digits of precision (F_floating).

The rules for expression handling in Fortran 8x require that arithmetic operations, such as +, -, *, /, and **, that return results maximize both the precision and range of two operands simultaneously. For example, in the following program,

```
REAL (PRECISION=15, EXPONENT__RANGE=50) A
REAL (PRECISION=16, EXPONENT__RANGE=35) B
...
C = A + B
...
```

precision is 16 and exponent range is 50 for "A+B." On a VAX, this combination can be delivered only with the REAL*16 type, although this specification never was explicitly declared.

Thus, the proposed Fortran 8x language, on the issue of numerical portability, makes no guarantee that programs which are ported, where the PRECISION and EXPONENT_RANGE attributes are used, produce acceptable results, since data representation is a non-portable aspect of this language feature. Further, while DATA and assignment statements are consistently represented from source code representation on one machine to source code representation on another machine, results generated from these declarations would again differ from machine implementation to machine implementation. Although Digital believes that this Fortran 8x feature achieves an increase in program portability, this aspect of the Fortran 8x language exposes an area of unportability that has not yet before been encountered. Digital further believes that programmers will learn to avoid this problem by using range and precision specifications that force a particular hardware data type to be used without regard to the actual numerical properties of their algorithms.

3.3 Language Extensibility

The motivation for many of the proposed Fortran 8x features associated with language extensibility is improved notational convenience, especially for the expression of algorithms in numeric and scientific computations. These features include: MODULE/USE, module procedures, derived and parameterized data types, user-defined operators, operator overloading, user-defined generic functions, as well as others.

MODULE/USE and module procedures are an attempt to package data definitions and procedures to manipulate them. The addition of MODULE to FORTRAN requires a program library capability, able to generate multiple versions and to maintain name spaces, to provide a FORTRAN programming environment. Under FORTRAN 77, a subroutine may be compiled independently from a main program unit. In Fortran 8x, the environment of the subroutine—that is, all the other caller and called programs relevant to the subroutine—must be made known to the compiler at the time of compilation. Support for dependent compilation implies a significant increase in compiler complexity, and in this scheme, may increase costs of providing other components of system software, such as linkers. Digital does not agree that

users would reap a major cost/performance benefit from the inclusion of this feature in standard FORTRAN.

Derived types allow new specification methods for many data structures commonly in use by FORTRAN programmers. Since derived types are not intrinsic to the language, they cannot exploit hardware capabilities for pointer, bit, and character string manipulation. Parameterized types permit flexibility in the specification of record structures, transferring the chore of name space management from the user to the compiler, but adding a level of complexity with respect to code maintenance to challenge the user.

User-defined operators permit tokens to appear as part of the language; FOO(X) may be specified as .FOO.X. The addition of this Fortran 8x feature would not result in a benefit to performance, and may, in fact, increase compiler complexity and compilation time, since the underlying support indicates simple function calls. Overloaded operators allow users to specify the contextual behavior of operators. With respect to FORTRAN, this technology is not proven, may be subject to error, would restrict optimization, and generally, increases compiler complexity and compilation time.

3.4 Deprecated Features

The deprecation of features, that have become redundant by the inclusion of certain new features in the draft standard which attempt to supersede the FORTRAN 77 functionality, is unwarranted. The list of deprecated features includes BLOCK DATA program unit, COMMON, ENTRY, EQUIVALENCE. FORTRAN users have made billion-dollar investments in FORTRAN 77 code that utilize some of these deprecated features. Since there are no cogent technical justifications for the removal of these features from the language, conversion costs to accommodate deprecation is not justifiable. Moreover, the indeterminate future of the deprecated features leaves the user with no way to predict whether the features will appear in a future version of the standard language.

4 CONCLUSION

Digital anticipates a negative impact on all users of the FORTRAN language, if the proposed draft standard, S8.104, is accepted as a revision of X3.9-1978—the FORTRAN 77 language. We strongly feel that the draft ignores or replaces existing practice that has become the de facto standard in the industry. Digital recommends that the X3J3/104.8 draft of Fortran 8x be reevaluated by X3J3, for resolution of the technical problems described in this paper or that X3J3 start over with a much reduced scope with the Fortran 8x work assigned to a separate technical committee. We reiterate that X3J3 should pay much more attention to the impact of language standardization on existing code, tools, and knowledge, and less on language design in the abstract. We do not believe that cosmetic changes to individual features will make Fortran 8x acceptable. At the same time we realize that some of our specific concerns would be manageable in the context of a smaller and more focused language. If the X3J3 Committee is unable to address this recommendation, Digital stresses that an alternative action should be the reconfirmation of FORTRAN 77, rather than superseding it at the time that Fortran 8x is approved.

RESULTS OF DIGITAL/CSSE's FALL'87 DECUS QUESTIONNAIRE

Pamela M. Blotcky

DIGITAL EQUIPMENT CORP., CSSE/Languages and Tools

February, 1988

1 INTRODUCTION

Customer Services Systems Engineering (CSSE) is an organization within DIGITAL whose purpose it is to ensure that DIGITAL's customer services organizations are prepared to support new products. One aspect of this job is to represent the needs of the customer services organizations, and the customers they serve, during the development cycle of new products.

Feedback from customers is vital in performing this task. As one means of collecting this information, CSSE/Languages and Tools developed a questionnaire that was distributed (via the Languages and Tools SIG folder) to attendees at the last three DECUS symposia.

This article describes the results of the Fall 1987 survey. These results have also been distributed to a number of organizations within DIGITAL. 51 of you took the time to respond to this survey, and we thank you very much for doing so.

This questionnaire will be distributed at future DECUSes.

2 PRODUCT-SPECIFIC CONCERNS

We asked, "Is there any particular software product that CSSE should examine in order to resolve problems pertaining to product functionality, product quality, service offerings, or administrative problems (ordering, SDC, etc.)"

If so, please indicate the product, and describe the problem."

As in previous surveys, there were some comments about MMS, particularly concerning difficulty in building the descriptor files. As for administrative problems, SPR response was mentioned.

3 DOCUMENTATION

We asked if you have experienced problems with documentation.

You told us that indices could be better, The System Services manual should have more examples, and that there is a great deal of improvement between the V3 and V4 VMS documentation sets.

The DATATREIVE manuals and the C RTL manual were criticized for organization, comments that also appeared in the Spring 1987 survey.

4 VMS

We asked the DECUS attendees to rate the quality of VMS, using the following scale:

1 (excellent) 2 (good) 3 (fair) 4 (poor) 5 (unacceptable)

The results were as follows:

1	-	26 responses
2	-	19 responses
3	-	2 responses

There were no responses for categories 4 and 5.

We asked "What kind of features would be of use for you to help you in maintaining your backup media library?"

The most popular request was for a tape librarian (8 responses). 3 people asked for an archiving system. These have also been the most popular features requested in surveys we've done at past DECUSes.

5 SECURITY

Responses to this section of the questionnaire were sent to the CSSE engineer concerned with security on VMS, and to the developers of SES/VMS (VMS Security Enhancement Service).

The VMS Security Enhancement Service is a software security consulting package that provides many features of mandatory access controls, security auditing and labelled output for VMS. It provides your system administrator or system security officer with the software to devise a system-wide security policy that helps safeguard users' data and software from security threats. These controls do not replace standard VAX/VMS security features, but rather augment them with an additional mandatory access control policy. Releases are numbered to correspond to the prerequisite VAX/VMS release.

Here are the questionnaire results:

38 of you told us that you are using VMS security features.

We also asked whether you felt that any security related features were missing in VMS. Here, we received many requests for encryption, including DECnet and Ethernet encryption. There were also requests for ACLs on queues, selective alarm ACLS, and batch support at varying classifications.

We asked "Which layered products are you using?" Fortran, VAX C, CDD, LSE, CMS, MMS, DTR and FMS were the layered products most frequently used in secure environments. This was also true in the survey's we did at the Spring '87 and Fall '86 DECUSes. You told us that you felt that security features in layered products were adequate.

6 TRAINING

We asked "Is there a course, not currently offered by DIGITAL, which you feel is badly needed? If so, please indicate the best medium for the course (CAI - computer-aided instruction; SPI - self-paced instruction; LEC/LAB - lecture/lab).

VAX SYSTEM MANAGEMENT, PERFORMANCE MANAGEMENT (SPI), RDB, RDB INTERNALS (lecture/lab) and TPU PROGRAMMING (SPI) were among the most popular responses.

7 SERVICE DELIVERY

Out of 51 questionnaires, 5 indicated a problem with the delivery of products. A list of these comments has been sent to SDC management.

Concerning telephone support, many of you provided comments, some of which pertained to specific products. These were forwarded to the telephone support center.

Most of you felt that you are "sufficiently aware of DIGITAL's software product offerings, their features and benefits, to develop solutions to your business needs."

10 of you told us that DIGITAL salespeople and software specialists not been able to answer your questions, or promptly provide you with information, pertaining to DIGITAL software products. Some of you indicated that you get this information from DECUS, tradeshows, or publications.

We asked "If you have utilized DEC's consulting service, were you satisfied with the results?" 5 of you said "yes", 4 said "no".

5 people had made use of DECstart, of which 4 reported that they were satisfied with the results.

L&T Woods Meeting Notes

The L&T SIG held its Woods Meeting at the Marriott Greenspoint in Houston, Texas on February 27 & 28. Attending were:

Earl Cory - Symposium Rep/Vice Chair
Al Folsom - Newsletter Editor
Steve Jackson - Standards Activities Coordinator/PDP-11 Rep
Mark Katz - Session Notes Editor
Lisa Kerby-Rodgers - ADA Working Group Chair
Mark Kidwell - CM Working Group Chair
Celeste LaRock - Digital Counterpart
Gary Lelvis - Alternate Symposium Rep/Session Coordinator
Gerald Lester - Low Level Languages Working Group Chair
Bruce Mebust - DIBOL Working Group Chair
Joe Mulvey - Development Counterpart, PDP-11 Software
Joe Pollizzi - Working Groups Coordinator & Campground Coordinator
Dave Ream - Volunteers Coordinator
George Scott - Clinic Director/Assistant Masters Program Coordinator
Bob van Keuren - Wishlist Coordinator
Sam Whidden - SIG Chair
Jay Wiley - CommComm Rep

Chief Scribe, Mark Kidwell, was responsible for ensuring that each segment was being recorded. He then compiled and edited the individual segments within two weeks. Individual recorders for each section are identified after the topic description in parenthesis.

1. L&T support of PDP-11 layered products. (Earl Cory)

There is concern within the L&T SIG leadership that the PDP-11 interests lost focus when the CL SIG merged with L&T. Discussion could not pin point whether or not this has occurred, but L&T wants to embrace the L&T concerns as they relate to the PDP-11 environment. One suggestion brought up repeatedly: We should get the PDP-11 related SIGS involved with us. Our roadmaps should list any language/tool related topics sponsored by the other SIGs, as well as the other SIGs mentioning L&T sponsored sessions which may affect their members. Joe will see about inviting the other SIG Chairs to send representatives to L&T's Working Group Leaders meeting.

Sam noted that the PDP-11 group does not want to be a SIG and sponsor sessions. It may desire to sponsor sessions in the future partially via the L&T SIG. Part of the reason lies in the fact that there are already four "PDP-11 SIGS" - RSX, IAS, RSTS, and RT.

Earl mentioned that the Cincinnati L&T has 100 "VAX" sessions, 13 "PDP", and 22 sessions which would be applicable to either. Earl also mentioned that the Anaheim symposium (Fall 1988) has a "session Czar" to call attention to sessions that are duplicated by different SIGs.

2. Newsletter content and volume, acquisition of material: (Jay Wiley)

Need to put some items annually into the SIG Newsletters. Suggested items:

SIG Charter
Working Group Descriptions, contact information
Masters List

Need to encourage DEC to submit. Some of the best newsletter input comes from DEC. Another suggestion - some SPRs could be a good source for the SIG Newsletter. SIG could convert to newsletter format.

Idea: Have a Hints and Kinks section of the newsletter. Stated need of an editor for it. Mark Katz volunteered.

Each Working Group Chair should have a columnist for newsletter input (if not the WG Chair themselves).

Final idea offered - often times speakers are unable to get their sessions into the Proceedings. Ask for session transcription help on the volunteer form. Start getting some of the sessions into the newsletter.

Some time spent discussing the page limits and lead time on the SIG Newsletters. Discussed how the page limits are set by the combination of postal expense and past history. One alternative Jay Wiley reported that was being looked at was having a professional organization out of Colorado handle the newsletters. This may relieve some of the postage expense pressure as the rates you could expect would be postal zone 4 rates rather than postal zone 7. Having a professional organization do the Newsletters may also reduce some of the lead time involved (ie. from time of submitted article to actual print date).

3. Anaheim Reports: (Mark Kidwell)

Anything extraordinary we should know about:

Newsletter and its problem being looked at. Newsletter subscriptions are not "renewed" - a new subscription is given. If someone checked "I want SIGNEWS" at both symposia, you get 2 (TWO!!) subscriptions. When checking with subscribers, they are basically happy with what they got. Therefore, CommComm is looking at doing a cross correlation on trying to find out who used to subscribe and who isn't currently and then trying to contact DECUS members who let their subscriptions expire. Another detail brought up was the need for standard electronic submission format for the newsletter.

4. Symposium Rep: (Bruce Mebust)

L&T is pushing hard at the number of session hours allocated by the Symposium Committee. We get additional resources at each symposium but only slowly.

To make the best use of the available resources, CFPs should be reviewed to eliminate duplicates, combine some or make panels of some. Perhaps sessions can be expanded from 45 minutes to one hour.

Volunteers are needed (a "Stream Team") to do this culling between the end of the CFP period and session scheduling. Although it is sometimes difficult to judge the level of a session, the group can also try to make sure that introductory sessions get scheduled before advanced sessions and clarify vague abstracts. The team can also suggest streaming strategies to Earl.

Sam will try to get the Stream Team a meeting to do the streaming for the Fall 88 symposium. Abstracts will be printed and mailed by Sam to the team. CFP closing is May 29. Final abstracts will be out on June

11. Scheduling will occur on June 25. The "Stream Team" will meet on June 11 in New England. The team will consist of Joe Mulvey, Steve Jackson, Celeste LaRock, Lisa Kerby-Rodgers, Earl Cory, and Joe Pollizzi.

CFPs for Fall 88 will be turned on at DCS on March 3, 1988.

5. SIG Tape: (Gerald Lester)

A new L&T tape should be ready by the end of March.

New contents include:

- 1) Updated TEX and LATEX
- 2) X-windows V11.0
- 3) GNUemacs
- 4) C++ (for UNIX)

6. Cincinnati Planning and Logistics: (Gerald Lester)

A problem that has shown up in in the past is an individual monopolizing equipment in the campground. Suggestion: Have a time restriction.

The skit is being done by DEC AI with a warm up by Kurt.

The campground is smaller than Anaheim but consists of 3 SMALL rooms, 1 medium room, and a LARGE hall. The layout is not available since the campground is still in the pre-planning phase. The steering committee felt, with the exception of having APL, the APL character set (font?), and an APL keyboard all on the SAME machine, the equipment was sufficient. It was also felt that an LNO3 was needed. Terry will be in charge of setting up the room (S240) at 0900 hrs on Sunday.

The suite will be in the Omni/Netherlands hotel. Both the campground and the suite will be shared with UNISIG and AISIG.

DECUS will be holding a press day on Monday with the press free to attend sessions Monday afternoon and evening.

UPDATE.DAILY will spotlight security. Articles were stated as being due in late April. Some suggestions were made as to how to offload the UPDATE.DAILY machine so that response will be better.

The developers' schedules will be posted in the campground, the booth, and in the suite. It was also suggested that the ANSI reps' schedules also be posted. The Clinic will be "combined" and shortened to two (2) hours.

Joe P. will be handling Language Wars.

It was felt that the L&T wizard session at Anaheim "degenerated". The following suggestions were made as to how to avoid a repeat of that occurrence and otherwise improve the session:

- 1) Have "Plants" go first
- 2) Give Wizard Widgets
- 3) Screen presenters
- 4) Have a "strong" chair

It was also suggested that we have a "collage" of wingers to fill in when we get a no show for a speaker. The issue was considered of

being able to check with registration on if speakers ever picked up their badges.

Store items:

In Cincinnati we will be selling:

- 1) Small Planners
- 2) Improved VAXpads (Celeste will have developers proofread)
- 3) A Screen Clean Chamois

It was suggested that in the future we offer update service for the VAXpad and that we remove times (just pre 0800 hrs) from the planner.

7. Session Quality Control: (Dave Ream)

Mark Katz passed out two collections of statistics from the session evaluation cards: one with and one without comments.

Many comments note the importance of having the session content match the abstract. Can comments be sent to the Speakers? Celeste will distribute to the DEC speakers. For Anaheim some distribution will be attempted via the Working Group Chairs. Mark Katz will supply an address list for this purpose. Future symposia will provide a box in the campground for speakers to deposit a self-addressed stamped envelope for evaluation returns.

Other comments requested more handouts. SIG policy is of only having handouts for DEC product release information that can't be placed in the session notes.

Collection of evaluations cards was down from Nashville. Reasons were given as: cleaning staff trashing them too fast at the end of the day and too many exits. Sam will provide colored paper signs to put on the boxes noting the purpose and permanency of the boxes.

Session Evaluation Cards should not be pushed at SIG interface sessions, except for those such as Q&A.

The "back" of the card containing speaker and chair information should be copied and sent to the Volunteers Coordinator.

Mark is overworked with the extra data being collected on the cards. George Scott offered to take over the evaluation process and will work with Gary Lelvis on coordination. Mark will still handle what appears on the card and getting it printed.

Only half the speaker evaluation forms were turned in and the results have not been distributed to the SIG yet. The idea of mini-GIB locations (giblets?) was mentioned to assist in collection of forms for symposia with multiple buildings

8. Anaheim-88 Planning & Logistics: (Al Folsom)

9. Counterparts' Reports: (Al Folsom)

10. Session BOFs: (Gary Lelvis)

Q&A time is lost with only having 45 minute sessions. For important

sessions WG chairs should schedule a BOF with Earl. Have the speaker announce the BOF room & time. We could do one BOF for a stream. DEC presentors and attendees are also frustrated about the Q&A cutoff - this period of time often provides the best feedback on Digital products. We are also in agreement that the Q&A period is an important part of the session tape.

On the DEC frustration - Earl feels DEC presentations tend to last a full 45 minutes, sometimes approaching an hour. Celeste requested that we go back to full hour sessions, especially for DEC sessions after Cincinnati.

Speakers/chairs will be responsible for announcing the upcoming BOF associated with the session. We need to keep track of dead spaces (ie. cancellations) and reschedule them to use effectively as BOF sessions. Earl is in charge of the BOF scheduling, but Mitch Brown will assist. Al will announce these new innovations in the newsletter.

BOFs now need session chairs independent of speakers. Commercialism during BOFs has become an issue. Gary will handle getting the session chairs on the fly with Dave Ream's help. We need to make sure the chair's company does not equal the speaker's company. There is also the concern about inexperienced chairs not being able to handle situations such as blatant commercialism.

11. Increased L&T emphasis on development methodologies: (Dave Ream)

Sam reiterated the need to stress connectivity and products other than Tools and Languages. People should be encouraged to give sessions on "how to do" approaches.

The "stream teams" should address these areas as well.

12. Management of Working Groups, Working Group contributions: (Mark Katz)

Joe indicated a definite "lack" in the commercial languages areas. Is this a downturn in the CL area or do we need to attract more attention somehow? It may be that there are no pressing issues in these languages.

As interest goes away, a void is created by a disappearing WG. At the same time we do not want a working group just for the sake of its existence. Mark Kidwell pointed out that both Tools and Methodologies are well covered and right now have no indication of any difficulty, but the problem lies in the sheer number of languages.

Lisa Kerby-Rodgers suggested BOFs for "orphan Languages" and if people are really interested then a real working group might be formed. Lots of agreement on this comment.

In the meantime, Bruce Mebust will act as a Working Group Facilitator for any query/activity that falls within the L&T SIG interests and are not covered by a Working Group or specific L&T position.

Certain Working Groups are sending out newsletters to WG members. These newsletters need to be copied to both Joe and Al.

DEC counterparts/liaisons for the working groups in some cases did not attend the working group meetings because of a lack of communication. We need to improve this.

L&T will provide Working Group specific business cards for the Chairs and are to be placed in the campground.

L&T working group meetings (will not be taped). Working group chairs should sign and turn in the form to refuse audio taping.

13. Wings: (Celeste LaRock)

Wingers are those people who literally save a session by "winging it when the original speaker doesn't show up". Although several scenarios were brought up and discussed, the general consensus within the L&T leadership is that we have handled the situation quite adequately (although it may be luck) and therefore there should be no change in the way things are currently done. We should, however, keep watch over the situation to come up with ideas, adjustments.

14. Session Notes Reorganization: (Steve Jackson)

Discussion centered on the desire to integrate the technical and commercial sessions. There seems to be no convenient way to break them into days. It was suggested to separate the manuals into non-contiguous days. The most popular suggestion is to have 4 books:

Monday,
Tuesday,
Wednesday, and
Thursday and Friday.

Mark Katz stated there should be more session notes for Cincinnati than Anaheim with more DEC submissions than ever. Additional discussion centered on the page counts which, like the SIG Newsletters are based on previous history. The question was raised that how can we get adequate page count if we're restricted by symposia 4 or 5 years ago. The algorithm needs to consider the number of sessions involved and possibly the percentage of people who submit sessions.

Mark Katz brought up that Digital sessions are often submitted without speaker names, so Mark doesn't know who will submit the session notes. Can the submitter field be used to identify who Mark should contact for session notes.

Gerald Lester requested that Mark Katz insert a bold notice between sessions to make it easier to tell where one stops and the other ends. Because of the white space involved, this is virtually impossible to expect it to be approved. After discussion, Mark stated that he would look at the possibility of having a header or footer for each page with the session identifier on it.

15. Organization of Folder Editing timing and tasks (new job):

This discussion was cancelled as the person who volunteered to be Folder Editor has withdrawn the offer.

16. L&T Volunteer management: Volunteers & Masters Databases: (Bob Van Keuren)

Dave Ream is constructing databases for volunteers and master. Sam Whidden sent him information, including feedback and survey forms. Sam made copies for Terry, Gary, and the working group chairs.

Dave is thinking about the database design for the sheets. He sees two types of records:

1. Persons: name, address, phone, areas of interest.
2. Survey: for miscellaneous stuff. There are many questions, which we can boil down to just a few. It would be easy to metricize them, with comments.

Dave will create reports for steering committee members.

Dave asked how long we should keep survey information. Sam replied that survey stuff doesn't need to be preserved. We should maybe send it to others, such as in DECUS. You don't need to fill your garage with information.

There is also a question how to file volunteer information. Maybe not in the database. What changes do we need? Some questions are 'Who are you?' information. Maybe we should store the date of entry into the database. Indicate which symposia they go to--fall, spring, or 'I don't know.'

Sam said we will budget if you want to send a form letter. He also mentioned that it is important to thank people who fill out a form. We can compile a list of various people: steering committee, session chairs, etc.

Earl said he put in a tear-off sheet to send back. He wants to get feedback about taking names off the list.

Joe Pollizzi suggested a generic letter about attendance. After we get one made, we can decide just how we are going to use it. Earl suggested just a little box to check off and return. Mark Katz suggested several little boxes. Earl added 'and a 22-cent stamp.'

It was mentioned that a lot of people use the fact that they are doing something at DECUS as a way of getting to go to symposia. Give them some options to do something.

Sam noted that we need help; we need to spread the work load. We can add more people to the steering committee and give them whatever titles you like to get them to help.

17. Cooperation with VAX SIG on Masters Directory: (Bob van Keuren)

The VAX SIG talked is interested in doing a Masters list, but haven't yet.

We would like to see the Masters concept used by many SIGs. The Steering Committee discussed whether we could put "VAX Masters" on our list since the VAX SIG isn't doing it yet. We will ask the VAX SIG whether they would like us to try it as it may help to be a deciding factor for the VAX SIG (and others) if people use the VAX Masters. (Dena Shelton is the Masters Coordinator)

18. New Wishlist procedures & timing: (Lisa Kerby-Rodgers)

The comment was raised that previously the wishlist had no real direction. General consensus is the desire to have the wishlist cycle start at one symposium and complete at the following symposium (with the next cycle starting at the same time). Some discussion centered on the balloting process: if placed into the newsletters, the turnaround time is too great to expect DEC to have proper time to review and respond if we wait to give them the wishlist items after the ballots are returned; if voted on at the symposium where brought up, then 80% of the DECUS membership is excluded for that cycle. Another point brought up is that only 20 - 30% of the DECUS membership subscribes to the SIG newsletters (another problem). Final results of the discussion are:

- a. Working Groups need to be brought into the cycle - for both analysis of the need and for getting input for the wishlist. At least one WG Chair assigned with each submission to keep track of and provide clarification/input for DEC.
- b. Preliminary "balloting" done at symposia (by WG Session or wishlist session or both).
- c. 2 or 3 lists need to be made up for easier management by L&T and DEC. (ie. one each for Languages, Tools, and Methods).
- d. Keep it simple until we know what works.
- e. Go with the following wishlist "flow":
 - SPRING SYMPOSIUM :
 - Working Groups submit wishlist items received since last wishlist deadline and from the current symposium
 - L&T Meetings receive wishlist items
 - Wishlist items received from L&T folders
 - Wishlist items received from campground
 - Wishlist coordinator, Working group chairs sectionalize wishlist items
 - AFTER SYMPOSIUM:
 - Wishlist coordinator creates master lists, sections them off according to Working Groups
 - Copy to Newsletter Coordinator (Al) by June 15 also copy to Working Group Chairs and DEC
 - AUGUST SIG NEWSLETTER: Wishlist Ballot in Newsletter
 - END OF SEPTEMBER/FIRST WEEK OCTOBER: Results to DEC
 - FALL SYMPOSIUM:
 - DEC response at symposium
 - Start of next wishlist cycle with similar time frame to above.
- f. Also need to provide mechanism for notifying 3rd party vendors of the user's wishes for items entered that are not DEC products.

19. Seminars: (Joe Pollizzi)

Barry had many more PSS suggestions that reached him at Anaheim, but they were too late for Cincinnati. As a result, Barry is asking that any suggestions be sent to him now BEFORE Cincinnati for inclusion in Anaheim.

L&T has had a good growth in the number of PSS's - from 2 to 7 even though there is no longer any financial benefit back to the SIG. Good reflection on L&T.

The idea of compensating PSS speakers was raised. Current feeling indicates that there exists many excellent speakers who would be more

willing to spend the time and effort putting together a quality seminar if some form of compensation/recognition were given. Even "just" free registration into the symposia for the week would be appreciated by many.

Some ideas raised concerning PSS's:

- a. Possibility of 1/2 day seminars?
- b. Double teaming - will PSS committee support two presenters?
- c. Selling PSS notes/text outside of seminar as a mechanism of revenue, and the
- d. Concept of taping the seminars.

20. Cincinnati Clinic: (Joe Mulvey)

Sam Whidden asked whether or not the CM Working Group really needs to have a separate Clinic from the L&T Clinic. The separate clinic was justified on the basis that discussions of CM within DECUS are fairly new and have generated much discussion during the last three symposia. Also, it may not be obvious to those interested that CM may/will be covered by the L&T Clinic. There were no objections to having this separate. L&T may want to consider expanding the abstract for the L&T clinic to mention more of the products/topics that are covered.

All products are going to be covered during the FULL clinic schedule. Past symposia indicate this is the best way to handle the clinic.

It was decided that for the Cincinnati Symposium, Campground hosts and product "experts" will wear sashes (much like Miss America!) to identify themselves to people coming into the clinic looking for help.

We should also see if round tables can be placed in the campground with the "experts" spread across the tables - this encourages group discussion/interaction. Rather than have the L&T doctor answer one question and then have the next person come forward, several people can hear/possibly provide the answer AND reduce some of the duplicate questions.

The L&T ANSI standard reps WILL be at the clinic and identifiable.

Question was raised and answered : Any expert, not just DIGITAL employees can be a "L&T Doctor" and will be identified as such.

L&T Masters (and any Masters from other SIGs who would like to participate) are expected to be available and identified.

21. L&T Session Indexes: (Mark Kidwell)

Several different indexes were passed out for review. The sessions for L&T were sorted three ways: by number, by day and time, and by room. All were judged to be VERY useful. A request was voiced that having a session list by topic or keyword would be nice. Earl Cory noted that this has been done. One such index was created for EVERY word occurrence, which created a listing book 5 inches thick!! The cost versus benefit for providing such extensive indexing to members is highly questionable. Right now, best known method is to rely on the working groups for providing "streams" for such comprehensive breakdowns.

22. L&T Standards Activities calendar & budget: (Bruce Mebust)

It was discussed that the Standards Coordinator must report four times a year on standards meetings attended by L&T reps, and on reports that they have provided for DECUS.

We are looking for a FORTRAN representative.

Jay Wiley raised the question of involvement in IEEE standards efforts. Steve Jackson will investigate.

Trip Reports will be forthcoming for any meetings supported by L&T. Reports will be given at Woods meetings, symposia, and published in newsletters.

A session on standards will be given at symposia. Placeholders should be put in each symposium to cover active standards issues.

23. SIG Job Descriptions: (Mark Kidwell)

We need to have detailed job descriptions for the different positions in the SIG. This is needed not only for transitions within the SIG (new people coming in, old leaving) and "transfers", but for the SIG Council to document the activity of the SIG, and possibly provide justification for budget requests (ie. amounts needed for Woods meetings). Joe should be responsible for an overall description for the Working Group chairs.

24. Alternate methods of session identification: (George Scott)

This topic was deferred.

25. L&T Logo: (Sam Whidden)

It was felt that a new SIG logo would be nice, but no one had any ideas.

26. Planned FY89 SIG budget (George Scott):

Sam passed out copies of the FY89 SIG budget.

27. Woods Meetings: (Lisa Kerby-Rodgers)

Next Woods meeting is in Nashua on Sunday, July 24 (L&T) and Monday July 25 (for meeting with DEC). Need to have DECUS office start planning now. We would like an Inn not the Tara. Part of the reason is expense. If Sam had known how cheap the Houston Woods Meeting Hotel was we would have had a three day meeting! BUDGET & FINANCE has cut the Woods budget somewhat. This may not hurt us too much as not everyone shows up who is invited. We may want to invite several extra Working Group Chairs to cover for those who don't show up and increase the communication within the SIG.

Celeste requested an agenda of items for Monday when at Spitbrook. Originally Sam wanted to allow the agenda to develop between now and July, but Celeste pointed out that we plan our meetings during the "prime vacation" time PLUS for the counterparts we often impact on the weekend. Celeste would therefore like to know who to request for the meeting well in advance. Suggestions for topics were:

- a. WG roles from the DEC developer side - How can they help DEC from a technical counterpart role?
- b. DEC's view of the SIG: how have we done, how are we doing, and what do we need for better communication between DEC and DECUS L&T?
- c. Have Celeste choose which WG Chairs are going to attend.
- d. DEC company organization - how it all fits together
- e. Have several developers who have been to DECUS symposia (both one who's only gone to 1 and one who's an "old-timer). Give their view of L&T.
- f. Have both individual and group discussions - alternate suggestion: Have us break into several groups based on languages, tools, and methodologies and talk to the respective developers.
- g. If we get non-disclosure back, have time for the non-disclosure items.
- h. DEC's approach to support of the OEM market.
- i. Have someone present to us what DEC has in mind for CASE - how will it affect us via changing Engineering? (Possible problem with Non-Disclosure)

- j. Celeste - Would we be interested in a presentation on object oriented design? Answer: Yes.
Also would like L&T to have 3 people state how we view DEC (ie. participation, feedback, supportiveness). By having 3 people present we reduce the risk of the "discussion becoming a many to 1 confrontation."

Celeste - Will tentatively plan on the morning as one group, object oriented presentation (possibly in afternoon), other areas to be identified when who (DEC) can attend becomes known. Will plan on having breakout sessions (Languages/Tools/Integration/PDP-11) during the afternoon.

28. SIG Activity Plan: (George Scott)

The primary topic was travel to symposia of other chapters (Non-US DECUS's). For example, DECUS Australia would like an US DECUS L&T member to give a presentation on CASE. DECUS US L&T might pay the way. Anybody that wants to go outside the US should present a plan to Sam Whidden. He will note the request. L&T SIG members present had no knowledge of a DECUS organizational body above the chapter level.

29. Counterpart Activities: (Steve Jackson)

Our DEC counterparts gave a report on the meeting of DEC counterparts. Very positive feedback came from the meeting. The use of the exhibit hall was talked about with a consensus that a combined schedule for the DEC personnel needs to be publicized/posted. The combined schedule consisting of a listing when a given developer is going to be at a campground or the exhibit hall. This is to encourage better utilization of the exhibit hall, DEC/customer feedback, and to move some of the demonstration of Digital Products BACK INTO the exhibit hall.

30. Other Matters: (Sam Whidden)

The symposium committee could publish an order form for session tapes with short titles to make it easier to order tapes.

Earl noted that if your abstract has been edited (by DECUS) to be longer than 20 lines it won't resubmit. If trying to resubmit an abstract for another symposium then cut down the abstract so it will work and send a message to Earl to reformat it.

Steering committee members find that DCS is extremely slow on the 800 line even when there are only 1 or 2 users.

Joe mentioned that there are companies that won't send representatives to DECUS if they can't promote the company. How can those companies be shown how much they're missing by staying away? Sam replied by mentioning the Board of Director's efforts to involve CEO's in DECUS management days. More articles on DECUS benefits should be appearing in management publications. An idea brought up was that a video for CEOs and MIS managers on the symposia should be done showing the benefits of attendance. DECUS Leadership could then request free copies of the video to show their management (have the video as part of a LUG's library also?). Perhaps this way, some steering committee members won't have to take vacation to attend symposia, woods meetings.

VAX LANGUAGES AND TOOLS RELEASE STATUS

VAX (tm) Ada (r) - Q*056

Current Version: V1.5
V1.5 Began Shipping: February, 1988
Major Features: - Full ANSI Language
- Production quality
- Highly integrated into VAX/VMS Environment
- Multi-language capabilities
- Comprehensive diagnostics
- U.S. Government validated
- Full symbolic debugging support
- VAX Language-Sensitive Editor support

(tm) VAX is a trademark of Digital Equipment Corporation
(r) Ada is a registered trademark of the U.S. Government (Ada Joint Program Office)

VAXELN Ada - Q*A97

Current Version: V1.2
V1.2 Began Shipping: March, 1988
Major Features: - Compatible with VAX Ada
- Retargetable to real-time/embedded environment
- Remote debugger
- Tailorable run-time environment
- Run-time library retargetted from VAX/VMS to VAXELN
- Package of interfaces to VAXELN services

VAX APL - Q*020

Current Version: V3.0
V3.0 Began Shipping: July, 1987
Major Features: - Nested arrays
- Several minor Apl extensions
- Performance improvements
- APL can call other VAX languages which adhere to the VMS calling standard
- Multi-key ISAM
- Full screen editing

VAX BASIC - Q*095

Current Version: V3.2
V3.2 Began Shipping: November, 1987
Major Features: - Embedded graphics statements
- Structured error handling
- Optional line numbers
- Print using format strings

VAX Bliss - Q*106

Current Version: V4.4
V4.4 Began Shipping: February, 1988
Major Features: - Ease of use
- /Check qualifiers
- /Cross reference switch
- VAX Language-Sensitive Editor support

VAX C - Q*015

Current Version: V2.4
V2.4 Began Shipping: May, 1988
Major Features: - ANSI X3J11 features
- Full debug support
- CDD support
- VAX Language-Sensitive Editor support
- VAX Source Code Analyzer support
- Improved run-time routines for UN*X compatibility
- Shareable run-time library is distributed as part of VMS

(VAX C/ULTRIX - ships with ULTRIX-32 kit, currently shipping V2.4, October 1987)

VAX COBOL - Q*099

Current Version: V4.0
V4.0 Began Shipping: January, 1988
Major Features: - ANSI-85 implementation
- Multi Stream DBMS Support
- DSLA Support
- Federally Validated at a High Level, ANSI 85
- VAX Language-Sensitive Editor support
- Screen handling extensions
- Extended DML
- Support for VAX COBOL Generator

VAX COBOL Generator: Q*365

Current Version: V1.2
V1.2 Began Shipping: January, 1988
Major Features: - 4GL approach to COBOL programming
- Graphical interface
- Generates error-free VAX COBOL code
- direct access to RMS and Rdb
- promotes structured design

VAX DEC/CMS - Q*007

Current version: V3.0
V3.0 Will Begin Shipping: May, 1988
Major Features: - A callable interface
- New security features
- Significantly improved performance
- Groups for the easy organization of related files
- VAX Source Code Analyzer support
- Binary and ASCII file support
- Distributed support thru DFS

VAX DEC/MMS - Q*500

Current version: V2.3
V2.3 Will Begin Shipping: May, 1988
Major features: - Support for VAX Source Code Analyzer
- Support for CDD
- Support for TDMS
- Support for FMS
- Support for CMS V3.0

VAX DEC/Shell - Q*143

Current Version: V2.0
V2.0 Began Shipping: January, 1987
Major features: - An alternate command line interpreter
- UUCP, NROFF and termcap support
- A set of commonly used UNIX utilities
- Bourne Shell

VAX DEC/Test Manager - Q*927

Current Version: V2.3
V2.3 Will Begin Shipping: May, 1988
Major features: - Ability to test interactive applications on a
character cell terminal
- Increased integration with VAX DEC/CMS (can store
tests in a CMS library for Test Manager retrieval)
- Performance Improvements
- Ability to edit session files

VAX DOCUMENT - Q*ZE7

Current Version: V1.0
V1.0 Began Shipping: September, 1987
Major Features: - Generic markup language
- Multiple document designs and styles
- Sophisticated page composition and pagination
software
- Complete book-building facilities
- High quality output
- Integrated into the VAX/VMS Environment
- VAX Language-Sensitive Editor support

VAX FORTRAN - Q*100

Current Version: V4.8
V4.8 Began Shipping: March, 1988
Major Features: - VAX Language-Sensitive Editor support
- Global optimizations
- CDD support
- Records
- VAX Source Code Analyzer support

(VAX Fortran on ULTRIX - Q*A99, Currently shipping V4.7 December, 1987

VAX Language-Sensitive Editor: Q*057

Current Version: V2.2
V2.2 Began Shipping: May, 1988
Major Features: - Interfaces with CMS, SCA
- User diagnostic file support
- Supports Ada(r), Basic, Bliss, C, COBOL, Fortran,
Pascal, PL/I, SCAN, EPascal, Dibol, and
others
- Edit, compile, review, and correct compilation
errors within a single editing session
- Speeds up source code entry using formatted
language-specific source code templates
- Provides for interactive editing capabilities during
a debugging (VAX Debug) or performance analysis
session (VAX Performance and Coverage Analyzer)
- User tailorable and user extensible
- Extensive on-line help for supported VAX languages

VAX NOTES: Q*960 - Server

Q*ZIT - Client
AL960A9-PD (see note)
Current Version: V1.3
V1.3 Began Shipping: January, 1988
Only functional change is to support LMF. Therefore, this version is
for VMS V5.0 only.
Major Features: Computer-based conferencing software
- Supports on-line discussions between groups of people
- Project team communication
- Maintains a permanent record of discussions
- Easily accessible by variety of search criteria
- Unique distributed architecture
- Server based
- Leadership performance in DECnet networks
- Easy discussion between geographically
dispersed groups
- Easy to learn and use
- Choice of DEC standard editing styles

Note: The 4-user license contains server capabilities that allows
four simultaneous users of nodes. The UBC options is additive (i.e.,
4-user, 8-user, 12-user).

VAX Pascal - Q*126

Current Version: V3.7
V3.7 Began Shipping: April, 1988
Major Features: - New ANSI standard
- Performance/runtime optimizations
- CDD support
- VAX Language-Sensitive Editor support
- Compatibility support for VAXELN Pascal
- Source line debugging
- VAX Source Code Analyzer support

VAX Performance and Coverage Analyzer - Q*119

Current Version: V2.0

V2.0 Began Shipping: April, 1988

- Major features:
- Helps to find execution bottlenecks in application programs
 - Provides test coverage analysis to determine which lines of an application are executed by a given set of test programs
 - Has an interface to the VAX DEC/Test Manager
 - Windowing
 - Ada Support
 - DSLA

VAX PL/I - Q*114

Current Version: V3.1

V3.1 Began Shipping: December, 1987

- Major Features:
- VMS integration
 - IBM features
 - VAX Language-Sensitive Editor support
 - CDD support
 - Compile-time pre-processor

VAX Software Project Manager - Q*A82

Current Version: V1.1

V1.1 Began Shipping: January, 1988

- Major features:
- A software development project management system designed to plan, schedule, and estimate projects.
 - Contains WBS (Work Breakdown Structures) that shows all tasks in a tree structure.
 - Choice of user interface, menu-driven or command line mode
 - Uses traditional project management tools, PERT and CPM (Critical Path Method), and Gantt charts to help keep projects on time
 - Easy to use graphic interface
 - Generates a variety of reports and charts
 - Enhanced date and time

VAX RPG II - Q*631

Current Version: V2.1

V2.1 Began Shipping: September, 1986

- Major Features:
- Conforms and is an extended implementation of the IBM RPGII defacto standard
 - Fast compile and runtime performance
 - Full screen editor
 - Compatible with IBM implementations on Systems 3, 34, and 38
 - CDD support
 - FMS translator for System 34 screen handling

VAX Source Code Analyzer - Q*ZBZ

Current Version: V1.2

V1.2 Will Begin Shipping: May, 1988

- Major Features:
- Faster LOAD and query performance
 - Multi-language source code cross-reference, navigation, static analysis tool. More than just a browser.
 - Works for entire system not just individual modules.
 - Closely integrated with LSE. All SCA commands are available from within the editor and user can directly access and modify the appropriate source code even if using CMS.
 - DSLA

VAX Scan - Q*495

Current Version: V1.1

V1.1 Began Shipping: January, 1987

- Major features:
- A complete VAX programming language used to create programs that deal with pattern matching and text transformation
 - Used for creating translators, preprocessors, filters, and parsers
 - To build tools for converting data from other vendor's computing equipment
 - Finds and replaces text in files

VAXset - Q*965

Q*966 (Educational License)

Current Version: V6.0

V6.0 Will Begin Shipping: May, 1988

- A package of software engineering tools consisting of:
- VAX DEC/CMS
 - VAX DEC/MMS
 - VAX Language-Sensitive Editor
 - VAX Performance and Coverage Analyzer
 - VAX DEC/Test Manager
 - VAX Source Code Analyzer

VNXset - Q*A80

A*A81 (Educational License)

Current Version: V5.0

V5.0 Will Begin Shipping: May, 1988

- A package of software engineering tools consisting of:
- VAX DEC/CMS
 - VAX DEC/MMS
 - VAX DEC/Shell
 - VAX C

Software Portfolio

Base Program Development Portfolio

Q42DA
Q82DA
Q22DA
Q02DA
Q32DA

Current Version: V1.0

V1.0 Began Shipping: January, 1987

A package of licenses that can be rented or a monthly basis for VAXstations or MicroVAXs. Includes licenses for:

- VAX ACMS	- VAX GKS
- VAX APL	- VAX LSE
- BASEVIEW	- VAX Notes
- VAX BASIC	- VAX PASCAL
- VAX BLISS	- VAX PCA
- VAX C	- VAX PL/I
- VAX CDD	- VAX Rdb/VMS
- VAX COBOL	- VAX RPG II
- VAX DATATRIEVE	- Remote System Manager Server VMS
- VAX DBMS	- Remote System Manager Client VMS
- VAX DEC/CMS	- VAX SCAN
- VAX DEC/MMS	- VAX SCA
- VAX DEC/Test Manager	- VAX TEAMDATA
- VAX FMS	- VAX TDMS
- VAX FORTRAN	- VAXELN Toolkit

Extended Program Development Portfolio

Q42DB
Q82DB
Q22DB
Q02DB
Q32DB

Current Version: V1.0

V1.0 Began Shipping: January, 1987

This package includes all licenses that are in the Base

Program Portfolio plus:

- VAX Ada	- VAX RALLY
- VAX COBOL Generator	- VAXELN Ada
- VAX LISP	- VIDA
- OPS5	

Program Development Run-time Portfolio

QZZDC
Q32DC
Q02DC

Current Version: V1.0

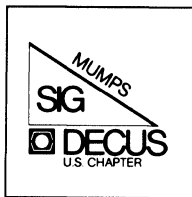
V1.0 Began Shipping: January, 1987

This package is used for application run-time environments on

MicroVAX systems only. The products included are:

- VAX ACMS Remote Access Option	- VAX LISP
- VAX ACMS Run-time Option	- VAX Notes
- VAX CDD	- VAX OPS5
- VAX DATATRIEVE	- VAX Rdb/VMS Run-time Option
- VAX DBMS Run-time Option	- VAX TDMS Run-time
- VAX FMS	- VAX TEAMDATA
- VAX GKS	- VIDA

GLOBAL ACCESS



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



GLOBAL ACCESS

Volume 1, No. 6

May, 1988

MUMPS means you never have to say you're sorting.

\$VIEW(Editor)

I don't want this piece to sound like an obituary, but I'm afraid that at least a little of that aspect is inevitable, so here goes: on February 24, Bill Leroy resigned from DECUS. At that point, his numerous DECUS hats included Chairmanship of both the Atlanta LUG and the SIG Publications Committee (which brings you this amazing compendium of editorial excellence every month). Bill had done some reflecting, and come to the (unfortunate for DECUS) conclusion that his heavy DECUS commitment was just not compatible with the rest of his responsibilities.

I first met Bill bright and early on the Sunday morning which preceded the initial Symposium I attended after joining the MUMPS Steering Committee. We chanced to sit next to each other in a leadership training session, and proceeded to work together on the assigned problems. This pure coincidence turned out to be a great stroke of luck. Back then, Bill was the RT-11 SIG Newsletter Editor, and already totally qualified in DECUS leadership arcana. I was brand new, and feeling like I had just parachuted into a strange city with a blank page where the roadmap was supposed to be. Bill did a lot to put information on my roadmap. For that, and for all the other ways Bill helped me personally, and DECUS in general, I would like to express my thanks. And, I am sure you will all join me in wishing Bill the best of luck in all his future endeavors.

\$DATA

Just look at all the goodies we've cooked up for you in Cincinnati:

General Interest

MUMPS Roadmap	M010	Mo	9:00AM
Multi-Lingual Translation of Text	M021	Mo	9:30AM
DECUS Abstract Keyword Index	M014	Mo	10:30AM
Large MUMPS Systems	M005	We	4:00PM
MUMPS System Management Panel	M006	We	5:00PM
MUMPS Tricks and Treats	M008	Th	8:00PM
MUMPS Development Committee Report	M019	Fr	10:00AM
MUMPS Future Planning Session	M018	Fr	1:00PM

Tutorials

Multi-Way B-Tree Database Implementation	M009	Mo	11:30AM
Software Prototyping	M020	Mo	6:00PM
MUMPS Tutorial, an Overview	M016	Mo	7:00PM

Public Domain Software

The Government and MUMPS	M004	Tu	2:00PM
Medical Query Language (MQL): An Application Generator for MUMPS Applications	M017	We	3:00PM
Full Relational Database in the Public Domain	M022	Fr	9:00AM

DSM Specific

DSM Product Panel	M015	Tu	9:00AM
DASL--A 4th Generation Application Generator	M011	Tu	10:00AM
DECRAD: Radiology Application System	M012	Tu	1:00PM
DSM and Networking	M007	We	12:00M
FMS, All-IN-1, and MUMPS	M013	We	2:00PM
MUMPS Dump Busters	M002	Th	7:00PM

\$HOROLOG

May 8	Submission deadline for July newsletter
May 16-20	Spring '88 Symposium; Cincinnati, OH
June 13-17	MUG '88 Conference; New Orleans
October 17-21	Fall '88 Symposium; Anaheim, CA

\$ORDER("Podium")

EVERYBODY misuses the word *podium*. The podium is the wooden contraption you stand behind, clamp your microphones to, and rest your note cards on while you're making a speech, right? (Joe Clubmember told several amusing stories while he was behind the podium....) Wrong! The podium is the dais or platform Joe was standing on at the time. The word comes from the Greek root *pod-* which means *foot*. The same root appears in the English word for "foot doctor," *podiatrist*. And, to finish straightening things out, the proper term for the microphone and note card stand is *lectern*, from the Latin word *lector*, meaning *reader*.

\$NEXT

Did you know that there is a Kermit written in MUMPS? Find out about that, and what really went on at the Cincinnati Symposium, in the July issue.

\$NEXT(\$ORDER)="Mission"

\$RANDOM

"Unless you're the lead dog, the scenery never changes."
--Bumper sticker

RSTS/E



May, 1988
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RST

From the Chair
Charles W. Mustain
RSTS SIG Chairman

A new generation of RSTS managers are meeting the challenges of their new jobs without benefit of the rich RSTS culture we "old timers" enjoyed. Gone are the RSTS Professional magazine and the CACHE BUFFER newsletter which was once sent to every DECUS member expressing an interest in RSTS. Both publications were filled with how-to articles, technical tips, letter columns, new utilities, and discussions about what's new in RSTS.

Our SIG Editor, Terry Kennedy, is bringing to the RSTS pages of this newsletter all those "cultural" benefits for the RSTS community. There is, however, a small problem (pun intended). Only a very small part of the RSTS community in DECUS receive the SIGS NEWSLETTERS. This is no doubt in some part due to our SIG's past record of not publishing regularly. We believe that Terry has resolved this problem.

We now need your help in spreading the word to the RSTS community. When you speak to other RSTS users, at LUG meetings, at Symposia, or to consulting clients, wherever, please make them aware of the revitalized newsletter. Carry the message that it is available to them as a source of information and as a place for sharing problems, solutions, neat bits of code, and general RSTS hints and kinks.

We know from surveys that there is a large RSTS community. We know that this includes many people new to RSTS using versions ranging from 5c to 9.5. With your help in spreading the word, your help in contributing articles and sharing insights, this newsletter can provide a meaningful service to all of us who use RSTS, DEC's friendliest operating system.

NEXT MONTH: Why upgrade to the latest version of RSTS?

From the Editor
Terry Kennedy

It's Spring again (or will be by the time you read this), and that means it's time for another Symposium - this time in Cincinnati. As usual, the SIG has a full set of sessions scheduled. As I've mentioned before, a Symposium is an event not to be missed - if you can get your company to send you, great - if not, you might seriously consider taking the time as vacation and going anyway. However, if you can't make it,

RST-2

We'll be bringing you coverage of the high points in the RSTS Newsletter.

This month, we have a condensed abstract of the combined Spring/Fall 1987 RSTS SIG Tape Copy tape. This tape contains submissions from users like yourself. If you have some handy programs or information related to RSTS, feel free to submit it to our Tape Copy Coordinator, Franklin Mitchell (See the article itself for more details). The entire tape is on-line on the RSTS Newsletter system at (201) 915-9361.

We also have Digital's responses to the Fall 1987 RSTS wishlist items in this issue. Special thanks to Ginger Landry, RSTS/E Product Manager, and the entire RSTS development team for their time in preparing these responses and agreeing to share them with us.

Since the how-to form has been removed, here is how to contact me for submissions, etc.:

Via US Mail:

Terence M. Kennedy
St. Peter's College
Department of Comp. Science
2641 Kennedy Blvd.
Jersey City, N.J. 07306
(201) 435-1890

Via UPS, FedEx, etc.:

Terence M. Kennedy
St. Peter's College
Department of Comp. Science
121 Glenwood Avenue
Jersey City, N.J. 07306
(201) 435-1890

You may electronically submit material by calling the RSTS SIG bulletin board system at (201) 915-9361, or you may reach me as user KENNEDY on both DCS and DECUServe, if you have access to either of those systems.

You may submit material on RX50's or RX33's (in RSTS or RT11 format), on 800, 1600, 3200, or 6250 BPI 9-track tape (in EOS, ANSI, BRU, RSTS BACKUP or VMS BACKUP format), or on PC-DOS floppies (5¼ or 3¼ inch format). If you are really desperate, I can also accept RSTS or RT11 format RL02 and RK07 disks. You may also submit hardcopy documents, but these will take longer to get into print.

Cincinnati Symposium Session List

Session	Day	Time	Title
RS015	Mon	9:00 AM	RSTS Roadmap
RS002	Mon	9:30 AM	RSTS Announcements
RS003	Mon	12:00 PM	RSTS V9.6 Tech Changes
RS028	Mon	12:30 PM	EMT calls from BP2
RS005	Mon	1:30 PM	What is RSTS/E LAT?

RST-3

RSC22 Mon 2:00 PM RSTS/VMS Compatibility Manual
RSC06 Mon 3:30 PM PBS Overview
RSC04 Mon 8:00 PM Intro to RSTS Optimization
RSC19 Mon 9:00 PM RSTS Performance Tuning

RSC29 Tue 11:00 AM RSTS V8 Q&A
RSC10 Tue 12:00 PM Resident Libraries
RSC25 Tue 2:30 PM RSTS Tech Tips I
RSC11 Tue 3:30 PM VMS System Mgt. for RSTS Sys. Mgrs.
RSC12 Tue 5:00 PM File transfer RSTS to VMS

RSC20 Wed 9:00 AM RSTS Internals Update
RSC17 Wed 10:00 AM RSTS SIG tape / library
RSC01 Wed 10:30 AM RSTS System Modifications

RSC15 Thu 9:00 AM DECnet/E Programming
RSC07 Thu 10:00 AM Terminal Services
RSC09 Thu 11:00 AM RSTS RMS-11
RSC30 Thu 12:00 PM Security for RSTS/E systems
RSC26 Thu 1:00 PM RSTS Tech Tips II
RSC13 Thu 3:00 PM RSTS/VMS BASIC Conversion
RSC14 Thu 5:00 PM RSTS/VMS Q&A
RSC18 Thu 9:00 PM Asynch I/O from BP2
RSC21 Thu 10:00 PM RSTS/E Interprocessor Link

RSC08 Fri 11:00 AM BACKUP for System Managers
RSC23 Fri 12:00 PM RSTS Wish List
RSC27 Fri 1:30 PM RSTS SIG Wrap-up

Related Sessions of Interest:

Session	Day	Time	Title
LTC31	Mon	11:15 AM	PDP-11 Language Status/Futures
RXC04	Mon	4:30 PM	PDP-11 Futures - User's View
RXC03	Mon	6:00 PM	MSD Meets DECUS [Ed. Note: MSD is the organization within Digital responsible for the current PDP-11 product line.]

1987 RSTS SIG Tape Copy now Available

* * * * * 1987 Nashville/Anaheim RSTS SIG Tape. * * * * *

Please share your RSTS "goodies" with the RSTS SIG. Please send your 1988 RSTS SIG Tape submissions to

Franklin Mitchell (DCS MITCHELLF)
RSTS SIG Tape Copy
Erskine College
1 Washington Street
Due West, SC 29639-0086

RST-4

Preferred tape density/format is 1600 BPI mag tape in DOS format. V9 BACKUP format is also accepted but please no V8 BACKUP tapes. Other media can be accepted with some delay for conversion.

Please enclose a DECUS "Tape Copy Release Form" with your submission. A "Tape Copy Release Form" is in each Fall/Spring DECUS Symposia announcement or you can get one from me at the address above.

What to submit? See the examples included on this tape! Submit only your work. I.E., if you have modified a DEC CUSP, submit only the changes, not the whole CUSP.

This tape contains the following:

Account	Who	What
87.0	RSTS SIG	This file+MT.LST directory
87.1	DEC RSTS Development	Example .COM files, etc.
87.2	Erskine College	Goodies
87.3	Mike Mayfield	Goodies
87.4	Brian Nelson, Univ of Toledo	CLE
87.5	Brian Nelson	New CLE
87.6	The Univ. of Toledo	Kermit 11
87.7	The Univ. of Toledo	Kermit for various PC's
87.8	Ed Moran, Horace Mann School	Pascal library routines
87.9	James B. Wilkinson	TYPE
87.10	Terry Kennedy, St Peter's	DECUS C
87.11	Terry Kennedy College	Fortune Cookie program
87.12	Terry Kennedy	Cookie data
87.13	Terry Kennedy	Cookie data
87.14	Terry Kennedy	Back issues of newsletter
87.15	Terry Kennedy	System utilities
87.16	Terry Kennedy	DEC MAIL utilities
87.17	Terry Kennedy	MS DOS Kermit 2.30
87.18	Terry Kennedy	Games
87.19	Gene Alpern	Directory of all past RSTS SIG tapes.

Most accounts contain a README.TXT document with additional information.

Fall 1987 RSTS Wish List Responses

[Ed. note - this is a transcription of the supplied wishlist forms, combined with Digital's written responses. I apologize for any typographical errors which may creep in... Also, I have added some information (in brackets) where I thought it might prove useful.]

RST-5

- W1) DECnet/E - Add a VMS-compatible proxy login to DECnet/E.
Reason: Many RSTS/DECnet sites are managed by a common staff (multiple systems, 1 manager). The day-to-day copying of files currently requires the account and password to be supplied each time. This is a lot of typing and is also a security opening.
- A1) This is an excellent idea. We are currently investigating many different options in this area. Technically, this is a difficult problem (Tech. 3). While the actual implementation may be relatively small, a lot of effort must be expended researching and resolving the myriad security issues that a proxy login feature implies. Providing this feature would be very valuable to RSTS/E and DECnet/E, for exactly the reasons that were already stated with submission of this wish (Prod. 1).
- W2) DECnet/E - Add support for the NFT /BL qualifier to the DCL copy command, or better still, to have DCL append it automatically.
Reason: Many files require the /BL switch to successfully transfer across the net. DCL does not generate or support this switch. Therefore, users must know both the DCL and NFT commands.
- A2) We are looking at ways with the architecture committee to remove the need for /BL entirely. (Tech. 1, Prod. 2)
- W3) Asynch DECnet!
Reason: Good idea!
- A3) We hope to be able to commit to provide this feature in some future release of DECnet/E. (Tech. 3, Prod. 1)
- W4A) RMS-11 - Asynchronous I/O capability for RMS, especially with the "get next key" directive.
Reason: Would improve performance of typical RMS processing for report generation or similar applications.
- W4B) RMS-11 - Asynch I/O as in RSX
- A4) This capability would require more than minimal effort. Hence we do not expect it will happen in the near future. (Tech. 2, Prod. 2)
- W5) Executive - Add supervisor mode library support, as in M & M-plus. For user built libraries + system libraries such as RMS.
- A5) This is a good idea and has been requested in the past. We are investigating this feature. (Tech. 2, Prod. 2)
- W6) Executive - More than 65536 disk clusters.
Reason: Less waste.
- A6) This is also a good idea, however it would require a major re-write of FIP therefore it is very low on our priority list. (Tech. 3, Prod. 3)
- W7) Executive - Allow a default disk to be defined for each account.
Reason: Continually specifying a disk name is tedious and prone to error; using multiple disks for the public structure significantly degrades performance.
- A7) Although this is a good idea, it is technically hard to implement. (Tech. 3, Prod. 2)
- W8) Executive - Ability to specify a KB using the new interface style designation like KBG12: in all those SYS() calls that ask for an integer KB number. At least give us a simple SYS() call that would take the string "KBG12:" and return the integer KB number.
Reason: I bought a new terminal interface and had to modify and recompile seven million programs.
- A8) Done in FSS - SYS(CHRS(6%)+CHRS(-10%)+...) (Tech. 0, Prod. 0)
- W9) Executive - In FSS, allow the '*' character to complete a name or type field for wildcard lookup. The exec could simply convert the '*' to multiple '?'s. Leading '*'s could be disallowed for ease of implementation.
Reason: DIR A*.BAS is easier than DIR A?????.BAS
- A9) We will take this into consideration in the future. (Tech. 1, Prod. 1)
- W10) Executive - Would like a system service to get/put DCL symbol definitions like VMS LIBSGETSYMBOL and LIBSPUTSYMBOL. Also, LIBSDOCOMMAND (hope, hope!)
Reason: Many user applications are being done in DCL and more and more higher level languages need to interface with DCL. Reading and writing intermediate files to communicate is a hack!
- A10) We consider this difficult to do therefore it is currently a low priority item. (Tech. 3, Prod. 2) *[Ed. note - with enough spare time, it *is* possible to figure out how to read symbols from a program. Writing them is substantially more difficult. One of the major problems is that since the method involved is undocumented, it changes from revision to revision (radically!). I had it figured out for 9.1, but never updated it for later versions.]*

W11) Executive - Allow large files to be accessed without excessive window turning.
Reason: Files that require several retrieval windows, even at cluster size 256, could be optimized. Suggest a cluster number/block count double word type of retrieval entry similar to ODS format.

A11) Good idea - we've had this one on our list, but with a method that won't change on-disk structure. (Tech. 3, Prod. 1)

W12) Executive - Improved performance from the scheduler.
Reason: Scheduler overhead has become a significant overhead on large memory, heavily loaded systems.

A12) We are looking at ways to further optimize it. (Tech. 3, Prod. 2)

W13) INIT - Allow INIT to format and place a RSTS file structure on an RX33 diskette as a 1-step operation.
Reason: 1) This will prevent users from wiping out the RDXX with the diagnostics! 2) This collects all the preparation steps for RX33 media (which DEC supplies only in unformatted mode) in one convenient location.

A13) We are investigating the possibility of enhancing the DSKINT option of INIT to allow for the formatting and initialization of RX33 diskettes for some future release of RSTS.

W14) DCL - Faster DCL
Reason: It's too S L O W

A14) This is an ongoing process. (Tech. 3, Prod. 1)

W15) DCL - Use symbols as in VMS:
\$ DOIT=="SFOO.EXE"
\$ DOIT param1 param2
(almost like user CCL)
Reason: User defined CCL's / VMS compatibility

A15) Good idea, but we couldn't make it VMS compatible and compatible with current DCL. (Tech. 3, Prod. 1)

W16) DCL - Wildcard like VMS
Reason: VMS compatibility

A16) We are investigating this to see what can be done, if anything. (Tech. 3, Prod. 3)

W17) Define values for escape, linefeed, return, etc. within DCL.

Reason: We use several "bold" prompts on video terminals and are forever defining escape of one form or other, using it once and clearing it out.

A17) It is better that only the people who need it, define it themselves rather than increase everyone's symbol table overhead. (Tech. 2, Prod. 3) [Ed. note - We have a program called 'spit' which checks the terminal attributes first, and then performs the necessary prompting, for example: SPIT BOLD, "Enter option", NORM]

W18) DCL - Help more like VMS, where one can enter the subtopic at "press RETURN to continue..."
Reason: VMS compatibility

A18) Good idea. Not as easy as it sounds. (Tech. 2, Prod. 2)

W19A) DCL - Here's a little one - how about being able to repeat the last line input (to DCL) with minimal editing?

W19B) DCL - Allow interactive cmd. editing & retrieval of the last 10 (or 20) cmnds.

W19C) DCL - Command line editing in DCL. (This is more important to me than LAT support).

W19D) DCL - It seems to me that it would be nice if you could recall the last few commands you had typed. I've seen it in VMS.

A19) This is a very nice feature. It would be hard to do and require major work in TERSER. Also potential large increase in memory usage. (Tech. 3, Prod. 2) [Ed. note - This is available in the CLE package in the '87 SIG tape. Be sure to get the one that doesn't require elevated privileges (That's the one in the [87,5] account)].

W20) DCL - REMOVE/JOB=9/QUERY would print a SYSTAT-like line and ask "Really remove?"
Reason: I don't want to kill the wrong job.

A20) Good idea. We will look into this sometime in the future. (Tech. 2, Prod. 1)

W21) DCL - Exit with no prompt
Reason: Same uses as Basic-Plus's exit with no prompt.

A21) At some point in the future, we will look into this. (Tech. 2, Prod. 2)

W22) Enhance the SET command by giving the /QUERY capability to more of the SET commands.

A22) Good idea. We will consider this sometime in the future.
(Tech. 2, Prod. 1)

W23) For SHOW QUOTA, the ability to specify at least: a PPN,
better: a wildcard PPN, best: A PPN range.

A23) Good idea. We will commit to this in a future release.
(Tech. 1, Prod. 2)

W24) DCL - New DCL command: SET SYSTEM/NOBULL[DOG]

A24) We like /BULL_DOG but not /NOBULL_DOG! How about
/NO_CHESHIRE_CAT? (Tech. 1, Prod. 1)

W25) DCL - Please provide documentation/examples of more
complicated DCL procedures - currently each function is
detailed but very little attention is given to how to
actually use them.

A25) Good idea. We will consider this sometime in the future.
*[Ed. Note - RSTS Engineering usually gives a talk on
'Advanced DCL' at Symposia. You could order the audio tape
(see the Symposium information packet). Also, the examples
from that presentation (and others) are on the '87 SIG
tape in account [87,1].]*

W26) DCL - Pass substituted symbols to programs (like VMS).
Reason: 1) VMS compatibility 2) Eliminate generation of
temporary command files by "main" .COM files.

A26) Highly desirable, but very hard to do. (Tech. 3, Prod. 1)
*[Ed. note - See my article "Why you can't manipulate DCL
symbols" right after this wishlist article.]*

W27) DCL - Don't charge the (sometimes large) DCL .TMP workfile
to a user's disk quota.
Reason: I'm tired of explaining several times a day to
students why they can't log out even though DIR says they
are below quota.

A27) We are considering ways of resolving this issue. One
method under consideration is placing all DCL .TMP files
into one account, therefore the user is not charged for
the disk space being taken up by that file.

W28) DCL - Copy was /RETAIN
Reason: The way it was (V8). Why did it change?

A28) Changes was made for VMS compatibility. You are creating a
new file, so the default should be /NORETAIN. (Tech. 1,
Prod. 3)

W29) PBS - Add an /APPEND switch to a /LOG_FILE= so we can

append batch logs together.

Reason: Reruns of batch jobs erase the previous log file
and often fail because of other than the original problem.

A29) This is a good wish and we will consider it for some
future release of RSTS/E. (Tech. 2, Prod. 2)

W30) PBS - Support PBS over DECnet
Reason: To be able to print to a device on another node.

A30) This has been a long-standing wish for PBS. We continue to
keep it in the list and at some point will consider this
when planning updates. (Tech. 3, Prod. 1)

W31) PBS - Remove words like "entry" etc. from a show queue
command and put in the form name instead.
Reason: There is all sorts of information we need about
the queue without having header info repeated on each
line!

A31) We have had a wish in the past for a selected SHOW
ENTRY/BRIEF=() command. This would be more useful to a
wide variety of customers. (Tech. 3, Prod. 2)

W32) PBS - A way to initialize/set-up a printer before and/or
after printing a job.

A32) We are looking at it. In the meantime, you may want to
try: Allocate device, PIP setup-file to it, Allocate
device to PBS. (Tech. 3, Prod. 2)

W33) RSX emulator - Allow RSX-style binary I/O (IO.RNE...) to
KB:

A33) Thank you for your suggestion. We will look at it (already
have MODE 1% in RSTS-style I/O). (Tech. 2, Prod. 3)

W34) RSX emulator - Memory-resident overlays
Reason: Execution speed

A34) It's in the manuals - TKB and MAKSil explain how to create
code only (read-only data) memory-resident overlays.
(Tech. 0, Prod. 0) *[Ed. note - You could also build a
normally-overlaid task and run it from the virtual disk]*

W35) Backup package - Backup to handle command lines longer
than 1024 characters.
Reason: So we can include/exclude a sufficient number of
files.

A35) We will look at a way for you to select more files. (Tech.
1, Prod. 1)

W36) Backup package - Have Backup create a bootable medium, or make SAVRES go faster on TK50's!

A35) No future development in SAVRES. Use RECOVER.COM (Tech. 3, Prod. 1) *[Ed. note - RECOVER.COM is documented only in the V9.C Release Notes - it allows you to make a bootable tape which can then be used to restore BACKUP savesets. Also see the 1987 SIG tape, which has a routine to make combined DOS/ANSI (Bootable BACKUP) tapes.]*

W37) Backup package - Backup should produce some stats such as # tape errors/tape, last file written to each tape, elapsed time, etc.

A37) We will look at this sometime in the future. (Tech. 2, Prod. 2)

W38) Backup package - Backup should be able to use the same account wildcarding as ACTMGR:
 BACKUP DU0:[100-200,*]*.* FOO.BCK

A38) At some point we will look at a way to select more files, maybe using ACTMGR's wildcarding. (Tech. 3, Prod. 3)

W39) All - Don't let RSTS/E die!
 Reason: It's the best OS around!

A39) RSTS has proven itself over the years and has a large dedicated customer base. Thank You for your investment...

W40) All - Keep up the good work!

A40) Keeping up the good work is a hard task. RSTS Engineering always tries to do what is best for the product and most of the time it is fun to do. Your job, which is also hard to do, is to keep us on the right track...

W41) All - It appears we must convert or coexist with VMS if we are to tap any of the new products. RSTS/E has been and is a fine product meeting most of our needs in a very easy, friendly, secure way. My wish: Please so everything possible, with high priority to facilitate co-existence and conversion.

A41) Digital is very concerned about continuing to meet the needs of its customers. For the RSTS customer, this need may mean coexisting with VMS or it may mean an eventual migration to VAXes. We are currently planning tools (i.e., RSTS/E - VMS Compatibility Guide) to assist our customers with the process of either coexisting or migration. Digital is actively supporting RSTS/E and will continue to

provide quality releases with emphasis placed on features that provide improved compatibility with VMS. (Tech. 3, Prod. 1)

W42) Other - LOGIN should have the ability to record all login attempts that fail to the "access denied" point.
 Reason: Security

A42) Thank you for your suggestion. We will look at it. (Tech. 1, Prod. 1) *[Ed. note - If you are running V9.x and not running OPSEK, if you declare a message receiver named OPSEK, it will receive all LOGIN/OUT console message traffic, which you may then store in a file and analyze. You may also have to modify LOGIN/OUT slightly to force logging for the job classes (local, dialup, net, etc.) you are interested in.]*

W43) Other - LOGIN.COM should be moved off [0,1] and onto an account which is smaller and can be REORDRed.

A43) We do realize there is a performance problem with logging into the system and we are looking at ways to improve the performance. Until then, you can continue to use PIP's /MODE:1536 to put LOGIN.COM at the top of [0,1]. We have not heard why that would not be sufficient. (Tech. 2, Prod. 2)

W44) Other - TERMGR should allow wildcards for KB #'s in the SET TERMINAL command. For example, SET TER KBG*/AUTOBAUD/DIALUP.
 Reason: System startup is extended by having many (possibly) identical SET TER commands, reloading DCL & TERMGR for each one. This would speed up system startup.

A44) Because TERMGR would have to go through all KB's, it is not certain if this would speed up system startup. Put a "RUN STERMGR" command before the first SET TERM command. *[Ed. note - The 1987 SIG tape has a utility which creates a patch file containing most system defaults. Once applied, you will not need to specify the defaults again.]*

W45) Add a /SORT=(NAME|TYPE|SIZE|DATE) switch to the DIRECTORY command. Combinations should be allowed: /SORT=(NAME,TYPE) would sort by name as primary and then by type. This would be the default if only /SORT was specified.
 Reason: It would make locating files in the directory easier.

A45) Do a DIRECTORY/OUTPUT=file and then SORT the output file using the SORT command. (Tech. 3, Prod. 3)

W46) Other: Facilities to help the visually impaired - SET DOUBLEHIGH/DOUBLEWIDE - Hooks and utilities for DECTalk.

- A46) This is a very reasonable request and it would be a nice feature. Thank you for your suggestion and we will keep it on file for future consideration.
- W47) Other - Ability to read the VAX CD disks - A handler or conversion program or both. (Tech. 3, Prod. 2)
- A47) You can hook up the CD disk to your VAX and copy the data across the network. (Tech. 0, Prod. 0)
- W48) Other - Directory should have the ability to get a list of files with only certain characteristics - in particular a public protection code, a priv protection code, and marked for caching.
Reason: System tuning and security.
- A48) This is a good idea. We consider it difficult to do. (Tech. 3, Prod. 2)
- W49) Other - Is it possible to make SYSLIB.OLB (or reasonable parts thereof) into a resident library?
- A49) Too many layered products that are task-built would have to be changed to warrant making this change. (Tech. 3, Prod. 2)
- W50) Other - I would like to get the source for HELP so that I could customize it. It could be in SOURCES: like SYSTAT and others.
- A50) You can do this by purchasing the source kit. *[Ed. note - I think there was a small slip-up here. HELP was included in SOURCES: for V9.0, but when it was updated (in 9.3) it was left off the update kit SOURCES: account. According to a SPR answer I received, this will be corrected in the next release.]*
- W51) Other - System callable routines for the creation / changing / deletion of symbols.
- A51) This is also technically difficult and falls low on our long priority list. (Tech. 3, Prod. 2)
- W52) Other - To have a class of terminals between local and dialup, for purposes of who can log in, and for whether LOGIN logs the attempts.
- A52) We hope to look at this for a future release. (Tech. 2, Prod. 2) *[Ed. note - You can modify LOGIN/OUT to change the classes for which information is logged.]*
- W53) Other - How about some way to quickly copy a tape to a

TM50 and the other way too!

- A53) We do not understand this wish item. Please submit again with additional explanation.

Why You Can't Manipulate DCL Symbols

Recently there has been a good deal of discussion about why you can't manipulate DCL symbols from within a (non-DCL) program. The following is a somewhat technical summary of the problems involved, as well as a pointer to some references if you really want to try it. Please remember that the opinions stated in it are my own, and don't hold DEC responsible for any errors.

RSTS DCL attempts to emulate VAX/VMS DCL in dealing with symbols. For applications coded entirely within DCL, it does admirably well in this emulation. However, users familiar with the VMS library routines for DCL symbol manipulation frequently wonder why RSTS/E doesn't support such routines.

T H E R E A S O N: VMS supports a vastly larger address space for user programs. Therefore, giving up 'N' K for DCL symbols has utterly no effect. Similarly, the routines to manipulate the symbols can be contained in user address space without constraining the size of a user's program.

However, on RSTS, users are squeezed against the hardware limit of 32Kw of instructions. Therefore, a design decision was made to place the DCL symbol table (and other context) in a workfile when DCL was not the current run-time system. There were significant technical hurdles involved, mainly centered around not wanting to force the user to give up a channel for the workfile.

The end result was to create a new set of 16 channels *just* for DCL' use. This is where the .COM file nesting depth limit comes from, and also explains why you give up a nesting level when using a logfile. These new channels can be opened, closed, read & written to, and SPEC'd just like normal channels. The only difference is where the channel information is kept. A new system call (UUO.PFB) was created to swap these channels back and forth between 'user context' and 'system context'.

Now that you know where it is and how to access it, you might be tempted to try looking for symbols in the workfile. The next problem you will have is 'what is the format of all this stuff?' If you define some text symbols, you may discern some sense of the format. The easiest thing to do would be to use the DCL symbol manipulation routines, no?

Unfortunately, you would have to switch run-time systems to get to these routines. Currently there exists no mechanism for preserving program context across such a switch (ever type HELP from within BASIC-Plus and lose your program?). So, the next idea you get is to incorporate these routines into your program. Unfortunately, your program is now too big to fit in the 32Kw limit!

And that, in a nutshell, is why you can't manipulate DCL symbols from within application programs.

Hardware Update Bulletin

This section covers hardware updates pertaining to RSTS/E systems.

The only news this month is that various type of power controllers may have incorrectly rated power cords. Apparently, the problem only manifests itself in fully-loaded RA81 cabinets. A quick way to tell if you have the problem is to look for 12 gauge wire (20 Amp rating) with a 30 Amp power plug.

Software Problem Report (SPR) Log

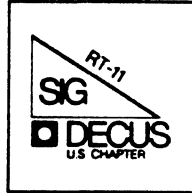
Please send the newsletter editor copies of any SPR's (and Digital's answer) on RSTS/E, DECNET/E, or RSTS layered products. We will print any that are of general interest. The reason for this is that many SPR's are answered with a patch or a notice of restriction, but due to space considerations, they are not published in the Software Dispatch. Since we're desperate for material, this should be useful information and we will print it.

The Newsletter system will be expanded in the near future to allow bulletin-board style messages to be posted for users to exchange this information, which should make it much more timely.

THE
**mini-
tasker**

DECUS

RT-11 SIG NEWSLETTER



RT

RT-11 MINITASKER

May, 1988

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From the Editor:

The submissions to the Minitasker this month were kinda scarce. Bob Walraven's FORTRAN SLATE shows how to get FORTRAN-77 programs to run as system jobs using as little of low memory as possible, and Rob Hamilton from Digital responds to an early FORTRAN SLATE column. Rob also gets this month's "Obscure Bug of the Month" award for unearthing (and analyzing) a truly deep-hidden bug in one of the SIG tape programs. Even if you never use the program in question, you'll want to know about this bug which could byte (!) you too, when you least expect it.

Gary Sallee has submitted a very good article about using KERMIT/RT-11, but it arrived too late to get edited into this issue. (It was postmarked December 3, 1987 by U.S. Snail, and was delivered on March 24, 1988. The increase in postal rates is clearly to cover storage!) I'll have to break it up, and it'll be serialized in the next two or three issues.

Unless I get some input from you readers, I'll be forced to start filling the pages with "My Favorite TECO Macros." So if you've got a little program you use to recover data from disks that have been scored by misaligned heads, or have managed to impliment the SET SYSTEM NOCRASH command, send me a page or two. The only thing more satisfying than stealing from your friends is sharing with them.

All the usual caveats apply. It is assumed that anything you send is in the public domain or at least that there are no nasty copyrights being violated. I'm supposed to be sure that the "DECUS Commercialism Policy" is adhered to, so I wary of anything that looks like marketing hype or product announcements. (There're several people beyond me who can override things I think can be printed.) There's no problem with talking about technical aspects of your product (e.g. "how we did it") though. I especially interested in programming tidbits, hacks, bugs and fixes.

Send stuff to:

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

Camera ready copy is appreciated, and machine readable submissions are nice too. (I'll return floppies - RX01, RX02, or RX50 please - I don't have a RX33 yet. RL02, TK50 and 9-track magtape are OK, but unlikely.) But it doesn't have to be so finished or polished. I've been known to accept hen scratchings on post-it pads. (It lets me feel that I'm actually doing some editing, after all.) I'll be seeing some of you in Cincinnati this month, so expect me to hit you up for an article or three.

The FORTRAN Slate

Bob Walraven
Multiware, Inc.

In this month's column we are going to present some VERY handy ways to build FORTRAN programs. You'll find out how to squeeze the last bit out of memory, and even learn how to build a FORTRAN program that runs as a system job with an itty-bitty root segment. A word of warning: these techniques are meant for the XM monitor only. If you don't use XM, read the column anyway - maybe you'll decide that its time to switch to XM and start realizing some of the real power of RT-11. Another caveat is that these techniques work with version 5.0A (and later) of FORTRAN-77, but probably will not work with version 5.0. On the other hand, we told you several months ago that you really should upgrade if you are still running 5.0; so if you havn't yet, you might want to call your local Digital office right now.

When a FORTRAN-77 program starts up, it first calls the OTS initialization routine OTIS\$. OTIS\$ builds the Dynamic Work Area (DWA) in memory to store

- o a buffer for formatted I/O
- o a channel table for locating the File Descriptor Block associated with an open unit
- o File Descriptor Blocks where pertinent information is stored for open units
- o I/O queue elements
- o I/O buffers for open units
- o Dynamically loaded handlers

The items are stored in the order shown, starting from the highest memory location of the DWA except for dynamically loaded handlers and I/O buffers, which are allocated as they are needed from the bottom of the DWA. If the DWA is not big enough for the items that are stored from the top down, the job will exit. If the DWA is big enough for these items, but does not have enough additional room for the handlers that are dynamically loaded or all the I/O buffers that must be simultaneously open, then the job will fail during execution.

The actual location of the DWA will depend on how the job is built:

- o For a program with no virtual overlays and no virtual arrays, the user typically builds a privileged job (as opposed to a virtual job) by simply compiling and linking the program. In this case, OTIS\$ performs a .SETTOP starting from the top of the program to the highest available address (near the bottom of the USR), and uses all the memory obtained for the DWA. Since the highest available address can be significantly less than the available 32K words of address space in the PDP-11 architecture, this mode is the most restrictive; programs built as privileged jobs can

easily run out of memory, especially on the PRO. Furthermore, the highest available address will depend on which handlers and system or foreground jobs are loaded, so you might find that a program will only run if you unload enough stuff from memory. If the program will not run with the R or RUN command, however, it probably can still be run under the XM monitor with VBGEXE. This is one reason that the XM monitor is sometimes preferred by FORTRAN programmers.

- o If a privileged job is changed to a virtual job (using SIPP to set the VIRT\$ bit in the Job Status Word), the program can then allocate all the memory from the top of the program up to the top of virtual address space (i.e., the 32K word boundary), but this may not help much, because a virtual job will not run with the R or RUN command if the top of the job is above the bottom of the USR.
- o If a FORTRAN-77 program on XM is linked with the module VIRTXM (required if the program has virtual arrays or virtual overlays), then VIRTXM preallocates the DWA in low memory. VIRTXM uses a default value for the line buffer length of 136 bytes and a default value for the maximum number of units of 6. You can change these default values by linking with the module F77DWA (shown below) placed after VIRTXM. For example, LINK myprog,SY:VIRTXM,F77DWA/XM. If you do this, be sure to compile your program with the corresponding switch values for UNITS and RECORD.

.TITLE F77DWA

```
-----  
; Allocate FORTRAN-77 Dynamic Work Area (line buffer, channel  
; table, I/O block buffers, etc.) in low mem psect.  
-----  
  
UNITS = 6. ; Maximum number of LUNs  
LRECL = 136. ; Line Buffer Length in bytes  
NSIZE = 512.+40.+1. ; Bytes required for each LUN  
; Size = buffer + channel table + LUB  
  
.PSECT $$OTSS,RW,D,LCL,REL,CON  
$IOBKF: .BLKB UNITS*NSIZE+LRECL  
.EVEN  
$IOBKL: .EVEN  
  
.END
```

The following program will allow you to see how the DWA is assigned when you link the program in different ways.

```

PROGRAM ShoDWA
implicit integer (A-Z)

OTSbase = IAOTS ()

plnbuf = IPEEK ( OTSbase + 2 )
chnatb = IPEEK ( OTSbase + 4 )
filetb = IPEEK ( OTSbase + 6 )
qelem = IPEEK ( OTSbase + 8 )
devhdr = IPEEK ( OTSbase + 10 )
freesp = IPEEK ( OTSbase + 12 )
bend = IPEEK ( OTSbase + 32 )
limit = IPEEK ( OTSbase + '164'O )
start = IPEEK ( limit )
top = IPEEK ( limit + 2 ) - 2

10 type 10 , freesp , devhdr , devhdr-freesp , plnbuf-chnatb
format ( ' Start of free DWA at ',06 /
1 ' End of free DWA at ',06 /
2 ' Amount of free DWA = ',06 /
3 ' Maximum units = ',06 )

if ( qelem .ne. filetb ) then
20 type 20 , qelem
format ( ' I/O queue elements at ',06 )
end if

30 type 30 , filetb , chnatb , plnbuf , bend
format ( ' File descriptor blocks at ',06 /
1 ' Channel table at ',06 /
2 ' Formatted I/O buffer at ',06 /
3 ' End of DWA at ',06 )

40 type 40 , start , top
format ( ' Start of program = ',06 /
1 ' Top of program = ',06 )

END
-----
.title IAOTS

; IAOTS is a FORTRAN-callable subroutine that returns the base address
; of the OTS impure data area.
;
; Usage: I = IAOTS ()

.psect $CODE1,rw,i,lcl,rel,con

IAOTS:: mov $OTSV,r0
return

.end

```

RT-5

VIRTXM contains the virtual array initialization routine \$VINIT that is called by \$OTI. If you don't link with VIRTXM, a dummy \$VINIT is automatically substituted from F77OTS during linking. If you DO link with VIRTXM and your program contains no virtual arrays, then you will be wasting a little room by having the real \$VINIT included in your .SAV image. This problem can be avoided by linking your program instead with the MACRO module VIRJOB:

```

.TITLE VIRJOB

; This module should be linked with a FORTRAN-77 program if a virtual job
; is desired and the program contains no virtual arrays.
;
; Usage: .LINK myprog,VIRJOB/XM

; The values of UNITS and LRECL below correspond to the default values
; of the FORTRAN-77 compiler /UNITS:n and /RECORD:length switches.
; If non-default values of these switches are specified, the values
; of UNITS and LRECL should be changed accordingly.

UNITS = 6. ; Maximum number of LUNS
LRECL = 136. ; Line Buffer Length in bytes

NSIZE = 512.+40.+1. ; Bytes required for each LUN
; Size = buffer + FDB + channel table entr
QSIZE = 10. ; Size of XM queue elements

.ASECT
.=44
.WORD 2000 ; Set the VIRTUAL bit in the JSW

.PSECT $$OTSV,RW,D,GBL,REL,OVR
QBLK$: .WORD $QBLK ; Location of queue elements
VIRSZ$: .WORD 0 ; No virtual arrays
IOBKF$: .WORD $IOBKF ; Start of dynamic area
IOBKL$: .WORD $IOBKL-2 ; End of dynamic area

.PSECT $$OTSS,RW,D,LCL,REL,CON
$QBLK$: .BLKW QSIZE*UNITS ; Allocate 1 queue element for each unit

$IOBKF$: .BLKB UNITS*NSIZE+LRECL ; Allocate storage for linebuffer
.EVEN ; and LUN tables
$IOBKL$:

.PSECT $$OTSI,RO,I,LCL,REL,CON
.MCALL .PRINT .EXIT

$VINIT::RETURN ; Dummy virtual array initializati

```

RT-6

```

SNOLXM: .PRINT #NOLXM           ; Error if no /XM specified in LIN
        .EXIT

        .PSECT $$OTS D,RO,D,LCL,REL,CON

NOLXM:  .BYTE 15,12
        .ASCII /Exiting due to ERROR 103/
        .BYTE 15,12
        .ASCIZ \VIRJOB needs LINK/XM\
        .EVEN

        .END

```

Let's take a moment to examine VIRJOB, because an understanding of its parts will be assumed below.

- o The maximum number of units and the length of the line buffer in bytes are specified so that you can set DWA to be exactly the length you need and no longer. If you have specified nonstandard values with the compiler switch /UNITS:n or /RECORD:length, then you need to change the values in VIRJOB to match the values you specified.
- o The VIRT\$ virtual image bit in the Job Status Word by loading referencing the JSW directly in an .ASECT.
- o The psect \$\$OTS V must appear exactly as shown. The four words in this psect provide information to \$OTI about the location of queue elements and the DWA. If you linked with VIRTXM instead of VIRJOB, then VIRSZ\$ would indicate how much extended memory is needed for virtual arrays.
- o The psect \$\$OTS S must also appear exactly as shown. It contains space for the queue elements and space for the DWA. If your program calls system services that require additional queue elements, then you should add additional queue elements here by changing the contents of \$QBLK accordingly. WARNING: Do not call IQSET in your program unless you have masochistic tendencies - you must declare all your queue elements in VIRJOB. Notice that the DWA is just big enough to contain the line buffer and one channel table entry, one FDB, and one 1 block buffer for each unit.
- o The psect \$\$OTS I is where most F77OTS code is stored. This psect contains a dummy virtual array initialization routine (\$VINIT) and an exit point that is called by \$OTI if you forgot to use the /XM switch (or /V CCL switch) when the job was linked.
- o The psect \$\$OTS D is used to store common F77OTS data. It contains the error message that is printed if you forgot the /XM switch

Try linking the program ShoDWA in various ways, including with VIRTXM and VIRJOB to see how the DWA is allocated.

Remember that a restriction RT-11/XM imposes on virtual jobs is that the top of the root must be below the USR for the job to be runnable. This means that the bulk of your code needs to be in virtual overlay regions. However, there is another GOTCHA that really has a bite: the linker likes to put lots of F77OTS and SYSLIB stuff in the root. Even if your root source is a one line subroutine call to the real code in a virtual overlay, it doesn't take much of a program before the root grows so large that the program won't run. What we are now going to present is a way for you to build your FORTRAN-77 programs so that the root is really small. Not only does this insure that your job will run, but it allows you to make FORTRAN system jobs that only use a little over 800 words of low memory. This means that you can have several FORTRAN system jobs, a FORTRAN foreground job, and a FORTRAN background job all running at the same time. Well not actually AT THE SAME TIME, but they can all be in memory at the same time with all but the one that is running in a waiting state. Thus if you have sufficient extended memory and run the XM monitor, it is possible to construct an application that consists of several large cooperating system jobs that are all in extended memory at the same time.

The secret to building a FORTRAN system job is to split up the work done by VIRJOB into a root part and an overlay part. You'll need the two MACRO routines VROOT and VMAIN, shown below.

```

        .TITLE VROOT

; This module acts as the root for a FORTRAN-77 program that is
; to be linked as a virtual job of minimum size.
; Usage:          R LINK
;                 myprog=VROOT//
;                 VMAIN,mymain/V:1
;                 mysegl/V:2
;                 :..
;                 'C

; The value of UNITS below corresponds to the default value of the
; FORTRAN-77 compiler /UNITS:n switch. If a non-default value of
; this switch is specified, the value of UNITS should be changed
; accordingly.

        UNITS = 6.           ; Maximum number of LUNs
        QSIZE = 10.         ; Size of XM queue elements

        .asect
        .=44
        .word 2000           ; Set the VIRTUAL bit in the JSW

        .psect $$OTS S,rw,d,lcl,rel,con

$QBLK: .blkw QSIZE*UNITS     ; Allocate 1 queue element per unit
; plus any others you need

VROOT: call VMAIN           ; CALL necessary so as not to confuse
        .mcall .exit       ; overlay handler
        .exit

        .end VROOT

```

```

        .title VMAIN

; This module provides the main entry point for a FORTRAN-77 program
; when it is linked as a virtual job of minimal size.

; The values of UNITS and LRECL below correspond to the default values
; of the FORTRAN-77 compiler /UNITS:n and /RECORD:length switches.
; If non-default values of these switches are specified, the values
; of UNITS and LRECL should be changed accordingly.

        UNITS = 6.           ; Maximum number of LUNS
        LRECL = 136.        ; Line Buffer Length in bytes
        NSIZE = 512.+40.+1. ; Bytes required for each LUN
                                ; Size = buffer + FDB + channel table entr

        .psect $$OTSv,rw,d,gb1,rel,ovr

QBLK$: .WORD $QBLK          ; Location of queue elements
VIRSZ$: .WORD 0             ; No virtual arrays
IOBKF$: .WORD $IOBKF        ; Start of dynamic area
IOBKL$: .WORD $IOBKL-2     ; End of dynamic area

$IOBKF: .BLKB UNITS*NSIZE+LRECL ; Allocate storage for linebuffer
        .EVEN ; and LUN tables
$IOBKL:

        .psect $$OTSI,ro,i,lcl,rel,con
        .mcall .PRINT .EXIT

$VINIT: .return ; Dummy virtual array initializati

$NOLXM: .PRINT #NOLXM ; Error if no /XM specified in LIN
        .EXIT

VMAIN: .psect $CODE1,rw,i,lcl,rel,con
        .psect $$OTSD,ro,d,lcl,rel,con

NOLXM: .ascii <15><12>/Exiting due to ERROR 103/<15><12>
        .asciz \VIRJOB needs LINK/XM\
        .even

        .end

```

The root calls the subroutine VMAIN in the overlay segment. Since the label VMAIN is at the very beginning of the psect \$CODE1 and your program main begins at the start of this psect, your program starts up at its normal entry point. Try building ShoDWA with these modules. You will notice the following advantages:

- o The root contains only the queue elements, 3 words of code, and a small overlay handler.
- o All F770TS and SYSLIB routines are put in the virtual overlay.
- o The program can be run as a foreground or system job, and only uses 833 words of low memory.

o The program has 28k words of memory available. (The bottom 4k of memory is used by the root.)

Try making your favorite FORTRAN-77 program into a system job and see how it behaves. I've tried this technique out on quite a few programs and have been very pleased with the results. One of the more exciting things I was able to do was to run two FORTRAN-77 system jobs that talked to each other through the MQ handler; I still had room left over to run a background job, even on the PRO. I've only encountered to problems making FORTRAN-77 system jobs. The first problem is that programs that called IQSET would crash (think about where the queue elements end up). This was easy to fix - I just allocated as many queue elements as I needed in VROOT and deleted the call to IQSET. The second problem was encountered when I tried outputting some graphics to the PRO screen using a package that uses the screen device registers. I had no problem mapping to the I/O page and producing the graphics, but the system crashed after the output was finished. A nasty problem with trying to do graphics on the PRO is that you must completely disable PI output to the screen and you must be sure to restore the screen device registers to their original state before you return control to PI, otherwise the system will CRASH. I'm almost certain that what happened was that RT-11 decided it was time to go to the background so it tried to output the B> prompt before my program was through with the device registers, even though I told PI to keep quiet.

In the next column I will say a bit more about running FORTRAN-77 programs in this nifty way. I'll also show you how to map in the I/O page, in case you need to directly access device registers.

RESPONSE TO DECEMBER FORTRAN SLATE

From: Rob Hamilton 21-MAR-1988 14:32
 To: Bob, Walraven, John Crowell
 Subj: Letter for Minitasker, FORTRAN issues

March 11, 1988

Dear Bob,

In your "Fortran Slate" of December 1987, you raised several issues regarding the status of FORTRAN-77/RT. First off, I apologize for taking three months to respond. Unfortunately, on top of the problems that you mentioned, a new one has appeared; first in Europe, and now in our own U.S. SDC. In some cases, the 2nd disk of RX50 distributions of FORTRAN-77 V5.0A turned out to be a FILES-11 disk of some POS layered product. This problem quickly assumed #1 priority, and we have

resubmitted the correct original to the SDC. I have since verified that what the SDC has is the correct disk. Customers who received the incorrect RX50 disk should contact their sales representative.

I'm not sure either, what happened to the original V5.0B that you submitted. In light of the recent V5.0A RX50 disk #2 master mixup, and the fact that you have since submitted a further improved F77OTS, I have suggested to the FORTRAN-77 product manager that we hold V5.0B and submit the most up-to-date modules to the SDC, perhaps with a different version number.

Next, I'll address the RT-11 SYSLIB routines that were moved between FORTRAN-77 OTS and SYSLIB.OBJ. As you pointed out, the first group of subroutines were removed from SYSLIB because they make direct references to FORTRAN OTS data structures. In some cases these references work with both FORTRAN-IV and FORTRAN-77. In others, they don't; there are specific versions of routines for FORTRAN-77, and they were originally supplied to FORTRAN-77 customers in SYSUPD.OBJ. The installation procedure replaces them in SYSLIB. The ones in SYSLIB were originally written for FORTRAN-IV, and are not relevant to other languages, including MACRO. We feel that they are now best maintained by the respective FORTRAN groups. It makes more sense that the routines specific to a FORTRAN OTS reside in that OTS. We would like for SYSLIB to evolve into a language-independent library.

Much of the concern over this subject revolves around the customer who updates or buys RT-11 and does not update FORTRAN-77. The subroutines that were removed from SYSLIB were NOT deleted from the kits. Every distribution of RT-11 V5.4x contains and will continue to contain, a complete update of all layered products, including FORTRAN-77/RT.

On the other side of the issue are the five routines that were moved from the FORTRAN OTS's to SYSLIB. These are DATE, IDATE, RAN, RAN\$, and RANDU. These routines have no dependencies on either FORTRAN run-time system, and can be called by any language (using the FORTRAN calling standard). Customers who might suffer from this move are those who buy a new FORTRAN-77 compiler for use with an old release of RT-11. Any such customer who already has a distributed version of FORTRAN-77 V5.0 or V5.0A can extract those modules from F77OTS.OBJ and insert them into the new F77OTS or SYSLIB.

The idea behind these changes was to logically organize object modules in a way to make maintenance easier and more logical; not to trap people into buying one product or another. We are continuing to explore ways of making SYSLIB more robust and language-independent.

Sincerely,

Rob Hamilton
RT-11 Development

John Crowell
Editor, RT-11 Minitasker
c/o Multiware Inc.
2121B 2nd Street
Davis, CA 95616

March 21, 1988

Jack,

Recently, I obtained a copy of some DECUS submission tapes from Nick Bourgeois, and ran into an interesting problem with one of the savesets.

The U.S. Spring 1986 tape has a logical disk called C2512B.DSK that contains LEX and some other stuff. Unfortunately, that logical disk has someone's FORTRAN program sitting in the home block, and the expression "I=IWRITE(256,BUFF1,BLKNO,OUTCHN)" appears such that the "BU" of "BUFF1" sits squarely in offset 252, which, as everyone knows, tells RT-11's DIR program that this is a BUP disk (which it's not). BUP, being more particular, looks for "BUP", finds "BUF", and rejects it with "?BUP-F-Not a BACKUP volume".

In order that a directory of this disk be displayed, one must first SIPP offset 252 of block 1 so that it contains zero.

The bigger message is that if someone out there has a nifty program that makes logical disk files, that program should be modified so that all of the homeblock is initialized properly. There are indeed many logical disks on the DECUS submission tapes that have extraneous stuff in the homeblock. It can occasionally surface in the form of weird problems like the one described above.

Regards,

Rob Hamilton
RT-11 Development



UNISIG

Editor's Springboard

Yes, spring is in the air, even here in Southern California, where the uninitiated claim we have no seasons. Spring is here, can the Spring Symposium be far behind? Unfortunately, I cannot attend the symposium. For those of you lucky enough to be going, be sure to stop by the Unisig Suite, which will be shared, as usual, with Languages and Tools and Artificial Intelligence. Symposium travelers are probably focusing on Cincinnati right now, but how about last January's UniForum? I am interested in hearing from anyone who attended and had a look at A/UX - Apple's Unix offering. "They" claim A/UX is *real* unix with a user-friendly face. If anyone has seen it, or has it, or perhaps was a beta site, please drop me a line.

This month we have a bit more variety than in previous months. We start with *A Reader's Riddle*, in which Daniel Fishman muses on Digital's commitment to the unix market. Next, we have another set of session notes that didn't make it into the published notes in Anaheim. This month's session is U039 - *Enhancing the Digital Computing Environment through VMS/ULTRIX Connectivity*. And finally, we have the winner of this month's *Joke of the Month* contest. There are two winning jokes, one winning entrant. Your comments, suggestions, articles are always welcome. Please send hardcopy to :

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amdahl!cit-vax!ndc!sgf

UNI-1

MARCH '21, 1988

VIEW

A Reader's Riddle

by Daniel Fishman

In August 1985 we received our microVAX II with Ultrix. Ultrix was perfect for our software developers, an environment with dozens of features and tools that make developing software easier. And Digital offered it on a new generation of machines that delivered an unprecedented price/performance combination. From the start it seemed digital wasn't really committed to Ultrix. Salespeople didn't know about it, software support was poor, and far more expensive than VMS software support. I brought these concerns to Digital's attention and was assured that Digital was committed to Ultrix and that DEC offered two operating systems (one of which I assumed was Ultrix) across the entire VAX line. Once I read a press report of some comments from an Ultrix product manager regarding LAVC (really lack of same) for Ultrix. He wrote me a nice reply telling me that he was misquoted and that I shouldn't believe everything I read. Well, the same irresponsible press is up to their old tricks again. This time misquoting Ken Olsen himself. I know he's misquoted because I deal with DEC every day regarding Ultrix. Isn't that commitment? They helped me get my diskless workstations running Ultrix only three months after receiving hardware! And when I needed workstation documentation, they were kind enough to insist I receive an entire Ultrix doc kit in addition to my X documentation - committed, and generous. Seriously, I like DEC, and I like Ultrix. They sold it to me, I use it. I wish *they* acted like they liked and used it. If DEC treats UNIX the same way it treated personal computers, it will be to everyone's disadvantage. As a customer I want to work with a vendor that can offer more than arm waving about support. DEC should either truly commit itself to the UNIX marketplace, or be truthful enough to suggest I locate another vendor who is in business to support it. In a future issue (assuming it gets by the digital police) will be my diskless workstation experience.

Olsen Calls Unix 'Snake Oil'; Says It's No Standard

By Wayne Howe

MARLBOROUGH, Mass. — What do Sun Microsystems Inc., Unisys, AT&T and others all have that DEC doesn't? The answer, of course, is an interest in the growth of Unix as an operating system standard.

"It's like selling the Brooklyn Bridge—it's absolutely snake oil," said DEC President Kenneth H. Olsen when asked at a press conference this month what he thinks of Unix and technology-sharing agreements among competitors.

Increasingly surrounded by companies that have staked their futures on users' choosing the Unix operating system, DEC has felt the cost of its reliance on VMS rather than Unix more than once. The most publicized instance occurred last summer when DEC lost its fight to bid on a multi-billion-dollar Air Force contract because it lacked a defined Unix SVID product as required by the bid specifications.

Olsen's bitterness toward Unix is more understandable in the wake of other, more recent industry events.

Just this month Unisys announced that it was working with 'SNAKE OIL,' Page 93

UNI-2

Bridging ULTRIX and VAX/VMS

A Working Proposal

Ken Reilly, ULTRIX Engineering Group

UNIX is a trademark of AT&T Bell Laboratories

NFS is a trademark of SUN Microsystems

Goals

- Establish VAX/VMS and VAXclusters as the best resource server for ULTRIX/UNIX workstations. Exploit the enhanced availability, reliability, and price/performance provided by VAXclusters.
- Bridge, don't merge, server and client environment. Two target user groups:
 - Mixed VAX/VMS - ULTRIX Shop
 - ULTRIX/UNIX only Shop
- Tracking the ULTRIX strategy and direction

UNI-3

Bridging ULTRIX and VAX/VMS

Presentation Overview

- Goals
- Proposal Summary
- ARPA Communication Subsystem Components
- NFS Components
- Feedback/Questions & Answers

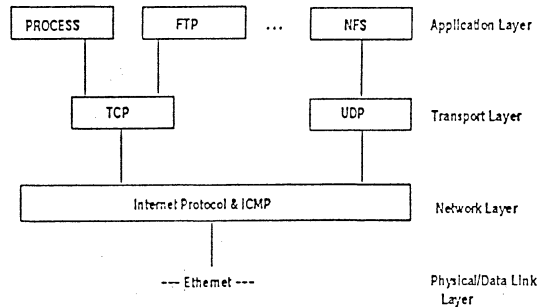
Proposal Summary

- Promote resource sharing between VMS server and ULTRIX workstation
- Components
 - ARPA Communication subsystem
 - NFS file server

UNI-4

ARPA Communication Subsystem

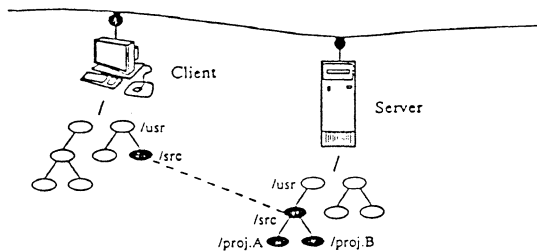
- Provide the intersystem networking facilities for Digital-supplied and customer applications



NFS file server

What is NFS ?

- Application protocol which provides NFS clients with remote, transparent file services



UNI-5

ARPA Communication Subsystem

Foundation Goals

- Provide Arpa Internet 'end node' implementation for Ethernet
- Provide application services related to data services (NFS, FTP)
- Provide application interface to network

Follow on Goals

- Provide complete ARPA application suite (SMTP, TELNET)

NFS file server

Foundation Goals

- Promote data sharing between VAX/VMS and NFS clients
- Provide NFS clients with same file service as any ULTRIX based server

Follow on Goals

- NFS client support for VAX/VMS
- support for data conversion for non-stream files
- support application interface to RPC and XDR

UNI-6

NFS file server

Foundation Goals

- Mount
- NFS

Follow on Goals

- Yellow Pages (YP)
- Remote Procedure Call (RPC)
- External Data Representation (XDR)
- Lock Manager (LM)
- Status Monitor (SM)

NFS file server

VMS file system

NFS client mounts VMS directory onto his local file system

```
LASSIE::LASSIESDUA0:[SMITH] to /usr/vms/smith/
```

The VMS file

```
LASSIE::LASSIESDUA0:[SMITH]TEST.TYPE;3
```

is accessed from the NFS client as

```
/usr/vms/smith/test.type.3
```

NFS file server

Mixed VAX/VMS - ULTRIX Shop

- Provide NFS clients with access to RMS StreamLF (VMS) files
 - files subject to VAX/VMS file system rules
 - clients limited by NFS protocol file system model
- Provide FTP client and server on VAX/VMS to access ULTRIX workstations

NFS file server

ULTRIX/UNIX only Shop

- Provide NFS clients with access to 100% compatible ULTRIX/UNIX filesystem
- Promote data sharing by providing VMS application access to these ULTRIX/UNIX files

NFS file server

ULTRIX file system ODS strategy

- Each ULTRIX regular file stored as a VMS data file
- ULTRIX directory hierarchy and inode info stored in a VMS data file

The Joke of the Month

We have two Jokes of the Month this month, both submitted by Mark Bartelt, a unix jokester from way back. Thanks, Mark. And to those of you who didn't win this month, keep those e-cards and e-letters coming. Your name could appear in this spot next month - all it takes is a joke!

Joke #1

A master was explaining the nature of Tao to one of his novices.

"The Tao is embodied in all software -- regardless of how insignificant," said the master.

"Is the Tao in a hand-held calculator?" asked the novice.

"It is," came the reply.

"Is the Tao in a video game?" continued the novice.

"It is even in a video game," said the master.

"And is the Tao in the DOS for a personal computer?"

The master coughed and shifted his position slightly. "The lesson is over for today," he said.

(From "The Tao of Programming", by Geoffrey James, via Mark Bartelt)

Additional Applications Services

- Provide VMS applications with callable service to return VMS file handle for a ULTRIX file handle
- Provide callable service to 'import' files into a ULTRIX file system
- Provide callable service to 'export' files into a VMS file system
- Provide system management utilities to create/delete modify ULTRIX file system

"Joke #2" *Beware ... Awful pun ahead.*

Once upon a time there lived a fearsome troll named Og. So nasty and uncivilized was he that he refused to wear clothes; he stomped around the village completely nude, scaring the children and embarrassing the quiet townfolk.

Down the road from Og's cave was a DEC sales office. It was only two weeks before the end of DEC's fiscal year, and all the DEC salespeople were in a panic, for they were far short of their quota for the year. Especially were they short of sales for their Unix-based software for VAXes, yclept "Ultrix". For most potential customers were suspicious, saying, "That soundeth like a name for a brand of leggings." So they were desperate to make even one more Ultrix sale.

Suddenly an idea occurred to the youngest DEC salesman in the office, yclept Harold the Slow. "Why don't we try to sell a VAX Ultrix system to Og?" he exclaimed. "After all, he has much treasure stored in his cave, so we can offer him an attractive cash discount. And a good all-DEC VAX system will surely help him with tax accounting for his bridge toll franchises."

"A wondrous suggestion!" said his supervisor, yclept Arnold the Superfluous. "Why don't you bring in Og for an Ultrix demo? I'm sure we can make the sale right on the spot."

So Harold the Slow went up the road to Og's cave, and after much flattery and persuasion convinced Og to come into the DEC sales office for a pawson Ultrix demonstration. All went well for a while; Og was familiar with secret passwords from his dealings with wizards and elves, and he was soon logged in at a terminal and ready for more.

But soon confusion set in, for though Og was large of body he was rather small of brain. "Awk?" he said. "Grep? Nroff?? Mkdir???" This be not software, this be Black Magic, and you be tools of the Dark Forces." Og stood up in a rage, and with a swipe of his paw sent the terminal crashing to the floor. Then, lashing about him with both paws, he laid waste to the entire office, finally crashing through the machine room to strike deadly blows at the VAXes therein before bursting through the wall and stomping off to his cave.

Harold the Slow and Arnold the Superfluous slowly picked themselves up from the rubble of their office. Looking at his underling ruefully, Arnold could only mutter, "We really should have known better ... After all, everyone knows that you can't teach a nude Og Ultrix!"

(Originally posted to the net in 1984; sent in by Mark Bartelt, who got it from Norman Wilson, who got it from Roseann Maclean.)

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

DECUS

Program Library

SOFTWARE ABSTRACTS

"A Solution with a Future"

LIB

DECUS PROGRAM LIBRARY

ANNOUNCEMENT:

"Take special notice of the VAX SIG Collection from the Fall 1987 Anaheim Symposium, DECUS Part No. V-SP-70, which is announced in this report. This is the first SIG collection to be offered on three 2400' Magnetic Tape reels at 1600 BPI. The DECUS Library is also going to make this collection the first one to be offered on one 2400' Magnetic Tape reel at 6250 BPI. As a result of these changes, new media service charge codes have been established. They are as follows:

MEDIA (SERVICE CHARGE CODE)	PRICE
(PD) 2400' Magnetic Tapes at 1600 BPI	\$ 190.00
(SD) 2400' Magnetic Tape at 6250 BPI	\$ 175.00

NOTE: These prices are effective from now until July 2, 1988. A new price list will be distributed at that time.

The VAX SIG Collection will continue to be offered on the popular TK50 tape cartridge, media service charge code (TC).

Corrections to programs that have been announced through this report.

DECUS No: VAX 6	Add: "Software Required: VAX C Compiler"
DECUS No: UX-SP-101	Add: "Software Required: VAX C Compiler"
DECUS No: UX-101	Add: "Software Required: VAX C Compiler"
DECUS No: UX-102	Add: "Software Required: VAX C Compiler"
DECUS No: UX-103	Add: "Software Required: VAX C Compiler"
DECUS No: UX-104	Add: "Software Required: VAX C Compiler"

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

DECUS No: V-SP-70 Title: Symposium Collection from the VAX SIG, Fall 1987, Anaheim Version: 1, February 1988

Author: Various

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

Operating System: VAX/VMS Source Language: BLISS-32, C, FORTRAN 77, MACRO-32, PASCAL, VAX BASIC, VAX FORTRAN Keywords: Symposia Tapes - VMS

Abstract: This is the VAX SIG tape from the Fall 1987 DECUS Symposium in Anaheim. The programs have been placed in three major directory structures named VAX87C, VAX87D and VAX87E. The following is a brief summary of highlights:

VAX87C
[ANLJOHNO] DCL interface for auto SUB single CMD batch jobs. VMS EXEC server symbiont. DECnet \$GETxxI server. Memory virtual disk driver much more efficient than PD-DRIVER.

[.ARC] Print on Hewlett Packard Laserjet includes forms. EVEPlus updates.
[.BASSETT] Loan and investment programs. Watchdog. FORTRAN menu system. Autodialer. Talaris fonts. VT241 colorset.
[.BATTELLE] ARGNUM - find number of args. User UIC change SYS service. Filename from FID. Locate by size. UIC, etc. Hashed password save/restore. Structured MACROS.
[.BZL] LSE templates for RUNOFF and LSE. Sample for outgoing connection to PSI. Erlang blocking formulas. Programs to measure real VAX CPU speed.
[.CI] Close VMS Accounting. Record counter. Dialup set. Paginate docs. FORCEX force exit. Reminder print.
[.CLEMENT] Bonner RUNOFF (large superset of DSR). Continuous system status.
[.CLIB] Non-Digital Equipment Corporation Clibrary and a few utilities using it.
[.COSTELLO] Update (minor bugfix) to TPC, tape -j disk -j tape copy.
[.CSDHBO] Filter repetitive broadcasts on consoles on cluster.
[.DJM] Elect. Telephone book: run AUTHORize in any directory. Define VT2xx keys. INFO re identifier. Tell what files will be purged. See who uses a CMD procedure.
[.DOLGEM] Utilities to ease conversion to DECcalc V3.0.
[.DOWN] DOWN - utility to move around directory tree.
[.DTREDIT] Utility to ease editing DTR fields w/o FMS or TDMS.
[.DTRSIG] ACCOUNTING - convert VMS Accounting to something DTR can handle. Also terminal meas. proc. ALL-IN-1 - DTR definitions for A1 files. CORPHONE - corporate phone directory in DTR. FUNCTIONS - more DTR functions including spawn and string length. NEWSLETTERS, PLOTS, CMD Recall, SYSUAF defs for DTR, more.
[.ELLIS] Numerous kernel mode programming examples. Such items as show process/files, purge worksheet of a process etc.
[.EROS] BATCHACC - set account of batch job. CPU hogs monitor. Limit sessions/user. Password reuse disallow.
[.EVEUPDS] Update to EVEPlus. DECUS Program No. VAX-150.
[.FLECSVMS] FLECS and ALECS structured preprocessors for FORTRAN and MACRO. Now totally native mode.
[.FLOWERS] Delete zero length files. Show disk space. Move around directory tree and/or draw tree. EDT files and wildcard editing. Mail UAF tools.
[.GAMES] HACK game from Dean Grover and CRIB game from MNVAXLUG.

[.GRC] CALC2SMG - Hewlett Packard calculator emulator. MODOBJ - fixup VMS object file.
[.GROVER] Extensions to EVEPlus. SWING directory management program.
[.HOWE] EVE extensions.
[.JCSLUG] SETUSER - Become another user. Mailutil - check if your mail is read. Fast symbol definitions at login. Load foreign tapes. Mail system built on VAXNET. Standard menu interface software. SET-USER
[.KETECH] Foreign tape reader. EVE extensions.
[.KKA] VMS_SHAR to mail files through NETS.
[.LATSHAW] EDTEM - very extended EDT emulator in TPU.
VAX87D
[.COY] DM - directory manager. SD - set default program. WPS-PLUS emulator in TPU. Color setup for VT241. WPS-PLUS emulator for LSE. MCL - multicolumn file lister. NOTES update utilities.
[.LEVINE] Extended accounting utilities. Cookie utility. INDEX - powerful FORTRAN cross referencer and static analysis. JUICER - Online and offline disk compression and file defragmenting. MUTEX - find sources of MWAIT states. NETLIST - condensed SHOWNET listing. QUICFONT - font editor for Talaris printers. System SNAP-SHOT. Card image tape read/write. Convert MACpaint to Talaris bitmap.
[.RCAP87] AMIGA editors and utilities. AnalytiCalc for AMIGA, VAX, RSX, IBMPC. Lists multicol print. RIM5 DBMS DOC update. Desktop Calendar. FINGER update. LZW compress/decompress. Numerous utilities from Arpanet newsgroups, indexed. SCI SUB package w/docs. TAR read/write. VMS Disassembler (EXE -j) MAR). More.
[.SEWELL] MWEB - WEB adapted to Modula 2. WEB-MERGE - merge multiple change files. SCANTEX.
VAX87E
[.LILUG] No processes versus time plot. VT100 demo.
[.MATUSCAK] WANG IIS WP document conversion to MASS-11.
[.MEADOWS] FILE - Change RMS attributes or dates on any files without copy. INDEX - find files based on several criteria (size, length, date, fragmentation, etc). FAST STATUS - fancy SHOW USERS plus DECnet info. VERB-decompiler for DCL tables, converts to CLD.
[.MERRIMACK] BATCH - CMD proc to generate Batch jobs interactively. Directory sharing utilities. Find LAT terminal location. Super TPU edit.
[.MIVAXLUG] PRIVILEGE - set/reset privs in menu fashion. CALCULATOR - SMG based calculator. GETQ1 - get queue info. SWING rewrite from Digital Equipment Corporation.

[.MNVAX] Key input in BASIC. Password change forcer. Video Attribute Text Formatter. Extended EVE. Statistical program. Edit/RUNOFF control. Let privileged user become invisible.
[.NANNY] Powerful system management aid/idle term killer/priority monitor.
[.NDS] Fast spelling checker.
[.NEWS_SRS] Un*x NEWS rewritten for VMS; the celebrated Geoff Huston NEWS program. Handles USENET newsgroups on VMS.
[.NSTLJ] SETDEF - set default program. FRED - powerful editor, complete but written in TPU. FLEXISMB - print symb.
[.NSWC] BATCH - "instant" BATCH commands. MAILUAF maint. Appointment REMINDER. Execute on OTHERNODE (DECnet).
[.PAGESWAPPER] "Pageswapper" issues since Spring 1987 Symposium.
[.PERFMON] VMS Performance Monitoring.
[.PICCARD] EDT TPU enhancements.
[.REMPRINT] REMPRINT - print one or more files on a remote system device.
[.RESTORE] RESTORE - recover deleted files from Files-11 ODS-2 disks.
[.RWK] DTR system management aids. PASCAL environment files.
[.RSXFINGER] FINGER utility for RSX; talks to VMS FINGER.
[.SCHUMANN] ARCHIVE - Procedures to archive disk directories to tape. INCREMENTALS - locate which tape contains a file. OPRSPOND - method to do two way COMM with operator WPS - WPS-PLUS emulator under TPU.
[.SEALUG] MACINTOSH - read MAC files on VAX; file transfer. DECNET - conversational DECnet object. Remote print, batch control; remote command exec. Build shareable.EXE, XMODEM and MODEM7 COMM programs.
[.SMITH] Remote print and form control over DECnet.
[.SOFTQUO] Soft Quota disk management system.
[.SPENCER] EDT enhancements (including WPS keypad). EDTINI examples. TECO emulator for EDT. LSE section file implementing. Multiple process monitor utility to watch paging.
[.SYSMON] Menu program in COBOL. Amortization program. Define logicals from a central file. Give text of VMS ERR numbers. EDT enhancements. Purge working set. LG02 control files. REMINDERS. Operations help libraries. Save/restore recall buffer. Text library menu. More.
[.T_NIELAND] EDTPLUS - EDT emulator in TPU with many additions. SEND - broadcast short message to other user. SETDEF - IN foreign utility. WSLTEX - Wordstar to LaTeX filter.

[.CALR] BBS- FULL function BBS system for VAX (MSG, conferences, uploads, downloads). CB- CB simulator for VAX. ETAPE- read/write EBC/ASCII tape. OPERMENU- menu driven operator system. WHO- cluster-wide who's on the system.

[.VFE] VAX File Editor, binary/hex/ASCII EBCDIC, etc., disk or file editor.

[.VT2XX] Program VT2xx function keys F6 to F20.

[.WATSON] EVE and EVEplus extensions includes Dennison speller interface, Dired.

[.WOLFE] Extended EVE with simple spell checker. Print Symbiont.

Complete sources may or may not be included.

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

DECUS No: V-SP-71 **Title:** Symposium Collection from the RSX SIG, Fall 1987, Anaheim **Version:** 1. February 1988

Author: Various

Submitted by: Glenn C. Everhart

Operating System: IAS, MICRO/RX, MicroVMS, P/OS, RSX-11M, RSX-11M-PLUS, RSX-11S, VAX/VMS **Source Language:** C, FORTRAN 77, FORTRAN IV-PLUS, MACRO-11 **Keywords:** Symposia Tapes - VMS

Abstract: This is the RSX SIG Tape from the Fall 1987 DECUS Symposium in Anaheim. It is available in either BRU format or VMS/BACKUP format. See DECUS Program No. 11-SP-99 for a description of the program.

Complete sources may or may not be included.

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

DECUS No: V-SP-72 **Title:** AMIGA Utilities Collection 3 **Version:** 1. February 1988

Author: Various

Submitted by: Glenn C. Everhart

Operating System: AMIGA DOS, VAX/VMS **Source Language:** ASSEMBLY, BASIC, C, FORTRAN 77, MODULA 2 **Keywords:** Data Base Management, Games, Graphics, Utilities - VMS

Abstract: This tape contains a large collection of utilities and programs for the AMIGA 32 bit computer. The AMIGA is an inexpensive machine well suited to be used as a powerful graphics workstation in a Digital Equipment Corporation host environment, with multitasking, large address space, windows, graphics, color, and more.

The tape contains some new and improved VT100 emulators, editors, CAD programs, database software, games, picture processors, code to let an AMIGA be a part of Usenet, drivers, music players, and scores, multiwindowing remote host packages, hard disk backup utilities, new fonts, appointment keepers, a

BBS, CLI frontends, instructions for a simple AMIGA based hypertext system, animations, plotters, disk catalogs, calculators, Prolog interpreter, and more.

This package contains items introduced for AMIGA PD consumption since the "AMIGA Utilities Collection 1". DECUS Program No. V-SP-68, and "AMIGA Utilities Collection 2". DECUS Program No. V-SP-69, tapes became available. Numerous source programs make these programs valuable even on non-AMIGA computer configurations.

Because many of the files are in .ARC form, the VMSSWEEP utility is provided to allow for examination of these archives online on a VAX under VMS. An executable version of the ARC utility for VMS is also provided. However, since this is an alpha version of VMS ARC, it has several limitations which make it less able to read archives under VMS than VMSSWEEP. This is why both are provided.

Complete sources may or may not be included.

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

DECUS No: VAX-302 **Title:** TELL.FOR **Version:** 1.0, January 1988

Author: Ed Carraway, CDI, 1916 Sam Rittenberg, Apt. 1716, Charleston, SC29407

Operating System: VAX/VMS V4.5 through V4.7 **Source Language:** VAX FORTRAN **Keywords:** Mail, Utilities - VMS

Abstract: TELL.FOR is modeled after the VMS utility REPLY. It does not necessarily have to be used in conjunction with operator functions because it is installed on the system as a privileged image. Thus, all users can take advantage of the \$BRKTHRU system service without having the responsibility of added privileges. TELL differs from REPLY by several factors, such as:

- It will not (without slight modification) notify all users simultaneously.
- It automatically rings the terminal bell, and also puts the message in bold video.
- It cannot be used in an operator reply/request context.
- It can grab the user's attention by blinking the terminal screen from normal to reverse (TELL/REVERSE).
- It can defer a message until a certain date and time (TELL/AFTER=).
- It can display the message in double-size text (TELL/LARGE).
- The REPLY/USER= and REPLY/TERMINAL= are incorporated into the one command TELL. If the breakthrough is unsuccessful in locating a user, it will search for a terminal.

It should be installed with the procedure TELL.INSTALL.COM, or this procedure should be closely followed.

The author welcomes any questions or comments.

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

DECUS No: VAX-313 **Title:** MANAGEMENT TOOLS **Version:** 8.802, February 1988

Submitted by: M.D. Smith, Smith Broadcasting, Inc., Huntsville, AL

Operating System: VAX/VMS V4.6 **Source Language:** VAX-11 BASIC **Keywords:** Business Applications, Utilities - VMS

Abstract: MANAGEMENT TOOLS is a series of ten programs and a text file written by a manager with twenty-five years experience as a manager, including ten years teaching management seminars. The entire program is MENU driven as you RUN the program MENU.EXE. VAX BASIC (.BAS), .OBJ and .DOC files of each program are also included. The .DOC files can be read from the main menu.

- COMMUN.EXE Communication effectiveness
- DECISLXEXE Decision making help
- DELEGA.EXE Be a better delegator
- EVALUO.EXE Employee evaluation
- GETDUN.EXE Getting more done in a day
- MANAGE.EXE Better overall manager of people
- MOTIVA.EXE Motivation of people and self
- MYBOSS.EXE Boss evaluation program
- PLANS.EXE Planning improvement
- TIMEFLXEXE Time management improvement
- INTERV.QES Interviewing prospective employees

The more times a manager uses these programs, the more benefits he/she will gain. There are options for hardcopy printouts of various portions of the programs as they run or they can be stored in files.

These programs were originally written on an MS-DOS PC and were further modified to run on a C-64 and an APPLE computer. The BASIC code used is highly transportable for this reason and will run, with only minor modifications, on any computer that runs BASIC. As requested by the author, this program is not to be redistributed for profit of any kind.

Non-management personnel will also find benefits in these programs for business and private lives.

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

DECUS No: VAX-319 **Title:** COBOL Cross Reference **Version:** 1.0, February 1988

Submitted by: Chester Czulada, E.F. Houghton & Co., Valley Forge, PA

Operating System: RSX-11M, RSX-11M-PLUS, VAX/VMS V3.0 - V4.7 **Source Language:** COBOL-74 **Keywords:** Cross-References

Abstract: COBOL CROSS REFERENCE is a COBOL program that reads the file created from the directory/out= TEMPI:-SRDCOBOL.DAT command. This file directs the program to read the COBOL files in a directory assign to "COB:". All COBOL programs are scanned for file names in the SELECT statements and for the use of the COPY verb.

Three report sections are produced:

- SECTION A - PROGRAMS WITH ASSOCIATED FILE NAMES
 - Each COBOL program is listed with all the file names used by the program. This allows a quick review of the program files without access to the COBOL source.

• SECTION D - FILE NAMES -- CROSS REFERENCE

- Each file found in the COBOL programs is arranged alphabetically in this cross reference section. This is a very quick reference to which user programs have access to specific data files.

• SECTION Y - COPY VERB USES -- CROSS REFERENCE

- Each COPY verb use is listed in alphabetic sequence with a cross reference to the program.

The only requirements for this program are the three assignments for data areas.

COB: COBOL SOURCE AREA IN'PUT
TEMP1: DIRECTORY/OUT=TEMP1:SRDCOBOL.DAT-FILE AREA
RPT: REPORT OUTPUT ASSIGNMENT

By limiting the directory/out option file enables you to look at only specific systems for cross referencing.

Example: Cross reference ap* programs only \$ directory/out=templ:srcobol.dateob:ap*.cob \$ run COBOL_CROSS_-REFERENCE

Documentation may or may not be on magnetic media.

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

DECUS No: VAX-320 **Title:** VCR_FILES **Version:** February 1988

Submitted by: Gail I. Schuman, Photon Research Associates

Operating System: MicroVMS V4.5 - V4.7 **Source Language:** VAX FORTRAN **Software Required:** VAX FORTRAN **Hardware Required:** Starbuck 8232 Data Acquisition and Control System **Keywords:** Data Communications, Device Handlers, Engineering Applications, Scientific Applications

Abstract: VCR_FILES is a set of four subroutines written in VAX FORTRAN to communicate with the Starbuck 8232 in order to control a JVC single frame recording subsystem. Routines are available for initializing the device (port) and communication channel, turning the unit "on" for a user-specified amount of time, turning the unit "off" for releasing the device and channel back to the system. Although this software is device and system specific, it is easily modifiable and could be used as an example for programming similar devices.

The routines are written in VAX FORTRAN, but are callable by either a VAX C or FORTRAN program. The routines all contain system service calls. The routine, VCR_ON is used to turn on a VCR through the Starbuck for a specific length of time and then turn it off. This could be modified for any length of time.

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

DECUS No: VAX-322 **Title:** VAXstation Games **Version:** 1.0, January 1988

Submitted by: Charles Bulkeley

Operating System: MicroVMS V4.5C **Source Language:** C **Memory Required:** 1MB **Keywords:** Games

Abstract: This tape is a collection of games and graphics demonstrations for the VAXstation. Among these is a simulator that lets the user fly a three dimensional wireframe helicopter. Also included is a pool table game that lets two users play a game of eight ball.

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

DECUS No: VAX-321 **Title:** QMON **Version:** 1.0, February 1988

Submitted by: Gardner Buchanan, C.F.S. Pacific Forestry Centre, Victoria, BC, Canada

Operating System: VAX/VMS V4.6 **Source Language:** VAX FORTRAN **Keywords:** Utilities - Disk - VMS

Abstract: When disk space suddenly becomes scarce, it is often hard to answer the question, "Who has used up the disk space?". This program builds upon the function of DISK QUOTA to provide a way of tracking disk storage allocation by each user in addition to the simple snapshot. By comparing a user's current resource usage to his recent average resource usage, increasing or decreasing trends can be seen and the system manager may focus his attention on users whose resource allocation is increasing.

Notes: Operating system VAX/VMS V4.X and later is required.

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

NEW LIBRARY PROGRAMS AVAILABLE FOR THE PDP-11 COMPUTER FAMILY

DECUS No: 11-SP-99 **Title:** Symposium Collection from the RSX SIG, Fall 1987, Anaheim **Version:** 1, February 1988

Author: Various

Submitted by: Glenn C. Everhart

Operating System: IAS, MICRO/RXSX, MicroVMS, P/OS, RSX-11M, RSX-11M-PLUS, RSX-11S, VAX/VMS **Source Language:** C, FORTRAN 77, FORTRAN IV-PLUS, MACRO-11 **Keywords:** Symposia Tapes - RSX-11

Abstract: This is the RSX SIG Tape from the Fall 1987 DECUS Symposium in Anaheim. It is available in either BRU format or VMS/BACKUP format. The VMS tape is DECUS Program No. V-SP-71. Following are brief descriptions of the contents of the directories on the tape. Common documents are found in directory [300.1] and tape copy utilities are found in directory [300.2].

[200.1] Mandelbrot set explorer and Graphic Microscope for Digital Equipment Corporation PRO 3xx. Submitted by R.J. Wilden; minor update by G. Everhart.

[240.1] The King James version of the BIBLE. Unlike previous versions, this one is in mixed upper and lower case; much easier to read than the earlier submissions.

[265.1] Set/reset/show global event flags. Command line editor. Send/receive packets from

command. Also, utility to show or delete send/receive and send/recv-by-ref packets (handy when pool gets cluttered...). Submitted by Hans Hamakers, DECCS Europe.

[300.117] FMS-11 enhancements. Adds runtime video attribute control, and read-with-timeout for single character fields, for FMS-11 2.0 and 2.1. Submitted by Joseph Kulaga.

[312.41] Update to LISTRS multicolumn lister for RSX. Adds support for PIP type wildcards, line numbering, and many more new features. Submitted by Chris Doran, SIRA, England.

[312.42] WLDCRD and ENTAB - utility programs for improved wildcard file handling and tabbing (replacing multiple spaces with tabs as appropriate).

[312.315] Scientific Subroutine Package, with docs. The complete SSP math and statistics package is presented for Digital Equipment Corporation machines, with all comments and documents in the sources so they can now be more readily accessed.

[312.350] Desktop Calendar. Appointment and schedule keeper version for PDP-11 complete with tested task images. Submitted by Mitch Wyle and Glenn Everhart.

[312.351] MicroEmacs 3.9e. These are the sources in C and all documents for MicroEmacs 3.9e. They need some work to port to PDP-11, but should be compact enough to do this with. MicroEmacs is a powerful but compact editor which can be customized for most needs.

[327.2] INUSE - lock terminal for up to ten minutes when you need to leave it briefly. VT200 and TEK4010 - toggle VT240 between VT200 and TEK modes. ALIAS - secure way of defining a user alias (including password) for another system on DECnet. Submitted by Arnold DeLarisch.

[327.100] Floppy Disk copier. Copies between floppy disks and disk container files, format independent.

[332.12] Bonner Lab RUNOFF, a large superset of Digital Equipment Corporation Standard RUNOFF. One of the best text formatters available on RSX. Submitted by John Clement, Rice University.

[343.120] BYE, TIMOD patches for secure CLI on RSX-11M-PLUS. Submitted by Jim Bostwick.

[343.121] BYE, TTMOD patches for secure CLI on RSX-11M-PLUS. Submitted by Jim Bostwick.

[343.122] Secure Command Line Interpreter. Allows you to control what a non logged-in terminal can do, and provides a reasonably secure password system. Submitted by Jim Bostwick.

[343.123] Ancillary Control Drivers: one for electronic scale, one a skeleton to roll your own... gives you fine grain control over terminal line protocols. Submitted by Jim Bostwick.

[343.124] Convert between 64 bit integers and DTR clunk date/times. Also, 64 bit integer math routines. Submitted by Jim Bostwick.

[351.144] Papers giving tutorials on RSX, P OS, and RT-11 indirect command languages and some utilities for use with indirect including case conversion, .STB dumper, BRU preprocessor, CDA preprocessor, indexed read, and printer port handler. Submitted by T. Wyant.

[351.145] FINGER/RXSX. A kind of DECNET based WHO utility that shows who's on the system, what they're doing, and much more. Interfaces with the FINGER utility on VMS also, and permits displays across DECnet in either direction. Also acts as a name server (to find an account given a name) across the network. Submitted by Tom Wyant.

[351.146] Task Image Zapper. Gives formatted dump and ability to modify most task header fields (E.G. name, partition, LUN assignments, priority, creation date, commons, etc.)/Calculator and radix converter. BRU command line builder. Submitted by Tom Wyant.

[352.4] SRD V6.62. Sorted Directory and general file system maintenance utility. Now supports either decimal or octal version numbers, named directories. Selects these using the RSX FEATS directive, so it'll work on most systems w/o taskbuild. Submitted by Arnold DeLarisch.

[356.31] DATATRIEVE SIG items: information on reading quadword dates in FORTRAN. Process RSX console log files. Process RSX-11M-PLUS system accounting with DTR. Graphing data on PRO-3xx.

[356.40] KERMIT. Several recent (1/14/88) KERMITs are present, including KERMIT-11, VMS KERMIT, MS-DOS KERMIT V2.30, CP/M KERMIT, C KERMIT, some IBM mainframe KERMITs, the new XK.* version of C KERMIT, and a few document files and associated odds and ends. This is NOT a complete KERMIT distribution of all KERMITs, but each KERMIT presented is complete (except for a few binaries of some machines and OSs which were removed to make some space). The full "KERMIT Distribution", DECUS Program No. V-SP-53, is available separately.

Complete sources may or may not be included.

Media (Service Charge Code): 2400' Magnetic Tape (PS) Format: BRU, TK50 Tape Cartridge (TC) Format: BRU

NEW UNIX PROGRAMS

DECUS No: UX-SP-102 **Title:** UNISIG Collection **Version:** April 1987

Submitted by: Carl D. Lowenstein, Marine Physical Lab., LaJolla, CA

Operating System: ULTRIX-32 V1.2, **UNIX Source Language:** C **Keywords:** Editors, Games, Text Formatting, Tools - Software Development, Utilities - VMS

Abstract: Following is a description of some of the highlights of the Spring 1987 UNISIG tape.

EDITORS Emacs V3.7, TVX (U. of Arizona), se (Georgia Tech), MicroEmacs, GNUEmacs, Macros to turn Emacs into EDT.
GAMES Hack, larn, sniglet, make phone numbers into words, rogomatic, game regulator.
LANGUAGES Yacc and lex descriptions of ANSI C, FORTH, LISP, C preprocessors and cross-referencers, BASIC.
DOCUMENTS C style manual, comparison of Berkeley and AT&T UNIX, compilation of uucp sites.

TEXT PROCESSING Hershey fonts, TeX index maker, TeX syntax checker, drivers for LA50 and LaserJet printers, simple text formatter(s), ditroff to postscript.

TOOLS Software tools in PASCAL, Turbo-PASCAL, faster grep, file compression, 68K disassembler, re-mapping of long identifiers, automatic source patching, bundling and unbundling of files, string manipulation routines, getopt (3), suntools, btrees.

COMPUTATION IEEE floating point routines, simplex curve fitting.

COMMUNICATION News handling software, pathalias, zmodem, MSG mail system, remote procedure call.

UTILITIES Rolodex, wire-wrap, ANSI tape read/write, calendars, collected useful shell scripts.

BUGFIXES Published MtXinu fixes, collected Usenet 4.2 BSD bugs.

Media (Service Charge Code): 2400' Magnetic Tape (PC) Format: UNIX/TAR, TK50 Tape Cartridge (TC) Format: UNIX/TAR

NEW UNIX PROGRAMS

DECUS No: UX-105 **Title:** SPICE3 **Version:** 3B.1, April 1987

Submitted by: University of California at Berkeley, through Digital Equipment Corporation

Operating System: ULTRIX/UNIX **Source Language:** C **Memory Required:** 65MB **Software Required:** VAXC Compiler **Keywords:** Circuit Simulation

Abstract: SPICE is a general-purpose circuit simulation program for nonlinear DC, nonlinear transient, and linear AC analysis. Circuits may contain resistors, capacitors, inductors, mutual inductors, ideal switches, independent voltage and current sources, four types of dependent sources, transmission lines and the five most common semiconductor devices: diodes, BJTs, JFETs, GaAs MESFETs, and MOSFETs.

The ordering information for the manuals is as follows:

- Order UX-105 (EA) for the User's Guide
- Order UX-105 (EB) for the User's Manual
- Order UX-105 (EC) for the Programmer's Manual

Release notes are distributed with each order.

Notes: Operating system UNIX V4.2 and 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 (EA), User's Manual (EB), User's Manual (EC), 2400' Magnetic Tape (PA) **Format:** TAR

DECUS No: UX-106 **Title:** RELAX2.3 **Version:** 2.3, March 1988

Submitted by: University of California at Berkeley, through Digital Equipment Corporation

Operating System: ULTRIX/UNIX **Source Language:** C **Memory Required:** 10MB **Software Required:** VAX C Compiler **Keywords:** Circuit Simulation

Abstract: RELAX2.3 performs a fast and accurate transient analysis of Metal-Oxide-Semiconductor (MOS) integrated circuits. The program uses a mixture of direct methods, like those used in the SPICE2 program, DECUS Program No. UX-109, and a modified version of the Waveform Relaxation (WR) algorithm. This combination of methods can greatly improve the computational efficiency of circuit simulation for MOS digital circuits by exploiting their loose coupling and relative inactivity, and can still efficiently solve tightly coupled analog circuits by switching automatically to direct methods when appropriate. Using this combination of methods, RELAX2.3 can produce results of the same accuracy as SPICE2 for both analog and digital MOS integrated circuits, but often uses less than ten percent of the computer time.

The ordering information for the manuals is as follows:

- Order UX-106 (EA) for the RELAX2.3 User's Guide
- Order UX-106 (ED) for the MULTIRATE INTEGRATION User's Manual

Release notes are distributed with each order.

Notes: 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 (EA), User's Manual (ED), 600' Magnetic Tape (MA) **Format:** TAR

DECUS No: UX-107 **Title:** MAHJONG **Version:** 1, October 1986

Submitted by: University of California at Berkeley, through Digital Equipment Corporation

Operating System: ULTRIX/UNIX **Source Language:** C **Memory Required:** 789W **Software Required:** VAX C Compiler **Keywords:** Circuit Simulation

Abstract: MAHJONG is a user-configurable test pattern generation (TPG) system for combinational logic circuits. It takes as input a circuit file and performs a tailored TPG process specified by the user through various options. MAHJONG contains two front-ends, a deterministic TPG program, several heuristics for guided TPG, and a back-end. A parallel fault simulator is embedded in the deterministic TPG program as well as in the back-end and is not directly accessible to the users.

The front-ends are heuristic TPG programs designed to efficiently generate test vectors for easily detectable faults. Users have the choice of the VICTOR-III front-end, the random front-end, or no front-end at all. Hard-to-detect faults are handled by the deterministic TPG program. Currently, this program is based on the PODEM algorithm. The back-end is a test compactor based on fault simulation and is very cost-effective. Four guided TPG heuristics are currently provided for the PODEM-based deterministic program.

Notes: 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): 600' Magnetic Tape (MA) **Format:** TAR

DECUS No: UX-108 **Title:** GLITTER2 **Version:** 2, January 1987

Submitted by: University of California at Berkeley, through Digital Equipment Corporation

Operating System: ULTRIX/UNIX **Source Language:** C **Memory Required:** 964W **Software Required:** VAX C Compiler **Keywords:** Circuit Simulation

Abstract: GLITTER2 is a two-layer channel routing and compaction tool for the layout design of integrated circuits. It consists of the gridless channel router GLITTER and a newly-developed channel spacer NUTCRACKER. The gridless approach we use can take advantage of different design rules on the two routing layers. No columns or tracks will be generated; only the wire width, spacing and contact size are considered. The major feature of this tool is to route channels with different wire widths and arbitrary terminal positions. It is also capable of handling channels with irregular boundaries. To minimize the channel height, contacts will be slid and necessary jogs will be automatically inserted. For channels with cyclic constraints, a preprocessor is used to generate the doglegs. The routing algorithm starts with a cycle-free weighted constraint graph, and generates a solution which minimizes the channel height.

Notes: Operating system UNIX 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 (EA), 600' Magnetic Tape (MA) **Format:** TAR

DECUS No: UX-109 **Title:** SPICE2 **Version:** 2G.6, March 1988

Submitted by: University of California at Berkeley, through Digital Equipment Corporation

Operating System: ULTRIX/UNIX **Source Language:** C, FORTRAN 77 **Memory Required:** 1.5MB **Software Required:** VAX C Compiler, FORTRAN 77 Compiler **Keywords:** Circuit Simulation

Abstract: SPICE2 is a general-purpose circuit simulation program for nonlinear DC, nonlinear transient, and linear AC analysis. Circuits may contain resistors, capacitors, inductors, mutual inductors, ideal switches, independent voltage and current sources, four types of dependent sources, transmission lines and the five most common semiconductor devices: diodes, BJTs, JFETs, GaAs MESFETs, and MOSFETs.

Release notes are distributed with each order.

Notes: Operating system UNIX V4.1BSD 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 (EA), 600' Magnetic Tape (MA) **Format:** TAR

REVISIONS TO LIBRARY PROGRAMS

DECUS No: VAX-238 **Title:** VMS Disassemblers Package **Version:** 3, March 1988

Author: Claus Calle, Andy Pavlin and others

Operating System: MicroVMS, VAX/VMS **Source Language:** MACRO-32, VAX FORTRAN **Keywords:** Disassemblers

Abstract: Two VMS disassemblers capable of creating MACRO-32 sources from VMS native mode images are presented. All sources and brief documents are present, and one contains compiled executable code so that it can be used by sites without FORTRAN. The disassembler so presented is capable of disassembling user mode images, drivers and other system images reasonably intelligently. All known areas where it was incomplete have been squashed and the resulting source code is VERY usable. Driver recognition and parsing has also been greatly upgraded, and all known RMS blocks are decoded.

Notes: Executable code is present so no compiler is needed.

Changes and Improvements: Understands VMS data structures much better; all RMS blocks decoded.

Media (Service Charge Code): 600' Magnetic Tape (MA) **Format:** VMS/BACKUP, or order VAX-LIB-7

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

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

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

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

Contributions can be sent to:

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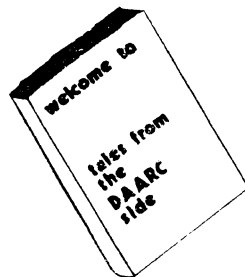
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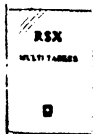
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Ask the WOMBAT WIZARD
Submission Form

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

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

Name: _____ DECUS Membership No. _____

Affiliation: _____

Address: _____

Telephone Number: _____

Statement of Problem: _____

Please following the following guidelines when submitting support
material:

1. If you are trying to demonstrate a method or a concept,
please simplify the procedures, records, and other information
to the shortest form possible.
2. Annotate your attachments. Simple comments or hand-written
notes ("Everything worked until I added this statement.") go a
long way toward identifying the problem.
3. Keep an exact copy of what you send. And number the pages
on both copies. But send everything that is related to your
question, even remotely.
4. If you would like a direct response or would like your
materials returned, please don't forget to include a stamped,
self-addressed envelope large enough to hold the materials you
send.



DATATRIEVE/4GL SIG
Product Improvement Request Submission Form

Submittor:
Address:

DECUS Membership Number:
Firm:

Phone:

Product or Products:

How to write a PIR

A PIR should be directed at a specific product or group of products. Be sure to give the full name of the product(s) and version numbers if applicable. Describe the functionality you would like to see in as complete terms as possible. Don't assume that the PIR editors or software developers know how it is done in some other software product - state specifically how you want the software to function. Provide justification of your request and give an example of its use. If you can, suggest a possible implementation of your request.

Abstract: (Please limit to one or two short sentences.)

Description and Examples: (Use additional pages as necessary.)

[Put my name and address on reverse side, thus:]

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

SUBMITTING ARTICLES TO HARD NEWS

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

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

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

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

Contributions can be sent to:

William K. Walker		Carmen D. Wiseman
Monsanto Research Corp.	OR	Digital Review
P.O. Box 32 A-152	==	Prudential Tower, Suite 1390
Miamisburg, OH 45342		800 Boylston Street
(513) 865-3557 (work)		Boston, MA 02199
(513) 426-7094/0344 (home)		(617) 375-4361 (work)

H M S S I G

HARDWARE SUBMISSION FORM -- A SIG INFORMATION INTERCHANGE

Message

Contact
Name

Address

Telephone

Type of equipment

SUBMIT ANY TYPE OF HARDWARE PROBLEMS AND/OR FIXES.

SEND TO:

William K. Walker
Monsanto Research Corp.
P.O. Box 32 A-152
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OR
==

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Prudential Tower, Suite 1390
800 Boylston Street
Boston, MA 02199

QU-7

MASTERS APPLICATION

Name: _____ Title _____

Company: _____

Address: _____

Phone: () _____

Network Address: _____ Date: _____

The Languages & Tools SIG has established the designation "LANGUAGES AND TOOLS MASTER", to be applied to selected, qualified people willing to share their expertise in various subjects with others. Masters are people who are knowledgeable enough in one or more languages or tools to be comfortable answering questions about them. The qualifications of an L&T Master are: expertise in a specific area, a willingness to have his/her name published as a Master, and a willingness to volunteer services in different ways. Each product may have several Masters, and there is an overall Masters Coordinator who is a member of the L&T Steering Committee.

Masters are asked to serve other users (and, under some circumstances, DEC), as a resource on products within their competence. In addition to being listed in the L&T Masters Directory (published in the newsletter) as available for occasional telephone consultation, Masters may act as 'Doctors' at Symposium Clinics, present Symposium sessions on the products of interest to them, field test products, interact with DEC product managers when appropriate, or act as a reference for a product for Digital salespeople. Especially on mature products, the SIG is anxious for knowledgeable users to offer product tutorial sessions at Symposia, and Masters can be of great help here. At Symposia, Masters will wear an identifying button bearing the legend "Ask Me About...." and the name of the language or tool in which he/she specializes.

If you'd like to serve as an L&T Master, please mark the products on which you are willing to answer questions with an "M" (for Master). Please mark any other products running at your site with an "A" (for "also running") to provide users with a broader picture of your facilities. (Although not an L&T product, Mumps is included here at the request of the Mumps SIG as a service to Mumps users). You may request removal of your name from the Masters Directory at any time, although you may continue to be listed for a month or two, because of publication lead times.

I am qualified to act as an L&T Master for the following products: Mumps

- | | | | | | |
|------------------------------------|--------------------------------|------------------------------|-------------------------------|---|---|
| <input type="checkbox"/> Debug | <input type="checkbox"/> Bliss | <input type="checkbox"/> CMS | <input type="checkbox"/> TPU | <input type="checkbox"/> C | <input type="checkbox"/> Test Manager |
| <input type="checkbox"/> Pascal | <input type="checkbox"/> Basic | <input type="checkbox"/> MMS | <input type="checkbox"/> EVE | <input type="checkbox"/> Ada ¹ | <input type="checkbox"/> Runoff & DSR |
| <input type="checkbox"/> Fortran | <input type="checkbox"/> Cobol | <input type="checkbox"/> LSE | <input type="checkbox"/> EDT | <input type="checkbox"/> APL | <input type="checkbox"/> T _E X & L ^A T _E X |
| <input type="checkbox"/> Document | <input type="checkbox"/> Dibol | <input type="checkbox"/> SCA | <input type="checkbox"/> TECO | <input type="checkbox"/> RPG | <input type="checkbox"/> Cobol Generator |
| <input type="checkbox"/> VAX Notes | <input type="checkbox"/> Emacs | <input type="checkbox"/> PCA | <input type="checkbox"/> PL/1 | <input type="checkbox"/> Scan | <input type="checkbox"/> 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.

¹Ada 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):

- | | | | | | |
|------------------------------------|--------------------------------|------------------------------|-------------------------------|---|---|
| <input type="checkbox"/> Debug | <input type="checkbox"/> Bliss | <input type="checkbox"/> CMS | <input type="checkbox"/> TPU | <input type="checkbox"/> C | <input type="checkbox"/> Test Manager |
| <input type="checkbox"/> Pascal | <input type="checkbox"/> Basic | <input type="checkbox"/> MMS | <input type="checkbox"/> EVE | <input type="checkbox"/> Ada ¹ | <input type="checkbox"/> Runoff & DSR |
| <input type="checkbox"/> Fortran | <input type="checkbox"/> Cobol | <input type="checkbox"/> LSE | <input type="checkbox"/> EDT | <input type="checkbox"/> APL | <input type="checkbox"/> T _E X & L ^A T _E X |
| <input type="checkbox"/> Document | <input type="checkbox"/> Dibol | <input type="checkbox"/> SCA | <input type="checkbox"/> TECO | <input type="checkbox"/> RPG | <input type="checkbox"/> Cobol Generator |
| <input type="checkbox"/> VAX Notes | <input type="checkbox"/> Emacs | <input type="checkbox"/> PCA | <input type="checkbox"/> PL/I | <input type="checkbox"/> Scan | <input type="checkbox"/> 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:

- | | | |
|---|---|---|
| <input type="checkbox"/> Newsletter | <input type="checkbox"/> Symposium Sessions | <input type="checkbox"/> Pre-Symposium Seminars |
| <input type="checkbox"/> Masters Program | <input type="checkbox"/> Working Group Activities | <input type="checkbox"/> Session Notes |
| <input type="checkbox"/> Information Folder | <input type="checkbox"/> SIG Tape | <input type="checkbox"/> DECUS Store Item |
| <input type="checkbox"/> Other L&T SIG topic: _____ | | |

Wish List Request—brief description: _____

Complete description—please explain your request thoroughly; don't assume we know details of other products or services; give examples. _____

Mail to: Shava Nerad, L&T Wishlist Coordinator, MIT, 77 Mass Ave. W91-219A, Cambridge, MA 02139; (617)253-7438

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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:

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FARMINGTON, CT 06032

Title: _____

Message: _____

Your Name: _____

Address: _____

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

QU-14

E. Catherine Ditamore
ARA Services
Corp MIS
The ARA Tower
1101 Market Street
Philadelphia, Pa. 19107

RT-11 WISH LIST SURVEY

Name (optional) _____

Address (optional) _____

DECUS Number (optional) -----

- | | | | | | | | | | |
|------|-------|------|-------|-------|-------|-------|-------|------|-------|
| 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 | _____ |
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| 1.9c | _____ | 3.4b | _____ | 3.8a | _____ | 3.17e | _____ | 6.4c | _____ |
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| 1.13 | _____ | 3.6b | _____ | 3.9c | _____ | 3.19c | _____ | 6.6c | _____ |
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| 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 | _____ |
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| 2.12 | _____ | 3.7h | _____ | 3.10e | _____ | 4.7d | _____ | 9.3a | _____ |
| 2.13 | _____ | 3.7i | _____ | 3.10f | _____ | 4.7e | _____ | 9.3b | _____ |
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| 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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 2121-B Second St. Suite 107
 Davis, CA 95616

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