



DECUS U.S. CHAPTER SIGs NEWSLETTERS

ARTIFICIAL INTELLIGENCE SIG	AI
BUSINESS APPLICATIONS SIG	BA
COMMERCIAL LANGUAGES SIG	CL
DAARC SIG	DAR
DATA MANAGEMENT SIG	DMS
DATATRIEVE/4GL SIG	DTR
EDUSIG	EDU
GRAPHICS SIG	GRA
HARDWARE MICRO SIG	HMS
IAS SIG	IAS
LANGUAGES AND TOOLS SIG	L&T
LARGE SYSTEMS SIG	LS
MUMPS SIG	MMP
NETWORKS SIG	NTW
OFFICE AUTOMATION SIG	OA
PERSONAL COMPUTER SIG	PC
RSTS SIG	RST
RSX SIG	RSX
RT SIG	RT
SITE MANAGEMENT & TRAINING SIG	SIT
UNISIG	UNI
VAX SYSTEMS SIG	VAX
LIBRARY INFORMATION SECTION	LIB
“HOW TO” SUBMIT AN ARTICLE . . . GROUP FORMS	HOW
SIG INFORMATION SECTION	SIC
QUESTIONNAIRE SECTION	QU

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Production Staff:

Mark Grundler: Communications Committee Chair
Palmer College
Don Golden: SIG Publications Chair
Shell Oil
Judy Arsenault: Publications Manager
DECUS
Judy Tessier: Phototypographer/Graphics Designer
DECUS

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GENERAL TABLE OF CONTENTS

SECTIONS

PAGE NO.

ARTIFICIAL INTELLIGENCE SIG

. Editor's Note	AI-1
. AI Gets Commercial	AI-1
. Islands of Automation	AI-5
. Experts Ponder the Future of Machine Intelligence	AI-8
. Artificial Intelligence and Tolas	AI-11
. New Prolog Compiler Available for VAX/VMS Systems	AI-15
. AI Events Calendar	AI-16

DATA MANAGEMENT SIG

. Wish List Submissions	DMS-1
. Do's and Don'ts of DSRI	DMS-23

DATATRIEVE/4GL SIG

. Contributions	DTR-1
. Table of Contents	DTR-1
. Chairman's Corner	DTR-2
. DTR/4GL Software Clinics at Nashville	DTR-2
. Coping With Digital's Office Automation Products	DTR-3
. User Defined Functions (UDF's) for VAX DATATRIEVE	DTR-20
. Spring 1987 Product Improvement Requests	DTR-42
. From the Editor's Pen	DTR-49
. DTR/4GL SIG - Digital Product List	DTR-50
. Ask The Wombat Wizard	QU-1
. DATATRIEVE/4GL SIG Product Improvement Request Submission Form	QU-3
. DTR/4GL SIG Volunteer	QU-5
. DTR/4GL SIG Spring 1987 PIR Ballot	QU-7

GRAPHICS

. DECwindows into the Future with X Windows	GRA-1
. When Someone Asks, "HOW FAST IS IT?"	GRA-6

HARDWARE MICRO SIG

. From The Editors	HMS-1
. Hardware Hints and Kinks	HMS-2
. Points to Ponder when Adding Hardware to Your DEC System	HMS-2
. Hitchhiker's Guide to the Nashville HMS Galaxy	HMS-5
. HMS Session Schedule for Nashville DECUS	HMS-8

IAS SIG

. Contribution Guidelines	IAS-i
. From The Editor's Terminal	IAS-1
. Ten Years Ago Today	IAS-2
. The Program of the Month Club	IAS-3
. Macro 16 to Macro 32	IAS-5
. IAS WHIMS	QU-9
. IAS SIG Membership Survey	QU-11

LANGUAGES AND TOOLS SIG

. Editor's Notes	L&T-2
. What's In A Formatter?—Philosophies In Conflict	L&T-3
. Reading a Program Version Number From the Image Header	L&T-7
. Languages and Tools Working Groups	L&T-14
. Languages and Tools Masters Program	L&T-16
. L&T Masters Application	QU-13

LARGE SYSTEMS SIG

. Contributions LS-1
. Chairperson's Article LS-1
. Nashville Preview LS-2
. From the TOPS-20 Mailing List LS-4

NETWORKS SIG

. The Editor's Cobwebb NTW-1
. Networks SIG Coming Highlights - Spring'87 NTW-1
. DATAGRAM QU-15

OFFICE AUTOMATION SIG

. In This Issue OA i
. From The Editor OA-1
. Upcoming Events in Nashville OA-2
. How to Submit for SIG Tape OA-3
. Building Your Own PDP-8 Communications Interface OA-4
. Notes-On-Notes OA-16
. OA Volunteers Needed OA-18
. OA SIG System Improvement Request Submission Form QU-17

PERSONAL COMPUTER SIG

. How to Submit an Article PC-1
. Contributor List PC-2
. Table of Contents PC-3
. Telephone Contact List PC-4
. PC PostScripts PC-5
. Rainbow Section PC-7
. DECmate Section PC-14
. Professional Section PC-15
. DECmate Wish List Ballot QU-19
. Professional Wish List Ballot QU-21
. Rainbow Wish List Ballot QU-23
. PRO/Sight Graphics Contest QU-25
. PC Postscript QU-27
. DECUS Personal Computer SIG Questionnaire QU-29
. Information Resource Sign Up Sheet PC SIG QU-31
. Personal Computing SIG Volunteer Form QU-33

RSTS SIG

. RSTS Security Topics RST-1
. RMS Hints and Kinks RST-11

RSX SIG

. Food for Thought RSX-1
. The Editor's Corner RSX-1
. RSX SIG Election Nominations Open RSX-4
. Response to Improving Spooler Performance RSX-5
. The Notebooks of Justin L. Hewser RSX-6
. Fall 1986 Q&A Session Transcript RSX-8
. Spring 1987 "Woods" Meeting Report RSX-24

RT SIG

. Notes from the RT-11 World RT-1

SITE

. Letter from the Editor SIT-1
. Site Symposium Activities at Nashville SIT-2

VAX SYSTEMS SIG

. Editor's Workfile	VAX-3
. VAX SIG Fall 1986 Symposium Tape	VAX-4
. Undocumented Monitor Display Classes	VAX-14
. INPUT/OUTPUT	VAX-20
. INPUT/OUTPUT Submission Form	QU-35
. System Improvement Request Submission Form	QU-37

LIBRARY

. New Library Programs Available	LIB-1
. Revisions To Library Programs	LIB-7
. DECUS Program Library Changes	LIB-11
. Library Announcement	LIB-12

HOW TO SUBMIT TO A SPECIFIC SECTION OF THE NEWSLETTER

. Submitting Articles To The HMS SIG Newsletter	HOW-1
. DECUS Subscription Service Form	HOW-3
. DECUS U.S. Chapter Application For Membership	HOW-5

SIG INFORMATION SECTION

. Special Interest Committee Lists	SIC-1
--	-------

QUESTIONNAIRE SECTION

. Ask the Wombat Wizard	QU-1
. DATATRIEVE/4GL SIG Product Improvement Request Submission Form	QU-3
. DTR/4GL SIG Volunteer 1987 Spring Symposia, Nashville	QU-5
. DTR/4GL SIG Spring 1987 PIR Ballot	QU-7
. IAS WHIMS	QU-9
. IAS SIG Membership Survey	QU-11
. L&T Masters Application	QU-13
. DATAGRAM	QU-15
. OA SIG System Improvement Request Submission Form	QU-17
. DECmate Wish List Ballot	QU-19
. Professional Wish List Ballot	QU-21
. Rainbow Wish List Ballot	QU-23
. PRO/SIGHT Graphics Contest	QU-25
. PC Postscript	QU-27
. DECUS Personal Computer SIG Questionnaire	QU-29
. Information Resource Sign Up Sheet/PC SIG	QU-31
. Personal Computing Special Interest Group Volunteer Form	QU-33
. INPUT/OUTPUT Submission Form	QU-35
. System Improvement Request Submission Form	QU-37

ARTIFICIAL INTELLIGENCE



DECUS

(THE (LINKED LIST))

The Newsletter of the DECUS Artificial Intelligence SIG

"...It's The Real Thing"

Vol. 3 No. 3

April 1987

FROM THE EDITOR:

On Saturday April 25, the DECUS Artificial Intelligence SIG will hold an open business meeting at 3PM in the AI/L&T/UNISIG Suite at the Opryland Hotel in Nashville. The purpose of this meeting to give SIG members an opportunity to participate in SIG leadership activities. If you're an AISIG member or potential member, you're cordially invited to attend the meeting.

AI GETS COMMERCIAL

By Terry C. Shannon

Reprinted from Digital Review, Vol. 4 No. 4, February 23, 1986 Copyright (C) 1987, Ziff-Davis Publishing Company Artificial intelligence has finally taken root in the commercial computing environment. The hardware and software that forms the foundation for commercial AI applications is becoming more powerful and less costly, bringing AI techniques within the reach of more and more users. General purpose computers are playing a larger role in AI application development and delivery, and today's AI software tools are easier to use and more functional than their predecessors.

AI's role in the mainstream computing environment has been constrained by a variety of factors, including inflated user expectations and the need for specialized AI hardware, software and developers. In addition, AI has long been regarded as a solution in search of a problem--the best known AI "success stories" involve arcane problems such as medical diagnosis and computer configuration.

The veil of secrecy that once surrounded AI is being lifted by an informed user community. Users have developed more realistic expectations of what AI can do as well as the applications for which AI solutions may be suitable. Conventional programming is limited to those applications that have a defined set of actions and results, while knowledge based programs are most appropriate for ill-defined problems

that resist solution by algorithmic, step-by-step programming techniques. Such problems are characterized by sketchy, uncertain information that is subject to frequent change. In addition, these problems have multiple correct solutions rather than a single best solution.

Selecting problems that meet the criteria for AI-based solutions is still easier said than done. DEC AI product marketing manager Art Beane uses an air traffic control analogy to describe the type of problem for which an AI-based solution might be appropriate. "One of the most important elements of air traffic control is collision avoidance, or ensuring that two aircraft do not occupy the same space at the same time," Beane said.

While Beane's hypothetical expert system for aircraft collision avoidance could arrive at any one of a vast number of satisfactory solutions, no single solution would be considered ideal or correct. Were the program required to find a single best solution instead of the first acceptable solution, it would be too ponderous and unwieldy to arrive at a decision in a timely manner.

Distribution Management Systems CEO John Landry views the universe of problems that are candidates for an AI solution as a pyramid. At the top of the pyramid are the complex, esoteric problems requiring dedicated hardware and software for an AI-based solution. "The problems at the top of the pyramid are not good candidates for commercial AI solutions--there's little commercial value in an expert guidance system for a lunar lander," Landry said.

The remainder of Landry's AI pyramid is composed of smaller, less arcane problems that can be solved by using AI technology in conjunction with conventional hardware and software. "AI's commercial payoff lies in problems at the middle and bottom of the pyramid--the vast number of problems that don't require dedicated symbolic processing and can be delivered to the masses," Landry explained.

KNOWLEDGE CZARS

While the reign of dedicated AI processors and esoteric programming techniques is on the decline (See "Islands Of Automation," this issue), the scarcity and expense of trained AI programmers known as "knowledge engineers" still poses an obstacle to the widespread use of AI technology.

Traditionally, it has been the job of the knowledge engineer to extract information from a domain expert (the human expert whose skills are archived in a knowledge based system), code the information as a set of IF-THEN rules, and put the program to work performing tasks that normally require human expertise.

In addition to being adept at extracting knowledge from a domain expert, the knowledge engineer must also know what specific kernels of information are germane to the knowledge based system that is being developed. This is a nontrivial task for a third party, for almost everything that an expert does involves judgement, heuristic rules of thumb, and a wealth of background information and presupposed knowledge.

Fortunately, software vendors are attempting to resolve the knowledge engineering bottleneck so that domain experts can develop intelligent programs without the assistance of specialized knowledge engineers.

The expert system shell or toolkit represents one viable solution to the lack of knowledge engineers. Such toolkits, which are available for a broad spectrum of computer hardware, allow domain experts and average programmers to develop knowledge based systems without the assistance of AI specialists. These software packages are called expert system shells because they consist of an inference engine and an empty knowledge base framework that must be filled with data and rules by the end user.

THINK SMALL

Expert system shells are not sufficiently powerful for huge AI development efforts, but massive AI applications that consume vast amounts of hardware, software and human resources are being replaced by less expensive, more manageable projects as AI dons its commercial garb. "The 'Star Wars' approach to AI application development has become bankrupt", said Cornelius Willis, marketing manager for Level 5 Research, a Melbourne, Florida AI software firm whose products include Insight II, a PC-based expert system shell.

"Early AI projects helped perpetrate the myth that AI requires specialized hardware, arcane programming languages, knowledge engineers, unlimited financing and a five year payback period. Today, corporations are concentrating on small, manageable AI applications that can be developed and implemented in-house. A growing number of firms have found that small knowledge systems--those that cost less than \$50,000 to develop and field--can be real moneymakers," Willis commented.

Willis also made several observations on the role of the personal computer in AI application development and delivery. "Level 5 Research views AI as a way of making computers applicable to a wider class of problems. Personal computers definitely are a part of the commercial AI picture. PCs are not yet sufficiently powerful for academic AI applications such as natural language processing, but PC-based knowledge systems are excellent for a wide variety of small, real-world applications," Willis said.

AJ MICROCOSM

When it comes to real-world AI applications, "small" does not necessarily mean "trivial." For example, the DuPont Corporation has over 300 PC-based expert systems up and running. By 1991, the firm expects to have more than 2,000 such programs in use, yielding a 10% increase in net profits.

Dr. Ed Mahler, manager of artificial intelligence for E.I. Du Pont de Nemours and Co. in Wilmington, Del., is a strong adherent of affordable AI. "At the time we first investigated the feasibility of an AI effort at Du Pont, a dedicated AI hardware, software and training package went for about \$160,000. We decided, if that was the ante, we weren't going to play the game--it would take an AI application that produced a \$1,500,000 payoff just to recover the entry fee," Mahler said.

Undaunted, Mahler formed a task force to investigate alternatives to big-ticket dedicated AI systems. The dozen members of the group, none of whom had a background or formal training in AI, began evaluating more than 40 expert system shells that ran on Du Pont's installed hardware base of VAXes and personal computers.

After Mahler selected several problems as candidates for AI solutions, his team began building prototype expert systems. Four months later, Mahler told top level Du Pont executives that in-house AI application development and delivery presented tremendous opportunities to the firm. The executives responded by establishing an AI department under Mahler's supervision.

Mahler's efforts have resulted in an ongoing AI application development effort and an in-house training program that has made more than 300 employees proficient in the use of Insight 2+ and 1st-CLASS, two PC-based expert system shells for which Du Pont has purchased site licenses.

The Du Pont team has found that, in general, domain experts can assume the role of knowledge engineers and produce prototype expert systems in less than two weeks. Because personnel costs account for the majority of the AI application development budget, the the learnability and ease of use of PC-based AI software packages is a very attractive feature.

Would-be users can choose among a vast array of PC-based expert system shells that range in price from less than \$50 to as much as \$5000. Freedom of choice is a double-edged sword, however, so the selection of a tool can be a long, involved process.

"The furor over tool selection is baloney, a non-issue," said Mahler. "An experienced developer should be able to choose an appropriate software package in no time at all." Indeed, the

selection of a tool should be based on the application at hand and the developer's personal preferences. "The structure of the data frequently dictates the shell to use. If the data is arranged as a checklist or a series of examples, an inductive, example-based shell is most appropriate. If the problem is diagnostic in nature, a backward-chaining rule-based shell is the best candidate," Mahler explained.

Tool selection may well be a non-issue, but the features and capabilities of the forthcoming wave of AI-based "power tools for the mind is an issue of concern to AI developers and end users alike.

Dr. Neil Pundit, manager of DEC's AI applications group in Hudson, Mass, said that future expert systems will include more powerful planning, reasoning and problem solving facilities as well as friendlier, more intuitive user interfaces.

Pundit also stressed the importance of knowledge acquisition, claiming that the next generation of expert systems will feature learning facilities that should help overcome the knowledge acquisition bottleneck that constrains present-day expert system programs.

ISLANDS OF AUTOMATION?

By Terry C. Shannon

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If the financial analysts and industry experts are correct, the commercialization of artificial intelligence is having an untoward effect on one of the tools that has helped make AI a commercial reality--the symbolic processor or "Lisp machine."

Manufactured by firms such as Symbolics, Lisp Machine Incorporated (LMI), Texas Instruments and Xerox, Lisp machines are special-purpose processors with high resolution graphic interfaces and powerful programming tools that simplify the development of Lisp-based AI software.

While Lisp machines enhance AI programmer productivity, the future of the symbolic processor may not be as bright as the future of commercial AI applications. As AI applications become de riger in the mainstream computing environment, the issues of cost, connectivity and language support will render Lisp machines increasingly vulnerable to conventional computers.

"Wall Street is confirming the view that special purpose AI hardware and software is losing its appeal," said John Landry,

CEO of Distribution Management Systems, Inc. Landry, the developer of IMPACT/AE, a COBOL-based material management software package with an embedded expert system that runs on IBM and DEC hardware, noted that the popularity of special purpose AI hardware can be traced to the academic roots of AI research.

"Most early AI work was conducted in an academic environment, where researchers had hardware, software and financial resources to burn. AI developers, who did the majority of their work in the Lisp programming language, dealt with Lisp's inherent inefficiencies and large memory requirements by developing computers with Lisp-specific architectures rather than by recoding AI applications in conventional languages," Landry explained.

Restricting AI applications to special purpose hardware is a strategic error, Landry claimed. "AI applications developed on dedicated processors should be recoded so they can be deployed on generic hardware. By rewriting a Lisp program in a language such as C or COBOL, a developer can integrate AI with the full spectrum of conventional EDP applications," Landry said.

Landry is not alone in his contention that standalone AI systems, like strategic hamlets, are powerful but isolated. The increased emphasis on linking knowledge processing programs with corporate databases has made connectivity an important consideration in the AI application marketplace, underscoring the need for conventional AI delivery systems. "I've talked with a number of people who invested in dedicated AI hardware and software only to find that standalone AI applications are islands of automation," Landry commented.

AI is no longer regarded as "anything written in Lisp," a fact that is underscored by the development of hybrid AI programs that include routines written in an AI language as well as routines coded in conventional languages. Many such programs have been developed at DEC's AI Technology Center, which has fielded a number of successful AI applications including a group of cooperative expert systems that automate the manufacture of DEC computer systems (See "AI At Work," (THE LINKED LIST)), December 1986).

"Most real-world AI applications include both symbolic and procedural components," said DEC AI marketing manager Art Beane. "For example," Beane noted, "XCON, DEC's expert system for configuring VAX and PDP-11 computers, includes a component written in the VAX OPS5 production system language as well as routines written in BASIC, C, COBOL and Fortran. Because of the language mix, XCON is incompatible with dedicated processors."

In addition to requiring integration with conventional programming languages, AI programs frequently must access databases that reside on remote hosts, making connectivity an important element of AI delivery systems. The development of cooperative expert systems that address large scale problems by the "divide and conquer" technique--using several expert systems to solve specific subproblems, then passing program output to a supervisory expert system--will make networking and data sharing even more critical to the next wave of commercial AI applications.

Finally, while symbolic processors are touted for their Lisp execution speed, supercomputers and high-end superminicomputers such as the VAX 8800 eclipse the performance of dedicated AI systems. Faster conventional processors, including UNIX workstations from Sun and Apollo as well as forthcoming DEC products, will further erode the performance advantage of Lisp machines.

SECOND OPINION

Not unexpectedly, Lisp machine vendors have a different view of the future of symbolic processing. AI hardware manufacturers have begun to embrace Common Lisp, a Lisp dialect that is rapidly becoming a de facto standard, and are reducing the cost of their systems to make them more competitive with general purpose processors. Most Lisp machines now offer support for conventional programming languages such as C and FORTRAN and vendors are busy upgrading the networking capabilities of their products.

Although high-end superminicomputers and supercomputers can outperform Lisp machines, a symbolic processor is still faster than a general purpose workstation. Lisp machines enjoy extensive use in government research applications, including numerous NASA and DARPA projects, as well as in major AI labs such as the research facilities at MIT and Carnegie Mellon University.

On the mainstream computing front, symbolic processors have been used to develop software products such as Inference Corporation's Automated Reasoning Tool (ART), Intellicorp's Knowledge Engineering Environment (KEE) and Neuron Data's NEXPERT, sophisticated tools for building expert systems.

SUPERMICRO ECONOMICS

The introduction of the VAXstation 2000 raises the spectre of an inexpensive yet powerful AI delivery system that is completely compatible with existing VMS and Ultrix applications software, a development that does not augur well for vendors of specialized AI hardware. Furthermore, DEC's recently announced AI Solution System, a Local Area VAXcluster that includes a VAX 8500 boot member and eight VAXstation 2000 satellite nodes, offers AI development groups a powerful yet economical alternative to dedicated AI systems.

In the future, users can expect to see more reliance on conventional computers and workstations as AI delivery systems. but the evolution of commercial AI will not sound the death knell for dedicated symbolic processors. The Lisp machine still dominates research and academic environments as well as AI application development. Furthermore, the symbolic processor will remain the tool of choice for AI programmers whose expertise--and salary--make high performance, dedicated hardware a cost effective solution.

EXPERTS PONDER THE FUTURE OF MACHINE INTELLIGENCE

By Terry C. Shannon

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Nearly three dozen scholars and industry leaders in the field of artificial intelligence gathered at the Boston Museum of Science on January 29 and 30 to explore recent developments in artificial intelligence and to discuss the societal impact of this emerging technology.

The colloquium, which coincided with the debut of "Robots and Beyond: The Age of Intelligent Machines," a major exhibit sponsored by DEC and The Kurzweil Foundation, featured participants from the labor and business community as well as AI pioneers such as Marvin Minsky, Roger Schank, Ray Kurzweil, Seymour Papert and Joseph Weizenbaum.

Exhibition cosponsor Ray Kurzweil lauded DEC's support for the first major program dedicated to exploring the tools and artifacts of the second industrial revolution. "DEC's early involvement with The Age of Intelligent Machines led to substantial funding by other organizations. DEC gave the exhibition credibility--as soon as DEC got behind the project, other supporters came out of the woodwork," Kurweil said.

THINKING ABOUT THINKING

In addition to discussing the impact of a forthcoming wave of AI-based "power tools for the mind," the colloquium attendees grappled with the meaning of artificial intelligence. Like politics and religion, the semantic meaning of AI is an issue that leads to spirited debate whenever two or more AI practitioners strike up a conversation.

"AI is an attempt to figure out the mind by playing with some very fuzzy ideas about the nature of mind," said Dr. Roger Schank. "A lot of what passes for AI today, isn't," Schank noted, because once an idea works, "it's no longer AI--it's technology."

The lack of commonly accepted definitions and benchmarks for intelligence--artificial or otherwise--makes AI a beguiling and confusing subdiscipline of computer science. "It's pretty easy to mystify people when you're an AI person," Schank quipped. "On the other hand, AI is fun, because it makes you think," he added.

Schank, a Yale University professor and president of Cognitive Systems, Inc., a New Haven, Conn., firm that specializes in natural language processing applications, contends that both artificial intelligence and human thought processes are intimately related to creativity.

"We live in an answer-oriented society, but life isn't like a theorem or equation. "Creativity depends on finding unusual explanations instead of relying on stock answers," Schank noted.

According to Schank, realizing that a predefined explanation does not answer a question inspires people to "tweak," or modify, their past experiences so they fit the question at hand. "Life isn't like a theorem. People are used to testing assertions, finding them wrong and then adapting the assertions to solve problems," Schank said.

Schank contends that the biggest drawback to expert systems is the fact that they don't learn. Consequently, such "intelligent" programs are idiot savants which are incapable of tweaking stored information to fit new situations.

Schank emphasized his point by drawing a parallel between a medical expert system and an experienced human physician: "Would you rather go to a doctor who based all of his diagnoses on a medical textbook, or would you feel more secure in the care of a doctor with forty years of experience?," Schank asked.

Semantic issues notwithstanding, Schank views information retrieval as one of the biggest implementation problems in AI. "The problem in AI is the indexing problem," Schank said. "Knowledge is a massive collection of experiences. People can retrieve these experiences on demand, a computer cannot," Schank added.

Marvin Minsky, the MIT computer scientist who helped coin the term "artificial intelligence" at the 1956 Dartmouth Conference, said that AI and expert system technology represents a departure from the way people have used computers during the past several decades.

"For more than 20 years, people have been taught that computers are unconditional, relentless machines. Conventional programming languages such as Fortran help foster this attitude," Minsky said.

AI GETS DIGITAL

This attitude is now shifting, thanks to vendors such as DEC who emphasize the value of AI as a complement to conventional computing. More than 400 DEC employees are involved in AI research and applications development, and their efforts are beginning to bear fruit in the form of AI programming languages and applications software such as the VAX Performance Advisor (VPA), an AI-based adjunct to VMS performance management.

Dr. Neil Pundit, manager of DEC's AI applications group in Hudson, Mass., cited several prototype expert systems currently under development within DEC's AI technology center. These include an expert construction time estimator, a translator's workstation and an operating system advisor designed to serve as "the expert down the hall" for novice users of DEC's VMS and Ultrix operating systems.

"The operating system advisor examines the user's current situation, gives specific answers based on the user's situation and plans sequences of DCL commands to carry out the user's requests," Pundit said. He added that the operating system advisor is an internal research project totally unrelated to the VAX Performance Advisor.

Pundit observed that successfully deployed expert systems have a number of beneficial side effects. "Expert systems represent the cloning or proliferation of scarce expertise. Properly applied, this asset can lead to increased productivity, happier workers and happier customers. Furthermore, expert systems can provide consistent answers because they are not subject to human weaknesses such as prejudice and temperament," Pundit said.

When questioned about future trends in AI applications, Pundit said that he expected the next generation of expert systems will be endowed with enhanced planning and problem solving capabilities as well as improved user interfaces that will make the use of AI technology almost second nature to novice computer users. "Today, most so-called natural language interfaces are in fact unnatural language interfaces," Pundit noted.

Pundit concluded by predicting that the expert systems of the future will feature knowledge acquisition or learning facilities. "The capacity to learn and think is more important than the mere possession of facts. The development of software that can model deep knowledge and reason about world knowledge will help extend learning capabilities to expert system programs."

ARTIFICIAL INTELLIGENCE AND TOLAS

By Dr. Allen Pinkus, Senior Vice President, Transcomm Data Systems Inc.

Editor's note--This case study recounts Transcomm Data Systems Inc.'s experience in the design and development of a suite of cooperative expert systems that complement an existing conventional data processing application. Readers who are familiar with the history of XCON are likely to see a number of parallels between DEC's experience and that of Transcomm.

Two years ago, GSI Transcomm embarked on a major development effort with the Carnegie Group Incorporated to explore how AI technologies can be used to significantly expand the capabilities of Transcomm's TOLAS business applications software. The strategic objective of this ongoing project is to identify those crucial decision-making tasks which people perform routinely within the TOLAS business environment, and to devise a means for replicating those capabilities in the software by expert systems which can assist end users.

Two key business areas related to sales order processing were selected for the initial investigation--telemarketing and credit checking. These were chosen not only because they represent activities which are critically important to any distributor operating in a competitive market, but also because, from a technical standpoint, they are instances of two different classes of AI problems and would permit us to evaluate a broader range of system design techniques. And since both cases deal with that crucial moment in time called "selling," benefits derived from the project would produce a maximum return for future TOLAS users.

Instances of AI Within TOLAS

The means by which AI technologies might be installed within TOLAS vary, depending upon the kinds of business problems being considered. Developing an AI system to assist sales and telemarketing entails a design which would be loosely coupled to TOLAS, having access to the database but not necessarily being connected to the program's standard functions. Such an expert system would serve as an intelligent assistant to the salesperson during a sales encounter by providing a high level of customer service while simultaneously attempting to fulfill corporate goals.

The system would draw from its own expertise and planning capabilities to retrieve information pertaining to products, inventory conditions and customer history. It would need to be flexible, depending on what transpired during a sales episode. For example, like an eavesdropping sales manager, the program

would "whisper" advice and strategies into the ear of the salesperson without interrupting the flow of his sales presentation.

As contrasted with an expert telemarketing assistant, an AI-based credit checker need not be interactive at all--except for its ability to explain its decisions upon request. Instead, the credit checker could be implemented as a subroutine which would be invoked as necessary during sales order processing to advise on the appropriateness of shipping a particular order on credit terms. Since it is tightly integrated with an existing, conventional software application, we refer to the credit checker as an embedded expert system.

Credit checking, like most conventionally programmed TOLAS functions, relies on a straightforward numerical comparison of order and invoice values with a predetermined customer credit limit. But more sophisticated decision making, which evaluates both qualitative and quantitative information and considers aspects of both the customer and the order beyond the dimension of pure liability, might be far more effective in balancing risk against reward. For example, how should profitability, historical buying trends or future business potential affect the decision to ship and order? What percentage of a customer's credit limit should be allowed to be exhausted on a single sales order? And should such decisions be influenced by the type and stocking level of those items which the customer is ordering?

In both telemarketing and credit checking, the optimal way to make critical decisions would likely involve the collaboration of several business experts, each of whom possessed a cursory knowledge of the corporation's operations, policies and goals as well as significant expertise in a specific business area such as accounting, inventory or sales. In this scenario, each expert would have access to a reservoir of pertinent information and each would rely on a collection of personal decisionmaking rules based on past experience. Although such experts do exist within every business organization, there is no practical way to employ their expertise in every routine business transaction.

Consequently, GSI Transcomm views AI and expert system development as the process of extracting, analyzing and modeling the expertise of corporate domain experts and incorporating this knowledge, where appropriate, within the basic operational structure of TOLAS. We feel that this application of AI technology can extend the functionality of our existing software products by making them more responsive to difficult and conflicting business decisions so they can more effectively fulfill corporate goals.

GSI Transcomm has developed working prototype expert systems for both the telemarketing and credit checking problem domains. The credit checker is an example of a "compensatory expert system" since it uses voting rules to determine whether a sales order should be shipped. The more complex telemarketing expert system, called TeleStream, involves a collection of cooperating mini-expert systems representing business managers from a firm's sales, inventory and marketing departments. While more complex, we feel that TeleStream represents a much greater potential since it could dramatically improve sales effectiveness among TOLAS customers whose markets are highly competitive and expanding more rapidly than their ability to hire and train additional salespeople.

Implementation Issues

Most of the expert systems developed to date address a relatively complex problem within a narrow domain. Rarely have developers attempted to embed scaled-down versions of such systems within the framework of an existing application such as TOLAS. Furthermore, expert systems have typically been programmed in a single AI language or through the use of a single set of AI development tools. Therefore, the first challenge we faced was the selection of the most appropriate programming vehicle for implementing the prototype expert systems within TOLAS.

The most efficient technique for us to have used would have been one of the growing number of AI tool kits or expert system shells. Such systems typically provide a facility for expressing rules gleaned from domain experts, a knowledge representation paradigm, an inference engine for rule processing, and a user interface. Although we used a proprietary GSI system called "Zero+" for some of our original work on the credit checking problem, we rejected this approach because of the software's expense and technical incompatibility with TOLAS.

We also considered writing our expert systems in VAX BASIC, but soon rejected this approach. While it is often possible to recast a program into an imperative language such as BASIC to achieve maximum run-time performance on conventional hardware, the language is inappropriate for expressing AI problems during the prototype phase. We learned that although we could express decision rules in BASIC through the use of IF-THEN-ELSE constructs, the language does not provide reasonable control structures for rule selection, evaluation and execution. In a sense, a program written in BASIC cannot evaluate itself--since its statements are compiled, a basic program cannot treat its rules as data. Furthermore, BASIC does not provide the kind of data structures normally required by an expert system, such as goal trees, attribute lists and, most importantly, a well-defined working memory.

After considerable research, we decided to do our preliminary work in OPS. OPS, an acronym for Official Production System language, was originally developed at Carnegie-Mellon University by Charles Forgy and others for use in building "production systems." A later version of the language, OPS 5, was used by CMU researchers in collaboration with DEC knowledge engineers to build the XCON computer configurator and subsequent expert systems.

We considered using DEC's OPS 5 implementation, but decided that its performance was not adequate for the real-time responsiveness required by our proposed applications, particularly in the case of the telemarketing assistant. Instead, we selected a more advanced version of the language, OPS-83. Developed by Forgy's current company, Production Systems Technologies, OPS-83 is written in the C language, making it both fast and potentially portable outside of the VAX/VMS environment.

Several additional factors influenced our selection of OPS-83 as the most suitable prototyping and development language for our applications. Chief among these is the language's provision of conventional imperative programming structures fashioned after Pascal. Despite its favorable features, however, OPS-83, like other common AI languages, lacks powerful programmer-friendly techniques for database access and screen management.

Consequently, from a software architecture standpoint, we decided to develop TOLAS' expert system prototypes using a mixture of techniques: rule processing and decisionmaking using OPS-83, coupled with VAX RMS database management and our proprietary Advanced Screen Management routines implemented in VAX BASIC.

Creating systems in a mixed language environment presented a number of challenges, the first involving the requirement to devise a bridge between VAX BASIC and OPS-83 to allow the development of unified expert systems. The software bridge finally developed uses message send/receive techniques that are also used in other parts of TOLAS, such as TQUMAN, which supports the Sales Order Picking Ticket processor. The bridge allows each of the expert systems envisioned for TOLAS to be partitioned into two pieces: an OPS-83 section which performs rule processing, and a VAX BASIC component which performs RMS database access, conventional processing and user interaction via TOLAS Advanced Screen Management functions.

The OPS-83 control structure determines the decisionmaking strategy to follow given the specific problem context, and also formulates alternative strategies when needed. Furthermore, OPS-83 executes the decision rules which have been defined based on whatever conditions exist at any given point in time, i.e., the contents of working memory.

The hybrid system works in a very straightforward manner. OPS-83 sends requests for information to the VAX BASIC component of the application, which in turn accesses the TOLAS database for information about customers, orders, inventory and prices. Alternatively, the OPS-83 module will query the user to supply necessary information which is not organic to either component of the application.

Once the requisite information is collected, it is passed across the software bridge to OPS-83 where it is loaded into working memory for further evaluation, analysis and decisionmaking. The overall control of the process is performed by a high-level BASIC program which can be called from the standard TOLAS software.

With the integration of AI and expert system technology into the standard TOLAS product, we have created what we feel is a state of the art application software system. We also feel that the performance of this hybrid application more than justifies the many challenges and problems we encountered during development.

NEW PROLOG COMPILER AVAILABLE FOR VAX/VMS SYSTEMS

Expert Systems International has released a VAX version of its PROLOG-2 interpreter and compiler. Based on the standard Edinburgh syntax, VAX/VMS PROLOG-2 is supported by a variety of programming aids, including online, context-sensitive, user-extensible help files, a Prolog source code verifier and cross-reference facility similar to the C language's "lint" utility, and a complete window-based Prolog Development Environment.

VAX/VMS PROLOG-2 is a compatible superset of DEC-10 Prolog and Expert Systems International's VAX/VMS PROLOG-1. Some DEC-10 Prolog features are handled more efficiently, but a DEC-10 compatibility module allows pure DEC-10 Prolog programs to run directly on VAX/VMS PROLOG-2. In addition, the new compiler can incorporate modules written in other languages, allowing programmers to develop standalone and embedded mixed language applications.

According to Expert Systems International president Angelos Kolokouris, compiled VAX/VMS PROLOG-2 code runs up to ten times faster than interpreted code. The performance increase is achieved through such techniques as automatic clause indexing, programmer-controlled or automatic garbage collection and support for Mode Declarations that let the compiler generate optimized code.

The PROLOG-2 package is supported by a library of commonly used procedures as well as source code for an automated theorem

prover and a Lisp interpreter. For more information, contact Expert Systems International, 1700 Walnut Street, Philadelphia, PA 19103 (215) 735-8510.

AI EVENTS CALENDAR

By Jim Sims

March 30- April 3

1987 IEEE International Conference on Robotics and Automation
IEEE Council on Robotics and Automation
Radisson Hotel and Raleigh Civic Center
Computer vision in robotics, Robot kinematics and control, mobile robots, and Expert Systems. Workshop for Advanced Computer Architectures for Robotics and Machine Intelligence on April 3.

Robotics
North Carolina University
Division for Lifelong Education
Box 7401
Raleigh, NC 27695-7401 (919) 737-2261

April

1-8

Industrial Robots/Assembly Technology '87
part of Industry '87
Hanover Fairgrounds, Hanover, West Germany

Hanover Fairs USA Inc.
103 Carneige Center
P.O. Box 7066
Princeton, NJ. 08540 (609) 987-1202

6-10

AISB-87

Society for the Study of Artificial Intelligence and the Simulation of Behavior
University of Edinburgh
Vision, Robotics, Cognitive Modeling, Learning and Memory, and Natural Language Processing.

Dr. Chris Mellis
Program Chairman
AISB-87 Conference
Arts D Building
University of Sussex
Falmer, Brighton, BN19QN, UK

20-24

Second Symposium on Complexity of Approximately Solved Problems
System Development Foundation
New York City
All papers are by invitation.

Susan Maser
450 Computer Science Building
Columbia University
New York, NY 10027 (212) 280-8832

22-24

AI 87 Third Annual Conference/Exhibition on Artificial Intelligence and Advanced Computer Technology
Digital Design Magazine, DM Data Inc., Society for Computer Simulation,
USAI, & Applied AI Reporter
Long Beach Convention Center, Long Beach, Ca.

Tower Conference Management Co.
331 W. Wesley Street
Wheaton, Il. 60187

23-24

18th Annual Pittsburgh Conference on Modeling and Simulation
Univ. Of Pittsburgh, Pittsburgh, Pa

Marlin Mickle
Conference Co-chairman
Univ. Of Pittsburgh
School of Engineering
Pittsburgh, Pa. 15261 (412) 624-4141

27-28

Twenty-Fourth Annual Rocky Mountain Bioengineering Symposium
Fargo, N.D.

see descrip for Northeast Bioengineering Conference above
CFP

200 words max, double spaced by Dec 5 to
John D. Enderle
Program Chairman
Div. of Bioengineering
Dept. of Electrical & Electronics Engineering
North Dakota State University
Fargo, N.D. 58105 (710) 237-7689

27-30

ROBOTS 11

Jeffery Burnstein
Robotics Industries Association
900 Victors Way
Ann Arbor, Mi 48106

May '87

13-15

Seventh Annual International Workshop on Expert Systems and Their Applications - Avignon '87
Avignon, France
New implementations, basic tools and techniques, practical guidelines for applications.

CFP

20 pages max, 5 copies, before Dec 13, to:

Jean-Claude Rault
Workshop Chairman
Agence de l'Informatique
Tour Fiat Cedex 16
92084 Paris-La Defense, France 331-47964314

25-30

International Workshop on Parallel Algorithms and Architectures
Suhl, GDR

Thomas Zeugmann
Mathematics Dept
Humboldt University Berlin
P.O. Box 1297
Berlin 1086, GDR Telex 011 2823

27-29

Workshop on Qualitative Physics
AAAI, Univ of Illinois at Urbana-Champaign

Foundational Research, Implementation techniques,
Applications, connections to other areas of AI

Kenneth D. Forbus
Qualitative Reasoning Group
Dept of Computer Science
University of Illinois
1304 W. Springfield Avenue
Urbana, Illinois 61801

June '87

22-25

Second Annual Symposium on Logic in Computer Science
Ithaca, N.Y.
Abstract data types, foundations of logic programming,
software specifications, logic-based languages, logic in
complexity theory.

CFP

2500 words max, 16 copies, by Dec 9 to:
David Gries
Program Chairman-LICS
Dept. of Computer Science
Cornell University
Ithaca, N.Y. 14853 (607) 225-9207

28-July 1

ACM/IEEE Design Automation
Fountainbleau Hilton Hotel, Miami, Fla

Design Automation Conference

1730 Massachusetts Ave., N.W.
Washington, D.C. 200036-1903 (202) 371-0101

July '87

12-18

AAAI-87 Sixth national Conference on Artificial Intelligence
Seattle, Washington
Science and Engineering Tracks

Call for Papers to:

AAAI-87
American Association for Artificial Intelligence
445 Burgess Drive
Menlo Park, Ca. 94025-3496

August '87

23-28

IJCAI-87 10th International Joint Conference on Artificial
Intelligence
Milan, Italy
Separate tracks for Science and Engineering

CFP - due by Jan 5, 1987

John McDermott
Dept. of Computer Science
Carneige-Mellon University
Pittsburgh, Pa. 15213

Conference Information

Alan Bundy
Dept. of Artificial Intelligence
University of Edinburgh
80 South Bridge
Edinburgh, EH11HN, UK

Sept

21-25

European Congress on Simulation Conference and Exhibition
Prague, Czechoslovakia

ECS '87

c/o Director , Institute of Computer Sciences
Czechoslovak Academy of Sciences
182 07 Prague
P.O. Box 5, Czechoslovakia 846669

Oct

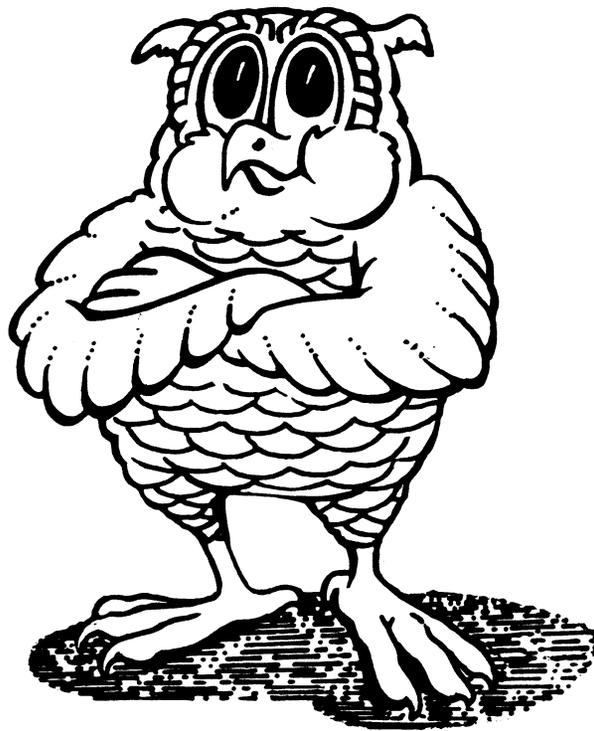
5-7

Spatial Reasoning and Multi-Sensor Fusion
AAAI
Pheasant Run Resort St Charles, Ill.
Spatial Reasoning, Multiple sensor inputs, Spatial
Planning, Formal Theory, Fusion of sensory inputs,
Evidential Reasoning

CFP to:

Su-shing Chen
Dept of Computer Science
University of North Carolina
Charlotte, NC 28223

INFO-the DMS SIG NEWSLETTER



JOIN THE WISE

Wish List Submissions

Submittor : Al Metzinger
Address : 901 Elmgrove Road, Rochester, NY 14612
Firm : Eastman Kodak Co.
Phone : (716) 726-1226
Product : CDD
Version :
Abstract : Hidden CDD node data
Description
& Examples: When a CDD node is backed up and then restored to a different node. The objects in the new node retain node information from the original node which cause problem when DBO/create in run. Would like a qualifier on the restore to tell DMU to change the original node information in the objects to the "new node". It is also frustrating in that there is no way to show this information. The problem is that the contents of the node copied are placed there by DBMS and have to be modified by DBMS, we have a feature to do this with DBO/INTEGRATE.

Digital
Response : Suggestions: use copy, no backup; when you refer to data definitions from other data definitions, use relative path when ever possible.

Submittor : Tom Rassieur
Address : 5711 East Park Avenue, St. Louis, MO 63110
Firm : Paulo Products Co.
Phone : (314) 647-7500
Product : CDD
Version :
Abstract : Allow use of DCL rights identifiers in CDD protection
Description
& Examples: DCL authorize utility allows assignments of users to categories via rights list identifiers; yet, one needs to name each of these users explicitly in CDD in order to allow them to use DATATRIEVE to access files opened to them via the rights list.

Digital
Response : This functionality currently exists. Check that you grant access to all CDD definitions associated with the domain: the record, the domain, and any procedures.

Submittor : Larry Goodhind

Address : P.O. Box 1044
Firm : Sharp Microelectronics
Phone : (206) 253-8000
Product : CDD
Version : 1.0+
Abstract : Could we have a dictionary instead of a file cabinet

Description
& Examples: Large applications (like multi task ACMS applications) have lots of related pieces. I know about the difference between Active/Passive Dictionary. I want to know how many more DECUS's I have to go to before we get notification that you're at least working on it as a product.

A dictionary that warns of inconsistency (rather than fixes) is good enough, save philosophy for people who don't heed performance.

Digital
Response : Digital is actively investigating new data dictionary functionality, with an eye to better serving the needs of related VAX information architecture products -- including ACMS.

Submittor : Walter Romijn
Address : 2235 Meyers Avenue, Escondido, CA 92025
Firm : Userware
Phone : (619) 745-6006
Product : RDB
Version : 2.2
Abstract : It would be useful if on a transaction that is stated with no reserved relations, that it could be stated that relations accessed could be locked shared write rather than shared read.

Description
& Examples: We have lots of locking contentions and dead locks. Where two processes have a read lock on a record in the relation and both try to promote to a read lock. These transactions are usually very short but of high volume. These occur of records containing sequence numbers. In most cases the occurrence of a dead lock far outweighs the consequence of a wait for a lock.

Digital
Response : We are looking at a number of ways to reduce contention and deadlocks in future releases of RDS/VMS. We will consider your request as part of this on-going effort.

Submittor : Chris Carvalho
Address : 5200 NE Elam Young Pkwy., Hillsboro, OR MS#JF1-73
Firm : Intel Corp.
Phone : (503) 681-4710
Product : RDB
Version :
Abstract :

Ability to store structures in RDB fields in addition to current scalar data types. Suggested structures are 1) arrays 2) record definitions similar to PASCAL or DTR.

Description & Examples:

```
DEFINE RELATION TEST_DATA DESCRIPTION IS
  LOT_NUMBER
    DATATYPE TEXT SIZE 10.
  TEST_RESULTS
    DATATYPE ARRAY [0..500] OF REAL. >this is
    TEST_NAMES
    DATATYPE ARRAY [0..500] OF TEXT >I
    SIZE 10. >want
END TEST_DATA RELATION.
```

Benefits:

1. Avoids performance/disk space problems that occur when normalizing very long lists (occurs clauses) used with DTR/RMS.
2. Data stored in structured types can be indexed, allowing efficient access by subscript.

Digital Response :

There have been a number of requests at this DECUS for support of additional datatypes including user defined types. We will take a look at this as a future enhancement to DSRI an RDB/VMS.

Submittor : David Fong
Address :
Firm : Intel
Phone : (503) 681-4701
Product : RDB
Version :
Abstract : Have RDB support arrays.

Description & Examples:

Digital Response : See response to Intel wishlist item from Chris Carvalho.

Submittor : John Doyle
Address : 2550 Mercantile Drive, Suite C, Sacramento, CA 95670
Firm : Steiner, Levi & Co.
Phone : (916) 361-7181
Product : RDB/VMS
Version : L.1
Abstract : Support packed decimal datatype directly

Description & Examples:

This is needed to get around the traditional round-off problems that occur with floating-point numbers.

Digital Response :

We will consider adding packed decimal support as a future enhancement to DSRI and RDB/VMS. In the current product, it is possible to avoid rounding problems by declaring the data item as a scaled (word/longword/quadword) in the database and as packed decimal in the application program. RDB/VMS will then read the scaled value and convert it to packed decimal (and visa versa).

Submittor : Adrian Vulpas
Address : 8200 W. Tower (R&D), Milwaukee, WI 53223
Firm : Marquette Electronics
Phone : (414) 355-5000
Product : RDB
Version : 2.?
Abstract : Fortran RDB Preprocessor: Allow F77 "Record.Field" syntax on the lefthand side of a RDB GET statement.

Description & Examples:

```
structure /x/
  integer*2 myfield
end structure

record /x/ myrecord
.
.
&rdb& get
.
&rdb& myrecord.myfield=relation.*tribute
.
```

Digital Response :

We will look into this.

Submittor : Paula Cowley
Address : P.O. Box 999, Richland, WA 99352
Firm : Battelle Northwest
Phone : (509) 375-2282
Product : RDB/VMS
Version : 2.1+
Abstract : Provide a facility for a read-only RDB data base that exists on WORM (write one, read-many) media. This would be used in conjunction with the data distributor.

Description
& Examples:

I want to periodically make snapshots of my data base and distribute them to remote sites where they will use the data base in read-only mode. RDB cannot currently handle a database on a WORM media because even in read-only mode, it writes to header records. Separate these areas and put them on a disk and allow the bulk of the data to exist on the non-updatable media. Better yet, allow me to partition my data base so a portion of it is read-only but another portion is on a conventional write-many media.

Digital

Response : We are looking at ways to support archival media such as WORM for a future release.

Submittor : Bryan Owen
Address : P.O.B. 188, Longview, WA 98632
Firm : Weyerhaeuser
Phone : (206) 425-2150 ext. 5232
Product : VAX RDB
Version : 2.1
Abstract : Support "last" as "first" is supported in RSE's. or provide the means to "store" new records to the top of the DB.

Description
& Examples:

This feature would eliminate a lot of I/O & CPU required to access current records in databases whose records are sequential with time.
ie: for last 24 h in hourly data
 print h.timestamp, h.hourly_reading
 end_for
Please! This will help alot!

Digital

Response : Data stored in an RDB database is inherently unordered. To achieve the results you desire define an index on the date/time in the record and issue a query such as:

```
For P in Port with time > (time-24 hours)
Print...
```

Submittor : Larry Goodhind
Address : 10510 NE 47th Street, Vancouver, WA 98667
Firm : Sharp Microelectronics
Phone : (206) 253-8000
Product : ACMS
Version : 2.n+
Abstract : Change default \$NOMENU to include path of selection prompt

Description
& Examples:

Create field in nomenu menu form to display current path.

```
+-----+
! SYS APP Task      !
! Selection:        !
!                   !
+-----+
```

Digital

Response : Digital has it now. See Application Definition Guide Chapter 5, "Modifying the Standard ACMS Menu Format"

The MENU_HEADER_RECORD sent to the request includes a field Menu_Path, the sequence of menus, identified by keyword, that the user followed in reading the current menu.

Submittor : Larry Goodhind
Address : 10510 NE 47th, Vancouver, WA 98667
Firm : Sharp
Phone : (206) 253-8000
Product : ACMS
Version : 2.n+
Abstract : Include a multi-threaded AST Agent example

Description
& Examples:

The agent examples in the distribution of ACMS are both single-threaded and synchronous, could get an AST-multi threaded CP agent example?

Digital

Response : Reasonable request. Too late to include in ACMS V2.1. Will try to get in the following release.

Submittor : John Vottero
Address : 2141 Fairwood Avenue, Columbus, OH 43207
Firm : Taytec
Phone : (614) 443-4891
Product : ACMS
Version : 2.0
Abstract : Goto previous task

Description
 & Examples: We would like to be able to say: To go to a task without losing tas workspaces and without passing them.
 Go to TASK taskname PRESERVING task_rec_name.
 To return GO TO PREVIOUS TASK
 Digital Response : It is a strong strategy goal of ACMS to provide capabilities that will allow this.

 Submitter : John Vottero
 Address : 2141 Fairwood Avenue, Columbus, OH 43207
 Firm : Taytec
 Phone : (614) 443-4891
 Product : ACMS
 Version : 2.0
 Abstract : Share procedure servers between groups
 Description & Examples: We would like to be able to use the same procedure server in more than one group. In our case, we have a procedure server with only one procedure which calls TPU to edit RDB segmented strings. We put this in a separate procedure server because the duration of the editing session is relatively long.
 This server is defined in almost all of our groups with a minimum server count of 0. We make this 0 because the use is not heavy enough to justify another process for every group. If the groups could all share the same procedure server, we could increase min. servers and give better response to our users.

Digital Response : I assume this server must share workspaces with the other servers in the group (or you want to chain to it). The server could be in its own group. On in its own application.
 We are looking very seriously of adding capabilities which will allow tasks in different groups have processing steps that use the same server.

 Submitter : John Vottero
 Address : 2141 Fairwood Avenue, Columbus, OH 43207
 Firm : Tytec

Phone :
 Product : ACMS
 Version : 2.0
 Abstract : Global user workspaces.
 Description & Examples: We would like to be able to define a user workspace that spans groups. I.E. each user has one copy of the workspace, which is used in all groups the user may enter.
 Digital Response : We are looking very seriously at adding capabilities which will allow this.

 Submitter : John Vottero
 Address : 2141 Fairwood Avenue, Columbus, OH 43207
 Firm : Taytec
 Phone : (614) 443-4891
 Product : ACMS
 Version : 2.0
 Abstract : Login and group entry tasks.
 Description & Examples: We would like to be able to define, by user, a task which is executed at login.
 We would like to be able to define, by group, a task which is executed when a user selects a task in the group.
 Digital Response : These are things we've always wanted to do. Right now we don't consider them critical. The good news is that they look like small work items, so they might show up in the medium term.

 Submitter : Larry Goodhind
 Address : 10510 NE 47th, Vancouver, WA 98667
 Firm : Sharp
 Phone : (205) 256-1943
 Product : ACMS
 Version : 2.n+
 Abstract : Provide generic CLI style server interface for DTR, and user developed DCL style servers.
 Description & Examples: Currently DTR servers and user DCL servers are image activated every call. Could a mechanism be developed with creates a reusable DCL server with options like a procedure server. I.E. Initialization Command= "QSTART" TASK IS ":REPORT A" by creating a channel to the process for funneling strings to parse into

the image.
Digital Response : We've thought about this before. Right now our strategic direction is to enhance the capabilities of the system using procedure servers. We think of DCL servers as a convenience rather than as central piece of the architecture.

But we'll keep your suggestion in mind.

Submittor : L. Goodhind
Address : P.O. Box 1044
Firm : Sharp Microelectronics Technology
Phone : (206) 256-1943
Product : ACMS
Version : 2.n+
Abstract : Provide server creation "high-water" stats
Description & Examples: Record the highest level that server creations reach and display in \$ACMS/SHOW APP for tuning purposes.

Digital Response : In general we're looking seriously at ways to enhance the performance monitoring capabilities of the system.

Right now there's a way to get this information. ACMS/ SHOW APPLICATION/CONTINUOUS give minimum/maximum active server processes. That's only min/max for the time you're doing the SHOW. If you want a long period, try running the command in a batch job and getting the information from the batch log.

Submittor : David Allen
Address : 1182 Market #216, San Francisco, Ca 94102
Firm : PSP, Inc.
Phone : (415) 626-9436
Product : VAX INFO II
Version : 1.1
Abstract : Bundling via products must not preclude the possibility of backing out a product with significant problems. Description & Examples: There is a known problem with DTR V3.4 when used in conjunction with RDB. Some indexed reads are performed incorrectly as sequential reads. VAXINFO II blocks one from retrieving to DTR V3.3. I appreciate the convenience and

price reduction associated with bundling, but will have to stop using it if DEC cannot maintain better quality control of better abilities to back out.
Digital Response : We recognize the need to control installation and deinstallation of individual products within the VAXINFO packages and are actively investigating this for a future release.

Submittor : Matt Robuzzi
Address : 730 Distel, Los Altos, CA 94022
Firm : ASK Computer Sys
Phone : (415) 969-4442
Product : DBMS
Version : 3.x
Abstract : We need to be able to add AREAs to a schema with DDL/ MODIFY, the same way that new RECORDS & SETs can be added.

Description & Examples: This is needed in order to place new records w/o having to overflow existing records. Recompiling the schema is unacceptable, as it means unload/loading an entire database.

Digital Response : Very, very high on the worksheet and you might see it sooner than you think. This will be available in the final release of DBMS V3.2

Submittor : Joe Deely
Address : Los Altos, CA
Firm : ASK
Phone : (415) 969-4442
Product : DBMS
Version : 3.2
Abstract : DSRI interface to DBMS so we can use SQL.

Description & Examples: Digital Response : A DSRI interface to DBMS has had some initial investigation, and the development team plans to investigate it further during the months ahead.

Submittor : Philip Kursian
Address : 1945 Charleston Rd., Mountain View, CA 94043
Firm : Censilium, Inc.

Phone : (415) 940-1400
Product : DBMS
Version : 3.0
Abstract : Please document, and continue to support, the capability to assign logical DBM\$BIND_BUFFERS on a per-process basis.

Description & Examples: Under DBMS V2.2, this logical was provided to allow an individual process to select an optimum number of buffers for its run unit. Under DBMS V3.0, this logical still appears to work, but is not documented. This flexibility is important in TP environments using simultaneous online/batch/maintenance run units.

Digital Response : The DBMS V3.1 documentation provides information on how to use the logical bind parameters.

Submittor : Philip Kurjan
Address : 1945 Charleston Rd., Mountain View, CA 94043
Firm : Consilium, Inc.
Phone : (415) 940-1400
Product : DBMS
Version : V3.0/3.1
Abstract : Fix DBO/VERIFY/READY=CONCURRENT; SUPPORT DBO/VERIFY/ READY=BATCH (RETRIEVAL)

Description & Examples: This capability is required for nonstop operation some of our customers report full DBO/verfity takes up to 16 hours.

Digital Response : The DBO/VERIFY/READY=CR bug has been fixed for V3.2 of DBMS. There are currently no plans to support a ready=batch update mode.

Submittor : Philip Kurjan
Address : 1945 Charleston Road, Mountain View, CA
Firm : Consilium, Inc.
Phone : (415) 940-1400
Product : DBMS
Version : 3.0/3.1
Abstract : Fix the DBO/LOAD/CONTINUE facility
Description & Examples: Our database reloads take 24 hours or more at large customer sites. Without this facility, exposure to machine failure during reload is unacceptable. (we have SPR'd this problem.)

Digital Response : Several problems with dbo/load continue have been fixed. Your particular SPR will be investigated further.

Submittor : Joseph Deely
Address : 730 Distel Drive, Los Altos, CA
Firm : ASK Computers
Phone : (415) 969-0002
Product : DBMS
Version : 3.2
Abstract : Be able to see how many times an area is being hit, how many IO's are being done on an area file over an extended period of time.

Description & Examples: The most important item that we have noticed within benchmarking large systems is spreading out of the area files across spindles. It would be nice to our users could use DBO/SHOW STAT to determine which files are being overloaded, so that they could spread out their IO's better. Although we give recommendations on which areas to spread apart, no two sites are the same and these recommendations can only be used as a guide.

Digital Response : Look for the new DBP/SHOW STATISTICS utility in DBMS V3.2, we are confident that this utility will provide you with enough information to analyze problems with your database. If there are still particular statistics you wish collected, please submit a QAR or SPR.

Submittor : Al Metzinger
Address : 901 Elmgrove Road, Rochester, NY
Firm : Eastman Kodak co.
Phone : (716) 726-1226
Product : DBMS
Version :
Abstract : Turn on snaps without shutting down database.
Description & Examples: Snaps would be much more valuable to us if we could turn them on without closing the database.

Digital Response : We have added this item to our wishlist. The problem is that to turn snapshots on we would have to force a database wide quiet point. This really falls into the category of making more of DBO/MODIFY concurrent.

Submittor : Ben Weleschuk
Address : 55 St. Clair Ave. W. Toronto, Ontario, Canada
M5W1K3
Firm : Esso Petroleum of Canada
Phone : (416) 968-5844
Product : DBMS (also applies to DTR)
Version : 3.1+
Abstract : Require a facility to log who made changes to
data using either DBQ or DTR.

Description
& Examples:

We currently restrict access to DBQ and DTR. However, application support people can access data either on a database (is a DBQ) or in a flat file (via DTR). They also have capabilities to change data and on some cases have to do so if a program bug is discovered and data is corrupted. Our internal corporate auditors have expressed to concur that we can't tell who made a specific change. Our requirement, therefore, is some facility that logs changes made (add, delete, modify) to the database or flat files: who & when to what data field.

Digital
Response :

We now have a new database tools group which will investigate new functionality such as audit trails and performance monitors. This, however, is not a commitment to providing this functionality.

Submittor : Al Metzinger
Address : 901 Elmgrove Road, Rochester, NY 14650
Firm : Eastman Kodak Co.
Phone : (716) 726-1226
Product : DBMS
Version :
Abstract : Want ability to get lock information from
application level.

Description
& Examples:

In DBQ you can SHOW LOCKS and see the locks you have in the database. It would be very advantageous on a applications level to have their capability to solve deadlock problems. Example: Modules could be coded to do a "get locks" function and then display or dump the information to a flat tile when deadlocks are detected. The hooks must already be there in DBCS because the information can be obtained in DBQ.

Digital
Response :

Look for the new DBP/SHOW STATISTICS utility in

DBMS V3.2, we are confident that this utility will provide you with enough information to analyze problems with your database.

If there are still particular statistics you wish collected, please submit a QAR or SPR. 2) Will add a deadlock/detection fracture to our wishlist it's already been on the lot for a long time.

Submittor : Philip Kurjan
Address : 1945 Charleston Road, Mountain View, CA 94043
Firm : Consilium, Inc.
Phone : (415) 940-1400
Product : DBMS
Version : 3.0
Abstract : Fix "remote bind" facility
Description
& Examples: We have SPR'd "Map ID Failure" and "data
overrun" errors within this facility.

Digital

Response :

This problem is currently being investigated, and we hope to be able to answer your SPR very soon.

Submittor : Ben Weleschuk
Address : 55 St. Clair Ave. W., Toronto Ontario, CANADA
M5W1K3
Firm : Esso Petroleum of Canada Ltd.
Phone : (416) 968-5844
Product : DBMS
Version : 3.1
Abstract : Add DBO/grant for DBQ.
Description
& Examples: DBO/grant currently works for granting/denying
access to DBO/Backup, etc. Requirement is
DBO/grant DBQ to allow someone access to DBQ.
Default is for a user not to have access.

Digital

Response :

This item has been requested several times, and we have added it to the wishlist. The difficulty lies with how to really protect against users using DBQ.EXE.

Submittor : Matt Rabuzzi
Address : 730 Distel, Los Altos, CA 94022
Firm : ASK Computer Sys

Phone : (415) 969-4442
Product : DBMS
Version : 3.x
Abstract : DBMS needs a "metaphysical reload" capability allowing one to resize database areas (size than large or smaller) which would be re-PLACE all records in those areas a fix up set pointers.

Description & Examples: DBO/UNLOAD and /LOAD require a lot of coding in order to write the LFL, USL & LSL files correctly, as well as maintenance in those files as the schema DDL grows (new records, sets added). We need "DBO/RELOAD [1 area=area] old=.roo=spec new=.roo=spec". Obviously this will require a lot of disk space--for the database copies and for scratch and sort space.

Digital Response : This request has been addressed in the past, and it remains on our wishlist. It would be a large effort, and needs to be investigated further.

Submittor : Mary Anne Wentink
Address : 6455 Nancy Ridge Drive, Suite 100, San Diego, CA 92121
Firm : STAFS
Phone : (619) 693-7927
Product : DBMS
Version : 3.?
Abstract : Need to Download DBMS/RMS files to 4GL for report/quey on the MICRO products.

Description & Examples: We have a large, extremely complex DBMS database which we would like to be able to query/report against via MICROVAX and similar products. The users of the MICROS would be virtually computer illiterate. Wish names of downloading DBMS records for user query using a 4GL product.

Digital Response : If DBMS provides a DSRI interface in the future, perhaps some of this problem would be resolved. In the meantime you should be able to use the DBM/UNLOAD utility to move your data to RMS files

Submittor : Joseph Deely
Address : Los Altos, CA

Firm : ASK Computers
Phone : 969-4442
Product : DBMS
Version : 3.1
Abstract : We want a new fast unload/load which is capable of unload/loading a 2+gigabyte database in a reasonable time.

Description & Examples: Digital Response : To begin with, everybody has a different opinion on what a "reasonable time" to unload and load a database is. We will consider investigating the DBMS load/unload utility for performance improvements and functionality enhancements.

Submittor : Mary M. McCormick
Address : W317/271/G13 P.O. Box 516, St. Louis, MO 63166
Firm : McDonnell Doublas
Phone : (314) 234-5285
Product : DBMS
Version : 3.0
Abstract : Allow broadening of check clauses on existing elements.

Description & Examples: According to documentation, check clauses cannot be modifies. However, we have done it with no apparent repercussions. It should be possible to verify that are original check clause is a subset of it's modification (e.g., old: object_flag.type character 1, check is (O_F EQ 'Y" or O_F EQ 'N') new: Object_flag.type character 1, check is (O_F EQ 'Y' or O_F EQ 'N' or O_F eq 'y' and therefore validate that there is no value in the database that would violate the new check clause.

Digital Response : This is currently a restriction of VAX DBMS, but we have added it to our wishlist for future investigation.

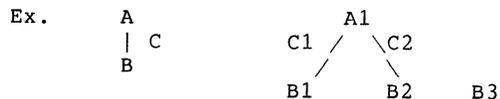
Submittor : Al Metzinger
Address : 901 Elmgrove Road, Rochester, NY 14650
Firm : Eastman Kodak
Phone : (716) 726-1226
Product : DBMS
Version : ???
Abstract : Prevention of duplicate in a CALC set

Description
 & Examples: When will DBMS have this feature.
 Digital
 Response : We hope to have code in DBMS 3.2 which will prevent duplicates in the calc set. Look for the UNIQUE clause and its documentation.

 Submitter : Mary Ann Wentink
 Address : 6455 Nancy Ridge Drive, Suite 100, San Diego, Ca 92121
 Firm : STAFS
 Phone : (619) 693-7927
 Product : DBQ
 Version : ?
 Abstract : Recall feature for DBQ commands.
 Description
 & Examples: Recommend allowing user to recall DBQ commands ala feature available in DCL. The general complexity of these commands and the repetitive nature of fetch makes the requirement to retype the "command before last" a real headache in the working environment.

Digital
 Response : We would also like to have a recall feature in DBQ. It's already on the wishlist, and hopefully we will be able to implement it shortly.

 Submitter : Mary Ann Wentink
 Address : 6455 Nancy Ridge Drive, Suite 100, San Diego, Ca 92121
 Firm : STAFS
 Phone : (619) 693-7927
 Product : DBMS
 Version : ?
 Abstract : Deny access to current "owner" records of unconnected sets.
 Description
 & Examples: We have discovered to our great discomfort that once currency has been established on an "owner" record any attempt to walk up the tree via a "member" record which is not connected to the "owner" record will fetch the current record of the owner type.



A, has already been addressed within current session. User does a fetch on B3 then asks for B3's owner within C. DBMS returns A, as the fetched record even though there is no current connection between the two. Need a warning statement instead. i.e., state that B3 is not connected to C vice pulling up an "owner" which may have absolutely no logical connection to the data.

Digital
 Response : Unfortunately, this is a restriction in VAX DBMS. We will consider adding new syntax which may enable you to fetch the actual record you desire, and not the record which you currently receive. This has been added to the wishlist.

 Submitter : Wren Hunt
 Address : 400 Commonwealth Avenue, Bristol, VA 24201
 Firm : Morrison Molded Fiber Glass
 Phone : (703) 669-1181
 Product : VAX TDMS
 Version : 1.6
 Abstract : Ability to re-define the tab key to the right-hand side of the keyboard so that data entry personnel need use only 1 hand to key input on forms.

Digital
 Response : Available in V1.7

 Submitter : Robert Schofield
 Address : 50 E. Algonquin, Box 501C, Des Plaines, IL
 Firm : Signal Research
 Phone : (312) 391-3340
 Product : TDMS
 Version :
 Abstract : Allow TDMS to interact (in & out) with D or F_Floating Variables.
 Description
 & Examples: Floating numbers must be converted to text for I/O with TDMS
 Digital
 Response : No plans to support FP on the form; requires redesign from FDU through the runtime system.

 Submitter : John Fogg
 Address : 100 DuChaire Blvd., New Bedford, MA 02745
 Firm : Polaroid Corp

Phone : (617) 998-5848
Product : VAX TDMS
Version : V1.5
Abstract : Allow a form field to be mapped to a record field in floating PT for both input and output.

Description & Examples: There is currently no convenient way to do display and input of a floating point number on a TDMS form. Would like, either with fixed decimal or floating decimal, to have such a relation be possible. Handling and out-of-range display could with current error signaling.

Digital Response : Duplicate question - development is aware of this-there are no plans to modify this.

Submittor : Deborah Ann Minich
Address : Build 561 0/72-CO, 1111 Lockheed Way, Sunnyvale, CA 94089-3504
Firm : Lockheed Missile & SPACED
Phone : (408) 756-2345
Product : TDMS
Version : 1.6
Abstract : Allow numeric fields to be used on control field

Description & Examples: Currently need to convert numeric fields to character field for to use as control field. After causes a duplication fields item in the records. The other option is have the input field defined as character this limits using the range checking in the TDMS form.

Digital Response : Development group will evaluate the impact of this - numeric control field - duplicate wish item.

Submittor : John Vottero
Address : 2141 Fairwood Avenue, Columbus, OH 43207
Firm : Taytec
Phone : (614) 443-4891
Product : TDMS
Version : 1.6
Abstract : Better support for signed quadwords, longwords with scale-n.

Description & Examples: In you have a quadword, scale - 4, I would like to be able to output, with rounding, and

display less than 4 dec. postions. During entry, TDMS should allow left justified entry of a number in any of the following forms:

1234
1234.56
-1234.56
1234.56-
1234.56
etc.
etc.

Digital Response : Aware of this problem; no plans to modify how this works in the near future.

This was a stated wish list item - I didn't catch the persons name. Ability to define keys to go forward or back a specific it's of fields - Gold 5 = 5 tabs

Submittor : Kathy Davidson
Address : 1255 Battery, Post Office box 7114, San Francisco, CA 94123
Firm : Tri/Valley Growers
Phone : (415) 445-1725
Product : TDMS
Version : 1.5
Abstract : 1) Improve Zero Suppress Field Attribute
2) Improve screen>request signed field interface
3) Allow numeric control fields in requests

Description & Examples: 1) When using the zero suppress attribute for fields it suppresses all zerox not just the heading zeros. Therefore, the number 100 displays as 1.

2) TDMS does not convert signed numeric fields correctly. If you have a field defined as S9(5)V99 and you leave 6 spaces to the left of the decimal the screen you get an error, so you have to either increase your record size or only allow users, to enter a smaller #

3) We would like to use numeric fields as control variables. This would be used to highlight a field if it is not zero; accept one field based on the value of a numeric field.

4) The FMS fixed decimal data entry procedures were great. I wish TDMS would have this facility

—|—
Cursor starts here, characters appear to the left of the decimal 'till you hit the decimal...then they appear to the right.

Digital

- Response :
- 1) Zero Suppress shouldn't do 100=1. If does, rebuild RLB & try again. Things were changed in 1.4. Also zero suppress doesn't suppress leading zeroes.
 - 2) ? (this may be caused by the sign/space problem which is fixed)
 - 3) no plans to fix - massive reengineering in several components.
 - 4) TDMS supports this for unsigned numerics only.

DECUS, Fall 1986
Wish List

1 DEFINE_KEY CAPABILITY

- Abstract: Ability to redefine the TAB key to the right hand side of the keyboard so that data entry personnel need use only 1 hand to key input on forms.
- Response: This feature will be available in V1.7.

2 FLOATING POINT SUPPORT (2)

- Abstract: Allow TDMS to interact (in or out) with D_ or F_Floating variables.
- Allow a form field to be mapped to a record field in floating point for both input or output.
- Response: The engineering effort necessary to provide floating point support to TDMS would be massive and would involve changes in most components. We will keep this suggestion in mind for future plans, but there are no current plans to add floating point support.

3 NUMERIC CONTROL FIELDS (2)

- Abstract: Allow numeric fields to be used on control field.
- Allow numeric control fields in requests.
- Response: Adding support for NUMERIC datatypes in control fields would require major reengineering of several components. We will keep this suggestion in mind for future plans, but there are no current plans to add this feature.

4 SCALED BINARY DATATYPES

- Abstract: Better support for signed quadwords, longwords with scale -n.
- Response: TDMS does not support scaled binary datatypes, and this is likely to remain a permanent restriction.

5 IMPROVED NAVIGATION

- Abstract: Ability to define keys to go forward to back a specific number of fields; for example, GOLD 5 = 5 TABS.
- Response: We will keep this suggestion in mind for future plans, but there are no current plans to add this feature.

6 IMPROVED ZERO SUPPRESS

- Abstract: When using the zero suppress attribute for fields, it suppresses all zeros, not just the leading zeros. Therefore, the number 100 displays as 1.
- Response: This was a problem that was fixed in TDMS V1.4. Current versions of TDMS display numbers, including zeros, correctly.
- Also, the function of the ZERO SUPPRESS attribute is not to suppress leading, or trailing, zeros. As the documentation states, this attribute governs whether or not to display a) when the value of a field is equal to 0.

7 SIGNED NUMERIC CONVERSIONS

- Abstract: TDMS does not convert signed numeric fields

correctly. If you have a field defined as S9(5)V99 and you leave 6 spaces to the left of the decimal on the screen, you get an error, so you either have to increase your record size or only allow users to enter smaller numbers.

Response: TDMS behaves as described. If you have a signed numeric or packed decimal 7 digits scale -2 in your record, the corresponding form field must NNNNN.NN. A form field of NNNNNN.NN will give %RDU-E-DSTLENGEQ. The reason for this is that the form field NNNNNN.NN could contain a maximum value of 999999.99. RDU must ensure that the corresponding record field is large enough to hold that value.

8 FIXED DECIMAL DATA ENTRY

Abstract: The FMS fixed decimal data entry procedures were great.

Response: TDMS supports this style of data entry for unsigned numerics only.

Do's and Don'ts of DSRI

Abstract

This paper discusses an implementation of the DSRI (Digital Standard Relational Interface) into a relational applications generator. The purpose of this paper is to illustrate some of the techniques used and some of the problems encountered in the implementation of the DSRI. A comparison of the RDO (Relational Database Operator) implementation of the DSRI and a direct DSRI implementation is made throughout the paper.

Project Background

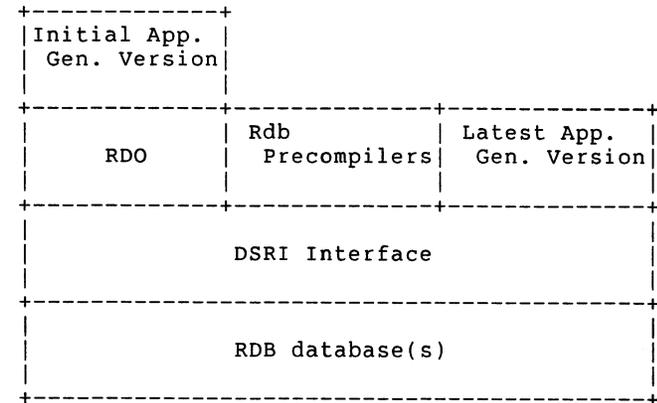
The company develops application packages primarily in the accounting, distribution and manufacturing markets. An applications generator was built to help develop these packages to use Digital Equipment Corporations (DEC) Relational Database (Rdb). This initial implementation of the applications generator used callable RDO, while the current version interfaces directly to the DSRI.

The current implementation was done on a MicroVAX II, using VMS Version 4.3 and RDB Version 2.2 .

What is DSRI ?

The DSRI is a set of routines which enables a program to communicate with a DSRI compliant database. The DSRI sits between the application programs and the Relational Database.

DSRI structure.



Some of these calls are fairly simple, such as to attach to a database or to start a transaction, but others primarily for data manipulation and selection require a language of their own called BLR (Binary Language Representation).

A set of BLR statements describes a requirement to perform some action on the data in the database. This complete set of BLR statements is called a request.

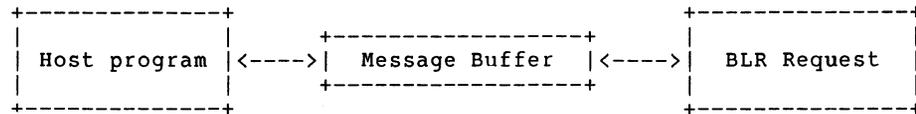
A request is much like a complete program in that it has source statements which need to be compiled into an internal machine representation.

Once the compiled request has been started, data is sent from the host program to the request via a send call. Data from the database is sent to the host program via receive calls.

The BLR language contains statements which allow logical decisions to be made, and a corresponding action to be taken on the result of the decision. As there is also a two way communication between the host program and the request, then it is possible to write a complex request to perform a selection of actions on the data dependant on parameters passed to the request.

Data is passed between the request and the host program in message buffers.

Data flow between host program and BLR request.



Reasons for conversion to DSRI

1. The precompiler was not suitable as we needed generalized routines. The fields and relations that were going to be used would not be defined until execution time. The precompiler requires that the field names and relation names be specified when the source is compiled.
2. Programing in 'C'.
(No pre-compiler)
3. Slowness of the RDO interface.

The main reason for the RDO interface being slow is that each action to be performed by RDO goes through two compilers.

The first compile is the interpretation of the RDO relational data manipulation language into a set of BLR statements.

The second compile is of the BLR program into the internal machine code.

Another reason for RDO being slow is that when using start_stream and end_stream RDO will retrieve a record twice.

- a) during the initial stream request when all the matching records DBKEYS are retrieved and stored. (Therefore at least a read lock would be put on all the records.)
- b) during the processing of the stream when the record data would be retrieved and modified.

The early test results gave some very promising figures.

An early timing experiment to retrieve all the global field names in a database from the relation RDB\$FIELDS , excluding the rdb fields gave the following results: (about 95 fields).

```
Using RDB$INTERPRET      Cpu time 7.32 secs
Using Precompiler (basic) Cpu Time  .95 secs
Using DSRI equiv         Cpu time  .35 secs
                        (plus .60 secs initial compile time)
```

Possible DSRI Implementations

Case 1.

At the start of a retrieve all records defined by an RSE and store their DBKEYS. Process the record stream , accessing the records by the DBKEYS.

In this scenario, each action becomes a stand alone request.

----- Request break down -----

- Request 1 - Read and store all the DBKEYS in a core array for the RSE.
Array pointer set to the first element
- Request 2,3,4... - Each request here is custom built for the action on the data required, but will always begin with a fetch of the record by DBKEY.
A fetch simply translates into a shift of the array pointer to the next element.

Advantages - Involves Simple DSRI requests, where each can be a complete action.

Disadvantages

- Data may need to be accessed twice. Once in the selection process, and then secondly in the update/modification.

Case 2.

Write one large request.
This large request contains code to:

1. Start a stream
2. Fetch a new record.
3. End a stream
4. Get a fields data from the current record.
5. Put data to a field on the current record.
6. Delete the current record.
7. Get a records DBKEY.

The store a new record procedure is not included in this list as it required the storage of data before the add can be actioned. A separate request was built specifically for the addition of records.

The large request is started once, and exists until the end of the record stream. The host program signals its requirements to the request through command tokens placed into message buffers. Data is received from the request via the message buffer.

Advantages

- Only accesses data once.
- No need to recompile requests.

Disadvantages

- Synchronization problems exist between sending and receiving of data between the host program and the request.
- Complex BLR requests get written, which are far more difficult to debug.
- All syntactical errors must be trapped by code in the host program, so that the request is not bought to a premature end.

Implementation of Case 2

In our implementation of Case 2 the aim was to get the same effect as RDO in starting a stream and then being able to do operations on the 'current record' in the stream.

The implementation was further complicated as we wished to reuse compiled requests, so any constants used within the RSE were also split out and sent to the request as a parameter in a message. request. Eg in WITH E.ORDER = F.ORDER AND E.DEPARTMENT = "CAT" "CAT" is the only 'static' target and as such would passed as a parameter.

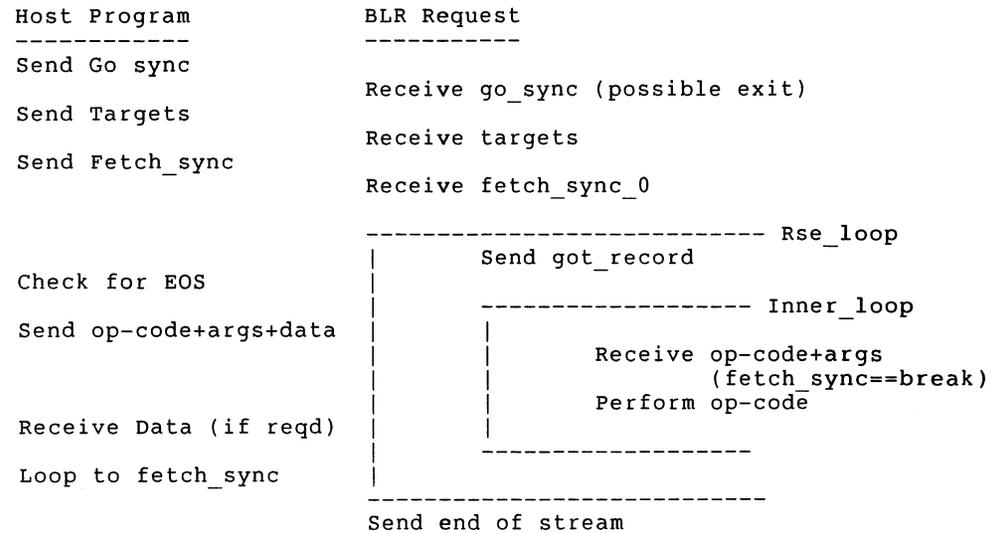
Therefore the request has to be started and then let hang between any get,put,erase that was required. I.e. each request will have:

- 1 A set of RSE targets (received from host)
- 2 An RSE
- 3 A wait_before_next receive (to effect a fetch)
- 4 A loop that receives a command token
- 5 A 'case' construct (in fact an if-then-else-if list) which dispatches the request to the right spot.
- 6 Do the comand
 - Start a stream
 - Fetch the next record
 - end a stream
 - get = send+assignment
 - put = receive+modify
 - erase = erase
 - Get the DBKEY value(s)
- 7 Loop back to 4

Each of the above case constructs has to be repeated once per relation mentioned in the RSE.

The message buffers. Apart from the 'op-code' parameters the data parameters were set up as only one per datatype. Strings were treated slightly differently in that a standard 30 character buffer was set up, and if a longer string occurred for one of the fields in any of the relations an extra area was assigned.

Segmented strings ???



Performance Increase Acheived

Process Run	(1848 records)
	Cpu (secs)
RDO	530.94
DSRI	89.18
Maintenance Procedure (Add - Modify - Delete)	
	Cpu (secs)
RDO	10.44
DSRI	8.63
Data Entry (Order Header plus 3 lines)	

	Cpu (secs)
RDO	17.79
DSRI	14.00

Errors and problems found associated with the current release

1. <field_count> in the BLR is not an unsigned byte as in the BNF documentation - its an unsigned word.
2. The <field_descriptor> for a segmented string field is not <ss_dtype> (i.e DSC\$K_DTYPE_QU) on its own - the best description is DSC\$K_DTYPE_Q followed by a zero scale byte as in the pascal examples.
3. A request can not be compiled before the first transaction has been started.
4. When retrieving and storing numeric fields it is usually easier to declare TEXT message parameters and let RDB do the conversion for you than do the conversions to text yourself.
5. However when using passed parameters as part of an RSE numeric fields that are passed in text parameters will not work properly with operators like < & > since comparisons are lexicographical, not numeric.
6. Some (M)BLR\$K_constant values are missing from the documentation. These are:

MBLR\$K_DESCRIPTION_SOURCE	51
MBLR\$K_SUB_TYPE	52
MBLR\$K_SEGMENT_LENGTH	53
7. Do not attempt to pass a segmented_string id to (or presumably from) a request in a message parameter of type DSC\$K_DTYPE_T. This gives a WISHLIST error - presumably because in the future the contents of the first segment will be retrieved and passed back if the message parameter type is TEXT.
8. Undocumented settings for the RDMS\$DEBUG_FLAGS logical are
 - "B" - display the BLR as its being COMPILED
 - "M" - display the MBLR as its being EXECUTED
 - "G" - displays the translation of BLR to macro
9. In requests that use an RSE involving more than one relation RDB currently disallows the modification of any context.fields (relation_fields) mentioned in the RSE. An error (field x is read_only) is given by RDB at BLR compile time. This INCLUDES not only the relation_fields which represent the join keys

(which is fair enough) but more importantly (for the unsuspecting user) also relation_fields which don't affect the join in any way.

One way around it is to use the RDO method which involves retrieving all DBKEYs for the RSE using one request and then re-retrieving individual records by DBKEY (BLR\$K_FETCH) to perform any reads or writes to the record. (Tacky)

The other way would be an improvement in the compilation checking!

10. In order to alleviate the problems of locking on high contention data, such as sequence numbers for documents, special constructs were introduced that allowed a second transaction to be started and quickly finished for this type of updating.

- This has a side effect in that these updates can not be rolled back with a roll back of the main transaction.

The Wombat

EXAMINER

and 4GL Dispatch

"Increases the Circulation of Anyone in America"

Volume 8

Number 8

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:

Editor, DATATRIEVE Newsletter
c/o DECUS U.S. Chapter
219 Boston Post Road, BP02
Marlboro, MA 01752

Donald E. Stern, Jr
Warner Lambert Company
10 Webster Road
Milford, CT 06460

Table of Contents

DECUS U.S. Chapter SIG Newsletters, Volume 2, No. 8, April, 1987
Wombat Examiner and 4GL Dispatch, Volume 8, No. 8

DTR-2	-	Chairman's Corner
DTR-2	-	DTR/4GL Software Clinics at Nashville
DTR-3	-	Coping With Digital's Office Automation Products (such as All-in-1 and WPS-Plus) using Datatrieve - Part 1
DTR-20	-	User Defined Functions (UDF's) for VAX Datatrieve
DTR-42	-	Spring 1987 Product Improvement Requests
DTR-49	-	From the Editor's Pen
DTR-50	-	DTR/4GL SIG - Digital Product List

Chairman's Corner

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

It is now less than a month until the 1987 Spring Symposium in Nashville. April 8th is the deadline for discounted registration. You can always wait till you get there to register, but you will save significantly if you register early. So do it now.

Only about 10 to 12% of the DECUS membership attend a given symposium. The amount of information that you learn at a Symposium more than justifies the cost of attendance. If you haven't attended one, you don't know what you are missing. Don't be left out. Join the fun and learning experience.

For those of you who will be attending, plan to participate in the activities of the DTR/4GL SIG. In last month's newsletter there is a DTR/4GL Volunteer form. Volunteer to host the suite for an hour or chair a session. You'll get more out of a symposium if you put something into it.

There will be an open meeting of the DTR/4GL Steering Committee on Sunday April 26th from 3:30pm to 5:30pm in the SIG's suite (the exact location of the suite will be posted in the lobby of the hotel).

And don't forget. DTR/4GL Volunteers are meeting in the suite at 5:30pm on April 26th to get their final assignments for the symposium.

There are several new presentations this time - especially in the area of non-Digital 4GL's. I'm looking forward to a good symposium. See you there.

PLEASE NOTE

The telephone number of the SIG's Volunteer Coordinator was incorrectly reported last month. Susan Krentz's can be reached at (703) 620-0900 or (703) 892-9600.

DTR/4GL Software Clinics at Nashville

The ever-popular DATATRIEVE Software Clinic will again be held at the Nashville Symposium. This session allows the DATATRIEVE User to obtain one-on-one help from an experienced DATATRIEVE Wizard. A (intelligent and single) DTR/4GL SIG representative will meet you at the door and direct you to an appropriate expert, who will spend as much time with you and your problems as you require. All levels of inquiries are welcomed, from the beginner to the 'seasoned' DATATRIEVE professional. As usual, the experts will consist of Digital DATATRIEVE Developers and experienced members of the DTR/4GL SIG.

As part of the SIG's expansion into the 4GL arena, we will also be offering a VAX POWERHOUSE Clinic for the first time in Nashville. As has been done with our other Clinic, experienced POWERHOUSE users will be on hand to provide assistance and guidance in this new and exciting area.

Both Clinics will be held in the DTR/4GL Campground, and all of our facilities will be available for use, including a MicroVAX and complete Documentation Sets. You are encouraged to bring along any documentation for your problem as you wish, and you are assured of going away with a smile on your face and an answer in your hand.

Because of their location, neither Clinic will be formally listed in the Symposium Program, so be sure to mark these times down now!

VAX POWERHOUSE Clinic	Tuesday	April 27	4-6pm
DATATRIEVE Clinic	Wednesday	April 29	4-6pm

You may arrive any time during the two hours as you wish, although the most crowded times are usually right at Startup. All the experts will remain in the area throughout the entire Clinic.

Coping with Office Automation Products (such as All-In-1 and WPS-Plus) Using Datatrieve - Part 1.

B. Z. Lederman, ITT World Communications, New York, NY

Introduction

Datatrieve is a product which allows easy access to and manipulation of data. In considering office automation, it is usually thought of as a product to manipulate end-user data (data bases containing accounting information, telephone directories, personnel directories, purchase order information, or whatever). What may not be immediately obvious is the data which must be managed when other office automation products are used, particularly All-In-1 and WPS word processing. These products create and use their own database files, and while they also (generally) come with their own utilities and commands for the proper examination and maintenance of those files, there are times when using Datatrieve allows faster, easier, or more versatile access or management of this information. I will present a number of such uses.

For the remainder of this article, AII is an abbreviation for All-In-1, WPS for any version of WPS or WPS-Plus, and DTR for Datatrieve.

The Document Database

The document database (the DOCDB.DAT file) contains the list of documents for each user of All-In-1 and/or WPS-Plus.

```

DELETE DOCDB_REC;
REDEFINE RECORD DOCDB_REC USING
!
! Document data base (DOCDB.DAT) definition
!   for WPS and All-In-1.
!
! I don't recommend adding or deleting documents using
! DATATRIEVE (except in emergencies like DOCDB.DAT
! corruption). However, it is useful if you want to find
! out what VMS file is related to a given document, and to
! check to see if there are any documents in a users'
! directory which do not appear in the document database,
! which happens occasionally when AII or WPS regurgitates.
!
! B. Z. Lederman
!
01 DOCDB_REC.
   10 LOOKUP.
!
! The first three 20 level fields are the keys defined
! by DEC.
!
   20 DOCUMENT PIC X(36).
   20 FOL REDEFINES DOCUMENT.
       30 FOLDER PIC X(30).
       30 FIXER PIC X(6).
   20 REFNUM PIC 9(6).
   20 TITLE_HASH PIC X(6).
10 FILENAME PIC X(64).
10 DAF_POINTER PIC X.
10 TITLE PIC X(72) EDIT_STRING T(32).
10 AUTHOR PIC X(30).
10 TYPE PIC X(15).
10 UNUSED_SETUP PIC X(15).
10 FORMAT PIC X(15).
10 KEYWORDS PIC X(50).
10 DATE1.
   20 FILLER PIC X(16).
   20 CREATED COMPUTED BY CHOICE OF
       (IM1 EQ " ") THEN
           FN$DATE("18-NOV-1858 00:00:00.00")
       ELSE FN$DATE(ID1 | "-" | IM1 VIA MONTH_TABLE |
           "-19" | IY1 | " 00:00:00.00")
   END_CHOICE.

```

```

20 MODIFIED COMPUTED BY CHOICE OF
  (IM2 EQ " ") THEN
  FN$DATE("18-NOV-1858 00:00:00.00")
ELSE FN$DATE(ID2 | "-" | IM2 VIA MONTH_TABLE |
  "-19" | IY2 | " 00:00:00.00")
END_CHOICE.
10 DI1 REDEFINES DATE1.
  20 IM1 PIC XX.
  20 FILLER PIC X.
  20 ID1 PIC XX.
  20 FILLER PIC X.
  20 IY1 PIC XX.
  20 IM2 PIC XX.
  20 FILLER PIC X.
  20 ID2 PIC XX.
  20 FILLER PIC X.
  20 IY2 PIC XX.
10 MAIL_ORIG PIC X(6).
10 F3 PIC X(30).
10 MAIL_STATUS PIC X(8).
10 F2 PIC X(12).
10 DOCNUM PIC 9(6) EDIT_STRING Z(6).
10 DELETABLE PIC X.
10 MODIFIABLE PIC X.
10 DATE2.
  20 FILLER PIC X(33).
  20 CREATED COMPUTED BY CHOICE OF
    (IM2 EQ " ") THEN
    FN$DATE("18-NOV-1858 00:00:00.00")
  ELSE FN$DATE(ID3 | "-" | IM3 VIA MONTH_TABLE |
    "-" | IY3 | " " | IH3 | ":" | II3 | ":" |
    IS3 | "." | IF3)
  END_CHOICE.
  20 CREATED_TIME COMPUTED BY FN$TIME(DATE2.CREATED)
    EDIT_STRING X(11).
  20 MODIFIED COMPUTED BY CHOICE OF
    (IM2 EQ " ") THEN
    FN$DATE("18-NOV-1858 00:00:00.00")
  ELSE FN$DATE(ID4 | "-" | IM4 VIA MONTH_TABLE |
    "-" | IY4 | " " | IH4 | ":" | II4 | ":" |
    IS4 | "." | IF4)
  END_CHOICE.
  20 MODIFIED_TIME COMPUTED BY FN$TIME(DATE2.MODIFIED)
    EDIT_STRING X(11).
10 DI2 REDEFINES DATE2.
  20 IY3 PIC XXXX.
  20 IM3 PIC XX.
  20 ID3 PIC XX.
  20 IH3 PIC XX.

```

```

20 II3 PIC XX.
20 IS3 PIC XX.
20 IF3 PIC XX.
20 F4 PIC X.
20 IY4 PIC XXXX.
20 IM4 PIC XX.
20 ID4 PIC XX.
20 IH4 PIC XX.
20 II4 PIC XX.
20 IS4 PIC XX.
20 IF4 PIC XX.
10 V1TYPE PIC X(16).
10 DSAB PIC X(16).
10 F6 PIC X(45).

```

;

I cannot find a use for all of the fields, and there are some (F4 and F6, for example), in which I have never seen any data from AII or WPS, but they must all be there to match the defined record length. I'm not sure what the distinction between the two sets of CREATED and MODIFIED dates is either, but I know they are there. In case you are wondering where I got some of these field names: I found a form in MEMRES called DOCDB (there is also one in OAFORM called DOCDBSF for the system shared DOCDB), and matched up the corresponding fields with a previous record definition which was obtained by looking for related data areas with the DUMP utility and Datatrieve. I have not found any forms, menus, or scripts in AII that will lead you to the DOCDB manipulation form (and I have looked), and once you are in the form it is typically tedious to use as you can only get one record at a time by using the FIXER field (entering a FOLDER doesn't seem to work). It does use FMS to spread the fields out on one screen, which can be nice, and it will allow you to add, delete, or modify records, but I prefer Datatrieve: I can always define my own form (or even copy the AII form) and use it from within DTR if I want to.

The key fields look a little odd, but they match the fields defined by WPS and AII: you can find out about such fields by doing an ANALYZE/RMS or DIR/FULL on a file to see the fields, or you can look in OA\$LIB for the FDL files supplied with the products and used during such things as document database (file cabinet) re-organization.

There is one very important field which is included in this record definition which is not usually obtainable within WPS or AII, and that is the VMS file which contains the document (the field FILENAME). It happens (a little too often) that the DOCDB.DAT file becomes corrupted, and then it is necessary to try to coordinate the VMS files with the documents: this record definition allows you to obtain a listing of all documents AII (or WPS) knows about and compare it with a directory listing to find missing documents or files. If there are VMS files not recorded in the document database you could add an entry with Datatrieve, though I would recommend you first try using WPS to create a document and then do a Gold-G (GET) to incorporate that file into a new document. If there is an entry in the document database for which there is no file you can use Datatrieve to delete the entry, though again I would suggest you first try the document database verification procedure supplied for the All-In-1 manager. If the normal procedures don't work, then you may want to use DTR to modify the DOCDB.DAT file.

I also find that it is faster to use DTR to obtain an index listing of all documents than it is to use AII.

```
REDEFINE PROCEDURE DOCDB_REPORT
!
! Fast report of all documents with their VMS file name.
!
! B. Z. Lederman
!
REPORT DOCDB ON *. "file specification"
SET COLUMNS_PAGE = 132
SET LINES_PAGE = 42
PRINT NUMBER, FOLDER, TITLE USING T(48), FILE USING T(24)
END_REPORT
END-PROCEDURE
```

13-Nov-1986
Page 1

NUMBER	FOLDER	TITLE	FILE
13	DEC	mulvey	[.DOC3]ZRQBBBSVI.WPL
2	DICTIONARIES	PERSONAL	DSK3:[SMITH]PERSONAL.LGP
16	OUTBOX	Read Receipt for test	OA\$SHARE1:ZRDXBRAEN.TXT
9	PLOTS	dtrgraph	[.DOC9]ZRBUSAZZA.WPL
15	READ	Test Mail Message	OA\$SHARE1:ZRDXBQWZF.TXT

The sample report has been squeezed to fit the newsletter page format, but you can still see the information provided. It happens to be sorted by folder because the folder name forms part of the primary key, but with DTR it is possible to easily change the report for the format and sort order you want. I have even put a Datatrieve procedure like this one into a form and included it as an All-In-1 application so that users can simply type one command and have a complete index of their documents sent to their default printer.

To use a record definition you must, of course, also define a domain. Rather than define one for every user, you can take advantage of the logical name created for WPS-Plus users during login to set the correct directory to access from DCL level:

```
DEFINE DOMAIN DOCDB USING DOCDB_REC ON OAUSER:DOCDB.DAT:
```

The logical name OAUSER should translate to the directory where your document database is (usually [user.WPSPLUS]). If you intend to use the definition only while you are within All-In-1 you should be able to specify the file as DOCDB.DAT with no directory, as AII should already have put you into the correct directory specified in your PROFILE, though you could also assign a logical name similar to OAUSER in the SYLOGIN.COM file so that the same definition can be used if you access DTR from within AII, or if you go into DTR directly from DCL level. By using logical names, you can put one copy of the record and domain definitions, and any report procedures, into a common dictionary rather than multiplying them for every user. You might also want to define one domain just for the postmaster:

```
DEFINE DOMAIN DOCDB POSTMASTER USING
DOCDB_REC ON SYS$SYSDEVICE:[ALLIN1.POSTMASTER]DOCDB.DAT:
```

changing the logical name SYS\$SYSDEVICE if you have your AII libraries on disk other than the system disk. This way you can look at the POSTMASTER's database (which may include system wide information such as mail messages) without logging into VMS POSTMASTER account, or you may not even have to have a VMS account for the POSTMASTER. This could be important, since the release notes for All-In-1 V2.1 warn against logging into the POSTMASTER account as it can lock out the message router and cause mail messages not to be delivered.

In defining the record definition I am covering up the ASCII character string representations of dates and times in the document database with FILLER, and then using COMPUTED_BY statements to convert them into Datatrieve standard dates and times. This may not be strictly necessary for all applications, but it does make it a lot easier to do lookups and comparisons of dates and times (for example, if you want to find the documents created or revised on a certain date, or before or after a given date, etc.). To do the conversion requires a table to translate numeric months into the appropriate abbreviated month name.

```
REDEFINE TABLE MONTH_TABLE
01 : "JAN",
02 : "FEB",
03 : "MAR",
04 : "APR",
05 : "MAY",
06 : "JUN",
07 : "JUL",
08 : "AUG",
09 : "SEP",
10 : "OCT",
11 : "NOV",
12 : "DEC"
END_TABLE
```

All-In-1 User Environment

This section describes how to manipulate the user environment files, which are used by All-In-1 to determine who is allowed to use it, where they are, and what sort of options are available to that user.

This section shows how to access files such as OA\$DATA:PROFILE.DAT, the master profile file for All-In-1, something that most managers are going to want to reserve to themselves only.

```
REDEFINE RECORD AII_PROFILE_REC USING
01 AII_PROFILE_REC.
10 USER PIC X(30).
10 USER_INFO.
20 VMSNAM PIC X(12).
```

```

20 FULNAM PIC X(32).
20 TITLE PIC X(30).
20 DEPART PIC X(24).
20 STATUS PIC X(68) EDIT_STRING T(24).
20 PASWRD PIC X(31).
20 PHONE PIC X(20).
10 RESERVED PIC X(15).
10 PRIV.
  20 DCL PIC X.
  20 SUP PIC X.
  20 ERR PIC X.
  20 CMD PIC X.
  20 SRC PIC X.
  20 CPHD PIC X.
  20 LOG PIC X.
  20 MULTI_NODE PIC X.
  20 RSVD_FOR_TCS PIC X.
10 ADDRESS.
  20 ADDR1 PIC X(30).
  20 ADDR2 PIC X(30).
  20 ADDR3 PIC X(30).
  20 ADDR4 PIC X(30).
  20 ZIPCOD PIC X(15).
10 NOTIFY.
  20 NOTICE PIC X.
  20 BATCH_NOT PIC X.
  20 PRINT_NOT PIC X.
  20 MAIL_READ_REC PIC X.
  20 TICKLER PIC X.
  20 ACTITEM PIC X.
10 DIRECTORY PIC X(68) EDIT_STRING T(32).
10 FORMLIB PIC X(68) EDIT_STRING T(24).
10 INIT_FORM PIC X(30).
10 EDITOR PIC X(10).
10 PRINTER PIC X(15).
10 NODE PIC X(13).
10 PRINT_PORT PIC X.
10 TERM_MODE PIC X.
10 MAIL.
  20 MAIL_FORWARD PIC X(66) EDIT_STRING T(24).
  20 MAIL_REPLY PIC X(31).
  20 MAIL_MENU PIC X(10).
  20 MAIDES PIC X(10).
10 CALENDAR.
  20 CALTIMEING PIC X(5).
  20 SETUSR PIC X.
  20 YESDAYS PIC X.
  20 STARTD PIC X.
  20 ENDD PIC X.

```

```

20 STARTR PIC X(7).
20 ENDR PIC X(7).
20 MEALS PIC X(7).
20 MEALE PIC X(7).
20 CALDAY PIC X.
10 UFLAG.
  20 UFLAG1 PIC X.
  20 UFLAG2 PIC X.
  20 UFLAG3 PIC X.
  20 UFLAG4 PIC X.
  20 UFLAG5 PIC X.
  20 UFLAG6 PIC X.
  20 UFLAG7 PIC X.
  20 UFLAG8 PIC X.
  20 UFLAG9 PIC X.
  20 UFLAG10 PIC X.
  20 CLASS PIC X(10).
10 LANGUAGE PIC X(20).
10 END PIC X(138) EDIT_STRING T(24).

```

;

If you compare this definition with the screens AII gives you for user profile addition, modification, etc., you will find the fields match (more or less). Since AII gives you access to these fields, why would you use Datatrieve? The answer is that AII management is oriented to processing one user at a time. If you want to find out, for example, which users have DCL access enabled, you have to go through several menus and screens to get an index of users, write down their names, then examine them all one at a time to find the ones with DCL. With Datatrieve, you can ready the PROFILE domain and say 'PRINT PROFILE WITH DCL = "Y"' to find all such users. Similarly, operations on large numbers of users such as turning DCL access or Logging on or off for everyone, or finding the users whose accounts point to certain disks and/or re-assigning them to other disks, are easier in DTR than in AII as presently supplied. You can also use DTR to produce nice formatted reports of all users or groups of users, and you can select which information fields are printed in that report. For example:

DTR> for profile print user, priv

	USER	DCL	SUP	ERR	CMD	SRC	CPHD	LOG	MULTI	FOR	RSVD
									NODE	TCS	
BOOT		Y	Y	Y	Y	Y	Y	N	Y	Y	
COOK		Y	Y	Y	Y	Y	Y	Y	Y		
GLANTON		Y	Y	Y	Y	Y	Y	Y	Y		
LEDERMAN		Y	Y	Y	Y	Y	Y	Y	Y		
MANAGER		Y	Y	Y	Y	Y	Y	Y	Y	Y	
POSTMASTER		Y	Y	Y	Y	Y	Y	Y	Y	Y	

DTR> for profile print user, directory, printer

```

USER          DIRECTORY          PRINTER
BOOT
COOK          USER$DEVICE:[COOK.WPSPLUS]  SYS$PRINT
GLANTON      USER$DEVICE:[GLANTON.WPSPLUS]  SYS$PRINT
LEDERMAN     USER$DEVICE:[LEDERMAN.WPSPLUS]  SYS$PRINT
MANAGER      SYS$SYSDEVICE:[ALLIN1.MGR]    SYS$PRINT
POSTMASTER   SYS$SYSDEVICE:[ALLIN1.POSTMASTE] SYS$PRINT

```

Because AI1 manipulates several files for user profiles, it is not a good idea to add or delete user profiles using DTR, though it could be done in emergencies or when AI1 fails to clean up properly after itself.

Another, somewhat less well known, file is OA\$DATA:NETWORK.DAT, which contains information on all users who have network or multi-node access (and, I suspect, all users). If you use a VAX Cluster, then you essentially have a multi-node system, and there will be a NETWORK.DAT file with something in it. Most managers probably don't do anything with this file, but there is at least one time it should be looked at, which may be deduced from looking at the record definition.

```

DELETE AI1_NETWORK_REC;
REDEFINE RECORD AI1_NETWORK_REC USING
!
! Read the ALL-IN-1 network data file.
!
! B. Z. Lederman
!
O1 AI1_NETWORK_REC.
  10 USER_NAME PIC X(30).
  10 NODE PIC X(6).
  10 DATE1.
    20 FILLER PIC X(16).
    20 LAST_UPDATE COMPUTED BY CHOICE OF
      (IY1 EQ " ") THEN
        FN$DATE("18-NOV-1858 00:00:00.00")
      ELSE FN$DATE(ID1 | "-" | IM1 VIA MONTH_TABLE |
        "-" | IY1 | " " | IH1 | ":" | II1 | ":" |
        IS1 | "." | IF1)
    END_CHOICE.
  20 UPDATE_TIME COMPUTED BY
    FN$TIME(DATE1.LAST_UPDATE)
    EDIT_STRING X(11).
10 D11 REDEFINES DATE1.
  20 IY1 PIC XXXX.
  20 IM1 PIC XX.
  20 ID1 PIC XX.
  20 IH1 PIC XX.
  20 II1 PIC XX.

```

```

20 IS1 PIC XX.
20 IF1 PIC XX.
10 FULL_NAME PIC X(32).
10 TITLE PIC X(30).
10 DEPARTMENT PIC X(24).
10 TELEPHONE PIC X(20).
10 ADDRESS.
  20 ADDR1 PIC X(30).
  20 ADDR2 PIC X(30).
  20 ADDR3 PIC X(30).
  20 ADDR4 PIC X(30).
  20 ZIPCOD PIC X(10).
10 NETWORK_ADDRESS PIC X(63) EDIT_STRING T(32).
10 TIMESTAMP PIC X(22).
10 M_NODE PIC X.
10 DELETED PIC X.

```

;

Most of the fields are self explanatory, and many match the fields you will find in the PROFILE, but notice the field "DELETED". I recently had to re-organize my system, and deleted a lot of old user profiles using the normal All-In-1 menus and procedures. I found, however, that there were still many (perhaps all) of the old users still in the NETWORK.DAT file. Most, but not all, were marked as deleted, but still: why take up space storing profiles on people who aren't here anymore? In this instance, Datatrieve is a useful tool for cleaning up when AI1 doesn't do a complete job of managing it's own data, and there will be more examples of this later in this article.

The NETWORK_ADDRESS field does not look like a regular node name: the reason is because it's really a Message Router Gateway type address, used when routing mail to other networks or mail agents.

DTR> for network print username, node, networkaddress

USER NAME	NODE	NETWORK ADDRESS
COOK	SYS30	COOK AT A1 AT SYS30
GLANTON	SYS30	GLANTON AT A1 AT SYS30
LEDERMAN	SYS30	LEDERMAN AT A1 AT SYS30
LEDERMAN	SYS31	LEDERMAN AT A1 AT SYS31
MANAGER	SYS30	MANAGER AT A1 AT SYS30
MANAGER	SYS31	MANAGER AT A1 AT SYS31
POSTMASTER	SYS30	POSTMASTER AT A1 AT SYS30

Time Management (Meetings)

Time Management is one of the applications which is built into All-In-1. It allows a user to mark a calendar for reminders and action items, and to allow groups of users to schedule meetings by checking all of the users' calendars for conflicts. Although most access to the data is done through AI1, there are times when the users, and especially the AI1 manager, may need to access and/or manipulate the data outside of AI1. This section will deal with multi-user time management (meetings).

To take the easiest case first, here is a definition for OA\$DATA:CALACCESS.DAT, the file which determines which users are allowed to access which other users' calendars.

```

REDEFINE RECORD AI1_CALACCESS_REC
01 AI1_CALACCESS_REC.
  10 GRANTUSER PIC X(30) EDIT_STRING T(16)
     QUERY_HEADER "User"/"Granting"/"Access".
  10 ACCUSER PIC X(30) EDIT_STRING T(16)
     QUERY_HEADER "Access"/"Given"/"To".
  10 READ PIC X QUERY_HEADER "Read"/"Your"/"Calendar".
  10 WRITE PIC X QUERY_HEADER "Schedule"/"for"/"You".
  10 PHONE PIC X QUERY_HEADER "".
;

```

When this domain is printed the fields look like this:

User Granting Access	Access Given To	Read Your Calendar	Schedule for You
ERSKINE	STEVE	Y	Y
ERSKINE	ELLIOTT	Y	Y
LEROY	REGGIE	Y	Y
LEROY	HOWIE	Y	N
LEROY	RALPH	Y	N
LEROY	SOLO	Y	N
LEROY	JOSHI	Y	N
LEROY	STEVE	Y	Y
RKELLY	VICKIC	Y	N
STEVE	ERSKINE	Y	N
VICKIC	BEATE	Y	N
VICKIC	ERSKINE	Y	Y
VICKIC	IRENE	Y	N
VICKIC	STEVE	Y	N
VICKIC	ELLIOTT	Y	N
VICKIC	RKELLY	Y	N

The fields and their use should be fairly obvious: each user has an entry for each other user to which they wish to grant read access and/or scheduling access. What is not immediately obvious is the first important reason why a manager would want Datatrieve access to this file, although it becomes apparent when I explain that none of the persons listed in this domain have access to this system. As mentioned in the previous article, All-In-1 does not clean up after itself properly, especially when deleting users. All of the persons you see listed above were deleted from All-In-1 using the normal System Manager's functions, but All didn't delete their entries from the Calendar Access files (neither this one or the others shown below). Using Datatrieve, it is easy to locate and delete all records which have the name of a person who is no longer an All user in either the GRANTUSER or ACCUSER fields and thus clean up the file. The other reason is that it is much easier to obtain a quick listing of all users in the CALACCESS file with DTR than it is with All. These two reasons for using Datatrieve to access All-In-1 data files will appear many times in this series of articles.

Something to be aware of is that any user with write access to this file can add or modify records. This is handy if the system manager wants to add new users to have access to many existing users, or if the manager wants to obtain access to other users' calendars, but it's not so good if users give themselves more access than they should have to other users' calendars. You should check to see that the world has read access only to the data file: the All task image is itself privileged and will still have access on behalf of the users.

The next file I will consider is OA\$DATA:ATTENDEE.DAT, the file which contains the list of meetings and attendees. The record definition for this file is:

```

REDEFINE RECORD AI1_ATTENDEE_REC
01 AI1_ATTENDEE_REC.
  02 MEET_REC.
  03 MEET_MATCH.
    10 NAME1 PIC X(30) EDIT_STRING T(15).
    10 MATCH1.
      20 FILLER PIC X(12).
      20 DATE COMPUTED BY CHOICE OF
         (MM1 EQ " ") THEN
           FN$DATE("18-NOV-1858 00:00:00.00")
         ELSE FN$DATE(MD1 | "-" | MM1 VIA MONTH_TABLE |
           "-" | MY1 | " " | MH1 | ":" | MI1 |
           ":00.00")
         END_CHOICE.
      20 TIME COMPUTED BY FN$TIME(MATCH1.DATE)
         EDIT_STRING X(5).
      20 LENGTH PIC X(4).
    10 MATCH1_R REDEFINES MATCH1.
      20 MY1 PIC X(4).
      20 MM1 PIC X(2).
      20 MD1 PIC X(2).
      20 MH1 PIC X(2).
      20 MI1 PIC X(2).
    03 MEETR REDEFINES MEET_MATCH.
      20 MEETING_POINTER PIC X(46).
    03 ATTEN.
      10 ATTENDEE_NAME PIC X(30) EDIT_STRING T(15).
    02 MEETRC REDEFINES MEET_REC.
      20 MEETING_RECORD PIC X(76).
    02 DATA.
      10 FLAG PIC X.
      10 YES_NO PIC X(3).
      10 MESSAGE PIC X(56) EDIT_STRING T(24).
      10 APPOINTMENTS OCCURS 6 TIMES.
        15 MATCH2.
          20 FILLER PIC X(12).
          20 DATE COMPUTED BY CHOICE OF
             (MM2 EQ " ") THEN

```

```

        FN$DATE("18-NOV-1858 00:00:00.00")
    ELSE FN$DATE(MD2 | "-" | MM2 VIA MONTH_TABLE |
        "-" | MY2 | " " | MH2 | ":" | MI2 |
        ":00.00")
    END_CHOICE.
    20 TIME COMPUTED BY FN$TIME(MATCH2.DATE)
        EDIT_STRING X(5).
    20 LENGTH PIC X(4).
    15 MATCH2_R REDEFINES MATCH2.
    20 MY2 PIC X(4).
    20 MM2 PIC X(2).
    20 MD2 PIC X(2).
    20 MH2 PIC X(2).
    20 MI2 PIC X(2).
    20 LENGTH PIC X(4).
    10 END PIC X(19).
;

```

As before, I am using the REDEFINES clause to take the date and time stored by A11 as ASCII characters and converting it into the Datatrieve (and VMS) standard binary date and time. This isn't strictly necessary to examine the file or for most management functions, but it does make retrieval by date easier within Datatrieve. Unlike most of the other definitions you will see in this article, I have not been able to find an A11 form which displays this data file, so I cannot be certain that I have the same names for these fields that A11 uses, and therefore some of the field names may not correspond to their intended use. However, there is an FDL file which has the key definitions, and some of the odd looking REDEFINES and group levels are there so that I can access the data in the individual fields and still have redefined fields that match the file keys.

This domains prints out best when 132 columns wide, but as this won't fit well in the newsletter I am going to show a listing of two records.

```

NAME1      : HOWIE
DATE       : 30-Aug-1985
TIME       : 20:00
LENGTH    : 0000
NAME2      : STEVE
FLAG       :
YES_NO    : NO
MESSAGE   :
    DATE    : 2-Sep-1985
    TIME    : 08:00
    LENGTH  : 0000
    DATE    : 2-Sep-1985
    TIME    : 17:00
    LENGTH  : 0000
    DATE    : 3-Sep-1985
    TIME    : 08:00

```

```

LENGTH    : 0000
DATE      : 3-Sep-1985
TIME      : 17:00
LENGTH    : 0000
DATE      : 4-Sep-1985
TIME      : 08:00
LENGTH    : 0000
DATE      : 4-Sep-1985
TIME      : 17:00
LENGTH    : 0000
END       :

NAME1     : IVP
DATE      : 1-Jan-2010
TIME      : 08:00
LENGTH    : 0001
NAME2     : NOT_A_REAL_NAME
FLAG      :
YES_NO    : YES
MESSAGE   : I will be a little late.
    DATE   : 18-Nov-1858
    TIME   : 00:00
    LENGTH :
    DATE   : 18-Nov-1858
    TIME   : 00:00
    LENGTH :
    DATE   : 18-Nov-1858
    TIME   : 00:00
    LENGTH :
    DATE   : 18-Nov-1858
    TIME   : 00:00
    LENGTH :
    DATE   : 18-Nov-1858
    TIME   : 00:00
    LENGTH :
    DATE   : 18-Nov-1858
    TIME   : 00:00
    LENGTH :
    DATE   : 18-Nov-1858
    TIME   : 00:00
    LENGTH :
END       :

```

You can probably begin to see from these few records some of the reasons for using DTR to get at this data. As before, removing a user from A11 does not remove that users' meetings from the data file, so DTR can be used to remove them. There also does not appear to be any mechanism to remove past meetings automatically (notice the meetings scheduled by IVP, the Installation Verification Procedure, are still present) so DTR can be used to remove them. Finally, the reason for using the REDEFINES clauses to put the date into a form where comparisons work well within DTR becomes apparent when a user tries to go in and remove past meetings. I have not found a way to get A11 to tell me which past days still have meetings assigned, and the tendency is

going to be for users to simply leave all past meetings scheduled. Eventually, the ATTENDEE.DAT file is going to be very large, and most of the data within it will be for meetings which already occurred. Using the date comparison within Datatrieve makes it easy to find and delete all past meeting records. You could also store them into a separate domain for journaling if you wish to, but you should keep obsolete data out of ATTENDEE.DAT or else AII performance could suffer.

Next comes OA\$DATA:MEETING.DAT, the file which contains a list of meetings.

```

REDEFINE RECORD AI1_MEETING_REC
01 AI1_MEETING_REC.
  10 MEETING_MATCH.
    15 SCHEDULER PIC X(30) EDIT_STRING T(15).
    15 MATCH1.
      20 FILLER PIC X(12).
      20 DATE COMPUTED BY CHOICE OF
        (MM1 EQ " ") THEN
          FN$DATE("18-NOV-1858 00:00:00.00")
        ELSE FN$DATE(MD1 | "-" | MM1 VIA MONTH_TABLE |
          "-" | MY1 | " " | MH1 | ":" | MI1 |
          ":00.00")
        END_CHOICE.
      20 TIME COMPUTED BY FN$TIME(MATCH1.DATE)
        EDIT_STRING X(5).
      20 LENGTH PIC X(4).
    15 MATCH1_R REDEFINES MATCH1.
      20 MY1 PIC X(4).
      20 MM1 PIC X(2).
      20 MD1 PIC X(2).
      20 MH1 PIC X(2).
      20 MI1 PIC X(2).
    10 MEETR REDEFINES MEETING_MATCH.
      20 MEETING_POINTER PIC X(46).
    10 MATCH2.
      20 FILLER PIC X(12).
      20 DATE COMPUTED BY CHOICE OF
        (MM2 EQ " ") THEN
          FN$DATE("18-NOV-1858 00:00:00.00")
        ELSE FN$DATE(MD2 | "-" | MM2 VIA MONTH_TABLE |
          "-" | MY2 | " " | MH2 | ":" | MI2 |
          ":00.00")
        END_CHOICE.
      20 TIME COMPUTED BY FN$TIME(MATCH2.DATE)
        EDIT_STRING X(5).
      20 LENGTH PIC X(3).
    10 MATCH2_R REDEFINES MATCH2.
      20 MY2 PIC X(4).
      20 MM2 PIC X(2).
      20 MD2 PIC X(2).

```

```

      20 MH2 PIC X(2).
      20 MI2 PIC X(2).
    10 PURPOSE PIC X(60) EDIT_STRING T(15).
    10 LOCATION PIC X(32) EDIT_STRING T(16).
    10 PRIORITY PIC XX.
    10 A PIC X(31).
    10 NAME2 PIC X(30) EDIT_STRING T(15).
    10 B PIC X(60).

```

;

Once again this information is easier to read when 132 columns wide, so I will have to list just a few records here.

```

SCHEDULER : ERSKINE
DATE      : 29-Aug-1985
TIME      : 13:30
LENGTH    : 0000
DATE      : 29-Aug-1985
TIME      : 14:00
LENGTH    : 000
PURPOSE   : test meeting
LOCATION    : my office
PRIORITY  : A1
A         :
NAME2     :
B         :

SCHEDULER : IVP
DATE      : 1-Jan-2010
TIME      : 08:00
LENGTH    : 0000
DATE      : 1-Jan-2010
TIME      : 21:00
LENGTH    : 000
PURPOSE   : To test Installation Verification Procedures
LOCATION    : Charlotte
PRIORITY  : A1
A         :
NAME2     :
B         :

SCHEDULER : IVP
DATE      : 1-Jan-2010
TIME      : 08:00
LENGTH    : 0001
DATE      : 1-Jan-2010
TIME      : 21:30
LENGTH    : 000
PURPOSE   : To test Installation Verification Procedures

```

```

LOCATION  : Charlotte
PRIORITY : A1
A       :
NAME2   :
B       :

```

As before, this domain contains records of obsolete meetings, meetings for persons no longer using the system, and IVP meetings that are scheduled for the future but really don't need to remain in the file once the Installation Verification Procedure finishes.

When cleaning up the ATTENDEE and MEETING files, you should remember that their use is interlinked: you shouldn't have meetings without attendees, and vice versa. I have not done much in the way of trying to match up the two files: whenever I have had to clean them up it has been a case of deleting all records which refer to a particular ex-user or deleting all records of meetings scheduled before a particular date, and just assuming that this doesn't leave any non-matched records (this is probably a fairly safe assumption). If you do want to try matching things up, then the field MEETING_POINTER, which is a keyed field in both domains, is probably the best place to start. For example (only a few records are reproduced here):

```

DTR>for meeting cross attendee over meeting_pointer -
CON>print scheduler, attendee_name, date

```

SCHEDULER	ATTENDEE NAME	DATE
ERSKINE	RALPH	29-Aug-1985
ERSKINE	STEVE	29-Aug-1985
ERSKINE	IRENE	30-Aug-1985
HOWIE	STEVE	30-Aug-1985
IRENE	PATMC	30-Aug-1985
IVP	NOT_A_REAL_NAME	1-Jan-2010
IVP	NOT_A_REAL_NAME	1-Jan-2010
IVP	YHTALEOJ	1-Jan-2010
LEDERMAN	MANAGER	15-Dec-1986
LEDERMAN	ERSKINE AT A1 AT SYS31	15-Dec-1986

User Defined Functions (UDF's) for VAX Datatrieve

Donald E. Stern, Jr. - Warner Lambert Co., Milford CT

Introduction

VAX Datatrieve provides a mechanism for easily extending the functionality provided in the "vanilla" product. This additional functionality comes in the form of User Defined Functions or UDF's. This article will deal with two major topics. A system for creating and maintaining UDF's will be discussed first. Following this discussion, several specific UDF's, which have been added at our site, will be presented and discussed.

Creating and Maintaining UDF's

User Defined Functions are linked into the Datatrieve shareable image, DTRSHR. Several functions are already linked with DTRSHR when the product is installed. These functions include FN\$ABS, FN\$COS, FN\$DAY, FN\$LOG, FN\$SHOW_TIMER, and FN\$TRANS_LOG to name a few. UDF's serve a wide variety of purposes. Some functions are used in value expressions while others are used to modify the execution environment of a process.

The functions linked with the Datatrieve image are specified in a Macro file called DFNFN.D.MAR. The code in this file provides information regarding the name Datatrieve will use for this function, the name of the routine which will be linked with the image and called when the function is used, information regarding input and output arguments, etc. The VAX DATATRIEVE *Guide to Programming and Customization* gives a thorough explanation of what the various components of this file are and how to modify this file in order to add functions.

The specific routines called when the various functions are invoked can be a Run Time Library (RTL) routine, a System Service, or a user-written routine. Although extending Datatrieve by adding UDF's is a fairly straightforward procedure, many people are discouraged from doing so because of the need to deal with Macro, the linker, etc. In a Wombat Magic presentation several years ago (Spring 1984) Phil Naecker described a process by which Datatrieve itself could be used to maintain the file DTRFND.MAR. In fact, it was pointed out that the VAX Datatrieve development team uses a similar method to maintain the file which is ultimately shipped to customers. We have implemented a system to create and maintain Datatrieve UDF's based upon this concept. This system is described in the following paragraphs.

UDF Database Description

There is a one-to-many relationship between a function's attributes (DTR name, external name, value, query header, etc.) and its arguments. A function can have 0 to 256 arguments, each having its own set of attributes (datatype, order, etc.) Two domains have

been created to contain the information needed to fully specify a UDF. These domains are DTR_FUNCTION_INFO and DTR_FUNCTION_INPUTS and use the following record definitions.

```

DEFINE RECORD DTR_FUNCTION_INFO_REC USING
01 FUNCTION.
  03 DTR_FUNCTION_NAME      PIC X(31).
  03 FUNCTION_DESCRIPTION   PIC X(60).
  03 EXT_FUNCTION_NAME     PIC X(31).
  03 OUT_ARG_TYPE          PIC X(6)
    VALID IF (OUT_ARG_TYPE IN FUN_TYPE_TABLE).
  03 OUT_ARG_DTYPE         BYTE.
  03 OUT_ARG_DESCRIPTION   PIC X(60).
  03 EDIT_STR              PIC X(31)
    MISSING VALUE " " QUERY_HEADER IS "EDIT STRING".
  03 QUERY_HDR             PIC X(80)
    QUERY_NAME HDR MISSING VALUE " "
    QUERY_HEADER IS "QUERY HEADER".
  03 NOVALUE               PIC X
    VALID IF NOVALUE EQ "Y", "N" MISSING VALUE "N".
  03 NO_OPTIMIZE           PIC X
    VALID IF NOVALUE EQ "Y", "N" MISSING VALUE "N".
  03 IN_COUNT              BYTE.
;

DEFINE RECORD DTR_FUNCTION_INPUTS_REC USING
01 INPUTS.
  03 DTR_FUNCTION_NAME     PIC X(31).
  03 IN_ARG_TYPE           PIC X(5)
    VALID IF (IN_ARG_TYPE IN FUN_TYPE_TABLE).
  03 IN_ARG_DESCRIPTION   PIC X(60).
  03 IN_ARG_DTYPE         BYTE.
  03 ORDER                BYTE.
  03 FUNCTION_ARG_ORDER   BYTE.
  03 OUT_PUT              PIC X
    VALID IF OUT_PUT EQ "Y", "N" MISSING VALUE "N".
  03 ALL_LEN              WORD.
;

```

The fields used in these records are described in the following table.

Field Name	Description
Domain: DTR_FUNCTION_INFO	
DTR_FUNCTION_NAME	The name of the UDF. This is the name that is used to reference the UDF from Datatrieve.
FUNCTION_DESCRIPTION	This is a brief description of the functions intent. The information is used to comment the MACRO code which is generated.
EXT_FUNCTION_NAME	This is the name of the external function which will be called when the UDF is used.
OUT_ARG_TYPE	This describes the value of the function. It can be a value (e.g. FN\$LOG10(27.6)) or it can return a status.
OUT_ARG_DTYPE	This is a code which specifies the datatype of the function. A database of valid codes and corresponding datatypes is maintained. (See Appendix IV for a listing of the domain, record, and table definitions, as well as, a listing of the valid datatypes.)
OUT_ARG_DESCRIPTION	This describes the output and is used to comment the generated MACRO code.
EDIT_STR	If a special edit-string is required. X(8) for example, this field is used to specify it. It is not required information and, if left blank, Datatrieve will supply a default value.
QUERY_HDR	If a query header, other than the UDF name, is required then this field is used to specify it.
NOVALUE	This field can contain a "Y" or an "N". A "Y" indicates that no value is returned from the external function. The UDFs FN\$WIDTH and FN\$CREATE_LOG are examples of such functions.
NO_OPTIMIZE	This field can contain a "Y" or an "N". If a "Y" is stored, then the UDF will not be optimized out of a loop. The default value is "N".
IN_COUNT	This specifies the number of arguments to be passed to/ from the external function. It corresponds exactly to the number of "member" records in DTR_FUNCTION_INPUTS. This field can contain a value between 0 and 256.

Domain: DTR_FUNCTION_INPUTS

DTR_FUNCTION_NAME The DTR function name. It relates records in this domain to records in DTR_FUNCTION_INFO.

IN_ARG_TYPE This field describes how the argument is passed, eg. by reference, by description, etc.

IN_ARG_DESCRIPTION This describes the argument. The description is used to comment the generated MACRO code.

IN_ARG_DTYPE This describes the datatype of the argument.

ORDER This describes the order in which the argument appears in the function's argument list for Datatrieve.

FUNCTION_ARG_ORDER This is the order in which the argument will appear in the external function's argument list.

OUT_PUT Permitted values are "Y" and "N". A "Y" indicates that this is a value returned from the external function rather than one passed to it.

ALL_LEN If the output is of predetermined length, it is specified here. See FN\$HEX and WL\$OCTAL for examples.

Every UDF has one, and only one, record occurrence in the domain DTR_FUNCTION_INFO. Each UDF must be identified by a unique function name, ie. FN\$LOG10, this name is stored in the field DTR_FUNCTION_NAME. Records in the domain DTR_FUNCTION_INPUTS contain information about a functions arguments. The field DTR_FUNCTION_NAME is used to relate records in this domain with the corresponding "owner" record in the DTR_FUNCTION_INFO domain.

Using the view definition given below the two domains are logically combined. Each record occurrence of this view contains sufficient information to completely define a UDF.

```

DEFINE DOMAIN DTR_FUNCTIONS OF DTR_FUNCTION_INFO,
  DTR_FUNCTION_INPUTS USING
01 DTR_FUNCTION OCCURS FOR DTR_FUNCTION_INFO.
   03 FUNCTION FROM DTR_FUNCTION_INFO.
   03 IN_ARGS OCCURS FOR DTR_FUNCTION_INPUTS WITH
       DTR_FUNCTION_NAME =
       DTR_FUNCTION_INFO.DTR_FUNCTION_NAME
       SORTED BY ASCENDING FUNCTION_ARG_ORDER.
   05 INPUTS FROM DTR_FUNCTION_INPUTS.
;

```

As previously pointed out, UDF's reference external functions which are called and to/ from which arguments are passed. In the case of the User Defined Function FN\$LOG10 the external function is the RTL routine MTH\$ALOG10. The following shows the data stored for the Digital-supplied UDF FN\$LOG10.

```

DTR_FUNCTION_NAME    : FN$LOG10
FUNCTION_DESCRIPTION : Common logarithm
EXT_FUNCTION_NAME    : MTH$ALOG10

```

```

OUT_ARG_TYPE         : VALUE
OUT_ARG_DTYPE        : 10
OUT_ARG_DESCRIPTION  : output is a floating value in R0, R1
EDIT_STR             :
QUERY_HDR            :
NOVALUE             : N
NO_OPTIMIZE         : N
IN_COUNT            : 1
  DTR_FUNCTION_NAME   : FN$LOG10
  IN_ARG_TYPE         : REF
  IN_ARG_DESCRIPTION  : input is a floating value passed by reference
  IN_ARG_DTYPE        : 10
  ORDER               : 1
  OUT_PUT             : N
  ALL_LEN             : 0

```

The data shows us that the function FN\$LOG10 uses the RTL function MTH\$ALOG10; that the function returns a value which is a real number; no special EDIT_STRING or QUERY_HEADER are used; that the function can be optimized out of a loop (at Datatrieve compile time); and that the function requires a single argument, a real number passed by reference.

Maintaining the UDF Database

The procedures ADD_DTR_FUNCTION and ADD_DTR_FUNCTIONS were created in order to add data to the database. The code for each is given in Appendix I. Separate forms were created to capture the data for DTR_FUNCTION_INFO and DTR_FUNCTION_INPUTS, these forms are show in figures 1 and 2. While simplifying the data entry procedures, the existence of forms are not necessary; the procedures can be modified if the target system does not have FMS or TDMS installed.

Two procedures, MAKE_DTRFND and PRINT_FUNCTION, are used to recreate the macro source file DTRFND.MAR. The source code is assembled and linked into the Datatrieve shareable image. The code for these procedures is given in Appendix II. MAKE_DTRFND, prints the Macro header information, executes PRINT_FUNCTION once for every record in DTR_FUNCTIONS, and prints the trailer information. PRINT_FUNCTION simply prints a DTR_FUNCTIONS record in the required format. Appendix II also contains the procedure MAKE_COMMAND which produces a DCL command file which, when executed, assembles DTRFND, copies the source, listing, and object files into a central location, and updates the library DTRFUN.OLB.

Since DTRFND.MAR is completely recreated by the use of these procedures, it is necessary to load data for Digital-supplied UDF's into the database as well as any site-specific UDF's.

Add a Function to Datatrieve

Function Name:
 External Function Name:
 Description:
 Output Argument Type: Output Datatype
 Out. Desc:
 Edit String: No Value: N No Optimize: N
 Query Header
 Number of Input Arguments:

Figure 1 - Form for DTR_FUNCTION_INFO fields

DTR Function - Add Input Arguments

Function Name: Argument #
 Arg. Description:
 Input Type: Input Datatype: Order: Output: N
 Allocation Length:
 Okay to enter?

Figure 2 - Form for DTR_FUNCTION_INPUTS fields

Site Specific UDF's

Naming Convention

We have developed a standard set of UDF's which are linked with the shareable Datatrieve images on each of the nodes in our network. Almost without exception, UDF's previously described by users, in this and other publications, have followed the Digital naming convention.

FN\$name

We have found it more convenient to name our UDF's using a different convention. All of our site specific UDF's are named using

WL\$name

as the convention. By doing this, we can easily identify and separate Warner Lambert functions from those supplied by Digital. Additionally, we are able to avoid naming conflicts as new versions of Datatrieve (with new functions) are released. This significantly reduces the maintenance effort needed when re-installing Datatrieve. The following is a list of some of the UDF's which have been implemented at our site.

Function Name	Function Description
WL\$CHAR	Convert an ASCII Code to an ASCII Character
WL\$DAY	Returns the number of days since the base date 17-Nov-1858
WL\$DAY OF WEEK	Returns a numeric day of the week for a date/time
WL\$DELETE_FILE	Delete a file
WL\$DELETE_LOGICAL	Deletes a supervisor-mode logical from a specified table
WL\$EDT	Edit an ASCII file using EDT
WL\$GET SYMBOL	Returns the value of a CLI symbol as a string
WL\$OCTAL	Convert an unsigned integer longword to an octal char. strg.
WL\$POWER	Computes the value of a number raised to a power
WL\$RANDOM	A random number generator
WL\$RENAME_FILE	Renames a file
WL\$SET LOGICAL	(Re)defines a supervisor mode logical in a specified table
WL\$SET SYMBOL	Define or redefine a CLI symbol
WL\$WAIT	Places current process in hibernation for specified time

WLSCHAR

We use this function primarily to generate non-printing ASCII characters, such as BELL (ASCII code 7) and ESCAPE (ASCII code 27), which tend to disrupt the printing of procedures when the character itself is embedded in the code. In the Fall 1986 Wombat Magic session held in San Francisco, Pat Scopelletti demonstrated how the escape character could be programmed into a procedure using this function (Pat named his UDF FN\$CHAR).

```
DECLARE ESC COMPUTED BY FN$CHAR(27).
```

```
      :  
      :  
PRINT ESC|"[?5i"  !Printer on  
      :  
      :  
PRINT ESC|"[?4i"  !Printer off
```

WL\$DAY_OF_WEEK

This function has a single argument, a DATE variable, and returns a value between 1 and 7 (Monday = 1 and Sunday = 7). For example:

```
DTR> PRINT "TODAY" USING WWWWWWWW, -  
CON> "TODAY" USING DD-MMM-YYYY, WL$DAY_OF_WEEK("TODAY")
```

```
      WL$DAY  
      OF  
      WEEK
```

```
Sunday 8-Feb-1987 7
```

WL\$DELETE_FILE

This function has a single argument, a TEXT variable, which contains a valid file specification. Unlike the DCL DELETE command, the file specification provided to this function does not require version number information. For example:

```
DTR> WL$DELETE_FILE("YACHTS.DAT")
```

will delete the latest version of YACHTS.DAT.

This function is very useful in procedures which contain a DEFINE FILE command. The UDF can be used to clear out any older versions of the file and thereby save disk space and the need to do this housekeeping outside of Datatrive.

WL\$DELETE_LOGICAL / WL\$SET_LOGICAL

The Digital UDF FN\$CREATE_LOG is used to create *User Mode* logical names. These functions are used to delete/create logical names in any specified logical name table (to which the user has write access of course.) We found this particularly useful when spawning a subprocess from Datatrive. User mode logical names will not be defined for the subprocess but Process Mode logical names will. For example, the statement

```
DTR> WL$SET_LOGICAL("DTR$LOGICAL"."My logical name",  
"LNM$PROCESS_TABLE")
```

will create a logical name called DTR\$LOGICAL in the process logical name table and assign the value "My logical name" to it. Similarly, the statement

```
DTR> WL$DELETE_LOGICAL("DTR$LOGICAL"."LNM$PROCESS_TABLE")
```

will delete the logical name from the table.

WL\$EDT

This UDF requires a single argument, a TEXT variable containing a valid file specification. It uses callable EDT to create/edit an ASCII text file. In order to incorporate this function into the Datatrive shareable image, we had to add a reference to the EDTSHR shareable image in the link command for DTRSHR.

```
cluster=edtrtl...sys$common:[syslib]edtshr.exe/shareable
```

This UDF can be used in Datatrive procedures to create and maintain ASCII files. In this implementation, only one argument is used however the RTL function which is referenced will take a number of optional arguments as well (an EDT initialization file, for example). The UDF could be restructured to accommodate these optional arguments as well.

One could achieve the same end result using an expression such as

```
DTR> FN$DCL("EDIT/EDT filespec")
```

but would incur the overhead involved with spawning a subprocess and activating the EDT.EXE image. Using this function

```
DTR> WL$EDT(filespec)
```

will result in much less overhead and faster response time.

WL\$GET_SYMBOL / WL\$SET_SYMBOL

This pair of functions permit one to translate or define a symbol in the symbol table. This can be particularly useful if Datatrive is executing inside of a command or batch procedure to pass parameters or communicate status between Datatrive and the DCL procedure..

WL\$OCTAL

Modeled after DEC's FN\$HEX function, WL\$OCTAL permits the user to translate a decimal value into a string representing the octal equivalent. This can be particularly useful when dealing with UIC's.

```
DTR> PRINT WL$OCTAL(16)
```

```
WL$OCTAL
```

```
20
```

WL\$POWER

This function simply raises a value to a power. Two real number arguments are required, the base and the exponent.

```
DTR> PRINT WL$POWER(4.0,0.5), WL$POWER(5,3)
```

```
WL$POWER WL$POWER
2.0000E+00 1.2500E+02
```

WL\$RANDOM

This function returns a random number. A single argument which is a longword "seed" value is required. The RTL function MTH\$RANDOM then computes a random value. The function can be useful in statistical calculations requiring many iterations to compute probabilities.

WL\$RENAME_FILE

As the name implies, this function is used to rename files. It requires two arguments, both TEXT variables, which contain the old and new file specifications respectively.

```
DTR> WL$RENAME_FILE(old_file_spec, new_file_spec)
```

WL\$WAIT

This function takes a single argument, a floating value representing a specified number of seconds. The function will then hibernate the process for the specified time.

```
DTR> WL$WAIT(5) !Wait 5 seconds
```

This function can be used in applications where several reports or plots are created sequential and displayed on the screen. If placed between report or plot statements, a pre-defined viewing time can be programmed into the procedure.

Generating Function Help

Digital supplies help text for all of the UDF's that are supplied with the installation kit. By insuring that UDF's not supplied by Digital can be identified (via our naming convention), we are able to automatically generate help file source text for these functions. The following procedure generates help file source text for our site-specific UDF's.

```
DEFINE PROCEDURE MAKE_FUNCTION_HELP
!
! This procedure generates help file source text for Warner Lambert
! UDF's.
!
! Written by: Donald E. Stern, Jr.
!
READY DTR_FUNCTIONS SHARED
```

```
!
ON WL_FUNCTIONS.HLP
!
FOR DTR_FUNCTIONS WITH DTR_FUNCTION_NAME STARTING "WL"
BEGIN ! Print the comments about the function
PRINT "2 "|DTR_FUNCTION_NAME, SKIP 2.
FUNCTION_DESCRIPTION (-), SKIP 2.
OUT_ARG_DESCRIPTION (-), SKIP 2. "Arguments:", SKIP 1.
ALL " "|IN_ARG_DESCRIPTION (-), SKIP OF IN_ARGS, SKIP
END
END-PROCEDURE
```

The following is excerpted from the file WL_FUNCTIONS.HLP which was generated using this procedure.

```
:
:
2 WL$DELETE_FILE

Delete a file

No output

Arguments:
    Input is a filename to delete
:
:
```

Using the following command one can extract Digital function help from the Datatrieve help library SYS\$HELP:DTRHELP.HLB.

```
$ LIB/HELP/EXT=FUNCTIONS SYS$HELP:DTRHELP DEC_FUNCTIONS
```

Our help (WL_FUNCTIONS.HLP) can be concatenated with the Digital function help (DEC_FUNCTIONS.HLP) into a single file (FUNCTIONS.HLP) using the following DCL command.

```
$ COPY/CONC DEC_FUNCTIONS.HLP.WL_FUNCTIONS.HLP FUNCTIONS.HLP
```

This new help text is used to update the Datatrieve help library by the following command.

```
$ LIB/LOG/HELP/REP SYS$HELP:DTRHELP FUNCTIONS
```

Summary

User Defined Functions are one way in which the functionality of VAX Datatrieve can be greatly extended. One need not be a MACRO programmer to implement UDFs. The "cookbook" procedure described in the Datatrieve documentation can be followed or a system such as the one described here can be implemented.

Appendix I - Data Entry Routines

```

DEFINE PROCEDURE ADD_DTR_FUNCTIONS
!
! This procedures readies the necessary domains and calls
! the ADD_DTR_FUNCTION procedure 1 or more times to add new
! definitions for Datatrieve User Defined Functions.
!
!   Written by:   Donald E. Stern, Jr.
!               Warner Lambert Company
!               10 Webster Road
!               Milford, CT 06460
!
!
READY DTR_FUNCTION_INFO SHARED WRITE
READY DTR_FUNCTION_INPUTS SHARED WRITE
DECLARE MORE PIC X.
!
! Shorthand for where we put User Defined DTR stuff.
FN$CREATE_LOG("SCHICK$DTR","SCHICK$DISK:[DTRLIB]")
MORE = "Y"
WHILE MORE="Y" BEGIN
    :ADD_DTR_FUNCTION
    MORE=FN$UPCASE(*.MORE)
END
END-PROCEDURE

DEFINE PROCEDURE ADD_DTR_FUNCTION
!
! This procedure is used to update the DTR_FUNCTIONS.DAT
! data file which all the necessary data to construct the
! DTRFUN.MAR file needed to add User Defined Functions
! (UDF's) to Datatrieve.
!
! NOTE: The domains DTR_FUNCTION_INFO and
!       DTR_FUNCTION_INPUTS must be readed for WRITE
!       access before invoking this procedure.
!
!
!   Written by:   Donald E. Stern, Jr.
!               Warner Lambert Company
!               10 Webster Road
!               Milford, CT 06460
!
!
! Create variables to contain data passed back from FMS
!

```

```

DECLARE FNAME PIC X(31).
DECLARE NARG BYTE.
DECLARE ARGNM BYTE.
DECLARE ARGORDER BYTE.
!
ARGNM=0
!
! Shorthand for where all our UDF stuff is.
!
FN$CREATE_LOG("SCHICK$DTR","SCHICK$DISK:[DTRLIB]")
!
!   Loop to update DTR_FUNCTION_INFO (1 record/UDF)
BEGIN
    STORE DTR_FUNCTION_INFO USING DISPLAY_FORM
        DTR_FUNCTION_ADD IN
        SCHICK$DTR:DTR_FUNCTIONS RETRIEVE USING
    BEGIN
        FNAME = GET_FORM NAME
        DTR_FUNCTION_NAME = FNAME
        FUNCTION_DESCRIPTION = GET_FORM FUN_DESC
        EXT_FUNCTION_NAME = GET_FORM EXTERNAL
        OUT_ARG_TYPE = GET_FORM OUT_TYPE
        OUT_ARG_DTYPE = GET_FORM OUT_DTYPE
        OUT_ARG_DESCRIPTION = GET_FORM OUT_DESC
        EDIT_STR = GET_FORM EDT_STR
        QUERY_HDR = GET_FORM QRY_HDR
        NOVALUE = GET_FORM NOVAL
        NO_OPTIMIZE = GET_FORM NOOPT
        NARG = GET_FORM NARGS
        IN_COUNT = NARG
    END
    ARGORDER = 0
    REPEAT NARG !Loop to update DTR_FUNCTION_INPUTS
    BEGIN !Contains 0-n records/UDF
        ARGNM = ARGNM + 1
        ARGORDER = ARGORDER + 1
        STORE DTR_FUNCTION_INPUTS USING DISPLAY_FORM
            DTR_FUNCTION_ADD_INARGS IN
            SCHICK$DTR:DTR_FUNCTIONS USING
        BEGIN
            PUT_FORM NAME = FNAME
            PUT_FORM ARGNUM = ARGNM
        END RETRIEVE USING
        BEGIN
            DTR_FUNCTION_NAME = FNAME
            IN_ARG_TYPE = GET_FORM IN_TYPE
            IN_ARG_DESCRIPTION = GET_FORM IN_DESC
            IN_ARG_DTYPE = GET_FORM IN_DTYPE
            ORDER = GET_FORM ARG_ORDER
        END
    END
END

```

```

        OUT_PUT          = GET_FORM OUTPUT
        ALL_LEN         = GET_FORM ALLEN
        FUNCTION_ARG_ORDER = ARGORDER
    END
END
END-PROCEDURE

```

Appendix II - Routines to Create DTRFND.MAR File

```

DEFINE PROCEDURE MAKE_DTRFND
!
! This procedure re-creates the MACRO file DTRFND.MAR
!
!       Supplied by:   Philip A. Naecker
!                   Consulting Engineer
!                   Altadena, CA
!
READY DTR_FUNCTIONS SHARED
SET COLUMNS_PAGE = 132
ON DTRFND.MAR
BEGIN
    PRINT -
    ".TITLE  DTRFND  VAX-11 Datatrieve Function Definitions",
    SKIP,
    ";+++++",
    SKIP, ";", SKIP,
    ";      F U N C T I O N      D E F I N I T I O N S", SKIP,
    ";", SKIP,
    ";-----",
    SKIP 2,
    ".PSECT  FND,NOWRT,SHR,PIC,2", SKIP 1,
    ".LIBRARY /DTR$LIBRARY:DTRFNLB/", SKIP 1,
    ".LIBRARY /SYS$LIBRARY:STARLET/", SKIP 1,
    ";.SHOW EXPANSIONS", SKIP 1,
    "$DSCDEF", SKIP 1,
    "$DTR$FUN_INIT", SKIP 4
!
!   Print all of the functions
!
    FOR DTR_FUNCTIONS :PRINT_FUNCTION
!
!   Print the trailer
!
    PRINT "$DTR$FUN_FINI", SKIP 2, ".END"
END;
END-PROCEDURE

```

```

DEFINE PROCEDURE PRINT_FUNCTION
!
! Print a single function definition in DTRFND.MAR
!
!       Supplied by:   Philip A. Naecker
!                   Consulting Engineer
!                   Altadena, CA
!
!       Modified by:   Donald E. Stern, Jr.
!                   Warner Lambert Company
!                   10 Webster Road
!                   Milford, CT 06460
!
BEGIN
! Print the comments about the function
PRINT "; "|DTR_FUNCTION_NAME||"- "|
    FUNCTION_DESCRIPTION, SKIP, ";", SKIP,
    "; "|OUT_ARG_DESCRIPTION, SKIP,
    ALL "; "|IN_ARG_DESCRIPTION, SKIP OF IN_ARGS,
    SKIP
! The opening line
PRINT "$DTR$FUN_DEF"||DTR_FUNCTION_NAME||
    ", "|EXT_FUNCTION_NAME||", "|IN_COUNT
! The output argument
PRINT "   $DTR$FUN_OUT_ARG TYPE = "|
    OUT_ARG_TYPE VIA FUN_TYPE_TABLE||
    IF (OUT_ARG_TYPE EQ "STATUS","INPUT")
    THEN " "
    ELSE ", DTYPE = DSC$K_DTYPE_"|
    OUT_ARG_DTYPE VIA DTYPE_VALUE_TO_NAME
! If the function is a novalue function, say so.
IF (NOVALUE EQ "Y") THEN
    PRINT "   $DTR$FUN_NOVALUE"
! If the function is a nooptimize function, say so
IF (NO_OPTIMIZE EQ "Y") THEN
    PRINT "   $DTR$FUN_NOOPTIMIZE"
! Do the edit-string and query-header
IF (EDIT_STR NOT MISSING) THEN
    PRINT "   $DTR$FUN_EDIT_STRING ^\"||
    EDIT_STR||"\"
IF (HDR NOT MISSING) THEN
    PRINT "   $DTR$FUN_HEADER  HDR = <"||HDR||">"
! OK, now for the input arguments
FOR A IN IN_ARGS
    CHOICE
    (IN_ARG_TYPE = "TEXT") THEN
    PRINT "   $DTR$FUN_IN_ARG TYPE = "|||
    (IN_ARG_TYPE VIA FUN_TYPE_TABLE)||

```

```

      (IF (ALL_LEN EQ 0) THEN " "
        ELSE ",ALL_LEN = "|ALL_LEN)|
      (CHOICE
        (ORDER NE 0) THEN
          ", ORDER = "|ORDER
          (OUT_PUT EQ "Y") THEN
            ", OUT_PUT = TRUE"
          ELSE
            ";;; illegal OUTPUT or ORDER"
        END_CHOICE)
      (IN_ARG_TYPE = "VALUE") THEN
        PRINT " $DTR$FUN_IN_ARG TYPE = "|||
        (IN_ARG_TYPE VIA FUN_TYPE_TABLE)||
        ", DTYPE = DSC$K_DTYPE_"|
        IN_ARG_DTYPE VIA
          DTYPE_VALUE_TO_NAME||", ORDER = "|
          ORDER
      (IN_ARG_TYPE = "NULL") THEN
        PRINT " $DTR$FUN_IN_ARG TYPE = "|||
        (IN_ARG_TYPE VIA FUN_TYPE_TABLE)
      (IN_ARG_TYPE = "REF", "DESC") THEN
        PRINT " $DTR$FUN_IN_ARG TYPE = "|||
        (IN_ARG_TYPE VIA FUN_TYPE_TABLE)||
        ", DTYPE = DSC$K_DTYPE_"|
        IN_ARG_DTYPE VIA
          DTYPE_VALUE_TO_NAME||
      (CHOICE
        (ORDER NE 0) THEN ", ORDER = "|
          ORDER
        (OUT_PUT EQ "Y") THEN
          ", OUT_PUT = TRUE"
        ELSE ";;; Illegal OUTPUT or ORDER"
      END_CHOICE)
      ELSE PRINT ";;; Illegal input type"
    END_CHOICE
  PRINT "$DTR$FUN_END_DEF", SKIP
END
END-PROCEDURE

DEFINE PROCEDURE MAKE_COMMAND_FILE
ON CHECK.COM
BEGIN
PRINT "$MAC/LIS DTRFND"
PRINT "$COPY DTRFND.MAR, DTRFND.LIS, DTRFND.OBJ -"
PRINT " SCHICK$DISK:[DTRLIB]*/*LOG"
PRINT "$LIBR/LOG/REP SCHICK$DISK:[SCHICK.DTRLIB]DTRFUN -"
PRINT " SCHICK$DISK:[DTRLIB]DTRFND"
END
END-PROCEDURE

```

Appendix III - WLSx Function Definitions from DTRFND.MAR

The following was extracted from the file DTRFND.MAR. It provides the precise definition for each of the site-specific UDF discussed above.

```

: WL$CHAR - convert an ASCII Code to an ASCII Character
:
: output is a one character string
:
: input is an unsigned byte ASCII code
$DTR$FUN_DEF WL$CHAR. LIB$CHAR. 2
  $DTR$FUN_OUT_ARG TYPE = FUN$K_STATUS
  $DTR$FUN_IN_ARG TYPE = FUN$K_TEXT. OUT_PUT = TRUE
  $DTR$FUN_IN_ARG TYPE = FUN$K_REF.
  DTYPE = DSC$K_DTYPE_BU. ORDER = 1
$DTR$FUN_END_DEF
: WL$DAY - returns the number of days since the base date 17-Nov-1858
:
: output is a longword integer cont. the days since base date
:
: input is a binary quadword date
$DTR$FUN_DEF WL$DAY. LIB$DAY. 2
  $DTR$FUN_OUT_ARG TYPE = FUN$K_STATUS
  $DTR$FUN_IN_ARG TYPE = FUN$K_REF.
  DTYPE = DSC$K_DTYPE_L. OUT_PUT = TRUE
  $DTR$FUN_IN_ARG TYPE = FUN$K_REF.
  DTYPE = DSC$K_DTYPE_ADT. ORDER = 1
$DTR$FUN_END_DEF
: WL$DAY_OF_WEEK - returns a numeric day of the week for a date/time
:
: output is an unsigned longword value between 1 and 7
: input is a 64-bit date/time
:
$DTR$FUN_DEF WL$DAY_OF_WEEK. LIB$DAY_OF_WEEK. 2
  $DTR$FUN_OUT_ARG TYPE = FUN$K_STATUS
  $DTR$FUN_IN_ARG TYPE = FUN$K_REF.
  DTYPE = DSC$K_DTYPE_ADT. ORDER = 1
  $DTR$FUN_IN_ARG TYPE = FUN$K_REF.
  DTYPE = DSC$K_DTYPE_L. OUT_PUT = TRUE
$DTR$FUN_END_DEF
: WL$DELETE_FILE - Delete a file
:
: No output
: Input is a filename to delete
$DTR$FUN_DEF WL$DELETE_FILE. LIB$DELETE_FILE. 1

```

```

$DTR$FUN_OUT_ARG TYPE = FUN$K_STATUS
$DTR$FUN_NOVALUE
$DTR$FUN_NOOPTIMIZE
$DTR$FUN_IN_ARG TYPE = FUN$K_DESC.
    DTYPE = DSC$K_DTYPE_T. ORDER = 1
$DTR$FUN_END_DEF
: WL$DELETE_LOGICAL - deletes a supervisor-mode logical from a specified table
:
: no output
: argument 1 is a char. string containing the logical name
: arg. 2 is a char. string cont. the logical name table
$DTR$FUN_DEF WL$DELETE_LOGICAL. LIB$DELETE_LOGICAL. 2
    $DTR$FUN_OUT_ARG TYPE = FUN$K_STATUS
    $DTR$FUN_NOVALUE
    $DTR$FUN_NOOPTIMIZE
    $DTR$FUN_IN_ARG TYPE = FUN$K_DESC.
        DTYPE = DSC$K_DTYPE_T. ORDER = 1
    $DTR$FUN_IN_ARG TYPE = FUN$K_DESC.
        DTYPE = DSC$K_DTYPE_T. ORDER = 2
$DTR$FUN_END_DEF
: WL$EDT - Edit an ASCII file
:
: No output
: input is a filename passed by descriptor
$DTR$FUN_DEF WL$EDT. EDT$EDIT. 1
    $DTR$FUN_OUT_ARG TYPE = FUN$K_STATUS
    $DTR$FUN_NOVALUE
    $DTR$FUN_NOOPTIMIZE
    $DTR$FUN_IN_ARG TYPE = FUN$K_DESC.
        DTYPE = DSC$K_DTYPE_T. ORDER = 1
$DTR$FUN_END_DEF
: WL$GET_SYMBOL - returns the value of a CLI symbol as a string
:
: output is a character string passed by desc.
: arg. 1 is a char. string cont. the symbol name
:
$DTR$FUN_DEF WL$GET_SYMBOL. LIB$GET_SYMBOL. 2
    $DTR$FUN_OUT_ARG TYPE = FUN$K_STATUS
    $DTR$FUN_IN_ARG TYPE = FUN$K_DESC.
        DTYPE = DSC$K_DTYPE_T. ORDER = 1
    $DTR$FUN_IN_ARG TYPE = FUN$K_TEXT. OUT_PUT = TRUE
$DTR$FUN_END_DEF
: WL$OCTAL - convert an unsigned integer longword to an octal char. strg.
:
: output is a character string representing an octal value

```

```

: input is an unsigned integer longword passed by reference
:
$DTR$FUN_DEF WL$OCTAL. OTS$CVT_L_TO. 2
    $DTR$FUN_OUT_ARG TYPE = FUN$K_STATUS
    $DTR$FUN_EDIT_STRING ^X(8)
    $DTR$FUN_IN_ARG TYPE = FUN$K_REF.
        DTYPE = DSC$K_DTYPE_L. ORDER = 1
    $DTR$FUN_IN_ARG TYPE = FUN$K_TEXT.
        ALL_LEN = 8. OUT_PUT = TRUE
$DTR$FUN_END_DEF
: WL$POWER - computes the value of a number raised to a power
:
: output is a real number
: argument 1 is the base
: argument 2 is a real exponent
$DTR$FUN_DEF WL$POWER. OTS$POWRR. 2
    $DTR$FUN_OUT_ARG TYPE = FUN$K_VALUE.
        DTYPE = DSC$K_DTYPE_F
    $DTR$FUN_IN_ARG TYPE = FUN$K_VALUE.
        DTYPE = DSC$K_DTYPE_F. ORDER = 1
    $DTR$FUN_IN_ARG TYPE = FUN$K_VALUE.
        DTYPE = DSC$K_DTYPE_F. ORDER = 2
$DTR$FUN_END_DEF
: WL$RANDOM - a random number generator
:
: output is an F-floating random number
: input is an unsigned integer longword
$DTR$FUN_DEF WL$RANDOM. MTH$RANDOM. 1
    $DTR$FUN_OUT_ARG TYPE = FUN$K_VALUE.
        DTYPE = DSC$K_DTYPE_F
    $DTR$FUN_IN_ARG TYPE = FUN$K_REF.
        DTYPE = DSC$K_DTYPE_L. ORDER = 1
$DTR$FUN_END_DEF
: WL$RENAME_FILE - Renames a file
:
: No output
: Argument 1 is the source filename passed by descriptor
: Argument 2 is the new filename passed by descriptor
$DTR$FUN_DEF WL$RENAME_FILE. LIB$RENAME_FILE. 2
    $DTR$FUN_OUT_ARG TYPE = FUN$K_STATUS
    $DTR$FUN_NOVALUE
    $DTR$FUN_NOOPTIMIZE
    $DTR$FUN_IN_ARG TYPE = FUN$K_DESC.
        DTYPE = DSC$K_DTYPE_T. ORDER = 1
    $DTR$FUN_IN_ARG TYPE = FUN$K_DESC.

```

```

        DTYPE = DSC$K_DTYPE_T. ORDER = 2
$DTR$FUN_END_DEF
: WL$SET_LOGICAL - (re)defines a supervisor mode logical in a specified table
:
: no output
: arg. 1 is a char. string containing the logical name
: arg. 2 is a char string containing the value to assign
: arg. 3 is a char. string cont. the name of the table
$DTR$FUN_DEF WL$SET LOGICAL. LIB$SET LOGICAL. 3
    $DTR$FUN_OUT_ARG TYPE = FUN$K_STATUS
    $DTR$FUN_NOVALUE
    $DTR$FUN_NOOPTIMIZE
    $DTR$FUN_IN_ARG TYPE = FUN$K_DESC.
        DTYPE = DSC$K_DTYPE_T. ORDER = 1
    $DTR$FUN_IN_ARG TYPE = FUN$K_DESC.
        DTYPE = DSC$K_DTYPE_T. ORDER = 2
    $DTR$FUN_IN_ARG TYPE = FUN$K_DESC.
        DTYPE = DSC$K_DTYPE_T. ORDER = 3
$DTR$FUN_END_DEF
: WL$SET_SYMBOL - define or redefine a CLI symbol
:
: no output
: arg. 1 is a string descriptor containing the CLI symbol
: arg. 2 is a string descriptor cont. the CLI symbol value
$DTR$FUN_DEF WL$SET SYMBOL. LIB$SET SYMBOL. 2
    $DTR$FUN_OUT_ARG TYPE = FUN$K_STATUS
    $DTR$FUN_NOVALUE
    $DTR$FUN_IN_ARG TYPE = FUN$K_DESC.
        DTYPE = DSC$K_DTYPE_T. ORDER = 1
    $DTR$FUN_IN_ARG TYPE = FUN$K_DESC.
        DTYPE = DSC$K_DTYPE_T. ORDER = 2
$DTR$FUN_END_DEF
: WL$WAIT - places current process in hibernation for specified time
:
: no output
: input is the number of seconds to wait - F-floating by ref.
$DTR$FUN_DEF WL$WAIT. LIB$WAIT. 1
    $DTR$FUN_OUT_ARG TYPE = FUN$K_STATUS
    $DTR$FUN_NOVALUE
    $DTR$FUN_IN_ARG TYPE = FUN$K_REF.
        DTYPE = DSC$K_DTYPE_F. ORDER = 1
$DTR$FUN_END_DEF

```

Appendix IV - Database for Valid Datatypes

```

DEFINE TABLE DTYPE_NAME_TO_VALUE FROM DTYPES USING
    NAME : VALUE
END_TABLE

DEFINE TABLE DTYPE_VALUE_TO_NAME FROM DTYPES USING
    VALUE : NAME
END_TABLE

DEFINE DOMAIN DTYPES USING DTYP_REC ON
    SCHICK$DISK:[DTRLIB]DTYPE.DAT;

DEFINE RECORD DTYP_REC
01 DTYPE.
    03 VALUE          PIC 99.
    03 NAME           PIC X(4).
    03 DESC           PIC X(60).
;

```

Value	Name	Description
00	Z	unspecified
01	V	bit - an aligned bit string
02	BU	byte logical - 8-bit unsigned quantity
03	WU	word logical - 16-bit unsigned quantity
04	LU	longword logical - 32-bit unsigned quantity
05	QU	quadword logical - 64-bit unsigned quantity
06	B	byte integer - 8-bit signed 2's complement integer
07	W	word integer - 16-bit signed 2's-complement integer
08	L	longword integer - 32-bit signed 2's-complement integer
09	Q	quadword integer - 64-bit signed 2's-complement integer
10	F	F-floating - 32-bit single precision real number
11	D	D-floating - 64-bit double precision
12	FC	F-floating complex - low address real, high address imag
13	DC	D-floating complex- Pair of D-float. (low real, high imag.)
14	T	char. coded text - string data type
15	NU	numeric string, unsigned
16	NL	numeric string, left separate sign
17	NLO	numeric string, left overpunched sign
18	NR	numeric string, right separate sign
19	NRO	numeric string, right overpunched sign
20	NZ	numeric string, zoned sign
21	P	packed decimal string
22	ZI	sequence of instructions
23	ZEM	procedure entry mask

24 DSC descriptor - levels of descriptors are allowed
 25 OU octaword logical - 128-bit unsigned quantity
 26 O octaword integer - 128-bit signed 2's complement integer
 27 G G-floating - 64-bit double precision number
 28 H H-floating - 128-bit quad precision real number
 29 GC G-floating complex- Pair of G-float. (low real, high imag.)
 30 HC H-floating complex- Pair of H-float. (low real, high imag.)
 31 CIT COBOL Interm. Temp. - 18-digit norm. dec. fract. 2-dig exp.
 32 BPV bound procedure value
 33 BLV bound label value
 34 VU bit unaligned - data are 0 to 2**16-1 contiguous bits
 35 ADT absolute date and time
 37 VT varying character-coded text

Appendix V - Table of Function/Argument Types

```

DEFINE TABLE FUN_TYPE_TABLE
  "STATUS"      :      "FUN$K_STATUS"
  "INPUT"       :      "FUN$K_INPUT"
  "VALUE"       :      "FUN$K_VALUE"
  "REF"         :      "FUN$K_REF"
  "DESC"        :      "FUN$K_DESC"
  "TEXT"        :      "FUN$K_TEXT"
  "NULL"        :      "FUN$K_NULL"
END_TABLE

```

Product Improvement Requests

Edited by Philip A. Naecker, Consulting Software Engineer

Response to the Product Improvement Request balloting last year was very gratifying, and DEC responded admirably to our requests. Last year we had 31 PIR's, and DEC has implemented or is implementing three of the top ten PIR's, as well as two others from our list. It is obvious that YOUR VOTE COUNTS! Please vote again in this year's PIR balloting. A ballot is found in the Questionnaires section at the end of the newsletters.

Please return your ballot as soon as possible. We will collect and tabulate your ballots and then forward the PIRs and vote counts to the software developers for their response. *BALLOTS RECEIVED AFTER JULY 31, 1987 CANNOT BE COUNTED.* Responses will be presented in a future edition of the Wombat Examiner as well as at the Fall Symposium.

***** INSTRUCTIONS *****

You have a total of 50 points with which to vote. You may allocate points either positive (in favor of a proposal) or negative (against a proposal.) The number of points you allocate to a particular PIR indicates how strongly you feel about it. In order to assure a wide range of choices, however, you may not allocate more than 10 points (positive or negative) to any one PIR and the absolute value of the total may not exceed 50 points. Note that you must be a DECUS member to vote (we require your DECUS membership number on the ballot) but that you do not have to be active in the DTR/4GL SIG to vote - anyone using any 4GL product is encouraged to participate in the PIR process.

VOTE EARLY! GET YOUR FRIENDS TO VOTE! And watch future editions of the Wombat Examiner for the results.

PIR: S87-1

Abstract: Provide a mechanism such that users don't have to edit DTRFND with every new release of VAX Datatrieve that includes function definition changes.

Description: When a new release of VAX Datatrieve includes new or changed function definitions, users with their own site-specific functions must edit DTRFND.MAR, update DTRFUN.OLB, and rebuild VAX Datatrieve. To insulate user functions from this kind of impact, do something like splitting DTRFUN.OLB into two libraries: one with user-defined functions and one with DTR-provided functions. When DTR-provided functions change, simply replace that library without affecting the user-provided library or functions.

PIR: S87-2

Abstract: Ability to eliminate leading and trailing <FF>'s in RW.

Description: When producing reports to be displayed on the terminal, it is very inconvenient to have the trailing form feed cause the report display to be scrolled off of the screen. Allow a report writer option to suppress the trailing form feed.

Similarly, allow a report writer option to suppress the form feed generated on the first page of a report. This would make it more convenient to product reports using multiple REPORT statements.

PIR: S87-3

Abstract: VAX Datatrieve should preserve and display the CDD descriptions for field definitions.

Description: If a record is defined using CDDL, comments for each field definition can be included in a format like:

```
/* This field contains the account code. The field is 5 digits and corresponds to the code in the payables file. */
```

Comments like these can be accessed via other languages (COBOL, for example) and by the field-level help in DECreporter, but cannot be accessed from within VAX Datatrieve. In fact, VAX Datatrieve will eliminate such descriptions if the record is edited in DTR.

Change DTR to retain and display these descriptions. One way to do this would be to add a new field level clause similar to the query header. For example:

```
03 ACCOUNT_CODE PIC XX
  QUERY_NAME IS AC_CODE
  QUERY_HEADER IS "ACCOUNT"/"CODE"
  DESCRIPTION IS "This field contains the account code."/
  "The field is 5 digits and corresponds"/
  "to the code in the payables file." .
```

PIR: S87-4

Abstract: Improve error processing in DTR.

Description: Current error processing in DTR is too simple to be very useful. Provide an ON_ERROR construct or some similar mechanism of dealing with run-time errors.

PIR: S87-5

Abstract: Datatrieve should allow multiple responses to a prompt.

Description: There should be some form of the prompt construct that allows multiple comma-separated arguments. For example, the **.prompt-string operates differently than the *.prompt-string. Perhaps a ***.prompt-string could allow comma-separated arguments to be logically connected just as a comma-separated list is logically connected interactively (as a Boolean AND). Thus, the following construct would be allowed:

```
FOR A IN YACHTS WITH BUILDER CONT ***. "builder
fragment(s):"
```

PIR: S87-6

Abstract: Allow exact spacing in the Report Writer.

Description: Currently, the Report Writer ignores SPACE clause if they cause a difficulty with the alignment of objects. Provide a means to exactly space print items either using the SPACE clause or by requiring an additional SET statement.

PIR: S87-7

Abstract: Provide access to FMS Set Supervisor Mode.

Description: Although the concept of FMS Supervisor Mode is not directly applicable in DTR applications, there would be advantages to having access to this functionality. Using SET SUPERVISOR or a similar syntax, a DTR procedure could exert additional run-time control over which fields could be modified by the user.

PIR: S87-8

Abstract: Improve all error messages to point more precisely to offending object.

Description: In some cases, DTR does not explicitly indicate which field, domain, or other object is the source of an error. For example, a duplicate key error from RMS is not intercepted by DTR to indicate the source of the problem. Improve all error messages to indicate, as precisely as possible, the source of the error. At a minimum, the domain should be indicated for all RMS errors.

PIR: S87-9

Abstract: Provide wildcard SHOW FIELDS command.

Description: Support wildcard operations for the SHOW FIELDS and SHOW VARIABLES operations. SHOW FIELDS SAL* would be a useful operation.

PIR: S87-10

Abstract: Wildcard search of CDD objects.

Description: Provide wildcard access to the CDD. SHOW YAC* would be a useful operation.

PIR: S87-11

Abstract: Retry clause on READY command.

Description: Some applications must contend heavily for file access. Since there is no error handling on the READY command and it cannot be implemented in a loop, there is effectively no way to implement retries on the READY command. Consider the syntax:

```
READY domain -  
WRITE RETRY 5 TIMES -  
WAIT 0:00:05 -  
MESSAGE "Waiting for domain-a"
```

PIR: S87-12

Abstract: Fully support RMS DESCENDING keys.

Description: DTR currently supports RMS descending keys in a limited fashion (EQ Booleans only). Support RMS descending keys in a more complete fashion so that the benefits of descending keys can be made available to DTR users.

PIR: S87-13

Abstract: Improve performance of VAX Datatrieve.

Description: VAX Datatrieve is used heavily at many sites. The users would like DEC to dedicate significant development resources to improving the performance of DTR. It is realized that the improvements are likely to be incremental and may be small, and that activity in this area will delay implementation of new features. Specific areas that the users would like to see addressed are:

- Sorting. DTR appears to be only a fraction as efficient as VMS Sort, possibly because insufficient working-set is given to SORT.
- IO. DTR does not honor all RMS Connect-time options, some of which would serve to improve IO performance of DTR. Access to CONVERT and FDL would also improve performance in some cases.
- Modular programming constructs. Some modular programming constructs (see related PIR) would also serve to improve compile-time performance.

(You may wish to vote AGAINST this PIR if you would prefer new features over possibly small improvements in performance.)

PIR: S87-13

Abstract: Provide a MENU construct.

Description: Numerous ingenious methods of implementing menus in DTR have been discovered by the users. Provide a menu construct, perhaps even utilizing FMS or TDMS if available, to implement simple menus from within DTR.

PIR: S87-14

Abstract: Support subroutines with parameter passing.

Description: DTR currently supports sub-procedures by expansion-in-place. There is no parameter passing since all sub-procedures are ultimately expanded in line. This type of expansion is often unnecessary since the sub-procedure may well be a complete and self-contained code segment rather than just a code fragment. Create a type of subroutine that accepts and passes parameters from other DTR procedures. Such a subroutine could be compiled only once per compiled segment (outer BEGIN-END) and would thus enhance performance as well as being generally re-usable. The variables declared in the subroutine would also be local and would thus avoid accidental modification of outer-level variables.

PIR: S87-15

Abstract: Provide a case-insensitive equals Boolean operator.

Description: In retrieval of true text data, especially names, it is often important to have case-insensitive retrieval. Currently this is possible using the FN\$UPCASE operator on the record side of the Boolean expression, but this has several disadvantages: (1) it is not clear to users how to do this, and (2) The use of the function precludes the use of keys in the retrieval. However, DTR could potentially do a "smart" case-insensitive retrieval, by implementing a search that would use keys (where applicable) in a recursive application of the RMS GE key retrieval. Similar functions are possible in DSRI.

PIR: S87-16

Abstract: Use of EDIT_STRINGs on forms.

Description: Provide a means to specify that edit-strings are to be used with forms. DTR currently uses some default format for displaying data on a form. Alternately, a DISPLAY_FORM statement can be used to format a field in a particular manner. However, if there are many DISPLAY_FORM statements they add substantially to the complexity and compile time of the procedure and make maintenance more difficult. Either a SET option, DISPLAY_FORM keyword (without specifying each field), or a record definition clause would seem to eliminate these problems.

PIR: S87-17

Abstract: Provide a device independent interface to VAX-11 DTR Graphics.

Description: DTR graphics is currently an unsupported "language" that works conveniently only with ReGIS devices. Users have modified it to drive non-ReGIS devices, but this is difficult and limited in functionality. However, with an apparent reduction in support of ReGIS from DEC (not available for LN03's or VAXstations, for instance) it is becoming important that DTR interface to other graphics devices. Rather than providing device-independent graphics in DTR, it would be best to provide an independent interface to any of the many DI packages available, including DEC's CORE and GKS packages. The interface could be embodied in the current plotting language (or something similar) which would continue to understand DTR syntax and be usable from DTR PLOT statements, or it the DTR language itself could be extended to include graphics primitives.

PIR: S87-18

Abstract: Provide an artificial intelligence training and guidance tool.
Description: DTR is sufficiently powerful that it serves as an excellent development environment and prototyping tool - not just as a data management system for novice users. However, the complexity of developing an application is great enough that some developers need some assistance in the definition of data formats, keys, order of CROSS operations, and so on. These concepts could be embodied in a separate AI product that would analyze DTR procedures and other metadata, working in a rule-based fashion. A substantial product could be developed with perhaps as few as 100 rules.

PIR: S87-19

Abstract: Provide SET and SHOW commands for all debugging features of DTR.
Description: Currently, one can retrieve certain debugging information only by running DTR with the debugger. SET and SHOW commands should be provided for this functionality. E.g., SET DISPLAY_OPTIMIZATIONS and SET DISPLAY_DDMF seem like minimal features.

PIR: S87-20

Abstract: Support bit datatypes and Boolean fields.
Description: Although CDDL can describe bit fields, DTR does not recognize them except in aggregate form. Provide a means to reference and operate on bit fields. Bit fields are a very compact means of storing flags and options in records, and can be referenced by other languages.

Complementary to bit fields would be the concept of Boolean or Logical fields. This would be familiar to FORTRAN users and would allow operations such as the following statement:

IF ENTRY_COMPLETE AND NOT ENTRY_HAS_BEEN_LOGGED
THEN PRINT stuff ELSE ...

as opposed to

IF ENTRY_COMPLETE = "Y" AND
ENTRY_HAS_BEEN_LOGGED = "N" THEN ...

Note that the bit field implementation is more general, clearer, and takes one-eighth the record space.

PIR: S87-21

Abstract: Provide access to VMS CONVERT from DTR.
Description: Storing many records in RMS files using \$PUTS is inefficient. There are cases when the user is aware that CONVERT should be used, but leaving DTR to use CONVERT is itself inefficient and may be difficult and time-consuming to build into an application. Calling the CONVERT command directly from DTR would improve the situation. A suggested syntax would essentially be an extension to the restructure statement:

DTR> CONVERT rse TO destination-domain

PIR: S87-22

Abstract: Provide a means to edit a field-value directly.
Description: Provide an EDIT_VALUE or similar value function. The EDIT_VALUE would take as an argument a list of fields to be placed into a buffer before calling the user's predefined editor (EDT or TPU.) The result of the EDIT_VALUE value expression could then be stored in a field or otherwise processed like any other DTR value expression. This would be particularly useful for accessing Rdb segmented strings or long text fields in any domain.

PIR: S87-23

Abstract: Provide a sort-merge join optimization.
Description: Although DTR originated as a moderate-performance tool for novice users, it is also an excellent software development environment for experienced users. Experienced users often know enough about the application to be able to give DTR information about certain optimizations. In the case of a join or CROSS between two record streams, the user may know enough about the size and access method of the two sources to be able to specify a special kind of join called a sort-merge join. In this case, two (or more) record sources would first be sorted and then merged in a key-matching fashion rather than the traditional method of using the first stream as a source and then finding matches in the second stream. The sort-merge join may be orders of magnitude faster than the traditional join in some cases.

PIR: S87-24

Abstract: Provide an outer join.
Description: An outer join would allow users to deal with missing values in a relational join. Basically, an outer join provides a means of getting all the records in two joined record streams, even if they don't all have a match. Consider, for example, YACHTS CROSS OWNER UNDER TYPE. It might return:

```
STEVE  ALBIN  VEGA
HUGH   ALBIN  VEGA
JIM     C&C    CORVETTE
                PEASON  12M
```

Note that no owners have indicated an interest in the Peason 12M yacht, but it appears anyway because this is an outer join. In this manner, all the yachts would appear, with null values (or missing values if defined) for the owner field. The syntax shown is arbitrary and might be improved upon.

PIR: S87-25

Abstract: Provide a merge operator.

Description: Provide a means to merge two record streams together to produce a single record stream. The input streams might be collections, separate RSEs, or even separate domains. An incomplete implementation, such as one that requires that the two sources be from the same domain or one that only produces a collection would be acceptable.

PIR: S87-26

Abstract: Extend RALLY to support RMS files.

Description: Many applications do not need the overhead associated with a relational database. Also, some existing RMS applications could be improved by having RALLY able to modify the files. RALLY should be able to fully support RMS applications.

PIR: S87-27

Abstract: Improve CDDL support from languages.

Description: The degree of support given to CDDL from the different layered products and languages varies greatly. Although it is recognized that the lack of CDD support in the languages rightly belongs in the lap of the language development teams, they are many and the CDD team is one. Therefore, the users would like the CDD team to concentrate effort on standardizing the use of CDDL from the languages. Examples of non-standard support include: COBOL allows records that don't contain structures, FORTRAN does not; most languages do not support the CDDL INITIAL_VALUE clause, although all have it in their native language constructs; only COBOL supports the EXTERNAL qualifier.

From the Editor's Pen

Donald E. Stern, Jr. - Warner Lambert Company, Milford, CT

A pilot program has been established in order to improve the quality of the Combined SIGS Newsletter while striving to control costs. Four SIGs (DMS, DTR/4GL, OA, and PC) are participating in the pilot program. We will be using a combination of WPS-Plus and DECpage to produce the newsletter. You, the readers, may begin to see the results of our efforts as early as the May 1987 issue of the newsletter. Please feedback your comments (positive and negative) to us so that we may better serve the needs of the readership. Thanks.

DTR/4GL SIG - Digital Product List

The following is a list of Digital Equipment Corporation software Products of interest to the Datatrieve/Fourth Generation Language Special Interest Group.

Product	Ver.	Annouce Date	Ship Date	Prerequisite Software
VAX Datatrieve	3.4	6/86	8/86	VMS 4.4
	3.3	11/85	12/85	VMS 4.2
	3.2	5/85	10/85	4.0
Datatrieve 11	3.1	8/84		RSTS 9.0
				RSX 4.1
				RSX+ 2.1
		12/85		Micro RSX 1.1
	1.0		1/85	VMS 4.0/RSX 1.0
			12/84	Micro RSTS 1.0
Pro Datatrieve	2.0	1.0*	12/84	P/OS 2.0
DECReporter	1.1	1.0	4/86	VMS 4.3
			11/85	VMS 4.2
VAX TEAMDATA	1.1	12/86	2/87	VMS/Rdb
VAX RALLY	1.1	12/86	1/87	VMS/Rdb

* unsupported



DECUS

GRAPHICS

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DECwindows Into the Future with X Windows

Eric Rehm

On January 15th DEC announced "DECwindows", a strategy to integrate the desktop across the VAXmate (MS-DOS) and VAX (ULTRIX and VMS) workstations. As part of the DECwindows desktop integration strategy, the X Window system was chosen as the windowing system for VAXstations using Ultrix or VMS as well as VAXmates using MS-DOS. This creates a desktop environment with a common applications programming interface (Xlib), a common user interface, and network transparent capability on all processors and operating systems.

The introduction of the VAXstation line, especially the VAXstation II/GPX, introduces many DEC users to the "graphics workstation" and windowing systems. The graphics screen greets us with new things: icons, windows, and pop-up menus. This article will discuss some of the design issues of windowing systems and the choices made for the cornerstone of the DECwindows strategy, the X Window system.

The 3M Workstation

The graphics workstation can be defined by the 3M criteria: 1 mega-pixel resolution, 1 MIPS performance, and 1 megabyte of memory. These kinds of features are expected by workstation users in engineering, scientific, graphics design, and software development computing environments. Workstations meeting and exceeding the 3M criteria are being shipped today by many vendors. However, users of these workstations are expecting...and getting...more. Users want a productive user interface in which to use our new hardware. The quality of this user interface is defined by a layer of software sitting just above the operating system called the "windowing system".

Windowing Systems

Making use of the high resolution graphics hardware, windowing systems allow us to manage our text processing, graphics processing, and computations like we do our desktops...more than one task at a time in our view through "windows". Separate processes may run concurrently sending text or graphics to the screen in possibly overlapping rectangular portions of the screen. Most of the functions of the variety of windowing systems in use today are common. The difference is how the windows look, how the user interacts with them, and how applications must be programmed to make use of the windowing system.

Windowing systems are typically responsible for the following "human interface" tasks:

- Creating a new window.
- Moving window to another part of the screen.
- Pushing a window behind other windows.
- Popping a window in front of other windows.
- Changing the size of a window.
- Deleting a window.
- Shrinking a window to a small graphic representation (an icon).
- Switching between processes running in terminal emulation windows.
- Switching the keyboard between windows.
- Suspending all screen activity.
- Printing portions of the screen.

The windowing system is how the user sees and uses the workstation. It can make it easy or difficult for the user to get tasks done. Windowing features are subject to debate among "human factors" researchers, programmers, and the end users alike:

- How many colors should be used on the screen?
- How many buttons should a mouse have?
- How do applications talk to a window manager application?
- Can applications running on a one network node present graphics output to another node?
- How is detail of a partially covered window refreshed when the occlusion is removed? Is this the task of the windowing system or the application?
- How are icons used to represent windows, files, applications and selections?
- Should the windowing system be implemented outside of the operating system kernel?
- Can the user develop custom graphic user interfaces?

Some examples of windowing systems available today are Microsoft's MS-Windows, Sun's NeWS (Network extensible Window System), Andrew Windows (Carneige Mellon University), DEC's UIS (User Interface System), X Windows, Digital Research's GEM and Apple's Macintosh.

Enter the VAXstation II

The VAXstation II and the VAXstation II/GPX have brought us the 3M workstation in the form of a VAX. The VAXstation II/GPX hardware consists of a MicroVAX with a graphics controller capable of displaying 16 or 256 simultaneous on-screen colors (depending on the model), a keyboard, a mouse, and a 19 inch color monitor with a resolution of 1024 X 864 pixels. The graphics controller includes DEC's custom Dragon graphics processor chip to provide rapid execution of primitive graphics commands to draw lines, fill polygons with a color, etc. The mouse is used to control the position of the graphics cursor, make menu selections and initiate commands.

UIS and X Windows

The VAXstation line is supported by both VMS and DEC's version of the V4.2 Berkeley UNIX called ULTRIX. Currently, the windowing system supported by VMS is UIS (User Interface System), while the X Window system is used with ULTRIX.

DEC plans to provide the X Window system for VMS-based VAXstations as well as MS-DOS-based VAXmates. The X Window system on VMS-based VAXstations probably won't be available until mid-1988. DEC says the current UIS users need not fear...they plan to support and maintain the UIS system "over the next five years" in recognition of the substantial investment users and developers have made in UIS. However, clearly DEC's long term strategy and mainline effort in the windowing environment is with the X Window system. Notably, the GPX was the first VAX announced with the availability of ULTRIX (and the X Window system) before VMS.

The X Window System

The X Window system was developed under the industry-financed Athena project at the MIT Laboratory for Computer Science. The principal design team included DEC personnel. Enhancements have been made by DEC's ULTRIX Engineering Group.

The X Window architecture consists of several layers of software. The upper layers of software handle window management, applications program interface, and terminal emulation, while the lowest layers are the device drivers for the support of different graphics controllers. A layer called the window server sits in the middle providing client applications, including the window manager, the ability to talk to the hardware in a device independent manner. The window server handles all of the keyboard, mouse and screen I/O. Thus, the window server itself has device independent and device dependent portions.

The X Window system is a network-based windowing system. It provides users with the ability to run applications on remote nodes and have the graphics appear in a window on the local workstation. This is not a feature of all windowing systems. Sun's NeWS is an example of another windowing system that does allow applications to manipulate windows across a network.

When partially occluded windows are uncovered or the window is resized, the X Window system takes the "memoryless approach". This means that the X Window system does not try to remember what happened to the window while it was covered nor does it automatically rescale the window contents if the window is resized. However, the client application is informed and it is left up to the client application to refresh the graphics.

The Xlib library consists of over 100 graphics functions that client applications can use to perform graphics and windowing functions. Graphics requests are sent by the window server to the graphics controller and windowing requests are interpreted by the X Window system. The application can communicate in either device coordinates or in normalized coordinates.

Client applications may also be written in the GKS (Graphical Kernel System) graphics system standard calls. The X Window system has a GKS driver library so that any application written using GKS can run on the GPX under the X Window system. Likewise, any application developed on the GPX using X window's GKS library will run on any workstation or terminal that is supported by GKS.

The X Window Human Interface

The X Window system provides all of the typical window management functions described earlier and more. For example, windows may be shrunk to icons of text and/or graphics or miniature replicas of the full-size window as the application in the window is running.

X window functions may be selected from pop-up menus that present the user with a list of choices. For the more experienced user, the menus may be bypassed by pressing buttons on the mouse in conjunction with keyboard control keys. Standard functions include control of window color, movement, sizing, and stacking. Further, custom pop-up menus and button/control key definitions are able to be configured by the user. Experienced users or system developers may customize the entire windowing environment through startup files that define the menus, buttons, window colors, text fonts, etc.

X Window Terminal Emulation Support

The X Window system allows the user to create multiple windows on a single screen, where each window represents a separate terminal. In each "virtual terminal" window, applications that normally run on a standard video terminal may be executed. These virtual terminals may be on the local workstation CPU or on any CPU on the network.

The startup files discussed earlier may be used to establish the network connection as well as size, color and position of multiple terminal emulator windows.

The X Window System as a Workstation Standard

At the January 15th announcement, nine companies announced support of the X Window system for applications on their workstation products: Apollo, Dana Computer, Data General, DEC, Hewlett-Packard, Masscomp, Siemens, Sony, and Stellar Computer. Adobe Systems announced support for PostScript extensions to X Windows while Applix Inc. announce support of its integrated mail and desktop communications product, Alice, for X Windows. One can now expect that window-based applications will be portable in a multi-vendor environment. One reason is that X Windows is not proprietary; it is available from MIT for a flat \$100 fee.

Sun is licensing its recently announced, but still unavailable NeWS (Network extensible Window System). Those reportedly interested in NeWS include Data General, Sony, and Siemens.

Meanwhile, an ANSI sanctioned group on display management has formed, including PC windowing representatives from Microsoft (MS-Windows) and Digital Research Inc. (GEM).

Sources:

"X Window Enhances UNIX Workstations", Ram Rao, Mini-Micro Systems, May 1986.

"Three Hats in the Ring", Jeff Moad, Datamation, October 15, 1986.

"Look Ahead", Datamation, January 15, 1987.

"Software Integrated Windows and Networks", Computer Design, January 1, 1987.

GAPSIG Session Notes, Spring 1986 DECUS Symposium, Dallas, TX.

"Graphics Programming on the VAXstation II/GPX" and "X, a case study", UNISIG sessions presented by Debby Haeck, Digital Equipment Corp. at Fall 1986 DECUS Symposium, San Francisco, CA.

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M E M O R A N D U M

TO: GAPSIG Newsletter

DATE: 20 February 87
FROM: Rick Landau
DEPT: Terminals/Printers
Pgm Ofc
LOCN: PK03-1/C10

SUBJ: WHEN SOMEONE ASKS, "HOW FAST IS IT?", LET'S
AT LEAST AGREE ON THE SCALE FOR THE ANSWER.

Performance, absolute or relative, is a multi-dimensional notion. Trying to put a single scalar number on it is a natural desire but is potentially misleading.

I spoke on this subject briefly at the last DECUS symposium, in October. I would now like to encourage your membership to lead the way in working on this problem.

THE PROBLEM

One of the more insightful supervisors in a systems performance analysis group I once knew never argued with his customers about metrics. His job was to help improve the performance, not to measure it. But the managers of the products wanted measurements. So they asked.

MISGUIDED QUESTION

SNAPPY ANSWER

"How fast is it?"

"Four. Maybe four-and-a-half."

"How good is that?"

"Well, it's a relative scale. That's pretty good, but there's always room for improvement, and we're still working on it."

"Is it faster than Brand X?"

"Depends on the application. With our standard work load, yes. But their advertising stresses only their unique functions, of course. We should stress our overall effectiveness."

Most walked away satisfied, if not altogether enlightened.

The rest of this letter paraphrases, more or less, what I said at DECUS in October.

MEASURING GRAPHICS PERFORMANCE

It would be a very good thing for manufacturers and users of graphical devices to have some commonly accepted definitions for measurements of those devices, as we now have common terminology to describe their functions. I encourage user groups, DECUS among them, to come up with some measurement criteria that can survive in the atmosphere of rapidly changing technology. I would like to propose some goals for such criteria.

GOAL: do something generally useful across a variety of graphics devices, not only terminals or only bit-mapped workstations or only bit-mapped printers, etc. I believe that the fundamental function we are trying to get at is the speed of scan conversion, but for a variety of environments and objects.

- o Include video and printing devices.
- o Include black and white (bitonal) devices, grey scale, and color.
- o Factor out fundamental differences where possible.

GOAL: do something useful for 5 to 7 years into the future. A shorter-term effort might be obsolete before it was codified.

- o Account for new graphical operations.
- o Plan for higher resolutions.
- o Concentrate entirely on raster devices.

GOAL: do something useful to manufacturers.

- o Think years into the future. It takes some time for research to influence future product development.
- o Manufacturers need information from the users about how application areas are changing.

BASIC FORMAT FOR RESULTS

We all really want scalar numbers. People feel that they understand scalars.

PROPOSAL: define a suite of specialized tests plus a set of weighting functions appropriate to certain applications.

- o Define a suite of standard tests to measure particular dimensions of performance.
- o Define, if possible, sets of weights appropriate to different applications. Weights applied to dimensions represent importance of functions to *perceived* performance of the application programs. The weighted average should reflect more information about the dimensions that are important for *this* application.

E.g., for wireframe modeling, lines are more important, and thus should carry more weight in the calculation, than areas; conversely for solid modeling.

- o Define standard weights for some application areas where there is some agreement. Particular applications may not fit the standard weighting functions; recognize that your mileage may differ.

WHAT CONSTITUTES A USEFUL TEST?

How do we specify tests?

- o Specify a suite of test images (pages and/or screens).
 - Confine images to single measurement (text, lines, curves, halftones, etc.).
 - Specify rules for generating the images.
- o Specify tests in a device independent way.
 - Consider differences between dynamic and static displays, phosphor vs paper.
 - Include additional tests for interactive video functions such as erase and move block.
 - Factor out the effects of device resolution, multiple image planes, color.
 - Factor out communications time.
 - Beware of alternative representations that may prejudice test results but be unrealistic in practice.
 - Choose appropriate suite of writing modes (e.g., overlay, replace, complement, xor, etc.).
 - Etc.

WELL, HOW FAST IS IT?

What one wants to end up with, I think, for each application area, is a figure that expresses the performance of a device when working on that application, on the average. My particular religion teaches that my-dog-is-bigger-than-your-dog statements are meaningless outside the context of particular application environments. Conveying information with pictures is one of the major movements in the computer industry today, but different applications have different needs, and place different stresses on hardware and software systems.

A brief example. Suppose we have a few measurements, testing very specific functions, made on several devices.

RAW DEVICE PERFORMANCE DIMENSIONS
(mysterious units)

Device Type	Prop. Text	Lines	Areas	Curves	Halftone Images
A	300	100	80	30	3
B	200	200	50	100	1
C	100	300	20	100	0.1

And suppose we have weighting functions suitable to several different applications.

APPLICATION WEIGHTING FUNCTIONS

# 1:	10%	50%	25%	12%	3%
# 2:	50%	30%	5%	0%	15%

NOTE 1: Weights are a combination of frequency of operation and scale of the dimensional measurement.

Applying the weights to the measurements results in the following very interesting rankings of the devices.

WEIGHTED DEVICE PERFORMANCE

Device Type	Applic # 1	Applic # 2	. . .
A	100	180	. . .
B	140	160	. . .
C	180	140	. . .

NOTE 2: These figures are for comparison only. Your mileage may differ.

Note that the orderings of the devices from "best" to "worst" differs markedly from one application to the next.

SUBTLETIES (suggestive, but not exhaustive, list)

Beware of alternative representations. Some methods of encoding an image are more compact or faster to process than others.

- o Presentation Level Protocols (PLPs): the compactness of encodings varies widely. Consider ReGIS or PostScript versus sixels, for example. If communications is a bottleneck in the overall system, then more compact representations can have an (unfair?) advantage.
- o End runs: for example, some implementations might try to avoid expensive scan conversions by scanning the image directly to a bitmap, then simply transporting and drawing that bitmap. One needs rules for drawing images from schematic representations. This is not simple without standards for data syntax.

THINGS TO TEST

Clarification: I am not suggesting that all of the operations mentioned here should be measured. Instead, I believe that a small suite of tests should be developed, but must be specified VERY carefully, to avoid some of the potential pitfalls.

- o Text, of course. Text comes in several types, and they are likely to have different performance characteristics. Also, applications may place very different loads on the devices.
 - Fixed pitch text, a la line printer and, most likely, the terminal on your desk. What you are reading now. Also called "character cell." All characters are the same width, and can be drawn with hardware character generators.

- Proportionally spaced text: characters of varying width, where "M" is wider than "i", unlike what you are reading now. There are usually many more characters on a page of proportional type, and each of them takes longer to place because of the positioning calculation.
 - Writing modes: some modes may operate more quickly than others because of specific accelerator hardware, e.g., OR-mode memory.
 - Be careful about the time needed to "rasterize" (scan-convert) characters. If testing text only at standard click-stop sizes and rotations, pre-rasterized dot fonts matching the device resolution offer an increase in speed, but cost flexibility. Some graphic interpreters rasterize characters once and then cache the results, so that tests must be careful not to compare apples (scan converting the characters the first time) with oranges (transferring the bitmaps to the image).
- o Lines: lines are simple, right?
 - Horizontal and vertical lines may be easier than oblique lines for certain devices, depending on algorithms used and hardware accelerators available.
 - Need to measure oblique lines, also, with some sample of angles; e.g., with so-called rosettes (clique graph)
 - The classic measure of line drawing speed is length, at least for video devices. However, to include higher resolution devices such as printers or new video devices, one must also include width. A one-pixel-wide line is not acceptable at, say, 300 dots per inch; at high resolution, a line is really an area that must be filled.
 - What measures to use for line speed? Pixels? No, for the reasons above. Inches? Not good, again for the same reasons. What might be useful over a range of resolutions is something like visual angle subtended, in degrees, at some standard viewing distance that probably depends on the resolution and the medium. Needs work.
 - o Areas are becoming more important, for instance, as solid modeling replaces wire frame modeling in CAD applications.
 - Include fill and flood operations on shapes. Fill on a bitonal device may be very different from filling with a constant density or color. Filling with a pattern, possibly by halftoning on a bitonal device, is even harder.
 - What kind of shape to fill? A box, or a general polygon? Straight or curved edges? If straight, vertical/horizontal or oblique (since trapezoid fill is important in other areas)?
- Are patterns constrained to be origin-aligned, or can they be aligned with the edges of the shape?
 - Is interpolated shading across a patch of some shape important? If there were some "standard" interpolation algorithms, . . .
- o Curves are becoming more important, both for higher quality display in general, and for text handling. Vectors were usually only approximations to curves for performance reasons, but they are fundamentally jagged, i.e., don't magnify well unless the software redraws from scratch.
 - What kinds of curves? Circular arcs, certainly. Cubics are harder but more useful. Unfortunately, there is not much agreement about types of curves and surfaces. I'm a fan of Beziers, personally, but that may not be a popular religion.
 - Be careful about requirements for approximating the curve on the display device: if the curve as drawn is, for instance, required to come within one device pixel of the true curve path, then device resolution makes a lot of difference.
 - o Images: scanned, halftoned, synthetic, all are basically bitmaps, but with potentially very different performance characteristics.
 - Bitonal and grey scale images vary in size, certainly, and in complexity of handling, depending on the rendering device.
 - If the image resolution and depth match the device resolution and depth, then rendering is simple. Character bitmaps are typically of this form, by the way.
 - If the image resolution and depth do not match the device resolution and depth, then more complex handling is required, e.g., scaling and digital halftoning, which are very compute intensive.
 - Does the image require decompression, according to some algorithm, before processing? Standard tradeoff between transmission time and processing time.

BENCHMARKS

Finally, such a yardstick must have a name.

- o For measuring floating point speed (and FORTRAN compilers), we have Whetstones. The underlying measurement of interest is mostly megaflops, and the Whetstone benchmark makes some particular decisions about instruction mixes for those flops.
- o For measuring fixed point speed (and C compilers), we have Dhrystones. The underlying measurement at issue is MIPS, which is not a very useful measurement in itself, but, again, the benchmark makes specific decisions about operation mix.
- o For measuring graphics speed, I would suggest RosettaStones, to honor that ancient demystifier of writing with pictures.



H M S

HMS

CONTENTS OF THIS ISSUE

- o FROM THE EDITOR
- o HARDWARE HINTS AND KINKS
- o POINTS TO PONDER WHEN ADDING HARDWARE TO YOUR DEC SYSTEM
- o HITCHHIKER'S GUIDE TO THE NASHVILLE HMS GALAXY
- o ** HMS SESSION SCHEDULE FOR NASHVILLE DECUS **

FROM THE EDITOR -- Bill Walker

HMS NEWSLETTER DEADLINES

JUNE: 23 APRIL

JULY: 24 MAY

If Carmen and I have got this figured out right, you should be receiving this issue of the HMS SIG Newsletter a couple of weeks before the spring 1987 DECUS symposium in Nashville. Those of you that will be attending this meeting can get a preview of what you are in for by reading Carmen's "Hitchhiker's Guide To the HMS Galaxy" article. Immediately following her narrative is the HMS session schedule.

We also have a very useful article from Tom Provost discussing the ins and outs (pardon the pun) of adding hardware to DEC systems.

The "Hardware Hints and Kinks" section contains an (ahem) anonymous contribution concerning the DEC BI-to-UNIBUS adapter that may be of interest to individuals migrating to, or adding to, BI-based configurations.

Finally, please note the above two deadlines. The one for the June issue is extremely tight and, perhaps, too optimistic -- I leave for the DECUS symposium the following day. But, if I have some material, and it's not too disorderly, I will try to get it edited and submitted. Stuff that gets to me by the deadline for July's newsletter should not present any unusual problems.

HARDWARE HINTS AND KINKS

DMA PROBLEMS WITH THE DEC BI-TO-UNIBUS ADAPTER

There is one known product that definitely does not work on the BI-to-UNIBUS adapter from DEC: the RL11 disk drive. In addition, at least one Emulex disk controller does not work on this same adapter. Emulex, however, has made some ROM changes to this controller that make it functional on the BI-to-UNIBUS adapter. UNIBUS bandwidth is about 20 percent less than other UNIBUS configurations, and this may affect other devices such as streaming tapes (?) as well.

POINTS TO PONDER WHEN ADDING HARDWARE TO YOUR DEC SYSTEM Tom Provost, HMS SIG Chair

DEC systems are carefully configured to maximize reliability and performance. When you add an item to an existing system, you should make sure the resulting system runs as well as it possibly can. This is true whether you buy the add-on from DEC or from a third-party vendor; it's also true for equipment migrated from other systems. If you keep the following guidelines in mind when you add peripherals or other hardware to your DEC system, you can help ensure continued high performance and reliability.

I. The hardware must physically fit into the system.

Interfaces require backplane space, so the required number of backplane slots must be available. Crosstalk can result when identical devices are adjacent to one another. Hex cards cannot fit into the end slots on a backplane segment or system unit (SU) (i.e., <DMC to DMR>).

On a Q-Bus system, there are two very different kinds of backplane slots, Q-Q and Q-CD. They are not interchangeable.

If no slots are available in a UNIBUS configuration, you can add an SU. This requires a power harness compatible with the unit and the cabinet. When adding new SUs to old systems, you may have to cut the backup 5V wires. Really old boxes cannot handle hex cards at all. If there is no room in the box for an additional SU, you must add another box and a segment of UNIBUS cable. The large DEC racks can handle two BA boxes, so you don't always need to add an entire rack.

When adding boards to or removing boards from a backplane, you must take care to ensure that the grant lines are continued and that the DMA grant is jumpered. (On Q-Bus systems, the grant line path is not always obvious.) People usually remember to do these things when adding equipment to their systems, but forget them when removing equipment.

Rack-mounted equipment often requires a rack-mount kit. Cabling is not always included; even if it is, it may not be long enough. Cabinet kits may be necessary to externalize the cables.

II. There must be adequate power and cooling.

Power begins with the AC wall outlet. It may not be a standard wall outlet, so be sure to check before you plug anything in.

Several voltages may be required at the backplane slot. You must ensure that sufficient amperage is available for each voltage.

You can estimate cooling requirements from the wattage drawn for the device. Room air conditioning should be designed to handle the people in the room as well as the load from the computer system.

The ability of the system box or expander box to cool the device properly depends on the temperature differential and the air flow. Unfortunately, the cooling capacity of these boxes is not given anywhere.

Some "hot boards" can affect adjacent boards.

III. Even if guidelines I and II are satisfied, several other system integration problems still need to be addressed.

Revision level. When integrating systems and peripherals of different vintages, you may run into conflicts due to engineering changes implemented in one model but not in the other. For example, the older UNIBUS backplanes had considerably different wiring, and thus will not work with some of the new interface boards. Equipment that worked fine on an old PDP-11 may require changes to operate properly on a recently acquired VAX.

Address and vector. Obviously, the add-on device must have an address and a vector that differ from those already in use on the system. What old-time PDP-11 users may not realize is that VAXen are accustomed to making the decisions about what those numbers are supposed to be. Choosing an arbitrary unused address for a device on a VAX could cause the operating system to miscalculate the vectors for terminal interfaces. You must consult VMS in the selection of address and vector.

Interrupt priority. When two devices want the CPU's attention at the same time, the hardware interrupt priority determines which gets there first. If you are not in control of the software, it's risky to increase the priority level of a device, but decreasing the priority level is usually safe. If you are in control of the software, you can increase the priority level providing the priority of the software interrupt service routine is altered accordingly. Interrupt priority levels on a Q-Bus system don't work with many devices and are best left at the standard. When multiple devices are at the same priority level, the distance of each device along the grant path line determines which one gets serviced first; in other words, units closer to the CPU have a higher priority.

DMA priority. This variable, which has nothing to do with interrupt priority, determines which device gets to use the bus to transfer words to and from the memory when CPU intervention is not necessary. DMA priority is affected by the position of the interface on the bus; again, devices closer to the CPU have a higher priority. To change DMA priority, you must reorder the interface boards.

DC loading. Each device--and each bus segment--causes a decrease in the available DC voltage on the bus signal lines. On short bus segments, as are common in Q-Bus configurations, you can ignore the length of the bus as a factor in loading. DC loading for a device is determined by the number of receivers and drivers on a particular bus line for that device; device DC loading is usually available in the device specifications. A UNIBUS system can handle 20 DC loads or 50 feet of bus--but not both. Typical devices assert two DC loads each.

AC loading. If all devices were electrically perfect, there would be no AC loading on the bus. Unfortunately, perfect devices are hard to come by. Imperfect devices present impedance to the signal lines, causing reflections or ringing. One AC load corresponds to 9.35 picofarads (pF) of capacitance. On a complex UNIBUS configuration, the combined AC loading of all devices on the bus can be great enough to cause intermittent failures. AC loading problems depend largely on interaction between the AC loads from each device. You can counteract these problems by eliminating symmetric cable lengths between backplane segments and by using segments of bus to separate devices with heavy loading (e.g., replacing M920s with M9202s).

NPR latency. DMA devices vary in speed and patience. To optimize performance, you should give the less patient devices higher priority by placing them closer to the CPU on the bus.

Here is a checklist of the factors to consider in adding hardware to your system:

- Amps and volts
- BTUs
- Backplane slots (quantity and variety)
- Rack
- Cabling
- Panel inserts
- DC loading
- AC loading
- DMA bandwidth
- Interrupt response
- ECO level

And here are the consequences of disregarding these things:

- Intermittent failures
- Poor performance
- FCC violations
- Damage

References (in order of increasing date and decreasing usefulness)

UNIBUS Troubleshooting User's Manual, EK-FS0002-OP-001 (DEC company confidential, 1977)

Computer Engineering: A DEC View of Hardware Systems Design by C. Gordon Bell, J. Craig Mudge and John E. McNamara (Bedford, MA: Digital Press, 1978)

PDP-11 Bus Handbook, EB 17525 20 (1979, out of print)

PDP-11 UNIBUS Processor Handbook, EB-26077-41 (1985)

Configuration guides:

Systems and Options Catalogs

Micro Systems Site Preparation and Verification Guide (H9642-JA/JP Cabinet), EK-H9642-SP-001

Micronotes

HITCHHIKER'S GUIDE TO THE NASHVILLE HMS GALAXY
Carmen D. Wiseman, Assistant Newsletter Editor

The idea of a Nashville DECUS brings some pretty strange images to mind: Minnie Pearl pricetags dangling from VAX-11/730s at the Digital Sale, hawg jowls and collar greens at the free lunch, honky-tonk muzak in the exhibition hall . . . and Lord knows what kind of party favors we'll pick up at registration! But all you hardware mavens can rest assured that you'll find plenty of solid information and no hee-haw, so to speak, in the array of Hardware Micro SIG sessions at the spring symposium.

Figuring out which sessions you want to attend before your official program book arrives is often tough, so your humble editors have decided to devote most of this issue of the HMS SIG newsletter to a roadmap of the spring 1987 HMS sessions.

This article will take you on a tour of our corner of the Nashville DECUS universe, with emphasis on session highlights and events that no hardcore hardware person should miss. On the last three pages of the newsletter, there's a chart that gives bare-bones info about all 53 of our Nashville sessions: title, date and time, and picturesque Opryland Hotel room name. Please feel free to remove the chart from this edition of SIGs Newsletters and take it along to the symposium.

Before launching into the roadmap, I'd like to congratulate HMS Symposium Seminar Coordinator Mike Allen for putting together an

exemplary group of sessions. The spring roster nicely reflects both the changing face of DEC and the shifting needs of the user community. As you'll see, there's something old, something new and definitely something for everyone who's interested in DEC hardware.

The symposium begins with a bang on Monday--19 HMS sessions, running from 9:00 a.m. to 10:00 p.m.--so don't party too hard Sunday night! Before you head anywhere else on this very full day, make sure you attend the official HMS roadmap session at 9:00 a.m. Our Peerless Leaders will give you the lowdown on the state of the HMS SIG, as well as last-minute schedule changes and other crucial HMS-related information.

You can spend the rest of Monday learning about what's been happening in DEC Micro Systems, mass storage, tape backup (I reserve comment on the TK50 update at 3:30 p.m.!), printers and video products since the fall symposium in San Francisco. RT-11 and/or would-be RT-32 users should check out "Programming VAX-11 Hardware Directly" at 8:00 p.m. and the session on the "brain-dead" KA260 real-time processor at 9:00 p.m. And if you need a bit of levity after a long, hard (no pun intended) day, drop in on "Edsel Murphy's Scrapbook: Digital's Lemons" at 6:30 p.m. to place your bets on which Digital product will win the 1987 Robin Award.

If you want to know more about DEC mass storage, Tuesday is your day. Seven sessions cover the entire spectrum of DEC devices, from low-end RDxx drives to HSC70 and KDB50 controllers. Of special note are the two afternoon sessions on CDROM applications and WORM disks. But attendees interested in things other than disks needn't feel neglected. MicroVAX and VAX system managers should find "Memory and System Performance" at 10:00 a.m. particularly valuable, and MicroVAX greenhorns, of which there are more and more all the time, shouldn't miss the MicroVAX II introductory session at 5:00 p.m.

Although DEC put most of its UNIBUS PDP-11s out to pasture last year, the 11/84 is still going strong, as are the Q-Bus MicroPDP-11s. To find out more about the status of these remaining PDP-11 family members, check out the PDP-11/84 and MicroPDP-11 update sessions on Wednesday morning. If you're into heavy-duty real-time action, there are two afternoon sessions on I/O processors. And if you're doing government work, the three sessions from 4:30 to 6:00 p.m., which deal with such arcana as environmental control and vibration testing of the MicroVAX II, will be of particular interest.

Because many DECUS attendees tend to cut and run before Friday, our SIG wrap-up session is being held at noon on Thursday. Here's a golden opportunity to tell our Peerless Leaders what you've liked or disliked about the Nashville symposium, and to help plan for the fall symposium in Anaheim. You can also put in your two cents worth about any HMS-related topic, including (gulp!) this newsletter.

After the wrap-up, the other 12 Thursday sessions are devoted to third-party hardware and OEM issues. Almost everyone will want to catch the ECO session at 1:00 p.m. to get the latest dirt on changes in the beleaguered FPJ11 and other products. Then comes a session called "Q-Bus Tape Choices"; it's hosted by yours truly and deals with (you guessed it) alternatives to the TK50. Other sessions on integrating non-DEC peripherals into DEC systems include the foreign peripherals forum and "Points to Ponder When Adding Hardware to a Digital Computer System," a digest of which appears in this issue of the HMS SIG newsletter. The theme of the evening sessions (from 6:00 on) seems to be how DEC and OEMs can peacefully co-exist; the OEMs get their say at 11:00 p.m.

If you're still around on Friday, there are four interesting sessions from 9:00 a.m. to 2:00 p.m.: an MSD hardware panel, a couple of sessions on PDP-11 and MicroVAX diagnostics, and "Hardware Hints and Kinks." The Nashville version of this popular session runs from 1:00 to 2:00 p.m. in the Washington Room and is followed immediately, same place, same channel, by the VAX SIG's hardware panel session. Mike Allen notes that the Washington Room will be THE PLACE for hardware folks to get information available nowhere else. Be there or be square!

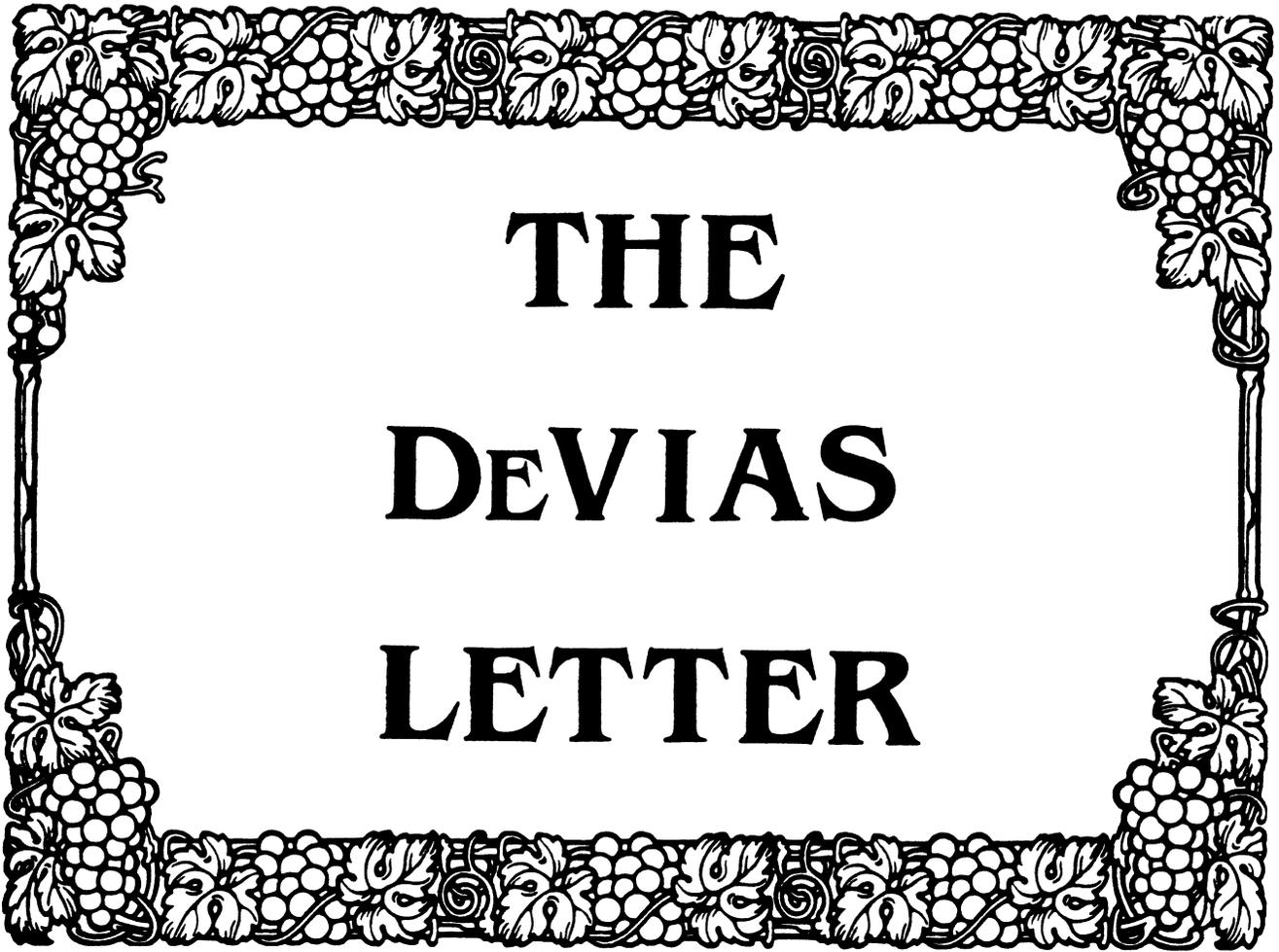
Well, there you have it--a peek at the 1987 HMS sessions at the spring symposium. We hope this guide will be useful to you in optimizing your Nashville DECUS experience. If you like it, we'll continue to run a roadmap newsletter issue before each symposium in the future. Let us know what you think. And see y'all in Nashville!

HMS Sessions
Nashville DECUS, April 27-May 1, 1987

TITLE	TIME	ROOM
Monday, April 27, 1987		
HMS Roadmap	9:00-10:00 a.m.	Knoxville
Micro Systems Development Directions and New Product Review	10:00-11:00 a.m.	Knoxville
MicroVAX Update	11:00 a.m.-noon	Jefferson
Extending the MicroVAX Family	noon-1:00 p.m.	Jefferson
Printers: Current Products and Future Needs	1:00-2:00 p.m.	Cumberland
Storage Systems News	1:00-2:00 p.m.	Knoxville
Advances in Digital Storage Architecture Disks	2:00-3:00 p.m.	Knoxville
Laser Printer Update	2:00-3:00 p.m.	Chattanooga
Advances in Tape Products	3:00-3:30 p.m.	Cumberland
Update on the TK50 Family of Products	3:30-4:30 p.m.	Cumberland
Tape Formats and Data Integrity	4:30-5:30 p.m.	Cumberland
Advances in Disk Technology	5:30-6:30 p.m.	Cumberland
Edsel Murphy's Scrapbook: Digital's Lemons	6:30-7:00 p.m.	Cumberland
Video Update	7:00-8:00 p.m.	J.C. Handy
Configuring New Micro Systems Packages	7:00-8:00 p.m.	Robertson
Programming the LN03	8:00-9:00 p.m.	J.C. Handy
Programming VAX-11 Hardware Directly	8:00-9:00 p.m.	Knoxville
Printing Queues Guide	9:00-10:00 p.m.	J.C. Handy
The KA260: A Real-Time, Single- Board Computer for Embedded Real-Time Applications	9:00-10:00 p.m.	Knoxville

----- Tuesday, April 28, 1987 -----		
Electronic Memories: The Next Five Years	9:00-10:00 a.m.	Knoxville
Electronic Memory and System Performance	10:00-11:00 a.m.	Knoxville
Low-End Disk Performance and Tuning Capabilities Can Increase System I/O	11:00 a.m.-noon	Knoxville
Advances in 5 1/4" Winchester Disk Drives	noon-1:00 p.m.	Knoxville
How to Design a CDROM Application	1:00-2:00 p.m.	Knoxville
Write-Once Optical Disks for Archiving Applications	2:00-3:00 p.m.	Knoxville
Digital Storage Architecture: What It Is and What It Is Not	3:00-4:00 p.m.	Knoxville
Configuring Systems with Digital Storage Architecture Controllers	4:00-5:00 p.m.	Knoxville
Digital Storage Architecture Controller Performance	5:00-6:00 p.m.	Knoxville
Introduction to MicroVAX II	5:00-6:00 p.m.	Chattanooga
----- Wednesday, April 29, 1987 -----		
PDP-11/84 Update	9:00-10:00 a.m.	Robertson
MicroPDP-11 Update	10:00-11:00 a.m.	Robertson
I/O Processing Application Notes	11:00-11:45 a.m.	Robertson
I/O Processors: Options That Supercharge the Real Time	11:45 a.m.- 12:30 p.m.	Robertson
Compact MicroVAX as a Boot Node for a Local Area VAXcluster	4:30-5:00 p.m.	Adams
Environmental Control for a MicroVAX II	5:00-5:30 p.m.	Adams
Preliminary Vibration and Thermal Testing of the MicroVAX II CPU and 1MB Memory Boards	5:30-6:00 p.m.	Adams

----- Thursday, April 30, 1987 -----		
HMS SIG Wrap-up	noon-1:00 p.m.	Cheekwood
Hardware Engineering Change Order Update	1:00-2:00 p.m.	Cumberland
Q-Bus Tape Choices	2:00-3:00 p.m.	Cumberland
Points to Ponder When Adding Hardware to a Digital Computer System	3:00-4:00 p.m.	Cumberland
Foreign Peripherals Forum	4:00-5:00 p.m.	Cumberland
Configuring Commercial PDP-11 Systems	5:00-6:00 p.m.	Cumberland
What Next? Storage Needs	5:00-6:00 p.m.	Nancy Ward
Digital's Components Strategy	6:00-6:30 p.m.	Cumberland
Digital's Relationship with Original Equipment Manufacturers: What Is an OEM and How to Become One	6:30-7:00 p.m.	Cumberland
Doing OEM Business with Digital	7:00-8:00 p.m.	Cumberland
OEM Case Histories	8:00-9:00 p.m.	Cumberland
Digital Answers the Top Questions from the OEM Helpline and the DECUS Computer System (DCS)	9:00-10:00 p.m.	Cumberland
OEM Issues Forum	10:00-11:00 p.m.	Cumberland
----- Friday, May 1, 1987 -----		
Micro Systems Hardware Panel	9:00-10:00 a.m.	J.C. Handy
PDP-11 Diagnostics	10:00-11:00 a.m.	J.C. Handy
MicroVAX Diagnostics	11:00 a.m.-noon	J.C. Handy
Hardware Hints and Kinks	1:00-2:00 p.m.	Washington



THE DEVIAS LETTER

IAS

Contribution guidelines..... i
From the Editor's Terminal..... 1
Ten Years Ago Today..... 2
The Program of the Month Club 3
Macro 16 to Macro 32 5

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:

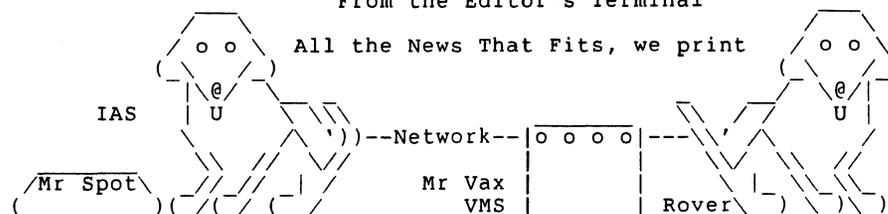
1. Non machine readable sources, (SPR's etc,) should be reasonably dark to insure good photocopying. Text whatever should be the equivalent of 66 lines at 6 lpi, with 4-line top margin, 5-line bottom margin, left-margin 10, right margin 74 at 10cpi. If using a DEC LN03 for output, use left-margin 8, 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



Its been a bad month for traditionalists like myself. DEC announces computers without a BUS structure for expansion, Garrison Keillor announces he's quitting PHC and moving from Lake Woebegon to Scandanavia. Next thing you know, IBM will announce a computer that is programmed in Octal instead of HEX and talks ASCII rather than EBCDIC. I comforted myself by re-cycling some CDC 9762 80-meg disk drives that we scrounged up to put on our 11/45 system.

This month's program of the month is not for casual users. Its a tool that allows a system manager to look at the internal status tables of a terminal, which gives one much insight into how the system is running. Its especially useful in that it will tell you if anyone who is complaining about their terminal being hung has managed to control-S their terminal without being aware of it. (Next month we'll probably introduce what to do about that problem.)

Our conversion project has started again, and is lurching along its merry way, (grunt, groan, pound on the keyboard...) so we have something to offer again.

This month we are again recruiting. If you are a new user of IAS, (or an older user who wants to be part of the fold but can't come to DECUS meetings,) fill out the user profile form in the questionnaire section and send it in.

Has anyone out there played with the new release of DECNET? If you have, drop us a line telling us about it. We'd be particularly interested in mixed VAX and IAS applications.

Spring is only 2073600. clock ticks away.
(1728000 ticks for you European users)

Ten Years Ago Today

The April 1977 Multi-Tasker reported that:

1. The result of a questionnaire included in the December issue reported that responses were received from 12 IAS users, (of version 1.1,) 108 RSX-11D users, 86 RSX-11M mapped users, 18 RSX-11M unmapped users, and 7 RSX-11S users. (Sure have a different mix now.)
2. The average IAS user had an 11/70 with 165K words, and 120Mbytes of disk storage. One user actually running IAS with 5 M-bytes, (2 RK05 disks.) I have no idea what that user ran, they were lucky if they had 200 free blocks on DK1.
3. Several users complained about having to re-boot the system when the print queue hung, (it took a while for the fix of deleting SPRQUEUE.SYS to promulgate thru the user group.)
4. RSX11M users griped about not having a crash dump, and about not having a full duplex terminal handler.
5. A thorny discussion centered around a proposal to charge a subscription fee for any SIG newsletter. Suggested subscription fee was to be \$20 for each SIG newsletter. (Makes current price for the "Big One" really look good. ed.) The editor suggested that a more reasonable fee of \$5 per newsletter, with the caveat that "I am totally opposed to any scheme to charge for subscriptions for SIG newsletters unless DECUS can guarantee that the newsletters will be published on a firm schedule..." The more things change... (Mark Lewis, by the way, NEVER missed an issue, and he was both SIG chair and Editor.)
6. Finally Oliver Walter of Zurich Switzerland submitted a patch to the TTY handler, along with the first printed example of installing a new terminal handler without doing a sysgen by installing the new version with a different name, scheduling it to execute in 10 seconds, and then unloading TT.

```
10 ! program to look at whole terminal table for a terminal
15 dim tt$(2)v
20 input "tt # (octal) "; tt$ : tn=oct(tt$)
30 tt=oct("7240") : ! octal offset to trmtbl psect (less par bits)
40 ta=oct("2760")*64 : ! octal address from par #2
50 ts=oct("110") : ! octal size of a table entry
60 oa=ta+tt+tn*ts
70 oh=int(oa/32768) : ol=int(oa-oh*32768)
80 ? "sc.cr ==000001 ; carriage return just done"
81 ? "sc.ro ==000002 ; hard-copy rubout sequence in progress"
82 ? "sc.eqp==000004 ; long escape sequence being sent to user"
83 ? "sc.tmo==000010 ; read-with-timeout in progress"
84 ? "sc.wip==000020 ; terminated write in progress"
85 ? "sc.wfn==000040 ; write waiting for nodes"
86 ? "sc.brk==000100 ;++094 last record terminated with break"
87 ? "sc.xof==000200 ; output temporarily suspended by xof"
88 ? "sc.inh==000400 ; character processing inhibited"
89 ? "sc.cno==001000 ; control-o in effect"
90 ? "sc.ofl==002000 ; terminal offline (interface not present)"
91 ? ";;;;;==004000 ;++076 a spare bit!"
92 ? "sc.hng==010000 ; modem line disconnected"
93 ? "sc.cnr==020000 ; output for control-r in progress"
94 ? "sc.stl==040000 ; line stalled (xoff sent)"
95 ? "sc.tap==100000 ; low speed reader active"
97 ? "change appropriate bits, terminate with an <esc>"
100 ad$=oct$(ol)
101 if len(ad$)<5 then let ad$="0"+ad$ : goto 101
102 ad$=oct$(oh)+ad$ : B=0 : call "SPAWN"("OPE "+AD$,b)
103 input "enter <cr> to view rest of Table, <ctl-z> to stop";tt$
104 print "Term with <esc> or new value <esc>" : print : print
105 Print "Read request " ; : gosub 500
115 Print "Write request " ; : gosub 500
120 Print "Read state " ; : gosub 500
125 Print "Read-ahead state " ; : gosub 500
130 Print "Dispatch vector pointer " ; : gosub 500
135 Print "PUD address " ; : gosub 500
140 Print "External page address " ; : gosub 500
145 Print "Task action queue " ; : gosub 500
150 Print "Task action flags " ; : gosub 500
155 Print "Event wait queue " ; : gosub 500
160 Print "Current xfer size " ; : gosub 500
165 Print "Control-O task atl " ; : gosub 500
170 Print "Unsolicited input ast " ; : gosub 500
175 Print "Control-C input ast " ; : gosub 500
180 Print "Attached task " ; : gosub 500
181 Print "IO.RTT term table add. " ; : gosub 500
182 Print "Autobaud status flags " ; : gosub 500
185 Print "Input buffer header (1) " ; : gosub 500
190 Print "Input buffer header (2) " ; : gosub 500
195 Print "Input buffer header (3) " ; : gosub 500
200 Print "Output buffer header (1) " ; : gosub 500
```

```

205 Print "Output buffer header (2) "; : gosub 500
210 Print "Output buffer header (3) "; : gosub 500
215 Print "Sec.,event wait flags "; : gosub 500
220 Print "Read timeout, immed char "; : gosub 500
225 Print "Modem timeout, status "; : gosub 500
230 Print "H-pos,start-pos "; : gosub 500
235 Print "V-pos, # of records "; : gosub 500
240 Print "Int tab offset, DMA size "; : gosub 500
245 Print "ESC state, read state "; : gosub 500
250 Print "Term I.D. characteristics"; : gosub 500
260 goto 20
500 tt=tt+2
515 break
520 oa=ta+tt+tn*ts : oh=int(oa/32768) : ol=int(oa-oh*32768) : ad$=oct$(ol)
525 if len(ad$)<5 then let ad$="0"+ad$ : goto 525
530 ad$=oct$(oh)+ad$ : B=0 : call "SPAWN"("OPE "+AD$,b)
550 return

```

Notes to adapting this program to your system:

```

30 tt=oct("7240") : ! octal offset to trmtbl psect (less par bits)
   This value is obtained by taking the octal address of the global
   symbol TRMTBL, less the upper 3 bits, "160000"

40 ta=oct("2760")*64 : ! octal address from par #2
   This value is obtained by issuing the commands:
   ACT TT.../AL (to find out where TT... is running)
   ACT TT.../TI=TTnn/FU (to get full list)
   Take the 3rd octal value in the line reading "HWPARS..."

50 ts=oct("110") : ! octal size of a table entry
   This value is fixed, but table size and ordering may change with
   any new release of the IAS terminal Handler

```

Macro 16 to Macro 3 A Tale of two Systems

Frank R. Borger
Michael Reese Medical Center

Once more we plunge into the world of conversion. It's been a while since I worked on the project, I've been busy being hardware engineer, physicist, fixing the heating, mopping out my office (after they "fixed" the leak in the roof,) and generally running around plugging holes in dikes. Trouble is I'm running out of fingers. Although we are still far from a running system, I have most of the code necessary for a terminal I/O only system converted. Its about time to start testing code. Now the fun starts. Since I would not want to link something as large as Reese Basic and just crank it up, I have to approach testing on the module level. Although the basic part of the interpreter is 15 year old code, and we have (hopefully) learned a lot about coding in the intervening time, the structure is modular enough that I could test each piece with a companion test routine. There tend to be 3 distinct cases of writing a test program for calling a module:

1. Some routines, typically ones that return system time or date, have a simple call, and return a text string or numeric value. Writing test routines for these is fairly simple.
2. More complex routines call other routines to do most of their work. Testing them really involves testing several routines at once. If one chooses carefully, one can test several routines with the same general test program.
3. Some routines really can only be tested after all the other pieces have been tested and debugged as much as possible, or can be tested just as easily by running the interpreter itself in diagnostic mode.

This month, lets start with a relatively simple test routine. We had to do significant re-writing of the routines that did time and date return and conversion. There were 4 very similar routines, all of which had a common calling procedure and returning procedure.

```

a$=dat$(n) ;returns date as mo/dd/yy
a$=ddat$(n) ;returns date as dd-mmm-yy
a$=vdat$(n) ;returns date as dd-mmm-YYYY
a$=tim$(n) ;returns time as hh:mm:ss

```

(N=0 means return system date, otherwise return date equivalent to n being day of century.) All routines were entered with r1 (the text pointer,) pointing past the "(", and returned a text string in users storage space, with r3 containing the address and

r4 containing the length.

The following test program:

1. Prompts for a test ascii string (which should contain a valid numeric quantity,) to pass to the date routines.
2. Appends a closing paren to the input text, (which the date routine expects.)
3. Calls the 4 date routines with the ascii text and prints the ascii strings returned by the 4 subroutines.
4. Simulates several of the storage areas that exist in the basic interpreter and are used by the routines being tested.

```
;
;   test program to test date functions
;
$ssdef      ;define sys status codes
$lnmdef     ;define logical names
;
;macro wrmess add,len,cctl,error
;qiow_s chan=tochan,-
;func=#io$ writevblk, -
;iosb=ttiosb, -
;pl=add, -
;p2=len, -
;p4=cctl
;bsbw error
;endm wrmess
;
;macro remess add,desc,error
;qiow_s chan=tichan, -
;func=#io$ readvblk, -
;iosb=ttiosb, -
;pl=add, -
;p2=desc
;bsbw error
;endm remess
;
.psect rodata,nowrt,noexe
;
prompt: .ascii /Test date date ? /
plen: .long plen-prompt
ohoh: .ascii /ERROR!//
ohln: .long ohln-ohoh
timest: .ascii /0)/
toname: .asciid /sys$output/
tiname: .asciid /sys$input/
;
;
.psect rwdata,rd,wrt,noexe
readds: .long 80
```

```
.address      readbf
readbf: .blkb 80
outbuf: .blkb 80
;
;   dummy user buffer etc required by basic code
;
lineno::.word 20      ;fake line number
usrbuf::.word 0      ;returned string header
strbuf: .blkw 1000   ;and string returned by functions
strlen::.word 0      ;length of returned string
enudat::.long usrbuf ;pointer to end of user buffer area
stgosb::.long enudat ;pointer to end of buffer
ac0:: .float 0      ;floating point registers
ac1:: .float 0
ac2:: .float 0
ac3:: .float 0
ac4:: .float 0
ac5:: .float 0
;
;   misc data areas for test program
;
ttiosb: .blkw 1      ;status
ttlen: .blkw 1      ;length
; .blk1 1 ;device char
tichan::.blkw 1     ;channel number
tochan::.blkw 1     ;channel number
;
;
.psect code,exe,nowrt
.entry start,M<r2,r3> ;entry mask
;
$assign_s -
devnam=toname, -
chan=tochan
blbs r0,10$
ret
10$: $assign_s -
devnam=tiname, -
chan=tichan
blbs r0,11$
ret
11$:
rego: wrmess prompt,plen,#36,err ;do prompt
movw #80,readds ;reset length indicator
remess readbf,readds,err ;read ascii string
cvtwl ttlen,readds ;put length in descriptor
movl #readbf,r1
addl readds,r1 ;point at end of string
movb #^o51,(r1) ;add terminating paren
movl #readbf,r1 ;reset text pointer
movl #usrbuf,enudat ;reset enduser pointer
jsb dat00 ;convert to mm/dd/yy
a:: movw r4,strlen ;return length of string
wrmess strbuf,strlen,#32,err ;write returned string
movl #readbf,r1 ;reset text pointer
```

```

        movl    #usrbuf,enudat    ;reset enduser pointer
        jsb    ddat00            ;convert to dd-mmm-yy
b::     movw    r4,strlen        ;return length of string
        wrmess strbuf,strlen,#32,err;write returned string
        movl    #readbf,r1      ;reset text pointer
        movl    #usrbuf,enudat  ;reset enduser pointer
        jsb    vdat00          ;convert to dd-mmm-yyyy
c::     movw    r4,strlen        ;return length of string
        wrmess strbuf,strlen,#32,err;write returned string
        movl    #timest,r1     ;reset text pointer
        movl    #usrbuf,enudat  ;reset enduser pointer
        jsb    tim00           ;convert to mm/dd/yy
d::     movw    r4,strlen        ;return length of string
        wrmess strbuf,strlen,#32,err;write returned string
        brw    rego            ;do it again
end:    ret
;
;     error routine
;
err:    blbc   r0,10$           ;br if error
        rsb
10$:    wrmess ohoh,ohln,#32,end
        rsb
eval00::                ;dummy evaluate call
        jsb    atof00          ;just let atof do it
        sev    ;fake a closed paren seen
        rsb
        .end    start

```

As you can see, even a simple routine can be rather complex. (This above test routine was about half as long as the routines it tested.) Once we had written one of these test routines, however, simple clones of the initial routine could be used to test other modules. A good working pace for me would be to test and debug one set of routines per every day or two, if (and that's the big IF in my job,) I got a few hours free.

At the present time, there is about one third of the code re-written and tested as above, about one third re-written and awaiting testing, (class 2 in the above list,) and one third still awaiting the final bulge, (file I/O conversion.) The best is yet to come, (If we can get to it.) Next time, what to do about complex or interlocking modules.

Leverage

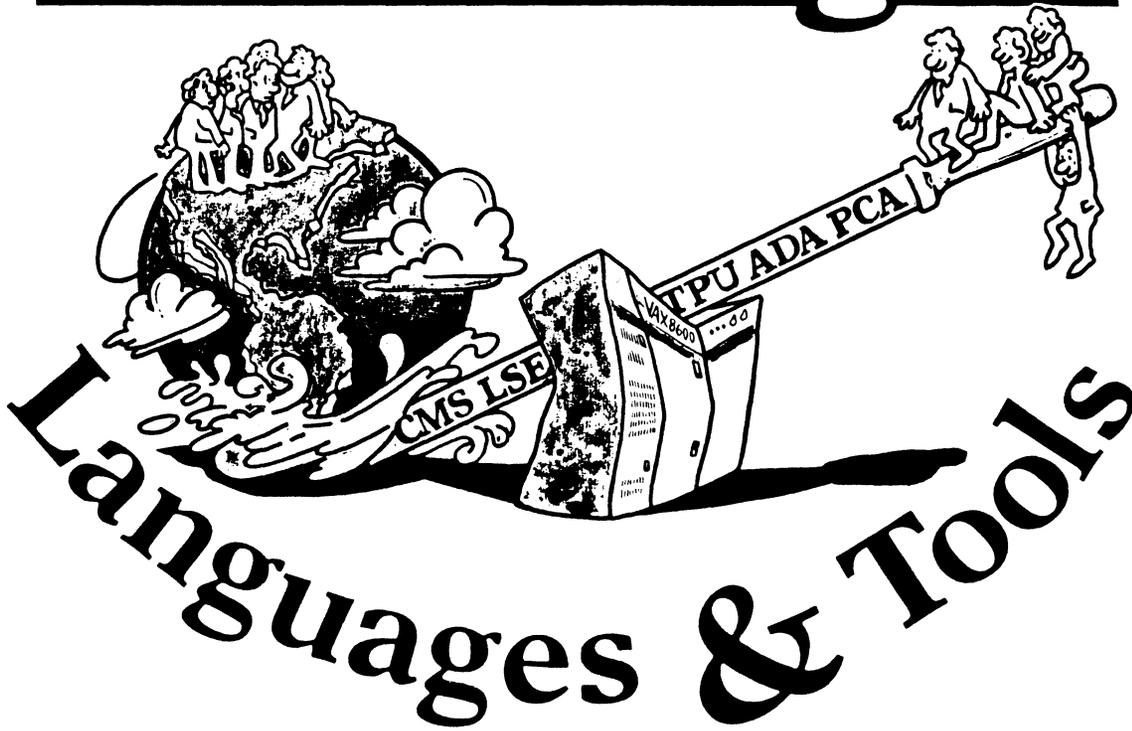


TABLE OF CONTENTS

Editor's Notes	2
WHAT'S IN A FORMATTER? -- PHILOSOPHIES IN CONFLICT <i>Sam Whidden, American Mathematical Society</i>	3
READING A PROGRAM VERSION NUMBER FROM THE IMAGE HEADER <i>John Miano, Berlex Laboratories, Inc</i>	7
FUN WITH DCL <i>Earl Cory, Eaton Corp.</i>	12
LANGUAGES AND TOOLS WORKING GROUPS <i>Joe Pollizzi, Space Telescope Science Institute</i>	14
LANGUAGES AND TOOLS MASTERS PROGRAM	16

EDITOR'S NOTES

Welcome to the next issue of *Leverage*. I say next, because I've just about lost track of which issue will come out when, but if my calculations are right, this will probably be the last issue to reach you before the Nashville Symposium. In this issue are two articles you should read before coming to Nashville, which discuss new programs for the Languages and Tools SIG. The first is Joe Pollizzi's discussion of the Working Groups, which are being established to help address the great number of interest areas we encompass. The second of these articles is the discussion of the L & T Masters Program. This has been in the process of getting started for awhile now, and is beginning to take off. A Masters Application is included at the back of the newsletter. Both of these are areas in which you can help contribute to the activity and growth of the SIG. Please look the articles over, and give it some thought.

Also in this issue is some of the first fruit of our Masters Program: John Miano of Berlex Laboratories has contributed a technical article which shows a method for reading version numbers from production software. Thanks, John.

Earl Cory of Eaton Corporation has sent articles to me several times for his *Fun With DCL* column. For some reason these have gotten misplaced, so this time he sent several in one envelope, to keep me in good supply. I owe Earl an apology for the mixup in the past, and hope you enjoy his forthcoming columns. I had to retype his submission, so any typos are probably mine.

Finally, we have the last installment in the *What's In A Formatter?* series. This month we have a transcription of the discussion following the panel. I hope everyone has enjoyed the series as much as I enjoyed the session in San Francisco.

As usual, I'm always looking for new articles or ideas for the newsletter. My address is always in the back of the Newsletters, so please feel free to write or call with suggestions.

Al Folsom
Leverage Editor

WHAT'S IN A FORMATTER? — Philosophies in Conflict

Sam Whidden, Chair, Languages & Tools SIG

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 LaTeX, 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 the February issue of the newsletter. In March we continued 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. This month we present a brief transcription of the 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.

Sam Whidden: Our timekeeper tells me our speakers' time is up. I am going to suggest that we take some questions or comments on what you have heard today and let our speakers respond to them and perhaps respond to other speakers. I will make a comment. I confess to feeling quite uncomfortable with a system, although I'm a user of mark-up languages, that would forbid me access to the format of what I'm creating. I

know that the present systems do not completely isolate me from control of my output form but I take it that, from what has been said today, one of the attempts behind pure mark-up language approaches is to take away control over the format. In a real world I think it has to be true that you can't wrest control away from the author completely, because you can't provide a system that knows all about all possible format demands that one may face. Suppose I write for a lot of different publishers and their styles are all different, which style is your system going to accommodate?

Lamport: If I may answer to that, I would say that to the extent that the author has to add his formatting commands that is the extent that the system has failed. No system is perfect and at some point in the game with every system there is going to be some human intervention to fix things up. However, that's the final thing you do. Moreover it's not reusable because once you have fixed it up for one format and then submit it for publication in the AMS journal, all of that formatting you did gets thrown out and you have to redo it. So it is very important that you separate that visual formatting from the logical structure that's really the document.

Whidden: Thank you. Let's take the first question.

Audience: I haven't used real WYSIWYG editors, but I have been frustrated with the other kind, especially SCRIBE. SCRIBE is really good for manuals and that kind of thing but as soon as I try to do anything specialized at all, I get to a certain point where I say I can't seem to be able to do this or that in SCRIBE. What I would really like to see is the ability to load the whole thing into a WYSIWYG editor, manipulate the file and get it out and then have the WYSIWYG editor prescribe the SCRIBE commands that I don't know.

Reid: Yes, I have fantasy's too, and that is a good fantasy. But I won't apologize for SCRIBE. When I did it in 1976, it seemed like a good idea at the time.

It seems to do a much better job on those things on which it was designed than on those things on which it wasn't designed. That's a trait that it shares with COBOL and VMS!

Audience: Yes, what you find is that as soon as you give a person a tool like that they, think they can do everything with it, I guess.

Reid: When you give a tool like that to a professional writer they don't want to do things like that with it. As soon as you give a programmer such a tool, there is something in their neurological structure that makes them find out whether or not it can be programmed, and if so, how far?

Audience: My name is Ed Boyen from Solomon Brothers. I would like to interject a real world problem. I'm responsible for providing technology to a group of about 100 stock research analysts who produce about 200 professionally published documents a month. These people are writers who would object quite violently being told they have to sit in front of a terminal and enter their documents. They all have secretaries and they write things out longhand and in some cases they dictate them. So a lot of what I heard here today had an unspoken assumption that the writer was sitting at a terminal. I'm not so sure that that's the way it is out in the real world. Also, there was some research that we came across that was done at Carnegie-Mellon. It was a very good piece of research. They looked at professional writers some of whom wrote on paper and some of whom wrote on screens and they had an independent panel of professionals evaluate the quality of the writing. They found quite consistently that the quality of the writers who worked on screens was inferior to the writing of those who worked on paper. I happen to think that the right answer for our problem is obvious. We want a mark-up system that allows us, as a corporation, to maintain style consistency. In other words, I don't want my writers dealing with form. I want them to worry about getting the article written. We have professional people who will deal with the style question but I don't want hundreds of people dealing with the style question. I would like to have a batch process that would crank the style out. Page compositors are not good enough to do a perfect job. I think all of you have mentioned that. So, I would like the WYSIWYG capability of fixing it up when the mark-up can't handle the little things.

Bohn: May I comment on that? I think you raise two interesting issues. One, is what the impact of that type of tool is on the actual work flow and whether or

not if you separate out the editing function if it precludes using a WYSIWYG function. I think that many companies, including my own, who are in the business of producing electronic publishing systems have made deliberate decisions not to prescribe the kind of work flow that a company has. For example, there are many people who use a system as per batch formatter. They mark up a file on a VT100 and send it to a VAX station-based processor. Then they batch compile the document, bring it up and do post-pagination editing. The document is always in a consistent state unlike other systems where you have to go back to the input source file if you want to actually make page break changes. There is nothing that precludes using the system as a batch system in the model of a WYSIWYG model. And it is important to remember that because the real distinction is not between WYSIWYG systems and batch systems it is between systems that are modeled on an underlying structure of a document first is composition light tables, systems like PC based products in which you are actually flowing text or diagrams on a page without any underlying structure. That's the real distinction and that type of system really does determine work flow. It's a distinction between a generic mark-up approach and a procedural approach.

Reid: I would like to comment on the Carnegie-Mellon Study. I was there at the time and I was very annoyed that, as a scientific control, they didn't limit the paper users to 24x80 pieces of paper. I believe very much that if they did the same experiment nowadays where everybody has a microvax II and a big screen, they would get different answers. Although, I must confess that all my own writing I do on paper and then I transcribe it on my microvax and then I format it. I think I just like paper.

Lamport: From my own experience, I went from paper to terminal and my observation of my own writing was that the quality of my writing got worse and the speed improved. But now, ten years later, I couldn't even write with paper and I think I write a lot better now. I compare my writing now to the writing I was doing on my thesis, I was rather embarrassed by some of the things I wrote back then! So, a lot of it is a matter of learning.

Audience: Jim Nasser, First Baptist, Orlando - we have a media department that does the layout work for several writers who really don't care what their work looks like. But our layout people are really getting bogged down because of all the work. So we have been going through an evaluation as to what type of system we should buy. We looked at the Compugraphics system, we looked at systems on the VAX and software

on the VAX. In about two weeks we will be purchasing it. I would appreciate some feedback from the panel on whether this is going to work or not. We are planning to have the secretaries use their favorite editor on the VAX, create an asci file of the document whether, it is 1 page or 100 pages. This file will be downloaded to MacIntosh's in the media department where they can do the layout work. The people who do the writing don't have to worry what it looks like. The people who do the layout don't have to worry about the words, they just care how it looks. Is this a good solution? Bad solution? Or what?

Bramhall: Without going into a commercial advertisement, I think one thing you should consider is the size of the documents and especially the size of the resulting completed document on a MacIntosh or PC-Based Product. Over and over again, I think people tend not to see the complexity of information flow within a document production environment. They end up buying minimal solutions that really hinder the overall work flow of productivity that might otherwise be gained. Another thing, of the systems that are under discussion today, it is important to look at total solutions and people and vendors that can support a product. I think today there are supported products for both VAX, SCRIBE, Interleaf, and others and that's important.

Reid: The general rule should be applied here: it's never the right time to buy any software product because there is always something new coming soon, so you should always wait.

Audience: I'm Tricia Cross from the American Mathematical Society - None of the panelist addressed the issue of ease-of-use. I'm curious to know, in terms of user friendliness, what you say to new users and people who really believe that WYSIWYG is much easier to learn and use than SCRIBE or LaTeX. We see a reluctance to learn mark-up languages because the training would take a long time.

Reid: I'll answer to that. I can't speak for anyone else but, my system was written not with the intention that it be rammed down anyone's throat but that only consenting adults actually use it. I'm in favor of having people use whatever system they think is easy to use. It has been my experience that people who think of themselves as writers, the professional technical writer, was the user I had in mind. It has also been my experience that those people in general find my system easy to use just because it minimizes the amount of time that they use doing things that they don't like

to do. I have met a lot of people for whom that is not true, I'm assuming that you are one of them? Thank heavens everybody doesn't find the same thing easy to use. But if you're going to use something 8 hours a day and you don't like it, then we have a big problem. And in two weeks if you don't learn to like it, then we have an even bigger problem here. Sometimes things that are called user-friendly after three weeks you want to put a brick through the screen because you get really sick of what it is saying to you. That is the way I feel about Word-Star. But there are people who think that menu-driven and ease-of-use are great and I think as punishment for believing this you should be permitted to use one as long as you want.

Lampport: I have observed among colleague's the "I'll do the next page" syndrome. They'll say they intend to use LaTeX but they have this paper that is due now and they don't have time to learn it now but before the next paper they will. So, of course, they say that with every paper. Actually, in each particular case, knowing the systems that they are now using, it is definitely easier and would save them an awful lot of work to not learn a new system. However, the longer they keep using the present unsatisfactory system, the more extra work they're going to be doing. But human nature being what it is, I don't know if they will ever change over. So, I'm not sure if people's reluctance to do something is really a fair measure of its being difficult.

Audience: I'm Kevin Brooks from ASK Computers in Los Altos. - A lot of attention has been placed on the writer's here and that's good. A lot of what I do is technical writing. However, it seems that there should also be attention to the readers. Brian Reid did do that and I had the pleasure of taking one of Professor Reid's courses while at Stanford. You have to understand that Brian Reid has hundreds of students who are basically captive reader's who pay \$30.00, \$40.00, \$50.00 for the book. That is a strong motivation to read some of the book, at least get to the table of contents. Then when Professor Reid assigns homework or a program, at least the day before it's due, people crack the first or second chapter. So, it seems as though he has a captured audience and they will read that book sooner or later after the course is finished. However, as a technical writer for a company that produces manufacturing software and has the policy when its customers has problems with documentation to patch them through to the technical writer, we are very concerned about making sure that our documentation is out there very fast since it's released with the software all the time. It seems to me the audience is most important. If you are writing to those who aren't going to read the stuff unless it looks good then fine. If you're writing to an audience that is

going to pay for the book because they have to, then you can do anything you want.

Reid: The book he's talking about, I didn't even write!

Audience: My name is Larry Kilgallen and for purposes of this question I'm the editor of one of the DECUS Newsletters. I see this as a problem of religion. If we were trying to put together a special edition of the DECUS Newsletter with contributions from the four panel members, we would get MAG tapes, floppy disks, TK50's and TU58's each in a different style in producing documents, and then we would have to merge this. I envy the gentlemen who was about to decide the new policy that his company would follow for all future time. However, those of us who are not in a structured corporate environment have other problems and I wonder if you folks, as leaders in this industry, will help us out, with anything in the way of ecumenism.

Lampport: Well I would like to point out that there are now a couple of proposed standards for document exchange. They are in fact mark-up languages. If those standards were in effect, you would get four contributions from all of us in the same format. That is, they would all have the same logical structure produced according to these standard conventions which you would then put into your system which would format it according to the rules for your DECUS Newsletters.

Reid: Everything would look like the Reader's Digest!

Lampport: The closest thing to this, that I know of, is the fact that I can take a LaTeX document, send it to somebody across the network who has a different computer, a different printer, different fonts than I do and it will work on his system and it will work logically equivalent to what comes out on my laser printer and, in fact, look reasonably similar.

Audience: My name is Rick Wallace from Los Alamos National Labs - Many of the discussions I've heard, especially from the folks using batch formatters, sounded to me a little bit like people saying this kind of thing is bad for you because you can't do it. I use LaTeX, for example, and it has a lot of predefined commands. So I hit a function and it types the actual command with all the brackets and stuff, which is a lot like what you would do with a WYSIWYG system. You hit a function key and it inserts something in a text except, instead of typing out all those words, it

actually does some spacing and moves you over to a tab or whatever. If you had a system which was procedural in the sense that when you hit a function key it might put you on a separate place on the page, it might do certain spacing things for you and so on. But really the author is not worried about what it is doing yet he can still see the output. Is there a real good reason why you shouldn't do that? I mean suppose a document designer predefined the structure points so all you do is hit the key and it puts in the structure but the guy is actually looking at it on the screen the way it will appear on the paper. We have a lot of people who go nuts with TeX and LaTeX because they want to see the paper output, they really want to see it! Would that be bad?

Lampport: When I said I don't want to see the subscript the way it's going to be on the paper, it doesn't mean that I particularly want to see it as underscored, left bracket, right bracket. I don't regard that as a terribly good solution either. So anything that will help the reader and the writer see the structure of the document is good. So, if you have some nice editor that's going to show that as a subscript, and make it obvious that it's a subscript, then that's fine. But that is totally different and I think that is what your users want. I don't think they want to see something that is a pictorial representation of what is actually going to appear on the paper.

Whidden: Well, we must stop now. I want to thank the panel for a very interesting and thought-provoking session.

Reading a Program Version Number from the Image Header

When a user reports a problem with a program that has several different versions in use, it is useful for him to be able to determine the version of the program he is using. This way the programmer who is sent to his aid can find out whether the program needs to be fixed or if the user should just get a newer version of the program. The VAX/VMS Linker allows a program identification to be written to a field in the image header. This image identification can be read by using the ANALYZE/IMAGE Utility. Unfortunately, using ANALYZE/IMAGE is beyond the capabilities of most users. A simple solution to this problem is to print out a banner with the version number every time the program is run. One way to do this in FORTRAN is to put a line such as

```
WRITE( *, * ) 'M-1A1 Utility Program Version 2-037'
```

at the start of the program.

The only problem with this method is that whenever any module is modified, the module containing the version number and WRITE statement must also be modified. A better method would be for the program to determine its image version directly from the image header. This way the version number can be changed externally from the program itself. It only takes a little programming to allow an executing image to determine its own version number. The MACRO routine READ_HEADER in Figure 1 returns the image identification and link time.

The program version number can be entered in the image identification field of the image header by using a linker options file. The version number is entered by assigning a value to the keyword IDENTIFICATION. This command procedure compiles, links, and runs a program with the identification "2-023".

```
$ FORTRAN      EXAMPLE
$ LINK         EXAMPLE, SYSS$INPUT/OPTIONS
              IDENTIFICATION="2-023"
$ RUN         EXAMPLE
```

The following DCL procedure creates and runs an image that will print out its image identification and link time:

```
$ CREATE      EXAMPLE.FOR
              PROGRAM EXAMPLE
              CHARACTER * 16 IDENTIFICATION
              CHARACTER * 20 LINK_TIME
              CALL READ_HEADER( IDENTIFICATION, LINK_TIME )
              WRITE( *, * ) 'Version ' // IDENTIFICATION // ' ' //
              1 LINK_TIME
              END
$ FORTRAN     EXAMPLE
$ MACRO      READ_HEADER
$ LINK       EXAMPLE, READ_HEADER, SYSS$INPUT/OPTIONS
            IDENTIFICATION="1-001"
$ RUN       EXAMPLE
```

The output from the example program will depend upon the time it is linked but it will look something like this:

```
Version 1-001          31-FEB-1988 10:13:10
```

The version can be changed by just re-linking the program with a different entry for the "IDENTIFICATION" in the options file.

```
$ LINK       EXAMPLE, READ_HEADER, SYSS$INPUT/OPTIONS
            IDENTIFICATION="1-002"
$ RUN EXAMPLE
```

This time the output will be similar to this:

```
Version 1-002          31-FEB-1988 10:29:21
```

When an image is executing the image header information is stored in the image activator's image header buffer. The symbol CTL\$GL_IMGHDRBF, defined in SYSS\$SYSTEM:SYS.STB, is the address of a pointer to that buffer. The first longword in the buffer is the address of the image header descriptor and the second longword is the address of the image file descriptor.

The structure of the image header descriptor is defined in the module \$IHDEF in SYSS\$LIBRARY:LIB.MLB. The IHD\$W_IMIDOFF field of the image header descriptor gives the offset from the start of the image header to the image identification block. This block contains the image name, image identification, link time, and link ID. Its structure is defined in the module \$IHIDEF in LIB.MLB.

The image identification is a counted character string at the offset IHI\$T_IMGID. The maximum number of characters in the string is fifteen. The link time is stored in standard VMS quadword format at the offset IHI\$T_LINKTIME.

It is very common to use a command procedure to link a program, especially when the link command is very long. This same command procedure can be used to help document the development of the the program as in the following example:

```

$LINK PROGRAM, LIB$:OBJECT/LIBRARY, SYS$INPUT/OPTIONS
IDENTIFICATION="1-003"
$EXIT

!
! 1-003 Added the LENGTH argument to the procedure NEXT_CHAR.
!           16-May-1986 GEM
! 1-002 Fixed buffer overflow in function READ_INPUT_LINE. 16-May-1986
!           REP
! 1-001 Original Version. 13-May-1986 GEP
!

```

There is a lot of other information that can be obtained through reading the image header. The image name is stored in the image header in a similar way as the image identification. In addition, the image header contains all of the information needed to map and read the Debug Symbol Table. The VMS microfiche and the VAX/VMS Internals and Data Structure book are the best sources for learning to read the image header.

Figure 1.

```

.title READ_HEADER - Reads Image Header
.Ident /1-001/

;++;
; John Miano
; 24-June-1986
;
; Subroutine to return the image identification and link time.
;
; status = READ_HEADER( ident [,time] )
;
; Ident : Character String Passed by Descriptor, Write Only, - The
;         image identification.
; Time  : Character String Passed by Descriptor, Write Only - The image
;         link time
;
;--
.LINK "SYSS$SYSTEM:SYS.STB"/SELECTIVE_SEARCH
.LIBRARY "SYSS$LIBRARY:LIB"

$DSCDEF
$IHDEF
$IHIDEF
$$SDEF

.DISABLE GLOBAL
.EXTERNAL CTL$GL_IMGHDRBF

;++;
; Argument Pointer Offsets.
;--
$OFFSET 4, POSITIVE, <IDENT, TIME>

.PSECT CODE, RD, NOWRT, EXE, LONG
.ENTRY READ_HEADER, `M< R2, R3, R4, R5, R6, R7, R8, R11 >

CMPL (AP), #1 ; Make sure that there is at least
BGEQ ENOUGH_ARGUMENTS ; one argument to this routine.
MOVL #SS$_INSFARG, R0
RET

ENOUGH_ARGUMENTS:
;++;
; Get the indentification of the image.
;--
MOVL @#CTL$GL_IMGHDRBF, R11 ; R11 = Address of image buffer.
MOVL (R11), R6 ; R6 = Address of image header.

CVTWL IHD$W IMGIDOFF(R6), R7
MOVAB (R6)[R7], R7 ; R7 = Address of ID Block.

CVTBL IHI$T IMGID(R7), R0 ; Length of the ID String
MOVL IDENT(AP), R8
MOVCS R0, <IHI$T_IMGID+1>(R7), #32, -

```

```
DSC$W_LENGTH(R8), @DSC$A_POINTER(R8)
```

```
CMPL (AP), #2  
BGEQ RETURN_TIME  
MOVZBL #1, R0  
RET
```

```
RETURN_TIME:
```

```
;++  
; Get the time the image was linked and convert it to ASCII.  
;--  
$ASCTIM_S TIMBUF=@TIME(AP), -  
TIMADR=IHI$Q_LINKTIME(R7)  
  
RET  
  
.END
```

FUN WITH DCL

This column is a feature of the Languages and Tools section of the combined newsletter. Each month I will present some DCL commands or command procedures that have been found to be useful by me (or you) in software development. Useful hints and tricks that may be done with DCL will be included.

I am not restricting this to VAX/VMS. RT-11, RSTS/E, RSX-11M, all have DCL to some level. I encourage each of you to send us any DCL procedures, symbols, one-liners, etc. that you find to be useful. Address your suggestions to me or Al Folsom, the *Leverage* newsletter editor.

Version 4 of VMS provides a lexical function, F\$EDIT. This lexical may be used to up-case or lower case a string.

```
$ Ans = F$EDIT(Ans, "UPCASE")
```

The available functions are:

COLLAPSE	Remove all spaces and tabs from the string.
COMPRESS	Replaces multiple spaces and tabs with a single space
LOWERCASE	Makes the string lower case.
TRIM	Removes leading and trailing spaces and tabs from the string.
UNCOMMENT	Removes comments from the string.
UPCASE	Makes the string upper case.

Edits are not applied to quoted sections of the strings. Therefore, if a string contains quotation marks, the characters within the quotes are not affected by the edits specified in the edits list. You can use one or more of the following keywords in the edit list: COLLAPSE COMPRESS LOWERCASE TRIM UNCOMMENT UPCASE.

An example for lower casing before the use of this function is as follows:

```
$      Count = 1
$ Loop:
$      Char = F$Extract(Count,1,Name)
$      If Char .GES. "A" .and. Char .LES. "Z" then -
          Char[5,1]=1
$      Name[Count,1] := ""Char""
$      Count = Count+1
$      If Count .LT. F$LENGTH(Name) then GOTO Loop
```

This procedure lowercases all but the first character in the string. It may now be replaced with:

```
$ Name = F$Extract(0,1,name)+-
          F$EDIT(F$Extract(1,F$LENGTH(name),Name),"LOWERCASE")
```

Earl S. Cory

**EATON Corporation
31717 La Tienda Drive
Westlake Village, California 91359**

Language and Tools SIG

Working Groups

The Language & Tools SIG has seen tremendous growth in both its membership and in the scope of topics and products that it attempts to cover for the body of DECUS. To better address the already large number of topic areas, and in anticipation of even additional topics, the L&T Steering Committee has drafted a plan to formalize "Working Groups" to concentrate on specific issues within an area of L&T.

Wherever there is a body of L&T members sufficiently interested in focusing on a L&T Topic, a Working Group can be formed. Working Groups can cover broad topic areas such as "Configuration Management" or become highly focused on some specific issue, such as "Data Type Compatibility Between Languages." Several of the working groups are already expected to become semi-permanent bodies for addressing ongoing issues in some area (a Fortran Language Working Group for example). Other working groups might be formed to address some critical need and then disband when their work is finished.

In general then, a Working Group will exist as long as there is a body of DECUS members sufficiently interested to make the group work.

There are only three requirements for a Working Group to exist within the L&T SIG:

1. The Working Group must have an acknowledged Chairperson to lead the group, to coordinate its activities with that of the L&T SIG and other bodies of DECUS, and in general be its champion that keeps the group alive.
2. Each Working Group must have some product (i.e. some output) delivered at least annually to the L&T SIG. Examples of suggested products are:
 - A position paper delivered to the L&T Newsletter.
 - The generation of sessions/papers/panels for a DECUS Symposia and/or submissions to the Symposia Proceedings.
 - To hold BOFs, either at DECUS Symposia or outside of the formal gathering, yet report on the BOF's findings through a Newsletter Article or Session at Symposia.
 - A collection of new submissions to the SIG's Tape Librarian , or the revision/maintenance and re-release of existing L&T SIG Tape programs.
3. Each Working Group must deliver a brief summary of the group's activities or plans, twice each year (prior to the DECUS Symposia's) to be incorporated into a report for the SIG Newsletter. This summary can be as short (and sweet) as a single paragraph which describes the current goals and or efforts of the working group.

Clearly a Working Group can provide all of the above or even consider other "deliverables" to the SIG, and do so more frequently than once a year if possible.

To represent the Working Groups to the Steering Committee, the permanent position of "Working Group Coordinator" has been formed on the L&T Steering Committee. The functions of the Working Group Coordinator (as currently envisioned) are:

- To serve as the liason between the various L&T Working Groups with each other and as the liason between the Working Groups and the other functions of the SIG.
- To maintain close contacts with the chairs of the various Working Groups, and to assist them in making contact with both other relevant DECUS groups and, in some cases, with DEC personel.
- To chair an open joint meeting of all working groups that can participate at a Symposia.
- To serve as the editor for the bi-annual Working Group Report for the Newsletter.
- In general, to assist the Working Group Chairs in whatever ways possible to support their group's effort.

In fact, Working Groups are not a new phenomena of the L&T SIG, just not as formally recognized. The Working Goups that do currently exist or are already in the process of being formed include:

- Configuration Management
- Tools Integration
- Software Metrics
- Public Domain Software
- PDP-11 Languages & Tools
- Fortran
- C
- Data-type Compatability
- Office Automation Technical Specifications
(Includes Desk Top Publishing and Word Processing Systems)
- Coordination of software version releases
- Documentation
- Project Management Systems
- TECO

There will more discussions of L & T Working Groups at the Nashville Symposia. Look for notices in the *Update.Daily* for the time and location of this open meeting.

If you are interested in participating in any of the L&T Working Groups, or if you have a topic around which to form a Working Group, contact any of the L&T SIG Steering Committee at Symposia, or send a note to:

Joseph A Pollizzi, III
Space Telescope Science Institute
Mail Stop: OSB
3700 San Martin Drive
Baltimore, MD 21218

Languages and Tools Masters Program

The LANGUAGES & TOOLS SIG has established the designation "LANGUAGES AND TOOLS MASTER", to be applied to selected, qualified people willing to share their expertise in various subjects with others. Masters are people who are knowledgeable enough in one or more languages and tools to be comfortable answering questions about them. The qualifications of an L&T Master are: expertise in a specific area, a willingness to have his/her name published as a Master, and a willingness to volunteer services in different ways. Each product may have several Masters, and there is an overall Masters Coordinator who sits on the L&T Steering Committee.

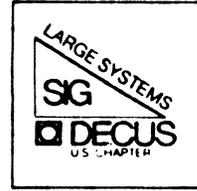
Masters are asked to act in at least some of the following capacities: to serve other users as a resource on products within their competence, submit articles to the newsletter, speak at LUG meetings in their area, participate in SIG Working Groups, suggest, chair, or present Symposium sessions, host BOFs at Symposia, help at clinics, field test products, interact with the DEC product manager when appropriate, or act as a reference for the product for Digital salespeople.

At Symposia, Masters will wear an identifying button bearing the legend "Ask Me About....." (and the name of the language or tool in which he/she specializes).

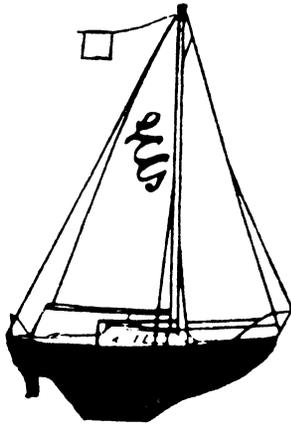
L&T will maintain and publish a directory of Masters in its newsletter. Readers are encouraged to seek assistance with products by calling appropriate Masters.

Those interested in serving as Masters should fill out the accompanying form. The form should be handed to any L&T Steering Committee member at Symposium, or to the Campground Host, or mailed to:

Dena Shelton, Languages & Tools SIG Masters Coordinator
Care of: Sam Whidden
American Mathematical Society
P.O. Box 6248
Providence, RI 02940



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

Chairperson's Article

Leslie Maltz

Let me share with you some things that have happened in recent weeks as well as some thoughts on some events yet to happen. As you certainly know by now, at the Fall Symposium in San Francisco in October, Digital announced some changes in their policy regarding the transfer of software licenses. The announcement represented a drastic shift in posture from the long standing policy of transferrability. We were told that as of the beginning of this year, such transfers would cease to be authorized. The announcement went further in its restrictions.

Much was said by all those present in San Francisco, and the announcement became a DECUS-wide issue. A task force was quickly formed by President Goldsmith, and included June Baker (DECUS Vice President), Marg Knox (VAX SIG Chair), Clair Goldsmith, and myself. This group held numerous discussions among ourselves to map out a strategy, and with Digital to try to understand their position. A result of these efforts in conjunction with your many comments to Digital, was a modification and delay in the implementation of the new policy until March instead of January. The effort did not stop at this point.

Early this year you were asked to participate in the process by informing us of the impact of Digital's decision. This was an effort to quantify the impact of the revised policy.

Since there was no symposium scheduled between January and the March effective date, a mailing was the only means available for collecting significant data. You responded quickly and strongly. The data was analyzed and presented to Digital at an executive level meeting. Further discussions ensued and we are all pleased to have participated in an effort that resulted in the modifications as now announced. The details have been covered elsewhere, but it is now the policy that the operating system belongs with the processor, and on a transfer, that is what will happen. This is a reversal of the San Francisco announcement.

There was a recent article in the trade press that questioned the effectiveness of user groups. The implication was that not much, if anything, was ever accomplished in influencing vendors. Some of us felt that this was not the case with DECUS, but now this is a clear example that shows the contrary. Having participated in the activities of the task force and seeing the end result, it is clear that the influence of DECUS in representing the user community is substantial. We worked together as a user society with a vendor to reach a more palatable solution.

The details of the amended policy will be described at the Spring Symposium in Nashville in addition to many other places. It will be covered in sessions, and it is expected that we will have an opportunity to discuss site specific problems in our campground. Every effort is being made to inform everyone of the details. There will be many other important and interesting activities in Nashville, and I encourage you to attend. The sessions should be informative and lively. With new highend systems now supported by Digital, we expect to see many new faces joining our ranks. Looks like Digital is back in the mainframe business according to the ads. On a light note, a new surprise will be available in the DECUS Store. You won't want to miss it.

The license transfer issue has been resolved. Now on to new challenges. See you in Nashville!

-Leslie

Nashville Preview

Betsy Ramsey

The DECUS U.S. Chapter Spring Symposium will be held at the Opryland Hotel in Nashville, Tennessee, April 27th through May 1st. The deadline for pre-paid registration is April 8th. Walk-in registration begins at 3:00 pm on Saturday, April 25th.

Over 1000 hours of sessions will be presented at the Symposium. The Large Systems SIG, which has as its focus the issues and concerns associated with the management and use of Digital's high-end computing systems, will present 41 sessions over the five days of the Symposium.

In addition, on Sunday, the Large Systems SIG will sponsor a pre-symposium seminar titled "Everything You Always Wanted to Know about TCP/IP". The seminar will provide a comprehensive overview of the TCP/IP family of network protocols. Originally developed by the Department of Defense for use on wide-area networks such as the

Arpanet, TCP/IP is now available from a wide variety of sources and is being used on many different types of networks and computer systems. The seminar will be taught by Len Bosack, the senior engineer for cisco Systems, a vendor of TCP/IP equipment. He has participated in the construction and operation of the Stanford University campus network, which consists of 50 separate Ethernet segments acting as a single network. Mr. Bosack has been involved with TCP/IP since its original development. Walk-in registration will be available for pre-symposium seminars, although there is an additional charge. "Everything You Always Wanted to Know about TCP/IP" has been very popular at previous symposia, so it's best to pre-register.

The Large Systems SIG sessions are mostly grouped by topic. The Large Systems SIG Roadmap and Directions sessions are scheduled for first thing Monday morning. Monday and Tuesday sessions are aimed at TOPS-10/20 users, with the emphasis Monday on conversion to VMS, and Tuesday on traditional 10/20 sessions. Wednesday and Thursday the emphasis shifts to high-end system concerns. Friday the focus is on Hewlett-Packard and CDC users converting to VAX/VMS.

The following is a complete list of the Large Systems SIG sessions, in chronological order.

Monday

- 9:00 - 9:30 LS005 Large Systems SIG Roadmap
- 9:30 - 10:00 LS007 Large Systems SIG - Current Issues, Emphasis and Directions
- 10:00 - 11:30 LS001 10/20 Marketing Update and Engineering Overview
- 11:30 - 13:00 LS037 TOPS to VMS Conversions: Getting Started on VMS for TOPS Users
- 13:00 - 14:00 LS030 TOPS to VMS Conversions: System Management Hints and Kinks for DECsystem-10/20 System Managers
- 14:00 - 15:00 LS029 TOPS to VMS Conversions: Moving Database Applications
- 15:00 - 16:00 LS003 DEC-10/20 to VAX/VMS Conversion: User Experiences in Moving to VMS; A Panel Discussion
- 16:00 - 16:30 LS018 An Academic Conversion From a DECsystem-10 to a VAX 8650
- 16:30 - 18:00 LS004 VMS Internals for DECsystem-10/20 System Programmers

Tuesday

- 9:00 - 10:30 LS027 DECsystem-10 Technical Update
- 10:30 - 11:00 LS028 DEC-10/20 Mail System Internals (Interfacing to External Mail Systems)
- 11:00 - 12:00 LS009 TOPS-20 EMACS Magic
- 12:00 - 13:00 LS026 DECSYSTEM-20 Technical Update
- 13:00 - 14:00 LS017 TOPS-20 to UNIX Conversion, Experience at Columbia University
- 14:00 - 15:00 LS021 AMAR - A Performance Analyzer For TOPS-10/20
- 15:00 - 16:00 LS010 Internet Domain Service
- 16:00 - 16:45 LS011 TOPS-10/20 Utility Closet
- 16:45 - 17:15 LS008 Fun with TOPS-20 - Customizing Your EXEC
- 17:15 - 18:00 LS020 TOPS-10/20 Gurus' Get-Together

Wednesday

- 9:00 - 10:00 LS013 Planning and Implementing a Large Network
- 10:00 - 11:00 LS014 Managing High-End Systems in a Multi-Vendor Environment

- 11:00 - 12:00 LS015 User Account Management at One Large VAXcluster Site
- 12:00 - 12:30 LS046 Project Accounting in a Cost Recovery Environment Using UIC's, ACL's and Right Identifiers
- 12:30 - 13:15 LS042 VAX/VMS Distributed Queuing System for Implementing Remote Queues
- 13:15 - 14:00 LS023 Large Tape Farm Management - Myth or Reality?
- 14:00 - 15:00 LS040 Magnetic Tape Handling on VAX/VMS: Digital Responds to DECUS Input
- 15:00 - 16:00 LS036 DECsystem-10/20 System Management and Operations for VAX/VMS System Managers
- 16:00 - 17:00 LS016 Disk Space Management at One Large VAXcluster Site
- 17:00 - 18:00 LS024 Large Disk Farm Management

Thursday

- 9:00 - 10:00 LS031 High-End Packaged VAXcluster Systems
- 10:00 - 11:00 LS034 High-End VAX Configuring: Wires and Boxes
- 11:00 - 12:00 LS035 High-End VAX/VMS Configuring: Case Studies
- 12:00 - 13:00 LS032 High-End VAX Product Positioning
- 18:00 - 19:00 LS006 Large Systems SIG Town Meeting
- 19:00 - 20:00 LS033 High-End VAX/VMS Hardware/Software Update
- 20:00 - 21:00 LS043 High-End VAXcluster Performance
- 21:00 - 22:00 LS045 VAXcluster as a Fault-Tolerant High-Availability System
- 22:00 - 23:00 LS038 Migrating Hewlett-Packard Data Centers to VAX/VMS

Friday

- 12:00 - 13:00 LS022 VAX Information Centers: Architecture for Success
- 13:00 - 14:00 LS039 Migrating Hewlett-Packard Data Centers to VAX/VMS: User Panel
- 14:00 - 15:00 LS041 Converting from CDC to VMS

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: Tue, 3 Feb 87 15:33 MST
 From: <RFORSTER@UNCAEDU.BITNET>
 Subject: BITnet to DECnet and vice versa
 To: tops-20@score.stanford.edu

We are currently in the process of trying to find a (or write) gateway between DECnet -> BITnet and vice versa. It is to be used on a VMS machine that currently has

JNET and gMAIL. We are also looking for a real SMTP server on a VMS machine to talk to the MM subsystem on the 20 side and mail the message to the VM\$MAIL system (such as it is) We are also looking for documentation of the mail/protocol= command on VMS.

If anyone can help with any of the above, we would be most grateful.

/Russ

“You can do anything you want with TECO and DDT” (as sung to ALICE’s Restaurant)

Date: Wed, 4 Feb 87 12:51 MST
From: <RFORSTER@UNCAEDU.BITNET>
Subject: LGOUT% not honoring ACJ denials

LGOUT% does not honor ACJ denials. Quite by accident we found out that ACJ denials were not being honored at logout time (we deny users from logging out when over perm quota).

I know this worked under 5.1, however in looking at the code I cannot see any difference.

TSC and I have figured out a hack for honoring the ACJ denial.

```
$Get Monitr.Exe
$Start 140
lgogok+15/ JRST SERPOF+33 jrst mretne
↑Z
$save Monitr.Exe
```

From what information I got from TSC, it appears that this hack sits right in the middle if the GETOK macro.

If someone else has another way to have LGOUT% honor ACJ’s requests I’d be interested in hearing from you.

/Russ

Date: Sat, 7 Feb 87 13:43:06 est
From: munnari!neumann.une.oz!gordon@seismo.CSS.GOV (Gordon Smith)
Subject: Mail routing...

We’ve just installed v6.1 (no we don’t have the official DEC release yet) on both our -20’s, brushed the dust off the NIA20’s, plugged them into the DELNI and installed PSI on the MicroVAX II.

Now... I’d like to be able to have some users on the -20’s send mail out on PSImail through the VAX. The reverse works fine - I can send mail out from the VAX via PSI back into the VAX then routed to a -20.

Are there any tricks (or software) I’m missing to route through the VAX and out using PSImail?

Gordon Smith. Computer Centre, University of New England, Armidale, Australia.

P.S. Thanks for letting Australia borrow that CUP for the last three years.

Date: Sat, 7 Feb 87 11:50 MST
From: <RFORSTER@UNCAEDU.BITNET>
Subject: Re: Mail routing...

Gordon Smith of Computer Centre, University of New England, Armidale, Australia.

Writes...

>We’ve just installed v6.1 (no we don’t have the official DEC release yet)
> ...
>Are there any tricks (or software) I’m missing to route through the
>VAX and out using PSImail?
>

If you also have MS v11 (and heaven help you if you do), you can send mail to a PSI address from the -20’s.

What you do is define an alias in your MS.Init file with the following format:

```
DEFINE ALIAS alias-name “psi%dte-addr::username”@vax-host
```

We use this quite successfully. There is one problem though, MS cannot reply to the message coming from PSI. You can forward and send just fine though.

I hope this helps.

/Russ

>P.S. Thanks for letting Australia borrow that CUP for the last three years.

You’re welcome.

Date: Mon, 9 Feb 87 13:37 MST
From: <RFORSTER@UNCAEDU.BITNET>
Subject: Re: Mail routing...

It appears that in my previous response to sending mail from a -20 to a vax with PSI was incomplete. In order for that procedure to work you must also create a file in UPS: called DNHOST.TXT and insert file following line.

```
vax-host/Strip-Quotes
```

The Strip-Quotes switch is an undocumented feature of MX.

Sorry for the incomplete response.

/Russ

Date: Mon, 9 Feb 87 13:16:48-1000
From: uhccux!uhmanoa!uhmanoa.ICS.HAWAII.EDU!jeff@nosc (Jeffrey Blomberg)
Subject: TeX

I am sure this question has been asked before, but I am fairly new to the Tops-20 mailing list.

I have been informed that there is a version of TeX available for TOPS-20. If this is the case, would someone be willing to point me in the right direction - I have a faculty member who is sure that there is a public domain version around, but this is not a must.

One other point worth mentioning. It would be best if this TeX package could generate postscript output for ease of use via LPTSPL.

Aloha. -jeff-

Date: Mon 9 Feb 87 21:46:29-PST
From: Eric M. Berg <A.ERIC@GSB-HOW.Stanford.EDU>
Subject: Re: TeX

Yes, "there is a version of TeX available for TOPS-20". TeX was developed on a TOPS-10 system (SU-AI), and much additional work was done on a TOPS-20 system (SU-Score.ARPA).

As your message suggested, it's in the public domain. (TeX itself is completely in the public domain, although certain implementations of it, mostly for micro-computers, are not.)

The preferred way of obtaining Tex is to order a TOPS-20 distribution tape from Maria Code, Data Processing Services
1371 Sydney Drive
Sunnyvale, CA 94087

You'll want the TOPS-20 tape, and then either the 200/240 dpi or 300 dpi FONT tape, depending on the resolution of your printer. The TOPS-20 tape includes sources and .EXE files for TeX, METAFONT, and associated programs, as well LaTeX; the font tape includes the CM fonts (METAFONT sources and .GF files).

The two tapes together will cost you \$164, plus \$4 shipping. Maria Code also can provide you with manuals & other documentation; you might want to write them for a price-list.

"Device driver" programs (programs which convert .DVI files output by TeX into a form capable of being printed on a specific printer) are generally not included on the Maria Code tapes. There is a public-domain .DVI to PostScript program (called DVI2PS) which was written for Unix systems and recently ported to TOPS-20 at Stanford. (You can send mail to BillW@Score.Stanford.Edu to get more information.) There are other device drivers for Imagen printers, DEC LN03s, etc., etc.

You probably want to ask to be added to the TeXhax mailing list (send mail to TEXHAX-REQUEST@Score.Stanford.Edu), and to join the TeX Users Group and the The TUGboat (their newsletter). The address for the TeX Users Group is P. O. Box 9506, Providence, RI, 02940.

Date: Thu, 19 Feb 87 18:40:30 PST
From: Mark Crispin <Crispin@SUMEX-AIM.Stanford.EDU>
Subject: found on an MIT ITS system

VAXOLOGY

There is a computer named VAX,
Which is totally loaded with hacks,
But the real piece of crap
Is the overflow trap,
Which an old-PC register lacks.

It's got byte-string instructions galore,
But the packed decimal format is poor,
And the halfword length means
That it isn't worth beans,
Just like the 360's of yore.

Oh, the branch mnemonics are losing,
And the right to left numbers confusing,
But the thing that's a pain,
An efficiency drain,
Is the minuscule page size they're using.

Well, they give you lots of good stuff,
And the address space size is enough,
But you can't do an "exch",
And it makes you say "bletch",
When you see all the RSX cruft.

I'm not sure who wrote this; I suspect it was Dave Moon. Anyway, at least it's some entertainment to those 10/20 folks who are in the throes of "integrating." The file, by the way, is on AI.AI.MIT.EDU as HUMOR;VAX BUGS

[Editor's Note: I changed the spelling of "minuscule" in the last line of the third verse. It was spelled "miniscule" in the mail received from Mark. On further consideration, I have decided that "mini" may have been intentional. ctp]

Date: Fri 20 Feb 87 22:12:41-PST
From: Mark Crispin <MRC%PANDA@SUMEX-AIM.Stanford.EDU>
Subject: and it isn't even 1988 yet!

Remember when Jupiter was cancelled, back in '83, they said we would have 5 more years of development on TOPS-20? Well, read the answer to SPR 20-21468 in the 15 January 1987 Software Dispatch. Joe Payne of 3M asked that the EXEC be taught about EDT's switches in the EDIT command, since it already knew about SED's and EDIT's switches.

DEC's answer: "at this time, we do not intend to add the functionality in question...possible inclusion...should the resources to do so become available."

Well, since development has ended at least a year early, let's hop to it and get more pressure going on DEC to put TOPS in the public domain...

Date: Mon 23 Feb 87 18:03:55-EST
From: Thomas De Bellis <Sy.SLogin@CU20B.COLUMBIA.EDU>
Subject: LPTSPL question

Recently I've been grumphed at by a number of people who have been trying to use the EXEC print/begin: option.

For example, we have a printer on campus that is restricted to a per job page limit maximum of 20 pages. A user had a 30 (printed) page file, issued a print request with a /begin:20 switch and expected to see more or less 10 pages come out. This sounds reasonable to me.

Nothing came out because LPTSPL still does accounting for the 20 pages. As soon as he went past page 20 and tried to print, he got kicked out. In other words, LPTSPL is doing accounting for pages that are not physically printed.

It strikes me as rather silly to bill for output that isn't generated.

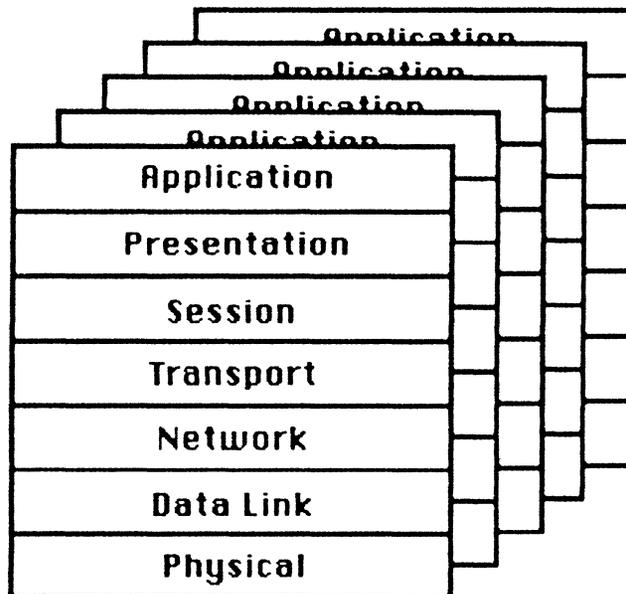
So, I've been thinking of making the /begin: code in LPTSPL subtract the number of pages to be printed from J\$APRT. It doesn't appear to be straightforward to make this happen correctly in the forward spacing code or make CNTDWN respect all this. For example, what would I do if the total number of pages printed remained negative? Not, print anything? Change the sign of the result? (Tee hee..)

If anyone has done it, I'd like to hear from you. Opinions are welcome, also. Otherwise I'll roll up my sleeves and do it myself (sigh).

- Tom

NETworks

The NETWORKS SIG Newsletter



The Editor's Cobwebb:

Here we go again!! It's hard to believe another month has gone by! You know what they say - time flies when you are having fun! Are we having fun yet???

As you may or may not realize the Nashville symposia is coming up fast. To help us decide what networks sessions we should attend, Bill Brindley has written an article describing the highlights for the week. Thanks, Bill!! I'm sure all of us will find this extremely helpful.

Starting with this quarter of the year (April, May and June) I will be numbering any submissions I receive that are published in NETwords. At the end of each quarter I will draw a number and the winning article/number will receive a nice prize! So come on - send your submissions TODAY!!! To submit your articles - send a hardcopy, a Macintosh floppy, or through DCS (for those of you who can). Remember - to win the article must have been PUBLISHED in NETwords starting with the April 1987 issue. The articles must relate to networks and communications, without any commercialism, in order to be published. The Networks steering committee is not eligible to win. - Sorry, guys!! Send your submissions to me at 2510 Limestone Lane, Garland, TX 75040.

See ya in Nashville!!

VH

Networks SIG Coming Highlights - Spring '87

By: Bill Brindley
Networks SIG Chair

The Networks SIG offers alot of interesting, informative, and entertaining activities at the upcoming Symposia. We are sponsoring approximately 70 sessions. I will present an overview of a few of the many sessions in this column. Do come to the Spring DECUS Symposium the last week of April in Nashville. You will find the investment of your time receives a better return than any other training/symposia/conference available anywhere today. DECUS offers incredible depth and breadth of topic coverage. The Networks SIG offers the same breadth and depth in all topic areas of Networks/Communications.

In addition to the sessions listed/described below, the Networks SIG sponsors a number of Networks Suite sessions thoroughout the week. At these sessions, the SIG personnel, Digital developers/product managers, and a large number of user personnel are available to discuss varying network issues and

solutions/alternatives which have proved to be very beneficial to a large number of users at past symposia. See you soon! Enjoy!

ROADMAP

In order to maximize your time at the Networks offerings, come to the Networks Roadmap session. This session is the first Networks session which is presented on Monday morning. This session presents an overview of all of the Networks SIGS activities during the week. This session will be presented at 9am in the Jefferson Room of the Opryland Hotel.

This is a "must attend" session for those interested in obtaining the most from the Networks SIG sponsored sessions at the symposium. First timers as well as continuing attendees should attend this session. A first time attendee who goes to this session will know more about this symposium than a regular attendee who doesn't. The Networks SIG presents an overview of the week's activities, and announces last-minute changes to the schedule. SIG Steering Committee members and Digital representatives are introduced to enhance communications throughout the week.

This session is designed to help attendees obtain the most benefit from the symposium. Sandra Traylor, our Symposium Coordinator, presents Symposium logistics. Our Standards Coordinator, Jim Ebright, highlights the SIG's Standards activities. The Technology Coordinator, Bill Hancock, covers current network developments. Bob Gustafson, Communications Representative, discusses Communications activities. Vickie Hess, our Newsletter Editor, highlights Our Publications activities. The Networks SIG's Digital involvement/support is provided by our Digital Counterpart, Carole Greenfield. Our SIG Chairman, Bill Brindley, will announce special SIG-sponsored activities.

NETWORKS AND COMMUNICATIONS UPDATE

This session presents highlights of recently announced software and hardware products, as well as service offerings. The presentation describes these products and discusses their applications. This session will be at 10am in the Jefferson Room on Monday. This session is your "Roadmap" into the new technology/products that will be discussed during the week related to Networks/Communications.

NETWORKS SIG KEYNOTE

As I mentioned in a previous article, our Networks SIG Keynote speaker will be Gordon Bell, previously Vice President of Engineering, Digital Equipment Corporation. This session will be presented at 11am on Monday morning in the Washington Room of the Opryland Hotel.

Since ENIAC, Government funding (e.g. military, National Science Foundation -- NSF) has played an important role in computing research, creating new computers and applications. The Computer and Information Science and Engineering (CISE) Directorate at NSF was formed to focus on computing; it includes both research and operations (NSFnet and five supercomputer centers). The challenges and opportunities appear to be:

- o a revolution in computation brought about by the evolution of mainline computing which exhibits a high degree of parallelism;
- o needs for networking to interconnect Campus/Local Area Networks sites;
- o software engineering and its diffusion and needs within all disciplines;
- o artificial intelligence and robotics; and
- o next generation Ultra Large Scale Integrated Systems.

USING BROADBAND WITH DIGITAL'S NETWORKING PRODUCTS

For those planning or installing broadband transmission media in their facilities, Digital offers a wide range of networking products. Many of these are directly usable on broadband facilities. This session discusses broadband capabilities in a DECnet networking environment, and their integration with Ethernet, PBX, and long haul links.

USING AND MANAGING DIGITAL'S TERMINAL SERVERS

This presentation discusses detailed aspects of setting up and running Digital's terminal servers in an Ethernet LAN environment. The session presents information on the latest versions of the terminal server product family. It covers ways to set up configurations to use some of the more advanced aspects of terminal servers. In addition, topics such as configurations, terminal server management, and performance are discussed. Time will be available for questions and answers.

UNDERSTANDING ETHERNET

While it is true that Digital has provided a fairly good Ethernet product set for most applications, there is still a general lack of understanding of what Ethernet is and where it can and cannot be used. This session focuses on the use of Ethernet, how it works, what kinds of cautions have to be followed in its specification and use by companies, and other general items of note for those interested in the technology and its potential usage. Time for questions will be provided.

NETWORKING PCS - QUESTION & ANSWER SESSION

A panel of experts on Digital's networking products for PCs will be on hand to answer your questions. Topics such as Thin Wire Ethernet and DECnet-DOS will be welcome. Bring your questions or just sit in to pick up valuable information on applications, technologies, and PC network uses.

DECCONNECT COMMUNICATIONS SYSTEM

This session will examine the features and benefits of the DECconnect Communications System. DECconnect focuses on Digital's distinctive competence--Local Area Networking--specifically, Ethernet. DECconnect provides a comprehensive communications solution with multiple technologies in one cabling system. DECconnect integrates into one faceplate: 10 Mbps ThinWire Ethernet for PC or workstation connections, unshielded twisted pair cable for terminal connections, unshielded twisted pair for voice connections and standard coaxial cable for video applications.

DECconnect is configured with radial wiring running from each office faceplate to a central point on the floor, a Satellite Equipment Room (SER), which houses the network electronics such as ThinWire Multiport Repeaters, DECserver 200 Terminal Servers, DELNIs, and LAN Bridge 100s. From the Satellite Equipment Room, the connection is made through a transceiver to the backbone standard Ethernet cable.

Standalone ThinWire Ethernet LANs will also be discussed. Time will be available for questions about specific floor or building LAN configurations.

INTRODUCTION TO NETWORK MONITORING USING DECNET/VAX

This session discusses the use of Network Control Program (NCP), Network Management Listener (NML), and event logging to monitor a DECnet network. The presentation describes the basic concepts of network management, with emphasis on monitoring. Information is related to the various "layers" of DECnet as an aid to understanding the source of some errors. The session presents examples to demonstrate building network tools using the features of DECnet/VAX.

EASYNET - DIGITAL'S DISTRIBUTED COMPUTER NETWORK

Digital has been providing networking and distributed processing products for many years. As a worldwide, multibillion dollar corporation, Digital has also used most of these products to conduct and improve its internal business communications and Management Information System (MIS) applications. In fact, Digital's corporate computer network -- EASYnet -- is the largest DECnet network in existence, with

over 10,000 nodes. Besides supporting the corporation's information flow, EASynet also plays a valuable role in being a test bed and showcase for Digital products.

This presentation describes the EASynet configuration, major network applications, support strategies, and network management tools and techniques.

DDCMP PROTOCOL ANALYSIS

This session analyzes the Digital Data Communications Message Protocol (DDCMP) from its initialization to running states, and discusses the different ways DDCMP handles error recovery and flow control. The presentation gives DDCMP examples, and includes a sample worksheet showing how to parse DDCMP messages. The session explains how the protocol works at the data link level to envelop other protocols at higher layers in the DECnet architecture. Prerequisite background for the presentation is an understanding of binary to hexadecimal conversion and a basic understanding of generic protocol handshaking.

THE DECNET PRODUCT SET: MILESTONES IN HISTORY, TEMPLATE FOR THE FUTURE

This session presents an overall review of the evolution of the DECnet product set throughout its history, and examines the product needs as they will be used into the 1990s. The presentation covers specific historical events, such as:

- o pre-DECnet Digital communications;
- o a product and function summary of each Phase of DECnet; and
- o the issues that each Phase addressed.

The session stresses how, by adhering to a single architecture (Digital Network Architecture), the product set evolved with time, technology, and changing customer needs to the current Phase IV implementation. DECNET/SNA GATEWAY AND VMS/SNA PERFORMANCE ANALYSIS WORKSHOP

SNA Gateway users often ask: "How many SNA functions can I run across a single Gateway concurrently?" and "I want to have N concurrent sessions of type X across a single gateway. What performance levels can I expect?" This session provides the answers to these and other questions about System Network Architecture (SNA) in the form of a detailed workshop. The workshop addresses:

- o key performance metrics for supported gateway and VMS/SNA functions;
- o tradeoffs in obtaining optimal values for these metrics; and
- o feasible combinations of functionality in a single gateway environment, keeping the goal of "reasonable performance" in mind.

New material on VMS/SNA performance is included. The material presented is largely a reflection of the detailed performance analysis work done on the IBM Interconnect products by Central Engineering.

THE DECNET/SNA GATEWAY: BRIDGING THE MULTIVENDOR ENVIRONMENT

In today's business world, information is a major corporate asset crucial to strategic and tactical decision making. Data processing managers need to be able to access and manage that information regardless of its location within an enterprise.

In many cases, systems from IBM and other vendors such as Digital coexist in a "complementary computing" fashion within a single company. Characteristically, these multivendor systems are required to communicate in a variety of ways: over corporate data networks to a central facility, between different divisions, across company functional lines, and within departmental or team computing situations.

This session discusses the evolution of some techniques used by corporations to interconnect IBM and Digital systems. Although products exist that fulfill specific needs such as "point to point" file transfer or protocol conversion, this session concentrates solely on connectivity between systems using Systems Network Architecture (SNA) and Digital Network Architecture (DNA). Members of the DECnet/SNA Gateway product set provide specific examples of end user functions.

NUTS & BOLTS PRIMER

This session emphasizes the total networking environment, covering everything from terminal to computer communications, to long distance public networking, to the currently popular local area networks. Starting with a definition of terms, the session removes the mystique of network acronyms, and sets the foundation for a quick pass over the world of Data Communications. It explains basic standards, from the physical layer (such as RS-232, 423, 422, baseband and broadband), to various data link protocols (such as BISYNC, DDCMP, SDLC and HDLC), on into worldwide accepted standards for packet switching (such as X.25). The session discusses the International Standards Organization (ISO) Open Systems Interconnect (OSI), to establish what it means and why it is important to establish standards in explosive data communications environments. The presentation provides explanations and comparative information for various network configurations, including STAR, RING, and BUS topologies. This session surveys the development of local area networks from the original ALOHA net implementation to the current contention protocols, such as Token Bus or Token Ring configurations. The presentation is recommended for anyone interested in obtaining a solid introduction to networks.

PLANNING AND INSTALLING A LAN: A CASE STUDY

This presentation discusses an alternative approach for planning, designing, installing and implementing a Local Area Network (LAN). It uses Bridge Communications hardware and software to virtually connect over 400 user sites with VAXes, Tandems, and an IBM 3083 as well as each other. This was the first application in the world to connect a Tandem computer to a LAN. Other applications include:

- o a remote LAN that is totally transparent to all users
- o shared modems and laser printers
- o a 3 comm file server with 8 pieces
- o access thru the LAN to the in-house security system, facilities monitoring computer, and the data switch computer that monitors all communication lines.

The system also provides access to the LAN from private homes via a dial-back security device.

In addition, the facility has a unique cabling system. It is proof that solutions other than DEC to Data exist to connect all of your computer needs.

SUPPORTING SUPERCOMPUTER COMMUNICATIONS WITH A VAXCLUSTER: A CASE STUDY

This session describes the development of a VAXcluster-based communications system to support research computing at the National Center for Supercomputing Applications, University of Illinois at Urbana-Champaign. Topics covered include:

- o a site overview;
- o cluster and network hardware configuration;
- o software design points;
- o current communications protocols in use;
- o highlights of protocol implementation; and
- o performance statistics for the network.

KERMIT (A FILE TRANSFER PROTOCOL): CURRENT STATUS, FUTURE DIRECTIONS

This session is intended for current users of Kermit file transfer and terminal emulation programs, and particularly for those responsible for maintaining and distributing Kermit programs and documentation at their sites. It presents the current state of the Kermit collection and distribution mechanisms. The session covers problems of installation, maintenance, support, and operation of Kermit. It reports progress on new Kermit implementations underway, new releases of existing implementations, and new protocol features, including extended-length packets and sliding windows. Authors of several popular Kermit programs will be invited to discuss

their work. The presentation includes an extensive question-and-answer session. The principle speakers are responsible for Kermit design, implementation, and distribution at Columbia University, the "home" of Kermit.

NETWORKS MAGIC SESSION

In the spirit of (almost) total fun, the Networks SIG invites you to the Networks SIG Magic Session. The orientation of this session is on war stories, problems, solutions, and other related items of interest to be recounted for the amazement and amusement of all. All entries should pertain to the use of Digital Equipment Corporation computers and networking products. For the top winners, there will be the awarding of networks/communications related prizes at the end of the session. Do plan to come for a unique DECUS experience. We do not publish the stories (unless you want them published); therefore, this is your chance to tell that story that you never could elsewhere.

GAINING CONTROL: PCS IN THE CORPORATE ENVIRONMENT

The most pressing issue before today's information processing industry is the distribution of information between diverse mainframe computers and PCs within the corporate environment. This has been caused at least in part by the ever-increasing distribution of tasks to personal computers, without a corresponding distribution of related information. Personal computers provide managers with an invaluable information analysis tool, but often they do not provide the data to be analyzed. Indeed, essential information stored on mainframes is often difficult or impossible to access. The controlled distribution of this information will, in large part, determine the quality of these managers' decisions, and thus the relative success of their corporations. This seminar examines the five primary requirements of any product that is given the task of servicing the information needs of PC users within the corporate environment. As solutions to each of these five requirements are presented, an architecture is developed for the optimum information distribution system.

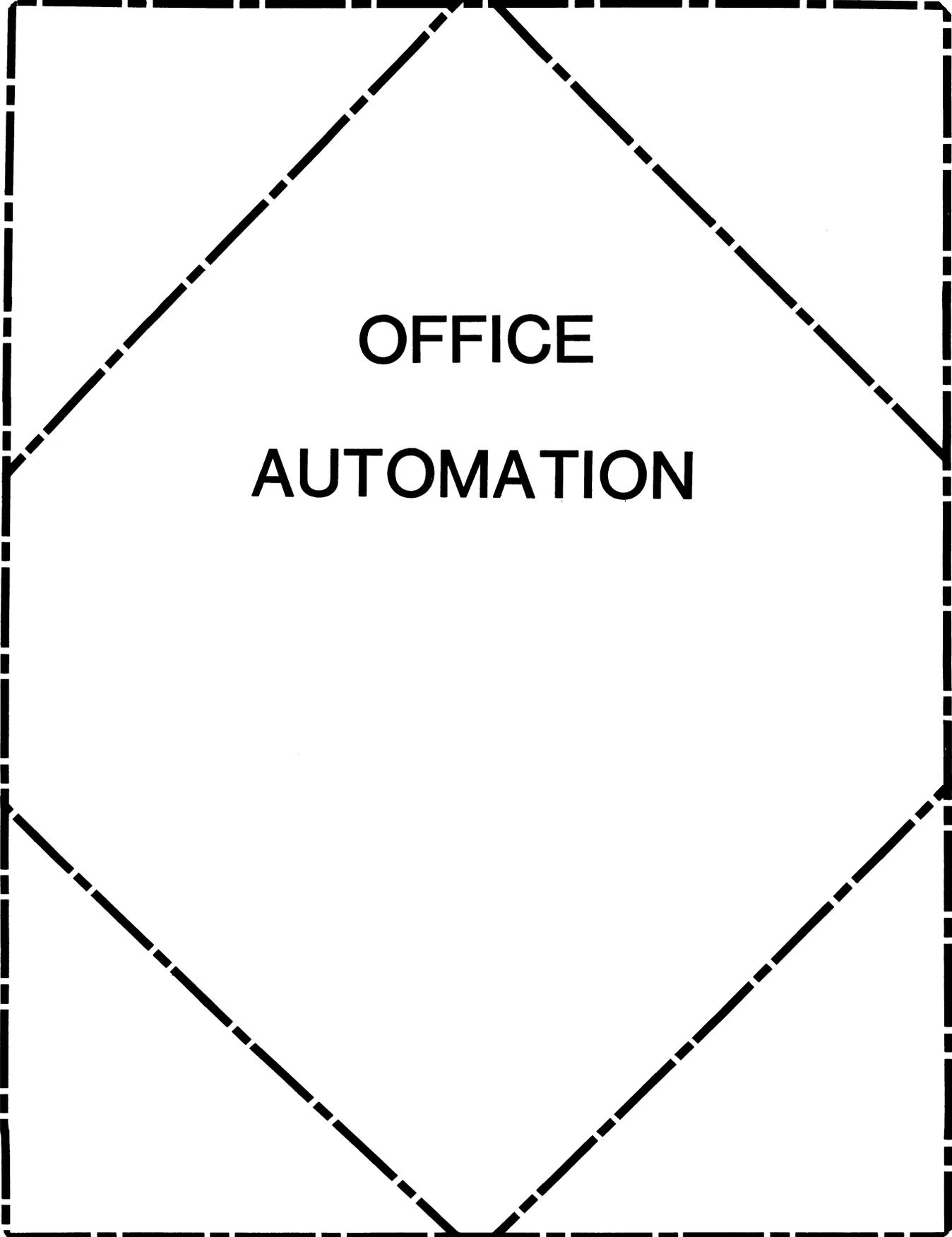
VOICE NETWORK MANAGEMENT

This presentation will provide a technical overview of two voice network management products, PBX Facilities Management (P/FM) and Cable Facilities Management (C/FM). P/FM is essentially an accounting-oriented package to handle rate tables and billing for usage of PBXs. It can run as a stand-alone VMS application, or can be integrated into an All-in-1 environment. C/FM, which is an optionally layered product on P/FM, enables the voice network manager to keep track of cable locations and availability.

INTEGRATED MULTIVENDOR FACILITY WIDE DATA COMMUNICATIONS
NETWORK

This presentation describes the network systems used at the University of Michigan for intersystem communication, distributed processing, and distributed information access. These networks permit the interchange of information over a wide variety of vendors, equipment, and operating systems. By combining multiple networks technologies such as broadband, baseband, and twisted pair wiring, an integrated facility for data communications has been developed. The hospital facilities consist of a facility-wide broadband cable plant with RS232/Applictech network for point-to-point and virtual terminal circuit connections from all areas of the hospital to departmental computing facilities. Complementary Ethernet channels provide DECnet support among Digital systems using DECOM/DEBIT or Applictech Broadband ethernet bridges. By providing shielded twisted pair low impedance connections between workstations and area telephone closets, with net interface devices such as Digital terminal service 100/200 or DECSA using an area network drop at the closet, a flexible wide area terminal communications network and a data path mechanism are available in a diverse multiple vendor environment.

====This is all (for this column)==== but not nearly all for our offerings for the Symposium. Come and see the incredible amount of information available sponsored by the Networks SIG at a DECUS Symposium!



**OFFICE
AUTOMATION**

OA

IN THIS ISSUE

From the Editor.....	OA-1
- Therese LeBlanc	
Upcoming Events in Nashville.....	OA-2
- Katherine Trimm	
How to Submit for SIG Tape.....	OA-3
- Mary Jane Bolling	
Building Your Own PDP-8 Communications Interface.....	OA-4-15
- Robert Weeks	
Notes-On-Notes.....	OA-16-18
- R. Copeland & G. Matthews, Digital Equipment Corp.	
OA Volunteers Needed.....	OA-18
- OA SIG	
WPS-Plus V.2.1 Editing Tricks.....	OA-19
- Therese LeBlanc	



FROM THE EDITOR

Spring is here at last! And for those of us who participate in DECUS that can only mean one thing - Symposia. In preparation for this event (April 27 - May 1) we have several articles announcing OA SIG sponsored events for Symposia. Our SIG members look forward to meeting those of you who will be attending Nashville, and answering any questions you might have and helping you participate more fully in Symposium. We are also looking for several people to fill volunteer positions (see page 18), please let us know if you are interested.

Our new SIG Tape coordinator, Mary Jane Bolling, has provided us with an article outlining; who, what, when and where for submitting to the tape. As always, to obtain a free (you provide the magnetic material) copy of the tape, contact your Local Users Group or the DECUS office.

Our featured technical article this month is a 'do-it-yourself' project for people interested in having their PDP-8 communicate with a VAX and assorted PC's. Finally, our regular VAX NOTES columnists are busy preparing for their session(s) in Nashville, and we have two guest authors (from Digital) filling in to bring you the VAXNotes column.

For those of you who have submitted articles in the past, or would like to do so in the future, I would like to begin accepting electronic submissions. Please contact me to discuss format before sending a submission (those of you on the DECUS DCS system can send them via Electronic Messaging). I will be developing a set of "How to" guidelines for future publication. I am still willing to accept hard copy type submissions.

I look forward to meeting you at the Nashville Symposium, don't forget to attend the OA WISHLIST session so that you can present your 'wishes' to Digital and help participate in the System Improvement Request (SIR) process.

Regards,

Therese M. LeBlanc
OA Newsletter Editor
275 London Pl.
Wheeling, IL 60090
(312) 459-1784

***** ANNOUNCEMENTS OF UPCOMING EVENTS *****

1. Executive Track

Would you like to raise senior management's consciousness about Office Automation in your company? The OA SIG and Digital co-sponsor a special one-day presentation at Nashville for senior level management. The program will include both nationally known consultants and senior managers who will share their experiences in implementing OA in their companies. If you would like someone to receive an invitation, please call Katherine Trimm at (602) 886-5563, or Mitch Brown at (617) 369-4400 x3053.

2. Pre-Symposia Seminars

We have some really outstanding PSS's for Nashville. Attendees at San Francisco requested seminars on:

- o Message Router
- o VideoText (VTX and VALU)

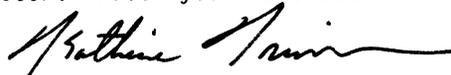
To our knowledge there are no seminars for customers on these subjects available anywhere, so we were really pleased to have the developers come out and give us these special seminars.

Back by popular demand is "ALL-IN-1, Capacity Planning, and Performance." This seminar is taught by Digital's ALL-IN-1 Performance team.

Finally, for those of you who have people in your organization who still don't understand "Why ALL-IN-1?", let me recommend "Why ALL-IN-1 is Not Just OA." This seminar received one of the highest seminar ratings when last given in Dallas. These PSS's are about the best buy for a training dollar I can think of. Look forward to seeing you there.

3. OA SIG Gets A Bulletin Board!!!

Digital is sponsoring a bulletin board for the use of the OA SIG. This bulletin board will have VideoText (VTX) with lots of useful information for you to access. It will also have the VAX Notes teleconference facility available. It will be available for you to dial into soon. Watch your Newsletter for details!



Katherine Trimm
Chair, OA SIG

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

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

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

- o The tape should be made in VAX/VMS BACKUP format, at a density that is acceptable to the volunteer tape coordinator (usually 1600 BPI).
- o Each submission should be in a separate "save set" that is made up of whatever files relate to that submission and a README file that briefly describes what the submission is. Typically, the README file is named "AAAREADME.TXT" so that it can be easily located in a directory listing of the tape. In submissions where there are many parts to the submission, each "piece" of the submission should have its own subdirectory as well.
- o Each submission must include a DECUS PROGRAM LIBRARY Submittal Form. These forms are available through the volunteer tape coordinator. Processing of your submission will be delayed if this form is not completed.

Remember, you are not limited to the number of items you submit. Of course, no previously copyrighted work, commercially available products, or DIGITAL layered software should ever be included in your submissions.

Your submissions should be sent directly to the DECUS OA SIG volunteer tape coordinator.

Mary Jane Bolling, Volunteer Tape Coordinator
Foreign Mission Board
3806 Monument Avenue
P.O. Box 6767
Richmond, VA 23230

Robert Weeks
Computer Technology Associates
7501 Forbes Blvd. Lanham Md. 20706
301-464-5300

This paper describes the construction of a board to provide a second serial interface to a DKC8A utilizing the parallel ports. A modification of the VAX: handler by Jim Van Zee and a simple communications program (described herein) will allow this interface to connect a Hayes compatible modem to the PDP-8. A system so equipped will be able to communicate with virtually any other system connected to a dial up modem. Systems tested to date include A VAX, IBM PC's, Macintoshes and the GTE Telemail System.

The hardware

The hardware consists of a small wirewrap board containing a UART (AY5-1013) and 3 74LS04 inverters to buffer and invert the signal levels coming from and going to the DKC8A. To facilitate construction wire-wrap sockets were used for all IC's. A COM 8116 baud rate generator was used with a 5.0688 mhz crystal to provide the 16X clock to the UART. To provide flexibility, a DIP switch was used to select the baud rates and the parity parameters. A 1488 line driver and a 1489 line receiver were used to convert the output and input of the UART to RS-232 signals. The power requirements of the board are very modest and could be derived from the backplane of a fully loaded 8A. The one that I have constructed is powered from an external power supply originally designed to run a video game. This power supply provides the -5,+5 and +12 volts required by the board. A CMOS 6402 would further reduce the power requirements, but it will be necessary to connect all unused inputs to either +5 volts or ground. In addition, the 6402 will have to have the programmable inputs "pulled-up" to +5 volts as well. (The AY5-1013 has internal pull up resistors and only a switch to ground is needed to control these inputs. There are RS-232 driver/receiver IC's on the market that will generate the requisite +12 and -12 volts from a single +5 volt input. This chip which was not available when I made the prototype could greatly simplify installation by requiring only one voltage. However, -12, +5, and +12 volts are not very difficult to obtain. Although RS232 is specified as low as + or - 6 volts, the 1488 requires a + voltage in excess of 7.0 volts. If you are attempting to obtain power from some other source keep this in mind. The negative supply of -5 volts seems to work well.

Testing

Connect J4 and J5 on the DKC8A to the input and output connectors on the interface board. Check the +12,-12 and +5 volt inputs with an ohmmeter. The readings should indicate a reading of several hundred ohms or greater. If readings are less, check for shorts.

Set the baud rate for 110 baud and connect the serial output to the serial input by jumpering pin 2 on the RS-232 connector to pin 3.

Run the XMIT.SV program. Characters typed on the console keyboard should appear on the Screen. It may be necessary to power down the PDP-8A and check SW 1-9 on the DKC8A. This switch must be on. (The output register should be cleared by TS1 for the program as written to work properly.)

If characters are not being echoed properly, connect a volt meter to the junction of pins 2 and 3. The meter should indicate at least -5 volts. Press a character and the meter should start pulsing with a positive voltage. If this occurs, troubleshoot the input circuit. If your machine has a front panel, the register displays will be helpful.

If your machine does not have a frontpanel, use ODT.

After the interface is working, reset the switches to 1200 baud, 8 bits, no parity. Connect a Hayes compatible modem and using the transmit program you should be able to dial and connect to other modem equipped systems.

Programming considerations

The following TTY like commands are supported by the Serial interface and the DKC-8A;

TTSF 6570 skip if output finished/clear output buffer
TTLS 6574 load and send output buffer
KKSF 6571 /skip if input ready
KKRB 6572 / read inputs
KKCC 6573 /clear input flags
DKIE 6575 /enable interrupts

Since these commands are not microprogrammable like the DEC serial interfaces, you must issue a KKCC followed by a KKRB.

The listing for the XMIT.SV program illustrates the use of these instructions. Also included is the modified VAX: handler which was written by Jim Van Zee.(Decus 8-921).

Description of the XMIT.SV program

The program waits in a loop for an interrupt. There are only four possible sources of this interrupt-the keyboard, the console CRT display, the remote (modem) input, and the remote(modem) output.

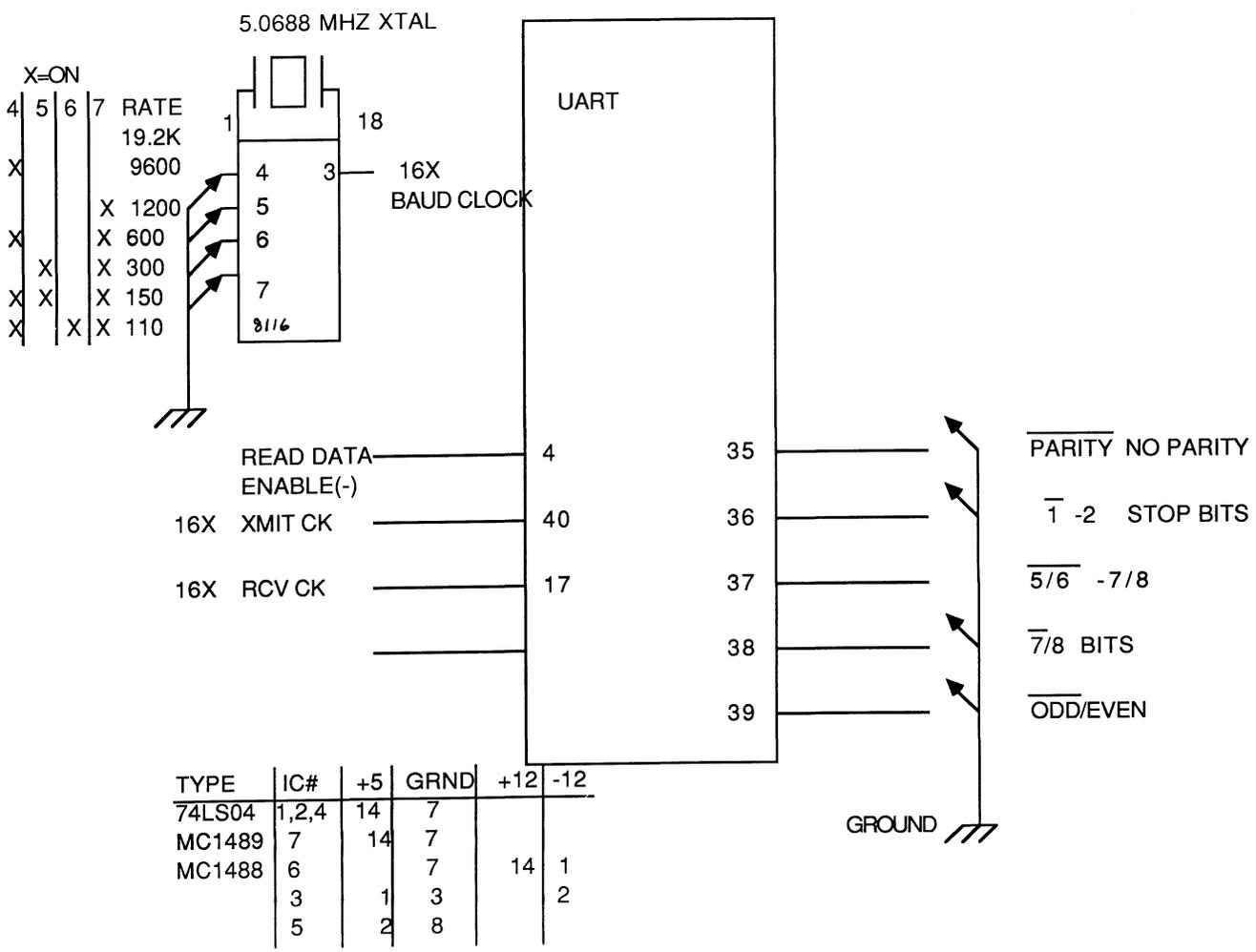
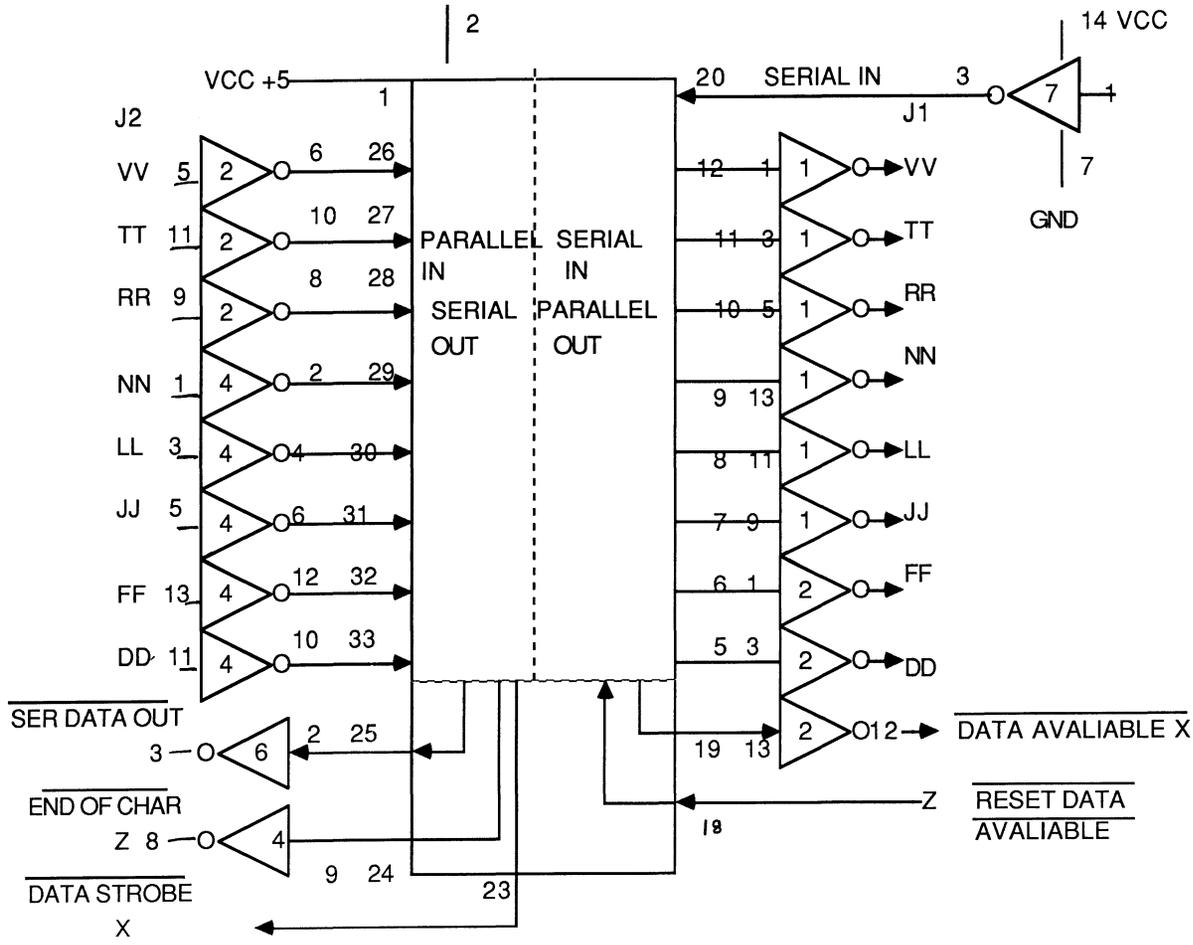
Input data from the keyboard is sent to the remote (modem)output and tested for the presence of a control F. This character is used to restart the monitor or can be used to chain to PIP. Data coming from the modem input is echoed to the CRT. Any other interrupts at this point constitute an error. Watch out if the RTC is enabled!

Sending and receiving files to/from a remote system.

To capture incoming data to a disk file or to transmit a previously written file, type all commands to send or receive the file but do not type the (CR) to terminate the command. Then type (CTRL) F. This will return the system to OS/8. Run PIP, and type either VAX:< FILNAM.EX /T/C (CR) to transmit a file or FILENAM.EX<VAX:/C/T to receive a file. The Handler will first send a CR to terminate the command and will operate until the file is transmitted. Type (CTRL) C to terminate PIP. Note ! The VAX: handler will leave the remote end X-Offed so when returning to XMIT, send an X-ON if the Keyboard appears to be dead when returning from PIP.

Problems with sending files to a moderately loaded VAX were noted when the input buffer in the VAX was overrun. A solution to this is to use the alternate type-ahead buffer set to 255 characters. Set the type ahead alarm set to 80 characters. This should provide enough time for the VAX to stop the transmission of your file before over run occurs. Another fix might be to set the baud rate to 300 if the VAX system manager is reluctant to provide you with a large type ahead buffer.

No problems of this sort have been noticed when communicating with Microvaxes, Macintoshes or IBM PC's.



```

/COMMUNICATIONS HANDLER FOR THE VAX
0002  VERSION="B&77
/REVISED 18-NOV-85 TO CORRECT VALUE OF X-ON AND X-OFF
/11-780 AT GSFC DOESN'T LIKE THE MSB SET.

6571 KKSF=6571
6573 KKCC=6573
6572 KKRB=6572
6574 TTLS=6574
6570 TTSF=6570
0000 PAGE 0
0000 7777 -1
00001 2601 DEVICE VAX
00002 3000
00003 2601 DEVICE VAX
00004 3000
00005 0410 410
00006 4000 VAX&177+4000
00007 0000 ZBLOCK 2
0200 PAGE 1
00200 0002 VAX, VERSION
00201 7326 CLA STL RTL
00202 6214 RDF
00203 1342 TAD CDFO
00204 3276 DCA CDIX
00205 7130 STL RAR
00206 1600 TAD I VAX
00207 0221 XON, AND V70
00210 1342 TAD CDFO
00211 3226 DCA TEMP
00212 1311 TAD V3700
00213 0600 AND I VAX
00214 2200 ISZ VAX
00215 7450 SNA
00216 5273 JMP VXIT
00217 7041 CIA
00220 3301 DCA DWC
00221 0070 V70, 70
00222 0155 XSW, -7623
00223 0177 V177, 177
00224 1600 TAD I VAX
00225 3300 DCA BAD
00226 7402 TEMP, HLT
00227 7420 SNL
00230 5374 JMP READ
00231 7006 WRIT, RTL
00232 7006 RTL
00233 7510 SPA
00234 5247 JMP WNO3
00235 3226 DCA TEMP
00236 1700 TAD I BAD
00237 4316 JMS PUTC
00240 1700 TAD I BAD
00241 2300 ISZ BAD
00242 7400 V7400, 7400

```

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00243 0242 AND .-1
00244 7104 CLL RAL
00245 1226 TAD TEMP
00246 5231 JMP WRIT
00247 4316 WNO3, JMS PUTC
00250 2301 ISZ DWC
00251 5231 JMP WRIT
00252 5273 JMP VXIT
00253 0000 INP, 0
00254 4653 JMS I INP
00255 3700 DCA I BAD
00256 4653 JMS I INP
00257 3316 DCA PUTC
00260 4653 JMS I INP
00261 4302 JMS SAVE
00262 1316 TAD PUTC
00263 3700 DCA I BAD
00264 1226 TAD TEMP
00265 4302 JMS SAVE
00266 2301 ISZ DWC
00267 5254 JMP INP+1
00270 1321 TAD XOFF
00271 4316 JMS PUTC
00272 4653 JMS I INP
00273 2200 VXIT, ISZ VAX
00274 2200 ISZ VAX
00275 2200 ISZ VAX
00276 7402 CDIX, HLT
00277 5600 JMP I VAX
00300 0000 BAD, 0
00301 0000 DWC, 0
00302 0000 SAVE, 0
00303 7006 RTL
00304 7006 RTL
00305 3226 DCA TEMP
00306 1226 TAD TEMP
00307 0242 AND V7400
00310 1700 TAD I BAD
00311 3700 V3700, DCA I BAD
00312 2300 ISZ BAD
00313 0175 M7603, -7603
00314 7100 CLL
00315 5702 JMP I SAVE
00316 0000 PUTC, 0
00317 3302 DCA SAVE
00320 1302 TAD SAVE
00321 0223 XOFF, AND V177
00322 7440 SZA
00323 1367 TAD MLF
00324 7650 SNA CLA
00325 5365 JMP PXIT
00326 1302 TAD SAVE
00327 0223 AND V177
/MUST MASK OFF MSB OF BYTE BEFORE SENDING
/OR THE VAX GETS CONFUSED!

```

00330	6574		TTLS
00331	1370		TAD M32
00332	7650		SNA CLA
00333	5273		JMP VXIT
00334	1344	EXON,	TAD V7600
00335	6034		KRS
00336	1313		TAD M7603
00337	7650		SNA CLA
00340	6031		KSF
00341	5344		JMP V7600
00342	6201	CDF0,	CDF
00343	5744		JMP I V7600
00344	7600	V7600,	7600
00345	1344		TAD V7600
00346	6573		KKCC
00347	6572		KKRB
00350	1222		TAD XSW
00351	7650		SNA CLA
00352	6571		KKSF
00353	5360		JMP PCHK
00354	1222		TAD XSW
00355	7112		CLL RTR
00356	7026		CML RTL
00357	3222		DCA XSW
00360	7126	PCHK,	STL RTL
00361	0222		AND XSW
00362	7650		SNA CLA
00363	6570		TTSF
00364	5334		JMP EXON
00365	7120	PXIT,	STL
00366	5716		JMP I PUTC
00367	7766	MLF,	-12
00370	7746	M32,	-32
	0374	*VAX!174	
00374	1207	READ,	TAD XON
00375	4316		JMS PUTC
00376	7130		STL RAR
00377	4253		JMS INP
	0400		PAGE
00400	0577	GETC,	(177
00401	7440		SZA
00402	5216		JMP NO1
00403	7430		SZL
00404	5243		JMP EOB
00405	1353		TAD CHAR
00406	7710		SPA CLA
00407	2210		ISZ .+1
00410	7402	HOLD,	HLT
00411	7450		SNA
00412	4304	BOB,	JMS FETCH
00413	0234		AND V377
00414	7100		CLL
00415	5600		JMP I GETC
00416	3353	NO1,	DCA CHAR

00417	1243		TAD EOB
00420	3210		DCA HOLD
00421	1304		TAD FETCH
00422	7640		SZA CLA
00423	5207		JMP HOLD-1
00424	3210		DCA HOLD
00425	1376		TAD (15 /A CR MSB CLEARED
00426	6574		TTLS/THIS MAY HAVE TO BE CHANGED TO PRODUCE A CR
00427	7200		CLA
00430	4267	GET2,	JMS CTRLC
00431	5230		JMP .-1
00432	6573		KKCC
00433	6572		KKRB
00434	0377	V377,	AND (177
00435	1375		TAD (-12
00436	7640		SZA CLA
00437	5230		JMP GET2
00440	4267		JMS CTRLC
00441	5240		JMP .-1
00442	5212		JMP BOB
00443	1353	EOB,	TAD CHAR
00444	7650		SNA CLA
00445	5262		JMP DONE
00446	1216		TAD NO1
00447	3255		DCA INST
00450	4304	BLOOP,	JMS FETCH
00451	3210		DCA HOLD
00452	1210		TAD HOLD
00453	7440		SZA
00454	2255		ISZ .+1
00455	7402	INST,	HLT
00456	1210		TAD HOLD
00457	7640		SZA CLA
00460	5250		JMP BLOOP
00461	5600		JMP I GETC
00462	3304	DONE,	DCA FETCH
00463	1374		TAD (21
00464	6574		TTLS
00465	2200		ISZ GETC
00466	5600		JMP I GETC
00467	0000	CTRLC,	0
00470	6571		KKSF
00471	7610		SKP CLA
00472	2267		ISZ CTRLC
00473	1373		TAD (7600
00474	6034		KRS
00475	1372		TAD (-7603
00476	7650		SNA CLA
00477	6031		KSF
00500	5667		JMP I CTRLC
00501	6201		CDF
00502	5773		JMP I (7600
00503	7700	DELAY,	7700 /ABOUT 6 SECONDS
00504	0000		FETCH, 0
00505	1353		TAD CHAR

00506	2352	ISZ	FLAG
00507	7650	SNA	CLA
00510	5704	JMP	I FETCH
00511	3351	DCA	TIMOUT
00512	1303	TAD	DELAY
00513	3350	DCA	TIMER
00514	4267	WAIT,	JMS CTRLC
00515	5341		JMP LOOP
00516	6573		KKCC
00517	6572		KKRB
00520	3353		DCA CHAR
00521	1353		TAD CHAR
00522	0377		AND (177
00523	7450		SNA
00524	5311		JMP WAIT-3
00525	1375		TAD (-12
00526	7640		SZA CLA
00527	5337		JMP LOOP-2
00530	7160		STL CMA
00531	1352		TAD FLAG
00532	7650		SNA CLA
00533	7160		STL CMA
00534	3352		DCA FLAG
00535	7430		SZL
00536	1371		TAD (3
00537	1353		TAD CHAR
00540	5704		JMP I FETCH
00541	2350	LOOP,	ISZ TIMER
00542	5314		JMP WAIT
00543	2351		ISZ TIMOUT
00544	5312		JMP WAIT-2
00545	3353		DCA CHAR
00546	1370		TAD (32
00547	5704		JMP I FETCH
00550	0000	TIMER,	0
00551	0000	TIMOUT,	0
00552	0000	FLAG,	0
00553	0000	CHAR,	0
00554	0000	SILO,	ZBLOCK 12
00570	0032		
00571	0003		
00572	0175		
00573	7600		
00574	0021		
00575	7766		
00576	0015		
00577	0177		

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BAD	0300
BLOOP	0450
BOB	0412
CDFO	0342
CDIX	0276
CHAR	0553
CTRLC	0467
DELAY	0503
DONE	0462
DWC	0301
EOB	0443
EXON	0334
FETCH	0504
FLAG	0552
GETC	0400
GET2	0430
HOLD	0410
INP	0253
INST	0455
KKCC	6573
KKRB	6572
KKSF	6571
LOOP	0541
MLF	0367
M32	0370
M7603	0313
NO1	0416
PCHK	0360
PUTC	0316
PXIT	0365
READ	0374
SAVE	0302
SILO	0554
TEMP	0226
TIMER	0550
TIMOUT	0551
TTLS	6574
TTSF	6570
VAX	0200
VERSIO	0002
VXIT	0273
V177	0223
V3700	0311
V377	0434
V70	0221
V7400	0242
V7600	0344
WAIT	0514
WNO3	0247
WRIT	0231
XOFF	0321
XON	0207
XSW	0222

ERRORS DETECTED: 0
LINKS GENERATED: 0

```

00000 0000 *0
00001 0000 0
00001 5402 JMP I 2
00002 0205 SERV
0200 0200 *200
00200 7300 START, CLA CLL/SET MODE FOR INPUT FROM THE KBD
00201 6575 DKIE /ENABLE DKC8A INPUT INTERRUPTS
/SCREEN AS THEY ARE RECEIVED BY THE MODEM
00202 6001 ION
/BACKGROUND PROGRAM
00203 7300 MODEM, CLA CLL
00204 5203 JMP MODEM
00205 3256 SERV, DCA AC
00206 7004 RAL
00207 3257 DCA L
/THAT SAVES THE AC AND THE LINK DURING THE
/INTERRUPT SERVICE
00210 6031 KSF
00211 7410 SKP
00212 5225 JMP KB
00213 6041 TSF
00214 7410 SKP
00215 5254 JMP TP
00216 6571 KKSF /MODEM INPUT IS INTERRUPTING
00217 7410 SKP
00220 5240 JMP RKBD/SERVICE THE INPUT FROM THE MODEM
00221 6570 TTSF /REMOTE OUTPUT SKIP
00222 7410 SKP
00223 5244 JMP ROUT/SEND THE SIGNAL TO THE MODEM
00224 7402 HLT /OOPS SOMEONE ELSE INTERRUPTED
00225 6032 KB, KCC /CLEAR KEYBOARD FLAGS
00226 6036 KRB /READ THE KBD INTO THE AC
00227 0264 AND MASK/SEND ONLY A SEVEN BIT CHARACTER
00230 3260 DCA TEMP
00231 1260 TAD TEMP
00232 1263 TAD MCTRLF/F IS THE ESCAPE CHARACTER
00233 7650 SNA CLA/SKIP IF AC NOT EQU ZERO
00234 5261 JMP QUIT
00235 1260 TAD TEMP
00236 6574 TTLS /ECHO TO MODEM
00237 5246 JMP EXIT/RETURN
00240 6573 RKBD, KKCC /CLEAR MODEM INPUT FLAGS
00241 6572 KKR B /READ MODEM INPUT INTO THE AC
00242 6046 TLS /ECHO TO CRT
00243 5246 JMP EXIT/RETURN
00244 7000 ROUT, NOP/OUTPUT TO MODEM CALLED WHEN CR IS DETECTED
00245 5246 JMP EXIT /RETURN TO BACKGROUND

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00246 1257 /EXIT IS TO RETURN TO THE BACKGROUND PROGRAM
00247 7110 EXIT, TAD L
00250 1256 CLL RAR
00251 6001 TAD AC /RESTORE LINK AND AC
00252 5400 ION /TURN ON INTERRUPT
JMP I 0 /AND RETURN

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```

00253 5246 /RKBD MODEM INPUT
00254 6042 JMP EXIT/RETURN
00255 5246 TP, TCF/CLEAR THE PRINTER FLAG
00256 0000 JMP EXIT
00257 0000 AC, 0
00260 0000 L, 0
00261 5662 TEMP, 0
00262 7600 QUIT, JMP I OS8/RE-CALL MONITOR
00263 7772 OS8, 7600
00264 0177 MCTRLF, -6
6574 MASK, 177
6574 TTLS= 6574
6570 TTSF= 6570
6573 KKCC= 6573
6571 KKSF= 6571
6575 DKIE= 6575/ENABLE DKC8A INTERRUPTS ON INPUT
6572 KKR B= 6572
$

```

```

AC 0256
DKIE 6575
EXIT 0246
KB 0225
KKCC 6573
KKRB 6572
KKSF 6571
L 0257
MASK 0264
MCTRLF 0263
MODEM 0203
OS8 0262
QUIT 0261
RKBD 0240
ROUT 0244
SERV 0205
START 0200
TEMP 0260
TP 0254
TTLS 6574
TTSF 6570

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Notes on Notes

-- Discussions on VAX Notes
Volume 1, Number 5

by R. Copeland and G. Matthews
VAX Notes Support Specialists
Digital Equipment Corporation

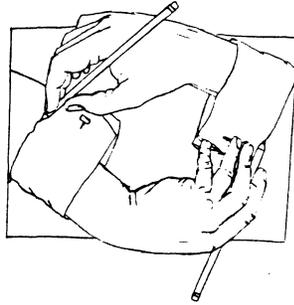
Mark Hyde and C. J. "Buck"
Trayser, the usual authors of
this column, are busily
preparing for their spring
DECUS seminar on VAX Notes.

Robert Copeland and Gary Matthews (your current authors)
are also Notes supporters and participators, and have
stepped in to bring you this month's article. The
subject this month is a bit about the history and
evolution of the VAX Notes product.

Notes was originally developed to allow members of the
VMS engineering community to share information about
their work in an asynchronous format to reduce the
hassles of traveling and scheduling meetings. It
provided a convenient forum for ideas and discussions as
well as being an effective test for PL/I - which had
recently added indexed files as a supported part of the
language.

The original incarnation of Notes was first written in
1980 in PL/I, by then DEC employee Len Kawell and had
its roots in the PLATO system, developed at the
University of Illinois. It was crude compared to the
current product, but proved very effective and soon
spread to VMS systems throughout the engineering
community. It became so widespread that some people
thought (mistakenly) that it was a standard VMS utility.
A separate tool was developed by former DEC employee
Stanley Rabinowitz using TECO which was used to provide
a feature called a Notary which can be equated to
today's notebook. This incarnation of the product
eventually came to be known as K-Notes, after Mr.
Kawell.

K-Notes ran only on VMS systems, which left a large part
of the Digital engineering community without access;
after all, there were still lots of PDP-11's running
other operating systems. In 1983, Mark Goodrich, then a
RSTS engineer developing DECmail/RSTS (now VAX Notes
project leader), created Notes-11, which would access
VMS note files from RSTS/E using transparent RMS file
access in BASIC-Plus-2. He later adapted it to run on
RSX-11M-Plus, VMS, and Micro-VMS, and finally P/OS and



Micro/RSX. Many enhancements suggested for the original
K-Notes were incorporated into Notes-11. Notes-11
introduced an integrated notary concept and time zone
support for keeping note dates in chronological order
over different time zones that covered the widening
Digital network.

Because of these enhancements, Notes-11 became the
utility of choice and spread like wildfire across
Digital's internal network, including sites overseas.
The number of 'noters' grew rapidly, and conferences,
then known only as 'notes files', sprang up everywhere.
It became an excellent means for the field to be able to
communicate with the corporate and engineering
communities. Notes-11 grew through several versions and
generated enough excitement about its potential that
people began to talk about turning it into a product.

In late 1984, VAX Notes became a funded project. Benn
Schreiber and Peter Gilbert produced a prototype known
as VNOTES (though it was often mistakenly called "VAX
Notes") in March 1985. Using remote servers and VAX
TPU, VNOTES provided better performance than its
predecessors. The use of servers helped particularly
with the long reaches of the network by introducing
optimized network access. And because of the decision
to implement Notes in TPU, the development period was
shortened by approximately 4 man-months! A conference
on VNOTES itself allowed the entire Digital noting
community the opportunity to comment on the prototype,
suggest changes, and argue the human interface and
design issues. Benn and Peter then used this input to
create the VAX Notes electronic conferencing system as
we know and love it today.

The first internal copy of the new VAX Notes product was
introduced to the Digital community in late 1985. A
conversion utility was developed to allow the conversion
of the numerous Notes-11 format note files to the new
format. VAX Notes version 1.0 additionally introduced
membership lists, choice of built-in editors, keywords
for notes, personal note markers for quick recall, and
personal profile for tailorable options. It also
provided an interface that was 'culturally compatible'
with its predecessors. Because VAX Notes was now TPU
based, its 'extensibility' was greatly increased.
Today, there are more than thirteen thousand distinct
systems connected worldwide through the Digital internal
network, many (if not most) of these being VMS machines.
Such an arrangement fits in well with the Notes concept
of being able to access many conferences.

There are literally thousands of conferences active
today within the Digital community. There are
conferences that cover the entire range of employee
interests from Amateur Radio to Wood Stoves. There are
conferences devoted to just about every software and

hardware product that Digital has ever produced. This gives Digital employees, whose job it is to support these products, an unparalleled access to information that could be found nowhere else. In many cases these conferences are participated in by both the current and former developers of the products. There are also an untold number of restricted, members only conferences, used as project meetings, private hot lines to various groups, product design, etc.

It is probably fair to say that there are many users of VAX Notes within Digital, such as your authors, that now consider it an indispensable tool of their trade.

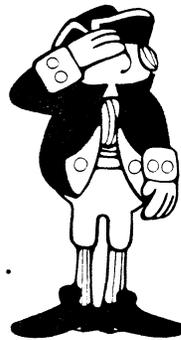
Don't forget to drop in on the "Notes on VAX Notes" with Mark and C. J. in Nashville, a "Hints and Kinks" session for those already familiar with Notes. They should return next month with another exciting episode.

Happy Noting!

!!!! VOLUNTEERS NEEDED !!!!!

Volunteers are needed for the following positions:

- o Pre-symposia Seminar Coordinator
Recruits PSSes, serves as representative to PSS Committee. Time required about 2 days per year.
Contact: Katherine Trimm 602 886-5563
- o Suite Coordinator
Coordinates activities for the OA Suite at Symposia. Must be planning to attend Nashville.
Contact: Mitch Brown 617 369-4400 x3052
- o Standards Committee Representative
This is a new position - time requirements may depend on your level of enthusiasm.
Contact: Katherine Trimm 602 886-5563



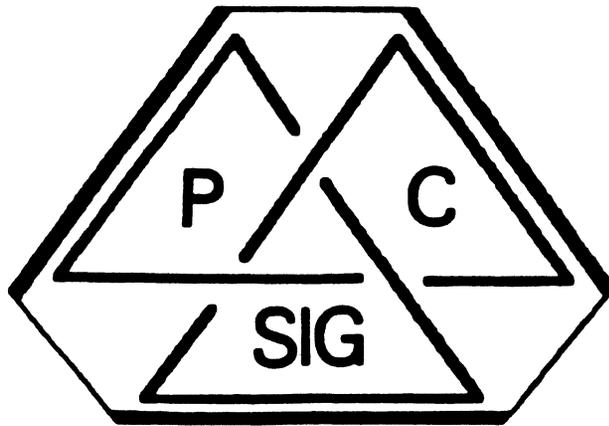
By: Therese LeBlanc
T.M. LeBlanc & Assoc.

With the introduction of V.2.1 last year Digital gave us many new features for WPS-Plus functions. Most of these were documented, however, I have found a few things which are neat tricks or 'short-cuts' that you might not have seen or tried yet. Here are a few of them:

- 1) GOLD TAB - Inserts a W (word wrap) in the ruler without having to display or change the ruler manually.
- 2) GOLD DEL WORD or DEL CHAR - Will restore the last item deleted using Del Word, Del Char, or a full line deleted using GOLD WORD/CHAR key.
- 3) F10 (top row function key, also labeled as EXIT)- This is a 'quick file' key. It does the same thing as GOLD F but with a single keystroke.
- 4) F8 (top row function key also labeled as QUIT) - This is a 'quick quit' key. It does the same thing as GOLD K, ends the editing session without saving changes made.
- 5) F9 (top row function key also labeled as MAIN SCREEN) - This is an alternative to GOLD M to access the internal editing menu.
- 6) DO (top row function key) - Will call up the form for selecting and activating a User Defined Process (UD)
- 7) Using Spell Check from the Word Processing or Electronic messaging menu can be tedious, instead, use select (SEL) to define a region of text (or your whole document) and press GOLD S to spell check. NOTE: pressing GOLD S while cursor is on any word in your text will spell check just that word.
- 8) For those of you who have been wanting to use technical characters, such as math symbols, Greek letters, infinity signs, degree marks, etc. Just turn on the Alternate Character Set. Press GOLD, Hold Down the CTRL (control) Key and press "E". You may now type alternate characters. Turn off the same way you turned it on. NOTE: A laser printer is required to print these symbols.

Stay tuned to future issues for more tricks and shortcuts.

Personal Computer Special Interest Group



Newsletter

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, Williamson, NY; SYSOP: Fritz Howard.
- Use EasyPlex on CompuServe and send it to **Kenneth LeFebvre 72447,261***

**Methods marked with an asterisk are preferred.*

Contributions can be sent to:

Kenneth LeFebvre, *Editor*
Sytek, Inc.
19 Church Street
Berea, OH 44017
(216) 243-1613

Gary Rice, *Associate Editor*
By Hand
P.O. Box 5536
Hacienda Heights, CA 91745
(714) 952-6001

NOTE: If you send your submission in electronics form, please follow these guidelines, *if possible*:

1. Use tabs not spaces for formatting
2. If using WPS, wrap instead of using hard returns
3. Do not justify
4. Do not use more than one space between sentences
5. Do not hyphenate
6. Please send a listing of the rulers you used, if applicable

T H A N K Y O U ! ! !

Contributor List

Leonard R. Gerstle
608 Grenville Avenue
Teaneck, NJ 07666
PC PostScript

Jim Hobbs
Adolph Coors Co.
Golden, CO 80401-1295
*Upgrading a Rainbow 100B Using
a Dual Winchester Controller*

Lynn Jarrett
Union Tribune Publishing
P.O. Box 191
San Diego, CA 92108
Rainbow Working Group Update

Kimmo Iinila
Finnish Forest Research Inst.
Dept. of Mathematics
Unioninkatu 40 A
00170 Helsinki
Finland
PC PostScript

Barbara Maaskant
Univ. of Texas
Health Science Center
7703 Floyd Curl Drive
San Antonio, TX 78284
ClickClak

Gary Rice
By Hand
P.O. Box 5536
Hacienda Heights, CA 91745
*DECmate Software Version List,
PROgramming Quickie, PRO Soft-
ware Version List, Rainbow
Software Version List*

Richard Thomsen
Flame-point Computer Products
Mountain Route Box 234
Jemez Springs, NM 87025
PC PostScript

Rainbow Working Group
DECUS PC Sig
P.O. Box 191
San Diego, CA 92108
Rainbow Wish List

TABLE OF CONTENTS

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.

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.

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.

PC PostScripts

There are three PostScripts this month, covering such topics as the Rainbow Wish List, hard disks, and MS-DOS.

Rainbow Section

Rainbow Working Group Update (Jarrett)

Our Rainbow Working Group Chairman says a few words about what is happening with the Sig and Rainbows.

ClkClok (Maaskant)

Have you heard about the greatest clock invented since the sundial? You will have if you read this article!

Upgrading a Rainbow 100B Using a Dual Winchester Controller (Hobbs)

Now you can have up to 142Mb of storage on you Rainbow!

Rainbow Wish List (Rainbow Working Group)

This is it! The official Rainbow Wish List... Is YOUR wish on it?

Rainbow Software Version List (Rice)

This is a list of all the Rainbow software products known to Gary Rice and their latest version levels.

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.

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.

PROgramming Quickie (Rice)

Once again, Gary Rice shares some of his programming expertise with us as we learn how to the PROATR routine.

Questionnaire Section

Rainbow Wish List Ballot

We need your help to prioritize and clarify what the wishlist should include. Please give us your input on this form.

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	Andrew L. Wax	(212) 701-5231
BASIC	Guy Stefan-Romano	(415) 753-5581
Communications/PRO	John R. Lynn	(714) 620-6667 after 7pm PST
Corvus Omnidrive	Kenneth Lemay	(219) 483-0001
dBASE	Guy Stefan-Romano	(415) 753-5581
dBASE II	Paul Bottone	(516) 928-0933 after 7pm EST
DBL	Philip Rice	(503) 369-2565
	Kenneth LeFebvre	(216) 243-1613
DECmate	Cheryl Johnson	(515) 236-2570
	Gary Swarthout	(607) 974-3152
DECspell	Cheryl Johnson	(515) 236-2570
Econometric Programming	Jeff Mackie-Mason	(617) 253-8717
FCS-EPS	Mark Lewis	(212) 563-5656
GraphWriter	Lynn Jarrett	(619) 293-1130
Hard Disk/Rainbow	Kenneth Lemay	(219) 483-0001
Hardware/PRO 350	John Pratchios	(703) 385-5880 x3887
Hardware/Rainbow	Bob Catt	(717) 794-2430
LN03	Kenneth LeFebvre	(216) 243-1613
Lotus 1-2-3	Lynn Jarrett	(619) 293-1130
	Joseph L. Marks	(404) 875-9211
	Miles Bridgford	(312) 496-4582
Low Level I/O on PRO	John R. Lynn	(714) 620-6667
LVP-16 Plotter	Lynn Jarrett	(619) 293-1130
Mass-11	Lynn Jarrett	(619) 293-1130
Medical Office Appl/DM	J. Kaufman	(201) 937-7816
Memory Additions	Caroline Mack	(703) 280-4404
	Tom Tugman	(703) 280-4404
Multiplan	Guy Stefan-Romano	(415) 753-5581
P/OS	Dr. Homer Baker	(602) 251-3830
PRO Applications	Tom Hintz	(904) 392-5180
PRO Ofc Workstations	Carol Britton	(805) 277-4808
PRO Series	Tom Hintz	(904) 392-5180
Robin (VT180)	John Comella	(617) 897-5922
Samna II	P. Chmielewski	(302) 777-5537
Scientific Programming	Jeff Mackie-Mason	(617) 253-8717
	Thomas R. LeBone	(603) 880-9097
Statistical Programming	Jeff Mackie-Mason	(617) 253-8717
TK!Files	Miles Bridgford	(312) 496-4582
TK!Solver	Miles Bridgford	(312) 496-4582
Turbo-Pascal	Thomas R. LeBone	(603) 880-9097
UCSD Pascal	Guy Stefan-Romano	(415) 753-5581
WordPerfect	Caroline Mack	(703) 280-4404
WordStar	Guy Stefan-Romano	(415) 753-5581
WPS	Cheryl Johnson	(515) 236-2570
	Kenneth LeFebvre	(216) 243-1613

PC PostScripts

by
YOU, the DECUS PC Sig Member
(For specific credits, see the Contributor's Page)

Dear PC Sig,

I have owned a Rainbow 100A for over 4 years. I have been very disappointed in the way that DEC has deserted Rainbow owners. I took a chance on DEC when many others wouldn't and I was repaid with neglect. In the DECEMBER newsletter, you published DEC's response to the Rainbow Wish List. This was a farce! Either there are no plans for the item, or it is included in PCSA. Since I am in a single user environment, this is of no use to me.

There are two additional items that I'd like to see on the wish list. The first, is a way of using CP/M BACKUP to back up the entire hard disk (all users) in one command. The second, is a discount for buying the same software package for both CP/M & MS-DOS. For example, if I were to buy a C compiler, 90% of the code would be identical across operating systems, differing only in the BIOS/BDOS calls. If the compiler were to sell for \$300, I should be able to purchase a package (for both CP/M & MS-DOS) for \$400-\$500.

Please continue your fight for Rainbow owners. You certainly have my support.

Leonard R. Gerstle

◆ ◆ ◆

Dear PC Sig,

I have a Rainbow 100B with hard disk that I have been using at home for about two and one-half years. I have been working on it as well as with it, and thought you might want to print some information in the newsletter. You might also be able to give me some help with what I have developed.

I have been working on my Rainbow to upgrade it. I replaced my floppy disk drives with a pair of Shugart 465 disk drives, which are double-sided, double-density drives. They have worked fine using the standard Rainbow firmware and software, except for one problem. When they are not moving, then the first access starts them turning and returns an error, which MS-DOS reports as a disk failure. By performing a retry while still turning, the disk works fine.

I first wrote some CP/M-80 programs for the Rainbow to use both sides of the disk. A friend of mine has a CP/M computer that has double-sided disks, so I wrote a program to copy files to disks in a format that his computer could read. Then I went to work on the MS-DOS side of my Rainbow.

I first modified the Z-80 program that runs the floppy disk drives from the MS-DOS code. This allows the Z-80 to use both sides of the disk. Then I modified IO.SYS so that it knew about double-sided disks. I also gave it the ability to read IBM PC double-sided disks. Then I modified the MS-DOS bootstrap so that it can boot the double-sided disks, and the primary floppy disk bootstrap so it can boot from double-sided disks. Finally, I modified the FORMAT program so that it can format the double-sided disks. In the process, I am adding enhancements to the IO.SYS default drivers that I find useful. It is kind of nice to run CHKDSK on a floppy and have it report 800,256 bytes total disk space.

PC PostScripts
(Continued)

The only problem that I have come up with so far is the timing. Booting the floppies from the ROM always fails the first time, but starts the disks turning. If it tries the second time while the disks are turning, then it succeeds. Also, my programs take longer to access the disks, since they now have to check if the disk is double-sided when doing a media check. But I feel that this is a small price to pay.

So it can be done, but with more than a little work. The main problem is that there are no debugging aids, so when it fails, it is hard to determine the cause.

Now the part where you may be able to help. The Digital Equipment Corporation license agreement says that I can modify the system for use on my own machine, but I cannot sell it or give it away. I wrote to Digital about selling the modifications, and it was "forwarded on to their legal department". That was 6 months ago, which is not surprising from my experience with Digital.

Do you or anyone else know of any way I can legally sell these new modifications without violating copyrights held by Digital (or anyone else)? I would be interested in any responses.

On another line, I have designed some new boards and attachments for the Rainbow to increase the capabilities. These include adding more memory for an MDRIVE, adding more disk and tape options, and other additions. However, I cannot develop these ideas, since the costs of building a board and especially the equipment needed to debug the hardware are enormous.

What I am looking for is a company that may be interested in developing some of these ideas. I would be willing to supply initial schematics and block diagrams of the ideas, and would like some other company to develop the ideas and sell the boards. Are there any companies that would be willing to work this way?

Thank you for your assistance.

Richard Thomsen

◆ ◆ ◆

Somehow this next submission got gobbled up by our international mail service, the US Postal Service or the internal mail monster at the University of Texas Health Science Center that occasionally swallows a missive only to spit it out in the unpredictable future. My sincere thanks to Kimmo Linnila for his timely response to the article he referred to and my apologies to all of you for the uncontrollable delay.

—Barbara A. Maaskant

Dear PC Sig,

Helsinki 20.08.1986

Referring to your article "Hints, Tricks, and Curiosities" in June in SIGs NEWSLETTERS I thought to give two suggestions to questions with no answers for the present. The answers seem to be quite trivial; I hope I didn't misunderstand your problems.

Q. How can I make a string containing "\$" if using the MSDOS string function?
A. The next BAT- file does work

```
echo off
set rec=word1^[+word2
set recl=^[+$
echo %rec%
echo %recl%
```

Q. How do you echo the words ON and OFF?
A. As above, let's make a short BAT- file:

```
echo off
set var1=^[+ON
set var2=^[+OFF
echo %var1%
echo %var2%
```

In the above [means <Esc> (<F6> in Edlin) and "+" is any character (almost)

I hope these contributions are of use for someone.

Kimmo linnila

Rainbow Working Group Update

by
Lynn Jarrett

Here it is April already and we're preparing for the Spring Symposium. This symposium looks to bring some exciting sessions and extremely educational Pre-Symposium seminars on the VAXmates--most valuable for those of us who are lucky enough to attend.

I look forward to symposia because of the sessions and the chance to hear interesting speakers, see old friends, meet new ones and look at what DEC is doing "now".

Of course the most exciting thing our SIG is involved in now is the VAXmate. Rainbow owners are fearful that DEC will forget they ever existed, and, to an extent, that's true. The third party vendors out there are the Rainbow owners' real friends. There is continual development going on, marketing of third party products and the continuous enthusiasm of those of us Rainbow owners who have stuck together and shared our knowledge, public domain software, etc.

But don't give up on DEC yet. I think you'll see continual assistance in some areas of the Rainbow world: Maintenance, the release of MS-DOS 3.1, the offering of the Lotus update and possibly other updates, and more.

As far as the Rainbow Wish List is concerned, there wasn't much to add this time. I am getting a lot of responses from the ballot that's printed herein. The majority of replies agree with the priorities as listed, and the Wish List will continue to be published monthly.

The letters published in this issue (*see PC PostScripts —ed.*) are ones that I received and most likely several of you will want to reply directly to the individuals who wrote them, but if you'd like, you may reply to me so that I may have the replies printed here.

I now have several VAXmates installed at my site and am anxious to share some of my knowledge about them and their uses with you soon. I am looking forward to hearing from you so keep the letters coming. And don't forget to return the ballot found in the Questionnaire section of this booklet to me as soon as possible. Until next month ...

CLIKCLOK Keeps on Ticking ...

by
Barbara A. Maaskant

The CLIKCLOK from Suitable Solutions has been receiving a lot of positive publicity from all sources. It is a clock on a chip that is inserted under an existing EPROM on the Rainbow motherboard. The CLIKCLOK has a 10 year battery, is accurate to 1 minute a month and is priced at a modest \$--.-- (*less than \$75 —ed.*) It is intended to work on any MS-DOS machine which is good news for VAXmate owners. The documentation and installation instructions are excellent!

Some of you may have read my recent article (*The DEC Microletter**, February 1987) on installing the CLIKCLOK in my home machine. There are two versions of the CLIKCLOK; one for the A and one for the B. Both work very well on their respective machines. They are not interchangeable so be sure and get the correct flavor. The problem I encountered was due to installing a "B" CLIKCLOK on my 100A. My "A" version CLIKCLOK is ticking away just fine!

*The DEC Microletter is a new newsletter published by Theodore Needleman, of *Hardcopy* fame.

Upgrading A Rainbow 100B Using A Dual Winchester Controller

by
Jim Hobbs

I imagine by now that most of you have at least heard of the micro-Computer Hardware Support's (C.H.S) RB-7. Perhaps not in those words, but more commonly as C.H.S's dual disk drive controller board for the Rainbow.

For those of you who do not have a hard disk controller or for those of you who wish for more disk space and thought the only way to achieve this was with the use of 32MB (RD52/ Q540) or 67MB (RD53/M1325) that is no longer true. A direct replacement of DEC's board, the C.H.S board offers the same functionality with a kick, the availability of connecting a second disk. Therefore, it is possible with an external power supply to have two (2) 67MB disks available to your Rainbow.

But I'm getting ahead of myself slightly, let me backup a little and explain MY personal experiences in getting two hard disks and a C.H.S. controller. (For some this may be boring since it is now rather 'old-hat' but for some of you it may be worthwhile, so forgive me if I reiterate the obvious.)

I bought a Rainbow 100B shortly after they were announced knowing that some day I would bite the bullet and upgrade the system to have a hard disk drive. At that time the 5MB disk was the largest supportable drive available. DEC soon announced a 10MB disk for nearly the same cost as the 5MB, then again announced the 20MB disk for nearly the same cost as the 10MB.

It was now common knowledge that the same controller could operate any one of the three disk drives. Also known was that DEC's disk drives were really Seagate drives. (RD50/ST506-5MB, RD51/ST412-10MB, RD31/ST225-20MB) So all one had to do was get their hands on a controller board and buy a Seagate drive from a third party vendor (since I didn't—and still don't—have DEC maintenance) one could save some hefty dollars. The catch here is that DEC was the only place one could buy a winchester disk controller. The key word in the last sentence is 'WAS'. C.H.S. a small (I presume small) company announced that they were making a controller board for the Rainbow and to 'one-up' the DEC board it would be able to support either one (1) or TWO (2) disks.

I had already purchased two new (2) ST-225's from a mail order house (cheap < \$280 each) and had downloaded a copy of WUTIL from the MARKET system all that I needed now was a controller board. (NOTE: WUTIL is a disk preparation utility written by Anthony Camas, available from several locations—I think it is better than any of the DEC WUP programs.) Given to desperation, I was about to buy a DEC board just as C.H.S. made their announcement. For a few hundred dollars less and the ability to use TWO disk drives I opted for the C.H.S. controller.

To test the two disk drives within the 30 day returnable period, I borrowed a friend's DEC controller board and used WUTIL to initialize, format and partition both drives. One came out perfect, the other only had two bad sectors. Satisfied that the drives were fine and WUTIL really worked, I return the borrowed board and waited for the C.H.S. controller to arrive.

And wait I did. It was late July 1986 when I sent in the \$--- + \$-- (C.H.S board & C.H.S disk formatter); the prices have gone up slightly, but are cheaper through group ordering with Wash-A-Rug. (*The price was less than \$500 plus less than \$75 —ed.*) And a few months later I still did not have anything to show for it.

Fall 1986 DECUS at San Francisco came and went and for once I was lucky. From a rather poor piece of Rainbow magic, I was in the running for one of several prizes. When it was my turn to choose my prize there was a C.H.S. controller from Andre Coltrin at the Rainbo-Works. I came home with a board in hand. The board went directly into my Rainbow and I TRIED to use WUTIL to again initialize one of the ST-225's but failed with a 'CANNOT SEEK TO TRACK 0'. Another attempt to initialize the second drive resulted with the same error. A call to Andre' and the board was in the mail going back to California with a replacement being sent out as soon as one arrived.

Shortly after the first board was sent back, the board I had purchased had arrived. Again it went quickly into the Rainbow. And again WUTIL was used to initialize and format the disk; it appeared to be working. The same messages that I had seen when using the DEC controller I was now seeing with the C.H.S. controller. BUT, all was NOT well. The same disk before had been initialized with zero (0) bad sectors now had over 400 bad sectors. The same was true with the second disk; before it had been initialized with only two (2) bad sectors and now it had over 300 bad sectors.

Continuing on, the next thing to do is to partition the disks. One contained errors in the first few tracks and could not be used as a bootable drive. I repeated the initialization and partitioning, again the same results. (I repeated doing this several times. Each time I received a large number of bad sectors, but they were not always the same sectors.) I finally conceded that something was wrong, but went ahead and put DOS on the one bootable drive.

After loading DOS, I loaded the remainder of my software (mostly public domain). I soon found several corrupted files and many programs that would not run from the hard disk. I began playing around with VERIFY. When I turned it on and copied files to and from the hard disk I received several 'ERROR WRITING TO DRIVE ?' errors. I just found out why the files were getting corrupted, they were not being copied correctly. After doing some more testing, it appeared that the larger the file the more likely it would get corrupted, but also nearly one (1) in ten (10) small files would also get corrupted. NOT GOOD.

A phone call back to the seller of the C.H.S. board and it, too, was back in the mail.

Two (2) out of two (2) C.H.S. controller boards had come and gone and neither one worked. One board was a 'REV A', the other a 'REV B'. Just before Christmas, Andre called saying a new board was in the mail. The original board he had sent would work with disks already formatted but could not itself format disks.

December 24, 1986, a new board from Andre arrives. This board is a 'REV C'. Again I disassemble the Rainbow from its floor stand, remove the cover and mother board. Insert the controller board reconnect the cables and prepare to initialize, format and partition one of the disk. This time I got through all of WUTIL with zero (0) bad sectors (same as with the DEC board) on the first drive, repeating the same steps the second disk WUTIL finishes with two (2) bad sectors (same as with the DEC board). I was cooking!!!

Using WUTIL I can only have one disk connected at a time. Using C.H.S's formatter program I can access either of the drives when installed but I did not feel as comfortable with the way it initialized the disks.

The acid (final) test would be setting VERIFY on and try copying files back and forth and see if the 'ERROR WRITING TO DRIVE ?' would occur. First I tried this with only one drive at a time connected—no problems. Second I set up to utilize both drives, again no problem. FINALLY, I have a C.H.S board that REALLY WORKS!

The installation of the controller board is just identical to that of a DEC board. Open the Rainbow unit, disconnect the floppy diskette flat cable and the power cable then remove the mother board. Insert the controller board into the mother board, replace the motherboard and reconnect the diskette and power cables. There are now two (three cables if two drives are being used) to be connected to the hard disk controller.

Since the two drives that I installed are half-height, both of them stacked can fit inside the Rainbow. The ST-225's are more efficient than the 5MB and 10MB and can BOTH be run from the internal power supply. I found another disk power connector and tapped into the existing power cable. Both drives are defined as drive 0 on the back jumper. The C.H.S. cable makes the appropriate changes in the cable. One other interesting thing, is that if you are planning to use two different disk drives, the slower of the two must be the second drive. This is because only one step rate can be used for both drives, and it is the second drive that sets the rate. Mixing two different drives (one fast, one slow) both drives operate at the slow rate, so plan accordingly.

Another small quirk is that if you desire any CPM partition(s) they have to be physically before any MS-DOS partition(s).

To utilize the second disk a driver provided by C.H.S. is placed into the CONFIG.SYS file. A short message appears that drive(s) ?.?.? are installed each time the system boots.

But this is not the end of the story. The controller board that I currently have is the one from the Rainbo Works, not the one I purchased. I have received a second board from the seller, but it too had the same problem as the one before it. So I'm in the process of getting it replaced with a working board or a refund.

Moral of the story. Being the first kid on the block to have something new isn't always what it's cracked up to be. The delay in getting the product has been terrible, the money was sent up front with a 'promised' delivery of ninety (90) days. Although there are C.H.S boards that do work (I HAVE ONE) there appear to be some boards that do not.

C.H.S did have some problems up front, getting a board manufacturer to follow specifications, running out of critical parts and what have you. But even so, it seems to take a long time (and a lot of patience) to get things to work.

To finish up with, C.H.S. is making a product that many Rainbow users want and the price is very reasonable; but, be sure to order them through a dependable source that will work with you till you are satisfied. (Andre has really fit the bill for me!)

micro C.H.S. Corp.
158 Boxboro Road
Stow, MA 01775
(617) 897-1868
[east coast distribution]

Rainbo Works
4220 Commercial Drive, Suite 5
Tracy, CA 95376
(209) 832-1001
[west coast distribution]

Rainbow Wish List

by
Rainbow Working Group

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—update 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, as well as updates on dBase III, WordStar, etc.
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.
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 VAXmate.

Rainbow Wish List
(Continued)

33. Ability to read and write to RX33 diskette drive upgrade kit.
34. Monitor connections for CAD products.
35. DEC suport for third party vendors wanting to develop and market hardware and software for Rainbows.
36. Ability to use CP/M BACKUP to back up the entire hard disk (all users) in one command.
37. Discount for buying the same software package that runs on both CP/M and MS-DOS.

The ballot can be found in the Questionnaire section of this copy of the SIG Newsletters. Please fill it in and send it to Lynn Jarrett (see the Steering Committee list in the back of this book).

Rainbow Software Version List

by
Gary Rice

This is a list of all the Rainbow software products of which I am aware and their version numbers. Often if you are having a problem with a piece of software, the next or latest version has corrected it. Unfortunately, it is not very easy to always know whether or not you have the latest version. I hope that this list will help you in this way.

PLEASE LET US KNOW WHAT VERSION YOU ARE USING
(EVEN IF YOU'RE NOT SURE THAT IT'S THE LATEST VERSION)

Software (alphabetically)	Vendor	Current or Last Version	Source of Information	Still Avail?	Operating System
<i>Code Blue</i>	Intersecting Concepts	1.0	User	Yes	MS-DOS
<i>CP/M-86/80</i>	DEC	1.01	User	Yes	CP/M
<i>DECnet-Rainbow</i>	DEC	1.0	DEC	Yes	
<i>GSX-86</i>	DEC	1.0	DEC	Yes	CP/M
<i>GW-Basic</i>	DEC	2.01.01	DEC	Yes	MS-DOS
<i>MS-DOS</i>	DEC	2.11-1	User	Yes	MS-DOS
<i>Rainbow ATHABASCAN Kit</i>	DEC	1.0	DEC	Yes	CP/M
<i>Rainbow CONNECTION</i>	DEC	1.0	DEC	Yes	MS-DOS
<i>Rainbow Office Workstation</i>	DEC	1.0	DEC	Yes	
<i>WPS-PLUS/Rainbow</i>	DEC	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).

For instructions on contacting Gary, please see the Contributor's Page in the beginning of the DECUS PC Sig Newsletter —ed.

DECmate Software Version List

by
Gary Rice

This is a list of all the DECmate software products of which I am aware and their version numbers. Often if you are having a problem with a piece of software, the next or latest version has corrected it. Unfortunately, it is not very easy to always know whether or not you have the latest version. I hope that this list will help you in this way.

PLEASE LET US KNOW WHAT VERSION YOU ARE USING
(EVEN IF YOU'RE NOT SURE THAT IT'S THE LATEST VERSION)

DEC Software (alphabetically)	Current or Last Version	Source of Information	Still Avail?	Operating System
<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 Emulator</i>	2.0	DEC	Yes	
<i>DECmate II Construction Business</i>	1.0	DEC	Yes	
<i>DECmate II Construction Management</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 WPS 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).

For instructions on contacting Gary, please see the Contributor's Page in the beginning of the DECUS PC Sig Newsletter —ed.

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.

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
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	Yes ¹
PRO/Smart Mailer	1.0	User	Yes ²	Yes*

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/UNIX	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?
D-M-Driver	Proto Systems	3a	Vendor	Yes	Yes
Fingraph	Graphic MIS	2.0	DEC	No	UNK
Online Disk Unfragmentor	By Hand	1.4e	User	Yes	Yes
PRO/Menu Manager	Wasatech Computer	1.0	User	Yes	UNK
PRO/Session Logger	By Hand	2.0	Vendor	Yes	Yes
TK!Solver	Software Arts	1.0(2A)	User	No	UNK

¹Restrictions apply

²This 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.

For instructions on contacting Gary, please see Contributor's Page in the beginning of the DECUS PC Sig Newsletter — ed.

PROgramming Quickie

by
Gary Rice

For the last two months, I have shared some sample programs with you that were suited to the PRO and the RSX environment as well. This month, I begin a series of examples that will ONLY work on your PRO.

The PRO operating system P/OS is shipped with a resident library known as POSSUM. IN that library are several user callable routines that perform various PRO related functions. In this series of examples, I will show you how to use the PROATR routine from that library. The routine can tell you many things about files on your system.

This first example shows you how to determine what the file protection is for a series of files. The program is written in FORTRAN and is followed by the linker command file required to build the task.

Please note that this example assumes that you have PRO/Toolkit including the document set and Toolkit FORTRAN. However, you can use ANY of the Toolkit languages or MACRO to call the PROATR routine. PROATR is documented in the Executive Reference Manual. You should refer to it while you study the program. This will aid you in understanding what the various structures in the program do.

Send me your OWN PROgramming Quickie and I will publish it in this column.

```
C GETPROT.FTN - This program uses the PRO system service PROATR to
C obtain file protection information about files in
C the [USERFILES] directory on DW1:.
C
C AUTHOR: Gary Rice
C
C CREATED: February 7, 1987
C
C REVISIONS: None
C
C INPUTS: None
C
C OUTPUTS: None
C
C NOTES:
C
C*****
C
C PROGRAM GETPRT
C
C 10 FORMAT (I5)
C
C
C INTEGER*2 STATUS(8), FILEID(3), LIST(8), PROT(2), NAME(5)
C INTEGER*2 REQUEST, LUN, TEMP, TEST
C
C CHARACTER*20 FILE
```

PROgramming Quickie
(Continued)

```
C
C BYTE MASK(2)
C
C LOGICAL*1 T, F
C
C EQUIVALENCE (MASK(1), TEMP)
C Begin
C
C T = .TRUE.
C F = .FALSE.
C CALL ERRSET (36,T,F,T,F) ! End of file condition
C
C OPEN(UNIT=1,NAME='SY:[0,0]USERFILES.DIR',TYPE='OLD',SHARED,
+ READONLY,FORM='UNFORMATTED',RECORDTYPE='FIXED',
+ ACCESS='DIRECT')
C
C REQUEST = 0 ! Request is "GET attributes"
C MASK(1) = 2 ! Attribute code for
! "protection"
C MASK(2) = 4 ! Size of PROT array in bytes
C LIST(1) = TEMP ! Set up the attribute list
C CALL GETADR(LIST(2),PROT(1))! Get the PROT array address
C LIST(3) = 0 ! Mark the end of the list
C LUN = 2 ! Pick an unused LUN for the
! data lookup
C I = 0 ! Init the directory entry
! pointer
C CALL ERRSNS ! Clear the error buffer -
! just in case
C 150 I = I + 1 ! Point to the next directory
! entry
C
C READ(1'I,ERR=200)FILEID(1),
+ FILEID(2),FILEID(3),(NAME(J),J=1,5)
C IF (FILEID(1) .EQ. 0) GOTO 150 ! File was deleted
C
C CALL PROATR (STATUS, REQUEST, LIST, FILEID, LUN)
! Get the info
C
C CALL R5OASC (9,NAME(1),FILE(1:9)) ! Convert the file
! name to ASCII
C FILE(10:10) = '.'
C CALL R5OASC (3,NAME(4),FILE(11:13)) ! Convert the file
! TYPE to ASCII
C FILE(14:14) = ';'
C ENCODE (5,10,FILE(15:19)) NAME(5) ! Convert the version
! # to ASCII
C TYPE *,',', FILE
```

PROgramming Quickie
(Continued)

C The file protection mask is only 16 bits long. The data (if any)
 C contained in the 2nd word of the PROT array is meaningless. The BIT
 C mapping is as follows in PROT(1):
 C WORLD, GROUP, OWNER, SYSTEM
 C bits bits bits bits
 C 16-13 12-9 8-5 4-1
 C DEWR DEWR DEWR DEWR
 C If a bit is CLEAR (ie: = 0) then access is GRANTED thru THAT
 C characteristic. For example: if bit 13 = 0, then the user has WORLD
 C READ access to the file
 C

```

TEST = IAND ("1,PROT(1))
IF (TEST .ne. "1) TYPE *, 'System Read access'
TEST = IAND ("20,PROT(1))
IF (TEST .ne. "20) TYPE *, 'Owner Read access'
TEST = IAND ("400,PROT(1))
IF (TEST .ne. "400) TYPE *, 'Group Read access'
TEST = IAND ("10000,PROT(1))
IF (TEST .ne. "10000) TYPE *, 'World Read access'
TEST = IAND ("2,PROT(1))
IF (TEST .ne. "2) TYPE *, 'System Write access'
TEST = IAND ("40,PROT(1))
IF (TEST .ne. "40) TYPE *, 'Owner Write access'
TEST = IAND ("1000,PROT(1))
IF (TEST .ne. "1000) TYPE *, 'Group Write access'
TEST = IAND ("20000,PROT(1))
IF (TEST .ne. "20000) TYPE *, 'World Write access'
TEST = IAND ("4,PROT(1))
IF (TEST .ne. "4) TYPE *, 'System Extend access'
TEST = IAND ("100,PROT(1))
IF (TEST .ne. "100) TYPE *, 'Owner Extend access'
TEST = IAND ("2000,PROT(1))
IF (TEST .ne. "2000) TYPE *, 'Group Extend access'
TEST = IAND ("40000,PROT(1))
IF (TEST .ne. "40000) TYPE *, 'World Extend access'
TEST = IAND ("10,PROT(1))
IF (TEST .ne. "10) TYPE *, 'System Delete access'
TEST = IAND ("200,PROT(1))
IF (TEST .ne. "200) TYPE *, 'Owner Delete access'
TEST = IAND ("4000,PROT(1))
IF (TEST .ne. "4000) TYPE *, 'Group Delete access'
TEST = IAND ("100000,PROT(1))
IF (TEST .ge. 0) TYPE *, 'World Delete access'
GOTO 150
CLOSE (UNIT=1)
END
  
```

200

Listing 1 — GETPRT

PROgramming Quickie
(Continued)

```

;
; GETPROT.COMD - Links the previous program
;
GETPROT/FP/CP=GETPROT
LB:[1,5]PROF77/LB
/
;
; Equate P/OS symbols to LUNS
;
GBLDEF=TT$LUN:0
GBLDEF=WC$LUN:0
GBLDEF=MS$LUN:4
GBLDEF=HL$LUN:0
GBLDEF=MN$LUN:0
;
; Define terminal event flag
;
GBLDEF=TT$EFN:1
;
; Define cluster scheme
;
LIBR=POSSUM:RO
CLSTR=PROF77,POSRES,RMSRES:RO
//
  
```

Listing 2 — GETPROT

R S T S

RST



1986 Fall
San Francisco

DECUS

RSTS Security Topics

Gary Barton
RSTS Development

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RSTS/E

October 6-10

What is security?

- o Trusted users or malicious users?
- o Beware "false sense of security"
- o Security is, by nature, inconvenient
- o Security is an art of compromise
- o Good security is expensive
- o Poor security is even more expensive
- o Know what your are doing

Passwords

- o Change them frequently?
 - System passwords need to be changed regularly
 - User passwords need to be changed whenever there is reason to believe they may have been compromised
- o Make them unique, memorable, not random!
- o Not names, addresses, phone numbers, or words found in a dictionary
- o Make them long, 6-14 characters, rest ignored
- o Phrases are good choices
- o Never put them on disk, in any form
- o Don't give passwords to NOUSER accounts
- o Set the default DECnet account to NOINTERACTIVE, NODIALUP
- o Use the System Password for NETWORK and DIALUP access

Account Management

- o Audit/Control data maintained
 - Account access control
 - Last password change date/time
 - Last login date/time and location
 - Expiration date
 - Authorized Privileges
 - Quotas
- o Use account expiration
- o Use restricted access
- o Use group account management
 - Instead of world account management
 - In a development shop
- o Types of accounts
 - Unrestricted user account
 - NOINTERACTIVE
 - NODIALUP
 - NONETWORK
 - NOPASSWORD (guest account)
 - CAPTIVE
 - NOUSER (files only)

Command Procedures

- o LOGIN Command Procedures
 - System, Group, or User level
 - Captive accounts
- o What are they good for?
 - Can encouragement password changes
 - Maintain audit trails

Command Procedures (continued)

- Control System/Program access

o Secure command files

- Limit the user's options with a menu
- Don't use substitution
- Fully parse all user input
- Prefix DCL commands with underscores

Quotas

o Controllable at Multiple Levels

- System management
- Group management

o Limit Amount of Secondary Storage Consumed

- When logged out
- When logged in
- On a per account/directory basis

o Limit the number of users/jobs per account

o Limit the number of detached jobs a user may keep active

o Limit the amount of system communications resources a job may hold

Multiple Privileges

o There is no requirement that ALL privileges be available

o Privileges should be granted based on

- User need for the privilege in question
- Frequency of need
- User skill and experience level

o Controllable at Multiple levels

- System, Group, or User
- Downwards modifiable during timesharing from maximum allowed

o Casual user

- Ability to change own password

o Group manager (Supervisor/Project leader)

- Ability to perform accounting functions/data access within group

o System manager

- Modify system parameters, files, commands, etc.
- Control Software/Hardware Configuration
- Control Device Availability

o Operator

- Control Print/Batch Services
- Ability to shut down system
- BACKUP the system

o Other

- Memory Modification
- System file access
- Any highly restricted functions

o Program privileges

- Privileged programs get all privileges except SYSMOD and TMPDRV

Multiple Privileges (continued)

- EXQTA is a program-only privilege
- o Third party checks
 - Third-party privilege check (UU.3PP)
 - Check file access rights (UU.CHK)

Activity Logging

- o Always log to paper
- o Check the Console Log every morning
- o Use the Event Logger (in a Network environment)
- o Consider using EMT Logging Facility

EMT Logging

- o Don't log passwords!
- o Log the following:
 - UU.ATR - Read/Write/Delete account attributes
 - UU.ATT - Attach/Reattach job
 - UU.BCK - Change file statistics
 - UU.BYE - Logout
 - UU.CFG - Set device/System defaults
 - UU.CHU - Set password, kill job, make coffee,
etc
 - UU.DAT - Change system date/time
 - UU.DLU - Delete user account
 - UU.FIL - File modification
 - UU.JOB - Create a job

EMT Logging (continued)

- UU.LIN - Login
- UU.PAS - Create user account
- UU.POK - Poke memory
- UU.RAD - Read and reset accounting data
- .RUN (optional)

Media Control

- o Physically write protect sensitive data if possible
- o Make frequent backups
- o Advantages offered by new BACKUP
 - More reliable
 - Better performance
 - More flexible
 - VMS compatible
 - Media independent

Device Management

- o Devices may be 'disabled' with sufficient privilege
- o Terminal line characteristics may be permanently changed
- o System characteristics for terminal lines are restored at logout, job kill, or detach with close

Print/Batch Services

- o Queue priority limits
 - User selected priority within queue limits
- o Job limits
 - Page limit
 - CPU/Elapsed time limit
- o Users are controlled by authorized privileges
 - Privileges are associated with Queues
 - Queues are assigned specific servers
 - Servers are assigned to specific devices
 - Devices are restricted to specific forms

Network Security

- o A compromised system provides a "base" for attempts on other systems.
- o Executor's default account
 - Used for remote printing, submission, etc.
 - Should be have NO privileges
 - Should be set NETWORK,NOINTERACTIVE,NODIALUP
 - Should be watched for abnormal activity.
 - Limit its size with quotas
- o Event logging
 - Event 2.1 - Access control reject
 - Event 33.0 - Remote file transfer
 - Event 34.0 - Object spawned
- o Network objects
 - Be certain you need the service rendered by each network object you have installed.

Network Security (continued)

- Object 19 - NML. Delete it unless you require remote network management.

Prevention and Detection

- o First Line of Defense - A good system password
- o Second Line of Defense - A controlled system
- o Third Line of Defense - Vigilance
 - o First point of detection - User awareness
 - o Second point of detection - Activity logs
 - o Third point of defense - Periodic surveys

Cleaning Up

- o Go "incommunicado"
- o Back up all disks and initialize them or use new disks
- o Do a complete system installation onto a blank disk
- o Restore to the last "good" BACKUP set
- o Keep old disks around for comparison



1986 Fall
San Francisco

DECUS

RMS Hints and Kinks

Charlie Katz
RMS-11 Development

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RSTS/E

October 6-10

RMS-11 HINTS and KINKS

- o GENERAL CONSIDERATIONS
- o NETWORK NITS
- o RMS-11 UTILITIES
- o RMS-11 vs. RMS-32
- o ADVANCED HINTS

GENERAL CONSIDERATIONS

- o ENVIRONMENT ERRORS
- o FILE ATTRIBUTES
- o FILE SHARING
- o CONTIGUITY
- o ABORTED PROGRAMS
- o RFA field layout

 * ENVIRONMENT ERRORS *

ER\$ENV in (R0) caused by:

- o Incorrect or missing ORG\$ statement
- o Code missing from overlay description file

ER\$LIB in (R0) caused by:

- o Missing resident library segment
- o Using subset library (RSX-11M)
- o Missing DAPRES library
- o Root detects generation problem

 * RMS-11 FILE ATTRIBUTES *

WHAT ?

- o RSTS/E DIRECT/HD
- o RSX DMP/HD
- o IFAB + 32 (10. words long)

WHAT !

- o FILE ORGANIZATION
- o RECORD FORMAT
- o RECORD ATTRIBUTES
- o LONGEST RECORD LENGTH
- o END OF FILE

MORE WHAT !

- o BUCKETSIZE
- o VFC HEADER SIZE
- o MAXIMUM RECORD SIZE
- o DEFAULT EXTENSION QUANTITY

NON-HOMOGENEOUS ACCESSORS

BASIC-PLUS - - - - - RMS-11
 (QIO's)



RSTS/E STREAM FILE
 (RSX FILE)

INTENTIONAL REMOVAL OF ATTRIBUTES

- o Are you really sure ?
- o Create from Basic-Plus
- o PIP/NOA, NFT/NOA

 * FILE SHARING *

GENERAL COMMENTS

- o RSTS/E - Normal Mode vs. Update Mode
- o RSTS/E - Read Regardless (Mode:4096)
- o RSX - User Provided Interlocks
- o RSX - Read restriction
- o No null sharing

DANGERS of BYPASSING RMS-11 SHARING

- o End of file inaccuracy
- o Indexed file in progress
- AND when program or system crashes ...
- o RSX locked files

FILE SHARING

SEQUENTIAL FILES - RSTS/E

		1st Accessor			
	Access/Share	W/W	W/R	R/W	R/R
	W/W	N	N	N	N
2nd	W/R	N	N	N	N
Accessor	R/W	MO	MO	Y	Y
	R/R	MO	MO	Y	Y

KEY

N = NOT ALLOWED

Y = ALLOWED

MO = ALLOWED WHEN USER SPECIFIES MODE 4096 (READ REGARDLESS)

SEQUENTIAL FILES - RSX

		1st Accessor			
	Access/Share	W/W	W/R	R/W	R/R
	W/W	N	N	U	N
2nd	W/R	N	N	U	N
Accessor	R/W	U	U	Y	Y
	R/R	U	U	YR	Y

KEY

N = NOT ALLOWED

Y = ALLOWED

U = ALLOWED WHEN USERS PROVIDE INTERLOCK (ONE WRITER LIMIT)

YR = ALLOWED, BUT SUBSEQUENT WRITERS DISALLOWED (UPI)

FILE SHARING

INDEXED/RELATIVE FILES - RSTS/E

	1st Accessor				
Access/Share	W/W	W/R	R/W	R/R	
	W/W	Y	NP	Y	NP
2nd	W/R	NP	NL	NP	NL
Accessor	R/W	Y	NP	Y	NP
	R/R	NP	NL	NP	Y

KEY

NP = NOT ALLOWED (PROTECTION VIOLATION - INCOMPATIBLE MODE)

NL = NOT ALLOWED (FILE LOCKED)

Y = ALLOWED

NOTE:

ALLOW WRITE FORCES UPDATE MODE

ALLOW READ FORCES NORMAL MODE

INDEXED/RELATIVE FILES - RSX

	1st Accessor				
Access/Share	W/W	W/R	R/W	R/R	
	W/W	Y	N	Y	N
2nd	W/R	N	N	YR	N
Accessor	R/W	Y	Y	Y	Y
	R/R	N	N	YR	Y

KEY

N = NOT ALLOWED

Y = ALLOWED

YR = ALLOWED, BUT SUBSEQUENT WRITERS DISALLOWED

 * CONTIGUOUS FILES *

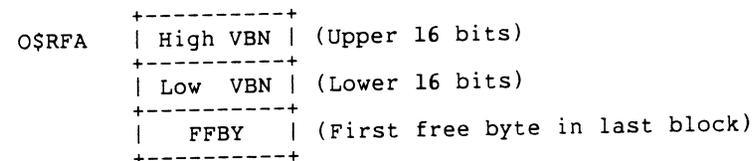
- o Eliminate hidden I/O's by file processor
- o FILE vs. AREA contiguity
- o IFL and Preallocated Areas
- o COPY it contiguous
- o Extending a contiguous file (RSX vs. RSTS/E)
- o Monitoring remaining blocks (RMSDSP)

 * RECORD FILE ADDRESS *

GENERAL LAYOUT (3 words available)

BLOCK I/O	Lo Vbn, Hi Vbn
SEQUENTIAL	Lo Vbn, Hi Vbn, Byte offset into block
RELATIVE	Lo Vbn, Hi Vbn, Byte offset into bucket
INDEXED	Lo Vbn, Hi Vbn, Unique Record ID (1 Byte)

\$CONNECT with BLOCK I/O
 to obtain end of file



* NETWORK NITS *

- o RUNNING OUT OF RMS DYNAMIC POOL (ER\$DME)
- o RSX PASSWORD LENGTH
- o LACK OF TRANSPARENT TASK-TO-TASK DAP
 "TASK = FOO", "0 = FOO"

* RMS-11 UTILITIES *

GENERAL COMMENTS

- o Parsing restrictions
- o RMSDES defaults vs. help
- o RMSDES FILE vs. AREA section
- o RSX naming convention

RMS-11 UTILITIES NAMING CONVENTION

 CNVxyz

- x : nothing at the moment
- y : RMS-11 Access Methods Code
- O = overlaid RMS-11
 - R = RMSRES (Resident Library)
 - S = Supermode RMSRES
- z: RMS-11 Network Access Methods Code
- O = overlaid RMSDAP
 - R = DAPRES (Resident Library)

* RMS-11 / RMS-32 *

COMMON ASPECTS

- o File and record operations
- o Sequential, Relative and Indexed (Prologue 1 & 2) files
- o Network interface
- o Access / Sharing overlap

DIFFERENCES

- o Locking granularity
- o Sequential file sharing
- o Nill sharing
- o Data and Key compression (Prologue 3 Indexed)
- o Journaling

VAX-11 / RSX

- o RMS-11 ---> RMS-32
- o Sharing, Search lists
- o No Prologue 3
- o Migrating programs

* ADVANCED HINTS *

TRACING RMS PROGRAMS

To observe RMS calls and Data structures

- o ODT BPT at offset 0 of ROEXEC
- o R5 --> Standard RMS argument list (FAB/RAB)
- o 2(SP) = User's operation code (RM\$xxx)
- o 4(SP) --> User's Return Address

Use RMS data structures layout diagram

RMS-11 INDEXED FILE RECOVERY

Prognosis - negative, go to backup

W A R N I N G WE DO NOT RECOMMEND TRYING TO RECOVER FILES THIS TOPIC IS BEING COVERED TO HELP USERS WHO ARE ALREADY DOING THIS

WHAT HAPPENS TO THESE FILES ?

- o Random disk corruption
- o Program aborted during access
- o System crash, parity error
 - multi-block buckets, multi-key index files
- o User deletes critical file
- o Sabotage

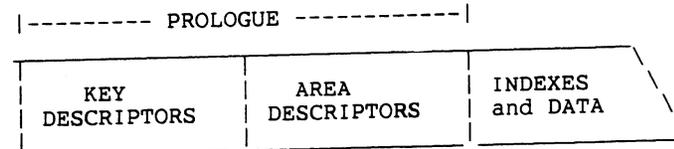
SYMPTOMS

- o RMS ERRORS
 - ER\$CHK, ER\$RRV, ER\$PLG, ER\$RVU, ER\$TRE
- o Missing Records (check key length)

FILE EXAMINATION

- o RMSDSP /FU
- o RMSCNV /KR
- o Dump utility
 - EOF (file header vs. prologue)
- o VMS ANALYZE
- o User written program
 - Block I/O, RFA access

INDEXED FILE - GENERAL STRUCTURE



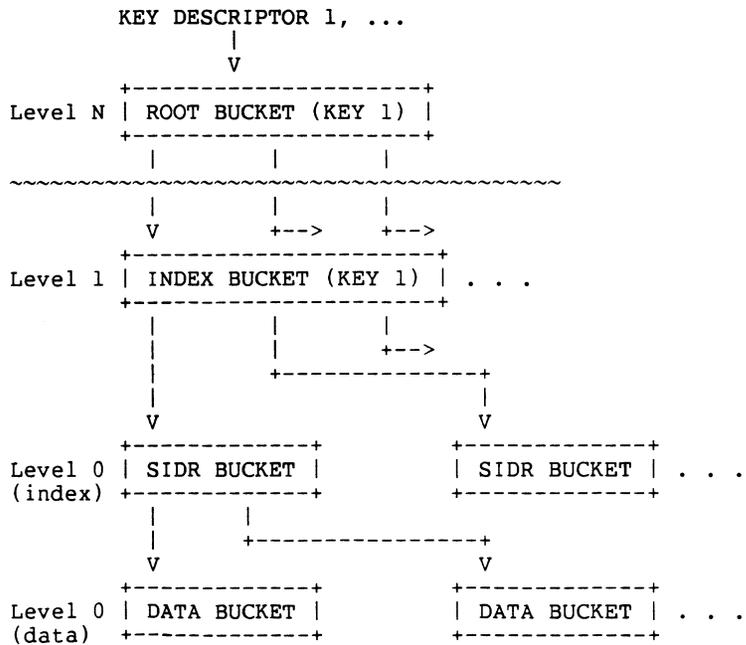
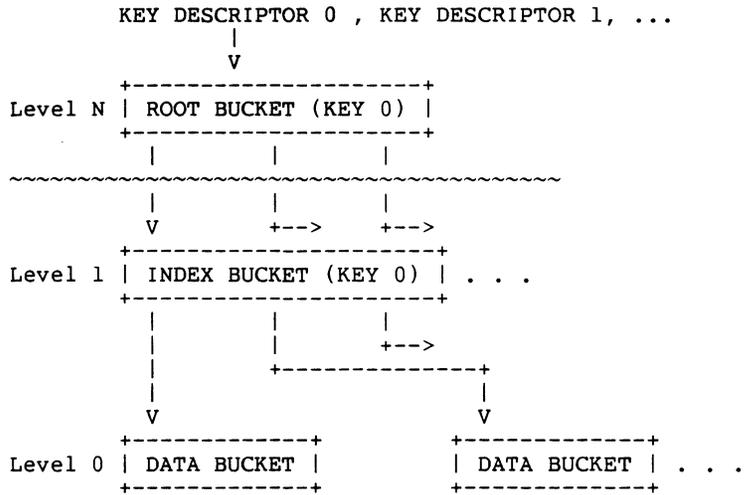
VBN 1 ----> n

AREA DESCRIPTORS

Start VBN of current extent
Size of current extent
Number of blocks used in current extent
Next VBN to allocate from current extent

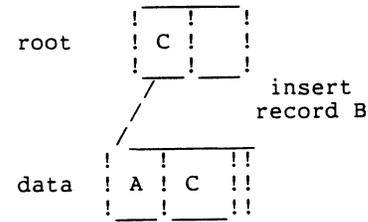
Only shows CURRENT extent

(if only it were a preallocated, non-extended file...)

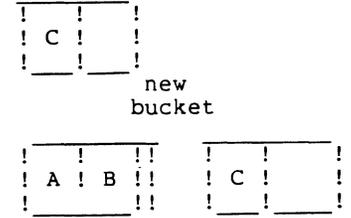


BUCKET SPLIT (simplest)

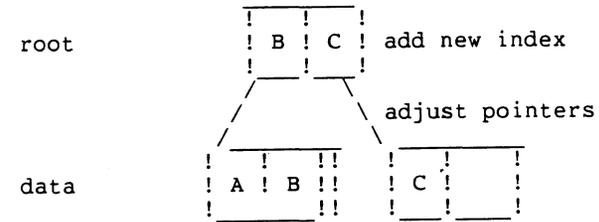
(1)



(2)



(3)



RECORD REFERENCE VECTOR (RRV)

General Record Layout

```

+-----+
| Flags | Record ID | RFA | Actual DATA |
+-----+
    
```

Record in Original Bucket

```

+-----+
| Record 1 | Record 2 | ... | Record Z |
+-----+
      |
      |-----+
      | RFA
      | (Record Pointer)
      +-----+
    
```

Record Layout For a Displaced Record

```

+-----+
| Flags | Record ID | RFA | (No DATA)
+-----+
    
```

Original Bucket (now Z is an RRV record)

```

+-----+
| Record 1 | Record 2 | ... | Record Z |
+-----+
    
```

New Bucket

```

+-----+
| Record 1 |
+-----+
      ^
      |
      |-----+
      | (RRV pointer)
      +-----+
      |
      |-----+
      | (Record pointer)
      +-----+
    
```

FILE MODIFICATION SEQUENCE

\$PUT

PRIMARY KEY (split)

Write Primary key index buckets (if necessary)
 Write New data bucket(s) resulting from split
 Rewrite original bucket (sequential access path all set)
 Write RRV bucket (RFA path all set)

PRIMARY KEY (no split)

Write Primary key index buckets (if necessary)
 Write the UDR bucket

ALTERNATE KEY(S)

Write Alternate key index buckets
 Write Alternate key SIDR bucket

\$DELETE

Lock UDR
 Write SIDRs (each alternate key)
 Write UDR's RRV bucket
 Write UDR

FILE MODIFICATION SEQUENCE (continued)

\$UPDATE

PRIMARY KEY (Split)

Write New UDR bucket(s) resulting from split

Update index bucket (possible split)

Rewrite original UDR bucket

Write RRV bucket

PRIMARY KEY (No Split)

Write UDR bucket

ALTERNATE KEY(S)

Delete phase

Rewrite SIDRs (dups - flag deleted)

(nodups - compress out)

Put phase

Write alt key index buckets (if necessary)

Write SIDR bucket with new insert (possible split)

Note: The delete phase and put phase are carried out before moving on to the next key.

RMS-11 DATA STRUCTURES (USER and INTERNAL) version 2.004

NOTE:

These structures may change. Consequently the user structures should always be accessed via the standard RMS-11 Macro Calls. The RMS-11 Internal Data Structures (Internal FAB Block, Internal RAB block, Index Descriptor, Buffer Descriptor Block) are reproduced here for informational purposes only. Do not reference them in your programs.

FAB [FILE ACCESS BLOCK] <<<<<		IFAB [INTERNAL FAB BLOCK] <<<<<	
BLOCK-LEN(120) BLOCK-ID(003)	0	BOOKKEEP BITS BLOCK-ID(013)	0
USER CONTEXT AREA	2	POINTER TO NEXT IFAB IN CHAIN	2
ADDRESS OF IFAB	4	USER BUFFER SZ ASSIGNED LUN	4
PRIMARY-STATUS	6	FAC & SHR MERGE DEVICE CHAR	6
SECONDARY-STATUS	10		10
ALLOCATION QUANTITY	12		14
DEFAULT-EXTEND ALLOC QUANTITY	16	POINTER TO BDB CHAIN	16
FILE-SHARING FILE-ACCESS	20	POINTER TO IFAB CHAIN	16
FILE OPTIONS	22	PRIVATE BUFFER	20
FILE ORG # RETRIEVAL PTR	24	POOL ADDRESS	24
RECORD FORMAT REC-ATTRIBUTES	26	MAXIMUM + POINTER TO INDEX DESC	24
PTR TO START OF XAB-CHAIN	30	RECORD + BLOCK SIZE (TAPE)	26
ADDRESS OF PRIVATE BUFFER POOL	32	NUMBER + SIZE OF KEY BUFFER	30
SIZE OF PRIVATE BUFFER POOL	34	MAXIMUM START+ FIRST DATA VBN	30
MAXIMUM RECORD SIZE	36	AREA +1 AREA + (RELATIVE)	32
MAXIMUM RECORD NUMBER	40	RECORD ATTRIB FILE ORGANIZ	34
LARGEST RECORD LENGTH	44	SIZE OF LARGEST/FIXED RECORD	36
ADDRESS OF NAME-BLOCK	46	HIGHEST VIRTUAL	36
ADDR OF PRIMARY FILE-NAME-STRING	50	END-OF-FILE VIRTUAL	42
ADDR OF DEFAULT FILE-NAME-STRING	52	BLOCK NUMBER	46
DEFAULT-SIZE PRIMARY-SIZE	54	FIRST FREE BYTE	50
BLOCK-SIZE	56	VFC HEADER SZ LARGEST BKTSIZ	52
BUCKET-SIZE VFC-HDR SIZE	60	MAXIMUM RECORD SIZE	54
LOGICAL CHANNEL DEVICE CHAR.	62	DEFAULT EXTEND ALLOCATION QTY	54
SPARES	64	RUN-TIME DEFAULT EXTENSION QTY	56
AND			
RMS WORK SPACE	120		60

DATE-TIME XAB <<<<<		NAM [NAME BLOCK] <<<<<	
BLOCK LENGTH	XAB-CODE (002)	ADDRESS OF RELATED FAB	
PTR TO NEXT XAB IN CHAIN		PTR TO RESULTANT FILE-NAME STR	
REVISION NUMBER		REAL SIZE-RSL	SIZE-RSL BUFFER
LAST REVISION DATE		ACTUAL DEVICE ID	
FILE CREATION DATE		WILD CARD DIRECTORY CONTEXT	
FILE EXPIRATION DATE		ACTUAL FILE ID	
FILE BACKUP DATE		ACTUAL DIRECTORY ID	
		FILE NAME BITS (SEE ROPRFN)	
		PTR TO EXPANDED STRING BUFFER	
		REAL-SIZE EX-STR SIZE-ESL BUFFER	
		WILD CARD CONTEXT BUFFER	

FILE-PROTECTION XAB <<<<<<<	
BLOCK LENGTH	XAB-CODE (003)
PTR TO NEXT XAB IN CHAIN	
PROGRAMMER	
PROJECT	
PROTECTION	

RST-32

KEY-XAB <<<<<		INDEX DESCRIPTOR <<<<<	
BLOCK LENGTH	XAB-CODE (001)	DATA BKS(VBN)	INDEX BKS(VBN)
PTR TO NEXT XAB IN CHAIN		POINTER TO NEXT INDEX DESCRIPTOR	
LEVEL OF ROOT	KEY OF REF	ROOT- LOW VBN + INDEX	USER
INDEX BUCKET FILL QUANTITY		(IF IDX EXISTS)+ ALLOC	ALLOC
DATA BUCKET FILL QUANTITY		ROOT- HIGH VBN + *FILL*	LOWLVL
IDX AREA NUM	NULL-KEY CHAR	(IF IDX EXISTS)+ *FILL*	IDX AN
DATA-LVL AREA	!LO-IDX AREA NUM	KEY-DATA TYPE	FLAGS
KEY DATA TYPE	FLAGS	"NULL" CHAR	NUMBER OF SEGS
PTR TO NAME OF KEY		KEY OF REF	TOTAL KEY SIZE
POSITION(S) AND SIZE(S) OF KEY		DATA FILL QTY	INDEX FILL QTY
VBN OF ROOT BUCKET FOR THIS KEY		POSITION(S) AND SIZE(S) OF KEY	
VBN OF FIRST DATA BUCKET			
DATA BKT SIZE	INDEX BKT SIZE		
TOTAL KEY SIZE	NUM KEY SEGS		
MINIMUM RECORD LENGTH			

RST-31

```

>>>>> AREA-ALLOCATION XAB <<<<<<<<
+-----+-----+-----+-----+-----+-----+
| RPU | XAB-CODE (004) | 0 |
+-----+-----+-----+-----+-----+
| PTR TO NEXT XAB IN CHAIN | 2 |
+-----+-----+-----+-----+-----+
| BUCKET SIZE | AREA-ID | 4 |
+-----+-----+-----+-----+-----+
| RELATIVE VOLUME NUMBER | 6 |
+-----+-----+-----+-----+-----+
| ALLOC OPTIONS | ALIGN OPTIONS | 10 |
+-----+-----+-----+-----+-----+
| ALLOCATION QUANTITY | 12 |
+-----+-----+-----+-----+-----+
| DEFAULT ALLOCATION QUANTITY | 16 |
+-----+-----+-----+-----+-----+
| RPU | 20 |
+-----+-----+-----+-----+-----+
| LOCATION ON DISK | 22 |
+-----+-----+-----+-----+-----+
| FOR PLACEMENT CONTROL | 26 |
+-----+-----+-----+-----+-----+
| RELATED FILE ID | 34 |
+-----+-----+-----+-----+-----+
| TO BE USED FOR |
+-----+-----+-----+-----+-----+
| PLACEMENT CONTROL |
+-----+-----+-----+-----+-----+
>>>>> SUMMARY-XAB <<<<<<<<
+-----+-----+-----+-----+-----+-----+
| BLOCK LENGTH | XAB-CODE (005) | 0 |
+-----+-----+-----+-----+-----+-----+
| PTR TO NEXT XAB IN CHAIN | 2 |
+-----+-----+-----+-----+-----+-----+
| NUM OF AREAS | NUMBER OF KEYS | 4 |
+-----+-----+-----+-----+-----+-----+
| RPU | NUM REC DSCR. | 6 |
+-----+-----+-----+-----+-----+-----+
| PROLOGUE VERSION NUMBER | 10 |
+-----+-----+-----+-----+-----+-----+
| 12 |
+-----+-----+-----+-----+-----+-----+
| 12 |
+-----+-----+-----+-----+-----+-----+
>>>>> BUFFER DESCRIPTOR BLOCK [BDB] <<
+-----+-----+-----+-----+-----+-----+
| WORK AREA | 0 |
+-----+-----+-----+-----+-----+-----+
| PTR TO NEXT BDB IN CHAIN | 2 |
+-----+-----+-----+-----+-----+-----+
| OWNER (PTR TO IRAB) | 4 |
+-----+-----+-----+-----+-----+-----+
| NUMBER OF BYTES USED | 6 |
+-----+-----+-----+-----+-----+-----+
| PTR TO WAIT THREAD | 10 |
+-----+-----+-----+-----+-----+-----+
| USE COUNT | FLAGS | 12 |
+-----+-----+-----+-----+-----+-----+
| BLOCK ADDRESS- LOW VBN | 14 |
+-----+-----+-----+-----+-----+-----+
| BLOCK ADDRESS-HIGH VBN | 16 |
+-----+-----+-----+-----+-----+-----+
| SIZE OF BUFFER (IN BYTES) | 20 |
+-----+-----+-----+-----+-----+-----+
| ADDRESS OF BUFFER | 22 |
+-----+-----+-----+-----+-----+-----+
| 24 |
+-----+-----+-----+-----+-----+-----+

```

RMS-11 Indexed File On-Disk Structures (ID 2.006)
Note: This information is correct to the best of our current knowledge. It will be updated periodically to ensure accuracy.

VBN 1 - PROLOGUE (KEY 0 Descriptor)
VBN P\$NLVB - KEY DESCRIPTOR BLOCK(s) (where alternate keys exist, 5 per block)
VBN P\$AVBN - AREA DESCRIPTOR BLOCK(s) (eight per block)
INDEX AND DATA BUCKET SPACE STARTS AT: ((P\$AMAX / 8 (TRUNCATED) + P\$AVBN)

BIT INTERPRETATIONS FOR PROLOGUE BLOCK

P\$FLGS (octal values)
1 - XB\$DUP (DUPLICATES)
2 - XB\$CHG (CHANGES)
4 - XB\$NUL (NULL CHAR ENABLED)
10
20 - XB\$INI (INITIALIZE INDEX)
40 - MAINTAIN DUPLICATE COUNT

P\$DTP (octal values)
0 - XB\$STG (ASCII STRING)
1 - XB\$IN (15-BIT SIGNED INTEGER)
2 - XB\$BN2 (16-BIT UNSIGNED INTEGER)
3 - XB\$IN4 (31-BIT SIGNED INTEGER)
4 - XB\$BN4 (32-BIT UNSIGNED INTEGER)
5 - XB\$PAC (PACKED DECIMAL)

PROLOGUE BLOCK	Oct	Hex	Dec
(P\$NLVB)	0	0	0.
VBN of NEXT DESCRIPTOR (P\$NHVB)	2	2	2.
0s	4	4	4.
LEVEL 1 AREA # (P\$LAN) LEVEL 2+ AREA # (P\$IAN)	6	6	6.
ROOT LEVEL (P\$LVL) LEVEL 0 AREA # (P\$DAN)	10	8	8.
DATA BKT SIZE (P\$DBKS) INDEX BKT SIZE (P\$IBKS)	12	A	10.
(P\$LVBVN)	14	C	12.
PRIMARY ROOT BUCKET POINTER (P\$HVBVN)	16	E	14.
DATATYPE (P\$DTP) FLAGS (P\$FLGS)	20	10	16.
0s # KEY SEGS (<= 8) (P\$NSEG)	22	12	18.
KEY of REF (0) (P\$KEY) TOT KEY SIZE (<=255) (P\$KYSZ)	24	14	20.
MINIMUM RECORD LENGTH (P\$MINL)	26	16	22.
INDEX FILL NUMBER (P\$IFIL)	30	18	24.
DATA FILL NUMBER (P\$DFIL)	32	1A	26.
(P\$POS0)	34	1C	28.
KEY (P\$POS1)	36	1E	30.

FIELD	(P\$POS2)	40	20	32.
SEGMENT	(P\$POS3)	42	22	34.
POSITIONS	(P\$POS4)	44	24	36.
(8	(P\$POS5)	46	26	38.
WORDS)	(P\$POS6)	50	28	40.
	(P\$POS7)	52	2A	42.
(P\$SIZ1)	(P\$SIZ0)	54	2C	44.
KEY FIELD	(P\$SIZ2)	56	2E	46.
(P\$SIZ3)	(P\$SIZ4)	60	30	50.
SEGMENT SIZES	(P\$SIZ6)	62	32	52.
(P\$SIZ5)	(P\$SIZ7)	64	34	54.
(4 WORDS)				
KEY NAME STRING (16 WORDS) (P\$KNM)				
FIRST DATA BUCKET (P\$LDVB)				
FIRST DATA BUCKET (P\$HDVB)				
SPARES (7 WORDS)				
MAX AREA # + 1 (P\$AMAX)	1ST AREA DESC VBN (P\$AVBN)	146	66	102.
FIRST DATA BUCKET (P\$DVBN)				
FIRST DATA BUCKET (P\$DVB2)				
MAXIMUM RECORD NUMBER (P\$LMRN)				
MAXIMUM RECORD NUMBER (P\$HMRN)				
END OF FILE (P\$LEOF)				
END OF FILE (P\$HEOF)				
PROLOGUE VERSION NUMBER (P\$VERN)				
SPARE (146 WORDS)				
BLOCK CHECK SUM		1000	200	510.

BIT INTERPRETATIONS FOR KEY DESCRIPTOR BLOCK(S)

K\$FLGS (octal values)
 1 - DUPLICATES
 2 - CHANGES
 4 - NULL CHAR ENABLED
 10
 20 - INITIALIZE INDEX
 40 - MAINTAIN DUPLICATE COUNT

K\$DTP (octal values)
 0 - XB\$STG (ASCII STRING)
 1 - XB\$IN (15-BIT SIGNED INTEGER)
 2 - XB\$BN2 (16-BIT UNSIGNED INTEGER)
 3 - XB\$IN4 (31-BIT SIGNED INTEGER)
 4 - XB\$BN4 (32-BIT UNSIGNED INTEGER)
 5 - XB\$PAC (PACKED DECIMAL)

KEY DESCRIPTOR BLOCK

	Oct	Hex	Dec
(K\$NLVB)	0	0	0.
VBN of NEXT DESCRIPTOR (K\$NHVB)	2	2	2.
OFFSET TO NEXT KEY DESCRIPTOR (K\$BYT)	4	4	4.
LEVEL 1 AREA # (K\$LAN)	6	6	6.
LEVEL 2+ AREA # (K\$IAN)	6	6	6.
ROOT LEVEL (K\$LVL)	10	8	8.
LEVEL 0 AREA # (K\$DAN)	10	8	8.
DATA BKT SIZE (K\$DBKS)	12	A	10.
INDEX BKT SIZE (K\$IBKS)	12	A	10.
(K\$LVBN)	14	C	12.
ALTERNATE ROOT BUCKET POINTER (K\$HVBN)	16	E	14.
DATATYPE (K\$DTP)	20	10	16.
FLAGS (K\$FLGS)	20	10	16.
NULL CHARACTER (K\$NULL)	22	12	18.
# KEY SEGS (<= 8) (K\$NSEG)	22	12	18.
KEY of REP(1-254) (K\$KEY)	24	14	20.
TOT KEY SIZ (<= 255) (K\$KYSZ)	24	14	20.
MINIMUM RECORD LENGTH (K\$MINL)	26	16	22.
INDEX FILL NUMBER (K\$IFIL)	30	18	24.
DATA FILL NUMBER (K\$DFIL)	32	1A	26.
(K\$POS0)	34	1C	28.
KEY (K\$POS1)	36	1E	30.
FIELD (K\$POS2)	40	20	32.
SEGMENT (K\$POS3)	42	22	34.
POSITIONS (K\$POS4)	44	24	36.
(8 (K\$POS5)	46	26	38.

WORDS)						
(K\$POS6)	50	28	40.			
(K\$POS7)	52	2A	42.			
(K\$SIZ1)	54	2C	44.			
KEY FIELD						
(K\$SIZ3)	56	2E	46.			
SEGMENT SIZES						
(K\$SIZ5)	60	30	50.			
(4 WORDS)						
(K\$SIZ7)	62	32	52.			
	64	34	54.			
KEY NAME STRING (16 WORDS)			(K\$KNM)			
FIRST DATA BUCKET			(K\$LDVB)	124	54	84.
			(K\$HDVB)	126	56	86.
SPARES				130	58	88.
OFFSET TO NEXT KEY DESCRIPTOR			(K\$BYT)			
LEVEL 1 AREA #	(K\$LAN)	LEVEL 2+ AREA #	(K\$IAN)			
ROOT LEVEL	(K\$LVL)	LEVEL 0 AREA #	(K\$DAN)			
DATA BKT SIZE	(K\$DBKS)	INDEX BKT SIZE	(K\$IBKS)			
(K\$LVBN)						
ALTERNATE ROOT BUCKET POINTER	(K\$HVBN)					
(K\$HVBN)						
etc.						
BLOCK CHECK SUM				1000	200	510.

BIT INTERPRETATIONS FOR AREA DESCRIPTOR

A\$FLG
(unused)

A\$ALN (octal values) ALIGNMENT OPTIONS
0 - USER NOT REQUESTING PLACEMENT CONTROL
1 - XB\$CYL CYLINDER ALIGNMENT
2 - XB\$LBN LOGICAL BLOCK ALIGNMENT
4 - XB\$VBN VIRTUAL BLOCK ALIGNMENT
10 - XB\$RFI ALLOCATE CLOSE TO FILE ID

A\$AOP (octal values) ALLOCATION OPTIONS
1 - XB\$HRD ABORT IF ALLOCATION ALIGNMENT FAILS
2 - XB\$CTG PERFORM CONTIGUOUS ALLOCATION (NOT SUPPORTED ON RSTS WITH AREAS)

AREA DESCRIPTOR BLOCK(s)			Oct	Hex	Dec	
FLAGS	(A\$FLG)	SPARE	(A\$FILL)	0	0	0.
BUCKET SIZE	(A\$BKZ)	AREA NUMBER (0-254)	(A\$AID)	2	2	2.
RELATIVE VOLUME NUMBER	(PLACEMENT CONTROL)	(A\$VOL)		4	4	4.
ALIGNMENT OPTIONS	(A\$AOP)	ALLOCATION ALIGNMENT	(A\$ALN)	6	6	6.
FIRST AVAILABLE BUCKET in RETURNED BUCKET CHAIN	(A\$AVL)			10	8	8.
	(A\$AVL2)			12	A	10.
START VBN of CURRENT EXTENT	(A\$CVB)			14	C	12.
	(A\$CVB2)			16	E	14.
SIZE of CURRENT EXTENT (BLOCKS)	(A\$CNB)			20	10	16.
	(A\$CNB2)			22	12	18.
# of BLOCKS USED in CURRENT EXTENT	(A\$NUS)			24	14	20.
	(A\$NUS2)			26	16	22.
NEXT VBN to ALLOCATE from CURRENT EXTENT	(A\$NBV)			30	18	24.
	(A\$NBV2)			32	1A	26.
NEXT EXTENT START VBN	(A\$NXT)			34	1C	28.
	(A\$NXT2)			36	1E	30.
SIZE of NEXT EXTENT (BLOCKS)	(A\$XBY)			40	20	32.
	(A\$XBY2)			42	22	34.
DEFAULT EXTENSION QUANTITY	(A\$DEQ)			44	24	36.
SPARE				46	26	38.

START LBN of CURRENT EXTENT	(A\$LOC)	50	28	40.
	(A\$LOC2)	52	2A	42.
RELATED	(A\$RFI0)	54	2C	44.
	(A\$RFI1)	56	2E	46.
FILE ID	(A\$RFI2)	60	30	48.
	(A\$FILL2)	62	32	50.
SPARES (7 WORDS)				
CRC CHECK CHARACTER	(A\$CRC)	1000	200	510.

BIT INTERPRETATION for BUCKETS

B\$BCB (BUCKET CONTROL BITS)(octal values)
 1 - (bit 0 set) BC\$LBK LAST BUCKET IN LEVEL
 2 - (bit 1 set) BC\$ROT ROOT BUCKET OF INDEX

BUCKET		Oct	Hex	Dec
ALLOC AREA # (B\$TAA)	CHECK BYTE (B\$CHK)	0	0	0.
BUCKET ADDRESS SAMPLE (B\$ADR)		2	2	2
NEXT FREE BYTE (B\$NBY)		4	4	4
LAST RECORD ID (B\$LID)	NEXT RECORD ID (B\$NID)	6	6	6
LOW (B\$NBK)		10	8	8
NEXT BUCKET POINTER HI		12	A	10.
BKT CONTROL BITS (B\$BCB)	LEVEL NUMBER (B\$LEV)	14	C	12.
		16	E	14.
RECORDS (DATA AND/OR RRV, OR INDEX) see record templates	B\$REC S\$BHD = Size of bucket header			
FREE SPACE				
CHECK BYTE	END OF BUCKET			

INDEX RECORD BIT INTERPRETATION

B\$PS (1ST 2 BITS) B\$IRCB (BITS 2-7)

B\$PS (INDEX RECORD POINTER SIZE)(2 bit values)
 00 - 2 BYTE VBN
 01 - 3 BYTE VBN
 10 - 4 BYTE VBN
 11 - UNDEFINED

B\$IRCB (INDEX RECORD CONTROL)(octal values for byte)
 4 - IC\$KCP COMPRESSED KEY VALUE (NOT IMPLEMENTED)
 10 - IC\$EMP POINTER TO EMPTY BUCKET
 20 - IC\$NUL NULL KEY VALUE

INDEX DATA RECORD(S)			Oct	Hex	Dec
V B N o f B U C K E T (B\$BPTR)	INDEX FLAGS (B\$IRCB)	SIZE (B\$PS)	16	E	14.
[Address of first block of a bucket in the next lowest data level, either index data rec or user data record (primary key) or a SIDR (alt. key)]					
KEY VALUE (<= 255 BYTES) (Hi key value for Above Bucket)					S\$IDXR (size of index rec overhead)
V B N o f B U C K E T (2 - 4 bytes)	INDEX FLAGS	SIZE			
KEY VALUE (<= 255 BYTES)					

Note: After the first record in the bucket there is no guarantee that a record will be word aligned.

USER DATA RECORD BIT INTERPRETATION

B\$PS POINTER SIZE (BITS 0,1)
 00 - 2 BYTE VBN
 01 - 3 BYTE VBN
 10 - 4 BYTE VBN
 11 - UNDEFINED
 B\$DRCB (Octal values for bits 2-7)
 4 - DC\$DEL RECORD DELETED
 10 - DC\$RRV RRV RECORD
 20 - DC\$NPS NULL POINTER SIZE FIELD PRESENT
 40 - DC\$KDL PTR TO RECORD FOR THIS KEY NO LONGER APPLIES
 (\$UPDATE CHANGED THE KEY, BUT RECORD STILL EXISTS [FAST DELETE])
 100 - DO NOT COMPRESS THIS DELETED RECORD

USER DATA RECORD(s)

RECORD ID	(B\$ID)	DATA FLAGS (B\$DRCB)	SIZE (B\$PS)
RECORD POINTER (B\$RPTR) [5 BYTES - 1 byte Record ID, 2 - 4 byte VBN]			
RECORD COUNT (OPTIONAL)	REC CNT (continued if present)		
(S\$UDR = Size of User Data Record Overhead)			
RECORD DATA			
RECORD ID	(B\$ID)	DATA FLAGS (B\$DRCB)	SIZE (B\$PS)
RECORD POINTER (B\$RPTR) [5 BYTES - 1 byte Record ID, 2 - 4 byte VBN]			
RECORD COUNT (OPTIONAL)	REC CNT (continued if present)		
(S\$UDR = Size of User Data Record Overhead)			
RECORD DATA			

16 E 14. (VARIABLE LENGTH REC)

SECONDARY INDEX RECORD BIT INTERPRETATION

B\$PS SIDR RECORD POINTER SIZE (BITS 0,1)
 00 - 2 BYTE VBN
 01 - 3 BYTE VBN
 10 - 4 BYTE VBN
 11 - UNDEFINED
 B\$DRCB (SIDR RECORD CONTROL)
 4 - DC\$DEL RECORD DELETED
 40 - DC\$KDL POINTER HAS BEEN DELETED DUE TO A KEY CHANGE ON \$UPDATE
 (IN THIS CASE, ID PORTION OF RECORD POINTER WILL BE ZERO)

SIDR RECORD(s) - No Duplicates

RECORD ID	(B\$ID)	DATA FLAGS (B\$DRCB)	SIZE (B\$PS)
RECORD POINTER (B\$RPTR) [3-5 BYTES : 1 byte Record ID, 2-4 byte VBN]			
SIZE of RECORD	(B\$SIZ)		
KEY VALUE (<= 255 BYTES)			
RECORD ID	(B\$ID)	DATA FLAGS (B\$DRCB)	SIZE (B\$PS)
RECORD POINTER (B\$RPTR) [3-5 BYTES : 1 byte Record ID, 2-4 byte VBN]			
SIZE of RECORD	(B\$SIZ)		
KEY VALUE (<= 255 BYTES)			
RECORD ID	(B\$ID)	DATA FLAGS (B\$DRCB)	SIZE (B\$PS)
RECORD POINTER (B\$RPTR) [3-5 BYTES : 1 byte Record ID, 2-4 byte VBN]			
SIZE of RECORD	(B\$SIZ)		
KEY VALUE (<= 255 BYTES)			

16 E 14. B\$KEY (Start of key)
 B\$SIZ (Size of key + ptr)

SIDR RECORD(s) - Duplicates

RECORD ID	(B\$ID)	DATA FLAGS	(B\$DRCB)	SIZE	(B\$PS)
		0		0	1
DUPLICATE COUNT					
20 10 16.					
SIZE of RECORD (B\$SIZ)					
KEY VALUE (<= 255 BYTES)					
SIDR RECORD POINTER (B\$RPTR)					
[3-5 BYTES : 1 byte Record ID, 2-4 byte VBN]					
R E C O R D		DATA FLAGS	(B\$DRCB)	SIZE	(B\$PS)
P O I N T E R		1		0	0
(3-5 BYTES, 1 BYTE ID, 2-4 BYTE VBN)					
R E C O R D		DATA FLAGS	(B\$DRCB)	SIZE	(B\$PS)
P O I N T E R		1		0	0
(3-5 BYTES, 1 BYTE ID, 2-4 BYTE VBN)					
RECORD ID	(B\$ID)	DATA FLAGS	(B\$DRCB)	SIZE	(B\$PS)
		0		0	1
DUPLICATE COUNT					
SIZE of RECORD (B\$SIZ)					

B\$KEY (Start of key)
 B\$SIZ (Size of key
 + ptr array)
 S\$SIDR (Size of SIDR
 Array Overhead)

RSX

MULTI-TASKER



RSX

The RSX Multi-Tasker
April, 1987

"Fiat Hax"

Fine Realtime Commentary Since 1975

FOOD FOR THOUGHT

"O civili! Si ergo. Fortibus es in ero."
"O nobili! Deis trux. Vatis enim, causan dux."

- Justin L. Hewser
Latin for the Masses

TABLE OF CONTENTS

Food for Thought	RSX-1
The Editor's Corner	RSX-1
Running Boards	RSX-2
Submitting Articles to the Multi-Tasker	RSX-3
And That's The Way Things Are	RSX-3
RSX SIG Election Nominations Open	RSX-4
Response to Improving Spooler Performance	RSX-5
The Notebooks of Justin L. Hewser	RSX-6
Fall 1986 Q & A Session Transcript	RSX-8
Spring 1987 "Woods" Meeting Report	RSX-24

THE EDITOR'S CORNER

Bruce R. Mitchell

By the time you have this issue in your hands, the elections for the DECUS Board of Directors will be well underway. The entire RSX SIG Steering Committee encourages you to exercise this opportunity to influence the future of DECUS. Vote. Return those cards.

As they say in Chicago: "Vote, and vote often."

The SIG also has elections coming up. See the announcement by Ralph Stamerjohn in this issue regarding RSX SIG Executive Committee elections. If you are interested, run for a position yourself. Sure, it demands a lot of time, specifically Symposium and Woods meeting attendance. But this is your chance to shape the future of the RSX SIG.

If you can't run, at least vote as you go by.

The Spring Symposium is coming up pretty fast on us now, and, as always, the SIG has a splendid lineup of presymposium seminars and sessions. Some of the sessions include:

- o The Files-11 On-Disk Structure
- o The First National RSX Test
- o Real-Time Example Applications Panel

Opinions expressed in the editorial section of the Multi-Tasker are those of the Editor. They do not represent the official position of the RSX SIG or that of DECUS leadership in general.

and, of course the Software Clinic, the Q & A session, "Meet the Developers", "What Digital Wants to Know About RSX", "System Programming Short Notes", and Magic aka "The Lore of RSX".

Make sure you get to Magic at Nashville. The SIG has a limited supply of *<top secret!>* as prizes for the best presentations at Short Notes and Lore. These are similar to, but not the same as the bigger *<eyes only!>* that the SIG will be selling on a test basis.

(Fair warning ahead of time: The big *<eyes only!>* are in very short supply - only 20 of them - so if you want one, make sure you get it early in the week. Even if they go over big, there's no guarantee that we'll be able to get them into the DECUS store in Anaheim.)

If you're still having trouble getting your supervisor to send you to DECUS, point out that the \$500 registration is quite a bit less than the \$1000-and-up that most 2 and 3 day training courses run. Shucks, take a week of vacation if you have to, sign up for a SuperSaver and come as you are. There is no better time and place to talk RSX with people who know it than at Symposia.

The Editor is so happy he could just cry. He has received, over just the last week, more articles than he has seen over the last three months. Thanks to each and every respondent. Your copies of the limited edition prints will be in the mail long before this issue hits the streets.

Keep them articles coming; there are still about 30 of the prints of the Fall 1986 SIG button artwork to give away. These prints are a limited edition, all signed by the artist and certified. The only way you can get one is to contribute an article. And, as always, if you don't want to write an article, at least drop a line telling what kind of articles you'd like to see in the Multi-Tasker.

And now, it's editorial time. We're terribly sorry that Justin L. Hewser, our guest editorialist, couldn't get in to the offices this month to write an editorial. We changed the locks on all the doors and bought a mean guard dog. The Editor has been oiling and cleaning his terminal every 50,000 lines anticipating this changeback. So here comes this month's editorial, at Mach Two.

----- Running Boards -----

Of late, a number of "end users" have expressed misgivings about the directions taken by DECUS as an organization (see past editorials). While the Multi-Tasker is officially neutral on such political items, the Editor does have a few opinions on the topic. And - guess what? - he's going to share them with you.

There is an election coming up for the DECUS Board of Directors. This is the group that sets the direction for DECUS as a whole. The

people elected to these positions have the responsibility of representing and acting on the will of the general membership.

If the people in those positions represent the membership, then those positions should be equally open to all the membership. That seems logical, does it not?

Well, this year an unnamed entity within the Society reputedly took upon itself the responsibility of pre-selecting a slate of candidates for the election. This certainly does prevent confusion among the electorate. But it also disallowed the candidacy of three well-known DECUS members who wish to run.

These "dark horses" are not Board members now, so they were forced - on very short notice - to go to the membership at large with petitions to support their candidacy.

Could you scrounge up a hundred DECUS members in your area in the space of a few weeks? Could you circulate a petition that fast, get it signed, and return it to DECUS? They tried.

It seems unnecessary for us to force people who want to run for a DECUS position to go through that trouble. They are, after all, offering us a service. The Society should be grateful for their offer to serve.

Even if the Society finds it necessary to restrict the number of candidates for elections, it seems equitable to demand that all candidates be subject to the same rules.

You, gentle readers, are the membership of DECUS. When the ballots come out, it is your votes that determine the outcome. Cast them for people who support the way you want DECUS to be in the future.

----- Submitting Articles to the Multi-Tasker -----

Please submit machine readable media if you can. RX01, RX02, RX50, or 9 channel magtape at 800 or 1600 BPI are best. Any RSX volume format is acceptable except ROLLIN or PRESRV. ANSI, BRU and DOS FLX formats are well-liked by the Editor's tape drive.

The Editor can now Kermit articles out of other hosts into the Multi-Tasker host. The reverse is unfortunately not true; the Multi-Tasker host is normally an isolate. If you want to submit an article via Kermit, call beforehand with (1) a login for the host machine and (2) system uptimes.

Submissions which aren't machine readable take longer to get into print. The editor is lazy and 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
(507) 775-6268

----- And That's The Way Things Are -----

... this month in Pool Lowbegone, where the LL(1) grammars are strong, the NDFSM state tables are good-looking, and the recursive-descent stack depth is above average.

RSX SIG ELECTION NOMINATIONS OPEN

Ralph Stamerjohn
Meridian Technology Corp.
PO Box 2006
St. Louis, MO 63011

It is once again time for RSX SIG Executive Committee elections. This is official notice of the opening of nominations for elected Executive Committee membership.

The RSX SIG policy-making group is the Executive Committee. It consists of 5 elected members and 2 appointed members. The SIG holds biannual elections to select a new group of elected members for the Executive Committee.

There are two qualifications for these positions. The first is simple; you must return a petition with 5 or more RSX SIG members' signatures to the Nomination Committee.

The second qualification is willingness and availability to serve. These positions demand significant commitment. Executive Committee members must attend both Symposia and both SIG Woods meetings each year. This is a direct commitment of 20 days. There is also an indirect commitment of about half an hour per day in phone calls and electronic mail - another 16 man-days a year.

Employer approval and support are clearly required for this level of commitment. This is especially true because there is little compensation for these positions. Executive Committee members pay their own way to Symposia. Only the Woods meetings are covered by DECUS.

If you are willing and able to serve in this capacity, send a simple petition with signatures and DECUS membership numbers of at least 5 SIG members to me, at the address above. And get them in soon, because nominations close two weeks after the Spring Symposium.

RESPONSE TO IMPROVING SPOOLER PERFORMANCE

Fred Tromans
Central Electricity Generating Board
Bedminster Down
Bridgwater Road
Bristol BS13 8AN
England

The following article is a response to the article in the September 1986 issue about improving M-Plus spooler performance. Thanks to Fred for his work on this topic. -- The Editor

The article in the September Multi-Tasker about improving M-Plus spooler performance was very helpful. The problem with completely flattening the spooler is soluble.

You can build a totally flat spooler if you change the segment name in the GBLPATs. TKB takes the segment name for each overlay from the name of the first module in the overlay. When you flatten the despooler, segment INIT disappears, so the GBLPATs for segment INIT fail. However, if you change the GBLPATs to use segment RECEIV, it all works correctly again.

Here is an example TKB command file for a fully flattened spooler. The changed GBLPATs are in italics.

```
SY:[1,54]LPPFSL/PR/SL/-FP/CP/-IP/MM, MP:[1,34]LPPFSL/-SP =  
SY:[1,24]LPP/LB:RECEIV:POTS:INIT:JOBSTR:JOBEND:IOPRT:FILPRO:CONT  
SY:[1,24]LPP/LB:ERPRT:PRT:FLPAG:FLINI:JBINI:FLGEN:PRTDN:DONE  
SY:[1,24]QMG/LB:QMGSYM:FPRIV:PROO  
SY:[1,54]RSX11M.STB/SS  
/  
TASK=LPO
```

```

IDENT=04.01
STACK=64
UNITS=6
ASG=CO:2
PAR=GEN:0:0
PRI=70
GBLDEF=E$OJFF:0
SUPLIB=FCSFSL:SV
GBLDEF=$DELCK:0
GBLDEF=GLBUFZ:400
EXTSCT=INPBF1:402
EXTSCT=INPBF2:402
GBLPAT=RECEIV:FRMTBL:144102
GBLPAT=RECEIV:FRMTBL+2:50102
GBLDEF=Q$LSPS:174
GBLDEF=Q$HSPS:177
GBLDEF=Q$LSPF:3
GBLDEF=Q$HSPF:6
GBLPAT=RECEIV:FRMTBL+6:102102
GBLPAT=RECEIV:FRMTBL+10:50102
GBLPAT=RECEIV:FRMTBL+12:102102
GBLPAT=RECEIV:FRMTBL+14:50102
//

```

The flat spooler task image produced by this build procedure is significantly smaller. It also executes faster in a heavy spooling environment. Additionally, if you want to implement big-buffering as discussed in the original article, the flattened spooler still has sufficient free space available to implement it (although not as much as in the overlaid version).

THE NOTEBOOKS OF JUSTIN L. HEWSE

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: he has been seen in nearly 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 write an ACP in FOCAL than look at this stuff voluntarily!

This month's note is from the MACRO section of the Notebooks. Justin apparently got hip to error detection somewhere along the line. This note describes his "generic" directive error handler.

**M330. -- MACRO Error Handler*

It is a good idea to check for errors in system directives. This is done by looking at the directive status word, \$DSW. The carry bit is also clear if the directive succeeded.

```

XYZ$$ #EFN ; Some directive
BCC 10$
MOV $DSW, R0 ; Make DSW show
IOT ; Crash and burn
10$: <continue your code>

```

If an error is detected, the error code is put in R0, and the program dies. You can see the error code from the register dump.

The gig here is that the IOT (I/O Trap) instruction is illegal in user mode, and it causes the program to SST trap. The program probably wasn't processing SSTs, so TKTN then gets control, kills the task with the classic error message and dumps the general register set.

Well, at least this is some form of error detection. In fact, I used to do something similar myself. I even took the trouble to put a tag in R1 which told me where the program died without looking in the Taskbuilder map.

... which is one of the problems with this technique. You have to look in the map to see where the program died. If used in a utility subroutine, you still don't know where in the main program things went awry, just the utility that bombed.

Another major problem with this technique is that RSX now uses the IOT for M-Plus V3.0 fast mapping. Very strange things may happen if you fire an IOT in that environment!

Aside from these considerations, the whole thing assumes that TKTN, the Task Terminator, is installed, TKTN is the guy who delivers those little messages giving the exit reason and register dump. No TKTN, no messages.

Perhaps this whole idea came from the RSX Executive itself. RSX has a macro called "CRASH" which does an IOT. It is used whenever Executive code gets into a "Catch-22" situation, and can do nothing but roll over and die. Because RSX tries to detect as many errors as it can, the CRASH macro appears throughout the Executive sources.

The astute reader of RSX, however, will note that CRASH is only used for truly irrecoverable errors - and that RSX does a lot more error detection and reporting in less final and more informative ways.

There is really no excuse not to do reasonable error reporting. Justin was either just too lazy or believed his code wouldn't encounter errors. Come to think of it, Justin still does believe his programs - and the systems they run on - are error free.

We mortals know better, and should prepare for the inevitable. Ralph Stamerjohn has written an excellent, perhaps definitive, paper on error reporting. You will find it in the December, 1986 issue of the DEC Professional. The associated code is also on the Fall 1986 RSX SIG tape.

Bruce Mitchell also put his SST reporter/handler in a previous MACRO Bag of Tricks column. It deals with non-directive errors, and is highly recommended.

If you haven't written your own error handlers, use these. Better yet, incorporate them into SYSLIB - Ralph tells how - and dictate that everyone (Justin included) use them.

There is 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 Interactive Batch Processor
- o Easy TTDRV Patches
- o FORTRAN Decompiler

FALL 1986 Q&A SESSION TRANSCRIPT

Gary Maxwell, editor
U.S. Geological Survey
Menlo Park, CA

The RSX and P/OS Technical Question and Answer session occupied three full hours on Tuesday afternoon during the Symposium. In contrast with previous versions of this session, no Q/A forms were used. This resulted in a somewhat informal and spontaneous session, with many technical tidbits flying about. This transcript is taken from the audio recording of the session.

Text enclosed in square brackets contains audience comments and follow-up information from the editor.

- Q Under RSX, how can I set one of the terminal ports to be 7-bit and even parity from a program?
- A This can be done using the Set Multiple Characteristics QIO directive. Consult the Full Duplex Terminal Driver section of the I/O Drivers Reference manual. [A session was given later on terminal driver functions.]
- Q Under M-Plus V2.1, using BRU with verify on a TK25, we encountered multiple "Device Not Ready" and "Fatal Hardware" errors during the verify pass. Is this a known problem? It happens on all of our TK25s.
- A We don't know. It sounds like a hardware problem, since both of these errors are generated by the device driver. Check your hardware configuration.
- Q How do you make a bootable BRUSYS tape for the TK50? I have a BRUSYS tape at 800 BPI, can I just use TPC to copy it over? Can I use VMR to create a BRUSYS tape under VMS?
- A You should be able to copy the BRUSYS tape onto the TK50 and be able to boot it. We don't think you can VMR SAV a BRUSYS tape on the VAX (but we don't know why not).
- Q Do you have any plans for a Pascal-11 compiler with RMS support under RSX?
- A RMS is one of the highest priority items with the Pascal developers.
- Q I need a DEUNA driver to run on a cramped 11/45, and I am running RSX V3.1. Is it possible to write one? I do not have enough available memory for DECnet.
- A You can write your own driver; however, the DEUNA is a complex controller. Consider upgrading to V4.2 (leaving out unnecessary options during SYSGEN), and use the DEUNA driver (XE:) supplied with the RSX kit.
- Q When using third party MSCP controllers and drives, attempting to boot unit zero with unit one spinning up causes SAV to hang after the first message, until unit one is ready. The controller vendor claims it is an RSX problem. Is it?
- A When bringing the device online, SAV may be intentionally waiting for the second unit to spin up, since SAV makes no assumptions about the drive type (it may be an RC25). Your controller may

also behave differently than a DEC controller while a drive is spinning up.

Q When FAL is invoked over the network to process large directories, secondary POOL becomes depleted. It remains that way until a later, simpler operation is performed, and secondary POOL recovers. What is happening?

A [Every time FAL accesses a file, it sends a message to FALLOG. FAL doesn't call the logger (FALLOG) until it exits. If FAL aborts, FALLOG may not be called. You can solve the depletion problem when it occurs by issuing a RUN FALLOG command. The general workaround is to disable FAL logging by rebuilding FAL after setting the symbol \$DFLLG to false in [137,10]DECPRM.COMD on the DECnet distribution. This problem should be fixed in Update C or D.]

Q I am running into POOL depletion problems on 11M when I try to maintain a large System Task Directory and run DECnet at the same time. Removing applications tasks from the STD causes problems because the applications have to run from privileged accounts for non-privileged users. Are there any workarounds?

A Besides recommending a system upgrade, we suggest that you modify the dispatcher (MCRDIS) to perform special processing of non-privileged UICs to obtain a workaround.

Q What changes can we expect to P/OS and the Tool Kit between V3.0 and V3.1?

A V3.1 is an update of V3.0. It does not require reinstallation of the system. Major changes primarily involved correcting print server bugs. There is also an update to the Tool Kit.

Q We recently upgraded from M to M-Plus. We assigned two LUNs to the terminal, 5 and 6, from a heavily overlaid task. Attempting to read from LUN 6 caused a system crash. Flattening the task or using only one LUN solved the problem.

A Please send a crash dump along with an SPR. We don't know what is happening.

Q We upgraded a 10 Megabyte drive to a 30 Megabyte drive. The new drive does not work. Why not?

A The drive's select jumpers are probably incorrect. If this is in a BA23 Micro box, the first Winchester must be set to unit 3.

Q We are running a medical Accounts Receivable package under A-to-Z on Micro/RSX. On occasion, the console terminal and the application hang. When we log onto another terminal, and do a SHO TERM command for the console, we get the message "Device not a terminal." What is the problem?

A It sounds like the console is being spooled. Check for an active task called TTO, which could be a spooler task.

Q I recently copied and initialized a system on a new RC25 drive. Following the virgin boot, I tried to SAV the system. SAV complained that RCT had active I/O. When I retried the operation about 10 seconds later, it worked. Why?

A When the driver first initializes itself (after the virgin boot), the driver invokes RCT to read the factory replacement control table on the drive. This can take some time. Just keep typing SAV until it works.

Q Under M-Plus V3.0, continually hitting the down arrow key depletes secondary POOL and eventually crashes the system. Is this a known problem? I brought a crash dump.

A The system should not crash, but the performance will degrade. We would like to see the crash dump.

Q After performing a SET HOST from a VMS system to an RSX system, terminal output wraps at column 72. Displaying the RT: device buffer shows 255 characters, with NOWRAP. What's the problem?

A VMS and RSX do not correctly pass all terminal characteristics to each other. Buffer size is probably one of these. We are still working on this problem. One workaround is to set the buffer size before the SET HOST command.

Q In trying to use PRO/LAT, I cannot stay connected for more than one or two minutes at a time to an RSX node before I get disconnected. It works fine with VMS, and a server on the same cable works fine to both hosts.

A The latest update to DECnet seems to improve the situation.

Q Has the positional device driver which used to be packaged with P/OS been upgraded?

A It didn't make it on the V3.0 kit. It will be out with the next version of PRO/Sight, with the next version of P/OS.

Q Under V4.1 of RSX, we installed the Shuffler in the GEN partition and made it checkpointable. The system crashed after about 15 minutes with a kernel stack underflow. There appears to be code in the Shuffler to prevent this, but it doesn't seem to be working. Has this been fixed for V4.2?

A Probably not.

Q There is a bug in EDT on M-Plus which causes it to crash in the system-wide initialization file. The only workaround that seems to work is to build EDT without any of the M-Plus features (/MU, etc.). When will this problem be fixed?

A We don't know. Not a lot of development effort is being spent on PDP-11 EDT. There are changes to EDT for Update C of V3.0. Try the PDP-11 Languages and Tools Q&A session later in the week.

Q With the PRO Host Tool Kit going away in the near future, is it feasible to build PRO applications under the vanilla M-Plus system? Will things on the Tool Kit be supplied on M-Plus that aren't on the Tool Kit? What about FDT?

A Everything you need to build an application can be done with the M-Plus Utilities, as long as they point to the P/OS-specific libraries. PRO/F77 has different object libraries and resident libraries. FDT has not been changed or rebuilt in some time; it should continue to work. We don't have all the answers as to the problems that will be caused by the retirement of the Pro Host Tool Kit.

Q We just received two RA60's, and we would like to do a SYSGEN on them. We have an RL02-based distribution. Can we just change a few symbols to make SYSGEN think it's a big-disk distribution? It seemed to work when we tried it.

A That trick should work. If it wasn't done right, then SYSGEN would fail early in the procedure.

Q On P/OS V3.1, Pro LOAD tries to bring all units online when it loads a driver. My driver does not want to come online until a task establishes a link with it. When my driver rejects the online request, Pro LOAD prints an error message and unloads the driver, which is not what I want. Can this behaviour be changed?

A Try one of the following: modify your application to work around the way Pro LOAD works; have the driver remain offline while lying to Pro LOAD by returning success; or during the online call, have the driver shuffle the kernel stack so that it gets called back to turn itself offline after Pro LOAD finishes the

online call.

Q I can perform a standalone SYSGEN with my distribution on a Cipher M891 (MS:) tape drive, but when I boot the new system, I can't access the tape drive anymore. During SYSGEN, the drive appears as a TK25; after booting the new system, it shows up as a TSV05. What's wrong?

A There was a problem with MSDRV for I/D space systems on 22-bit Q-Bus systems. It was fixed in V3.0 Update B.

Q We have users queueing up a whole bunch of print jobs while using A-to-Z, and they regularly call us to delete print jobs from the queue. Is there an easy way of deleting all jobs for a particular user?

A Try creating a global command file which a user can invoke which will walk him/her through the process of deleting queue entries. You might also talk to the A-to-Z developers about adding a menu option to do this.

Q We currently have devices on DL11-Ws, where we switch between a custom device driver and the terminal driver using a set of commands. If we change from a DL-11 to a multiplexor, can we switch a few of the ports on the multiplexor to the special driver, or do we have to switch them all?

A In general, you have to switch all of the ports. You can try to create a mechanism whereby your driver fielded all interrupts, and then simulated an interrupt to the terminal driver, when necessary. That is a non-trivial solution.

Q The Connect to Interrupt and Switch State Directives do not seem to work for an I/D space task. A mapping error occurs when APR 5 has I- and D-space segments.

A This is intentional. One way to enable I- and D-space when your system state code is entered is to read the User Mode D-space APRs to load up the Kernel Mode D-Space APRs. The Executive really doesn't care about the APR contents once your code gets control. (Try to leave APRs 0 and 7 alone, though.)

Q I was able to build loadable XDT from the available tools on the M-Plus distribution, and it worked. Will you support it as a SYSGEN question? What about loadable XDT on 11M? What about loadable crash dump driver support?

A The loadable XDT source code has conditional code in it for 11M,

but it hasn't been tested. On 11M, loadable XDT is run as a task (and not loaded) and it "disappears" into the system. Loadable crash dump driver support would take some work to implement on M-Plus. Loadable XDT does not have to be a SYSGEN option: XDT is a vectored task image, so you can always load it, and it is transportable to any other system.

Q We have some applications using the terminal driver for non-terminal devices, and recently the controllers hung. Examination of the UCB showed a bit called "terminal disabled" was on. What is it and what does it mean?

A The disable line is used for /REMOTE terminals and LAT terminals to perform modem control. It should not be set unless the terminal was set /REMOTE.

Q What are the new features of P/OS V3.1? Does it affect software compatibility from V3.0?

A Changes were made to Print Services, there were some Base System fixes, and some Tool Kit changes were made. There shouldn't be any incompatibilities.

Q I have a user who was able to use CTRL/C to abort his current program on a Micro/RSX system. How do I turn it on for M-Plus?

A It only works for DCL. You need to specify the /CTRLC switch when DCL is initialized with the CLI command, and then set each individual terminal to /CTRLC.

Q I have been trying to "cluster" FCSRES against an I/O Page Common. I do it by having TKB map FCSRES to APR 6 and IOCOM to APR 7. The program performs a Get Mapping Context, and then maps FCSRES and IOCOM when each is needed. I get an alignment error the first time I try to remap, but the operation works anyway (crash dump verifies this). Do you know if there are any problems with doing this?

A Try to create a simple case, and send in an SPR. It should work.

Q Is there any difference between tasks which link to FCSRES with ANSI magtape support and FCSRES without ANSI magtape support? Are tasks which link to RMSRES transportable between 11M and M-Plus, since the number of RMS resident library segments is different between the systems?

A For FCSRES, the task images will be the same, since the vectors for both flavors of FCSRES are identical. For RMSRES, we're not

sure.

Q Our system degrades after a few months of use, apparently due to file fragmentation on the disk as our files grow. Besides a backup and restore, how can we reorganize a disk volume?

A We have seen and tried several schemes for online compression, some better than others. There is a commercial second-source product out, but we personally wouldn't try online compression on a disk that we cared about.

Q Do Print Services under P/OS V3.1 allow RS/1 to print? It doesn't work under V3.0.

A Check the Release Notes for V3.0 to see if there was a restriction. We will try to figure out if there is a problem.

Q A user on my system submitted a trivial batch job. A few hours later, the batch job was still active, the Virtual Terminal was logged in, but no tasks were active. The log file showed a message that error status was returned for something and the batch job was being terminated, but it didn't finish. What happened?

A It looks like BYE couldn't get started up by the Batch Processor. We're not sure what really happened.

Q On an 11/84, we had problems running BAD on an RA81. BAD would run for about 15 minutes, then it would "die horribly" [whatever that means], and the RA81 would be left software write-protected. I finally got it to work by submitting and resubmitting an overnight batch job to run BAD on the disk, and now everything works fine. Any ideas?

A There was a problem with the Replacement Control Task for V3.0 Update B, one effect being the software write-protecting of the disk. It has been fixed for Update C.

Q We are upgrading from 11M V3.1 with Fortran-IV-Plus to M-Plus and Fortran-77, and have been told about some differences between the Fortran/Macro interface, especially with logical variables. What should we be concerned about?

A An Appendix to the Fortran-77 manual has a list of differences between F77 and F4P. There are some incompatibilities. You can also use the /NOF77 switch to F77 to turn off some of the language features.

Q I couldn't install V3.0 of P/OS on a 5 Megabyte Pro 350, because I ran out of disk space. Can it be done?

A We have a big disk space crunch on V3.0. Come to a session tomorrow which will cover how to optimize the disk space. You should be able to get the base system, Pro Comm, and DCL on the disk, but not all that and the Tool Kit.

Q How many blocks are needed for a single dedicated application running on P/OS?

A The documentation describes how to build a dedicated application that runs off the floppies. P/OS needs a minimum of about 450 blocks to boot the system, and up to 1000 blocks are generally needed for overhead. It's up to you to do the rest of the tailoring.

Q We perform a SET HOST to a Micro/R SX node from a VAX node. After we log in, a Control-C hangs the terminal port. TSC reported that it is fixed in V3.1 of Micro/R SX, but apparently it isn't. Do you have anything new on that?

A We don't know if it has been fixed.

Q Can V3.0 of M-Plus be generated on an online V2.1 system?

A Yes.

Q What does the block mode attribute of the TT driver do?

A Absolutely nothing.

Q I also seem to have a problem with the Replacement Control Task software write-locking my disks. Data caching errors occur on the write-back. Is this the same problem?

A It probably is. Until Update C arrives, try removing RCT and see what happens. You should get a hard error in that case.

Q When starting up Pro Comm, it takes over 60 seconds for the window manager to come up with the first menu. Is there any way to speed it up?

A Disable the graphics option. See the Pro Comm documentation on how to do it from the setup screen. You can also call up DTE directly from the Tool Kit.

Q When you perform a Set Terminal /Inquire in Pro Comm, the cursor is positioned to the second column in the first row, and the disk makes noises. What is happening?

A You don't want to know. [Laughter] The system goes to the disk for the Regis initialization codes.

Q If you disable graphics on the Pro, do you lose VT125 emulation?

A Yes. You lose all Regis emulation.

Q Does Pro Comm V1.7 or V1.8 work on P/OS V3.0?

A Absolutely not.

Q We would like to get to the video registers on the Pro. Do you have documentation on the terminal subsystem so that we can do our own graphics?

A We originally distributed the documentation, and we took it away. You have to be extremely careful so that the system doesn't crash. See us offline for some information. A real neat thing you can do is to run tasks in the bitmap partition. [Laughter]

Q When M-Plus V2.1C came along, we rebuilt all of our tasks to take advantage of vectored FCSFSL, and thought we'd never have to build them again. Along came V3.0, and we want to avoid rebuilding everything again. What can we do?

A The news is that V2.1C FCSFSL really wasn't vectored. We thought it was, and advertised it as such. You can still install the old one. We think we've got it right this time, but you'll have to rebuild your tasks for the last time.

Q When I upgraded a system from 11M V4.1C to M-Plus V3.0 on an I/D system, the Basic-Plus-2 compiler could no longer open its work files. When I installed the compiler with a POOL-resident header, it worked. Do you have an explanation?

A We have no idea. Until you apply Update C, avoid installing tasks with POOL-resident headers, because issuing PLAS directives from such tasks will crash the system.

Q We want to boot 11M V4.2 off of an RX50. How do we do it?

A It has to be a very small system. Load the drivers, then delete the driver images. Then install the privileged tasks that you

need, fix them, and delete their images (if they are not overlaid).

Q Can P/OS support Ancillary Control Drivers?

A No.

Q With Pro Comm V3.0 and Synergy, it would be nice to go directly into the menus. Can we get it like before?

A No.

Q Are you aware of the problem with the new Pro Comm where you connect to a modem and the characters come in but are not displayed on the screen until you do a Clear Comm?

A We aren't aware of the problem.

Q How often do you expect P/OS to be updated now?

A We are currently working on V3.2.

Q The DCL SHOW ERROR /RECENT and /HISTORY options don't seem to be documented, but there are help files. They don't seem to work. What about them?

A They are there for Micro/RXS, and they don't function under M-Plus. You can go into the M-Plus sources (SYSCM.MAC) and modify \$EFMSK to change error logging behaviour to include more packet types.

Q Can you distribute two versions of P/OS: one for hardware that supports I/D space, and one for hardware that doesn't?

A No. We don't have the development team to maintain and support two different versions of the system (four if you count Pro Server).

Q Regarding SET HOST problems between VMS and RSX, I cannot get 132 column mode to work from an RSX node on a VAX host. Can you get the RSX/DECnet group to talk to the VMS/DECnet group to solve these problems?

A Noted.

Q We have the Ivis touch screen monitor on our Pro 350. When we start the verification application for the touch screen after the system has been booted, the application hangs. If we abort and restart the application, it works. What is the problem?

A We don't know about the problem, but we'll look into it.

Q I am trying to get escape sequences into a CLI that I wrote, but I'm losing the characters. How can I get it to work?

A Unfortunately, there is no attribute you can set to enable unsolicited input to have escape sequences. One workaround is to set up a CLI that does very little except to communicate with a task which keeps outstanding read requests with escape sequences enabled to the terminal.

Q We're having problems with the LAT driver. Terminal characteristics are not being properly reset (/ECHO, for example) when users disconnect. Attempts to use SYSLOGOUT.CMD to reset the terminal are only partially acceptable. Can this be improved?

A Look in the terminal driver module TTMOD.MAC to add the ability to reset any terminal characteristics that require it. We will consider adding some more characteristics to the reset function.

Q I keep getting what I consider to be undeserved parity errors on my RQDX1/RD52 subsystem under Micro/RXS V3.0, but they aren't being logged by the error logger. What is the problem?

A We don't know why you are getting so many errors. [Someone from the audience suggested that a peculiarity with the controller prevents the error logger from writing packets to disk while a retry operation is in progress.]

Q RMS always uses a file extension of one block [for sequential files], no matter what the volume default is. Why is this and is there a remedy?

A RMS has a complicated algorithm for calculating the extent size. It has to consider file organization, bucket size, and other criteria. We have tried various changes to the algorithm; the current one is the best one we have. It would make sense for sequential files to use the default; we can't remember why that isn't so.

Q I recently tried to get help for P/OS from Telephone Support Center in Atlanta, and they had incorrect information for my problem. Is there any ongoing effort to enlighten these people?

A Yes. We're not always successful. We suggest that if you don't get satisfaction from TSC, call them back and ask to have your problem elevated. The problem then comes to us, so that we can pass along the right answer.

Q A driver that we have for an array processor requires tasks to have POOL-resident headers. Could you expound on external headers and speculate on the restriction we have?

A Until M-Plus V3.0 Update C, if there is any task which uses PLAS directives (including FCSRES, memory-resident overlays, and Fortran programs with Virtual Arrays) with a POOL-resident header, the system does not correctly initialize a location, which causes writes to random memory locations. Regarding your driver, it probably is missing the straightforward code used to map to an external header, which was a design decision on the vendor's part.

Q The documentation indicates that you can pass messages to a CLI task. Is there an Executive directive available for a task to send a message to a CLI?

A We decided not to implement one at this time. We can do it if there is sufficient interest. The message facility in its current form is not very useful.

Q Is there some facility to allow a user to abort a remote terminal session over DECnet from an RSX host?

A Yes. Type CTRL-\ (Control-Backslash) and RETURN. You will get a local node prompt, and then type CLEAR HOST to break the connection.

Q When logging off remote terminals, we have encountered system problems when modem noise enters the system after BYE completes. Is there some way to remedy this? Slaving the terminal seems to be a possibility.

A We suggest that you create a privileged task which spawns BYE and then resets the slave bit after BYE exits.

Q Regarding RMS file extension on the Pro, we have been field testing Pascal. When Pascal extends its work files, it extends them by ten blocks. However, if the largest fragment remaining on the disk is less than ten blocks, Pascal quits. FCS is able to give back what it can; why can't RMS?

A The Pro version of RMS does extend files by a default value of ten blocks. We can't tell if it is Pascal or RMS which is causing

this problem. If Pascal is asking for ten contiguous blocks, then RMS will return with an error if it cannot allocate that. If Pascal asks for the default extension, then RMS will return any ten available blocks it can find. We suggest that you talk to one of the languages people.

Q Regarding software licensing, if I use the coprocessor products (KXT11, KXJ11), I can end up with sixteen PDP-11's running RSX on one "system." What are my licensing options?

A At this point, you need to purchase a Class L license for whichever system you want to run on the board or chip set you are using. We are looking into licensing options for these particular products, including a new variant of the old General License. We are open for input on this. [OK, folks, you heard it right. Send those letters to: Dick Day, Product Manager, Digital Equipment Corporation, 110 Spitbrook Road, ZK01-3/G10, Nashua, NH 03062-2642.]

Q In the file header format on RSX, there is a much-needed attribute called "Printable File." Have you considered this?

A No. It would be difficult for the system to tell whether a particular file is printable or not. We leave it up to the user to decide that.

Q There are serious deficiencies with remote terminal support from VAX nodes to RSX nodes, including /INQUIRE support, prompting, extra line feeds, etc. What is the prognosis?

A We have tried to clean up some of the problems. The real problem is a lack of communication between VAX-DECnet and RSX-DECnet people to get the VAX people to fix the problems. We suggest you send in an SPR to the VAX people.

Q Is there any documentation describing the various error messages that are reported by various devices; in particular, the DU driver?

A The messages have a one-to-one correspondence with the errors described in the hardware error manual. The exception is the DU driver, which uses the proprietary MSCP protocol.

Q We have had a similar problem on Micro/RSX with RPT reporting unknown errors for the DU driver and "Device Message" packets that are indecipherable. It took us a long time to convince Field Service that there was a hardware problem. Can there be any improvement?

A Even though you only have a DU type disk on your system, it looks like RPT get a packet it couldn't recognize. The Micro/RX error library is heavily pruned, so it can't translate every error for every device. We're sorry, we can't give more information for the DU driver packets.

Q We are having problems with time-blocked batch jobs never getting started when the time comes due. The problem occurs randomly. Any ideas?

A We don't know what the problem might be. [Audience suggestion: You can rebuild Indirect with Foreign Command Support by enabling the DEF CMD symbol. Install it, schedule it to run at a certain time, and then it looks up INDINI???.CMD where ??? are the first three characters of the task name.]

Q I would like to have a read-wait-and-lock feature for RMS. It would make applications requiring several communicating tasks easier to implement, so that a task can post a read on a shared file and wait for it to become unlocked.

A We would have to put code in the Executive to support waiting for a particular block of a file to get unlocked: a difficult proposition. [Your best bet would probably be to use Group Global or Global event flags to have the tasks signal when a block is unlocked, so the other one can retry the read.]

Q Is there any way in RMS to tell it to update a record but leave the record locked?

A We don't think so. That is all done as a part of reads and writes.

Q I've hooked up two applications terminal ports on a MicroVAX 11 to TT0: and TT1: on an 11/24. I then performed a SET HOST/DTE to TT0: and started up the print queue to TT0: on the 11/24. Things printed on the MicroVAX for awhile, and then it hung. I then performed another SET HOST/DTE to TT1: on the 11/24, hit a RETURN, and things started printing again for awhile. I continued to intervene until the print queue was empty. Trying the same procedure with Kermit worked perfectly. Any ideas?

A There may be a problem at the VAX side, but we're not sure.

Q Is there any way to perform a BRU /IMAGE:SAVE/NOINI to a Files-11 mounted disk? The command refuses to be parsed correctly.

A That may be a recent problem, because it used to work.

Q The DTEs for M-Plus V3.0A and for 11M V4.1D do not support wildcard filenames. Can this be fixed?

A Update C for M-Plus should fix the problem. [No mention of 11M.]

Q How can you perform an image copy of an RX50 to another RX50? Could I use PRESERV?

A [From the audience: use TPC, a DECUS utility]. PRESERV wouldn't know how to deal with RX50s. You could also write a block-for-block copy task, or use one of the Update tools on XXDP. DECUS may have a disk copy utility.

Q When trying to build a I/D multi-user task, the EXTTSK option to TKB seems to extend the read-write I-space, and not the read-write D-space.

A That sounds like a problem. Please send in an SPR. [It seems to work on Update C.]

Q Do you give anything up when XDT is included in a system with Kernel D-space support, such as POOL?

A About the only thing you give up is physical memory. XDT mostly uses I-space. Loadable XDT will be on the next version of M-Plus.

Q On 11S V4.2D, we would like to be able to install and fix tasks beyond 124K of memory. Any possibility of this happening?

A No. We looked into it, and decided not to do it for various reasons. We can look into it again.

Q Regarding the Test Feature Directive, I am having problems determining if the task has Fast Map support. The same holds true for P/OS.

A For M-Plus, the problem is fixed in Update C. For P/OS, we will try to fix the problem soon.

Q We would like to be able to use DTE from Batch to get into a terminal server to change the characteristics of the server. The problem is that DTE does not want to accept data from the batch stream. Why not?

A DTE uses QIO functions that the Virtual Terminal driver does not understand. Your best alternative is to write a program that talks directly to the server.

- Q When can we expect to get terminal server support for 11M?
- A We don't have a plan at present to do it. It is more technically complicated than we originally thought.
- Q I'm getting lots of Data Access Protocol errors when performing wildcard copy operations between a MicroVAX 11 and an M-Plus system. Has anyone else seen this?
- A [Some others in the audience had seen the problem.]
- Q Would it be possible to put the files necessary to create a BRUSYS tape on the M-Plus kit? I can't get BRUSYS to boot from an MM: device on an 11/44.
- A You would need sources for BRU, FMT, CNF, and BAD, plus an 11S system. That is just too much for us to put on the distribution. Regarding your problem, try lowering the baud rate of the console and check the XON/XOFF settings.

SPRING 1987 "WOODS" MEETING REPORT

Bruce R. Mitchell, editor
Machine Intelligence and Industrial Magic
PO Box 816
Byron, MN 55920

The 1987 RSX SIG Executive Committee planning meeting was held in Salt Lake City the weekend of January 31. These meetings (the "Woods" meetings) are held by the SIG leadership to determine the future direction of the SIG, to discuss current problems, and to bring members up to date on DECUS affairs.

The following DECUS members attended this meeting:

Al Bennett - Exec Committee, Communications Committee rep
Jim Bostwick - Steering Comm., Working Group coordinator
Ed Cetron - Exec Committee, SIG Lobbyist
Bob Curley - Guest, DECUS Board representative
Dan Eisner - Exec Committee, RSX SIG chair
Beverly Kasper - Steering Committee, Suite Coordinator
Brian McCarthy - Guest, Digital RSX implementation group
Gary Maxwell - Exec Committee, Budget and Finance
Bruce Mitchell - Exec Committee, Multi-Tasker Editor

Rick Sharpe - Steering Committee, Symposium Committee rep
Bob Uleski - Exec Committee, Planning Coordinator
Denny Walthers - Exec Committee, PSS Coordinator

Saturday, January 31

The meeting began with a review of the agenda by Dan Eisner. Individual reports followed from the representatives to Communications Committee, Symposium Committee, Planning Committee and Finance Committee; and from the Multi-Tasker, Lobbyist and PSS Coordinator.

Al Bennett (Communications) is now on the Budget subcommittee of Communications Committee. He pointed out that removal of the SIG notes purchase option from the pre-registration packet was done without our permission. Discussion followed on the usefulness and appropriateness of refereed papers at symposia.

Denny Walthers (PSS) noted that one RSX PSS in Nashville will have a computer online for demonstrations. This is a first for the SIG.

Gary Maxwell (Finance) submitted the FY88 activity plan for the SIG. The SIG is requesting \$31K for FY88, up \$6K from this year's \$25K. Discussion of the budget followed. It was pointed out that the proposed standards activity will probably be removed. The prototype budget was adopted by unanimous consent.

Gary's budget report was followed by a discussion of the upcoming RSX SIG elections. As 1987 is an odd-numbered year, the new SIG bylaws require an Executive Committee election this year.

Dan Eisner reported that Ralph Stamerjohn agreed to accept the job of nomination committee chair for the upcoming SIG Executive Board elections. Bylaws require publication of a notice of open nominations in the Multi-Tasker; Bruce Mitchell will coordinate with Ralph.

Dan Eisner stated that he is standing for re-election as a member of the SIG Executive Committee. This announcement was greeted with massive applause.

After a break, the meeting broke up into three working groups. The first group, led by Bruce Mitchell, discussed the topic of PDP-11 and RSX SIG futures. The second group, led by Gary Maxwell, dealt with volunteer recruitment and retention. The third group, led by Rick Sharpe, evaluated the present SIG products and personnel.

The meeting re-formed after the working groups completed discussion. A summary of their reports follows.

PDP-11 and SIG Futures group: It is likely that we have seen the last new architectural implementation of the PDP-11, though new products based on the J11 may yet be built. There will thus be incremental changes, but no major new CPUs. PDP-11 multiprocessing is of course still a possibility.

As for commonality with RSTS and RT SIGs, the group felt that the basic missions and needs of the SIGs are not the same. Amalgamation of these SIGs would only dilute their missions. Additionally, any chair of a "16-bit SIG" would naturally feel a loyalty to his own operating system, jeopardizing the future of other groups within the SIG.

The group divided SIG goals and mission into short-term and long-term. Short term SIG goals are to support users and RSX coprocessing systems. Long term SIG goals are keeping the SIG viable, supporting conversions to next-generation hardware, and addressing the "real" mission of RSX - process control and industrial automation.

Volunteer Recruitment and Retention group: We should request LDEC to support us for volunteer recruitment, since that is their function. Likewise, we should request the NLC to help us support LUGs, since that is the NLC's function, and LUGs need all the support they can get from us. Gary Maxwell will draft the necessary letters.

We have problems keeping volunteers active between symposia. The SIG should publish a bulletin to keep volunteers active. Contents of the bulletin should include activities, contact people, and SIG futures. It was agreed that the bulletin will have a one year trial and be entered into the budget as a new activity. Editorship of the bulletin went up for grabs; it was decided that Gary Maxwell will assume the position.

Necessity of the bulletin was questioned when DCS is available. The response was that DCS is not available to all our volunteers, and is unsuitable for the limited readership of the bulletin.

SIG Products and Personnel Evaluation group: The SIG has two "products". These products are (1) technical assistance and support, and (2) personnel.

Under technical assistance and support, the following items were identified and evaluated:

1. SIG tapes. OK, continue handling as done now.

2. Campground. Unacceptable, more work required.
3. Clinic. Acceptable.
4. Magic. OK, continue handling as done now.
5. Sessions. OK, continue handling as done now.

It was pointed out that our room sizes are too small. We need rooms having capacities of 200-250.

6. Working groups. OK, more work required.

Working groups have some serious problems which must be addressed; in specific, goals and longevity.

7. Product feedback to DEC. OK, more work required.
8. Menu. OK, but more work required.

The menu needs to be more dynamic, and more give-and-take.

9. Multi-Tasker. OK, continue handling as done now.

The Multi-Tasker needs articles, as always. Production is OK. Assignment of topics and lengths may help.

10. Session notes. OK, continue handling as done now.

There are some severe problems with the long lead time for submission of session notes.

Under the general heading of "personnel", the following items were identified and evaluated:

1. Leadership development: OK, continue handling as done now.
2. Recruitment. Acceptable, but more work required.
3. SIG suite: OK, more work required.

There are staffing and time problems with the SIG suite.

4. SIG identity: OK, more work required.

We need to promote a unique SIG identity to the "outside" world.

5. Store: Unacceptable, more work required.

We lost big bucks in the store and are just beginning to recoup them with the mailing boxes. More unique items are needed.

Sunday, February 1

Sunday opened with a general discussion of SIG needs.

Symposium campground: The Nashville campground will probably be a temporary area like the one at San Francisco. It needs at least two signs, one at the entrance and one inside. The campground should be publicized in Update.daily.

Magic sessions: We need special rewards for Magic / Short Notes contributors. Several items were discussed. Bruce Mitchell will coordinate with Jim Hopp. This led to a discussion of a new store item; Al Bennett will contact Judy Arsenault to see about getting a very limited quantity of 'top secret item' into the store on a test basis.

There will be a programming contest for Magic. Terms will be announced in the Multi-Tasker ahead of time, so members unable to attend will be able to mail in submissions.

Welcome letter: The SIG has been asked to write a welcome letter for new members. This is due by March 15th. Bev Kasper will write this.

RSX BBS: A phone budget does exist. Dan Eisner will look into modems. Base hardware has been donated. Control should be implemented by sending a user info packet out by U.S. Mail. Software does exist and will be investigated further. Bruce Mitchell and Jim Bostwick are contact points.

After a short break, Ed Cetron reported on SIG classified positions.

After lunch, Brian McCarthy addressed the group on RSX and hardware futures.

The meeting closed after polling attendees for their opinions of the meeting. The following good points were brought out:

- o Position descriptions were filled
- o Bob Curley's attendance (good friend of the SIG)
- o Got a lot done
- o SIG definition and purpose
- o The group works well together

- o The group included recent members
- o Leadership problems were dragged into the light

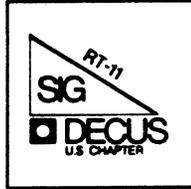
The following bad points were also brought out:

- o Bob Curley's attendance (preaching to the converted)
- o Occasional digressions from the agenda
- o Mongolian food aftereffects
- o Bugle music
- o Noisy meeting room

THE
mini-
tasker

DECUS

RT-11 SIG NEWSLETTER



Notes from the RT-11 World

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.

The RT-11 SIG DOES solicit signed articles for insertion in the mini-tasker, on or about bugs, features, hints, kinks, nifty things, etc., all about the RT-11 and/or RT-32 operating systems and their environments. 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.

CALL FOR PARTICIPATION!

User Application Workshop
at the Spring 1987
DECUS Symposium in Nashville

At the Nashville DECUS, you will have an opportunity to strut your best stuff! The RT-11 SIG welcomes 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; and we encourage you to 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 Rally Barnard, and he will present it for you (giving credit where it is due!). His address is:

R. W. Barnard
Sandia National Laboratories
Division 7523
P. O. Box 5800
Albuquerque, NM 87185

C Survey

I've begun to receive a number of C surveys, and in addition, quite a nice letter from Hamish Ross at The University of Birmingham in England. I hope you find his comments of interest.

RT-1

Notes from the RT-11 World

RT-11 Communications

Marty Gentry and Linda Banche of the RT-11 Development Team submitted a presentation on RT-11 Communications. It covers a little of just what VTCOM, XC/XL, and TRANSF are. I'm sure if you ask either of them, they will tell you LOTS more.

*** Letters to the Editor ***

Electronic Distribution of RTSIG Tape

Dear RT-11 SIG:

The statistics for the Fall 1986 RT-11 abridged SIG tape electronic distribution are as follows:

167 logged sessions
205 hours, 53 minutes connect time
1 hour, 8 minutes, 55.2 seconds CPU time.

The program is obviously working and makes software available to those who don't have tape facilities. As a reminder, the site details are:

Site: GENERAL SCIENTIFIC CORPORATION
Service: Binaries and index
Protocol: KERMIT and VTCOM/TRANS
Phone: (301) 340-2776
Time zone: Eastern
Hours: 6:00 p.m. to 8:00 a.m. <--- PLEASE NOTE !!
Data rate: 1200 baud
Log-on: DECUS
Pass-word: GUEST

Thanks,

Tom Shinal

TK-50 RELIABILITY AND PROBLEMS

Dear RT-11 SIG:

We are experiencing reliability problems with some of our TK50 tape systems. Nosing around brings similiar complaints from other users. If you have any hints/kinks/complaints etc., send them to me and I'll act as a clearing house and forward them to the appropriate DEC bodies, and maybe solve my own TK50 problems. Maybe some of the

RT-2

Notes from the RT-11 World

problems are simply "cockpit" errors, and maybe not.

Regards,

Tom Shinal (301) 340-2773
General Scientific Corporation
1684 East Gude Drive
Rockville, MD 20850

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)
The Software House, Inc.
P. O. Box 52661 (OR)
Atlanta, GA 30355-0661

Bill Leroy (RT-11 mini-tasker)
The Software House, Inc.
2964 Peachtree Road, NW #300
Atlanta, GA 30305-2120



The University of Birmingham

DEPARTMENT OF PHYSIOLOGY
The Medical School, Vincent Drive, Birmingham B15 2TJ
Telephone 021-472 1301

Professor J H Coote - Professor of Physiology and Head of Department
Professor P M H Rack - Professor of Experimental Neurology
Professor S M Hilton - Bowman Professor

Bill Leroy,
Mini-Tasker Editor,
The Software House Inc,
P. O. Box 52661
Atlanta, GA,
30355-0661
U.S.A.

26th. January 1987

Dear Bill,

It takes some time for the US chapter newsletters to reach here so I have only just seen this survey.

I have been using DECUS C for about 4 years for everything I used to do in FORTRAN and some things I used to do in assembler. I have made some extensions and changes to the old 11-SP-18 kit (see DECUS 11-800) to make it more compatible with UNIX C and now I am fairly happy with it. However, I think it would be useful to have a DIGITAL product which was as close to the ANSI standard as possible. I have had few problems porting things written in DECUS C to other C compilers since, DECUS C is slightly more restrictive than some others.

I have not been able to find much interest in DECUS C in the UK RTSIG, it seems that there must be some more interest in your SIG. Is there likely to be any interest in putting together any collections of applications software in C in areas like statistics, numerical methods or graphics (GKS)?

Since the survey suggests that it might take some time to get out a DIGITAL supported product is there any way that DIGITAL might make use of parts of the DECUS C kit?

Yours sincerely,

Hamish Ross.

Components-XC/XL

- * Handler on local RT machine
- * Provides interface to DL-type serial hardware (XC for PRO Communications port)
- * Provides some modem control
- * Provides full XON/XOFF support

Components-TRANSF

- * Runs on host
- * Provides host end of protocol based file transfers with error checking and limited recovery
- * Version distributed since V5.1 runs on RT, TSX+, and RTEM
- * Versions for other DEC operating systems are available.

RT-11 COMMUNICATIONS

SERIAL COMMUNICATIONS

VTCOM, XC/XL, TRANSF

- * Virtual terminal
- * Crude ASCII file transfers
- * Error-free file transfers

XC/XL Handler Internals

- * Internal receive buffer (64 chars)
- * XON/XOFF flow control
- * .READ/.WRITE support
- * .SPFUN support

XC/XL Handler Internals

- * .SPFUN's for port control

201	Resets internal flags sends XON to host
202	Set/Reset BREAK wcnt is flag
203	Special read wcnt is count of bytes to read. Returns count, or contents of buffer, or will wait for at least one character. Final byte returned is null.

VTCOM, XC/XL, TRANSF

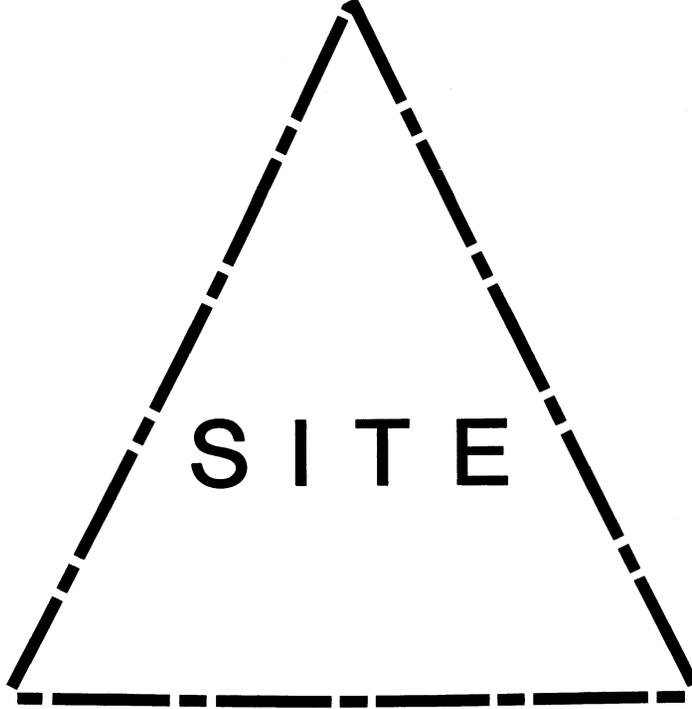
- * History
- * Availability
- * Components
- * XC/XL Operation
- * Transfer protocol

Components-VTCOM

- * Runs on local RT machine
- * Can capture (to file) characters received from host
- * Can send ASCII files to host as if typed
- * Provides some modem control
- * Provides local end of protocol based file transfers



DECUS



Letter from the Editor

Welcome to the April issue of the Site, Management, and Training SIG Newsletter. This our pre-symposium issue for the Nashville Symposium.

All is quiet on the DEC Software Licensing war, but some inside information indicates that another announcement is forthcoming. In fact, by the time you read this, the announcement should be history.

In this issue Sue Abercrombie, the Site, Management, and Training SIG's Symposia Coordinator outlines the schedule for Nashville. As in San Fransisco, the SIG has grouped sessions under a central theme for a particular day, allowing one to concentrate on that day's theme topic.

I am always interested in your feedback and welcome your comments, suggestions, thoughts, and articles. Please send them to :

Gregory N. Brooks
Washington University
Department of Psychology
Behavior Research Laboratories
1420 Grattan Street
St. Louis, MO. 63104
(314) 241 7600 extension 257

See y'all in Nashville!

Site Symposium Activities at Nashville

Susan M. Abercrombie
SITE SIG Symposium Coordinator

The Site, Management and Training SIG will have a busy schedule at the Nashville Symposium. In addition to the scheduled sessions, we will have suite hours in the Opryland Hotel on Tuesday and Thursday evenings. Stop by on either evening to become acquainted or involved.

Our sessions are listed below. Those presented by DIGITAL are noted in bold type. As far as possible, we have tried to organize our sessions into coherent content areas, which are described for each day. In addition to the published schedule, we hope to provide up to three DIGITAL Field Service sessions which were submitted (extremely) late. Check the Update.Daily for additions/cancellations/changes. (Note that the Friday afternoon session titled "DEC Today and Tomorrow," which was listed in the registration kit, has been cancelled.)

On Monday our topics will be documentation, and people and technology issues. Monday evening (as usual) we will have our magic stream. On Monday afternoon, Ray Strackbein will present our keynote address on People and Technology.

9:00am	S025	SITE SIG Roadmap
9:30am	S019	Meeting End User Training Needs
10:30am	S001	Time Management for Data Processing Professionals
11:30am	S051	Cutting the Learning Curve - New Documentation Approaches
12:00n	S021	QC Processes for DEC Course Development Cycle
2:00pm	S017	Easy and Quick Documentation Method
3:00pm	S045	How to Write Documentation That Works--Tutorial
4:00pm	S048	KEYNOTE ADDRESS--PEOPLE AND TECHNOLOGY
5:00pm	S036	Professional Skills Panel
8:30pm	S031	DECUS Exhibit Hall System Management
9:30pm	S023	Site, Mgmt & Trng--Magic, War Stories & Lessons Learned
10:30pm	S024	What to Do When the Computer Is Down

On Tuesday, SITE will focus on physical facilities.

9:00am S010 Necessary Electrical Environment for Network Systems
10:00am S027 Computer Room Fire Protection
11:00am S002 Planning & Installation of Power Distribution Systems
1:00pm S015 A New Processor Is on the Way--Now What?
2:00pm S009 Computer Room Design & Construction--A Case History
3:00pm S008 Computer Room Survival without the Computer Room "Extras"

9:00am S022 SITE -- Business Meeting and Future Directions
9:30am S035 Time Management Using an Automated System
10:00am S004 Synergy--Internal User Groups to Supplement Training & Support
11:00am S005 Effective User Training
1:00pm S028 Training Program for a DEC/IBM-PC Environment at Dupont
1:30pm S006 The Training Experience of a New Instructor
3:30pm S037 People & Technology Working Group

See you in Nashville.... HowwwDEEE!!

Wednesday will be devoted to management, with the emphasis in the afternoon on people and technology.

9:00am S011 Managing and Accounting for Disk Resources
9:30am S007 Setting Priorities for Effective System & Site Management
10:30am S049 BACKUP--The Administrative Viewpoint
11:30am S050 PDP-11 Software Licensing
3:00pm S047 Interpersonal Relations for Computer Professionals
4:00pm S026 How to Sell Ideas to Management
5:00pm S039 Developing a Hardware/Software Request for Proposal

On Thursday, we will cover resource utilization and growth planning in the morning, and security in the afternoon.

9:00am S046 Accounting and Monitor Data Analysis Using Speakeasy
9:45am S029 Using SAS to process Raw System Performance Analysis Data
10:30am S003 Analysis of VMS Acctng Data to Determine Resource Consumption
11:00am S038 Planning Growth for VAX Systems
2:30pm S033 DIGITAL's Tempest Program
3:30pm S013 Anatomy of a Computer Security Program
4:00pm S012 Access Control Lists (ACL)--the Alternative File Protection
5:00pm S020 VAX Security and System Management

Friday's sessions will address user support and training, and other people and technology issues. Our SIG business meeting will start the day's activity.

NEWSLETTER OF THE VAX SYSTEMS SIG



Our Mascot

Pageswapper

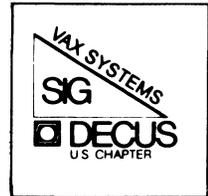


TABLE OF CONTENTS

Editor's Workfile	VAX-3
VAX SIG Fall 1986 Symposium Tape	VAX-4
Undocumented Monitor Display Classes	VAX-14
INPUT/OUTPUT	VAX-20

Forms at the End

INPUT/OUTPUT Submission Form	QU-35
System Improvement Request Submission Form	QU-37

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

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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USA

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

Editor's Workfile

What are you NOT able to do with a VAX?

Ross Miller of the VAX SIG Steering Committee is looking for a few good failures in VAX I/O performance. From time to time there are stories about some large project whose I/O requirements could not be met on a VAX when it seemed that it "ought" to be possible. But it is hard to convince DEC there is really a problem if every case is in the form of a vague rumor. Ross is looking for documentation of such problems, and would like to hear from you giving your measurement results (a letter is fine, 14 volume MIL-spec project reports are not required). It would be ESPECIALLY helpful in bringing these concerns to the attention of DEC if you were in a position to compare execution time on a VAX with that on some other comparable processor (we can presume your Cray has faster I/O than your MicroVAX 2000, but Ross is in a position to get the word to the right people at DEC if you found a case where a VAX is significantly slower than a comparably sized HP, DG, IBM or other competitive machine). Send your tale of woe to:

Ross W. Miller
Online Data Processing, Inc.
N 637 Hamilton
Spokane, WA 99202

Convincing DEC to take your money

I received a letter from the Electronic Store, acknowledging my letter (previously mentioned in this column) asking WHY they refused to use US mail. Unfortunately, although they acknowledged receiving the letter, they did not bother to answer the question!!! Stay tuned.

VAX SIG Fall 1986 Symposium Tape

Distribution of the Fall 1986 (San Francisco) VAX Systems SIG Symposium tape was started in January 1987. This tape is characterized by a number of TPU enhancements, VT241 color manipulation routines, command buffer saving and restoration, a number of system monitoring programs and, as usual, many updates to previous submissions and much, much more. The size of the distribution is down slightly but the amount of material is up - we have made extensive use of an LZ compression program (C sources included this time) to fit everything on two 2400 foot reels of tape at 1600 bpi. Much of the material requires VMS version 4.x and no attempt has been made to identify material compatible with earlier versions of VMS or to make the file names compatible with earlier versions of VMS.

If you are going to make disk-to-tape copies of this tape for others be sure you expand the compressed files to a new directory structure and, if you use COPYTREES.COM, do not use a name like VAX86C_EXPANDED which will fall between VAX86C and VAX86D.

Most of the following is excerpted from [VAX000]000README.TXT and ABSTRACT.TXT.

The top level description summary to the Fall '86 VAX SIG tapes is contained in VAX86CD_BRIEF.SUMMARY and VAX86CD_TC_FORUM_HANDOUT.PLUS in [VAX000]. For a longer description see AAAREADME.86C and .86D, the concatenated AAAREADME.TXT files from the respective submissions. AAAREADME.TXT's back through the Fall 1984 tape are in a sub-directory [.OLD_AAAREADME].

The tapes are in VMS Backup format in three save-sets - one each for [VAX000...], [VAX86C...] and [VAX86D...]. As usual VAX000 and VAX86C will fit on one 2400 foot tape at 1600 bpi and VAX86D will fit on one tape at 1600 bpi. Many of the filenames violate VMS version 3.x naming conventions so you will get RMS errors if you try to load the tape on a version 3 system.

Many larger files are compressed (such as [VAX86D.SPELL.SPELL]-COMMON_WORDS.DAT) and some directories and directory trees are compressed backup save-sets (such as [VAX86D.RCAF86.DSTGNUEMX]). In most cases restoration procedures are given in the local AAAREADME.TXT file. In some cases a command procedure is

provided. More detailed information about LZCMP and LZDCM can be found in [VAX86D.LZW]. Extensive use of this utility allows us to fit the material on two reels of tape. We have tried to use compression without hiding the contents of the submission. That is, the AAAREADME.TXT's are not compressed and in most cases an uncompressed directory listing is provided.

All areas have ONE AAAREADME.TXT (and possibly many AAAREADME.something-else) file. This is done to ensure that the summary is short enough to be useful.

Note that we again have an index of the tapes. In order to minimize the preparation time of this tape we have not put its index on, we have, however included the index for the Spring 1986 tape and a composite index for all the tapes. The composite index is quite large and has been compressed.

This tape was put together from submissions at the Fall 1986 DECUS Symposium, San Francisco, California, by

Joe Bingham
Librarian, VAX Systems SIG
ManTech Services Corporation and
2320 Mill Road
Alexandria, VA 22314
(703) 838-5600

Glenn Everhart
RCA A & D Engineering
Rt 38, Bldg 206-1
Cherry Hill
New Jersey 08358
(609) 486-6328

The following is a brief summary of the contents of the tape:

VAX86C Tape

- [.AKCOUNT] VMS chargeback accounting package and resource accounter. From Martin Serrer, NRC Canada.
- [.BATTELLE] FILES - program to find files based on ownership, size, expiration, etc. FLUSH - flush DCL recall buffer (a security must sometimes). Command procedures to fix All-in-1 mail read and to assist in building dynamically linked images. From Mark Oakley, Battelle.

- [.BCLUG] Hardcopy from VT240 for LN03 or LA50. Idle terminal monitor for terminal server terminals primarily. VMS Performance monitoring system. From British Columbia LUG.
- [.BULLETIN] VAX Bulletin board and notes system. Very similar functions to VAXnotes though with different interface details, plus network operation, mail interface, etc. From Mark London, MIT.
- [.CENTRAL_FLORIDA] Color representation on the VT-241 and LCP01. Set colors on a VT-241. TPU EDT enhancements.
- [.SEE] Utilities. Count records. Set up Hayes modems for VMS. Format text for LN03. Force other process to exit. Reminder utility. System status report. From Ken Richardson, Compassion International.
- [.CLEMENT] A set default program, a directory wipeout procedure, a spying program, Bonner Lab Runoff, TPU EDT extensions.
- [.COY] DM - Directory Management package revision COLORS - allows you to manage and set default VT241 colors. SD - Revision of Set Default program from Al Zirkle. From Dale Coy, Los Alamos.
- [.CSC] Calc - fixed up calculator program; fixes a bug on non 11/780 processors. COMPARE - Compares two sets of files and lists which ones differ based on directory information. Useful for finding probable file copies or checking what changed on a disk from a backup disk. From Dennis Fitzgerald, CSC.
- [.DMM] Revisions to the DM Directory Management package. From Rich Gregory, Pharmaceutical Research Associates.
- [.DUFF] INQUIRE - Improved DCL Inquire verb with timeout, buffer length, etc. control. STRETCH - performance analysis system for capacity planning. Structured Cluster Management talk command files. From Steven Duff, Ergodic

- Systems.
- [.EDTPLUS] Enhanced emulation of EDT in TPU. From Edward Nieland, Systems Research Labs.
- [.ERI] Greyscale to Apple Laserwriter postscript images. Program to create halftone images suitable for LA50. Programs to capture user opinion of system response time and report. From Bob Goldstein, Eye Research Institute.
- [.ESYSTEMS] Do DCL operations on a list of files. Reminder utility. Ada pretty printer. PASCAL pretty printer. TeX procedures for unsophisticated users to create memos, contact reports, slides, etc. using LaTeX. List duplicate filenames in a directory tree. Scroll a humorous saying horizontally across a VT100. From Wayne Sewell, E-Systems.
- [.FLEETWOOD] Autodial MICOM or VADIC modems. Get pictures from VT240 to LN03 hardcopy. Stop processes by user name, not PID. Find which users are using the most disk. From Barry Wallis, Fleetwood Enterprises.
- [.FPAIN] Data entry manager for use with Fortran. Basically this is an FMS type product which allows you to create custom data entry screens easily with many predefined capabilities. From John Sinclair, Inland Steel Research.
- [.FRANCE] DECUS France submission. Set of procedures to simplify use of FMS. Font editor for LN03 which allows you to use TeX type fonts on LN03 (or to use fonts from TeX). Font design system also. From Didier Fortier, DECUS France VAX SIG.
- [.GAMES.CONQUEST] Multi-player realtime spacewar game based on Empire. Runs on almost any CRT. From Craig Leres, LBL.
- [.GENDYN] DCL access to the lock manager. From Ken Coar, General Dynamics.

[.GOULD] Identifier-only Authorize program. Disk storage monitor. Automount - mount all disks on the system. Notify batch owner of messages. Remove debugger and traceback info from an image. SETTERM - sets all terminals to a given type in one shot at startup rather than one at a time. From Eric Richards, Gould.

[.GQM] Group Quota Manager - allow group managers to alter quotas in their groups. From Valerie Caro, University of Mass.

[.GRC] Check if account is about to expire, warn user. Set process name to guaranteed unique name if necessary. Search queue for job by name. Security banner labeler. Clock for VAXstation. VMS variant of UN*X GREP (similar to SEARCH but much more powerful pattern match). Directory tree editor (graphically). Emulation of HP calculator. Eric Andresen, GRC.

[.HATFIELD] LBN - find file based on logical block (or track/sect/cylinder). DISKFRAG - tell how fragmented your disks are. PRFILE -file dump for all or part of indexed files. From Jim Shelly, Hatfield Packing Co.

[.IIT] Integrated accounting facility for academic systems. Network print symbiont for full function remote printing over DECnet. From George Stafanek, IIT.

[.KAZ] EDT and EDT TPU emulator customizations and docs. Program for rapid login. Utilities to clean up internal carriage control files like those Runoff makes. More. From Richard Piccard, Kalamazoo College.

[.LATSHAW] EDTEM - TPU based editor using EDT keypad. Utilities for doing binary DEC-IBM and IBM-DEC conversions. From Mike Latshaw, Pacific Power and Light.

[.MCV] Formatted listing of first few records of each file on a tape. Cluster-wide SHOW USERS. CLI PARSE FOREIGN: allows you to link a command table into a foreign command; eliminates slow SET COMMAND. Write arbitrary chunks of memory to object files so they can be linked into other programs. MAKE or MMS replacement utilities. Message-to-PASCAL translator. Extract labeled blocks from one or more files and concatenate them. From Medical College of Virginia.

[.MIVAXLUG] Directory compare program. Perpetual batch job facility. Print files on terminal printer. DCL command procedure structure analysis. Image to make a VMSINSTAL - able KERMIT. SEEALL mode for TPU. DRAWTREE update. Key definition utilities for VT200. Send message utility. From James Fischer et. al., EDS.

[.NSWC] EXPORT - submit that waits for job to finish (possibly on another node). SD utility update. LET command - easy ASSIGN or DEFINES. Reminder utility update. Kill - interactively edit jobs you have in print queue. From Alan Zirkle, NSWC.

[.PAGESWAPR] Pageswapper articles since last tape. From Larry Kilgallen, VAX Pageswapper editor.

[.PRTSERVER] Print server system to allow a remote PDP11 to print on a VAX transparently. From Les Stockton.

[.RECALL] Save and restore your DCL command buffer.

[.RIGS] Extensions to C library with equivalent of Un*x "system" function and some support routines. From Wayne Baisley, Rockwell International.

[.RSTSOPEN] Extend BASIC OPEN statement to allow access to many more RMS features than were possible with standard OPEN. From Victor Lindsey, VLSystems Incorporated.

- [.SEALUG] MICOM 600 control program. Filter to Wollengong TCP/IP to allow forwarding of VAX mail to a TCP/IP node. Conversational DECnet link. Netsubmit - submit jobs across net. Object library to Shareable Image converter. Queue display. Talaris laser printer support. SWAP (become another user) update. From James Belonis, University of Washington.
- [.SIXTPU] SIXEL - program to plot ReGIS graphics to sixel files. Program to dump to LAL00. Additions to EDT interface to TPU. From Robert Thompson, Martin Marietta.
- [.TPUWPS] WPS - Plus emulation in TPU. Also multi-node cluster command procedure. From Dar Schumann, Farm Credit Services.
- [.UAB] Foreign Tape processor. ASCII or EBCDIC. LIST - screen lister in TPU. Fix to BIGBRO display for 4.4. LILBRO smaller dynamic user display. GRADE - class grading system. SMAUG - process to lower priority of CPU hogs, raise it again when they use less CPU. GOLLUM - throttles processes at idle terminals after time interval. From Mark Vevle, University of Alabama.
- [.UALR] Full function bulletin board system for VAX. CB simulator for VAX. DELTREE procedure. Posters update. Cluster-wide WHO. More. From Lon Jones and Dale Miller, University of Arkansas, Little Rock.
- [.VIEWRPT] NEWS utility. REMOTE - issue commands across DECnet. SNOOPY - continuous user monitor to watch what a process is doing. VIEWSYSTEM - watch what's going on on whole system. From Joe Lawrence, Rockwell, International.
- [.WKU] Compile, link and execute a program in any language, check to see if mail has been read, save logicals for another session, tab programs, process monitor, more.

- [.WSIPC] Menu driven front end for VMS. Also an RSX version. From Warren Falls, Washington School Info Proc. Coop.
- VAX86D Tape

- [.BIBLE] Full text (uppercase only) of King James Version of the BIBLE (compressed). Also some programs to change the display width. From Dean Lampman.
- [.BNELSON] BITNET interface programs, Kermit-11 Version 3.54, slides, a fast tape-disk-tape copy program (VMSTPC), and the TED full screen editor for VMS (native mode), RSX, RSTS, and P/OS, plus some other items. From Brian Nelson, University of Toledo
- [.DTRSIG] Collection of DTR related material. DTR definitions for AIL logging or WPS-PLUS logging. Replacement for All-in-1 corporate phone directory (much faster than DEC's). DAB definitions in Macro-32. User defined functions including SPAWN and string length. Wombat Examiner issues. Additional PLOTS and articles on adding your own. Command line recall from inside DTR. RSX accounting system with DTR. Transcripts of some Symposium sessions. From Bart Lederman, ITT. (DTR SIG Librarian.)
- [.FERMILAB] EDTX extended EDT. Extract comments from src modules for Runoff or TeX post processing. GETUAI. Programs to entab/detab, some of which know VAX Fortran tab conventions. Modified VAX C include files for system items not in DEC distributed files. XDFO - extracts definitions files from object files. From Frank Nagy, Fermilab.
- [.FERMLIB] Device Independent Graphics System. Terminal emulation, file transfer. Teleconferencing utilities. User interface for hyperchannel file transfer. News. Conversion between ASCII and Cyber 6/12 format. ADM3 support for SCRFT. Help files. More. From Arthur Kreymer, Fermilab.

- [.ICON] This is Version 6.0 for VAX and 5.9 form MSDOS of the ICON programming language, which is a next generation text language with some SNOBOL antecedents. From Ken Harris and the University of Arizona.
- [.LEVINE] RK05 driver w/src for VMS. INDEX - powerful FORTRAN static analyzer, cross referencer and flowchart generator. JUICER - IN PLACE ODS2 DISK COMPRESSION. Includes several packages for reducing disk fragmentation. From Michael Levine, Naval Weapons Center.
- [.LZW] This area contains source and executable for the LZW compress and decompress tools used to compress some items on the tape to gain space (and make things fit on two reels). Written by Martin Minow, DEC.
- [.RCAF86] AnalytiCalc update (Version 21.2) with cell annotation. Virtual disk driver and control image for VMS (V4 and later) that treats a contiguous file as a separate volume. MSDOS version of AnalytiCalc and of RIM5 relational DBMS with src. Update to network Finger for VMS 4.4. SIXEL program to dump ReGIS graphs to sixels for LN03 with modifications for ReGIS editor from DECUS. VMS Smartmailer from DECUS library. Miscellaneous programs from CSnet messages. Update to VMS GNU EMACS which works much better than the early version from the Spring '86 tape. Much more. In the [.MISC.CSNETITM] directory are various utilities and informational items from CSnet mail. Several important VMS patches are among them, and information on how to obtain the PMDF mail system (which can act as a store/forward phone based mailer for anyone, interface with DECnet or other networks, and more.) From Glenn Everhart.
- [.SPELL] Spelling checker for TPU/EVE, plus a stand-alone version. Allows you to check a document while in edit. From Thomas Woolfe, JPL
- [.VMSKERMIT] Maintenance release of Kermit-32. This version (3.3.111) fixes several bugs and now works correctly with FILE TYPE FIXED files with short final blocks. From Robert McQueen, Stevens Institute of Tech.

Undocumented Monitor Display Classes

Lee K. Gleason
Control-G Consultants
2416 Branard D
Houston TX 77098

I was reading the VMS 4.4 microfiche a while back, looking into the inner workings of MONITOR, out of idle curiosity, and I came across some references to five classes of MONITOR display I had never seen in the manuals. These classes were JDEVICE, JOURNALING, RU, VMS1 and ETHERNET.

Well, I could understand not hearing about the first three, since VMS Journaling, like the mid-engine Corvette, is always coming out "next year" (though I often wonder what the SYSGEN parameter CJFLOAD really does...). The fourth one, VMS1, had that exotic, internal use only sound to it, and ETHERNET, I had to presume, monitored Ethernet performance.

I fair leapt away from the fiche reader, and got on to one of my systems - with disappointing results.

```
$ MON ETHERNET
```

resulted only in the

```
MONITOR>
```

prompt appearing. Likewise for all the rest of the new class names.

This was not all bad, though - since it parsed the class name without an error message, that meant at least SOME of the code was in the MONITOR image. Once again, I turned to that dark grimoire of VMS lore, the microfiche. In module MONDAT, fiche page 293, I found the data structure that describes each display class - the Class Descriptor Block (henceforth we shall call it the CDB). The different display and data collection requirements of each MONITOR class are summarized in it's CDB. This allows generic routines to deal with the several different types of MONITOR displays. Each CDB has a lot of fields in it, but I won't bother describing all of them - the CDB is defined only for the MONITOR image, and is of no external use. One field, though, showed some promise - the FLAGS field.

The FLAGS field is a longword that has various bits set in it that control assorted MONITOR display options. The bit that caught my eye was labeled CDB\$M_DISABLE. The commentary for this bit indicated that it would, when set in a CDB FLAGS field, prevent that class from displaying. That sounded to me like a mechanism for turning off features not meant to see the light of day.

Well, I asked myself, rhetorically, I wonder if I can patch the image to turn that bit off in these five CDBs? The CDBs are stored sequentially starting at label CDBHEAD. The link map of MONITOR (also, conveniently in the fiche, on page 292) showed CDBHEAD to have an address of 4158. The listing for MONDAT gave the offset from CDBHEAD to each flags longword. Using these addresses, I used PATCH to find these values.

Class	Offset	Value
PROCESS	53	0
STATES	A6	14
MODES	F9	15
PAGE	14C	11
IO	19F	11
FCP	1F2	11
POOL	245	410
LOCK	298	11
DECnet	2EB	11
JOURNAL	33E	211*
RU	391	211*
FILE_SYSTEM	3E4	11
DISK	691	4035
JDEVICE	48A	235*
DLOCK	4DD	11
SCS	530	35
VMS1	583	211*
SYSTEM	5D6	111
ETHERNET	629	211*
CLUSTER	67C	2011
ALL	6CF	11

(* indicates undocumented class)

A little study of the values showed that there is only one bit that the five unknown classes have in common that is not found in any other class's value. That is bit nine, or 200 as a hex mask value. I used PATCH to clear this bit in the five fields, then reinstalled MONITOR, and gave them a try. This time, they all worked (well, more or less).

The following is the command file I used to turn off the disabling bits.

```
$ set default sys$common:[sysexe]
$ patch monitor.exe
REPLACE 4158+33E
211
EXIT
11
EXIT
REPLACE 4158+391
211
EXIT
11
EXIT
REPLACE 4158+48A
235
EXIT
35
EXIT
REPLACE 4158+583
211
EXIT
11
EXIT
REPLACE 4158+629
211
EXIT
11
EXIT
UPDATE
EXIT
$ install:==$install/command_mode
$ install
replace sys$common:[sysexe]monitor.exe
```

The ETHERNET class gives a monitor page that displays the statistics from the DEUNA or DEQNA. It does not, however, work on the Ethernet devices of newer BI class machines. If you have a BI VAX, and your Ethernet device calls itself ETA0, this

display will always have zeroes in all fields. To use the ETHERNET display, you must have PHY_IO privilege.

\$ MON ETHERNET

VAX/VMS Monitor Utility
 ETHERNET STATISTICS
 on node TWONKY
 3-FEB-1987 02:48:49

	CUR	AVE	MIN	MAX
Packets/second	30.00	30.00	30.00	30.00
Kbytes/second	1.33	1.33	1.33	1.33
Packet size	47.00	47.00	47.00	47.00
Multicast Packets/second	4.33	4.33	4.33	4.33
Multicast Kbytes/second	0.00	0.00	0.00	0.00
Multicast Packet size	57.00	57.00	57.00	57.00
Trans Single Collision	0.00	0.00	0.00	0.00
Trans Multiple Collision	0.00	0.00	0.00	0.00
Trans Initially Deferred	0.00	0.33	0.00	0.35
Internal Buffer Error	0.00	0.00	0.00	0.00
Local Buffer Error	0.00	0.00	0.00	0.00
Buffer Unavailable	0.00	0.00	0.00	0.00

The VMS1 class produces statistics on XQP file system related locking.

\$ MON VMS1

VAX/VMS Monitor Utility
 VMS DEVELOPMENT 1
 on node AMBER
 3-FEB-1987 02:53:55

	CUR	AVE	MIN	MAX
FCP Call Rate	32.33	32.07	31.89	32.33
Volume Lock Req. Rate	0.00	0.00	0.00	0.00
Volume Lock Wait Rate	0.00	0.00	0.00	0.00

Other Sync Lock Req. Rate	32.00	31.85	31.56	32.00
Other Sync Lock Wait Rate	0.00	0.00	0.00	0.00
Access Lock Req. Rate	2.66	0.88	0.00	2.66
Cache Wait Rate	1.33	0.88	0.66	1.33

The RU class produced an interesting, but hardly useful screen that tells me there is no Recovery Unit activity going on at present.

\$ MON RU

VAX/VMS Monitor Utility
RECOVERY UNIT FACILITY STATISTICS
on node AVALON
2-FEB-1987 23:01:55

	CUR	AVE	MIN	MAX
Active Recovery Units	0.00	0.00	0.00	0.00
Active RU Journals	0.00	0.00	0.00	0.00
RU Channels Assigned	0.00	0.00	0.00	0.00
RU Journal Write Rate	0.00	0.00	0.00	0.00
RU Journal Read Rate	0.00	0.00	0.00	0.00
RU Journal Extend Rate	0.00	0.00	0.00	0.00
Mark ID Rate	0.00	0.00	0.00	0.00
Mark ID Rollback Rate	0.00	0.00	0.00	0.00
RU Abort Rate	0.00	0.00	0.00	0.00

The JOURNAL class produced a display that will, no doubt, some day, tell us about journal activity. Right now, it is mostly zeroes, except for an apparently spurious count of Journal channels assigned

\$ MON JOURNAL

VAX/VMS Monitor Utility
JOURNALING FACILITY STATISTICS
on node CABRA

2-FEB-1987 23:02:29

	CUR	AVE	MIN	MAX
Active Journals	0.00	0.00	0.00	0.00
Journal Channels Assigned	4076.00	4076.00	4076.00	4076.00
Journal Write Rate	0.00	0.00	0.00	0.00
Journal Buffer-write Rate	0.00	0.00	0.00	0.00
AI Journal Write Rate	0.00	0.00	0.00	0.00
BI Journal Write Rate	0.00	0.00	0.00	0.00
AT Journal Write Rate	0.00	0.00	0.00	0.00
RU Journal Write Rate	0.00	0.00	0.00	0.00
Journal Direct I/O Rate	0.00	0.00	0.00	0.00
Journal Buffered I/O Rate	0.00	0.00	0.00	0.00
FORCEJNL Flush Rate	0.00	0.00	0.00	0.00
FORCEJNL Null Rate	0.00	0.00	0.00	0.00
Force Modifier Write Rate	0.00	0.00	0.00	0.00

The Jdevice class produced only an error message - no doubt some piece of Journaling it can't live without is missing.

\$ MON JDEVICE

%MONITOR-E-COLLERR, error during data collection
-SYSTEM-F-BADPARAM, bad parameter value

What any of these statistics mean will take a little study, as they are, of course, completely undocumented. I should also mention that, although I have been running them on clusters and stand alone systems for weeks now with no untoward results, I certainly can't be held responsible if they crash your system - I mean, we have no way of knowing why they were turned off in the MONITOR image.

I have used these displays on VMS 4.4 and 4.5. Since VMS 4.4 supplied a new MONITOR image, odds are these patches wouldn't be correct on version 4.3 and older.

INPUT/OUTPUT

A SIG Information Interchange

A form for INPUT/OUTPUT submissions is available at the back of the issue.

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

(617) 262-6830

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

```
=====
Note 530.12      Remote Print Symbiont wanted      12 of 13
"Jack Patteeuw"      17 lines      2=FEB#1987 07:59
      * < another solution from DEC > *
*****
```

.. but this one will cost you !

DEC has a new product out called "Remote System Manager". It is a tool for managing your uVAXes from a central system. Some of the things it claims to do are backup a remote system to tape (but we all know how to do that already) as well as printing from a remote system.

As part of VMS Services (or is it called MS-DOS Services ?) for PC's, the Network File Transfer (NFT) program will queue files for printing, but only to SYS\$PRINT and you can not specify any other PRINT options (it uses the RMS "submit on close" option I think).

Remember DEC new credo ... "Add functionality will cost added \$\$\$"

Jack Patteeuw
Ford Motor Co.
Electrical and Electronics Division
31630 Wyoming
Livonia, MI 48150
313-323-8643

```
=====
Note 530.13      Remote Print Symbiont wanted      13 of 13
"John Osudar"      34 lines      17-FEB#1987 16:50
      * < Re: note 35.xx from Fall '86 DECUS > *
*****
```

I was responsible for posting note 35 on the Fall '86 Symposium NOTES conference. I've got a microVAX that has no real (physical) printers running a bunch of print queues that send jobs to a 785 that DOES have real printers. Things come out with the right username on the flag page, etc. I also have spooled null devices on the microVAX for people who prefer copying to LPA0: instead of PRINT/Q=LPA0. The whole thing is based on a general server symbiont called EXECYSMB, which acts as a "sub-job-controller". It handles the grungy details of talking to the job controller, and puts up with the weird symbiont environment (e.g. no SYS\$OUTPUT), and allows each queue that it services to run a detached process "queue processor" that is a DCL command procedure. (The command procedure can simply contain a "\$ RUN programname" command if you want to do the processing in a faster language than DCL!) EXECYSMB has a much simpler protocol for talking to the queue processor than what you get if you write a naked user-written symbiont (or even a user-modified symbiont). It also lets you do some other useful things. My problem (at least at the time of the last DECUS) was that I didn't have the OK to put this stuff on the VAX Sig tape. It may be difficult to get an official OK -- but I am willing to submit it anyway, to the Nashville tape. I could send out copies of the software in BACKUP format to anyone who's connected via a network, or can accept an ASCII text file (containing an Ascified and compressed copy of the saveset) -- but most people at commercial places aren't on networks. If anyone wants to suggest what I should do, you can call me at (312) 972-7505, send electronic mail to B35049@ANL.CMT.BITNET, or send paper mail to me the address below.

I'd appreciate comments -- and I'd like to apologize to those who responded to note 35 and got no reply from me; the overwhelming number of responses precluded me from trying to reply on my own.

John Osudar
Argonne National Laboratory
9700 S. Cass Ave.
Bldg. 205 A-051

Argonne, IL 60439-4837
(312) 972-7505

=====
Note 532.4 Warning - BSO/DECnet problem 4 of 4
"Ken A L Coar" 14 lines 5-FEB-1987 11:54
 <- Found the exact reference! >-

I figured that the statement of the standard would be in the
'Guide to Creating Modular Procedures on VAX/VMS.' In fact, it
isn't. I looked all over the place, asked all sorts of people
about it, and the reference was finally located by my DEC
resident on page 3-14 of the 'Introduction to VAX/VMS:'

"The use of a dollar sign (\$) within logical names is
reserved for DIGITAL."

I have SPR'd that this should be copied or moved to the ModProc
Guide.

#k

Ken A L Coar
General Dynamics
Office Systems
12101 Woodcrest Executive Drive
Creve Coeur, MO 63141
(314) 851.4003 (CST)

=====
Note 559.2 High-Order Word of a PID 2 of 2
"Offline Submission" 38 lines 25-FEB-1987 00:25
 -< PID information (non-cluster system) >-

There are really two PIDs in VMS - an "internal" PID (IPID) and
an "extended" PID (EPID). The IPID is the one we used to know
prior to VMS version 4. It still exists on the system but is
not normally displayed. You will see both in the output of the
ANALYZE/SYSTEM "SHOW PROCESS" command. The EPID is simply the
IPID with the high order word shifted. The low order word is
the process index, the high order word starts at 1 when the
system is booted and is incremented in a new PID each time the
process index number is reused. I don't know how high this

value can get, but you could find out by creating a lot of
processes. Unfortunately, the number of bits that the value
will be shifted depends on the value of the SYSGEN parameter
MAXPROCESSCNT. At the default (72), it is shifted 9 bits. If
the value of MAXPROCESSCNT is 140, the high order word will be
shifted only 8 bits. My assumption is that just enough space is
saved (at the low order part of the EPID) to store the process
index, and the maximum value of the process index is set by
MAXPROCESSCNT. Following this assumption, since the maximum
value for MAXPROCESSCNT is 8192, the most that the process index
would require is 12 bits. This suggests to me that at least the
high order 4 bits are not used. I don't know that this answers
the question, but maybe it helps. Of course, all of this is
subject to change without notice.

David Williams
Seismograph Service Corporation
Post Office Box 1590
Tulsa, OK 74102

Telephone: (918) 627-3330

February 13, 1987

=====
Note 560.2 DECnet Node Isolation Needed 2 of 8
"John Osudar" 33 lines 17-FEB-1987 17:05
 -< Approaches to area isolation >-

Despite HEPNET's efforts with "area filters", the problem still
persists, and it will continue to do so until DEC comes up with
a solution. Since Phase V appears to be at least 2 to 3 years
away, the problem is likely to be around for a while. I
proposed a software solution (a software "DECnet bridge") over a
year ago. It involves using a pseudo-device that looks like a
DECnet communications device (e.g. a pseudo-DMC) to provide
hooks for a process that maps area.node numbers from one network
into those for another. This would allow you to restrict access
from outside your local network to only those nodes that are in
your translation table, and would completely isolate your local
DECnet from the area numbers in use on other nets, at the
expense of one area in the network on each side. Best of all,
it would be totally local -- one end of a communications link
could run the software, and the other end would never know it,
or both ends could run it for mutual isolation and security. I
have an informal paper written on this idea. The HEPNET people

discussed the idea, but shied away from developing something that wasn't supported by DEC. It was stated (by FNAL people, in fact) that they would "never run third-party software on their VAXes" because of the risk of crashes that wouldn't be fixable by DEC. (I wonder -- do they run third-party device drivers for data acquisition interfaces, or is that a special case???) In any case -- I feel that what I proposed is implementable with a relatively small amount of software development effort, and it would work in the interim, until Phase V "solves all of our problems forever". I'd be glad to share/discuss details.

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

```
=====
Note 560.3          DECnet Node Isolation Needed          3 of 8
"Jamie Hanrahan"          43 lines 18=FEB=1987 19:44
      <- I don't think it's that easy >-
-----
```

If I understand you correctly, what you're asking for is a pseudo-device driver that sits between DECnet and the real DECnet data link driver. It would have to look inside the packets, interpret the from/to addresses, and check them against a permissions list/translation table. Implementation of that part looks pretty trivial, especially if you've already had experience writing DECnet data link drivers, as I have [he said modestly].

The pseudo-driver would also have to intercept and translate segmented routing messages. This looks like a real pain. It is not just a matter of translating addresses, as the routing messages consist of a byte count, followed by the address of the first node for which routing information is being supplied, followed by the cost/hop information for that and all numerically subsequent nodes whose cost/hop data has changed. You might end up having to send multiple routing messages when the local system only thought it needed to send one, for instance. It's certainly do-able, but I wonder what other DECnet messages contain node numbers encoded in "funny" ways. It might take an awful lot of "research" (i.e. late-night debugging sessions) to find them all.

I also have objections on philosophical grounds. What you are suggesting is that a piece of software which the rest of DECnet will see as a data link driver (DNA level 2) have knowledge of upper-layer protocols. My instincts tell me that this is an invitation to disaster. (Of course, my instincts have been wrong before.)

Nor am I sure what this buys you in terms of security. If you are running such software you are essentially saying that you trust some nodes at the remote site, but not others. The catch is that it is easy for other nodes at the remote site to masquerade as the trusted node, particularly if the trusted node is down for a while. It seems to me that if you don't trust the other site, you shouldn't give them *any* DECnet access to your machines.

This technique *would* solve the area/node number management problem across network boundaries, but I'm not sure that it would be worth it; nor am I convinced that it would be a simple task to implement.

Jamie Hanrahan
Simpact Associates
9210 Sky Park Court
San Diego, CA 92123
619-565-1865

```
=====
Note 560.4          DECnet Node Isolation Needed          4 of 8
"John Osudar"          49 lines 19=FEB=1987 16:40
      <- Is it that easy? & other philosophical questions >-
-----
```

What I'm proposing is a bit simpler than what you describe -- but I appreciate your comments as an experienced data link driver writer. Here's the crux of my proposal: At the point in your local network where you have a physical link to a large external wide-area network, you install (for example) a pseudo-DMC driver, and tell DECnet that it's to use this device. You also install a process that works with the driver, and contains some of the higher-layer intelligence you describe. In particular, here's what it does: Through the pseudo-DMC driver, it makes the local DECnet think that there's a single external area reachable through this pseudo-device. To do this, it should be sufficient if the software knows how to send level II routing messages -- but since only one area is reachable through

the pseudo-device, this is not as complex as it might be otherwise. This software also does I/O to the real communications device that the local DECnet would have used to talk to the external DECnet. There, it makes the external net think that there's a single independent area accessible through this communications link. Again, the software problem should be similar as before -- level II routing messages. Finally, the software examines the address fields of packets sent by the local DECnet through the pseudo-device, or by the external DECnet sent through the real communications device. It has two tables: one that maps the local network area.node numbers into node numbers in the single "pseudo+area" that's seen by the external net, and one that maps the external network area.node numbers into node numbers in the single "pseudo-area" that's seen by the local net. Using these, it modifies the addresses and forwards the packet out the other end. Clearly, this restricts your local net to having at most 1022 nodes that can be accessed (or can access) the external net, and it also limits to 1022 the number of external network nodes that can be accessed (or can access) you local net. These numbers seem high enough, but if someone needs more they could make the software fancier, so it "pretends" to be more than one area. (In the cases I've seen, this wouldn't be necessary. We have a bunch of nodes that want to talk to one another locally, and about a dozen of them occasionally want to talk to a limited number of nodes on the HEP DECnet. Neither figure is anywhere near 1022.) I will state up front that I am not a DECnet expert; I have read the protocol descriptions, I know how VMS device drivers work, and I haven't seen any reason to think that what I propose would not work. If someone would tell me that this won't work, I'd shut up and go back to my dungeon to hide -- but all I've heard (prior to Jamie's reply) is "yeah, sounds like it would work, but we're not interested in developing anything because DEC will fix it for us REAL soon..." THAT is what bugs me...

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

```
=====
Note 560.5          DECnet Node Isolation Needed          5 of 8
"Jamie Hanrahan"      31 lines  20-FEB-1987 16:23
                    -< yet more comments >-
-----
```

OK. The area-number restrictions you describe would certainly make the job easier, since node-within-area info doesn't cross area boundaries. I haven't seen a description of Level 2 routing messages, but it shouldn't be too hard to come by.

Yes, it definitely can be done. Your associated process (might as well call it an ACP) would only be necessary to update the translation tables, and possibly send and receive the Level 2 routing messages; normal I/O traffic would go directly from the pseudo-driver to the physical line driver, or vice versa. You do not want to put a process context switch in the path of every I/O.

DECnet data link drivers are "strange" in many ways. Meg Dumont of DEC has presented an excellent "how to write a datalink driver" session at a couple of Symposia; I heard it in New Orleans (Session V067, Spring 85) and again in Dallas. If you are interested in working on this stuff, get a copy of the session notes and the corresponding audio tape.

One other little glitch: The internal start I/O interface for DECnet data link drivers varies a bit. For instance, on the DMR11, writes are direct I/O while reads are buffered I/O; for most of the others I've looked at, all transfers are buffered. The pseudo-driver needs to be smart enough to look at the buffered function mask of the physical data link driver and do the right thing.

I *still* don't like the idea of having a data link driver peeping into (and changing) the upper-layer protocol headers.

Jamie Hanrahan
Simpact Associates
9210 Sky Park Court
San Diego, CA 92123
619-565-1865

=====
Note 560.6 DECnet Node Isolation Needed 6 of 8
"John Osudar" 23 lines 20-FEB-1987 20:59

-< more comments on more comments... >-

Your points are well taken. I guess I agree with your "philosophical objections" to having a data-link driver tinkering with (or even knowing about) higher-level protocols -- but as you point out, this would ONLY be done to avoid context-switching overhead; otherwise it could be done in a process that represents higher-level DNA functionality. I think there's still a problem with doing it in a driver, though: something needs to have a read posted to the real datalink device. How do you go about that without using a process? In any case -- I'd like to know what other people see as the alternatives; I've listed two: (1) wait two years or more for DEC to "solve all our problems"; and (2) develop an interim software solution. I should point out that (2) is an INTERIM solution. DEC has to do something eventually about network isolation. (You should note that I didn't say "about the lack of node addresses or area numbers in DECnet". The problem goes FAR beyond just that!) It's been suggested that something like the software I've proposed here ought to run in a DEC router/server-type device, providing isolation between a local network and the external net(s). I haven't heard any interest from DEC in that one...

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

=====
Note 560.7 DECnet Node Isolation Needed 7 of 8
"Jamie Hanrahan" 62 lines 23-FEB-1987 16:34

-< still more comments >-

>I think there's still a problem with doing it in
>a driver, though: something needs to have a read posted to the
>real datalink device. How do you go about that without using a
>process?

All DECnet datalink drivers must address this problem; the problem is not solved by having NETACP post reads to the data link (normal data reads and writes do not go through NETACP). They do it via preallocated receive buffers. This works much like regular buffered I/O, except that the driver allocates the buffers when the line is started rather than at FDT time.

The driver maintains several queues: One for buffers which have been allocated but which the device hasn't been told about yet; one for buffers which the device knows about but which haven't been filled yet; one for filled buffers; and one for read requests (either \$QIOs or internal IRPs from other drivers) for which there are no matching filled receive buffers. (Of the latter two queues, only one will be non-empty at a time.)

When the driver can match a filled buffer with a read request, it links the buffer to the IRP, sends the IRP to posting (for internal IRPs, IRP\$\$_PID's high-order bit is set, so the posting routine just JSBs indirect through that value, which is a location within the originating driver), and allocates a replacement buffer.

The simplest driver in the system that plays these games is the DMC/DMR11 driver (XMDRIVER).

>In any case -- I'd like to know what other people see as the
>alternatives; I've listed two: (1) wait two years or more for
>DEC to "solve all our problems"; and (2) develop an interim
>software solution.

I'd also like to know how many other potential users are interested in this problem. If the market is big enough, we (Simpact Associates) could come up with a product. Sounds like it might be a difficult beast to sell, though.

>DEC has to do something eventually about network isolation.

I dunno. The designers of DECnet clearly assumed that all nodes on a given network would have, if not a single network manager, a collection of network managers who would get together and coordinate things like node and area numbers. Temporary, "ad hoc" connections between separately-managed networks are pretty foreign to the entire DECnet philosophy. I'm not saying that they're not useful; I'm just saying that DEC may have a hard time believing in their utility. What you may see, though, is net address translation, or some other capability that can solve this problem, available as a side effect of something else.

>It's been suggested that something like the software I've >proposed here ought to run in a DEC router/server-type device, >providing isolation between a local network and the external >net(s). I haven't heard any interest from DEC in that one...

Certainly, address translation could be added to the DECnet router/server software. But if it's to be third-party software it has to go in the VAX.

Jamie Hanrahan
Simpact Associates
9210 Sky Park Court
San Diego, CA 92123
619-565-1865

=====
Note 561.3 Pervasive Pagefaults 3 of 4
"Jamie Hanrahan" 16 lines 30-JAN-1987 17:12
-< all's well here >-

Well, someone at our site did a full image backup save and restore of their system disk. Sure 'nuff, the "real file name" of the 001054/SYSEXE pair became 001054, and etc. BUT, when we used INSTALL to LIST the known images, they were all installed under [sys0.sysexel], and etc., as desired. So people running those images did in fact share a common copy of each image. No problems.

I'd like to know more about the original problem... But it looks very much as though INSTALL is smart enough to use the file name specified on the ADD command line, rather than the "real" file name (and directory spec). This is not what was reported in the Pageswapper article (Dec 86, vol 8 #5, page VAX-5). The system in question there was part of a VAXcluster; maybe the problem is cluster-specific.

Jamie Hanrahan
Simpact Associates
9210 Sky Park Court
San Diego, CA 92123
619-565-1865

=====
Note 561.4 Pervasive Pagefaults 4 of 4
"Jamie Hanrahan" 20 lines 30-JAN-1987 19:47
-< more good news >-

After posting the previous reply I went back and reread the original article, then did some more poking around on both our affected system and another system where the "real file names" of the aliased directories are still intact.

On the affected system, SHOW DEVICE/FILES does indeed list the open files on the system disk as [sys0.001054], etc. BUT, multiple processes touching the same installed, shared or shareable images do NOT create multiple entries in the display. So the files are being shared, as intended, despite their directory names. I obtained further confirmation by looking at INSTALL> LIST/GLOBAL ; the reference counts for the files *were* reflecting all of the 'interested' processes.

Again, maybe the problem is cluster-specific, or maybe something was wrong with the system root directory specifications on the system where the problem was reported. There are no VAXclusters here, so I can't investigate further. Anyone else?

Jamie Hanrahan
Simpact Associates
9210 Sky Park Court
San Diego, CA 92123
619-565-1865

```
=====
Note 567.5          BACKUP Hints and Questions          5 of 5
"Bill Johnson 214-519-3454"      26 lines  23-FEB-1987 14:06
      -< More backup large buffer problems >-
-----
```

Using a block size of 65535 will decrease the time to copy an RA81 to tape and will also allow you to get a full RA81 on 3 tapes, however at two different sites I have seen the problem where the tape runs off the end of the reel. DEC (DALLAS TEXAS) local office says the following about the problem:

The tape runs off the end of the reel when a large block size is being used and an error occurs in the space required to write BPI*BLOCK_SIZE*#BUFFERS bytes of data before EOT is encountered. If error occur in this space, BACKUP will retry writing the data to tape after it has done a space forward on the tape, thus spacing forward right over the EOT marker never to find another.

You can do one of three things to prevent all this.

- 1 - Put two EOT markers on your tapes (HA HA)
- 2 - Use smaller block sizes
- 3 - Don't do backups.

We have chosen to use a block size of 32767 keeping in mind that the same problem can happen at any block size. It seems to be a real software bug with backup complimented with a hardware bug not letting backup know it really went past EOT and it is currently writing in EXE\$BLACKHOLE.

William Davis Johnson
1323 Branch Hollow
Carrollton, TX 75007
214-394-8416

```
=====
Note 573.7          I want Kermit for VAX/VMS!          7 of 7
"Jack Patteeuw"      14 lines  30-JAN-1987 16:43
      -< New is Better, Ain't it ?!?? >-
-----
```

Hey, we changed the color of the carpeting, what more do you want !!!

Actually, if you dial up the LCG.MARKET system and type out (yes DEC20's know what TYPE means) KERMIT:VMSMIT.DOC (or maybe it was .MEM) it will tell you in specific (down to which module and who made the change) what was changed and why !

For those of you who are real hackers at heart, the source code in both BLISS and MACRO are also on line with command files to build the .OBJ and .EXE !

What do you think of those tail lights on the Mustang GT (ugh !)

Jack Patteeuw
Ford Motor Co.
Electrical and Electronics Division
31630 Wyoming
Livonia, MI 48150
313-323-8643

```
=====
Note 574.1          Cluster time coordination.          1 of 1
"William Davis Johnson"      14 lines  23-FEB-1987 13:52
      -< There really is a GOOD solution >-
-----
```

I am interested in cluster time synchronization, however having a 10 node cluster makes DCL out of the question. I have considered a method where by using DECnet and nontransparent task-to-task co communication, allowing the "master" timekeeper migrate from vax to vax as the "master" processor goes down. I have the logistics worked out but, my concern is one of, what happens to things like outstanding TQE', SPM, Jobs in the batch queue with a "/after" switch...ETC.

Someone has suggested using the LOCK manager and passing the 64 bit time mask in the lock block from one node to another but that is a real kludge. I understand DEC is looking at the problem but doesn't know what to do about outstanding TQE's. I understand that SPM looses it in particular when you set time backwards. ANY Ideas??

William Davis Johnson
1323 Branch Hollow
Carrollton, TX 75007
214-394-8416

```
=====
Note 577.12      Questions/Comments on TPU      12 of 14
"C J "Buck" Trayser"      28 lines  29-JAN-1987 22:14
      * < Perspective... > -
-----
```

Net gain or loss? Hard to say. Given the basic manner in which your people use EDT, my suggestion would be to let them stay at EDT until they NEED the features of TPU.

I use both EDT and TPU (with an EDT style keypad on EVE) depending on what I am doing. Sometimes I need two windows on the same screen, other times I am doing extensive searches or I might be editing a file with records longer than 255 (which is EDT's limit). I find that other than a few of my favorite line-mode commands a good EDT emulator in TPU makes going back and forth quite easy.

TPU uses a good bit more memory (real and virtual) than EDT, but having a 'kept' sub-process which can be attached to easily saves on the page faulting. Then again, since TPU can use more real memory it is much faster when doing massive changes, searches, etc.

As far as a definitive statement of 'better or worse than EDT', I think this will depend on your current memory usage more than anything. Maybe a bit more input from your side would be helpful. How tight is memory? Are there any obvious bottlenecks on your system? Are you planning on taking away EDT or making both EDT and TPU available? Are your users complaining because of EDT's lack of speed or its lack of features?

\$

C J Trayser
360 Interstate North Parkway
Suite 600 - MS: 6/B4
Atlanta, Georgia 30339

```
=====
Note 577.13      Questions/Comments on TPU      13 of 14
"Michael R. Pizolato"      10 lines  3-FEB-1987 11:51
      - < More general comments... > -
-----
```

I use EVE exclusively. I think I am the only one on my system who uses it at all. We do fairly large amounts of editing (average file size about 250 blocks), and I don't know if switching to TPU would help us. Besides, my users are impossible to get to try something new.

I have defined about 10 keys with some simple EVE commands, and I have done no sophisticated TPU programming, and I am happy. I do use the LEARN command very frequently. Once I tried EVE, I never went back.

Michael R. Pizolato
AT&T Technology Systems
Dept. 323610
555 Union Blvd.
Allentown, PA 18103
215/439-5500

```
=====
Note 577.14      Questions/Comments on TPU      14 of 14
"Mark Hyde"      10 lines  4-FEB-1987 08:38
      - < editors, like religion, tend to be personal issues > -
-----
```

As far as it being an overall gain or loss, I think Buck probably covered most of the bases. You just have to consider your particular system in terms of the resources TPU based editors will require.

Even though I've used EDT for years, I never learned how to use all the features proficiently. I never used buffers and only did pretty simple key definitions, much less ever figure out how to do macros. With TPU and the EDT section file, I have the best of both worlds as far as I'm concerned; the familiar EDT keypad and all the power of the TPU language to use.

Mark Hyde
Digital Equipment Corp
360 Interstate North Pkwy
Suite 600 IPO1-6/C2
Atlanta, Ga 30339

=====
Note 579.3 autodialing problems 3 of 3
"Bob Hassinger" 6 lines 30-JAN-1987 15:39
-< Consider DECserver 200 >-

I have had the same problem - phone lines and modems are real hard to come by here so we want to share incoming and outgoing if we can. The latest is we just got Ethernet and our first DECserver-200. First efforts to hook up modems to the DS using DEC's instructions have seemed to be working well, even in the "dynamic" (i.e. both dial in and out) case.

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

=====
Note 580.3 ODS-2 Specification Wanted 3 of 13
"Ken A L Coar" 7 lines 30-JAN-1987 13:59
-< Aye! >-

I've got a copy of the ODS-2 document authored by Andy Goldstein in January of 1979. It has most of the information except the details of the extensions for ACLs, longer file names, &c.

I would definitely like to see this made a real publication.

#k

Ken A L Coar
General Dynamics
Office Systems
12101 Woodcrest Executive Drive
Creve Coeur, MO 63141
(314) 851.4003 (CST)

=====
Note 580.5 ODS-2 Specification Wanted 5 of 13
"Jamie Hanrahan" 2 lines 30-JAN-1987 16:59
-< me too >-

I also vote yes. Let's see it unofficially in the pageswapper now, and officially later on in the new internals manual.

Jamie Hanrahan
Simpact Associates
9210 Sky Park Court
San Diego, CA 92123
619-565-1865

=====
Note 580.6 ODS-2 Specification Wanted 6 of 13
"Frank J. Nagy" 5 lines 31-JAN-1987 11:16
-< Yes, Oh Please Yes >-

Count me another YES. I'd also like to put in my 2 cents on the new Internals manual. I'd much rather see it expand to 2 volumes rather than see useful (and even semi-relevant) material left out. Frankly, I don't see how it can help expanding to a second volume unless all Digital wants to publish is an "Introduction to Internals".

Frank J. Nagy
Fermilab
PO Box 500 MS/220
Batavia, IL 60510
(312)840-4935

=====
Note 580.8 ODS-2 Specification Wanted 8 of 13
"James Littlefield" 4 lines 2-FEB-1987 11:38
-< Vote! >-

Here's another yes. I can't believe that DEC thinks they can get away with a single volume Internals Manual. Sounds like we are in for another fiasco similar to what they did with the MicroVMS documentation!

James Littlefield
170 Aquidneck Ave
Middletown, RI 02840
(401) 849-8440

=====
Note 580.9 ODS-2 Specification Wanted 9 of 13
"M. Erik Husby" 10 lines 2-FEB-1987 12:55
-< Another Yes vote >-

Another Yes. And could DEC please release the VMS V4 Internals Manual before VMS 5 comes out.

M. Erik Husby
Project Software & Development
14 Story St.
Cambridge, MA. 02138
(617)-661-1666

=====
Note 580.12 ODS-2 Specification Wanted 12 of 13
"Bruce Bowler" 2 lines 4-FEB-1987 09:09
-< Me too, me too, me too!!! >-

Count me as another YES regardless of how many volumes the internals manual is (and PLEASE DEC, get the internals book out before V5).

Bruce Bowler
General Electric
1 River Road

Bldg 2 Room 609
Schenectady, NY 12345

=====
Note 580.13 ODS-2 Specification Wanted 13 of 13
"Matthew M. Wilbert" 1 line 4-FEB-1987 21:09
-< yea, verily >-

Yes. More volumes is OK (makes the spines last longer too!)

Matthew M. Wilbert
6 Washington Avenue
Cambridge MA, 02140
(617)-725-3458

=====
Note 581.2 Saving Terminal Output 2 of 3
"Ken A L Coar" 7 lines 30-JAN-1987 14:02
-< a la SCRIPT? non.. >-

A transcript of the terminal session cannot be gotten using DEC-supplied (that is, documented and purchasable) software, short of SET HOST /LOG, to the best of my knowledge. However, many more DCL commands now accept a /OUTPUT qualifier than did before.. *someone* is finally trying to impose a kind of orthogonality..

#k

Ken A L Coar
General Dynamics
Office Systems
12101 Woodcrest Executive Drive
Creve Coeur, MO 63141
(314) 851.4003 (CST)

```
=====
Note 581.3          Saving Terminal Output          3 of 3
"Dave Close"          3 lines    6-FEB-1987 18:58
                    -< What about DUMP? >-
-----
```

The DUMP command uses the terminal width when directed to your screen. With SET HOST/LOG, it seems to come out 132 wide. I haven't tried @TT yet but there doesn't seem to be any other way to get 80-column dumps.

Dave Close
Anadex/Printronic
1080 Avenida Acaso
Camarillo, CA 93010
805/987-9660

```
=====
Note 582.0          What is DECUSERVE ?              3 replies
"Jack Patteeuw"          9 lines    30-JAN-1987 16:48
-----
```

I just got my new DECUSCOPE and there is a small article on something that is going to be called DECUSERVE.

How is it going to be different than the Pageswapper NOTES system (ie. this one) ?

Will it replace this system ?

Why will it cost \$20 to use ?

Jack Patteeuw
Ford Motor Co.
Electrical and Electronics Division
31630 Wyoming
Livonia, MI 48150
313-323-8643

```
=====
Note 582.1          What is DECUSERVE ?              1 of 3
"Larry Kilgallen"          2 lines    30-JAN-1987 17:27
                    -< The present Pageswapper system will remain >-
-----
```

Perhaps someone more involved in DECUS committees can answer the other questions.

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

```
=====
Note 582.2          What is DECUSERVE ?              2 of 3
"Ken A L Coar"          24 lines    2-FEB-1987 14:33
-----
```

I can't answer 'officially,' because I'm not that closely involved with it, but DECUServe is different from the Pageswapper forums in that it will have conferences covering all areas of DECUS, not just VAX. Also, it will be administered centrally by DECUS personnel, on equipment owned by the Society.

Remember that the IO conference here was, originally anyway, intended to make the Input/Output form more interactive. I don't know whether the way it has developed into a freewheeling discussion typical of VAXnotes conferences was anticipated [comments, Larry?], but DECUServe is being set up with that exact goal in mind.

There will be a 'nominal' fee to cover routine maintenance, like backups, support and maintenance contracts, and so forth.

Please remember that this is NOT official, just what was discussed in various committee meetings. I have no information more recent than last November, both because I'm not directly involved, and because I haven't gotten my DECUScope recently. Don Golden and Ray Kaplan are the people to talk to (see the Steering Committee lists in the newsletters).

#k

Ken A L Coar
General Dynamics
Office Systems
12101 Woodcrest Executive Drive
Creve Coeur, MO 63141
(314) 851.4003 (CST)

Jack Patteeuw
Ford Motor Co.
Electrical and Electronics Division
31630 Wyoming
Livonia, MI 48150
313-323-8643

```
=====
Note 582.3          What is DECUSERVE ?          3 of 3
"Mark Hyde"        2 lines    4-FEB-1987 08:30
                   -< also speaking unofficially >-
-----
```

I believe that there is going to be more information and possibly a session on DECUServe in Nashville.

Mark Hyde
Digital Equipment Corp
360 Interstate North Pkwy
Suite 600 IP01#6/C2
Atlanta, Ga 30339

```
=====
Note 583.1          DMR11 Interface          1 of 1
"Jamie Hanrahan"   4 lines    2-FEB-1987 16:32
                   -< no secondary stuff needed >-
-----
```

The DMR uses none of the secondary channel stuff, not even in half-duplex mode. Connect all of the ordinary modem control signals (CTS, RTS, DSR, CD, DTR, RI), frame and signal ground and transmitted and received data and you should be fine.

Jamie Hanrahan
Simpact Associates
9210 Sky Park Court
San Diego, CA 92123
619-565-1865

```
=====
Note 583.0          DMR11 Interface          1 reply
"Jack Patteeuw"    14 lines    2-FEB-1987 07:40
-----
```

Due to some shuffling of multiplexors and other equipment, I am forced to make up a cable to connect my DMR11 to a modem that is over 300 feet away.

I am using a RS232C interface but don't expect to have any signal strength problems (both Black Box and Belden Wire make extremely low capacitance/low noise cable that should be adequate).

My real question is, does a DMR11, when used with an RS232C interface, use the Secondary Channel (ie. Secondary Transmit Data, Secondary Receive Data, etc.; pins 12, 13, 14, 16, 19). What about other odd signals (22 = Ring, 21 = Signal Quality, 23 = Signal Rate). I've looked in the hardware reference but it is unclear to me. I need to know so that I will order cable with enough conductors.

```
=====
Note 584.0          SET HOST/DTE woes.      1 reply
"Michael R. Pizolato" 39 lines    4-FEB-1987 15:57
-----
```

After trying everything exactly the way the "Guide to Networking" says, I can't get SET HOST/DTE to work. We are using DF112 modems, which are supposed to be just rack-mounted DF03's. However, there is a separate file in SYSS\$LIBRARY (DTE DF112.EXE), that I think is supposed to be used for the DF112's. Here is what I get:

```
$ SET HOST/DTE TTD7:/DIAL=(NUMBER:1234567,MODEM:DF112)
... PAUSE LONGER THAN SHOULD BE NEEDED FOR DCL TO DETECT
      A PARSING ERROR ...
```

%DCL-W-BADVALUE, '1234567' is an invalid keyword value

- OR -

```
$ SET HOST/DTE TTD7:/DIAL=(NUMBER:1234567)
...LONG PAUSE...
```

%SYSTEM-F-TIMEOUT, device timeout

This is the case no matter what number I specify, even if it is in quotes, or any other thing I could think of.

- OR -

\$ SET HOST/DTE TTD7:

%REM-I-TOEXIT, connection established, type ^\ to exit
... NO RESPONSE TO ANYTHING (INCLUDING ^Y) UNTIL ^\ IS TYPED
%REM-S=END, control returned to node _Ull::

"_Ull::" is our node.

I should note that we are still running VMS V4.2 until we get our update service straightened out with DEC, :-(. This also means I can't call Colorado about this, :-{.

Can anyone help?

P. S. Thanks for trying, Jack.

Michael R. Pizolato
AT&T Technology Systems
Dept. 323610
555 Union Blvd.
Allentown, PA 18103
215/439-5500

=====
Note 584.1 SET HOST/DTE woes. 1 of 1
"Bob Hassinger" 9 lines 5-FEB-1987 09:08
-< Set speed & check recent NOTES >-
=====

I had a simple problem with symptoms like the last example. It was just that I was failing to set the port speed to match what the modem wanted to hear. I was trying to use a 1200 baud modem at the port's default 9600 baud speed.

Most likely you have considered this and your problem is more likely to be along the lines of the recent NOTES about needing to force modem control signals to be able to accept input from the modem before a connection to the remote modem is completed.

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

=====
Note 585.0 Anyone use defrag programs? 2 replies
"Matthew M. Wilbert" 10 lines 4-FEB-1987 21:23
=====

I am looking for a disk defragmentation utility. (my main software package requires contiguous files) I am trying to find out what people use, and whether the DECUS program JUICER does anything useful.

All that I need done is the generation of large areas of contiguous free space, and (as far as I know) nothing on my system cares about particular file id 's or any other specialized information likely to be destroyed by such a program.

Any suggestions, warnings, etc

Matthew M. Wilbert
6 Washington Avenue
Cambridge MA, 02140
(617)-725-3458

=====
Note 585.1 Anyone use defrag programs? 1 of 2
"Mark Oakley" 11 lines 9-FEB-1987 22:57
-< We use BACKUP >-
=====

We investigated some defragmentation programs. The author of JUICER told me that it is not especially robust, and should be used at your own risk.

A number of vendors are now releasing defragmentation programs, most of which suffer from various problems (take too long, require considerable resources, don't always work, etc.). There may be one or two that actually work well, but not in our environment.

Currently, we compress our disks via BACKUP and some extra disks. This means that they are unavailable for a period of time.

Mark Oakley
Battelle Memorial Institute
505 King Ave.
Columbus, Ohio 43201-2693
614/424-7154

```
=====
Note 585.2      Anyone use defrag programs?      2 of 2
"C J "Buck" Trayser"      12 lines  10-FEB-1987 06:45
      -< BACKUP/IMAGE is probably your best bet >-
-----
```

When you want files to be contiguous you can do two things, First, use the BACKUP program with /IMAGE to a different disk. This makes your entire disk (all files) contiguous and is generally one of the better things to help disk performance. The other 'trick' is to create an FDL which specifies that the file is to be contiguous, then use CONVERT/FDL to create your new (contiguous) file. Don't use the COPY/CONTIGUOUS command as that is 'contiguous=best=effort', and the effort isn't too exhaustive - if your disk is heavily fragmented COPY/CONTIGUOUS won't give you a contiguous file and it won't tell you.

\$

C J Trayser
360 Interstate North Parkway
Suite 600 - MS: 6/B4
Atlanta, Georgia 30339

```
=====
Note 586.0      Message Router VMSmail Gateway      1 reply
"Jack Patteeuw"      5 lines  5-FEB-1987 19:26
-----
```

The syntax to send VMSmail through the Message Router Gateway to another node (without Message Router) is very cumbersome (see page 3-4 of the Message Router VMSmail Gateway Guide). I recall that at the last DECUS National Symposium there was a simpler syntax but I don't recall what it is, does anyone else ?

Jack Patteeuw
Ford Motor Co.
Electrical and Electronics Division
31630 Wyoming
Livonia, MI 48150
313-323-8643

```
=====
Note 586.1      Message Router VMSmail Gateway      1 of 1
"Ken A L Coar"      15 lines  6-FEB-1987 14:51
-----
```

All I know is that, to get mail from VAXmail to ALL-IN-1 at our site, one uses the following syntax:

To: node::MRGATE::A1::all-in-1-username

where A1 is the name of the MR mailbox. To get stuff from ALL-IN-1 back to VAXmail,

TO: vms=username@MRGATE@node

works.

Hope this helps, but I doubt it..

#k

Ken A L Coar
General Dynamics
Office Systems
12101 Woodcrest Executive Drive
Creve Coeur, MO 63141
(314) 851.4003 (CST)

```
=====
Note 587.0      Goodbye ReGIS, Hello GKS, so ???      5 replies
"Jack Patteeuw"      35 lines      6-FEB-1987 17:42
*****
```

A recent article in "Digital Review" stated that DEC had announced the "retirement" of the ReGIS Graphics Library product. DEC was quoted as saying that users of this product should begin migrating to GKS.

A separate article in the same publication (different issue) said that the soon to be announced VT300 series terminals will support GKS.

These two facts (?) combined, along with my general lack of knowledge on how graphics programs are really written, opens up a whole series of questions.

First, how can a terminal device support GKS ? I thought that GKS was a collection of device independent, standard subroutines for doing graphics. Drivers were provided for different types of hardware (ie. ReGIS, Tek4010, Tek41xx, HP, etc.). I assume that these drivers are held in a shareable library so that they can be selected at run-time (sounds good anyway). Would drivers for new device not written by DEC be able to be added to this library ? How would application software be able to know what kind of a terminal you are running on (new device types, ie. SET TERM/DEVICE=TEK4010 ?)

What will DEC do with their own products that now use ReGIS ? (Such as Datatrieve, DEC Slide, DEC Graph, etc.) Will these be re-written (and when) to use GKS ? Will that mean I can use them on non-DEC (ie. Tek) terminals ? (pretty please, pretty please)

Finally, with all the excitement about X-Windows on WorkSystems (that's what DEC calls them), I assume they will also be available on traditional VAXes and does this mean the end of SMG ?

I'm sure that no one person knows the answer to all these questions (and if there was, he certainly wouldn't spill his guts in this forum), but maybe someone can shed some light on this subject.

Jack Patteeuw

Ford Motor Co.
Electrical and Electronics Division
31630 Wyoming
Livonia, MI 48150
313-323-8643

```
=====
Note 587.1      Goodbye ReGIS, Hello GKS, so ???      1 of 5
"Larry Kilgallen"      86 lines      6-FEB-1987 21:42
      *-< Perceptions of a non-graphics person >-
*****
```

>First, how can a terminal device support GKS ? I thought that >GKS was a collection of device independent, standard >subroutines for doing graphics. Drivers were provided for >different types of hardware (i.e., ReGIS, Tek4010, Tek41xx, HP, >etc.). I assume that these drivers are held in a shareable >library so that they can be selected at run-time (sounds good >anyway). Would drivers for new device not written by DEC be >able to be added to this library ? How would application >software be able to know what kind of a terminal you are >running on (new device types, ie. SET TERM/DEVICE=TEK4010 ?)

My understanding from listening to tapes of past DECUS US Chapter Symposia sessions (goodness knows, one doesn't have time in a Symposium week to actually ATTEND sessions about areas in which one is not directly involved) is that effective with Version n.0 of VAX GKS, DEC added support for a standard graphic metafile format. My understanding of this format is that it is portable between vendors, but check with someone who really knows before spending money.

Given that metafile format, it would be possible to build some hardware which reads the metafile and displays it. Perhaps in some (or many) cases this would result in a faster display time than repeating all the calculations involved in processing the calls to the standard subroutines (remember, graphics software developers have an international contest going to see who can add the most levels of coordinate system abstraction - it is not at all like communications, where you are supposed to stop after seven layers).

It is my understanding that VAX GKS (again effective with version x.0) allows you to write drivers for strange plotters, crochet machines, or your own favorite graphic output device.

Given the lack of mechanisms for reliably identifying terminals across vendor lines, I am under the impression that in most cases one must explicitly choose a GKS output library, perhaps with a logical name.

The ReGIS graphics library was DEC's way of helping those who write graphics programs to do output in the ReGIS format. These days DEC is in the mood to help them use the GKS call standard. The existing graphics library will still work, but it would seem the goal is to discourage new entrants in the graphics output business from using ReGIS. Given the fact that graphics is a field where participants seem to be very eager to embrace inter-vendor standards, it seems possible that DEC sales of additional ReGIS graphics library licenses had dropped to zero already.

>What will DEC do with their own products that now use ReGIS ?
>(Such as Datatrieve, DEC Slide, DEC Graph, etc.) Will these be
>re-written (and when) to use GKS ? Will that mean I can use
>them on non-DEC (ie. Tek) terminals ? (pretty please, pretty
>please)

Another goal is to support PostScript output. I think the real answer as to when your favorite program will be updated to use newer output technique is "when they get around to it". This varies depending upon the development group at DEC. You may think that converting Datatrieve to be able to output GKS is the most important advance to be made, while another person thinks Postscript should take precedence. Secret internal DEC development on the half-bit (a new VAX datatype) may take precedence for the time of Datatrieve developers, or it may not. Make your own preferences known through DECUS mechanisms (SIRs and similar mechanisms run by other SIGs, as well as comments to DEC folk at Symposia and LUG meetings). Write an article for the newsletter of your choice to lobby on the issue. (I say this for the benefit of others who may read the reply. Jack has not been hesitant to use these channels.)

>Finally, with all the excitement about X-Windows on WorkSystems
>Finally, with all the excitement about X-Windows on WorkSystems
>(that's what DEC calls them), I assume they will also be
>available on traditional VAXes and does this mean the end of
>SMG ?

I am under the impression that X-Windows can only work in a case where there is plenty of CPU power at the terminal to perform tasks specified by the host (whether that is at the terminal or elsewhere). SMG or an equivalently unpowerful interface will still be required to support the thousands of dumb terminals in the installed base. Anybody at DEC who thinks every customer's boss is going to buy her a VAXstation should walk around a DEC software development office to see what percentage of THOSE desks have a VAXstation. (And it is rumored those departments get them at a discount).

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

```
=====
Note 587.2          Goodbye ReGIS, Hello GKS, so ???          2 of 5
"C J "Buck" Trayser"          8 lines 10-FEB-1987 06:54
-< ReGIS will remain, RGL is heading out. >-
-----
```

A recent article in the Digital publication called DESKTOPics stated that DEC is committed to ReGIS, and was merely retiring RGL. GKS is being pushed as the new programming standard, as was mentioned in the previous note. ReGIS will remain a 'standard' on DEC terminals for some time, but that doesn't preclude new developments.

\$

C J Trayser
360 Interstate North Parkway
Suite 600 - MS: 6/B4
Atlanta, Georgia 30339

=====

Note 587.3	Goodbye ReGIS, Hello GKS, so ???	3 of 5
"Bob Hassinger"	65 lines	10-FEB-1987 11:33

-< 2 cents worth... >-

I have been very interested in this topic for a long time. Like everyone who uses computer graphics I too have the classic problems that come from a lack of standards in this area. Being a small operation I can not afford to just keep reprogramming for new devices and keep buying new packages all the time. To date I have not been able to get VAX GKS (we never even got RGL) but I have been following it as carefully as possible so I may be able to offer a little useful information.

The current version of VAX GKS is 2.0. For my system it would cost at least as much as many of the popular language compilers. You get a library of routines to call from your programs. You also are supposed to get the tools you need to write support for your own devices. I have found it very hard to get detailed, up to date information on exactly what GKS can do and what devices it currently supports at any particular point in time.

The new (V3.0) release of VAX BASIC includes extensive new support for graphics that works via the GKS package. You put statements like PLOT LINES 0,0; 2*PI,0 in your program and suitable calls to GKS are compiled for you (i.e. you do not have to write CALLs to subroutines and so on - very nice as far as it goes). The new BASIC manual for this package has allowed me to infer new information about GKS that I could not get elsewhere. Note that there is a very obscure package available to go with this called the VAX Run Time Option (Qx811) I think. The idea is that for a much lower price you get just enough of GKS to support the BASIC graphics features. I was told last Spring the intention was that it would not support the full functionality of GKS V2 and you would not be able to call it from your own programs or write device drivers. Just try to get details about this one however!!!

The BASIC manual tells us to set a logical, GKS\$WSTYPE, to a number that designates the device type you want to use. They list input and output metafiles, VT125 in three flavors, VT240 two ways (color and monochrome), LCP01 printer, LA34 with graphics option (and LA100 & LA210), LA50 with 2:1 aspect ration, LA12, VAXstation I, II and II/GPX, LVP16 for 8 1/2 by 11 and 11 by 17 paper (which seems to imply compatibility with

other devices that use the HP plotter protocol), and the Tektronix 4014 which implies compatibility with a great many 4010/4014 class devices. The book does not mention it but there has been a lot of talk about support of the Apple Laserwriter too which was taken to imply a level of Postscript support - can not tell the current status of this however.

I should think support for a new graphics device such as one that uses Postscript (a follow on to the LN03 - oh PLEASE...) would be an issue of priorities in the group that supports GKS. On the other hand, "support for" or "use of" GKS by layered products would seem to fall to the groups that support those products. For example, I think this question may have come up to the Datatrieve group and I think the answer was they were not very interested - DTR was seen as being too far down the product life cycle to make this big a change. They seem to think better graphics belongs outside in different (extra cost?) products. Similar considerations are going to apply for other products.

Re X-Windows - I thought most of these windowing products were critically dependent on direct access to a bit mapped display - i.e. a PC with graphics board, VAXstation, etc. That is not to say some new generation of more conventional "terminals" might not be able to support a good part of this kind of thing. My guess would be that a wide band connection would be needed however - for example a high speed or direct connection to Ethernet rather than a serial RS232 connection running at customary speeds. Most likely a good bit of power in the "terminal" too. Remember the original Unibus VAXstation 100 for example.

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

=====
Note 587.4 Goodbye ReGIS, Hello GKS, so ??? 4 of 5
"Bob Hassinger" 33 lines 10-FEB-1987 16:50
-< Another penny's worth... >-

I checked the Electronic Store again and finally, after many questions and complaints from my and others, they have updated their online SPD info for GKS to Version 2 (SPD 26.20.04). It tells us more about several issues.

Yes, a metafile format is supported - the "ISO Suggested Metafile" (GKSM) format. As I understand it, this is not as stable as GKS proper. There have been different formats used - the new GKS based version of the NCAR Graphics package has a basic (level 0a) GKS implementation for example but it uses a different (earlier?) format for metafile i/o that is incompatible, so beware. Also, this format, among other things, will "store accompanying nongraphical information". This fact and various articles suggest that the metafile format is not likely to be the basis of a viable device level interface. There does seem to be work on standards for lower level device level interface(s) but I do not see how that ties directly to a device being a "GKS" device. I do not think those standards have stabilized anyway.

In addition to the devices mentioned in .3, the SPD says VAX GKS also supports the LN03 Plus and the LN03 upgrade that makes it into the Plus. It also supports the LaserGraphics MPS-2000 film recorder (what protocol does IT use?). The SPD also confirms the Apple Laserwriter Postscript support.

They finally say something about the Run Time Option in this version of the SPD. It allows you to run applications but you can not develop them. That has to be done on a system with a full license. They do not mention the issue of developing new device drivers under the run time option kit. A year ago I got the impression the plans then for the run time option would not actually stop you from doing this although you were not going to get the documentation and support files that come with the full system. It would be very helpful if someone who knows about this could cast some light on the subject.

Bob Hassinger
Liberty Mutual Research Center
71 Frankland Road

Hopkinton, MA 01748
617-435-9061

=====
Note 587.5 Goodbye ReGIS, Hello GKS, so ??? 5 of 5
"Jack Patteeuw" 14 lines 11-FEB-1987 17:37
-< 2 bits more ... >-

My memory of the last DECUS Symposium is a bit hazy but I seem to recall that the LaserGraphic Film Recorder uses HP Graphics Language (HPGL).

I also recall hearing somewhere that the next version of GKS from DEC would also support PostScript (ie. Apple LaserWriter and Print Server 40's)

Version 4.0 of Datatrieve was just formally announced and although there was mention of a few enhancements in the graphics area I didn't see anything mentioned about GKS support. I certainly hope that DTR is not "too far down the life cycle" to add this feature, as we are just "discovering" it and what it can do as a low-end "database" product.

Jack Patteeuw
Ford Motor Co.
Electrical and Electronics Division
31630 Wyoming
Livonia, MI 48150
313-323-8643

=====
Note 588.0 Does BACKUP's incremental restore have a problem? No
"Bob Hassinger" 38 lines 12-FEB-1987 13:45

We were surprised to find BACKUP did not delete some files as the manual seems to say it will when doing an image plus incremental restore. The TSC duplicated the problem, said it was not the expected result and that it was not a known bug. Does any one know anything about this?

What we did was to make an image save set (i.e. /image/record) of a disk, then delete a directory tree with files in it and make an incremental save set (i.e. /since:backup). Then we restored the image save set followed by the incremental set all as shown in the System Manager's Reference Manual (V4.4) section 7.7.

The result was that the directory and files that had been deleted between the baseline and the incremental backups remained on the disk after the incremental restore. The expected result seems to be that the directory and files in it would be deleted during the incremental restore the same way that that individual files that have been deleted handled.

When we looked at the disk we found all directories that had been restored correctly had a backup date that matched the incremental save set date but the directory that should have been deleted still had a backup date that matched the baseline save set date. The problem seems to be that BACKUP is just failing to delete the directory and files in it even though the dates are as they should be.

Is this a known problem? Is it something simple that has gotten past me and TSC? Surely others have seen it too if it is real. We saw it with the versions of BACKUP from both VMS V.4 and V4.5.

The real case when this came up was a full system disk that was being restored after a crash. Between the baseline and the incremental backups large directory trees had been deleted to make space for new files. The result was failure of the incremental restore because of not having enough space on the disk plus many unwanted files being left on the disk. Not much fun when it happens while you are trying to get the system back into operation as quickly as possible after replacing an 800Mb HDA that is used to emulate two RM05s (e.g. CDC 9771/Emulex SC7000 = 1,000,000 blocks) for the system and user disks.

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

=====
Note 589.0 VAXstar/uVAX2000 Announcement 2 replies
"Larry Kilgallen" 40 lines 12-FEB-1987 14:38

I went to the Boston version of "New Product Announcement Day" this morning, and I was interested in comparing notes with those who attended the same thing in other cities. (On the whole, I found everything much less informative than the impromptu presentation given to the Boston VAX LUG Tuesday by Pete Kaiser, our DEC counterpart. Then again, that is to be expected.)

The professional marketeers had one slide showing device support for an LN03R printer (I actually forget what was providing the support, that was not the interesting part).

When I asked in the demo area (they have learned since last year not to schedule mass question and answer sessions), I was told by one DEC representative that the LN03R was indeed the desired Postscript-compatible small printer, but that it was just being "program announced" today. Another DEC representative (always check your sources) said that it was NOT being "program announced" today, even though it was on the slide.

On another slide, designed to make claims about Ethernet, an orange cable circled the picture making connections to various DEC systems, including an "Ultrix cluster". When I asked about that one, I was told it was a bad slide, that they merely intended to indicate a collection of Ultrix machines connected to the Ethernet, that they were in no sense a cluster like a VAX cluster is for VMS.

What happened in other cities? Did they have the same slides? What answers were provided when you asked about those items?

On a sad note, a Boston DEC marketeer ended with an analogy about buying a sports car. After asking everyone to imagine buying the car of their dreams, he then asked if the car in question was build by the leading automaker in the US.

The only problem is, a DEC marketeer used the same line before essentially the same audience barely 12 months ago when they announced the BI-based machines. How quickly do they think we forget?

Larry Kilgallen


```
=====
Note 590.1          VAX 11/750 Word Processor      1 of 1
"M. Erik Husby"    21 lines  17-FEB-1987 14:10
                   -< Word Processor experiences >-
-----
```

I looked at four word processing packages almost 2 years ago for our 750's. Mass-11, Lex-11, DECType, and WPS+.

WPS+ was a memory hog quickly faulting up to 2000 pages simply during startup.

DECType seemed to have the best performance from a system manager's viewpoint, (i.e. io and memory usage).

The other two were not bad but did not give us enough new features to get our users to change from DECType.

So we have stayed with DECType and have not looked at the market since then.

DECType does have problems such as not working in true VT220 mode and requiring physical device names for the VMS print queues. I like to use names for my printers such as LOWER_2ND or LASER_RM66 where the name indicates the type and location of the printer. As you may guess we have different types of printers scattered around the buildings.

M. Erik Husby
Project Software & Development
14 Story St.
Cambridge, MA. 02138
(617)-661-1666

```
=====
Note 591.0          TeX Change Bar Macro needed    1 reply
"regan"            13 lines  17-FEB#1987 14:37
-----
```

HELP HELP HELP

I am looking for a change bar macro for TeX. This macro would allow me to mark passages in a document that had undergone changes since the last version.

If anybody has seen one or has heard of one please contact me.

PS: I am desperate.

regan
General Electric
FRP1-C6
Syracuse, NY 13210
3154564913

```
=====
Note 591.1          TeX Change Bar Macro needed    1 of 1
"Jamie Hanrahan"  8 lines  18-FEB#1987 19:49
                   -< have you looked at TuGBOAT? >-
-----
```

There was a query for something like this in a recent issue of the TeX User's Group newsletter ("TuGBOAT"). I believe that the suggested implementation was a command that would directly insert something in the .dvi file for "begin bar" and "end bar", then the output driver could easily add the bars. Alas, you might end up with change bars extending through figures and tables and other floating bodies.

Jamie Hanrahan
Simpact Associates
9210 Sky Park Court
San Diego, CA 92123
619-565-1865

=====
Note 592.0 ALL-IN-1/INGRES INTEGRATION 3 replies
"Lora Wetherill" 16 lines 18-FEB-1987 11:11
#-----#

PLEASE FORGIVE ME IF I MESS THIS UP... IT'S MY "FIRST TIME"....

WE ARE HAVING A PROBLEM RUNNING INGRES DATABASE SOFTWARE UNDER ALL-IN-1. INGRES REQUIRES THAT A VMS LOGICAL CALLED TERM INGRES BE DEFINED TO IDENTIFY TERMINAL TYPE. WE DEFINE IT WITH A /JOB QUALIFIER. WHEN ALL-IN-1 CREATES THE INGRES SUBPROCESS, INGRES KNOWS WHAT THE LOGICAL IS SET TO, SINCE THE ERROR MESSAGE GIVES THE VALUE, BUT STILL CANNOT RUN. OUR FIX HAS BEEN TO EXPLICITLY SPAWN THE INGRES PROCESS FROM ALL-IN-1. THIS WORKS, UNLESS WE DO A "SHOW LOGICAL" IMMEDIATELY BEFORE THE SPAWN COMMAND. (THEN IT BLOWS UP AS IF WE WERE SIMPLY USING THE ALL-IN-1 CREATE.) WE ARE NOT CRAZY ABOUT THE PERFORMANCE DEGRADATION USING THE SPAWN. HAS ANYONE ELSE HAD TROUBLE PASSING LOGICALS THROUGH ALL-IN-1 TO THIRD PARTY SOFTWARE. ANYONE HAVE ANY SUGGESTED FIXES OR WORKAROUNDS?

Lora Wetherill
P.O. Box 179
Mail Stop I0096
Denver, Colorado 80201

=====
Note 592.1 ALL-IN-1/INGRES INTEGRATION 1 of 3
"Mark Hyde" 7 lines 18-FEB-1987 11:52
#-----#

When running in the ALL-IN-1 subprocess, SYSS\$INPUT is pointing to a mailbox instead of an actual terminal. If your application expects to be talking to a terminal this can cause problems. Try the following in the command procedure:

```
$DEFINE SYSS$INPUT 'F$LOGICAL("SYSS$OUTPUT")'  
$ RUN INGRES (or whatever)
```

Mark Hyde
Digital Equipment Corp
360 Interstate North Pkwy
Suite 600 IP01-6/C2
Atlanta, Ga 30339

=====
Note 592.3 ALL-IN-1/INGRES INTEGRATION 3 of 3
"Lora Wetherill" 7 lines 20-FEB-1987 16:57

-< Let's try REPLY again >-

We tried that already, but with no luck. Is there possibly anyone out there who is familiar with INGRES and might be able to tell me exactly what INGRES is looking for in that TERM_INGRES variable, or why it recognizes it enough to print it in the error message but not enough to execute?~r

Lora Wetherill
P.O. Box 179
Mail Stop I0096
Denver, Colorado 80201

=====
Note 593.0 Memory disk driver going away??? 2 replies
"John Osudar" 7 lines 19-FEB-1987 16:52
#-----#

You may have seen a recent rumor that VMS V5.0 will no longer include a distribution of the memory disk driver that has "unofficially" been available with VMS V4.x. (The driver has been written up in the PAGESWAPPER before.) We've been using a memory disk to improve performance on our systems, and it has helped considerably. If DEC is really considering not including PDDRIVER.EXE in the V5 kit, I think we ought to scream loudly to change their minds.

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

=====
Note 593.1 Memory disk driver going away??? 1 of 2
"Jack Patteeuw" 14 lines 23-FEB-1987 17:12
 "< But what replaces them ? >"

I have heard that same rumor also but I can't remember where or when, but there was more to the story.

Pseudo Disks (which are created/accessed via the PDDRIVER not the PUDRIVER like I said at the San Francisco VAX Magic Session) were nearly a kludge way of building STABACKUP for uVAXes. They did have some other nice uses (very fast access) which (as the rumor I heard goes) would be replaced by disk-caching from memory in version 5.0!!! This would have the same benefit as pseudo disk but require absolutely no application re-writing !!

I not sure about your applications but I'd rather have disk-caching. Lets just hope this is not another one of those "added features will cost added \$\$\$\$" !!

Jack Patteeuw
Ford Motor Co.
Electrical and Electronics Division
31630 Wyoming
Livonia, MI 48150
313-323-8643

=====
Note 593.2 Memory disk driver going away??? 2 of 2
"John Osudar" 3 lines 23-FEB-1987 20:08
 "< vote for FREE disk caching >"

Disk caching would sure be nice... but, as you say, if we have to shell out real bucks for disk caching it might present a problem. Do we dare hope that DEC does the "right thing"???

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

=====
Note 595.0 Calling a WOMBAT Wizards No replies
"Jack Patteeuw" 10 lines 23-FEB-1987 17:22

I know that the PAGESWAPPER is a VAX forum but Datatrieve runs on a VAX so I'll ask anyway !

Being a neophyte wombat, I need to find a procedure to left justify existing data in a field (ie. the field is PIC X(6) and the data is some where between 1 and 6 characters long but located anywhere in the field).

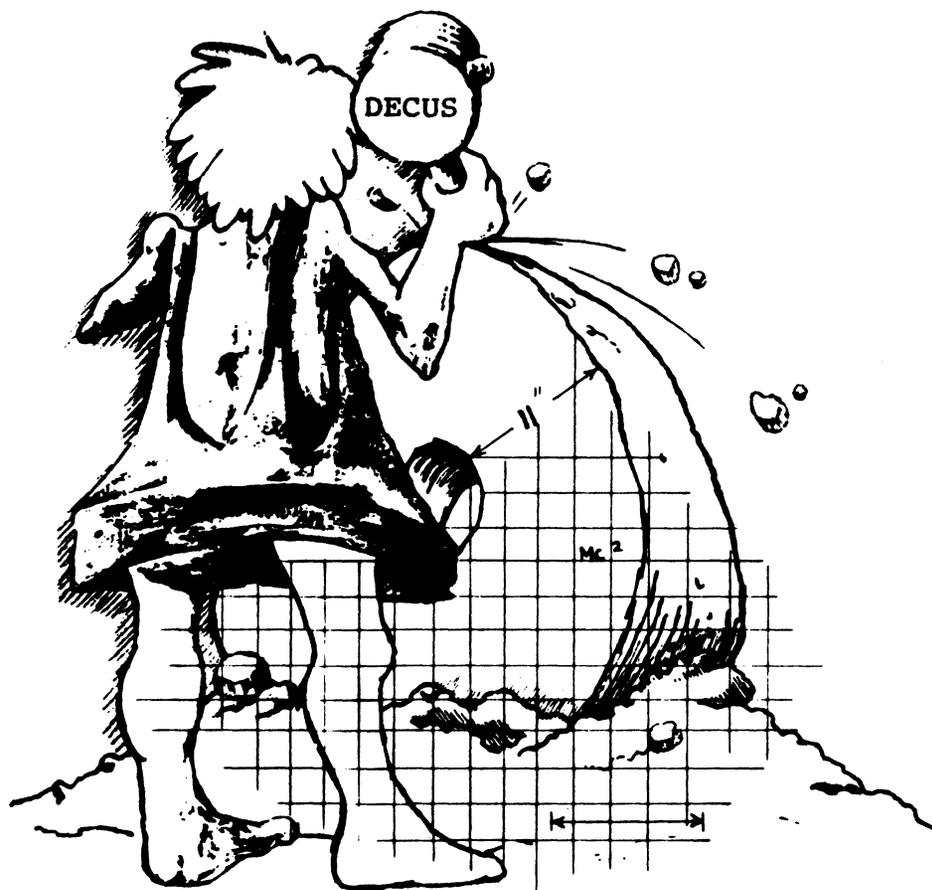
I know I will probably have to create a new data file but that is not a problem. I just looking for the simplest method.

Jack Patteeuw
Ford Motor Co.
Electrical and Electronics Division
31630 Wyoming
Livonia, MI 48150
313-323-8643

*
*



LIBRARY



DECUS PROGRAM LIBRARY

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

DECUS NO:V-SP-60 **Title:** Symposium Collection from the RSX-11 SIG, Fall 1986, San Francisco, in VMS/BACKUP **Version:** V1, December 1986

Submitted by: Glenn C. Everhart, Ph.D. **Operating System:** VAX/VMS, RSX-11M-PLUS, RSX-11M, RSX-11D, IAS **Source Language:** BASIC-11, PASCAL, MACRO-32, MACRO-11, VAX FORTRAN, FORTRAN77, FORTRAN IV-PLUS, C **Keywords:** KERMIT, ReGIS, Spreadsheet, Symposia Tapes - VMS

Abstract: This tape contains programs submitted at the Fall 1986 DECUS US Symposium for the RSX collection. Its contents pertain to all RSX environments (including the VAX) and some also run native mode on other machines (e.g. VAX, 8088). Most contain complete sources. The tape is available in both BRU and VMS/BACKUP formats since it is of use to both RSX and VMS sites. To obtain the BRU version, order Program No. 11-SP-95.

Following is a list of the contributions to this RSX SIG Tape.

AUTHOR	CONTENTS
R. J. Wilden	APFELM Maldelbrot set generator for PRO 3XX.
E. D. Willink G. Everhart	ReGIS to HP-GL converter. AnalytiCale for 8088 MS/DOS. Also 8088 version of RIM DBMS with src, doc and current ARC utility dist'n to separate it all.
Various	MS/DOS utilities (in C mainly) from DECUS Europe RSX group. MASTER INDEX DIRECTORY... Read it first! TPC and VMSTPC tools for copying tape.
F. Borger	RSX BASIC (11M/M+). Dammit utility... snappy remarks on demand.
W. Falls	SCRIPT- command language menu program.
D. Lampman	King James Bible - all uppercase.
G. Everhart	AnalytiCale update, VMS VD: driver, a few other items.
B. Uleski	Tape Copy tree for other media. Patch for Q-bus DH11 drvtr to use I/D space.
J. Bostwick	Virt disks, clunk time conv, manip EFNs, define VT220 keys.

F. Borger BASIC for IAS.
"Reese's Pieces" utility collection:
Docs
Errors
Help files
MRHLOGIN (and
CLI) tasks
MRHLOGIN1
PIECE1
PIECE2
See the ALLREADME.86 B file for the contents of this large and varied area.

B. Mitchell Flying install, pool monitor, Multi-taskers since last symposium, EMPIRE w/src

F. Borger VTL, AUX, DIR reissues. VTL is a nifty fullscreen lister. AUX is a command processor that allows keypad commands. DIR is a directory lister.

T. Wyant Intro to programming in Indirect (@).

J. Kodis RENUM - rennumbers FORTRAN statements.

J. Ethington Memory virtual disk drivers for PRO series.

B. Lederman DATATRIEVE SIG submissions. Newsletters, RSX accounting in DTR, plots info and some session transcripts.

B. Nelson KERMIT-11 V3.54 (probably the most powerful KERMIT of any of them). Docs for 356,* . VMSTPC-TPC in native mode for VMS. TED fullscreen editor. Slides for DECUS talks. Command Line Editor.

J. Shultz Useful Utilities in Indirect Cmd Proc.

C. Staase Set external clock from DECUS C via I/O page.

Notes: Most submissions include source; a few do not. Source code is present where it was supplied.

Complete sources not included.

Media (Service CHARGE Code): 2400' Magnetic Tape (PS) **Format:** VMS/BACKUP

DECUS NO: VAX-188 **Title:** KEYS: A DCL Keys Definition Program **Version:** June 1986

Submitted by: Ken Judy, General Electric Company, Charlottesville, VA **Operating System:** VAX/VMS V4.3 **Source Language:** DCL **Hardware Required:** Terminal with advanced video option. **Keywords:** DCL

Abstract: KEYS.COM is a DCL program written to handle multiple definitions of keypads with the control keys PF1 thru PF4 used to manipulate the keys. PF1 is a second function key like "gold" in EDT. Each state of the keys has a second function invoked by depressing PF1 followed by the desired key - like EDT. (One exception: the numeric state has no second function.) PF2 is VMS help or "gold PF2" is help on this facility. At anytime, depressing PF3 will display the current key definitions. PF4 toggles you to the next state or "gold PF4" sets you back to NUMERIC state (which is the initial state). The keypads may define as deep as you like, but this template currently only goes to state3 as follows:

NUMERIC state, state1, state2, state3, ... -} NUMERIC state

Execute this comfile from your login.com and you are ready to go. **NOTE:** This comfile is called by the PF3 key for displaying current key definitions and "gold PF2" for KEYS help.

This program is relatively simple to customize to your own tastes. State1 has been set up with definitions that include most file manipulation commands which may be changed by you and templates are there for you to easily define keys in state2 and state3. To add more states will require some program changes, but comments point to places where changes will need to be made.

Notes: VAX/VMS V4.0 and later is required.

Media (Service Charge Code): One RX50 Diskette (JA) **Format:** FILES-11, 600' Magnetic Tape (MA) **Format:** VAX/ANSI

DECUS NO: VAX-213 **Title:** CORPHONE **Version:** June 1986

Submitted by: Bart Lederman, Sheepshead Bay, NY **Operating System:** VAX/VMS V4.2/4.3 **Source Language:** DATATRIEVE/FMS **Keywords:** ALL-IN-1, DATATRIEVE

Abstract: One of the functions supplied with ALL-IN-1 V2 is a corporate telephone directory. I have developed this replacement for the corporate telephone directory which can read the same data file. This allows any information which has already been input to the telephone directory to be saved. The application uses VAX-DATATRIEVE and FMS to present the information in menu-driven form, which allows better manipulation of the information. The application is also more easily adapted to individual requirements. In this example, a field for a third telephone

number has been added, the state is recorded as a separate field, and the information may be entered in lower case so that it will have a better appearance when used for other purposes such as mailing labels.

Because the application now runs in DATATRIEVE, it may be used without ALL-IN-1, as well as being accessed from within ALL-IN-1.

Also included are DATATRIEVE definitions for the ALL-IN-1 user profile data file, the document database and logging files, with a procedure to normalize the logging data so that counts may be made of the most often used forms and scripts (to determine which should be placed in MEMRES or the TXL, etc.). This procedure uses the TRIM utility supplied with ALL-IN-1. If you have not yet done so, I urge you to look at this utility. It makes parsing directory or library listings into files suitable for command procedures several orders of magnitude easier than using DCL (and quite a bit faster).

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

DECUS NO: VAX-225 **Title:** RECALL BUFFER Save/Restore **Version:** November 1986

Submitted by: Michael Mouat, TRIUMF **Operating System:** MicroVMS V4.2, VAX/VMS V4.4 **Source Language:** MACRO-32

Abstract: These programs have been developed to save the user's CLI command buffer and to restore the user's CLI command recall buffer. The practical application of these programs is in a situation where the user is doing some repetitive set of commands, then logs out of the system and later logs in to resume the work. By saving the recall buffer as you log out and then restoring it as you log in, the last twenty CLI commands are once again available to you without your having to re-execute them.

To be able to use these programs, the user must do certain set-up procedures and the system manager must install one image with privilege.

Restrictions: One image must be installed with privilege.

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

DECUS NO: VAX-226 **Title:** BLOCKER: A Block Diagram Editor **Version:** September 1986

Author: Roger Anderson, Lawrence Livermore National Lab., Livermore, CA

Operating System: VAX/VMS V4.3 **Source Language:** PRAXIS Software **Required:** No other software is needed for use. Will need PRAXIS compiler to modify. **Hardware Required:** VT100 terminal **Keywords:** Editors

Abstract: The BLOCKER block diagram utility was written in the interest of promoting better software documentation. It allows the user to easily create block diagrams which can be stored within software source text files and printed out with standard line printing devices. In this way, sketches which are often drawn on paper during software coding can be kept in an organized manner for later reference.

The block diagram editor provides a "worksheet" of 132 columns by 500 lines, which can be loaded with an existing 80- or 132-column text file, drawn on with the block diagram editor functions, then saved to a text file for later inclusion in source code. It enables the user to move lines, text, and boxes and their contents around in the worksheet, singly or in groups. Existing connecting lines to other screen elements are maintained by shrinking or stretching those lines as required.

The block diagram editor enables the user to "cut" any given rectangle from the diagram and "paste" it back in any other position. It has some of the standard DEC VAX/VMS}EDT keypad functions, such as deleting and undeleting lines, words and characters, and backing up and advancing by words, characters and pages.

BLOCKER is written in the PRAXIS programming language. It runs on VT100 compatible terminals under version 4.3 of the VMS operating system on VAX computers.

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

DECUS NO: VAX-227 **Title:** E-Systems Grab Bag - Fall 1986 **Version:** V1.0, October 1986

Submitted by: E. W. Sewell, E-Systems, Garland Div., Dallas, TX **Operating System:** VAX/VMS V4.4 **Source Language:** SCAN, PASCAL, VAX FORTRAN, DCL, ADA **Hardware Required:** VAX **Keywords:** PASCAL, Utilities - VMS

Abstract: This submission contains various utilities and sample programs contributed by several E-Systems employees. REFORMPAS is a PASCAL pretty-printer, written as a SCAN learning exercise. REFORMADA is a similar program for ADA, written in ADA. RADIX is a program to interactively perform conversions between decimal, hex, octal, binary and character values, displaying the values with longwords, words and by alignment simultaneously. FORCELOW forces a text file to lowercase. PRINTABLE forces a text file have printable characters (0-127). The files in the .SEWELL.TALK directory contain the TeX sources for the LT022 talk at San Francisco, plus the sample programs written to support the talk, (the SCANPCB program and EXAM-SUBS, a change-mode-to-Kernel dispatcher).

The files in the .SEWELL.TEXSTUFF directory contain various command procedures and TeX files to allow unsophisticated users to run LaTeX. LEAVE is yet another reminder utility. GANGDCL is a means to perform the same DCL command on a list of files. FORBIN is a command procedure to horizontally scroll a saying across the top of a VT100 screen.

Restrictions: Pretty printers require VMS V4 so that ADA and SCAN RTIs are present.

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

DECUS NO: VAX-228 **Title:** SCAN: A Directory Scan Utility for VMS **Version:** V1.1, November 1986

Submitted by: David Spencer, Americare Health Corp., Sacramento, CA **Operating System:** MicroVMS V4.2, VAX/VMS V4.2 **Source Language:** VAXTPU **Hardware Required:** Video Terminal **Keywords:** Editors, File Management, Utilities - VMS

Abstract: SCAN is a directory management tool written entirely in the new VAXTPU language distributed with VMS and MicroVMS beginning with version 4.2 of the operating system.

SCAN allows the user to display a file directory on the screen in an editing window. The user may use the arrow and other cursor movement keys to move the cursor to a specific file of interest. Other editing keys are available to take that file and type it to the screen, edit it, copy it, rename it, print it, delete it, run it, get a full directory listing, submit it to the batch queue, execute it as a DCL command procedure, enter that file as a subdirectory and so forth. More editing keys are available to select a new directory (and/or wildcard filename specification) to view, spawn a DCL subprocess, search for a string in the directory buffer, return to the last directory specified, enter and execute a TPU command and so on.

SCAN is so useful for managing and cleaning up directories, that some users start it at the beginning of the day and never leave. Full help is provided with SCAN and is integrated with the standard VMS help utility so help is available on SCAN outside of SCAN.

Please do not confuse SCAN with the Digital Equipment Corporation language by the same name. Systems with Digital Equipment Corporation's SCAN will encounter no difficulty with both packages co-existing on their system. (My SCAN is called DIRECTORY_SCAN on the disk and can easily be renamed if required.) Installation instructions are included with distribution.

Notes: Operating system VMS V4.2 or later required.

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

DECUS NO: VAX-229 **Title:** REGTRDG: ReGIS Translator for DECgraph **Version:** V1.0, October 1986

Submitted by: Massimo Boano, I 10125, Torino, Italy **Operating System:** VAX/VMS V4.4 **Source Language:** VAX FORTRAN, C **Memory Required:** 120KB **Software Required:** HP-ISPP and/or DEC/GKS **Hardware Required:** LVP-16 or equivalent **Keywords:** ReGIS

Abstract: This program translates the ReGIS output of VAX-11/DECgraph into either standard GKS primitives or HP-ISPP commands thus permitting DECgraph to communicate either with GKS workstations or with the Digital Equipment Corporation plotter LVP-16 (equivalent to HP-7475 A or HP-7550 A). Since the HP-7550 A can be configured as a GKS workstation, the output flow can pass through GKS to this plotter, yielding greater precision but at the expense of longer execution times. Use of this program requires the presence of the HP-ISPP library or the DEC/GKS system.

This program has been realized at 'CENTRO RICERCHE FIAT (CED)', Orbassano (Torino), Italy.

ReGIS code is processed by a bottom-up parser, implemented using the LEX and YACC tools in the standard manner using the C language. (For information about LEX and YACC, see the user's manual. A virtual screen, conceived as a bidimensional array, is implemented to simulate the generation of the graphic result at a logical level.

The program is distributed as a principal directory and the subdirectories: GKS.DIR, HP.DIR and EXAMPLES.DIR.

Restrictions: Tested for DECgraph, not for DECslide (Treats only ReGIS primitives used by DECgraph) Only executable versions of LEX and YACC are included.

Complete sources not included.

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

DECUS NO: VAX-230 **Title:** PLTXSMB: Symbiont for Spooled Output to a Device **Version:** V1.0, July 1986

Submitted by: Reiner Fuhrmann, Institut fur Schiffbau, Lammersiekh 90, D-2000, Hamburg 60, Germany **Operating System:** VAX/VMS V4.X **Source Language:** VAX FORTRAN **Memory Required:** 5490 bytes **Keywords:** Interface Routines

Abstract: PLTXSMB is a sample of a single-threaded, asynchronous symbiont for spooled output to a device. It must be linked with subroutines performing device dependent functions. As an example, the program PSFTST may be used. It simulates an output to a terminal-queue. For understanding the mechanism of this symbiont, read chapter 9 of "VAX/VMS Utility Routines Reference Manual" - Symbiont/Job-controller Interface (SMB)

Routines - of Binder 5B of the documentation for the VAX/VMS - Version 4. The program is written in VAX FORTRAN.

Notes: Operating system VMS V4.1 or later is required.
Assoc. Documentation: VAX/VMS Utilities Reference Manual

Documentation not available.

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

DECUS NO: VAX-231 **Title:** ICON: VMS **Version:** V6.0, October 1986

Author: Ralph Griswold, ICON Project, Univ. of Arizona

Submitted by: Ken Harris, Unico Inc., Franksville, WI **Operating System:** VAX/VMS V4.3 **Source Language:** C **Software Required:** ICON Programming Language, Prentice-Hall, ISBN 0-13-449777-5. **Keywords:** Programming Languages

Abstract: This is the University of Arizona's distribution of ICON V6.0 for VAX/VMS. ICON is a high level programming language especially suited for non-numeric tasks. The distribution contains:

- . Executables for VMS V4.X
- . Source Code
- . ICON Program Library

Notes: To obtain the MS/DOS version, order DECUS No. RB-124.

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

DECUS NO: VAX-232 **Title:** CODER **Version:** V1.0, July 1986

Submitted by: Ed Mills, Harris Semiconductor, Melbourne, FL **Operating System:** VAX/VMS V4.2 **Source Language:** PASCAL **Memory Required:** 9 blocks required for source **Software Required:** PASCAL compiler and linker **Keywords:** File Management, Security

Abstract: CODER is a VAX PASCAL program which encrypts and decrypts text files. The program transforms the text file into a non-readable format based on a key entered by the user. It is interactive and offers error recovery.

Release Notes are distributed with each order.

Restrictions: Special care must be taken to avoid encryption of files which are not TEXT files or with line-lengths longer than 132 characters. Also, the user must ensure that he/she knows the key in order to decrypt the file. The user should read all Release Notes prior to using the software.

Documentation not available.

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

NEW LIBRARY PROGRAMS AVAILABLE FOR THE PDP-11 COMPUTER FAMILY

DECUS NO: 11-SP-95 **Title:** Symposium Collection from the RSX-11 SIG, Fall 1986, San Francisco **Version:** V1, December 1986

Submitted by: Glenn C. Everhart, Ph.D. **Operating System:** IAS, RSX-11D, RSX-11M, RSX-11M-PLUS, VAX/VMS **Source Language:** BASIC-11, C, FORTRAN IV-PLUS, FORTRAN 77, VAX FORTRAN, MACRO-11, MACRO-32, PASCAL **Keywords:** KERMIT, ReGIS, Spreadsheet, Symposia Tapes - RSX-11

Abstract: This tape contains programs submitted at the Fall 1986 DECUS US Symposium for the RSX collection. Its contents pertain to all RSX environments (including the VAX) and some also run native mode on other machines (e.g. VAX 8088). Most contain complete sources. The tape is available in both BRU and VMS/BACKUP formats since it is of use to both RSX and VMS sites. To order the VMS/BACKUP version, order DECUS No. V-SP-60.

Following is a list of the contributions to this RSX SIG Tape.

AUTHOR	CONTENTS
R. J. Wilden	APFELM Maldelbrot set generator for PRO 3XX.
E. D. Willink	ReGIS to HP-GL converter.
G. Everhart	AnalytiCalc for 8088 MS/DOS. Also 8088 version of RIM DBMS with src, doc and current ARC utility dist'n to separate it all.
Various	MS/DOS utilities (in C mainly) from DECUS Europe RSX group. MASTER INDEX DIRECTORY ... Read it first! TPC and VMSTPC tools for copying tape.
F. Borger	RSX BASIC (11M/M+). Dammit utility ... snappy remarks on demand.
W. Falls	SCRIPT: command language menu program.
D. Lampman	King James Bible - all uppercase.
G. Everhart	AnalytiCalc update, VMSVD: driver, a few other items.
B. Uleski	Tape Copy tree for other media. Patch for Q-bus DH11 drv'r to use I/D space.

J. Bostwick
F. Borger

Virt disks, clunk time conv, manip EFNs, define VT220 keys.
BASIC FOR IAS "Reese's Pieces" utility collection: Docs
Errors
Help files
MRHLOGIN (and CLI) tasks
MRHLOGIN
PIECE1
PIECE2
See the ALLREADME.86 B file for the contents of this large and varied area.

B. Mitchell
F. Borger
T. Wyatt
J. Kodis
J. Ethington
B. Lederman
B. Nelson
J. Shultz
C. Staase

Flying install, pool monitor, Multi-taskers since last symposium. EMPIRE w/src
VTL, AUX, DIR reissues. VTL is a nifty fullscreen lister. AUX is a command processor that allows keypad commands. DIR is a directory lister.
Intro to programming in Indirect (@).
RENUM - rennumbers FORTRAN statements.
Memory virtual disk drivers for PRO series.
DATATRIEVE SIG submissions. Newsletters, RSX accounting in DTR, plots info and some session transcripts.
KERMIT-11 V3.54 (probably the most powerful KERMIT of any of them). Docs for 356, * . VMSTPC-TPC in native mode for VMS. TED fullscreen editor. Slides for DECUS talks. Command Line Editor.
Useful Utilities in Indirect Cmd Proc
Set external clock from DECUS C via I/O page.

Notes: Most submissions include source; a few do not. Source code is present where it was supplied.

Complete sources not included.

Media (Service Charge Code): 2400' Magnetic Tape (PS) **Format:** BRU

DECUS NO: 11-861 **Title:** UNDELETE: A Program to Recover Deleted RSX-11 Disk Files **Version:** June 1986

Submitted by: Lawrence M. Baker, U. S. Geological Survey, Menlo Park, CA **Operating System:** RSX-11M V3.1, RSX-11M-PLUS V2.1 **Source Language:** FORTRAN 77 **Memory Required:** 35008 Bytes **Keywords:** File Management, Utilities - Disk - RSX-11

Abstract: UNDELETE is a non-privileged utility program for the in-place restoration of accidentally deleted disk files for the Digital Equipment Corporation PDP-11 RSX-family operating systems. Files are restored based on a user-specified search pattern which provides a flexible means of wildcard matching by character or by field within a file specification. A dry run option is available to identify candidates for restoration without actually modifying the disk file structure.

Release Notes are distributed with each order.

Notes: UNDELETE will probably work with little or no modifications on a P/OS system or under VAX/RSX on a VMS system as well, but that has not been tested to identify restrictions in those environments.

Restrictions: EIS is required.

Media (Service Charge Code): User's Manual (EA), Two RX01 Diskettes (KB) **Format:** FILES-11, 600' Magnetic Tape (MA) **Format:** FILES-11

DECUS NO: 11-864 **Title:** CLNDRS: A Calendar Program **Version:** V1.0, December 1986

Submitted by: V. Johnson & R. Elliott, City of Dania, Dania, FL **Operating System:** RSTS/E, RSX, Micro/RSTS **Source Language:** BASIC-PLUS-2, BASIC-PLUS **Memory Required:** 7 KW (BASIC-PLUS), 14 TO 21 KW (BASIC-PLUS-2) **Software Required:** BASIC-PLUS or BASIC-PLUS-2 **Keywords:** Calendars

Abstract: CLNDRS is a program to produce monthly calendars for any month of any year from 1752 to 2099. This is a re-write of 'BIGCAL' (DECUS No. 11-623) originally written in FORTRAN by Stev Kass. CLNDRS will produce calendars 40 to 132 columns wide and 40 to 60 rows long. A function for a title or name has been added and the default can be changed in the program with any editor. This version has been written with VT100 screen controls, but can be modified to run on any Digital Equipment Corporation terminal. Calendars may be output to the screen or to a file for later submission to a printer. If output to a file, the headings will contain escape codes to print double wide but can be changed or edited out for printing on printers other than Digital Equipment Corporation's 'LA' dot matrix types.

Included are the .BAS and .B2S source files as well as .BAC and .TSK executables. The source files are well documented and should be easy to follow and modify if necessary.

Restrictions: Runs on RSTS/E V7.0 thru V9.2.

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

NEW LIBRARY PROGRAMS AVAILABLE FOR THE RAINBOW SERIES OF COMPUTERS

DECUS NO: RB-123 **Title:** DECUS Point-of-Sale System **Version:** V42., December 1986

Submitted by: Digital Equipment Corporation **Operating System:** MS/DOS V2.11 **Source Language:** dBASE III V1.1 **Memory Required:** At least 320 KB **Software Required:** dBASE III, V1.1 **Hardware Required:** 5/10/20 Mb Winchester Hard Disk, LA50 Printer **Keywords:** Business Applications, Utilities - MS/DOS

Abstract: The DECUS Point-of-Sale System has undergone numerous changes since it was first developed. The documentation for the program provides fairly concise information as to its use, however, several new functions that appear in various menus of the program have not yet been included in the documentation but should be intuitive as to their functionality.

The POS System is a very customized program and was designed to meet a specific purpose. It is highly unlikely that the program can be used in its present state for general purpose point-of-sale and inventory applications without considerable modifications. The intent of releasing this application into public domain is to provide a number of various dBASE III routines and procedures to assist you in developing your own applications. Please feel free to use any portion of these programs for your own development.

Notes: Documentation is on disk. Operating system MS/DOS V2.11 is required.

Media (Service Charge Code): RX50 Diskette (Special) (JS) **Format:** MS/DOS

DECUS NO: RB-124 **Title:** ICON: MS/DOS **Version:** V 5.9, October 1986

Author: Ralph Griswold, ICON Project, University of Arizona

Submitted by: Ken Harris, Unico Inc., Franksville, WI **Operating System:** MS/DOS V2.11 **Source Language:** C **Software Required:** ICON Programming Language, Prentice-Hall, ISBN 0-13-449777-5. **Keywords:** Programming Languages

Abstract: This is the University of Arizona's distribution of ICON V6.0 (Large Model) for MS/DOS. ICON is a high level programming language especially suited for non-numeric tasks. The distribution contains executables and sample programs for MS/DOS V2.X.

Notes: To obtain the VMS/BACKUP version, order DECUS No. VAX-231.

Media (Service Charge Code): One RX50 Diskette (JA) **Format:** MS/DOS

**NEW LIBRARY PROGRAMS AVAILABLE
FOR THE
DECSYSTEM-20 FAMILY OF COMPUTERS**

DECUS NO: 20-189 **Title:** LaserWriter Utilities **Version:** December 1986

Submitted by: Michael P. Kaczmareczik, University of Texas at Austin, Austin, TX **Operating System:** TOPS-20 release 5.4 **Source Language:** C, PASCAL **Hardware Required:** Apple LaserWriter **Keywords:** Utilities - TOPS-20

Abstract: This software consists of programs to manipulate the Apple LaserWriter printer. Most of the programs were gathered from the ARPAnet bulletin boards, INFO-POSTSCRIPT and LASER-LOVERS, and were modified for use at the University of Texas by Michael P. Kaczmareczik.

Media (Service Charge Code): 600' Magnetic Tape (MA)

REVISIONS TO LIBRARY PROGRAMS

DECUS NO: VAX-99 **Title:** INDEX:FORTRAN Cross-Referencer and Flow Chart Generator **Version:** V3.22, January 1987

Submitted by: Michael N. LeVine, Naval Weapons Center, China Lake, CA **Operating System:** VAX/VMS V4.X **Source Language:** MACRO-32 **Software Required:** RUNOFF **Keywords:** Cross-Referencers, Tools - Applications Development, Utilities - VMS

Abstract: INDEX is a FORTRAN source cross-referencing and flow charting utility that allows the user to look at individual source files (optionally saving the data for an overall SUPER INDEX) and determine what variables are used on what lines and how they are used. Furthermore, the user can select for display/save for SUPER INDEX only those variables or COMMON blocks with the characteristics that he is interested in; global/local, assigned value/not assigned value, used/unused, imported/exported, etc. in any combination. Also available is the optional ability to show up to four additional items of information for display during the regular and SUPER INDEX:

The variable storage location information (local, in COMMON, passed by argument, etc).

The variable type (REAL F_ Floating, structured etc)

Usage in FUNCTION/SUBROUTINE calls (routine used in and argument number).

A user selected tag of up to 31 characters.

The data saved for a SUPER INDEX listing (consisting of 6 data items as outlined above) can be displayed with a great deal of flexibility as to the data item selection, order and format (or saved in an ISAM data file for the

user to work on directly). A special option of the SUPER INDEX allows the output of a list of module entry points which pass data in and out by argument, the name of each argument and its type, the name of any module which calls that entry point along with the name of each variable passed in the corresponding argument position and its type. The resulting information supplied allows the user to follow the flow of data throughout a program or find the usage of any selected data variable as required.

If selected, the user may at the same time generate a flow chart of the source file currently being cross-referenced.

If wanted, the user can generate in place of the SUPER INDEX, an entry point cross-reference listing showing who calls who and is called by who (with optional graphical tree output).

Notes: Operating system VMS V4.X required; not V3.X

Changes and Improvements: Bug fixes, internal enhancements

Restrictions: Does not handle CDD "Dictionary" directive

Media (Service Charge Code): 600' Magnetic Tape (MA)
Format: VAX/ANSI, or order VAX-LIB-3

DECUS NO: VAX-127 **Title:** AKCOUNT: A VMS System Accounting Package **Version:** August 1986

Submitted by: Martin Serrer, National Research Council, Ontario, Canada K1A 0R6 **Operating System:** VAX/VMS V4.3 **Source Language:** MACRO-32, VAX FORTRAN **Keywords:** System Accounting - VMS

Abstract: The AKCOUNT software has been designed to provide a VAX computer installation running V4.X of VMS operating system software with all the necessary accounting tools to charge users for resources used. The package includes all the source code, associated help files, command procedures and installation notes.

The software in SYSTEMS LABORATORY of NRC has been set up as a batch job to execute every Friday night. When the job runs, the information from the system accounting file, plus listing files from DISKQUOTA and AUTHORIZE are merged together and written to a file "SYSSACCOUNT.AKCOUNT.TOT". A report generator reads this file and creates detailed or summary type printouts.

The latest addition to the AKCOUNT software package is a repair utility. This utility enables the system manager to repair; (both automatically and interactively) and edit records in the AKCOUNT.TOT file.

Changes and Improvements: Bug fixes and new utility to EDIT/REPAIR damaged AKCOUNT.TOT files. Upgraded to work on VMS V4.X systems.

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

DECUS NO: VAX-149 **Title:** DIAL **Version:** November 1986

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

Operating System: MicroVMS V4.4, VAX/VMS V3.4 - 4.3
Source Language: C **Keywords:** Security, System Management - VMS

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

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

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

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

DECUS NO: VAX-183 **Title:** JUICER ODS-2 Disk Compressor **Version:** January 1987

Submitted by: Michael N. LeVine, Naval Weapons Center, China Lake, CA **Source Language:** MACRO-32 **Memory Required:** VAX/VMS V4.X **Keywords:** Utilities - Disk - VMS

Abstract: The JUICER package of programs and command files is provided to the system manager to allow him to monitor VAX/VMS ODS-2 disks for disk and file fragmentation and to do such compression as might be needed. The package is made up of five parts:

- . JUICER to do on line disk compression.
- . FRAG to monitor disk fragmentation.
- . FILE to monitor and optionally compress fragmented files.
- . DIR to make a map of disk directory structure and its file/block usage.
- . DISKMON to run as a detached process to provide a constant monitor to all disk(s) free space.

JUICER is an in-place disk compression utility for VAX/VMS ODS-2 disks suffering from excessive fragmentation. This program, within limitations, attempts to move portions of files from the high end of the disk to any unused areas (fragments) at the low end, freeing up larger contiguous free areas at the high end.

FRAG is run on a disk to see how badly the target disk free space is fragmented, giving a histogram of fragmented areas by size, and a calculated measure of the disk free space fragmentation.

FILE scans all the file headers on the target disk and outputs two list files, one containing a list of the 100 files having the most retrieval pointers in use, and the second being a matrix of file size versus number of pointers in use. The command file CONTIG is used which reads one of the list files produced by FILE and running interactively with the user, converts the listed files from fragmented to contiguous.

The command file DIR scans a target disk and creates an output file DIRECTORY.MAP containing a graphical output showing the on disk directory structure, with a notation for each directory showing the number of files and blocks contained therein.

DISKMON is a program that I found on a VAX SIG tape submitted by Eric Richards of Gould Ocean Systems, 18901 Euclid Avenue, Cleveland, Ohio 44117. It is a detached process which constantly monitors all disks on the system and warns when free space falls below preset values.

Notes: Operating system VMS V4.X required. Will not run under V3.X because of change in ODS-2.

Changes and Improvements: Debug internal enhancements, improved performance and output files.

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

DECUS NO: VAX-193 **Title:** VTEDIT: Keypad Text Editor and Corrector for VAXTPU **Version:** V4.2, November 1986

Submitted by: Dr. Gerhard Weck, Infodas GmbH, D-5000 Koln 71, West Germany **Operating System:** Micro VMS V4.4, VAX/VMS V4.4 **Source Language:** VAX FORTRAN, VAXTPU **Memory Required:** Virtual Hardware Required: DEC/ANSI Terminal (VT100, VT220 compatible) **Keywords:** Editors

Abstract: The Video Terminal Editor VTEDIT is an editing interface for the VAX Text Processing Utility VAXTPU available under VAX/VMS. The VTEDIT interface is an efficient, keypad driven editor allowing multi window editing and providing semi automatic, context dependent text formatting.

VTEDIT is based on the VTEDIT.TEC keyboard interface that is a part of the TECO distribution kit. This new version of VTEDIT implements nearly all of the functions of the original VTEDIT.TEC in a compatible way, and has been extended to include many new features, such as:

- . multi file and multi buffer editing
- . split screen editing
- . selection of insert and overstrike mode of editing
- . many additional editor functions, like:
 - search and replace operations
 - rectangular cut and paste operations

- operations to remember and retrieve buffer positions
 - insertion of date, time, file and buffer names
 - case and position control for searches
 - case conversion and capitalization of words
 - center line and fill paragraph operations
 - sorting of buffers and ranges
 - wildcard filename search
- . recognition of all TECO match control constructs and access to VAXTPU pattern building constructs
 - . journaling the editing session
 - . access to the VMS operating system via DCL, SPAWN and ATTACH commands
 - . access to VAXTPU
 - . optional semi automatic, context dependent text formatting providing the following functions:
 - case conversion / automatic case control
 - automatic indentation
 - manual correction of indentation
 - automatic word wrap
 - automatic line justification
 - optional automatic insertion of closing parentheses
 - optional highlighting of the matching opening parenthesis
 - . extensive online help

Notes: Installation via VMSINSTAL, needs at least 1500 blocks and SETPRV or SYSPRV & SYSNAM & CMKRNL privileges. Operating system VMS V4.4 is required.

Changes and Improvements: Adaptation to VMS V4.4, extended functionality.

Restrictions: Recompilation needs page file quota of 32000.

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

DECUS NO: VAX-208 **Title:** IMAGE **Version:** V04-03C, October 1986

Submitted by: C. J. Chapman, MEL, Crawley, Sussex, England **Operating System:** VAX/VMS V4.3 **Source Language:** DCL, FORTRAN 77, MACRO-32 **Keywords:** System Management - VMS, Utilities - VMS

Abstract: The IMAGE utility is a system management tool that enables the systems manager to obtain information on user processes or system wide processes. IMAGE is very useful for taking a snapshot look at your system to establish what images are executing. IMAGE runs on both hardcopy (LA120) and video terminals (VT220, VT241) and returns the following data:

- . User__name, process__id, uic, process state and type
- . Base priority, current priority, CPU minutes/seconds
- . Disc i/o, page faults, user image executing
- . Balance set, node, date, time

Additional functions include:

- . System image monitoring.
- . User image monitoring using batch and detached processes with data replay capability.

Release Notes are included with this utility together with the necessary files to relink. Future releases will follow.

Notes: Operating system VMS V4.0 or later required.

Changes and Improvements: Data replay capability, the node name is displayed, does not force process to inswap if outswapped.

Sources not included.

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

DECUS NO: PRO-128 **Title:** BITMAP: Direct Access Bitmap Graphics for the Professional-300 Series **Version:** November 1986

Submitted by: Stephen Hirsch, NZAEL, Canterbury, New Zealand **Operating System:** RT-11 V5.2 **Source Language:** FORTRAN IV, MACRO-11 **Hardware Required:** Professional-300 series **Keywords:** Graphics, Professional-300 Series - RT-11

Abstract: BITMAP is a group of FORTRAN callable routines that make it possible to map to the Pro300 video bitmap which is located by default at the 3 Megabyte address boundary. The main driving routine, called BITMAP allows the programmer to MOV, BIS, BIC a user buffer to or from the screen.

Also included are routines to set/clear any given pixel, to fill a horizontal line on the screen with a mask word and to dump the screen to an LA50 printer in graphics mode. It is possible by modifying BITMAP, to write to the screen in 512x4 or 256x8 resolution, but the default is 1024x2 (pixels/line x intensity levels). Using these routines, it should be possible to develop a library of routines to draw virtually anything on the Pro 300 screen.

This revision includes a new version of the BITMAP routine that uses the Global memory region allocation capabilities of RT-11 V5.2 and also allocates the Bitmap hardware wherever it may be installed in the option slots. In addition, it can be used with FORTRAN programs linked as virtual jobs and automatically handles the memory mapping required.

Notes: Operating system RT-11 V5.2 is required. Uses system calls available under V5.2 or later. Some demonstration files are incomplete.

Changes and Improvements: Modified to take advantage of RT-11 V5.2 enhancements.

Complete sources not included.

Media (Service Charge Code): One RX50 Diskette (JA) **Format:** RT-11

DECUS NO: PRO-140 **Title:** CGS: Common Graphics System for the Professional - 300 Series **Version:** V2.0, January 1987

Submitted by: John F. Davis, Los Alamos, NM **Operating System:** RT-11 V5.1 **Source Language:** FORTRAN IV, MACRO-11 **Memory Required:** Application dependent **Software Required:** FORTRAN, MACRO, RUNOFF (to generate documentation) **Keywords:** Graphics, Libraries - RT-11, Professional-300 Series - RT-11

Abstract: The Common Graphics System (CGS) is a library of FORTRAN callable subroutines that provide general purpose 2-D graphics primitives across a variety of mainframe computers. RT CGS supports the same set of user-visible primitives on all PDP-11 systems under RT-11.

The RT CGS library features loadable output device drivers, including a metafile driver. A tested user-written plotter driver is furnished as an example. The original RATFOR source for a Tektronix driver is also provided, but it has not been adapted for the PDP-11.

The metafile format is now fully documented. (This is of interest only to advanced application programmers.) Translator utility examples are provided to plot metafiles on the PRO screen or plotter.

A RATFOR definitions file, RATDEF.RFR, is now included. This file was needed only for reprocessing the original RATFOR code of the metafile translator utilities.

Except for RATFOR.SAV, all *.SAV files have been omitted. Documentation for the library is contained in RUNOFF files. Source files are provided for the entire set of libraries, utilities, and demonstration programs. Precompiled and preassembled object modules are provided. Command procedures for re-linking are furnished.

(Maintenance and upgrade documentation exists only in the form of the original VMS RATFOR and MACRO files from which RT CGS was adapted for the PRO-300 series. Anyone wishing to customize RT CGS may contact the submitter.)

Notes: Will also run on Micro PDP-11, running RT-11 V5.1.

Changes and Improvements: Loadable and/or user-written device drivers. Missing documentation and RATFOR include file now supplied.

Restrictions: 2-D primitives only.

Media (Service Charge Code): Two RX50 Diskettes (JB) **Format:** RT-11

DECUS NO: RB-101 **Title:** DTC/PC: Desktop Calendar for MS/DOS on the Rainbow **Version:** V2.0, October 1986

Submitted by: Glenn C. Everhart, Ph.D. **Operating System:** MS/DOS **Source Language:** FORTRAN 77, FORTRAN IV **Keywords:** Calendars, Scheduling

Abstract: This program allows day, week, or month at a glance displays, private and public calendar appointment files, meeting scheduling, multiple appointment setup, evening appointments, and a few other functions.

It requires an ANSI display, though the MS/DOS ANSI SYS driver will do. For users with Digital Equipment Corporation Rainbows, the 132 column mode is used to permit a full year calendar to be displayed. For others, the 80 column mode is used. This program has all the capabilities of the RSX or VMS versions except that it doesn't know what the current date is; it accepts any date you give as today. Complete source code is included (for MS FORTRAN 77). This package was developed by Mitchell Wyle and Glenn Everhart, who would appreciate copies of any significantly enhanced versions.

For installation, place DTC.EXE, DTC.DAT and DTC.HLP in the directory you will be using. If you are running MS/DOS V2 (or PCDOS V2) and do not have a VTI00, place the line DEVICE@ANSLSYS into your root CONFIG.SYS file and boot. This program requires the ANSI cursor controls.

Changes and Improvements: Fixed the date problem.

Restrictions: This program runs only under MS/DOS, uses ANSI cursor controls. 132 column mode will not work on non-supporting terminals. This program does not automatically determine current date, it must be entered.

Media (Service Charge Code): One RX50 Diskette (JA) **Format:** MS/DOS

DECUS NO: RB-113 **Title:** ADDRESS BOOK **Version:** V7, December 1986

Submitted by: Bruce W. Roeckel, Florida Power Corp., St. Petersburg, FL **Operating System:** MS/DOS V2.11 **Source Language:** FORTRAN 77 **Memory Required:** 256K **Keywords:** Business Applications

Abstract: The ADDRESS BOOK program is designed to allow a user to store the names, addresses and phone numbers of any individual. It contains a full-screen editor for the updating of any entries in the master file, as well as various means of printing the data for hardcopy storage.

The file structure is designed such that integration of other software is easy. Each entry in the master file contains a "Structure ID". This is a unique number dedicated to each entry. If a software package was designed to keep track of family member names, for instance, all that would be required is to store the Structure ID along

with the list of family member names in the new file. These names could then be indexed back to other data using the Structure ID.

Also included in this release is a copy of the first of a series of software packages that directly integrate with the ADDRESS BOOK. This first package is called Names & Dates, and allows the user to store first names, birthdates and anniversary dates of anyone listed in the ADDRESS BOOK database.

A batch file containing the compile and link run string for Microsoft FORTRAN is included.

Release Notes are distributed with each order.

Notes: Operating system MS/DOS V2.11 or later is required.

Changes and Improvements: MS/DOS MDRIVE no longer required. Other minor changes made to user interface and printouts. First in a series of integrated software packages is included.

Restrictions: Sources for private library functions are not included, but the object module required during link is supplied.

Complete sources not included.

Media (Service Charge Code): One RX50 Diskette (JA)
Format: MS/DOS

DECUS PROGRAM LIBRARY CHANGES

DECUS NO: VAX-6, **Title:** SPICE 3A6

The User's Manual, Media Service Charge Code (EC), is listed in the Catalog as being available is currently ON HOLD.

LIBRARY ANNOUNCEMENT

The Library has the following list of products available on the TK50. Each tape (media code TC) sells for \$194.00 (U.S. only), and will be treated as a regular Library product.

VAX-LIB-1	VAX LIBRARY TAPE 1
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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
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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
11-SP-84	RSX SIG COLLECTION, SPRING '85, NEW ORL
11-SP-90	RSX SIG COLLECTION, FALL '85, ANAHEIM
11-SP-92	SIG COLLECTION, SPRING '86, DALLAS

These products (media code TC) sell for \$194.00 (U.S. only).

NEW MEDIA CODE

DECUS NO: RB-123, **Title:** DECUS Point-of-Sale System, as announced in the February 09, 1987 Status Report, is available in the new media code:

RX50 Diskette (JS).

The Service Charge Code is:

Member Charge, \$60;

Non Member Charges, \$65.

SUBMITTING ARTICLES TO THE HMS SIG NEWSLETTER

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.

Contributions can be sent to:

William K. Walker		Carmen D. Wiseman
Monsanto Research Corp.	OR	Digital Review
P.O. Box 32 A-152	==	Prudential Tower, Suite 1390
Miamisburg, OH 45342		800 Boylston Street
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2200 North Greenville Ave.
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(214) 699-9500 x 272

NEWSLETTER EDITOR

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800 Boylston St. Suite 1390
Boston, MA 02199
(617) 375-4321

SYMPOSIA COORDINATOR

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P.O. Box 902 E52/ D220
El Segundo, CA 90245-0902
(213) 616-7071

MEMBERSHIP COORDINATOR

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9210 Skypark Court
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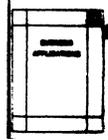
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(212) 371-2000 x 3107

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Computer Products
Pompano Beach, FL
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Ramtek
2211 Lawson Lane
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(408) 988-2211

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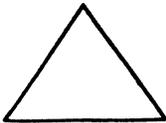
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Nashua, NH 03061-2004
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5800 West Friendly Avenue
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SPOCAD
E 502 Boone
Spokane, WA 99258
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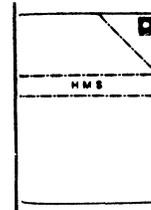
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P.O. Box 24346 M/S 03-73
Seattle, WA 98124
(206) 342-1442

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Northrop Services Inc.
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NETWORKS SIG LIAISON

Sandra Traylor
Target Systems
Yorba Linda, CA

VAX SIG LIAISON

Dave Schmidt
5100 Centre Avenue
Pittsburgh, PA

UNISIG LIAISON

Jim Livingston
1 Results Way
Cupertino, CA

SITE SIG LIAISON

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(416) 598-5955

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Bldg 180 Labs Area
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Adelaide, S.A. Australia 5001
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304 Metallurgy
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(408) 255-1500 x 5571

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(812) 299-2121 x 271

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Escondido, CA 92025
(619) 745-6006

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70 West Red Oak Lane
White Plains, NY 10604
(914) 683-6388

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Joseph Polizzi, III
Space Telescope Science Institute
3700 San Martin Drive
Homewood Campus
Baltimore, MA 21218
(301) 338-4901

PAST CHAIR

Jim Livingston
Measurex Corporation
One Results Way
Cupertino, CA 95014
(408) 973-1800 x 766

STEERING COMMITTEE MEMBERS

Ted Bear
Ramtek
2211 Lawson Lane
Santa Clara, CA 95050
(408) 988-2211

Shava Nerad
MIT
77 Mass Ave., W91-219 A
Cambridge, MA 02139

George Scott
Computer Sciences Corporation
304 West Route #38, P.O. Box N
Moorestown, NJ 08057
(609) 234-1100

Ray Strackbein
Digital Scientific
23542 Lyon's Avenue
Suite 204
Newhall, CA 91321
(805) 254-8811

Barbara Chase
Hughes Aircraft
P.O. Box 92426
Bldg RI MSC327
Los Angeles, CA 90009
(213) 606-1601

Susan Abercrombie
RD8S, INC
48 Mallilly Road
Portland, ME 04103
(207) 772-2837

**LARGE SYSTEMS****CHAIR**

Leslie Maltz
Stevens Institute of Technology
Computer Center
Hoboken, NJ 07030
(201) 420-5478
BITNET: LMALTZ@SITVXB;
ARPANET: SIT.MALTZ@CU20.B.COLUMBIA.EDU

SYMPOSIA COORDINATOR

Robert C. McQueen
Stevens Institute of Technology
Computer Center
Hoboken, NJ 07030
(201) 420-5454
BITNET: RMCQUEEN@SITVXB;
ARPANET: SIT.MCQUEEN@CU20.B.COLUMBIA.EDU

SIC-5**COMMUNICATIONS REPRESENTATIVE
NEWSLETTER EDITOR**

Clyde Poole
The University of Texas at Austin
Department of Computer Science
Taylor Hall 2.124
Austin, TX 78712-1188
(512) 471-9551
ARPANET: ctp@sally.utexas.edu

MENU COORDINATOR

Charles R.T. Bacon
National Institutes of Health
Building 12B Room 2N207
Bethesda, MD 20205
(303) 496-4823
BITNET: CRB@NIHCUDEC

HARDWARE COORDINATOR

Clive Dawson
Microelectronics & Computer Technology Corp.
9430 Research Blvd
Echelon Bldg. # 1, Suite 200
Austin, TX 78759
(512) 343-0860
ARPANET/CSNET: CLIVE@MCC.COM

LANGUAGES COORDINATOR

David Edwards
SRI International
MS PN 349
333 Ravenswood Ave
Menlo Park, CA 94021
(415) 859-6136

ASST SYMPOSIUM COORDINATOR

Betsy Ramsey
American Mathematical Society
P.O. Box 6248
Providence, RI 02940
(410) 272-9500 x 295
ARPANET: EWR@XX.LCS.MIT.EDU

SYSTEM SOFTWARE COORDINATOR

Carla Rissmeyer
University of Texas at Austin
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Austin, TX 78712
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ARPANET: CC.RISSMEYER@A20.CC.UTEXAS.EDU

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P.O. Box 1045
St. Louis, MO 63136
(314) 889-6636
UUCP: BERKLEY@WUCS.UUCP

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Austin, TX 78712
(512) 471-3241
ARPANET: CC.KASSEBAUM@A20.CC.UTEXAS.EDU

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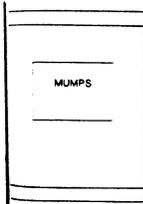
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P.O. Box 52661
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APL CONTACT

Doug Bohrer
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(203) 786-5050

RT-11 HARDWARE CONTACT C CONTACT

Carl Lowenstein
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Scripps Inst. Oceanography
San Diego, CA 92152
(619) 294-3678

WISH LIST CONTACT
UNIX CONTACT
Bradford Lubbell
L.A. Heart Lab
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Los Angeles, CA 90024
(213) 825-9290

TSX CONTACT
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Horizon Data Systems
1899- E Billingsgate Ctr
Richmond, VA 23233
(804) 740-9244

COMMUNICATIONS REPRESENTATIVE
FMS CONTACT
Susan Rasted
Softawre Dynamics Inc
85 Barnes Road
Wallingford, CT 06492
(203) 265-2226

SYMPOSIA COORDINATOR
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1684 Gude Road
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4335 N.W. Loop 410, # 209
San Antonio, TX 78229
(512) DIG-ITAL

BASIC CONTACT
Ed Stevens
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77 N Oak Knoll #104
Pasadena, CA 91101
(818) 795-5991

CAMAC CONTACT
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Kinetic Systems, Inc
11 Mary Knoll Drive
Lockport, IL 60441
(815) 888-0005

LUG CONTACT
PERSONAL COMPUTERS
Bill Walker
Monsanto Research Corp.
P.O. Box 32
Miamisburg, OH 45342
(513) 865-3557

FORTRAN CONTACT
Robert Walraven
Multiware, Inc
139 G. Street, Suite 161
Davis, CA 95616
(916) 756-3291



SITE SIG

CHAIRMAN
DMS SIG Liason
Larry W. Hicks
Relational Database services
P.O. Box 644
121 S. Main St.
Kernersville, NC 27285-0644
(919) 996-4882

SYMPOSIA COORDINATOR
Sue Abercrombie
48 Malilly Rd.
Portland, ME 04103
(207) 772-2837

SESSION NOTE EDITOR
LARGE SYSTEMS SIG LIAISON
Gary Bremer
Emerson Electric Co
8100 W. Florissant
St. Louis, MO 63136
(314) 553-4448

NEWSLETTER EDITOR
NETWORKS SIG LIAISON

OA SIG LIAISON
Gregory N. Brooks
Washington University
Behavior Research Labs
1420 Grattan St.
St. Louis, MO 63104
(314) 241-7600 ext. 257

LIBRARY COORDINATOR
RSTS SIG LIAISON
Timothy Frazer
Specialized Bicycle Components
15130 Concord Circle #77
Morgan Hill, CA 95037
(408) 779-6229

HARDWARE COORDINATOR
HMS SIG Liason
Emily Kitchen
A.H. Robins Co.
1211 Sherwood Ave. RT-2
Richmond, VA 23220
(804) 257-2925

COMMUNICATIONS COMMITTEE REPRESENTATIVE
AI SIG Liason
Terry C. Shannon
Digital Review
160 State St.
6th Floor
Boston, MA 02109
(617) 367-7190

PRE-SYMPOSIA SEMINAR COORDINATOR
Phillip Ventura

STAFF MANAGEMENT
Adam Zavitski
Simmonds Precision ICD
3100 Highland Blvd.
Raleigh, NC 27625
(919) 872-9500

MEMBERS-AT-LARGE
Ann Goergen
Texas Instruments
13510 N. Central
M/S 437
Dallas, TX 75266
(214) 995-4629

HMS SIG Liason
RT SIG Liason
David Hunt
Lawrence Livermore National Lab
MS L-230
P.O. Box 808
Livermore CA 94550
(802) 656-3190
Gary Siftar
Digital Equipment Corporation
Tulsa, OK

DEC COUNTERPARTS

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UNISIG

CHAIRMAN
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Hadron Incorporated
9990 Lee Highway
Fairfax, VA 22030
(703) 359-6100
deevax!seismo!hadron!klr

SYMPOSIA COORDINATOR
Stephen M. Lazarus
Ford Aerospace, MS X-20
3939 Fabian Way
Paulo Alto, CA 94304
(415) 852-4203
ihnp4!fortune!wdll!sml

SESSION NOTE EDITOR
Sam Kimery
716 Second Street NW
Rochester, MN 55901
(507) 281-1505

COMMUNICATIONS REPRESENTATIVE
NEWSLETTER EDITOR
James W. Livingston
Measurax Corporation
1 Results Way
Cupertino, CA 95014
(408) 255-1500 x 5556
ihnp4!deewr!jwl

ADMINISTRATIVE DAEMON
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49 Showers Drive, 451
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LaJolla, CA 92093
(619) 294-2678
(ihnp4 deevax akgua dedwest uebvax)
'sdesvax!mplvax!edl

USENET LIAISON
Joe Kelsey
FlexComm Corporation
711 Powell Avenue, SW
Renton, WA 98055
allegra!fluke!joe

STANDARDS COORDINATOR
Jeff Gilliam
National Semiconductor
2900 Semiconductor Drive, MS (2303)
Santa Clara, CA 95051
(408) 721-3801
ihnp4!nsc!voder!jeff

MINISTER WITHOUT PORTFOLIO
Norman Wilson
Bell Laboratories, 2C-529
600 Mountain Avenue
Murray Hill, NJ 07974
(201) 582-2842
(deevax ihnp4!research!norman

DEC COUNTERPART
Roseann Maclean
Merrimack, NH
(603) 884-5702
deevax!maclean

**VAX SYSTEMS SIG****CHAIR (CORE)**

Margaret Knox
Computation Center
University of Texas
Austin, TX 78712

COMMUNICATIONS REPRESENTATIVE (CORE)

Don Golden
Shell Oil Company
Westhollow Research Center
P.O. Box 1380, Room D2132
Houston, TX 77001

SYMPOSIA COORDINATOR

Jack Cundiff
Horry-Georgetown
P.O. Box 1966
Conway, SC 29526

ASST SYMPOSIUM COORD. (CORE)

David Casey
Computer Center
Union College
Schenectady, NY 12308

SESSION NOTE EDITOR

Ken Johnson
Meridian Technology Corp.
P.O. Box 2006
St. Louis, MO 63011

NEWSLETTER EDITOR

Lawrence J. Kilgallen
Box 81, MIT Station
Cambridge, MA 02139-0901

VICE CHAIR**WORKING GROUP COORDINATOR (CORE)**

Ross W. Miller
Online Data Processing, Inc.
N 637 Hamilton
Spokane, WA 99202

LIBRARIAN (CORE)

Joe L. Bingham
Mantech International
2320 Mill Road
Alexandria, VA 22314

VAXCLUSTER WORKING GROUP

Thomas Linscomb
Computation Center
University of Texas
Austin, TX 78712

CAMPGROUND

Jane Furze
3820 West Cochise
Phoenix, AZ 85064

NETWORK WORKING GROUP

Bill Hancock
Dimension Data Systems, Inc.
2510 Limestone Lane
Garland, TX 75040
(214) 495-7353

HISTORIAN

Jeffrey S. Jalbert
JCC
P.o. Box 381
Granville, OH 43023
(614) 587-0157

ADVISOR

Art McClinton
Mitre
1820 Dolley Madison Blvd.
McLean, VA 22102

MICROVAX WORKING GROUP

Ray Kaplan
Pivotal, Inc.
P.O. Box 32647
Tucson, AZ 85715-32647
(601) 886-5563

SYSTEM IMPROVEMENT REQUEST

Mark D. Oakley
Battelle Columbus Labs
Room 11-6-008
505 King Avenue
Columbus, OH 43201-2669

MULTIPROCESSOR WORKING GROUP

Eugene Pal
U.S. Army
CAORA (ATOR-CAT-C)
Fort Leavenworth, KA

PRE-SYMPOSIUM SEMINAR COORDINATOR

Susan Rehse
Lockheed Missiles
3251 Hanover Street
Palo Alto, CA 94301-1187

VAXELN WORKING GROUP

Bob Robbins
Array Computer Consultants
5364 Woodvale Drive
Sarasota, FL 33582

REAL TIME/PROCESS CONTROL WORKING GP

Larry Robertson
Bear Computer Systems Inc.
5651 Case Avenue
North Hollywood, CA

LUG COORDINATOR**HARDWARE WORKING GROUP****STORE REPRESENTATIVE (CORE)**

David Schmidt
Management Sciences Associates
5100 Centre Avenue
Pittsburgh, PA 15232

ADVISOR

Al Siegel
Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201-2693

FIELD SERVICE WORKING GROUP

D. Slater
Institute for Defense Analysis
1801 North Beauregard Street
Alexandria, VA 22314

LARGE SYSTEMS INTEGRATION WORKING GP

Osman K. Ahmad
Association of American Railroads
3140 South Federal Street
Chicago, IL 60616

VOLUNTEER COORDINATOR

Elizabeth Bailey
222 CEB
Tennessee Valley Authority
Muscle Shoals, AL 35660

ADVISOR

June Baker
Computer Sciences Corporation
6565 Arlington Boulevard
Falls Church, VA 22046

COMMERCIAL WORKING GROUP

Bob Boyd
GE Microelectronics Center
MS 2 P-04
Post Office Box 13409
Research Triangle Park, NC 27709

SECURITY

C. Douglas Brown
Sandia Labs
Division 2644
P.O. Box 5800
Albuquerque, NM 87185

ADVISOR (CORE)

Joe Angelico
US Coast Guard CCGD8(DT)
Hale Boggs F&D. Bldg
500 Camp Street
New Orleans, LA 70130

VACCLUSTER

Jim Caddick
General Datacom
Strait Turnpike
Middlebury, CT 06762-1299

MICROVAX WORKING GROUP

Barbara Dow-Pleines
Magic One
1971 Mount Pleasant Road
San Jose, CA 95148
(408) 238-0861

MIGRATION AND HOST DEVELOPMENT**VAXINTOSH WORKING GROUP**

Jim Downward
KMS Fusion Incorporated
3941 Research Park Drive
Ann Arbor, MI 48106

REAL TIME/PROCESS CONTROL WORKING GP

Dennis Frayne
McDonnell Douglas
5301 Dolsa Avenue
Huntington Beach, CA 92646

INTERNALS WORKING GROUP

Carl E. Friedberg
In House Systems
165 William Street
New York, NY 10038

Ask the WOMBAT WIZARD
Submission Form

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

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

Name: _____ DECUS Membership No. _____

Affiliation: _____

Address: _____

Telephone Number: _____

Statement of Problem: _____

Please following the following guidelines when submitting support
material:

1. If you are trying to demonstrate a method or a concept,
please simplify the procedures, records, and other information
to the shortest form possible.
2. Annotate your attachments. Simple comments or hand-written
notes ("Everything worked until I added this statement.") go a
long way toward identifying the problem.
3. Keep an exact copy of what you send. And number the pages
on both copies. But send everything that is related to your
question, even remotely.
4. If you would like a direct response or would like your
materials returned, please don't forget to include a stamped,
self-addressed envelope large enough to hold the materials you
send.

DATATRIEVE/4GL SIG
Product Improvement Request Submission Form

Submittor:
Address:

DECUS Membership Number:
Firm:

Phone:

Product or Products:

How to write a PIR

A PIR should be directed at a specific product or group of products. Be sure to give the full name of the product(s) and version numbers if applicable. Describe the functionality you would like to see in as complete terms as possible. Don't assume that the PIR editors or software developers know how it is done in some other software product - state specifically how you want the software to function. Provide justification of your request and give an example of its use. If you can, suggest a possible implementation of your request.

Abstract: (Please limit to one or two short sentences.)

Description and Examples: (Use additional pages as necessary.)

[Put my name and address on reverse side, thus:]

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

**DTR/4GL SIG Volunteer
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 DATATIEVE-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

SUITE HOST/HOSTESS

Monday April 27	Tuesday April 28	Wednesday April 29	Thursday April 30	Friday May 1
9:00-10:00am	9:00-10:00am	9:00-10:00am	9:00-10:00am	9:00-10:00am
10:00-11:00am	10:00-11:00am	10:00-11:00am	10:00-11:00am	10:00-11:00am
11:00-12:00m	11:00-12:00m	11:00-12:00m	11:00-12:00m	11:00-12:00m
12:00- 1:00pm	12:00- 1:00pm	12:00- 1:00pm	12:00- 1:00pm	12:00- 1:00pm
1:00- 2:00pm	1:00- 2:00pm	1:00- 2:00pm	1:00- 2:00pm	1:00- 2:00pm
2:00- 3:00pm	2:00- 3:00pm	2:00- 3:00pm	2:00- 3:00pm	
3:00- 4:00pm	3:00- 4:00pm	3:00- 4:00pm	3:00- 4:00pm	
4:00- 5:00pm			4:00- 5:00pm	

Susan Krentz
 NKF Engineering
 12200 Sunrise Valley Drive
 Reston, VA 22091

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)

Name: _____

Company: _____

Address: _____

Phone: _____

Please mail to:

Kathleen M. Anderson
EATON Information Management
Systems Division
2017 Cunningham Drive
Suite 208
Hampton, Virginia 23666

Phone: (804) 326-1941

IAS SIG MEMBERSHIP SURVEY

Name: _____

Address: _____

Telephone: _____

Current Hardware: (Include number and type of processors, mass storage devices, communication devices, etc.)

IAS Release: (Indicate release of IAS under which these systems are running)

Software: (Indicate software running on these systems, i.e., DECNET, Decus C, etc.)

Application: (Indicate the type of application running on the system.)

Contacts: Would you be willing to be placed on a list of contacts? If so, what areas?

Features: Do you have any features which you would like IAS to include?

Any further comments?

IAS SIG MEMBERSHIP SURVEY

fold

Frank R. Borger
Michael Reese Medical Center
Dept of Radiation Therapy
Lake Shore Drive at 31st Street
Chicago Il 60616

L&T MASTERS APPLICATION

Name _____

Business address _____

Phone number () _____

Current position _____

How long have you held this position? _____

Please check the products on which you are able to answer questions from other users:

- | | | | | | | | |
|--------------------------|-----------------------------|--------------------------|------------------|--------------------------|--------------------------|--------------------------|------|
| <input type="checkbox"/> | Fortran | <input type="checkbox"/> | Ada ¹ | <input type="checkbox"/> | Pascal | <input type="checkbox"/> | C |
| <input type="checkbox"/> | Bliss | <input type="checkbox"/> | PL/1 | <input type="checkbox"/> | APL | <input type="checkbox"/> | Scan |
| <input type="checkbox"/> | MMS | <input type="checkbox"/> | CMS | <input type="checkbox"/> | Debug | <input type="checkbox"/> | LSE |
| <input type="checkbox"/> | TPU | <input type="checkbox"/> | EVE | <input type="checkbox"/> | EDT | <input type="checkbox"/> | DTM |
| <input type="checkbox"/> | Runoff & DSR | <input type="checkbox"/> | PCA | <input type="checkbox"/> | VAX Notes | <input type="checkbox"/> | TECO |
| <input type="checkbox"/> | Software Project Management | | | <input type="checkbox"/> | Configuration Management | | |

Briefly describe your experience with those you checked. _____

Are you able to attend at least one symposium each year? _____

As a Master, your name and telephone number will be published in the Masters Directory, and users will call on you for limited help from time to time. In addition, the SIG hopes Masters will be able to do at least some of the following. Please check those you can do at least occasionally:

- Write a newsletter article on your products.
- Chair a Symposium session.
- Speak at a LUG meeting in your city.
- Host Birds-of-a-Feather or Clinic sessions at Symposia.
- Field test new versions of your product at your work site.
- Provide feedback on the product when needed by its DEC product manager.
- Act as a reference for the product at the request of Digital Sales or Marketing people.

¹Ada is a trademark of the DoD

DATAGRAM

DATAGRAMs are short messages, comments, requests, or answers that are published in NETwords. Please fill in the sections below and send the DATAGRAM to:

Vickie Hess
NETWords Editor
2510 Limestone Ln.
Garland, Tx. 75040

Title: _____

Message: _____

Your Name: _____

Address: _____

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**

Fold Here

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 _____

**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:

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:

Comments:

Name: _____

Company: _____

Address: _____

Work Phone: _____

Home Phone: _____

Return Ballot to:

**Thomas Hintz
DECUS Professional Working Group
University of Florida
IPAS 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. _____	43. _____
8. _____	17. _____	26. _____	35. _____	44. _____
9. _____	18. _____	27. _____	36. _____	45. _____

Please add the following to the wish list:

Comments:

Name: _____

Company: _____

Address: _____

Work Phone: _____

Home Phone: _____

Return Ballot to:

Lynn Jarrett
DECUS PC Sig Rainbow Working Group Chairman
Union Tribune Publishing
P.O. Box 191
San Diego, CA 92108

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: _____

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 - April 1987 - Volume 8 Number 9
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 * April 1987 - Volume 8 Number 9
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



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