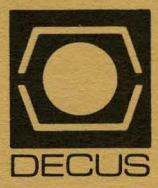
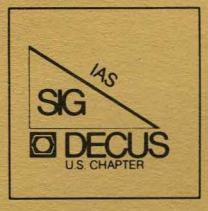
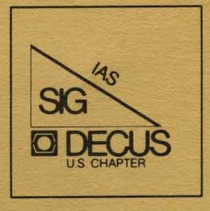



# The DeVIAS Letter




# The RSX Multi-Tasker

November 1983 Issue

*Printed in the U.S.A.*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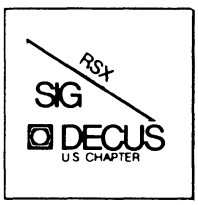
# Section One




# The RSX Multi-Tasker

# THE MULTI-TASKER

## The Newsletter of the RSX Special Interest Group

November 1983

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# From the Editor

It is not news to you that the "Multi-Tasker" has been absent from your mail for many months. It will be good news for you to hear that starting with the last issue (October) the "Multi-Tasker" will once again be a monthly occurrence.

Thank you, Ralph Stamerjohn, for doing the October issue otherwise known as the "Anniversary Special". The November (which you are reading) and the December issues will be done by myself, the Temporary Newsletter Editor. Starting with the January 1984 issue the "Multi-Tasker" will have two editors or co-editors: Allen Watson and Dominic Di Nollo, more about them in the November issue.

Any editor needs articles in order to publish an interesting newsletter. I challenge each reader to submit an article during the upcoming year....

TOGETHER LET'S MAKE THE "MULTI-TASKER" HAPPEN

Contributions shoud be sent to:

The Multi-Tasker
c/o DECUS
One Iron Way, MR2-3/E55
Marlboro, MA 01752

Nancy L. Pallett
RSX SIG Publications Coordinator
Cameron Shaw Associates
Birmingham, Michigan

# Ask A Question

"Ask A Question" is a place for you to get your tough questions answered, this used to be "Help Yourself". Each month, questions from readers will be published seeking answers from the membership. If you have a question, send a letter to the Multi-Tasker - "Ask A Question", c/o DECUS, One Iron Way, MR2-3/E55, Marlboro, MA 01752.

1. Will REGAL work on RSX-22M V3.2? If not, are there any graphic routines that will?

   Joe Gagliardino
   Division of Environmental Control
   14 Ashley Place, Wilmington, DE 19804

2. We are trying to use Duplex between a remote 11/44 and a host 11/70. The communication link is via a 1200 baud modem. My terminal at the 11/70 which Duplex is running on, is set to 9600 baud. When we transmit a file to the 11/44, the echo'd characters are filling up my type-ahead buffer and thereby losing characters. How can I prevent this? Also is "PIP" the only way to transfer files, and is anyone using indirect command files on the remote site to receive transmitted files?

   Robert J. Howell
   Ford Motor Company
   15568 Hanfor, Allen Park, MI 48101

3. I have a PDP 11/23 using RSX 4.0 and FORTRAN 77. With this system we are using a DigiData magnetic tape drive through an Emulex controller. While many of the RSX utilities run properly with the tape drive (e.g.: DSC, FLX), some DO NOT.
   I have found certain features of PDP that will not work with our magnetic tape drive. I can read and write files to DEC labeled tapes, however, I can only read non-labeled tapes. If I try to write to a non-labeled tape, I get a tape label error.
   I have also found that INIT will not initialize a magnetic tape label properly. I now initialize magnetic tapes as FOREIGN tapes using a FORTRAN writing program and QIO subroutine calls.
   My experience using FORTRAN based QIO subroutine calls is that they do not always work and the pattern of when they will work is inconsistent. For example, in one program I found that I could only write to the magnetic tape if I also wrote to the CRT.
   The personnel at my installation are primarily users and we have no system expertise. I would be pleased to talk with someone who is familiar with the above problems and can explain to me any limits of my hardware configuration.

   Bruce Jackson
   Blackland Research Center
   P.O. Box 748, Temple, TX 76503

# Your Questions Answered

"Your Questions Answered" is the place to look for published answers from the "Ask A Question" column. If you can answer the question, sent it to the Multi-Tasker - "Your Questions Answered", c/o DECUS, One Iron Way, MR2-3/E55, Marlboro, MA 01752.

No answers this month. See the article "DECUS SYMPOSIUM Spring '83, Question and Answer Session".

Over the years, DECUS, through the DECUS library, and the RSX SIG, through the SIG tapes, have accumulated a huge set of useful software. If you have news about this software: problems discovered, patches to existing software or short notes on library submissions you found useful, send it to the Multi-Tasker - "DECUS/RSX Library News", c/o DECUS, One Iron Way, MR2-3/E55, Marlboro, MA 10752.

# DECUS/RSX SIG Library News

1. 11-SP-47 (new), PORTACALC: A Portable Spsreadsheet Program

   Author: Glenn C. Everhart, RCA, Mt. Holly, NJ

   Operating System: IAS, RSX-11D, RSX-11M, RSX-11M-Plus, VAX/VMS

   Source Language: FORTRAN IV-PLUS

   The PortaCalc spreadsheet is a FORTRAN written program able to perform the usal "what if" type of calculations.

2. 11-603 (new), TEXT System for Technical Manuscript Preparation

   Author: Dan Dill, Bauston University, Boston, MA

   Operating System: RSX-11M V3.2 or later, RT-11 V4.0 or later,

   VAX/VMS V2.0 or later

   Source Language: C, MACRO-11

   The TEXT System is a collection of software tools, which in combination with DECUS RUNOFF (RNO); form a comprehensive text processing system for technical manuscript preparation of PDP-11 and VAX-11 computers with NEC Spinwriters and the Technical Math / Times Roman type thimble.

3. V-SP-12 (new), RSX SIG Symposium Tape, Spring 1982, Atlanta

   Author: Many

   Operating System: IAS, RSX-11D, RSX-11M, VAX/VMS

   Source Language: BASIC, FORTRAN IV-PLUS, MACREL, MACRO-11, PASCAL, TECO

   This set of tapes contains the RSX SIG tape from the Spring 1982 DECUS Sumposium in Atlanta. It is in RMSBCK format.

4. 11-229 (revision), INDEX: FORTRAN Cross-Referencer

   Author: Michael N. LeVine,
   Naval Weapons Center, China Lake, CA

   Operating System: IAS, RSX-11M V3.1 or later, RT-11 V4 or later

   Source Language: MACRO-11

   INDEX is a cross referencing program that does for FORTRAN what CREF does for MACRO. A source program run through INDEX will be checked for all of its variable name and label usage. The results will then be listed in alphabetical order, listing all the variable names and labels used in the program, the lines on which they were used, and how they were used.

5. 11-606 (new), SPAL-11 Structured Programming Using Assembly Language

   Author: G. Laurent and S. Rozenberg,
   INFI, Chaville, France

   Operating System: RSX-11M, RT-11

   Source Language: MACRO-11

   SPAL-11 is a set of macros which, when incorporated in your default macro library gives you the ability to write will constructed, clear and maintainable programs.

# Hints 'N Things

"Hints 'n Things" is a monthly potpouri of helpful tidbits and rumors. Readers are encouraged to submit items to this colmun. Any input about a way to make life easier on RSX is needed. Please beware that items in this column have not been checked for accuracy. Send any contributions to Multi-Tasker - "Hints 'n Things", c/o DECUS, One Iron Way, MR2-3/E55, Marlboro, MA 01752.

## Modify RSX-11M Prompts

Don Jensen
Lake County Public Water District
P.O. Box 462, Zion, IL 60099

We are currently running RSX-11M on both 11/24 and 11/34 systems at our water filteration plant. Terminals are switched manually and automatically between CPUs. Until we learned of the following method (courtesy of the fine folks at DEC Telephone Support Service), determining which system one was accessing required running RMD, DEV, etc. Now a simple <CR> is all that's necessary. I hope that this is of use to our fellow "Multi-Taskers".

PROCEDURE FOR MODIFICATION OF MCR PROMPTS RSX-11M SYSTEM

```
>>>>>>>>>>>>>>>>>>>>>>>> NOTE <<<<<<<<<<<<<<<<<<<<<<<<<<<<
>                                                          <
>   Manual page references are for RSX-11M V4.0 manual.    <
>      They may be different for V4.1 manual set.          <
>                                                          <
>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>
```

1. Examine RSX11M.MAP generated at SYSGEN for address associated with symbol $CPTBL on our 11/34A system, the map reads: $CPTBL 010042-R

2. >OPE 010042<CR>  NOTE: <CR> designates CARRIAGE RETURN
   010042 /010054<CR>  (See MCR MANUAL 3-138,139)
   010044 /000000<CR>
   . / . <CR>
   . / . <CR>

   Continue until you find an address sequence containing the following values (the addresses, again are those on our particular system).

   . / . <CR>
   010070 /000076<CR>  NOTE: '>' symbols
   010072 /005015<CR>  'LF CR' symbols
   010074 /041515<CR>  'C M' symbols
   010076 /037122<CR>  '> R' symbols
   010100 /000000<ESCAPE>
   >^C
   MCR> (The original prompts > and MCR> remain unchanged.)

"Modify RSX-11M Prompts" (Continued)

3. Now the locations containing the MCR prompts may be modified. We selected a plus sign (53 OCT) for ouR 11/34A system.

```
>OPE 010070<CR>
 010070 /000076 53<CR>        NOTE: '+'      symbols
 010072 /005015<CR>                 'LF CR' symbols
 010074 /041515<CR>                 'C M'   symbols
 010076 /037122<CR>                 '+ R'   symbols
 010100 /000000<ESCAPE>
+^C
MCR+  (The MCR prompts are now altered on this system.)
```

4. Back-up system disk!!! and Prepare to 'SAV' the system.
(See MCR manual page 3-160,169)

```
>SAV /WB <CR>
   (Will overwrite the old default system and prompts.)
```

This system will now have a characteristic prompt. One need only glance at the prompt to determine which system a terminal is attached to.

## Using ODT Unattended

Roland Kessi
Swiss Institute for Nuclear Research
CH-5234 Villigen, Switzerland

It is often desirable to include ODT in a task in such a way that the task starts automatically, without user intervention on a terminal. This is particularly important when debugging tasks, like network servers, which are started by other tasks and must respond within a time too short to start them manually (ODT command G). The debugging session may be started later, either by explicitely placing a BPT instruction in the task code, or on RSX-11M-Plus, with the DEBUG command.

In Principle, ODT will always prompt for a command when a task is started, unless the task is fixed and has already run. However, the desisred effect may be obtained with a simple patch at task build time. Note that the header line:

```
ODT:taskname
```

will still be displayed on the task TI:. The following paragraphs describe the procedure to use on RSX-11M-Plus.

1. Tasks not using data space.
   Use the following TKB command file for tasks which DO NOT usa data space:

```
name/DA,.....=
      .
      .
      .
/
GBLPAT=root_segment_name:.ODTL1+706:240
      .
      .
      .
//
```

   This procedure should also work on RSX-11M version 4.0 or later, but I have not tested it.

2. Tasks using data space
   The procedure for tasks using data space is a little more complicated, because ODT has no global symbol in instruction space that we can reference. It is, therefore, necessary to first obtain a MAP and to use an absolute patch. The following TKB command file should be used:

```
name/ID/DA,.....=
      .
      .
      .
/
ABSPAT=root_segment_name:nnnnnn:240
      .
      .
      .
//
```

   Where nnnnnn is computed as the base address of the program section $ODTCD plus 274.

   Note that this procedure works on RSX-11M-Plus version 2.1. I could not use it on version 2.0, because ABSPAT insisted upon patching data space.

# Working Group News

Reported by: Elizabeth Bailey

The working group chairmen are as follows:

RSX-11M Unsupported Versions:
Bill Burton
Texas Research Institute
1300 Moursand, Houston, Texas, 77030
(713) 797-1976 ext 501

System Performance and Accounting:
Paul Sorenson
American Electric Power
Interactive Graphics Section
1 Riverside Plaza, Columbus, Ohio 43215
(614) 223-1000 ext 3486 (Call during morning hours only)

DECUS Library:
Glenn Everhart
RCA Government Systems Division
Route 38, Cherry Hill, New Jersey, 08358
(609) 338-6022

Virtual Disks:
Bob Hayes
P O Box X
Building 3500, Oak Ridge, Tennessee, 37830
(615) 574-5726

SIG Tape Collection:
Jim Neeland
Hughes Research Lab
3011 Malibu Canyon Road, Malibu, Calif., 90265
(213) 456-6411 ext 333

SRD:
Bob Turkelson
NASA/Goddard Space Flight Center
Mail Code 935, Greenbelt, Maryland, 20771
(301) 344-5003

Data Acquisition, Simulation and Process Control:
Allen J. Bennett
Clark Equipment Co.
P O Box 3000, Battle Creek, Mich., 49016
(616) 966-4464

Runoff:
Chuck Spalding
Unimation, Inc.
1202 Charleston Rd., Mountain View, Calif., 94043
(415) 965-0557 (Call during morning hours only)

## System Performance and Accounting Working Group

The SYSTEM PERFORMANCE AND ACCOUNTING working group is interested in improving/enhancing RSX-11M/M+. In general, this group will continue efforts to bring standard RSX-11M PLUS features to RSX-11M, and also plans to provide new users with help in improving their initial installations. Specific projects that have been defined are:

1. Provide a solid batch processing facility for RSX-11M.

2. Ensure that performance tools from previous SIG tapes are upgraded to the current versions of RSX-11M and RSX-11M PLUS.

3. Provide vectored FCS and F4P/F77 resident libraries.

4. Make CCL function as an alternate CLI under RSX-11M PLUS.

This group is very interested in receiving suggestions and participation from the RSX-11M community on these and any other projects relating to the general functioning of RSX-11M and RSX-11M PLUS systems.

## SRD Working Group

The SRD working group submitted a new version of SRD to the Spring 1983 SIG tape. It is version 6.3 found in [352,4], which updates version 6.2 on the Fall 1982 tape in [352,4]. The new version includes the switches /HD, /SM and /BK, which were originally in Glen Everhart's version in [312,332] on the Fall 1982 tape. Version 6.3 also corrects a problem with searches specifying version number and does not allow SRD /DE with file specification. Previous versions of SRD deleted the entire directory when given this command. The group is working on the following projects: improving the current documentation runoff file, merging various useful features from other version on past SIG tapes and adding some new features. The next issue of the Multi-Tasker will discuss the many changes in version 6.4, which was submitted on the Fall 1983 tape.

## RUNOFF Working Group

A new version of RUNOFF was submitted to the Fall 1983 SIG tape in [307,50]. This submission adds two enhancements to the Fall 1982 submission: tables of contents and some fixes to the Block command. It also adds the following enhancements over the Spring 1983 version: an "include file" capability and a substantial number of bug fixes and other minor changes. A separate version of RUNOFF which emulates DSR was submitted on the Fall 1983 tape under the UIC [332,12]. The RUNOFF working group continues to be interested in user comments on any bugs found and any additional desired functionality.

## SIG Tape Collection Working Group

The SIG TAPE COLLECTION working group is concentrating on the following projects:

1. Updating Ralph Stamerjohn's index of previous SIG tapes.

2. Drawing up a composite list of the best of the SIG tapes.

3. Following up on lost LUG's in order to complete the tree for SIG tape distribution.

## RSX-11M Unsupported Versions Working Group

The RSX UNSUPPORTED VERSIONS working group has worked out patches to the magnetic tape driver which makes BRU work better on older systems (RSX-11M v 3.1 and 3.2). These patches will appear in a future issue of the Multi-Tasker.

## Virtual Disks Working Group

The VIRTUAL DISKS working group submitted some enhancements to the Virtual Disk driver on the Spring 1983 SIG tape. The only known change between versions 3.2 and 4.0 of RSX-11M was the addition of 6 bytes at a negative offset from the UCB. This can be determined by comparing the UCB definitions between the two versions.

# RSX-11M New Users Question and Answer Session

Ken Johnson, Session Chairperson
Monsanto, St. Louis, MO

Reported by Marc Caffee, DECUS Scribe Service

Q. We use MCR for our primary CLI with TDX as a catchall. We also use indirect command files to make our system more user friendly. Occasionally we experience system crashes because we tie up all the available pool space. Would using CCL as a second CLI allow us to use memory more effectively?

A. More than one task is trying to attach to the given terminal. Some versions of indirect are checkpointable, however a task that is trying to attach to a terminal can not be checkpointed until it becomes attached. CCL as a second CLI would not fix the problem.

Q. When using a SYSLOGIN.CMD, why does it disable the ACNT file CLI (in this case DCL)?

A. This should not happen if the last command of SYSLOGIN.CMD is "CLI/UNOVR".

Q. After a reboot of RSX-11M-PLUS, a new version of the accounting records file is created, rather than appended to the existing file. How can the accounting be continued in the same file?

A. Try using PIP to append the separate versions.

Q. How can I sysgen an RSX-11M Q-Bus system so that the DY driver will work with 512 KB memory?

A. Create a separate partition in the lower part of memory and install the DY driver in that partition.

Q. When a task attaches a itself to a terminal that is already attached, why is the stop bit raised until the attach is finished, like other terminal I/O. If this were not the case the system might not lock up. Is there a way to prevent this from occurring?

A. No, this is a restriction of the system.

Q. Can PMT prevent unsolicited input from a crashing RSX-11M-PLUS system or does it just monitor and warn?

A. PMT can only warn of impending problems. However, the source on PMT is provided so it could be rewritten.

Q. I wrote a F77 program named DATE. When I tried to install this program in the startup command file it wouldn't work. It appears that DATE did not get installed. When I changed the name to IDATE it worked fine.

A. DATE is an indirect variable file name, so this could be a problem.

Q. When or why does the terminal qualifier remain set and when not? For example, SET VT100=TI: from a privileged account does not seen to retain the CRT attribute after the privileged account is logged off.

A. Some of the qualifiers are reset when remote lines are hung up. No change in this is foreseen. There are two solutions: Use a startup command file to reset terminal characteristics or utilize QIOs to interrogate the remote terminal to see if its characteristics are properly set. I believe there is such a program on the RSX DECUS tapes.

Q. DCL requires multiuser protection. Will CCL work on a single user system?

A. It should.

Q. Can a DSC tape created by V3.2 be read by V4.0 DSC?

A. Yes.

Q. Is there any way to have a software reboot on an unattended RSX-11S system running on a PDP 11/23.

A. Try using the HLD utility.

Q. Can there be more than one co-tree in an ODL file?

A. Yes.

Q. Patches to resident libraries require that all tasks mapped be rebuilt. Is there any relief in sight?

A. Yes, although not in V4.1/V2.1. Possibly in the next release after these.

Q. Is there any method to recover an RSX system which is slowly degrading itself by swapping tasks instead of doing processor work?

A. It shouldn't happen. Make sure the MCR priority is high enough.

Q. If in RSX-11M-PLUS you want to write a Fortran subroutine that will map a window in either VD space, is there a way to check if your task is in I/O space other than a bit mapping.

A. Use US.EDS

Q. Every so often our LA180 printer hangs up and the active job cannot be deleted from the queue manager.

A. Try making the terminal slaved and logoff.

Q. When trying to copy source disks for backup using DSC16 or online DSC we receive an error 30 (undocumented). This does not occur when using BRU. What is the problem?

A. You might be using an old version of DSC (V3.1 or before) in V3.2.

Q. I need to print several copies of a file and delete it on completion. Unfortunately, .PMD is deleted immediately.

A. Try to modify PRT... task, or use use queue manager.

Q. Under RSX-11M V4.0 PMT will keep enough pool to be able to abort tasks. The size to which the pool will decrease can be set by a privileged user. PMT must be fixed to run, however. This might be an answer to a previous user's problems with pool depletion which the panel previously did not mentioned.

Q. How can I tell in M+ V2.0 if a terminal is in a control-S state when it is spooled as a printer?

A. No guaranteed way to tell.

Q. Most tasks truncate a file when they close a file. EDT doesn't, should it?

A. Yes.

Q. How do I read the revision date on INDEXF.SYS?

A. Use the SRD utility which is available on the SIG tapes.

Q. Why can't I save a system image larger than 798 blocks with RSX-11M V4.0?

A. No plans to do it for RSX-11M, but it already exists on M-PLUS.

Q. How does one tell if a VT100 is powered up? We get IS.SUC on powered down terminals.

A. Send the VT100 the the escape sequence for terminal identification and see if it responds.

Q. Using BRU under RSX-11M-PLUS for disk to disk of a RM05 we get an error on the verify pass. The error is always on an RMS file of 760000 blocks, which is a multiheader file. The BRU error is "sort table overflow" limit exceeded.

A. Try opening files with larger chunks or use DSC once and that will sort the pointers. BRU will then work for a while.

Q. In RSX-11M V4.0 some utilities will not take more than 80 bytes in a command line.

A. The Get Command Line directive will not get long commands lines. This should be fixed later.

Q. Does an RL02 use 256 byte sectors?

A. No, 512.

Q. Is SRD available on public domain? Does it require a new sysgen?

A. Yes, it available through a LUG. It does not require a new sysgen.

Q. Can you only autobaud lines set to remote? Will this be changed?

A. Yes, there are no plans to change this.

Q. Can you boot RSX from a floppy disk?

A. Yes.

Q. By sampling (clock interrupt) a device busy UCB or DCB will I ever see busy?

A. Yes, use S.BSY except never set in full duplex driver.

# RSX Question and Answer Session

1983 Spring DECUS U. S. Symposium
St. Louis, Missouri

Reported by Nancy Pallett

1. Jim Webb, Taulman Engineering

   We have battery backup for moss memmory. We would like on power up (after power fail) for our power-up routine AST to execute if memory is still intact; if memory NOT intact reBOOT. How?

   ANSWER: Depends on hardware.

   Q: What if another AST is queued?

   ANSWER: The current executing AST will complete first.

2. Phil Reed, Clark Automated Systems

   After the sysgen of RSX-11M-Plus 2.0, why is there so much duplication between UFDs [1,54] and [3,54]? Related VMR gets tasks out of UFD [3,54], but the .TKB files put the new task images into UFD [1,54]. Explain logic?

   ANSWER: Problem is in distribution, will be looked at.

3. Bill Burdick, Clark Equipment Automated Systems

   Under RSX-11M V4.0, an indirect command file with multiple "PRI" file commands occasionally gets "MCR -- Task Active" messages (ie: ICP goes on to issue the next "PRI" before previous one finishes).

   ANSWER: Should submit an SPR. Did we use parent/offspring functions in ICP and have we included parent/offspring support in the gen?

   Q: Can we use /NM switch to suppress unwanted "success" messages from QMGCLI?

   ANSWER: This switch does not have any effect on QMGCLI error messages. This switch is presently undocumented.

4. Dave Birkenmeyer, Clark Automated Systems

   Assembling and building RSX-11M-Plus V1.0 TDX under V2.0 does not work. The flying indirect fails with a -26 I/O error from .FIND. Why?

   ANSWER: This is probably a problem with the "GIN" directive. V2.1 has a full function TDX similar to V1.0 and should solve the problem.

5. Dale A. DeMott, Caterpillar Tractor Company

I was recently disappointed by a pair of SPR responses to RSX-11M. In one case I documented an instance that IO.ATT does not work; in another, a supposedly brickwall system will crash or corrupt itself under circumstances which would normally be encountered inadvertently. DEC's ultimate response in the first case was "we'll document the problem", in the second, "we consider this a system restriction". In view of the fact that over 1200 of 1500 menu responses are still from RSX-11M systems, would you please relate your expressed concern for product quality to what I precieve as a programmed abandomnent of RSX-11M in favor of RSX-11M-Plus and the 22-bit only world?

ANSWER: In cases which involve inherent system design limitations, such problems cannot be corrected and are considered to be system restrictions. In the case of IO.ATT which is caused by a priveleged task breaking thru a terminal attached by another task, an effective work-around is to also attach the terminal by the privilege task, thus precluding a break-thru.

6. Martin R. Furuhjelm, Scientific Micro Systems

In LB:[1,2] there is a file: QIOSYM.MSG which is used by several of the DEC utilities to translate the FCS error code to an error message. How do I use this file and is there a routine in SYSLIB, or a macro?

ANSWER: Module in PIPUTL.OLB, see CON for example of use, module is something like CONER...

7. Allen Sandburg, Kaiser-Permanent Medical Group

Could DEC modify the RSX terminal driver in order to efficiently support FMS character validation similar to what is currently done for RSTS?

ANSWER: Ancillary Control Process hooks are already in RSX-11M V4.0 and RSX-11M-Plus V2.0 that can be used by FMS for this purpose. FMS must not be currently using this feature. Will get together with FMS group to resolve issue.

8. Richard Kohl, Defense Mapping Agency

Is there at all any kind of software management source code system like CMS for RSX-11M V3.2.

ANSWER: RSX soon to be converted for CMS also check the DECUS spring 1980 tape. Also SECS may be on the DECUS spring 1980 tape.

9. David Weber, Westreco, Inc.

We have RSX-11M V4.0 on a 11/34, and use an indirect command file to scroll paper up on a printer. A file END.CMD contains the line:
Print TTY:=DL2:[Y,5]ENDTXT.TX
Works 99% of the time, but; occasionally system crashes. Both the printer and the console monitor print out the message:
I/O Error -- DL:347

ANSWER: Patch published in May Dispatch. Need to rebuild QMG and all of the processor patches when you apply the patch.

10. Mike Nei, Essex

11/44 RA80 RSX-11M-Plus V2.0 Autopatch B, error logger says "Ready lost between sectors". Is this normal? They show up as hard and soft errors.

ANSWER: UDA-50 has many errors, an ECO has been issued.

11. Charlotte Derouchie, cmd Services

Why are unrelated patches being published as one patch? Specifically DX and XM patches in the May '83 dispatch.

ANSWER: Patches are cumulative. DMC patch was previously published (or should have been).

12. Tony Scandora, Science Applications, Inc.

RQLCB allocates top down. I would like to make it bottom up to manage a HEAP. If I change it and put it in FCSRES will I break something?

ANSWER: Probably not.

13. Vince Perriello, CSI

I have heard a gread deal at this symposium about EDT bugs. Many of them seem to be considered SERIOUS. We have 20 people using this thing! What are the problems? I want an idea what to look for.

ANSWER: Major bug - typing control/C during exit results in truncated output file. Minor bugs - in screen handling. For more see Jim Downward.

14. Ed James, Burlington Industries R & D

The indirect command line, indicated with an astrisk below, works only when STR is less than or equal to a string length of 127., any longer causes A to be set like STR.

```
   ; initilize STR to a character string with a length
   ; of 128. or greater (132. Max).
   .TEST STR
   ;STR='<STRLEN>' octal characters
*  .SETS A STR[4:5]
   .TEST A
   ;A='<STRLEN>' octal characters
```

ANSWER: Submit an SPR.

15. Richard Waltz, Marine Biological Lab.

RSX-11M V4.0 run on a PDP-11/60 with memory battery back-up and RA80 drives. When the RA80 drive is used as the system disk and we get a power failure the RA80 does not spin-up during power-up and the system does not recover from the failure.

ANSWER: Problem will be corrected in RSX-11M V4.1.

16. Mark Weston, City of Gainesville

Discuss relative merits of using: STOP, WAIT FOR, BLOCK and SUPEND directives.

ANSWER: No BLOCK directive (use MCR command). STOP sets priority to zero as far as competing for memory. WAIT FOR and SUPPEND are basically equivalent in effect and overhead. WAIT FOR use event flag and SUPPEND is waiting for a RESUME.

17. Yuval Brash, Brash Concepts

What is the status of BRU V1 thru V2 Thru V?, Compatibility? Integrity?

ANSWER: * New BRU will work on V2 and V1.
* Many problems with the stand alone version.

18. Gary L. Maxwell, U. S. Geological Survey

Would it be possible in the case of RW Commons to have INSTALL save the current protection of the task image, set a new protection preventing task image file deletion, so that users could not delete the task image and risk corrupting other files when the common is written back out to the disk?

ANSWER: We are re-examining the way common regions are handled, so that the files cannot be deleted in this case. We are also considering options to REM to prevent writeback of the region.

19. Phil Reed, Clark Automated Systems

Is there any way for a user to reformat a TU58?

ANSWER: No DEC method ("use a hammer"). However a ROM exists to do it, developed independently.

20. Thomas F. Gojan, Western Union Telegraph Company

For the Receive Data directive (RCVD$), the documentation states that RSX ignores the taskname parameter. It actually operates the opposite way: if a taskname is specified, a datablock from the specified task is transferred. Has the operation changed in V4.0 or V4.1? The V4.0 documentation carries a similar statement of ignoring the parameter.

ANSWER: The operation is correct, the documentation is wrong.

21. Charles Goodpasture, Transco Energy Company

When I PIP a file to tape I find that my record length has been changed to 512. and three bytes are placed in front of each record. What is going on?

ANSWER: Submit a SPR.

22. Arthur Smith, University of Florida

TAS, ACT, and TAL can all find a task, ABORT task returns MCR Task not in system. This task is priviledged, Do I always have to reBOOT?

ANSWER: Submit a SPR.

23. Not returned

24. Denny Walthers, American McGraw

Can we get all documentation regarding the queue manager into one manual and separate from the batch spooler?

ANSWER: Fill out a reader comment form and you will get results.

25. Dave Birkenmeyer, Clark Automated Systems

Does the new .FLUSH directive update the file header on disk immediately?

ANSWER: The current implementation of the .FLUSH subroutine does not update the file header!!! The next release will write out all file attributes.

26. Jim Preciado, Advanced Technology Systems

Is there a standard network management function that will return operating system version information to a program?

ANSWER: Talk to DECnet people.

27. J. B. Flippin, Raytheon Service Company

After initalizing and mounting an ANCII tape in RSX-11M V4.0, using PIP on a group of files by wildcard, only the first file is completely transfered, all other files are only partially transfered. The transfers are complete if the files are done one file at a time.

ANSWER: SPR submitted and reply on way... Seems a patch has been referenced.

28. Phil Merritt, Hughes Research Labs

Will EDT on V2.1 of RSX-11M-Plus delete the journal file when a recover session is terminated with a quit command as it does now in V1.0 of RSX-11M-Plus.

ANSWER: No.

29. Vincent Della Fera, E. R. Squibb and Sons

Is there any way to eliminate the message
xxn: Dismounted - Final Dismount

ANSWER: No, Submit SPR with suggestion to make message optional.

30. Alan E. Frisbie, Flying Disk Systems

Software Dispatch article 2.2.5.1 for RSX-11S (May '83) requires that modules in VMR.OLB be patched. Since VMR.OLB is not part of the 11-S distribution, how do VMS only sites correct this problem?

ANSWER: Fixed in next release.

31. Richard Kohl, Defense Mapping Agency

RSX-11M V3.2, I need to create a spooled header page and send a message line to the first 2 lines of each subsequent page. Where can I find the source to modify the spooler?

ANSWER: Buy documentation.

32. K. F. Uhland, Xonics Imaging, Inc.

Are there any known BUGS in BRU or MS: driver that would cause BRU to say thank you when a directory is requested?

ANSWER: Possible problem in MS: driver... Try MOUnting /FOReign before using BRU.

33. Tom Wyant, Du Pont

After dismount RM03, next access of other drive causes errlog called. Why?

ANSWER: Believe it has been fixed, not sure it will make release.

34. Not returned

35. Jim Webb, Taulman Engineering

Our RL02 boot block is being corrupted (first 128 words zeroed except first 2 words). No privileged application tasks in system. Any clues why?

Maybe a privileged task doing physical write.

36. Ken Krivoshein, Dow Chemical

In RSX-11M-Plus V2.0, if a task was built with /ID and /MV and with F4PRES, the R0 data section was mapped over the F4PRES. Has this been fixed with RSX-11M-Plus V2.1?

ANSWER: Should be.

37. Larry Owens, Ohio State University

Is/can a sub-function bit be added to the Unsolicited Input AST request to cause it to return all characters currently available in the typeahead buffer instead of queuing the next single character as an AST?

ANSWER: Recognize need for same, will take this as a suggestion.

38. Mike Nei, Essex

RSX-11M-Plus V2.0 Basic +2 V2 run mode usually fails.

ANSWER: Not a know problem.

39. Jim Webb, Taulman Engineering

Are all releases of same version of 11M guaranteed to be identical? (ie: at same patch level?)

ANSWER: Yes, in general.

40. Tony Scandora, Science Applications, Inc.

Please put unsupported software like bag of tricks UIC back on distribution kits.

ANSWER: Lawyers say all components of supported kits must be supported.

41. Phil Merritt, Hughes Research Labs

Are there any ways in which RSX-11M-Plus accounting can be bypassed by a user, in particular does the accounting system collect statistics about tasks initiated with DECnet connect requests when verification is turned on?

ANSWER: No, as far as DECnet is concerned.

42. Vince Perriello, CSI

I have a need for more than one supervisor mode library. That doesn't seem to be in the cards at present. What would you say would be the major constraints on creating a single LARGE supervisor mode library?

ANSWER: Working on multiples... Will work already if one doesn't call the other.

43. K. F. Uhland, Xonics Imaging

Why does the ICP terminate reading a line when it sees a null character; e.g.: in .SETS STRING "...<NULL>...". STRING will contain only those characters upto but not including the <NULL>.

ANSWER: Some cleanup of parsing of command lines was done for the new release. Try it again with the new release to see if this particular problem has been fixed.

44. Bob Agresta, General Motors Cadillac Motor Division

I have a "FULLY SUPPORTED" DT07 unibus switch. DEC supplies a driver under RSX-11M V4.0 (BSDRV) that successfully swaps the unibus, but all peripherals will be "offline" on the target CPU. But thank goodness for RSX-11M-Plus V2.0 and CON). However to get the BSDRV to build under RSX-11M-Plus V2.0 one needs to SYSGEN a multiprocessor system. Three problems, a) BSDRV only works intermittently, b) we can't keep a multiprocessor sysgen running more than about 30 minutes, c) multiprocessor is unsupported by DEC. How can I get the BS driver to work under RSX-11M-Plus V2.0 without sysgening multiprocessor? Is this standard policy in fully supported products?

ANSWER: We will "look at" any information you can supply under a multiprocessor GEN. (No, the BS driver must have multiprocessors). NOTE: perhaps we could converse about the MP sysgen configuration, documentation is a little vague.

45. Jim Neeland, Hughes Research Labs

In RSX-11M-Plus V2.0 after power-fail RL02's are inaccessible until dismounted and remounted. I think mounted-for-user-mode-diagnostics is set). Is this either fixed in a to-be-published patch or in RSX-11M-Plus V2.1?

ANSWER: This is the first this problem has been heard.

46. Allen Jay Bennett, Clark Equipment-Automated Systems

RSX-11M-Plus V2.0 has a bug with F11ACP in files with extended headers in INDEXF.SYS that will CRASH a system? Is this fixed? In RSX-11M-Plus V2.1? Does it damage files in RSX-11M-Plus V2.0?

ANSWER: Bug is fixed in RSX-11M V4.1 and RSX-11M-Plus V2.1. May cause file corruption on RSX-11M-Plus V2.0.

47. Martin Anilane, Western Union

I have a heavily overlaid fortran program which takes about 20 minutes to taskbuild under RSX-11M V3.2. Under RSX-11M V4.0 it takes about 40 minutes. What could be the problem?

ANSWER: The RSX-11M V4.0 taskbuilder has less internal workspace than the RSX-11M V3.2 which may degrade its performance. The source should be submitted to the TKB maintainers so that they can run an instrumented TKB to determine the problem.

48. Mark Weston, City of Gainesville

Ideas on controlling DF03-AC from RSX on REMOTE line with AUTOBAUD detect.

ANSWER: Will be supported under RSX-11M-Plus V2.1.

49. Glen Hoffing, RCA

How do you locate the word in the task image label block that points to the task header block.

ANSWER: See system id byte, in task label. A zero indicates there are seven library descriptions in task label. A four indicates there are 15 of them.

50. Gary L. Maxwell, U. S. Geological Survey

Will EDT be changed in the future so that files with 512 byte records (or task image files) do not hang EDT while it allocates all the free space on the system disk?

ANSWER: Should be fixed in update B for RSX-11M V4.1 and RSX-11M-Plus V2.1.

51. Thomas F. Gojan, Western Union Telegraph Company

The RSX-11M V4.0 Sysgen manual suggests that if the system is to be copied to a disk of a type different than the type on which the Gen was performed, the largest disk of the new type disk should be specified in the sysgen even if not present (e.g. specify RP06 even if only RP04 is present). Please elaborate on reason for specifying largest disk during GEN.

ANSWER: Errors may occur in logical block number conversion from disk to disk. To elimiate problems, specify the largest disk type to have SAV set to the largest LBN incroment.

52. Phil Reed, Clark Automated Systems

REM FOO/REG while logged off gets MCR -- Privileged command instead of MCR -- Not logged in (RSX-11M-Plus V2.1).

ANSWER: Was supposed to be removed for RSX-11M-Plus V2.0 and apparently was not. Will be looked into again.

53. Not returned

54. Mike Nei, Essex

Question nor answer not understandable as submitted.

55. Tony Scandora, Science Applications, Inc.

Please support utilities in PLAS overlaid versions for speed and current releases on VMS for all utilities.

ANSWER: PLAS won't help much, they already looked at it. It also won't work with tasks that EXTK$. VMS has problems because the AME is behind RSX. They're looking at it.

56. Vince Perriello, CSI

When you create a queue using the QMGCLI task, exit status is: 1) success if queue created, 2) fatal if something goes wrong, 3) fatal if queue already exists. Shouldn't the return be unique for "queue already exists"?

ANSWER: Issue is meaningful exit status vs compatibility with previous versions. Will be explored.

57. Jasper Davis, LTX

Will IND support ".ASKN NUM" allow a negative number? Current work around is "ASKS QUS" and parseing.

ANSWER: No.

58. Michael L. Dierker, Washington University

In RSX-11M-Plus V2.0 I wanted to reassign SP0: to a disk other than LB0:. Upon doing this (also RED befor starting QMG) PRI and SUB would bomb with a T-Bit Trap. The file would first be transfered to SP0:[1,7].

ANSWER: Maybe fixed in the future.

59. Phil Merritt, Hughes Research Labs

What can you say about I and D support in the Fortran-77 compiler for RSX-11M-Plus V2.1?

ANSWER: Fully supported now.

60. Phil Merritt, Hughes Research Labs

Is it reasonable for RSX to support the DMF32 and if not why not or if yes when?

ANSWER: Yes and probably never.

61. Gary L. Maxwell, U. S. Geological Survey

Are there any methods to improve the speed of RPT by taking advantage of I-&-D space on RSX-11M-Plus or by increasing resident work space to speed up the interpretative process?

ANSWER: Try working with RPTBLD.BLD to implement I-&-D space. Otherwise unload previous log packets and create a new LOG.ERR file for better performance.

62. K. F. Uhland, Xonics Imaging, Inc.

Are there any plans to allow QMG and/or PRT... to correctly process files with line lengths in excess of 132. characters. (e.g.: going to an LA120 with 16.5 char/ins or overprinted lines)?

ANSWER: No plans at present, but will be added to a wish list.

63. Tony Scandora, Science Applications, Inc.

What layered products and patched on the RSX-11M V4.1 and RSX-11M-Plus V2.1 distributions.

ANSWER:
DECnet PSI
Protocol Emulators
Languages - many have new releases soon and aren't updated
DTR
DPM?
SORT

64. Phil Merritt, Hughes Research Labs

Are you planning on providing per user disk accounting and if so what system inpact can be expected?

ANSWER: No.

65. Gary L. Maxwell, U. S. Geological Survey

Will DCL eventuanlly support all MCR commands, such as SET /SYSUIC, CON, and START/ACCOUNTING?

ANSWER: As time permits, all MCR commands will have their DCL equivalents. START/ACCOUNTING will be fixed in a later update.

66. Tony Scandora, Science Applications, Inc.

Can RMS utilities be built against RMSRES? SORT?

ANSWER: Utilities come that way in RSX-11M-Plus V2.1. Don't know about sort.

67. Phil Merritt, Hughes Research Labs

Has anything been done to enhance the real-time performance for the upcoming RSX versions?

ANSWER: No, Not any slower anyway!

68. Jim Neeland, Hughes Research Labs

DCL and MCR use different fields for protection UICs, can ICL be fixed?

ANSWER: Will look into it.

69. Tony Scandora, Science Applications, Inc.

A non privileged user who does not own a file can not unlock it, even if it has /PR/WO:RWED.

ANSWER: That was way back in RSX-11M V3.2 and was fixed in RSX-11M V4.0.

70. Gary L. Maxwell, U. S. Geological Survey

We would like to be able to use the VMR SAV command such that any device bootstrap can be written, independent of the output device for the SAV command.

ANSWER: Try using ASN to fool VMR to use a different bootstrap. VMR probably doesn't chase down the device chain when it parses the SAV command.

71. Jim Neeland, Hughes Research Labs

IND can create a file in a directory where the user doesn't have write access. Fixed and/or Known?

ANSWER: Fixed in next release.

72. Tony Scandora, Science Applications, Inc.

Please allow us to build FMT, BAD, BRU and DSC all flat and reusable for standalone use.

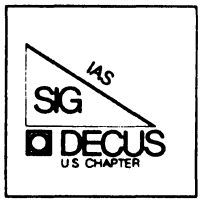
ANSWER: Noted.

73. Jim Neeland, Hughes Research Labs

Will new BRU allow keep of BOOT block even if device is different.

ANSWER: No.

# The DeVIAS Letter




## Section Two

## In This Issue

Curley's Corner: News from the Chairman

Letters:

George Wells: RM05 Disk Problems using BRU & DSC
Dan Stebbins: Computerized Text Editing for Newspapers

Annotated Directory of Paul Clayton's tape
ACP Tutorial
DeVIAS Questions and Answers Form

(Next Issue)
Highlights of FALL 83 DECUS
Preview of the RSX Spring 83 SIG tape.

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## From the Editor

I hope you find the material contained in these newsletters of use. If you wish to see articles of a particular type, use the DeVIAS Questions and Answers form to start a dialogue.

For those of you who didn't get the previous issue, I need submissions. I will take anything that can be printed in a free-press society and has some relevance to IAS, DEC or DECUS.

I hope to publish at the rate of one issue every month or two, so I need material. If I get something before the beginning of the month it should be published the following month (6 weeks later).

I didn't get my copy of the Spring 83 tape. I can't publish a directory until I do (hopefully next issue).

## Contributions

The DeVIAS Letter needs contributions in order to continue as an effective medium for exchange of information regarding IAS.

Contributions may be submitted in any form you wish. Originals on 8½ x 11 paper are preferred. However, even photocopies of relevant match-book covers would be appreciated.

Send all contributions to:

Ontario Hydro
700 University Avenue
Toronto, Ontario
CANADA, M5G 1X6

Attn: John W. Drummond
Mail Stop - M2E10

Department of Radiation Therapy
University of Pennsylvania
Room 410 - 133 South 36th Street
Philadelphia, Pennsylvania 19104
6 October 1983

Dear IAS Enthusiast,

One of my favorite topics has been returned to the higher (!) levels of my mind recently by the response to an SPR. I have already told all of you who would listen about the following MACRO-11 puzzle:

```
        .MACRO BLUE
        .IF NDF,BLACK
BLACK=0
        .ENDC
;
BLACK=BLACK+1
        .ENDM BLUE
;
        BLUE
RED:    .WORD BLACK
        .END
```

I wrote this as part of a scheme to implement some structured macros inspired by Robert Ritenour of EG&G when he spoke at the Atlanta Symposium. The question is: "What value does the assembler put into the memory location RED?" The answer that I wanted, and really expected, was one. The correct (what the assembler actually does) answer is two. Try it!

```
.MAIN.  MACRO D1113  14-SEP-83 10:30  PAGE 1


      1                                         .MACRO BLUE
      2                                         .IF NDF,BLACK
      3                                 BLACK=0
      4                                         .ENDC
      5                                 ;
      6                                 BLACK=BLACK+1
      7                                         .ENDM BLUE
      8                                 ;
      9 000000                                  BLUE
     10 000000  000002                  RED:    .WORD BLACK
     11         000001                          .END

.MAIN.  MACRO D1113  14-SEP-83 10:30  PAGE 1-1
SYMBOL TABLE

BLACK = 000002           RED     000000R

. ABS.  000000      000
        000002      001
ERRORS DETECTED:  0

VIRTUAL MEMORY USED:  96 WORDS  ( 1 PAGES)
DYNAMIC MEMORY:  2050 WORDS  ( 7 PAGES)
```

```
ELAPSED TIME:  00:00:02
DR0:[200,1]AQUA,DR0:[200,1]AQUA/-SP=DR0:[200,1]AQUA
```

The RT-11 and RSTS/E assemblers do the same thing (no real wonder). The VAX assembler for the emulator mode does the same, as discovered by Paul Clayton. He also discovered that the native mode assembler (VAX-11 MACRO) gives the answer "one". Paul found that interesting and send in an SPR to his VAX support group. The answer was "They are both right."

Another MACRO oddity (pejorative words always seem to slip into my conversations on this subject): The instruction DIV #10.,R1 is assembled into 071127, 000012, which appears to be correct (as I was informed by the response to my SPR). The assembler has assembled a prohibited instruction on the PDP-11 (even those that permit the DIV). The register must be an even numbered register, because the dividend is 32 bits long in adjacent registers, starting with an even numbered one. This obscure fact is stated explicitly, "R must be even." in the PDP-11 04/05/10/35/40/45 Processor Handbook of 1975-1976. The PDP-11 04/24/34a/44/70 Processor Handbook" of 1981 doesn't mention it. My 11/70, however, remembers, and protests. The SPR response said, in the second iteration, that there were so many of these processor error possibilities that the assembler could not (and would not) be altered to check for them (it would make the assembler too big).

I suspect that most of us who program in assembler know these things, possibly learned the hard way. The PDP-11 is used in many schools as the computer on which to teach assembler, there are at least seven different textbooks on the subject, and "buss" (another loaded word) like this are disquieting to students.

Some of you, I hope, will share your opinions with me on this small foible of mine. Perhaps there is a market for a thorough PDP-11 MACRO-11 assembler in academia (and elsewhere) that could be addressed. Mike Reilly suggested, today, that a pre-processor might serve as well as a separate assembler, flowing automatically into MACRO-11 in order to minimize student confusion. He even mentioned that there were two examples on the RSX/IAS SIG Tapes!

"What do you know about IAS-Plus?" I got that in a phone call last month. It was a new one on me, although it did sound DECish. The "Typeset Group" within Digital has modified IAS to "solve the node pool problem" and appears to be marketing it as a separate product. I called my "usually reliable sources" and got this: IAS-Plus is IAS modified so that there is a node pool in each partition. A task uses only the nodes within it's own partition (usually). When you run out of nodes, add a partition and redistribute your jobs. It sounds good, from the users' viewpoint. But, it was demonstrated, from the view of the system, every task that maps SCOM must be changed so that it can tell WHICH SCOM. A device driver must notify the requesting task in the correct "SCOM" OR the task won't know that I/O is done. It is plain that many of us would need to do some serious program development to be able to move our existing software to IAS-Plus. The magnitude of the task is suggested by the fact that PDS doesn't run yet on this system, only the multi-user level.

Please tell me your feelings -- does IAS-Plus sound like it answers your prayers?

This leads me to plug Ken Guralnik's effort at divining your feelings about where you would steer IAS development. While we are certainly out of the habit of asking for new features and directions, I believe that the Development Team really wants to know and will be responsive.

There was an article in Issue 15 that caused some comment. It was a transcript of a presentation by Rod Shepardson, given with very little preparation, in Atlanta. Frankly, the official DEC IAS presentation was unsatisfactory to the point of embarrassment. Mr. Shepardson spoke to me and asked if there was any way he could help. I said that what I had wanted and expected was a "walk through the EXEC" -- What happens when I send a QIO? I said he could have the first half hour or so of the IAS Q&A the next evening. He said that he'd try. I got an emergency call from home that night and left Atlanta quickly, but got wonderful reviews of Mr. Shepardson's effort. Larry Ebbinger had thoughtfully taped the session, and under intense pressure from me, had a non-technical person transcribe the tape. Neither he nor I had the time to edit it. So, I sent it to Mr. Shepardson. He too, was short of time.

What you got, then, was the best we could do. I wanted it printed for those of us who missed it, even though it was a draft transcription. Since I hope that you feel that this is OUR newsletter, I want to hear your complaints and compliments. When you gripe enough I won't do it anymore. Further, if one or more of you would take that article and enhance it, we'll run it again.

Thus, to clarify my position: I thank Mr. Shepardson for going well beyond the call of duty to help us and I thank Mr Ebbinger for the same. Both have contributed to all of us.

Does anyone out there still run DBMS-11 on IAS besides us? With support for DBMS-11 going away, I'd like to identify those of us that remain. Please call me (215-662-3083) or my partner, Ted Smith (215-662-6816) or send us a note. He's the real DBMS-11 programmer in our shop. Since there is no DMS SIG newsletter, we would welcome DBMS-11 articles, notes, gossip, hints in the DeVIAS Letter, even if they relate to IAS.

We will need papers, sessions, panels, etc. at Cincinnati. Calls for participation are already out. Think about sending one in. Maybe you could get three guys together and have a panel? Call me and discuss your idea if you're shy or not sure if you should do it. Tell me which sessions you want again, etc.

The personal computers are really out! I finally noticed. Even I have a Rainbow. Who's got a (free) program to transfer files from my IAS machine to my Rainbow and back? Or any other IAS-PC programs or ideas. Does someone want to run a PC-IAS Column in the Letter? Please?

The first person to run IAS (any flavor) on the PRO 325/350 gets special mention here (if you want it!) -- the first that gets PDS running on the PRO gets double-height mention!

I wish you a pleasant Autumn and Happy Halloween!

Robert F. Curley
IAS SIG Chairman

23-Sep-83

To: (1) Digital Equipment Company
(2) DeVIAS Editor

From: George Wells
General Electric Company.
4500 Progress Blvd.
Louisville, Ky 40225

Subject: RM05 disk problems using BRU & DSC

System: IAS V3.1 Autopatch E (multi-user)

Attachments: (1) SPR form numbers #877661 (DSC) & #877662 (BRU)
(2) Suggested patch for BRU.

Available: (1) Two CASES of console log.
(2) 12 reels of DSC tape.
(3) 11 reels of BRU tape.

I. Summary

DSC -- Creates 30 to 40 BAD FILE HEADERS when restoring from tapes that were created using /BL=32. switch.

BRU -- Refuses to restore to disk files whose file id is greater than can be mapped via the retrieval pointers of the primary header of [0,0]INDEXF.SYS. In other words does not consider index file extension headers.

```
DISK-TO-DISK ==> **WARNING** VBN NOT IN FILE
TAPE-TO-DISK ==> **FATAL**   ..............
DISK-TO-TAPE ==> NO ERROR, FILE COPIED
```

II. July problems

Field service told us our RM05 disk HAD NOT been aligned for a long time. We had them to come in and CHECK the alignment WITHOUT adjusting. They found that we were in DANGER and must have the alignment as soon as possible. We began the FULL backup of our system on Sunday afternoon of 24-Jul-83. The plan was to copy to tape, restore back to another disk (to insure that our tapes were good), and let field service re-align the disk drive. After re-alignment our orginal disk most likely could not be read.

1. We had the USER's to cleanup their accounts.
2. Ran VFY utility to find all MARKED FOR DELETE and LOST FILES. Reported NO bad file headers.
3. We tried several times (using NEW tapes) to copy using the BRU, WITHOUT success.
4. We finally used the DSC utility which takes longer and uses more tape. I included /BL=32., which I think leads to restoring BAD FILE HEADERS (later). We ended up with 12 reels of tape. By this time, it was late Monday 25-Jul-83.
5. We loaded a scratch disk (to restore the tapes) and it HEAD CRASHED.
6. I called in field service ($600+), who worked until about 2 AM repairing the disk drive.
7. We only have two disk packs, (1) our ORGINAL, which most likly couldn't be read anymore, and (2) the one that head crashed. I requested field service to loan us one of their packs from their office system.

8. We restored the tapes to THEIR pack (about 8 hours) successfully.
9. We then restored the tapes to our ORGINAL pack, after formating and bad blocking (another 8 hours).

As you will later see , we SHOULD have run the VFY utility to verify the disk structure. Instead, we released the system for use beginning Wednesday morning 27-Jul-83.

III. September problems (Round 1)

On Wednesday morning 07-Sep-83 we started having problems with creating files with BAD FILE HEADERS. We shut-off the users and ran the VFY utility. We discovered that not only did we have 30 to 40 bad header files, but that some of the same disk blocks were thought to be part of several files. Also some allocated blocks were marked FREE in storage bitmap.

1. We had field service come out and run diagnosics on the disk drive as well as the whole system. The only thing they found was that the FAN over the power supply for the RH70 was dead.
2. We began restoring the July full backup tapes (above), with the plan to follow that with the incremental backups since then. This took about 8 hours plus several more trying the incrementals.
3. We discovered that we COULD NOT read ANY of our incremental tapes.
4. We ran the VFY utility again to discover that not only did we still have bad header files, but the SAME ones.
5. Called Remote Diagnosic Center to run diagnosics on disk drive and processor for 3 to 4 hours. They didn't find anything wrong.
6. At this point we didn't know if the problems were there after the FULL restore or after attempts with one or more of the incrementals.
7. Since we couldn't use our incremental tapes, we had NO CHOICE but to load the ORGINAL disk and manually locate all files that had been created or revised since 25-Jul-83 (used SRDCMD). We copied these to another disk (for later).
8. We restored the FULL backup tapes again (8 hours).
9. We ran the VFY utility and discovered that we already had the bad file headers. That means that the problems had been there ever since July, but we didn't know it. Most likly DSC is not properly handling /BL=32. switch.
10. We had NO WAY to identify WHAT these files were that were bad. Our ONLY choice was to TURN OFF the header bit for each of these files. That means that whatever they were are now GONE. This MAY not be as bad as it sounds, since no user has complained of missing files since 27-Jul-83 these MAY not even be files. Conversely, many many files on the system have not been accessed for long periods of time.
11. We ran the VFY utility again and the disk structure was good.
12. We manually moved the files from #7 above onto the new disk.
13. We ran the VFY utility again and the disk structure was still good.
14. We then decided that we BEST backup what we have to avoid a repeat of all the above.
15. We started a FULL backup to tape (BRU) at about 13:00 Friday 09-Sep-83. This took until after 20:00 and 11 reels of NEW tape. We had many more files than orginally, because we did not want to risk purging until we had it backed up.

16. We then loaded our ORGINAL disk, formatted it, and ran BAD utility to identify and hide any bad blocks.
17. Began the restore of the tapes only to discover that these tapes that we had just written and VERIFIED, COULD NOT be read back in. BRU terminated with "**FATAL** VBN NOT IN FILE". This says that a file with an invalid file id has been encountered.
18. We even tried restoring using /NOPRESERVE (no system on disk) with no luck.
19. After many attempts, we decided that the tape drive may be over-heated. Powered it off and went home for the night.
20. Attempts Saturday morning were no better. Called field service to checkout tape drive (another $600+).
21. While awaiting them, called Remote Diagnosic Center and had them to run diagnosics on tape drive.
22. Possible cause, I cleaned the CAPSTAIN on the tape drive with the tape cleaning solution that we have. I was told (later) that's a NO NO. This solution has strange effects on rubber. At any rate it was replaced. The drive still had problems. It was decided by that afternoon, that the controller needed a new power supply. Neither the local nor Lexington office had it. It was P1 airborne ordered out of New Jersey, for Sunday (another $600+).
23. Received and installed power supply, wasn't the problem. It was decided that the read/write/erase head was bad. Replaced, yep that was it.
24. This meant that the 11 reels of tape we had, could no longer be read because the SKEW had to be adjusted for the new head. Even though we tried the mothers.
25. Make 11 reels of tape again using BRU (/NOPRESERVE).
26. Attempted restore to disk (/NOPRESERVE), only to get almost to the end of the tenth reel and have BRU belly-up with **FATAL** VBN NOT IN FILE.
27. At this point, we believed that DSC, besides making bad file headers was screwing up the entire file-11 structure. We experimented with PIPing [0,0]INDEXF.SYS of our input disk and others, only to discover that we could not copy it (but could others). Now we were convinced that we had a bad file-11 structure. So using a combination of one RM03 pack, five RP03 packs, and one RK06 pack, mannually PIPed all the files out.
28. We then loaded our ORGINAL disk pack, formatted, bad blocked, and init'ed it. We then proceeded to PIP back all the files from the seven different disk packs. This whole process (out and back) took approx. 28 hours.
29. Again, we decided we BEST back this mother up!
30. Make 11 reels of tape again with BRU (/NOPRESERVE).
31. Attempted to restore to scratch pack, only to have the same problem, but this time we were at beginning of seventh reel.
32. By now we had been at it for ONE WEEK (24 hours a day) and BRU also has bugs.
33. We put the system back on line, while we tried to (1) find a site with a pair of RM05's (for disk-to-disk, that wouldn't have worked anyway) and (2) try to find the BRU bug ourself (because we felt the SPR turn around time would be to long to run without a backup).

IV. September problems (Round 2)

Beginning at about 21:00 on Tuesday 20-Sep-83 we started flooding the ERRLOG with errors on the RM05. On Wednesday morning, users started reporting files with parity errors.

1. Turned off users and ran VFY. Sure enough disk is corrupt.
2. Contacted RDC to check disk drive and system (using a scratch pack). They found no problem. We then transmitted (at 300 baud) most of the ERRLOG text to RDC, as well as have them READ our disk. The pattern that showed up was that all the errors were with head #8.
3. Couldn't get service in that day/evening because their TESTER was at another site. Made an incremental backup since previous Monday, had all kinds of errors. Next morning, yep head #8 has touched down LIGHTLY on our pack. Replaced head and re-aligned, could not SEE any damage to our pack. Loaded it to TRY to make a BETTER incremental tape since Monday, worst than before. Service examined heads again.
4. Service concluded that head #8, when installed in July, was defective. Note that head #8 is apporx. midway into pack, were INDEXF.SYS is.
5. At this time, I was final testing the fix to the BRU VBN bug.
6. Restored 13-Sep-83 using revised BRU tapes (11 reels) and VERIFIED (a first).
7. Ran VFY utility, all's well.
8. Married incremental tapes from 15-Sep-83 and 19-sep-83 into disk.
9. Ran VFY utility, all's well.
10. Restored incremental tape from #3 above to a scratch RP03 pack.
11. Brought up system with all but selected terminals disabled and let them decide if they wanted anything off the RP03.
12. Ran VFY utility, all's well.
13. Made an incremental tape of all files created or revised since 13-Sep-83. I know, your thinking we should have made a FULL backup and restore, but look back and calculate how much down time we've had. At least, we have a workable method of recovery.

V. Future prevention

1. Purchase massbus TU16 tape drive (delivery in two weeks).
2. Consider purchasing another RM05 disk drive and several disk packs, so we can do disk-to-disk backups. Would most likely still use tapes for incrementals. We have a floor space problem, computer room designed for two processors, currently has four with another VAX due in about a week. Currently planning and budgeting a new facility for early next year.
3. For awhile, restore each and every incremental backup tape to a scratch disk. This will insure that they are readable. Also run VFY utility on resultant disk.
4. Regularly run VFY utility to insure that file structure is still good.

digital

# SOFTWARE PERFORMANCE REPORT

FIELD NO.: | CORPORATE SPR NO.: 877661

TO SET UP FOR PROPER ALIGNMENT, START AT MARK BELOW.



| OPERATING SYSTEM | VERSION | SYSTEM PROGRAM OR DOCUMENT TITLE | VERSION OR DOCUMENT PART NO. | DATE |
|---|---|---|---|---|
| IAS | V3.1 | DSC | X0036 | 9/23/83 |


NAME: GEORGE R. WELLS
FIRM: GENERAL ELECTRIC COMPANY
4500 PROGRESS BLVD.
LOUISVILLE, KY 40225
ADDRESS:
CUST. NO.:


DEC OFFICE AND CONTACT PERSON: LOUISVILLE, KY

DO YOU HAVE SOURCES? YES [X] NO [ ]

REPORT TYPE/PRIORITY

- [X] PROBLEM/ERROR
- [ ] SUGGESTED ENHANCEMENT
- [ ] OTHER

1. [X] HEAVY SYSTEM IMPACT
2. [ ] MODERATE SYSTEM IMPACT
3. [ ] MINOR SYSTEM IMPACT
4. [ ] NO SIGNIFICANT IMPACT
5. [ ] DOCUMENTATION/SUGGESTION

SUBMITTED BY: SAME PHONE: (502) 452-5061

CAN THE PROBLEM BE REPRODUCED AT WILL? YES [X] NO [ ]

ATTACHMENTS
MAG TAPE [ ] FLOPPY DISKS [ ] LISTING [ ] DECTAPE [ ]
OTHER:

COULD THIS SPR HAVE BEEN PREVENTED BY BETTER OR MORE DOCUMENTATION? PLEASE EXPLAIN IN PROVIDED SPACE BELOW. YES [ ] NO [X]

| CPU TYPE | SERIAL NO. | MEMORY SIZE | DISTRIBUTION MEDIUM | SYSTEM DEVICE | DO NOT PUBLISH |
|---|---|---|---|---|---|
| PDP11/70 | 81037635H | 512KW | 9 TRACK | RM05 | [ ] |

MULTI-USER SYSTEM (AUTOPATCH E)

PROBLEM: CREATES 30 TO 40 "BAD FILE HEADERS" WHEN RESTORED FROM TAPE.

CAUSE: WHEN WE CREATED THE TAPES (RM05-TO-TU10, 12 REELS), WE USED BL=32. TO REDUCE NO. OF TAPES. I BELIEVE DSC NOT HANDLING PROPERLY DURING RESTORE.

ATTACHMENTS: LETTER LISTING STEPS PERFORMED.

AVAILABLE ON REQUEST: TWO CASES OF CONSOLE LOG
12 REELS OF DSC TAPE
11 REELS OF BRU TAPE

ALL SUBMISSIONS BECOME THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION.

| SHORT NAME | MNT. CAT. | MNT. GRP. | XFER GRP. | PL | PRB. TYPE |
|---|---|---|---|---|---|
| | | | | | |

| DATE RECEIVED (MAIL) | DATE TO MAINTAINER | XFER DATE | LOGGED ON |
|---|---|---|---|
| | | | |

| DATE RECEIVED (ASG) | DATE RECEIVED FROM MAINTAINER | DATE ANSWERED | LOGGED OFF |
|---|---|---|---|
| | | | |

digital

SOFTWARE PERFORMANCE REPORT

FIELD NO.:

CORPORATE SPR NO.: 877662

✓ TO SET UP FOR PROPER ALIGNMENT, START AT MARK BELOW.

PAGE ____ OF ____

| OPERATING SYSTEM | VERSION | SYSTEM PROGRAM OR DOCUMENT TITLE | VERSION OR DOCUMENT PART NO. | DATE |
|---|---|---|---|---|
| [ IAS | V3.1 | BRU | V1.01 | 9/23/83 |


NAME: GEORGE R. WELLS
FIRM: GENERAL ELECTRIC COMPANY
4500 PROGRESS BLVD.
LOUISVILLE, KY 40225
ADDRESS:
CUST. NO.: 189


DEC OFFICE AND CONTACT PERSON

DO YOU HAVE SOURCES? YES [X] NO [ ]

REPORT TYPE/PRIORITY

| | | | |
|---|---|---|---|
| [X] | PROBLEM/ERROR | 1. [X] | HEAVY SYSTEM IMPACT |
| [ ] | SUGGESTED ENHANCEMENT | 2. [ ] | MODERATE SYSTEM IMPACT |
| [ ] | OTHER | 3. [ ] | MINOR SYSTEM IMPACT |
| | | 4. [ ] | NO SIGNIFICANT IMPACT |
| | | 5. [ ] | DOCUMENTATION/SUGGESTION |

SUBMITTED BY: SAME PHONE: (502) 452-5061

CAN THE PROBLEM BE REPRODUCED AT WILL? YES [X] NO [ ]

ATTACHMENTS
MAG TAPE [ ] FLOPPY DISKS [ ] LISTING [ ] DECTAPE [ ]
OTHER:

COULD THIS SPR HAVE BEEN PREVENTED BY BETTER OR MORE DOCUMENTATION? PLEASE EXPLAIN IN PROVIDED SPACE BELOW. YES [ ] NO [X]

| CPU TYPE | SERIAL NO. | MEMORY SIZE | DISTRIBUTION MEDIUM | SYSTEM DEVICE | DO NOT PUBLISH |
|---|---|---|---|---|---|
| PDP11/70 | 81037635H | 512KW | 9 TRACK | RM05 | [ ] |

MULTI-USER SYSTEM (AUTO PATCH E)

PROBLEM: REFUSES TO RESTORE TO DISK, FILES WHOSE FILE ID IS GREATER THAN CAN BE MAPPED VIA THE RETRIEVAL POINTERS OF THE PRIMARY HEADER OF (0,0)INDEXF.SYS. IN OTHER WORDS, DOES NOT CONSIDER INDEX FILE EXTENSION HEADERS.

DISK-TO-DISK = = **WARNING** VBN NOT IN FILE
TAPE-TO-DISK = = **FATAL** VBN NOT IN FILE
DISK-TO-TAPE = = NO ERROR, FILE COPIED

ATTACHMENTS: LETTER LISTING STEPS PERFORMED, SUGGESTED PATCH TO BRUHEAD.OBJ

AVAILABLE ON REQUEST: TWO CASES OF CONSOLE LOG
12 ~~21~~ REELS OF DSC TAPE
11 REELS OF BRU TAPE


ALL SUBMISSIONS BECOME THE PROPERTY OF DIGITAL EQUIPMENT CORPORATION.


| SHORT NAME | MNT. CAT. | MNT. GRP. | XFER GRP. | PL | PRB. TYP |
|---|---|---|---|---|---|
| | | | | | |

| DATE RECEIVED (MAIL) | DATE TO MAINTAINER | XFER DATE | LOGGED ON |
|---|---|---|---|
| | | | |

| DATE RECEIVED (ASG) | DATE RECEIVED FROM MAINTAINER | DATE ANSWERED | LOGGED OFF |
|---|---|---|---|
| | | | |

The Herald
Box 930/Everett, WA 98206-0930
206/339-3000

Sept. 19, 1983

John Drummond
Ontario Hydro
Toronto

Dear Mr. Drummond,

Bob Curley suggested I foward this outline of my DECUS fall symposium session notes for inclusion in the October IAS newsletter.

I spoke with Bob because I was concerned that the session had been scheduled erroreously under the Office Automation sig.

The presentation in Las Vegas will be Monday, Oct. 24 at 7p.m. It involves an integrated indirect MCR command file and User Definable keys which monitor wire services, edit text and typeset without editor intervention. The enclosed session notes explain the process in more detail.

I am anxious that other DEC newspapers be aware of this presentation even though it is listed under the OA sig.

If you feel this might be of interest to your newsletter readers, please use all or any part of it as your space limitations allow. Edit or paraphrase as you deem necessary.

Thank you for your consideration. I look foward to meeting you next month in Nevada.

Sincerely,

Dan Stebbins
Systems Editor

```
        .TITLE  BRUHEAD
        .IDENT  /091683/        ;30916 Fix LARGE FID Problem

; This is not a published patch by Digital Equipment Corp.
;
; General Electric Co. assumes no liability to OTHERS using this patch.
;
; PROBLEM:
;       If the output disk [0,0]INDEXF.SYS has file header EXTENSIONS and
;       an input file has a file id GREATER than can be mapped via the
;       retrieval pointers of the PRIMARY HEADER of [0,0]INDEXF.SYS, then
;       the input file was REJECTED with the following message:
;
;       DISK-TO-DISK ==> **WARNING** VBN NOT IN FILE
;       TAPE-TO-DISK ==> **FATAL**   ..............
;       DISK-TO-TAPE ==> No error, input file COPIED
;
;       To state the problem a different way: If you HAVE HAD MORE than
;       approx. 25,593. files on your disk (at one time), you WILL NOT BE
;       ABLE TO COPY and/or RESTORE SOME THEM.  The exact quantity COULD
;       BE LESS depending on the placement of "BAD BLOCKS" on your disk
;       and the size of header bitmap.
;
; SOLUTION:
;       Table all retrieval pointers for [0,0]INDEXF.SYS for PRIMARY and upto
;       TWO extension headers.
;
; This patch ASSUMES autopatch E has been applied:
;
;       Current BRUHEAD.OBJ check sum = 050244
;       This patch check sum          = 014770
;
        .PSECT

.BLK.   =       .

.       =       .BLK. + 400     ;30916 WHERE TO PLANT PATCH

        CALL    P30916          ;30916 CALL PATCH (REPLACE CALL READRP)

        .PSECT  $$PAT           ;30916

$$PAT   =       .
.       =       $$PAT + 372     ;30916 AFTER AUTOPATCH E PATCHES

P30916:                         ;30916
        MOV     #-2,EXTFLG      ;30916 PROCESS UPTO 2 INDEXF EXTENSIONS
        CALL    READRP          ; READ THE INDEX FILE HEADERS
        RETURN                  ;30916

        .END
```

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[14,2]          FORTRAN 4+ SYMBOLIC DEBUGGER
[14,3]          'SMART' COMPILE COMMAND GENERATOR
[14,4]          SRD ENHANCEMENTS
[14,5]          ENHANCED SRD
[14,6]          TAPE UTILITY
[14,7]          BRU
[14,10]         BURST- UNCONCATENATE SOURCE MODULES
[14,11]         RESEQUENCE FORTRAN PROGRAMS
[14,12]         TRU- TRUNCATES FILES BUT CHANGES DATE ONLY IF TRUNCATED
[14,13]         XEQ- ALLOWS SEARCH SEQUENCE FOR LOCATING TASK
[14,14]         SUP ??
[14,15]         RATFIV- STRUCTURED FORTRAN
[14,16]         MULTI-TREK
[14,17]         QX??
[14,20]
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[14,35]
[14,36]         FORTH- IAS VERSION, STANDALONE, RT, RSX
[14,37]
[14,40]
[14,41]
[14,42]
[14,43]
[14,44]
[14,45]         ICE- CHARACTER EDITOR FOR VT100
[14,46]         DOB??
[14,47]         DUNGEON aka ZORK
[14,50]         MO ENHANCEMENTS- DT03/DT07 HANDLER
[14,51]
[14,52]
[14,53]
[14,54]         STRUCTURED FORTRAN WORKSHOP FILES
[14,55]         POT-POURRI INCLUDING LEVELS,BROOM,LG
[14,56]         FORTRAN CALLABLE COMMAND LINE PARSER
[14,57]         METCALF & EDDY ACCOUNTING ENHANCEMENTS FOR IAS
[14,60]         DDT,FDT
[14,61]
[14,62]         GLEN EVERHARDT'S DDT SYMBOLIC DEBUGGER
[14,63]         IAS VIRTUAL DISK PACKAGE, FOCAL
[14,64]
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[14,100]
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[14,102]
[14,103]
[14,104]
[14,105]
[14,106]  BASIC FOR RSX11-D
[14,107]  ADVENTURE
[14,110]  VARIOUS GRAPHICS PACKAGES
[14,111]
[14,112]
[14,113]  RMS INTERNALS MANUAL, RSX INTER-TASK COMM. PAPER
[14,114]
[14,115]  RT TO IAS TAPE TRANSFER UTILITY
[14,116]
[14,117]
[14,120]
[14,121]
[14,122]
[14,123]
[14,124]  OBJECT DISASSEMBLER

          END OF TAPE

# ONE FOR THE GIPPER:
## A new concept in computerized text editing for newspapers

BY DAN STEBBINS and MICHAEL HALLINAN

THE HERALD
GRAND AND CALIFORNIA
EVERETT,WA, 98204

Phone: 206-339-3000

1-INTRODUCTION:

GIPPER IS ONE OF SEVERAL unique text-editing and wire-service monitoring programs developed at the Everett, Wash., Herald over the past 15 months. The programs run on IAS operating systems. The Herald has two DEC 11/70s running Editorial Management System, Text Management System and Classified Management System. EMS,TMS and CMS are currently version 5.1. These programs will run on version 5.0 and above.

The Herald's text-editing programs run on newsroom VT71s,VT72s and VT173s, using utilities provided with DEC's EMS, TMS and CMS systems. In addition, some programs,such as the ROLODEX, will run on a VT61.

The programs operate under the control of indirect MCR command files which call other tasks as necessary. In some instances, the indirect MCR files load User Definable Key programs into the terminal and call particular UDK routines to assist in the editing of the copy.

Coordination of these specialized progams with system command files is essential. System files of particular importance are START.CMD, WIREFLOW.SYS, CONFIG.SYS and NOMCR.CMD.

The Herald is a 57,000-circulation daily, PM Monday through Friday and AM Saturday and Sunday. Everett is a city of 50,000 located 30 miles north of Seattle on Puget Sound.

The programs developed by Dan Stebbins, Systems Editor, and Michael Hallinan, News Programmer, with the technical assistance of Bruce Barker, Systems Manager , aim at harnessing the computer to perform routine file-management and editing chores, freeing news staff to concentrate on decisions requiring news judgment. As such, they promise a quantum leap forward in newsroom productivity gains.

While computer systems in the newsroom have increased editing efficiency as fancy word processors, they have also transferred some tasks formerly performed by non-professionals to the news staff. For instance, where newspapers once employed copy boys to "rip" the Associated Press wire, wire editors must now sort through

long directories and merge associated files themselves. One program recently installed at The Herald, RIP, has now taken these chores off the staff's hands once again. When complete, the program should save up to an hour of very valuable deadline time every day.

In addition, DEC's newspaper computer system is far more than a fancy word processor. Undermutilized software features can be used to perform many tasks that do not require sophisticated judgments. Sports scores, financial tables, recipes, weather data, weddings and engagements, obituaries, television logs, bestseller lists, fire calls, police blotters - all follow routine formulas and are published daily in every metropolitan newspaper.

In each of these cases and in many others, the editing decisions employed can be translated into software code and executed with minimal user involvement. GIPPER, for instance, requires only a minute of staff time to perform a task that once took up to two hours a day - the editing of sports box scores for The Herald's scoreboard page.

A detailed description of GIPPER is included later in these notes.

2-$MORGY;

THE HERALD SPECIAL EDITING PROGRAMS are accessed through a menu program dubbed $MORGY for its smorgasbord of versatile editing functions. Many of the menu options are multi-user. Others are restricted, with access password-controlled. Because MCR must be enabled at a terminal to run the programs, special procedures have been developed to insure system security against accidental or intentional misuse of the powers of Monitor Console Routine.

In addition to accessing GIPPER, $MORGY;

1- Accesses extensively cross-referenced ROLODEX-type files. Data available includes thousands of phone numbers, addresses and names of news contacts, government agencies, local and state organizations, school districts etc. Cross-referencing allows retrieval of related data from numerous files in a single search. For example a search for data on the ""SEATTLE SCHOOL DISTRICT"" will retrieve data on the Seattle School District alone, but a reporter doing a story on a subject affecting all the school districts in his circulation area simply searches for ""SCHOOLS"". Data will be retrieved from files on every school district. The program allows for a terminal display, hard copy or both. Files are categorized as GENERAL, SPORTS, LEISURE, BUSINESS, OPINION and PRIVATE. Searches for data are speeded by referencing the correct category in the search. Private Rolodex listings are also accessed through the main menu with a password security system. The ROLODEX user has the option of viewing the index of subjects in any or all

categories. The program is easily edited and expanded.

2- Allows a non-journalist, a secretary, to write and typeset marriages, weddings, engagements and anniversaries. The program, named CUPID, asks for vital information. The information is then compiled in one of four optional text styles. A headline is written automatically and fitted. Markup is automatically affixed in the necessary places. The story is then queued to a speller-check program. If no spelling errors or inconsistancies are found, the story is justified and queued to the photocomp. Serious spelling errors result in the flagging of the appropriate editor with a message that special editing is required.

3- Calls programs that monitor the wire for anticipated television logs and grids. Upon their arrival they are automatically text edited. BOGEY edits TV movie listings to space according to criteria established by the TV Editor. TRUEGRID edits prime-time TV grids. It makes sure show titles will fit in the grid, and attempts various strategies to shorten long titles. Successful abbreviations are stored in data files for use in later runs. Both BOGEY and TRUEGRID insert necessary markup and format calls in the edited copy.

4- Accesses RIP, a program that monitors news wires overnight, leaving only the most recent updates of stories in the wire directory. RIP also merges multiple-take stories into single files.

5- Permits editors without systems backround to change the formats loaded into core to fit the time of day and day of week as format needs changes. This is menu-driven and the actual functions are masked to the editors.

6-Provides for automatic updating of the exception word dictionary by editors without systems training.

7- Accesses WALLY, a program that checks for stock-market listings and alerts business editors if listings are delayed for any reason. Automatically checks for appropriate market quotations and justifies and sets them when the task cannot be accomplished by wireflow. Text edits, justifies and sets listings which require special markup. Alerts editors to any problems and gives instructions for handling the particular problem encountered.

8- Includes the MESSAGE,WHO and TIM features of the MUL command which are not available on TMS versions 5.1 and below.

9- Accesses a mathematics program which allows add, subtract, multiply and divide functions.

10- Allows systems department people to utilize specialized command files through menus.

11- Provides some diversions with games, trivia questions and jokes. These have proven useful in introducing reluctant editors and reporters to the features SMORGY offers.

12- Allows EMS users to use TMS UDK spooler features without needing to understand TMS. Program masks TMS operations and automatically converts TMS UDK files to EMS files in appropriate desk. Useful for EMS Version 5.1 and below.

13- Utilizes a sub-menu to allow an editor to select and load special purpose UDKs, such as sort, unjustify, etc. There is also a program demonstrating the applications and versitility of UDKs.

14- Compiles, edits and updates a personal calender of events for each editor and reporter as desired with information recorded by the day, week or month.

15- Allows for special programs such as one to quickly tabulate the results of a survey conducted in the newspaper. For example, a Herald poll querried readers' opinions on 75 different comic strips. The readers marked a ballot and a secretray was able to enter the results as the ballots came in on a daily basis. The program created data files containing a running tally and printed a hard copy report.

3-GIPPER:

DESCRIPTION: GIPPER edits Associated Press copy for The Herald's daily sports scoreboard page. Run time averages 22 minutes, requiring an average of only 1 minute of user time. The editing it performs once took Herald sports staff more than an hour of valuable deadline time each day. The program can be run overnight so that its editing is complete when the scoreboard editor arrives in the morning.

With minimal user input, Gipper determines the scoreboard files it needs for a particular publication day, locates the latest versions and all takes of each type of file, inserts typesetting codes and performs other routine editing to Herald specifications, writes headlines and merges files into finished copy.

Gipper also presents the editor with a report detailing the files edited, problems encountered while editing and possible errors in the copy. (Gipper often proves more accurate than a human editor since it checks data in the file it is editing against other data it has collected. Gipper will flag an editor, for instance, when scores received in a file reviewing the previous day's activity do not agree with the scores in box-score files for individual games.)

OPERATIONS: Upon entry with authorized password Gipper presents the following screen:

```
>|
>|Hello, Michael, this is Gipper.
>|
>|
>|*********************************************|
>|                                             |
>|                    TASKS                    |
>|                                             |
>|            1 = Get acquainted              |
>|            2 = Coach                       |
>|            3 = Review game plan            |
>|            4 = Execute game plan           |
>|            5 = You call the plays          |
>|                                             |
>|      0 = Never mind                         |
>|                                             |
>|*********************************************|
>|
>* What task number do you want? [D]:
```

Choice of Option 0 ends the program. The five main branches are as follows:

1. Get acquainted - Gives new users an overview of the program's capabilities and operating instructions.

2. Coach - Allows users to enter data specifying when various seasons begin and end. This data is used in compiling the ""game plan"" (below). Users may also indicate an interruption in league play due to player strikes and other unscheduled occurrences. In some cases, users may neglect to enter this information. But, since the approximate beginnings of major league seasons are known, Gipper begins asking for data when a season approaches. For instance, if the date NFL exhibition play begins hasn't been entered by July 1, Gipper will begin asking for the information. Gipper may also make reasonable guesses about a season's end if data has not been provided through the coach option: If Gipper encounters no future games during its editing of a league schedule, it automatically enters coach option on its next run to ask if that league's season is now over.

3. Review game plan - Allows the user to view the game plan for the current day and add or delete editing jobs from the plan. The game plan is a list of all files to be edited for all sports currently in season. Each day before running, the Gipper compares the game plan against league schedules gathered in previous editing runs. It automatically deletes certain files from the game plan if no games were scheduled. Users may override these decisions when reviewing the game plan. When user requests an editing job

for a sport not known to be in season, program asks if play has begun in that league and enters coach option if it receives an affirmative answer. Selection of Option 3 will produce the following typical screen:

```
>|
>|*********************************************|
>|                                             |
>|                  GAME PLAN                  |
>|                                             |
>|            1 = NFL Glance                  |
>|            2 = NFL Sums                    |
>|            3 = NBA Glance                  |
>|            4 = NBA Sums                    |
>|            5 = NHL Glance                  |
>|            6 = Transactions                |
>|            7 = Line                        |
>|                                             |
>|*********************************************|
>|
>|(NOTE: NO NHL Sums today because no games scheduled.)
>|
>|
>* Do you want to change the game plan? [Y/N]:
```

Changes in the game plan are accomplished through a series of menus. When the user wishes to make no more changes, the program asks if the user now wants to execute the game plan. If yes, it proceeds to Option 4; if no, it returns to main menu.

4. Execute game plan - Instructs the program to edit the files currently in the daily game plan. If files cannot be found, program so notes in its report to agate page editor. User may then use option 5 to enter the file's slug and location and to order editing. (See editing procedure, below.)

5. You call the plays - Allows user to ask for editing of specific files rather than editing of the entire game plan. User provides the file's slug and location. Program copies the file and performs editing. This option is designed for use when program failed to find needed copy and when updates of specific files are needed for later editions.

EDITING: Option 4 is the guts of the program, and normally takes about 21 minutes from the time it is chosen until editing is complete. No further user input is needed once Option 4 is selected.

Gipper begins by checking its directory for each of the types of files it needs to edit. Wireflow selects the stories by keyword and sends them both to EMS and to TMS. (Gipper, of course, uses the TMS files.) A TMS file is identified by an extension that indicates to Gipper what type of file it is. For instance, an NFL sums file (a

compilation of NFL box scores) will bear the extension FNS: F for football, N for NFL, S for sums.

Due to the vagaries of the Associated Press, keyword selection will sometimes not succeed in sending the needed files to Gipper's UIC. In such cases, Gipper will load a UDK into the terminal it is running on, and sign off. The UDK will log in to EMS, search for the file, enter MCR mode and call Gipper again, presenting it with the file's location. Using the DFI and PIP utilities, Gipper copies the file into its UIC and proceeds.

When all files are accounted for, Gipper then finds the latest version of each type of file and, in the case of multiple-take files, each take. These are the files to be edited. The files are sorted, regardless of sport, so that like files can be edited in sequence. For instance, as far as editing is concerned, an NBA glance file and an NFL glance file require nearly identical operations, as do an NFL sums file and an NBA sums file.

The glance files — which contain team standings, the results of yesterday's games and the game schedule for the next few days — contain data Gipper needs for other decisions, so they are edited first. Gipper loads a UDK to edit the files and then calls the files to the terminal one by one.

When all glance files are edited, Gipperloads a UDK for the next type of file to be editgd, say sums, and the procedure is repeated until all files are edited.

When the editing is complete, Gipper merges the edited files into single files for each individual sport. For example, it will merge NFL glance and NFL sums into one file; NBA glance and NBA sums into another and so on. As it does so, it records the names of the files and their contents — together with any additional notes pertaining to the files — into a separate report file. The merged files and the report file are copied to EMS, using the CVT utility.

Gipper then cleans its directories of wire and data files that are no longer needed, displays its report file on the terminal and signs off.

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## ACPs

A presentation by Mike Garcia at US Decus Fall 82

In this presentation I will be discussing ACPs, and how they interface with the IAS Operating System. This talk is not intended to explain F11ACP in detail , although there will be some examples shown. All slides shown, plus some others, are included in a handout.

Let's briefly go over an outline of the items to be discussed in this talk.

We can begin by talking about where the letters 'ACP' came from, and what they mean in IAS. ACP is one of Digital's many acronyms, formed from the words 'Ancillary Control Processor'. As you will notice, I'll be using many acronyms throughout this session.

What does the word 'Ancillary' mean to an IAS user? Well, Webster's defines "ancillary" as something that is "auxillary", which in turn means "giving assistance or support; aiding; helping". And that is exactly what ACPs do; they are tasks that are sitting off to the side, ready at all times to come to the aid of the device handlers, to help handle functions related to input and output. ACPs are separate tasks that are distinct from the Exec and device handlers.

ACPs are considered part of the I/O subsystem, which will be described later. ACPs are used for QIOs that are very complicated or serve several functions. They can take heavy work loads off of the device handler by processing such QIOs themselves, thereby freeing the device handler to process other QIOs. Two areas involving such complicated I/O are file systems and networks. Another function of an ACP is to aid in maintaining a common database such as available free space on the disk or other network nodes

available to the user.

ACPs assist in producing a faster system; without them the device handlers would have to do all the work for each QIO. Unlike PIP, FLX, or other Utilities that need to be invoked, ACPs are not explicitly invoked. They are brought in when necessary to work with the device handlers.

## IAS Supplied ACPs

IAS supplies three ACPs:

1. F11ACP -- for Files-11 volumes (disks, DECtape),
2. DTAACP -- a variation of F11ACP; for installations that require significant amounts of DECtape processing.
3. MTAACP -- for ANSI magtape handling,

DECnet also has its own ACP called NETACP.

All file processing in IAS is routed through ACP tasks. Therefore, all file processing operations such as creating and deleting files are performed by ACPs. File access is performed by the ACP task that is associated with the device being used. Basic operations such as read and write logical are totally controlled by the device handler.

All file processing in these ACP tasks is serial. Since all file processing in these ACPs is serial, system throughput is improved by having separate ACPs for each device.

That is why DTAACP is available for large amounts of DECtape processing. DTAACP is a version of F11ACP modified to reduce the amount of tape motion. Thus DTAACP gives not only the advantages of a separate ACP for DECtape, but also modifications based on DECtapes' physical characteristics. See the IAS Performance and Tuning Guide for more details.

## General Characteristics of ACPs

Let's continue now with some general characteristics of ACPs. ACPs are tasks. As such, they have all the attributes of tasks. ACPs are always built as Executive privileged, so that they can access SCOM, the System Common Area.

ACPs can use routines in the handler library, HNDLIB. They can either include the routines from HNDLIB.OLB at task build time, or access the System Global Area HNDLIB.TSK. ACPs must be installed, as they are not automatically installed when needed.

ACPs are made known to the system as ACPs via the Physical Unit Directory. The Physical Unit Directory, or PUD, is a system table that contains descriptive information about each device in the system. It is created during SYSGEN. There is one entry in the PUD for each device. A detailed definition of the PUD is given in EM00. You should familiarize yourself with this description before attempting to write or debug an ACP, or any of the other data structures that I'll be mentioning later.

Each PUD entry contains four words listing various characteristics about the device. They are words U.C1, U.C2, U.C3, and U.C4. Only word U.C1 is of interest to us here. The PUD entry for each device using an ACP must be set up appropriately. This is done by declaring the device mountable by setting bit UC.MNT in U.C1.

Each ACP must have a six character task name, such as F11ACP. The last three characters must always be 'ACP'. A default ACP for a device may be specified by storing the first three characters of the task name in RAD50 in word U.DACP in the PUD entry. If no ACP is specified when the device is mounted, the default ACP will be used. When the device is mounted, the ACP that is associated with the device is indicated by word U.ACP in the PUD

entry, which contains the address of the System Task Directory (STD) node for that ACP.

The PUD entries for supported devices are initialized by SYSGEN Phase 1 (SGN1) in accordance with the DEV directive specified in the Phase 1 command file, SYSGEN.CMD. SGN1 gets the information from the Device Characteristics Table (DCHST), using the type entry in the DEV statement to indicate which entry in DCHST should be used. If no default ACP is specified by the DEV directive, SYSGEN uses F11ACP for disks and MTAACP for magtapes.

If you wish to add an unsupported device or override the values given in DCHST, see the description of the DEV directive in the System Generation and Start-Up Guide. DCHST is explained in Appendix B of the same manual.

## The I/O Subsystem

Now let's take a look at the I/O Subsystem, the area of the system which involves ACPs. The I/O subsystem consists of the device handlers, ACPs, the handler library HNDLIB, and the Exec QIO processing. One of the major goals of the I/O subsystem is to allow users to utilize various peripherals without worrying about the specifics of the devices.

First, let's talk about QIOs. The QIO is the lowest level of task I/O. User tasks can make I/O requests to device handlers by issuing QIO directives. When user tasks issue QIO requests, the Directive Parameter Block (DPB) gets created.

The DPB contains all the information that the Exec requires to place the I/O request into the queue of the desired device handler.

The first word of each DPB contains a Directive Identification Code (DIC) byte and a DPB size byte. The DIC indicates which directive is to be performed, the size byte indicates the DPB length in words. The DIC is always odd, and is the low-order byte of this first word.

The DPB is 6 to 12 words long, depending on the number of parameters given in the QIO$ macro call. The DPB receives all the information it needs from whatever the user specifies in the QIO$ macro call. QIO requests are queued only if the DPB contains the proper arguments.

The DPB provides the following information:

1. An I/O function code -- IO.RVB, IO.WLB, etc.,

2. A Logical Unit Number (LUN),

3. An event flag number,

4. A request priority,

5. The address of the I/O Status Block,

6. The address of the I/O done Asynchronous Trap (AST) entry point,

7. A list of up to six parameters specific to the I/O function.

The device handlers provide a device independent I/O interface by using the standard interface provided by the QIO$ and the QIOW$ directive.

The QIO$ and QIOW$ directives are virtually the same. The QIOW$ directive is used when it is necessary to perform I/O and wait until it is complete. In addition to all of the functions of the QIO$ directive, QIOW$ also executes a WAIT$ directive if an event flag is specified. Its format is identical to that of QIO$.

As is true of all directives, the QIO directives use the Directive Status Word (DSW) to indicate success or failure of the QIO directive itself. If the directive is successful, all that has happened is that the request has been sent to the proper handler for processing.

If the I/O operation is successful, the user task is notified via the setting of an event flag and/or an AST routine when the actual I/O function is completed. At that time, the user task should examine the I/O Status Block. The I/O Status Block is a 2-word buffer defined in the DPB. In the I/O Status Block is the indication of the success or failure of the I/O function.

The device handlers are separate tasks that perform the physical I/O that is actually controlling the device. ACPs are the last component of the I/O Subsystem.

## Basic Flow of the I/O Subsystem

How does the user set the I/O Subsystem to perform I/O? He issues a QIO.

Once a QIO is issued, the Executive translates the QIO into an I/O Request Queue (IRQ) entry, taking the information from the DPB to set up the IRQ, and then passes it on to the device handler. Here is a layout of the I/O Request Queue, and how the items are taken from the DPB to set up the IRQ. The IRQ records all I/O requests for a particular device handler. There is one I/O Request Queue for each device handler. Its listhead is in the device handler task's task header. There is one I/O request node for each QIO. The IRQ is defined in Exec module zero.

The I/O Request Node, which resides in SCOM, is linked into the I/O Request Queue. It is in SCOM so the device handlers can avoid having to reference the DPB, and to allow the I/O subsystem to modify the user's request without modifying the DPB.

The handler dequeues an I/O Request Node each time it is ready to perform another I/O operation. It takes the IRQ entry and translates it into specific commands for that particular device. In other words, the device handlers can receive any I/O requests that use QIOs, translate the request into specific terms of an RP06, RM05, etc., and then perform the I/O. It is the responsibility of the device handler to recognize and reject any requests that cannot be handled by that device. We will see later how and when ACPs are involved.

Upon completion of the I/O, the handler uses ..IODN to notify the task that the I/O is complete. The device handler then looks for more requests.

## Basic Flow of a QIO

Let's take a look at the flow of a QIO through the I/O subsystem in more detail.

The user issues this QIO request via an EMT 377. All system directives are invoked by an EMT 377. It is the execution of the EMT 377 which causes a trap that transfers control to the Exec.

As a result of the EMT, a new Processor Status (PS) and a new PC are taken from the trap vector. The new PS is set up to cause a switch to Kernel mode. Therefore, the next instruction at the new PC will be taken from Kernel virtual address space.

The flow continues with the Executive determining which system directive was issued by examing the DPB. The Exec will figure out whether it is a valid system directive. If it is a valid directive, the Executive goes to the appropriate module.

In the case of a QIO$ or QIOW$ request, we then move to the DMQIO module. DMQIO contains the code to service the QIO$ and QIOW$ directives. The Exec examines the Logical Unit Number (LUN) parameter of the QIO directive to determine which device handler is to process the request. The particular device handler is chosen by mapping the LUN into an entry in the PUD, using the Logical Unit Table (LUT). The LUT is used by the system to resolve the correspondence between LUNs and physical devices. The LUT is contained in the tasks' header.

If the device is known to the system, the IRQ entry is created and inserted in the queue for that device handler. In addition, DMQIO signals which handler should run by setting the appropriate event flag for the handler, and then declaring a significant event.

Next, the Directive Status Word (DSW) is set to indicate acceptance or

rejection of the directive.

Device handlers are in a WAITFOR event flag state when they can do no more work, for example when waiting for a request to be queued or an interrupt to occur. The event flag set above indicates to the handler that a request was queued, and indicates to the Executive that the WAITFOR has been satisfied. (Note that event flags used by the handlers are all local event flags.)

The device handler becomes active as a result of the Executive scanning the Active Task List for the highest priority runnable task. When it finds the device handler, the handler is run.

When the handler runs, it dequeues the request. It then makes sure that the function code is within the range of codes that the handler can process. If the code is within the legal range, the flow proceeds to the function dispatch routine, ..DISP.

.DISP is contained in HNDLIB, the handler library. The function of the ..DISP routine is to dispatch an I/O request according to the specified I/O function code using the handler supplied dispatch table. The ..DISP routine assumes that the I/O function codes will map into the dispatch table properly. .DISP will invoke the specific routine within the handler to perform the QIO function requested. The ..DISP routine will be discussed in more detail later.

Eventually, the device handler starts the transfer of data. The device handler will then WAITFOR a specific event flag until an interrupt occurs.

When a device handler completes an I/O request, it goes to the routine ..IODN to cause the I/O status to be posted in the I/O status block, the event flag specified by the user to be set, and the AST queued.

Eventually, the Exec's ATL scan will find the user task in a runnable

state because the I/O has completed.

This completes the flow through the I/O subsystem for those cases where an ACP is not involved. The flow is the same when an ACP is involved until we get to ..DISP. Let's take a closer look at ..DISP.

## ..DISP

..DISP plays an important role in the life of an ACP function. It is the only IAS system routine that is not actually a subroutine. ..DISP is jumped to rather than called.

As I mentioned previously, ..DISP's job is to dispatch an I/O request according to the I/O function code specified in the QIO system directive. This I/O function code is used to index into the Dispatch table.

The Dispatch table is used by ..DISP to deal with file processor requests. The Dispatch table is contained in the appropriate device handler. It contains read-only information; its contents are never altered.

1. Here's how the dispatch table is constructed:

    1. It is ordered by function code -- each function code entry would contain certain information from the dispatch table.

    2. The first two words contain an address to branch to if the SEND/REQUEST is successful or fails. We'll see where the SEND/REQUEST comes from in a moment.

    3. The next two words are A and B. There is an entry composed of words A and B for each function code up to and including the maximum function code that the device handler recognizes.

    4. Word A contains 2 bytes telling who can make this request:

        1. Byte A0 is the Volume Characteristics mask. If bits in here are set, certain things must be true, such as the volume must be mounted, the device must be a Files-11 device, etc.

2. Byte A1 is the control variable. Bits 8 through 11 determine the required minimum user access rights.

5. Byte A1 indicates if this request is an ACP function. If bit 15 is set in Byte A1, the function is an ACP function.

6. Word 8 gives the handler routine address which will process the I/O request. Word 8 is used if bit 15 discussed above is not set. In other words, if the function is not an ACP function, ..DISP transfers control to the routine specified in Word 8.

7. A full description and layout of the Dispatch table can be found in the Guide to Writing a Device Handler Manual.

2. If the function is an ACP function, ..DISP will check if the device that is used is mountable. It will return an error if it is not. ..DISP then builds a 3-word data block which it sends to the ACP task, using the Send Data and Request or Resume directive (VSDR$).

..DISP then goes to the good or bad routines in the handler, depending on the send succeeding or failing. If it is an ACP function, the handler then cleans up its data base. Since the handler has done all it can with this request, it will treat it as completed. Should the ACP re-queue the request, suitably modified, it will appear to be a completely new request.

At this point, ..DISP has done it's job. We now move on to the ACP itself.

Contained in the 3-word data block is:

1. The request node address

2. A pointer to the Physical Unit Directory for information on the device that the task will use

3. the I/O function code.

### The ACP Takes Over

At this point, the ACP takes over. Once the 3-word data block is sent to the ACP, the ACP becomes active and will run when the handler returns to the wait loop, since handlers run at a higher priority than the ACPs.

ACPs are in a suspend state when there are no more requests to process. They may be in other states at other times. Unlike handlers, they are not in a suspend state whenever they are waiting for something to do.

When the ACP is requested to run, it will perform a receive data or suspend. The received data is in a 5-word data block format, with the last three words identical to the data block sent by ..DISP. The 5-word data block contains:

1. The sender task name -- 1st half is the handler's name
2. Sender task name -- 2nd half
3. Request node address
4. Pointer to the device PUD
5. The I/O function code

Once the data is received successfully, the ACP can do certain checks on who did the send. It can check by task name, and if it was a privileged task that did the send. The Receive Data directive (RCVD$) will set the V bit if the sender is an Executive Privileged Task. The ACP will proceed to decode the function code. It will then dispatch to the appropriate routine in the ACP. This is analogous to what happens in ..DISP.

While this routine does its processing, it has a decision to make. The routine can either:

1. modify the original request and re-queue it back to the handler for final processing.

2. or, the ACP will do all the work itself. When finished, the ACP will call ..IODN to notify the user that the I/O is complete.

In either case, the ACP then does another 'Receive Data or Suspend' to either set another request if one is present, or Wait For the next request if none were present at that time.

## An Example of RVB Processing

Let's take a look at a specific example on how RVB maps into a RLB, and how the simple and complex requests shown in the last slide are handled.

Virtual blocks are File Relative, Logical blocks are Volume Relative. The virtual blocks in a file are allocated in groups of contiguous blocks called extents.

Here is an example of extents, and how RVB maps into RLB. Even though files A and B both have the same VBNs, the corresponding LBNs are different since the VBNs relate to the block's placement within the individual file, not the volume as a whole.

When the ACP gets a RVB request, it goes to the RWVB module and does either a short transfer or a long transfer.

If it is a short transfer, i.e, a transfer wholly within one extent, the function code and the starting address get modified. That is, the RVB is mapped to a RLB, and the starting VBN into an LBN. The ACP plays the part of DMQIO and queues the I/O request queue entry to the handler. The handler thinks it is just another request, and it is the handler's responsibility from here on.

If it is a long request, a transfer involving a number of extents, the ACP goes from the RWVB module to the RWVBL module. This long request involves several extents, and the ACP handles each of these similar to short requests. The ACP does real QIOs for each short request. The ACP also uses the original I/O request queue entry to keep track of how much was transferred, and the starting address of each short request. When the long request is complete, the ACP uses ..IODN to post success or failure status, just as the handler would.

The ACP is now finished with this request. It will then do another

Receive Data or Suspend directive (RCVS$).

## Summary

Since this talk was mainly an overview, there were some things that were not discussed, as going into detail takes much longer to discuss properly.

1. I haven't gone into any specifics of calling sequences
2. or any detail on writing handlers. See the Guide to Writing a Device Handler Manual for more information.
3. No detail on F11ACP.
4. I do strongly suggest reading all the modules listed in the handout.

Some helpful hints:

1. Any handlers that interface with an ACP may need a high node pool limit. If the ACP is receiving slower than the device handler is sending, then the handler can exhaust its node pool limit, and the sends will fail.
2. Therefore, I suggest installing those handlers with a maximum node limit of 255. Don't worry about node pool usage. You are most likely to save yourself from having problems that are hard to detect.

That about wraps it up.

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