



DECUS U.S. CHAPTER SIGs NEWSLETTERS

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| COMMERCIAL LANGUAGES SIG | CL |
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| DATA MANAGEMENT SIG | DMS |
| DATATRIEVE/4GL SIG | DTR |
| EDUSIG | EDU |
| GRAPHICS SIG | GRA |
| HARDWARE MICRO SIG | HMS |
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| LANGUAGES AND TOOLS SIG | L&T |
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| DECmate | Master Menu | RD53 | VAX/VMS |
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Circulation: 7071

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**ARTIFICIAL
INTELLIGENCE**



DECUS

(THE (LINKED LIST))

The Newsletter of the DECUS Artificial Intelligence Special Interest Group

"...It's The Real Thing"

Vol. 3 No. 2

March 1987

FROM THE EDITOR:

(THE (LINKED LIST)) welcomes your articles, book reviews, questions, comments and suggestions. Please send your submissions to me at the address below or give me a call at 617-375-4321.

Terry C. Shannon
Digital Review
Prudential Tower Suite 1390
Boston, MA 02199

NASHVILLE BECKONS . . .

By Pam Vavra

The AI SIG has been experiencing rapid growth, as has the field of AI in general. If you have been watching its development, we think you'll be pleased with the breadth and depth of its offerings this Spring. For the Nashville Symposium, the AI SIG is pleased to offer once again, a host of excellent Pre-Symposium Seminars, plus a full week of informative sessions for practitioners and managers alike. Highlights include plenary talks by acknowledged experts in knowledge-based systems, Computer Integrated Manufacturing (CIM), robotics, and numerical control systems, who will share their view of the contributions they anticipate from AI to their respective fields.

A tradition that began in San Francisco, will be continued and augmented in Nashville--namely, The Great Tool Debate on Thursday evening. In fact, most of the sessions given prior to that time can be viewed as preparatory material for this event. This is the place to defend your favorite tool, or expose the weaknesses in the tools revered by your colleagues. If your mission is to discover just what issues are involved in selecting among the myriad tools available, this is the place for you.

We have so many sessions, that unfortunately, we are forced to double-stream. Please take a look at the Index and Sessions-at-a-Glance to find the AI Sponsored and AI Related sessions to be offered in Nashville. We think you'll find the Symposium well worth attending on the basis of the AI sessions alone! Session Notes are generally considered a valuable aid, not only to reduce note-taking; but also as an aid in deciding which sessions to attend, and to provide material from unavoidably missed sessions.

As with all DECUS Symposia, a great deal of technology transfer take place outside the session rooms. We'll be providing numerous opportunities for face-to-face contact with tool developers and users during lunch, during dinner, at Receptions, in the Campground, and in the Suite. In particular, most tool developers will be present in the Campground immediately following their talk, in order to answer questions and/or illustrate fine points on a running system. DEC developers also promise to be readily available for questioning.

We look forward to meeting you in Nashville, as we continue to work toward facilitating information exchange among DECUS AIers. Your participation is needed to help our young group continue to grow and develop in a manner that spells excellence and success for us all.

PSS ABSTRACTS

Following are brief abstracts of AISIG-sponsored Pre-Symposium Seminars to be held in Nashville.

LISP AND AI PROGRAMMING TECHNIQUES

LISP is a list oriented programming language ideally suited for developing Artificial Intelligence applications. Its tools and high flexibility have made it a common choice for building prototypes, even of systems eventually suited for other languages. Many AI tools are written in LISP and a majority of the applications in the United States include LISP segments.

The first half of the seminar includes an introduction to LISP, its data structures, its control mechanisms and its programming style.

The second half will be a hands on workshop. Attendees will complete several assignments emphasizing program extensibility and LISP's adaptability. Attendees will gain enough familiarity with LISP concepts to master LISP programming on their own.

Credentials:

Dr. David Slater has been working with AI and programming in LISP for over 14 years. His special interests include natural language programs, foundations of expert systems, and expert systems.

Ms. Sarah Townsend has been programming in LISP for two years and has worked on expert systems research (using LISP to develop more sophisticated expert systems than are possible using expert system languages), logic programming a natural language.

Prerequisites of Attendees:

Attendees should have a strong programming background, and an interest in learning to program in LISP. The purpose of this seminar will be to prepare attendees to learn LISP on their own when they return.

OP55 PROGRAMMING WORKSHOP

The emphasis of this seminar will be on the practical application of OPS5 for building rule-based expert systems. The fundamentals of OPS5 programming will be covered, as well as some advanced programming techniques and practices including calling out from OPS5 to other languages. Examples from a real-world expert system will be covered in depth and attendees will have the opportunity to use OPS5 on a VAXstation in the classroom. Programming style as well as efficiency will be discussed. Attendees should gain enough familiarity with OPS5 to be able to begin generating prototypes on their own. In the past, attendees of this hands-on workshop have been able to begin programming useful prototypes during Symposium week.

General topics in Artificial Intelligence will not be covered, but the appropriateness of OPS5 for different types of rule-based systems will be discussed. Time will be allotted to discuss questions and problems brought to the workshop by the attendees.

Credentials:

Nancy Wogrin is Senior Instructor of the Expert Systems Training Program and is in charge of advanced curriculum for Digital. She has written a self-paced introductory course on OPS5 and Expert Systems, as well as a lecture/lab on OPS5 Expert System Prototyping.

Don Rosenthal is Senior Computer Scientist for the Space Telescope Science Institute. He introduced the use of OPS5 as a tool for building expert ground support sub-systems for NASA's Hubble Space Telescope. He has developed several OPS5-based systems which are in day-to-day use, and has published and lectured on the work accomplished. As well as having programmed in OPS5 for several years, he has taught OPS5 programming to numerous software developers.

Prerequisites of Attendees:

Attendees should be software developers, but need not have a background in Artificial Intelligence or OPS5. The seminar will be most useful to attendees who have a particular expert system or OPS5 application in mind.

INTRODUCTION TO AI AND NEXT-GENERATION COMPUTING

AI technology finally has emerged from the research labs and is providing feasible solutions to a variety of real-world problems in the EDP environment. Many companies are eagerly searching for AI expertise and a growing number of computer professionals are seeking a grounding in AI.

This seminar addresses the application of AI technology to real-world problems, the relationship of AI technology and the conventional computing environment, the tools available or required for AI applications development, the impact of AI technology and the management of AI projects. The content of this seminar is primarily conceptual and technical. After being introduced to the capabilities and limitations of today's AI applications, seminar attendees will learn what can reasonably be expected from new developments in AI and knowledge engineering. The seminar concludes with an overview of next-generation computing concepts and the major AI research programs currently underway here and abroad.

Credentials:

Art Beane is the manager of the Base Product Marketing and Product Management groups at Digital's Artificial Intelligence Technology Group, with responsibility for all Digital-developed AI products. During his ten years at Digital, Art's responsibilities have been in the area of opening up new marketplaces for the corporation. Art has a BS in electrical engineering from Rensselaer Polytechnic Institute.

Terry Shannon is the technical editor of Digital Review magazine. He specializes in computer technology and artificial intelligence and has written extensively on these topics for several publications. In addition to presenting numerous

AI-related sessions at previous DECUS symposia, Terry serves on the Executive Committee of the DECUS AI SIG and edits (THE LINKED LIST), the AI SIG newsletter. Terry has a BS in liberal studies from the State University of New York.

Prerequisites of Attendees:

There are no prerequisites for this presentation.

ADVANCED REASONING PARADIGMS AND KNOWLEDGE REPRESENTATIONS

(Sponsored by the ARTIFICIAL INTELLIGENCE SIG)

Artificial intelligence applications development entails building symbolic models of complex problems, acquiring and storing both procedural and descriptive knowledge about the problem and its solution, and then reasoning about the model and the knowledge, causes and consequences of events, and selecting an acceptable solution from an undetermined set of possible solutions.

In this PSS, Dr. Hartzband will introduce the basic concepts of knowledge representation and reasoning implementation techniques, and examples of problem solving using the procedures discussed.

Credentials:

David Hartzband is currently a Consulting Software Engineer and Chief Scientist and Manager for Architectures of the Artificial Intelligence Technology Group at Digital. Prior to joining the AITG, he was DSRI architect at Digital. His primary research area is in deduction and learning in machine systems.

David received his doctorate in mathematics from the Universitat Homburg (Federal German Republic) and is on the faculty of Boston University (Metropolitan College) where he has taught courses in databases and artificial intelligence. He is also currently a Visiting Research Associate in the Knowledge Base Systems Group of the Department of Computer Science at Stanford University.

Prerequisites of Attendees:

A basic understanding of AI concepts is assumed. Particularly, attendees should be familiar with commonly used knowledge representation schemes and the situations for which they are most appropriate.

Sessions Presented by the AI SIG in Nashville, Spring '87 DECUS Symposium

(Sessions in Order by Session Number)

| | | | |
|------|---|----|---------------|
| AI01 | AN EXPERT SYSTEM IN POWER PLANT CONSTRUCTION | Th | 10:00-10:45am |
| AI02 | AI IN THE PUBLIC DOMAIN | F | 9:00-10:00am |
| AI03 | INTRO TO LANGUAGES & TOOLS FOR AI DEVELOPMENT | M | 11:30-12:30pm |
| AI05 | ESCAD: AN EXPERT SYSTEM FOR CAD | F | 2:15-3:00pm |
| AI06 | AI ON PERSONAL COMPUTERS | W | 12:00-1:00pm |
| AI07 | OPS5 PROGRAMMING TECHNIQUES | T | 4:00-5:00pm |
| AI08 | WRITING EFFICIENT OPS5 RULES | T | 3:00-4:00pm |
| AI09 | DESIGNING AND BUILDING EXPERT SYSTEMS IN OPS5 | T | 9:00-9:45am |
| AI10 | AI AND IMAGE PROCESSING | F | 10:45-11:30am |
| AI11 | ART: AUTOMATED REASONING TOOL | M | 1:00-2:00pm |
| AI12 | SEMANTIC PROBLEMS IN AI & OTHER AREAS OF COMPUTING | T | 10:00-10:30am |
| AI14 | KNOWLEDGE REPRESENTATION ISSUES | M | 7:30-8:30pm |
| AI15 | INTELLICORP'S KEE & PC-HOST | Th | 9:00-10:00am |
| AI16 | SURVEY OF EXPERT SYSTEM TOOLS POSITIONING | T | 12:30-1:15pm |
| AI17 | VAXMATE LISP | T | 6:00-7:00pm |
| AI18 | NEURON DATA NEXPERT OBJECT | W | 5:00-6:00pm |
| AI19 | THE GREAT AI TOOL DEBATE | Th | 8:30-10:00pm |
| AI20 | OPS5 QUESTION AND ANSWER SESSION | Th | 7:30-8:30pm |
| AI21 | ARTIFICIAL INTELLIGENCE IN A DISTRIBUTED NETWORK | T | 1:15-2:00pm |
| AI22 | OPS5 CONTROL CONSTRUCTS | T | 9:45-10:30am |
| AI23 | DENNIS O'CONNOR ON MANAGEMENT ISSUES FOR AI | T | 4:00-5:00pm |
| AI24 | VAX LISP FOR ADVANCED USERS | W | 4:30-5:00pm |
| AI25 | INTRODUCTION TO MACHINE LEARNING | W | 3:00-3:30pm |
| AI26 | ADDING META-RULES TO OPS5--A PROPOSED EXTENSION | Th | 6:45-7:30pm |
| AI28 | AN AI PROJECT CASE STUDY--THE FIRST SIX MONTHS | M | 8:30-9:30pm |
| AI29 | DISPATCHER: INTELLIGENT APPROACH TO FACTORY CONTROL | F | 1:30-2:15pm |
| AI30 | FOUNDATIONS OF AI IN PHILOSOPHY AND COGNITIVE SCIENCE | T | 3:00-4:00pm |
| AI31 | ARTIFICIAL INTELLIGENCE SIG ROADMAP | M | 9:00-10:00am |
| AI32 | ARTIFICIAL INTELLIGENCE SIG BUSINESS MEETING | T | 2:00-3:00pm |
| AI33 | ARTIFICIAL INTELLIGENCE SIG WRAPUP SESSION | F | 3:00-4:00pm |
| AI34 | HOW TO SELECT A PROJECT FOR YOUR FIRST EXPERT SYSTEM | W | 10:00-10:30am |

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|------|---|----|-----------------|-----------------------|--|
| AI35 | HOW TO WRITE YOUR FIRST EXPERT SYSTEM PROPOSAL | W | 10:45-11:30pm | <lunch> | |
| AI37 | EXPERT SYSTEM IN AUTOMATIC MACHINERY TESTING | Th | 10:45-11:30am | 1:00 p.m.- 2:00 p.m. | AI11 ART: AUTOMATED REASONING TOOL |
| AI38 | EXPERT SYSTEMS FOR NAIVE USERS | Th | 9:00-10:00am | 1:30 p.m.- 2:30 p.m. | AI54 THE FIFTH GENERATION |
| AI40 | USING PROLOG FOR ADVANCED APPLICATION DEVELOPMENT | M | 5:30-6:30pm | 3:30 p.m.- 4:30 p.m. | AI42 AN INTRODUCTION TO PROLOG |
| AI41 | USING PROLOG TO BUILD EXPERT SYSTEMS | M | 4:30-5:30pm | 4:30 p.m.- 5:30 p.m. | AI41 USING PROLOG TO BUILD EXPERT SYSTEMS |
| AI42 | AN INTRODUCTION TO PROLOG | M | 3:30-4:30pm | 5:00 p.m.- 6:00 p.m. | AI59 VAX OPS5 PRODUCT DESCRIPTION |
| AI43 | LARRY HARRIS ON NATURAL LANGUAGE PROCESSING | T | 9:00-10:00am | 5:30 p.m.- 6:30 p.m. | AI40 USING PROLOG FOR ADVANCED APPLICATION DEVELOPMENT |
| AI44 | INTELLECT/RDB TECHNICAL OVERVIEW | W | 3:00-4:00pm | 6:30 p.m.- 7:30 p.m. | AI49 EXPERT SYSTEMS CONCEPTS CRASH COURSE |
| AI45 | APPLICATIONS USING GURU | Th | 6:00-6:45pm | 7:30 p.m.- 8:30 p.m. | AI14 KNOWLEDGE REPRESENTATION ISSUES |
| AI47 | EARL SACERDOTI ON EXPERT SYSTEM DEVELOPMENT | W | 1:00-2:00pm | 8:30 p.m.- 9:30 p.m. | AI28 AN AI PROJECT CASE STUDY--THE FIRST SIX MONTHS |
| AI48 | CHARLES WEISBIN ON RECENT ROBOTICS RESEARCH | Th | 3:00-4:00pm | 9:30 p.m.-10:00 p.m. | AI53 ARTIFICIAL INTELLIGENCE MUSINGS OF A SLOTH |
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| AI50 | KB TOOLS TO ASSIST THE DIAGNOSIS OF FASTBUS FAULTS | W | 9:00-10:00am | | |
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| AI53 | ARTIFICIAL INTELLIGENCE MUSINGS OF A SLOTH | M | 9:30-10:00pm | 9:00 a.m.- 9:45 a.m. | AI09 DESIGNING AND BUILDING EXPERT SYSTEMS IN OPS5 |
| AI54 | THE FIFTH GENERATION | M | 1:30-2:30pm | 9:45 a.m.-10:30 a.m. | AI22 OPS5 CONTROL CONSTRUCTS |
| AI55 | CARE AND FEEDING OF MATURE EXPERT SYSTEMS | F | 1:00-1:30pm | 10:00 a.m.-10:30 a.m. | AI12 SEMANTIC PROBLEMS IN AI & OTHER AREAS OF COMPUTING |
| AI56 | DEFINING AN EXPERT SYSTEM LANGUAGE | Th | 2:00-3:00pm | 10:30 a.m.-11:30 a.m. | AI63 GETTING STARTED IN AI -- NOVICE Q&A |
| AI57 | INTRODUCTION TO VAX LISP | W | 10:00-10:45am | | <lunch> |
| AI58 | INTRODUCTION TO ARTIFICIAL INTELLIGENCE | M | 10:00-11:00am | 12:30 p.m.- 1:15 p.m. | AI16 SURVEY OF EXPERT SYSTEM TOOLS POSITIONING |
| AI59 | VAX OPS5 PRODUCT DESCRIPTION | M | 5:00-6:00pm | 12:30 p.m.- 1:15 p.m. | AI67 AI IMPACT ON DATABASE TECHNOLOGY |
| AI60 | VAX LISP FOR VMS AND ULTRIX | W | 10:45-11:30am | 1:15 p.m.- 2:00 p.m. | AI65 PACKAGING AND CONFIGURING VAX SYSTEMS FOR AI |
| AI61 | LISP QUESTION AND ANSWER SESSION | W | 5:00-6:00pm | 1:15 p.m.- 2:00 p.m. | AI21 ARTIFICIAL INTELLIGENCE IN A DISTRIBUTED NETWORK |
| AI62 | EXTENDING THE VAX LISP EDITOR | W | 3:30-4:30pm | 2:00 p.m.- 3:00 p.m. | AI32 ARTIFICIAL INTELLIGENCE SIG BUSINESS MEETING (OPEN) |
| AI63 | GETTING STARTED IN AI -- NOVICE Q & A | T | 10:30-11:30am | 3:00 p.m.- 4:00 p.m. | AI30 FOUNDATIONS OF AI IN PHILOSOPHY AND COGNITIVE SCIENCE |
| AI64 | CHARLES JORGENSEN ON SIMULATED NEURAL NETS | Th | 11:30-12:30pm | 3:00 p.m.- 4:00 p.m. | AI08 WRITING EFFICIENT OPS5 RULES |
| AI65 | PACKAGING AND CONFIGURING VAX SYSTEMS FOR AI | T | 1:15-2:00pm | 4:00 p.m.- 5:00 p.m. | AI23 DENNIS O'CONNOR ON MANAGEMENT ISSUES FOR AI |
| AI66 | MIKE HOWARD ON STRATEGY FOR AI & CIM | T | 5:00-6:00pm | 4:00 p.m.- 5:00 p.m. | AI07 OPS5 PROGRAMMING TECHNIQUES |
| AI67 | AI IMPACT ON DATABASE TECHNOLOGY | T | 12:30-1:15pm | 5:00 p.m.- 6:00 p.m. | AI66 MIKE HOWARD ON STRATEGY FOR AI & CIM |
| AI68 | KNOWLEDGE ENGINEERING IN PART PHYS EXPERMNTS @ CERN | F | 11:30-12:00noon | | |
| AI69 | WHAT'S AN INFERENCE ENGINE, ANYWAY? | W | 2:00-3:00pm | | |

Sessions in Chronological Order...

MONDAY

9:00 a.m.-10:00 a.m. AI31 ARTIFICIAL INTELLIGENCE SIG ROADMAP
 10:00 a.m.-11:00 a.m. AI58 INTRODUCTION TO ARTIFICIAL INTELLIGENCE
 11:00 a.m.-11:30 a.m. AI51 SURVEY OF AI LITERATURE
 11:30 a.m.-12:30 p.m. AI03 INTRO TO LANGUAGES & TOOLS FOR AI DEVELOPMENT

<Reception in Suite for AI Managers with Dennis O'Conner and Mike Howard>

WEDNESDAY

9:00 a.m.-10:00 a.m. AI50 KB TOOLS TO ASSIST THE DIAGNOSIS OF FASTBUS FAULTS
 10:00 a.m.-10:45 a.m. AI57 INTRODUCTION TO VAX LISP
 10:00 a.m.-10:30 a.m. AI34 HOW TO SELECT A PROJECT FOR YOUR FIRST EXPERT SYSTEM
 10:30 a.m.-11:00 a.m. AI35 HOW TO WRITE YOUR FIRST EXPERT SYSTEM PROPOSAL
 10:45 a.m.-11:30 a.m. AI60 VAX LISP FOR VMS AND ULTRIX, AND THE AI VAXSTATION

<lunch>

12:00 noon- 1:00 p.m. AI06 AI ON PERSONAL COMPUTERS
 1:00 p.m.- 2:00 p.m. AI47 EARL SACERDOTI ON EXPERT SYSTEM DEVELOPMENT
 2:00 p.m.- 3:00 p.m. AI69 WHAT'S AN INFERENCE ENGINE, ANYWAY?
 3:00 p.m.- 4:00 p.m. AI44 INTELLECT/RDB TECHNICAL OVERVIEW
 3:00 p.m.- 3:30 p.m. AI25 INTRODUCTION TO MACHINE LEARNING
 3:30 p.m.- 4:30 p.m. AI62 EXTENDING THE VAX LISP EDITOR
 4:30 p.m.- 5:00 p.m. AI24 VAX LISP FOR ADVANCED USERS
 5:00 p.m.- 6:00 p.m. AI61 LISP QUESTION AND ANSWER SESSION
 5:00 p.m.- 6:00 p.m. AI18 NEURON DATA NEXPERT OBJECT

THURSDAY

9:00 a.m.-10:00 a.m. AI38 EXPERT SYSTEMS FOR NAIVE USERS
 9:00 a.m.-10:00 a.m. AI15 INTELICORP'S KEE & PC-HOST
 10:00 a.m.-10:45 a.m. AI01 AN EXPERT SYSTEM IN POWER PLANT CONSTRUCTION
 10:45 a.m.-11:30 a.m. AI37 EXPERT SYS TECHNOLOGY IN AUTOMATIC MACHINERY TESTING
 11:30 a.m.-12:30 p.m. AI64 CHARLES JORGENSEN ON SIMULATED NEURAL NETS

<lunch>

2:00 p.m.- 3:00 p.m. AI56 DEFINING AN EXPERT SYSTEM LANGUAGE
 3:00 p.m.- 4:00 p.m. AI48 CHARLES WEISBIN ON RECENT ROBOTICS RESEARCH

<Reception in Suite for Weisbin/ Jorgensen>

6:00 p.m.- 6:45 p.m. AI45 APPLICATIONS USING GURU
 6:00 p.m.- 7:00 p.m. AI17 VAXMATE LISP
 6:45 p.m.- 7:30 p.m. AI26 ADDING META-RULES TO OPS5--A PROPOSED EXTENSION
 7:30 p.m.- 8:30 p.m. AI20 OPS5 QUESTION AND ANSWER SESSION
 8:30 p.m.-10:00 p.m. AI19 THE GREAT AI TOOL DEBATE

FRIDAY

9:00 a.m.-10:00 a.m. AI02 AI IN THE PUBLIC DOMAIN
 10:45 a.m.-11:30 a.m. AI10 AI AND IMAGE PROCESSING
 11:30 a.m.-12:00 noon AI68 KNOWLEDGE ENGINEERING IN PART PHYS EXPRMNTS AT CERN

<lunch>

1:00 p.m.- 1:30 p.m. AI55 CARE AND FEEDING OF MATURE EXPERT SYSTEMS
 1:30 p.m.- 2:15 p.m. AI29 DISPATCHER: INTELLIGENT APPROACH TO FACTORY CONTROL
 2:15 p.m.- 3:00 p.m. AI05 ESCAD: AN EXPERT SYSTEM FOR CAD
 3:00 p.m.- 4:00 p.m. AI33 ARTIFICIAL INTELLIGENCE SIG WRAPUP SESSION

<Reception in Suite for die-hards>

*** ANNOUNCEMENT ***

People with AI experience are being sought to participate in an AI SIG "Masters List." Pleaser don't be fooled by the title--you need not be an AI guru to join up. The idea is to provide a forum in (THE (LINKED LIST)) patterned after the question and answer sessions at DECUS symposia. Newsletter readers may submit their questions, and I will pass them on to the Masters for answers. Questions and answers will be published in the newsletter in as timely a manner as possible.

If you would like to be a Master, please send me your name, address, telephone number and some idea of the types of questions you might answer (novice, LISP, AI tools, etc.). If you have a question, send it to me (with your name, address and telephone number) also. I'll find SOMEONE to answer it!

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*** ANNOUNCEMENT ***

LISP POINTERS

We're putting together a newsletter and we'd like you to come along.

Every other month, starting in March of 1987, Lisp Pointers will be bringing you articles, implementation summaries, opinion columns, and information on the latest action on the standardization front. And we need you -- to contribute to our departments, to read the results of our efforts, and to suggest ways we can provide more of the kinds of information you want to see.

Lisp Pointers is being funded by companies who care about the future of Lisp. The editorial content of the newsletter will not be influenced by these companies nor will the companies be responsible for the material contained within Lisp Pointers. Until such time as we affiliate with a more formal organization, subscriptions to Lisp Pointers will be free. Please spread the word among your friends, both real and electronic.

Our newsletter will be available through the mails. To join our mailing list, send your name and address to:

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Transcript of AI Novice Q&A Session - Spring 1986 DECUS Symposium

By Becky Wise

Introduction of panel by Cheryl Jalbert, AI SIG Chair.

Panelists are: Don Rosenthal, AI SIG Vice-Chair, Dr. David

Slater, AI SIG Executive Committee, Art Beane, DEC

counterpart, and Terry Shannon, AI SIG newsletter editor.

Question, Answers, and Discussion:

Q1: Mr. Ole Jenson of Mitel Corp -- "I'm just starting out in AI and expert systems, and I have a long list of questions. First of all, 'How do I go about selecting between S.1, Lisp, Prolog, KEE, OPS5, ART and the multitude of other tools that I've heard about so far this week?"

A1: C. Jalbert -- "I think you are doing one thing right; you are going to sessions and you are hearing about different tools. You can't make a selection without first listening and beginning to get some idea of what each tool does. This is the same kind of problem you run into whenever you enter any new area in computing. The rest of the argument might depend on exactly what you're trying to achieve. If you are in an exploratory phase, one of the less expensive products is good for exploration. If you have a specific project in mind, the project requirements will affect your decision."

R1: O. Jensen -- "The particular thing that I'm doing is, or trying to do, is develop an expert system for tuning VAXes. I know that there is at least one commercially available package, but we don't have the funds to buy the package. My management has requested that I try to do it myself so I can learn a little bit about what's available in expert systems and see if we can apply this technology to other problems."

A1:R1: C. Jalbert -- "For one thing, you will find a number of useful sessions tomorrow. For another thing, because of what you said about your starting point and the goals and so forth, I am going to turn the mike over to Don."

D. Rosenthal -- "Oh Boy! We have already got an argument going."

D. Slater -- "We are having an argument between three of us who are trying to decide which one of us should say its OPS5. Let me give you my reasons for saying it, and then somebody else might give you theirs."

"It's not Lisp because it's a clearly defined problem. The data structures you are going to need are not at the level of complexity, and you are not prototyping both your data and your reasoning methods. You are really going to be prototyping rules. So it fits into an expert system language."

"OPS5 is a fairly good general expert system language and has the power and capability to handle it and is also part of the VAX architecture, which means that it can interface well to the information it needs."

A. Beane -- "The reason I think you should be working with OPS5 is because OPS5 is inexpensive, and you said that the price was an issue. The other thing that I think is significant is of all the tools that are available, OPS5 has a self-paced instruction course available for it."

"There are also a number of books about OPS5 in the public domain. One of them is called, strangely enough, 'Programming Expert Systems in OPS5', and its published by Addison Wesley. So the ability to bootstrap yourself on OPS5 is much higher than it is in any of the other tools."

Q2: Ray Schwartz, Goodyear Tire and Rubber -- "Since we have no expertise in-house, or amongst our management, what should I use to educate our management as to what it takes in terms of time and money and experience to start-up and run an expert system?"

A2: A. Beane -- "DEC has some real good management seminar services from the Ed Services organization. Check with them; I know they have a brochure and there is some information on the seminars upstairs in the exhibit hall."

C2: R. Schwartz -- "Maybe I can clarify this. When they want me to do something dumb with the database, because I'm a database administrator, I quote James Martin at them. Is there anyone comparable in the AI or Expert Systems area?"

A2:C2: A. Beane -- "James Martin again."

C. Jalbert -- "Hang on, David will make a comment on that last question."

D. Slater -- "There is a relatively good general text on building expert systems and it's three authors, the only two I can remember right now are Waterman and Lenat, but you can get a lot of good ideas about what's practical and what's not practical in there and it has the same advantage as James Martin and this is that your management will never read it."

C. Jalbert -- "The other thought is that this does not help you right at the moment, but we have in the business meeting today formed a task force to identify what we can do to make some resources available at this juncture."

D. Rosenthal -- "The third author is Hayes-Roth and I think that's the important one as he is listed first."

D. Slater -- "You might also show your management the 'Artificial Intelligence Experience.' This is a good book for introducing management to AI."

D. Rosenthal -- "That is available upstairs."

D. Slater -- "This is available in the bookstore."

T. Shannon -- "The book is authored by Susan Scown and is published by Digital Press."

Q3: ????? -- "How do you begin to project the number of rules that you need to implement a specific expert system application?"

A3: D. Rosenthal -- "Number of rules is not a particularly useful measurement or criterion. You basically want to know, 'How much is this going to cost me in time and real money?' You can't think of rules the way you think of lines of code."

C3: ????? -- "A lot of people say that if you are above 500 rules you shouldn't be using a particular tool. So how do I know if I am at 500 rules or at 5 rules? I know what my particular task needs. For example, I know all the rules I work under when I do things manually, but that doesn't easily translate in my mind into a number of program steps in OPS5 that I can tabulate and say that it is going to add up to 600 and make it not worth doing in OPS5."

C3:A3: D. Rosenthal -- "A better way to think about it is in terms of functionality. How much you are going to have to build in? When you are tuning your system, do you on average come up with the right solution? Is it something that you can figure out in a few minutes or do you have a lot of studying; does the task take you a day or does it take several days?"

"Questions like that are reasonable things to think about. If the task typically takes you an hour or so, it may be appropriate for an expert system solution."

C3: (mumble)

C3:A3: D. Rosenthal -- "It's about three days? Then it might be hard to do as your first system. I would descope your problem as your first project. In other words, take on part of the system tuning task and try to capture your methods in a rule base. Something that you could typically do in an hour or so, let's say."

C3: ????? -- "The reason it takes three days boils down to the torrent of data you have to analyze. You know, examine Monitor data for about a month and try to determine how much of that information shows that something is out of whack. And then you have to look at image level accounting records accumulated over an extended period of time. How many users are doing what kind of faulting and so on."

And it's a question of looking at the data and separating the wheat from the chaff by identifying and discarding the useless garbage to wind up with 20 or 30 pieces of useful information."

C3:A3: -- D. Rosenthal -- "That implies that if you have something that does an efficient search through the data the solution will be relatively easy to arrive at. Rule based systems, particularly OPS5, have a very efficient search and pattern matching mechanism. So if the problem is taking a long time to solve because you have to sort through all this data by hand, it looks as if your rule base is going to be small, and it is going to spend a lot of its time doing the pattern matching. OPS5 will do this fairly efficiently, so maybe we are not talking about a three day task anymore."

C. Jalbert -- "I'd like to suggest that if your proposed problem involves an expert system with over 500 rules, it's probably not the right problem for your first AI application. I'd also like to invite comments on doing an initial system in OPS5 that is smaller and can be considered to be a prototype for a larger system that might follow. It is not necessarily a bad thing that you have to change languages after a certain point."

D. Slater -- Given these comments, I would like to change my recommendation on languages. You can put a lot of queueing theory in FORTRAN callable subroutines and pass this information to OPS5.

Q4: John Tutman, Harris Bank -- I've used OPS5 and Topsy to do hardware configuration and I noticed two different ways to program it and I want to get a feel for efficiencies. One way was requirements and a set of hardware that would satisfy those

requirements and I found that my rule statements were very much the same. It was like 'fill in the blanks' for different software packages or hardware."

"One attempt that I made was to put all those fill in the blanks in the database and then gave generic rules that would build themselves. The other way is to put all that information into separate rules, which would give you control of the special situations. The question is, 'Which way is more efficient in OPS5?'"

A4: D. Rosenthal -- "First we have to answer another question. I like the table driven approach. You don't lose control with this method and it takes less time. You don't have to write as many rules and testing shorter. It is also better for people who have to take over the project from you. In that sense it's just like programming in any other language."

"Efficiency? I don't want to give you a 'generic' answer. Let's talk to Mark Schaffer who is the OPS5 developer off-line and we will get the correct answer for you."

Q5: ????? -- "A lot of systems that I've seen and heard about ask a whole bunch of questions to get the fact base together or the information is variable. How do you make it automatic with 100's of bits of information so that I don't have to answer these questions?"

A5: D. Rosenthal -- "Same as any other programming language -- read a file. The RHS (right hand side) reads a file. The system I demo at DECUS is totally batch; there's no need to do anything interactively."

Q6: George Hall - E-Systems -- "What can you expect in terms of interactive response? Sometimes the response can be slow and the user complains."

A6: D. Rosenthal -- "That is pretty much application dependent. I've got some metrics from my projects that show that an expert takes a day to at a task and that the equivalent program takes 200 CPU seconds. We consider that acceptable."

A. Beane -- "There are two other solutions to that problem. If the computer is too small or overloaded, get a larger processor. Two, you can take the RSTS approach and be responsive to user input."

D. Rosenthal -- "Maybe you should talk to Dave Slater, our systems tuning expert."

D. Slater -- "Are you using gigantic working sets? If the WSQUOTA and WSEXTENT are set extremely high, an expert system will be doing nothing but running the swapper. For

example, I had a LISP system that took 30 minutes to execute. Once I returned my account, the same task took just 1 minute."

C. Jalbert -- "You won't always find a system manager that is that trusting."

Q7: Kent Simons, Bechtel Power Corp. -- "I'd like to share some information and see if we did things right. Six months ago we started a project and descope it. It was to check the quality of design for nuclear power plants. We have an extensive 3-D CAD system. We wanted to pull data from the CAD system and check it against expert knowledge of how it should be put together. We evaluated different avenues to go down. Should we write our own inference engine, use OPS5, and several shells? We decided to use the Software A&E KES shell."

"Something that hasn't been mentioned yet--KES doesn't have the bells and whistles that some other shells do. We used it and feel successful. We learned how to do knowledge engineering. The bottom line is that in six months we produced a satisfactory prototype that examines the 3-D CAD data and evaluates how well the design on that section went. Do you think that future work would be enhanced by our getting into OPS5 or another language? Or do you think that we are okay with the method we are using?"

A7: D. Rosenthal -- "You have learned a great deal. You should now look over the tools that you did not originally pick because you will be looking at them with different eyes. I don't know KES. I don't know what is missing. I consider OPS5 bare bones."

C7: K. Simons -- "KES is a shell. It comes with an inference engine, a define syntax for writing a knowledge base, and a minimal user interface for the inference engine. It takes the ASCII coded knowledge base and compiles it; the interface is keyed from the objects that you have in the rules. There are a few ways to extend the user interface. It is callable. We put it into a FORTRAN program. I sat in a session that evaluated four shells including S.1 and KEE. These seem more complex than KES, but this may be because I have worked with KES and haven't worked with the others yet."

C7A7: Don Rosenthal -- "I think you are right. The other shells are more syntactically rich, and therefore they are harder to understand at first. It sounds like KES has all things a rule based programming language has. It sounds like you made a good choice. Is there a limit to the rule base size, memory use?"

C7: K. Simons -- "No, not on the VAX. There's also a limited version that runs on IBM PC's."

A. Beane -- "I think you should attend the session on the newspaper expert system and ask that question there. They started with ART and after the prototype got large they needed more flexibility than ART had so they went on to the LISP environment, which ART needs to run, and they ended up with a 20% ART, 80% LISP system. I think this will answer your problem."

D. Slater -- "I've seen KES a lot, and used it a little bit, and my feeling is that it is too semantically poor to give full expressiveness for your data. You may be stuck with LISP. It is in a sense a last-choice language. You can do anything, but it is the hardest. You are going to need something richer than KES for data representation. KES is poorer than OPS5, PROLOG, etc."

Q8: Valaneeta (?), Ford Motor Co. -- "I'll describe a situation and then I'd like you to tell me if it is applicable to writing an expert system or not."

"We have an extensive system running on a cluster of VAXes. The system has been in existence for six years, all the original authors left, but it has to be maintained. There are three of us who have been working with the system for some time and have developed some expertise. But most of the people who maintain the system don't have our expertise."

"We also have a help desk for the people who have to answer user questions/problems. The question/problems range from trivial, no-scroll key hit by accident, etc, to the serious, there is an actual bug in the software. The problem is that we three experts who don't work on the system anymore are called back in to resolve these things. Resolution requires knowledge about the software, the physical application. My supervisor asked me if it were possible to have an expert system help out with this. I said sure because I wanted to work on it. Keep in mind that the system is still growing. The expert system would have to learn, answer questions, etc. Where do you start?"

A8: C. Jalbert -- "One of the nice things about expert systems is that they are suitable in environments where change is expected. Does anyone have a more detailed response to his question?"

D. Slater -- "Sounds like a fascinating research project. The state of the art in automatic program writing is such that unless you make a major breakthrough, you will not succeed."

C8: Valaneeta -- "The topic of program rewriting is not called for here. We want to come up with the cause of the problem. For example, bad data could have been fed into the program."

This would be clear to someone who had worked with the program for some time as a good guess. It may in fact be a bug, and so the expert system would leave it at that, flag the fact, and someone else would come in and fix the bug."

D. Slater -- "This is under research in the AI field. There have been small gains in this area but they are considered major successes. I think if you attacked this you would have a major success but accomplish very little."

D. Rosenthal -- "I want to disagree. You will learn a lot and have fun with this. If your aim is to find the line of code that caused the bug, this is not what you want to do. You could have a suggestion as to which sections to look at or a series of tests that could be run. You don't need an autonomous system, a debugging assistant you can certainly do. You want to automate yourself out of this job. I think you will have something useful when you are done."

????? -- "I hear two people who have seen two different problems because they have not had the same thing. I think you have said that you have a running system and you have various types of problems in the system, some of them generated by bad data, some of them generated by faulty hardware, and some of them generated by faulty code. This system is too complex; beyond the state of the art right now in AI, and I would discourage you from the effort because of the payback given by expert systems."

C. Jalbert -- "The code may be old enough to consider doing something fundamental about it."

????? -- "You may find that after you build an expert system that you have the data you need to rewrite the system. That allows you to get a new team for the new version. That is a management technique called "Tar and feathering", you get some new person to do the job and you leave and he gets to say awful things about you for six months."

A. Beane -- "I would discourage anyone from writing programs that learn. Learning is not well understood, and is a significant area of research. For example, you have to un-learn what you learned wrong and there are no good methods for making an autonomous system unlearn. That problem is called non-monotonic reasoning. If you want to learn about learning and learning systems, you should look at that topic. If you have an opportunity to solve a learning system, you have a system that is not solveable with the current technology."

Q9: ????? -- "Can you tell me about where I would use a frame or scenario description?"

A9: C. Jalbert -- "We have a session that addresses frame technology. I'll scan while Art talks."

A. Beane -- "Frame-based systems are presently used less than rule-based systems. When we make a choice between the two we look and see what takes precedence in the project. Frame based projects cause you to build an extremely large model of a complex system and maintain that model at a very accurate state."

"A rule based system is keyed on the question 'how to?' What do you do when a situation arises? How do you do this? These tend to be more procedure oriented. The problem here is that it is hard to make a generic choice between the two. There are people in the frame arena who say that a rule is a frame with two slots, the 'If' slot and the 'Then' slot. There are others who say that it doesn't matter because in working memory the data is in a frame representation anyway. So that most systems are mixed no matter what you do. When highly developed frame systems are available it will be easier. Right now if you can identify the problem with the keys you can make the choice."

C. Jalbert -- "See the 'Frame Technology' session."

George Humfeld, Naval Sea Systems Command -- "I've been to presentations of ART and they claim, I haven't worked with ART so I can't validate the claim, but they claim that ART has multiple integrated representations. There are times when you think in rules and frames and you need both."

C. Jalbert -- "Another topic of interest is Sally Townsend's talk."

D. Slater -- "Another comment. You are approaching something that is state of the art. Try it, it may work. Most topics are fun to theoreticians. Hammer away with the tools until you get something that works."

Q10: ????? -- "If you want to do analysis of large bodies of text, with a lot of contextual factors -- like the work that Schank at Yale has done, what sort of expert system packages are well suited to that kind of work?"

A10: D. Slater -- "Lisp. I'll be giving a talk about semantics in San Francisco."

C. Jalbert -- "We have a steering committee member from Schank's company and maybe we can persuade him to come to San Francisco. This is research that you are talking about; not something that would be used in a commercial enterprise."

A. Beane -- "What Terry wants is an expert editor for reviewing text. I think you are working in an area where the boundaries of expert systems lie. You can not point to a human expert who can extract the procedures."

Terry -- "I disagree because there are experts called editors and english teachers."

A. Beane -- "You can't point to one expert."

Terry -- "For a lot of it I think you can. Our application allows a student to go from a vague idea to a rough draft of an essay. It's all creative up to that point. What we want to do now is take a look at the draft and check it for coherence, completeness. We don't worry about grammar at this point."

C. Jalbert -- "I have some research for you. There is a package, now out-moded, on the DECUS tapes that did some small amount of this. We are now working with an english professor at Dennison University on this. You might want to talk to me about this and I can get you in touch with someone at the company."

D. Slater -- "Three books: Naomi Sagar, 'Natural Language', North-Holland has a book that is a collection of articles on natural language."

Terry -- "There is another one called 'Parsing Natural Language'."

D. Slater -- "Yes. Another author is Winograd. Those books give a good idea of the state of the art. Also Winograd and Winston have written. Winston has an article on Shakespeare's plays in CACM in the last five years. He went into these problems and said why Lisp is the only language that can do this."

David Frydenlund, Coast Guard R&D -- "National Technical Information Center (NTIC) has items on this. It is also called 'Deep Reasoning.' DARPA did a lot of research into this."

D. Slater -- "Research is ongoing at Rutgers and Stanford."

????? -- "Doesn't Writer's Workbench does this already?"

Terry Shannon -- "There was a review of this kind of software in a DEC-specific publication, but the package in question isn't available on VMS."

????? -- "I'd like to put a FOG index written in FORTRAN onto the SIG tapes."

C. Jalbert -- "Wonderful. Talk to Don."

Q11: Pauline Noakes, Cumular Systems, London (sp) -- "I work for a company that services banks. My question was, 'What is the best shell?'. Given your answer to the previous question on this I am discouraged. If we were going to spend 12,000 pounds sterling, the system has to work."

A11: D. Rosenthal -- "We were giving short answers here, but we would be happy to have a discussion later in the week with anyone."

A. Beane -- "In addition, you should talk to Peter Sell or Lori McDonald at DEC park in Redding. They will be happy to consult and recommend the best tool. They will be at the barbeque and they will be able to answer your questions directly."

C. Jalbert -- "We hope to have them in the suite."

Pam Vavra -- "Art promised to have a DEC representative sign-up sheet in the campground. Lori and Peter will sign up."

END OF MEETING

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BUSINESS APPLICATIONS

The Business Application SIG sponsors a new PSS entitled "Software Piracy". Software piracy and its prevention are the topics of a pre-symposium seminar for Fall 1987 symposium in Anaheim, CA.

The focus will be on the techniques employed by software firms to prevent illegal copying of software and the relative success/problems they have encountered. These techniques include software hooks, special hardware, and contractual obligations.

If you are interested in participating as a presenter in this PSS, contact:

Dan Esbensen
9990 Mesa Rim Road
Suite 220
San Diego, Ca 92121

(619) 455-7404

SIGNificant Business Applications in Nashville

The DECUS Nashville symposium promises to be of great interest to users, designers and managers of application systems for business. The DECUS Business Applications SIG is presenting a symposium experience comprised of numerous sessions covering such diverse topics as:

- o Manufacturing
- o Printing Technologies
- o PC's vs Terminals
- o Accounting
- o End-User Computing
- o PBX and Facilities Management
- o Spreadsheets
- o Managing a Multi-Vendor Environment
- o Management Concerns in Integrating VAX Applications
- o Videotex Business Solutions
- o Managing a Large Software Development Project

and many MORE.

The Business Applications SIG is committed to providing sessions covering all areas of business applications from A-To-Z including A-To-Z, Digital's system integration products.

In addition, please note that the Business Application SIG will be presenting two forums of particular interest:

- o Digital's Software Licensing Policies
- o Digital's Software Distribution Policies

Please watch the Update.Daily newspaper for the location of our campground and suite. In these areas throughout the week we will be establishing working groups on the following areas:

- o Multi-Vendor Environments
- o Transaction Processing
- o Distribution
- o Government
- o Aerospace
- o Manufacturing
- o Banking and Insurance

Also, we will be sponsoring the Business Applications Clinic and Get-Together. This will be an excellent opportunity to meet fellow users and DEC developers, in order to solve problems and share experiences.

Please join us Monday morning for our roadmap session. We will highlight the week's schedule as well as offer survival techniques for Symposium.

Nashville promises to be an excellent opportunity to do some SIGNificant business. See you there!.

BA003 - Commercial Applications for DECTalk

Tuesday, April 28 12:00-1:00pm Commodore room

DECTalk Users discuss their applications; covering such areas as order entry/order status systems, financial services, and field services dispatching.

BA005 - Spreadsheet to Corporate Database: A Case Study

Friday, May 1 1:00-1:30pm Belmont room

This session presents a case study on uploading spreadsheet data to a database. The emphasis is placed on protection and privacy, accuracy, and accountability and control issues. A system was developed that allowed managers to easily create custom budget spreadsheets for their cost centers.

BA007 - Business Graphics From a Non-graphics Terminal

Tuesday, April 28 2:30-3:00pm Commodore room

This session presents examples of programs which can be used for creating and viewing simple graphics on a VT100 (or compatible).

BA009 - Business Applications Roadmap

Monday, April 27 9:00-9:30am Commodore Room

New and previous attendees should attend this session to learn the times and locations of sessions which are interesting to Business Application users, developers and managers.

BA011 - Business Applications Business Meeting

Tuesday, April 28 10:00-10:30am Commodore room

As a member of DECUS, you are an important, integral part of its success. By attending this session, you have the opportunity to participate in the planning process for the next symposium as well as review and critique the current symposium activities.

BA012 - A-to-Z State of the Product

Monday April 27 9:30-10:00am Commodore room

This session describes the latest developments in the A-to-Z family of products; giving particular attention to the latest releases of product and particular product announcements that are being made at DECUS.

BA013 - Management Concerns in Integrating VAX Applications

Monday, April 27 1:00-2:00pm Commodore room

This session provides an overview of how the information flow in large organizations can be structured. The discussion centers on:

- . Techniques for improved data management on PC's through VAXclusters
- . Use of intelligent terminals
- . Information flow in a multi-vendor environment
- . Integration of office and data processing

BA014 - Creating Videotex Business Solutions

Tuesday, April 28 3:00-4:00pm Commodore room

This session covers a variety of information distribution problems in areas of -- office sales and marketing, management information systems, purchasing, personnel, engineering, and manufacturing. The session presents examples of how VAX VTX and VAX VALU can create solutions to common distribution problems in these environments.

BA015 - Application Development Clinic using 4GL Tools

Thursday, April 30 3:30-5:00pm Adams room

This session is devoted to developing a personnel application from scratch using the Database Manager and Application Generator in A-to-Z. Design will include screens, reports, and ad hoc reporting.

A MicroVAX II will be used in this session and attendees are invited to participate.

BA017 - Benefits of An Integrated System

Tuesday, April 28 9:00-10:00am Adams room

This session introduces the attendee to Digital's view of integrated software. The A-to-Z product is discussed in detail with emphasis on how A-to-Z has been used in business and scientific environments for integration.

BA018 - VMS Software Productivity Tools Workshop

Tuesday, April 28 12:00-2:00pm Volunteer Room

This workshop is divided into three segments. The first is a general overview of the VAX/VMS programmer productivity tools including; CMS, MMS, LSE, DTM, SCAN, SHELL and Cobol Generator. The second segment is a discussion on ways (metrics) to measure programmer productivity lines of code per hour, etc.). In the third segment attendees are invited to participate in smaller group discussions geared towards individual solution.

BA019 - Satisfying Business Applications using 4GL Languages

Tuesday, April 28 4:00-5:00pm J.C. Handy room

This workshop consists of a series of user presentations that address business problems in implementing applications including; 4GL selection criteria, implementation, and overall results. Questions will be entertained by a panel.

BA021 - Virtual Applications Engines - Added Value to Multi-user Systems

Friday, May 1 9:00-10:00am Belmont room

This session discusses current virtual application engine approaches, technologies, and the decision criteria involved in making the decision between "porting the application" and "porting the environment".

BA023 - Managing Product Engineering Datalow W/ Engineering Data Control System

Monday, April 27 6:00-7:00pm Commodore room

This session is oriented to engineering managers faced with the problem of managing and sharing engineering data throughout their company.

BA024 - Addressing the True Software Needs of the Small-Medium Manufacturer

Wednesday, April 29 12:00-1:00pm Volunteer room

This session addresses the typical problems which are found in the smaller manufacturing environment, and presents several models to be used as guides in deciding which business application software is appropriate and the order in which it should be installed.

BA025 - Should A Manufacturer Jump on the MRP and JIT Bandwagon?

Wednesday, April 29 11:00-12:00 noon Volunteer room

This session discusses some of the problems in implementing MRP and JIT successfully. Topics include:

- . Management commitment
- . Personnel training
- . Typical operational changes on the shop floor
- . Common pitfalls to avoid
- . Applicability of MRP and JIT to different manufacturing environments

This session is helpful to both software resellers and end users considering computerization of their manufacturing operations.

BA026 - Implementing Advanced Manufacturing Systems in Businesses With Complex Product Engineering Requirements

Wednesday, April 29 3:00-4:00pm Volunteer room

This session provides insight into the organizational, software, procedural, hardware, scheduling, and personnel requirements necessary to implement advanced manufacturing systems in companies with complex product engineering requirements.

BA027 - Digital's Small Business Accounting Product Strategy

Monday, April 27 3:00-4:00pm Commodore room

This session concentrates on major business account products which are geared toward to small businesses. Includes an overview of DECTap, Digital Accounting System, Digital Construction System, and third-party products available through Digital.

BA029 - Update on the Digital Accounting System

Monday, April 27 2:00-3:00 Commodore Room

Update on new features and services for the product.

BA031 - Using the SMG Facility on VAX/VMS

Tuesday, April 28 10:30-11:30am Commodore room

This is a tutorial session on how to write a program in BASIC using the SMG routines. Session will cover:

- . How to write terminal independent programs
- . A generalized menu program
- . Some hints and kinks

BA032 - Future Trends in Printing

Monday, April 27 11:00-12:00pm Volunteer room

The paperless office has not yet arrived, but the balance of applications generating paper, from data processing to office automation is changing. This session discusses some of the technical and economic pressures on the printing portion of businesses over the next five years, and the possible solutions.

BA033 - Overview of Digital's Business Application Packages

Monday, April 27 12:00-1:00pm Commodore room

This session presents comprehensive computing solutions for Sales and Marketing, Finance and Business Management, Personnel, and corporate telecommunications departments.

BA034 - Selecting DBMS's for Solving Business Problems

Friday, May 1 12:00-1:00pm Belmont room

This session addresses the selection of an appropriate database for business applications. The question is approached from the viewpoint of the manager and considers the relative merits of Codasyl-based and relational DBMS for various types of business applications.

BA035 - An MIS Managers's Guide to Performance Monitoring & Capacity Planning Tools for Systems, VAXclusters, and Networks

Tuesday, April 28 2:00-4:00pm Volunteer room

This workshop covers performance monitoring and capacity planning on VAX systems and DECnet. The presentation describes the types of performance problems that are often encountered and the impact of these problems on productivity.

The second portion of the presentation addresses the need for long-term hardware resource planning by the MIS manager and the capacity tools available for use in the process. Digital specialists are available to talk with the attendees and answer specific questions.

BA036 - Managing a Large Software Development Project

Monday, April 27 4:00-5:00pm Commodore room

The session addresses VAX/VMS tools which can be used for project management, with particular emphasis on tools for estimating and tracking project time and costs. The session also looks at project implementation issues and the ongoing monitoring of application performance.

BA037 - End-User Computing - Issues in Planning & Implementation

Tuesday, April 28 4:00-5:00 Volunteer room

This session assists the manager in planning an end-user computing environment which meets critical business demands. It also stresses the selection, distribution channels, and support services for products which are oriented toward meeting user needs for business success.

BA038 - Survival With Manufacturing Acronyms

Wednesday, April 29 9:00-10:00am Volunteer room

You have just been given the task of finding, recommending and installing a manufacturing control system. The first thing you notice is acronyms: BIO, BTS, MRP, JIT, TRQ, IM, SFC, and more. What do they all mean? The session breaks them all down to their simplest definitions and provides a good working knowledge of manufacturing terms.

BA039 - The Shop Floor - Where Reality is

Wednesday, April 29 2:00-3:00pm Volunteer room

The heart of any manufacturing system is its ability to interact with the shop floor. This session looks closely at the computing requirements of the shop floor.

BA040 - Management Commitment - Recipe for Success in MFG Systems

Wednesday, April 29 1:00-2:00pm Volunteer room

What are the chances of implementing a successful manufacturing planning control system? Management commitment is one of the key ingredients for successful implementation. This session explains how to gain that commitment and use it effectively within the organization.

BA041 - Computer Integrated Manufacturing - Everything You Wanted To Know But Were Afraid To Ask

Wednesday, April 29 10:00-11:00am Volunteer room

CIM is the topic on most manufacturers' minds. What does it mean? How does it work? What are its elements? This session answers these and other questions related to CIM.

BA048 - Audio Response with IBM Host Applications Using DECTalk

Tuesday, April 28 2:00-2:30pm Commodore room

BA049 - Improving Application System Performance Using Subprocessors

Friday, May 1 11:00-12:00 Belmont room

This session will provide a detailed method for creating a subprocess environment and communication mechanism which can be used to execute both interactive and non-interactive tasks.

BA051 - Prototyping as a Methodology for Rapid Development

Thursday, April 30 5:00-6:00pm Belmont room

This session will discuss the following points:

- . The role of 4GL's
- . Prototyping strategies
- . The impact on the Development cycle
- . Managing the developer/user relationship

The A-to-Z Application Generator will be used to demonstrate the relationship between 4GL's and prototyping.

BA052 - The Value of a Natural Language System to Business Professionals

Tuesday, April 28 11:30-12:00noon Commodore room

The goal of a natural language system is to go beyond simply easing the user of a database language to providing an environment in which the business professional can effectively solve the business problems at hand. By analyzing these issues in some detail, it will become evident why business professionals have not been able to effectively make use of the "easy-to-user" fourth generation tools and the critical role that the natural language technology can play in the process.

BA061 - Forum on DEC Software Distribution Policies & Practices

Wednesday, April 29 5:00-6:00pm Jefferson room

In recognition of the wide interest shown at the San Francisco Symposium in Digital software distribution policies and practices, the Business Applications SIG Steering Committee has invited Digital to hold a forum on its present and proposed software distribution policies where the policies and practices will be explained and discussed by Digital representatives. Users questions will be answered.

BA064 - End User Computing - Meeting the Demand

Tuesday, April 28 5:00-6:00pm Volunteer room

This session will propose a technical architecture for end user computing. Guidelines for selecting from a range of products and tools to meet the need for timely delivery of end user applications will be discussed.

BA065 - Software for Managing Multi-Vendor Environments

Monday, April 27 5:00-6:00pm Commodore room

This session will present an overview of software packages available for managing and controlling multi-vendor hardware environments and providing manageable interconnections and communications in such environments.

BA067 - Laser Printer Applications for Business

Tuesday, April 28 10:00-11:00am Volunteer room

This session discusses different applications where laser printers can be used in the business environment.

BA068 - A Generic User Interface

Friday, May 1 10:00-11:00am Belmont room

This session presents the method and programs which allow users to have a menu/screen oriented interface to the VAX. The User Interface (UIF) has the following features:

- . Tree-structured menu
- . Table driven
- . Transaction oriented
- . runs interactive jobs
- . Prompts for parameters with validation
- . submits batch jobs
- . built-in security

BA069 - Asynchronous Communications -- Methods and Applications

Monday, April 27 10:30-11:15am Commodore room

This presentation discusses situations in which asynchronous communications appropriate, describes current asynchronous communications products, services, methods, and provides guidance in making the "right" decisions among the alternative approaches.

BA070 - PBX/Facilities Management-An Application for Communications Control

Tuesday, April 28 5:00-6:00pm Judges C room

A general overview of PBX/Facilities Management markets, and Digital's response to the needs and requirements of the telecommunications manager. PBX/Facilities Management (P/FM) product will be overviewed. P/FM is a VAX/VMS software application package which bridges the gap between computer and PBX application requirements. P/FM allows a VAX to function as an attached processor to PBXs and other telecommunications switches.

BA071 - Matching Printing Technologies to Business Applications

Tuesday, April 28 9:00-10:00am Volunteer room

The session is designed to review available printing technologies and their strengths in various business applications. It will cover the ranges of technologies from serial to page printers, including color printing.

BA073 - PCs Vs Terminals -- Making the Decision

Monday, April 27 11:15-12:00noon Commodore room

This presentation addresses how to recognize the symptoms, how to define the nature of the problems faced, and how to reach appropriate solutions to the problems of PCs vs terminals.

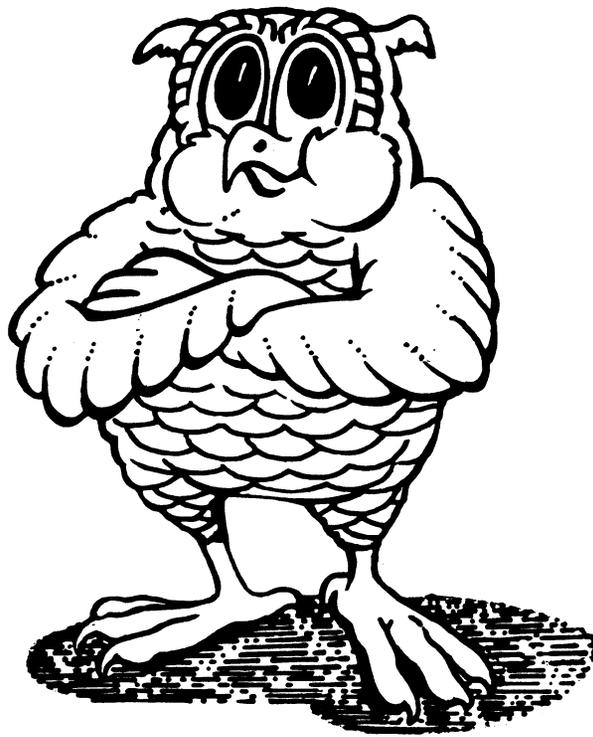
BA076 - DECTalk Application Development Guidelines

Tuesday, April 28 1:00-2:00pm Commodore room

This session presents guidelines for designing effective interactive telephone applications using DECTalk speech synthesizer. It covers the flow of application development from the architecture of the application to the final tuning of the application text. The following issues will be addressed:

- . Initialization of the DECTalk
- . Loading the user dictionary
- . Security/user verification
- . Use of telephone management capabilities
- . Creation of effective voice menus
- . Entering keypad commands

INFO-the DMS SIG NEWSLETTER



JOIN THE WISE

DECUS REPRESENTATIVE ATTENDS ANSI FIMS MEETING

by Paul W. Plum, Jr.
FORMS Working Group Chair
LUKENS STEEL COMPANY
ARC Bldg, A100
Coatesville, Pa 17527

In December, a new standards committee had its first official meeting. The committee is sponsored by CODASYL and accredited by ANSI to define a Form Interface Management System (FIMS) Standard. This comprises an Independent Form Description Language (IFDL) and a generic interface for programming to the IFDL. The FIMS is to fill the requirements of the data processing community for the presentation of data upon interactive I/O devices.

I am the DECUS representative to this committee. This means that I am representing you. Over the next few months I will describe the development as it exists now as well as the how it is progressing towards a full ANSI standard. Currently there is a document which will be the starting point of the FIMS committee. This starting point is the proposed CODASYL Screen Management System Journal of Development. Hopefully next issue I can tell you where you can get a copy if you are interested.

The first meeting of the FIMS committee was held to set up some of the ground work on how the committee will operate. The second meeting, which was in February, started to work on turning the JOD into a standard.

There will be a session at the spring DECUS symposium where I will go over the basic features of the FIMS and hopefully get a discussion started on the standard and its implications. This meeting will also be a place to discuss any problems/benefits you may see with DEC's strategy as it pertains to forms product offerings.

Paul.

DMS SIG ANNOUNCES PRE-SYMPOSIUM SEMINARS FOR SPRING 1987

The DMS SIG is pleased to offer the following Pre-symposium Seminars:

1. NETWORK DATABASE DESIGN USING CODASYL COMPLIANT NETWORK DATABASES

This seminar will describe the process of determining the correct data structure for an example application. The course will be divided into two sections: Logical Design and Physical Design. The Logical Design section will discuss the process of Normalization, and the use of various models (e.g. the entity-relationship model). The Physical Design section will discuss the ramifications of various design decisions using CODASYL Compliant data definition language, and data manipulation language.

Credentials:

Mary Anne Wentink is an Analyst in the STAFS Project Office. She has extensive DBMS experience as a designer, and implementor of many network data base applications. Presently, she is responsible for supervising the development of the Standard Automated Financial System, one of the most complex, and large database applications ever undertaken.

J. G. Russell Poisson is the Manager of User Support for Seed Software Corporation, a vendor of a CODASYL Compliant network data base. Mr. Poisson serves as Seed's principal consultant in the area of data base design, and teaches courses in data base administration, and data base design.

Prerequisites of Attendees:

Users should have a basic knowledge of the Network Data Model, and CODASYL Compliant Data Definition Language, and Data Manipulation Language.

2. DESIGNING RDB/VMS DATABASES FOR SANITY AND PERFORMANCE

As a relational database, Rdb/VMS is an extremely flexible and powerful tool. It allows developers to quickly implement and modify database applications. However, to take full advantage of Rdb's features, and to get the best performance possible, it is necessary to pay careful attention to the database design.

Entity-relationship modeling and normalization techniques are tools for designing databases. By following these techniques, it is possible to design and construct an elegant database.

However, in some instances, a fully normalized database will not provide for the performance needed for a particular application. It may be prudent to trade normalization and elegance for better performance.

Rdb provides a number of features to define and enforce data integrity and consistency. These features can greatly reduce the amount programming needed in an application since they are implemented and enforced in the database.

Indices provide for performance improvements for some queries. The performance of other queries will be hampered by indices.

This seminar will present design techniques that are useful in the relational database environment and the tradeoffs between theoretically correct design, safety and consistency of the data (and therefore the sanity of the database personnel), and performance of the database application.

Topics to be covered include:

- o Introduction to Relational Databases and Rdb/VMS
- o Entity-Relationship Modeling
- o Normalization
- o Transaction Design
- o Data Integrity and Consistency
- o Indices
- o Concurrency
- o Locking and Lock Conflicts

Credentials:

Keith W. Hare is a Senior Consultant with JCC, specializing in relational databases and database design. He has a Masters Degree in Computer and Information Science from the Ohio State University. He is the DECUS Symposium Committee representative for the Data Management Systems SIG and is a member of ACM.

Dr. Jeffrey S. Jalbert is the founder and president of JCC, a consulting firm in training, application design, and system management. His responsibilities have included managing software design projects, computer systems and academic computer centers. His special interests include database theory and practice, application design, and system planning.

Prerequisites of Attendees:

Application developers, database managers, analysts, and developers familiar with the problems of designing and managing data management applications, who have a desire to learn about relational database design should attend this course.

Low-level interface to Digital's relational products. The DSRI allows Digital, non-Digital software developers, and end-users to develop sophisticated end-user level software layered on top of Digital's relational database engine Rdb/VMS, on top of Digital's access path to IBM databases (VIDA), and on top of Digital's other DSRI implementations.

This seminar will present the DSRI and examples of how it can be used. It is geared towards programmers and application designers who wish to use the DSRI to create their own user interface to the DSRI products. If you are using Rdb for any purpose whatsoever, you should attend this presentation to find out how much more you can make your system using DSRI.

Credentials:

Jim Melton is the current DSRI Architect for Digital. He has been in the database business for 15 years, and has worked for Digital for three years. Before becoming the DSRI architect, he was the project leader for Rdb/Eln. He presently represents Digital on the X3H2 ANSI SQL Standards Committee.

Prerequisites of Attendees:

Designers, developers, and programmers who wish to use the DSRI to create their own interface to the DSRI. The attendee is expected to be familiar with at least one of Digital's DSRI products, its data manipulation language and its data definition language, and should have experience with programming in large applications.

Data Access Methods in
Data Base Management Systems
and
4th Generation Languages

by J. G. Russell Poisson
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INTRODUCTION

The proliferation of data base management products and so-called Fourth Generation Languages have caused people to expect many things. The MIS manager expects increased productivity from the non-procedural language and increased efficiency of data storage and access. The systems' developers expect an enriched tool set for rapid development of both prototypes and production systems. End users expect an easy to use, rememberable interface to facilitate maintenance and ad-hoc data retrieval. Taking into account these diverse expectations, what is the role of data access methods in a DBMS or 4GL? This article answers this question.

Data access methods have little impact on the "features" of a DBMS or 4GL and are independent of the data model implemented by the DBMS product regardless of whether the data model is hierarchical, inverted lists, network, relational, or entity-relationship. However, data access methods have considerable impact on performance, measured in response time and/or hardware required to support your system requirements.

A Quick Look at File Organization and Terminology

Data base disk files are made up of fixed or variable length physical records. When these physical records contain more than one logical record (also called an entity or row), the physical record is then usually referred to as a page or a bucket.

Disk I/O operations on the VAX that return at least 3 blocks (512 bytes) of fixed length data have been shown to provide optimum I/O efficiency.

Data can be written to a disk file in sequential order, sorted sequential order, or randomly distributed within a file.

How do we define a data access method? For purposes of our discussion, there are 6 data access methods:

1. Physical key access
2. Indexed key access
3. Hashed key access
4. Linked lists
5. B-tree lists
6. Clustering

Each of these data access methods is discussed in this article. Attention is paid to the comparative strengths and weaknesses of these six methods.

PHYSICAL KEY ACCESS

A physical key is the unique physical address or location of a logical record in the data base. It is the fastest way to locate a record in a data base. Physical keys are used in many ways:

1. They can be used as a pointer, stored elsewhere in the data base to support data structures such as linked lists or pointer arrays. Pointers are maintained internally by most DBMS products to support their logical data models.
2. They can serve as a way of returning to a database element already retrieved.
3. Special uses of physical keys can be made in applications which are particularly performance sensitive. In these cases, the data base programmer can have absolute control over the physical data base design.

WHAT PHYSICAL KEYS DON'T DO FOR YOU

1. Physical keys by themselves do not provide access to data based on data contents. That is, there is generally no relationship between data in a record and its physical key.
2. Physical key values for any record cannot be consistent across a restructure or reorganization.

INDEX KEY ACCESS

An index is a disk file containing pairs made up of a key data field extracted from data base records and the physical access key for that record. Searching this smaller file for matches with the key field is much faster than searching the original data base file for a record with a matching field value. B-tree (balanced binary tree) indexes are the current state-of-the-art in data base index technology. Bit mapping and other redundancy leveraging techniques are often used to speed retrieval times.

INDEXED KEY ACCESS PROVIDES MANY ADVANTAGES:

1. Index keys provide an efficient means of accessing data records based on field value that works well with sequential data files.
2. Index retrieval performance is independent of redundancy in key values.
3. Indexes can be mapped against each other to represent inter-record relationships.
4. Indexes provide a good means of retrieving information based on a range of possible keys values.

WHAT INDEX KEYS DON'T DO FOR YOU

1. Index performance is not independent of data record volume. Indexed retrievals, as an access method, are heavy users of I/O, memory, and CPU.
2. Indexes require disk I/Os for each record retrieved. The primary method to improve performance is through heavy buffering of index files.
3. Each index adds an open file to the DBMS system load and requires additional disk storage for the index itself.

HASHED KEY ACCESS

A hashed direct access file is one where the location of a record to be stored (its future physical key) is determined by applying a randomizing mathematical function to the value of the primary key keyed field. In order to retrieve a record based on its key value, applying the same function returns the physical data base key for that record. The storage of a record requires an inexpensive mathematical CPU operation and usually one read and one write. A retrieval requires only the mathematical operation and usually just one read.

STRENGTHS AND USES OF HASHED KEY ACCESS

1. Hashed keys provide the most efficient means of accessing data records based on a match of a unique field value.
2. Hashed key access retrieval performance is independent of data base record volume.

3. Randomized hashed placement of records provides a solid basis for clustering related records without excessive overflow.
4. Tuning of hashing algorithms can accommodate almost any profile of key.

WHAT HASHED KEYS DON'T DO FOR YOU

1. Hashing performance is not independent of data key redundancy. Duplicate key values can result in performance-robbingpage overflow.
2. Unless hashing tables are used, there can only be one hash key per data base record.
3. Hashed access provides little support in searching for records that match ranges of possible key values.
4. Unless hashing tables are used, hashing cannot be used with sequential files.

LINKED LISTS

Linked lists provide a means of linking logically related records without having to map two indexes together (join). Linked lists represent a one-to-many relationship where the parent record contains a pointer (the physical key) to the first child record on the list. Each child record contains a pointer to the next child in the list. The last child points back to the parent record. Optionally, each child record can contain pointers to both the previous child record in the list and to the parent record.

STRENGTHS AND USES OF LINKED LISTS

1. Linked lists provide the most physically efficient means of representing inter-record relationships between records that are not physically contiguous.
2. Two linked lists with a common child provide the most physically efficient means of representing a man-to-many relationship.
3. Two linked lists with both a common parent record type and a common child record type provide the most physically efficient means of representing a recursive relationship such as in Bill Of Materials Processing (BOMP).

WHAT LINKED LISTS DON'T DO FOR YOU

1. Since the pointers are embedded in data records, linked lists are difficult to add to an existing data structure.
2. Large sorted relationships are expensive to maintain as linked lists of non-contiguous records.

B-TREE LISTS

B-tree lists provide a means of linking logically related records using small list-specific indexes rather than linked lists. The parent record contains or is linked to the index of the child records in the list. Each child record contains a pointer to the parent record.

SPECIFIC STRENGTHS AND USES OF B-TREE LISTS

1. Large sorted relationships are inexpensive to maintain as B-tree lists of non-contiguous records.
2. B-tree structures are easily updated, enable location of information with moderately few disk accesses, and use available disk storage effectively.

WHAT B-TREE LISTS DON'T DO FOR YOU

1. The maintenance of any complex search trees can be time-consuming.
2. Unless the growth pattern of the B-tree list can be predicted, storing the tree on disk to minimize the disk access and utilize disk storage efficiently is difficult.

RECORD CLUSTERING

Record clustering is a technique that involves the storage of a list in physically contiguous or logically contiguous pages in the data base file. In a standard clustering arrangement, all records of a linked list are stored at the same location as the owner of the list. In a cross-file clustered arrangement, the members of the list are contiguous to each other but stored in a separate file from the owner.

SPECIFIC STRENGTHS AND USES OF RECORD CLUSTERS

1. Clustering results in optimized retrieval times for records which are regularly accessed together. If an owner record

(of a list) is retrieved, all members of the list are also retrieved, without additional IO.

2. Record clustering allows for the distributed location of record types which do not contain unique keys in a hashed random file.

WHAT CLUSTERING DOESN'T DO FOR YOU

1. In systems that don't support cross-file clustering, clusters of large records or clusters of unpredictable length or size can cause a considerable amount of page overflows. Page overflows mean an increase in IO and a decrease in performance.

CONCLUSION

Each and every data base intensive application goes through a phase where the data base itself is logically defined (using normalization or some other technique) and then physically defined (if possible). Once the logical design is completed, system performance requirements must be examined carefully to determine if the DBMS product provides the physical access methods required to ensure the success of the application. Can multiple access methods be used with a single record type? What tuning information is available in order to optimize the available access paths used in my expected transactions? What tools are available to add or change data structures on existing systems? What kinds of changes can or should be done "on the fly"? What kinds of changes can or should be able to be done without major programming efforts? If performance is an issue in your application, a careful study of your system performance requirements with a view to the available data access methods will greatly increase your chances of a favorable outcome.

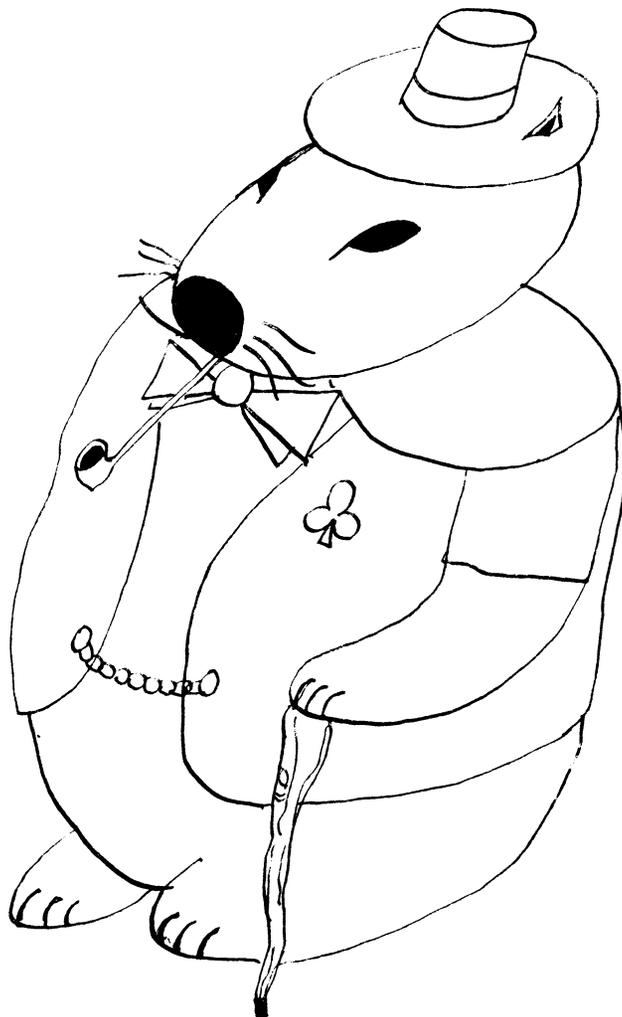
The Wombat

EXAMINER and 4GL Dispatch

"Increases the Circulation of Anyone in America"

Volume 8

Number 7



DTR

Contributions

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

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

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Chairman's Corner

Joe H. Gallagher, 4GL Solutions, Overland Park, Kansas

It is about seven weeks until the 1987 Spring Symposium in Nashville. There is an opportunity for you to participate in the activities at the symposium. The DTR/4GL SIG is seeking volunteers to chair sessions and to act as host/hostess in the DTR/4GL suite.

A session chair makes sure that the session starts and stop on time, introduces the speaker or speakers, assists the speaker with the lights and audio-visuals, controls the question and answer period at the end so that questioners are identified for the recording and all get a fair change to ask questions, and makes sure that the audience observes the fire code by keeping them from blocking the exits. This sounds like a lot, but it is an easy thing to do if you were already planning to go to the presentation anyway. There is high visibility for you and the company you represent, and there is no significant preparation involved.

A suite host/hostess has an even easier job to "baby sit" the suite for an hour. Their main function is to be responsible for seeing that literature, equipment, and other things in the suite don't grow legs and walk away. They will also help direct attendees to the experienced users and Digital representatives in the suite to get their questions answered or to an easy chair and a cool drink between sessions.

In the past those who have performed volunteer service to the SIG have received a shirt. You can not buy a DTR/4GL shirt with money; you can only earn it with service to the SIG by presenting a session, chairing a session, or hosting the suite or campground. In Nashville as in San Francisco, the DTR/4GL SIG shirt (like the newsletter and everything else we try to do) will be a quality item. Here is your chance to get one!

At the back of the newsletter in the Questionnaire Section, is a form (DTR/4GL Volunteer) which you should fill out and send to Susan Krentz, the Assistant Volunteer Coordinator. Susan's address is on the back of the form and her phone number is 703-620-0990. Indicate your preference as to which session you would like to chair and/or which hour you would like to host the suite. Please indicate your preference with a "1" for first choice, "2" for second choice, etc. Please give up to five choices. Volunteer jobs will be assigned by the date of the post mark on your request sent to Susan.

All those who volunteer to host the suite or chair a session should plan to meet with the volunteer coordinators in the DTR/4GL Suite in the hotel to get final instruction and pick up their assignment at 5:30pm on Sunday, April 26. The location of the DTR/4GL Suite will be posted at registration or in the hotel lobby.

Be sure to give your correct formal name, your phone number, and your DECUS membership number. If you would like a "thank you" letter sent to your boss, please give your boss' exact name, title, and address. After the symposium, a letter will be sent (if you indicate that you want one) to your boss thanking him or her for your participation in DECUS.

You'll get more out of a DECUS Symposium if you participate fully. Volunteer and be a part of the DTR/4GL SIG. See you in Nashville.

VAX Datatrieve's Interface Into Relational Databases: How Does It Work?

Donna Brown, Digital Equipment Corp., Nashua, NH

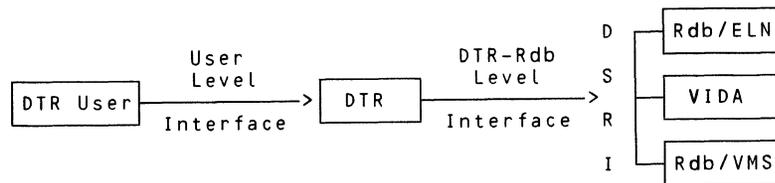
1.0 Introduction

This paper discusses two aspects of the DATATRIEVE/RDB interface. The first aspect is how you as a user can access Rdb through DATATRIEVE. The second is DATATRIEVE's interface with Rdb from an Rdb perspective. If you currently use DATATRIEVE to access RMS or DBMS data, section 2 will introduce you to the new commands you will need to access Rdb data through DATATRIEVE.

If you currently use Rdb, you may want to use DATATRIEVE as a convenient means of making ad-hoc queries, updates, and reports. DATATRIEVE allows you to easily combine information from Rdb, RMS and DBMS sources. DATATRIEVE can also be used to transfer data between different types of databases. Section 3 will describe DATATRIEVE's interface with Rdb.

Throughout this paper, unless otherwise stated, Rdb will be used to denote any of the VMS family of relational products: Rdb/VMS, Rdb/ELN and VIDA. For the most part, it is transparent which type of relational database is being accessed. Exceptions will be noted.

The diagram below depicts a DATATRIEVE user accessing Rdb data through the Digital Standard Relational Interface, DSRI.



2.0 Accessing Rdb Through Datatrieve

This section discusses how you can access Rdb data through DATATRIEVE. It includes:

- definition of the Rdb database
- definitions, commands and statements used to access Rdb data within DATATRIEVE

- segmented string handling
- transaction concepts

2.1 Data Definition

You cannot define Rdb data through DATATRIEVE. Rdb data is defined through an Rdb utility or program such as RDO or ERDL. VIDA data definition is done on the IBM system. Therefore, the following discussion on data definition does not apply to VIDA.

When you define an Rdb database you specify the database, the relations, fields, indexes, and constraints.

There are some DATATRIEVE specific clauses you might want to consider using when defining an Rdb/VMS or Rdb/ELN database to be accessed through DATATRIEVE.

- DEFAULT_VALUE FOR DTR
- EDIT_STRING FOR DTR
- QUERY_HEADER FOR DTR
- QUERY_NAME FOR DTR

These clauses correspond to the DATATRIEVE record definition clauses DEFAULT_VALUE, EDIT_STRING, QUERY_HEADER, and QUERY_NAME.

There are a number of differences between DATATRIEVE and Rdb. Unlike DATATRIEVE records, Rdb records do not have the concept of group fields. DATATRIEVE expects the first field in a record to be a group field. Since this is not the case for Rdb records, DATATRIEVE creates a top level group field using the name of the Rdb relation as the group field's name. You cannot use this group field for purposes such as control breaks in the Report Writer, because it duplicates the name of the Rdb relation.

Data type support differs between DATATRIEVE and Rdb. DATATRIEVE supports F, D, G, and H Floating while Rdb supports only F and G. Rdb supports datatypes of segmented string and varying text. DATATRIEVE's support of these datatypes is for Rdb sources only.

Rdb/VMS has a DEFINE CONSTRAINT clause. Rdb constraints are typically used to enforce dependencies between two fields within an Rdb database. When defining a database, you can specify when constraint checking is to be performed. We recommend that you specify that constraint checking be done when you store or modify (VERB_TIME), rather than when you commit (COMMIT_TIME). COMMIT_TIME constraint checks may produce validation errors later than the interactive user is accustomed to seeing them.

2.2 Datatrieve Definition

The preceding section discussed how Rdb data is defined. This section describes the DATATRIEVE definitions you need to access Rdb data from within DATATRIEVE.

2.2.1 DATATRIEVE DATABASE DEFINITION

The DEFINE DATABASE command sets up a link between DATATRIEVE and the Rdb database. Note that the DEFINE DATABASE command does not create data definitions within the CDD, it simply associates a CDD path name with an Rdb database.

Accessing an Rdb/VMS database does not always require a DATATRIEVE DATABASE definition. If the Rdb/VMS database was given a CDD path name when it was defined in RDO, this path name may be used to access the database rather than a DATATRIEVE DATABASE definition. DATATRIEVE DATABASE definitions are always required for Rdb/ELN and VIDA access.

The following example shows a DATATRIEVE DEFINE DATABASE command which creates a link with an Rdb/VMS or Rdb/ELN database:

```
DTR> DEFINE DATABASE CDD$TOP.DEPT39.PERSONNEL ON
CON> PERS$DISK:PERSONNEL.RDB;
```

CDD\$TOP.DEPT39.PERSONNEL is the CDD path name you provide. The path name is later used to refer to the database from within DATATRIEVE. PERS\$DISK:PERSONNEL.RDB is the file specification of the Rdb database root file. The format of the DEFINE DATABASE command for VIDA is a bit different. The definition also includes a CDD path name, but a quoted string replaces the root file specification. The quoted string contains information about the database on the IBM system and the name of a VAF file (VIDA access file). The VAF file resides on the VAX system and contains information about logging into the IBM system.

The following example shows the DEFINE DATABASE command for VIDA databases:

```
DTR> DEFINE DATABASE CDD$TOP.VIDAPERS ON
CON> "/TYPE=VIDA/FILE=VIDAPERS.VAF";
```

The DATATRIEVE database definition provides an extra level of ACL protection which allows you to regulate who can access the database through DATATRIEVE and what kind of access they have.

2.2.2 Domain Definition

You can access relations through the DATATRIEVE database directly or by defining domains that reference relations within the Rdb database. Advantages to defining domains for Rdb relations are:

- You can associate a TDMS or FMS form with a relational source through a DATATRIEVE domain.
- Once you have defined a domain which refers to a relation, that relation can be referred to by a DATATRIEVE view.

The following example shows a DATATRIEVE domain definition for a relational source:

```
DTR> DEFINE DOMAIN JOBS_DOMAIN USING JOBS OF
CON> DATABASE CDD$TOP.DEPT39.PERSONNEL;
```

This command defines a domain named JOBS_DOMAIN. JOBS_DOMAIN points to the relation JOBS in the Rdb database PERSONNEL.RDB. The DATATRIEVE database CDD\$TOP.DEPT39.PERSONNEL points to PERSONNEL.RDB.

2.2.3 Views

A DATATRIEVE view is a domain that refers to fields from one or more other domains. Although views can also be defined in Rdb, there are advantages to defining views in DATATRIEVE.

With DATATRIEVE views you can create views combining data from relational and non-relational sources. For example, you can define a view with some fields from an RMS source and other fields from relations in an Rdb database. DATATRIEVE also allows you to define views that are application specific and do not warrant definition within the Rdb database.

Defining a view through DATATRIEVE provides the only method of using views with a VIDA source, because VIDA databases do not contain views.

There are also advantages to defining Rdb/VMS or Rdb/ELN views. DATATRIEVE treats an Rdb defined view as if it were just a normal Rdb relation. Therefore, DATATRIEVE's response time is slightly faster when readying an Rdb defined view than when readying DATATRIEVE views.

You can also store or modify records using an Rdb/VMS or Rdb/ELN view if all of the fields in the view are from the same relation. You cannot, however, store into a DATATRIEVE view.

2.3 Ready Command

After defining the Rdb data and doing the necessary definitions within DATATRIEVE, you are ready to access the data. You must first enter the DATATRIEVE READY command. There are three methods of readying Rdb sources.

- You can READY the whole DATABASE directly. The following example readies all of the relations in the database PERSONNEL.
DTR> READY CDD\$TOP.DEPT39.PERSONNEL MODIFY
- You can also READY selected relations from within the database. The following example readies the relation EMPLOYEES from the PERSONNEL database.
DTR> READY CDD\$TOP.DEPT39.PERSONNEL USING EMPLOYEES
- You can READY individual relations through DATATRIEVE domains that reference them. If you have defined DOMAIN JOBS_DOMAIN to point to the JOBS relation in database PERSONNEL, the following command readies the relation JOBS.
DTR> READY CDD\$TOP.DEPT39.JOBS_DOMAIN

You can use the same access options with Rdb sources that you use with RMS sources (SHARED, PROTECTED, EXCLUSIVE). You can also use SNAPSHOT access with Rdb sources. SNAPSHOT READ access is the default for relational sources.

When a relational source is readied for SNAPSHOT access a "picture" is taken of the database. Other users' changes to the database will not be visible to you until the transaction ends. This provides a consistent view of the database as it was when the transaction began (Transaction concepts will be discussed later). SNAPSHOT access allows you to look at a database without locking other users out of the database.

To use SNAPSHOT access, all Rdb sources currently readied from your DATATRIEVE session must also be using SNAPSHOT access. If you are accessing Rdb sources in a mode other than SNAPSHOT at the time a SNAPSHOT READY is done, a warning message is displayed telling you that SHARED READ access is used in place of SNAPSHOT access.

The following READY command readies all the relations in the database personnel for SNAPSHOT access.

```
DTR> READY CDD$TOP.DEPT39.PERSONNEL USING EMPLOYEES SNAPSHOT
```

The following restrictions are associated with accessing a VIDA database through DATATRIEVE.

- You must issue a SET LOCK_WAIT command before readying the VIDA source.
- You must specify SNAPSHOT access and a consistency option of CONCURRENCY on the READY command line.

The following shows the sequence needed to ready a VIDA source.

```
DTR> SET LOCK_WAIT
DTR> READY VIDAPERS CONCURRENCY
```

SNAPSHOT is the default access option and therefore you can omit it from the READY command line. CONCURRENCY is not the default however, so you must include it on the command line.

2.4 Other Commands and Statements

After you have readied an Rdb source, you can access it using other DATATRIEVE commands and statements. For the most part, you can use all of DATATRIEVE's commands and statements with relational sources. There are three main exceptions:

- Segmented string fields are subject to a number of restrictions and require special handling.
- Transaction considerations affect many areas of Rdb access through DATATRIEVE.
- VIDA supports only read-only access. Operations that require write access cannot be performed on a VIDA database. Therefore, DATATRIEVE STORE, MODIFY, and ERASE operations are not allowed for VIDA sources.

The following example shows DATATRIEVE statements that produce a report from Rdb data. Note that these are the same statements that would be used when reporting RMS or DBMS data.

```
DTR> FIND FIRST 5 DEPARTMENTS WITH
CON> DEPARTMENT_NAME CONTAINING "CORPORATE"
DTR> SELECT
DTR> MODIFY USING DEPARTMENT_CODE = "ADMN"
DTR> REPORT CURRENT
RW> PRINT DEPARTMENT_NAME, DEPARTMENT_CODE,
RW> TOTAL BUDGET_ACTUAL
RW> END_REPORT
```

2.5 Segmented Strings

The segmented string data type is unstructured. You can store any type of data of virtually any length in a segmented string.

Segmented strings are defined for an Rdb database using the RDO or ERDL utility. VIDA databases do not contain segmented strings. When defining a segmented string field, keep in mind that DATATRIEVE accepts only the T edit string with segmented strings. When a relational source containing a segmented string is readied, DATATRIEVE displays a warning message if the segmented string uses an edit string other than the T edit string.

If you do not specify an edit string, the output line length defaults to the DATATRIEVE COLUMNS PAGE setting. When printing a record containing a segmented string, DATATRIEVE places the segmented string field last, regardless of its defined position within the record.

The following example illustrates a segmented string field that is used to store a resume. Each segment of the segmented string stores one section of the resume

| Segment 1 | Segment 2 | Segment 3 | Segment 4 |
|--|-----------------------|--------------------------|----------------------|
| Resume: | Education: | Experience: | References |
| Alan Thomas 6 Therry Rd. Amherst, NH | - B.S. Math : : | - Digital-1968 : : | - Dr. Long : : |

You can use the DATATRIEVE PRINT and LIST statements to display the data stored in segmented string fields. DATATRIEVE displays the segmented string field in segments of up to 255 characters. If a segmented string segment is longer than 255 bytes, DATATRIEVE will display the segment in sub-segments of 255 bytes.

DATATRIEVE stores and modifies segmented string fields in segments. These segments must not exceed a maximum length of 255 characters per segment, due to the limit on the size of a DATATRIEVE input line. Rdb can handle much longer segments.

You must enter an entire segmented string field using a single store operation. When modifying a segmented string field, you cannot modify just a single segment. You must re-enter all of the other segments along with the one you wish to modify.

The following example shows a segmented string being stored through DATATRIEVE. DATATRIEVE prompts you for segments until you enter a tab/carriage return sequence.

```
DTR> STORE RESUMES
Enter EMPLOYEE_ID: 23456
Enter RESUME: This is the first line of the RESUME field.<RETURN>
Enter RESUME: This is the second line.<RETURN>
Enter RESUME: To end a segmented string, press the TAB key <RETURN>
Enter RESUME: then the RETURN key at the "Enter" prompt.<RETURN>
Enter RESUME: <TAB><RETURN>
DTR>
```

Restrictions exist in the use of segmented strings within DATATRIEVE for two reasons. The first is that the relational interface, DSRI, does not support certain features for segmented strings. The second is that some DATATRIEVE specific operations do not make sense for segmented string fields, because segmented strings essentially have no data type. The restrictions include the following:

- You cannot specify MISSING_VALUE or DEFAULT_VALUE clauses for segmented string fields.
- You cannot output segmented string fields using the DISPLAY statement. You must use either the PRINT or LIST statement.
- When storing or modifying you cannot assign values of fields or variables to a segmented string field. You must enter data either in response to a DATATRIEVE prompt, or as a quoted string literal.
- You cannot retrieve or store segmented string fields from DATATRIEVE remote domains.
- Segmented string fields cannot be used with forms or plots.
- You cannot refer to segmented strings from within Boolean expressions, SORTED BY, REDUCED TO, or CROSS clauses.

2.6 Transaction Concepts

When dealing with Rdb sources, it is important to understand the concept of a "transaction". A transaction can be defined as: "a series of operations that execute as one unit, or not at all." All access to Rdb is through the transaction mechanism.

Changes to the database are not considered permanent until the transaction completes. A transaction starts with a READY command and ends with a FINISH command or an exit from DATATRIEVE.

Additionally, you can control the scope of the transaction with explicit commands. The COMMIT statement ends the transaction and makes all changes to the database permanent. The ROLLBACK statement ends the transaction but throws out all changes made to the database for that transaction and releases collections. After executing a COMMIT or ROLLBACK statement, DATATRIEVE automatically starts a new transaction. When you end a transaction by entering a COMMIT, ROLLBACK or FINISH command, all of your locks on the database are released.

Note that when you use SNAPSHOT access, entering a COMMIT or ROLLBACK has another consequence. Statement changes other users have committed to the database since your transaction started will become visible to you when DATATRIEVE starts your next transaction.

Note also that you cannot use COMMIT and ROLLBACK statements within a compound statement if the context of the compound statement is dependent on an Rdb source. This is because changes other users have committed to the database become visible when a transaction ends. These changes may alter the environment in which the compound statement is executing and affect the results of the statement.

The following example shows the invalid use of a COMMIT statement within a compound statement. The COMMIT statement is not valid because it is embedded within a FOR loop which references JOBS_DOMAIN, which is a relational source. Therefore, an error message is displayed and the FOR loop is aborted.

```
DTR> READY JOBS_DOMAIN WRITE
DTR> FOR JOBS_DOMAIN WITH GROUP = 3
CON> BEGIN
CON> MODIFY GROUP = 4
CON> COMMIT! NOT allowed
CON> PRINT GROUP
CON> END
DTR> FINISH
```

Compound statements referencing relational fields may not contain COMMITs.

This section has outlined what you need to know in order to access Rdb data through DATATRIEVE. Next, the internals of DATATRIEVE's interface with Rdb will be discussed.

3.0 Datatrieve-RDB INTERFACE OVERVIEW

This section discusses DATATRIEVE's interface with Rdb, describing what happens internally when you use DATATRIEVE to access Rdb data. What happens when DATATRIEVE executes a READY, FINISH, COMMIT or ROLLBACK statement is described followed by an explanation of how DATATRIEVE queries are mapped to Rdb requests. This section also includes suggestions on using DATATRIEVE collections with Rdb sources and on accessing multiple databases.

If you are not currently an Rdb user, the information in this section may be unfamiliar. Do not be concerned. While you need a general, conceptual understanding of Rdb to access Rdb data through DATATRIEVE, understanding the internals is not required.

3.1 READY Concepts

This section describes what happens internally when DATATRIVEVE executes a READY command.

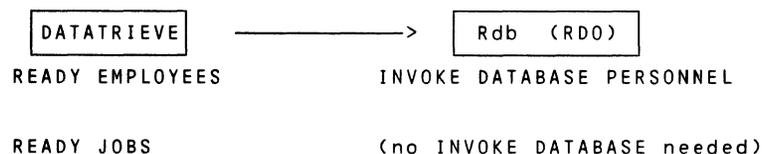
3.1.1 Database Invoke

When readying an Rdb source, DATATRIVEVE issues an Rdb INVOKE DATABASE request to attach to the Rdb database. This is done only if the DATATRIVEVE session is not currently attached to the database such as on the first READY for a database.

DATATRIVEVE passes a DSRI parameter on the INVOKE DATABASE request which specifies that database keys (DBKs) not be used again while the database is attached. This ensures that the DBKs held by a collection will still be valid after you issue a COMMIT statement.

DATATRIVEVE communicates with Rdb via the DSRI interface. However, in the interest of simplicity and clarity, requests that are sent from DATATRIVEVE to Rdb are discussed here in terms of RDO or ERQL. Examples show mappings from DATATRIVEVE to RDO or ERQL equivalents.

This example shows DATATRIVEVE issuing an Rdb INVOKE DATABASE request when a relation from the PERSONNEL database is first readied. It also shows that an INVOKE DATABASE request is not issued the second time a relation from PERSONNEL is readied.



3.1.2 Transaction Start

DATATRIVEVE next issues the Rdb START_TRANSACTION request. A START_TRANSACTION is done only if a transaction with an identical transaction parameter list (of DSRI transaction parameters) is not already started. If a transaction with an identical transaction parameter list has already been started, that transaction is used to pass requests for the source being readied.

DATATRIVEVE passes the following items to Rdb in the transaction parameter list:

- CONSISTENCY is always specified unless CONCURRENCY was included on the READY command line.
- The EVALUATING clause is not specified. As a result constraints are evaluated at the time that was specified by the DEFINE CONSTRAINTS clause when the database was defined.
- The DATATRIVEVE LOCK_WAIT value is passed in the WAIT parameter.

- Rdb's transaction mode parameter is READ_ONLY only if all sources for the database are readied in DATATRIVEVE SNAPSHOT mode. Otherwise, the transaction is started in READ_WRITE mode.
- If the share mode for any source for this database is PROTECTED or EXCLUSIVE, then RESERVING clauses are specified for all sources, along with appropriate lock types and access modes.

The following chart shows mappings of DATATRIVEVE access modes onto Rdb modes. The first section shows that if all relations are readied in SNAPSHOT mode, DATATRIVEVE starts a read-only transaction. The second section shows what happens when SNAPSHOT and SHARED access are combined in the same transaction. DATATRIVEVE changes the SNAPSHOT access to SHARED and starts a read-write transaction. The third section shows that if a share mode of PROTECTED or EXCLUSIVE is requested for any of the relations, then a reserving list specifying lock type and share mode is included.

Note that when a DATATRIVEVE read access mode (SHARED READ for example) is mapped to an Rdb read-write transaction, DATATRIVEVE enforces read access and prohibits write operations from being performed.

ALL sources in SNAPSHOT:

| READY Options | Transaction Mode | Reserving | Lock Type | Share Mode |
|---------------|------------------|-----------|-----------|------------|
| ALL SNAPSHOT | READ_ONLY | - | - | - |

Mixture of SNAPSHOT and SHARED:

| READY Options | Transaction Mode | Reserving | Lock Type | Share Mode |
|---------------|------------------|-----------|-----------|------------|
| ALL SNAPSHOT | READ_WRITE | - | - | - |
| SHARED READ | READ_WRITE | - | - | - |
| SHARED MODIFY | READ_WRITE | - | - | - |
| SHARED WRITE | READ_WRITE | - | - | - |
| SHARED EXTEND | READ_WRITE | - | - | - |

Any other mix that includes at least one PROTECTED or EXCLUSIVE:

| READY options | Transaction Mode | Reserv- ing | Lock Type | Share Mode |
|---------------|------------------|-------------|-----------|------------|
| SNAPSHOT | READ_WRITE | YES | READ | SHARED |
| SHARED READ | READ_WRITE | YES | READ | SHARED |
| SHARED MODIFY | READ_WRITE | YES | WRITE | SHARED |
| SHARED WRITE | READ_WRITE | YES | WRITE | SHARED |
| SHARED EXTEND | READ_WRITE | YES | WRITE | SHARED |
| PROT. READ | READ_WRITE | YES | READ | PROTECTED |
| PROT. MODIFY | READ_WRITE | YES | WRITE | PROTECTED |
| PROT. WRITE | READ_WRITE | YES | WRITE | PROTECTED |
| PROT. EXTEND | READ_WRITE | YES | WRITE | PROTECTED |
| EXCL. READ | READ_WRITE | YES | READ | EXCLUSIVE |
| EXCL. MODIFY | READ_WRITE | YES | WRITE | EXCLUSIVE |
| EXCL. WRITE | READ_WRITE | YES | WRITE | EXCLUSIVE |
| EXCL. EXTEND | READ_WRITE | YES | WRITE | EXCLUSIVE |

When DATATRIEVE processes a READY command, it does not start a new transaction if another transaction has already been started with an identical parameter list. If it is necessary for DATATRIEVE to start a new transaction and you have not accessed the database at all during the current transaction, then DATATRIEVE issues an implicit COMMIT statement.

If it is necessary for DATATRIEVE to start a new transaction but you have already accessed the database during the current transaction, DATATRIEVE does not issue a COMMIT request. Doing so could result in changes being made permanent without your knowledge. Instead, DATATRIEVE displays a message informing you that an explicit COMMIT or ROLLBACK statement must be entered before you can execute another READY command. The following example illustrates these three situations.

You should ready all needed Rdb sources "all-at-once" to avoid these problems and to minimize the number of transaction starts.

```

DATATRIEVE -----> Rdb (RDO)
READY EMPLOYEES      INVOKE DATABASE PERSONNEL
                     START_TRANSACTION
                     (READ_ONLY,CONSISTENCY,NOWAIT)
READY JOBS           (nothing) !no change in params
READY JOBS WRITE    COMMIT !implicit COMMIT
                     START_TRANSACTION
                     (READ_WRITE,CONSISTENCY,NOWAIT)
PRINT FIRST 3 JOBS  (Rdb request for data)
READY JOBS EXCLUSIVE WRITE DATATRIEVE gives error
"Source cannot be readied unless a COMMIT, ROLLBACK or
FINISH is issued"
COMMIT              COMMIT !explicit COMMIT
READY JOBS EXCLUSIVE WRITE START_TRANSACTION
                     (READ_WRITE,CONSISENNCY,NOWAIT,
                     JOBS,EMPLOYEES,WRITE,EXCLUSIVE)

```

You can control locking with the DATATRIEVE SET LOCK_WAIT and SET NO LOCK_WAIT commands. DATATRIEVE's default is NO LOCK_WAIT. NO LOCK_WAIT was selected as the default for DATATRIEVE because it is the RMS default. However, NO LOCK_WAIT is not always the recommended mode for relational access. LOCK_WAIT is required for VIDA. Note that LOCK_WAIT changes can only occur at the start of a new transaction, so you must issue a SET LOCK_WAIT before entering a READY command. This is shown in the example below.

```

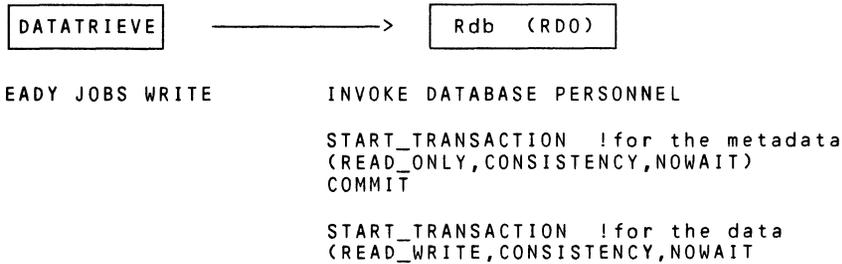
DATATRIEVE -----> Rdb (RDO)
READY EMPLOYEES      INVOKE DATABASE PERSONNEL
                     START_TRANSACTION
                     (READ_ONLY,CONSISTENCY,NOWAIT)
SET LOCK_WAIT
:
:
READY JOBS WRITE    START_TRANSACTION
                     (READ_WRITE,CONSISTENCY,NOWAIT)

```

3.1.3 Rdb Metadata

When executing a READY command DATATRIEVE must build a 'field' tree that describes all of the fields in a domain or a relation. This information is acquired from "metadata" in the Rdb system relations. A READ_ONLY transaction is needed to acquire the metadata. Rdb will not allow the system relations to be accessed by a READ_WRITE transaction. If a READ ONLY transaction has not already been started, DATATRIEVE must start a READ_ONLY transaction in order to acquire this information.

The following example shows that DATATRIEVE must start an initial read-only transaction to acquire metadata from the database. DATATRIEVE must start another transaction for data access because READ_WRITE access is required. However, if JOBS were being readied in SNAPSHOT mode, DATATRIEVE could use the initial transaction for both metadata and data access.



3.2 FINISH, COMMIT, and ROLLBACK

When you enter a FINISH, COMMIT, or ROLLBACK statement, DATATRIEVE sends the appropriate requests to Rdb. Mappings of DATATRIEVE FINISH, COMMIT and ROLLBACK statements to Rdb requests are discussed below.

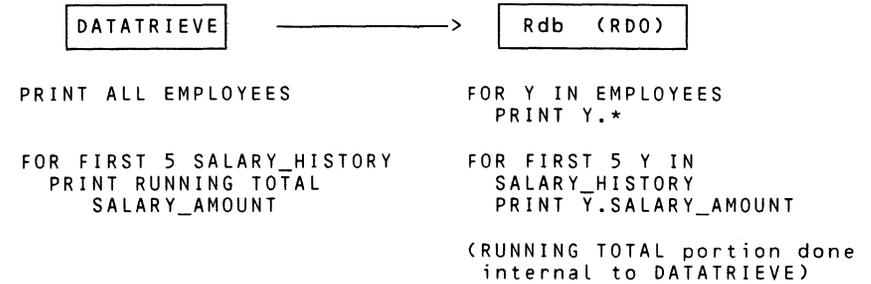
- When you enter a FINISH command which applies to all of the readied relations from a particular database, DATATRIEVE sends Rdb a COMMIT request, followed by a DETACH DATABASE request. If you enter a FINISH command which does not finish all of the relations from a particular database, DATATRIEVE sends no request to Rdb.
- When you enter a COMMIT statement, DATATRIEVE sends Rdb a COMMIT request, followed by a START_TRANSACTION request.
- When you enter a ROLLBACK statement, DATATRIEVE sends Rdb a ROLLBACK request, followed by a START_TRANSACTION request.

3.3 DATATRIEVE Query To Rdb Requests

DATATRIEVE queries are 'mapped' to Rdb requests. As part of this mapping, DATATRIEVE automatically generates the required context variables for the Rdb request.

Where possible, DATATRIEVE passes record selection expressions (RSEs) to Rdb. Rdb cannot perform some DATATRIEVE RSE operations. Some of these operations include: IN, VIA, FROM, prompting expressions, double and triple concatenate, standard deviation, function calls, RUNNING COUNT, RUNNING TOTAL, FORMAT, CHOICE, IF and expressions containing variables.

The following example shows DATATRIEVE queries being mapped to Rdb requests. Note that a context variable "Y" is generated as required by Rdb.



3.4 Collection Considerations

Consider the following points if you use collections of Rdb records. Collections are supported by DATATRIEVE, not by Rdb. Within DATATRIEVE, collections are maintained as lists of DBKeys. DATATRIEVE cannot perform keyed retrieval on collections. You should thus avoid the use of large collections except in the case of VIDA sources, as will be discussed later in this section.

COMMIT statements retain collections, but ROLLBACKs release them. If a collection is established and, as the result of a COMMIT statement, the transaction is ended and then restarted, records in your collection may be changed or deleted by other users during the time between the old and the new transaction.

A parameter passed to Rdb on the INVOKE DATABASE request prevents Rdb from assigning the DBKeys of deleted records to other records in the database. This ensures that new records will not appear in your collection after you enter a COMMIT statement. However, it does not prevent another user from modifying or even erasing records in your collection between transactions.

You should therefore avoid entering a COMMIT statement until you have completed your work with a collection.

In the example below, the PRINT statement entered after the COMMIT statement may produce unexpected results if another user changed the record during the time between the end of the committed transaction and the start of the new transaction.

When used with DATATRIEVE, VIDA must cache all requests internally. Every request will be cached until the database is detached, that is, when all sources for that database have been finished in DATATRIEVE.

Multiple requests for the same data will be cached in multiple locations. Therefore, it is more efficient to establish a single collection of the VIDA records you plan to use than to make multiple requests for the data.

3.5 Multiple Database Considerations

If a DATATRIEVE user has multiple relational databases readied, DATATRIEVE will maintain a single transaction for all relational sources from all databases. Only one START_TRANSACTION request is made for all of the relations from all of the databases.

DATATRIEVE



Rdb (RDO)

| | |
|----------------|---|
| FIND EMPLOYEES | Get list of DBkeys from Rdb |
| SELECT; PRINT | Send first DBkey to Rdb, print the data returned |
| COMMIT | COMMIT |

Window when other users can potentially update the record

| | |
|---------------|---|
| | START_TRANSACTION |
| SELECT; PRINT | Send first DBkey to Rdb, print the data returned |

If all of the relations for one of the databases is finished. DATATRIEVE must commit and detach the specified database. DATATRIEVE must then do another INVOKE DATABASE and START_TRANSACTION on the databases which are to remain readied.

You cannot direct a COMMIT or ROLLBACK statement to a specific source. A COMMIT or ROLLBACK statement applies to all relational and VAX DBMS sources which are readied at the time the COMMIT or ROLLBACK is issued.

While you can specify different access modes and shareability options for different sources with a READY command, the LOCK_WAIT setting applies to all sources, including VAX DBMS and RMS sources which are readied after the SET LOCK_WAIT command is issued.

When you ready different databases with domains or relations of the same name, use the alias clause of the READY command to prevent names from duplicating each other. If a DATATRIEVE query references multiple Rdb databases, DATATRIEVE decomposes the query into multiple Rdb requests. If a DATATRIEVE query references a mixture of Rdb, VAX DBMS, and/or RMS sources, DATATRIEVE decomposes the query such that each portion of the query is dispatched to the appropriate subsystem.

4.0 Summary

If you are already familiar with DATATRIEVE you can access Rdb data through DATATRIEVE by learning just a few new commands and concepts. You can use the DATATRIEVE commands you already know to query, update and produce reports on Rdb databases.

If you currently use Rdb, you already understand the Rdb concepts necessary to access Rdb data through DATATRIEVE. You now also have an idea of how DATATRIEVE interacts with Rdb. Knowing how DATATRIEVE interacts with Rdb internally should make it easier for you to start using DATATRIEVE to access your Rdb data.

4GL APPLICATION DEVELOPMENT GUIDELINES

Marc Praly, Cognos Incorporated, Ottawa, Ontario

About the Author

The author, a senior project manager with Cognos Incorporated, has 19 years experience as a programmer, analyst, and project manager. Born in France, Praly has built systems in 5 countries on three continents.

This paper is condensed from an address delivered at DECUS in the fall of 1986. It is now part of a three-day seminar for system developers and a one day seminar for managers that Cognos is delivering in major cities in the United States, Canada, the United Kingdom, Holland, Finland and France.

PowerHouse, the programming language from Cognos, is an advanced application development language for business systems on mid-range computers.

Introduction

Anyone who has switched to a 4GL will appreciate that, to develop applications effectively with it, a new development approach must be used. Common questions expressing this are the following:

- How do I build applications using 4GL?
- What changes will a 4GL impose on my organization?
- How do I manage 4GL projects?
- What is the best approach to system development with a 4GL?

I plan to address these questions by elaborating a sound approach to 4GL application development.

Four basic steps

Traditional system development follows a rigid sequence of steps, and each step must be complete before the next is undertaken. A consequence of this type of development is that system specifications cannot easily be altered after they have been signed off. Changes are often too hard, and too time-consuming, to make.

In contrast, 4GLs promote a flexible approach to system development. And this approach suggests that 4GL system designers should return to the basic steps of system design:

- I. Identify what needs to be done.
- II. Define a solution.
- III. Construct the solution.
- IV. Implement the solution.

Note that these steps are consistent with the steps involved in any type of construction, whether of a road, a house or a computer, and that they apply, with equal vigor, to the largest and the smallest project

I. Identify what needs to be done

The identification process can be divided into four steps:

- a. Review the user environment.
- b. Review the techniques that will be used.
- c. Get to know the people who will be involved.
- d. Gain a thorough understanding of the problem you are to tackle.

Let's look at these steps more closely.

a. Review the user environment

Learn the structure of the organization within the proposed system will operate. Study job descriptions and current procedures. Try to locate the proposed system within the procedures you have studied. Ask yourself: What changes in these organizations will impact the proposed system? How will the proposed system impact the organization?

Get to know the general direction of your organization's plans. If you know at the outset that a system request from your sales manager reflects the first step toward the organization's overall goal of budget consolidation, you will be able to plan it more effectively.

Develop a good working understanding of the way your organization's data is organized, and learn to control it. Centralized data administration helps to keep duplicate databases and redundant information to a minimum.

Plan on training system developers before you begin building the proposed system. Developers who are familiar with 3GLs will need to re-think some of their accustomed practices; you will want to communicate the differences between a 3GL and a 4GL to them very carefully.

Bad experiences can discourage system users and developers. Since your first aim in bringing in a 4GL is to bring everyone involved up to speed as smoothly as possible, consider making your first application a simple one.

b. Review the techniques that are involved

The following techniques have proven effective:

- In collaboration with users study major work-flows, and generate a concise expression of each user requirement.
- Analyze business functions by identifying each major business function, and decomposing it until you are satisfied you understand it. Alternatively, you can draw your analysis from work-flow diagrams.
- Perform data analysis, defining a logical view of your data using either entity modeling or normalization techniques.

Entity modeling is performed by following these basic steps:

- 1 Identify entities, each entity being a name that represents a group of data elements. (Examples are customer, product, and so on.)
2. Establish one-to-one, one-to-many and many-to-many relationships between entities.
3. Draw an entity-relationship diagram.
4. Check and optimize the diagram using identified requirements.
5. Complete the entity model by distributing data elements to each entity.

Data elements should be identified and documented as you define system requirements.

The steps in normalization are as follows:

1. List all the elements that appear on the input/output documents and forms that were collected during the user requirements analysis.
2. Identify major keys.
3. Extract and remove redundancy.
4. Verify data dependency.
5. Consolidate groupings of data.
6. Draw an entity-relationship diagram.
7. Check and optimize the diagram against identified requirements.

Normally, entity modelling is sufficient to define a logical view of data, especially since it involves a lot of interaction with users. But users are not always available. In this case normalization is the best substitute.

On the other hand, normalization takes a lot of time to complete. If you take this route, try not to lose yourself in detail. Later on, prototyping will help you correct minor mistakes.

Prototyping refers to the creation of the first physical draft of a system. This draft becomes a working system by being refined using an interactive development approach in which end-users and system developers engage in a dialogue about the system.

You waste no work when you develop a production system from a prototype. But bypassing heavy program specifications can only succeed if the data has already been organized.

When the system you are about to create is complex consider using several development phases, each corresponding to one of its subsystems. This supports the unspoken rule in system development: small systems have better chances of success than large ones.

c. Get to know the people who will be involved

The people who are involved in the building of a system must be motivated, and they must understand their roles.

The Project Manager defines a solution in consultation with users and system developers. Consequently, this person must be able to communicate effectively with both users and management, and to manage expectations, in terms of what is feasible to do and what simply cannot be done. The project manager controls the development and implementation processes.

System Developers must be able to communicate, too. In addition, they must be able to analyze problems, and adapt the system to the user's environment as they consult with the user. These people must be able to live with the idea that 'change/redo/delete' is part of the game.

The User Services group are those people who will help implement the system, and service the users after the system has been implemented. They might, in time, take on system maintenance responsibilities.

Project Review Committee members are the 'champions' of the new system. They are user representatives who are occasionally called upon to review the system's progress, and to take some responsibility for it.

In contrast, the User Committee is a group which has not been convened specifically for this project. This committee is a higher-level group, very close to your organization's top decision-makers. They resolve problems that Project Review Committee members cannot handle.

d. Gain a thorough understanding of the problem you are to tackle.

The best way to make sure you have a good understanding of the system you are about to build is to ask yourself the following questions:

- Is there an existing system in place?
- Have the system requirements been defined with sufficient precision?
- How much is the problem that has sparked this project a real problem? Has an easier solution to it been overlooked?
- Will this system have user interfaces? (If not, so much for prototyping.)
- Is management completely committed to the idea of a new system?
- Is everyone, including me, convinced that a 4GL offers the best solution to the problem?

II. Define a solution

This step involves two activities.

a. Understanding the problem

To clarify the problem so that a working solution looms, you should conduct meetings to satisfy the following objectives:

- Clearly define each identified requirement. "Capture all orders for any customer providing there is enough stock." is not a precise enough specification. A better one would be: "Orders must be recorded for each customer. An on-line capability must be supplied to create new customer records, and ensure that the credit limits for these customers are not exceeded. Attempt to use form F1-A, or propose a new design. Stock checking may be done at a later stage."
- Understand the basic flow of data.
- Define the functions that users are performing.
- Collect all documents that may relate to the requirements.

Data analysis, using the entity modelling technique, helps you to identify a logical view of data and to group data within each entity. The relationships between entities, and the access routes to these entities, are clearly defined.

Properly formulated requirements and data analysis, and a thorough understanding of business functions provide a springboard for a first draft of a system of menus and screens. The idea is not to finalize the details of each screen, but to produce a high-level design in which functions are well identified. This prepares you to take full advantage of the power of the language you will use.

In effect, you have already mapped the functions of your organization against a well-defined data structure. You must now carefully devise a set of applications through which to satisfy the information needs that prompted this system.

b. Defining the approach to the solution

After confirming with users that the draft system of menus and screens corresponds with their requirements, parcel the programming work so that one person can develop his or her application(s) through to implementation.

As Project Manager your role is to coordinate, communicate, and organize. You must ensure that everyone is moving in the same direction at the same pace.

Once you are ready to put the system-building process in motion, describe both process and system to the users. Now is the time to obtain their commitment to go ahead. Explain the prototyping approach, and what the users' involvement will be. Commit yourself to a completion date for the first prototype.

III. Construct the solution

How many times have systems failed because the designers jumped into coding without checking that their solution was a feasible one!

The following two steps contribute to building a system that works.

a. Tasks in building a working system

Four tasks contribute to the building of a working system. First, build a physical database. This is a draft database. It corresponds with the logical view of the data that was developed earlier, and is constructed on the understanding that this might change as a result of user reviews of the initial prototype.

Second, build a prototype. You cannot afford to let users wait too long before they see some results. They will lose interest over time; a long wait frustrates expectations. The important features of this prototype are that data entry screens are complete, and that reports contain pertinent information in a logical sequence. Concentrate on functionality, not cosmetics.

Third, review the prototype, by application, with users. This should be an informal review in which the person who has developed the application demonstrates it. Comments, change requests, and agreements to adopt or not to adopt specific suggestions should be recorded. More important, the date for the next review and the number of reviews should be decided here. At most, accept 5 reviews. If after 5 reviews of one function developer and user cannot agree, something has gone wrong. In this case, be prepared to investigate alternative solutions.

Fourth, manage expectations. Suggested changes must be analyzed on the spot. If you cannot accede to a user's request, given realistic constraints, you should explain why.

b. Build the remaining functions

Up to this point, you have been dealing with the users. You have probably left unwritten some of the volume processing applications, and not worried very much about the progress of the applications that produce the less-important reports.

Now is the time to attend to these and to build the remaining functions: year-end processing modules, interfaces with other systems and conversion modules, for example. This is the time to ensure consistency across the system, between help and error messages, for example. Now, too, you should prepare for production by moving system modules to your production environment and by testing them there.

IV. Implement the solution

Allow the users to use the system while you are adding the finishing touches to it. The advantage of this is that it gives you a chance to see how the system will actually be used, and this, in turn, provides a meaningful opportunity to refine it before the production version is finalized.

An associated benefit is that it generates user commitment to the system. This lessens a danger that faces any new system: that the system will never be implemented because there is always something in it to finish.

Treat the first implementation of a system as Release 1.0. Regular reviews can be organized, and the change requests that stem from them can be addressed in future releases.

The implementation plan should include a day-by-day start-up of functions. Each function should be introduced to the appropriate user by its designer to ensure that any problem can be fixed quickly.

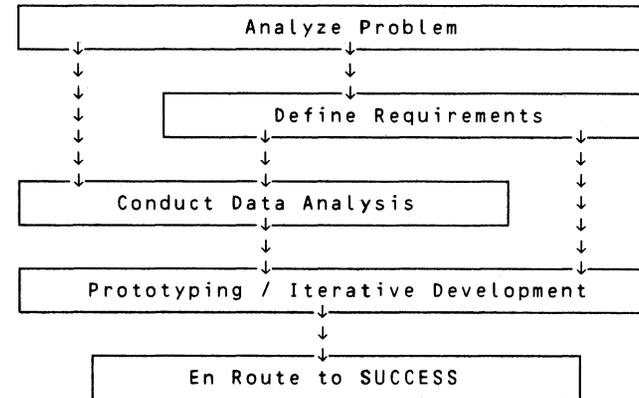


Diagram 1: This outlines the steps necessary to successfully develop a fourth-generation language system in the shortest amount of time.

Summary

The advantages of using this approach to system design with a 4GL are as follows:

- Applications and data are considered separately.
- It promotes the organization of data at the outset.
- It promotes a "We" approach between developers and users.
- It makes effective use of the system users time and the range of contributions he or she can make.
- Its flexible approach promotes creativity and productivity in system development from the point of view of users, designers, and your organization's management.

Scheduled Sessions for the Spring 1987 DECUS U.S. Chapter Symposium

Nashville, Tennessee - April 27, 1987 to May 1, 1987

Submitted by: Chris Wool, DTR/4GL SIG Symposia Representative

DT001 - THE BEST OF WOMBAT MAGIC

Tuesday April 28, 1987 11:30 a.m. - 12:30 p.m.

Over the past many years, the Wombat Magic sessions have provided fertile ground for the many users of DATATRIEVE to share hints and kinks with other users of this popular product. The material which is presented in this session is a collection of magic well worth sharing again.

Orientation: Intermediate/Technical

DT002 - DATATRIEVE SOFTWARE CLINIC

Wednesday April 29, 1987 4:00 p.m. - 6:00 p.m.

This session allows the DATATRIEVE user to obtain one-on-one help from an experienced DATATRIEVE wizard. A DATATRIEVE/Fourth Generation Languages Special Interest Group (DTR/4GL SIG) representative meets you at the door and directs you to an appropriate expert, who spends as much time with you and your problem as you require. All levels of inquiries are accepted, from the beginner to the 'seasoned' DATATRIEVE professional. The experts consist of Digital developers and experienced members of the DTR/4GL SIG.

Orientation: Intermediate/Technical

DT003 - VAX TEAMDATA - END-USER INFORMATION MANAGEMENT

Monday April 27, 1987 4:00 p.m. - 5:00 p.m.

This session describes VAX TEAMDATA, a powerful yet easy to use information management product for those who need to use data in their work, but who don't want to do "data processing." The session shows how TEAMDATA lets users easily store and manipulate data in both personal and shared databases (Rdb/VMS) using a simple screen oriented text editing style. The presentation makes heavy use of examples, showing TEAMDATA's combination menu/command language interface, its extensive online HELP and tutorial facilities, and its other integrated components, including data tables, spreadsheets, reporting and graphics. The session illustrates how VAX TEAMDATA answers the need many non-professionals have for access to information for use in a broad range of decision support activities.

Orientation: General

DT004 - VAX RALLY - FOURTH GENERATION APPLICATION DEVELOPMENT SYSTEM

Monday April 27, 1987 5:00 p.m. - 6:00 p.m.

This session presents an overview of VAX RALLY, a fourth generation application development system from Digital. Using VAX RALLY, application designers can create entire database applications, including forms, reports, menus, complex logic and flow control, and user HELP. These applications can then be run from DCL, from within TEAMDATA or from an ALL-IN-1 menu. Based on Rdb/VMS, RALLY provides low-end transaction processing capabilities for a range of application types, from order entry to financial systems. This session presents the highlights of VAX RALLY and uses examples to demonstrate its features and potential uses.

Orientation: General

DT005 - ADVANCED REPORT WRITING TECHNIQUES IN VAX DATATRIEVE

Thursday April 30, 1987 2:00 p.m. - 3:00 p.m.

The DATATRIEVE Report Writer is made up of just a few simple statements that may be used to create simple or complex reports. Because of the many defaults, it is easy for a novice to get started. However, users soon find they need something different from the standard defaults. With a little imagination and creativity, the power and flexibility of VAX DATATRIEVE makes it possible to create almost any report you need. A series of examples demonstrate some advanced and unusual applications.

Orientation: Advanced/Technical

DT006 - ADVANCED DATATRIEVE RECORD DEFINITIONS

Thursday April 30, 1987 1:00 p.m. - 2:00 p.m.

The record definition is the basis for all data retrieval within DATATRIEVE. There are many possibilities for the manipulation of data, and the presentation of that data, which are not immediately obvious nor presented in the documentation. This session is intended for those persons who are familiar with DATATRIEVE and are looking for additional methods of describing data, who have to interface with files written by other programs/products, or who need additional options in developing special applications.

Orientation: Advanced/Technical

DT007 - SOLVING EQUATIONS IN DATATRIEVE

Monday April 27, 1987 8:00 p.m. - 9:00 p.m.

Most people, when first coming in contact with DATATRIEVE, assume that it only stores, retrieves, and reports data. Although not known as a "number cruncher," DATATRIEVE will perform mathematical computations, and while manipulating data may also manipulate numbers. This session gives an introduction to the subject, showing some methods by which even fairly complicated numerical functions may be performed with DATATRIEVE.

Orientation: Intermediate/Technical

DT008 - DESIGNING AN APPLICATION USING THE VAX FORMS MANAGEMENT

Monday April 27, 1987 7:00 p.m. - 8:00 p.m.

This session takes a top-down approach to the design, coding, and implementation of a software package created using the VAX Forms Management System (FMS) and VAX DATATRIEVE. The attendee gains a knowledge of creating forms and form libraries, and using VAX DATATRIEVE to add, modify, and retrieve data stored in Record Management System (RMS) sequential and indexed-sequential files using the VAX forms management interface.

Orientation: Intermediate/Technical

DT009 - MANTIS - A FOURTH GENERATION LANGUAGE FOR THE VAX

Friday May 1, 1987 9:00 a.m. - 10:00 a.m.

MANTIS is a menu-driven, procedural, interactive Fourth Generation Language (4GL). This session discusses the following issues: 1) what is a 4GL 2) what are the common elements of a 4GL, 3) two different kinds of 4GLs, and 4) performance issues with 4GLs. We then discuss how we have implemented the 4GL concept through MANTIS. We cover the following features of MANTIS: screen design, file access/design (for MANTIS and Record Management System (RMS) files), prototyping facilities, built-in documentation, directory facilities, interface capability to other languages, and the MANTIS programming language. We also demonstrate examples of the programming language and menu-driven facilities. We wrap up with an outlook on the future of 4GLs.

Orientation: General

DT010 - WHAT'S WRONG WITH FOURTH GENERATION LANGUAGES?

Tuesday April 28, 1987 10:00 a.m. - 11:00 a.m.

This talk is a general discussion about the current state of Fourth Generation Languages (4GLs). It briefly touches upon the definition and use of 4GLs, and how they fit into—and have changed—the entire spectrum of typical application development. The talk examines the two basic strategies that 4GL vendors have taken in solving the traditional problems of application development: Information Center 4GLs (intended primarily for end-users) and Development Center 4GLs (intended primarily for data processing professionals). Included in this discussion is a look at the two different prototyping philosophies typically found in each type of 4GL. The presentation categorizes the different types of products that are freely referred to as 4GLs. A closer look is taken at two of these categories: relational database systems and file-independent languages. Lastly, the audience is left with some general topics to consider when investigating various Fourth Generation Languages.

Orientation: General

DT011 - PROTOTYPING IN FOURTH GENERATION LANGUAGES

Friday May 1, 1987 10:00 a.m. - 10:30 a.m.

"Prototyping" is almost as popular a buzzword in today's industry as "Fourth Generation Language (4GL)." In fact, most Fourth Generation Language vendors cite the ability to prototype applications with their 4GL as a major benefit of their product. However, just as the 4GLs in today's market differ greatly from each other, one vendor's definition of prototyping may be drastically different from the next. This talk outlines some of the different prototyping philosophies found in today's market. A closer look is taken at two of the most predominant prototyping approaches: cosmetic-driven and data/function-driven. The relative advantages and disadvantages of each are discussed.

Orientation: General

DT012 - HOW TO EVALUATE FOURTH GENERATION LANGUAGES

Thursday April 30, 1987 9:00 a.m. - 10:00 a.m.

Today's market is full of Fourth Generation Languages (4GLs). Many corporations have been excitingly successful in implementing a 4GL as their primary development language, while others have sorrowfully failed. Quite often the failure is not the fault of the 4GL itself, but rather due to a misplacement—and correspondingly a misuse—of the product. Not all 4GLs are designed with the same objectives in mind. This talk defines some areas that most 4GLs address, and presents the audience with some aspects to consider when evaluating 4GLs. Among other things, we discuss the need for careful interpretation of marketing literature, detailed areas to look into from a technical aspect, and things to remember when bringing a copy of a product in-house on a trial basis. This talk does not evaluate different products on the market; it highlights some areas concerning 4GLs in an attempt to assist the audience members in their subsequent evaluations of today's Fourth Generation Languages.

Orientation: General

DT013 - VAX DATATRIEVE SECURITY USING ENVIRONMENT ACCOUNTS AND ACCESS CONTROL LISTS

Thursday April 30, 1987 4:00 p.m. - 5:00 p.m.

DATATRIEVE system and data security are paramount, particularly where personnel or financial data are maintained, or where sensitive performance and failure analyses are performed. This is true of DATATRIEVE systems, be they for single or multiple users. A relatively straight-forward system design and protection scheme has been developed to assist in optimizing data integrity. Examples of several different systems are examined, together with the "case" method of system protection. Environment accounts and their usefulness for group DATATRIEVE applications are also examined.

Orientation: Intermediate/Technical

DT014 - BEGINNER'S GUIDE TO DATATRIEVE

Monday April 27, 1987 11:00 a.m. - 12:00 noon

DATATRIEVE is certainly one of Digital's most popular products. It is extraordinarily effective in providing a robust means for interactive access to data in Record Management System (RMS) files, VAX/Rdb databases, or VAX DBMS databases on VAXs, PDP-11s, PROs and DECSYSTEM-20s. This session presents a basic description of the essential characteristics of DATATRIEVE and describes situations in which it is effective. At the end of this session, attendees should understand the capabilities of DATATRIEVE, strategies for using it, and typical situations in which it is effective.

Orientation: General

DT016 - A SOFTWARE DEVELOPER'S COMPARISON OF FOURTH GENERATION LANGUAGES

Thursday April 30, 1987 10:00 a.m. - 11:00 a.m.

Care Information Systems Inc., a manufacturer of software for the health care industry, has chosen a Fourth Generation Language (4GL) over the traditional Third Generation Languages for its new Prepaid Health System which is under development. This session is an overview from a software developer's perspective of selection criteria, comparison of selected 4GLs, and economic considerations - both in development time and in resale of the 4GL runtime libraries.

Orientation: General

DT017 - USING ACCENT R'S SIMULTANEOUS UPDATE AND ADVANCED SYSTEM FUNCTIONS

Tuesday April 28, 1987 12:30 p.m. - 1:30 p.m.

This session covers how to properly program an ACCENT R simultaneous update application and how to use some of ACCENT R's advanced functions for applications such as command parsing and locking out unauthorized users. Orientation: Advanced/Technical

DT018 - USING ACCENT R DATA SETS WITH SPSS-X AND RMS INDEXED FILES

Tuesday April 28, 1987 1:30 p.m. - 2:30 p.m.

A sample application submitting an ACCENT R data set to analysis by the statistical package SPSS-X is presented. Since some forms of ACCENT R data sets are not compatible with SPSS-X input file restrictions, several methods for converting ACCENT R data sets are discussed. Each method is considered in terms of disk space, execution time, and user time considerations. Also use of ACCENT R to handle missing values appropriately for interpretation by statistical packages is presented. A short tutorial is also held on using Record Management System (RMS) indexed files in ACCENT R. The session discusses the syntax, uses, and the advantages and disadvantages of using ACCENT R instead of COBOL/FORTRAN.

Orientation: Intermediate/Technical

DT019 - WOMBAT MAGIC

Thursday April 30, 1987 7:00 p.m. - 9:00 p.m.

This session presents numerous clever and useful hints and kinks for users of DATATRIEVE and other Fourth Generation Language (4GL) products. If you are a user of DATATRIEVE or any other 4GL, you will want to attend this session to learn how to increase the power of your language through ingenious tricks and simple work-arounds. Wombat Magic focuses on showing simple ways to make your life easier. At each symposium, numerous door prizes and awards are presented at Wombat Magic, including valuable prizes for the winners in each of two categories - Best DATATRIEVE Magic and Best 4GL Magic. If you have something you've done using DATATRIEVE or a 4GL that you think will be useful to others, please come and submit your Magic. If you haven't got anything to submit but you want to have fun and learn how to make your DATATRIEVE or 4GL work harder for you, then you should come too!

Orientation: Novice/Technical

DT020 - POWERHOUSE WORKING GROUP MEETING

Monday April 27, 1987 6:00 p.m. - 7:00 p.m.

The DATATRIEVE/Fourth Generation Languages Special Interest Group (DTR/4GL SIG) Powerhouse Working Group meets to plan for the presentation of VAX POWERHOUSE sessions at future symposia. Because the working group is newly formed, much work needs to be done to provide DECUS members with information about this important application development language. Strategies for a series of SIG newsletter articles will be discussed.

Orientation: General

DT021 - VAX POWERHOUSE HINTS AND KINKS

Monday April 27, 1987 1:30 p.m. - 2:00 p.m.

This panel discussion by experienced POWERHOUSE users covers techniques which help attendees make successful use of VAX POWERHOUSE. The panel discusses several methods of managing larger POWERHOUSE applications for increased performance. Ample time is allowed for questions from the floor.

Orientation: Novice/Technical

DT022 - ADDING FUNCTIONS TO VAX DATATRIEVE

Thursday April 30, 1987 5:00 p.m. - 6:00 p.m.

This session shows the DATATRIEVE manager how to add functions to DATATRIEVE. Both VMS supplied functions and user-written functions are discussed. Topics covered include: Writing the function, Inclusion in DTRFND.MAR definition file, Rebuilding DATATRIEVE. Several useful and interesting examples are shown.

Orientation: Intermediate/Technical

DT023 - DEALING WITH HIERARCHIES IN VAX DATATRIEVE

Monday April 27, 1987 9:00 p.m. - 10:00 p.m.

It is often convenient and sometimes necessary in VAX DATATRIEVE to create list fields in record definitions. However, it is not easy to deal with these fields and the message "fld-name UNDEFINED OR USED OUT OF CONTEXT" frequently appears. In this session, we discuss some of the methods available to handle list fields.

Orientation: Intermediate/Technical

DT024 - WRITING MENU-DRIVEN SYSTEMS IN VAX DATATRIEVE

Thursday April 30, 1987 3:00 p.m. - 4:00 p.m.

There are four commonly used methods for providing menus for systems written in VAX DATATRIEVE: writing the menu using interactive DATATRIEVE; writing the menu using logicals; writing the menu using DCL; writing the menu using callable DATATRIEVE. This session demonstrates how to create a menu using each method. In addition, a comparison of the methods is presented. This comparison emphasizes the cause and length of the user's waiting time, and the impact that each menu method has on system resources.

Orientation: Intermediate/Technical

DT026 - VAX POWERHOUSE CLINIC

Tuesday April 28, 1987 4:00 p.m. - 6:00 p.m.

Bring your problems/questions one and all! Experienced POWERHOUSE users are on hand to provide informal assistance in areas such as: . How to use POWERHOUSE directory security effectively . Interfacing POWERHOUSE to 3GLs . QUICK screen techniques . QUIZ issues . QTP snags A complete set of POWERHOUSE documentation is available for you to (re)view.

Orientation: Intermediate/Technical

DT027 - A COMPARISON OF THE DATATRIEVE AND VAX POWERHOUSE REPORT WRITERS

Friday May 1, 1987 11:00 a.m. - 11:30 a.m.

This session summarizes the capabilities of the VAX POWERHOUSE report writer and compares it with the DATATRIEVE report writer. Specific attention is given to those features which are unique to each product to help users choose the appropriate tool when building production reports.

Orientation: General

DT028 - SPSS-X GET DATATRIEVE: AN APPLICATION USING THE DATATRIEVE

Wednesday April 29, 1987 2:30 p.m. - 3:00 p.m.

This session explains how the DATATRIEVE call interface is used to provide a direct link between DATATRIEVE and SPSS-X, a large data analysis package, allowing users of the package to simply and directly access data from any DATATRIEVE domain. In the simplest case, the user needs to know only the name of the DATATRIEVE domain. The more advanced user can limit the data accessed to specific fields or records, rename fields, and use the full power of DATATRIEVE to perform any DATATRIEVE task. The use of call interface features such as DTR\$COMMAND, DTR\$DTR, DTR\$INFO, DTR\$LOOKUP, and using ports to transfer data from DATATRIEVE are discussed.

Orientation: Intermediate/Technical

DT029 - A COMPARISON OF CDD AND VAX POWERHOUSE PHD DICTIONARIES

Friday May 1, 1987 10:30 a.m. - 11:00 a.m.

This presentation presents an application developer's view of the features of the VAX POWERHOUSE dictionary which make the development and maintenance of applications easy. These features are contrasted with the data definition philosophy present in the Common Data Dictionary (CDD). The pros and cons of each dictionary approach are discussed.

Orientation: General

DT030 - SELECTING AN APPLICATION DEVELOPMENT FOURTH GENERATION LANGUAGE

Thursday April 30, 1987 11:00 a.m. - 11:30 a.m.

This session presents a description of the selection process that took place in the actual selection of an application development Fourth Generation Language (4GL). A discussion of the tradeoffs facing the person(s) responsible for making the final choice is presented.

Orientation: Managerial

DT031 - UNDERSTANDING VAX POWERHOUSE SCREEN PROCESSING

Monday April 27, 1987 1:00 p.m. - 1:30 p.m.

This session describes the internal field processing logic used by VAX POWERHOUSE. The presentation covers where application specific code can be employed to customize the screen processing. Also the importance of screen processing modes is discussed.
Orientation: Intermediate/Technical

DT032 - USING A FOURTH GENERATION LANGUAGE TO ENHANCE MANUFACTURING SOFTWARE

Thursday April 30, 1987 11:30 a.m. - 12:30 p.m.

Many companies are moving toward using prepackaged manufacturing/financial software for their basic information needs. This session focuses on the use of SMARTSTAR within Criton Technologies to augment and extend the basic package. This is significant because the company has few traditional people, and a good deal of the design and development is done by the users. A Fourth Generation Language (4GL) should provide high productivity to those that use it, and the people who can use it should range from the novice computer user to very experienced programmers.

Orientation: Managerial

DT033 - USING THE DATATRIEVE CALL INTERFACE

Wednesday April 29, 1987 1:30 p.m. - 2:30 p.m.

This session explains and demonstrates the use of the DATATRIEVE call interface. Using the call interface, the user can incorporate a highly effective interactive capability into an application; add functionality to DATATRIEVE by using user-defined keywords; provide very effective menu-driven applications; and, in general, combine the best of both third generation languages, such as COBOL, BASIC or FORTRAN, and the powerful capabilities of DATATRIEVE. Although this session is an advanced session, the emphasis is on demonstrating how easy it is to use the call interface.

Orientation: Advanced/Technical

DT034 - SYSTEM MANAGEMENT TECHNIQUES USING DATATRIEVE

Thursday April 30, 1987 6:00 p.m. - 7:00 p.m.

Examples presented during this session demonstrate how DATATRIEVE can be used to assist system managers with disk space capacity planning and performance management. Data for disk space capacity planning is collected every evening through the use of AUTHORIZE and DISKQUOTA utilities. DATATRIEVE then reads those reports, merging data from both into a single master file. It then processes that file producing historic records of disk usage by user, account, and disk device. Several capacity planning charts and reports are then produced. Performance management reports are created by applying DATATRIEVE to reports generated by the ACCOUNTING utility. DATATRIEVE reads those reports and creates a master work file. It then analyzes fields within the work file and creates several other fields containing interesting ratios and percentages such as faults per CPU second, direct I/Os per CPU second, and percent CPU consumed. Several informative performance management reports and charts are then produced.

Orientation: Intermediate/Technical

DT036 - VAX DATATRIEVE STATUS UPDATE AND INTERNALS

Monday April 27, 1987 2:00 p.m. - 3:00 p.m.

This session first addresses the status of current versions of the VAX DATATRIEVE product. Following the status report, this session provides an overview of some of the internals of VAX DATATRIEVE, and provides some suggestions for optimizing DATATRIEVE applications based on these internals. Some of the areas covered include DATATRIEVE invocation and start-up, procedure and loop organization alternatives, and trade-offs during the execution phase of DATATRIEVE.

Orientation: Advanced/Technical

DT037 - VAX DATATRIEVE'S INTERFACE INTO RELATIONAL DATABASES: HOW

Wednesday April 29, 1987 11:00 a.m. - 12:00 noon

This session presents a technical overview of how VAX DATATRIEVE interfaces into Digital's family of relational database products. The first portion of the talk covers the user-level interface into DATATRIEVE, and how it relates to relational databases. The second portion of the talk covers the more technical aspect of the interface, specifically, covering the internal architecture and design of DATATRIEVE's interface into the relational database itself. Some general areas of coverage include transaction considerations, locking and access considerations, and a comparison of DATATRIEVE commands and how they map into relational databases.

Orientation: Advanced/Technical

DT038 - USING VAX DATATRIEVE GRAPHICS

Monday April 27, 1987 3:00 p.m. - 4:00 p.m.

The VAX DATATRIEVE PLOT statement gives users a quick and easy-to-use method of displaying information as a graph. A wide range of predefined plot formats are used to enhance decision support applications and can be produced in hardcopy form for presentations and reports. This session presents effective techniques for producing graphs from data managed with VAX DATATRIEVE.

Orientation: Intermediate/Technical

DT039 - DATATRIEVE APPLICATION DESIGN CONSIDERATIONS AND TUTORIAL

Tuesday April 28, 1987 2:30 p.m. - 3:30 p.m.

This session describes the way in which a typical application might be analyzed and implemented using DATATRIEVE. The presentation includes initial design considerations, implementation, and performance trade-offs. This session presents information from Digital performance analysts and testing done by the DATATRIEVE/Fourth Generation Languages Special Interest Group (DTR/4GL SIG) concerning various aspects of VAX DATATRIEVE. It discusses design issues (e.g., FOR versus FIND, query optimization, CROSS, nested FOR loops, etc.), Record Management System (RMS) file design and tuning, and some Common Data Dictionary (CDD) considerations.

Orientation: Intermediate/Technical

DT040 - POSITIONING DIGITAL'S FOURTH GENERATION LANGUAGE PRODUCTS

Monday April 27, 1987 10:00 a.m. - 11:00 a.m.

This session describes RALLY, TEAMDATA, the A-to-Z Application Generator, the A-to-Z Data Base Manager, and the VAX COBOL Generator. It also positions these products with respect to each other.

Orientation: General

DT041 - RMS BASED 4GL DEVELOPMENT TOOLS

Tuesday April 28, 1987 11:00 a.m. - 12:30 p.m.

This session is an overview session which describes how A-to-Z is used as an application development tool with emphasis on the Database Manager and Application Generator and how these tools make it possible to create sophisticated applications without Rdb, FMS, CDD, etc. There is an in-depth discussion of the A-to-Z Database Manager and A-to-Z Application Generator and how these products are used to reduce the amount of development effort involved in creating fully integrated applications. This session includes a live demonstration of each product to help illustrate the power of these products as application development tools.

Orientation: Intermediate/Technical

DT042 - BEGINNER'S GUIDE TO INTELLECT/RDB

This session presents a basic description of the essential characteristics of INTELLECT a natural language front-end to Rdb databases. It will describe situations where INTELLECT is effective. At the end of the session, attendees should understand the capabilities of INTELLECT, strategies for using it, and typical situations in which it is effective.

Orientation: Novice/General

DT043 - APPLICATION DEVELOPMENT USING INTELLECT/RDB

Friday May 1, 1987 11:30 a.m. - 12:30 p.m.

This session briefly introduces the capabilities of INTELLECT, a natural language front-end to VAX Rdb/VMS, which allows English language query, update and definition of Rdb databases. The primary focus of the session is on the application development cycle for INTELLECT. Development of a fluent and robust INTELLECT application which meets the needs of its target audience is similar to any other end-user application development process. In this session we examine the lexicon development cycle and consider what should be done in each phase to ensure success. Topics include introducing potential users to INTELLECT, assessing its performance, and strategies for effective lexicon maintenance. Attendees gain an understanding of the overall implementation process and receive practical guidelines for success with INTELLECT.

Orientation: General

DT044 - DATA MANAGEMENT SYSTEMS AND DATATRIEVE/4GL SIGS OPENING

Monday April 27, 1987 9:00 a.m. - 10:00 a.m.

This is the joint opening and roadmap session for the Data Management Systems SIG and DATATRIEVE/Fourth Generation Languages SIG. Come to get a look at what these SIGs do, and what sessions and activities are planned by them for the week of the symposium. SIG Steering Committee members and Digital representatives are introduced.

Orientation: General

DT046 - DATATRIEVE/4GL SIG CLOSING SESSION

Friday May 1, 1987 1:00 p.m. - 2:00 p.m.

This session is the final session for the DATATRIEVE/Fourth Generation Languages Special Interest Group (DTR/4GL SIG). In this session, we wind up any loose ends that have developed during the symposium and establish plans for the Anaheim symposium. At this session, Digital developers respond to the product improvement request (PIR) items which accumulate in the campground during the symposium.

Orientation: General

DT047 - ADVANCED RMS FILE DESIGN AND TUNING FOR DATATRIEVE PERFORMANCE

Tuesday April 28, 1987 5:00 p.m. - 6:00 p.m.

DATATRIEVE performance is dominated by Record Management System (RMS) buffer allocation, file design, and file disorganization. This presentation uses DATATRIEVE graphs to show how the performance monitoring techniques within DATATRIEVE can be used to determine which factors affect optimal file design and tuning for both retrieval and record storage. This presentation discusses the following topics in-depth: how to use the RMS utilities to determine the level of disorganization of a file; the optimal number of buffers; how to optimize files using the File Definition Language (FDL); and how to reload files.

Orientation: Advanced/Technical

DT048 - CDD OPTIMIZATION FOR PERFORMANCE

Tuesday April 28, 1987 4:30 p.m. - 5:00 p.m.

The VAX Common Data Dictionary (CDD) is used heavily by many VAX Information Architecture (VIA) products, including DATATRIEVE, TDMS, and ACMS. But like all databases, the CDD requires proper maintenance and design if it is to perform well. There are a number of things that you can do to improve the performance of the CDD. These activities may generate substantial performance gains for your applications, especially DATATRIEVE. It has been said that good DATATRIEVE performance has five

keys, the first three of which are "Proper use of the CDD". This session provides a short overview of the CDD, its internals, and utilities. Then it covers tools and methods for properly using and maintaining the CDD, and explains what sort of performance gains you can expect if you adopt these techniques.

Orientation: Advanced/Technical

DT049 - EVERYTHING YOU WANTED TO KNOW ABOUT DATATRIEVE-11

Wednesday April 29, 1987 9:00 a.m. - 10:00 a.m.

This talk uses a question and answer format in which a software engineer from the DATATRIEVE-11 development group answers the most commonly asked questions about DATATRIEVE-11. Topics covered include DATATRIEVE-11 internals, how to make the most of DATATRIEVE-11 pool, and future directions. Following are some questions which are addressed: - What do you do when you get "Compiler Pool Space Exhausted"? - What will building with supervisor mode Record Management System (RMS) get me? - Is DATATRIEVE-11 compatible with VAX-DATATRIEVE? - Why isn't I & D space supported? Along with the above questions, the developer addresses any additional user questions.

Orientation: Intermediate/Technical

DT050 - VAX DECREPORTER - A BUSINESS REPORTING PACKAGE

Tuesday April 28, 1987 5:00 p.m. - 6:00 p.m.

This session presents an informational and technical overview of the VAX DECreporter product as an information management tool for end users. The session also presents the new functionality added to the product since the last DECUS symposium presentation. The technical presentation includes points on how to set up your current system to use DECreporter and other VAX Information Architecture (VIA) products such as the Common Data Dictionary (CDD) and DATATRIEVE, as well as an overview on how to use the callable interface.

Orientation: General

DT051 - VAX RALLY: ADVANCED USAGE

Thursday April 30, 1987 4:00 p.m. - 6:00 p.m.

This session discusses how developers have used VAX RALLY to solve real application problems. "How-to" overviews are given on using such RALLY features as windows, lists of values, computed fields, sub-forms, aggregates, and validation. RALLY is discussed as part of a complete Fourth Generation Language (4GL) solution consisting of Rdb/VMS, TEAMDATA, and RALLY. Interfaces to other VMS languages are also discussed.

Orientation: Advanced/Technical

DT052 - PERFORMANCE MANAGEMENT FOR DATATRIEVE APPLICATIONS

Tuesday April 28, 1987 3:30 p.m. - 4:30 p.m.

This presentation discusses the management of performance (speed and resource consumption) for DATATRIEVE applications. It presents specific information to assist you in determining if you have a DATATRIEVE performance problem; and if so, how to fix it. Topics covered include an overview of performance management: the tuning and monitoring tools available; how DATATRIEVE's architecture and internals affect performance; and strategies for improving performance. Hints and kinks for the developer interested in building efficient DATATRIEVE applications also are presented. Since much of the session material applies to almost any data management application on a VAX (including applications in COBOL, BASIC, and other third generation languages), attendees who do not use DATATRIEVE will also be interested in this talk. Bring your System Manager as well, as many of the topics are pertinent to the management of systems with heavy DATATRIEVE usage.

Orientation: Advanced/Technical

DT053 - USING SMARTSTAR TO COMPLIMENT DATATRIEVE

Thursday April 30, 1987 12:30 p.m. - 1:00 p.m.

SMARTSTAR is a user-friendly application development tool. When used in conjunction with DATATRIEVE, SMARTSTAR can be used to develop an efficient relational interface for simple or extremely complex applications in a production programming environment. This session describes the application development process using SMARTSTAR and DATATRIEVE using a simple application. Each step in the development process is described and shown by example. The distribution of application functions between SMARTSTAR and DATATRIEVE is discussed, along with the reasons for choosing to use one or the other, or both.

Orientation: Novice/Technical

Ask the Wombat Wizard - The Architecture of VAX Datatrieve, Part III

Philip A. Naecker, Consulting Engineer, Altadena, CA

In Part I of "The Architecture of VAX Datatrieve," we discussed the purpose of a software architecture and some of the features of the Datatrieve software architecture. We saw how the various components of Datatrieve are broken into several images and linked together using a layered approach.

In Part II, we explored how this layering allows you to modify Datatrieve without having to re-write your new program every time a new version of Datatrieve or any of the other components of the VIA architecture is released.

In this final part of the series, we'll investigate the shareable images that make up the run-time Datatrieve image and discuss the origins of each. We can then also discuss the interface DTR uses to each image and see if this has any implications for your applications or the management of your VAX system.

Shareable Images

Shareable images are special images (.EXE files) that can't be run directly. Instead, a user program must be run that has been linked against the shareable image. It turns out that shareable images are both convenient to program and efficient to use. Shareable images are more than just programs that can be shared. (A shared program is one that uses the same pages of the program in memory for many users. Using shared programs is efficient because each user doesn't have to have a different copy of their program in memory, thus saving memory and ultimately saving page faults and disk IO's.) Shareable images are essentially subroutine libraries that can be called from many different programs without having different copies of the subroutines in memory or on disk - just a single copy. Furthermore, the connection between a program image and a shareable image is made at RUN time, so changing a shareable image can be done any time (as long as it is done in an upward compatible fashion) without requiring any changes in the program images (user programs.) When the user program is activated, the VMS image activator will in turn activate the shareable image as well.

One of the nifty things about shareable images is that you can use a different image simply by pointing at it with a logical name. For example, Datatrieve functions are stored in the DTRSHR shareable image. If you wanted to build yourself a test version of DTRSHR shareable image with a different set of functions, you can use a slightly modified version of the DTRBLD.COM procedure to build it, then point to your test version with the logical name DTR32. When you invoke the DTR32 image, the image activator will recognize that DTRSHR is required and use the DTRSHR logical to find your test version of the shareable image instead of the production version.

Shareable Images used by Datatrieve

Datatrieve uses many different shareable images. Some of them are explicitly linked into the DTRSHR image or into the terminal server. Here is the LINK command that is used to build the DTRSHR image, for example.

```
$ link/nosyslib/nomap/notraceback/shareable=-
  sys$common:[syslib]DTRSHR.EXE sys$input/options
  identification="VAX DTR V4.0-1"
  cluster=transfer_vector...dtr$library:DTRLIB.OLB-
  /include=(dtrentry)
  cluster=cddshr...sys$common:[syslib]cddshr.exe/shareable
  cluster=lbrshr...sys$common:[syslib]lbrshr.exe/shareable
  cluster=cobrtl...sys$common:[syslib]cobrtl.exe/shareable
  cluster=forrtl...sys$common:[syslib]forrtl.exe/shareable
  cluster=librtl...sys$common:[syslib]librtl.exe/shareable
  cluster=mthrtl...sys$common:[syslib]mthrtl.exe/shareable
  dtr$library:DTRLIB.OLB-
  /library/include=(DDM)
  dtr$library:DTRFUN.OLB/library
  sys$common:[syslib]starlet.olb/library
  psect_attr=$pdata.pic.usr.con.rel.lcl.shr.exe.rd.nowrt.nover
  gsmatch=lequal.1.1
```

Note that Datatrieve explicitly invokes six shareable images (CDDSHR through MTHRTL).

- CDDSHR is the CDD interface routines.
- LBRSHR is the VAX Librarian Utility. That is used to support help libraries.
- COBRTL and FORRTL are the COBOL and FORTRAN Run Time Libraries, and those contain a number of utility routines (for formatting and data manipulation and the like) that DTR uses.
- MTHRTL is the mathematics RTL. On a microVAX, this in turn is pointed to a file UVMTHRTL using a logical name.

If you to include functions in your site-specific function definitions (that's the file DTRFUN.OLB) that reference a shareable image, you would need to a reference to the shareable image in a manner similar to that used for the RTL's above.

Besides the explicitly referenced shareable images, DTR accesses a number of other shareable images as well. Using a program that checks to see what images are open, I find the following result after DTR has been running for a while.

| | |
|--------|--------------------------------------|
| DTR32 | The DTR program image |
| DTRSHR | The DTR shareable image |
| CDDSHR | We know where all these come from... |
| COBRTL | |

| | |
|------------------|---|
| FORRTL | |
| LIBRTL | |
| UVMTHRTL | |
| LBRSHR | |
| SECURESHR | Part of VMS - knows about access control. |
| CDD.DIC | The CDD itself |
| YACHT.DAT | The data file I'm using (!) |
| DTRMSG | The DTR message file |
| CDDEXC | The CDD message file |
| SHRIMGMSG | More messages |
| SORTSHR | VMS Sort |
| TPUSHR | TPU |
| TPU\$CCTSHR | More TPU |
| EVE.TPU\$SECTION | Still more TPU |
| TPUMSG | And the TPU messages |
| RDBSHR | Rdb |
| RDBMSG | Rdb's messages |
| RDBBMSG | ..and more messages |

Now, we know that the Run Time Libraries and LBRSHR are all linked explicitly with DTR. And we know about the message files (from last month's column) - those were linked in dynamically once they were referenced. And the CDD.DIC and YACHT.DAT are no mystery. So where did the other files come from?

First, a little history. Before VMS Version 4.0, all shareable images had to be explicitly linked in with the image (except for message files.) That means that, for example, if you had Rdb on your system, the RDB shareable images would be linked in explicitly with the DTRSHR. However, in V4.0, VMS changed the image activator. The change made it take substantially longer to activate (start from the DCL \$) images that had many shareable images linked in. To reduce the impact of this change, and for other very good reasons, VMS also provided a means to dynamically locate additional shareable images and reference them. This mechanism is called LIB\$FIND_IMAGE_SYMBOL, and it is very powerful.

Thus, when DTR needs a shareable image like, say, TPU, it simply uses LIB\$FIND_IMAGE_SYMBOL and dynamically links with the new image. How does it find the image symbol? It uses the image name (TPUSHR) and gives it to RMS with a related file specification of SYSS\$SHARE:.EXE. RMS of course attempts to translate the image name, and that is how logical names can be used to change the image that is dynamically activated.

So, what good is it?

"So," you ask. "What good is all this? Who cares if I can use a logical name to control the image?" Well, besides the fact that you can test the DTRSHR that you build with new functions, before you turn it loose on the general population, you can also control other images that DTR uses. For example, you might want to have a test version and a production version of Rdb on your system simultaneously. (As long as you are careful that the database files each creates are compatible, and that both are compatible with DTR.) You might do the same with new forms products (which don't appear in my list above, but work the same way.)

The only limitation in this technique is that the image you point to using your logical name must match what DTR expects in the call interface. In particular, the major and minor version numbers of the images should be compatible, and each of the symbols DTR expects must exist in the image. Otherwise, you will get an error from LIB\$FIND_IMAGE_SYMBOL.

Just remember - if you use any of these short-cuts to test new software versions, use a fully supported method (like following the installation instructions for the software product) before you start complaining about any bugs you find.

An Interesting Aside...

You will note that DTR uses the same shareable image as you use at DCL in order to sort files (SORTSHR.) You might assume therefore that sorting inside of DTR should be just as fast as sorting outside of DTR. In principle, this is true. In practice, it may not be true for several reasons.

VMS SORT supports several different sorting processes. The default when you call SORT at DCL or in a program is for sort to use a record sort, in which entire records are passed between your program (or file) and SORT. The sort utility manages the records, allocates virtual memory and work file space, and in general optimizes the sort for performance. The record sort is very efficient, because sort does not have to do very much IO.

DTR uses another type of sort process, the tag sort. In this sort method, just the keys are sorted and a record tag or pointer is used to re-access the sorted file or record stream. In a sort of an RMS file, the tag is the RFA - record's file address. In a sort of a database, the tag is the DBKEY - a unique pointer to the record. A tag sort requires more IO than a record sort, and so is slower.

DTR could use the record sort in some cases, but in others DTR must use the tag sort. Presently, however, DTR uses ONLY the tag sort and is therefore less efficient than VMS SORT at DCL level. Of course, you can't use DCL SORT unless you are sorting the entire file (or can write a description of the records you want to sort using the SORT description language.)

There is another reason DTR is slower than DCL SORT. It seems to allocate very, very little memory to the sort shareable image to do the sort. In contrast, DCL SORT will use prodigious amounts of VM when sorting large files. On a VAX, heavy use of VM is almost always faster than doing extra IO, but DTR does not give SORT that opportunity.

To illustrate the point, consider the following very simple case. I took the sequential version of YACHTS file and copied it into itself to make a somewhat larger file of 1808 records. Compare the results of the following two sequences of statement in DTR:

```
$ @test
$ define cdd$default "CDD$TOP.DTR$LIB.DEMO"
$ DTR VAX Datatrieve V4.0
DEC Query and Report System
Type HELP for help
```

```

DTR>fn$init_timer
DTR>ready_yachts
DTR>for a in yachts sorted by type print "a" on NL:
DTR>fn$show_timer
ELAPSED: 0 00:00:39.98 CPU: 0:00:18.97 BUFIO: 7 DIRIO: 2364 FAULTS: 347
DTR>finish !
DTR>fn$init_timer
DTR>fn$dcl("SORT/STAT/KEY=(POS:1.SIZE:20.CHARACTER) -

```

YACHT.DAT YACHT.DAT")

VAX Sort/Merge Statistics

| | | | |
|---------------------|-------------|-------------------------|-------------|
| Records read: | 1808 | Input record length: | 41 |
| Records sorted: | 1808 | Internal length: | 41 |
| Records output: | 1808 | Output record length: | 41 |
| Working set extent: | 2204 | Sort tree size: | 1870 |
| Virtual memory: | 578 | Number of initial runs: | 0 |
| Direct I/O: | 28 | Maximum merge order: | 0 |
| Buffered I/O: | 8 | Number of merge passes: | 0 |
| Page faults: | 306 | Work file allocation: | 0 |
| Elapsed time: | 00:00:05.22 | Elapsed CPU: | 00:00:04.11 |

```

DTR>ready_yachts
DTR>for a in yachts print "a" on NL:
DTR>fn$show_timer
ELAPSED: 0 00:00:18.37 CPU: 0:00:09.21 BUFIO: 137 DIRIO: 1831 FAULTS: 8
DTR>exit
$

```

In the first test, I did a FOR...SORTED BY to illustrate the typical way you might go about processing a domain you need to have sorted. (The "print "A" on NL:" is about the closest thing in DTR to a NOP.) In the second test, I spawned a subprocess running SORT to perform the sort of the entire YACHTS file for me.

If you add up the CPU time from the spawned SORT and the FOR loop, you notice that it takes considerably less than the 19 CPU seconds used in the FOR A...SORTED case. The direct io's are also much less. Of course, there is some overhead from spawning the subprocess (a couple of cpu seconds on a 11/780). Also, the problem with the SORT I've done is that I am making a copy of the entire file - something that isn't practical if your input file is thousands of blocks or you are interested in only a few records. But the performance difference between a DCL sort and a DTR sort goes up as the number of records goes up, so you might consider pre-sorting sequential files into a convenient order before you do extensive reporting, especially if you can always use the same sort order in your report.

Our little experiment does point out that sometimes it is better to use DCL SORT than to use the DTR interface to the exact same shareable image.

Here are some user's questions and the Wiz's answers.

Dear WW:

I have a problem that I hope the Wombat Wizard Can solve.

Each month my company sends out a mailing to an average of 9,000 clients. Since it takes about two hours to print 2,000 pieces (one box), this really cuts into the normal operations schedule. And since a faster printer is not a viable option, I wanted to come up with a more efficient method of printing this monthly mailing. My idea was to break the mailing into multiple output files so that the printing could be spread out over many days, thus not monopolizing the printer with one job for so long.

I attempted to make the response to the "ON" statement a variable determined by a "COMPUTED BY" statement. The program is:

```

DECLARE NUMBER PIC 99999.
DECLARE OUT COMPUTED BY
CHOICE
NUMBER BT 1 AND 1999 THEN "OUT1.LST"
NUMBER BT 2000 AND 3999 THEN "OUT2.LST"
NUMBER BT 4000 AND 5999 THEN "OUT3.LST"
ELSE "OUT4.LST"
END_CHOICE EDIT_STRING IS X(9).
FOR file SORTED BY ZIP BEGIN
NUMBER = NUMBER + 1
PRINT SKIP.
NAME (-), etc.
ZIP (-) ON OUT
END

```

The variable execution never takes place. The output is always directed to "OUT.LIS".

Is there some way to accomplish this goal so that the operations staff can be happy and more productive?

Sincerely,

Debra in Nebraska

Dear Debra:

Before we talk about the solution, let's understand what happened to your own attempt to solve the problem.

First, the reason the file is always directed at OUT.LIS is that the argument to the ON statement is a filename, not a variable or value expression. Thus, if you named your COMPUTED BY variable FOO instead of OUT, the file would have ended up as FOO.LIS because the "ON FOO" statement interprets the FOO as a filename. (The .LIS comes from the RMS Default Filename in the call DTR makes to RMS to create the file. If you put "ON FOO.DAT" then the file would end up as FOO.DAT.)

Second, you should look for a copy of the Wombat Examiner from about a year ago and find the article by Sue Harris. She talks about the stages of DTR command execution. You will see in that article that the processing for the ON clause takes place only once - at the time the entire BEGIN-END clause is compiled into an executable form. Thus, even if the ON clause took a value expression, or you could trick DTR by using a logical name and the FN\$CREATE_LOG function, it would not help because DTR does the processing of the ON only once - at the beginning.

Now, let's see if we can construct a solution.

Since you know how many records you have how many you want to put in each file, you could do something like the following. Put your PRINT statement in a sub-procedure, thus:

```
DEFINE PROCEDURE PRINT_ONE_LABEL
! This procedure is the PRINT statement for a single label
PRINT NAME(-), etc.... ZIP(-)
END_PROCEDURE
```

Then invoke that procedure four times, each time to a different device. You could use the CHOICE statement (not the CHOICE value expression - check the documentation for the difference) and invoke the procedure with the correct ON statement.

```
FOR file SORTED BY ZIP BEGIN
  COUNTER = COUNTER + 1
  CHOICE
    COUNTER BT 1 AND 1999 THEN :PRINT_ONE_LABEL ON OUT1.LST
    COUNTER BT 2000 AND 3999 THEN :PRINT_ONE_LABEL ON OUT2.LST
    COUNTER BT 4000 AND 5999 THEN :PRINT_ONE_LABEL ON OUT3.LST
    ELSE :PRINT_ONE_LABEL ON OUT4.LST
  END_CHOICE
END
```

My own preference, assuming the mailman doesn't mind, would be to rotate between files for each label, using the FN\$MOD function. That way we don't have to know in advance how many labels there are - only that we want them divided into four separate files.

Another solution is to use Callable DTR. One of the easiest things to do with Callable is to call DTR\$DTR (the DTR terminal server) and tell it to only return to your program when it has a print line for the terminal. Your program could then capture the print line, decide which of the four files to print it on, and send the line to that file. To use this approach, write a program to call DTR\$DTR and set the bit indicate by DTR\$M_OPT_LINE so that DTR returns control to your program when it reaches a PRINT stallpoint. Your program can be trivially small - just invoke DTR\$DTR with the proper bit set (after first calling DTR\$INIT to start up DTR), and define your report procedure using the DTR\$STARTUP logical name.

There are numerous other solutions using DTR, but I'm afraid the best solution of all is no farther away than your DCL manual. Use the /PAGES qualifier in the PRINT command.

\$ PRINT/PAGES=(lower.upper)

The default for the lower bound is the first page and the default for the upper bound is the last page. You could print the same file in as many portions as you want this way.

Also, your operations people in charge of the printers have even more control. They can use qualifiers on the START/QUEUE command to restart a job at any position in the job. See the documentation on the /SEARCH and /FORWARD qualifiers for more information.

Good luck!

Sincerely,

The Wombat Wizard

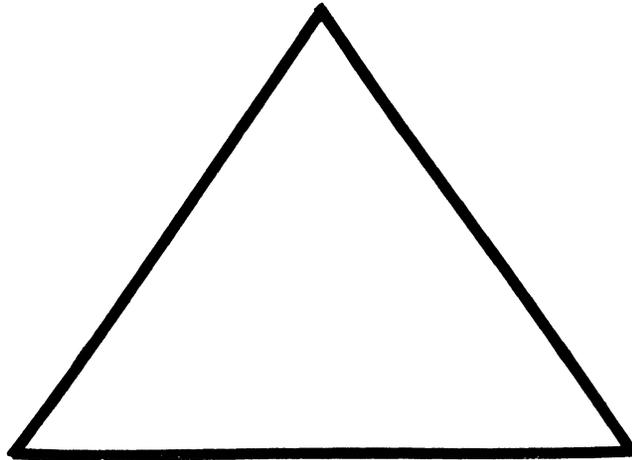
-

Coming Soon...

Coping With DEC's Office Automation Products Using Datatrieve
Programming User Defined Functions
Spring 1987 Product Improvement Request Ballot
and more...



edusig



(Sponsored by the EDUSIG SIG)

Are you satisfied with the administrative system at your educational institution? If not, are you considering a change? Are you wondering how to go about selecting a new system? This seminar can help solve these problems with an integrated set of useful tactics for assessing the administrative needs of an educational institution.

Much preliminary work should be done before beginning to research software vendor literature or hearing sales presentations. It is necessary first to decide what the institution and its component parts should do to improve administrative management. Furthermore, one must decide which of those functions can best be accomplished or improved by a new computer system. Only then can the market be intelligently searched.

Participants in this seminar will not merely receive a survey of available systems, but will participate in an in-depth discussion of effective preparatory steps for the system selection process. The cost of this seminar can be repaid many times over in time and dollar savings for any institution contemplating such a project.

Credentials:

Mr. Robert Green has a B.A. degree in Economics from California State University in Los Angeles and an Advanced Mathematics Degree from the University of Cambridge, England. He has held the position of Director of Corporate Information Systems for an international transportation firm, and presently has his own management consulting partnership. He specializes in financial and information systems planning, concentrating on the integration of information systems planning into the overall organizational master plan, serving both corporate and educational clients.

Prerequisites of Attendees:

Attendees should have an interest in the acquisition of Administrative systems, although no special background is required.

by Neicole M. Crepeau
and Tom Allison

Choosing software for colleges is difficult. Most software just doesn't meet the needs of the academic environment. Or, it's only a teaching tool, with no application to the real-world. Does this sound familiar:

- o your language meets the needs of beginning students, but is too simple for advanced students (or vice versa).
- o student's find the language so cumbersome, they lose interest in exploring and trying new things.
- o the language is outdated and doesn't prepare students for work in the business world.
- o every time a project is due, your VAX system crawls. At the end of the semester, it stops dead.

If any of these problems sound familiar, Touch Technologies, Inc. has developed a language which could be your solution. INTOUCH is a next-generation language for VAX/VMS computers. The language is similar to PASCAL or structured BASIC, and includes an advanced database interface--making it even more powerful than PASCAL. INTOUCH has been widely praised as a simple, yet powerful, instructional tool.

INTOUCH offers a number of features to meet the needs of colleges today. It incorporates traditional structured programming concepts. Yet it is a 4th generation language; powerful enough to be used in the real-world, yet simple enough to be taught in schools. Though INTOUCH is being used in businesses across the country, the language is simple enough that even beginning students can use it.

INTOUCH is a compiler which acts like an interpreter. Students are notified of errors IMMEDIATELY--so they don't lose interest from lengthy compiles. Work is done in an interactive environment, encouraging students to experiment and explore.

INTOUCH offers advantages to instructors. It allows you to interrupt program execution, change code, and continue execution, in a matter of seconds. How many times have you tried to explain what happens if you change the program like this or that? Now when students pose questions, you can change the code, show them the results, and return to your lecture.

INTOUCH includes a transparent interface to all VMS file management systems. It allows instructors and students to learn one language, while experimenting and comparing numerous DBMS's.

Students can concentrate on the differences between hierarchical and relational databases, or sequential versus indexed keys, instead of spending their time learning the details of different database languages.

INTOUCH's debug facilities perform on the level of assembler debuggers, yet simple enough for students to use. Algorithm analysis, one of the most difficult subjects for students to learn, can be taught in an understandable and useful way with INTOUCH's built-in code analysis package. INTOUCH also lets you dynamically show the contents of variables. So student's can learn how variables change in memory, and how software and hardware interact.

All of this is available with a minimal impact on your school's VAX/VMS system. INTOUCH is extremely easy on system resources, and can help you fit more students on your computer--even during crunch periods. INTOUCH has been used to run as many as 64 users on a MicroVax II.

INTOUCH is a real-world language. It is being used across the country for development of business applications, administrative software and for scientific research. INTOUCH makes learning easier, and helps prepare students for real-world programming. It is a next-generation language; ideal for instructors, and the next-generation of programmers.

Remarks from the editor:

I've taught programming using the INTOUCH language and find it clean, clear and fast.

Fred BELL



DECUS

GRAPHICS

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DIGITAL ANNOUNCES THE X-WINDOWS SYSTEM WILL BECOME THE CORPORATE STANDARD

Digital announced its intention to use the X-Windows System developed at Massachusetts Institute of Technology (MIT) as the basis for its new DECwindows program. The newly announced DECwindows program is intended to provide users with network-transparent application programming interfaces for windowing, graphics, and user interface services for all its systems running under the VMS, ULTRIX, and MS-DOS operating systems.

The announcement of the new interface program follows Digital's decision to endorse X-Windows as an industry standard. At a meeting with other computer manufacturers in Boston, Digital indicated that a consistent and open windowing standard based on X-Windows would assist both software developers and users alike. This shift in Digital's position first became evident at Fall 1986 *GAPSIG* Symposium sessions, where Digital announced that future window developments would not necessarily be tied to the existing products, in particular the UIS interface.

The DECwindows program is an example of Digital's commitment to that standard. According to Richard Treadway, Digital's VMS Product Manager, "Our customers have indicated they would prefer an **open windowing system across multiple hardware and software architectures**. In addition, they have asked that Digital lead the effort to develop and promote public standards and multivendor environments."

The X-Windows system, which was developed at MIT, is an endorsed industry standard. It runs on hardware from a variety of vendors, including IBM and Hewlett Packard. In January, Digital and nine other major vendors endorsed X-Windows. According to Treadway, "Digital supports recognized industry standards such as X-Windows. We can think of no stronger endorsement than a public commitment to the development of an architecture based in this standard." By providing a common user interface and application environment, the DECwindows program will simplify the task of running application programs that span the cost/performance curve from personal computers to 32-bit workstations. Users will be able to choose a combination of these workstations, each running a common user

interface, to solve their computing needs.

According to Treadway, "Digital remains committed to support for its existing desktop windowing products. With the introduction of the DECwindows program, we will provide software tools and migration aids for those customers who have implemented applications [using UIS and previous versions of X] and wish to take advantage of the DECwindows architecture."

At the DECUS Symposium, Treadway noted that "... full portability may eventually require integration with current UIS applications. If so, Digital will provide coexistence products, tools or support to protect customer and application partner investment." However, it appears that DECwindows will be the major system for all future Digital window development.

At the symposium, the commitment to cooperate with users and DECUS was clear. "Digital's plan will be reviewed with our application partners, DECUS and other customers before it is finalized and we are committed to making periodic public reports on the progress and further definition of this ... effort." Over the past several months, the DECUS *GAPSIG* has been working closely with Treadway and other Digital personnel to clarify the issues involved with moving to the new windowing standard. In the coming months, the *GAPSIG* will sponsor a number of articles, symposia sessions and other activities designed to prepare Digital users to make quick and full use of the new software.

The *GAPSIG* wishes to thank Digital for their openness in their plans and receptiveness to suggestions on this issue. If you have any comments or suggestions yourself, feel free to contact the *GAPSIG* Sig Chair, Bill Kramer, NASA Ames Research Center, NAS Systems Division, Moffett Field, CA 94035.

GRAPHICS PRE-SYMPOSIUM SEMINARS

For the Nashville symposium, there will be three exciting pre-symposium seminars offered by the Graphics Applications Special Interest Group on the Sunday before the symposium, April 26. Pre-Symposium seminars give attendees a chance to spend a full day involved with a topic, thereby providing a great deal of information and training. One of the seminars the GAPSIG is presenting, *Generating Efficient Postscript Documents*, was a success at last Fall's San Francisco symposium. The seminar *Using GKS - A practical Guide to Programming GKS Applications* is an expanded version of the half day seminar presented during the past two symposia. A new seminar, requested by a number of attendees in the past, is on the topic of *Software Usability Engineering - or Secrets for Creating Effective Applications*.

These seminars are explained in more detail below. In order to register to attend one of these seminars or any of the other 75 pre-symposium seminars, look for the Nashville Symposium Preliminary Program and registration booklet which is sent to every DECUS member, or call the DECUS office at (617) 480-3259.

USING GKS - A PRACTICAL GUIDE TO PROGRAMMING GKS APPLICATIONS was expanded from a seminar that discussed GKS and UIS for Vaxstations, which was presented at the last two symposia. The seminar has been reorganized to reflect the growing importance of GKS in Digital's product line, which gains added importance based on Digital's recent announcements regarding UIS (see related articles in this issue). The GKS standard defines a set of functions used to produce two dimensional graphics. Since GKS is a device independent interface it allows a programmer to create applications that will run on several different devices.

This seminar focuses on creating VAX GKS applications. An overview of the GKS standard will be given. The various VAX GKS functions will be discussed with programming examples provided in PASCAL, BASIC, FORTRAN and C, illustrating their use. The seminar will also cover the use of attributes, input, segments and transformations. In particular, the seminar will discuss:

- Attribute Specification Methods
- Using Transformations for Picture Composition, Scaling, Zooming, Panning, and Multiple Simultaneous Views

- Using GKS to Obtain Input
- Advantages of Using Segments, Segment Transformations, and Segment Input.

Other topics which will be discussed are VAX GKS data structures and writing device-independent applications. This seminar will emphasize the creation of applications through the use of GKS with many examples and the exploration of application development in a step by step method.

The presenters of this seminar, Deborah Stephans and William Wernsing, are software specialists who provide support for Digital's graphics products, specifically VAX GKS, and are involved in field testing VAX GKS and other graphics products. They also teach the "VAX GKS SUPPORT SEMINAR" held several times a year for Digital employees in the U.S. and Europe. In addition, the speakers provide VAX GKS pre-sales presentations, demos, and on-site training for Digital customers.

This *USING GKS - A PRACTICAL GUIDE TO PROGRAMMING GKS APPLICATIONS* seminar is important for anyone who is developing or considering the development of graphics applications on VAX system, or for any system using GKS. The seminar assumes experience with programming in a high level language and with VMS. It also will assume a basic understanding of computer graphics techniques.

GENERATING EFFICIENT POSTSCRIPT DOCUMENTS was a seminar which received great reviews at the San Francisco symposium. The seminar explores the issues and techniques for using Postscript for high quality text and graphics applications. Postscript is the page description language coming into wide use as the interface to laser printers and window systems. For people developing a software application that writes output pages in the form of Postscript files this seminar will recommend many techniques to help you make the best use of available resources.

Applications can suffer in function or performance from improper or inefficient use of PostScript. Whether your application is a text formatter, a WYSIWYG editor, a graphics package or a CAD system, speed and accuracy of the printed output is important to you. The seminar topics include:

- A Model Postscript Device Drives
- What is ideal PostScript
- Structuring conventions, modularity and specifics for DEC laser printers

- How to use font metrics An Overview of the PostScript Interpreter, Including
- The graphics image model
- Datatypes and stacks
- The font cache and virtual memory Advanced Uses of PostScript
- Dictionaries and name scoping
- Saving and restoring mechanism
- Changing and preserving coordinate transforms
- Digitized and synthesized images
- Halftoning
- Font management
- Customization
- Variations on the show verb
- Debugging aids and techniques

The seminar will be presented by Matt Foley who is a customer support engineer for Adobe Systems, the company that invented PostScript. Matt developed the Advanced PostScript course for Adobe and consults with manufacturers, OEMs and third party software developers to help create and optimize PostScript drivers. Matt has a BS and MA from Stanford. He will be assisted in the seminar by a Digital developer involved with developing PostScript drivers and translators.

This seminar is intended for programmers who are actively involved in writing applications that generate PostScript or for anyone interesting in page description languages.

SOFTWARE USABILITY ENGINEERING OR SECRETS FOR CREATING EFFECTIVE APPLICATIONS is a new seminar being offered by the GAPSIG. Usability Engineering is an engineering process for achieving known levels of usability in software. It is a new and exciting area of study and development which allows the manager or developer to define, both operationally and in advance, what levels of usability are desired. Usability, once operationally defined may then be traded off against other desirable product qualities, such as cost, schedule, reliability, maintainability, and performance.

This seminar introduces operational definitions of usability, conceptual tools for measuring usability, tools for setting the appropriate usability goal levels for products, tools for organizing and applying engineering solutions in an effort to achieve usability goals, and tools for measuring product performance against these tools.

GAPSIG is lucky to have John Whiteside, a Consulting Software

Engineer at Digital as the seminar presenter. He serves as supervisor and technical director of the Software Usability Engineering group. This eight person group consists of a variety of software engineers and industrial engineers who are responsible for the usability of many of Digital's software products. John holds a Ph.D. in cognitive psychology from the University of Rochester, and a M.S. in Computer Science from Worcester Polytechnic Institute. He has been active in human-computer interaction for over seven years and has worked for Digital for six years.

Attendees of this innovative seminar should have an interest in software user interface issues. The material presented should be useful to software developers, managers, technical writers and product managers who are in the position to contribute to or need to evaluate the usability of software.

All of these GAPSIG seminars contain exciting information for anyone who is developing on Digital systems, particularly graphics applications. The seminar program has been growing and in San Francisco, over 1500 people participated. This time make sure you don't miss the unique opportunity to learn something new! If you have any questions, call Bill Kramer at (415) 694-4418.

Analysis and Commentary

In the exciting announcement made recently, Digital and nine other computer vendor to endorse a windowing system as an industry standard. The move is a welcome one for people who use Digital systems, setting the stage for a single interface which will allow transportability, across different hardware and operating systems. In the past, software standards have made a tremendous impact in the growth and usability of software. There is no reason to expect a windowing standard to be any different.

The move by Digital and the other vendors is reminiscent of the development of Ethernet, where Digital, Xerox and Intel cooperated in developing and endorsing the Local Area Network. No one can question that ethernet is now an international standard, and a center piece of network systems. X-Windows, the basis for the DECWindows program, was developed at MIT by Project Athena. Project Athena is funded mainly through grants and projects from IBM and Digital. Since X-Windows is a publically domain program, it has been ported to many different system, there by generating a large base of support.

That is not to say this is the end of the *Window Wars* . There were major workstation vendors who were absent from the list endorsing X-Windows. There are technical points where other window system are better. There is an ANSI committee looking at windowing issues and may eventually arrive at a standard. Thus, X-Windows will still evolve, possibility to incorporate 3-D abilities and more function.

This announcement is a major step forward for Digital Equipment users. It will now be possible to develop a window application on any Digital operating system - VMS, Ultrix and even MS-DOS, and transport that application to any hardware or any other operating system. It also allows application on one system use window functions on another. This has the potential to increase the number of products available and decrease the delivery time for software on all the operating systems.



H M S

HMS

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- o HARDWARE HINTS AND KINKS

FROM THE EDITORS -- Bill Walker/Carmen Wiseman

DEADLINE FOR THE NEXT ISSUE: 23 MARCH 1987

I have updated the HMS "How To Submit" page in the back section of the combined newsletter. Please note that you can now send material on just about any reasonable media including diskettes from an IBM PC (no accounting for taste). You can also submit articles via DCS, CompuServe, or EasyLink. Hardcopy, like cash, is always acceptable, too.

Yes, that is a hint . . .

Basically, we are going to try to get out a minimum of four issues a year. If we have enough material (actually, any material) in any given month, however, we'll publish it.

Bill Walker
Editor

The HMS SIG has long been in need of a logo/mascot ala the Commercial Languages seal or the L&T "leverage" cartoon. But we need your help in selecting the right critter or image to represent us. I was thinking of something along the lines of the MicroBear I picked up at the Digital Micro Systems Development booth at the last symposium. If you have other ideas, please send them to the HMS Newsletter and your Humble but Talented Assistant Editor will promptly do a graphic rendition. If we get two or three decent suggestions, we can have a contest to choose the one everyone likes best. Keep in mind, however, that the editors will summarily dismiss anything to do with antipodean marsupials. Next time, the newsletter will run a roadmap to HMS sessions in Nashville. See y'all there!

Carmen D. Wiseman
Assistant Editor

IT'S THE SAME OLD SONG...

Some cross-pollination from the RT-11 SIG: Thomas J. Shinal notes that his company is experiencing reliability problems with TK50 tape drives on some of its MicroVAX II systems. Tom says, "Nosing around brings similar complaints from other users. If you have any hints/kinks/complaints etc., send them to me. I'll act as a clearinghouse and forward them to the appropriate DEC bodies--and perhaps solve my own TK50 problems, some of which may be 'cockpit' errors and some not."

We at Digital Review went through seven TK50 drives in as many months, not to mention the Great Cartridge Drought of 1986. (I'm still hearing of lengthy delays in obtaining cartridges, despite claims that they're now available off the shelf. Anyone else having trouble?) I doubt that all of Tom's TK50 hassles are due to pilot error, although Digital would probably like to think so. I've read both DEC and independent reports that try to attribute TK50 reliability problems solely to user abuse and misuse, rather than to inherent design flaws. It's true that TK50s are better than they used to be, however: ours hasn't died for at least a month! (Scratch that...as I write, field service is installing another one.) Some folks may tell us to sit tight until the TK70 arrives, but who knows when that will be--or even whether the TK70 will be an improvement?

If you have a TK50 horror/war story or advice on how to live with the half-inch beastie, why not tell us about it at the HMS Newsletter? We'll pass along any info we receive to Tom Shinal in the hope that he can indeed get DEC's ear long enough to let people know that there are still problems. It would be a great thing if the TK50 were as wonderful in practice as it is in theory.

cdw

Q-BUS MEMORY COMPARISON -- Scott Taylor

EDITOR'S NOTE

The following article consists of a set of related notes and tables submitted by Scott Taylor, the results of a study that he conducted comparing the relative speeds of several Q-Bus memory boards. He has managed to include just about every major manufacturer of Q-Bus memories except DEC and Camintonn. (He couldn't get evaluation units and "did not know anyone with DEC or Camintonn memories.")

Scott Taylor owns Douglas Engineering (Santa Monica, CA), an engineering and consulting firm specializing in optimizing hardware/software interfaces in time-critical and other unique applications.

Initially I set out to show how much faster one memory board was than another. I first noticed the difference between boards while timing short instruction loops. As the testing and comparison progressed, I found that speed was not necessarily the most important factor in choosing a memory board.

Note: The following applies only to the LSI-11/73, not to the 11/23, and only when a floating-point chip is installed.

The LSI-11/73 floating-point accelerator chip can cause problems with some memory boards, particularly the faster ones. When there is a floating-point exception (dividing by zero is the most common example), a "short cycle" occurs. In simple terms, what happens is that the CPU requests a memory fetch, then changes its mind. The SYNCH signal is asserted for a short period and then removed. Some memory boards can handle this, but others become corrupted. New releases of the floating-point chip in 1987 may or may not solve the problem.

Several memory manufacturers are aware of the short SYNCH cycle problem and have devised fixes; others have not. All manufacturers were notified IF their board failed the test. To date, only one manufacturer has indicated that the problem has been fixed. Early versions of some boards will fail, but current versions function properly. Therefore, a test program has been included to enable testing a board directly. Older memories (the slower ones) that do not start their memory cycle until DIN or DOUT occur do not exhibit the problem.

The following FORTRAN-77 program can be run to determine if a particular memory board, floating-point chip and CPU are compatible when short SYNCH cycles occur. The program should be run once with the cache enabled and once with the cache disabled. (Un)commenting the cache control register lines before compiling will take care of this.

Boards that pass the test put a message on the screen to that effect. Boards that fail the test crash the monitor (under RT-11 V5.2) during or after the test (usually immediately), or produce unrelated error messages and abort the program. A few of the memory boards tested would fail on the first occurrence one time and complete several thousand another. Therefore, 100,000 iterations were performed to give the memory every chance to fail. One memory board completed all 100K iterations but corrupted other parts of memory. That board crashed shortly after the test was completed when other operations were performed. Because of this, running the program a few times may be safer than increasing the iteration count.

```

program FPTest
c
logical F,T
c
c call ipoke("177746,"1000) ! this turns the cache memory off
c
F = .false.
T = .true.
c
c call ErrSet(73,T,F,F,F,15) ! intercept divide by zero error,
c                               ! prevent program from aborting
c
icount = 0
icount = 0
c
c 100 continue ! a real do loop doing this sort of nothing would
c           ! be optimized out of existence so we'll simulate
c           ! one
c           a = 1234./0. ! divide any real*4 number by zero
c
icount = icount + 1
if(icount .lt. 1000) go to 100
icount = 0
itimes = itimes + 1
type 872,itimes ! put periodic progress reports on the
c               ! screen
c if(itimes .le. 100) go to 100
c
type 666
666 format(' Memory/Floating Point chip compatibility test'
1      ' complete')
c
872 format('+',i4) ! optional lines, type 872 ... and this one
c
c call ipoke("177746,"0) ! this turns the cache back on
c
call exit
end

```

It is important to note that the fastest memory board is not necessarily the best choice. Price and packaging (dual or quad) along with other factors (see Hardcopy, January 1987, "Q-Bus Memory Access Times Are the Result of Several Factors") are equally or more important.

If a particular application is 100 percent compute-bound, the tables represent the amount of speed increase you can expect. When input/output (disk access or terminal output) is involved, the external device is usually the limiting factor.

Also, before coming down too hard on memory board manufacturers, you should be aware that the LSI CPUs don't take full advantage of bus transaction times. By using current 11/23 and 11/73 CPU chips and modifying only the support logic on the CPU boards, you can obtain significant increases (almost double) in performance without exceeding Q-Bus timing specifications.

Because of the amount of effort involved with CPU vs. memory testing, block-mode testing was not performed. I will, however, pass on some information gathered during my discussions with the manufacturers. During block-mode DMA, several of the newer memory boards could show an increase in speed much greater than that shown with CPU testing. This is because some of the high-performance disk controller boards take full advantage of the bus timing specs. If a memory board responds in less time, an increase in speed will result during block-mode DMA transfers. The increase will be the difference in access time x the number of accesses x two. The factor of two exists because a board must actually respond twice for every transfer, once to acknowledge and once to un-acknowledge (DIN to Reply and Reply to DIN). These increases may only be noticed in applications with extensive input/output, or where more than one DMA device is heavily active.

Because few DMA controllers and external devices are actually capable of maintaining full bus bandwidth (maximum) transfer rates, the realized increase in speed will be less than the difference in memory board response times. External RAM disks and caching disk controllers are the most likely to make use of faster memories and full bus bandwidth.

It has been pointed out that my write test loops, not the instruction under test, took several read cycles for each write cycle. In addition to the test results in the tables, another set of tests was performed using 100 in-line instructions with no loop. The results and ratios were similar, with differences of less than one percent. During short timing tests, memory refresh conflicts accounted for most of the differences. Some of the memory boards use refreshing techniques that make refreshing almost transparent, although the 11/23 at 20 MHz shows refresh conflicts for all of the boards tested.

Two special notes:

The Clearpoint board tested had 120ns DRAMs. The Q-Ram board is normally shipped with 150ns DRAMs but was available with 120ns DRAMs on request, at no extra charge.

The Chrislin CI-1173 board has a jumper option that enables an advanced reply ability. Results for this board are given with advanced reply enabled and regular. There are errors in some manuals for this jumper, so contact your sales rep for the correct configuration.

All times are in microseconds. Uncertainty is plus or minus 100ns. Differences of around one percent should be ignored since manufacturing variations, temperature, backplane termination and loading can have effects in that range.

The normalized times are for comparison. A board taking 1.056 took 5.6 percent longer than the fastest board in that column.

| Manufacturer and Model | Act Time | Normalized | Act Time | Normalized |
|------------------------|----------|--------------|----------|---------------|
| LSI-11/73 CPU | - - | Cache On - - | - - | Cache Off - - |

Memory Read-Modify-Write Results

| | | | | |
|------------------------|---------|-------|---------|-------|
| Clearpoint Q-Ram | 1053445 | 1.000 | 3160319 | 1.000 |
| Andromeda MM22-3 | 1053445 | 1.000 | 3160319 | 1.000 |
| Chrislin CI-1123+ | 1053446 | 1.000 | 3160319 | 1.000 |
| National Semiconductor | 1053761 | 1.000 | 3166791 | 1.002 |
| Eastern Digital | 1061656 | 1.008 | 3185668 | 1.008 |
| Chrislin CI-1173 (Adv) | 1079782 | 1.025 | 3207726 | 1.015 |
| Chrislin CI-1173 (Reg) | 1079782 | 1.025 | 3218265 | 1.018 |
| Monolithic Systems | 1079782 | 1.025 | 3429663 | 1.085 |
| Andromeda MEM-11 | 1079783 | 1.025 | 3447930 | 1.091 |

The instruction used for the Read-Modify-Write test was INC A. The CPU fetches the instruction and the contents of memory location A, adds one and writes it back to memory. The fetches come from cache memory during the Cache-On test, but the write must go to main memory in both cases.

| Manufacturer and Model | Act Time | Normalized | Act Time | Normalized |
|------------------------|----------|--------------|----------|---------------|
| LSI-11/73 CPU | - - | Cache On - - | - - | Cache Off - - |

Memory Write Results

| | | | | |
|------------------------|---------|-------|---------|-------|
| Andromeda MM22-3 | 1185098 | 1.000 | 3160282 | 1.000 |
| Clearpoint Q-Ram | 1185098 | 1.000 | 3160282 | 1.000 |
| National Semiconductor | 1185118 | 1.000 | 3174158 | 1.004 |
| Eastern Digital | 1188775 | 1.003 | 3185990 | 1.008 |
| Chrislin CI-1123+ | 1220374 | 1.030 | 3160283 | 1.000 |
| Chrislin CI-1173 (Adv) | 1224601 | 1.033 | 3226121 | 1.021 |
| Monolithic Systems | 1224601 | 1.033 | 3439680 | 1.088 |
| Andromeda MEM-11 | 1224684 | 1.033 | 3443561 | 1.090 |
| Chrislin CI-1173 (Reg) | 1228049 | 1.036 | 3259020 | 1.031 |

The instruction used for the Write test is MOV R0,A. Since the source is a register, only the instruction is fetched from memory. The destination will always be main memory. Because of this cache, ON/OFF test results do not vary as much as those for the Read-Modify-Write test.

| Manufacturer and Model | Act Time | Normalized | Act Time | Normalized |
|------------------------|----------|--------------|----------|---------------|
| LSI-11/73 CPU | - - | Cache On - - | - - | Cache Off - - |

Memory Read Results

| | | | | |
|------------------------|---------|-------|--|--|
| Andromeda MM22-3 | 3160284 | 1.000 | | |
| Clearpoint Q-Ram | 3160285 | 1.000 | | |
| Chrislin CI-1123+ | 3160285 | 1.000 | | |
| Chrislin CI-1173 (Adv) | 3160286 | 1.000 | | |
| Chrislin CI-1173 (Reg) | 3160286 | 1.000 | | |
| National Semiconductor | 3174456 | 1.004 | | |
| Eastern Digital | 3185861 | 1.008 | | |
| Monolithic Systems | 3440537 | 1.089 | | |
| Andromeda MEM-11 | 3450567 | 1.092 | | |

The instruction used for the Read was MOV A,R0. Since the destination was a register, all fetches would be from the cache memory if is is enabled; therefore, only the Cache-Off test was performed.

| Manufacturer and Model | Act Time | Normalized | Act Time | Normalized |
|------------------------|----------|------------|----------|------------|
| LSI-11/23 CPU | - - | 20 MHz | - - | 13.8 MHz |

Memory Read-Modify-Write Results

| | | | | |
|------------------------|---------|-------|---------|-------|
| Andromeda MM22-3 | 1608760 | 1.000 | 2131266 | 1.001 |
| Clearpoint Q-Ram | 1621105 | 1.008 | 2128534 | 1.000 |
| National Semiconductor | 1640548 | 1.027 | 2236970 | 1.051 |
| Eastern Digital | 1652521 | 1.027 | 2266614 | 1.065 |
| Chrislin CI-1173 (Adv) | 1653284 | 1.028 | 2244373 | 1.054 |
| Chrislin CI-1123+ | 1715825 | 1.067 | 2225066 | 1.045 |
| Chrislin CI-1173 (Reg) | 1736947 | 1.080 | 2244372 | 1.054 |
| Andromeda MEM-11 | 1891249 | 1.176 | 2405881 | 1.130 |
| Monolithic Systems | 1895642 | 1.178 | 2439598 | 1.146 |

Memory Write Results

| | | | | |
|------------------------|---------|-------|---------|-------|
| Andromeda MM22-3 | 1708709 | 1.000 | 2298489 | 1.000 |
| Clearpoint Q-Ram | 1716084 | 1.004 | 2302257 | 1.002 |
| National Semiconductor | 1739217 | 1.018 | 2392872 | 1.041 |
| Eastern Digital | 1742554 | 1.020 | 2400111 | 1.044 |
| Chrislin CI-1173 (Adv) | 1752440 | 1.026 | 2410854 | 1.049 |
| Chrislin CI-1123+ | 1786980 | 1.046 | 2439832 | 1.061 |
| Chrislin CI-1173 (Reg) | 1832028 | 1.072 | 2410853 | 1.049 |
| Andromeda MEM-11 | 1963595 | 1.149 | 2576431 | 1.121 |
| Monolithic Systems | 1980371 | 1.159 | 2537446 | 1.104 |

Memory Read Results

| | | | | |
|------------------------|---------|-------|---------|-------|
| Andromeda MM22-3 | 1617630 | 1.000 | 2140397 | 1.006 |
| Clearpoint Q-Ram | 1627927 | 1.006 | 2128505 | 1.000 |
| National Semiconductor | 1637620 | 1.012 | 2240955 | 1.053 |
| Eastern Digital | 1646184 | 1.018 | 2249672 | 1.057 |
| Chrislin CI-1173 (Adv) | 1663388 | 1.028 | 2266060 | 1.065 |
| Chrislin CI-1173 (Reg) | 1714602 | 1.060 | 2273298 | 1.068 |
| Chrislin CI-1123+ | 1746221 | 1.079 | 2277826 | 1.070 |
| Monolithic Systems | 1884590 | 1.165 | 2412488 | 1.133 |
| Andromeda MEM-11 | 1920358 | 1.187 | 2435119 | 1.144 |

The Read and Write tests each performed 300,000 iterations. The Read-Modify-Write test performed 200,000 iterations. This ratio was selected to give the same elapsed time for all three tests. It can be seen that Read-Modify-Write operations take 50 percent longer than reads or writes. A read or write cycle requires an address cycle and a data fetch or store. The Read-Modify-Write cycle requires the address cycle and a fetch and store.

HARDWARE HINTS AND KINKS

Tom Provost, Jeff Killeen

RD/BA123 HINT

BA123 cabinets are shipped with panels installed only for the disk drives that come with the original system package. But Jeff Killeen notes that if you want to add non-DEC RDxx disk drives to a Q-Bus system in a BA123 box, you can get the write protect-drive on-line/off-line panel from Trimarchi and Associates in State College, PA.

VAXSTATION KINKS

The VAXstation II is a basically a MicroVAX II with one additional board to communicate with a pretty screen. It looks like this board, the VCB01, is the source of several fairly serious problems.

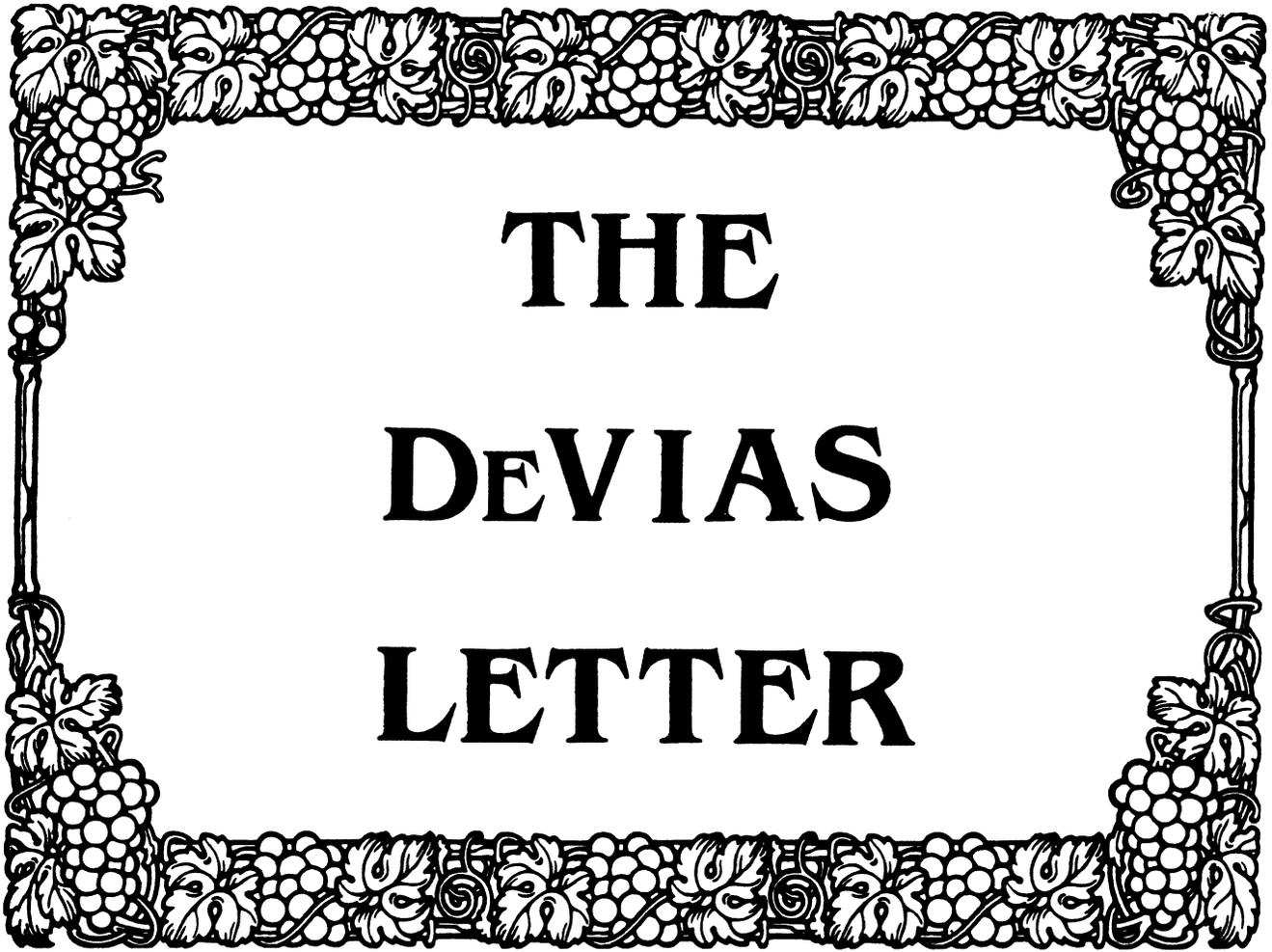
First, the VCB01 apparently doesn't know how to handle multilevel Q-Bus interrupts! I had to disassemble the VCDRIVER to verify this, as no level of software support yielded source listings to the VAXstation software and the available hardware documentation was inadequate and incorrect. Digital must be aware of the problem, because the driver checks for stolen interrupts and then BUGCHECKS when it finds them. I finally talked to someone from Digital who admitted interrupt-stealing to be a known problem. (I wish DEC would let us know about these "known problems." It would have saved me many man-hours.)

Second, when housing a VAXstation and a full set of boards, the BA123 cabinet appears to misread vectors from boards far from the CPU. This occurs with no power problems, but there seems to be a timing problem when the signals must pass through too many boards. Again, the VCB01 appears to be a contributing factor. If someone recognizes this as another "known problem," please let me know before I spend too much time debugging it.

Third, we have found one VCB01 board that causes our data acquisition operations to fail intermittently. Three other boards work fine. The circumstances required for failure are very complex: a UNIBUS-based front end is sending high-speed DMA and interrupting frequently.

All of these problems occur in situations where the pretty monitor screen is not in use, so we can always avoid them simply by removing the board. The trouble is that our users have grown addicted to multiple screens. If anyone has any suggestions or advice, please contact the HMS Newsletter.

Tom Provost, HMS SIG Chair



THE DEVIAS LETTER

IAS

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CONTRIBUTION GUIDELINES

Contributions for the newsletter should be sent to:

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

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

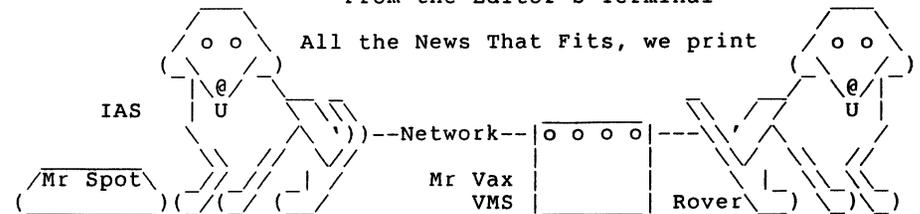
1. Non machine readable sources, (SPR's etc,) should be reasonably dark to insure good photocopying. Text whatever should be the equivalent of 66 lines at 6 lpi, with 4-line top margin, 5-line bottom margin, left-margin 10, right margin 74 at 10cpi. If using a DEC LN03 for output, use left-margin 8, right margin 72.
2. Machine readable sources may be submitted on 9-track Mag-tape, (800,1600, or 6250 BPI,) DEC-tape II, DecMate floppies, or whatever. We're not fussy, we'll even accept paper tape or cards. Preferred format is DOS or BRU for tapes, Files-11 for DEC-tape II.
3. 1200 baud dial-up modems are available on our IAS system and our VAX, with various servers available. Give the editor a call at (312)-791-2515 (preferably later in the day,) to obtain access information, etc.
4. If long distance dialout is not possible on your system, we'll be willing to call your system and do the work, (unless you want to transfer the entire manual set at 300 baud.)

Any media sent to us will be promptly returned.

ASK THE DEVIAS WIZARD

If you have a problem you would like to submit to the Devias wizzard, write a letter or fill out a copy of a standard SPR and send it to the Editor at the above address. Answers to problems from members (or anyone) should also be sent to the Editor.

From the Editor's Terminal



This issue starts off with a bang. (Caused by an impending system crash.) Hans Plasman of Information Services, The Netherlands has sent us info on a bug in the DB and DR handlers. Seems if they are running on 22bit UMR machines and try to correct a disk read error using ECC code, they end up "correcting" unknown parts of core, rather than the offending bad read. An example of great deceptive work by Hans, along with thanks for quickly sharing it with other IAS users, (especially ones who do not subscribe to the Software Dispatch.)

If you have been intrigued by the series of MACRO-11 to MACRO-32 conversion articles, look at the abstract for the IAS pre-symposium seminar for the Nashville meeting. It looks like a good one.

The DeVIAS Demon makes his first appearance, answering the user's questions, (now if we can just get the Demon to stop talking...)

This month's program of the month is a solution to the complex pip command structure necessary to change file protection codes, (which even IAS wizzards usually need 2 or 3 tries at.) The program PRO will clear the system and owner delete privileges for a file, (or multiple files, wild carding is supported.) A companion program, UNP, UNProtects files. We didn't include the source for UNP, since UNP is the same as PRO, with only the line "NEWPRO=164210" changed to read "NEWPRO=164000"

Things have been hot and heavy, and our conversion project has slipped again. We should have something again next issue. Some day I might get a job where I don't wear 3 or 4 different hats, but for now...

Spring is only 4665600. clock ticks away.

DB/DR Disk Handler BUG Report

Hans Plasman
Information Services
The Netherlands

This article deals with a potentially dangerous bug in the handlers for disk drivers using ECC to correct corrupted transfers. Mr Plasman graciously supplied copies of corrected DR and DB handlers to the editor. The editor has taken it upon himself to expand upon these sources to provide the rest of the article.

The DB, (RP04/05/06) and DR (RP03/03) handlers have been found to have a serious bug in their ECC handling routines. This bug only occurs on 22 bit machines that use unibus mapping registers, (UMR's.) In essence the handlers use information in the QIO request to map to the information that was just transferred into memory and to correct it using information from the ECC polynomial. Unfortunately part of this information is overwritten by the UMR routine ..ALMR, resulting in the wrong part of the CPU memory being "Corrected."

DESCRIPTION OF THE PROBLEM

The ECC correction routines expect to be called with the following information still in the paramter block of the IO request node:

R.PB+2(R1) = Low 16 bits of real address of buffer
R.PB+12(R1) = High bits of real address of buffer

Unfortunately, the handlers routine ALMR: calls ..ALMR to allocate UMRs for the transfer. The HNDLIB routine ..ALMR does the following:

```
JSR    PC,..URAD
MOV    R3,M.SL(R2)
MOV    R4,R.PB(R1)
MOV    R5,R.PB+2(R1)
```

The lower order 16 bits of the address returned in R.PB+2(R1) along with the upper bits of the address returned in R.PB(R1) are now suitable for addressing the proper UMR, but no longer represent the actual in core address of the data transfer. (This corruption of the IO request node paramters is noted in the Guide to Writing a Device Handler, but it is on the next page of the description, and the first time the Editor read the description, he too failed to notice it.)

SOLUTION

The following edit procedures should be applied to any DR.MAC and/or DB.MAC, (and to DRMU.MAC and DBMU.MAC if they are used.) In an effort to support users of earlier versions of IAS, the editor prefers to supply solutions in this form rather than a SLP command file,(which would only work with the current version.) Its a good idea to keep the original .MAC source file around, so that if DEC comes out with a SLP correction patch, it can be applied to the virgin file, and then this patch added.

1. Locate the line:

```
DRVBSY: .WORD 0 ; DRIVE BUSY BIT MASK
```

and insert the following line after it

```
SAVPB2: .WORD 0 ; Save Parameter word 2
```

2. In the routine "ALMR:" locate the line:

```
CALL @#..ALMR ; ALLOCATE UMRS
```

and insert the following line BEFORE IT

```
MOV R.PB+2(R1),SAVPB2 ; Save low 16-bits of address
```

3. In the routine "ECC:" locate the line:

```
MOV R.PB+2(R1),R1 ;; GET LOW 16 BITS....
```

And replace it by the following lines:

```
TST UMRFLG ;; Are we using UMR'S ?
BEQ 1$ ;; Br if not
MOV SAVPB2,R1 ;; Get low 16 bits of 22
1$: MOV R.PB+2(R1),R1 ;; Get low 16 bits of 18
2$:
```

The handler should then be re-assembled and task built using the standard DEC command files, and included into your system via a syngen.

Ten Years Ago Today

The March 1977 Multi-Tasker reported that:

- o New submissions to the DECUS LIBRARY included:

MAP: Disk Block usage. An RSX-11D task to print a map of all logical blocks on a disk. If the block was used the program printed the first file-ID number of the file using the block. The authors caveat noted that the program was "Not suitable for large disks."

REC: The fabulous file recover program, originally from Ray French at Boing.

DTY: An alphabetical Directory listing program. (An ancient precursor of SRD.)

ACC: A program to tabulate the output from the copious accounting reports created by ACCLOG.

SEND: The famous terminal to terminal communication program first appeared in the library.

- o A user complained that he thought \$200 was too much to pay for a full day DEC seminar on the new RSX-11M version 3. After paying \$1200 per year for software maintenance, he thought that he should get something off the basic DEC price. (Look at the software costs now ed.)
- o A user provided a correction to the old EDIT editor commands:

| | |
|-----------------------|----------------|
| The command of | LC/A/B&LC/D/E |
| Operating on the line | ADADAD |
| Should result in | BEBEBE |
| But actually gives | B &EB &EB &E |
| While the command of | LC/A/B/&LC/D/E |
| Works correctly | |

The command prior to the concatenation character ('&' was the concatenation character,) must be properly terminated. Oh the days of dumb terminal editing.

- o Finally, as even occurs now, there was a discussion of what to do about CANADA users who wanted to join a US Sig if there were no equivalent Canadian SIG, and a report on suggested revised By-laws due to the recently approved DECUS sig reorganization.

Pre-Symposium Seminar

GETTING STARTED WITH VAX MACRO
(Sponsored by the IAS SIG)

Learn to write and understand MACRO programs.

This seminar is a practical introduction to programming in VAX MACRO. The emphasis is on working programs that demonstrate the essential parts, the syntax, and the commands.

- o Introduction
- o Fundamentals
Basic programs
Assembler concepts and source code format.
- o Basic Addressing Modes and How They Are Used
- o The VAX Instruction Set
- o Procedure Calls
CALLx, RET and the VAX calling standard
Linkage to higher level language procedures
- o Structured MACRO
- o I/O from MACRO Programs
- o Optimization of MACRO Programs

The goal of this seminar enables the attendee to write complete working programs and understand the essentials. With this introduction to VAX MACRO you should be able to return to your VAX and continue to develop your understanding.

Credentials:

Kerry Wyckoff has extensive experience using VAX assembly language, which has followed several years of RSX-11M/M+ and IAS experience using MACRO-11. He has been active in DECUS for many years.

Prerequisites of Attendees:

Attendees should be familiar with a high level or assembly language and programming principals and wish to create working MACRO programs on a VAX under VMS in one day. No knowledge of MACRO-11 or MACRO-32 is required.

Ask the DeVIAS Demon

From: Harold Salwen
Professor of Physics and Engineering Physics
Stevens Institute of Technology

Dear Devias Demon,

For me, the major benefit of the consolidation of the DECUS Sigs newsletters is that I find interesting material in sections that I never would have thought of subscribing to. As a PRO/350 owner who previously had done scientific computing mostly in Fortran on the DEC-10 and was (when I bought my computer) rather ignorant with regards to the PDP11, I find this extremely useful.

In particular, I have enjoyed reading a number of articles in the IAS section (including yours on PDP to VAX conversion) even though I'm still not sure what IAS is! I have some basic questions which may or may not be appropriate for the DEVIAS WIZARD; if they are not appropriate, I don't know where they should be directed.

1) The wealth of PDP11 operating systems is rather confusing. I'm now fairly clear on the relation between P/OS (my opsys) and RSX11M/PLUS and I understand the special position of RT-11 but I really don't know what distinguishes IAS from RSX and I have no idea how RSTS fits into the scheme.

2) What is the distinction between PDP and LSI and does this have anything to do with the fact that some 11's use QBUS and some use UNIBUS (not to speak of my own CTI bus)?

Dear Professor,

Actually, there are even MORE PDP11 operating systems than the ones you mentioned. Although we may miss a couple, lets try to give a somewhat chronological listing of the various systems. We will loosely break them up into 3 parts, and we will not discuss 3rd party operating systems and or enhancements such as UNIX and TSX.

THE EARLY YEARS - CIRCA 1972

When the PDP11 first came out, (as the PDP11/20,) there were only four systems available for the fledgling computer, PTS-11 and (for those lucky enough to have a big disk like an RK03,) DOS-11, RSTS, or RSX11-C. Remember that anything over 4K words of memory was a BIG computer.

PTS stood for, (oook, gaak,) Paper Tape System. This was a core only high speed paper tape (you had to have the high speed paper tape reader punch at least, no more program load and dump thru a Teletype,) system. What you got were an editor, (ED11) a machine language assembler, (PAL11) a set of loaders, an on-line debugger, (ODT11) a set of device IO routines, (IOX) and a math package for the new floating point unit, (FPP11) You could also run an interactive BASIC if you had at least 4k words of memory. If you expanded to 8K of memory you could run a MULTI-USER version, and support up to eight users, (at least for very small programs.) This Basic, of course, did not support any file IO or program storage.

DOS stood for Disk Operating System (of course.) This included the above mentioned editor, assembler and ODT, along with a task linker, (LINK11) a set of file utilities, (PIP11, Peripheral Interchange Program) and a librarian, (LIBR11) DOS supported disks ranging in size from the 65536 word RS64 fixed head disk, all the way up to the RP02 which held all of 10M words. (The RK05 was not yet a DEC product, and DEC relabeled another manufacturer's drive as the RK03.) With this you could run ANSI standard FORTRAN-IV. Yours truly wrote a couple of handlers for DOS. This was unfun work, with a very primitive editor, stupid debugger, and cryptic error messages.

RSTS was ReSource Timesharing System. (Note that it had not gained the "/E" in the name.) RSTS could support up to SIXTEEN terminal users running an enriched version of Dartmouth BASIC. It was designed for the education environment, to be used for teaching programming and simple time sharing.

RSX11-C was the precursor of the current RSX systems, (and your system.) Realtime System eXecutive was a port of an operating system that ran on the PDP15. In it's initial form it was designed to provide support for Digital's Industrial Data Acquisition and Control System. IDACS was a series of hardware modules designed to interface to industrial control, (as opposed to connecting to laboratory equipment, etc.) At the C level, you did program development etc. using DOS, then had to switch to RSX to run your application, (and could not do development.)

Already at this time one could see the 11 systems multiplying like rabbits. Although RSX had not yet developed its own disk system, you already had two different disk storage structures for DOS11 and RSTS. Around this time DEC also came out with their own communications processing system, COMTEX-11. (This would be used for instance to let a PDP11 be a front end terminal processor for a large computer system.)

THE MIDDLE YEARS - CIRCA 1976

By this time, systems and variants had really multiplied.

PTS-11
was still around, but almost no-one really bought a system without some kind of mass storage system.

CAPS-11
was an operating system for the short lived dual cassette drive. (These drives used modified audio cassettes to store data.) The best that can be said about them is that they were quickly supplanted by floppies.

RT-11
had made its appearance. Again, it had a different disk structure than DOS or RSX. The basic structure was still the same as today, capability of running one fast real-time application, with program development as a background task. Variations of RT-11 were produced catering to special uses, including:

1. DECgraphic-11, a series of computer-based graphic systems.
2. DEClab-11, a laboratory data handling system.
3. Gamma-11, a system for processing nuclear medicine scans.
4. PHA-11, a system for nuclear and X-Ray spectroscopy.

MUMPS
(Massachusetts general hospital Utility Multiprogramming System) appeared. It is an operating system and data base management package developed at Massachusetts General Hospital. Although initially built to support a hospital environment, MUMPS has acquired a wide usage as a general data-base system. MUMPS is somewhat unique in that it is an interperative language and system, thereby avoiding any assembly or linking.

Typeset-11
was a computer based system for setting type, text storage and editing, classified ad handling and related business applications. (Various versions of Typeset also ran on PDP-8's and PDP-10's.)

RSX11-D
had supplanted RSX11-C. In the process it gained another different file structure, basically the one used by 11M, POS, and (in an enhanced version,) by VMS. On-line Disk Structure, (pronounced odious,) had arrived. RSX11-D supported simultaneous multiple real-time tasks, along with program development. One could now submit BATCH jobs, (just like big blue,) and run a wide variety of compilers, (FORTRAN, BASIC, COBOL, etc.) Also three spin-offs had been made from 11-D.

RSX-11M
was created by taking the EXEC of 11D and paring it down to its essentials to create a multi-user system that would run on the smaller DEC computers. (11D required an 11/40 or bigger computer, and required memory management hardware.) 11M did keep the common disk structure and system calls of 11D.

RSX-11S
was a small stand-alone system for very small PDP's. It was a core only system that one could generate on an 11D or 11M system, and then down line load to the small PDP, (typically over a phone line.) The Real time family was now complete, comprising Dad, Mom, and Son. But then DEC blew the family concept when it introduced - - -

IAS
Interactive Application System was created by adding two things to 11D. The developers provided a good package for system security, including good password and protection features and the ability to restrict any user to only using part of the system, (such as not letting users BOOT the system disk.) They also provided a Scheduler, which heuristically promoted and demoted tasks in priority so that interactive tasks (such as editors,) got good terminal response, while number crunchers and batch runs got demoted to lower priority. The result was a system whereby one could support a mix of program development, real-time and batch. As a result of this, IAS was being widely used as a multi-user operating system, with the Real-time capabilities often little used. The security features made the system especially attractive to Hospitals, Banks, and Government. Users who had a more open environment usually opted for 11D or 11M. Most programs written for 11D, 11M or IAS would run equally well on all three systems.

RSTS
had become RSTS/E, (E for extended.) The greatly enhanced BASIC language, along with comprehensive file protection, print spooling, etc. made RSTS a system that many 3rd party suppliers would use to produce commercial packages for more mudane operations such as payroll, accounts payable, etc. Not bad for a computer Digital originally targeted for the school environment.

COS-11
had also debued, Commercial Operating System was directly aimed at the smaller office environment. It was a package built around DEC's DIBOL, (Digital Business Oriented Language, DEC's answer to COBOL for mini's which had first appeared on the PDP-8.) Although larger, more sophisticated users would take an RSX or IAS system running COBOL, or a RSTS/E system running BASIC and develop or buy their application packages, smaller users could buy a turn-key package with ready-made applications, and without having to have massive computer expertise to use it.

THE MATURE YEARS - TODAY

By now, some shaking out has occurred, the ranks have thinned, and DEC has pared their offerings down to a manageable handful.

Due to cheapening prices of mass storage systems, PTS-11 and CAPS-11 have suffered a well deserved demise.

RT-11

is now the package for lower-end 11's. Mostly used in a lab or engineering environment, often networked to larger mini's or super-minis. DEC has gotten out of the business of supporting specialty operating systems or packages, so DECgraphic-11, DE-Clab-11, Gamma-11 and PHA-11 are no longer mentioned. The simpler operating system and file system do not lend themselves to multiple users or large disks.

RSX-11M and RSX-11M-Plus

are the multi-user real-time systems used in cases where system security is of less importance. As mentioned before, 11M is the system of choice for smaller system, M-Plus provides many enhancements such as larger programs using supervisor mode, multiple batch streams, accounting, etc. As all operating systems tend to grow, another "trimming" has been done to create Micro/RSX for operation on the new micro-PDP11's.

RSX11-D

is no longer supported. Some users have stabilized their operations at version 6.2, most have either migrated to RSX-11M-Plus or to IAS.

RSX-11S

is still the operating system for stand-alone, diskless systems. Loading method is usually from an RSX, IAS, or VMS system, usually over DECnet.

IAS

is still going strong, mainly due to the enhanced security features, the multiple priority scheduling system which lets one support more users, the ability to support different CLI (command Line Interpreters) at each terminal, and the many users (such as ourselves) who have become locked to the system by the enhancements and modifications we have made. IAS is the only major PDP11 operating system not supported on the micro series of PDP-11s.

RSTS/E

has really grown up. The original multi-user BASIC only limitation is now gone, and RSTS now supports the popular languages, FORTRAN, BASIC, COBOL and DIBOL.

DSM-11

(now Digital Standard MUMPS,) has become a very powerful package for data-base management.

CTS-300

has replace COS-11. It still is a DIBOL based commercial system, (basically a layered product added on top of RT11. A version that ran on top of RSTS/E called CTS-500 is no longer actively mentioned. It still is more of a turn-key package for the smaller office environment.

Finally, DEC has recognized UNIX, and offers an enhanced version 7.0 UNIX system called ULTRIX-11. A major point could be made that ULTRIX-11 and ULTRIX-32 (on the VAXen) provide a very nearly transparent transition between the 16-bit and 32-bit worlds of DEC.

UNIBUS VERSUS Q-BUS

Although it is initially confusing, the difference is simple. DEC calls any PDP-11 or VAX that uses the UNIBUS a Mini-computer, and any PDP-11 or VAX that uses the Q-BUS a Micro-computer. Lets take them in somewhat chronological order.

UNIBUS was the first PDP11 bus, coming out on the PDP11-20. It comprised 56 lines, including:

- 18 Address Lines, A0 - A17.
- 16 Data Lines, D0 - D15.
- 2 Xfer mode lines, C0 and C1
- 1 Master sync line, MSYN
- 1 Slave sync line, SSYN
- 2 Parity lines, PA and PB
- 4 BUS request lines, BR4 - BR7
- 4 BUS grant lines, BG4 - BG7
- 1 DMA request line, NPR
- 1 DMA grant line, NPG
- 1 acknowledge line, SACK (Selection ACKnowledge)
- 1 Bus control line, BBSY (Bus BuSY)
- 1 Bus control line, INTR (INTeRrupt)
- 1 Master reset line, INIT (INITialize)
- 2 Power fail lines, ACLO and DCLO

The UNIBUS is designed for expansion, after 20 devices or 50 feet of bus cable, one should add a UNIBUS repeater. Older PDP11 hardware tended to be multiple cabinets with many devices and long cables. Two versions of the UNIBUS came out later. MODIFIED UNIBUS was a physical re-structuring of the BUS lines on system units, while EXTENDED UNIBUS was MODIFIED UNIBUS with 4 extra address lines, and is used on 11 44's, 24's etc for memory. Unibus system units are set up to hold hex or quad size boards, and come in 4 and 9 slot versions. If you fill up one cabinet, you run a cable to another expansion cabinet. If you have too many devices, you use a unibus repeater to buffer the load. The UNIBUS is terminated at each end by 180 ohms to +5 volts and 330 ohms to ground, yielding a voltage divider with a thevenin equivalent of 120 ohms.

Q-BUS was DEC's answer to lowering the cost of the BUS for the

smaller Micro computer. The main difference is that it is multiplexed. The Address and Data signals share the same lines, a separate control line is used to tell which is which. Q-bus looks like this. (Note that early Q-bus computers only had 16 or 18 address bits, and some early controllers had the same limitations, and early Q-BUS versions did not have 4 levels of interrupt request/grant.)

- 16 Multiplexed Data/Address Lines, BDAL0-15
- 2 Multiplexed Parity/Address Lines, BDAL16-17
- 4 Extended address lines, BDAL18-21
- 6 Data xfer control lines,
BBS7, BDIN, BDOUT, BRPLY, BSYNC, BWTBT
- 6 System control lines,
BHALT, BREF, BEVNT, BINIT, BDCOK, BPOK
- 10 Interrupt and DMA control lines
BIAKO, BIAKI, BIRQ4, BIRQ5, BIRQ6
BIRQ7, BDMGO, BDMR, BSAK, BDMGI

The Q-bus is designed for physically smaller systems. Although two bus cycles are required to talk to a peripheral (due to the multiplexed address and data,) faster bus operations (due to shorter bus lengths and no extension cables,) make up for this. The end result is a package specifically aimed at physically smaller computers. Q-BUS system units are designed to hold Dual or Quad sized interface boards. Q-BUS systems normally run with a 120 ohm terminator at the CPU end only, (due to the short length of the BUS,) and can support up to 35 loads. The exception is the MicroVAX-I which uses a 220-ohm CPU terminator and can support 20 ac loads. Both busses can be expanded, (the PDP version to 45 loads, the MicroVAX-I to 35,) by adding a 120 ohm terminator at the END of the bus. Both versions are still limited to 20 DC loads. Finally, the Q-BUS is not designed to be expanded with expansion cabinets or bus repeaters, (although those things are available from other parties.)

Finally there is the CTI bus used in your micro. The main difference is that although the lines are similar, the physical board sizes and layouts are a departure from the older DEC dual/quad/hex format. As such the PRO series are limited in their expansion capabilities, (1 free slot on the 325, 3 on the 350 and 5 on the 380.) They are also limited in that there aren't the slew of 3rd party manufacturers making interfaces for that bus.

If this hasn't totally overloaded you by now, good. If anyone out there feels I left out their favorite operating system or variant, sorry about that. I'm beginning to feel overloaded myself.

From: Frank Borger
Michael Reese Medical Center
Editor, The DeVIAS Letter

Dear Devias Demon,

Your editor is getting tired of not having a KERMIT usable on IAS. Since our VAX has a good KERMIT, our IAS system is green with envy.

We have waited and waited for RMS version 2.0, and are still waiting.

We have looked at converting the RMS11 version to work with RMS version 1.8, or with FCS.

We have grumbled over the inclusion of a TASK IMAGE ONLY on the SIG tape distribution, (without inclusion of changed sources or even object modules.) The TASK only works if you are running the correct version of IAS and of RMS11, so that lets out almost everyone from using it.

We got 11-803, KERMIT for IAS from the DECUS library, but gave up on it, since it was written in RATFIV, (there are probably more versions of RATIONAL FORTRAN out there than there are people who program in RATFOR or RATFIV, and we just gave up on trying to support packages written in these pre-processors.)

We are beginning to grasp at straws, such as bringing up the old RT11 emulator under IAS, and then running RT KERMIT. (Now that's grasping.)

Are there other IAS users interested in getting a working KERMIT going, (or users who already have done it?) Anyone out there who's interested, please get in touch.

```

MICHAEL REESE MEDICAL CENTER DEPARTMENT OF MEDICAL PHYSICS COMPUTER
PRO.MAC;30 PAGE 1
.TITLE PROTECT
.SBTTL INTRO PAGE
.IDENT /MRH001/
;
;PROTECT IS A SYSTEM PROGRAM DESIGNED TO LET THE INEXPERIENCED
;(OR EXPERIENCED) USER CHANGE THE PROTECTION CODES FOR A FILE
;WITHOUT HAVING TO DO BATTLE WITH THE COMPLEX SYNTAX NEEDED TO
;ACHIEVE THE SAME RESULT WITH PIP
;
;A TYPICAL COMMAND SEQUENCE WOULD BE
;
;MCR>PRO FILENAME.EXT;VERS
;
;PROTECT WILL CHANGE THE FILE PROTECT CODES FOR THE FILE
;TO [RWE,RWE,RWE,R]
;
;PROTECT SUPPORTS WILD CARD OPERATIONS, WITH A RESTRICTION THAT
;VERSION # MUST BE * OR EXPLICIT IF NAME OR EXTENSION ARE WILD
;
;MAIN PURPOSE IS TO PROVIDE A SIMPLE METHOD FOR AN OPERATOR TO
;PREVENT A FILE FROM BEING DELETED (SUCH AS A .TSK FILE).
;
;A COMPANION PROGRAM, UNPROTECT (...UNP) WILL RESET THE FILE
;CHARACTERISTICS TO THE SYSTEM DEFAULT OF [RWED,RWED,RWE,R]
;
; FRANK BORGER
; MICHAEL REESE MEDICAL CENTER
; DEC 1976
;
.MCALL FRSZ$,FINIT$,FDBDF$,FDP$A,QIOW$,DIR$,EXIT$$,CLOSE$
.MCALL GMCR$,GCML$,GCMLB$,CSI$,CSI$1,CSI$2,OPEN$,NMBLK$
DIRSTA=0
;VALUE TO SET NEW PROTECT CODE TO ([SYSTEM,OWNER,GROUP,WORLD])
;164000=[RWED,RWED,RWE,R]
;164210=[RWE,RWE,RWE,R]
NEWPRO=164210
.PAGE
.SBTTL MAIN CODE
;
;GET COMMAND LINE
;
START: FINIT$ ;INITIALIZE FCS STUFF
CKMORE: GCML$ #GCLBLK ;GET COMMAND LINE
        BCC 10$ ;BR IF GOT ONE
        MOV #GCLBLK,R0 ;POINT TO GCMD CONTROL BLOCK
        CMPB #GE.EOF,G.ERR(R0) ;WAS ERROR END OF A CMD FILE ?
        BEQ 1$ ;YES TAKE EXIT WITHOUT SCREAMING
        DIR$ #GETERR ;NO REPORT COULDN'T GET CMD LINE
1$: EXIT$$ ;AND EXIT CPU LEFT
;INTERPERT FILE NAME
10$: CSI$1 #CSIBLK,GCLBLK+G.CMLD+2,GCLBLK+G.CMLD
        BCS CSIERR ;WOOPS BAD COMMAND LINE

```

```

CSI$2 #CSIBLK,OUTPUT
BCS CSIERR ;SOMETHING WRONG HERE TOO
;
;CHECK FOR WILD CARDS AND ACT ACCORDINGLY
CLR WILDFL ;CLEAR FLAG FOR WILD CARDS
MOV #FDB,R0 ;R0 -> FDB
MOV R0,R1
ADD #F.FNB,R1 ;R1 -> FILE NAME BLOCK
MOV #CSIBLK+C.DSDS,R2 ;R2 -> DATASET DESCRIPTOR
MOV #DEFFNB,R3 ;R3 -> DEFAULT FILE NAME BLOCK
JSR PC,.PARSE
BIT #NB.SVR!NB.STP!NB.SNM,N.STAT(R1) ;WILD CARDS ?
BEQ DOOPEN ;NONE, JUST OPEN
INC WILDFL ;SET WILD CARD FLAG
FIND: JSR PC,.FIND ;FIND NEXT FILE THAT MATCHES
        BCC DOOPEN ;GOT ANOTHER ONE
        CLR WILDFL ;LAST ONE CLEAR FLAG
        JMP CKMORE ;AND TRY FOR ANOTHER COMMAND
DOOPEN: OPEN$ #FDB ;OPEN THE FILE
        BCS FILERR ;COULDN'T OPEN FILE
;READ ATTRIBUTES
DIR$ #READAT ;DO DIRECTIVE
BCS RWATER ;BR IF DIRECTIVE FAILED
CMPB IOSTAT,#IS.SUC ;DID READ GO ?
BNE RWATER ;BR IF READ FAILED
;CHANGE PROTECT CODE
MOV #NEWPRO,FATBUF
;WRITE ATTRIBUTES
DIR$ #WRITAT ;DO DIRECTIVE
BCS RWATER ;BR IF DIRECTIVE FAILED
CMPB IOSTAT,#IS.SUC ;DID WRITE GO ?
BNE RWATER ;NO
;WE'RE DONE, TRY FOR MORE
DONE: CLOSE$ #FDB ;CLOSE FILE OUT
        TST WILDFL ;DOING MORE THAN ONE ?
        BNE FIND ;YES TRY FOR MORE
        JMP CKMORE ;AND TRY FOR MORE COMMANDS
.PAGE
.SBTTL ERROR CONDITIONS
;
;ERROR IN COMMAND STRING INTERPERTER
;
CSIERR: DIR$ #BADNAM ;REPORT BAD NAME FROM CSI
        JMP CKMORE
;
;COULD NOT FIND/OPEN FILE
;
FILERR: DIR$ #NOFILE ;REPORT IT
        JMP CKMORE
;
;FAILED TO READ OR WRITE ATTRIBUTES
;
RWATER: DIR$ #BADATT ;REPORT IT

```

```

CLOSE$ #FDB ;JUST IN CASE
JMP CKMORE

.PAGE
.SBTTL DPB'S AND DATA
;
;READ/WRITE FILE ATTRIBUTES DPB'S AND CONTROL BLOCK
;
READAT: QIOW$ IO.RAT,4,1,,IOSTAT,,<FDB+F.FNB,RATBLK>
;
RATBLK: .BYTE -2,2 ;READ FILE PRO CODE ONLY
        .WORD FATBUF ;BUFFER ADDRESS
        .WORD 0 ;END OF BLOCK INDICATOR
;
;
WRITAT: QIOW$ IO.WAT,4,1,,IOSTAT,,<FDB+F.FNB,WATBLK>
;
WATBLK: .BYTE 2,2 ;WRITE FILE PRO CODE ONLY
        .WORD FATBUF ;BUFF ADDRESS
        .WORD 0 ;END OF BLOCK INDICATOR
;
;
FATBUF: .BLKW 2 ;BUFFER FOR ATTRIBUTES (PRO CODE)
.PAGE
.SBTTL ERROR MESSAGES AND DIRECTIVES
;
;BAD FILE NAME ERROR
BADNAM: QIOW$ IO.WVB,5,1,,IOSTAT,,<BADNA1,BADNAL,60>
BADNA1: .ASCII /PRO -- BAD FILE NAME/
        BADNAL=-BADNA1
        .EVEN
;
;
;
;
;TRIED TO MODIFY OTHER UIC AND NOT PRIVILEGED
BADUIC: QIOW$ IO.WVB,5,1,,IOSTAT,,<BADUI1,BADUIL,60>
BADUI1: .ASCII /PRO -- NON-SYSTEM UIC MAY ONLY MODIFY OWN FILES/
        BADUIL=-BADUI1
        .EVEN
;
;
;
;COULD NOT FIND/OPEN FILE
NOFILE: QIOW$ IO.WVB,5,1,,IOSTAT,,<NOFIL1,NOFILL,60>
NOFIL1: .ASCII ?PRO -- COULD NOT FIND/(OPEN FOR WRITE) FILE?
        NOFILL=-NOFIL1
        .EVEN
;
;
;
;COULD NOT READ/WRITE FILE ATTRIBUTES
BADATT: QIOW$ IO.WVB,5,1,,IOSTAT,,<BADAT1,BADATL,60>
BADAT1: .ASCII ?PRO -- FAILED TO READ/WRITE FILE PROTECT CODES?

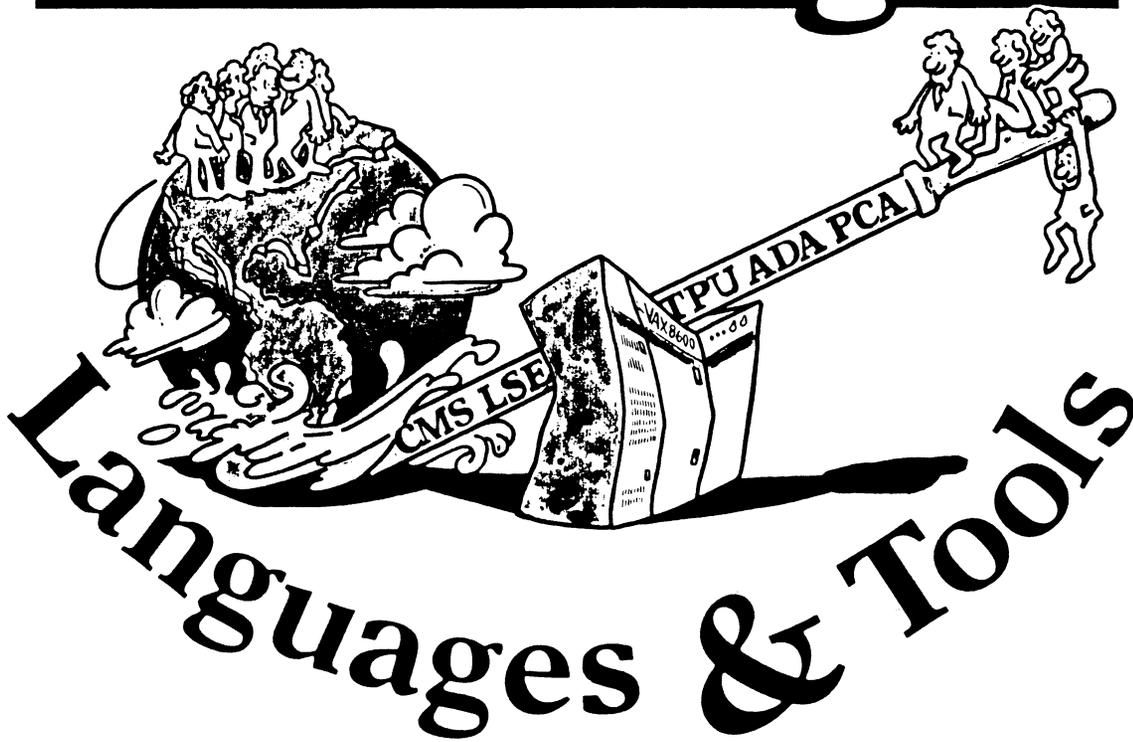
```

```

BADATL=-BADAT1
.EVEN
;
;
;FAILED TO OPEN INDIRECT COMMAND FILE
GETERR: QIOW$ IO.WVB,5,1,,IOSTAT,,<GETER1,GETERL,60>
GETER1: .ASCII /PRO -- FAILED TO OPEN INDIRECT COMMAND FILE/
        GETERL=-GETER1
        .EVEN
;
;
;IOSTAT: .BLKW 2 ;IOSTATUS BUFFER
.PAGE
.SBTTL FILE GOODIES
WILDFL: .WORD 0 ;FLAG FOR DOING WILD CARD THINGS
;
;
;DEFINE FCS WORK AREA
FSRSZ$ 2
;DEFINE DEFAULT FILE NAME BLOCK
;(FILE SY:XXXXXX.TSK
DEFFNB: NMBLK$ ,TSK,,SY
;DEFINE FILE DESCRIPTOR BLOCK
FDB: FDBDF$
;INITIALIZE FILE OPEN
FDOP$A 4,CSIBLK+C.DSDS,DEFFNB,FO.MFY
;SPEC FILE INFO FROM CSI AND USE
;DEFAULT FILE NAME BLOCK
;
;
;
;DEFINE GETMCR (INDIRECT) MACROS
;GET CMD LINE, DEPTH OF 2, PROMPT
;PRO, BUFFER AT CMDBUF, VIA LUN 5
GCLBLK: GCMLB$ 2,PRO,,5
;
;
;DEFINE CSI MACROS
CSI$
;DEFINE CSI BLOCK
CSIBLK: .BLKB C.SIZE
        .END START
PRO,PRO/-SP=PRO
/
PAR=GEN
UIC={1,1}
PRI=150
ASG=TI:5
TASK=...PRO
/

```

Leverage



Please note that the final submission for this issue, the abstracts for Nashville, are already in an extremely small print. If at all possible, I would prefer to have these printed one to a page in portrait mode, rather than going to the "two up" format.

Other than that, no special instructions. Hope everybody there had pleasant holidays, and a happy New Year to everyone.



Al Folsom

Editor, *Leverage*

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EDITOR'S NOTES

In this issue of *Leverage* I've included a number of time critical articles; I hope they reach you soon enough to be of some use. Also, the lead article is the second of three based on the panel discussion *WHAT'S IN A FORMATTER? -- Philosophies in Conflict* from the San Francisco Symposium. This month, we have the presentations from Brian Reid, the author of *Scribe*, and Mark Bramhall, the project leader for VAX/TPU.

The other two submissions in this symposium are the current release status of the various Digital VAX offerings in the area of Languages and Tools, and the abstracts for the L & T sessions to be presented in Nashville. Hopefully, these will help you plan your schedule, justify your trip, impress your boss, or what have you.

That's all for now. PLEASE consider submitting something to the newsletter. We are interested in feedback on the Formatter series, suggestions for areas to investigate with articles, hostile criticisms, or even brilliantly written essays which justify spending your company's entire research budget on software tools.

WHAT'S IN A FORMATTER? — Philosophies in Conflict

Sam Whidden, Chair, Languages & Tools SIG

January 15, 1987

At the Fall DECUS Symposium in San Francisco, the Languages & Tools SIG sponsored a panel on the differences in usage and purpose between What-You-See-Is-What-You-Get editors and markup languages.

Which is better? That is a hotly debated question, examined in this panel by four well-qualified experts: Dr. Leslie Lamport is the author of L^A-T_EX, a system of document formatting macros built on Knuth's typesetting language. Lawrence Bohn, an experienced software developer, is Director of Product Planning at Interleaf Corporation. The articles submitted by Dr. Lamport and Mr. Bohn appeared in last month's issue of the newsletter. This month we continue with Mark Bramhall's thought-provoking suggestions and a transcription of Brian Reid's remarks. Mr. Bramhall is a Consulting Software Engineer at Digital and VAX/TPU project leader. Dr. Reid is the author of Scribe, a powerful and widely-used markup language.

We expect in April to present a brief transcription of the sharp and interesting Q&A period that completed the discussion.

This subject is one in which feeling runs broad and deep, judgement can be colored by familiarity, and emotional preference seems as compelling as logic. How should the issues we raised be resolved? Did the panelists address them? What have we learned? What concerns have we missed completely so far? Substantial investments of time and money ride on these questions; where do we look for the right answers if there are any? If you have ideas or experiences in this area, please share them with us. Send us your thoughts, however brief, and let us consider them in LEVERAGE. Write to Al Folsom, Editor of LEVERAGE, or to me, Sam Whidden; our addresses are in the administrative section in the back of this issue.

Dr. Brian Reid (Figure 1) of DEC Western Research/Stanford University is the author of Scribe, a powerful and widely-used markup language. What follows are excerpts from his entertaining and perceptive presentation (since these are transcribed from tape,

**What you see
is what you deserve**

**WYSIWYG editors
and the
American preoccupation
with form over content**

**Brian Reid
DEC Western Research/Stanford**

Figure 1:

*we may have misspelled a proper name or two
- if so, we apologize.- ed.).*

What is WYSIWYG? (Figure 2) Or as I sometimes call it "What-You-Get-Is-What-You-Deserve!". Everyone is going to define WYSIWYG so that it avoids all the objections that I raise to it. That's why they are making me go first! My definition of WYSIWYG is that the visual interaction one has with the system is based on appearance and not on structure. The document is shown in its concrete form and not its abstract form and there is a high coupling between the act of writing and publication. In particular, the author is working with something that is the image of what is being written.

There is a continuum. (Figure 3) There is no precise definition that allows one to point at a software system and say "Yes, this is WYSIWYG, no, that is not WYSIWYG". I don't know exactly where to draw the line, but many WYSIWYG systems that people actually pay money for seem to lack the properties I have outlined. You frequently find the inability to manipulate abstractions. As programmers, I'm sure you all know what I mean by abstractions....to deal with the document in something other than its "nuts and bolts" form....the ability to separate content from structure. A writer is often not concerned with content, some-

What is WYSIWYG?

- Visual interaction based on appearance and not structure
- Document shown in its concrete form, not abstract form
- Tight coupling between writing and publication

Figure 2:

What usually comes with WYSIWYG?

- Inability to manipulate abstractions
- Inability to separate content and structure
- Inability to hide distracting detail
- Inability to re-use the stored document in other contexts

Figure 3:

times he isn't even allowed to work on it. The organization of an encyclopedia is a good example of something where the structure exists quite independent of the content. The majority of WYSIWYG editors in existence do not give you the ability to keep separate the content and the structure, the ability to hide distracting detail when writing. I have a small brain and I need my whole brain to concentrate on the words I am writing and I really don't want to have "Times Bold Italic Twelve" fluttering all over the screen interfering with my train of thought. If I am dealing with words, I want words on the screen. If I am dealing with pictures, I want pictures on the screen. For my own purposes I find excess information on the screen is a bad idea.

The inability to reuse the stored document in another context....this is where the "what you deserve" comes in. If you need to reuse a document created by a WYSIWYG editor in another context, it is usually cheaper and faster to rekeyboard it than to try to do some kind of automated conversion. As a matter of fact, there is a booming business in Malasia where people will take MACWRITE output and type it into textbook publishing systems! WYSIWYG isn't all bad (Figure 4). I would, for example, let my mother use WYSIWYG sometime. There are sometimes when WYSIWYG is a good thing and that is when form

When appearance is a consideration, WYSIWYG is often not harmful

- letters and memos
- short documents that will not be further edited
- Rough-draft tabular material

Figure 4:

matters and content doesn't....when appearance is everything. In advertising copy it doesn't really matter very much what is said as long as it looks the way you want. However, the WYSIWYG systems aren't yet good enough for advertising copy. I would choose to use WYSIWYG if I were putting together a display ad for a newspaper and I wanted total control over where everything went. Signs and posters are other examples of things that are very visual and where words are secondary. It is useful when you need a "grabbing appearance". You become the graphics designer as well as the author.

Documents that prove to your friends that you've learned how to use the "change fonts" commands in your word processor are always appealing and everybody goes through it. In my life, I call this the Hewert effect. It's named after Carl Hewert who currently holds the record for number of different fonts per page in scholarly prose - 41.! Documents that are primarily pictorialfor example.... a couple of weeks ago I put together a bicycle trailer to peddle a baby behind the bicycle. There were some very tricky three dimensional drawings in there and it appeared to have been done on a MacIntosh. I wouldn't have dreamed of doing a document like that without a WYSIWYG system because there is an extremely complex interaction between the text and the diagram. There is a paragraph justified inside the image of one of the panels of the trailer, for example, because that was the only place left in the page to put it. You can't do things like that with a markup system and you can and should with a WYSIWYG system. When appearance is a consideration, but not the dominant consideration, WYSIWYG systems are usually not harmful (Figure 5). This is true for business letters and memos. If a letter is going out in the company mail after you sign off on it, then you are responsible for its appearance and you might want to use a system that lets you have some con-

When appearance matters more than content WYSIWYG is ideal

- advertising copy
- signs and posters
- Documents that prove to your friends that you have learned how to use the *change-fonts* command in your word processor.
- Documents that are primarily pictorial

Figure 5:

control and feedback over that appearance. There is no denying that short documents that will not be further edited will be produced faster in a WYSIWYG system. A two-hundred-thousand page document, on the other hand, is not suited to WYSIWYG. Somewhere in between, according to the Mean Value Theorem, is the point at which it becomes easier to use one system over the other. Well, it depends. High precision tables are too complex to do with a true WYSIWYG system although what the vendors of WYSIWYG systems do is hide command-based table formatters in their WYSIWYG system and hope that you won't notice. But, in general, the accurate visual positioning of things in tables can't be done on the screen because it needs to be done with a higher precision than screen control affords. But when structure and content are important WYSIWYG genuinely gets in the way and since this is the kind of writing that I do, that is my point of view (Figure 6). I'm working on a textbook right now. It has eight hundred pages. I would be out of my ever-loving mind to try to do those eight hundred pages in a WYSIWYG editor for a lot of reasons. Structure and content are important in reference works, dictionaries, encyclopedias, catalogs. Other things that are large and complex and have a great deal of structure include proposals and user manuals of the type military-industrial-complex companies put together on a moment's notice by weaving together various pieces to arrive at a finished product. To my knowledge those people do not use WYSIWYG more successfully than command-based formatters because the nature of the problem is something where enormous control of structure and content is much more important than where the right margin is.

If you look at what goes on in writing a complex document there are really three levels that the writer has to deal with (Figure 7). There is the writing and editing for content; What does it say? There is writing,

When structure and content are important, WYSIWYG is a serious impediment to good writing

- textbooks
- reference works
- user's manuals
- proposals

Figure 6:

Writing a complex document

- Writing and editing for content
- Writing, editing, and organizing for structure
- Editing for format

Tools should focus on the task at hand and not distract with irrelevant detail.

Figure 7:

editing and organizing for structure. Should I pick up this section out of Chapter Three and make it into an appendix? Should I take all of Chapter Three and demote it to be a section of Chapter Five, etc. And finally there is editing for format. I've been in this business long enough to know that I have no taste whatsoever in format and I want to turn all of that over to a professional. When I work on my book I do not want to be anywhere near the format. I want to hand a mag tape to Prentice-Hall or somebody and say, "Here, fix this, you do the format". If I've done this in a system that has erroneously given me control over the format, they'll have to work a lot harder.

So, when I say that WYSIWYG actually interferes, what are the mechanisms of this interference (Figure 8)? It forces diskfile organizations to be parallel to document organization. Text has to be put physically in the file where it will appear or approximately where it will appear and not where it makes sense from a structural point of view. Consider, for example, the Ency-

clopedia Britannica. If you choose to have an entry about artichokes, you would want the word artichoke to appear in about fifteen places in the encyclopedia. There is the primary article, there is a secondary article, there are the indexes, and there are cross-references to it. What you want is a single little piece of the disk which contains inside of it everything having to do with artichokes that you can put in or take out as you see fit. Although it is certainly possible to do that kind of thing in WYSIWYG editors, in general, people don't. The need to sit there and wait for all that recomputation seriously gets in the way. It makes structure difficult to see by cluttering it with irrelevant detail, linebreaks, and fonts and things like that. When I am meditating on the full structure of my eight hundred page textbook I really don't care where the page breaks are. Any form of abstraction tool that will give me an advantage in seeing the structure and ignoring the form is to my advantage. The WYSIWYG editors prevent me from doing that by distracting me with "Times Roman Ten"! It slows the user by forcing him to wait for unnecessary reformatting computations. I don't care how fast your WYSIWYG system is, my system is faster because it doesn't do those computations that you do so rapidly. And when I update the screen on my MicroVAX, my screen updates faster than yours does if you are using WYSIWYG on the same hardware, by definition, because your program is doing a lot more. And although it's nice to be able to see a markup of what my page is going to look like, what I really want, in a hundredth of a second, is to see a markup of what my paragraph is going to look like. If it's doing some computations that I don't care about very much then I have to wait and I don't like to wait. I'm very impatient.

WYSIWYG lures the user into a false sense of complacency about the quality in his writing; it might be illiterate but the right margin is pretty! This is WYSIWYG Disease, capital "W" capital "D", when people get so caught up in appearance that they neglect the content. Somehow things that are typeset are considered right. You can take something that someone wrote and typeset it and suddenly they will have more confidence in it because, after all, it has just been typeset. I've done many experiments since discovering this phenomenon and it is always true. WYSIWYG lures the writer into getting involved with the format and appearance when often it is neither his business nor his area of expertise. All God's children think they know what looks good, just as everybody thinks his own handwriting is readable. The truth is that most people find attractive that with which they are most familiar. Once you have looked long enough at some ugliness you have created, you're going to like it!

So the question is, is WYSIWYG fundamentally flawed or are these just limitations in current imple-

How WYSIWYG interferes

- Forces disk file organization to be parallel to document organization. Text must be put where it will appear, not where it makes sense or is convenient.
- Makes structure more difficult to see by cluttering it with irrelevant detail (line breaks, fonts, etc.).
- Slows the user by forcing him to wait for unnecessary reformatting computations.
- Lures the user into a false sense of complacency about the quality of his writing. It might be illiterate, but the right margin is pretty.
- Lures the writer into getting involved with the format and appearance, when often that is not his business, his area of expertise, or his interest.

Figure 8:

mentations of WYSIWYG systems (Figure 9)? The editing dialogue takes place in a pictorial domain not a structural domain. I claim that this is a fundamental flaw. I don't want to have to deal with my editor in terms of format and geometric position and concrete details. If the disk file isn't structural, then WYSIWYG is fundamentally flawed. It is possible to implement a WYSIWYG system that maintains a structural disc file and not a concrete disc file. However, if a disc file is structural then the formatting transformation must be invertible otherwise you won't be able to ask for changes to be made to it. If the transformation is not invertible, then you can't necessarily edit everything, and any transformation that discards information is by definition not invertible. There are ways of hacking around this and different systems have made attempts in various ways. But the net result is always an editor that's very heavily modal, must conceal structure, or must prevent certain classes of operation. That's not desirable... one of the things that people learned at Three Mile Island is that concealing structure is dangerous. If the complexity is there and you don't make it available to the user, something will go wrong.

So what have I just said (Figure 10)? WYSIWYG is bad because it distracts the writer, it diverts compute power from more important tasks and encourages sloppy habits that impinge on good writing.

These are two observations that I have made in watching people go out and use WYSIWYG systems (Figure 11). The first one says that WYSIWYG edi-

Is WYSIWYG fundamentally flawed or are these just shortcomings in current implementations?

- Editing dialog takes place in pictorial domain, not structural domain.
- If disk file not structural, then WYSIWYG is fundamentally flawed.
- If disk file structural, then formatting transformation must be invertible, else structure cannot be manipulated.
- Any transformation that discards information is not invertible.
- Therefore, editor must be heavily modal, must conceal structure, or must prevent certain classes of operation.

Figure 9:

Summary

WYSIWYG is bad because:

- It distracts the writer
- It diverts compute power from more important tasks
- It encourages a way of thinking in which form dominates substance. This way of thinking is antithetical to good writing.

Figure 10:

Observations

WYSIWYG editors are like Polaroid photography: the desire for instant gratification is hard to resist, but the resulting artifact is usually of much lower quality.

Publishers have spent centuries formulating the concept of *quality* in published material. People buy WYSIWYG editors because they think that a justified right margin will give their documents that same quality.

Figure 11:

What is the right answer?

- Editors that work and display in the abstract structural domain. Simple realtime formatting, e.g. keeping text paragraphs filled.
- High-speed proofing mode for any subset of a document.
- Realtime proofing mode when needed. I would prefer split-window realtime proofing, but many people dislike that.

Figure 12:

tors are like Polaroid photography. The desire for instant gratification is hard to resist but the resulting artifact is usually of much lower quality. The second is that publishers have spent centuries formulating the concept of **QUALITY** in published material. People buy WYSIWYG editors because they think that a justified right margin will give their document that same quality. I am expecting that the free market in written quality will have a backlash against this sort of thing. I'm waiting for Remington typewriters to be the typeface used in "The New Yorker" for example, backlashed against typesetting because obviously the intellectual elite use typewriters and not word processors!

WYSIWYG or markup language?

Why not have both!

Mark Bramhall

DECUS Symposium
San Francisco, California

Tuesday, October 7, 1986

Many people have recently placed "What You See Is What You Get" (WYSIWYG) editing and markup languages at odds with each other. I believe no such conflict exists. Both need to exist and work together. The conflict is a matter of unclear definitions and evolving computing styles made possible by emerging technology.

A markup language document consists of intermixed formatting commands and content. The formatting commands reference, implicitly or explicitly, an external style guide used to direct the actual document formatting. A markup language document is stored as a simple ASCII text file.

Please note that I'm referring to a markup language document. What many people think of as a markup language usually also includes the editing, viewing, and formatting of the document. Editing a markup language document is done with almost any ASCII text editor.

Viewing any document happens in three different stages of document preparation: editing, draft, and final. The viewing of a markup language document during editing must occur in the user's mind. Many markup language systems provide some form of draft form viewing and all have a formatter that produces final form.

Unfortunately, many WYSIWYG editors are just that. What you get on paper is exactly what you saw on the screen. This is unfortunate because the resolution of video screens will probably never catch up with the resolution available in today's laser printers.

What you really want is a WYGINS — What You Get Is No Surprise — editor. A WYGINS editor displays on the screen a view of the document which is not as perfect as the printed version, but which is as close to it as possible at the screen's limited resolution. The remainder of this paper will discuss WYGINS editors.

A WYGINS editing system stores its documents in a binary encoding. The WYGINS editor processes the encoded document and displays its contents — or more — on a bitmap terminal screen. While in the editor the editing and draft stages of document viewing are combined. A separate formatter is provided to generate the final form of the document for printing.

How then can and should WYGINS editors and markup languages be combined? The document storage of the editing system is a markup language document. It is stored in a binary encoding using tagged data to indicate the standard elements of a markup language document: formatting commands, content (possibly external), and style guide references. Nothing of a traditional markup language is lost. A compact, very easily parsed and processed representation of the document is gained.

One of the most unclear definitions that has caused WYGINS editors and markup languages to be pitted against each other is document editing versus document formatting. Document formatting is the final casting of the revisible document into some presentation level protocol (PLP) for printing. This is a unidirectional and, hopefully, one time — because of "no surprises" — process. Document editing is the revising of the revisible form of the document. This is an almost never ending process.

Document editing should permit the user to concentrate on the content of the document. By combining the viewing stages of editing and draft on the user's screen, a WYGINS editor permits the user to fully concentrate on content; the format of the document is automatically presented ensuring no surprises at final form time.

Some users never wish to see the "why" behind a document's format. They only care about "how it looks." I also believe that all users deal with documents that need only be expressed visually. Most short, one time documents fall into this category. On the other hand, there are times when the formatting commands are very important and must be or become visible. Any WYGINS editor must allow for this and be capable of showing and allowing the editing of the formatting rules.

Just as different documents require different kinds or amounts of visibility, any editing system must allow for different terminals. There is no reason a WYGINS editing system should not operate on a simple ASCII terminal. It would process the document and render it with its intermixed formatting commands and contents just like a traditional markup language editing system does on the same terminal.

Network rather than terminal line transmission of files, reasonable resolution bitmap terminals, and enough memory and processor power in an inexpensive configuration have made binary encoding of files, the combination of editing and draft document viewing, and the processing to do the above possible. What is left to do is the actual product development. Then we will be able to offer easy, yet powerful, document editing and final form generation to all computer users.

VAX LANGUAGES AND TOOLS RELEASE STATUS

VAX (tm) Ada (r) - Q*056

Current Version: V1.3
 V1.3 Began Shipping: November, 1986
 Major Features of V1.0: -Full ANSI Language
 -Production quality
 -Highly integrated into VAX/VMS Environment
 -Multi-language capabilities
 -Comprehensive diagnostics
 -U.S. Government validated
 -Full symbolic debugging support
 -VAX Language-Sensitive Editor support

(tm) VAX is a trademark of Digital Equipment Corporation
 (r) Ada is a registered trademark of the U.S. Government (Ada Joint Program Office)

VAXELN Ada - Q*A97

Current Version: V1.0
 Began Shipping: April, 1986
 Major Features: -Compatible with VAX Ada
 -Retargetable to real-time/embedded environment
 -Remote debugger
 -Tailorable run-time environment
 -Run-time library retargetted from VAX/VMS to VAXELN
 -Package of interfaces to VAXELN services

VAX APL - Q*020

Current Version: V2.1
 V2.1 Began Shipping: June, 1986
 Major Features: -Performance Improvements
 -APL can call other VAX languages which adhere to the VMS calling standard
 -Multi-key ISAM
 -Full screen Editing

VAX Basic - Q*095

Current Version: V3.0
 V3.0 Began Shipping: November, 1986
 Major Features: -Embedded graphics statements
 -Structured error handling
 -Optional line numbers
 -Print using format strings

VAX Bliss - Q*106

Current Version: V4.2
 V4.2 Began Shipping: February, 1986
 Major Features: -Ease of use
 -/Check qualifiers
 -/Cross reference switch
 -VAX Language-Sensitive Editor support

VAX C - Q*015

Current Version: V2.2
 V2.2 Began Shipping: July, 1986
 Major Features: -Full Debug support
 -CDD support
 -VAX Language-Sensitive Editor support
 -Improved run-time routines for UN*X compatibility
 -Shareable run-time library (which is now distributed as part of VMS, not longer on the VAX C binary kit)

VAX Cobol - Q*099

Current Version: V1.0
 V1.0 Began Shipping: October, 1986
 Major Features: -VAX Language-Sensitive Editor support
 -Screen handling extensions
 -Extended DML
 -Support for VAX Cobol Generator

VAX Fortran - Q*100

Current Version: V4.5
 V4.5 Began Shipping: July, 1986
 Major Features: -VAX Language-Sensitive Editor support
 -Global optimizations
 -CDD support
 -Records
 (VAX Fortran on Ultrix - Q*A99, Started shipments: May, 1986)

VAX Pascal - Q*126

Current Version: V3.4
 V3.4 Began Shipping: August, 1986
 Major Features: -Performance/Runtime Optimizations
 -CDD Support
 -VAX Language-Sensitive Editor Support
 -Compatibility support for VAXELN Pascal
 -Source Line Debugging

VAX PL/I - Q*114

Current Version: V2.4
 V2.4 Began Shipping: April, 1986
 Major Features: -VAX Language-Sensitive Editor support
 -CDD support
 -Compile-time pre-processor

VAX RPG II - Q*631

Current Version: V2.1
 V2.1 Starts shipping: October, 1986
 Major Features: -Conforms and is an extended implementation of the IBM RPGII defacto standard
 -Fast compile and runtime performance
 -Full screen editor
 -Compatible with IBM implementations on Systems 3, 34, and 38
 -CDD support
 -FMS translator for System 34 screen handling

VAX Performance and Coverage Analyzer - Q*119

Current Version: V1.1
V1.1 began shipping: December, 1985
Major features: -Helps to find execution bottlenecks in application programs
-Provides test coverage analysis to determine which lines of an application are executed by a given set of test programs
-Has an interface to the VAX DEC/Test Manager

VAX DEC/CMS - Q*007

Current version: V2.2
V2.2 began shipping: May, 1986
Major Features of V2.0 are:
-a callable interface
-new security features
-significantly improved performance
-groups for the easy organization of related files

VAX DEC/MMS - Q*500

Current version: V2.1
V2.1 began shipping: December, 1985
Major features of V2.0 are:
-support for CDD
-support for TDMS
-support for FMS

VAX DEC/Shell - Q*143

Current Version: V2.0
V2.0 began shipping: January, 1987
Major features of the V2.0 DEC/Shell include:
-an alternate command line interpreter
-UUCP, NROFF and termcap support
-a set of commonly used UN*X utilities
o DEC/Shell is based on the UN*X V7 Bourne Shell

VAX DEC/Test Manager - Q*927

Current Version: V2.1
V2.0 began shipping: December, 1986
Major features: -Ability to test interactive applications on a character cell terminal
-Increased integration with VAX DEC/CMS (can store tests in a CMS library for Test Manager retrieval)
-Performance Improvements
-Ability to edit session files

VAX Language-Sensitive Editor: Q*057

Current Version: V1.3
V1.3 began shipping: May, 1986
Major Features: -Supports Ada(r), Basic, Bliss, C, Cobol, Fortran, Pascal, Pl/I
-Edit, compile, review, and correct compilation errors within a single editing session
-Speeds up source code entry using formatted language-specific source code templates
-Provides for interactive editing capabilities during a debugging (VAX Debug) or performance analysis session (VAX Performance and Coverage Analyzer)
-User tailorable and user extensible
-Extensive on-line help for supported VAX languages

VAX Scan - Q*495

Current Version: V1.0
V1.0 began shipping: November, 1985
Major features: -A complete VAX programming language used to create programs that deal with pattern matching and text transformation
-Used for creating translators, preprocessors, filters, and parsers
-To build tools for converting data from other vendor's computing equipment
-Finds and replaces text in files

VAX NOTES: Q*960

Current Version: V1.1
V1.1 Began shipping: December, 1986
Computer-based conferencing software
- Supports online discussions between groups of people
- Project team communication
- Maintains a permanent record of discussions
- Easily accessible by variety of search criteria
- Unique distributed architecture
- Server based
- Leadership performance in DECnet networks
- Easy discussion between geographically dispersed groups
- Easy to learn and use
- Choice of DEC standard editing styles

VAX Cobol Generator: Q*365

Current Version: V3.3
V3.3 to begin shipping: May, 1986
- 4GL approach to Cobol programming
- Graphical interface
- Generates error-free VAX Cobol code
- direct access to RMS and Rdb
- promotes structured design

VMS - current version is 4.4

VAXset: Q*965

Current Version: V3.0
V3.0 Began shipping: December, 1986
A package of Software Engineering Tools consisting of:
- VAX DEC/CMS
- VAX DEC/MMS
- VAX Language-Sensitive Editor
- VAX Performance and Coverage Analyzer
- VAX DEC/TEST Manager
- VAX Source Code Analyzer (Spring 1987)

Languages & Tools

DEVELOPING LSE SOURCE CODE TEMPLATES

LT002 Orientation:Intermediate/General

Thursday 3:00 p.m.-4:00 p.m. Jefferson

James M. Briggs
RCA

The VAX Language Sensitive Editor (LSE) allows a user to construct syntactically correct programs for languages for which the specific LSE templates have been developed. DEC provides templates for the programming languages which it supports, such as FORTRAN and Pascal. In this session the steps necessary for a user to create LSE templates for other programming languages are discussed. These steps are illustrated by examples from creating an LSE editing environment for the Navy CMS-2 programming language. The steps discussed include:

- How to start
- How much of the language syntax to support
- Adding of help messages
- Process of creating the template file including translating from the BNF description of the computer language
- Adding features which support non-syntactic local programming standards

WRITING A TPU SECTION FROM SCRATCH

LT004 Orientation:Intermediate/Technical

Thursday 9:30 p.m.-11:00 p.m. Jefferson

Ken Coar
General Dynamics

Experiences in writing a TPU section from scratch - that is, one not based upon either EVE of the EDT emulator - is presented in this session. The discussion outlines typical implementation pitfalls, and suggests advanced capabilities.

JOINT STEERING COMMITTEE MEETING - COMMERCIAL LANGUAGES SIG AND LANGUAGES & TOOLS SIG

LT005 Orientation:Novice/General

Monday 8:00 p.m.-9:00 p.m. Memphis

Dena Shelton
System Industries

Sam Whidden
American Mathematical Society

At this meeting, the Steering Committees of the Commercial Languages SIG and the Languages and Tools SIG will explore the proposal that the CL SIG dissolve and that the L&T SIG assume sponsorship of the languages hitherto the concern of CL. Should such a change take place, members of the CL Steering Committee wishing to do so would become members of the L&T Steering Committee. Issues such as the resulting strength of DECUS support for commercial languages will be discussed. Anyone interested should attend.

DESIGN OF A FORTRAN-77 COMPILER FOR MULTI-SYSTEM USE - WATFOR-77

LT006 Orientation:Intermediate/General

Friday 12:00 noon-1:00 p.m. Jefferson

Sandra Ward
WATCOM Products Inc.

The University Of Waterloo and WATCOM Systems Inc. are using a VAX running VMS to develop software targetable to a variety of hardware. Using various tools and special techniques, VAX/VMS has proven to be a very productive system for software development. The speaker discusses the methodology used to develop WATFOR-77 and ensure portability using VAX/VMS. WATFOR-77 is an implementation of the full ANSI Fortran Standard based upon the design philosophy of WATFOR/WATFIV.

DIGITAL'S INTERNAL DOCUMENTATION TOOLS

LT007 Orientation:Novice/General

Monday 9:30 a.m.-11:00 a.m. Memphis

Brian Adler
Digital Equip Corp.

The documentation set for VAX/VMS version 4.0, as well as various VMS layered products and languages were typeset using an in-house documentation production system. This system was designed and developed at Digital to address and solve problems unique to the development, writing, and production of technical documentation.

This session summarizes the requirements for software documentation for VMS software products. It discusses the documentation development cycle. The markup language and the tools developed to produce this documentation are described. The speaker solicits user input on their requirements for documentation and production tools.

FORTRAN 8X AND OTHER ANSI STANDARDS UPDATE

LT009 Orientation:Intermediate/General

Friday 9:00 a.m.-10:00 a.m. Jefferson

Jay Wiley
Bechtel Power Corp.

This session updates the status of the ANSI Standards of interest to Language and Tools SIG members since the fall 86 Symposium. Special attention is paid to the FORTRAN 8X standard activities.

USER INTERFACE MANAGEMENT SYSTEMS: A NEW GENERATION OF PRODUCTIVITY TOOLS FOR SOFTWARE DEVELOPMENT ON THE VAX

LT010 Orientation:Intermediate/Managerial

Tuesday 2:00 p.m.-3:00 p.m. Memphis

Gilbert Cardwell
Precision Visuals Inc

Recent industry conferences sponsored by SIGGRAPH, Eurographics, and IFIPS have identified the improvements in productivity and in the quality of user interfaces which can result from development and use of a new generation of software tools called User Interface Management Systems (UIMS). This presentation offers an introduction and guide to these new tools. A general

model of UIMS is presented, the benefits developers can expect to obtain from this class of tools is reviewed, and suggestions are made for evaluation of UIMS features, performance, and design.

**CONFIGURATION MANAGEMENT OF
LARGE, PORTABLE SOFTWARE SYSTEMS**

LT011 Orientation:Intermediate/General
Friday 3:00 p.m.-4:00 p.m. Volunteer

Mark S. Kowalski
SPSS Inc. Northfield Division

Kathy Tymoczko
SPSS Inc. Northfield Division

SPSS Inc. actively maintains and develops several commercial software products. New, incremental, or maintenance releases of a product occur regularly and coordinate across several major computer systems (for example, IBM, DEC VAX, Prime). The portable pseudo-Fortran source code constituting the products is substantial (typically 500k source code lines per product) and is developed, maintained, and tested in a multi-vendor computer environment.

Although one of our in-house computer systems acts as a master of depository of code, code management must be practiced on all our systems. This is due to machine-specific code and market-driven product releases. Machine-specific code typically results from intractable machine dependencies in compilers or architecture, from requirements for efficiency or integration into a "typical" user environment, and from machine-specific software bugs. Market forces sometimes dictate the schedule of releases, particularly maintenance releases and therefore create a need to separate development from maintenance coding on the major systems. In this session we discuss our practical experiences in this development environment with various commercial software tools and communication products from DEC and other vendors.

**SETPACK: A SOFTWARE ENGINEERING
TOOLPACK FOR ANALYSIS AND DESIGN**

LT012 Orientation:Novice/General
Friday 10:30 a.m.-11:00 a.m. Volunteer

John J. Rhodes
Lawrence Livermore Natl Lab

Computer software development personnel support many software projects in various stages of the software life cycle. With the increased size and complexity of these projects, it has become necessary to employ a structured development methodology for the development and maintenance of these software systems. Structured methodologies, while increasing the resultant product reliability and decreasing development and testing time, can involve a tedious, labor-intensive system of documentation to support the methodology. This session describes the capabilities and features of SETPack, a VMS-based set of software engineering tools for analysis and design. This non-commercial package supports the interactive creation of dataflow diagrams, state transition diagrams, entity-relationship diagrams and structure charts as well as data dictionaries and mini-specs. Consistency checking is also a feature of the package.

WRITING VAXTPU PROCEDURES

LT013 Orientation:Intermediate/General
Thursday 1:00 p.m.-2:00 p.m. Jefferson

Richard J. Faust
E.I. du Pont de Nemours & Co

VAXTPU provides a multitude of features for developing custom editing functions tailored to personal preferences. Taking advantage of these features is not difficult after a few basic concepts are understood. The capabilities of VAXTPU are explored through several sample procedures, including development of a user buffer list, cut and past manipulation of columns of text rather than rows, and implementation of the CALL.USER built-in procedure.

The information contained in this session was developed during the course of work under Contract No. DE-AC09-76SR00001 with the U.S. Department of Energy.

**TOOLS INTEGRATION WORKING GROUP
OPEN MEETING**

LT014 Orientation:Intermediate/Managerial
Wednesday 5:00 p.m.-6:00 p.m. Natchez

Jay Wiley
Bechtel Power Corporation

The Tools Integration Working Group is a multi SIG [L&T, DMS, DTR/4GL, CL] working group that was formed at the Fall 1986 Symposium. The purpose of the working group is to provide input to Digital on user requirements in the area of tool integration. At the Fall 1986 Symposium, the following areas of concern were identified:

1. VIA and 3GL interfaces
 - (a) Use of DATE calculations in 3GL's such as BASIC, FORTRAN, C, etc.
 - (b) Support for all CDD data types by 3GL's such as BASIC, FORTRAN, C, etc.
2. Tool Interaction
 - (a) Better documentation on how the DEC tools such as CMS, MMS, DTM, LSE, SCA, PCA, DEBUG, SCAN, etc.
 - (b) Development of improved tool interactions and a programmer environment

At this open meeting, DECUS members can join the working group and/or provide input to the working group on their requirements in these areas and/or help define other areas of tool integration that need to be addressed.

VAX C PRODUCT UPDATE

LT015 Orientation:Intermediate/General
Wednesday 4:00 p.m.-5:00 p.m. Memphis

Chris Nolan
Digital Equipment Corp.

This presentation by Digital engineering discusses the latest release of VAX C and presents features and functionality of that product. This session also discusses features and functionality of the VAX C Run Time Library and addresses issues of conformance to the proposed ANSI standard for the C programming language as they relate to the VAX C Run Time Library.

**THE PROPOSED ANSI C PROGRAMMING
LANGUAGE STANDARD**

LT016 Orientation:Intermediate/General
Thursday 4:00 p.m.-5:00 p.m. Jefferson

Chris Nolan
Digital Equipment Corp.

This presentation by Digital engineering discusses the proposed ANSI C Programming Language Standard.

This proposed standard has not been made available for public review and some changes have been made to it based upon comments made during public review. This presentation presents the current state of the proposed standard and discusses VAX C conformance to the standard.

VAX APL STATUS

LT017 Orientation:Intermediate/General
Wednesday 9:00 a.m.-10:00 a.m. Natchez

Leslie Klein
Digital Equipment Corp.

A representative of Digital engineering discusses what's new in VAX APL. Among the features described is a nested arrays feature, which allows any item of an array to be another array. Details of the terminals support which was released in V2.1 are also discussed.

UTILIZING TOOLS FROM VAX FORTRAN

LT018 Orientation:Intermediate/General
Thursday 6:00 p.m.-7:00 p.m. Jefferson

Leslie Klein
Digital Equipment Corp.

Coding problems in FORTRAN can be simplified by the clever use of tools in the applications development process. A representative from Digital discusses how the use of tools such as VAX LSE, VAX SCA, VAX DEBUG, and VAX PCA can help to identify and correct the sources of various programming and performance problems in FORTRAN programs.

WHAT'S NEW WITH VAX PL/I

LT019 Orientation:Intermediate/General
Tuesday 9:00 a.m.-10:00 a.m. Memphis

Ken Glossop
Digital Equipment Corp.

The VAX PL/I programming language is an ANSI G Subset compliant implementation of PL/I. This session gives an overview of the VAX PL/I product, with emphasis on new features included in the latest release. Both language enhancements and improvements in integrating with the VAX Software Engineering Tools are discussed. This presentation by Digital engineering is intended for both new and existing PL/I users and includes a brief standards update.

VAX LANGUAGE-SENSITIVE EDITOR WIZARDS' NOTES

LT020 Orientation:Intermediate/General
Thursday 2:00 p.m.-3:00 p.m. Jefferson

Laura Schwartz
Digital Equipment Corp.

The VAX Language-Sensitive Editor has been designed to be a highly integrated member of the VAX/VMS software development environment. In addition to its language-sensitive editing

features and its ability to assist in error correction, it works directly with the VAX Symbolic Debugger and with the VAX associated language compilers. This session, presented by a representative of the Digital development team, concentrates on the ties that the Editor gives you to your VMS environment. It describes advanced capabilities of the Editor and shows how you can create your own templates in addition to the language templates that exist with the Editor. This can give user-language support for languages that are specific to your company [Jovial...]. Also covered are ways of extending and reformatting the VMS language support available with the Editor to handle subroutine packages and common conventions that are unique to the needs of your company.

VAX SOURCE CODE ANALYZER TUTORIAL

LT021 Orientation:Intermediate/General
Monday 2:00 p.m.-3:00 p.m. Memphis

Mark Arsenault
Digital Equipment Corp.

The need for interactive cross-referencing and for source code analysis while doing software development is itemized in this session. The ability to give access to source data for entire systems can be extremely useful during the implementation and maintenance phases of a project. The features of VAX Source Code Analyzer, along with using such facilities to understand the complexities of a software system are discussed, by a representative of Digital engineering. Integration of such facilities for use within the VAX Language-Sensitive Editor is discussed.

HOW THE VAX SCA PROJECT USED TOOLS FOR SOFTWARE DEVELOPMENT - A CASE STUDY

LT022 Orientation:Intermediate/General
Wednesday 11:00 a.m.-12:00 noon Jefferson

Mark Arsenault
Digital Equipment Corp.

This session walks users through the development of the VAX Source Code Analyzer software. It focuses on how the team used its own product to enhance their own development. The ways that other tools were also used and where they were beneficial is discussed. This session is given by a developer from the group developing VAX SCA, giving the developer's view of tracking, debugging, etc., while using extensions of the VAX Language-Sensitive Editor. How they used DEC/CMS and the DEC/Test Manager is also included.

EXAMPLES OF USING VAX SOURCE CODE ANALYZER

LT023 Orientation:Intermediate/General
Wednesday 1:00 p.m.-2:00 p.m. Jefferson

Mark Arsenault
Digital Equipment Corp.

The VAX Source Code Analyzer has been shown to provide very strong productivity gains for users of PASCAL, PL/I, FORTRAN, Ada¹, BASIC, BLISS, and C. Rather than hints on using this tool, this session, by a representative of Digital engineering, gives full-blown examples of just how it is useful for software development. This session gives you a quick "how to" course by

¹Ada is a trademark of the Ada Joint Program Office

itemizing "how we did these things." The examples are straightforward and applicable to developers on large and small project teams.

THE VAX ADA PROGRAMMING ENVIRONMENT

LT024 Orientation:Intermediate/General
Tuesday 1:00 p.m.-2:00 p.m. Memphis

Bill Meier
Digital Equipment Corp.

An important part of the international Ada¹ effort is the concept of an Ada Program Support Environment, or APSE. The term "APSE" has acquired a variety of connotations, both technical and philosophical. This session by a representative from the VAX Ada development group shows how the combination of VAX Ada and VAX productivity tools provides an exceptionally strong Ada support environment. It discusses how and why the VAX environment differs from the APSE described in the DoD Stoneman document. Particular emphasis is placed on program development using the program library manager component (ACS) of the VAX Ada product.

DEC ADA STATUS

LT025 Orientation:Intermediate/General
Tuesday 10:00 a.m.-11:00 a.m. Memphis

Bill Meier
Digital Equipment Corp.

Representatives from Digital discuss the current status and direction of Digital's Ada¹ products, including VAX Ada and VAX-ELN Ada. This sessions covers recently introduced capabilities and performance enhancements, validation status, and Digital's on-going efforts to address critical Ada customer needs.

VAX LANGUAGE-SENSITIVE EDITOR TUTORIAL

LT026 Orientation:Intermediate/General
Wednesday 9:00 a.m.-10:00 a.m. Jefferson

Laura Schwartz
Digital Equipment Corp.

The VAX Language-Sensitive Editor is a powerful multi-language screen-oriented editor specifically designed to assist in the development of software. It supports many VAX languages including: VAX Ada¹, VAX BASIC, VAX BLISS, VAX C, VAX COBOL, VAX FORTRAN, VAX PASCAL, VAX PL/1, VAX Datatrieve, and VAX SCAN. It is language-sensitive in a number of ways. It provides formatted language-specific templates for program constructs and for calls to VMS system services and run-time library routines. These templates interface to language-specific on-line help. The editor also provides code and comment formatting aids. Through an interface with the VAX compilers, the editor provides for locating and correcting compilation errors.

A representative from Digital provides a tutorial of the VAX Language-Sensitive Editor, with an emphasis on the language-sensitive features.

VAX LANGUAGE-SENSITIVE EDITOR PROGRAM ENVIRONMENT

LT027 Orientation:Intermediate/General
Friday 3:00 p.m.-4:00 p.m. Jefferson

Laura Schwartz
Digital Equipment Corp.

The VAX Language-Sensitive Editor has been designed as a highly integrated member of the VAX/VMS software development environment. In addition to its language-sensitive features that assist in editing code, it works with VAX language processors to help locate and correct compilation errors. It interfaces to the VAX Source Code Analyzer, a cross-reference and static analysis tool, to provide for following cross-reference threads through a program system and for performing other static analysis functions. The VAX Language-Sensitive Editor is also integrated with VAX DEC/CMS (Code Management System), the VAX Symbolic Debugger, and the VAX Performance and Coverage Analyzer. This environment can be tailored by users to support additional languages, and, through its integration with VAXTPU (Text Processing Utility), users can enhance the editor with their own advanced editing functions.

This session by Digital engineering describes the VAX Language-Sensitive Editor and how its integration with other tools provides a sophisticated environment that streamlines many development tasks.

VAX PASCAL WIZARDS' SESSION

LT028 Orientation:Intermediate/General
Friday 2:00 p.m.-2:30 p.m. Jefferson

John Reagan
Digital Equipment Corp.

VAX PASCAL is a very robust language that allows the programmer to do many things that may not be initially obvious. This presentation by Digital engineering describes advanced capabilities of the compiler and shows you how to use some of these features. Some of the features described and shown in examples include the IADDRESS builtin, typecasting operator and external literals.

USING VAX PASCAL IN THE VAX/VMS SOFTWARE DEVELOPMENT ENVIRONMENT

LT029 Orientation:Intermediate/General
Wednesday 3:00 p.m.-4:00 p.m. Jefferson

John Reagan
Digital Equipment Corp.

VAX PASCAL is well integrated into the VAX/VMS Software Development Environment. This presentation by Digital engineering describes how to take full advantage of the capabilities of the environment. Topics include using the VAX CDD from VAX PASCAL and using VAX CMS, VAX SCA, VAX DEBUG, VAX LSE, and VAX PCA for developing and tuning Pascal applications.

VAX PCA STATUS

LT030 Orientation:Intermediate/General
Monday 6:00 p.m.-7:00 p.m. Memphis

Walter Carrell
Digital Equipment Corp.

Enhancements to the VAX Performance and Coverage Analyzer (PCA) are covered in this session, presented by Digital engineering. VAX PCA is a performance analysis tool which pinpoints the locations of execution, page-faulting, and I/O bottlenecks in user programs. It is also a test coverage tool. Some of the

enhancements to be discussed include more ways to collect performance data and new and better ways to analyze and display such data.

SOLVING PERFORMANCE PROBLEMS WITH VAX PCA

LT031 Orientation:Intermediate/General
Wednesday 2:00 p.m.-3:00 p.m. Jefferson

Walter Carrell
Digital Equipment Corp.

This talk demonstrates how you can use the VAX Performance and Coverage Analyzer to locate performance problems in user-mode programs. Real examples from Digital's own development groups illustrate how PCA has been used to achieve often dramatic performance gains in various Digital products.

VAX DEBUG TUTORIAL

LT032 Orientation:Intermediate/General
Tuesday 12:00 noon-1:00 p.m. Memphis

Ken Glossop
Digital Equipment Corp.

This session describes the capabilities of the VAX/VMS Symbolic Debugger and shows how to use VAX DEBUG effectively to locate bugs in your programs. Breakpoints, examine capabilities, source displays, and the effective use of screen mode are among the topics covered by a representative from Digital engineering.

VAX PCA TUTORIAL

LT033 Orientation:Intermediate/General
Tuesday 11:00 a.m.-12:00 noon Memphis

Walter Carrell
Digital Equipment Corp.

This session by Digital Engineering describes how to use the VAX Performance and Coverage Analyzer to locate performance problems in user-mode programs and how to use it to measure test coverage. The collection of program counter sampling, page fault, and I/O data are discussed, and the many ways the PCA Analyzer can plot performance and coverage data, including source displays, are explained.

INTRODUCTION TO VAXSET

LT034 Orientation:Novice/General
Monday 12:00 noon-1:00 p.m. Memphis

Bob Abramson
Digital Equipment Corp.

This session describes VAXset, a powerful collection of proven software engineering tools: VAX Language-Sensitive Editor, VAX Performance and Coverage Analyzer, VAX DEC/Test Manager, DEC/CMS (Code Management System), and DEC/MMS (Module Management System).

The focus is on what the tools do to help solve problems and how they work together in the VMS environment.

While primarily a presentation of the technical capabilities of the tools when used together, the session also covers how their usage can simplify and enhance the process of software development and maintenance.

SOFTWARE PROJECT MANAGEMENT

LT035 Orientation:Novice/General
Monday 3:00 p.m.-4:00 p.m. Memphis

Bob Abramson
Digital Equipment Corp.

This session provides an overview of the application of Project Management techniques to software development.

Software Project Management is the process of facilitating the estimating, planning, and controlling of software development projects. The estimation activity provides a projection of the total effort, development time, and staff levels required to do a software project. Planning provides task-level schedules to which projects "commit." Both estimation and planning provide the project manager and project leader with information to do "what if" analysis at differing levels of detail and increasing levels of confidence. Control is a process of comparing, measuring and reporting progress against plan at the project and individual contributor levels. It provides the information to track project status, determine progress trends, and to take corrective action if necessary.

SOFTWARE PROJECT MANAGEMENT EXAMPLES

LT036 Orientation:Novice/General
Wednesday 10:00 a.m.-11:00 a.m. Jefferson

Jim Wiechmann
Digital Equipment Corp.

Examples of the application of Project Management techniques to the software development process are discussed in this session.

A widely accepted method for estimating the total effort, development time, and staff levels required to do a software project is the COCOMO macro-estimation model developed by Barry Boehm. Projections for effort, time, and staff levels are made using the estimated size of the project and "cost drivers," such as programmer capability, product complexity, and the programming environment.

The planning of a software project involves the manipulation and analysis of large amounts of data, including information about the project as a whole, individual tasks to be performed, milestones (critical points in time), and resources to perform tasks. A hierarchical representation of project task known as a Work Breakdown Structure (WBS) is developed and a precedence network is defined showing dependencies among task and milestones so that the order in which task must be done may be established.

The control of a software project involves maintaining data pertaining to actual efforts expended and extracting project data into a variety of formats, such as Gantt charts, to track project status and view actual versus planned progress.

DEC ASKS THE USERS

LT037 Orientation:Intermediate/General
Monday 9:00 p.m.-10:00 p.m. Memphis

Bob Abramson
Digital Equipment Corp.

Are you willing to be questioned rather than ask questions? If so, attend this session in which Digital personnel will turn the tables on DECUS ATTENDEES. The ground rules (strictly enforced) are that only Digital personnel may ask questions and members of the audience must agree to respond - individually and collec-

tively. The focus will be on software and hardware purchasing decisions and software development methodologies in use within your corporations (no proprietary information, please!). By helping us understand your buying decisions and work modes, we'll be better able in the future to provide the products and processes you need.

HOW VMS DEVELOPMENT USES CMS

LT038 Orientation:Intermediate/General
 Monday 7:00 p.m.-8:00 p.m. Knoxville

David Solomon
 Digital Equipment Corp.

This presentation describes how and why the VMS Development Team at Digital uses VAX DEC/CMS for source control in their development process. Topics to be covered include: why CMS was chosen, how we use the various capabilities in CMS, problems encountered, and future needs and requirements.

WHY YOU NEED THE DEC/TEST MANAGER

LT040 Orientation:Intermediate/Technical
 Wednesday 12:00 noon-1:00 p.m. Jefferson

Martin Dickau
 Digital Equipment Corp.

Producing high quality, reliable software is one of the main goals for anyone doing software development or programming of any kind. It has been estimated that more than 50% of the effort and more than 50% of the cost of developing software are the efforts that must be put into testing and validating the software throughout the software development lifecycle.

If you are interested in reducing the costs and labor of developing reliable software then this session may provide you with some answers. A Digital representative discusses tools and methodologies and an on-line demonstration shows the capabilities of the DEC/Test Manager and its use with other tools such as DEC/CMS and the VAX Performance and Coverage Analyzer.

TRYING TO GET MORE OUT OF CMS

LT041 Orientation:Intermediate/Technical
 Monday 5:00 p.m.-6:00 p.m. Natchez

Martin Dickau
 Digital Equipment Corp.

Are you trying to use CMS for more than just source code control? Are there things that you'd like it to do just a LITTLE differently than it does? Do you think you know how to wring a piece of functionality out of it but it doesn't "quite" seem to do what you want?

A technical representative from Digital's Tools Group talks about various requests and attempts of which we've heard and discuss ways of accomplishing them. In many cases, these are things we've heard from customers that have had success in this area. Since we certainly don't know all the answers (or the problems) audience participation is a strong part of this session.

A LANGUAGE FOR BUILDING TOOLS: VAX SCAN

LT043 Orientation:Novice/Technical
 Monday 4:00 p.m.-5:00 p.m. Memphis

Jim Totton
 Digital Equipment Corp

This session is an overview of a new programming language called VAX SCAN, with an emphasis of how the language is suited to building tools. The strength of the language is in the area of string processing and text pattern matching. This makes the language very useful for performing parsing and building conversion utilities. Examples are presented.

VNXSET OVERVIEW

LT044 Orientation:Novice/Technical
 Monday 1:00 p.m.-2:00 p.m. Memphis

Liz Freburger
 Digital Equipment Corp.

VAX DEC/Shell is a port of the UNIX² V7 Bourne Shell and many of the most popular UNIX utilities to VMS and Micro/VMS. The DEC/Shell runs as an alternate command line interpreter to DCL while at the same time allowing easy access to VMS functionality. DEC/Shell, along with VAX C, VAX DEC/CMS, and VAX DEC/MMS, make up the layered product set called VNXset. All of the VNXset products will be discussed in this presentation.

DECALC-PLUS - A SOFTWARE DEVELOPMENT TOOL

LT045 Orientation:Intermediate/Technical
 Friday 1:00 p.m.-2:00 p.m. Volunteer

Todd Sunshine
 Digital Equipment Corp.

This session focuses on the features of DECALC-PLUS which free a programmer from the time-consuming development of a software interface. Because of DECALC-PLUS's unique ability to directly call an external routine, the traditional role of a spreadsheet is expanded, allowing the spreadsheet to become, in effect, an extensive, pre-packaged front end for many applications. Particular attention will be given to the advantages of allowing a spreadsheet to handle the necessary terminal and file I/O that is common to most applications. Through the use of DECALC-PLUS, a programmer can concentrate on the fundamental aspects of program development, and leave the formatting organization, and storage of information to a product dedicated to such tasks. As such, DECALC-PLUS is not only a terrific spreadsheet, but is a tool that can improve the productivity and quality of software development.

USING PDP-11 SYMBOLIC DEBUGGER

LT046 Orientation:Intermediate/Technical
 Wednesday 1:00 p.m.-2:00 p.m. Centennial A

Call Fisher
 Digital Equipment Corporation

Debugging a program is an art, not a science. Finding a bug in a program requires a firm knowledge of the program's workings, a little intuition, and a little luck. Some tricks of the trade in finding problems in FORTRAN-77, COBOL-81, and MACRO-11 programs using the PDP-11 Symbolic Debugger include:

- Losing my mind (or how to find infinite loops)
- What's going on here (or uses of smart breakpoints)

²UNIX is a trademark of AT&T Bell Laboratories.

- WHEN did you say I should do it? (the use of these clauses in breakpoints)
- I'm not gonna type that AGAIN (or where you should use indirect command files)
- My files are gone (or how to examine FABs, RABs, and other ugly data structures)
- No lo comprendo (or language specific problems like COBOL's STATUS variable)
- What you've got here is a classic hardware problem (or problems with I- and D-space)
- Pretty Pictures on your PRO (how to send debugger output out the printer port)
- Running away from the problem (or debugging across the network)

GETTING MORE FROM FORTRAN-77

LT047 Orientation:Intermediate/Technical
Monday 4:00 p.m.-5:00 p.m. Volunteer

Bill Starkgraph
Digital Equipment Corporation

What exactly are the options that I might choose when customizing my FORTRAN-77 OTS? How do I implement the chosen options and how does this customization help me? Should I build a resident library or link against a Supervisor Mode Library? Which OTS should I choose?

What do the switches for the FORTRAN-77 compiler really mean and what do they do for me? How can I- and D-Space help my application? What are the areas to watch when using I- and D-Space?

These and other questions are addressed in this session. Examples will be given on how to build and use both the OTS options and I- and D-Space. Explanations are given on the advantages and any problem areas that one might encounter.

PDP-11 LANGUAGES & LAYERED PRODUCTS Q & A

LT048 Orientation:Intermediate/General
Thursday 6:00 p.m.-7:00 p.m. Natchez

PDP-11 Languages
Digital Equipment Corporation

This session provides PDP-11 users on all operating systems the opportunity to ask questions about PDP-11 Languages and other layered products.

All attending Digital developers and Product Managers will be on the panel representing these languages:

- BASIC-PLUS-2
- DIBOL
- BASIC-PLUS/RT
- FORTRAN-77
- PDP-11 Pascal & PRO/Pascal

and these layered products:

- PDP-11 Symbolic Debugger
- DATATRIEVE-11

If the panel can not answer your questions on these and other PDP-11 layered products during this session, they promise to follow-up later either during or after the symposium.

PDP-11 PASCAL STATUS AND FUTURES

LT049 Orientation:Novice/General
Monday 3:00 p.m.-4:00 p.m. Volunteer

Marilyn Finch
Digital Equipment Corporation

This is a program announcement that reveals the latest corrections and enhancements being considered for a PDP-11 Pascal future release. It is an opportunity for Pascal users to provide input that will help direct the future of PDP-11 Pascal.

PDP-11 C USERS FORUM

LT050 Orientation:Intermediate/Technical
Thursday 5:00 p.m.-6:00 p.m. Natchez

Anthony E. Scandora, Jr.
Argonne National Lab.

Do you write C programs for the PDP-11? How is your support? Have you written a useful subroutine package that is not in the distribution kit? Have you fixed compiler or library bugs? Do you need subroutine packages that are not in the distribution kit or bug fixes? A panel of long-time C users discuss some of their problems with, enhancements to, and fixes to both Whitesmiths and DECUS C for the PDP-11. Audience participation is encouraged, and there is plenty of time for questions.

SOFTWARE CONFIGURATION MANAGEMENT PANEL

LT051 Orientation:Intermediate/General
Tuesday 12:30 p.m.-2:00 p.m. Natchez

George L Scott
Computer Sciences Corp.

Howard Holcombe
RCA

Joesph Pollizzi
Space Telescope Science Institute

Chair: Mark Kidwell

A panel of users from the L&T Configuration Management Working Group discuss configuration management throughout the software life cycle. Both government and non-government environments are included. Problem reporting, source change control and tracking, and relating executable to source are all topics of discussion.

Past panels have shown a large amount of audience participation.

DESIGN CONSIDERATIONS FOR CONFIGURATION MANAGEMENT SYSTEMS

LT052 Orientation:Intermediate/General
Monday 6:00 p.m.-7:00 p.m. Natchez

Mark Kidwell
Texas Instruments

Configuration Management (CM) is becoming more of an issue with the growing need for controlling existing and developing software. With the increased time and cost of CM, automated

CM procedures become imperative. What the CM/user community needs is an integrated approach towards developing a CM system. This session presents what should be considered when developing an integrated product for CM.

IN SEARCH OF THE BEST USER INTERFACE FOR VAX/VMS DEVELOPMENT

LT053 Orientation:Intermediate/Technical
Tuesday 3:00 p.m.-3:30 p.m. Memphis

Shava Nerad
MIT

Available user interface software packages can be expedient, but may not produce the most flexible or the most usable interface design. What are the layered products we could use? What methods are good for language-based development? What can we learn from computer-based instruction interfaces?

These and other questions are addressed in this session.

ISSUES IN LARGE SYSTEM MAINTENANCE, THE TURNOVER

LT054 Orientation:Intermediate/General
Thursday 5:30 p.m.-6:00 p.m. Volunteer

Joseph A Pollizzi, 3rd
Space Telescope Science Inst.

The Space Telescope Science Institute (STScI) is currently accepting a large satellite ground system from a major government contractor. The ongoing maintenance and planned enhancements to this system will be performed by an in-house group. This session discusses the formation of this group, its experiences in planning for the delivery of the system, its acceptance and the first year afterwards.

Special emphasis is placed on our choice and usage of various "off the shelf" tools for configuration control, program analysis, and build processing. The Digital Equipment Corporation products of CMS and MMS were chosen as the configuration/build tools for this application. Many of the special build construction tools were developed using VAX Scan. Other than build and configuration control, various other tools have been investigated for automating the testing (VAX DEC/Test Manager), and to provide for some automatic analysis of the software construction and operation (MAT and VAX PCA).

LANGUAGES & TOOLS ROADMAP

LT055 Orientation:Novice/Technical
Monday 9:00 a.m.-9:30 a.m. Memphis

Sam Whidden
American Mathematical Society

Katherine Hornbach
Digital Equipment Corp.

This session is a roadmap to sessions and events during the week that are of interest to Language and Tool users. It provides pointers to detailed sessions on many topics later in the week. You will be introduced to the Digital developers, and the L&T steering committee members.

The information-packed Languages & Tools folder will be distributed at this session - it's a collection of over a dozen useful documents, questionnaires, and other goodies that are essential for anyone interested in L&T.

CONFIGURATION MANAGEMENT CLINIC

LT056 Orientation:Intermediate/General
Tuesday 2:00 p.m.-3:00 p.m. Judges A

G Del Merritt
Computer Sciences Corp.

A group of knowledgeable VAX users and Digital Equipment Corporation representatives will be available to answer Configuration management related questions.

APPLICATION TUNING: CONTRASTING SPM, PCA, IMON, AND PROFILE

LT057 Orientation:Intermediate/General
Monday 7:00 p.m.-8:00 p.m. Memphis

Louise Wholey
Measurex Corp

USING VMS SYSTEM SERVICES FROM VAX C

LT058 Orientation:Intermediate/General
Wednesday 5:00 p.m.-6:00 p.m. Memphis

James Maves
EATON Corp.

This session addresses the use of VAX system services and standard Run Time Libraries from C programs. It includes examples of C programs that use VMS system services and gives techniques for making it easier and more efficient to use the VMS utility routines.

CHANGING TOOLS IN MIDSTREAM

LT059 Orientation:Intermediate/General
Friday 11:00 a.m.-12:00 noon Volunteer

Al Magruder
E.G.&G.

Lyn Lewis
Lawence Livermore National Labs

Chair: Bill Lennon

LANGUAGES & TOOLS WIZARDRY

LT060 Orientation:Intermediate/General
Tuesday 5:00 p.m.-6:00 p.m. Memphis

Dena Shelton
System Industries

At this session, users have the opportunity to mystify and impress the audience with stories of their tool prowess and wizardry. Have you done something incredible with CMS, MMS, DEC Test Manager, LSE, TPU, PCA or any of the other DEC tools (language, including DCL tricks are acceptable also)? This is an opportunity to impress your peers and perhaps win a prize.

Stories of wizardry, magic, and war stories are all welcome. Stories can be humorous, but this is not required. Judging is by a panel of expert tools users and DEC developers.

LANGUAGES & TOOLS CLINIC

LT061 Orientation:Intermediate/Technical
Tuesday 10:00 a.m.-11:30 a.m. Judges A

Mark Kidwell
Texas Instruments

The Languages & Tools Clinic is an opportunity for novices and experts alike to ask questions about Languages and Tools, in an informal, one-on-one atmosphere. Digital developers are on-hand, as will experts from the user community. Fair game are questions about almost any VAX language, plus the Code Management System (CMS), Module Management System (MMS), DEC Test Manager (DTM), Performance Coverage Analyzer (PCA), Language Sensitive Editor (LSE), Text Processing Utility (TPU), and EDT. TeX and LaTeX experts are also present. Both specific technical questions as well as general strategy and implementation questions are welcome. This session is held in the relaxed atmosphere of the SIG Campground; stop by and take some time to go over your questions with the experts.

LANGUAGES & TOOLS Q&A

LT062 Orientation:Intermediate/Technical
Thursday 8:00 p.m.-9:30 p.m. Jefferson

Bob Abramson
Digital Equipment Corp.

This session provides a means for users to get their questions on languages and tools answered. Representatives from Digital will be available to answer questions on languages such as FORTRAN, Pascal, C, Ada, Bliss, APL, and Scan, as well as tools such as NOTES, LSE, TPU, PCA, MMS, CMS, DEBUG and DEC/Test Manager. This session also is a resource for locating more specialized languages and tools not currently supplied by Digital, with knowledgeable users sitting on the panel, to answer questions about things like TeX, LaTeX, cross-targeting compilers, requirements and design tools, etc.

LANGUAGES & TOOLS OPEN STEERING COMMITTEE MEETING AND USER FEEDBACK

LT063 Orientation:Novice/General
Thursday 4:00 p.m.-5:00 p.m. Nancy Ward

Sam Whidden
American Mathematical Society

During the Languages & Tools open steering committee meeting, steering committee members discuss current and planned SIG activities. The committee solicits feedback and questions from the audience. Opinions and suggestions on session, seminars, campground activities, newsletters, and any other SIG activities are welcome. This is an opportunity to learn more about the Languages and Tools SIG and how it functions.

Part of the meeting is devoted to recruiting new volunteers to help in SIG activities; if you are interested in becoming more involved in the L&T SIG, come to this session.

BOUQUETS OR BRICKBATS? USER'S FORUM ON DEC L&T PRODUCTS

LT064 Orientation:Novice/General
Tuesday 3:30 p.m.-5:00 p.m. Memphis

Sam Whidden
American Mathematical Society

Katherine Hornbach
Digital Equipment Corporation

Ever wanted to tell Digital developers how they should be doing

their job? What new products they should be working on but seem to be ignoring? Or maybe some feature you really like and would like to see replicated in other products? This is your chance to toss bouquets or brickbats in Digital's direction. We have all the Languages and Tools developers and managers that we can find, lined up at the front of the room. Tell them what you like and don't like about how they're doing their job. To get things started, we'll do some general audience surveys about some of the more prominent issues in the L&T area at present, such as text formatting tools and software design tools. Then we'll open it up to comments from the floor - any Digital L&T product or potential product is fair game.

Part of the session will be devoted entirely to documentation issues. How well are the L&T products documented? Is the online help adequate? Do you have any suggestions on how things could be improved?

(This session will try to stick to more technical aspects of Languages and Tools - go to the "Digital Asks the L&T User" session to tell Digital that software costs too much or isn't delivered on time).

VAX FORTRAN AND SYSTEM SERVICES

LT065 Orientation:Advanced/Technical
Thursday 5:00 p.m.-6:00 p.m. Jefferson

Earl S. Cory
EATON Information Management

New features in version 4 of VAX FORTRAN ease the use of VMS System Services. The STRUCTURE, MAP, UNION, and RECORD statements eliminate the need of named COMMON areas in calling system services. These new features are discussed and examples of their use in calling VMS System Services and Run-Time Library functions are shown. In particular \$GETJPI, LIB\$GETJPI, and \$SYSQIO are covered and examples provided.

LANGUAGES & TOOLS WRAPUP

LT066 Orientation:Novice/General
Friday 4:00 p.m.-5:00 p.m. Jefferson

Sam Whidden
American Mathematical Society

At this session, the successes and problems encountered at this symposium are evaluated. Feedback from the user community is requested. Preferences for sessions to be presented at the next symposium are solicited. The current activities of the SIG are summarized, and you get to know some of the SIG leadership. In addition, we try to interest the attendees in participation in the activities of the SIG as volunteers.

If your interests lead you to sessions on languages and tools, come see if you can find some way in which to take a more active role in the Languages & Tools SIG.

AUTOMATED AND RELIABLE SOFTWARE DEVELOPMENT AND DELIVERY USING DIGITAL SOFTWARE PRODUCTS

LT067 Orientation:Intermediate/General
Friday 10:00 a.m.-10:30 a.m. Volunteer

Glenn Cooley
Survey Sampling, Inc.

Presented are the details of a software development and delivery environment which makes innovative use of the Digital

software products such as the Language Sensitive Editor (LSE), Code Management System (CMS), Module Management System (MMS), and DECnet along with a concept called "tiered releasing". These tools and concepts reduce the time demands on software developers through extensive automation and increase software reliability. In this environment, software developers are better able to concentrate on the creative aspects of software development since many of the non-creative steps are automated. Similarly, automating these steps has increased reliability since far more data can be maintained on the software developed and delivered with much less reliance on user input accuracy and completeness.

AI/LANGUAGES & TOOLS/UNISIG JOINT RECEPTION

LT068 Orientation:Novice/General
Friday 10:00 a.m.-10:30 a.m. Volunteer

Sam Whidden
American Mathematical Society

One of the biggest benefits of attending a DECUS symposium is getting to know so many interesting people with common interests - a chance meeting with someone who has already solved a problem you have been wrestling with for two weeks; or an opportunity to ask a Digital developer an intricate technical question. It is with this in mind that the Artificial Intelligence, UNISIG, and Languages and Tools SIG steering committees will be hosting an informal reception for symposium attendees. The steering committees of all three SIGs will be there, as will the Digital developers from the AI, ULTRIX, Technical Languages and Tools groups. It will be a chance to relax during a hectic day, and meet people interested in the same things you are. It is rumored that some of the Digital developers will be performing an encore - something that you surely will not want to miss. There will be a cash bar and munchies; please come join us.

PUBLIC DOMAIN LANGUAGES AND TOOLS SOFTWARE

LT069 Orientation:Intermediate/General
Thursday 7:00 p.m.-8:00 p.m. Jefferson

Anthony E. Scandora, Jr.
Argonne National Lab.

Public Domain software panel

INTRODUCTION TO VAX TPU AND THE EVE EDITOR

LT070 Orientation:Novice/General
Thursday 9:00 a.m.-10:00 a.m. Jefferson

Barry Tannenbaum
Digital Equipment Corp.

VAX TPU is a high performance, programmable text processing utility distributed with the VAX/VMS operating system. VAX TPU contains a high level programming language, a compiler, and two editing interfaces; EVE, the extensible VAX editor, and an EDT keypad emulator. Both are written in the VAX TPU language.

This session provides an introduction to the concepts and capabilities of VAX TPU and the EVE editing interface. Ways to customize the EVE interface are discussed.

PROGRAMMING IN VAX TPU

LT071 Orientation:Intermediate/Technical
Thursday 11:00 a.m.-12:00 noon Jefferson

Barry Tannenbaum
Digital Equipment Corp.

VAX TPU provides a high-level programming language that allows creation of text processing utilities. This session discusses the basics of the VAX TPU language and how it is used to extend and modify TPU-based editors.

AN INTRODUCTION TO CONFERENCING, OR, HOW DO YOU USE VAXNOTES ANYWAY?

LT074 Orientation:Novice/Technical
Friday 10:00 a.m.-11:00 a.m. Jefferson

Dan Eisner
Perkin-Elmer Corp.

DECUS is in the process of establishing a conferencing system, DECUServe, for its membership. The VAXnotes product was selected as the basis for this system. This session describes how VAXnotes is used from a tutorial viewpoint. Experiences in using it are also described.

This session should be of interest to those who want to determine if conferencing can be useful to them or those who want to know more about the VAXnotes product.

SYSTEM MANAGEMENT IMPLICATIONS OF VAXNOTES: WHAT VAXNOTES WILL DO TO YOU AND YOUR SYSTEM

LT075 Orientation:Intermediate/Technical
Friday 11:00 a.m.-12:00 noon Jefferson

Terry Medlin
Survey Sampling, Inc.

Ray Kaplan
Pivotal, Inc.

The DECUServe project has an ultimate goal of providing conferencing service to any DECUS member. Given the fact, that there are about 40,000 DECUS members in this country, it is not hard to envision a system that is fairly large. Data collected from the prototype of the DECUServe project is presented. Also presented is the design for the final system and we tell you why we plan to do it that way.

If you are involved in a large company that is exploring or pondering the usage of VAXnotes, then we may be able to give you some experiential advice and save you some time and trouble.

MANAGING SOFTWARE PROJECTS - MYTH OR REALITY

LT076 Orientation:Novice/General
Thursday 6:00 p.m.-7:30 p.m. Volunteer

Terry Medlin
Survey Sampling, Inc.

Have you ever been in a project that did not proceed on schedule. Have you ever seen a project not live up to user expectations or needs. A panel of people involved in software project management presents their own viewpoints of the state of project management techniques.

The output of this session should be an introduction to project management techniques that are being applied today. In addition you should expect to hear what others think we still need to do to further improve our ability to manage projects even better.

Expect some lively interchange between speakers!

MAKING PRODUCTIVITY TOOLS BE PRODUCTIVE TOGETHER

LT077 Orientation:Intermediate/General
Friday 9:00 a.m.-10:00 a.m. Volunteer

Cindy McDonnell-Feinberg
Digital Equipment Corp.

On VAX/VMS systems, Digital provides quite a number of "productivity tools" - Language-Sensitive Editor (LSE), Code Management System (CMS), Module Management System (MMS), Performance and Coverage Analyzer (PCA), DEC/Test Manager (DTM), and Source Code Analyzer (SCA). Their very number and apparent complexity can make them seem difficult to use. Some sites shy away from them for that reason.

This session presents case studies of application development to address the issues of integrating the use of the tools to be more productive.

The tasks of application development and maintenance are enormous, but not insurmountable! The hints and suggestions from this session will help ease the way through those enormous tasks.

WHAT IS APL?

LT078 Orientation:Novice/General
Friday 2:00 p.m.-3:00 p.m. Volunteer

Robert van Keuren
UserWare International Inc.

APL stands for A Programming Language. It is a general-purpose language that is particularly popular for mathematical, array-oriented purposes, but its flexible, modular approach make it useful for many other purposes, including text processing. It has even been used for music and composition.

This session is a general introduction to APL. It explores what APL is and why you might find it useful.

EXPERIENCES WITH VAXSET

LT079 Orientation:Intermediate/General
Friday 2:30 p.m.-3:00 p.m. Jefferson

Gerald W. Lester
Computerized Process Unlimited

This session describes the experiences of using VAXset and the project management techniques described in "Using VAXset" on the development of a database compiler and access routines. It is assumed that the audience is familiar with the use of the components of VAXset.

GNU EMACS - A UNIX/GNU/VMS VERSION OF EMACS

LT080 Orientation:Intermediate/Technical
Thursday 10:00 a.m.-11:00 a.m. Jefferson

Don Kassenbaum
Computation Center

GNU EMACS is a UNIX/GNU implementation of the popular screen editor. Like other versions of EMACS, it is based on the original MIT EMACS. GNU EMACS has been ported to the VAX/VMS operating system. GNU EMACS is not in the public domain, but everyone is free to use it and redistribute it on a free basis.

This session will describe the features of GNU EMACS.

USING DCL TO DEVELOP MENU DRIVEN SYSTEMS

LT081 Orientation:Novice/General
Thursday 7:30 p.m.-8:00 p.m. Volunteer

Jim Carpenter
Central Area Data Processing

Digital Command Language (DCL) can be used to quickly develop a hierarchical structure for a menu driven system. DCL menus have the advantages of being quickly constructed and quickly modified. This allows programmers to concentrate more on the application and less on the cosmetic appearance of the system.

This session presents an example of a DCL menu structure; and examines the DCL commands which are essential for this function. Such commands include:

- INQUIRE,
- TYPE,
- lexical functions,
- symbols, and
- terminal escape and control sequences.

Consideration is given to the appropriate use of DCL implemented menus.

CMS FOR PROJECT CONTROL - MANAGING A MAJOR FIRMWARE PROJECT

LT082 Orientation:Novice/Technical
Thursday 12:00 noon-1:00 p.m. Volunteer

Bill Sturm
Tektronix Inc.

Chair: Joy Williams

This session describes the migration from workstations to a central processing unit for the development and control of a major firmware project. The need to share data and tools while maintaining rigid control over the software source dictated the use of reliable central tools.

EXCURSIONS IN EVE

LT083 Orientation:Novice/Technical
Thursday 12:00 noon-1:00 p.m. Jefferson

John Claxton
Collier-Jackson, Inc.

This session covers various EVE and TPU commands including:

- An EVE/EDT key pad toggle,
- EVE is not a word processor
- The EVE User Exit, and
- Assorted EVE Magic.

**PROGRAMMING FOR DIRECTORY AND FILE
SECURITY IN VAX PASCAL**

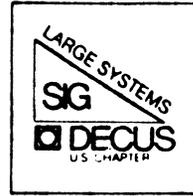
LT084 Orientation:Intermediate/Technical

Friday 1:00 p.m.-2:00 p.m.

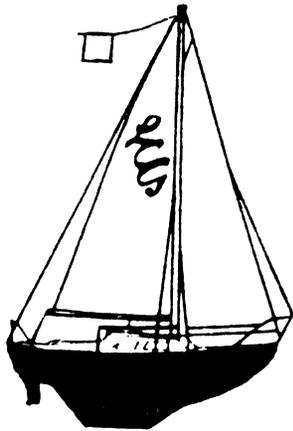
Jefferson

**John M. Keefe Jr.
Sentry-Schlumberger**

This session describes how the Access Control List (ACL) system service routines and the User Identification Code (UIC) file protection facilities within the VAX Record Management Services (RMS) may be used from VAX PASCAL. An Automated Test Equipment (ATE) Test Program Librarian (TPL) system is used as an example of how both of these protection mechanisms can be employed in order to supply directory and file object security. The Test Program Librarian which is examined in this session runs on a VAX-family processor and communicates via either DECnet or ETHERNET to the various attached ATE systems. This session will describe the implementation experiences of the Test Program Librarian development team and will share some of the insight gained into the access control mechanisms available in the VAX/VMS operating system. Although the code examples presented are in VAX PASCAL, this session presents information useful to any programmer who may wish to employ the UIC or ACL based access protection facilities within his/her own applicaton system.



DIGITAL EQUIPMENT COMPUTER USERS SOCIETY



AT LARGE

LS

The Newsletter of the Large Systems SIG

Contributions

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

Send your contributions to:

ARPA: ctp@sally.utexas.edu
UUCP: ctp@ut-sally.uucp ({harvard,ihnp4,seismo}!ut-sally!ctp)
CIS: 75226,3135
BITNET: use the Wisconsin Gateway

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

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

Nashville Symposium Preview

Compiled by: Betsy Ramsey

The Large Systems SIG concerns itself with the issues and needs of users of Digital's large computer systems: large VAXs, VAXclusters, and DEC-10/20s in standalone and networked environments. The SIG is presenting a number of sessions at the Nashville symposium that should be of interest to these users.

High-End System Planning and Management

On Wednesday and Thursday, there are a number of sessions pertaining to the management of high-end systems, and planning for new high-end systems. Some sessions of particular interest are the following:

- Managing High-End Systems in a Multi-Vendor Environment

An increasing number of sites that use Digital's high-end systems are also supporting systems from a variety of other vendors. The support of systems (microcomputers through mainframes) in a multi-vendor environment is a challenge that presents new opportunities for creativity as well as new levels of complexity. Speakers at this session discuss their experiences in supporting and managing systems in the multi-vendor/multi-operating system environment.

- User Account Management at One Large VAXcluster Site

This session describes General Electric's policies and tools for managing a large VAX-cluster user community. The site has an eight node cluster; 22 RA81s; and 800 authorized, 500 active, and occasionally 125 concurrent users with very diverse needs. Items discussed include: usernames and a tool to look up usernames; passwords and a tool to update networked accounts; account creation, expiration, renewal, archival, resurrection; well-structured user accounts; user and Operations responsibilities; user education.

- Project Accounting in a Cost-Recovery Environment Using UIC's, ACL's and Right Identifiers

The computer facility at the University of Texas Health Science Center at San Antonio is a cost recovery site that supports research, administrative and office automation functions. Users need to login to the system in their personal accounts (to receive mail and messages) but they also need to work on various projects that need to be charged to other account numbers. CPU usage, connect time and disk usage need to be tracked while the users are using one of their various project accounts, but the users must also maintain some of their original identity (specifically their username). Additionally, while users are in one project, they may need some special access to a file (or files) in another project. We have developed a method that implements all of these features using UIC based protection, Rights Identifiers, ACL's and a "Change Project" program.

- VAX/VMS Distributed Queuing System for Implementing Remote Queues

The VAX/VMS Distributed Queuing System (DQS) is a facility which allows the implementation of remote VMS queues. Its popular usage is the implementation of print servers using off the shelf products. DQS in such a situation would allow users on one system to submit PRINT requests using standard VMS PRINT command, and to have the file(s) printed on a remote system. This allows sharing of printing resources among systems, as well as designating one system to handle the entire printing load for a large group of systems. This makes for greater efficiency and cost effectiveness for large, expensive printers.

- Magnetic Tape Handling on VAX/VMS: Digital Responds to DECUS Input

DECUS leadership presented Digital with a White Paper on requirements for VAX/VMS tape handling. This session provides Digital's Tape Engineering division with an opportunity to respond to key points of the White Paper, as well as to solicit additional information on specific points where needed.

- High-End Packaged VAXcluster Systems

This session describes two new large-scale VAXcluster system offerings which are used as general-purpose systems for data processing, database management, information systems, and decision support applications. The VAXCluster systems are compared to the largest traditional mainframes in performance, capacity, and system availability in a computing environment which is characterized by multi-function, multi-application, and high capacity requirements.

- High-End VAX Configuring: Wires and Boxes & Case Studies

Configuring high-end VAX/VMS systems involves numerous details. While many individuals have a good knowledge of the overall concepts, information on some of the details which are necessary to complete a "clean" configuration are sketchy. Most often these details involve two basic areas: cables (wires) and system options (boxes). The first session ("Wires and Boxes") covers, in detail, the configuration rules involved in each of

these two areas; other areas are covered as time permits. The second session ("Case Studies") presents multiple studies in developing an entire VAX configuration. This consists of defining the work load requirements, the necessary processor and peripheral resources needed to meet those requirements, and the configuring of the target system. Possible points of future expansion on the configured systems are also discussed.

DECSYSTEM-10/20 Sessions

On Monday and Tuesday, the Large Systems SIG will present sessions of special interest to users of DEC-10 or DEC-20 computer systems, including the following.

- An Academic Conversion from a DECsystem-10 to a VAX 8650

The Catholic University of America is in the process of converting all of its academic and administrative computing from a DECsystem-10 SMP system to a VAXcluster. This session describes the conversion of the academic computing; the planning and the work involved, the successes and the problems encountered.

- VMS Internals for DECsystem-10/20 System Programmers

DECsystem-10/20 system programmers have traditionally worked with a good understanding of the internals of their respective operating systems. This session is for those systems programmers; it is based on their existing knowledge of how an operating system functions. It presents details of key portions of the VMS operating system. This subject is quite broad, and is the topic of numerous training courses; the topics covered in this session are only a small subset of the entire picture, but are aimed at providing the most information in the time allotted.

- DEC-10/20 Mail System Internals (Interfacing to External Mail Systems)

The release of the DECmail/MS V11 mail system for TOPS-10 and TOPS-20 has raised interest in the details of interfacing it to external mail protocols. This session covers the implementation details of the MS and MX mail programs, knowledge of which is necessary to perform such a task.

- TOPS-20 to UNIX Conversion, Experience at Columbia University

This session discusses Columbia University's decision to replace a DECSYSTEM-2065 with a VAX 8650 running Ultrix 1.2, including how the decision was made; why Ultrix was selected rather than VMS; what should be done with the remaining DEC-20s. It presents issues regarding the conversion from TOPS-20 to UNIX in an academic setting, such as security, politics, and finances; and differences in the "user interface", the file systems, the set of applications, the programming environment, communications, performance, etc. A new "user interface" is presented which provides the capabilities of the TOPS-20 COMND JSYS to the C programmer (not only in UNIX, but also MS-DOS and other systems with C compilers).

- AMAR - A Performance Analyzer for TOPS-10/20

AMAR is a performance monitor and analyzer that runs on the TOPS-10 and TOPS-20 operating systems. The system component of AMAR provides general system statistics, while the workload component allows a system manager to see exactly how, and by whom, the system is being used. AMAR is in the public domain, and is available through the DECUS Program Library. This session presents an overview of AMAR, and then describes how it is used at the American Mathematical Society for capacity

planning.

Special-Interest Sessions

On Wednesday, the Large System SIG and Digital present a special session for VAX system managers who have been given responsibility for managing a DEC-10 or a DEC-20:

- DECsystem-10/20 System Management and Operations for VAX/VMS System Managers

Many sites are discovering the need to have their DECsystem-10/20 run by systems managers who are familiar with other operating systems. In particular, the need for a VAX/VMS system manager to understand the operation of a companion DECsystem-10/20 is becoming more and more important. This session covers the operational and system management aspects of DECsystem-10/20s for persons experienced with similar tasks on a VAX/VMS system.

Programmers at sites using the TCP/IP network protocols will be interested in the following session on Tuesday:

- Internet Domain Service

Many sites have Digital computers that participate in the Arpanet network, or which otherwise use the Internet protocols. The Arpanet has recently moved to a domain system for support of node name processing. This session discusses the implementation details of Domain Service for Internet. A description of the protocol is included.

On Thursday and Friday, Digital is presenting several sessions for users of Hewlett-Packard and Control Data Corporation systems. These sessions will discuss the migration from these systems to the VAX/VMS environment. Software tools to aid in the conversion are described, and users will relate their experiences in making the move.

From the TOPS-20 Mailing List

Abstracted by: Clive Dawson

The following messages are selections taken from the TOPS-20 interest group, which is a mailing list maintained on the DARPA Internet. These items appear for information purposes only. Neither DECUS nor the authors assume any responsibility regarding the usefulness or accuracy of the information herein.

Date: 30 Oct 86 10:21:48 +1000 (Thu)
Subject: 2 questions that have been asked before
From: Craig Warren <munnar!charlie.oz!ccw@seismo.CSS.GOV>

1. Can Tops-20 be patched to use an RP07 as a bootable PS: structure? Is this supported in V6?

2. Can an RP07 that has been used as a structure on a VAX be used on a DEC-20 without going back to the factory for 36 bit sector formatting?

Craig Warren ccw%charlie.oz@seismo.css.gov

Date: Thu 30 Oct 86 02:40:44-MST
From: Mark Crispin <MRC@SIMTEL20.ARPA>
Subject: Re: 2 questions that have been asked before

Craig -

Lots of sites use RP07's as PS: structures. It's supported by DEC. What you cannot do with an RP07 is have the *front end* booted from it. This is because the RP07 is too fast for the RH11.

There is a field procedure to reformat an RP07. Your Field Service troll should know how to do this.

- Mark -

Date: Wed 7 Jan 87 18:35:10-PST
From: Vivian Neou <Vivian@SRI-NIC.ARPA>
Subject: DUMPER tape copying?

I've been trying to copy a dumper archive tape, and have so far been unsuccessful. The methods that worked under Rel. 5 (COPY at the EXEC, MTCOPY from swskit and TCOPY from CMU) no longer seem to work on 6.1. Does anyone have a way to copy dumper tapes that works on 6.1? Thanks.

Vivian Neou

Date: Wed 7 Jan 87 21:59:16-EST
From: Ken Rossman <sy.Ken@CU20B.COLUMBIA.EDU>
Subject: Re: DUMPER tape copying?

If you want verbatim tape-to-tape dumper copies, I believe the EXEC's COPY command should still work. You will need to make sure the following parameters are set:

- If the source tape is labelled, then make sure the other tape is also labelled. I am not sure, but I think somehow DUMPER's checksumming process takes into account the label info, so the label on the target tape will have to be the same as the source tape label, and you will need to go through TOPS-20 labelled tape handling (i.e. let TOPS-20 handle the label processing). This is just a gut impression I got from one of the times I worked with tape copying in the EXEC, and it might not be correct. Anyone else care to tackle this one? I'd like to know since the topic was raised.
- Find out the following about the source tape, and make sure to issue the appropriate EXEC SET TAPE commands:
 - o Was it core-dump or industry-compatible? (other formats I can't guarantee will work, but they should theoretically). Also, theoretically, SET TAPE FORMAT INDUSTRY should work in all cases, since it should just simply do straight 8 bit byte copies from one tape to the other, preserving all bits and bit positions, but for

some reason, this seemed to generate checksum errors in the output tape. I never understood why, so I just made sure that the EXEC used the same parameters that matched the input tape.

- o Was the source tape even parity instead of odd (which is default)?
- o You will need to know the actual physical blocking factor of the source tape. If the DUMPER blocking factor was 1, then you will need to tell the EXEC to use a record length of 2590. Actually, this might have changed with version 6, so this might be your problem, though I don't know what to tell you about how to find out what DUMPER would now use as a blocking factor in actual bytes. Other DUMPER blocking factors would then, of course, be multiples of that magic number 2590, or whatever the new V6 magic number is now.
- o You'll want to probably make sure that the output density is also the same, though theoretically it doesn't have to be as long as the output tape can hold all of the data if you wish to make the output tape a lower density than the input one.

The EXEC command "copy T1:*** T2:***" (where T1 is the input tape and T2 is the output tape, of course) should then work. If the tape is unlabelled, then you will need to issue separate copy commands for each file on the source tape ("copy T1: T2:" - no asterisks will work here, since unlabelled tapes know nothing about the TOPS-20 file system).

/Ken

Date: Wed 7 Jan 87 23:36:50-PST
From: Mark Lottor <MKL@SRI-NIC.ARPA>
Subject: CRYPT part II

Well, I had this diary of sorts that I had spent two years working on, from around '82-'84. I hadn't made an entry in a few months, and when I went to decode the file I found that I had forgotten the password. So, last week I thought I'd do something about it.

I got the sources to the CRYPT program and I hacked it up to try every single key. I figured it might run for 5 or 10 years but I wasn't in a hurry. The key was 71 bits, but I found what may have been a bug that reduced it to only 35. This computed to only about 200 days. I tried a test case with a simple key, and was a bit surprised when it was decoded in about a minute. So, I fired up the batch job that was going to take all year to complete. But it finished a minute later! Yes, it was decoded. No, it didn't try every key. Hardly any matter of fact. I don't know how the algorithm was supposed to work, but it appears that lots of keys are "equal" to each other.

I have found that I can decode any text file in about a minute. This is using the CRYPT program (NCRYPT.FAI) that writes out the coded file in a format like:

```
;crypt  
ahdsj jhaud oiqmn djdud djsau kasia zajza husdh  
;end
```

Just a warning to anyone using it; it's worthless.

Now the questions: Was it known this program was so bad? Is there a good crypt program for Tops-20? One that's been tested?

Mark

Date: Thu 8 Jan 87 10:07:00-PST
From: Stu Grossman <GROSSMAN@Sierra.Stanford.EDU>
Subject: Re: CRYPT part II

The two most common encryption things that people on TOPS-10 have been using for years were in BACKUP (the Tops-10 equivalent of DUMPER), and in SOS (EDIT to you TOPS-20 folks). I have no idea how well the encryption stuff works in either of these programs.

By the way, VMS has a DES encryption program. You may want to look into that as I know that SRI runs VMS and has sources.

Sorry I didn't mention anything on TOPS-20, but I sure that someone somewhere on the Arpanet still has copies of Tops-10 sources around.

Stu Grossman

Date: Thu 8 Jan 87 13:46:40-CST
From: Clive Dawson <AL.CLIVE@MCC.COM>
Subject: Re: CRYPT part II

The encryption stuff found in TOPS-10 Backup and SOS is also rather unreliable. Years ago I performed a "known plaintext" attack on that algorithm and developed a program which would spit out keys instantaneously given just a few bytes of the encrypted and corresponding plaintext. If I recall correctly, the set of keys was partitioned into equivalence classes of 30 keys each. The program would output all 30, any of which would work; but it was usually quite obvious what the original one was.

It sounds as if the keys for TOPS-20's Crypt program form equivalence classes that are many times greater than 30, which would explain the success of the brute force approach. I don't know how the SOS algorithm would stand up to brute force, given that there are only 30 possible keys, but the algorithm is so weak that a semi-brute-force attack based on guessing portions of the plaintext would certainly succeed very quickly.

Clive

Date: Tue 13 Jan 87 07:53:29-CST
From: Clifford A. Wilkes <CC.Wilkes@R20.UTEXAS.EDU>
Subject: DECnet CTY output

I need some help. Our other 20 has DECnet and only a 300-baud CTY. There are some 400 DECnet nodes that are defined at boot and the output to the CTY takes forever. It also wastes a lot of paper. I have tried everything I can think of to get the output to go to a file. My last attempt in our SYSTEM:DECNET.COMD file which is called from SYSTEM:SYSTEM.COMD used the following two lines.

```
SET LOGGING FILE ALL
SET LOGGING FILE SYSTEM:DECNET.LOG
```

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However, this did no good. It didn't even duplicate the output to the log file.

We are currently running 6.1 with the DECnet routed over an NI.

Could someone help? What am I not getting here? I've checked the DECnet manual and thought my last try would do it. Even speeding up the output with a 1200-baud CTY would be nicer but this billion-dollar university can't seem to scrape up the \$200 or so necessary to buy one.

Thanks.

Date: Tue, 13 Jan 87 09:09:08 EST
From: Thomas De Bellis <sluggo@cunixc@columbia.edu>
Subject: Re: DECnet CTY output

What kind of a Galaxy are you running? I ask this for two reasons.

- 1) If it isn't a vanilla 6.1 Galaxy, it may be that you are using an old QSRNET file which is still printing the topology change interrupts. If this is the case, you should either toss that old module or modify your Orion to be able to disable those messages. This is a trivial modification to make (I made it in 1983, I think).
- 2) Alternatively, you should check to make sure that the NCPTAB and related files that you link with your Orion are the same as what that crock NMLT20 wants. It may be that NMLT20 isn't able to understand what you are sending it.

- Tom

Date: Mon 19 Jan 87 18:52:16-PST
From: Stu Grossman <GROSSMAN@Sierra.Stanford.EDU>
Subject: Re: DECnet CTY output

The first things you should try should be see what options you have when you type DISABLE OUTPUT ? to OPR. One of them may disable the messages you are complaining about. Failing that, you could try DISABLE OUTPUT ALL.

In any case, none of the above methods will really work all that well if you subsequently re-enable output. What will happen is that you will start getting responses to those SET NODE commands that were still pending to NMLT20 at the time that you re-enabled output. Ie: the sequence:

```
OPR>DISABLE OUTPUT-DISPLAY ALL
OPR>SET NODE 1 NAME FOO
OPR>SET NODE 2 NAME BAR
OPR>SET NODE ad nauseum...
OPR>ENABLE OUTPUT-DISPLAY ALL
```

will NOT properly suppress the ALL of the responses generated by the SET NODE commands.

However, there may still be a solution... I believe that there is a program on the DECnet tools tape called NODSET or SETNOD. This program will accept a file containing only a bunch of "SET NODE number NAME name" commands, and will perform the same function that you would get by doing those commands in the NCP sub-mode of OPR. This program also runs pretty fast too, as it doesn't have the overhead of dealing with GALAXY and NMLT20 (and four IPCF packets per command!)

LS-8

Stu Grossman

Date: Mon 19 Jan 87 19:10:15-PST
From: Stu Grossman <GROSSMAN@Sierra.Stanford.EDU>
Subject: Re: DECnet CTY output

- 1) If it isn't a vanilla 6.1 Galaxy, it may be that you are using an old QSRNET file which is still printing the topology change interrupts.

From the implications in his message, he is not getting topology change interrupts. He is getting swamped with responses to his SET NODE commands.

- 2) Alternatively, you should check to make sure that the NCPTAB and related files that you link with your Orion are the same as what that crock NMLT20 wants. It may be that NMLT20 isn't able to understand what you are sending it.
- 1) If you use the wrong NCPTAB with NMLT20, you get far stranger results than he is seeing, especially with the LOGGING class commands. NMLT20 will probably print diagnostics on the console complaining about format errors in ORION packets.
- 2) The commands under ENABLE/DISABLE OUTPUT are not even in NCPTAB, and never get within a mile of NMLT20.
- 3) If you think that NMLT20 is such a crock, then I eagerly await your suggestions for something better to replace it with.

Stu Grossman

Date: Tue, 20 Jan 87 11:05:28 EST
From: Thomas De Bellis <sluggo@cunixc@columbia.edu>
Subject: Re: DECnet CTY output

Stu,

I am pretty much aware of how messages are disabled—I rewrote part of that code in 1983 to be able to disable QSRADM topology change messages. Different versions of NCPTAB can cause NMLT20 to loop printing junk. Diagnostic messages??! Are you kidding? NMLT20's only diagnostic is to hang, exhaust DECnet resources and then snarf up the CPU. Differing versions of OPRCMD (where part of the disable stuff is) and incorrectly linked modules can also produce the effect of not being able to issue certain commands, such as a disable.

Yes, I do think NMLT20 is a crock. Next to IBMSPL, it is the worst piece of junk that we've ever seen and we had to try very hard to get the sources out of DEC. It was such a mess that we actually did start writing one from scratch. That's a big job and we've never finished it. If you'd like some of the sources, I'll go see if I can find them.

- Tom

Date: Tue 20 Jan 87 10:52:07-PST
From: Stu Grossman <GROSSMAN@Sierra.Stanford.EDU>
Subject: Re: DECnet CTY output

Having spent a lot of time working on NMLT20 and NCPTAB while I was at DEC, I must admit that I never heard any complaints from anyone about some of the problems

you mention.

Different versions of NCPTAB can cause NMLT20 to loop printing junk.

It sounds like you didn't follow the manufacturers installation instructions, and had a version skew between NMLT20 and NCPTAB.

Date: Tue 27 Jan 87 09:04:35-CST
From: Clifford A. Wilkes <CC.Wilkes@R20.UTEXAS.EDU>
Subject: SETNOD, bleah!

Well, after many (really a couple) recommendations I tried to use SETNOD to define our DECnet system and prevent all of the that tiresome output from clogging up our 300 baud CTY. Well, it got rid of the output to the CTY but didn't do much else. Unless there is a secret to doing this that I don't know it doesn't do didly. Since the documentation was sparse at best I could only try to define the system via the TAKE command. I couldn't find out how to make a binary file of definitions so unless some kind soul out there knows more and can direct me I'm going to abandon SETNOD and keep searching.

Thanks in advance for any help forthcoming.

Date: Sun, 25 Jan 87 23:23:26-1000
From: uhccux!uhmanoa.ICS.HAWAII.EDU!jeff@nosc.ARPA (Jeffrey Blomberg)
Subject: Mailsystems

We have implemented MM as our favored mailsystem on the -20. It appears that soon we will have to get the -20 to send mail to DECnet hosts which appear to only support mail-11. We can accomplish this by using DEC's new MS/MX system in parallel to MM/MMAILR. I am just curious to know if anyone has trained MM to talk mail-11 instead of SMTP to DECnet hosts running Ultrix or VMS?

Jeffrey Blomberg, University of Hawaii Computing Center (UHCC)
UUCP: {ihnp4,seismo,ucbvax,dcdwest}!sdcsvax!nosc!uhccux!jeff
ARPA: uhccux!jeff@nosc.ARPA Phone: (808) 948-7351
INTERNET: jeff@UHCC.HAWAII.EDU

Date: Mon 26 Jan 87 14:23:14-PST
From: Mark Crispin <MRC%PANDA@SUMEX-AIM.Stanford.EDU>
Subject: Re: Mailsystems

Jeff -

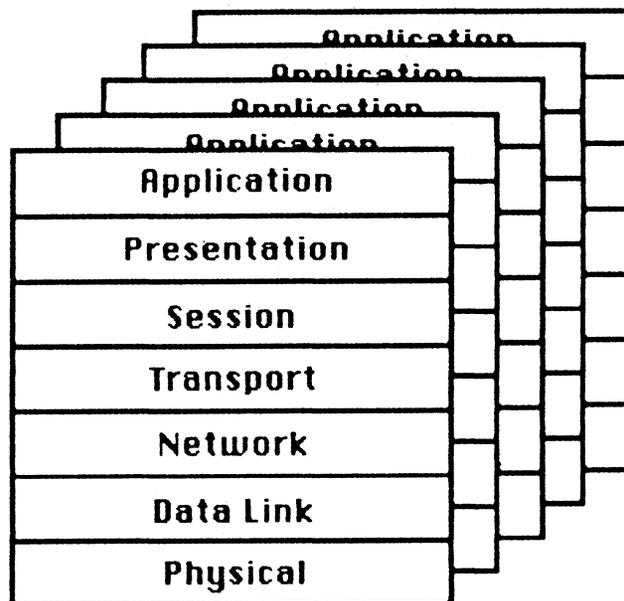
A forthcoming version of MMailr will support MAIL-11. The code exists, it's just a matter of porting it to the current version of MMailr.

Wesleyan distributes a VAX/VMS mail program which is compatible with MM using DECnet SMTP. You might want to consider that and abandon MAIL-11. MAIL-11 is trash of the lowest variety.

- Mark -

NETwords

The NETWORKS SIG Newsletter



PSS ABSTRACTS FOR NASHVILLE

INTRODUCTION TO OSI (OPEN SYSTEMS INTERCONNECT) (Sponsored by the NETWORKS SIG)

There is currently a major trend in networking towards compatibility with the ISO model for a layered network architecture. The Open Systems Interconnect (OSI) is a standard that is increasing in importance. DIGITAL as well as other computer vendors are quoting compatibility of products with OSI. Since the customer environment is typically made up of products from various vendors, there is an increasing interest in having these products as network compatible as possible.

This course will:

- o Discuss the Advantages of a Layered Network Architecture
- o Explain at a Functional Level the OSI Model
- o Compare DNA to OSI
- o Identify DIGITAL Products That are Compatible with OSI

This course will not address the following topics:

- o Technical Details of DIGITALs' ISO/OSI Products
- o In Depth Coverage of DNA
- o Compare SNA to OSI
- o Overview of Data Communications Concepts

Who should attend:

- Networking managers and planners who are required to make sound business decisions regarding the purchase of computers and networking equipment and Customer Application Programmers who require a base of OSI Networking knowledge.

Credentials:

Steve Wendler works in the Networks and Communications group at Digital. Steve has a number of years of experience in protocol design and the OSI architecture.

Prerequisites of Attendees:

In order to successfully complete this course the attendee should be able to:

- o Use Network Terms and Definitions to Describe Basic Data Communications Concepts
- o Explain the Following Concepts: Private Networking, Public Networking

It is assumed that the student has a prerequisite knowledge of basic datacommunications and VAX/VMS.

ADVANCED TERMINAL SERVER TOPICS (Sponsored by the NETWORKS SIG)

This seminar presents a more in-depth study of Digital terminal servers, and the environment in which they operate. Advanced management features and concepts, suggested applications and limitations, and server performance will be discussed. The communications protocol used by Digital terminal servers, and how the protocol is controlled by both servers and host systems, will also be studied.

Topics Covered Include:

- o Introduction to Terminal Servers
- o History of Terminal Server Development
- o Digital's Terminal Server Family
- o DECserver 200
- o Ethernet terminal server
- o DECserver 100
- o MUXserver 100
- o Terminal server manager
- o Others?
- o LAT Architecture
- o Terminal Server Features
- o Advanced Concepts
- o Configuration guidelines
- o Performance
- o Management (Terminal Server Manager)
- o Why TSM?
- o TSM concepts
- o Functionality of TSM
- o TSM design and organization
- o Hints and kinks of TSM
- o Examples of TSM use

Credentials:

Ken Izbicki is an OSI Consultant for Digital's Corporate Communications Support Group. Ken has been with Digital for eight and one half years, six of which have been in corporate and European area communications support. Ken has an MS from the University of Oregon and a BA from Colby College.

Prerequisites of Attendees:

Attendees are assumed to have some knowledge of terminal server technology. This knowledge can be from either working with terminal servers, or attending previously offered seminars on Digital terminal servers.

DESIGNING & IMPLEMENTING PERSONAL & WORKSTATION NETWORKS WITH VAX SYSTEMS
(Sponsored by the NETWORKS SIG)

In many corporations, the need to network personal computers to minicomputer and mainframe systems is becoming an increasing issue. As such, there is also a great deal of confusion as to "which" product to use to solve the personal computer to minicomputer and mainframe communications issue. This seminar has been designed to help individuals charged with the implementation of personal computer networks to corporate VAX systems and features examples of implemented networks to illustrate solutions and problems encountered. This highly interactive seminar will cover the following topics:

- Introduction
- Issues of personal computing
- Traditional vs. workstation environments
- Applications and usage
- Reality vs. perception
- Personal Computer/Workstation Communications Capabilities & Architectures
 - IBM PC, PC/XT, PC/AT and compatibles
 - Apple Macintosh, Macintosh/Plus
 - Sun workstations
 - Apollo workstations
 - VAXStation I and II
 - Large System Communications Architectures
 - Digital Network Architecture (DNA, DECnet product set)
 - Systems Network Architecture (SNA)
 - Open Systems Interconnect (OSI)
 - Local Area Networks (LAN) Architectures
 - IEEE 802 Series, Ethernet (IEEE 802.3), IBM Token Ring (IEEE 802.5)
 - Wangnet
 - MS-NET
 - Twisted Pair technologies
 - AppleTalk Network
 - PBX as the network
 - Other useful technologies
- Commercially Available Products for Communication
 - LAN-based products
 - Synchronous products
 - Asynchronous products

- Other technologies
- Implementation Issues
- General planning
- Traffic analysis
- Throughput planning
- Site survey
- Cable plant and management
- Hardware installation
- Distribution kits
- Software installation
- Testing and conformance
- Throughput analysis
- Application testing
- Support plan
- Support training
- User training
- Turnover and daily operations
- Management Issues
- Network management
- Software issues
- Hardware issues
- Troubleshooting and fault finding
- Repairs and reconfigurations
- Network enhancement and add-ons
- Case Studies
- Very large office automation network
- Computer Aided Design (CAD) network
- Engineering and development network
- Banking/financial network

Credentials:

Bill Hancock is an independent network and systems consultant with a wide variety of architecture, design, and implementation experience in many areas including network technologies and operating systems. Mr. Hancock has worked for a variety of high-tech companies including Digital, Texas Instruments, and IBM. Mr. Hancock has provided network consulting services to a variety of companies including General Electric, Digital, MBank, Chase Manhattan Bank, and IBM. Mr. Hancock has authored many articles and books on networking and computer technologies and is the Networking Editor for The DEC Professional magazine.

Prerequisites of Attendees:

It is recommended that attendees have a general familiarity with VAX Systems Networking/DECnet capabilities. A familiarity with at least one type of PC (Personal Computer) is also advisable. This seminar is targeted for the user or manager involved in networking PCs to VAX Systems.

DECNET/SNA PRODUCT SET OVERVIEW
(Sponsored by the NETWORKS SIG)

This seminar presents an in-depth, technical introduction to the complete DNA (Digital Network Architecture)/SNA (Systems Network Architecture) Interconnect product set including the DECnet/SNA Gateways and the new VMS/SNA link to IBM Networks. Discussion includes the DECnet functionality which supports the gateway concepts.

The capability of each product in the multi-vendor environment of VAX/VMS systems and IBM mainframe will be described. Attendees will learn how they can access both Digital and IBM systems and applications from their current workstations. Anyone involved in the planning, implementation, management, or use of a multi-vendor network of IBM and VAX systems will benefit from this seminar.

Topics to be covered include:

Comparative History of DNA and SNA
DNA, SNA, How Gateways Bridge the Difference

DNA/SNA Interconnect Architecture
System to Network Interface - VMS/SNA
Network to Network Interface - Gateways
Access Protocols, Routines, and Servers

Configuring A DNA/SNA Interface
Overview of Connecting Digital and IBM

DECnet/SNA VMS Access Routines

Other IBM Interconnect Products
Emulators, Terminal Support

Credentials:

Kelly Caudill is a Senior Engineer in the Networks and Communication Systems Support Group of Digital. He is responsible for the development of all courses related to SNA for Digital. Kelly has been instructing the Digital SNA Gateway courses for three years. He has more than eight years of experience in this field.

Prerequisites of Attendees:

It is recommended that attendees have some training and/or experience in basic data communications concepts, and DECnet usage and programming.

NETWORKS COMMUNICATIONS & PROTOCOLS: A COMPREHENSIVE SURVEY
(Sponsored by the NETWORKS SIG)

This seminar is a must for those new to networks. This is a foundation course - not requiring prerequisites. In this fast paced overview of all areas, including local area and global networking concepts, the novice can rapidly acquire the necessary basic knowledge he/she needs to begin and additionally gain a real sense of being on top of the latest developments in the field.

By defining communications, its history and requisites, the networking environment is revealed in detail. From there, Communications standards and Open Systems Interconnect are discussed in respect to their structures, processes, systems, and architecture. Protocol evolution and the conceptual layers of the network interface are defined in terms that everyone, not just the interface designer, can understand.

After a wide-ranging exploration of contemporary networking strategies and global network structures, general comparisons are made between the capabilities of the various types of networks. The seminar concludes with a glimpse into the future of communications.

Topics to be covered include:

- I. The Electronic Tower Of Babel
 - o Communications: A definition
 - o history, standards (past, present, future)
- II. Open Systems Interconnect
 - o Architectures: Layers, OSI architecture
- III. Protocol Evolution
- IV. Session Layer
- V. Presentation Layer
- VI. Application Layer
- VII. Facilitating Various Networks
 - o Contemporary networking strategies
- VIII. Global network structures
 - o Architecture: Layers, packets, frames, channels
- IX. Transports Using X.25: Tymnet, GTE Telenet, CCITT
- X. General Purpose Network Interface
- XI. Physical Layer Media
- XII. Applications Studies
- XIII. Conclusions And Discussions

Credentials:

Ken O'Mohundro is the President of ABLE Computer. He worked in aerospace electronics with McDonnell Douglas and Interstate Electronics. He then moved to become a computer designer and engineering manager for Microdata. He became the Director of

Engineering and the architect of a state of the art emulation computer at California Data Processors in 1971. He founded his own company (ABLE Computer) in 1975. A frequent speaker at DECUS and DEXPO symposia, he is also a regular contributor to Hardcopy Magazine.

Prerequisites of Attendees:

This course does not require prerequisites, however it is recommended that the attendee have some familiarity with communications devices.

DIGITAL'S ETHERNET AND LAN PRODUCT SET
(Sponsored by the NETWORKS SIG)

This seminar covers Digital Ethernet products and their use in creating a Local Area Network (LAN) and some of the services it can provide. Starting with an overview of what Ethernet is and it's background, the seminar will provide some definitions of LAN terms and proceed to a detailed look at Digital's line of Ethernet products. Many of the products will be available for a "hands on" look. Installation and troubleshooting of these components and Ethernet in general will be discussed. Product functions and specifications will be examined along with LAN configuration requirements and guidelines. Performance, availability and maintainability will be discussed including practical network applications. Ethernet configurations will be analyzed and limitations of products and the network will be examined. Time will be provided to answer real user network problems.

The attendees will be provided with knowledge of Digital's products, and their use in LAN design.

Topics to be covered include:

- o Physical Channel Components
 - . COAX cables, Thinwire and Ethernet
 - . Transceiver cables
 - . Fiber optic cables
 - . Repeaters, DEREPE, DEMPR
 - . Transceivers, H4000, DESTA
 - . DELNIs
 - . Broadband channel components, DECOM, DEFTR
- o DECCONNECT Strategy for Wiring
 - . Services; high speed, low speed, video, phone
 - . Components
 - . Configurations

- o Controllers
 - . Controllers, Q bus, UNIBUS, Pro 350
 - . Terminal servers
- o Extended LAN Components
 - . Local bridges
 - . Fiber optic bridges
- o LAN and Extended LAN Configurations
 - . Reasons for limitations
 - . Ethernet configurations
 - . Thinwire configurations
 - . Extended (bridged) Ethernet configurations
 - . Expandability
- o Troubleshooting Ethernets
 - . Maintainability features
 - . Backup capability
 - . Tools

Credentials:

Bob Petrella is the Manager of the 802 Technology Center at the Network and Communication Group at Digital. This group is responsible for Digital's adherence to the IEEE 802 standards. Bob has been involved with the design of extended baseband, broadband, and fiber optic LANs for the last six years.

Prerequisites of Attendees:

None are required. Some understanding of LANs and general data communications will aid in understanding details.

X.25 AND PSI TECHNICAL OVERVIEW
(Sponsored by the NETWORKS SIG)

This technical seminar presents an overview of X.25 and PSI. It covers topics including where packet switching is used, what it is used for, common applications, interaction of DECnet and PSI, and an introduction to common setups found on VAX, RSX, or TOPS PSI nodes.

Topics to be covered include:

PSI Compared to Types of Networking
Wide Area Networks and PSI
Types of Routing Used
The X.25 Recommendations
Other Recommendations, X.3, X.21, X.3, X.21, X.28, X.29, X.75
Reasons for Using Public Networks
X.25 Levels and Layered Design

Interaction with DEC Systems and DECnet Networks
Virtual Circuits
Additional User Facilities
Optional User Facilities
DTE Addressing
Packet Switching Interface Products
User Utility Use
X.25 Frame Level Protocol (LAPB)
X.25 Packet Level Protocol
DECnet Data Link Mapping Setup
X.25 Gateway/Multihost/Access Setup
X.25 and X.29 Servers

Credentials:

Skipper Morris is a Principal Instructor teaching Communications and Network courses at Digital's Educational Services Center in Bedford, MA. He teaches the full range of networks courses to both employee and customer students. Skip has been working in the communications field for eleven years, working both in hardware and software support positions. He has extensive experience in network design, management and troubleshooting.

Prerequisites of Attendees:

It is recommended that attendees have experience with DECnet and/or networking protocols, DECnet network management or network support. VAX/VMS system management or management of an RSX or TOPS system is a plus.

DECNET-DOS & DECNET ULTRIX - USE & APPLICATIONS DEVELOPMENT
(Sponsored by the NETWORKS SIG)

This seminar will cover the use of the DECnet utilities and go into some detail on how to write your own. DECnet-DOS and DECnet-ULTRIX use the same basic network socket interface. Most of the material will be common to both. The minor differences between them will also be covered.

Both DECnet products include utilities for File Transfer, Mail, Network Management, etc. Their proper use and fine points will be briefly covered. They both also use a task-to-task communication interface based on the socket interface of UNIX 4.2bsd. This seminar will go into some detail on how to use sockets properly to write DECnet network applications.

Topics to be covered include:

- o Concepts of Network Task-to-Task Programming
- o Correspondence of Socket Option to DECnet-RSX and DECnet-VAX QIOs

- o Use of Non-Blocking and Asynchronous Completions
- o Proper Use of the Select Call
- o Monitoring the Link State
- o Preventing Task Hangs on DOS
- o Developing Portable Code to Run on Both Systems
- o Tuning the Application for Performance
- o Hints, Tips and Advanced Topics

Participants will receive and review sample program listings of various simple applications written in C for both DOS and ULTRIX. The reviews will concentrate on identifying the proper techniques to use the network and avoid logic bugs.

Credentials:

David Mitton is the original project leader and architect of DECnet-DOS. Currently he is responsible for the internals and advanced development of the product. Dave has been working in various projects in the Networks and Communications group at Digital for nine years. Previous work included DECnet-RSX Development and developing architecture for the DAP Protocol.

Edward Ferris is a senior software engineer in the Networks and communications group, currently working on the DECnet-ULTRIX product. His responsibilities include the DECnet routing layer, the DECnet drivers and downline-load utilities. For the past four years, Ed has worked on both hardware and software projects in the networking area. His work has also included microcode development.

Prerequisites of Attendees:

This seminar will assume that the participant is familiar with writing and debugging programs for either MS-DOS or ULTRIX operating systems. Working knowledge of the C programming language is also assumed, but not strictly required. Most examples will be given in the C language, but the concepts are applicable to any language.

ADVANCED ETHERNET CONCEPTS AND CONFIGURATIONS
(Sponsored by the NETWORKS SIG)

This seminar will provide and in depth look at the working of Ethernet and DEC's CSMA/CD LAN products. The course will begin assuming a working knowledge of the Ethernet or the 802.3 specification and delve into the technical details. A quick review will be made of the products comprising the network with many of the products available for a "hands on" discussion of

implementation details. Product functions and specifications will be examined with insight provided into design decisions made during development.

Performance, availability and maintainability will be discussed focused on solving and managing a "real" Ethernet network. Ethernet configurations will be analyzed and limitations of products and the network will be examined. The attendee will be provided with knowledge of the tradeoffs in the design of Ethernets using the standard components and how nonstandard component may "fit" his LAN. Performance of the Ethernet will be addressed with theoretical and actual examples of real networks presented. Similarities and differences between IEEE 802.3 and Ethernet will be discussed in technical detail.

Time will be provided to answer real user network concerns and problems. This course is taught by an engineer and meant for the engineer and technical network manager.

Attendance will be limited to encourage questions, interaction and feedback.

Topics to be covered include:

- o Ethernet Technical Description and Details
 - . Physical channel components operation
 - . Manchester encoding
 - . CSMA/CD operation
 - . Jitter specifications
 - . Maximum access delay
- o Thinwire Operation and Technical Details
 - . Thinwire components
 - . Configurations and limitations
- o Terminal Server Operations
 - . LAT operation
 - . Performance and delay characteristics
- o Ethernet Configurations
 - . Technical reasons for limitations
 - . Roundtrip delay calculations
 - . Space-time diagram of network operations
 - . Tradeoffs in Ethernet configurations
 - fiber optic interface operation
 - fiber optic interface optical budget
 - standby repeater details
- o Extended LAN Components
 - . LAN Bridge 100 internal operation
 - . Fiber optic bridges
 - . Extended LAN performance

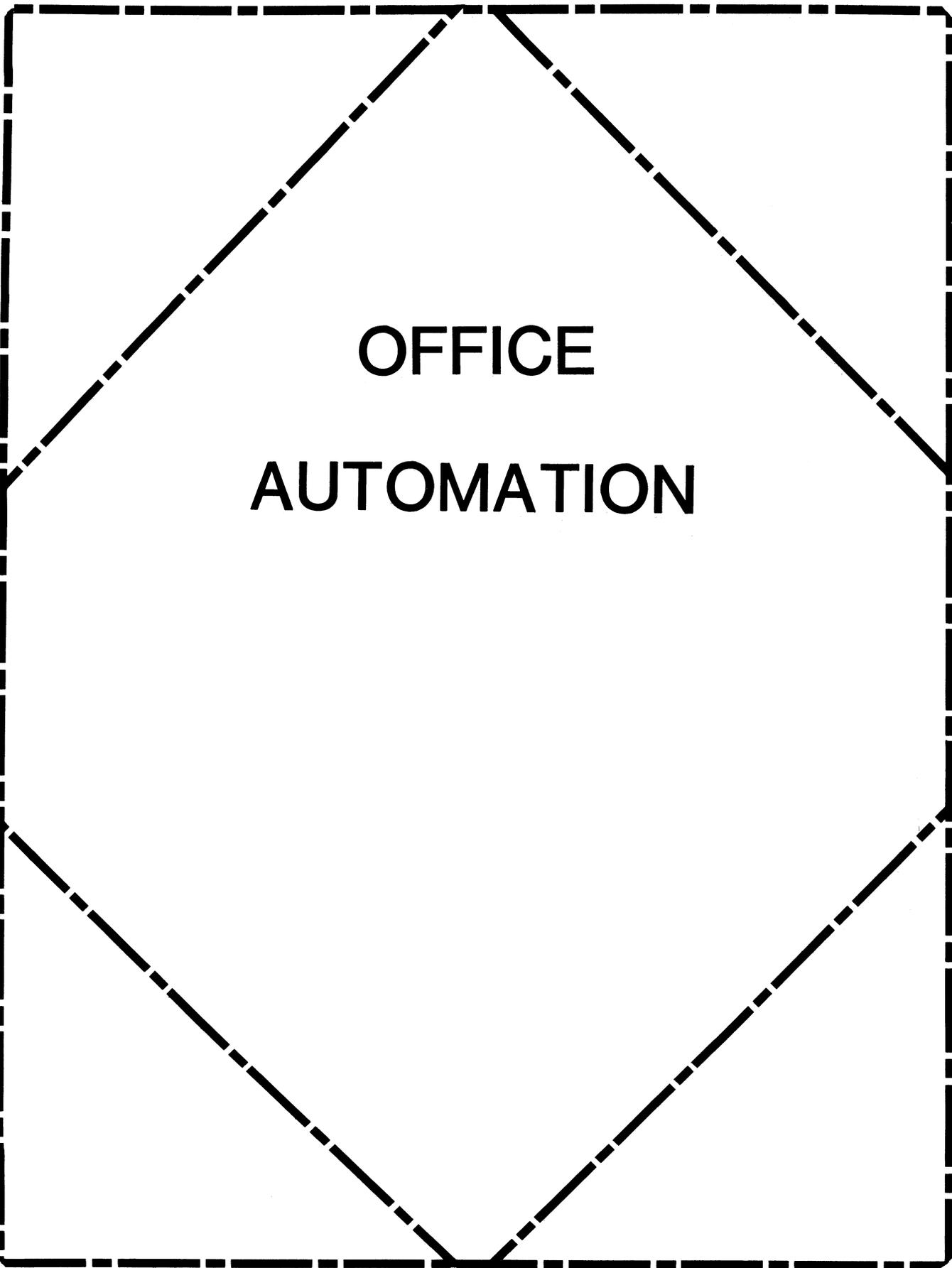
- . Extended LAN delay
- . Extended LAN configurations
- o Troubleshooting Ethernets
 - . Maintainability features
 - . Backup capability
 - . Procedures
 - . Tools
- o Designing a Ethernet LAN
- o DEC's Migration to 802.3 and it's Meaning
 - . Glossary of terms and meaning
 - . Technical details and differences

Credentials:

Rich Graham has been working in the Networks and Communications Group at Digital for five years. He has been active in the development of Ethernet components including the specifications and physical channel components such as transceivers, repeaters, and controllers. His most recent work has been in the development of the LAN Bridge 100, a bridge for extending the Ethernet. Rich has consulted on the development of the thinwire Ethernet components and continues to be an active, voting member of the IEEE 802.3 committee.

Prerequisites of Attendees:

Understanding of Ethernet or the Ethernet Specification Standard 802.3 is strongly recommended. A more introductory level seminar "Digital's Ethernet and LAN Product Set is also offered at this symposia. Knowledge of the material from the introductory seminar or equivalent will satisfy the prerequisite requirement.



**OFFICE
AUTOMATION**

From The Editor

In This Issue . . .

| | |
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A word about submissions: Many thanks to all of you who have contributed articles to our newsletter. Your articles make our newsletter fun, informative and informational to others. Please remember that when you send an article it will be at least two months before you see it in print. This is because we are always working two months out on the newsletter. Example: An article submitted in January and published immediately would appear in the March issue.

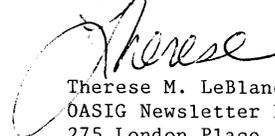
If you have submitted an article and are waiting to see it in print... never fear! It will be printed. We are receiving enough material on a monthly basis to fill each newsletter and have some left over. This backlog of articles is printed as quickly as possible.

If you have an article and would like to submit it, please feel free to do so. This does not mean that we have 'enough' articles or are not looking for more. We are always happy to receive and publish information from you.

In this issue we have some timely information for those of you who would like to attend the upcoming Spring Symposium in Nashville, TN. Our first article is a "Justification Package" with some ideas and information to help you justify (to your manager) your attendance in April. Included is a brief review of some of the sessions which will be offered, and a full review of the Pre-Symposium Seminars (PSS's) offered by the OA SIG on Sunday prior to Symposia.

We also have several excellent articles on PC ALL-IN-1, sharing WPS-Plus VMS and ALL-IN-1 Document Databases, a review of some new contributions to the OASIG Tape (which is free to you if you call your Local Users Group or the DECUS office), and of course, our regular Notes column.

Regards,



Therese M. LeBlanc
OASIG Newsletter Editor
275 London Place
Wheeling, IL 60090

SYMPOSIA JUSTIFICATION PACKAGE

Once again it is time to look at the upcoming Spring Symposium (April 27th - May 1st in Nashville) and ask yourself that all important question...How am I going to convince my manager to let me attend?

And once again we have some ideas for justification, plus a review of some of the Office Automation sessions which will be offered in Nashville. (Ammunition to use for your justification) Good luck, we hope to see you all at the Symposium!

How do I justify going to DECUS?

Many of us face the challenge of justifying to our management why we should be allowed to go to a DECUS symposium. There are a variety of very valid reasons that make economic sense for any company with DEC equipment to send key people to a forum where they will be able to interact with product developers and their technical/managerial peers in other organizations. It is a well know fact that organizations with similar equipment configurations face similar problems in making the best use of their computing resources. Here are some ways which others have used to justify their attendance at symposia:

1. The cost of attendance is often less than a single training session at a DEC training facility and the value of the sessions at symposia is significantly greater because they are presented by the developers or people who have had real experience in using the products. The instructors at training facilities are often giving information based on what they have only learned in a class or have only heard about. In addition, the information presented at symposia, often exists in no other form or document and the question and answer periods reveal equally obscure information that is known to have saved man hours and dollars for other corporations.
2. An individual can often get the equivalent of three weeks of training at one week of symposia. Because of the number and variety of sessions and the opportunity to select sessions that are germane to your own work environment, the information that you obtain is immediately useful and can cut hours off of your efforts on the job. The sessions are scheduled from 9:00 am to as late as 10:00 pm with no scheduled break for lunch or dinner, therefore increasing your "classroom time" significantly beyond what would be available in any formal course of instruction on a single subject.

3. The contacts that one can make with peers and DEC developers are an invaluable resource for problem resolution in your day to day activities and often can not be acquired in any other way.
4. Specific questions and problems as well as the pitfalls of future installations or implementations can be quickly and painlessly addressed saving your organization and its staff countless hours and frustrations and, therefore, dollars.
5. Sharing your company's successes can be free advertising for the quality of your organization and its work. This can often lead in improved relations and new business for your firm.
6. Your participation in the DECUS organization can lead to your personal development in technical and managerial skills at no risk to your corporation or your professional advancement in your place of employment.
7. Your company recognizes the value of its employees making formal presentations in a national forum such as DECUS and will encourage you to present a session or to chair some of the sessions. Thus, by actively participating, you can obtain permission to attend where you might not otherwise be able to get approval.
8. There is the opportunity to attend pre symposia seminars which are only offered in conjunction with DECUS symposium which provide specialized training which is often not available from any other source. For example, at the Nashville symposium, a seven hour course on the product Message Router is offered for the first time and is not available from any other source.
9. In conjunction with the symposium Digital provides an extensive exhibit of their hardware and software products. This gives you the opportunity to get hands on experience and can be very helpful in evaluating the products that you are considering for future purchase.

We hope this is of some help to those of you who have not understood why you personally should attend a symposium and those of you who have not been able obtain permission to attend. If there are some other valid reasons for attending a DECUS symposium, please send them the newsletter editor who will publish them in future editions.

OVERVIEW OF SESSIONS OFFERED FOR NASHVILLE

The following is a brief overview of some of the sessions being offered in Nashville. For a complete listing and abstract, be sure to read your Symposia Information booklet when it arrives.

In Search Of Office Automation Excellence (DEC)

This session is a practical discussion of the development and operation of excellent office automation systems.

Justify Office Automation - It Can Be Done (USER)

Addresses the challenge of cost-justifying OA projects by addressing organizational impact from administrative personnel through management. It is possible to get believable, quantifiable measures of the cost benefits of the system.

VAX System Management fo ALL-IN-1

Addresses topics such as routine maintenance, performance mangement, etc.

Customizing ALL-IN-1: Where to Start

Discusses how to begin customizing an ALL-IN-1 system.

Notes on Vax Notes (DEC)

Presents a variety of information targetd for al levels of users dealing with VAX NOTES. Usage techniques, management suggestions, etc.

Integrating Personal Computers in the Office Environment

Panel Q&A

ALL-IN-1: Debugging Techniques

Methods of testing ALL-IN-1 applications. Explanation of OA\$TRA_SET and how to use.

OASIG WISHLIST Q&A

Attendees present their "wishes" to Digital

DecMate Product Update/ Q&A (DEC)

To bring you up-to-date on the latest DecMate developments...includes a product overview.

ALL-IN-1: What the Applications Programmers Reference Didn't Tell You

Provides examples of the most common "gotchas" and explanations of some areas that are not clearly explained in the APR.

Organizing User Support Groups (DEC)

Discussion of "Gold Key" users groups including first hand presentation by a user.

ALL-IN-1 on Vaxclusters

How clusters can be managed and how to get the benefits of resilience, load sharing and disk space savings.

The Power of Modifiable Printer Tables

Describes Digital's Solutions to the printing maze and providing technical details for controlling third party devices.

Private Versus Public Electronic Mail Networks (USER)

Looks at the differences between pulic mail services and those networks which result when organizations cooperatively connect their computers into large networks.

Technical Overview of PDP-11 WPS-Plus V1.0

Technical overview of the new product WPS-PLUS/RSTS as well as an overview of WPS-PLUS/RSX.

The Power of Gold-Key Style Editing: Tricks of WPS-Plus

Discusses some of the ways to utilize Gold Key editing and document processing.

Tailoring ALL-IN-1: One Size Does Not Fit All (USER)

Introduces three types of tailoring used at User's facility and includes a detailed review of the mechanisms used to modify standard functions.

*Plus sessions on: Spreadsheets, Saturn Systems, Scripts, DSAB's, DecPage, Compound Documents, VAX/VTX, Message Router, and much more.

ONE DAY PSS (PRE-SYMPOSIA SEMINARS)OFFERED

ALL-IN-1 SYSTEM PERFORMANCE AND CAPACITY PLANNING
(Sponsored by the Office Automation SIG)

This presymposium seminar is aimed at ALL-IN-1 system managers and technical support specialists who have responsibility for setting up, maintaining, managing, and tuning ALL-IN-1 systems. Much emphasis will be placed on capacity planning and how to get the best performance from an ALL-IN-1 system.

Topics to be covered include:

- o Capacity Planning
- o Methodology
- o Load and Service Measurements
- o Forecasting
- o General ALL-IN-1 Performance Considerations
- o Performance expectations
- o Configuration sizing and planning
- o System housekeeping and maintenance
- o User workload profiles
- o Performance Tuning and Monitoring
- o Memory management
- o Which system parameters to monitor and tune
- o Major factors which influence performance
- o System Maintenance and Performance Management Issues
- o Performance Troubleshooting

Credentials:

Marc Slater and Terry Griggs are Senior Technical Support Specialists for Digital in the Systems Performance Group in Merrimack, New Hampshire. Marc has over five years' experience with Digital both in the field as a Software Specialist and as a member of a team dedicated to the performance evaluation of Digital's Office Products. Both Marc and Terry have spent the last three years helping ALL-IN-1 customers characterize, manage, plan, and troubleshoot the performance of their systems.

Prerequisites of Attendees:

Attendees should have a working knowledge of ALL-IN-1.

DEVELOPING APPLICATIONS USING VTX AND VALU
(Sponsored by the Office Automation SIG)

This seminar provides an introduction to VTX and VALU, how they work and how they can be used to develop applications.

Outline:

- o VTX and VALU Capabilities
- Types of applications
- When to use - when not to
- Developing applications

How to structure data
Strategies for getting data into the application
Application maintenance issues

- o Integrating VTX and VALU with Other Products
- ALL-IN-1
- Datatrieve

Credentials:

This seminar will be taught by a member of the Software Services Engineering organization with experience in supporting applications development in VTX and VALU.

Prerequisites of Attendees:

Familiarity with VTX and/or VALU would be helpful but is not required.

ELECTRONIC MAIL GATEWAYS - THE MESSAGE ROUTER
(Sponsored by the Office Automation SIG)

Message Router is an important tool for building multi-system mail networks. This seminar is designed to help office system designers, implementors, ALL-IN-1 managers and system managers understand and use the capabilities of Message Router.

This seminar explores how the Message Router works in a network and how you can use it to write applications that use the message router to communicate information throughout a network.

Topics to be covered will include:

- o Planning and Installation of a Message Router Network
- o How to configure
- o Installation hints
- o Day to Day Management of the Network and Network management
- o Managing in a distributed environment
- o Writing Applications for the Message Router
- o Writing mail user agents and mail gateways to Foreign Mail Systems
- o Writing non-mail messaging applications

Credentials:

This seminar will be taught by a member of the Message Router Development Group from Redding England.

Prerequisites of Attendees:

This seminar is of interest to office system designers, implementors, ALL-IN-1 managers and system managers who desire to understand and use the capabilities of Message Router.

PC ALL-IN-1 FROM DIGITAL

by
Katherine Trimm
PIVOTAL, Inc.
Tucson, Arizona

PC ALL-IN-1 is an entirely new product, designed to address problems created by the explosive growth of PCs in the workplace. Using a MicroVAX as a server, PC ALL-IN-1 allows companies to build a Local Area Network to integrate their PC workstations. It compares well against alternative systems such as "Token Ring" since it provides connectivity of the full range of Digital systems instead of just PCs.

Even more valuable is the integrated environment which is created. Not only do users all work with the same information base, but they also become accustomed to working within a network environment. With PC ALL-IN-1, PC users don't have to spend time carrying floppies back and forth between machines by hand. Not only can IBM XTs and ATs share information (they are not diskette compatible), but, through the server, they can also share information with DECmates, Rainbows, PROs and the new VAXmate Workstation.

Due to the lack of compatibility, most corporations are not getting full use of their PCs. Inability of the various PCs to share information with corporate VAX and IBM mainframes, inability to hook into Electronic Mail systems, and lack of adequate backup systems have made these workstations as much a liability as an asset. The need for a common user interface and the ability to insulate the user from the MS-DOS environment are also concerns of MIS managers.

For the system manager, the product offers some obvious advantages. Data and file security, generally nonexistent in the PC environment, become standard operating procedure with PC ALL-IN-1. Since system standards are fully tailorable, each company can determine what standards are appropriate to their environment.

Backup also becomes an automatic function with PC ALL-IN-1. Data loss as a result of inadequate or nonexistent backup procedures has become almost a fact of life. This system places backup under the control of the network server. Software is downloaded to the PCs, insuring that all users are operating with the appropriate versions. Updates and upgrades are done with the aid of the server.

In addition, organizations may also discover some not so obvious features. The entire system is designed as a turnkey product which allows system administration by people who are not system managers. The basic system management functions are menu driven, allowing the System Manager to designate a Key Operator to perform functions such as backup on a day to day basis.

PC ALL-IN-1 also allows many projects to be processed on individual PCs rather than on the VAX. This offloading means additional processing time on the VAX or mainframe. At the same time it also means lower processing costs for applications run on the PCs, since PC cycle time can be less expensive than mainframe or VAX cycle time.

This offloading feature is of interest to companies which purchased a number of PCs and then found themselves using the machines primarily as expensive door stops. That computing power can now be put to use and managed effectively through a single system.

PC ALL-IN-1 is actually a "departmental computing machine." It is a fully configured VAX which supports 32 PCs and is intended to allow companies with a large number of PCs to fully integrate their office computing environment. The only requirement is that all PCs must have a 20 megabyte hard disk, 640K of memory and support DOS 3.1 or higher.

By using the ALL-IN-1-like interface - which is customizable in PC ALL-IN-1 - the user is able to continue using familiar software, such as their own word processor, while remaining insulated from the MS-DOS environment. The user can switch from application to application easily. It also allows the user to drop back into DOS and then return to the application program without having to reload the program. This is a major convenience for users who are used to using MS-DOS utilities for various system maintenance functions.

One of the biggest advantages offered by PC ALL-IN-1 is its support of Electronic Mail. Full Message Router support is provided and the server system will handle all file types. Even third party forms are supported. This allows reports, memos and other information to be "mailed" between users, a capability which is a critical first step in the formation of a truly integrated Office Automation system. However, some features, such as return receipt, are not available.

Another major advantage of PC ALL-IN-1 is its ability to provide transparent file access to the workstations, while utilizing the file backup capabilities of the MicroVAX to maintain data integrity. A system of "File Cabinets" allows users to move files from system to system. The file cabinet supports both workstation files, RMS files, PC ALL-IN-1 VAX files and allows file sharing. The file cabinet also allows users to store files and documents on the network server, providing automatic backup and preventing information loss in case of a system crash.

This file sharing capacity is a unique function of PC ALL-IN-1. There are three authorization levels allowed under PC ALL-IN-1: read, write and share. Each allows authorized users to access files in another user's file area, while maintaining the originator's control over their data. Read and write authorization have their standard meanings. Shared authorization allows the authorized user to read, write and make the files available to a third party.

For example, corporate marketing can develop prototype proposals. These can be accessed by sales personnel in the field, who modify the proposal to fit the needs of their customer. At the same time, corporate marketing can review and edit the same document without having to wait for completed versions to be sent back and forth. This allows a team of people to work together concurrently on a project rather than sequentially.

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

PC ALL-IN-1 provides a default document processor - WPS-Plus. Users may continue to use their own processor, but, since WPS-Plus offers a spell checker, list processing, sorting, multicolumn printing and most other standard word processing features, many users will probably find it more convenient to use it. Printing capabilities are enhanced by the system, since users can access high quality high speed printers through the VAX.

How well PC ALL-IN-1 will work for a particular company depends to a large extent on their present system configuration. It is most suitable for companies with large numbers of isolated PCs running standardized application software, and as a concentrator for remote installations which use their PCs as VT220 emulators. Companies with well established Office Automation systems and integrated workstations are less likely to benefit from PC ALL-IN-1. This is also true of companies with a large number of non-PC machines such as Macintoshes which are not currently supported.

PC ALL-IN-1 is not an inexpensive solution to gaining productivity from a heterogeneous equipment environment, but could be well worth the investment for any company trying to bring order out of chaos. Since the system is server licensed, a copy doesn't have to be purchased for each PC, thus making it cost competitive with LANs.

Pulling the PC users out of their autonomous environment and into a shared system configuration may be the biggest obstacle to the acceptance of Digital's new product. However, the development of products such as Digital's Remote System Manager software is a clear indicator that the days of the isolated worker with a PC on the desk are coming to an end. Local Area Networks are becoming a necessity in today's Office Automation environment, and the development of true Local Area Systems is not far away. Companies which develop an infrastructure based on information accessibility will gain a significant edge.

It is possible to run both ALL-IN-1 (which includes WPS and/or WPS-Plus for editing documents and mail) and WPS-Plus/VMS on the same system. There is a slight drawback as you can't have any forms libraries installed in memory for either product, but it has the advantage that people who want to do only word processing don't have to go into ALL-IN-1.

It is also possible for both products to share the same document database (for a particular user and/or account) so that a person could edit the same documents from within ALL-IN-1 or from DCL using WPS-Plus.

IMPORTANT!

There is currently a limitation that only one person can be using a document database at a given time. For example: If you have an account used by a secretarial pool, only one person can be using WPS-Plus at a time. This limitation DOES NOT change by having WPS-Plus and ALL-IN-1 share the same database. Only one person, using either WPS-Plus or ALL-IN-1 can edit a document at one time. It is to be hoped that DEC will do something about this very serious crimp in normal office procedure soon.

The problem is quite simple. WPS-Plus expect your document database to be in a sub-directory [.WPSPLUS]. For example: If you log into account SMITH with default directory [SMITH], WPS-Plus will look for it's database in [SMITH.WPSPLUS]. ALL-IN-1 also expects to use a sub-directory, but it normally looks for [.OA]; or, in our example, [SMITH.OA]. The solution is also quite simple, although the directory WPS-Plus looks for is fixed, the one ALL-IN-1 wants is not. You can set it to be whatever you want, or, to be more accurate, the ALL-IN-1 MANAGER can. When setting up an account, there is a line for the default directory near the bottom of the account management screen which can be set to match the WPS-Plus default of [.WPSPLUS] rather than the default ALL-IN-1 gives you of [.OA].

If you've already set up an account using [.OA] and now want to use WPS-Plus, just create a sub-directory [.WPSPLUS] and rename or copy all files from [.OA...] to [.WPSPLUS...].

Newsnotes from Digital's Office Systems Engineering
CONTRIBUTIONS TO THE OASIG TAPE

Geoffrey Bock
DECUS Counterpart
Strategic Planning Group
Business Office Systems Engineering

The OASIG Tape contains a number of useful office tools, developed by engineers in Digital's office systems engineering group, and designed to enhance the flexibility of ALL-IN-1. The tools are in the areas of

- o Customized printer tables
- o Samples of the eXternal Applications Link
- o File Sharing

PRINTER TABLES

WPS-PLUS and ALL-IN-1 now provide the capability to customize printer tables, either to modify the operation of a supported printer or to allow users to develop their own printer support. The tape has a printer table for the HP Laser Jet (tm) Printer. It also has printer tables for the LN03 to display miniturized (6.7 point) characters -- used for mathematical superscripts and subscripts -- settings and keywords to invoke ROM cartridge fonts, and a method to put a border around a page.

To further document the Printer Table Utility, Don Goguen's paper from San Francisco DECUS is also included.

EXTERNAL APPLICATION LINKS

The eXternal Application Link is a technique for integrating a spreadsheet, database query, or any other VMS subprocess application into the context of a WPS-PLUS editing session. The results of the external application can then be imported into the midst of a document while editing.

The tape contains sample eXternal application link .COM files to access and then incorporate results from:

- o VMS Mail
- o DECcalc
- o 20-20

These .COM files also have internal documentation for system managers to write their own.

WPS-PLUS FILE SHARING

The tape contains the necessary scripts and installation instructions for WPS-PLUS/VMS users to share files on the same node, utilizing the full power of the VMS directory system. Users can create and then edit a document by referencing any specified external .WPL file, within their own directory tree.

User notes, explaining the operation of shared files from the users' perspective, is also included.

DON'T FORGET TO HEAR THE OUTCOME OF YOUR VOTES ON THE SIR PROCESS!

If you participated in the SIR (System Improvement Request) process by voting on your top ten SIR's (January Newsletter), make sure to attend the OASIG WISHLIST session in Nashville. Digital will begin the session by presenting the results of the voting...and...their response (action) to each item!

PLUS -- you will have the opportunity to present your wishlist 'wishes' directly to the panel of Digital representatives. These wishes will be used for our next SIR list.

SYMPOSIA

FIRST TIMERS...

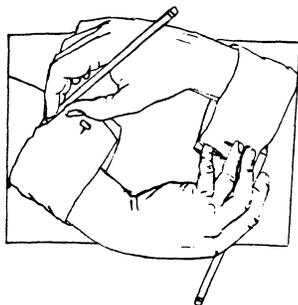
Is this your first Symposium? Are you confused by all of the things to see and do? Would you like to meet associates with the same interests? If the answer to one or more of these questions is YES. The OASIG would like to help you.

Make sure to stop by our 'table' during the Sunday night reception and tell us you are a First Timer. We will try to answer your questions and introduce you to other attendees. (Ask us about special activities or events for First Timers). We are pleased you will be able to attend and would like to help you become familiar with Symposia and the OASIG.

Notes on Notes

-- Discussions on VAX Notes
Volume 1, Number 4

by Mark Hyde and C J Trayser
VAX Notes Support Specialists
Digital Equipment Corporation



When developing applications it is nearly impossible to design the user interface to suit all the users' tastes. Key sequences or commands may be set so that they just don't fit your hand. Many people have key sequences that they have become accustomed to using in editors or other applications. Most people also want control over things like bells, beeps and margins.

Since building the perfect interface is impossible at best - the next best thing is to build an interface that can be changed - and of course VAX Notes has done just that. Since the human interface is written in VAX TPU, some of the features of TPU may be used for customization.

Notes uses a file called NOTES\$COMMAND.TPU as an initialization command file much like other products; VMS Mail has MAIL\$INIT.COM, EDT has EDTINI.EDT and ALL-IN-1 has OAINI.COM and OAINI.SCP. To use this feature the user must create a file called NOTES\$COMMAND.TPU in SYS\$LOGIN: which contains the desired commands. If you choose to call the file by another name or locate it somewhere other than SYS\$LOGIN:, then DEFINE the logical name NOTES\$COMMAND to point to the file. Its contents may be any valid TPU commands, definitions or procedures. Notes will compile the commands every time it is invoked and they will be available for the duration of that Notes session.

The primary usage for NOTES\$COMMAND.TPU for most users will probably be to define keys or TPU procedures for use within the integrated EDT, EVE, or WPS editor interfaces. It can also be used to define keys and procedures for use at the Notes command level. VAX Notes makes use of a TPU feature called "key maps" to make it easy to create custom key definitions. Notes provides 2 empty key maps for use by the user, NOTES\$USER_KEYS and EVE\$USER_KEYS. These are the actual key map names and must be in quotation marks when used. These same 2 key maps can be referred to by their internal variable names NOTES\$KT NOTES_KEYS and EVE\$X_USER_KEYS. If you use the variable names, quotes are not necessary. The examples below will demonstrate the use of both. Any keys you define in NOTES\$COMMAND should go to one of these key maps and will supersede any existing

definition.

When defining a key to perform a command at the Notes level, you should use the internal procedure NOTES\$DO_COMMAND as shown in the examples below. Calling this procedure to execute the command will insure that the proper context is retained and that you are returned to the command buffer after the command has been executed.

An excellent example of using NOTES\$COMMAND can be found in the sample conference which comes with VAX Notes. Topic number 8 contains many examples of both Notes and editor key definitions.

NOTES\$COMMAND is really a case where a picture can be worth a thousand words - so here is a heavily commented NOTES\$COMMAND.TPU file that contains many examples of what you can do.

```
!---
! Notice: The 'SHIFT_KEY' to TPU is what OA users normally
! refer to as the GOLD key. It is NOT the SHIFT
! key on main keyboard, but rather it is PF1.
!
! A note to non-TPU programmers - procedures MUST
! be defined at the beginning of the file. Use
! this example as a guideline.
!
!---
! Notes can be used as a posting place for reports that
! many people need access to. Sometimes these reports
! are in 132 column mode, thus making them difficult to
! read with Notes' standard 80 column screen. This short
! procedure accomplishes the goal of allowing the TEXT of
! the note and the command line to toggle between 132 and
! 80 characters. If you use this you will note that it is
! not 100% complete. We will leave this as the proverbial
! exercise for the reader. The first key definition that
! follows the procedure is associated with the procedure.
!
procedure toggle
  xwidth := get_info(current_window,"width");
  if xwidth = 80
    then set(width,notes$x_main_window,132);
    set(width,current_window,132);
  else set(width,notes$x_main_window,80);
    set(width,current_window,80);
  endif;
endprocedure;
!
define_key ("toggle",key_name("C",shift_key),"Toggle width",
  "notes$user_keys");
!
!---
! Here is a different approach to the same problem.
! In TPU you have the ability shift a screen to the
! left or right by the specified number of columns.
```

```

! Gold Right arrow and Gold Left arrow will shift the
! display screen to the left and right by 16 columns
! with the following definitions.
!
define_key
("notes$do_command('tpu shift (Notes$x_main_window,-16)'),",
key_name(right,shift_key),"Shift right",
"notes$user_keys");
define_key
("notes$do_command('tpu shift (Notes$x_main_window,16)'),",
key_name(left,shift_key),"Shift left",
"notes$user_keys");
!
!---
! TPU traps broadcast messages and forces them to the
! Notes message line immediately below the command line.
! Sometimes messages appear and disappear before they can
! be read. These are all stored in the MESSAGES buffer.
! The command EVE BUFFER MESSAGES will place you in that
! buffer until you press Control/Z. We have chosen to
! defined Gold ? for this.
!
define_key ("notes$do_command ('eve buffer messages')",
key_name ('?', shift_key), "Msg buff", notes$kt_user_keys);
!
!---
! To define a command to give you a full listing of all of
! the topics in a conference from the newest to the oldest
! the command of 'DIR LAST-1' is normally used. We will
! assign this to Control/D.
!
define_key ("notes$do_command ('DIR LAST-1')", ctrl_d_key,
"Reverse directory", notes$kt_user_keys);
!
!---
! To close a conference and return to the Notebook, the
! proper command is 'CLOSE'. We will bind this to PF3.
!
define_key ("notes$do_command ('close')", pf3, "Close",
notes$kt_user_keys);
!
!---
! While in the built-in editor it is often convenient to
! move between the two windows. The 'OTHER' command will
! do this. We will define Control/P to do this.
!
define_key ("eve_other_window", ctrl_p_key, "Other window",
eve$x_user_keys);
!
!---
! For ALL-IN-1 and WPS-Plus users, Gold W is a familiar
! keystroke to get an expanded error message.
!
define_key ("notes$do_command('show error')",
key_name("W",shift_key), "Show error", "notes$user_keys");
!

```

```

!---
! All too often the VMS PHONE will ring while you are in
! Notes. A quick way to answer it is by pressing '9' on
! the keypad, with the following definition...
!
define_key ("notes$do_command('spawn phone answer')", KP9,
"Answer phone", "notes$user_keys");
!
!---
! Want specific margins while in the Notes editor? Set
! them like this.
!
set (margins, notes$x_edit_buffer, 3, 75);
set (margins, notes$x_mail_buffer, 1, 77);
!
!---
! Having a VT220 allows the user to disable the warning
! bell on the terminal. But for those of you with VT100s
! this might make your life a little nicer. The following
! command turns off the bell during a Notes session.
!
set (bell, broadcast, OFF);
!
! To turn it back on, change the 'OFF' to an 'ON'.
!
!set (bell, broadcast, ON);
!
!---
! And one last example that might be useful. With a
! little bit of knowledge about the buffers you can
! perform many one-key functions that can save you
! several minutes of Noting. Here is an example of
! extracting the current topic and all of its replies
! to the mail buffer. From here you can then forward
! an entire discussion by typing 'SEND/LAST' at the Notes
! prompt. Try it for yourself and then experiment!
!
define_key
("notes$do_command('ext/buf notes$mail_edit topic/all')",
KP6, "Extract to mail", "notes$user_keys");
!
!---
Remember that you can also include any of your favorite EVE
editing procedures as well.

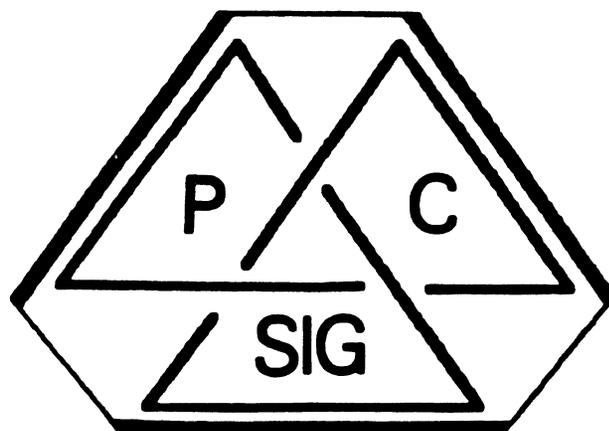
We hope this has been helpful and has provided some seeds for
experimentation. Try new commands and new functions for
yourself. If you get stumped contact someone who knows TPU
or Notes, or look us up at the "Notes On Notes" session in
Nashville.

Next month we'll look back at the history of Notes and noting
within DEC. Until then...

Happy Noting!

```

Personal Computer Special Interest Group



PC

Newsletter

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**Just think how exciting it would be to open the DECUS PC Sig Newsletter
and find YOUR NAME on this page!!!**

S U B M I T T O D A Y ! ! !

How to Submit an Article

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

There are several ways you can submit your articles:

- Fill out and mail in the *PC PostScript* form in the back of this newsletter*.
- Mail a Camera Ready hard copy to an address below
(Note: this method does not preclude editing).
- On DCS, send articles to **LEFEBVRE_K***
- Send an RX50 diskette to an address below in one of the following formats:*

| | |
|-----------------------|-------------------|
| WPS-8* | WPS-80 |
| CP/M or MS-DOS ASCII* | Select |
| WordPerfect | WPS-Plus/Rainbow* |
| PC-DOS ASCII* | PC-Write |
- Upload your file to the FIDO bulletin board:
(315) 589-7361, *Hitchiker's Guide* 107/23, William-son, NY; SYSOP: Fritz Howard.
- Use EasyPlex on CompuServe and send it to **Kenneth LeFebvre 72447,261***

**Methods marked with an asterisk are preferred.*

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General Section

How to Submit an Article

We need your help to make this newsletter the best that we can. Please be sure to read this page and write something for us. We are interested in what you have to say.

Contributor List

Once you've made that wise move to write for the DECUS PC Sig Newsletter, your name will appear on this page to let everybody else know who to congratulate.

Trademarks

Of course, I have to give due credit to all of the folks who made it possible to have so much fun with our computers!

Table of Contents

If you need to know what is where in this issue of the newsletter (and would like to enjoy a little of my writing at the same time!) look on this page.

SIG Update (Maaskant)

Our Sig chairman introduces us to this issue of the newsletter with a little news of Sig happenings.

Telephone Contact List

This is the list to be on! If you've ever needed help or advice, you know the advantage of being a member of DECUS. On this page, we list anybody who knows anything.

PROfessional Section

Professional Software Version List (Rice)

This is a handy list of all the current versions of Professional Software. It includes both DEC and Third Party packages.

PRO-Active: Installing a Non-DEC Hard Disk in Your PRO 350 (Glenchur)

You've read several articles here about installing third party disks in your Rainbow. Now read this article to find out how to do it to your PRO!

Notes on PRO/DECnet V1.0 (Gordon)

This is THE article for you if you're interested in PRO/DECnet! A good technically oriented article is somewhat refreshing after listening to DEC's marketing articles.

PRO/Sight Status Report (Hintz)

Our PRO working group chairman brings us the latest news concerning PRO/Sight. Do you use PRO/Sight? Then this article is for you.

Tape Backup for the PRO? (Hintz)

This is another good article from Thomas Hintz about a new product available for the PRO: a tape backup unit from DMI.

DECmate Section

DECmate Software Version List (Rice)

Our friend, Gary Rice, has done it again! He has compiled an excellent list of DECmate software and their current revision levels. Please be sure to tell him when you get a newer version than he has listed.

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Rainbow Section

Rainbow Working Group Notes (Jarrett)

Our Rainbow Working Group Chairwoman, Lynn Jarrett, would like to tell you a little about what is going on and what will be going on in the Rainbow world.

Rainbow Software Version List (Rice)

Here is another superb software version list by Gary Rice.

Visible Software Releases Dr. Pascal (Visible Software)

This press release about a new educational language from Visible Software came out last October. Watch for a review of this package by the editor in the future.

Rainbow Wish List (Jarrett)

Here is the latest Rainbow Wish List. Be sure to check to be sure that what you want is listed. If you are a manufacturer of equipment or software, take note for this article will tell you what people want to buy from you!

VAXmate Section

DMI Announces Major New Products for DEC PC's (DMI)

Duican MacDonald Inc. has announced a new series of expansion devices for your Vaxmate and PRO. Be sure to read this article to find out about them.

Introduction to VAXmate System Administration and Customization (DECUS PC Sig)

This is a preliminary abstract for one of the great new PreSymposium Seminars being offered this year in Nashville by the DECUS PC Sig.

MS-Windows Application Development on Digital PC's (DECUS PC Sig)

Another abstract for another super PSS being sponsored by your favorite PC user's group — the DECUS PC Sig!

Questionnaire Section

Professional Wish List Ballot

DECmate Wish List Ballot

Rainbow Wish List Ballot

We need your help to prioritize and clarify what the wishlists should include. Please give us your input on this form.

PC PostScript Form

DECUS Personal Computer Sig Questionnaire

We'd like to know more about you and your desires for the Sig. Please fill this out and return it to us with any comments you may have to offer concerning this Sig.

Information Resource Sign Up Sheet

Have you wondered how to get your name onto the Contact List? Fill out this form and return it to us right now!

PRO/Sight Graphics Contest Entry Form

If you use PRO/Sight, try entering our first graphics contest! You might win if you enter, but you can only lose if you don't!

SIG Update

by
Barbara Maaskant

In just one month the Spring Symposium will take place. I hope many of you are planning to attend and will take time to see us in Nashville. There are some things I want to update you on from the last meeting and also help you plan for next month.

Terms of office must end and my three years will be up in December of this year (1987). In an effort to protect the SIG and assure continuity, we voted on a new Vice-Chair position in December. Lynn Jarrett is the new Vice-Chair. She is doing double duty as the Rainbow Working Group Chair while she is getting her feet wet as the Vice-Chair, and will take over as the Chairman of the SIG in December. The position of Vice-Chair and Rainbow Working Group Chair will be open for election at that time. In addition, we created the position of Symposia Coordinator Backup. Jim Wilson, who has done an excellent job as Campground Coordinator, is also serving as backup to Rick Eliopoulos, Symposia Coordinator. It was felt that these two positions (SIG Chair and Symposia Coordinator) were too critical to fill without some preliminary introduction. Thus, we will be seeking a new Campground Coordinator in December should Jim fill the Symposia Coordinator position when Rick steps down. These positions are open to all and interested parties should contact me or any other PC SIG officer by mail, phone or during the symposium.

The SIG is constantly trying to improve our representation as well as what we offer at the symposia. We received several complaints from folks who were volunteered and were never contacted to help at following meetings. I am happy to announce that we have closed that gap and plan to take you up on your generous offers. Pierre Hahn, who for some time was the SIG NLO Rep, has taken on the task of coordinating volunteers. If you filled out a form to volunteer, you should hear from Pierre. If you want to volunteer, call Pierre (see the Steering Committee list). We need you to help—especially to spend time in the campground.

There are two areas where you can help right now! Any of you who attended the Magic Session know what a great success it was and are probably looking forward to seeing it again. Well, we need your help. The DECSEE presentation (a take-off on Johnny Carson's Carnac) requires answers and questions. We like to use original material and are in desperate need of PROfessional and DEC-mate submissions, **so please help!** Also, we are having a graphics contest. Details should be later in this issue. The first 50 entries will receive a PC SIG T-shirt, so try to put something together. There will be a special session showing all of the submissions, mid-week.

Finally, in response to many requests we have started publishing this newsletter on a monthly basis. This required a **MAJOR** time commitment from Kenneth LeFebvre and Gary Rice. *Will you please do your best to provide them with submissions?* This is your vehicle for communication; take advantage of it! Let us hear from you now and in Nashville!

Telephone Contact List Sorted by Areas of Expertise

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

| | | |
|--|---|--|
| All-In-1, V.1 & V.2 BASIC Communications/PRO Corvus Omnidrive dBASE dBASE II DBL | Andrew L. Wax Guy Stefan-Romano John R. Lynn Kenneth Lemay Guy Stefan-Romano Paul Bottone Philip Rice Kenneth LeFebvre | (212) 701-5231 (415) 753-5581 (714) 620-6667 aft. 7pm PST (219) 483-0001 (415) 753-5581 (516) 928-0933 aft. 7pm EST (503) 369-2565 (216) 243-1613 |
| DECmate | Cheryl Johnson Gary Swarouth Cheryl Johnson | (515) 236-2570 (607) 974-3152 (515) 236-2570 |
| DECspell Econometric Programming FCS-EPS GraphWriter Hard Disk/Rainbow Hardware/PRO 350 Hardware/Rainbow LN03 Lotus 1-2-3 | Jeff Mackie-Mason Mark Lewis Lynn Jarrett Kenneth Lemay John Pratchios Bob Catt Kenneth LeFebvre Lynn Jarrett Joseph L. Marks Miles Bridgford John R. Lynn Lynn Jarrett Lynn Jarrett J. Kaufman Caroline Mack Tom Tugman | (617) 253-8717 (212) 563-5656 (619) 293-1130 (219) 483-0001 (703) 385-5880 x3887 (717) 794-2430 (216) 243-1613 (619) 293-1130 (404) 875-9211 (312) 496-4582 (714) 620-6667 (619) 293-1130 (619) 293-1130 (201) 937-7816 (703) 280-4404 (703) 280-4404 |
| Low Level I/O on PRO LVP-16 Plotter Mass-11 Medical Office Appl/DM Memory Additions | Guy Stefan-Romano Dr. Homer Baker Tom Hintz Carol Britton Tom Hintz John Comella P. Chmielewski Jeff Mackie-Mason Thomas R. LeBone Jeff Mackie-Mason Miles Bridgford Miles Bridgford Thomas R. LeBone Guy Stefan-Romano Caroline Mack | (415) 753-5581 (602) 251-3830 (904) 392-5180 (805) 277-4808 (904) 392-5180 (617) 897-5922 (302) 777-5537 (617) 253-8717 (603) 880-9097 (617) 253-8717 (312) 496-4582 (312) 496-4582 (603) 880-9097 (415) 753-5581 (703) 280-4404 |
| Multiplan P/OS PRO Applications PRO Ofc Workstations PRO Series Robin (VT180) Samna II Scientific Programming | Guy Stefan-Romano Cheryl Johnson Kenneth LeFebvre | (415) 753-5581 (515) 236-2570 (216) 243-1613 |
| Statistical Programming TK!Files TK!Solver Turbo-Pascal UCSD Pascal WordPerfect WordStar WPS | Jeff Mackie-Mason Thomas R. LeBone Jeff Mackie-Mason Miles Bridgford Miles Bridgford Thomas R. LeBone Guy Stefan-Romano Caroline Mack Guy Stefan-Romano Cheryl Johnson Kenneth LeFebvre | (617) 253-8717 (603) 880-9097 (617) 253-8717 (312) 496-4582 (312) 496-4582 (603) 880-9097 (415) 753-5581 (703) 280-4404 (415) 753-5581 (515) 236-2570 (216) 243-1613 |

Professional Software Version List

by
Gary Rice

In an effort to keep you informed about software being shipped from various vendors, I began the following list in April, 1986.

Here is the sixth edition of the PRO Software List Update.

| DEC Software (alphabetically) | Current or Last Version | Source of Information | Still Avail? | P/OS V3.0 Supported? |
|-------------------------------|--|-----------------------|------------------|----------------------|
| 20/20 | 1.0.54 | User | Yes | UNK |
| Athena/Graph | 1.0 | DEC | Yes | UNK |
| BASIC-11/RT-11 | (Replaced — See BASIC-PLUS/RT-11) | | | |
| BASIC-Plus/RT-11 | 3.0 | DEC | Yes | N/A |
| CTOS | 1.0 | DEC | Yes | UNK |
| CTS-300 | 1.0 | DEC | Yes | N/A |
| Fingraph | 2.0 | DEC | UNK | UNK |
| Fortran IV/RT-11 | 2.6 | DEC | Yes | N/A |
| LOGO | 1.4 | DEC | Yes | UNK |
| Mail-Plus | 1.0 | DEC | No | UNK |
| MJA Accounts Payable | 5.2 | DEC | Yes | UNK |
| MJA Accounts Receivable | 5.2 | DEC | Yes | UNK |
| MJA General Ledger | 5.2 | DEC | Yes | UNK |
| MJA Order Entry/Inventory | 5.2 | DEC | Yes | UNK |
| MJA Payroll & Personnel | 5.2 | DEC | Yes | UNK |
| NPL Information Management | 1.4 | DEC | Yes | UNK |
| Phoenix-PRO | 1.0A | DEC | Yes | UNK |
| P/OS (Diskette) | 1.8 | DEC | UNK | No |
| P/OS (Hard Disk) | 3.1 | User | Yes | Yes |
| PRO-2780/3780 | 1.2 | DEC | UNK | No |
| PRO Application Starter Kit | 1.0 | DEC | Yes | No |
| PRO/Associate | 1.0 | DEC | No | No ¹ |
| PRO/BASIC | 1.3 | User | Yes | Yes ¹ |
| PRO/BASIC Plus 2 | 2.3 | DEC | UNK | Yes |
| PRO/COBOL-81 | 2.4 | DEC | UNK | Yes |
| PRO/Comm (Diskette) | 1.7 | DEC | Yes | No |
| PRO/Comm (Hard Disk) | 3.0 | DEC | Yes | Yes |
| PRO/CPM-80 | 1.1 | DEC | UNK | UNK |
| PRO/Datatrieve | 2.0 | User | Yes | Yes |
| PRO/DECnet | 2.0 | DEC | Yes | Yes |
| PRO/DIBOL | 1.7 | DEC | Yes | Yes |
| PRO/Fortran-77 | 5.0 | User | Yes | Yes |
| PRO/Fortran-77 Debug | (Replaced — See PRO/Toolkit Symbolic Debugger) | | | |
| PRO/IVIS Driver & Library | 3.1 | DEC | Yes | UNK |
| PRO/Lab Subroutine Library | 1.2 | DEC | Yes | No |
| PRO/NAPLPS | 1.0 | DEC | UNK | UNK |
| PRO/Office Workstation | 1.4A | DEC | UNK | No |
| PRO/Pascal | 1.2 | DEC | Yes | Yes |
| PRO/PRODUCER Toolkit | 1.6 | DEC | Yes | No |
| PRO/RDT | 1.0 | DEC | UNK | No |
| PRO/Scientific Subroutines | 1.3 | DEC | UNK | No |
| PRO/SIGHT | 1.0 | User | Yes ² | Yes ¹ |
| PRO/Smart Mailer | 1.0 | User | Yes ² | UNK |

Professional Software Version List (Continued)

| DEC Software (alphabetically) | Current or Last Version | Source of Information | Still Avail? | P/OS V3.0 Supported? |
|--------------------------------------|-------------------------|-----------------------|--------------|----------------------|
| PRO/SNA | 1.1 | DEC | UNK | No |
| PRO/Toolkit | 3.1 | User | Yes | Yes |
| PRO/Toolkit BASIC-Plus 2 | 2.3 | DEC | Yes | Yes |
| PRO/Toolkit COBOL-81 | 2.4 | DEC | Yes | Yes |
| PRO/Toolkit DIBOL | 1.7 | DEC | Yes | Yes |
| PRO/Toolkit Fortran-77 | 5.0 | User | Yes | Yes |
| PRO/Toolkit Pascal | 1.2 | User | Yes | Yes |
| PRO/Toolkit Real Time Lib. | 2.1 | DEC | Yes | No |
| PRO/Toolkit Symb. Debugger | 2.0 | DEC | Yes | Yes |
| PRO/VENIX | 2.0 | DEC | Yes | N/A |
| PRO/Videotex | 1.0 | DEC | Yes | UNK |
| Professional CTS-300 | 1.0 | DEC | Yes | N/A |
| Professional Real Time Library/RT-11 | 1.0 | DEC | Yes | N/A |
| PROSE PLUS | 2.0 | User | Yes | UNK |
| RS/1 | 12.0 | DEC | Yes | UNK |
| RSX Host Toolkit | 3.0 | DEC | Yes | Yes |
| RT-11 | 5.3 | DEC | Yes | N/A |
| Supercomp-20 | 1.28 | User | Yes | UNK |
| Synergy | 2.0 | User | Yes | UNK |
| VAX Host Toolkit | 3.0 | DEC | Yes | Yes ¹ |
| WPS/Plus | 1.0 | DEC | Yes | Yes ¹ |

| 3 rd Party Software (alphabetically) | Vendor | Revision | Source | Avail? | P/OS V3.0? |
|---|-------------------|----------|--------|--------|------------|
| Fingraph | Graphic MIS | 2.0 | DEC | No | UNK |
| Online Disk Unfragmentor | By Hand | 1.3 | User | Yes | Yes |
| PRO/Menu Manager | Wasatech Computer | 1.0 | User | Yes | UNK |
| PRO/Session Logger | By Hand | 2.0 | Vendor | Yes | Yes |
| TKISolver | Software Arts | 1.0(2A) | User | No | UNK |

¹ Restrictions apply

² This product is available through the DECUS Program Library only

If you have received a shipment of software in the last month (and you DIDN'T get it in a fire sale), please compare the documented REV level to the one I have listed. If your software is more recent (or it isn't listed at all), please let me know so I can update the list. Also, if the source of my information is listed as "DEC", I would appreciate hearing from a user, since I've found that hearing about it from DEC doesn't always mean that it is already shipping.

I will submit a new list to the PC Sig Newsletter about the 20th of each month.

PRO-Active: Installing a Non-DEC Hard Disk in Your PRO 350

by
Tom Glenchur

Since I first purchased my *Professional 350*, I have desired a larger capacity disk drive than 10 megabytes. There are now several drives available which exceed 10 megabytes. The problem has been, and remains for Digital computer owners, the price barrier.

There are three parts to the disk upgrade puzzle: the disk drive, the controller card and the operating system. The good news is that there are cost competitive alternatives to DEC's hard disks. Digital's RD52 33 megabyte disk is a *Quantum Q540* 5-1/4 inch drive. It is 40 megabytes when unformatted. The surprise is that it currently retails with a one-year warranty from \$-100 for \$---. You can also use a 20 megabyte *Seagate ST-225* (prices go as low as \$---). Digital sells the same disk at three times the cost that you can find elsewhere.

The controller card and operating systems are more complicated to explain. The first version of the controller card, DEC part number 54-15134-00, carried a 063B2 PROM. The last two digits of the DEC part numbers are the revision number. (Digital's electronic store will tell you it is an obsolete part number.) Revision 00 supported the RD50 and RD51 disk drives. The RD50 and RD51 are *Seagate Technology's* five megabyte model *ST506* and 10 megabyte model *ST412* 5-1/4 inch disk drives, respectively.

Professional Operating Systems, P/OS, supported the RD50 and RD51 through Version 2.0. In order to run a higher megabyte capacity disk drive, one had to buy an RCD52 update kit for a sum approaching the cost of the original system. The kit contained an RD52, a controller board revision 0-1, DEC part number 54-15134-01, and a postcard to send for the P/OS 2.0A system update.

Wait! There's more! Field change order 54-15134-M006 was issued 31 January 1984 to retrofit the controller PROM with a new PROM of the same part number at no charge to service contract customers. It seems the startup file was being overwritten by instructions in the PROM. It came with a diskette called PRO/WHACK which helps one to retrieve lost files. Remember that new systems were sold with a one year contract of free service. Field change orders are part of that service contract. Changing the PROM set the controller board to revision 01: If your board has a "REV F1" near the part number and the PROM on the far right of the second row of chips does not have a "H1" marked on it you may need to replace it in order to run more than 10 megabytes. DEC now sells disk controller boards for the Pro with only the revision 01.

If you are not under a Digital service contract, **Horizon Computer Service** or **American Digital Systems** sell an upgrade chip for about \$---. **Horizon Computer Service** will also convert the 120 kilobyte RAM daughter board to one megabyte for a nominal fee ... about one-fifth the price of Digital.

The service manager at **Horizon Computer Service** informs me that P/OS version 3.0 can control the either revision of the controller board for high capacity drives. So assuming that the start-up file remains uncorrupted, switching to P/OS version 3.0 may obviate the necessity of upgrading controller boards. If you already have a 5 or 10 megabyte hard disk in your Pro, complete upgrade kits can be obtained through **Horizon Computer Service** or **American Digital Systems** for about \$---. [Contact *Horizon Computer Service*, 14 Heather Drive, Edison, NJ 08820, (201) 420-5888; and *American Digital Systems*, 75 Union Avenue, Sudbury, MA 01776, (617) 443-7711]

PRO-Active:
Installing a Non-DEC Hard Disk in Your PRO 350
(Continued)

If you do not have a hard disk controller board, there are many used boards available from which to start. You will need the hard disk drive, a mounting skip plate, the two ribbon cables, a power supply wire, a version of the Professional Operating System version 2.0A or later, and possibly a new controller card PROM.

Installation: All of the parts I mention in these directions should be removable or installable without much force. Turn off the computer's power switch and remove the power cord from the back of the box. Removing the plug from the power socket might not be such a bad idea either. Close the diskette drive doors so the cover can clear them. Grasp the system cover at its bottom side latches and gently slide them forward and then outward to locking position. Remove the cover straight up and place the cover in a safe place. If your room is like mine, you can take this opportunity to wash the cover in water and maybe a little dishwashing detergent (nothing stronger than Ivory).

To change or install the hard disk controller board, gently remove the two ribbon cables which connect to one board inside the slotted box called the card cage. Loosen the thumb screws on either side of the card cage door. They should loosen for a while then permit themselves to be pulled clear of the sides of the cage when swinging open the cage door. Grasp the door and pull it gently away from the cage and then up to reveal the option cards. In slot one, the maroon colored lever numbered 000401 is pulled out about an inch and then twisted clockwise about 90 degrees to release the connector on the controller board from the card cage bus.

The board should slide out easily for replacement of the PROM chip. With the board oriented with the components facing you and the maroon lever to the right, remove the PROM on the far right of the second row from the top with a DIP extractor or screw driver. Replace it and slide the controller board back inside the cage.

Twist the maroon lever counter-clockwise to lock the board in place. Replace the card cage door. Reinsert the door thumb screws. Replace the cables in their former location unless you are replacing the hard disk at the same time.

To change or install the hard disk, gently depress the button in front of the hard disk drive with a pointed object or your fingers if they are small enough. The hard disk drive slide mounting plate will release from the system. Slide the drive towards you about halfway and remove the power wire from the power supply at the left of the disk drive.

Transfer the two controller cables from the old drive to the new drive. Be careful not to flex the board under the drive. Slide the unit halfway back. Reconnect the power supply wires. Slide the unit back until the button in front of it locks it in place.

Reconnect the ribbon cables to the controller boards. Replace the cover. Pull the cover latches slightly towards you. Then guide them gently back into their former closed position. Replace the power cable and turn it on. Your 20 megabyte hard disk should now be successfully installed. Format it. If it doesn't work, check all of the connections again.

Now, does anyone know who makes the RD53?

[Yes, *Micropolis* makes the RD53! — editor]

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Notes on PRO/DECnet V 1.0

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We have been using PRO/DECnet V 1.0 to link together six PRO-350 computers in a Local Area Network for about four months. Our three objectives in installing the LAN were, 1) to make efficient use of disk storage for several large data bases, 2) to minimize the effort required to make updated data files and applications available to each computer, and 3) to share printer resources, including an LN03 laser printer and LQPO2 printer.

Our largest data base consisted of four indexed files comprising a total storage requirement of 2500 Kbytes. Not only does this hog disk space when installed on each machine, but frequent updates to several computers is a cumbersome chore. Therefore, I looked forward to a LAN which would allow remote file access and use of DCL across the network. We planned to keep several large data files on one 33 Mbyte hard disk, which would be constantly available on the network, and other PROs would access the various data files as needed.

I was not concerned that commercial data base programs would be unable to access data files on another node. The data bases are, for the most part, accessed by in-house applications which edit, display and print data. Some applications access several data files simultaneously in order to draw on different kinds of data. I did have the delusion, however, that programming in a PRO/DECnet environment would involve little more than changes in the formation of file specifications and modification of OPEN statements.

A number of limitations of PRO/DECnet required unforeseen modifications to our applications. In many cases these limitations are not clearly documented in the PRO/DECnet volume of the Tool Kit. Some of these limitations are presented here.

1. PRO/DECnet supports RMS-11 file access by remote nodes. On a single PRO, the number of files that can be simultaneously opened by remote nodes is limited to five. When a remote node opens a file using RMS-11, a File Access Listener (FAL) program is installed on the PRO where the file being accessed is located. This FAL task performs operations on the file and communicates with the remote task. Apparently, there are only five FAL tasks on a single PRO. Since one FAL task is used for each file being accessed by a remote node using RMS-11, a maximum of five files can be opened on a single node by one or more remote nodes. For example, if remote node A opens five files on node B, no other node could open a file on node B. The attributes of the files being opened do not affect this particular limitation (i.e., each sequential file uses one FAL program as does each indexed or random file). Other nodes can still do task-to-task communication with node B using DECnet high level language communication calls and can communicate using the mail and phone utilities.

If a program cannot access a file because the FAL tasks on the remote node are all busy, BASIC=PLUS-2 returns ERR = 175. This same error is returned if the program cannot access a remote node because the access string is incorrect or the remote computer is not on the network. BASIC=PLUS-2 will not return the correct error message, since it does not support this error. The error can be handled by an error handler routine.

2. Using BASIC-PLUS-2, a single task can access remote files using RMS-11, or the task can use DECnet high level language communication calls to open a channel on the network and establish a logical link to a remote task. However, a single task cannot do both simultaneously. This may be because there is a conflict between the LUN used by RMS-11 and that used by the subroutine to open a channel on the network. At any rate, DEC engineering did not have a solution to this problem. If your application requires remote file access and communication with a remote task, it will have to confine each process to separate tasks locally, and use local task-to-task communication to coordinate the process.

3. Pool space can be a severe limitation when files are accessed by a remote node. Considerably more pool space (five times as much in some cases) is used when a file is accessed by another node as when the same file is accessed locally. Listed below are typical files with pool requirements for local access and for access by a remote node.

| File Attributes | Local Access | Access by Remote |
|---|--------------|------------------|
| Sequential fixed; Recordsize = 1 byte | 52 words | 236 words |
| Sequential variable; recordsize, no maximum | 52 words | 254 words |
| Indexed fixed bucketsize 1 block; 1 key | 52 words | 274 words |
| Indexed fixed; bucketsize 2 blocks; 10 keys | 94 words | 296 words |

The amount of pool space available on a system depends partly on the activity of background and foreground tasks and also on the number of tasks actually installed but not active. The default start up file for the tool kit (START.COM in your tool kit directory) installs a number of tasks such as editors, compilers, RMS utilities, and DCL HELP. Each task typically uses 40 or more words of pool space. When I enter the Tool Kit using the default start up file, I have a total of 1864 words of pool space available. Access of five files by a remote node, plus use of print services and/or a text editor can reduce pool space to critically low levels.

Depletion of pool space can be a problem because the operating system often cannot gracefully handle depletion of pool space. My system has crashed on me or just stalled out due to depletion of pool space. At other times I have tried to enter the Tool Kit while another node was accessing files. Only about half of the Tool Kit tasks installed correctly. The other INSTALL commands produced the following message:

```
INSTALL -- Status - -12, -32 Id=E0000049
```

This is an RMS error indicating that a file could not be accessed.

I have minimized this problem by modifying my START.COM file for the tool kit to install only the tasks that I frequently use (e.g. EDT, compilers). This saves over 500 words of pool space. I put the installation commands for other utilities in individual command files in [1,2]. Where possible, I have included the REMOVE command in the command file to free up pool space. The following is an example of my command file for PROSE. This command file, located in [1,2]PROSE.COM, can be run by typing @PROSE while in the Tool Kit.

```

.OPEN TI:
.DISABLE QUIET
.DATA   Install the PROSE Editor - EDIT/PROSE command
.IFNINS CET      INSTALL LB:[ZZSYS]CET
.IFNINS ... PRO  INSTALL APPL$DIR:DCLPROSE
.ENABLE QUIET
.ENABLE SUBSTITUTION
.DATA
.ASKS F1 File name to edit:
.DISABLE QUIET
EDIT /PROSE 'F1'
.REMOVE CET
.REMOVE ... PRO

```

```
OPEN node::filespec AS FILE #1%
```

Therefore, if the file already exists, the most recent version is opened rather than opening a new version. The clause { FOR INPUT } executes correctly, returning an ERR = 5 if the file doesn't exist.

PRO/DECnet has functioned well as long as the limitations are kept in mind. In an environment consisting solely of PROs, I would consider PRO/DECnet to be useful primarily for copying files from node to node. Heavy access of remote files using RMS-11 may not be practical in a busy network.

DEC engineering did not have a solution to the problem of depletion of pool space. They did say that V 3.0 of P/OS and Tool Kit lets you increase pool space.

4. PRO/DECnet subroutines let you perform task-to-task communication across the network and run an installed task on another node, but it will not let you install a task on another node (as far as I know). I've gotten around this by using an application to install (with /NOREMOVE option), but not run, any tasks which I may later want to run from a remote node. This application is named in FIRSTAPPL.PTR so that the tasks are installed each time the system is booted. Thus the tasks are always ready to run, but use only pool space, no memory, until they are run.

5. Although PRO/DECnet lets you print a file residing on another node on a printer attached to your node, it will not let you send a file to a printer connected to another PRO. Since we had hoped to be able to do this in our LAN, I created an application to give us this capability. To do this, the technique described above (4) was used. Using DECnet task-to-task communication, the local task (on the computer that the user is sitting at) spawns the already installed remote task (where the printer is located). The remote task checks to make sure the printer is available and sends a message indicating the printer status back to the local node. If the printer is available, the local task sends lines of text to the remote task which in turn sends them to the printer. The remote task runs in the background and does not interfere with that user's work.

6. PRO/DECnet DCL does not allow the use of command modifiers.

7. PRO/DECnet clutters up the message board with hundreds of uninteresting (to a typical user) messages. Every time a file is accessed, three messages are written to the message board; and this is when the access was successful! Formerly I had used the message board for displaying messages concerning the status of background tasks. If such a message is one of 250 messages stating that a file had been successfully accessed, the usefulness of this technique is severely limited. PRO/DECnet uses the message board to indicate when new mail has been received, but, again, this message is likely to be buried on an active network.

8. When opening a file on a remote node using BASIC-PLUS-2, the clause { FOR OUTPUT } is ignored. In other words the following line

```
OPEN node::filespec FOR OUTPUT AS FILE #1%
```

executes as

PRO/Sight Status Report

by
Thomas R. Hintz

During the last two years, I have become a regular user of *PRO/SIGHT*, the only graphics editor available for the DEC *PROfessional* computer. During this time, I have talked with many other PRO users who have a need for the capabilities of SIGHT or are already using the product. If you attend any DEC or DECUS meetings, you will probably see many slide and overhead transparency images that were created with PRO/SIGHT. DEC is a big user of this product! I find nothing but enthusiasm for its capabilities. Even MacIntosh users have had favorable comments. The low price, high resolution and color display are tough to beat.

SIGHT appears to be migrating to the VAX world. At previous DECUS meetings, I have seen a version of SIGHT running on the graphics VAXstation on the display floor. Although no product has been announced, rumors persist that it is still in the works. It contained all the features of the PRO version in addition to many other desirable features. Because it uses the same product name, it might be assumed that the GIDIS format will be supported on the VAX and that .GID files created on the PROfessional will be at least upward compatible for editing and hopefully backward compatible for display. For now we can only speculate, but...!

Seeing the VAX/SIGHT version only brought to mind all those other features that many users would like to see in the PRO version. Version 1.0 of PRO/SIGHT is nice, but it does lack some of the capabilities that are available on other graphics editors found on my personal computers. At the fall '86 DECUS, we were told that version 1.1 is expected to be released in the spring. But, the only significant change would be that the image created would no longer be limited by memory. Larger (file size) images could be created because they would be written to disk during creation. Also, the Positional Device Interface (PDI) has been extensively rewritten and will work with version 3.0 of P/OS. Both of these fixes have been needed for a long time and are (will be) appreciated.

To circumvent some of the shortcomings of PRO/SIGHT, the support programs that come with it have been rewritten at my site to provide new and improved capabilities. My main concern was the limited number of fonts and fill characters available for use. Consequently, we have developed a font/fill editor, improved the Frame Viewer, provided a decoder/encoder of .GID files and a few other miscellaneous programs. These programs were briefly described in sessions at the fall '86 DECUS and in more detail at the spring '87 DECUS.

Because the PDI does not work on version 3.0 of P/OS, we are still using version 2.0 of P/OS so we can continue to use our digitizers. Although we have not tried it yet, we should be able to use some of the new fixed-size fonts that come with P/OS version 3.0.

With the new support programs mentioned above, we have exhausted all the avenues available to us for improving SIGHT. Without writing our own version of the PRO/SIGHT program, enhancements to the PRO/SIGHT program itself, can only be done by DEC. Because of this, the continuing interest in having new features, and the large number of users, I am presenting a list of user requested improvements that were given to me during previous DECUS meetings. This itemization can act as a PRO/SIGHT user wish list that may encourage DEC to make further improvements to the graphics editor.

PRO/Sight Status Report
(Continued)

Wish List Items:

1. Rotate objects
2. Command level interface
3. Bug fix for memory allocation problems
4. "Acquire" object attributes (color, font, pattern, etc.)
5. Italics as a variable
6. Text size as a variable
7. More fonts available for specific image
8. More fonts to select from
9. Page display for editing on screen
10. Plotter font support
11. Increase complex figure size when using fill
12. Overlay grid to help with positioning (not part of image frame)
13. Numeric position feedback of pointer position (could be turned on/off for performance)
14. Join multiple objects into one object
15. Setup save (size, position, current object, etc.)
16. LVP16 font improvements (filled fonts, etc.)
17. LVP16 rotation (landscape vs. portrait)
18. LVP16 11 x 17 (A2) images (scrolling?, paste-up?)
19. More loadable fonts (text and fill)
20. Choice between small and full screen crosshair
21. SELECT ALL key or capability
22. New PDI that works with P/OS version 3.0 and tool kit
23. Complete compatibility with SIGHT/GIDIS on other computers when or if they become available.

The suggested improvements are not listed in any order of importance at this time. The only exception is item 1, "rotation of an object." Rotation was the single most requested feature. Other items are listed as they were relayed to me. If you have any others to add to this list, send them to me. Please provide as much detail as necessary to make your request completely understandable. Some of the items listed above need further clarification to be helpful. In the future, we may vote on their importance if the interest continues.

Tape Backup for the PRO?

by
Thomas R. Hintz

YES! After more than two years of hearing that a third party vendor was developing a tape backup system for the PRO, it has finally arrived. A product is available from **Cipher Data Products, Inc.**

This is not a review of the product since I just found out about it myself. This is to let you know what it is and that it does exist. If you buy one of these units, write a short article and submit it to the newsletter. Others will want to know about ease of installation, support, operation, etc., etc.

The specific product is a *Cipher Data: Model 5230*. It is a cartridge tape backup system that is compatible with all models of the PROfessional running P/OS. The system consists of a floppy tape drive (39 ips) with its own cabinet (8.1 in. wide x 5.6 in. high x 17.5 in. deep) and power supply, a controller board for the PRO/CTI bus, two 512 byte ping-pong buffers, a complete software package, a chassis adapter, and cabling. The floppy tape drive plugs into an external jack on the chassis adapter box.

Each tape has a 25 megabyte capacity per cartridge which would make it equivalent to about 65 to 70 diskettes. The software provided to support this device is a modification of DEC's BRU (Backup and Resture Utility). This menu-driven adaption of BRU provides a file backup capability and includes a formatter routine, a diagnostic program, and the stand-alone BRU.

More technical information and pricing can be obtained from *Cipher Data Products, Inc., Mountain View, California 94040*. Their toll-free telephone numbers are 1-800-772-0670 (in California) and 1-800-843-3751 (anywhere else in the U.S.) or 1-415-964-2211 (if neither of the others work). The only distributor that I am aware of is **Duncan MacDonald, Inc.** of *Laguna Niguel, California 92677*. This company has been providing a similar tape backup system for the Rainbow computer. DMI can be reached at 1-714-582-3118.

DECmate Software Version List

by
Gary Rice

I began a list similar to this one for the PRO series of computers in April of 1986. This is the first edition of the DECmate Software Version List.

This list reflects information that I have received as of September 14, 1986.

| <u>DEC Software (alphabetically)</u> | <u>Current or Last Version</u> | <u>Source of Information</u> | <u>Still Avail?</u> | <u>Operating System</u> |
|--|------------------------------------|----------------------------------|-------------------------|-----------------------------|
| <i>COS-310</i> | 9.3 | User | UNK | COS-310 |
| <i>DECmate CP/M-80</i> | 2.1W | User | Yes | CP/M |
| <i>DECmate DBMS</i> | 1.0 | DEC | Yes | |
| <i>DECmate Graphics Terminal</i> | 2.0 | DEC | Yes | |
| <i>DECmate II Construct. Bus.</i> | 1.0 | DEC | Yes | |
| <i>DECmate II Construct. Mng.</i> | 1.0 | DEC | Yes | |
| <i>DECmate Master Menu</i> | 1.11 | DEC | Yes | MENU |
| <i>DECmate MS-DOS</i> | 1.0 | DEC | Yes | MS-DOS |
| <i>DECmate Office Workstation</i> | 2.0 | DEC | Yes | |
| <i>DECmate TYPEasy</i> | 1.0 | DEC | Yes | |
| <i>DECmate WPS</i> | 2.1 | User | Yes | WPS |
| <i>DECmate DECspell</i> | 2.1 | DEC | Yes | WPS |
| <i>DECmate Natural Languages</i> | 1.02 | DEC | Yes | WPS |
| <i>Graphtalk</i> | 1.0 (3.27) | User | UNK | MS-DOS |
| <i>Multiplan</i> | 1.05 | User | UNK | CP/M |
| <i>OS-278</i> | V2.VB3 | User | UNK | OS-278 |
| <i>R:Base 4000</i> | 1.1 | DEC | Yes | MS-DOS |

If you have received a shipment of software in the last month (*and you DIDN'T get it in a fire sale*), please compare the documented Revision Level to the one I have listed. If your software is more recent (or it isn't listed at all), please let me know so that I can update the list. Also, if the source of information is listed as "DEC", I would appreciate hearing from a user, since I have found that hearing about it from DEC doesn't always mean that it is already shipping.

I will submit a new list to the PC Sig Newsletter about the 20th of each month (two months in advance of publication).

You can contact me by writing:

Gary Rice
P.O. Box 5536
Hacienda Heights, CA 91745-0536

or calling: **(818) 913-7996**
and leaving a message.

Rainbow Working Group Notes

by
Lynn Jarrett

It's amazing the response I received from the Wish List questionnaire in the last six weeks! The interest in the Rainbow is still alive and well and the third-parties are still developing new and useful utilities!

Code Blue available from **Intersecting Concepts** is the newest and most popular software package in the Rainbow world right now. It gives Rainbow users a certain amount of IBM PC compatibility though it does have some restrictions. It will not allow IBM PC graphics to run on the Rainbow and in some cases, you'll need a lot of memory (*like over 768K*).

Some of the non-graphics PC programs that will work on the Rainbow include utilities, hard disk managers, database application programs, spreadsheet programs and some word processors. All in all a good job was done with this program and you should really give it a try!

A multi-window multi-file text viewing utility for the Rainbow which offers many features such as the ability to open from one to four files for viewing at the same time and the ability to search the files in windows for strings, or step through the files in these windows forward or backward, a line at a time or a screen at a time, *View Ingenuity* has an AUTODEMO mode that will automatically demonstrate the features, commands, and function keys of *View Ingenuity*. This is also a nice utility worth looking into.

Be sure to express your complaints and wishes by filling out the questionnaire on the Rainbow Wish List in the back of this book. I need to know your wishes when I update the list again! After all, there are vendors out there wanting to know what you want! And we're here to tell them.

Telephone numbers of interest:
Intersecting Concepts, Inc.
CICA

(805) 529-5073
(502) 448-2719

Rainbow Software Version List

by
Gary Rice

I began a list similar to this one for the PRO series of computers in April of 1986. This is the first edition of the Rainbow Software Version List.

This list reflects information that I have received as of September 14, 1986.

PLEASE LET US KNOW WHAT VERSION YOU ARE USING
(EVEN IF YOU'RE NOT SURE THAT IT'S THE LATEST VERSION)

| <u>DEC Software (alphabetically)</u> | <u>Current or Last Version</u> | <u>Source of Information</u> | <u>Still Avail?</u> | <u>Operating System</u> |
|--|------------------------------------|----------------------------------|-------------------------|-----------------------------|
| <i>DECnet-Rainbow</i> | 1.0 | DEC | Yes | |
| <i>GSX-86</i> | 1.0 | DEC | Yes | CP/M |
| <i>GW-Basic</i> | 2.01.01 | DEC | Yes | MS-DOS |
| <i>CP/M-86/80</i> | 1.01 | User | Yes | CP/M |
| <i>MS-DOS</i> | 2.11-1 | User | Yes | MS-DOS |
| <i>Rainbow ATHABASCAN Kit</i> | 1.0 | DEC | Yes | CP/M |
| <i>Rainbow CONNECTION</i> | 1.0 | DEC | Yes | MS-DOS |
| <i>Rainbow Office Workstation</i> | 1.0 | DEC | Yes | |
| <i>WPS-PLUS/Rainbow</i> | 1.0 | DEC | UNK | |

If you have received a shipment of software in the last month (*and you DIDN'T get it in a fire sale*), please compare the documented Revision Level to the one I have listed. If your software is more recent (or it isn't listed at all), please let me know so that I can update the list. Also, if the source of information is listed as "DEC", I would appreciate hearing from a user, since I have found that hearing about it from DEC doesn't always mean that it is already shipping.

I will submit a new list to the PC Sig Newsletter about the 20th of each month (two months in advance of publication).

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Gary Rice
P.O. Box 5536
Hacienda Heights, CA 91745-0536

or calling: (818) 913-7996
and leaving a message.

Visible Software Releases Dr. Pascal

by
Visible Software

The following is reprinted from a press release dated 12 October 1986.

Princeton, NJ. **Visible Software** has just released *Dr. Pascal*, a visible programming environment for the Pascal language. *Dr. Pascal* combines an editor, interpreter and visible features in a single system. It is unique in that it allows the user to observe the inner workings of a program as it runs.

Dr. Pascal is for Pascal programmers at all levels of experience. For novice and intermediate level programmers, *Dr. Pascal* eases the pain of figuring out, "Why doesn't my program work?" Even experienced programmers can find errors that have evaded conventional testing procedures. *Dr. Pascal* is ideal for university or high school programming classes. In class, students learn by seeing the inner operations of demonstration programs as they run. In the lab, they find errors in their own programs quickly—this means less frustration and more productive use of lab time.

In visible mode, *Dr. Pascal* runs a program while displaying the current statement in context, the procedure calling sequence, and the values of simple and structured variables. These views are constructed automatically, even for complex data structures, with no need for clumsy debugger commands. In addition to its visible capability, *Dr. Pascal* provides many enhanced features for programmers. For example, the screen editor enables entire structured statements to be typed with one or two keystrokes. A high level Procedure Editor allows the inspection or modification of the nested procedure structure of a complete program.

Dr. Pascal uses only Standard Pascal, thereby ensuring upward compatibility with other Pascal compilers on micro-computers (including *Turbo Pascal* and *Microsoft Pascal*), as well as those on IBM mainframe, VAX, and UNIX systems. Programs developed and debugged with *Dr. Pascal* can be compiled with an optimizing compiler on any of these systems (not supplied) to produce a fast executable file.

Another benefit of using Standard Pascal is that the user's programs and programming skills will not be "locked in" to today's generation of compilers or hardware. However, programs already written with non-standard or hardware-specific extensions will not run in *Dr. Pascal* without change. Also, program size is currently limited to 30K of source and 300 identifiers.

Dr. Pascal is now available for the IBM-PC and compatibles, DEC Rainbow and selected other MS-DOS and CP/M-86 computers with at least 256K RAM and 320 kb disk space. It is priced at \$59.00, including shipping within North America (US, Canada, Mexico). For other destinations, \$6.00 should be added for shipping.

For more information, or to place an order, contact **Visible Software**, 22 The Western Way, Princeton, NJ 08540, (609) 683-4386.

Rainbow Wish List

by
Lynn Jarrett

1. Lotus Release 2.01.
2. MS-DOS 3.1
3. Larger memory upgrades and removable hard disks at reasonable prices.
4. Larger than 20MB hard disks and controllers.
5. Nationwide TRUMP upgrades--updates from a 100A to 100B.
6. Printer drivers for LN03 and more non-DEC printers on all DCS software.
7. A second COMM port that doesn't require you to disconnect the hard disk controller to put it in.
8. Come up with an ANSI.SYS device driver like that of IBM that would give people the ability to redefine the function keys. This could allow users the use of extended sequence for color or monochrome shading that DEC could add as well as give the users the ability to run many IBM programs on their Rainbows.
9. MS-DOS installable graphics driver similar to GSX-86.
10. Rainbow versions of RBase 5000, Framework, Thinktank, and Borland's Sidekick.
11. A new ROM upgrade for the Rainbow that would include support for an IBM PC compatible character set. (This would allow Rainbow users to easily run all the programs that take advantage of all the IBM PC graphic characters.)
12. More software packages overall--for business and personal use.
13. Concurrent MS-DOS.
14. Better basic documentation with purchase of each unit, i.e., BIOS, firmware listing and schematics.
15. Software spooler.
16. Hardware Reset and Halt keys.
17. Terminal mode to support the additional keys of the LK201 keyboard.
18. Larger print buffers built into printers.
19. Remove copy protection from DCS and DDS software.
20. Coordination between local DEC Field Service offices and Atlanta Hotline Support Center.
21. ASSIGN command.

Rainbow Wish List
(Continued)

22. Cheaper maintenance prices.
23. Rainbow Draw and Paint.
24. VT220 and VT240 emulation software.
25. Lap-top or portable Rainbow.
26. Rainbow LAN without the need for a VAX.
27. Field Service support for third-party wares such as the disk controller and formatter as well as for the clock boards that are on the market.
28. Full featured GW-Basic compiler.
29. "Open" Winchester utility that allows users to specify disk geometry to take advantage of great third-party disk prices.
30. Direct Ethernet access for the Rainbow; i.e., a board that plugs into the Rainbow that doesn't preclude the use of a hard disk.
32. Liberal trade-in allowance on Rainbow to VAXmae.
33. Ability to read and write to RX33 diskette drive upgrade kit.
34. Monitor connections for CAD products.
35. DEC support for third party-vendors wanting to develop and market hardware and software for Rainbows.

The ballot can be found in the Questionnaire section of this copy of the SIG Newsletter.

DMI Announces Major New Products for DEC PC's

DMI is announcing new products that will support the DEC *VAXmate* and *PRO* product lines. The products for the *VAXmate* are centered around the new *DM300* series of Expansion Systems which offers the end user the combination of price performance, flexibility and ergonomic features.

The *DMI Base Expansion System* consists of an integrated external cabinet with hard disk and controller, power subsystem, quiet cooling system, connecting cable assemblies, and necessary documentation.

The system design includes practical user features such as a single power on switch along with the flexibility to add additional peripherals and DMI certified board enhancements for EGA and expanded memory.

The *DMI Base Expansion System* is currently available in four models which are:

DM320A - 60 cycle with 20 Megabyte hard disk
DM320B - 50 cycle* with 20 Megabyte hard disk
DM340A - 60 cycle with 40 Megabyte hard disk
DM340B - 50 cycle* with 40 Megabyte hard disk

*The 50 cycle units are for foreign units.

Other accessories and services available include: Type back-up units with controller, additional 360K floppy disk with controller, 2 megabyte memory expansion boards, EGA graphics adapters, tape cartridge, etc.

DMI has provided the end user with the flexibility to add to the *Base Expansion System* another hard disk with a maximum of 80 megabytes on this release.. They will also provide system integration services to those customers that wish to have accessories added to their *Base Expansion System* at the factory. They will also ensure that all accessory products are certified as *VAXmate/AT* compatible before they are included in the DMI catalog.

Delivery was started on February 1987.

Another important announcement by DMI is the availability of a 20 megabyte internal hard disk unit for the DEC *PRO* series.

DMI is in *Laguna Niguel, CA*, and has manufacturing facilities in California and Taiwan. DMI products are sold worldwide via multiple distribution channels. They can be reached at (714) 955-2422 or (714) 582-3118.

Introduction to VAXmate System Administration and Customization

*A Pre-Symposium Seminar
sponsored by
the DECUS PC SIG*

This seminar is designed for the new VAXmate System Administrator or user who has responsibility for maintaining and/or customizing a VAXmate Local Area Network system environment and supporting the VAXmate user community.

The primary focus of the course will be on the management, control and customization issues which are critical to an effective and flexible system. A question and answer period will give attendees an opportunity to discuss issues specific to their situations.

Topics to be covered include:

- ✧ Defining Your Needs
- ✧ Analyzing Your Expectations
- ✧ VAXmate System Concepts
- ✧ System Administrator Duties
- ✧ Primary and Secondary Server Configurations
- ✧ VAXmate Directory, User and Resource Options
- ✧ System Resource Allocations, Management and Control
- ✧ System Data Allocation, Management and Control
- ✧ MicroVAX Server Performance Tuning
- ✧ Server Management and Control

Credentials:

Steve Telsey is an Instructor teaching VAX/VMS and office product courses for Digital's Office Applications Training group within Educational Services. He teaches courses to both employees and customers at a variety of internal and external sites. Steve is responsible for the development of end-user VAXmate system administrator and tailoring courses for Digital.

Prerequisites of Attendees:

Attendees should have a basic familiarity with VAX/VMS, networks and personal computers. System management experience within a local area network environment would be helpful but is not required.

MS-Windows Application Development on Digital PC's

*A Pre-Symposium Seminar
sponsored by
the DECUS PC Sig*

This seminar is an introduction to MS-Windows applications development on the VAXmate.

The attendee will gain an understanding of what MS-Windows is and why it should be used as an application environment. The design and coding of applications will be discussed in order to gain a familiarity with the MS-Windows Application Programming interface.

In order to meet the objectives above, the following topics will be addressed:

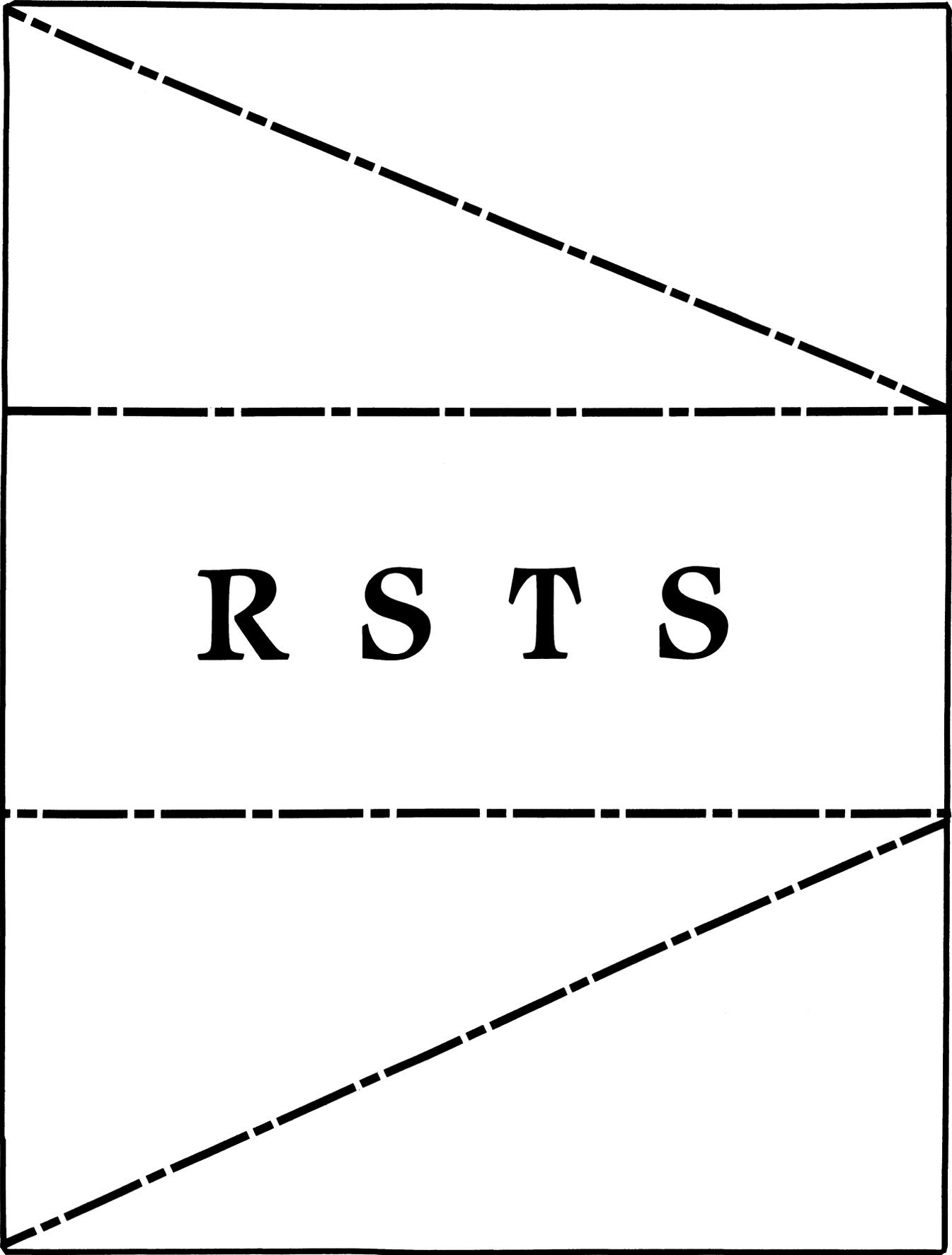
- ✧ The internals of MS-Windows that relate to applications development will be discussed. This will include the role of the device drivers, the MS-Windows kernel, the windowing manager, and the graphics device interface.
- ✧ Simple applications will be used as case studies. The goal is to introduce the structure of an MS-Windows application and the Application Programming Interface. We will also examine the steps and tools required to build and test an application.
- ✧ Extensions to the MS-Windows environment available on the VAXmate will be introduced. The goal is to expose the attendee to these extended features since they are not part of the standard Microsoft software development kit.

Credentials:

Dennis Giokas is a Principal Software Engineer in Digital's Personal Computing Systems Group. He has been working with MS-Windows since mid-1984 when he began developing a VT220 emulator using prototype versions of the product. Most recently, he was project leader of the team which ported MS-Windows to the VAXmate.

Prerequisites of Attendees:

The attendee should be familiar with personal computers, MS-DOS, and graphics systems. In addition, he or she should have a reading knowledge of the C programming language and a familiarity as a user with a windowing system.



RST

NOTE: The following is from information supplied by Ginger Landry, product manager for DECmail-11. Ginger will also be filling in as RSTS product manager for Kathy Waldron who is on maternity leave.

For the past year my employer, Stark County Board of Education, has provided a county-wide electronic mail network for the superintendents of local school districts using our data center's services. We began this service largely as the result of having the opportunity to test an early copy of DECmail-11, which we subsequently purchased.

After some early resistance and a sorting out of who (secretary or superintendent) would do the actual accessing via terminal, electronic mail has been a real success story for us. No one appears to miss the "telephone tag" that previously prevailed. Most of our superintendents have expanded service to include their principals and selected other administrators. Access to the system has been via Rainbows, IBM PCs and clones, Apples, and various DEC terminals and their imitators. Anything that can talk to RSTS appears to work well.

Persons wishing a low-risk way to introduce electronic mail in their shops are being offered a unique opportunity. Through the end of May, 1987, DECmail-11 is being offered to RSTS (and RSX) users for a 60-day free trial. The obligation is to sign an agreement to return all media and documentation after 60 days and destroy all copies. One could, of course, elect to purchase a license at the end of the trial.

Anyone interested may contact Ginger Landry at 603-881-1210 to arrange for the trial. Alternatively, one can contact the friendly local DEC rep and give them Ginger's number and ask that they arrange the free trial. Note that this is not a field test. DECmail-11 version 3 is a released product.



1986 Fall
San Francisco

DECUS

Introduction: Writing DCL Command Procedures

Paul Laba
RSTS Development

RSTS/E

October 6-10

Overview

The information in this document is subject to change without notice and should not be construed as a commitment by Digital Equipment Corporation. Digital Equipment Corporation assumes no responsibility for any errors that may appear in this document.

- o What is a DCL Command File?
- o Using DCL Command Files
- o Creating DCL Command Files
- o Executing DCL Command Files
- o Reading Program Data in a Command File
- o Entering Program Data From Your Terminal
- o Terminal Output From a COM File
- o DCL symbols
- o Assigning Values to Symbols
- o Using Symbols in a COM File
- o Passing data to a COM File
- o DCL Expressions
- o DCL Functions
- o Program Flow in a COM File
- o Handling Errors in a COM File
- o Handling CTRL/C's in a COM File
- o Reading and Writing Files in a COM File
- o (Easy) Questions and Answers

For more advanced information on DCL command procedures, attend the session:

Advanced DCL on RSTS
Wednesday, October 8
5:30 PM - 7:00 PM
Lower Level Section E

What is a DCL Command File?

- o Best thought of as a "program" that uses DCL commands as its instructions
- o DCL gets its commands from the command file instead of your terminal
- o DCL command files range from very simple (one command) to very complex (billions of commands)

Using DCL Command Files

- o Like BASIC-PLUS, COM files are very easy to get started with
- o COM files are very handy to use
- o COM files are easy to maintain and enhance
- o COM files are addictive! (billions of 1-block files infest your system)
- o Generally, you can do anything in a COM file that you could do at your terminal:
 - Execute DCL commands
 - Run programs
 - Assign logicals
 - Set terminal characteristics
 - Define DCL symbols
 - Execute other COM files
- o You can also do some things in a COM file that are not so easy to do at your terminal:
 - Selectively EDIT multiple files using wildcards
 - Maintain a log of your LOGIN/LOGOUT activities
 - Define new DCL commands, or re-define existing DCL commands

Creating DCL Command Files

- o Create them using your favorite text editor (EDT, TECO, EDIT-11, etc.)
- o Choose easy to remember file names (it's easy to lose track of the many COM files you create)
- o COM files can reside on disk or tape. If you execute a command file on tape, DCL first makes a copy of it on disk
- o Begin each line of a command file with \$ (except data lines to be read by programs or other keyboard monitors)
- o Use "full" DCL commands; don't abbreviate keywords to less than four characters
- o Use comments to document commands in your COM files
- o Use underscores (_) in front of DCL commands to prevent automatic command substitution (faster, too)
- o A very simple COM file:

```
$! EASY.COM - A simple command file
$_ Show User [1,2]      ! Display all [1,2] jobs
$_ Show Entry/Batch/All ! Display all batch entries
$_ _Exit                ! Exit
```

Executing DCL Command Files

- o Use the @ command (called "at"). Type @ followed by the name of your command file:
 - \$ @DOTHIS
 - or
 - \$ @DU2:[10,7]DO THAT
- o You can also use the SUBMIT command to execute your COM files under BATCH:
 - \$ _Submit DO THIS
 - or
 - \$ _Submit/Delete _DU1:TEMP
- o If a COM file has the "Execute" bit (64) set in its protection code, then you can also:

Executing DCL Command Files (continued)

- Run it (using the RUN command)
- Chain to it from another program
- Execute it using a CCL

Reading Program Data in a Command File

- o "Program data" are any lines NOT read by DCL (programs, other run-time systems)
- o By default, program data is expected to appear in the COM file, immediately after the command that invoked the program:

```
$ _Run TEST
3
22.3
29.7
26.5
$ _EOD
```

- o Terminate your data list with the \$ EOD command, or any command that begins with dollar (\$).
- o If the program "runs out of data" in your COM file, RSTS will cause it to exit by one of these steps (in order):
 1. Forcing up to 5 CTRL/Z's
 2. Forcing a single CTRL/C
 3. Forcing a double CTRL/C
 4. Forcing job back to DCL

Entering Program Data From Your Terminal

- o Issue SET NODATA to redirect program data input from your terminal:

Reading Program Data in a Command File (continued)

```
$ _Set NoData
$ _Edit FOO.BAR
:
:
```

- o You can use SET DATA and SET NODATA to "toggle" program data input between a COM file and your terminal:

```
$ _Set Data/End Of _Data="&"
$ _Create FOO.COM
D ---> $ _Show Users
a ---> $ _Show System
t ---> $ _Delete *.TMP
a ---> $ _Exit
&
$ _EOD
$ _Exit
```

Terminal Output From a COM File

- o You can control "what you see"
- o By default, DCL commands in your COM file are not displayed (echoed)
- o By default, data output to your terminal from DCL or other programs are displayed
- o Use SET NOECHO to execute a COM file "silently" - only warnings, errors and WRITE 0 lines are displayed
- o Use SET VERIFY to echo DCL commands as they are executed. Overridden by SET NOECHO
- o WRITE 0 "Text" command always displays text on terminal

DCL symbols

- o Symbols are the "variables" in DCL
- o Symbols can store numbers (integers) or text (strings)

DCL symbols (continued)

- o Symbols can be permanent (global) or temporary (local)
- o Use "reasonable" symbols names. Long names take up symbol tables space and slow down processing
- o You can define and manipulate symbols inside or outside a COM file
- o Whenever a COM file exits, all of its local symbols are deleted
- o Global symbols remain until you delete them or logout

Assigning Values to Symbols

- o Use "=" operator for local assignments:
\$ Count = 0
\$ Vowels = "A E I O U"
- o Use "==" or "==" for assigning text to symbols:
\$ Print == PRINT/NOLOG

Using Symbols in a COM File

- o Automatic command substitution:
\$! Define new TELL command
\$ Tell == WRITE 0
:
:
\$ Tell "Hello there"
Hello there
- o You can define abbreviations for symbols used in command substitution:
\$ Dir-ectory == DIRECTORY/DATE
\$ Pr-int == PRINT/NOFEED
- o Apostrophe substitution:

Using Symbols in a COM File (continued)

- ```
$ My_File = " SY:[1,2]NOTICE.TXT"
$ Print 'My_File'
```
- o Expressions:  
\$ Count = Count + 1  
\$ Name = First + " " + Last  
\$ Flag = Flag .and. .not. 255  
\$ Mid\_Point = (S1 + S2) / 2
  - o Use SHOW SYMBOL to display your defined global or local symbols:  
\$ \_Show Symbol PRINT  
\$ \_Show Symbol/Local/All  
\$ \_Show Symbol/All
  - o Use DELETE/SYMBOL to remove symbols you no longer need:  
\$ \_Delete/Symbol FILES  
\$ \_Delete/Symbol/Global/All

### Passing Data To a COM File

- o You can pass up to 8 parameters using the @ command:  
\$ @SHOW \*.\* 30 100 abc
- o Parameters are assigned (as strings) to the local symbols P1 to P8:  
P1 = "\*. \*" P5 = ""  
P2 = "30" P6 = ""  
P3 = "100" P7 = ""  
P4 = "ABC" P8 = ""
- o Use INQUIRE to prompt for a value and assign it to local or global symbol:

Passing Data To a COM File (continued)

```

$ _Inquire FILE "File to print"
File to print: _
or
$ _Inquire/Global END
END: _
or
$ _Inquire/Nopunctuation -
GO "Proceed? "
Proceed? _

```

- o Use OPEN and READ commands to read data directly from files and assign to local or global symbols:

```

$ _Open/Read 1 CMDS.DAT
:
:
$ _Read 1 CMD_LINE

```

DCL Expressions

- o Expressions work much like those in BASIC-PLUS
- o All arithmetic is 32-bit INTEGER
- o Division produces truncated integer
- o Strings can be up to 255 characters
- o Logical operators perform 32-bit bit-wise operation
- o Operators defined:

| Integer    | String        | Logical |
|------------|---------------|---------|
| -----      | -----         | -----   |
| + Add      | + Concatenate | .And.   |
| - Subtract |               | .Or.    |
| * Multiply |               | .Not.   |
| / Divide   |               |         |

- o "+" operator means string concatenate if both arguments are strings:

DCL Expressions (continued)

```

$ @ADD 33 67
(inside ADD.COM)
$ Write 0 P1+P2
3367

```

- o Comparison operators produce the integer values 1 (true) or 0 (false)

- o Defined comparison operators:

| Comparison                  | Integer | String |
|-----------------------------|---------|--------|
| -----                       | -----   | -----  |
| Equal                       | .EQ.    | .EQS.  |
| Not equal                   | .NE.    | .NES.  |
| Less than                   | .LT.    | .LTS.  |
| Less than<br>or equal to    | .LE.    | .LES.  |
| Greater than                | .GT.    | .GTS.  |
| Greater than<br>or equal to | .GE.    | .GES.  |

- o Order of operations:

- 1st Unary plus(+) and minus (-), logical .NOT.
- 2nd Multiply (\*) and divide (/)
- 3rd Add (+) and subtract (-), concatenate (+)
- 4th All comparison operators
- 5th Logical .AND.
- 6th Logical .OR.

- o Use parentheses to change the order of operations:

```

$ Count = 2 * (Count - 1)

```

- o DCL performs automatic "type conversion" (Integer <-> String) as required:

```

$ Value = "25"
$ Write 0 Value * 10
250
$ Value = 25
$ Write 0 F$Length(Value)
2

```

- o Converting strings to integers:

## DCL Expressions (continued)

| Strings beginning with                     | Return |
|--------------------------------------------|--------|
| Character {Y,y,T,t}                        | 1      |
| Any other character<br>(or null string "") | 0      |

## DCL Functions

- o All functions begin with "F\$"
- o Functions work much like those in BASIC-PLUS and BASIC-PLUS-2
- o Most "powerful" functions are:
  - F\$Parse
  - F\$Search
- o Use F\$Parse to:
  - Merge a file-spec with a "default" file-spec:

```
$ File = F$Parse(File, ".LST")
$! Default type .LST
```
  - Return any part of a file-spec:

```
$ PPN = F$Parse(File, "PPN")
$! Get file's PPN
```
  - Return "status" information about a file-spec:

```
$ Dev_Handler_Index = -
$ F$Parse(File, "STATUS") .and. 255
$! Get device handler
```
  - Return "flags" information about a file-spec:

```
$ PPN_Found = -
$ F$Parse(File, "FLAGS") .and. 128
$! Check if any PPN field
```

## DCL Functions (continued)

- Check if file-spec is valid:

```
$ _If F$Parse(File, "FLAGS") .EQ. -1 -
$ Then _Goto BAD_FILE
$! Returns -1 if invalid
```
- o Use F\$Search to:
  - Check if a file exists:

```
$ _If F$Search(File) .EQS. "" -
$ Then _Goto NO_FILE
$! Returns "" if not found
```
  - Process all files that match a file-spec:

```
$ File = F$Search("*.BAK")
$! Get 1st .BAK file

$LOOP:
$ _If File .EQS. "" Then Exit
$! Exit if no more
$
$
$ File = F$Search()
$! Get next .BAK file
$ _Goto LOOP ! Loop again
```

## Program Flow in a COM File

- o Use GOTO to branch (forward or backward) to a DCL label
- o Labels are like symbols, but can begin with a digit:

```
$LOOP:
$10:
```
- o Labels must begin with "\$" and end with ":"
- o Labels can be on same line as command, but best to use separate line
- o DCL reports error and stops processing if label not found
- o IF - THEN command works similar to BASIC-PLUS (but not identical):

## Program Flow in a COM File (continued)

- "IF" expression is evaluated by examining ONLY low-order bit
- If low bit is on (odd value), then result is TRUE
- If low bit is off (even value), then result is FALSE
- o Different from BASIC-PLUS, where any non-zero result is TRUE
- o Use ".ne. 0" to test expressions in DCL:
  - In BASIC-PLUS:  
If (Expression) then ...
  - In DCL:  
If (Expression) .ne. 0 then ...
- o You can execute other COM files from within a COM file ("nested" COM files)
- o You can nest COM files up to a maximum of 13 levels deep
- o Nesting uses DCL I/O channels
- o OPEN command and F\$SEARCH function also use DCL I/O channels
- o Use EXIT command to end a COM file normally
- o If EXIT from a nested COM file, processing continues in outer level COM file
- o You can include an "exit status" value with an EXIT command
- o Use STOP command to terminate a COM file
- o If STOP from a nested COM file, control returns to interactive level (not outer level COM file)

## Handling Errors in a COM File

- o Supports three levels of error severity:
  - WARNING (%Message)
  - ERROR (?Message)
  - SEVERE\_ERROR (??Message)
- o Reserved symbol \$SEVERITY contains most recent status:
  - 0 Warning
  - 1 Success
  - 2 Error
  - 4 Severe Error
- o Use ON (severity level) THEN command to define action to take when error at or above severity level occurs:
  - \$ \_On Warning -  
Then \_Goto CHECK
  - \$ \_On Severe\_Error -  
Then \_Stop
- o Use SET NOON and SET ON commands to disable, re-enable DCL error checking:
  - \$ \_Set NoOn ! Don't check errors
  - \$ \_Edit 'File' ! Edit file
  - \$ \_Set On ! Check errors again
- o \$SEVERITY value updated, even with SET NOON in effect
- o DCL only acts on errors when control returns to DCL
- o Exit status is passed to outer-level COM file, which can also process the error
- o Default is:
  - \$ \_On Error Then \_Exit
  - \$ \_Set On

## Handling CTRL/C's in a COM File

- o Use ON CONTROL C THEN command to define action when DCL detects a CTRL/C:

## Handling CTRL/C's in a COM File (continued)

- ```
    $ _On Control_C -
      Then _Goto INTERRUPT
```
- o Use SET NOCONTROL=C and SET CONTROL=C commands to disable and re-enable DCL CTRL/C checking:

```
    $ _Set NoControl=C ! Don't check CTRL/C's
    $ _Edit 'File'     ! Edit file
    $ _Set Control=C  ! Check CTRL/C's
```
 - o DCL only acts on CTRL/C's when control returns to DCL
 - o If ON CONTROL_C THEN EXIT action taken, CTRL/C status is passed to outer-level COM file
 - o Default is:

```
    $ _On Control_C Then _Exit
    $ _Set Control=C
```

Reading and Writing Files in a COM File

- o Use OPEN command to open or create a text file for processing:

```
    $ _Open/Read 1 TEXT.DOC
    $             ! Open file to read
    $             ! on channel 1

    $ _Open/Write Chnl FILES.TXT
    $             ! Open file to write
    $             ! on channel 'Chnl'
```
- o You can open up to 13 files at the same time
- o Each OPEN requires one DCL I/O channel
- o Nesting and F\$SEARCH function also use DCL I/O channels
- o DCL returns an error if you try to open a file on a channel already open
- o Use CLOSE command to close an open channel or all open channels:

Reading and Writing Files in a COM File (continued)

- ```
 $ _Close 1
 $ _Close Chnl+2
 $ _Close/All
```
- o No error if you close a channel not open
  - o Use READ command to read next file record into local or global string:

```
 $ _Read 1 Record
 $ _Read/Global 1 File_Spec
```
  - o Use /END\_OF\_FILE with READ to define label to branch to when EOF detected:

```
 $ _Read/End Of File=END -
 Chnl Record
 :
 $END:
 $ _Close Chnl
```
  - o Use WRITE command to write list of data to open file:

```
 $ _Write 1 "User ",F$User, -
 " logged out on ", -
 F$Time
```
  - o Use /NODELIMITER to disable automatic <CR><LF> at end of WRITE:

```
 $ _Write/NoDelimiter 1 "User "
 $ _Write/NoDelimiter 1 F$User
 $ _Write/NoDelimiter 1 " logged off on "
 $ _Write 1 F$Time
```
  - o WRITE 0 is a special form of WRITE command that outputs to your terminal:

```
 $ _Write 0 "Starting BACKUP ..."
```
  - o WRITE 0 output is not affected by SET NOECHO or SET NOVERIFY commands



1986 Fall  
San Francisco

# DECUS

## **Advanced: Writing DCL Command Procedures**

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RSTS/E

October 6-10

## SYSDO.COM

- o SYSDO.COM is a BATCH command file which runs every day at 2:00 am
- o Performs once-a-day, once-a-week and once-a-month tasks for all users
- o SUBMITs to BATCH (queue BA1:) any DAILY.COM found on system disk
- o On Sunday, also SUBMITs any WEEKLY.COM found on system disk
- o On first day of month, also SUBMITs any MONTHLY.COM found on system disk
- o Automatically Re-SUBMITs itself for next day (/AFTER=TOMORROW:2:00AM)
- o Passes following parameters to users' DAILY, WEEKLY and MONTHLY COM files:
  - P1 = Year index (e.g. 85)
  - P2 = Month index (1-12)
  - P3 = Day index (1-31)
  - P4 = Day name (e.g., "FRIDAY")
- o Illustrates:
  - Calling local "Subroutines"
  - Using "recursive" COM files
  - Passing parameters to nested COM files

## SYSDO.COM

```
$ Verify = F$Verify(0)
$
$! SYSDO.COM - Perform daily, weekly and monthly tasks
$!
$! This command file runs under batch and performs
$! once-a-day, once-a-week, and once-a-month tasks on
$! behalf of system users.
$!
$! Each day at 2:00 am (or thereabouts), SYSDO submits
$! to batch (queue BA1:) the command file DAILY.COM
$! found in all users' accounts on the system disk.
$!
$! If the current day is Sunday, then SYSDO also
$! SUBMITs all users' WEEKLY.COM command files.
$!
$! On the first day of the month, SYSDO also SUBMITs
$! all users' MONTHLY.COM command files.
$!
$! SYSDO passes the following parameters to all daily,
$! weekly or monthly command files it submits:
$!
$! P1 Year index (e.g. 85)
$! P2 Month index (1-12)
$! P3 Day index (1-31)
$! P4 Day name (e.g., "FRIDAY")
$!
$! To have SYSDO submit itself, use the command:
$!
$! $ @[0,1]SYSDO SUBMIT
$!
$! SYSDO always re-SUBMITs itself to run the next day
$! (TOMORROW) after 2:00 am.
$!
$
```

```

$ _On Error then _Goto END
$
$! Ensure running under batch for the rest
$ _If F$Access() .nes. "BATCH" then -
 _If P1 .eqs. "" then -
 _Write 0 "?SYSDO must run under BATCH"
$
$! Ensure job has WACNT and WREAD privileges
$ _If .not. F$Privilege("WACNT") then -
 _Write 0 "?WACNT privilege required"
$ _If .not. F$Privilege("WREAD") then -
 _Write 0 "?WREAD privilege required"
$
$! Resubmit batch job for next day at 2:00 am
$ _Set NoOn
$ _Set Entry BA1:[1,2]SYSDO -
 /Release
 /After=Tomorrow:2:00am
$ Severity = $Severity
$ _Set On
$ _If .not. Severity then -
 _Submit _SY:[0,1]SYSDO.COM -
 /Queue=BA1: -
 /Owner=[1,2] -
 /After=Tomorrow:2:00am -
 /Log_Queue -
 /Log_Delete
!
!
$! Exit now if that's all were supposed to do
$ _If P1 .eqs. "SUBMIT" then -
 _Goto END
$
$! Get current year/month/day values
$ Date_Time = F$Cvtime()
$ Yr = +F$Left(Date_Time,2)
$ Mon = +F$Mid(Date_Time,4,2)
$ Day = +F$Mid(Date_Time,7,2)
$
$! Call DATE.COM to get day of week name
$! (Name returned in global symbol "Today")
$ @[0,1]DATE.COM "'Date_Time'" "Today"
$
$! Perform daily processing
$ Com_File = F$Search("_SY:[*,*]DAILY.COM")
$ Return = "WEEKLY"
$ _Goto SUBMIT
$

```

```

$! Perform weekly processing on Sunday
$WEEKLY:
$ _If Today .nes. "SUNDAY" then -
 _Goto MONTHLY
$ Com_File = F$Search("_SY:[*,*]WEEKLY.COM")
$ Return = "MONTHLY"
$ _Goto SUBMIT
$
$! Perform monthly processing on first day of month
$MONTHLY:
$ _If Day .ne. 1 then -
 _Goto END
$ Com_File = F$Search("_SY:[*,*]MONTHLY.COM")
$ Return = "END"
$ _Goto SUBMIT
$
$END:
$ Verify = F$Verify(Verify)
$ _Exit
$
$! Subroutine to SUBMIT users' COM files
$SUBMIT:
$ _If Com_File .eqs. "" then -
 _Goto 'Return'
$ Ppn = F$Parse(Com_file,,"PPN")
$ _Set NoOn
$ _Submit 'Com File' -
 /Param=("Yr","Mon","Day","Today") -
 /Queue=BA1: -
 /Owner='Ppn' -
 /Time_Limit=120
$ _Set On
$ Com_File = F$Search()
$ _Goto SUBMIT

```

## DATE.COM

- o DATE.COM accepts standard DCL date string and displays "pretty" date:

```
$ @DATE TODAY
Monday, September 22nd, 1986
```

```
$ @DATE -3DAYS
Friday, September 19th, 1986
```

```
$ @DATE 01-JAN-87
Thursday, January 1st, 1987
```

- o Optional P2 argument is name of global symbol to save day-of-week name

- o Invoked by SYSDO.COM

- o Illustrates:

- Defining and using arrays
- Using "variable" symbol names
- Executing complex expressions
- Defining and using "string" arrays
- Using SET NOECHO to suppress output
- Using \$SEVERITY to check for errors

```
$! DATE.COM - Display Date in "Pretty" Format
```

```
$! Parameters:
```

```
$! P1 = Date string (in F$Cvtime format)
$! P2 = Global symbol to assign day name
$! (if null, display date only)
```

```
$! DATE.COM displays date passed in format:
```

```
$! Monday, September 22, 1986
```

```
$! If P2 not null, then also assigns name of
$! day (in uppercase) to global symbol P2
```

```
$
```

## DATE.COM

```
$! Build array of total days before each month
```

```
$ Mon_Days_1 = 0
$ Mon_Days_2 = 31
$$ Mon_Days_3 = 59
$ Mon_Days_4 = 90
$ Mon_Days_5 = 120
$ Mon_Days_6 = 151
$ Mon_Days_7 = 181
$$ Mon_Days_8 = 212
$ Mon_Days_9 = 243
$ Mon_Days_10 = 273
$ Mon_Days_11 = 304
$ Mon_Days_12 = 334
```

```
$$! Build array of month names
```

```
$ Month_1 = "January"
$ Month_2 = "February"
$ Month_3 = "March"
$ Month_4 = "April"
$ Month_5 = "May"
$$ Month_6 = "June"
$ Month_7 = "July"
$ Month_8 = "August"
$ Month_9 = "September"
$ Month_10 = "October"
$ Month_11 = "November"
$ Month_12 = "December"
```

```
$$! Build array of day names
```

```
$ Day_0 = "Sunday"
$ Day_1 = "Monday"
$ Day_2 = "Tuesday"
$$ Day_3 = "Wednesday"
$ Day_4 = "Thursday"
$ Day_5 = "Friday"
$ Day_6 = "Saturday"
```

```
$! Build date string using F$Cvtime
```

```
$ _Set NoOn
$ _Set NoEcho/NoWarning
$ Date_Time = F$Cvtime("''P1'")
$ Error_ = .not. $Severity
$ _Set Echo
$ _Set On
$ _If Error then -
$ _Write 0 "?'P1' is not a valid date"
```

```
$! Save year, month and day values
```

```
$ Yr = +F$Left(Date_Time,2)
$ Mon = +F$Mid(Date_Time,4,2)
$ Day = +F$Mid(Date_Time,7,2)
```

```
$
```

## DATE.COM

```

$! Compute day index in year
$ Day_of_Yr = Day + Mon_Days_'Mon'
$ Leap_Yr = (Yr .and. 3) .eq. 0
$ _If Leap_Yr then -
 _If Mon .gt. 2 then -
 Day_of_Yr = Day_of_Yr + 1
$
$! Compute no. years since 1970
$ Yrs_Aft_70 = Yr - 70
$
$! Compute no. leap years since 1970
$ Leap_Yrs_Aft_70 = (Yrs_Aft_70 + 2) / 4 - Leap_Yr
$
$! Compute no. days since 1970
$ Days_Aft_70 = 365 * (Yrs_Aft_70) -
 + Leap_Yrs_Aft_70 + Day_of_Yr
$
$! Compute day index in week (0=Sunday,...)
$ Day_of_Week = Days_Aft_70 + 3 -
 - (7 * ((Days_Aft_70 + 3) / 7))
$
$! Build day ordinal string (1st, 2nd, ...)
$ Ord = +F$Right(10+Day,2)
$ _If (Ord .lt. 1) .or. (Ord .gt. 4) then -
 Ord = 4
$ Ord = "'Day'" + F$Mid("stndrdth",2*Ord-1,2)
$
$! Display date (e.g., Monday, July 2nd, 1986)
$ _Write 0 Day_'Day_of_Week',",",",",_
 Month_'MOn'," ",Ord,",",",",1900+Yr
$
$! Save U/C name-of-day if any global symbol P2
$ _If P2 .nes. "" then -
 'P2' == F$Edit(Day_'Day_of_Week',32)
$
$ _Exit

```

## DAILY.COM

- o DAILY.COM is executed by SYSDO system BATCH job
- o Invokes CLEAN.COM to delete old "junk" in user's directory
- o Invokes ORDER.COM to place most often used files at front of user's directory

```

$! DAILY.COM - Perform daily chores under SYSDO
$!
$! P1 = Year ("86")
$! P2 = Month ("9")
$! P3 = Day ("22")
$! P4 = Day of week ("Monday")
$!
$ _set noon
$
$! Clean up old junk
$ @gmb$com:clean 'P4'
$
$! Reorder the important files
$ @gmb$com:order
$
$! Wake up the LN01
$ _submit gmb$com:lnwake /after=8:00am
$
$ _exit 1

```

## CLEAN.COM

- o CLEAN.COM purges user's mail folder every Sunday
- o Deletes all "junk" files that are more than two days old
- o Keeps slightly more important files around for seven days

```
#!/ CLEAN.COM - Clean up old files
$!
$! P1 = Day of week ("MONDAY")
$
$! Purge the mailbox every Sunday
$_If P1 .eqs. "SUNDAY" then -
 _mail purge
$
$! Define handy command
$ Delete_Old_Files := -
 Delete/nowarnings/created/before =
$
$ Delete_Old_Files -2Days [,]*.BAK, -
 [,]*.JOU, -
 [,]*.TMP
$ Delete_Old_Files -2Days [,]*.FOO, -
 [,]*.BAR, -
 [,1]*.LOG
$
$ Delete_Old_Files -2Days x:[,]*.BAK, -
 x:[,]*.JOU, -
 x:[,]*.TMP
$ Delete_Old_Files -2Days x:[,]*.FOO -
 x:[,]*.BAR, -
 x:[,]*.LOG
$
$ Delete_Old_Files -7Days []*.SRH, -
 []*.OBJ
$
$_Exit
```

## ORDER.COM

- o ORDER.COM moves files that need to be accessed quickly to front of user's directory

```
#!/ ORDER.COM - Order Important Files
$
$! Define a handy command
$ First := Pip []/mo:1600./lo =
$
$! Now move files to front of directory
$ First NETWORK.COM
$ First DIALUP.COM
$ First BATCH.COM
$ First MAILCK.BAC
$ First SYMBOL.COM
$ First LOGICAL.COM
$ First LOCAL.COM
$ First LOGIN.COM
$ First MAIL.INI
$ First EDTINI.EDT
$
$_Exit
```

## BIGACC.COM

- o BIGACC.COM displays accounts using n or more blocks
- o Useful tool for monitoring disk space use
- o Analyzes SHOW ACCOUNT output to select accounts for display
- o Provides totals for accounts displayed
- o Illustrates:
  - Opening and reading a text file
  - How to create a temporary text file, using your job number
  - Computing totals and sub-totals in a loop
  - Right justifying a text line

```

$! BIGACC.COM - Display P1 accounts using P2 or
$! more blocks
$!
$! Parameters:
$!
$! P1 = Account-spec to select
$! (default = _SY:[*,*])
$! P2 = Minimum blocks to select
$! (default = 1)
$!
$! BIGACC.COM produces a listing of all accounts
$! matching the P1 account-spec with P2 or more
$! blocks allocated.
$!
$! This COM file is dependent on the format of the
$! SHOW ACCOUNT command. It expects that account
$! lines are listed with "[" in the first column,
$! and each account's allocation value is located
$! starting at position 25, length 10.
$!

```

## BIGACC.COM

```

$$
$ _On Control_C then _Goto EXIT
$ _On warning then _Goto EXIT
$
$! Define constants
$ Alloc_Pos = 25
$ Alloc_Len = 10
$ Alloc_End = Alloc_Pos + Alloc_Len - 1
$ Indent = " "
$
$! Set up defaults for parameters
$ P1 = F$Parse(P1,"_SY:[*,*]")
$ P2 = +P2
$ _If P2 .le. 0 then -
$ P2 = 1
$
$! Build temp file-spec (TEMPnn.TMP)
$ Temp_File = "TEMP" _
$ + F$Right(100+F$Job,2) -
$ + ".TMP"
$
$! Tell user to wait (this could take a while)
$ _Write 0 "Creating data file ..."
$
$! Build SHOW ACCOUNT listing file
$ _Show account/brief/output='Temp_File' 'P1'
$
$! Initialize counters
$ Total_Blocks = 0
$ Total_Accts = 0
$
$! Open SHOW ACCOUNT output file
$ _Close 1
$ _Open/read 1 'Temp_File'
$
$! Read lines from SHOW ACCOUNT file
$$READ:
$ _Read/end of file=END 1 Rec
$ _If F$Left(Rec,1) .nes. "[" then -
$ _Goto READ
$ Size = +F$Mid(Rec,Alloc_Pos,Alloc_Len)
$ _If Size .lt. P2 then -
$ _Goto READ
$ Total_Blocks = Total_Blocks + Size
$ _If Total_Accts .gt. 0 then -
$ _Goto CONT
$ _Write 0 ""
$ _Write 0 "Accounts ",P1," using ", -
$ P2," or more blocks:"
$ _Write 0 ""
$

```

## BIGACC.COM

```

$CONT:
$ Write 0 indent,F$Left(Rec,Alloc_End)
$ Total_Accts = Total_Accts + 1
$ _Goto READ
$
$END:
$ _If Total_Accts .eqs. 0 then -
 _Write 0 "%No ",P1," accounts using " -
 ,P2," blocks or more"
$
$ Write 0 ""
$ Text = "Total 'Total_Accts' account"
$ _If Total_Accts .ne. 1 then -
 Text = Text + "s"
$ Spaces = Alloc_End - F$Len(F$string(Total_Blocks))
$ Text = F$Left(Text + " ",Spaces)
$ _Write 0 Indent,Text,Total_Blocks
$
$EXIT:
$! Close/delete temporary SHOW ACCOUNT data file
$ _Close 1
$ _Delete/nowarn/nolog 'Temp_File'
$
$ _Exit

```

## DIFF.COM

- o DIFF.COM is a "front-end" to the DCL DIFFERENCES command
- o Applies "File 1" defaults to "File 2"
- o If no "File 2" parameter, then DIFF uses .BAK file
- o Outputs differences to terminal or optional .DIF file
- o Used in conjunction with re-defined DIFFERENCES command:

```
$ DIF-FERENCES = "@DIFF"
```

- o Illustrates:

- How to use F\$PARSE function to build file-specs
- How you can "re-define" an existing DCL command
- Simple loop for processing P1 - P8 parameters

```

$! DIFF.COM - Execute DIFFERENCES command
$!
$! Arguments passed:
$!
$! P1 = File 1 (prompt if null)
$! P2 = File 2 (P1 + ".BAK" if null)
$! P3 = Output file ("KB:.DIF" if null)
$!
$! DIFF.COM makes the standard DIFFERENCES command
$! easier to use, as it applies defaults from the
$! "File 1" parameter to the "File 2" parameter.
$! If no "File 2" parameter is passed, then DIFF
$! uses assumes a .BAK file.
$!
$! For writing the DIFFERENCES report to a file,
$! specify a file-spec as P3.

```

## DIFF.COM

```

$
$! Build defaults for arguments
$ _If P1 .eqs. "" then -
 _Inquire P1 "File 1"
$ _If P2 .eqs. "" then -
 P2 = ".BAK"
$ _If P3 .eqs. "" then -
 P3 = "_KB:.DIF"
$
$! Ensure P1 - P3 files are valid
$ X = 1
$LOOP 1:
$ _If F$Parse(P'X',,"FLAGS") .eq. -1 then -
 _Write 0 "?File name ",P'X'," is invalid"
$ X = X + 1
$ _If X .le. 3 then -
 _Goto LOOP_1
$
$! Add "." to "File 1" if no file type given
$ P1 = F$Parse(P1, ".")
$
$! Build "File 2" spec using "File 1" defaults
$ P2 = F$Parse(P2,P1)
$
$! Build "Output file" using "File 1" defaults
$ P3 = F$Parse(P3,P1)
$
$! Ensure P1, P2 files exist
$ X = 1
$LOOP 2:
$ _If F$search(P'X') .eqs. "" then -
 _Write 0 "?File ",P'X'," does not exist"
$ X = X + 1
$ _If X .le. 2 then -
 _Goto LOOP_2
$
$! Execute real DIFFERENCES command
$ _Differences/output='P3' 'P1' 'P2'
$
$ _Exit

```

## TRMTYP.COM

- o TRMTYP.COM determines your terminal type, and assigns it to the global symbol TT\_Type
- o Since there is no DCL function to do this, TRMTYP.COM "calls" a program to return the type code
- o Useful for COM files that might want to take different actions based on type of terminal
- o Illustrates:

- How a COM file and program can "cooperate" as a single utility
- How a program can pass data back to a COM file
- Defining and using string "arrays"
- How to check if a symbol exists

```

$! TRMTYP.COM - Determine user's terminal (KB) type
$!
$! Parameters: None
$!
$! Returns: TTY_Type == "terminal type keyword"
$!
$! This COM file runs the TRMTYP program, which returns
$! (in the local symbol TRMTYP_Val) the user's terminal
$! type code as an integer.
$!
$! TRMTYP.COM then uses the terminal type code to fetch
$! the user's terminal type keyword from an array, and
$! save it in the global symbol TTY_Type.
$
$! Define cooperating TRMTYP task file-spec
$ TRMTYP_Task = "_SY:[]TRMTYP.BAC"
$
$! Make sure TRMTYP program exists
$ _If f$search(TRMTYP_Task) .eqs. "" then -
 _Write 0 "?Program 'TRMTYP_Task' does not exist"
$

```

TRMTYP.COM

TRMTYP.BAS

```

$! Define terminal type keywords array
$! (older terminal types not included)
$ Type_1 = "UNKNOWN"
$ Type_2 = "LA36"
$ Type_3 = "VT52"
$ Type_4 = "VT55"
$ Type_5 = "LA180S"
$ Type_6 = "VT100"
$ Type_7 = "LA120"
$ Type_8 = "LA12"
$ Type_9 = "LA100"
$ Type_10 = "LA34"
$ Type_11 = "LA38"
$ Type_12 = "LA50"
$ Type_13 = "VT101"
$ Type_14 = "VT102"
$ Type_15 = "VT125"
$ Type_16 = "VT131"
$ Type_17 = "VT132"
$ Type_18 = "VT220"
$ Type_19 = "VT240"
$ Type_20 = "VT241"
$ Type_21 = "VT105"
$
$! Run TRMTYP program to get type code
$! (returned in symbol TRMTYP_Val)
$ _Run 'TRMTYP_Task'
$
$! See if symbol TRMTYP_Val defined
$ _If F$Type(TRMTYP_Val) .eqs. "" then -
 TRMTYP_Val = I
$
$! Use "Unknown" for values not defined in array
$ _If F$Type(Type_'TRMTYP_Val') .eqs. "" then -
 TRMTYP_Val = 1
$
$! Save type keyword in global symbol TTY_Type
$ TTY_Type == Type_'TRMTYP_Val'
$
$! Display what terminal type we're on
$ _Write 0 "Your terminal's type is ",TTY_Type
$
$ _exit

```

o TRMTYP.BAS gets the user's terminal type code and returns it in the DCL (local) symbol TRMTYP\_Val

```

100 ! T R M T Y P . B A S &
! ! &
! ! &
! This program is run by the DCL command file &
! TRMTYP.COM. When run, TRMTYP issues the SET TERM &
! Part II directive to get the user's terminal type &
! and return it to the COM file by exiting with the &
! CCL: &
! ! &
! ! $ TRMTYP_Val = <type value> &
200 ! D i m e n s i o n S t a t e m e n t s &
! ! &
! ! &
Dim Firqb%(30) &
! Array used for SYS call &
1000 ! M a i n R o u t i n e &
! ! &
! ! &
Symbol$ = "TRMTYP_Val" &
! Define DCL symbol name &
! ! &
\ Firqb%(Idx%) = 0% &
\ For Idx% = 1% to 30% &
\ Firqb%(0%) = 30% &
\ Firqb%(1%) = 6% &
\ Firqb%(2%) = 16% &
\ Firqb%(3%) = 1% &
\ Firqb%(4%) = 255% &
! Set up for SET TERM Part II Sys call &
! (Terminal type returned in position 5) &
! ! &
\ Change Firqb% to Junk$ &
\ Change Sys(Junk$) to Firqb% &
\ Term.Type$ = Num1$(Firqb%(5%)) &
! Convert array to string &
! Do Sys call &
! Save terminal type as string &

```

TRMTYP.BAS

```

2000 Exit.Cmd$ = "$ " + Symbol$ +
 " = " + Term.Type$
 ! Build Exit command
\
!
Junk$ = Sys(Chr$(14%)) + Exit.Cmd$
\
Stop
 ! Exit and execute command
 ! Stop (good for nothing)

19000 ! Error Handler
 !
 !
 Term.Type$ = ""
\
Resume 2000
 ! Unexpected error
 ! Return type as null string
 ! Resume to exit

32767 End

```

TIMER.COM

```

o TIMER.COM accepts a standard DCL command and executes it
 every "n" seconds:
 $ @TIMER 10 "$ SHOW JOB 3"

o Illustrates:
 - How INQUIRE can be used to insert delays between
 commands (poor man's " SLEEP command)
 - How you can define a simple (crude?) system
 monitoring tool

```

```

$! TIMER.COM - Execute P2 command every P1 secs
$!
$! Arguments passed:
$!
$! P1 = No. seconds delay between commands
$! P2 = Command to execute repeatedly
$!
$! TIMER.COM allows you to repeat a specified
$! command (P2) every P1 seconds. If P1 is
$! zero, then no delay is inserted between
$! iterations of the command. If P1 is negative
$! or an invalid number, then an error is
$! displayed and the COM file exits.
$!
$! Errors returned by the command are ignored.
$! Type CTRL/C to terminate the loop.
$
$! Prompt if no delay specified
$ _If P1 .eqs. "" then -
 _ Inquire P1 "Delay <0>"
$ _If P1 .eqs. "" then -
 _ P1 = "0"
$
$! Ensure delay (P1) is valid
$ Delay = +P1
$ If P1 .nes. "'Delay'" then -
 _ Write 0 "?Delay is not a valid number"
$ _If Delay .lt. 0 then -
 _ _Write 0 "?Delay cannot be negative"
$

```

## TIMER.COM

```

$! Prompt if no command (P2) specified
$ _If P2 .eqs. "" then -
 _Inquire P2 "Command <Exit>"
$ _If P2 .eqs. "" then -
 _Exit
$
$! Ignore errors
$ _Set NoOn
$
$! Loop on the command
$LOOP:
$ _Write 0 ""
$ _Write 0 "-----", -
 F$Time(), -
 "-----"
$ _Write 0 ""
$ P2'
$ _If Delay .gt. 0 then -
 _Inquire/nopunc/time='Delay' Junk ""
$ _Goto LOOP

```

## SEARCH.COM

- o SEARCH.COM runs SEARCH.TEC utility, which searches files for text strings
- o Keeps you logged in if SEARCH.TEC detaches
- o Lowers your priority if you have TUNE privilege
- o Illustrates:
  - Running detached jobs in a command procedure
  - Using F\$PRIVILEGE function

```

$! SEARCH.COM - Front-end to SEARCH TECO Command
$
$! Any data comes from the terminal
$ _Set NoData
$
$! Exit on any errors or CTRL/C
$ _On error then Goto EXIT
$ _On Control_C then _Goto EXIT
$
$! Lower job's priority if able
$ _If F$Priv("TUNE") then -
 _Set Job/priority=-16
$
$! Run it
$ _Run %SEARCH.TEC
$
$EXIT:
$
$! Restore priority if able
$ _If F$Priv("TUNE") then -
 _Set Job/priority=-8
$
$ _Exit

```

## SUBCMD.COM

- o SUBCMD.COM creates a temporary command file and SUBMITs it to BATCH
- o Saves you the trouble of creating small, "throw-away" command files
- o Allows mutiple commands separated by backslashes
- o Mails (via DECmail-11) BATCH log to you
- o "Cleans up" after itself
- o Illustrates:
  - Command line parsing
  - How to create command files "on the fly"
  - Sending messages via DECmail-11 in a command procedure

```

$! SUBCMD.COM - Submit command(s) to BATCH
$
$! Example: @SUBCMD MAIL PURGE
$
$ _On Control_C then _Goto ERROR
$ _On error then _Goto ERROR
$
$! Find a name for the temporary command file
$ Temp = -1
$FIND:
$ Temp = Temp + 1
$ File = F$Search("TEMP''Temp'.COM")
$ _if File .nes. "" then -
 _Goto FIND
$
$! Open the temp file
$ _Open/write 1 TEMP'Temp'.COM
$ _Write 1 "$ _Set NoOn"
$
$! Parse the command line
$ Command = "'p1' 'p2' 'p3' 'p4' " -
 + "'p5' 'p6' 'p7' 'p8'"
$ Command = F$edit(Command,8+16+128+256)
$!Trim the command
$

```

## SUBCMD.COM

```

$! Find next line separator (\)
$WRITE:
$ Pos = F$Instr(1, Command, "\")
$ _if Pos .eq. 0 then -
 Pos = F$Len(Command) + 1
$
$! Write command to temp file & terminal
$ Cmd = F$Left(Command,Pos-1)
$ _Write 1 Cmd
$ _write 0 Cmd
$
$! Get remainder of line
$ Command = F$Right(Command,Pos+1)
$
$! If more, do next line
$ _if Command .nes. "" then -
 _Goto WRITE
$
$! Write commands to mail log back to me
$ _Write 1 "$ _Close/log"
$ _Write 1 "$ _Mail send/noquery/nofile " -
 + "TEMP''Temp'.LOG to Barton"
$ _Write 1 "$ _Delete TEMP''Temp'.LOG"
$ _Write 1 "$ _Exit"
$
$! Close the temp file & submit it to batch
$ _Close 1
$ _Submit/delete TEMP'Temp'.COM
$
$ _Exit
$
$ERROR:
$ _Close 1
$ _Delete/nolog/nowarn TEMP'Temp'.COM
$ _Exit

```

**RSX**

**MULTI-TASKER**



**RSX**

## **FOOD FOR THOUGHT**

"In this galaxy, there's a mathematical probability of three million Earth-type planets. And in all of the universe, three million, million galaxies like this. But in all of that, and perhaps more, only one of each of us."

The RSX Multi-Tasker  
March, 1987

*"Uchronia"*

Fine Realtime Commentary Since 1975

- Dr. Leonard McCoy  
*Star Trek, "Balance of Terror"*

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## **THE EDITOR'S CORNER**

Bruce R. Mitchell

Well, lazengermum, here's fair warning before we jump off into this month's issue. This editorial is longer than usual - the editor's crank was recently turned relative to one of his pet peeves. However, like icky medicine, if you swallow it all I promise a worthwhile and educational experience. It's good for what ails 'ya.

As we go to press, in late January, the DECUS Board should be inundated with responses from their user survey concerning the new DEC software licensing policy. Myself, I was unhappy that the survey cards didn't have multiple choice boxes. I would have suggested boxes labeled "Egregious", "We're DEC and You're Not", and "Robber Baron Tactics" for starters.

There are interesting rumors floating about the SIG. One concerns a senior SIG wizard who is reputed to have implemented ODS-2 under RSX-11M-Plus. That's the VAX/VMS file system, for all us RSX diehards. This is reported to have been accomplished by stealth, deceit, trickery, chicanery, double-dealing - wups, wrong project. It is reported to have been done through divine

intervention, the consumption of two cases of brew, and a bet with Brian McCarthy. The stakes of the bet remain unknown at this time.

It is also rumored that M-Plus Version 4.0 is in field test. Changes in the operating system, and new features thereof, remain a mystery. Nobody's talking. There are dark whisperings of new caching algorithms and new device support, though. As news trickles in, we'll keep you up to date.

On to the contents. In this issue, we have SPRs again. My goodness, do they never end? (I guess not, judging from comments the Editor has heard about Update C of M-Plus.) We have an article on how to change CLI prompts by subtle trickery and sleight-of-hand; this falls into the category of minor wizardry. And, of course, there is the continuing saga of "The Notebooks of Justin L. Hewser". Prolific writer, that boy.

The editor often sighs, and wishes in his heart of hearts that people would write him. Or send articles. Or argue with him about his editorials. It's been a slow month for submissions. I know for a fact that there are programmers who are not on vacation in Florida. If the readership would only smite the keys of their terminals to write articles, they would be much warmer.

Now it's time for me to stick in my two cents worth. Yer gettin' a bargain here, folks, it's three cents worth this month at no extra charge. Flame on!

----- Craftsmanship -----

From time to time, I hear purportedly intelligent and experienced computer professionals make remarkable comments on various topics. Sometimes the unexpected magnificence of those comments makes me cringe and want to hide.

Most of us have experienced this situation many times. I gladly wager, however, that there are few matches for these classic, untarnished gems of "wisdom" heard recently. The topic is program documentation.

- o "Documentation takes so long to write, you might as well spend the time doing something useful."  
(Implication: Documentation isn't useful.)
- o "It's much better to improve interpersonal communication by asking the person who wrote it how it works."  
(Implication: Nobody is ever allowed to quit.)
- o "Six months after I've written documentation, I don't

understand it, so why write it?"

(Implication: Speaker can't write competently.)

- o "You rarely need to use it anyway, so it's normally wasted time. It's an acceptable risk not to document your programs."  
(Implication: Speaker knows nothing about game theory.)
- o "It takes too long to do it, and I just don't want to do it, so I won't."  
(Implication: Daddy can't make me do it. Nyaaaah!)

Grrrrrrrr!

A perceptive observer would have noted my face flush, primary evidence of rising blood pressure. A careful listener would have noted the subdued gnashing of teeth on my side of the table. (And people wonder why I'm so terribly fond of milk of magnesia and aspirin!)

The Editor believes in documentation. It has saved his butt more than once. Documentation is a Good Thing, and good documentation should be revered and respected. My opinion is that programmers who do not document are, at best, marginally tolerable subhumans who have learned to bathe, wear clothes, and not make messes in the house.

But please don't take my unsupported word as final. Compare the "interesting" (growl!) comments above with Frederick Brooks' comments, extracted from his book The Mythical Man-Month:

"Why have formal documents?"

"First, writing the decisions down is essential. Only when one writes do the gaps appear and the inconsistencies protrude. The act of writing turns out to require hundreds of mini-decisions, and it is the existence of these that distinguishes clear, exact policies from fuzzy ones."

"Second, the documents will communicate the decisions to others...."

"There are those who would argue that the OS/360 shelf of manuals represents verbal diarrhea, that the very voluminosity introduces a new kind of incomprehensibility...."

"First ... if one uses it selectively, he can ignore the bulk most of the time."

"Second, this is far preferable to the severe underdocumentation that characterizes most programming

systems."

Consider also these comments by Denny Walthers, who is a senior SIG member and an established programming manager. Denny has seen what happens when programs are left undocumented, and offers these remarks in his RSX programming textbook:

"Documentation starts with the system formal specification. The formal spec should be part of the final system documentation, so the end users can see how well the delivered product stands up against the specified product."

"Documentation must be both internal to the code modules and external in the form of a system manual or set of manuals."

"Bad documentation is easy to get. Just let your programmers do what they want for documentation. What you will get - if you get anything at all - is a series of printouts of the source code."

"Good documentation is harder to get. Getting useful external documentation out of programmers is like pulling teeth without anesthetic; you'd think the act of writing was physically painful."

"It is often useful to force programmers and first-line supervisors to attend a technical writing course - the resulting improvement is amazing. And if budget allows, a staff "technical" writer can make user manuals readable."

"Documentation should be specified in the system design too, and the best rule of thumb is to allocate 50 percent of the time used in coding each module to documentation of that module."

"It is easy to let contingencies eat into the documentation time. Don't do it. If you do it once, you will end up doing it again and again, until you have no documentation time left. Documentation is all too often never written because the time allocated to it was used for coding, debugging or what have you. Documentation time is sacred."

"Note this well: Good programmers are mobile, changing jobs every three or four years on average. Without documentation, the expected useful life of your system degrades to  $(1 / \# \text{programmers}) * 3$ . For  $(\# \text{programmers})$  greater than 3, then, without documentation you may as well not do the project."

Very well. Most of us are agreed that documentation is good and useful. It is desirable. It is necessary. But, given the reluctance to write any documentation at all, can production of good documentation ever be assured?

In brief - yes. Adhere to the following rules consistently, and success is assured:

- o Make documentation required. Allow programmers no choice in writing it.
- o Require all programmers and supervisors to attend a technical writing course. Require a passing grade.
- o Lay down standards for the content of documentation.
- o Require peer review and approval of all finished documentation.

These rules guarantee your success if you adhere to them, with no exceptions. But they sometimes produce this reaction: "Gosh, that sure sounds simple, doesn't it? But everybody at my site is willing to write good documentation, and they're all professionals, so we sure don't need to spend money to send anyone away to learn how to write."

In two words - bull, poop. Universities, technical schools and - let's face it - the real world, don't teach people to take responsibility for their work. They do teach avoidance of responsibility, and writing documentation is the ultimate assumption of responsibility for one's work.

But documenting one's work should be more than assuming responsibility for that work. It is an act of pride, in which the craftsman proudly signs his work, telling the world: "This is mine. I want everyone to know it. I built it, and I have pride in my work."

An program left undocumented, on the other hand, shouts to the world that the author is not proud of his work. It may even indicate an author ashamed of his work. It always states clearly that the author is not a craftsman, not a professional peer, and unworthy of admission to the guild hall of master artisans.

Document your work. Document it well, and proudly. Be a craftsman.

----- Submitting Articles to the Multi-Tasker -----

Please submit machine readable media when possible. RX01,

RX02, RX50, or 9 channel magtape at 800 or 1600 BPI are best. Any RSX/ODS-1 volume format is acceptable except ROLLIN or PRESRV. ANSI, BRU and DOS FLX formats are well-liked by the Editor's tape drive.

Submissions which aren't machine readable take longer to get into print. The editor, being lazy, types mass quantities only once a month when progress reports are due.

If you preformat a submission in RUNOFF format, please set page size 58,80; left margin 10; right margin 75; and, when changing margins, use incremental changes rather than absolute. The editor blesses you for the consideration.

Send all submissions to:

Bruce R. Mitchell  
Machine Intelligence and Industrial Magic  
PO Box 816  
Byron, MN 55920

----- And That's The Way Things Are -----

... this month in Pool Lowbegone, where the H960 mounting rails are strong, the 11/70 backplane is good-looking, and the NPR jumper count is above average.

## ***DECNET FALLOG SPR***

*This article, and the one following, appeared by magic on the Editor's desk one day. My thanks to the contributor.  
--- The Editor*

### Secondary POOL Depletion During FAL Operations

#### Problem:

During certain DECnet operations involving FAL on RSX-11M-Plus systems, secondary POOL becomes depleted, causing serious system degradation. This problem occurs while wildcard copying from the RSX node to a VMS node, and when a VMS image opens and reads many files on the RSX node.

#### Diagnosis:

FAL uses secondary POOL to hold file logging records which are eventually passed to the logger task, FALLOG.

Observing secondary POOL using RMDemo while performing the above operations shows that secondary POOL declines steadily. When the operation completes and FAL invokes FALLOG, secondary POOL is recovered.

It has also been observed that if the VMS image is aborted and the process stopped, FAL exits on the RSX node without requesting FALLOG. This causes log packets to remain in secondary POOL until completion of the next file operation involving FALLOG.

If secondary POOL becomes exhausted, FAL becomes "loop-bound", apparently waiting for more secondary POOL to become available. Although this is the standard "recovery" method for POOL exhaustion, it is unsatisfactory when used by the task causing the POOL problem.

#### Solution:

FAL's handling of logging packets requires improvement. FAL violates a principal rule of operating systems by assuming that secondary POOL is limitless. Since FAL cannot predetermine how many log packets it will generate, it should periodically request FALLOG to process waiting packets.

#### Workaround:

Disabling FAL logging avoids the problem. Discovering how to do this was not easy.

To disable FAL logging, edit the NETgen parameter file [137,10]DECPRM.DAT. This file is on the DECnet distribution kit. Search for the symbol \$DFLLG and set it to false:

```
.SETF $DFLLG
```

Perform a Component Mode NETgen to rebuild FAL, and install the resulting FAL. The new FAL requires no FALLOG.

# INS AND BOO SPR

BR FNDERR

## Erroneous Error Messages from INS and BOO

### Problem:

If an invalid file specification is given to INS, the error message "Task image I/O error" may result. BOO may report "Device offline" under the same circumstances.

### Diagnosis:

The FILBN module used by INS and BOO was corrected in Update C of M-Plus V3.0. The .CSI1 routine (CSI\$1 macro) branches incorrectly to the "Task image I/O error" handler rather than the "Syntax error" handler.

### Solution:

The following correction file to FILBN.MAC corrects the problem.

```
FILBN.MAC;2/AU/-BF=[12,10]FILBN.MAC;1
-2,2 .IDENT /7.00/
-4,4
; COPYRIGHT (C) 1986 BY DIGITAL EQUIPMENT CORPORATION
-23,24
; MODIFIED FOR RSX-11M/M-PLUS V4.1/V2.1 BY:
;
; J. R. KAUFFMAN
; C. B. PETROVIC
;
; LAST MODIFICATION DATE: 24-JAN-86
; MODIFIED FOR UPDATE C BY:
;
; RMC001 ADD I/O ERRORS, RESPONSE TO SPR 82337
%
-152,,/;RMC001/
;
-248,248,/;RMC001/
 BCS 65$; -8 - TASK IMAGE I/O ERROR
-302,302,/;RMC001/
 BR FNDIOR ; SYNTAX ERROR
112$: BR FNDIOR ; NO, I/O ERROR
-349,,/;RMC001/
FNDIOR: MOV #-8., R1 ; TASK IMAGE I/O ERROR
```

## MODIFYING RSX CLI PROMPTS

Rick Sharpe  
Toledo Edison  
Toledo, OH

*This is a update of an article by Don Jensen of Lake County Public Water District. The original appeared in the November 1983 Multi-Tasker. --- The Editor*

Many production RSX systems co-exist with other computer systems. In such environments, it is often impossible to have dedicated terminals for each computer system. Instead, terminals are shared between computer systems by manual or electronic switching.

When terminals are shared between systems, users often have trouble deciding which system their terminal is connected to. Because entry of invalid commands on a system can have unexpected or disastrous results, it is important for users to know their host system.

While experienced users can use RMD, DEV or other means to find out what system they're on, this is impractical for most front-line workers. A quick and certain method of knowing the host system is desirable.

Changing the command line interpreter (CLI) prompt is a practical way of identifying the host system to all terminals connected to it. Every time the user gets a CLI prompt, he is reminded that he is connected to system (x).

Changing CLI prompts for DCL or RMT isn't difficult - it can be done at system startup time. MCR can be difficult for novice system managers, however, because changing its prompt demands a small patch in the Executive. Fortunately, this patch isn't difficult, and here's how to do it.

Before proceeding, however, note well: Caution! Apply this patch only to virgin, unSAved systems!

## 1.0 Find the CLI Prompt Table Address

If you have a copy of the Executive map file from SYSgen, examine it to find the symbolic value \$CPTBL. \$CPTBL is the CLI prompt table pointer. Make a note of its value.

If you run Micro/RXS, or do not have a copy of the Executive map file, you can still get the necessary information. Taskbuild LB:[1,54]RSX11M.STB, the Executive symbol table. The resulting map contains a symbol table listing.

In the example below, the value of \$CPTBL is 053716.

|        |        |         |        |         |        |         |        |
|--------|--------|---------|--------|---------|--------|---------|--------|
| X.TCB  | 000026 | \$BCPC  | 001570 | \$CPMSK | 053656 | \$DDSHD | 053274 |
| X.TRCK | 000030 | \$BILDS | 033630 | \$CPNIT | 030044 | \$DEACB | 014402 |
| X.UHVR | 000037 | \$BILNG | 002133 | \$CPTBL | 053716 | \$DEAC1 | 014442 |
| X.UNFL | 000002 | \$BLKCK | 023560 | \$CPUER | 001470 | \$DEAGF | 050472 |
| X.UNIT | 000054 | \$BLKC1 | 023574 | \$CPURM | 053656 | \$DEARG | 040234 |

## 2.0 Find the CLI Prompt Table

Build a new virgin copy of the system image as you would after a normal SYSgen. Boot the virgin image.

Use the MCR OPEN command to open the Executive at the address given by \$CPTBL. On systems supporting I/D space, open the Exec /KNLD (kernel D-space). In the text following, italics indicate user input:

```
OPEN 53716/KNLD
00053716 /053756 <ESC>
```

The value at location 53716 is a pointer to the first active CLI prompt/control block. In the example above, the value is 53756. Make a note of this value.

## 3.0 Find the CLI Prompt/Control Block

Open the Executive at the CLI prompt/control block address just found. The CLI prompts are stored about six words "upstream" from this address. Find the CLI prompts, and make a note of their address. You'll need to hand translate the octal words to ASCII.

In the example below, the CLI is MCR, the prompt is "> ", and the control-C prompt is "MCR>".

```
OPEN 53756/KNLD
00053756 /117134 <CR>
00053760 /050712 <CR>
00053762 /000000 <CR>
00053764 /000004 <CR>
00053766 /003405 <CR>
00053770 /005015 <CR>
00053772 /020076 <CR>
00053774 /006400 <CR>
00053776 /046412 <CR>
00054000 /051103 <CR>
00054002 /000076 <CR>
00054004 /171000 <ESC>
```

```
ASCII contents
<LF> <CR>
> <BLK>
<NUL> <CR>
<LF> M
C R
> <NUL>
```

There should not be more than one CLI prompt/control block on a virgin system.

## 4.0 Changing the Prompt

The locations containing the CLI prompts are modified using OPEN. Continuing with the example above, let's say that we have decided to change the "> " prompt to "] ". The value at location 53772 must be changed to 20135 (high byte 40, low byte 135).

```
OPEN 53772/KNLD
00053772 /020076 20135<CR>
00053774 /006400 <ESC>
```

## 5.0 SAVING the System

The procedure above changed the virgin system image, so only now it is safe to change the new system image. Save the system with a SAV /WB command as you normally would.

After completion of SAV, the system has a new, permanent, unique prompt. Users need only see what the prompt is to determine which system they are using.

## THE NOTEBOOKS OF JUSTIN L. HEWSER

Jim Bostwick  
Cargill, Inc.  
PO Box 9300  
Minneapolis, MN 55440

This month continues our series of articles based on the personal programming notebooks of Justin L. Hewser. We all know Justin: his work has been seen in every programming shop. The desk in the corner, right next to Murphy. Yeah, him.

Justin is a prolific programmer, and we have all at one time or another been forced to work with his product. Forced, because we'd sooner do an spelling checker in APL than look at his stuff voluntarily!

This month's note is from the MACRO section of the Notebooks, although it applies equally well to most languages. It presents Justin's solution to the common programming problem of synchronizing access to a shared resource through a global event flag.

### \*M109. -- EFN Synchronization

*Use global event flags to synchronize file access. Each program looks at the flag, and sets it to indicate the file is locked.*

```

 EFN=1
10$: SETF$S #EFN ; Set the flag
 CMP #IS.CLR, $DSW ; Was it clear?
 BNE 10$; No, try again
 < do your thing here >
 CLEF$S #EFN ; Release lock
```

*The program tries to set the lock flag. If it was clear, you have it. Otherwise, someone else has set the lock, and you must wait. When it clears the flag, your set returns "IS.CLR" indicating that it was clear, and you know YOU have set the flag.*

The margin notes for this trick indicate random system crashes, also "Don't use this if you don't have to". I'm not surprised.

Justin obviously found out that the directive status word tells you the former status of an EFN following a set or clear directive. What he did with this tidbit might be described as

massively awesome.

Where shall we begin? The program using this is a total pig. Not only does it twiddle its fingers tight looping while waiting for the lock to release, it gets RSX twiddling its fingers, too!

Furthermore, because Justin only looks for a specific DSW return code, a coding or runtime error goes undetected. Worse, the program logic jumps right back and does it again, probably repeating the error.

The funny thing is, if there are no errors, this bit of code can actually work: only one program can successfully transit the event flag to the set state. What it does to the system is another story altogether.

Possibly Justin's system didn't really crash, but just came to a grinding halt from the combined effect of several programs spinning on the \$SETF directive.

The correct way to implement this kind of lock is to invert the sense of the event flag. You can then use a WTSE\$ to put the program to sleep until the resource is available. Be sure to repeat the CLEF\$ directive when you wake up - someone else may be competing for access, and you must guarantee that your program cleared the flag, and not some other. For example:

```

10$: CLEF$S #EFN ; Try for lock
 BCS ERROR ; My error handler
 CMP #IS.SET, $DSW ; If eq, we got the lock
 BEQ 20$
 WTSE$S #EFN ; Wait for unlock
 BCS ERROR
 BR 10$; Bid for lock again

20$: ... code continues
```

We might use \$STSE rather than \$WTSE to put sleeping tasks in the stopped state rather than wait-for state. A stopped task checkpoints at zero priority, while a waiting one checkpoints at normal run priority.

The choice between stopping and waiting depends upon how long the task intends to wait to gain access. If it will be a "long" time, use \$STSE. If the delay will be "short", use \$WTSE.

Another requirement with this code is a guarantee that the flag will eventually release. Doing this rigorously is easier said than done. A successful compromise is to set a mark time (\$MRKT) for some reasonable period as soon as the lock is set,

specifying an AST completion routine. Cancel the marktime when the lock is released. If the AST ever fires, do something useful in the AST service routine.

This whole mechanism is wrapped up in a 'lock' and 'unlock' pair of subroutines, with error handling and optionally timeout support. Aside from the timer support, you can do the whole thing in your favorite HLL (FORTRAN or whatever) if you don't like MACRO.

There is certainly a wealth of information in Justin's notebooks. I have only begun to analyze them in detail. Here are some candidates for future columns:

- o Emulating TECO with EDT Keypad Macros
- o System Programming in DIBOL-11
- o Fast Fourier Transforms in Datatrieve

\*

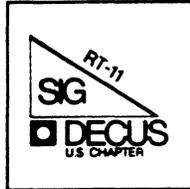
THE  
**mini-  
tasker**

DECUS

RT-11 SIG NEWSLETTER

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Notes from the RT-11 World

Copyrights

All copyrights in the RT-11 mini-tasker belong to the owner/submitter of the material, and not to the RT-11 SIG, DECUS, or Digital Equipment Corporation. If you have a question about any article in the mini-tasker, please contact the author directly - not the Editor - and not DECUS. However, if you have a comment or rebuttal, the mini-tasker is a forum for open discussion, and comments are encouraged.

We DO solicit signed articles for insertion in the mini-tasker, on or about bugs, features, nifty things, etc., all about the RT-11 operating system and its environment. Write it up, send it to me (with a note to rewrite if you wish), and I will try and get it in an upcoming issue.

New location of SIG Steering Committee Members  
and

Fall 1986 RT-11 Symposium Index

Starting with the January issue of TBO, all steering committee members were listed in one section. The RT-11 SIG was listed on pages SIC-7 and SIC-8. I would have properly proof read the listing, but the type size was so small, and my page SIC-7 was so faint, that I could not. However, on page SIC-8, the TAPE COPY CONTACT is "Tom Shinal".

See the January issue of TBO. See Rallys INDEX at the end using HIS page numbers. You can NOT see my neatly ADDING those page numbers to the CUT and PASTE'd copy I submitted to DECUS, because they were WHITE'd out.

FORTRAN IV version 2.8 announced

I am including a letter from George P. Pappas of DEC announcing a new version of FORTRAN. By popular request, a utility for debugging (FDT) will be included in the kit. Please read his letter and problem fixes.

Micro/VMS on the MicroPDP-11/73

I think many of you might like to read Scott Harrod's letter in regards to VMS on the PDP-11 vs. RT-11 on the VAX. I must agree with Scott, in that if DEC can get 32-bit VMS to run on a 16-bit PDP-11, they can certainly get 16-bit RT-11 to run on a 32-bit VAX!!

Notes from the RT-11 World

Pre-Symposia Seminars

Diane Spirio of DEC has been kind enough to forward to me the abstracts for the PSS for Nashville. Please read them and give serious thought to going a day early to Nashville to attend.

HELP, HELP, & HELP!!

D. Bruce MacDonald recently acquired a PRO-350, and needs help in learning the basics of the PRO-350, as well as how to program it. I am including his letter outlining his basic needs. Can someone out there in "PRO-350" land give him some help?

New DECUS Library Submissions

Tom Shinal has included in this issue two abstracts on recent submissions to the library. One is on "FC - A FILE COMPRESSION UTILITY", and the other is "NBS PASCAL". Tom is interested in someone volunteering to critique each of these packages. His address is at the end of the write-up later on in this issue.

Ian Hammond is ALIVE and well

In his spare time (?) from a year on the European DECUS Symposia Committee, Ian Hammond has submitted two fascinating articles on: (1) writing yet another RT-11 look-alike operating system -- in a single day! (SHAREboot); and (2) on closing and/or purging (.CLURP). In his cover letter, Ian adds quite an interesting comment on the Modula-2 controversy, and also mentions plans to update his "Short History of RT-11". Please encourage Ian to do so.

Extended Memory RT-11XM Drivers

Robert (Abe) Williams [Ed Note. Bill Walker says he looks a LOT like A. Lincoln] has submitted an XM driver for publication. He states that the article has been read by others, and the main question appears to be the driver's APR 2 usage. "Abe" personally cannot find a reason why it should not work (nor has anyone else), and in fact, the driver he is using with this method works fine, but wants it published anyway so all you RT-11'ers can tear it apart.

Letters to the Editor

CALL FOR PARTICIPATION!

User Application Workshop  
at the  
Spring 1987, DECUS Symposium

Dear RT-11 SIG:

At the Nashville DECUS, you will have the opportunity to strut your best stuff! We welcome presentations on anything YOU consider interesting or clever. Some examples of material you can talk about are application programs, utilities, control/command files, games, personal finance programs, the SDI control program -- anything!

Presentations should be roughly 5 - 10 minutes in length; you may use visual aids. If you plan to contribute anything to the RT-11 SIG Tape, you can describe your contribution here.

If you will not be attending the Spring DECUS but wish to make a contribution, please send the materials to me, and I will present it for you (giving credit where it is due!). Thanks.

R. W. Barnard  
Sandia National Laboratories  
Division 7523  
P. O. Box 5800  
Albuquerque, NM 87185

New RT-11 DECUS Library Submissions

Dear RT-11 SIG:

New Library submissions are posted to my attention twice monthly by the DECUS Program Library. I am initiating a program to field test this software prior to inclusion in the DECUS Library Catalog whenever possible.

If you would like to participate in this program and become a "Beta" test site, watch this column for notice of "PROGRAM AVAILABILITY". If you see an abstract that interests you, send me a letter (no phone calls please) and we'll get a copy to you. In return, I will expect a short written critique as to the general condition and functioning of the program and documentation. You will have received it many months in advance of the rest of the RT-11 world and will have been a service to your colleagues.

Thomas J. Shinal  
DECUS RT-11 Librarian  
General Scientific Corporation  
1684 East Gude Drive  
Rockville, MD 20850

TEARS, TEARS, and more TEARS!

Dear RT-11 SIG:

I think we now have our answer from DEC concerning our request for a viable real-time operating system (VAX/RT) for the VAX. The following articles make me draw this conclusion:

Digital Review, 12 Jan 87  
Page 1, "DEC Stands by ELN; Hones Real-Time Plan"  
Page 8, "Users Find Real-Time Products No Bargain"

Computer System News, 12 Jan 87  
Page 59, "DEC Expands VAX for Real-Time Use"

It appears that our hope now must be placed in Digital Scientific of Newhall, CA. They are reported to be working on a real-time operating system for the VAX. Lets encourage those good folks.

N. A. (Nick) Bourgeois

p.s. The following generates incorrect code as far as I am concerned:

```
.MACRO BLUE
.IIF NDF, BLACK, BLACK = 0
BLACK = BLACK + 1
.ENDM

; black = 0
BLUE
RED: .WORD BLACK
.END
```

If the above is passed through the assembler, it generates an incorrect value for BLACK. However, if the semi-colon is removed, it generates correct code.

I just thought you all might like to know!

Nick

And finally, I am always looking for something of interest to print.

Please send your submissions to the mini-tasker (on RX-50, 1600bpi mag tape, or pieces of paper) to me at:

Bill Leroy (RT-11 mini-tasker)      Bill Leroy (RT-11 mini-tasker)  
The Software House, Inc.            The Software House, Inc.  
P. O. Box 52661                      2964 Peachtree Road, NW #300  
Atlanta, GA 30355-0661              Atlanta, GA 30305-2120

**digital**

George P. Pappas  
Digital Equipment Corp.  
40 Old Bolton Road  
Stow, Mass. 01775-1215  
Telephone: (617)496-9166

Bill Leroy  
The Software House, Inc.  
P.O. Box 52661  
Atlanta, GA. 30355-0661

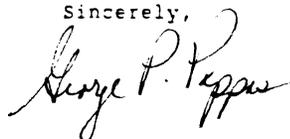
Dear Bill,

Let me take the opportunity to introduce myself. I'm the Product Manager for Fortran IV. I found your name in the DECUS Newsletter publication and thought I'd contact you regarding a request I have.

I will be announcing a new version of Fortran IV for the RT-11 operating system (version 2.8) very shortly. As you know, Fortran IV has been in existence for a long time and we have several hundred users. With this in mind, I have enclosed an article that I think would be valuable in the DECUS Newsletter publication (RT SIG), outlining the changes to the new version of Fortran IV.

If you have any further questions or concerns, please feel free to contact me.

Sincerely,



DIGITAL EQUIPMENT CORPORATION, 40 OLD BOLTON ROAD, STOW, MASSACHUSETTS 01775  
(617) 896-1111

RT-5

### Announcing FORTRAN IV/RT-11 Version 2.8

-----

With the purpose of correcting various bugs associated with the current Version 2.6 of FORTRAN IV/RT-11 and FORTRAN IV/RT-11 on the Professional, Version 2.8 will be released shortly. At the request of many FORTRAN IV users, a utility for debugging FORTRAN IV programs known as the FORTRAN Debugging Technique (FDT) will be distributed as an unsupported component of the FORTRAN IV/RT-11 V2.8 kit.

The following problems occurring in FORTRAN IV/RT-11 V2.6 have been corrected in the new release:

- o All known problems with non-PLAS VIRTUAL arrays:
  - Absence of 22-bit addressing capability
  - Corruption of trap vectors when ^C^C from console terminates a program during VIRTUAL array initialization
  - Failure to confirm at runtime that sufficient memory is available to accommodate requested VIRTUAL arrays
- o All known problems with byte-oriented unformatted I/O:
  - Failure to update directory information when output follows a BACKSPACE operation
  - Error in file structure, resulting in corruption of data
  - Non-detection of attempt to read past end of record
  - Processing of zero-length records as if of length one
  - Non-detection of ENDFILE records that span block boundary
- o All known problems with BACKSPACE operation:
  - Confusion of buffers when double-buffering is used
  - Incorrect setting of formatted file pointers when record separator coincides with a block boundary
  - Mishandling of end-of-file condition for formatted files

RT-6

January 14, 1987

- o All known problems with list-directed input:
  - Non-recognition of lowercase LOGICAL data
  - Non-recognition of COMPLEX data containing white space between left parenthesis and real component
  - Non-recognition of COMPLEX data of the form "(x)", now evaluated as (x,0.0)
  - Non-detection of error when COMPLEX data is entered in the form "(x,y,)"
  - Conversion of invalid COMPLEX input data to null value. Errors are now detected and reported as ERROR 64, INPUT CONVERSION ERROR.
  - Non-conversion of COMPLEX input data whose destination variable is of data type LOGICAL\*4
  - Misinterpretation of right parenthesis as record terminator
  - Generation of fatal error when destination of input is a VIRTUAL array
  - Incorrect processing of null data when destination is a VIRTUAL array
  - Failure to clear destination variables on INPUT CONVERSION ERROR
  - Failure to transfer control as specified by ERR= argument when invalid COMPLEX data is supplied as input
- o Failure to pass the carriage-control argument to the ASSIGN library subroutine
- o Fatal error when opening a file under the XM monitor
- o Appearance of incorrect sign for certain DSIN and DCOS results, occurring with the FPU hardware option
- o Intermittent truncation of REAL values output with the "E" field descriptor
- o Incorrect processing of '\$' carriage control character and '\$' field descriptor when output is to a terminal
- o Failure to update directory information in word-oriented unformatted files when output follows a BACKSPACE operation

Bill Leroy  
 The Software House, Inc.  
 P.O. Box 52661  
 Atlanta, GA 30355-0661

Dear Bill,

I am sending along a copy of page 2-7 from the DEC's Realtime Products Catalog - Second Edition, 1987 (number ED-27920-61 11/86 61 15). I thought you might want to put the top half of that page in the "for your amusement and amazement" section of the Mini-Tasker. If you can't do it without running afoul of various copyrights, a reference to the appropriate page probably would suffice.

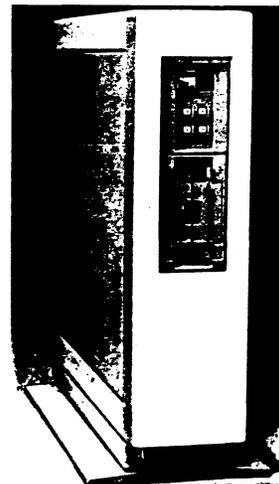
Perhaps that you can run Micro/VMS on a MicroPDP-11/73 is well known, but it was news to me. Actually I don't really need (or even want) to run VMS on an 11/73, but if they can get MicroVMS to run on an 11/73, I don't see why they can't get a nice little single user operating system to run on the MicroVax. (Something like RT-11 but with all the 16 bit address limits removed.)

Yours truly,

*Scott B. Harrod*  
 Scott B. Harrod

Scott B. Harrod  
 21084 N. Middleton Drive  
 Kildeer, Illinois 60089

MicroPDP-11/73



The MicroPDP-11/73 is a high-performance, multi-user, Q-bus computer. It features the new 15MHz J-11 chip, an 8KB direct-mapped cache, and a 32KB boot-strap/diagnostic ROM. The MicroPDP-11 family is available in two packages. One fits under a desk or on a tabletop. The other is a rackmountable enclosure. It can support up to 14 terminals and four to 12 active users.

Processor: J-11

Realtime operating systems: Micro/VMS, RSX-11M/M+, RT-11

Mass storage options: RX50, RD52, RQC25, TK50, RD53, TSV05, RA81, RA60, RLV22, TQK25

RAM: 1MB TO 4MB

I/O bus: Q-bus

Expandability: An expansion box and backplane (BA23-cc) are available.

**Space and power available for realtime options:**

The MicroPDP-11/73 backplane has a total of eight slots. The first slot is reserved for the CPU. Of the seven remaining slots, one is usually used for the disk controller (RQDX2) and at least one is used for memory (MSV11). This leaves five quad slots for more memory and real-time options with the following power:

| Available Slots | DC Amps Available at +5 | +12V | Bus Loads | I/O Panel Units |
|-----------------|-------------------------|------|-----------|-----------------|
| 8 Quad          | 36                      | 7    | 30        |                 |

DEVELOPING REAL-TIME APPLICATIONS IN FORTRAN UNDER RT-11 AND RSX-11M/M-PLUS  
(Sponsored by the RT-11 SIG)

This seminar will prepare FORTRAN programmers to use RT (and RSX) systems for typical laboratory and industrial data collection applications. Basic real-time concepts will be introduced, including monitor clock services, double-buffered and queued (asynchronous) I/O, etc. The seminar will follow the development (specification, architecture, design, coding, and enhancement) of a typical and useful laboratory application program which continuously samples an analog input using a DEC ADV11 (or AXV11) bus module and writes the values to disk, along with a companion program to display the data. Attendees will retain the working sample programs as templates for development of their own application software.

FORTRAN calls to a typical commercially-available device interface routine library (DTLIB - available from Digital) will be used.

The seminar software demonstrates RT-style system calls, but equivalent facilities are provided under RSX, and since an RSX flavor of DTLIB is available, the example programs are readily migrated to RSX-11M/M-PLUS or Micro-RSX environments.

Although the implementation example centers around analog data input, many concepts are also applicable to analog output and digital input and output, and process control applications as well as laboratory work.

Credentials:

Bruce Sidlinger has a B.S. in computer science and 13 years of professional computer programming and systems design experience, with the last ten years concentrated on Digital RT, RSX, and VMS systems. He has implemented several major commercial hardware and software products. He is now president of a DEC OEM and consulting firm in San Antonio, TX.

Prerequisites of Attendees:

Engineers and programmers wishing to learn how to design and code real-time applications will find this a good entry level seminar. Some familiarity with RT-11 and FORTRAN will be assumed.

Attendees can expect to return to work well-equipped to immediately write FORTRAN code for medium-performance (i.e., 60 sample sets/second) multiple-channel analog input. He/she would also understand many real-time architectural issues, be able to select between RT, RSX, Micro-Power Pascal, or VMS for a given application, and be somewhat prepared to learn more advanced techniques such as device programming in MACRO, higher-speed data acquisition using DMA-type interfaces, etc.

This seminar is not intended for those already experienced with double-buffered analog input via system calls from FORTRAN.

RT-11 SYMBOLIC DEBUGGER  
(Sponsored by the RT-11 SIG)

This seminar is intended to give the RT-11 programmer a working knowledge of DBG-11, the RT-11 symbolic debugger. Topics to be covered include:

1. DBG-11 functions and commands
2. Symbol table preparation and editing
3. Examining/modifying program contents
4. Control of program execution
5. Using DBG-11 on FORTRAN programs
6. Pitfalls (e.g., overlaid programs)
7. Accessing memory outside program space
8. Debugging device handlers

Upon completion of this tutorial, the RT-11 programmer should be able to use DBG-11 comfortably in his software development.

Credentials:

Dr. Crowell is a physicist at the Los Alamos National Laboratory and an independent consultant for small computer systems in the scientific environment. He has been programming in PDP-11 Assembly Language for twelve years. He has worked with RT-11 since Version 1.

Prerequisites of Attendees:

Attendees should have some familiarity with the PDP-11 instruction set and some MACRO-11 programming experience.



January 8, 1987

Mr. Bill Leroy  
The Software House, Inc.  
2964 Peachtree Road, N.W. #320  
P. O. Box 52661  
Atlanta, Georgia 30355

Dear Mr. Leroy:

I have recently purchased a turnkey computer system which includes a Digital PRO 350 with a 5 megabyte Winchester from Stenograph Corporation (a court reporting software firm). My wife is the court reporter and I am an applications programmer for American Airlines in Tulsa, Oklahoma. I am interested in learning how to operate and program on the 350 but I have no knowledge of this system. Through some DECUS literature I have obtained your name and am looking for some assistance.

I am interested in learning the basics of the PRO system as well as how to program with it. I am needing assistance in obtaining information (i.e. manuals, etc.) and any other literature that may help me, as we received no operating manuals with the system. I have talked with the local Digital representatives but they don't seem too responsive to my needs. When in college, I took several programming courses on the VAX system so maybe this will be of some help.

My basic needs as I see them are:

1. Learn the functions of the RT11 operating system.
2. Obtain an editor which will run under the RT11 system.
3. Find out if other operating systems (i.e. POS) will function with files of the RT11 system.
4. Find a basic accounting system that I may use on this system for my wife's business.
5. Find a language (i.e. C or Pascal) that I may write small programs with and the manuals that go with it. I have seen that DECUS has a version of C. Is it a quality product?

These are some of the functions I would like to have but I do not want to spend much for them. I am willing to pay for manuals, etc., but I don't want to buy software as most of what I have seen is too expensive for what I wish to do. I have talked with the president of my local users group but he knows of no one in Tulsa that works with the PROs. I am interested in the programs that DECUS has but I need to learn the functions of the system first. Enclosed is a list of the files that were shipped with the system.

I would appreciate any help that you might be able to give me. Please forward any information to:

15522 East 80th Street North  
Owasso, Oklahoma 74055

Thank you very much.

Sincerely,

D. Bruce MacDonald

Enclosure

The following program synopsis is a recent submittal to the DECUS Library. It may be ordered as DECUS NO. 11-850, FC - A File Compression Utility. It consumes about 100 blocks and includes sources and documentation. DECUS C is required for compilation, however a .SAV file is included.

#### FC - A FILE COMPRESSION UTILITY

by

Ted Dustman

May 1986

#### Files:

|             |        |        |
|-------------|--------|--------|
| .sys files  |        |        |
| swap        | pix    | dwX    |
| lsx         | rtllxm | dzx    |
| vmx         | l6x    |        |
| .com files  |        |        |
| startx      | start  | instal |
| chgptr      | clnup  | diag   |
| bldpar      | startw | speed  |
| setup       | startv | idiskt |
| fulli       | ldcat  | getnam |
| update      | lang   |        |
| .sav files  |        |        |
| pip         | dir    | setup  |
| sipp        | dparti | mapchk |
| whirmi      | dup    | ind    |
| resorc      | format | dtscan |
| dconl       | pasprt |        |
| .misc files |        |        |
| syspar.3    |        |        |
| syspar.6    |        |        |

FC is a program designed to compress and decompress text files. Of course the compressed version of the file may not be edited; it is useful for archival purposes only. The program is ineffective on small (say, 1 block) text files. Files will generally be reduced in size by 35% to 50%. The program uses the Huffman algorithm for compressing text.

There are three options in addition to 'd' (decompress): s, c, v. The 's' option will cause the program to analyze the input file and print out a table of compression statistics but will not actually compress the file. The 'c' option will cause the program to compress the file but will not display the statistics. The 'v' option will cause the program to display status messages during its execution. The d, s, and c options are mutually exclusive; the v option may be used in conjunction with any of the others.

#### THE COMPRESSION STATISTICS

The compression statistics give you the frequency of occurrence of each character in the file, its ASCII code (in binary format), and its compressed code (also in binary format). You will discover that for a character of low frequency the number of bits for its compressed code might actually be greater than the number of bits for its ASCII code (which is always 7 bits in an 8 bit byte). For characters of high frequency the number of bits in the compressed code will be smaller than 8 bits, sometimes consisting of only 2 or 3 bits; this is where the space savings occur. Occasionally the compressed bit code for a character will consist of 1 bit only. Note that the decimal value of a character will be displayed if the character is not printable.

The file compression statistics are normally sent to the user's terminal but may be sent to an alternate file by using redirection notation (a la UNIX) in the command line, for example:

```
FC> file1 >stats.txt This will send the statistics to
 stats.txt.
```

In this case you must supply the entire file name specification; no defaults are assumed.

Examples:

```
FC> file1.rno -s !list statistics only
FC> file1 file2 -dv !decompress the file and be verbose about
 !it
FC> file1 -c !compress the file with no statistics
 !listed
FC> file1 d11: !compress and put the output file on D11:
```

On large files (say 100 blocks) the program will take a couple of minutes to compress a file; decompression usually takes less time.

#### THE PROGRAM

The program was written in DECUS C running under TSX+ V5.0 on a PDP11/23+. All sources are provided on disk. The file "fc.c" contains the code for the main program. However "fc" relies on 7 external functions which do most of the work of compression and decompression. The table below gives the name of each function, the name of its source code file, and a brief description of the purpose of each function.

The compressed file is 'organized' as follows:

The first 4 bytes of the file form a long integer which is the number of characters in the original file. Next is the code tree which will consist of  $10 \times UC - 1$  bits where UC is the number of unique characters in the input file. Next are the compressed characters; the number of bits occupied by the compressed characters is the summation of the product of the frequency of each character and the number of bits in its compressed code. The compressed file is written as a stream of bits; there are no byte or 'record' boundaries that impose a structure upon the file. The only structure is that which is indirectly imposed by the Huffman code tree.

Also submitted is DECUS NO: 11-854, NBS PASCAL for RT-11. It requires 867 blocks of storage for the entire kit. Following is a synopsis:

#### NBS Pascal

RT-11  
Version 1.6i(EG6)

Brian G. Lucas  
Justin C. Walker  
Bill Heidebrecht  
John R. Barr

The NBS Pascal compiler for the PDP-11 implements most of Standard Pascal, as defined in "Pascal User Manual and Report" by Kathleen Jensen and Niklaus Wirth (Second Edition, Springer Verlag, 1975). For the remainder of this guide, the term "Standard Pascal" will refer to the language defined in that Report. This User's Guide describes the use of the NBS compiler as well as the exceptions and extensions to Standard Pascal. This version of the Guide is primarily directed to RSX, IAS, RT-11 and RSTS users, although much of the information presented pertains to other systems as well. The reader is assumed to be familiar with the Jensen and Wirth Report.

The current compiler consists of two passes, written entirely in Pascal except for the runtime library. It is capable of compiling itself on a PDP-11/45 in less than five minutes. Pass 1 performs lexical, syntax, and semantic analysis, and pass 2 performs code generation. The compiler is currently available under RSX-11M, -11D, IAS, RT-11, RSTS and UNIX on LSI-11 and PDP-11 machines. The present version assumes the existence of the EIS and FP11 or FIS hardware options.

The NBS Pascal compiler was written by Brian G. Lucas and Justin C. Walker. An early bootstrap version was implemented by Lucas and Walker using their BSM (Block Structured Macros) under PDP-11 DOS. It had its roots in the P-compiler of Urs Ammann, et al., but was different in that it produced machine code for the PDP-11. The BSM compiler was later replaced by a version written in C under UNIX by Lucas and Walker, and was then hand translated to Pascal. The Pascal version was subsequently moved to RSX-11D, -11M and RT-11 by John R. Barr. Bill Heidebrecht has assisted with documentation and maintenance.

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I am interested in one or two "serious" individuals to evaluate these packages and submit a report back to me. If you are interested, please send me a letter indicating your intent and experience in the appropriate package. Your critique may be published in this newsletter. No phone calls please....

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## SHAREboot

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December 29, 1986

Dear Bill

Please find enclosed two articles for the Mini-Tasker:

SHAREboot  
.CLURP

As I got out a Mini-Tasker to copy your address I picked up by chance the August issue and reread your editorial on commercialism.

It is unfortunate that Modula-2 should be put in the center of such a debate as this is not entirely a commercial product. The basic compiler is developed and distributed at a nominal price from the ETH in Zürich by Professor Doctor Niklaus Wirth. Companies like ModulaWare pick the compiler up and add libraries and support for specific systems.

I still have a copy of the original compiler which I purchased from Zürich for the equivalent of about 30 dollars. DECUS library prices. Gunter Döztels article is just part of a Modula-2 mania that is taking place in Europe. People like it because it solves the problems of Pascal without introducing the bells and whistles of ADA - and because you can get it on a PDP-11. At present (and probably in the future) DEC offer no structured language for RT-11. Not even a PASCAL.

I hope to send you an article on SHAREplus next year. I promised this to your predecessor Ken. But in the meantime I spent a year on the European symposium planning committee which took up all my DECUS time'.

Every so often I get out my old Short History of RT-11' with the object of updating it for V5.\* - but the time always seems to run out. I will try and do more here next year as well.

All the best for 1987

  
Ian Hammond

It is not everyday you have the pleasure of writing yet another RT-11 look-alike operating system.

It is not everyday you have the pleasure of writing one in a single day.

I need to explain this a little further. We have a large RT-11 'utility' suite called SHAREplus. Typically you first bootstrap RT-11 to run SHARE. It takes over and emulates RT-11. In a small number of situations there has always been a good case for bootstrapping SHAREplus directly without RT-11. For example, on a small floppy system it is a matter of saving about 200 blocks required by RT11SJ, SWAP.SYS etc.

So the idea was to add a bootstrap to SHAREplus. I confess that at first I was less than enthusiastic. Adding a bootstrap would have meant rearranging a lot of code in the first five blocks of the monitor. It would have meant replacing standard RT-11 program requests with special code. Actually, it would have meant maintaining two sets of calls since a RUN interface was still needed.

It was during these considerations that the penny dropped.

An RT-11 bootstrap has the following layout:

| Location | Contents                                                                      |
|----------|-------------------------------------------------------------------------------|
| 000000   | start of the primary bootstrap                                                |
| 000210   | usual entry point for bootstrap read routine<br>most of the primary bootstrap |
| 000664   | bootstrap error routine                                                       |
| 001000   | start of the secondary boot                                                   |
| 004714   | bootstrap fixed impure area                                                   |
| 005000   | DUP time parameters                                                           |
| 005006   | lots of stack space                                                           |
| 010000   | bootstrap stack                                                               |

The point being that the secondary bootstrap has almost 996 words available. The bright idea was to use this space for a miniscule RT-11 monitor. The monitor would have to perform some standard configuration tests, relocate itself to the top of memory and emulate a subset RT-11 environment sufficient to load SHAREplus.

Since SHAREplus uses not much more than .LOOKUP and .READW this was all feasible. But, ask a programmer to write a program that will milk a cow and you will probably end up with a complete farm management system. This kind of programmers leap occurred immediately here: it was obviously a game as to how much of RT-11 could be supported in 996 words. So, the goal was not just to boot SHAREplus.

I confess that the small size available was the real delight of the project. After five years of writing systems that end looking like telephone books it was great to go back to the buzz of fitting everything into nothing. In fact it was an entirely redundant exercise: obviously the secondary boot could have searched for itself on the disk to load additional code. But there would have been no fun in that. 996 words. Period.

Work began on the monitor about ten minutes after the bright idea at six in the evening.

### The initial monitor

The primary bootstrap supplies a driver in the first 256 words of memory. The design was to leave that in place and hope that SHAREplus did not corrupt it.

The initial section of the secondary bootstrap has to protect itself against flak from the clock and setup the RT-11 CONFIG and CONFIG2 system variables. I already had some code from my first RT-11 monitor that I could adapt for most of that task.

The second task was to relocate the monitor. One simplification was to assume that the processor had 28 kilowords. This saves the use of space consuming PIC code in the monitor. So, the space from 27kw to 28kw was reserved for the monitor 'high area'. A fixed constant was added to all address computations in the high area.

Now an RT-11 monitor starts off with the fixed offset RMON impure area. This occupies 142 precious words of memory. However, 85 words are used for the channel area. This area was used for the once-only code that built the CONFIG and CONFIG2 variables. The RMON area was placed at the start of the secondary bootstrap - so it started at exactly 27kw which made debugging easier (since no debugger would be available other than the finger-locking micro-ODT of the 11/73).

Having got the basic layout done the next minor task was to initialize vectors and other variables. This was quite straightforward (and thus cost more time debugging than the complicated stuff which received more thought).

The next delight was yet another RT-11 EMT dispatcher. For those who are not initiated into the intricacies of RT-11 I should explain that RT-11, despite its small size, takes the luxury of supporting a number of EMT interfaces. The main ones are the OLD and NEW interfaces. The OLD interface uses the stack for arguments. The NEW interface uses R0 or R0 as a pointer to a set of arguments.

The OLD interface is a hassle since it requires stack manipulation to get arguments off the stack before returning to the program. Since I KNEW that SHAREplus did not use the OLD interface I decided not to support it - except for the OLD 340:360 group which handles things like .TTYOUT and .PRINT. I decided to ignore any EMTs I could not support.

One of the ways to save on space is to have the EMT dispatcher setup various common things in advance for program request routines. On SHAREplus this is an elaborate exercise of setting a complete parameter frame for the routines. On SHAREboot it simply consisted of guaranteeing R1=0, R4 pointing to the channel (if any), and R5 being a copy of the entry point R0. R5 is also returned as the result R0. I point out these details because they were main pleasure for your writer: on SHAREplus EMT dispatch and the tables occupies about 15 pages of source. The initial version of SHAREboot did it in three quarters of page complete.

It was then a matter of filling in some essential program requests. I did most of these from memory. They were:

```
.print .ttyout .exit .gval
.trpset .gtim .date
.lookup .readw
```

Some could be easily ignored. Lookup would not check to see if a channel was already open - this meant that .PURGE and .CLOSE could be ignored.

```
.close .purge
.scca .serr .herr
```

An RT-11 lookup is very easy to code. The first version included extra-word handling and checks for a valid directory structure. The initial .READW routine was also simple: 5 lines of code to translate the call to the bootstrap driver read interface.

### The monitor ...

The last three monitor tasks were traps, errors and the terminal handler. The code handled BUS and CPU traps for .TRPSET. The clock interrupt incremented the time variables (and set the CLOCK\$ bit in CONFIG). This was necessary since SHAREplus tested the clock for activity during startup.

The terminal handler was taken from the SHAREplus console software. The routine was short enough and handled [ctrl/q] and [ctrl/s].

As usual the last piece of monitor code to go in was the error routines. At this point it was a matter of working out the best (i.e. smallest) interface to actual error conditions that the monitor checked. Some optimisation was performed on keeping the text small. Errors resulted in a fatal halt (actually branch-self loop).

The last piece of code to go in was the startup code that loaded the image (in this case SHAREplus). Once again the difference between SHAREplus and SHAREboot was wonderful. On SHAREplus image activation sprawls across about five very long pages. On SHAREboot it costs about a page.

### Debugging

It was assembled and linked and ready to go. I got up to walk to the system console to attempt a boot.

Then I sat down and wrote a simple software emulator. I knew I had enough bugs to warrant it - and debugging with some symbolics on the screen takes much less time. Since I had a 30kw jobspace available there was no real problem with the emulator and I got most of the typos out.

I patched each EMT in the monitor to a TRAP so that I could test the EMT dispatcher. This all worked fine and I debugged the basic algorithms. Then I ran my first hard bootstrap.

I pointed out earlier that I KNEW that SHAREplus did not use the OLD EMT interface. I was wrong. The first EMT in SHAREplus uses the OLD interface. The monitor startup code is overlaid and the the RT-11 overlay handler still uses the old form of .READW. This caused me more embarrassment than time: I dispatched EMT 217 to a routine that cleaned up the stack and joined in with the NEW .READW code.

The next Ah Ha concerned the initialization of low memory. During image loading I had not setup the SYSCOM area with the start location of the program etc. It was not an oversight, but more a vain hope. I was cautious about modifying the first 256 words because that is where the bootstrap read routine lived. The result was that the clear-memory routine in SHAREplus started at location zero instead of the top of the program and very quickly erased itself completely - except for the last two instructions of the clear loop.

The next Ah Ha concerned the same routine. Once again the same vain hope. In .SETTOP I returned the new high limit value in R0 only and did not place the additional copy in the SYSCOM area. For some reason my SHAREplus code used that value.

A couple of minor bugs later I had a complete page of environment error messages on the screen from SHAREplus. I considered this a success - since if it could talk to me it could work for me. It was six in the morning and I went to bed.

## Cleaning up

The next evening I cleaned up the code and got the system fully functional. I tested it out with COPY/BOOT and so on. It worked. An RT-11 monitor in a day. I could have left it there. Maybe I should have left it there.

But the problem was that on examination I found that I still had: 335 free words in the monitor area.

335 words begging for functionality.

335 words that stole a couple of nights more from the projects that were at the top of the priority list (but, it was Christmas time after all). I rationalized all this by telling myself that if we were going to distribute the software we needed a good validation environment and that that meant being able to run a number of monitor structure and EMT test programs.

Actually there were some things that were missing. I had omitted tests for the 11/60 and 11/70, cache memory and so on. I confess I burnt a whole night putting in all these tests. Since I do not have an 11/60, 11/70, CIS etc. I found myself being extraordinarily cautious (as in paranoid).

The READ routine got most of the attention. Some programs could not coexist with the system device driver in locations 200:1000. After all, that is where 99.9% of RT-11 programs like to put their stack. So I context switched the first 256 words of memory during READ operations. I also had to context switch a location at 4722 called B\$DEVU which holds the bootstrap device unit during standard RT-11 bootstrap operations. Of course, I also had to switch stacks for all this.

It went on and on. The bootstrap READ routine handles I/O errors by jumping to a fixed location (664) - I patched this location to get control back (even though I am not sure if all bootstrap read routines can be called again after an error since some are self-modifying). The result READ routine actually wastes two pages of source.

Context switching B\$DEVU was a classic case of overprogramming. I went through detailed checks to see if B\$RDVU was enclosed in the read transfer area. When I looked at the code the next day I replaced the code with a simple check to see if the value of location B\$DEVU changed during the read operation.

I added location information and the name of the system image to error messages. And I pushed in more common RT-11 EMTs such as .DSTAT, .CSTAT, .GTJB etc.

The idea of just ignoring the EMTs I couldn't handle was not a good one. It made debugging a hopeless task. I modified the EMT dispatcher to return an error code on any EMT that it could not gracefully ignore. But, the OLD EMTs reared their ugly heads again. Even an ungraceful ignorance of OLD EMTs requires that you remove the parameters from the stack.

I found a new solution to this ancient problem with a routine that performs a stack rotation. You call the routine with the depth of the stack you want rotated and with the number of words you want it rotated by. It returns with the parameters at stack top where you can pop them for use - or just to throw them away. It is not unreasonably slow either - although speed was not an issue for this monitor.

I still had 150 free words. So, I added support for .TTYIN and .GTLIN and some other requests and a few more validity tests.

Since I still had some space I changed the fatal error loop into a simple CCL command interface. This cost me little more than a collection loop and a small ascii to rad50 routine. On top of this I put [ctrl/c] detection into the terminal handler to catch aborts. This lets you interrupt the bootstrap with a judicious [ctrl/c] and run a different image.

After some other changes and additions I felt a lot better. There are now only ten free words. Which means that if I want to add functionality I will have to start squeezing the code: and this is as it should be for a small RT-11 monitor. After all, this is what you call Tradition.

## More or less?

Actually I kept going. While RT-11 passes the date and time to a new monitor it does not pass the clock frequency. In Europe every RT-11 monitor has to be patched for 50 hertz. So I pushed the code around so that the program could be run as a utility with a simple command interface to SET and SHOW the clock rate and image name (the SHAREboot default evens up the score - it is 50 hertz).

My one night project had grown to five (with some interruptions called work). The source had grown to 105. blocks (mostly commentary on lots of structures and interfaces - an effective way to hide the actual code).

What did I learn?

I learned once again that programmers have a great ability to waste time on marginal projects if they catch their fancy.

It was a pleasant excursion back to my not always fond memories of memory cramped machines. The first eleven I used had precisely 4096 words of memory (fourteen were reserved for the paper tape bootstrap loader). I remember that when the department installed a second 4k words that I felt completely lost in space. What would I do with this huge area of memory.

The main thing I was aware of was the difference in how I saved memory. I used every trick in the book. Little things like:

```
bis (pc),2(sp) ;set the vbit
rti
```

Except that in SHAREboot the code reads:

```
stack pc ps ;entry point stack frame
assume vbit eq 2 ;
assume sp.ps eq 2 ;
bis (pc),ve.ps(sp);set the vbit
rti ;(is also 2)
```

In other words, I used all the old tricks but with assumption checks that made clear(er) what was happening and check the validity. This technique led to more reduction because I felt surer about what was happening.

The reason that the project was possible was the elegant simplicity of the basic RT-11 architecture. This elegance (with the single exception of the B\$DEVU variable stuck out in the middle of Nowhere) extends to its bootstrap procedure.

The name of the monitor took some time. I ended up calling it SHAREboot. But, the first name that occurred to me, and the name I still have in my head fits it better: RTminus. Less is more.

## .CLURP

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RT-11 is a knot with purges and closes. It always was.

Some of the historic problems:

.CLOSE to a simple lookup to a disk or non-file device is the same as .PURGE. On a disk .ENTER it causes the file to be made permanent. On a .LOOKUP/.ENTER to a SPECL\$ device (like magtape) it causes a call to the handler.

.PURGE is unconditional. It does not wait for I/O to run down on a channel. It just clears the channel status word and returns.

This has useful applications if you have run out of channels and have a slow rotating magnetic device. You can open the tape, issue something that will take a long time. Close the tape. Open up another file on the same channel. Do what you want with the second file. Close the second file and reopen the tape device in time to catch I/O completion.

While hunting thru the code I noticed some changes to .CLOSE. There are four new lines of strange code (added in V5.1 or V5.2). What they imply is that a device handler could have both the SPECL\$ and RT11A\$ bits set in the device status word. In this case every .CLOSE would be unconditionally sent to the handler .CLOS code.

```
; r3 -> channel status word
; r5 -> device status word

c$close: ...
bit #specl$(r5) ;new ;this a SPECL$ device?
beq 10$;new ;no - use standard test
bit #filst$(r5) ;new ;sic) this SPECL$ and RT11A?
brn 20$;new ;yes - call USR unconditionally
10$: bit #renam$chrit$(r3) ;need a directory update?
beq purge ;no
20$: jmp c$los2 ;yes - call the USR
p$urge: clr (r3)+ ;clear the CSW
br exit ;go back to user
```

No RT-11 device handler on the distribution kit sets both these bits. They could set on of them on the fly I guess - but it is more likely to be some layered product that needs it (perhaps dear DECnet). The new code is not in the SJ monitor.

## CSIGEN

.CSIGEN has a confused history of when it should close, or more recently, when it should purge channels.

In V1/V2 of RT-11 .CSIGEN always closed 9 channels. It tended to do this after errors as well, which meant that if it had entered an output file the error .CLOSE would make the new (zero length) file permanent effectively deleting the old file.

Therefore, around V4 .PURGE was used to cleanup the channels after an error. It purged 3 for SJ and 10. (one too many) for the FB monitor. This code was still in place in V5.2. And it was still in place in V5.3.

In V5.4 a number of changes were made.

In the routine below the #6 (.close) was changed to #3 (.purge). This means that CSIGEN never closes a channel.

```
restrt: mov #6+400+10,r5
10$: mov r5,r0
emt 374
decb r5
bpl 1$
```

The purge code for the SJ monitor at CSRTRY was removed:

```
csrtry: ...
mov #1402,r0
3$: emt 374
decb r0
bge 3$
```

In RMONFB the CSIERR routine below was replaced:

```
csierr: ...
mov (pc)+,r0
.byte 9.,3.
1$: emt 374
decb r0
bge 1$
```

with purges at the start of the CSIGEN entry point. The 9. was changed to an 8. so that only 9 channels would be purged rather than 10.

```
c$sign: ...
mov (pc)+,r0
.byte 8.,3.
10$: emt 374
decb r0
bge 10$
```

So, the V5.4 SJ monitor purges channels 0 thru 8. The V5.4 FB monitor does the same, but does them twice to make really sure (once at C\$SIGN and once at RESTRT).

The reason I looked at this code was because the V5.4 release notes said that in fact the change had been introduced before V5.4 and they were now correcting the documentation. I could not believe I would have missed such a change.

The problem is that some people expect CSIGEN to close output files for them. RT-11 has come the full circle. Where V1 could destroy output files V5.4 just refuses to create them at all.

## Magtape

The V5.4 release notes recognise a number of problems with .PURGE. Mainly, that if you purge a magtape channel you need to UNLOAD and LOAD the magtape again.

So we have been told that we should not use .PURGE. We have also been told that that CSIGEN will now use only .PURGE. Now, there used to be this book called CATCH 22.

What this means is that a typo during CSIGEN input will lose your magtape unit for you (if it is loaded). The documentation recommends that you do not LOAD magtape to get around this problem.

Perhaps what RT needs is .CLURP - a sort of purge-or-close-maybe request. It could use a random number generator (standard MACRO programmers arithmetic can normally be used for this purpose) to choose between .PURGE or .CLOSE. This way we would get it right at least some of the time.

The real way to solve the CSIGEN typo problem is to use CSISPC to collect the command and parse the syntax. Then resubmit the line to the monitor with CSIGEN. Most RT-11 utilities use CSISPC rather than CSIGEN - so you do not get burnt to often with the standard cusps.

## HNDLR\$ & ABTIO\$

These two device status word flags let a device handler get control of most of the things they need to cleanup. The HNDLR\$ forces all program aborts to be passed unconditionally to a handler. The ABTIO\$ flag forces all program exits to a handler.

The new MU: TK50 magtape handler uses both these flags. The older magtape handlers use only HNDLR\$. Reworking the code of the older magtape handlers is definitely not a rewarding experience.

## V5.3/V5.4 driver utility calls

V5.3/V5.4 introduce a set of handler driver utility calls that let a handler get control during installation, fetch, release and removal operations. This is great stuff because it lets a handler take out patches it put into the monitor or turn off interrupts that it left enabled across calls.

There is an even better case for device handlers to be able to get a call when a program wants to purge/close the connection (if the handler wants it). Magtape needs this badly but other handlers could use it as well.

To: Persons interested in extended memory RT11XM drivers

From: Robert (Abe) Williams  
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Before the advent of shared global regions in RT11XM, my communications driver used extended memory for packet buffers. However, the application programs had to go through a painful process in order to remove the packets destined for them. With shared global regions the applications can access the communications buffers considerably easier.

When I received RT11XM vs 5.3, I decided to do it right(?) by using the LOAD/UNLOAD entry points and the shared global regions. I examined the DU driver provided by DEC (which uses the \$REL macro for code relocation) and decided that there must be an easier way. This submission reflects the results.

This code was written as an example of how to write and use drivers that reside in upper memory. This is not a good example of how to write an efficient or usefull printer driver. The model for this driver is a network communications system that contains internal queueing and simultaneous transmitting and receiving from multiple jobs in the RT11XM environment.

To keep it as small as possible, the driver was changed to a simple printer write function with no internal queueing. In addition, comments and explanatory lines have been greatly reduced. Some parts remain that are not actually needed or useful so that code was included describing means by which the upper and lower code can communicate.

e.g: The Packet address could be passed in R4 instead of via SAVCEQ  
There is no real need for the Open or Close requests.  
There is no need for the ABTIO!HNDLR settings  
There is no need to copy the user buffer to upper memory since  
this driver does not use internal queueing.  
etc. etc. etc.

In addition to saving space in low memory, the advantage of this method is the ease of coding the upper driver code. Use of the \$REL macro and position independant code are eliminated resulting in less code and faster processing.

When writting the upper code, I set the .ASECT value to 40000. The use of APR 2 for the upper driver code is non standard to say the least. The main (and I think only ?) limitation is that no driver or interrupt service routine can be located within the APR 2 boundry. In most cases in an RT11XM environment, this should not be problem. However, care must be used in handling Apr 2 to assure proper system mapping (see code).

With Apr 2 mapped to the driver code, I can map Apr 1 easily in the code and access the user buffers directly. However, the method will still work if the upper code were mapped to Apr 1 and the system move macros used.

One point remains. This was (to me) the easiest way to do it. However, all of the code could be combined in one large .MAC file and the LOAD entry point of the main driver could:

- 1). Create the Common region,
- 2). Read the remainder of the driver file and load the code to upper memory, and
- 3). Initialize both the lower and upper code regions.

This would eliminate the additional program to load the common area. However, if the load portion is included in the main driver file, additional effort is needed to pic all of the address constants for the region and window control blocks. Also, since most of my development work was on the upper code area, this way resulted in less time consumed when the driver was rebuilt. Anyway, The main purpose of this document is to present an idea and possibly provide useful information for someone else.

After the code is written, the following lines are required to build install and use the driver:

- 1). Build the program that creates the common region in addition to loading the upper part of the driver code in extended memory.

```
MAC/OBJ:DK:LDCOMM DK:LDCOMM
LINK DK:LDCOMM
```

- 2). Create a .SAV image out of the upper code driver area with a global symbol table which is used by the lower driver code.

```
MAC DK:TPE.MAC
LINK/OBJ:TPE.SAV/SYM:DK:TPE.STB DK:TPE
```

- 3). Build the driver low memory code in normal driver build fasion.

```
MAC/OBJ:TPM.OBJ DK:XM.MAC+DK:RT11XM.CND+DK:TPM
LINK/EXE:DK:TPX.SYG/NOBITMAP/PROMPT
TPM
DK:TPE.STB
DK:RT11XM.STB
//
```

- 4). Copy LDCOMM.SAV and TPE.SAV to SY:  
Copy TPM.SYG TO SY:TPX.SYS

- 5). Include the following in a startup file:  
LDCOMM  
LOAD TP:

The code for the three .MAC files are presented on the following pages.

```
.TITLE LDCOMM.MAC Create Common and load driver code
; Author: Abe Williams
; Conference Communications Inc
```

```
.MCALL .EXIT, .RDBBK, .CRRG, .ELRG, .CRAW, .MAP
.MCALL .WDBBK, .PRINT, .CLOSE
```

```
; This code creates the TPRINT common area and loads TPE.SAV to
; the extended memory driver common area. The loaded code is an
; extension of the TPX.SYS driver which is loaded into the normal
; system driver area. Also, after the TPE.SAV image is built,
; the SPLIT program could be used to eliminate the lower 40000
; bytes of the .SAV image thereby saving space on SY:.
```

```
; First we need to see if it is worth it, is the hardware there ?
```

```
LDCOM: MOV @#4,SVTRAP ; Save the system address trap location
 MOV #ERTRAP,@#4 ; Move our local trap address
```

```
CLR ERROR ; Clear the error indication
TST @#176500 ; Test the hardware controller address
```

```
MOV SVTRAP,@#4 ; Restore the systems trap address
TST ERROR ; See if we bumped it
BNE NODEV ; NE = The hardware is missing
```

```
Printer hardware is there, create the driver common area
```

```
.CRRG #AREA,#REGION ; Create the system common region
BCS COMERR ; CS = We have a problem
MOV REGION+R.GID,WINDOW+W.NRID
```

```
; Put Region ID in Window ID
.CRAW #AREA,#WINDOW ; Create the window
BCS COMERR ; No good
.MAP #AREA,#WINDOW ; Map it
BCS COMERR
```

```
CALL LDCOMM ; Load the common area
```

```
.ELRG #AREA,#REGION ; Deattach from the area, Leave it global
BR DONE ; All is well, exit
```

```
NODEV: MOV #HDWERR,R0 ; No driver hardware
```

```
BR QUIT
```

```
COMERR: MOV #CMNERR,R0 ; Common region error
```

```
BR QUIT
```

```
FILERR: MOV #NOFIL,R0 ; Can't find the driver code
```

```
QUIT: .PRINT R0
```

```
DONE: .EXIT ; Leave the program
```

```
; Local Address trap entry point
```

```
ERTRAP: INC (PC)+ ; Bump it, Device not there
```

```
ERROR: .WORD 0 ; Error flag for non existand memory
```

```
RTI ; Return from interrupt
```

```

;
; Load the driver comon region -
;

LDCOMM: MOV #DFILE,R0 ; Point to the lookup function
 EMT 375 ; Find the driver code
 BCS FILERR ; No driver code

 MOV #40,RDBLK ; First block to read biased to APR 2

 MOV WINDOW+W.NBAS,R2; Driver window address

100$: MOV #READIT,R0 ; Disk Read DPB Address
 EMT ^0375 ; Issue the Read
 BCS 300$; CS = Read Error

 INC RDBLK ; Increment the disk block number
 MOV #256.,R0 ; Length of the block
 MOV #SYSBUF,R1 ; Point to the start of the local buffer

200$: MOV (R1)+,(R2)+ ; Move the code a word at a time
 SOB R0,200$; Loop for 256. words
 BR 100$; Loop until End of File or disk error

300$: .CLOSE #WK.CHN ; Assume an end of file error
 RETURN

;
; Region and Window definition blocks -
;

REGION: .RDBBK 64.,<RS.CGR!RS.GBL>,NAME=TPRINT ; 2 KW common area
WINDOW: .WDBBK 3,64. ; for the driver code
AREA: .WORD 0,0,0,0,0,0 ; I/O request work area
SVTRAP: .WORD 0 ; Save Systems trap address

 WK.CHN = 1 ; Channel for the file read

READIT: .BYTE WK.CHN ; Read block channel number
 .BYTE 10 ; Read function code
RDBLK: .WORD 0 ; Block number to read
 .WORD SYSBUF ; Block read buffer
 .WORD 256. ; Block read word count
 .WORD 0 ; Read with wait

DFILE: .BYTE WK.CHN ; Using the work channel number
 .BYTE 1 ; Lookup function
 .WORD DNAME ; Driver code file name
 .WORD 0

DNAME: .RAD50 /SY TPE SAV/ ; RAD 50 name of driver code
SYSBUF: .BLKW 256. ; Input file read buffer

HDWERR: .ASCIZ /Printer Hardware is missing/
CMNERR: .ASCIZ /Error in creating the driver common region/
NOFIL: .ASCIZ /Driver code is missing/
 .END LDCOM

```

```

.TITLE TPM.MAC Line printer test driver

; Author: Abe Williams
; Conference Communications

.MCALL .DRDEF, .INTEN

;
; I/O Initialization section -
;

TP$CSR = 176500 ; Printer CSR
TR$VEC = 300 ; Receiver vector
TT$VEC = 304 ; Transmitter vector

.DRDEF TP,371,HNDLR$!ABTIO$!SPFUN$,0,TP$CSR,TR$VEC
.DRPTR FETCH=*NO*,LOAD=TPINI,RELEASE=0,UNLOAD=TPGONE
.DREST CLASS=DVC.UK
.DRSFF <200,201,202> ; Open, Close, Write
.DRBEG TP

RELOC = . - 6 ; Load code needs a relocation address

INIT: MOV #D$MAIN,JMPADD ; Enter upper code at main entry point
; CALLIT: Entered when the driver code in the comon area is accessed

CALLIT: MOV @#KISAR2,-(SP) ; Save the system APR 2mapping
 MOV APBASE,@#KISAR2 ; Map the upper code
 CALL @JMPADD ; Enter the Upper code
 MOV (SP)+,@#KISAR2 ; Restore system mapping
 RETURN ; Back to the system

TPGONE: CLR @#TP$CSR+4 ; Unload entry point
 RETURN ; Stop Tx interrupts just in case

;
; D R I V E R I N T E R R U P T T A B L E -
;

.DRVTB TP,TR$VEC,RXINT ; Receiver interrupt code
.DRVTB ,TT$VEC,TPINT ; Transmitter interrupt code

;
; T R A N S M I T T E R I N T E R R U P T C O D E -
;

PTABO: JMP TPABO ;;; Enter the abort code
 .DRAST TP,6,PTABO
 MOV @#KISAR2,-(SP) ;;; Save the system APR 2 value
 MOV APBASE,@#KISAR2 ;;; Map the upper code TX buffer

 MOV @#TXCURR,R5 ;;; Address of the current byte to transmit
 MOV (R5)+,@#TP$CSR+6 ;;; Send a byte to the printer
 DECB @#TXLEN ;;; One more byte is gone
 BMI TXDONE ;;; If the length is minus, we are done

 MOV R5,@#TXCURR ;;; Save the transmit buffer address
 MOV (SP)+,@#KISAR2 ;;; Restore system mapping
 RTS PC ;;; Back to the system

```

```

;-----
; Packet sent, stop transmitter, see what is next -
;-----
TXDONE: BIC #100,@#TP$CSR+4 ;; Stop transmitter interrupts
MOV (SP)+,@#KISAR2 ;; Restore APR 2 before the fork

.FORK TXMFRK ;; Drop to priority zero

MOV #D$TRAN,JMPADD ; Enter upper code at TX completion
JMP CALLIT

;-----
; A B O R T E N T R Y P O I N T -
;-----
TPABO: MOV #D$ABO,JMPADD ; Enter upper code at Abort entry point
JMP CALLIT

;-----
; R e c e i v e r I n t e r r u p t -
;-----
JMP TPABO
RXINT:: RETURN ; This is a semi-fake driver, ignore
; XON/XOF stuff.

;-----
; L o c a l S t o r a g e -
;-----
KISAR2 = 172344 ; Hardware APR 2 address
JMPADD: .WORD 0 ; Jump address to the upper code section
APBASE: .WORD 0 ; APR Base for the upper code
TXMFRK: .WORD 0,0,0,0 ; Transmit Fork block area
.DREND TP

```

RT-31

```

;-----
; TPINI: Entry point for the TP driver when it is loaded -
;-----
.PSECT SETOVR

; The actual driver code is loaded and R5 points to the base of it.
; We do not know where we are in memory so any addresses used must be PICed.

TPINI:: NOP ; Needed for ODT usage
MOV (R5),SVBASE ; Save the base of the driver code
MOV @#SYSPTR,R4 ; Find the driver buffer common
MOV LP1EXT(R4),R4 ; using system pointer to P1ext

MOV PC,R5 ; Pic the common area name
ADD #DNAME-. ,R5 ; Driver common name pointed to by R5

CALL FINDGR(R4) ; Find the driver common region
BCS 900$; Not found, do not load the driver
MOV 2(R1),SVCODE ; APR base of the common area
CALL INTDRV ; Init the driver
CLC ; Exit, driver is loaded and initialized
900$: RETURN

;-----
; Initialize the TP Driver low memory code section -
;-----
INTDRV: MOV SVBASE,R5 ; Get back the drivers base address
MOV R5,R0 ; Need a copy
ADD #APBASE-RELOC,R0 ; Offset to the APR save area
MOV SVCODE,(R0) ; Move the upper code starting base address

;-----
; Load the driver extended code region -
;-----
MOV @#KISAR2,-(SP) ; Upper code is mapped to APR 2
MOV SVCODE,@#KISAR2 ; Map the upper code directly
MOV R5,R0 ; Driver base address again
ADD #TPCQE-RELOC,R0 ; Point to the Queue element address
MOV R0,@#SAVCQE ; Save packet address in the upper code
MOV (SP)+,@#KISAR2 ; Restore system mapping
RETURN

SYSPTR = 54 ; RMON System pointer
LP1EXT = 432 ; Offset to systems $P1EXT and difference to
FINDGR = -12 ; the find global region code

SVCODE: .WORD 0 ; Upper memory code base address
SVBASE: .WORD 0 ; Driver low memory base address
DNAME: .RAD50 /TPRINT/ ; Driver common name
.END

```

RT-32

```

.TITLE TPE.MAC Upper code for line printer example
; Author: Abe Williams
; Conference Communications
.MCALL .QELDF ; Need Queue Element symbols
.MACRO .TPFIN ; Need to build our own version of this
MOV @#54,R5 ; because no one knows we are a driver.
MOV SAVCQE,R4 ; We need the queue element address
JSR PC,@270(R5) ; Need JSR instead of the normal JMP
.ENDM
HDERR$ = 1 ; Define Hardware error bit
.QELDF ; Define the queue element offsets

.ASECT ; Build the code in an absolute section
.=40000 ; Bias the addresses to APR 2 values

D$MAIN:
MOV @SAVCQE,R4 ; Get the I/O packet address
MOVB Q$FUNC(R4),R2 ; Get the function code
BIC #177600,R2 ; Remove the high order bits, leave function
CMP R2,#FNCMAX ; Is the function too big ?
BGT DRVERR ; GT = Invalid function
ASL R2 ; Word offset for the jump table
ADD #FNCTBL,R2 ; Index into the table
JMP @(R2) ; Process the request

DRVERR: BIS #HDERR$,@-(R4) ; Set driver error
Q.EXIT: .TPFIN ; Complete the packet
RETURN ; Back to the main driver to remap APR 2

;-----
; OPEN: Driver open request -
;-----
OPEN: BIT #S.OPEN,STATUS ; Is this a duplicate request ?
BNE DRVERR ; NE = Yes, a duplicate open

BIS #S.OPEN,STATUS ; Driver is open for business
BR Q.EXIT ; Complete the request

;-----
; CLOSE: Driver Close Request -
;-----
CLOSE: BIT #S.OPEN,STATUS ; Is someone here ?
BEQ DRVERR ; EQ = Nope

BIC #S.OPEN,STATUS ; Close up shop
BR Q.EXIT

;-----
; WRITE: Write request -
;-----
WRITE: BIT #S.OPEN,STATUS ; Are we open for business ?
BEQ DRVERR ; EQ = Nope, forget it
MOV Q$WCNT(R4),R0 ; Get the packet byte count
CMP #1,R0
BGT DRVERR ; Must be at least one
CMP #P.SIZE,R0 ; Look for the maximum size packet
BLT DRVERR ; LT = No good

MOV R0, TXLEN ; Save the packet length
ASL TXLEN ; Need bytes for the transmit length
MOV #TXBUFF,R2 ; Get internal buffer address
MOV R2, TXCURR ; Reset the transmit address

MOV @#KISAR1,-(SP) ; Save the system mapping
MOV Q$PAR(R4),@#KISAR1 ; Map the users buffer
MOV Q$BUFF(R4),R1 ; Users buffer
BIT #1,R1 ; Make sure it is word aligned
BNE DRVERR ; NE = No good

100$: MOV (R1)+,(R2)+ ; Move the Data to our buffer
SOB R0,100$
MOV (SP)+,@#KISAR1 ; Restore system mapping
BIS #100,@#TP.CSR ; Enable transmitter interrupts
RETURN ; Done, Let TPM driver send it

;-----
; D$TRAN: Transmit completion code -
;-----
D$TRAN: .TPFIN ; For this simple example, nothing to do but
RETURN ; complete the I/O request.
; Return to interrupt handler to remap APR 2

;-----
; A B O R T E N T R Y P O I N T -
;-----
D$ABO: BIT #S.OPEN,STATUS ; A job aborted, assume it is ours if the
BEQ 100$; link is open (Actually R4 contains the
; job number and it should be checked)
BIC #S.OPEN,STATUS ; Close up
TST @SAVCQE ; Are we doing something ?
BEQ 100$; EQ = Nope
.TPFIN ; Terminate the packet
100$: RETURN

;-----
; Driver internal work areas and jump addresses -
;-----
KISAR1 = 172342 ; System APR one Value
P.SIZE = <134/2> ; Max line size in words (Example only)
TP.CSR = 176504 ; Transmitter CSR register
TP.BUF = 176506 ; Transmitter buffer register

STATUS: .WORD 0 ; Driver status
S.OPEN = 1 ; Set = Open has been issued

; The following need to be global so the interrupt handler can find them.
SAVCQE: .WORD 0 ; Main section queue element addresses
TXCURR: .WORD 0 ; Current transmit address
TXLEN: .WORD 0 ; Current (remaining) Transmit count
TXBUFF: .BLKW 60. ; Transmit buffer
FNCTBL: .WORD OPEN ; 200 Driver open
; .WORD CLOSE ; 201 Close request
; .WORD WRITE ; 202 Write request
FNCMAX=<<.-FNCTBL>/2> ; Maximum valid functions
.END

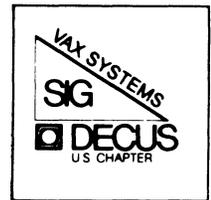
```

# NEWSLETTER OF THE VAX SYSTEMS SIG



*Our Mascot*

# Pageswapper



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Preference is given to material submitted as machine-readable text (best is Runoff source). Line length should not exceed 64 characters and the number of text lines per page should not exceed 48 (these limits are particularly important for sample commands, etc. where simple text justification will not produce a meaningful result).

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

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

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DECUS U.S. Chapter  
Attention: Publications Department  
249 Northboro Road (BP02)  
Marlborough, MA 01752  
USA

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

## Editor's Workfile

Not to say I told you so, but -

There aren't any real feature articles this month, because none were submitted. There are still some outstanding promises people have made to me to send specific articles (you know who you are). There is a strong showing this month, however, from the I/O section. Personally, I find the I/O material we have been getting lately quite instructive. There is (naturally) a lack of coherent writing style, something which cannot be fixed without perturbing the original spirit of the submissions. There could be a better graphic rendition, and I am working on fixing that. But what about the material? If anyone is bored by so much material about specific problems, send me a note. Absent your comments, the Pageswapper will be arranged in whatever fashion appeals to me!

In praise of Bliss -

I just finished a very intense period of work to finish some software before a trade show. The software was to run in driver context, but including the reboot time in the debug cycle would be extremely painful. So I debugged the logic in process context (including QIOs to communicate with the "other machine") where I could learn my lessons with the better debug facilities, and maybe even let others at the site use the VAX during my development effort.

Another major aid to the debugging process was Bliss. Using Bliss with FIELD declarations (unlike most of the examples in the VMS microfiche) provides a modicum of type-checking, although it is nothing like the strong checking I would prefer from a language like Pascal or (I am led to believe) Ada. But I did not have the freedom of choice because the ultimate environment of the code was driver context. It was Bliss or Macro, and the choice was clear.

There is a certain difficulty in starting up, because there are not DEC-supplied declarations for all the JSB=linkages used in calling exec subroutines, but once you specify it, you can be sure that no error on your part is going to be due to forgetting that EXE\$INSERTIRP destroys the contents of R1.

I was exempted from the troublesome WFIKPC linkage (not supported in Bliss) because my driver was a pseudo-driver with no physical device. The lack of that linkage, however, is probably the strongest reason why there are not a larger number of VMS device drivers being written in Bliss.

This praise for Bliss (despite such shortcomings), is however partly out of scorn for other languages which have not supplied ANY facilities which are needed for writing VMS device drivers. The management in question is a STRONG proponent of C, but using C to call exec routines is out of the question because it does not support JSB linkages at all. (I am talking about DEC-supplied languages here, but I doubt that any other vendor provides this support for a VAX if DEC does not).

And looking to the future, what improvements might be in this area? I put the question to a DEC software developer involved with Ada, and the answer was a polite "not very likely". The are considering increased use of JSB linkages for their compiler-generated calls to the RTL, but not to open it up for user-specified JSB linkages (I am not sure how one extends the language in that fashion without incurring the wrath of the Pentagon, but I gather there are enough loopholes in the bureaucracy that one can get around it by calling it a Pragma or a Package; probably not a Rendezvous -- I think I know what that one means).

I have an acquaintance I have met through DECUS Symposia who is under what might best be called "management direction" to develop code which does not use any calls to the DEC runtime libraries, including calls generated automatically by the compilers. My friend is also under instructions to use the highest level languages possible. That is a thorny problem. So, compiler-writers of the world take note: just because we want access to the VMS exec doesn't mean we don't want higher level languages.

## INPUT/OUTPUT

### A SIG Information Interchange

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```
=====
Note 416.1 Journal files created using Backup 1 of 1
"Michael R. Pizolato" 16 lines 15-JAN-1987 14:58
 <- Getting around the problem. >-

```

I got around the problem by creating a uniquely named journal file for each type of backup I do (daily, weekly, etc.). Then, my backup command procedure simply purges the old journal file after the new one has been created. To view the journals, I wrote a command procedure to display the files in newest to oldest order, taking the BACKUP qualifiers /SELECT, /SINCE, /BEFORE, etc. to specify files.

I can send you a copy of the procedures if you want.

Michael R. Pizolato  
AT&T Technology Systems  
Dept. 323610  
555 Union Blvd.  
Allentown, PA 18103  
215/439-5500

=====  
Note 508.2           LAl00 Line Drawing Problem           2 of 3  
"DON A IRONS"           7 lines   2-JAN#1987 15:50  
  -< VT100 line drawing not working on LAl00 >-  
-----

We had a similar problem with the LAl00 font cartridge for VT100 line drawing characters. It worked in one LAl00 but not in another. We did "call Field Service" thinking one LAl00 was broken. It turns out one LAl00 was not up to the current ROM revision level (v2.0). Since our printers were on maintenance DEC fixed the problem at no additional cost. You can check the ROM revision level on the first line of the self-test output.

DON A IRONS  
PRC SYSTEMS SERVICES COMPANY  
151 CENTER STREET  
CAPE CANAVERAL FL 32920  
305-784-4290

=====  
Note 508.3           LAl00 Line Drawing Problem           3 of 3  
"Jack Patteeuw"           7 lines   5-JAN#1987 14:04  
  -< V2.0 not available on KSR >-  
-----

Ah Ha ! But you have a LetterPrinter 100 (Receive Only) while I had a LetterWriter 100 (Keyboard Send/Receive) and the V2.0 software was never released for the KSR models (except in Japan ?!!!).

So if you've got the R0 model get the V2.0 software, else if you have the KSR model you need the overlay chip !

Jack Patteeuw  
Ford Motor Co.  
Electrical and Electronics Division  
31630 Wyoming  
Livonia, MI 48150  
313-323-8643

=====  
Note 529.3           WPS+ Printer tables           3 of 3  
"Jack Patteeuw"           20 lines   22-JAN#1987 18:00  
  -< Here it is ! >-  
-----

Well someone had to do it, so we did !

In my directory [US17698] there are WPS+ printer tables for the XEROX 2700 and HP Laserjet printers (XEROX.PRA, XEROX.PRC, HP.PRA and HP.PRC). I believe that the HP ones are better than the ones DEC is distributing which we could not make work. I wish to thank Jim Buczkowski of Ford Motor Co. and Terry Dishneau of DEC for their help.

In building these tables we found a bug in the Printer Table Utility. (PTU which is not documented in your ALLIN1 manuals nor is it supported for users by Digital. It was documented in the DECUS Newsletter under the OA Newsletter a few months ago). If you add too many additional attributes to the Printer Attributes file (.PRA) (as we have) PTU will blow up. Luckily these are just straight sequential files so you can use your favorite editor to add more add the end. The record format is obvious.

Both of these printer and the associated .PRA and .PRC file have certain optional font cartridges that you may not have. The HP table even handle most of the VT100 line drawing set !

Jack Patteeuw  
Ford Motor Co.  
Electrical and Electronics Division  
31630 Wyoming  
Livonia, MI 48150  
313-323-8643

```
=====
Note 534.1 Looking for public-domain SMTP 1 of 1
"John P. Hoekstra" 11 lines 9-JAN-1987 10:07
 * < Software Tools has it. > -

```

There is such an implementation in the LBL (Berkeley Labs) Software Tools release that runs on many different computer systems. The tools are written in RATFOR.

There is also a gateway to VMS mail that we have been using that works well. The SMTP protocol is implemented independently from the network support, so it can be used over DECnet, UUCP, etc.

In general we have been very pleased with this implementation. We are running it on VMS, RSX-11M, and RSX-11M-PLUS using both the SMTP and VMS mail protocols.

John P. Hoekstra  
Macatawa Computer Services, Inc.  
1 West Fifth Street  
Holland, MI 49423-2908  
(616)392-6941

```
=====
Note 541.2 DZ11-A multiplexer with DF112 modem? 2 of 3
"Chris Erskine" 7 lines 5-JAN-1987 07:43
 * < Jumpers on older boards > -

```

On the DZ11-A, the distribution panel is the 16 port board. One of the jumpers on the board should control the Request-To-Send signal to the port for the jumper.

If this does not work, by creating a special cable which will connect pin 4 of the modem connector to pin 20 of both connectors, RTS will follow DTR.

Chris Erskine  
6001 Adams Rd.  
Bloomfield Hills, MI 48013  
(313) 258-4049

```
=====
Note 541.3 DZ11-A multiplexer with DF112 modem? 3 of 3
"John P. Hoekstra" 8 lines 9-JAN-1987 10:16
 - < Hardware disagreement on DTR at pin 25 > -

```

A problem that we encountered with DF112s, DZ-11, and 25-pin cables is that the DZ-11 sends DTR to pin 25 on the distribution panel. Unfortunately, the DF112 uses pin 25 to put itself into test mode. Pin 25 is officially unused, so this is allowed(?) in standard RS-232.

Our fix was to disable the usage of pin 25 on the DF112 end by setting switch #6 in switch pack #2 to the off or open position. This switch pack is the one closer to the finger side of the board.

John P. Hoekstra  
Macatawa Computer Services, Inc.  
1 West Fifth Street  
Holland, MI 49423-2908  
(616)392-6941

```
=====
Note 545.2 Problem with Job Queue Manager 2 of 2
"Jack Patteeuw" 22 lines 5-JAN-1987 15:15
 - < "one" solution > -

```

After much wailing and moaning and gnashing of teeth with my local DEC office, I finally got the problem elevated at Colorado Spring, who admitted they didn't know what the problem was. Finally the VMS development team was brought in.

After modifying the code to log the transaction of events and analyzing the log files after the job queue manager died, The VMS team admitted there is a bug in 4.5 (and previous versions) which could cause a bad record to be written into the JBCSYSQUE.DAT file. They have sent me a patched version 4.5 job controller but I haven't tried it yet because my problem seems to have gone away !

I had guessed that the problem was caused/aggravated by the JBCSYSQUE.DAT file not being contiguous either because it had to grow from it's initial size or because the disk was to fragmented to create it contiguously to begin with. So I backed up and reloaded my system disk and made the initial size much larger (500 blocks) and the problem "seems" to have gone away !

File this piece of info for the next time you have a "unexplained" problem with the Job Queue Manager !

Jack Patteeuw  
Ford Motor Co.  
Electrical and Electronics Division  
31630 Wyoming  
Livonia, MI 48150  
313-323-8643

=====  
Note 548.2                    Disc Corruption Problem                    2 of 2  
"Ken A L Coar"                    6 lines                    9-JAN-1987 13:59  
                  < CI rev 7 mu-code, maybe? >-  
#####

Concerning the 'unsupported file structure' problem: I have heard that Revision 7 of the CI microcode introduces problems with the HSC-CI interaction; might this be biting you by corrupting data synchronization?

#k

Ken A L Coar  
General Dynamics  
Office Systems  
12101 Woodcrest Executive Drive  
Creve Coeur, MO 63141  
(314) 851.4003 (CST)

=====  
Note 549.3                    VAX 785 Memory Requirements                    3 of 4  
"Ken A L Coar"                    4 lines                    9-JAN-1987 14:01  
                  < 24Mb.. 24Mb.. Do I hear 32Mb? >-  
#####

Ballpark figure department for memory requirements: 24Mb on a 785 for 30-40 interactive All-At-Once users.

#k

Ken A L Coar  
General Dynamics  
Office Systems  
12101 Woodcrest Executive Drive  
Creve Coeur, MO 63141  
(314) 851.4003 (CST)

=====  
Note 549.4                    VAX 785 Memory Requirements                    4 of 4  
"C J "Buck" Trayser"                    4 lines                    12-JAN-1987 11:56  
                  < Ballparks, never any better... >-  
#####

24Mb would be good. For 35 users I usually suggest 20Mb, so your suggestion sound to be in line!

\$

C J Trayser  
360 Interstate North Parkway  
Suite 600 - MS: 6/B4  
Atlanta, Georgia 30339

=====  
Note 561.1                    Pervasive Pagefaults                    1 of 2  
"Jamie Hanrahan"                    16 lines 12-JAN-1987 17:21  
                                          -< what about analyze/disk ? >-  
-----

It occurs to me that the problem described in the article will also occur every other time that an ANALYZE/DISK/REPAIR is done on the system disk! (I haven't seen it occur either, but I haven't tried to reproduce it yet.) Even if you don't have compatibility mode installed, there are other ways that the problem could occur; for instance, if you have stand-alone BACKUP installed under [SYSE] on your system disk, you'll find that [SYSE.SYSCOMMON] is an alias for [SYSØ] (I believe; my memory on this is fuzzy), and an ANALYZE/DISK/REPAIR can make [SYSE.SYSCOMMON] the real one and [SYSØ] the alias.

It also occurs to me that if your disk HAS become messed up this way and you want to put things right on-line (or maybe you have to, if for instance you don't have another disk drive handy), judicious use of the "Y" response to ANALYZE/DISK/REPAIR/CONFIRM would let you restore all of the directory backlinks to the correct values. But again, I haven't tried any of this. (Something else to do in my "copious free time".)

Jamie Hanrahan  
Simpact Associates  
9210 Sky Park Court  
San Diego, CA 92123  
619-565-1865

=====  
Note 561.2                    Pervasive Pagefaults                    2 of 2  
"Jack Patteeuw"                    6 lines 13-JAN-1987 15:54  
                                          -< NOT an ANALYZE/DISK problem >-  
-----

I am not familiar with the original problem but I can say from experience that ANALYZE/DISK/REPAIR will NOT in anyway harm your system disk, even if you have built Stand-alone Backup in [SYSE].

It may complain a little about doubley defined files but it will do "it's thing" correctly.

Jack Patteeuw  
Ford Motor Co.  
Electrical and Electronics Division  
31630 Wyoming  
Livonia, MI 48150  
313-323-8643

=====  
Note 564.1                    SYNCHRONOUS AUTODIALING                    1 of 1  
"Jamie Hanrahan"                    13 lines 12-JAN-1987 17:11  
                                          -< sorry, no. Try a DMF? >-  
-----

My first guess is that you can't do it. The fact that the DMC is owned by DECnet is only part of the problem, as it ought to be possible to write some code that emits the proper network management \$QIOs to get DECnet to turn the device loose, then autodials, then tells DECnet to start the line again. A much more difficult problem is the fact that the DMC will send no data out the line until DDCMP has been started on that line; this involves the exchange of DDCMP START and START ACK messages with the remote system. You can't talk to the remote system until you've autodialed, so you're stuck.

Do you have a DMF32 sync port available? If so, you might consider running this connection through that. Sure, the DMF is less efficient in terms of host CPU loading, but at 1200 or even 2400 bps I doubt you'll notice the difference (except on a 730, and maybe not then).

Jamie Hanrahan  
Simpact Associates  
9210 Sky Park Court  
San Diego, CA 92123  
619-565-1865

```
=====
Note 565.0 RM02's on a VAX/750 1 reply
"Jacob Schwartz" 10 lines 5-JAN-1987 00:40

```

I'm trying to attach RM02's to an RH750 Massbus Adapter. SYSGEN's AUTOCONFIGURE ALL command does not bring any DR devices up. I tried to CONNECT DRA0: specifying the CSR and vector. Now, the SHOW DEVICE command displays the device DRA0:, but the status is "offline". SHOW DEVICE/FULL gives me a device type RP07. VMS thinks the RM02 is an RP07. What if I change the serial #/ID on the RM02 to look like an RM03, which is definitely a supported device? Will I also have to change the pulley to increase the drive speed from 2400 to 3600 RPM?

Jacob Schwartz  
Albest Metal Stamping Corp.  
1-15 Kent Ave.  
Brooklyn, N.Y. 11211  
1-718-388-6000

```
=====
Note 565.1 RM02's on a VAX/750 1 of 1
"Chris Erskine" 13 lines 5-JAN-1987 08:20
 =< Alias device type for RM02 >-

```

The driver for VMS does not know what a RM02 is. This has been the case since the first 780. We had a 'DEC SALESMAN' sell us an RM02 to be connected to a 780 saying that all orders were checked to be sure that it would all work. (This salesman also told us we could dual port disc's between an RSX and VMS system for concurrent access).

DEC field service fixed the RM02 problem for use by reconfiguring the RM02 controller to respond as an RM03 drive. VMS does know what an RM03 is and the disc drives use the same interface boards. With the RM02 telling the VAX that it is an RM03, the VAX would use it with out any problems. Our PDP 11/40 also worked with the RM03/2.

Chris Erskine  
6001 Adams Rd.  
Bloomfield Hills, MI 48013  
(313) 258-4049

```
=====
Note 566.0 Re-using VMS Subprocesses 1 reply
"Jack Patteeuw" 7 lines 5-JAN-1987 16:49

```

Please help I think I'm losing my mind ! In some publication (Amazing how many there are now on VAX/DEC, isn't it ? I still think that the combined DECUS newsletters, especially Pageswapper, is the BEST !) I remember reading an article on "re-using" VMS subprocesses. Can somebody please point me in the proper direction as my personal library is not well organized enough to allow me to search through the indices.

Jack Patteeuw  
Ford Motor Co.  
Electrical and Electronics Division  
31630 Wyoming  
Livonia, MI 48150  
313-323-8643

```
=====
Note 566.1 Re-using VMS Subprocesses 1 of 1
"M. Erik Husby" 82 lines 6-JAN-1987 10:43
 =< Asynchronous Subprocess routines >-

```

I assume that you mean from within a program. We have written a set of routines that you should be able to duplicate very easily; I do not know if we plan to release the routines to DECUS but I will describe what we did. These routines run the subprocesses asynchronously. These routines allow you to run any program that does not expect to use a terminal because they direct all input and output to mailboxes. We have also extended the routines so that we can run processes across DECnet.

Our package consists of:

create process -- this routine sets up mailboxes and the necessary internal control blocks.

write command +- Sends a command to the SYS\$INPUT mailbox of a process.

read output, no wait -- returns a line of output if one is available. Returns a status code which can be one of three values: Success -- a line of output returned, No output available, and Subprocess is waiting for input.

read output, wait -- same as previous read except if no output is available waits until some is or the subprocess needs input.

status -- returns status information about a process, i.e. image being executed, number of pending output messages, and other information.

send eof -- sends an eof message to the subprocess.

force exit -- uses the forcexit system service to kill an image, causes subprocess to return to DCL level.

The system uses the following mailboxes:

A general SYS\$OUTPUT mailbox -- each subprocess has SYS\$OUTPUT directed to this mailbox. The pid of a process is in the io status block when a message is read so we know where it came from.

A subprocess specific SYS\$INPUT mailbox -- each subprocess gets its own SYS\$INPUT mailbox.

A general subprocess termination mailbox -- VMS writes an accounting message to this mailbox when a subprocess terminates.

We use asynchronous traps to read messages written to the SYS\$OUTPUT mailbox. Once we determine who the message came from it is added to a message queue for the particular process. The read output routines simply pull messages off this queue.

We also use an asynchronous trap to read the termination messages. status bits in the internal process control block are updated upon receipt of a termination message.

Programming these routines is not hard if you are familiar with the system services, specifically we use \$CREMBX, \$QIO, \$FORCEX, \$GETJPI and the runtime routine LIB\$SPAWN.

We did the network enhancements by creating a network server process that used the existing routines to control subprocesses. The network server simply passes command lines to the subprocesses and sends their output back to the originating node.

As a final flair we packaged the routines into a shared image that can be called from TPU. Now while I am in EVE I can run programs asynchronously on other nodes in our network and get their output into a buffer. Very slick -- I now have easy access to several mips of computing power from an editor.

If this is not enough information to inspire you please feel free to give me a call. I will be talking with people here about putting these routines on a DECUS tape.

M. Erik Husby  
Project Software & Development  
14 Story St.  
Cambridge, MA. 02138  
(617)-661-1666

```
=====
Note 567.0 BACKUP Hints and Questions 4 replies
"Jack Patteeuw" 20 lines 5-JAN-1987 17:49

```

As I sit here doing my Stand-alone Backup, I thought of a tip to pass on to others and some questions also.

First, setting the /BUFFER\_COUNT qualifier to the max (5) makes a significant difference in the amount of time it takes to write tapes on either a TU77 or TU78 tape, regardless of whatever other options you have chosen (it even works well in Stand-alone).

It was brought up at a MI VAX LUG meeting that on TU78, at 6250 bpi, the hardware in the tape drive is actually doing a CRC so that the /CRC qualifier in BACKUP could be disabled with out much fear of loss of data. I have heard comments otherwise. Anyone else care to comment ?

Also, a fellow SM type found that if you make the /BLOCK\_SIZE qualifier big enough (approx 32k) you could fit a whole RA81 on to 3 reels of tape (at 6250 bpi). The book warns against this practice, saying it could run off the end of the reel, but has anyone seen this happen, or do we all just accept the defaults? Does changing the /BLOCK\_SIZE make much difference in performance (ie. time)?

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Ford Motor Co.  
Electrical and Electronics Division  
31630 Wyoming  
Livonia, MI 48150  
313-323-8643

```
=====
Note 567.1 BACKUP Hints and Questions 1 of 4
"Larry Kilgallen" 21 lines 7-JAN-1987 00:26
 -< To CRC or not to CRC >-

```

One question is how much time /NOCRC will save you. On a 780 with a TU78 it is significant. 8650s are faster. Fragmented disks are slower (outweighing the CRC at some sites). TK50s are so slow that it seems a MicroVAX would surely be able to keep up.

How much is that time worth to you? Isn't there a good book worth reading in the serenity and peace of mind you have from knowing that the software is checking on the hardware?

I don't have any war stories which can be directly attributed to CRC hardware, but some people also advocate doing backups /NOVERIFY. I have experienced a solid six weeks where the image backup (different disk every night) failed only on the /VERIFY comparison. CPUs and drives (disk and tape) were supposed to catch these problems, but only the software saved the day.

In the end, it is your decision. After all, some people choose to parachute out of airplanes for the fun of it!

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

```
=====
Note 567.2 BACKUP Hints and Questions 2 of 4
"Frank J. Nagy" 21 lines 8-JAN-1987 08:04
 =< MicroVAX timings /CRC and /NOCRC >=

```

-< BACKUP Hints and ... >=

I have advocated using /NOVERIFY on the daily/weekly backups for years. Haven't yet gotten burned (knock on silicon). Of course, when doing a save/restore to compress the disk I always do it stand-alone and always, always use /VERIFY on the save operation (guarantees (?) that the tape is good before I go smashing all those lovely disk bits).

I too have heard the lore about /NOCRC. I don't know how performance on 78x/86xx systems using TA78's is (my old position), but have tried it on a MicroVAX-II going from and RD53 to a TK50.

With /CRC: CPU time=14 min. Elapsed=35 min.

With /NOCRC: CPU time=2.5 min. Elapsed=26 min.

The effect on the MicroVAX CPU time is surprisingly large. At the last DECUS I talked to the tape people about the new QBus TU81-Plus and was getting the advice to use /NOCRC when doing BACKUP's at 6250 bpi - esp. on the MicroVAX.

Frank J. Nagy  
Fermilab  
PO Box 500 MS/220  
Batavia, IL 60510  
(312)840-4935

=====  
Note 567.3           BACKUP Hints and Questions           3 of 4  
"Ken A L Coar"           13 lines   9-JAN-1987 14:21  
                  \* < Burnt chile > \*  
\*\*\*\*\*

Yes, I got burned innumerable times by the tape running off the end of the reel, until I determined the maximum safe value for the /BLOCK\_SIZE qualifier. From my own experience:

At 1600bpi, use no more than /BLOCK\_SIZE=16384  
At 6250bpi, use up to 32768.

I always use /BUFFERS=5 and /GROUP=25. I don't remember exactly where I learned the latter, nor do I know for sure what it's effect on performance is, but it sure has reduced the number of unrecoverable tape problems I used to have..

#k

Ken A L Coar  
General Dynamics  
Office Systems  
12101 Woodcrest Executive Drive  
Creve Coeur, MO 63141  
(314) 851.4003 (CST)

=====  
Note 567.4           BACKUP Hints and Questions           4 of 4  
"Bruce Bowler"           14 lines   15-JAN-1987 08:53  
                  \* < /BLOCK, /RECORD interaction ? > \*  
\*\*\*\*\*

We had an interesting problem with /BLOCK=32768 and a TA78. Whenever we create tapes with multiple save sets and anyone of the save sets attempted to backup more than about 40% of the files on the volume (RA81's) and do a date recording pass via /RECORD, the next BACKUP command would fail with a position lost error. after six months of arguing with field service and 3 visits from district support, DEC finally agreed to swap tape drives. The new drive arrived and lo and behold same problem. We dropped back to the default buffer size and no problem. We have not noticed a significant decrease in performance or tape used and as such my recommendation would be use the default block size.

I haven't experimented to see how high I can go on block size without problem. Maybe in my spare time...

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

=====  
Note 569.0           Ethernet VAXcluster           4 replies  
"Eric Varsanyi"           5 lines   9-JAN-1987 12:54  
\*\*\*\*\*

Does anyone know if the local area VAXcluster (over the Ethernet) allows more than one "large" (780) machine to participate in the cluster?

Eric Varsanyi  
3416 S. La Cienega Blvd  
Los Angeles, CA 90016  
213-938-1111

=====  
Note 569.1           Ethernet VAXcluster           1 of 4  
"Ken A L Coar"           9 lines   9-JAN-1987 14:26  
                  \* < Don't think so, but here's one who knows > -  
\*\*\*\*\*

Someone from DEC gave a presentation to our LUG on LAVCs just last month, and I seem to recall that only one high-end VAX could participate in a particular LAVC.

#k

Ken A L Coar  
General Dynamics  
Office Systems  
12101 Woodcrest Executive Drive  
Creve Coeur, MO 63141  
(314) 851.4003 (CST)

=====  
Note 569.2                    Ethernet VAXcluster                    2 of 4  
"Frank J. Nagy"                    24 lines 11-JAN-1987 11:30  
    \* < LAVC Boot members and Ethernet Booting > -  
-----

First, the only VAX which can be booted over the Ethernet is the MicroVAX since only it (or the DEQNA, not clear which) has ROM support to drive the Ethernet Controller (DEQNA in this case). None of the other VAXes or their Ethernet Controllers (DEUNA, DELUA or the AIE for the BI) can boot across Ethernet and so must be boot members of a LAVC.

Digital's official line is that a LAVC can have only one boot member (and thus only one system disk). However, I have heard rumors that multiple boot members can be supported if you tinker a bit. The tinkering probably has to do with the QUORUM/VOTES SYSGEN parameters. Normally in a LAVC the boot member has 1 vote and the satellite members all have 0 votes. Thus the LAVC can operate as a single node (boot member only) VAXcluster. This configuration makes sense since without the boot member, the satellite members have no access to the system disk so...

With two boot members (and thus two system disks), your LAVC could easily fall into two pieces; each with one boot member and some satellites. Whether they could do this and still be able to access the other set's disks, I don't know. In either case, I suspect the single boot member restriction is artificial and will be lifted once Digital understands the implications of and actually is able to test some other LAVC configurations.

Frank J. Nagy  
Fermilab  
PO Box 500 MS/220  
Batavia, IL 60510  
(312)840-4935

=====  
Note 569.3                    Ethernet VAXcluster                    3 of 4  
"Greg Isett"                    3 lines 15-JAN-1987 17:55  
    \* < LAVC Boot Members part of CI Cluster? > -  
-----

A bit off the subject, but does anyone know when DEC is going to allow the LAVC Boot Members be part of a CI-based cluster?

Greg Isett  
hrb-singer incorporated  
department 125  
p o box 60  
state college pa 16804

=====  
Note 569.4                    Ethernet VAXcluster                    4 of 4  
"Jamie Hanrahan"                    6 lines 16-JAN-1987 20:23  
    \* < sorry, no rtg in SCS > -  
-----

I doubt you'll see this soon. There's no routing in SCS; it knows only to send requests to the local system or to some other system, and there's no mechanism for selecting which of several 'wires' to use in the latter case. To change this would require many fundamental changes. So don't look for it before V5, if ever.

Jamie Hanrahan  
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9210 Sky Park Court  
San Diego, CA 92123  
619-565-1865

=====  
Note 570.1                    Heard here first !                    1 of 6  
"Jack Patteeuw"                    15 lines 19-JAN-1987 07:07  
                                  -< A Marketing Ploy ? >-  
\*\*\*\*\*

Hey, when did DEC start hiring marketing people ?

If you haven't heard by now, the 8974 and 8978 are really non-announcements. All these systems are is just a re-hashed pre-configured clusters along with the new (I guess they are new, the rumor mill reported them over a year ago !) RA82, which are presently only available in the 4 high-cabinet configuration (SA482-AA).

Included in the deal is one year of maintenance plus an on-site field service engineer. SA482-AA comes with one year of maintenance standard.

Now I heard that my local DEC Sales Office has reserved a large banquet room at one of the fancy hotel downtown in mid-February. Maybe there really is a uVAX 2000 !

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Ford Motor Co.  
Electrical and Electronics Division  
31630 Wyoming  
Livonia, MI 48150  
313-323-8643

=====  
Note 570.2                    Heard here first !                    2 of 6  
"Jamie Hanrahan"                    30 lines 19-JAN-1987 19:43  
                                  -< DEC marketing >-  
\*\*\*\*\*

>"Hey, when did DEC start hiring marketing people ?"

In Douglas Adams' lovely sf radio series, "The Hitchhiker's Guide to the Galaxy", the complaints department of a particularly silly corporation is defined as "A bunch of mindless jerks who'll be the first against the wall when the revolution comes." In our little microcosm, I feel this role should be reserved for DEC's new marketing people...

There may indeed really be a MicroVAX 2000, whatever that is. There certainly is a 3- to 4-mip uVAX in the wings. I have it on good authority that the only thing keeping it from the market is... DEC's marketing people.

How long do they think they can keep this sort of thing up before massive numbers of prospective customers decide that no possible benefits (not even VMS) can make it worthwhile to (try to) do business with DEC?

As for true symmetric multiprocessing (i.e.: Is your 8300 too slow? Drop in a third CPU card... or a fourth, maybe even a fifth (which is when the BI will almost certainly be the limiting factor)), we will have to wait for VMS V5. According to Kathy Morse's talk at SFO, symmetric multiprocessing is what defines Version 5. This one isn't due to Marketing; they're still working on it in the lab.

Jamie Hanrahan  
Simpact Associates  
9210 Sky Park Court  
San Diego, CA 92123  
619-565-1865

=====  
Note 570.3                    Heard here first !                    3 of 6  
"Larry Kilgallen"                    9 lines 21-JAN-1987 00:18  
                                  -< In defense of marketing ploys >-  
\*\*\*\*\*

There may be somebody out there (not at one of my sites, certainly) who will only be able to justify a large purchase if it looks like one machine. That is, unless you start taking into account trivial matters like software, loosely coupled multiprocessors are the same as tightly coupled multiprocessors -- same footprint, same BTUs. So if someone out there is saved from a life of CICS because some variation of a DEC sales pitch made it look acceptable to their local purchasing agent, more power to them.

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

=====  
Note 570.4                    Heard here first !                    4 of 6  
"Larry Kilgallen"                    3 lines 21-JAN-1987 00:21  
    #< In appreciation of marketing ploys >-  
=====

Some of us (myself included) make a living separating out the wheat from the chaff of DEC marketing statements. Bring on the confusing pseudo-announcements!!!

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

=====  
Note 570.6                    Heard here first !                    6 of 6  
"Jack Patteeuw"                    28 lines 21-JAN-1987 17:54  
    #< More juicy stuff ... >-  
=====

I recently attend a one day seminar on VAX "worksystems" (that's what they are calling them now) and much of the juicy stuff is covered by non-disclosure but a few interesting things came up outside of that.

DEC is definitely going to X-Windows on both ULTRIX and VMS. Check your local Electronics/Computer magazine for an announcement from 15-Jan-1987 at MIT where the first X-Window conference was held. DEC funded most of MIT's original X-Windows development and then placed it in the public domain. DEC and other have recently donated many "tools" to the public domain for the development of new applications.

According to a DEC source "we have it (X-Window on VMS) running in house now and if you asked MIT for it I'm sure they would give to you". And it will be officially released "before the end of the year".

DEC is working hard at bringing ULTRIX and VMS closer together as far as networking and file sharing. There will be VMS version of TCP/IP (DEC not Wollongong) out "soon" and someday you will be able to have ULTRIX node in your clusters! Local area VAX clusters should jump to 128 members pre-V5.

DEC and CRAY have signed an agreement to work together on a new system interconnect. This will eliminate third part hardware/software. Could a CRAY be a member of a cluster ????? If not they will certainly be a node on the network !!!

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Electrical and Electronics Division  
31630 Wyoming  
Livonia, MI 48150  
313-323-8643

=====  
Note 571.0                    All-In-1 2.1 Looping Problems                    3 replies  
"Mark Oakley"                    22 lines 9-JAN-1987 18:11  
=====

We are running All-In-1 Version 2.1 on our Vax cluster which is at VMS 4.4. Our All-In-1 user base is about 500. Several times a week, a process running All-In-1 (Al.EXE) will become compute-bound and loop endlessly. Usually the process is disconnected and will time-out, but considerable resources are consumed before this happens. The All-In-1 users I have contacted indicated they were running an application in a spawned All-In-1 subprocess, when the application seemed to hang. Control-Y did not help, so they usually powered off their terminal.

I have never been able to reproduce the problem. I have contacted TSC and submitted an SPR, but DEC was not able to reproduce the problem. Has anyone seen or heard of looping problems in version 2.1 of All-In-1?

Mark Oakley  
Battelle Memorial Institute  
505 King Ave.  
Columbus, Ohio 43201-2693  
614/424-7154

```
=====
Note 571.1 All-In-1 2.1 Looping Problems 1 of 3
"Jack Patteeuw" 16 lines 13-JAN-1987 15:44
 < Not All-In-1 >
```

I don't think that your problem is with ALLIN1, but rather with VMS it self !

We have had similar problems or disconnected processes chewing up CPU time when people could not get out of Kermit so they "just turned the terminal off".

There is also a known problem similar to this with DECNET. If you are on node A and \$SET HOST B and then your process on A becomes disconnected (phone line drops) there is a possibility that the process on B will hang, in a infinite loop burning CPU time ! I have seen this more than once and those "in the know" at previous Symposia concur.

I think it has something to do with outstanding read/write requests.

Can anyone else add more ?

Jack Patteeuw  
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Electrical and Electronics Division  
31630 Wyoming  
Livonia, MI 48150  
313-323-8643

```
=====
Note 571.2 All-In-1 2.1 Looping Problems 2 of 3
"Larry Kilgallen" 6 lines 13-JAN-1987 18:48
 < The preceding may be two separate problems >
```

Under previous versions of VMS I have found looping processes where the user had "hung up" and the process got into a loop trying to output the SS\$HANGUP text. It probably takes a particular combination of terminal driver settings, but that scenario would seem to match Jack's situation (.1) but not Mark's (.0).

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

```
=====
Note 571.3 All-In-1 2.1 Looping Problems 3 of 3
"C J "Buck" Trayser" 11 lines 14-JAN-1987 12:04
 < I think the culprit for looping may be FMS >
```

The looping problems mentioned in .0 sounds like the old FMS-looking-for-the-terminal problem with virtual terminals. This part is solved (workaround) by setting the timeout (TTY\_TIMEOUT) for virtual terminals to zero to disable them or to a relatively small number so that the impact is reduced. A number around 180 would give the user 3 minutes to reconnect.

The hang problem sounds like a system resource problem. How well tuned is that system?

\$

C J Trayser  
360 Interstate North Parkway  
Suite 600 - MS: 6/B4  
Atlanta, Georgia 30339

```
=====
Note 572.0 DECnet reporting routines No replies
"Chris Erskine" 2 lines 13-JAN-1987 12:01
```

Does anyone have any routines which will take the event messages from DECnet and report on node transitions.

Chris Erskine  
6001 Adams Rd.  
Bloomfield Hills, MI 48013  
(313) 258-4049

=====  
Note 573.0 I want Kermit for VAX/VMS! 6 replies  
"Michael R. Pizolato" 21 lines 15-JAN-1987 16:40  
\*\*\*\*\*

Can anyone tell me how to acquire KERMIT for VAX/VMS? I got it once, but it was stored on MS-DOS floppies, and had no good documentation, so even though I could get it onto the VAX (after weeks of gymnastics involving an AT&T PC-6300, a UNIX machine, my VMS machine, some home-grown file transfer programs, several modems and unreliable phone lines, numerous headaches, lawyers, guns, money, and a partridge in a pear tree) I couldn't figure out how to install it. I want it on tape if possible, with good user and system manager documentation on paper or on the tape (really, I want all the documentation I can get my grubby little paws on; I love to have manuals lining my shelves).

Eternally lusting after quality public-domain software,

;\*)

Michael R. Pizolato  
AT&T Technology Systems  
Dept. 323610  
555 Union Blvd.  
Allentown, PA 18103  
215/439-5500

=====  
Note 573.1 I want Kermit for VAX/VMS! 1 of 6  
"Bob Hassinger" 8 lines 16-JAN-1987 09:16  
 \*< Try SIG tape or DECUS Program Library > \*  
\*\*\*\*\*

We got the version we are using from the VAX SIG Symposium tapes available through your DECUS Local User Group. KERMIT is also available from the DECUS Program Library. For example Program Library number V-SP-53 was recently updated with everything that was current as of July 2, 1986. It contains versions of KERMIT for practically every DEC system including VAX/VMS and MicroVMS (even OS/78 and OS/278 !). The format is VMS BACKUP on magtape. Normally these magtape distributions have contained sizable documentation files.

Bob Hassinger

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

=====  
Note 573.2 I want Kermit for VAX/VMS! 2 of 6  
"Ken A L Coar" 6 lines 23-JAN-1987 08:35  
 \*< Go to the source > \*  
\*\*\*\*\*

You could always go to the source, for the latest and greatest. Send a letter to Frank da Cruz at Columbia University in New York. I don't remember (or have readily available) the exact address, but it should be in one of the old VAXSIG tapes, in the Kermit stuff.

#k

Ken A L Coar  
General Dynamics  
Office Systems  
12101 Woodcrest Executive Drive  
Creve Coeur, MO 63141  
(314) 851.4003 (CST)

=====  
Note 573.3 I want Kermit for VAX/VMS! 3 of 6  
"Jack Patteeuw" 28 lines 27-JAN-1987 08:19  
 \*< Digital Has it Now ! > \*  
\*\*\*\*\*

Well I thought I'd "borrow" that phrase from the sales guys !

The Large Computer Group (you know, the guys who brought you the DEC-10's and 20's) have KERMIT for VMS (and EVERYTHING else in the world) online and available to the public on their MARKET system (node name LCG.MARKET) which is a DEC20. Our host is Bernie Eiben.

The phone number is 617-467-7437. Once you get the carrier hit return until you get SYS\$ANNOUNCE followed by a "@" (the standard TOPS20 prompt). To log in issue the command line "LOGIN<space>LCG.KERMIT <space>KERMIT". Remember this is a DEC20 but most of the commands look like VMS.

Now the trick is how do you get a file (especially an .EXE) file to your node without KERMIT (no this is not a catch-22, you don't need KERMIT to get KERMIT, but its helpful). Using the DCL command "\$ SET HOST/DTE/LOG=KERMIT.HEX Tcnn" to go out of you VAX and login into LCG.MARKET as I previously described. Once logged on TYPE the file KERMIT:VMSMIT.HEX. This is a HEX"ified" .EXE file. You will also need the file KERMIT:VMSDEH.MAR which is a short macro program to "de"HEX"ify" the file and create a .EXE. Sounds hookie but it works. You will also need KERMIT:VMSMIT.RNH which is the runoff help file.

There is a bunch of info online (including the history of KERMIT). You should also look at all KERMIT:VMS\*.\* for more info on installing KERMIT and its help files as well as source for it.

If you have questions you can call me at 313#323-8643.

Jack Patteeuw  
Ford Motor Co.  
Electrical and Electronics Division  
31630 Wyoming  
Livonia, MI 48150  
313#323#8643

```
=====
Note 573.4 I want Kermit for VAX/VMS! 4 of 6
"Jamie Hanrahan" 13 lines 27#JAN=1987 14:41
* < Here's the address > *

```

The address is:

Kermit Distribution  
Columbia Univ. Center for Computing Activities  
612 West 115th Street  
New York, NY 10025  
USA

The Spring 86 VAX SIG tape has what may be the current VMS Kermit (if not the absolute latest, it's certainly usable), along with C=Kermit (with versions for VMS, Unix, Amiga, and MacIntosh), and CP/M Kermit, and MS=DOS Kermit, and all the docs therefor.

Jamie Hanrahan

Simpact Associates  
9210 Sky Park Court  
San Diego, CA 92123  
619-565-1865

```
=====
Note 574.0 Cluster time coordination. No replies
"Michael R. Pizolato" 42 lines 15#JAN=1987 16:51

```

For anyone who is concerned with time coordination on a cluster, here is a pair of command procedures that work for me. I have a two node cluster (nodes Gandalf and Elrond, not their real node names); I designate Gandalf as the "official timekeeper," and put the following command procedure in GANDALF::SYS\$MANAGER:TIME.COM:

```
$ if f$mode () .nes. "NETWORK" then exit
$ open /write NETLINK sys$net
$ write NETLINK f$time ()
$ close NETLINK
```

On Elrond, the following batch job runs every night at midnight:

```
$ on control_y then goto CLEANUP
$ on error then goto CLEANUP
$ open /read NETLINK GANDALF"SYSTEM PASSWORD": "task=TIME"
$ wait 00:00:05
$ read NETLINK TIME
$ set time = "'TIME'"
$ CLEANUP:
$ if f$trnlnm ("NETLINK") .nes. "" then close NETLINK
```

Of course, I use my real SYSTEM password. If you want to avoid the use of passwords, put the first file in the default DECnet account directory and remove the network access string from the second file.

Using these procedures, I am able to keep my system times within 0.08 to 0.15 seconds of each other. This is more than close enough for all our applications.

Any comments are welcome.

;=)

Michael R. Pizolato  
AT&T Technology Systems  
Dept. 323610  
555 Union Blvd.  
Allentown, PA 18103  
215/439-5500

=====  
Note 575.0 SET HOST/DTE blows up with data overrun 1 reply  
"Eric Varsanyi" 4 lines 19=JAN=1987 00:21  
\*\*\*\*\*

I'm running VMS 4.4 on a 782 and when the load is real heavy, sessions started with SET HOST/DTE blow up with a data overrun error. Is there anyway to fix this? I don't see the same problem with VAXNET however.

Eric Varsanyi  
3416 S. La Cienega Blvd  
Los Angeles, CA 90016  
213-938-1111

=====  
Note 575.1 SET HOST/DTE blows up with data overrun 1 of 1  
"Dave Close" 4 lines 29-JAN-1987 18:29  
=< One idea >=

I'm a new Decnet user so this might not be completely accurate. However, I have noticed that SET HOST/DTE turns off the TYPE\_AHEAD attribute for the outgoing port, assuming ALTYPAHD will take over. If you don't have ALTYPAHD, that could account for your problem.

Dave Close  
Anadex/Printronix  
1080 Avenida Acaso  
Camarillo, CA 93010  
805/987-9660

=====  
Note 576.0 DATAPROBE Software? No replies  
"Joel Gallun" 10 lines 20-JAN-1987 10:31  
\*\*\*\*\*

In the October 1986 issue of the DEC Professional magazine there is an article about a software product called DATAPROBE. If anyone has any info on this product please contact me.

Joel Gallun  
oao corp  
7500 greenway ctr  
greenbelt, md 20770

=====  
Note 577.0 Questions/Comments on TPU 11 replies  
"Jack Patteeuw" 38 lines 22=JAN=1987 17:44  
\*\*\*\*\*

I would like to open up a little discussion on TPU.

First I'm sure that most System Manager types have at least tried it. But how many of you out there really use it on a day to day basis? Do you use the standard EDT or EVE interfaces or have you customized them? How much? Has anyone tried something DEC donated to DECUS called EVE-plus?

My user community is a large group of Engineers, both EE and ME, who, for the most part, have learned EDT thru EDTCAI. These people can barely handle EDT in screen mode (I have setup a system wide symbol called EDT that automatically puts them in screen mode). Most know a few Line Mode commands (SUBSTITUTE, DELETE BEFORE, etc) but know nothing of other EDT options like buffers. I dread introducing something else especially seeing as there is no definitive documentation or online training. What are some other peoples experience with their user community?

I know TPU uses LOTS of memory, but what other impacts are there on the system. Is it a net gain or loss? (We use EDT VERY heavily.) What have you done to solve the problem of editing really BIG files? (TPU takes forever to read in a large file and it may blow up do to lack of virtual memory!)



Creve Coeur, MO 63141  
(314) 851.4003 (CST)

Hopkinton, MA 01748  
617-435-9061

=====  
Note 577.3                    Questions/Comments on TPU                    3 of 11  
"Bob Hassinger"                    29 lines    23-JAN#1987 11:31  
                  \* < Our experiences > -  
-----

=====  
Note 577.4                    Questions/Comments on TPU                    4 of 11  
"Mark Oakley"                    18 lines    24-JAN#1987 16:44  
                  \* < TPU Comments > -  
-----

I have been using TPU myself since the day it got here. I wanted the efficiency and speed they promised and the ability to fix and change things. Also, it seemed clear EDT was dead as far as development goes and the future was with TPU. I really wanted multi-buffers so I started trying to use EVE but I did not adapt well so I started with the EDT command emulations given in the manual as an obscure example, then I adapted a few routines from EDTEM to add on to EVE. The result is a minimal EDT emulation on the VT200 keypad that lets me get by. Just have not had time to do the right things - more than a year now. I can not even afford time to sort out EVE#plus and the other TPU stuff that has been on the tapes.

I switched to TPU (from EDT) about 6 months ago. I run TPU as a "kept" editor, so I pay the startup cost just once a day. Attachs between a parent and subprocess are MUCH faster than firing up EDT. I also use the multiple window facility a lot.

I had one user hack up his own modifications to the editing interface \* mostly moving keys around and the like I think - he turned his group loose on it and they use it all the time I understand. Otherwise our users are like those of .0 - just functional in EDT. They do not care about the features of TPU and they do not push EDT hard enough to get much system level gain from moving them into TPU/EDTEM.

The EVEplus extensions are quite useful, especially the rectangular cut and paste. I have made local extensions/modifications to set/show the default directory, and move more easily between buffers. I also wrote a SEARCH utility in TPU, which can accept more complex search patterns than the DCL SEARCH utility.

Yes, it takes TPU a long time to get started because the whole file is read into virtual memory up front but you can get big gains moving around and searching afterwards. I do not mind for my use.

Most of the users at my site still use EDT. The ones that migrate to TPU usually use the EDT emulation.

Both the above point and the one about not wanting a hard limit at the end of virtual memory were made very forcefully when our LUG had pre release presentations from the developers. They were made again at the Symposium. I think the developers understand the needs but who knows what might happen. (They had trouble believing people really wanted to work on files big enough to run into the limits on normal systems.)

Larry Kilgallen has pointed out that TPU can be difficult to use, due to a lack of certain primitives. The January issue of the Pageswapper contains the latest SIR ballot, and several TPU SIRS are included.

Bob Hassinger  
Liberty Mutual Research Center  
71 Frankland Road

Mark Oakley  
Battelle Memorial Institute  
505 King Ave.  
Columbus, Ohio 43201-2693  
614/424-7154

=====  
Note 577.5            Questions/Comments on TPU            5 of 11  
"Matthew M. Wilbert"            7 lines    25-JAN-1987 21:09  
                  \* < <tpu comments>- >-  
#-----#

We have only had TPU at our site for about eight months, and most users still only use EDT. A few use EVE; I use my own extended version. A big factor is the lack of an EDTCAI equivalent for TPU.

For myself, I find TPU so superior that I feel depressed and impatient when forced to use EDT. I should say that I try to avoid editing very large files.

Matthew M. Wilbert  
6 Washington Avenue  
Cambridge MA, 02140  
(617)-725-3458

=====  
Note 577.6            Questions/Comments on TPU            6 of 11  
"Jamie Hanrahan"            1 line    26-JAN-1987 13:42  
                  \* < Likely a dumb question >-  
#-----#

What/where is EvePLUS?

Jamie Hanrahan  
Simpact Associates  
9210 Sky Park Court  
San Diego, CA 92123  
619-565-1865

=====  
Note 577.7            Questions/Comments on TPU            7 of 11  
"Jack Patteeuw"            4 lines    27-JAN-1987 08:30  
                  \* < No such thing as a dumb question ... >-  
#-----#

EVE+ is Digital Equipment written TPU section that has been donated to the DECUS library. EVE+ has lots of bells and whistle that aren't in the standard EVE or EDT emulators. I've been told that the TPU section that NOTES uses is very similar to EVE+.

Jack Patteeuw  
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31630 Wyoming  
Livonia, MI 48150  
313-323-8643

=====  
Note 577.8            Questions/Comments on TPU            8 of 11  
"Jack Patteeuw"            6 lines    27-JAN-1987 08:39  
                  \* < The question is ... >-  
#-----#

Thanks for all the interesting info, but the real questions I had are:

Is TPU a net gain or loss to system performance ?

How do you "train" the average users ?

Jack Patteeuw  
Ford Motor Co.  
Electrical and Electronics Division  
31630 Wyoming  
Livonia, MI 48150  
313-323-8643

=====  
Note 577.9                    Questions/Comments on TPU                    9 of 11  
"Jamie Hanrahan"                    3 lines    27#JAN-1987 14:43  
                  #< I found it >#  
=====

Thanks, Jack. Since posting that question I noticed EVE#Plus on the Spring 86 SIG tape. I should have looked there first!

Jamie Hanrahan  
Simpact Associates  
9210 Sky Park Court  
San Diego, CA 92123  
619-565-1865

=====  
Note 577.10                    Questions/Comments on TPU                    10 of 11  
"Kevin Angley"                    21 lines    27-JAN-1987 20:02  
                  #< A Man's EDT Emulator >#  
=====

We have been using our own flavour of EVE for over a year that emulates EDT. By emulating EDT I don't mean whatever it was that DEC tried to do with the so-called EDT emulator. I mean that the keypad does exactly the same thing in our EVE that it did under good old EDT (with a cosmetic exception or two perhaps). We implemented a "substitute" command that is much faster than EVE's REPLACE and you can specify "all". The only things of EDT's that it doesn't do are the wonderful ranges on line commands (e.g. %all 'string') # I really miss that.

How close is it? Well, we have migrated 175 users from EDT to our new EVE (some without telling them that it was not really EDT anymore). If there is an interest in bringing this to Nashville, give me a call

Kevin Angley  
Telex Computer Products  
3301 Terminal Drive  
Raleigh, N.C. 27604  
(800)-334-4380 ext. 416

=====  
Note 577.11                    Questions/Comments on TPU                    11 of 11  
"Jack Patteeuw"                    3 lines    29#JAN#1987 18:00  
                  #< One More time ... >#  
=====

Please bring to Nashville !!

But is it a plus or minus to the system ?????

Jack Patteeuw  
Ford Motor Co.  
Electrical and Electronics Division  
31630 Wyoming  
Livonia, MI 48150  
313-323-8643

=====  
Note 578.0                    Reserved identifiers in VAX C                    No replies  
"Jamie Hanrahan"                    49 lines    22#JAN#1987 18:44  
=====

This may be old hat (^) to many of you, but it was news to us...

A while ago I convinced some of our C programmers to link against the shareable run-time library (VAXCTRL.EXE) instead of the object library, and some of them started seeing 'psect attribute conflict' warning messages from the linker. In VAX-11 C, all 'extern' identifiers (which includes any identifier that's declared outside the scope of the outermost#level functions) are put in their own psects; the name of the identifier becomes the name of the psect. These psects have the OVR attribute, and this is how the linker matches up the identifiers when they're mentioned in different object modules.

ANYway, it seems that DEC, in their infinite wisdom (am I becoming overly bitter in my old age, or what?), has used a number of these things in various parts of VAXCTRL.EXE. A few of them are mentioned in the VAX-11 C manual (errno, stdin, stderr, stdout), but many others are not. And, they failed to follow their own rules for DEC-created identifiers, in that they did NOT put dollar signs in the names.

If you have the microfiche, you can find the names of these `reserved extern names' by looking in the program section synopsis of VAXCRTL.MAP (facility CRTL; in the 4.4 fiche the psect synopsis starts at frame L#8 of fiche #91). For those of you without access to fiche, here's the list:

|                 |                      |                         |                 |
|-----------------|----------------------|-------------------------|-----------------|
| XFRVECTOR       | C\$STRNS_VALUES      | CTYPE                   | C\$SEX_HANDLER  |
| COLS            | CURSCR               | ENVIRON                 | ERRNO           |
| LINES           | RANDX                | STDERR                  | STDIN           |
| STDKB           | STDOUT               | STDPB                   | STDSR           |
| SYS_ERRLIST     | SYS_NERR             | VAXC\$ERRNO             | RMSPROTOS       |
| \$CODE          | CLI\$CODE            | CLI\$READ_ONLY_DATA     |                 |
| LIB\$KEYO\$     | LIB\$STATES          | \$CHAR_STRING_CONSTANTS |                 |
| \$DATA          | CLI\$DATA            | SHELL\$FIXTIME\$CODE    |                 |
| \$ADDRESS_DATA  | SHELL\$FIXTIME\$DATA |                         |                 |
| MSGPTR\$AAAAAAA | MSGPTR\$AAAAAAB      | MSGPTR\$AAAAAAC         | MSGPTR\$SECTION |

I don't guarantee freedom from typos, but this should be pretty close. Note that since the linker upcases everything, naming your extern identifiers in lower case doesn't help. Some of these names are things you would likely never use for identifiers, but others (like `lines' and `cols') are pretty easy to hit by accident.

I am submitting a reader's comments form suggesting that this list appear in future versions of the manual. It wouldn't hurt if a few other people did the same...

Jamie Hanrahan  
Simpact Associates  
9210 Sky Park Court  
San Diego, CA 92123  
619-565-1865

```

=====
Note 579.0 autodialing problems 2 replies
"Jamie Hanrahan" 45 lines 26*JAN*1987 14:07

```

I have been working on code that operates autodialing modems, and I have run into the following Catch#22. Something like this has already been mentioned in an SIR or something like that, but I was wondering if anybody had found a workaround:

To do autodialing reasonably, you need to be able to see the call progress status information that the modem sends back to you. But, on a DMF32 modem port, the hardware won't receive any characters unless Carrier Detect (CD) from the modem is true. Since CD isn't true until the call is done, this isn't helpful.

I can't find a way to override this in software. If you turn off the MODEM characteristic, then the port isn't sending DTR to the modem, so the modem won't work at all.

Another option is to use a funny cable to strap CD high. But then, when the modem is used for incoming calls, the VAX can't detect line hangups, which opens up a large security hole.

I have seen one type of modem (Racal-Vadic VA212) which can be optioned, via commands given to the serial port, to assert CD at all times. You're operating blind while sending the option command, but at least you can see what you're doing after that. When the call is done, you send it the command to send normal CD signals so that later incoming calls are handled properly. This works, but it's specific to that modem.

I've used DZ ports with no problems. DHU ports may present a problem of another kind: I've seen some modems (US Robotics 300/1200/9600 units) which emit call progress messages on INCOMING calls! These cause trouble (I'm not sure what; maybe clogging the typeahead buffer, maybe interfering with autobaud detection) when connected to DHU ports. So you can option the modem to not send call progress messages... and you're back to dialling blind on outgoing calls.

Haven't experimented with DHV's or DZV's yet, though we have one of each, and I'll get to it soon.

Has anybody come up with work-arounds? The best I've been able to think of is to live with dialling blind, and have the program use sense mode \$qios and look for CD to go high rather than watching for modem status messages.

Jamie Hanrahan  
Simpact Associates  
9210 Sky Park Court  
San Diego, CA 92123  
619-565-1865

=====  
Note 579.1                    autodialing problems                    1 of 2  
"Dave Close"                    9 lines    29-JAN\*1987 18:50  
                              -< More ideas >-  
-----

I have left a number of previous messages on this same subject, with the same conclusion: it can't be done well. My modem (an Anchor SECURE12 which emulates Hayes) sends progress messages on in-coming calls but they can be disabled with a status command. I find I also need to set the port NOBROADCAST to avoid echos which look like login attempts when the system sends a notice to users. The SECURE12 has a way to overcome at least part of the security exposure with CD strapped high: it requests and validates a password before allowing a caller to reach the VAX. But a Vadic-type solution or a change to the terminal driver would be better.

Dave Close  
Anadex/Printronic  
1080 Avenida Acaso  
Camarillo, CA 93010  
805/987-9660

=====  
Note 579.2                    autodialing problems                    2 of 2  
"Jamie Hanrahan"                    4 lines    29-JAN\*1987 20:51  
                              -< driver fix won't work >-  
-----

A change to the terminal driver won't help on the DMF32. Its \*hardware\* won't permit it to read anything unless it sees CD true. Or so I understand, both from my perusal of the hardware doc and from other peoples' comments.

Jamie Hanrahan  
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9210 Sky Park Court  
San Diego, CA 92123  
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=====  
Note 580.0                    ODS\*2 Specification Wanted                    2 replies  
"Offline Submission"                    18 lines    29-JAN\*1987 19:02  
-----

The November 1986 issue of the RSX MULTI-TASKER contains an interesting article by DEC on the RSX file structure "Files-11 On Disk Structure Specification". Has a similar article on the VMS file structure, i.e., ODS\*2 ever been published? Would it be possible to persuade DEC to submit one for publishing in the PAGESWAPPER?

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Leatherhead  
Surrey  
KT22 7SE  
ENGLAND

Telephone 0372 734488

January 9, 1987

January 9, 1987

=====  
Note 580.1 ODS#2 Specification Wanted 1 of 2  
"Offline Submission" 41 lines 29-JAN#1987 19:27  
\* < P.S., regarding the differences... >\*

ODS#2 is very similar in general to ODS#1 but differs greatly in details, such as field layout, position and size. Anyone interested could try reading the MULTI-TASKER article whilst studying SYS\$LIBRARY:LIB.REQ modules \$FH1DEF, \$FH2DEF, \$HM1DEF, \$HM2DEF etc. for details of field layout.

Sections 1.0 to 3.4.4 would apply to ODS#2 except the field names etc. are different, the version number (section 3.4.1.5) is 200 (hex) and more flags have been added to the file characteristics mask.

The ident area (section 3.4.2) contains the file name in ASCII instead of Radix#50. Originally 20 bytes were used for this but with the advent of long file names in VMS version 4.0 an extension area of 66 bytes was tacked onto the end of the ident area in the first file header. The file name is padded with spaces. The file dates are stored in VMS time format rather than packed ASCII. The section on directories (4.0) applies to ODS#2 except:

- Hierarchies of more than two levels are implemented
- \* There is usually no relationship between UFD and UIC
- \* File names inside directories are stored as ASCII in variable length records which are kept in alphabetic order.

Similar comments to those in sections 5 and 6 would also apply to ODS#2.

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Kelvin Avenue  
Leatherhead  
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KT22 7SE  
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Telephone 0372 734488

=====  
Note 580.2 ODS#2 Specification Wanted 2 of 2  
"Larry Kilgallen" 33 lines 29-JAN#1987 19:41  
\* < The ODS-2 specification does exist... >\*

There are some users who have actually obtained a copy with the strict provision that they were NOT allowed to submit it for publication to the Pageswapper. My best guess is that this is because it takes a higher level of approval within DEC to offer it for publication than it takes to give out a few copies here and there.

Since ODS#2 is not a great trade secret like the BI#bus specifications, it seems likely that publication approval could ultimately be given, and at that point it would be easy for me to contact someone at DEC to get a copy. The problem is that without a coordinated expression of "market" demand, there is probably no effort within DEC even to figure out who would give such publication approval.

There is also a possibility that DEC Press is planning to include the ODS#2 spec in the VMS V4 version of the Internals and Data Structures manual, but as I understand it they are already turning material down because they feel the public does not want to see the Internals and Data Structures book expand to 2 volumes.

Well, I really hate "all those in favor raise your hands" mechanisms, since unlike SIRs there are no cost trade#offs to be made by the voter. Since there is no particular cost to DEC on this one, however, we will tolerate it. All those in favor give a reply to this I/O. Only the most brilliantly worded will be published (my own comments excepted), the others will just be tallied. To be fair, anyone who does NOT want to see this information made available to those who want it may also express that feeling, but somehow I don't feel that will require a separate phone number.

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

PAGESWAPPER = March 1987 - Volume 8 Number 8  
INPUT/OUTPUT

```
=====
Note 581.0 Saving Terminal Output 1 reply
"Offline Submission" 13 lines 29-JAN-1987 19:02

```

Has anyone come up with a way to echo terminal output to a file, like the Unix "script" command does? I know you can do it with DECnet using SET HOST/LOG, but many users at the university find this method confusing to use.

Larry Schafer  
ECC Building  
Saint Cloud State University  
Saint Cloud, MN 56301

Telephone: (612) 255-4710

January 9, 1987

```
=====
Note 581.1 Saving Terminal Output 1 of 1
"Eric Varsanyi" 6 lines 29-JAN-1987 19:57
-< Yes, the @ does it >-

```

Try using

\$ @tt/out=mumble.dat

You can't see the output but it beats SET HOSTing for capturing the output of something (like a SHO MEMORY or SHO SYS).

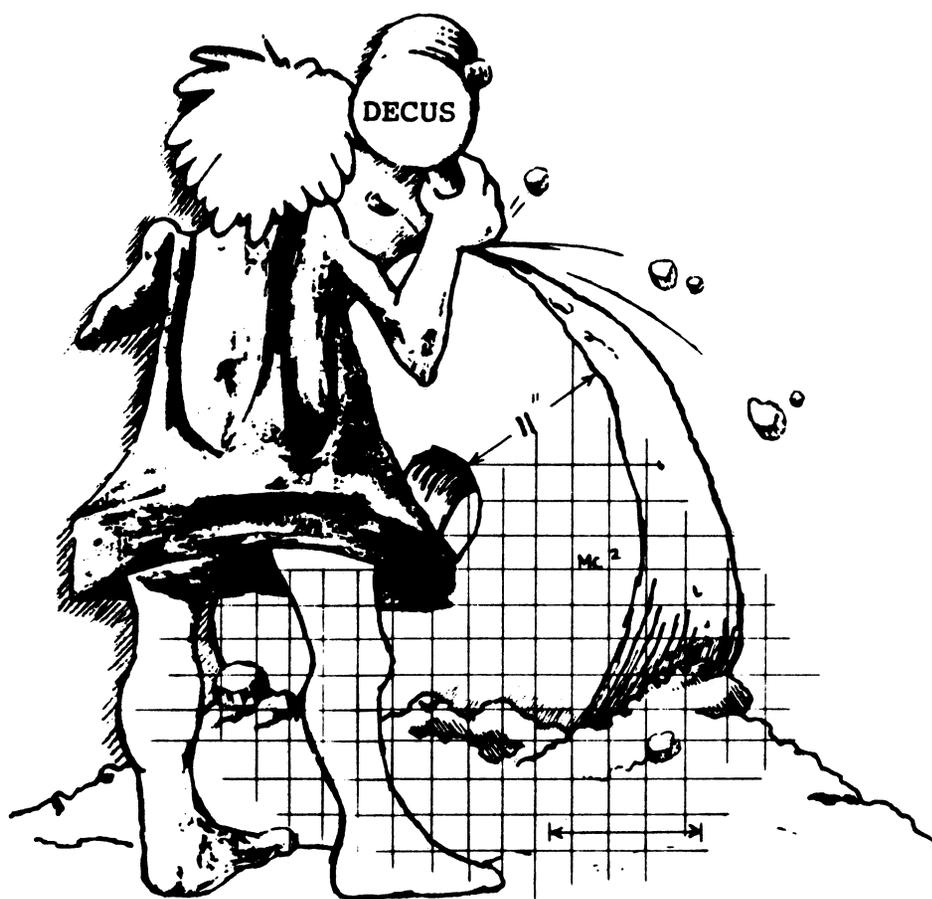
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\*

\*



# LIBRARY



LIB

# DECUS PROGRAM LIBRARY

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

**DECUS NO:** V-SP-57 **Title:** PC-8088 Collection #11 **Version:** V1, October 1986

**Submitted by:** Glenn C. Everhart Ph.D. **Operating System:** MS/DOS **Source Language:** FORTRAN 77, FORTRAN IV, C, BASIC, MANY OTHERS **Keywords:** Business Applications, Data Communications

**Abstract:** This collection contains a number of programs from PC-SIG disks in the range 511 to 605, KERMITTED to a VAX in FILE TYPE BINARY mode, plus various other odds and ends from miscellaneous sources. Included are versions of MS/DOS and VMS KERMITs plus some CP/M utilities, database managers, editors, etc. Also present are revisions of some of the older disks, including Pianoman, Extended Batch, Ultra Utilities, File Express, AnalytiCalc and PC RIM.

New files include such packages as Alan's Editor and Calc, DRAFTMAN, EXPERT, ExpressCalc, FreeFile, FreeWord, ImageprintNY Word, PDS Quote, SideWriter, C Tutorial, PASCAL Tutorial, DREAM DBMS, GANTT, PC Sell, PC Prompt, XASM, FORTRAN Tools, math libraries, DBSKAT and many more. The intent is to have enough files here that the PC-8088 collections are less expensive and much easier to handle than the diskette based software is. Even though the DECUS tape charge is significant, the cost of the contained software at \$4 to \$6 per diskette would be much greater than the cost on tape in this format.

Most of the new files are present as .ARC files, a compressed format which will facilitate moving the files back to MS/DOS machines. The VMSSWEEP utility, which will allow these archives to be inspected from VMS, is also present. Another notable addition is a program which allows an IBM AT to read or write RX50 MS/DOS disks so that Rainbow software can be accessed. One or more complete disks have been included per archive, so considerable storage economy has been achieved.

A new release of VMS KERMIT (Version 3.3.111) is also included.

**Notes:** Not all sources are available publicly. What is available is here.

Complete sources not included.

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

**DECUS NO:** V-SP-59 **Title:** PDATATRIEVE Library Collection **Version:** V1.0, October 1986

**Author:** Members of the DTR/4GL SIG

**Submitted by:** Bart Z. Lederman **Operating System:** RSX-11M-PLUS V2.1, VAX/VMS V4.0, P/OS V2.0 **Source Language:** FORTRAN 77, MACRO-11, MACRO-32, DATATRIEVE **Software Required:** Some portions use FMS, MACRO, FORTRAN; most require only DATATRIEVE **Keywords:** DATATRIEVE, Plotting

**Abstract:** This comprises a collection of items using or related to DATATRIEVE, submitted by various members of the SIG. This is intended to be an on-going collection which will be updated as we receive submissions from anyone working with DATATRIEVE or other Forth Generation Languages.

The current collection includes:

**PLOTS** Extra plots, plus articles on how you can design your own plots or modify existing plots.

**FUNCTIONS** Additional FN\$ type functions including STRING\_LENGTH and SPAWN.

**ALL-IN-1** Record definitions for profile and document database files (also works for WPS-PLUS/VMS), ALL-IN-1 logging file and how to find out what forms and scripts are most used.

**CORPORATE TELEPHONE DIRECTORY** Related to ALL-IN-1, there is a complete replacement for the Corporate Telephone Directory which uses the same data file but runs much faster. It also allows you to access the same forms WITHOUT ALL-IN-1 (from DCL).

**NEWSLETTERS** The first several years of "The Wombat Examiner", the DATATRIEVE newsletter, in machine readable form.

**SESSIONS** Transcriptions of a number of symposia sessions.

**RSX SYSTEM ACCOUNTING** DATATRIEVE (and other) processing of M-PLUS system accounting and console log information.

**Restrictions:** Some portions of the collection are VMS specific.

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

**DECUS NO:** VAX-178 **Title:** Accounting File to Data-trieve Conversion Tools **Version:** V1.0, April 1986

**Submitted by:** Digital Equipment Corporation **Operating System:** VAX/VMS V4.0 **Source Language:** MACRO-32, DATATRIEVE **Software Required:** DATATRIEVE **Keywords:** Conversions, DATATRIEVE, System Accounting - VMS

**Abstract:** Normally VAX/VMS accounting records are stored in a format that cannot be interpreted by DATATRIEVE. This makes complex analysis and manipulation of the accounting data difficult.

This package consists of a conversion program, CNVACC, and the associated DATATRIEVE record definition, VMS\_ACCOUNTING\_REC, to support the conversion and analysis of the VAX/VMS accounting records.

**Restrictions:** The CNVACC utility does not support VMS version 4 filename syntax.

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

**DECUS NO:** VAX-196 **Title:** IDX - SORT **Version:** V1.0, August 1985

**Submitted by:** Dale Barrett, E. F. Houghton & Company, Valley Forge, PA **Operating System:** VAX/VMS V4.0 - 4.3 **Source Language:** DCL, DTR **Software Required:** DTR (optional), Create & Convert could be used to create required file, DTR is easier. **Keywords:** File Management, Sorting

**Abstract:** IDX\_SORT is a DCL command procedure system which sorts selected index files. This results in a new file which typically is smaller and allows faster access (a 50% savings in block-size is not uncommon). This is achieved with the convert utility and FDL file definitions. It can also be used for modifying file structures (key-fields, etc) during testing and implementation on new/modified systems.

It consists of three elements:

- **IDX\_SORT.TABLE** - an indexed file containing names and locations of files to be sorted, (maintained with supplied DTR definition). It stores the date of the last sort and has a selection flag.

- **IDX\_SORT.COM** - a menu driven selection program allowing the user to easily select/cancel files for sorting, view dates of last sort and list files selected for sorting.

- **IDX\_SORT.EXE.COM** - copies the selected file to a backup directory and converts the backup copy, creating a new version of the file and leaving the original intact. Creates a report documenting each step of the operation. Can be run in batch mode or interactively.

Procedure has complete error handling to prevent loss of files/data during unattended use. Could easily be modified to provide automated nightly sorts. Everything is provided to set up the system easily. Complete documentation files are supplied.

In about eleven months of constant use, we have not had a problem. In one case, we reclaimed about 28,000 blocks, an 80% reduction in size. This was a special case involving a file transferred from a PDP-11/70. Typically, reductions of 40-50% are experienced, but this depends on the file activity.

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

**DECUS NO:** VAX-203 **Title:** UP TIME REPORTER **Version:** V1.0, June 1986

**Submitted by:** D. P. Schumacher, TRIUMF, Vancouver, B.C., Canada **Operating System:** VAX/VMS V4.3 **Source Language:** C **Memory Required:** Data Collector=270 KB; Report Generator=300 KB **Keywords:** System Accounting - VMS, System Management - VMS

**Abstract:** This package consists of two components:

- A data collector running in detached mode
- A report generator

On startup, the data collector obtains the system boot time and writes the information to a file. At regular intervals thereafter, the job wakes up and writes the current time and elapsed CPU time of the NULL process

to the file. All records are appended to the output file, or if the file doesn't exist, it creates a new one. To protect the data from being lost on a system crash, the file is opened, one record is written, then immediately closed.

The report generator uses the binary data file created by the detached process as input. The program will process multiple files as long as the files are in chronological order. The program will not correct the up time if the system clock has been re-set. The report includes:

- The reporting period designated by the user.
- A listing of the boot times during the report period.
- The system up time in VMS delta time format: DDH:MM.
- The percent of time the system was running during the report period.
- The percent of CPU time used while the system was running.

**Restrictions:** Requires DETACH, ALTPRI, and ACNT privileges to run the data collector program - the detached program requires WORLD privilege.

**Media (Service Charge Code):** 600' Magnetic Tape (MA) **Format:** VAX/ANSI

**DECUS NO:** VAX-204 **Title:** Temporary Allocation of Disk Space **Version:** V3.0, August 1986

**Submitted by:** Jean Paul Lemaire, ITODYS, 75005 Paris, France **Operating System:** VAX/VMS V4.3 **Source Language:** MACRO-32 **Memory Required:** 3MB **Keywords:** Utilities - Disk - VMS

**Abstract:** This system allows a user in batch or interactive mode to acquire disk space by means of directory creation and allocation of disk quotas under his UIC on a particular disk. This allocation is granted only if there is enough free space on the disk. The free space can be known by the DCL command QTMP.

The allocation is done by the DCL command GETTMP/BLOCK@n where n is the number of required blocks. The default directory contained in SYSUAF is used to create the temporary directory on a common root defined by the system logical name SYS\$TMP. The temporary quotas, the directory and the created files are deleted at the end of the process or on request of the user by the DCL command RELTMP.

The previous DCL commands set the DCL symbol \$STATUS and the symbol QUOTA\$TMP which contains the number of blocks allocated or the number of free blocks.

**Notes:** Operating system VMS V4.2 or later required.

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

**DECUS NO:** VAX-212 **Title:** SPELL: Interactive Dictionary **Version:** V1.0, October 1986

**Submitted by:** Dr. D. W. Burgess, RAF Institute of Aviation Medicine, Farnborough, Hants, England GU14 652 **Operating System:** VAX/VMS V2 or greater **Source Language:** FORTRAN77, VAX-11 FORTRAN **Memory Required:** Peak 450 pages; average 120 pages **Software Required:** FORTRAN **Hardware Required:** VT100 type terminal **Keywords:** Spell

**Abstract:** SPELL is an interactive dictionary used either to find the spelling of a word from limited initial characters or to check a document for spelling errors. Words can be added by the users with password protection to expand the dictionary in specific directions.

The present edition contains over 10,000 English words, but as the program is totally user adjustable, the dictionary can be in any language within a word limit of 15 ASCII characters to a maximum of 70,000 words.

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

**DECUS NO:** VAX-214 **Title:** NEWS **Version:** October 1986

**Submitted by:** Geoff Huston, Australian National University, Canberra City, A.C.T. 2601 **Operating System:** VAX/VMS V4.3 **Source Language:** C **Memory Required:** Virtual **Keywords:** Bulletin Board

**Abstract:** NEWS is a software product which manages user, system and network news items. The news items are a set of text files which have been posted on the system for general public view, as distinct from person-to-person MAIL.

NEWS items are divided into NEWSGROUPS. All items with a similar subject matter are normally contained in a single newsgroup, and the same item may appear in a number of newsgroups. Within newsgroups, each item is stored as a text file, containing item headers as well as text of the item. The NEWS program allows the user to select newsgroups, then read items within that newsgroup. You can also reply to an item by posting a follow-up news item, create new items, extract items into a text file and mail a new item via VMS MAIL. You can also be notified of new items that are placed in NEWS.

The interface to NEWS is either by normal scrolling command prompts, or using a screen-based mode, where newsgroup and newsitem directories are posted to the screen. NEWS calls TPU as the default editor, but the facility exists for users to define their own editor for use with NEWS.

NEWS also has facilities to support a DECNET connected set of news sites, where items posted on one site will be automatically fed to all other news sites (this automatic cross feed of news items is performed normally in the batch queues during off-peak times).

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

**DECUS NO:** VAX-215 **Title:** HILLED: A High-Level Language Editor **Version:** October 1986

**Author:** W. Dunz

**Submitted by:** Walter H. Burkhardt, Univ. Stuttgart/Inst. of Informatik, D-7000 Stuttgart-1, West Germany **Operating System:** VAX/VMS V3.7 or greater **Source Language:** PASCAL **Memory Required:** 1M **Hardware Required:** VT100 or similar. **Keywords:** Editors, Tools-Software Development

**Abstract:** This system is an extended PASCAL version of the system in RATFOR by Kernighan and Plauger. The extensions are:

- . Editing and combining of several files is possible
- . The editor can be adjusted for displaying the maximal current window.
- . Command names can be abbreviated and redefined.
- . Several commands can be combined into macros.
- . Understandable error messages in case of error.
- . A journal can be run during editing.

**Restrictions:** Documentation in German

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

**DECUS NO:** VAX-217 **Title:** DECnet Conversational Objects **Version:** V.1.2, September 1986

**Submitted by:** James J. Belonis II, University of Washington, Seattle, WA **Operating System:** VAX/VMS V4.3 **Source Language:** VAX-11 FORTRAN, DCL **Memory Required:** 4KB **Software Required:** DECnet **Hardware Required:** Any DECnet connection between multiple VAXen. **Keywords:** Networking

**Abstract:** ATNODE is a DECnet conversational program. It allows you to send arbitrary DCL commands with qualifiers and parameters to another DECnet node and observe the displayed result as if you were logged into the remote node. Built on top of this are NETPRINT and NETSUBMIT which send print and batch jobs to another DECnet node with arbitrary qualifiers, positional qualifiers and multiple filenames.

**Notes:** ATNODE is made 'conversational' so arbitrary DCL commands with qualifiers and parameters can be executed at remote DECnet nodes.

**Restrictions:** Cannot execute many DECnet related commands at the remote node, such as Mail, Reply, Phone. Cannot run interactive programs at the remote node such as editors. The ATNODE program may hang if attempted.

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

**DECUS NO:** VAX-218 **Title:** PASTOR: A Syntax-directed PASCAL Editor **Version:** October 1986

**Author:** Dunz, Gittinger

**Submitted by:** Walter H. Burkhardt, Univ. of Stuttgart/Inst. fur Informatik, D-7000 Stuttgart, West Germany **Operating System:** VAX/VMS V3.7+ **Source Language:** PASCAL **Memory Required:** 1MB **Hardware Required:** VT100 terminal or compatible **Keywords:** Editors, PASCAL, Programming Languages

**Abstract:** PASTOR is a syntax-directed editor for creating PASCAL programs. The user receives a template from the system for building his program. The starting template is PASCALPROGRAMM which the user can expand in all permitted syntactic detail of the standard and insert his program constructs. The user can check at any time for syntactic or semantic correctness of his program. The control functions for the editor portion are programmed into the control keys of the VT100 terminal.

**Notes:** All documentation on tape in German.

**Media (Service Charge Code):** 600' Magnetic Tape(MA)  
**Format:** VAX/ANSI

**DECUS NO:** VAX-219 **Title:** LAN Printer Symbiont **Version:** V1.1, August 1986

**Submitted by:** David L. Cathey, Texas Instrument Incorporated **Operating System:** VAX/VMS V4.2 to V4.4 **Source Language:** MACRO-11 **Software Required:** Ungermann-Bass **Hardware Required:** Ungermann-Bass Local Area Network **Keywords:** Utilities - VMS

**Abstract:** The LANPRTSMB implements a distributed printer server by synchronizing access to a printer through the Network Interface Units from Ungermann-Bass. The symbiont requests access to the printer by modem control signals (DTR), and the NIU's arbitrate control over the printer resource.

This allows several VAXen (with no need for direct communication between any VAX, i.e. VAXclustering, DECnet, etc..) to share a single printer, or collection of printers.

**Notes:** Must have operating system VMS V4.2+ (BMB-SRUSHR fixes).

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

**DECUS NO:** VAX-222 **Title:** EXPERT: An Experimental Learning Expertsystem **Version:** October 1986

**Author:** B. Koeder

**Submitted by:** Walter H. Burkhardt, Univ. Stuttgart/Inst. fur Informatik, D-7000 Stuttgart, West Germany **Operating System:** VAX/VMS V3.7 and greater **Source Language:** PASCAL **Memory Required:** 500KB **Software Required:** PASCAL (for modifications). **Keywords:** Artificial Intelligence

**Abstract:** EXPERT is an experimental learning expert-system. It derives new knowledge from known information. The information is given in examples. By their analysis, the user is asked some questions. The program draws conclusions from these within a knowledge area. The tape contains several examples that are explained in the documentation.

The program is written in PASCAL, instead of one of the exotic KI-languages. It runs very fast, therefore, it can easily be modified.

**Notes:** Documentation on tape is in German.

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

**DECUS NO:** VAX-224 **Title:** FPaint: A FORTRAN Data Entry Manager **Version:** V3.12, October 1986

**Submitted by:** Messrs. J. Sinclair & M. Geih, Inland Steel Company Research, East Chicago, IN **Operating System:** VAX/VMS V4.4 **Source Language:** VAX FORTRAN **Hardware Required:** ANSI Terminal **Keywords:** FORTRAN

**Abstract:** FPaint permits a programmer to interactively design a data entry screen for use in a FORTRAN application. This provides an easy way to generate complex screen entry applications and maintains a standard user and program interface across applications. With a minimum of system requirements, FPaint can be ported to any system with FORTRAN 77 and video display terminals capable of cursor addressing. FPaint provides integer, real, character, date and label field types, control of the display attributes, input range checking and type validation, and optional help text for each field. The programmer has complete control over the runtime screen dynamics.

**Notes:** Company could not complete paperwork releasing sources at this time. Contact author for source code.

**Sources not included.**

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

#### NEW LIBRARY PROGRAMS AVAILABLE FOR THE PDP-11 COMPUTER FAMILY

**DECUS NO:** 11-845 **Title:** RDIR/SQMAP Repair Directories and Squeeze Load Maps Utilities **Version:** April 1986

**Submitted by:** H. Reints, AKZO PHARMA **Operating System:** RT-11 V5.2 **Source Language:** FORTRAN IV, MACRO-11 **Memory Required:** 20KW **Software Required:** RT-11 or TSX operating system. FORTRAN IV compiler, FORTRAN OTS in, SY:FORLIB.OBJ **Keywords:** Utilities - RT-11

**Abstract:** RDIR is a program that generates ASCII formatted dumps of the directory segments of an RT-11 volume. This can be very useful to search through directory segments, much easier than by using DUMP, because the RDIR output conforms exactly to the directory structure. With RDIR, a corrupted directory can also be re-

paired by patching the contents of the directory segments much easier than using SIPP, (for example bypassing a corrupted segment by modifying the "linked list").

SQMAP is a program to squeeze load maps of overlaid FORTRAN programs into a short map, showing only the sizes of overlay segments and the global names that do not contain dollar signs or periods. It also produces a one page plot of the overlaid memory usage and an optional cross reference that shows in what segments the globals are referenced.

Extra utilities included in the package: HRLIB, a library containing some useful routines (RDIR uses some of them); CALCUL, a VT100 calculator program; GONLIB, a library with goniometric functions that are not in the FORTRAN library (used by CALCUL); and HRMAC, a useful macro library.

**Assoc. Documentation:** RT-11 Documentation Kit

**Restrictions:** Program requires RT-11 V5.0 or later.

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

**DECUS NO:** 11-858 **Title:** EMPIRE **Version:** October 1986

**Submitted by:** Richard D. Newell, Utah Power & Light **Operating System:** RSX-11M-PLUS V2.1 **Source Language:** MACRO-11, FORTRAN 77 **Memory Required:** 68KB **Hardware Required:** VT52 compatible **Keywords:** Games

**Abstract:** EMPIRE is a strategy and tactics war game, pitting you against the computer. The game is played on a computer generated map that contains land areas, sea areas and cities. The object of the game is to eliminate the opponent by capturing cities and destroying the enemy forces. Cities once captured have production capability and can produce units such as armies, fighters, destroyers, submarines or carriers for offense or defense. Of course, the computer is trying to crush your forces and take over the world, as are you.

Early in the game, exploration is most predominate, followed later by planned offensives and holding actions, till eventually victory or defeat.

Warning: typical games can take as long as ten hours, and some people find the game addictive. The program keeps the game state in a disk file, and a single game usually takes multiple terminal sessions. The .DOC file containing the instructions is correct and complete, but is terse and lacks examples. This sometimes causes confusion in the first games.

**Notes:** Uses I & D space, reduced mapping, fixes odd address trap on input.

**Media (Service Charge Code):** Two RX02 Diskettes (LB) **Format:** FILES-11, 600' Magnetic Tape (MA) **Format:** FILES-11

**DECUS NO:** 11-859 **Title:** DEVICS **Version:** V1.0, August 1986

**Submitted by:** R. Bremmer & D. K. Wagner, Rockwell International, Golden, CO **Operating System:** RSX-11M V4.1E **Source Language:** MACRO-11

**Abstract:** The purpose of the DEVICS task is to output the CSR address, vector, device priority and other device status information for each device in the system. RSX-11M currently does not have a simple method of gaining access to this information.

This information is especially useful if a SysGen is to be performed on the current hardware configuration. Many times the answer file from the previous SysGen was not saved, or a list was not prepared containing the above information when the hardware was installed.

Other information is given regarding the unit or device's status as well as their individual characteristics. Details of where and how this information is obtained is described in the I/O Drivers reference manual.

**Notes:** Operating System RSX-11M V4.1 is required. Will work on other versions, but will not report new devices on releases better than V4.1E.

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

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

**DECUS NO:** PRO-160 **Title:** IMAGE **Version:** V6, 1986

**Submitted by:** John M. Crowell, Crowell, Ltd., Los Alamos, NM **Operating System:** RT-11 V5.3 **Source Language:** MACRO-11 **Memory Required:** 256 KB **Keywords:** Graphics, Professional-300 Series - RT-11

**Abstract:** IMAGE is a program for displaying images on the Professional-300 series bitmapped display. Full-color images can be displayed on systems with the extended bitmap option and a color video monitor. Use of RT-11 extended memory regions allows an image file to be read from the disk while another image is being displayed. Several sample image files are included in the distribution.

**Notes:** RT-11 V5.2 or later is necessary (for global region usage).

**Media (Service Charge Code):** Two RX50 Diskettes (JB) **Format:** RT-11

**DECUS NO:** PRO-165 **Title:** Technical Graphics Programs for the Pro-350 **Version:** July 1986

**Submitted by:** Robert A. Brockman Ph.D. **Operating System:** P/OS V2.0 **Source Language:** FORTRAN 77 **Memory Required:** 64KB maximum **Software Required:** PROSE (optional) **Hardware Required:** Hard Disk **Keywords:** Graphics, Utilities - P/OS

**Abstract:** This package contains five programs which can be used to create three basic types of graphic displays.

- GCPLLOT plots, and optionally labels, contours of a function (or collection of data points) in two dimensions. The region on which the data is defined and displayed may be highly irregular.

- CCPLOT is very similar to GCPLLOT and accepts the same data. Output from CCPLOT is in the form of color-filled plots (or grey scale on a B/W monitor), coded according to function values. Color-coding may be specified using color maps created in COLMAP.

- XYPLOT is a simple X-Y plotter, with axis limits, tick mark spacing, titles and label formats specified by the user.

- GCDATA is built around a FORTRAN interpreter, which allows formulas to be translated into the contouring data used by GCPLLOT and CCPLOT. The PROSE editor, under control of GCDATA, allows for user input and editing of one or more FORTRAN-like statements defining the function. Data for contour plotting is then generated on up to five rectangular and five curved regions specified by the user.

- COLMAP is a color map editor, which is useful in specifying the color-coding scheme in CCPLOT. A set of eight colors (including background) may be edited at once. Colors are modified by adjusting red, green, and blue levels, with the color display being updated interactively.

**Restrictions:** CCPLOT and COLMAP require extended bitmap option, and a color monitor is recommended. GCDATA uses PROSE callable editor task (CET).

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

#### NEW LIBRARY PROGRAMS AVAILABLE FOR THE RAINBOW SERIES OF COMPUTERS

**DECUS NO:** RB-117 **Title:** Vehicle Records **Version:** V6, July 1986

**Submitted by:** Bruce W. Roeckel, Florida Power Corp., St. Petersburg, FL **Operating System:** MS/DOS V2.11 **Source Language:** FORTRAN 77 **Memory Required:** 128K **Software Required:** Microsoft FORTRAN is re-

quired to recompile and relink. **Hardware Required:** LA50 printer. Software uses special escape sequences to control printer fonts. **Keywords:** Business Applications

**Abstract:** The Vehicle Records program is designed to allow a user to store mileage and maintenance information for up to twenty-five vehicles. A full-screen editor is utilized for the addition, editing and selling of vehicle entries in the master file. Prompts are used for data to be entered when updating mileage or maintenance.

Mileage information is broken up into two categories; city and trip mileage. When reports and/or graphs are generated, these two categories are always kept separate. Also, when entering trip mileage, the user is prompted for a description of the trip.

Maintenance information is also broken up into two categories; recurring items and special repairs. For the recurring items, the only data stored is that which pertains to the last time you performed the task. Typical recurring maintenance items are oil changes, lube jobs, tire rotations, etc. Each time you update the recurring items, you're prompted for any notes that you may want to store, (i.e. the type of oil used), as well as the date of repair, cost and odometer reading. For the special repair items, you are asked for a description of the repair in addition to other data, i.e. date, cost, etc.

Summary reports can be obtained for any vehicle and include

- . A maintenance records report
- . A city or trip mileage report
- . A city or trip mileage graph

The graphs can be displayed directly on the screen (without the Rainbow Graphics Option Card) and/or printed on an LA50 printer. All of the data on any of the summary reports is sorted by odometer reading.

**Notes:** MS/DOS V2.11 is required. Software must have ANSI escape sequences. Author's special library routines are not included, but object module is included for linking.

**Restrictions:** System must be configured with an E: drive. This can be either an MS/DOS partition on a hard disk, or a 64K MDRIVE (Ram Disk).

Complete sources not included.

**Media (Service Charge Code):** One RX50 Diskette (JA)  
**Format:** MS/DOS

**DECUS NO:** RB-122 **Title:** DBMS/Spreadsheet for MS/DOS **Version:** V1, October 1986

**Submitted by:** Glenn C. Everhart, Ph.D. **Operating System:** MS/DOS **Source Language:** FORTRAN 77 **Memory Required:** 512K **Keywords:** Data Base Management, Spreadsheet

**Abstract:** This is primarily a relational DBMS with sources that will run on 512K MS/DOS machines including the Rainbow. Also present is a barebone AnalytiCalc which runs (but with flawed function key mapping) on the Rainbow and runs perfectly on the IBM PC/XT/AT and compatible like VAXmate. The DBMS is fully relational, supports large databases, has built-in help, a program interface, a command-spawn subcommand and more. It is essentially the same as public domain VAX RIM with enhancements.

**Notes:** Not all sources fit on disks. DBMS source is complete. Spreadsheet source is not there.

**Assoc. Documentation:** AnalytiCalc manual - see Program No. 11-SP-47 documentation.

**Complete sources not included.**

**Media (Service Charge Code):** Four RX50 Diskettes (JD) **Format:** MS/DOS

#### NEW LIBRARY PROGRAMS AVAILABLE FOR THE DECsystem-10 FAMILY OF COMPUTERS

**DECUS NO:** 10-367 **Title:** Fpaint: A FORTRAN Data Entry Manager **Version:** V3.12, October 1986

**Submitted by:** Messrs. J. Sinclair & M. Geib, Inland Steel Company Research, East Chicago, IN **Operating System:** TOPS-10 **Source Language:** FORTRAN 77 **Hardware Required:** ANSI Terminal **Keywords:** FORTRAN

**Abstract:** FPaint permits a programmer to interactively design a data entry screen for use in a FORTRAN application. This provides an easy way to generate complex screen entry applications and maintains a standard user and program interface across applications. With a minimum of system requirements, Fpaint can be ported to any system with FORTRAN 77 and video display terminals capable of cursor addressing. Fpaint provides integer, real, character, date and label field types, control of the display attributes, input range checking and type validation, and optional help text for each field. The programmer has complete control over the run-time screen dynamics.

**Notes:** Company could not complete paperwork releasing sources at this time. Contact author for source code.

**Sources not included.**

**Media (Service Charge Code):** 600' Magnetic Tape (MA)

#### REVISIONS TO LIBRARY PROGRAMS

**DECUS NO:** VAX-154 **Title:** Screen Management System Subroutines **Version:** October 1986

**Submitted by:** Kenneth Messer, Allied Electronics, Ft. Worth, TX **Operating System:** VAX/VMS V4.4 **Source Language:** VAX BASIC **Keywords:** BASIC, Tools - Applications Development

**Abstract:** This submission consists of a group of subroutines written in VAX BASIC V2.3, comprising a system allowing the (relatively) simple usage of the new VAX Screen Management System under VMS version 4.2. Also, included is a demonstration program using it. With this system, a programmer can create up to 10 virtual displays and manipulate them quite simply, by keeping track of the sequence number of the intended virtual display (0 through 9) and passing that number as an argument in the subroutine call. Specific information about the routines, as well as argument layouts and more detailed explanations, are to be found in SMGDOC.MEM, which is included in the submission.

**Notes:** Operating system VMS V4.2 or higher is required.

**Changes and Improvements:** Several new subroutines & bug fixes

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

**DECUS NO:** VAX-167 **Title:** CMSBROWSE **Version:** January 1986

**Operating System:** VAX/VMS V4.4 **Source Language:** PASCAL **Software Required:** Operates on CMS Libraries, but CMS not required. **Keywords:** Utilities - VMS

**Abstract:** CMSBROWSE is a utility designed to access files created by Digital Equipment Corporation's Code Management System (CMS). CMSBROWSE allows easy access to CMS data files, bypassing normal CMS operations which can be quite slow. CMSBROWSE can also be of use in sites that don't have CMS, but want the ability to easily read and fetch data files stored in a CMS library (presumably created off site). CMSBROWSE supports the following operations on CMS data files: read-only edit, fetch (i.e. copy to default directory) and print.

**Restrictions:** Tested with CMS V2.2 and VMS V4.4.

**Media (Service Charge Code):** 600' Magnetic Tape (MA) **Format:** VAX/ANSI

**DECUS NO:** 10-SP-10 **Title:** AMAR-10: A Performance Analysis Tool **Version:** V4.3, February 1986

**Submitted by:** Digital Equipment Corporation **Operating System:** TOPS-10 release 7.02 **Source Language:** MACRO-

10, FORTRAN IV-10, COBOL-74, COBOL-68 **Software Required:** Particular Compiler versions. See tape. **Keywords:** System Management - TOPS-10

**Abstract:** AMAR-10/20 is a unique performance analysis tool, formerly a Digital Equipment Corporation product. AMAR maintains two distinct databases; one records operating system performance metrics; the other characterizes the timesharing workload. AMAR retains data at user-specified granularity. This allows for easy trend analysis and problem identification.

AMAR is in the public domain. Neither AMAR nor any derivative performance monitoring tools may be resold.

AMAR does not support recent TOPS operating system releases.

Persons upgrading AMAR to support current releases are encouraged to submit their changes to DECUS.

**Restrictions:** Not updated for release 7.03.

**Media (Service Charge Code):** User's Manual (ED), 2400' Magnetic Tapes (PB)

**DECUS NO:** 20-SP-9 **Title:** AMAR-20: A Performance Analysis Tool **Version:** V4.3, February 1986

**Submitted by:** Digital Equipment Corporation **Operating System:** TOPS-20 release 5.1 **Source Language:** MACRO-20, FORTRAN IV-20, COBOL-74, COBOL-68 **Software Required:** Particular Compiler versions. See tape. **Keywords:** System Management - TOPS-20

**Abstract:** AMAR-10/20 is a unique performance analysis tool, formerly a Digital Equipment Corporation product. AMAR maintains two distinct databases; one records operating system performance metrics; the other characterizes the timesharing workload. AMAR retains data at user-specified granularity. This allows for easy trend analysis and problem identification.

AMAR is in the public domain. Neither AMAR nor any derivative performance monitoring tools may be resold.

AMAR does not support recent TOPS operating system releases.

Persons upgrading AMAR to support current releases are encouraged to submit their changes to DECUS.

**Restrictions:** Not updated for release 6.0.

**Media (Service Charge Code):** User's Manual (ED), 2400' Magnetic Tapes (PB)

**DECUS NO:** PRO-126 **Title:** User Command Linkage-Plus for RT-11 and TSX-PLUS on the PRO **Version:** V07.54a, May 1986

**Submitted by:** William K. Walker, Monsanto Research Corporation, Miamisburg, OH **Operating System:** RT-11 V5.4, TSX-PLUS V6.1 **Source Language:** MACRO-11

**Memory Required:** Non-XM-10079W; XM-478W low mem; 10240W ext mem. **Keywords:** Professional-300 Series - RT-11, TSX, Utilities - RT-11

**Abstract:** UCL+ is a user command linkage program for use with RT-11 V5 or later, RTEM V2.0 or later and TSX-PLUS V4.1 or later monitors. It allows the dynamic, on-line definition of user commands and contains full support for the user command related features of these operating systems. These include:

- . UCL - User Command Linkage (RT-11, RTEM, and TSX-PLUS)
- . UCI - User Command Interpreter (TSX-PLUS, starting with V5.0)
- . UCF - User Commands First (RT-11, starting with V5.2)

UCL+ contains a number of extensions to the distributed RT-11 and TSX-PLUS UCL programs. Among these are:

- . Optional chaining to additional "UCL's".
- . A user-definable "run-by-name path" which extends the monitor's "run-from-SY:" default.
- . The capability to STORE/RECALL the program settings to/from a separate file in either "binary" or "journal" mode. Journal files can be edited.
- . A PASS\_ON command that allows you to force UCL+ to "pass-on" a given command string to the next program in the chain (the default mode) or to a program that you specify.
- . DISPLAY of symbol expansions with or without execution. The DISPLAY command can also be used to output ASCII strings to the console or printer (handy for sneaky escape sequences).
- . Several useful "hard-wired" commands, including a DCL-style RNO command for use with the DECUS RUNOFF program.
- . Provision for accepting lower-case input and most control characters.
- . A "quoting" facility which overrides the effect of "operator" characters.
- . Support for more complex command definitions by allowing the parsing of argument strings into as many as nine sub-strings.
- . A CI "handleroid" which controls and displays the action of the various RT-11 Command Language Interpreters.
- . A special version of UCL+ for the XM monitor. Almost the entire program is continuously resident in a global region in extended memory. It is very fast, and uses less than 512 (decimal) words of low memory.

The distribution also includes the source text and instructions necessary to create an on-line HELP facility for UCL+.

**Notes:** Operating system, RT-11 or TSX-PLUS that runs on the PRO is required.

**Changes and Improvements:** Support has been added for the new RT-11 features introduced with V5.2 such as UCF (User Commands First) and the individual enabling/disabling of command line interpreters. The more recent versions of TSX-PLUS are supported also. Other new features include a memory-resident version of UCL+ for extended memory environments and more complex parsing of argument strings.

**Restrictions:** The CI handler included in this package runs under RT-11 V5.2 or later monitors only. The extended memory version of UCL+ requires an RT-11 V5.2 or TSX-PLUS V6.0 or later monitor.

**Media (Service Charge Code):** One RX50 Diskette (JA)  
**Format:** RT-11

**DECUS NO:** PRO-157 **Title:** NBS PASCAL **Version:** June 1986

**Submitted by:** Earl Chew **Operating System:** RT-11 V5.1, V5.2 **Source Language:** PASCAL **Memory Required:** 512KB **Keywords:** Compilers, PASCAL

**Abstract:** A much modified version of the NBS PASCAL compiler V1.6i is provided. This is basically a runtime distribution only, the aim being to provide an executable PASCAL compiler on one floppy. A fuller kit should be available soon on 8" media.

This kit provides PRO/RT users with a PASCAL compiler. Documentation is included which details the changes made to the original. A string handling package is included as well as a program demonstrating its usage. A cross referencer and a profiler are also included.

**Changes and Improvements:** Bug fixes

**Restrictions:** Compiler sources not included

**Complete sources not included.**

**Media (Service Charge Code):** One RX50 Diskette (JA)  
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#### DECUS PROGRAM LIBRARY CHANGES:

**DECUS NO:** 11-597, **Title:** DTC: Desk Top Calendar is listed without the following restriction in the Catalog Please add the following restriction: "Task image for RSTS/E is not provided. Must have FORTRAN compiler in this case."

#### DECUS PROGRAM LIBRARY CHANGES:

The following programs are now available on the new media code (TC) TK 50 Tape Cartridge. These programs are listed in the 1986/1987 Software Catalog

| DECUS NO    | TITLE                                                                    | MEDIA                    |
|-------------|--------------------------------------------------------------------------|--------------------------|
| VAX-LIB-1   | The VAX Library Tape 1                                                   | TK50 Tape Cartridge (TC) |
| VAX-LIB-2   | The VAX Library Tape 2                                                   | TK50 Tape Cartridge (TC) |
| VAX-LIB-3   | The VAX Library Tape 3                                                   | TK50 Tape Cartridge (TC) |
| VAX-LIB-4   | The VAX Library Tape 4                                                   | TK50 Tape Cartridge (TC) |
| VAX-SPLIB-1 | The Special Lib. Tape 1                                                  | TK50 Tape Cartridge (TC) |
| VAX-SPLIB-2 | The Special Lib. Tape 2                                                  | TK50 Tape Cartridge (TC) |
| V-SP-24     | PortaCalc (AnalytiCalc): A 3D Spreadsheet/ Database System in VMS/BACKUP | TK50 Tape Cartridge (TC) |
| V-SP-43     | Symposium Tape from the RSX SIG, Spring 1985, New Orleans in VMS/BACKUP  | TK50 Tape Cartridge (TC) |
| V-SP-46     | Symposium Tape from VAX SIG, Spring 1985, New Orleans                    | TK50 Tape Cartridge (TC) |
| V-SP-48     | Best of PC-8088 Collections 1-8                                          | TK50 Tape Cartridge (TC) |
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| 11-SP-90    | Symposium tape from the RSX SIG, Fall 1985, Anaheim                      | TK50 Tape Cartridge (TC) |

# LIBRARY ANNOUNCEMENT

The Library has the following items available on the TK50 cartridge(media code TC).

|             |                                         |
|-------------|-----------------------------------------|
| VAX-LIB-1   | VAX LIBRARY TAPE 1                      |
| VAX-LIB-2   | VAX LIBRARY TAPE 2                      |
| VAX-LIB-3   | VAX LIBRARY TAPE 3                      |
| VAX-LIB-4   | VAX LIBRARY TAPE 4                      |
| VAX-LIB-5   | VAX LIBRARY TAPE 5                      |
| VAX-SPLIB-1 | SPECIAL VAX LIBRARY TAPE 1              |
| VAX-SPLIB-2 | SPECIAL VAX LIBRARY TAPE 2              |
| V-SP-24     | PORTACALC                               |
| V-SP-43     | RSX SIG COLLECTION, SPRING '85, NEW ORL |
| V-SP-46     | VAX SIG COLLECTION, SPRING '85, NEW ORL |
| V-SP-48     | BEST OF PC-8088 COLLECTIONS 1-8         |
| V-SP-49     | VAX SIG COLLECTION, FALL '85, ANAHEIM   |
| V-SP-50     | RSX SIG COLLECTION, FALL '85, ANAHEIM   |
| V-SP-51     | PC-8088 COLLECTION 9                    |
| V-SP-52     | VAX SIG COLLECTION, SPRING '86, DALLAS  |
| V-SP-53     | KERMIT DISTRIBUTION                     |
| V-SP-54     | PC-8088 COLLECTION 10                   |
| V-SP-55     | RSX SIG COLLECTION, SPRING '86, DALLAS  |
| V-SP-58     | LATEX, TEX                              |
| 11-SP-47    | PORTACALC                               |
| 11-SP-18    | C LANGUAGE SYSTEM                       |
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Please call 617-480-3418 for pricing and details on the above announcement.

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SUBMITTING ARTICLES TO THE HMS SIG NEWSLETTER  
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The purpose of the HMS SIG newsletter is to serve as a forum to share information related to DEC hardware with the members of the SIG. As such, the existence of the newsletter is entirely dependent on your contributions. If you have an HHK item, a better or safer way to do something, product news, a tutorial article of general interest, etc., we are interested in publishing it in the newsletter. It is intended that the HMS newsletter be published at least four times a year.

You can submit material to either the editor, Bill Walker, or the assistant editor, Carmen Wiseman. We can accept submissions in a wide variety of formats:

- o Items can be sent to the assistant editor on VMS format RX50's or IBM PC format 5 1/4" floppys.
- o The editor can handle just about any reasonable media, but prefers RT-11 format diskettes.
- o Hard copy, like cash, is always acceptable. If it is camera-ready it will save us a lot of typing, but we don't insist on it.
- o Those of you that have access to DCS can send things to WALKER or WISEMAN. DCS is usually checked on a daily basis.
- o The editor can also be reached on CompuServe as "Bill Walker 71066,24" or via EasyLink mailbox 62752448.

In any event, if you have anything to submit, send it! If it is a mess, but we can read it, we will get it in the newsletter somehow. Finally, if you have any question about submitting material, call one of us. The telephone numbers are listed below.

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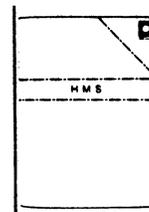
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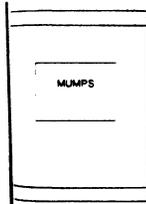
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Statement of Problem: \_\_\_\_\_

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1. If you are trying to demonstrate a method or a concept, please simplify the procedures, records, and other information to the shortest form possible.
2. Annotate your attachments. Simple comments or hand-written notes ("Everything worked until I added this statement.") go a long way toward identifying the problem.
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Product Improvement Request Submission Form

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DECUS Membership Number:  
Firm:

Phone:

Product or Products:

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A PIR should be directed at a specific product or group of products. Be sure to give the full name of the product(s) and version numbers if applicable. Describe the functionality you would like to see in as complete terms as possible. Don't assume that the PIR editors or software developers know how it is done in some other software product - state specifically how you want the software to function. Provide justification of your request and give an example of its use. If you can, suggest a possible implementation of your request.

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Abstract: (Please limit to one or two short sentences.)

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Description and Examples: (Use additional pages as necessary.)

[Put my name and address on reverse side, thus:]

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1987 Spring Symposia, Nashville**

**April 27, 1987 to May 1, 1987**

I would like to volunteer to be a session chair or suite host for the DTR/4GL SIG at the 1987 Spring DECUS Symposium in Nashville, April 27 to May 1. I can meet in the DTR/4GL Suite at 5:30pm on Sunday, April 26 for final assignments and instructions. I have indicated my first (1) to fifth (5) choices for assignments.

|          |       |                                   |
|----------|-------|-----------------------------------|
| Name:    | _____ | I would like a letter to my boss. |
| Phone:   | _____ | Boss' name: _____                 |
| DECUS #: | _____ | Boss' address: _____              |
| Address: | _____ | _____                             |
|          | _____ | _____                             |
|          | _____ | _____                             |

SESSION CHAIR

Monday, April 27

|               |                                                              |
|---------------|--------------------------------------------------------------|
| 10:00-11:00am | Positioning Digital's Fourth Generation Language Products    |
| 11:00-12:00pm | Beginner's Guide to DATATRIEVE                               |
| 1:00- 1:30pm  | Understanding VAX POWERHOUSE Screen Processing               |
| 1:30- 2:00pm  | POWERHOUSE Hints and Kinks                                   |
| 2:00- 3:00pm  | VAX DATATRIEVE Status Update and Internals                   |
| 3:00- 4:00pm  | Using VAX DATATRIEVE Graphics                                |
| 4:00- 5:00pm  | VAX TEAMDATA - End-user Information Management               |
| 5:00- 6:00pm  | VAX RALLY - Fourth Generation Application Development System |
| 6:00- 7:00pm  | POWERHOUSE Working Group Meeting                             |
| 7:00- 8:00pm  | Designing Applications with FMS and DATATRIEVE               |
| 8:00- 9:00pm  | Solving Equations in DATATRIEVE                              |
| 9:00-10:00pm  | Dealing with Hierarchies in VAX DATATRIEVE                   |

Tuesday, April 28

|               |                                                              |
|---------------|--------------------------------------------------------------|
| 10:00-11:00am | What's Wrong with Fourth Generation Languages                |
| 11:00-12:30pm | RMS Based 4GL Development Tools                              |
| 11:30-12:30pm | The Best of Wombat Magic                                     |
| 12:30- 1:30pm | ACCENT R Simultaneous Update and Advanced System Functions   |
| 1:30- 2:30pm  | Using ACCENT R Data Sets with SPSS-X and RMS Indexed Files   |
| 2:30- 3:30pm  | DATATRIEVE Application Design Considerations and Tutorial    |
| 3:30- 4:30pm  | Performance Management for DATATRIEVE Applications           |
| 4:30- 5:00pm  | CDD Optimization for Performance                             |
| 5:00- 6:00pm  | Advanced RMS File Design & Tuning for DATATRIEVE Performance |
| 5:00- 6:00pm  | VAX REPORTER - A Business Reporting Package                  |

Wednesday, April 29

|               |                                                      |
|---------------|------------------------------------------------------|
| 9:00-10:00am  | Everything You Wanted to Know About DATATRIEVE-11    |
| 11:00-12:00pm | VAX DATATRIEVE's Interface into Relational Databases |
| 1:30- 2:30pm  | Using the DATATRIEVE Call Interface                  |
| 2:30- 3:00pm  | DATATRIEVE Call Interface and SPSS-X                 |

Thursday, April 30

|               |                                                      |
|---------------|------------------------------------------------------|
| 9:00-10:00am  | How to Evaluate Fourth Generation Languages          |
| 10:00-11:00am | A Software Developer's Comparison of 4GLs            |
| 11:00-11:30am | Selecting an Application Development 4GL             |
| 11:30-12:30pm | Using a 4GL to Enhance Manufacturing Software        |
| 12:30- 1:00pm | Using SMARTSTAR to Complement DATATRIEVE             |
| 1:00- 2:00pm  | Advanced DATATRIEVE Record Definitions               |
| 2:00- 3:00pm  | Advanced Report Writing Techniques in VAX DATATRIEVE |

| | 3:00- 4:00pm Writing Menu-driven Systems in VAX DATATRIEVE  
 | | 4:00- 5:00pm VAX DATATRIEVE Security Using Environment Accounts & ACLs  
 | | 4:00- 6:00pm VAX RALLY: Advanced Usage  
 | | 5:00- 6:00pm Adding Functions to VAX DATATRIEVE  
 | | 6:00- 7:00pm System Management Techniques Using DATATRIEVE

Friday, May 1

| | 9:00-10:00am MANTIS - A Fourth Generation Language for the VAX  
 | | 10:00-10:30am Prototyping in Fourth Generation Languages  
 | | 10:30-11:00am A Comparison of CDD and VAX POWERHOUSE PHD Dictionaries  
 | | 11:00-11:30am DATATRIEVE vs POWERHOUSE QUIZ Report Writers  
 | | 11:30-12:30pm Application Development Using INTELLECT/Rdb

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|---------------|---------------|----------------------|---------------|---------------|---------------|--|
| Monday        | Tuesday       | Wednesday            | Thursday      | Friday        |               |  |
| April 27      | April 28      | April 29             | April 30      | May 1         |               |  |
| 10:00-11:00am | 9:00-10:00am  | 9:00-10:00am         | 9:00-10:00am  | 9:00-10:00am  | 9:00-10:00am  |  |
| 11:00-12:00m  | 10:00-11:00am | 10:00-11:00am        | 10:00-11:00am | 10:00-11:00am | 10:00-11:00am |  |
| 12:00- 1:00pm | 11:00-12:00m  | 11:00-12:00m         | 11:00-12:00m  | 11:00-12:00m  | 11:00-12:00m  |  |
| 1:00- 2:00pm  | 12:00- 1:00pm | 12:00- 1:00pm        | 12:00- 1:00pm | 12:00- 1:00pm | 12:00- 1:00pm |  |
| 2:00- 3:00pm  | 1:00- 2:00pm  | 1:00- 2:00pm         | 1:00- 2:00pm  | 1:00- 2:00pm  | 1:00- 2:00pm  |  |
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IAS WHIMS

WHAT: (Describe your WHIM) (Please print or type)

WHY: (Describe the reason for the WHIM)

HOW: (Make any suggestions for a possible implementation)

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**Telephone:** \_\_\_\_\_

**If this is a reply to a previous DATAGRAM, what #? \_\_\_\_\_**

**Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Place  
Stamp  
Here**

**Vickie Hess  
NETWords Editor  
2510 Limestone Ln.  
Garland, Tx. 75040**

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## OFFICE AUTOMATION SIG SYSTEM IMPROVEMENT REQUEST SUBMISSION FORM

Name \_\_\_\_\_ Address \_\_\_\_\_

Firm \_\_\_\_\_

Telephone \_\_\_\_\_

**INSTRUCTIONS:** System Improvement Requests (SIR) can be either hardware or software; please check the category addressed by this SIR. Under ABSTRACT, give a brief definition of the capability you would like. In the DESCRIPTION section, give a detailed description and examples of what you want. Be specific; don't assume that we know how other products function. Justify the usefulness of the capability and give an example of its use.

**HARDWARE IMPROVEMENT**

**SOFTWARE IMPROVEMENT**

DECmate \_\_\_\_\_

ALL-IN-1 \_\_\_\_\_

WPS \_\_\_\_\_

PRO-Series \_\_\_\_\_

CP/M (DECmate) \_\_\_\_\_

P/OS \_\_\_\_\_

Rainbow \_\_\_\_\_

CP/M (Rainbow) \_\_\_\_\_

MS-DOS \_\_\_\_\_

Other \_\_\_\_\_

Other \_\_\_\_\_

**ABSTRACT** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**DESCRIPTION** \_\_\_\_\_

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\_\_\_\_\_

**E. Catherine Ditamore  
ARA Services  
Corp MIS  
The ARA Tower  
1101 Market Street  
Philadelphia, Pa. 19107**

# DECmate Wish List Ballot

Use this ballot to show which items on the DECmate Wish List are most important to you. Put the number of the most important item on the list in space 1, the next most in space 2, etc.

|          |           |           |           |           |
|----------|-----------|-----------|-----------|-----------|
| 1. _____ | 10. _____ | 19. _____ | 28. _____ | 37. _____ |
| 2. _____ | 11. _____ | 20. _____ | 29. _____ | 38. _____ |
| 3. _____ | 12. _____ | 21. _____ | 30. _____ | 39. _____ |
| 4. _____ | 13. _____ | 22. _____ | 31. _____ | 40. _____ |
| 5. _____ | 14. _____ | 23. _____ | 32. _____ | 41. _____ |
| 6. _____ | 15. _____ | 24. _____ | 33. _____ | 42. _____ |
| 7. _____ | 16. _____ | 25. _____ | 34. _____ | 43. _____ |
| 8. _____ | 17. _____ | 26. _____ | 35. _____ | 44. _____ |
| 9. _____ | 18. _____ | 27. _____ | 36. _____ | 45. _____ |

Please add the following to the wish list:

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Comments:

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

Work Phone: \_\_\_\_\_

Home Phone: \_\_\_\_\_

Return Ballot to:

**Cheryl Johnson**  
**DECUS DECmate Working Group**  
**Grinnell College**  
**P.O. Box 805**  
**Grinnell, IA 50112-0810**

# Professional Wish List Ballot

Use this ballot to show which items on the Professional Wish List are most important to you. Put the number of the most important item on the list in space 1, the next most in space 2, etc.

|          |           |           |           |           |
|----------|-----------|-----------|-----------|-----------|
| 1. _____ | 10. _____ | 19. _____ | 28. _____ | 37. _____ |
| 2. _____ | 11. _____ | 20. _____ | 29. _____ | 38. _____ |
| 3. _____ | 12. _____ | 21. _____ | 30. _____ | 39. _____ |
| 4. _____ | 13. _____ | 22. _____ | 31. _____ | 40. _____ |
| 5. _____ | 14. _____ | 23. _____ | 32. _____ | 41. _____ |
| 6. _____ | 15. _____ | 24. _____ | 33. _____ | 42. _____ |
| 7. _____ | 16. _____ | 25. _____ | 34. _____ | 43. _____ |
| 8. _____ | 17. _____ | 26. _____ | 35. _____ | 44. _____ |
| 9. _____ | 18. _____ | 27. _____ | 36. _____ | 45. _____ |

Please add the following to the wish list:

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Comments:

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

Work Phone: \_\_\_\_\_

Home Phone: \_\_\_\_\_

Return Ballot to:

**Thomas Hintz  
DECUS Professional Working Group  
University of Florida  
IFAS Computer Network  
1022 McCarty Hall  
Gainesville, FL 32611**

# Rainbow Wish List Ballot

Use this ballot to show which items on the Rainbow Wish List are most important to you. Put the number of the most important item on the list in space 1, the next most in space 2, etc.

|          |           |           |           |           |
|----------|-----------|-----------|-----------|-----------|
| 1. _____ | 10. _____ | 19. _____ | 28. _____ | 37. _____ |
| 2. _____ | 11. _____ | 20. _____ | 29. _____ | 38. _____ |
| 3. _____ | 12. _____ | 21. _____ | 30. _____ | 39. _____ |
| 4. _____ | 13. _____ | 22. _____ | 31. _____ | 40. _____ |
| 5. _____ | 14. _____ | 23. _____ | 32. _____ | 41. _____ |
| 6. _____ | 15. _____ | 24. _____ | 33. _____ | 42. _____ |
| 7. _____ | 16. _____ | 25. _____ | 34. _____ |           |
| 8. _____ | 17. _____ | 26. _____ | 35. _____ |           |
| 9. _____ | 18. _____ | 27. _____ | 36. _____ |           |

Please add the following to the wish list:

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Comments:

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

Work Phone: \_\_\_\_\_

Home Phone: \_\_\_\_\_

Return Ballot to:

Lynn Jarrett  
DECUS Rainbow Working Group Chairman  
Union Tribune Publishing Co.  
Post Office Box 191  
San Diego, CA 92108

(619) 299-3131

# PRO/SIGHT GRAPHICS CONTEST

SPRING 1987 DECUS

## << ENTRY FORM >>

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone ( \_\_\_\_\_ ) \_\_\_\_\_

Image/Script Title \_\_\_\_\_

Category Number \_\_\_\_\_ File Name \_\_\_\_\_

\*\*\*\*\*

**NOTE:** If diskette(s) are to be returned to the author, please send entries with self-addressed AND stamped envelope. Provide sufficient postage and packing material. The PC SIG will not be responsible for damage to diskette or entries not returned because of insufficient postage. Returned diskette will contain some .GID files from the contest if requested, so ORIGINAL IMAGE MAY BE DELETED to provide space.

If multiple entries are submitted, xerox and fill out an entry form for each submission. Multiple entries may be sent on a single diskette.

**PC POSTSCRIPT**

PC Postscripts are short requests, comments and responses to be published in the *Postscript Section* of the PC SIG Newsletter. Please respond to the following:

Y/N This is a reply to a previous Postscript.   Issue No.  No.

**Title:** \_\_\_\_\_

**Message:** \_\_\_\_\_

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**Name:** \_\_\_\_\_

**Address:** \_\_\_\_\_

\_\_\_\_\_

**Phone:** (\_\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

**Signature:** \_\_\_\_\_ **Date** \_\_\_\_\_

DECUS PERSONAL COMPUTER SIG QUESTIONNAIRE

General:

I would like information on \_\_\_\_\_
I would like to see an article
in the newsletter on \_\_\_\_\_
I would like to see a symposium
session on \_\_\_\_\_

I am willing to write an article(s) on: \_\_\_\_\_
I am willing to be contacted by PC SIG members by telephone to give
assistance/advice on: \_\_\_\_\_
Phone number to call: Area Code ( ) # \_\_\_\_\_ Times \_\_\_\_\_

I attend DECUS Symposiums : always Sometimes never
I expect to attend these symposiums Fall 85 Spring 86 Fall 86

I use/own: Rainbow(s) PRO(s) DECmate(s) Robin Other
I use the machine(s) checked above: at work at home both
If a work, total number of DEC PC's at your site:
I also use: VAX IBM or other mainframe IBM/other PC
Type of use: business educational government other
Primary Operating System: MS-DOS CP/M both equally
P/OS UNIX other

I belong to a local DEC PC Group: yes no
There is a user group in my geographic area: yes no
I would like information on starting a user group: yes
I use a modem: often reluctantly never
for work for pleasure both

Here is information on he DEC PC User Group I belong to or know of:

Name of Group
Name of Contact Person
Address
Telephone ( )
Supports Rainbow PRO DECmate Robin LUG Gold Key

Here is a DEC oriented bulletin board not on your list, or new information on a
listed board:

Name of Board
Full name of Sysop
Address if known
City and State
Telephone Number
Other Info:
Supports Rainbow PRO DECmate Robin

The subjects of greatest ineres to me are:
word processing project management
spreadsheets specialized vertical software
database (type)
graphics Other:
communications Rainbow
programming PRO
software reviews DECmate
technical articles Robin

DEC Gossip and News       Other: \_\_\_\_\_

If I had it to do over again, I:

would buy another DEC Rainbow/PRO/DECmate (circle one)

might buy another Rainbow/PRO/DECmate if it was a bargain (circle one)

would not buy another Rainbow/PRO/DECmate (circle one)

Will you continue to subscribe at the new price of \$35/year?     yes     no

Feel free to enclose another page(s) with comments!

Do you feel that leaving the prices out of the newsletter

is appropriate

is very annoying

makes the articles less useful

Do you feel that Decus should revise its (anti)commercialism policy?

yes

no

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City/ST/ZIP \_\_\_\_\_

Work Phone (\_\_\_\_) \_\_\_\_\_

Home Phone (\_\_\_\_) \_\_\_\_\_

Return to:

Barbara Maaskant

Computing Resources

The University of Texas Health

Science Center at San Antonio.

7703 Floyd Curl Drive

San Antonio, Texas 78284

fold here, flap under-----

stamp

Barbara Maaskant  
Computing Resources  
The University of Texas Health  
Science Center at San Antonio  
7703 Floyd Curl Drive  
San Antonio, Texas 78284

**Information Resource Sign Up Sheet  
Personal Computing Special Interest Group - PC SIG**

Are you willing to be an information resource for other PC SIG members? Placing your name on the *Contact List* means you are willing to answer questions within the span of a brief telephone conversation. A Contact is not expected to be a consultant. *Please Register below.* Your name and phone number (including restrictions) will be posted in the PC SIG Newsletter.

First Name: \_\_\_\_\_ Last Name: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ ZIP: \_\_\_\_\_

Phone: (\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

Areas of Expertise: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Suggestions for Additional Services the SIG can Provide:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Barbara A. Maaskant**  
**UTHSCSA Computing Resources**  
**7703 Floyd Curl Drive**  
**San Antonio, Texas 78216**

**PERSONAL COMPUTING SPECIAL INTEREST GROUP  
VOLUNTEER FORM**

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
Telephone \_\_\_\_\_

What special talents do you have? \_\_\_\_\_

---

When do you attend symposia?

- |                                          |                                                 |
|------------------------------------------|-------------------------------------------------|
| <input type="checkbox"/> Always          | <input type="checkbox"/> Occasional Attendance  |
| <input type="checkbox"/> East Coast Only | <input type="checkbox"/> Other (please specify) |
| <input type="checkbox"/> West Coast Only | _____                                           |
|                                          | _____                                           |

Please check if you are interested in helping with any of the following activities.

**Symposia Related Activities:**

- |                                                     |                                                        |
|-----------------------------------------------------|--------------------------------------------------------|
| <input type="checkbox"/> Session Chairs _____       | <input type="checkbox"/> Articles for Update.Daily     |
| <input type="checkbox"/> Campground Volunteer _____ | <input type="checkbox"/> Write letters of appreciation |
| <input type="checkbox"/> Suite Volunteer _____      | <input type="checkbox"/> Equipment Setup               |
| <input type="checkbox"/> DECUS Store _____          |                                                        |
| <input type="checkbox"/> Software Clinic _____      |                                                        |
| <input type="checkbox"/> Panels _____               | (indicate topics) _____                                |
| <input type="checkbox"/> Technical Sessions _____   | (indicate topics) _____                                |

**Ongoing SIG Activities:**

- |                                                                     |                               |
|---------------------------------------------------------------------|-------------------------------|
| <input type="checkbox"/> Working Groups _____                       | (indicate which groups) _____ |
| <input type="checkbox"/> Newsletter _____                           |                               |
| <input type="checkbox"/> Public Domain Software Project _____       |                               |
| <input type="checkbox"/> Write Software for Special SIG Needs _____ |                               |

**Other SIG Activities:** (please specify) \_\_\_\_\_

---

Do you wish to see the PCSIG undertake any activities which it is not currently doing?  
Please specify.

---

Would you be willing to coordinate the activity you have listed above?  Yes  No

Thank you

## INPUT/OUTPUT Submission form

A SIG Information Interchange

Please reprint in the next issue of the Pageswapper

If this is a reply to a previous I/O, which number? \_\_\_\_\_

Caption: \_\_\_\_\_

Message: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Contact:

Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Telephone \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Mail this form to: Larry Kilgallen, PAGESWAPPER Editor  
Box 81, MIT Station, Cambridge, MA 02139-0901, USA

To register for online submission, dial (in the United States):  
(617) 262-6830 and log in with the username PAGESWAPPER.

PAGESWAPPER # March 1987 # Volume 8 Number 8  
INPUT/OUTPUT Submission Form

Tear out or photocopy reverse to submit an I/O item

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

## System Improvement Request Submission Form

Page 1 of \_\_\_\_\_

---

Submittor:

Firm:

Address:

Phone:

---

How to write an SIR:

Describe the capability you would like to see available on VAX systems. Be as specific as possible. Please don't assume we know how it's done on the XYZ system. Justify why the capability would be useful and give an example of its use. If you wish, suggest a possible implementation of your request.

---

Abstract (Please limit to four lines):

---

Description and examples (use additional pages if required)

PAGESWAPPER \* February 1987 \* Volume 8 Number 7  
System Improvement Request Submission Form

Tear out or photocopy reverse to submit an SIR

Mark D. Oakley  
Battelle Columbus Division  
Room 11#6#008  
505 King Avenue  
Columbus, Ohio 43201-2369  
USA

## VAX Systems SIG Spring 1987 SIR Ballot

DECUS membership number \_\_\_\_\_ (six digits)

Our site uses the following VAX models (check all that apply)

8800 \_\_\_\_\_ 8600/8650 \_\_\_\_\_ 8500 \_\_\_\_\_ 8300/8200 \_\_\_\_\_ MicroVAX \_\_\_\_\_  
11/780,11/782,11/785 \_\_\_\_\_ 11/750 \_\_\_\_\_ 11/730,11/725 \_\_\_\_\_

We use VAX's in the following applications (Check all that apply)

|                                |                                 |
|--------------------------------|---------------------------------|
| Business EDP _____             | Software Development _____      |
| Education _____                | Computer Science Research _____ |
| Data Acquisition/Control _____ | CAD/CAM _____                   |
| Service Bureau _____           | Hardware Development _____      |
| Scientific/Engineering _____   | Office Automation _____         |
| Telecommunications _____       | Other _____                     |

I support the following as the most important System Improvement Requests. (List from zero to fifteen SIR's):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I oppose the following SIR's as detrimental. (List from zero to five SIR's):

\_\_\_\_\_

Mail to:

Mark D. Oakley  
Battelle Columbus Division  
Room 11-6#008  
505 King Avenue  
Columbus, OH 43201#2369  
USA

To be counted, you ballot must be received by March 20.

PAGESWAPPER # March 1987 - Volume 8 Number 8  
VAX Systems SIG Spring 1987 SIR Ballot

Tear out or photocopy reverse to vote on SIRs

Mark D. Oakley  
Battelle Columbus Division  
Room 11#6#008  
505 King Avenue  
Columbus, Ohio 43201#2369  
USA



DECUS SUBSCRIPTION SERVICE  
DIGITAL EQUIPMENT COMPUTER SOCIETY  
219 BOSTON POST ROAD, (BP02)  
MARLBORO, MA 01752-1850

Bulk Rate  
U.S. Postage  
**PAID**  
Permit No. 18  
Leominster, MA  
01453

**STATUS CHANGE**

Please notify us immediately to guarantee continuing receipt of DECUS literature. Allow up to six weeks for change to take effect.

- Change of Address
- Please Delete My Membership Record  
(I Do Not Wish To Remain A Member)

DECUS Membership No: \_\_\_\_\_

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

State/Country: \_\_\_\_\_

Zip/Postal Code: \_\_\_\_\_

Affix mailing label here. If label is not available, print old address here. Include name of installation, company, university, etc.

Mail to: DECUS - Attn: Subscription Service  
219 Boston Post Road, BP02  
Marlboro, Massachusetts 01752-1850  
USA